

## Polycrystalline Solar Module

### OVERVIEW

Hanwha SolarOne's SF220 Polycrystalline Module delivers the performance and efficiency required for large power output applications. Featuring a smooth, all-blue surface and a tight  $\pm 3\%$  power tolerance, the SF220 Poly provides an aesthetically attractive and efficient option for commercial and utility 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 high snow loads, up to 5.4kN/m<sup>2</sup>\*\*
- Tight power tolerance:  $\pm 3\%$ , anti-reflective coating
- Free module recycling through membership in PV Cycle

\*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
- 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 development and financing, 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.



## ELECTRICAL CHARACTERISTICS

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

MAXIMUM POWER ( $P_{max}$ )	225W	230W	235W	240W	245W	250W
OPEN CIRCUIT VOLTAGE ( $V_{oc}$ )	36.7V	36.8V	36.8V	37.0V	37.1V	37.2V
SHORT CIRCUIT CURRENT ( $I_{sc}$ )	8.18A	8.34A	8.44A	8.54A	8.64A	8.74A
VOLTAGE AT MAXIMUM POWER ( $V_{mp}$ )	29.9V	30.0V	30.1V	30.2V	30.3V	30.4V
CURRENT AT MAXIMUM POWER ( $I_{mp}$ )	7.53A	7.67A	7.81A	7.95A	8.08A	8.22A
MODULE EFFICIENCY (%)	13.6	13.9	14.2	14.5	14.8	15.1

$P_{max}$ ,  $V_{oc}$ ,  $I_{sc}$ ,  $V_{mp}$ , and  $I_{mp}$  tested at STC defined as irradiance of 1000W/m<sup>2</sup> at AM 1.5G 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 ( $P_{max}$ )	163W	167W	170W	174W	178W	182W
OPEN CIRCUIT VOLTAGE ( $V_{oc}$ )	33.1V	33.3V	33.5V	33.7V	34.1V	34.2V
SHORT CIRCUIT CURRENT ( $I_{sc}$ )	6.50A	6.66A	6.74A	6.84A	6.99A	7.07A
VOLTAGE AT MAXIMUM POWER ( $V_{mp}$ )	27.1V	27.2V	27.3V	27.4V	27.6V	27.7V
CURRENT AT MAXIMUM POWER ( $I_{mp}$ )	6.02A	6.14A	6.23A	6.35A	6.46A	6.58A
MODULE EFFICIENCY (%)	12.3	12.6	12.9	13.2	13.5	13.8

$P_{max}$ ,  $V_{oc}$ ,  $I_{sc}$ ,  $V_{mp}$ , and  $I_{mp}$  tested at STC defined as irradiance of 1000W/m<sup>2</sup> at AM 1.5G solar spectrum and temperature 25 ±2°C.  
Power tolerance of ±3% refers to measured performance.

### Temperature Characteristics

NORMAL OPERATING CELL TEMPERATURE (NOCT)	45 ±3°C
TEMPERATURE COEFFICIENTS OF P	-0.45%/°C
TEMPERATURE COEFFICIENTS OF V	-0.32%/°C
TEMPERATURE COEFFICIENTS OF I	-0.04%/°C

### Maximum Ratings

MAXIMUM SYSTEM VOLTAGE	1000V (IEC); 600V (UL)
SERIES FUSE RATING	15A
MAXIMUM REVERSE CURRENT	Series fuse rating multiplied by 1.35

## MECHANICAL CHARACTERISTICS

DIMENSIONS	1652mm x 1000mm x 45mm (65.04 in x 39.37 in x 1.77 in)
WEIGHT	21kg (46.2 lbs)
FRAME	Aluminum alloy
FRONT	Tempered glass
ENCAPSULANT	EVA
BACK COVER	Composite sheet
CELL TECHNOLOGY	Polycrystalline
CELL SIZE	156mm x 156mm (6.14 in x 6.14 in)
NUMBER OF CELLS (Pieces)	60 (6 x 10)
JUNCTION BOX	Protection class IP65 with bypass-diode
OUTPUT CABLES	Solar cable: 4mm <sup>2</sup> ; length 900mm (35.4 in)
CONNECTOR	Linyang LY0706-2

## 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	5.4kN/m <sup>2</sup>

## PACKAGING AND STORAGE

STORAGE TEMPERATURE	-40°C to 85°C
PACKAGING CONFIGURATION	22 pcs per pallet
LOADING CAPACITY (40 FT. CONTAINER)	572 pieces

### 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 1.5G spectrum) is less than 5%.

