



# LESSO<sup>®</sup> America

## SOLAR PV MODULES

**LESSO AMERICA, INC.**

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

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\* This catalog has been prepared as a support guide. Under no circumstance shall LESSO America assume any liability or responsibility with the information in this catalog. Every effort has been made by LESSO America to provide accurate and up to date information.

# LESSO, BUILDING A SOLAR-POWERED WORLD

## CONTENT

<b>OVERVIEW</b> .....	02
<b>GLOBAL FOOTPRINT</b> .....	06
<b>N Series</b> .....	08

# LESSO AMERICA, INC.

Headquarter based in Corona, CA. We are dedicated to manufacturing reliable and high efficiency photovoltaic (PV) panels that meet stringent U.S. approvals and raw material traceability.

PT LESSO Indonesia facility is the largest and most advanced PV factory in Indonesia, with a robust 2.4GW+ annual production capacity to meet the U.S. domestic market demands.

Certified by 100+ international certificate authorities, including UL, CEC, TUV, CE, and ISO, which emphasizes our focus on quality, safety, and environmental responsibility.



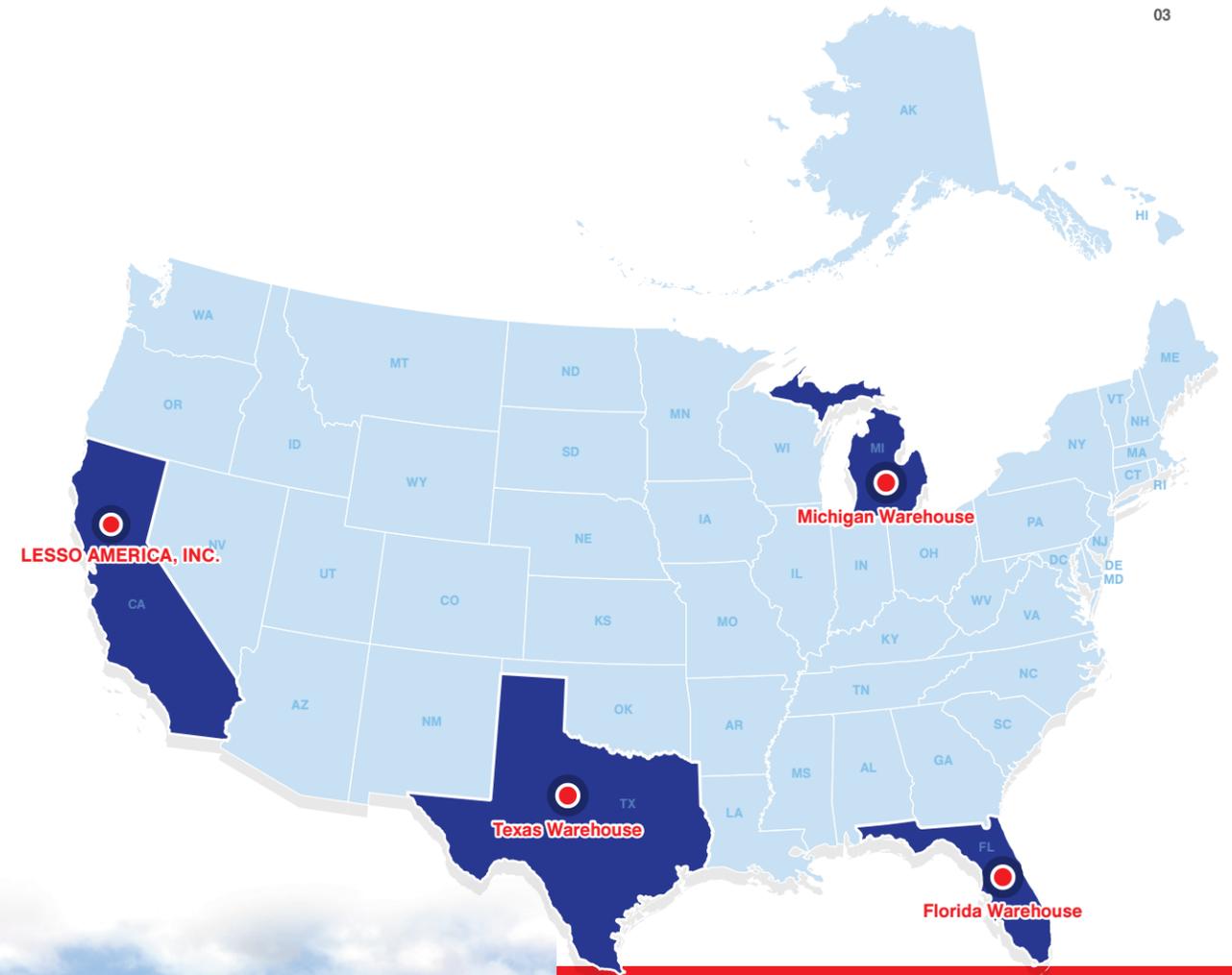
**USD 4.38 Bil**  
Annual Sales Revenue



**40 Years**  
Production Experience



**15.3GW**  
Solar Modules Manufacturing Capacity



With a strong distribution network across the U.S. through our 4 major warehousing centers in California, Michigan, Texas, and Florida, LESSO America has the confidence to ensure the timely delivery of high-quality TOPCon PV panels from coast to coast. Keep providing a better after sales service experience in decades.



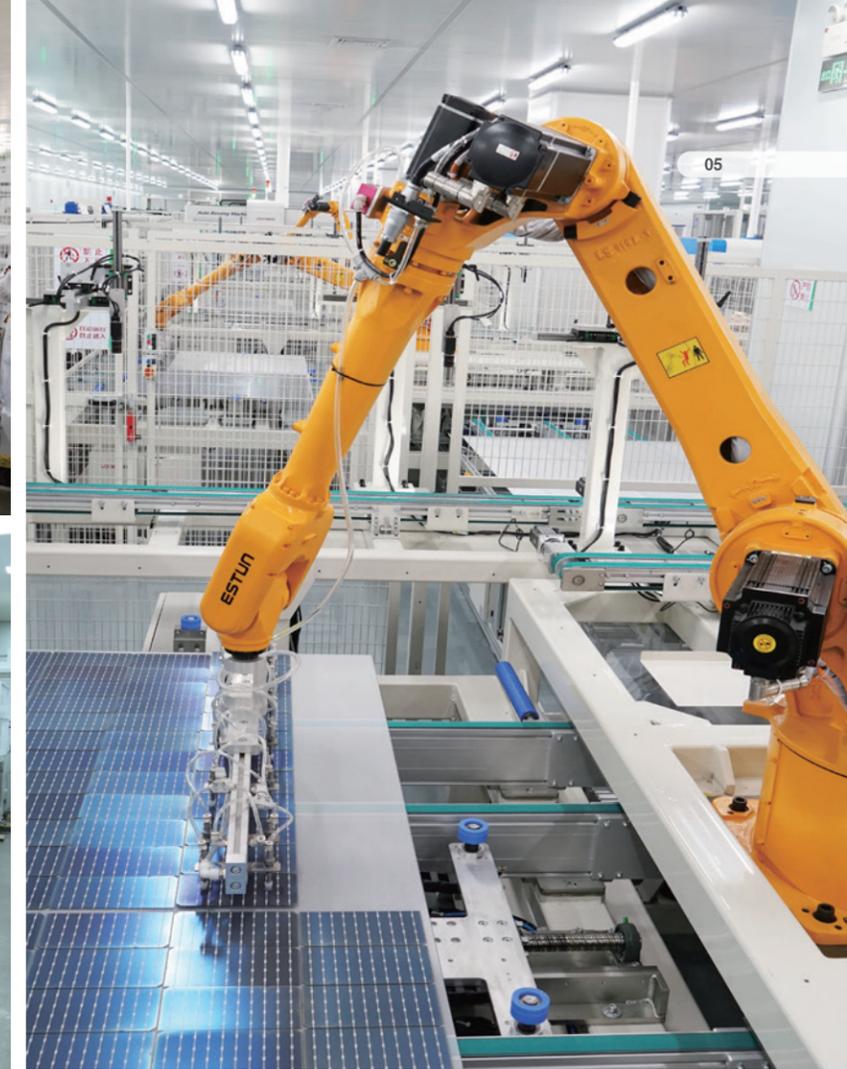
LESSO Florida Warehouse



LESSO Michigan Warehouse



LESSO Texas Warehouse



# LEADING THE FUTURE WITH INTELLIGENT MANUFACTURING



## PT LESSO Indonesia

LESSO America, INC. is dedicated to providing superior American standard solar solutions. To support this aspiration, we have established the PT LESSO Indonesia in 2022, located at Batu Town, Demak, which is focused on manufacturing and supplying high-efficiency photovoltaic (PV) panels to the U.S. market.

Covering an area of 118,000 m<sup>2</sup>, the factory is equipped with advanced automated machineries. Currently, two production lines are operating, with a yearly capacity of 1.2GW+. The third production line is also under way, and the yearly capacity will increase to 2.4GW+.

The LESSO Indonesia production centre guarantees that the solar panels comply with the exacting standards of the U.S. market and provides customers across the U.S. with dependable and high-performance solar solutions.

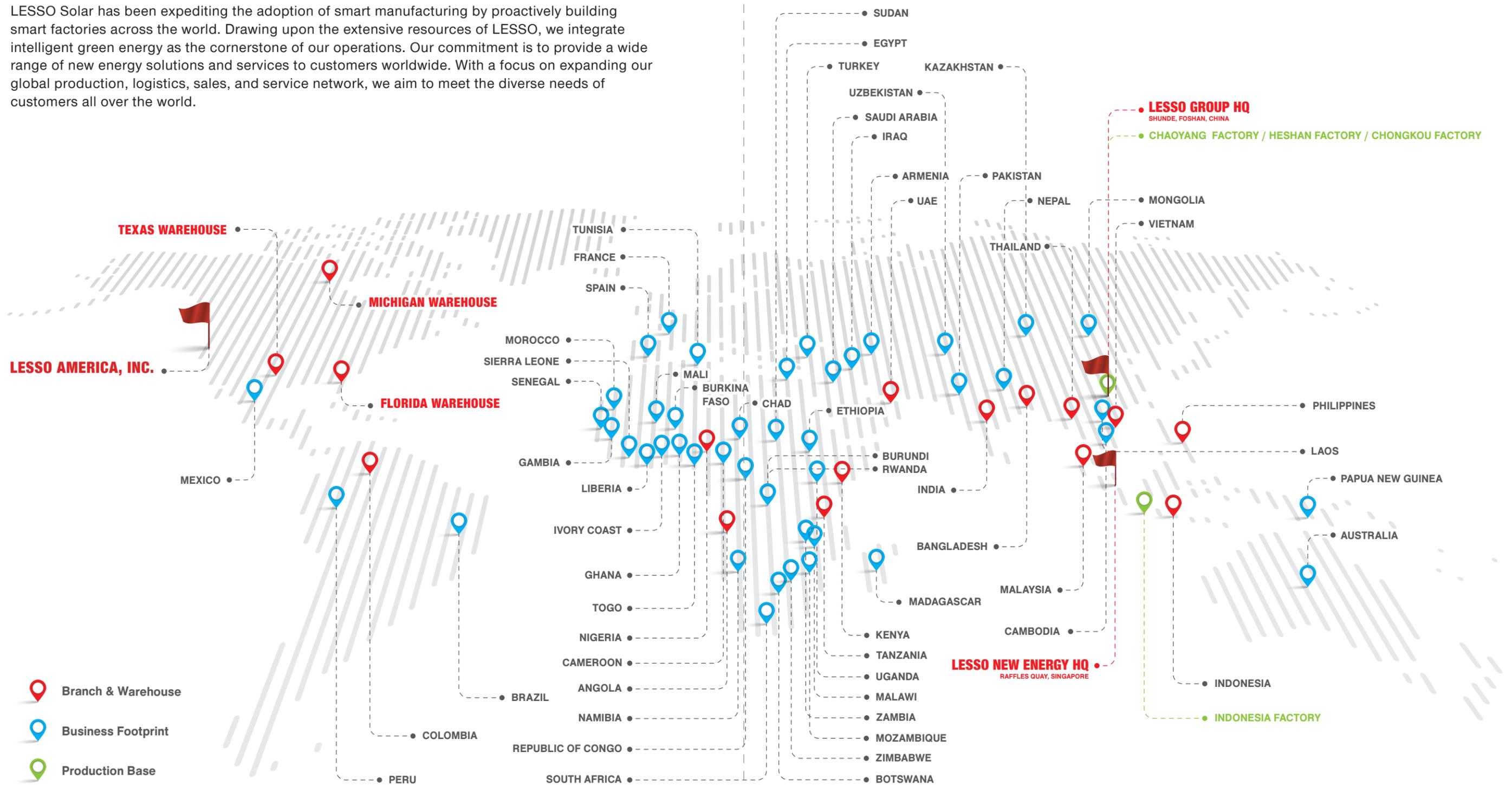
## Our Certificates

- IEC 61215, IEC 61730
- ISO 9001:2015 Quality Management System
- ISO 14001:2015 Environment Management System
- ISO 45001:2018 Occupational Health and Safety Management System



# LESSO SOLAR GLOBAL FOOTPRINT

LESSO Solar has been expediting the adoption of smart manufacturing by proactively building smart factories across the world. Drawing upon the extensive resources of LESSO, we integrate intelligent green energy as the cornerstone of our operations. Our commitment is to provide a wide range of new energy solutions and services to customers worldwide. With a focus on expanding our global production, logistics, sales, and service network, we aim to meet the diverse needs of customers all over the world.

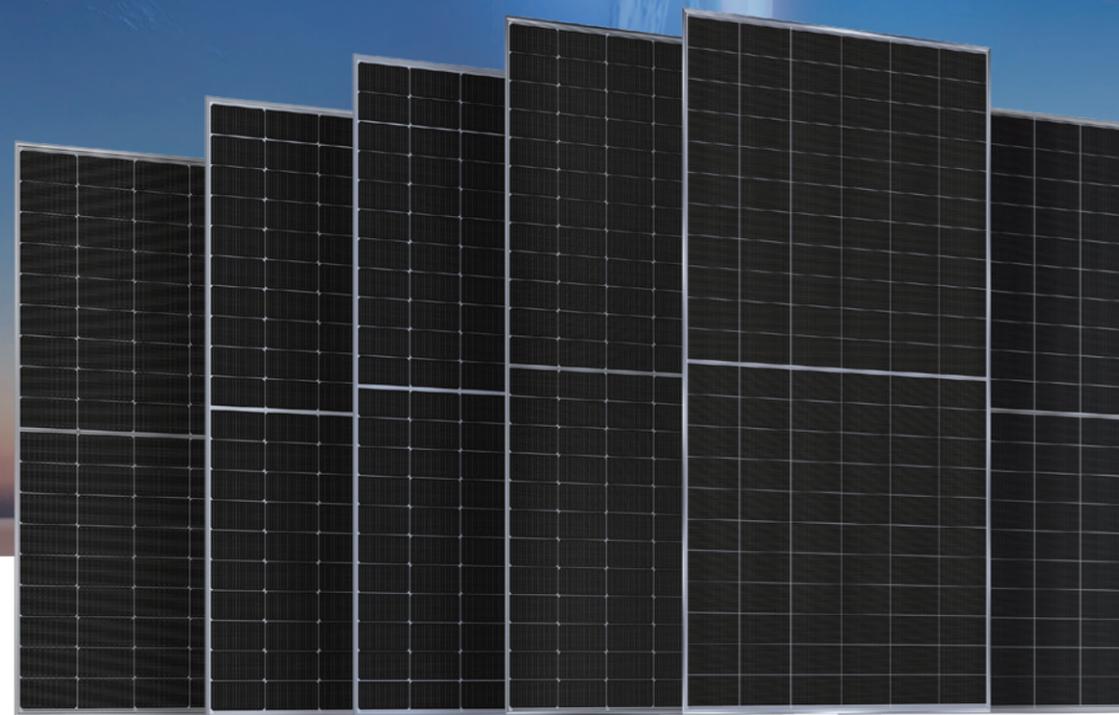


# N series

## Release Unlimited Power, Leading Innovation

The LESSO Solar N Series relies on TOPCon technology, maximum efficiency reaches 22.65%.

N-type cell is zero LID can increase power generation. The degradation is only 1% in the first year and 0.4% each subsequent year. Excellent power generation performance creates higher revenue for customers.



**TOPCon Technology**  
Higher Power Generation



**MBB Technology**  
Reducing String & Busbar Loss



**High Density Packaging**  
Improving Energy Density



**Even Cloudy or Foggy Days**  
Better Weak Illumination Response



**Zero LID**  
Increase Power Generation



**Better Temperature Coefficient**  
More Power Generation



**Higher Power Output**  
Lower BOS Cost



**Multiple Weather Resistance Tests**  
Wider Applicability



**Double-sided Generation**  
Powerfully Energy Boost

Power Range  
**410W ~ 585W**

Maximum Efficiency  
**22.65%**

12 years product workmanship warranty

30 years linear power output warranty

1% 1st-year degradation  
0.40% annual degradation

### N Series Products

Product	Power	Maximum Efficiency	Size
182 N-type (54) double glass	415 - 435W	22.28%	1722×1134×35/30mm 67.80×44.65×1.38/1.18inches
182 N-type (60) double glass	465 - 485W	22.40%	1909×1134×35/30mm 75.16×44.65×1.38/1.18inches
182 N-type (66) double glass	510 - 535W	22.53%	2094×1134×35/30mm 82.44×44.65×1.38/1.18inches
182 N-type (72) double glass	555 - 585W	22.65%	2278×1134×35/30mm 89.69×44.65×1.38/1.18inches
182 N-type (54) bifacial single glass	415 - 435W	22.28%	1722×1134×35/30mm 67.80×44.65×1.38/1.18inches
182 N-type (60) bifacial single glass	465 - 485W	22.40%	1909×1134×35/30mm 75.16×44.65×1.38/1.18inches
182 N-type (66) bifacial single glass	510 - 535W	22.53%	2094×1134×35/30mm 82.44×44.65×1.38/1.18inches
182 N-type (72) bifacial single glass	555 - 585W	22.65%	2278×1134×35/30mm 89.69×44.65×1.38/1.18inches
182 N-type (54) pure black bifacial single glass	410 - 435W	22.28%	1722×1134×35/30mm 67.80×44.65×1.38/1.18inches

Note: see datasheet for details

## 182 N-type Bifacial Module (54)

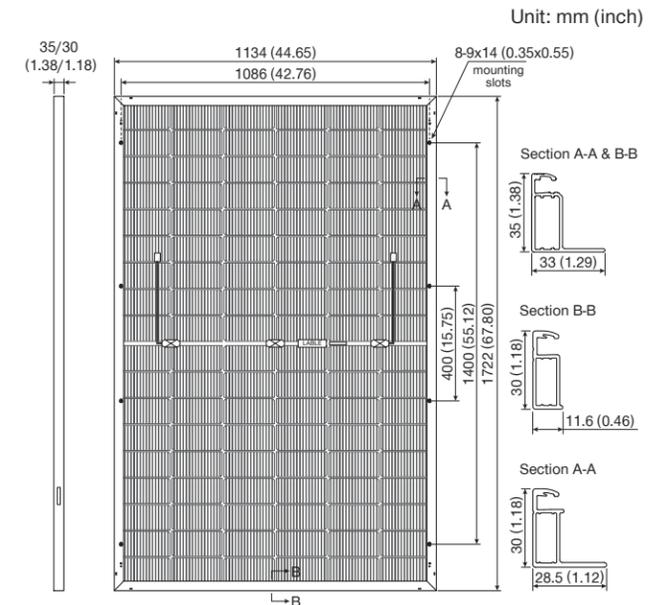
Power Range  
**415W ~ 435W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.28%**

### Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1722×1134×35/30mm (67.80×44.65×1.38/1.18inches)
Weight	24.1kg (53.13lbs) (35mm (1.38 inches)) 23.1kg (50.93lbs) (30mm (1.18 inches))
Front Glass	2.0mm (0.08inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+) 250mm (9.84in.) (-) * landscape 1200mm (47.24in.) (+) 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	806pcs (35mm (1.38 inches)) / 936pcs (30mm (1.18 inches))

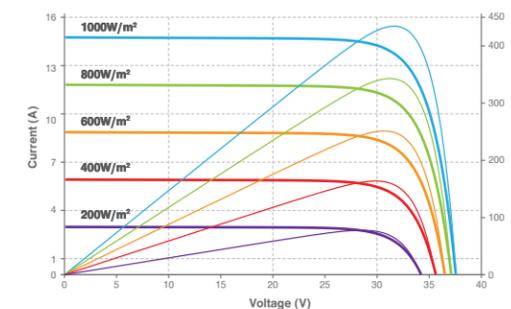


### Electrical Performance Parameters

Model Type	415C(HBD)54(182)		420C(HBD)54(182)		425C(HBD)54(182)		430C(HBD)54(182)		435C(HBD)54(182)		
	STC	BNPI									
Nominal Max. Power	$P_{max}$ (W)	415	457	420	463	425	468	430	474	435	479
Max. Power Voltage	$V_{mp}$ (V)	31.18	31.24	31.42	31.48	31.65	31.71	31.88	31.94	32.11	32.17
Max. Power Current	$I_{mp}$ (A)	13.31	14.65	13.37	14.72	13.43	14.79	13.49	14.85	13.55	14.92
Open Circuit Voltage	$V_{oc}$ (V)	38.57	38.56	38.72	38.71	38.87	38.86	39.02	39.01	39.17	39.16
Short Circuit Current	$I_{sc}$ (A)	14.55	16.06	14.61	16.13	14.67	16.20	14.73	16.26	14.79	16.33
Module Efficiency	(%)	21.25		21.51		21.76		22.02		22.28	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) + φ \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance ±3%.

### Current-Voltage & Power-Voltage Curve (435C)



### Bifacial Output-rearside Power Gain

5%	Maximum Power	$P_{max}$ (W)	436	441	446	452	457
	Module Efficiency	(%)	22.31%	22.58%	22.85%	23.12%	23.39%
10%	Maximum Power	$P_{max}$ (W)	457	462	468	473	479
	Module Efficiency	(%)	23.38%	23.66%	23.94%	24.22%	24.50%
25%	Maximum Power	$P_{max}$ (W)	519	525	531	538	544
	Module Efficiency	(%)	26.57%	26.89%	27.21%	27.53%	27.85%

### Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient ( $V_{oc}$ )	-0.25%
Temperature Coefficient ( $I_{sc}$ )	+0.043%	Temperature Coefficient ( $P_{max}$ )	-0.30%

### Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

# 182 N-type Bifacial Module (60)

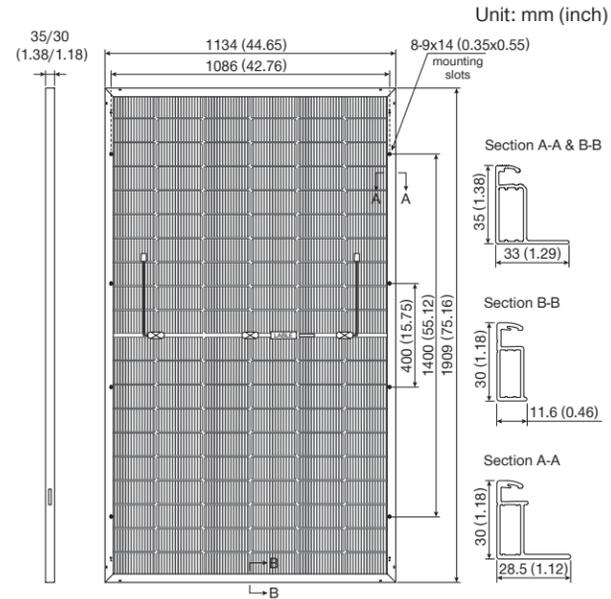
Power Range  
**465W ~ 485W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.40%**

## Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	1909×1134×35/30mm (75.16×44.65×1.38/1.18inches)
Weight	26.9kg (59.30lbs) (35mm (1.38 inches)) 25.7kg (56.66lbs) (30mm (1.18 inches))
Front Glass	2.0mm (0.08inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+) / 250mm (9.84in.) (-) , landscape 1200mm (47.24in.) (+) / 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	744pcs (35mm (1.38 inches)) / 864pcs (30mm (1.18 inches))

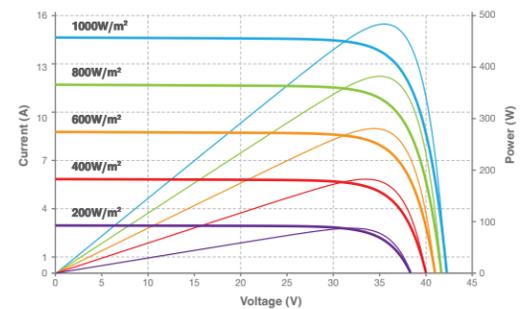


## Electrical Performance Parameters

Model Type	465C(HBD)60(182)		470C(HBD)60(182)		475C(HBD)60(182)		480C(HBD)60(182)		485C(HBD)60(182)	
	STC	BNPI								
Nominal Max. Power $P_{max}$ (W)	465	513	470	518	475	524	480	529	485	535
Max. Power Voltage $V_{mp}$ (V)	34.84	34.91	35.05	35.12	35.27	35.34	35.48	35.55	35.69	35.76
Max. Power Current $I_{mp}$ (A)	13.35	14.70	13.41	14.76	13.47	14.83	13.53	14.90	13.59	14.96
Open Circuit Voltage $V_{oc}$ (V)	43.02	43.01	43.18	43.17	43.35	43.34	43.52	43.51	43.68	43.67
Short Circuit Current $I_{sc}$ (A)	14.43	15.93	14.49	16.00	14.55	16.06	14.61	16.13	14.67	16.20
Module Efficiency (%)	21.48		21.71		21.94		22.17		22.40	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) +  $\phi$  \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance  $\pm$ 3%.

## Current-Voltage & Power-Voltage Curve (485C)



## Bifacial Output-rearside Power Gain

5%	Maximum Power $P_{max}$ (W)	488	494	499	504	509
	Module Efficiency (%)	22.55%	22.80%	23.04%	23.28%	23.52%
10%	Maximum Power $P_{max}$ (W)	512	517	523	528	534
	Module Efficiency (%)	23.63%	23.88%	24.14%	24.39%	24.64%
25%	Maximum Power $P_{max}$ (W)	581	588	594	600	606
	Module Efficiency (%)	26.85%	27.14%	27.43%	27.72%	28.00%

## Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient ( $V_{oc}$ )	-0.25%
Temperature Coefficient ( $I_{sc}$ )	+0.043%	Temperature Coefficient ( $P_{max}$ )	-0.30%

## Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

# 182 N-type Bifacial Module (66)

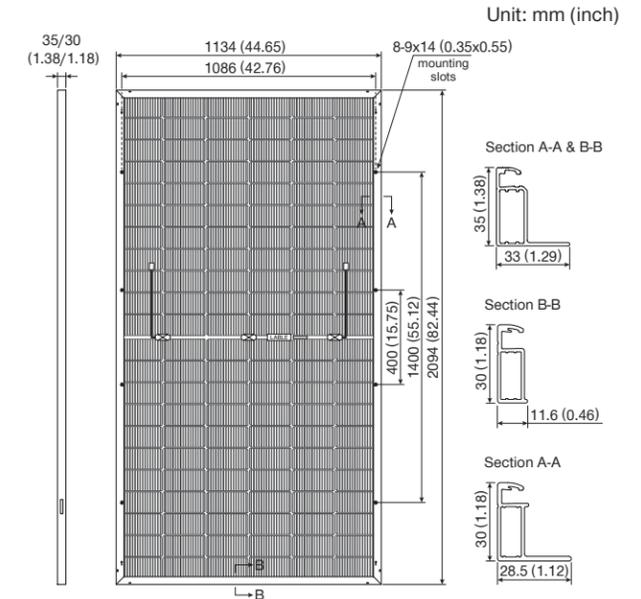
Power Range  
**510W ~ 535W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.53%**

## Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2094×1134×35/30mm (82.44×44.65×1.38/1.18inches)
Weight	29.6kg (65.26lbs) (35mm (1.38 inches)) 28.4kg (62.61lbs) (30mm (1.18 inches))
Front Glass	2.0mm (0.08inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+) / 250mm (9.84in.) (-) , landscape 1200mm (47.24in.) (+) / 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	682pcs (35mm (1.38 inches)) / 792pcs (30mm (1.18 inches))

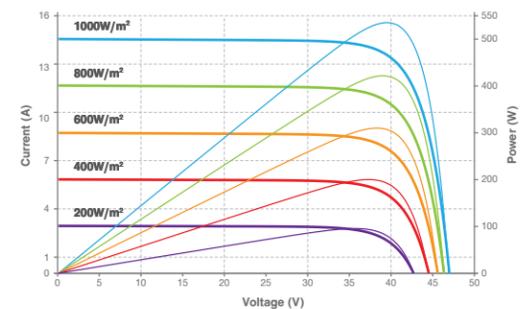


## Electrical Performance Parameters

Model Type	510C(HBD)66(182)		515C(HBD)66(182)		520C(HBD)66(182)		525C(HBD)66(182)		530C(HBD)66(182)		535C(HBD)66(182)	
	STC	BNPI										
Nominal Max. Power $P_{max}$ (W)	510	562	515	568	520	573	525	579	530	584	535	590
Max. Power Voltage $V_{mp}$ (V)	38.29	38.37	38.50	38.58	38.70	38.78	38.89	38.97	39.09	39.17	39.29	39.37
Max. Power Current $I_{mp}$ (A)	13.32	14.67	13.38	14.73	13.44	14.80	13.50	14.86	13.56	14.93	13.62	15.00
Open Circuit Voltage $V_{oc}$ (V)	47.32	47.31	47.50	47.49	47.69	47.68	47.87	47.86	48.05	48.04	48.24	48.23
Short Circuit Current $I_{sc}$ (A)	14.25	15.73	14.31	15.80	14.37	15.86	14.43	15.93	14.49	16.00	14.55	16.06
Module Efficiency (%)	21.48		21.69		21.90		22.11		22.32		22.53	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) +  $\phi$  \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance  $\pm$ 3%.

## Current-Voltage & Power-Voltage Curve (535C)



## Bifacial Output-rearside Power Gain

5%	Maximum Power $P_{max}$ (W)	536	541	546	551	557	562
	Module Efficiency (%)	22.55%	22.77%	22.99%	23.21%	23.44%	23.66%
10%	Maximum Power $P_{max}$ (W)	561	567	572	578	583	589
	Module Efficiency (%)	23.63%	23.86%	24.09%	24.32%	24.55%	24.78%
25%	Maximum Power $P_{max}$ (W)	638	644	650	656	663	669
	Module Efficiency (%)	26.85%	27.11%	27.37%	27.64%	27.90%	28.16%

## Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient ( $V_{oc}$ )	-0.25%
Temperature Coefficient ( $I_{sc}$ )	+0.043%	Temperature Coefficient ( $P_{max}$ )	-0.30%

## Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

# 182 N-type Bifacial Module (72)

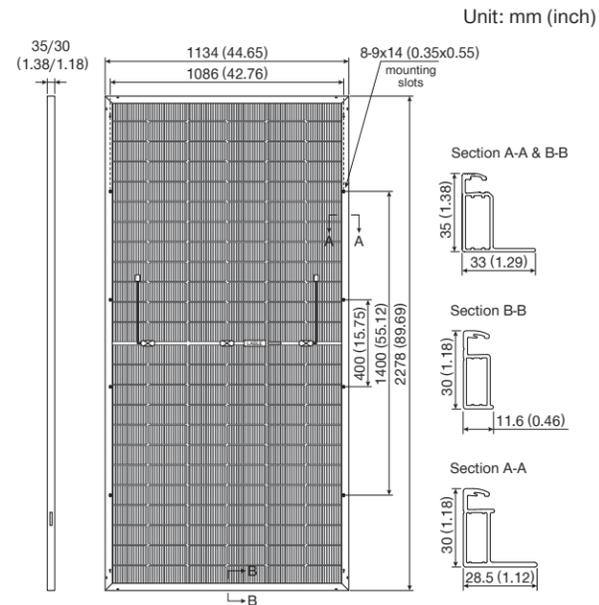
Power Range  
**555W ~ 585W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.65%**

## Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35/30mm (89.69×44.65×1.38/1.18inches)
Weight	32.3kg (71.21lbs) (35mm (1.38 inches)) 31.2kg (68.78lbs) (30mm (1.18 inches))
Front Glass	2.0mm (0.08inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+) 250mm (9.84in.) (-) , landscape 1200mm (47.24in.) (+) 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	620pcs (35mm (1.38 inches)) / 720pcs (30mm (1.18 inches))

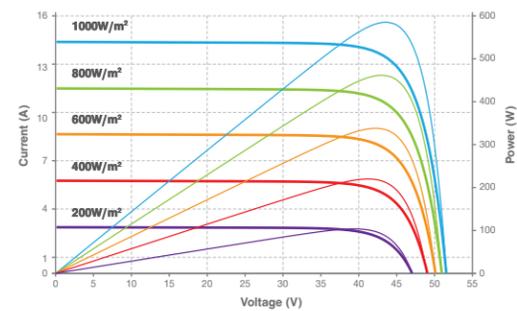


## Electrical Performance Parameters

Model Type	555C(HBD)72(182)		560C(HBD)72(182)		565C(HBD)72(182)		570C(HBD)72(182)		575C(HBD)72(182)		580C(HBD)72(182)		585C(HBD)72(182)	
	STC	BNPI												
Nominal Max. Power $P_{max}$ (W)	555	612	560	617	565	623	570	628	575	634	580	639	585	645
Max. Power Voltage $V_{mp}$ (V)	41.92	42.00	42.11	42.19	42.30	42.38	42.45	42.53	42.60	42.69	42.75	42.84	42.89	42.98
Max. Power Current $I_{mp}$ (A)	13.24	14.58	13.30	14.64	13.36	14.71	13.43	14.79	13.50	14.86	13.57	14.94	13.64	15.02
Open Circuit Voltage $V_{oc}$ (V)	51.42	51.41	51.62	51.61	51.82	51.81	52.02	52.01	52.22	52.21	52.42	52.41	52.62	52.61
Short Circuit Current $I_{sc}$ (A)	14.03	15.49	14.09	15.56	14.15	15.62	14.21	15.69	14.27	15.75	14.33	15.82	14.39	15.89
Module Efficiency (%)	21.48		21.68		21.87		22.07		22.26		22.45		22.65	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) +  $\phi$  \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance  $\pm$ 3%.

## Current-Voltage & Power-Voltage Curve (585C)



## Bifacial Output-rearside Power Gain

5%	Maximum Power $P_{max}$ (W)	583	588	593	599	604	609	614
	Module Efficiency (%)	22.56%	22.76%	22.97%	23.17%	23.37%	23.57%	23.78%
10%	Maximum Power $P_{max}$ (W)	611	616	622	627	633	638	644
	Module Efficiency (%)	23.63%	23.85%	24.06%	24.27%	24.48%	24.70%	24.91%
25%	Maximum Power $P_{max}$ (W)	694	700	706	713	719	725	731
	Module Efficiency (%)	26.86%	27.10%	27.34%	27.58%	27.82%	28.07%	28.31%

## Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient ( $V_{oc}$ )	-0.25%
Temperature Coefficient ( $I_{sc}$ )	+0.043%	Temperature Coefficient ( $P_{max}$ )	-0.30%

## Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

# 182 N-type Bifacial Single Glass Module (54)

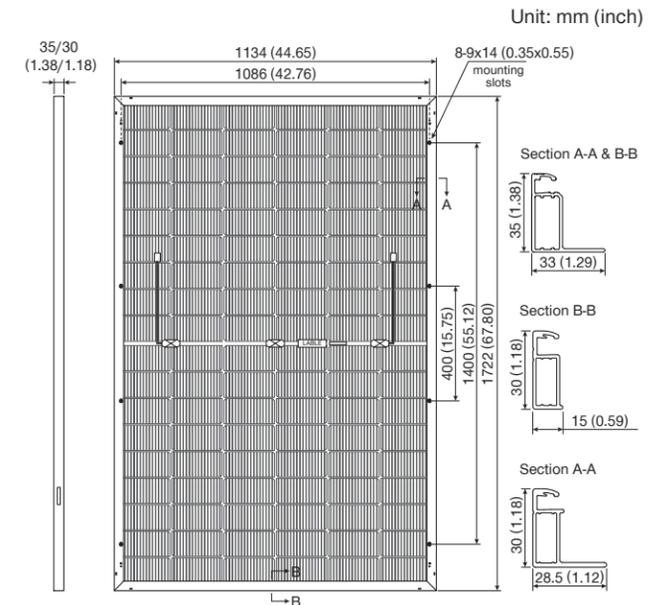
Power Range  
**415W ~ 435W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.28%**

## Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1722×1134×35/30mm (67.80×44.65×1.38/1.18inches)
Weight	21.7kg (47.84lbs) (35mm (1.38 inches)) 20.7kg (45.64lbs) (30mm (1.18 inches))
Front Glass	3.2mm (0.13inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+) 250mm (9.84in.) (-) , landscape 1200mm (47.24in.) (+) 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	806pcs (35mm (1.38 inches)) / 936pcs (30mm (1.18 inches))

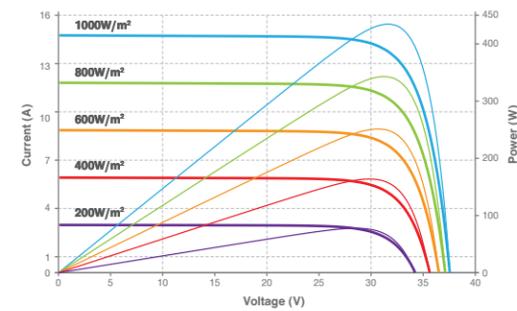


## Electrical Performance Parameters

Model Type	415C(HWB)54(182)		420C(HWB)54(182)		425C(HWB)54(182)		430C(HWB)54(182)		435C(HWB)54(182)	
	STC	BNPI								
Nominal Max. Power $P_{max}$ (W)	415	457	420	463	425	468	430	474	435	479
Max. Power Voltage $V_{mp}$ (V)	31.18	31.24	31.42	31.48	31.65	31.71	31.88	31.94	32.11	32.17
Max. Power Current $I_{mp}$ (A)	13.31	14.65	13.37	14.72	13.43	14.79	13.49	14.85	13.55	14.92
Open Circuit Voltage $V_{oc}$ (V)	38.57	38.56	38.72	38.71	38.87	38.86	39.02	39.01	39.17	39.16
Short Circuit Current $I_{sc}$ (A)	14.55	16.06	14.61	16.13	14.67	16.20	14.73	16.26	14.79	16.33
Module Efficiency (%)	21.25		21.51		21.76		22.02		22.28	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) +  $\phi$  \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance  $\pm$ 3%.

## Current-Voltage & Power-Voltage Curve (435C)



## Bifacial Output-rearside Power Gain

5%	Maximum Power $P_{max}$ (W)	436	441	446	452	457
	Module Efficiency (%)	22.31%	22.58%	22.85%	23.12%	23.39%
10%	Maximum Power $P_{max}$ (W)	457	462	468	473	479
	Module Efficiency (%)	23.38%	23.66%	23.94%	24.22%	24.50%
25%	Maximum Power $P_{max}$ (W)	519	525	531	538	544
	Module Efficiency (%)	26.57%	26.89%	27.21%	27.53%	27.85%

## Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient ( $V_{oc}$ )	-0.25%
Temperature Coefficient ( $I_{sc}$ )	+0.043%	Temperature Coefficient ( $P_{max}$ )	-0.30%

## Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

# 182 N-type Bifacial Single Glass Module (60)

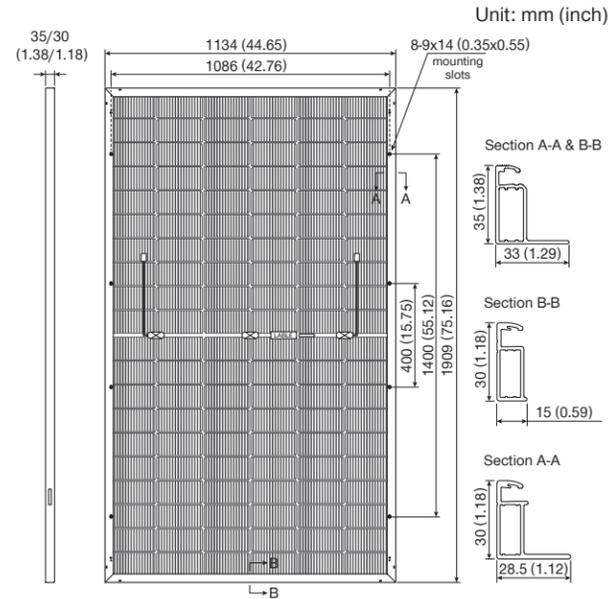
Power Range  
**465W ~ 485W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.40%**

## Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	120pcs(6×20)
Module Dimension	1909×1134×35/30mm (75.16×44.65×1.38/1.18inches)
Weight	23.2kg (51.15lbs) (35mm (1.38 inches)) 22.1kg (48.72lbs) (30mm (1.18 inches))
Front Glass	3.2mm (0.13inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+) 250mm (9.84in.) (-) , landscape 1200mm (47.24in.) (+) 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	744pcs (35mm (1.38 inches)) / 864pcs (30mm (1.18 inches))

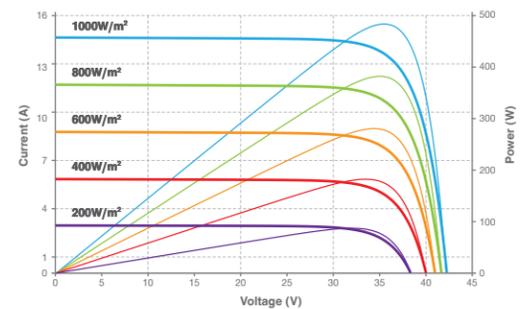


## Electrical Performance Parameters

Model Type	465C(HWB)60(182)		470C(HWB)60(182)		475C(HWB)60(182)		480C(HWB)60(182)		485C(HWB)60(182)	
	STC	BNPI								
Nominal Max. Power $P_{max}$ (W)	465	513	470	518	475	524	480	529	485	535
Max. Power Voltage $V_{mp}$ (V)	34.84	34.91	35.05	35.12	35.27	35.34	35.48	35.55	35.69	35.76
Max. Power Current $I_{mp}$ (A)	13.35	14.70	13.41	14.76	13.47	14.83	13.53	14.90	13.59	14.96
Open Circuit Voltage $V_{oc}$ (V)	43.02	43.01	43.18	43.17	43.35	43.34	43.52	43.51	43.68	43.67
Short Circuit Current $I_{sc}$ (A)	14.43	15.93	14.49	16.00	14.55	16.06	14.61	16.13	14.67	16.20
Module Efficiency (%)	21.48		21.71		21.94		22.17		22.40	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) +  $\phi$  \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance  $\pm$ 3%.

## Current-Voltage & Power-Voltage Curve (485C)



## Bifacial Output-rearside Power Gain

5%	Maximum Power $P_{max}$ (W)	488	494	499	504	509
	Module Efficiency (%)	22.55%	22.80%	23.04%	23.28%	23.52%
10%	Maximum Power $P_{max}$ (W)	512	517	523	528	534
	Module Efficiency (%)	23.63%	23.88%	24.14%	24.39%	24.64%
25%	Maximum Power $P_{max}$ (W)	581	588	594	600	606
	Module Efficiency (%)	26.85%	27.14%	27.43%	27.72%	28.00%

## Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient ( $V_{oc}$ )	-0.25%
Temperature Coefficient ( $I_{sc}$ )	+0.043%	Temperature Coefficient ( $P_{max}$ )	-0.30%

## Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

# 182 N-type Bifacial Single Glass Module (66)

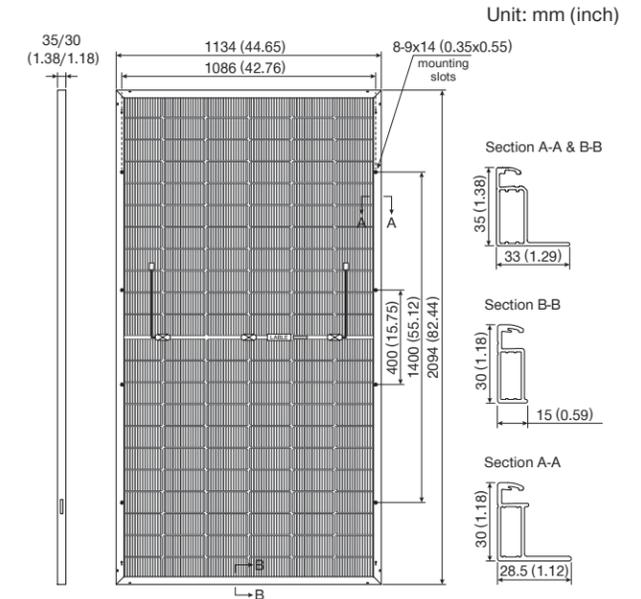
Power Range  
**510W ~ 535W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.53%**

## Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	132pcs(6×22)
Module Dimension	2094×1134×35/30mm (82.44×44.65×1.38/1.18inches)
Weight	25.1kg (55.34lbs) (35mm (1.38 inches)) 23.8kg (52.47lbs) (30mm (1.18 inches))
Front Glass	3.2mm (0.13inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+) 250mm (9.84in.) (-) , landscape 1200mm (47.24in.) (+) 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	682pcs (35mm (1.38 inches)) / 792pcs (30mm (1.18 inches))

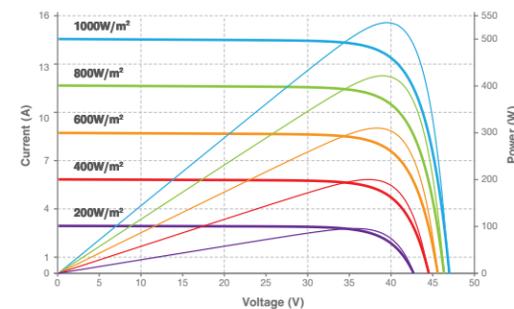


## Electrical Performance Parameters

Model Type	510C(HWB)66(182)		515C(HWB)66(182)		520C(HWB)66(182)		525C(HWB)66(182)		530C(HWB)66(182)		535C(HWB)66(182)	
	STC	BNPI										
Nominal Max. Power $P_{max}$ (W)	510	562	515	568	520	573	525	579	530	584	535	590
Max. Power Voltage $V_{mp}$ (V)	38.29	38.37	38.50	38.58	38.70	38.78	38.89	38.97	39.09	39.17	39.29	39.37
Max. Power Current $I_{mp}$ (A)	13.32	14.67	13.38	14.73	13.44	14.80	13.50	14.86	13.56	14.93	13.62	15.00
Open Circuit Voltage $V_{oc}$ (V)	47.32	47.31	47.50	47.49	47.69	47.68	47.87	47.86	48.05	48.04	48.24	48.23
Short Circuit Current $I_{sc}$ (A)	14.25	15.73	14.31	15.80	14.37	15.86	14.43	15.93	14.49	16.00	14.55	16.06
Module Efficiency (%)	21.48		21.69		21.90		22.11		22.32		22.53	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) +  $\phi$  \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance  $\pm$ 3%.

## Current-Voltage & Power-Voltage Curve (535C)



## Bifacial Output-rearside Power Gain

5%	Maximum Power $P_{max}$ (W)	536	541	546	551	557	562
	Module Efficiency (%)	22.55%	22.77%	22.99%	23.21%	23.44%	23.66%
10%	Maximum Power $P_{max}$ (W)	561	567	572	578	583	589
	Module Efficiency (%)	23.63%	23.86%	24.09%	24.32%	24.55%	24.78%
25%	Maximum Power $P_{max}$ (W)	638	644	650	656	663	669
	Module Efficiency (%)	26.85%	27.11%	27.37%	27.64%	27.90%	28.16%

## Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient ( $V_{oc}$ )	-0.25%
Temperature Coefficient ( $I_{sc}$ )	+0.043%	Temperature Coefficient ( $P_{max}$ )	-0.30%

## Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

# 182 N-type Bifacial Single Glass Module (72)

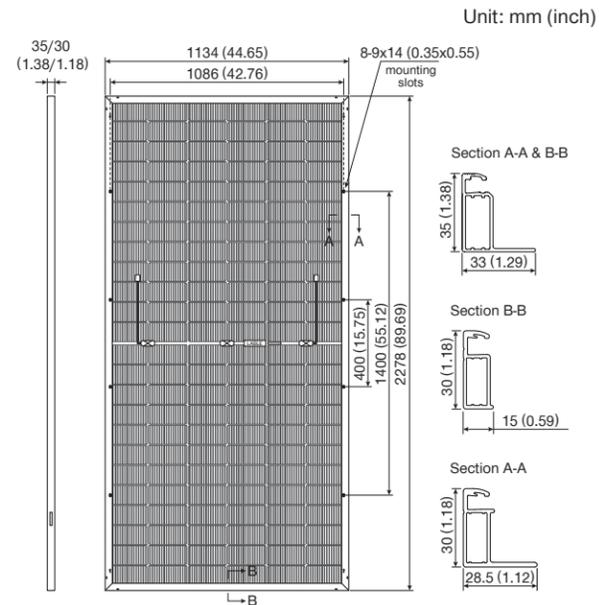
Power Range  
**555W ~ 585W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.65%**

## Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	144pcs(6×24)
Module Dimension	2278×1134×35/30mm (89.69×44.65×1.38/1.18inches)
Weight	28.0kg (61.73lbs) (35mm (1.38 inches)) 26.9kg (59.30lbs) (30mm (1.18 inches))
Front Glass	3.2mm (0.13inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+), 250mm (9.84in.) (-), landscape 1200mm (47.24in.) (+), 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	620pcs (35mm (1.38 inches)) / 720pcs (30mm (1.18 inches))

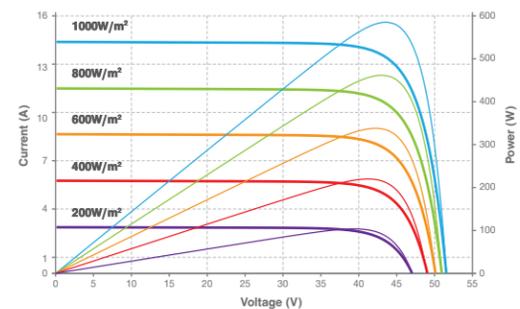


## Electrical Performance Parameters

Model Type	555C(HWB)72(182)		560C(HWB)72(182)		565C(HWB)72(182)		570C(HWB)72(182)		575C(HWB)72(182)		580C(HWB)72(182)		585C(HWB)72(182)			
	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI		
Nominal Max. Power	P <sub>max</sub> (W)		555	612	560	617	565	623	570	628	575	634	580	639	585	645
Max. Power Voltage	V <sub>mp</sub> (V)		41.92	42.00	42.11	42.19	42.30	42.38	42.45	42.53	42.60	42.69	42.75	42.84	42.89	42.98
Max. Power Current	I <sub>mp</sub> (A)		13.24	14.58	13.30	14.64	13.36	14.71	13.43	14.79	13.50	14.86	13.57	14.94	13.64	15.02
Open Circuit Voltage	V <sub>oc</sub> (V)		51.42	51.41	51.62	51.61	51.82	51.81	52.02	52.01	52.22	52.21	52.42	52.41	52.62	52.61
Short Circuit Current	I <sub>sc</sub> (A)		14.03	15.49	14.09	15.56	14.15	15.62	14.21	15.69	14.27	15.75	14.33	15.82	14.39	15.89
Module Efficiency	(%)		21.48		21.68		21.87		22.07		22.26		22.45		22.65	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) + φ \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance ±3%.

## Current-Voltage & Power-Voltage Curve (585C)



## Bifacial Output-rearside Power Gain

Irradiance	Parameter	P <sub>max</sub> (W)	Power Gain (%)						
			585C	575C	570C	565C	560C	555C	
5%	Maximum Power	P <sub>max</sub> (W)	583	588	593	599	604	609	614
	Module Efficiency	(%)	22.56%	22.76%	22.97%	23.17%	23.37%	23.57%	23.78%
10%	Maximum Power	P <sub>max</sub> (W)	611	616	622	627	633	638	644
	Module Efficiency	(%)	23.63%	23.85%	24.06%	24.27%	24.48%	24.70%	24.91%
25%	Maximum Power	P <sub>max</sub> (W)	694	700	706	713	719	725	731
	Module Efficiency	(%)	26.86%	27.10%	27.34%	27.58%	27.82%	28.07%	28.31%

## Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient (V <sub>oc</sub> )	-0.25%
Temperature Coefficient (I <sub>sc</sub> )	+0.043%	Temperature Coefficient (P <sub>max</sub> )	-0.30%

## Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

# 182 Pure Black N-type Bifacial Single Glass Module (54)

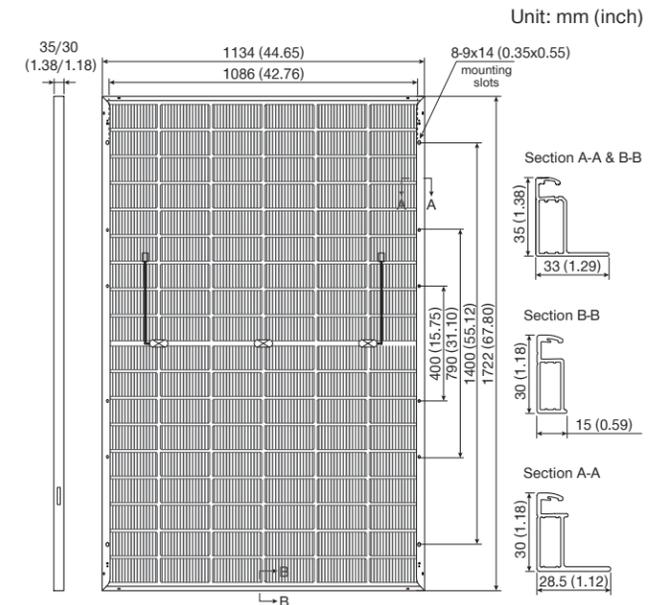
Power Range  
**410W ~ 435W**

Power Output Tolerance  
**0W ~ +5W**

Maximum Efficiency  
**22.28%**

## Structure Performance

Solar Cell Type	182mm N-TOPCon Mono Cell (Half Cell)
Solar Cell Arrangement	108pcs(6×18)
Module Dimension	1722×1134×35/30mm (67.80×44.65×1.38/1.18inches)
Weight	21.7kg (47.84lbs) (35mm (1.38 inches)) 20.7kg (45.64lbs) (30mm (1.18 inches))
Front Glass	3.2mm (0.13inches), highly transparent tempered glass with anti-reflective coating
Frame	Anodized Aluminum Alloy (Black)
Junction Box	IP68 rated
Cable	4mm <sup>2</sup> (IEC), 12 AWG(UL) portrait 450mm (17.72in.) (+), 250mm (9.84in.) (-), landscape 1200mm (47.24in.) (+), 1200mm (47.24in.) (-) or customized
Diode Quantity	3 pcs
Front side / Rear side	5400pa / 2400pa
Connector	MC4 Compatible
Per Pallet	31pcs (35mm (1.38 inches)) / 36pcs (30mm (1.18 inches))
Per Container(40'HQ)	806pcs (35mm (1.38 inches)) / 936pcs (30mm (1.18 inches))

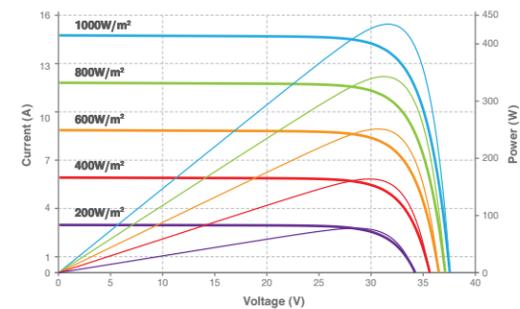


## Electrical Performance Parameters

Model Type	410C(HBB)54(182)		415C(HBB)54(182)		420C(HBB)54(182)		425C(HBB)54(182)		430C(HBB)54(182)		435C(HBB)54(182)			
	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI	STC	BNPI		
Nominal Max. Power	P <sub>max</sub> (W)		410	445	415	450	420	456	425	461	430	467	435	472
Max. Power Voltage	V <sub>mp</sub> (V)		30.77	30.80	31.00	31.02	31.23	31.26	31.46	31.49	31.69	31.73	31.92	31.96
Max. Power Current	I <sub>mp</sub> (A)		13.33	14.46	13.39	14.52	13.45	14.59	13.51	14.65	13.57	14.72	13.63	14.78
Open Circuit Voltage	V <sub>oc</sub> (V)		39.53	39.60	39.68	39.75	39.83	39.90	39.98	40.05	40.13	40.20	40.28	40.35
Short Circuit Current	I <sub>sc</sub> (A)		14.58	16.10	14.64	16.16	14.70	16.23	14.76	16.30	14.82	16.36	14.88	16.43
Module Efficiency	(%)		21.00		21.25		21.51		21.76		22.02		22.28	

\* STC: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in), Cell Temperature 25°C (77°F), Air Mass AM1.5; BNPI: Irradiance 1000W/m<sup>2</sup> (0.65W/sq.in) + φ \* 135W/m<sup>2</sup> (0.09W/sq.in); Power measurement tolerance ±3%.

## Current-Voltage & Power-Voltage Curve (435C)



## Bifacial Output-rearside Power Gain

Irradiance	Parameter	P <sub>max</sub> (W)	Power Gain (%)					
			435C	430C	425C	420C	415C	410C
5%	Maximum Power	P <sub>max</sub> (W)	431	436	441	446	452	457
	Module Efficiency	(%)	22.05%	22.31%	22.58%	22.85%	23.12%	23.39%
10%	Maximum Power	P <sub>max</sub> (W)	451	457	462	468	473	479
	Module Efficiency	(%)	23.10%	23.38%	23.66%	23.94%	24.22%	24.50%
25%	Maximum Power	P <sub>max</sub> (W)	513	519	525	531	538	544
	Module Efficiency	(%)	26.25%	26.57%	26.89%	27.21%	27.53%	27.85%

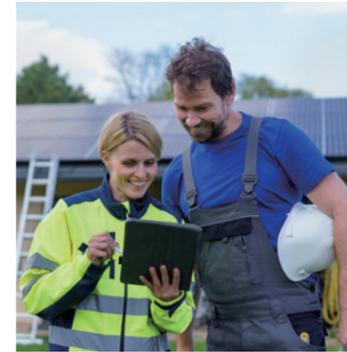
## Temperature Characteristics

Nominal Module Operating Temperature	44±2°C (111.2±35.6°F)	Temperature Coefficient (V <sub>oc</sub> )	-0.25%
Temperature Coefficient (I <sub>sc</sub> )	+0.043%	Temperature Coefficient (P <sub>max</sub> )	-0.30%

## Maximum Parameters

Working Temperature	-40~+85°C (-40~+185°F)
Maximum System Voltage	1500V DC
Nominal Maximum Fuse Current	30A

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