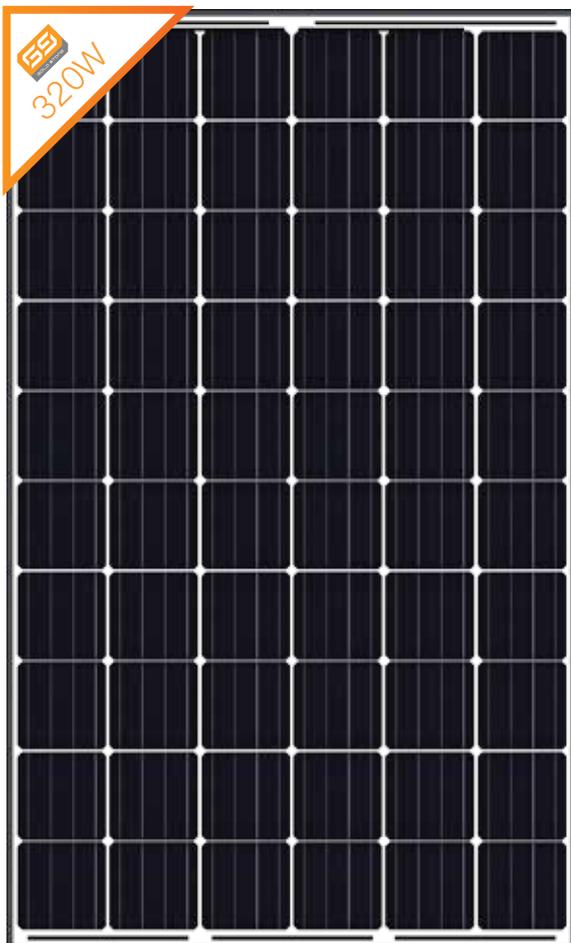




HDT solar modules use high efficiency mono-crystalline hetero-junction double-sided solar cells technology (HDT). HDT solar cells can generate power from both sides. It uses N-type mono-crystalline silicon as substrate. A thin layer of undoped (intrinsic) hydrogenated amorphous silicon is deposited on both sides of the silicon substrate followed by the p-type and n-type thin film silicon. This process improves the performance of PN junction, enabling HDT solar cells to achieve one of the highest conversion efficiency in the world. HDT solar cells have low manufacturing process temperature, high conversion efficiency and low temperature coefficient. Today HDT solar module provides the best value among all mass produced high efficiency solar modules in the market. It is the best choice for optimizing all type of solar projects for performance, cost and reliability.

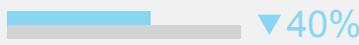


HDT Solar Module Characteristics:

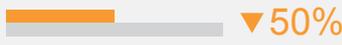
1 High Efficiency :
 HDT solar module's conversion efficiency is **10-20%** higher than those of traditional crystalline solar module, therefore, it greatly reduces the required cost of land, mounting frames, cable, transportation, installation and maintenance for the same installation capacity.

Conversion Efficiency  ▲ 10%-20%

2 Excellent Temperature Performance :
 HDT solar module's power-temperature coefficient is **40%** lower than traditional crystalline silicon solar modules (-0.45%), therefore, it can have a much higher power output than traditional crystalline silicon solar module in high temperature environment.

  ▼ 40%

3 High Stability :
 Compared to traditional crystalline silicon solar modules, HDT solar module's LID (Light induced degradation) is **50%** lower. This leads to higher output over 25 years.

  ▼ 50%

4 Double-sided Power Generation :
 HDT solar cells have symmetrical structure and are suitable for double glass encapsulation, thus generating power from both sides of the cell, this increases the power output by a least **10%** over conventional single glass crystalline modules.

 ▲ 10%

5 High ROI :
 Compared to solar projects built with traditional crystalline silicon solar module, HDT solar module has a lower levelized cost of electricity (LCOE), therefore, producing higher overall return on investment.

 ▲

Electrical Data (at STC)

Module	HDT-310	HDT-315	HDT-320
Maximum Power (Pmax) [W]	310	315	320
Open Circuit Voltage (Voc)[V]	44	44.1	44.2
Max Power Voltage (Vmp)[V]	35.8	36.1	36.4
Short Circuit Current (Isc)[A]	9.2	9.24	9.28
Max Power Current (Imp)[A]	8.66	8.73	8.8
Module Efficiency (%)	19.05	19.36	19.67
Output Power Tolerance [W]	0/+5 W		
Temperature Coefficient Isc α [%/°C]	0.025		
Temperature Coefficient Voc β [%/°C]	-0.26		
Temperature Coefficient Pmax γ [%/°C]	-0.3		
Test Conditions [STC]	Air Mass 1.5, Irradiance 1000W/m ² , Cell temperature 25 °C		

Electrical Data (at NOCT)

Module	HDT-310	HDT-315	HDT-320
Nominal Operating Cell Temperature (NOCT)	45°C ± 2°C		
Maximum Power (Pmax)[W]	222	225	229
Open Circuit Voltage (Voc)[V]	41.85	41.95	42.04
Max Power Voltage (Vmp)[V]	32.38	32.48	32.58
Short Circuit Current (Isc)[A]	7.365	7.413	7.416
Max Power Current (Imp)[A]	6.87	6.93	7.03
Test Conditions [NOCT]	Air Mass 1.5, Irradiance 800W/m ² , Air temperature 20°C, Wind speed 1m/s		

Operating Conditions

Maximum System Voltage	1000VDC(IEC)
Operating Temperature	-40°C ~ 85°C
Maximum Fuse Rating	15A
Front Static Load Test (Snow)	5400Pa
Rear Static Load Test (Wind)	2400Pa
Hail Stone Impact Test	Distance 1000mm, Hailstone Diameter 25mm, Speed 23m/s
Nominal Operating Cell Temperature	45°C ± 2°C
Applications Class	Class A

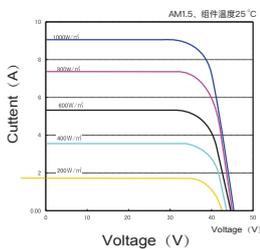
Mechanical Data

Solar Cells	6×10 HDT Cells 156.75mm×156.75mm 4 Busbar
Dimensions	1640mm×992mm×40mm
Weight	19kg
Front Glass	ARC 3.2mm High Transmision Tempered
Encapsulation	EVA/0.5mm
Frame	Anodized Aluminum Alloy (Silver, Grey, Black)
Juction Box	IP67 rated with 3 bypass diodes
Output Cables	4mm ² 1000mm/ MC4 Connectors
Electrical Protection Class	Class II

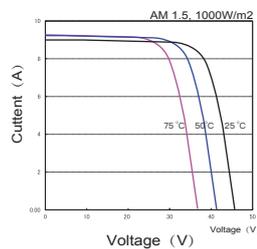
Packaging Data

Modules per Pallet	26
Packaging Dimentsions	1670mm×1080mm×1125mm
Weight per Pallet	504kg
Pallets per 40' HQ Container	28
Pallets per Shipping Flat Car(17.5m)	40

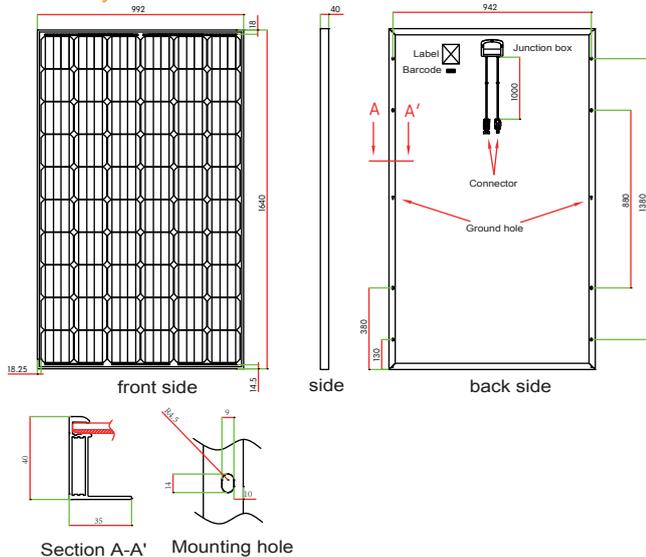
Module I-V curves at different irradiance



Module I-V curves at different temperature



Module Physical Dimensions



Certifications

Certification	TUV NORD/IEC61215,IEC61730
Fire Safety Class	Class C

Warranty

Product	10 years product warranty
Power Output	10 years[90% of Pmin], 25 years[80% of Pmin]

Note :

- Due to ongoing research and development, innovation and product upgrading, the content in the product specification can be changed without prior notice. These data are not for a single HDT solar module, they are used to differentiate various types of solar modules.
- GOLDSTONE Company reserves the right to interpret changes in technologies and testing methods.



Warning : Please read installation manuals carefully before handling, installing and using HDT solar module.