

# Vertex N

**BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE**

PRODUCT: TSM-XXXNEG19RC.20

POWER RANGE: 570-595W

## 595W

MAXIMUM POWER OUTPUT

## 0~+5W

BINNING TOLERANCE

## 22.0%

MAXIMUM EFFICIENCY



### High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components
- Higher return on Investment



### High power up to 595W

- Up to 22.0% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



### High reliability

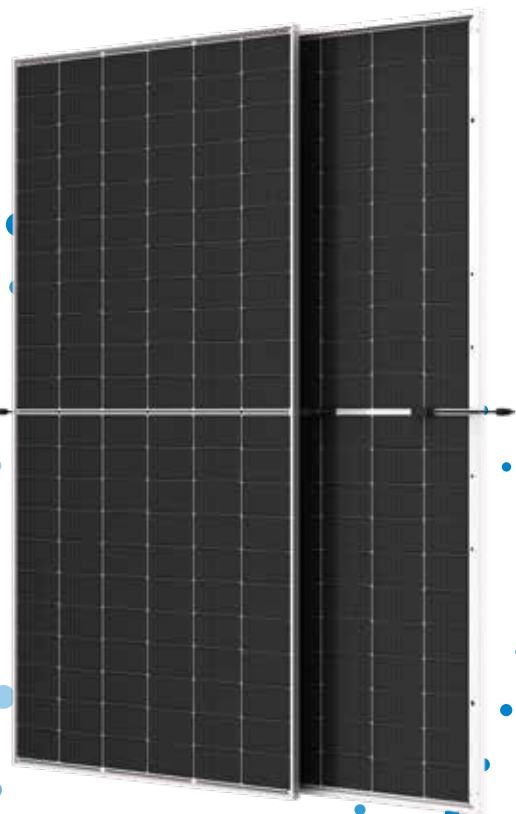
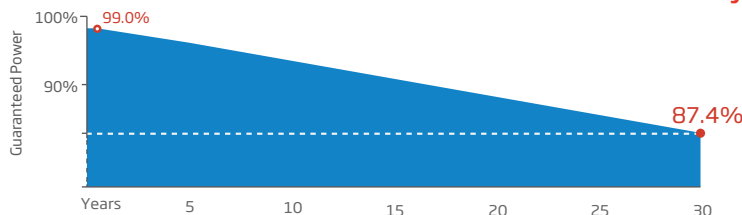
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control and fire class rating C
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance 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
- 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/UL61730

ISO 9001: Quality Management System

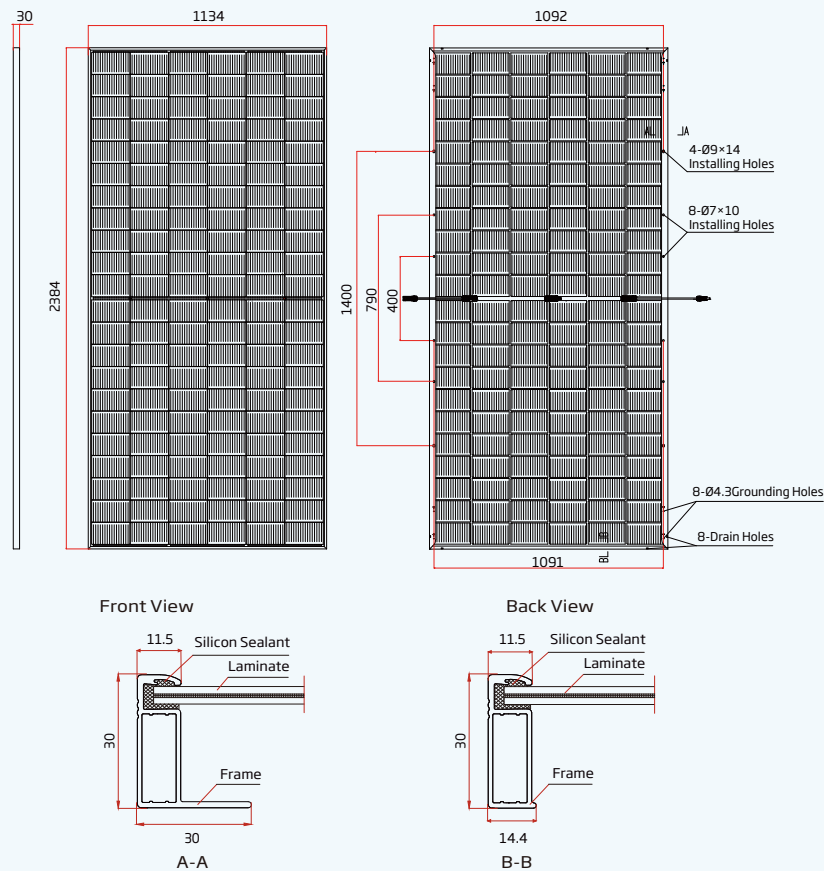
ISO 14001: Environmental Management System

ISO14064: Greenhouse Gases Emissions Verification

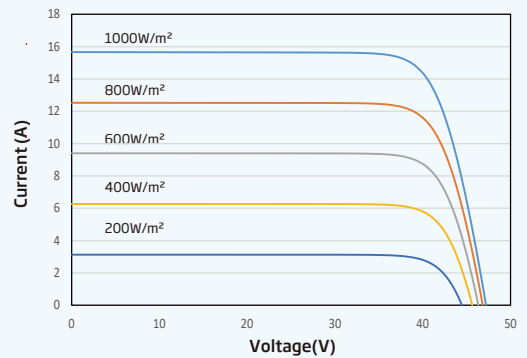
ISO45001: Occupational Health and Safety Management System



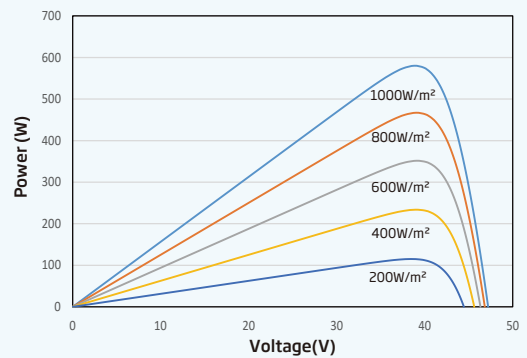
### DIMENSIONS OF PV MODULE(mm)



### I-V CURVES OF PV MODULE(590 W)



### P-V CURVES OF PV MODULE(590 W)



### ELECTRICAL DATA (STC) TSM-XXXNEG19RC.20 (XXX=570-595)

Peak Power Watts- $P_{MAX}$ (Wp)*	570	575	580	585	590	595
Binning Tolerance- $P_{MAX}$ (W)	0 ~ +5					
Maximum Power Voltage- $V_{MPP}$ (V)	38.6	38.9	39.2	39.5	39.7	40.0
Maximum Power Current- $I_{MPP}$ (A)	14.75	14.78	14.79	14.82	14.86	14.89
Open Circuit Voltage- $V_{OC}$ (V)	46.6	46.9	47.2	47.5	47.8	48.1
Short Circuit Current- $I_{SC}$ (A)	15.61	15.63	15.65	15.68	15.72	15.76
Module Efficiency $\eta_m$ (%)	21.1	21.3	21.5	21.6	21.8	22.0

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 - $P_{MAX}$ (Wp)	616	621	626	632	637	643
Maximum Power Voltage- $V_{MPP}$ (V)	38.6	38.9	39.2	39.5	39.7	40.0
Maximum Power Current- $I_{MPP}$ (A)	15.93	15.96	15.97	16.01	16.05	16.08
Open Circuit Voltage- $V_{OC}$ (V)	46.6	46.9	47.2	47.5	47.8	48.1
Short Circuit Current- $I_{SC}$ (A)	16.86	16.88	16.90	16.93	16.98	17.02
Irradiance ratio (rear/front)	10%					

Power Bifaciality: 80±5%.

### ELECTRICAL DATA (NOCT)

Maximum Power- $P_{MAX}$ (Wp)	434	438	442	446	450	454
Maximum Power Voltage- $V_{MPP}$ (V)	36.3	36.5	36.8	37.1	37.3	37.6
Maximum Power Current- $I_{MPP}$ (A)	11.97	11.99	12.00	12.02	12.05	12.08
Open Circuit Voltage- $V_{OC}$ (V)	44.2	44.5	44.7	45.0	45.3	45.6
Short Circuit Current- $I_{SC}$ (A)	12.58	12.59	12.61	12.64	12.67	12.70

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

### MECHANICAL DATA

Solar Cells	N type
No. of cells	132 cells
Module Dimensions	2384×1134×30 mm (93.86×44.65×1.18 inches)
Weight	33.1kg (72.97lb)
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	30mm(1.18 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	Staubli MC4 EVO2 / Trina Solar TS4

### 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

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

(Please refer to product warranty for details)