

# HYUNDAI SOLAR MODULE

## HG SERIES

### G12 PERC Shingled

HiE-S430HG(FB) HiE-S435HG(FB)  
HiE-S440HG(FB) HiE-S445HG(FB)



Shingled  
Technology



For Both Residential  
& Commercial  
Applications



More Power  
Generation  
In Low Light



### G12 PERC Shingled

G12 PERC Shingled Technology provides ultra-high efficiency with better performance in low irradiation. Maximizes installation capacity in limited space.



### Anti-LID / PID

Both LID(Light Induced Degradation) and PID(Potential induced Degradation) are strictly eliminated to ensure higher actual yield during lifetime.



### Mechanical Strength

Tempered glass and reinforced frame design withstand rigorous weather conditions such as heavy snow and strong wind.



### Reliable Warranty

Global Brand with powerful financial strength provide reliable 25-year warranty. (Australia and Europe Only)



### Corrosion Resistant

Various tests under harsh environmental conditions such as ammonia and salt-mist passed



### UL / VDE Test Labs

Hyundai's R&D center is an accredited test laboratory of both UL and VDE.

### Hyundai's Warranty Provisions



- **25-Year Product Warranty**
- On material and workmanship  
**Australia and Europe Only**



- **25-Year Performance Warranty**
- Initial year: 98.0%
- Linear warranty after second year: with 0.55%p annual degradation, 84.80% is guaranteed up to 25 years

### About Hyundai Energy Solutions

Established in 1972, Hyundai Heavy Industries Group is one of the most trusted names in the heavy industries sector and is a Fortune 500 company. As a global leader and innovator, Hyundai Heavy Industries is committed to building a future growth engine by developing and investing heavily in the field of renewable energy.

As a core energy business entity of HHI, Hyundai Energy Solutions has strong pride in providing High-quality PV products to more than 3,000 customers worldwide.

### Certification



## Electrical Characteristics

|                                 |      | Mono-Crystalline Module (HiE-S_HG(FB)) |       |       |       |
|---------------------------------|------|--|-------|-------|-------|
|                                 |      | 445                                    | 440   | 435   | 430   |
| Nominal Output (Pmpp)           | W    | 445                                    | 440   | 435   | 430   |
| Open Circuit Voltage(Voc)       | V    | 43.8                                   | 43.7  | 43.6  | 43.5  |
| Short Circuit Voltage (Isc)     | A    | 13.01                                  | 12.90 | 12.79 | 12.68 |
| Voltage at Pmax (Vmpp)          | V    | 36.4                                   | 36.3  | 36.2  | 36.1  |
| Current at Pmax (Imp)           | A    | 12.23                                  | 12.13 | 12.02 | 11.92 |
| Module Efficiency               | %    | 21.4                                   | 21.1  | 20.9  | 20.7  |
| Cell Type                       | -    | PERC Mono-Crystalline Silicon Shingled |       |       |       |
| Maximum System Voltage          | V    | 1,500                                  |       |       |       |
| Temperature Coefficient of Pmax | %/°C | -0.34                                  |       |       |       |
| Temperature Coefficient of Voc  | %/°C | -0.27                                  |       |       |       |
| Temperature Coefficient of Isc  | %/°C | 0.04                                   |       |       |       |

\*All data at STC(Standard Test Conditions). Above data may be changed without prior notice.

\*Tolerance of Pmax:0~+5W.

\* Performance deviation of Voc [V], Isc [A], Vm[V] and Im[A]:±3%.

## Mechanical Characteristics

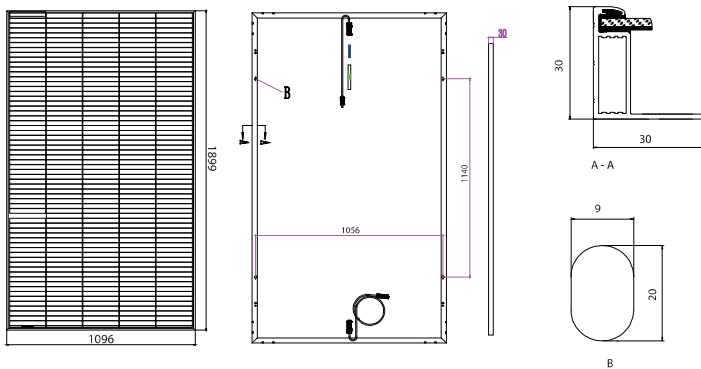
|               |   |                              |
|---------------|---|------------------------------|
| Dimensions    | 1,899 × 1,096 × 30 mm (L × W × H)   |                              |
| Weight        | 21.8kg  |                              |
| Solar Cells   | 320 Cells, PERC Mono-crystalline Shingled (210 × 210mm)                                     |                              |
| Output Cables | 4mm <sup>2</sup> +500mm/-1100mm(Vertical),<br>+220mm/-180mm(Horizontal)                     | Connector Stäubli : MC4-Evo2 |
| Junction Box  | IP68, TUV&UL, two diodes  |                              |
| Construction  | Front Glass: AR Coated tempered glass, 3.2mm<br>Encapsulation: EVA (Ethylene-Vinyl-Acetate) |                              |
| Frame         | Anodized Aluminum   |                              |

## Installation Safety Guide

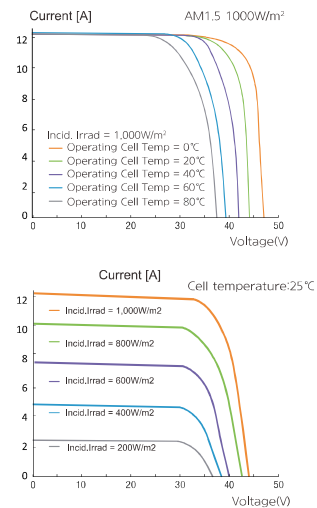
- Only qualified personnel should install or perform maintenance.
- Be aware of dangerous high DC voltage.
- Do not damage or scratch the rear surface of the module.
- Do not handle or install modules when they are wet.

|                                    |                                 |
|------------------------------------|---------------------------------|
| Nominal Operating Cell Temperature | 42.3°C ( ± 2°C )                |
| Operating Temperature              | -40 ~ 85 °C                     |
| Maximum System Voltage             | DC 1,500 / 1,000 (IEC)          |
| Series Fuse Rating [A]             | 25                              |
| Maximum Surface Load Capacity      | Front 5,400 Pa<br>Rear 2,400 Pa |

## Module Diagram (Unit: mm)



## I-V Curves



Manufactured in China

**HYUNDAI**  
ENERGY SOLUTIONS



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