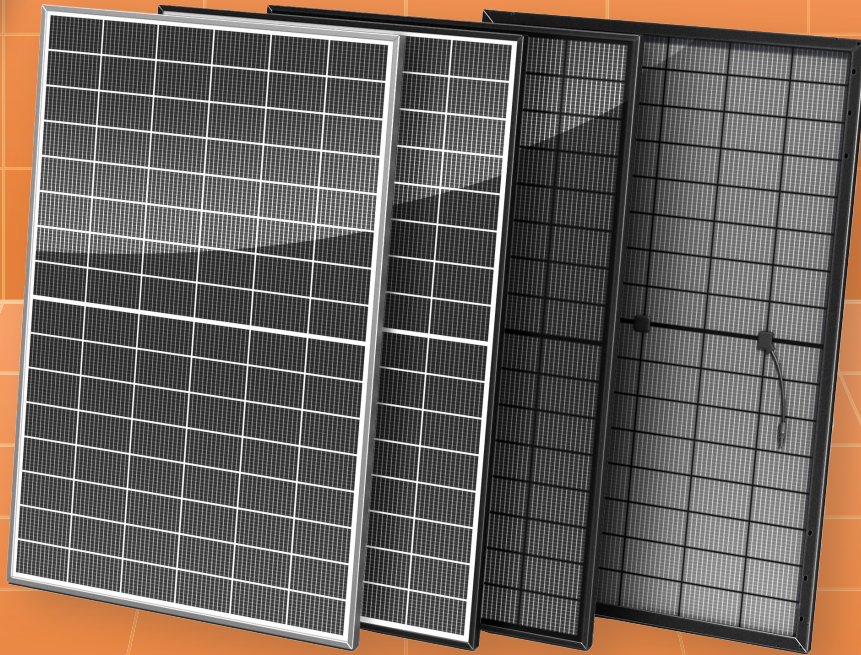


STANDARD SOLAR PANELS

GermanSolar's standard solar panels are high efficiency, convenient, and easy to use



GermanSolar
The Partner For Your Solar Lifetime!



BIFACIAL APOLLO

G12R 96 MONO CELL SOLAR PANELS

GSM-440W 445W 450W 455W 460W

GermanSolar is a specialist in customization, introducing colored glass, frames, and back-sheet material and shapes to aesthetically match your ideas with the prospective application. With innovative technology and design, GermanSolar offers high quality modules with enhanced aesthetic appearance for building structures and facades. By providing outstanding customization options, GermanSolar supports your required project needs with colored and shaped panels of your choice, and consults with you in choosing the right size, thickness, shape, and color to complement the design of your application and your building.

FEATURES

 <p>Best price-performance ratio</p>	 <p>Positive power of up to +5.00 Wp 0 - 5.00W</p>	 <p>EL tested and micro cracks inspected</p>	 <p>Fully automated production line with German quality engineering and design standards</p>
 <p>Better performance in diffused sunlight and high temperature</p>	 <p>High ammonia & salt mist resistant certified, and PID-free</p>	 <p>Withstands wind loads up to 2400Pa / heavy snow loads up to 5400Pa</p>	 <p>15-year limited product warranty</p>
 <p>30-year linear performance warranty</p>	  	  <p>IEC61215: CRYSTALLINE SILICON TERRESTRIAL PHOTOVOLTAIC (PV) MODULES - DESIGN QUALIFICATION AND TYPE APPROVAL IEC61730: Photovoltaic (PV) module safety qualification</p>	 <p>EN IEC 61730: PHOTOVOLTAIC (PV) MODULE SAFETY QUALIFICATION 2014/35/EU: THE LOW VOLTAGE DIRECTIVE</p>

STANDARD SOLAR PANELS

ELECTRICAL DATA

Nominal Max. Power (Pmax)* (W)	440	445	450	455	460
Open Circuit Voltage (Voc) (V)	36.40	36.45	36.61	36.77	36.93
Short Circuit Current (Isc) (A)	15.22	15.24	15.34	15.43	15.52
Max. Power Voltage (Vmpp) (V)	30.43	30.61	30.76	30.90	31.05
Max. Power Current (Impp) (A)	14.46	14.54	14.64	14.73	14.82
Module Efficiency (%)	22.02	22.27	22.52	22.77	23.02
Power Tolerance (%)	± 3				
Power Temperature Coefficient γ	-0.35 % / °C				
Current Temperature Coefficient α	+0.04 % / °C				
Voltage Temperature Coefficient β	-0.27 % / °C				

*STC: Irradiance 1000 W / m², cell temperature 25 °C, AM = 1.5, Tolerance of Pmax is within + / - 3 %.

BSTC * *

Nominal Max. Power (Pmax)* (W)	490	496	501	507	512
Open Circuit Voltage (Voc) (V)	36.42	36.58	36.74	36.90	37.06
Short Circuit Current (Isc) (A)	16.91	16.99	17.10	17.20	17.30
Max. Power Voltage (Vmpp) (V)	30.50	30.72	30.86	31.01	31.16
Max. Power Current (Impp) (A)	16.07	16.15	16.25	16.36	16.46
NMOT (Nominal Module Operating Temperature) (°C)	41 ± 3				

**BSTC: Front side irradiation 1000 W / m², back side reflection irradiation 135 W / m², AM = 1.5, ambient temperature 25 °C.

MECHANICAL DATA

Dimensions (mm)	1762 × 1134 × 30
Weight (kg)	25.0 (2.0 mm glass) or 23.0 (1.6 mm glass)
Solar Cells (mm)	HJT Mono 182 × 105
Front Glass	2.0 mm glass or 1.6 mm glass
Back Glass	2.0 mm glass or 1.6 mm glass
Frame	Anodised aluminum alloy
Junction Box	IP68, 3 diodes
Cables	4 mm ² , 300 mm in length, length can be customized / UV resistant
Connectors	MC4 original / MC4 compatible

PACKAGING

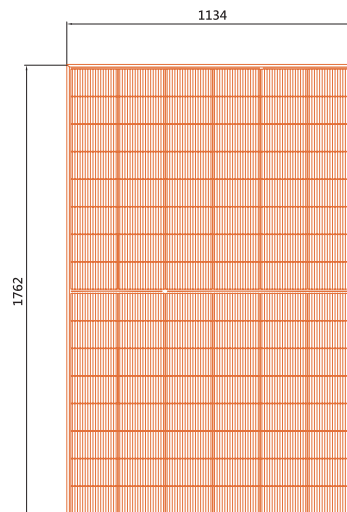
Modules Per Pallet (pcs)	36
Pallets Per Container (pcs)	26
Module quantity per 40' container (pcs)	936

OPERATING CONDITIONS

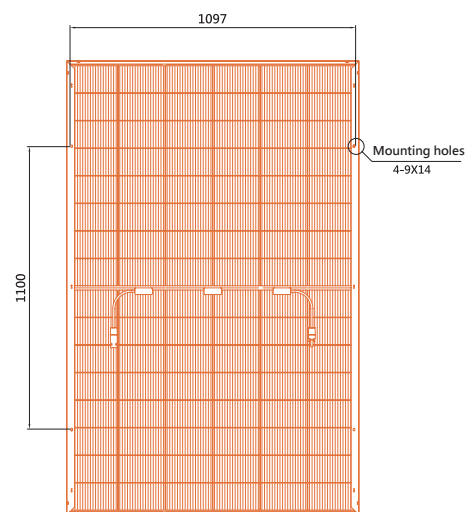
Max. System Voltage (V)	1500
Operating Temperature (°C)	-40 ~ +85
Max. Series Fuse Rating (A)	30
Front Side Maximum Static Loading/ Rear Side Maximum Static Loading (Pa)	5400 / 2400

Design (mm)

Front View



Back View



LINEAR PERFORMANCE WARRANTY

15-Year Product Warranty | 30-Year Performance Warranty

