

Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09R
 PRODUCT RANGE: 415-435W

435W

MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

21.8%

MAXIMUM EFFICIENCY



Small in size, big on power

- Small form factor. Generate a huge amount of energy even in limited space.
- Up to 435W, 21.8% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection
- Reduce installation cost with higher power bin and efficiency
- Boost performance in warm weather lower temperature coefficient (-0.34%) and operating temperature



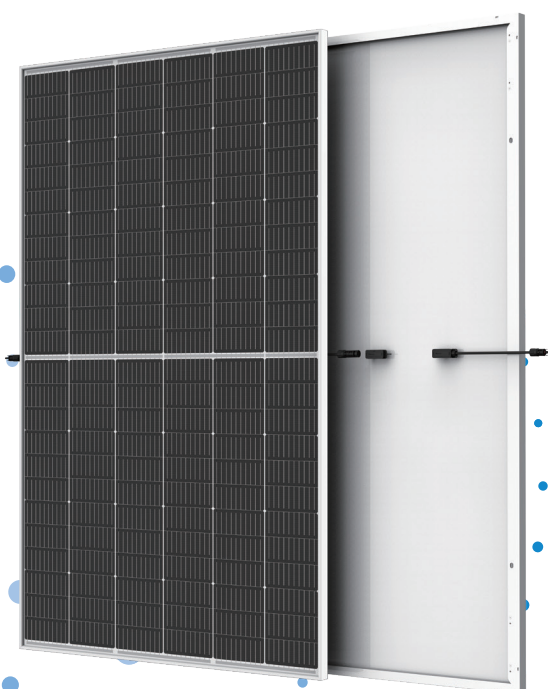
Universal solution for residential and C&I rooftops

- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems
- Perfect size and low weight. Easy for handling. Economy for transporting
- Diverse installation solutions. Flexible for system deployment

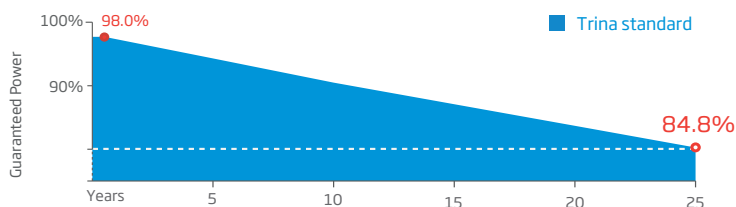


High Reliability

- 12 year product warranty
- 25 year performance warranty with lowest degradation;
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Mechanical performance up to 6000 Pa positive load and 4000 Pa negative load



Trina Solar's Backsheet Performance Warranty



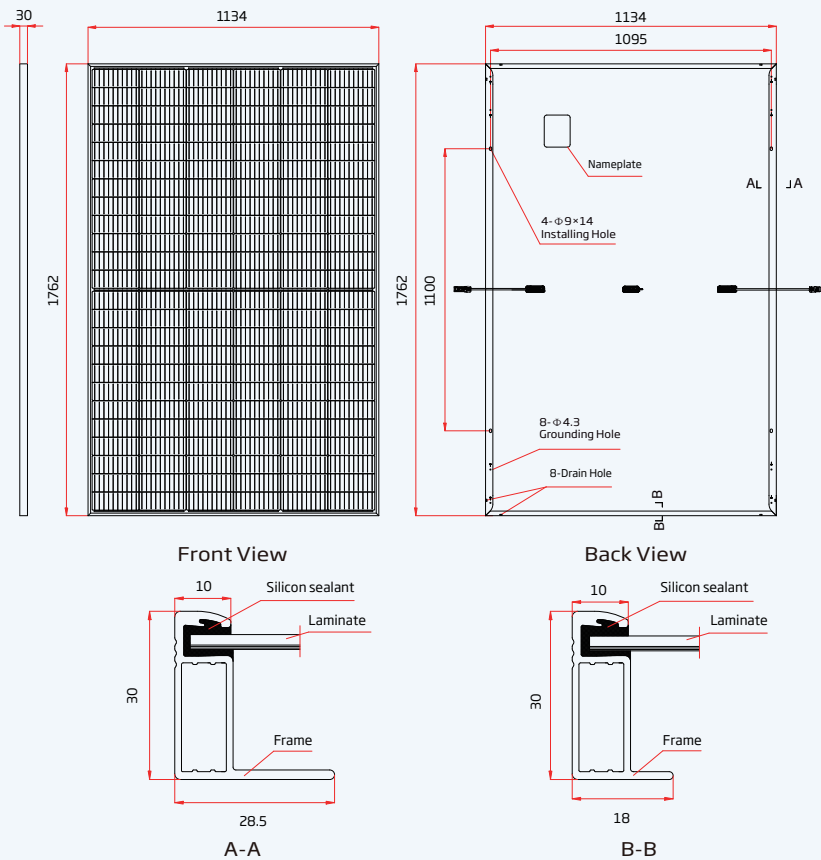
Comprehensive Products and System Certificates



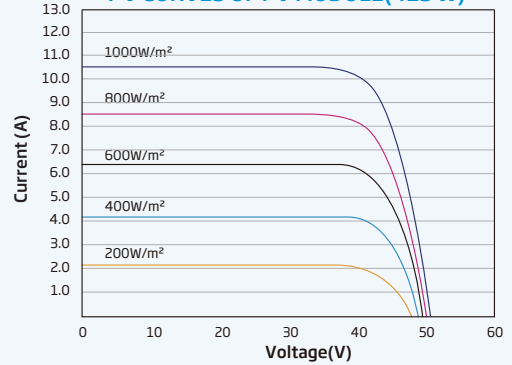
IEC61215/IEC61730/IEC61701/IEC62716
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System



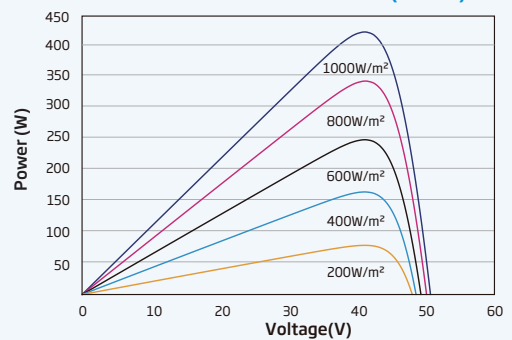
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(425 W)



P-V CURVES OF PV MODULE(425W)



ELECTRICAL DATA (STC)

| Parameter | 415 | 420 | 425 | 430 | 435 |
|--------------------------------------|-------|-------|--------|-------|-------|
| Peak Power Watts- P_{MAX} (Wp)* | 415 | 420 | 425 | 430 | 435 |
| Power Tolerance- P_{MAX} (W) | | | 0 ~ +5 | | |
| Maximum Power Voltage- V_{MPP} (V) | 41.7 | 42.0 | 42.2 | 42.3 | 42.5 |
| Maximum Power Current- I_{MPP} (A) | 9.94 | 10.01 | 10.08 | 10.17 | 10.24 |
| Open Circuit Voltage- V_{OC} (V) | 50.0 | 50.1 | 50.2 | 50.3 | 50.4 |
| Short Circuit Current- I_{SC} (A) | 10.55 | 10.58 | 10.61 | 10.64 | 10.67 |
| Module Efficiency η_m (%) | 20.8 | 21.0 | 21.3 | 21.5 | 21.8 |

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

ELECTRICAL DATA (NOCT)

| Parameter | 312 | 317 | 321 | 325 | 329 |
|--------------------------------------|------|------|------|------|------|
| Maximum Power- P_{MAX} (Wp) | 312 | 317 | 321 | 325 | 329 |
| Maximum Power Voltage- V_{MPP} (V) | 38.7 | 39.2 | 39.5 | 39.7 | 40.0 |
| Maximum Power Current- I_{MPP} (A) | 8.07 | 8.10 | 8.13 | 8.17 | 8.23 |
| Open Circuit Voltage- V_{OC} (V) | 47.1 | 47.1 | 47.2 | 47.4 | 47.5 |
| Short Circuit Current- I_{SC} (A) | 8.50 | 8.53 | 8.55 | 8.60 | 8.65 |

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

MECHANICAL DATA

| | |
|----------------------|---|
| Solar Cells | Monocrystalline |
| No. of cells | 144 cells |
| Module Dimensions | 1762×1134×30 mm (69.37×44.65×1.18 inches) |
| Weight | 21.6 kg (47.6 lb) |
| Glass | 3.2 mm (0.13 inches), High Transmission, Tempered Glass |
| Encapsulant material | EVA/POE |
| Backsheet | White |
| Frame | 30mm(1.18 inches) Anodized Aluminium Alloy |
| J-Box | IP 68 rated |
| Cables | Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²) Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized |
| Connector | MC4 EV02 / TS4 Plus/ TS4* |

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

| | |
|---|-------------|
| NOCT (Nominal Operating Cell Temperature) | 43°C (±2°C) |
| Temperature Coefficient of P_{MAX} | -0.34%/°C |
| Temperature Coefficient of V_{OC} | -0.25%/°C |
| Temperature Coefficient of I_{SC} | 0.04%/°C |

MAXIMUM RATINGS

| | |
|-------------------------|----------------|
| Operational Temperature | -40~+85°C |
| Maximum System Voltage | 1500V DC (IEC) |
| Max Series Fuse Rating | 20A |

WARRANTY

12 year Product Workmanship Warranty
 25 year Power Warranty
 2% first year degradation
 0.55% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

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