

- Wide 2:1 input voltage range
- High efficiency up to 88%
- No-load power consumption as low as 0.09W
- I/O isolation test voltage 1.5k VDC
- Operating ambient temperature range:
-40°C to +85°C
- Meets CISPR32/EN55032 CLASS A, without extra components (except for 5VDC input)
- Input under-voltage protection, output short- circuit, over-current, over-voltage protection
- Industry standard pin-out

SDUT6-XXXXZP



RoHS 3-Year Warranty

Description

SDUT6-xyyyZP series are isolated 6W DC-DC converter products with a wide range of voltage input of 4.5-9VDC, 9-18VDC, 18-36VDC, 36-75VDC isolation voltage of 1500VDC, input under-voltage protection, output short circuit, over-current, over-voltage protection and EMI meets CISPR32/EN55032 CLASS A without external components (except for 5VDC input); these products are widely used in fields such as industrial control, electric power, instruments and communication.

Selection Guide

Certification	Part No.	Input Voltage (Vdc) Nominal (Range)	Input Voltage (Vdc) Max.	Output Voltage (Vdc)	Output Current (mA)	Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF) Max.
/	SDUT6-0505ZP	5 (4.5-9)	12	5	1200/0	76/78	1000
	SDUT6-0512ZP			12	500/0	82/84	470
	SDUT6-0515ZP			15	400/0	82/84	220
	SDUT6-0524ZP			24	250/0	82/84	100
	SDUT6-1203ZP	12 (9-18)	20	3.3	1500/0	73/75	1800
	SDUT6-1205ZP			5	1200/0	78/80	1000
	SDUT6-1212ZP			12	500/0	82/84	470
	SDUT6-1215ZP			15	400/0	83/85	220
	SDUT6-1224ZP			24	250/0	83/85	100

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/	SDUT6-2403ZP	24 (18-36)	40	3.3	1500/0	76/78	1800
	SDUT6-2405ZP			5	1200/0	80/82	1000
	SDUT6-2412ZP			12	500/0	83/85	470
	SDUT6-2415ZP			15	400/0	84/86	220
	SDUT6-2424ZP			24	250/0	84/86	100
	SDUT6-4803ZP	48 (36-75)	80	3.3	1500/0	77/79	1800
	SDUT6-4805ZP			5	1200/0	81/83	1000
	SDUT6-4812ZP			12	500/0	85/87	470
	SDUT6-4815ZP			15	400/0	86/88	220
	SDUT6-4824ZP			24	250/0	85/87	100

Notes:

Exceeding the maximum input voltage may cause permanent damage;

Efficiency is measured In nominal input voltage and rated output load;

The specified maximum capacitive load for Vo1 and Vo2 output is identical.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	5V / ±5V output	--	1539/10	1579/30	mA
		Others	--	1429/10	1464/30	
	12VDC input	3.3V output	--	550/7	566/25	
		Others	--	607/7	641/25	
	24VDC input	3.3V output	--	265/7	272/25	
		Others	--	296/7	313/25	
	48VDC input	3.3V output	--	131/7	134/25	
		Others	--	147/7	155/25	
Reflected Ripple Current	5VDC input		--	50	--	
	Others		--	20	--	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Surge Voltage (1sec. max.)	5VDC input	-0.7	--	16	VDC
	12VDC input	-0.7	--	25	
	24VDC input	-0.7	--	50	
	48VDC input	-0.7	--	100	
Start-up Voltage	5VDC input	--	--	4.5	
	12VDC input	--	--	9	
	24VDC input	--	--	18	
	48VDC input	--	--	36	
Input Under-voltage Protection	5VDC input	3	3.5	--	
	12VDC input	5.5	6.5	--	
	24VDC input	13	15	--	
	48VDC input	26	30	--	
Input Filter		Pi filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	5VDC input, 0%-100% load ①	Vo1	--	±1	±2	%
		Vo2	--	±1	±3	
	Others	Vo1	--	±1	±3	
		Vo2				
Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
		Vo2	--	±0.5	±1	
Load Regulation	5VDC input, 0%-100% load	Vo1	--	--	±1	
		Vo2	--	--	±1.5	
	other input, 5%-100% load ②	Vo1	--	±0.5	±1	
		Vo2	--	±0.5	±1.5	
Cross Regulation	Dual output, Vo1 load at 50%, Vo2 load at range of 10%-100%		--	--	±5	

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Transient Recovery Time	25% load step change, Nominal input voltage		--	300	500	μs
Transient Response Deviation		3.3V/5V/±5V output	--	±5	±8	%
		Others	--	±3	±5	
Temperature Coefficient	Full load		--	--	±0.03	%/°C
Ripple & Noise③	20MHz bandwidth, 5%-100% load		--	--	100	mVp-p
Over-voltage Protection	Input voltage range		110	--	160	%Vo
Over-current Protection			110	140	190	%Io
Short-circuit Protection			Continuous, self-recovery			

Note: ①At 0%~5% load, the Max. output voltage accuracy of ±5VDC output converter is ±5%;

②load regulation for 0%-100% load is ±5%;

③Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for ripple and noise test, please refer to *DC-DC Converter Application Notes* for specific information.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	--	--	VDC
	Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	--	--	
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	1000	--	pF
Operating Temperature	See Fig. 1	-40	--	85	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	°C
Vibration		10-150Hz, 5G, 30 Min. along X, Y and Z			
Switching Frequency *	PWM mode	--	300	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	k hours

Note: * Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

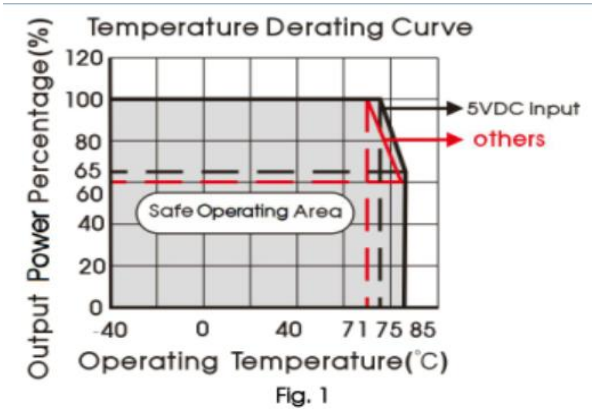
Mechanical Specifications

Case Material	Aluminum alloy
Dimensions	32.00 × 20.00 × 10.80mm
Weight	12.0g(Typ.)
Cooling Method	Free air convection

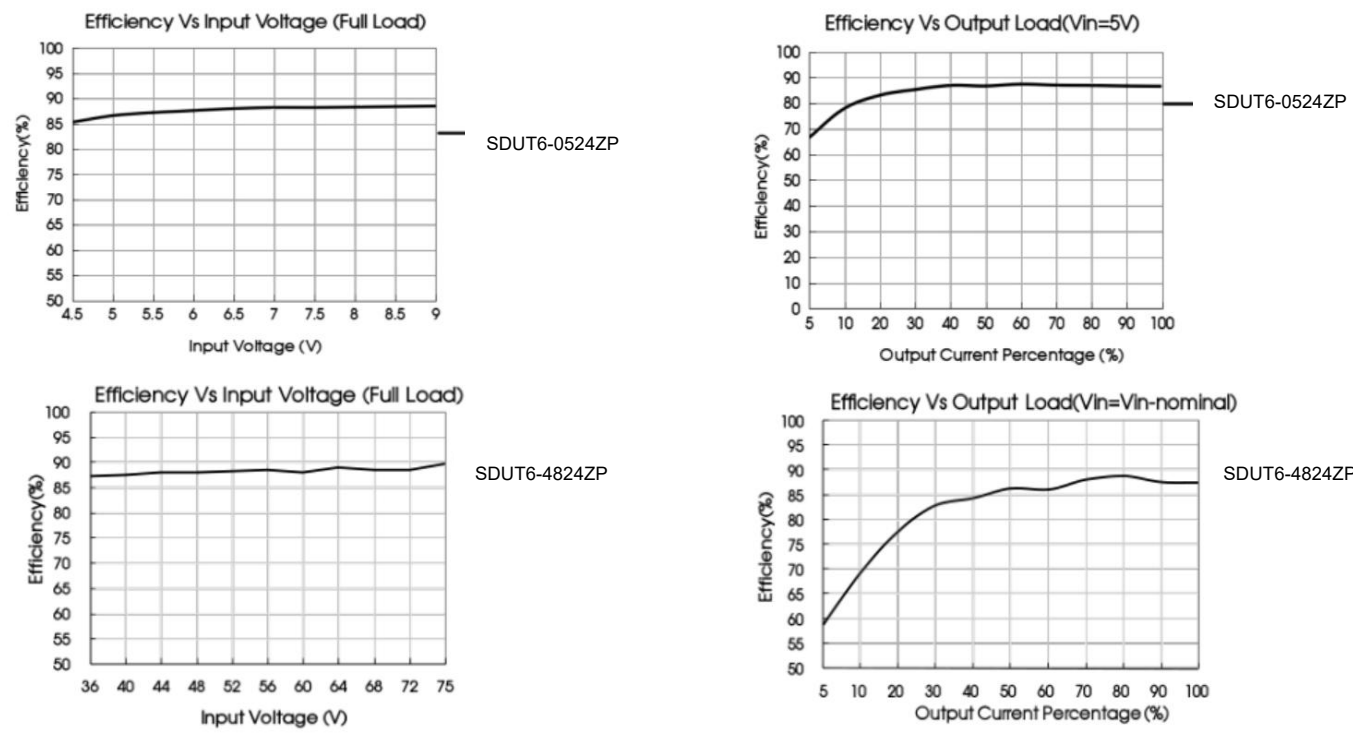
Electromagnetic Compatibility (EMC)

Emissions	CE	5VDC input	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)
		Others	CISPR32/EN55032 CLASS A (without external components)/ CLASS B (see Fig.4-② for recommended circuit)
	RE	5VDC input	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)
		Others	CISPR32/EN55032 CLASS A (without external components)/ CLASS B (see Fig.4-② for recommended circuit)
Immunity	ESD		IEC/EN61000-4-2 Contact ±4kV perf. Criteria B
	RS		IEC/EN61000-4-3 10V/m perf. Criteria A
	EFT	5VDC input	IEC/EN61000-4-4 ±2kV (see Fig.3-① for recommended circuit) perf. Criteria B
		Others	IEC/EN61000-4-4 ±2kV (see Fig.4-① for recommended circuit) perf. Criteria B
	Surge	5VDC input	IEC/EN61000-4-5 line to line ±2kV (see Fig.3-①for recommended circuit) perf. Criteria B
		Others	IEC/EN61000-4-5 line to line ±2kV (see Fig.4-①for recommended circuit) perf. Criteria B
	CS		IEC/EN61000-4-6 3 Vr.m.s perf. Criteria A

Typical Characteristic Curves



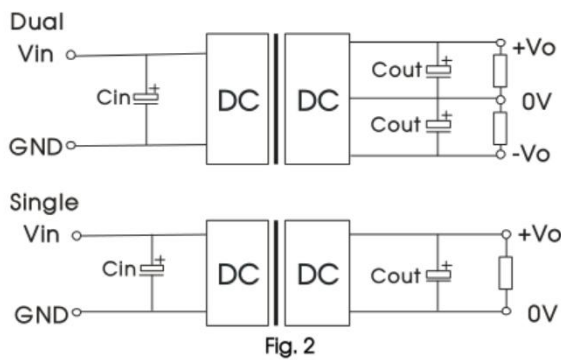
Typical Characteristic Curves



Design Reference

1. Typical application

All the DC/DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.



Vin(VDC)	Vout(VDC)	Cin	Cout
5	5/±5	100µF/16V	10µF/16V
	12/15/±12/±15		10µF/25V
	24/±24		10µF/50V
12	3.3/5/±5	100µF35V	10µF/16V
	12/15/±12/±15		10µF/25V
	24/±24		10µF/50V
24	3.3/5/±5	100µF/50V	10µF/16V
	12/15/±12/±15		10µF/25V
	24/±24		10µF/50V
48	3.3/5/±5	10µF - 47µF/100V	10µF/16V
	12/15/±12/±15		10µF/25V
	24/±24		10µF/50V

Design Reference

2. EMC compliance circuit

Parameter description:

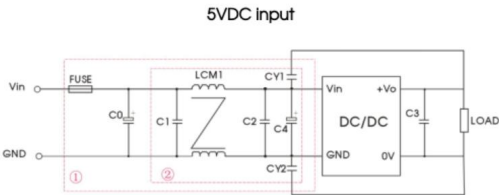


Fig. 3

Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Model	Vin: 5VDC
FUSE	Select fuse value according to actual input current
C0	2200μF/35V
C1/C2	4.7μF/50V
C3	Refer to the Cout in Fig.2
C4	100μF/35V
LCM1	2.2mH
CY1/CY2	2.2nF/2kV

Parameter description:

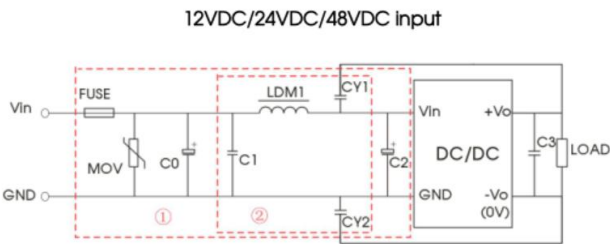


Fig. 4

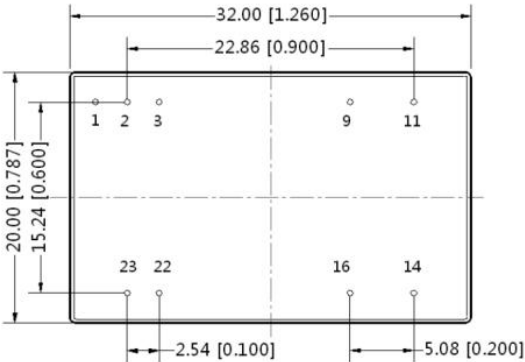
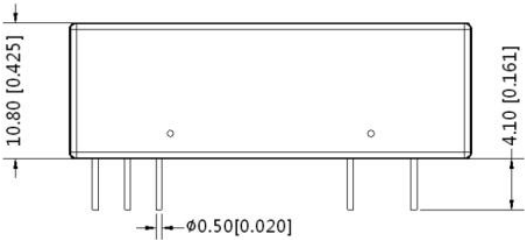
Notes: For EMC tests we use Part ① in Fig. 4 for immunity and part ② for emissions test. Selecting based on needs.

Model	Vin: 12VDC	Vin: 24VDC	Vin: 48VDC
FUSE	Select fuse value according to actual input current		
MOV	S14K20	S20K30	S14K60
C0	1000μF/35V	1000μF/50V	680μF/100V
C2	100μF/35V	100μF/50V	100μF/100V
C1	1μF/50V		1μF/100V
C3	Refer to the Cout in Fig.2		
LDM1	4.7μH		
CY1, CY2	1nF/2kV		

3. The products do not support parallel connection of their output

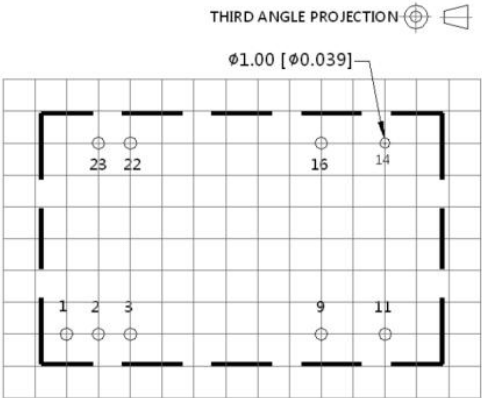
Dimensions and Recommended Layout

units: mm [inch]
tolerance: $\pm 0.50[\pm 0.020]$
pin diameter tolerance: $\pm 0.10[\pm 0.004]$



PIN CONNECTIONS		
PIN	Function	
	Single	Dual
1	CTRL	CTRL
2, 3	GND	GND
9	no pin	0V
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V
22, 23	Vin	Vin

Note: NC = no connect



Note:Grid 2.54*2.54mm
Recommended PCB Layout
Top View

- Note:
- 1. The maximum capacitive load offered were tested at input voltage range and full load;
 - 2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load;
 - 3. All index testing methods in this datasheet are based on company corporate standards;
 - 4. We can provide product customization service, please contact our technicians directly for specific information;
 - 5. Products are related to laws and regulations: see "Features" and "EMC";