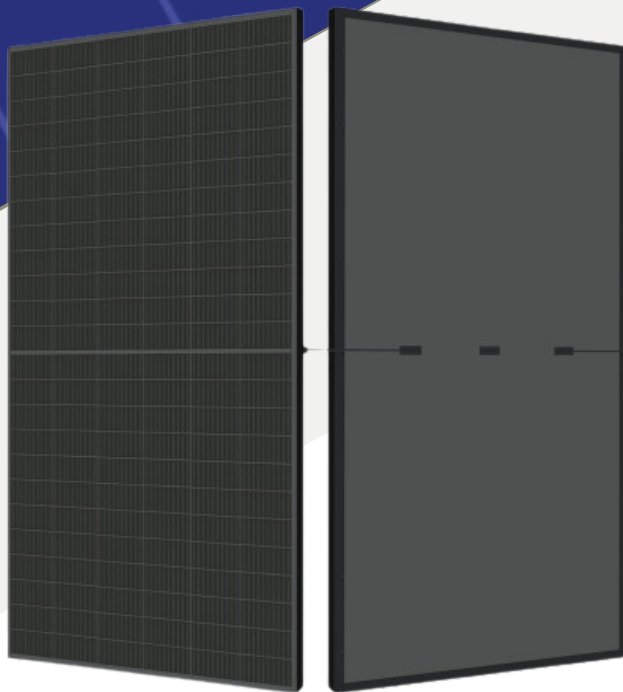


TOPSUN

ALL BLACK

HIGH PERFORMANCE
MONOCRYSTALLINE
N- TYPE TECHNOLOGY

120



TOP - 460/480M-120AB

120 CELL
Mono N - Type Module

460 - 480Wp
Power Output Range

1500VDC
Maximum System Voltage

22.20%
Maximum Efficiency

KEY SALIENT FEATURES

- Industry leading lowest thermal co-efficient of power
- Industry leading 15 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



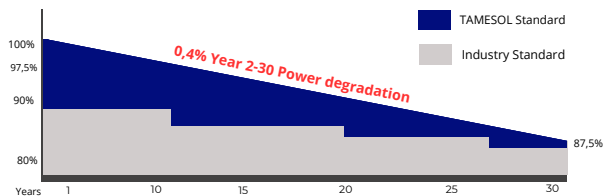
TAMESOL BUILDING A GREEN FUTURE S.L

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

LINEAR PERFORMANCE WARRANTY

15 year Product Warranty / 30-Year Linear Power Warranty



Since 2007, building a green future

22,20% MAX MODULE EFFICIENCY	0 - 3% POWER TOLERANCE	2,0% FIRST YEAR POWER DEGRADATION	0,50% YEAR 2-30 POWER DEGRADATION	N-TYPE CELL Lower operating temperature
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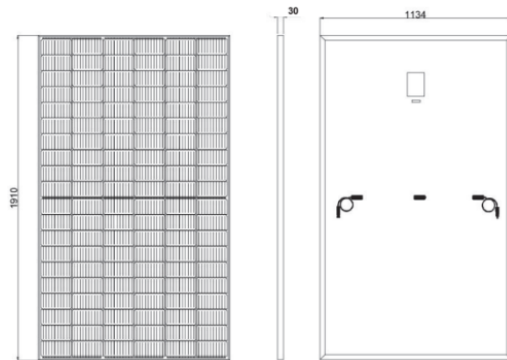
ELECTRICAL CHARACTERISTICS STC: AM1.5 1.000W/m2 NOTC: AM1.5 800W/m2 20° 1 m/s Test uncertainty for Pmax 0 - +3%

Module type	TOP - 460M-120AB		TOP - 465M-120AB		TOP - 470M-120AB		TOP - 475M-120AB		TOP - 480M-120AB	
	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC	STC	NOTC
Testing condition										
Maximum Power (Pmax/w)	460	346	465	350	470	353	475	357	480	361
Open Circuit Voltage (Voc/V)	32.50	39.94	42.22	40.10	42.38	40.25	42.54	40.41	42.71	40.57
Short Circuit Current (Isc/A)	13.99	11,29	14,07	11,36	14,15	11,42	14,23	11,49	14,31	11.55
Voltage at Maximum Power (Vmp/V)	34.72	32.60	34.89	32.77	35.05	32.21	32.21	33.10	35.38	33.27
Current at maximum Power (Imp/A)	13.25	10.61	13.33	10,67	13,41	10,73	13,49	10,79	13,57	10.85
Module Efficiency (%)	21.24%		21.60%		21.80%		22.0%		22.20%	

MECHANICAL PARAMETERS

Cell Orientation	single crystal N-Topcon 182x91mm (120 pieces)
Junction Box	IP68, three diodes
Output Cable	1000mm (can be customized)
Glass	3.2mm high transparency, tempered glass
Frame	Anodized aluminum alloy frame
Weight	24 kg
Dimensión	1910(±2)*1134*30mm
Packaging	31 pcs*pallet / 864 pcs*40HC

PHYSICAL CHARACTERISTICS



OPERATING PARAMETERS

Operational Temperature	-40°C - +85°C
Power Output Tolerance	(0, +3%)
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	25 A
Nominal Operating Cell Temperature	45±2°C
Protection Glass	Class II
Fire Rating	Class C

MECHANICAL LOADING

Front Side Maximum Static Loading	5400 PA
Rear Side Maximum Static Loading	2400 PA

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	864
Number of modules per pallet	36
Number of pallets per container	24

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.