



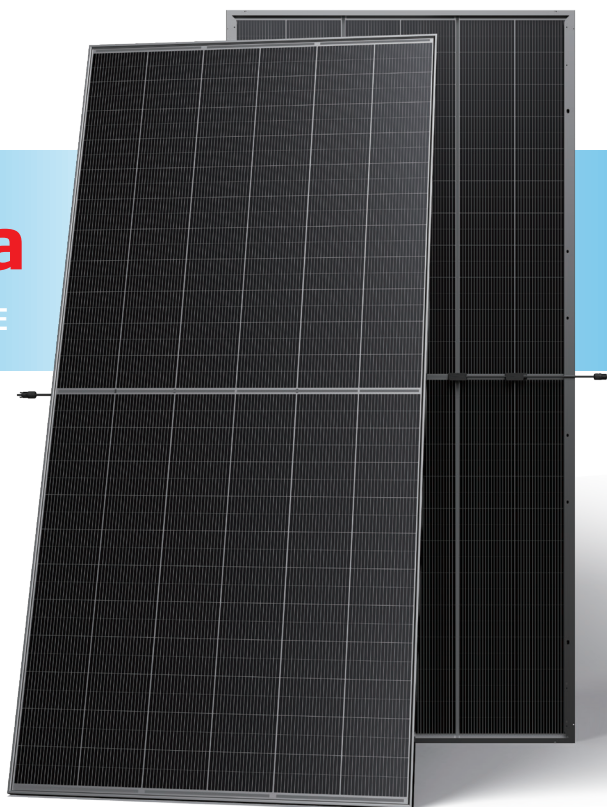
N-type i-TOPCon Ultra

BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

TSM-NEG19RC.20Q 645-670W

670_W / MAXIMUM
POWER OUTPUT

24.8% / MAXIMUM
EFFICIENCY



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)
- Excellent compatibility with existing mainstream system components



High power up to 670W

- Up to 24.8% module efficiency, on 210 innovation platform
- Patented i-TOPCon Ultra technology with continuous efficiency upgrade, including contact resistance reduction, rear reflection enhancement



High reliability

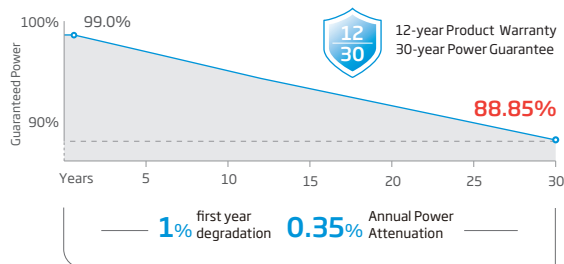
- Minimized micro-cracks with innovative non-destructive cutting technology and high-density packaging
- Reduced risks of hot-spot and micro-cracks with multi-cut technology and cell clearance buffering
- Certified high resistance against salt, ammonia, sand, PID, LID, LeTID
- Sustainable in harsh environments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



High energy yield, power bifaciality 85±5%

- Excellent low irradiation performance, validated by 3rd party
- Lower temperature coefficient (-0.26%/°C)
- 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
- Lower annual attenuation guarantees a higher power generation within lifecycle

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- $P_{MAX}(W_p)^*$	645	495	719	650	499	725	655	503	730	660	507	736	665	511	741	670	515	747
Power Selection (W)**	0 ~ +5																	
Maximum Power Voltage- V_{MPP} (V)	41.22	39.50	41.22	41.43	39.70	41.43	41.59	39.90	41.59	41.74	40.10	41.74	41.88	40.30	41.88	42.04	40.60	42.04
Maximum Power Current- I_{MPP} (A)	15.65	12.53	17.45	15.69	12.57	17.49	15.75	12.60	17.56	15.82	12.64	17.64	15.88	12.67	17.70	15.94	12.70	17.77
Open Circuit Voltage- V_{oc} (V)	49.78	47.40	49.78	50.00	47.70	50.00	50.25	47.90	50.25	50.45	48.10	50.45	50.70	48.30	50.70	50.95	48.60	50.95
Short Circuit Current- I_{sc} (A)	16.38	13.20	18.26	16.43	13.24	18.32	16.47	13.27	18.36	16.53	13.32	18.43	16.56	13.35	18.46	16.60	13.38	18.50
Module Efficiency η_m (%)	23.9			24.1			24.2			24.4			24.6			24.8		

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- $P_{MAX}(W_p)$	677	710	683	715	688	721	693	726	698	732	704	737
Maximum Power Voltage- V_{MPP} (V)	41.22	41.22	41.43	41.43	41.59	41.59	41.74	41.74	41.88	41.88	42.04	42.04
Maximum Power Current- I_{MPP} (A)	16.43	17.22	16.47	17.26	16.54	17.33	16.61	17.40	16.67	17.47	16.74	17.53
Open Circuit Voltage- V_{oc} (V)	49.78	49.78	50.00	50.00	50.25	50.25	50.45	50.45	50.70	50.70	50.95	50.95
Short Circuit Current- I_{sc} (A)	17.20	18.02	17.25	18.07	17.29	18.12	17.36	18.18	17.39	18.22	17.43	18.26

Power Bifaciality: 85±5%.

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature) 43°C (±2°C)

Temperature Coefficient of P_{MAX} -0.26% /°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

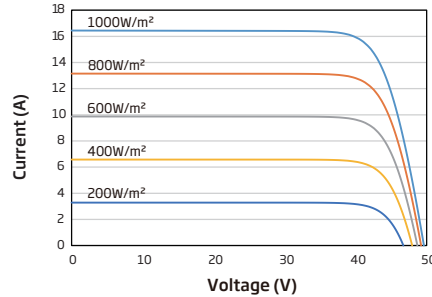
Operating Temperature -40~+70°C

Maximum System Voltage 1500V DC (IEC)

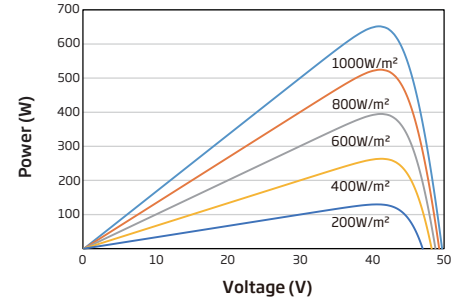
Max Series Fuse Rating 35A

CURVES OF PV MODULE

I-V CURVES OF PV MODULE (655W)



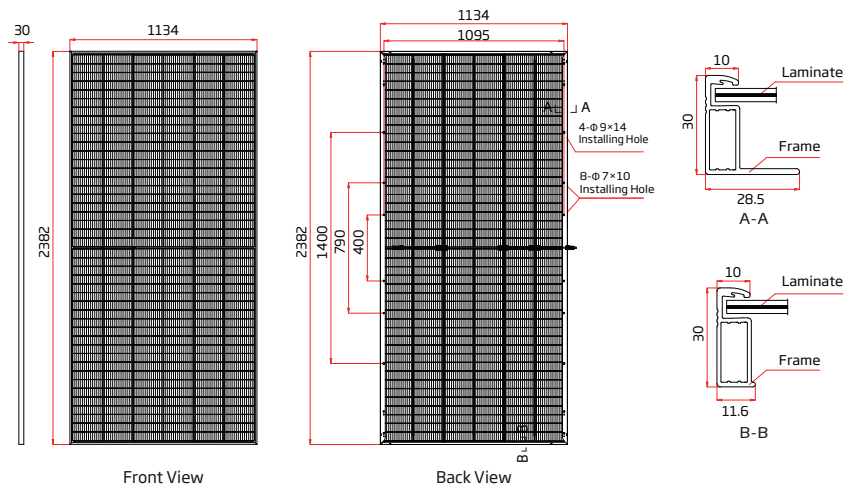
P-V CURVES OF PV MODULE (655W)



MECHANICAL DATA

Solar Cells	N-type i-TOPCon Monocrystalline
No. of cells	264 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: 200/510 mm (7.87/20.08 inches) Length can be customized
Connector	MC4 EV02 / TS4 Plus / TS4*
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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