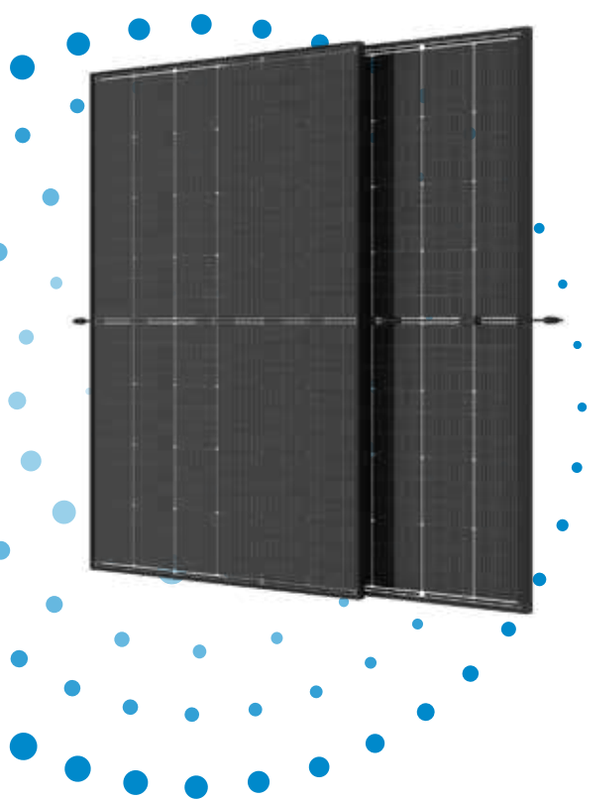
Vertex S+

N-type i-TOPCon Bifacial Dual Glass
MONOCRYSTALLINE MODULE

PRODUCT: TSM-NEG9RC.27

POWER RANGE: 415-445W

445W	0~+5W	22.3%
MAXIMUM POWER OUTPUT	POSITIVE POWER TOLERANCE	MAXIMUM EFFICIENCY



Small in size, bigger on power

- Up to 445W,22.3% 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
- Excellent fire rating, weather resistance, salt spray, sand dust, ammonia performance which is fully applicable in coastal, high temperature, humidity area and harsh environment

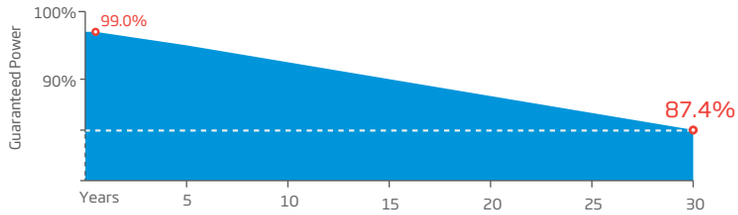
Ultra-low Degradation, longer warranty, higher output

- First-year degradation 1% and annual degradation at 0.4%
- Up to 15/25 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

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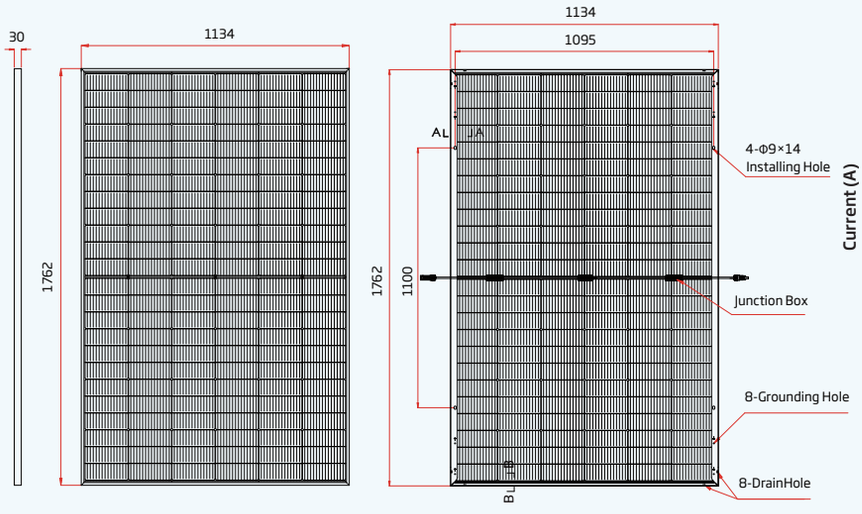
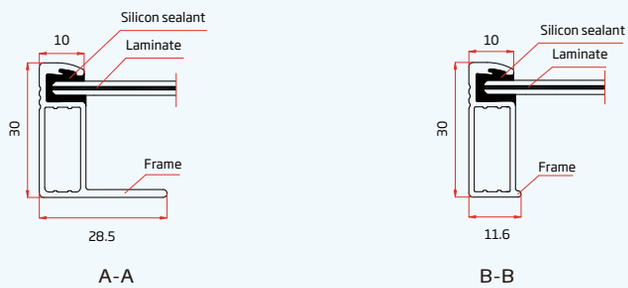
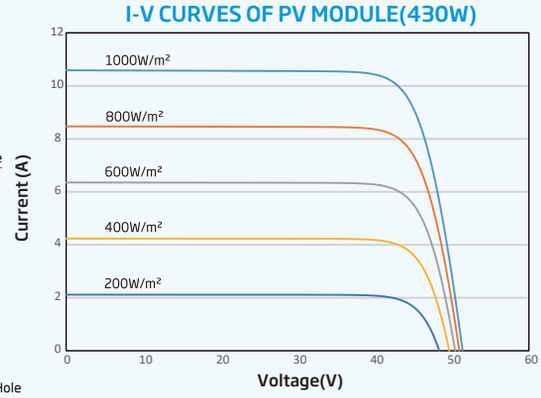
DIMENSIONS OF PV MODULE(mm)

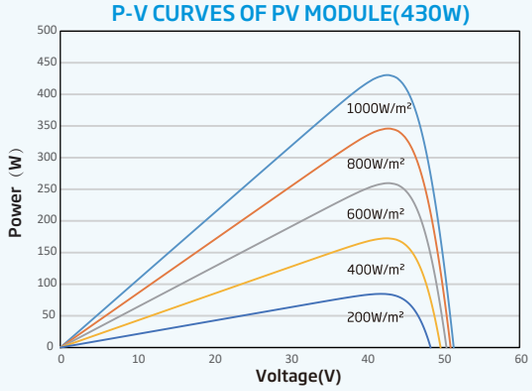




I-V CURVES OF PV MODULE(430W)



P-V CURVES OF PV MODULE(430W)



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 4.0mm² (0.006 inches²) Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	TS4 PLUS / TS4

ELECTRICAL DATA (STC & NOCT)

Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Peak Power Watts-PMAX (Wp)*	415	317	420	321	425	325	430	328	435	332	440	336	445	338
Power Tolerance-PMAX (W)	0 ~ +5													
Maximum Power Voltage-VMPP (V)	42.1	39.3	42.5	39.7	42.9	40.0	43.2	40.4	43.6	40.7	44.0	41.0	44.3	41.3
Maximum Power Current-IMPP (A)	9.86	8.03	9.89	8.07	9.92	8.09	9.96	8.11	9.99	8.15	10.01	8.17	10.05	8.20
Open Circuit Voltage-VOC (V)	50.1	47.6	50.5	47.9	50.9	48.3	51.4	48.8	51.8	49.2	52.2	49.5	52.6	49.9
Short Circuit Current-ISC (A)	10.50	8.46	10.53	8.49	10.56	8.51	10.59	8.53	10.64	8.57	10.67	8.60	10.71	8.63
Module Efficiency η m (%)	20.8		21.0		21.3		21.5		21.8		22.0		22.3	

STC: Irrdiance 1000W/m2, Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s. *Measuring tolerance: ±3%.

Electrical characteristics with different power bin (reference to 5% & 10% backside power gain)

Backside Power Gain	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
Total Equivalent power -PMAX (Wp)	436	457	441	462	446	468	452	473	457	479	462	484	467	490
Maximum Power Voltage-VMPP (V)	42.1	42.1	42.5	42.5	42.9	42.9	43.2	43.2	43.6	43.6	44.0	44.0	44.3	44.3
Maximum Power Current-IMPP (A)	10.35	10.85	10.38	10.88	10.42	10.91	10.46	10.96	10.49	10.99	10.51	11.01	10.55	11.06
Open Circuit Voltage-VOC (V)	50.1	50.1	50.5	50.5	50.9	50.9	51.4	51.4	51.8	51.8	52.2	52.2	52.6	52.6
Short Circuit Current-ISC (A)	11.03	11.55	11.06	11.58	11.09	11.62	11.12	11.65	11.17	11.70	11.20	11.74	11.25	11.78

Power Bifaciality:80±5%.

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of PMAX	- 0.29%/°C
Temperature Coefficient of VOC	- 0.24%/°C
Temperature Coefficient of ISC	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85° C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	25A

WARRANTY

15 / 25* year Product Workmanship Warranty

30 year Power Warranty

1% first year degradation

0.4% Annual Power Attenuation

(*upon request. Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 36 pieces

Modules per 40' container: 936 pieces

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CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

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