

# Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09  
PRODUCT RANGE: 390-410W

## 410W

MAXIMUM POWER OUTPUT

## 0~+5W

POSITIVE POWER TOLERANCE

## 21.3%

MAXIMUM EFFICIENCY



### Small in size, big on power

- Small form factor. Generate a huge amount of energy even in limited space. Up to 410W, 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 with lower temperature coefficient (-0.34%) and operating temperature



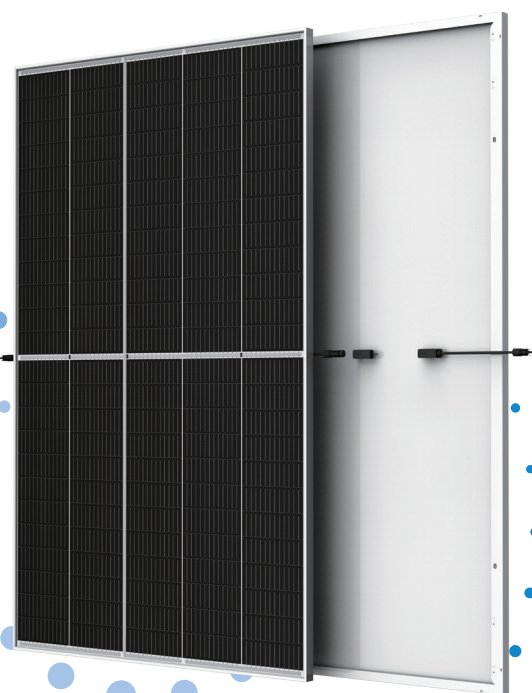
### Universal solution for residential and C&I rooftops

- 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

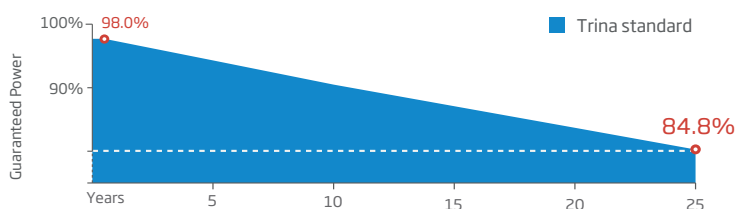


### High Reliability

- 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



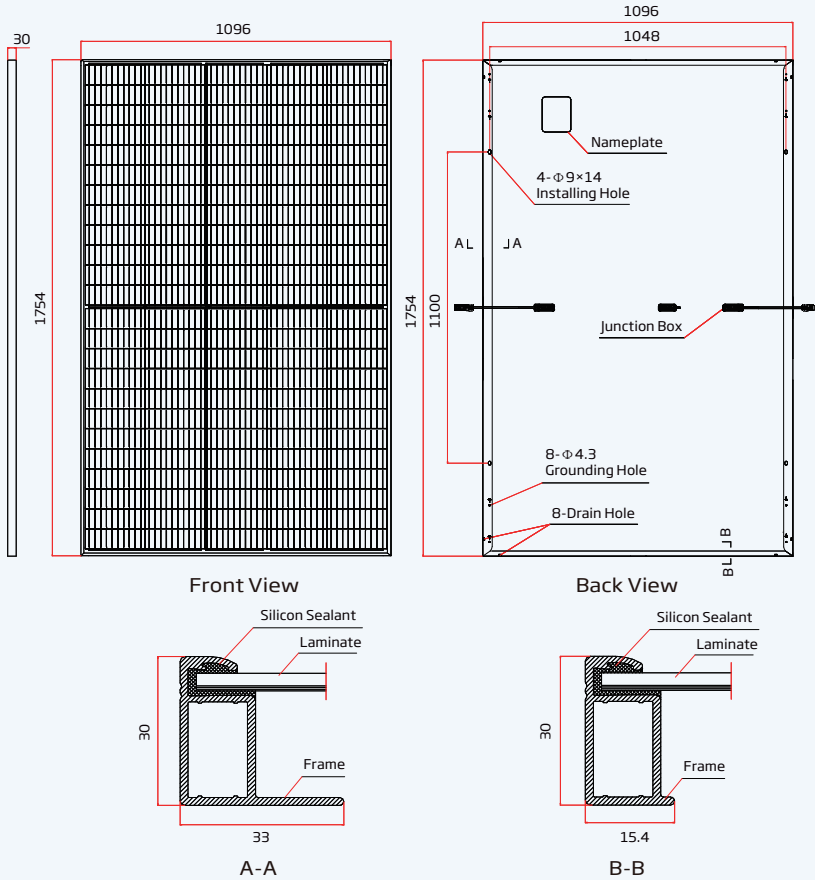
### Comprehensive Products and System Certificates



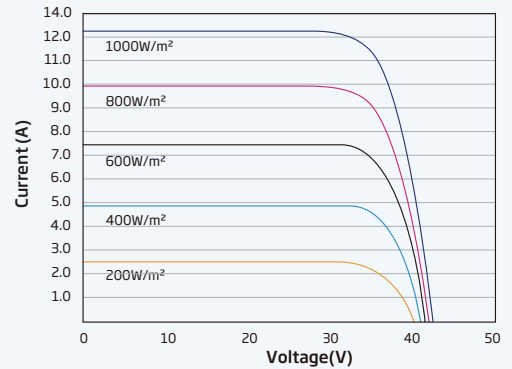
IEC61215/IEC61730/IEC61701/IEC62716/UL61730  
ISO 9001: Quality Management System  
ISO 14001: Environmental Management System  
ISO14064: Greenhouse Gases Emissions Verification  
ISO45001: Occupational Health and Safety Management System



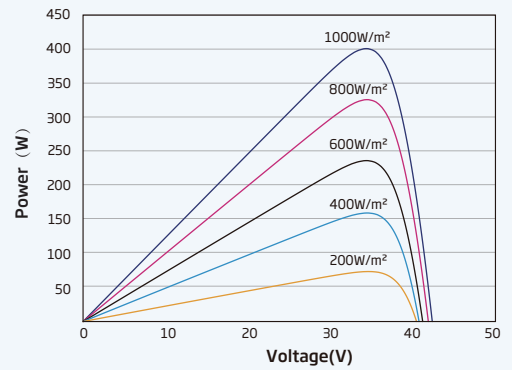
## DIMENSIONS OF PV MODULE(mm)



## I-V CURVES OF PV MODULE(400W)



## P-V CURVES OF PV MODULE(400W)



## ELECTRICAL DATA (STC)

Parameter	390	395	400	405	410
Peak Power Watts- $P_{MAX}$ (Wp)*	390	395	400	405	410
Power Tolerance- $P_{MAX}$ (W)	0 ~ +5				
Maximum Power Voltage- $V_{MPP}$ (V)	33.8	34.0	34.2	34.4	34.6
Maximum Power Current- $I_{MPP}$ (A)	11.54	11.62	11.70	11.77	11.85
Open Circuit Voltage- $V_{OC}$ (V)	40.8	41.0	41.2	41.4	41.6
Short Circuit Current- $I_{SC}$ (A)	12.14	12.21	12.28	12.34	12.40
Module Efficiency $\eta_m$ (%)	20.3	20.5	20.8	21.1	21.3

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	310
Maximum Power- $P_{MAX}$ (Wp)	295	298	302	306	310
Maximum Power Voltage- $V_{MPP}$ (V)	31.8	32.0	32.2	32.5	32.8
Maximum Power Current- $I_{MPP}$ (A)	9.26	9.32	9.38	9.41	9.46
Open Circuit Voltage- $V_{OC}$ (V)	38.4	38.6	38.8	38.9	39.1
Short Circuit Current- $I_{SC}$ (A)	9.78	9.84	9.90	9.95	9.99

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> ), Portrait: 280/280 mm(11.02/11.02 inches) Length can be customized
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 $P_{MAX}$	-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

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: 36 pieces  
Modules per 40' container: 936 pieces