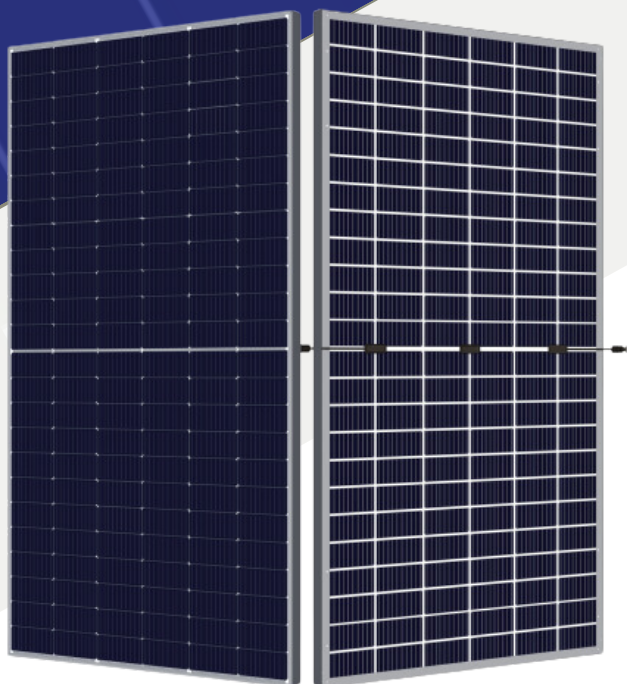


TOPSUN

BISOL

HIGH PERFORMANCE
MONOCRYSTALLINE
N-TYPE TECHNOLOGY
DOUBLE GLASS



108

TOP - 440/460M-108BI

108 CELL
Mono N - Type Module

440 - 460Wp
Power Output Range

1500VDC
Maximum System Voltage

23.00%
Maximum Efficiency

KEY SALIENT FEATURES



Industry leading lowest thermal co-efficient of power



Industry leading 25 years product warranty



Excellent low irradiance performance



Excellent PID resistance



Positive power tolerance of 0~+3%



Fully automated production at all stages



Fully Reduced power loss by minimizing the effect of shadow shading (9 - 18 Busbar)



European Warranty & After - Sales Service



TAMESOL BUILDING A GREEN FUTURE S.L

TAMESOL is a global provider of high-efficiency PV panels with a 10GW annual production capacity and a 100% automated production line, innovating state-of-the-art products for over 15 years. Our panels have been installed in more than 50 countries, with over 20 million panels already connected to the grid.

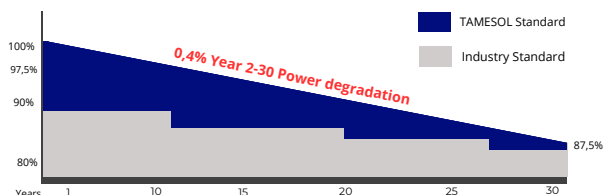
Tel : +34 872 222 388

E - mail: info@tamesol.com Website: www.tamesol.com

TAMESOL
— be bright, go solar —

LINEAR PERFORMANCE WARRANTY

25 year Product Warranty / 30-Year Linear Power Warranty



Since 2007, building a green future

23,00%

MAX MODULE
EFFICIENCY

0 - 3%

POWER
TOLERANCE

1,0%

FIRST YEAR POWER
DEGRADATION

0,40%

YEAR 2-30
POWER DEGRADATION

N-TYPE CELL

Lower operating temperature

ELECTRICAL CHARACTERISTICS

STC: AM1.5 1.000W/m2

NOTC: AM1.5 800W/m2 20° 1 m/s Test uncertainty for Pmax +-3%

Module type	TOP - 440M-108BI		TOP - 445M-108BI		TOP - 450M-108BI		TOP - 455M-108BI		TOP - 460M-108BI	
Testing condition	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC
Maximum Power (Pmax/w)	440	331	445	335	450	388	455	342	460	346
Open Circuit Voltage (Voc/V)	38,90	36,96	39,10	37,15	39,30	37,34	39,50	37,53	39,7	37.72
Short Circuit Current (Isc/A)	14,31	11,33	14,40	11,41	14,48	11,45	14,56	11,52	14,64	11.59
Voltage at Maximum Power (Vmp/V)	32.47	30,85	32,65	31,02	32,82	31,18	33,00	31,35	33,18	31.52
Current at maximum Power (Imp/A)	13,55	10,73	13,63	10,8	13,71	10,84	13,79	10,91	13,87	10.98
Module Efficiency (%)	22,00%	16,6%	22,3%	16,8%	22,5%	16,9%	22,8%	17,1%	23.00%	17.3%

MECHANICAL PARAMETERS

Cell Orientation single crystal N-Topcon 182x94mm (108 pieces)

Junction Box IP68, three diodes

Output Cable 4.0mm² 300mm(+) / 300mm(-) or customized

Glass 1.6mm / 1.6mm

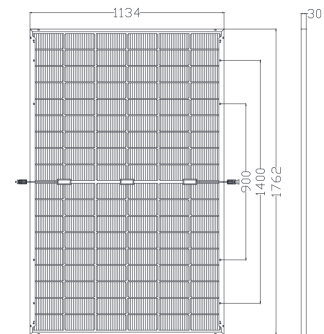
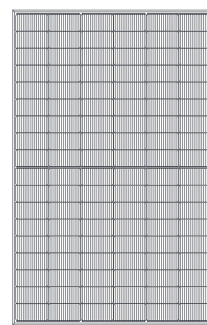
Frame Anodized aluminum alloy frame

Weight 22 kg

Dimensión 1762*1134*30mm

Packaging 36 pcs*pallet / 366pcs*20GP / 936pcs*40HC

PHYSICAL CHARACTERISTICS



OPERATING PARAMETERS

Operational Temperature -40°C - +85°C

Power Output Tolerance (0, +3%)

Voc and Isc Tolerance ±3%

Maximum System Voltage 1500V DC

Maximum Series Fuse Rating 30 A

Nominal Operating Cell Temperature 45±2°C

Protection Glass Class II

Fire Rating Class C

Bifacial - Factor 80% ± 10%

MECHANICAL LOADING

Front Side Maximum Static Loading 5400 PA

Rear Side Maximum Static Loading 2400 PA

Hailstone Test Diameter 25mm, impact speed 23m/s

TEMPERATURA RATINGS (STC)

Temperature Coefficient of Isc +0.046%/°C

Temperature Coefficient of Voc -0.25%/°C

Temperature Coefficient of Pmax -0.30%/°C

PACKING MANNER

Container 40ft(HQ)

Number of modules per container 936

Number of modules per pallet 36

Number of pallets per container 26

TAMESOL Authorized Solar Dealer

Note: The specifications are obtained under the Standard Test Conditions (STCs): 1000 W/m2 solar irradiance, 1.5 Air Mass, and cell temperature of 25°C. The NOCT is obtained under the Test Conditions: 800 W/m2, 20°C ambient temperature, 1m/s wind speed, AM 1.5 spectrum.

Please contact info@tamesol.com for technical support. The actual transactions will be subject to the contracts. This parameter is for reference only and it is not a part of the contracts. The specifications are subject to change without prior notice.