



# TWMND-54HS415-435W

N-type Half-cell Monofacial Black Frame Module (54)

## PRODUCT FEATURES



High Power Output  
Low LCOE



Maximum Power  
435W+



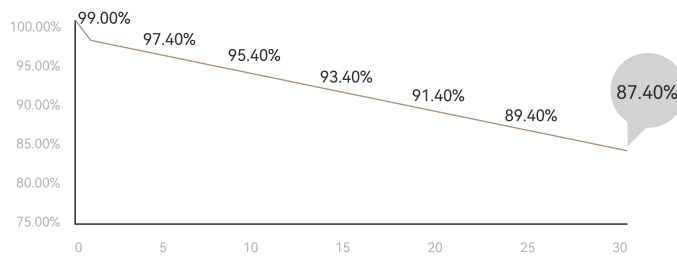
High Reliability



Low LID

## POWER WARRANTY

1st year <1%, 0.4% power degradation per year from 2 to 30 years



12-year Warranty for Materials



30-year Warranty for Linear Power Output

## MANAGEMENT SYSTEM AND PRODUCT CERTIFICATION

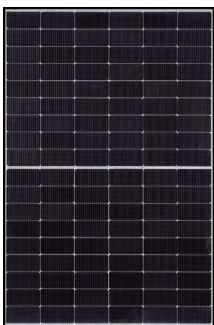
ISO9001: 2015/Quality Management System

ISO14001: 2015/Environment Management System

ISO45001: 2018/Occupational Health and Safety Management System



Front



Rear



## Electrical Characteristics (STC)

Module Type: TWMND-54HSXXX

|                                   |       |       |       |       |       |
|-----------------------------------|-------|-------|-------|-------|-------|
| Maximum Power: Pmax [W]           | 415   | 420   | 425   | 430   | 435   |
| Open Circuit Voltage: Voc [V]     | 37.85 | 38.00 | 38.15 | 38.30 | 38.45 |
| Short Circuit Current: Isc [A]    | 14.22 | 14.27 | 14.32 | 14.37 | 14.42 |
| Voltage at Maximum Power: Vmp [V] | 31.25 | 31.41 | 31.57 | 31.73 | 31.89 |
| Current at Maximum Power: Imp [A] | 13.28 | 13.37 | 13.46 | 13.55 | 13.64 |
| Module Efficiency: $\eta$ [%]     | 21.3  | 21.5  | 21.8  | 22.0  | 22.3  |

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass1.5, Measuring Tolerance:  $\pm$ 3%

## Electrical Characteristics (NMOT)

|                                   |       |       |       |       |       |
|-----------------------------------|-------|-------|-------|-------|-------|
| Maximum Power: Pmax [W]           | 312.0 | 316.0 | 320.0 | 324.0 | 328.0 |
| Open Circuit Voltage: Voc [V]     | 35.98 | 36.14 | 36.30 | 36.46 | 36.62 |
| Short Circuit Current: Isc [A]    | 11.51 | 11.57 | 11.63 | 11.69 | 11.75 |
| Voltage at Maximum Power: Vmp [V] | 29.18 | 29.34 | 29.50 | 29.66 | 29.82 |
| Current at Maximum Power: Imp [A] | 10.69 | 10.77 | 10.85 | 10.92 | 11.00 |

NMOT: Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, Air Mass1.5, Wind Speed 1m/s

## Mechanical Parameters

|                  |  |
|------------------|--|
| Cells            | TNC  |
| Cell Orientation | 108[6X18]  |
| Dimension        | 1722 $\pm$ 2 X 1134 $\pm$ 2X30mm                         |
| Weight           | 20.5kg   |
| Front Glass      | 3.2mm high transmittance, AR coated tempered glass       |
| Backsheet        | White  |
| Frame            | Anodized aluminum alloy black frame                      |
| Junction Box     | IP68, 3 diodes   |
| Output Cable     | 4.0mm <sup>2</sup>                                       |
| Cable Length     | +400mm, -200mm or $\pm$ 1200mm, length can be customized |
| Wind/Snow Load   | 2400Pa/5400Pa  |
| Packaging        | 36pcs per pallet, 936pcs per 40'HC                       |

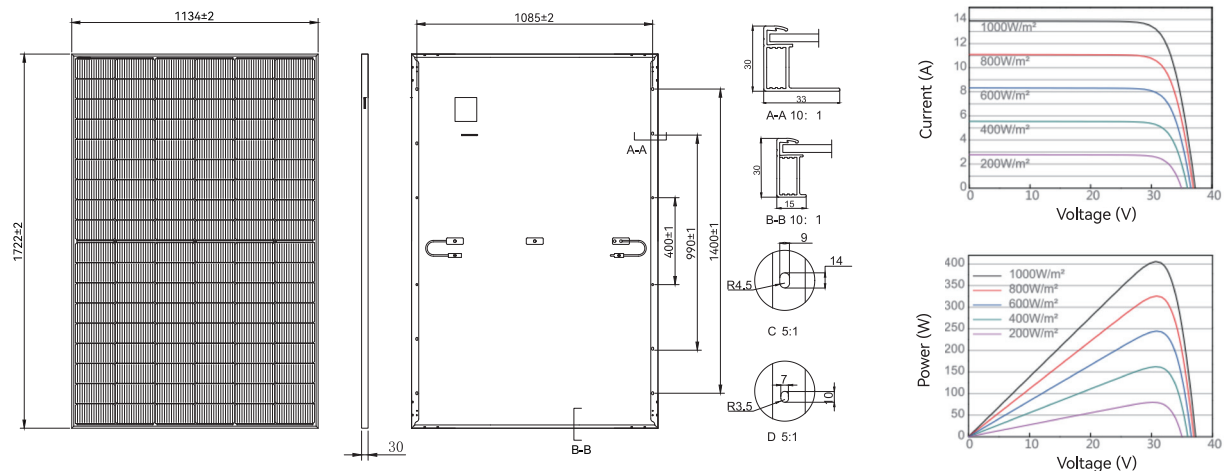
## Operating Parameters

|                            |             |
|----------------------------|-------------|
| Operational Temperature    | -40°C~+85°C |
| Maximum System Voltage     | 1500V DC    |
| Maximum Series Fuse Rating | 25A         |
| Power Output Tolerance     | 0~+5W       |

## Temperature Ratings

|                                |              |
|--------------------------------|--------------|
| Temperature Coefficient (Pmax) | -0.30%/°C    |
| Temperature Coefficient (Voc)  | -0.25%/°C    |
| Temperature Coefficient (Isc)  | +0.046%/°C   |
| NMOT                           | 45 $\pm$ 2°C |

## Drawings (Unit: mm)



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