



## 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: certified to withstand up to 4000 Pa wind load and up to 7000 Pa snow load\*\*
- 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	8.80 A	8.89 A	8.95 A
Voltage at Maximum Power ( $V_{mpp}$ )	29.1 V	29.5 V	29.7 V	30.0 V	30.1 V
Current at Maximum Power ( $I_{mpp}$ )	8.08 A	8.14 A	8.25 A	8.34 A	8.48 A
Module Efficiency (%)	14.5 %	14.8 %	15.2 %	15.5 %	15.8 %

$P_{max}$ ,  $V_{oc}$ ,  $I_{sc}$ ,  $V_{mpp}$ , 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. Module power class have positive power sorting: 0 to +5W. 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 ( $P_{max}$ )	170 W	174 W	178 W	181 W	185 W
Open Circuit Voltage ( $V_{oc}$ )	34.2 V	34.5 V	34.6 V	34.8 V	34.9 V
Short Circuit Current ( $I_{sc}$ )	6.98 A	7.07 A	7.11 A	7.18 A	7.23 A
Voltage at Maximum Power ( $V_{mpp}$ )	26.3 V	26.7 V	26.9 V	27.1 V	27.2 V
Current at Maximum Power ( $I_{mpp}$ )	6.47 A	6.52 A	6.62 A	6.68 A	6.81 A
Module Efficiency (%)	13.1 %	13.5 %	13.8 %	14.0 %	14.3 %

$P_{max}$ ,  $V_{oc}$ ,  $I_{sc}$ ,  $V_{mpp}$ , 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	-0.43 % / °C
Temperature Coefficients of V	-0.32 % / °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	1636 mm × 988 mm × 40 mm
Weight	19 ± 0.5 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 1000 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	4000Pa/7000Pa

## Packaging and Storage

Storage Temperature	- 40 °C to 85 °C
Packaging Configuration	24 pieces per pallet
Loading Capacity (40 ft. HQ Container)	672 pieces

### Nomenclature

eg. HSL60P6-PB-0-245TW

HSL60P6-PB-    -xxx

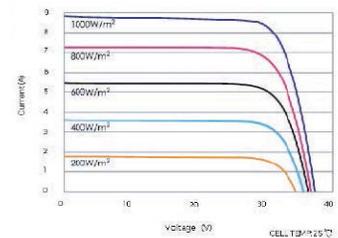
Code	Certification	Code	Frame / Backsheet
0	600 V (UL)	T	Silver / White
4	1000 V (UL)	TW	Black / White
		TB	Black / Black

xxx represents the power class

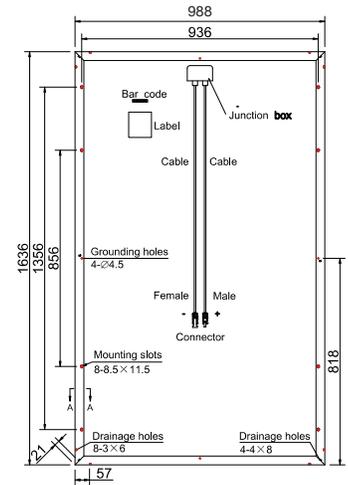
### Performance at Low Irradiance:

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



BACK VIEW

