

Vertex N

— i-TOPCon —

TSM-NEG19RC.20
Anti-glare Series

620-645W

Key Features



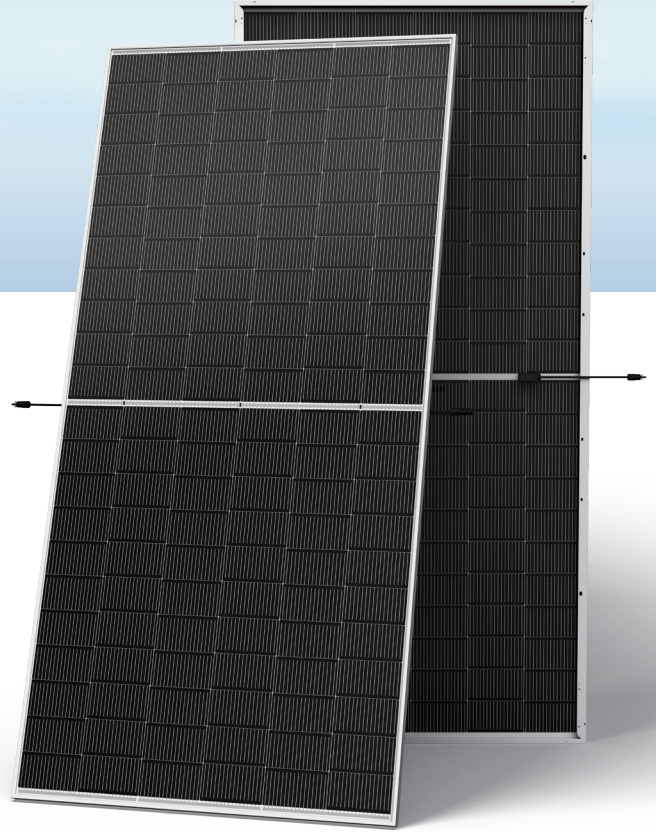
47% lower glare intensity than regular modules , critical for aviation safety



200% wider glare-free zones , protecting drivers' visibility



Superior green energy output, enabling your eco-friendly travel



High customer value

- Best partner of 1P tracker, with highest utilization of tracker length
- Low voltage design with higher string power, effectively reducing BOS (Balance of System) and LCOE (Levelized Cost of Energy) by 1%~5%
- Excellent compatibility with existing mainstream system components



High power up to 645W

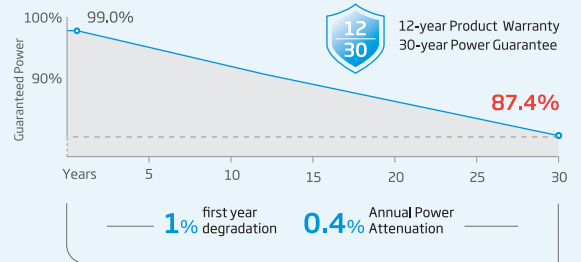
- Up to 23.9% module efficiency, on 210 innovation platform
- Patented i-TOPCon technology with continuous efficiency upgrade, including contact resistance reduction, rear reflection enhancement and edge quality repairment



High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology and high-density packaging
- Reduced risks of hot-spot with half-cut technology
- Certified high resistance against salt, ammonia, sand, PID, LID, LeTID
- Sustainable in harsh environments and extreme weather conditions

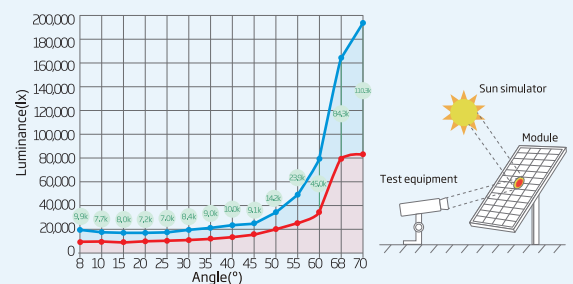
Performance Warranty



* Please refer to product warranty for details

Luminance of Anti-glare module

Illumination(lux)	Module	Angle(°)	Luminance(cd/m ²)
100000	Anti-glare module	≤50	≤20000



ELECTRICAL DATA (STC & NOCT & BNPI)

Testing Condition	STC			NOCT			BNPI			STC			NOCT			BNPI		
Peak Power Watts- $P_{MAX}(W_p)^*$	620	473	687	625	477	692	630	481	698	635	487	704	640	489	709	645	492	715
Power Selection (W)**	0 ~ +5																	
Maximum Power Voltage- V_{MPP} (V)	40.24	37.90	40.24	40.46	38.10	40.46	40.68	38.30	40.68	40.84	38.60	40.84	41.06	38.70	41.06	41.22	38.80	41.22
Maximum Power Current- I_{MPP} (A)	15.41	12.47	17.07	15.45	12.52	17.12	15.49	12.57	17.16	15.55	12.60	17.23	15.60	12.67	17.28	15.65	12.70	17.34
Open Circuit Voltage- V_{oc} (V)	48.50	46.10	48.50	48.70	46.30	48.70	48.90	46.50	48.90	49.10	46.60	49.10	49.30	46.80	49.30	49.52	47.00	49.52
Short Circuit Current- I_{sc} (A)	16.26	13.10	18.02	16.32	13.15	18.08	16.38	13.20	18.15	16.44	13.25	18.22	16.51	13.30	18.29	16.55	13.33	18.34
Module Efficiency η_m (%)	23.0			23.1			23.3			23.5			23.7			23.9		

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s. BNPI: Irradiance: front 1000W/m², rear 135W/m², Temperature 25°C, Air Mass AM1.5
 *Measuring tolerance: ±3%. **Power selection up to: +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%	
Peak Power Watts- $P_{MAX}(W_p)$	651	682	656	688	662	693	667	699	672	704	677	710	682	715	687	720	692	725	697	730
Maximum Power Voltage- V_{MPP} (V)	40.24	40.24	40.46	40.46	40.68	40.68	40.84	40.84	41.06	41.06	41.22	41.22	41.44	41.44	41.66	41.66	41.88	41.88	42.10	42.10
Maximum Power Current- I_{MPP} (A)	16.18	16.95	16.22	17.00	16.26	17.04	16.33	17.11	16.38	17.16	16.43	17.22	16.48	17.27	16.53	17.32	16.58	17.37	16.63	17.42
Open Circuit Voltage- V_{oc} (V)	48.50	48.50	48.70	48.70	48.90	48.90	49.10	49.10	49.30	49.30	49.52	49.52	49.74	49.74	49.96	49.96	50.18	50.18	50.40	50.40
Short Circuit Current- I_{sc} (A)	17.07	17.89	17.14	17.95	17.20	18.02	17.26	18.08	17.34	18.16	17.38	18.21	17.46	18.29	17.54	18.37	17.62	18.45	17.70	18.53

Power Bifaciality: 80±5%.

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

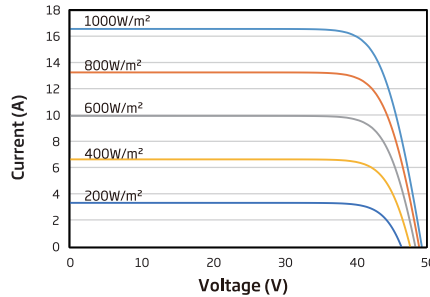
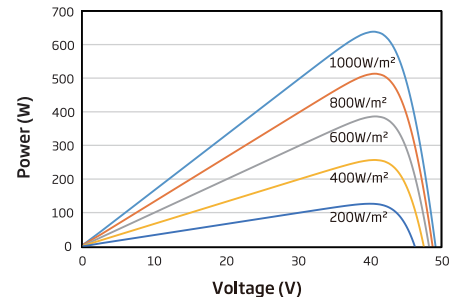
Due to different testing methods, the actual performances might differ from the declared specifications.

APPLICATION CONDITIONS

Operating Temperature -40 ~ +70°C

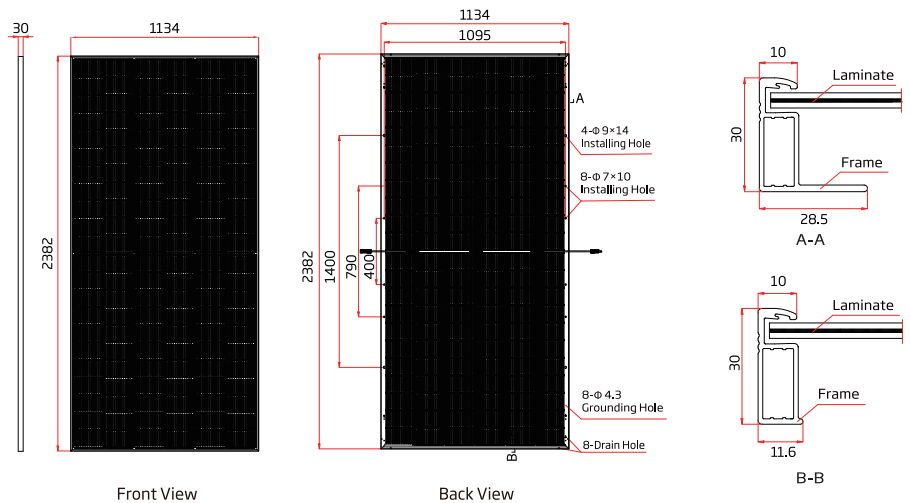
Maximum System Voltage 1500V DC (IEC)

Max Series Fuse Rating 35A

CURVES OF PV MODULE
I-V CURVES OF PV MODULE (640W)

P-V CURVES OF PV MODULE (640W)

MECHANICAL DATA

Solar Cells	N-type i-TOPCon Monocrystalline
No. of cells	132 cells
Module Dimensions	2382 × 1134 × 30 mm (93.78 × 44.65 × 1.18 inches)
Weight	33.0 kg (72.8 lb)
Front Glass	2.0 mm (0.08 inches), Anti-glare Heat Strengthened Glass
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass
Frame	30mm (1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²) Portrait: 200/320 mm (7.87/12.60 inches) Length can be customized
Connector	TS4 / TS4 Plus / MC4 EVO2*
Packaging	Modules per box: 36 pieces Modules per 40' container: 720 pieces

*The connector names listed are general names; specific types are subject to the certification documents.



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