NIWA Black Series

JOLYWOOD

JW-HD96N-R2

n-type Bifacial Dual-Glass ***Transparent Black*** Module

435-460W



460W	23.0%	0~+3%
Maximum Power Output	Maximum Module Efficiency	Power Output Tolerance

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.

Higher Reliability

New generation TOPCon technology for the cell. No polysilicon wrap around,no current leakage,and greater resistance to hot spots.

Better Weak Illumination Response

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

Better Temperature Coefficient

Lower temperature coefficient (-0.28%) and lower working temperature, resulting in more power.

Wider Applicability

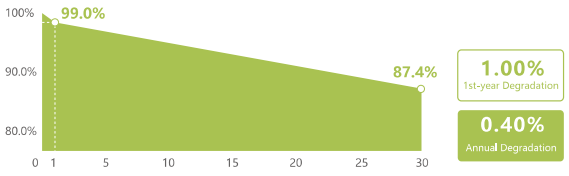
More application scenes like BIPV, vertical installation, snowfield, high-humid, windy and dusty area.

Munich RE CE IEC

TIER 1 Bloomberg NEW ENERGY FINANCE · TÜV SÜD · TÜV NORD Type Tested · TOP PERFORMER 2024 kiwa PVEL PV MODULE RELIABILITY SCORECARD

IEC 61215(2021)/IEC 61730(2023)/IEC 61701/IEC 62716
ISO 9001:2015: Quality Management System
ISO 14001:2015: Environment Management System
ISO 45001:2018: Occupational health and safety
IEC 62941:2019: Quality system for PV module manufacturing

Linear Performance Warranty



25 Years Product Material & Workmanship / **30** Years Linear Performance Warranty

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JW-HD96N Series | n-type Bifacial Dual-Glass Transparent Black Module

SEN

Electrical Properties | STC*

Testing Condition	Front Side	Front Side	Front Side	Front Side	Front Side	Front Side
Peak Power (Pmax) (W)	435	440	445	450	455	460
MPP Voltage (Vmp) (V)	29.44	29.62	29.80	29.98	30.16	30.34
MPP Current (Imp) (A)	14.78	14.85	14.93	15.01	15.09	15.16
Open Circuit Voltage (Voc) (V)	34.31	34.51	34.71	34.91	35.11	35.31
Short Circuit Current (Isc) (A)	15.65	15.72	15.79	15.86	15.93	16.00
Module Efficiency (%)	21.8	22.0	22.3	22.5	22.8	23.0

*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 pratical testing Power Measurement Tolerance ±3%

Electrical Properties | NMOT*

Testing Condition	Front Side	Front Side	Front Side	Front Side	Front Side	Front Side
Peak Power (Pmax) (W)	326	330	333	337	341	345
MPP Voltage (Vmp) (V)	28.19	28.36	28.53	28.71	28.88	29.05
MPP Current (Imp) (A)	11.56	11.62	11.68	11.74	11.80	11.86
Open Circuit Voltage (Voc) (V)	32.86	33.05	33.24	33.43	33.62	33.81
Short Circuit Current (Isc) (A)	12.64	12.70	12.76	12.81	12.87	12.92

*NMOT: Irradiance 800 W/m², Ambient Temperature 20°C, Wind Speed 1 m/s

Electrical PropertiesUnder Different Rear Gain | JW-HD96N-R2-450

Power Gain (%)	Peak Power (Pmax) (W)	MPP Voltage (Vmp) (V)	MPP Current (Imp) (A)	Open Circuit Voltage (Voc) (V)	Short Circuit Current (Isc) (A)
10	495.00	29.80	16.61	34.91	17.55
15	517.50	29.80	17.37	34.91	18.35
20	540.00	29.80	18.12	34.91	19.15
25	562.50	29.90	18.81	35.01	19.89
30	585.00	29.90	19.57	35.01	20.68

Operating Properties

Operating Temperature (℃)	-40℃~+85℃
Maximum System Voltage (V)	1500V DC (IEC)
Maximum Series Fuse Rating (A)	35
Bifaciality*	80%
Static Load	Front side 5400Pa, Rear side 2400Pa

*Bifaciality=Pmaxrear (STC) /Pmaxfront (STC) , Bifaciality tolerance:±5%

Temperature Coefficient

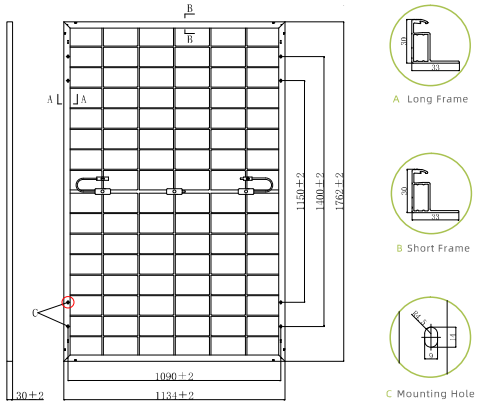
Temperature Coefficient of Pmax	-0.280%/℃
Temperature Coefficient of Voc	-0.250%/℃
Temperature Coefficient of Isc	+0.045%/℃
Nominal Operating Cell Temperature	45±2℃

Mechanical Properties

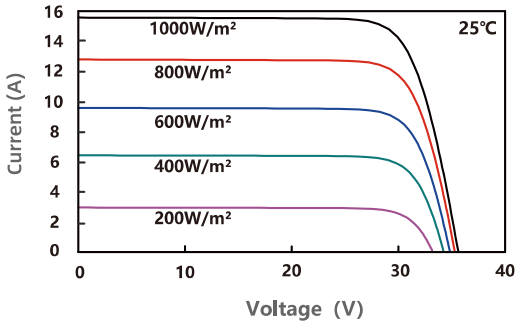
Number of Cells	96pcs
Module Dimension	1762mm*1134mm*30mm
Weight	24.6kg
Front / Rear Glass	2.0mm/2.0mm Heat-strengthened glass
Frame	Anodized Aluminium Alloy
Junction Box	IP68 (3 diodes)
Length of Cable	4.0mm², +1200mm/-1200mm (Cable length can be customized)
Packaging Configuration	37pcs/Pallet,962pcs/40'HQ

*The specification and key features described in this datasheet may deviate slightly and arenot guaranteed. Due to ongoing innovation, R&D enhancement,Jolywood (Taizhou) SolarTechnology Co., Ltd. reserves the right to make any adjustment to the information describedherein at any time without notice. Please always obtain the most recent version of the datasheetwhich shallbe duly incorporated into the binding contract made by the parties governing allthe transactions related to the purchase and sale ofthe products descri-bed herein.

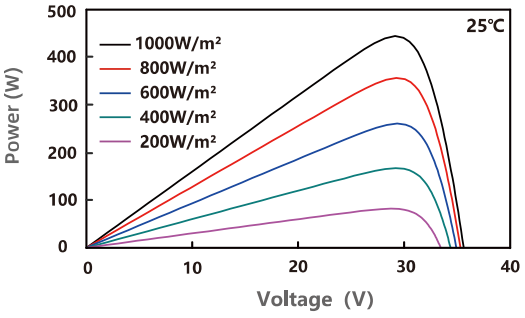
Engineering Drawing (unit: mm)



Characteristic Curves | JW-HD96N-R2-450



I-V Characteristics At Different Irradiations



P-V Characteristics At Different Irradiations

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