



**BACKSHEET MONOCRYSTALLINE MODULE**

PRODUCT: TSM-DE21

POWER RANGE: 650 -670W

**670W**

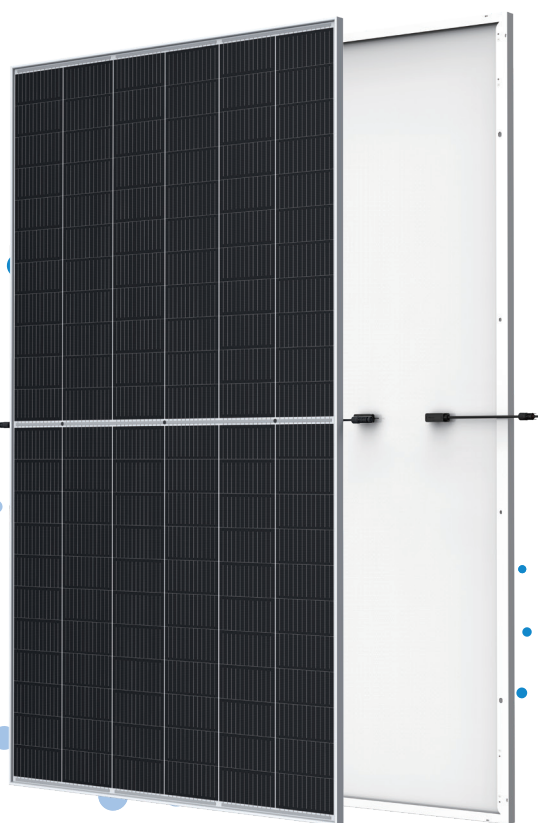
MAXIMUM POWER OUTPUT

**0~+5W**

POSITIVE POWER TOLERANCE

**21.6%**

MAXIMUM EFFICIENCY



**High customer value**

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components



**High power up to 670W**

- Up to 21.6% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



**High reliability**

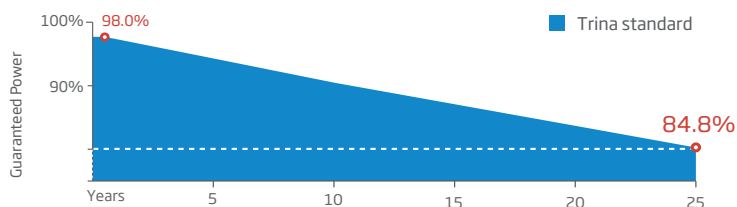
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



**High energy yield**

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature

**Trina Solar's Backsheet Performance Warranty**

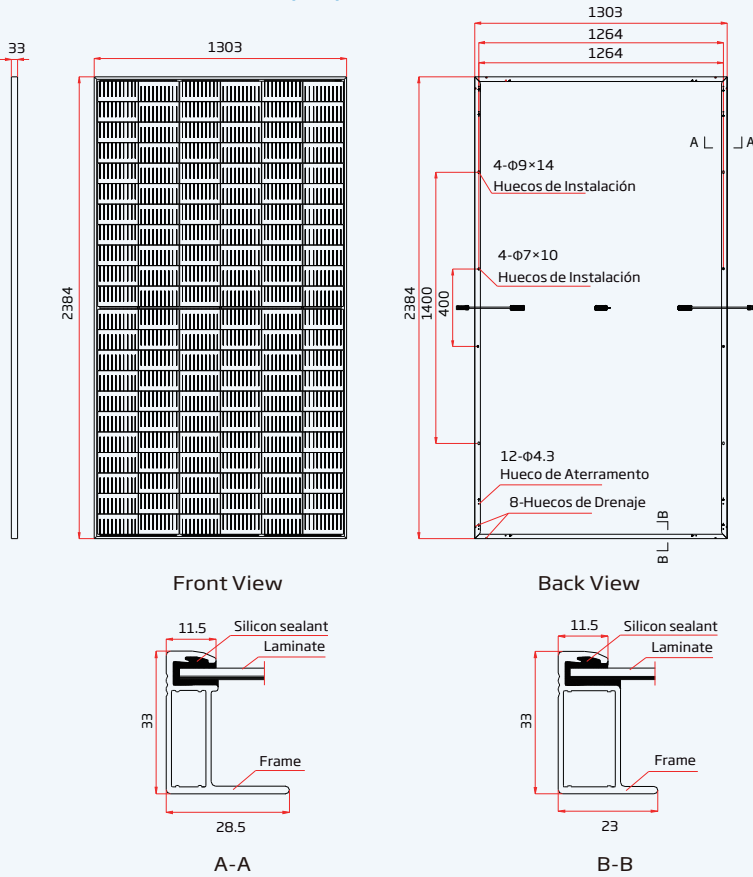
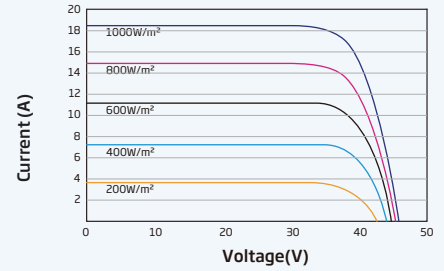
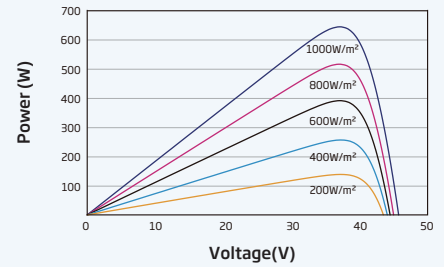
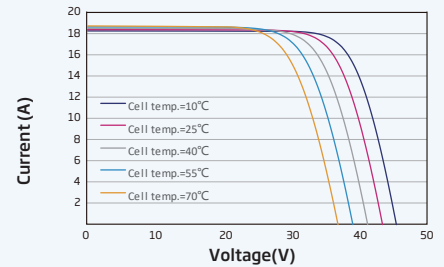


**Comprehensive Products and System Certificates**



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(655 W)**

**P-V CURVES OF PV MODULE(655W)**

**I-V CURVES OF PV MODULE(655 W)**

**ELECTRICAL DATA (STC)**

|  |       |       |        |       |       |
|--|-------|-------|--------|-------|-------|
| Peak Power Watts - P <sub>MAX</sub> (Wp)*    | 650   | 655   | 660    | 665   | 670   |
| Power Tolerance - P <sub>MAX</sub> (W)       |       |       | 0 ~ +5 |       |       |
| Maximum Power Voltage - V <sub>MPP</sub> (V) | 37.4  | 37.6  | 37.8   | 38.0  | 38.2  |
| Maximum Power Current - I <sub>MPP</sub> (A) | 17.39 | 17.43 | 17.47  | 17.51 | 17.55 |
| Open Circuit Voltage - V <sub>OC</sub> (V)   | 45.3  | 45.5  | 45.7   | 45.9  | 46.1  |
| Short Circuit Current - I <sub>SC</sub> (A)  | 18.44 | 18.48 | 18.53  | 18.57 | 18.62 |
| Module Efficiency $\eta_m$ (%)               | 20.9  | 21.1  | 21.2   | 21.4  | 21.6  |

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

**ELECTRICAL DATA (NOCT)**

|  |       |       |       |       |       |
|--|-------|-------|-------|-------|-------|
| Maximum Power - P <sub>MAX</sub> (Wp)        | 492   | 496   | 500   | 504   | 508   |
| Maximum Power Voltage - V <sub>MPP</sub> (V) | 34.9  | 35.1  | 35.3  | 35.4  | 35.6  |
| Maximum Power Current - I <sub>MPP</sub> (A) | 14.09 | 14.13 | 14.17 | 14.22 | 14.26 |
| Open Circuit Voltage - V <sub>OC</sub> (V)   | 42.7  | 42.9  | 43.0  | 43.2  | 43.4  |
| Short Circuit Current - I <sub>SC</sub> (A)  | 14.86 | 14.89 | 14.93 | 14.96 | 15.01 |

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

**MECHANICAL DATA**

|                      |  |
|----------------------|--|
| Solar Cells          | Monocrystalline  |
| No. of cells         | 132 cells  |
| Module Dimensions    | 2384×1303×33 mm (93.86×51.30×1.30 inches)  |
| Weight               | 33.3 kg (73.4 lb)  |
| Glass                | 3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass   |
| Encapsulant material | EVA  |
| Backsheet            | White  |
| Frame                | 33mm(1.30 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 ( $\pm 2^\circ\text{C}$ ) |
| 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)<br>1500V DC (UL) |
| Max Series Fuse Rating  | 30A                             |

**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: 33 pieces  
Modules per 40' container: 594 pieces