

# Vertex S

BACKSHEET MONOCRYSTALLINE MODULE

PRODUCT: TSM-DE09.08  
POWER RANGE: 390-410 W

## 410 W+

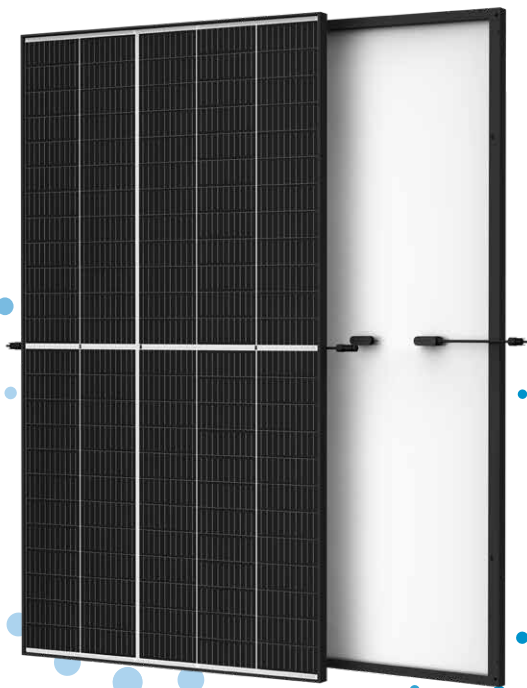
MAXIMUM POWER OUTPUT

## 0/+5 W

POSITIVE POWER TOLERANCE

## 21.3 %

MAXIMUM EFFICIENCY



### Small in size, big on power

- Generates up to 410 W, 21.3 % 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

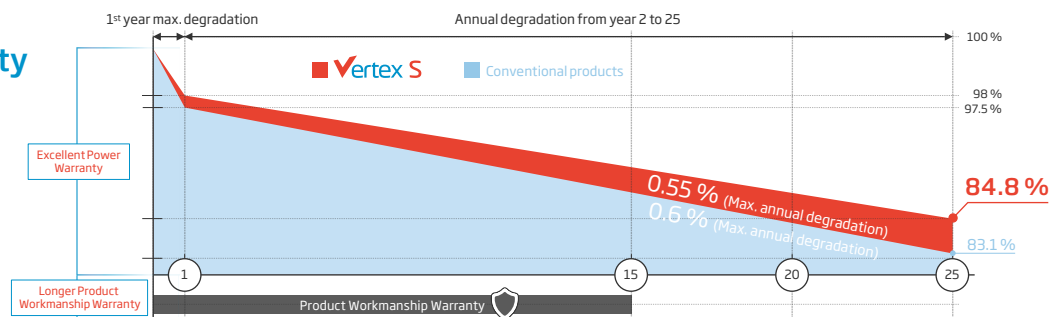
- 6,000 Pa snow load (test load)
- 4,000 Pa wind load (test load)

## Extended Vertex S Warranty

**2 %**  
1<sup>st</sup> year max. degradation

**0.55 %**  
Max. annual degradation from year 2 to 25

**15 Years**  
Product Workmanship Warranty

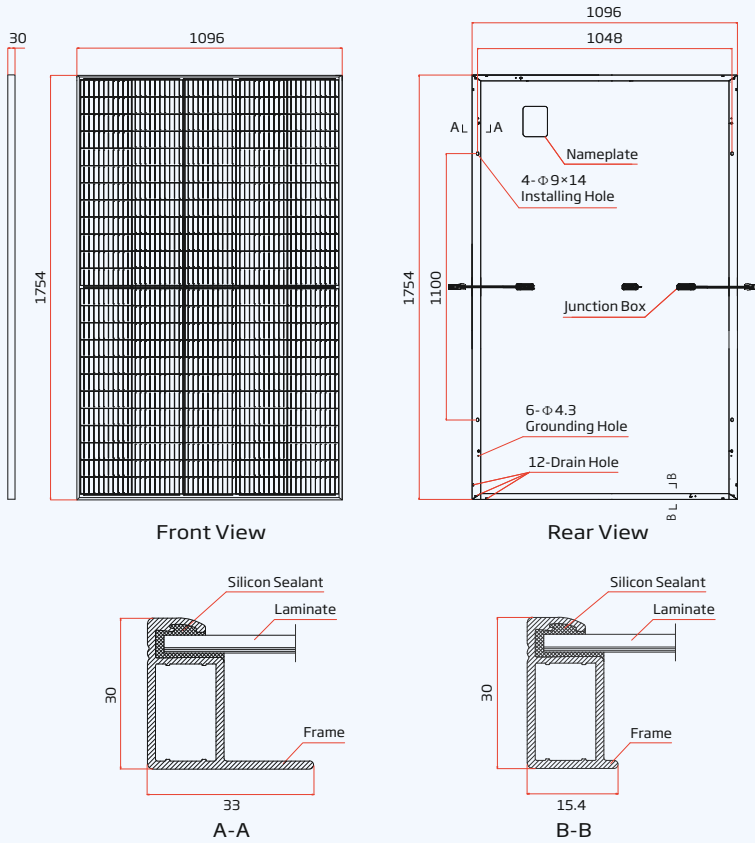


## Comprehensive Product and System Certificates

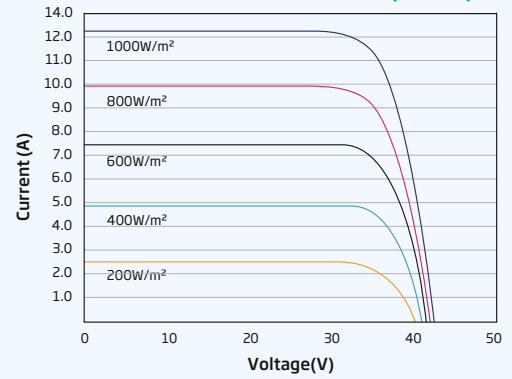


IEC61215/IEC61730/IEC61701/IEC62716  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System

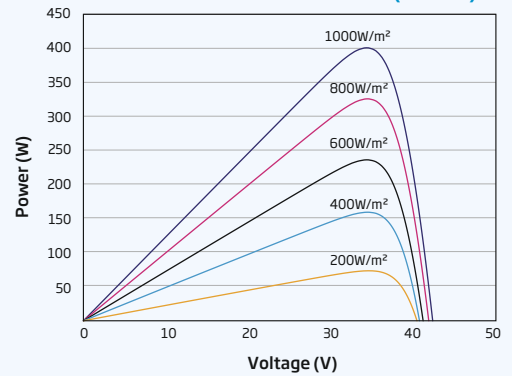
## DIMENSIONS OF PV MODULE (mm)



## I-V CURVES OF PV MODULE (400 W)



## P-V CURVES OF PV MODULE (400 W)



## ELECTRICAL DATA (STC)

	TSM-390 DE09.08	TSM-395 DE09.08	TSM-400 DE09.08	TSM-405 DE09.08	TSM-410 DE09.08
Peak Power Watts- $P_{MAX}$ (Wp)*	390	395	400	405	410
Power Tolerance- $P_{MAX}$ (W)	0/+5	0/+5	0/+5	0/+5	0/+5
Maximum Power Voltage- $V_{MPP}$ (V)	33.8	34.0	34.2	34.4	34.6
Maximum Power Current- $I_{MPP}$ (A)	11.54	11.62	11.70	11.77	11.85
Open Circuit Voltage- $V_{oc}$ (V)	40.8	41.0	41.2	41.4	41.6
Short Circuit Current- $I_{sc}$ (A)	12.14	12.21	12.28	12.34	12.40
Module Efficiency $\eta_m$ (%)	20.3	20.5	20.8	21.1	21.3

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

## MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	120 cells
Module Dimensions	1754×1096×30 mm
Weight	21.0 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 <sup>2</sup> Landscape: 1100/1100 mm Portrait: 280/280 mm*
Connector	TS4/MC4 EVO2*

\*Special order only

## ELECTRICAL DATA (NOCT)

	TSM-390 DE09.08	TSM-395 DE09.08	TSM-400 DE09.08	TSM-405 DE09.08	TSM-410 DE09.08
Maximum Power- $P_{MAX}$ (Wp)	295	298	302	306	310
Maximum Power Voltage- $V_{MPP}$ (V)	31.8	32.0	32.2	32.5	32.8
Maximum Power Current- $I_{MPP}$ (A)	9.26	9.32	9.38	9.41	9.46
Open Circuit Voltage- $V_{oc}$ (V)	38.4	38.6	38.8	38.9	39.1
Short Circuit Current- $I_{sc}$ (A)	9.78	9.84	9.90	9.95	9.99

NOCT: Irradiance at 800 W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

## TEMPERATURE RATINGS

NOCT(Nominal Operating Cell Temperature)	43°C ( $\pm 2$ 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