

Vertex N

— i-TOPCon Ultra —

TSM-NEG19RC.70 **615-640W**

Key Features



Patented short-edge frame design reduces energy loss from soiling



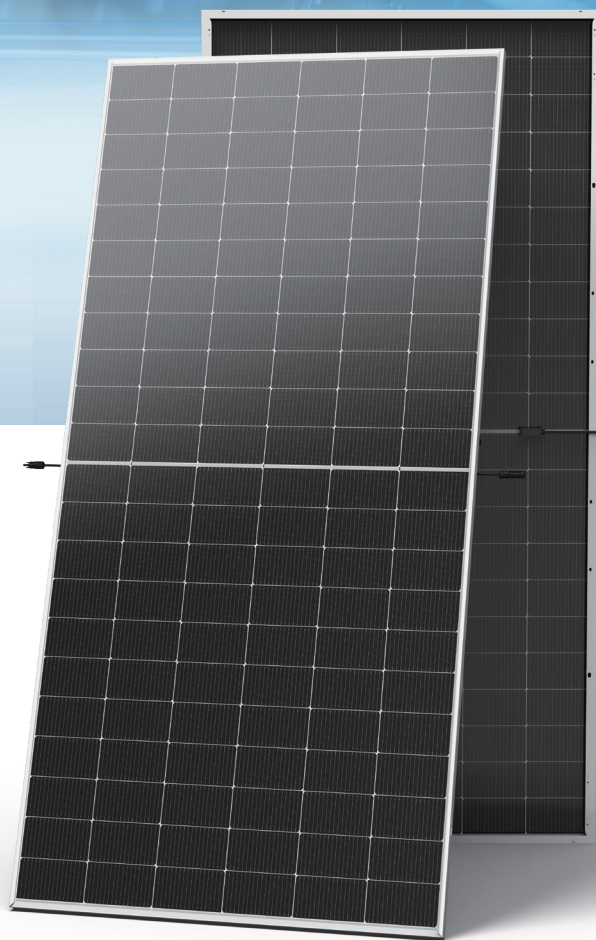
Low-tilt installations minimize dust and snow accumulation, boosting average yield by over 2%



Lowers cleaning frequency and O&M costs



Higher bifaciality, enhancing total PV system energy output



High power up to 640W

- Up to 23.7% 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

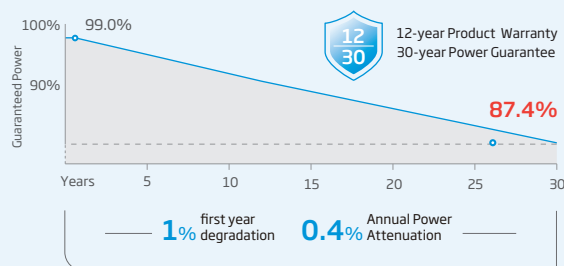
- Minimized micro-cracks with innovative non-destructive cutting technology and high-density packaging
- Certified high resistance against salt, ammonia, sand, PID, LID, LeTID
- Sustainable in harsh environments and extreme weather conditions



High energy yield

- Excellent low irradiation performance, validated by 3rd party
- Higher bifaciality, with up to 10%~20% additional power gain from back side depending on albedo
- Reliable dual-glass structure with 30-year power guarantee

Performance Warranty



* Please refer to product warranty for details

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



ELECTRICAL DATA (STC & NOCT & BNPI)

Testing Condition	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI
Peak Power Watts- $P_{MAX}(W_p)^*$	615	469	681	620	473	687	625	477	692	630	481	698	635	487	704	640	489	709
Power Selection (W)**	0 ~ +5																	
Maximum Power Voltage- V_{MPP} (V)	39.97	37.80	39.97	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
Maximum Power Current- I_{MPP} (A)	15.39	12.43	17.05	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
Open Circuit Voltage- V_{oc} (V)	48.29	45.90	48.29	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
Short Circuit Current- I_{sc} (A)	16.20	13.05	17.95	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
Module Efficiency η_m (%)	22.8			23.0			23.1			23.3			23.5			23.7		

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%	5%	10%
Peak Power Watts- $P_{MAX}(W_p)$	646	677	651	682	656	688	662	693	667	699	672	704
Maximum Power Voltage- V_{MPP} (V)	39.97	39.97	40.24	40.24	40.46	40.46	40.68	40.68	40.84	40.84	41.06	41.06
Maximum Power Current- I_{MPP} (A)	16.16	16.93	16.18	16.95	16.22	17.00	16.26	17.04	16.33	17.11	16.38	17.16
Open Circuit Voltage- V_{oc} (V)	48.29	48.29	48.50	48.50	48.70	48.70	48.90	48.90	49.10	49.10	49.30	49.30
Short Circuit Current- I_{sc} (A)	17.01	17.82	17.07	17.89	17.14	17.95	17.20	18.02	17.26	18.08	17.34	18.16

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

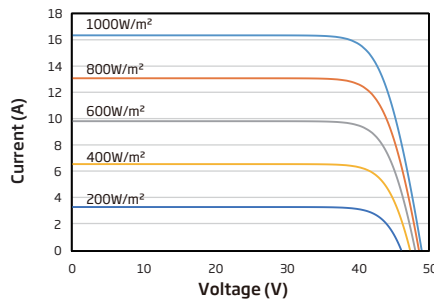
Operating Temperature -40~+70 °C

Maximum System Voltage 1500V DC (IEC)

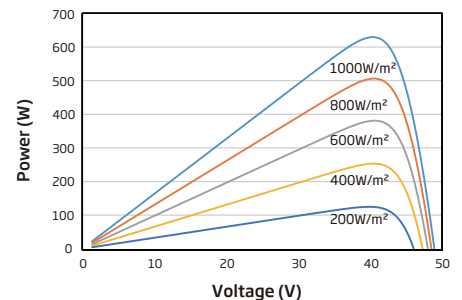
Max Series Fuse Rating 35A

CURVES OF PV MODULE

I-V CURVES OF PV MODULE (635W)



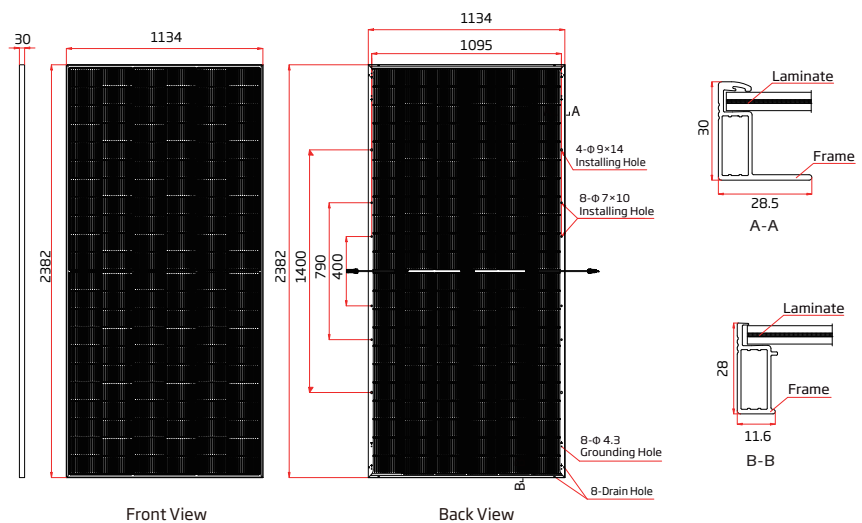
P-V CURVES OF PV MODULE (635W)



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), AR Coating 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 Plus / TS4 / 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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