HUASUN

PIONEER OF
HJT SOLAR TECHNOLOGY

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BUILD A ZERO CARBON WORLD

Intelligently produce clean energy
Together share the warm sunshine

CONTENT

cutline:

★ Global headquarters Manufacturing base/office center Project location

Huasun Global Network

Huasun Himalaya high-efficient HJT products have been delivered to more than 30 countries and regions around the world.

Tier 1

BloombergNEF Tier 1 Manufacturer

Huasun is the only company in the list that focuses on HJT technology and is also the only company being ranked fully by HJT projects.Besides,Huasun is the youngst company in Tier 1 list. At present,Huasun has worked with a group of well-know enterprises in the world.

FRONT RUNNER OF NEW PHOTOVOLTAIC ERA

Pioneer of HJT mass production

Anhui Huasun Energy Co , Ltd (hereinafter referred to as "Huasun"), founded in July 2020, is a technological innovation enterprise specialized in the R&D and large-scale manufacturing of ultra-high efficiency N-type silicon-based heterojunction(HJT) wafer,cell and modules.

Under the mission of "bringing superior solar energy into life, making home more livable and beautiful", Huasun adheres to the operation philosophy of "Integrity, Open-mind, Ecology, Mutual benefits", focusing on the research and development of high-efficient HJT technology, manufacture of HJT products and provision of clean energy solutions. Committed to becoming the world's leading technological company in intelligent manufacturing of high-efficient solar energy, Huasun strives to provide customers with the most effective clean energy solutions of greater performance and better returns.

Huasun is the HJT product maker with the best CTM, highest productivity and excellent cost control. As the industrial pioneer of HJT technology in China, Huasun has delivered morn than 4GW HJT products to over 40 countries around the globe.

Relying on its 20GW annual capacity , Huasun is now ranked as the largest HJT manufacturer in the world. The company plans to achieve 40GW total capacity by the end of 2025 , and promote HJT' s industrilization and application via integrating industrial chain and upgrading technology which is faciliated by large scale production.

With active response to the goal of "emission peak and carbon neutrality", Huasun keeps exploring effective improvements on the efficiency of solar cells and modules as well as the way to realize low-cost mass production of HJT products. In the future, Huasun will deliver more solar products with higher performance and better quality, so as to contribute to build a zero-carbon world!

20 GW
Annual capacity of HJT product

40 GW+
HJT production capacity planning by 2025

Core product
High-efficient HJT wafer/cell/module

GUIDE ENERGY SOLUTION BY HJT

It is inevitable for solar industry sustainability to realize the efficiency improvement and technological innovation, promote energy security and reduce environmental pollution as soon as possible. As one of the first patch of companies that achieve large-scale production of HJT products, Huasun actively responds to climate change solutions, gathers the most experienced talents in HJT field, and forms a super R&D team led by authorities, so as to explore effective approaches to improve solar cell efficiency, build a technical patent system, and challenge the low-cost but productive mass production of HJT cells and modules.

Today,
the looming challenges of energy efficiency in the world present an opportunity to leverage our strengths

250 Million+
Annual R&D investment in HJT

236 Patents
116 Invention patents
117 Utility model patents
3 Design patents
6 PCT patents

Stunning R&D Team

Huasun owns a strong R&D team with more than 200 core technicians, including 4 industrial scientists from National High-tech R&D program as well as National Key Basic Research Project, 4 leading talents in HJT field,and over 200 M.D and Ph.D. These team members are with an average of 15 years' experience in photovoltaic technology development and management in top companies.

4 industrial scientists
High-level imported talents

400 +
Core technicians in HJT field

15 years+
Team members' average experience in solar technology development and management in leading companies

Super Team

- Most senior
- Most enthusiastic
- Most experienced
- Best understanding
- Excellent configuration

TECHNOLOGY LEADS THE FUTURE

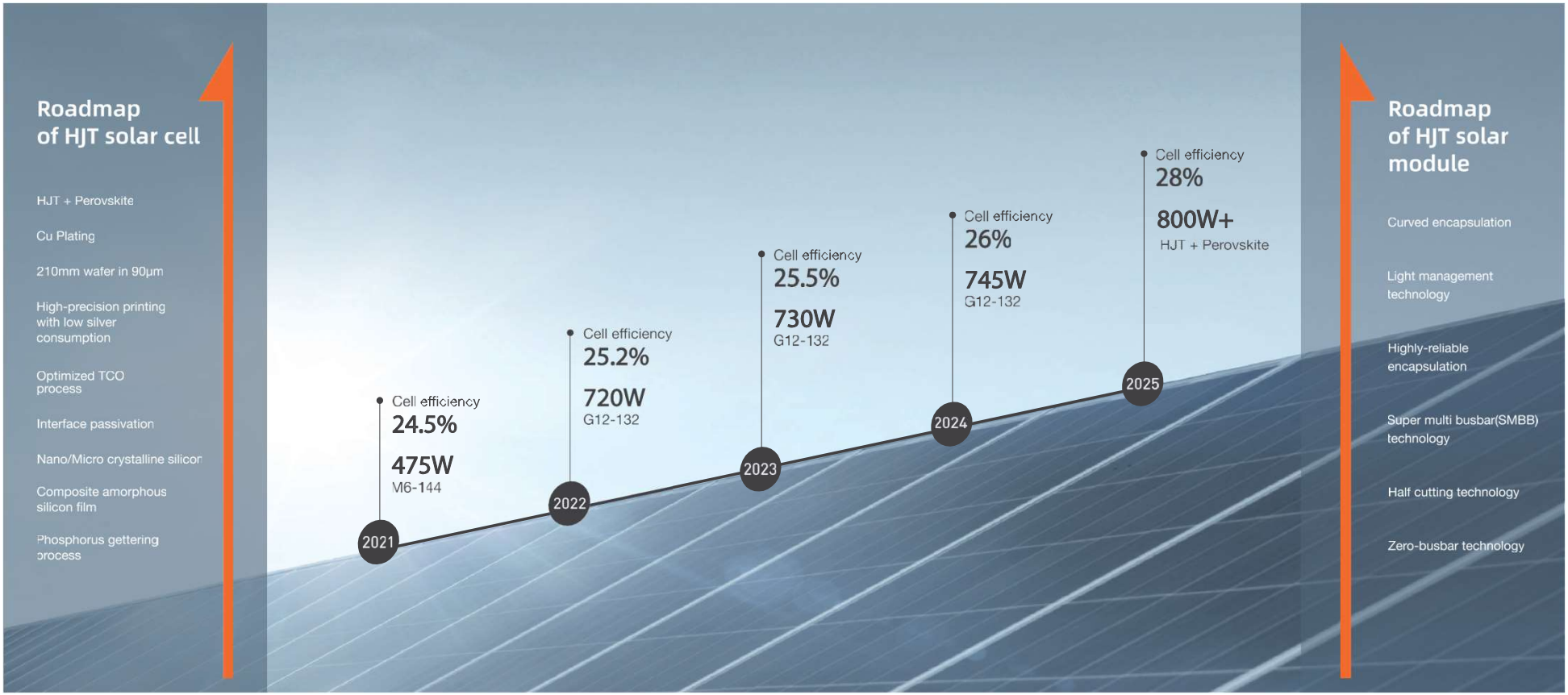
To build up a TOP enterprise in high-efficienct HJT solar industry

Taking HJT as the core, Huasun would like to enhance clients' confidence of solar energy' s future via higher product efficiency, more stable power generation performance, better quality assurance and platform-based technology expansion capabilities.

Huasun simultaneously laid out the R&D of single-microcrystalline, double-microcrystalline, HBC, copper electroplating and heterojunction-perovskite tandem cells, which continuously improves the efficiency of solar cells and reduces product costs.

HJT+Perovskite+210mm wafer
to realize module power up to
800W+

Goal of production capacity to reach
40GW+



Technical Comparison

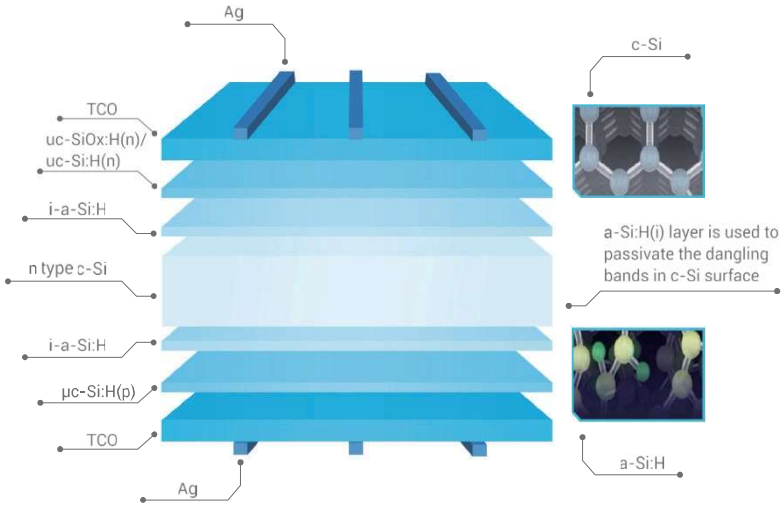
HJT vs Others

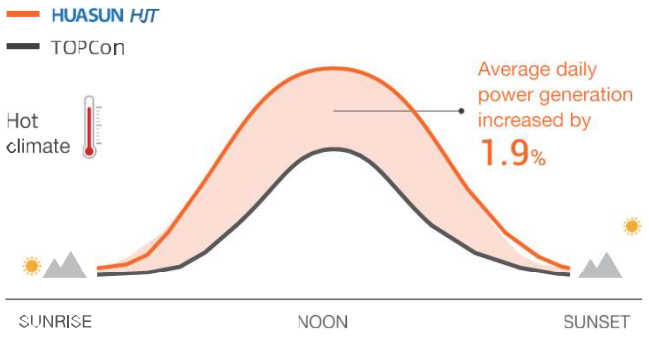
HJT Technology		TOPCon	HJT
Higher cell eff.	Cell eff.	24.5%→25.0%→25.5%	25.5%→26.5%→28%
Higher power generation per watt	Bifaciality	80%	85%→97%
	Lower Pmax temperature coefficient	-0.29%/°C	-0.24%/°C
	Lower yearly degradation	0.4%/ year	0.375%/ year
Better processing and lower Carbon footprint	Less cell manufacturing process	12	4
	Lower process temperature	1000°C	200°C
	Wafer thickness (μm)	130→125	120→90
	Lower carbon footprint (kg eq CO_2/kW)	450-500	<400, Future<300
More promising in future	More easier to combine with perovskite	Complex	Easy

NEW GENERATION MAINSTREAM CELL TECHNOLOGY PLATFORM

HJT cells combine the advantages of crystalline silicon and thin film technologies, with excellent light absorption and passivation effects, and are superior in efficiency and performance. It is one of the solar cell technologies that increase conversion efficiency and power output to the highest level and also represents the development direction of new generation cell platform technology.

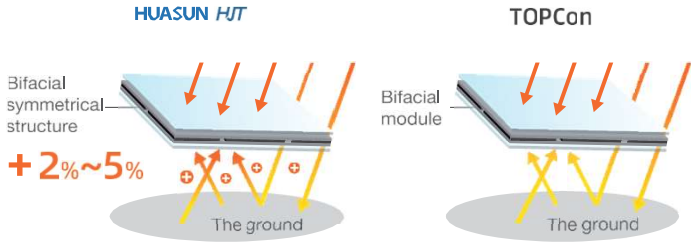
The natural bifacial-symmetrical structure of HJT cells can effectively rise the power generation capacity on module' s backside. The extremely low temperature coefficient enables modules to maintain stable power generation performance even in high temperature environments. Excellent weak light performance increases modules' power generation period and further improves energy yield.





-0.24%/°C Extreme temperature coefficient

The temperature coefficient of HJT cell is -0.24%/°C. The average daily power generation of HJT bifacial cells can increase by 3.9%, comparing to PERC bifacial cells in a high temperature environment.



Up to 97% Bifaciality

HJT' s natural bifacial symmetrical structure makes the bifaciality up to 97%. The power generation per watt of HJT cells is about 3%-6% higher than that of bifacial PERC cells.

HIMALAYA SERIES HJT SOLAR CELL

By using doped microcrystalline silicon or doped microcrystalline oxygen (silicon carbide) and further increasing the doping concentration, Huasun reduces the doped layer resistance and lifts the light transmission performance, thereby increasing the current density and cell efficiency.

Huasun HJT solar cells have the merits of high conversion rate, low temperature coefficient, no PID, no LID, and uniform color, etc. Compared to other solar cell technologies, Huasun HJT cell production requires only four low-temperature process steps, resulting in higher productivity and lower losses.

Industrial leading

Microcrystalline tech

single/double sided

No LID
No PID

Natural

Bifacial Symmetrical

structure

SMBB

Unique SMBB Technology

Less silver paste consumption, higher cell efficiency, lower cost

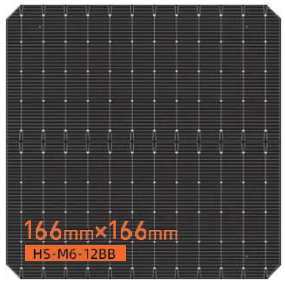
Better performance in power generation

- Ultra-low temperature coefficient ensures modules' higher power output in hot climate
- No LID, NO PID, leads to lower power loss
- Great weak light performance ensures higher power generation in low light environment

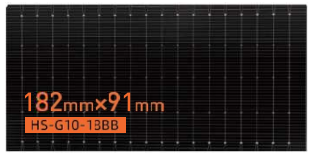
More Energy Yield

The natural bifacial structure of HJT cells can raise modules' bifaciality to a maximum of 97%, and gain more power output

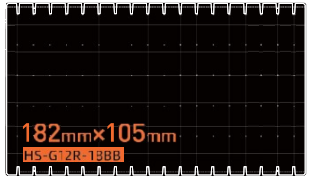
24.5%
Average cell eff. in mass production



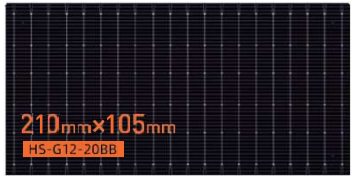
25.9%
Average cell eff. in mass production



26.1%
Average cell eff. in mass production



26.2%
Average cell eff. in mass production



	HS-M6-12BB	HS-G10-18BB	HS-G12R-18BB	HS-G12-20BB
Wafer	N-type wafer	N-type wafer	N-type wafer	N-type wafer
Thickness	130μm±14μm	110μm±13μm	110μm+20μm/-10μm	110μm+20μm/-10μm
Busbar	12BB	18BB	18BB	20BB

PIONEER OF LARGE-SCALE INTELLIGENT MANUFACTURING

Huasun is the first company that synchronously integrates the technology and production of the whole industrial chain of HJT special silicon wafers, cells and modules.Huasun takes the lead in adopting single-sided micro-crystalline process and silver-coated copper paste to GW-scale production.Huasun' s factories are equipped with whole sets of temperature and humidity control equipment.

All production lines are monitored by centralized software, and each production equipment can detect and report even a single fault online, ensuring product quality and improving productivity.

26.2 %

Champion cell efficiency in mass production

210mmHJT cell mass production champion efficiency

14400

pcs/hour

The best productivity of GW-level lost-cost HJT cell production line

IINP mature technology

The first IINP mass production line, raising the cell efficieny by 0.2%

MES System

MES system equipped in the whole line providing precise management and control by big data, tracking and tracing single chips

Low-cost mass production technology

Introducing silver-coated copper paste and new printing technology, greatly reducing production cost

GW-level HJT production line

The first GW-level high-capacity production line of microcrystalline process, with an average cell efficiency in mass production over 25%

LEADING HJT MANUFACTURING

Huasun's R&D team spares no effort to explore effective ways to improve product efficiency while reduce production cost and has achieved several key breakthroughs.

As a front runner in HJT field, Huasun has realized low cost in large scale manufacturing of high-efficient HJT products and is driving a further cost reduction in process, equipment and materials by scale production.

750.54w

Max.Laboratorial module power (conversion module eff. 24.16%)

-0.24 %/℃

Industrial leading temperature coefficient

2-5 % ↑

The energy yield that Huasun HJT module could gain compared to PERC

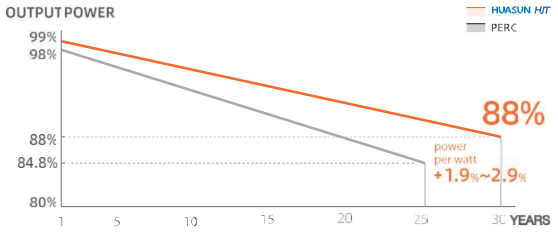
<12 %

Power degradation in 30 years

EXCELLENT MODULE EMINENT WARRANTY

Huasun HJT solar modules all have 15-year product warranty and industrial leading 30-year linear performance warranty.

Huasun has absolute confidence in module manufacturing. Compared to traditional modules, HJT modules provide more power output along with higher reliability, and result in more cost saving.Huasun HJT products all passed industrial third party's professional tests to guarantee the best quality and energy yield.



* Refer to Huasun's warranty for details

PRODUCT WARRANTY

Huasun HJT modules have passed the most severe tests in the industry and obtained a range of certifications in product quality and safety. At present, Huasun HJT products have gained the following certifications.

*TÜV认证 (IEC 61215, IEC 61730)

HIGH QUALITY RESULT FROM ADVANCED MATERIALS

Huasun cooperates with first-class material suppliers around the world, providing products that exceed industry quality standards. Whether it is a cell, a piece of glass or a bucket of encapsulant, all materials are selected with care and inspected rigorously, in order to provide customers with HJT products in better quality.

Huasun HJT modules have industrial leading linear performance warranty: ess than 1% attenuation in the 1st year, the annual attenuation from the 2nd year is no more than 0.375%, and the power is no less than 88% until the 30th year.

Higher Reliability

Precut silicon rod

Avoid .oss of efficiency

Light converted film

Excellent UV resistance. significantly raising efficiency.

Sealing with PIB based sealant

The edge of the module is sealed with PIB based sealant to improve water resistance.

Double glass design with frame

Front/back mechanical loading up to 5400/2400Pa.

More Power Generation

Lower temperature coefficient

Compared to PERC, HJT has lower temperature coefficient, to raise power output in high temperature and high irradiation area.

Higher bifacial energy yield

HJT cell' s highest bifacility can reach 97%, which would bring more energy yield.

Better weak light performance

The minority carrier lifetime of N-type cell is high, resulting in a better power generation ability in weak light condition than PERC.

Extremely low LID and PID

N-type wafer has no B-O bond, and TCO conducts electricity on HJT cell surface without insulating layers, so LID and PID can be eliminated in principle.

Lower lifetime degradation rate

Less than 1% attenuation in the 1st year, the annual attenuation from the 2nd year is no more than 0.375%, and the power is no less than 88% until the 30th year.

HIMALAYA
G12 SERIES

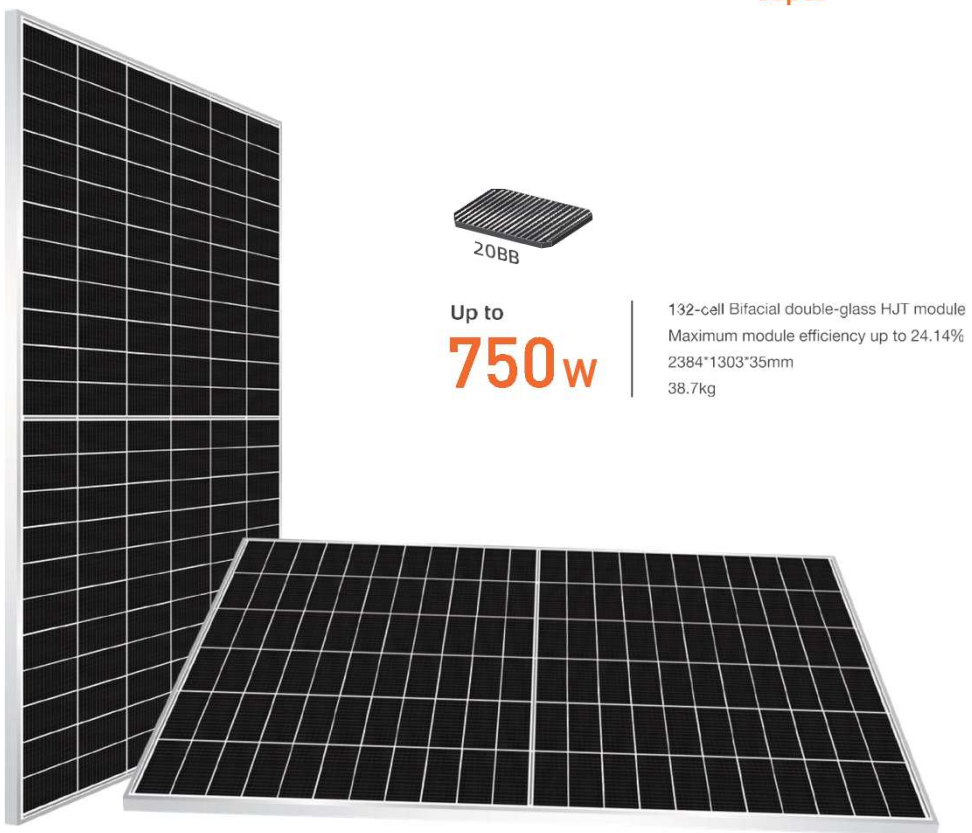
BIFACIAL DOUBLE-GLASS HJT MODULE

750W
Max.power output in mass production

24.14%
Maximum module efficiency

- N-type 210mm solar cell
- Microcrystalline HJT technology
- SMBB technology
- Half wafer pre-cut technology
- >85% bifaciality
- 15-year product warranty
  30-year linear performance warranty
- Suitable for large scale utility projects

15 years product warranty | **30** years performance warranty



HIMALAYA
G10 SERIES

BIFACIAL DOUBLE-GLASS HJT MODULE

600W Maximum power output

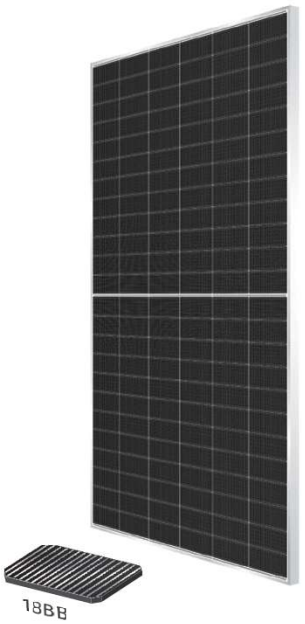
23.23% Maximum module efficiency

- N-type 182 mm solar cell
- Double-sided microcrystalline Tech
- Half silicon rod slicing technology
- Small chamfer design combined with SMBB technology
- >85% bifaciality
- 15-year product warranty
  30-year linear performance warranty
- Suitable for residential, commercial and utility projects

15 years product warranty | **30** years performance warranty

IEC CE TÜV SÜD

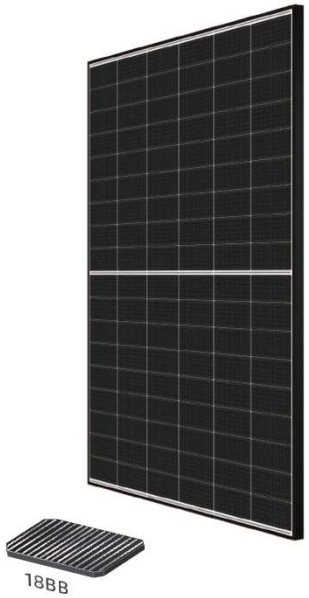
144pcs



Up to
600W

144-cell Bifacial double-glass HJT module
Maximum module efficiency up to 23.23%
2278*1134*30mm
32kg

108pcs



Up to
450W

108-cell Bifacial double-glass HJT module
Maximum module efficiency up to 23.0%
1722*1134*30mm
22kg

HIMALAYA
V-ocean SERIES

BIFACIAL DOUBLE-GLASS HJT MODULE

750W
Max.power output in mass production

24.14%
Maximum module efficiency

- N-type 210mm HJT solar cell
- Double-sided microcrystalline Tech
- Light conversion film adopted
- PIB all-around sealing and IP68 junction box
- Integrated coating frames
- Double-side coated glass
- 15-year product warranty
  30-year linear performance warranty

15 years product warranty | **30** years performance warranty

IEC CE

Sronger wind load capacity

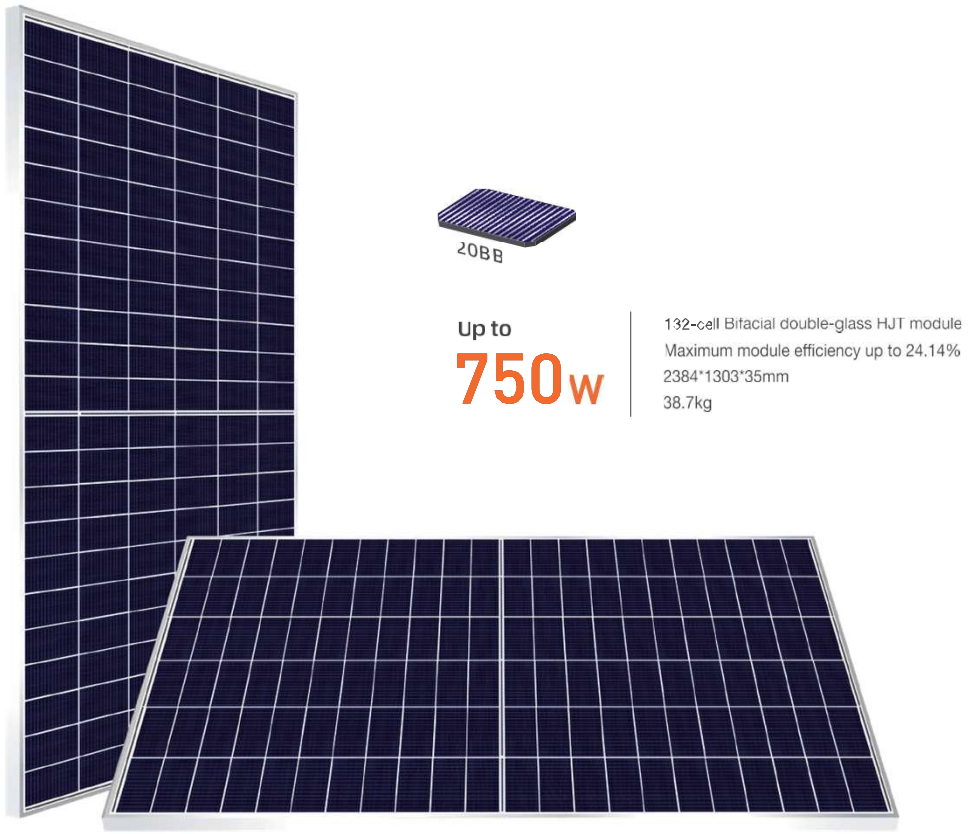
Better anti-wave vibration ability

Great UV resistance

Super-strong waterlightness

Great resistibility against salt-mist

132pcs



Up to **750W**

132-cell Bifacial double-glass HJT module
Maximum module efficiency up to 24.14%
2384*1303*35mm
38.7kg

HIMALAYA
G12 SERIES

ULTRA BIFACIALITY
BIFACIAL DOUBLE-GLASS
HJT MODULE

750W
Max.power output
in mass production

24.14%
Maximum module efficiency

- N-type 210mm HJT solar cell
- Double-sided microcrystalline Tech
- 97% ultra bifaciality
- Small chamfer design combined with SMBB technology
- Ultimate reduction of floor space and Ultra-low operating& maintenance costs
- 15-year product warranty
  30-year linear performance warranty、
- Suitable for farm, rangeland and utility projects

15 years product warranty | **30 years** performance warranty

IEC CE

Ultra-high cell efficiency & module output

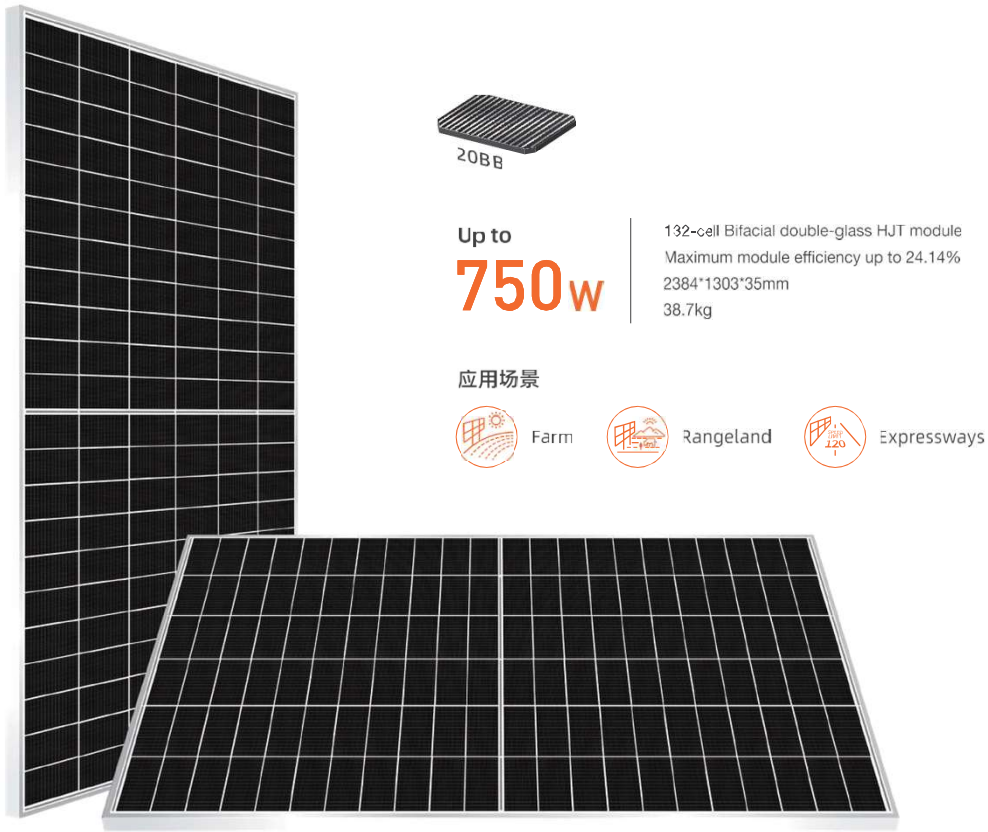
Up to 97% of bifaciality

Ultimate reduction of floor space

Ultra-low operating and maintenance costs

Excellent power generating performance

132pcs



Up to
750W

132-cell Bifacial double-glass HJT module
Maximum module efficiency up to 24.14%
2384*1303*35mm
38.7kg

应用场景

Farm | Rangeland | Expressways

HIMALAYA
BLACK SERIES

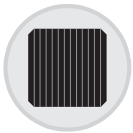
BLACK BIFACIAL
DOUBLE-GLASS HJT MODULE

- Aesthetic design in all black
- Double glass structure, safety guarantee
- Super light，easy for transportation & installation
- Ideal choice for residential rooftop system

30* years product warranty | 30 years performance warranty

IEC CE TUV

*Regular for 15yrs，optional for 30yrs



HJT solar cell

Glass with black grid line

Matte Frame in black

Aesthetic design

Up to **400W**

120-cell Black Bifacial double-glass HJT module(M6)
Maximum module efficiency up to 22.0%
1755*1038*30mm
19.5kg

Up to **450W**

108-cell Black Bifacial double-glass HJT module(G10)
Maximum module efficiency up to 23.04%
1722*1134*30mm
22kg

EVEREST
G12R SERIES

BIFACIAL DOUBLE-GLASS HJT MODULE

640W Maximum power output

23.70% Maximum module efficiency

- N-type 210 mm solar cell
- Double-sided microcrystalline Tech
- Half silicon rod slicing technology
- Small chamfer design combined with SMBB technology
- >85% bifaciality
- 15-year product warranty
  30-year linear performance warranty
- Suitable for residential, commercial and utility projects

15 years product warranty | **30** years performance warranty

IEC CE

132pcs

Up to
640W

132-cell Bifacial double-glass HJT module
Maximum module efficiency up to 23.70%
2382* 1134*30mm
33.6kg

108pcs

Up to
520W

108-cell Bifacial double-glass HJT module
Maximum module efficiency up to 23.40%
1960* 1134*30mm
27.6kg

96pcs

Up to
460W

108-cell Bifacial double-glass HJT module
Maximum module efficiency up to 23.02%
1762* 1134*30mm
23kg

BUILD A ZERO CARBON WORLD

HJT · FUTURE HAS COME

Huasun keeps on exploring the deep integration of advanced technology and intelligent manufacturing of clean energy, and actively facilitates the practice of carbon neutrality in China and the world.

With the completion of global projects built by its HJT modules around the world, Huasun contributes to lowering energy costs, reducing carbon dioxide emissions and further stimulating the use of renewable energy.

Bulgaria

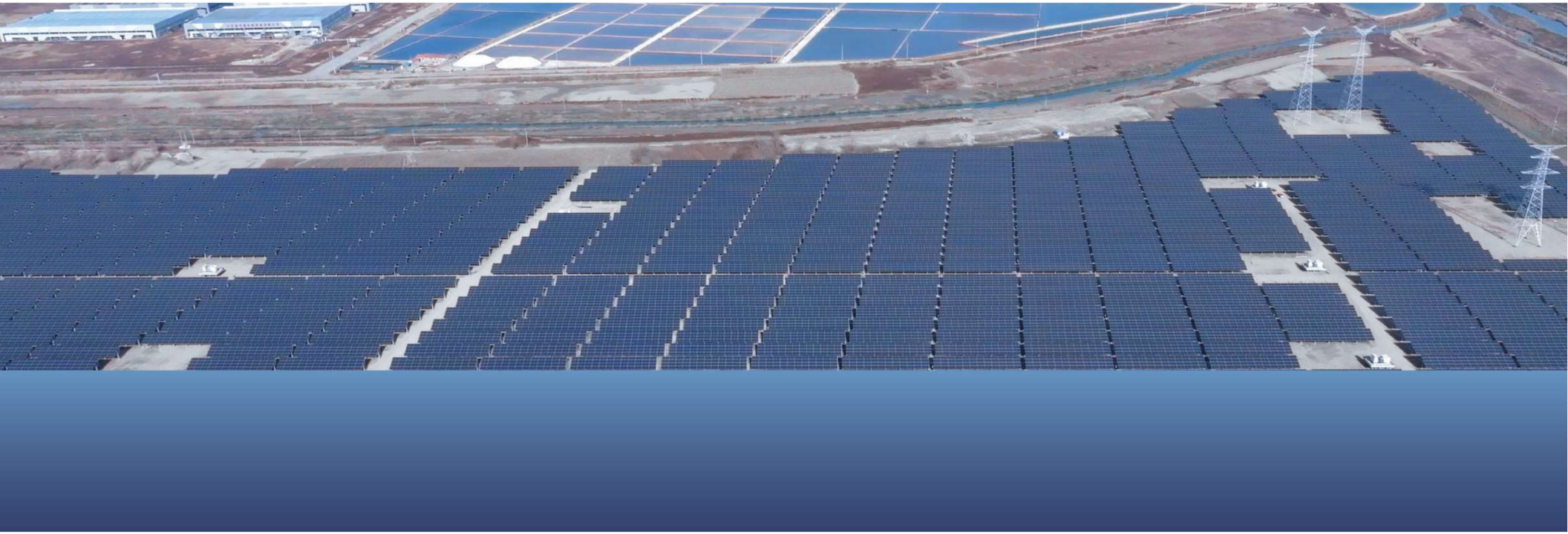
INERCOM Apriltsi Village

Location: PAZARDZHIK, Bulgaria

Capacity: 650 MW

The existent largest HJT utility projects around the globe

*The project is under construction.



THE LARGEST CENTRALIZED HJT POWER STATION IN CHINA

50MW

Agricultural Photovoltaics Utility Project

Location:Weifang City, Shandong province, China

Capacity: 50MW

Xuancheng, Anhui 23MW fishery photovoltaic project

Location：Xuancheng City, Anhui

Capacity：23MW

Shouguang, Shangdong 14MW Utility project

Location：Shouguang City, Shandong

Capacity：10MW

Dali, Yunnan 300MW mountain power plant

Location：Dali City, Yunnan

Capacity：300MW

Shizuoka, Japan 6MW ground power station

Location：Hamamatsu City, Japan

Capacity：6MW

Ningguo of Anhui 15MW industrial rooftop project

Location：Ningguo of Anhui

Capacity：15MW

Xuancheng, Anhui 4.5MW industrial rooftop project

Location: Xuancheng, Anhui

Capacity: 4.5MW

Xuancheng, Anhui 3.5MW industrial rooftop project

Location：Xuancheng, Anhui

Capacity：3.5MW

Tunisia 180KW residential rooftop project

Location: Tunisia

Capacity: 180KW

Switzerland 43KW residential rooftop project

Location: THUN, SWITZERLAND

Capacity: 43KW

Germany 5KW residential rooftop project

Location：Oiskirchen, Germany

Capacity：5KW

VISION

Become the world's leading technological company in intelligent manufacturing of high-efficient solar clean energy.

MISSION

Committed to bringing superior solar clean energy into life, making home more livable and beautiful.

HUASUN

PIONEER OF HETEROJUNCTION SOLAR TECHNOLOGY