

Shell Solar

Product Information Sheet

Shell SM110-12P Photovoltaic Solar Module

General

The Shell SM110-12P module contains two parallel strings of 36 series connected 103 x103 mm PowerMax® mono-crystalline silicon solar cells.

The Shell SM110-12P can generate a peak power of 110 watts at 17.5 volts.

The Shell SM110-12P solar module has been designed for grid connected and industrial applications.

Qualifications and Certificates

The Shell SM110-12P solar module meets the following requirements:

- UL – Listing 1703

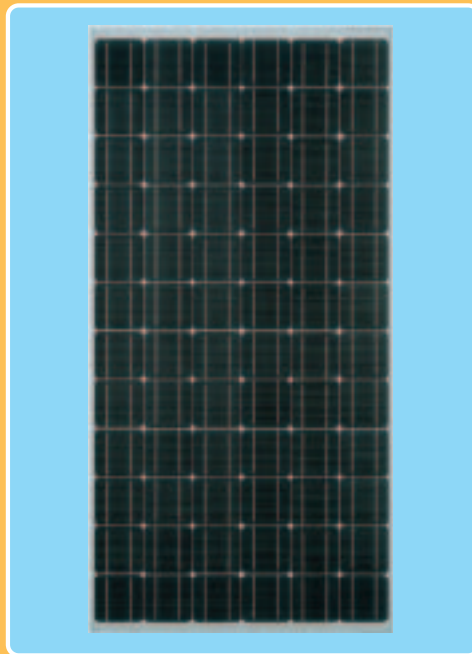


All Shell Solar modules are produced in EN-ISO 9001 certified factories.

Limited Warranties

- Peak Power for 25 years

Shell SM110-12P Module Benefits



- Tolerance on the peak power output is $\pm 5\%$ ensuring that you receive the power that we promise.
- PowerMax® mono-crystalline solar cells deliver maximum power output even under reduced light conditions providing more power where space is a limitation.
- The surface of the PowerMax® cell has a pyramidal textured surface to enable more light absorption and deliver exceptional efficiency.
- Highly transparent tempered glass delivers more power and ensures high impact resistance and protection against hail, snow, ice, and storms.
- Nearly 300MW of cumulative installed experience has been applied to the evolution of our mono-crystalline range to ensure that our products have a long and reliable service life backed by a 25 year warranty.

Junction Box

The junction box provides a high quality, dust protected and splash proof IP44-rated housing. The housing contains a rigid connection block with screw terminals and by-pass diodes providing "hot spot" protection for the solar cells.

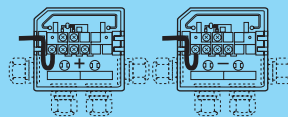


**ELECTRICAL EQUIPMENT,
CHECK WITH YOUR INSTALLER**

Due to continuous research and product improvement the specifications in this Product Information Sheet are subject to change without notice. Specifications can vary slightly. For installation and operation instructions, see the applicable manuals. No rights can be derived from this Product Information Sheet and Shell Solar assumes no liability whatsoever connected to or resulting from the use of any information contained herein.

ProCharger™ – CR Junction Box

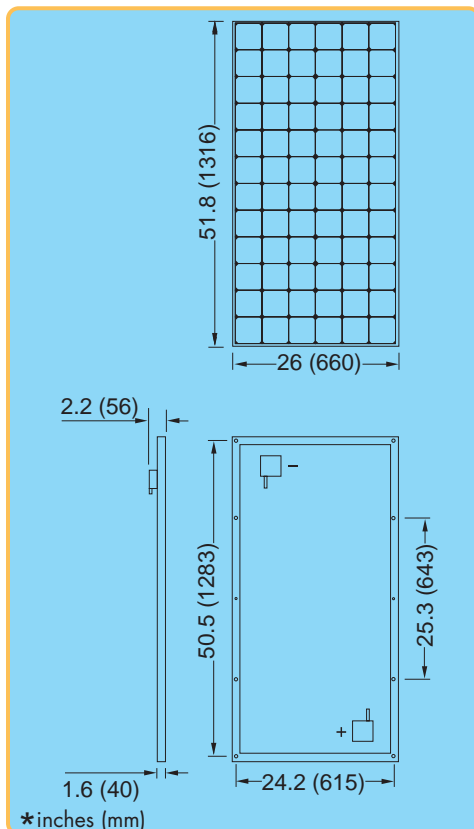
Maximum conductor cross-section: 4 mm²
Type of protection: IP44
Number of by-pass diodes: 2



Shell SM110-12P Photovoltaic Solar Module

Mechanical Specifications Module

A torsion and corrosion-resistant anodized aluminium frame ensures dependable performance, even under harsh weather conditions. Pre-drilled mounting holes are provided for ease of installation.



Outside dimensions (in)	51.8 x 26
Thickness (inc. junction box) (in)	2.2
Thickness (exc. junction box) (in)	1.6
Weight (lbs)	25.1

For installation instructions, please refer to the **Installation Manual** which is available from Shell Solar.

Electrical Characteristics

Data at Standard Test Conditions (STC)

STC: irradiance level 1000W/m², spectrum AM 1.5 and cell temperature 25°C

Rated power	P_r	110W
Peak power*	P_{mpp}^*	110W
Peak power voltage	V_{mpp}	17.5V
Peak power current	I_{mpp}	6.3A
Open circuit voltage	V_{oc}	21.7V
Short circuit current	I_{sc}	6.9A
Series fuse rating		10A
Minimum peak power	$P_{mpp\ min}$	104.5W
*Tolerance on Peak Power		±5%

The abbreviation 'mpp' stands for Maximum Power Point.

Typical data at Nominal Operating Cell Temperature (NOCT) conditions

NOCT: 800W/m² irradiance level, AM 1.5 spectrum, wind velocity 1m/s, T_{amb} 20°C

Temperature	T_{NOCT}	45°C
Mpp power	P_{mpp}	80W
Mpp voltage	V_{mpp}	16V
Open circuit voltage	V_{oc}	20V
Short circuit current	I_{sc}	5.6A

Typical data at low irradiance

The relative reduction of module efficiency at an irradiance of 200W/m² in relation to 1000W/m² both at 25°C cell temperature and AM 1.5 spectrum is 7%.

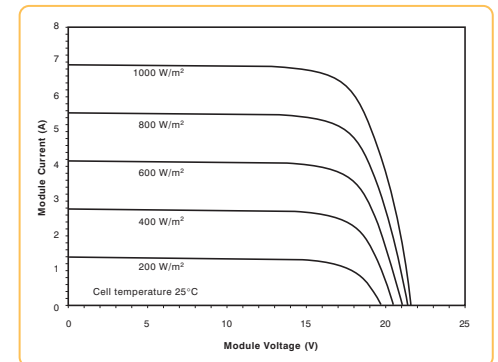
Temperature coefficients

αP_{mpp}	-0.45 %/°C
αV_{mpp}	-76 mV/°C
αI_{sc}	+2.8 mA/°C
αV_{oc}	-76 mV/°C

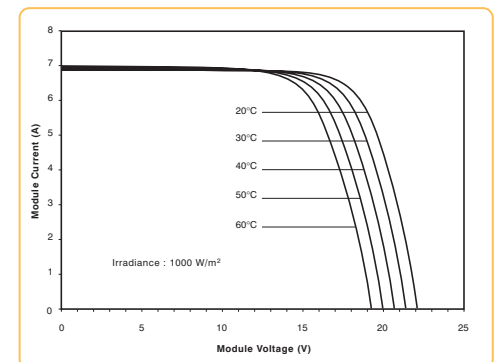
Maximum system voltage: 600 Vdc

Typical I/V Characteristics

The I/V graph below shows the typical performance of the solar module at various levels of irradiance.



The I/V graph below shows the typical performance of the solar module at various cell temperatures.



References in this Product Information Sheet to 'Shell Solar' are to companies and other organizational entities within the Royal Dutch/Shell Group of Companies that are engaged in the photovoltaic solar energy business. Shell Solar was set up in 1999 and has its principal office in Amsterdam, the Netherlands.

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V2/SM110-12P/05/02/US

