

## Product Sheet

# SF160 Monocrystalline Black Diamond Module (UL)



## OVERVIEW

Hanwha SolarOne's SF160 Monocrystalline Black Diamond Module combines the performance, high efficiency, and reliability of our standard SF160 Mono module with an attractive, all-black design. A streamlined appearance provides the ability to blend in visually with rooftops and other architectural designs, making the SF160 Mono Black Diamond ideal for residential and small commercial solar installations. The module has undergone comprehensive testing for reliable performance over time and is certified to comply with the latest Class A safety standards.

## KEY TECHNICAL FEATURES

- 5 year product warranty, 25 year performance warranty\*
- Module certified to withstand wind loads up to 2400 Pa and snow loads up to 5400 Pa\*\*

\*Please refer to Hanwha SolarOne Product Warranty for details.

\*\*Please refer to Hanwha SolarOne 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
- UL 1703 certification
- Conformity to CE

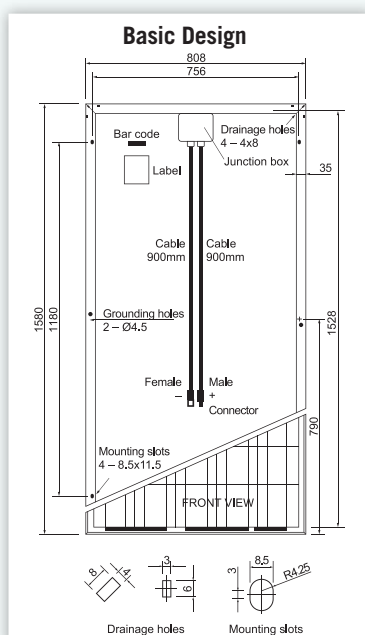
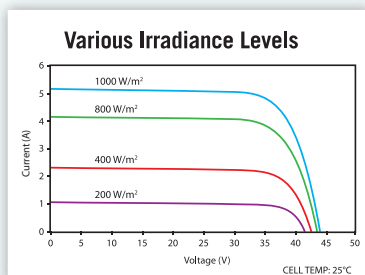
## ABOUT HANWHA SOLARONE

Hanwha SolarOne is a vertically integrated manufacturer of photovoltaic modules designed to meet the demands of the global energy consumer. From high-grade crystalline silicon, to module production, to project support, Hanwha SolarOne is setting the new standard in innovation and value.

- 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.

## Performance at Low Irradiance:

The typical relative change in module efficiency at an irradiance of 200W/m<sup>2</sup> in relation to 1000W/m<sup>2</sup> (both at 25°C and AM 1.5 spectrum) is less than 5%.



## ELECTRICAL CHARACTERISTICS

### Electrical Characteristics at Standard Test Conditions (STC)

MAXIMUM POWER (P <sub>MAX</sub> )	170W	175W	180W	185W	190W	195W
OPEN CIRCUIT VOLTAGE (V <sub>OC</sub> )	43.8V	44.0V	44.3V	44.6V	44.8V	45.0V
SHORT CIRCUIT CURRENT (I <sub>SC</sub> )	5.36A	5.48A	5.59A	5.68A	5.78A	5.85A
VOLTAGE AT MAXIMUM POWER (V <sub>MP</sub> )	35.0V	35.2V	35.4V	35.6V	35.8V	36.0V
CURRENT AT MAXIMUM POWER (I <sub>MP</sub> )	4.86A	4.98A	5.11A	5.21A	5.33A	5.42A
MODULE EFFICIENCY (%)	13.3	13.7	14.1	14.5	14.9	15.3
CELL EFFICIENCY (%)	15.4	15.8	16.3	16.7	17.2	17.6

P<sub>max</sub>, V<sub>oc</sub>, I<sub>sc</sub>, V<sub>mp</sub>, and I<sub>mp</sub> tested at STC defined as irradiance of 1000W/m<sup>2</sup> at AM 1.5 solar spectrum and temperature 25 ±2°C. Power tolerance of ±3% refers to measured performance.

### Electrical Characteristics at Normal Operating Cell Temperature (NOCT)

MAXIMUM POWER (P <sub>MAX</sub> )	122W	126W	130W	133W	137W	140W
OPEN CIRCUIT VOLTAGE (V <sub>OC</sub> )	40.3V	40.5V	40.8V	41.0V	41.2V	41.4V
SHORT CIRCUIT CURRENT (I <sub>SC</sub> )	4.34A	4.44A	4.53A	4.60A	4.68A	4.74A
VOLTAGE AT MAXIMUM POWER (V <sub>MP</sub> )	31.5V	31.7V	31.9V	32.0V	32.2V	32.4V
CURRENT AT MAXIMUM POWER (I <sub>MP</sub> )	3.89A	3.98A	4.09A	4.17A	4.26A	4.34A
MODULE EFFICIENCY (%)	11.9	12.3	12.7	13.0	13.4	13.7
CELL EFFICIENCY (%)	15.4	15.8	16.3	16.7	17.2	17.6

P<sub>max</sub>, V<sub>oc</sub>, I<sub>sc</sub>, V<sub>mp</sub>, and I<sub>mp</sub> tested at NOCT defined as irradiance of 800W/m<sup>2</sup>; wind speed 1m/s. Power tolerance of ±3% refers to measured performance.

### Temperature Characteristics

NORMAL OPERATING CELL TEMPERATURE (NOCT)	45 ±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

POWER TOLERANCE	±3%
MAXIMUM SYSTEM VOLTAGE	600V (UL)
SERIES FUSE RATING	10A
MAXIMUM REVERSE CURRENT	Series fuse rating multiplied by 1.35

## MECHANICAL CHARACTERISTICS

DIMENSIONS	1580mm x 808mm x 40mm (62.2 in x 31.8 in x 1.57 in)
WEIGHT	13kg (28.6 lbs)
FRAME	Aluminum alloy
FRONT	Tempered glass
ENCAPSULANT	EVA
BACK COVER	Composite sheet
CELL TECHNOLOGY	Monocrystalline
CELL SIZE	125mm x 125mm (4.92 in x 4.92 in); small chamfer angle
NUMBER OF CELLS (PIECES)	72 (6 x 12)
JUNCTION BOX	Protection class IP65 with bypass-diode
OUTPUT CABLES	Solar cable: 4mm <sup>2</sup> ; length: 900mm (35.4 in)

## SYSTEM DESIGN

OPERATING TEMPERATURE	-40°C to 85°C
HAIL SAFETY IMPACT VELOCITY	25mm at 23m/s
FIRE SAFETY CLASSIFICATION	Class C
STATIC LOAD SNOW	5400 Pa
STATIC LOAD WIND	2400 Pa

## PACKAGING AND STORAGE

STORAGE TEMPERATURE	-40°C to 85°C
PACKAGING CONFIGURATION	24 pcs per pallet
LOADING CAPACITY (40 FT. CONTAINER)	672 pieces



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