



High Power Output
Low LCOE



Maximum Power
465W+



TWMNH

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

48HW445-465W

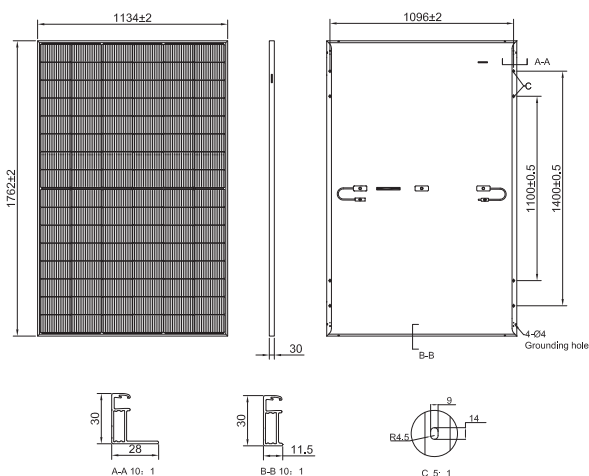


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Drawings (Unit: mm)



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

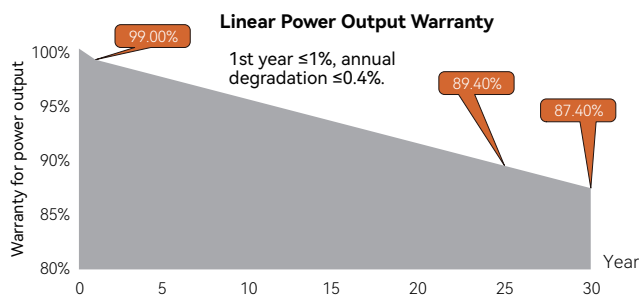
Electrical Characteristics (STC)

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%

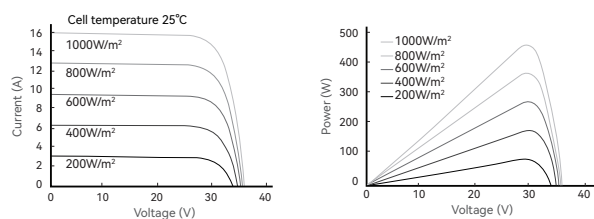
Linear Warranty



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)



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Statement: With technological process and product update, there may be deviation between the technical parameters of Tongwei's module products and the technical parameters contained in the specification, and Tongwei Solar has the right to adjust the technical parameters at any time without notifying the customer, the final interpretation of the technical specification is vested in Tongwei Solar. (Preview-20250514)