

# Vertex S

DUAL GLASS MONOCRYSTALLINE MODULE

PRODUCT: TSM-DEG9R.28  
 PRODUCT RANGE: 415-435W

**435W**

MAXIMUM POWER OUTPUT

**0~+5W**

POSITIVE POWER TOLERANCE

**21.8%**

MAXIMUM EFFICIENCY



reddot winner 2022



### Small in size, big on power

- Small form factor. Generate a huge amount of energy even in limited space. Up to 435W, 21.8% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection
- 15 years product warranty, 30 years power warranty, annual degradation -0.45% ; Lower working temperature and excellent warranty bring more electrical power generation



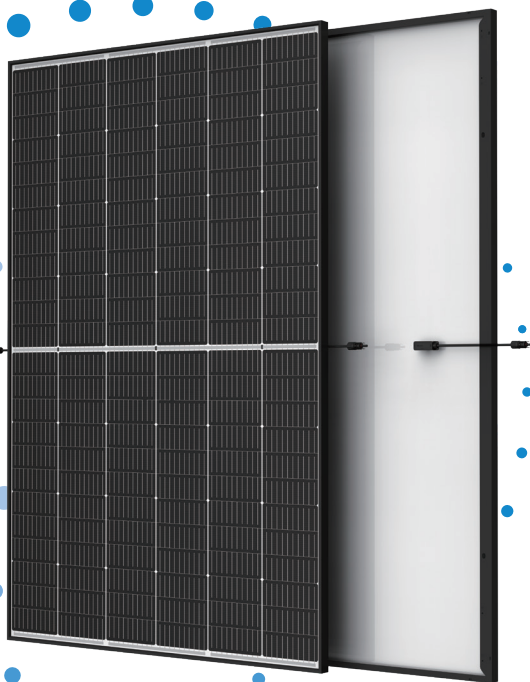
### Universal solution for residential and C&I rooftops

- Compatible with mainstream optimizers, inverters and mounting systems
- Smart size and low weight. Easy for handling. Economy for transporting
- Most valuable solution for roofs with low load capacity (weight similar to backsheet version)

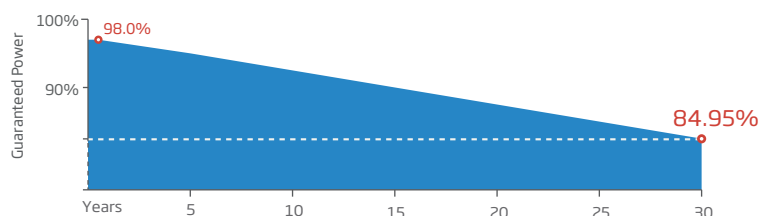


### High Reliability

- Minimized micro-cracks with innovative non-destructive cutting technology
- Fire Rating: Class A+C
- 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 4000 Pa negative load



### Trina Solar's Vertex Dual Glass Performance Warranty



### Comprehensive Products and System Certificates



IEC61215/IEC61730/IEC61701/IEC62716

ISO 9001: Quality Management System

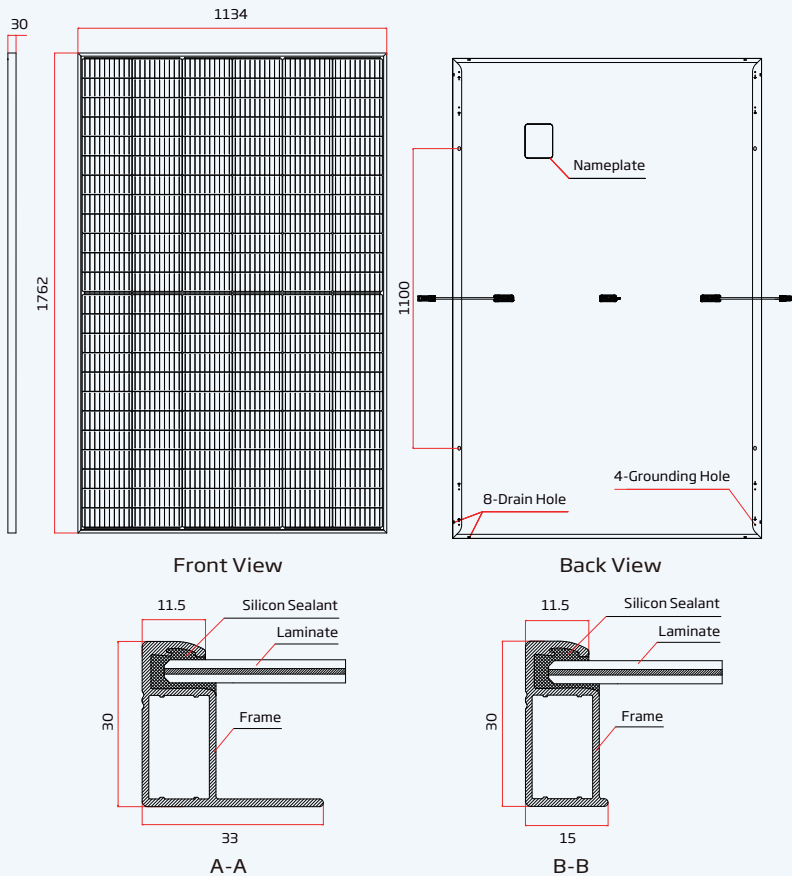
ISO 14001: Environmental Management System

ISO14064: Greenhouse Gases Emissions Verification

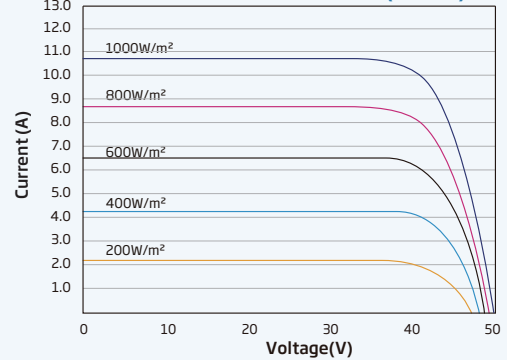
ISO45001: Occupational Health and Safety Management System



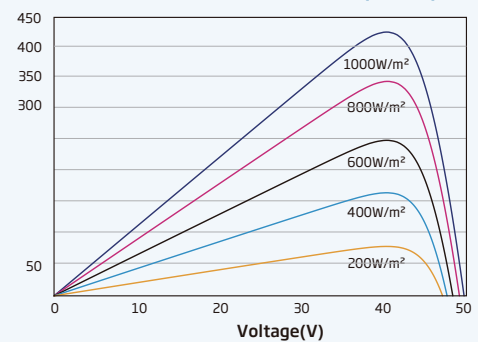
## DIMENSIONS OF PV MODULE(mm)



## I-V CURVES OF PV MODULE(425W)



## P-V CURVES OF PV MODULE(425W)



## ELECTRICAL DATA (STC)

Parameter	415	420	425	430	435
Peak Power Watts- $P_{MAX}$ (Wp)*	415	420	425	430	435
Power Tolerance- $P_{MAX}$ (W)	0 ~ +5				
Maximum Power Voltage- $V_{MPP}$ (V)	41.0	41.3	41.5	41.8	42.0
Maximum Power Current- $I_{MPP}$ (A)	10.11	10.17	10.24	10.30	10.36
Open Circuit Voltage- $V_{OC}$ (V)	49.4	49.7	49.9	50.3	50.6
Short Circuit Current- $I_{SC}$ (A)	10.64	10.69	10.74	10.81	10.86
Module Efficiency $\eta_m$ (%)	20.8	21.0	21.3	21.5	21.8

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

## ELECTRICAL DATA (NOCT)

Parameter	313	317	320	325	328
Maximum Power- $P_{MAX}$ (Wp)	313	317	320	325	328
Maximum Power Voltage- $V_{MPP}$ (V)	38.5	38.7	39.0	39.3	39.5
Maximum Power Current- $I_{MPP}$ (A)	8.13	8.17	8.21	8.27	8.30
Open Circuit Voltage- $V_{OC}$ (V)	46.5	46.8	46.9	47.3	47.6
Short Circuit Current- $I_{SC}$ (A)	8.58	8.61	8.65	8.71	8.75

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	22.3 kg (49.2 lb)
Front Glass	1.6 mm (0.06 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Back Glass	1.6 mm (0.06 inches), High Transmission, Heat Strengthened Glass
Frame	30mm (1.18 inches) Anodized Aluminium Alloy, Black
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> ), Portrait: 350/280 mm (13.78/11.02 inches) 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)
Max Series Fuse Rating	20A

## WARRANTY

15 year Product Workmanship Warranty  
 30 year Power Warranty  
 2% first year degradation  
 0.45% Annual Power Attenuation

(Please refer to product warranty for details)

## PACKAGING CONFIGURATION

Modules per box: 36 pieces  
 Modules per 40' container: 936 pieces