

TS CIGS SERIES HIGH-EFFICIENCY CIGS SOLAR MODULE

145 W / 150 W / 155 W / 160 W / 165 W

Features

- Advanced proprietary CIGS thin-film technology
- Plus sorting at +5 W to -0 W
- Up to 3% additional energy yield due to light soaking effect
- Low temperature coefficient provides energy yield benefits
- Aesthetically appealing all-black appearance
- Framed module designed for easy use with industry-standard mounting systems
- Etched, unchangeable serial numbers for full traceability of each module

Quality and Safety

- Dual glass module enhance module durability and prevent micro-cracks
- Free of potential induced degradation (PID) effects
- Certified for harsh environments: Salt Mist Corrosion (IEC 61701), Blowing Sand Resistant (DIN EN 60068-2-68) and Ammonia Corrosion Test (IEC 62716)
- UL, IEC and MCS certified
- California Energy Commission (CEC) listed
- Rated for snow and wind loads up to 2,400 Pa
- Manufactured at an ISO 9001: 2008, ISO 14001 and OHSAS 18001 certified facility

Warranty

- Product warranty*: 10 years for material and workmanship
- Power output warranty*: 90% at 10 years and 80% at 25 years of minimum rated power output



A TSMC Company

www.tsmc-solar.com

Technical data

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Electrical Characteristics

Standard Test Conditions (STC)

TS CIGS Series		TS-145C2	TS-150C2	TS-155C2	TS-160C2	TS-165C2	
Max power	P_{max}	145	150	155	160	165	W
Factory binning		+5/-0	+5/-0	+5/-0	+5/-0	+5/-0	W
Open-circuit voltage	V_{oc}	85.2	86.1	86.9	87.8	88.7	V
Short-circuit current	I_{sc}	2.66	2.66	2.66	2.66	2.66	A
Max power voltage	V_{mpp}	60.4	62.5	64.6	66.7	68.5	V
Max power current	I_{mpp}	2.40	2.40	2.40	2.40	2.41	A
Module efficiency	Eff%	13.3	13.8	14.3	14.7	15.2	%
Max reverse current	I_R	6.5 A					
Max system voltage		1000 Vdc [IEC], 600 Vdc [UL]					
Operating temperature		-40°C to 85°C					

IV Parameters measured at STC: 1000 W/m², module temperature 25°C, AM 1.5 after factory light soaking. All IV ratings are +/- 10%.

Pre-binning power tolerance of +/-5%, as certified by UL/TÜV-SÜD. TSMC Solar only delivers modules with greater than or equal to nameplate power.

Normal Operating Cell Temperature Conditions (NOCT)

Max power	P_{max}	109.4	113.2	116.9	120.7	124.6	W
Open-circuit voltage	V_{oc}	79.3	80.2	80.9	81.8	82.6	V
Short-circuit current	I_{sc}	2.14	2.14	2.14	2.14	2.14	A
Max power voltage	V_{mpp}	56.8	58.7	60.7	62.7	64.4	V
Max power current	I_{mpp}	1.93	1.93	1.93	1.93	1.93	A

Conditions at NOCT: 800 W/m², ambient temperature 20°C, AM 1.5

Mechanical Characteristics

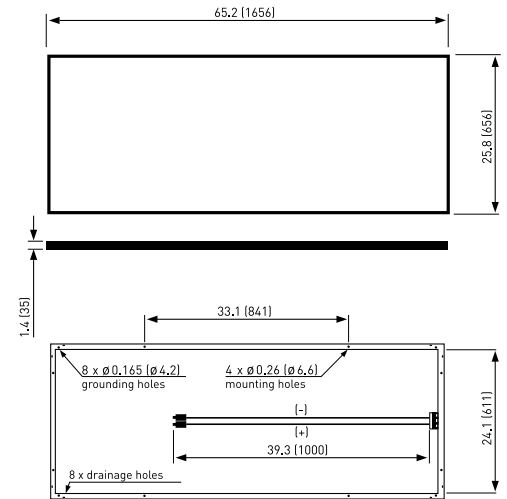
Snow/wind load (IEC)	50 lb/ft ² (2,400 Pa)
Snow/wind load (UL)*	35 lb/ft ² (1,695 Pa) design load
Dimensions in inches (mm)	65.2 (1656) x 25.8 (656) x 1.4 (35)
Weight in lbs (kg)	38.5 (17.5)
Frame	Black anodised aluminum
Front cover	Anti-reflective coated, textured white tempered glass
Junction box, connector	IP 67, MC-4 compatible
Output cable in inches (mm)	14 AWG (2.5 mm ²), 39.3 (1000)
Cell type	133 CIGS cells
Safety class	II
Fire rating	Class C

*UL testing applies loading 50% above design load. i.e. > 2,500 Pa was applied to achieve 1,695 Pa design load rating

The information contained herein is subject to change without notice.

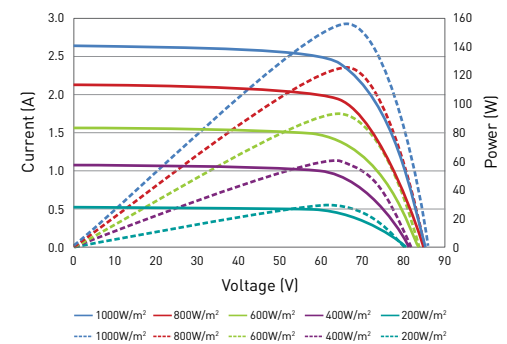
Caution: Read the installation guidelines before using, handling, installing or operating TSMC Solar modules.

Physical Specifications



All measurements in inches (mm)

I-V and P-V Curve (TS-155C2)



Thermal Characteristics

NOCT	46.5 ± 1°C
Temperature Coefficient of P_{max}	-0.30% / °C
Temperature Coefficient of V_{oc}	-0.29% / °C
Temperature Coefficient of I_{sc}	0.01% / °C

Performance at Low Irradiance

Typical relative efficiency reduction of maximum power from an irradiance of 1,000 W/m² to 200 W/m² at 25°C is 7%.

Certifications



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Get in contact with us!
We look forward to your
call or your e-mail!

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