

## N-type i-TOPCon Ultra

DUAL GLASS MONOCRYSTALLINE MODULE

TSM-NEG9RP.25Z 460-480W

**480W** MAXIMUM POWER OUTPUT

**24.0%** MAXIMUM EFFICIENCY



### Premium full black aesthetic

- Uniform, all-black, full-screen high density interconnection for a seamless design with no cell gaps



### High power & efficiency

- Up to 480 W and 24% efficiency with low-voltage, high-current architecture for more power on limited roof space



### Optimised performance

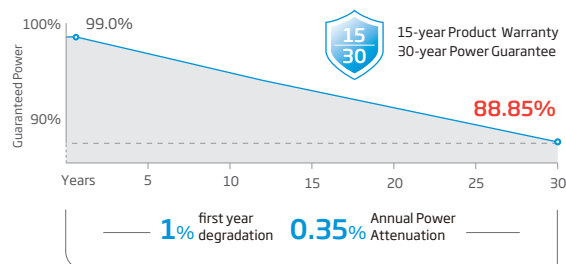
- Lower temperature coefficient and strong low-irradiance performance maximises power generation on rooftops



### Long-term value for residential homes

- Low annual degradation backed by up to 30 year power warranty and 25 year product warranty

### Performance Warranty



\* Please refer to product warranty for details

### Comprehensive Products and System Certificates

- ISO 9001: Quality Management System
- ISO 14001: Environmental Management System
- ISO14064: Greenhouse Gases Emissions Verification
- ISO45001: Occupational Health and Safety Management System



\*For ground-mounted installation, please consult Trinasolar sales team.

## ELECTRICAL DATA (STC)

|                                      |        |       |       |       |       |
|--------------------------------------|--------|-------|-------|-------|-------|
| Peak Power Watts- $P_{MAX}(W_p)^*$   | 460    | 465   | 470   | 475   | 480   |
| Power Selection (W)**                | 0 ~ +5 |       |       |       |       |
| Maximum Power Voltage- $V_{MPP}$ (V) | 30.90  | 31.20 | 31.50 | 31.80 | 32.00 |
| Maximum Power Current- $I_{MPP}$ (A) | 14.89  | 14.91 | 14.93 | 14.96 | 15.00 |
| Open Circuit Voltage- $V_{oc}$ (V)   | 36.90  | 37.10 | 37.30 | 37.50 | 37.70 |
| Short Circuit Current- $I_{sc}$ (A)  | 15.93  | 15.96 | 15.99 | 16.02 | 16.05 |
| Module Efficiency $\eta_m$ (%)       | 23.0   | 23.3  | 23.5  | 23.8  | 24.0  |

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. \*Measuring tolerance:  $\pm 3\%$ . \*\*Power selection up to: +3%.

## ELECTRICAL DATA (NOCT)

|                                      |       |       |       |       |       |
|--------------------------------------|-------|-------|-------|-------|-------|
| Peak Power Watts- $P_{MAX}(W_p)$     | 349   | 353   | 357   | 361   | 364   |
| Maximum Power Voltage- $V_{MPP}$ (V) | 29.00 | 29.20 | 29.40 | 29.60 | 29.80 |
| Maximum Power Current- $I_{MPP}$ (A) | 12.06 | 12.11 | 12.16 | 12.20 | 12.23 |
| Open Circuit Voltage- $V_{oc}$ (V)   | 35.00 | 35.20 | 35.40 | 35.60 | 35.80 |
| Short Circuit Current- $I_{sc}$ (A)  | 12.80 | 12.83 | 12.85 | 12.88 | 12.90 |

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

## TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature) 43°C ( $\pm 2^\circ\text{C}$ )

Temperature Coefficient of  $P_{MAX}$  -0.26% /°C

Temperature Coefficient of  $V_{oc}$  -0.24% /°C

Temperature Coefficient of  $I_{sc}$  0.04% /°C

Due to different testing methods, the actual performances might differ from the declared specifications.

## APPLICATION CONDITIONS

Operating Temperature -40~+70°C

Maximum System Voltage 1500V DC (IEC)

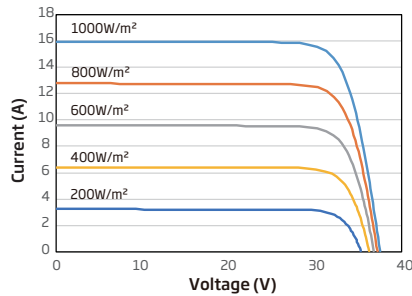
Max Series Fuse Rating 30A

\*PV module 98th percentile operating temperature: 70°C.

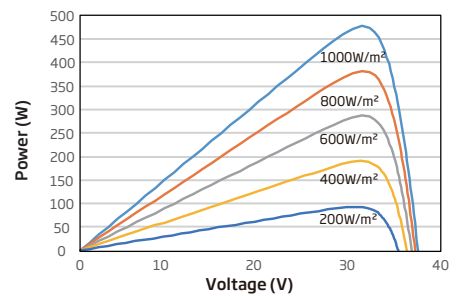
## CURVES OF PV MODULE

Preliminary

I-V CURVES OF PV MODULE (475W)



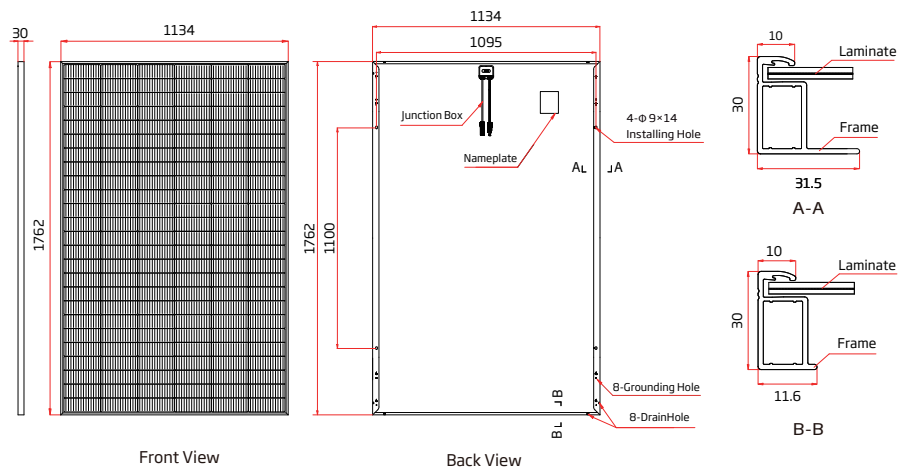
P-V CURVES OF PV MODULE (475W)



## MECHANICAL DATA

|                   |                                                                                                                                                             |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solar Cells       | N-type i-TOPCon Monocrystalline                                                                                                                             |
| No. of cells      | 150 cells                                                                                                                                                   |
| Module Dimensions | 1762×1134×30 mm<br>(69.37×44.65×1.18 inches)                                                                                                                |
| Weight            | 21.1 kg (46.52lb)                                                                                                                                           |
| Front Glass       | 1.6mm (0.06inches),<br>AR Coating Heat Strengthened Glass                                                                                                   |
| Back Glass        | 1.6mm (0.06inches),<br>Heat Strengthened Glass                                                                                                              |
| Frame             | 30mm (1.18 inches)<br>Anodized Aluminium Alloy, Black                                                                                                       |
| J-Box             | IP 68 rated                                                                                                                                                 |
| Cables            | Photovoltaic Technology<br>Cable 6.0mm <sup>2</sup> (0.009inches <sup>2</sup> )<br>Landscape :1100/1100 mm (43.31/43.31 inches)<br>Length can be customized |
| Connector         | TS4 Plus / TS4 / MC4 EV02*                                                                                                                                  |
| Packaging         | Modules per box: 36 pieces<br>Modules per 40' container: 936pieces                                                                                          |

\*The connector names listed are general names; specific types are subject to the certification documents.



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CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.  
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