

MS-N Series

N-type i-TOPCon bifacial dual glass

Monocrystalline module

PRODUCT: MS-NSP

POWER RANGE: 620-645W

645W

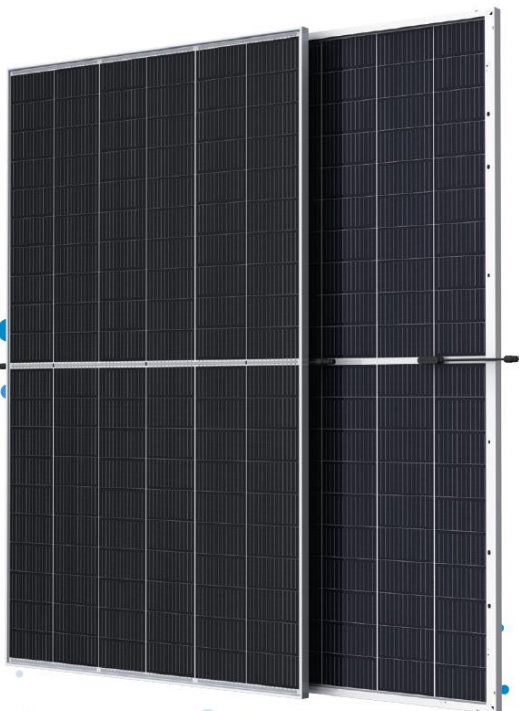
MAXIMUM POWER OUTPUT

0 ~ +5W

POSITIVE POWER TOLERANCE

22.8%

MAXIMUM EFFICIENCY



High customer value

- Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance of System) cost, shorter payback time
- More energy harvest with cutting-edge N-type i-TOPCon technology
- Designed for compatibility with existing mainstream system components



High power up to 645W

- Up to 22.8% module efficiency with high density interconnect technology
- SMBB (Super multi-busbar) technology for better light trapping effect, lower series resistance and improved current collection



High reliability

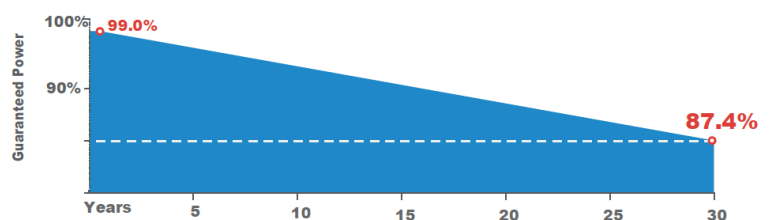
- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load



High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- Lower degradation: 1% first year, 0.4% annually thereafter
- Lower temperature coefficient (-0.29%/°C)
- Up to 30% additional power gain from back side depending on albedo

Macsun Solar's MS-N Bifacial Dual Glass Performance Warranty



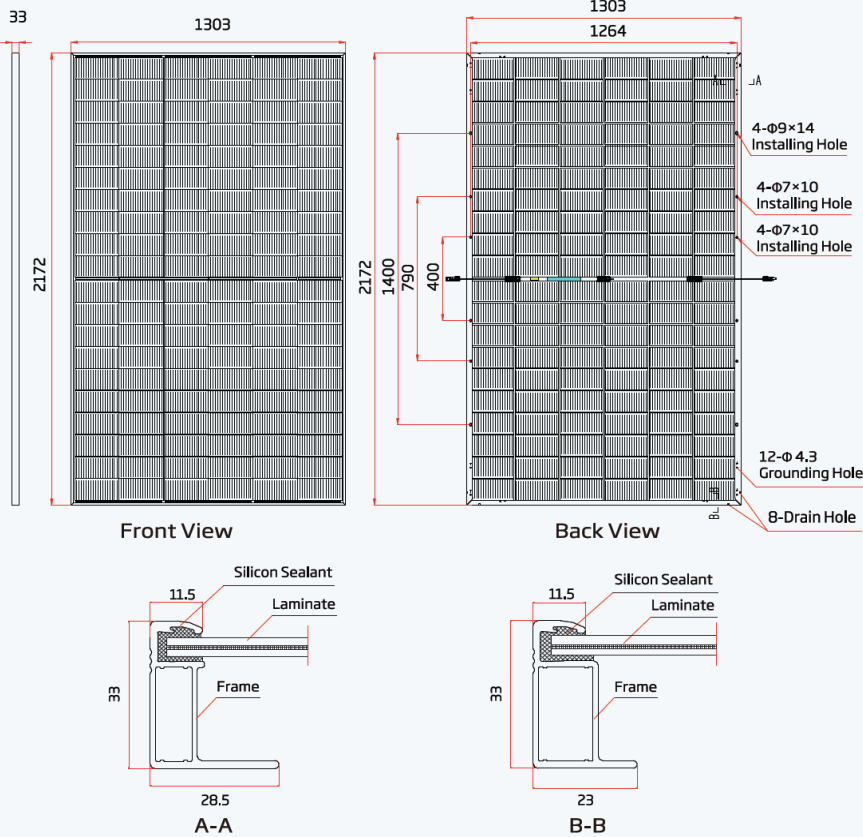
Comprehensive Products and System Certificates



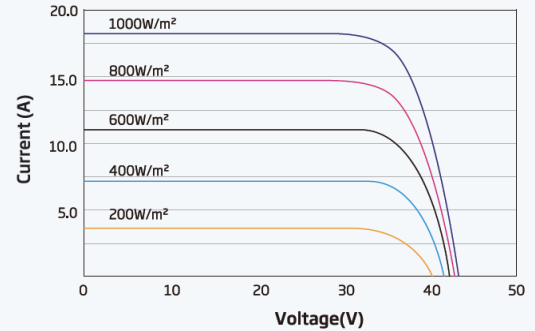
IEC61215/IEC61730/IEC61701/IEC62716
 ISO 9001: Quality Management System
 ISO 14001: Environmental Management System
 ISO14064: Greenhouse Gases Emissions Verification
 ISO45001: Occupational Health and Safety Management System

MS-N series N - type i-TOPCon BIFACIAL DUAL GLASS MODULE

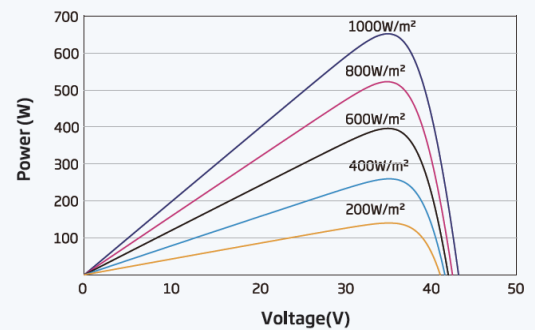
DIMENSIONS OF PV MODULE(mm)



I-V CURVES OF PV MODULE(630W)



P-V CURVES OF PV MODULE(630 W)



MECHANICAL DATA

Solar Cells	N-type Monocrystalline
No. of cells	120 cells
Module Dimensions	2172×1303×33 mm (85.51×51.30×1.30 inches)
Weight	34.9 kg (76.9 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)

Frame	33mm(1.30 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm ² (0.006 inches ²) Portrait: 350/280 mm(13.78/11.02 inches) Length can be customized
Connector	MC4 EVO2 / TS4 PLUS / TS4*

*Please refer to regional datasheet for specified connector.

ELECTRICAL DATA (STC & NOCT)

Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Peak Power Watts-P _{MAX} (Wp) *	620	473	625	478	630	482	635	486	640	490	645	493
Power Tolerance-P _{MAX} (W)	0 ~ +5											
Maximum Power Voltage-V _{MPP} (V)	36.1	33.9	36.4	34.3	36.6	34.5	36.8	34.7	37.0	35.0	37.2	35.2
Maximum Power Current-I _{MPP} (A)	17.16	13.94	17.19	13.95	17.22	13.96	17.26	13.98	17.30	14.00	17.34	14.03
Open Circuit Voltage- V _{OC} (V)	43.2	41.0	43.5	41.3	43.9	41.6	44.2	41.9	44.5	42.2	44.8	42.5
Short Circuit Current-I _{SC} (A)	18.18	14.65	18.21	14.68	18.24	14.70	18.27	14.73	18.30	14.75	18.33	14.77
Module Efficiency η _m (%)	21.9		22.1		22.3		22.4		22.6		22.8	

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s. *Measuring tolerance: ±3%.

Electrical characteristics with different power bin (reference to 5% & 10% backside power gain)

Backside Power Gain	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
Total Equivalent power -P _{MAX} (Wp)	651	682	656	688	662	693	667	699	672	704	677	710
Maximum Power Voltage -V _{MPP} (V)	36.1	36.1	36.4	36.4	36.6	36.6	36.8	36.8	37.0	37.0	37.2	37.2
Maximum Power Current -I _{MPP} (A)	18.02	18.88	18.05	18.91	18.08	18.94	18.12	18.99	18.17	19.03	18.21	19.07
Open Circuit Voltage-V _{OC} (V)	43.2	43.2	43.5	43.5	43.9	43.9	44.2	44.2	44.5	44.5	44.8	44.8
Short Circuit Current I _{SC} (A)	19.09	20.00	19.12	20.03	19.15	20.06	19.18	20.10	19.22	20.13	19.25	20.16

Power Bifaciality:80~5%

TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of P _{MAX}	-0.29%/°C
Temperature Coefficient of V _{OC}	-0.24%/°C
Temperature Coefficient of I _{SC}	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85° C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	35A

WARRANTY

- 12 year Product Workmanship Warranty
- 30 year Power Warranty
- 1% first year degradation
- 0.40% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

- Modules per box: 26/39 pieces
- Modules per 40' container: 234/351 pieces