



**BIFACIAL DUAL GLASS N type i-TOPCon MODULE**

PRODUCT: TSM-XXXNEG9RC.27

POWER RANGE: 415-440W

**440W**

MAXIMUM POWER OUTPUT

**0~+5W**

BINNING TOLERANCE

**22.0%**

MAXIMUM EFFICIENCY



**Small in size, bigger on power**

- Up to 440W, 22.0% module efficiency with high density interconnect technology
- Reduce installation cost with higher power bin and efficiency
- Boost performance in warm weather with low temperature coefficient and operating temperature



**Transparent Dual-glass Design**

- Transparent design with aesthetics appearance, 3.2% transparency
- Upgraded dual glass of Vertex S, less prone to micro-cracks and scratches on the back during installation
- Fire rating class C, weather resistance, salt spray, sand dust, ammonia performance which is fully applicable in coastal, high temperature, humidity area and harsh environment



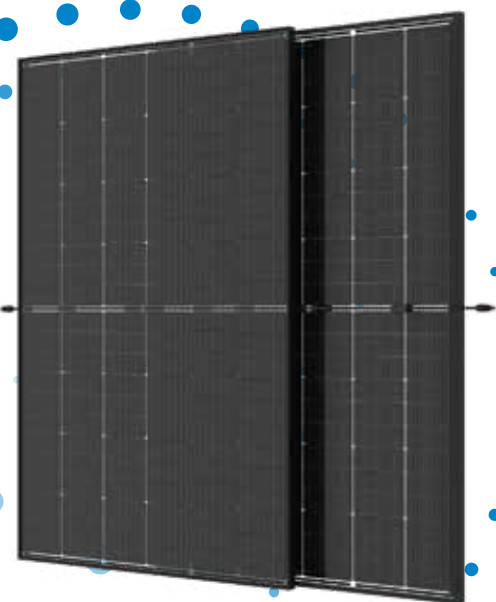
**Ultra-low Degradation, longer warranty, higher output**

- First-year degradation 1% and annual degradation at 0.4%
- Up to 25 years product warranty and 30 years power warranty

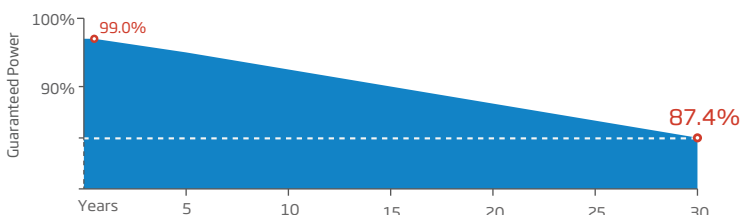


**Universal solution for residential and C&I rooftops**

- Easy for integration, designed for compatibility with existing mainstream inverters and diverse mounting systems
- Perfect size and low weight for handling and installation
- Most valuable solution on low load capacity rooftops (weight similar to backsheet version)
- Mechanical performance up to 5400 Pa positive load and 4000 Pa negative load



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



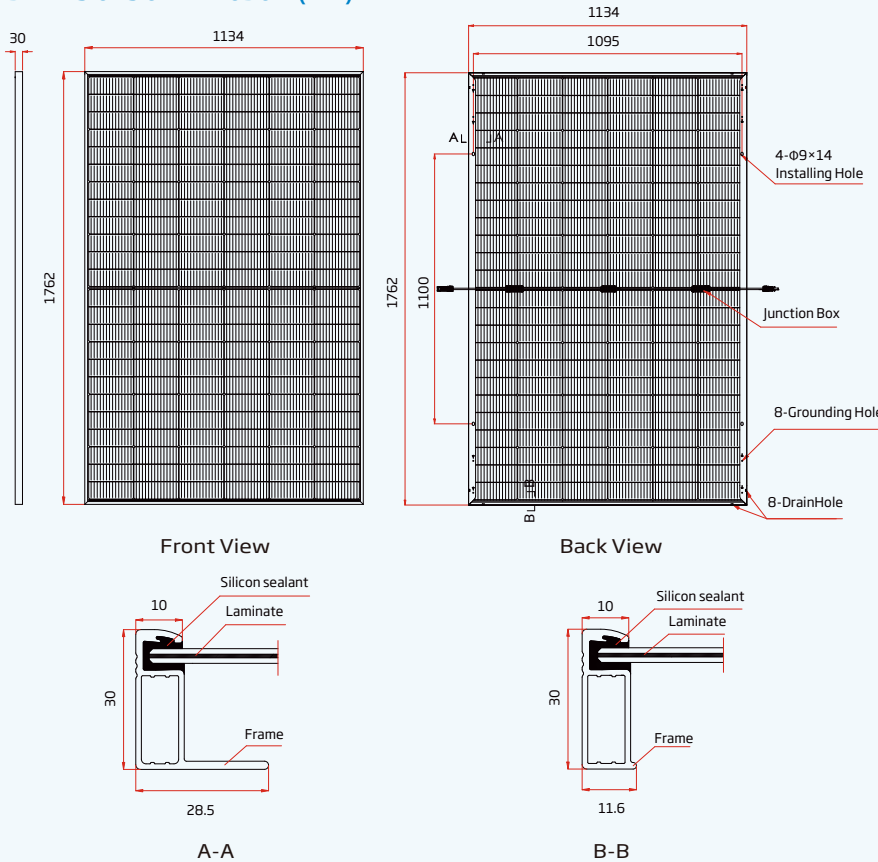
**Comprehensive Products and System Certificates**



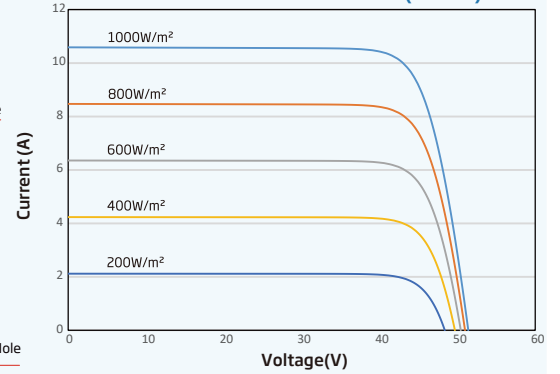
IEC61215/IEC61730/IEC61701/IEC62716/UL61730  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO14064: Greenhouse Gases Emissions Verification  
 ISO45001: Occupational Health and Safety Management System



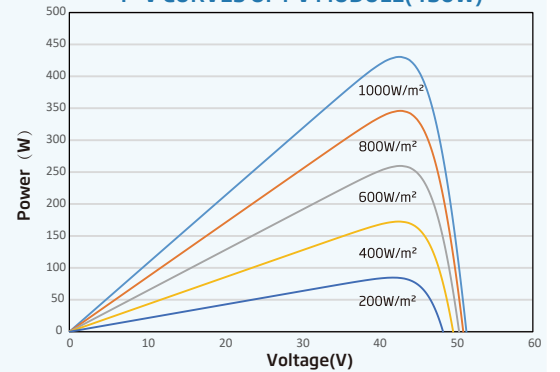
**DIMENSIONS OF PV MODULE(mm)**



**I-V CURVES OF PV MODULE(430W)**



**P-V CURVES OF PV MODULE(430W)**



**ELECTRICAL DATA (STC) TSM-XXXNEG9RC.27(XXX=415-440)**

Peak Power Watts-P <sub>MAX</sub> (Wp)*	415	420	425	430	435	440
Binning Tolerance-P <sub>MAX</sub> (W)	0 ~ +5					
Maximum Power Voltage-V <sub>MPP</sub> (V)	42.1	42.5	42.9	43.2	43.6	44.0
Maximum Power Current-I <sub>MPP</sub> (A)	9.86	9.89	9.92	9.96	9.99	10.01
Open Circuit Voltage-V <sub>OC</sub> (V)	50.1	50.5	50.9	51.4	51.8	52.2
Short Circuit Current-I <sub>SC</sub> (A)	10.50	10.53	10.56	10.59	10.64	10.67
Module Efficiency η <sub>m</sub> (%)	20.8	21.0	21.3	21.5	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 <sub>MAX</sub> (Wp)	448	454	459	464	470	475
Maximum Power Voltage-V <sub>MPP</sub> (V)	42.1	42.5	42.9	43.2	43.6	44.0
Maximum Power Current-I <sub>MPP</sub> (A)	10.65	10.68	10.71	10.76	10.79	10.81
Open Circuit Voltage-V <sub>OC</sub> (V)	50.1	50.5	50.9	51.4	51.8	52.2
Short Circuit Current-I <sub>SC</sub> (A)	11.34	11.37	11.40	11.44	11.49	11.52
Irradiance ratio (rear/front)	10%					

Power Bifaciality: 80±5%.

**ELECTRICAL DATA (NOCT)**

Maximum Power-P <sub>MAX</sub> (Wp)	316	320	324	328	332	335
Maximum Power Voltage-V <sub>MPP</sub> (V)	39.3	39.7	40.0	40.4	40.7	41.0
Maximum Power Current-I <sub>MPP</sub> (A)	8.03	8.07	8.09	8.11	8.15	8.17
Open Circuit Voltage-V <sub>OC</sub> (V)	47.5	47.8	48.2	48.7	49.1	49.4
Short Circuit Current-I <sub>SC</sub> (A)	8.46	8.49	8.51	8.53	8.57	8.60

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

**MECHANICAL DATA**

Solar Cells	N type Monocrystalline
No. of cells	144cells
Module Dimensions	1762×1134×30 mm (69.06×43.15×1.18 inches)
Weight	21.0kg (46.30 lb)
Front Glass	1.6 mm (0.06 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	1.6 mm (0.06 inches), High Transmission, Heat Strengthened Glass
Frame	30mm (1.18 inches) Anodized Aluminium Alloy, Black
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	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)
Max Series Fuse Rating	25A

**WARRANTY**

25 year Product Workmanship Warranty\*\*  
30 year Power Warranty  
1% first year degradation  
0.4% Annual Power Attenuation

**PACKAGING CONFIGURATION**

Modules per box: 36 pieces  
Modules per 40' container: 936 pieces

\*\*Please refer to Limited Warranty Supplement that applies to the TSM-\*\*\*NEG9R.28, TSM-\*\*\*NEG9RC.27, Products supplied after 1st Jan 2023 and installed within Australia & New Zealand rooftop market.)