

# Vertex N

N-type i-TOPCon bifacial dual glass  
Monocrystalline module

PRODUCT: TSM-NEG21C.20  
PRODUCT RANGE: 675-700W

## 700W

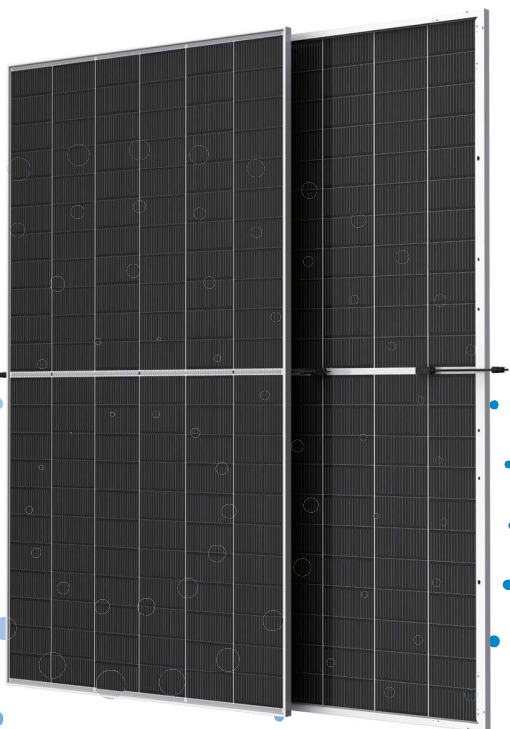
MAXIMUM POWER OUTPUT

## 0~+5W

POSITIVE POWER TOLERANCE

## 22.5%

MAXIMUM EFFICIENCY



### High customer value

- The star of LCOE (Levelized Cost Of Energy) .Higher string power feature effectively reduces BOS (Balance of System)and LCOE
- More energy harvest with cutting-edge N-type i-TOPCon technology
- Designed for compatibility with existing mainstream system components



### High power up to 700W

- Up to 22.5% module efficiency with high density interconnect technology
- SMBB (Super multi-busbar) technology for better light trapping effect, lower series resistance and improved current collection



### High reliability

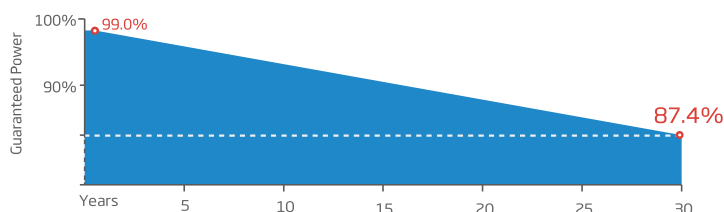
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive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



### High energy yield

- Excellent product bifaciality and low irradiation performance, validated by 3rd party
- Lower degradation: 1% first year, 0.4% annually thereafter
- Lower temperature coefficient (-0.30%)
- Up to 30% additional power gain from back side depending on albedo

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



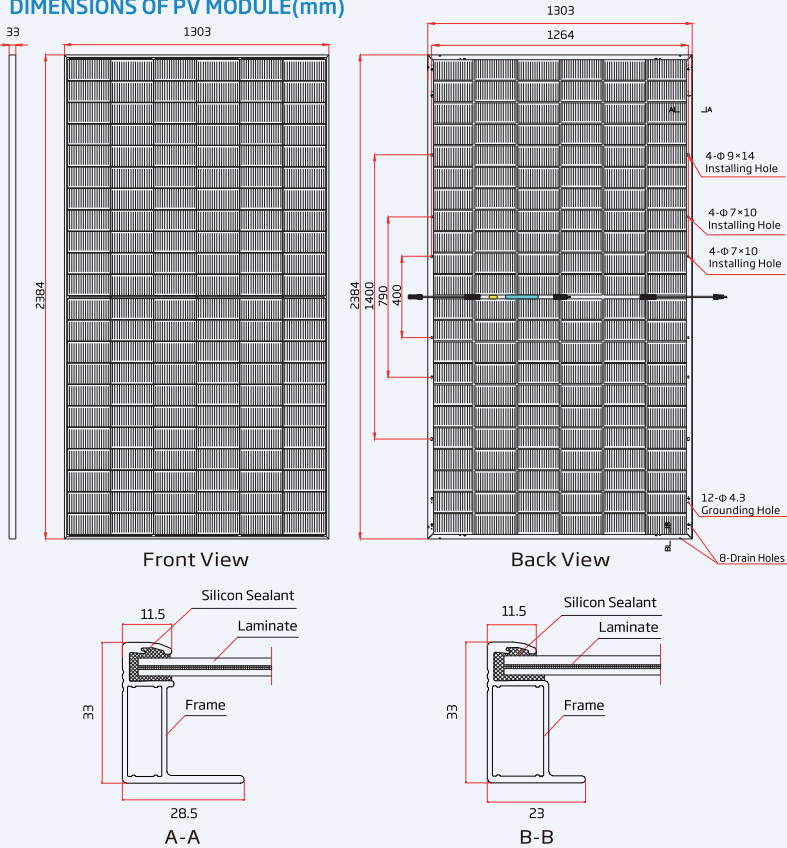
### Comprehensive Products and System Certificates



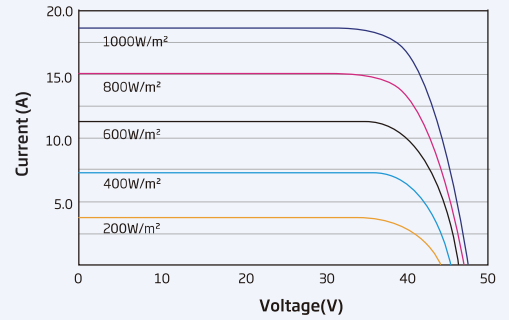
IEC61215/IEC61730/IEC61701/IEC62716  
ISO 9001: Quality Management System  
ISO 14001: Environmental Management System  
ISO14064: Greenhouse Gases Emissions Verification  
ISO45001: Occupational Health and Safety Management System



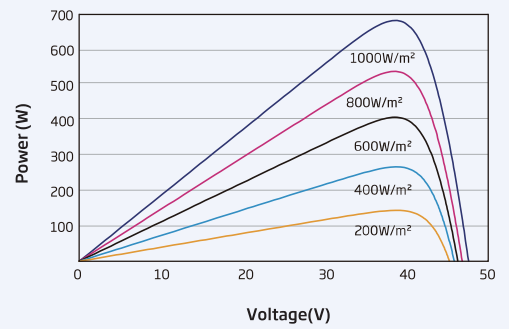
**DIMENSIONS OF PV MODULE(mm)**



**I-V CURVES OF PV MODULE(690W)**



**P-V CURVES OF PV MODULE(690 W)**



**MECHANICAL DATA**

Solar Cells	N-type Monocrystalline
No. of cells	132 cells
Module Dimensions	2384×1303×33 mm (93.86×51.30×1.30 inches)
Weight	38.3 kg (84.4 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)

Frame	33mm(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: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	MC4 EVO2 / TS4 PLUS / TS4*

\*Please refer to regional datasheet for specified connector.

**ELECTRICAL DATA (STC & NOCT)**

Testing Condition	STC		NOCT		STC		NOCT		STC		NOCT		STC		NOCT	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Peak Power Watts-P <sub>MAX</sub> (Wp)*	675	514	680	517	685	521	690	526	695	530	700	534				
Power Tolerance-P <sub>MAX</sub> (W)	0 ~ +5															
Maximum Power Voltage-V <sub>MPP</sub> (V)	39.4	37.0	39.6	37.2	39.8	37.3	40.1	37.7	40.3	37.8	40.5	38.0				
Maximum Power Current-I <sub>MPP</sub> (A)	17.12	13.89	17.16	13.91	17.19	13.94	17.23	13.96	17.25	14.02	17.29	14.05				
Open Circuit Voltage-V <sub>OC</sub> (V)	47.2	44.7	47.4	44.9	47.7	45.2	47.9	45.4	48.3	45.8	48.6	46.0				
Short Circuit Current-I <sub>SC</sub> (A)	18.14	14.62	18.18	14.65	18.21	14.67	18.25	14.71	18.28	14.73	18.32	14.76				
Module Efficiency η <sub>m</sub> (%)	21.7		21.9		22.1		22.2		22.4		22.5					

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s. \*Measuring tolerance: ±3%.

**Electrical characteristics with different power bin (reference to 5% & 10% backside power gain)**

Backside Power Gain	5%		10%		5%		10%		5%		10%		5%		10%	
	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
Total Equivalent power -P <sub>MAX</sub> (Wp)	709	743	714	748	719	754	725	759	730	765	735	770				
Maximum Power Voltage-V <sub>MPP</sub> (V)	39.4	39.4	39.6	39.6	39.8	39.8	40.1	40.1	40.3	40.3	40.5	40.5				
Maximum Power Current-I <sub>MPP</sub> (A)	17.98	18.83	18.02	18.88	18.05	18.91	18.09	18.95	18.11	18.98	18.15	19.02				
Open Circuit Voltage-V <sub>OC</sub> (V)	47.2	47.2	47.4	47.4	47.7	47.7	47.9	47.9	48.3	48.3	48.6	48.6				
Short Circuit Current-I <sub>SC</sub> (A)	19.05	19.95	19.09	20.00	19.12	20.03	19.16	20.08	19.19	20.11	19.24	20.15				

Power Bifaciality: 90±5%.

**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) 1500V DC (UL)
Max Series Fuse Rating	35A

**WARRANTY**

- 12 year Product Workmanship Warranty
  - 30 year Power Warranty
  - 1% first year degradation
  - 0.40% Annual Power Attenuation
- (Please refer to product warranty for details)

**PACKAGING CONFIGURATION**

- Modules per box: 33 pieces
- Modules per 40' container: 594 pieces