







LESSO

SOLAR PV MODULES

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

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LESSO

BUILDING A SOLAR-POWERED WORLD



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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.

Founded in 2022, LESSO Solar has been growing with spectacular pace. We have a production capacity of 7GW for solar panels in early 2023, and expect a global capacity of over 15GW by the end of 2023.

○ **USD4.5 bil**

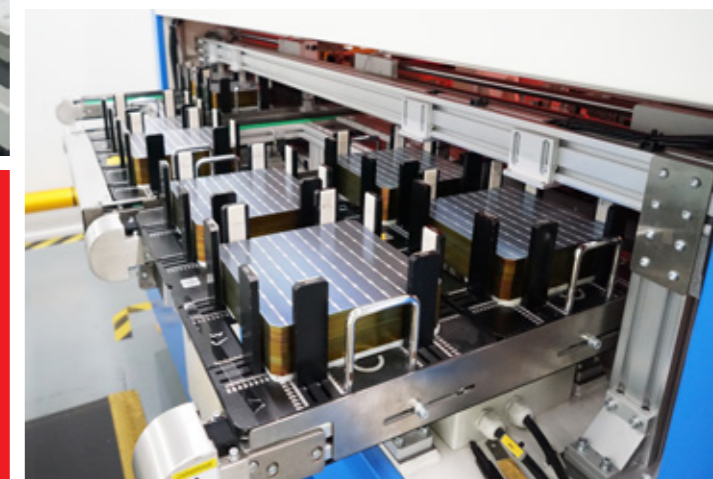
Group Revenue for 2021

○ **7GW**

Production Capacity

○ **15GW**

By the end of 2023



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



Our Strategic Goals



Focused Technologies



Large-Scale Production



Well-Known Brand



International Market



Collectivize Management



LESSO Solar GLOBAL PRODUCTION

This map illustrates global locations where LESSO 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 INVERTERS

2023 ENERGY STORAGES

2023 EV CHARGERS

LONGJIANG FACTORY

FOSHAN, GUANGDONG, CHINA

2023 6,000KM ELECTRICAL WIRES

2023 2,000KM ELECTRICAL CABLES

CHAOYANG 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 INVERTERS

2023 300,000 ENERGY STORAGES

HESHAN FACTORY

JIANGMEN, GUANGDONG, CHINA

2023 6GW SOLAR MODULES

2023 2GW P-TYPE SOLAR CELLS

2023 4GW N-TYPE SOLAR CELLS

2023 10,350,000 SOLAR MODULE FRAMES

LESSO NEW ENERGY HQ

RAFFLES QUAY, SINGAPORE

SEMARANG FACTORY

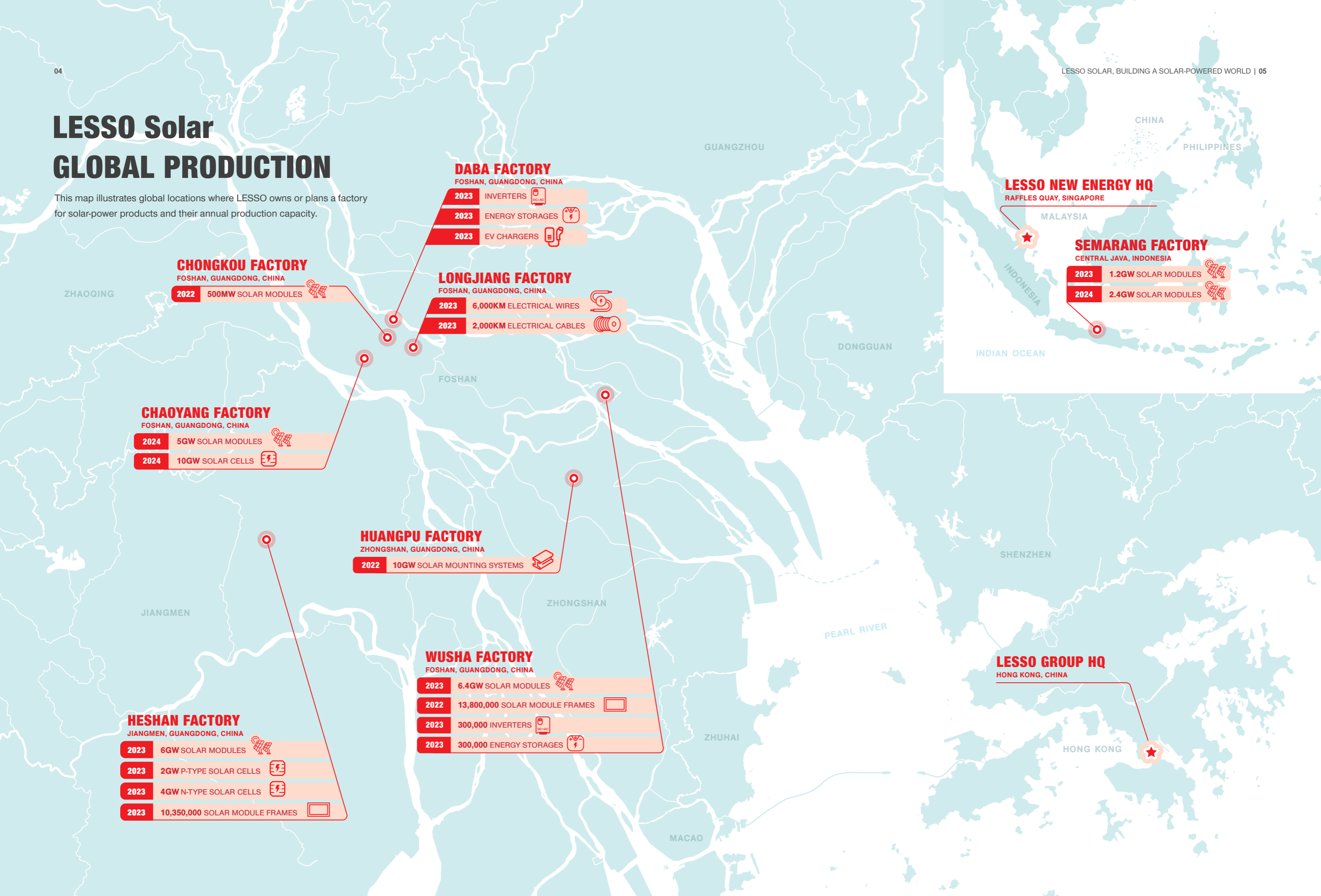
CENTRAL JAVA, INDONESIA

2023 1.2GW SOLAR MODULES

2024 2.4GW SOLAR MODULES

LESSO GROUP HQ

HONG KONG, CHINA

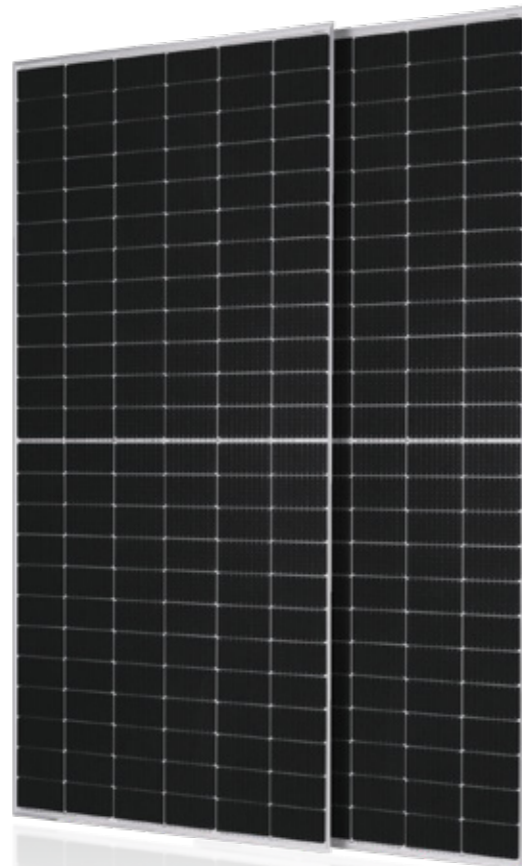


N-type series

Cutting-edge Technology, Leading Innovation

Features and Benefits

- 10-30% Additional Power Generation**
30 years lifespan 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-type 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.



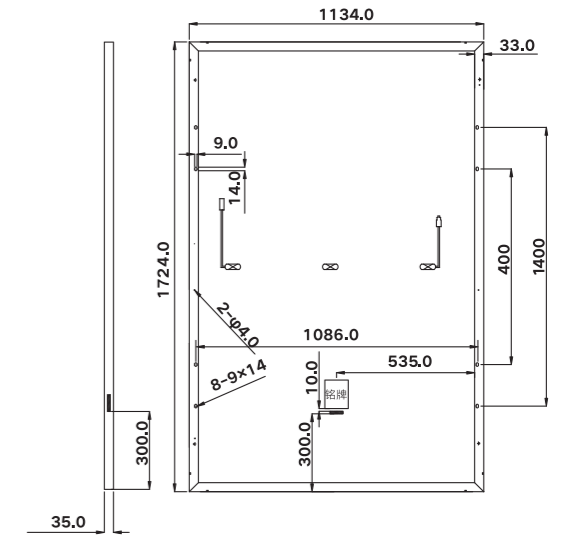
182 N-type Mono Half-cell Module

Power Range
415W ~ 435W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.3%

(Unit: mm)



Electrical Performance Parameters | STC

Model Type	415D(HPM) 54(182)	420D(HPM) 54(182)	425D(HPM) 54(182)	430D(HPM) 54(182)	435D(HPM) 54(182)
Nominal Max. Power P _{max} (W)	415	420	425	430	435
Max.imum Power Voltage V _{mp} (V)	31.68	32.02	32.35	32.68	33.01
Max.imum Power Current I _{mp} (A)	13.10	13.12	13.14	13.16	13.18
Open Circuit Voltage V _{oc} (V)	38.45	38.48	38.54	38.60	38.72
Short Circuit Current I _{sc} (A)	13.77	13.78	13.79	13.80	13.89
Module Efficiency (%)	21.30	21.50	21.80	22.00	22.30
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	415D(HPM) 54(182)	420D(HPM) 54(182)	425D(HPM) 54(182)	430D(HPM) 54(182)	435D(HPM) 54(182)
Nominal Max. Power P _{max} (W)	313	316	319	322	325
Max.imum Power Voltage V _{mp} (V)	29.82	30.05	30.28	30.51	30.83
Max.imum Power Current I _{mp} (A)	10.50	10.52	10.54	10.56	10.54
Open Circuit Voltage V _{oc} (V)	36.37	36.40	36.46	36.52	36.82
Short Circuit Current I _{sc} (A)	11.10	11.11	11.11	11.12	11.20

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

Structure Performance

Solar Cell Type	182mm N-Type Mono Cell
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1724×1134×35mm
Weight	23.7kg
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	806pcs

Temperature Characteristics

Nominal Module Operating Temperature	41±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



* Available for pre-order. Stocks will be ready by June 2023.

12 years product workmanship warranty

30 years linear power output warranty

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

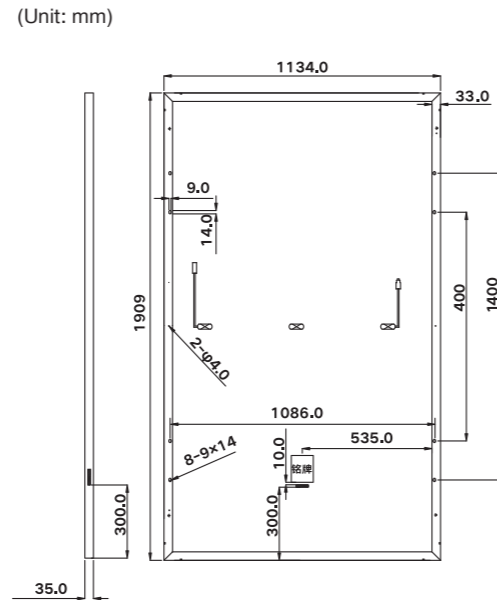
Subsequent annual power degradation no more than **0.40%**

182 N-type Mono Half-cell Module

Power Range
460W ~ 480W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.17%



Electrical Performance Parameters STC						
Model Type		460D(HPM) 60(182)	465D(HPM) 60(182)	470D(HPM) 60(182)	475D(HPM) 60(182)	480D(HPM) 60(182)
Nominal Max. Power	P _{max} (W)	460	465	470	475	480
Maximum Power Voltage	V _{mp} (V)	34.86	35.02	35.18	35.35	35.51
Maximum Power Current	I _{mp} (A)	13.20	13.28	13.36	13.44	13.52
Open Circuit Voltage	V _{oc} (V)	42.01	42.18	42.34	42.50	42.67
Short Circuit Current	I _{sc} (A)	13.95	14.03	14.11	14.19	14.27
Module Efficiency	(%)	21.25	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		460D(HPM) 60(182)	465D(HPM) 60(182)	470D(HPM) 60(182)	475D(HPM) 60(182)	480D(HPM) 60(182)
Nominal Max. Power	P _{max} (W)	346	350	354	358	362
Maximum Power Voltage	V _{mp} (V)	32.77	32.96	33.15	33.34	33.52
Maximum Power Current	I _{mp} (A)	10.56	10.62	10.68	10.74	10.80
Open Circuit Voltage	V _{oc} (V)	39.97	40.13	40.29	40.45	40.61
Short Circuit Current	I _{sc} (A)	11.28	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-Type Mono Cell
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	1909×1134×35mm
Weight	23.2kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	744pcs

Temperature Characteristics	
Nominal Module Operating Temperature	41±2°C
Temperature Coefficient (I _{sc})	+0.043%
Temperature Coefficient (V _{oc})	-0.25%
Temperature Coefficient (P _{max})	-0.30%

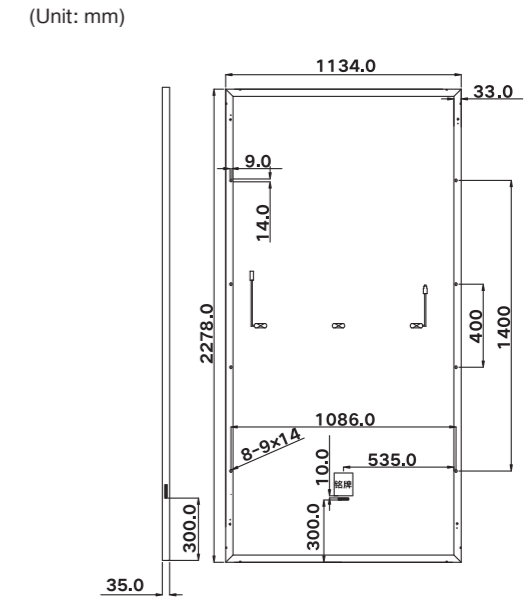
Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

182 N-type Mono Half-cell Module

Power Range
565W ~ 585W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.65%



Electrical Performance Parameters STC						
Model Type		565D(HPM) 72(182)	570D(HPM) 72(182)	575D(HPM) 72(182)	580D(HPM) 72(182)	585D(HPM) 72(182)
Nominal Max. Power	P _{max} (W)	565	570	575	580	585
Maximum Power Voltage	V _{mp} (V)	42.08	42.23	42.38	42.53	42.67
Maximum Power Current	I _{mp} (A)	13.43	13.50	13.57	13.64	13.71
Open Circuit Voltage	V _{oc} (V)	50.56	50.70	50.84	50.98	51.12
Short Circuit Current	I _{sc} (A)	14.19	14.27	14.35	14.43	14.51
Module Efficiency	(%)	21.87	22.07	22.26	22.45	22.65
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		565D(HPM) 72(182)	570D(HPM) 72(182)	575D(HPM) 72(182)	580D(HPM) 72(182)	585D(HPM) 72(182)
Nominal Max. Power	P _{max} (W)	425	429	433	437	441
Maximum Power Voltage	V _{mp} (V)	39.58	39.73	39.84	39.95	40.10
Maximum Power Current	I _{mp} (A)	10.74	10.80	10.87	10.94	11.00
Open Circuit Voltage	V _{oc} (V)	48.02	48.16	48.29	48.42	48.56
Short Circuit Current	I _{sc} (A)	11.45	11.51	11.58	11.64	11.71

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

Structure Performance	
Solar Cell Type	182mm N-Type Mono Cell
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35mm
Weight	26.9kg
Front Glass	3.2mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	620pcs

Temperature Characteristics	
Nominal Module Operating Temperature	41±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%**

12 years product workmanship warranty

30 years linear power output warranty

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

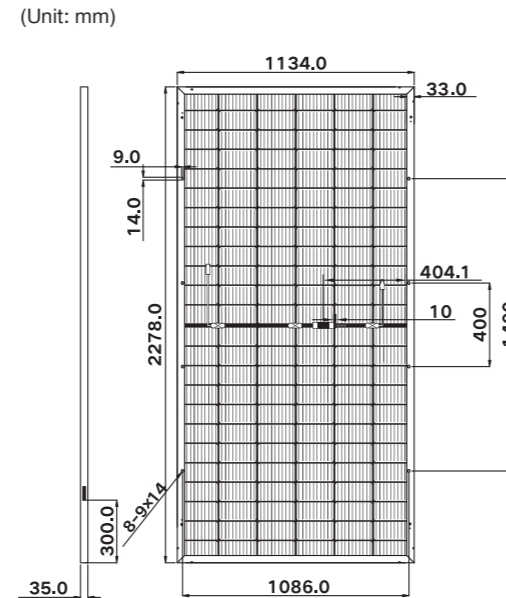
Subsequent annual power degradation no more than **0.40%**

182 N-type Mono Bifacial Half-cell Module

Power Range
550W ~ 580W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
22.45%



Electrical Performance Parameters | STC

Model Type	550D(HPM) 72(182)	555D(HPM) 72(182)	560D(HPM) 72(182)	565D(HPM) 72(182)	570D(HPM) 72(182)	575D(HPM) 72(182)	580D(HPM) 72(182)
Nominal Max. Power P _{max} (W)	550	555	560	565	570	575	580
Maximum Power Voltage V _{mp} (V)	41.73	41.92	42.11	42.30	42.45	42.60	42.75
Maximum Power Current I _{mp} (A)	13.18	13.24	13.30	13.36	13.43	13.50	13.57
Open Circuit Voltage V _{oc} (V)	50.23	50.43	50.63	50.83	51.03	51.23	51.43
Short Circuit Current I _{sc} (A)	13.97	14.03	14.09	14.15	14.21	14.27	14.33
Module Efficiency (%)	21.29	21.48	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

Model Type	550D(HPM) 72(182)	555D(HPM) 72(182)	560D(HPM) 72(182)	565D(HPM) 72(182)	570D(HPM) 72(182)	575D(HPM) 72(182)	580D(HPM) 72(182)
Nominal Max. Power P _{max} (W)	413	417	421	425	429	433	437
Maximum Power Voltage V _{mp} (V)	39.26	39.42	39.57	39.72	39.87	40.02	40.13
Maximum Power Current I _{mp} (A)	10.52	10.58	10.64	10.70	10.76	10.82	10.89
Open Circuit Voltage V _{oc} (V)	47.71	47.90	48.09	48.28	48.47	48.66	48.85
Short Circuit Current I _{sc} (A)	11.27	11.32	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-Type Mono Cell
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35mm
Weight	32.5kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	620pcs

Temperature Characteristics

Nominal Module Operating Temperature	42±2°C
Temperature Coefficient (I _{sc})	+0.045%
Temperature Coefficient (V _{oc})	-0.25%
Temperature Coefficient (P _{max})	-0.30%

Maximum Parameters

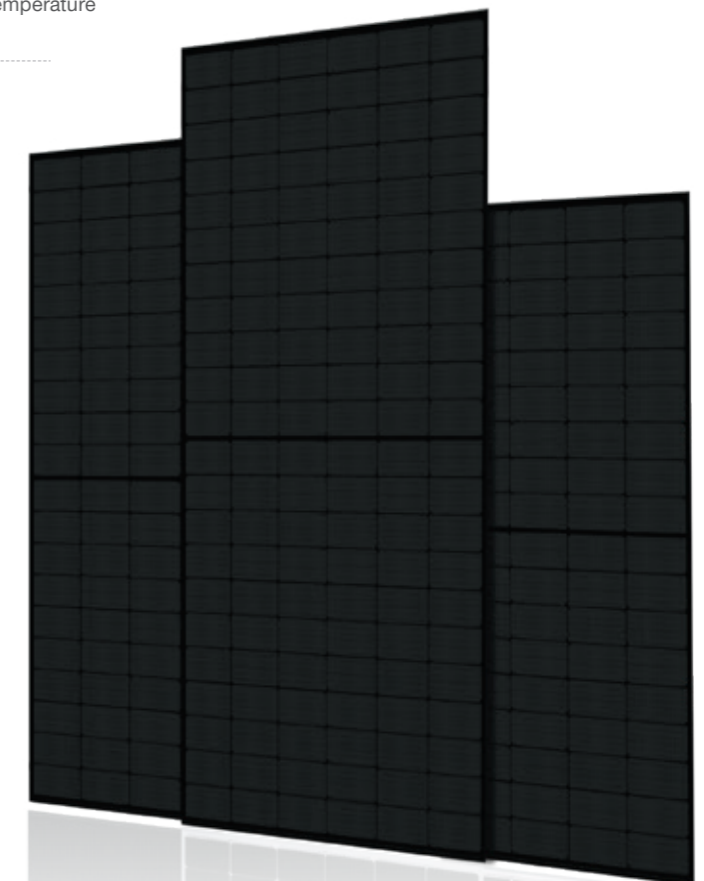
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

Pure Black P-type 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.



* Customizable with 15 days lead time

12 years product workmanship warranty

30 years linear power output warranty

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

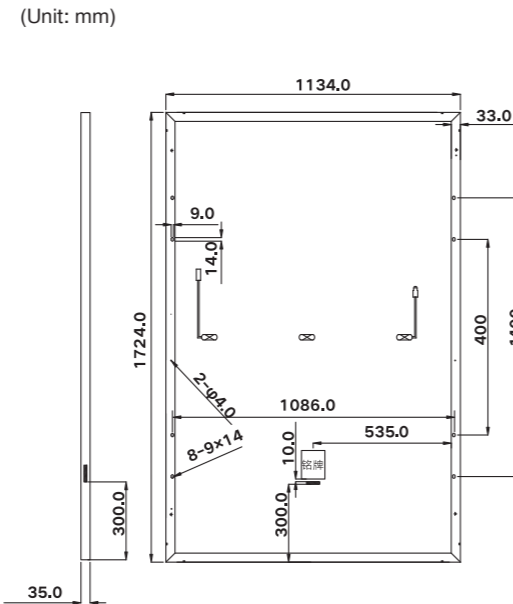
Subsequent annual power degradation no more than **0.40%**

182 MBB Mono Perc Half-cell Module

Power Range
390W ~ 410W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.0%



Electrical Performance Parameters STC						
Model Type		390D(BPM) 54(182)	395D(BPM) 54(182)	400D(BPM) 54(182)	405D(BPM) 54(182)	410D(BPM) 54(182)
Nominal Max. Power	P _{max} (W)	390	395	400	405	410
Maximum Power Voltage	V _{mp} (V)	30.62	30.82	31.02	31.22	31.42
Maximum Power Current	I _{mp} (A)	12.74	12.82	12.90	12.98	13.05
Open Circuit Voltage	V _{oc} (V)	36.50	36.70	36.90	37.10	37.30
Short Circuit Current	I _{sc} (A)	13.55	13.60	13.65	13.70	13.75
Module Efficiency	(%)	19.90	20.20	20.50	20.70	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		390D(BPM) 54(182)	395D(BPM) 54(182)	400D(BPM) 54(182)	405D(BPM) 54(182)	410D(BPM) 54(182)
Nominal Max. Power	P _{max} (W)	270	275	280	285	290
Maximum Power Voltage	V _{mp} (V)	26.74	27.02	27.03	27.62	27.90
Maximum Power Current	I _{mp} (A)	10.10	10.18	10.26	10.32	10.40
Open Circuit Voltage	V _{oc} (V)	34.00	34.20	34.40	34.60	34.80
Short Circuit Current	I _{sc} (A)	10.99	11.19	11.39	11.59	11.79

* 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	108pcs(6×18)
Module Dimension	1724×1134×35mm
Weight	21.8kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	806pcs

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%

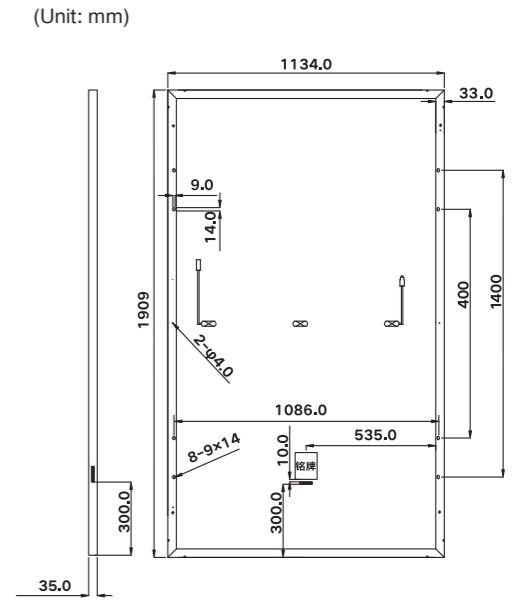
Maximum Parameters	
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	25A

182 MBB Mono Perc Half-cell Module

Power Range
435W ~ 455W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.0%



Electrical Performance Parameters STC						
Model Type		435D(BPM) 60(182)	440D(BPM) 60(182)	445D(BPM) 60(182)	450D(BPM) 60(182)	455D(BPM) 60(182)
Nominal Max. Power	P _{max} (W)	435	440	445	450	455
Maximum Power Voltage	V _{mp} (V)	34.02	34.22	34.42	34.62	34.82
Maximum Power Current	I _{mp} (A)	12.79	12.86	12.93	13.00	13.07
Open Circuit Voltage	V _{oc} (V)	40.78	40.98	41.18	41.38	41.58
Short Circuit Current	I _{sc} (A)	13.19	13.26	13.33	13.40	13.47
Module Efficiency	(%)	20.10	20.30	20.60	20.80	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		435D(BPM) 60(182)	440D(BPM) 60(182)	445D(BPM) 60(182)	450D(BPM) 60(182)	455D(BPM) 60(182)
Nominal Max. Power	P _{max} (W)	315	320	325	330	335
Maximum Power Voltage	V _{mp} (V)	31.04	31.24	31.44	31.64	31.84
Maximum Power Current	I _{mp} (A)	10.15	10.25	10.34	10.43	10.53
Open Circuit Voltage	V _{oc} (V)	38.28	38.48	38.68	38.88	39.08
Short Circuit Current	I _{sc} (A)	10.57	10.77	10.97	11.17	11.37

* 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
Weight	23.2kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	744pcs

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%**

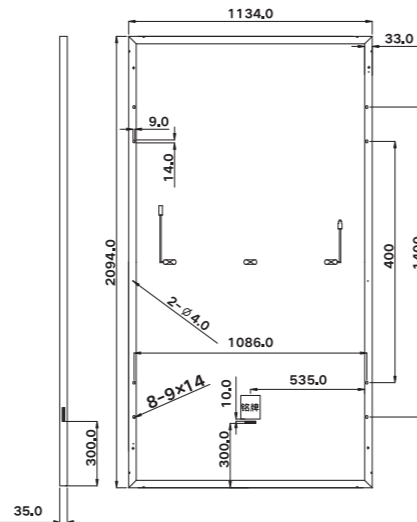
182 MBB Mono Perc Half-cell Module

Power Range
480W ~ 500W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.1%

(Unit: mm)



Electrical Performance Parameters STC						
Model Type		480D(BPM) 66(182)	485D(BPM) 66(182)	490D(BPM) 66(182)	495D(BPM) 66(182)	500D(BPM) 66(182)
Nominal Max. Power	P _{max} (W)	480	485	490	495	500
Maximum Power Voltage	V _{mp} (V)	37.42	37.62	37.82	38.02	38.22
Maximum Power Current	I _{mp} (A)	12.83	12.90	12.96	13.02	13.09
Open Circuit Voltage	V _{oc} (V)	45.38	45.58	45.78	45.98	46.18
Short Circuit Current	I _{sc} (A)	13.52	13.57	13.62	13.67	13.72
Module Efficiency	(%)	20.20	20.40	20.60	20.80	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		480D(BPM) 66(182)	485D(BPM) 66(182)	490D(BPM) 66(182)	495D(BPM) 66(182)	500D(BPM) 66(182)
Nominal Max. Power	P _{max} (W)	360	365	370	375	380
Maximum Power Voltage	V _{mp} (V)	34.44	34.64	34.84	35.04	35.24
Maximum Power Current	I _{mp} (A)	10.46	10.54	10.62	10.71	10.79
Open Circuit Voltage	V _{oc} (V)	42.88	42.93	42.98	43.03	43.08
Short Circuit Current	I _{sc} (A)	10.52	10.72	10.92	11.12	11.32

* 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
Weight	25.1kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	682pcs

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

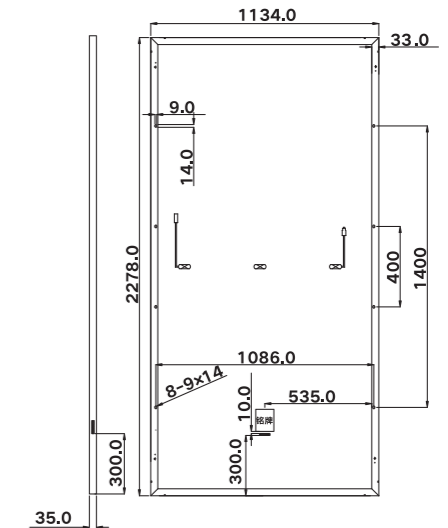
182 MBB Mono Perc Half-cell Module

Power Range
525W ~ 545W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.1%

(Unit: mm)



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
Maximum Power Voltage	V _{mp} (V)	40.82	41.04	41.24	41.44	41.64
Maximum 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	(%)	20.30	20.50	20.70	21.09	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
Maximum Power Voltage	V _{mp} (V)	37.84	39.04	38.24	38.44	38.64
Maximum 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
Weight	28.0kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	620pcs

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%**

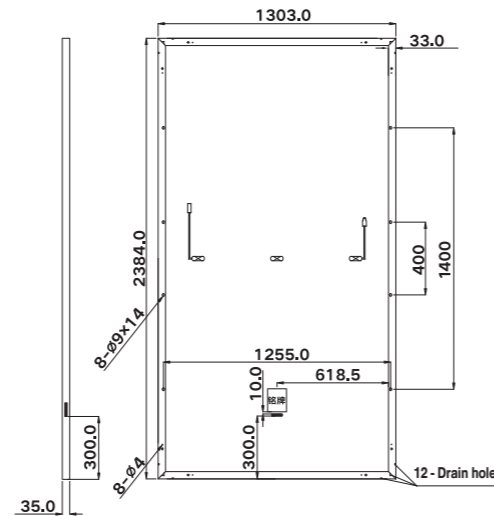
210 MBB Mono Perc Half-cell Module

Power Range
635W ~ 660W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.2%

(Unit: mm)



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
Maximum Power Voltage V _{mp} (V)	36.85	37.05	37.25	37.45	37.65	37.85
Maximum 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	18.02	18.26	18.30	18.34	18.40
Module Efficiency (%)	20.40	20.60	20.80	20.90	21.10	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	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
Maximum Power Voltage V _{mp} (V)	34.20	34.40	34.60	34.80	35.00	35.20
Maximum 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	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	Black
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
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	25A

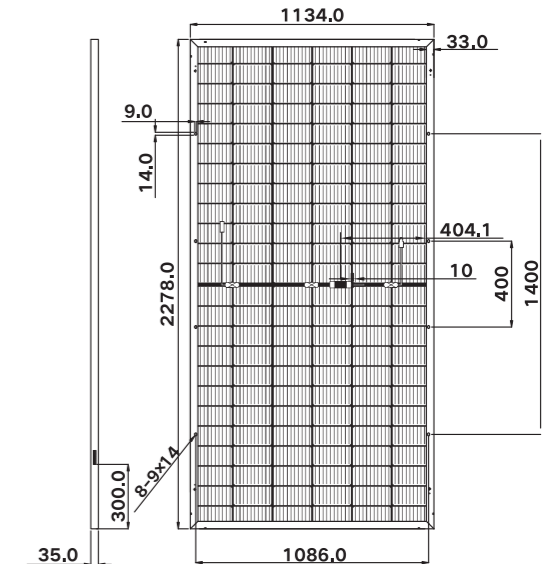
182 MBB Mono Perc Bifacial Half-cell Module

Power Range
530W ~ 555W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.5%

(Unit: mm)



Electrical Performance Parameters | STC

Model Type	530D(HBB) 72(182)	535D(HBB) 72(182)	540D(HBB) 72(182)	545D(HBB) 72(182)	550D(HBB) 72(182)	555D(HBB) 72(182)
Nominal Max. Power P _{max} (W)	530	535	540	545	550	555
Maximum Power Voltage V _{mp} (V)	41.29	41.45	41.61	41.77	41.93	42.08
Maximum 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 (%)	20.50	20.70	20.90	21.10	21.30	21.50
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(HBB) 72(182)	535D(HBB) 72(182)	540D(HBB) 72(182)	545D(HBB) 72(182)	550D(HBB) 72(182)	555D(HBB) 72(182)
Nominal Max. Power P _{max} (W)	402	405	408	411	414	417
Maximum Power Voltage V _{mp} (V)	38.65	38.78	38.88	39.00	39.13	39.26
Maximum 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
Weight	32.3kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	620pcs

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

30 years linear power output warranty

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

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

210 MBB Mono Perc Bifacial Half-cell Module

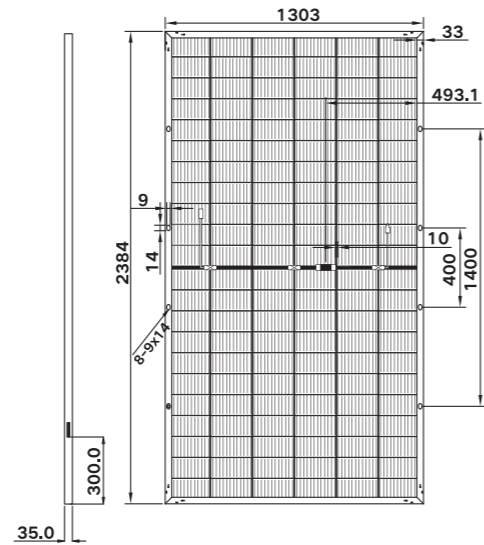
Power Range
645W ~ 670W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.6%

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

(Unit: mm)



Electrical Performance Parameters | STC

Model Type	645D(HBB) 66(210)	650D(HBB) 66(210)	655D(HBB) 66(210)	660D(HBB) 66(210)	665D(HBB) 66(210)	670D(HBB) 66(210)
Nominal Max. Power P _{max} (W)	645	650	655	660	665	670
Max.imum Power Voltage V _{mp} (V)	37.43	37.63	37.83	38.03	38.23	38.43
Max.imum Power Current I _{mp} (A)	17.24	17.28	17.32	17.36	17.40	17.44
Open Circuit Voltage V _{oc} (V)	45.40	45.60	45.80	46.00	46.20	46.40
Short Circuit Current I _{sc} (A)	18.30	18.34	18.38	18.42	18.46	18.50
Module Efficiency (%)	20.80	20.90	21.10	21.20	21.40	21.60
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(HBB) 66(210)	650D(HBB) 66(210)	655D(HBB) 66(210)	660D(HBB) 66(210)	665D(HBB) 66(210)	670D(HBB) 66(210)
Nominal Max. Power P _{max} (W)	488	492	496	500	504	508
Max.imum Power Voltage V _{mp} (V)	34.84	35.04	35.22	35.42	35.62	35.82
Max.imum Power Current I _{mp} (A)	14.02	14.06	14.08	14.12	14.16	14.20
Open Circuit Voltage V _{oc} (V)	42.80	43.00	43.20	43.40	43.60	43.80
Short Circuit Current I _{sc} (A)	14.74	14.78	14.82	14.86	14.90	14.94

* 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 PV cable, 300mm or customized length
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

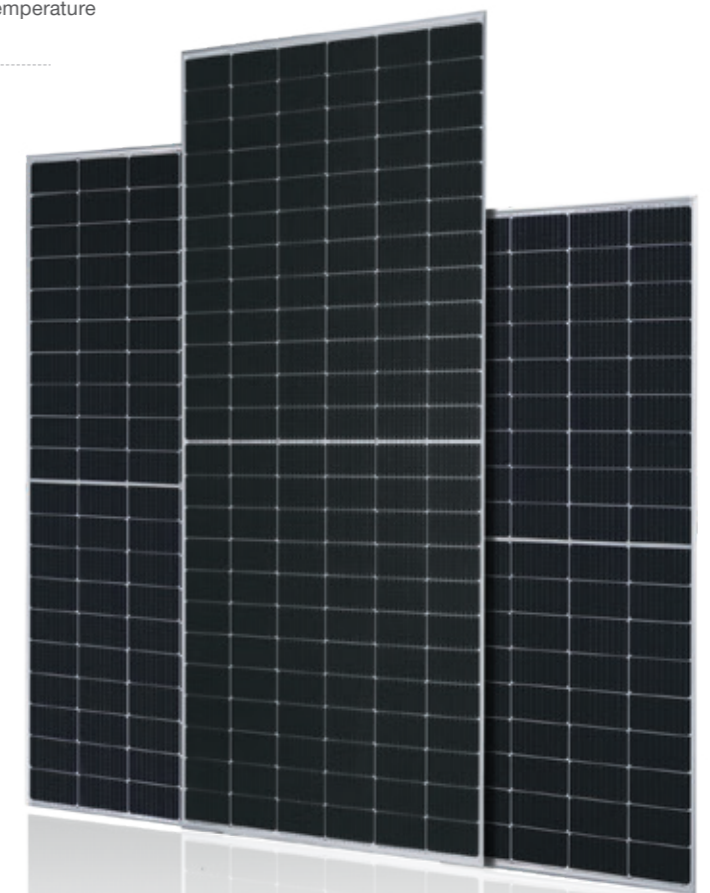
Working Temperature	-40~+85°C
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

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%**



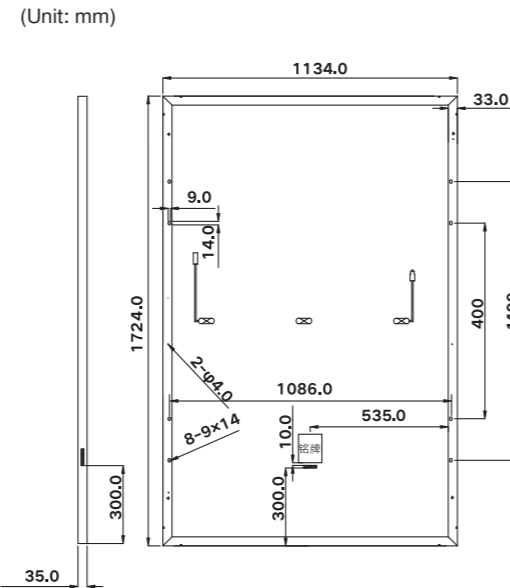
182 MBB Mono Perc Half-cell Module

Power Range
390W ~ 415W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.2%

*Customizable with Black Frame.



Electrical Performance Parameters | STC

Model Type	390D(HPM) 54(182)	395D(HPM) 54(182)	400D(HPM) 54(182)	405D(HPM) 54(182)	410D(HPM) 54(182)	415D(HPM) 54(182)
Nominal Max. Power P _{max} (W)	390	395	400	405	410	415
Maximum Power Voltage V _{mp} (V)	30.55	30.75	30.95	31.15	31.35	31.55
Maximum Power Current I _{mp} (A)	12.77	12.84	12.92	13.00	13.08	13.16
Open Circuit Voltage V _{oc} (V)	36.57	36.77	36.97	37.17	37.37	37.57
Short Circuit Current I _{sc} (A)	13.64	13.71	13.79	13.87	13.95	14.03
Module Efficiency (%)	19.90	20.20	20.50	20.70	21.00	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	390D(HPM) 54(182)	395D(HPM) 54(182)	400D(HPM) 54(182)	405D(HPM) 54(182)	410D(HPM) 54(182)	415D(HPM) 54(182)
Nominal Max. Power P _{max} (W)	285	290	295	300	305	310
Maximum Power Voltage V _{mp} (V)	27.25	27.64	28.00	28.38	28.72	28.88
Maximum Power Current I _{mp} (A)	10.46	10.50	10.54	10.58	10.62	10.54
Open Circuit Voltage V _{oc} (V)	34.53	34.68	34.83	34.98	35.13	35.28
Short Circuit Current I _{sc} (A)	10.84	10.94	11.70	11.19	11.24	11.32

* 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	1724×1134×35mm
Weight	21.8kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy (White/Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	806pcs

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

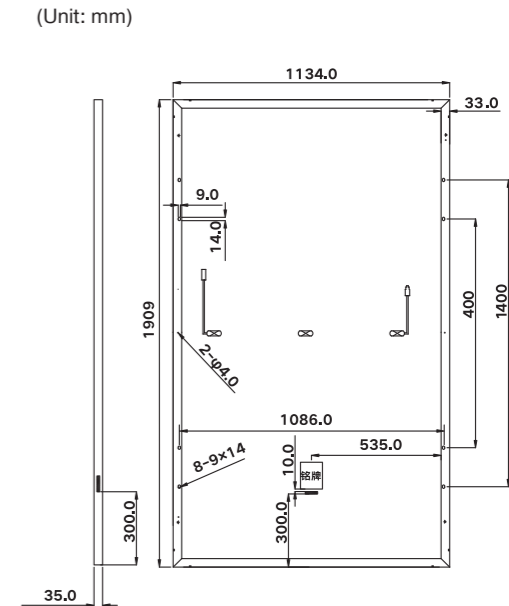
182 MBB Mono Perc Half-cell Module

Power Range
435W ~ 460W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.2%

*Customizable with Black Frame.



Electrical Performance Parameters | STC

Model Type	435D(HPM) 60(182)	440D(HPM) 60(182)	445D(HPM) 60(182)	450D(HPM) 60(182)	455D(HPM) 60(182)	460D(HPM) 60(182)
Nominal Max. Power P _{max} (W)	435	440	445	450	455	460
Maximum Power Voltage V _{mp} (V)	33.93	34.13	34.33	34.53	34.73	34.93
Maximum Power Current I _{mp} (A)	12.83	12.90	12.97	13.04	13.11	13.18
Open Circuit Voltage V _{oc} (V)	40.72	40.92	41.12	41.32	41.52	41.72
Short Circuit Current I _{sc} (A)	13.69	13.76	13.83	13.90	13.97	14.04
Module Efficiency (%)	20.10	20.30	20.60	20.80	21.00	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	435D(HPM) 60(182)	440D(HPM) 60(182)	445D(HPM) 60(182)	450D(HPM) 60(182)	455D(HPM) 60(182)	460D(HPM) 60(182)
Nominal Max. Power P _{max} (W)	315	320	325	330	335	340
Maximum Power Voltage V _{mp} (V)	30.47	30.77	31.08	31.37	31.67	31.96
Maximum Power Current I _{mp} (A)	10.34	10.40	10.46	10.52	10.58	10.64
Open Circuit Voltage V _{oc} (V)	38.68	38.72	38.79	38.87	39.01	39.15
Short Circuit Current I _{sc} (A)	10.59	10.64	10.69	10.74	10.79	10.84

* 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
Weight	23.2kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy (White/Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	744pcs

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%**

182 MBB Mono Perc Half-cell Module

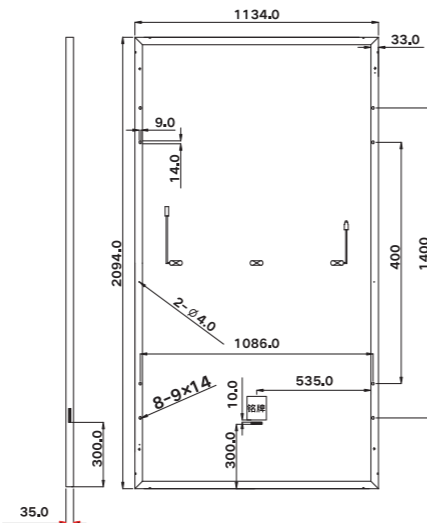
Power Range
480W ~ 505W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.3%

*Customizable with Black Frame.

(Unit: mm)



Electrical Performance Parameters | STC

Model Type	480D(HPM) 66(182)	485D(HPM) 66(182)	490D(HPM) 66(182)	495D(HPM) 66(182)	500D(HPM) 66(182)	505D(HPM) 66(182)
Nominal Max. Power P _{max} (W)	480	485	490	495	500	505
Maximum Power Voltage V _{mp} (V)	37.60	37.80	38.00	38.20	38.40	38.60
Maximum Power Current I _{mp} (A)	12.77	12.84	12.90	12.96	13.03	13.09
Open Circuit Voltage V _{oc} (V)	44.67	44.87	45.07	45.27	45.47	45.67
Short Circuit Current I _{sc} (A)	13.64	13.70	13.77	13.83	13.89	13.95
Module Efficiency (%)	20.20	20.40	20.60	20.80	21.10	21.30
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	480D(HPM) 66(182)	485D(HPM) 66(182)	490D(HPM) 66(182)	495D(HPM) 66(182)	500D(HPM) 66(182)	505D(HPM) 66(182)
Nominal Max. Power P _{max} (W)	360	365	370	375	380	385
Maximum Power Voltage V _{mp} (V)	34.62	34.80	34.97	35.34	35.51	35.64
Maximum Power Current I _{mp} (A)	10.40	10.50	10.60	10.62	10.71	10.81
Open Circuit Voltage V _{oc} (V)	42.17	42.31	42.45	42.70	42.87	43.03
Short Circuit Current I _{sc} (A)	11.02	11.07	11.13	11.23	11.30	11.42

* 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
Weight	25.1kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy (White/Black)
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	682pcs

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

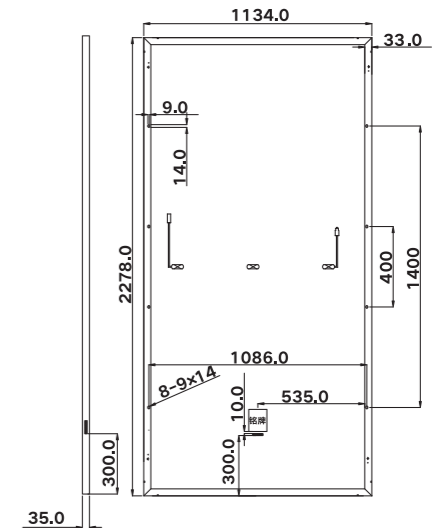
182 MBB Mono Perc Half-cell Module

Power Range
530W ~ 550W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.3%

(Unit: mm)



Electrical Performance Parameters | STC

Model Type	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)	530	535	540	545	550
Maximum Power Voltage V _{mp} (V)	41.20	41.40	41.60	41.80	42.00
Maximum Power Current I _{mp} (A)	12.87	12.92	12.98	13.04	13.10
Open Circuit Voltage V _{oc} (V)	49.02	49.22	49.42	49.62	49.82
Short Circuit Current I _{sc} (A)	13.74	13.79	13.85	13.91	13.97
Module Efficiency (%)	20.60	20.70	20.80	21.10	21.30
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(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)	394	398	402	405	409
Maximum Power Voltage V _{mp} (V)	37.79	37.91	38.08	38.25	38.42
Maximum Power Current I _{mp} (A)	10.45	10.50	10.55	10.60	10.65
Open Circuit Voltage V _{oc} (V)	46.51	46.57	46.65	46.72	46.84
Short Circuit Current I _{sc} (A)	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
Weight	28.0kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	620pcs

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%**

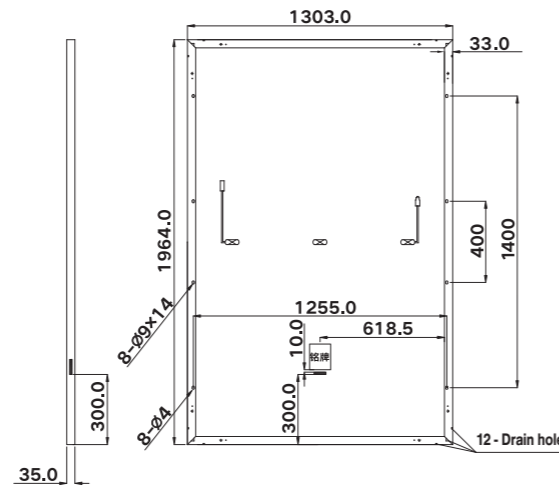
210 MBB Mono Perc Half-cell Module

Power Range
525W ~ 545W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.3%

(Unit: mm)



Electrical Performance Parameters | STC

Model Type	525D(HPM) 54(210)	530D(HPM) 54(210)	535D(HPM) 54(210)	540D(HPM) 54(210)	545D(HPM) 54(210)
Nominal Max. Power P _{max} (W)	525	530	535	540	545
Maximum Power Voltage V _{mp} (V)	30.10	30.30	30.50	30.70	30.90
Maximum Power Current I _{mp} (A)	17.45	17.50	17.55	17.60	17.65
Open Circuit Voltage V _{oc} (V)	36.80	37.20	37.60	37.80	38.00
Short Circuit Current I _{sc} (A)	18.34	18.38	18.42	18.46	18.50
Module Efficiency (%)	20.50	20.70	20.90	21.10	21.30
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)	545D(HPM) 54(210)
Nominal Max. Power P _{max} (W)	398	402	406	410	415
Maximum Power Voltage V _{mp} (V)	28.33	28.54	28.74	28.94	29.15
Maximum Power Current I _{mp} (A)	14.05	14.09	14.13	14.17	14.24
Open Circuit Voltage V _{oc} (V)	34.40	34.60	34.80	35.00	35.20
Short Circuit Current I _{sc} (A)	14.80	14.84	14.88	14.92	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	108pcs(6×18)
Module Dimension	1964×1303×35mm
Weight	28.4kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
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

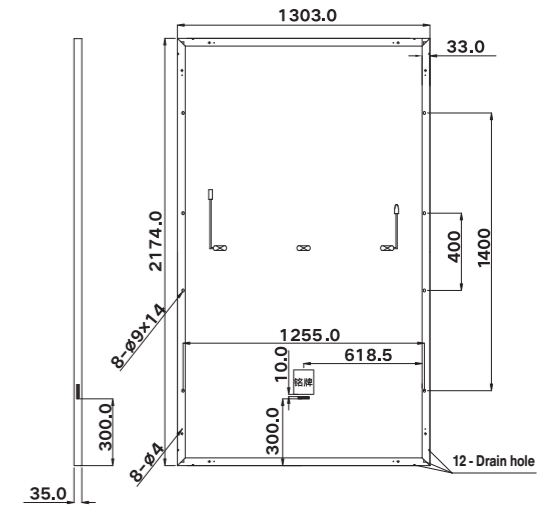
210 MBB Mono Perc Half-cell Module

Power Range
585W ~ 605W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.4%

(Unit: mm)



Electrical Performance Parameters | STC

Model Type	585D(HPM) 60(210)	590D(HPM) 60(210)	595D(HPM) 60(210)	600D(HPM) 60(210)	605D(HPM) 60(210)
Nominal Max. Power P _{max} (W)	585	590	595	600	605
Maximum Power Voltage V _{mp} (V)	33.70	33.90	34.10	34.30	34.50
Maximum Power Current I _{mp} (A)	17.36	17.41	17.45	17.50	17.54
Open Circuit Voltage V _{oc} (V)	40.80	41.00	41.20	41.40	41.60
Short Circuit Current I _{sc} (A)	18.36	18.40	18.44	18.48	18.56
Module Efficiency (%)	20.70	20.80	21.00	21.20	21.40
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)	605D(HPM) 60(210)
Nominal Max. Power P _{max} (W)	443	447	451	454	458
Maximum Power Voltage V _{mp} (V)	31.54	31.73	31.92	32.02	32.21
Maximum Power Current I _{mp} (A)	14.05	14.09	14.13	14.18	14.22
Open Circuit Voltage V _{oc} (V)	38.50	38.70	38.90	39.10	39.30
Short Circuit Current I _{sc} (A)	14.81	14.85	14.89	14.93	14.97

* 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	2174×1303×35mm
Weight	31.2kg
Front Glass	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
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

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%**

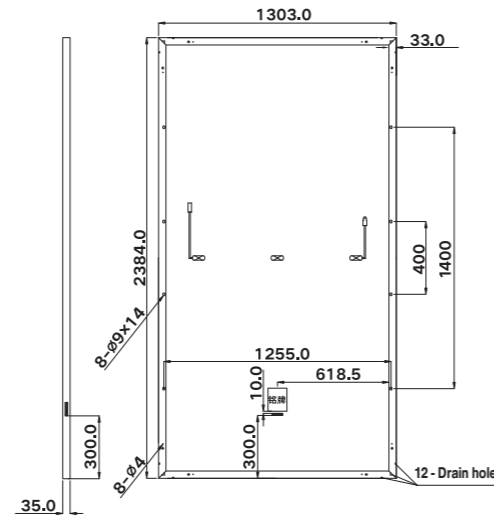
210 MBB Mono Perc Half-cell Module

Power Range
645W ~ 670W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.6%

(Unit: mm)



Electrical Performance Parameters STC		645D(HPM) 66(210)	650D(HPM) 66(210)	655D(HPM) 66(210)	660D(HPM) 66(210)	665D(HPM) 66(210)	670D(HPM) 66(210)
Nominal Max. Power	P _{max} (W)	645	650	655	660	665	670
Maximum Power Voltage	V _{mp} (V)	37.30	37.50	37.70	37.90	38.10	38.30
Maximum Power Current	I _{mp} (A)	17.30	17.34	17.38	17.42	17.46	17.50
Open Circuit Voltage	V _{oc} (V)	45.00	45.20	45.40	45.60	45.80	46.00
Short Circuit Current	I _{sc} (A)	18.38	18.42	18.46	18.50	18.54	18.60
Module Efficiency	(%)	20.80	20.90	21.10	21.20	21.40	21.60
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		645D(HPM) 66(210)	650D(HPM) 66(210)	655D(HPM) 66(210)	660D(HPM) 66(210)	665D(HPM) 66(210)	670D(HPM) 66(210)
Nominal Max. Power	P _{max} (W)	488	492	496	500	504	508
Maximum Power Voltage	V _{mp} (V)	34.74	34.92	35.04	35.28	35.48	35.66
Maximum Power Current	I _{mp} (A)	14.05	14.09	14.13	14.18	14.21	14.25
Open Circuit Voltage	V _{oc} (V)	42.50	42.70	42.90	43.10	43.20	43.40
Short Circuit Current	I _{sc} (A)	14.82	14.86	14.90	14.94	14.98	15.10

* 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	3.2 mm, highly transparent tempered glass with anti-reflective coating
Back Sheet	White
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
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	25A

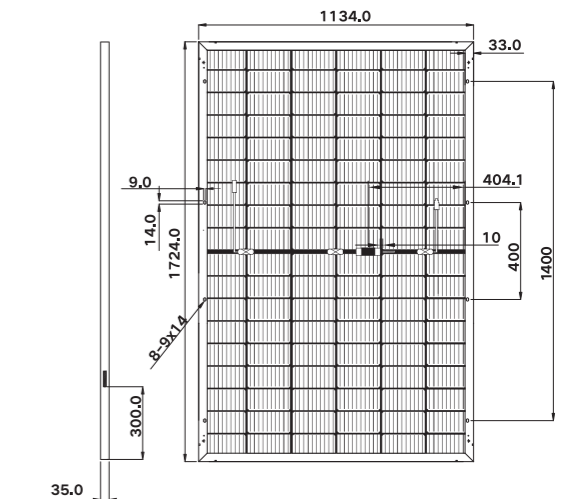
182 MBB Mono Perc Bifacial Half-cell Module

Power Range
395W ~ 420W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.5%

(Unit: mm)



Electrical Performance Parameters STC		395D(HBD) 54(182)	400D(HBD) 54(182)	405D(HBD) 54(182)	410D(HBD) 54(182)	415D(HBD) 54(182)	420D(HBD) 54(182)
Nominal Max. Power	P _{max} (W)	395	400	405	410	415	420
Maximum Power Voltage	V _{mp} (V)	30.92	31.13	31.35	31.57	31.79	31.99
Maximum Power Current	I _{mp} (A)	12.78	12.85	12.92	12.99	13.06	13.13
Open Circuit Voltage	V _{oc} (V)	36.86	36.96	37.08	37.20	37.34	37.49
Short Circuit Current	I _{sc} (A)	13.67	13.74	13.81	13.88	13.95	14.02
Module Efficiency	(%)	20.20	20.50	20.70	21.00	21.20	21.50
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		395D(HBD) 54(182)	400D(HBD) 54(182)	405D(HBD) 54(182)	410D(HBD) 54(182)	415D(HBD) 54(182)	420D(HBD) 54(182)
Nominal Max. Power	P _{max} (W)	267	275	282	287	292	297
Maximum Power Voltage	V _{mp} (V)	25.88	26.55	27.12	27.50	27.87	28.24
Maximum Power Current	I _{mp} (A)	10.32	10.36	10.40	10.44	10.48	10.52
Open Circuit Voltage	V _{oc} (V)	34.52	34.62	34.74	34.86	35.00	35.14
Short Circuit Current	I _{sc} (A)	11.04	11.09	11.15	11.20	11.26	11.32

* 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	1724×1134×35mm
Weight	24.2kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	806pcs

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

30 years linear power output warranty

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

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

182 MBB Mono Perc Bifacial Half-cell Module

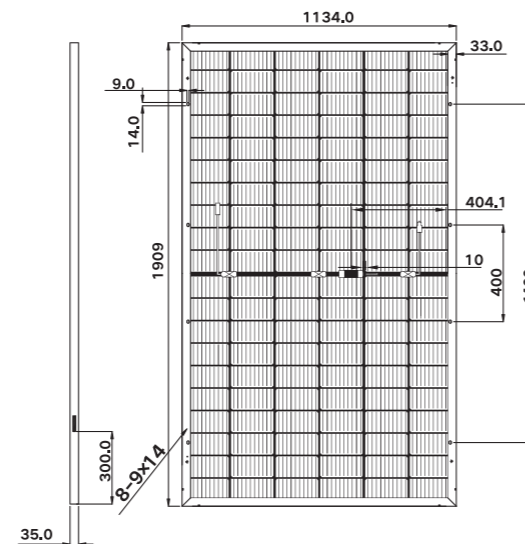
Power Range
440W ~ 465W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.5%

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

(Unit: mm)



Electrical Performance Parameters STC		440D(HBD) 60(182)	445D(HBD) 60(182)	450D(HBD) 60(182)	455D(HBD) 60(182)	460D(HBD) 60(182)	465D(HBD) 60(182)
Model Type							
Nominal Max. Power	P _{max} (W)	440	445	450	455	460	465
Maximum Power Voltage	V _{mp} (V)	34.38	34.58	34.78	34.98	35.18	35.38
Maximum Power Current	I _{mp} (A)	12.80	12.87	12.94	13.01	13.08	13.15
Open Circuit Voltage	V _{oc} (V)	40.98	41.08	41.20	41.32	41.46	41.61
Short Circuit Current	I _{sc} (A)	13.69	13.76	13.83	13.90	13.97	14.04
Module Efficiency	(%)	20.30	20.60	20.80	21.00	21.20	21.50
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		440D(HBD) 60(182)	445D(HBD) 60(182)	450D(HBD) 60(182)	455D(HBD) 60(182)	460D(HBD) 60(182)	465D(HBD) 60(182)
Model Type							
Nominal Max. Power	P _{max} (W)	312	317	322	327	332	337
Maximum Power Voltage	V _{mp} (V)	30.18	30.54	30.91	31.27	31.62	31.98
Maximum Power Current	I _{mp} (A)	10.34	10.38	10.42	10.46	10.50	10.54
Open Circuit Voltage	V _{oc} (V)	38.68	38.78	38.90	39.02	39.14	39.30
Short Circuit Current	I _{sc} (A)	11.06	11.11	11.17	11.22	11.28	11.34

* 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
Weight	26.9kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	744pcs

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 MBB Mono Perc Bifacial Half-cell Module

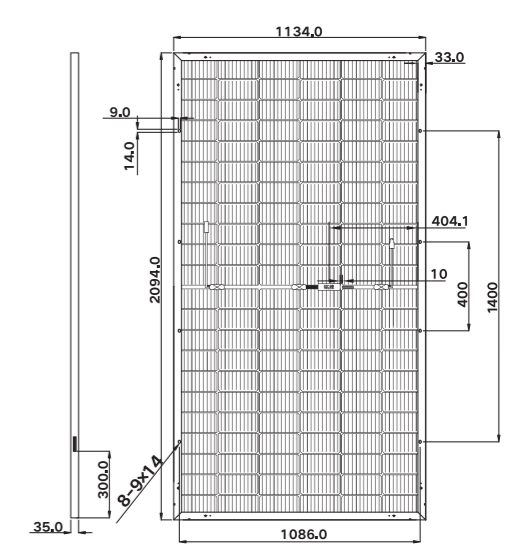
Power Range
485W ~ 510W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.5%

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

(Unit: mm)



Electrical Performance Parameters STC		485D(HBD) 66(182)	490D(HBD) 66(182)	495D(HBD) 66(182)	500D(HBD) 66(182)	505D(HBD) 66(182)	510D(HBD) 66(182)
Model Type							
Nominal Max. Power	P _{max} (W)	485	490	495	500	505	510
Maximum Power Voltage	V _{mp} (V)	37.84	38.02	38.20	38.38	38.56	38.74
Maximum Power Current	I _{mp} (A)	12.82	12.89	12.96	13.03	13.10	13.17
Open Circuit Voltage	V _{oc} (V)	45.14	45.24	45.36	45.48	45.62	45.77
Short Circuit Current	I _{sc} (A)	13.71	13.78	13.85	13.92	13.99	14.06
Module Efficiency	(%)	20.40	20.60	20.80	21.10	21.30	21.50
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		485D(HBD) 66(182)	490D(HBD) 66(182)	495D(HBD) 66(182)	500D(HBD) 66(182)	505D(HBD) 66(182)	510D(HBD) 66(182)
Model Type							
Nominal Max. Power	P _{max} (W)	357	362	367	372	377	382
Maximum Power Voltage	V _{mp} (V)	34.47	34.81	35.16	35.50	35.84	36.18
Maximum Power Current	I _{mp} (A)	10.36	10.40	10.44	10.48	10.52	10.56
Open Circuit Voltage	V _{oc} (V)	42.84	42.94	43.06	43.18	43.32	43.47
Short Circuit Current	I _{sc} (A)	11.08	11.13	11.19	11.24	11.30	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	132pcs(6×22)
Module Dimension	2094×1134×35mm
Weight	29.6kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	682pcs

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%**

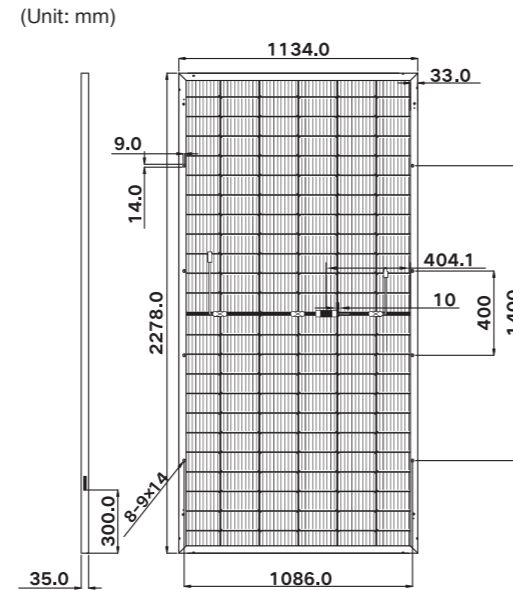
182 MBB Mono Perc Bifacial Half-cell Module

Power Range
530W ~ 555W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.5%

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



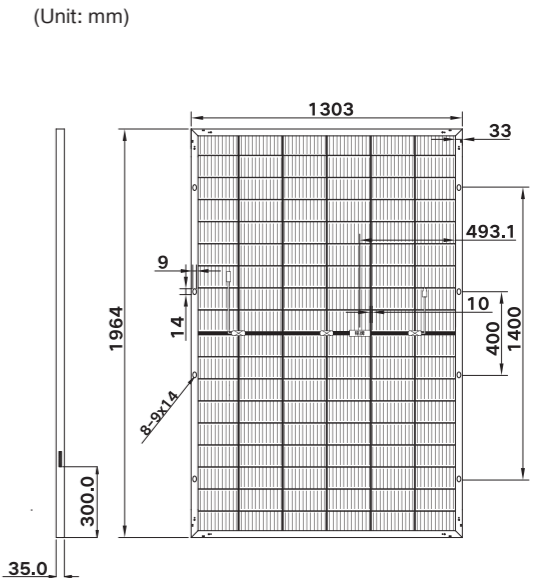
210 MBB Mono Perc Bifacial Half-cell Module

Power Range
525W ~ 550W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.5%

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.imum Power Voltage V _{mp} (V)	41.29	41.45	41.61	41.77	41.93	42.08
Max.imum 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 (%)	20.50	20.70	20.90	21.10	21.30	21.50
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.imum Power Voltage V _{mp} (V)	38.65	38.78	38.88	39.00	39.13	39.26
Max.imum 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
Weight	32.3kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	620pcs

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

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)	550D(HBD) 54(210)
Nominal Max. Power P _{max} (W)	525	530	535	540	545	550
Max.imum Power Voltage V _{mp} (V)	30.43	30.63	30.83	31.03	31.23	31.43
Max.imum Power Current I _{mp} (A)	17.26	17.31	17.36	17.41	17.46	17.50
Open Circuit Voltage V _{oc} (V)	37.00	37.20	37.40	37.60	37.80	38.00
Short Circuit Current I _{sc} (A)	18.20	18.24	18.28	18.32	18.36	18.40
Module Efficiency (%)	20.50	20.70	20.90	21.10	21.30	21.50
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)	550D(HBD) 54(210)
Nominal Max. Power P _{max} (W)	398	402	406	410	414	418
Max.imum Power Voltage V _{mp} (V)	28.43	28.64	28.84	29.04	29.24	29.44
Max.imum Power Current I _{mp} (A)	14.00	14.04	14.08	14.12	14.16	14.20
Open Circuit Voltage V _{oc} (V)	34.60	34.80	35.00	35.20	35.40	35.60
Short Circuit Current I _{sc} (A)	14.68	14.72	14.76	14.80	14.84	14.88

* 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	1964×1303×35mm
Weight	32.8kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
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

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 MBB Mono Perc Bifacial Half-cell Module

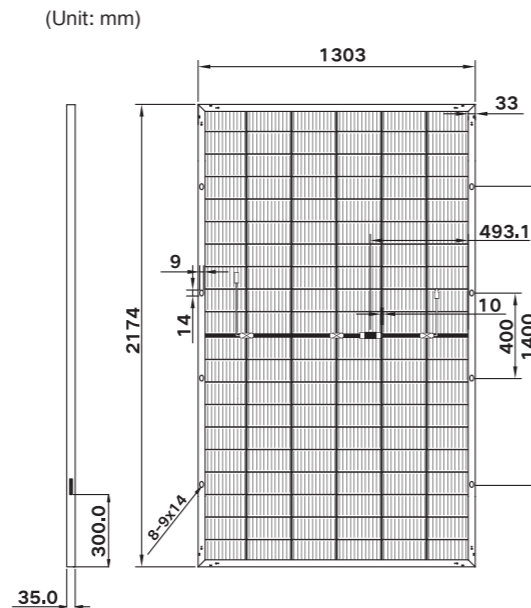
210 MBB Mono Perc Bifacial Half-cell Module

Power Range
585W ~ 610W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.5%

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

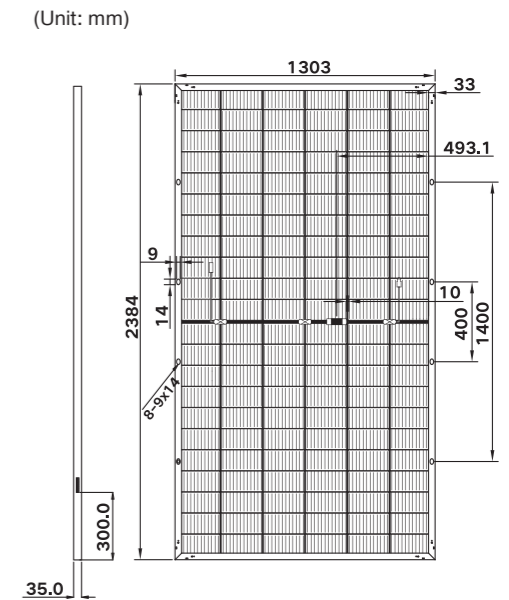


Power Range
645W ~ 670W

Power Output Tolerance
0W ~ +5W

Maximum Efficiency
21.6%

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



Electrical Performance Parameters STC		585D(HBD) 60(210)	590D(HBD) 60(210)	595D(HBD) 60(210)	600D(HBD) 60(210)	605D(HBD) 60(210)	610D(HBD) 60(210)
Nominal Max. Power	P _{max} (W)	585	590	595	600	605	610
Max.imum Power Voltage	V _{mp} (V)	33.93	34.13	34.33	34.53	34.73	34.93
Max.imum Power Current	I _{mp} (A)	17.25	17.29	17.34	17.38	17.43	17.47
Open Circuit Voltage	V _{oc} (V)	41.20	41.40	41.60	41.80	42.00	42.20
Short Circuit Current	I _{sc} (A)	18.25	18.29	18.33	18.37	18.41	18.45
Module Efficiency	(%)	20.70	20.80	21.00	21.20	21.40	21.50
Power Output Tolerance	(W)	0~+5W					

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

Structure Performance	
Solar Cell Type	210mm Mono-crystalline (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	2174×1303×35mm
Weight	35.6kg
Front Glass	2.0mm, highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
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

Electrical Performance Parameters STC		645D(HBD) 66(210)	650D(HBD) 66(210)	655D(HBD) 66(210)	660D(HBD) 66(210)	665D(HBD) 66(210)	670D(HBD) 66(210)
Nominal Max. Power	P _{max} (W)	645	650	655	660	665	670
Max.imum Power Voltage	V _{mp} (V)	37.43	37.63	37.83	38.03	38.23	38.43
Max.imum Power Current	I _{mp} (A)	17.24	17.28	17.32	17.36	17.40	17.44
Open Circuit Voltage	V _{oc} (V)	45.40	45.60	45.80	46.00	46.20	46.40
Short Circuit Current	I _{sc} (A)	18.30	18.34	18.38	18.42	18.46	18.50
Module Efficiency	(%)	20.80	20.90	21.10	21.20	21.40	21.60
Power Output Tolerance	(W)	0~+5W					

* STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
* 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
Junction Box	IP68 rated
Cable	4mm ² PV cable, 300mm or customized length
Diode Quantity	3 pcs
Front side/Rear side	5400pa/2400pa
Connector	MC4 Compatible
Per Pallet	31pcs
Per Container(40'HQ)	558pcs

Electrical Performance Parameters NMOT		645D(HBD) 66(210)	650D(HBD) 66(210)	655D(HBD) 66(210)	660D(HBD) 66(210)	665D(HBD) 66(210)	670D(HBD) 66(210)
Nominal Max. Power	P _{max} (W)	488	492	496	500	504	508
Max.imum Power Voltage	V _{mp} (V)	34.84	35.04	35.22	35.42	35.62	35.82
Max.imum Power Current	I _{mp} (A)	14.02	14.06	14.08	14.12	14.16	14.20
Open Circuit Voltage	V _{oc} (V)	42.80	43.00	43.20	43.40	43.60	43.80
Short Circuit Current	I _{sc} (A)	14.74	14.78	14.82	14.86	14.90	14.94

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

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%**

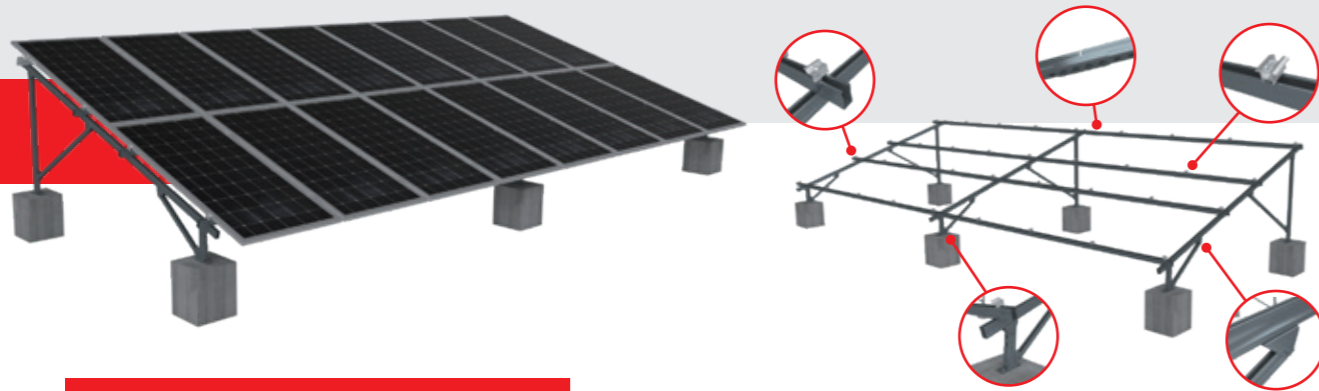
12 years product workmanship warranty

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



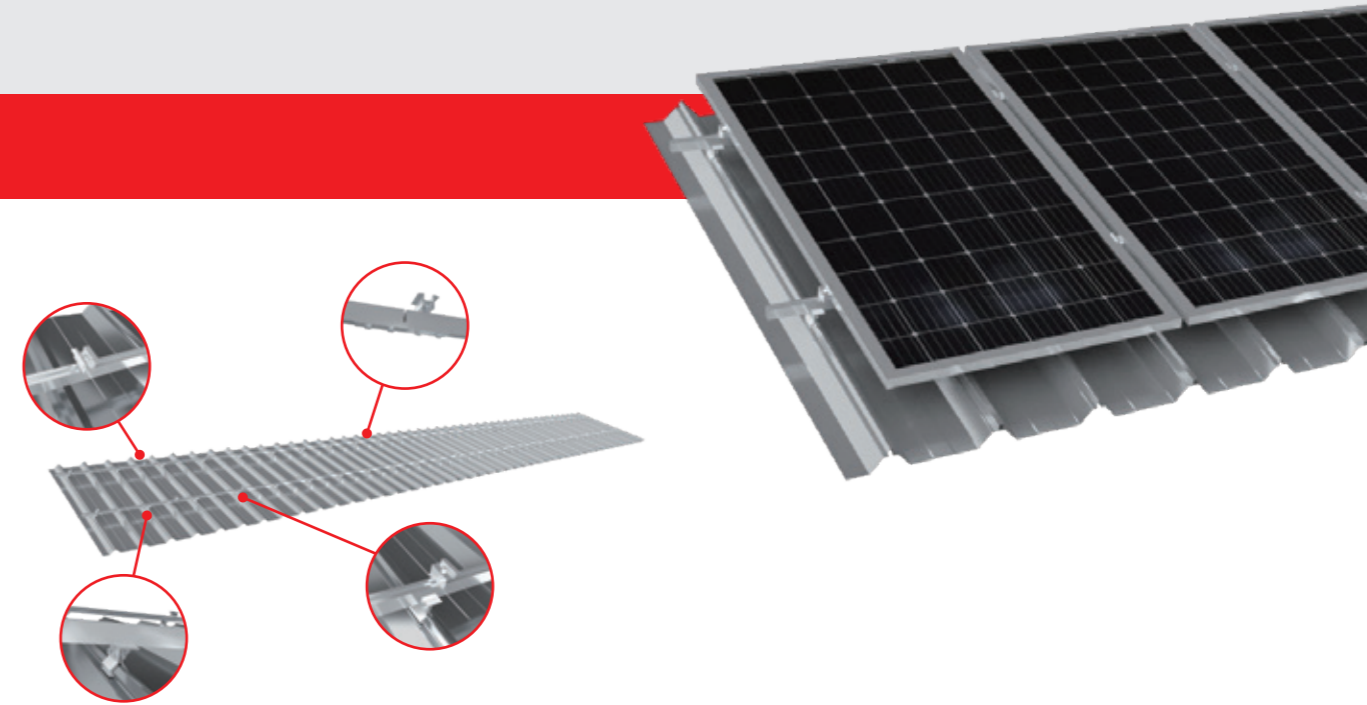
Side block	
Size / Model	H35mm
Material	6005-T5
Surface treatment & mechanical property	Anodization AA15, tensile strength 260N/mm ²



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

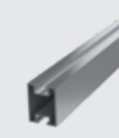


MOUNTING SYSTEM FOR COLOR STEEL TILE ROOF



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



Yunan Rooftop Solar Power Station

Location: Ducheng Town, Yunan County, Yunfu, Guangdong, China
Project Capacity: 4300KW
Module Type: LESSO 182 PV Module - 545W / 655W



Tianfeng Rooftop Solar Power Station

Location: Jingling Town, Jingzhou, Hubei, China
Project Capacity: 1054.62KW
Module Type: LESSO 182 PV Module - 545W



Muling Rooftop Solar Power Station

Location: Mujiangdan, Heilongjiang, China
Project Capacity: 799.74KW
Module Type: LESSO 182 PV Module - 545W



Chongkou Rooftop Solar Power Station

Location: Chongkou, Shunde, Foshan, Guangdong, China
Project Capacity: 2300KW
Module Type: LESSO 182 PV Module - 540W



Baoying Rooftop Solar Power Station

Location: Maonan, Maoming, Guangdong, China
Project Capacity: 700KW
Module Type: LESSO 182 PV Module - 540W



Our Choice Rooftop Solar Power Station

Location: Shunde, Foshan, Guangdong, China
Project Capacity: 167.4KW
Module Type: LESSO 182 PV Module - 540W



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

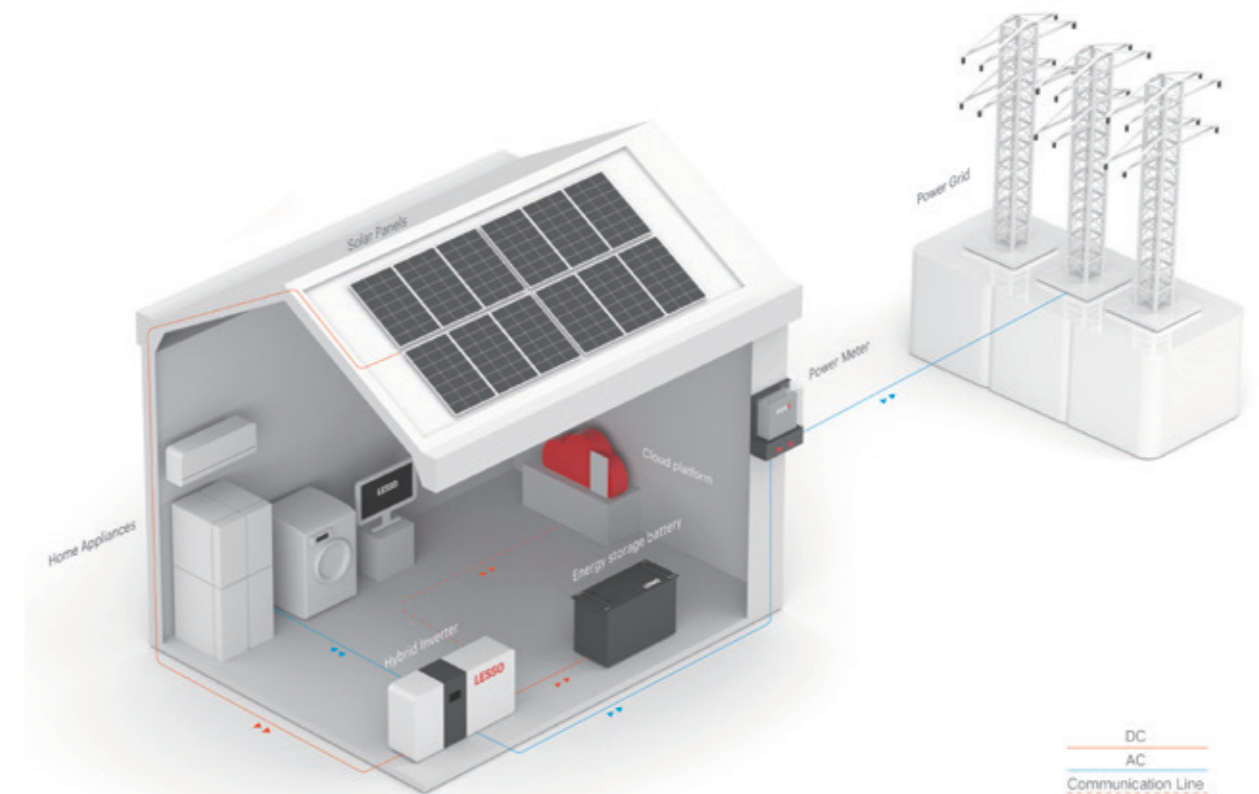
PV panels can protect rooftops by reducing the exposure to sun and heavy rain, and thus prolong the life span and maintain the value of the building.



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.



LESSO BUILDING A SOLAR-POWERED WORLD

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

