

# 450-465Watt 120cells 182 P- Type Mono-facial Module

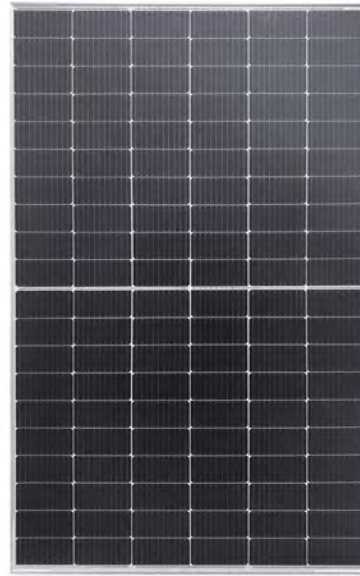
Positive power tolerance of 0~+3%

IEC61215(2016), IEC61730(2016)

ISO9001:2015: Quality Management System

ISO14001:2015: Environment Management System

ISO45001:2018  
Occupational Health and Safety Management Systems



## Key Features



### MBB Technology

Better light trapping and current collection to improve module power output and reliability.



### Hot 2.0 Technology

The P-type module with Hot 2.0 technology has better reliability and lower LID/LETID.



### PID Resistance

Excellent Anti-PID performance guarantee via optimized mass-production process and materials control.



### Enhanced Mechanical Load

Certified to withstand: wind load (2400 Pascal) and snow load (5400 Pascal).

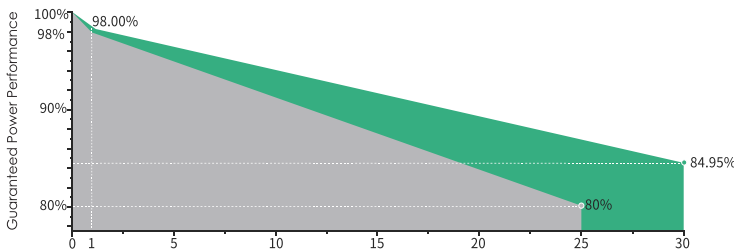


### Durability Against Extreme Environmental Conditions

High salt mist and ammonia resistance.



## LINEAR PERFORMANCE WARRANTY



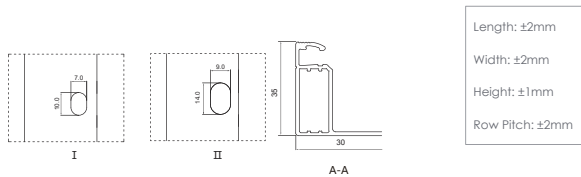
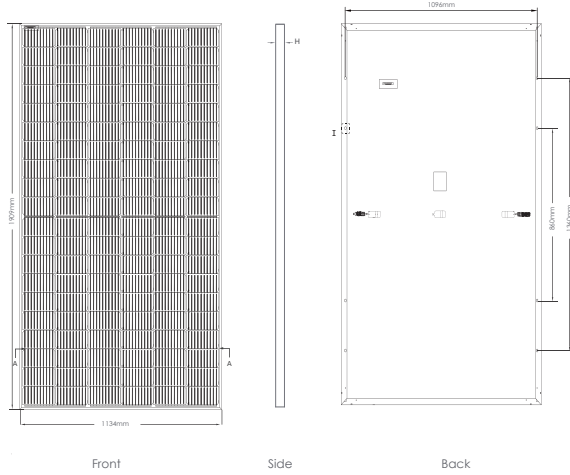
12 Year Product Warranty

30 Year Linear Power Warranty

0.45% Annual Degradation Over 30 years



## Engineering Drawings

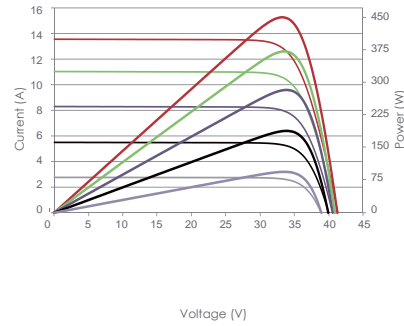


## Packaging Configuration

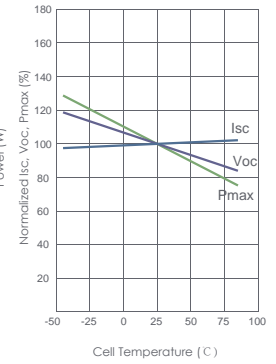
36/31 pcs/pallets, 72/62 pcs/stack, 864 pcs/ 40'HQ Container

## Electrical Performance & Temperature Dependence

Current - Voltage & Power - Voltage Curves (450W)



Temperature Dependence of  $I_{sc}$ ,  $V_{oc}$ ,  $P_{max}$



## Mechanical Characteristics

|               |   |
|---------------|---|
| Cell Type     | 182 P type Mono-crystalline   |
| No. of cells  | 120 (6×20)  |
| Dimensions    | 1909×1134×30mm/35mm   |
| Weight        | 21.5kg  |
| Front Glass   | 3.2mm, Anti-Reflection Coating, High Transmission, Low Iron, Tempered Glass |
| Frame         | Anodized Aluminium Alloy  |
| Junction Box  | IP68 Rated  |
| Output Cables | TUV 1×4.0mm <sup>2</sup><br>(+): 300mm, (-): 300mm or Customized Length     |

## SPECIFICATIONS

| Module Type                               | GPM-450W(120)      |        | GPM-455W(120) |        | GPM-460W(120) |        | GPM-465W(120) |        |
|---|--------------------|--------|---------------|--------|---------------|--------|---------------|--------|
|   | STC                | NOCT   | STC           | NOCT   | STC           | NOCT   | STC           | NOCT   |
| Maximum Power (Pmax)                      | 450Wp              | 335Wp  | 455Wp         | 339Wp  | 460Wp         | 342Wp  | 465Wp         | 346Wp  |
| Maximum Power Voltage (Vmp)               | 34.88V             | 31.73V | 35.03V        | 31.91V | 35.18V        | 32.07V | 35.33V        | 32.12V |
| Maximum Power Current (Imp)               | 12.91A             | 10.55A | 12.99A        | 10.61A | 13.08A        | 10.67A | 13.17A        | 10.77A |
| Open-circuit Voltage (Voc)                | 41.40V             | 38.87V | 41.60V        | 39.01V | 41.80V        | 39.15V | 42.00V        | 39.29V |
| Short-circuit Current (Isc)               | 13.68A             | 11.19A | 13.73A        | 11.25A | 13.78A        | 11.32A | 13.83A        | 11.38A |
| Module Efficiency STC (%)                 | 20.85%             |        | 21.08%        |        | 21.32%        |        | 21.55%        |        |
| Operating Temperature(°C)                 | -40°C~+85°C        |        |               |        |               |        |               |        |
| Maximum system voltage                    | 1000/1500VDC (IEC) |        |               |        |               |        |               |        |
| Maximum series fuse rating                | 25A                |        |               |        |               |        |               |        |
| Power tolerance                           | 0~+3%              |        |               |        |               |        |               |        |
| Temperature coefficients of Pmax          | -0.35%/°C          |        |               |        |               |        |               |        |
| Temperature coefficients of Voc           | -0.28%/°C          |        |               |        |               |        |               |        |
| Temperature coefficients of Isc           | 0.048%/°C          |        |               |        |               |        |               |        |
| Nominal operating cell temperature (NOCT) | 45±2°C             |        |               |        |               |        |               |        |

\*STC: Irradiance 1000W/m<sup>2</sup>

Cell Temperature 25°C

AM=1.5

NOCT: Irradiance 800W/m<sup>2</sup>

Ambient Temperature 20°C

AM=1.5

Wind Speed 1m/s

Note: Due to continuous technical innovation and R&D, the above mentioned technical parameters may subject to modification accordingly. **G&P SUN ENERGY** reserves the right to make such modification at any time without further notice.