

# Vertex N

**BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE**

PRODUCT: TSM-XXXNEG19RC.20

POWER RANGE: 570-605W

## 605W

MAXIMUM POWER OUTPUT

## 0~+5W

BINNING TOLERANCE

## 22.4%

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 605W

- Up to 22.4% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



### High reliability

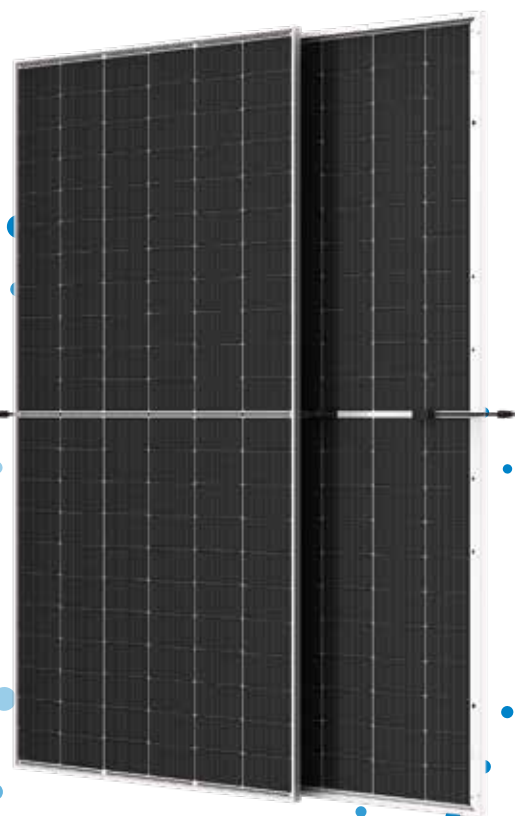
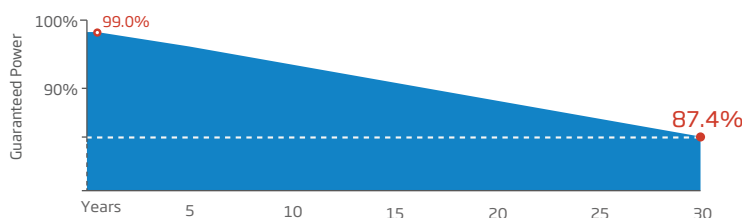
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control and fire class rating C
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance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



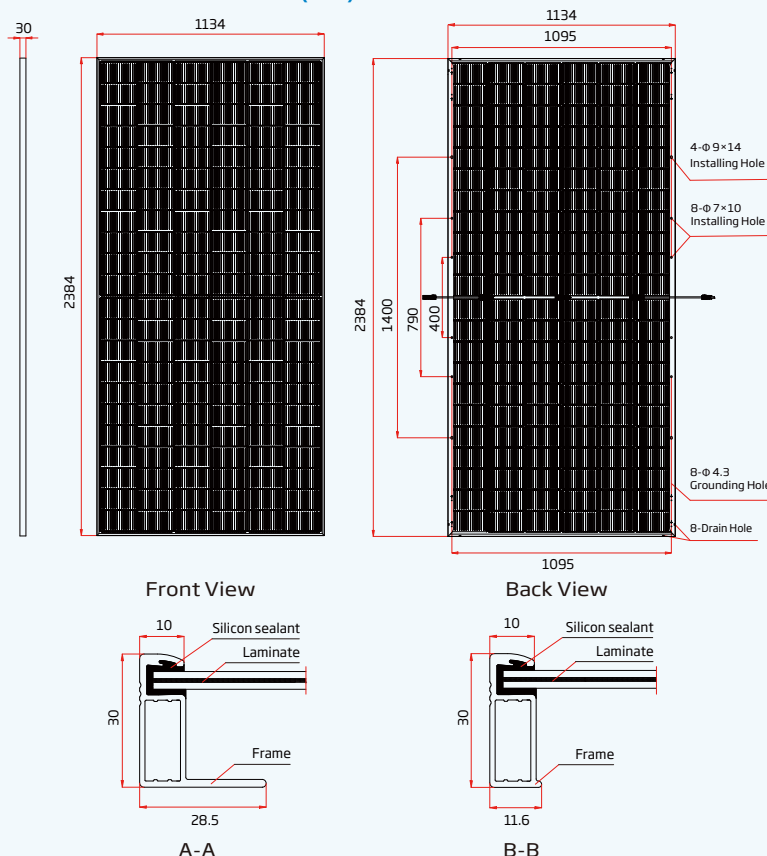
### Comprehensive Products and System Certificates



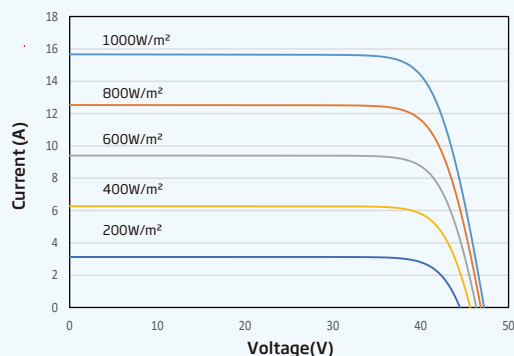
IEC61215/IEC61730/IEC61701/IEC62716/UL61730  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System

**Trina**solar

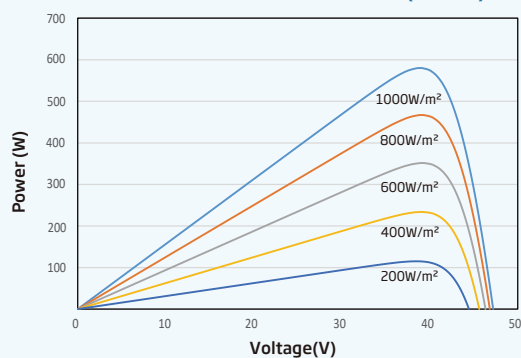
## DIMENSIONS OF PV MODULE(mm)



## I-V CURVES OF PV MODULE(595 W)



## P-V CURVES OF PV MODULE(595 W)



## ELECTRICAL DATA (STC) TSM-XXXNEG19RC.20 (XXX=570-605)

|                                            |        |       |       |       |       |       |       |       |
|--------------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|
| Peak Power Watts-P <sub>MAX</sub> (Wp)*    | 570    | 575   | 580   | 585   | 590   | 595   | 600   | 605   |
| Binning Tolerance-P <sub>MAX</sub> (W)     | 0 ~ +5 |       |       |       |       |       |       |       |
| Maximum Power Voltage-V <sub>MPP</sub> (V) | 38.6   | 38.9  | 39.2  | 39.5  | 39.7  | 40.0  | 40.3  | 40.5  |
| Maximum Power Current-I <sub>MPP</sub> (A) | 14.75  | 14.78 | 14.79 | 14.82 | 14.86 | 14.89 | 14.91 | 14.94 |
| Open Circuit Voltage-V <sub>OC</sub> (V)   | 46.6   | 46.9  | 47.2  | 47.5  | 47.8  | 48.1  | 48.4  | 48.7  |
| Short Circuit Current-I <sub>SC</sub> (A)  | 15.61  | 15.63 | 15.65 | 15.68 | 15.72 | 15.76 | 15.80 | 15.83 |
| Module Efficiency η <sub>m</sub> (%)       | 21.1   | 21.3  | 21.5  | 21.6  | 21.8  | 22.0  | 22.2  | 22.4  |

STC: Irradiance 1000W/m², 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 <sub>MAX</sub> (Wp) | 616   | 621   | 626   | 632   | 637   | 643   | 648   | 653   |
| Maximum Power Voltage-V <sub>MPP</sub> (V)    | 38.6  | 38.9  | 39.2  | 39.5  | 39.7  | 40.0  | 40.3  | 40.5  |
| Maximum Power Current-I <sub>MPP</sub> (A)    | 15.93 | 15.96 | 15.97 | 16.01 | 16.05 | 16.08 | 16.10 | 16.14 |
| Open Circuit Voltage-V <sub>OC</sub> (V)      | 46.6  | 46.9  | 47.2  | 47.5  | 47.8  | 48.1  | 48.4  | 48.7  |
| Short Circuit Current-I <sub>SC</sub> (A)     | 16.86 | 16.88 | 16.90 | 16.93 | 16.98 | 17.02 | 17.06 | 17.10 |
| Irradiance ratio (rear/front)                 | 10%   |       |       |       |       |       |       |       |

Power Bifaciality: 80±5%.

## ELECTRICAL DATA (NOCT)

|                                            |       |       |       |       |       |       |       |       |
|--------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Maximum Power-P <sub>MAX</sub> (Wp)        | 434   | 438   | 442   | 446   | 450   | 454   | 458   | 461   |
| Maximum Power Voltage-V <sub>MPP</sub> (V) | 36.3  | 36.5  | 36.8  | 37.1  | 37.3  | 37.6  | 37.8  | 38.0  |
| Maximum Power Current-I <sub>MPP</sub> (A) | 11.97 | 11.99 | 12.00 | 12.02 | 12.05 | 12.08 | 12.12 | 12.14 |
| Open Circuit Voltage-V <sub>OC</sub> (V)   | 44.2  | 44.5  | 44.7  | 45.0  | 45.3  | 45.6  | 45.9  | 46.1  |
| Short Circuit Current-I <sub>SC</sub> (A)  | 12.58 | 12.59 | 12.61 | 12.64 | 12.67 | 12.70 | 12.73 | 12.76 |

NOCT: Irradiance at 800W/m², 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               | 33.7kg (74.3 lb)                                                                                                             |
| 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 (TS306F20/F20T)                                                                                                  |
| Cables               | Photovoltaic Technology Cable 4.0mm² (0.006 inches²)<br>Portrait: 350/280 mm(13.78/11.02 inches)<br>Length can be customized |
| Connector            | Stabuli MC4 EVO2 / Trina Solar TS4 Plus / Trina Solar TS4                                                                    |

## 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)<br>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 |