

# Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09.08  
 PRODUCT RANGE: 390-405W

**405W+**

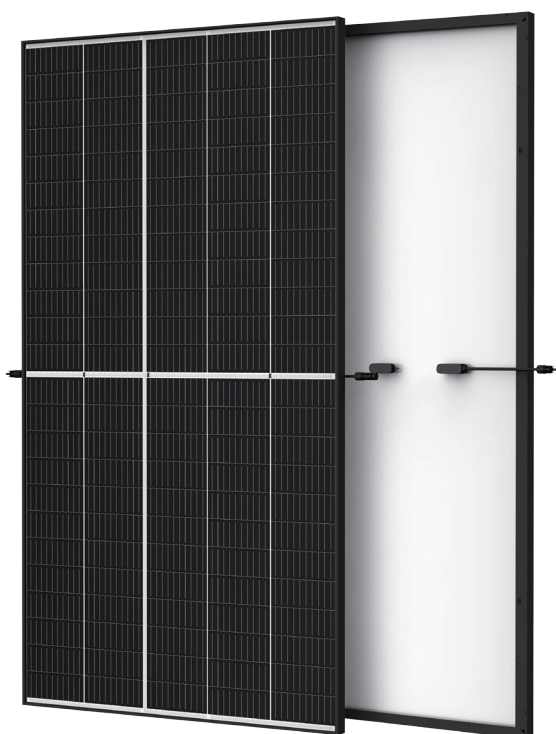
MAXIMUM POWER OUTPUT

**0~+5W**

POSITIVE POWER TOLERANCE

**21.1%**

MAXIMUM EFFICIENCY



### Small in size, big on power

- Small form factor. Generate a huge amount of energy even in limited space. Up to 405W, 21.1% 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 with lower temperature coefficient (-0.34%) and operating temperature



### Universal solution for residential and C&I rooftops

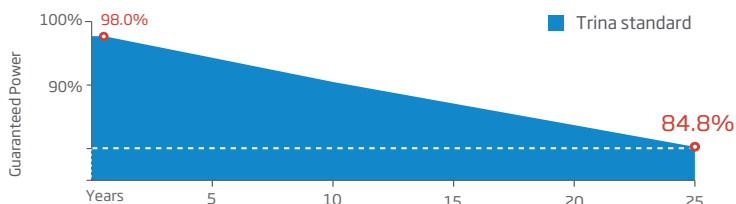
- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems
- Perfect size and low weight. Easy for handling. Economy for transporting
- Diverse installation solutions. Flexible for system deployment



### High Reliability

- 15 year product warranty
- 25 year performance warranty with lowest degradation;
- 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



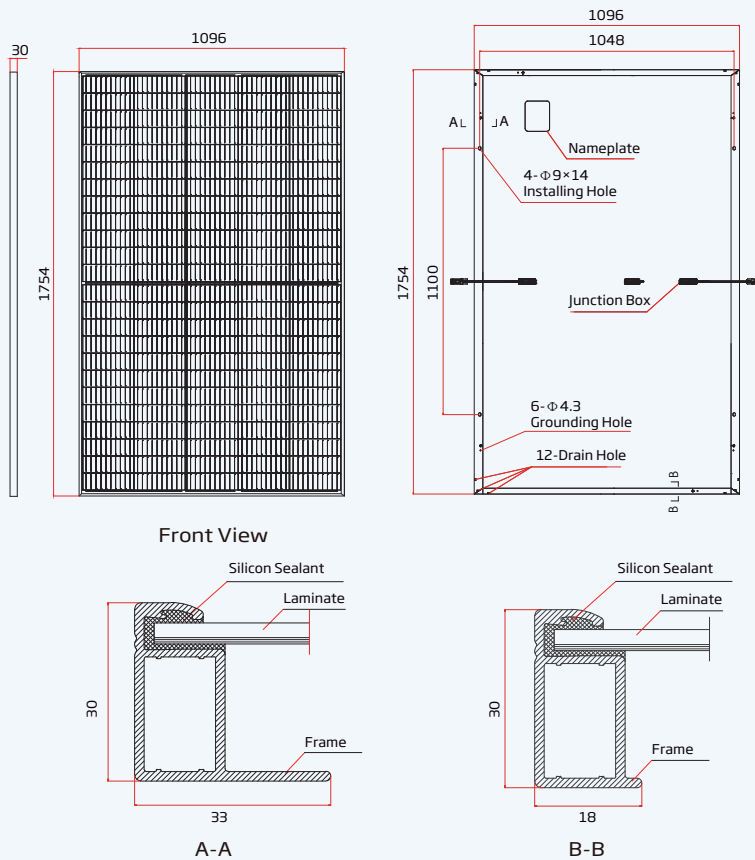
### Comprehensive Products and System Certificates



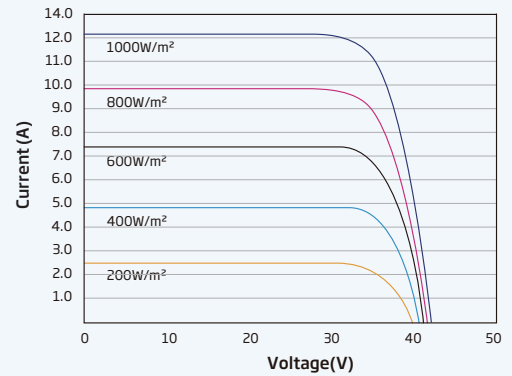
IEC61215/IEC61730/IEC61701/IEC62716  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System



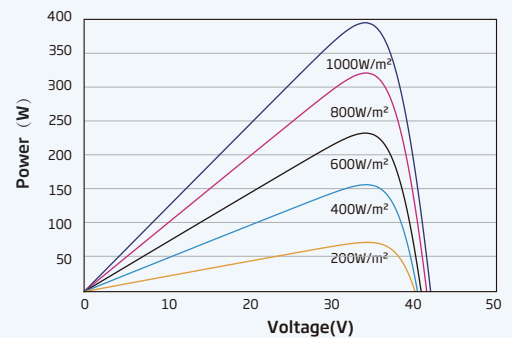
## DIMENSIONS OF PV MODULE(mm)



## I-V CURVES OF PV MODULE(395 W)



## P-V CURVES OF PV MODULE(395W)



## ELECTRICAL DATA (STC)

| Parameter                                  | 390    | 395   | 400   | 405   |
|--|--------|-------|-------|-------|
| Peak Power Watts-P <sub>MAX</sub> (Wp)*    | 390    | 395   | 400   | 405   |
| Power Tolerance-P <sub>MAX</sub> (W)       | 0 ~ +5 |       |       |       |
| Maximum Power Voltage-V <sub>MPP</sub> (V) | 33.8   | 34.0  | 34.2  | 34.4  |
| Maximum Power Current-I <sub>MPP</sub> (A) | 11.54  | 11.62 | 11.70 | 11.77 |
| Open Circuit Voltage-V <sub>OC</sub> (V)   | 40.8   | 41.0  | 41.2  | 41.4  |
| Short Circuit Current-I <sub>SC</sub> (A)  | 12.14  | 12.21 | 12.28 | 12.34 |
| Module Efficiency η <sub>m</sub> (%)       | 20.3   | 20.5  | 20.8  | 21.1  |

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

## ELECTRICAL DATA (NOCT)

| Parameter                                  | 295  | 298  | 302  | 306  |
|--|------|------|------|------|
| Maximum Power-P <sub>MAX</sub> (Wp)        | 295  | 298  | 302  | 306  |
| Maximum Power Voltage-V <sub>MPP</sub> (V) | 31.8 | 32.0 | 32.2 | 32.5 |
| Maximum Power Current-I <sub>MPP</sub> (A) | 9.26 | 9.32 | 9.38 | 9.41 |
| Open Circuit Voltage-V <sub>OC</sub> (V)   | 38.4 | 38.6 | 38.8 | 38.9 |
| Short Circuit Current-I <sub>SC</sub> (A)  | 9.78 | 9.84 | 9.90 | 9.95 |

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

## MECHANICAL DATA

|                      |   |
|----------------------|---|
| Solar Cells          | Monocrystalline   |
| No. of cells         | 120 cells   |
| Module Dimensions    | 1754×1096×30 mm (69.06×43.15×1.18 inches)   |
| Weight               | 21.0 kg (46.3 lb)   |
| Glass                | 3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened 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 <sup>2</sup> (0.006 inches <sup>2</sup> ),<br>Portrait: 280/280 mm(11.02/11.02 inches)<br>Landscape: 1100/1100 mm(43.31/43.31 inches) |
| Connector            | MC4 EVO2 / TS4*   |

\*Please refer to regional datasheet for specified connector.

## TEMPERATURE RATINGS

|   |             |
|---|-------------|
| NOCT (Nominal Operating Cell Temperature)   | 43°C (±2°C) |
| Temperature Coefficient of P <sub>MAX</sub> | -0.34%/°C   |
| Temperature Coefficient of V <sub>OC</sub>  | -0.25%/°C   |
| Temperature Coefficient of I <sub>SC</sub>  | 0.04%/°C    |

## MAXIMUM RATINGS

|                         |                |
|-------------------------|----------------|
| Operational Temperature | -40~+85°C      |
| Maximum System Voltage  | 1500V DC (IEC) |
| 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

## FEATURES

- Graphene supercapacitor cells
- Safest technology
- Ultra-long cycle life
- Extreme temperature
- Highest energy transfer efficiency
- Easy to install
- Rarely maintenance
- 10 years warranty



| Part Number                       | 24878K  |
|-----------------------------------|---|
| Energy storage                    | 5.5 kWh   |
| Nominal Voltage                   | 48V/DC  |
| Maximum Charge Voltage            | 58V/DC  |
| Discharge Cut-off Voltage         | 37.8V/DC  |
| ESR/AC @1KHz 50% SOC              | <10mΩ   |
| Max. Continuous Charge Current    | 100A  |
| Max. Continuous Discharge Current | 100A  |
| Power/Energy                      | 0.926   |
| Round Trip Efficiency*1           | 95%   |
| Cells Self-discharge Rate         | 2% per month  |
| Projected Cycle Life (25°C)       | 20,000 times  |
| Recommended Depth of Discharge    | ≤90%  |
| Maximum Depth of Discharge        | 100%  |
| Cooling Method                    | Natural   |
| Shell Material                    | Metal & ABS plastic   |
| Parallel Connection               | Up to 10sets  |
| Monitoring Data                   | System voltage, current, temperature, SOC, SOH, cycle, cell's voltage |

Remark: \*1 (1) At room temperature 25 °C, charge-discharge at 100A. (2) Limited charge at 100A for resident energy storage, (3) At the beginning of life.

### COMPLIANCE INFORMATION

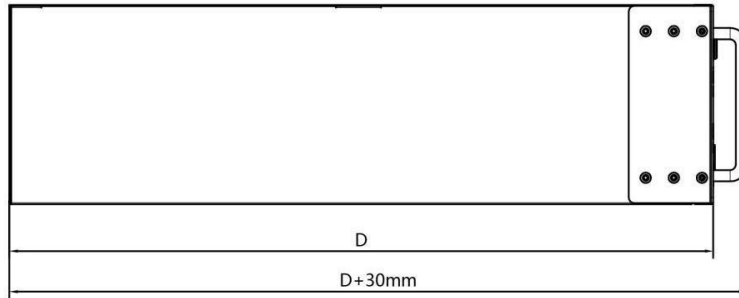
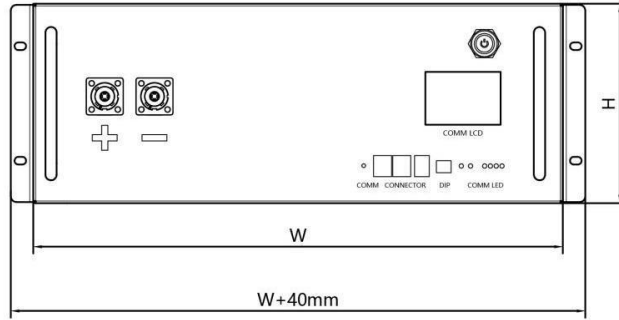
|               |   |
|---------------|---|
| Safety        | IEC62619  |
| Transport     | UN38.3, MSDS  |
| CE            | EN 62133:2013, EN 55032:2015+AC:2016, EN 55035:2017, EN 61000-3-2:2014, EN 61000-3-3:2013 |
| Environmental | RoHS  |

### ENVIRONMENTAL SPECIFICATIONS

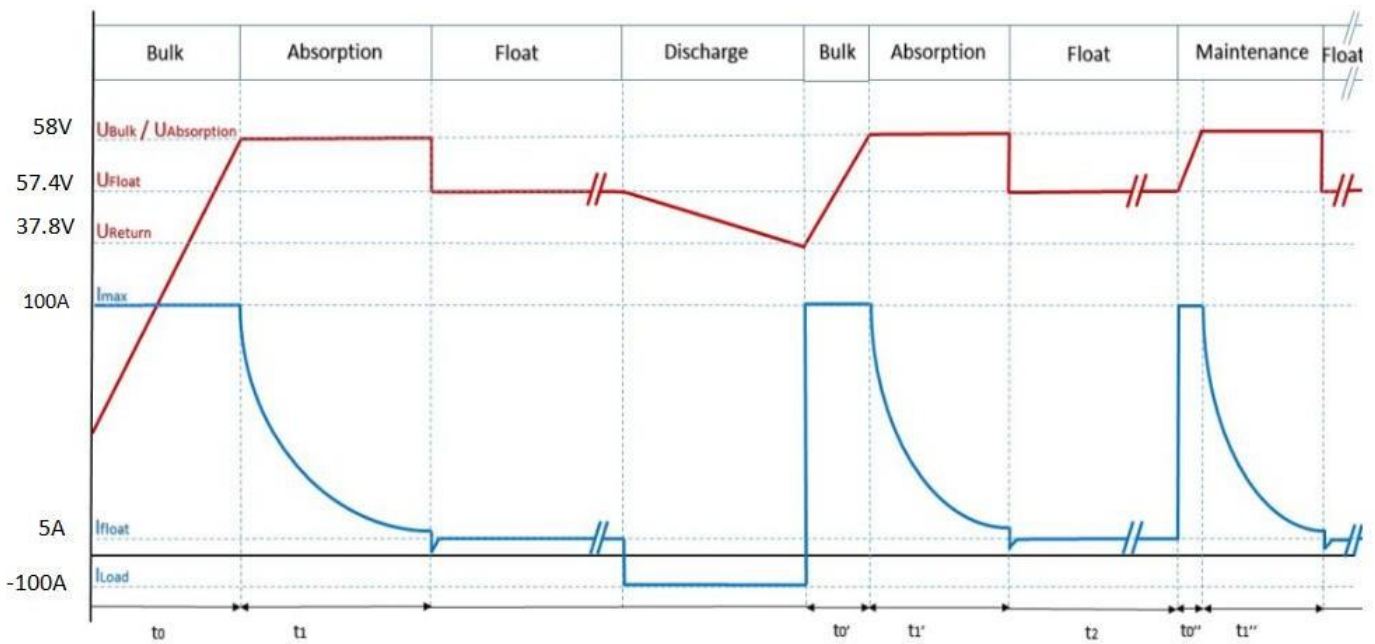
|                          |  |
|--------------------------|--|
| Environmental Protection | IP20   |
| Operating Humidity       | 0~90% RH Non-condensing  |
| Charge Temperature       | 0°C ~ +55°C  |
| Discharge Temperature    | -20°C ~ +60°C  |
| Storage Conditions       | -20°C ~ +40°C, 25% ~ 95% RH<br>SOC>30% one full charge needed per two months |

# SUPER CAPACITOR ENERGY STORAGE MODULE

| MECHANICAL SPECIFICATIONS |                     |
|---------------------------|---------------------|
| Part Number               | 24878K              |
| Weight                    | 58Kg                |
| Dimensions (W x D x H)    | 475 x 665 x 177(mm) |
| Mount Options             | On floor            |



## CHARGING-DISCHARGING CURVE



**Note:** If the charger needs to set the floating charge voltage, it is recommended to set the  $U_{Float}$  value to 57.4V.