

N-type i-TOPCon Ultra

DUAL GLASS MONOCRYSTALLINE MODULE

TSM-NEG9RP.25Z 460-480W

480_W / 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

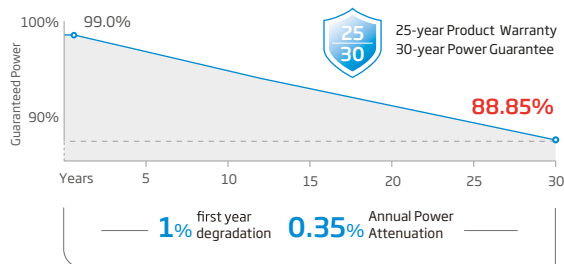
- Lower temperature coefficient and strong low-irradiance performance maximises power generation on rooftops



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

IEC61215/IEC61730/IEC61701/IEC62716

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	37.40	37.70
Short Circuit Current- I_{sc} (A)	15.93	15.96	15.99	16.02	16.05
Module Efficiency η_m (%)	23.0	23.3	23.5	23.8	24.0

STC: Irradiance 1000W/m², 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/m², 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

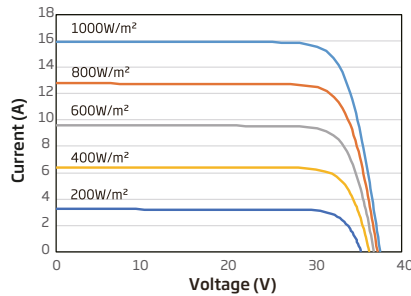
Maximum System Voltage 1500V DC (IEC)

Max Series Fuse Rating 30 A

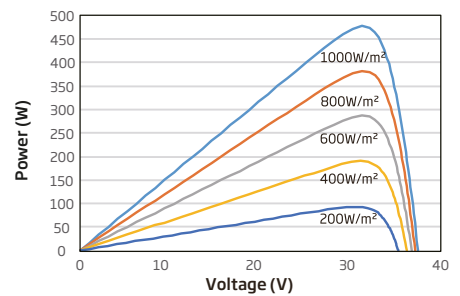
*PV module 98th percentile operating temperature $\leq 70^\circ\text{C}$

CURVES OF PV MODULE

I-V CURVES OF PV MODULE (475 W)



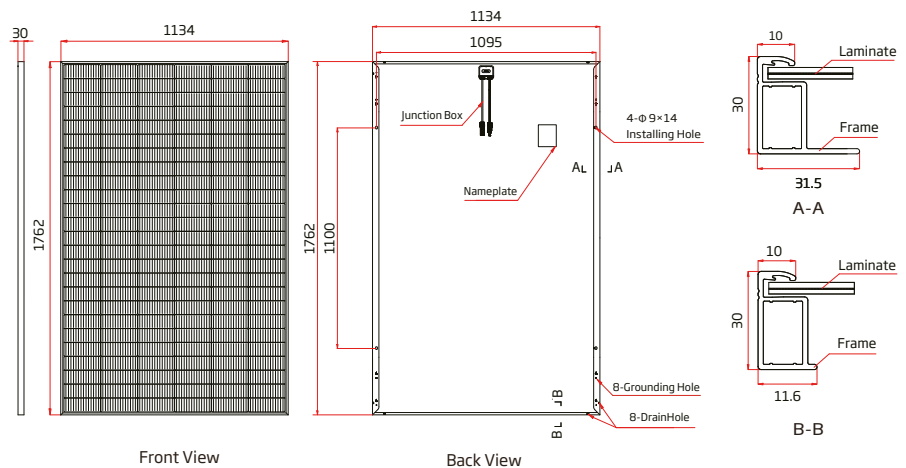
P-V CURVES OF PV MODULE (475 W)



MECHANICAL DATA

Solar Cells	N-type i-TOPCon Monocrystalline
No. of cells	150 cells
Module Dimensions	1762×1134×30 mm (69.37×44.65×1.18 inches)
Weight	21.7 kg (47.84lb)
Front Glass	1.6 mm (0.06 inches), AR Coating Heat Strengthened Glass
Back Glass	1.6 mm (0.06 inches), Heat Strengthened Glass
Frame	30 mm (1.18 inches) Anodized Aluminium Alloy, Black
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 6.0 mm ² (0.009 inches ²) Landscape: 1100/1100 mm (43.31/43.31 inches) Length can be customized
Connector	TS4 Plus / TS4 / MC4 EV02*
Packaging	Modules per box: 37 pieces Modules per 40' container: 962 pieces

*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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