

Vertex S+

DUAL GLASS MONOCRYSTALLINE MODULE

PRODUCT: TSM-XXXNEG9.28

PRODUCT RANGE: 400-425W

425W

MAXIMUM POWER OUTPUT

0~+5W

BINNING TOLERANCE

21.9%

MAXIMUM EFFICIENCY

25 Years **PRODUCT WARRANTY**

30 Years **POWER WARRANTY**



Small in size, bigger on power

- Up to 425W, 21.9% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping, lower series resistance, improved current collection and enhanced reliability
- Reduce installation cost with higher power bin and efficiency
- Boost performance in warm weather with low temperature coefficient and operating temperature



Dual-glass Design, more secure and sustainable

- Upgraded dual glass of Vertex S, less prone to micro-cracks and scratches on the back during installation
- Double-glass + innovative non-destructive cutting for improved mechanical resistance and strength
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas and fire class rating A or C



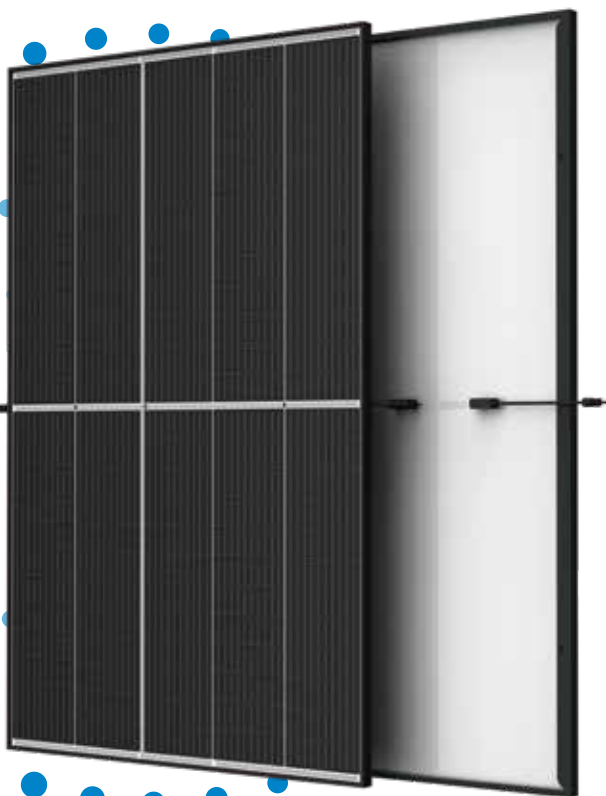
Ultra-low Degradation, longer warranty, higher output

- First-year degradation 1% and annual degradation at 0.4%
- 25 years product warranty and 30 years power warranty

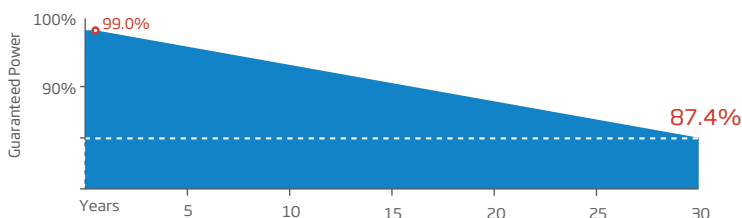


Universal solution for residential and C&I rooftops

- Easy for integration, designed for compatibility with existing mainstream inverters and diverse mounting systems
- Perfect size and low weight for handling and installation
- Most valuable solution on low load capacity rooftops (weight similar to backsheet version)
- Mechanical performance up to 5400 Pa positive load and 4000 Pa negative load



Trina Solar's Dual Glass Performance Warranty



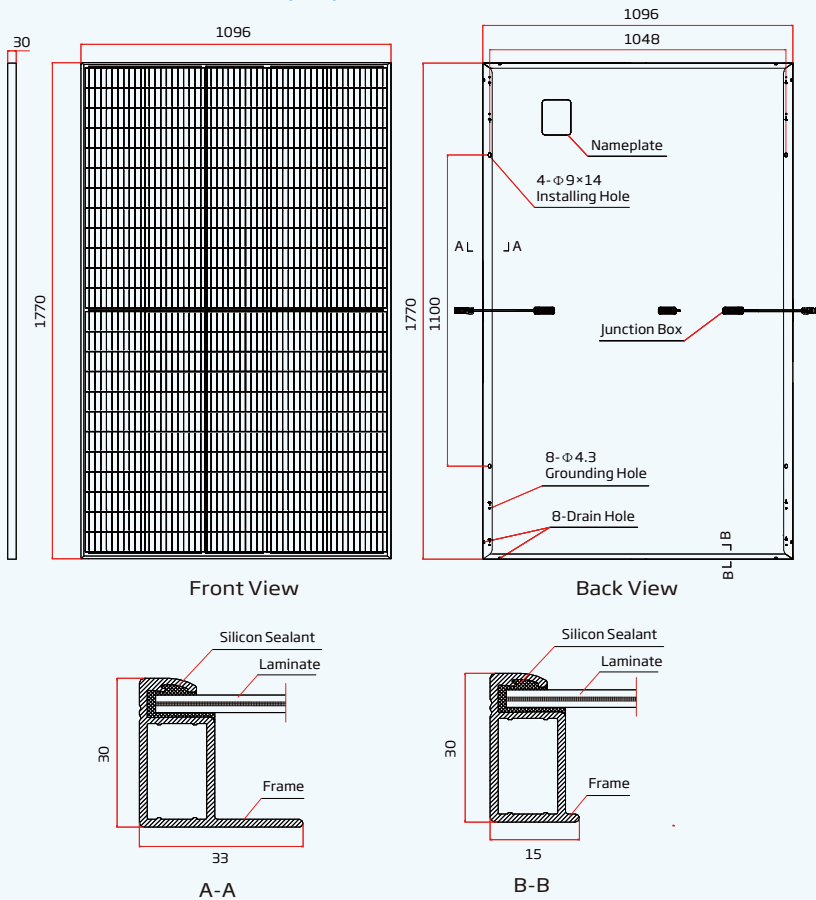
Comprehensive Products and System Certificates



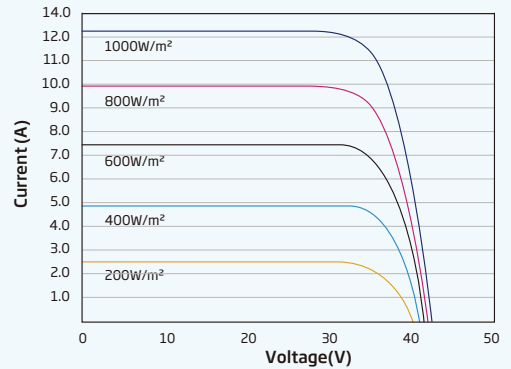
ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO 14064: Greenhouse Gases Emissions Verification
 ISO 45001: Occupational Health and Safety Management System



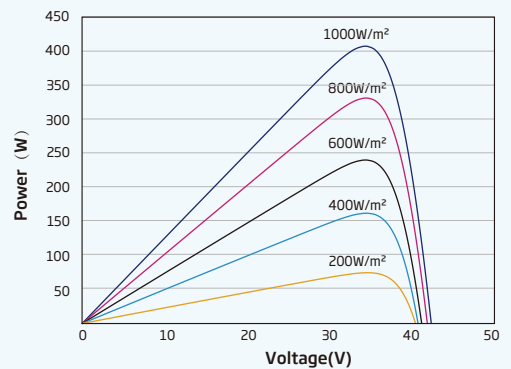
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(415 W)



P-V CURVES OF PV MODULE(415W)



ELECTRICAL DATA (STC) TSM-XXXNEG9.28(XXX=400-425)

| | | | | | | |
|--|--------|-------|-------|-------|-------|-------|
| Peak Power Watts-P _{MAX} (Wp)* | 400 | 405 | 410 | 415 | 420 | 425 |
| Binning Tolerance-P _{MAX} (W) | 0 ~ +5 | | | | | |
| Maximum Power Voltage-V _{MPP} (V) | 35.1 | 35.4 | 35.7 | 36.0 | 36.3 | 36.6 |
| Maximum Power Current-I _{MPP} (A) | 11.41 | 11.44 | 11.48 | 11.52 | 11.57 | 11.61 |
| Open Circuit Voltage-V _{OC} (V) | 41.9 | 42.2 | 42.4 | 42.7 | 43.1 | 43.4 |
| Short Circuit Current-I _{SC} (A) | 12.16 | 12.20 | 12.23 | 12.27 | 12.33 | 12.37 |
| Module Efficiency η _m (%) | 20.6 | 20.9 | 21.1 | 21.4 | 21.7 | 21.9 |

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

ELECTRICAL DATA (NOCT)

| | | | | | | |
|--|------|------|------|------|------|------|
| Maximum Power-P _{MAX} (Wp) | 305 | 308 | 312 | 316 | 320 | 324 |
| Maximum Power Voltage-V _{MPP} (V) | 32.8 | 33.1 | 33.3 | 33.6 | 33.9 | 34.2 |
| Maximum Power Current-I _{MPP} (A) | 9.29 | 9.32 | 9.36 | 9.40 | 9.45 | 9.48 |
| Open Circuit Voltage-V _{OC} (V) | 39.7 | 40.0 | 40.2 | 40.5 | 40.8 | 41.1 |
| Short Circuit Current-I _{SC} (A) | 9.80 | 9.83 | 9.86 | 9.89 | 9.94 | 9.97 |

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

| | |
|----------------------|--|
| Solar Cells | N type Monocrystalline |
| No. of cells | 120 cells |
| Module Dimensions | 1770×1096×30 mm (69.06×43.15×1.18 inches) |
| Weight | 21.5 kg (47.4lb) |
| Front Glass | 1.6 mm (0.06 inches), High Transmission, AR Coated Heat Strengthened Glass |
| Encapsulant material | EVA/POE |
| Back Glass | 1.6mm(0.06 inches), Heat Strengthened Glass |
| Frame | 30mm (0.06 inches) Anodized Aluminium Alloy, Black |
| J-Box | IP 68 rated |
| Cables | Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), Portrait: 280/280 mm(11.02/11.02 inches) Length can be customized |
| Connector | Staubli MC4 EVO2 / Trina TS4 |

TEMPERATURE RATINGS

| | |
|---|-------------|
| NOCT(Nominal Operating Cell Temperature) | 43°C (±2°C) |
| Temperature Coefficient of P _{MAX} | -0.30%/°C |
| Temperature Coefficient of Voc | -0.25%/°C |
| Temperature Coefficient of Isc | 0.04%/°C |

MAXIMUM RATINGS

| | |
|-------------------------|----------------|
| Operational Temperature | -40~+85°C |
| Maximum System Voltage | 1500V DC (IEC) |
| Max Series Fuse Rating | 25A |

WARRANTY

25 year Product Workmanship Warranty
30 year Power Warranty
1% first year degradation
0.4% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 36 pieces
Modules per 40' container: 936 pieces