

产品规格书

Product Specification for Approval

规格书编号/Ref Nr: QR202605172

客户名称或代码/Customer Name or Code:

产品名称/Product Types:单晶滴胶板/Monocrystalline Epoxy Resin Solar Panel

产品额定输出，尺寸/Product Rated Output， Size:136x110x3MM 18V/2W

普光产品代码/Solarparts Model Nr:203040053

客户产品代码/Client Model Nr:

日期/Date: 2026/5/30 版本号/Version: A0

新产品/New Offer: ☒ 材料变更/Material Change: ☐ 规格变更/Specs Change: ☐

序号 /Item	客户确认/Customer Confirmation		制造商/Manufacturer	
1	检测/TEST		制样 /SAMPLE	
2	审核 /CHECK		审核 /CHECK	
3	批准 /APPROFAL		批准 /APPROVAL	

产品规格书 Product Specification

独特外观要求/Unique appearance requirements:

上传数据以及出货检查记录/Uploading data and shipment inspection records:

产品序列号/Product serial number:

1.适用范围 SCOPE:

本产品规格书对产品的尺寸，性能，测试方法进行规范，作为技术确认的依据。

This product specifications define the size, performance, and test methods of the product as a basis for technical confirmation.

2.一般特征 General Specification:

2.1 产品应用范围 Application Range:

本产品可以在太阳能应用产品等领域使用。 This product can be used in solar applications products and other fields.

2.2 测试标准条件 Testing Conditions:

标准测试条件：光照强度为 1000W/m²，光谱为 AM1.5，电池温度 25℃；

Standard Test Condi(STC):Irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25℃

最大功率工作温度：光照强度为 800W/m²，光谱为 AM1.5，环境温度 20℃,风速：1m/s;

Normal Operating Cell Temperature(NOCT): Irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20℃, wind speed 1 m/s.

3. 电气参数和机械参数 Electrical Parameter and Mechanical Parameter

3.1 电性参数 Electrical Parameter

参数测试/parameter testing	指标/Criterion
测试环境：光照强度为 1000W/m ² ，光谱为 AM1.5，电池温度 25℃； Standard Test Condi(STC):Irradiance of 1000 W/m ² , spectrum AM 1.5 and cell temperature of 25℃	
额定功率（Pmpp）	2W（±10%）
额定电压（Vmpp）	18V（±10%）
额定电流（Impp）	111mA（±10%）
开路电压（Voc）	21.6V（±10%）
短路电流（Isc）	122.1mA（±10%）
测试环境：光照强度为 800W/m ² ，光谱为 AM1.5，环境温度 20℃,风速：1m/s; Normal Operating Cell Temperature(NOCT): Irradiance of 800 W/m ² , spectrum AM 1.5, ambient temperature 20℃, wind speed 1 m/s	
额定功率（Pmpp）	1.5W（±10%）
额定电压（Vmpp）	16.92V（±10%）
额定电流（Impp）	88.65mA（±10%）
开路电压（Voc）	20.30V（±10%）
短路电流（Isc）	97.5mA（±10%）

3.2 机械参数和包装方式 Mechanical specifications and packaging methods

电池片/Solar Cell Monocrystalline Silicon		单晶硅/Monocrystalline Silicon
电池片尺寸/Battery cell dimensions		39*7.5mm
工作温度/working temperature		-40℃~85℃
底板材料/Base material		PCB
面板材料/Panel material		环氧树脂/Epoxy resin
产品尺寸 Product dimensions	长度/Length	136mm (±0.5mm)
	宽度/Width	110mm (±0.5mm)
	厚度/Thickness	3mm (±0.5mm)
产品主要材料/Main materials used in the product		1、环氧树脂/Epoxy resin 2、PCB 3、单晶硅电池片/Monocrystalline silicon cell
输出连接方式/Output Connecting Method		背面焊盘/reverse side pad
接线盒/Junction box	是否有二极管/二极管类型 Whether there are diodes/diode types	否/no
	是否灌胶 Whether to glue it	否/no
包装信息 Packaging Information	包装方式 Packaging Method	纸箱包装 Carton packaging
	包装尺寸 Packaging Dimensions	外尺寸 658*344*70mm (20 片) External dimensions:658*344*70mm (20pcs)
	包装毛重 Packaging gross weight	2.5kg/箱 2.5kg/box

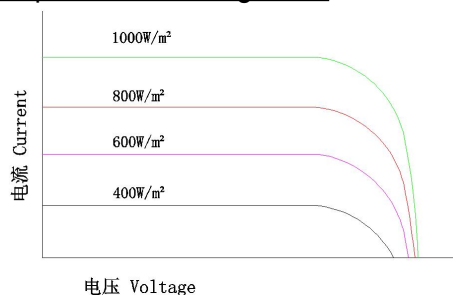
4.注意事项，使用和存放环境条件 Attention ,Using and Storage Condition

注意事项 Attention	1	本产品不能与强腐蚀性物质接触。中性硅胶可以匹配使用。 Not contact with strongly corrosive substances..Neutral silicone adhesives are not corrosive to products.
	2	使用过程中避免硬物刮伤、撞击太阳能板表面 Avoid scratching and striking the surface of the solar panel by hard objects .
	3	不能超出功率使用范围。 Can not exceed the power using range.
	4	运输和装配时不能承受弯曲力。 Can not withsand bending forces during transportation and assembly.
	5	太阳能板与电器链接市，注意接线是否为断路，正负极是否接反等现象。 Please Make sure all the connections and cable are normal. Pay attention to whether the connection is open.whether the positive and negative poles are reversed. Etc.
使用及存储 Use and storage	1	储存条件：常温，干燥通风处,-20C-+80C Storage conditions: Normal temperature, dry and ventilated place,-20C-+80C.
	2	阳光下无遮挡之户外环境使用 Use in outdoor environment without shielding under the sun.
	3	防尘防水等级：IP65 Dust and water proof grade of solar panel: IP65
	4	烙铁温度 380±10℃，焊接时间不超过 3 秒。 Soldering Iron Temp 380±10℃, not exceed 3 seconds.

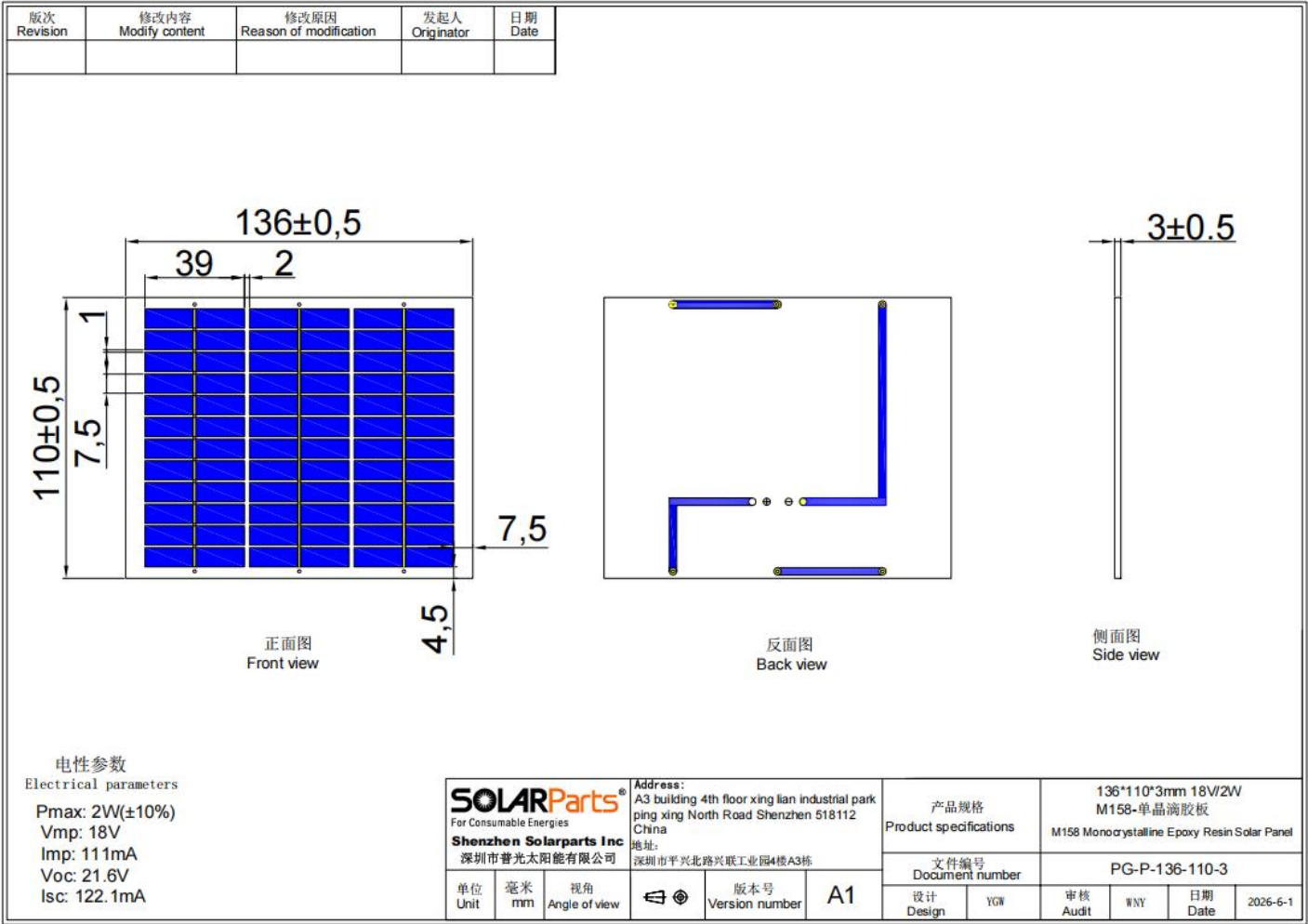
5.温度系数 Temperature Coefficient

温度系数 Temperature coefficient	1	功率温度系数 Temperature coefficient of power	$-(0.47\pm0.05)\%/^{\circ}\text{C}$
	2	电压温度系数 Temperature Coefficient of voltage	$-(0.34\pm0.01)\%/^{\circ}\text{C}$
	3	电流温度系数 Temperature Coefficient of current	$(0.045\pm0.01)\%/^{\circ}\text{C}$

光强-电性 曲线图 Intensity-Electrical performance diagram:



6.机械图纸 Mechanical diagrams:



7、质保期 Warranty period

- 1、组件质保期：1 年。
- 2、全部符合 CE、ROHS 要求。
1. Component warranty period: 1 year.
2. Fully compliant with CE and RoHS requirements.

8、太阳能电池电性能测试标准方法及使用环境 Standard Method for Electrical Performance Testing of Solar Cells and Operating Environment

- 1、太阳能电池板在层压好之后，主要对其进行工作功率测试。
- 2、太阳辐射强度:1000W/平方米 或客户签样。
- 3、温度:25℃。
- 4、湿度:10~90%。
- 5、大气质量：AM1.5。
- 6、使用电子负载仪 CV 模式带载测试时的功率值。
1. Following lamination, solar panels undergo primary operational power testing.
2. Solar radiation intensity: 1000 W/m² or as per customer-approved samples.
3. Temperature: 25°C.
4. Humidity: 10–90%.
5. Atmospheric quality: AM1.5.
6. Power values measured during load testing using an electronic load tester in CV mode.

9、工作功率测试 Working Power Test

- 1、将光强调至客户签样调光
- 2、使用电子负载仪，带线测试
- 3、每 2 小时校正一次光强
1. Adjust lighting to match the client's approved sample
2. Conduct wiring tests using an electronic load tester
3. Calibrate light intensity every two hours

10、使用及存放环境条件 Operating and Storage Environmental Conditions

- 1、储存条件：-20-80℃，湿度≤90%；
 - 2、阳光下无遮挡之户外环境使用；
 - 3、工作环境温度：-40℃~85℃；
 - 4、使用烙铁温度：380±10℃；
 - 5、点焊接时间不超过 3 秒，且多次点焊接间隔时间不低于 30 秒；
 - 6、防水等级：IP65
 1. Storage conditions: -20-80℃, humidity ≤90%;
 2. Use in unshaded outdoor environments under direct sunlight;
 3. Operating ambient temperature: -40°C to 85°C;
 4. Soldering iron temperature: 380±10°C;
-

5. Spot welding duration shall not exceed 3 seconds, with a minimum interval of 30 seconds between multiple spot welds;

6. Waterproof rating: IP65

11、外观检验要求 Visual Inspection Requirements

目视检查条件：光照度在 500Lux 的近似自然光下，视距 500mm，相距观测时间 5 秒内不能发现明显缺陷视为合格，可接收无感划伤。

检查者位于被检查表面的正面、视线与被检表面呈 45-90°进行正常检验。要求检验者的校正视力不低于 1.2。不能使用放大镜用于外观检验。

代码说明：L:长度 W: 宽度 H:高度 D:距离 N:数量 ⊙:直径

1、同一产品，在室内灯光下无明显色差；

2、硅片排列整齐；

3、硅片崩边、缺角：L≤1.5mm

W≤0.5mm N≤2；

4、硅片表面污点：⊙≤1.5mm

N ≤ 2；

5、划痕：L ≤ 10mm N≤2；

6、无明显亮点:W ≤ 1.5mm N ≤ 3；

7、电池片间隙脏污，斑点面积：⊙≤1mm N ≤ 2；

8、胶内锡渣、气泡、杂异物：⊙≤ 1mm

N ≤ 2；

9、组装后间隙≤0.8、断差≤0.3；

以上标准如有争议，以双方确认的限度样为准。

Visual inspection conditions: Under near-natural light with an illuminance of 500 lux, at a viewing distance of 500 mm, no obvious defects detectable within a 5-second observation period shall be deemed acceptable. Imperceptible scratches may be accepted.

The inspector shall position themselves directly facing the surface to be inspected, maintaining a viewing angle of 45-90° relative to the surface during standard examination. The inspector's corrected visual acuity must not be less than 1.2. Magnifying glasses shall not be used for visual inspection.

Code Explanation: L: Length W: Width H: Height D: Distance N: Number ⊙: Diameter

1. No noticeable colour variation under indoor lighting for identical products;

2. Silicon wafers must be neatly arranged;

3. Wafer chipping or corner loss: L ≤ 1.5mm

W ≤ 0.5mm N ≤ 2;

4. Surface blemishes: ⊙ ≤ 1.5mm

N ≤ 2;

5. Scratches: L ≤ 10mm N ≤ 2;

6. No conspicuous bright spots: W ≤ 1.5mm N ≤ 3;

7. Contamination in cell gaps, spot area: ⊙ ≤ 1mm N ≤ 2;

8. Tin residue, bubbles, foreign matter within adhesive: ⊙ ≤ 1mm N ≤ 2;

9. Post-assembly gap ≤ 0.8mm, step difference ≤ 0.3mm;

In case of dispute regarding the above standards, the limits confirmed by both parties shall prevail.

附件 ANNEX

产品描述: Product Description

这个系列是推出的单晶硅高效太阳能模块产品线，专为各类电池供电的便携式消费电子产品设计，同时也适用于工业领域，包括无线传感器、便携式仪器及应急备用电池充电。

This series product is a high-efficiency monocrystalline silicon solar module product line, designed for a wide range of battery-powered portable consumer electronics as well as industrial applications, including wireless sensors, portable instruments, and emergency backup battery charging.

核心优势: Key Advantages

- 高效率电池片，即使在弱光条件下也能延长运行时间
- 提高了电池寿命和在小空间内运行的运行时间，适应便携式产品设计。
- 支持串联和/或并联连接，以完美满足定制特定应用的功率要求。
- 具有宽光谱响应范围（300–1100 纳米），因此适用于室内外多种场景。
- 通过 RoHS 认证，符合环保标准，工作温度范围-40℃~+85℃，适应极端气候
- High-efficiency solar cells, extending runtime even in low-light conditions.
- Enhanced battery life and operation time in compact spaces, making it ideal for portable product designs.
- Supports series and/or parallel connections to perfectly meet customized power requirements for specific applications.
- Wide spectral response range (300–1100 nm), ensuring optimal performance in both indoor and outdoor scenarios.
- RoHS-certified, meeting environmental standards, with an operational temperature range of -40°C to 85°C for extreme climate adaptability.

产品特点: Product Features:

- 单晶硅技术
- 室内外高效能
- 长寿命与稳定输出
- 高机械强度
- 卓越环境适应性
- Monocrystalline silicon technology
- High efficiency for both indoor and outdoor use
- Long lifespan with stable output
- High mechanical strength
- Excellent environmental adaptability

应用场景: Application Scenarios

- 消费电子产品
-

典型应用： 移动设备的太阳能充电数码相机、便携娱乐设备、低功耗电子产品的持续供电

优势体现：小巧轻薄易集成，弱光环境下仍保持高效充电

- 工业与物联网设备

典型应用：野外无线传感器网络（温湿度/环境监测）、远程监控设备、农业物联网（土壤监测、智能灌溉系统）

优势体现：-40℃~+85℃宽温域工作，抗机械震动，适合恶劣环境

- 应急与特种领域

典型应用：应急照明设备/紧急通信装置电源、军用单兵装备的便携充电、户外探险设备的离网供电

优势体现：快速响应光照变化，23%高转换效率保障紧急供电

- 绿色能源创新应用

典型应用：太阳能充电背包/帐篷、智能穿戴设备、微型离网发电系统（露营设备）

优势体现：支持串联/并联灵活扩展，无污染材料符合环保要求

- 特殊环境解决方案

典型应用：极地科考设备供电、沙漠地区监测装置、高空无人机续航补能

优势体现：耐紫外线老化设计，在低光照/冰雪/沙尘环境下性能稳定

注：不可用于医疗植入、生命维持系统等关键领域。所有应用需确保符合产品规格书中标注的工作条件范围。

1.Consumer Electronics

- Typical Applications: Solar charging for mobile devices (digital cameras, portable entertainment devices);Continuous power supply for low-power electronics
- Key Advantages: Compact and lightweight design for easy integration, maintains efficient charging even in low-light conditions

2.Industrial and Internet of Things devices

- Typical applications: Wireless sensor networks in the wild (temperature and humidity / environmental monitoring), remote monitoring devices, agricultural Internet of Things (soil monitoring, intelligent irrigation systems)
- Key Advantages: Operates in a wide temperature range (-40°C to 85°C), resistant to mechanical vibration, suitable for harsh environments

3.Emergency and Specialized Fields

- Typical applications: Power supply for emergency lighting equipment / emergency communication devices, portable charging for military individual equipment, off-grid power supply for outdoor exploration equipment
- Key Advantages: Rapid response to light changes, 23% high conversion efficiency ensures reliable emergency power

4.Green Energy Innovations

- Typical applications: Solar charging backpack/tent, smart wearable devices, micro off-grid power generation system (camping equipment)
- Key Advantages: Supports flexible series/parallel expansion, uses pollution-free materials that meet environmental standards.

5.Special Environment Solutions

- Typical applications: Power supply for polar scientific research equipment, monitoring devices in desert areas, and energy replenishment for long-duration unmanned aircraft at high altitudes.
- Key Advantages: UV-resistant design, stable performance in low-light /snow/sand environments

Note: Not suitable for critical fields such as medical implants and life support systems. All applications must ensure compliance with the working conditions range specified in the product specification.

湿度敏感性、回流焊接及清洗说明

Humidity Sensitivity, Reflow Soldering and Cleaning Instructions

组件采用薄膜层压封装结构，具有吸湿特性。在电极焊接过程中，吸收的湿气与高温焊接相结合，可能导致组件出现湿气引起的分层和开裂问题。为避免此类情况，焊接时必须谨慎操作该组件。由于采用了 EVA 和聚合物薄膜通过层压工艺封装，禁止高温回流焊接，建议手动焊接（<260℃，≤2 秒）。若焊接时出现分层/起泡，需在 140℃ 干燥箱中预烘 1 小时。清洁仅推荐温水，化学溶剂（如 IPA）可能损伤薄膜，使用前需局部测试兼容性。

The component adopts a film laminated packaging structure and has hygroscopic properties. During electrode soldering, the absorbed moisture combines with the high-temperature soldering, which may cause problems such as moisture-induced delamination and cracking of the component. To avoid such situations, the component must be handled carefully during soldering. Due to the use of EVA and polymer films encapsulated through the laminating process, high-temperature reflow soldering is prohibited. Manual soldering (<260℃, ≤2 seconds) is recommended. If delamination/bubbling occurs during soldering, it is necessary to preheat in a 140℃ drying oven for 1 hour. Cleaning is only recommended with warm water. Chemical solvents (such as IPA) may damage the film, and compatibility should be tested locally before use.

太阳能电池类型 Types of solar cells

在比较不同太阳能电池材料时，需注意以下成本与性能的权衡：

- 多晶硅电池

主要用于户外，光谱敏感范围为 500nm 至 1100nm。价格中等，典型功率转换效率为 13%。

- 单晶硅电池

光谱敏感范围更广，覆盖 300nm（近紫外）至 1100nm（近红外），单晶硅电池可同时适用于室内外场景。材料成本最高，但因其无杂质特性，功率转换效率不会随时间衰减，商用单晶硅电池效率范围为 15%-25%。

- 非晶硅电池

工作光谱范围为 300nm 至 600nm，主要用于室内产品（如太阳能计算器）。由于对长波光谱不敏感，无法有效利用自然阳光，其功率转换效率仅约 5%，通常用于时钟、电子计算器等超低功耗设备，也存在效率衰减问题。

The following cost-performance trade-offs should be evaluated when comparing different solar cell material options.

- Polycrystalline silicon cells

Mainly used outdoors, with a spectral sensitivity range of 500nm to 1100nm. The price is moderate, and the typical power conversion efficiency is 13%.

- Monocrystalline silicon cells

They have a wider spectral sensitivity range, covering from 300nm (near ultraviolet) to 1100nm (near infrared). Monocrystalline silicon cells can be used in both indoor and outdoor scenarios. The material cost is the highest, but due to its impurity-free nature, the power conversion efficiency will not decline over time. The efficiency range of commercial monocrystalline silicon cells is 15% - 25%.

- Amorphous Silicon Battery

The working spectral range is from 300nm to 600nm. It is mainly used for indoor products (such as solar calculators). Due to its insensitivity to long-wave spectra, it cannot effectively utilize natural sunlight. Its power conversion efficiency is only about 5%, and it is usually used in ultra-low power devices such as clocks and electronic calculators. There is also a problem of efficiency decline.

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Note: All technical parameters are subject to the actual product. Consultation with professional technical personnel is recommended prior to use.
