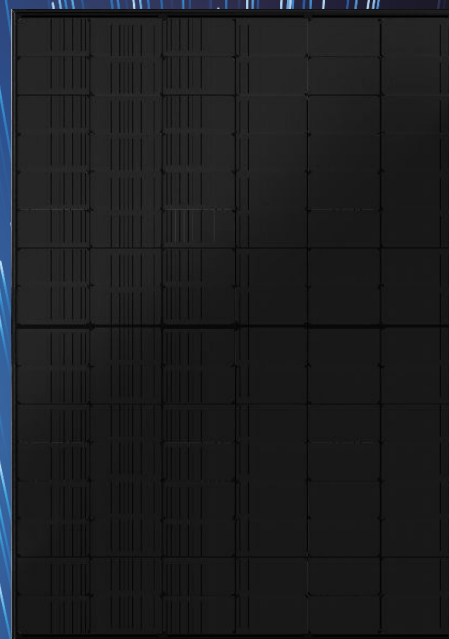


G12R- MBB TOPCon Mono Black Bifacial module

96 Half Cells

12 years Product warranty 30 years Linear power warranty

Integrated Solar Manufacturing & Technology Since 1964



435-455W /Output power

22.8% /Maximum efficiency

0~+5W /Power tolerance

Comprehensive product certification

- IEC TS 62941 (PV quality Management System)
- ISO9001: 2015 (Quality Management System)
- ISO14001 (Environmental Management System)
- OHSAS18001 (Occupational Health and Safety Management System)



Rectangular cell design

Products with low open circuit voltage, high current design, effectively reduce the system 3%BOS



High quality

Strict selection of packaging materials, resistance to PID hot spot anomaly, mechanical strength meets the conventional component hail test, 5400PA /2400PA snow load, wind load test through IEC61215, IEC61730 and other reliability certification tests



Better Performance

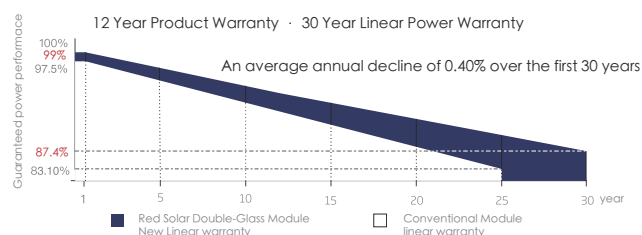
30-year linear warranty, 1% decline in the first year on average annual decline of 0.40% over the first 30 years, increased return on investment No Boron-oxygen LID (Light Induced Degradation).



High Returns

The n-type module has lower annual attenuation, better photoelectric conversion efficiency and temperature coefficient benefit, bifaciality can reach 80%.

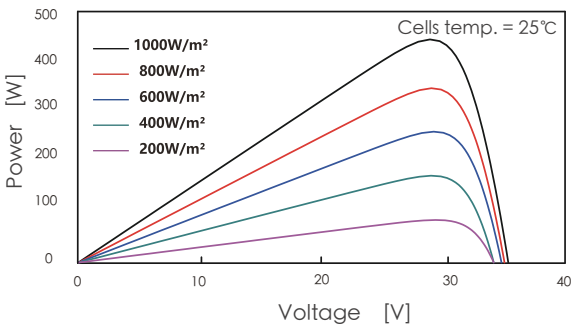
Excellent Power Guarantee



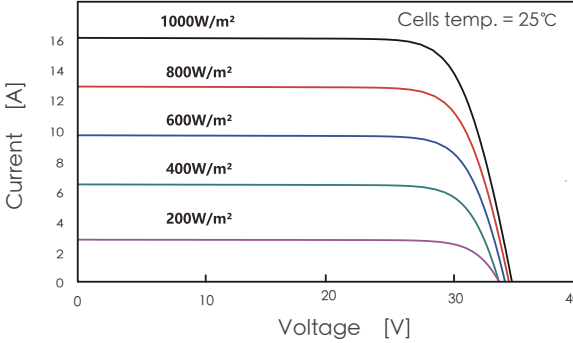
Model of PV Module
CETC-xxxTR(GDF)/96

Power Range
435-455W

P-V Curves of PV Module



I-V Curves of PV Module



Electrical Parameter(STC)

Model	435TR	440TR	445TR	450TR	455TR
Maximum power (W)	435	440	445	450	455
Working point voltage (V)	28.60	28.81	29.03	29.24	29.45
Working point current (A)	15.21	15.27	15.33	15.39	15.45
Open circuit voltage (V)	34.54	34.60	34.67	34.73	34.80
Short circuit current (A)	16.05	16.11	16.17	16.23	16.29
PV module efficiency	21.77%	22.02%	22.27%	22.52%	22.77%
Standard test conditions	Atmospheric quality Am1.5, Irradiance 1000W/m², Cell Temperature 25°C				

RearSide Power gain

5%	Maximum Power	457Wp	462Wp	467Wp	473Wp	478Wp
	Efficiency STC	22.9%	23.1%	23.4%	23.6%	23.9%
15%	Maximum Power	500Wp	506Wp	512Wp	518Wp	523Wp
	Efficiency STC	25.0%	25.3%	25.6%	25.9%	26.2%
25%	Maximum Power	544Wp	550Wp	556Wp	563Wp	569Wp
	Efficiency STC	27.2%	27.5%	27.8%	28.2%	28.5%

The Electrical performance parameters are neither just referred to one PV panel, nor are a part of the contract; They are only used as reference.

Mechanical Parameters

Module size	1762*1134*30mm
Number of solar cells	96Cells (2*6*8)
Weight	23.9 Kg ±5%
Junction Box	IP68, 3 diodes
Cables	4mm², 300mm, (Customizable)
Front glass	2.0mm Ultra white AR semi-toughened glass
Front glass	2.0mm semi-toughened glass
Static load on the front	5400Pa
Static load on the back	2400Pa

Packaging&Transport

40'HQ container transport	36 Pcs/box × 26 box = 936Pcs
Note: Packing tray requires additional customization	

Temperature Parameter Maximum Ratings

NMOT	42±2°C	Working temperature	-40~+85°C
Temperature coefficient of maximum power(Pmax)	-0.30%/°C	Maximum system voltage	1500VDC
Temperature coefficient of open circuit voltage(Voc)	-0.25%/°C	Maximum fuse rated current	30A
Temperature coefficient of short circuit current(Isc)	+0.045%/°C		



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