



High Power Output  
Low LCOE



Maximum Power  
460W+



# TWMNH

N-type Half-cell Dual Glass  
Monofacial Full-black Module(48)

## 48HE440-460W



Residential  
Rooftop



15  
YEAR  
Materials  
Warranty



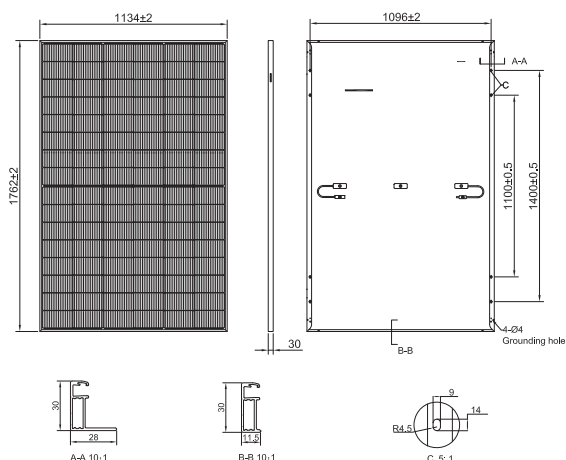
30  
YEAR  
Power  
Warranty

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



Learn More

## Drawings (Unit: mm)



## Electrical Characteristics (STC)

Moduel type: TWMNH-48HEXXX

|                                   |       |       |       |       |       |
|-----------------------------------|-------|-------|-------|-------|-------|
| Maximum Power: Pmax [W]           | 440   | 445   | 450   | 455   | 460   |
| Open Circuit Voltage: Voc [V]     | 35.65 | 35.80 | 35.95 | 36.10 | 36.25 |
| Short Circuit Current: Isc [A]    | 15.74 | 15.79 | 15.84 | 15.89 | 15.94 |
| Voltage at Maximum Power: Vmp [V] | 29.55 | 29.85 | 30.15 | 30.44 | 30.73 |
| Current at Maximum Power: Imp [A] | 14.89 | 14.91 | 14.93 | 14.95 | 14.97 |
| Module Efficiency: η [%]          | 22.0  | 22.3  | 22.5  | 22.8  | 23.0  |

\* STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5, Power measurement tolerance: ±3%

## Temperature Rating

|                                 |            |
|---------------------------------|------------|
| Temperature Coefficient of Pmax | -0.28%/°C  |
| Temperature Coefficient of Voc  | -0.24%/°C  |
| Temperature Coefficient of Isc  | +0.046%/°C |

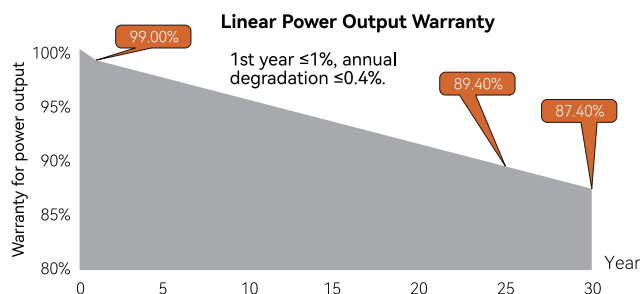
## Operating Parameters

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

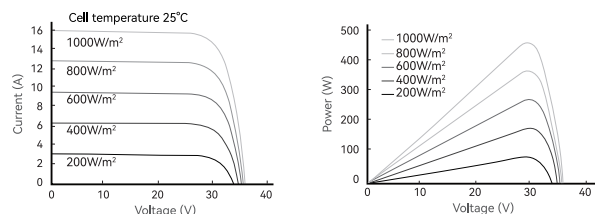
## Mechanical parameters

|                  |                                            |
|------------------|--------------------------------------------|
| 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 <sup>2</sup>                         |
| Cable length     | +1200mm, -1200mm, length can be customized |
| Wind/Snow load   | 2400Pa/5400Pa                              |
| Per pallet       | 36 pcs                                     |
| Packaging        | 936 pcs per 40'HC                          |

## Linear Warranty



## I-V Curve



## 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)

