

# HYUNDAI SOLAR MODULE

## VG SERIES

### PERC Shingled

HiE-S390VG    HiE-S395VG    HiE-S400VG  
HiE-S405VG    HiE-S410VG



Shingled  
Technology



For Both  
Residential &  
Commercial  
Applications



More Power  
Generation  
In Low Light



M6 PERC Shingled

M6 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. (Europe and Australia 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 (Europe and Australia only)
- On materials and workmanship



- 25-Year Performance Warranty
- Initial year: 98.0%
- Linear warranty after second year: with 0.55%p annual degradation, 84.8% 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___VG)   |       |       |       |       |
|---|------|--|-------|-------|-------|-------|
|   |      | 390                                    | 395   | 400   | 405   | 410   |
| Nominal Output (P <sub>mpp</sub> )              | W    | 390                                    | 395   | 400   | 405   | 410   |
| Open Circuit Voltage (V <sub>oc</sub> )         | V    | 46.3                                   | 46.3  | 46.4  | 46.5  | 46.6  |
| Short Circuit Current (I <sub>sc</sub> )        | A    | 10.87                                  | 10.92 | 10.97 | 11.02 | 11.07 |
| Voltage at P <sub>max</sub> (V <sub>mpp</sub> ) | V    | 38.5                                   | 38.5  | 38.6  | 38.7  | 38.8  |
| Current at P <sub>max</sub> (I <sub>mp</sub> )  | A    | 10.13                                  | 10.26 | 10.36 | 10.47 | 10.57 |
| Module Efficiency                               | %    | 19.9                                   | 20.2  | 20.4  | 20.7  | 20.9  |
| Cell Type                                       | -    | PERC Mono-Crystalline Silicon Shingled |       |       |       |       |
| Maximum System Voltage                          | V    | 1,500                                  |       |       |       |       |
| Temperature Coefficient of P <sub>max</sub>     | %/°C | -0.34                                  |       |       |       |       |
| Temperature Coefficient of V <sub>oc</sub>      | %/°C | -0.27                                  |       |       |       |       |
| Temperature Coefficient of I <sub>sc</sub>      | %/°C | 0.04                                   |       |       |       |       |

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

\*Tolerance of P<sub>max</sub>: 0~+5W

\*Performance deviation of V<sub>oc</sub> [V], I<sub>sc</sub> [A], V<sub>m</sub> [V] and I<sub>m</sub> [A]: ±3%.

## Mechanical Characteristics

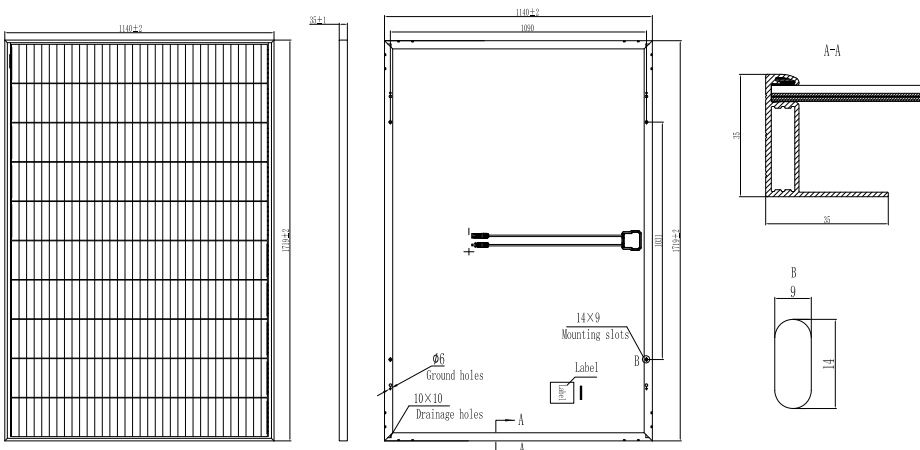
|               |   |           |                    |
|---------------|---|-----------|--------------------|
| Dimensions    | 1,719 × 1,140 × 35mm (L × W × H)  |           |                    |
| Weight        | 22kg  |           |                    |
| Solar Cells   | 340 cells, PERC Mono-crystalline Shingled (166 × 166mm)   |           |                    |
| Output Cables | Length 1,500mm, 1×4mm <sup>2</sup>  | Connector | Stäubli : MC4-Evo2 |
| Junction Box  | Rated current : 20A, IP67, TUV&UL   |           |                    |
| Construction  | Front Glass : White toughened safety 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 ± 2°C                      |
| Operating Temperature              | -40 ~ 85°C                      |
| Maximum System Voltage             | DC 1,500 / 1,000 (IEC)          |
| Maximum Reverse Current            | 20A                             |
| Maximum Surface Load Capacity      | Front 5,400 Pa<br>Rear 2,400 Pa |

## Module Diagram (unit : mm)



## I-V Curves

