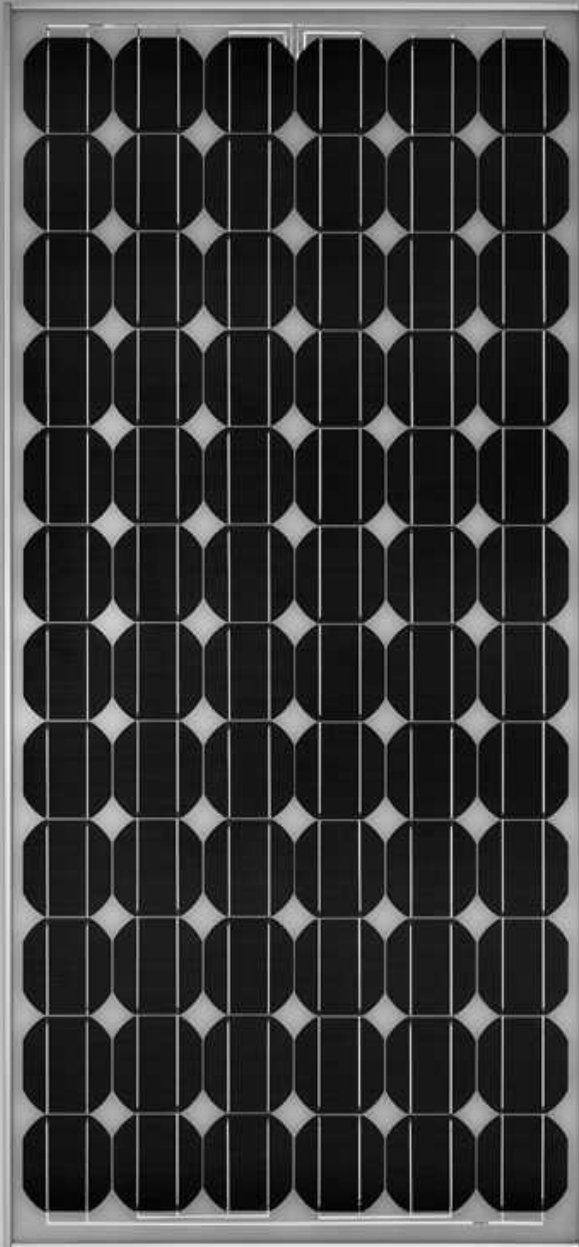


## Solar module SP140

Preliminary



PowerMax®

When it comes to reliable and environmentally-friendly generation of electrical power from sunlight, solar modules from Siemens provide the perfect solution. Manufactured in compliance with the most stringent quality standards, they are designed to withstand the toughest environmental conditions and are characterized by their long service life.

Siemens solar modules are covered by a 25-year limited warranty on power output – your guarantee of trouble-free solar power generation.

### PowerMax® technology

Siemens proprietary PowerMax® technology optimizes the energy production of individual cells and solar modules for all types of environmental conditions. PowerMax process optimization includes a special refining technique for ingots, a clean room semiconductor grade production process and a multistage proprietary TOPS™ (Texture Optimized Pyramidal Surface) process. The TOPS process incorporates the formation of textured pyramids on the surface of the solar cell. These pyramids are then treated with special oxides to passivate the surface. TOPS maximizes photon absorption from direct and diffused light (typical under cloudy conditions). This means that light absorption is especially high, even at low light levels. Siemens PowerMax® solar cells deliver maximum energy throughout the day.

### Solar module

Model:	<b>SP140</b>
Rated power:	<b>140 Watts</b>
Limited warranty:	<b>25 Years</b>

- Module voltage 24 volts
- Single crystalline PowerMax® solar cells, textured for maximum output ratios
- Rugged weather-proof design
- Utility, large project and BIPV applications

### Intelligent module design

- All cells are electrically matched to assure the greatest power output possible.
- Ultra-clear tempered glass provides excellent light transmission and protects from wind, hail, and impact.
- Torsion and corrosion-resistant anodized aluminum module frame ensures dependable performance, even through harsh weather conditions and in marine environments.
- Built-in bypass diodes (24V configuration) help system performance during partial shadowing.

### High quality

- Every module is subject to final factory review, inspection, and testing to assure compliance with electrical, mechanical, and visual criteria.
- 72 PowerMax® single-crystalline solar cells deliver excellent performance even in reduced light or poor weather conditions.
- Cell surfaces are treated with the Texture Optimized Pyramidal Surface (TOPS™) process to generate more energy from available light.
- Fault tolerant multi-redundant contacts on the front and back of each cell provide superior reliability.
- Solar cells are laminated between a multi-layered polymer backsheet and layers of ethylene-vinyl acetate (EVA) for environmental protection, moisture resistance and electrical isolation.
- Durable backsheet provides the module underside with protection from scratching, cuts, breakage, and most environmental conditions.
- Laboratory tested for a wide range of operating conditions.
- Ground continuity of less than 1 ohm for all metallic surfaces.
- Manufactured in ISO 9001 certified facilities to exacting Siemens quality standards.

### Easy installation

- Standard Sp junction box is designed for trouble-free field wiring and environmental protection.
- Light weight, aluminum frame and pre-drilled mounting holes for easy installation.
- Modules may be wired together in series or parallel to attain required power levels.

### Options

- The module is supplied from the factory in a standard 24 volt configuration.
- Modified versions of the solar module are also available, e.g. as frameless laminate. Please contact your Siemens Solar dealer for further information.

### Performance warranty

- 25 Year limited warranty on power output.

Further information on solar products, systems, principles, and applications is available in the Siemens Solar product catalog.

## Solar module SP140

Electrical parameters		(24 V)
Maximum power rating $P_{max}$	[W <sub>p</sub> ] <sup>1)</sup>	140
Rated current $I_{MPP}$	[A]	4.25
Rated voltage $V_{MPP}$	[V]	34.0
Short circuit current $I_{SC}$	[A]	4.7
Open circuit voltage $V_{OC}$	[V]	42.8
Thermal parameters		
NOCT <sup>2)</sup>	[°C]	45±2
Temp. coefficient of the short-circuit current		2.06 mA / °C
Temp. coefficient of the open-circuit voltage		-0.77 V / °C
Qualification test parameters <sup>4)</sup>		
Temperature cycling range	[°C]	-40 to +85
Humidity freeze, Damp heat	%RH]	85
Maximum permitted system voltage [V]		600 V (1000 V per IEC 1215)
Wind Loading PSF	[N/m <sup>2</sup> ]	50 (2400)
Maximum distortion <sup>3)</sup>	[°]	1.2
Hailstorm / hailstones	inches [mm]	1.0 (ø 25)
	MPH [m/s]	52 (v = 23)
Weight	Pounds [kg]	32.6 (14.8)

1)  $W_p$  (Watt peak) = Peak power

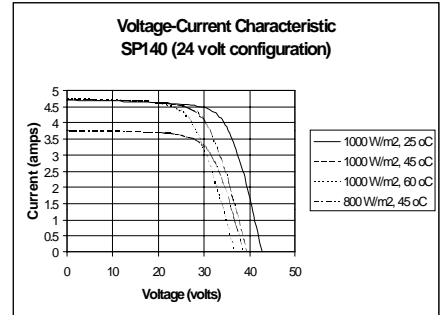
Air Mass AM= 1.5  
Irradiance E= 1000 W/m<sup>2</sup>  
Cell temperature  $T_c = 25$  °C

2) Normal Operating Cell Temperature at:

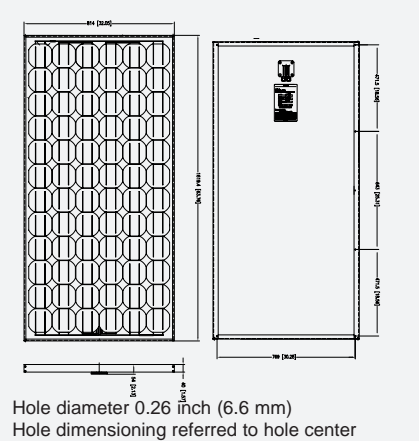
Irradiance E = 800 W/m<sup>2</sup>  
Ambient temperature  $T_a = 20$  °C  
Wind speed  $v_w = 1$  m/s

3) Diagonal lifting of the module plane

4) Per IEC 61215 test requirements

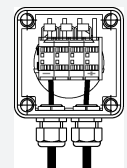


### Module dimensions



### Sp J box

Maximum cable diameter: 4 mm<sup>2</sup>  
Degree of protection: IP54



Your address for photovoltaics from Siemens Solar:

Siemens modules are recyclable.



© Siemens Solar 2000 Status 9/00 – Subject to modifications

## Siemens Solar GmbH

A joint venture of  
Siemens AG and E.ON Energie AG  
Postfach 46 07 05  
D-80915 München  
Germany

## Siemens Solar Industries

P.O. Box 6032  
Camarillo, CA 93011, U.S.A.  
Tel: 805-482-6800  
Fax: 805-388-6395  
Web site: www.siemenssolar.com  
E-mail: ssi.sales@solar.siemens.com

## Siemens Showa Solar Pte. Ltd.

166 Kallang Way  
Singapore 349249  
Tel: 65-842-3886  
Fax: 65-842-3887



Printed in U.S.A.