



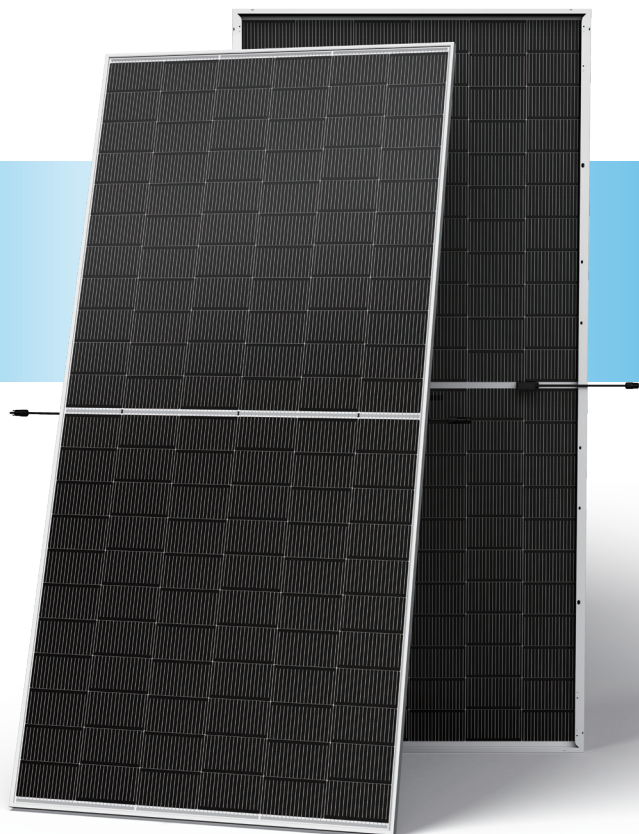
# N-type i-TOPCon

BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

TSM-NEG19RC.20 610-635W

**635W** / MAXIMUM POWER OUTPUT

**23.5%** / 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) by 1%~5%
- Standardized module size with higher container space utilization effectively reduces the freight cost
- Excellent compatibility with existing mainstream system components
- Certified Low-Carbon Footprint



## High power up to 635W

- Up to 23.5% 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

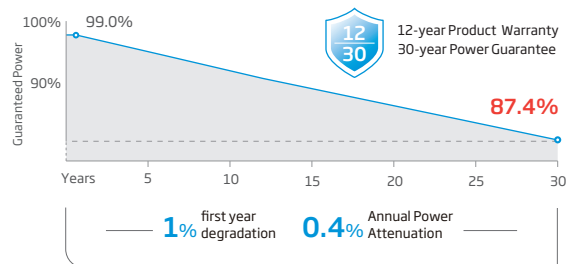
- Minimized micro-cracks with innovative non-destructive cutting technology and high-density packaging
- Reduced risks of hot-spot with half-cut technology
- Certified high resistance against salt, ammonia, sand, PID, LID, LeTID
- Sustainable in harsh environments and extreme weather conditions



## High energy yield

- Excellent low irradiation performance, validated by 3rd party
- Lower temperature coefficient (-0.29%/°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

## 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

ISO14067: Product Carbon Footprint Limited Assurance



## ELECTRICAL DATA

| Testing Condition                    | STC    | NOCT  | BNPI  | STC   | NOCT  | BNPI  | STC   | NOCT  | BNPI  | STC   | NOCT  | BNPI  | STC   | NOCT  | BNPI  | STC   | NOCT  | BNPI  |
|--------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Peak Power Watts- $P_{MAX}(W_p)^*$   | 610    | 465   | 676   | 615   | 469   | 681   | 620   | 473   | 687   | 625   | 477   | 692   | 630   | 481   | 698   | 635   | 487   | 704   |
| Power Selection (W)**                | 0 ~ +5 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| Maximum Power Voltage- $V_{MPP}$ (V) | 39.79  | 37.60 | 39.79 | 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 |
| Maximum Power Current- $I_{MPP}$ (A) | 15.33  | 12.38 | 17.00 | 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 |
| Open Circuit Voltage- $V_{oc}$ (V)   | 48.09  | 45.70 | 48.09 | 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 |
| Short Circuit Current- $I_{sc}$ (A)  | 16.14  | 13.00 | 17.88 | 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 |
| Module Efficiency $\eta_m$ (%)       | 22.6   |       |       | 22.8  |       |       | 23.0  |       |       | 23.1  |       |       | 23.3  |       |       | 23.5  |       |       |

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s. BNPI: Irradiance: front 1000W/m<sup>2</sup>, rear 135W/m<sup>2</sup>, 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- $P_{MAX}(W_p)$     | 641   | 671   | 646   | 677   | 651   | 682   | 656   | 688   | 662   | 693   | 667   | 699   |
| Maximum Power Voltage- $V_{MPP}$ (V) | 39.79 | 39.79 | 39.97 | 39.97 | 40.24 | 40.24 | 40.46 | 40.46 | 40.68 | 40.68 | 40.84 | 40.84 |
| Maximum Power Current- $I_{MPP}$ (A) | 16.10 | 16.86 | 16.16 | 16.93 | 16.18 | 16.95 | 16.22 | 17.00 | 16.26 | 17.04 | 17.26 | 18.08 |
| Open Circuit Voltage- $V_{oc}$ (V)   | 48.09 | 48.09 | 48.29 | 48.29 | 48.50 | 48.50 | 48.70 | 48.70 | 48.90 | 48.90 | 49.10 | 49.10 |
| Short Circuit Current- $I_{sc}$ (A)  | 16.95 | 17.75 | 17.01 | 17.82 | 17.07 | 17.89 | 17.14 | 17.95 | 17.20 | 18.02 | 16.33 | 17.11 |

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

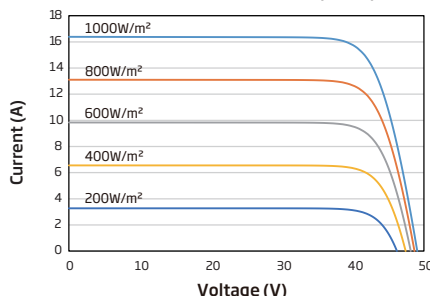
Maximum System Voltage 1500V DC (IEC)

1500V DC (UL)

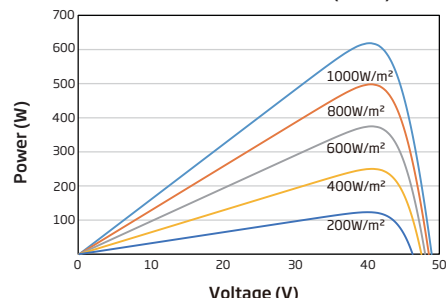
Max Series Fuse Rating 35A

## CURVES OF PV MODULE

I-V CURVES OF PV MODULE (620W)



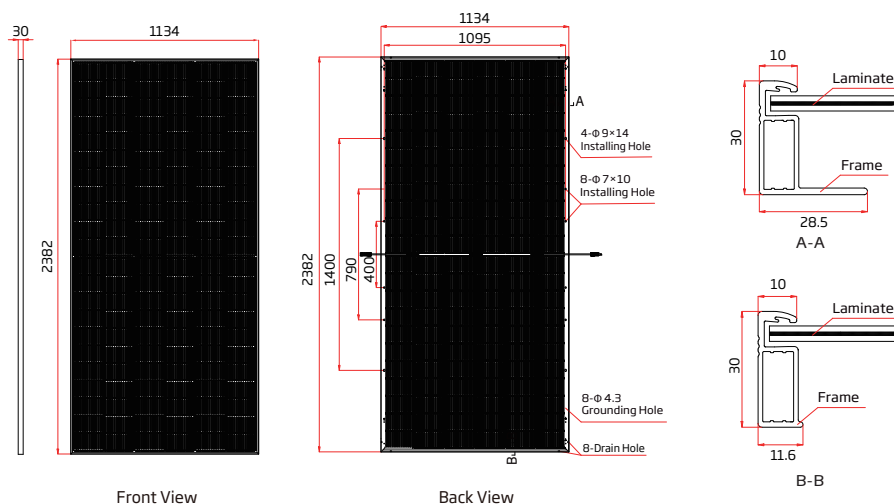
P-V CURVES OF PV MODULE (620W)



## MECHANICAL DATA

|                   |                                                                                                                                                          |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Solar Cells       | N-type i-TOPCon Monocrystalline                                                                                                                          |
| No. of cells      | 132 cells                                                                                                                                                |
| Module Dimensions | 2382×1134×30 mm<br>(93.78×44.65×1.18 inches)                                                                                                             |
| Weight            | 33.0 kg (72.8 lb)                                                                                                                                        |
| Front Glass       | 2.0 mm (0.08 inches),<br>AR Coating Heat Strengthened Glass                                                                                              |
| Back Glass        | 2.0 mm (0.08 inches),<br>Heat Strengthened Glass                                                                                                         |
| Frame             | 30mm (1.18 inches)<br>Anodized Aluminium Alloy                                                                                                           |
| J-Box             | IP 68 rated                                                                                                                                              |
| Cables            | Photovoltaic Technology<br>Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> )<br>Portrait: 200/320 mm (7.87/12.60 inches)<br>Length can be customized |
| Connector         | MC4 EV02 / TS4 Plus / TS4*                                                                                                                               |
| Packaging         | Modules per box: 36 pieces<br>Modules per 40' container: 720 pieces                                                                                      |

\*Please refer to regional datasheet for specified connector.



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

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