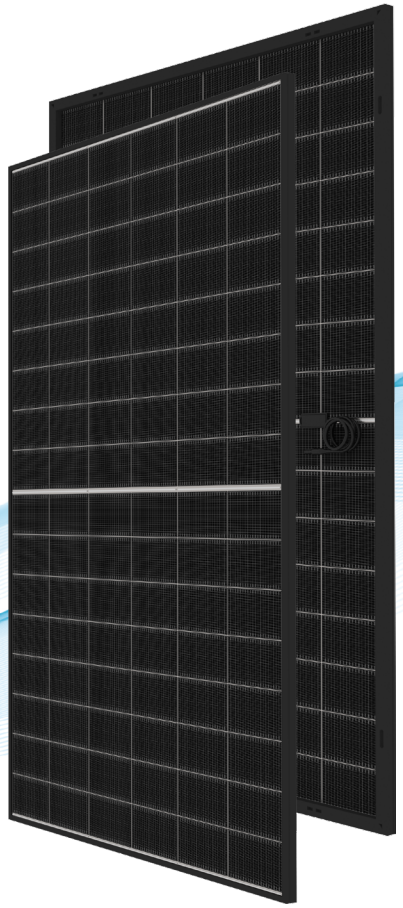
HD HYUNDAI SOLAR MODULE

HeteroMax™ (CE-BF(ZB) Series)

Premium N-Type HJT module

HiT-H440CE-BF(ZB) | HiT-H445CE-BF(ZB) | HiT-H450CE-BF(ZB)
HiT-H455CE-BF(ZB) | HiT-H460CE-BF(ZB) | HiT-H465CE-BF(ZB)

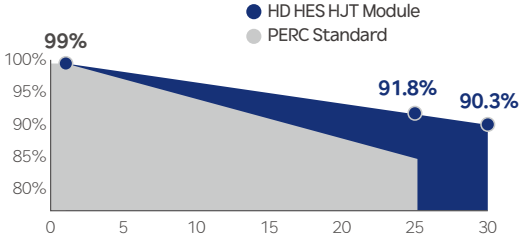


- 23.3% — 23.3% High Efficiency
- HJT — High-End Heterojunction Technology
- Enhanced Power Generation with low Temp. Coefficient
- More Power Generation In Low Light
- For Residential

HD Hyundai's Warranty Provisions

30 YEARS
- 30-Year Product Warranty
  - Materials and workmanship

30 YEARS
- 30-Year Performance Warranty
  - First year degradation: 1%
  - Linear warranty after initial year: with 0.3%p annual degradation, 90.3% is guaranteed up to 30years



*Refer to HD HES standard warranty for details.

Certification

TÜV SÜD CE IEC

- ISO 9001:2015:ISO Quality Management System
- ISO 14001:2015:ISO Environment Management System
- ISO 45001:Occupational Health and Safety
- IEC 61215, IEC 61730

Electrical Characteristics (STC*)

HiT-HxxxCE-BF(ZB)							
Item	Unit	440	445	450	455	460	465
Nominal Output (Pmax)	W	440	445	450	455	460	465
Open Circuit Voltage (Voc)	V	36.52	36.62	36.72	36.82	36.92	37.02
Short Circuit Current (Isc)	A	15.31	15.42	15.53	15.64	15.75	15.86
Voltage at Pmax (Vmpp)	V	30.61	30.72	30.83	30.94	31.05	31.16
Current at Pmax (Impp)	A	14.38	14.49	14.60	14.71	14.82	14.93
Module Efficiency	%	22.0	22.3	22.5	22.8	23.0	23.3
Power Selection	W	0 ~ +5					
Temperature Coefficient of Pmax	%/℃	-0.24					
Temperature Coefficient of Voc	%/℃	-0.22					
Temperature Coefficient of Isc	%/℃	0.04					
Bifaciality (Pmax / Voc / Isc)	%	90 ± 5 / 95 ~ 100 / 90 ± 5					

*STC : Irradiance 1,000 W/m², cell temperature 25℃, AM=1.5 / Tolerance of Pmax 0~+3%; Voc ±3%; Isc ±5%

BNPI** (Bifacial Nameplate Irradiance)

Item	Unit	440	445	450	455	460	465
Nominal Output (Pmax)	W	493	499	504	510	515	521
Open Circuit Voltage (Voc)	V	36.65	36.75	36.85	36.95	37.05	37.15
Short Circuit Current (Isc)	A	17.17	17.29	17.42	17.54	17.66	17.79
Voltage at Pmax (Vmpp)	V	30.72	30.83	30.94	31.05	31.16	31.27
Current at Pmax (Impp)	A	16.07	16.19	16.31	16.44	16.56	16.68

**The electrical properties of BNPI are measured under the irradiance corresponding to 1,000 W/m² on the module front and 135 W/m² on the module rear.

Additional Power Gain from rear side

Pmax Gain	Pmax[W]	Vmpp[V]	Impp[A]	Voc[V]	Isc[A]
5%	472.5	30.88	15.30	36.79	16.31
10%	517.5	30.99	16.70	36.91	17.86
15%	562.5	31.08	18.10	37.02	19.41

*Electrical characteristics with different rear power gain (reference to 450 W)

Mechanical Characteristics

Dimensions	1,762 mm (L) x 1,134 mm (W) x 30 mm (H)
Weight	21.6 kg
Solar Cells	N-Type HJT, 96 (6x16) monocrystalline half-cut bifacial cells
Output Cables	Cable : 4mm² / 12AWG / (+)1,250 mm, (-)1,250 mm / Customized length Connector : PV-H4(Ningbo huayu Photovoltaic Technology Co.,Ltd.) PV-KST4-EVO 2/xy_UR, PV-KBT4-EVO 2/xy_UR(Stä ubli Electrical connectors AG)
Junction Box	3-part, 3 bypass diodes, IP68 rated
Construction	Front : 1.6mm Ultra-white AR-coating rolled toughened glass Rear : 1.6mm Ultra-white AR-coating rolled toughened glass
Frame	Anodized aluminum alloy

Installation Safety Guide

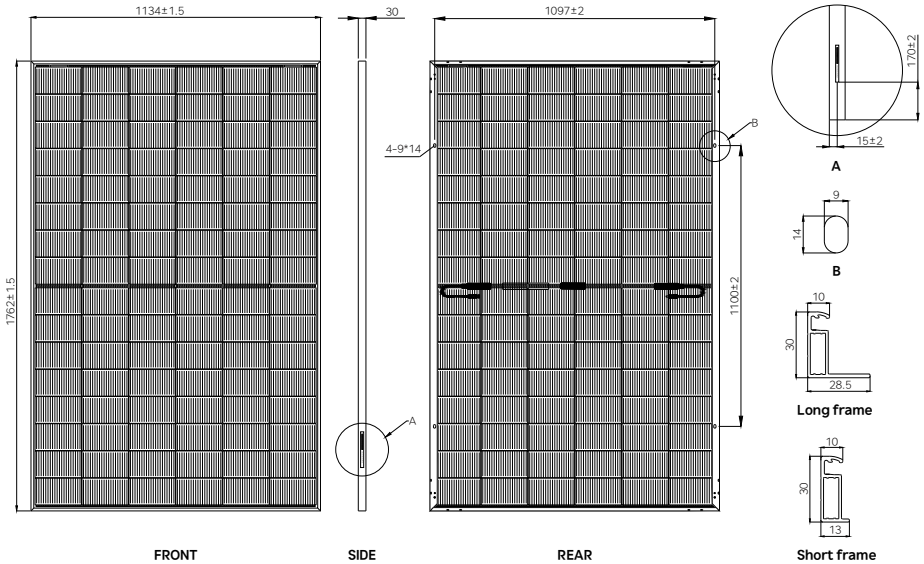
- Only qualified personnel should install or perform maintenance.
- Be aware of dangerous high DC voltage.
- Do not damage or scratch the rear surface of the module.
- Do not handle or install modules when they are wet.

Nominal Module Operation Temperature	44℃ ± 2℃
Operating Temperature	-40℃~+70℃
Maximum System Voltage	DC 1,500 V
Max Fuse Rating / Overcurrent Protection	30A
Maximum Test Load	Front 5,400Pa Rear 2,400Pa
Fire Class Rating	Fire class C

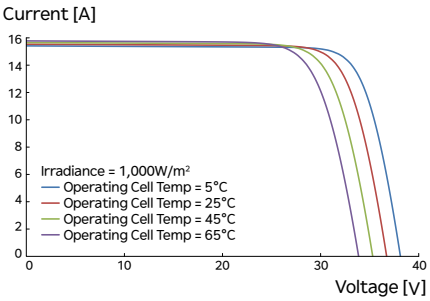
Shipping Configurations

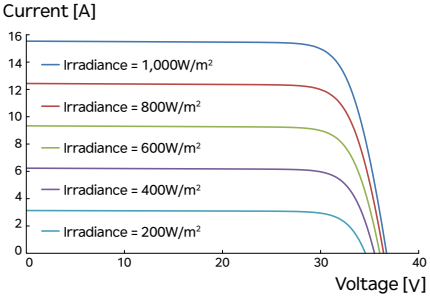
Container Size (HC)	40'	Modules Per Pallet (pcs)	36
Pallets Per Container	26	Modules Per Container (pcs)	936

Module Diagram (unit : mm)



I-V Curves (HiT-H450CE-BF(ZB))





Manufactured in China

Sales & Marketing
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HD HYUNDAI ENERGY SOLUTIONS