

Vertex N

N-type i-TOPCon Monofacial Dual Glass
MONOCRYSTALLINE MODULE

PRODUCT: TSM-NEG18R.28/20

PRODUCT RANGE: 475-505W

505W

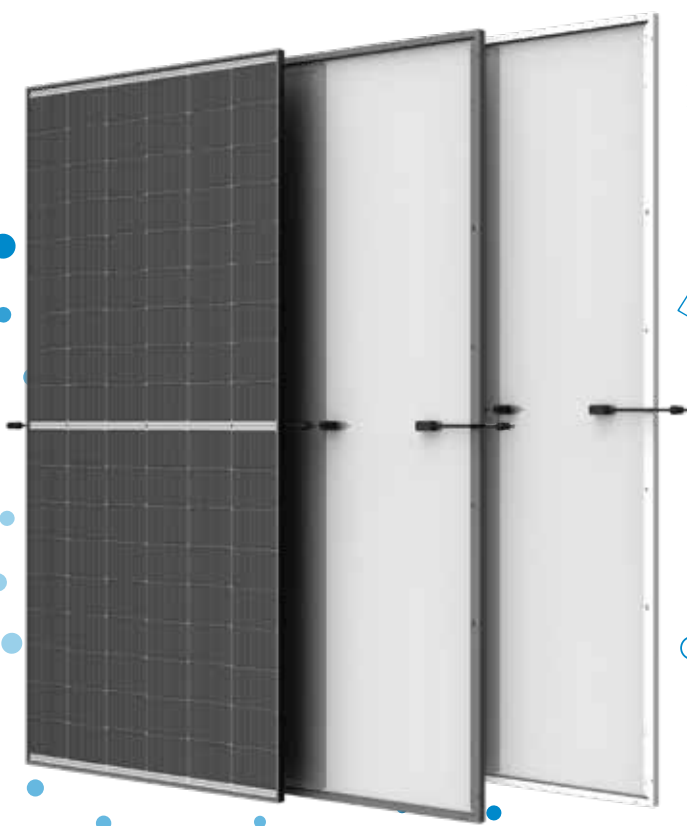
MAXIMUM POWER OUTPUT

0~+5W

POSITIVE POWER TOLERANCE

22.7%

MAXIMUM EFFICIENCY



High customer value

- Lower LCOE (levelized cost of energy), reduced BOS (balance of system) cost, shorter payback time
- Designed for compatibility with existing mainstream system components
- High module power, high string power and low voltage design



High power up to 505W

- Up to 22.7% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



Dual-glass design, high reliability

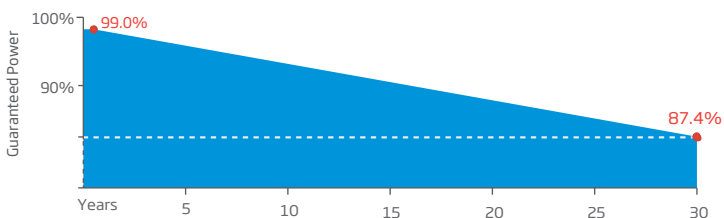
- Less prone to micro-cracks and scratches on the back during installation
- Applicable in harsh environments such as salt, ammonia, sand, high temperature and high humidity areas with excellent fire rating, weather resistance, salt spray, sand dust, ammonia performance
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load
- Easy to handle and install on roofs with excellent size and light weight



Ultra-low degradation, longer warranty, higher output

- Extremely low 1% first year degradation and 0.4% annual power attenuation
- Up to 15 years product warranty and 30 years power warranty
- Lower temperature coefficient (-0.29%/°C) and operating temperature

Trina Solar's Vertex Monofacial Dual Glass Performance Warranty



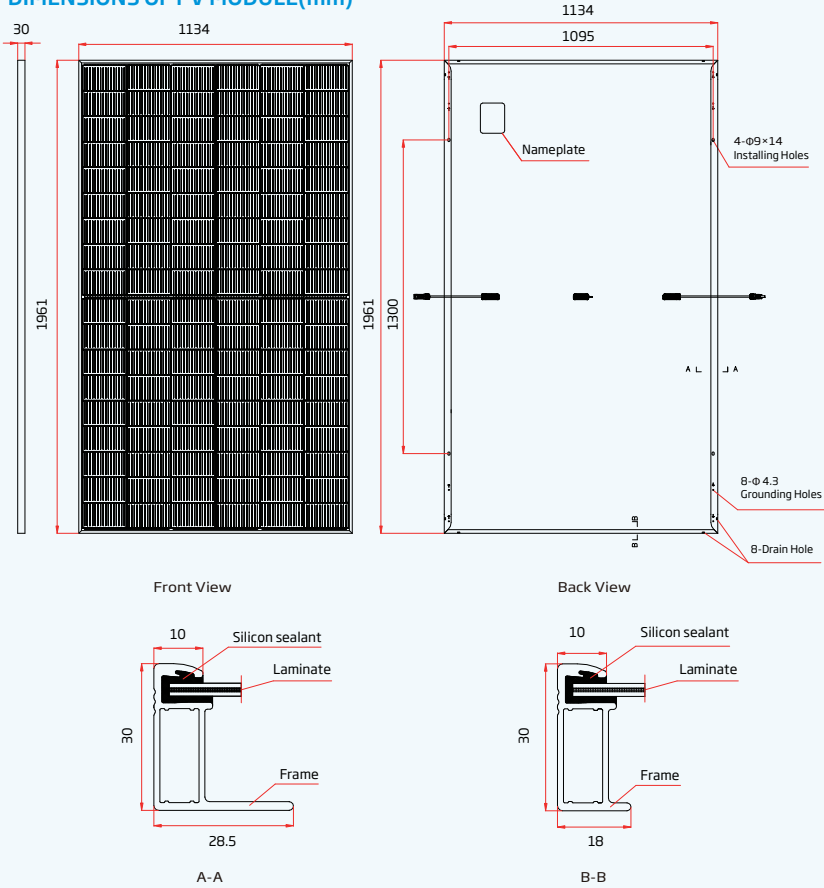
Comprehensive Products and System Certificates



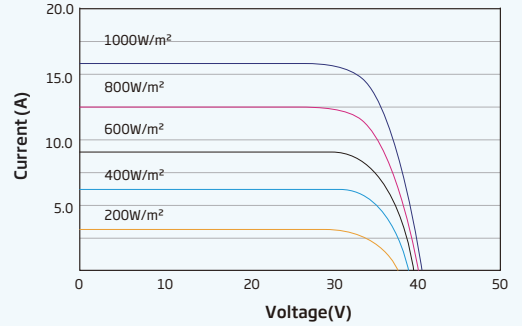
IEC61215/IEC61730/IEC61701/IEC62716
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System



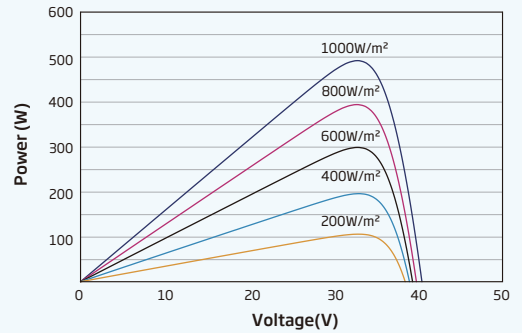
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE (490W)



P-V CURVES OF PV MODULE (490W)



ELECTRICAL DATA (STC)

Peak Power Watts- P_{MAX} (Wp)*	475	480	485	490	495	500	505
Power Tolerance- P_{MAX} (W)	0 ~ +5						
Maximum Power Voltage- V_{MPP} (V)	32.3	32.5	32.7	32.9	33.1	33.3	33.5
Maximum Power Current- I_{MPP} (A)	14.72	14.77	14.84	14.91	14.97	15.03	15.09
Open Circuit Voltage- V_{OC} (V)	39.0	39.2	39.4	39.6	39.8	40.1	40.3
Short Circuit Current- I_{SC} (A)	15.68	15.72	15.76	15.80	15.83	15.86	15.89
Module Efficiency η_m (%)	21.4	21.6	21.8	22.0	22.3	22.5	22.7

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

ELECTRICAL DATA (NOCT)

Maximum Power- P_{MAX} (Wp)	363	367	371	375	378	382	386
Maximum Power Voltage- V_{MPP} (V)	30.4	30.6	30.8	31.0	31.3	31.5	31.8
Maximum Power Current- I_{MPP} (A)	11.94	11.98	12.02	12.06	12.08	12.11	12.15
Open Circuit Voltage- V_{OC} (V)	36.9	37.2	37.4	37.6	37.7	38.0	38.3
Short Circuit Current- I_{SC} (A)	12.64	12.67	12.70	12.74	12.76	12.78	12.81

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	N-type Monocrystalline
No. of cells	108 cells
Module Dimensions	1961×1134×30mm (77.20×44.65×1.18 inches)
Weight	23.5kg (51.8 lb)
Front Glass	1.6mm High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	1.6mm (0.06 inches), Heat Strengthened Glass
Frame	30mm (0.06 inches) Anodized Aluminium Alloy (.28 black / .20 silver)
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²) Portrait: 280/350 mm (11.02/13.78 inches) Length can be customized
Connector	TS4 Plus / TS4

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P_{MAX}	-0.29%/°C
Temperature Coefficient of V_{OC}	-0.24%/°C
Temperature Coefficient of I_{SC}	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	30A

WARRANTY

15 year Product Workmanship Warranty
30 year Power Warranty
1% first year degradation
0.4% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 36 pieces
Modules per 40' container: 864 pieces