

# CHG ENSOL Efficient PV Module N-TOPCon Technology

CHGMN78D1

N-type Mono High Efficiency  
Double Glass Bifacial PV Module

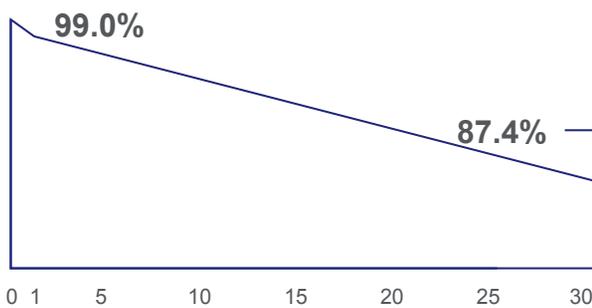
## 625-650W

**650W**  
Maximum  
Power Output

**23.3%**  
Maximum  
Module Efficiency

**0~+5W**  
Positive power  
tolerance

CHGMN78D1 Linear performance warranty



### Excellent Power Output

Adopting large-sized, highly efficient cell technology and leading manufacturing processes to effectively enhanced product power



### Excellent Temperature Coefficient

The product has excellent temperature coefficient, outstanding outdoor power generation performance and longer lifespan



### Ultra-multi-busbar Technology

Better light utilization and current collection capability, effectively improving product power output and reliability



### No LeTID/LID

While achieving efficiency gains in N-type photovoltaic cells, virtually no LID loss



### Excellent Irradiance Response

Superior weak-light power generation performance in environments such as early morning, evening, and cloudy conditions.



### High Profitability

Effectively reducing the system's BOS costs, achieving lower cost of electricity, and increasing project return



IEC61215(2016), IEC61730(2016)  
ISO14001: 2015 Environment Management System  
ISO9001: 2015: Quality Management System  
ISO45001: 2018: Occupational health and safety management systems

1.0%  
1st year  
degradation

0.4%  
2-30th annual  
degradation

15 Year  
material and  
workmanship  
warranty

30 Year  
linear  
warranty

## Electrical Properties | STC\*

Peak Power (Pmax/W)	625	630	635	640	645	650
MPP Voltage (Vmp/V)	47.49	47.69	47.89	48.08	48.28	48.47
MPP Current (Imp/A)	13.16	13.21	13.26	13.31	13.36	13.41
Open Circuit Voltage (Voc/V)	56.93	57.13	57.33	57.53	57.73	57.93
Short Circuit Current (Isc/A)	13.79	13.84	13.89	13.94	13.99	14.04
Module Efficiency (%)	22.4	22.5	22.7	22.9	23.1	23.3

\*STC (Standard Test Conditions): Irradiance 1000 W/m<sup>2</sup>, cell Temperature 25°C, AM 1.5

## Electrical Properties | BNPI\*

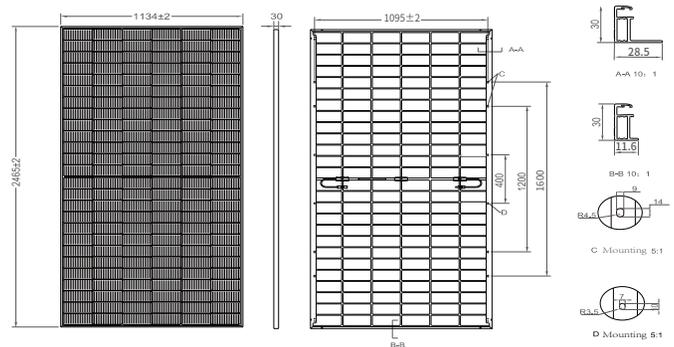
Peak Power (Pmax/W)	475	479	483	487	491	494
MPP Voltage (Vmp/V)	45.19	45.32	45.48	45.64	45.76	45.91
MPP Current (Imp/A)	10.51	10.57	10.62	10.67	10.73	10.76
Open Circuit Voltage (Voc/V)	54.50	54.70	54.89	55.08	55.27	55.46
Short Circuit Current (Isc/A)	11.12	11.16	11.20	11.24	11.28	11.32

\*NMOT (Nominal Module Operating Temperature Conditions): front 800W/m<sup>2</sup>, ambient temperature 20°C, wind speed 1m/s. The test conditions take the front side as an example.

## Mechanical Properties

Cell Type	n-type half cell
Number of Cells	156pcs(2*78)
Module Dimension	2465mm*1134mm*30mm
Weight	33.9kg
Front / Rear Glass	2.0mm/2.0mm
Frame	Anodized Aluminum Alloy
Junction Box	IP68
Output cables	TUV 1x4.0mm <sup>2</sup> , +300mm/-200mm or Customized Length

## Engineering Drawings (unit: mm)



For specific dimensions and tolerance ranges, please refer to the corresponding component drawings.

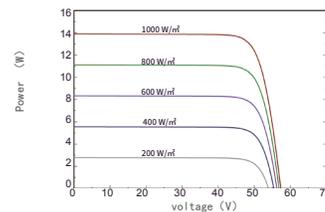
## Temperature Coefficient

Temperature coefficients of Pmax	-0.29% / °C
Temperature coefficients of Voc	-0.25% / °C
Temperature coefficients of Isc	+0.045% / °C
Nominal Module Operating Temperature	42±2 °C

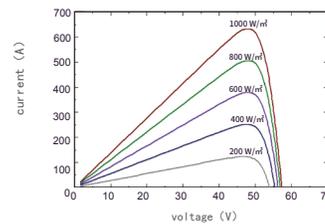
## Operating Properties

Operating Temperature (°C)	-40°C~+85°C
Maximum System Voltage (V)	1500V DC (IEC)
Maximum Series Fuse Rating (A)	30A
Power Tolerance	0~+5W
Bifaciality	80%±5%
Static load	Snow load 5400Pa, Wind load 2400Pa
Packaging Configuration	36pcs/pallet, 720pcs/13m flatcar 36pcs/pallet, 864pcs/17.5m flatcar

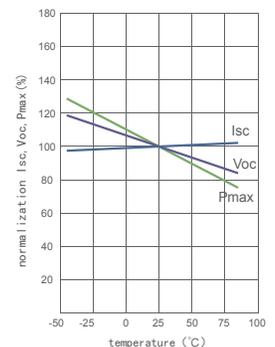
## Characteristic Curves: CHGMN78D1



Current and voltage curves under different irradiations



Power and voltage curves under different irradiations



Temperature Curves of Isc, Voc, Pmax under Different Temperatures