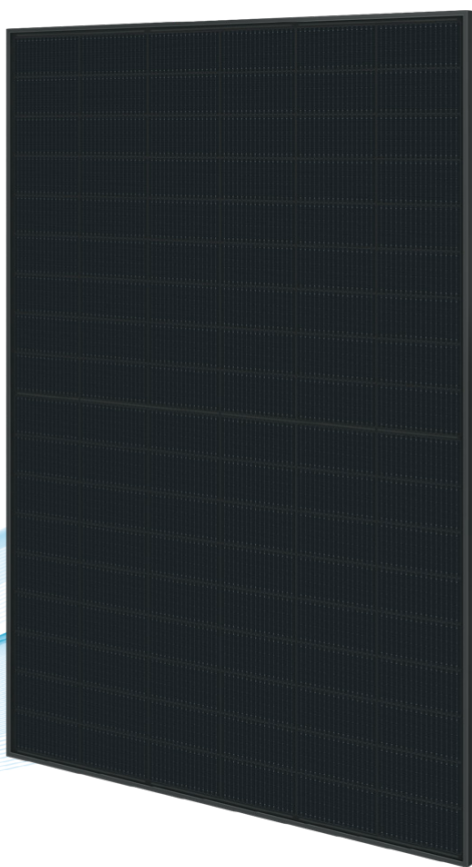


# HD HYUNDAI SOLAR MODULE

## NF(BK) Series

### Premium N-Type TOPCon Module

HiS-T430NF(BK) | HiS-T435NF(BK) | HiS-T440NF(BK)



22.53%  
High Efficiency



High-End  
TOPCon  
Technology



Higher  
Bifaciality



Long-Term  
Reliability



For Residential  
(Full Black Design)

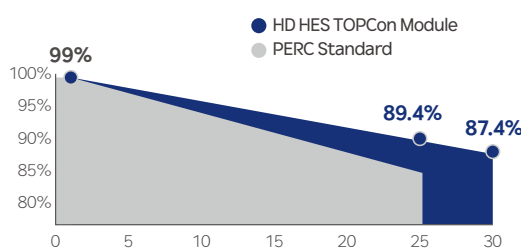
#### HD Hyundai's Warranty Provisions

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-T430NF(BK) |       | HiS-T435NF(BK) |       | HiS-T440NF(BK) |       |
|---------------------------------|------|----------------|-------|----------------|-------|----------------|-------|
| Item                            | Unit | BNPI           |       | BNPI           |       | BNPI           |       |
| Nominal output (Pmax)           | W    | 430            | 477   | 435            | 482   | 440            | 487   |
| Open circuit voltage (Voc)      | V    | 39.49          | 39.64 | 39.69          | 39.84 | 39.90          | 40.05 |
| Short circuit current (Isc)     | A    | 13.83          | 15.32 | 13.91          | 15.41 | 14.06          | 15.58 |
| Voltage at Pmax (Vmpp)          | V    | 32.51          | 32.70 | 32.74          | 32.87 | 32.82          | 32.95 |
| Current at Pmax (Impp)          | A    | 13.23          | 14.59 | 13.29          | 14.67 | 13.41          | 14.79 |
| Module efficiency               | %    | 22.02          |       | 22.28          |       | 22.53          |       |
| Power Class Sorting             | W    | 0 ~ +5         |       |                |       |                |       |
| Temperature coefficient of Pmax | %/K  | -0.290         |       |                |       |                |       |
| Temperature coefficient of Voc  | %/K  | -0.250         |       |                |       |                |       |
| Temperature coefficient of Isc  | %/K  | 0.043          |       |                |       |                |       |
| Bifaciality                     | %    | 80±5           |       |                |       |                |       |

\*STC : Irradiance 1,000 W/m<sup>2</sup>, cell temperature 25°C, AM=1.5 / Test uncertainty for Pmax ±3%; Isc; Voc ±5%  
 \*\*The electrical properties of BNPI are measured under the irradiance corresponding to 1000 W/m<sup>2</sup> on the module front and 135 W/m<sup>2</sup> 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)

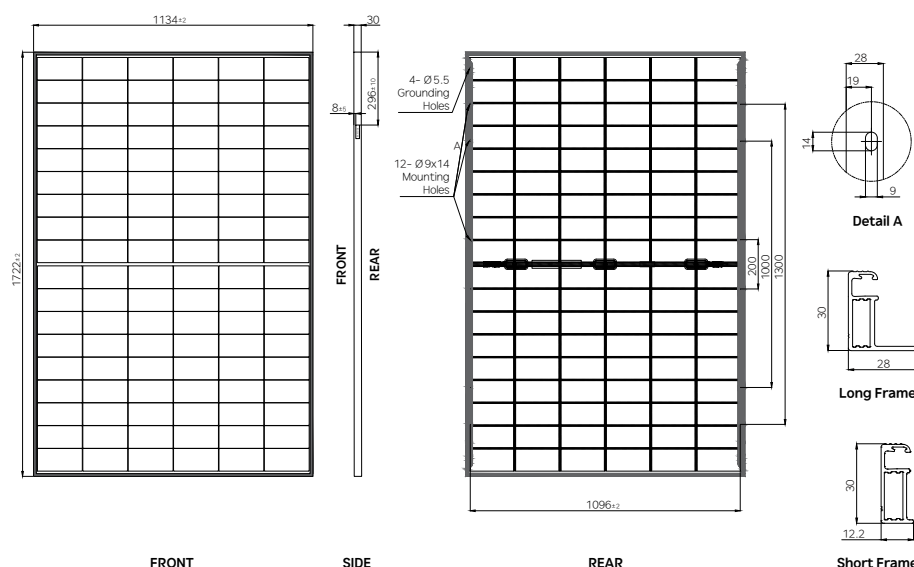
## Mechanical Characteristics

|               |                                                                                                                                                       |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dimensions    | 1,722mm (L) x 1,134mm (W) x 30mm (H)<br>(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<br>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<br>Rear : 2.0mm(0.08in) semi-tempered solar glass |
| Frame         | Anodized aluminum alloy                                                                                                                               |

## Shipping Configurations

|                       |     |                             |     |
|-----------------------|-----|-----------------------------|-----|
| Container Size (HC)   | 40' | Modules Per Pallet (pcs)    | 36  |
| Pallets Per Container | 22  | Modules Per Container (pcs) | 792 |

## 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<br>Rear 4,500Pa |
| Fire Performance                     | Type 29                       |

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

