



Five Key Features

- 1 Guaranteed quality: 12 year product warranty, 25 year 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 SolarOne Co., Ltd. Product Warranty for details.

** Please refer to Hanwha SolarOne Co., Ltd. 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 SolarOne Co., Ltd.

Hanwha SolarOne Co., Ltd. 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.

SF160 | Mono x-tra Black Diamond

Electrical Characteristics

Electrical Characteristics at Standard Test Conditions (STC)

Power Class	170 W	175 W	180 W	185 W	190 W	195 W
Maximum Power (P_{max})	170 W	175 W	180 W	185 W	190 W	195 W
Open Circuit Voltage (V_{oc})	44.2 V	44.4 V	44.6 V	44.8 V	45.0 V	45.2 V
Short Circuit Current (I_{sc})	5.18 A	5.26 A	5.35 A	5.47 A	5.56 A	5.67 A
Voltage at Maximum Power (V_{mpp})	35.9 V	36.1 V	36.3 V	36.5 V	36.7 V	36.9 V
Current at Maximum Power (I_{mpp})	4.76 A	4.85 A	4.96 A	5.09 A	5.18 A	5.29 A
Module Efficiency (%)	13.3 %	13.7 %	14.1 %	14.5 %	14.9 %	15.3 %
Cell Efficiency (%)	15.6 %	16.0 %	16.5 %	16.9 %	17.4 %	17.8 %

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	170 W	175 W	180 W	185 W	190 W	195 W
Maximum Power (P_{max})	124 W	128 W	132 W	136 W	139 W	143 W
Open Circuit Voltage (V_{oc})	41.0 V	41.2 V	41.4 V	41.7 V	41.9 V	42.1 V
Short Circuit Current (I_{sc})	4.28 A	4.33 A	4.42 A	4.50 A	4.56 A	4.64 A
Voltage at Maximum Power (V_{mpp})	32.5 V	32.7 V	32.9 V	33.1 V	33.3 V <td 33.5 V	
Current at Maximum Power (I_{mpp})	3.82 A	3.91 A	4.01 A	4.11 A	4.18 A	4.27 A
Module Efficiency (%)	12.1 %	12.5 %	12.9 %	13.3 %	13.6 %	14.0 %
Cell Efficiency (%)	15.6 %	16.0 %	16.5 %	16.9 %	17.4 %	17.8 %

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 Coefficients of P	- 0.44 %/°C
Temperature Coefficients of V	- 0.33 %/°C
Temperature Coefficients of I	+ 0.03 %/°C

Maximum Ratings

Maximum System Voltage	1000 V (IEC)
Series Fuse Rating	10 A
Maximum Reverse Current	Series fuse rating multiplied by 1.35

Mechanical Characteristics

Dimensions	1580 mm × 808 mm × 35 mm
Weight	13 kg
Frame	Aluminum alloy
Front	Tempered glass
Encapsulant	EVA
Back Cover	Composite sheet
Cell Technology	Monocrystalline
Cell Size	125 mm × 125 mm
Number of Cells (Pieces)	72 (6 × 12)
Junction Box	Protection class IP67 with bypass-diode
Output Cables	Solar cable: 4 mm ² ; length 900 mm
Connector	Linyang LY0706-2

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	28 pieces per pallet
Loading Capacity (40 ft. Container)	784 pieces

Nomenclature

Full product name:
SF160-24-1MxxxL-B
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 %.

