

Vertex N

N-type i-TOPCon bifacial dual glass
Monocrystalline module

PRODUCT: TSM-NEG19RC.20

POWER RANGE: 585-610W

610W

MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

22.6%

MAXIMUM EFFICIENCY



High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- More energy harvest with cutting-edge N-type i-TOPCon technology
- Designed for compatibility with existing mainstream system components
- Higher container space utilization effectively reduces the freight cost



High power up to 610 W

- Up to 22.6% 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

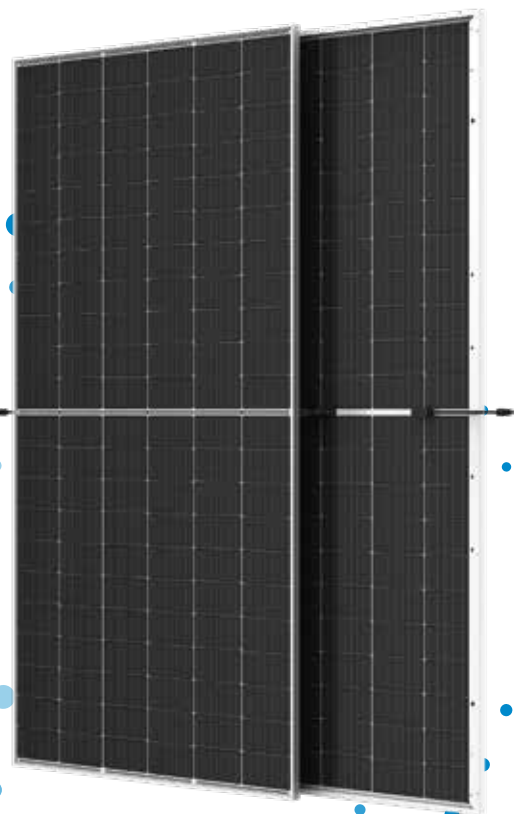
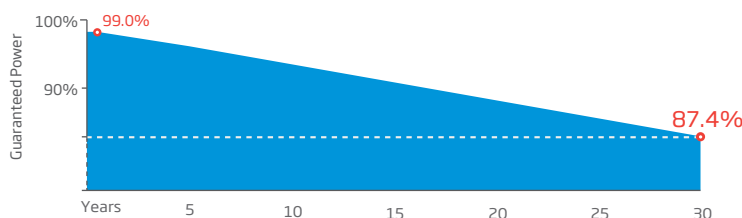
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive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



High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- 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



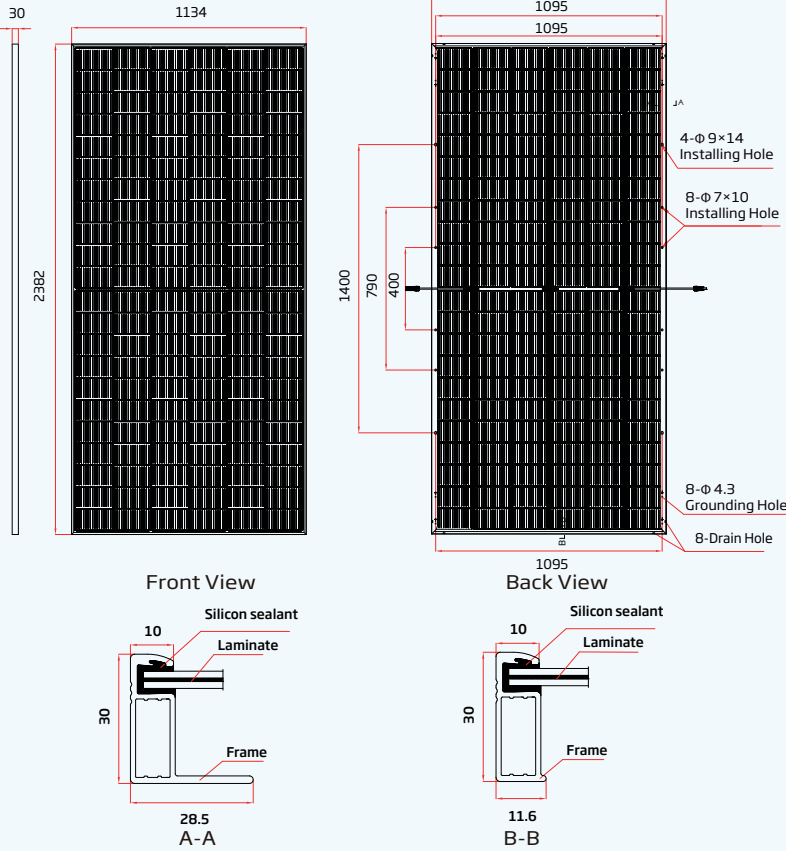
Comprehensive Products and System Certificates



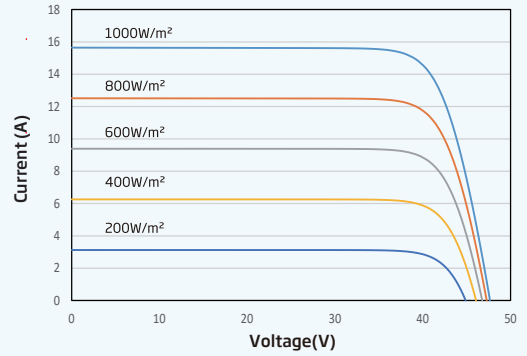
IEC61215/IEC61730/IEC61701/IEC62716/UL61730
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System



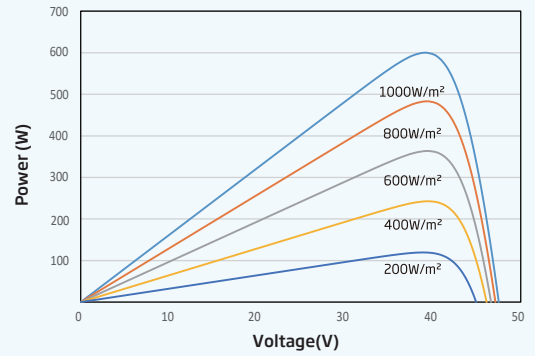
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE (600 W)



P-V CURVES OF PV MODULE (600 W)



MECHANICAL DATA

Solar Cells	N-type Monocrystalline
No. of cells	132 cells
Module Dimensions	2382×1134×30 mm (93.78×44.65×1.18 inches)
Weight	33.7kg (74.3 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	30mm(1.18 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	TS4 PLUS / TS4

ELECTRICAL DATA (STC & NOCT)

Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Peak Power Watts-P _{MAX} (Wp)*	585	446	590	450	595	454	600	458	605	461	610	465
Power Tolerance-P _{MAX} (W)	0 ~ +5											
Maximum Power Voltage-V _{MPP} (V)	39.5	37.1	39.7	37.3	40.0	37.6	40.3	37.8	40.5	38.0	40.8	38.3
Maximum Power Current-I _{MPP} (A)	14.82	12.02	14.86	12.05	14.89	12.08	14.91	12.12	14.94	12.14	14.96	12.16
Open Circuit Voltage-V _{OC} (V)	47.5	45.0	47.8	45.3	48.1	45.6	48.4	45.9	48.7	46.1	49.0	46.4
Short Circuit Current-I _{SC} (A)	15.68	12.64	15.72	12.67	15.76	12.70	15.80	12.73	15.83	12.76	15.86	12.78
Module Efficiency η _m (%)	21.7		21.8		22.0		22.2		22.4		22.6	

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass 1.5. NOCT: Irradiance at 800W/m², 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%
Total Equivalent power -P _{MAX} (Wp)	614	644	620	649	625	655	630	660	635	666	641	671
Maximum Power Voltage-V _{MPP} (V)	39.5	39.5	39.7	39.7	40.0	40.0	40.3	40.3	40.5	40.5	40.8	40.8
Maximum Power Current-I _{MPP} (A)	15.56	16.30	15.60	16.35	15.63	16.38	15.66	16.40	15.69	16.43	15.71	16.46
Open Circuit Voltage-V _{OC} (V)	47.5	47.5	47.8	47.8	48.1	48.1	48.4	48.4	48.7	48.7	49.0	49.0
Short Circuit Current-I _{SC} (A)	16.46	17.25	16.51	17.29	16.55	17.34	16.59	17.38	16.62	17.41	16.65	17.45

Power Bifaciality: 80±5%.

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P _{MAX}	-0.30%/°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

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

- Modules per box: 36 pieces
- Modules per 40' container: 720 pieces