

# ASTRO 4 Semi

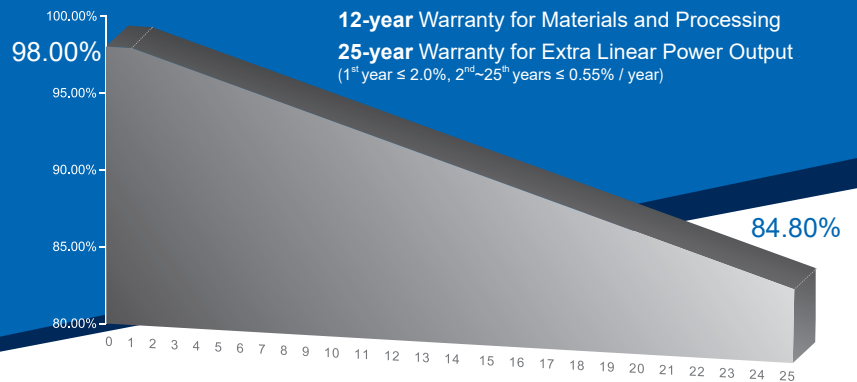
Create Sustainable and Efficient Green Energy



## 440W~455W

Monocrystalline PV Module

CHSM72M-HC Series (166)



### KEY FEATURES

- +5W OUTPUT POSITIVE TOLERANCE**  
Guaranteed 0~+5W positive tolerance to ensure power output.
- INNOVATIONAL HALF-CUT TECHNOLOGY**  
Better shading tolerance, higher reliability.
- INNOVATIONAL MULTI-BUSBAR TECHNOLOGY**  
Higher light absorption, lower risk of microcrack.
- SUPER PERC+ CELL TECHNOLOGY**  
Higher module power and module efficiency, lower power degradation.
- Anti PID RESISTANCE**  
Excellent PID resistance.

### COMPREHENSIVE CERTIFICATES



The first solar company which passed the TUV Nord IEC/TS 62941 certification audit.

For Global Market



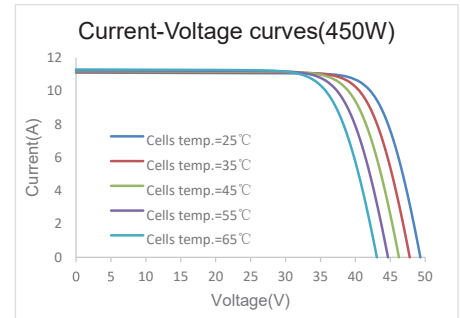
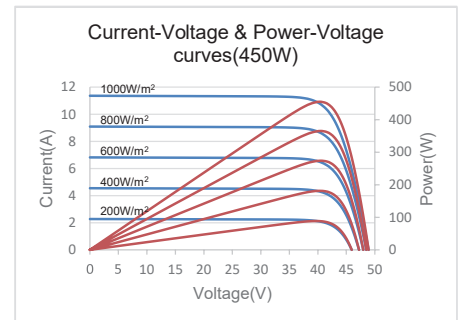
**ASTRONERGY**  
A CHNT COMPANY

## ELECTRICAL SPECIFICATIONS

STC rated output ( $P_{mpp}$ )	440 Wp	445 Wp	450 Wp	455 Wp
Rated voltage ( $V_{mpp}$ ) at STC	40.85 V	41.05 V	41.32 V	41.51 V
Rated current ( $I_{mpp}$ ) at STC	10.77 A	10.84 A	10.89 A	10.96 A
Open circuit voltage ( $V_{oc}$ ) at STC	48.50 V	48.80 V	49.05 V	49.35 V
Short circuit current ( $I_{sc}$ ) at STC	11.24 A	11.30 A	11.37 A	11.44 A
Module efficiency	20.2%	20.5%	20.7%	20.9%
Rated output ( $P_{mpp}$ ) at NMOT	327.1 Wp	330.8 Wp	334.5 Wp	338.2 Wp
Rated voltage ( $V_{mpp}$ ) at NMOT	37.93 V	38.12 V	38.37 V	38.55 V
Rated current ( $I_{mpp}$ ) at NMOT	8.62 A	8.68 A	8.72 A	8.78 A
Open circuit voltage ( $V_{oc}$ ) at NMOT	45.42 V	45.70 V	45.94 V	46.22 V
Short circuit current ( $I_{sc}$ ) at NMOT	9.06 A	9.10 A	9.16 A	9.22 A
Temperature coefficient ( $P_{mpp}$ )	- 0.35%/°C			
Temperature coefficient ( $I_{sc}$ )	+0.035%/°C			
Temperature coefficient ( $V_{oc}$ )	- 0.28%/°C			
Nominal module operating temperature (NMOT)	41±2°C			
Maximum system voltage (IEC/UL)	1500V <sub>DC</sub>			
Number of diodes	3			
Junction box IP rating	IP 68			
Maximum series fuse rating	20 A			

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5  
 NMOT: Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, AM=1.5, Wind Speed 1m/s

## CURVE



## MECHANICAL SPECIFICATIONS

Outer dimensions (L x W x H)	2094 x 1038 x 35 mm
Frame technology	Aluminum, silver anodized
Front glass thickness	3.2 mm
Cable length (IEC/UL)	Portrait: 300 mm Landscape: 1300 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
① Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Fire performance (IEC/UL)	Class C (IEC) or Type 4 (UL)
Connector type (IEC/UL)	HCB40 / MC4-EVO2

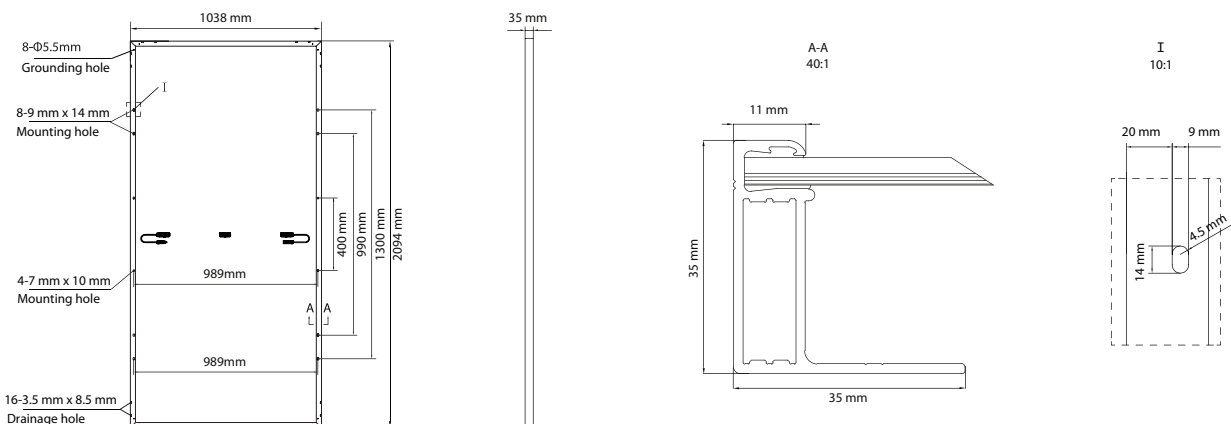
① Refer to Astronergy crystalline installation manual or contact technical department.  
 Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

## PACKING SPECIFICATIONS

① Module Weight	23.5 kg
② Packing unit	31 pcs / box
Weight of packing unit (for 40'HQ container)	772 kg
Number of modules per 40'HQ container	682 pcs

① Tolerance +/- 1.0kg  
 ② Subject to sales contract

## MODULE DIMENSION DETAILS



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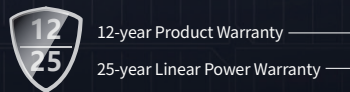
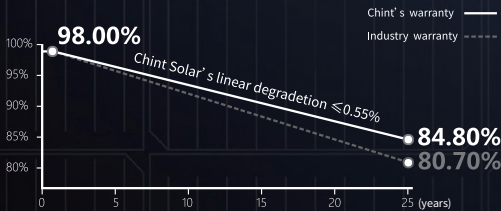
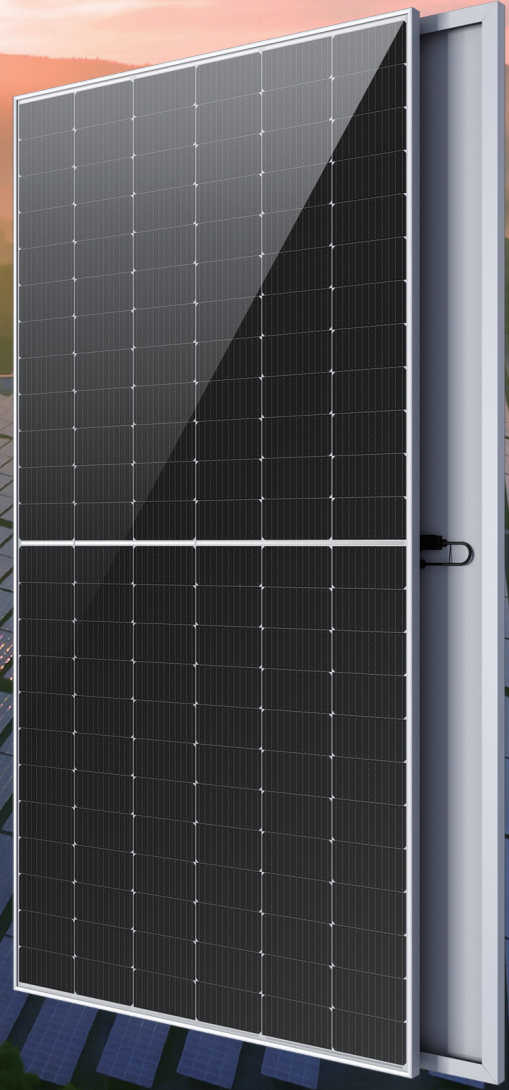
# ASTRO 5 Semi

Create Sustainable and Efficient Green Energy

CHSM72M-HC  
Monofacial Series (182)

## 535~550W

- PERC+ / Multi-busbar / Half-cut
- Non-destructive cutting
- PID resistance
- Lower 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



**535~550W**

POWER RANGE

**0~+5W**

POWER TOLERANCE

**21.3%**

MAX MODULE EFFICIENCY

**≤ 2.0%**

FIRST YEAR POWER DEGRADATION

**≤ 0.55%**

YEAR 2-25 POWER DEGRADATION

## Electrical Specifications

**STC:** Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25° C, AM=1.5

Rated output (Pmpp / Wp)	535	540	545	550
Rated voltage (Vmpp / V)	41.60	41.76	41.93	42.10
Rated current (Impp / A)	12.86	12.93	13.00	13.06
Open circuit voltage (Voc / V)	49.50	49.70	49.90	50.10
Short circuit current (Isc / A)	13.61	13.72	13.81	13.90
Module efficiency	20.7%	20.9%	21.1%	21.3%

**NMOT:** Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20° C, AM=1.5, Wind Speed 1m/s

Rated output (Pmpp / Wp)	399.8	403.5	407.3	411.0
Rated voltage (Vmpp / V)	38.77	38.92	39.08	39.24
Rated current (Impp / A)	10.31	10.37	10.42	10.48
Open circuit voltage (Voc / V)	46.78	46.97	47.16	47.34
Short circuit current (Isc / A)	11.04	11.13	11.20	11.27

## Temperature Ratings (STC)

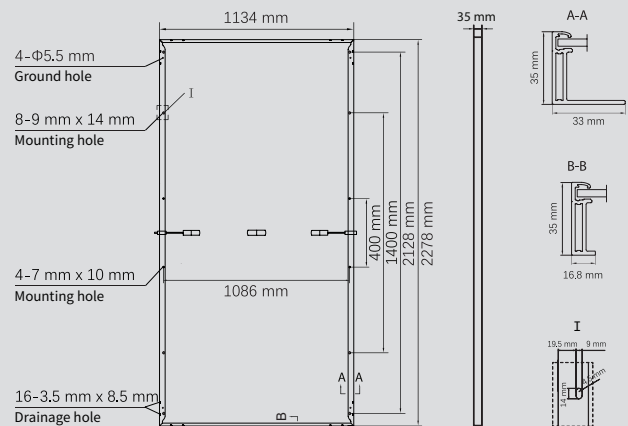
Temperature coefficient (Pmpp)	-0.35%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.045%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.27%/°C	Max. series fuse rating	25 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

## Operating Parameters

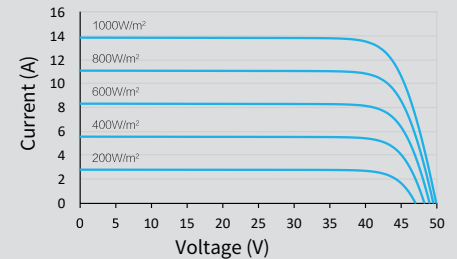
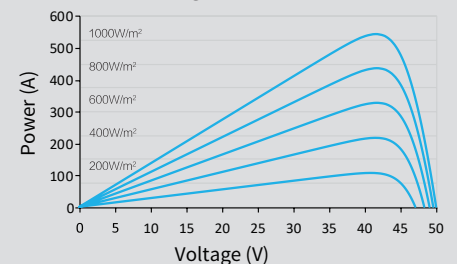
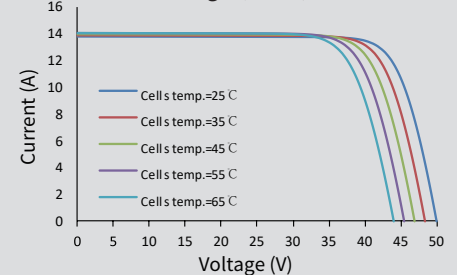
## Mechanical Specifications

Outer dimensions (L x W x H)	2278 x 1134 x 35 mm
Cell Type	P type Mono-crystalline
No. of cells	144 (6*24)
Frame technology	Aluminum, silver anodized
Front glass thickness	3.2 mm
Cable length (IEC/UL)	Portrait: 300 mm; Landscape: 1400 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
① Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	26.9 kg (Tolerance +/- 1.0kg)
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40' HQ container)	893 kg
Modules per 40' HQ container	620 pcs

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



## Curve

**Current-Voltage (545W)****Power-Voltage (545W)****Current-Voltage (545W)**

# ASTRO 6 Semi

Create Sustainable and Efficient Green Energy



**ASTRONERGY**  
A CHINT COMPANY

## 660W~675W

Monocrystalline PV Module  
CHSM66M-HC Series (210)



### KEY FEATURES

**+5W**

**OUTPUT POSITIVE TOLERANCE**  
Guaranteed 0~+5W positive tolerance to ensure power output.



**NON-DESTRUCTIVE CUTTING**  
Higher bending strength of cells and mechanical properties of modules.



**HIGH CUSTOMER VALUE**  
Lower BOS cost and LCOE.

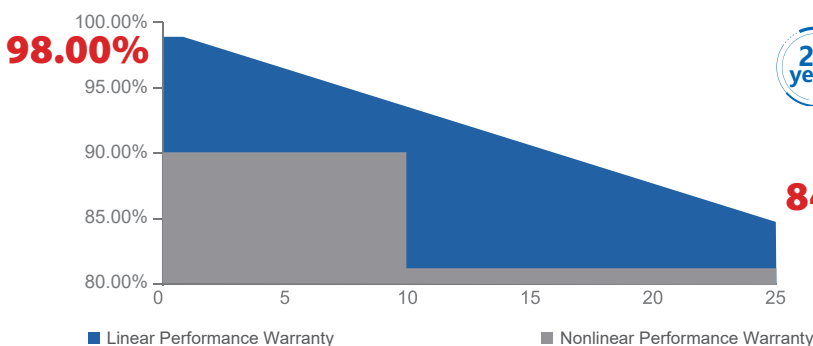


**INNOVATIONAL HALF-CUT&MULTI-BUSBAR TECHNOLOGY**  
Lower risk of microcrack, better shading tolerance, higher reliability.



**SUPER PERC+ CELL TECHNOLOGY**  
Higher module power and module efficiency, lower power degradation.

### WARRANTY



Warranty for Materials and Processing



Warranty for Extra Linear Power Output  
(1<sup>st</sup> year ≤ 2.0%, 2<sup>nd</sup>~25<sup>th</sup> years ≤ 0.55% / year)

**84.80%**

Preliminary  
Designed for the Australian Market



## ELECTRICAL SPECIFICATIONS

STC rated output ( $P_{mpp}$ )	660 Wp	665 Wp	670 Wp	675 Wp
Rated voltage ( $V_{mpp}$ ) at STC	37.85 V	38.05 V	38.23 V	38.42 V
Rated current ( $I_{mpp}$ ) at STC	17.45 A	17.50 A	17.54 A	17.58 A
Open circuit voltage ( $V_{oc}$ ) at STC	45.68 V	45.88 V	46.08 V	46.28 V
Short circuit current ( $I_{sc}$ ) at STC	18.53 A	18.58 A	18.63 A	18.68 A
Module efficiency	21.2%	21.4%	21.6%	21.7%
Rated output ( $P_{mpp}$ ) at NMOT	493.2 Wp	497.0 Wp	500.7 Wp	504.4 Wp
Rated voltage ( $V_{mpp}$ ) at NMOT	35.28 V	35.46 V	35.63 V	35.81 V
Rated current ( $I_{mpp}$ ) at NMOT	13.99 A	14.03 A	14.06 A	14.10 A
Open circuit voltage ( $V_{oc}$ ) at NMOT	43.17 V	43.36 V	43.55 V	43.73 V
Short circuit current ( $I_{sc}$ ) at NMOT	15.03 A	15.07 A	15.11 A	15.15 A
Temperature coefficient ( $P_{mpp}$ )		- 0.34%/°C		
Temperature coefficient ( $I_{sc}$ )		+ 0.04%/°C		
Temperature coefficient ( $V_{oc}$ )		- 0.25%/°C		
Nominal module operating temperature (NMOT)		43±2°C		
Maximum system voltage (IEC/UL)		1500V <sub>DC</sub>		
Number of diodes		3		
Junction box IP rating		IP 68		
Maximum series fuse rating		30 A		

Power Sorting: 0~+5W

\* Measurement tolerance +/- 3%

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, AM=1.5

NMOT: Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, AM=1.5, Wind Speed 1m/s

## MECHANICAL SPECIFICATIONS

Outer dimensions (L x W x H)	2384 x 1303 x 35 mm
Frame technology	Aluminum, silver anodized
Front glass thickness	3.2 mm
Cable length (IEC/UL)	Portrait: 350 mm Landscape: 1400 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
① Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Fire performance (IEC/UL)	Class C (IEC) or Type 4 (UL)
Connector type (IEC/UL)	HCB40 or PV-KST4-EVO2/XY-UR, PVKBT4-EVO2/XY-UR(optional)

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

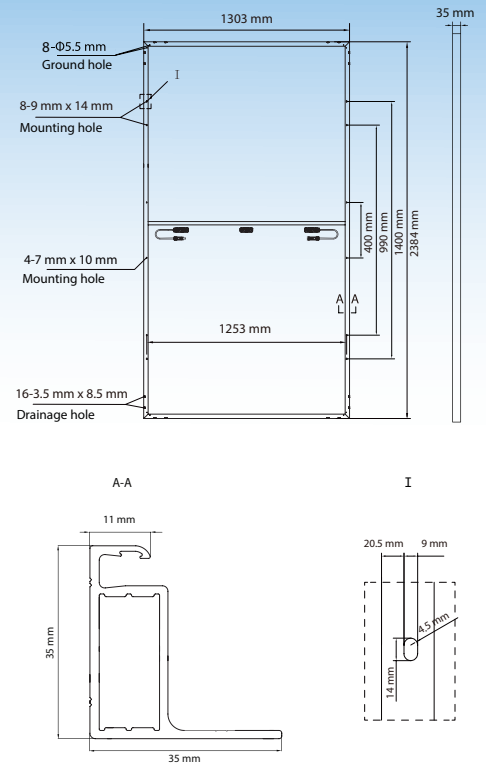
## PACKING SPECIFICATIONS

① Module Weight	34.8 kg
② Packing unit	31 pcs / box
Weight of packing unit (for 40'HQ container)	1119 kg
Number of modules per 40'HQ container	527 pcs

① Tolerance +/- 1.0kg

② Subject to sales contract

## MODULE DIMENSION DETAILS



## CURVE

