

BiMAX**5****Bifacial Double Glass/Transparent Backsheet**

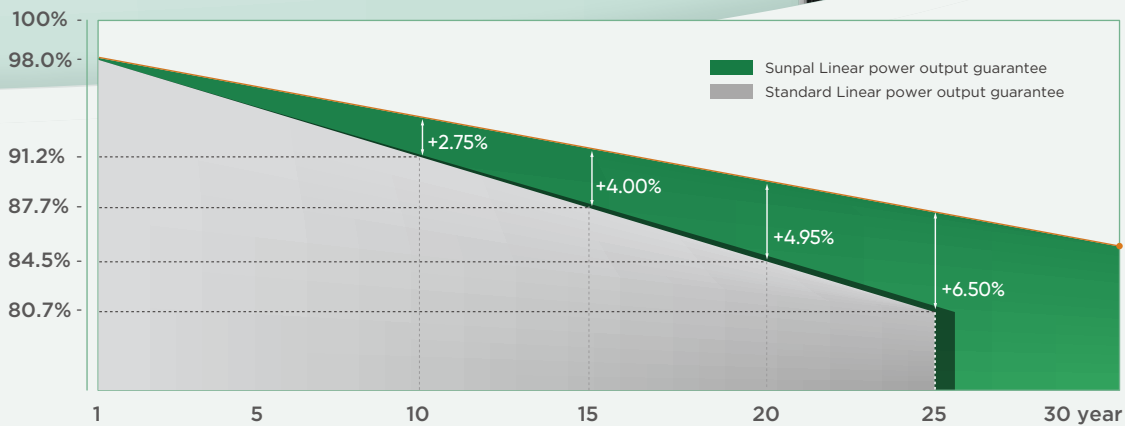
440~460W

120 Half-Cell | 182mmCell. | MBB

High Efficiency
Low LID Bifacial PERC with
MBB & Half-cut Technology

Quality Guarantee

12-year material & technology warranty
30-year linear power output warranty

**84.95%****21.27%**

Max Module Eff.

0~+5W

Positive Tolerance

Front side performance equivalent to conventional low LID mono PERC:

- > High module conversion efficiency (up to 21.27%)
- > Better energy yield with excellent low irradiance performance and temperature coefficient
- > First year power degradation <2%

Bifacial technology enables additional energy harvesting from rear side (up to 25%)

Glass/glass lamination ensures 30 year product lifetime, with annual power degradation < 0.45%, 1500V compatible to reduce BOS cost

Solid PID resistance ensured by solar cell process optimization and careful module BOM selection

Reduced resistive loss with lower operating current

Higher energy yield with lower operating temperature

Reduced hot spot risk with optimized electrical design and lower operating current

Complete System and Product Certifications

IEC 61215, IEC 61730, UL 61730

ISO 9001:2008: ISO Quality Management System

ISO 14001: 2004: ISO Environment Management System

OHSAS 18001: 2007 Occupational Health and Safety



* Specifications subject to technical changes and tests. Sunpal Solar reserves the right of interpretation.



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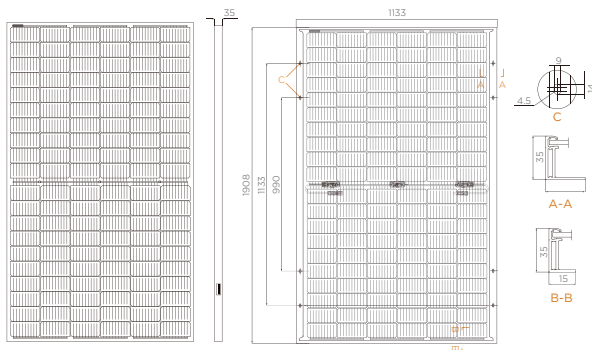
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Design (mm)



*Units: mm *Tolerance: ±2mm

Cell Orientation	120 (6x20)
Junction Box	IP68, three diodes
Output Cable	4mm ² , 300mm in length, length can be customized
Glass	Double/Single glass 2.0/3.2mm coated tempered
Frame	Anodized aluminum alloy frame
Weight:	26.5kg
Dimension	1908×1133×35mm
Packaging	31pcs per pallet 744pcs per 40'GP

Operational Temperature	-40°C~+85°C
Power Output Tolerance	0~+5W
Voc & Isc Tolerance	±3%
Max. System Voltage	DC1500V(IEC/UL)
Max. Series Fuse Rating	25A
NOCT	45±2°C
Safety Class	II
Fire Rating	UL type 3
Bifaciality	Glazing 70±5%
Max. Static Load(Front)	5400Pa
Max. Static Load(Back)	2400Pa

Electrical Characteristics

Model Number	SP440M-60H		SP445M-60H		SP450M-60H		SP455M-60H		SP460M-60H	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	440	327	445	331	450	335	455	339	460	343
Open Circuit Voltage (Voc/V)	41.02	38.72	41.12	38.82	41.22	38.92	41.32	39.02	41.42	39.12
Short Circuit Current (Isc/A)	13.73	11.09	13.8	11.15	13.87	11.21	13.94	11.27	14.01	11.33
Voltage at Maximum Power (Vmp/V)	33.72	31.39	33.84	31.56	33.96	31.73	34.08	31.9	34.2	32.07
Current at Maximum Power (Imp/A)	13.05	10.42	13.16	10.49	13.26	10.56	13.36	10.63	13.46	10.7
Module Efficiency(%)	20.34		20.57		20.8		21.03		21.27	
Temperature Coefficient of Isc	+0.04%/°C									
Temperature Coefficient of Voc	-0.25%/°C									
Temperature Coefficient of Pmax	-0.34%/°C									

* STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25°C, Spectra at AM1.5

* NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20°C, Spectra at AM1.5, Wind at 1m/S

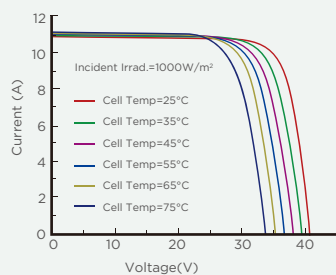
*Test uncertainty for Pmax: ±3%

Electrical characteristics with different rear side powerin (reference to 445W front)

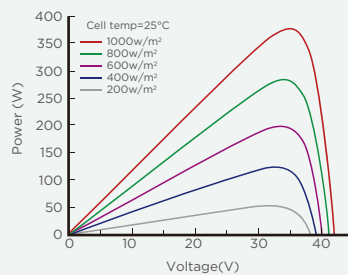
Pmax/W	Vmp/V	Imp/A	Voc/V	Isc/A	Pmax gain
468	41.2	11.36	41.12	14.49	5%
490	41.2	11.89	41.22	15.18	10%
512	41.2	12.43	41.32	15.87	15%
534	41.2	12.96	41.42	16.56	20%
557	41.2	13.52	41.52	17.25	25%

I-V Curve

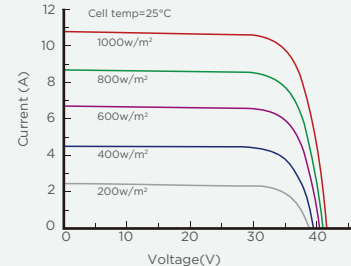
Current-Voltage Curve(SP450M-60H)



Current-Voltage Curve(SP450M-60H)



Current-Voltage Curve(SP450M-60H)



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*CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

*Specifications included in this datasheet are subject to change without notice.

