

Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09R.05

PRODUCT RANGE: 405-425W

425W

MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

21.3%

MAXIMUM EFFICIENCY



Outstanding Visual Appearance

- Designed with aesthetics in mind
- Excellent cell color control by dedicated cell blackening treatment and machine selection.
- Thinner wires that appear all black at a distance



Small in size, big on power

- Small form factor. Generate a huge amount of energy even in limited space.
- Up to 425W, 21.3% 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

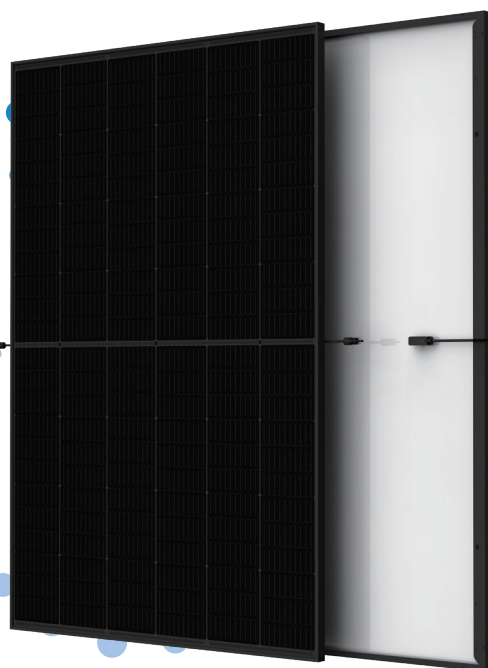
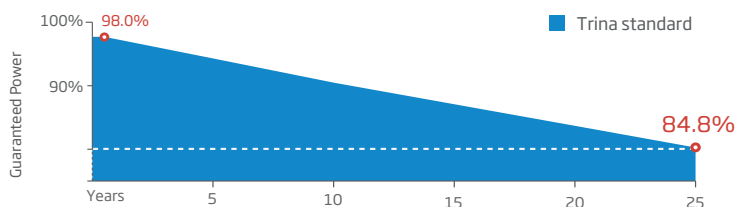
- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems
- Perfect size and low weight. Easy for handling. Economy for transporting
- Diverse installation solutions. Flexible for system deployment



High Reliability

- 15 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



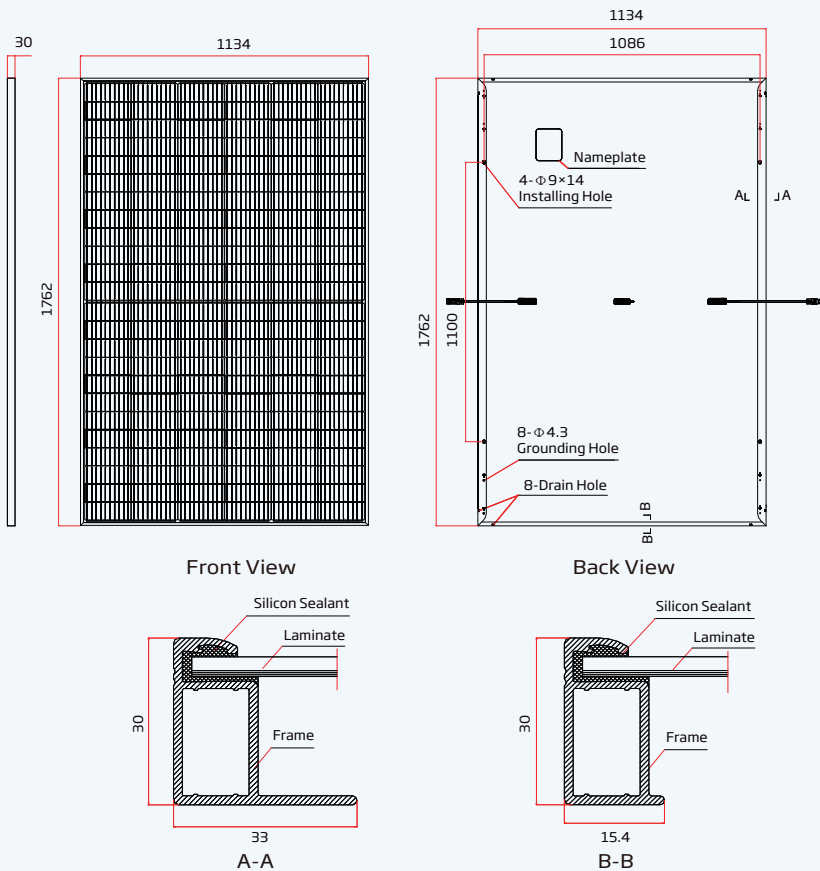
Comprehensive Products and System Certificates



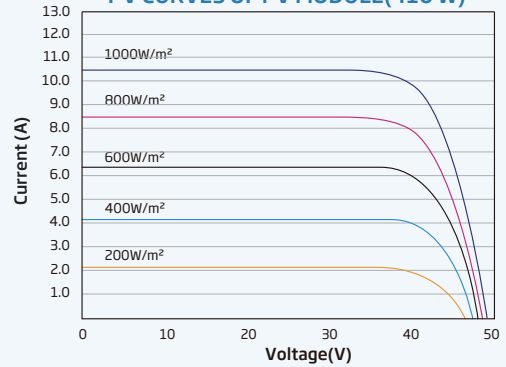
IEC61215/IEC61730/IEC61701/IEC62716/UL61730
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System



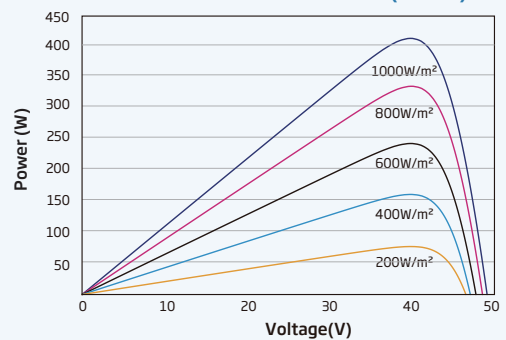
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(410 W)



P-V CURVES OF PV MODULE(410W)



ELECTRICAL DATA (STC)

| | | | | | |
|--------------------------------------|-------|-------|--------|-------|-------|
| Peak Power Watts- P_{MAX} (Wp)* | 405 | 410 | 415 | 420 | 425 |
| Power Tolerance- P_{MAX} (W) | | | 0 ~ +5 | | |
| Maximum Power Voltage- V_{MPP} (V) | 40.6 | 40.8 | 41.0 | 41.3 | 41.5 |
| Maximum Power Current- I_{MPP} (A) | 9.99 | 10.05 | 10.11 | 10.17 | 10.24 |
| Open Circuit Voltage- V_{OC} (V) | 49.0 | 49.2 | 49.4 | 49.7 | 49.9 |
| Short Circuit Current- I_{SC} (A) | 10.52 | 10.58 | 10.64 | 10.69 | 10.74 |
| Module Efficiency η_m (%) | 20.3 | 20.5 | 20.8 | 21.0 | 21.3 |

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

ELECTRICAL DATA (NOCT)

| | | | | | |
|--------------------------------------|------|------|------|------|------|
| Maximum Power- P_{MAX} (Wp) | 306 | 310 | 313 | 317 | 321 |
| Maximum Power Voltage- V_{MPP} (V) | 38.2 | 38.3 | 38.5 | 38.8 | 39.1 |
| Maximum Power Current- I_{MPP} (A) | 8.03 | 8.08 | 8.13 | 8.17 | 8.21 |
| Open Circuit Voltage- V_{OC} (V) | 46.1 | 46.3 | 46.5 | 46.7 | 46.9 |
| Short Circuit Current- I_{SC} (A) | 8.48 | 8.53 | 8.58 | 8.62 | 8.66 |

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 | 21.8 kg (48.1 lb) |
| Glass | 3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass |
| Encapsulant material | EVA/POE |
| Backsheet | Black-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* |

*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) 1500V DC (UL) |
| Max Series Fuse Rating | 20A |

WARRANTY

15 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