

435 W

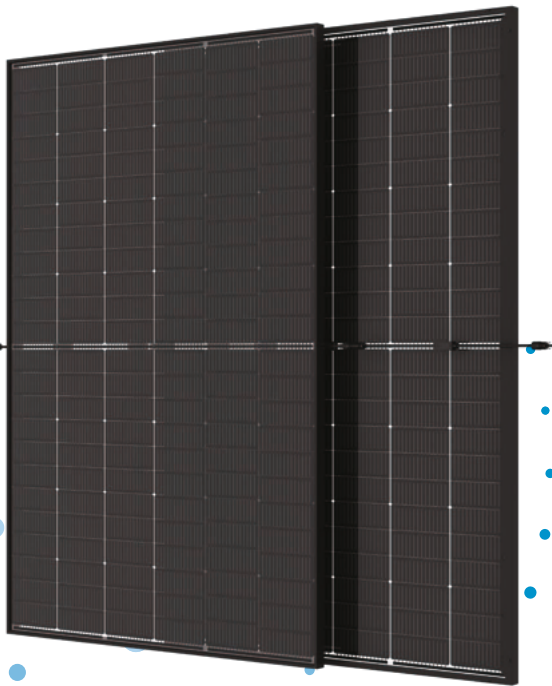
MAXIMUM POWER OUTPUT

0/+5 W

POSITIVE POWER TOLERANCE

21.8 %

MAXIMUM EFFICIENCY



Small in size, bigger on power

- Generates up to 435 W, 21.8 % module efficiency with high density interconnect technology
- Boost performance at high temperature environments with better thermal behavior



Transparent Dual-glass Design

- Designed with aesthetics in mind
- Excellent fire rating and resistance to harsh environmental conditions
- 5,400 Pa snow load and 4,000 Pa wind load (test loads)



Maximize Energy Harvest

- Higher bifaciality up to 85 %
- Up to 25 years product warranty and 30 years power warranty
- 1 % first-year degradation and 0.4 % annual degradation enabled by N-type technology



Universal solution for residential and C&I rooftops

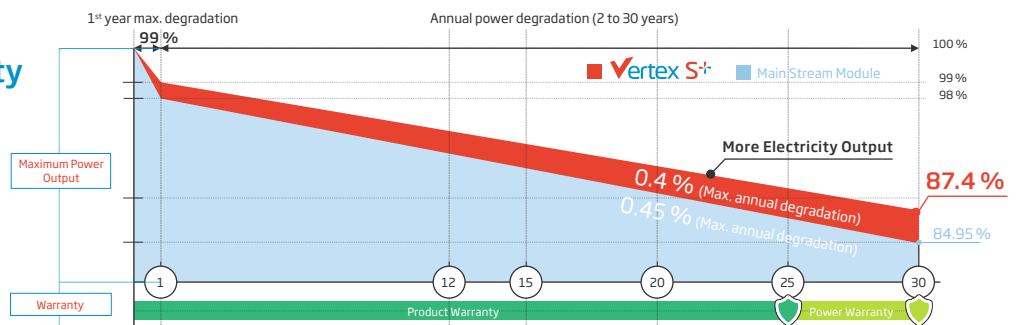
- Designed for compatibility with existing mainstream inverters, optimizers and mounting systems
- Perfect size and low weight for easy handling

Extended Vertex S+ Warranty

1 %
1st year max. degradation

0.4 %
Max. annual degradation from year 2 to 30

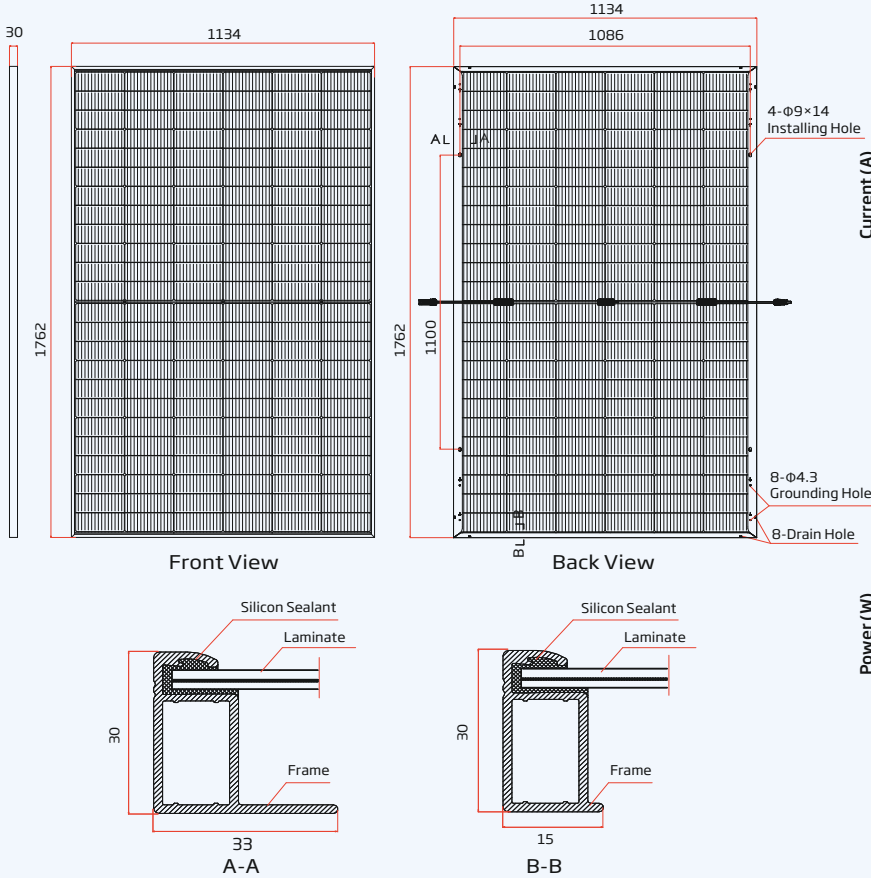
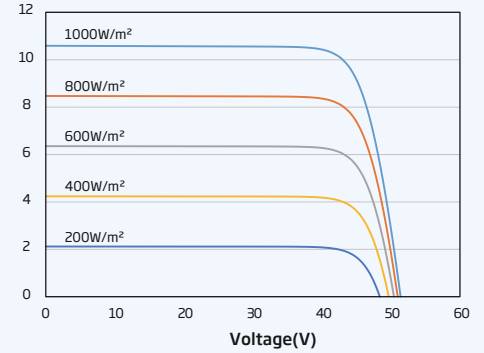
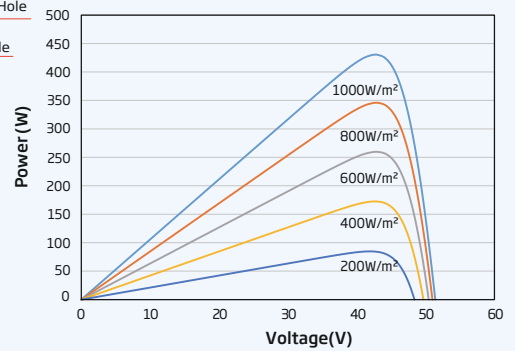
25 Years
Product Workmanship Warranty



Comprehensive Products and System Certificates



IEC61215/IEC61730/IEC61701/IEC62716/UL61730
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO 14064: Greenhouse Gases Emissions Verification
 ISO 45001: Occupational Health and Safety Management System

DIMENSIONS OF PV MODULE (mm)

I-V CURVES OF PV MODULE (430 W)

P-V CURVES OF PV MODULE (430 W)


ELECTRICAL DATA (STC)	TSM-415	TSM-420	TSM-425	TSM-430	TSM-435
	NEG9RC.27	NEG9RC.27	NEG9RC.27	NEG9RC.27	NEG9RC.27
Peak Power Watts -P _{MAX} (Wp)*	415	420	425	430	435
Power Tolerance -P _{MAX} (W)	0/+5				
Maximum Power Voltage -V _{MPP} (V)	42.1	42.5	42.9	43.2	43.6
Maximum Power Current -I _{MPP} (A)	9.86	9.89	9.92	9.96	9.99
Open Circuit Voltage -V _{OC} (V)	50.1	50.5	50.9	51.4	51.8
Short Circuit Current -I _{SC} (A)	10.50	10.53	10.56	10.59	10.64
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: \pm 3 %.

Electrical characteristics with different power bin (reference to 10% Irradiance ratio)

Total Equivalent power -P _{MAX} (Wp)	448	454	459	464	470
Maximum Power Voltage -V _{MPP} (V)	42.1	42.5	42.9	43.2	43.6
Maximum Power Current -I _{MPP} (A)	10.65	10.68	10.71	10.76	10.79
Open Circuit Voltage -V _{OC} (V)	50.1	50.5	50.9	51.4	51.8
Short Circuit Current -I _{SC} (A)	11.34	11.37	11.40	11.44	11.49
Irradiance ratio (rear/front)	10 %				

Power Bifaciality: 80 \pm 5 %.

ELECTRICAL DATA (NOCT)	TSM-415	TSM-420	TSM-425	TSM-430	TSM-435
	NEG9RC.27	NEG9RC.27	NEG9RC.27	NEG9RC.27	NEG9RC.27
Maximum Power -P _{MAX} (Wp)	316	320	324	328	332
Maximum Power Voltage -V _{MPP} (V)	39.3	39.7	40.0	40.4	40.7
Maximum Power Current -I _{MPP} (A)	8.03	8.07	8.09	8.11	8.15
Open Circuit Voltage -V _{OC} (V)	47.5	47.8	48.2	48.7	49.1
Short Circuit Current -I _{SC} (A)	8.46	8.49	8.51	8.53	8.57

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

MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	144 cells
Module Dimensions	1762 \times 1134 \times 30 mm
Weight	21.1 kg
Front Glass	1.6 mm, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Back Glass	1.6 mm, High Transmission, Heat Strengthened Glass
Frame	30 mm Anodized Aluminium Alloy, Black
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0 mm ² Landscape: 1100/1100 mm Portrait: 280/350 mm*
Connector	TS4 / MC4 EVO2*

*Special order only

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43 °C (\pm 2 K)
Temperature Coefficient of P _{MAX}	-0.30 %/ K
Temperature Coefficient of V _{OC}	-0.24 %/ 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	25 A

WARRANTY

25 year Product Workmanship Warranty
 30 year Power Warranty
 1 % first year degradation
 0.4 % Annual Power Attenuation

PACKAGING CONFIGURATION

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

(Please refer to product warranty for details)