



ASTRONERGY

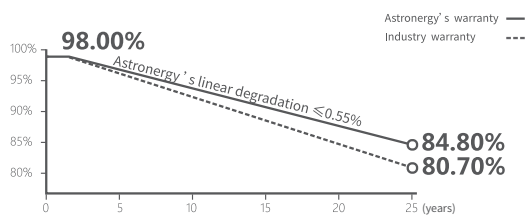


ASTRO 5^{Semi} CHSM60M-HC Monofacial Series(182)

450~460W

Warranty

- 15** 15-year Product Warranty
- 25** 25-year Linear Power Warranty



Key Features

- PERC+ / Half-cut
- Non-destructive cutting
- PID resistance
- Low BOS cost & LCOE



ISO 9001:2015:ISO Quality Management System
ISO 14001:2015:ISO Environment Management System
ISO 45001:Occupational Health and Safety
The first solar company which passed the Nord IEC/TS 62941 certification audit



Tier 1
BloombergNEF



450~460W

POWER RANGE

0~+5W

POWER SORTING

21.3%

MAX MODULE
EFFICIENCY

≤ 2.0%

FIRST YEAR
POWER DEGRADATION

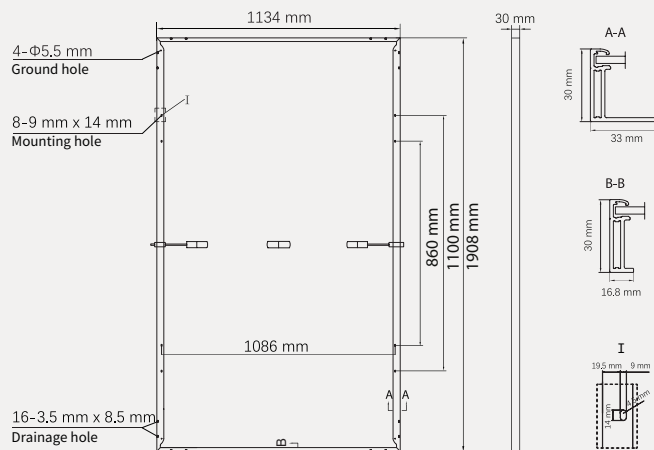
≤ 0.55%

YEAR 2-25
POWER DEGRADATION

Mechanical Specifications

Outer dimensions (L x W x H)	1908 x 1134 x 30 mm
Cell type	P type mono-crystalline
No. of cells	120 (6*20)
Frame technology	Aluminum, black or silver anodized
Front glass thickness	3.2 mm
Cable length (Including connector)	Portrait: (+)350 mm,(-)250 mm; Customized length
Cable diameter (IEC/UL)	4 mm ² / 12 AWG
① Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 (Standard) / MC4-EVO2A (Optional)
Module weight	23.9 kg
Packing unit	36 pcs / box
Weight of packing unit (for 40'HQ container)	905 kg
Modules per 40' HQ container	864 pcs (Subject to sales contract)

① Refer to Astronergy crystalline installation manual or contact technical department.
Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.



Electrical Specifications

STC: Irradiance 1000W/m², Cell Temperature 25° C, AM=1.5

Rated output (P _{mpp} / W _p)	450	455	460
Rated voltage (V _{mpp} / V)	34.83	35.00	35.17
Rated current (I _{mp} / A)	12.92	13.00	13.08
Open circuit voltage (V _{oc} / V)	41.45	41.65	41.85
Short circuit current (I _{sc} / A)	13.71	13.81	13.91
Module efficiency	20.8%	21.0%	21.3%

NMOT: Irradiance 800W/m², Ambient Temperature 20° C, AM=1.5, Wind Speed 1m/s

Rated output (P _{mpp} / W _p)	336.3	340.0	343.8
Rated voltage (V _{mpp} / V)	32.46	32.62	32.78
Rated current (I _{mp} / A)	10.36	10.42	10.49
Open circuit voltage (V _{oc} / V)	39.17	39.36	39.55
Short circuit current (I _{sc} / A)	11.12	11.20	11.29

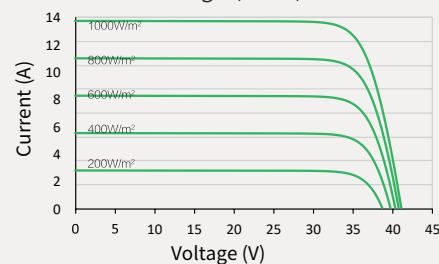
Temperature Ratings (STC)

Temperature coefficient (P _{mpp})	-0.34%/°C	No. of diodes	3
Temperature coefficient (I _{sc})	+0.04%/°C	Junction box IP rating	IP 68
Temperature coefficient (V _{oc})	-0.25%/°C	Max. series fuse rating	25 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V _{DC}

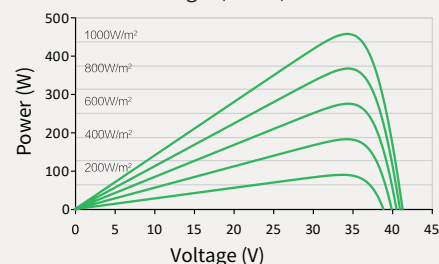
Operating Parameters

Curve

Current-Voltage (455W)



Power-Voltage (455W)



Current-Voltage (455W)

