



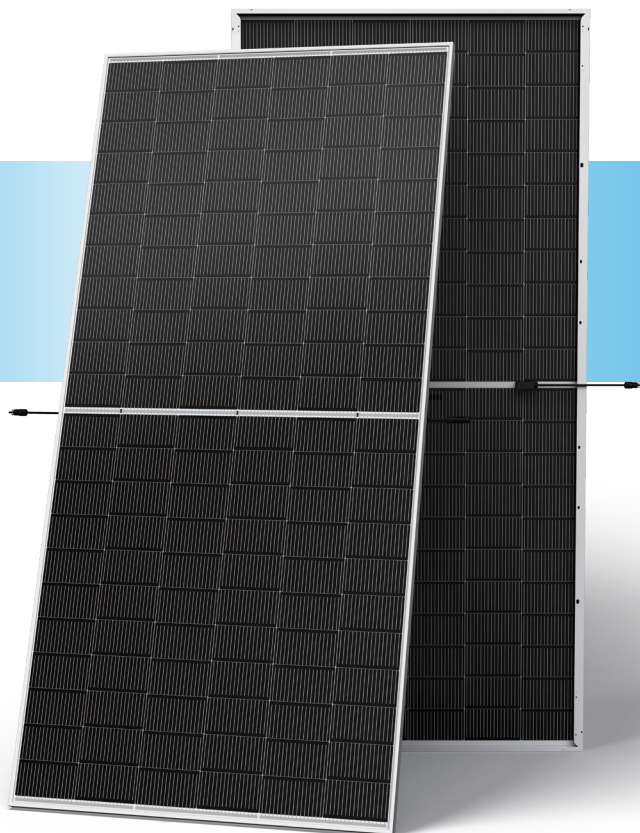
N-type TOPCon

BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

TSM-NEG19RC.20 590-620W

620_W / MAXIMUM
POWER OUTPUT

23.0% / MAXIMUM
EFFICIENCY



High customer value

- Lower LCOE, reduced BOS cost, better ROI
- Lowest guaranteed first year and annual degradation
- Optimized compatibility with existing mainstream system components



High power up to 620W

- Up to 23.0% module efficiency
- High density interconnection provides improved power density
- MBB technology improves lighttrapping effect and currentcollection, while lowering series resistance



High reliability

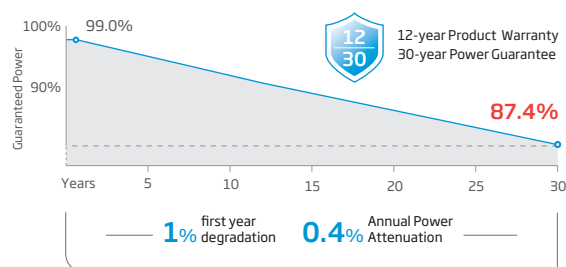
- Minimized micro-cracks with innovative non-destructive cutting technology minimizes micro-cracking
- Ensured PID resistance through improved cell process and module material control
- Resistant to harsh environments
- Mechanical performance up to +5400/-2400 Pa



High energy yield

- Excellent IAM and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.29%/°C) and operating temperature
- Up to 30% additional power gain from back side

Performance Warranty



* Please refer to product warranty for details

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



ELECTRICAL DATA (STC & NOCT)

Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Peak Power Watts- $P_{MAX}(W_p)^*$	590	450	595	454	600	458	605	462	610	465	615	469
Power Selection (W)**	0 ~ +5											
Maximum Power Voltage- V_{MPP} (V)	39.13	36.90	39.28	37.10	39.43	37.30	39.57	37.40	39.79	37.60	39.97	37.80
Maximum Power Current- I_{MPP} (A)	15.08	12.19	15.15	12.24	15.22	12.29	15.29	12.33	15.33	12.38	15.39	12.43
Open Circuit Voltage- V_{oc} (V)	47.29	44.90	47.49	45.10	47.69	45.30	47.89	45.50	48.09	45.70	48.29	45.90
Short Circuit Current- I_{sc} (A)	15.90	12.81	15.96	12.86	16.02	12.91	16.08	12.96	16.14	13.00	16.20	13.05
Module Efficiency η_m (%)	21.8		22.0		22.2		22.4		22.6		22.8	

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. *Measuring tolerance: $\pm 3\%$. **Power selection up to: $\pm 3\%$.

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- $P_{MAX}(W_p)$	620	649	625	655	630	660	635	666	641	671	646	677
Maximum Power Voltage- V_{MPP} (V)	39.13	39.13	39.28	39.28	39.43	39.43	39.57	39.57	39.79	39.79	39.97	39.97
Maximum Power Current- I_{MPP} (A)	15.83	16.59	15.91	16.67	15.98	16.74	16.05	16.82	16.10	16.86	16.16	16.93
Open Circuit Voltage- V_{oc} (V)	47.29	47.29	47.49	47.49	47.69	47.69	47.89	47.89	48.09	48.09	48.29	48.29
Short Circuit Current- I_{sc} (A)	16.70	17.49	16.76	17.56	16.82	17.62	16.88	17.69	16.95	17.75	17.01	17.82

Power Bifaciality: $80 \pm 5\%$.

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature) 43°C ($\pm 2^\circ\text{C}$)

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.

MAXIMUM RATINGS

Operational Temperature -40 ~ +85°C

Maximum System Voltage 1500V DC (IEC)

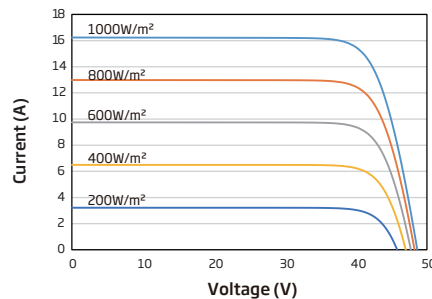
1500V DC (UL)

Max Series Fuse Rating 30A*

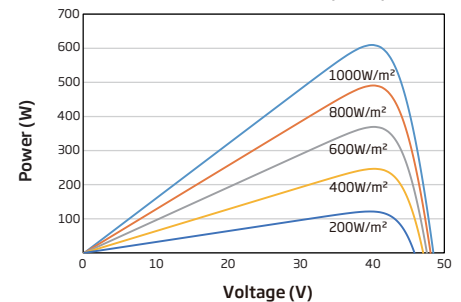
*This is for customers engineering to decide

CURVES OF PV MODULE

I-V CURVES OF PV MODULE (610W)



P-V CURVES OF PV MODULE (610W)



MECHANICAL DATA

Solar Cells	N-type 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 (White Coating)
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: 350/280 mm (13.78/11.02 inches) Landscape: 1400/1400mm (55.1/55.1 inches) Length can be customized
Connector	MC4 EV02 / TS4 Plus / TS4*
Fire Type	Type 29
Packaging	Modules per box: 36 pieces Modules per 40'/53' container: 540 pieces

*Customer to choose connector type

