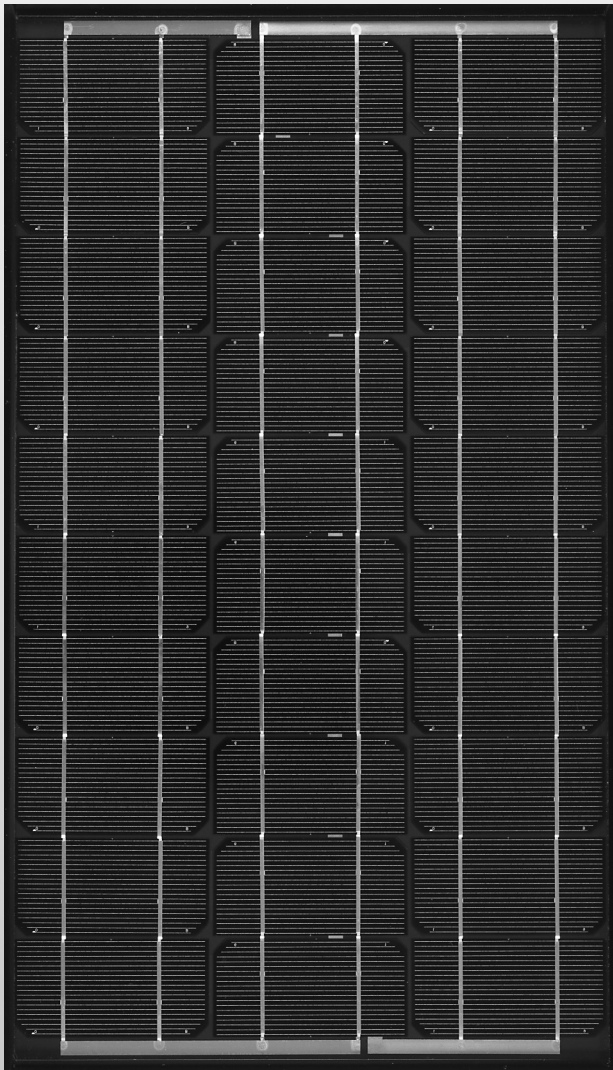


Solar module SM20



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, Siemens Solar modules are designed to withstand the toughest environmental conditions and are characterized by their long service life. Siemens Solar modules are covered by a 10-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. An anti-reflective coating is added to optimize the cells optical properties for maximum absorption of photons from the sun's light. TOPS also maximizes photon absorption from direct and diffused light (typical under cloudy conditions).

Solar module

Model:	SM20
Rated power:	20 Watts
Limited Warranty:	10 Years

Certifications and Qualifications

- UL-Listing 1703
- JPL Specification No. 5101-161
- MIL Standard 810
- CE mark
- FM Certification

Intelligent module design

- 30 PowerMax[®] solar cells form the heart of the module. These cells make optimum use of the modules surface area.
- Thanks to their rectangular shape, they are highly efficient and still provide the maximum power possible even under low-light level conditions
- Ultra-clear tempered glass provides excellent light transmission and protects from wind, hail, and impact.
- The solar cells are laminated in EVA (ethylene-vinyl acetate) between a multilayer rear film and the front glass. This permanently laminated assembly protects the cells against moisture and ensures electrical insulation.
- Torsion and corrosion resistant anodized aluminum module frame ensures dependable performance, even through harsh weather conditions and in marine environments.
- Intended for 12 V systems only, the SM20 regulates its electrical output to the needs of the battery.
- Self-regulation eliminates the need for separate charge control devices, resulting in a simple, reliable and economical system.

High quality

- Every module is subject to final factory review, inspection and testing to assure compliance with electrical, mechanical and visual criteria.
- Laboratory tested and certified for a wide range of operating conditions.
- Manufactured in ISO 9001 certified facilities to exacting Siemens quality standards.

Easy installation

- Lightweight aluminum frame and pre-drilled mounting holes for easy installation.
- Sealed terminal cover includes color-coded lead wires for fast, safe, and easy field connections.

Performance warranty

- 10 Year limited warranty on power output.

Solar module SM20 [formerly M20]

Electrical parameters		
Maximum power rating P_{max}	[W _p] ¹⁾	20
Rated current I_{MPP}	[A]	1.38
Rated voltage V_{MPP}	[V]	14.5
Short circuit current I_{SC}	[A]	1.6
Open circuit voltage V_{OC}	[V]	18.0
Thermal parameters		
NOCT ²⁾	[°C]	45 ±2
Temp. coefficient: short-circuit current		1.2mA/°C
Temp. coefficient: open-circuit voltage		-.0775V / °C
Qualification test parameters ⁴⁾		
Temperature cycling range	[°C]	-40 to +85
Humidity freeze, Damp heat	[%RH]	85
Maximum system voltage	[V]	25
Wind Loading	PSF [N/m ²]	50 [2400]
Maximum distortion ³⁾	[°]	1.2
Hailstone impact	Inches [mm]	1.0 [25]
	MPH [m/s]	52 [v=23]
Weight	Pounds [kg]	5.6 [2.5]

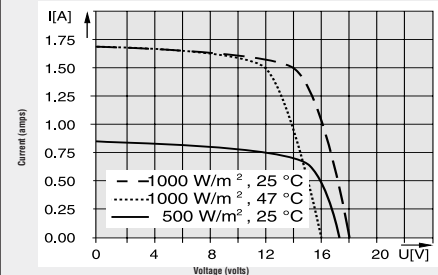
- 1) W_p (Watt peak) = Peak power (Minimum W_p = 18 Watts)

Air Mass AM = 1.5
 Irradiance E = 1000 W/m²
 Cell temperature T_C = 25 °C

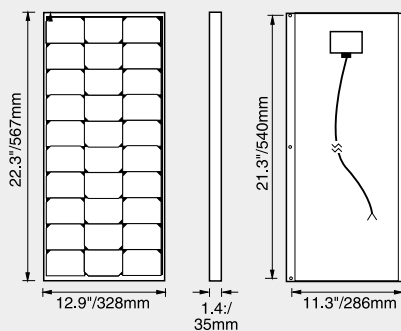
2) Normal Operating Cell Temperature at:
 Irradiance E = 800 W/m²
 Ambient temperature T_U = 20 °C
 Wind Speed v_W = 1 m/s

- 3) Diagonal lifting of module plane
- 4) Per IEC 61215 test requirements

Voltage-current characteristic



Module dimensions



Hole Diameter 0.26 inch (6.6mm)
 Mounting hole dimensions are center to center

Your address for photovoltaics from Siemens Solar

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

Siemens modules are recyclable.



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Siemens Solar GmbH

A joint venture of
 Siemens AG and Bayernwerk AG

Postfach 46 07 05
 D-80915 München
 Germany

Siemens Solar Industries

P.O.Box 6032
 Camarillo, CA 93011, U.S.A.
 Web site: www.siemenssolarpv.com
 E-mail: sunpower@solarpv.com
 Tel: 805-482-6800
 Fax: 805-388-6395

Siemens Showa Solar Pte. Ltd.

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

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