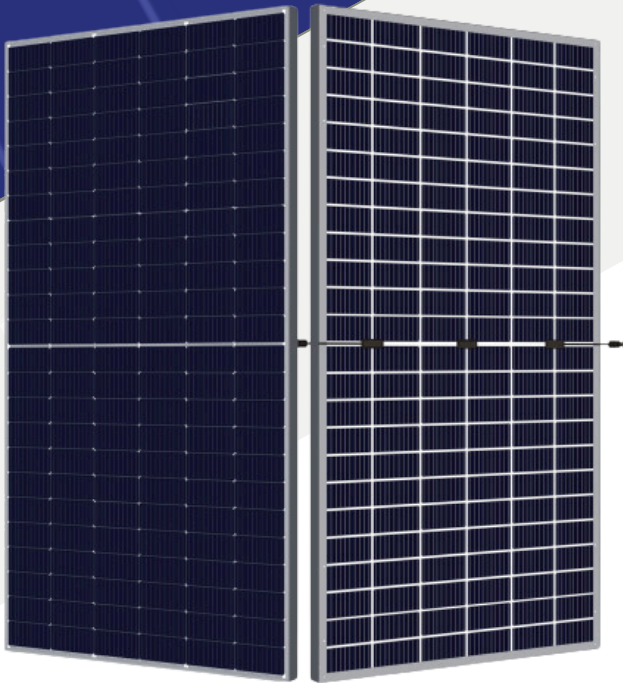


TOP - 440/460M-108BI

108 CELL
Mono N - Type Module440 - 460Wp
Power Output Range1500VDC
Maximum System Voltage23.00%
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

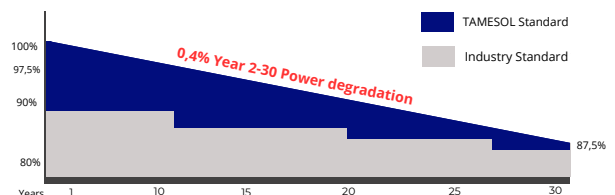
TAMESOL is a global provider of high-efficiency PV panels with a 10GW annual production capacity and a 100% automated production line, innovating state-of-the-art products for over 15 years. Our panels have been installed in more than 50 countries, with over 20 million panels already connected to the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



| | | | | |
|--|-----------------------------------|---|---|---|
| 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 |
|--|-----------------------------------|---|---|---|

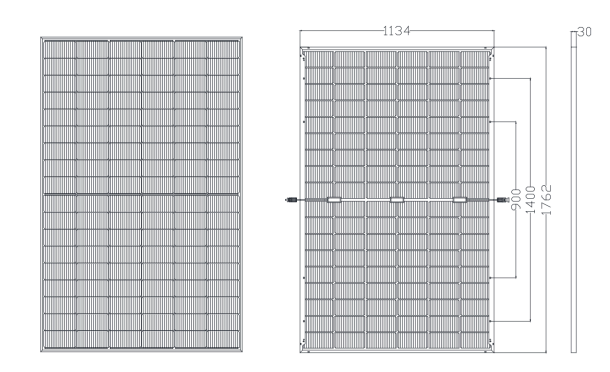
ELECTRICAL CHARACTERISTICS STC: AM1.5 1.000W/m2 NOTC: AM1.5 800W/m2 20° 1 m/s Test uncertainty for Pmax 0 - +3%

| Module type | TOP - 440M-108BI | | TOP - 445M-108BI | | TOP - 450M-108BI | | TOP - 455M-108BI | | TOP - 460M-108BI | |
|----------------------------------|------------------|-------|------------------|-------|------------------|-------|------------------|-------|------------------|-------|
| | STC | NOTC | STC | NOTC | STC | NOTC | STC | NOTC | STC | NOTC |
| Testing condition | | | | | | | | | | |
| 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% | | 22,30% | | 22,50% | | 22,80% | | 23,00% | |

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 - 26 kg |
| Dimensión | 1762*1134*30mm |
| Packaging | 36/37 pcs*pallet / 936pcs*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 | 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 |

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 | 936/962 |
| Number of modules per pallet | 36/37 |
| Number of pallets per container | 22/26 |

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.