

Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

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

435 W+

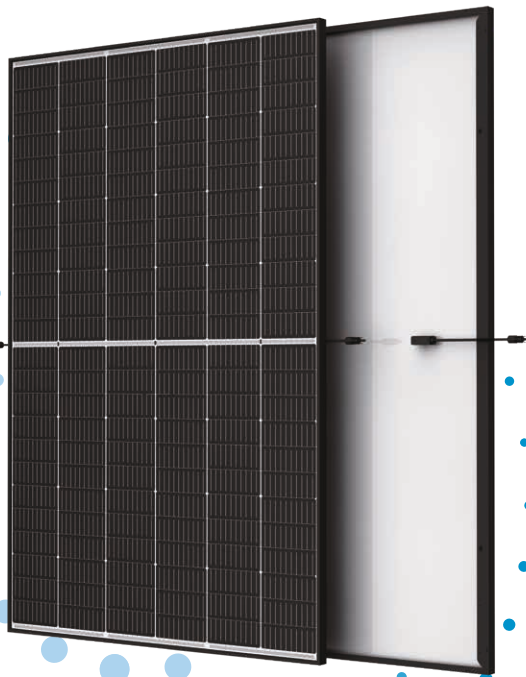
MAXIMUM POWER OUTPUT

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

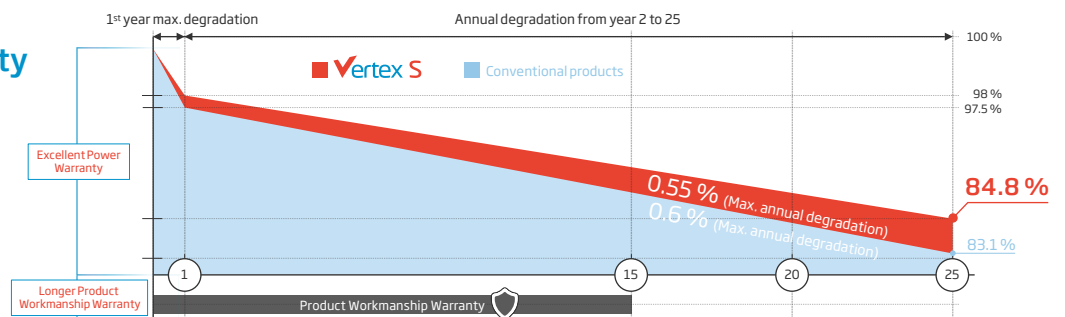
- Positive load up to 6,000 Pa (snow)
- Negative load up to 4,000 Pa (wind)

Extended Vertex S Warranty

2 %
1st year max. degradation

0.55 %
Max. annual degradation from year 2 to 25

15 Years
Product Workmanship Warranty



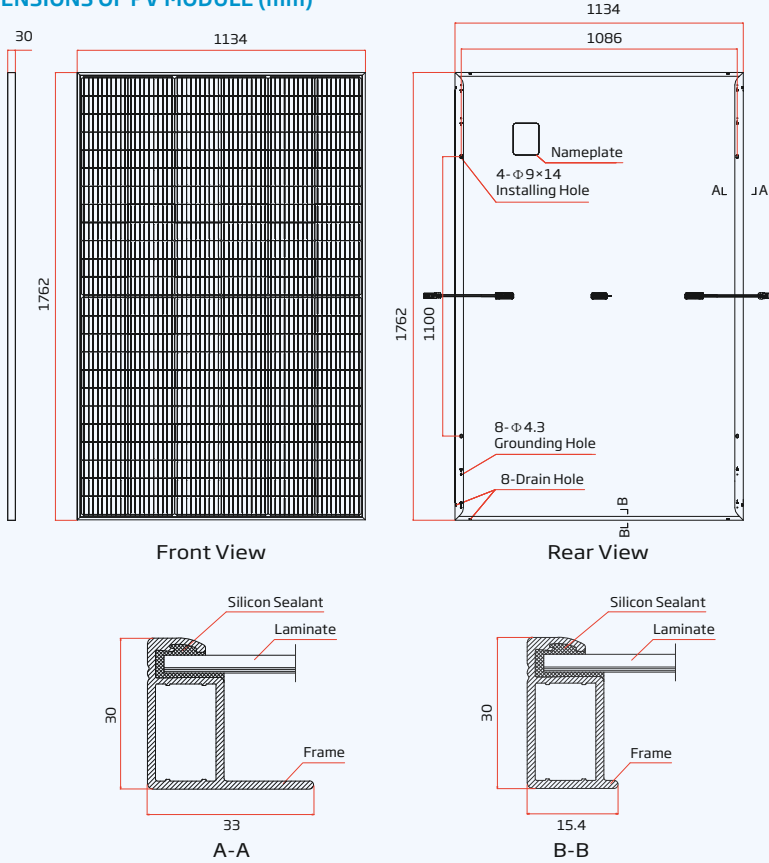
Comprehensive Product and System Certificates



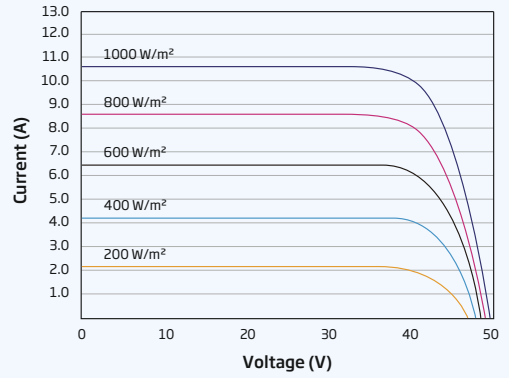
IEC61215/IEC61730/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupational Health and Safety Management System



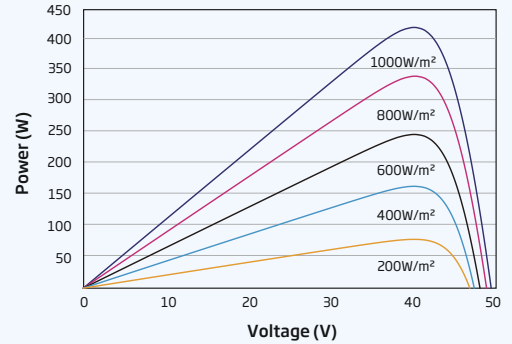
DIMENSIONS OF PV MODULE (mm)



I-V CURVES OF PV MODULE (425 W)



P-V CURVES OF PV MODULE (425 W)



ELECTRICAL DATA (STC)

| | TSM-415 DE09R.08W | TSM-420 DE09R.08W | TSM-425 DE09R.08W | TSM-430 DE09R.08W | TSM-435 DE09R.08W |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| 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.08W | TSM-420 DE09R.08W | TSM-425 DE09R.08W | TSM-430 DE09R.08W | TSM-435 DE09R.08W |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| 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 |