

# Vertex N

**Preliminary**

**BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE**

PRODUCT: TSM-NEG19RC.20

POWER RANGE: 580-605W

**605W**

MAXIMUM POWER OUTPUT

**0~+5W**

POSITIVE POWER 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

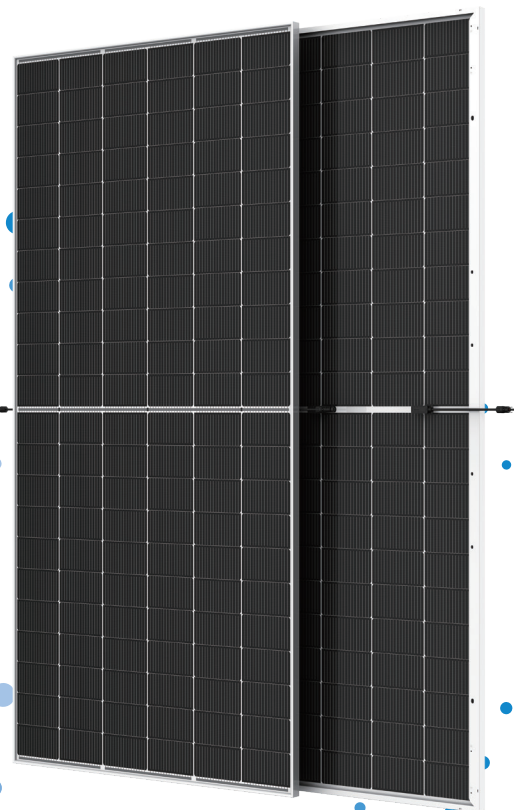
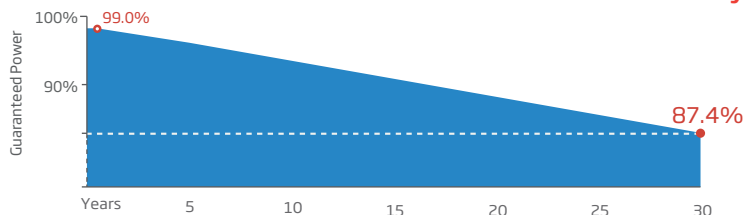
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive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



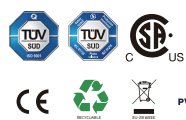
### High energy yield

- 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



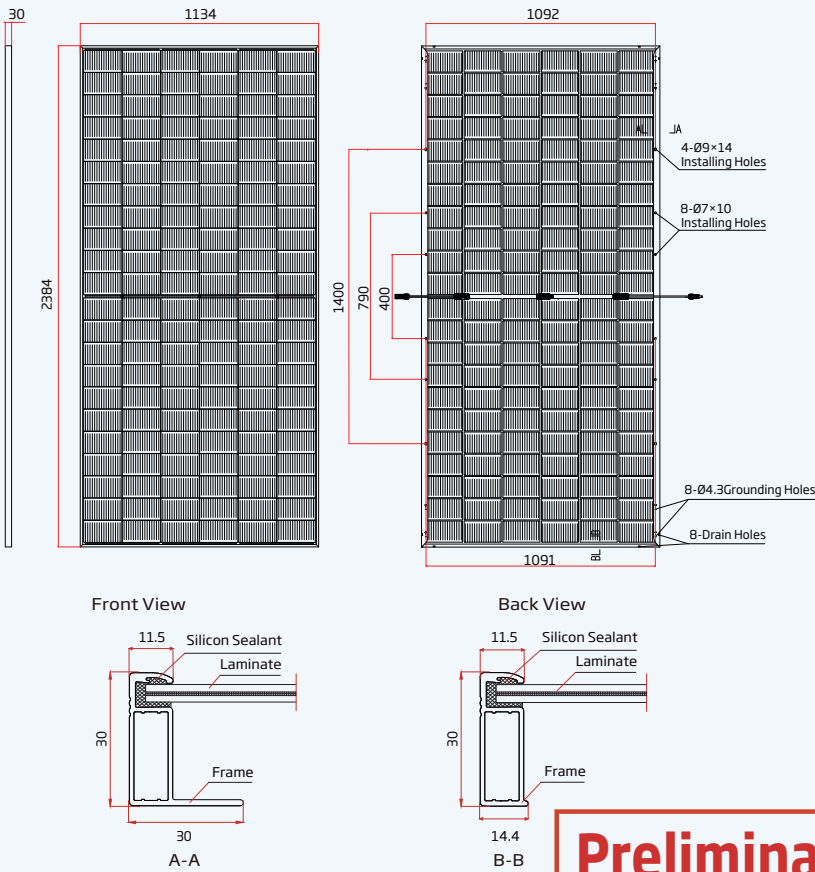
### Comprehensive Products and System Certificates



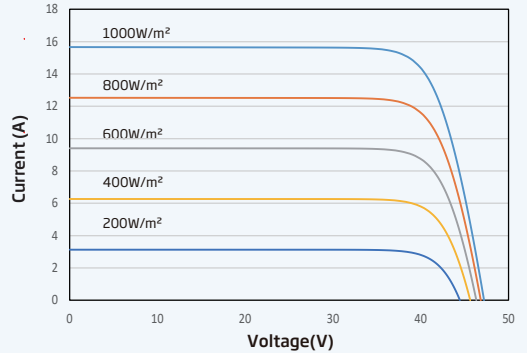
IEC61215/IEC61730/IEC61701/IEC62716/UL61730  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System



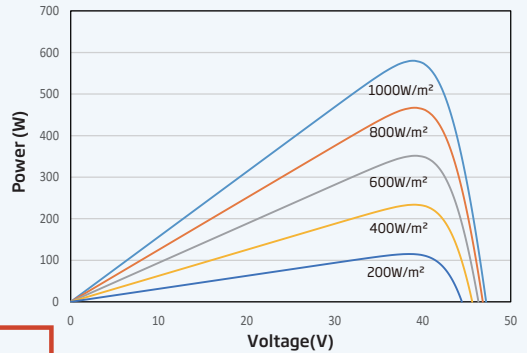
**DIMENSIONS OF PV MODULE(mm)**



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



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



**Preliminary**

**ELECTRICAL DATA (STC)**

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

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 <sub>MAX</sub> (Wp)	626	632	637	643	648	653
Maximum Power Voltage - V <sub>MPP</sub> (V)	39.2	39.5	39.7	40.0	40.3	40.5
Maximum Power Current - I <sub>MPP</sub> (A)	15.97	16.01	16.05	16.08	16.10	16.14
Open Circuit Voltage - V <sub>OC</sub> (V)	47.2	47.5	47.8	48.1	48.4	48.7
Short Circuit Current - I <sub>SC</sub> (A)	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)	442	446	450	454	458	461
Maximum Power Voltage - V <sub>MPP</sub> (V)	36.8	37.1	37.3	37.6	37.8	38.0
Maximum Power Current - I <sub>MPP</sub> (A)	12.00	12.02	12.05	12.08	12.12	12.14
Open Circuit Voltage - V <sub>OC</sub> (V)	44.7	45.0	45.3	45.6	45.9	46.1
Short Circuit Current - I <sub>SC</sub> (A)	12.61	12.64	12.67	12.70	12.73	12.76

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

**MECHANICAL DATA**

Solar Cells	Monocrystalline
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	MC4 EVO2 / TS4*

\*Please refer to regional datasheet for specified connector.

**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) 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