

# Vertex N

**N-type i-TOPCon bifacial dual glass**  
Monocrystalline module

PRODUCT: TSM-XXXNEG21C.20

POWER RANGE: 705-725W

## 725W

MAXIMUM POWER OUTPUT

## 0~+5W

BINNING TOLERANCE

## 23.3%

MAXIMUM EFFICIENCY



### High customer value

- Standardized module size with flagship module power, 35W higher compared with conventional technology
- Low voltage design with higher string power, effectively reducing BOS (Balance of System) and LCOE (Levelized Cost of Energy) by 2%~6%
- Higher container space utilization effectively reduces the freight cost
- Certified Low-Carbon Footprint
- The Star of LCOE



### High power up to 725W

- Up to 23.3% module efficiency, on 210 innovation platform
- Patented i-TOPCon technology with continuous efficiency improvement, including contact resistance reduction, rear reflection enhancement and edge quality repairment



### High reliability

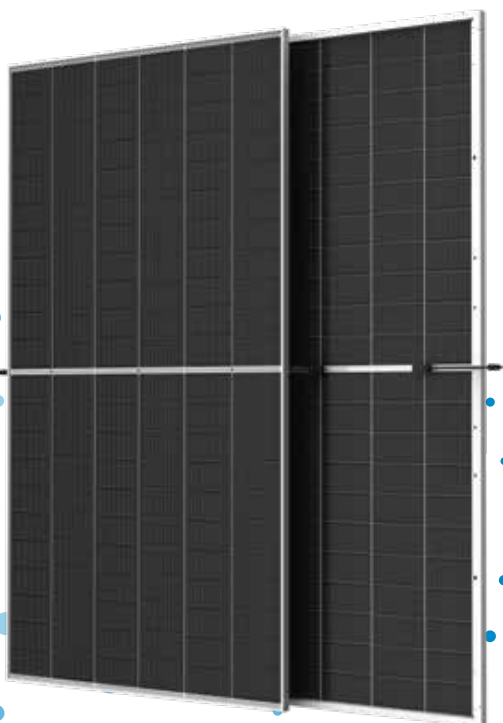
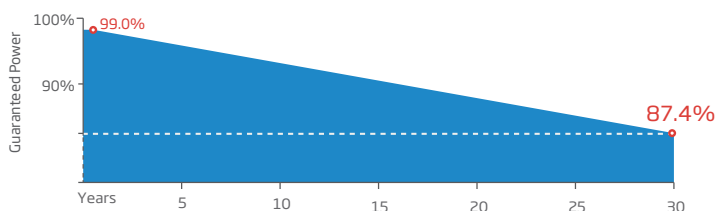
- Minimized micro-cracks with innovative non-destructive cutting technology and high-density packaging
- Reduced risks of hot-spot with half-cut technology
- Fire Class rating C



### High energy yield

- Excellent low irradiation performance, validated by 3rd party
- Lower temperature coefficient (-0.29%/°C)
- Higher bifaciality, with up to 10%~20% additional power gain from back side depending on albedo
- Reliable dual-glass structure with 30-year power guarantee

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



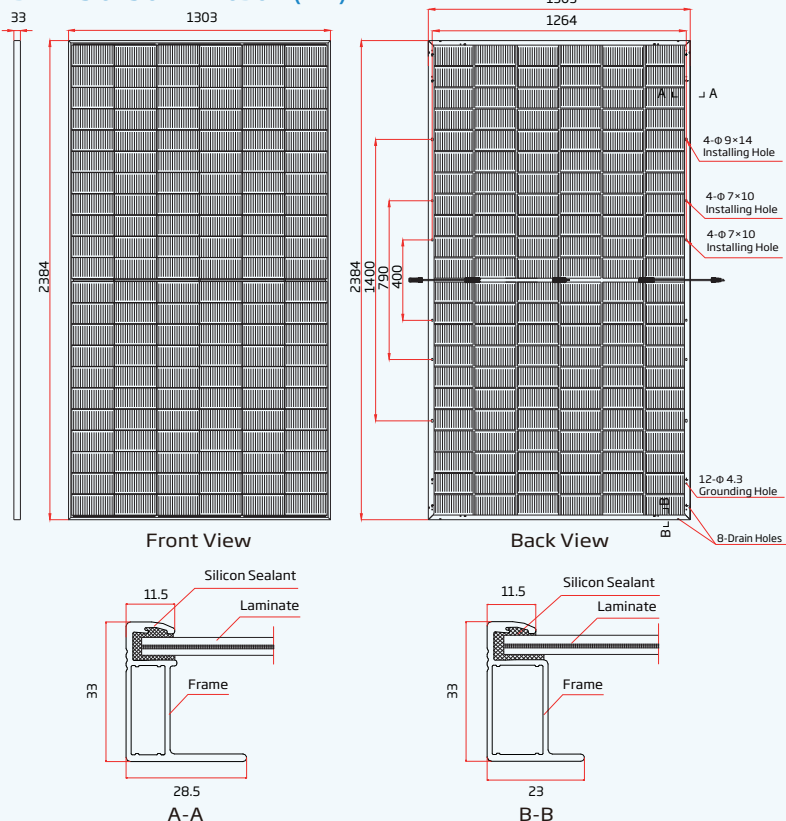
### Comprehensive Products and System Certificates



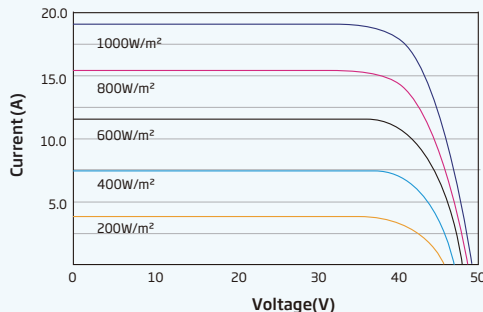
IEC61215/IEC61730  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System  
 ISO14067: Product Carbon Footprint Limited Assurance



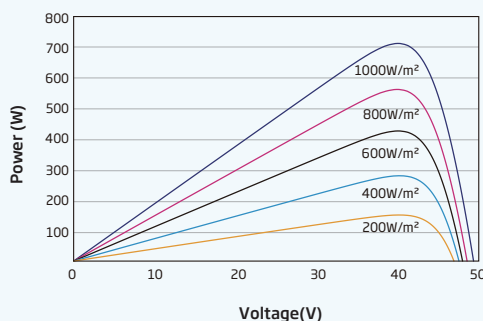
### DIMENSIONS OF PV MODULE(mm)



### I-V CURVES OF PV MODULE(715 W)



### P-V CURVES OF PV MODULE(715 W)



### MECHANICAL DATA

Solar Cells	N-type i-TOPCon 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), AR Coated Heat Strengthened Glass
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Coating)

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	Stäubli MC4 EVO2

### ELECTRICAL DATA (STC & NOCT& BNPI) TSM-XXXNEG21C.20 (XXX=705-725)

Testing Condition	STC			NOCT			BNPI			STC			NOCT			BNPI		
	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI
Peak Power Watts- $P_{MAX}$ (Wp)*	705	540	781	710	543	787	715	547	792	720	551	798	725	555	801			
Binning Tolerance- $P_{MAX}$ (W)	0 ~ +5																	
Maximum Power Voltage- $V_{MPP}$ (V)	40.7	38.3	40.7	40.9	38.5	40.9	41.1	38.7	41.1	41.3	38.8	41.3	41.5	39.0	41.5			
Maximum Power Current- $I_{MPP}$ (A)	17.33	14.08	19.19	17.36	14.12	19.23	17.40	14.14	19.28	17.44	14.19	19.32	17.47	14.23	19.30			
Open Circuit Voltage- $V_{OC}$ (V)	48.8	46.3	48.8	49.0	46.5	49.0	49.2	46.7	49.2	49.4	46.9	49.4	49.6	47.1	49.6			
Short Circuit Current- $I_{SC}$ (A)	18.36	14.80	20.34	18.40	14.83	20.39	18.44	14.86	20.43	18.49	14.90	20.49	18.54	14.94	20.54			
Module Efficiency $\eta_m$ (%)	22.7			22.9			23.0			23.2			23.3					

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 - $P_{MAX}$ (Wp)	740	776	746	781	751	787	756	792	761	798						
Maximum Power Voltage- $V_{MPP}$ (V)	40.7	40.7	40.9	40.9	41.1	41.1	41.3	41.3	41.5	41.5						
Maximum Power Current- $I_{MPP}$ (A)	18.20	19.06	18.23	19.10	18.27	19.14	18.31	19.18	18.34	19.22						
Open Circuit Voltage- $V_{OC}$ (V)	48.8	48.8	49.0	49.0	49.2	49.2	49.4	49.4	49.6	49.6						
Short Circuit Current- $I_{SC}$ (A)	19.28	20.20	19.32	20.24	19.36	20.28	19.41	20.34	19.47	20.39						

Power Bifaciality: 80±7%;  $\eta_{Pmax}$ : 80±7%;  $\eta_{Voc}$ : 100±3%;  $\eta_{Isc}$ : 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~+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  
 (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