

# Vertex N

**BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE**

PRODUCT: TSM-NEG19RC.20

PRODUCT RANGE: 535-565W

**565W**

MAXIMUM POWER OUTPUT

**0~+5W**

POSITIVE POWER TOLERANCE

**20.9%**

MAXIMUM EFFICIENCY



### High customer value

- Lower LCOE , reduced BOS cost, better ROI
- Lowest guaranteed first year and annual degradation
- Optimized compatibility with existing mainstream system components



### High power up to 600W

- Up to 22.2% module efficiency
- High density interconnection provides improved power density
- MBB technology improves lighttrapping effect and currentcollection, while lowering series resistance



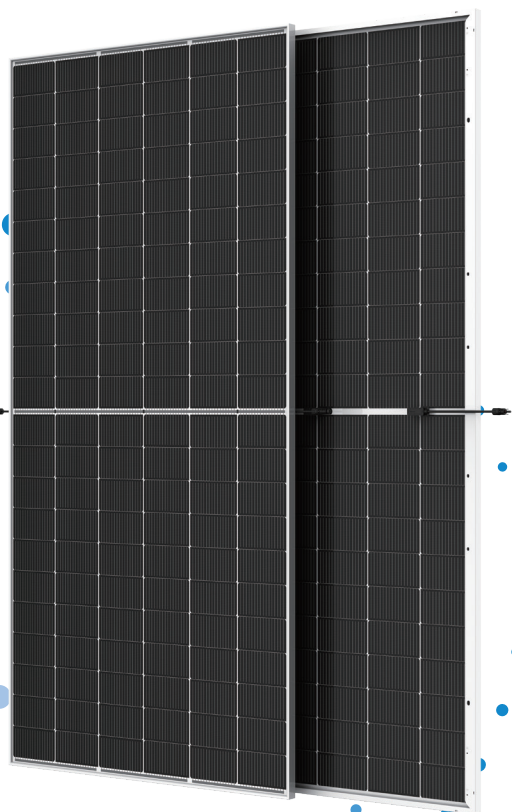
### High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology minimizes micro-cracking
- Ensured PID resistance through improved cell process and module material control
- Resistant to harsh environments
- Mechanical performance up to +5400/-2400 Pa

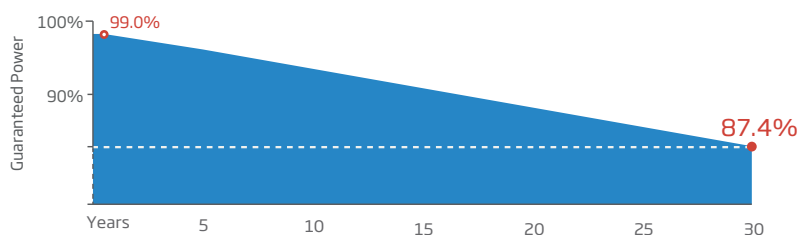


### High energy yield

- Excellent IAM 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



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



### Comprehensive Products and System Certificates



IEC61215/IEC61730/IEC61701/IEC62716/UL61730

ISO 9001: Quality Management System

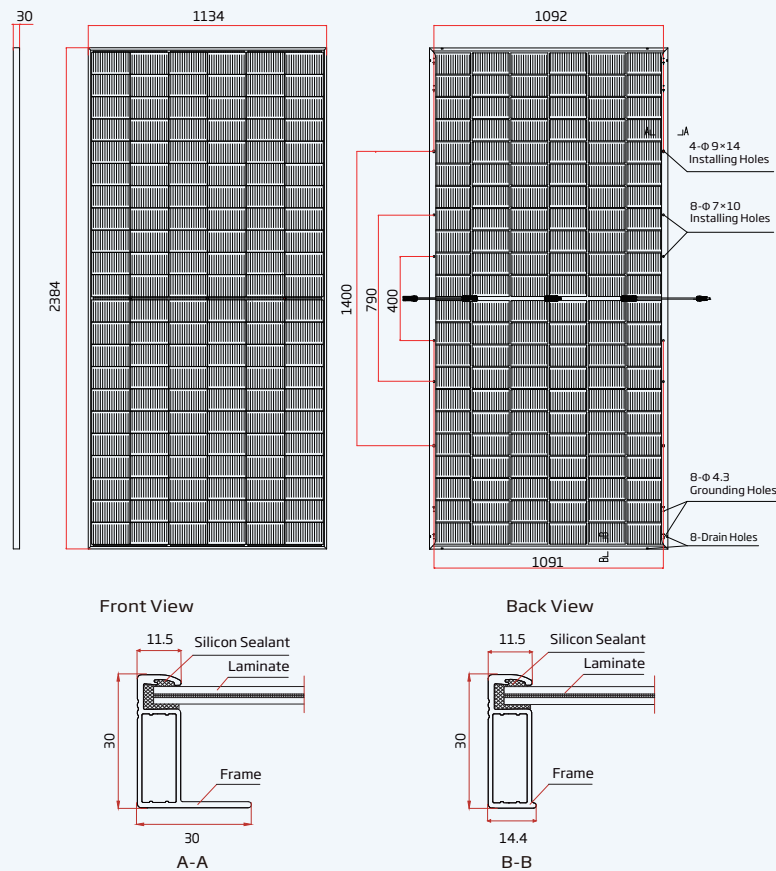
ISO 14001: Environmental Management System

ISO14064: Greenhouse Gases Emissions Verification

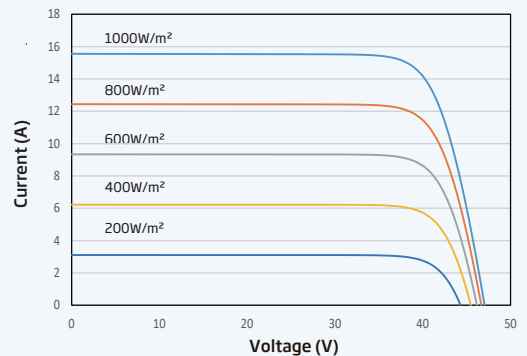
ISO45001: Occupational Health and Safety Management System



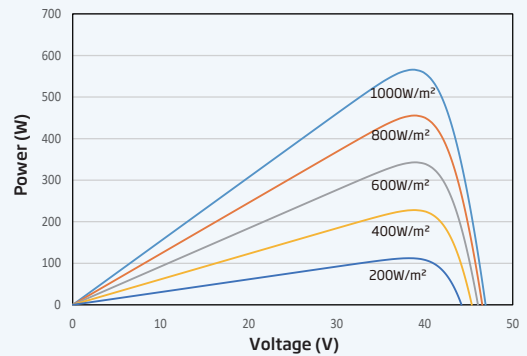
## DIMENSIONS OF PV MODULE (mm)



## I-V CURVES OF PV MODULE (565 W)



## P-V CURVES OF PV MODULE (565 W)



## ELECTRICAL DATA (STC)

Peak Power Watts - P <sub>MAX</sub> (Wp)*	535	540	545	550	555	560	565
Power Tolerance - P <sub>MAX</sub> (W)	0 ~ +5						
Maximum Power Voltage - V <sub>MPP</sub> (V)	36.7	37.0	37.3	37.6	37.8	38.1	38.4
Maximum Power Current - I <sub>MPP</sub> (A)	14.58	14.60	14.62	14.65	14.68	14.70	14.72
Open Circuit Voltage - V <sub>OC</sub> (V)	44.5	44.8	45.1	45.4	45.7	46.0	46.3
Short Circuit Current - I <sub>SC</sub> (A)	15.47	15.49	15.51	15.53	15.55	15.57	15.59
Module Efficiency η <sub>m</sub> (%)	19.8	20.0	20.2	20.3	20.5	20.7	20.9

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)	578	583	589	594	599	605	610
Maximum Power Voltage - V <sub>MPP</sub> (V)	36.7	37.0	37.3	37.6	37.8	38.1	38.4
Maximum Power Current - I <sub>MPP</sub> (A)	15.75	15.77	15.79	15.82	15.85	15.88	15.90
Open Circuit Voltage - V <sub>OC</sub> (V)	44.5	44.8	45.1	45.4	45.7	46.0	46.3
Short Circuit Current - I <sub>SC</sub> (A)	16.71	16.73	16.75	16.77	16.79	16.82	16.84
Irradiance ratio (rear/front)	10%						

Power Bifaciality: 80±5%.

## ELECTRICAL DATA (NOCT)

Maximum Power - P <sub>MAX</sub> (Wp)	407	411	415	419	423	427	431
Maximum Power Voltage - V <sub>MPP</sub> (V)	34.5	34.8	35.0	35.3	35.5	35.8	36.1
Maximum Power Current - I <sub>MPP</sub> (A)	11.81	11.83	11.85	11.88	11.91	11.93	11.95
Open Circuit Voltage - V <sub>OC</sub> (V)	42.2	42.5	42.8	43.1	43.3	43.6	43.9
Short Circuit Current - I <sub>SC</sub> (A)	12.47	12.48	12.50	12.51	12.53	12.55	12.56

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

## MECHANICAL DATA

Solar Cells	Monocrystalline 210Rmm N-type
No. of cells	132 cells
Module Dimensions	2384×1134×30 mm (93.86×44.65×1.18 in)
Weight	33.7 kg (74.3 lb)
Front Glass	2.0 mm (0.08 in), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	POE/EVA
Back Glass	2.0 mm (0.08 in), Heat Strengthened Glass (White Grid Glass)
Frame	30 mm (1.18 in) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0 mm <sup>2</sup> (0.006 in <sup>2</sup> ) Portrait: 350/280 mm (13.78/11.02 in) Landscape: 1400/1400 mm (55.1/55.1 in) *
Connector	MC4 EV02 / TS4 PLUS / TS4 **

\*Length can be customized

\*\*Customer to choose connector type

## 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	30A*

\*This is for customers engineering to decide

## 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: 504 pieces  
Pallets per 40' container: 14