

Five Key Features

- 1 Guaranteed quality: 12 year product warranty, 25 year linear performance warranty*
- 2 Excellent efficiency: Module peak power up to 215W
- 3 Small form factor: Optimum roof space utilization on small roof areas
- 4 Robust design: Module certified to withstand high snow loads, up to 5400 Pa **
- 5 Predictable output: Positive power sorting of 0 to +5W

* 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

Electrical Characteristics

Electrical Characteristics at Standard Test Conditions (STC)

Power Class	190 W	195 W	200 W	205 W	210 W	215 W
Maximum Power (P_{max})	190 W	195 W	200 W	205 W	210 W	215 W
Open Circuit Voltage (V_{oc})	30.0 V	30.2 V	30.4 V	30.6 V	30.8 V	31.0 V
Short Circuit Current (I_{sc})	8.66 A	8.73 A	8.80 A	8.87 A	8.94 A	9.01 A
Voltage at Maximum Power (V_{mpp})	23.9 V	24.1 V	24.3 V	24.5 V	24.7 V	24.9 V
Current at Maximum Power (I_{mpp})	7.95 A	8.10 A	8.24 A	8.37 A	8.51 A	8.64 A
Module Efficiency (%)	14.2 %	14.6 %	14.9 %	15.3 %	15.7 %	16.1 %

P_{max} , V_{oc} , I_{sc} , V_{mpp} , and I_{mpp} tested at Standard Testing Conditions (STC) defined as irradiance of 1000 W/m² at AM 1.5 solar spectrum and a temperature 25 ± 2 °C.

Electrical Characteristics: measurement tolerance of ± 3 %.

Electrical Characteristics at Normal Operating Cell Temperature (NOCT)

Power Class	190 W	195 W	200 W	205 W	210 W	215 W
Maximum Power (P_{max})	139 W	143 W	147 W	150 W	154 W	158 W
Open Circuit Voltage (V_{oc})	28.0 V	28.2 V	28.4 V	28.6 V	28.8 V	29.0 V
Short Circuit Current (I_{sc})	6.99 A	7.05 A	7.11 A	7.16 A	7.22 A <td 7.28 A	
Voltage at Maximum Power (V_{mpp})	21.7 V	21.9 V	22.1 V	22.2 V	22.4 V	22.6 V
Current at Maximum Power (I_{mpp})	6.41 A	6.53 A	6.66 A	6.76 A	6.88 A	7.00 A
Module Efficiency (%)	13.0 %	13.4 %	13.7 %	14.0 %	14.4 %	14.8 %

P_{max} , V_{oc} , I_{sc} , V_{mpp} , and I_{mpp} tested at Normal Operating Cell Temperature (NOCT) defined as irradiance of 800W/m²; 45±3°C; Wind speed 1m/s. Measurement tolerances: +/- 3% (P_{max})

Nomenclature

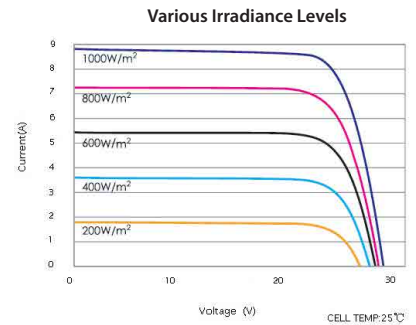
Full product name:

HSL48M6-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 %.



Temperature Characteristics

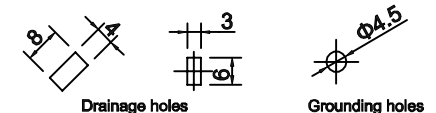
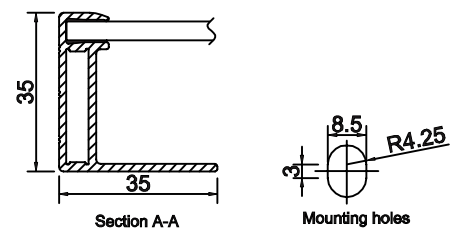
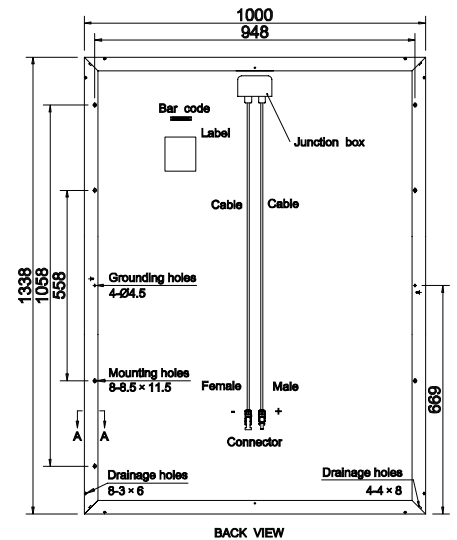
Normal Operating Cell Temperature (NOCT)	45°C ± 3 °C
Temperature Coefficients of P	- 0.47 % / °C
Temperature Coefficients of V	- 0.32 % / °C
Temperature Coefficients of I	+ 0.05 % / °C

Maximum Ratings

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

Mechanical Characteristics

Dimensions	1338mm × 1000mm × 35 mm
Weight	15.5 ± 0.5 kg
Frame	Aluminum-alloy
Front	Tempered glass
Encapsulant	EVA
Back	Composite sheet
Cell Technology	Monocrystalline
Cell Size	156mm × 156 mm (6 in × 6 in)
Number of Cells (Pcs)	48 (6 × 8)
Junction Box	Protection class IP67, with 3 bypass-diode(or 3 pairs, 2 each)
Output Cables	Solar cable: 4 mm ² ; 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	28 pieces per pallet
Loading Capacity (40 ft. Container)	896 pieces