



High Power Output  
Low LCOE



Maximum Power  
450W+



# TWMNH

N-type Half-cell  
Bifacial Full-black Module (48)

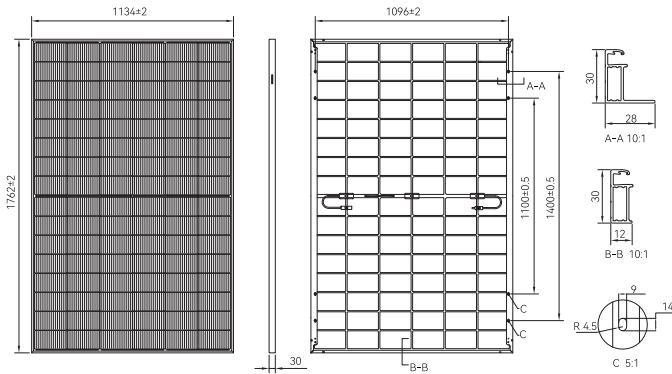
## 48HC430-450W

Tongwei Co.,Ltd.  
[en.tongwei.com.cn](http://en.tongwei.com.cn)



Learn More

## DRAWINGS (Unit: mm)



## ELECTRICAL CHARACTERISTICS (STC)

|                                               |       |       |       |       |       |
|-----------------------------------------------|-------|-------|-------|-------|-------|
| Model type: TWMNH-48HCXXX                     |       |       |       |       |       |
| Maximum Power: P <sub>max</sub> [W]           | 430   | 435   | 440   | 445   | 450   |
| Open Circuit Voltage: Voc [V]                 | 34.95 | 35.15 | 35.35 | 35.55 | 35.75 |
| Short Circuit Current: Isc [A]                | 15.83 | 15.86 | 15.89 | 15.92 | 15.95 |
| Voltage at Maximum Power: V <sub>mp</sub> [V] | 29.16 | 29.42 | 29.67 | 29.93 | 30.19 |
| Current at Maximum Power: Imp [A]             | 14.75 | 14.79 | 14.83 | 14.87 | 14.91 |
| Module Efficiency: η [%]                      | 21.5  | 21.8  | 22.0  | 22.3  | 22.5  |

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

## ELECTRICAL CHARACTERISTICS (BNPI)

|                                               |       |       |       |       |       |
|-----------------------------------------------|-------|-------|-------|-------|-------|
| Maximum Power: P <sub>max</sub> [W]           | 474.7 | 480.4 | 485.7 | 491.5 | 496.9 |
| Open Circuit Voltage: Voc [V]                 | 34.95 | 35.15 | 35.35 | 35.55 | 35.75 |
| Short Circuit Current: Isc [A]                | 17.48 | 17.51 | 17.54 | 17.57 | 17.61 |
| Voltage at Maximum Power: V <sub>mp</sub> [V] | 29.16 | 29.42 | 29.67 | 29.93 | 30.19 |
| Current at Maximum Power: Imp [A]             | 16.28 | 16.33 | 16.37 | 16.42 | 16.46 |

\* BNPI: Front side Irradiance 1000W/m<sup>2</sup>, Back side irradiance 135W/m<sup>2</sup>, Cell Temperature=25°C, AM=1.5, Power measurement tolerance: ±3%

## ELECTRICAL CHARACTERISTICS (NMOT)

|                                               |       |       |       |       |       |
|-----------------------------------------------|-------|-------|-------|-------|-------|
| Maximum Power: P <sub>max</sub> [W]           | 325   | 329   | 332   | 336   | 340   |
| Open Circuit Voltage: Voc [V]                 | 33.27 | 33.46 | 33.65 | 33.84 | 34.03 |
| Short Circuit Current: Isc [A]                | 12.78 | 12.80 | 12.83 | 12.85 | 12.88 |
| Voltage at Maximum Power: V <sub>mp</sub> [V] | 27.29 | 27.56 | 27.74 | 27.98 | 28.24 |
| Current at Maximum Power: Imp [A]             | 11.91 | 11.94 | 11.97 | 12.01 | 12.04 |

\* NMOT: Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, AM=1.5, Wind Speed 1m/s

## TEMPERATURE RATING

|                                             |            |
|---------------------------------------------|------------|
| Temperature Coefficient of P <sub>max</sub> | -0.28%/°C  |
| Temperature Coefficient of Voc              | -0.24%/°C  |
| Temperature Coefficient of Isc              | +0.046%/°C |
| NMOT                                        | 45±2°C     |

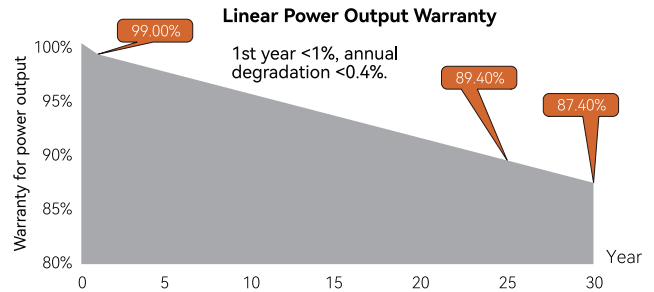
## OPERATING PARAMETERS

|                                             |             |
|---------------------------------------------|-------------|
| Operating Temperature                       | -40°C~+70°C |
| Maximum System Voltage                      | 1500V DC    |
| Maximum Series Fuse Rating                  | 30A         |
| Power Selection Tolerance                   | 0~+3%       |
| Bifaciality coefficient of P <sub>max</sub> | 80±10%      |
| Bifaciality coefficient of Voc              | 98±5%       |
| Bifaciality coefficient of Isc              | 80±10%      |
| Fire Class Rating                           | Class C     |

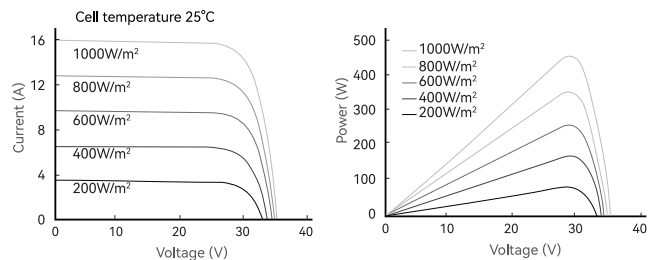
## MECHANICAL PARAMETERS

|                  |                                                                                                                                                                           |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cell Type        | TNC (N Type Monocrystalline Cell)                                                                                                                                         |
| Cell Orientation | 96[6×16]                                                                                                                                                                  |
| Dimensions       | 1762±2×1134±2×30mm                                                                                                                                                        |
| Weight           | 20.9kg                                                                                                                                                                    |
| Front Glass      | 1.6mm AR coated heat strengthened glass                                                                                                                                   |
| Rear Glass       | 1.6mm heat strengthened glass                                                                                                                                             |
| Frame            | Anodized aluminum alloy black frame                                                                                                                                       |
| Junction Box     | IP68, 3diodes                                                                                                                                                             |
| Cable            | 4.0mm <sup>2</sup>                                                                                                                                                        |
| Cable length     | +1200mm, -1200mm, length can be customized                                                                                                                                |
| Connector        | TW-PVCON-01(Tongwei Solar)<br>PV-KST4-EVO2/xy_UR, PV-KBT4-EVO2/xy_UR(Stäubli)<br>PV-KST4-EVO2A/xy, PV-KBT4-EVO2A/xy(Stäubli)<br>PV-ZH202B(Zhonghuan), PV-JK03M2/xy(Jinko) |
| Wind/Snow load   | 2400Pa/5400Pa                                                                                                                                                             |
| Per pallet       | 36pcs                                                                                                                                                                     |
| Packaging        | 936pcs per 40'HC                                                                                                                                                          |

## 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 / Occupational 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)

