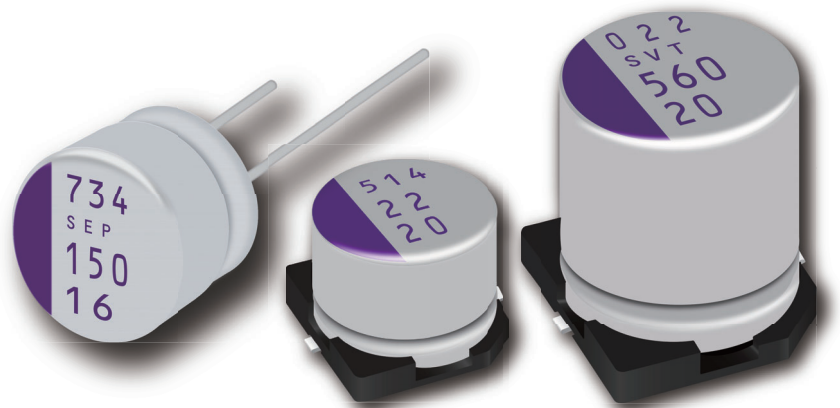


Products Catalog

# Conductive Polymer Aluminum Solid Capacitors

**OS-CON**



# IN Your Future



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## Safety and Legal Matters to Be Observed

### Product specifications and applications

- Please be advised that this product and product specifications are subject to change without notice for improvement purposes. Therefore, please request and confirm the latest delivery specifications that explain the specifications in detail before the final design, or purchase or use of the product, regardless of the application. In addition, do not use this product in any way that deviates from the contents of the company's delivery specifications.
- Unless otherwise specified in this catalog or the delivery specifications, this product is intended for use in general electronic equipment (AV products, home appliances, commercial equipment, office equipment, information and communication equipment, etc.).  
When this product is used for the following special cases, please separately discuss the delivery specifications suited to each application with the company. These include applications requiring special quality and reliability, wherein their failures or malfunctions may directly threaten human life or cause harm to the human body (e.g.: space/aircraft equipment, transportation/traffic equipment, combustion equipment, medical equipment, disaster prevention/crime prevention equipment, safety equipment, etc.).

### Safety design and product evaluation

- Please ensure safety through protection circuits, redundant circuits, etc., in the customer's system design so that a defect in our company's product will not endanger human life or cause other serious damage.
- This catalog shows the quality and performance of individual parts. The durability of parts varies depending on the usage environment and conditions. Therefore, please ensure to evaluate and confirm the state of each part after it has been mounted in your product in the actual operating environment before use.  
If you have any doubts about the safety of this product, then please notify us immediately, and be sure to conduct a technical review including the above protection circuits and redundant circuits at your company.

### Laws / Regulations / Intellectual property

- The transportation of dangerous goods as designated by UN numbers, UN classifications, etc., does not apply to this product. In addition, when exporting products, product specifications, and technical information described in this catalog, please comply with the laws and regulations of the countries to which the products are exported, especially those concerning security export control.
- Each model of this product complies with the RoHS Directive (Restriction of the use of hazardous substances in electrical and electronic equipment) (2011/65/EU and (EU) 2015/863). The date of compliance with the RoHS Directive and REACH Regulation varies depending on the product model.  
Further, if you are using product models in stock and are not sure whether or not they comply with the RoHS Directive or REACH Regulation, please contact us by selecting "Sales Inquiry" from the inquiry form.
- During the manufacturing process of this product and any of its components and materials to be used, Panasonic does not intentionally use ozone-depleting substances stipulated in the Montreal Protocol and specific bromine-based flame retardants such as PBBs (Poly-Brominated Biphenyls) / PBDEs (Poly-Brominated Diphenyl Ethers). In addition, the materials used in this product are all listed as existing chemical substances based on the Act on the Regulation of Manufacture and Evaluation of Chemical Substances.
- With regard to the disposal of this product, please confirm the disposal method in each country and region where it is incorporated into your company's product and used.
- The technical information contained in this catalog is intended to show only typical operation and application circuit examples of this product. This catalog does not guarantee that such information does not infringe upon the intellectual property rights of Panasonic or any third party, nor imply that the license of such rights has been granted.

**Panasonic Industry will assume no liability whatsoever if the use of our company's products deviates from the contents of this catalog or does not comply with the precautions. Please be advised of these restrictions.**

## Matters to Be Observed When Using This Product

### (Conductive Polymer Aluminum Solid Capacitors / OS-CON)

#### Use environments and cleaning conditions

- This product (capacitor) is intended for standard general-purpose use in electronic equipment, and is not designed for use in the specific environments described below. Using the product in such specific environments or service conditions, therefore, may affect the performance of the product.

Please check with us about the performance and reliability of the product first before using the product.

- (1) Used in liquid, such as water, oil, chemicals, and organic solvents.
- (2) Used in a place exposed to direct sunlight, an outdoor place with no shielding, or a dusty place.
- (3) Used in a wet place (dew concentration on a resistor, water leakage, etc.), a place exposed to sea breeze, or a place filled with a corrosive gas, such as  $\text{Cl}_2$ ,  $\text{H}_2\text{S}$ ,  $\text{NH}_3$ ,  $\text{SO}_2$ , or  $\text{NO}_x$ .
- (4) Used in an environment where static electricity and electromagnetic waves are strong.
- (5) The product is located close to a heating component or a flammable material, such as a vinyl cable, is placed near the product.
- (6) The product is used sealed with a resin, etc.
- (7) Solder flux of the soldered product is cleansed with a solvent, water, and a water-soluble cleaner.  
(Be careful with water soluble solder flux.)
- (8) Used in an environment where an acidic or alkali atmosphere is present.
- (9) Used in an environment where excessive vibration or impact is applied to the product.
- (10) Used under a low atmospheric pressure condition or depressurized condition.

- Cleaning can be performed with cleaning agents, including higher-grade alcohol-based cleaning solutions such as Pine Alpha ST-100S, Cleanthru 750H, 750L, 710M, 750K, Techno Care FRW14-17, CFC substitutes such as AK-225AES, and IPA. Please confirm the following precautions before cleaning.

- (1) Use an immersion, ultrasonic wave, or other cleaning method, and the cleaning time should not exceed 2 minutes.
- (2) The temperature of the cleaning solution should be less than or equal to 60°C.
- (3) Control contamination of cleaning agents (conductivity, pH, specific gravity, water content, etc.).
- (4) After cleaning, do not store the product in the atmosphere of the cleaning solution or in an airtight container.
- (5) When drying the circuit board or this product, use hot air below the upper limit temperature of their category.
- (6) Please be mindful that rubbing the printed surface of this product after cleaning may erase the markings depending on the cleaning agent used.
- (7) Please contact us separately for details on cleaning agents, cleaning methods, etc., and for cleaning solutions other than those listed above.

- Fixing agents and coating agents

- (1) Select appropriate materials for the outer packaging and sealing materials of this product. Do not use acetone, especially in fixing agents, coating agents, or diluents.
- (2) When using a fixing agent or coating agent, ensure that no flux residue or contamination remains between the circuit board and the sealing area of this product.
- (3) Allow cleaning agents, etc. to dry before using fixing agents or coating agents.
- (4) Please contact us for thermal curing conditions for fixing agents or coating agents.

- When the capacitor is used in a circuit where an impact voltage is applied or a high voltage is applied in a short period (transient phenomenon) or a high pulse voltage is applied, make sure to use the capacitor at a voltage equal to or lower than its rated voltage.



## Response to anomalies and handling conditions

- The main failure mode is a short-circuit mode caused mainly by thermal stress, electrical stress, and mechanical stress due to soldering and operating temperature environments. To prevent the occurrence of short circuits, the following measures should be adequately taken to ensure safety.
  - (1) If odorous gases are generated, then turn off the main power of the set equipment and stop using it.  
In this case, keep your face and hands away from the equipment.
  - (2) Depending on conditions, it may take several seconds to several minutes before odorous gases are generated.  
When using a protection circuit, design it so that it operates during this period.
  - (3) If odorous gases get into your eyes or are inhaled, immediately wash your eyes with water or gargle.
  - (4) Do not lick the electrolyte of the product. If the electrolyte gets on your skin, then wash it off with soap.
  - (5) When a current value after the short of the product is extremely large, the shorted capacitor may spark out, which, in the worst scenario, may result in ignition. Ensure the safety of the circuit by, for example, giving it a redundant circuit structure or providing it with a protective circuit.

## Reliability and product life

The failure rate of the capacitor is specified based on 0.5%/1000 h (reliability level 60%), a failure rate conforming to JIS C 5003 (failure rate level). This indicates that the possibility of occurrence of a failure is by no means zero. One of the failure modes is a wear out failure. This happens when the period of guaranteeing the durability and high-temperature/high-humidity resistance of the capacitor is over, changes in the electrical characteristics of the capacitor (product) get larger and its electrolyte gradually deteriorates into an insulating material to create an open mode. Another failure mode is a random failure in which a short mode results mainly because of thermal, electrical, or mechanical stress, etc.

## Circuit design and circuit board design

- Due to reasons such as increased leakage currents, do not use this product in high impedance circuits, coupling circuits, time constant circuits, and circuits that are significantly affected by leakage currents.
- During circuit design, be mindful that the electrical characteristics of this product, such as capacitance and ESR, may fluctuate within the specified ranges even under conditions that meet the rated electrical and mechanical performance.
- Leakage currents may increase due to mechanical and thermal stress (soldering, high-temperature no-load test, etc.). However, when the voltage (lower than or equal to the category voltage and upper limit temperature) is applied, leakage currents gradually decrease due to the self-recovery function.
- If an excessive rush current flows due to rapid charging and discharging, then it may lead to short circuits and increased leakage currents. Therefore, apply a protection circuit to this product if the rush current value flowing through it is as follows.
  - (1) When a rush current of 10 A or more flows through a product whose tenfold allowable ripple current is less than 10 A.
  - (2) With regard to a product whose tenfold allowable ripple current is 10 A or more, when a rush current exceeding the tenfold value flows through the product.
- The resin on the surface of the case does not guarantee insulation. In addition, there is an indefinite resistance between the case and the cathode terminal, and they are not insulated. Therefore, completely isolate the case from the cathode terminal, anode terminal, and circuit pattern.

## Mounting and storage conditions

- Soldering with a soldering iron
  - (1) Since the lead wire pitch dimension of the radial lead type capacitor and the printed circuit board hole pitch dimension do not match, when processing the lead wires, do not apply stress to the body before soldering.
  - (2) When soldering, do not apply excessive stress to the body of this product.
  - (3) Once the product has been soldered, when using a soldering iron to remove it, remove it after the solder has completely melted so as not to apply stress to the electrode terminals of the product.
  - (4) Do not allow the tip of the soldering iron to touch the body of this product.

**■ Flow soldering**

- (1) Do not apply flow soldering to the surface mount type model of this product.
- (2) Do not solder this product by immersing its body in molten solder.
- (3) Solder only on the opposite side of the circuit board surface where this product is mounted.
- (4) Do not allow flux to adhere to parts other than the electrode terminals.
- (5) Do not allow other parts to fall over and come into contact with this product during soldering.

**■ Reflow soldering**

- (1) Do not apply reflow soldering to the radial lead type model of this product.
- (2) Please contact us separately for soldering conditions for using the VPS method.

**■ Handling after soldering**

Observe the following precautions to avoid applying excessive stress on this product.

- (1) Do not tilt, knock over, or twist this product.
- (2) Do not move the circuit board by grabbing this product.
- (3) Do not hit this product with objects.
- (4) When stacking circuit boards, do not allow circuit boards or other parts to come in contact with this product.

- It is recommended that all components in the bag be used up by opening the bag immediately before use. However, if the remaining components are to be stored after opening the bag, please use them up within the following specified period\* to maintain good solderability.

\* The surface mount type does not comply with the JEDEC J-STD-020 specification.

- |                                       |                                                                                                                  |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------|
| (1) Surface mount type                | : Within 24 months after shipment (before opening) and within 30 days after opening (packaged with carrier tape) |
| (2) Radial lead type (bagged product) | : Within 30 months after shipment (before opening) and within 7 days after opening                               |
| (3) Radial lead type (taped product)  | : Within 24 months after shipment (before opening) and within 7 days after opening                               |

## Reference information

### Intellectual property

Panasonic Group provides customers with safe products and services. We are also making great efforts to protect our intellectual property rights for Panasonic Group products. Typical patents related to this product are as follows.

[U.S. patent]

USP No. 7158367

## Line up

## SMD type

| Series | Features                                           | Small size/Low profile | Large cap. | Low ESR | High voltage | Long life/High reliability | Category tem. range (°C) | Rated voltage range (V) | ESR (mΩ) | Rated capacitance range (μF) | Size code | Size (mm) |      |
|--------|----------------------------------------------------|------------------------|------------|---------|--------------|----------------------------|--------------------------|-------------------------|----------|------------------------------|-----------|-----------|------|
|        |                                                    |                        |            |         |              |                            |                          |                         |          |                              |           | øD        | L    |
| SVT    | Low ESR<br>Large capacitance<br>125 °C 2000 h      |                        | ●          | ●       | ●            | ●                          | -55 to 125               | 2.5 to 16               | 15 to 24 | 100 to 820                   | C65       | 6.3       | 6.4  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 2.5 to 50               | 20 to 35 | 18 to 680                    | E7        | 8.0       | 6.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16                      | 18       | 560                          | E10       | 8.0       | 10.0 |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 2.5 to 50               | 10 to 25 | 39 to 1500                   | E12       | 8.0       | 11.9 |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16                      | 16       | 1000                         | F10       | 10.0      | 10.0 |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 2.5 to 50               | 12 to 20 | 68 to 2700                   | F12       | 10.0      | 12.6 |
| SVPT   | Low ESR<br>Large capacitance<br>105 °C 20000 h     |                        | ●          | ●       | ●            | ●                          | -55 to 105               | 2.5 to 16               | 15 to 24 | 100 to 820                   | C65       | 6.3       | 6.4  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 2.5 to 50               | 20 to 35 | 18 to 680                    | E7        | 8.0       | 6.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 18       | 560                          | E10       | 8.0       | 10.0 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 2.5 to 50               | 10 to 25 | 39 to 1500                   | E12       | 8.0       | 11.9 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 16       | 1000                         | F10       | 10.0      | 10.0 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 2.5 to 50               | 12 to 20 | 68 to 2700                   | F12       | 10.0      | 12.6 |
| SVF    | High voltage<br>Large capacitance<br>125 °C 1000 h |                        | ●          |         | ●            | ●                          | -55 to 125               | 16 to 25                | 27 to 40 | 27 to 82                     | B6        | 5.0       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16 to 50                | 22 to 40 | 10 to 180                    | C6        | 6.3       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16 to 50                | 22 to 35 | 18 to 270                    | E7        | 8.0       | 6.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16 to 50                | 14 to 25 | 39 to 560                    | E12       | 8.0       | 11.9 |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16                      | 16       | 1000                         | F10       | 10.0      | 10.0 |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16 to 50                | 12 to 20 | 68 to 1000                   | F12       | 10.0      | 12.6 |
| SVPK   | High voltage<br>Large capacitance<br>125 °C 1000 h |                        | ●          |         | ●            | ●                          | -55 to 125               | 16 to 50                | 27 to 80 | 10 to 100                    | B6        | 5.0       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16 to 50                | 22 to 35 | 22 to 220                    | C6        | 6.3       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16 to 50                | 22 to 35 | 33 to 330                    | E7        | 8.0       | 6.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16 to 50                | 14 to 25 | 68 to 680                    | E12       | 8.0       | 11.9 |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 16 to 50                | 12 to 20 | 120 to 1200                  | F12       | 10.0      | 12.6 |
| SXV    | Super high voltage<br>125 °C 1000 h                |                        |            |         | ●            | ●                          | -55 to 125               | 63 to 100               | 60       | 6.8 to 18                    | E7        | 8.0       | 6.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 63 to 100               | 50 to 60 | 15 to 39                     | F8        | 10.0      | 7.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 63 to 100               | 25 to 40 | 15 to 56                     | E12       | 8.0       | 11.9 |
|        |                                                    |                        |            |         |              |                            | -55 to 125               | 63 to 100               | 25 to 30 | 18 to 100                    | F12       | 10.0      | 12.6 |
| SVPG   | Low ESR<br>High ripple current<br>105 °C 5000 h    |                        |            |         | ●            | ●                          | -55 to 105               | 16 to 25                | 25 to 30 | 15 to 47                     | B45       | 5.0       | 4.4  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 15       | 100                          | B6        | 5.0       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 14       | 220                          | C6        | 6.3       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 10       | 270                          | C8        | 6.3       | 7.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 8        | 270                          | C10       | 6.3       | 9.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 6.5      | 330                          | C10L      | 6.3       | 10.4 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 16       | 330                          | E7        | 8.0       | 6.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 10       | 560                          | E10       | 8.0       | 10.0 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 8        | 680                          | E12       | 8.0       | 11.9 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 9        | 820                          | F10       | 10.0      | 10.0 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 7        | 1200                         | F12       | 10.0      | 12.6 |
| SVPF   | High voltage<br>Large capacitance<br>105 °C 5000 h |                        | ●          |         | ●            | ●                          | -55 to 105               | 16 to 25                | 27 to 40 | 27 to 82                     | B6        | 5.0       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16 to 50                | 22 to 40 | 10 to 180                    | C6        | 6.3       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16 to 50                | 22 to 35 | 18 to 270                    | E7        | 8.0       | 6.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 18       | 560                          | E10       | 8.0       | 10.0 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16 to 50                | 14 to 25 | 39 to 560                    | E12       | 8.0       | 11.9 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 16                      | 16       | 1000                         | F10       | 10.0      | 10.0 |
| SVPA   | Low ESR<br>High ripple current                     |                        |            | ●       |              |                            | -55 to 105               | 16 to 50                | 12 to 20 | 68 to 1000                   | F12       | 10.0      | 12.6 |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 2.5 to 20               | 30 to 40 | 10 to 82                     | B6        | 5.0       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 2.5 to 20               | 20 to 35 | 22 to 180                    | C6        | 6.3       | 5.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 2.5 to 20               | 20 to 33 | 47 to 330                    | E7        | 8.0       | 6.9  |
|        |                                                    |                        |            |         |              |                            | -55 to 105               | 2.5 to 16               | 19 to 29 | 180 to 820                   | F8        | 10.0      | 7.9  |

**Line up**
**SMD type**

| Series               | Features                                             | Small size/Low profile | Large cap. | Low ESR | High voltage | Long life/High reliability | Category tem. range (°C) | Rated voltage range (V) | ESR (mΩ)   | Rated capacitance range (μF) | Size code | Size (mm) |      |
|----------------------|------------------------------------------------------|------------------------|------------|---------|--------------|----------------------------|--------------------------|-------------------------|------------|------------------------------|-----------|-----------|------|
|                      |                                                      |                        |            |         |              |                            |                          |                         |            |                              |           | øD        | L    |
| <b>NRFND</b><br>SVPB | Low profile                                          | ●                      |            |         |              |                            | -55 to 105               | 2.5 to 20               | 40 to 45   | 15 to 120                    | C5        | 6.3       | 4.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 20                      | 35         | 22                           | C55       | 6.3       | 5.4  |
| SVPC                 | Low ESR<br>Large capacitance                         |                        | ●          | ●       |              |                            | -55 to 105               | 2.5 to 16               | 19 to 35   | 39 to 180                    | B6        | 5.0       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.5 to 16               | 15 to 30   | 68 to 560                    | C6        | 6.3       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.5 to 16               | 19 to 27   | 120 to 680                   | E7        | 8.0       | 6.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.5 to 16               | 9 to 16    | 270 to 1500                  | E12       | 8.0       | 11.9 |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.5                     | 12         | 2700                         | F12       | 10.0      | 12.6 |
| SVPD                 | Guaranteed at 125°C<br>High voltage<br>85 °C 85 % RH |                        |            |         | ●            | ●                          | -55 to 125               | 10 to 25                | 45 to 65   | 10 to 56                     | C6        | 6.3       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 125               | 16 to 35                | 40 to 70   | 8.2 to 82                    | E7        | 8.0       | 6.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 125               | 25 to 35                | 45 to 60   | 18 to 39                     | F8        | 10.0      | 7.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 125               | 25 to 35                | 30 to 50   | 22 to 47                     | E12       | 8.0       | 11.9 |
|                      |                                                      |                        |            |         |              |                            | -55 to 125               | 25 to 35                | 28 to 30   | 47 to 82                     | F12       | 10.0      | 12.6 |
| SVPE                 | Low ESR<br>Large capacitance                         |                        | ●          | ●       |              |                            | -55 to 105               | 2.5 to 6.3              | 10 to 15   | 150 to 390                   | B6        | 5.0       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.5 to 10               | 10 to 20   | 220 to 820                   | C6        | 6.3       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.0 to 16               | 8 to 11    | 180 to 1200                  | C10       | 6.3       | 9.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 16                      | 10         | 470                          | F12       | 10.0      | 12.6 |
| SVPS                 | Long life                                            |                        |            |         | ●            |                            | -55 to 105               | 4.0 to 10               | 200 to 220 | 10 to 33                     | A5        | 4.0       | 5.4  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 4.0 to 16               | 30 to 90   | 22 to 68                     | B6        | 5.0       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 4.0 to 20               | 22 to 60   | 22 to 150                    | C6        | 6.3       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 4.0 to 25               | 22 to 60   | 10 to 270                    | E7        | 8.0       | 6.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 4.0 to 16               | 20 to 35   | 100 to 680                   | F8        | 10.0      | 7.9  |
| SVQP                 | Guaranteed at 125 °C                                 |                        |            |         | ●            |                            | -55 to 105               | 4.0 to 20               | 40 to 60   | 22 to 150                    | C6        | 6.3       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 6.3 to 20               | 35 to 45   | 47 to 220                    | E7        | 8.0       | 6.9  |
| SVP                  | Standard                                             |                        |            |         |              |                            | -55 to 105               | 4.0 to 16               | 200 to 260 | 3.3 to 33                    | A5        | 4.0       | 5.4  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 4.0 to 20               | 60 to 120  | 10 to 68                     | B6        | 5.0       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.5 to 20               | 23 to 60   | 22 to 220                    | C6        | 6.3       | 5.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 4.0 to 20               | 35 to 45   | 33 to 330                    | E7        | 8.0       | 6.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 4.0 to 20               | 25 to 40   | 56 to 680                    | F8        | 10.0      | 7.9  |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.5 to 20               | 13 to 24   | 100 to 680                   | E12       | 8.0       | 11.9 |
|                      |                                                      |                        |            |         |              |                            | -55 to 105               | 2.5 to 20               | 12 to 20   | 150 to 1500                  | F12       | 10.0      | 12.6 |

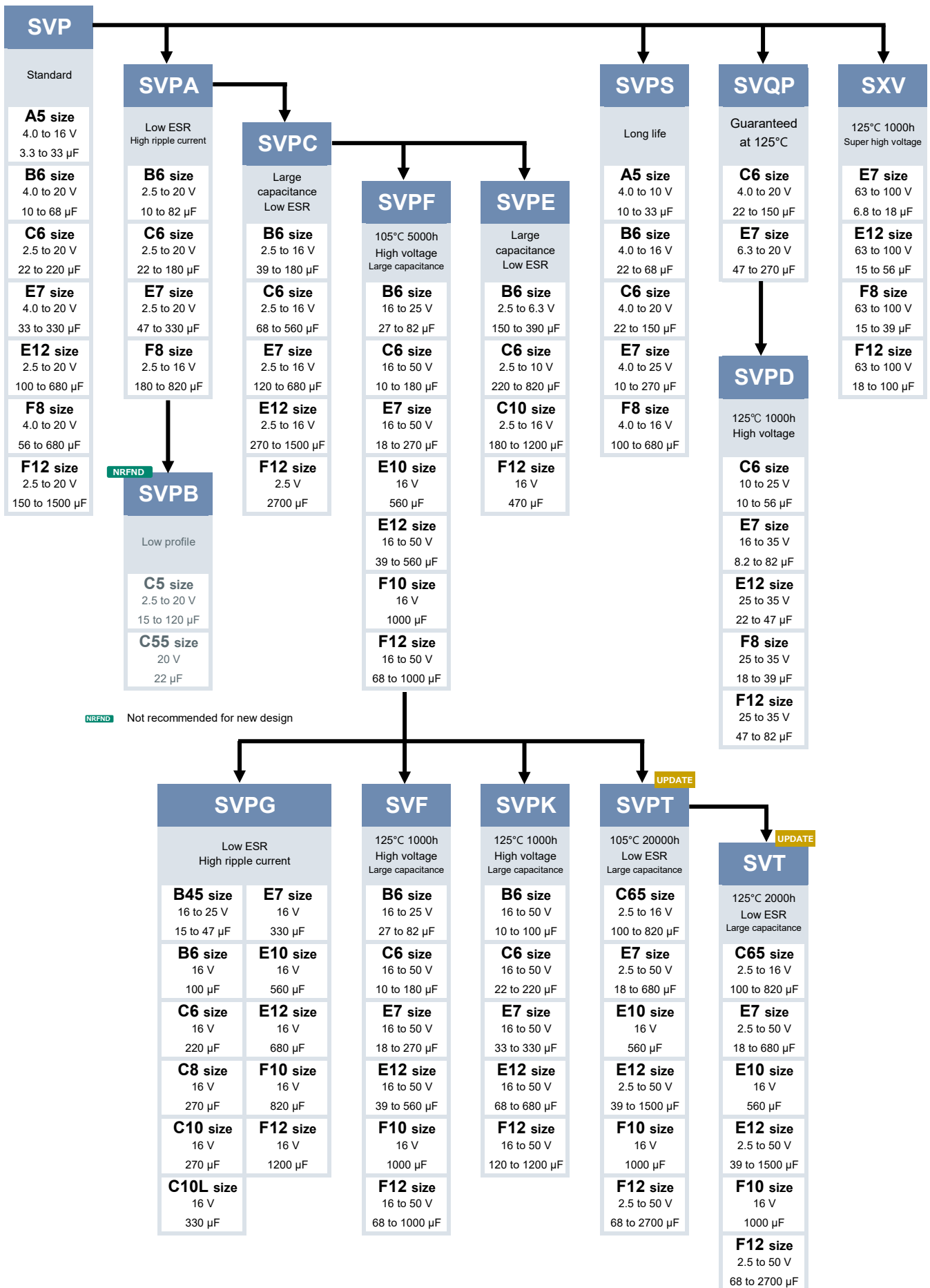
**NRFND** Not recommended for new design

**Line up**
**Radial lead type**

| Series | Features                                                                         | Small size/Low profile | Large cap. | Low ESR | High voltage | Long life/High reliability | Category tem. range (°C) | Rated voltage range (V) | ESR (mΩ)  | Rated capacitance range (μF) | Size code | Size (mm) |      |
|--------|----------------------------------------------------------------------------------|------------------------|------------|---------|--------------|----------------------------|--------------------------|-------------------------|-----------|------------------------------|-----------|-----------|------|
|        |                                                                                  |                        |            |         |              |                            |                          |                         |           |                              |           | øD        | L    |
| SEF    | High voltage<br>Large capacitance<br>125 °C 1000 h                               |                        | ●          |         | ●            | ●                          | -55 to 125               | 16 to 35                | 22 to 35  | 22 to 180                    | C6        | 6.3       | 5.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 16 to 35                | 22 to 30  | 39 to 270                    | E7        | 8.0       | 6.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 16 to 35                | 14 to 20  | 82 to 560                    | E12       | 8.0       | 11.9 |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 16 to 5                 | 12 to 18  | 120 to 1000                  | F13       | 8.0       | 12.9 |
| SEK    | High voltage<br>Large capacitance<br>125 °C 1000 h                               |                        | ●          |         | ●            | ●                          | -55 to 125               | 25 to 50                | 25 to 35  | 22 to 82                     | C6        | 6.3       | 5.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 25 to 50                | 24 to 35  | 33 to 120                    | E7        | 8.0       | 6.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 25 to 50                | 16 to 25  | 68 to 270                    | E12       | 8.0       | 11.9 |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 25 to 50                | 14 to 20  | 120 to 470                   | F13       | 8.0       | 12.9 |
| SEPG   | Low ESR<br>High ripple current<br>105 °C 5000 h                                  |                        |            | ●       |              | ●                          | -55 to 105               | 16                      | 12        | 150                          | B9        | 5.0       | 8.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16                      | 10        | 270                          | C9        | 10.0      | 8.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16                      | 8         | 270                          | C10       | 6.3       | 9.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16                      | 8         | 470                          | E9        | 8.0       | 8.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16                      | 8         | 560                          | E13       | 8.0       | 12.9 |
| SXE    | Super high voltage<br>125 °C 1000 h                                              |                        |            |         | ●            | ●                          | -55 to 125               | 63 to 100               | 60        | 6.8 to 18                    | E7        | 8.0       | 6.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 63 to 100               | 50 to 60  | 15 to 39                     | F8        | 8.0       | 7.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 63 to 100               | 25 to 40  | 15 to 56                     | E12       | 8.0       | 11.9 |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 63 to 100               | 25 to 30  | 18 to 100                    | F13       | 8.0       | 12.9 |
| SEPF   | Small size<br>Low profile<br>High voltage<br>Large capacitance<br>105 °C 5000 h  | ●                      | ●          |         | ●            | ●                          | -55 to 105               | 16 to 32                | 30 to 35  | 22 to 150                    | C55       | 6.3       | 5.4  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16 to 35                | 22 to 35  | 22 to 180                    | C6        | 6.3       | 5.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16 to 35                | 22 to 30  | 39 to 270                    | E7        | 8.0       | 6.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16 to 35                | 14 to 20  | 82 to 560                    | E12       | 8.0       | 11.9 |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16 to 35                | 12 to 18  | 120 to 1000                  | F13       | 10.0      | 12.9 |
| SEPC   | Super low ESR<br>Large capacitance<br>Small size<br>Low profile<br>105 °C 5000 h | ●                      | ●          | ●       |              | ●                          | -55 to 105               | 2.5                     | 7         | 100 to 560                   | B9        | 5.0       | 8.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 6.3                     | 18        | 220                          | C55       | 6.3       | 5.4  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 2.5 to 16               | 10 to 24  | 100 to 560                   | C6        | 6.3       | 5.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 2.5 to 16               | 7 to 10   | 100 to 820                   | C9        | 6.3       | 8.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 2.5 to 16               | 8 to 22   | 150 to 1000                  | E7        | 8.0       | 6.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 2.5 to 16               | 5 to 10   | 180 to 1000                  | E9        | 8.0       | 8.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 16                      | 11 to 16  | 180 to 270                   | E12       | 8.0       | 11.9 |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 2.5 to 6.3              | 7 to 8    | 470 to 820                   | E13       | 8.0       | 12.9 |
| SEQP   | 105 °C 5000 h<br>Guaranteed at 125 °C<br>Rated 32 V max.                         |                        |            |         | ●            | ●                          | -55 to 105               | 2.5 to 16               | 7 to 10   | 470 to 2700                  | F13       | 10.0      | 12.9 |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 4.0 to 20               | 40 to 60  | 22 to 150                    | C6        | 6.3       | 5.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 4.0 to 32               | 35 to 100 | 6.8 to 330                   | E7        | 8.0       | 6.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 4.0 to 32               | 25 to 80  | 15 to 680                    | F8        | 10.0      | 7.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 125               | 4.0 to 32               | 13 to 50  | 18 to 560                    | E12       | 8.0       | 11.9 |
| SEP    | Standard                                                                         |                        |            |         | ●            | ●                          | -55 to 125               | 4.0 to 20               | 12 to 20  | 150 to 1200                  | F13       | 10.0      | 12.9 |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 4.0 to 20               | 40 to 60  | 22 to 150                    | C6        | 6.3       | 5.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 4.0 to 20               | 35 to 45  | 33 to 330                    | E7        | 8.0       | 6.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 4.0 to 20               | 25 to 40  | 56 to 680                    | F8        | 10.0      | 7.9  |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 2.5 to 20               | 13 to 24  | 100 to 680                   | E12       | 8.0       | 11.9 |
| SEP    | Standard                                                                         |                        |            |         | ●            | ●                          | -55 to 105               | 2.5 to 20               | 12 to 20  | 150 to 1500                  | F12       | 10.0      | 12.9 |
|        |                                                                                  |                        |            |         |              |                            | -55 to 105               | 2.5 to 20               | 12 to 20  | 150 to 1500                  | F12       | 10.0      | 12.9 |

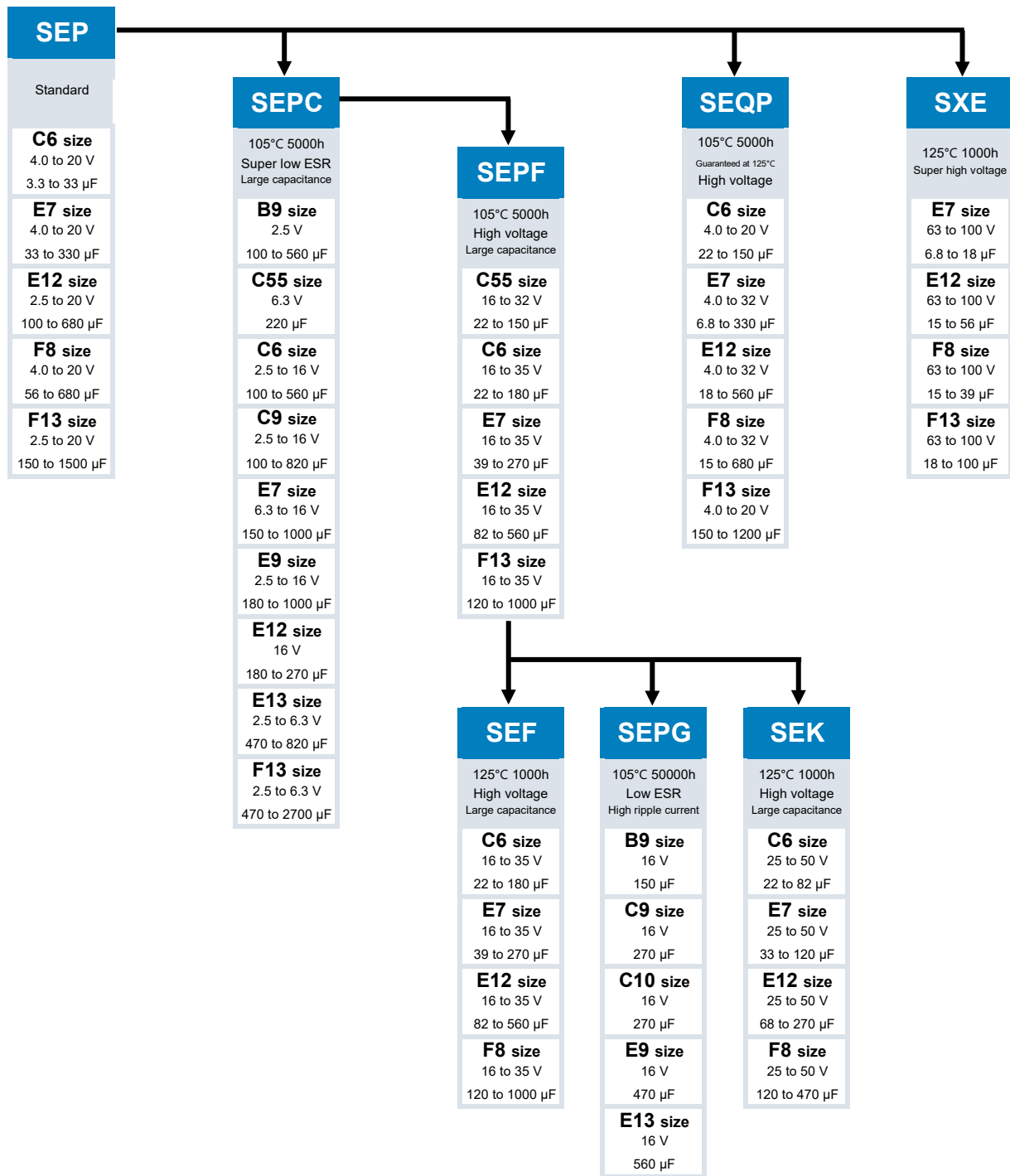
## Series flow chart

## ● SMD type



## Series flow chart

### ● Radial lead type





Voltage - Capacitance table (SMD type) (Vol. : 2.0 to 16 V / Cap. : 3.3 to 33  $\mu$ F)Series [Size]  
(ESR m $\Omega$ )

| V<br>$\mu$ F | 3.3               | 4.7               | 6.8               | 8.2 | 10                 | 12 | 15                 | 18 | 22                 | 27 | 33                |
|--------------|-------------------|-------------------|-------------------|-----|--------------------|----|--------------------|----|--------------------|----|-------------------|
| 2.0          |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
| 2.5          |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
| 4.0          |                   |                   |                   |     |                    |    |                    |    | SVPS [A5]<br>(200) |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    | SVP [A5]<br>(200)  |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
| 6.3          |                   |                   |                   |     |                    |    |                    |    | SVPS [A5]<br>(200) |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    | SVP [A5]<br>(200)  |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
| 10           |                   | SVP [A5]<br>(240) | SVP [A5]<br>(240) |     | SVPS [A5]<br>(220) |    | SVPS [A5]<br>(200) |    |                    |    | SVPS [B6]<br>(70) |
|              |                   |                   |                   |     | SVP [A5]<br>(220)  |    | SVP [A5]<br>(200)  |    |                    |    | SVP [B6]<br>(70)  |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
| 16           | SVP [A5]<br>(260) |                   |                   |     |                    |    | SVP [B6]<br>(120)  |    | SVPS [B6]<br>(90)  |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    | SVP [B6]<br>(90)   |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |
|              |                   |                   |                   |     |                    |    |                    |    |                    |    |                   |

Size list  $\phi \times L$  (mm)

|    |         |     |         |     |         |      |          |     |          |     |           |
|----|---------|-----|---------|-----|---------|------|----------|-----|----------|-----|-----------|
| A5 | 4.0x5.4 | B45 | 5.0x4.4 | C6  | 6.3x5.9 | C8   | 6.3x7.9  | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | B6  | 5.0x5.9 | C65 | 6.3x6.4 | C10  | 6.3x9.9  | E10 | 8.0x10.0 | F10 | 10.0x10.0 |
|    |         |     |         |     |         | C10L | 6.3x10.4 | E12 | 8.0x11.9 | F12 | 10.0x12.6 |

Voltage - Capacitance table (SMD type) (Vol. : 2.0 to 16 V / Cap. : 39 to 270  $\mu$ F)Series [Size]  
(ESR m $\Omega$ )

| V $\mu$ F | 39                   | 47                 | 56                | 68                   | 82                | 100                  | 120                  | 150                     | 180                     | 220                  | 270                |
|-----------|----------------------|--------------------|-------------------|----------------------|-------------------|----------------------|----------------------|-------------------------|-------------------------|----------------------|--------------------|
| 2.0       |                      |                    |                   |                      |                   |                      |                      |                         |                         |                      |                    |
| 2.5       |                      |                    |                   |                      | SVPA [B6]<br>(30) |                      |                      |                         | SVPA [C6]<br>(20)       | SVP [C6]<br>(23)     | SVPE [B6]<br>(10)  |
|           |                      |                    |                   |                      |                   |                      |                      |                         | SVPC [B6]<br>(30,24,19) |                      |                    |
|           |                      |                    |                   |                      |                   |                      |                      |                         |                         |                      |                    |
|           |                      |                    |                   |                      |                   |                      |                      |                         |                         |                      |                    |
|           |                      |                    |                   |                      |                   |                      |                      |                         |                         |                      |                    |
| 4.0       | SVP [B6]<br>(70)     |                    |                   | SVPA [B6]<br>(30)    |                   |                      |                      | SVPA [C6]<br>(22)       |                         |                      | SVPA [E7]<br>(22)  |
|           |                      |                    |                   | SVPS [B6]<br>(30)    |                   |                      |                      | SVPC [B6]<br>(30,23,20) |                         |                      | SVPS [E7]<br>(22)  |
|           |                      |                    |                   | SVP [B6]<br>(60)     |                   |                      |                      | SVPS [C6]<br>(22)       |                         |                      |                    |
|           |                      |                    |                   |                      |                   |                      |                      | SVQP [C6]<br>(40)       |                         |                      |                    |
|           |                      |                    |                   |                      |                   |                      |                      | SVP [C6]<br>(40)        |                         |                      |                    |
| 6.3       |                      | SVPA [B6]<br>(30)  |                   |                      | SVQP [C6]<br>(45) | SVPC [B6]<br>(30,25) | SVPA [C6]<br>(22)    | SVPE [B6]<br>(12)       |                         | SVPA [E7]<br>(22)    |                    |
|           |                      | SVPS [B6]<br>(30)  |                   |                      | SVP [C6]<br>(45)  | SVQP [C6]<br>(40)    | SVPC [B6]<br>(21)    |                         |                         | SVPC [C6]<br>(27,15) |                    |
|           |                      | SVP [B6]<br>(70)   |                   |                      |                   | SVP [C6]<br>(40)     | SVPS [C6]<br>(22)    |                         |                         | SVPE [B6]<br>(15)    |                    |
|           |                      |                    |                   |                      |                   |                      | SVP [C6]<br>(17)     |                         |                         | SVPE [C6]<br>(10)    |                    |
|           |                      |                    |                   |                      |                   |                      |                      |                         |                         | SVPS [E7]<br>(22)    |                    |
|           |                      |                    |                   |                      |                   |                      |                      |                         |                         | SVQP [E7]<br>(35)    |                    |
|           |                      |                    |                   |                      |                   |                      |                      |                         |                         | SVP [E7]<br>(35)     |                    |
|           |                      |                    |                   |                      |                   |                      |                      |                         |                         | SVP [F8]<br>(25)     |                    |
| 10        |                      | SVP [C6]<br>(50)   | SVPD [C6]<br>(45) | SVPA [C6]<br>(30)    |                   |                      | SVPC [C6]<br>(27,22) | SVPA [E7]<br>(30)       |                         | SVPE [C6]<br>(20)    | SVPC [E7]<br>(22)  |
|           |                      |                    | SVQP [C6]<br>(45) | SVPC [B6]<br>(30,23) |                   |                      | SVQP [E7]<br>(35)    | SVPS [E7]<br>(30)       |                         |                      | SVP [F8]<br>(25)   |
|           |                      |                    | SVP [C6]<br>(45)  | SVPS [C6]<br>(30)    |                   |                      | SVP [E7]<br>(35)     | SVPS [F8]<br>(30)       |                         |                      |                    |
|           |                      |                    |                   |                      |                   |                      |                      | SVQP [E7]<br>(35)       |                         |                      |                    |
|           |                      |                    |                   |                      |                   |                      |                      | SVP [E7]<br>(35)        |                         |                      |                    |
|           |                      |                    |                   |                      |                   |                      |                      | SVP [F8]<br>(30)        |                         |                      |                    |
| 16        | SVPA [C6]<br>(35,24) | SVPG [B45]<br>(25) | SVP [E7]<br>(45)  | SVPC [C6]<br>(30,25) | SVPA [E7]<br>(30) | SVT [C65]<br>(24)    | SVPC [E7]<br>(27)    | SVPC [E7]<br>(22)       | SVPA [F8]<br>(29)       | SVPG [C6]<br>(14)    | SVT [E7]<br>(22)   |
|           | SVPC [B6]<br>(35,27) |                    |                   |                      | SVPD [E7]<br>(40) | SVPT [C65]<br>(24)   |                      | SVP [F8]<br>(30)        | SVPE [C10]<br>(11)      | SVPK [C6]<br>(22)    | SVPT [E7]<br>(22)  |
|           | SVPS [C6]<br>(24)    |                    |                   |                      | SVPF [B6]<br>(24) | SVPC [C6]<br>(24)    |                      |                         | SVPF [C6]<br>(22)       |                      | SVPC [E12]<br>(16) |
|           | SVQP [C6]<br>(50)    |                    |                   |                      | SVPS [E7]<br>(30) | SVPG [B6]<br>(15)    |                      |                         | SVPS [F8]<br>(29)       |                      | SVPF [E7]<br>(22)  |
|           | SVP [C6]<br>(50)     |                    |                   |                      | SVQP [E7]<br>(40) | SVPK [B6]<br>(27)    |                      |                         | SVP [F8]<br>(30)        |                      | SVPG [C8]<br>(10)  |
|           |                      |                    |                   |                      | SVP [E7]<br>(40)  | SVPS [F8]<br>(35)    |                      |                         | SVP [E12]<br>(20)       |                      | SVPG [C10]<br>(8)  |
|           |                      |                    |                   |                      | SVF [B6]<br>(25)  | SVP [F8]<br>(35)     |                      |                         | SVF [C6]<br>(22)        |                      | SVF [E7]<br>(22)   |
|           |                      |                    |                   |                      |                   |                      |                      |                         |                         |                      |                    |

Size list  $\phi \times L$  (mm)

|    |         |     |         |     |         |      |          |     |          |     |           |
|----|---------|-----|---------|-----|---------|------|----------|-----|----------|-----|-----------|
| A5 | 4.0x5.4 | B45 | 5.0x4.4 | C6  | 6.3x5.9 | C8   | 6.3x7.9  | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | B6  | 5.0x5.9 | C65 | 6.3x6.4 | C10  | 6.3x9.9  | E10 | 8.0x10.0 | F10 | 10.0x10.0 |
|    |         |     |         |     |         | C10L | 6.3x10.4 | E12 | 8.0x11.9 | F12 | 10.0x12.6 |

## Voltage - Capacitance table (SMD type) (Vol. : 2.0 to 16 V / Cap. : 330 to 2700 µF)

Series [Size]  
(ESR mΩ)

| V<br>µF | 330                     | 390                  | 470                | 560                | 680                | 820                | 1000               | 1200               | 1500               | 2700               |
|---------|-------------------------|----------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 2.0     |                         |                      |                    |                    |                    |                    |                    | SVPE [C10]<br>(8)  |                    |                    |
| 2.5     | SVPA [E7]<br>(20)       | SVPC [C6]<br>(25,15) |                    | SVT [C65]<br>(16)  | SVT [C65]<br>(16)  | SVPA [F8]<br>(19)  |                    |                    | SVT [E12]<br>(10)  | SVT [F12]<br>(12)  |
|         | SVPE [B6]<br>(15,10)    | SVPE [B6]<br>(10)    |                    | SVPT [C65]<br>(16) | SVT [E7]<br>(20)   | SVPC [E12]<br>(9)  |                    |                    | SVPT [E12]<br>(10) | SVPT [F12]<br>(12) |
|         |                         | SVPE [C6]<br>(10)    |                    | SVPC [C6]<br>(16)  | SVPT [C65]<br>(16) | SVT [C65]<br>(16)  |                    |                    | SVPC [E12]<br>(10) | SVPC [F12]<br>(12) |
|         |                         |                      |                    |                    | SVPT [E7]<br>(20)  | SVPT [C65]<br>(16) |                    |                    | SVP [F12]<br>(12)  |                    |
|         |                         |                      |                    |                    | SVPC [E7]<br>(20)  |                    |                    |                    |                    |                    |
|         |                         |                      |                    |                    | SVP [E12]<br>(13)  |                    |                    |                    |                    |                    |
| 4.0     | SVPC [C6]<br>(27,21,15) |                      |                    | SVT [E7]<br>(22)   | SVPA [F8]<br>(20)  |                    |                    | SVPC [E12]<br>(12) | SVT [E12]<br>(12)  |                    |
|         | SVP [E7]<br>(35)        |                      |                    | SVPT [E7]<br>(22)  | SVPS [F8]<br>(20)  |                    |                    | SVP [F12]<br>(12)  | SVPT [E12]<br>(12) |                    |
|         |                         |                      |                    | SVPC [E7]<br>(22)  | SVP [F8]<br>(25)   |                    |                    |                    | SVPC [E12]<br>(12) |                    |
|         |                         |                      |                    | SVPC [E12]<br>(9)  |                    |                    |                    |                    |                    |                    |
|         |                         |                      |                    | SVP [E12]<br>(13)  |                    |                    |                    |                    |                    |                    |
| 6.3     | SVT [C65]<br>(15)       | SVT [E7]<br>(22)     | SVPA [F8]<br>(20)  |                    |                    | SVT [E12]<br>(12)  |                    |                    |                    |                    |
|         | SVPT [C65]<br>(15)      | SVPT [E7]<br>(22)    | SVPS [F8]<br>(20)  |                    |                    | SVPT [E12]<br>(12) |                    |                    |                    |                    |
|         | SVPC [C6]<br>(17)       | SVPC [E7]<br>(22)    | SVP [E12]<br>(15)  |                    |                    | SVPC [E12]<br>(12) |                    |                    |                    |                    |
|         | SVP [F8]<br>(25)        |                      | SVP [F8]<br>(25)   |                    |                    | SVP [F12]<br>(12)  |                    |                    |                    |                    |
|         |                         |                      |                    |                    |                    |                    |                    |                    |                    |                    |
|         |                         |                      |                    |                    |                    |                    |                    |                    |                    |                    |
|         |                         |                      |                    |                    |                    |                    |                    |                    |                    |                    |
| 10      | SVPA [F8]<br>(24)       |                      |                    | SVP [F12]<br>(13)  |                    |                    |                    |                    |                    |                    |
|         | SVPC [E7]<br>(19)       |                      |                    |                    |                    |                    |                    |                    |                    |                    |
|         | SVPS [F8]<br>(24)       |                      |                    |                    |                    |                    |                    |                    |                    |                    |
|         | SVP [E12]<br>(17)       |                      |                    |                    |                    |                    |                    |                    |                    |                    |
|         | SVP [F8]<br>(25)        |                      |                    |                    |                    |                    |                    |                    |                    |                    |
| 16      | SVPG [C10L]<br>(6.5)    |                      | SVPE [F12]<br>(10) | SVT [E10]<br>(18)  | SVPG [E12]<br>(8)  | SVPG [F10]<br>(9)  | SVT [F10]<br>(18)  | SVPG [F12]<br>(7)  |                    |                    |
|         | SVPG [E7]<br>(16)       |                      |                    | SVT [E12]<br>(14)  | SVPK [E12]<br>(14) |                    | SVT [F12]<br>(12)  | SVPK [F12]<br>(12) |                    |                    |
|         | SVPK [E7]<br>(22)       |                      |                    | SVPT [E10]<br>(16) |                    |                    | SVPT [F10]<br>(16) |                    |                    |                    |
|         | SVP [F12]<br>(16)       |                      |                    | SVPT [E12]<br>(14) |                    |                    | SVPT [F12]<br>(12) |                    |                    |                    |
|         |                         |                      |                    | SVPF [E10]<br>(18) |                    |                    | SVPF [F10]<br>(16) |                    |                    |                    |
|         |                         |                      |                    | SVPF [E12]<br>(14) |                    |                    | SVPF [F12]<br>(12) |                    |                    |                    |
|         |                         |                      |                    | SVPG [E10]<br>(10) |                    |                    | SVF [F10]<br>(16)  |                    |                    |                    |
|         |                         |                      |                    | SVF [E12]<br>(14)  |                    |                    | SVF [F12]<br>(12)  |                    |                    |                    |
|         |                         |                      |                    |                    |                    |                    |                    |                    |                    |                    |

Size list ø x L (mm)

|    |         |     |         |     |         |      |          |     |          |     |           |
|----|---------|-----|---------|-----|---------|------|----------|-----|----------|-----|-----------|
| A5 | 4.0x5.4 | B45 | 5.0x4.4 | C6  | 6.3x5.9 | C8   | 6.3x7.9  | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | B6  | 5.0x5.9 | C65 | 6.3x6.4 | C10  | 6.3x9.9  | E10 | 8.0x10.0 | F10 | 10.0x10.0 |
|    |         |     |         |     |         | C10L | 6.3x10.4 | E12 | 8.0x11.9 | F12 | 10.0x12.6 |

Voltage - Capacitance table (SMD type) (Vol. : 20 to 100 V / Cap. : 3.3 to 33  $\mu$ F)Series [Size]  
(ESR m $\Omega$ )

| V $\mu$ F | 3.3 | 4.7 | 6.8              | 8.2               | 10                | 12               | 15                 | 18                | 22                 | 27                | 33                 |
|-----------|-----|-----|------------------|-------------------|-------------------|------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
| 20        |     |     |                  |                   | SVPA [B6]<br>(40) |                  |                    |                   | SVPA [C6]<br>(35)  | SVP [C6]<br>(60)  | SVPG [B45]<br>(27) |
|           |     |     |                  |                   | SVP [B6]<br>(120) |                  |                    |                   | SVPS [C6]<br>(60)  |                   | SVP [E7]<br>(45)   |
|           |     |     |                  |                   |                   |                  |                    |                   | SVQP [C6]<br>(60)  |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   | SVP [C6]<br>(60)   |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
| 25        |     |     |                  |                   | SVPD [C6]<br>(65) |                  | SVPG [B45]<br>(30) |                   | SVPD [E7]<br>(48)  | SVPF [B6]<br>(40) | SVPK [B6]<br>(35)  |
|           |     |     |                  |                   | SVPS [E7]<br>(60) |                  |                    |                   |                    | SVF [B6]<br>(40)  |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
| 35        |     |     |                  | SVPD [E7]<br>(70) |                   |                  |                    | SVPD [F8]<br>(60) | SVPD [E12]<br>(50) |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   | SVPF [C6]<br>(35)  |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   | SVF [C6]<br>(35)   |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   | SVPK [B6]<br>(35)  |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
| 50        |     |     |                  |                   | SVPF [C6]<br>(40) |                  |                    | SVT [E7]<br>(35)  | SVPK [C6]<br>(35)  |                   | SVPK [E7]<br>(35)  |
|           |     |     |                  |                   | SVF [C6]<br>(40)  |                  |                    | SVPT [E7]<br>(35) |                    |                   |                    |
|           |     |     |                  |                   | SVPK [B6]<br>(80) |                  |                    | SVPF [E7]<br>(35) |                    |                   |                    |
|           |     |     |                  |                   |                   |                  |                    | SVF [E7]<br>(35)  |                    |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
| 63        |     |     |                  |                   |                   |                  |                    | SXV [E7]<br>(60)  |                    |                   | SXV [E12]<br>(25)  |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
| 80        |     |     |                  |                   |                   | SXV [E7]<br>(60) |                    |                   |                    | SXV [E12]<br>(35) | SXV [E12]<br>(35)  |
|           |     |     |                  |                   |                   |                  |                    |                   |                    | SXV [F8]<br>(55)  |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |
| 100       |     |     | SXV [E7]<br>(60) |                   |                   |                  | SXV [E12]<br>(40)  | SXV [E12]<br>(40) | SXV [F12]<br>(30)  | SXV [F12]<br>(30) |                    |
|           |     |     |                  |                   |                   |                  | SXV [F8]<br>(60)   | SXV [F12]<br>(30) |                    |                   |                    |
|           |     |     |                  |                   |                   |                  |                    |                   |                    |                   |                    |

Size list  $\phi \times L$  (mm)

|    |         |     |         |     |         |      |          |     |          |     |           |
|----|---------|-----|---------|-----|---------|------|----------|-----|----------|-----|-----------|
| A5 | 4.0x5.4 | B45 | 5.0x4.4 | C6  | 6.3x5.9 | C8   | 6.3x7.9  | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | B6  | 5.0x5.9 | C65 | 6.3x6.4 | C10  | 6.3x9.9  | E10 | 8.0x10.0 | F10 | 10.0x10.0 |
|    |         |     |         |     |         | C10L | 6.3x10.4 | E12 | 8.0x11.9 | F12 | 10.0x12.6 |

## Voltage - Capacitance table (SMD type) (Vol. : 20 to 100 V / Cap. : 39 to 270 µF)

Series [Size]  
(ESR mΩ)

| V   | µF | 39                 | 47                 | 56                | 68                 | 82                 | 100               | 120                | 150               | 180                | 220               | 270                |
|-----|----|--------------------|--------------------|-------------------|--------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|
| 20  |    |                    | SVPA [E7]<br>(33)  | SVPF [B6]<br>(30) | SVPK [B6]<br>(30)  |                    | SVP [E12]<br>(24) | SVPF [C6]<br>(25)  | SVPK [C6]<br>(25) | SVT [E7]<br>(25)   | SVPK [E7]<br>(25) |                    |
|     |    |                    | SVPS [E7]<br>(45)  | SVF [F8]<br>(40)  | SVF [F8]<br>(40)   |                    |                   | SVF [C6]<br>(25)   | SVF [F12]<br>(20) | SVPT [E7]<br>(25)  |                   |                    |
|     |    |                    | SVQP [E7]<br>(45)  | SVF [B6]<br>(30)  |                    |                    |                   |                    |                   | SVPF [E7]<br>(25)  |                   |                    |
|     |    |                    | SVF [E7]<br>(45)   |                   |                    |                    |                   |                    |                   | SVF [E7]<br>(25)   |                   |                    |
|     |    |                    |                    |                   |                    |                    |                   |                    |                   |                    |                   |                    |
| 25  |    | SVPD [F8]<br>(45)  | SVPD [E12]<br>(30) | SVPF [C6]<br>(30) |                    | SVPD [F12]<br>(28) | SVT [E7]<br>(24)  | SVPK [E7]<br>(24)  |                   | SVT [E12]<br>(16)  |                   | SVPK [E12]<br>(16) |
|     |    |                    | SVPF [C6]<br>(30)  | SVF [C6]<br>(30)  |                    | SVPF [E7]<br>(28)  | SVPT [E7]<br>(24) |                    |                   | SVPT [E12]<br>(16) |                   |                    |
|     |    |                    | SVF [C6]<br>(30)   |                   |                    | SVPK [C6]<br>(25)  | SVPF [E7]<br>(24) |                    |                   | SVPF [E12]<br>(16) |                   |                    |
|     |    |                    |                    |                   |                    | SVF [E7]<br>(28)   | SVF [E7]<br>(24)  |                    |                   | SVF [E12]<br>(16)  |                   |                    |
|     |    |                    |                    |                   |                    |                    |                   |                    |                   |                    |                   |                    |
| 35  |    | SVT [E7]<br>(30)   | SVPD [F12]<br>(30) |                   |                    | SVT [E12]<br>(20)  |                   | SVT [F12]<br>(18)  |                   | SVPK [E12]<br>(20) |                   |                    |
|     |    | SVPT [E7]<br>(30)  | SVPK [C6]<br>(27)  |                   |                    | SVPT [E12]<br>(20) |                   | SVPT [F12]<br>(18) |                   |                    |                   |                    |
|     |    | SVPF [E7]<br>(30)  |                    |                   |                    | SVPF [E12]<br>(20) |                   | SVPF [F12]<br>(18) |                   |                    |                   |                    |
|     |    | SVF [E7]<br>(30)   |                    |                   |                    | SVF [E12]<br>(20)  |                   | SVF [F12]<br>(18)  |                   |                    |                   |                    |
|     |    |                    |                    |                   |                    | SVPK [E7]<br>(25)  |                   |                    |                   |                    |                   |                    |
| 50  |    | SVT [E12]<br>(25)  |                    |                   | SVT [F12]<br>(20)  |                    |                   | SVPK [F12]<br>(20) |                   |                    |                   |                    |
|     |    | SVPT [E12]<br>(25) |                    |                   | SVPT [F12]<br>(20) |                    |                   |                    |                   |                    |                   |                    |
|     |    | SVPF [E12]<br>(25) |                    |                   | SVPF [F12]<br>(20) |                    |                   |                    |                   |                    |                   |                    |
|     |    | SVF [E12]<br>(25)  |                    |                   | SVF [F12]<br>(20)  |                    |                   |                    |                   |                    |                   |                    |
|     |    |                    |                    |                   | SVPK [E12]<br>(25) |                    |                   |                    |                   |                    |                   |                    |
| 63  |    | SXV [E12]<br>(25)  |                    | SXV [E12]<br>(25) | SXV [F12]<br>(25)  |                    | SXV [F12]<br>(25) |                    |                   |                    |                   |                    |
|     |    | SXV [F8]<br>(50)   |                    |                   |                    |                    |                   |                    |                   |                    |                   |                    |
| 80  |    |                    | SXV [F12]<br>(28)  | SXV [F12]<br>(28) |                    |                    |                   |                    |                   |                    |                   |                    |
|     |    |                    |                    |                   |                    |                    |                   |                    |                   |                    |                   |                    |
| 100 |    |                    |                    |                   |                    |                    |                   |                    |                   |                    |                   |                    |
|     |    |                    |                    |                   |                    |                    |                   |                    |                   |                    |                   |                    |

Size list ø x L (mm)

|    |         |     |         |     |         |      |          |     |          |     |           |
|----|---------|-----|---------|-----|---------|------|----------|-----|----------|-----|-----------|
| A5 | 4.0x5.4 | B45 | 5.0x4.4 | C6  | 6.3x5.9 | C8   | 6.3x7.9  | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | B6  | 5.0x5.9 | C65 | 6.3x6.4 | C10  | 6.3x9.9  | E10 | 8.0x10.0 | F10 | 10.0x10.0 |
|    |         |     |         |     |         | C10L | 6.3x10.4 | E12 | 8.0x11.9 | F12 | 10.0x12.6 |

**Voltage - Capacitance table (SMD type) (Vol. : 20 to 100 V / Cap. : 330 to 2700  $\mu$ F)**

Series [Size]  
(ESR m $\Omega$ )

| V $\mu$ F | 330 | 390                | 470                | 560                | 680                | 820 | 1000 | 1200 | 1500 | 2700 |
|-----------|-----|--------------------|--------------------|--------------------|--------------------|-----|------|------|------|------|
| 20        |     | SVT [E12]<br>(14)  | SVPK [E12]<br>(14) | SVT [F12]<br>(12)  | SVPK [F12]<br>(12) |     |      |      |      |      |
|           |     | SVPT [E12]<br>(14) |                    | SVPT [F12]<br>(12) |                    |     |      |      |      |      |
|           |     | SVPF [E12]<br>(14) |                    | SVPF [F12]<br>(12) |                    |     |      |      |      |      |
|           |     | SVF [E12]<br>(14)  |                    | SVF [F12]<br>(12)  |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
| 25        |     | SVT [F12]<br>(14)  | SVPK [F12]<br>(14) |                    |                    |     |      |      |      |      |
|           |     | SVPT [F12]<br>(14) |                    |                    |                    |     |      |      |      |      |
|           |     | SVPF [F12]<br>(14) |                    |                    |                    |     |      |      |      |      |
|           |     | SVF [F12]<br>(14)  |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
| 35        |     | SVPK [F12]<br>(18) |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
| 50        |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
| 63        |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
| 80        |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |
| 100       |     |                    |                    |                    |                    |     |      |      |      |      |
|           |     |                    |                    |                    |                    |     |      |      |      |      |

Size list  $\phi \times L$  (mm)

|    |         |     |         |     |         |      |          |     |          |     |           |
|----|---------|-----|---------|-----|---------|------|----------|-----|----------|-----|-----------|
| A5 | 4.0x5.4 | B45 | 5.0x4.4 | C6  | 6.3x5.9 | C8   | 6.3x7.9  | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | B6  | 5.0x5.9 | C65 | 6.3x6.4 | C10  | 6.3x9.9  | E10 | 8.0x10.0 | F10 | 10.0x10.0 |
|    |         |     |         |     |         | C10L | 6.3x10.4 | E12 | 8.0x11.9 | F12 | 10.0x12.6 |

Voltage - Capacitance table (Radial lead type) (Vol. : 2.5 to 16 V / Cap. : 6.8 to 68  $\mu\text{F}$ )Series [Size]  
(ESR m $\Omega$ )

| V $\mu\text{F}$ | 6.8 | 12 | 15 | 18 | 22 | 27 | 33 | 39                | 47 | 56                | 68 |
|-----------------|-----|----|----|----|----|----|----|-------------------|----|-------------------|----|
| 2.5             |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
| 4.0             |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
| 6.3             |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
| 10              |     |    |    |    |    |    |    |                   |    | SEQP [C6]<br>(45) |    |
|                 |     |    |    |    |    |    |    |                   |    | SEP [C6]<br>(45)  |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
| 16              |     |    |    |    |    |    |    | SEQP [C6]<br>(50) |    |                   |    |
|                 |     |    |    |    |    |    |    | SEP [C6]<br>(50)  |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |
|                 |     |    |    |    |    |    |    |                   |    |                   |    |

Size list  $\phi \times L$  (mm)

|    |         |     |         |     |          |     |           |
|----|---------|-----|---------|-----|----------|-----|-----------|
| B9 | 5.0x8.9 | C55 | 6.3x5.4 | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | C6  | 6.3x5.9 | E9  | 8.0x8.9  | F13 | 10.0x12.9 |
|    |         | C9  | 6.3x8.9 | E12 | 8.0x11.9 |     |           |
|    |         | C10 | 6.3x9.9 | E13 | 8.0x12.9 |     |           |

Voltage - Capacitance table (Radial lead type) (Vol. : 2.5 to 16 V / Cap. : 82 to 560  $\mu\text{F}$ )Series [Size]  
(ESR m $\Omega$ )

| V   | $\mu\text{F}$ | 82                | 100               | 120               | 150                | 180                | 220                | 270                | 330                | 390               | 470                | 560                |
|-----|---------------|-------------------|-------------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|
| 2.5 |               |                   | SEPC [B9]<br>(7)  |                   |                    |                    |                    |                    | SEPC [B9]<br>(7)   | SEPC [C6]<br>(10) | SEPC [B9]<br>(7)   | SEPC [B9]<br>(7)   |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    | SEPC [C6]<br>(10)  |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    | SEPC [C9]<br>(7)   |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    | SEPC [E9]<br>(8)   |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    |                    |
| 4.0 |               |                   | SEP [C6]<br>(40)  |                   | SEQP [C6]<br>(35)  |                    | SEP [E7]<br>(35)   |                    | SEQP [E7]<br>(35)  |                   | SEP [F7]<br>(25)   | SEPC [C9]<br>(7)   |
|     |               |                   |                   |                   | SEP [E7]<br>(35)   |                    |                    |                    | SEP [E7]<br>(35)   |                   |                    | SEPC [E9]<br>(7)   |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    | SEPC [E13]<br>(7)  |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    | SEQP [E12]<br>(13) |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    | SEP [E12]<br>(13)  |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    |                    |
| 6.3 |               | SEQP [C6]<br>(45) |                   |                   | SEQP [E7]<br>(40)  |                    | SEPC [C55]<br>(18) |                    | SEQP [F8]<br>(25)  |                   | SEPC [C9]<br>(7)   | SEPC [C9]<br>(7)   |
|     |               | SEP [C6]<br>(45)  |                   |                   | SEP [E7]<br>(40)   |                    |                    |                    | SEP [F8]<br>(25)   |                   | SEPC [E9]<br>(8)   | SEPC [E9]<br>(7)   |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   | SEPC [E13]<br>(8)  |                    |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   | SEQP [E12]<br>(15) |                    |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   | SEP [E12]<br>(15)  |                    |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    |                    |
| 10  |               |                   |                   | SEQP [E7]<br>(35) |                    |                    |                    | SEPC [E7]<br>(22)  | SEQP [E12]<br>(17) |                   |                    | SEQP [F13]<br>(13) |
|     |               |                   |                   | SEP [E7]<br>(35)  |                    |                    |                    | SEQP [F8]<br>(25)  | SEP [E12]<br>(17)  |                   |                    | SEP [F13]<br>(13)  |
|     |               |                   |                   |                   |                    |                    |                    | SEP [F8]<br>(25)   |                    |                   |                    |                    |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    |                    |
| 16  |               | SEQP [E7]<br>(40) | SEPC [C6]<br>(24) |                   | SEPC [E7]<br>(22)  | SEF [C6]<br>(22)   | SEPC [E7]<br>(13)  | SEF [E7]<br>(22)   | SEQP [F13]<br>(16) |                   | SEPG [E9]<br>(8)   | SEF [E12]<br>(14)  |
|     |               | SEP [E7]<br>(40)  | SEPC [C9]<br>(10) |                   | SEPG [B9]<br>(12)  | SEPC [E9]<br>(10)  |                    | SEPG [C9]<br>(10)  | SEP [F13]<br>(16)  |                   | SEPC [F13]<br>(10) | SEPG [E13]<br>(8)  |
|     |               |                   |                   |                   | SEPF [C55]<br>(30) | SEPC [E12]<br>(16) |                    | SEPG [C10]<br>(8)  |                    |                   |                    | SEPF [E12]<br>(14) |
|     |               |                   |                   |                   | SEQP [F8]<br>(30)  | SEPF [C6]<br>(22)  |                    | SEPC [E9]<br>(10)  |                    |                   |                    |                    |
|     |               |                   |                   |                   | SEP [F8]<br>(30)   | SEQP [E12]<br>(20) |                    | SEPC [E12]<br>(11) |                    |                   |                    |                    |
|     |               |                   |                   |                   |                    | SEP [E12]<br>(20)  |                    | SEPF [E7]<br>(22)  |                    |                   |                    |                    |
|     |               |                   |                   |                   |                    |                    |                    |                    |                    |                   |                    |                    |

Size list  $\phi \times L$  (mm)

|    |         |     |         |     |          |     |           |
|----|---------|-----|---------|-----|----------|-----|-----------|
| B9 | 5.0x8.9 | C55 | 6.3x5.4 | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | C6  | 6.3x5.9 | E9  | 8.0x8.9  | F13 | 10.0x12.9 |
|    |         | C9  | 6.3x8.9 | E12 | 8.0x11.9 |     |           |
|    |         | C10 | 6.3x9.9 | E13 | 8.0x12.9 |     |           |



**Voltage - Capacitance table (Radial lead type) (Vol. : 2.5 to 16 V / Cap. : 680 to 2700  $\mu$ F)**

Series [Size]  
(ESR m $\Omega$ )

| V   | $\mu$ F | 680               | 820                | 1000               | 1200               | 1500               | 2700               |
|-----|---------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 2.5 |         | SEP [E12]<br>(13) | SEPC [C9]<br>(7)   | SEPC [E9]<br>(7)   |                    | SEP [F13]<br>(12)  | SEPC [F13]<br>(10) |
|     |         |                   | SEPC [E7]<br>(8)   |                    |                    |                    |                    |
|     |         |                   | SEPC [E9]<br>(5,7) |                    |                    |                    |                    |
|     |         |                   | SEPC [E13]<br>(7)  |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
| 4.0 |         | SEPC [E13]<br>(7) | SEPC [F13]<br>(7)  |                    | SEQP [F13]<br>(12) |                    |                    |
|     |         | SEQP [F8]<br>(25) |                    |                    | SEP [F13]<br>(12)  |                    |                    |
|     |         | SEP [F8]<br>(25)  |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
| 6.3 |         | SEPC [F13]<br>(7) | SEQP [F13]<br>(12) | SEPC [E7]<br>(18)  |                    | SEPC [F13]<br>(10) |                    |
|     |         |                   | SEP [F13]<br>(12)  |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
| 10  |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
| 16  |         |                   |                    | SEF [F13]<br>(12)  |                    |                    |                    |
|     |         |                   |                    | SEPF [F13]<br>(12) |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |
|     |         |                   |                    |                    |                    |                    |                    |

Size list  $\phi \times L$  (mm)

|    |         |     |         |     |          |     |           |
|----|---------|-----|---------|-----|----------|-----|-----------|
| B9 | 5.0x8.9 | C55 | 6.3x5.4 | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | C6  | 6.3x5.9 | E9  | 8.0x8.9  | F13 | 10.0x12.9 |
|    |         | C9  | 6.3x8.9 | E12 | 8.0x11.9 |     |           |
|    |         | C10 | 6.3x9.9 | E13 | 8.0x12.9 |     |           |

Voltage - Capacitance table (Radial lead type) (Vol. : 20 to 100 V / Cap. : 6.8 to 68  $\mu\text{F}$ )Series [Size]  
(ESR m $\Omega$ )

| V   | $\mu\text{F}$ | 6.8                | 12                | 15                 | 18                 | 22                | 27                | 33                | 39                | 47                | 56 | 68                |
|-----|---------------|--------------------|-------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|----|-------------------|
| 20  |               |                    |                   |                    | SEQP [C6]<br>(60)  | SEP [E7]<br>(45)  |                   | SEQP [E7]<br>(45) | SEP [F8]<br>(40)  | SEQP [F8]<br>(40) |    |                   |
|     |               |                    |                   |                    | SEP [C6]<br>(60)   |                   |                   | SEP [E7]<br>(45)  |                   | SEP [F8]<br>(40)  |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
| 25  |               |                    |                   |                    |                    |                   |                   |                   |                   | SEF [C6]<br>(30)  |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   | SEPF [C6]<br>(30) |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
| 32  |               | SEQP [E7]<br>(100) | SEQP [F8]<br>(80) | SEQP [E12]<br>(50) | SEPF [C55]<br>(35) |                   |                   |                   |                   |                   |    | SEF [E7]<br>(25)  |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    | SEPF [E7]<br>(25) |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
| 35  |               |                    |                   |                    | SEF [C6]<br>(35)   |                   |                   | SEF [E7]<br>(30)  | SEK [C6]<br>(27)  |                   |    |                   |
|     |               |                    |                   |                    | SEPF [C6]<br>(35)  |                   |                   | SEPF [E7]<br>(30) |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
| 50  |               |                    |                   |                    | SEK [C6]<br>(35)   |                   | SEK [E7]<br>(35)  |                   |                   |                   |    | SEK [E12]<br>(25) |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
| 63  |               |                    |                   | SXE [E7]<br>(60)   |                    |                   | SXE [E12]<br>(25) | SXE [E12]<br>(25) |                   | SXE [E12]<br>(25) |    | SXE [F13]<br>(25) |
|     |               |                    |                   |                    |                    |                   |                   | SXE [F8]<br>(50)  |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
| 80  |               | SXE [E7]<br>(60)   |                   |                    |                    | SXE [E12]<br>(35) | SXE [E12]<br>(35) |                   | SXE [F13]<br>(28) | SXE [F13]<br>(28) |    |                   |
|     |               |                    |                   |                    |                    | SXE [F8]<br>(55)  |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
| 100 |               | SXE [E7]<br>(60)   | SXE [E12]<br>(40) | SXE [E12]<br>(40)  | SXE [F13]<br>(30)  | SXE [F13]<br>(30) |                   |                   |                   |                   |    |                   |
|     |               |                    | SXE [F8]<br>(60)  | SXE [F13]<br>(30)  |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |
|     |               |                    |                   |                    |                    |                   |                   |                   |                   |                   |    |                   |

Size list  $\phi \times L$  (mm)

|    |         |     |         |     |          |     |           |
|----|---------|-----|---------|-----|----------|-----|-----------|
| B9 | 5.0x8.9 | C55 | 6.3x5.4 | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | C6  | 6.3x5.9 | E9  | 8.0x8.9  | F13 | 10.0x12.9 |
|    |         | C9  | 6.3x8.9 | E12 | 8.0x11.9 |     |           |
|    |         | C10 | 6.3x9.9 | E13 | 8.0x12.9 |     |           |

## Voltage - Capacitance table (Radial lead type) (Vol. : 20 to 80 V / Cap. : 82 to 560 µF)

Series [Size]  
(ESR mΩ)

| V   | µF | 82                 | 100                | 120                | 150                | 180                | 220 | 270               | 330                | 390                | 470               | 560                |
|-----|----|--------------------|--------------------|--------------------|--------------------|--------------------|-----|-------------------|--------------------|--------------------|-------------------|--------------------|
| 20  |    |                    | SEQP [E12]<br>(24) | SEF [C6]<br>(25)   | SEQP [F13]<br>(20) | SEF [E7]<br>(25)   |     |                   |                    | SEF [E12]<br>(24)  |                   | SEF [F13]<br>(12)  |
|     |    |                    | SEP [E12]<br>(24)  | SEPF [C6]<br>(25)  | SEP [F13]<br>(20)  | SEPF [E7]<br>(25)  |     |                   |                    | SEPF [E12]<br>(24) |                   | SEPF [F13]<br>(12) |
|     |    |                    | SEP [F8]<br>(35)   |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
| 25  |    | SEK [C6]<br>(25)   |                    | SEK [E7]<br>(24)   |                    | SEF [E12]<br>(16)  |     | SEK [E12]<br>(16) | SEF [F13]<br>(14)  |                    | SEK [F13]<br>(14) |                    |
|     |    | SEF [E7]<br>(28)   |                    |                    |                    | SEPF [E12]<br>(16) |     |                   | SEPF [F13]<br>(14) |                    |                   |                    |
|     |    | SEPF [E7]<br>(28)  |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
| 32  |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
| 35  |    | SEK [E7]<br>(25)   |                    | SEF [F13]<br>(18)  |                    | SEK [E12]<br>(20)  |     |                   | SEK [F13]<br>(18)  |                    |                   |                    |
|     |    | SEF [E12]<br>(20)  |                    | SEPF [F13]<br>(18) |                    |                    |     |                   |                    |                    |                   |                    |
|     |    | SEPF [E12]<br>(20) |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
| 50  |    |                    |                    | SEK [F13]<br>(20)  |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
| 63  |    |                    | SXE [F13]<br>(25)  |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
| 80  |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
| 100 |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |
|     |    |                    |                    |                    |                    |                    |     |                   |                    |                    |                   |                    |

Size list ø x L (mm)

|    |         |     |         |     |          |     |           |
|----|---------|-----|---------|-----|----------|-----|-----------|
| B9 | 5.0x8.9 | C55 | 6.3x5.4 | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | C6  | 6.3x5.9 | E9  | 8.0x8.9  | F13 | 10.0x12.9 |
|    |         | C9  | 6.3x8.9 | E12 | 8.0x11.9 |     |           |
|    |         | C10 | 6.3x9.9 | E13 | 8.0x12.9 |     |           |

Voltage - Capacitance table (Radial lead type) (Vol. : 20 to 100 V / Cap. : 680 to 2700 μF)

Series [Size]  
(ESR mΩ)

| <div>V</div> <div>μF</div> | 680 | 820 | 1000 | 1200 | 1500 | 2700 |
|----------------------------|-----|-----|------|------|------|------|
| 20                         |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
| 25                         |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
| 32                         |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
| 35                         |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
| 50                         |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
| 63                         |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
| 80                         |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
| 100                        |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |
|                            |     |     |      |      |      |      |

Size list  ø x L (mm)

|    |         |     |         |     |          |     |           |
|----|---------|-----|---------|-----|----------|-----|-----------|
| B9 | 5.0x8.9 | C55 | 6.3x5.4 | E7  | 8.0x6.9  | F8  | 10.0x7.9  |
|    |         | C6  | 6.3x5.9 | E9  | 8.0x8.9  | F13 | 10.0x12.9 |
|    |         | C9  | 6.3x8.9 | E12 | 8.0x11.9 |     |           |
|    |         | C10 | 6.3x9.9 | E13 | 8.0x12.9 |     |           |

## Explanation of part numbers

### ◇ Part number system

#### • Surface mount type

16

Rated voltage

↓

| R.voltage (V) | Code |
|---------------|------|
| 2.0           | 2    |
| 2.5           | 2R5  |
| 4.0           | 4    |
| 6.3           | 6    |
| 10            | 10   |
| 16            | 16   |
| 20            | 20   |
| 25            | 25   |
| 35            | 35   |
| 100           | 100  |

SVP

Series

↓

| Series |
|--------|
| SVT    |
| SVPT   |
| SVF    |
| SVPK   |
| SXV    |
| SVPG   |
| SVPF   |
| SVPA   |
| SVPB   |
| SVPC   |
| SVPD   |
| SVPE   |
| SVPS   |
| SVQP   |
| SVP    |

3R3

Rated capacitance

↓

| R.capacitance (μF) | Code |
|--------------------|------|
| 3.3                | 3R3  |
| 4.7                | 4R7  |
| 10                 | 10   |
| 22                 | 22   |
| 100                | 100  |
| 220                | 220  |
| 470                | 470  |
| 1500               | 1500 |

M

Capacitance tolerance

↓

| Cap. tolerance | Code |
|----------------|------|
| ±20%           | M    |

#### • Radial lead type

| <div>16</div> <div>Rated voltage</div>                                                                                                                                                                                                                                                                                                                              | <div>SEPC</div> <div>Series</div> | <div>470</div> <div>Rated capacitance</div> | <div>M</div> <div>Capacitance tolerance</div> | <div>+</div> <div>T</div> <div>Taping or forming of terminal code</div> |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------------|-----|---|-----|---|----|----|----|----|----|----|----|----|----|----|-----|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----|-----|------|-----|------|------|------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|-----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|------|------|------|------|----------------------------------------------------------------------------------------------|----------------|------|------|---|-----------------------------------------------------------------------------------------------------------------------------|
| <div>↓</div>                                                                                                                                                                                                                                                                                                                                                        | <div>↓</div>                      | <div>↓</div>                                | <div>↓</div>                                  | <div>↓</div>                                                            |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| <table><tr><th>R.voltage (V)</th><th>Code</th></tr><tr><td>2.5</td><td>2R5※<sup>1</sup></td></tr><tr><td>4.0</td><td>4</td></tr><tr><td>6.3</td><td>6</td></tr><tr><td>10</td><td>10</td></tr><tr><td>16</td><td>16</td></tr><tr><td>20</td><td>20</td></tr><tr><td>25</td><td>25</td></tr><tr><td>32</td><td>32</td></tr><tr><td>100</td><td>100</td></tr></table> | R.voltage (V)                     | Code                                        | 2.5                                           | 2R5※ <sup>1</sup>                                                       | 4.0 | 4 | 6.3 | 6 | 10 | 10 | 16 | 16 | 20 | 20 | 25 | 25 | 32 | 32 | 100 | 100 | <table><tr><th>Series</th></tr><tr><td>SEF</td></tr><tr><td>SEK</td></tr><tr><td>SEPG</td></tr><tr><td>SXE</td></tr><tr><td>SEPC</td></tr><tr><td>SEPF</td></tr><tr><td>SEQP</td></tr><tr><td>SEP</td></tr></table> | Series | SEF | SEK | SEPG | SXE | SEPC | SEPF | SEQP | SEP | <table><tr><th>R.capacitance (μF)</th><th>Code</th></tr><tr><td>6.8</td><td>6R8</td></tr><tr><td>10</td><td>10</td></tr><tr><td>22</td><td>22</td></tr><tr><td>100</td><td>100</td></tr><tr><td>220</td><td>220</td></tr><tr><td>470</td><td>470</td></tr><tr><td>1000</td><td>1000</td></tr><tr><td>2700</td><td>2700</td></tr></table> | R.capacitance (μF) | Code | 6.8 | 6R8 | 10 | 10 | 22 | 22 | 100 | 100 | 220 | 220 | 470 | 470 | 1000 | 1000 | 2700 | 2700 | <table><tr><th>Cap. tolerance</th><th>Code</th></tr><tr><td>±20%</td><td>M</td></tr></table> | Cap. tolerance | Code | ±20% | M | <div>Taping products and lead terminal cutting products indicate process code. Regular lead products don't have code.</div> |
| R.voltage (V)                                                                                                                                                                                                                                                                                                                                                       | Code                              |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 2.5                                                                                                                                                                                                                                                                                                                                                                 | 2R5※ <sup>1</sup>                 |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 4.0                                                                                                                                                                                                                                                                                                                                                                 | 4                                 |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 6.3                                                                                                                                                                                                                                                                                                                                                                 | 6                                 |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 10                                                                                                                                                                                                                                                                                                                                                                  | 10                                |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 16                                                                                                                                                                                                                                                                                                                                                                  | 16                                |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 20                                                                                                                                                                                                                                                                                                                                                                  | 20                                |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 25                                                                                                                                                                                                                                                                                                                                                                  | 25                                |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 32                                                                                                                                                                                                                                                                                                                                                                  | 32                                |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 100                                                                                                                                                                                                                                                                                                                                                                 | 100                               |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| Series                                                                                                                                                                                                                                                                                                                                                              |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| SEF                                                                                                                                                                                                                                                                                                                                                                 |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| SEK                                                                                                                                                                                                                                                                                                                                                                 |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| SEPG                                                                                                                                                                                                                                                                                                                                                                |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| SXE                                                                                                                                                                                                                                                                                                                                                                 |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| SEPC                                                                                                                                                                                                                                                                                                                                                                |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| SEPF                                                                                                                                                                                                                                                                                                                                                                |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| SEQP                                                                                                                                                                                                                                                                                                                                                                |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| SEP                                                                                                                                                                                                                                                                                                                                                                 |                                   |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| R.capacitance (μF)                                                                                                                                                                                                                                                                                                                                                  | Code                              |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 6.8                                                                                                                                                                                                                                                                                                                                                                 | 6R8                               |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 10                                                                                                                                                                                                                                                                                                                                                                  | 10                                |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 22                                                                                                                                                                                                                                                                                                                                                                  | 22                                |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 100                                                                                                                                                                                                                                                                                                                                                                 | 100                               |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 220                                                                                                                                                                                                                                                                                                                                                                 | 220                               |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 470                                                                                                                                                                                                                                                                                                                                                                 | 470                               |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 1000                                                                                                                                                                                                                                                                                                                                                                | 1000                              |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| 2700                                                                                                                                                                                                                                                                                                                                                                | 2700                              |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| Cap. tolerance                                                                                                                                                                                                                                                                                                                                                      | Code                              |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |
| ±20%                                                                                                                                                                                                                                                                                                                                                                | M                                 |                                             |                                               |                                                                         |     |   |     |   |    |    |    |    |    |    |    |    |    |    |     |     |                                                                                                                                                                                                                     |        |     |     |      |     |      |      |      |     |                                                                                                                                                                                                                                                                                                                                          |                    |      |     |     |    |    |    |    |     |     |     |     |     |     |      |      |      |      |                                                                                              |                |      |      |   |                                                                                                                             |

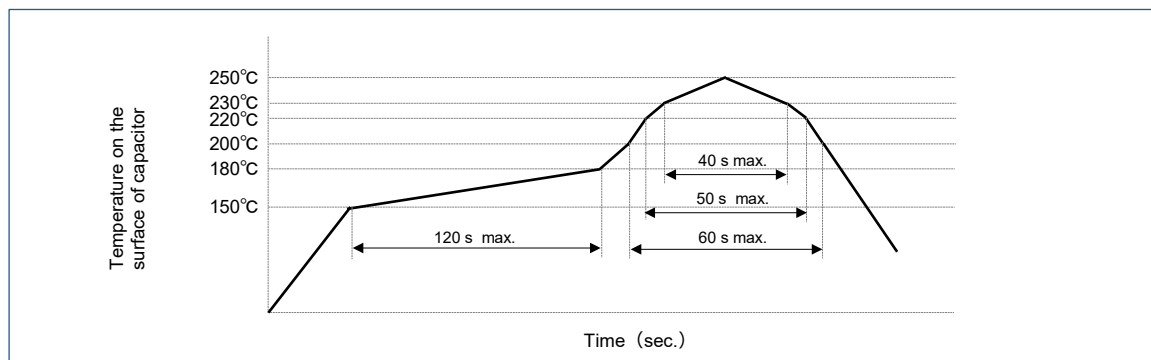
※1 Code 2 is used for 2.5 V products of B9, C6, C9, E7, E9 and F13 size in SEPC series.

## Mounting specifications

### ◆ Recommendable reflow soldering (SMD type)

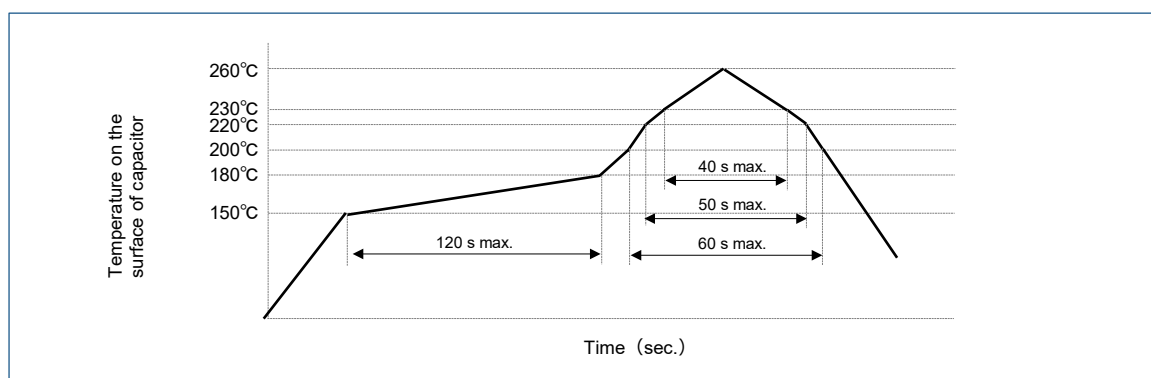
- Peak temperature 250 °C lead free reflow soldering profile

The cycle of reflow soldering : 2 max.



- Peak temperature 260 °C lead free reflow soldering profile

The cycle of reflow soldering : 1 max.



### ◆ Flow soldering (Radial lead type)

|                     | Temperature                             | Time              | Flow number                   |
|---------------------|-----------------------------------------|-------------------|-------------------------------|
| Preheating          | 120 °C or less<br>(ambient temperature) | 120 sec. or less  | 1 time                        |
| Soldering condition | 260 °C+5 °C or less                     | 10+1 sec. or less | 2 times or less <sup>*1</sup> |

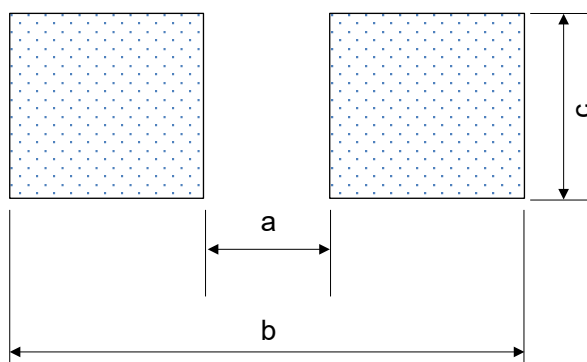
<sup>\*1</sup> : When soldering 2 times, total immersion time should be 10+1 sec. or less.

### ◆ Soldering with a soldering iron

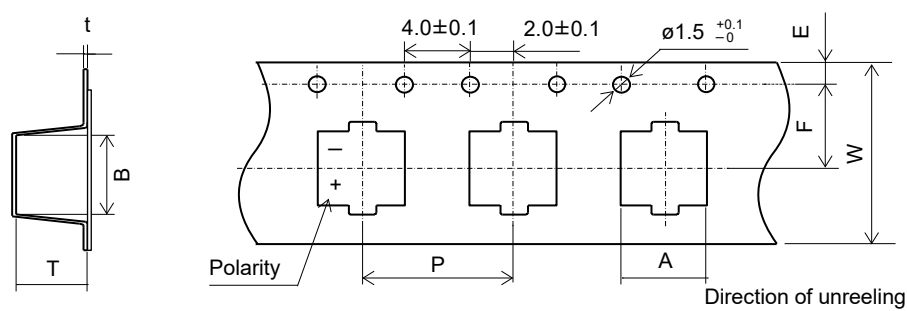
Tip of a soldering iron : 400 °C±10 °C

Working time : 5 sec. max.

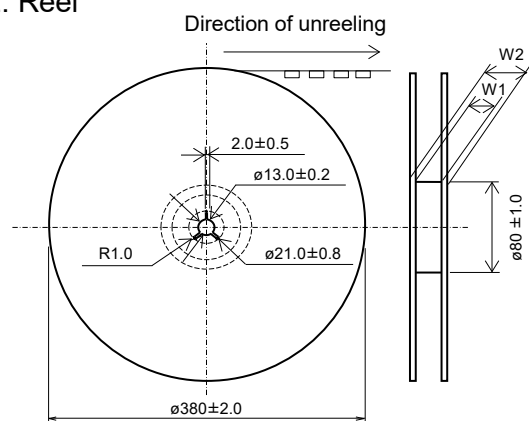
## Land Pattern



| Unit : mm |     |      |     |
|-----------|-----|------|-----|
| Size code | a   | b    | c   |
| A5        | 1.0 | 6.2  | 1.6 |
| B45       | 1.4 | 7.4  | 1.6 |
| B6        | 1.4 | 7.4  | 1.6 |
| C5        | 2.1 | 9.1  | 1.6 |
| C55       | 2.1 | 9.1  | 1.6 |
| C6        | 2.1 | 9.1  | 1.6 |
| C65       | 2.1 | 9.1  | 1.6 |
| C8        | 2.1 | 9.1  | 1.6 |
| C10       | 2.1 | 9.1  | 1.6 |
| C10L      | 2.1 | 9.1  | 2.5 |
| E7        | 2.8 | 11.1 | 1.9 |
| E10       | 2.8 | 11.1 | 1.9 |
| E12       | 2.8 | 11.1 | 1.9 |
| F8        | 4.3 | 13.1 | 1.9 |
| F10       | 4.3 | 13.1 | 1.9 |
| F12       | 4.3 | 13.1 | 1.9 |

**Packing specifications**
**◇ SMD type**
**● Taping**
**1-1. Carrier tape**


| Size code | A±0.2 | B±0.2 | W±0.3 | F±0.1 | E±0.1 | P±0.1 | t±0.1 | T±0.2 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|
| A5        | 4.7   | 4.7   | 12.0  | 5.5   | 1.75  | 8.0   | 0.4   | 5.8   |
| B45       | 5.6   | 5.6   | 16.0  | 7.5   | 1.75  | 8.0   | 0.4   | 4.8   |
| B6        | 5.6   | 5.6   | 16.0  | 7.5   | 1.75  | 8.0   | 0.4   | 6.2   |
| C5        | 6.9   | 6.9   | 16.0  | 7.5   | 1.75  | 12.0  | 0.4   | 5.3   |
| C55       | 6.9   | 6.9   | 16.0  | 7.5   | 1.75  | 12.0  | 0.4   | 6.2   |
| C6        | 6.9   | 6.9   | 16.0  | 7.5   | 1.75  | 12.0  | 0.4   | 6.2   |
| C65       | 6.9   | 6.9   | 16.0  | 7.5   | 1.75  | 12.0  | 0.4   | 6.7   |
| C8        | 7.0   | 7.0   | 16.0  | 7.5   | 1.75  | 12.0  | 0.5   | 8.2   |
| C10       | 7.0   | 7.0   | 24.0  | 11.5  | 1.75  | 16.0  | 0.5   | 10.5  |
| C10L      | 7.0   | 7.0   | 16.0  | 7.5   | 1.75  | 12.0  | 0.5   | 11.0  |
| E7        | 8.6   | 8.6   | 24.0  | 11.5  | 1.75  | 12.0  | 0.4   | 7.2   |
| E10       | 8.6   | 8.6   | 24.0  | 11.5  | 1.75  | 16.0  | 0.5   | 11.0  |
| E12       | 8.6   | 8.6   | 24.0  | 11.5  | 1.75  | 16.0  | 0.5   | 12.3  |
| F8        | 10.7  | 10.7  | 24.0  | 11.5  | 1.75  | 16.0  | 0.4   | 8.2   |
| F10       | 10.7  | 10.7  | 24.0  | 11.5  | 1.75  | 16.0  | 0.4   | 11.0  |
| F12       | 10.7  | 10.7  | 24.0  | 11.5  | 1.75  | 16.0  | 0.4   | 13.0  |

**1-2. Reel**


| Size code                           | W1±0.5 | W2±1.0 |
|-------------------------------------|--------|--------|
| A5                                  | 13.0   | 17.5   |
| B45, B6, C5, C55, C6, C65, C8, C10L | 17.0   | 21.5   |
| C10, E7, E10, E12, F8, F10, F12     | 25.0   | 29.5   |

**● Minimum packing quantity and weight**

| Size code | Quantity (pcs./Reel, ø380) | Typical weight (g) |
|-----------|----------------------------|--------------------|
| A5        | 2000                       | 700                |
| B45       | 2500                       | 900                |
| B6        | 1500                       | 800                |
| C5        | 1300                       | 800                |
| C55       | 1000                       | 800                |
| C6        | 1000                       | 800                |
| C65       | 1000                       | 800                |
| C8        | 900                        | 800                |
| C10       | 500                        | 700                |
| C10L      | 700                        | 900                |

| Size code | Quantity (pcs./Reel, ø380) | Typical weight (g) |
|-----------|----------------------------|--------------------|
| E7        | 1000                       | 1100               |
| E10       | 500                        | 900                |
| E12       | 400                        | 800                |
| F8        | 500                        | 1000               |
| F10       | 500                        | 1000               |
| F12       | 400                        | 1000               |

## Packing specifications

### ◇ Radial lead type

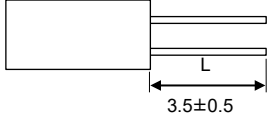
#### ● Lead terminal process

##### 1-1. Correspondence list

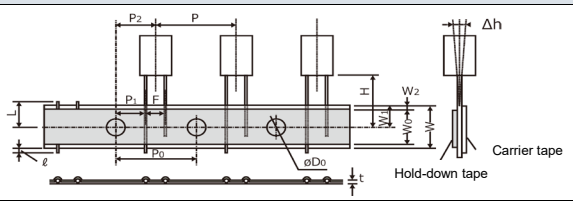
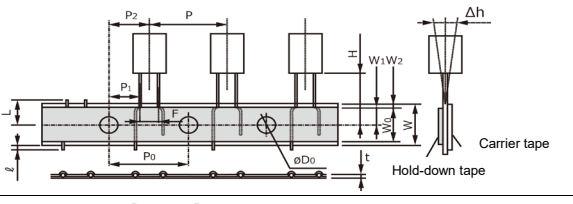
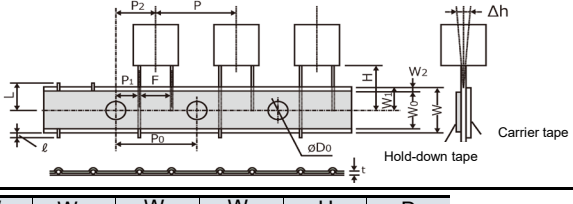
※ The following table is a standard specification. Please contact us separately concerning specifications except for that mentioned below.  
Because of a limit on the length of a model name, the part of process name changes to +S from +TSS, +D from +TS,  
+3 from +C3. Please contact us for details.

| Series          | Size code                         | Bag-packed products (lead terminal cutting) |              | Taping products |
|-----------------|-----------------------------------|---------------------------------------------|--------------|-----------------|
|                 |                                   | Not processed                               | Straight cut |                 |
| SEP, SEQP, SEPC | B9, C55, C6, C9, C10, E7, E9, E12 | No code                                     | +C3 (+3)     | +TSS (+S)       |
| SEPF, SXE, SEPG | E13                               | No code                                     | +C3 (+3)     | +TS (+D)        |
| SEF, SEK        | F8, F13                           | No code                                     | +C3 (+3)     | +T              |

##### 1-2. Lead terminal cutting specifications

| Process names | Size code                                             | Lead terminal cutting code | Lead terminal dimensions                                                                                                           |
|---------------|-------------------------------------------------------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Straight cut  | B9<br>C55, C6, C9, C10<br>E7, E9, E12, E13<br>F8, F13 | +C3 (+3)                   |  <div style="text-align: right;">Unit : mm</div> |

##### 1-3. Taping specifications for automatic insertion

| Size code        | Case size | F        | Taping code | Taping dimensions                                                                    |
|------------------|-----------|----------|-------------|--------------------------------------------------------------------------------------|
| B9               | ø5        | F=2.0 mm | +TSS (+S)   |   |
| C55, C6, C9, C10 | ø6.3      | F=2.5 mm |             |                                                                                      |
| E7, E9, E12      | ø8        | F=3.5 mm |             |                                                                                      |
| E13              | ø8        | F=3.5 mm | +TS (+D)    |  |
| F8, F13          | ø10       | F=5.0 mm | +T          |  |

| Taping code | Case size | F                                 | P    | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | Δh   | W    | W <sub>0</sub> | W <sub>1</sub> | W <sub>2</sub> | H     | øD <sub>0</sub> |
|-------------|-----------|-----------------------------------|------|----------------|----------------|----------------|------|------|----------------|----------------|----------------|-------|-----------------|
|             |           | <sup>+0.8</sup> / <sub>-0.2</sub> | ±1.0 | ±0.2           | ±0.5           | ±1.0           | ±1.0 | ±0.5 | min.           | ±0.5           | max.           | ±0.75 | ±0.2            |
| +TSS (+S)   | ø5        | 2.0                               | 12.7 | 12.7           | 5.35           | 6.35           | 0    | 18.0 | 9.5            | 9.0            | 2.5            | 17.5  | 4.0             |
|             | ø6.3      | 2.5                               | 12.7 | 12.7           | 5.10           | 6.35           | 0    | 18.0 | 9.5            | 9.0            | 2.5            | 17.5  | 4.0             |
|             | ø8        | 3.5                               | 12.7 | 12.7           | 4.60           | 6.35           | 0    | 18.0 | 9.5            | 9.0            | 2.5            | 17.5  | 4.0             |
| +TS (+D)    | ø8        | 3.5                               | 12.7 | 12.7           | 4.60           | 6.35           | 0    | 18.0 | 9.5            | 9.0            | 2.5            | 17.5  | 4.0             |
| +T          | ø10       | 5.0                               | 12.7 | 12.7           | 3.85           | 6.35           | 0    | 18.0 | 9.5            | 9.0            | 2.5            | 18.5  | 4.0             |

| Taping code | Case size | t    | ℓ    | L    |
|-------------|-----------|------|------|------|
|             |           | ±0.3 | max. | max. |
| +TSS (+S)   | ø5        | 0.6  | 0    | 11.0 |
|             | ø6.3      | 0.6  | 0    | 11.0 |
|             | ø8        | 0.6  | 0    | 11.0 |
| +TS (+D)    | ø8        | 0.6  | 0    | 11.0 |
| +T          | ø10       | 0.6  | 0    | 11.0 |

Unit : mm

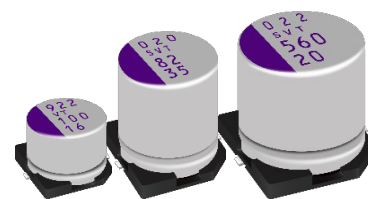
#### ● Minimum packing quantity and weight

| Size code | Case size | Bag-packed products |                   | Taping products    |                   |
|-----------|-----------|---------------------|-------------------|--------------------|-------------------|
|           |           | Quantity(pcs./Bag)  | Typical weight(g) | Quantity(pcs./Bag) | Typical weight(g) |
| B9        | ø5        | 500                 | 180               | 2000               | 1000              |
| C55       | ø6.3      | 500                 | 150               | 1500               | 650               |
| C6        | ø6.3      | 500                 | 160               | 1500               | 700               |
| C9        | ø6.3      | 500                 | 240               | 1500               | 1000              |
| C10       | ø6.3      | 500                 | 260               | 1500               | 1100              |

| Size code | Case size | Bag-packed products |                   | Taping products    |                   |
|-----------|-----------|---------------------|-------------------|--------------------|-------------------|
|           |           | Quantity(pcs./Bag)  | Typical weight(g) | Quantity(pcs./Bag) | Typical weight(g) |
| E7        | ø8        | 200                 | 110               | 1000               | 820               |
| E9        | ø8        | 200                 | 130               | 1000               | 900               |
| E12       | ø8        | 200                 | 200               | 1000               | 980               |
| E13       | ø8        | 200                 | 160               | 1000               | 1060              |
| F8        | ø10       | 200                 | 180               | 500                | 890               |
| F13       | ø10       | 200                 | 280               | 500                | 940               |



# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVT series



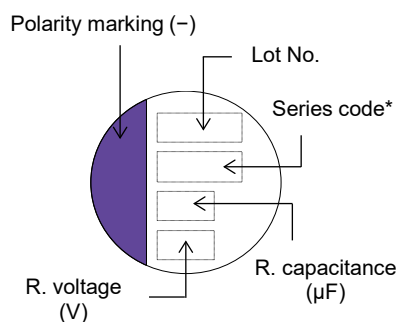
## Features

- Low ESR (10 mΩ max.)
- Large capacitance (2700 μF max.)
- 125 °C 2000 h
- RoHS compliance, Halogen free

## Specifications

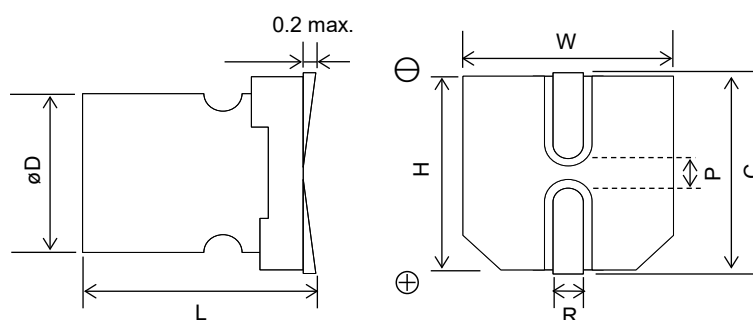
| Size code                   | C65                                                 | E7        | E10                                                 | E12        | F10  | F12        |
|-----------------------------|-----------------------------------------------------|-----------|-----------------------------------------------------|------------|------|------------|
| Category temp. range        | -55 °C to +125 °C                                   |           |                                                     |            |      |            |
| Rated voltage range (V)     | 2.5 to 16                                           | 2.5 to 50 | 16                                                  | 2.5 to 50  | 16   | 2.5 to 50  |
| Nominal cap. range (μF)     | 100 to 820                                          | 18 to 680 | 560                                                 | 39 to 1500 | 1000 | 68 to 2700 |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |           |                                                     |            |      |            |
| DC leakage current          | Please see the attached characteristics list        |           |                                                     |            |      |            |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |           |                                                     |            |      |            |
| Endurance                   | +125 °C 2000 h, rated voltage applied               |           |                                                     |            |      |            |
|                             | Capacitance change                                  |           | Within ±20 % of the initial value                   |            |      |            |
|                             | Dissipation factor (tanδ)                           |           | ≤ 200 % of the initial limit                        |            |      |            |
|                             | DC leakage current                                  |           | Within the initial limit                            |            |      |            |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |           |                                                     |            |      |            |
|                             | Capacitance change                                  |           | Within ±20 % of the initial value                   |            |      |            |
|                             | Dissipation factor (tanδ)                           |           | ≤ 150 % of the initial limit                        |            |      |            |
|                             | DC leakage current                                  |           | Within the initial limit (after voltage processing) |            |      |            |

## Marking



\* Depends on the case size.

## Dimensions (not to scale)



| Unit : mm |        |                                     |       |       |       |            |                 |
|-----------|--------|-------------------------------------|-------|-------|-------|------------|-----------------|
| Size code | øD±0.5 | L <sup>+0.1</sup> / <sub>-0.4</sub> | W±0.2 | H±0.2 | C±0.2 | R          | P <sup>*2</sup> |
| C65       | 6.3    | 6.4                                 | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1             |
| E7        | 8.0    | 6.9                                 | 8.3   | 8.3   | 9.0   | 0.6 to 0.8 | 3.2             |
| E10       | 8.0    | 10.0 <sup>*1</sup>                  | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2             |
| E12       | 8.0    | 11.9                                | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2             |
| F10       | 10.0   | 10.0 <sup>*1</sup>                  | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6             |
| F12       | 10.0   | 12.6                                | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6             |

\*1: ±0.5, \*2: Reference

## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                                                 |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-------------------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current* <sup>1</sup> (mA rms) | Allowable ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 2.5               | 560                            | 6.3            | 6.4  | C65       | 1100                                  | 3500                                            | 16                          | 0.12                | 300                   | 2R5SVT560M                  | 1000                      |
|                   | 680                            | 6.3            | 6.4  |           | 1000                                  | 3500                                            | 16                          | 0.12                | 850                   | 2R5SVT680MX                 | 1000                      |
|                   |                                | 8.0            | 6.9  | E7        | 1060                                  | 3370                                            | 20                          | 0.12                | 500                   | 2R5SVT680M                  | 1000                      |
|                   | 820                            | 6.3            | 6.4  | C65       | 1100                                  | 3500                                            | 16                          | 0.12                | 1020                  | 2R5SVT820M                  | 1000                      |
|                   | 1500                           | 8.0            | 11.9 | E12       | 1620                                  | 5150                                            | 10                          | 0.12                | 750                   | 2R5SVT1500M                 | 400                       |
|                   | 2700                           | 10.0           | 12.6 | F12       | 1600                                  | 5070                                            | 12                          | 0.12                | 1350                  | 2R5SVT2700M                 | 400                       |
| 4.0               | 560                            | 8.0            | 6.9  | E7        | 1010                                  | 3220                                            | 22                          | 0.12                | 500                   | 4SVT560M                    | 1000                      |
|                   | 1500                           | 8.0            | 11.9 | E12       | 1480                                  | 4700                                            | 12                          | 0.12                | 1200                  | 4SVT1500M                   | 400                       |
| 6.3               | 330                            | 6.3            | 6.4  | C65       | 1070                                  | 3390                                            | 15                          | 0.12                | 415                   | 6SVT330M                    | 1000                      |
|                   | 390                            | 8.0            | 6.9  | E7        | 1010                                  | 3220                                            | 22                          | 0.12                | 491                   | 6SVT390M                    | 1000                      |
|                   | 820                            | 8.0            | 11.9 | E12       | 1480                                  | 4700                                            | 12                          | 0.12                | 1033                  | 6SVT820M                    | 400                       |
| 16                | 100                            | 6.3            | 6.4  | C65       | 780                                   | 2490                                            | 24                          | 0.12                | 300                   | 16SVT100M                   | 1000                      |
|                   | 270                            | 8.0            | 6.9  | E7        | 1040                                  | 3300                                            | 22                          | 0.12                | 864                   | 16SVT270M                   | 1000                      |
|                   | 560                            | 8.0            | 10.0 | E10       | 1230                                  | 3900                                            | 18                          | 0.12                | 1792                  | 16SVT560MX                  | 500                       |
|                   | 560                            | 8.0            | 11.9 | E12       | 1560                                  | 4950                                            | 14                          | 0.12                | 1792                  | 16SVT560M                   | 400                       |
|                   | 1000                           | 10.0           | 10.0 | F10       | 1350                                  | 4300                                            | 16                          | 0.12                | 3200                  | 16SVT1000MX                 | 500                       |
|                   | 1000                           | 10.0           | 12.6 | F12       | 1700                                  | 5400                                            | 12                          | 0.12                | 3200                  | 16SVT1000M                  | 400                       |
| 20                | 180                            | 8.0            | 6.9  | E7        | 1010                                  | 3200                                            | 25                          | 0.12                | 720                   | 20SVT180M                   | 1000                      |
|                   | 390                            | 8.0            | 11.9 | E12       | 1560                                  | 4950                                            | 14                          | 0.12                | 1560                  | 20SVT390M                   | 400                       |
|                   | 560                            | 10.0           | 12.6 | F12       | 1700                                  | 5400                                            | 12                          | 0.12                | 2240                  | 20SVT560M                   | 400                       |
| 25                | 100                            | 8.0            | 6.9  | E7        | 1010                                  | 3200                                            | 24                          | 0.12                | 500                   | 25SVT100M                   | 1000                      |
|                   | 180                            | 8.0            | 11.9 | E12       | 1470                                  | 4650                                            | 16                          | 0.12                | 900                   | 25SVT180M                   | 400                       |
|                   | 330                            | 10.0           | 12.6 | F12       | 1580                                  | 5000                                            | 14                          | 0.12                | 1650                  | 25SVT330M                   | 400                       |
| 35                | 39                             | 8.0            | 6.9  | E7        | 880                                   | 2800                                            | 30                          | 0.12                | 273                   | 35SVT39M                    | 1000                      |
|                   | 82                             | 8.0            | 11.9 | E12       | 1260                                  | 4000                                            | 20                          | 0.12                | 574                   | 35SVT82M                    | 400                       |
|                   | 120                            | 10.0           | 12.6 | F12       | 1390                                  | 4400                                            | 18                          | 0.12                | 840                   | 35SVT120M                   | 400                       |
| 50                | 18                             | 8.0            | 6.9  | E7        | 850                                   | 2700                                            | 35                          | 0.12                | 180                   | 50SVT18M                    | 1000                      |
|                   | 39                             | 8.0            | 11.9 | E12       | 1200                                  | 3800                                            | 25                          | 0.12                | 390                   | 50SVT39M                    | 400                       |
|                   | 68                             | 10.0           | 12.6 | F12       | 1350                                  | 4300                                            | 20                          | 0.12                | 680                   | 50SVT68M                    | 400                       |

\*1: Ripple current (100 kHz / +105 °C < Tx ≤ +125 °C) / Allowable ripple current (100 kHz / Tx ≤ +105 °C)

Tx: Temperature measured at the top surface of aluminum case including self-heating by ripple current

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

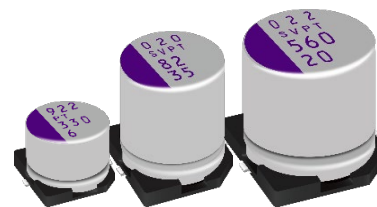
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPT series



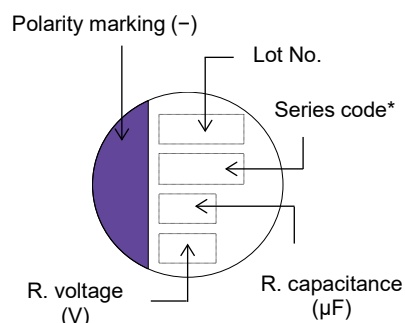
## Features

- Low ESR (10 mΩ max.)
- Large capacitance (2700 μF max.)
- 105 °C 20000 h
- RoHS compliance, Halogen free

## Specifications

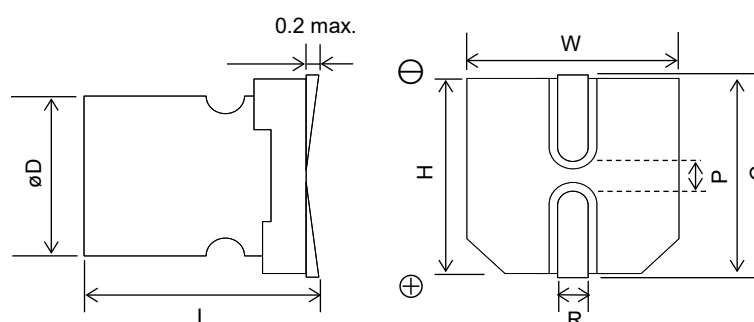
| Size code                   | C65                                                 | E7        | E10                                                 | E12        | F10  | F12        |
|-----------------------------|-----------------------------------------------------|-----------|-----------------------------------------------------|------------|------|------------|
| Category temp. range        | -55 °C to +105 °C                                   |           |                                                     |            |      |            |
| Rated voltage range (V)     | 2.5 to 16                                           | 2.5 to 50 | 16                                                  | 2.5 to 50  | 16   | 2.5 to 50  |
| Nominal cap. range (μF)     | 100 to 820                                          | 18 to 680 | 560                                                 | 39 to 1500 | 1000 | 68 to 2700 |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |           |                                                     |            |      |            |
| DC leakage current          | Please see the attached characteristics list        |           |                                                     |            |      |            |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |           |                                                     |            |      |            |
| Endurance                   | +105 °C 20000 h, rated voltage applied              |           |                                                     |            |      |            |
|                             | Capacitance change                                  |           | Within ±20 % of the initial value                   |            |      |            |
|                             | Dissipation factor (tanδ)                           |           | ≤ 150 % of the initial limit                        |            |      |            |
|                             | DC leakage current                                  |           | Within the initial limit                            |            |      |            |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |           |                                                     |            |      |            |
|                             | Capacitance change                                  |           | Within ±20 % of the initial value                   |            |      |            |
|                             | Dissipation factor (tanδ)                           |           | ≤ 150 % of the initial limit                        |            |      |            |
|                             | DC leakage current                                  |           | Within the initial limit (after voltage processing) |            |      |            |

## Marking



\* Depends on the case size.

## Dimensions (not to scale)



| Unit : mm |        |                                   |       |       |       |            |                 |
|-----------|--------|-----------------------------------|-------|-------|-------|------------|-----------------|
| Size code | øD±0.5 | L <sup>+0.1</sup> <sub>-0.4</sub> | W±0.2 | H±0.2 | C±0.2 | R          | P <sup>*2</sup> |
| C65       | 6.3    | 6.4                               | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1             |
| E7        | 8.0    | 6.9                               | 8.3   | 8.3   | 9.0   | 0.6 to 0.8 | 3.2             |
| E10       | 8.0    | 10.0 <sup>*1</sup>                | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2             |
| E12       | 8.0    | 11.9                              | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2             |
| F10       | 10.0   | 10.0 <sup>*1</sup>                | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6             |
| F12       | 10.0   | 12.6                              | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6             |

\*1: ±0.5, \*2: Reference

## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 2.5               | 560                            | 6.3            | 6.4  | C65       | 3500                                  | 16                          | 0.12                | 300                   | 2R5SVPT560M                 | 1000                      |
|                   | 680                            | 6.3            | 6.4  |           | 3500                                  | 16                          | 0.12                | 850                   | 2R5SVPT680MX                | 1000                      |
|                   |                                | 8.0            | 6.9  | E7        | 3370                                  | 20                          | 0.12                | 500                   | 2R5SVPT680M                 | 1000                      |
|                   | 820                            | 6.3            | 6.4  | C65       | 3500                                  | 16                          | 0.12                | 1020                  | 2R5SVPT820M                 | 1000                      |
|                   | 1500                           | 8.0            | 11.9 | E12       | 5150                                  | 10                          | 0.12                | 750                   | 2R5SVPT1500M                | 400                       |
|                   | 2700                           | 10.0           | 12.6 | F12       | 5070                                  | 12                          | 0.12                | 1350                  | 2R5SVPT2700M                | 400                       |
| 4.0               | 560                            | 8.0            | 6.9  | E7        | 3220                                  | 22                          | 0.12                | 500                   | 4SVPT560M                   | 1000                      |
|                   | 1500                           | 8.0            | 11.9 | E12       | 4700                                  | 12                          | 0.12                | 1200                  | 4SVPT1500M                  | 400                       |
| 6.3               | 330                            | 6.3            | 6.4  | C65       | 3390                                  | 15                          | 0.12                | 415                   | 6SVPT330M                   | 1000                      |
|                   | 390                            | 8.0            | 6.9  | E7        | 3220                                  | 22                          | 0.12                | 491                   | 6SVPT390M                   | 1000                      |
|                   | 820                            | 8.0            | 11.9 | E12       | 4700                                  | 12                          | 0.12                | 1033                  | 6SVPT820M                   | 400                       |
| 16                | 100                            | 6.3            | 6.4  | C65       | 2490                                  | 24                          | 0.12                | 300                   | 16SVPT100M                  | 1000                      |
|                   | 270                            | 8.0            | 6.9  | E7        | 3300                                  | 22                          | 0.12                | 864                   | 16SVPT270M                  | 1000                      |
|                   | 560                            | 8.0            | 10.0 | E10       | 3900                                  | 18                          | 0.12                | 1792                  | 16SVPT560MX                 | 500                       |
|                   | 560                            | 8.0            | 11.9 | E12       | 4950                                  | 14                          | 0.12                | 1792                  | 16SVPT560M                  | 400                       |
|                   | 1000                           | 10.0           | 10.0 | F10       | 4300                                  | 16                          | 0.12                | 3200                  | 16SVPT1000MX                | 500                       |
|                   | 1000                           | 10.0           | 12.6 | F12       | 5400                                  | 12                          | 0.12                | 3200                  | 16SVPT1000M                 | 400                       |
| 20                | 180                            | 8.0            | 6.9  | E7        | 3200                                  | 25                          | 0.12                | 720                   | 20SVPT180M                  | 1000                      |
|                   | 390                            | 8.0            | 11.9 | E12       | 4950                                  | 14                          | 0.12                | 1560                  | 20SVPT390M                  | 400                       |
|                   | 560                            | 10.0           | 12.6 | F12       | 5400                                  | 12                          | 0.12                | 2240                  | 20SVPT560M                  | 400                       |
| 25                | 100                            | 8.0            | 6.9  | E7        | 3200                                  | 24                          | 0.12                | 500                   | 25SVPT100M                  | 1000                      |
|                   | 180                            | 8.0            | 11.9 | E12       | 4650                                  | 16                          | 0.12                | 900                   | 25SVPT180M                  | 400                       |
|                   | 330                            | 10.0           | 12.6 | F12       | 5000                                  | 14                          | 0.12                | 1650                  | 25SVPT330M                  | 400                       |
| 35                | 39                             | 8.0            | 6.9  | E7        | 2800                                  | 30                          | 0.12                | 273                   | 35SVPT39M                   | 1000                      |
|                   | 82                             | 8.0            | 11.9 | E12       | 4000                                  | 20                          | 0.12                | 574                   | 35SVPT82M                   | 400                       |
|                   | 120                            | 10.0           | 12.6 | F12       | 4400                                  | 18                          | 0.12                | 840                   | 35SVPT120M                  | 400                       |
| 50                | 18                             | 8.0            | 6.9  | E7        | 2700                                  | 35                          | 0.12                | 180                   | 50SVPT18M                   | 1000                      |
|                   | 39                             | 8.0            | 11.9 | E12       | 3800                                  | 25                          | 0.12                | 390                   | 50SVPT39M                   | 400                       |
|                   | 68                             | 10.0           | 12.6 | F12       | 4300                                  | 20                          | 0.12                | 680                   | 50SVPT68M                   | 400                       |

\*1: Ripple current (100 kHz / +105 °C)

The surface temperature of aluminum case top must not exceed 105 °C. A rise in temperature due to self-heating by ripple current should be factored in.

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

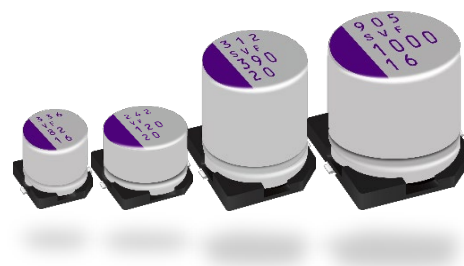
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVF series



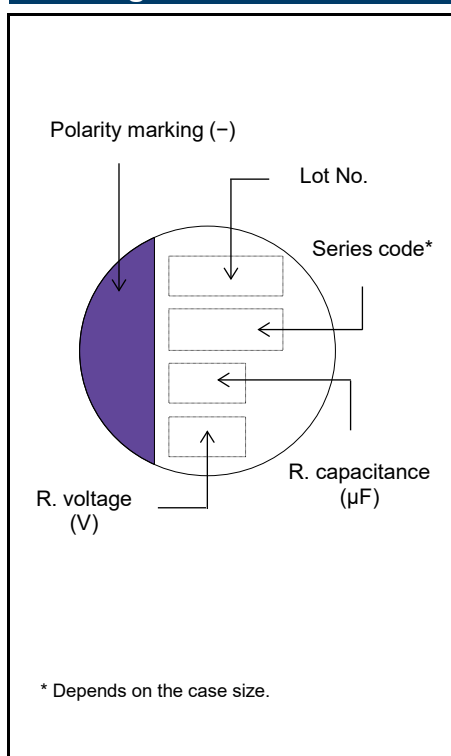
## Features

- High voltage (50 V max.)
- Large capacitance (1000 µF max.)
- 125 °C 1000 h
- RoHS compliance, Halogen free

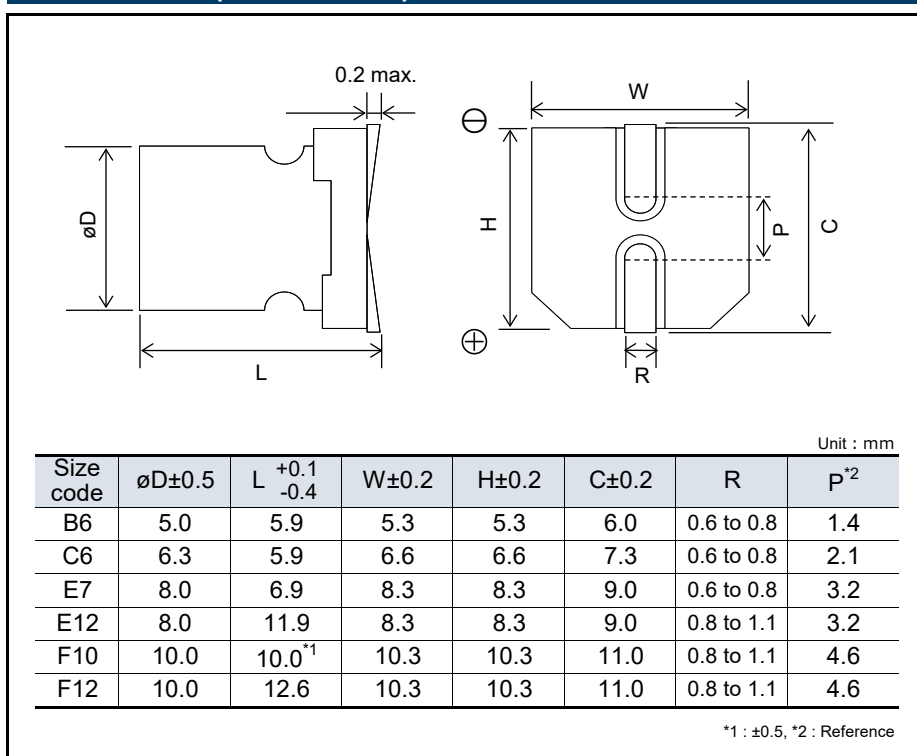
## Specifications

| Size code                   | B6                                                  | C6              | E7                                                  | E12             | F10     | F12              |
|-----------------------------|-----------------------------------------------------|-----------------|-----------------------------------------------------|-----------------|---------|------------------|
| Category temp. range        | -55 °C to +125 °C                                   |                 |                                                     |                 |         |                  |
| Rated voltage range         | 16 V to 25 V                                        | 16 V to 50 V    |                                                     |                 | 16 V    | 16 V to 50 V     |
| Nominal cap.range           | 27 µF to 82 µF                                      | 10 µF to 180 µF | 18 µF to 270 µF                                     | 39 µF to 560 µF | 1000 µF | 68 µF to 1000 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                 |                                                     |                 |         |                  |
| DC leakage current          | Please see the attached characteristics list        |                 |                                                     |                 |         |                  |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                 |                                                     |                 |         |                  |
| Endurance                   | +125 °C 1000 h, rated voltage applied               |                 |                                                     |                 |         |                  |
|                             | Capacitance change                                  |                 | Within ±20 % of the initial value                   |                 |         |                  |
|                             | Dissipation factor (tanδ)                           |                 | ≤ 200 % of the initial limit                        |                 |         |                  |
|                             | DC leakage current                                  |                 | Within the initial limit                            |                 |         |                  |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                 |                                                     |                 |         |                  |
|                             | Capacitance change                                  |                 | Within ±20 % of the initial value                   |                 |         |                  |
|                             | Dissipation factor (tanδ)                           |                 | ≤ 150 % of the initial limit                        |                 |         |                  |
|                             | DC leakage current                                  |                 | Within the initial limit (after voltage processing) |                 |         |                  |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                                                 |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-------------------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current* <sup>1</sup> (mA rms) | Allowable ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 16                | 82                             | 5.0            | 5.9  | B6        | 940                                   | 3000                                            | 27                          | 0.12                | 262                   | 16SVF82M                    | 1500                      |
|                   | 180                            | 6.3            | 5.9  | C6        | 1040                                  | 3300                                            | 22                          | 0.12                | 576                   | 16SVF180M                   | 1000                      |
|                   | 270                            | 8.0            | 6.9  | E7        | 1040                                  | 3300                                            | 22                          | 0.12                | 864                   | 16SVF270M                   | 1000                      |
|                   | 560                            | 8.0            | 11.9 | E12       | 1560                                  | 4950                                            | 14                          | 0.12                | 1792                  | 16SVF560M                   | 400                       |
|                   | 1000                           | 10.0           | 10.0 | F10       | 1350                                  | 4300                                            | 16                          | 0.12                | 3200                  | 16SVF1000MX                 | 500                       |
|                   |                                | 10.0           | 12.6 | F12       | 1700                                  | 5400                                            | 12                          | 0.12                | 3200                  | 16SVF1000M                  | 400                       |
| 20                | 56                             | 5.0            | 5.9  | B6        | 880                                   | 2800                                            | 30                          | 0.12                | 224                   | 20SVF56M                    | 1500                      |
|                   | 120                            | 6.3            | 5.9  | C6        | 1010                                  | 3200                                            | 25                          | 0.12                | 480                   | 20SVF120M                   | 1000                      |
|                   | 180                            | 8.0            | 6.9  | E7        | 1010                                  | 3200                                            | 25                          | 0.12                | 720                   | 20SVF180M                   | 1000                      |
|                   | 390                            | 8.0            | 11.9 | E12       | 1560                                  | 4950                                            | 14                          | 0.12                | 1560                  | 20SVF390M                   | 400                       |
|                   | 560                            | 10.0           | 12.6 | F12       | 1700                                  | 5400                                            | 12                          | 0.12                | 2240                  | 20SVF560M                   | 400                       |
| 25                | 27                             | 5.0            | 5.9  | B6        | 770                                   | 2450                                            | 40                          | 0.12                | 135                   | 25SVF27M                    | 1500                      |
|                   | 47                             | 6.3            | 5.9  | C6        | 880                                   | 2800                                            | 30                          | 0.12                | 235                   | 25SVF47M                    | 1000                      |
|                   | 56                             | 6.3            | 5.9  |           | 880                                   | 2800                                            | 30                          | 0.12                | 280                   | 25SVF56M                    | 1000                      |
|                   | 82                             | 8.0            | 6.9  | E7        | 940                                   | 3000                                            | 28                          | 0.12                | 410                   | 25SVF82M                    | 1000                      |
|                   | 100                            | 8.0            | 6.9  |           | 1010                                  | 3200                                            | 24                          | 0.12                | 500                   | 25SVF100M                   | 1000                      |
|                   | 180                            | 8.0            | 11.9 | E12       | 1470                                  | 4650                                            | 16                          | 0.12                | 900                   | 25SVF180M                   | 400                       |
|                   | 330                            | 10.0           | 12.6 | F12       | 1580                                  | 5000                                            | 14                          | 0.12                | 1650                  | 25SVF330M                   | 400                       |
| 35                | 22                             | 6.3            | 5.9  | C6        | 820                                   | 2600                                            | 35                          | 0.12                | 154                   | 35SVF22M                    | 1000                      |
|                   | 39                             | 8.0            | 6.9  | E7        | 880                                   | 2800                                            | 30                          | 0.12                | 273                   | 35SVF39M                    | 1000                      |
|                   | 82                             | 8.0            | 11.9 | E12       | 1260                                  | 4000                                            | 20                          | 0.12                | 574                   | 35SVF82M                    | 400                       |
|                   | 120                            | 10.0           | 12.6 | F12       | 1390                                  | 4400                                            | 18                          | 0.12                | 840                   | 35SVF120M                   | 400                       |
| 50                | 10                             | 6.3            | 5.9  | C6        | 790                                   | 2500                                            | 40                          | 0.12                | 100                   | 50SVF10M                    | 1000                      |
|                   | 18                             | 8.0            | 6.9  | E7        | 850                                   | 2700                                            | 35                          | 0.12                | 180                   | 50SVF18M                    | 1000                      |
|                   | 39                             | 8.0            | 11.9 | E12       | 1200                                  | 3800                                            | 25                          | 0.12                | 390                   | 50SVF39M                    | 400                       |
|                   | 68                             | 10.0           | 12.6 | F12       | 1350                                  | 4300                                            | 20                          | 0.12                | 680                   | 50SVF68M                    | 400                       |

\*1: Ripple current (100 kHz / +105 °C < Tx ≤ +125 °C) / Allowable ripple current (100 kHz / Tx ≤ +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPK series



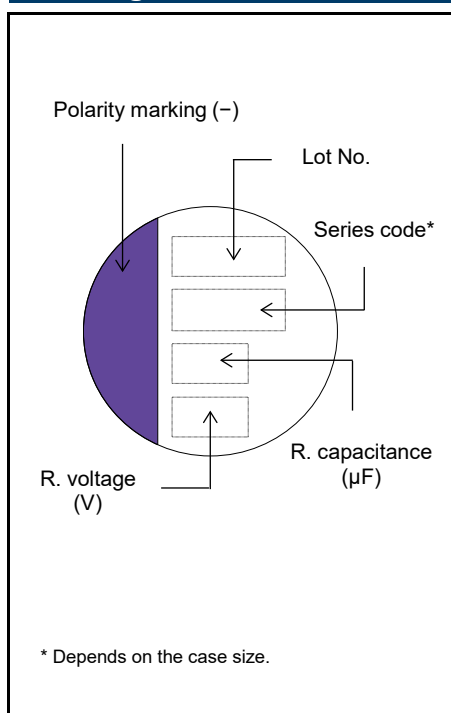
## Features

- High voltage (50 V max.)
- 125 °C 1000 h
- RoHS compliance, Halogen free

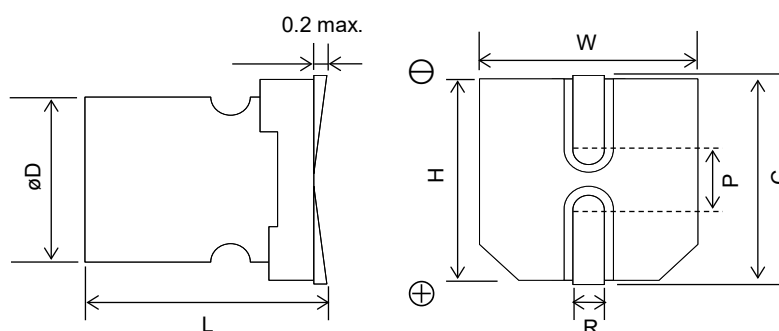
## Specifications

| Size code                   | B6                                                  | C6                                                  | E7              | E12             | F12               |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------|-----------------|-------------------|
| Category temp. range        | -55 °C to +125 °C                                   |                                                     |                 |                 |                   |
| Rated voltage range         | 16 V to 50 V                                        |                                                     |                 |                 |                   |
| Nominal cap.range           | 10 µF to 100 µF                                     | 22 µF to 220 µF                                     | 33 µF to 330 µF | 68 µF to 680 µF | 120 µF to 1200 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |                 |                 |                   |
| DC leakage current          | Please see the attached characteristics list        |                                                     |                 |                 |                   |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |                 |                 |                   |
| Endurance                   | +125 °C 1000 h, rated voltage applied               |                                                     |                 |                 |                   |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                 |                   |
|                             | Dissipation factor (tanδ)                           | ≤ 200 % of the initial limit                        |                 |                 |                   |
|                             | DC leakage current                                  | Within the initial limit                            |                 |                 |                   |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |                 |                 |                   |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                 |                   |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                 |                 |                   |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |                 |                 |                   |

## Marking



## Dimensions (not to scale)



| Unit : mm |        |                                     |       |       |       |            |                 |
|-----------|--------|-------------------------------------|-------|-------|-------|------------|-----------------|
| Size code | øD±0.5 | L <sup>+0.1</sup> / <sub>-0.4</sub> | W±0.2 | H±0.2 | C±0.2 | R          | P <sup>*1</sup> |
| B6        | 5.0    | 5.9                                 | 5.3   | 5.3   | 6.0   | 0.6 to 0.8 | 1.4             |
| C6        | 6.3    | 5.9                                 | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1             |
| E7        | 8.0    | 6.9                                 | 8.3   | 8.3   | 9.0   | 0.6 to 0.8 | 3.2             |
| E12       | 8.0    | 11.9                                | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2             |
| F12       | 10.0   | 12.6                                | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6             |

\*1 : Reference

## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                                                 |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-------------------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current* <sup>1</sup> (mA rms) | Allowable ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 16                | 100                            | 5.0            | 5.9  | B6        | 940                                   | 3000                                            | 27                          | 0.12                | 320                   | 16SVPK100M                  | 1500                      |
|                   | 220                            | 6.3            | 5.9  | C6        | 1040                                  | 3300                                            | 22                          | 0.12                | 704                   | 16SVPK220M                  | 1000                      |
|                   | 330                            | 8.0            | 6.9  | E7        | 1040                                  | 3300                                            | 22                          | 0.12                | 1056                  | 16SVPK330M                  | 1000                      |
|                   | 680                            | 8.0            | 11.9 | E12       | 1560                                  | 4950                                            | 14                          | 0.12                | 2176                  | 16SVPK680M                  | 400                       |
|                   | 1200                           | 10.0           | 12.6 | F12       | 1700                                  | 5400                                            | 12                          | 0.12                | 3840                  | 16SVPK1200M                 | 400                       |
| 20                | 68                             | 5.0            | 5.9  | B6        | 880                                   | 2800                                            | 30                          | 0.12                | 272                   | 20SVPK68M                   | 1500                      |
|                   | 150                            | 6.3            | 5.9  | C6        | 1010                                  | 3200                                            | 25                          | 0.12                | 600                   | 20SVPK150M                  | 1000                      |
|                   | 220                            | 8.0            | 6.9  | E7        | 1010                                  | 3200                                            | 25                          | 0.12                | 880                   | 20SVPK220M                  | 1000                      |
|                   | 470                            | 8.0            | 11.9 | E12       | 1560                                  | 4950                                            | 14                          | 0.12                | 1880                  | 20SVPK470M                  | 400                       |
|                   | 680                            | 10.0           | 12.6 | F12       | 1700                                  | 5400                                            | 12                          | 0.12                | 2720                  | 20SVPK680M                  | 400                       |
| 25                | 33                             | 5.0            | 5.9  | B6        | 820                                   | 2600                                            | 35                          | 0.12                | 165                   | 25SVPK33M                   | 1500                      |
|                   | 82                             | 6.3            | 5.9  | C6        | 960                                   | 3060                                            | 25                          | 0.12                | 410                   | 25SVPK82M                   | 1000                      |
|                   | 120                            | 8.0            | 6.9  | E7        | 1010                                  | 3200                                            | 24                          | 0.12                | 600                   | 25SVPK120M                  | 1000                      |
|                   | 270                            | 8.0            | 11.9 | E12       | 1470                                  | 4650                                            | 16                          | 0.12                | 1350                  | 25SVPK270M                  | 400                       |
|                   | 470                            | 10.0           | 12.6 | F12       | 1590                                  | 5000                                            | 14                          | 0.12                | 2350                  | 25SVPK470M                  | 400                       |
| 35                | 22                             | 5.0            | 5.9  | B6        | 820                                   | 2600                                            | 35                          | 0.12                | 154                   | 35SVPK22M                   | 1500                      |
|                   | 47                             | 6.3            | 5.9  | C6        | 930                                   | 2950                                            | 27                          | 0.12                | 329                   | 35SVPK47M                   | 1000                      |
|                   | 82                             | 8.0            | 6.9  | E7        | 960                                   | 3060                                            | 25                          | 0.12                | 574                   | 35SVPK82M                   | 1000                      |
|                   | 180                            | 8.0            | 11.9 | E12       | 1260                                  | 4000                                            | 20                          | 0.12                | 1260                  | 35SVPK180M                  | 400                       |
|                   | 330                            | 10.0           | 12.6 | F12       | 1390                                  | 4400                                            | 18                          | 0.12                | 2310                  | 35SVPK330M                  | 400                       |
| 50                | 10                             | 5.0            | 5.9  | B6        | 550                                   | 1750                                            | 80                          | 0.12                | 100                   | 50SVPK10M                   | 1500                      |
|                   | 22                             | 6.3            | 5.9  | C6        | 820                                   | 2600                                            | 35                          | 0.12                | 220                   | 50SVPK22M                   | 1000                      |
|                   | 33                             | 8.0            | 6.9  | E7        | 850                                   | 2700                                            | 35                          | 0.12                | 330                   | 50SVPK33M                   | 1000                      |
|                   | 68                             | 8.0            | 11.9 | E12       | 1200                                  | 3800                                            | 25                          | 0.12                | 680                   | 50SVPK68M                   | 400                       |
|                   | 120                            | 10.0           | 12.6 | F12       | 1350                                  | 4300                                            | 20                          | 0.12                | 1200                  | 50SVPK120M                  | 400                       |

\*1: Ripple current (100 kHz / +105 °C < Tx ≤ +125 °C) / Allowable ripple current (100 kHz / Tx ≤ +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |



# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SXV series



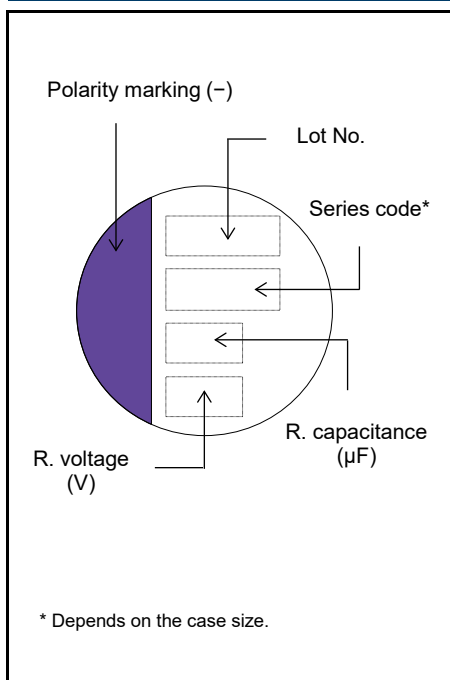
## Features

- Super high voltage (100 V max.)
- 125 °C 1000 h
- RoHS compliance, Halogen free

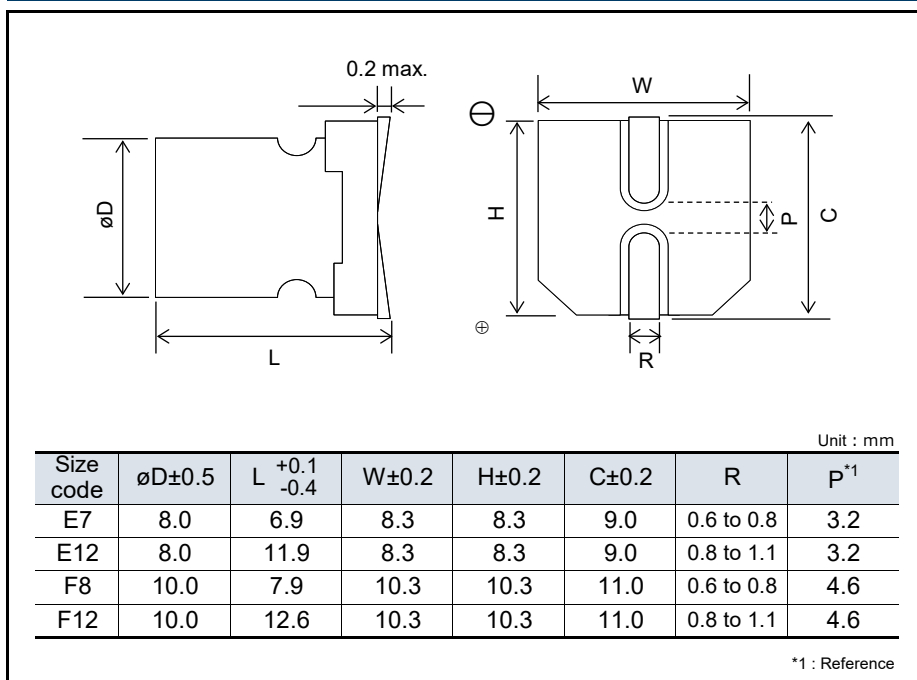
## Specifications

| Size code                   | E7                                                  | E12                                                 | F8             | F12             |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------------|-----------------|
| Category temp. range        | -55 °C to +125 °C                                   |                                                     |                |                 |
| Rated voltage range         | 63 V to 100 V                                       |                                                     |                |                 |
| Nominal cap.range           | 6.8 µF to 18 µF                                     | 15 µF to 56 µF                                      | 15 µF to 39 µF | 18 µF to 100 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |                |                 |
| DC leakage current          | Please see the attached characteristics list        |                                                     |                |                 |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |                |                 |
| Endurance                   | +125 °C 1000 h, rated voltage applied               |                                                     |                |                 |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                |                 |
|                             | Dissipation factor (tanδ)                           | ≤ 200 % of the initial limit                        |                |                 |
|                             | DC leakage current                                  | Within the initial limit                            |                |                 |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |                |                 |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                |                 |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                |                 |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |                |                 |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                                                 |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-------------------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current <sup>*1</sup> (mA rms) | Allowable ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (mΩ max.) | tan δ <sup>*3</sup> | LC <sup>*4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 63                | 18                             | 8.0            | 6.9  | E7        | 340                                   | 1100                                            | 60                          | 0.12                | 56                    | 63SXV18M                    | 1000                      |
|                   | 33                             | 8.0            | 11.9 | E12       | 930                                   | 2950                                            | 25                          | 0.12                | 104                   | 63SXV33M                    | 400                       |
|                   | 39                             | 8.0            | 11.9 | E12       | 930                                   | 2950                                            | 25                          | 0.12                | 122                   | 63SXV39M                    | 400                       |
|                   |                                | 10.0           | 7.9  | F8        | 690                                   | 2190                                            | 50                          | 0.12                | 122                   | 63SXV39MX                   | 500                       |
|                   | 56                             | 8.0            | 11.9 | E12       | 930                                   | 2950                                            | 25                          | 0.12                | 176                   | 63SXV56M                    | 400                       |
|                   | 68                             | 10.0           | 12.6 | F12       | 1030                                  | 3280                                            | 25                          | 0.12                | 214                   | 63SXV68M                    | 400                       |
|                   | 100                            | 10.0           | 12.6 | F12       | 1030                                  | 3280                                            | 25                          | 0.12                | 315                   | 63SXV100M                   | 400                       |
| 72                | 82                             | 10.0           | 12.6 | F12       | 980                                   | 3100                                            | 28                          | 0.12                | 295                   | 72SXV82M                    | 400                       |
| 80                | 12                             | 8.0            | 6.9  | E7        | 340                                   | 1100                                            | 60                          | 0.12                | 48                    | 80SXV12M                    | 1000                      |
|                   | 27                             | 8.0            | 11.9 | E12       | 780                                   | 2490                                            | 35                          | 0.12                | 108                   | 80SXV27M                    | 400                       |
|                   |                                | 10.0           | 7.9  | F8        | 660                                   | 2080                                            | 55                          | 0.12                | 108                   | 80SXV27MX                   | 500                       |
|                   | 33                             | 8.0            | 11.9 | E12       | 780                                   | 2490                                            | 35                          | 0.12                | 132                   | 80SXV33M                    | 400                       |
|                   | 47                             | 10.0           | 12.6 | F12       | 980                                   | 3100                                            | 28                          | 0.12                | 188                   | 80SXV47M                    | 400                       |
|                   | 56                             | 10.0           | 12.6 | F12       | 980                                   | 3100                                            | 28                          | 0.12                | 224                   | 80SXV56M                    | 400                       |
| 100               | 6.8                            | 8.0            | 6.9  | E7        | 340                                   | 1100                                            | 60                          | 0.12                | 34                    | 100SXV6R8M                  | 1000                      |
|                   | 15                             | 10.0           | 7.9  | F8        | 630                                   | 2000                                            | 60                          | 0.12                | 75                    | 100SXV15MX                  | 500                       |
|                   |                                | 8.0            | 11.9 | E12       | 730                                   | 2350                                            | 40                          | 0.12                | 75                    | 100SXV15M                   | 400                       |
|                   | 18                             | 10.0           | 12.6 | F12       | 940                                   | 3000                                            | 30                          | 0.12                | 90                    | 100SXV18M                   | 400                       |
|                   |                                | 8.0            | 11.9 | E12       | 730                                   | 2350                                            | 40                          | 0.12                | 90                    | 100SXV18MX                  | 400                       |
|                   | 22                             | 10.0           | 12.6 | F12       | 940                                   | 3000                                            | 30                          | 0.12                | 110                   | 100SXV22M                   | 400                       |
|                   | 27                             | 10.0           | 12.6 | F12       | 940                                   | 3000                                            | 30                          | 0.12                | 135                   | 100SXV27M                   | 400                       |

\*1: Ripple current (100 kHz / +105 °C < Tx ≤ +125 °C) / Allowable ripple current (100 kHz / Tx ≤ +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

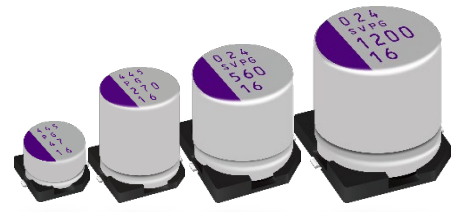
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPG series



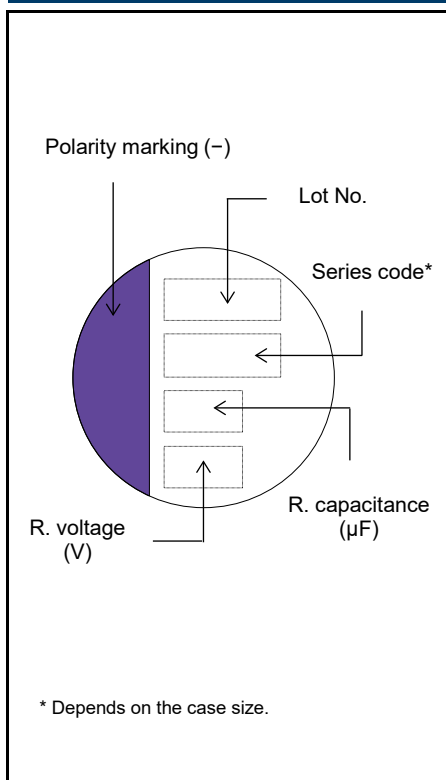
## Features

- Low profile (Height 4.5 mm max.)
- Low ESR (6.5 mΩ max.)
- High ripple current (7500 mA rms max.)
- RoHS compliance, Halogen free

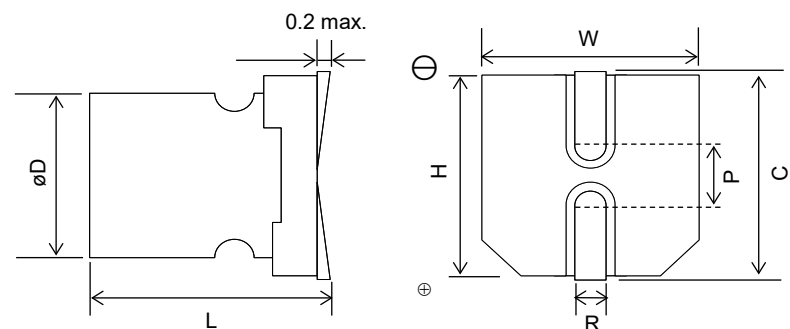
## Specifications

| Size code                   | B45                                                 | B6  | C6  | C8                                                  | C10 | C10L | E7 | E10 | E12 | F10 | F12  |
|-----------------------------|-----------------------------------------------------|-----|-----|-----------------------------------------------------|-----|------|----|-----|-----|-----|------|
| Category temp. range        | -55 °C to +105 °C                                   |     |     |                                                     |     |      |    |     |     |     |      |
| Rated voltage range (V)     | 16 to 25                                            | 16  |     |                                                     |     |      |    |     |     |     |      |
| Nominal cap.range (µF)      | 15 to 47                                            | 100 | 220 | 270                                                 |     | 330  |    | 560 | 680 | 820 | 1200 |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |     |     |                                                     |     |      |    |     |     |     |      |
| DC leakage current          | Please see the attached characteristics list        |     |     |                                                     |     |      |    |     |     |     |      |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |     |     |                                                     |     |      |    |     |     |     |      |
| Endurance                   | +105 °C 5000 h, rated voltage applied               |     |     |                                                     |     |      |    |     |     |     |      |
|                             | Capacitance change                                  |     |     | Within ±20 % of the initial value                   |     |      |    |     |     |     |      |
|                             | Dissipation factor (tanδ)                           |     |     | ≤ 150 % of the initial limit                        |     |      |    |     |     |     |      |
|                             | DC leakage current                                  |     |     | Within the initial limit                            |     |      |    |     |     |     |      |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |     |     |                                                     |     |      |    |     |     |     |      |
|                             | Capacitance change                                  |     |     | Within ±20 % of the initial value                   |     |      |    |     |     |     |      |
|                             | Dissipation factor (tanδ)                           |     |     | ≤ 150 % of the initial limit                        |     |      |    |     |     |     |      |
|                             | DC leakage current                                  |     |     | Within the initial limit (after voltage processing) |     |      |    |     |     |     |      |

## Marking



## Dimensions (not to scale)



| Size code | øD±0.5 | L <sup>+0.1</sup> <sub>-0.4</sub> | W±0.2 | H±0.2 | C±0.2 | R          | P <sup>*2</sup> |
|-----------|--------|-----------------------------------|-------|-------|-------|------------|-----------------|
| B45       | 5.0    | 4.4                               | 5.3   | 5.3   | 6.0   | 0.6 to 0.8 | 1.4             |
| B6        | 5.0    | 5.9                               | 5.3   | 5.3   | 6.0   | 0.6 to 0.8 | 1.4             |
| C6        | 6.3    | 5.9                               | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1             |
| C8        | 6.3    | 7.9                               | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1             |
| C10       | 6.3    | 9.9                               | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1             |
| C10L      | 6.3    | 10.4                              | 6.6   | 6.6   | 7.3   | 1.5 to 1.8 | 2.1             |
| E7        | 8.0    | 6.9                               | 8.3   | 8.3   | 9.0   | 0.6 to 0.8 | 3.2             |
| E10       | 8.0    | 10.0 <sup>*1</sup>                | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2             |
| E12       | 8.0    | 11.9                              | 8.3   | 8.3   | 9.0   | 0.8 to 1.1 | 3.2             |
| F10       | 10.0   | 10.0 <sup>*1</sup>                | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6             |
| F12       | 10.0   | 12.6                              | 10.3  | 10.3  | 11.0  | 0.8 to 1.1 | 4.6             |

\*1 : ±0.5, \*2 : Reference

## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 16                | 47                             | 5.0            | 4.4  | B45       | 3200                                  | 25                          | 0.12                | 150                   | 16SVPG47M                   | 2500                      |
|                   | 100                            | 5.0            | 5.9  | B6        | 4000                                  | 15                          | 0.12                | 320                   | 16SVPG100M                  | 1500                      |
|                   | 220                            | 6.3            | 5.9  | C6        | 4100                                  | 14                          | 0.12                | 704                   | 16SVPG220M                  | 1000                      |
|                   | 270                            | 6.3            | 7.9  | C8        | 5080                                  | 10                          | 0.12                | 864                   | 16SVPG270MX                 | 900                       |
|                   |                                | 6.3            | 9.9  | C10       | 5800                                  | 8                           | 0.12                | 864                   | 16SVPG270M                  | 500                       |
|                   | 330                            | 6.3            | 10.4 | C10L      | 7500                                  | 6.5                         | 0.12                | 1056                  | 16SVPG330M                  | 700                       |
|                   |                                | 8.0            | 6.9  | E7        | 4100                                  | 16                          | 0.12                | 1056                  | 16SVPG330MX                 | 1000                      |
|                   | 560                            | 8.0            | 10.0 | E10       | 5200                                  | 10                          | 0.12                | 1792                  | 16SVPG560M                  | 500                       |
|                   | 680                            | 8.0            | 11.9 | E12       | 6500                                  | 8                           | 0.12                | 2176                  | 16SVPG680M                  | 400                       |
| 20                | 820                            | 10.0           | 10.0 | F10       | 5700                                  | 9                           | 0.12                | 2624                  | 16SVPG820M                  | 500                       |
|                   | 1200                           | 10.0           | 12.6 | F12       | 7000                                  | 7                           | 0.12                | 3840                  | 16SVPG1200M                 | 400                       |
|                   |                                |                |      |           |                                       |                             |                     |                       |                             |                           |
| 20                | 33                             | 5.0            | 4.4  | B45       | 3000                                  | 27                          | 0.12                | 132                   | 20SVPG33M                   | 2500                      |
| 25                | 15                             | 5.0            | 4.4  |           | 2800                                  | 30                          | 0.12                | 75                    | 25SVPG15M                   | 2500                      |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

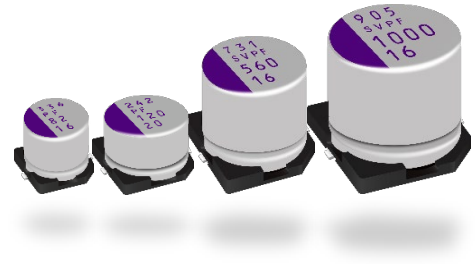
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPF series



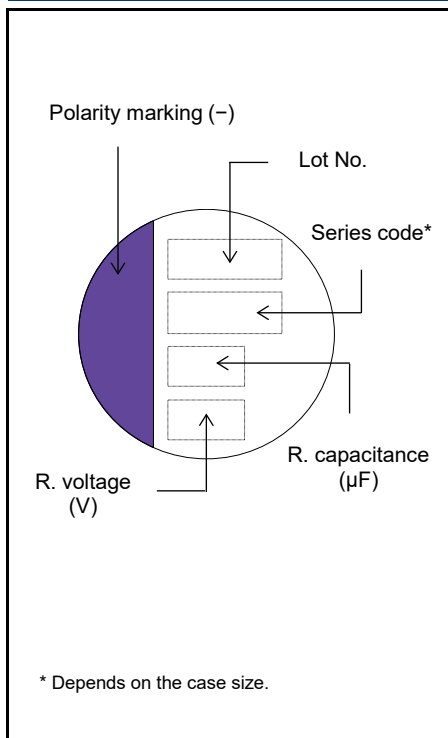
## Features

- High voltage (50 V max.)
- Large capacitance (1000  $\mu$ F max.)
- 105  $^{\circ}$ C 5000 h
- RoHS compliance, Halogen free

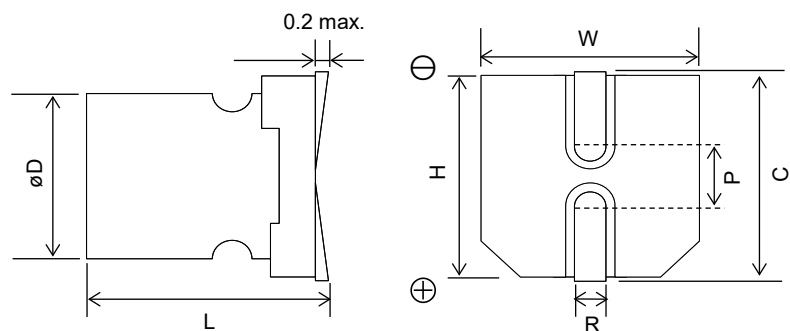
## Specifications

| Size code                   | B6                                                  | C6        | E7                                                  | E10 | E12       | F10  | F12        |
|-----------------------------|-----------------------------------------------------|-----------|-----------------------------------------------------|-----|-----------|------|------------|
| Category temp. range        | -55 °C to +105 °C                                   |           |                                                     |     |           |      |            |
| Rated voltage range (V)     | 16 to 25                                            | 16 to 50  |                                                     | 16  | 16 to 50  | 16   | 16 to 50   |
| Nominal cap.range (μF)      | 27 to 82                                            | 10 to 180 | 18 to 270                                           | 560 | 39 to 560 | 1000 | 68 to 1000 |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |           |                                                     |     |           |      |            |
| DC leakage current          | Please see the attached characteristics list        |           |                                                     |     |           |      |            |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |           |                                                     |     |           |      |            |
| Endurance                   | +105 °C 5000 h, rated voltage applied               |           |                                                     |     |           |      |            |
|                             | Capacitance change                                  |           | Within ±20 % of the initial value                   |     |           |      |            |
|                             | Dissipation factor (tanδ)                           |           | ≤ 150 % of the initial limit                        |     |           |      |            |
|                             | DC leakage current                                  |           | Within the initial limit                            |     |           |      |            |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |           |                                                     |     |           |      |            |
|                             | Capacitance change                                  |           | Within ±20 % of the initial value                   |     |           |      |            |
|                             | Dissipation factor (tanδ)                           |           | ≤ 150 % of the initial limit                        |     |           |      |            |
|                             | DC leakage current                                  |           | Within the initial limit (after voltage processing) |     |           |      |            |

## Marking



## Dimensions (not to scale)



| Unit : mm |                  |                                                        |             |             |             |            |                 |
|-----------|------------------|--------------------------------------------------------|-------------|-------------|-------------|------------|-----------------|
| Size code | $\phi D \pm 0.5$ | $L \begin{smallmatrix} +0.1 \\ -0.4 \end{smallmatrix}$ | $W \pm 0.2$ | $H \pm 0.2$ | $C \pm 0.2$ | R          | P <sup>*2</sup> |
| B6        | 5.0              | 5.9                                                    | 5.3         | 5.3         | 6.0         | 0.6 to 0.8 | 1.4             |
| C6        | 6.3              | 5.9                                                    | 6.6         | 6.6         | 7.3         | 0.6 to 0.8 | 2.1             |
| E7        | 8.0              | 6.9                                                    | 8.3         | 8.3         | 9.0         | 0.6 to 0.8 | 3.2             |
| E10       | 8.0              | 10.0 <sup>*1</sup>                                     | 8.3         | 8.3         | 9.0         | 0.8 to 1.1 | 3.2             |
| E12       | 8.0              | 11.9                                                   | 8.3         | 8.3         | 9.0         | 0.8 to 1.1 | 3.2             |
| F10       | 10.0             | 10.0 <sup>*1</sup>                                     | 10.3        | 10.3        | 11.0        | 0.8 to 1.1 | 4.6             |
| F12       | 10.0             | 12.6                                                   | 10.3        | 10.3        | 11.0        | 0.8 to 1.1 | 4.6             |

\*1 :  $\pm 0.5$ , \*2 : Reference

## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (mΩ max.) | tan δ <sup>*3</sup> | LC <sup>*4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 16                | 82                             | 5.0            | 5.9  | B6        | 3000                                  | 27                          | 0.12                | 262                   | 16SVPF82M                   | 1500                      |
|                   | 180                            | 6.3            | 5.9  | C6        | 3300                                  | 22                          | 0.12                | 576                   | 16SVPF180M                  | 1000                      |
|                   | 270                            | 8.0            | 6.9  | E7        | 3300                                  | 22                          | 0.12                | 864                   | 16SVPF270M                  | 1000                      |
|                   | 560                            | 8.0            | 10.0 | E10       | 3900                                  | 18                          | 0.12                | 1792                  | 16SVPF560MX                 | 500                       |
|                   |                                | 8.0            | 11.9 | E12       | 4950                                  | 14                          | 0.12                | 1792                  | 16SVPF560M                  | 400                       |
|                   | 1000                           | 10.0           | 10.0 | F10       | 4300                                  | 16                          | 0.12                | 3200                  | 16SVPF1000MX                | 500                       |
|                   |                                | 10.0           | 12.6 | F12       | 5400                                  | 12                          | 0.12                | 3200                  | 16SVPF1000M                 | 400                       |
| 20                | 56                             | 5.0            | 5.9  | B6        | 2800                                  | 30                          | 0.12                | 224                   | 20SVPF56MX                  | 1500                      |
|                   | 120                            | 6.3            | 5.9  | C6        | 3200                                  | 25                          | 0.12                | 480                   | 20SVPF120M                  | 1000                      |
|                   | 180                            | 8.0            | 6.9  | E7        | 3200                                  | 25                          | 0.12                | 720                   | 20SVPF180M                  | 1000                      |
|                   | 390                            | 8.0            | 11.9 | E12       | 4950                                  | 14                          | 0.12                | 1560                  | 20SVPF390M                  | 400                       |
|                   | 560                            | 10.0           | 12.6 | F12       | 5400                                  | 12                          | 0.12                | 2240                  | 20SVPF560M                  | 400                       |
| 25                | 27                             | 5.0            | 5.9  | B6        | 2450                                  | 40                          | 0.12                | 135                   | 25SVPF27MX                  | 1500                      |
|                   | 47                             | 6.3            | 5.9  | C6        | 2800                                  | 30                          | 0.12                | 235                   | 25SVPF47M                   | 1000                      |
|                   | 56                             | 6.3            | 5.9  |           | 2800                                  | 30                          | 0.12                | 280                   | 25SVPF56M                   | 1000                      |
|                   | 82                             | 8.0            | 6.9  | E7        | 3000                                  | 28                          | 0.12                | 410                   | 25SVPF82M                   | 1000                      |
|                   | 100                            | 8.0            | 6.9  |           | 3200                                  | 24                          | 0.12                | 500                   | 25SVPF100M                  | 1000                      |
|                   | 180                            | 8.0            | 11.9 | E12       | 4650                                  | 16                          | 0.12                | 900                   | 25SVPF180M                  | 400                       |
|                   | 330                            | 10.0           | 12.6 | F12       | 5000                                  | 14                          | 0.12                | 1650                  | 25SVPF330M                  | 400                       |
| 35                | 22                             | 6.3            | 5.9  | C6        | 2600                                  | 35                          | 0.12                | 154                   | 35SVPF22M                   | 1000                      |
|                   | 39                             | 8.0            | 6.9  | E7        | 2800                                  | 30                          | 0.12                | 273                   | 35SVPF39M                   | 1000                      |
|                   | 82                             | 8.0            | 11.9 | E12       | 4000                                  | 20                          | 0.12                | 574                   | 35SVPF82M                   | 400                       |
|                   | 120                            | 10.0           | 12.6 | F12       | 4400                                  | 18                          | 0.12                | 840                   | 35SVPF120M                  | 400                       |
| 50                | 10                             | 6.3            | 5.9  | C6        | 2500                                  | 40                          | 0.12                | 100                   | 50SVPF10M                   | 1000                      |
|                   | 18                             | 8.0            | 6.9  | E7        | 2700                                  | 35                          | 0.12                | 180                   | 50SVPF18M                   | 1000                      |
|                   | 39                             | 8.0            | 11.9 | E12       | 3800                                  | 25                          | 0.12                | 390                   | 50SVPF39M                   | 400                       |
|                   | 68                             | 10.0           | 12.6 | F12       | 4300                                  | 20                          | 0.12                | 680                   | 50SVPF68M                   | 400                       |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

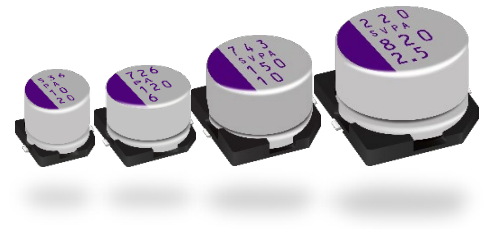
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPA series



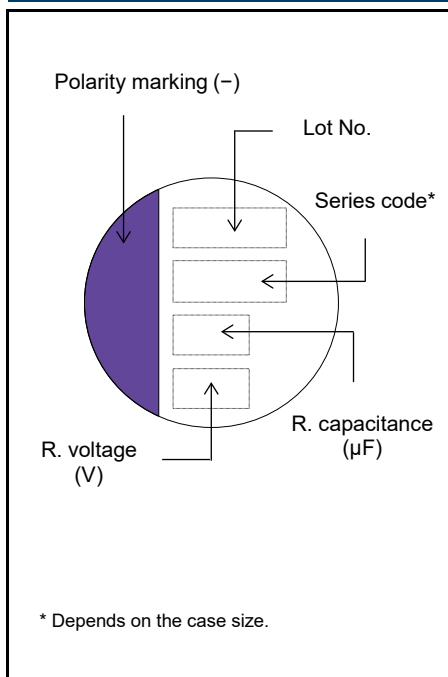
## Features

- Low ESR (19 mΩ max.)
- High ripple (4240 mA rms)
- RoHS compliance, Halogen free

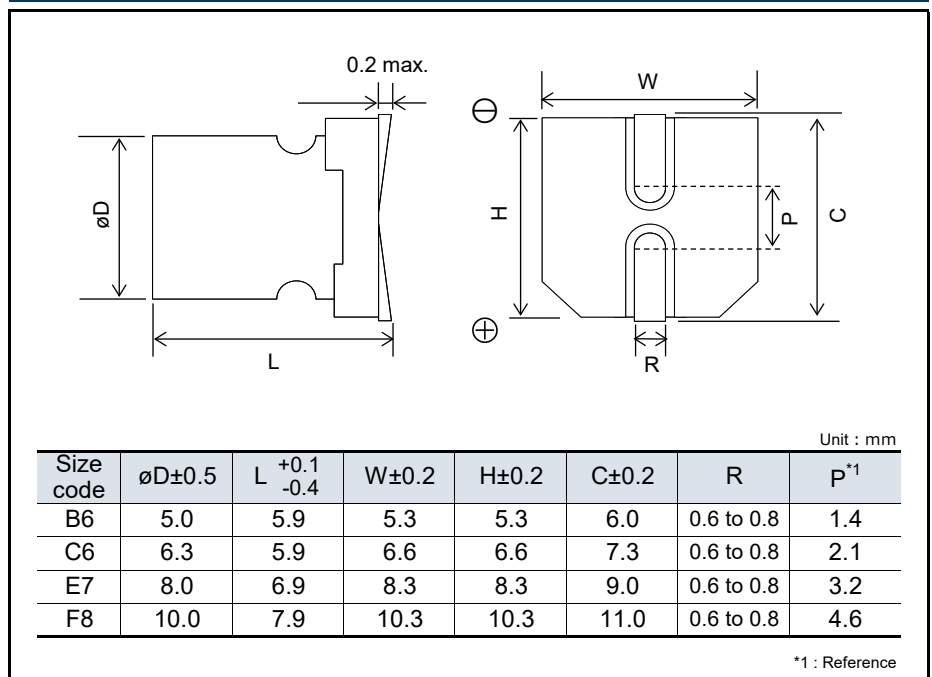
## Specifications

| Size code                   | B6                                                  | C6                                                  | E7              | F8               |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------|------------------|
| Category temp. range        | -55 °C to +105 °C                                   |                                                     |                 |                  |
| Rated voltage range         | 2.5 V to 20 V                                       |                                                     |                 | 2.5 V to 16 V    |
| Nominal cap.range           | 10 μF to 82 μF                                      | 22 μF to 180 μF                                     | 47 μF to 330 μF | 180 μF to 820 μF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |                 |                  |
| DC leakage current          | Please see the attached characteristics list        |                                                     |                 |                  |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |                 |                  |
| Endurance                   | +105 °C 2000 h, rated voltage applied               |                                                     |                 |                  |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                  |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                 |                  |
|                             | DC leakage current                                  | Within the initial limit                            |                 |                  |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |                 |                  |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                  |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                 |                  |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |                 |                  |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |     | Size code | Specifications                        |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|-----|-----------|---------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L   |           | Ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (mΩ max.) | tan δ <sup>*3</sup> | LC <sup>*4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 2.5               | 82                             | 5.0            | 5.9 | B6        | 1970                                  | 30                          | 0.12                | 300                   | 2R5SVPA82MAA                | 1500                      |
|                   | 180                            | 6.3            | 5.9 | C6        | 2690                                  | 20                          | 0.12                | 300                   | 2R5SVPA180MAA               | 1000                      |
|                   | 330                            | 8.0            | 6.9 | E7        | 3370                                  | 20                          | 0.12                | 500                   | 2R5SVPA330MAA               | 1000                      |
|                   | 820                            | 10.0           | 7.9 | F8        | 4240                                  | 19                          | 0.12                | 500                   | 2R5SVPA820M                 | 500                       |
| 4.0               | 68                             | 5.0            | 5.9 | B6        | 1970                                  | 30                          | 0.12                | 300                   | 4SVPA68MAA                  | 1500                      |
|                   | 150                            | 6.3            | 5.9 | C6        | 2570                                  | 22                          | 0.12                | 300                   | 4SVPA150MAA                 | 1000                      |
|                   | 270                            | 8.0            | 6.9 | E7        | 3220                                  | 22                          | 0.12                | 500                   | 4SVPA270MAA                 | 1000                      |
|                   | 680                            | 10.0           | 7.9 | F8        | 4130                                  | 20                          | 0.12                | 544                   | 4SVPA680M                   | 500                       |
| 6.3               | 47                             | 5.0            | 5.9 | B6        | 1970                                  | 30                          | 0.12                | 300                   | 6SVPA47MAA                  | 1500                      |
|                   | 120                            | 6.3            | 5.9 | C6        | 2570                                  | 22                          | 0.12                | 300                   | 6SVPA120MAA                 | 1000                      |
|                   | 220                            | 8.0            | 6.9 | E7        | 3220                                  | 22                          | 0.12                | 500                   | 6SVPA220MAA                 | 1000                      |
|                   | 470                            | 10.0           | 7.9 | F8        | 4130                                  | 20                          | 0.12                | 592                   | 6SVPA470M                   | 500                       |
| 10                | 68                             | 6.3            | 5.9 | C6        | 2200                                  | 30                          | 0.12                | 300                   | 10SVPA68MAA                 | 1000                      |
|                   | 150                            | 8.0            | 6.9 | E7        | 2760                                  | 30                          | 0.12                | 500                   | 10SVPA150MAA                | 1000                      |
|                   | 330                            | 10.0           | 7.9 | F8        | 3770                                  | 24                          | 0.12                | 660                   | 10SVPA330M                  | 500                       |
| 16                | 39                             | 6.3            | 5.9 | C6        | 2040                                  | 35                          | 0.12                | 300                   | 16SVPA39MAA                 | 1000                      |
|                   |                                | 6.3            | 5.9 |           | 2460                                  | 24                          | 0.12                | 300                   | 16SVPA39MAAY                | 1000                      |
|                   | 82                             | 8.0            | 6.9 | E7        | 2760                                  | 30                          | 0.12                | 262                   | 16SVPA82MAA                 | 1000                      |
|                   | 180                            | 10.0           | 7.9 | F8        | 3430                                  | 29                          | 0.12                | 576                   | 16SVPA180M                  | 500                       |
| 20                | 10                             | 5.0            | 5.9 | B6        | 1700                                  | 40                          | 0.12                | 80                    | 20SVPA10M                   | 1500                      |
|                   | 22                             | 6.3            | 5.9 | C6        | 2040                                  | 35                          | 0.12                | 88                    | 20SVPA22M                   | 1000                      |
|                   | 47                             | 8.0            | 6.9 | E7        | 2630                                  | 33                          | 0.12                | 188                   | 20SVPA47M                   | 1000                      |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

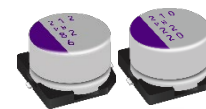
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |





# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPB series

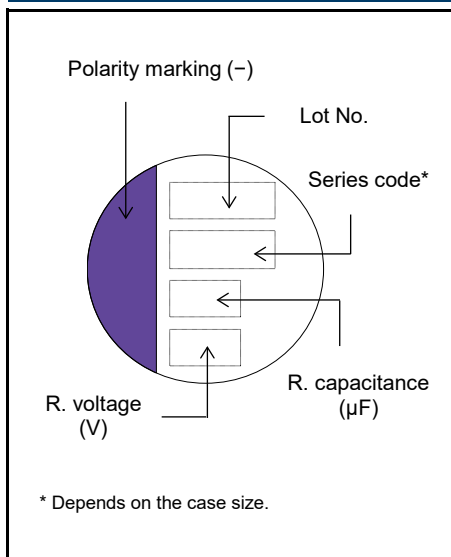
## Features

- Low profile (Height 5 mm max.)
- RoHS compliance, Halogen free

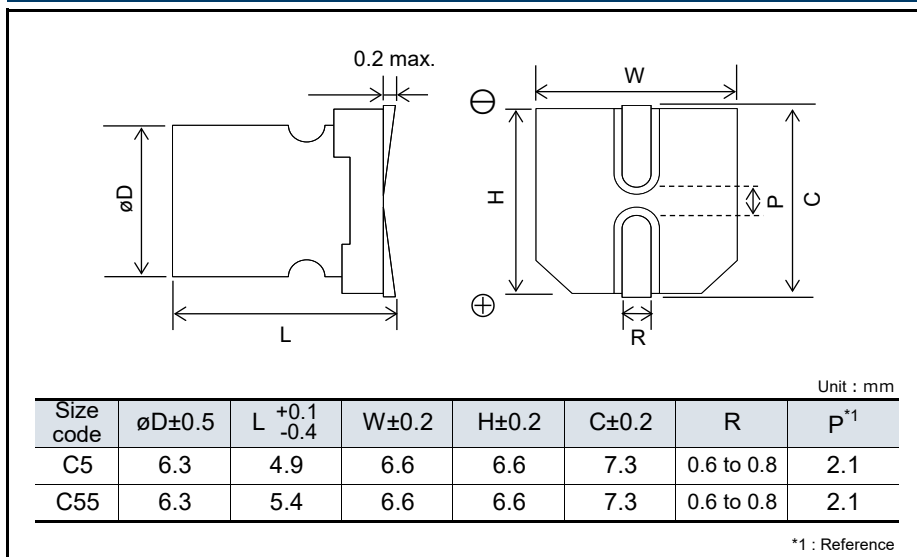
## Specifications

| Size code                   | C5                                                  | C55                                                   |
|-----------------------------|-----------------------------------------------------|-------------------------------------------------------|
| Category temp. range        | -55 °C to +105 °C                                   |                                                       |
| Rated voltage range         | 2.5 V to 20 V                                       | 20 V                                                  |
| Nominal cap.range           | 15 µF to 120 µF                                     | 22 µF                                                 |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                       |
| DC leakage current          | Please see the attached characteristics list        |                                                       |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                       |
| Endurance                   | +105 °C 1000 h, rated voltage applied               |                                                       |
|                             | Capacitance change                                  | Within ±20 % of the initial value (±30 % for C5 size) |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                          |
|                             | DC leakage current                                  | Within the initial limit                              |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                       |
|                             | Capacitance change                                  | Within ±20 % of the initial value                     |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                          |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing)   |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |     | Size code | Specifications                        |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|-----|-----------|---------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L   |           | Ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (mΩ max.) | tan δ <sup>*3</sup> | LC <sup>*4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 2.5               | 120                            | 6.3            | 4.9 | C5        | 1670                                  | 40                          | 0.12                | 120                   | 2R5SVPB120M                 | 1300                      |
| 4.0               | 100                            | 6.3            | 4.9 |           | 1670                                  | 40                          | 0.12                | 160                   | 4SVPB100M                   | 1300                      |
| 6.3               | 82                             | 6.3            | 4.9 |           | 1670                                  | 40                          | 0.12                | 207                   | 6SVPB82M                    | 1300                      |
| 10                | 56                             | 6.3            | 4.9 |           | 1670                                  | 40                          | 0.12                | 224                   | 10SVPB56M                   | 1300                      |
| 16                | 33                             | 6.3            | 4.9 |           | 1670                                  | 40                          | 0.12                | 211                   | 16SVPB33M                   | 1300                      |
| 20                | 15                             | 6.3            | 4.9 | C55       | 2000                                  | 45                          | 0.12                | 120                   | 20SVPB15M                   | 1300                      |
|                   | 22                             | 6.3            | 5.4 |           | 2000                                  | 35                          | 0.12                | 88                    | 20SVPB22M                   | 1000                      |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

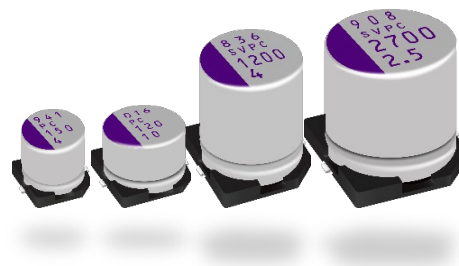
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPC series



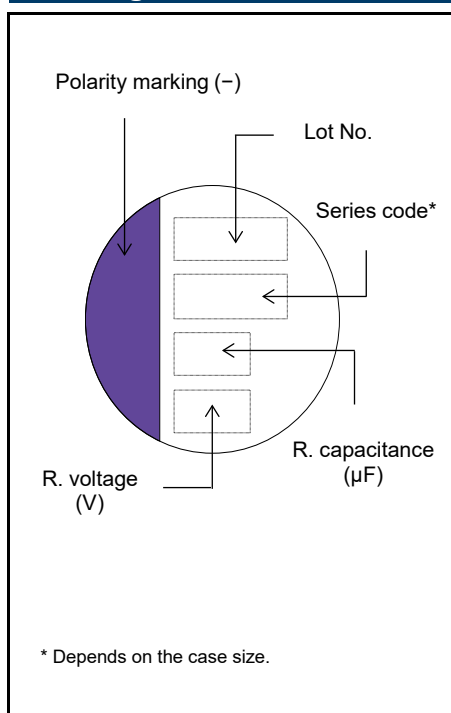
## Features

- Low ESR (9 mΩ max.)
- Large capacitance (2700 μF max.)
- RoHS compliance, Halogen free

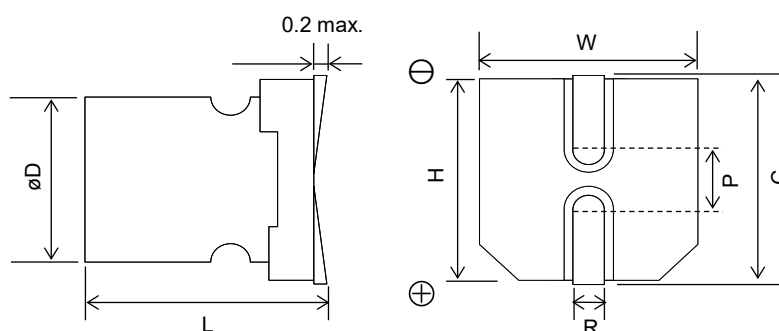
## Specifications

| Size code                   | B6                                                  | C6              | E7                                                  | E12               | F12     |
|-----------------------------|-----------------------------------------------------|-----------------|-----------------------------------------------------|-------------------|---------|
| Category temp. range        | -55 °C to +105 °C                                   |                 |                                                     |                   |         |
| Rated voltage range         | 2.5 V to 16 V                                       |                 |                                                     |                   | 2.5 V   |
| Nominal cap.range           | 39 μF to 180 μF                                     | 68 μF to 560 μF | 120 μF to 680 μF                                    | 270 μF to 1500 μF | 2700 μF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                 |                                                     |                   |         |
| DC leakage current          | Please see the attached characteristics list        |                 |                                                     |                   |         |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                 |                                                     |                   |         |
| Endurance                   | +105 °C 2000 h, rated voltage applied               |                 |                                                     |                   |         |
|                             | Capacitance change                                  |                 | Within ±20 % of the initial value                   |                   |         |
|                             | Dissipation factor (tanδ)                           |                 | ≤ 150 % of the initial limit                        |                   |         |
|                             | DC leakage current                                  |                 | Within the initial limit                            |                   |         |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                 |                                                     |                   |         |
|                             | Capacitance change                                  |                 | Within ±20 % of the initial value                   |                   |         |
|                             | Dissipation factor (tanδ)                           |                 | ≤ 150 % of the initial limit                        |                   |         |
|                             | DC leakage current                                  |                 | Within the initial limit (after voltage processing) |                   |         |

## Marking



## Dimensions (not to scale)



| Unit : mm |        |                                     |       |       |       |            |                 |
|-----------|--------|-------------------------------------|-------|-------|-------|------------|-----------------|
| Size code | øD±0.5 | L <sup>+0.1</sup> / <sub>-0.4</sub> | W±0.2 | H±0.2 | C±0.2 | R          | P <sup>*1</sup> |
| B6        | 5.0    | 5.9                                 | 5.3   | 5.3   | 6.0   | 0.6 to 0.8 | 1.4             |
| C6        | 6.3    | 5.9                                 | 6.6   | 6.6   | 7.3   | 0.6 to 0.8 | 2.1             |
| E7        | 8.0    | 6.9                                 | 8.3   | 8.3   | 9.0   | 0.6 to 0.8 | 3.2             |
| E12       | 8.0    | 11.9                                | 8.3   | 8.3   | 9.0   | 0.8 to 1.0 | 3.2             |
| F12       | 10.0   | 12.6                                | 10.3  | 10.3  | 11.0  | 0.8 to 1.0 | 4.6             |

\*1 : Reference

## Characteristics list

| Rated voltage<br>(V) | Rated capacitance<br>(±20 %) (μF) | Case size<br>(mm) |      | Size code | Specifications               |                    |                      |         |              | Standard (Reel size : ø380) |                              |
|----------------------|-----------------------------------|-------------------|------|-----------|------------------------------|--------------------|----------------------|---------|--------------|-----------------------------|------------------------------|
|                      |                                   | øD                | L    |           | Ripple current*1<br>(mA rms) | ESR (mΩ max.)      |                      | tan δ*3 | LC*4<br>(μA) | Part number                 | Min. Packaging Q'ty<br>(pcs) |
|                      |                                   |                   |      |           |                              | 100 kHz<br>/ 20 °C | 300 kHz*2<br>/ 20 °C |         |              |                             |                              |
| 2.5                  | 180                               | 5.0               | 5.9  | B6        | 1970                         | 30                 | 26                   | 0.12    | 300          | 2R5SVPC180M                 | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 2200                         | 24                 | 20                   | 0.12    | 300          | 2R5SVPC180MY                | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 2800                         | 19                 | 16                   | 0.12    | 300          | 2R5SVPC180MV                | 1500                         |
|                      | 390                               | 6.3               | 5.9  | C6        | 2410                         | 25                 | 22                   | 0.12    | 300          | 2R5SVPC390M                 | 1000                         |
|                      |                                   | 6.3               | 5.9  |           | 3160                         | 15                 | 13                   | 0.12    | 300          | 2R5SVPC390MV                | 1000                         |
|                      | 560                               | 6.3               | 5.9  |           | 3500                         | 16                 | 14                   | 0.12    | 300          | 2R5SVPC560M                 | 1000                         |
|                      | 680                               | 8.0               | 6.9  | E7        | 3370                         | 20                 | 17                   | 0.12    | 500          | 2R5SVPC680M                 | 1000                         |
|                      | 820                               | 8.0               | 11.9 | E12       | 5380                         | 9                  | 8                    | 0.15    | 500          | 2R5SVPC820M                 | 400                          |
|                      | 1500                              | 8.0               | 11.9 |           | 5150                         | 10                 | 9                    | 0.15    | 750          | 2R5SVPC1500M                | 400                          |
|                      | 2700                              | 10.0              | 12.6 | F12       | 5070                         | 12                 | 10                   | 0.15    | 1350         | 2R5SVPC2700M                | 400                          |
| 4.0                  | 150                               | 5.0               | 5.9  | B6        | 1970                         | 30                 | 26                   | 0.12    | 300          | 4SVPC150M                   | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 2240                         | 23                 | 20                   | 0.12    | 300          | 4SVPC150MY                  | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 2730                         | 20                 | 17                   | 0.12    | 300          | 4SVPC150MV                  | 1500                         |
|                      | 330                               | 6.3               | 5.9  | C6        | 2320                         | 27                 | 23                   | 0.12    | 300          | 4SVPC330M                   | 1000                         |
|                      |                                   | 6.3               | 5.9  |           | 2630                         | 21                 | 18                   | 0.12    | 300          | 4SVPC330MY                  | 1000                         |
|                      |                                   | 6.3               | 5.9  |           | 3160                         | 15                 | 13                   | 0.12    | 300          | 4SVPC330MV                  | 1000                         |
|                      | 560                               | 8.0               | 6.9  | E7        | 3220                         | 22                 | 19                   | 0.12    | 500          | 4SVPC560M                   | 1000                         |
|                      |                                   | 8.0               | 11.9 | E12       | 5380                         | 9                  | 8                    | 0.15    | 500          | 4SVPC560MX                  | 400                          |
|                      | 1200                              | 8.0               | 11.9 |           | 4700                         | 12                 | 10                   | 0.15    | 960          | 4SVPC1200M                  | 400                          |
|                      | 1500                              | 8.0               | 11.9 |           | 4700                         | 12                 | 10                   | 0.15    | 1200         | 4SVPC1500M                  | 400                          |
| 6.3                  | 100                               | 5.0               | 5.9  | B6        | 1970                         | 30                 | 26                   | 0.12    | 300          | 6SVPC100M                   | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 2150                         | 25                 | 21                   | 0.12    | 300          | 6SVPC100MY                  | 1500                         |
|                      | 120                               | 5.0               | 5.9  |           | 2660                         | 21                 | 18                   | 0.12    | 300          | 6SVPC120MV                  | 1500                         |
|                      | 220                               | 6.3               | 5.9  | C6        | 2320                         | 27                 | 23                   | 0.12    | 300          | 6SVPC220M                   | 1000                         |
|                      |                                   | 6.3               | 5.9  |           | 3160                         | 15                 | 13                   | 0.12    | 300          | 6SVPC220MV                  | 1000                         |
|                      | 330                               | 6.3               | 5.9  |           | 3390                         | 17                 | 15                   | 0.12    | 415          | 6SVPC330M                   | 1000                         |
|                      | 390                               | 8.0               | 6.9  | E7        | 3220                         | 22                 | 19                   | 0.12    | 491          | 6SVPC390M                   | 1000                         |
|                      | 820                               | 8.0               | 11.9 | E12       | 4700                         | 12                 | 10                   | 0.15    | 1033         | 6SVPC820M                   | 400                          |
| 10                   | 68                                | 5.0               | 5.9  | B6        | 1970                         | 30                 | 26                   | 0.12    | 300          | 10SVPC68M                   | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 2540                         | 23                 | 20                   | 0.12    | 300          | 10SVPC68MV                  | 1500                         |
|                      | 120                               | 6.3               | 5.9  | C6        | 2320                         | 27                 | 23                   | 0.12    | 300          | 10SVPC120M                  | 1000                         |
|                      |                                   | 6.3               | 5.9  |           | 2600                         | 22                 | 19                   | 0.12    | 300          | 10SVPC120MV                 | 1000                         |
|                      | 270                               | 8.0               | 6.9  | E7        | 3220                         | 22                 | 19                   | 0.12    | 500          | 10SVPC270M                  | 1000                         |
|                      | 330                               | 8.0               | 6.9  |           | 3460                         | 19                 | 17                   | 0.12    | 660          | 10SVPC330M                  | 1000                         |
| 16                   | 39                                | 5.0               | 5.9  | B6        | 1820                         | 35                 | 30                   | 0.12    | 300          | 16SVPC39M                   | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 2350                         | 27                 | 23                   | 0.12    | 300          | 16SVPC39MV                  | 1500                         |
|                      | 68                                | 6.3               | 5.9  | C6        | 2200                         | 30                 | 26                   | 0.12    | 300          | 16SVPC68M                   | 1000                         |
|                      |                                   | 6.3               | 5.9  |           | 2440                         | 25                 | 22                   | 0.12    | 300          | 16SVPC68MV                  | 1000                         |
|                      | 100                               | 6.3               | 5.9  |           | 2490                         | 24                 | 23                   | 0.12    | 300          | 16SVPC100M                  | 1000                         |
|                      | 120                               | 8.0               | 6.9  | E7        | 2900                         | 27                 | 23                   | 0.12    | 500          | 16SVPC120M                  | 1000                         |
|                      | 150                               | 8.0               | 6.9  |           | 3220                         | 22                 | 21                   | 0.12    | 500          | 16SVPC150M                  | 1000                         |
|                      | 270                               | 8.0               | 11.9 | E12       | 4070                         | 16                 | 14                   | 0.15    | 864          | 16SVPC270M                  | 400                          |

\*1: Ripple current (100 kHz / +105 °C)

\*2: Reference value at 300 kHz

\*3: tan δ (120 Hz / +20 °C)

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

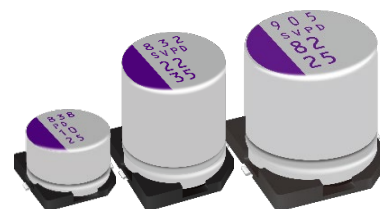
| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.

Should a safety concern arise regarding this product, please be sure to contact us immediately.

06-Feb-17

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPD series



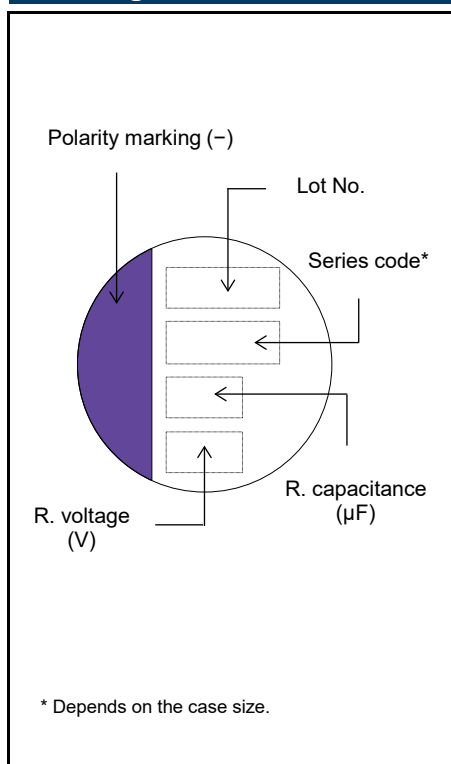
## Features

- 125 °C 2000 h
- Guaranteed at 85 °C 85 %
- RoHS compliance, Halogen free

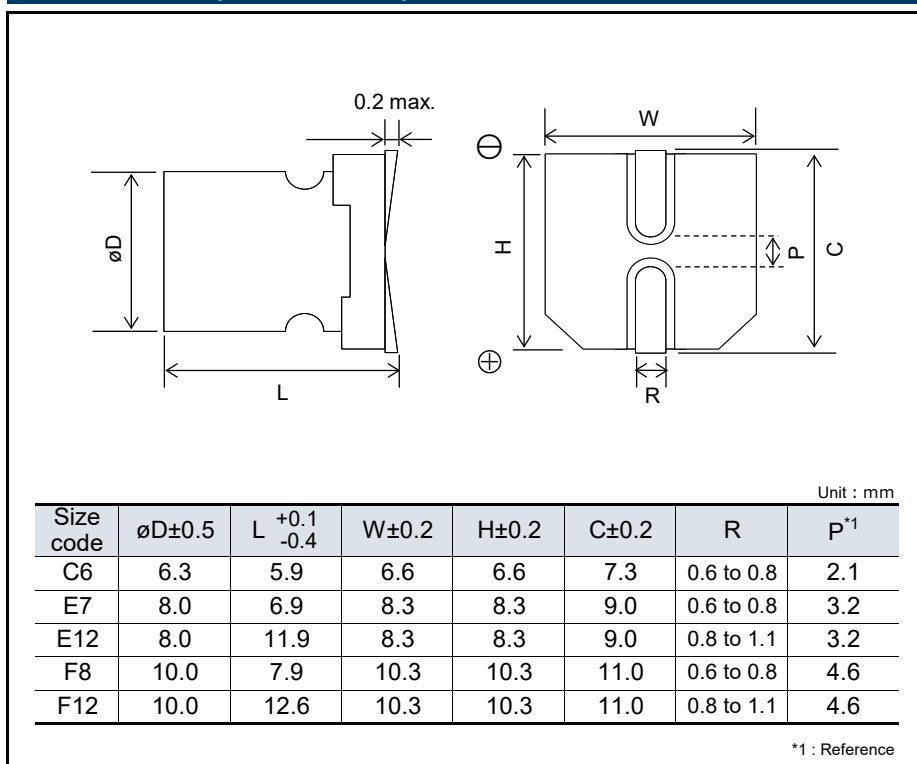
## Specifications

| Size code                   | C6                                                      | E7                                                  | E12            | F8             | F12            |
|-----------------------------|---------------------------------------------------------|-----------------------------------------------------|----------------|----------------|----------------|
| Category temp. range        | -55 °C to +125 °C                                       |                                                     |                |                |                |
| Rated voltage range         | 10 V to 25 V                                            | 16 V to 35 V                                        | 25 V to 35 V   |                |                |
| Nominal cap.range           | 10 µF to 56 µF                                          | 8.2 µF to 82 µF                                     | 22 µF to 47 µF | 18 µF to 39 µF | 47 µF to 82 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                                 |                                                     |                |                |                |
| DC leakage current          | Please see the attached characteristics list            |                                                     |                |                |                |
| Dissipation factor (tan δ)  | Please see the attached characteristics list            |                                                     |                |                |                |
| Endurance                   | +125 °C 2000 h, rated voltage applied                   |                                                     |                |                |                |
|                             | Capacitance change                                      | Within ±20 % of the initial value                   |                |                |                |
|                             | Dissipation factor (tanδ)                               | ≤ 200 % of the initial limit                        |                |                |                |
|                             | DC leakage current                                      | Within the initial limit                            |                |                |                |
| Damp heat<br>(Steady state) | +85 °C, 80 % to 90 % RH, 1000 h, rated voltage applied. |                                                     |                |                |                |
|                             | Capacitance change                                      | Within ±20 % of the initial value                   |                |                |                |
|                             | Dissipation factor (tanδ)                               | ≤ 200 % of the initial limit                        |                |                |                |
|                             | DC leakage current                                      | Within the initial limit (after voltage processing) |                |                |                |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                                                 |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-------------------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current* <sup>1</sup> (mA rms) | Allowable ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 10                | 56                             | 6.3            | 5.9  | C6        | 538                                   | 1700                                            | 45                          | 0.12                | 112                   | 10SVDPD56M                  | 1000                      |
| 16                | 82                             | 8.0            | 6.9  | E7        | 670                                   | 2120                                            | 40                          | 0.12                | 262                   | 16SVDPD82M                  | 1000                      |
| 25                | 10                             | 6.3            | 5.9  | C6        | 474                                   | 1500                                            | 65                          | 0.10                | 50                    | 25SVDPD10M                  | 1000                      |
|                   | 22                             | 8.0            | 6.9  | E7        | 580                                   | 1835                                            | 48                          | 0.10                | 110                   | 25SVDPD22M                  | 1000                      |
|                   | 39                             | 10.0           | 7.9  | F8        | 664                                   | 2100                                            | 45                          | 0.10                | 195                   | 25SVDPD39M                  | 500                       |
|                   | 47                             | 8.0            | 11.9 | E12       | 943                                   | 2980                                            | 30                          | 0.12                | 235                   | 25SVDPD47M                  | 400                       |
|                   | 82                             | 10.0           | 12.6 | F12       | 1202                                  | 3800                                            | 28                          | 0.12                | 410                   | 25SVDPD82M                  | 400                       |
| 35                | 8.2                            | 8.0            | 6.9  | E7        | 400                                   | 1300                                            | 70                          | 0.10                | 57                    | 35SVDPD8R2M                 | 1000                      |
|                   | 18                             | 10.0           | 7.9  | F8        | 550                                   | 1800                                            | 60                          | 0.10                | 126                   | 35SVDPD18M                  | 500                       |
|                   | 22                             | 8.0            | 11.9 | E12       | 700                                   | 2300                                            | 50                          | 0.12                | 154                   | 35SVDPD22M                  | 400                       |
|                   | 47                             | 10.0           | 12.6 | F12       | 1150                                  | 3650                                            | 30                          | 0.12                | 329                   | 35SVDPD47M                  | 400                       |

\*1: Ripple current (100 kHz / +105 °C < Tx ≤ +125 °C), Allowable ripple current (100 kHz / Tx ≤ +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

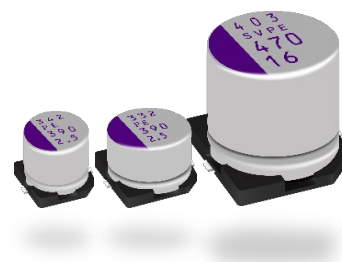
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPE series



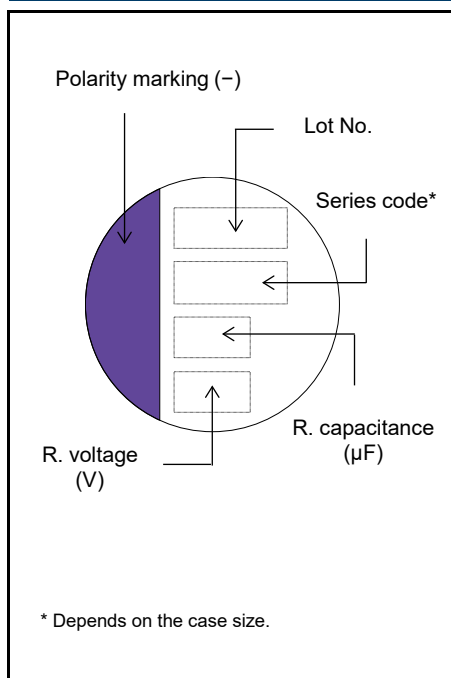
## Features

- Low ESR (8 mΩ max.)
- Large capacitance (1200 μF max.)
- RoHS compliance, Halogen free

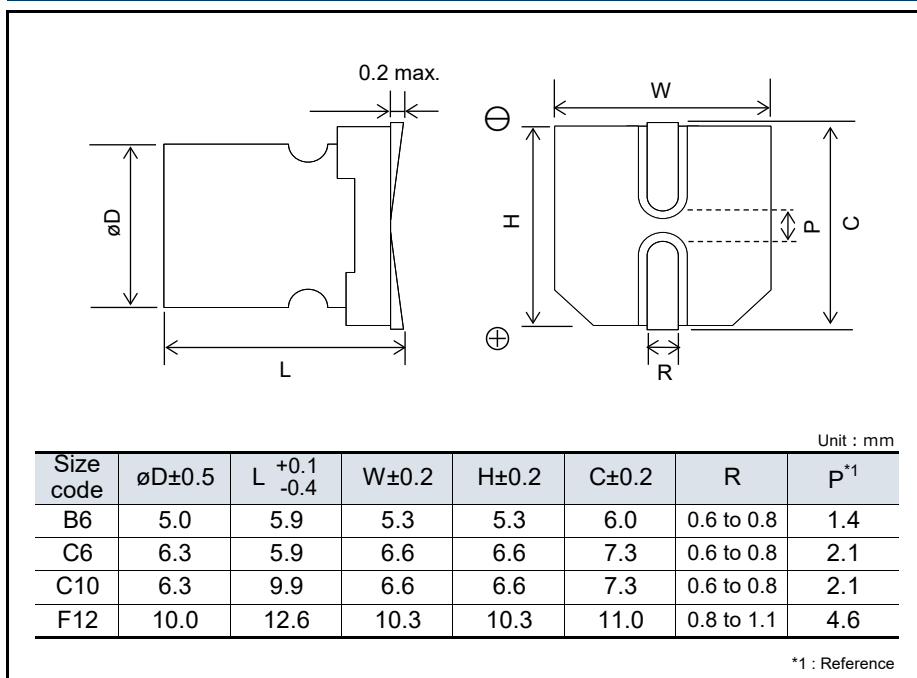
## Specifications

| Size code                   | B6                                                  | C6                                                  | C10               | F12    |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|-------------------|--------|
| Category temp. range        | -55 °C to +105 °C                                   |                                                     |                   |        |
| Rated voltage range         | 2.5 V to 6.3 V                                      | 2.5 V to 10 V                                       | 2.0 V to 16 V     | 16 V   |
| Nominal cap.range           | 150 μF to 390 μF                                    | 220 μF to 820 μF                                    | 180 μF to 1200 μF | 470 μF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |                   |        |
| DC leakage current          | Please see the attached characteristics list        |                                                     |                   |        |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |                   |        |
| Endurance                   | +105 °C 2000 h, rated voltage applied               |                                                     |                   |        |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                   |        |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                   |        |
|                             | DC leakage current                                  | Within the initial limit                            |                   |        |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |                   |        |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                   |        |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                   |        |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |                   |        |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage<br>(V) | Rated capacitance<br>(±20 %) (μF) | Case size<br>(mm) |      | Size code | Specifications                           |                    |                                  |                     |                          | Standard (Reel size : ø380) |                              |
|----------------------|-----------------------------------|-------------------|------|-----------|------------------------------------------|--------------------|----------------------------------|---------------------|--------------------------|-----------------------------|------------------------------|
|                      |                                   | øD                | L    |           | Ripple current* <sup>1</sup><br>(mA rms) | ESR (mΩ max.)      |                                  | tan δ* <sup>3</sup> | LC* <sup>4</sup><br>(μA) | Part number                 | Min. Packaging Q'ty<br>(pcs) |
|                      |                                   |                   |      |           |                                          | 100 kHz<br>/ 20 °C | 300 kHz* <sup>2</sup><br>/ 20 °C |                     |                          |                             |                              |
| 2.0                  | 1200                              | 6.3               | 9.9  | C10       | 5230                                     | 8                  | 8                                | 0.12                | 500                      | 2SVPE1200M                  | 500                          |
| 2.5                  | 270                               | 5.0               | 5.9  | B6        | 3860                                     | 10                 | 9                                | 0.12                | 500                      | 2R5SVPE270M                 | 1500                         |
|                      | 330                               | 5.0               | 5.9  |           | 3150                                     | 15                 | 13                               | 0.12                | 500                      | 2R5SVPE330M                 | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 3860                                     | 10                 | 9                                | 0.12                | 500                      | 2R5SVPE330MY                | 1500                         |
|                      |                                   | 5.0               | 5.9  |           | 3860                                     | 10                 | 9                                | 0.12                | 700                      | 2R5SVPE390MX                | 1500                         |
|                      | 390                               | 6.3               | 5.9  | C6        | 3900                                     | 10                 | 9                                | 0.12                | 500                      | 2R5SVPE390M                 | 1000                         |
|                      |                                   | 820               | 6.3  |           | 5.9                                      | 3900               | 10                               | 9                   | 0.12                     | 1020                        | 2R5SVPE820M                  |
| 6.3                  | 150                               | 5.0               | 5.9  | B6        | 3520                                     | 12                 | 10                               | 0.12                | 500                      | 6SVPE150M                   | 1500                         |
|                      | 180                               | 5.0               | 5.9  |           | 3150                                     | 15                 | 13                               | 0.12                | 500                      | 6SVPE180M                   | 1500                         |
|                      | 220                               | 5.0               | 5.9  |           | 3150                                     | 15                 | 13                               | 0.12                | 500                      | 6SVPE220MW                  | 1500                         |
|                      |                                   | 6.3               | 5.9  | C6        | 3900                                     | 10                 | 9                                | 0.12                | 500                      | 6SVPE220M                   | 1000                         |
|                      | 390                               | 6.3               | 5.9  |           | 3900                                     | 10                 | 9                                | 0.12                | 1220                     | 6SVPE390M                   | 1000                         |
| 10                   | 220                               | 6.3               | 5.9  |           | 2700                                     | 20                 | 18                               | 0.12                | 500                      | 10SVPE220M                  | 1000                         |
| 16                   | 180                               | 6.3               | 9.9  | C10       | 4460                                     | 11                 | 10                               | 0.12                | 576                      | 16SVPE180M                  | 500                          |
|                      | 470                               | 10.0              | 12.6 | F12       | 6100                                     | 10                 | 9                                | 0.12                | 1504                     | 16SVPE470M                  | 400                          |

\*1: Ripple current (100 kHz / +105 °C)

\*2: Reference value at 300 kHz

\*3: tan δ (120 Hz / +20 °C)

\*4: After 2 minutes

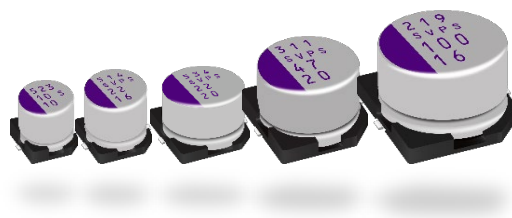
◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |



# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVPS series



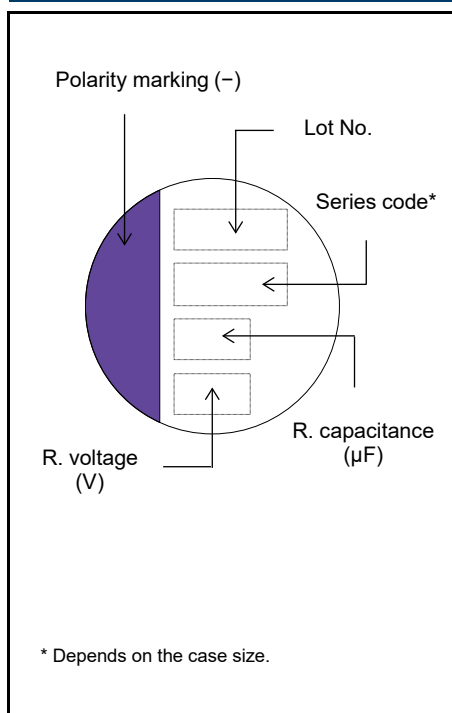
## Features

- 105 °C 5000 h
- RoHS compliance, Halogen free

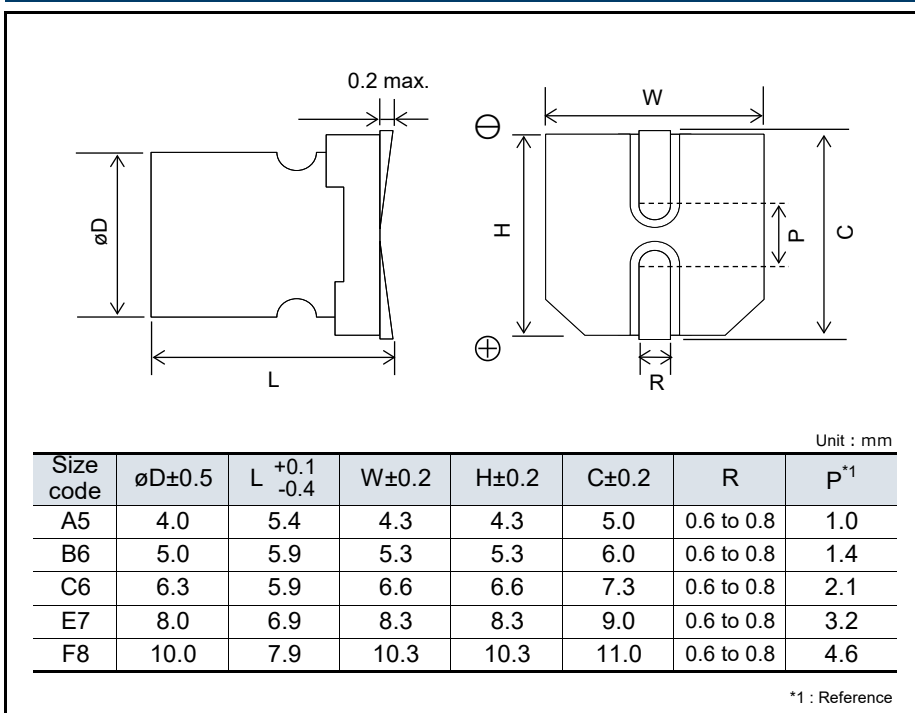
## Specifications

| Size code                   | A5                                                                  | B6                                                  | C6              | E7              | F8               |
|-----------------------------|---------------------------------------------------------------------|-----------------------------------------------------|-----------------|-----------------|------------------|
| Category temp. range        | -55 °C to +105 °C                                                   |                                                     |                 |                 |                  |
| Rated voltage range         | 4.0 V to 10 V                                                       | 4.0 V to 16 V                                       | 4.0 V to 20 V   | 4.0 V to 25 V   | 4.0 V to 16 V    |
| Nominal cap.range           | 10 µF to 33 µF                                                      | 22 µF to 68 µF                                      | 22 µF to 150 µF | 10 µF to 270 µF | 100 µF to 680 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                                             |                                                     |                 |                 |                  |
| DC leakage current          | Please see the attached characteristics list                        |                                                     |                 |                 |                  |
| Dissipation factor (tan δ)  | Please see the attached characteristics list                        |                                                     |                 |                 |                  |
| Endurance                   | +105 °C 5000 h, rated voltage applied (25 V product : 20 V applied) |                                                     |                 |                 |                  |
|                             | Capacitance change                                                  | Within ±20 % of the initial value                   |                 |                 |                  |
|                             | Dissipation factor (tanδ)                                           | ≤ 150 % of the initial limit                        |                 |                 |                  |
|                             | DC leakage current                                                  | Within the initial limit                            |                 |                 |                  |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage                 |                                                     |                 |                 |                  |
|                             | Capacitance change                                                  | Within ±20 % of the initial value                   |                 |                 |                  |
|                             | Dissipation factor (tanδ)                                           | ≤ 150 % of the initial limit                        |                 |                 |                  |
|                             | DC leakage current                                                  | Within the initial limit (after voltage processing) |                 |                 |                  |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |     | Size code | Specifications                        |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|-----|-----------|---------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L   |           | Ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 4.0               | 33                             | 4.0            | 5.4 | A5        | 740                                   | 200                         | 0.15                | 66                    | 4SVPS33M                    | 2000                      |
|                   | 68                             | 5.0            | 5.9 | B6        | 1970                                  | 30                          | 0.12                | 300                   | 4SVPS68M                    | 1500                      |
|                   | 150                            | 6.3            | 5.9 | C6        | 2570                                  | 22                          | 0.12                | 300                   | 4SVPS150M                   | 1000                      |
|                   | 270                            | 8.0            | 6.9 | E7        | 3220                                  | 22                          | 0.12                | 500                   | 4SVPS270M                   | 1000                      |
|                   | 680                            | 10.0           | 7.9 | F8        | 4130                                  | 20                          | 0.12                | 544                   | 4SVPS680M                   | 500                       |
| 6.3               | 22                             | 4.0            | 5.4 | A5        | 740                                   | 200                         | 0.12                | 69.3                  | 6SVPS22M                    | 2000                      |
|                   | 47                             | 5.0            | 5.9 | B6        | 1970                                  | 30                          | 0.12                | 300                   | 6SVPS47M                    | 1500                      |
|                   | 120                            | 6.3            | 5.9 | C6        | 2570                                  | 22                          | 0.12                | 300                   | 6SVPS120M                   | 1000                      |
|                   | 220                            | 8.0            | 6.9 | E7        | 3220                                  | 22                          | 0.12                | 500                   | 6SVPS220M                   | 1000                      |
|                   | 470                            | 10.0           | 7.9 | F8        | 4130                                  | 20                          | 0.12                | 592                   | 6SVPS470M                   | 500                       |
| 10                | 10                             | 4.0            | 5.4 | A5        | 700                                   | 220                         | 0.10                | 50                    | 10SVPS10M                   | 2000                      |
|                   | 15                             | 4.0            | 5.4 |           | 740                                   | 200                         | 0.10                | 75                    | 10SVPS15M                   | 2000                      |
|                   | 33                             | 5.0            | 5.9 | B6        | 1100                                  | 70                          | 0.12                | 165                   | 10SVPS33M                   | 1500                      |
|                   | 68                             | 6.3            | 5.9 | C6        | 2200                                  | 30                          | 0.12                | 300                   | 10SVPS68M                   | 1000                      |
|                   | 150                            | 8.0            | 6.9 | E7        | 2760                                  | 30                          | 0.12                | 500                   | 10SVPS150MX                 | 1000                      |
|                   |                                | 10.0           | 7.9 | F8        | 3020                                  | 30                          | 0.12                | 300                   | 10SVPS150M                  | 500                       |
|                   | 330                            | 10.0           | 7.9 |           | 3770                                  | 24                          | 0.12                | 660                   | 10SVPS330M                  | 500                       |
| 16                | 22                             | 5.0            | 5.9 | B6        | 1060                                  | 90                          | 0.10                | 176                   | 16SVPS22M                   | 1500                      |
|                   | 39                             | 6.3            | 5.9 | C6        | 2460                                  | 24                          | 0.12                | 300                   | 16SVPS39M                   | 1000                      |
|                   | 82                             | 8.0            | 6.9 | E7        | 2760                                  | 30                          | 0.12                | 262                   | 16SVPS82M                   | 1000                      |
|                   | 100                            | 10.0           | 7.9 | F8        | 2670                                  | 35                          | 0.12                | 320                   | 16SVPS100M                  | 500                       |
|                   | 180                            | 10.0           | 7.9 |           | 3430                                  | 29                          | 0.12                | 576                   | 16SVPS180M                  | 500                       |
| 20                | 22                             | 6.3            | 5.9 | C6        | 1450                                  | 60                          | 0.10                | 88                    | 20SVPS22M                   | 1000                      |
|                   | 47                             | 8.0            | 6.9 | E7        | 1890                                  | 45                          | 0.12                | 188                   | 20SVPS47M                   | 1000                      |
| 25                | 10                             | 8.0            | 6.9 |           | 1500                                  | 60                          | 0.10                | 125                   | 25SVPS10M                   | 1000                      |

\*1: Ripple current (100 kHz / +105 °C)

: The surface temperature of aluminum case top must not exceed 105 °C.

A rise in temperature due to self-heating by ripple current should be factored in.

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

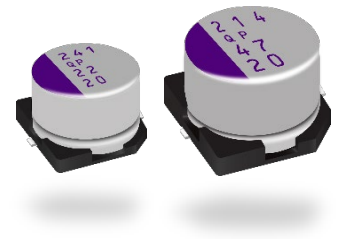
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVQP series



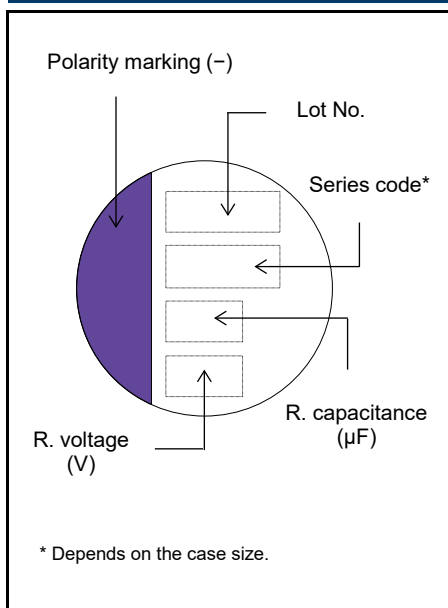
## Features

- 125 °C 1000 h
- RoHS compliance, Halogen free

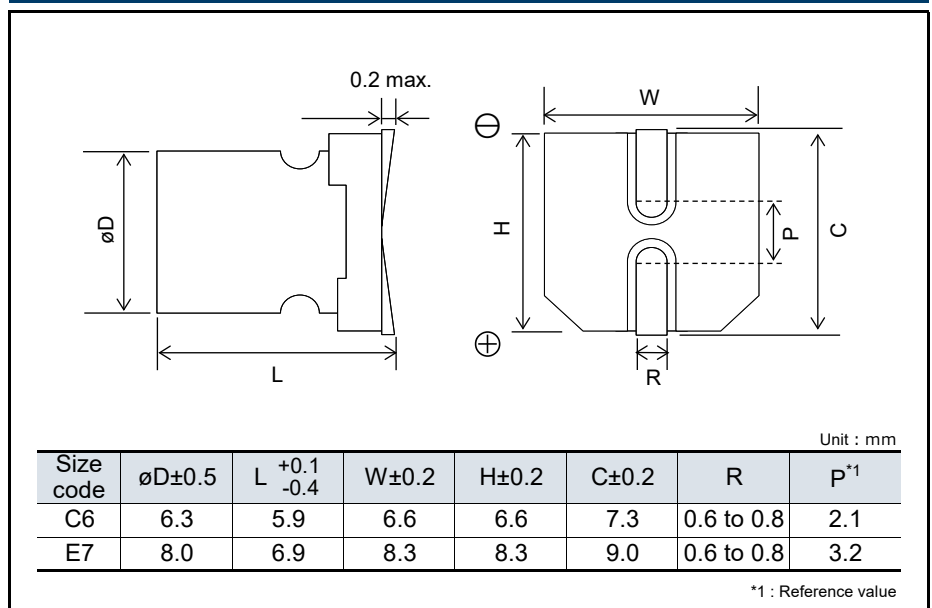
## Specifications

| Size code                   | C6                                                  | E7                                                  |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|
| Category temp. range        | -55 °C to +125 °C                                   |                                                     |
| Rated voltage range         | 4.0 V to 20 V                                       | 6.3 V to 20 V                                       |
| Nominal cap.range           | 22 µF to 150 µF                                     | 47 µF to 220 µF                                     |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |
| DC leakage current          | Please see the attached characteristics list        |                                                     |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |
| Endurance                   | +125 °C 1000 h, rated voltage applied               |                                                     |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |
|                             | Dissipation factor (tanδ)                           | ≤ 200 % of the initial limit                        |
|                             | DC leakage current                                  | Within the initial limit                            |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |     | Size code | Specifications                        |                                                 |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|-----|-----------|---------------------------------------|-------------------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L   |           | Ripple current* <sup>1</sup> (mA rms) | Allowable ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 4.0               | 150                            | 6.3            | 5.9 | C6        | 572                                   | 1810                                            | 40                          | 0.12                | 300                   | 4SVQP150M                   | 1000                      |
| 6.3               | 82                             | 6.3            | 5.9 |           | 538                                   | 1700                                            | 45                          | 0.12                | 258                   | 6SVQP82M                    | 1000                      |
|                   | 100                            | 6.3            | 5.9 |           | 572                                   | 1810                                            | 40                          | 0.12                | 315                   | 6SVQP100M                   | 1000                      |
| 10                | 220                            | 8.0            | 6.9 | E7        | 810                                   | 2560                                            | 35                          | 0.12                | 693                   | 6SVQP220M                   | 1000                      |
|                   | 56                             | 6.3            | 5.9 | C6        | 538                                   | 1700                                            | 45                          | 0.12                | 280                   | 10SVQP56M                   | 1000                      |
|                   | 120                            | 8.0            | 6.9 | E7        | 810                                   | 2560                                            | 35                          | 0.12                | 600                   | 10SVQP120M                  | 1000                      |
| 16                | 150                            | 8.0            | 6.9 |           | 810                                   | 2560                                            | 35                          | 0.12                | 750                   | 10SVQP150M                  | 1000                      |
|                   | 39                             | 6.3            | 5.9 | C6        | 512                                   | 1620                                            | 50                          | 0.10                | 312                   | 16SVQP39M                   | 1000                      |
|                   | 82                             | 8.0            | 6.9 | E7        | 670                                   | 2120                                            | 40                          | 0.12                | 656                   | 16SVQP82M                   | 1000                      |
| 20                | 22                             | 6.3            | 5.9 | C6        | 459                                   | 1450                                            | 60                          | 0.10                | 220                   | 20SVQP22M                   | 1000                      |
|                   | 47                             | 8.3            | 6.9 | E7        | 598                                   | 1890                                            | 45                          | 0.12                | 470                   | 20SVQP47M                   | 1000                      |

\*1: Ripple current (100 kHz / +105 °C < Tx ≤ +125 °C), Allowable ripple current (100 kHz / Tx ≤ +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

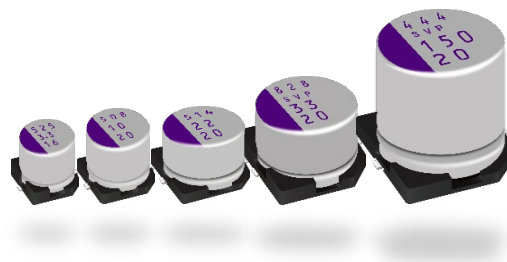
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Surface Mount Type SVP series



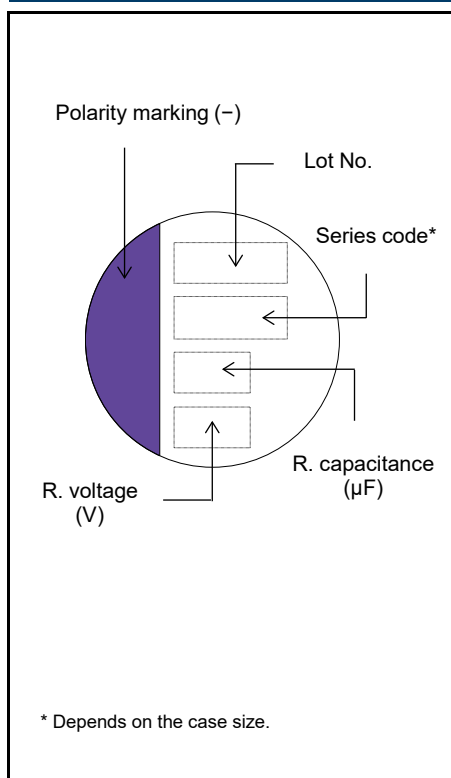
## Features

- Standard
- RoHS compliance, Halogen free

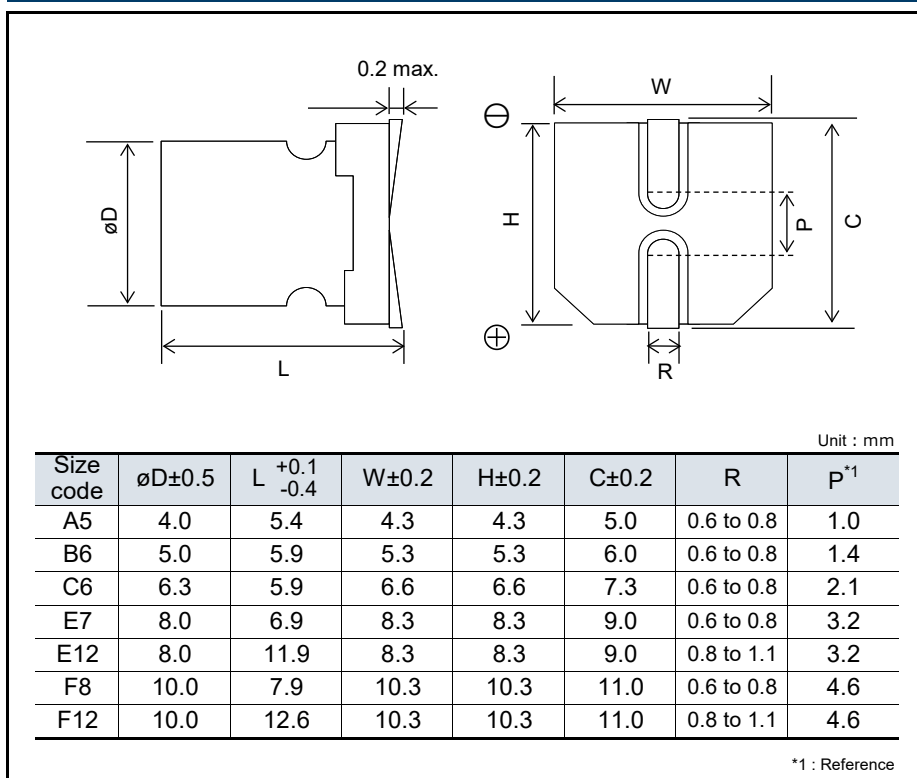
## Specifications

| Size code                   | A5                                                  | B6        | C6                                                  | E7        | E12        | F8        | F12         |
|-----------------------------|-----------------------------------------------------|-----------|-----------------------------------------------------|-----------|------------|-----------|-------------|
| Category temp. range        | -55 °C to +105 °C                                   |           |                                                     |           |            |           |             |
| Rated voltage range (V)     | 4.0 to 16                                           | 4.0 to 20 | 2.5 to 20                                           | 4.0 to 20 | 2.5 to 20  | 4.0 to 20 | 2.5 to 20   |
| Nominal cap.range (μF)      | 3.3 to 33                                           | 10 to 68  | 22 to 220                                           | 33 to 330 | 100 to 680 | 56 to 680 | 150 to 1500 |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |           |                                                     |           |            |           |             |
| DC leakage current          | Please see the attached characteristics list        |           |                                                     |           |            |           |             |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |           |                                                     |           |            |           |             |
| Endurance                   | +105 °C 2000 h, rated voltage applied               |           |                                                     |           |            |           |             |
|                             | Capacitance change                                  |           | Within ±20 % of the initial value                   |           |            |           |             |
|                             | Dissipation factor (tanδ)                           |           | ≤ 150 % of the initial limit                        |           |            |           |             |
|                             | DC leakage current                                  |           | Within the initial limit                            |           |            |           |             |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |           |                                                     |           |            |           |             |
|                             | Capacitance change                                  |           | Within ±20 % of the initial value                   |           |            |           |             |
|                             | Dissipation factor (tanδ)                           |           | ≤ 150 % of the initial limit                        |           |            |           |             |
|                             | DC leakage current                                  |           | Within the initial limit (after voltage processing) |           |            |           |             |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                             |                     |                       | Standard (Reel size : ø380) |                           |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-----------------------------|---------------------|-----------------------|-----------------------------|---------------------------|
|                   |                                | øD             | L    |           | Ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (mΩ max.) | tan δ <sup>*3</sup> | LC <sup>*4</sup> (μA) | Part number                 | Min. Packaging Q'ty (pcs) |
| 2.5               | 220                            | 6.3            | 5.9  | C6        | 2390                                  | 23                          | 0.12                | 110                   | 2R5SVP220M                  | 1000                      |
|                   | 680                            | 8.0            | 11.9 | E12       | 4520                                  | 13                          | 0.15                | 340                   | 2R5SVP680M                  | 400                       |
|                   | 1500                           | 10.0           | 12.6 | F12       | 5440                                  | 12                          | 0.18                | 750                   | 2R5SVP1500M                 | 400                       |
| 4.0               | 33                             | 4.0            | 5.4  | A5        | 740                                   | 200                         | 0.15                | 66                    | 4SVP33M                     | 2000                      |
|                   | 39                             | 5.0            | 5.9  | B6        | 1100                                  | 70                          | 0.12                | 78                    | 4SVP39M                     | 1500                      |
|                   | 68                             | 5.0            | 5.9  |           | 1400                                  | 60                          | 0.12                | 136                   | 4SVP68M                     | 1500                      |
|                   | 150                            | 6.3            | 5.9  | C6        | 1810                                  | 40                          | 0.12                | 120                   | 4SVP150MX                   | 1000                      |
|                   | 330                            | 8.0            | 6.9  | E7        | 2560                                  | 35                          | 0.12                | 264                   | 4SVP330M                    | 1000                      |
|                   | 560                            | 8.0            | 11.9 | E12       | 4520                                  | 13                          | 0.15                | 448                   | 4SVP560M                    | 400                       |
|                   | 680                            | 10.0           | 7.9  | F8        | 3700                                  | 25                          | 0.12                | 544                   | 4SVP680M                    | 500                       |
|                   | 1200                           | 10.0           | 12.6 | F12       | 5440                                  | 12                          | 0.18                | 960                   | 4SVP1200M                   | 400                       |
|                   | 22                             | 4.0            | 5.4  | A5        | 740                                   | 200                         | 0.12                | 69.3                  | 6SVP22M                     | 2000                      |
| 6.3               | 47                             | 5.0            | 5.9  | B6        | 1100                                  | 70                          | 0.12                | 148                   | 6SVP47M                     | 1500                      |
|                   | 82                             | 6.3            | 5.9  | C6        | 1700                                  | 45                          | 0.12                | 103                   | 6SVP82M                     | 1000                      |
|                   | 100                            | 6.3            | 5.9  |           | 1810                                  | 40                          | 0.12                | 126                   | 6SVP100M                    | 1000                      |
|                   | 120                            | 6.3            | 5.9  |           | 2780                                  | 17                          | 0.12                | 151                   | 6SVP120MV                   | 1000                      |
|                   | 220                            | 8.0            | 6.9  | E7        | 2560                                  | 35                          | 0.12                | 277                   | 6SVP220MX                   | 1000                      |
|                   |                                | 10.0           | 7.9  |           | 3700                                  | 25                          | 0.12                | 277                   | 6SVP220M                    | 500                       |
|                   | 330                            | 10.0           | 7.9  | F8        | 3700                                  | 25                          | 0.12                | 416                   | 6SVP330M                    | 500                       |
|                   |                                | 10.0           | 7.9  |           | 3700                                  | 25                          | 0.12                | 592                   | 6SVP470MX                   | 500                       |
|                   | 470                            | 8.0            | 11.9 | E12       | 4210                                  | 15                          | 0.15                | 592                   | 6SVP470M                    | 400                       |
|                   |                                | 10.0           | 12.6 |           | 5440                                  | 12                          | 0.15                | 775                   | 6SVP820M                    | 400                       |
| 10                | 4.7                            | 4.0            | 5.4  | A5        | 670                                   | 240                         | 0.08                | 23.5                  | 10SVP4R7M                   | 2000                      |
|                   | 6.8                            | 4.0            | 5.4  |           | 670                                   | 240                         | 0.09                | 34                    | 10SVP6R8M                   | 2000                      |
|                   | 10                             | 4.0            | 5.4  |           | 700                                   | 220                         | 0.10                | 50                    | 10SVP10M                    | 2000                      |
|                   | 15                             | 4.0            | 5.4  |           | 740                                   | 200                         | 0.10                | 75                    | 10SVP15M                    | 2000                      |
|                   | 33                             | 5.0            | 5.9  | B6        | 1100                                  | 70                          | 0.12                | 165                   | 10SVP33M                    | 1500                      |
|                   | 47                             | 6.3            | 5.9  | C6        | 1620                                  | 50                          | 0.12                | 94                    | 10SVP47M                    | 1000                      |
|                   | 56                             | 6.3            | 5.9  |           | 1700                                  | 45                          | 0.12                | 112                   | 10SVP56M                    | 1000                      |
|                   | 120                            | 8.0            | 6.9  | E7        | 2560                                  | 35                          | 0.12                | 240                   | 10SVP120M                   | 1000                      |
|                   |                                | 8.0            | 6.9  |           | 2560                                  | 35                          | 0.12                | 300                   | 10SVP150MX                  | 1000                      |
|                   | 150                            | 10.0           | 7.9  | F8        | 3020                                  | 30                          | 0.12                | 300                   | 10SVP150M                   | 500                       |
|                   |                                | 10.0           | 7.9  |           | 3700                                  | 25                          | 0.12                | 540                   | 10SVP270M                   | 500                       |
|                   | 270                            | 10.0           | 7.9  |           | 3700                                  | 25                          | 0.12                | 660                   | 10SVP330MX                  | 500                       |
|                   | 330                            | 8.0            | 11.9 |           | 3950                                  | 17                          | 0.15                | 660                   | 10SVP330M                   | 400                       |
|                   | 560                            | 10.0           | 12.6 | E12       | 5230                                  | 13                          | 0.15                | 840                   | 10SVP560M                   | 400                       |
|                   |                                | 10.0           | 12.6 | F12       | 5230                                  | 13                          | 0.15                | 840                   | 10SVP560M                   | 400                       |
| 16                | 3.3                            | 4.0            | 5.4  | A5        | 660                                   | 260                         | 0.07                | 26.4                  | 16SVP3R3M                   | 2000                      |
|                   | 15                             | 5.0            | 5.9  | B6        | 1020                                  | 120                         | 0.10                | 120                   | 16SVP15M                    | 1500                      |
|                   | 22                             | 5.0            | 5.9  |           | 1060                                  | 90                          | 0.10                | 176                   | 16SVP22M                    | 1500                      |
|                   | 39                             | 6.3            | 5.9  | C6        | 1620                                  | 50                          | 0.10                | 125                   | 16SVP39M                    | 1000                      |
|                   | 56                             | 8.0            | 6.9  | E7        | 1890                                  | 45                          | 0.12                | 179                   | 16SVP56M                    | 1000                      |
|                   | 82                             | 8.0            | 6.9  |           | 2120                                  | 40                          | 0.12                | 262                   | 16SVP82M                    | 1000                      |
|                   | 100                            | 10.0           | 7.9  | F8        | 2670                                  | 35                          | 0.12                | 320                   | 16SVP100M                   | 500                       |
|                   |                                | 10.0           | 7.9  |           | 3020                                  | 30                          | 0.12                | 480                   | 16SVP150M                   | 500                       |
|                   | 150                            | 10.0           | 7.9  |           | 3020                                  | 30                          | 0.12                | 576                   | 16SVP180MX                  | 500                       |
|                   | 180                            | 8.0            | 11.9 |           | 3640                                  | 20                          | 0.15                | 576                   | 16SVP180M                   | 400                       |
|                   | 330                            | 10.0           | 12.6 | F12       | 4720                                  | 16                          | 0.15                | 792                   | 16SVP330M                   | 400                       |
| 20                | 10                             | 5.0            | 5.9  | B6        | 1020                                  | 120                         | 0.10                | 100                   | 20SVP10M                    | 1500                      |
|                   | 22                             | 6.3            | 5.9  | C6        | 1450                                  | 60                          | 0.10                | 88                    | 20SVP22M                    | 1000                      |
|                   | 27                             | 6.3            | 5.9  |           | 1450                                  | 60                          | 0.10                | 108                   | 20SVP27M                    | 1000                      |
|                   | 33                             | 8.0            | 6.9  | E7        | 1890                                  | 45                          | 0.12                | 132                   | 20SVP33M                    | 1000                      |
|                   | 47                             | 8.0            | 6.9  |           | 1890                                  | 45                          | 0.12                | 188                   | 20SVP47M                    | 1000                      |
|                   | 56                             | 10.0           | 7.9  | F8        | 2400                                  | 40                          | 0.12                | 224                   | 20SVP56M                    | 500                       |
|                   | 68                             | 10.0           | 7.9  |           | 2400                                  | 40                          | 0.12                | 272                   | 20SVP68M                    | 500                       |
|                   | 100                            | 8.0            | 11.9 | E12       | 3320                                  | 24                          | 0.15                | 400                   | 20SVP100M                   | 400                       |
|                   | 150                            | 10.0           | 12.6 | F12       | 4320                                  | 20                          | 0.15                | 600                   | 20SVP150M                   | 400                       |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz to 300 kHz/+20 °C)

\*3: tan δ (120 Hz / +20 °C)

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Reflow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

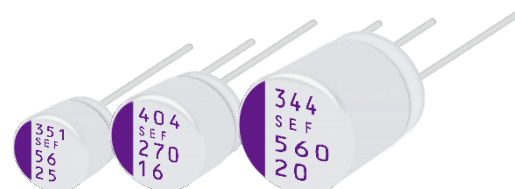
| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum

## Solid Capacitors

### Radial Lead Type

#### SEF series



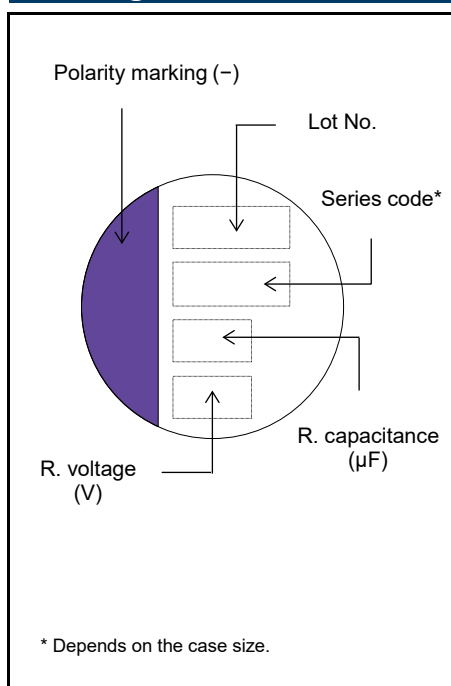
### Features

- High voltage (35 V max.)
- Large capacitance (1000  $\mu$ F max.)
- RoHS compliance, Halogen free

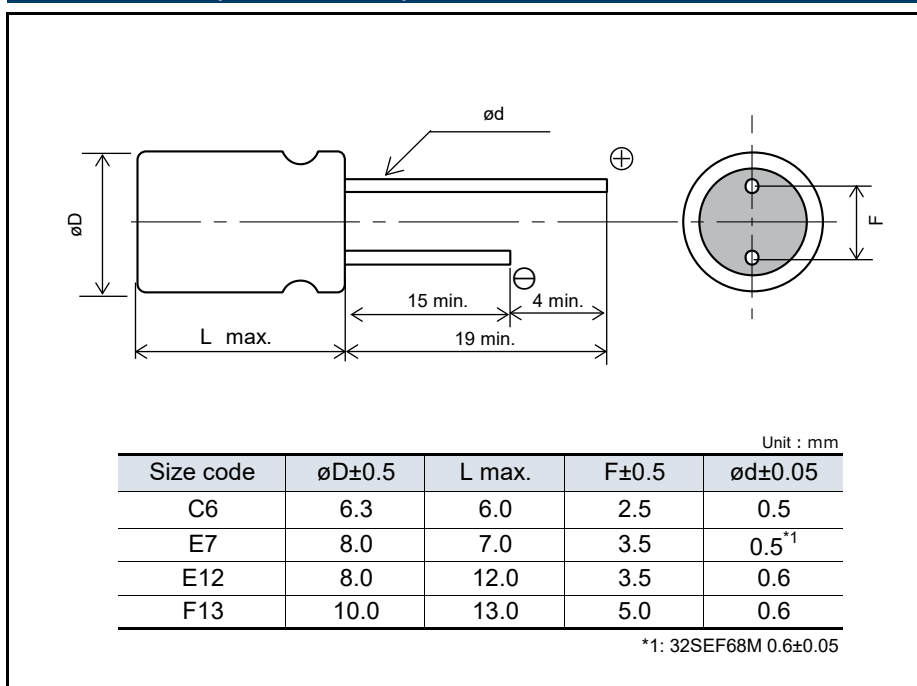
### Specifications

| Size code                   | C6                                                  | E7                                                  | E12             | F13               |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------|-------------------|
| Category temp. range        | -55 °C to +125 °C                                   |                                                     |                 |                   |
| Rated voltage range         | 16 V to 35 V                                        |                                                     |                 |                   |
| Nominal cap.range           | 22 µF to 180 µF                                     | 39 µF to 270 µF                                     | 82 µF to 560 µF | 120 µF to 1000 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |                 |                   |
| DC leakage current          | Please see the attached characteristics list        |                                                     |                 |                   |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |                 |                   |
| Endurance                   | +125 °C 1000 h, rated voltage applied               |                                                     |                 |                   |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                   |
|                             | Dissipation factor (tanδ)                           | ≤ 200 % of the initial limit                        |                 |                   |
|                             | DC leakage current                                  | Within the initial limit                            |                 |                   |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |                 |                   |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                   |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                 |                   |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |                 |                   |

### Marking



### Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance ( $\pm 20\%$ ) ( $\mu\text{F}$ ) | Case size (mm)  |      | Size code | Specifications                        |                                                 |                                     |                             |                                    | Part number<br><br><small>Click here for part number list of lead terminal cutting and lead terminal taping</small> |
|-------------------|----------------------------------------------------|-----------------|------|-----------|---------------------------------------|-------------------------------------------------|-------------------------------------|-----------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|                   |                                                    | $\varnothing D$ | L    |           | Ripple current <sup>*1</sup> (mA rms) | Allowable ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (m $\Omega$ max.) | $\tan \delta$ <sup>*3</sup> | LC <sup>*4</sup> ( $\mu\text{A}$ ) |                                                                                                                     |
| 16                | 180                                                | 6.3             | 6.0  | C6        | 1040                                  | 3300                                            | 22                                  | 0.12                        | 576                                | 16SEF180M                                                                                                           |
|                   | 270                                                | 8.0             | 7.0  | E7        | 1040                                  | 3300                                            | 22                                  | 0.12                        | 864                                | 16SEF270M                                                                                                           |
|                   | 560                                                | 8.0             | 12.0 | E12       | 1560                                  | 4950                                            | 14                                  | 0.12                        | 1792                               | 16SEF560M                                                                                                           |
|                   | 1000                                               | 10.0            | 13.0 | F13       | 1700                                  | 5400                                            | 12                                  | 0.12                        | 3200                               | 16SEF1000M                                                                                                          |
| 20                | 120                                                | 6.3             | 6.0  | C6        | 1010                                  | 3200                                            | 25                                  | 0.12                        | 480                                | 20SEF120M                                                                                                           |
|                   | 180                                                | 8.0             | 7.0  | E7        | 1010                                  | 3200                                            | 25                                  | 0.12                        | 720                                | 20SEF180M                                                                                                           |
|                   | 390                                                | 8.0             | 12.0 | E12       | 1560                                  | 4950                                            | 14                                  | 0.12                        | 1560                               | 20SEF390M                                                                                                           |
|                   | 560                                                | 10.0            | 13.0 | F13       | 1700                                  | 5400                                            | 12                                  | 0.12                        | 2240                               | 20SEF560M                                                                                                           |
| 25                | 56                                                 | 6.3             | 6.0  | C6        | 880                                   | 2800                                            | 30                                  | 0.12                        | 280                                | 25SEF56M                                                                                                            |
|                   | 82                                                 | 8.0             | 7.0  | E7        | 940                                   | 3000                                            | 28                                  | 0.12                        | 410                                | 25SEF82M                                                                                                            |
|                   | 180                                                | 8.0             | 12.0 | E12       | 1470                                  | 4650                                            | 16                                  | 0.12                        | 900                                | 25SEF180M                                                                                                           |
|                   | 330                                                | 10.0            | 13.0 | F13       | 1580                                  | 5000                                            | 14                                  | 0.12                        | 1650                               | 25SEF330M                                                                                                           |
| 32                | 68                                                 | 8.0             | 7.0  | E7        | 1010                                  | 3200                                            | 25                                  | 0.10                        | 435                                | 32SEF68M                                                                                                            |
| 35                | 22                                                 | 6.3             | 6.0  | C6        | 820                                   | 2600                                            | 35                                  | 0.12                        | 154                                | 35SEF22M                                                                                                            |
|                   | 39                                                 | 8.0             | 7.0  | E7        | 880                                   | 2800                                            | 30                                  | 0.12                        | 273                                | 35SEF39M                                                                                                            |
|                   | 82                                                 | 8.0             | 12.0 | E12       | 1260                                  | 4000                                            | 20                                  | 0.12                        | 574                                | 35SEF82M                                                                                                            |
|                   | 120                                                | 10.0            | 13.0 | F13       | 1390                                  | 4400                                            | 18                                  | 0.12                        | 840                                | 35SEF120M                                                                                                           |

\*1: Ripple current (100 kHz /  $+105^\circ\text{C} < T_x \leq +125^\circ\text{C}$ ) / Allowable ripple current (100 kHz /  $T_x \leq +105^\circ\text{C}$ )

\*2: ESR (100 kHz to 300 kHz /  $+20^\circ\text{C}$ )

\*3:  $\tan \delta$  (120 Hz /  $+20^\circ\text{C}$ )

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Flow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | $120\text{ Hz} \leq f < 1\text{ kHz}$ | $1\text{ kHz} \leq f < 10\text{ kHz}$ | $10\text{ kHz} \leq f < 100\text{ kHz}$ | $100\text{ kHz} \leq f < 500\text{ kHz}$ |
|--------------|---------------------------------------|---------------------------------------|-----------------------------------------|------------------------------------------|
| Coefficient  | 0.05                                  | 0.3                                   | 0.7                                     | 1                                        |



# Conductive Polymer Aluminum Solid Capacitors Radial Lead Type SEK series



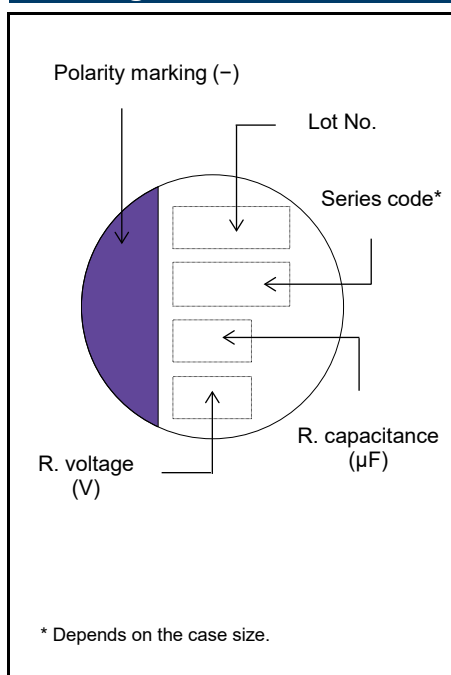
## Features

- High voltage (50 V max.)
- 125 °C 1000 h
- RoHS compliance, Halogen free

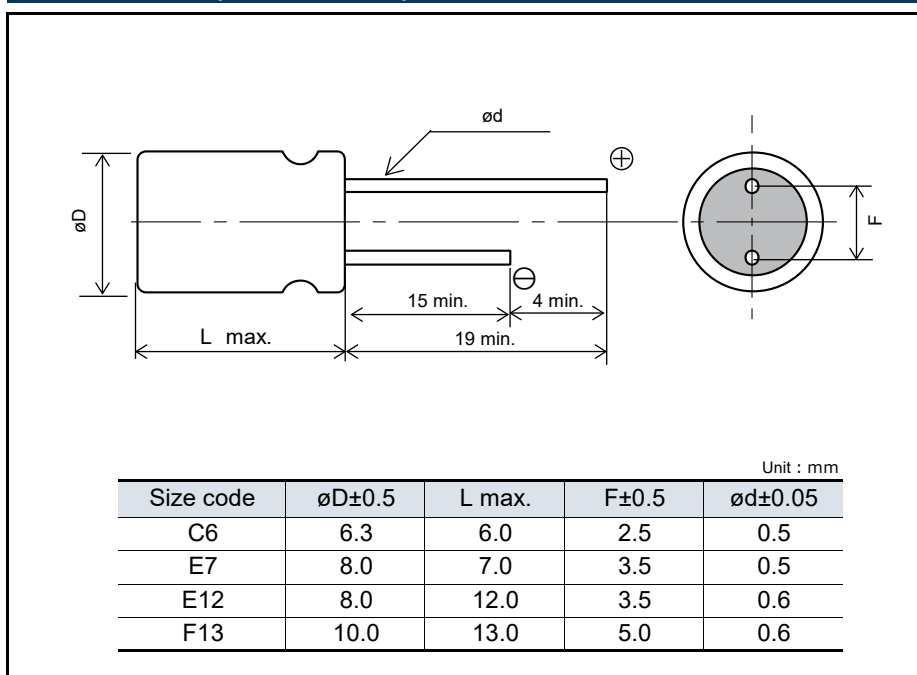
## Specifications

| Size code                   | C6                                                  | E7                                                  | E12             | F13              |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------|------------------|
| Category temp. range        | -55 °C to +125 °C                                   |                                                     |                 |                  |
| Rated voltage range         | 25 V to 50 V                                        |                                                     |                 |                  |
| Nominal cap.range           | 22 µF to 82 µF                                      | 33 µF to 120 µF                                     | 68 µF to 270 µF | 120 µF to 470 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |                 |                  |
| DC leakage current          | Please see the attached characteristics list        |                                                     |                 |                  |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |                 |                  |
| Endurance                   | +125 °C 1000 h, rated voltage applied               |                                                     |                 |                  |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                  |
|                             | Dissipation factor (tanδ)                           | ≤ 200 % of the initial limit                        |                 |                  |
|                             | DC leakage current                                  | Within the initial limit                            |                 |                  |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |                 |                  |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                  |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                 |                  |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |                 |                  |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance ( $\pm 20\%$ ) ( $\mu\text{F}$ ) | Case size (mm)  |      | Size code | Specifications                        |                                                 |                                     |                             |                                    | Part number<br><br><a href="#">Click here for part number list of lead terminal cutting and lead terminal taping</a> |
|-------------------|----------------------------------------------------|-----------------|------|-----------|---------------------------------------|-------------------------------------------------|-------------------------------------|-----------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|                   |                                                    | $\varnothing D$ | L    |           | Ripple current <sup>*1</sup> (mA rms) | Allowable ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (m $\Omega$ max.) | $\tan \delta$ <sup>*3</sup> | LC <sup>*4</sup> ( $\mu\text{A}$ ) |                                                                                                                      |
| 25                | 82                                                 | 6.3             | 6.0  | C6        | 960                                   | 3060                                            | 25                                  | 0.12                        | 410                                | 25SEK82M                                                                                                             |
|                   | 120                                                | 8.0             | 7.0  | E7        | 1010                                  | 3200                                            | 24                                  | 0.12                        | 600                                | 25SEK120M                                                                                                            |
|                   | 270                                                | 8.0             | 12.0 | E12       | 1470                                  | 4650                                            | 16                                  | 0.12                        | 1350                               | 25SEK270M                                                                                                            |
|                   | 470                                                | 10.0            | 13.0 | F13       | 1590                                  | 5000                                            | 14                                  | 0.12                        | 2350                               | 25SEK470M                                                                                                            |
| 35                | 47                                                 | 6.3             | 6.0  | C6        | 930                                   | 2950                                            | 27                                  | 0.12                        | 329                                | 35SEK47M                                                                                                             |
|                   | 82                                                 | 8.0             | 7.0  | E7        | 960                                   | 3060                                            | 25                                  | 0.12                        | 574                                | 35SEK82M                                                                                                             |
|                   | 180                                                | 8.0             | 12.0 | E12       | 1260                                  | 4000                                            | 20                                  | 0.12                        | 1260                               | 35SEK180M                                                                                                            |
|                   | 330                                                | 10.0            | 13.0 | F13       | 1390                                  | 4400                                            | 18                                  | 0.12                        | 2310                               | 35SEK330M                                                                                                            |
| 50                | 22                                                 | 6.3             | 6.0  | C6        | 820                                   | 2600                                            | 35                                  | 0.12                        | 220                                | 50SEK22M                                                                                                             |
|                   | 33                                                 | 8.0             | 7.0  | E7        | 850                                   | 2700                                            | 35                                  | 0.12                        | 330                                | 50SEK33M                                                                                                             |
|                   | 68                                                 | 8.0             | 12.0 | E12       | 1200                                  | 3800                                            | 25                                  | 0.12                        | 680                                | 50SEK68M                                                                                                             |
|                   | 120                                                | 10.0            | 13.0 | F13       | 1350                                  | 4300                                            | 20                                  | 0.12                        | 1200                               | 50SEK120M                                                                                                            |

\*1: Ripple current (100 kHz /  $+105\text{ }^{\circ}\text{C} < T_x \leq +125\text{ }^{\circ}\text{C}$ ) / Allowable ripple current (100 kHz /  $T_x \leq +105\text{ }^{\circ}\text{C}$ )

\*2: ESR (100 kHz to 300 kHz /  $+20\text{ }^{\circ}\text{C}$ )

\*3:  $\tan \delta$  (120 Hz /  $+20\text{ }^{\circ}\text{C}$ )

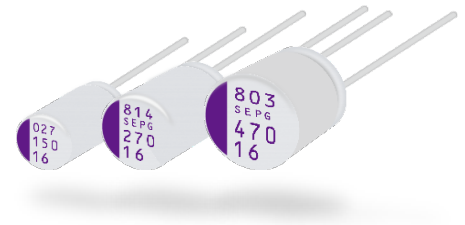
\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Flow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | $120\text{ Hz} \leq f < 1\text{ kHz}$ | $1\text{ kHz} \leq f < 10\text{ kHz}$ | $10\text{ kHz} \leq f < 100\text{ kHz}$ | $100\text{ kHz} \leq f < 500\text{ kHz}$ |
|--------------|---------------------------------------|---------------------------------------|-----------------------------------------|------------------------------------------|
| Coefficient  | 0.05                                  | 0.3                                   | 0.7                                     | 1                                        |

# Conductive Polymer Aluminum Solid Capacitors Radial Lead Type SEPG series



## Features

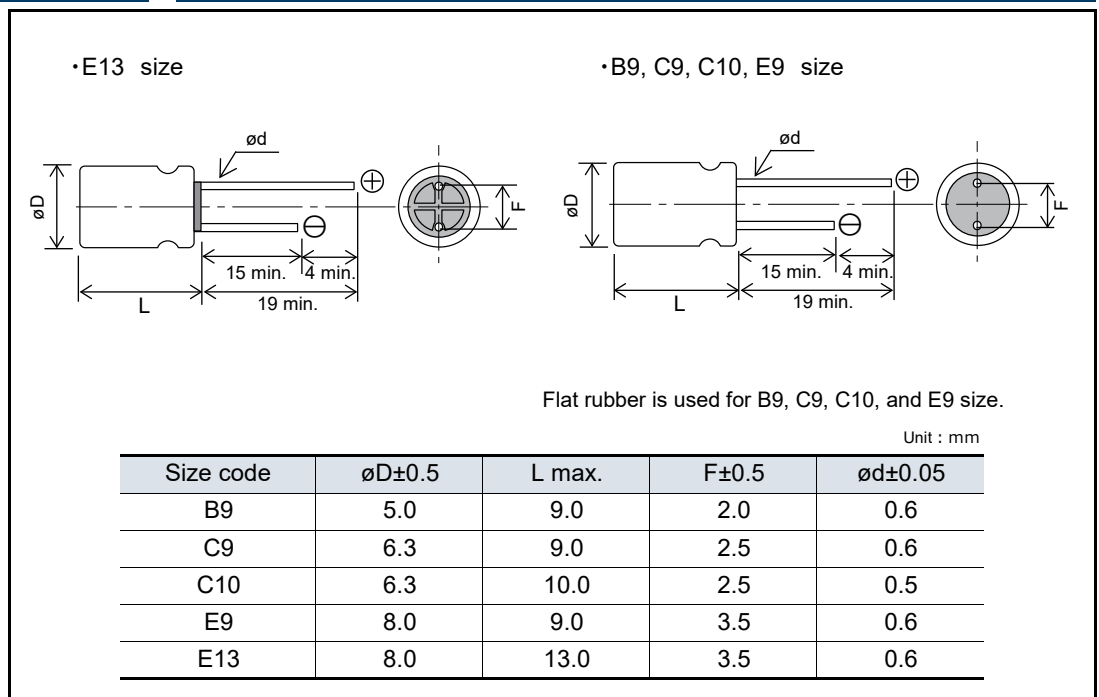
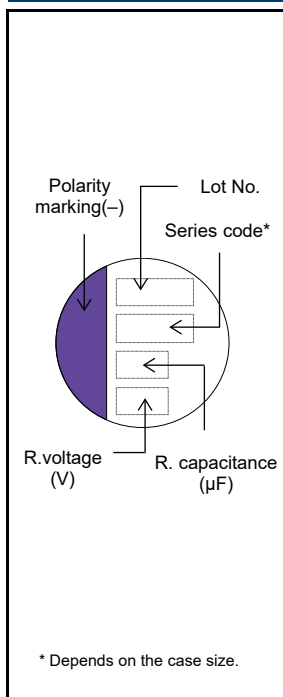
- High ripple current (6100 mA rms max.)
- RoHS compliance, Halogen free

## Specifications

| Size code                   | B9                                                  | C9                                                  | C10 | E9     | E13    |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|-----|--------|--------|
| Category temp. range        | -55 °C to +105 °C                                   |                                                     |     |        |        |
| Rated voltage range         | 16 V                                                |                                                     |     |        |        |
| Rated cap. range            | 150 µF                                              | 270 µF                                              |     | 470 µF | 560 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |     |        |        |
| Leakage current             | Please see the attached characteristics list        |                                                     |     |        |        |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |     |        |        |
| Endurance                   | +105 °C 5000 h, rated voltage applied               |                                                     |     |        |        |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |     |        |        |
|                             | Dissipation factor (tan δ)                          | ≤ 200 % of the initial limit                        |     |        |        |
|                             | DC leakage current                                  | Within the initial limit                            |     |        |        |
| Damp heat<br>(Steady State) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |     |        |        |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |     |        |        |
|                             | Dissipation factor (tan δ)                          | ≤ 150 % of the initial limit                        |     |        |        |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |     |        |        |

## Marking

## Dimensions (not to scale)



## Characteristics list

| Rated voltage<br>(V) | Rated capacitance<br>( $\pm 20\%$ )<br>( $\mu\text{F}$ ) | Case size<br>(mm) |      | Size code | Specifications                           |                                        |                             |                                       | Part number<br><br><small><a href="#">Click here for part number list of lead terminal cutting and lead terminal taping</a></small> |
|----------------------|----------------------------------------------------------|-------------------|------|-----------|------------------------------------------|----------------------------------------|-----------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                                          | $\varnothing D$   | L    |           | Ripple current <sup>*1</sup><br>(mA rms) | ESR <sup>*2</sup><br>(m $\Omega$ max.) | $\tan \delta$ <sup>*3</sup> | LC <sup>*4</sup><br>( $\mu\text{A}$ ) |                                                                                                                                     |
| 16                   | 150                                                      | 5.0               | 9.0  | B9        | 4500                                     | 12                                     | 0.12                        | 480                                   | 16SEPG150M                                                                                                                          |
|                      | 270                                                      | 6.3               | 9.0  | C9        | 5040                                     | 10                                     | 0.12                        | 864                                   | 16SEPG270W                                                                                                                          |
|                      |                                                          | 6.3               | 10.0 | C10       | 5800                                     | 8                                      | 0.12                        | 864                                   | 16SEPG270M                                                                                                                          |
|                      | 470                                                      | 8.0               | 9.0  | E9        | 5400                                     | 8                                      | 0.12                        | 1504                                  | 16SEPG470M                                                                                                                          |
|                      | 560                                                      | 8.0               | 13.0 | E13       | 6100                                     | 8                                      | 0.12                        | 1792                                  | 16SEPG560M                                                                                                                          |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz / +20 °C)

\*3:  $\tan \delta$  (120 Hz / +20 °C)

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Flow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

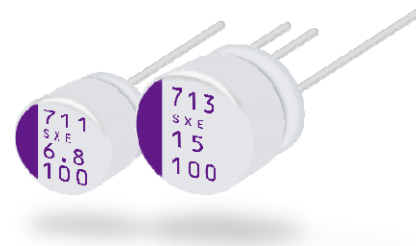
| Frequency(f) | 120 Hz $\leq f < 1$ kHz | 1 kHz $\leq f < 10$ kHz | 10 kHz $\leq f < 100$ kHz | 100 kHz $\leq f < 500$ kHz |
|--------------|-------------------------|-------------------------|---------------------------|----------------------------|
| Coefficient  | 0.05                    | 0.3                     | 0.7                       | 1                          |

## Conductive Polymer Aluminum

### Solid Capacitors

#### Radial Lead Type

#### SXE series



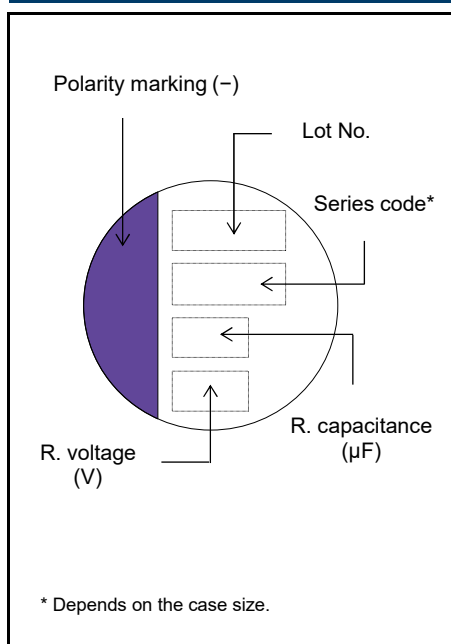
### Features

- Super high voltage (100 V max.)
- 125 °C 1000 h
- RoHS compliance, Halogen free

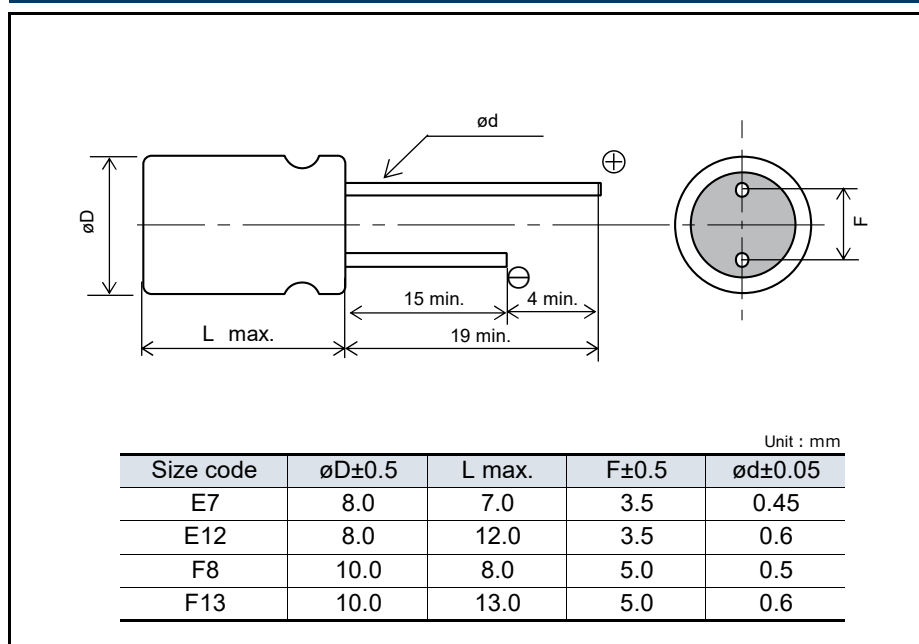
### Specifications

| Size code                   | E7                                                  | E12                                                 | F8             | F13             |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|----------------|-----------------|
| Category temp. range        | -55 °C to +125 °C                                   |                                                     |                |                 |
| Rated voltage range         | 63 V to 100 V                                       |                                                     |                |                 |
| Nominal cap.range           | 6.8 µF to 18 µF                                     | 15 µF to 56 µF                                      | 15 µF to 39 µF | 18 µF to 100 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |                |                 |
| DC leakage current          | Please see the attached characteristics list        |                                                     |                |                 |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |                |                 |
| Endurance                   | +125 °C 1000 h, rated voltage applied               |                                                     |                |                 |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                |                 |
|                             | Dissipation factor (tanδ)                           | ≤ 200 % of the initial limit                        |                |                 |
|                             | DC leakage current                                  | Within the initial limit                            |                |                 |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |                |                 |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                |                 |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                |                 |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |                |                 |

### Marking



### Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                                                 |                             |                     |                       | Part number<br><br><a href="#">Click here for part number list of lead terminal cutting and lead terminal taping</a> |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-------------------------------------------------|-----------------------------|---------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------|
|                   |                                | øD             | L    |           | Ripple current* <sup>1</sup> (mA rms) | Allowable ripple current* <sup>1</sup> (mA rms) | ESR* <sup>2</sup> (mΩ max.) | tan δ* <sup>3</sup> | LC* <sup>4</sup> (μA) |                                                                                                                      |
| 63                | 18                             | 8.0            | 7.0  | E7        | 340                                   | 1100                                            | 60                          | 0.12                | 56                    | 63SXE18M                                                                                                             |
|                   | 33                             | 8.0            | 12.0 | E12       | 930                                   | 2950                                            | 25                          | 0.12                | 104                   | 63SXE33M                                                                                                             |
|                   | 39                             | 8.0            | 12.0 | E12       | 930                                   | 2950                                            | 25                          | 0.12                | 122                   | 63SXE39M                                                                                                             |
|                   |                                | 10.0           | 8.0  | F8        | 690                                   | 2190                                            | 50                          | 0.12                | 122                   | 63SXE39MX                                                                                                            |
|                   | 56                             | 8.0            | 12.0 | E12       | 930                                   | 2950                                            | 25                          | 0.12                | 176                   | 63SXE56M                                                                                                             |
|                   | 68                             | 10.0           | 13.0 | F13       | 1030                                  | 3280                                            | 25                          | 0.12                | 214                   | 63SXE68M                                                                                                             |
|                   | 100                            | 10.0           | 13.0 | F13       | 1030                                  | 3280                                            | 25                          | 0.12                | 315                   | 63SXE100M                                                                                                            |
| 72                | 82                             | 10.0           | 13.0 | F13       | 980                                   | 3100                                            | 28                          | 0.12                | 295                   | 72SXE82M                                                                                                             |
| 80                | 12                             | 8.0            | 7.0  | E7        | 340                                   | 1100                                            | 60                          | 0.12                | 48                    | 80SXE12M                                                                                                             |
|                   | 27                             | 8.0            | 12.0 | E12       | 780                                   | 2490                                            | 35                          | 0.12                | 108                   | 80SXE27M                                                                                                             |
|                   |                                | 10.0           | 8.0  | F8        | 660                                   | 2080                                            | 55                          | 0.12                | 108                   | 80SXE27MX                                                                                                            |
|                   | 33                             | 8.0            | 12.0 | E12       | 780                                   | 2490                                            | 35                          | 0.12                | 132                   | 80SXE33M                                                                                                             |
|                   | 47                             | 10.0           | 13.0 | F13       | 980                                   | 3100                                            | 28                          | 0.12                | 188                   | 80SXE47M                                                                                                             |
|                   | 56                             | 10.0           | 13.0 | F13       | 980                                   | 3100                                            | 28                          | 0.12                | 224                   | 80SXE56M                                                                                                             |
| 100               | 6.8                            | 8.0            | 7.0  | E7        | 340                                   | 1100                                            | 60                          | 0.12                | 34                    | 100SXE6R8M                                                                                                           |
|                   | 15                             | 10.0           | 8.0  | F8        | 630                                   | 2000                                            | 60                          | 0.12                | 75                    | 100SXE15MX                                                                                                           |
|                   |                                | 8.0            | 12.0 | E12       | 730                                   | 2350                                            | 40                          | 0.12                | 75                    | 100SXE15M                                                                                                            |
|                   | 18                             | 10.0           | 13.0 | F13       | 940                                   | 3000                                            | 30                          | 0.12                | 90                    | 100SXE18M                                                                                                            |
|                   |                                | 8.0            | 12.0 | E12       | 730                                   | 2350                                            | 40                          | 0.12                | 90                    | 100SXE18MX                                                                                                           |
|                   | 22                             | 10.0           | 13.0 | F13       | 940                                   | 3000                                            | 30                          | 0.12                | 110                   | 100SXE22M                                                                                                            |
|                   | 27                             | 10.0           | 13.0 | F13       | 940                                   | 3000                                            | 30                          | 0.12                | 135                   | 100SXE27M                                                                                                            |

\*1: Ripple current (100 kHz / +105 °C < Tx ≤ +125 °C) / Allowable ripple current (100 kHz / Tx ≤ +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Flow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Radial Lead Type SEPF series



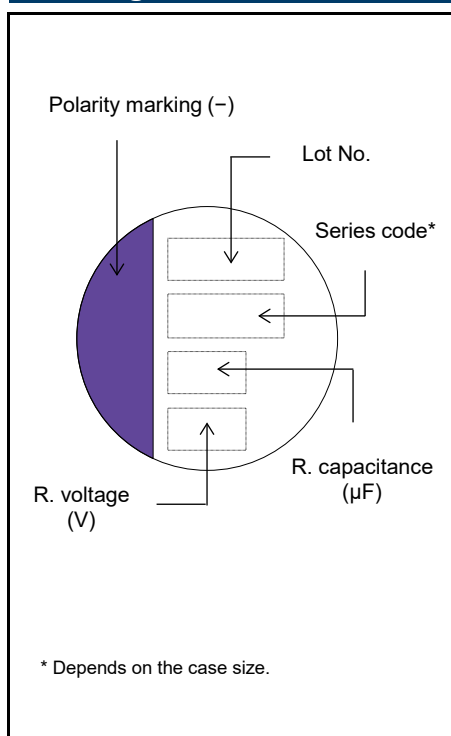
## Features

- High voltage (35 V max.)
- Large capacitance (1000  $\mu$ F max.)
- RoHS compliance, Halogen free

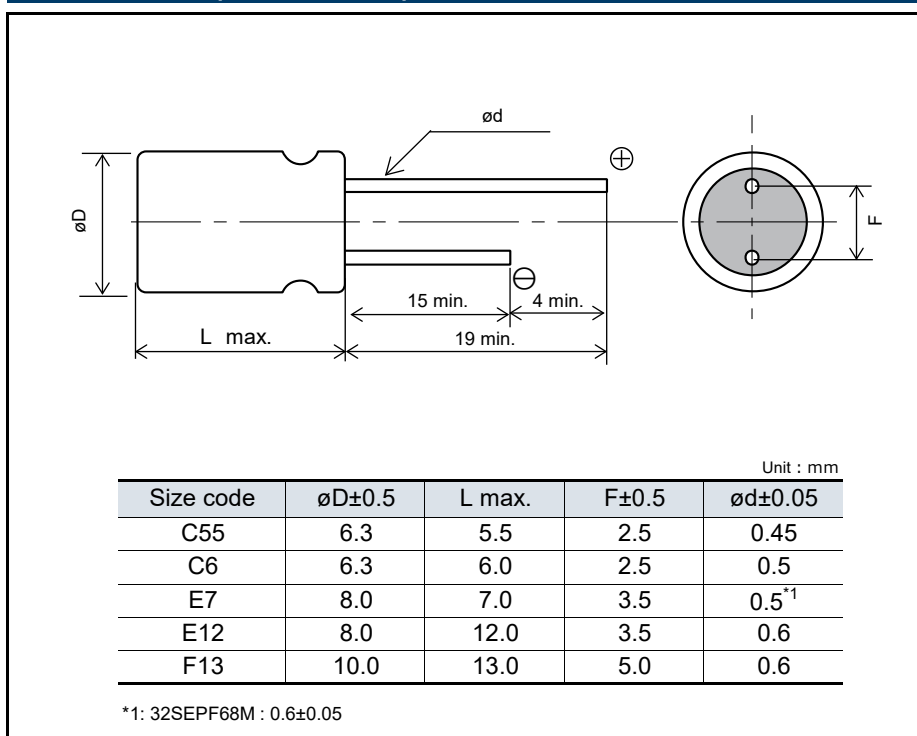
## Specifications

| Size code                   | C55                                                 | C6                                                  | E7              | E12             | F13               |
|-----------------------------|-----------------------------------------------------|-----------------------------------------------------|-----------------|-----------------|-------------------|
| Category temp. range        | -55 °C to +105 °C                                   |                                                     |                 |                 |                   |
| Rated voltage range         | 16 V to 32 V                                        | 16 V to 35 V                                        |                 |                 |                   |
| Nominal cap.range           | 22 µF to 150 µF                                     | 22 µF to 180 µF                                     | 39 µF to 270 µF | 82 µF to 560 µF | 120 µF to 1000 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |                                                     |                 |                 |                   |
| DC leakage current          | Please see the attached characteristics list        |                                                     |                 |                 |                   |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |                                                     |                 |                 |                   |
| Endurance                   | +105 °C 5000 h, rated voltage applied               |                                                     |                 |                 |                   |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                 |                   |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                 |                 |                   |
|                             | DC leakage current                                  | Within the initial limit                            |                 |                 |                   |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |                                                     |                 |                 |                   |
|                             | Capacitance change                                  | Within ±20 % of the initial value                   |                 |                 |                   |
|                             | Dissipation factor (tanδ)                           | ≤ 150 % of the initial limit                        |                 |                 |                   |
|                             | DC leakage current                                  | Within the initial limit (after voltage processing) |                 |                 |                   |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance ( $\pm 20\%$ ) ( $\mu\text{F}$ ) | Case size (mm)        |      | Size code | Specifications                        |                                     |                             |                                    | Part number<br><br><small><a href="#">Click here for part number list of lead terminal cutting and lead terminal taping</a></small> |
|-------------------|----------------------------------------------------|-----------------------|------|-----------|---------------------------------------|-------------------------------------|-----------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|                   |                                                    | $\varnothing\text{D}$ | L    |           | Ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (m $\Omega$ max.) | $\tan \delta$ <sup>*3</sup> | LC <sup>*4</sup> ( $\mu\text{A}$ ) |                                                                                                                                     |
| 16                | 150                                                | 6.3                   | 5.5  | C55       | 2590                                  | 30                                  | 0.12                        | 480                                | 16SEPF150M                                                                                                                          |
|                   | 180                                                | 6.3                   | 6.0  | C6        | 3300                                  | 22                                  | 0.12                        | 576                                | 16SEPF180M                                                                                                                          |
|                   | 270                                                | 8.0                   | 7.0  | E7        | 3300                                  | 22                                  | 0.12                        | 864                                | 16SEPF270M                                                                                                                          |
|                   | 560                                                | 8.0                   | 12.0 | E12       | 4950                                  | 14                                  | 0.12                        | 1792                               | 16SEPF560M                                                                                                                          |
|                   | 1000                                               | 10.0                  | 13.0 | F13       | 5400                                  | 12                                  | 0.12                        | 3200                               | 16SEPF1000M                                                                                                                         |
| 20                | 120                                                | 6.3                   | 6.0  | C6        | 3200                                  | 25                                  | 0.12                        | 480                                | 20SEPF120M                                                                                                                          |
|                   | 180                                                | 8.0                   | 7.0  | E7        | 3200                                  | 25                                  | 0.12                        | 720                                | 20SEPF180M                                                                                                                          |
|                   | 390                                                | 8.0                   | 12.0 | E12       | 4950                                  | 14                                  | 0.12                        | 1560                               | 20SEPF390M                                                                                                                          |
|                   | 560                                                | 10.0                  | 13.0 | F13       | 5400                                  | 12                                  | 0.12                        | 2240                               | 20SEPF560M                                                                                                                          |
| 25                | 56                                                 | 6.3                   | 6.0  | C6        | 2800                                  | 30                                  | 0.12                        | 280                                | 25SEPF56M                                                                                                                           |
|                   | 82                                                 | 8.0                   | 7.0  | E7        | 3000                                  | 28                                  | 0.12                        | 410                                | 25SEPF82M                                                                                                                           |
|                   | 180                                                | 8.0                   | 12.0 | E12       | 4650                                  | 16                                  | 0.12                        | 900                                | 25SEPF180M                                                                                                                          |
|                   | 330                                                | 10.0                  | 13.0 | F13       | 5000                                  | 14                                  | 0.12                        | 1650                               | 25SEPF330M                                                                                                                          |
| 32                | 22                                                 | 6.3                   | 5.5  | C55       | 2400                                  | 35                                  | 0.12                        | 140                                | 32SEPF22M                                                                                                                           |
|                   | 68                                                 | 8.0                   | 7.0  | E7        | 3200                                  | 25                                  | 0.10                        | 435                                | 32SEPF68M                                                                                                                           |
| 35                | 22                                                 | 6.3                   | 6.0  | C6        | 2600                                  | 35                                  | 0.12                        | 154                                | 35SEPF22M                                                                                                                           |
|                   | 39                                                 | 8.0                   | 7.0  | E7        | 2800                                  | 30                                  | 0.12                        | 273                                | 35SEPF39M                                                                                                                           |
|                   | 82                                                 | 8.0                   | 12.0 | E12       | 4000                                  | 20                                  | 0.12                        | 574                                | 35SEPF82M                                                                                                                           |
|                   | 120                                                | 10.0                  | 13.0 | F13       | 4400                                  | 18                                  | 0.12                        | 840                                | 35SEPF120M                                                                                                                          |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3:  $\tan \delta$  (120 Hz / +20 °C)

\*4: After 2 minutes

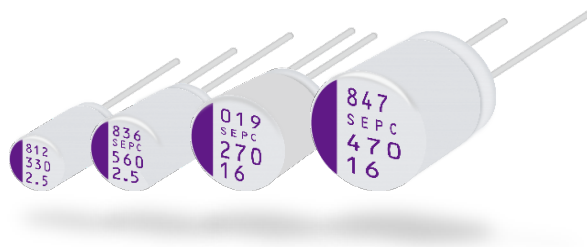
◆ Please refer to each page in this catalog for "Flow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz $\leq$ f < 1 kHz | 1 kHz $\leq$ f < 10 kHz | 10 kHz $\leq$ f < 100 kHz | 100 kHz $\leq$ f < 500 kHz |
|--------------|-------------------------|-------------------------|---------------------------|----------------------------|
| Coefficient  | 0.05                    | 0.3                     | 0.7                       | 1                          |



# Conductive Polymer Aluminum Solid Capacitors Radial Lead Type SEPC series



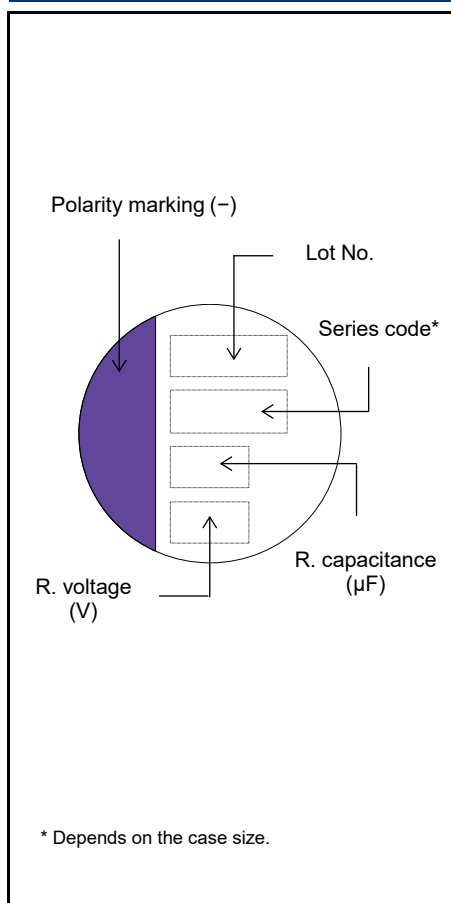
## Features

- Super low ESR (5 mΩ max.)
- Large capacitance (2700 μF max.)
- RoHS compliance, Halogen free

## Specifications

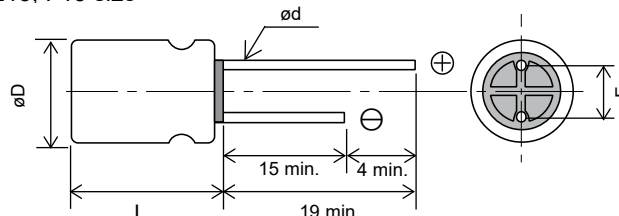
| Size code                   | B9                                                  | C55 | C6                                                  | C9         | E7          | E9          | E12        | E13        | F13         |
|-----------------------------|-----------------------------------------------------|-----|-----------------------------------------------------|------------|-------------|-------------|------------|------------|-------------|
| Category temp. range        | -55 °C to +105 °C                                   |     |                                                     |            |             |             |            |            |             |
| Rated voltage range (V)     | 2.5                                                 | 6.3 | 2.5 to 16                                           |            | 6.3 to 16   | 2.5 to 16   | 16         | 2.5 to 6.3 | 2.5 to 16   |
| Nominal cap.range (μF)      | 100 to 560                                          | 220 | 100 to 560                                          | 100 to 820 | 150 to 1000 | 180 to 1000 | 180 to 270 | 470 to 820 | 470 to 2700 |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                             |     |                                                     |            |             |             |            |            |             |
| DC leakage current          | Please see the attached characteristics list        |     |                                                     |            |             |             |            |            |             |
| Dissipation factor (tan δ)  | Please see the attached characteristics list        |     |                                                     |            |             |             |            |            |             |
| Endurance                   | +105 °C 5000 h, rated voltage applied               |     |                                                     |            |             |             |            |            |             |
|                             | Capacitance change                                  |     | Within ±20 % of the initial value                   |            |             |             |            |            |             |
|                             | Dissipation factor (tanδ)                           |     | ≤ 150 % of the initial limit                        |            |             |             |            |            |             |
|                             | DC leakage current                                  |     | Within the initial limit                            |            |             |             |            |            |             |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage |     |                                                     |            |             |             |            |            |             |
|                             | Capacitance change                                  |     | Within ±20 % of the initial value                   |            |             |             |            |            |             |
|                             | Dissipation factor (tanδ)                           |     | ≤ 150 % of the initial limit                        |            |             |             |            |            |             |
|                             | DC leakage current                                  |     | Within the initial limit (after voltage processing) |            |             |             |            |            |             |

## Marking

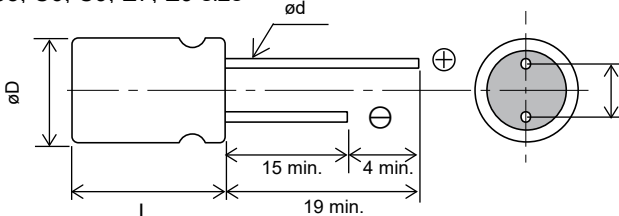


## Dimensions (not to scale)

• E12, E13, F13 size



• B9, C55, C6, C9, E7, E9 size



Flat rubber is used for B9, C55, C6, C9, E7, and E9 size.

Unit : mm

| Size code | øD±0.5 | L max. | F±0.5 | ød±0.05          |
|-----------|--------|--------|-------|------------------|
| B9        | 5.0    | 9.0    | 2.0   | 0.6              |
| C55       | 6.3    | 5.5    | 2.5   | 0.45             |
| C6        | 6.3    | 6.0    | 2.5   | 0.5 <sup>1</sup> |
| C9        | 6.3    | 9.0    | 2.5   | 0.6              |
| E7        | 8.0    | 7.0    | 3.5   | 0.6 <sup>2</sup> |
| E9        | 8.0    | 9.0    | 3.5   | 0.6              |
| E12       | 8.0    | 12.0   | 3.5   | 0.6              |
| E13       | 8.0    | 13.0   | 3.5   | 0.6              |
| F13       | 10.0   | 13.0   | 5.0   | 0.6              |

\*1: 16SEPC100M : 0.45±0.05

\*2: 16SEPC150MD, 10SEPC270M : 0.45±0.05

## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications                        |                             |                     |                       | Part number<br><br><small><a href="#">Click here for part number list of lead terminal cutting and lead terminal taping</a></small> |
|-------------------|--------------------------------|----------------|------|-----------|---------------------------------------|-----------------------------|---------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|                   |                                | øD             | L    |           | Ripple current <sup>*1</sup> (mA rms) | ESR <sup>*2</sup> (mΩ max.) | tan δ <sup>*3</sup> | LC <sup>*4</sup> (μA) |                                                                                                                                     |
| 2.5               | 100                            | 5.0            | 9.0  | B9        | 4180                                  | 7                           | 0.10                | 500                   | 2SEPC100MZ                                                                                                                          |
|                   | 330                            | 5.0            | 9.0  |           | 4180                                  | 7                           | 0.10                | 500                   | 2SEPC330MZ                                                                                                                          |
|                   | 390                            | 6.3            | 6.0  | C6        | 3900                                  | 10                          | 0.12                | 500                   | 2SEPC390M                                                                                                                           |
|                   | 470                            | 5.0            | 9.0  | B9        | 4180                                  | 7                           | 0.10                | 500                   | 2SEPC470MZ                                                                                                                          |
|                   | 560                            | 5.0            | 9.0  |           | 4180                                  | 7                           | 0.10                | 500                   | 2SEPC560MZ                                                                                                                          |
|                   |                                | 6.3            | 6.0  | C6        | 3900                                  | 10                          | 0.12                | 500                   | 2SEPC560M                                                                                                                           |
|                   |                                | 6.3            | 9.0  | C9        | 5600                                  | 7                           | 0.10                | 500                   | 2SEPC560MW                                                                                                                          |
|                   |                                | 8.0            | 9.0  | E9        | 4700                                  | 8                           | 0.10                | 280                   | 2SEPC560MX                                                                                                                          |
|                   | 820                            | 6.3            | 9.0  | C9        | 5600                                  | 7                           | 0.10                | 500                   | 2SEPC820MW                                                                                                                          |
|                   |                                | 8.0            | 7.0  | E7        | 5300                                  | 8                           | 0.10                | 500                   | 2SEPC820MD                                                                                                                          |
|                   |                                | 8.0            | 9.0  | E9        | 6100                                  | 7                           | 0.10                | 500                   | 2SEPC820MX                                                                                                                          |
|                   |                                | 8.0            | 9.0  |           | 7200                                  | 5                           | 0.10                | 500                   | 2SEPC820MY                                                                                                                          |
|                   |                                | 8.0            | 13.0 | E13       | 6100                                  | 7                           | 0.10                | 500                   | 2R5SEPC820M                                                                                                                         |
|                   | 1000                           | 8.0            | 9.0  | E9        | 6100                                  | 7                           | 0.10                | 500                   | 2SEPC1000MX                                                                                                                         |
|                   | 2700                           | 10.0           | 13.0 | F13       | 5560                                  | 10                          | 0.10                | 1350                  | 2SEPC2700M                                                                                                                          |
| 4.0               | 560                            | 6.3            | 9.0  | C9        | 5600                                  | 7                           | 0.10                | 500                   | 4SEPC560MW                                                                                                                          |
|                   |                                | 8.0            | 9.0  | E9        | 6100                                  | 7                           | 0.10                | 500                   | 4SEPC560MX                                                                                                                          |
|                   |                                | 8.0            | 13.0 | E13       | 6100                                  | 7                           | 0.10                | 500                   | 4SEPC560M                                                                                                                           |
|                   | 680                            | 8.0            | 13.0 |           | 6100                                  | 7                           | 0.10                | 544                   | 4SEPC680M                                                                                                                           |
|                   | 820                            | 10.0           | 13.0 | F13       | 6640                                  | 7                           | 0.10                | 656                   | 4SEPC820M                                                                                                                           |
| 6.3               | 220                            | 6.3            | 5.5  | C55       | 2980                                  | 18                          | 0.12                | 280                   | 6SEPC220M                                                                                                                           |
|                   | 470                            | 6.3            | 9.0  | C9        | 5600                                  | 7                           | 0.10                | 592                   | 6SEPC470MW                                                                                                                          |
|                   |                                | 8.0            | 9.0  | E9        | 5700                                  | 8                           | 0.10                | 592                   | 6SEPC470MX                                                                                                                          |
|                   |                                | 8.0            | 13.0 | E13       | 5700                                  | 8                           | 0.10                | 592                   | 6SEPC470M                                                                                                                           |
|                   | 560                            | 6.3            | 9.0  | C9        | 5600                                  | 7                           | 0.10                | 705                   | 6SEPC560MW                                                                                                                          |
|                   |                                | 8.0            | 9.0  | E9        | 6100                                  | 7                           | 0.10                | 705                   | 6SEPC560MX                                                                                                                          |
|                   | 680                            | 10.0           | 13.0 | F13       | 6640                                  | 7                           | 0.10                | 857                   | 6SEPC680M                                                                                                                           |
|                   | 1000                           | 8.0            | 7.0  | E7        | 3530                                  | 18                          | 0.10                | 1260                  | 6SEPC1000MD                                                                                                                         |
| 10                | 1500                           | 10.0           | 13.0 | F13       | 5560                                  | 10                          | 0.10                | 1890                  | 6SEPC1500M                                                                                                                          |
|                   | 270                            | 8.0            | 7.0  | E7        | 3220                                  | 22                          | 0.12                | 500                   | 10SEPC270MD                                                                                                                         |
| 16                | 100                            | 6.3            | 6.0  | C6        | 2490                                  | 24                          | 0.10                | 320                   | 16SEPC100M                                                                                                                          |
|                   |                                | 6.3            | 9.0  | C9        | 4680                                  | 10                          | 0.10                | 500                   | 16SEPC100MW                                                                                                                         |
|                   | 150                            | 8.0            | 7.0  | E7        | 3220                                  | 22                          | 0.12                | 500                   | 16SEPC150MD                                                                                                                         |
|                   | 180                            | 8.0            | 9.0  | E9        | 5000                                  | 10                          | 0.10                | 576                   | 16SEPC180MX                                                                                                                         |
|                   |                                | 8.0            | 12.0 | E12       | 4360                                  | 16                          | 0.10                | 576                   | 16SEPC180M                                                                                                                          |
|                   | 220                            | 8.0            | 7.0  | E7        | 4150                                  | 13                          | 0.10                | 500                   | 16SEPC220MD                                                                                                                         |
|                   | 270                            | 8.0            | 9.0  | E9        | 5000                                  | 10                          | 0.10                | 864                   | 16SEPC270MX                                                                                                                         |
|                   |                                | 8.0            | 12.0 | E12       | 5000                                  | 11                          | 0.10                | 864                   | 16SEPC270M                                                                                                                          |
|                   | 470                            | 10.0           | 13.0 | F13       | 6100                                  | 10                          | 0.10                | 1504                  | 16SEPC470M                                                                                                                          |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Flow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

# Conductive Polymer Aluminum Solid Capacitors Radial Lead Type SEQP series



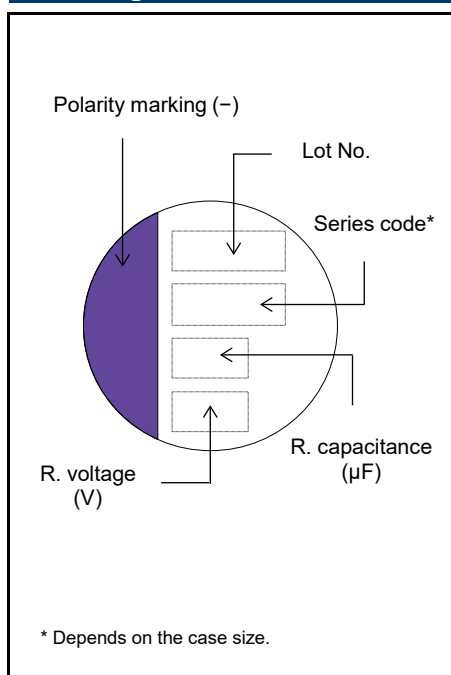
## Features

- High voltage (32 V max.)
- 125 °C 1000 h
- RoHS compliance, Halogen free

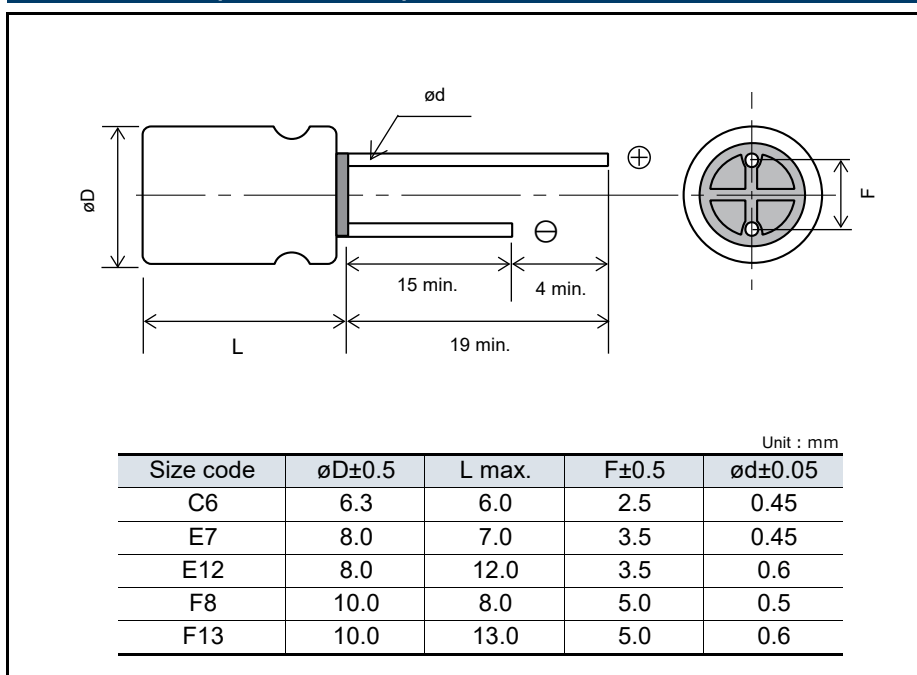
## Specifications

| Size code                   | C6                                                     | E7                                                  | E12             | F8              | F13               |
|-----------------------------|--------------------------------------------------------|-----------------------------------------------------|-----------------|-----------------|-------------------|
| Category temp. range        | -55 °C to +125 °C                                      |                                                     |                 |                 |                   |
| Rated voltage range         | 4.0 V to 20 V                                          | 4.0 V to 32 V                                       |                 |                 | 4.0 V to 20 V     |
| Nominal cap.range           | 22 µF to 150 µF                                        | 6.8 µF to 330 µF                                    | 18 µF to 560 µF | 15 µF to 680 µF | 150 µF to 1200 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                                |                                                     |                 |                 |                   |
| DC leakage current          | Please see the attached characteristics list           |                                                     |                 |                 |                   |
| Dissipation factor (tan δ)  | Please see the attached characteristics list           |                                                     |                 |                 |                   |
| Endurance                   | +125 °C 1000 h / +105 °C 5000 h, rated voltage applied |                                                     |                 |                 |                   |
|                             | Capacitance change                                     | Within ±20 % of the initial value                   |                 |                 |                   |
|                             | Dissipation factor (tanδ)                              | ≤ 200 % of the initial limit                        |                 |                 |                   |
|                             | DC leakage current                                     | Within the initial limit                            |                 |                 |                   |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage    |                                                     |                 |                 |                   |
|                             | Capacitance change                                     | Within ±20 % of the initial value                   |                 |                 |                   |
|                             | Dissipation factor (tanδ)                              | ≤ 150 % of the initial limit                        |                 |                 |                   |
|                             | DC leakage current                                     | Within the initial limit (after voltage processing) |                 |                 |                   |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage<br>(V) | Rated capacitance<br>( $\pm 20\%$ )<br>( $\mu\text{F}$ ) | Case size<br>(mm) |      | Size code | Specifications                           |                                                    |                                        |                             |                                       | Part number<br><br><small><a href="#">Click here for part number list of lead terminal cutting and lead terminal taping</a></small> |
|----------------------|----------------------------------------------------------|-------------------|------|-----------|------------------------------------------|----------------------------------------------------|----------------------------------------|-----------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                                          | $\varnothing D$   | L    |           | Ripple current <sup>*1</sup><br>(mA rms) | Allowable ripple current <sup>*1</sup><br>(mA rms) | ESR <sup>*2</sup><br>(m $\Omega$ max.) | $\tan \delta$ <sup>*3</sup> | LC <sup>*4</sup><br>( $\mu\text{A}$ ) |                                                                                                                                     |
| 4.0                  | 150                                                      | 6.3               | 6.0  | C6        | 572                                      | 1810                                               | 40                                     | 0.12                        | 300                                   | 4SEQP150M                                                                                                                           |
|                      | 330                                                      | 8.0               | 7.0  | E7        | 810                                      | 2560                                               | 35                                     | 0.12                        | 660                                   | 4SEQP330M                                                                                                                           |
|                      | 560                                                      | 8.0               | 12.0 | E12       | 1430                                     | 4520                                               | 13                                     | 0.15                        | 448                                   | 4SEQP560M                                                                                                                           |
|                      | 680                                                      | 10.0              | 8.0  | F8        | 1170                                     | 3700                                               | 25                                     | 0.12                        | 544                                   | 4SEQP680M                                                                                                                           |
|                      | 1200                                                     | 10.0              | 13.0 | F13       | 1721                                     | 5440                                               | 12                                     | 0.18                        | 960                                   | 4SEQP1200M                                                                                                                          |
| 6.3                  | 82                                                       | 6.3               | 6.0  | C6        | 537                                      | 1700                                               | 45                                     | 0.12                        | 258                                   | 6SEQP82M                                                                                                                            |
|                      | 150                                                      | 8.0               | 7.0  | E7        | 810                                      | 2560                                               | 35                                     | 0.12                        | 472                                   | 6SEQP150M                                                                                                                           |
|                      | 330                                                      | 10.0              | 8.0  | F8        | 1170                                     | 3700                                               | 25                                     | 0.12                        | 416                                   | 6SEQP330M                                                                                                                           |
|                      | 470                                                      | 8.0               | 12.0 | E12       | 1332                                     | 4210                                               | 15                                     | 0.15                        | 592                                   | 6SEQP470M                                                                                                                           |
|                      | 820                                                      | 10.0              | 13.0 | F13       | 1721                                     | 5440                                               | 12                                     | 0.15                        | 775                                   | 6SEQP820M                                                                                                                           |
| 10                   | 56                                                       | 6.3               | 6.0  | C6        | 537                                      | 1700                                               | 45                                     | 0.12                        | 280                                   | 10SEQP56M                                                                                                                           |
|                      | 120                                                      | 8.0               | 7.0  | E7        | 810                                      | 2560                                               | 35                                     | 0.12                        | 600                                   | 10SEQP120M                                                                                                                          |
|                      | 270                                                      | 10.0              | 8.0  | F8        | 1170                                     | 3700                                               | 25                                     | 0.12                        | 540                                   | 10SEQP270M                                                                                                                          |
|                      | 330                                                      | 8.0               | 12.0 | E12       | 1250                                     | 3950                                               | 17                                     | 0.15                        | 660                                   | 10SEQP330M                                                                                                                          |
|                      | 560                                                      | 10.0              | 13.0 | F13       | 1655                                     | 5230                                               | 13                                     | 0.15                        | 840                                   | 10SEQP560M                                                                                                                          |
| 16                   | 39                                                       | 6.3               | 6.0  | C6        | 512                                      | 1620                                               | 50                                     | 0.10                        | 312                                   | 16SEQP39M                                                                                                                           |
|                      | 82                                                       | 8.0               | 7.0  | E7        | 670                                      | 2120                                               | 40                                     | 0.12                        | 656                                   | 16SEQP82M                                                                                                                           |
|                      | 150                                                      | 10.0              | 8.0  | F8        | 955                                      | 3020                                               | 30                                     | 0.12                        | 480                                   | 16SEQP150M                                                                                                                          |
|                      | 180                                                      | 8.0               | 12.0 | E12       | 1151                                     | 3640                                               | 20                                     | 0.15                        | 576                                   | 16SEQP180M                                                                                                                          |
|                      | 330                                                      | 10.0              | 13.0 | F13       | 1493                                     | 4720                                               | 16                                     | 0.15                        | 792                                   | 16SEQP330M                                                                                                                          |
| 20                   | 22                                                       | 6.3               | 6.0  | C6        | 458                                      | 1450                                               | 60                                     | 0.10                        | 220                                   | 20SEQP22M                                                                                                                           |
|                      | 47                                                       | 8.0               | 7.0  | E7        | 598                                      | 1890                                               | 45                                     | 0.12                        | 470                                   | 20SEQP47M                                                                                                                           |
|                      | 68                                                       | 10.0              | 8.0  | F8        | 759                                      | 2400                                               | 40                                     | 0.12                        | 272                                   | 20SEQP68M                                                                                                                           |
|                      | 100                                                      | 8.0               | 12.0 | E12       | 1050                                     | 3320                                               | 24                                     | 0.15                        | 400                                   | 20SEQP100M                                                                                                                          |
|                      | 150                                                      | 10.0              | 13.0 | F13       | 1367                                     | 4320                                               | 20                                     | 0.15                        | 600                                   | 20SEQP150M                                                                                                                          |
| 32                   | 6.8                                                      | 8.0               | 7.0  | E7        | 440                                      | 1400                                               | 100                                    | 0.10                        | 44                                    | 32SEQP6R8M                                                                                                                          |
|                      | 15                                                       | 10.0              | 8.0  | F8        | 560                                      | 1800                                               | 80                                     | 0.10                        | 96                                    | 32SEQP15M                                                                                                                           |
|                      | 18                                                       | 8.0               | 12.0 | E12       | 790                                      | 2500                                               | 50                                     | 0.12                        | 115                                   | 32SEQP18M                                                                                                                           |

\*1: Ripple current (100 kHz /  $+105^\circ\text{C} < T_x \leq +125^\circ\text{C}$ ) / Allowable ripple current (100 kHz /  $T_x \leq +105^\circ\text{C}$ )

\*2: ESR (100 kHz to 300 kHz /  $+20^\circ\text{C}$ )

\*3:  $\tan \delta$  (120 Hz /  $+20^\circ\text{C}$ )

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Flow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | $120\text{ Hz} \leq f < 1\text{ kHz}$ | $1\text{ kHz} \leq f < 10\text{ kHz}$ | $10\text{ kHz} \leq f < 100\text{ kHz}$ | $100\text{ kHz} \leq f < 500\text{ kHz}$ |
|--------------|---------------------------------------|---------------------------------------|-----------------------------------------|------------------------------------------|
| Coefficient  | 0.05                                  | 0.3                                   | 0.7                                     | 1                                        |

# Conductive Polymer Aluminum Solid Capacitors Radial Lead Type SEP series



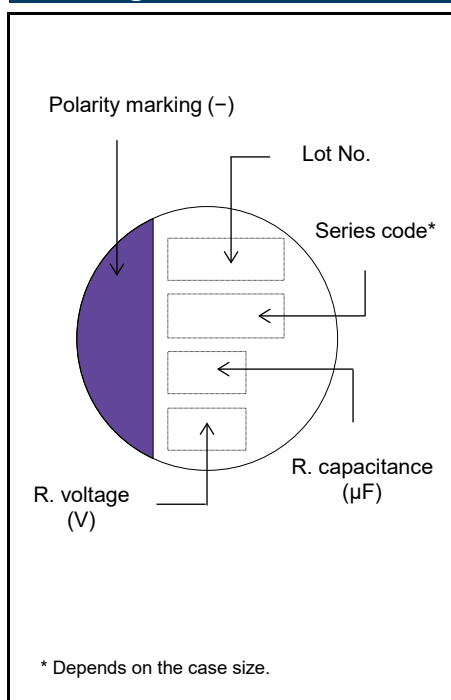
## Features

- Standard
- 105 °C 3000 h
- RoHS compliance, Halogen free

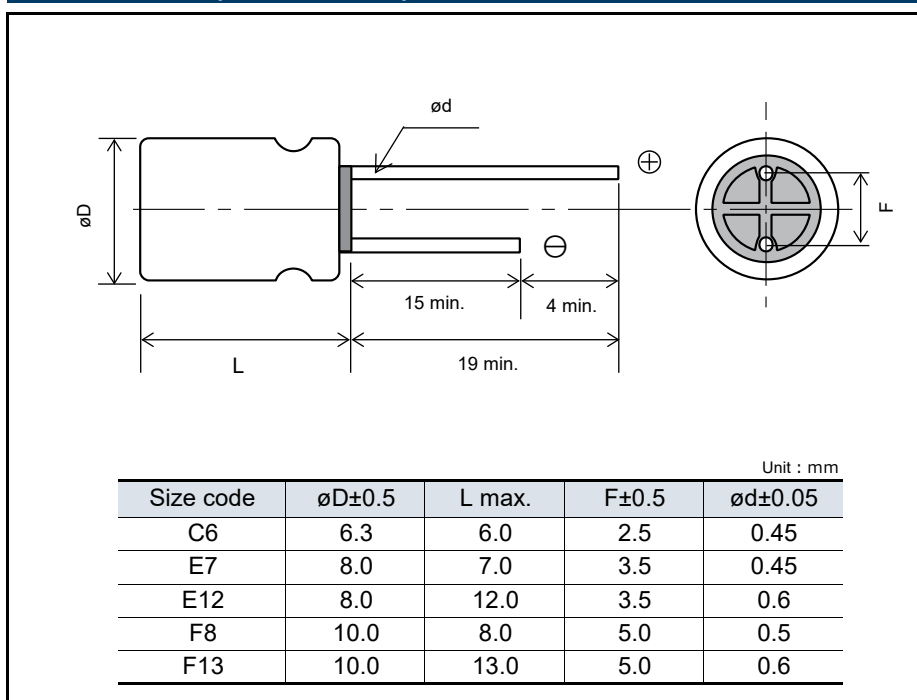
## Specifications

| Size code                   | C6                                                              | E7              | E12                                                 | F8              | F13               |
|-----------------------------|-----------------------------------------------------------------|-----------------|-----------------------------------------------------|-----------------|-------------------|
| Category temp. range        | -55 °C to +105 °C                                               |                 |                                                     |                 |                   |
| Rated voltage range         | 4.0 V to 20 V                                                   |                 | 2.5 V to 20 V                                       | 4.0 V to 20 V   | 2.5 V to 20 V     |
| Nominal cap.range           | 22 µF to 150 µF                                                 | 33 µF to 330 µF | 100 µF to 680 µF                                    | 56 µF to 680 µF | 150 µF to 1500 µF |
| Capacitance tolerance       | ±20 % (120 Hz / +20 °C)                                         |                 |                                                     |                 |                   |
| DC leakage current          | Please see the attached characteristics list                    |                 |                                                     |                 |                   |
| Dissipation factor (tan δ)  | Please see the attached characteristics list                    |                 |                                                     |                 |                   |
| Endurance                   | +105 °C 3000 h, rated voltage applied (2.5 V products : 2000 h) |                 |                                                     |                 |                   |
|                             | Capacitance change                                              |                 | Within ±20 % of the initial value                   |                 |                   |
|                             | Dissipation factor (tanδ)                                       |                 | ≤ 150 % of the initial limit                        |                 |                   |
|                             | DC leakage current                                              |                 | Within the initial limit                            |                 |                   |
| Damp heat<br>(Steady state) | +60 °C, 90 % to 95 % RH, 1000 h, No-applied voltage             |                 |                                                     |                 |                   |
|                             | Capacitance change                                              |                 | Within ±20 % of the initial value                   |                 |                   |
|                             | Dissipation factor (tanδ)                                       |                 | ≤ 150 % of the initial limit                        |                 |                   |
|                             | DC leakage current                                              |                 | Within the initial limit (after voltage processing) |                 |                   |

## Marking



## Dimensions (not to scale)



## Characteristics list

| Rated voltage (V) | Rated capacitance (±20 %) (μF) | Case size (mm) |      | Size code | Specifications             |                  |          |            | Part number<br><a href="#">Click here for part number list of lead terminal cutting and lead terminal taping</a> |
|-------------------|--------------------------------|----------------|------|-----------|----------------------------|------------------|----------|------------|------------------------------------------------------------------------------------------------------------------|
|                   |                                | øD             | L    |           | Ripple current *1 (mA rms) | ESR *2 (mΩ max.) | tan δ *3 | LC *4 (μA) |                                                                                                                  |
| 2.5               | 680                            | 8.0            | 12.0 | E12       | 4520                       | 13               | 0.15     | 340        | 2R5SEP680M                                                                                                       |
|                   | 1500                           | 10.0           | 13.0 | F13       | 5440                       | 12               | 0.18     | 750        | 2R5SEP1500M                                                                                                      |
| 4.0               | 100                            | 6.3            | 6.0  | C6        | 1810                       | 40               | 0.12     | 200        | 4SEP100M                                                                                                         |
|                   | 150                            | 6.3            | 6.0  |           | 1810                       | 40               | 0.12     | 300        | 4SEP150M                                                                                                         |
|                   | 220                            | 8.0            | 7.0  | E7        | 2560                       | 35               | 0.12     | 440        | 4SEP220M                                                                                                         |
|                   | 330                            | 8.0            | 7.0  |           | 2560                       | 35               | 0.12     | 660        | 4SEP330M                                                                                                         |
|                   | 470                            | 10.0           | 8.0  | F8        | 3700                       | 25               | 0.12     | 376        | 4SEP470M                                                                                                         |
|                   | 560                            | 8.0            | 12.0 | E12       | 4520                       | 13               | 0.15     | 448        | 4SEP560M                                                                                                         |
|                   | 680                            | 10.0           | 8.0  | F8        | 3700                       | 25               | 0.12     | 544        | 4SEP680M                                                                                                         |
|                   | 1200                           | 10.0           | 13.0 | F13       | 5440                       | 12               | 0.18     | 960        | 4SEP1200M                                                                                                        |
| 6.3               | 82                             | 6.3            | 6.0  | C6        | 1700                       | 45               | 0.12     | 258        | 6SEP82M                                                                                                          |
|                   | 150                            | 8.0            | 7.0  | E7        | 2560                       | 35               | 0.12     | 472        | 6SEP150M                                                                                                         |
|                   | 330                            | 10.0           | 8.0  | F8        | 3700                       | 25               | 0.12     | 416        | 6SEP330M                                                                                                         |
|                   | 470                            | 8.0            | 12.0 | E12       | 4210                       | 15               | 0.15     | 592        | 6SEP470M                                                                                                         |
|                   | 820                            | 10.0           | 13.0 | F13       | 5440                       | 12               | 0.15     | 775        | 6SEP820M                                                                                                         |
| 10                | 56                             | 6.3            | 6.0  | C6        | 1700                       | 45               | 0.12     | 280        | 10SEP56M                                                                                                         |
|                   | 120                            | 8.0            | 7.0  | E7        | 2560                       | 35               | 0.12     | 600        | 10SEP120M                                                                                                        |
|                   | 270                            | 10.0           | 8.0  | F8        | 3700                       | 25               | 0.12     | 540        | 10SEP270M                                                                                                        |
|                   | 330                            | 8.0            | 12.0 | E12       | 3950                       | 17               | 0.15     | 660        | 10SEP330M                                                                                                        |
|                   | 560                            | 10.0           | 13.0 | F13       | 5230                       | 13               | 0.15     | 840        | 10SEP560M                                                                                                        |
| 16                | 39                             | 6.3            | 6.0  | C6        | 1620                       | 50               | 0.10     | 312        | 16SEP39M                                                                                                         |
|                   | 82                             | 8.0            | 7.0  | E7        | 2120                       | 40               | 0.12     | 656        | 16SEP82M                                                                                                         |
|                   | 150                            | 10.0           | 8.0  | F8        | 3020                       | 30               | 0.12     | 480        | 16SEP150M                                                                                                        |
|                   | 180                            | 8.0            | 12.0 | E12       | 3640                       | 20               | 0.15     | 576        | 16SEP180M                                                                                                        |
|                   | 330                            | 10.0           | 13.0 | F13       | 4720                       | 16               | 0.15     | 792        | 16SEP330M                                                                                                        |
| 20                | 22                             | 6.3            | 6.0  | C6        | 1450                       | 60               | 0.10     | 220        | 20SEP22M                                                                                                         |
|                   | 33                             | 8.0            | 7.0  | E7        | 1890                       | 45               | 0.12     | 330        | 20SEP33M                                                                                                         |
|                   | 47                             | 8.0            | 7.0  |           | 1890                       | 45               | 0.12     | 470        | 20SEP47M                                                                                                         |
|                   | 56                             | 10.0           | 8.0  | F8        | 2400                       | 40               | 0.12     | 224        | 20SEP56M                                                                                                         |
|                   | 68                             | 10.0           | 8.0  |           | 2400                       | 40               | 0.12     | 272        | 20SEP68M                                                                                                         |
|                   | 100                            | 10.0           | 8.0  |           | 2570                       | 35               | 0.12     | 400        | 20SEP100MX                                                                                                       |
|                   |                                | 8.0            | 12.0 |           | 3320                       | 24               | 0.15     | 400        | 20SEP100M                                                                                                        |
|                   | 150                            | 10.0           | 13.0 | F13       | 4320                       | 20               | 0.15     | 600        | 20SEP150M                                                                                                        |

\*1: Ripple current (100 kHz / +105 °C)

\*2: ESR (100 kHz to 300 kHz / +20 °C)

\*3: tan δ (120 Hz / +20 °C)

\*4: After 2 minutes

◆ Please refer to each page in this catalog for "Flow conditions" and "Taping specifications".

## Frequency correction factor for ripple current

| Frequency(f) | 120 Hz ≤ f < 1 kHz | 1 kHz ≤ f < 10 kHz | 10 kHz ≤ f < 100 kHz | 100 kHz ≤ f < 500 kHz |
|--------------|--------------------|--------------------|----------------------|-----------------------|
| Coefficient  | 0.05               | 0.3                | 0.7                  | 1                     |

## Safety Precautions

When using our products, no matter what sort of equipment they might be used for,  
be sure to confirm the applications and environmental conditions with our specifications in advance.

**Panasonic**  
INDUSTRY

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