

## Monocrystalline Solar Module

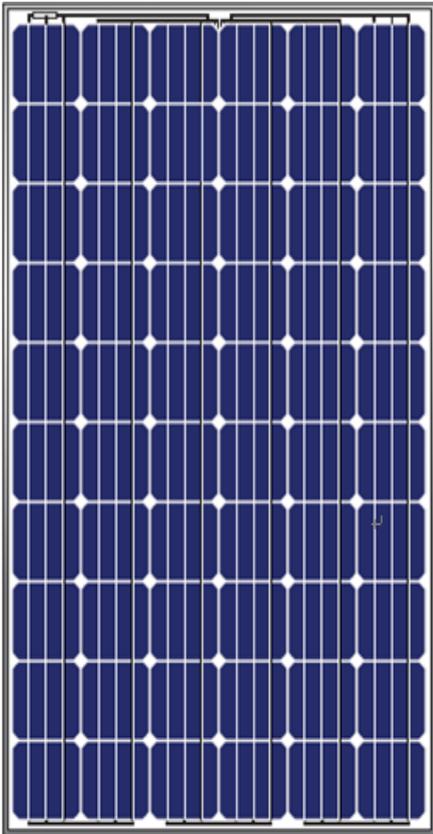
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### Product Overview

USP Module delivers the performance and efficiency required for large power output applications.

Featuring a smooth, all-blue surface and a tight  $\pm 3\%$  power tolerance.

Provides an aesthetically attractive and efficient option for residential, commercial, and utility installations.



### Technical Features

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- 5 year product warranty, 25 year performance warranty\*
- Module certified to withstand high snow loads, up to 5.4kN/m<sup>2</sup>\*\*
- Tight power tolerance:  $\pm 3\%$ , anti-reflective coating
- Free module recycling through membership in PV Cycle

### Warranty

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5-year limited product warranty

Limited performance warranty: 10 years at 90% of the minimal rated power output, 25 years at 80% of the minimal rated power out

### About USP

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USP is a vertically integrated manufacturer of photovoltaic modules designed to meet the demands of the global energy consumer. From high-grade crystalline silicon, to module production, to project development and financing, USP is setting the new standard in innovation and value.

- High reliability, guaranteed quality, and excellent cost-efficiency due to vertically integrated production and control of the supply chain;
- Optimization of product performance and manufacturing processes through a strong commitment to research and development;
- Global presence throughout Europe, North America, and Asia, offering regional technical and sales support.

## Electrical Characterist

### Electrical Characteristics At Standard Test Conditions (STC)

Maximum Power (P <sub>max</sub> )	230W	235W	240W	245W	250W	255W
Open Circuit Voltage (V <sub>oc</sub> )	36.93V	37.19V	37.49V	37.74V	37.92V	38.10V
Short Circuit Current (I <sub>sc</sub> )	8.44A	8.49A	8.54A	8.58A	8.62A	8.66A
Voltage At Maximum Power (V <sub>mp</sub> )	30.16V	30.36V	30.56V	30.76V	30.96V	31.16V
Current At Maximum Power (I <sub>mp</sub> )	7.63A	7.74A	7.86A	7.96A	8.08A	8.19A
Module Efficiency (%)	14.17	14.47	14.78	15.09	15.40	15.70

P<sub>max</sub>, V<sub>oc</sub>, I<sub>sc</sub>, V<sub>mp</sub>, and I<sub>mp</sub> tested at STC defined as irradiance of 1000W/m<sup>2</sup> at AM 1.5G solar spectrum and temperature 25 ±2°C. Power tolerance of ±3% refers to measured performance.

### Electrical Characteristics At Normal Operating Cell Temperature (NOCT)

Maximum Power (P <sub>max</sub> )	169W	172W	175W	178W	182W	185W
Open Circuit Voltage (V <sub>oc</sub> )	34.35V	34.41V	34.52V	34.61V	34.73V	34.85V
Short Circuit Current (I <sub>sc</sub> )	6.88A	6.97A	7.04A	7.12A	7.21A	7.28A
Voltage At Maximum Power (V <sub>mp</sub> )	27.42V	27.51V	27.62V	27.76V	27.97V	28.14V
Current At Maximum Power (I <sub>mp</sub> )	6.17A	6.26A	6.34A	6.42A	6.51A	6.58A
Module Efficiency (%)	10.41	10.59	10.78	10.96	11.21	11.40

P<sub>max</sub>, V<sub>oc</sub>, I<sub>sc</sub>, V<sub>mp</sub>, and I<sub>mp</sub> tested at NOCT defined as irradiance of 800W/m<sup>2</sup>; wind speed 1m/s. Power tolerance of ±3% refers to measured performance.

### Temperature Characteristics

Normal Operating Cell Temperature (NOCT)	45 ±3°C
Temperature Coefficients OFP	-0.45%/°C
Temperature Coefficients OFV	-0.32%/°C
Temperature Coefficients OFI	-0.04%/°C

### Maximum Ratings

Maximum System Voltage	1000V (IEC); 600V (UL)
Series Fuse Rating	10A
Maximum Reverse Current	Series Fuse Rating Multiplied By 1.35

### Mechanical Characteristics

Dimensions	1640mm x 990mm x 40mm
Weight	20kg
Frame	Aluminum alloy
Front	Tempered glass
Encapsulant	EVA
Back Cover	Composite sheet
Cell Technology	Monocrystalline
Cell Size	156mm x 156mm
Number of Cells (Pieces)	60 (6 x 10)
Junction Box	Protection class IP65 with bypass-diode
Output Cables	Solar cable: 4mm <sup>2</sup> ; length 900mm

### Packaging and Storage

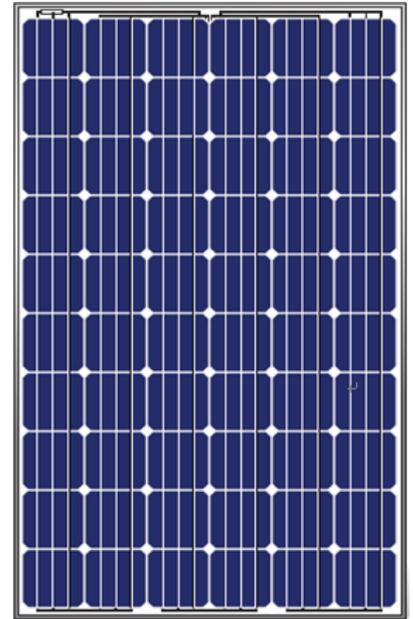
#### System Design

Operating Temperature	-40°C to 85°C	Storage Temperature	-40°C to 85°C
Hail safety Impact Velocity	25mm at 23m/s	Packaging Configuration	25 pcs per pallet
Fire Safety Classification	Class C	Loading Capacity	
Static Load Wind/snow	5.4kN/m <sup>2</sup>	(40 FT. Container)	700 pieces

### Performance At Low Irradiance:

The typical relative change in module efficiency at an irradiance of 200W/m<sup>2</sup> in relation to 1000W/m<sup>2</sup> (both at 25°C and AM 1.5G spectrum) is less than 5%.

### Various Irradiance Levels



### Basic Design

