



• Qualified, IEC 61215  
• Safety tested, IEC 61730  
• Periodic inspection



# Hyundai Solar Module

## | SG-Series |

### Multi-crystalline Type

HiS-M215SG | HiS-M218SG | HiS-M221SG  
HiS-M224SG | HiS-M227SG | HiS-M230SG  
HiS-M233SG

### Mono-crystalline Type

HiS-S218SG | HiS-S221SG | HiS-S224SG  
HiS-S227SG | HiS-S230SG | HiS-S233SG  
HiS-S236SG

### Mechanical Characteristics

|               |   |
|---------------|---|
| Dimensions    | 983 mm (38.7") (W) × 1645 mm (64.76") (L) × 35 mm (1.38") (H)   |
| Weight        | Approx. 19.0 kg (41.9 lbs)  |
| Solar cells   | 60 cells in series (6 × 10 matrix)  |
| Output cables | 4 mm <sup>2</sup> (12AWG) cables with polarized weatherproof connectors, IEC certified (UL listed), Length 1.0 m (39.4")    |
| Junction box  | IP65, weatherproof, IEC certified (UL listed)   |
| Bypass diodes | 3 bypass diodes to prevent power decrease by partial shade  |
| Construction  | Front : High transmission low-iron tempered glass, 3.2 mm (0.126")<br>Encapsulant : EVA      Back Sheet : Weatherproof film |
| Frame         | Clear anodized aluminum alloy type 6063   |

### High Quality

- IEC 61215(Ed.2) and IEC 61730 by TÜV Rheinland
- UL listed (UL1703), Class C Fire Rating
- Output power tolerance ±3%
- ISO 9001:2000 and ISO 14001:2004 Certified
- Advanced Mechanical Test (5,400 Pa) Passed (IEC)  
/Mechanical Load Test (40 lbs/ft<sup>2</sup>) Passed (UL)

### Limited Warranty

- 5 years for product defect
- 10 years for 90% of warranted min. power
- 25 years for 80% of warranted min. power

### Fast and Inexpensive Mounting

- Delivered ready for connection
- Pre-confectioned cables
- IEC (UL) passed and weatherproof connectors
- Integrated bypass diodes



### ※ Important Notice on Warranty

The warranties apply only to the PV modules with Hyundai Heavy Industries Co., Ltd.'s logo (shown left) and product serial number on it.

## Electrical Characteristics

### Multi-crystalline Type

|                                 |     | HiS-M <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;"> </span> SG |       |       |       |       |       |       |
|---------------------------------|-----|--|-------|-------|-------|-------|-------|-------|
|                                 |     | 215  | 218   | 221   | 224   | 227   | 230   | 233   |
| Nominal output (Pmpp)           | W   | 215  | 218   | 221   | 224   | 227   | 230   | 233   |
| Warranted minimum power         | W   | 208.6  | 211.5 | 214.4 | 217.3 | 220.2 | 223.1 | 226.0 |
| Voltage at Pmax (Vmpp)          | V   | 28.7   | 28.9  | 29.0  | 29.2  | 29.3  | 29.4  | 29.6  |
| Current at Pmax (Impp)          | A   | 7.5  | 7.6   | 7.7   | 7.7   | 7.8   | 7.9   | 7.9   |
| Open circuit voltage (Voc)      | V   | 36.3   | 36.4  | 36.6  | 36.7  | 36.8  | 36.9  | 37.1  |
| Short circuit current (Isc)     | A   | 8.2  | 8.3   | 8.3   | 8.3   | 8.3   | 8.4   | 8.4   |
| Output tolerance                | %   | ±3   |       |       |       |       |       |       |
| No. of cells & connections      | pcs | 60 in series   |       |       |       |       |       |       |
| Cell type                       | —   | 6" Multi-crystalline silicon   |       |       |       |       |       |       |
| Module efficiency               | %   | 13.3   | 13.5  | 13.7  | 13.9  | 14.0  | 14.2  | 14.4  |
| Temperature coefficient of Pmpp | %/K | -0.43  | -0.43 | -0.43 | -0.43 | -0.43 | -0.43 | -0.43 |
| Temperature coefficient of Voc  | %/K | -0.32  | -0.32 | -0.32 | -0.32 | -0.32 | -0.32 | -0.32 |
| Temperature coefficient of Isc  | %/K | 0.056  | 0.056 | 0.056 | 0.056 | 0.056 | 0.056 | 0.056 |

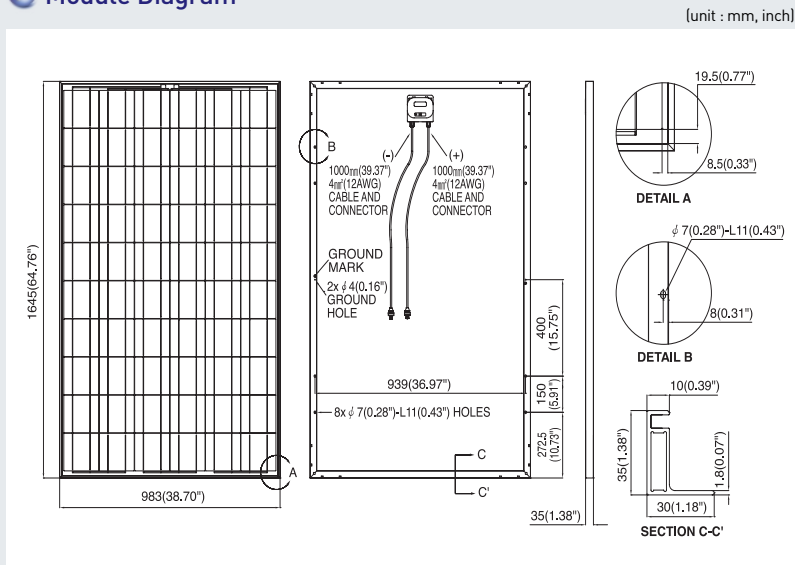
※ All data at STC (Standard Test Conditions). Above data may be changed without prior notice.

### Mono-crystalline Type

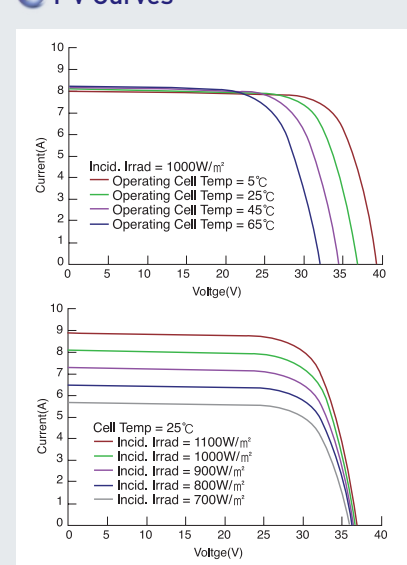
|                                 |     | HiS-S <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;"> </span> <span style="border: 1px solid black; padding: 0 2px;"> </span> SG |       |       |       |       |       |       |
|---------------------------------|-----|--|-------|-------|-------|-------|-------|-------|
|                                 |     | 218  | 221   | 224   | 227   | 230   | 233   | 236   |
| Nominal output (Pmpp)           | W   | 218  | 221   | 224   | 227   | 230   | 233   | 236   |
| Warranted minimum power         | W   | 211.5  | 214.4 | 217.3 | 220.2 | 223.1 | 226.0 | 228.9 |
| Voltage at Pmax (Vmpp)          | V   | 28.9   | 29.1  | 29.2  | 29.3  | 29.4  | 29.6  | 29.7  |
| Current at Pmax (Impp)          | A   | 7.6  | 7.6   | 7.7   | 7.7   | 7.9   | 7.9   | 8.0   |
| Open circuit voltage (Voc)      | V   | 36.4   | 36.6  | 36.7  | 36.8  | 37.0  | 37.1  | 37.2  |
| Short circuit current (Isc)     | A   | 8.3  | 8.3   | 8.3   | 8.3   | 8.4   | 8.4   | 8.4   |
| Output tolerance                | %   | ±3   |       |       |       |       |       |       |
| No. of cells & connections      | pcs | 60 in series   |       |       |       |       |       |       |
| Cell type                       | —   | 6" Mono-crystalline silicon  |       |       |       |       |       |       |
| Module efficiency               | %   | 13.6   | 13.8  | 14.0  | 14.2  | 14.4  | 14.6  | 14.8  |
| Temperature coefficient of Pmpp | %/K | -0.44  | -0.44 | -0.44 | -0.44 | -0.44 | -0.44 | -0.44 |
| Temperature coefficient of Voc  | %/K | -0.34  | -0.34 | -0.34 | -0.34 | -0.34 | -0.34 | -0.34 |
| Temperature coefficient of Isc  | %/K | 0.052  | 0.052 | 0.052 | 0.052 | 0.052 | 0.052 | 0.052 |

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

## Module Diagram



## I-V Curves



## 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 | 46 °C ± 2                          |
| Operating Temperature              | -40 - 85 °C                        |
| Maximum System Voltage             | DC 1,000 V (IEC),<br>DC 600 V (UL) |
| Maximum Reverse Current            | 15 A                               |