

## G12R-68P N-type Bifacial Double Glass Module

HSM-GRA-NM610~635

### 635W

Maximum Power Output

### 23.2%

Maximum Efficiency

#### High Energy Yield

- High-density cell package, increasing 2% cells
- Lower temperature coefficient (Pmax):  $-0.29\%/^{\circ}\text{C}$
- Up to 80% power bifaciality

#### Industry-leading G12 Wafer

- $<1\%$  degradation in the first year
- Smaller wafer chamfer, larger light receiving area
- Wafer: 210R, Thickness:  $\leq 130\mu\text{m}$

#### Superior Customer Value

- Integrated technology: TOPCon + Shingling
- Optimized dimension design for all scenarios
- More artistic beauty with no-gap design

#### Long-term Reliability

- 1/3 cell technology, lower current loss and hot spot risk
- Harsh environment resistance
- Damage-free laser cutting, lower micro-crack risk
- Mechanical load: Front 5400 Pa, Back 2400 Pa

#### Comprehensive Products and System Certificates



IEC 61215 / IEC 61730 ISO 9001:2015 ISO 45001:2018 ISO 14001:2015

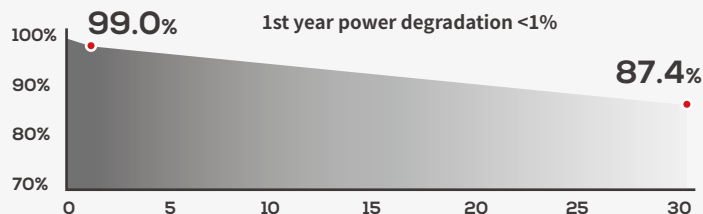
#### Linear Performance Warranty



15 Years  
Product Warranty



30 Years Linear  
Performance Warranty



# G12R-68P N-type Bifacial Double Glass Module

HSM-GRA-NM610~635

635W

Maximum Power

23.2%

Maximum Efficiency

0~+5W

Power Tolerance

## Electrical Parameters (STC\*)

\* STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM1.5, Measuring Tolerance: ±2%

|                       |                      |       |       |       |       |       |       |
|-----------------------|----------------------|-------|-------|-------|-------|-------|-------|
| Maximum Power         | P <sub>max</sub> (W) | 610   | 615   | 620   | 625   | 630   | 635   |
| Open Circuit Voltage  | V <sub>oc</sub> (V)  | 49.00 | 49.20 | 49.40 | 49.60 | 49.85 | 50.10 |
| Short Circuit Current | I <sub>sc</sub> (A)  | 15.57 | 15.60 | 15.63 | 15.66 | 15.68 | 15.70 |
| Maximum Power Voltage | V <sub>mp</sub> (V)  | 41.60 | 41.80 | 42.00 | 42.20 | 42.45 | 42.70 |
| Maximum Power Current | I <sub>mp</sub> (A)  | 14.67 | 14.72 | 14.77 | 14.82 | 14.85 | 14.88 |
| Module Efficiency     | (%)                  | 22.3  | 22.5  | 22.7  | 22.8  | 23.0  | 23.2  |

## Electrical Characteristics with 10% Bifacial Gain\*

\* The additional gain from the back side depends on mounting (structure, height, tilt angle etc.) and albedo of the ground.

|                       |                      |       |       |       |       |       |       |
|-----------------------|----------------------|-------|-------|-------|-------|-------|-------|
| Maximum Power         | P <sub>max</sub> (W) | 671   | 677   | 682   | 688   | 693   | 699   |
| Open Circuit Voltage  | V <sub>oc</sub> (V)  | 49.00 | 49.20 | 49.40 | 49.60 | 49.85 | 50.10 |
| Short Circuit Current | I <sub>sc</sub> (A)  | 17.13 | 17.16 | 17.19 | 17.23 | 17.25 | 17.27 |
| Maximum Power Voltage | V <sub>mp</sub> (V)  | 41.60 | 41.80 | 42.00 | 42.20 | 42.45 | 42.70 |
| Maximum Power Current | I <sub>mp</sub> (A)  | 16.14 | 16.19 | 16.25 | 16.30 | 16.34 | 16.37 |

## Mechanical Data

\* Please refer to installation manual for details

|                     |                                                                 |
|---------------------|-----------------------------------------------------------------|
| No. of Cells        | 204pcs (6×34)                                                   |
| Dimension           | 2413×1134×30mm                                                  |
| Weight              | 33.2kg                                                          |
| Front Glass         | 2.0mm High Transmission, Heat Strengthened Glass                |
| Back Glass          | 2.0mm Heat Strengthened Glass                                   |
| Frame               | Anodized Aluminium Alloy                                        |
| J-Box               | IP68                                                            |
| Cables              | 4.0mm <sup>2</sup> , +350mm, -280mm/±1400mm (can be customized) |
| Diodes              | 3                                                               |
| Maximum Static Load | Front: 5400Pa/Back: 2400Pa*                                     |

## Temperature Coefficient

\* NMOT: Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s

|                                            |            |                                             |           |
|--------------------------------------------|------------|---------------------------------------------|-----------|
| Nominal Module Operating Temperature*      | 43±2°C     | Temperature Coefficient of Voc              | -0.25%/°C |
| Temperature Coefficient of I <sub>sc</sub> | +0.045%/°C | Temperature Coefficient of P <sub>max</sub> | -0.29%/°C |

## Operating Parameters

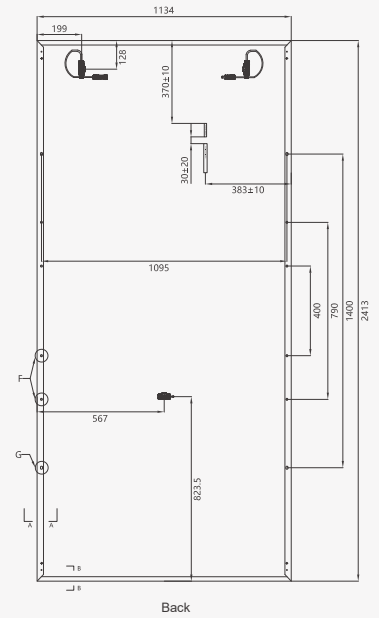
|                            |           |
|----------------------------|-----------|
| Operating Temperature      | -40~+85°C |
| Maximum System Voltage     | 1500V DC  |
| Maximum Series Fuse Rating | 30A       |
| Power Bifaciality          | 80±5%     |

## Packaging Configuration

|                             |        |
|-----------------------------|--------|
| Modules per Pallet          | 36pcs  |
| Modules per 40'HQ Container | 576pcs |
| Pallets per 40'HQ Container | 16plt  |

## Engineering Drawing

[Unit: mm]



F-Installation Hole



G-Installation Hole



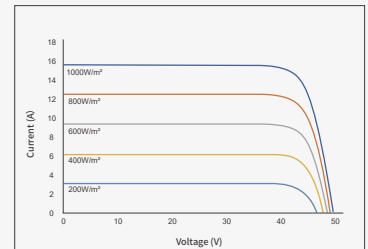
A-A



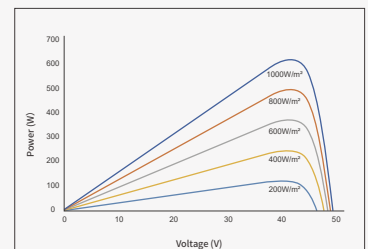
B-B

## Curve Graph

### I-V Curves (620W)



### P-V Curves (620W)



TCL

Head office: No. 20 Wenzhuang Road, Economic Development Zone, Yixing City, Jiangsu Province | PRC  
Marketing center: 21F, Building 1, No.99 Si 'an Street, Industrial Park, Suzhou City, Jiangsu Province | PRC  
Tel: 86-0510-87121106 E-mail: modules-contact@tzeco.com Website: www.tzeco.com



Datasheets