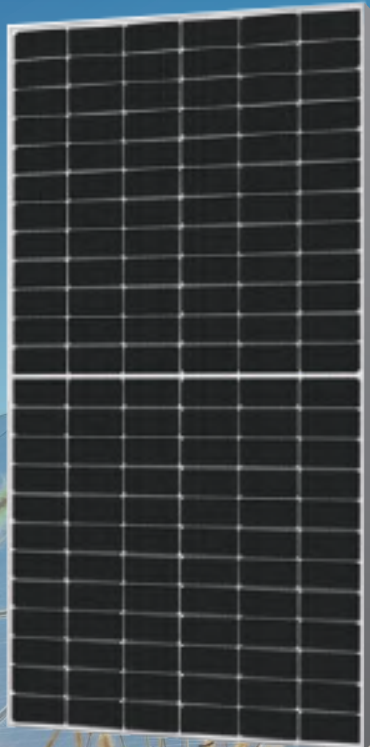


High Efficiency
PERC Module

GSM- MP5/144- M465

445W | 450W | 455W
460W | 465W



465W
Maximum Power Output

21.39%
Maximum Efficiency

25Years
Linear Power Warranty

Product Features



MBB Half Cell

Multi-busbar half cell design, together with many other technologies to increase module power and efficiency



High Energy Yield

High density interconnection technology optimizes module efficiency up to 21.39%



M6 Cell/Module

Small in size, big on efficiency, applicable to multiple scenarios



High Reliability

Certified mechanical performance up to 5400 Pa positive load and 2400 Pa negative load, with better protection against harsh weather



Higher Performance

Low temperature coefficient, low operating temperature, more energy yield



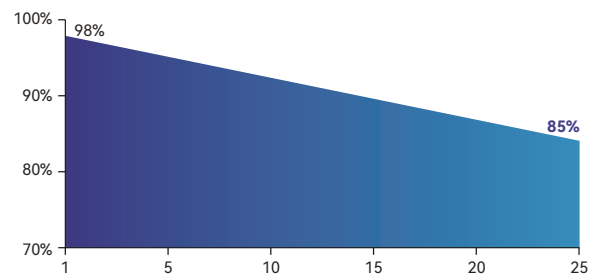
Better Warranty

Low LID/PID in longer service life, less than 15% power degradation in 25 years

Quality Assurance

12 Years Product Warranty

25 Years Linear Power Warranty



Certificates



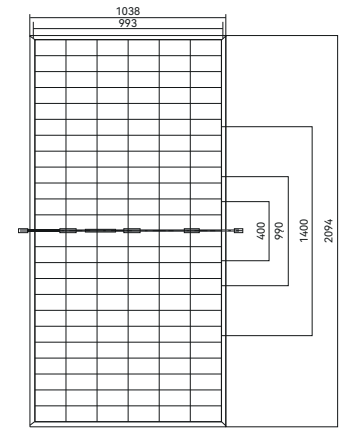
Guosheng Energy Co., Ltd.

Web: www.grandsunergy.com E-mail: sales@grandsunergy.com

Add: West Side to Zhongjing 7th Road, South Side to Pengcheng Boulevard, Xuzhou Industrial Park, Xuzhou City, Jiangsu Province

Mechanical Data

Cell(mm)	166×83
Weight(kg)	24.5±0.5kg
Dimension(L×W×H)(mm)	2094×1038×35mm
Cable(mm)	4mm ² , 300mm(customized length based on needs)
Frame	anodized aluminum
Junction Box	IP68, 1500VDC, 3 Diodes
Packaging configuration (40' Container; 17.5' Trailer)	31pcs/pallet, 22pallets/container, 682pcs/container 31pcs/pallet, 32pallet / Trailer, 992pcs / Trailer



Electrical Data (STC)

Model	GSM-MP5/144-M445	GSM-MP5/144-M450	GSM-MP5/144-M455	GSM-MP5/144-M460	GSM-MP5/144-M465
Pmax(Wp)	445	450	455	460	465
Voc(V)	49.4	49.6	49.8	50	50.2
Isc(A)	11.46	11.53	11.61	11.68	11.75
Vmpp(V)	40.8	41	41.2	41.3	41.45
Impp(A)	10.9	10.98	11.06	11.13	11.21
Efficiency	20.47%	20.70%	20.93%	21.16%	21.39%

STC: AM1.5 Irradiance: 1000W/m² Temperature=25°C

Electrical Characteristics (NOCT)

Model	GSM-MP5/144-M445	GSM-MP5/144-M450	GSM-MP5/144-M455	GSM-MP5/144-M460	GSM-MP5/144-M465
Pmax(Wp)	330	334	337	341	345
Voc(V)	44.78	44.98	45.18	45.38	45.58
Isc(A)	9.36	9.41	9.48	9.50	9.53
Vmpp(V)	38.50	38.65	38.75	38.85	38.95
Impp(A)	8.57	8.65	8.71	8.78	8.87

$\alpha_{Isc} (\%/K) : 0.05; \beta_{Voc} (\%/K) : -0.265; \gamma_{Pmp} (\%/K) : -0.34$

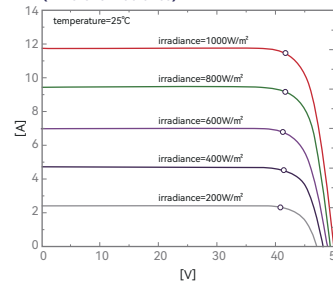
NMOT standard: AM1.5 Front irradiance: 800W/m² temperature=20°C wind speed=1m/s

Working Condition

Maximum System Voltage	1500VDC
Operating Temperature	-40°C ~ +85°C
Maximum Fuse Rating	20A
Rear Side Mechanical Load	2400Pa
Front Side Mechanical Load	5400Pa
NOCT	44±2°C
Safety Class	Class II
Grounding Electric Conductivity	< 0.1Ω

I-V Diagram

(Different Irradiance)



I-V Diagram

(Different Temperature)

