

Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09R.08
POWER RANGE: 415-435 W

435 W+

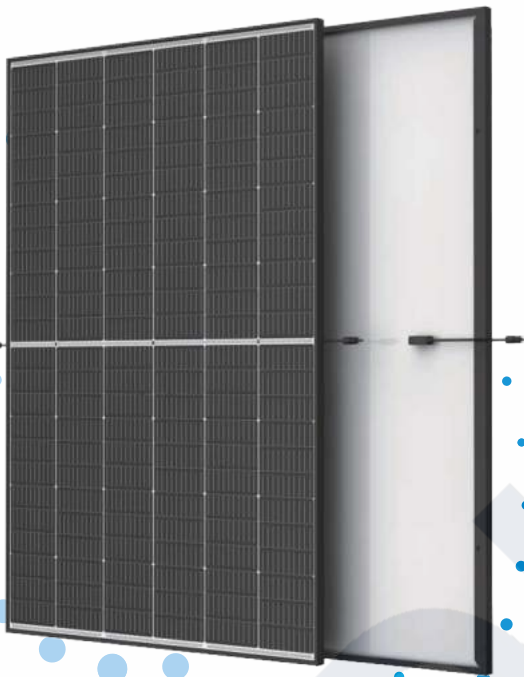
MAXIMUM POWER OUTPUT

0/+5 W

POSITIVE POWER TOLERANCE

21.8 %

MAXIMUM EFFICIENCY



Small in size, big on power

- Generates up to 435 W, 21.8 % module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping, lower series resistance, improved current collection and enhanced reliability
- Excellent low light performance (IAM) with cell process and module material optimization



Universal solution for residential and C&I rooftops

- Designed for compatibility with existing mainstream inverters, optimizers and mounting systems
- Perfect size and low weight for easy handling. Optimized transportation cost
- Reduces installation cost with higher power bin and efficiency
- Flexible installation solutions for system deployment



High Reliability

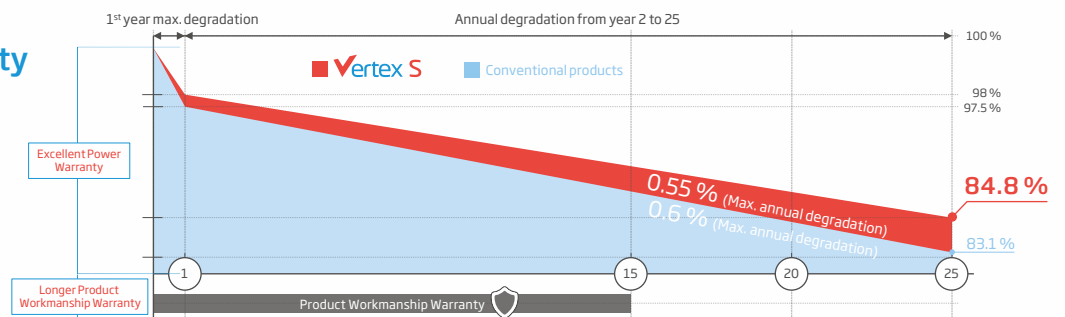
- Positive load up to 6,000 Pa (snow)
- Negative load up to 4,000 Pa (wind)

Extended Vertex S Warranty

2 %
1st year max. degradation

0.55 %
Max. annual degradation from year 2 to 25

15 Years
Product Workmanship Warranty

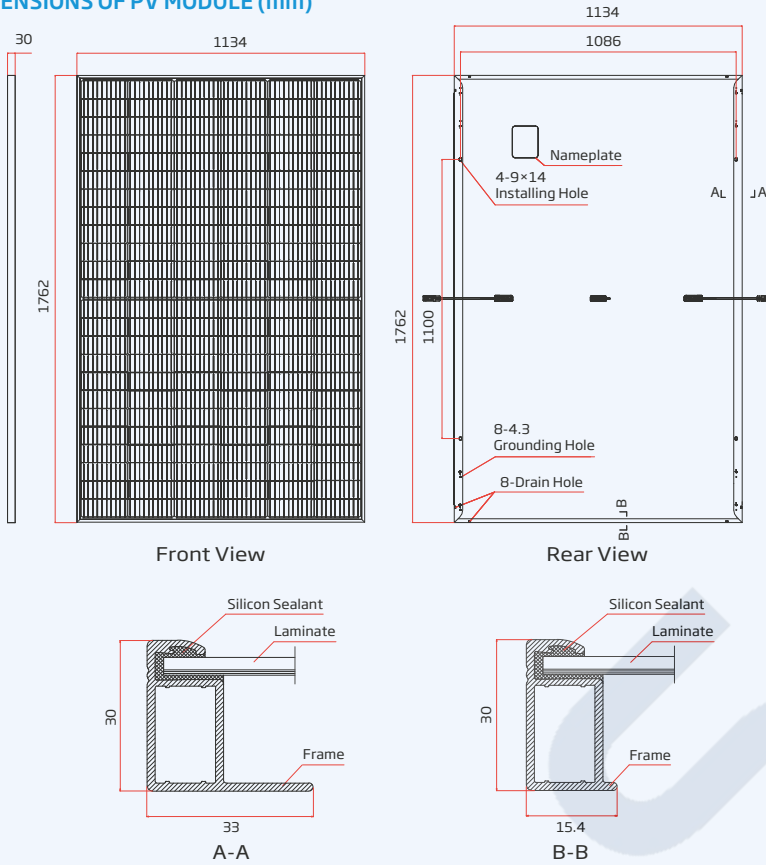


Comprehensive Product and System Certificates

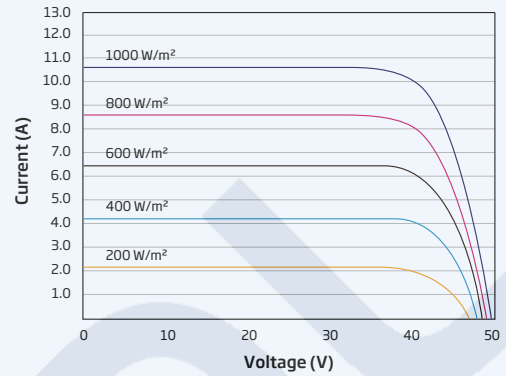


IEC61215/IEC61730/IEC61701/IEC62716
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System

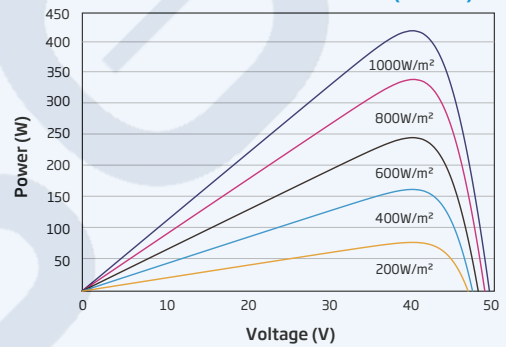
DIMENSIONS OF PV MODULE (mm)



I-V CURVES OF PV MODULE (425 W)



P-V CURVES OF PV MODULE (425 W)



ELECTRICAL DATA (STC)

	TSM-415 DE09R.08	TSM-420 DE09R.08	TSM-425 DE09R.08	TSM-430 DE09R.08	TSM-435 DE09R.08
Peak Power Watts- P_{MAX} (Wp)*	415	420	425	430	435
Power Tolerance- P_{MAX} (W)	0/+5	0/+5	0/+5	0/+5	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 η_m (%)	20.8	21.0	21.3	21.5	21.8

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

MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	144 cells
Module Dimensions	1762×1134×30 mm
Weight	21.8 kg
Glass	3.2 mm, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Backsheet	White
Frame	30 mm Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0 mm ² Landscape: 1100/1100 mm Portrait: 280/350 mm*
Connector	TS4/MC4 EV02*

*Special order only

ELECTRICAL DATA (NOCT)

	TSM-415 DE09R.08	TSM-420 DE09R.08	TSM-425 DE09R.08	TSM-430 DE09R.08	TSM-435 DE09R.08
Maximum Power- 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 800 W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

TEMPERATURE RATINGS

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

MAXIMUM RATINGS

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

WARRANTY

- 15 Year product workmanship warranty
- 25 Year power warranty
- 2% First year degradation
- 0.55% Annual power degradation

(Please refer to the applicable limited warranty for details)

PACKAGING CONFIGURATION

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