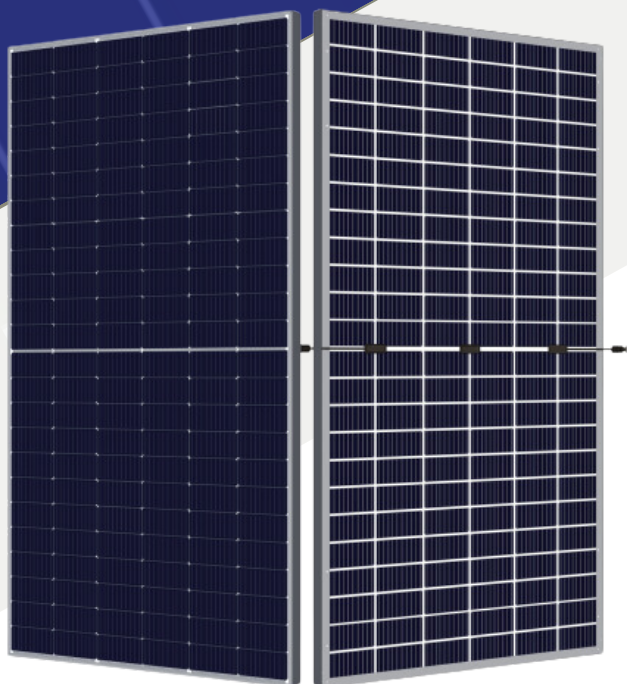


TOPSUN

BISOL

HIGH PERFORMANCE
MONOCRYSTALLINE
N-TYPE TECHNOLOGY
DOUBLE GLASS



108

TOP - 435/455M-108BI

108 CELL
Mono N - Type Module

435 - 455Wp
Power Output Range

1500VDC
Maximum System Voltage

22.80%
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.

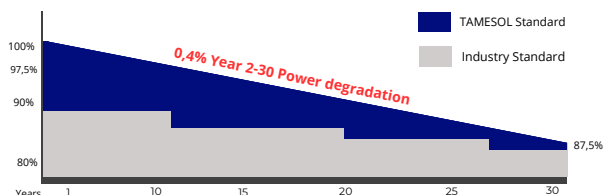
Tel : +34 872 222 388

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

22,80%

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

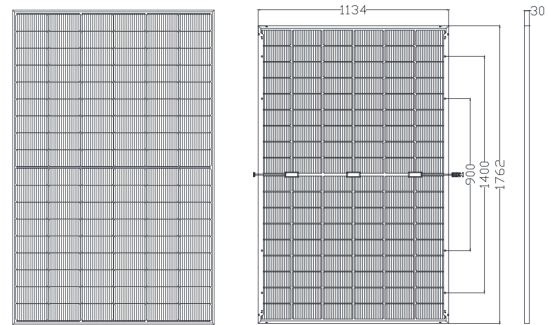
NOTC: AM1.5 800W/m2 20° 1 m/s Test uncertainty for Pmax +-3%

Module type	TOP - 435M-108BI		TOP - 440M-108BI		TOP - 445M-108BI		TOP - 450M-108BI		TOP - 455M-108BI	
Testing condition	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC
Maximum Power (Pmax/w)	435	327	440	331	445	335	450	338	455	342
Open Circuit Voltage (Voc/V)	38,70	36,77	38,90	36,96	39,10	37,15	39,30	37,34	39,50	37,53
Short Circuit Current (Isc/A)	14,23	11,26	14,31	11,33	14,40	11,41	14,48	11,45	14,56	11,52
Voltage at Maximum Power (Vmp/V)	32,29	30,68	32,47	30,85	32,65	31,02	32,82	31,18	33,00	31,35
Current at maximum Power (Imp/A)	13,47	10,66	13,55	10,73	13,63	10,80	13,71	10,84	13,79	10,91
Module Efficiency (%)	21,80%	16,4%	22,00%	16,6%	22,3%	16,8%	22,5%	16,9%	22,80%	17,1%

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.