



TUNGHSU

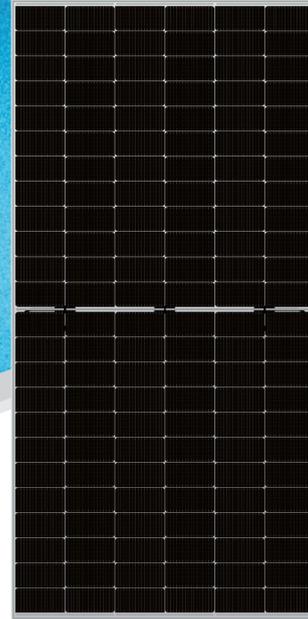
Supreme (N-Type)



565W/570W/575W/580W/585W

144 CELLS SMBB HALF-CELL MONO PV MODULE

N-TYPE M10(182mm) SINGLE GLASS MODULE



585W

Maximum Power Output

22.6%

Maximum Module Efficiency

0~+5W

Power Output Tolerance

565-585W

Tungshu components with high efficiency and high reliability

- * Advanced production equipment, highly automated process control, world-class production technology
- * The company has a product research and development laboratory that meets the new ISO/IEC international standards
- * Excellent weak light performance, resistant to salt spray and ammonia corrosion.
Passing the certification test of the PV standards.
- * Certified by international quality management and environmental management system
- * Application grade: A, Safe grade: II, Fireproofing grade: C

Comprehensive Products And System Certificates

IEC61215/IEC61730/UL1703/IEC61701/IEC62716
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO 45001: Occupation Health and Safety Management System
 GB/T 23001-2017: Management system with Integration of Information Technology and Industrialization



10-30% Additional Power Generation

30 years lifespan brings 10-30% additional power generation comparing with conventional p-type module

ZERO LID (Light Induced Degradation)

N-type solar cell has no LID naturally which can increase power generation

Lower LCOE

Higher bifaciality, higher power output and lower BOS cost

Better Weak Illumination Response

Higher power output even under low-light environments like on cloudy or foggy days

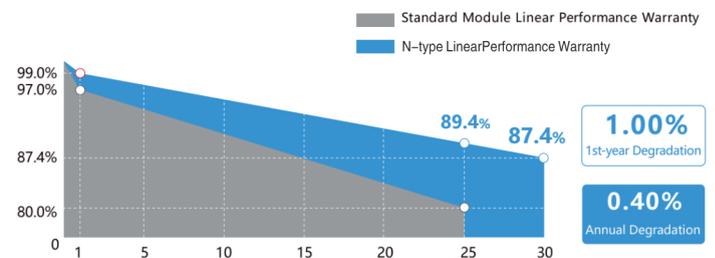
Better Temperature Coefficient

Higher power generation under working conditions, thanks to passivating contact cell technology

Wide Range Application

More application scenes like BIPV, vertical installation, snow field, high-humid, windy and dusty area

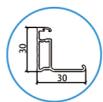
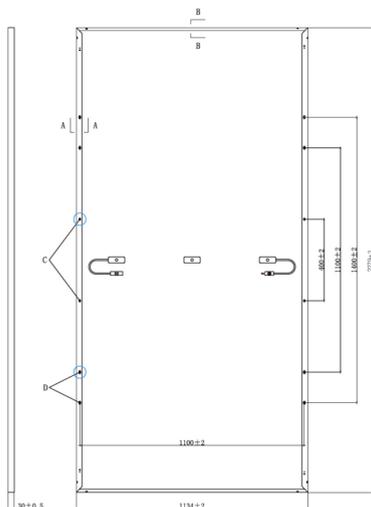
Linear Performance Warranty



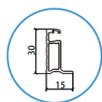
15 Years Product Material & Workmanship

30 Years Linear Performance Warranty

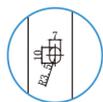
Engineering Drawing (unit: mm)



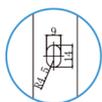
A Long Frame



B Short Frame



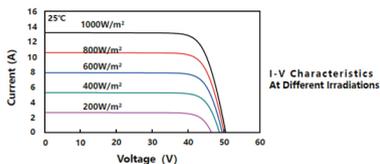
C Mounting Hole



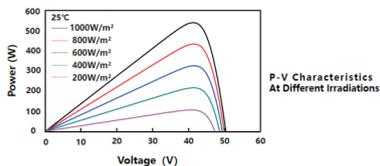
D Mounting Hole

Front View

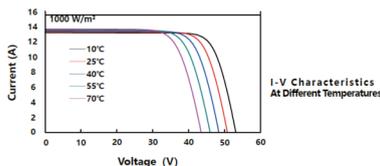
Characteristic Curves | HD144N-555



I-V Characteristics At Different Irradiations



P-V Characteristics At Different Irradiations



I-V Characteristics At Different Temperatures

ELECTRICAL DATA (STC)

| | | | | | |
|-----------------------------------|-------|-------|-------|-------|-------|
| Peak Power (Pmax) (W) | 565 | 570 | 575 | 580 | 585 |
| MPP Voltage (Vmp) (V) | 41.98 | 42.13 | 42.28 | 42.43 | 42.58 |
| MPP Current (Imp) (A) | 13.46 | 13.53 | 13.60 | 13.67 | 13.74 |
| Open Circuit Voltage (Voc) (V) | 50.63 | 50.77 | 50.91 | 51.05 | 51.19 |
| Short Circuit Current (Isc) (A) | 14.22 | 14.30 | 14.38 | 14.46 | 14.54 |
| Module Efficiency (%) | 21.9 | 22.1 | 22.2 | 22.4 | 22.6 |

*STC: Irradiance 1000 W/m², Cell Temperature 25° C, AM1.5
The data above is for reference only and the actual data is in accordance with the practical testing
Power Measurement Tolerance ± 3%

With Different Power Generation Gain (regarding 560W as an example)

| Power Gain (%) | Peak Power (Pmax)(W) | Mpp Voltage (Vmp)(V) | Mpp Current (Imp)(A) | Open Circuit Voltage (Voc) (V) | ShortCircuit Current (Isc)(A) |
|----------------|----------------------|----------------------|----------------------|--------------------------------|-------------------------------|
| 10 | 597 | 42.2 | 14.13 | 50.4 | 14.96 |
| 15 | 617 | 42.2 | 14.62 | 50.4 | 15.48 |
| 20 | 638 | 42.2 | 15.11 | 50.4 | 15.99 |
| 25 | 659 | 42.3 | 15.59 | 50.5 | 16.51 |
| 30 | 680 | 42.3 | 16.08 | 50.5 | 17.02 |

Back gain: Under standard test conditions, the additional gain from the back and the front power depends on the installation and ground albedo parameters.

ELECTRICAL DATA (NOCT)

| | | | | | |
|-----------------------------------|-------|-------|-------|-------|-------|
| Peak Power (Pmax) (W) | 425 | 429 | 432 | 436 | 440 |
| MPP Voltage (Vmp)(V) | 39.46 | 39.59 | 39.71 | 39.84 | 39.97 |
| MPP Current (Imp) (A) | 10.77 | 10.84 | 10.88 | 10.95 | 11.01 |
| Open Circuit Voltage (Voc) (V) | 48.18 | 48.35 | 48.52 | 48.69 | 48.86 |
| Short Circuit Current (Isc) (A) | 11.46 | 11.52 | 11.57 | 11.62 | 11.68 |

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

Mechanical Properties

| | |
|------------------|--|
| Cell Size | 182.00mm*91.00mm |
| Number of Cells | 144pcs(12*12) |
| Module Dimension | 2279mm * 1134mm * 30mm |
| Weight | 29.0kg |
| Front / Glass* | 3.2mm |
| Frame | Anodized Aluminium Alloy |
| Junction Box | 1p68 (3 diodes) |
| Length of Cable | 4.0mm ² , +300mm/-300mm (Cable length can be customized) |

*Heat strengthened glass

Temperature Coefficient

| | |
|---|------------|
| Temperature Coefficient of Pmax* | -0.300%/°C |
| Temperature Coefficient of Voc | -0.250%/°C |
| Temperature Coefficient of Isc | +0.045%/°C |
| Nominal Operating Cell Temperature (NOCT) | 42±2°C |

*Temperature Coefficient of Pmax+0.03%/° C

Operating Properties

| | |
|--------------------------------|----------------|
| Operating Temperature(°C) | -40~+85°C |
| Maximum System Voltage (V) | 1500V DC (IEC) |
| Maximum Series Fuse Rating (A) | 30 |
| Power Tolerance | 0~+5W |
| Bifaciality* | 80% |

Bifaciality=Pmaxrear (STC) /Pmaxfront (STC) . Bifaciality tolerance:+5%

WARRANTY

| |
|--------------------------------------|
| 15 year Product Workmanship Warranty |
| 30 year Linear Power Warranty |

Packaging Configuration

| | | | |
|------------------|-------|-------|-------|
| Packing Type | 20'GP | 40'GP | 40'HQ |
| Piece/Pallet | 35 | | |
| Pallet/Container | 4 | 10 | 20 |
| Piece/Container | 140 | 350 | 700 |

Note: Read the safety and installation instructions before using the product.
Affirm: With technological progress and product updates, the technical parameters of Anhui RiChao's later component products may deviate from the technical parameters contained in this specification. Anhui RiChao has the right to adjust various technical parameters at any time without notifying the customer. The final interpretation right of this technical specification belongs to Anhui RiChao New Energy Technology Co., Ltd.

