

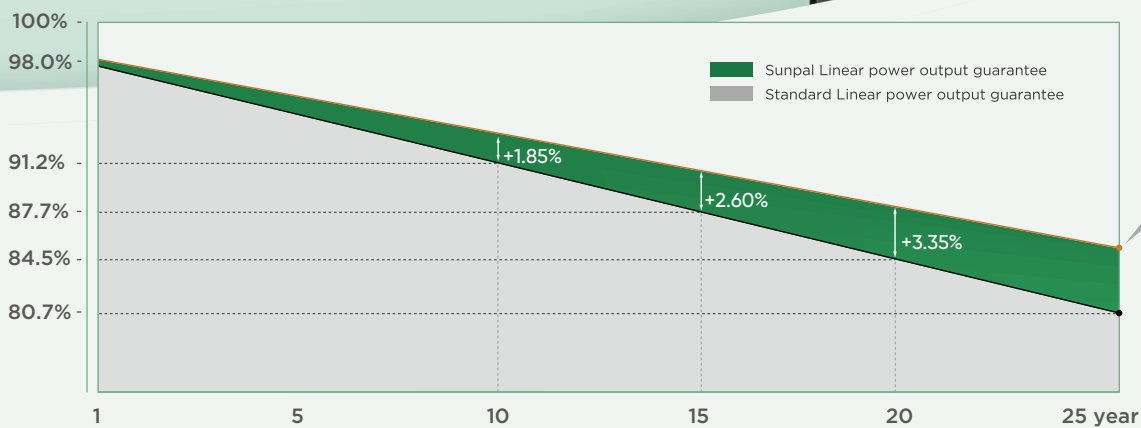
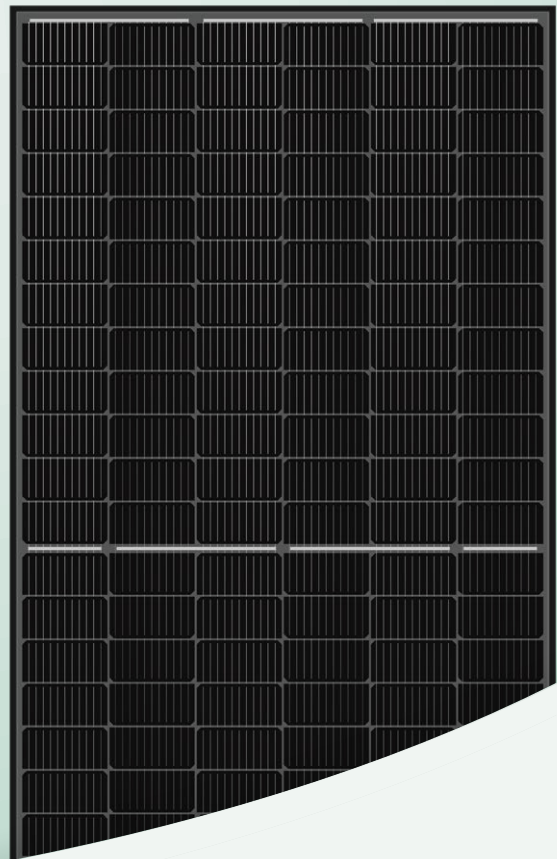
HIMAX 4 ALL BLACK

440~465W

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



84.80%

21.4%

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 21.4%)

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



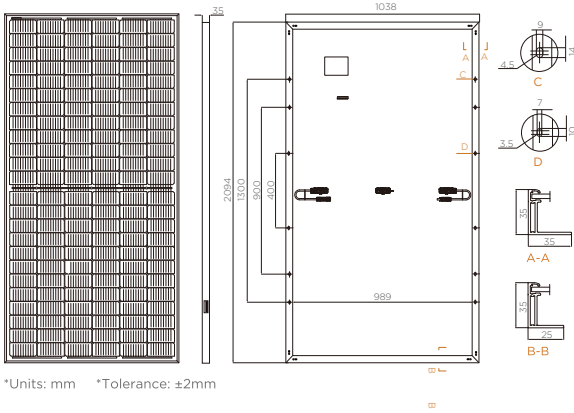
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Design (mm)



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

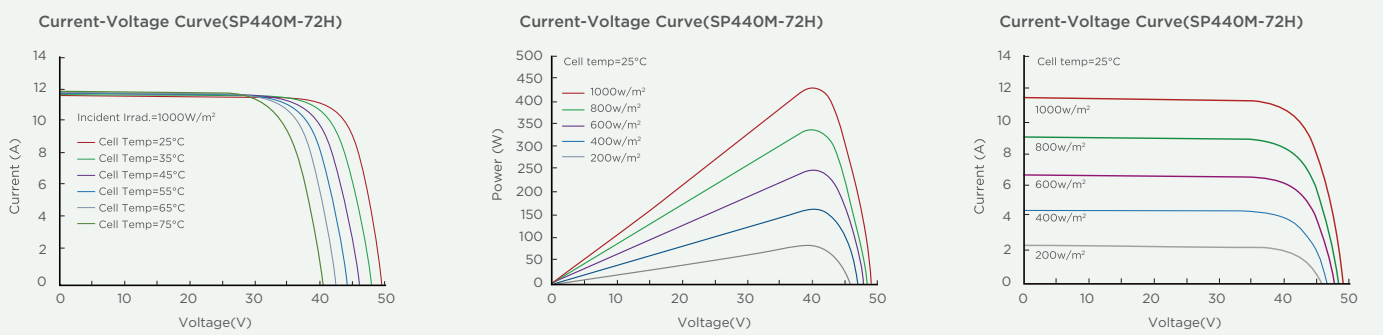
*Units: mm *Tolerance: ±2mm

Electrical Characteristics

Model Number	SP440M-72H		SP445M-72H		SP450M-72H		SP455M-72H		SP460M-72H		SP465M-72H	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power (Pmax/W)	440	332	445	336	450	340	455	344	460	348	465	352
Open Circuit Voltage (Voc/V)	49.2	46.4	49.4	46.6	49.6	46.8	49.8	47	50	47.2	50.2	47.4
Short Circuit Current (Isc/A)	11.39	9.17	11.46	9.23	11.53	9.29	11.6	9.35	11.67	9.41	11.74	9.47
Voltage at Maximum Power (Vmp/V)	40.6	38.3	40.8	38.5	41	38.7	41.2	38.9	41.4	39.1	41.6	39.3
Current at Maximum Power (Imp/A)	10.84	8.67	10.91	8.73	10.98	8.79	11.05	8.85	11.12	8.91	11.18	8.96
Module Efficiency(%)	20.25		20.48		20.71		20.94		21.17		21.4	
Temperature Coefficient of Isc												+0.048%/°C
Temperature Coefficient of Voc												-0.270%/°C
Temperature Coefficient of Pmax												-0.350%/°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%

I-V Curve



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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.



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