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^2 (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″) 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/-0%
- ISO 9001:2000 and ISO 14001:2004 Certified
- Advanced Mechanical Test (5,400 Pa) Passed (IEC) /Mechanical Load Test (40 lbs/ft^2) 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.

HYUNDAI
HEAVY INDUSTRIES CO.,LTD.

Electrical Characteristics

| Multi-crystalline Type |

		HiS-M□□□SG						
		215	218	221	224	227	230	233
Nominal output (Pmpp)	W	215	218	221	224	227	230	233
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/−0						
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.

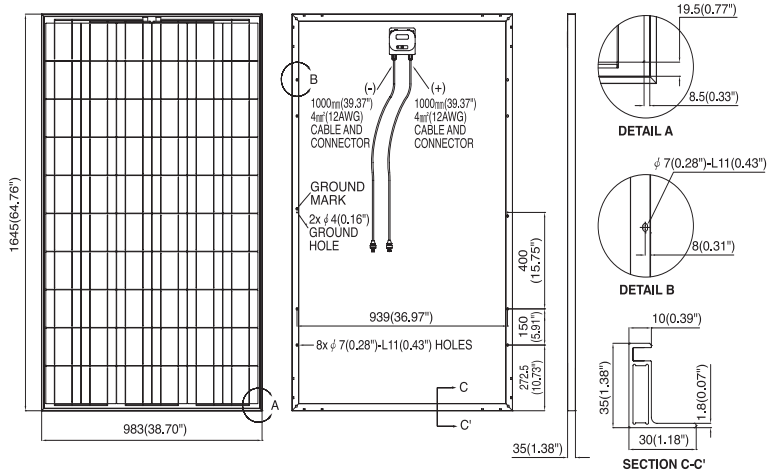
| Mono-crystalline Type |

		HiS-S□□□SG						
		218	221	224	227	230	233	236
Nominal output (Pmpp)	W	218	221	224	227	230	233	236
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/−0						
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

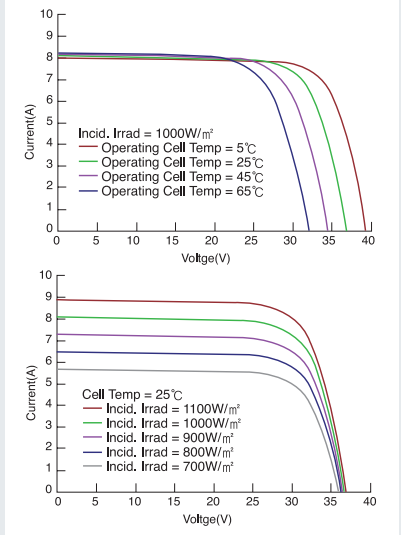
※ All data at STC (Standard Test Conditions). Above data may be changed without prior notice.

Module Diagram

(unit : mm, inch)



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 ℃ ± 2
Operating Temperature	-40 - 85 ℃
Maximum System Voltage	DC 1,000 V (IEC), DC 600 V (UL)
Maximum Reverse Current	15 A

HYUNDAI HEAVY INDUSTRIES CO.,LTD.

Sales & Marketing
140-2, Gye-dong, Jongno-gu, Seoul, Korea
Tel: 82-2-746-7563, 8405, 8406 Fax: 82-2-746-7675

Latest Update: October 2010

Hyundai Solar Module

| SF-Series |

Multi-crystalline Type

HiS-M194SF | HiS-M197SF | HiS-M200SF
HiS-M203SF | HiS-M206SF | HiS-M209SF
HiS-M212SF

Mono-crystalline Type

HiS-S200SF | HiS-S203SF | HiS-S206SF
HiS-S209SF | HiS-S212SF | HiS-S215SF
HiS-S218SF

Mechanical Characteristics

Dimensions	983 mm (38.7″) (W) × 1476 mm (58.11″) (L) × 35 mm (1.38″) (H)
Weight	Approx. 17.0 kg (37.5 lbs)
Solar cells	54 cells in series (6×9 matrix)
Output cables	4 mm² (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″) 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/-0%
- ISO 9001:2000 and ISO 14001:2004 Certified
- Advanced Mechanical Test (5,400 Pa) Passed (IEC) /Mechanical Load Test (40 lbs/ft²) 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

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HYUNDAI
HEAVY INDUSTRIES CO.,LTD.

Electrical Characteristics

Multi-crystalline Type

		HiS-M□□□SF						
		194	197	200	203	206	209	212
Nominal output (Pmpp)	W	194	197	200	203	206	209	212
Voltage at Pmax (Vmpp)	V	26.2	26.4	26.4	26.6	26.8	26.9	27.0
Current at Pmax (Impp)	A	7.5	7.5	7.6	7.7	7.7	7.8	7.9
Open circuit voltage (Voc)	V	32.9	33.0	33.1	33.3	33.4	33.5	33.6
Short circuit current (Isc)	A	8.1	8.1	8.2	8.2	8.2	8.3	8.3
Output tolerance	%	+3/−0						
No. of cells & connections	pcs	54 in series						
Cell type	–	6" Multi-crystalline silicon						
Module efficiency	%	13.4	13.6	13.8	14.0	14.2	14.4	14.6
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.

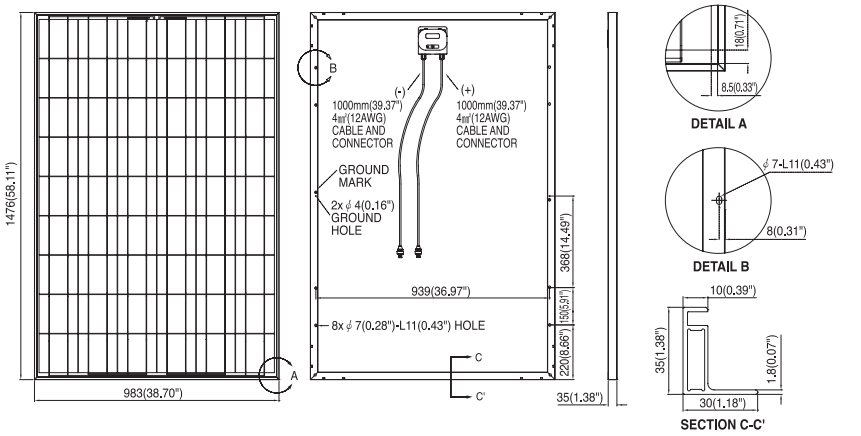
Mono-crystalline Type

		HiS-S□□□SF						
		200	203	206	209	212	215	218
Nominal output (Pmpp)	W	200	203	206	209	212	215	218
Voltage at Pmax (Vmpp)	V	26.5	26.6	26.8	26.9	27.0	27.1	27.2
Current at Pmax (Impp)	A	7.6	7.7	7.7	7.8	7.9	8.0	8.1
Open circuit voltage (Voc)	V	33.1	33.2	33.4	33.5	33.6	33.7	33.8
Short circuit current (Isc)	A	8.2	8.2	8.2	8.2	8.3	8.3	8.4
Output tolerance	%	+3/−0						
No. of cells & connections	pcs	54 in series						
Cell type	–	6" Mono-crystalline silicon						
Module efficiency	%	13.8	14.0	14.2	14.4	14.6	14.8	15.0
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

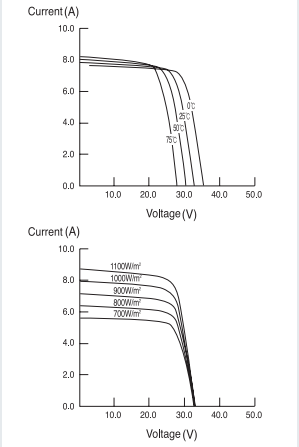
※ All data at STC (Standard Test Conditions). Above data may be changed without prior notice.

Module Diagram

(unit : mm, inch)



I-V Curves



Installation Safety Guide

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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 ℃ ± 2
Operating Temperature	-40 - 85 ℃
Maximum System Voltage	DC 1,000 V (IEC), DC 600 V (UL)
Maximum Reverse Current	15 A

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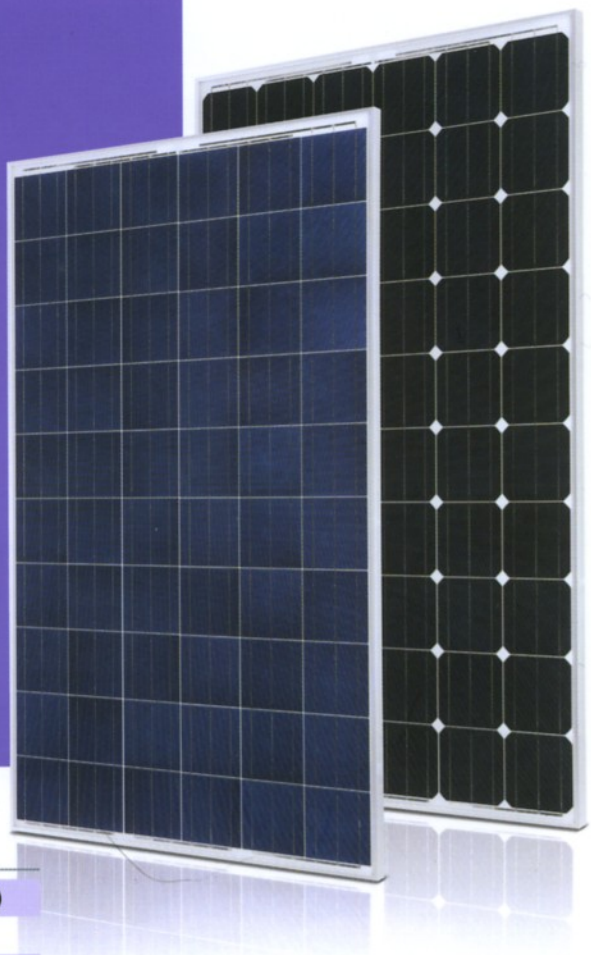
Hyundai Solar Module

| MG-Series |



- **Multi-crystalline Type**
  HiS-M223MG | HiS-M225MG | HiS-M228MG | HiS-M230MG
  HiS-M233MG | HiS-M235MG | HiS-M238MG
- **Mono-crystalline Type**
  HiS-S235MG | HiS-S238MG | HiS-S240MG | HiS-S243MG
  HiS-S245MG | HiS-S248MG | HiS-S250MG

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 mm² (12AWG) cables with polarized weatherproof connectors, IEC certified, Length 1.0 m (39.4″)
Junction box	IP65, weatherproof, IEC certified
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″) 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
- Output power tolerance +3/-0%
- ISO 9001:2000 and ISO 14001:2004 Certified
- Advanced Mechanical Test (5,400 Pa) Passed (IEC)

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 certified and weatherproof connectors
- Integrated bypass diodes

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

※ **Important Notice on Warranty**
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HYUNDAI
HEAVY INDUSTRIES CO.,LTD.

Electrical Characteristics

| Multi-crystalline Type |

		HiS-M□□□MG						
		223	225	228	230	233	235	238
Nominal output (Pmpp)	W	223	225	228	230	233	235	238
Voltage at Pmax (Vmpp)	V	30.0	30.0	30.0	30.1	30.3	30.3	30.4
Current at Pmax (Impp)	A	7.4	7.5	7.6	7.7	7.7	7.8	7.8
Open circuit voltage (Voc)	V	36.8	37.1	37.1	37.1	37.3	37.4	37.4
Short circuit current (Isc)	A	8.0	8.2	8.2	8.2	8.2	8.3	8.3
Output tolerance	%	+3/-0						
No. of cells & connections	pcs	60 in series						
Cell type	–	6" Multi-crystalline silicon						
Module efficiency	%	13.8	13.9	14.1	14.2	14.4	14.5	14.7
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□□□MG						
		235	238	240	243	245	248	250
Nominal output (Pmpp)	W	235	238	240	243	245	248	250
Voltage at Pmax (Vmpp)	V	29.8	29.8	30.1	30.1	30.3	30.3	30.5
Current at Pmax (Impp)	A	7.9	8.0	8.0	8.1	8.1	8.2	8.2
Open circuit voltage (Voc)	V	37.0	37.0	37.3	37.3	37.4	37.5	37.5
Short circuit current (Isc)	A	8.4	8.5	8.5	8.6	8.6	8.7	8.7
Output tolerance	%	+3/-0						
No. of cells & connections	pcs	60 in series						
Cell type	–	6" Mono-crystalline silicon						
Module efficiency	%	14.5	14.7	14.8	15.0	15.2	15.3	15.5
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

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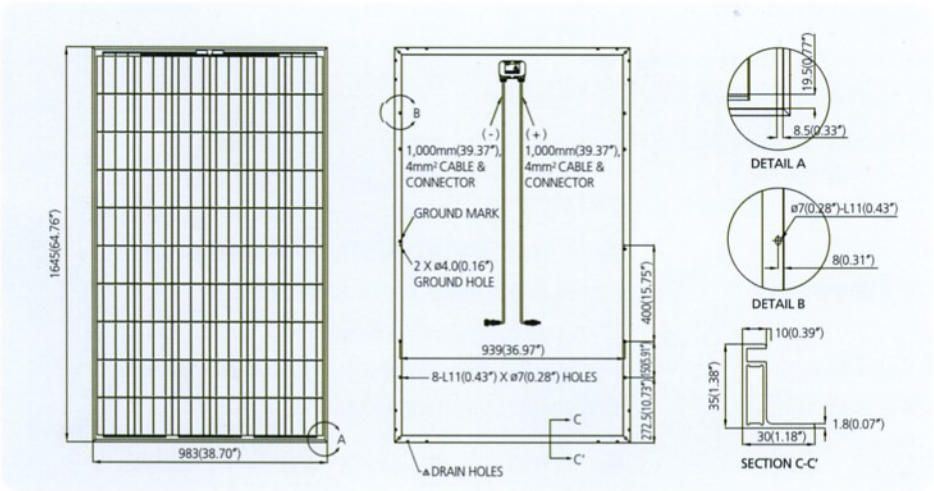
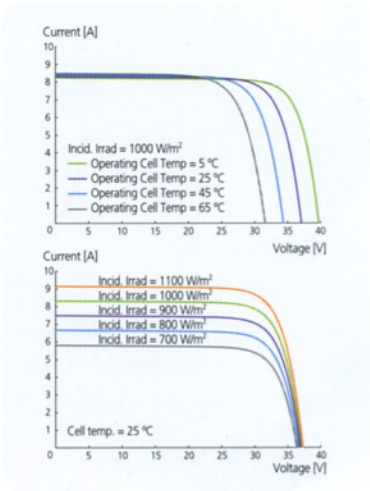
| Module Diagram |

(unit : mm, inch)



| I-V Curves |



| Installation Safety Guide |

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Do not damage or scratch the rear surface of the module.
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Nominal Operating Cell Temperature	46 ℃ ± 2
Operating Temperature	-40 - 85 ℃
Maximum System Voltage	DC 1,000 V (IEC)
Maximum Reverse Current	15 A

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Latest Update: November 2010

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Hyundai Solar Module

| MF-Series |

- **Multi-crystalline Type**
  HiS-M200MF | HiS-M203MF | HiS-M205MF | HiS-M208MF
  HiS-M210MF | HiS-M213MF | HiS-M215MF
- **Mono-crystalline Type**
  HiS-S213MF | HiS-S215MF | HiS-S218MF | HiS-S220MF
  HiS-S223MF | HiS-S225MF | HiS-S228MF

Mechanical Characteristics

Dimensions	983 mm (38.7″) (W) × 1476 mm (58.11″) (L) × 35 mm (1.38″) (H)
Weight	Approx. 17.0 kg (37.5 lbs)
Solar cells	54 cells in series (6×9 matrix)
Output cables	4 mm² (12AWG) cables with polarized weatherproof connectors, IEC certified, Length 1.0 m (39.4″)
Junction box	IP65, weatherproof, IEC certified
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″) 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
- Output power tolerance +3/-0%
- ISO 9001:2000 and ISO 14001:2004 Certified
- Advanced Mechanical Test (5,400 Pa) Passed (IEC)

Fast and Inexpensive Mounting

- Delivered ready for connection
- Pre-confectioned cables
- IEC certified and weatherproof connectors
- Integrated bypass diodes

Limited Warranty

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

www.tuv.com · Qualified, IEC 61215 · Safety tested, IEC 61730 · Periodic inspection

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HYUNDAI
HEAVY INDUSTRIES CO.,LTD.

Electrical Characteristics

| Multi-crystalline Type |

		HiS-M□□□MF						
		200	203	205	208	210	213	215
Nominal output (Pmpp)	W	200	203	205	208	210	213	215
Voltage at Pmax (Vmpp)	V	26.9	27.1	27.1	27.1	27.3	27.4	27.6
Current at Pmax (Impp)	A	7.5	7.5	7.6	7.7	7.7	7.8	7.8
Open circuit voltage (Voc)	V	32.8	33.0	33.1	33.2	33.3	33.5	33.6
Short circuit current (Isc)	A	8.0	8.1	8.1	8.2	8.2	8.3	8.3
Output tolerance	%	+3/-0						
No. of cells & connections	pcs	54 in series						
Cell type	–	6" Multi-crystalline silicon						
Module efficiency	%	13.8	14.0	14.1	14.3	14.5	14.7	14.8
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□□□MF						
		213	215	218	220	223	225	228
Nominal output (Pmpp)	W	213	215	218	220	223	225	228
Voltage at Pmax (Vmpp)	V	27.0	27.3	27.6	27.6	27.6	27.8	27.9
Current at Pmax (Impp)	A	7.9	7.9	7.9	8.0	8.1	8.1	8.2
Open circuit voltage (Voc)	V	33.4	33.5	33.6	33.6	33.7	33.7	33.8
Short circuit current (Isc)	A	8.4	8.4	8.4	8.5	8.5	8.6	8.7
Output tolerance	%	+3/-0						
No. of cells & connections	pcs	54 in series						
Cell type	–	6" Mono-crystalline silicon						
Module efficiency	%	14.7	14.8	15.0	15.2	15.4	15.5	15.7
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

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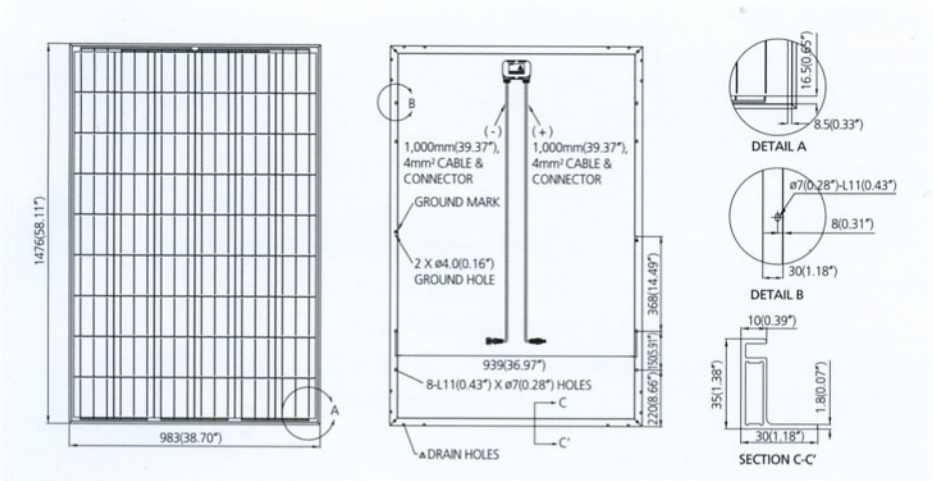
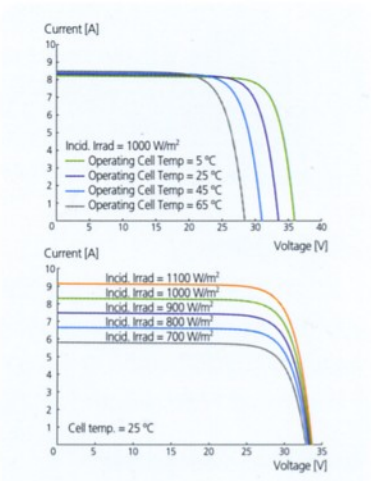
| Module Diagram |

(unit : mm, inch)



| I-V Curves |



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Nominal Operating Cell Temperature	46 ℃ ± 2
Operating Temperature	-40 - 85 ℃
Maximum System Voltage	DC 1,000 V (IEC)
Maximum Reverse Current	15 A

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Latest Update: November 2010

Hyundai Solar Inverters

▶Feature

- Compact design, lightweight, and easy to install
- IP54 enclosure for outdoor use (3kW-class only)
- Maximum efficiency with high performance MPPT control
- Increased flexibility due to a wide range of MPPT tracking
- Remote and local data monitoring
- LCD display of operating status
- Over-/Under-voltage and frequency protection
- Anti-islanding protection

Technical Specifications & Product Overview

Model	HPC-003SL	HPC-012HT	HPC-050HT	HPC-100HT	HPC-250HT
System Overview					
Phase	1-Phase	3-Phase	3-Phase	3-Phase	3-Phase
PV Input Control Method	MPPT	MPPT	MPPT	MPPT	MPPT
Output Operating Method	Grid-Tied Inverter	Grid-Tied Inverter	Grid-Tied Inverter	Grid-Tied Inverter	Grid-Tied Inverter
Inverter Control Method	PWM	PWM	PWM	PWM	PWM
Design Concept	Transformerless	Low-Frequency Transformer			
Input Data					
Max. Input Voltage	600Vdc	600Vdc	650Vdc	650Vdc	880Vdc
Nominal Voltage	430Vdc	430Vdc	450Vdc	450Vdc	650Vdc
MPPT Voltage Range	250-600Vdc	250-600Vdc	300-600Vdc	300-600Vdc	450-820Vdc
Output Data					
Nominal AC Power	3kW	12.5kW	50kW	100kW	250kW
Nominal AC Voltage	220V, ±10%	380V, +10%/−12%			
Nominal AC Frequency	60Hz, ±0.5Hz	50/60Hz, ±0.5Hz			
THD of AC Current	< 5% Total (< 3% Individual) at rated power				
System Specifications					
Max. Efficiency	> 94%	> 92%	> 95%	> 95%	> 96%
Power Factor	> 0.98	> 0.99	> 0.99	> 0.99	> 0.99
Protection Degree	IP54	IP20	IP20	IP20	IP20
Ambient Temperature	−10℃-40℃	−10℃-40℃	−10℃-40℃	−10℃-40℃	−20℃-40℃
Dimensions					
(W x D x H) mm	321×189×432	575×445×1,113	800×700×1,945	1,000×800×2,145	2,200×850×2,320
Weight	17.3kg	170kg	790kg	1,230kg	2,300kg
Protective Functions	DC Over-/Under-Voltage, AC Line Over-/Under-Voltage, AC Line Frequency Failure, AC Line Failure, Anti-Islanding Protection, Overheating				

※ Specifications subject to change without prior notice.