

Shell Solar

Product Information Sheet*

PowerMax™ Ultra 80-P/85-P Photovoltaic Solar Modules

General

Shell PowerMax™ is a range of high performance crystalline products designed specifically for off-grid photovoltaic applications.

Shell PowerMax™ Ultra 80-P and 85-P products contain 36 series connected 125mm x 125mm mono-crystalline silicon solar cells, which can generate a peak power of 80/85 watts at 16.9/17.2 volts.

Qualifications and Certificates

The Shell PowerMax™ Ultra 85-P and 80-P products meet the following requirements:

- IEC 61215
- UL-Listing 1703
- FM
- TÜV Safety Class 2



These Shell Solar modules are produced in ISO 9001:2000 certified factories.

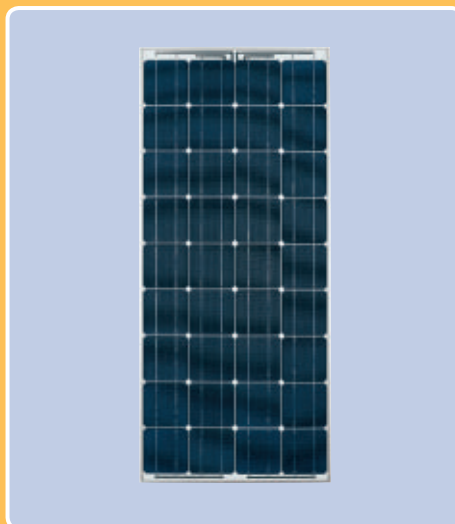
Limited Warranties

- 25 year power warranty**
- 2 year workmanship warranty**

* except North America

** See Shell Solar Limited Warranty for PV Modules 2005-01-UK

Shell PowerMax™ Ultra 80-P/85-P



Junction Box

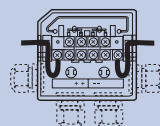
The junction box allows for easy field replacement of diodes and cable assemblies.

Pro Charger™ – CR Junction Box

Maximum conductor cross-section: 4mm²

Type of protection: IP54

Number of by-pass diodes: 2



Benefits

Exceptional Performance

- High efficiency mono-crystalline silicon solar cell technology; enhanced by TOPS™ and new silicon nitride anti-reflection coatings.
- Industry leading energy yields in a wide variety of climates.
- Products rated on fully stabilized initial power so you get the power you pay for.
- Industry leading max power current.

Proven Reliability

- Module design proven over 30 years of field operations with failure rates less than 0.1%.
- Extended limited power warranties backed by a company you can trust.
- UL 1703 and IEC 61215

Safety by Design

- Suitable for high snow and wind loads
- UL fire safety class C

Easy to install

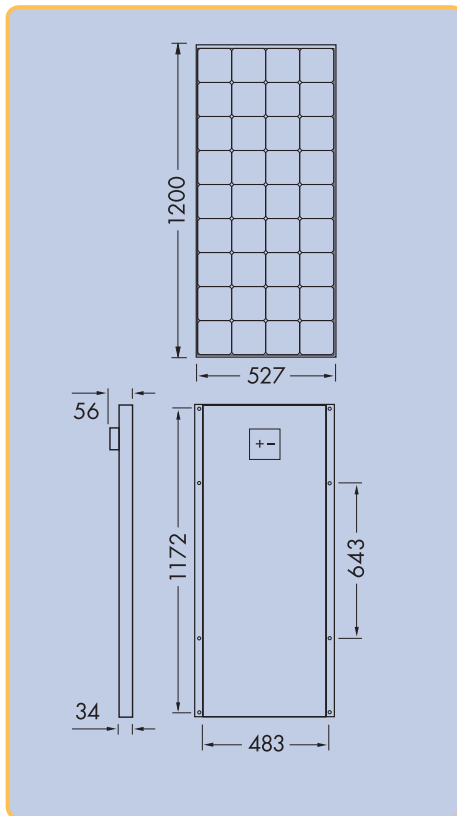
- Conduit ready junction box
- 20A series fuse rating



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Mechanical Specifications Modules

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



| | |
|------------------------------------|------------------|
| Outside dimensions (mm) | 1200 x 527 |
| Thickness (inc. junction box) (mm) | 56 |
| Thickness (exc. junction box) (mm) | 34 |
| Weight (kg) | 7.6 |
| Junction box type | ProCharger™ IP54 |
| Junction box dimensions | 126 x 111 x 46 |

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.

| PowerMax™ Ultra | | 80-P | 85-P |
|------------------------------|----------------|------|-------|
| Rated power [W] | P_r | 80 | 85 |
| Peak power* [W] | P_{mpp}^* | 80 | 85 |
| Module efficiency [%] | η | 12.7 | 13.4 |
| Peak power voltage [V] | V_{mpp} | 16.9 | 17.2 |
| Peak power current [A] | I_{mpp} | 4.76 | 4.95 |
| Open circuit voltage [V] | V_{oc} | 21.8 | 22.2 |
| Short circuit current [A] | I_{sc} | 5.35 | 5.45 |
| Series fuse rating [A] | I_{fuse} | 20 | 20 |
| Minimum peak power [W] | $P_{mpp\ min}$ | 76 | 80.75 |
| *Tolerance on Peak Power [%] | | +/-5 | |

Typical Data at Nominal Operating Cell Temperature (NOCT) conditions

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

| PowerMax™ Ultra | | 80-P | 85-P |
|---------------------------|------------|------|------|
| Temperature [°C] | T_{NOCT} | 45.5 | 45.5 |
| Mpp power [W] | P_{mpp} | 59 | 63 |
| Mpp voltage [V] | V_{mpp} | 15.5 | 16.0 |
| Open circuit voltage [V] | V_{oc} | 20.3 | 20.5 |
| Short circuit current [A] | I_{sc} | 4.31 | 4.39 |

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 spectrum AM 1.5 is 8%.

Temperature coefficients

| PowerMax™ Ultra | 80-P | 85-P |
|--------------------------|-------|-------|
| αP_{mpp} [%/°C] | -0,43 | -0,43 |
| αV_{mpp} [mV/°C] | -72.5 | -72.5 |
| αI_{sc} [mA/°C] | 0.8 | 0.8 |
| αV_{oc} [mV/°C] | -72.5 | -72.5 |

Maximum system voltage V_{sys} :

UL: 600Vdc, TÜV: 715Vdc.



**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.

References in this Product Information Sheet to 'Shell Solar' are to companies and other organisational 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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