Double Glass Module Introduction

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Product Management
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01 Background
02 Product design
03 Product advantage
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Double glass module can cover cell technology, module technology and system application.

**Cell Technology**
- PERC
- MBB
- Black Silicon
- N-Type
- P-Type

**Module Technology**
- Smart module
- Half-cut Cell
- Stack wafe module
- MBB

**System Application**
- 1500V
- Ground system
- Overwater system
- Agricultural system
- BIPV
Product Design

5BB+PERC
Superposition double - glass technique

Half-cut Cell
Superposition double - glass technique

Agricultural system
1500V System

Overwater system
Agricultural system
Product Design--Photo

TP660 Mono 300W
TP6H60 Mono 305W
TP672 Mono 365W
TP6H72 Mono 370W

Positive photograph
<table>
<thead>
<tr>
<th>Model</th>
<th>Mono PERC</th>
<th>P/N-Type Bifacial</th>
<th>Mono PERC</th>
<th>P/N-Type Bifacial</th>
<th>Mono PERC + Half-cut Cell</th>
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<tbody>
<tr>
<td>Version</td>
<td>TP660</td>
<td></td>
<td>TP672</td>
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<td>TP660</td>
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<tr>
<td>System voltage</td>
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<td>1500V</td>
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<td>Pmax</td>
<td>300W</td>
<td>365W</td>
<td>305W</td>
<td>370W</td>
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<td>Backside power generation</td>
<td>N/A</td>
<td>5%~30%</td>
<td>N/A</td>
<td>5%~30%</td>
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<td>contribution gain</td>
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<tr>
<td>Size</td>
<td>1658*992 mm</td>
<td>1974*992 mm</td>
<td>1675*992 mm</td>
<td>2000*992 mm</td>
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<tr>
<td>Weight</td>
<td>23kg</td>
<td>27kg</td>
<td>23.5 Kg</td>
<td>27.5 Kg</td>
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<td>Installation</td>
<td>4*150mm  Lock block</td>
<td>6*150mm Lock block</td>
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<tr>
<td>Static Loading</td>
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<td></td>
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<td>5400Pa</td>
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<td>Glass</td>
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<td></td>
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<td>2.5+2.5mm</td>
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<td>Packing</td>
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<td>33/Box</td>
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<td></td>
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<td>10 years Material &amp; workmanship warranty</td>
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<td>30 years Linear power output warranty</td>
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<td>TUV IEC</td>
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</table>
Double glass module

- **Hi-Rel**
  - 30 years Linear power output warranty
  - Pmax decrease is less than 0.5%.

- **Anti-PID**
  - 85% RH 85°C 1000V 600h Pmax<2%

- **Anti-crack**
  - 5400P Static Loading test <0.2%, 0 Crack

- **Self-cleaning**
  - Self-cleaning, not easy to accumulate ash, increase power generation.

- **Widely used**
  - Overwater system & Agricultural system
  - BIPV
  - Distributed system
High Reliability

1. **High-Reliability**
   The glass replaces the traditional polymer backboard, which has higher reliable performance and stronger corrosion resistance.

2. **Fire resistance**
   The back is glass, grade A fireproof, increase safety.

3. **Higher tightness**
   Avoid water vapor entry, and avoid snail lines

4. **Fully automated**
   Fully automated, 700MW fully autonomous production line.

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- Double glass module (mono) linear power output warranty
- Conventional module (mono) linear power output warranty

*Power decline is less than 0.5% per year.*
Anti-PID

PID Test 85% RH 85°C 1000V D.C. Time 600H

Power loss <2%

EL test before PID test

EL test after PID test

NO significant changes

Double glass edges coated with copper foil.
Ante EL Crack

**Loading test**

Loading test: Standard IEC61215 (front 5400Pa, back 3600Pa)

Power loss: **0.18%**

EL: **0 Crack**

EL test before loading test → EL test after loading test

**NO Crack**
Self-Cleaning Capability

1. **Snow**: double glass module have obvious advantages.
2. **Dust**: conventional module are easy to accumulate ash, and double-glass module can be washed clean by rain.
3. **Save the cost of operation and maintenance.**
4. **Increase power generation capacity.**
Application Case

Ground system

Agricultural system

Overwater system

Distributed system

BIPV

Large Overwater system
Additional Advantage

1. Have all the advantages of double glass.
2. Bifacial: double sided power generation, increase power generation gain.
3. Lower LCOE
The installation environment is different, the reflectivity difference is very large, the backside power generation contribution gain is up to 27.3%, at least 14.3%.

Additional Advantage (energy generation benefit)

Data is derived from the TUV SUD outdoor test verification.
Bifacial module LCOE is 11.24% lower than single double glass module.

Bifacial module power gain is 15% higher than single double glass module.

(installation surface: soil)

Case study: 1.0 MW Solar Home System, Tokyo, Japan
Thank you for your attention!

If you have any question, pls contact us.
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