








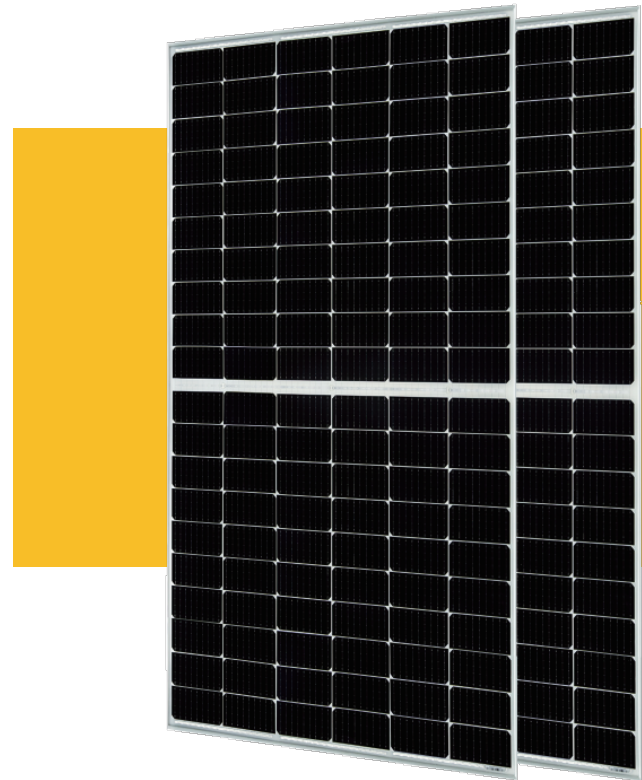
# 182 M10 cells half cut Mono-crystalline Module

## MSMDxxxM10-60 440W-460W

### KEY FEATURES

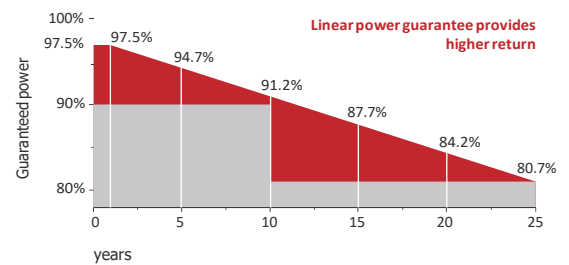
-  **Class A fire resistant (industry standard class C)**
-  Outstanding performance in low-light conditions
-  Low temperature coefficient (Pmax): -0.36 % / °C
- +5W** 0~+5W positive tolerance - to assure high output
-  Lower internal current, lower hot spot temperature
-  Cell crack risk limited in small region, enhance the module reliability
- PID FREE** Excellent anti-PID module design, TÜV SÜD certified
-  Certified to withstand high wind loads (2400pa) and snow loads (5400pa)
-  Salt mist and ammonia corrosion resistant

### PRODUCT CERTIFICATES



### WARRANTY

- Our linear power guarantee
- Standard linear power guarantee



**15**  
years Enhanced product guarantee on product and workmanship

**25**  
years Linear power output warranty

# MSMDxxxM10-60

## ELECTRICAL PERFORMANCE

### Electrical parameters at Standard Test Conditions (STC)

Module Type

Power output (w)	Pmax	440	445	450	455	460
Power output tolerances (w)	ΔPmax	0~+5W				
Module efficiency (%)	ηm	20.3	20.5	20.7	21.0	21.2
Voltage at Pmax (V)	Vmpp	34.1	34.3	34.5	34.7	34.9
Current at Pmax (A)	Imp	12.91	12.98	13.05	13.11	13.18
Open circuit voltage (V)	Voc	41.0	41.2	41.4	41.6	41.8
Short circuit current (A)	Isc	13.64	13.71	13.78	13.85	13.93

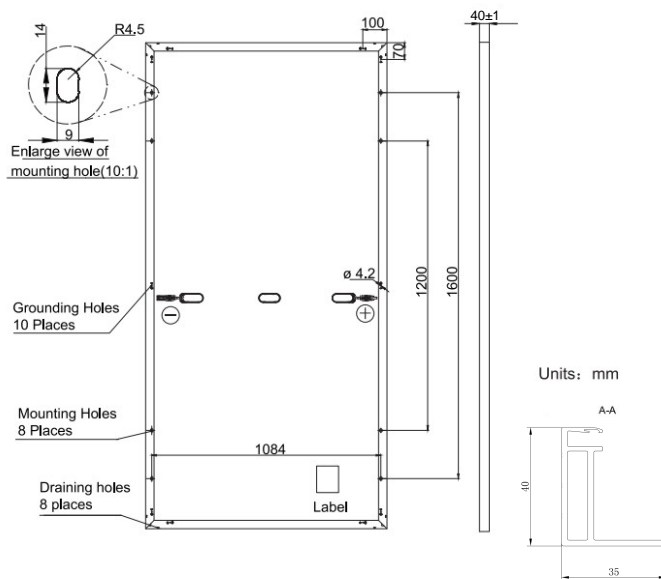
STC: 1000W/m<sup>2</sup> irradiance, 25°C cell temperature, AM1.5g spectrum according to EN 60904-3. Average relative efficiency reduction of 5% at 200W/m<sup>2</sup> according to EN 60904-1.

## THERMAL CHARACTERISTICS

Nominal operating cell temperature	NOCT	°C	45 +/-2
Temperature coefficient of Pmax	γ	% / °C	-0.36
Temperature coefficient of Voc	βVoc	% / °C	-0.26
Temperature coefficient of Isc	Isc	% / °C	+0.043

## OPERATING CONDITIONS

Max. System Voltage	1000V/1500V/DC (IEC)
Max. series fuse rating	25 A
Limiting reverse current	20 A
Operating temperature range	-40°C to 85°C
Max. static load, front (e.g., snow)	5400 Pa
Max. static load, back (e.g., wind)	2400 Pa
Max. hailstone impact (diameter/velocity)	25 mm / 23 m / s



## MECHANICAL CHARACTERISTICS

Front Cover (material / thickness)	AR Coating tempered glass / 3.2 mm
Cell (quantity)	120pcs (6x10x2)
Encapsulant (material)	EVA
Frame material	anodized aluminum alloy
Junction box(Protection degree)	IP68 with bypass-diode
Cable (length / cross sectional area)	4 mm <sup>2</sup> (portrait: 300 mm/landscape: 1200 mm)
Plug connector (type / protection degree)	MC4 / IP68
Fire Safety Classification (IEC 61730)	Class C

Specifications are subject to change without notice.

## GENERAL CHARACTERISTICS

Dimensions	1915mm/1133mm/40mm
Weight	24.6kg
Packing Information	27 pcs/Carton, 648pcs/40HQ

