

P-type PERC

BACKSHEET MONOCRYSTALLINE MODULE

TSM-DE09R 415-435W

435W / MAXIMUM POWER OUTPUT

21.8% / MAXIMUM EFFICIENCY



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
- Reduce installation cost with higher power bin and efficiency
- Boost performance in warm weather lower temperature coefficient (-0.34%) and operating temperature



Universal solution for rooftop scenario

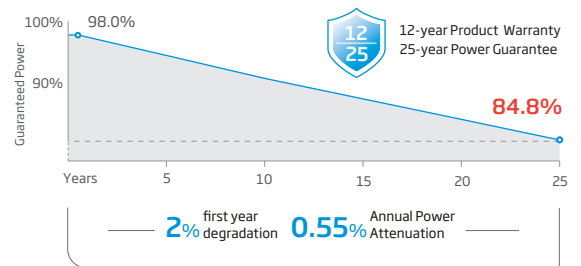
- Designed for compatibility with existing mainstream optimizers, inverters and mounting systems
- Perfect size and low weight. Easy for handling. Economy for transporting
- Diverse installation solutions. Flexible for system deployment



High reliability

- 12 year product warranty
- 25 year performance warranty with lowest degradation
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Mechanical performance up to 6000 Pa positive load and 4000 Pa

Performance Warranty



* Please refer to product warranty for details

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



ELECTRICAL DATA (STC)

Peak Power Watts- $P_{MAX}(Wp)^*$	415	420	425	430	435
Power Selection (W)**	0 ~ +5				
Maximum Power Voltage- $V_{MPP}(V)$	41.7	42.0	42.2	42.3	42.5
Maximum Power Current- $I_{MPP}(A)$	9.94	10.01	10.08	10.17	10.24
Open Circuit Voltage- $V_{oc}(V)$	50.0	50.1	50.2	50.3	50.4
Short Circuit Current- $I_{sc}(A)$	10.55	10.58	10.61	10.64	10.67
Module Efficiency $\eta_m(\%)$	20.8	21.0	21.3	21.5	21.8

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

ELECTRICAL DATA (NOCT)

Peak Power Watts- $P_{MAX}(Wp)$	312	317	321	325	329
Maximum Power Voltage- $V_{MPP}(V)$	38.7	39.2	39.5	39.7	40.0
Maximum Power Current- $I_{MPP}(A)$	8.07	8.10	8.13	8.17	8.23
Open Circuit Voltage- $V_{oc}(V)$	47.1	47.1	47.2	47.4	47.5
Short Circuit Current- $I_{sc}(A)$	8.50	8.53	8.55	8.60	8.65

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

TEMPERATURE RATINGS

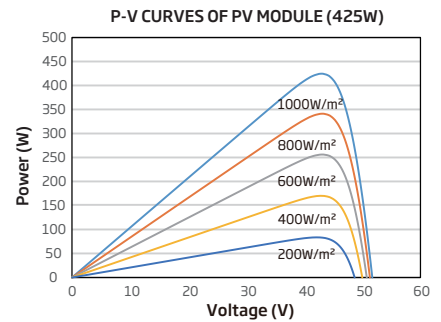
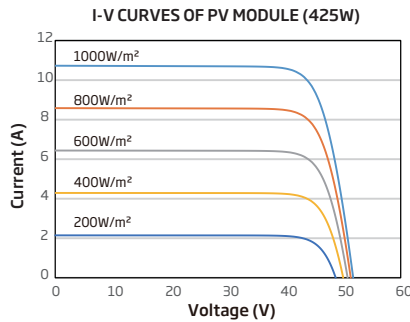
NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P_{MAX}	-0.34% /°C
Temperature Coefficient of V_{oc}	-0.25% /°C
Temperature Coefficient of I_{sc}	0.04% /°C

Due to different testing methods, the actual performances might differ from the declared specifications.

MAXIMUM RATINGS

Operational Temperature	-40 ~ +85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

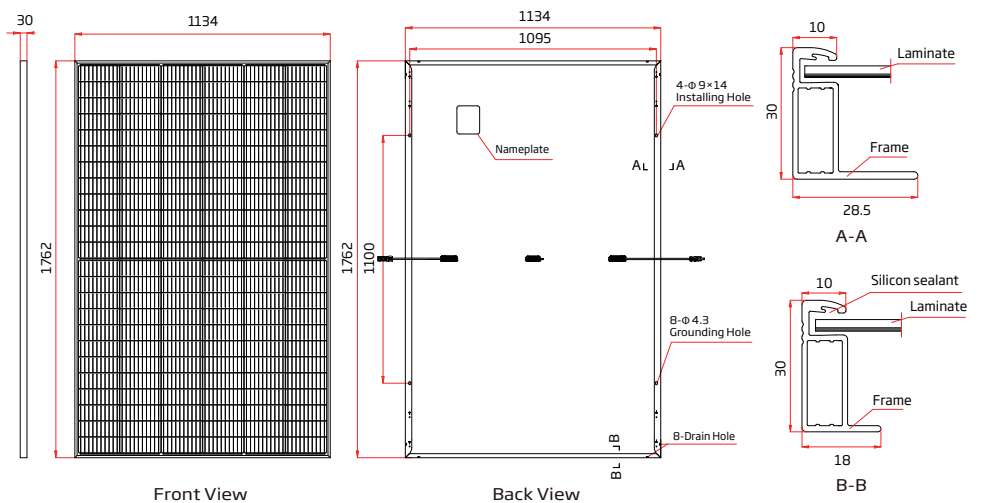
CURVES OF PV MODULE



MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	144 cells
Module Dimensions	1762×1134×30 mm (69.37×44.65×1.18 inches)
Weight	21.6 kg (47.6 lb)
Front Glass	3.2mm (0.13inches), AR Coating Tempered Glass
Backsheet	White
Frame	30mm (1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²) Portrait: 350/280 mm (13.78/11.02 inches) Length can be customized
Connector	MC4 EV02 / TS4 Plus / TS4*
Packaging	Modules per box: 36 pieces Modules per 40' container: 936 pieces

*Please refer to regional datasheet for specified connector.



www.trinasolar.com

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.
© 2024 Trina Solar Co., Ltd. All rights reserved. Specifications included in this datasheet are subject to change without notice.
The right of final interpretation belongs to Trina Solar Co., Ltd.
Version number: TSM_EN_2024_A