Technical Datasheet: Custom Mini Solar Panel Series (0.1W - 20W)

Product Category: OEM/ODM Small-Wattage Solar Modules
Encapsulation Options: ETFE / PET / Epoxy Resin

1. Product Overview

Sola-E specializes in high-precision, small-scale solar solutions designed for IoT devices, environmental sensors, and portable electronics. Our mini solar panels offer industry-leading conversion efficiency and can be customized in shape, voltage, and encapsulation material to meet specific integration requirements.

2. Electrical Characteristics (Standard Test Conditions: STC 1000W/m², 25°C, AM1.5)

Parameter	Symbol	Value (Example)	Unit
Peak Power	Pmax	2.0	W
Maximum Power Voltage	Vmp	18.0	V
Maximum Power Current	Imp	400	mA
Open Circuit Voltage	Voc	21.6	V
Short Circuit Current	Isc	440	mA
Power Tolerance	-	± 3%	-
Cell Efficiency	-	19% - 23%	-

3. Mechanical Specifications

- **Dimensions:** reference or custom
- **Dimension Tolerance:** ± 0.2mm (Precision Cut), Ideal for precise plastic enclosure integration
- **Solar Cell Type:** Monocrystalline Silicon (High Efficiency)
- **Backboard Material:** PCB (FR4) / Aluminum / Fiberboard

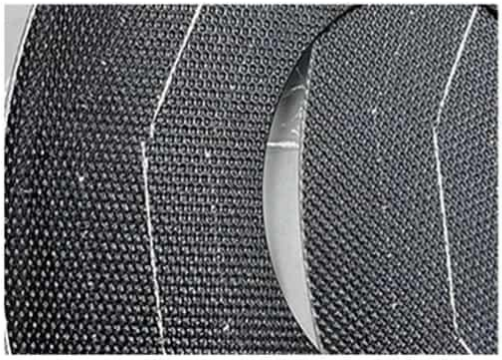
Target Power	Reference Dimensions (mm)	Matching Battery
0.5W	70 x 50 mm	1.2V Ni-MH
1.0W	70 x 90 mm	1.2V Ni-MH
2.0W	90 x 160 mm	3.2V LiFePO4
3.0W	100 x 160 mm	3.7V Li-ion / 3.2V LFP
5.0W	160 x 180 mm	3.7V Li-ion / 6V Lead Acid

6.0W	160 x 225 mm	3.7V Li-ion
10W	160 x 385 mm	6V Lead Acid / 3.2V LFP
18W	320 x 360 mm	12V Lead Acid

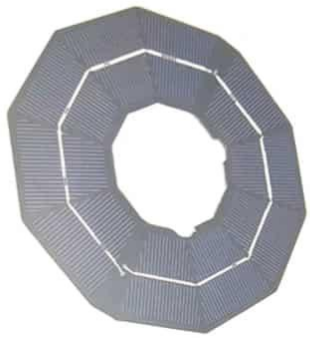
4. Encapsulation Comparison Table

Feature	ETFE	PET	Epoxy Resin
Durability	High (5-8 years)	Medium (2-3 years)	Standard (1-2 years)
Light Transmittance	95% (Matte/Self-cleaning)	91% (Glossy)	90% (Clear)
Application	Marine/Outdoor IoT	Consumer Electronics	Indoor/Gift Items
Resistance	UV & Salt Spray	Standard	Impact Resistant

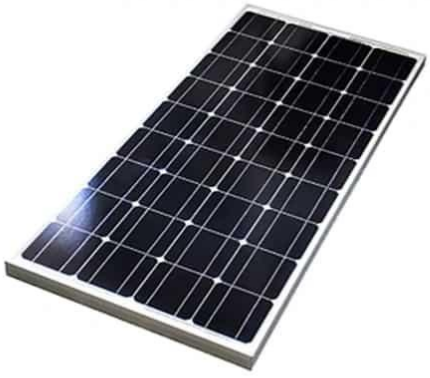
Different Solar Panels With The Features And Pictures



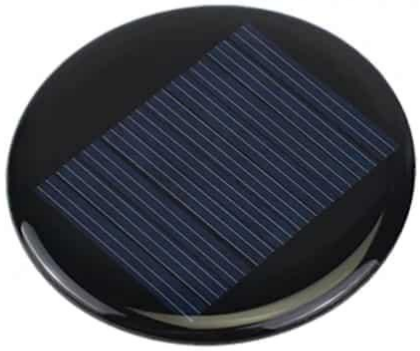
ETFE Lamination Solar Panel	
Features:	Glossy Finish, Better Anti-Scratching
	Thin, High Hardness, More Flexible
	Non-flammable, Longer Durability
Applicable for:	Small to Large Power Ranges (1W to 100W)



PET Lamination Solar Panel	
Features:	Matte Finish, Less Anti-Scratching
	Thin, Lower Hardness, Less Flexible
	Flammable, Shorter Durability
Applicable for:	Small to Large Power Ranges (1W to 100W)



Glass Lamination Solar Panel	
Features:	Sturdy Finish, Heavy Weight, Thicker
	High Hardness with Aluminum Frame;
	Non-flexible, Long Durability
Applicable for:	Mainly Large Power Ranges (3W~600W)



Epoxy Solar Panel	
Features:	Thicker than ETFE/PET lamination
	Low Hardness, Non-flexible
	Cheap ones get aged easily
Applicable for:	Mainly Small Power Ranges (0.1W~10W)

5. Customization Capabilities (OEM/ODM)

As a dedicated **small solar panel factory**, Sola-E provides full design support for:

- **Custom Shapes:** Circular, triangular, or irregular geometric cuts.
- **Soldering Points:** Customized position for wires or SMD pins.
- **Output Ports:** Integration with DC connectors, USB-C, or JST headers.
- **Branding:** Laser-engraved logo on the backboard or front film.

6. Quality Control & Certifications

- 100% EL (Electroluminescence) Testing for micro-crack detection.
- Visual Inspection for bubble-free encapsulation.
- Compliant with **CE, RoHS, and ISO 9001:2015** standards.

How to Customize Your Panel (4 Steps)

Step 1: Confirm Battery Voltage (Crucial)

The solar panel voltage must be sufficiently higher than your battery's voltage to charge it effectively.

Engineering Rule: Solar Vmp ≈ 1.5 x Battery Voltage.

Quick Match Table (Based on your datasheet):

Battery Type	Nominal Voltage	Recommended Solar Panel Vmp
Ni-MH/ Ni-CD	1.2V	2.0V - 2.5V
LiFePO4	3.2V	5.0V - 5.5V
Li-ion/ Polymer	3.7V	5.5V - 6.0V
Lead Acid	6V / 12V	9V / 18V

Step 2: Dimension & Shape

We maximize the active area on your device housing.

- **Standard Shapes:** Square / Rectangular (Most cost-effective, highest efficiency).
- **Custom Shapes:** Round, Triangle, or Arc shapes are available via precision laser cutting.

Step 3: Material & Structure

- **Solar Cells:** Choose **Monocrystalline (21%+ eff)** for the best performance in small sizes

- **Backboard Structure:** We highly recommend **FR4(**Fiberglass - Flame Retardant**)**
- Unlike paper or cardboard, FR4 is rigid, strong, and waterproof, making it safe to solder and easy to mount

Step 4: Quantity & Prototyping

- **MOQ:** We support flexible MOQs for mass production.
- **Samples: Sample Orders** are available for prototyping and validation testing.

Need a Custom Design Proposal?

Our engineering team is ready to help you integrate solar power into your next IoT project. We provide **CAD/3D design support** for all OEM clients.

Get a Custom Design Proposal:

Email: sam.zou@sola-e.us

Live Chat: Chat on WhatsApp

Website: https://sola-e.us/contact-us/