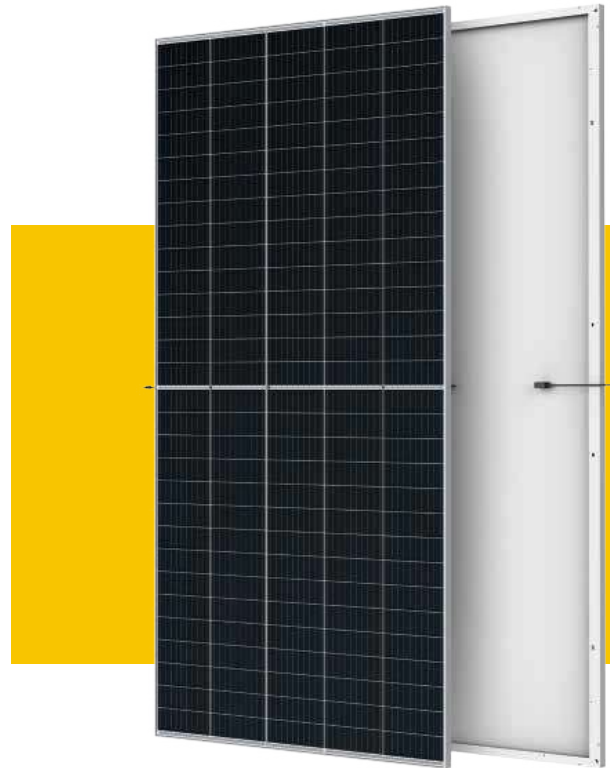


# MSMDxxxM12-60

# 485-510W

210mm cells 1/3 cut cell technology



## Product Advantages



### High customer value

Lower LCOE (Levelized Cost Of Energy), reduced BOS (Balance Of System) cost shorter payback time  
Lower guaranteed first year and annual degradation  
Designed for compatibility with existing mainstream system components  
Higher return on Investment



### High power up to 510W

Large area cells based on 210mm silicon wafers and 1/3-cut cell technology  
Up to 21.2% module efficiency with high density interconnect technology  
Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection



### High reliability

Minimized micro-cracks with innovative non-destructive cutting technology Ensured PID resistance through cell process and module material control Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas. Mechanical performance up to 5400 Pa positive load and 2400



### High energy yield

Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications  
The unique design provides optimized energy production under inter-row shading conditions

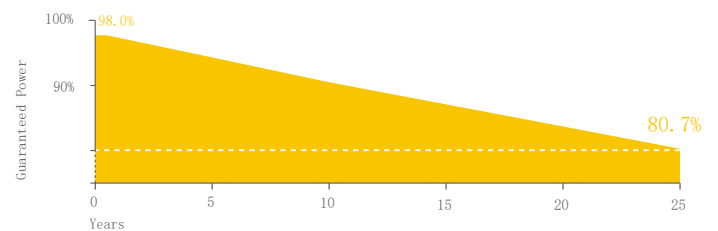
**21.2%**

Module efficiency

**510W**

Highest power output

## Performance Warranty



- 2.00 %

First year power degradation

- 0.55 %

Annual degradation

**15**  
Years

Materials and workmanship warranty

**25**  
Years

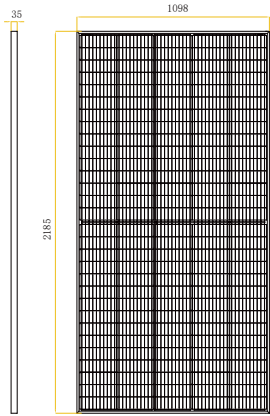
Linear power warranty

## Product Certification

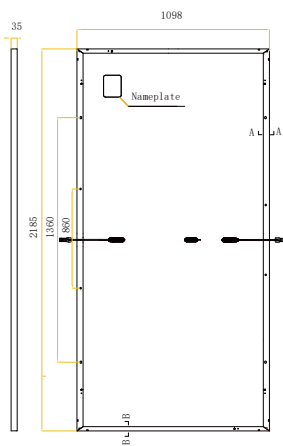


# MSMDxxxM12-60

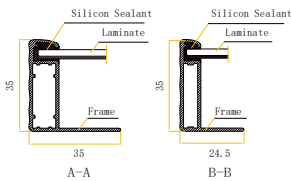
## DIMENSIONS OF PV MODULE(mm)



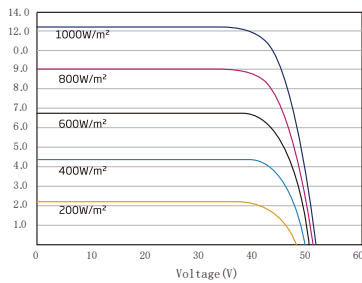
Front View



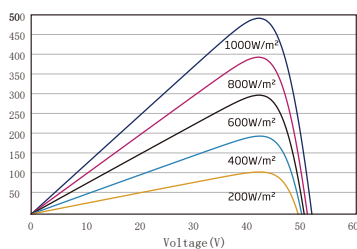
Back View



## I-V CURVES OF PV MODULE(495W)



## P-V CURVES OF PV MODULE(495W)



## ELECTRICAL DATA (STC)

Peak Power Watts	$P_{MAX}(W_p)^*$	485	490	495	500	505	510
Power Tolerance	$P_{MAX}(W)$	0 ~ +5					
Maximum Power Voltage	$V_{MPP}(V)$	42.2	42.4	42.6	42.8	43.0	43.2
Maximum Power Current	$I_{MPP}(A)$	11.49	11.56	11.63	11.69	11.75	11.81
Open Circuit Voltage	$V_{oc}(V)$	51.1	51.3	51.5	51.7	51.9	52.1
Short Circuit Current	$I_{sc}(A)$	12.07	12.14	12.21	12.28	12.35	12.42
Module Efficiency	$\eta_n(\%)$	20.1	20.3	20.5	20.7	21.0	21.2

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5.  
\*Measuring tolerance: ±3%.

## ELECTRICAL DATA (NOCT)

Maximum Power	$P_{MAX}(W_p)$	365	369	373	377	381	385
Maximum Power Voltage	$V_{MPP}(V)$	39.9	40.0	40.2	40.4	40.6	40.5
Maximum Power Current	$I_{MPP}(A)$	9.17	9.22	9.28	9.33	9.38	9.50
Open Circuit Voltage	$V_{oc}(V)$	48.1	48.2	48.4	48.6	48.8	49.0
Short Circuit Current	$I_{sc}(A)$	9.73	9.78	9.84	9.90	9.95	10.01

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

## MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	150 cells
Module Dimensions	2185x1098x35mm
Weight	26.5kg
Glass	3.2mm, High Transmission, AR Coated Heat Strengthened Glass
Encapsulant Material	EVA
Backsheet	White
Frame	35mm Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm <sup>2</sup> Cable length 350mm or customized length
Connector	MC4 Compatible

\*Please refer to regional datasheet for specified connector.

## TEMPERATURE RATINGS

NOCT (Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of $P_{MAX}$	- 0.34%/°C
Temperature Coefficient of $V_{oc}$	- 0.25%/°C
Temperature Coefficient of $I_{sc}$	0.04%/°C

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

## MAXIMUM RATINGS

Operational Temperature	-40~+85 °C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

## WARRANTY

15 years Product Workmanship Warranty
25 year Power Warranty
2% first year degradation
0.55% Annual Power Attenuation

(Please refer to product warranty for details)

## PACKAGING CONFIGURATION

Modules per box: 31 pieces
Modules per 40' container: 660 pieces