

SP470M-72H

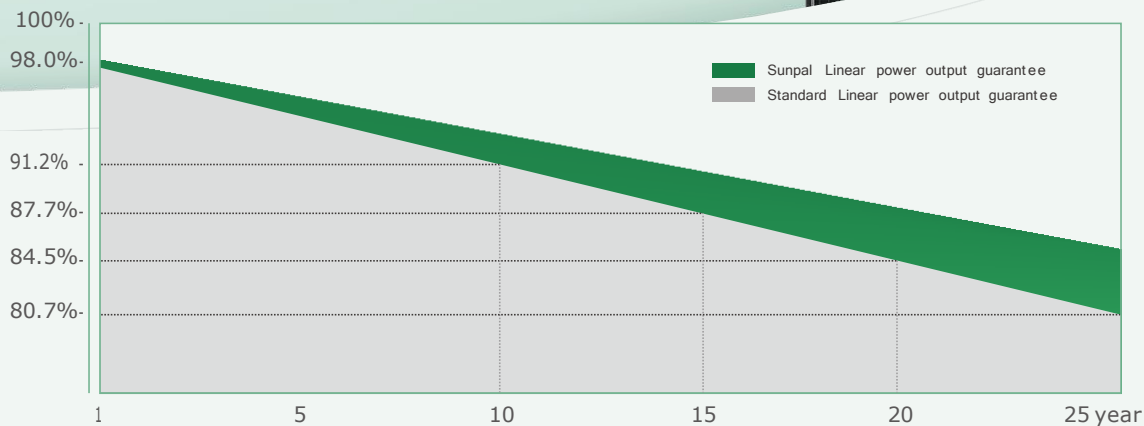
MBB

# 445~470W

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

## Quality Guarantee

12-year Warranty for Materials and Processing  
25-year Warranty for Extra Linear Power Output



**21.2%**  
Max Module Eff.

**0~+5W**  
Positive Tolerance

### 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.

Positive power tolerance (0 +5W) guaranteed

High module conversion efficiency (up to 21.2%)

Slower power degradation enabled by Low LID Mono PERC technology: first year <2%, 0.55% year 2-25

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



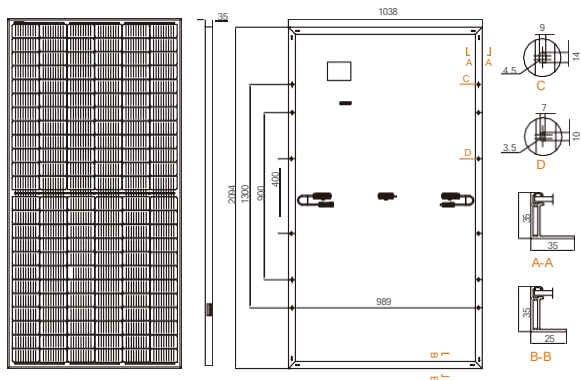
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SP470M-72H 445~470W

Design (mm)



\*Units: mm \*Tolerance: ±2mm

|                  |                                                                 |
|------------------|-----------------------------------------------------------------|
| Cell Orientation | 144 (6x24)                                                      |
| Junction Box     | IP68, three diodes                                              |
| Output Cable     | 4mm <sup>2</sup> , 300mm in length,<br>length can be customized |
| Glass            | Single glass<br>3.2mm coated tempered glass                     |
| Frame            | Anodized aluminum alloy frame                                   |
| Weight:          | 23.5kg                                                          |
| Dimension        | 2094x1038x35mm                                                  |
| Packaging        | 30pcs per pallet<br>150pcs per 20'GP<br>660pcs per 40'HC        |

|                         |                 |
|-------------------------|-----------------|
| 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 | 20A             |
| NOCT                    | 45±2°C          |
| Safety Class            | II              |
| Fire Rating             | UL type 1 or 2  |
| Max. Static Load(Front) | 5400Pa          |
| Max. Static Load(Back)  | 2400Pa          |

## Electrical Characteristics

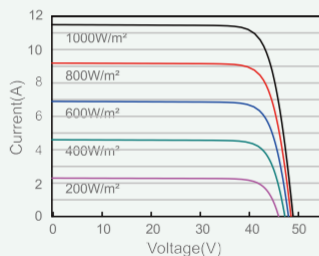
| Model Number                     | SP445M-72H |       | SP450M-72H |       | SP455M-72H |       | SP460M-72H |       | SP465M-72H |       | SP470M-72H |       |
|----------------------------------|------------|-------|------------|-------|------------|-------|------------|-------|------------|-------|------------|-------|
| Testing Condition                | STC        | NOCT  | STC        | NOCT  | STC        | NOCT  | STC        | NOCT  | STC        | NOCT  | STC        | NOCT  |
| Maximum Power (Pmax/W)           | 445        | 336   | 450        | 340   | 455        | 344   | 460        | 348   | 465        | 352   | 470        | 355   |
| Open Circuit Voltage (Voc/V)     | 49.56      | 46.65 | 49.70      | 46.90 | 49.85      | 47.15 | 50.01      | 47.38 | 50.15      | 47.61 | 50.31      | 47.84 |
| Short Circuit Current (Isc/A)    | 11.32      | 9.20  | 11.36      | 9.25  | 11.41      | 9.29  | 11.45      | 9.33  | 11.49      | 9.38  | 11.53      | 9.42  |
| Voltage at Maximum Power (Vmp/V) | 41.21      | 38.95 | 41.52      | 39.19 | 41.82      | 39.44 | 42.13      | 39.68 | 42.43      | 38.90 | 42.69      | 40.10 |
| Current at Maximum Power (Imp/A) | 10.80      | 8.64  | 10.84      | 8.68  | 10.88      | 8.72  | 10.92      | 8.76  | 10.96      | 8.81  | 11.01      | 8.86  |
| Module Efficiency(%)             | 20.0       |       | 20.3       |       | 20.5       |       | 20.7       |       | 20.9       |       | 21.2       |       |
| Temperature Coefficient of Isc   | +0.044%/°C |       |            |       |            |       |            |       |            |       |            |       |
| Temperature Coefficient of Voc   | -0.272%/°C |       |            |       |            |       |            |       |            |       |            |       |
| Temperature Coefficient of Pmax  | -0.350%/°C |       |            |       |            |       |            |       |            |       |            |       |

\* STC (Standard Testing Conditions): Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Spectra at AM1.5\* NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, Spectra at AM1.5, Wind at 1m/s

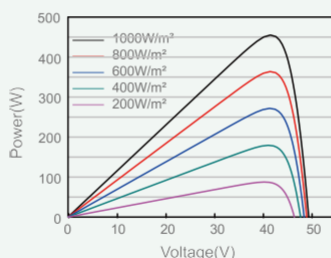
\*Test uncertainty for Pmax: ±3%

## I-V Curve

Current-Voltage Curve(SP455M-72H)



Power-Voltage Curve(SP455M-72H)



Current-Voltage Curve(SP455M-72H)

