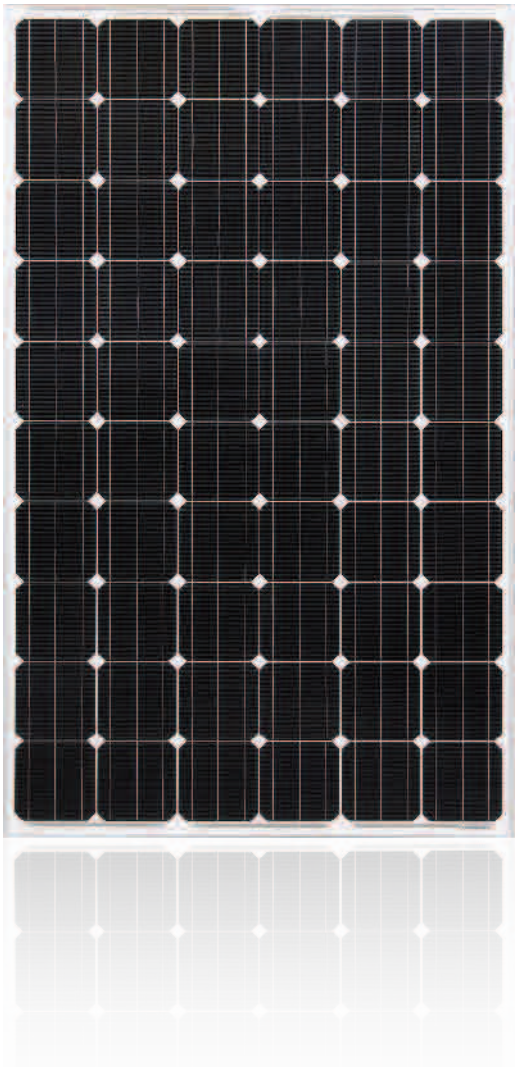
HSL60 | Mono

Hanwha Solar



Five Key Features

1. Guaranteed quality: 12 year product warranty, 25 year linear performance warranty*
2. Excellent efficiency: Module peak power up to 260W
3. Predictable output: Positive power sorting of 0 to +5W
4. Robust design: Module certified to withstand high snow loads, up to 5400Pa **
5. Long term responsibility: Free module recycling in PV Cycle member countries

* 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
- IEC 61215 and IEC 61730 Class A certification
- Conformity to CE

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

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Electrical Characteristics

Electrical Characteristics at Standard Test Conditions (STC)

Power Class	240 W	245 W	250 W	255 W	260 W	265 W
Maximum Power (P_{max})	240 W	245 W	250 W	255 W	260 W	265 W
Open Circuit Voltage (V_{oc})	36.8 V	37.0 V	37.2 V	37.4 V	37.6 V	37.8 V
Short Circuit Current (I_{sc})	8.52 A	8.6 A	8.7 A	8.82 A	8.9 A	8.98 A
Voltage at Maximum Power (V_{mpp})	30.2 V	30.4 V	30.5 V	30.7 V	30.9 V	31.2 V
Current at Maximum Power (I_{mpp})	7.95 A	8.06 A	8.2 A	8.32 A	8.41 A	8.50 A
Module Efficiency (%)	14.5 %	14.8 %	15.1 %	15.4 %	15.7 %	16.0 %

P_{max}, V_{oc}, I_{sc}, V_{mpp}, and I_{mpp} tested at STC defined as irradiance of 1000W/m² at AM 1.5 solar spectrum and temparature 25 ±2°C.
Electrical Characteristics: Measurement tolerance of ±3% (P_{max}); ±10% (V_{oc}, I_{sc}, V_{mpp}, I_{mpp}).

Electrical Characteristics at Normal Operating Cell Temperature (NOCT)

Power Class	240 W	245 W	250 W	255 W	260 W	265 W
Maximum Power (P_{max})	181 W	184 W	189 W	193 W	196 W	200 W
Open Circuit Voltage (V_{oc})	34.3 V	34.5 V	34.7 V	34.9 V	35.1 V	35.3 V
Short Circuit Current (I_{sc})	6.88 A	6.94 A	7.02 A	7.12 A	7.19 A	7.25 A
Voltage at Maximum Power (V_{mpp})	28.2 V	28.4 V	28.6 V	28.8 V	29.0 V	29.2 V
Current at Maximum Power (I_{mpp})	6.42 A	6.51 A	6.62 A	6.72 A	6.79 A	6.85 A
Module Efficiency (%)	11.0 %	11.1 %	11.4 %	11.7 %	11.9 %	12.1 %

P_{max}, V_{oc}, I_{sc}, V_{mpp}, and I_{mpp} tested at NOCT defined as irradiance of 800W/m²; wind speed 1m/s.
Electrical Characteristics: Measurement tolerance of ±5% (P_{max}); ±10% (V_{oc}, I_{sc}, V_{mpp}, I_{mpp}).

Temperature Characteristics

Normal Operating Cell Temperature (NOCT)	45°C± 3 °C
Temperature Coefficients of P	- 0.47 % / °C
Temperature Coefficients of V	- 0.32 % / °C
Temperature Coefficients of I	+ 0.05 % / °C

Maximum Ratings

Maximum System Voltage	1000 V
Series Fuse Rating	15 A
Maximum Reverse Current	Series fuse rating multiplied by 1.35

Mechanical Characteristics

Dimensions	1652mm × 1000mm × 45 mm
Weight	20±0.5kg
Frame	Aluminum-alloy
Front	3mm tempered glass with anti reflective coating
Encapsulant	EVA
Back	Composite sheet
Cell Technology	Monocrystalline
Cell Size	156mm × 156 mm (6 in × 6 in)
Number of Cells (Pcs)	60 (6 × 10)
Junction Box	Protection class IP67 with 3 bypass-diodes
Output Cables	Solar cable: 4 mm²; length: 900 mm
Connector	Amphenol H4

System Design

Operating Temperature	– 40 °C to +85 °C
Hail Safety Impact Velocity	25mm at 23m/s
Fire Safety Classification	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. Container)	572 pieces

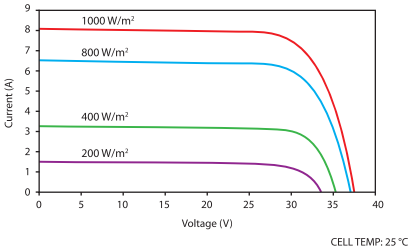
Nomenclature

Full product name:
HSL60M6-HA-1-*xxx*
xxx represents the power class

Performance at Low Irradiance:

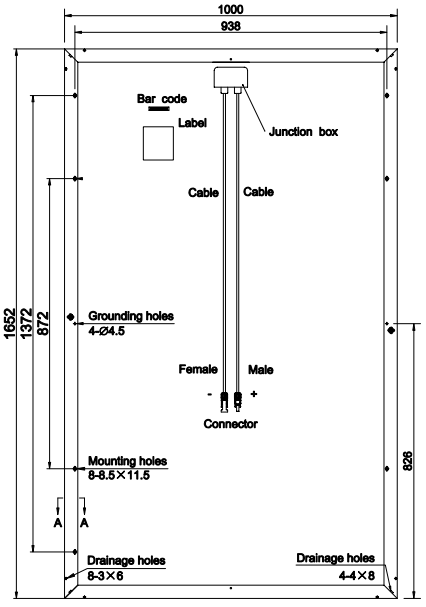
The typical relative change in module efficiency at an irradiance of 200 W / m² in relation to 1000 W / m² (both at 25°C and AM 1.5 spectrum) is less than 5%.

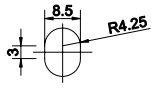
Various Irradiance Levels



CELL TEMP: 25 °C

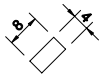
Basic Design



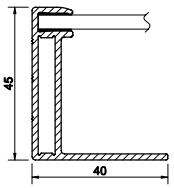


Mounting holes

Grouding holes



Drainage holes



Section A-A

Hanwha Solar