

## Five Key Features

- 1 Guaranteed quality: 12 year product warranty, 25 year linear performance warranty \*
- 2 Predictable output: Positive power sorting of 0 to + 5 W
- 3 Innovation solutions: UL certified up to 1000V for optimized system designs
- 4 Robust design: Module certified to withstand high snow loads, up to 5400 Pa \*\*
- 5 Tariff free: High performance Taiwan cells

\* Please refer to Hanwha Solar Product Warranty for details.

\*\* Please refer to Hanwha Solar module Installation Guide.

## Quality and Environmental Certificates

- ISO 9001 quality standards and ISO 14001 environmental standards
- OHSAS 18001 occupational health and safety standards
- UL 1703 600V and 1000V certification
- CEC listed



## About Hanwha Solar

Hanwha Solar is a vertically integrated manufacturer of photovoltaic modules designed to meet the needs of the global energy consumer.

- 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 Characteristics

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

Power Class	235 W	240 W	245 W	250 W	255 W
Maximum Power ( $P_{max}$ )	235 W	240 W	245 W	250 W	255 W
Open Circuit Voltage ( $V_{oc}$ )	36.8 V	37.1 V	37.2 V	37.4 V	37.5 V
Short Circuit Current ( $I_{sc}$ )	8.65 A	8.75 A	8.8 A	8.89 A	8.95 A
Voltage at Maximum Power ( $V_{mpp}$ )	29.1 V	29.5 V	29.7 V	30 V	30.1 V
Current at Maximum Power ( $I_{mpp}$ )	8.05 A	8.13 A	8.25 A	8.33 A	8.47 A
Module Efficiency (%)	14.2 %	14.5 %	14.8 %	15.1 %	15.4 %

$P_{max}$ ,  $V_{oc}$ ,  $I_{sc}$ ,  $V_{mpp}$  and  $I_{mpp}$  tested at STC defined as irradiance of 1000 W/m<sup>2</sup> at AM 1.5 solar spectrum and temperature 25 ± 2 °C.  
Electrical Characteristics: measurement tolerance of ± 3 %.

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

Power Class	235 W	240 W	245 W	250 W	255 W
Maximum Power ( $P_{max}$ )	176 W	180 W	184 W	188 W	192 W
Open Circuit Voltage ( $V_{oc}$ )	34.3 V	34.6 V	34.7 V	34.9 V	35.0 V
Short Circuit Current ( $I_{sc}$ )	7.00 A	7.08 A	7.12 A	7.19 A	7.24 A
Voltage at Maximum Power ( $V_{mpp}$ )	27.1 V	27.5 V	27.7 V	28.0 V	28.1 V
Current at Maximum Power ( $I_{mpp}$ )	6.51 A	6.58 A	6.67 A	6.74 A	6.85 A
Module Efficiency (%)	14.2 %	14.5 %	14.8 %	15.1 %	15.4 %

$P_{max}$ ,  $V_{oc}$ ,  $I_{sc}$ ,  $V_{mpp}$  and  $I_{mpp}$  tested at NOCT defined as irradiance of 800 W/m<sup>2</sup>; wind speed 1 m/s.  
Electrical Characteristics: measurement tolerance of ± 3 %.

### Temperature Characteristics

Normal Operating Cell Temperature (NOCT)	45°C + / - 3°C
Temperature Coefficients of P	- 0.48 % / °C
Temperature Coefficients of V	- 0.35 % / °C
Temperature Coefficients of I	+ 0.05 % / °C

### Maximum Ratings

Maximum System Voltage	600 V or 1000 V (UL)
Series Fuse Rating	15 A
Maximum Reverse Current	Series fuse rating multiplied by 1.35

## Mechanical Characteristics

Dimensions	1652 mm × 1000 mm × 45 mm
Weight	21 kg
Frame	Aluminum alloy, available in silver or black finish
Front	Tempered glass
Encapsulant	EVA
Back Cover	White or black back sheet
Cell Technology	Polycrystalline (Taiwan)
Cell Size	156 mm × 156 mm (6 in × 6 in)
Number of Cells (Pieces)	60 (6 × 10)
Junction Box	Protection class IP67 with bypass-diode
Output Cables	Solar cable: 4 mm <sup>2</sup> ; length 900 mm
Connector	Amphenol H4

## System Design

Operating Temperature	- 40 °C to 85 °C
Hail Safety Impact Velocity	25 mm at 23 m/s
Fire Safety Classification (IEC 61730)	Class C
Static Load Wind / Snow	2400 Pa / 5400 Pa

## Packaging and Storage

Storage Temperature	- 40 °C to 85 °C
Packaging Configuration	22 pieces per pallet
Loading Capacity (40 ft. HQ Container)	572 pieces

### Nomenclature

eg. HSL60P6-PA-0-245TW

HSL60P6-PA- -xxx

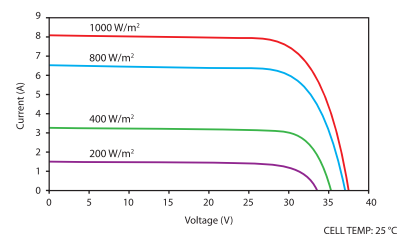
Code	Certification	Code	Frame / Backsheet
0	600 V (UL)	T	Silver / White
4	1000 V (UL)	TW	Black / White
		TB	Black / Black

xxx represents the power class

### Performance at Low Irradiance:

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

Various Irradiance Levels



Basic Design

