



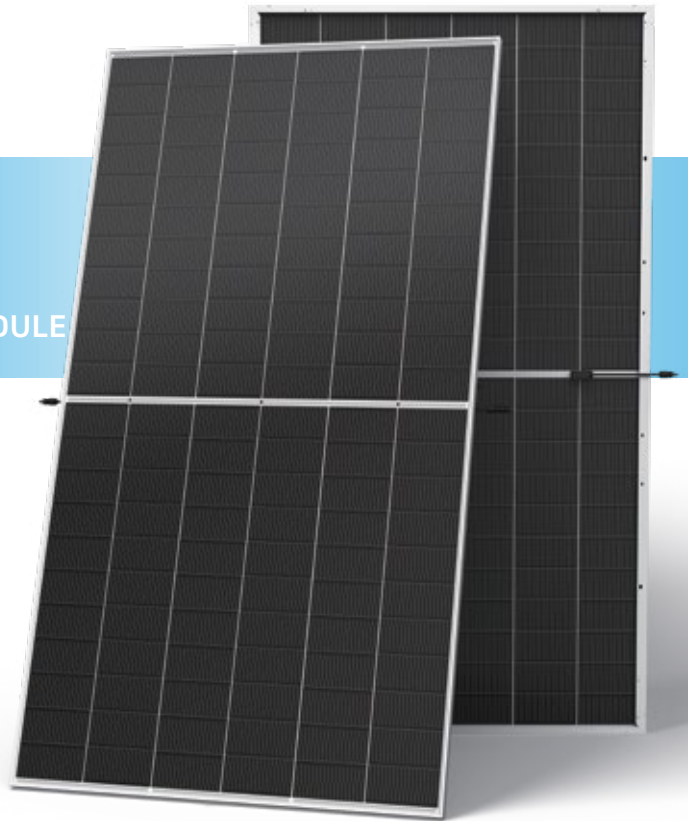
# N-type i-TOPCon

BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

TSM-XXXNEG21C.20 700-725W

**725W** / MAXIMUM POWER OUTPUT

**23.3%** / MAXIMUM EFFICIENCY



## High customer value

- Standardized module size with flagship module power, 35W higher compared with conventional technology
- Low voltage design with higher string power, effectively reducing BOS (Balance of System) and LCOE (Levelized Cost of Energy) by 2%~6%
- Higher container space utilization effectively reduces the freight cost
- Certified Low-Carbon Footprint
- The Star of LCOE



## High power up to 725W

- Up to 23.3% module efficiency, on 210 innovation platform
- Patented i-TOPCon technology with continuous efficiency improvement, including contact resistance reduction, rear reflection enhancement and edge quality repairment



## High reliability

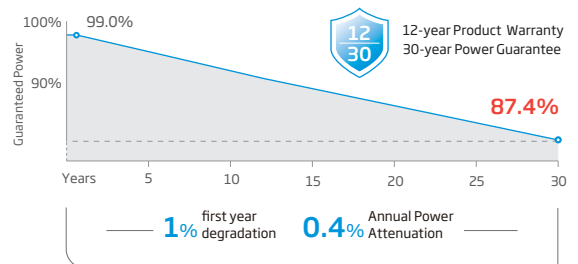
- Minimized micro-cracks with innovative non-destructive cutting technology and high-density packaging
- Reduced risks of hot-spot with half-cut technology
- Fire Class rating C, Safety Class II



## 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



\* (Power degradation values above apply to frontside, refer to product warranty for power degradation for backside and other details)

## Comprehensive Products and System Certificates

IEC61215/IEC61730

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) TSM-XXXNEG21C.20 (XXX=700-725)

| Testing Condition                    | STC    |       |       | NOCT  |       |       | BNPI  |       |       | STC   |       |       | NOCT  |       |       | BNPI  |       |        | STC |  |  | NOCT |  |  | BNPI |  |  |
|--------------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-----|--|--|------|--|--|------|--|--|
| Peak Power Watts- $P_{MAX}(W_p)^*$   | 700    | 534   | 776   | 705   | 540   | 781   | 710   | 543   | 787   | 715   | 547   | 792   | 720   | 551   | 798   | 725   | 555   | 801    |     |  |  |      |  |  |      |  |  |
| Power Selection (W)**                | 0 ~ +5 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |        |     |  |  |      |  |  |      |  |  |
| Maximum Power Voltage- $V_{MPP}$ (V) | 40.5   | 38.0  | 40.5  | 40.7  | 38.3  | 40.7  | 40.9  | 38.5  | 40.9  | 41.1  | 38.7  | 41.1  | 41.3  | 38.8  | 41.3  | 41.5  | 39.0  | 41.5   |     |  |  |      |  |  |      |  |  |
| Maximum Power Current- $I_{MPP}$ (A) | 17.29  | 14.04 | 19.15 | 17.33 | 14.08 | 19.19 | 17.36 | 14.12 | 19.23 | 17.40 | 14.14 | 19.28 | 17.44 | 14.19 | 19.32 | 17.47 | 14.23 | 19.301 |     |  |  |      |  |  |      |  |  |
| Open Circuit Voltage- $V_{oc}$ (V)   | 48.6   | 46.1  | 48.6  | 48.8  | 46.3  | 48.8  | 49.0  | 46.5  | 49.0  | 49.2  | 46.7  | 49.2  | 49.4  | 46.9  | 49.4  | 49.6  | 47.1  | 49.6   |     |  |  |      |  |  |      |  |  |
| Short Circuit Current- $I_{sc}$ (A)  | 18.32  | 14.76 | 20.30 | 18.36 | 14.80 | 20.34 | 18.40 | 14.83 | 20.39 | 18.44 | 14.86 | 20.43 | 18.49 | 14.90 | 20.49 | 18.54 | 14.94 | 20.54  |     |  |  |      |  |  |      |  |  |
| Module Efficiency $\eta_m$ (%)       | 22.5   |       |       | 22.7  |       |       | 22.9  |       |       | 23.0  |       |       | 23.2  |       |       | 23.3  |       |        |     |  |  |      |  |  |      |  |  |

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% |  |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----|--|-----|--|----|--|-----|--|
| Peak Power Watts- $P_{MAX}(W_p)^*$   | 735   | 770   | 740   | 776   | 746   | 781   | 751   | 787   | 756   | 792   | 761   | 798   |    |  |     |  |    |  |     |  |
| Maximum Power Voltage- $V_{MPP}$ (V) | 40.5  | 40.5  | 40.7  | 40.7  | 40.9  | 40.9  | 41.1  | 41.1  | 41.3  | 41.3  | 41.5  | 41.5  |    |  |     |  |    |  |     |  |
| Maximum Power Current- $I_{MPP}$ (A) | 18.15 | 19.02 | 18.20 | 19.06 | 18.23 | 19.10 | 18.27 | 19.14 | 18.31 | 19.18 | 18.34 | 19.22 |    |  |     |  |    |  |     |  |
| Open Circuit Voltage- $V_{oc}$ (V)   | 48.6  | 48.6  | 48.8  | 48.8  | 49.0  | 49.0  | 49.2  | 49.2  | 49.4  | 49.4  | 49.6  | 49.6  |    |  |     |  |    |  |     |  |
| Short Circuit Current- $I_{sc}$ (A)  | 19.24 | 20.15 | 19.28 | 20.20 | 19.32 | 20.24 | 19.36 | 20.28 | 19.41 | 20.34 | 19.47 | 20.39 |    |  |     |  |    |  |     |  |

Power Bifaciality: 80±5%.  $\phi_{Pmax}$  : 80%±7% ;  $\phi_{Voc}$ : 100%±3%;  $\phi_{Isc}$ : 80%±7%

**TEMPERATURE RATINGS**

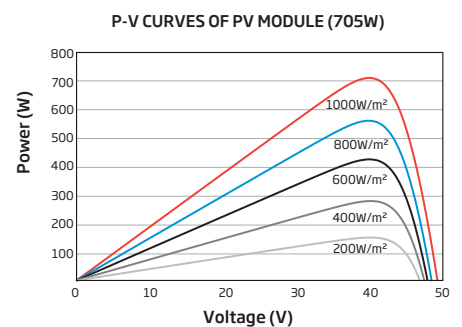
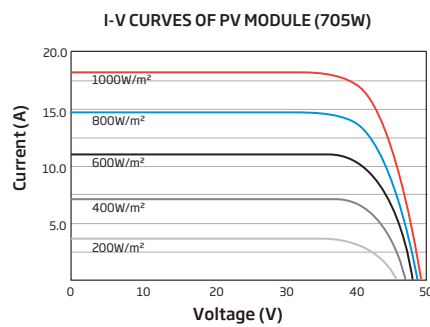
|   |             |
|---|-------------|
| NOCT (Nominal Operating Cell Temperature) | 43°C (±2°C) |
| Temperature Coefficient of $P_{MAX}$      | -0.29%/°C   |
| Temperature Coefficient of $V_{oc}$       | -0.24%/°C   |
| Temperature Coefficient of $I_{sc}$       | 0.04%/°C    |

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

**MAXIMUM RATINGS**

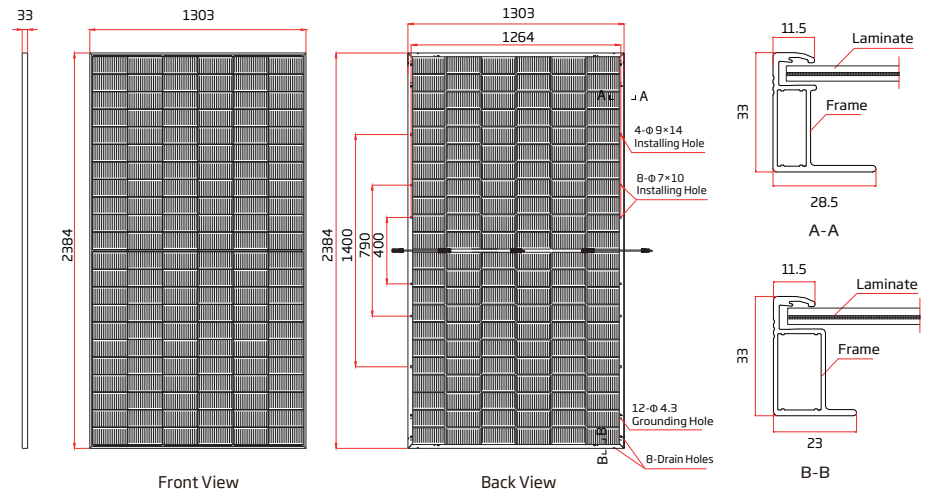
|                         |                |
|-------------------------|----------------|
| Operational Temperature | -40~+85°C      |
| Maximum System Voltage  | 1500V DC (IEC) |
|                         | 1500V DC (UL)  |
| Max Series Fuse Rating  | 35A            |

**CURVES OF PV MODULE**



**MECHANICAL DATA**

|                   |  |
|-------------------|--|
| Solar Cells       | N-type i-TOPCon Monocrystalline  |
| No. of cells      | 132 cells  |
| Module Dimensions | 2384×1303×33 mm<br>(93.86×51.30×1.30 inches)   |
| Weight            | 38.3 kg (84.4 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             | 33mm (1.30 inches) Anodized Aluminium Alloy  |
| J-Box             | IP 68 rated  |
| Cables            | Photovoltaic Technology Cable 4.0mm <sup>2</sup> (0.006 inches <sup>2</sup> )<br>Portrait: 350/280 mm (13.78/11.02 inches)<br>Length can be customized |
| Connector         | Stäubli MC4 EVO2   |
| Packaging         | Modules per box: 33 pieces<br>Modules per 40' container: 594 pieces  |



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