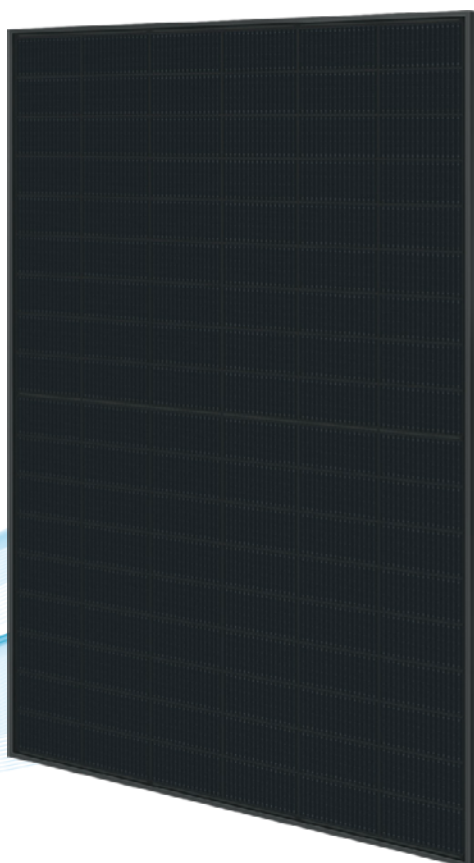


HD HYUNDAI SOLAR MODULE

NF(BK) Series

Premium N-Type TOPCon Module

HiS-T435NF(BK) | HiS-T440NF(BK) | HiS-T445NF(BK)



22.79%
High Efficiency



High-End
TOPCon
Technology



Higher
Bifaciality



Long-Term
Reliability



Compatible
with Carport
Applications



For Residential
(Full Black Design)

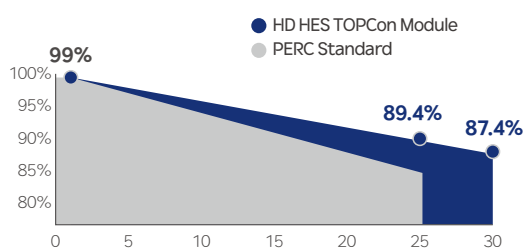
HD Hyundai's Warranty Provisions

25
YEARS

- 25-Year Product Warranty
- Materials and workmanship

30
YEARS

- 30-Year Performance Warranty
- First year degradation: 1%
- Linear warranty after initial year: with 0.4%p annual degradation, 87.4% is guaranteed up to 30years



*Refer to HD HES standard warranty for details.

Certification



- UL 61215 / UL 61730 / IEC 61215 / IEC 61730 Certified
- ISO 9001 : Quality management systems
- ISO 14001 : Environmental management systems
- ISO 45001 : Occupational health and safety management systems

Electrical Characteristics

HiS-TxxxNF(BK)		HiS-T435NF(BK)		HiS-T440NF(BK)		HiS-T445NF(BK)	
Item	Unit	BNPI		BNPI		BNPI	
Nominal output (Pmax)	W	435	482	440	487	445	492
Open circuit voltage (Voc)	V	39.69	39.84	39.90	40.05	40.10	40.25
Short circuit current (Isc)	A	13.91	15.41	14.06	15.58	14.14	15.67
Voltage at Pmax (Vmpp)	V	32.74	32.87	32.82	32.95	33.05	33.13
Current at Pmax (Impp)	A	13.29	14.67	13.41	14.79	13.47	14.87
Module efficiency	%	22.28		22.53		22.79	
Power Class Sorting	W	0 ~ +5					
Temperature coefficient of Pmax	%/°C	-0.290					
Temperature coefficient of Voc	%/°C	-0.250					
Temperature coefficient of Isc	%/°C	0.043					
Bifaciality	%	80±5					

*STC : Irradiance 1,000 W/m², cell temperature 25°C, AM=1.5 / Test uncertainty for Pmax ±3%; Isc±5%; Voc±5%
 **The electrical properties of BNPI are measured under the irradiance corresponding to 1000 W/m² on the module front and 135 W/m² on the module rear.

Additional Power Gain from rear side					
Pmpp gain	Pmpp[W]	Vmpp[V]	Impp[A]	Voc[V]	Isc[A]
5%	462	32.82	14.08	39.90	14.77
15%	506	32.82	15.42	39.90	16.17
25%	550	32.82	16.76	39.90	17.58

*Electrical characteristics with different rear power gain (reference to 440W)

Mechanical Characteristics

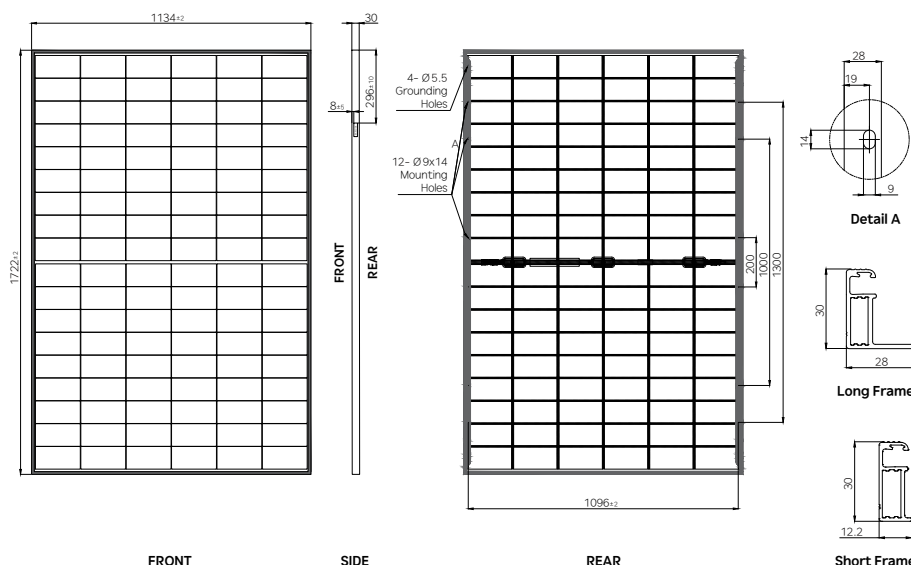
Dimensions	1,722mm (L) x 1,134mm (W) x 30mm (H) (67.8in x 44.6in x 1.2in)
Weight	24.3 kg (53.57 lbs)
Solar Cells	N-Type TOPCon, 108 (6x18) monocrystalline 16BB half-cut bifacial cells
Output Cables	Cable : (+) 1,200mm(47.2in), (-) 1,200mm(47.2in) / Customized length available Connector : Stäubli MC4 genuine Connector / IP68
Junction Box	3-part, 3 bypass diodes, IP68 rated
Construction	Front : 2.0mm(0.08in) semi-tempered solar glass with high transmittance and anti-reflective coating Rear : 2.0mm(0.08in) semi-tempered solar glass
Frame	Anodized aluminum alloy

Shipping Configurations

Truck Type	53' Dry Van	Modules Per Pallet (pcs)	36
Pallets Per Truck	22	Modules Per Truck (pcs)	792

* Packing Direction: Vertical

Module Diagram (unit : mm)



Installation Safety Guide

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

Nominal Module Operation Temperature	41°C ± 2°C
Operating Temperature	-40°C~+85°C
Maximum System Voltage	DC 1,500 V
Maximum Reverse Current	30A
Maximum Test Load	Front 5,400Pa Rear 4,500Pa
Fire Performance	Type 29

I-V Curves (HiS-T440NF(BK))

