



BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE21

PRODUCT RANGE: 635-660W

660W+

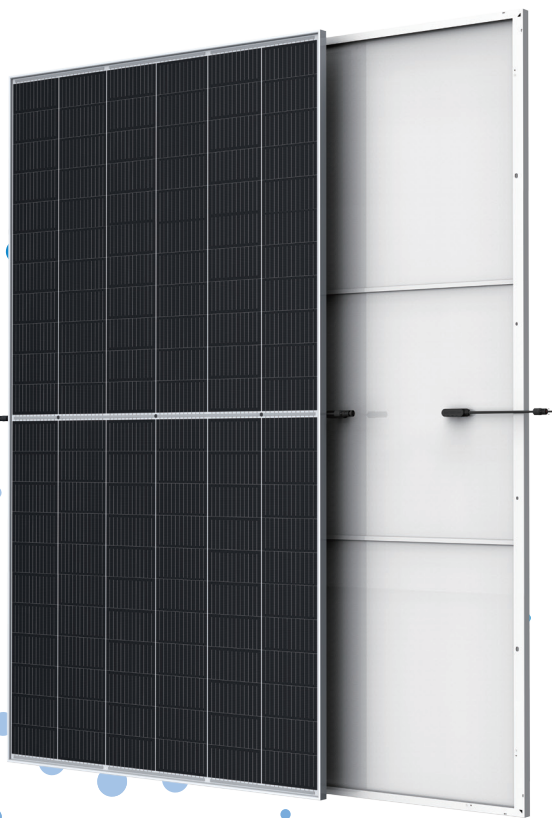
MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

21.2%

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
- Higher return on Investment



High power up to 660W

- Up to 21.2% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



High reliability

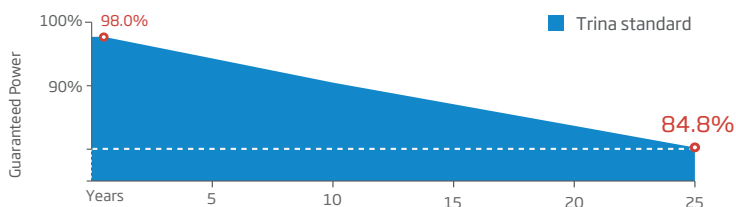
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



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



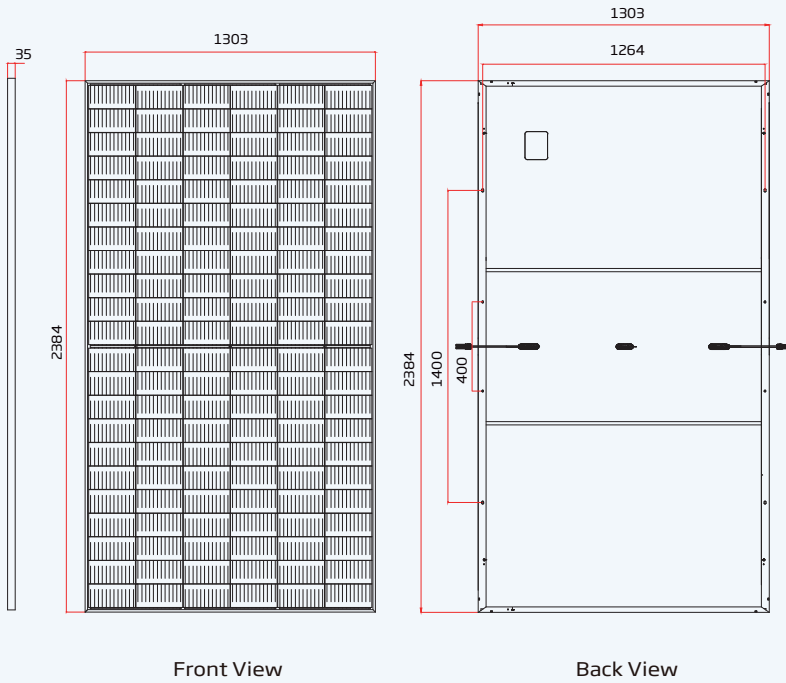
Comprehensive Products and System Certificates



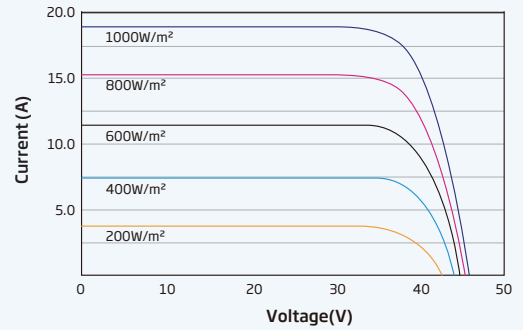
IEC61215/IEC61730/IEC61701/IEC62716
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System



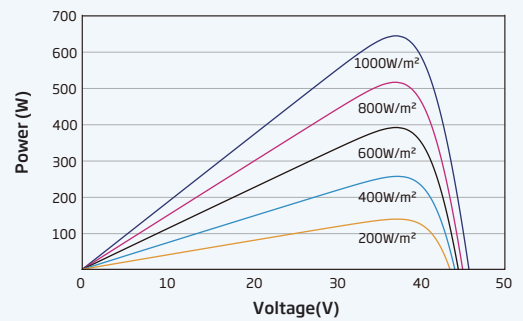
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(645 W)



P-V CURVES OF PV MODULE(645W)



ELECTRICAL DATA (STC)

| | | | | | | |
|--|--------|-------|-------|-------|-------|-------|
| Peak Power Watts-P _{MAX} (Wp)* | 635 | 640 | 645 | 650 | 655 | 660 |
| Power Tolerance-P _{MAX} (W) | 0 ~ +5 | | | | | |
| Maximum Power Voltage-V _{MPP} (V) | 36.8 | 37.0 | 37.2 | 37.4 | 37.6 | 37.8 |
| Maximum Power Current-I _{MPP} (A) | 17.26 | 17.30 | 17.35 | 17.39 | 17.43 | 17.47 |
| Open Circuit Voltage-V _{OC} (V) | 44.7 | 44.9 | 45.1 | 45.3 | 45.5 | 45.7 |
| Short Circuit Current-I _{SC} (A) | 18.30 | 18.34 | 18.39 | 18.44 | 18.48 | 18.53 |
| Module Efficiency η _m (%) | 20.4 | 20.6 | 20.8 | 20.9 | 21.1 | 21.2 |

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

ELECTRICAL DATA (NOCT)

| | | | | | | |
|--|-------|-------|-------|-------|-------|-------|
| Maximum Power-P _{MAX} (Wp) | 481 | 485 | 488 | 492 | 496 | 500 |
| Maximum Power Voltage-V _{MPP} (V) | 34.3 | 34.6 | 34.8 | 34.9 | 35.1 | 35.3 |
| Maximum Power Current-I _{MPP} (A) | 13.97 | 14.01 | 14.05 | 14.09 | 14.13 | 14.17 |
| Open Circuit Voltage-V _{OC} (V) | 42.1 | 42.3 | 42.5 | 42.7 | 42.9 | 43.0 |
| Short Circuit Current-I _{SC} (A) | 14.75 | 14.78 | 14.82 | 14.86 | 14.89 | 14.93 |

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

MECHANICAL DATA

| | |
|----------------------|---|
| Solar Cells | Monocrystalline |
| No. of cells | 132 cells |
| Module Dimensions | 2384×1303×35 mm (93.86×51.30×1.38 inches) |
| Weight | 33.9 kg (74.7 lb) |
| Glass | 3.2 mm (0.13 inches), High Transmission, AR Coated Heat Strengthened Glass |
| Encapsulant material | EVA |
| Backsheet | White |
| Frame | 35mm(1.38 inches) Anodized Aluminium Alloy |
| J-Box | IP 68 rated |
| Cables | Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²), Portrait: 280/280 mm(11.02/11.02 inches) Landscape: 1400/1400 mm(55.12/55.12 inches) |
| 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) |
| 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)