



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 Innovative solutions: Anti-reflecting coating for high sunlight absorption
- 4 Robust design: Module certified to withstand high snow loads, up to 5.4 kN/m² **
- 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 certifications
- 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	230 W	235 W	240 W	245 W	250 W	255 W
Maximum Power (P_{max})	230 W	235 W	240 W	245 W	250 W	255 W
Open Circuit Voltage (V_{oc})	36.8 V	36.8 V	37.0 V	37.1 V	37.2 V	37.4 V
Short Circuit Current (I_{sc})	8.34 A	8.44 A	8.54 A	8.64 A	8.74 A	8.85 A
Voltage at Maximum Power (V_{mpp})	30.0 V	30.1 V	30.2 V	30.3 V	30.4 V	30.5 V
Current at Maximum Power (I_{mpp})	7.67 A	7.81 A	7.95 A	8.08 A	8.22 A	8.35 A
Module Efficiency (%)	13.9 %	14.2 %	14.5 %	14.8 %	15.1 %	15.4 %
Cell Efficiency (%)	15.8 %	16.1 %	16.5 %	16.8 %	17.2 %	17.5 %

P_{max} , V_{oc} , I_{sc} , V_{mpp} and I_{mpp} tested at STC defined as irradiance of 1000 W/m² 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	230 W	235 W	240 W	245 W	250 W	255 W
Maximum Power (P_{max})	167 W	170 W	174 W	178 W	182 W	186 W
Open Circuit Voltage (V_{oc})	33.3 V	33.5 V	33.7 V	34.1 V	34.2 V	34.5 V
Short Circuit Current (I_{sc})	6.66 A	6.74 A	6.84 A	6.99 A	7.07 A	7.16 A
Voltage at Maximum Power (V_{mpp})	27.2 V	27.3 V	27.4 V	27.6 V	27.7 V	27.8 V
Current at Maximum Power (I_{mpp})	6.14 A	6.23 A	6.35 A	6.46 A	6.58 A	6.68 A
Module Efficiency (%)	12.6 %	12.9 %	13.2 %	13.5 %	13.8 %	14.1 %

P_{max} , V_{oc} , I_{sc} , V_{mpp} and I_{mpp} tested at NOCT defined as irradiance of 800 W/m²; wind speed 1 m/s.
Electrical Characteristics: measurement tolerance of ± 3 %.

Temperature Characteristics

Normal Operating Cell Temperature (NOCT)	45 °C ± 3 °C
Temperature Coefficient of P	- 0.45 %/°C
Temperature Coefficient of V	- 0.32 %/°C
Temperature Coefficient of I	+ 0.04 %/°C

Maximum Ratings

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

Nomenclature

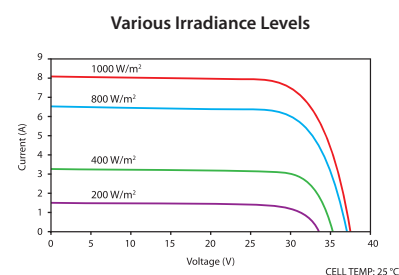
Full product name:

SF220-30-1PxxxL

xxx represents the power class

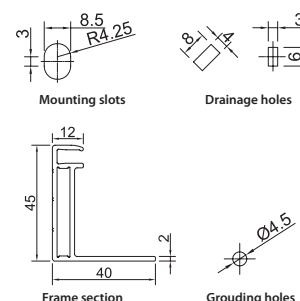
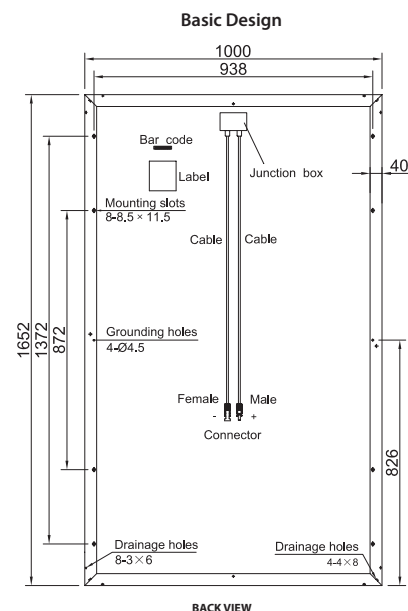
Performance at Low Irradiance:

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 %.



Mechanical Characteristics

Dimensions	1652 mm × 1000 mm × 45 mm
Weight	20±0.5kg
Frame	Aluminum alloy
Front	Tempered glass
Encapsulant	EVA
Back Cover	Composite sheet
Cell Technology	Polycrystalline
Cell Size	156mm×156mm(6in×6in)
Number of Cells (Pieces)	60 (6 × 10)
Junction Box	Protection class IP67 with bypass-diode
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	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