

Vertex N

N-type i-TOPCon Bifacial Dual Glass
Monocrystalline module

PRODUCT: TSM-XXXNEG21C.20

PRODUCT RANGE: 685-710W

710W

MAXIMUM POWER OUTPUT

0~+5W

BINNING TOLERANCE

22.9%

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 710W

- Up to 22.9% module efficiency with high density interconnect technology
- SMBB (Super multi-busbar) technology for better light trapping effect, lower series resistance and improved current collection



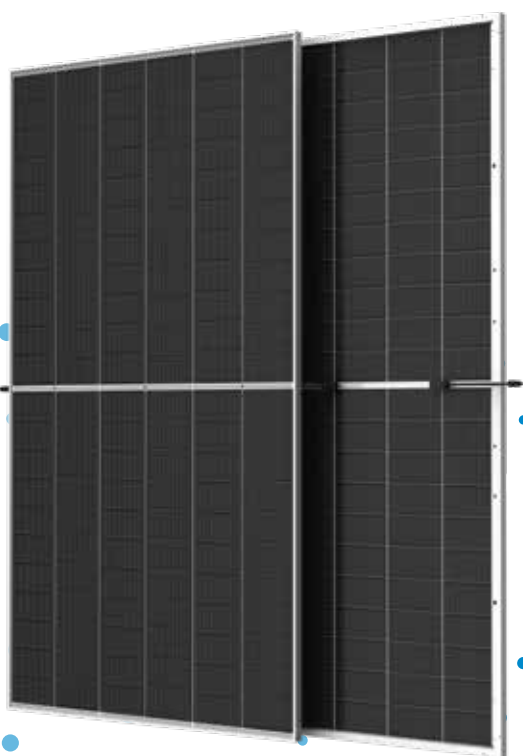
High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology
- Fire Class rating C
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load

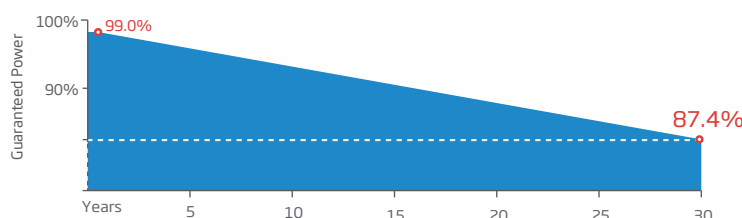


High energy yield

- Excellent product bifaciality and low irradiation performance, validated by 3rd party
- Lower degradation: 1% first year , 0.4% annually thereafter
- Lower temperature coefficient (-0.29%/°C)
- Up to 30% additional power gain from back side depending on albedo



Trina Solar's Vertex Bifacial Dual Glass Performance Warranty

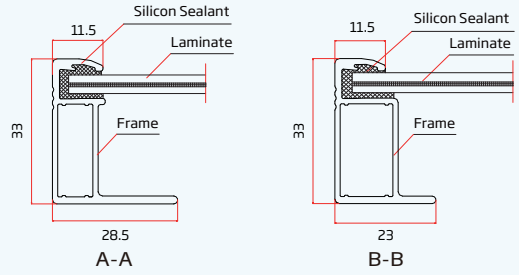
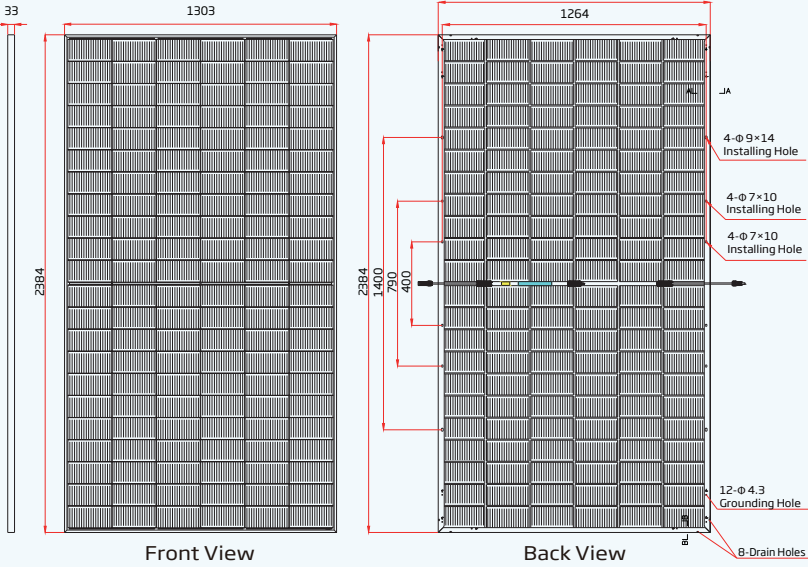
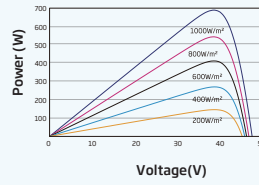
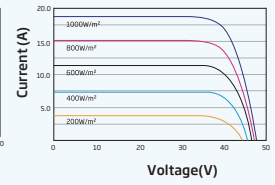


Comprehensive Products and System Certificates



IEC61215/IEC61730
 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)

P-V CURVES OF PV MODULE(695W)

I-V CURVES OF PV MODULE(695W)

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 ² (0.006 inches ²) Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	Stäubli MC4 EVO2

ELECTRICAL DATA (STC & NOCT&BNPI) TSM-XXXNEG21C.20 (XXX=685-710)

Testing Condition	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI
Peak Power Watts-P _{MAX} (Wp)*	685	522	759	690	526	765	695	531	770	700	534	776	705	540	781	710	543	787
Binning Tolerance-P _{MAX} (W)	0 ~ +5																	
Maximum Power Voltage-V _{MPP} (V)	39.8	37.4	39.8	40.1	37.7	40.1	40.3	37.9	40.3	40.5	38.0	40.5	40.7	38.3	40.7	40.9	38.5	40.9
Maximum Power Current-I _{MPP} (A)	17.19	13.93	19.07	17.23	13.95	19.07	17.25	14.00	19.11	17.29	14.04	19.15	17.33	14.19	19.19	17.36	14.12	19.23
Open Circuit Voltage-V _{OC} (V)	47.7	45.3	47.7	47.9	45.4	47.9	48.3	45.9	48.3	48.6	46.1	48.6	48.8	46.3	48.8	49.0	46.5	49.0
Short Circuit Current-I _{SC} (A)	18.21	14.67	20.18	18.25	14.71	20.22	18.28	14.72	20.25	18.32	14.76	20.30	18.36	14.83	20.34	18.40	14.83	20.39
Module Efficiency η _m (%)	22.1			22.2			22.4			22.5			22.7			22.9		

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s. BNPI: Irradiance at 1000W/m²+g_x135W/m², Air Mass AM1.5, Temp 25°C *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%
Total Equivalent power -P _{MAX} (Wp)	719	754	725	759	730	765	735	770	740	776	746	781		
Maximum Power Voltage-V _{MPP} (V)	39.8	39.8	40.1	40.1	40.3	40.3	40.5	40.5	40.7	40.7	40.9	40.9		
Maximum Power Current-I _{MPP} (A)	18.05	18.91	18.09	18.95	18.11	18.98	18.15	19.02	18.20	19.06	18.23	19.10		
Open Circuit Voltage-V _{OC} (V)	47.7	47.7	47.9	47.9	48.3	48.3	48.6	48.6	48.8	48.8	49.0	49.0		
Short Circuit Current-I _{SC} (A)	19.12	20.03	19.16	20.08	19.19	20.11	19.24	20.15	19.28	20.20	19.32	20.24		

Power Bifaciality: 80±7%; q_{pmax}: 80%±7%; q_{p100}: 100%±3%; q_{isc}: 80%±7%

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P _{MAX}	-0.29%/°C
Temperature Coefficient of V _{OC}	-0.24%/°C
Temperature Coefficient of I _{SC}	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+70 °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 (Power degradation values above apply to frontside, refer to product warranty for power degradation for backside and other details)

PACKAGING CONFIGURATION

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