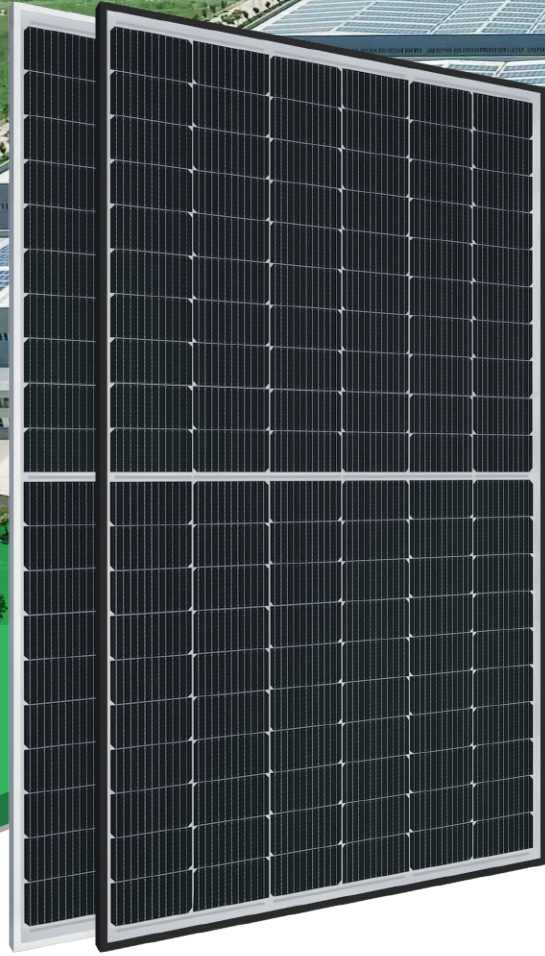
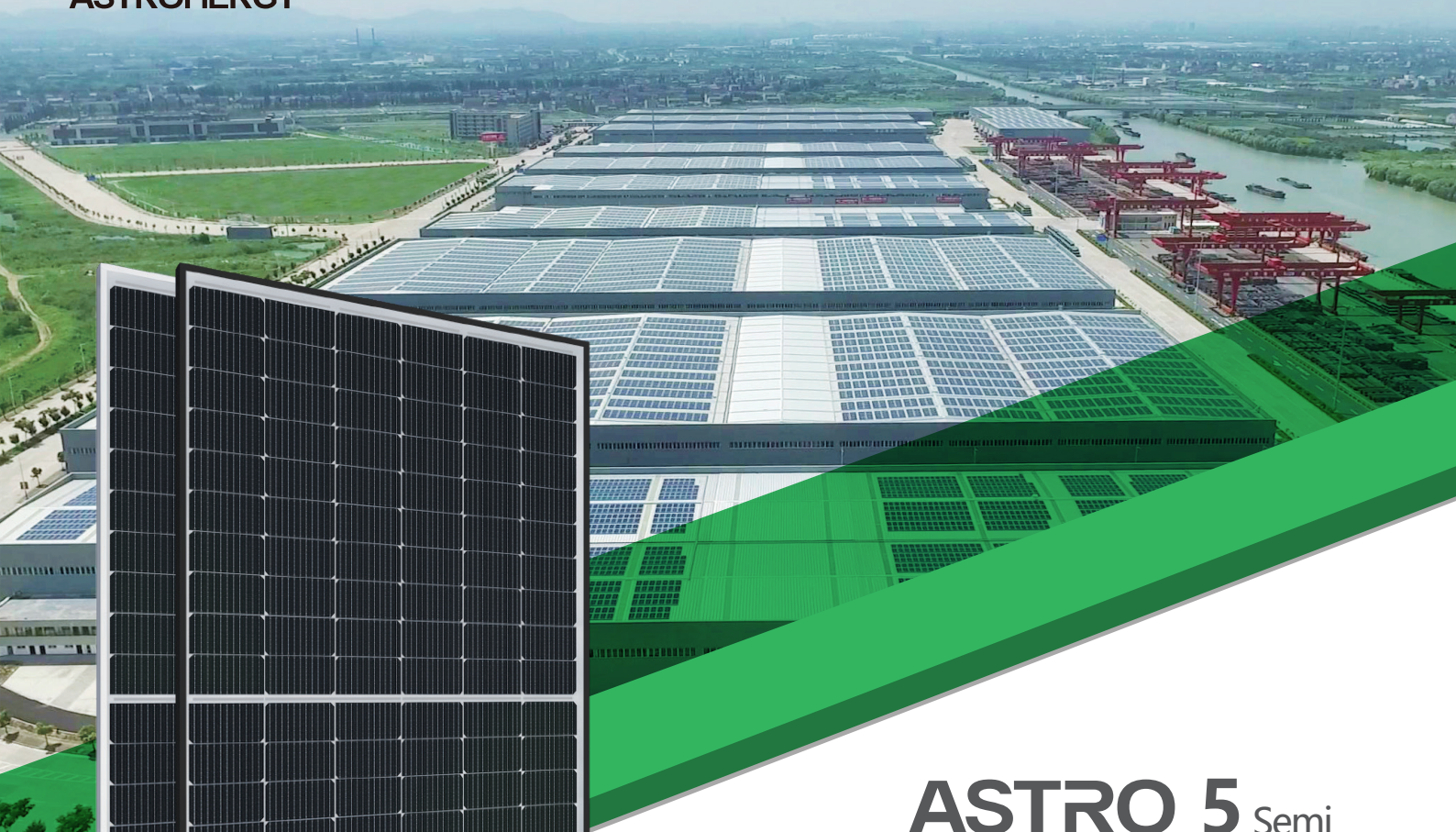




ASTRONERGY



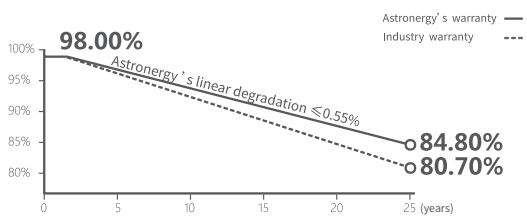
ASTRO 5 Semi CHSM60M-HC Monofacial Series(182)

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~+3%

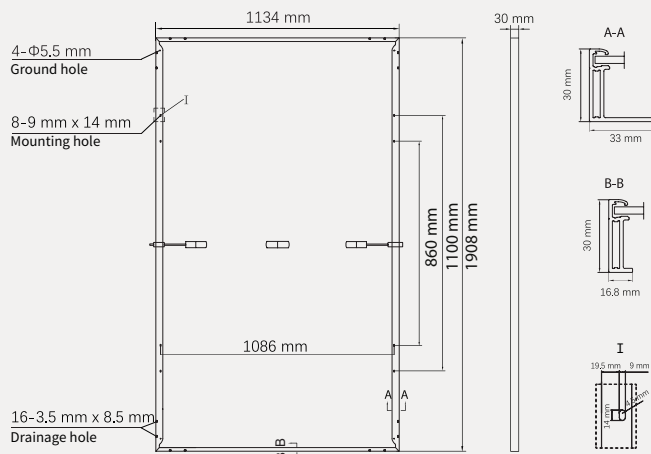
POWER SORTING

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 (Pmpp / Wp)	450	455	460
Rated voltage (Vmpp / V)	34.83	35.00	35.17
Rated current (Impp / A)	12.92	13.00	13.08
Open circuit voltage (Voc / V)	41.45	41.65	41.85
Short circuit current (Isc / 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 (Pmpp / Wp)	336.3	340.0	343.8
Rated voltage (Vmpp / V)	32.46	32.62	32.78
Rated current (Impp / A)	10.36	10.42	10.49
Open circuit voltage (Voc / V)	39.17	39.36	39.55
Short circuit current (Isc / A)	11.12	11.20	11.29

Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.34%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.04%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-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

