

# ASTRO 3 Twins

Create Sustainable and Efficient Green Energy

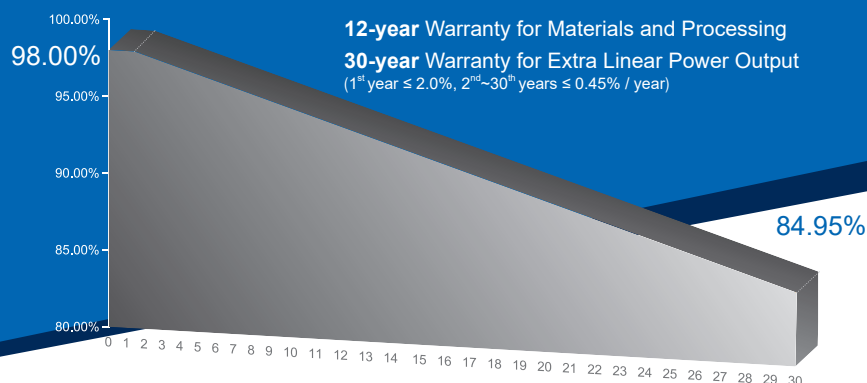


## 400W~415W

### Monocrystalline PV Module

### CHSM72M(DG)/F-BH Series (158.75)

CHSM72M(DG)/F-BH is bifacial module with white glazed glass



#### 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.
- BIFACIAL POWER**  
Up to 25% additional power gain from rear side.
- APPLICABLE FOR MULTI DIFFERENT ENVIRONMENTS**  
Wide range of applications, such as snow areas, high humidity areas and strong sandstorm areas, etc.

#### COMPREHENSIVE CERTIFICATES



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

For Global Market



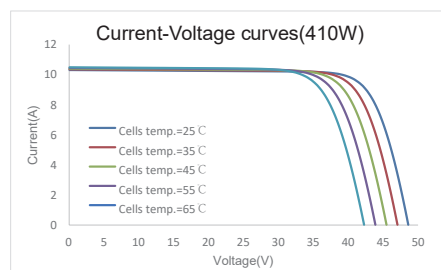
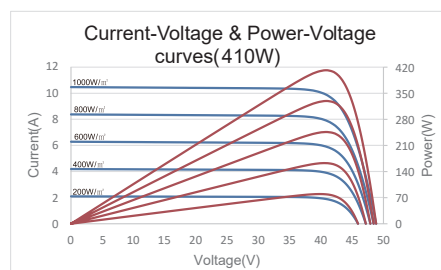
**ASTRONERGY**  
A CHNT COMPANY

## ELECTRICAL SPECIFICATIONS

| Power rating (front)                        | 400 Wp              |       | 405 Wp |       | 410 Wp |       | 415 Wp |       |
|---------------------------------------------|---------------------|-------|--------|-------|--------|-------|--------|-------|
| Testing Condition                           | Front               | Back  | Front  | Back  | Front  | Back  | Front  | Back  |
| STC rated output ( $P_{mpp}/Wp$ )           | 400                 | 282   | 405    | 285   | 410    | 289   | 415    | 292   |
| Rated voltage ( $V_{mpp}/V$ ) at STC        | 40.67               | 40.88 | 40.89  | 41.10 | 41.10  | 41.31 | 41.31  | 41.52 |
| Rated current ( $I_{mpp}/A$ ) at STC        | 9.84                | 6.89  | 9.91   | 6.94  | 9.98   | 6.99  | 10.05  | 7.04  |
| Open circuit voltage ( $V_{oc}/V$ ) at STC  | 48.24               | 46.82 | 48.42  | 46.99 | 48.60  | 47.17 | 48.78  | 47.34 |
| Short circuit current ( $I_{sc}/A$ ) at STC | 10.30               | 7.22  | 10.38  | 7.28  | 10.46  | 7.33  | 10.54  | 7.39  |
| Module efficiency                           | 19.4%               | 13.7% | 19.7%  | 13.8% | 19.9%  | 14.0% | 20.2%  | 14.2% |
| 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

## CURVE



## ELECTRICAL SPECIFICATIONS (Integrated power)

| $P_{mpp}$ gain | $P_{mpp}$ | $V_{mpp}$ | $I_{mpp}$ | $V_{oc}$ | $I_{sc}$ |
|----------------|-----------|-----------|-----------|----------|----------|
| 5%             | 431 Wp    | 41.10 V   | 10.47 A   | 48.60 V  | 10.98 A  |
| 10%            | 451 Wp    | 41.10 V   | 10.97 A   | 48.60 V  | 11.51 A  |
| 15%            | 472 Wp    | 41.00 V   | 11.50 A   | 48.70 V  | 12.03 A  |
| 20%            | 492 Wp    | 41.00 V   | 12.00 A   | 48.70 V  | 12.55 A  |
| 25%            | 513 Wp    | 41.00 V   | 12.50 A   | 48.70 V  | 13.08 A  |

Electrical characteristics with different rear power gain (reference to 410W)

## MECHANICAL SPECIFICATIONS

|                                |                                        |
|--------------------------------|----------------------------------------|
| Outer dimensions (L x W x H)   | 2038 x 1010 x 30 mm                    |
| Frame technology               | Aluminum, silver anodized              |
| Glass thickness                | 2.0 mm                                 |
| Cable length (IEC/UL)          | Portrait: 350 mm<br>Landscape: 1200 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                       |

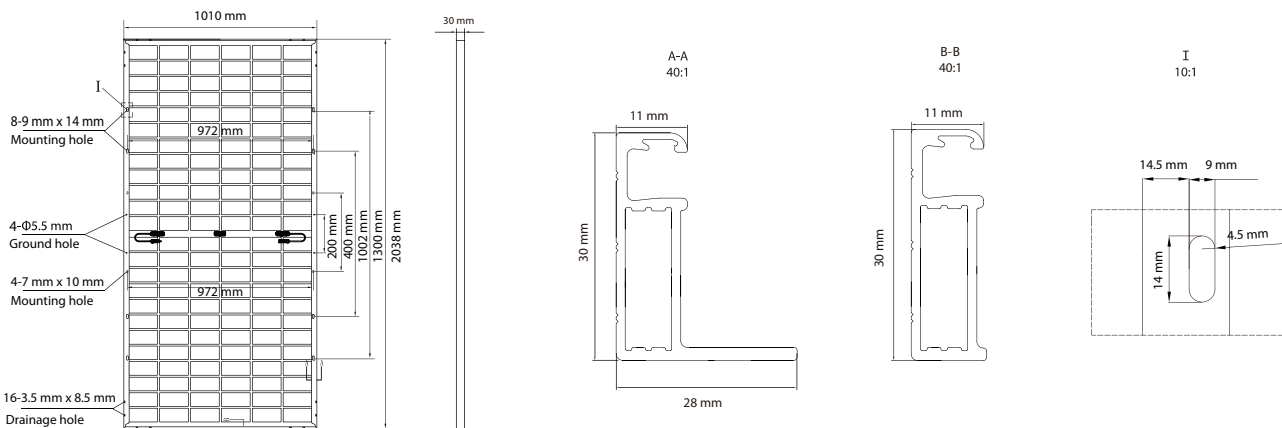
① Refer to Astronergy crystalline installation manual or contact technical department.  
Maximum Mechanical Test Load=1.5×Maximum Mechanical Design Load.

## PACKING SPECIFICATIONS

|                                              |              |
|----------------------------------------------|--------------|
| ① Module Weight                              | 26.3 kg      |
| ② Packing unit                               | 36 pcs / box |
| Weight of packing unit (for 40'HQ container) | 994 kg       |
| Number of modules per 40'HQ container        | 792 pcs      |

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

## MODULE DIMENSION DETAILS



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