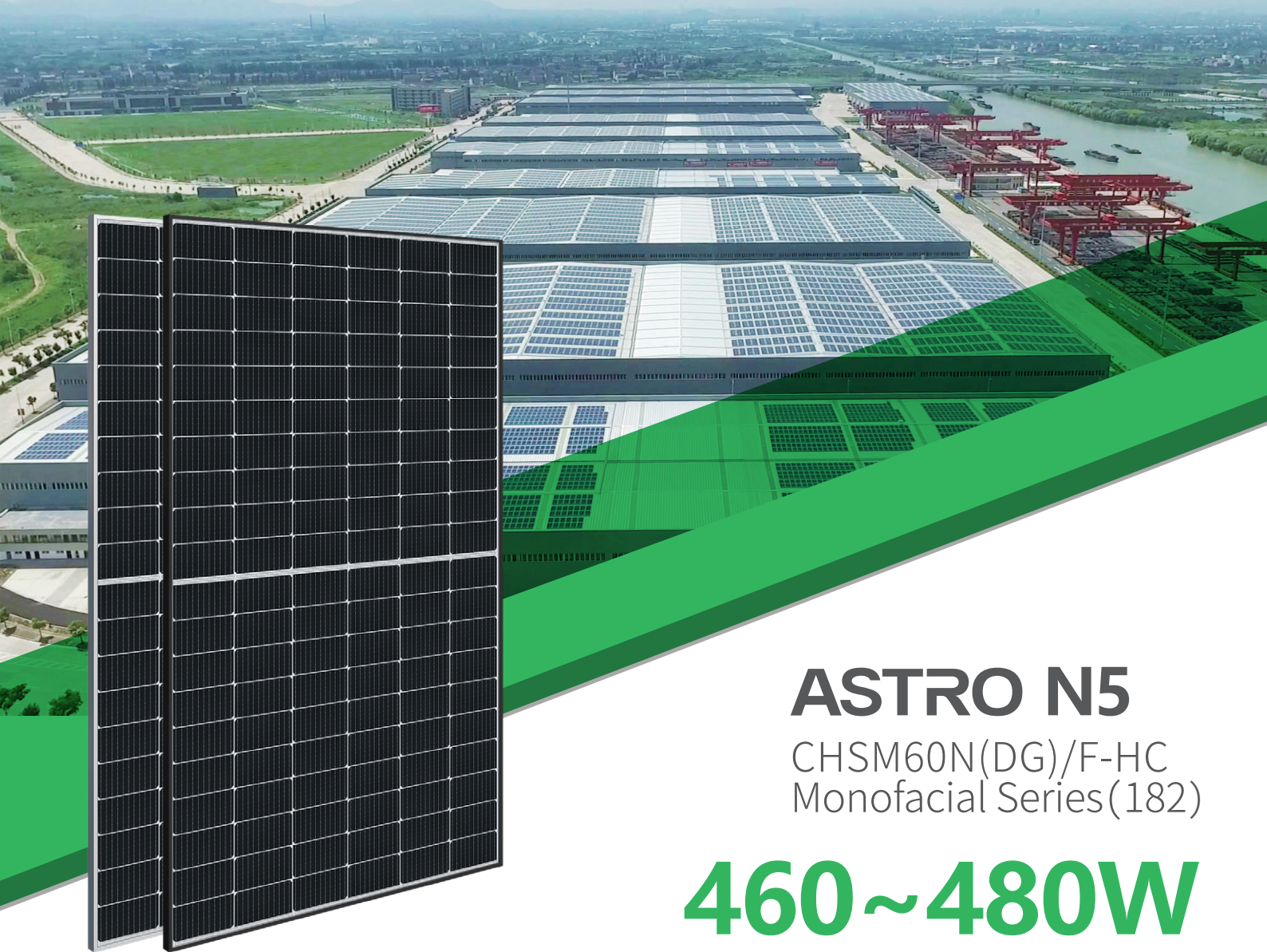




ASTRONERGY



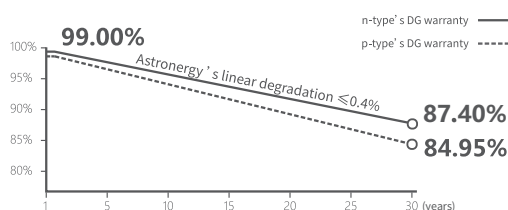
# ASTRO N5

CHSM60N(DG)/F-HC  
Monofacial Series(182)

## 460~480W

### Warranty

- 30** 30-year Product Warranty (special for rooftop market)
- 30** 30-year Linear Power Warranty



### Key Features

- TOPCon / Half-cut
- Better temperature coefficient (Pmpp)
- Non-destructive cutting



ISO 9001:2015:ISO Quality Management System  
ISO 14001:2015:ISO Environment Management System  
ISO 45001:Occupational Health and Safety



Tier 1  
BloombergNEF



# 460~480W

POWER RANGE

# 0~+5W

POWER SORTING

# 22.2%

MAX MODULE  
EFFICIENCY

# ≤ 1.0%

FIRST YEAR  
POWER DEGRADATION

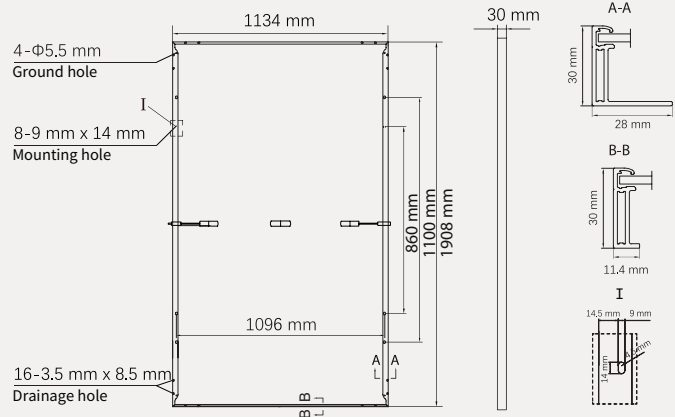
# ≤ 0.4%

YEAR 2-30  
POWER DEGRADATION

## Mechanical Specifications

|                                              |                                                                          |
|----------------------------------------------|--------------------------------------------------------------------------|
| Outer dimensions (L x W x H)                 | 1908 x 1134 x 30 mm                                                      |
| Cell type                                    | n-type mono-crystalline                                                  |
| No. of cells                                 | 120 (6*20)                                                               |
| Frame technology                             | Aluminum, black or silver anodized                                       |
| Front glass thickness                        | 1.6+1.6 mm                                                               |
| Cable length (Including connector)           | Portrait: ( + )350 mm,( - )250 mm;<br>Customized length                  |
| 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)                      | PV-HCB40 (Astronergy) or PV-KST4-EVO2A/<br>xy,PV-KBT4-EVO2A/xy (Stäubli) |
| Module weight                                | 23 kg                                                                    |
| Packing unit                                 | 36 pcs / box                                                             |
| Weight of packing unit (for 40'HQ container) | 874 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 CHSM60N(DG)/F-HC-XXX(XXX=460-480)

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

|                                             |       |       |       |       |       |
|---------------------------------------------|-------|-------|-------|-------|-------|
| Rated output (P <sub>mpp</sub> / Wp)        | 460   | 465   | 470   | 475   | 480   |
| Rated voltage (V <sub>mpp</sub> / V)        | 36.02 | 36.14 | 36.27 | 36.39 | 36.52 |
| Rated current (I <sub>mp</sub> / A)         | 12.77 | 12.87 | 12.96 | 13.05 | 13.14 |
| Open circuit voltage (V <sub>oc</sub> / V)  | 42.86 | 43.01 | 43.16 | 43.31 | 43.46 |
| Short circuit current (I <sub>sc</sub> / A) | 13.45 | 13.57 | 13.68 | 13.80 | 13.91 |
| Module efficiency                           | 21.3% | 21.5% | 21.7% | 22.0% | 22.2% |

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

|                                             |       |       |       |       |       |
|---------------------------------------------|-------|-------|-------|-------|-------|
| Rated output (P <sub>mpp</sub> / Wp)        | 349.7 | 353.4 | 357.2 | 361.0 | 361.0 |
| Rated voltage (V <sub>mpp</sub> / V)        | 34.02 | 34.14 | 34.26 | 34.37 | 34.37 |
| Rated current (I <sub>mp</sub> / A)         | 10.28 | 10.35 | 10.43 | 10.50 | 10.50 |
| Open circuit voltage (V <sub>oc</sub> / V)  | 40.85 | 40.99 | 41.14 | 41.28 | 41.28 |
| Short circuit current (I <sub>sc</sub> / A) | 10.95 | 11.04 | 11.14 | 11.23 | 11.23 |

Power Sorting: 0~+5W Power tolerance: +/- 3.5%

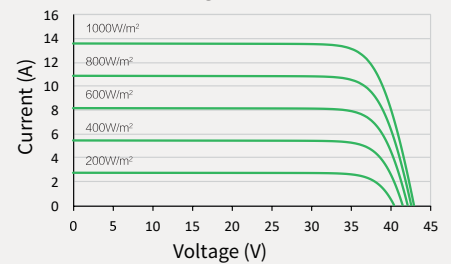
## Temperature Ratings (STC) Operating Parameters

|                                             |            |                              |                     |
|---------------------------------------------|------------|------------------------------|---------------------|
| Temperature coefficient (P <sub>mpp</sub> ) | -0.29%/°C  | No. of diodes                | 3                   |
| Temperature coefficient (I <sub>sc</sub> )  | +0.043%/°C | Junction box IP rating       | IP 68               |
| Temperature coefficient (V <sub>oc</sub> )  | -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> |

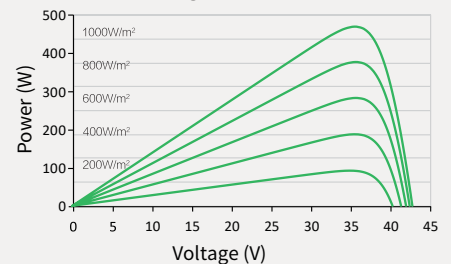
Fire performance: Class A

## Curve

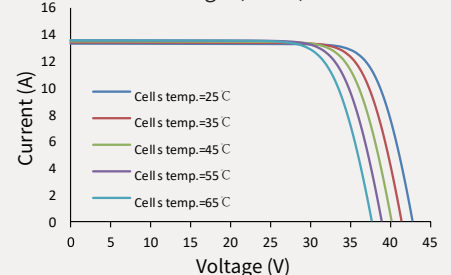
Current-Voltage (475W)



Power-Voltage (475W)



Current-Voltage (475W)



Made in China, Made in Thailand.

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