



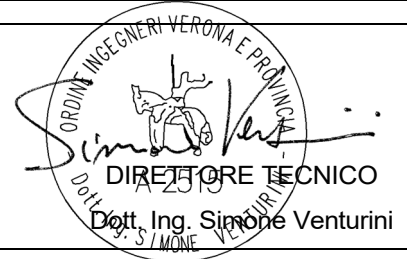
**PROGETTO DEFINITIVO DELL'IMPIANTO AGRIVOLTAICO DELLA POTENZA DI PICCO DI 360MW CON SISTEMA DI ACCUMULO DI CAPACITA' PARI A 82,5MWH E RELATIVE OPERE DI CONNESSIONE ALLA RETE RTN, DA REALIZZARSI NEL COMUNE DI SASSARI NELLE FRAZIONI DI "PALMADULA, LA CORTE, CANAGLIA, LI PIANI, SAN GIORGIO, SCALA ERRE"**

## PROGETTO DEFINITIVO

COMMITTENTE:

**PALMADULA  
SOLAR S.R.L.** 

PROGETTISTA:



TITOLO ELABORATO:

**BROCHURE MODULI FOTOVOLTAICI**

ELABORATO n°:  
BI028F-D-PAL-SH-02-r00

NOME FILE:

SCALA: ----

DATA: AGOSTO 2023

REVISIONE	N.	DATA	DESCRIZIONE	ELABORATO	CONTROLLATO	APPROVATO
	00		Agosto 2023	Prima Emissione	E. Guiot	M. Sandri
01						
02						
03						
04						

# Vertex N

BIFACIAL DUAL GLASS MODULE

PRODUCT: TSM-NEG21C.20

PRODUCT RANGE: 665-685W

## 685W

MAXIMUM POWER OUTPUT

## 0~+5W

POSITIVE POWER TOLERANCE

## 22.1%

MAXIMUM EFFICIENCY



### High customer value

- Lower LCOE (levelized cost of energy), reduced BOS (balance of system) cost, shorter payback time
- Guaranteed first year and annual degradation
- High module power; high string power and low voltage design



### High power up to 685W

- Up to 22.1% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



### High reliability

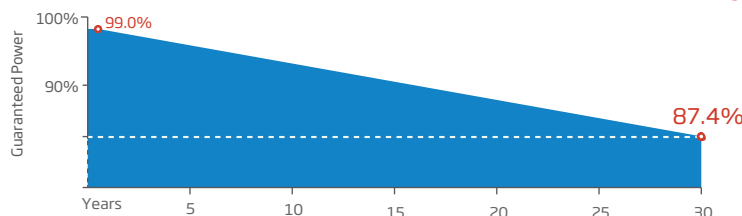
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



### High energy yield

- Excellent product bifaciality and low irradiation performance, validated by 3rd party
- Extremely low 1% first year degradation and 0.4% annual power attenuation
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.30%) and operating temperature
- Up to 30% additional power gain from back side depending on albedo

### Trina Solar's Vertex Bifacial Dual Glass Performance Warranty

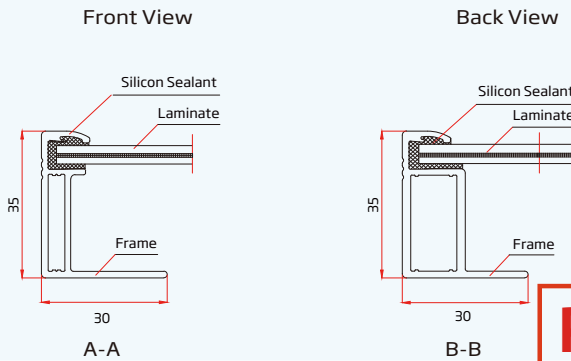
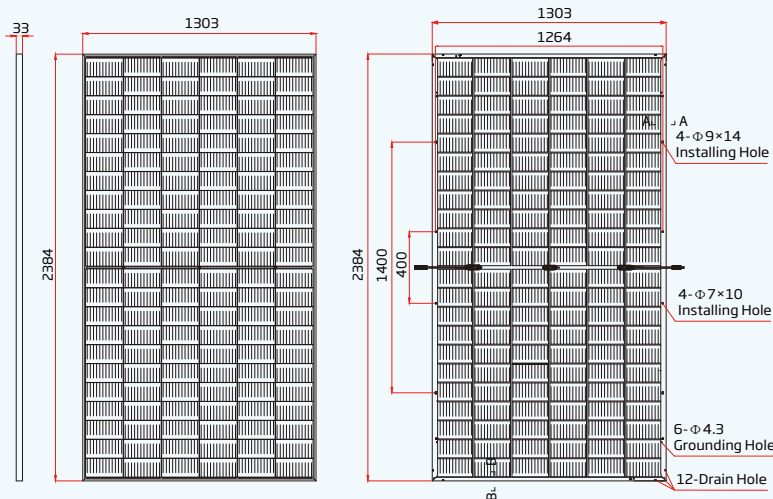
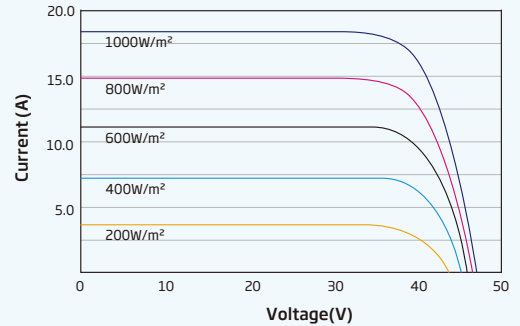
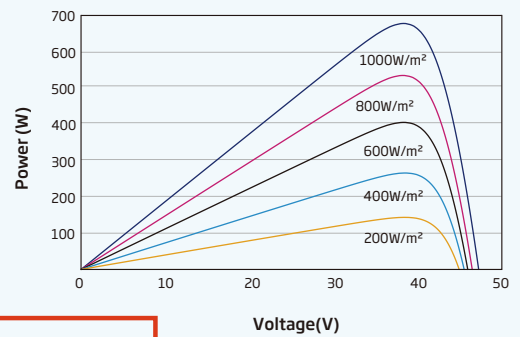


### Comprehensive Products and System Certificates



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



**DIMENSIONS OF PV MODULE(mm)**

**I-V CURVES OF PV MODULE(675W)**

**P-V CURVES OF PV MODULE(675 W)**


Preliminary

**ELECTRICAL DATA (STC)**

Peak Power Watts - P <sub>MAX</sub> (Wp)*	665	670	675	680	685
Power Tolerance - P <sub>MAX</sub> (W)	0 ~ +5				
Maximum Power Voltage - V <sub>MPP</sub> (V)	39.0	39.2	39.4	39.6	39.8
Maximum Power Current - I <sub>MPP</sub> (A)	17.06	17.09	17.12	17.16	17.19
Open Circuit Voltage - V <sub>OC</sub> (V)	46.8	47.0	47.2	47.4	47.7
Short Circuit Current - I <sub>SC</sub> (A)	18.07	18.10	18.14	18.18	18.21
Module Efficiency η <sub>m</sub> (%)	21.4	21.6	21.7	21.9	22.1

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

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

Total Equivalent power - P <sub>MAX</sub> (Wp)	718	724	729	734	740
Maximum Power Voltage - V <sub>MPP</sub> (V)	39.0	39.2	39.4	39.6	39.8
Maximum Power Current - I <sub>MPP</sub> (A)	18.42	18.46	18.49	18.53	18.57
Open Circuit Voltage - V <sub>OC</sub> (V)	46.8	47.0	47.2	47.4	47.7
Short Circuit Current - I <sub>SC</sub> (A)	19.51	19.55	19.59	19.63	19.67
Irradiance ratio (rear/front)	10%				

Product Bifaciality: 80±5%.

**ELECTRICAL DATA (NOCT)**

Maximum Power - P <sub>MAX</sub> (Wp)	506	510	514	517	521
Maximum Power Voltage - V <sub>MPP</sub> (V)	36.6	36.8	37.0	37.2	37.3
Maximum Power Current - I <sub>MPP</sub> (A)	13.84	13.86	13.89	13.91	13.94
Open Circuit Voltage - V <sub>OC</sub> (V)	44.4	44.5	44.7	44.9	45.2
Short Circuit Current - I <sub>SC</sub> (A)	14.56	14.59	14.62	14.65	14.67

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

**MECHANICAL DATA**

Solar Cells	Monocrystalline
No. of cells	132 cells
Module Dimensions	2384×1303×33 mm (93.86×51.30×1.30 inches)
Weight	38.7 kg (85.3 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)
Frame	35mm(1.30 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> ), Portrait: 280/280 mm(13.78/11.02 inches) Length can be customized
Connector	MC4 EV02 / TS4*

\*Please refer to regional datasheet for specified connector.

**TEMPERATURE RATINGS**

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P <sub>MAX</sub>	-0.30%/°C
Temperature Coefficient of V <sub>OC</sub>	-0.24%/°C
Temperature Coefficient of I <sub>SC</sub>	0.04%/°C

**MAXIMUM RATINGS**

Operational Temperature	-40 ~ +85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	35A

**WARRANTY**

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

(Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

Modules per box: 31 pieces
Modules per 40' container: 558 pieces