



ASTRONERGY

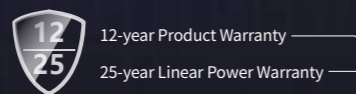
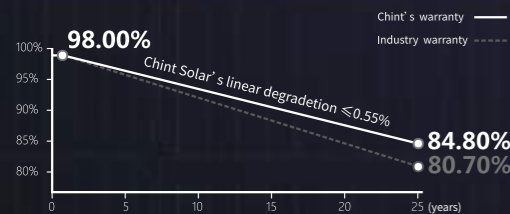
# ASTRO 6 Semi

Create Sustainable and Efficient Green Energy

## CHSM66M-HC Monofacial Series (210)

# 650~670W

- 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



**650~670W**  
POWER RANGE

**0~+5W**  
POWER TOLERANCE

**21.6%**  
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)	650	655	660	665	670
Rated voltage (Vmpp / V)	37.45	37.65	37.85	38.05	38.23
Rated current (Impp / A)	17.36	17.41	17.45	17.50	17.54
Open circuit voltage (Voc / V)	45.28	45.48	45.68	45.88	46.08
Short circuit current (Isc / A)	18.43	18.48	18.53	18.58	18.63
Module efficiency	20.9%	21.1%	21.2%	21.4%	21.6%

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

Rated output (Pmpp / Wp)	489.5	493.2	497.0	500.7	504.4
Rated voltage (Vmpp / V)	35.09	35.28	35.46	35.63	35.81
Rated current (Impp / A)	13.96	13.99	14.03	14.06	14.10
Open circuit voltage (Voc / V)	42.55	42.75	42.95	43.15	43.35
Short circuit current (Isc / A)	14.82	14.87	14.92	14.97	15.02

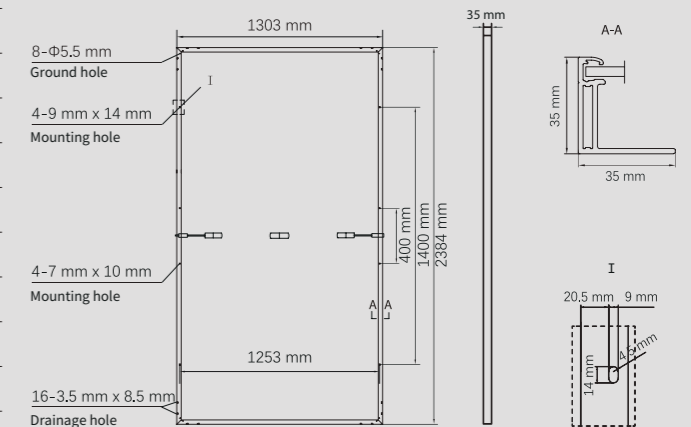
### Temperature Ratings (STC)

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	30 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

### Operating Parameters

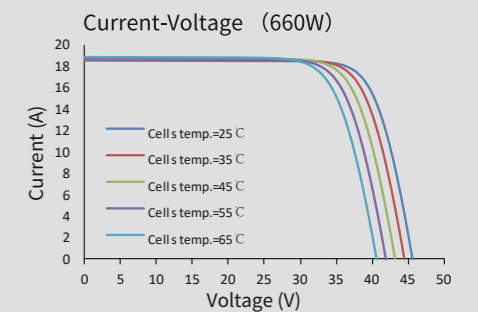
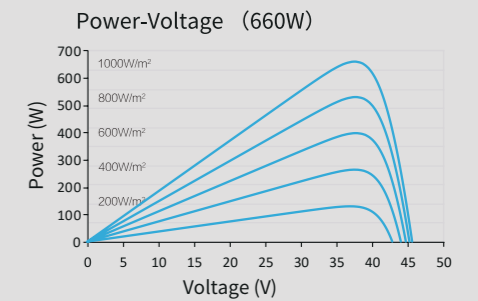
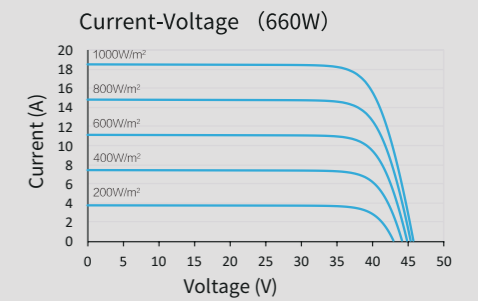
### Mechanical Specifications

Outer dimensions (L x W x H)	2384 x 1303 x 35 mm
Cell Type	P type Mono-crystalline
No. of cells	132 (6*22)
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
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	34.8 kg
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40' HQ container)	1125 kg
Modules per 40' HQ container	527 pcs



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

### Curve





ASTRONERGY

# ASTRO 6 Twins

Create Sustainable and Efficient Green Energy

## CHSM66M(DG)/F-BH Bifacial Series (210)

# 645~665W

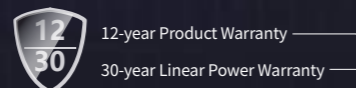
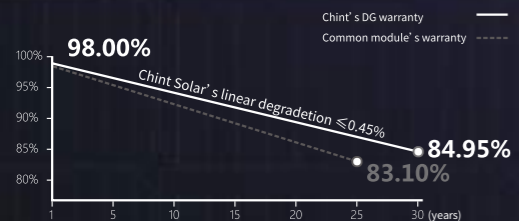
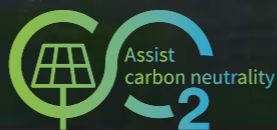
PERC+ / Multi-busbar / Half-cut

Non-destructive cutting

PID resistance

Bifacial gain

Lower BOS cost & LCOE



12-year Product Warranty

30-year Linear Power Warranty



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



### 645~665W

POWER RANGE

### 0~+5W

POWER TOLERANCE

### 21.4%

MAX MODULE EFFICIENCY

### ≤ 2.0%

FIRST YEAR POWER DEGRADATION

### ≤ 0.45%

YEAR 2-30 POWER DEGRADATION

## Electrical Specifications

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

Rated output (Pmpp / Wp)	645	650	655	660	665
Rated voltage (Vmpp / V)	37.48	37.68	37.88	38.08	38.28
Rated current (Impp / A)	17.21	17.26	17.30	17.34	17.38
Open circuit voltage (Voc / V)	45.29	45.49	45.69	45.89	46.09
Short circuit current (Isc / A)	18.27	18.32	18.37	18.42	18.47
Module efficiency	20.8%	20.9%	21.1%	21.2%	21.4%

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

Rated output (Pmpp / Wp)	485.8	489.5	493.3	497.1	500.8
Rated voltage (Vmpp / V)	35.03	35.19	35.34	35.47	35.60
Rated current (Impp / A)	13.87	13.92	13.97	14.02	14.07
Open circuit voltage (Voc / V)	42.43	42.63	42.83	43.03	43.23
Short circuit current (Isc / A)	14.72	14.77	14.82	14.87	14.92

## Electrical Specifications (Integrated power)

Pmpp gain	Pmpp / Wp	Vmpp / V	Impp / A	Voc / V	Isc / A
5%	687	37.88	18.17	45.69	19.29
10%	720	37.88	19.03	45.69	20.21
15%	753	37.89	19.90	45.70	21.13
20%	786	37.89	20.76	45.70	22.04
25%	818	37.89	21.63	45.70	22.96

Electrical characteristics with different rear power gain (reference to 655W)

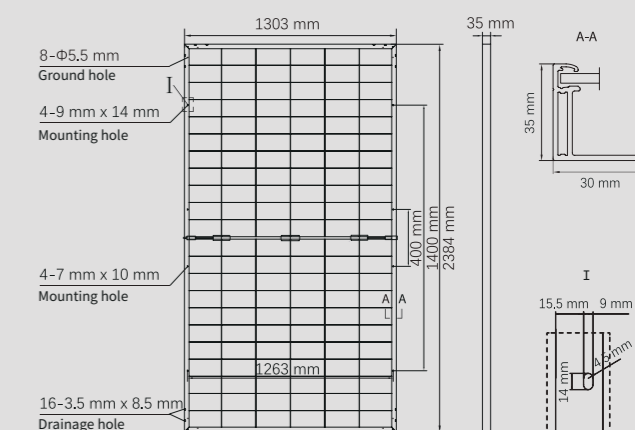
## Temperature Ratings (STC)

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	35 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

## Operating Parameters

## Mechanical Specifications

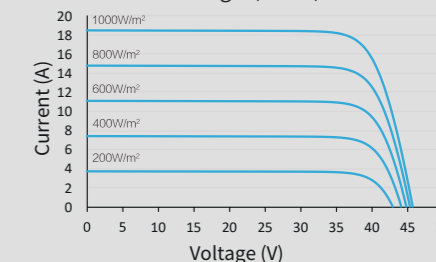
Outer dimensions (L x W x H)	2384 x 1303 x 35 mm
Cell Type	P type Mono-crystalline
No. of cells	132 (6*22)
Frame technology	Aluminum, silver anodized
Front / Back glass	2.0+2.0 mm
Cable length (IEC/UL)	Portrait: 350 mm; Landscape: 1400 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	38.2 kg
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	1230 kg
Modules per 40' HQ container	527 pcs



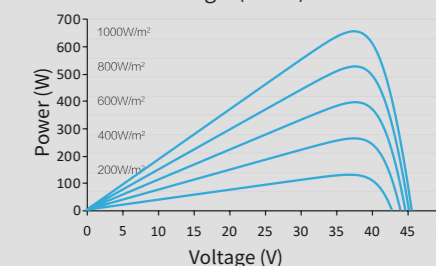
<sup>①</sup> Refer to Astronergy crystalline installation manual or contact technical department.  
Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

## Curve

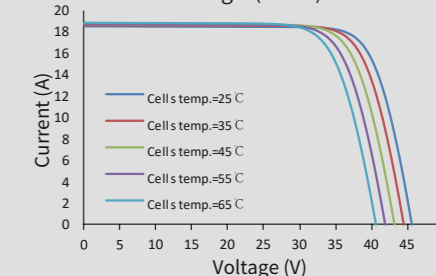
Current-Voltage (655W)



Power-Voltage (655W)



Current-Voltage (655W)





ASTRONERGY

# ASTRO 6 Semi

Create Sustainable and Efficient Green Energy

## CHSM60M-HC Monofacial Series (210)

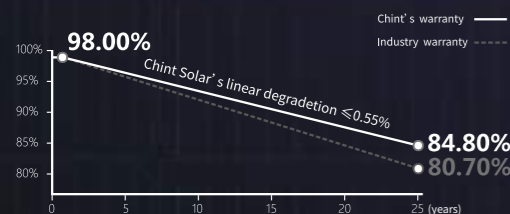
# 590~605W

PERC+ / Multi-busbar / Half-cut

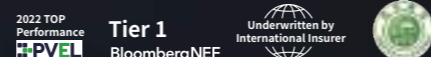
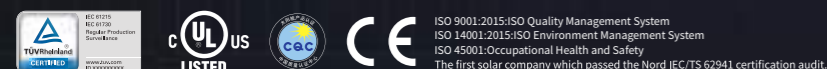
Non-destructive cutting

PID resistance

Lower BOS cost & LCOE



**12** 12-year Product Warranty  
**25** 25-year Linear Power Warranty



**590~605W**

POWER RANGE

**0~+5W**

POWER TOLERANCE

**21.4%**

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

	590	595	600	605
Rated output (Pmpp / Wp)	590	595	600	605
Rated voltage (Vmpp / V)	34.00	34.20	34.40	34.60
Rated current (Impp / A)	17.36	17.40	17.45	17.50
Open circuit voltage (Voc / V)	41.10	41.30	41.50	41.70
Short circuit current (Isc / A)	18.42	18.47	18.52	18.57
Module efficiency	20.8%	21.0%	21.2%	21.4%

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

	440.9	444.6	448.4	452.1
Rated output (Pmpp / Wp)	440.9	444.6	448.4	452.1
Rated voltage (Vmpp / V)	31.68	31.87	32.06	32.25
Rated current (Impp / A)	13.92	13.95	13.99	14.03
Open circuit voltage (Voc / V)	38.40	38.60	38.80	39.00
Short circuit current (Isc / A)	14.77	14.82	14.87	14.92

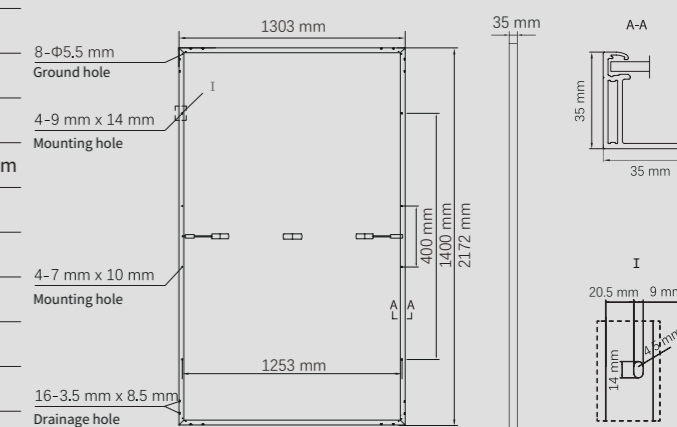
### Temperature Ratings (STC)

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	30 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

### Operating Parameters

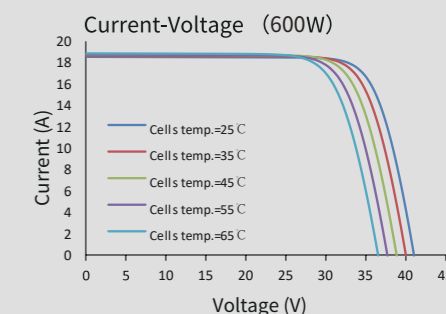
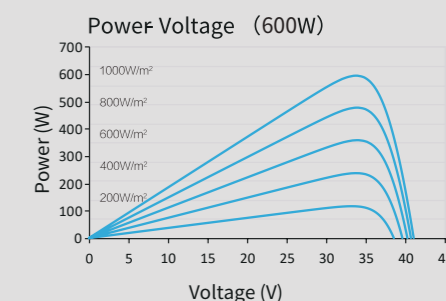
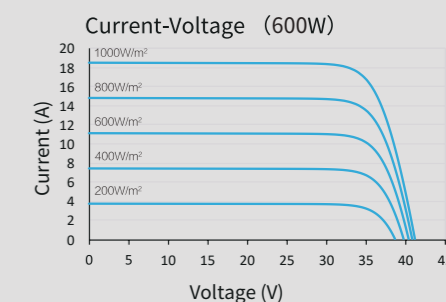
### Mechanical Specifications

Outer dimensions (L x W x H)	2172 x 1303 x 35 mm
Cell Type	P type Mono-crystalline
No. of cells	120 (6*20)
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
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	31 kg
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40' HQ container)	1006 kg
Modules per 40' HQ container	527 pcs



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

### Curve





ASTRONERGY

# ASTRO 6 Twins

Create Sustainable and Efficient Green Energy

## CHSM60M(DG)/F-BH Bifacial Series (210)

# 585~600W

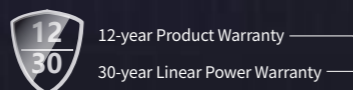
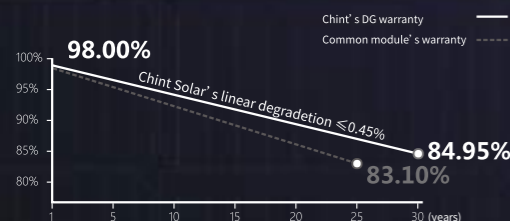
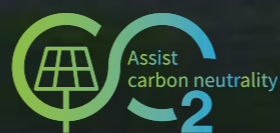
PERC+ / Multi-busbar / Half-cut

Non-destructive cutting

PID resistance

Bifacial gain

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



### 585~600W

POWER RANGE

### 0~+5W

POWER TOLERANCE

### 21.2%

MAX MODULE EFFICIENCY

### ≤ 2.0%

FIRST YEAR POWER DEGRADATION

### ≤ 0.45%

YEAR 2-30 POWER DEGRADATION

## Electrical Specifications

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

Rated output (Pmpp / Wp)	585	590	595	600
Rated voltage (Vmpp / V)	34.00	34.20	34.40	34.61
Rated current (Impp / A)	17.21	17.26	17.30	17.34
Open circuit voltage (Voc / V)	41.10	41.30	41.50	41.70
Short circuit current (Isc / A)	18.26	18.31	18.36	18.41
Module efficiency	20.7%	20.8%	21.0%	21.2%

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

Rated output (Pmpp / Wp)	437.2	440.9	444.6	448.4
Rated voltage (Vmpp / V)	31.68	31.81	31.97	32.13
Rated current (Impp / A)	13.81	13.86	13.91	13.96
Open circuit voltage (Voc / V)	38.40	38.60	38.80	39.00
Short circuit current (Isc / A)	14.65	14.70	14.75	14.80

## Electrical Specifications (Integrated power)

Pmpp gain	Pmpp / Wp	Vmpp / V	Impp / A	Voc / V	Isc / A
5%	619	34.20	18.12	41.30	19.23
10%	649	34.20	18.99	41.30	20.14
15%	678	34.21	19.85	41.31	21.06
20%	708	34.21	20.71	41.31	21.97
25%	737	34.22	21.58	41.32	22.89

Electrical characteristics with different rear power gain (reference to 590W)

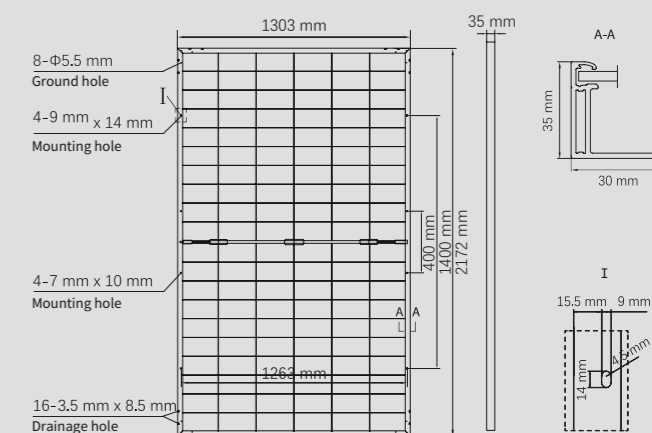
## Temperature Ratings (STC)

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	35 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

## Operating Parameters

## Mechanical Specifications

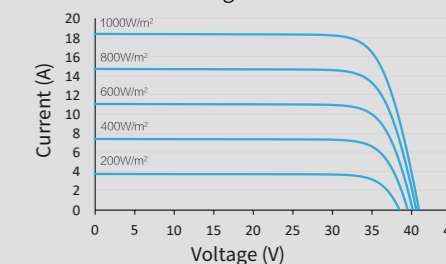
Outer dimensions (L x W x H)	2172 x 1303 x 35 mm
Cell Type	P type Mono-crystalline
No. of cells	120 (6*20)
Frame technology	Aluminum, silver anodized
Front / Back glass	2.0+2.0 mm
Cable length (IEC/UL)	Portrait: 350 mm; Landscape: 1400 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	34.9 kg
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	1127 kg
Modules per 40' HQ container	527 pcs



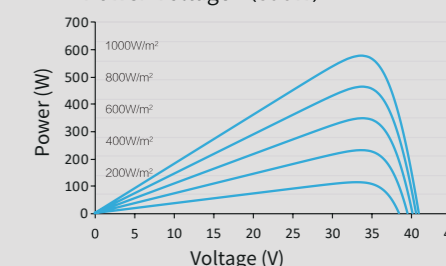
<sup>①</sup> Refer to Astronergy crystalline installation manual or contact technical department.  
Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

## Curve

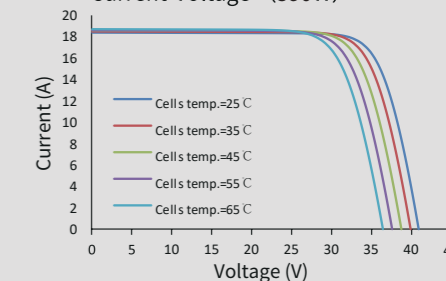
Current-Voltage (590W)



Power-Voltage (590W)



Current-Voltage (590W)





ASTRONERGY

# ASTRO 5 Semi

Create Sustainable and Efficient Green Energy

## CHSM72M-HC Monofacial Series (182)

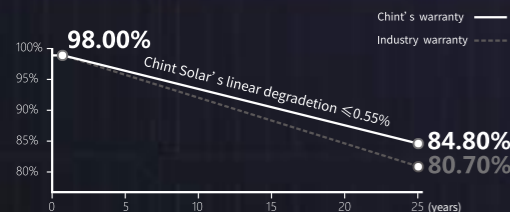
# 540~555W

PERC+ / Multi-busbar / Half-cut

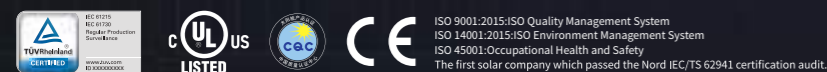
Non-destructive cutting

PID resistance

Lower BOS cost & LCOE



**12** 12-year Product Warranty  
**25** 25-year Linear Power Warranty



**540~555W**  
POWER RANGE

**0~+5W**  
POWER TOLERANCE

**21.5%**  
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

	540	545	550	555
Rated output (Pmpp / Wp)	540	545	550	555
Rated voltage (Vmpp / V)	41.76	41.93	42.10	42.27
Rated current (Impp / A)	12.93	13.00	13.06	13.13
Open circuit voltage (Voc / V)	49.70	49.90	50.10	50.30
Short circuit current (Isc / A)	13.72	13.81	13.90	13.98
Module efficiency	20.9%	21.1%	21.3%	21.5%

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

	403.5	407.3	411.0	414.8
Rated output (Pmpp / Wp)	403.5	407.3	411.0	414.8
Rated voltage (Vmpp / V)	38.92	39.08	39.24	39.39
Rated current (Impp / A)	10.37	10.42	10.48	10.53
Open circuit voltage (Voc / V)	46.97	47.16	47.34	47.53
Short circuit current (Isc / A)	11.13	11.20	11.27	11.35

### 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 <sub>DC</sub>

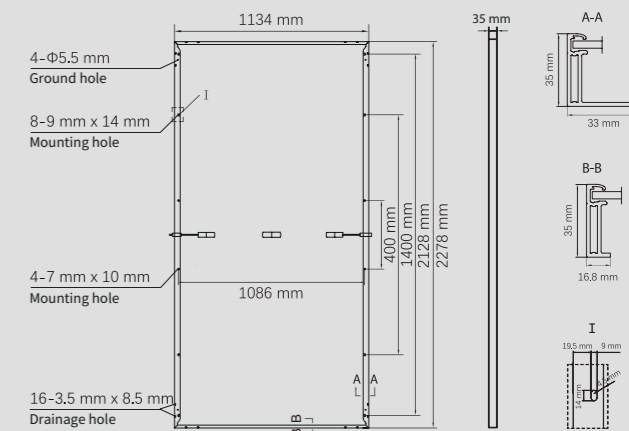
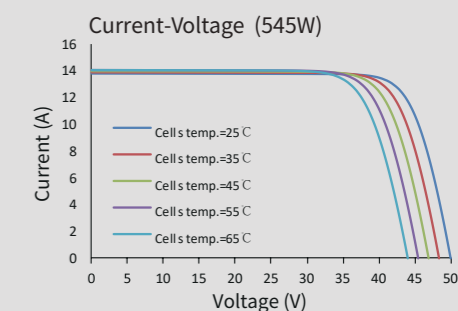
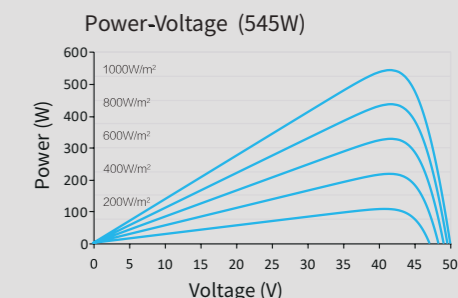
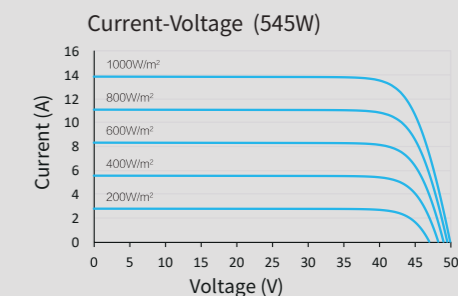
### Operating Parameters

### 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
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	26.9 kg
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

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

### Curve





ASTRONERGY

# ASTRO 5 Twins

Create Sustainable and Efficient Green Energy

## CHSM72M(DG)/F-BH Bifacial Series (182)

# 535~550W

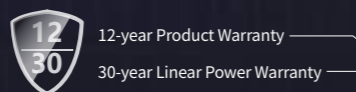
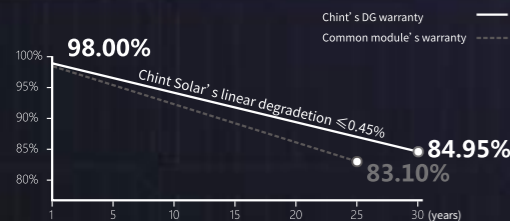
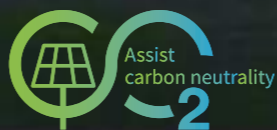
PERC+ / Multi-busbar / Half-cut

Non-destructive cutting

PID resistance

Bifacial gain

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

### ≤ 0.45%

YEAR 2-30 POWER DEGRADATION

## Electrical Specifications

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

	535	540	545	550
Rated output (Pmpp / Wp)	535	540	545	550
Rated voltage (Vmpp / V)	41.76	41.93	42.10	42.27
Rated current (Impp / A)	12.81	12.88	12.95	13.01
Open circuit voltage (Voc / V)	49.70	49.90	50.10	50.30
Short circuit current (Isc / A)	13.57	13.66	13.75	13.84
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

	399.8	403.5	407.3	411.0
Rated output (Pmpp / Wp)	399.8	403.5	407.3	411.0
Rated voltage (Vmpp / V)	38.92	39.08	39.24	39.39
Rated current (Impp / A)	10.27	10.33	10.38	10.43
Open circuit voltage (Voc / V)	46.97	47.16	47.34	47.53
Short circuit current (Isc / A)	11.01	11.08	11.16	11.23

## Electrical Specifications (Integrated power)

Pmpp gain	Pmpp / Wp	Vmpp / V	Impp / A	Voc / V	Isc / A
5%	567	41.93	13.52	49.90	14.35
10%	594	41.93	14.17	49.90	15.03
15%	621	41.94	14.81	49.91	15.71
20%	648	41.94	15.45	49.91	16.39
25%	675	41.95	16.09	49.92	17.07

Electrical characteristics with different rear power gain (reference to 540W)

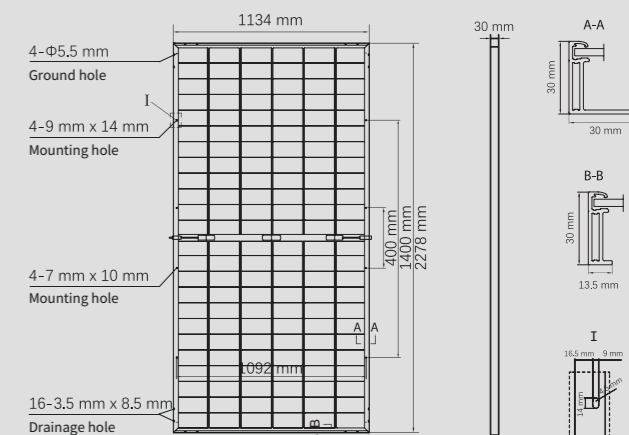
## Temperature Ratings (STC)

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	30 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

## Operating Parameters

## Mechanical Specifications

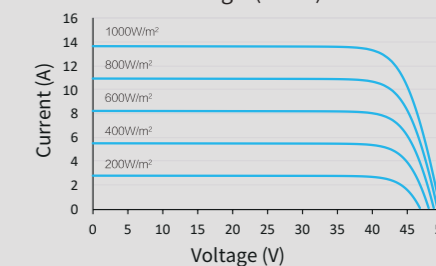
Outer dimensions (L x W x H)	2278 x 1134 x 30 mm
Cell Type	P type Mono-crystalline
No. of cells	144 (6*24)
Frame technology	Aluminum, silver anodized
Front / Back glass	2.0+2.0 mm
Cable length (IEC/UL)	Portrait: 300 mm; Landscape: 1400 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
① Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	32.1 kg
Packing unit	36 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	1215 kg
Modules per 40' HQ container	720 pcs



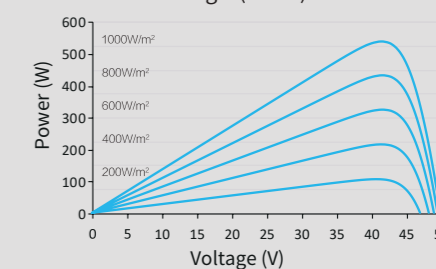
① Refer to Astronergy crystalline installation manual or contact technical department. Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

## Curve

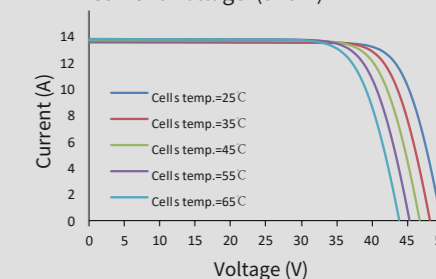
Current-Voltage (540W)



Power-Voltage (540W)



Current-Voltage (540W)





ASTRONERGY

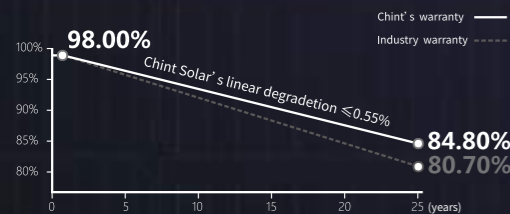
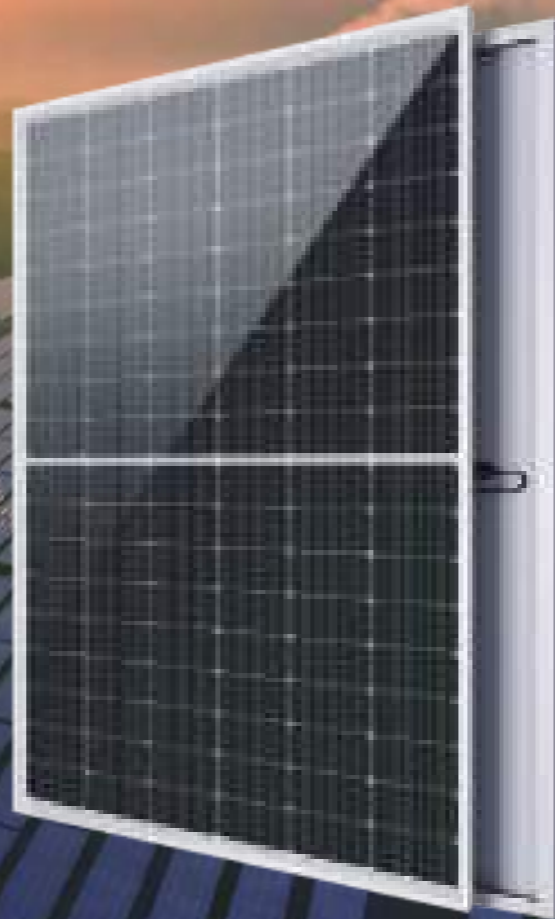
# ASTRO 5s

Create Sustainable and Efficient Green Energy

## CHSM54M-HC Monofacial Series (182)

# 400~415W

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



12-year Product Warranty (Standard)  
 15-year Product Warranty (Optional, special for rooftop market)  
 25-year Linear Power Warranty



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



**400~415W**  
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

	400	405	410	415
Rated output (Pmpp / Wp)	400	405	410	415
Rated voltage (Vmpp / V)	31.09	31.26	31.43	31.60
Rated current (Impp / A)	12.86	12.96	13.05	13.13
Open circuit voltage (Voc / V)	37.00	37.20	37.40	37.60
Short circuit current (Isc / A)	13.65	13.76	13.88	13.99
Module efficiency	20.5%	20.7%	21.0%	21.3%

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

	298.9	302.7	306.4	310.1
Rated output (Pmpp / Wp)	298.9	302.7	306.4	310.1
Rated voltage (Vmpp / V)	28.98	29.13	29.29	29.45
Rated current (Impp / A)	10.32	10.39	10.46	10.53
Open circuit voltage (Voc / V)	34.97	35.15	35.34	35.53
Short circuit current (Isc / A)	11.07	11.17	11.26	11.35

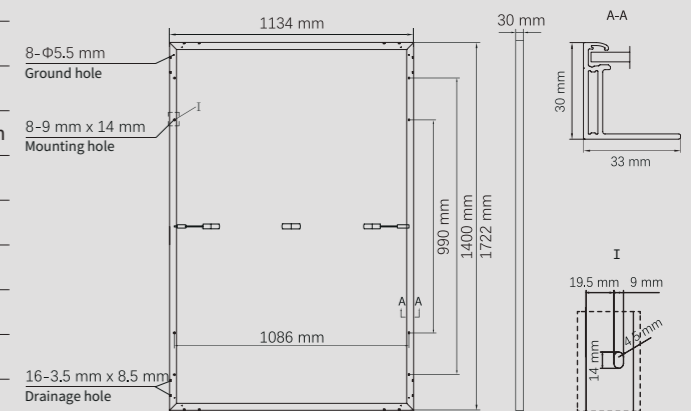
### Temperature Ratings (STC)

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 <sub>DC</sub>

### Operating Parameters

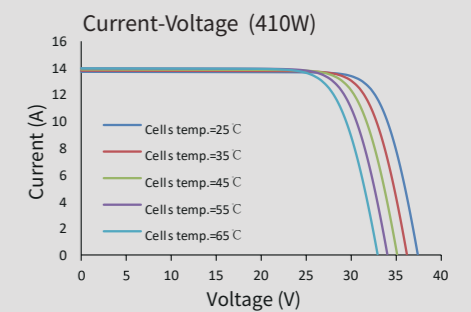
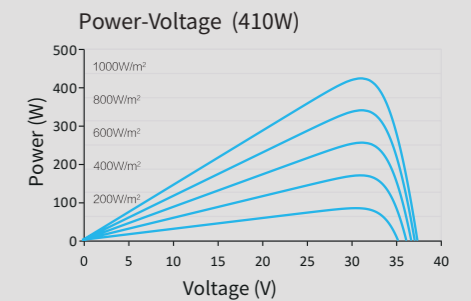
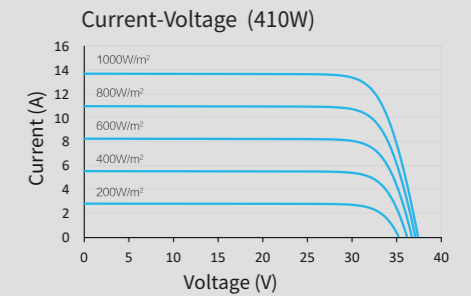
### Mechanical Specifications

Outer dimensions (L x W x H)	1722 x 1134 x 30 mm
Cell Type	P type Mono-crystalline
No. of cells	108 (6*18)
Frame technology	Aluminum, silver anodized
Front glass thickness	3.2 mm
Cable length (IEC/UL)	Portrait: 300 mm; Landscape: 1200 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	21.6 kg
Packing unit	36 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	821 kg
Modules per 40' HQ container	936 pcs



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

### Curve





ASTRONERGY

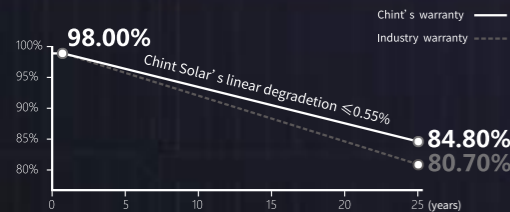
# ASTRO 5s

Create Sustainable and Efficient Green Energy

## CHSM54M(BL)-HC Monofacial Series (182)

# 390~405W

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



- 12-year Product Warranty (Standard)
- 15-year Product Warranty (Optional, special for rooftop market)
- 25-year Linear Power Warranty



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



**390~405W**  
POWER RANGE

**0~+5W**  
POWER TOLERANCE

**20.7%**  
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)	390	395	400	405
Rated voltage (Vmpp / V)	30.76	30.92	31.09	31.26
Rated current (Impp / A)	12.68	12.77	12.86	12.96
Open circuit voltage (Voc / V)	36.60	36.80	37.00	37.20
Short circuit current (Isc / A)	13.40	13.52	13.65	13.76
Module efficiency	20.0%	20.2%	20.5%	20.7%

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

Rated output (Pmpp / Wp)	291.5	295.2	298.9	302.7
Rated voltage (Vmpp / V)	28.66	28.82	28.98	29.13
Rated current (Impp / A)	10.17	10.24	10.32	10.39
Open circuit voltage (Voc / V)	34.59	34.78	34.97	35.15
Short circuit current (Isc / A)	10.87	10.97	11.07	11.17

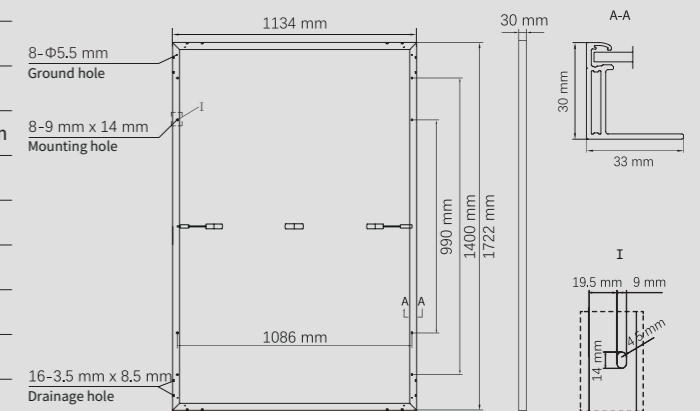
### Temperature Ratings (STC)

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)	1000V <sub>DC</sub>

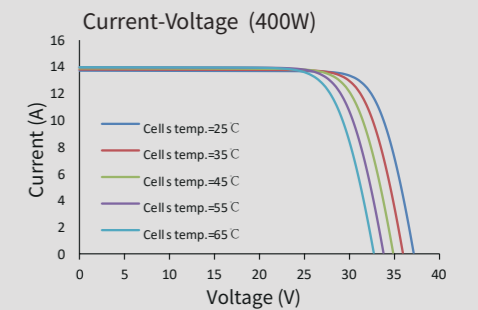
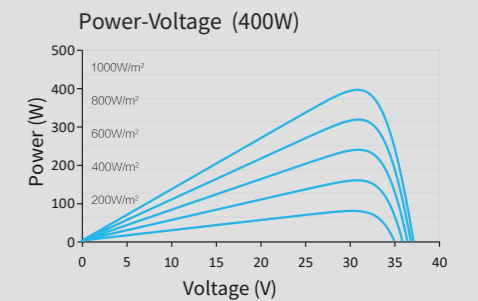
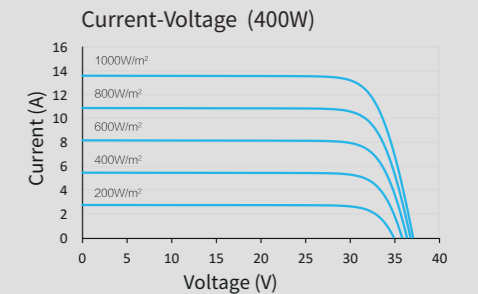
### Operating Parameters

### Mechanical Specifications

Outer dimensions (L x W x H)	1722 x 1134 x 30 mm
Cell Type	P type Mono-crystalline
No. of cells	108 (6*18)
Frame technology	Aluminum, black anodized
Front glass thickness	3.2 mm
Cable length (IEC/UL)	Portrait: 300 mm; Landscape: 1200 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4 (optional)
Module weight	21.6 kg
Packing unit	36 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	821 kg
Modules per 40' HQ container	936 pcs



### Curve



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



ASTRONERGY

preliminary

# ASTRO N6

Create Sustainable and Efficient Green Energy

## CHSM66N-HC Monofacial Series (210)

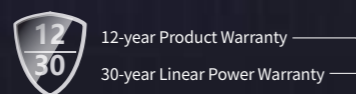
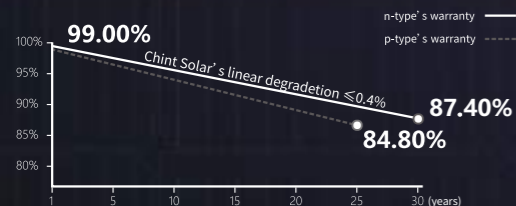
# 675~695W

TOPCon / Multi-busbar / Half-cut

Non-destructive cutting

PID resistance

Lower BOS cost & LCOE



12-year Product Warranty  
30-year Linear Power Warranty



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



**675~695W**  
POWER RANGE

**0~+5W**  
POWER TOLERANCE

**22.4%**  
MAX MODULE EFFICIENCY

**≤ 1.0%**  
FIRST YEAR POWER DEGRADATION

**≤ 0.4%**  
YEAR 2-30 POWER DEGRADATION

### Electrical Specifications

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

Rated output (Pmpp / Wp)	675	680	685	690	695
Rated voltage (Vmpp / V)	39.14	39.31	39.48	39.65	39.82
Rated current (Impp / A)	17.24	17.30	17.35	17.40	17.46
Open circuit voltage (Voc / V)	47.17	47.37	47.57	47.78	47.98
Short circuit current (Isc / A)	17.96	18.03	18.11	18.19	18.27
Module efficiency	21.7%	21.9%	22.1%	22.2%	22.4%

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

Rated output (Pmpp / Wp)	507.6	511.4	515.1	518.9	522.6
Rated voltage (Vmpp / V)	36.84	37.00	37.16	37.32	37.48
Rated current (Impp / A)	13.78	13.82	13.86	13.90	13.95
Open circuit voltage (Voc / V)	44.80	44.99	45.19	45.38	45.57
Short circuit current (Isc / A)	14.50	14.56	14.62	14.68	14.75

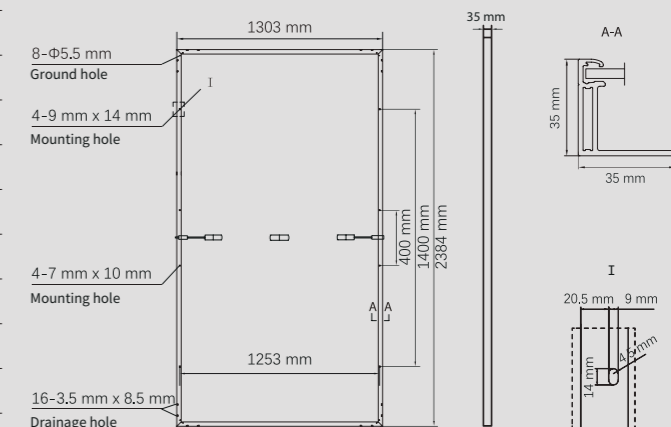
### Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.30%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.24%/°C	Max. series fuse rating	30 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

### Operating Parameters

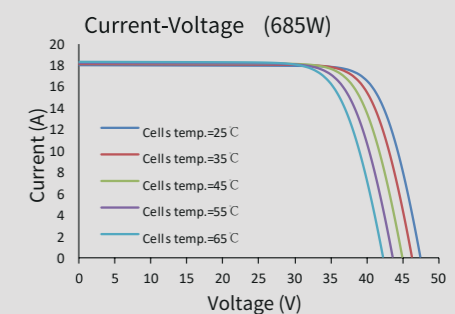
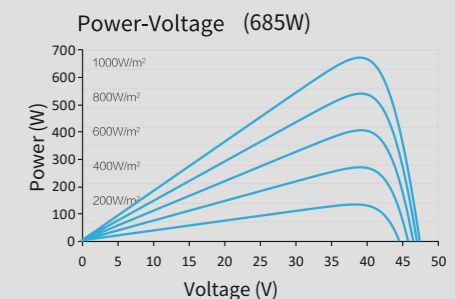
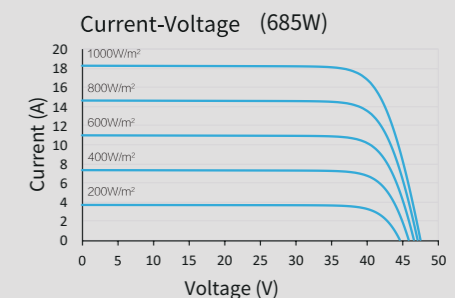
### Mechanical Specifications

Outer dimensions (L x W x H)	2384 x 1303 x 35 mm
Cell Type	n-type Mono-crystalline
No. of cells	132 (6*22)
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
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	34.8 kg
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	1128 kg
Modules per 40' HQ container	527 pcs



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

### Curve





ASTRONERGY

# ASTRO N6

Create Sustainable and Efficient Green Energy

## CHSM66N(DG)/F-BH Bifacial Series (210)

# 670~690W

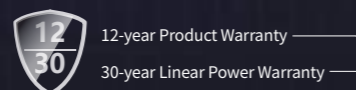
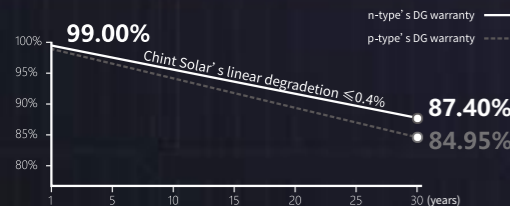
TOPCon / Multi-busbar / Half-cut

Non-destructive cutting

PID resistance

Bifacial gain

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.

2022 TOP Performance  
Tier 1  
Underwritten by International Insurer  
BloombergNEF

### 670~690W

POWER RANGE

### 0~+5W

POWER TOLERANCE

### 22.2%

MAX MODULE EFFICIENCY

### $\leq 1.0\%$

FIRST YEAR POWER DEGRADATION

### $\leq 0.4\%$

YEAR 2-30 POWER DEGRADATION

## Electrical Specifications

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

Rated output (Pmpp / Wp)	670	675	680	685	690
Rated voltage (Vmpp / V)	39.14	39.31	39.48	39.65	39.81
Rated current (Impp / A)	17.12	17.17	17.22	17.28	17.33
Open circuit voltage (Voc / V)	47.17	47.37	47.57	47.77	47.98
Short circuit current (Isc / A)	17.78	17.86	17.94	18.01	18.09
Module efficiency	21.6%	21.7%	21.9%	22.1%	22.2%

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

Rated output (Pmpp / Wp)	503.8	507.6	511.4	515.1	518.9
Rated voltage (Vmpp / V)	36.84	37.00	37.16	37.32	37.48
Rated current (Impp / A)	13.68	13.72	13.76	13.80	13.85
Open circuit voltage (Voc / V)	44.80	44.99	45.19	45.38	45.57
Short circuit current (Isc / A)	14.35	14.42	14.48	14.54	14.60

## Electrical Specifications (Integrated power)

Pmpp gain	Pmpp / Wp	Vmpp / V	Impp / A	Voc / V	Isc / A
5%	714	39.48	18.09	47.57	18.83
10%	748	39.48	18.95	47.57	19.73
15%	782	39.49	19.80	47.58	20.62
20%	816	39.49	20.67	47.58	21.52
25%	850	39.49	21.53	47.58	22.41

Electrical characteristics with different rear power gain (reference to 680W)

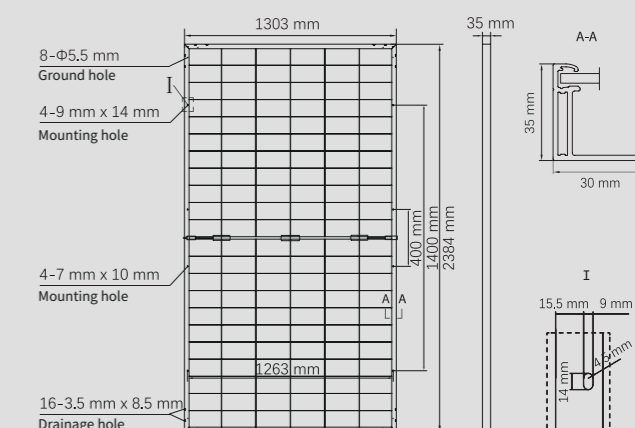
## Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.30%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.24%/°C	Max. series fuse rating	35 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

## Operating Parameters

## Mechanical Specifications

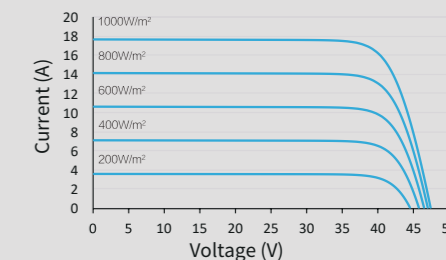
Outer dimensions (L x W x H)	2384 x 1303 x 35 mm
Cell Type	n-type Mono-crystalline
No. of cells	132 (6*22)
Frame technology	Aluminum, silver anodized
Front glass thickness	2.0+2.0 mm
Cable length (IEC/UL)	Portrait: 350 mm; Landscape: 1400 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	38.2 kg
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	1233 kg
Modules per 40' HQ container	527 pcs



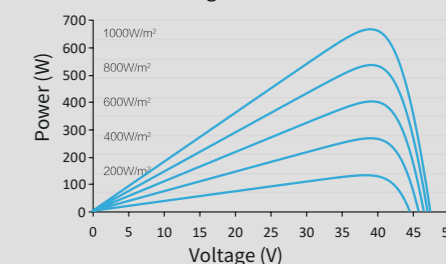
<sup>①</sup> Refer to Astronergy crystalline installation manual or contact technical department.  
Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

## Curve

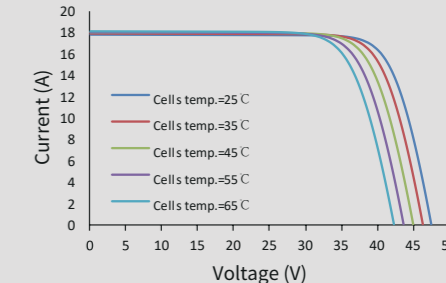
Current-Voltage (680W)



Power-Voltage (680W)



Current-Voltage (680W)





ASTRONERGY

preliminary

# ASTRO N6

Create Sustainable and Efficient Green Energy

## CHSM60N-HC Monofacial Series (210)

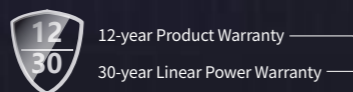
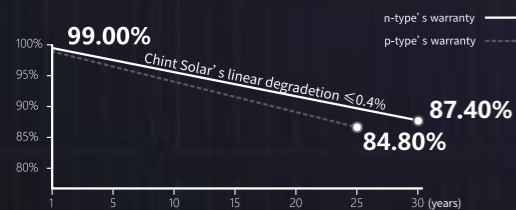
# 610~630W

TOPCon / 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



**610~630W**  
POWER RANGE

**0~+5W**  
POWER TOLERANCE

**22.3%**  
MAX MODULE EFFICIENCY

**≤ 1.0%**  
FIRST YEAR POWER DEGRADATION

**≤ 0.4%**  
YEAR 2-30 POWER DEGRADATION

### Electrical Specifications

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

	610	615	620	625	630
Rated output (Pmpp / Wp)	610	615	620	625	630
Rated voltage (Vmpp / V)	35.53	35.70	35.87	36.04	36.21
Rated current (Impp / A)	17.17	17.23	17.28	17.34	17.40
Open circuit voltage (Voc / V)	42.82	43.02	43.22	43.43	43.63
Short circuit current (Isc / A)	17.85	17.94	18.02	18.10	18.19
Module efficiency	21.6%	21.7%	21.9%	22.1%	22.3%

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

	458.7	462.5	466.2	470.0	473.8
Rated output (Pmpp / Wp)	458.7	462.5	466.2	470.0	473.8
Rated voltage (Vmpp / V)	33.45	33.60	33.76	33.92	34.08
Rated current (Impp / A)	13.72	13.76	13.81	13.86	13.90
Open circuit voltage (Voc / V)	40.67	40.86	41.06	41.25	41.44
Short circuit current (Isc / A)	14.41	14.48	14.55	14.61	14.68

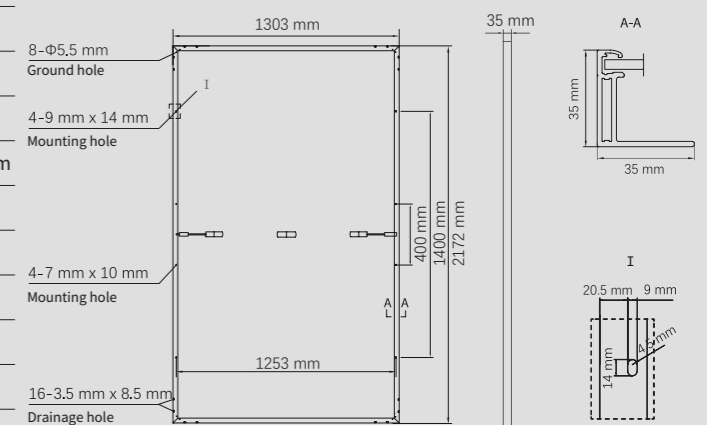
### Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.30%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.24%/°C	Max. series fuse rating	30 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

### Operating Parameters

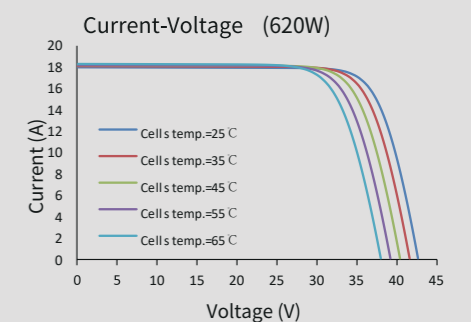
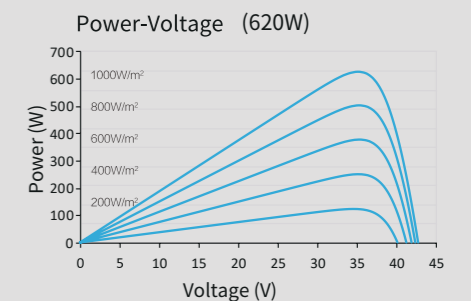
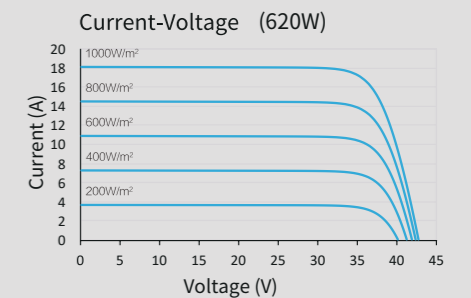
### Mechanical Specifications

Outer dimensions (L x W x H)	2172 x 1303 x 35 mm
Cell Type	n-type Mono-crystalline
No. of cells	120 (6*20)
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
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	31 kg
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40' HQ container)	1009 kg
Modules per 40' HQ container	527 pcs



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

### Curve





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# ASTRO N6

Create Sustainable and Efficient Green Energy

## CHSM60N(DG)/F-BH Bifacial Series (210)

# 605~625W

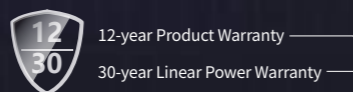
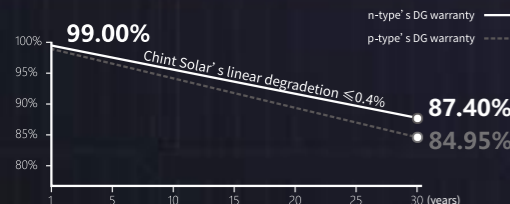
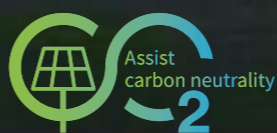
TOPCon / Multi-busbar / Half-cut

Non-destructive cutting

PID resistance

Bifacial gain

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



### 605~625W

POWER RANGE

### 0~+5W

POWER TOLERANCE

### 22.1%

MAX MODULE EFFICIENCY

### $\leq 1.0\%$

FIRST YEAR POWER DEGRADATION

### $\leq 0.4\%$

YEAR 2-30 POWER DEGRADATION

## Electrical Specifications

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

Rated output (Pmpp / Wp)	605	610	615	620	625
Rated voltage (Vmpp / V)	35.52	35.69	35.86	36.03	36.20
Rated current (Impp / A)	17.03	17.09	17.15	17.21	17.27
Open circuit voltage (Voc / V)	42.81	43.01	43.21	43.41	43.62
Short circuit current (Isc / A)	17.67	17.75	17.83	17.92	18.00
Module efficiency	21.4%	21.6%	21.7%	21.9%	22.1%

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

Rated output (Pmpp / Wp)	455.0	458.7	462.5	466.2	470.0
Rated voltage (Vmpp / V)	33.44	33.60	33.75	33.91	34.07
Rated current (Impp / A)	13.61	13.65	13.70	13.75	13.79
Open circuit voltage (Voc / V)	40.66	40.85	41.05	41.24	41.43
Short circuit current (Isc / A)	14.26	14.33	14.40	14.47	14.53

## Electrical Specifications (Integrated power)

Pmpp gain	Pmpp / Wp	Vmpp / V	Impp / A	Voc / V	Isc / A
5%	646	35.31	18.29	42.73	19.18
10%	677	35.31	19.16	42.73	20.09
15%	707	35.32	20.02	42.74	21.00
20%	738	35.32	20.89	42.74	21.91
25%	769	35.32	21.76	42.74	22.83

Electrical characteristics with different rear power gain (reference to 615W)

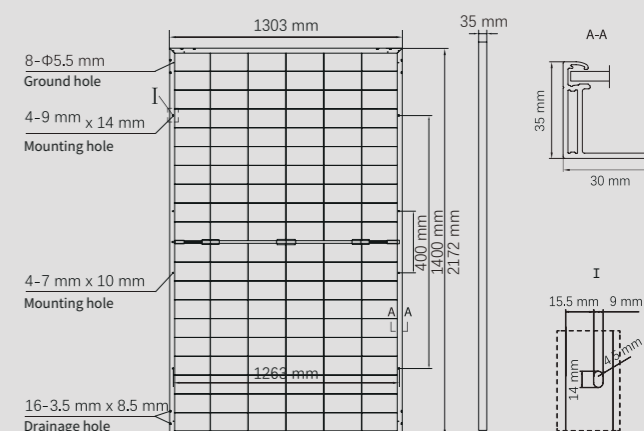
## Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.30%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.24%/°C	Max. series fuse rating	35 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

## Operating Parameters

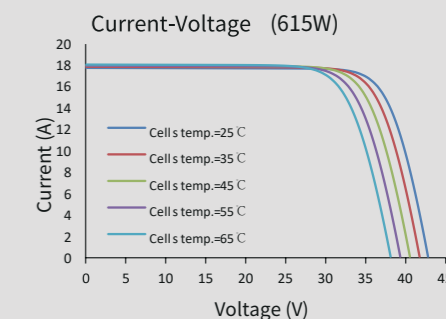
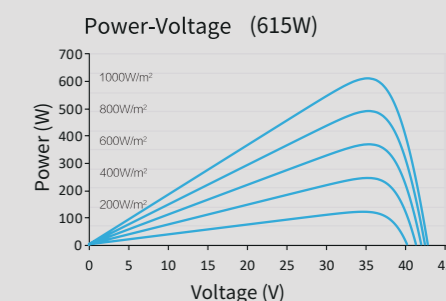
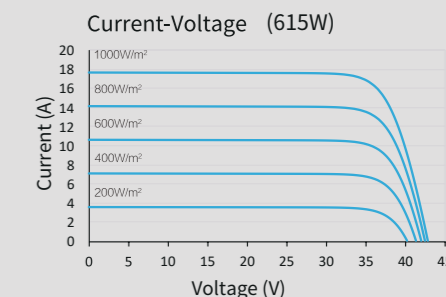
## Mechanical Specifications

Outer dimensions (L x W x H)	2172 x 1303 x 35 mm
Cell Type	n-type Mono-crystalline
No. of cells	120 (6*20)
Frame technology	Aluminum, silver anodized
Front glass thickness	2.0+2.0 mm
Cable length (IEC/UL)	Portrait: 350 mm; Landscape: 1400 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	34.9 kg
Packing unit	31 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	1130 kg
Modules per 40' HQ container	527 pcs



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

## Curve





ASTRONERGY

preliminary

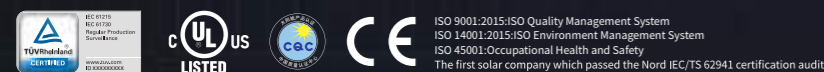
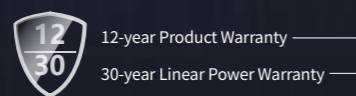
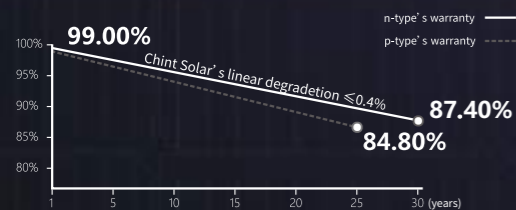
# ASTRO N5

Create Sustainable and Efficient Green Energy

## CHSM72N-HC Monofacial Series (182)

# 555~570W

- TOPCon / Multi-busbar / Half-cut
- Non-destructive cutting
- PID resistance
- Lower BOS cost & LCOE



**555~570W**  
POWER RANGE

**0~+5W**  
POWER TOLERANCE

**22.1%**  
MAX MODULE EFFICIENCY

**≤ 1.0%**  
FIRST YEAR POWER DEGRADATION

**≤ 0.4%**  
YEAR 2-30 POWER DEGRADATION

### Electrical Specifications

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

Rated output (Pmpp / Wp)	555	560	565	570
Rated voltage (Vmpp / V)	42.00	42.13	42.25	42.38
Rated current (Impp / A)	13.21	13.29	13.37	13.45
Open circuit voltage (Voc / V)	50.40	50.55	50.70	50.85
Short circuit current (Isc / A)	13.80	13.90	14.00	14.10
Module efficiency	21.5%	21.7%	21.9%	22.1%

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

Rated output (Pmpp / Wp)	417.4	421.1	424.9	428.6
Rated voltage (Vmpp / V)	39.53	39.65	39.77	39.89
Rated current (Impp / A)	10.56	10.62	10.68	10.75
Open circuit voltage (Voc / V)	47.87	48.02	48.16	48.30
Short circuit current (Isc / A)	11.14	11.22	11.30	11.38

### Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.30%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.24%/°C	Max. series fuse rating	25 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

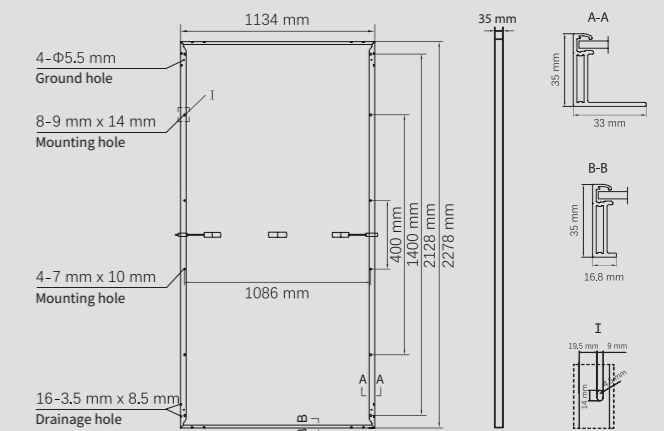
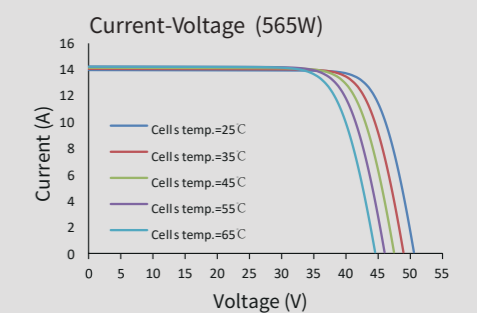
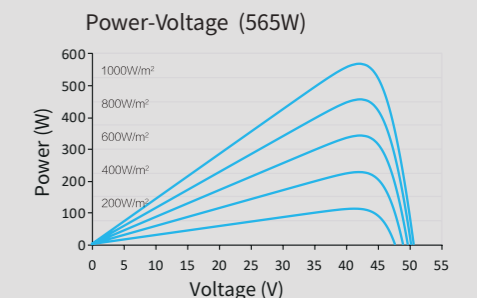
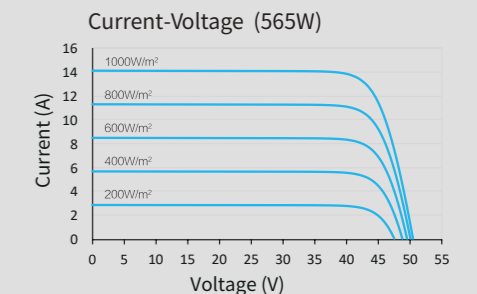
### Operating Parameters

### Mechanical Specifications

Outer dimensions (L x W x H)	2278 x 1134 x 35 mm
Cell Type	n-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
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	26.9 kg
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

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

### Curve





ASTRONERGY

# ASTRO N5

Create Sustainable and Efficient Green Energy

## CHSM72N(DG)/F-BH Bifacial Series (182)

# 550~565W

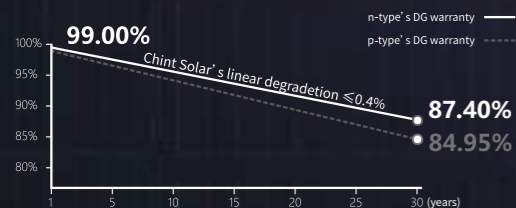
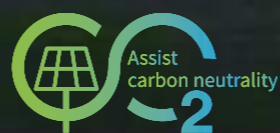
TOPCon / Multi-busbar / Half-cut

Non-destructive cutting

PID resistance

Bifacial gain

Lower BOS cost & LCOE



12-year Product Warranty  
30-year Linear Power Warranty



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



### 550~565W

POWER RANGE

### 0~+5W

POWER TOLERANCE

### 21.9%

MAX MODULE EFFICIENCY

### ≤ 1.0%

FIRST YEAR POWER DEGRADATION

### ≤ 0.4%

YEAR 2-30 POWER DEGRADATION

## Electrical Specifications

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

Rated output (Pmpp / Wp)	550	555	560	565
Rated voltage (Vmpp / V)	42.10	42.27	42.44	42.61
Rated current (Impp / A)	13.06	13.13	13.20	13.26
Open circuit voltage (Voc / V)	50.10	50.30	50.50	50.70
Short circuit current (Isc / A)	13.76	13.84	13.93	14.02
Module efficiency	21.3%	21.5%	21.7%	21.9%

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

Rated output (Pmpp / Wp)	413.6	417.4	421.1	424.9
Rated voltage (Vmpp / V)	39.63	39.79	39.94	40.10
Rated current (Impp / A)	10.44	10.49	10.54	10.60
Open circuit voltage (Voc / V)	47.59	47.78	47.97	48.16
Short circuit current (Isc / A)	11.11	11.18	11.25	11.32

## Electrical Specifications (Integrated power)

Pmpp gain	Pmpp / Wp	Vmpp / V	Impp / A	Voc / V	Isc / A
5%	588	42.39	13.87	50.45	14.64
10%	616	42.39	14.53	50.45	15.34
15%	644	42.40	15.19	50.46	16.03
20%	672	42.40	15.85	50.46	16.73
25%	700	42.40	16.51	50.46	17.43

Electrical characteristics with different rear power gain (reference to 560W)

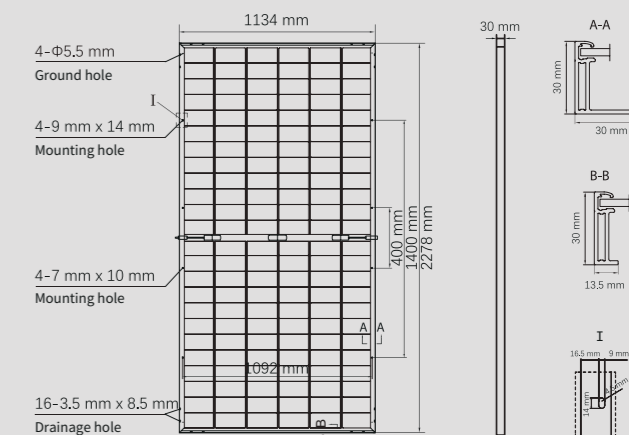
## Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.30%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.24%/°C	Max. series fuse rating	30 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1500V <sub>DC</sub>

## Operating Parameters

## Mechanical Specifications

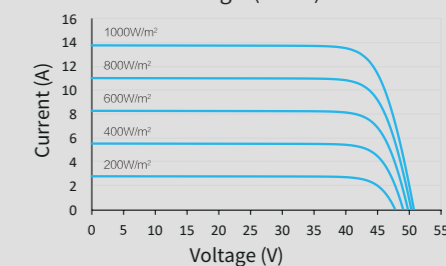
Outer dimensions (L x W x H)	2278 x 1134 x 30 mm
Cell Type	n-type Mono-crystalline
No. of cells	144 (6*24)
Frame technology	Aluminum, silver anodized
Front glass thickness	2.0+2.0 mm
Cable length (IEC/UL)	Portrait: 300 mm; Landscape: 1400 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
① Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	32.1 kg
Packing unit	36 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	1215 kg
Modules per 40' HQ container	720 pcs



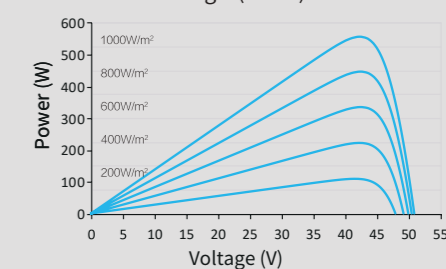
① Refer to Astronergy crystalline installation manual or contact technical department.  
Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

## Curve

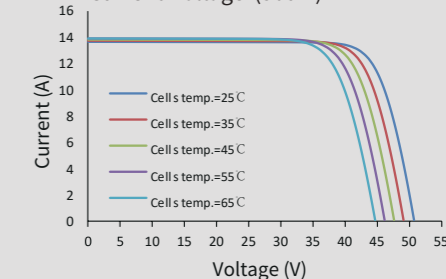
Current-Voltage (560W)



Power-Voltage (560W)



Current-Voltage (560W)





ASTRONERGY

preliminary

# ASTRO N5s

Create Sustainable and Efficient Green Energy

## CHSM54N-HC Monofacial Series (182)

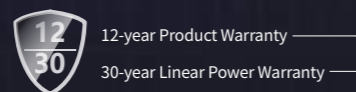
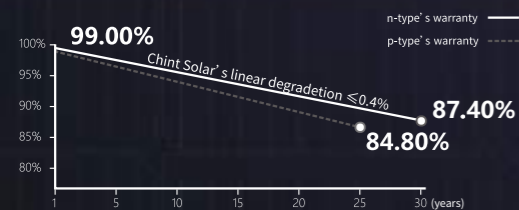
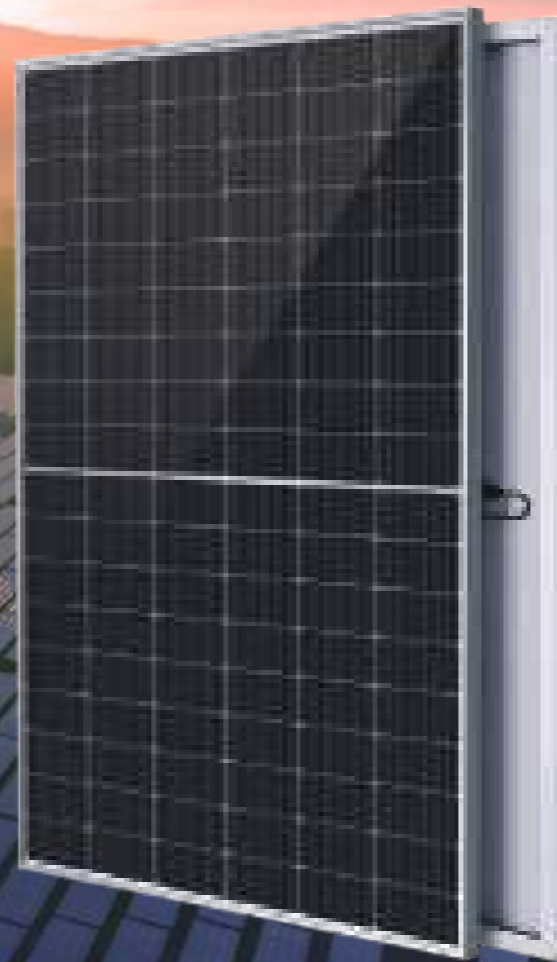
# 415~430W

TOPCon / 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



**415~430W**  
POWER RANGE

**0~+5W**  
POWER TOLERANCE

**22.0%**  
MAX MODULE EFFICIENCY

**≤ 1.0%**  
FIRST YEAR POWER DEGRADATION

**≤ 0.4%**  
YEAR 2-30 POWER DEGRADATION

### Electrical Specifications

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

	415	420	425	430
Rated output (Pmpp / Wp)	415	420	425	430
Rated voltage (Vmpp / V)	31.76	31.93	32.10	32.27
Rated current (Impp / A)	13.06	13.15	13.24	13.33
Open circuit voltage (Voc / V)	37.80	38.00	38.20	38.40
Short circuit current (Isc / A)	13.76	13.87	13.98	14.09
Module efficiency	21.3%	21.5%	21.8%	22.0%

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

	312.1	315.8	319.6	323.4
Rated output (Pmpp / Wp)	312.1	315.8	319.6	323.4
Rated voltage (Vmpp / V)	29.90	30.06	30.21	30.37
Rated current (Impp / A)	10.44	10.51	10.58	10.65
Open circuit voltage (Voc / V)	35.91	36.10	36.29	36.48
Short circuit current (Isc / A)	11.11	11.20	11.28	11.37

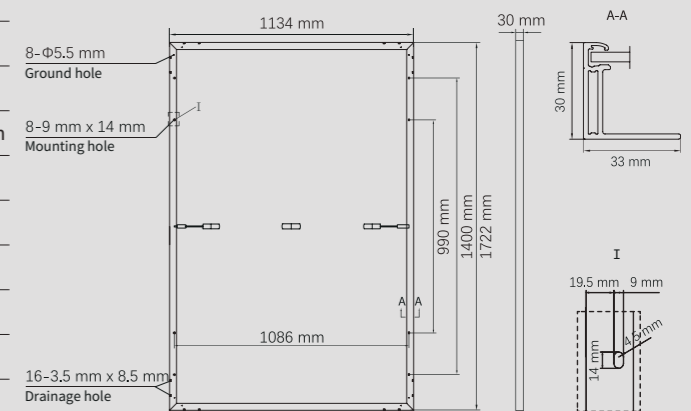
### Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.30%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.24%/°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

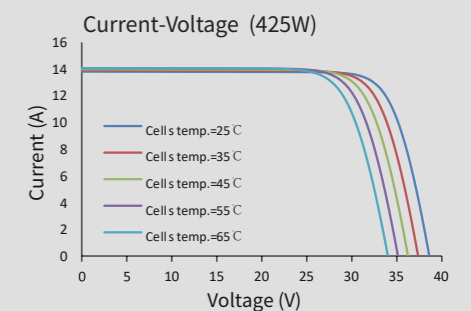
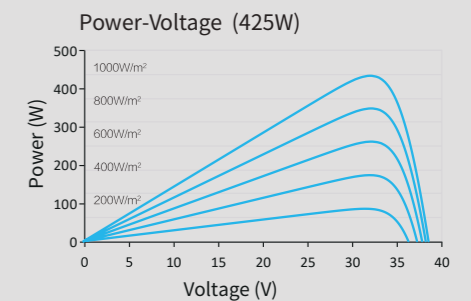
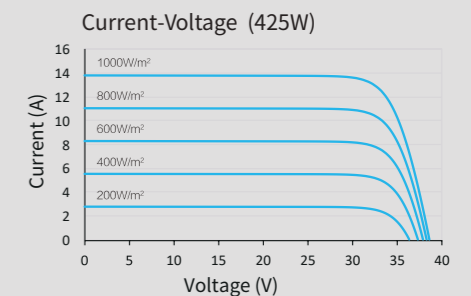
### Mechanical Specifications

Outer dimensions (L x W x H)	1722 x 1134 x 30 mm
Cell Type	n-type Mono-crystalline
No. of cells	108 (6*18)
Frame technology	Aluminum, silver anodized
Front glass thickness	3.2 mm
Cable length (IEC/UL)	Portrait: 300 mm; Landscape: 1200 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	21.3 kg
Packing unit	36 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	811 kg
Modules per 40' HQ container	936 pcs



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

### Curve





ASTRONERGY

# ASTRO N5s

Create Sustainable and Efficient Green Energy

## CHSM54N(BL)-HC Monofacial Series (182)

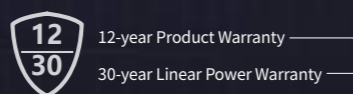
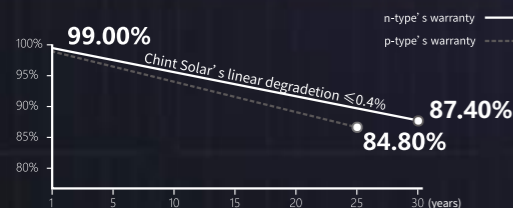
# 405~420W

TOPCon / 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



**405~420W**  
POWER RANGE

**0~+5W**  
POWER TOLERANCE

**21.5%**  
MAX MODULE EFFICIENCY

**≤ 1.0%**  
FIRST YEAR POWER DEGRADATION

**≤ 0.4%**  
YEAR 2-30 POWER DEGRADATION

### Electrical Specifications

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

	405	410	415	420
Rated output (Pmpp / Wp)	405	410	415	420
Rated voltage (Vmpp / V)	31.73	31.75	31.76	31.93
Rated current (Impp / A)	12.76	12.91	13.06	13.15
Open circuit voltage (Voc / V)	37.76	37.78	37.80	38.00
Short circuit current (Isc / A)	13.41	13.58	13.76	13.87
Module efficiency	20.7%	21.0%	21.3%	21.5%

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

	304.6	308.3	312.1	315.8
Rated output (Pmpp / Wp)	304.6	308.3	312.1	315.8
Rated voltage (Vmpp / V)	29.87	29.88	29.90	30.06
Rated current (Impp / A)	10.20	10.32	10.44	10.51
Open circuit voltage (Voc / V)	35.87	35.89	35.91	36.10
Short circuit current (Isc / A)	10.82	10.96	11.11	11.20

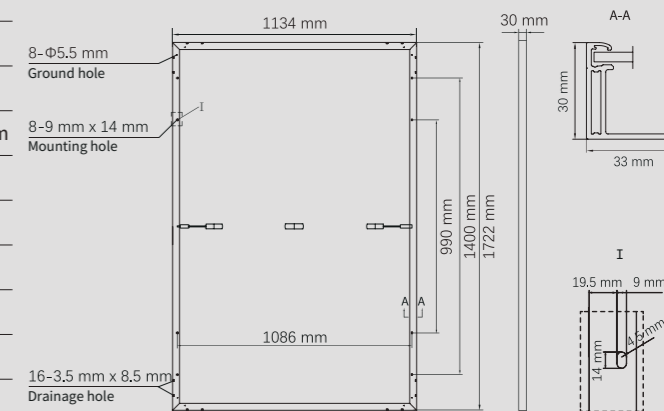
### Temperature Ratings (STC)

Temperature coefficient (Pmpp)	-0.30%/°C	No. of diodes	3
Temperature coefficient (Isc)	+0.043%/°C	Junction box IP rating	IP 68
Temperature coefficient (Voc)	-0.24%/°C	Max. series fuse rating	25 A
Nominal module operating temperature (NMOT)	41±2°C	Max. system voltage (IEC/UL)	1000V <sub>DC</sub>

### Operating Parameters

### Mechanical Specifications

Outer dimensions (L x W x H)	1722 x 1134 x 30 mm
Cell Type	n-type Mono-crystalline
No. of cells	108 (6*18)
Frame technology	Aluminum, black anodized
Front glass thickness	3.2 mm
Cable length (IEC/UL)	Portrait: 300 mm; Landscape: 1200 mm
Cable diameter (IEC/UL)	4 mm <sup>2</sup> / 12 AWG
<sup>①</sup> Maximum mechanical test load	5400 Pa (front) / 2400 Pa (back)
Connector type (IEC/UL)	HCB40 / MC4-EVO2 (optional)
Module weight	21.3 kg
Packing unit	36 pcs / box (Subject to sales contract)
Weight of packing unit (for 40'HQ container)	811 kg
Modules per 40' HQ container	936 pcs



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

### Curve

