



LESSO

SOLAR PV MODULES

Lesso New Energy Global Trading Private Limited

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LESSO Group (2128) is listed in the Stock Exchange of Hong Kong.

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A Bright and Exciting Journey

LESSO Group is a Hong Kong-listed (2128.HK) manufacturer of building materials with an annual revenue of over USD4.5 billion from its global operations.

LESSO Solar, a flagship division of LESSO Group, specialises in manufacturing solar panels, inverters, and energy storage systems, and providing solar-energy solutions.

Our 5 production bases, introduce advanced equipment, and create intelligent and automated production lines for intelligent building photovoltaic integrated BIPV, solar photovoltaic modules, and solar cells. The sales network of LESSO solar has covered Asia, North America, South America, Europe, South Africa, and the Middle East.

Founded in 2021, LESSO Solar has been growing with spectacular pace, with global production capacity of over 15GW for solar panels and 6GW for solar cells by the end of 2023.



USD4.57 bil
2022 Group Revenue



5 Major
Manufacturing Bases



37
Years of Experiences



15.3GW
Solar Modules Manufacturing Capacity



Leading the Future with Intelligent Manufacturing

Poised to grow into a large-scale global manufacturer of solar solutions, we are rapidly expanding our production capabilities by utilizing the latest manufacturing technologies and building more factories around the world.

Using only the best raw materials and leveraging on our in-house logistics capabilities, we ensure each step of the process is well controlled to deliver the best experience for our customers.

Our Certificates

IEC61215, IEC61730,
ISO 9001:2015 Quality management system,
ISO 14001:2015 Environment management system,
ISO 45001:2018 Occupational health and safety management system



LESSO Solar GLOBAL PRODUCTION

This map illustrates global locations where LESSO Solar owns or plans a factory for solar-power products and their annual production capacity.

CHONGKOU FACTORY

FOSHAN, GUANGDONG, CHINA

2022 500MW SOLAR MODULES

DABA FACTORY

FOSHAN, GUANGDONG, CHINA

2023 1GW INVERTERS

2023 3GWh ENERGY STORAGES

2023 100,000 EV CHARGERS

LONGJIANG FACTORY

FOSHAN, GUANGDONG, CHINA

2023 6,000KM ELECTRICAL WIRES

2023 2,000KM ELECTRICAL CABLES

JIULONG FACTORY

FOSHAN, GUANGDONG, CHINA

2024 5GW SOLAR MODULES

2024 10GW SOLAR CELLS

HUANGPU FACTORY

ZHONGSHAN, GUANGDONG, CHINA

2022 10GW SOLAR MOUNTING SYSTEMS

WUSHA FACTORY

FOSHAN, GUANGDONG, CHINA

2023 6.4GW SOLAR MODULES

2022 13,800,000 SOLAR MODULE FRAMES

2023 300,000 PORTABLE ENERGY STORAGES

HESHAN FACTORY

JIANGMEN, GUANGDONG, CHINA

2023 6GW SOLAR MODULES

2023 2GW P-TYPE SOLAR CELLS

2023 4GW N-TOPCON SOLAR CELLS

2023 10,350,000 SOLAR MODULE FRAMES

LESSO NEW ENERGY HQ

RAFFLES QUAY, SINGAPORE

INDONESIA FACTORY

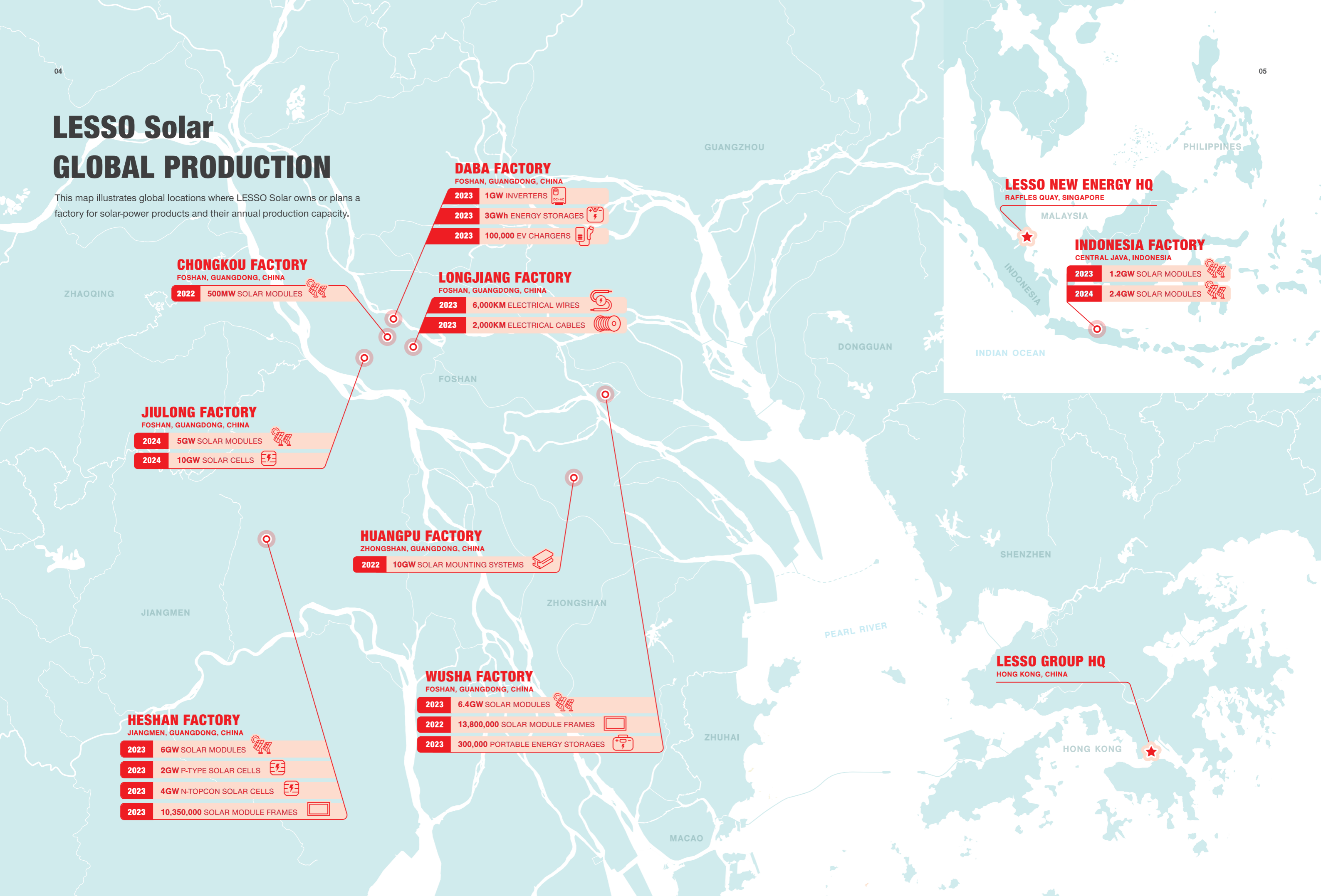
CENTRAL JAVA, INDONESIA

2023 1.2GW SOLAR MODULES

2024 2.4GW SOLAR MODULES

LESSO GROUP HQ







HONG KONG, CHINA

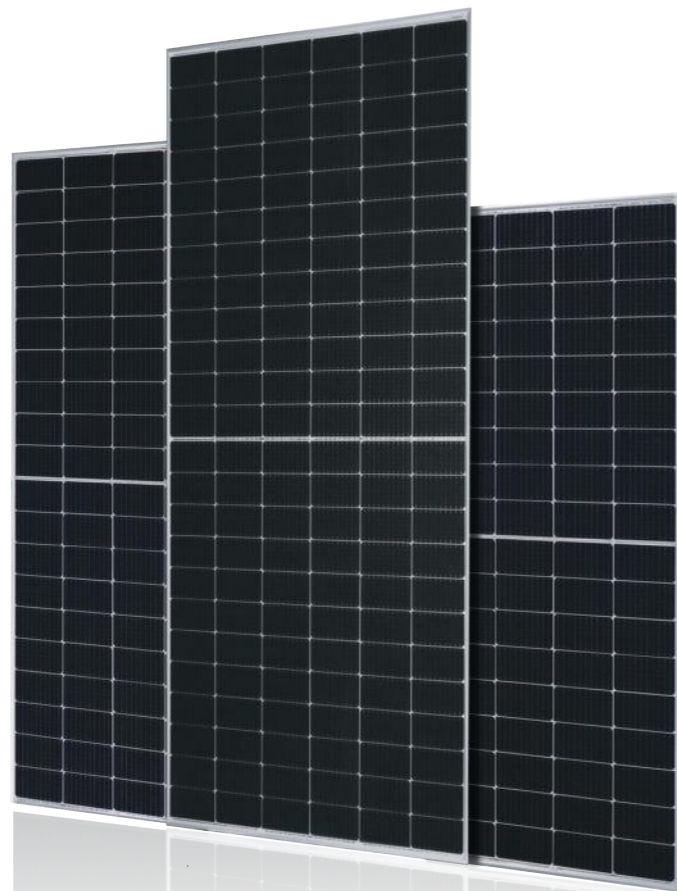


N-TopCon series

Cutting-edge Technology, Leading Innovation

Features and Benefits

- 
10-30% Additional Power Generation
 N-TopCon brings 10-30% additional power generation compared to conventional P-type module.
- 
Better Weak Illumination Response
 Higher power output even under low-light conditions like on cloudy or foggy days.
- 
ZERO LID (Light Induced Degradation)
 N-TopCon solar cell has no LID naturally which can increase power generation.
- 
Better Temperature Coefficient
 Higher power generation under working conditions, thanks to passivating contact cell technology.
- 
Lower LCOE
 Higher bifaciality, higher power output and lower BOS cost.
- 
Wider Applicability
 More application scenes like BIPV, vertical installation, snowfield, high-humid, windy and dusty area.



182 N-TopCon Monofacial Module



Power Range
415W ~ 430W

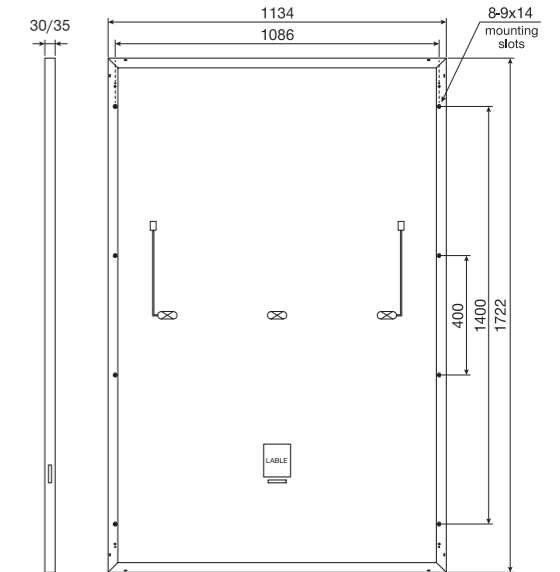


Power Output Tolerance
0W ~ +5W



Maximum Efficiency
22.02%

(Unit: mm)



Electrical Performance Parameters | STC

Model Type	415C(HPM) 54(182)	420C(HPM) 54(182)	425C(HPM) 54(182)	430C(HPM) 54(182)
Nominal Max. Power P _{max} (W)	415	420	425	430
Max. Power Voltage V _{mp} (V)	31.44	31.63	31.82	32.00
Max. Power Current I _{mp} (A)	13.20	13.28	13.36	13.44
Open Circuit Voltage V _{oc} (V)	37.97	38.16	38.35	38.54
Short Circuit Current I _{sc} (A)	13.97	14.05	14.13	14.21
Module Efficiency (%)	21.25	21.51	21.76	22.02
Power Output Tolerance (W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
 * Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	415C(HPM) 54(182)	420C(HPM) 54(182)	425C(HPM) 54(182)	430C(HPM) 54(182)
Nominal Max. Power P _{max} (W)	312	316	320	323
Max. Power Voltage V _{mp} (V)	29.36	29.51	29.69	29.75
Max. Power Current I _{mp} (A)	10.63	10.71	10.78	10.86
Open Circuit Voltage V _{oc} (V)	36.07	36.25	36.43	36.61
Short Circuit Current I _{sc} (A)	11.28	11.35	11.42	11.49

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
 * Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm N-TopCon Mono Cell (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1722×1134×35mm/30mm
Weight	21.7kg(35mm)/20.6kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	806pcs(35mm)/936pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.043%
Temperature Coefficient (V _{oc})	-0.25%
Temperature Coefficient (P _{max})	-0.30%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **1%**

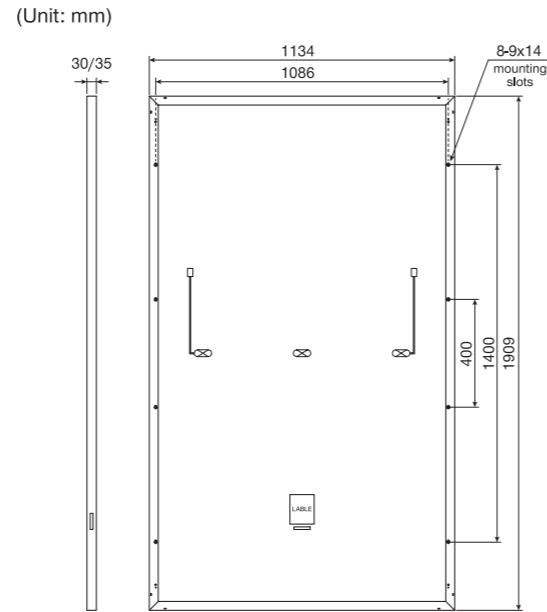
Subsequent annual power degradation no more than **0.40%**

182 N-TopCon Monofacial Module

Power Range
465W ~ 480W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.17%



Electrical Performance Parameters STC					
Model Type		465C(HPM) 60(182)	470C(HPM) 60(182)	475C(HPM) 60(182)	480C(HPM) 60(182)
Nominal Max. Power	P _{max} (W)	465	470	475	480
Max. Power Voltage	V _{mp} (V)	35.02	35.18	35.35	35.51
Max. Power Current	I _{mp} (A)	13.28	13.36	13.44	13.52
Open Circuit Voltage	V _{oc} (V)	42.18	42.34	42.50	42.67
Short Circuit Current	I _{sc} (A)	14.03	14.11	14.19	14.27
Module Efficiency	(%)	21.48	21.71	21.94	22.17
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters NMOT					
Model Type		465C(HPM) 60(182)	470C(HPM) 60(182)	475C(HPM) 60(182)	480C(HPM) 60(182)
Nominal Max. Power	P _{max} (W)	350	354	358	362
Max. Power Voltage	V _{mp} (V)	32.96	33.15	33.34	33.52
Max. Power Current	I _{mp} (A)	10.62	10.68	10.74	10.80
Open Circuit Voltage	V _{oc} (V)	40.13	40.29	40.45	40.61
Short Circuit Current	I _{sc} (A)	11.35	11.42	11.49	11.56

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance	
Solar Cell Type	182mm N-TopCon Mono Cell (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	1909×1134×35mm/30mm
Weight	23.2kg(35mm)/22.1kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 200mm(+), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	744pcs(35mm)/864pcs(30mm)

Temperature Characteristics	
Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.043%
Temperature Coefficient (Voc)	-0.25%
Temperature Coefficient (Pmax)	-0.30%

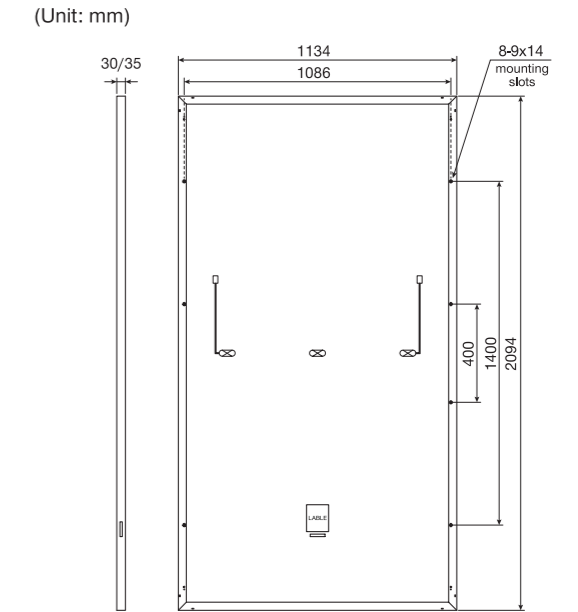
Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

182 N-TopCon Monofacial Module

Power Range
515W ~ 530W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.32%



Electrical Performance Parameters STC					
Model Type		515C(HPM) 66(182)	520C(HPM) 66(182)	525C(HPM) 66(182)	530C(HPM) 66(182)
Nominal Max. Power	P _{max} (W)	515	520	525	530
Max. Power Voltage	V _{mp} (V)	38.55	38.70	38.84	38.98
Max. Power Current	I _{mp} (A)	13.36	13.44	13.52	13.60
Open Circuit Voltage	V _{oc} (V)	46.21	46.26	46.31	46.36
Short Circuit Current	I _{sc} (A)	14.09	14.17	14.25	14.33
Module Efficiency	(%)	21.69	21.90	22.11	22.32
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters NMOT					
Model Type		515C(HPM) 66(182)	520C(HPM) 66(182)	525C(HPM) 66(182)	530C(HPM) 66(182)
Nominal Max. Power	P _{max} (W)	387	391	395	399
Max. Power Voltage	V _{mp} (V)	36.41	36.58	36.75	36.92
Max. Power Current	I _{mp} (A)	10.63	10.69	10.75	10.81
Open Circuit Voltage	V _{oc} (V)	43.87	44.01	44.15	44.29
Short Circuit Current	I _{sc} (A)	11.42	11.49	11.56	11.63

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance	
Solar Cell Type	182mm N-TopCon Mono Cell (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2094×1134×35mm/30mm
Weight	25.1kg(35mm)/23.8kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 200mm(+), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	682pcs(35mm)/792pcs(30mm)

Temperature Characteristics	
Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.043%
Temperature Coefficient (Voc)	-0.25%
Temperature Coefficient (Pmax)	-0.30%

Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **1%**

Subsequent annual power degradation no more than **0.40%**

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **1%**

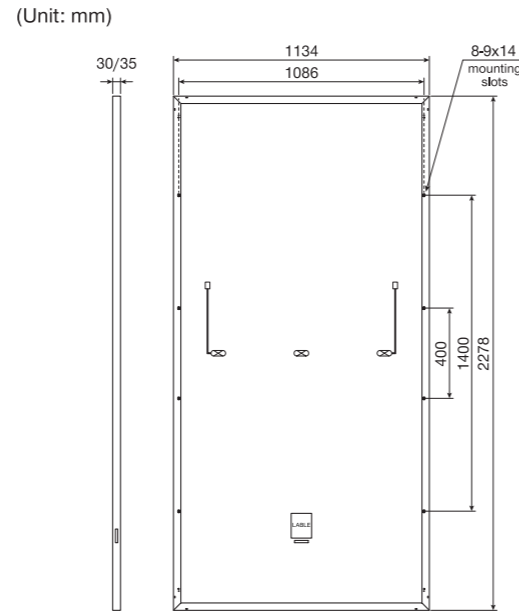
Subsequent annual power degradation no more than **0.40%**

182 N-TopCon Monofacial Module

Power Range
560W ~ 580W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.45%



Electrical Performance Parameters STC		560C(HPM) 72(182)	565C(HPM) 72(182)	570C(HPM) 72(182)	575C(HPM) 72(182)	580C(HPM) 72(182)
Model Type						
Nominal Max. Power	P _{max} (W)	560	565	570	575	580
Max. Power Voltage	V _{mp} (V)	41.92	42.08	42.23	42.38	42.53
Max. Power Current	I _{mp} (A)	13.36	13.43	13.50	13.57	13.64
Open Circuit Voltage	V _{oc} (V)	50.42	50.56	50.70	50.84	50.98
Short Circuit Current	I _{sc} (A)	14.11	14.19	14.27	14.35	14.43
Module Efficiency	(%)	21.68	21.87	22.07	22.26	22.45
Power Output Tolerance	(W)	0~+5W				

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters NMOT		560C(HPM) 72(182)	565C(HPM) 72(182)	570C(HPM) 72(182)	575C(HPM) 72(182)	580C(HPM) 72(182)
Model Type						
Nominal Max. Power	P _{max} (W)	421	425	429	433	437
Max. Power Voltage	V _{mp} (V)	39.42	39.58	39.73	39.84	39.95
Max. Power Current	I _{mp} (A)	10.68	10.74	10.80	10.87	10.94
Open Circuit Voltage	V _{oc} (V)	47.88	48.02	48.16	48.29	48.42
Short Circuit Current	I _{sc} (A)	11.39	11.45	11.51	11.58	11.64

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance	
Solar Cell Type	182mm N-TopCon Mono Cell (Half Cell)
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35mm/30mm
Weight	28.0kg(35mm)/26.3kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 200mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	620pcs(35mm)/720pcs(30mm)

Temperature Characteristics	
Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.043%
Temperature Coefficient (Voc)	-0.25%
Temperature Coefficient (Pmax)	-0.30%

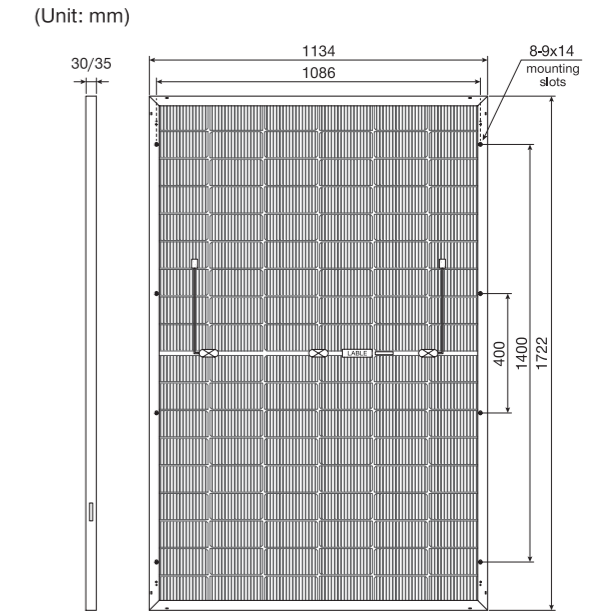
Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

182 N-TopCon Bifacial Module

Power Range
415W ~ 430W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.02%



Electrical Performance Parameters STC		415C(HBD) 54(182)	420C(HBD) 54(182)	425C(HBD) 54(182)	430C(HBD) 54(182)
Model Type					
Nominal Max. Power	P _{max} (W)	415	420	425	430
Max. Power Voltage	V _{mp} (V)	31.18	31.42	31.65	31.88
Max. Power Current	I _{mp} (A)	13.31	13.37	13.43	13.49
Open Circuit Voltage	V _{oc} (V)	36.77	36.97	37.17	37.37
Short Circuit Current	I _{sc} (A)	14.55	14.61	14.67	14.73
Module Efficiency	(%)	21.25	21.51	21.76	22.02
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters NMOT		415C(HBD) 54(182)	420C(HBD) 54(182)	425C(HBD) 54(182)	430C(HBD) 54(182)
Model Type					
Nominal Max. Power	P _{max} (W)	311	315	319	323
Max. Power Voltage	V _{mp} (V)	29.41	29.61	29.82	30.02
Max. Power Current	I _{mp} (A)	10.58	10.64	10.70	10.76
Open Circuit Voltage	V _{oc} (V)	34.30	34.49	34.68	34.87
Short Circuit Current	I _{sc} (A)	11.80	11.85	11.90	11.95

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance	
Solar Cell Type	182mm N-TopCon Mono Cell (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1722×1134×35mm/30mm
Weight	24.1kg(35mm)/23.4kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 200mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	806pcs(35mm)/936pcs(30mm)

Temperature Characteristics	
Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.043%
Temperature Coefficient (Voc)	-0.25%
Temperature Coefficient (Pmax)	-0.30%

Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **1%**

Subsequent annual power degradation no more than **0.40%**

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **1%**

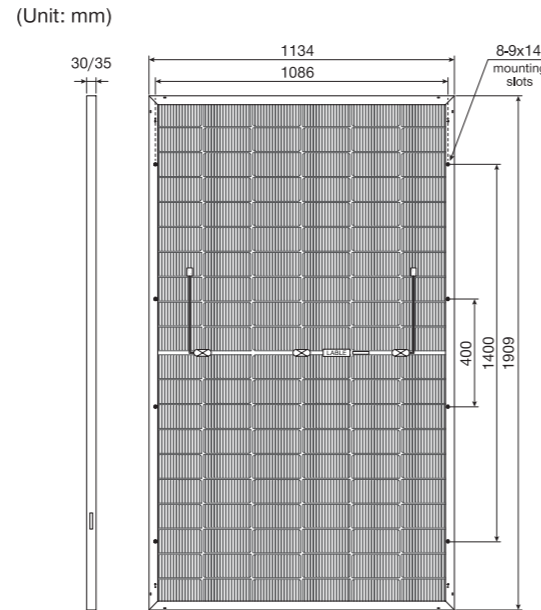
Subsequent annual power degradation no more than **0.40%**

182 N-TopCon Bifacial Module

Power Range
465W ~ 480W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.17%



Electrical Performance Parameters STC					
Model Type		465C(HBD) 60(182)	470C(HBD) 60(182)	475C(HBD) 60(182)	480C(HBD) 60(182)
Nominal Max. Power	P _{max} (W)	465	470	475	480
Max. Power Voltage	V _{mp} (V)	34.84	35.05	35.27	35.48
Max. Power Current	I _{mp} (A)	13.35	13.41	13.47	13.53
Open Circuit Voltage	V _{oc} (V)	41.47	41.67	41.87	42.07
Short Circuit Current	I _{sc} (A)	14.43	14.49	14.55	14.61
Module Efficiency	(%)	21.48	21.71	21.94	22.17
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters NMOT					
Model Type		465C(HBD) 60(182)	470C(HBD) 60(182)	475C(HBD) 60(182)	480C(HBD) 60(182)
Nominal Max. Power	P _{max} (W)	349	353	357	361
Max. Power Voltage	V _{mp} (V)	32.87	33.06	33.25	33.43
Max. Power Current	I _{mp} (A)	10.62	10.68	10.74	10.80
Open Circuit Voltage	V _{oc} (V)	38.96	39.15	39.34	39.53
Short Circuit Current	I _{sc} (A)	11.74	11.79	11.84	11.89

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance	
Solar Cell Type	182mm N-TopCon Mono Cell (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	1909×1134×35mm/30mm
Weight	26.9kg(35mm)/25.7kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 230mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	744pcs(35mm)/864pcs(30mm)

Temperature Characteristics	
Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.043%
Temperature Coefficient (V _{oc})	-0.25%
Temperature Coefficient (P _{max})	-0.30%

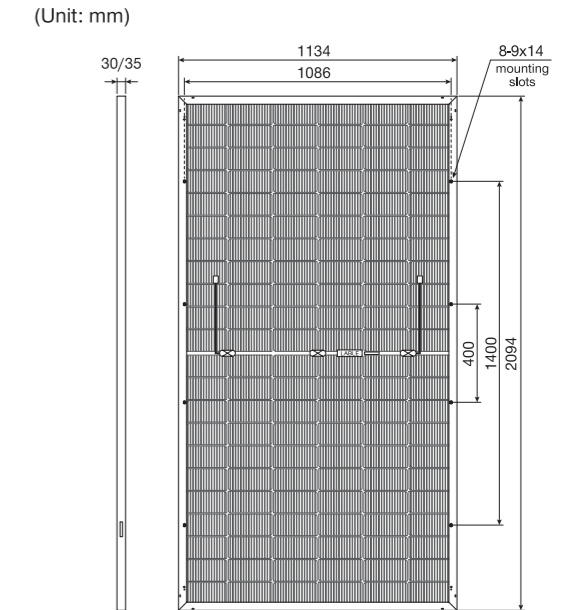
Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

182 N-TopCon Bifacial Module

Power Range
515W ~ 530W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.32%



Electrical Performance Parameters STC					
Model Type		515C(HBD) 66(182)	520C(HBD) 66(182)	525C(HBD) 66(182)	530C(HBD) 66(182)
Nominal Max. Power	P _{max} (W)	515	520	525	530
Max. Power Voltage	V _{mp} (V)	38.50	38.70	38.89	39.09
Max. Power Current	I _{mp} (A)	13.38	13.44	13.50	13.56
Open Circuit Voltage	V _{oc} (V)	46.17	46.37	46.57	46.77
Short Circuit Current	I _{sc} (A)	14.31	14.37	14.43	14.49
Module Efficiency	(%)	21.69	21.90	22.11	22.32
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters NMOT					
Model Type		515C(HBD) 66(182)	520C(HBD) 66(182)	525C(HBD) 66(182)	530C(HBD) 66(182)
Nominal Max. Power	P _{max} (W)	386	390	394	398
Max. Power Voltage	V _{mp} (V)	36.22	36.39	36.55	36.72
Max. Power Current	I _{mp} (A)	10.66	10.72	10.78	10.84
Open Circuit Voltage	V _{oc} (V)	43.62	43.81	44.00	44.19
Short Circuit Current	I _{sc} (A)	11.58	11.63	11.68	11.73

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance	
Solar Cell Type	182mm N-TopCon Mono Cell (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2094×1134×35mm/30mm
Weight	29.6kg(35mm)/28.4kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 230mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	682pcs(35mm)/792pcs(30mm)

Temperature Characteristics	
Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.043%
Temperature Coefficient (V _{oc})	-0.25%
Temperature Coefficient (P _{max})	-0.30%

Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **1%**

Subsequent annual power degradation no more than **0.40%**

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **1%**

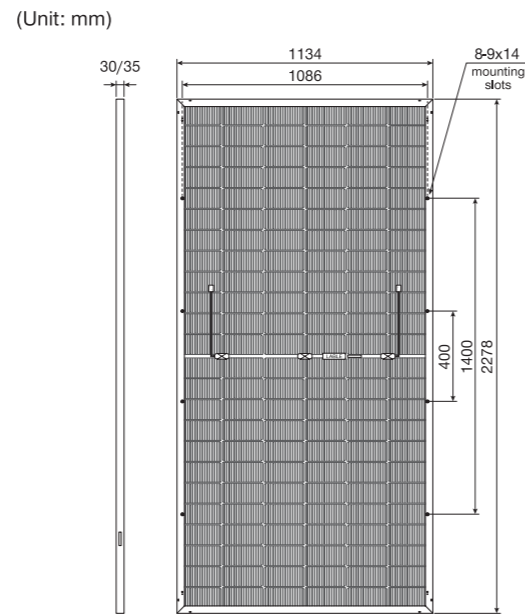
Subsequent annual power degradation no more than **0.40%**

182 N-TopCon Bifacial Module

Power Range
560W ~ 580W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.45%



Electrical Performance Parameters STC		560C(HBD) 72(182)	565C(HBD) 72(182)	570C(HBD) 72(182)	575C(HBD) 72(182)	580C(HBD) 72(182)
Nominal Max. Power	P _{max} (W)	560	565	570	575	580
Max. Power Voltage	V _{mp} (V)	42.11	42.30	42.45	42.60	42.75
Max. Power Current	I _{mp} (A)	13.30	13.36	13.43	13.50	13.57
Open Circuit Voltage	V _{oc} (V)	50.63	50.83	51.03	51.23	51.43
Short Circuit Current	I _{sc} (A)	14.09	14.15	14.21	14.27	14.33
Module Efficiency	(%)	21.68	21.87	22.07	22.26	22.45
Power Output Tolerance	(W)	0~+5W				

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters NMOT		560C(HBD) 72(182)	565C(HBD) 72(182)	570C(HBD) 72(182)	575C(HBD) 72(182)	580C(HBD) 72(182)
Nominal Max. Power	P _{max} (W)	421	425	429	433	437
Max. Power Voltage	V _{mp} (V)	39.57	39.72	39.87	40.02	40.17
Max. Power Current	I _{mp} (A)	10.64	10.70	10.76	10.82	10.88
Open Circuit Voltage	V _{oc} (V)	48.09	48.28	48.47	48.66	48.85
Short Circuit Current	I _{sc} (A)	11.37	11.42	11.46	11.51	11.56

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance	
Solar Cell Type	182mm N-TopCon Mono Cell (Half Cell)
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35mm/30mm
Weight	32.3kg(35mm)/31.2kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait ^{400mm(+)} / _{200mm(-)} , landscape ^{1400mm(+)} / _{1400mm(-)} Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	620pcs(35mm)/720pcs(30mm)







Temperature Characteristics	
Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.043%
Temperature Coefficient (Voc)	-0.25%
Temperature Coefficient (Pmax)	-0.30%

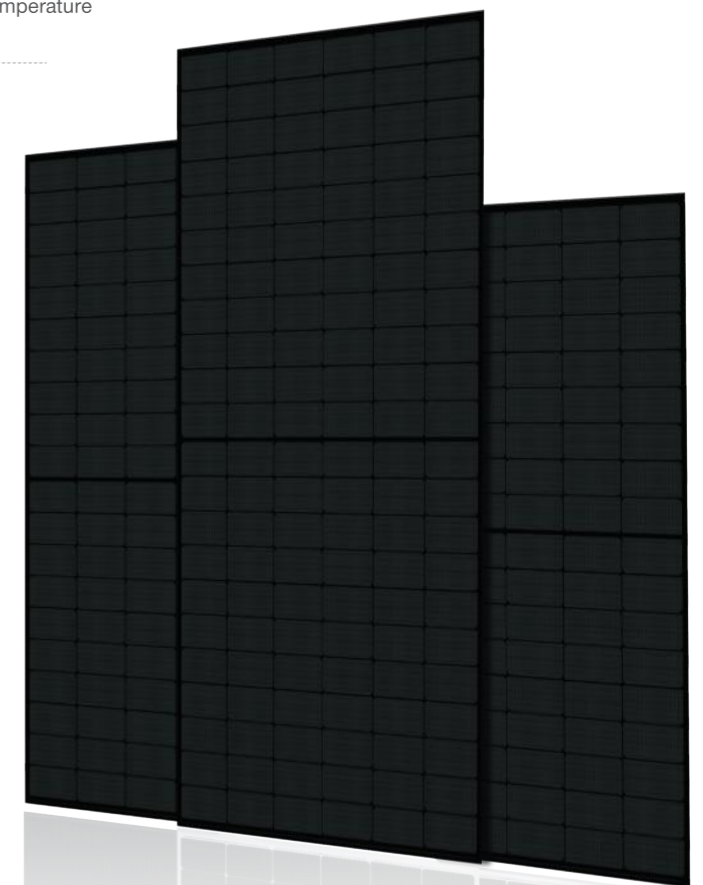
Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

Pure Black series

Aesthetic Design, Darker, Purer, Seamless Integration

Features and Benefits

-  The application of multi-busbar (MBB) half-cut cell technology brings stronger resistance to shade and lower risk of hot spot.
-  Strict control on raw materials and process optimization of high efficiency PERC ensure better resistance against PID of PV module.
-  Through harsh weathering tests of sand, dust, salt mist, ammonia, etc., to get stronger weather resistance of outdoor environment.
-  Lower oxygen and carbon content result in lower LID.
-  By series and parallel design, to reduce the series RS and achieve higher power output and lower BOS cost.
-  Lower temperature coefficient and lower operating temperature can ensure higher power generation.



12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **1%**

Subsequent annual power degradation no more than **0.40%**

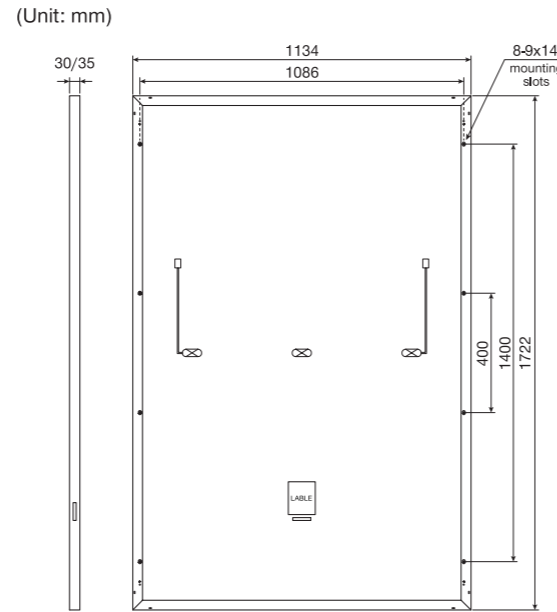
*Customizable with 15 days lead time

182 Pure Black P-type Monofacial Module

Power Range
395W ~ 405W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
20.74%



Electrical Performance Parameters | STC

Model Type	395D(BPM) 54(182)	400D(BPM) 54(182)	405D(BPM) 54(182)	
Nominal Max. Power	P _{max} (W)	395	400	405
Max. Power Voltage	V _{mp} (V)	30.82	31.02	31.22
Max. Power Current	I _{mp} (A)	12.82	12.90	12.98
Open Circuit Voltage	V _{oc} (V)	36.70	36.90	37.10
Short Circuit Current	I _{sc} (A)	13.60	13.65	13.70
Module Efficiency	(%)	20.23	20.48	20.74
Power Output Tolerance	(W)	0~+5W		

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	395D(BPM) 54(182)	400D(BPM) 54(182)	405D(BPM) 54(182)	
Nominal Max. Power	P _{max} (W)	275	280	285
Max. Power Voltage	V _{mp} (V)	27.02	27.30	27.62
Max. Power Current	I _{mp} (A)	10.18	10.26	10.32
Open Circuit Voltage	V _{oc} (V)	34.20	34.40	34.60
Short Circuit Current	I _{sc} (A)	11.19	11.39	11.59

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1722×1134×35mm/30mm
Weight	21.7kg(35mm)/20.6kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(+) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	806pcs(35mm)/936pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.048%
Temperature Coefficient (Voc)	-0.26%
Temperature Coefficient (Pmax)	-0.34%

Maximum Parameters

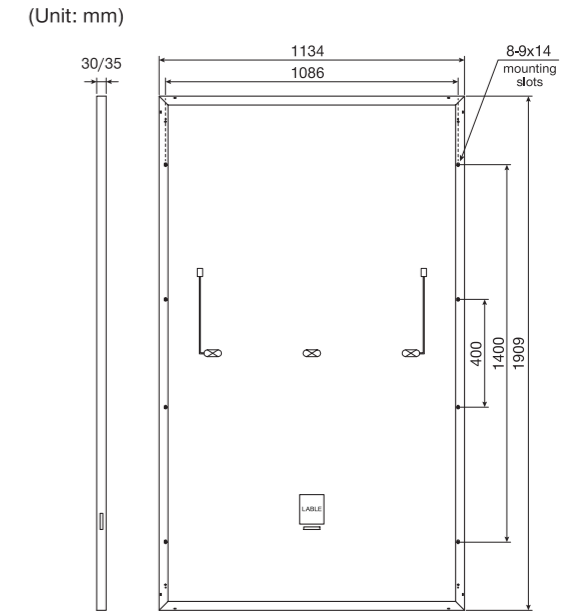
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

182 Pure Black P-type Monofacial Module

Power Range
440W ~ 450W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
20.79%



Electrical Performance Parameters | STC

Model Type	440D(BPM) 60(182)	445D(BPM) 60(182)	450D(BPM) 60(182)	
Nominal Max. Power	P _{max} (W)	440	445	450
Max. Power Voltage	V _{mp} (V)	34.22	34.42	34.62
Max. Power Current	I _{mp} (A)	12.86	12.93	13.00
Open Circuit Voltage	V _{oc} (V)	40.98	41.18	41.38
Short Circuit Current	I _{sc} (A)	13.60	13.66	13.72
Module Efficiency	(%)	20.33	20.56	20.79
Power Output Tolerance	(W)	0~+5W		

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	440D(BPM) 60(182)	445D(BPM) 60(182)	450D(BPM) 60(182)	
Nominal Max. Power	P _{max} (W)	320	325	330
Max. Power Voltage	V _{mp} (V)	31.24	31.44	31.64
Max. Power Current	I _{mp} (A)	10.25	10.34	10.43
Open Circuit Voltage	V _{oc} (V)	38.48	38.68	38.88
Short Circuit Current	I _{sc} (A)	10.77	10.97	11.17

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	1909×1134×35mm/30mm
Weight	23.2kg(35mm)/22.1kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(+) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	744pcs(35mm)/864pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.048%
Temperature Coefficient (Voc)	-0.26%
Temperature Coefficient (Pmax)	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.55%**

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

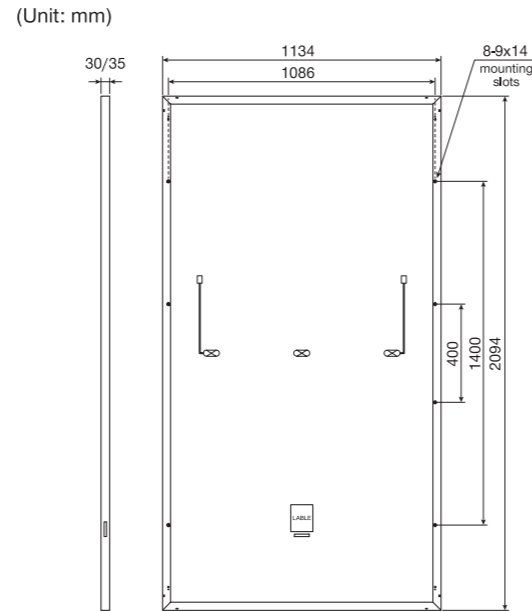
Subsequent annual power degradation no more than **0.55%**

182 Pure Black P-type Monofacial Module

Power Range
485W ~ 495W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
20.85%



Electrical Performance Parameters | STC

Model Type	485D(BPM) 66(182)	490D(BPM) 66(182)	495D(BPM) 66(182)
Nominal Max. Power	P _{max} (W) 485	490	495
Max. Power Voltage	V _{mp} (V) 37.62	37.82	38.02
Max. Power Current	I _{mp} (A) 12.90	12.96	13.02
Open Circuit Voltage	V _{oc} (V) 45.58	45.78	45.98
Short Circuit Current	I _{sc} (A) 13.57	13.62	13.67
Module Efficiency	(%) 20.42	20.64	20.85
Power Output Tolerance	(W)	0~+5W	

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	485D(BPM) 66(182)	490D(BPM) 66(182)	495D(BPM) 66(182)
Nominal Max. Power	P _{max} (W) 365	370	375
Max. Power Voltage	V _{mp} (V) 34.64	34.84	35.04
Max. Power Current	I _{mp} (A) 10.54	10.62	10.71
Open Circuit Voltage	V _{oc} (V) 42.93	42.98	43.03
Short Circuit Current	I _{sc} (A) 10.72	10.92	11.12

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2094×1134×35mm/30mm
Weight	25.1kg(35mm)/23.8kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	682pcs(35mm)/792pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

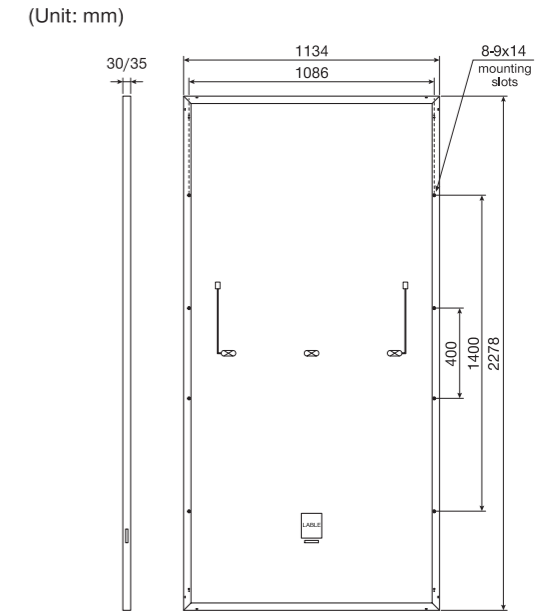
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

182 Pure Black P-type Monofacial Module

Power Range
525W ~ 545W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.1%



Electrical Performance Parameters | STC

Model Type	525D(BPM) 72(182)	530D(BPM) 72(182)	535D(BPM) 72(182)	540D(BPM) 72(182)	545D(BPM) 72(182)
Nominal Max. Power	P _{max} (W) 525	530	535	540	545
Max. Power Voltage	V _{mp} (V) 40.82	41.04	41.24	41.44	41.64
Max. Power Current	I _{mp} (A) 12.87	12.92	12.98	13.04	13.09
Open Circuit Voltage	V _{oc} (V) 49.98	50.18	50.38	50.58	50.78
Short Circuit Current	I _{sc} (A) 13.54	13.59	13.64	13.69	13.74
Module Efficiency	(%) 20.32	20.52	20.71	20.90	21.10
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	525D(BPM) 72(182)	530D(BPM) 72(182)	535D(BPM) 72(182)	540D(BPM) 72(182)	545D(BPM) 72(182)
Nominal Max. Power	P _{max} (W) 390	395	400	405	410
Max. Power Voltage	V _{mp} (V) 37.84	38.04	38.24	38.44	38.64
Max. Power Current	I _{mp} (A) 10.31	10.39	10.47	10.54	10.62
Open Circuit Voltage	V _{oc} (V) 47.48	47.68	47.88	48.08	48.28
Short Circuit Current	I _{sc} (A) 10.92	10.97	11.02	11.07	11.12

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35mm/30mm
Weight	28.0kg(35mm)/26.3kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	620pcs(35mm)/720pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.55%**

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

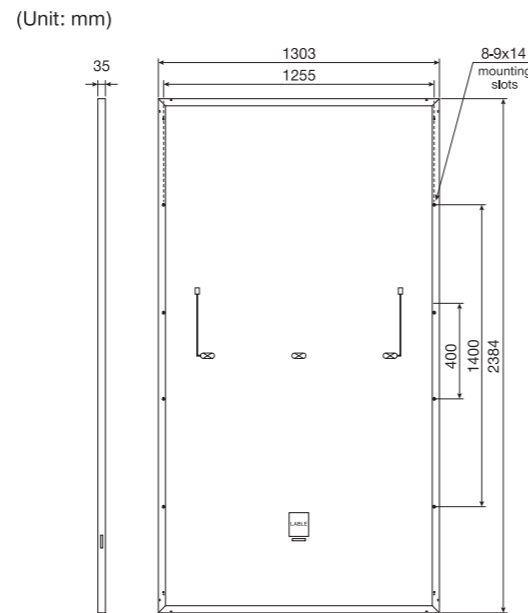
Subsequent annual power degradation no more than **0.55%**

210 Pure Black P-type Monofacial Module

Power Range
635W ~ 660W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.25%



Electrical Performance Parameters | STC

Model Type		635D(BPM) 66(210)	640D(BPM) 66(210)	645D(BPM) 66(210)	650D(BPM) 66(210)	655D(BPM) 66(210)	660D(BPM) 66(210)
Nominal Max. Power	P _{max} (W)	635	640	645	650	655	660
Max. Power Voltage	V _{mp} (V)	36.85	37.05	37.25	37.45	37.65	37.85
Max. Power Current	I _{mp} (A)	17.24	17.28	17.32	17.36	17.40	17.44
Open Circuit Voltage	V _{oc} (V)	45.12	45.32	45.52	45.72	45.92	46.12
Short Circuit Current	I _{sc} (A)	18.18	18.22	18.26	18.30	18.34	18.40
Module Efficiency	(%)	20.44	20.60	20.76	20.92	21.09	21.25
Power Output Tolerance	(W)	0~+5W					

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type		635D(BPM) 66(210)	640D(BPM) 66(210)	645D(BPM) 66(210)	650D(BPM) 66(210)	655D(BPM) 66(210)	660D(BPM) 66(210)
Nominal Max. Power	P _{max} (W)	477	481	485	489	493	497
Max. Power Voltage	V _{mp} (V)	34.20	34.40	34.60	34.80	35.00	35.20
Max. Power Current	I _{mp} (A)	13.97	14.00	14.03	14.06	14.09	14.12
Open Circuit Voltage	V _{oc} (V)	42.20	42.40	42.60	42.80	43.00	43.20
Short Circuit Current	I _{sc} (A)	14.10	14.76	14.80	14.84	14.88	15.00

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2384×1303×35mm
Weight	33.8kg
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 200mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	558pcs

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.048%
Temperature Coefficient (Voc)	-0.26%
Temperature Coefficient (Pmax)	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

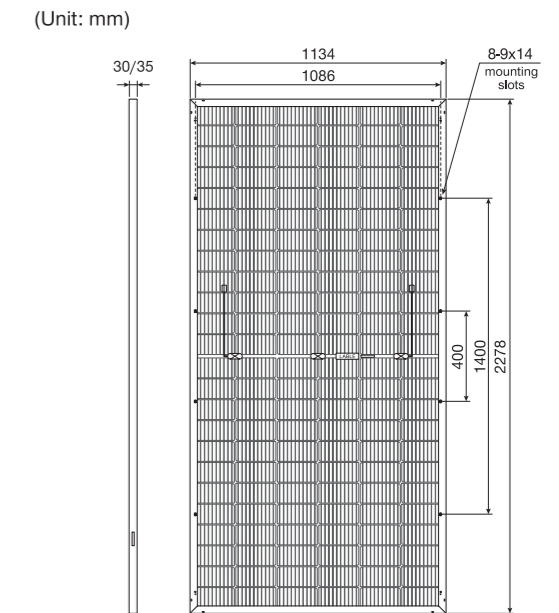
182 Pure Black P-type Bifacial Module

Power Range
530W ~ 555W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.48%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type		530D(HBD) 72(182)	535D(HBD) 72(182)	540D(HBD) 72(182)	545D(HBD) 72(182)	550D(HBD) 72(182)	555D(HBD) 72(182)
Nominal Max. Power	P _{max} (W)	530	535	540	545	550	555
Max. Power Voltage	V _{mp} (V)	41.29	41.45	41.61	41.77	41.93	42.08
Max. Power Current	I _{mp} (A)	12.84	12.91	12.98	13.05	13.12	13.19
Open Circuit Voltage	V _{oc} (V)	49.30	49.40	49.52	49.64	49.78	49.93
Short Circuit Current	I _{sc} (A)	13.73	13.80	13.87	13.94	14.01	14.07
Module Efficiency	(%)	20.52	20.71	20.90	21.10	21.29	21.48
Power Output Tolerance	(W)	0~+5W					

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type		530D(HBD) 72(182)	535D(HBD) 72(182)	540D(HBD) 72(182)	545D(HBD) 72(182)	550D(HBD) 72(182)	555D(HBD) 72(182)
Nominal Max. Power	P _{max} (W)	402	405	408	411	414	417
Max. Power Voltage	V _{mp} (V)	38.65	38.78	38.88	39.00	39.13	39.26
Max. Power Current	I _{mp} (A)	10.38	10.42	10.47	10.52	10.57	10.63
Open Circuit Voltage	V _{oc} (V)	47.00	47.18	47.37	47.56	47.75	47.94
Short Circuit Current	I _{sc} (A)	11.10	11.15	11.21	11.26	11.31	11.36

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35mm/30mm
Weight	32.3kg(35mm)/31.2kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 200mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	620pcs(35mm)/720pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.048%
Temperature Coefficient (Voc)	-0.26%
Temperature Coefficient (Pmax)	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.55%**

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

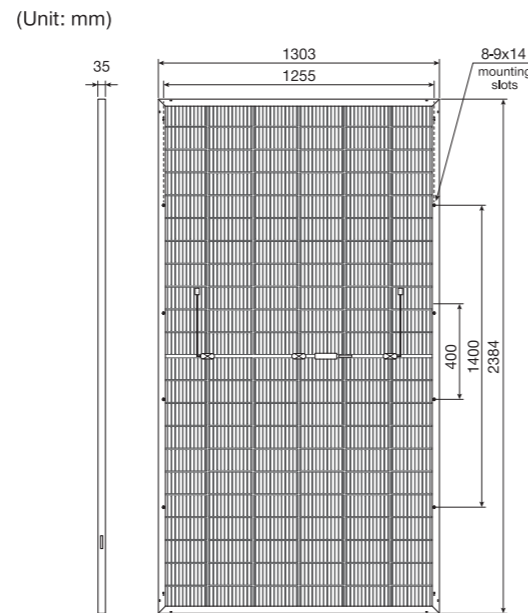
210 Pure Black P-type Bifacial Module

Power Range
645W ~ 665W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.41%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type	645D(HBD) 66(210)	650D(HBD) 66(210)	655D(HBD) 66(210)	660D(HBD) 66(210)	665D(HBD) 66(210)
Nominal Max. Power P _{max} (W)	645	650	655	660	665
Max. Power Voltage V _{mp} (V)	37.43	37.63	37.83	38.03	38.23
Max. Power Current I _{mp} (A)	17.24	17.28	17.32	17.36	17.40
Open Circuit Voltage V _{oc} (V)	45.40	45.60	45.80	46.00	46.20
Short Circuit Current I _{sc} (A)	18.30	18.34	18.38	18.42	18.46
Module Efficiency (%)	20.76	20.92	21.09	21.25	21.41
Power Output Tolerance (W)	0~+5W				

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	645D(HBD) 66(210)	650D(HBD) 66(210)	655D(HBD) 66(210)	660D(HBD) 66(210)	665D(HBD) 66(210)
Nominal Max. Power P _{max} (W)	488	492	496	500	504
Max. Power Voltage V _{mp} (V)	34.84	35.04	35.22	35.42	35.62
Max. Power Current I _{mp} (A)	14.02	14.06	14.08	14.12	14.16
Open Circuit Voltage V _{oc} (V)	42.80	43.00	43.20	43.40	43.60
Short Circuit Current I _{sc} (A)	14.74	14.78	14.82	14.86	14.90

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2384×1303×35mm
Weight	38.2kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 230mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	558pcs

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

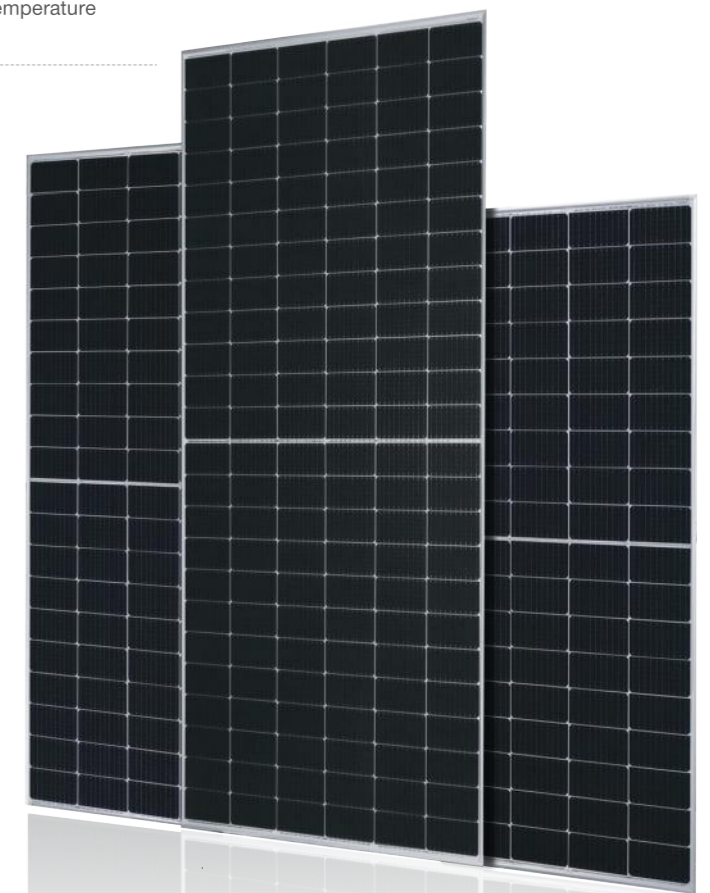
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

P-type series

Hardcore Energy, Reliable Technology

Features and Benefits

- The application of multi-busbar (MBB) half-cut cell technology brings stronger resistance to shade and lower risk of hot spot.
- Strict control on raw materials and process optimization of high efficiency PERC ensure better resistance against PID of PV module.
- Through harsh weathering tests of sand, dust, salt mist, ammonia, etc., to get stronger weather resistance of outdoor environment.
- Lower oxygen and carbon content result in lower LID.
- By series and parallel design, to reduce the series RS and achieve higher power output and lower BOS cost.
- Lower temperature coefficient and lower operating temperature can ensure higher power generation.



12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

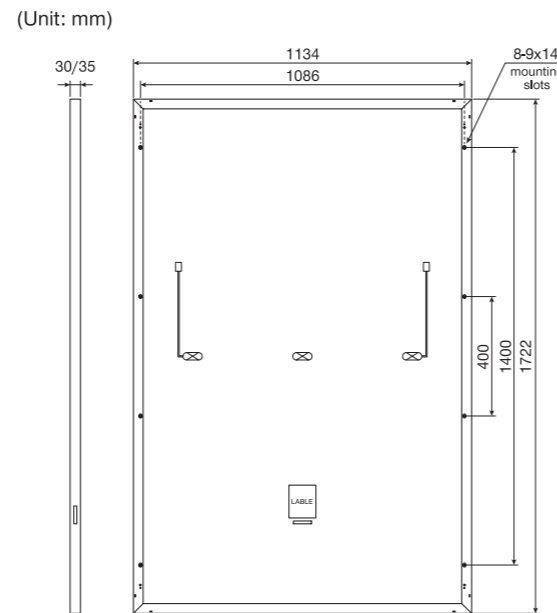
182 P-type Monofacial Module

Power Range
395W ~ 410W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21%

*Customizable with Black Frame.



Electrical Performance Parameters | STC

Model Type	395D(HPM) 54(182)	400D(HPM) 54(182)	405D(HPM) 54(182)	410D(HPM) 54(182)	
Nominal Max. Power	P _{max} (W)	395	400	405	410
Max. Power Voltage	V _{mp} (V)	30.75	30.95	31.15	31.35
Max. Power Current	I _{mp} (A)	12.85	12.93	13.01	13.09
Open Circuit Voltage	V _{oc} (V)	36.77	36.97	37.17	37.37
Short Circuit Current	I _{sc} (A)	13.71	13.79	13.87	13.95
Module Efficiency	(%)	20.23	20.48	20.74	21.00
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	395D(HPM) 54(182)	400D(HPM) 54(182)	405D(HPM) 54(182)	410D(HPM) 54(182)	
Nominal Max. Power	P _{max} (W)	290	295	300	305
Max. Power Voltage	V _{mp} (V)	27.64	28.00	28.38	28.72
Max. Power Current	I _{mp} (A)	10.50	10.54	10.58	10.62
Open Circuit Voltage	V _{oc} (V)	34.68	34.83	34.98	35.13
Short Circuit Current	I _{sc} (A)	10.94	11.07	11.19	11.24

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1722×1134×35mm/30mm
Weight	21.7kg(35mm)/20.6kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy(White/Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait ^{400mm(+)} / _{200mm(-)} , landscape ^{1400mm(+)} / _{1400mm(-)} Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	806pcs(35mm)/936pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.048%
Temperature Coefficient (Voc)	-0.26%
Temperature Coefficient (Pmax)	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

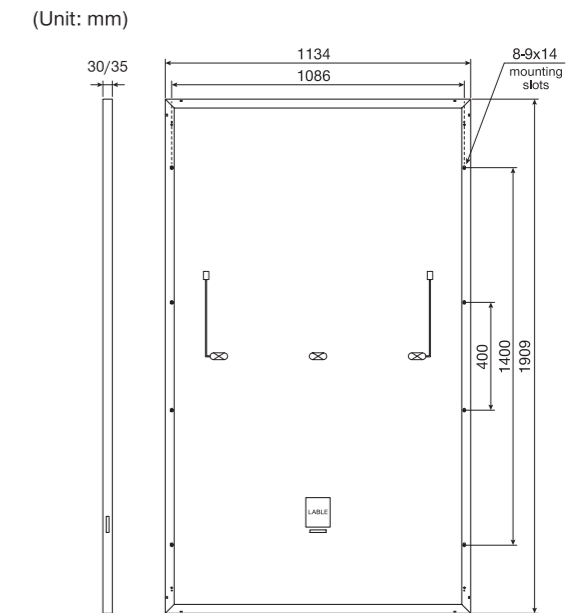
182 P-type Monofacial Module

Power Range
440W ~ 455W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.02%

*Customizable with Black Frame.



Electrical Performance Parameters | STC

Model Type	440D(HPM) 60(182)	445D(HPM) 60(182)	450D(HPM) 60(182)	455D(HPM) 60(182)	
Nominal Max. Power	P _{max} (W)	440	445	450	455
Max. Power Voltage	V _{mp} (V)	34.13	34.33	34.53	34.73
Max. Power Current	I _{mp} (A)	12.90	12.97	13.04	13.11
Open Circuit Voltage	V _{oc} (V)	40.92	41.12	41.32	41.52
Short Circuit Current	I _{sc} (A)	13.76	13.83	13.90	13.97
Module Efficiency	(%)	20.33	20.56	20.79	21.02
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	440D(HPM) 60(182)	445D(HPM) 60(182)	450D(HPM) 60(182)	455D(HPM) 60(182)	
Nominal Max. Power	P _{max} (W)	320	325	330	335
Max. Power Voltage	V _{mp} (V)	30.77	31.08	31.37	31.67
Max. Power Current	I _{mp} (A)	10.40	10.46	10.52	10.58
Open Circuit Voltage	V _{oc} (V)	38.72	38.79	38.87	39.01
Short Circuit Current	I _{sc} (A)	10.64	10.69	10.74	10.79

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	1909×1134×35mm/30mm
Weight	23.2kg(35mm)/22.1kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy(White/Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait ^{400mm(+)} / _{200mm(-)} , landscape ^{1400mm(+)} / _{1400mm(-)} Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	744pcs(35mm)/864pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.048%
Temperature Coefficient (Voc)	-0.26%
Temperature Coefficient (Pmax)	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.55%**

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.55%**

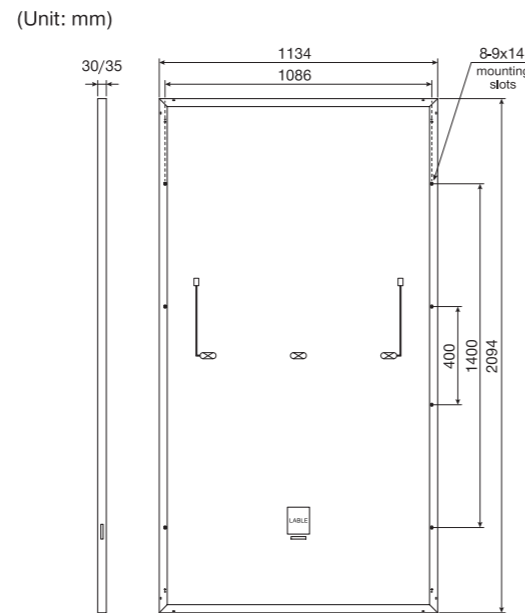
182 P-type Monofacial Module

Power Range
485W ~ 500W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.06%

*Customizable with Black Frame.



Electrical Performance Parameters | STC

Model Type	485D(HPM) 66(182)	490D(HPM) 66(182)	495D(HPM) 66(182)	500D(HPM) 66(182)
Nominal Max. Power P _{max} (W)	485	490	495	500
Max. Power Voltage V _{mp} (V)	37.80	38.00	38.20	38.40
Max. Power Current I _{mp} (A)	12.84	12.90	12.96	13.03
Open Circuit Voltage V _{oc} (V)	44.87	45.07	45.27	45.47
Short Circuit Current I _{sc} (A)	13.70	13.77	13.83	13.89
Module Efficiency (%)	20.42	20.64	20.85	21.06
Power Output Tolerance (W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	485D(HPM) 66(182)	490D(HPM) 66(182)	495D(HPM) 66(182)	500D(HPM) 66(182)
Nominal Max. Power P _{max} (W)	365	370	375	380
Max. Power Voltage V _{mp} (V)	34.80	34.97	35.34	35.51
Max. Power Current I _{mp} (A)	10.50	10.60	10.62	10.71
Open Circuit Voltage V _{oc} (V)	42.31	42.45	42.70	42.87
Short Circuit Current I _{sc} (A)	11.07	11.13	11.23	11.30

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2094×1134×35mm/30mm
Weight	25.1kg(35mm)/23.8kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy(White/Black)
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	682pcs(35mm)/792pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

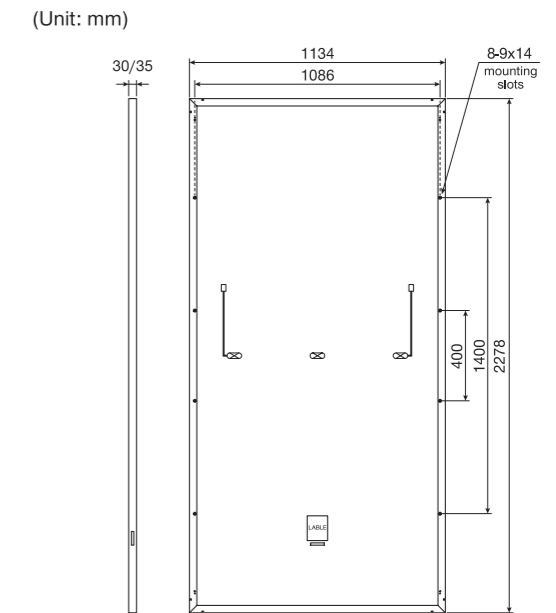
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

182 P-type Monofacial Module

Power Range
525W ~ 550W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.29%



Electrical Performance Parameters | STC

Model Type	525D(HPM) 72(182)	530D(HPM) 72(182)	535D(HPM) 72(182)	540D(HPM) 72(182)	545D(HPM) 72(182)	550D(HPM) 72(182)
Nominal Max. Power P _{max} (W)	525	530	535	540	545	550
Max. Power Voltage V _{mp} (V)	41.00	41.20	41.40	41.60	41.80	42.00
Max. Power Current I _{mp} (A)	12.81	12.87	12.92	12.98	13.04	13.10
Open Circuit Voltage V _{oc} (V)	48.82	49.02	49.22	49.42	49.62	49.82
Short Circuit Current I _{sc} (A)	13.68	13.74	13.79	13.85	13.91	13.97
Module Efficiency (%)	20.32	20.52	20.71	20.90	21.10	21.29
Power Output Tolerance (W)	0~+5W					

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	525D(HPM) 72(182)	530D(HPM) 72(182)	535D(HPM) 72(182)	540D(HPM) 72(182)	545D(HPM) 72(182)	550D(HPM) 72(182)
Nominal Max. Power P _{max} (W)	390	394	398	402	405	409
Max. Power Voltage V _{mp} (V)	37.57	37.74	37.91	38.08	38.25	38.42
Max. Power Current I _{mp} (A)	10.40	10.45	10.50	10.55	10.60	10.65
Open Circuit Voltage V _{oc} (V)	46.44	46.51	46.57	46.65	46.72	46.84
Short Circuit Current I _{sc} (A)	11.03	11.10	11.14	11.19	11.26	11.33

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35mm/30mm
Weight	28.0kg(35mm)/26.3kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	620pcs(35mm)/720pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.55%**

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

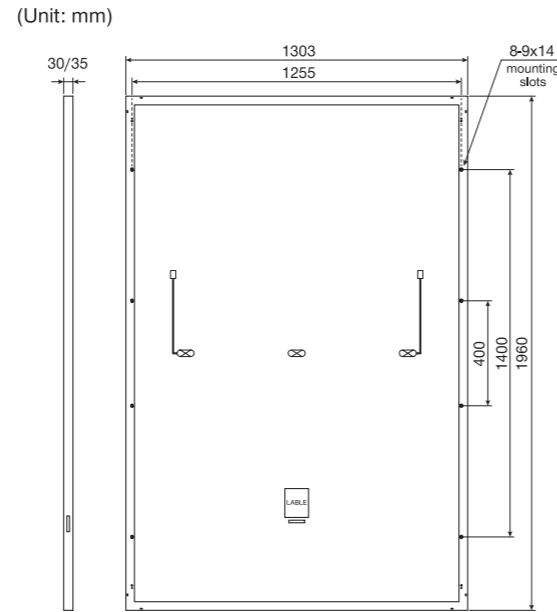
Subsequent annual power degradation no more than **0.55%**

210 P-type Monofacial Module

Power Range
525W ~ 540W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.14%



Electrical Performance Parameters | STC

Model Type	525D(HPM) 54(210)	530D(HPM) 54(210)	535D(HPM) 54(210)	540D(HPM) 54(210)
Nominal Max. Power P _{max} (W)	525	530	535	540
Max. Power Voltage V _{mp} (V)	30.10	30.30	30.50	30.70
Max. Power Current I _{mp} (A)	17.45	17.50	17.55	17.60
Open Circuit Voltage V _{oc} (V)	36.80	37.20	37.60	37.80
Short Circuit Current I _{sc} (A)	18.34	18.38	18.42	18.46
Module Efficiency (%)	20.56	20.75	20.95	21.14
Power Output Tolerance (W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	525D(HPM) 54(210)	530D(HPM) 54(210)	535D(HPM) 54(210)	540D(HPM) 54(210)
Nominal Max. Power P _{max} (W)	398	402	406	410
Max. Power Voltage V _{mp} (V)	28.33	28.54	28.74	28.94
Max. Power Current I _{mp} (A)	14.05	14.09	14.13	14.17
Open Circuit Voltage V _{oc} (V)	34.40	34.60	34.80	35.00
Short Circuit Current I _{sc} (A)	14.80	14.84	14.88	14.92

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1960×1303×35mm/30mm
Weight	28.4kg(35mm)/27.3kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 200mm(+), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	558pcs(35mm)/648pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

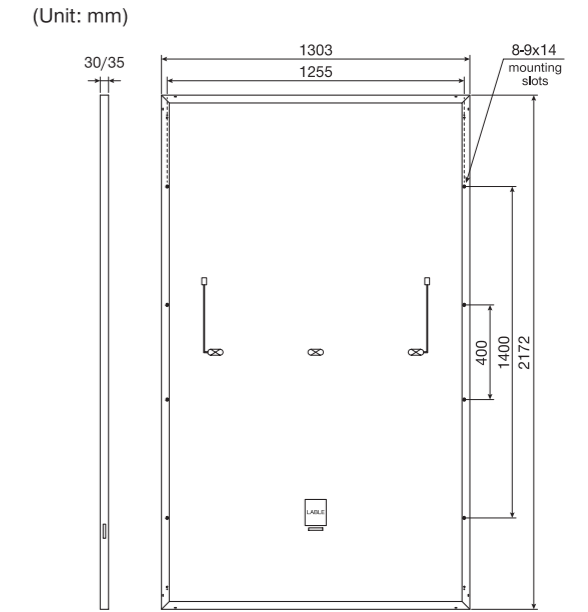
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

210 P-type Monofacial Module

Power Range
585W ~ 600W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.2%



Electrical Performance Parameters | STC

Model Type	585D(HPM) 60(210)	590D(HPM) 60(210)	595D(HPM) 60(210)	600D(HPM) 60(210)
Nominal Max. Power P _{max} (W)	585	590	595	600
Max. Power Voltage V _{mp} (V)	33.70	33.90	34.10	34.30
Max. Power Current I _{mp} (A)	17.36	17.41	17.45	17.50
Open Circuit Voltage V _{oc} (V)	40.80	41.00	41.20	41.40
Short Circuit Current I _{sc} (A)	18.36	18.40	18.44	18.48
Module Efficiency (%)	20.67	20.85	21.02	21.20
Power Output Tolerance (W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	585D(HPM) 60(210)	590D(HPM) 60(210)	595D(HPM) 60(210)	600D(HPM) 60(210)
Nominal Max. Power P _{max} (W)	443	447	451	454
Max. Power Voltage V _{mp} (V)	31.54	31.73	31.92	32.02
Max. Power Current I _{mp} (A)	14.05	14.09	14.13	14.18
Open Circuit Voltage V _{oc} (V)	38.50	38.70	38.90	39.10
Short Circuit Current I _{sc} (A)	14.81	14.85	14.89	14.93

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	2172×1303×35mm/30mm
Weight	31.2kg(35mm)/29.8kg(30mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 200mm(+), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	558pcs(35mm)/648pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.55%**

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

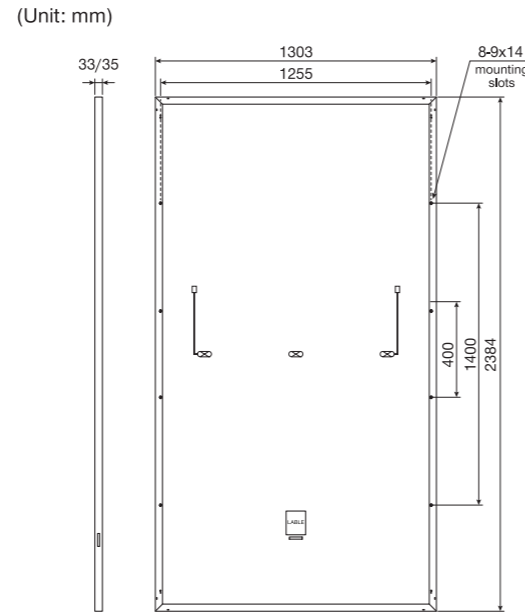
Subsequent annual power degradation no more than **0.55%**

210 P-type Monofacial Module

Power Range
645W ~ 665W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.41%



Electrical Performance Parameters | STC

Model Type		645D(HPM) 66(210)	650D(HPM) 66(210)	655D(HPM) 66(210)	660D(HPM) 66(210)	665D(HPM) 66(210)
Nominal Max. Power	P _{max} (W)	645	650	655	660	665
Max. Power Voltage	V _{mp} (V)	37.30	37.50	37.70	37.90	38.10
Max. Power Current	I _{mp} (A)	17.30	17.34	17.38	17.42	17.46
Open Circuit Voltage	V _{oc} (V)	45.00	45.20	45.40	45.60	45.80
Short Circuit Current	I _{sc} (A)	18.38	18.42	18.46	18.50	18.54
Module Efficiency	(%)	20.76	20.92	21.09	21.25	21.41
Power Output Tolerance	(W)	0~+5W				

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type		645D(HPM) 66(210)	650D(HPM) 66(210)	655D(HPM) 66(210)	660D(HPM) 66(210)	665D(HPM) 66(210)
Nominal Max. Power	P _{max} (W)	488	492	496	500	504
Max. Power Voltage	V _{mp} (V)	34.74	34.92	35.04	35.28	35.48
Max. Power Current	I _{mp} (A)	14.05	14.09	14.13	14.18	14.21
Open Circuit Voltage	V _{oc} (V)	42.50	42.70	42.90	43.10	43.20
Short Circuit Current	I _{sc} (A)	14.82	14.86	14.90	14.94	14.98

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2384×1303×35mm/33mm
Weight	33.8kg(35mm)/33.3kg(33mm)
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/33pcs(33mm)
Per Container(40'HQ)	558pcs(35mm)/594pcs(33mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.048%
Temperature Coefficient (Voc)	-0.26%
Temperature Coefficient (Pmax)	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

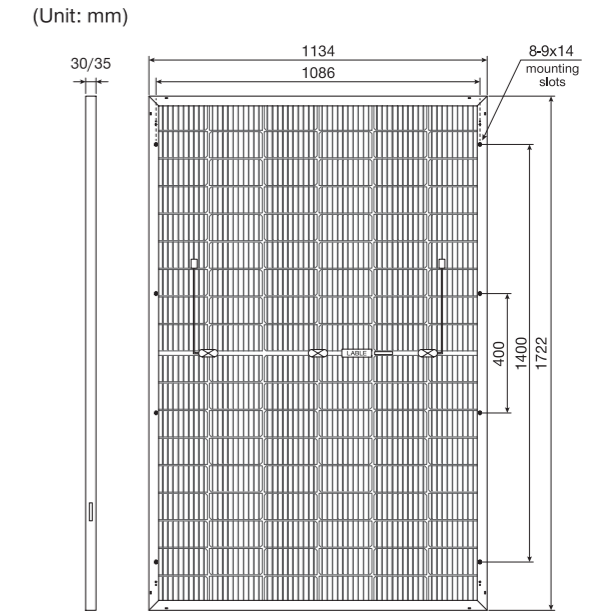
182 P-type Bifacial Module

Power Range
400W ~ 415W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.25%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type		400D(HBD) 54(182)	405D(HBD) 54(182)	410D(HBD) 54(182)	415D(HBD) 54(182)
Nominal Max. Power	P _{max} (W)	400	405	410	415
Max. Power Voltage	V _{mp} (V)	31.13	31.35	31.57	31.79
Max. Power Current	I _{mp} (A)	12.85	12.92	12.99	13.06
Open Circuit Voltage	V _{oc} (V)	36.96	37.08	37.20	37.34
Short Circuit Current	I _{sc} (A)	13.74	13.81	13.88	13.95
Module Efficiency	(%)	20.48	20.74	21.00	21.25
Power Output Tolerance	(W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type		400D(HBD) 54(182)	405D(HBD) 54(182)	410D(HBD) 54(182)	415D(HBD) 54(182)
Nominal Max. Power	P _{max} (W)	275	282	287	292
Max. Power Voltage	V _{mp} (V)	26.55	27.12	27.50	27.87
Max. Power Current	I _{mp} (A)	10.36	10.40	10.44	10.48
Open Circuit Voltage	V _{oc} (V)	34.62	34.74	34.86	35.00
Short Circuit Current	I _{sc} (A)	11.09	11.15	11.20	11.26

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1722×1134×35mm/30mm
Weight	24.1kg(35mm)/23.4kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), landscape 1400mm(+) 200mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	806pcs(35mm)/936pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (Isc)	+0.048%
Temperature Coefficient (Voc)	-0.26%
Temperature Coefficient (Pmax)	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

25 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.55%**

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

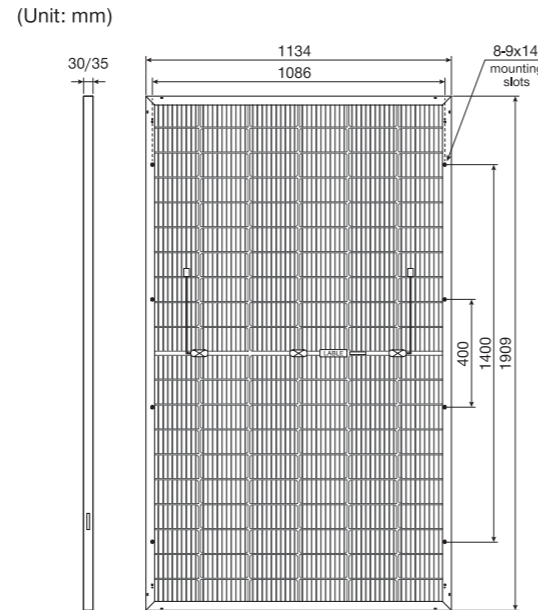
182 P-type Bifacial Module

Power Range
445W ~ 460W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.25%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type	445D(HBD) 60(182)	450D(HBD) 60(182)	455D(HBD) 60(182)	460D(HBD) 60(182)
Nominal Max. Power P _{max} (W)	445	450	455	460
Max. Power Voltage V _{mp} (V)	34.58	34.78	34.98	35.18
Max. Power Current I _{mp} (A)	12.87	12.94	13.01	13.08
Open Circuit Voltage V _{oc} (V)	41.08	41.20	41.32	41.46
Short Circuit Current I _{sc} (A)	13.76	13.83	13.90	13.97
Module Efficiency (%)	20.56	20.79	21.02	21.25
Power Output Tolerance (W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	445D(HBD) 60(182)	450D(HBD) 60(182)	455D(HBD) 60(182)	460D(HBD) 60(182)
Nominal Max. Power P _{max} (W)	317	322	327	332
Max. Power Voltage V _{mp} (V)	30.54	30.91	31.27	31.62
Max. Power Current I _{mp} (A)	10.38	10.42	10.46	10.50
Open Circuit Voltage V _{oc} (V)	38.78	38.90	39.02	39.14
Short Circuit Current I _{sc} (A)	11.11	11.17	11.22	11.28

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	1909×1134×35mm/30mm
Weight	26.9kg(35mm)/25.7kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 230mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	744pcs(35mm)/864pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

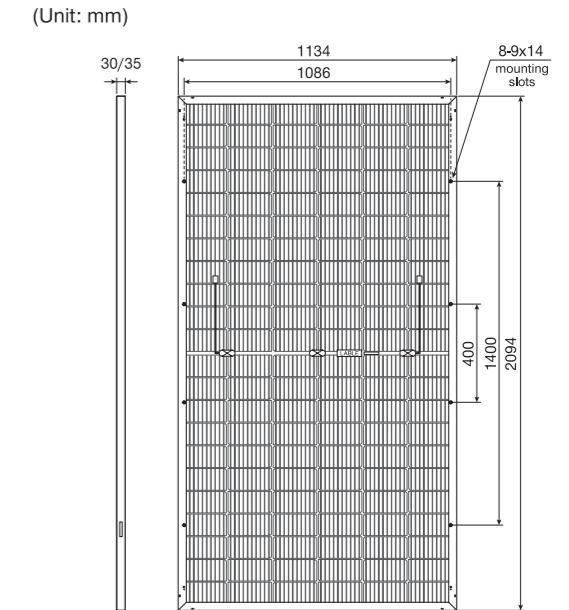
182 P-type Bifacial Module

Power Range
490W ~ 505W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.27%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type	490D(HBD) 66(182)	495D(HBD) 66(182)	500D(HBD) 66(182)	505D(HBD) 66(182)
Nominal Max. Power P _{max} (W)	490	495	500	505
Max. Power Voltage V _{mp} (V)	38.02	38.20	38.38	38.56
Max. Power Current I _{mp} (A)	12.89	12.96	13.03	13.10
Open Circuit Voltage V _{oc} (V)	45.24	45.36	45.48	45.62
Short Circuit Current I _{sc} (A)	13.78	13.85	13.92	13.99
Module Efficiency (%)	20.64	20.85	21.06	21.27
Power Output Tolerance (W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	490D(HBD) 66(182)	495D(HBD) 66(182)	500D(HBD) 66(182)	505D(HBD) 66(182)
Nominal Max. Power P _{max} (W)	362	367	372	377
Max. Power Voltage V _{mp} (V)	34.81	35.16	35.50	35.84
Max. Power Current I _{mp} (A)	10.40	10.44	10.48	10.52
Open Circuit Voltage V _{oc} (V)	42.94	43.06	43.18	43.32
Short Circuit Current I _{sc} (A)	11.13	11.19	11.24	11.30

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2094×1134×35mm/30mm
Weight	29.4kg(35mm)/28.4kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 230mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	682pcs(35mm)/792pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

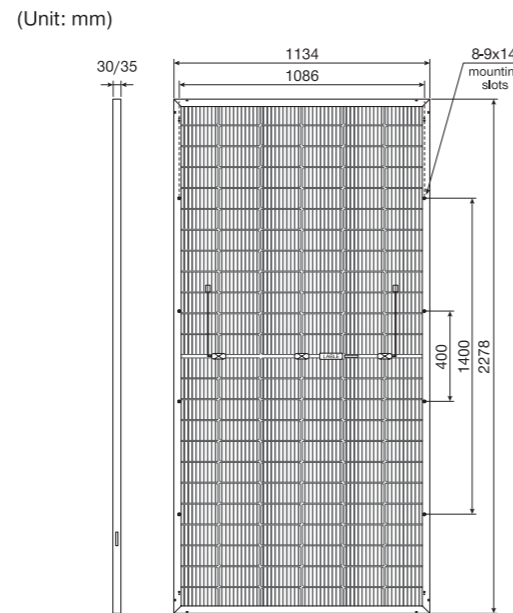
182 P-type Bifacial Module

Power Range
535W ~ 550W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.29%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type	535D(HBD) 72(182)	540D(HBD) 72(182)	545D(HBD) 72(182)	550D(HBD) 72(182)
Nominal Max. Power P _{max} (W)	535	540	545	550
Max. Power Voltage V _{mp} (V)	41.45	41.61	41.77	41.93
Max. Power Current I _{mp} (A)	12.91	12.98	13.05	13.12
Open Circuit Voltage V _{oc} (V)	49.40	49.52	49.64	49.78
Short Circuit Current I _{sc} (A)	13.80	13.87	13.94	14.01
Module Efficiency (%)	20.71	20.90	21.10	21.29
Power Output Tolerance (W)	0~+5W			

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	535D(HBD) 72(182)	540D(HBD) 72(182)	545D(HBD) 72(182)	550D(HBD) 72(182)
Nominal Max. Power P _{max} (W)	405	408	411	414
Max. Power Voltage V _{mp} (V)	38.78	38.88	39.00	39.13
Max. Power Current I _{mp} (A)	10.42	10.47	10.52	10.57
Open Circuit Voltage V _{oc} (V)	47.18	47.37	47.56	47.75
Short Circuit Current I _{sc} (A)	11.15	11.21	11.26	11.31

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	182mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35mm/30mm
Weight	32.3kg(35mm)/31.2kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait ^{400mm(+)} / _{200mm(-)} , landscape ^{1400mm(+)} / _{1400mm(-)} Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	620pcs(35mm)/720pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

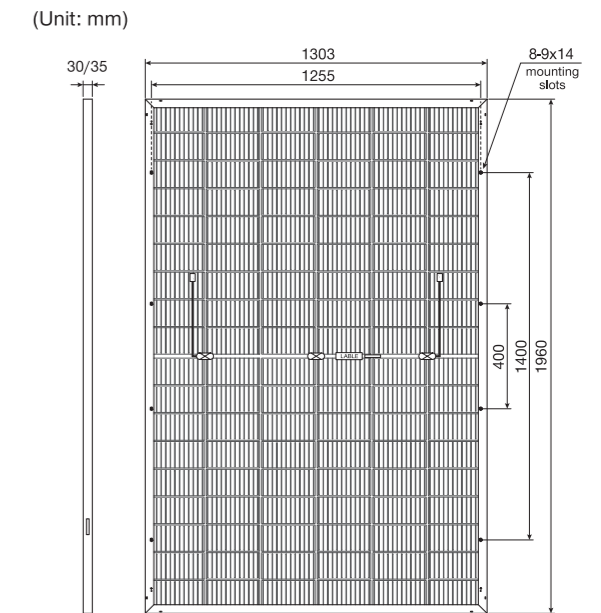
210 P-type Bifacial Module

Power Range
525W ~ 545W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.34%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type	525D(HBD) 54(210)	530D(HBD) 54(210)	535D(HBD) 54(210)	540D(HBD) 54(210)	545D(HBD) 54(210)
Nominal Max. Power P _{max} (W)	525	530	535	540	545
Max. Power Voltage V _{mp} (V)	30.43	30.63	30.83	31.03	31.23
Max. Power Current I _{mp} (A)	17.26	17.31	17.36	17.41	17.46
Open Circuit Voltage V _{oc} (V)	37.00	37.20	37.40	37.60	37.80
Short Circuit Current I _{sc} (A)	18.20	18.24	18.28	18.32	18.36
Module Efficiency (%)	20.56	20.75	20.95	21.14	21.34
Power Output Tolerance (W)	0~+5W				

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	525D(HBD) 54(210)	530D(HBD) 54(210)	535D(HBD) 54(210)	540D(HBD) 54(210)	545D(HBD) 54(210)
Nominal Max. Power P _{max} (W)	398	402	406	410	414
Max. Power Voltage V _{mp} (V)	28.43	28.64	28.84	29.04	29.24
Max. Power Current I _{mp} (A)	14.00	14.04	14.08	14.12	14.16
Open Circuit Voltage V _{oc} (V)	34.60	34.80	35.00	35.20	35.40
Short Circuit Current I _{sc} (A)	14.68	14.72	14.76	14.80	14.84

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1960×1303×35mm/30mm
Weight	32.8kg(35mm)/31.5kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait ^{400mm(+)} / _{200mm(-)} , landscape ^{1400mm(+)} / _{1400mm(-)} Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	558pcs(35mm)/648pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

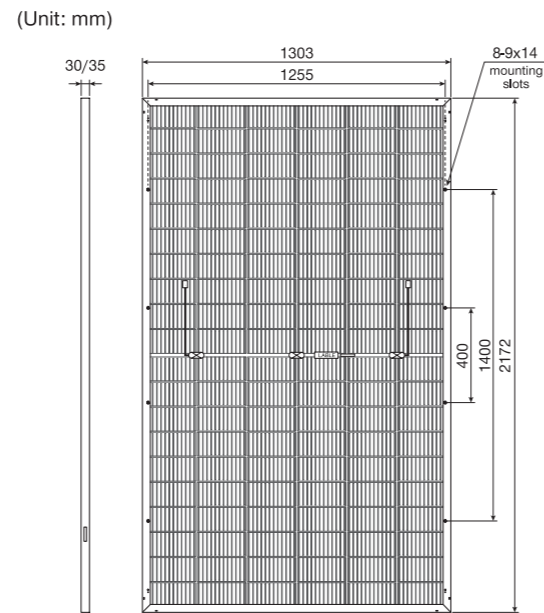
210 P-type Bifacial Module

Power Range
585W ~ 605W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.38%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type	585D(HBD) 60(210)	590D(HBD) 60(210)	595D(HBD) 60(210)	600D(HBD) 60(210)	605D(HBD) 60(210)
Nominal Max. Power P _{max} (W)	585	590	595	600	605
Max. Power Voltage V _{mp} (V)	33.93	34.13	34.33	34.53	34.73
Max. Power Current I _{mp} (A)	17.25	17.29	17.34	17.38	17.43
Open Circuit Voltage V _{oc} (V)	41.20	41.40	41.60	41.80	42.00
Short Circuit Current I _{sc} (A)	18.25	18.29	18.33	18.37	18.41
Module Efficiency (%)	20.67	20.85	21.02	21.20	21.38
Power Output Tolerance (W)	0~+5W				

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	585D(HBD) 60(210)	590D(HBD) 60(210)	595D(HBD) 60(210)	600D(HBD) 60(210)	605D(HBD) 60(210)
Nominal Max. Power P _{max} (W)	443	447	451	455	459
Max. Power Voltage V _{mp} (V)	31.63	31.82	32.01	32.21	32.40
Max. Power Current I _{mp} (A)	14.01	14.05	14.09	14.13	14.17
Open Circuit Voltage V _{oc} (V)	38.80	39.00	39.20	39.40	39.60
Short Circuit Current I _{sc} (A)	14.71	14.75	14.79	14.83	14.87

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	2172×1303×35mm/30mm
Weight	35.6kg(35mm)/33.7kg(30mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 230mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/36pcs(30mm)
Per Container(40'HQ)	558pcs(35mm)/648pcs(30mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

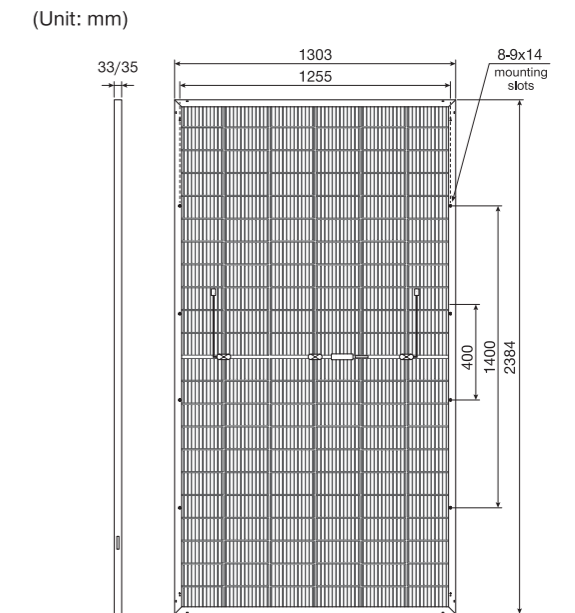
210 P-type Bifacial Module

Power Range
645W ~ 665W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.41%

Double sides power output to reach higher comprehensive efficiency and get more profit.



Electrical Performance Parameters | STC

Model Type	645D(HBD) 66(210)	650D(HBD) 66(210)	655D(HBD) 66(210)	660D(HBD) 66(210)	665D(HBD) 66(210)
Nominal Max. Power P _{max} (W)	645	650	655	660	665
Max. Power Voltage V _{mp} (V)	37.43	37.63	37.83	38.03	38.23
Max. Power Current I _{mp} (A)	17.24	17.28	17.32	17.36	17.40
Open Circuit Voltage V _{oc} (V)	45.40	45.60	45.80	46.00	46.20
Short Circuit Current I _{sc} (A)	18.30	18.34	18.38	18.42	18.46
Module Efficiency (%)	20.76	20.92	21.09	21.25	21.41
Power Output Tolerance (W)	0~+5W				

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* Power measurement tolerance ±3%.

Electrical Performance Parameters | NMOT

Model Type	645D(HBD) 66(210)	650D(HBD) 66(210)	655D(HBD) 66(210)	660D(HBD) 66(210)	665D(HBD) 66(210)
Nominal Max. Power P _{max} (W)	488	492	496	500	504
Max. Power Voltage V _{mp} (V)	34.84	35.04	35.22	35.42	35.62
Max. Power Current I _{mp} (A)	14.02	14.06	14.08	14.12	14.16
Open Circuit Voltage V _{oc} (V)	42.80	43.00	43.20	43.40	43.60
Short Circuit Current I _{sc} (A)	14.74	14.78	14.82	14.86	14.90

* NMOT: Irradiance 800W/m², Cell Temperature 20°C, Wind Speed 1m/s.
* Power measurement tolerance ±3%.

Structure Performance

Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2384×1303×35mm/33mm
Weight	38.2kg(35mm)/37.8kg(33mm)
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² , portrait 400mm(+), 230mm(-), landscape 1400mm(+), 1400mm(-) Length can be customized
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs(35mm)/33pcs(33mm)
Per Container(40'HQ)	558pcs(35mm)/594pcs(33mm)

Temperature Characteristics

Nominal Module Operating Temperature	44±2°C
Temperature Coefficient (I _{sc})	+0.048%
Temperature Coefficient (V _{oc})	-0.26%
Temperature Coefficient (P _{max})	-0.34%

Maximum Parameters

Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

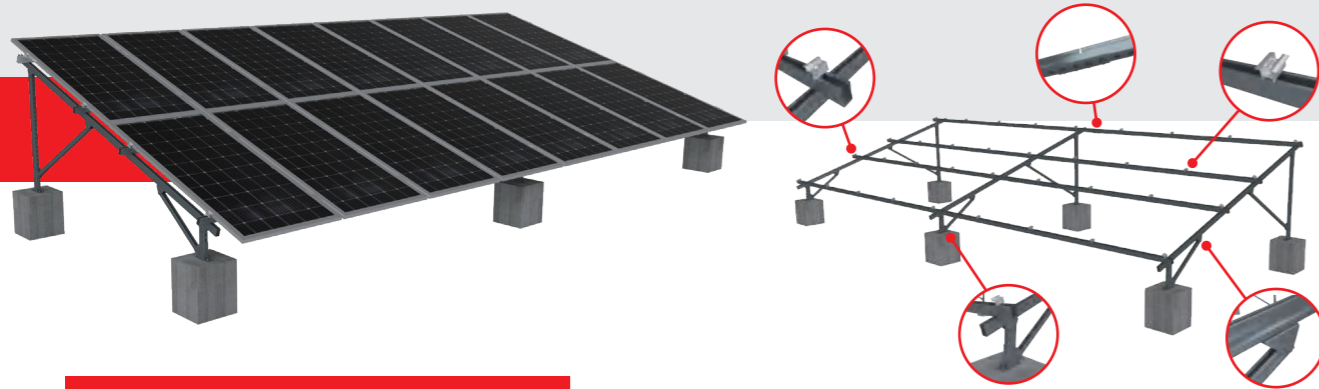
12 years product workmanship warranty

30 years linear power output warranty

1st year power degradation no more than **2%**

Subsequent annual power degradation no more than **0.45%**

MOUNTING SYSTEM FOR CONCRETE ROOF



Mounting Components

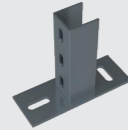
Steel beam	
Size / Model	U41×72×2.5 mm
Material	Q235B
Surface treatment & mechanical property	Hot-dip galvanization > 55µm Tensile strength > 375N/mm ² Yield strength 235N/mm ²



Column	
Size / Model	U41×72×2.5 mm
Material	Q235B
Surface treatment & mechanical property	Hot-dip galvanization > 55µm Tensile strength > 375N/mm ² Yield strength 235N/mm ²



Base	
Size / Model	160×153×3 mm
Material	Q235B
Surface treatment & mechanical property	Hot-dip galvanization > 55µm Tensile strength > 375N/mm ² Yield strength 235N/mm ²



Steel beam connector	
Size / Model	50×200×3 mm
Material	Q235B
Surface treatment & mechanical property	Hot-dip galvanization > 55µm Tensile strength > 375N/mm ² Yield strength 235N/mm ²



Triangle connector	
Size / Model	75×120×3 mm
Material	Q235B
Surface treatment & mechanical property	Hot-dip galvanization > 55µm Tensile strength > 375N/mm ² Yield strength 235N/mm ²



Inclined support	
Size / Model	U41×41×2 mm
Material	Q235B
Surface treatment & mechanical property	Hot-dip galvanization > 55µm Tensile strength > 375N/mm ² Yield strength 235N/mm ²



Back support	
Size / Model	L50×3 angle steel
Material	Q235B
Surface treatment & mechanical property	Hot-dip galvanization > 55µm Tensile strength > 375N/mm ² Yield strength 235N/mm ²



U shape bolt	
Size / Model	M12
Material	Q235B
Surface treatment & mechanical property	Hot-dip galvanization > 55µm Tensile strength > 375N/mm ² Yield strength 235N/mm ²



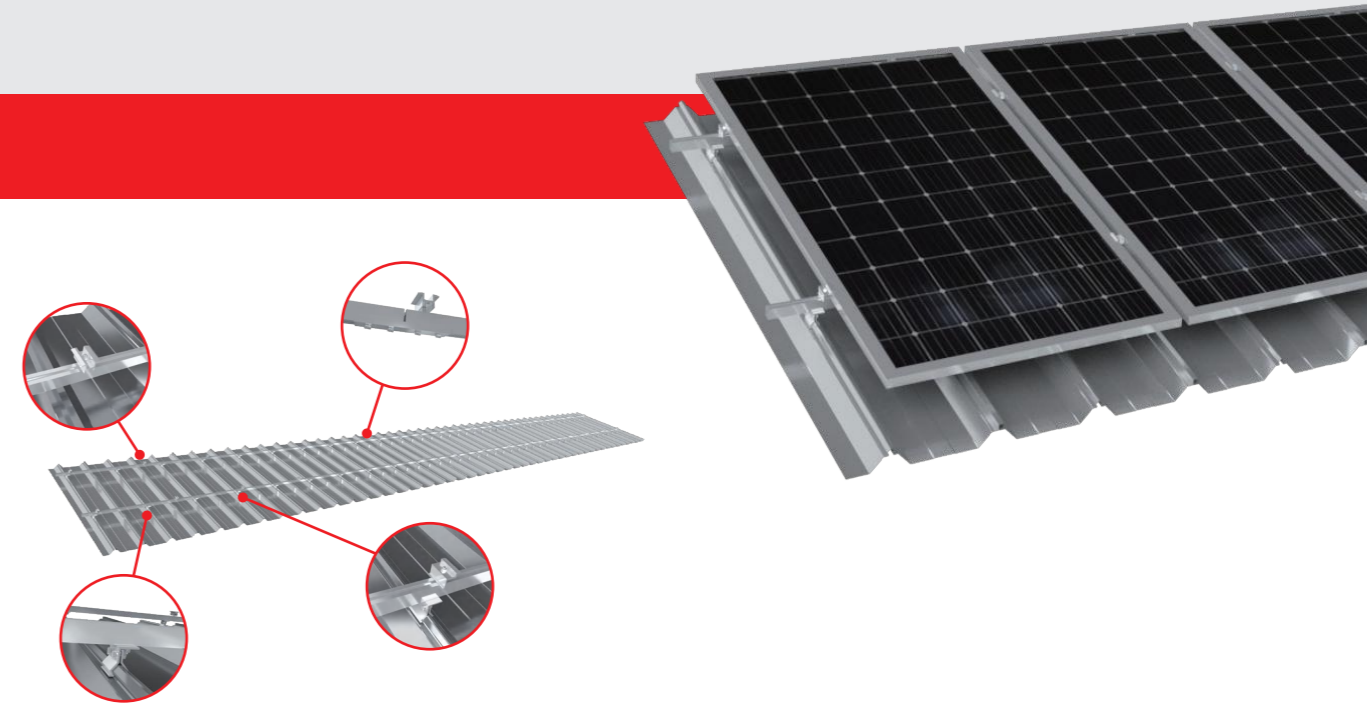
Side block	
Size / Model	H35mm
Material	6005-T5
Surface treatment & mechanical property	Anodization AA15, tensile strength 260N/mm ²



Medium block	
Size / Model	H35mm
Material	6005-T5
Surface treatment & mechanical property	Anodization AA15, tensile strength 260N/mm ²



MOUNTING SYSTEM FOR COLOR STEEL TILE ROOF



Mounting Components

Aluminum alloy rail	
Size / Model	40x30x1.2 mm
Material	6005-T5
Surface treatment and mechanical property	Anodization AA15, tensile strength 260N/mm ²



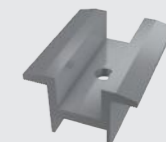
Rail connector	
Size / Model	U35x15x2.0 mm
Material	6005-T5
Surface treatment and mechanical property	Anodization AA15, tensile strength 260N/mm ²



Side block	
Size / Model	H35mm
Material	6005-T5
Surface treatment and mechanical property	Anodization AA15, tensile strength 260N/mm ²



Medium block	
Size / Model	H35mm
Material	6005-T5
Surface treatment and mechanical property	Anodization AA15, tensile strength 260N/mm ²



Vertical fixture	
Size / Model	H60mm
Material	6005-T5
Surface treatment and mechanical property	Anodization AA15, tensile strength 260N/mm ²



**LESSO Solar Business was founded
in January 2022.**

**In our first year,
our solar modules have been used to build
over 90 projects around the world.**










Utility Scale Solar Power Station

- A Utility Scale Solar Power Station refers to medium to large scale PV power generation systems, mainly installed in areas such as deserts, barren mountains, wastelands, tidal flats, scrapyards, abandoned mining zones, etc., giving otherwise unusable land a new lease of life. The power generated through these systems can be connected to the power grid through long-distance high-pressure transmission systems.
- The most common applications of Utility Scale Solar Power Stations include ground-mounted power stations on flat lands and mountains, as well as implementations that are complementary with agriculture, aquaculture, as well as forestry industries.
- Almost all implementations of Utility Scale Solar Power Stations are connected to the power grid and are able to generate income by the sale of power at a certain grid purchase price.





ADVANTAGE

- 
Inexhaustible
 Solar power is everlasting, sustainable and inexhaustible.
- 
Safe and reliable
 Clean energy that is safe and reliable.
- 
Universally available
 Unused rooftops and spare land resources can be intensively utilized.
- 
No resource consumption
 No other fuel or power transmission lines needed. Generate and consume electricity locally.
- 
Energy efficient set-up
 PV panels effectively reduces internal temperature of buildings, saving energy and cost.



Industrial & Commercial Rooftop Solar Power Station

ADVANTAGE

- 
Heat insulation - reduction of building temperature
 PV modules convert sunlight irradiation into electricity, and can act as a thermal insulation layer on rooftops to reduce building temperature by 3-4°C.
- 
Save energy and carbon emissions
 Solar power is an inexhaustible source of green energy, and can alleviate urban electricity consumption and relieve power shortage pressure. Besides, by using solar power to reduce carbon emissions, an enterprise can enhance brand image, save energy expenditure and strengthen competitiveness.
- 
Increase usable floor space
 If local authority permits, shed-type Solar power stations, within authorized height limit, can be constructed on the rooftops of industrial and commercial buildings. This frees up floor space for owners to meet other purposes.
- 
Generate additional profit
 Industrial and commercial businesses require high power consumption. By developing and constructing rooftop Solar power stations, businesses can harvest cheap and clean green electricity efficiently and conveniently during the day to save on power bills to save power bills and increase profit. A Solar power station can run safely and efficiently over 25 years, and its ROI is 15% or more.

PROJECT HIGHLIGHTS

Businesses can use the free electricity generated from PV power stations directly, reducing consumption of electricity from the power grid, thereby enjoying immense savings on their electrical bill. If applicable, a PV power station can even be connected to the power grid, allowing businesses to sell excess electricity to the grid to generate additional profit.



Foshan Haitian Roof Solar Power Station

Location: Shunde, Foshan, China
Project Capacity: 6.14MW



Dingan Roof Solar Power Station

Location: Dingan, Hainan, China
Project Capacity: 6MW



Ducheng Roof Solar Power Station

Location: Yunan, Yunfu, China
Project Capacity: 5MW



Mulingke Roof Solar Power Station

Location: Mudanjiang, Heilongjiang, China
Project Capacity: 0.8MW



Karamay Desert Solar Power Station (Phase I)

Location: Karamay, Xinjiang, China

Project Capacity
600MW



Changsha Roof Solar Power Station

Location: Changsha, Hunan, China

Project Capacity
9.75MW



Application example of
Pure Black series PV module

Residential Solar Power Station

ADVANTAGE



Increase usable floor space

If local authority permits, shed-type solar power stations, within authorized height limit, can be constructed on the rooftop of residential houses. This frees up floor space for owners to meet other purposes.



Heat insulation - reduction of building temperature

PV modules on rooftops can absorb sunshine and heat and play as a thermal insulation layer over rooftop to reduce building temperature by 3-6°C, especially in summer. Meanwhile, PV panels will protect rooftops and help delay signs of aging.



Prevent damage and delay aging of rooftops

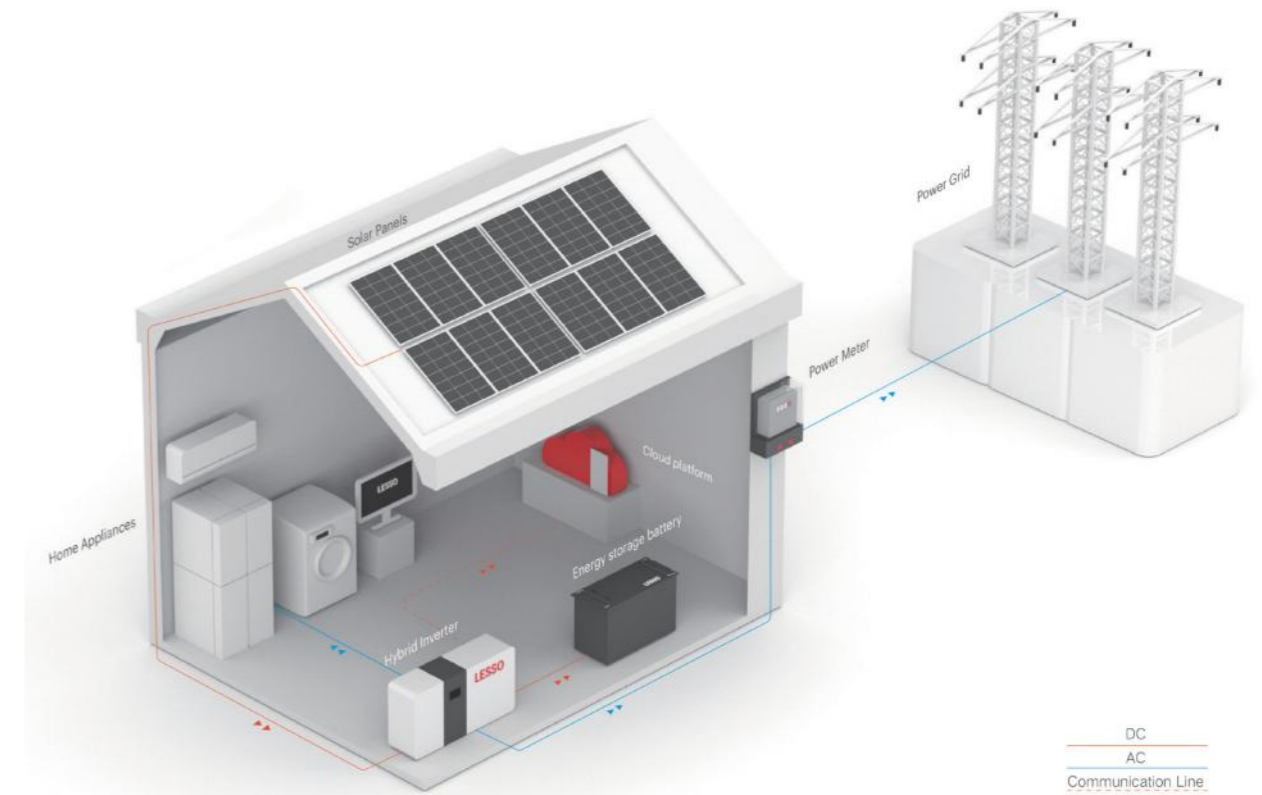
PV panels can protect rooftops by reducing the exposure to sun and heavy rain, and thus prolong the life span and maintain the value of the building.



Triple lightning protection

With the built-in triple lightning protection system, solar power station is safe and able to protect family, rooftop and home appliances in the building from lightning damage.

Illustration of Residential On-Grid Solar Power System



LESSO

TURNING DESERTS INTO OASIS



In deserts like the Gobi in China or Rub' al Khali in UAE and Saudi Arabia, vegetation is hard to find, but sunshine is abundant. Solar panels not just turn sunlight into clean electricity, but also reduce the wind speed on the ground, protecting the vegetation. The water from these solar panels' periodical cleaning spills on the ground, further nurturing the grass. If the grass grows high enough, it may cover the solar panels, reducing their power generation efficiency and risking fire. You may hire someone to mow them or, marvellously, you may herd flocks of sheep to eat them. If you raise the height of the solar panels from the usual 50cm to 120cm, you will get a green lane for herding sheep under the panels. A new ecological system is born: solar, sheep, oasis.

Video:
Solar panels turn
desert into oasis





Agriculture-complementary Solar Power Station

Agriculture-complementary Solar power station is a new development that combines Solar power stations constructed on top of greenhouses or pillars with agricultural plantations under it.

By constructing agriculture-complementary Solar power stations, clean energy can be generated and connected to the power grid. Meanwhile, high-tech farming methods can be implemented, thus intensively utilizing sunshine and land resources, improving their values and profits. This new method produces no pollution or emissions and doesn't occupy farmland.

Mode of Operation:

PV power generation on the top of the shed, vegetables are planted in the shed, and the power can be used not only by the shed, but also connected to the public power grid to sell electricity and get new energy subsidy.



Aquaculture-complementary Solar Power Station

Aquaculture-complementary Solar power station is a combination of Solar power station and aquaculture. In this combined mode, PV panels are installed over fish ponds, which can offer shelter and shade and maintain the temperature and oxygen content of the pond, so as to increase aquaculture productivity.

Aquaculture-complementary Solar power station is a good example of efficient land utilization and clean energy generation. By combining PV power generation and aquaculture above and in the fish ponds, lands are utilized more efficiently and can produce more social and economical profits.





Countries listed on the map are those where LESSO Solar has a sales and marketing office.

