



High Power Output
Low LCOE



Maximum Power
465W+



TWMNH

N-type Half-cell Dual Glass
Monofacial Black Frame Module(48)

48HW445-465W

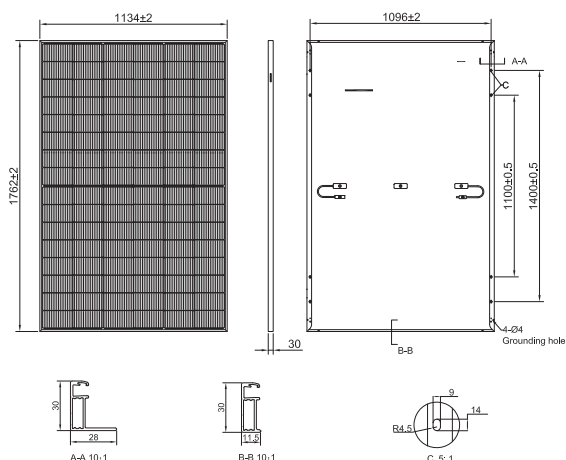


<https://en.tongwei.cn/>



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Drawings (Unit: mm)



Mechanical parameters

Cell Type	TNC (N Type Monocrystalline Cell)
Cell Orientation	96[6×16]
Dimensions	1762±2×1134±2×30mm
Weight	23.7kg
Front Glass	2.0mm AR coating semi tempered glass
Rear Glass	2.0mm semi tempered glass
Frame	Anodized aluminum alloy black frame
Junction Box	IP68, 3 diodes
Cable	4.0mm ²
Cable length	+1200mm, -1200mm, length can be customized
Wind/Snow load	2400Pa/5400Pa
Per pallet	36 pcs
Packaging	936 pcs per 40'HC

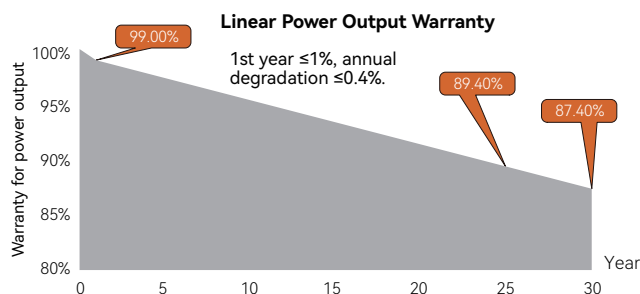
Electrical Characteristics (STC)

Module type: TWMNH-48HWXXX

Maximum Power: P _{max} [W]	445	450	455	460	465
Open Circuit Voltage: V _{oc} [V]	35.80	35.95	36.10	36.25	36.40
Short Circuit Current: I _{sc} [A]	15.79	15.84	15.89	15.94	15.99
Voltage at Maximum Power: V _{mp} [V]	29.85	30.15	30.44	30.73	31.03
Current at Maximum Power: I _{mp} [A]	14.91	14.93	14.95	14.97	14.99
Module Efficiency: η [%]	22.3	22.5	22.8	23.0	23.3

* STC: Irradiance 1000W/m², Cell Temperature 25°C, AM=1.5, Power measurement tolerance: ±3%

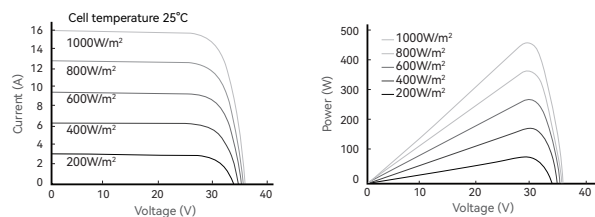
Linear Warranty



Temperature Rating

Temperature Coefficient of P _{max}	-0.28%/°C
Temperature Coefficient of V _{oc}	-0.24%/°C
Temperature Coefficient of I _{sc}	+0.046%/°C

I-V Curve



Operating Parameters

Operating Temperature	-40°C~+70°C
Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	30A
Power Output Tolerance	0~+3%

Certifications

Quality Management System and Product Certification

ISO 9001: 2015/Quality management systems
 ISO 14001: 2015/Environmental management systems
 ISO 45001: 2018/Occupation health and safety management systems
 ISO 50001: 2018/Energy management systems
 IEC 62941: 2019/Quality system for PV module manufacturing
 IEC 61215(2021) / IEC 61730(2023), IEC 62804(PID),
 IEC 61701(Salt), IEC 62716 (Ammonia), IEC 60068-2-68(Sand)

