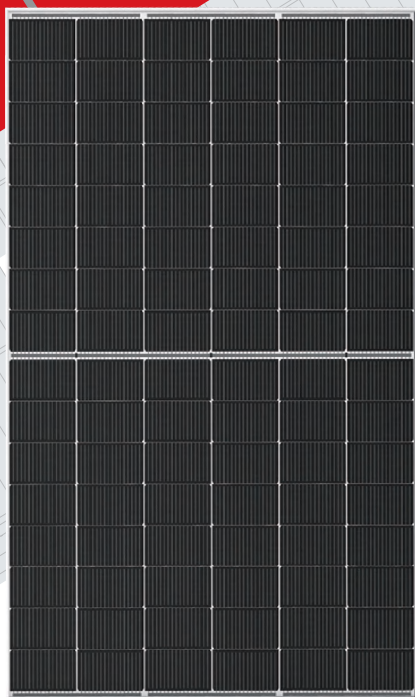


# Mars Series

440W/445W/450W/455W/460W

## SUN 48MD-H12RS

N TYPE TOPCON BIFACIAL MODULE



### COMPREHENSIVE CERTIFICATES

IEC61215 / IEC61730 / IEC61701 / IEC62716 / IEC62804  
ISO 9001: 2015 Quality management systems;  
ISO 14001: 2015 Environmental management systems;  
ISO 45001: 2018 Occupational health and safety management systems;

### Sunergy Advantages



#### Overflow tank can be waterproof

The excess silicone will flow into the overflow tank, can reduce 3% water vapor entering the panels.



#### Stronger frame

The C side of the frame contains curved hook reinforcement, enhanced the mechanical load strength by 10%



#### Current grading

Current classification effectively avoids 2% power loss caused by current mismatch during installation, achieving max output power



#### Higher utilization of container space

Higher container space utilization significantly reduce transportation costs



#### Better Temperature Coefficient

-0.30%/°C Pmax temperature coefficient  
More stable power generation performance and even better in hot climate



#### Higher fire rating

Fire rating up to Class A, reduce fire hazards;

### SUNERGY USA WORKS LLC

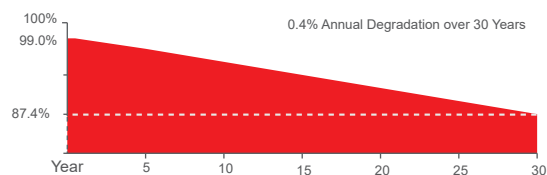
Founded in 2008, Sunergy is a manufacturer of high-performance photovoltaic products. With 12 manufacturing bases and more than 20 branches around the world, the company's business covers modules, photovoltaic power stations and EPC. Sunergy products are available in over 120 countries and regions and are used extensively in ground-mounted power plants, commercial & industrial rooftop PV systems and residential rooftop PV systems.

### QUALIFICATIONS AND CERTIFICATES



### LINEAR PERFORMANCE WARRANTY

- 12 Years Manufacturing Warranty
- 12 Years 94.6% Power Output
- 30 Years 87.4% Power Output

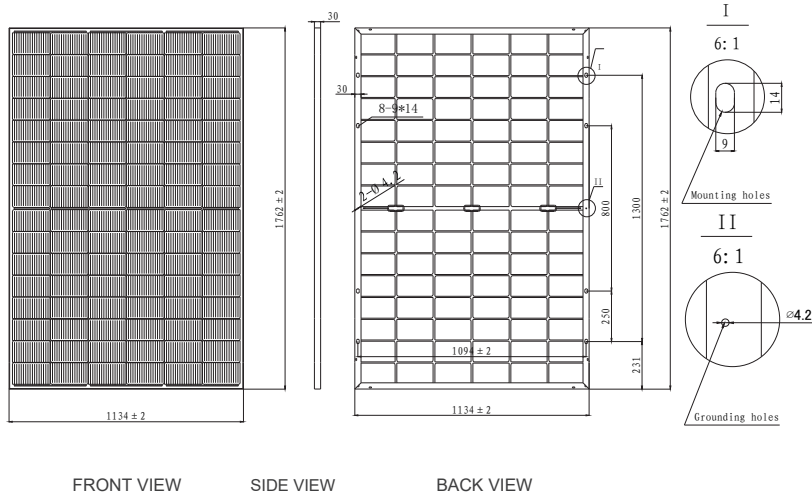


SUNERGY USA WORKS LLC  
[www.sunergyworks.com](http://www.sunergyworks.com)

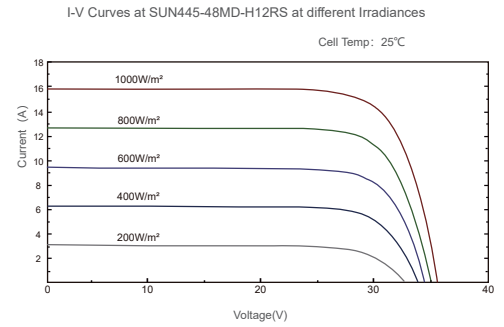


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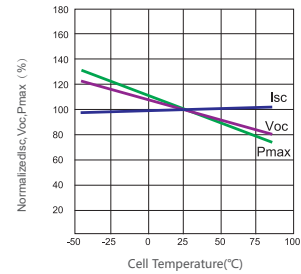
## MECHANICAL DRAWINGS



## I-V CURVES



Power voltage current curve at different temperature



## MECHANICAL SPECIFICATION

Cell Type	N-Type Mono Crystalline 182x105mm
Number Of Cells	96 (6x16)
Dimensions(AxBxC)	1762x1134x30mm
Weights	24.5kg
Glass	2.0/2.0mm Tempered Low Iron Glass
Aluminium Frame	Anodised Aluminium
Junction Box	Split Junction Box (IP68 ,three diode)
Connector	Mc4 Compatible
Output Cables	4.0mm <sup>2</sup> ,+300mm,-300mm Customized Length

## PACKING CONFIGURATION

Container	40' HQ
Pieces Per Pallet	36
Pallets Per Container	26
Pieces Per Container	936

## ELECTRICAL CHARACTERISTICS

Module Type	440W		445W		450W		455W		460W	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum Power At STC(Pmax)	440W	335.0W	445W	338.8W	450W	342.6W	455W	346.4W	460W	350.2W
Short Circuit Current(Isc)	15.84A	12.83A	15.92A	12.90A	15.99A	12.96A	16.08A	13.03A	16.15A	13.09A
Open Circuit Voltage(Voc)	35.07V	33.98V	35.27V	34.18V	35.47V	34.37V	35.67V	34.56V	35.87V	34.76V
Maximum Power Current(Imp)	14.94A	12.13A	15.02A	12.19A	15.09A	12.25A	15.17A	12.31A	15.25A	12.37A
Maximum Power Voltage(Vmpp)	29.46V	27.62V	29.63V	27.79V	29.82V	27.98V	30.00V	28.13V	30.17V	28.32V
Module Efficiency	22.0%		22.3%		22.5%		22.8%		23.0%	
Power Tolerance	0~+5W		0~+5W		0~+5W		0~+5W		0~+5W	

## ELECTRICAL CHARACTERISTICS WITH DIFFERENT REAR SIDE POWER GAIN

(Reference to 445W Front)

Backside Power Gain	10%	15%	20%	25%
Maximum Power At STC(Pmax)	489.5	512.0	534.0	556.0
Short Circuit Current(Isc)	17.50	18.23	18.94	19.64
Open Circuit Voltage(Voc)	35.29	35.44	35.59	35.74
Maximum Power Current(Imp)	16.51	17.20	17.87	18.53
Maximum Power Voltage(Vmpp)	29.65	29.77	29.89	30.01

STC: 1000W/m<sup>2</sup> irradiance, 25°C cell temperature, AM1.5. NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, wind speed 1m/s.



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