BLACK WOLF

ONE-STOP SOLAR BIPV AND ESS SOLUTION PROVIDER

50 • Patents + certification

30 • Years power warranty

13 • Years of PV module manufacturing experience

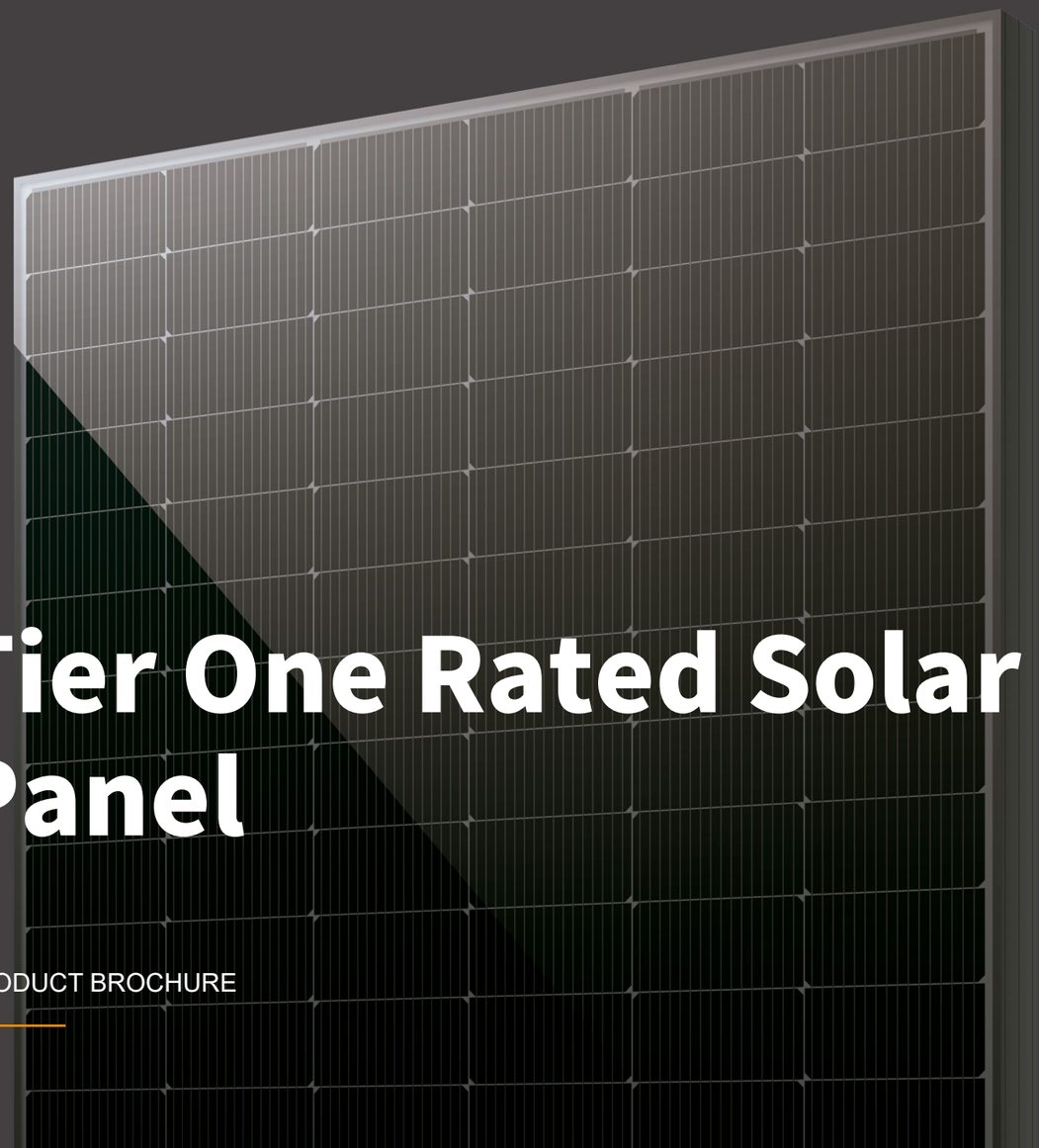
5 • GW production capacity of a full range of PV modules

4 • Continents marketing service center

3 • Global manufacturing bases

2 • Billion investment amount

1 • Integrated and coordinated development



Tier One Rated Solar Panel

PRODUCT BROCHURE

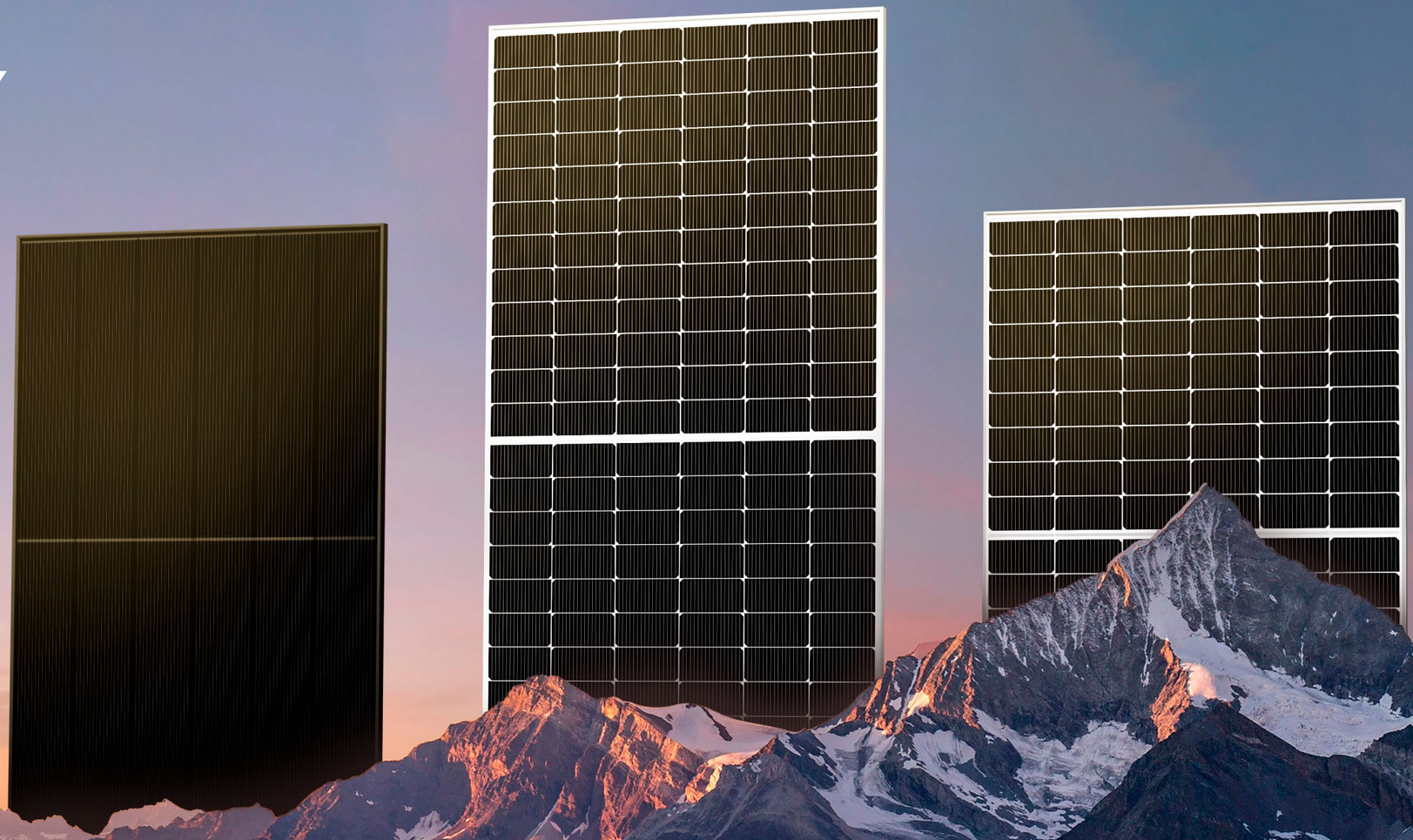
Black Wolf Enterprise

Add : 600 Old Combee Road, Lakeland, Florida 33801 United States

E-mail : Shawn@blackwolfsolar.com
Website : https://Blackwolfsolar.com

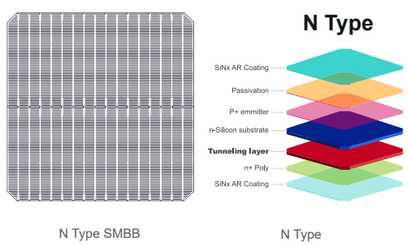
HIGH EFFICIENCY

PV Module Series



Black Wolf High Efficiency N-Type PV Module | Advantages

Half-Cell N Type PV Series

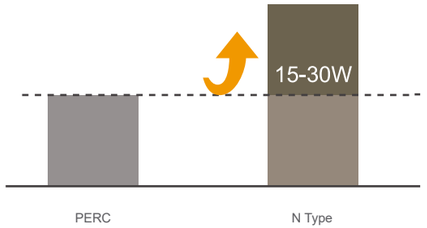


N Type SMBB

N Type

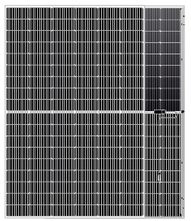
SMBB Technology

- Reduce the current transmission distance, reduce grid line shielding, and improve optical utilization
- SMBB technology combined with round wire ribbon can increase the utilization rate of incident light by 70%, and increase the power by 1-1.5%

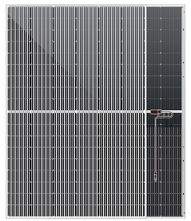


Higher Power

- For the same module type, the power of N-type modules is 15-30W higher than that of P-type modules



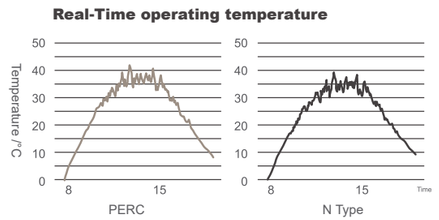
PERC 60%Bifaciality



N Type(↗ 25%)85%Bifaciality

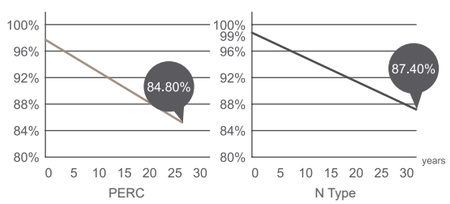
85%Bifaciality

- For the same module type, the double-sided rate of N-type modules is 25% higher than that of P-type modules



Lower Temperature Coefficient

- The temperature coefficient of P-type PV module is -0.35%/°C
- N-type module optimized temperature coefficient to -0.29%/°C
- Power generation is particularly prominent in high temperature environments



Better Power Guarantee

- N-type modules decay 1% in the first year (P-type 2%)
- Power warranty for 30 years (Double Glass)
- After 30 years, the output power is not lower than 87.4% of the initial power (Double Glass)

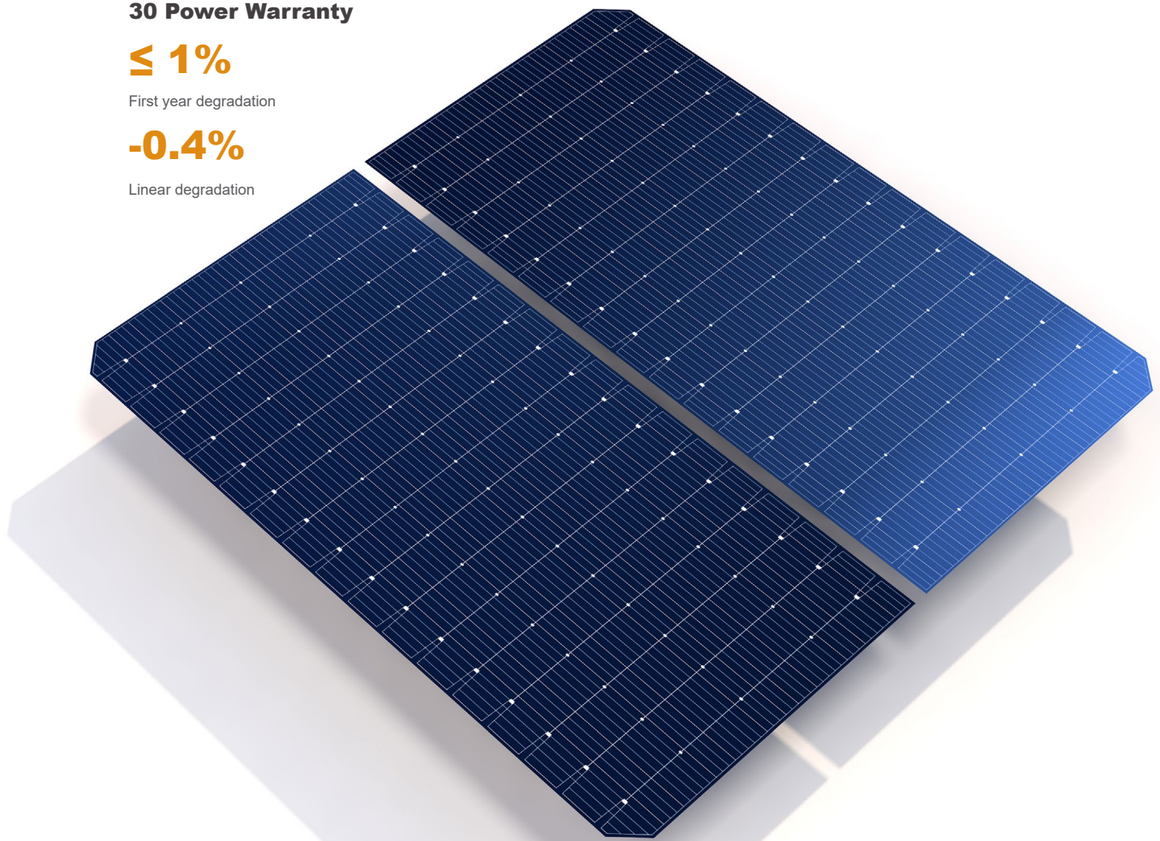
30 Power Warranty

≤ 1%

First year degradation

-0.4%

Linear degradation



N Type Bifacial

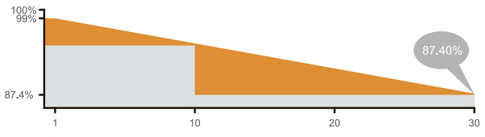
Learn more about the production of 182mm Mono PV Module

BW420~440M10-108D6

420~440 Watt

182mm 16BB 108Cells All Black Double Glass Bifacial
N Type Mono Half Cell PV Module Series

Black Wolf N Type Linear Warranty



15 Years
Materials and workmanship

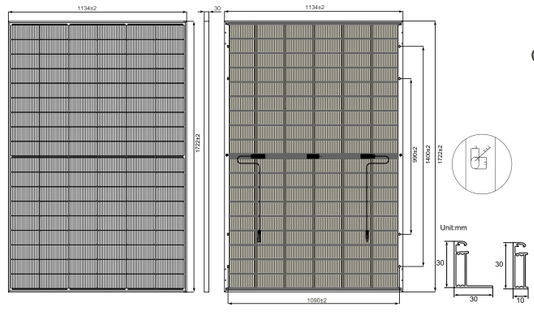
30 Years
87.4% Output Power guarantee

- SMBB Technology Half Cut N Type Cell
- High Energy Performance
- 100% Inspection 30years Guarantee
- Fire Class A
- 5400Pa Strengthened Mechanical Load
- Advanced Bifacial Efficiency

BLACK WOLF

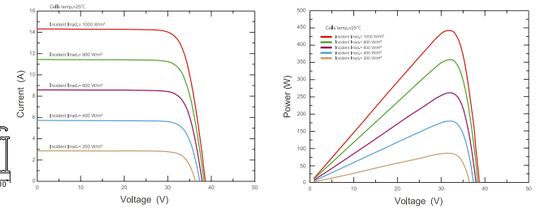
BW420~440M10-108D6

182mm 16BB 108Cells All Black Double Glass Bifacial
N Type Mono Half Cell PV Module



All Dimensions in mm
The above drawing is a graphical representation of the product.

Current-Voltage & Power-Voltage Curves (440M10-108D6)



Electrical Characteristics (STC/NOCT)

Module Type	BW420M10-108D6		BW425M10-108D6		BW430M10-108D6		BW435M10-108D6		BW440M10-108D6	
Test Conditions	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power- Pmax(W)	420	321.1	425	325.0	430	328.7	435	332.4	440	336.3
Open Circuit Voltage - Voc(V)	38.46	36.50	38.59	36.60	38.72	36.80	38.85	36.90	38.98	37.10
Short- Circuit Current - Isc(A)	13.71	11.13	13.81	11.22	13.91	11.28	14.33	11.36	14.41	11.44
Voltage at Pmax -Vmp(V)	31.97	29.90	32.15	30.01	32.34	30.19	32.52	30.30	32.70	30.41
Current at Pmax - Imp(A)	13.14	10.74	13.22	10.83	13.30	10.89	13.38	10.97	13.46	11.06
Module Efficiency -ηm(%)	21.50	/	21.80	/	22.00	/	22.27	/	22.53	/
Power Tolerance(W)	(0，+4.99W)									
Maximum System Voltage(V)	1500Vdc (IEC / UL)									
Maximum Series Fuse Rating (A)	30A									

*STC： Irradiance 1000W/m², Cell Temperature 25℃, Air Mass 1.5
*NOCT： Irradiance 800W/m², Ambient Temperature 20℃, Air Mass1.5, Wind Speed 1m/s
*Measurement tolerance: ±3%　*Power binning up to: +3%

Mechanical Specifications

External Dimensions	1722×1134×30mm
Weight	21kg
Solar Cells	N-Type 16BB 182mm (2×54pcs)
Glass	AR Coated 1.6+1.6 mm tempered glass
Frame	Anodized aluminum alloy
Junction Box	IP68
Output Cables	4.0mm², 1200mm (+), 1200mm (-), length can be customized
Connector	MC4 Compatible
Mechanical Load	Front Side Max. 5400Pa, Rear Side Max. 2400Pa

Bifacial Output Rear Side Power Gain

*Take BW430M10-108D6 as an example.

Power Gain	5%	15%	25%
Maximum Power- Pmax(W)	452.0	495.0	538.0
Open Circuit Voltage - Voc(V)	38.72	38.72	38.72
Short- Circuit Current - Isc(A)	14.68	16.07	17.46
Voltage at Pmax -Vmp(V)	32.34	32.34	32.34
Current at Pmax - Imp(A)	13.98	15.31	16.64

Temperature Characteristics

Pmax Temperature Coefficient	-0.290%/℃
Voc Temperature Coefficient	-0.250%/℃
Isc Temperature Coefficient	+0.045%/℃
Operating Temperature Range	-40~+85℃
Nominal Operating Cell Temperature(NOCT)	45±2℃

Packing Configuration

Pallet Dimensions	1750×1140×1254mm		
Ways of Transport	40'HQ	13.5m Flatbed Truck	17.5m Flatbed Truck
Pieces per Pallet	37 Pcs	36 Pcs	36 Pcs
Pallets per Container	26 Pallets	24 Pallets	36 Pallets
Pieces per Container	962 Pcs	864 Pcs	1296 Pcs

Specifications are subject to change without further notification

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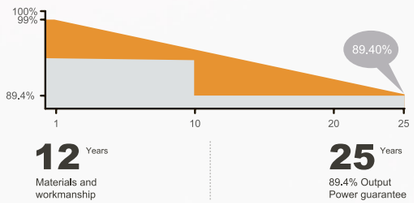
N Type Monofacial

Black Wolf N Type Linear Warranty

BW430M10-108S1

430 Watt

182mm 16BB 108Cells
N Type Mono Half Cell PV Module



Lighter weight

Higher strength

Higher efficiency

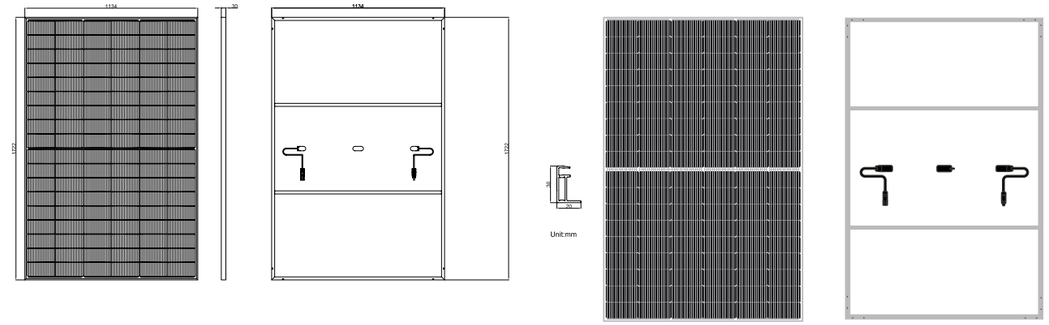
Safer

Stronger weather resistance

Easier to install

BW430M10-108S1

182mm 16BB 108Cells
N Type Mono Half Cell PV Module



All Dimensions in mm
The above drawing is a graphical representation of the product.

Electrical Characteristics (STC/NOCT)

Module Type	BW430M10-108S1	
Test Conditions	STC	NOCT
Maximum Power- Pmax(W)	430	329
Open Circuit Voltage - Voc(V)	38.72	36.80
Short- Circuit Current - Isc(A)	14.25	11.49
Voltage at Pmax -Vmp(V)	32.33	30.20
Current at Pmax - Imp(A)	13.30	10.89
Module Efficiency -ηm(%)	22.10	/
Power Tolerance(W)	(0，+5W)	
Maximum System Voltage(V)	1500Vdc (IEC / UL)	
Maximum Series Fuse Rating (A)	25A	

*STC ： Irradiance 1000W/m², Cell Temperature 25℃, Air Mass 1.5
*NOCT： Irradiance 800W/m², Ambient Temperature 20℃, Air Mass1.5, Wind Speed 1m/s
*Measurement tolerance: ±3%　*Power binning up to: +3%

Mechanical Specifications

External Dimensions	1722×1134×30mm
Weight	10.2kg
Solar Cells	N-Type 16BB 182mm (2×54pcs)
Front Glass	1.1mm reinforced tempered glass
Frame	Anodized aluminum alloy
Junction Box	IP68
Output Cables	4.0mm², 1200mm (+), 1200mm (-), length can be customized
Connector	MC4 Compatible

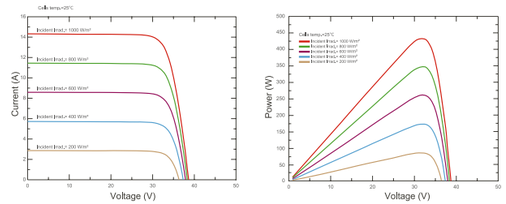
Packing Configuration

Ways of Transport	Pieces per Container	Pieces per Pallet
40'HQ	962	37
13m	1036	37
17m	1776	37

Temperature Characteristics

Pmax Temperature Coefficient	-0.290%/℃
Voc Temperature Coefficient	-0.250%/℃
Isc Temperature Coefficient	+0.045%/℃
Operating Temperature Range	-40~+85℃
Nominal Operating Cell Temperature(NOCT)	45±2℃

Current-Voltage & Power-Voltage Curves (430M10-108S1)



Specifications are subject to change without further notification

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N Type Bifacial

ULTRA
N TYPE

- Fire Class A
- High Energy Performance
- Strengthened Mechanical Load — 5400Pa
- Advanced Bifacial Efficiency
- 100% Inspection 30years Guarantee — 100% TEST MES
- SMBB Technology Half Cut N Type Cell

440~460M12-96D4

440~460 Watt

210x182mm 16BB 96Cells All Black Double Glass Bifacial
N Type Mono Half Cell PV Module Series

N Type Linear Warranty

30 Year
87.4% Output Power guarantee

15 Year
Materials and workmanship

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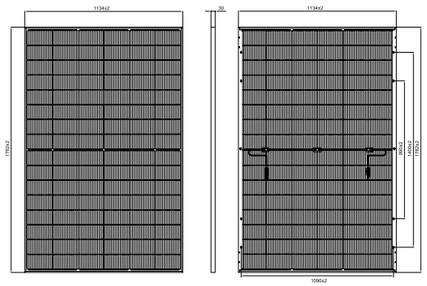
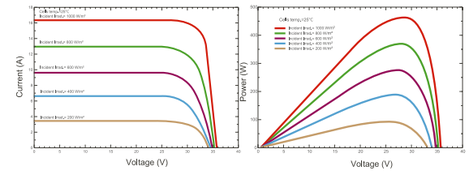
440~460M12-96D4

210x182mm 16BB 96Cells All Black Double Glass Bifacial
N Type Mono Half Cell PV Module Series



Current-Voltage & Power-Voltage Curves (460M12-96D4)



All Dimensions in mm
The above drawing is a graphical representation of the product.

Electrical Characteristics (STC/NMOT)

Module Type	440M12-96D4		445M12-96D4		450M12-96D4		455M12-96D4		460M12-96D4	
Test Conditions	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum Power- Pmax(W)	440	332.3	445	336.1	450	339.8	455	343.5	460	347.4
Open Circuit Voltage - Voc(V)	35.30	33.54	35.47	33.73	35.64	33.92	35.80	34.11	35.97	34.30
Short- Circuit Current - Isc(A)	15.88	12.81	15.97	12.86	16.06	12.91	16.14	12.96	16.23	13.01
Voltage at Pmax -Vmp(V)	29.36	27.51	29.49	27.67	29.63	27.83	29.76	27.99	29.89	28.15
Current at Pmax - Imp(A)	14.99	12.08	15.09	12.15	15.19	12.21	15.29	12.27	15.39	12.34
Module Efficiency -ηm(%)	22.02	/	22.27	/	22.52	/	22.77	/	23.02	/
Power Tolerance(W)	（0，+5W）									
Maximum System Voltage(V)	1500Vdc (IEC / UL)									
Maximum Series Fuse Rating (A)	30A									

*STC ： Irradiance 1000W/m², Cell Temperature 25℃, Air Mass 1.5
*NMOT： Irradiance 800W/m², Ambient Temperature 20℃, Air Mass1.5, Wind Speed 1m/s
*Measurement tolerance: ±3%　*Power binning up to: +3%

Mechanical Specifications

External Dimensions	1762×1134×30mm
Weight	21.5kg
Solar Cells	N-Type 16BB 182×105mm (2×48pcs)
Glass	AR Coated 1.6+1.6 mm tempered glass
Frame	Anodized aluminum alloy
Junction Box	IP68
Output Cables	4.0mm², 1200mm (+),1200mm (-), length can be customized
Connector	MC4 Compatible
Mechanical Load	Front Side Max. 5400Pa, Rear Side Max. 2400Pa

Bifacial Output Rear Side Power Gain

*Take 460M12-96D4 as an example.

Power Gain	5%	10%	20%
Maximum Power- Pmax(W)	483.0	506.0	552.0
Open Circuit Voltage - Voc(V)	35.97	35.97	35.97
Short- Circuit Current - Isc(A)	16.89	17.69	19.29
Voltage at Pmax -Vmp(V)	29.89	29.89	29.89
Current at Pmax - Imp(A)	16.16	16.93	18.46

Temperature Characteristics

Pmax Temperature Coefficient	-0.290%/℃
Voc Temperature Coefficient	-0.250%/℃
Isc Temperature Coefficient	+0.045%/℃
Operating Temperature Range	-40~+85℃
Nominal Operating Cell Temperature(NMOT)	45±2℃

Packing Configuration

Pallet Dimensions	1790×1140×1254mm		
Ways of Transport	40'HQ	13.5m Flatbed Truck	17.5m Flatbed Truck
Pieces per Pallet	37 Pcs	36 Pcs	36 Pcs
Pallets per Container	26 Pallets	24 Pallets	36 Pallets
Pieces per Container	962 Pcs	864 Pcs	1296 Pcs

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N Type Bifacial

ULTRA
N TYPE

- Fire Class A
- High Energy Performance
- Strengthened Mechanical Load (5400Pa)
- Advanced Bifacial Efficiency
- 100% Inspection 30years Guarantee (100% TEST MES)
- SMBB Technology Half Cut N Type Cell

440~460M12-96D3

440~460 Watt

210x182mm 16BB 96Cells All Black Double Glass Bifacial
N Type Mono Half Cell PV Module Series

N Type Linear Warranty

30 Year
87.4% Output Power guarantee

15 Year
Materials and workmanship

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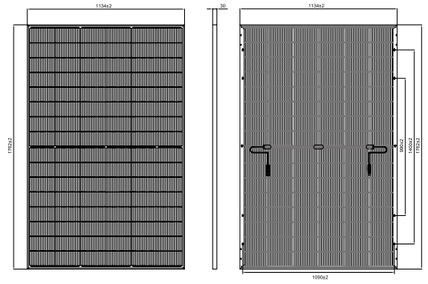
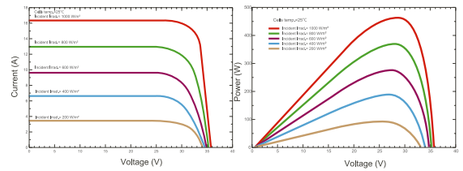
440~460M12-96D3

210x182mm 16BB 96Cells All Black Double Glass Bifacial
N Type Mono Half Cell PV Module Series



Current-Voltage & Power-Voltage Curves (460M12-96D3)



All Dimensions in mm
The above drawing is a graphical representation of the product.

Electrical Characteristics (STC/NMOT)

Module Type	440M12-96D3		445M12-96D3		450M12-96D3		455M12-96D3		460M12-96D3	
Test Conditions	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum Power- Pmax(W)	440	332.3	445	336.1	450	339.8	455	343.5	460	347.4
Open Circuit Voltage - Voc(V)	35.30	33.54	35.47	33.73	35.64	33.92	35.80	34.11	35.97	34.30
Short- Circuit Current - Isc(A)	15.88	12.81	15.97	12.86	16.06	12.91	16.14	12.96	16.23	13.01
Voltage at Pmax -Vmp(V)	29.36	27.51	29.49	27.67	29.63	27.83	29.76	27.99	29.89	28.15
Current at Pmax - Imp(A)	14.99	12.08	15.09	12.15	15.19	12.21	15.29	12.27	15.39	12.34
Module Efficiency -ηm(%)	22.02	/	22.27	/	22.52	/	22.77	/	23.02	/
Power Tolerance(W)	（0，+5W）									
Maximum System Voltage(V)	1500Vdc (IEC / UL)									
Maximum Series Fuse Rating (A)	30A									

*STC ： Irradiance 1000W/m², Cell Temperature 25°C, Air Mass 1.5
*NMOT： Irradiance 800W/m², Ambient Temperature 20°C, Air Mass1.5, Wind Speed 1m/s
*Measurement tolerance: ±3%　*Power binning up to: +3%

Mechanical Specifications

External Dimensions	1762×1134×30mm
Weight	21.5kg
Solar Cells	N-Type 16BB 182×105mm (2×48pcs)
Glass	AR Coated 1.6+1.6 mm tempered glass
Frame	Anodized aluminum alloy
Junction Box	IP68
Output Cables	4.0mm², 1200mm (+),1200mm (-), length can be customized
Connector	MC4 Compatible
Mechanical Load	Front Side Max. 5400Pa, Rear Side Max. 2400Pa

Bifacial Output Rear Side Power Gain

*Take 460M12-96D3 as an example.

Power Gain	5%	10%	20%
Maximum Power- Pmax(W)	483.0	506.0	552.0
Open Circuit Voltage - Voc(V)	35.97	35.97	35.97
Short- Circuit Current - Isc(A)	16.89	17.69	19.29
Voltage at Pmax -Vmp(V)	29.89	29.89	29.89
Current at Pmax - Imp(A)	16.16	16.93	18.46

Temperature Characteristics

Pmax Temperature Coefficient	-0.290%/°C
Voc Temperature Coefficient	-0.250%/°C
Isc Temperature Coefficient	+0.045%/°C
Operating Temperature Range	-40~+85°C
Nominal Operating Cell Temperature(NMOT)	45±2°C

Packing Configuration

Pallet Dimensions	1790×1140×1254mm		
Ways of Transport	40'HQ	13.5m Flatbed Truck	17.5m Flatbed Truck
Pieces per Pallet	37 Pcs	36 Pcs	36 Pcs
Pallets per Container	26 Pallets	24 Pallets	36 Pallets
Pieces per Container	962 Pcs	864 Pcs	1296 Pcs

Specifications are subject to change without further notification

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N Type Bifacial

ULTRA
N TYPE

- Fire Class A
- High Energy Performance
- Strengthened Mechanical Load — 5400Pa
- Advanced Bifacial Efficiency
- 100% Inspection 30years Guarantee — 100% TCR MES
- SMBB Technology Half Cut N Type Cell

490~510M12-108D6

490~510 Watt

210x182mm 16BB 108Cells All Black Double Glass Bifacial
N Type Mono Half Cell PV Module Series

N Type Linear Warranty

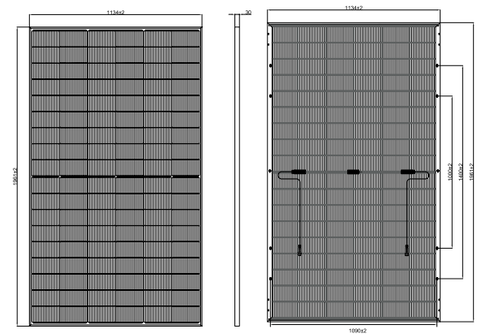
30 Year
87.4% Output Power guarantee

15 Year
Materials and workmanship

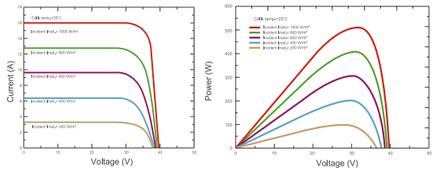
TÜV SÜD · CE · CQC · MCS

490~510M12-108D6

210x182mm 16BB 108Cells All Black Double Glass Bifacial
N Type Mono Half Cell PV Module Series



Current-Voltage & Power-Voltage Curves (510M12-108D6)



All Dimensions in mm
The above drawing is a graphical representation of the product.

Electrical Characteristics (STC/NMOT)

Module Type	490M12-108D6		495M12-108D6		500M12-108D6		505M12-108D6		510M12-108D6	
Test Conditions	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum Power- Pmax(W)	490	370.0	495	373.8	500	377.5	505	381.3	510	385.1
Open Circuit Voltage - Voc(V)	39.52	37.52	39.71	37.68	39.90	37.84	40.09	38.00	40.28	38.16
Short- Circuit Current - Isc(A)	15.80	12.77	15.87	12.83	15.93	12.89	16.00	12.95	16.05	13.01
Voltage at Pmax -Vmp(V)	32.88	30.76	33.03	30.89	33.18	31.02	33.33	31.15	33.48	31.28
Current at Pmax - Imp(A)	14.90	12.03	14.99	12.10	15.07	12.17	15.15	12.24	15.23	12.31
Module Efficiency -ηm(%)	22.03	/	22.26	/	22.48	/	22.71	/	22.93	/
Power Tolerance(W)	（0，+5W）									
Maximum System Voltage(V)	1500Vdc (IEC / UL)									
Maximum Series Fuse Rating (A)	30A									

*STC ： Irradiance 1000W/m², Cell Temperature 25°C, Air Mass 1.5
*NMOT： Irradiance 800W/m², Ambient Temperature 20°C, Air Mass1.5, Wind Speed 1m/s
*Measurement tolerance: ±3% *Power binning up to: +3%

Mechanical Specifications

External Dimensions	1961x1134x30mm
Weight	23.9kg
Solar Cells	N-Type 16BB 182x105mm (2x54pcs)
Glass	AR Coated 1.6+1.6 mm tempered glass
Frame	Anodized aluminum alloy
Junction Box	IP68
Output Cables	4.0mm², 1200mm (+),1200mm (-), length can be customized
Connector	MC4 Compatible
Mechanical Load	Front Side Max. 5400Pa, Rear Side Max. 2400Pa

Bifacial Output Rear Side Power Gain

*Take 510M12-108D6 as an example.

Power Gain	5%	10%	20%
Maximum Power- Pmax(W)	536.0	561.0	612.0
Open Circuit Voltage - Voc(V)	40.28	40.28	40.28
Short- Circuit Current - Isc(A)	16.86	17.66	19.26
Voltage at Pmax -Vmp(V)	33.48	33.48	33.48
Current at Pmax - Imp(A)	15.99	16.76	18.28

Temperature Characteristics

Pmax Temperature Coefficient	-0.290%/°C
Voc Temperature Coefficient	-0.250%/°C
Isc Temperature Coefficient	+0.045%/°C
Operating Temperature Range	-40~+85°C
Nominal Operating Cell Temperature(NMOT)	45±2°C

Packing Configuration

Pallet Dimensions	1980×1140×1254mm		
Ways of Transport	40'HQ	13.5m Flatbed Truck	17.5m Flatbed Truck
Pieces per Pallet	37 Pcs	36 Pcs	36 Pcs
Pallets per Container	24 Pallets	22 Pallets	33 Pallets
Pieces per Container	888 Pcs	792 Pcs	1188 Pcs

Specifications are subject to change without further notification

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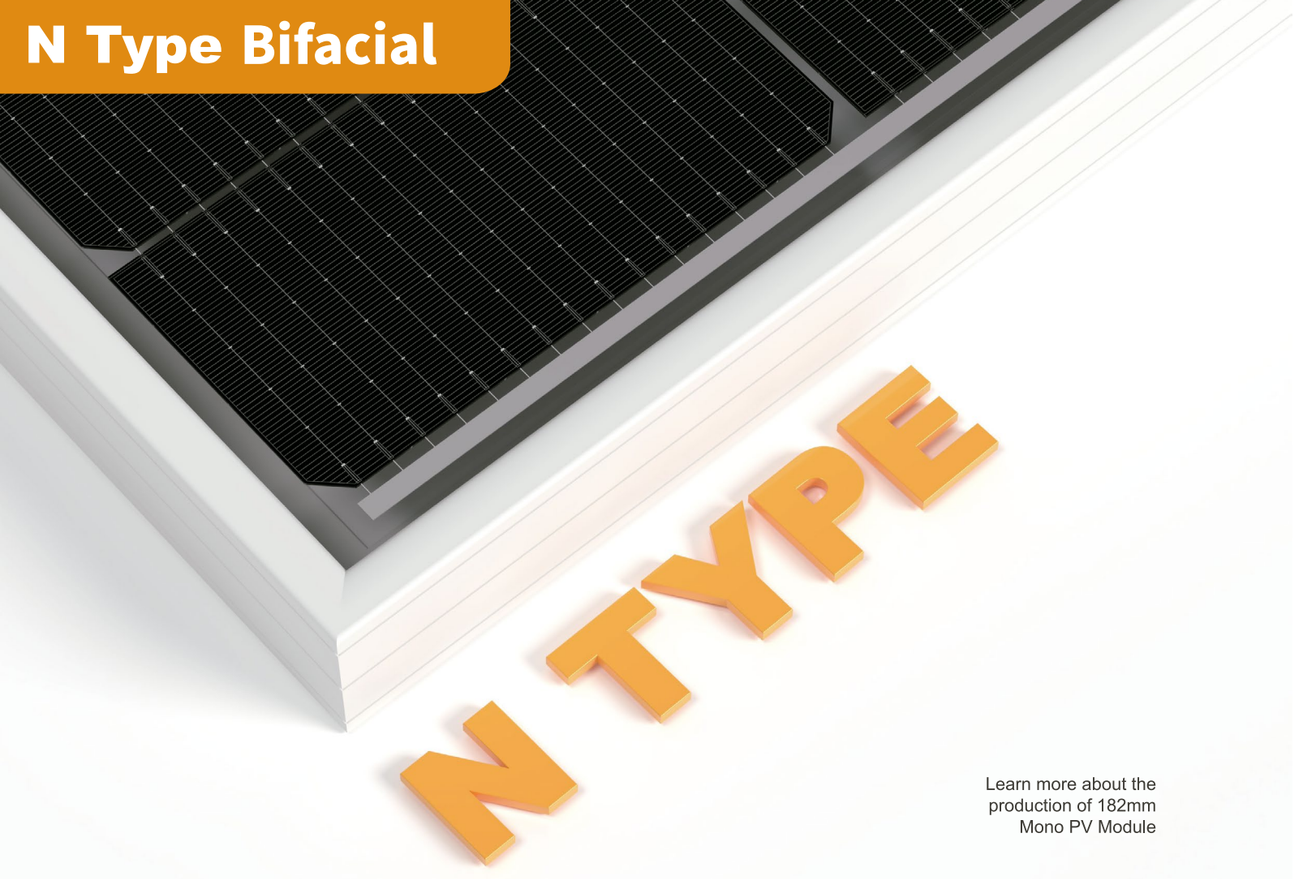
N Type Bifacial



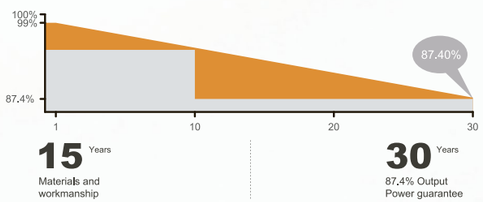
Learn more about the production of 182mm Mono PV Module

BW580~590M10-144D4

580~590 Watt

182mm 16BB 144Cells Double Glass Bifacial
N Type Mono Half Cell PV Module Series

Black Wolf N Type Linear Warranty



- SMBB Technology Half Cut N Type Cell
- High Energy Performance
- 100% Inspection 30years Guarantee
- Fire Class A
- 5400Pa Strengthened Mechanical Load
- Advanced Bifacial Efficiency

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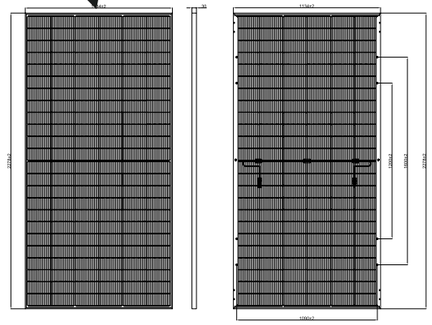
BLACK WOLF

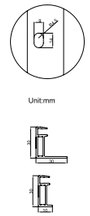
BLACK WOLF

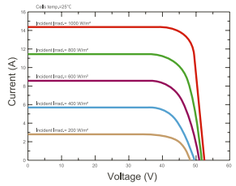
BW580~590M10-144D4

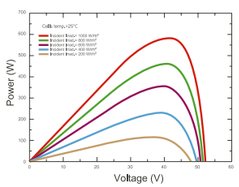
182mm 16BB 144Cells Double Glass Bifacial
N Type Mono Half Cell PV Module



Current-Voltage & Power-Voltage Curves (590M10-144D4)







All Dimensions in mm
The above drawing is a graphical representation of the product.

Electrical Characteristics (STC/NOCT)

Module Type	BW580M10-144D4		BW585M10-144D4		BW590M10-144D4	
Test Conditions	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power- Pmax(W)	580	436	585	440	590	444
Open Circuit Voltage - Voc(V)	51.47	48.89	51.67	49.08	51.87	49.27
Short- Circuit Current - Isc(A)	14.37	11.21	14.43	11.26	14.49	11.31
Voltage at Pmax -Vmp(V)	42.60	39.86	42.76	39.97	42.92	40.08
Current at Pmax - Imp(A)	13.62	10.94	13.69	11.01	13.75	11.08
Module Efficiency -ηm(%)	22.45	/	22.64	/	22.84	/
Power Tolerance(W)	(0，+4.99W)					
Maximum System Voltage(V)	1500Vdc (IEC / UL)					
Maximum Series Fuse Rating (A)	30A					

*STC ： Irradiance 1000W/m², Cell Temperature 25℃, Air Mass 1.5
*NOCT： Irradiance 800W/m², Ambient Temperature 20℃, Air Mass1.5, Wind Speed 1m/s
*Measurement tolerance: ±3%　*Power binning up to: +3%

Mechanical Specifications

External Dimensions	2278×1134×30mm
Weight	31kg
Solar Cells	N-Type 16BB 182mm (2×72pcs)
Glass	AR Coated 2+2 mm tempered glass
Frame	Anodized aluminum alloy
Junction Box	IP68
Output Cables	4.0mm²,1200mm (+), 1200mm (-), length can be customized
Connector	MC4 Compatible
Mechanical Load	Front Side Max. 5400Pa, Rear Side Max. 2400Pa

Bifacial Output Rear Side Power Gain

*Take BW585M10-144D4 as an example.

Power Gain	5%	15%	25%
Maximum Power- Pmax(W)	614	673	731
Open Circuit Voltage - Voc(V)	51.67	51.67	51.67
Short- Circuit Current - Isc(A)	14.81	16.23	17.63
Voltage at Pmax -Vmp(V)	42.76	42.76	42.76
Current at Pmax - Imp(A)	14.36	15.74	17.10

Temperature Characteristics

Pmax Temperature Coefficient	-0.290%/℃
Voc Temperature Coefficient	-0.250%/℃
Isc Temperature Coefficient	+0.045%/℃
Operating Temperature Range	-40~+85℃
Nominal Operating Cell Temperature(NOCT)	45±2℃

Packing Configuration

Pallet Dimensions	2320×1140×1254mm		
Ways of Transport	40'HQ	13.5m Flatbed Truck	17.5m Flatbed Truck
Pieces per Pallet	37 Pcs	36 Pcs	36 Pcs
Pallets per Container	20 Pallets	17 Pallets	26 Pallets
Pieces per Container	740 Pcs	612 Pcs	936 Pcs

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N Type Bifacial

ULTRA
N TYPE

- Fire Class A
- High Energy Performance
- Strengthened Mechanical Load (5400Pa)
- Advanced Bifacial Efficiency
- 100% Inspection 30years Guarantee (100% TEST MES)
- SMBB Technology Half Cut N Type Cell

610~630M12-132D4

610~630 Watt

210x182mm 16BB 132Cells Double Glass Bifacial
N Type Mono Half Cell PV Module Series

Sunket N Type Linear Warranty

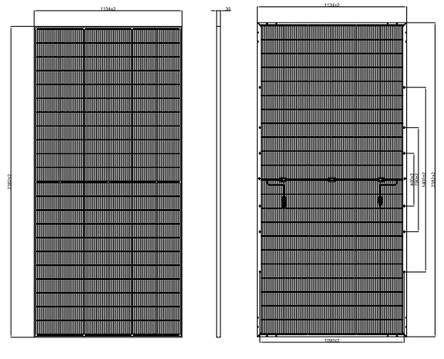
30 Year
87.4% Output Power guarantee

15 Year
Materials and workmanship

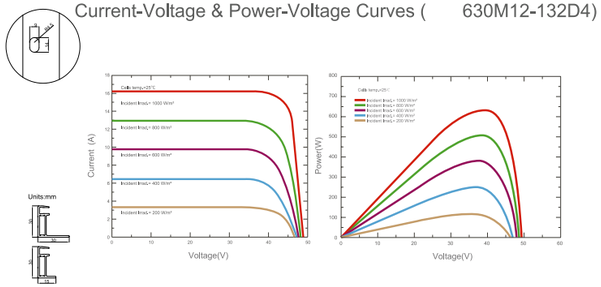
TUV SUD · CE · CQC · MCS

610~630M12-132D4

210x182mm 16BB 132Cells Double Glass Bifacial
N Type Mono Half Cell PV Module Series



Current-Voltage & Power-Voltage Curves (630M12-132D4)



All Dimensions in mm
The above drawing is a graphical representation of the product.

Electrical Characteristics (STC/NMOT)

Module Type	610M12-132D4		615M12-132D4		620M12-132D4		625M12-132D4		630M12-132D4	
Test Conditions	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum Power- Pmax(W)	610	460.7	615	464.4	620	468.2	625	471.9	630	475.7
Open Circuit Voltage - Voc(V)	48.70	46.24	48.90	46.43	49.10	46.62	49.30	46.81	49.50	47.00
Short- Circuit Current - Isc(A)	15.95	12.88	16.01	12.93	16.07	12.98	16.13	13.03	16.19	13.08
Voltage at Pmax -Vmp(V)	40.48	37.92	40.62	38.10	40.76	38.25	40.91	38.42	41.04	38.59
Current at Pmax - Imp(A)	15.07	12.15	15.14	12.19	15.21	12.24	15.28	12.28	15.35	12.33
Module Efficiency -ηm(%)	22.60	/	22.80	/	23.00	/	23.10	/	23.30	/
Power Tolerance(W)	（0，+5W）									
Maximum System Voltage(V)	1500Vdc (IEC / UL)									
Maximum Series Fuse Rating (A)	30A									

*STC ： Irradiance 1000W/m², Cell Temperature 25°C, Air Mass 1.5
*NMOT： Irradiance 800W/m², Ambient Temperature 20°C, Air Mass1.5, Wind Speed 1m/s
*Measurement tolerance: ±3%　*Power binning up to: +3%

Mechanical Specifications

External Dimensions	2382x1134x30mm
Weight	32.4kg
Solar Cells	N-Type 16BB 182x105mm (2x66pcs)
Glass	AR Coated 2+2 mm tempered glass
Frame	Anodized aluminum alloy
Junction Box	IP68
Output Cables	4.0mm², 1200mm (+),1200mm (-), length can be customized
Connector	MC4 Compatible
Mechanical Load	Front Side Max. 5400Pa, Rear Side Max. 2400Pa

Bifacial Output Rear Side Power Gain

*Take 630M12-132D4 as an example.

Power Gain	5%	10%	20%
Maximum Power- Pmax(W)	661.5	693.0	756.0
Open Circuit Voltage - Voc(V)	49.50	49.50	49.50
Short- Circuit Current - Isc(A)	16.81	17.60	19.20
Voltage at Pmax -Vmp(V)	41.04	41.04	41.04
Current at Pmax - Imp(A)	16.12	16.89	18.42

Temperature Characteristics

Pmax Temperature Coefficient	-0.290%/°C
Voc Temperature Coefficient	-0.250%/°C
Isc Temperature Coefficient	+0.045%/°C
Operating Temperature Range	-40~+85°C
Nominal Operating Cell Temperature(NMOT)	45±2°C

Packing Configuration

Pallet Dimensions	1164x1140x2495mm		
Ways of Transport	40'HQ	13.5m Flatbed Truck	17.5m Flatbed Truck
Pieces per Pallet	37 Pcs	36 Pcs	36 Pcs
Pallets per Container	20 Pallets	16 Pallets	25 Pallets
Pieces per Container	740 Pcs	576 Pcs	900 Pcs

Specifications are subject to change without further notification

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