

# Vertex S

**BACKSHEET MONOCRYSTALLINE MODULE**

PRODUCT: TSM-DE09R.B5  
 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

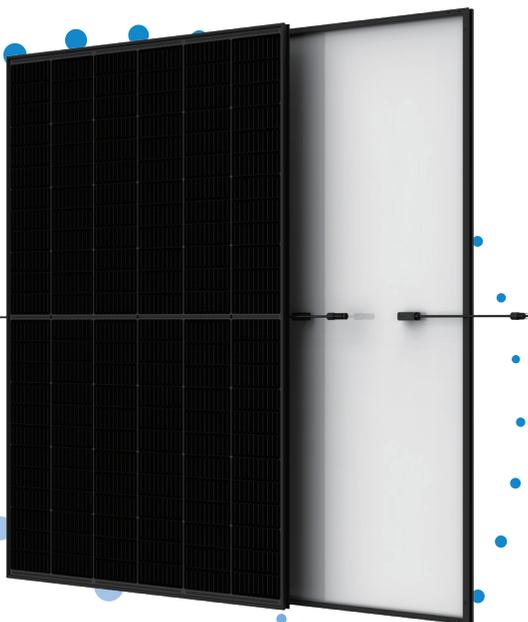
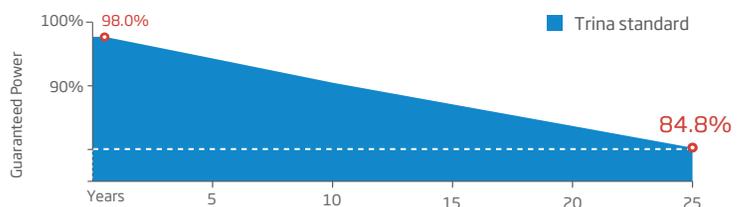
- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems
- Perfect size and low weight. Easy for handling. Economy for transporting
- Diverse installation solutions. Flexible for system deployment



### 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



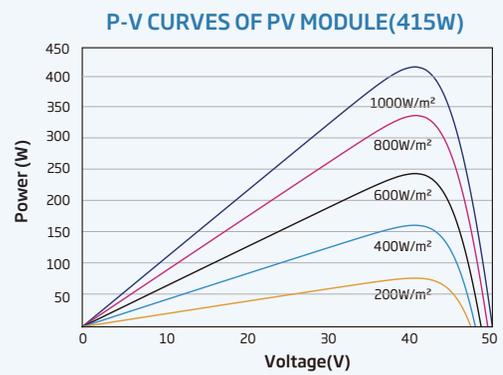
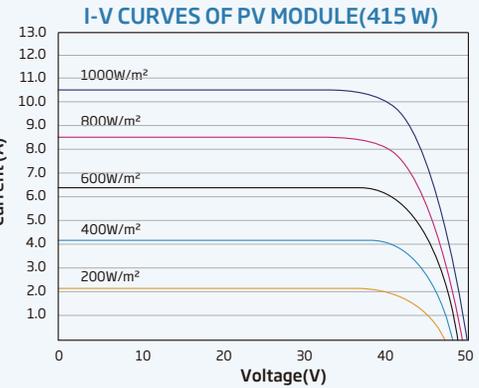
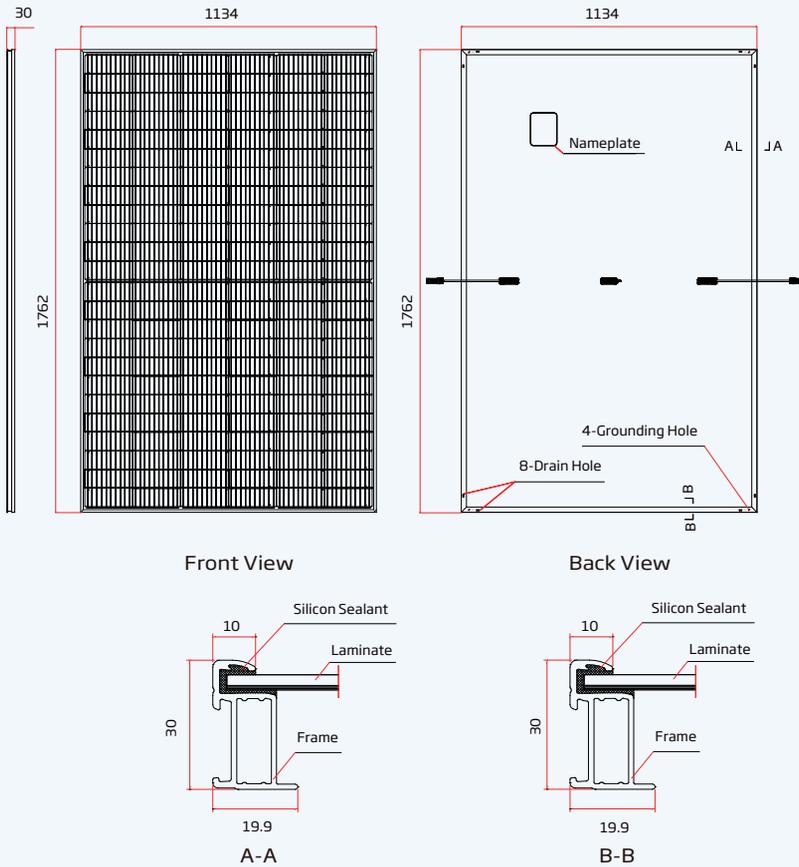
### Comprehensive Products and System Certificates



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)



## 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) | 41.3  | 41.5  | 41.7   | 42.0  | 42.2  |
| Maximum Power Current- $I_{MPP}$ (A) | 9.82  | 9.87  | 9.94   | 10.01 | 10.08 |
| Open Circuit Voltage- $V_{OC}$ (V)   | 49.7  | 49.8  | 50.0   | 50.1  | 50.2  |
| Short Circuit Current- $I_{SC}$ (A)  | 10.50 | 10.53 | 10.55  | 10.58 | 10.61 |
| Module Efficiency $\eta_m$ (%)       | 20.3  | 20.5  | 20.8   | 21.0  | 21.3  |

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. \*Measuring tolerance: ±3%.

## ELECTRICAL DATA (NOCT)

|                                      |      |      |      |      |      |
|--------------------------------------|------|------|------|------|------|
| Maximum Power- $P_{MAX}$ (Wp)        | 306  | 309  | 312  | 317  | 321  |
| Maximum Power Voltage- $V_{MPP}$ (V) | 38.3 | 38.5 | 38.7 | 39.2 | 39.5 |
| Maximum Power Current- $I_{MPP}$ (A) | 7.99 | 8.03 | 8.07 | 8.10 | 8.13 |
| Open Circuit Voltage- $V_{OC}$ (V)   | 46.8 | 46.9 | 47.1 | 47.1 | 47.2 |
| Short Circuit Current- $I_{SC}$ (A)  | 8.46 | 8.49 | 8.50 | 8.53 | 8.55 |

NOCT: Irradiance at 800W/m<sup>2</sup>, 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 <sup>2</sup> (0.006 inches <sup>2</sup> ),<br>Portrait: 350/280 mm(13.78/11.02 inches)<br>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)<br>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