

Tier1

BloombergNEF

OPTONICA
SOLAR

YHSUNPRO
POWER



ISO 9001
ISO 45001

ISO 14001
OHSAS 18001

SA 8000



210R TOPCON MONO

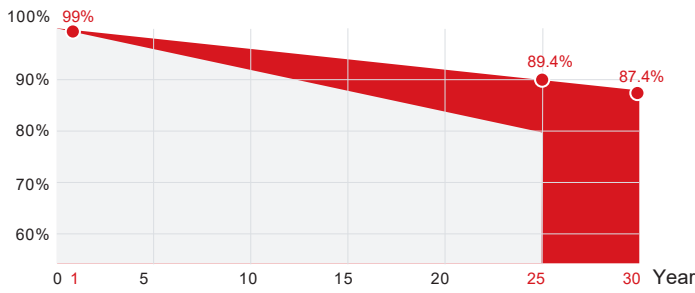
SPDG450-N96R12

450W

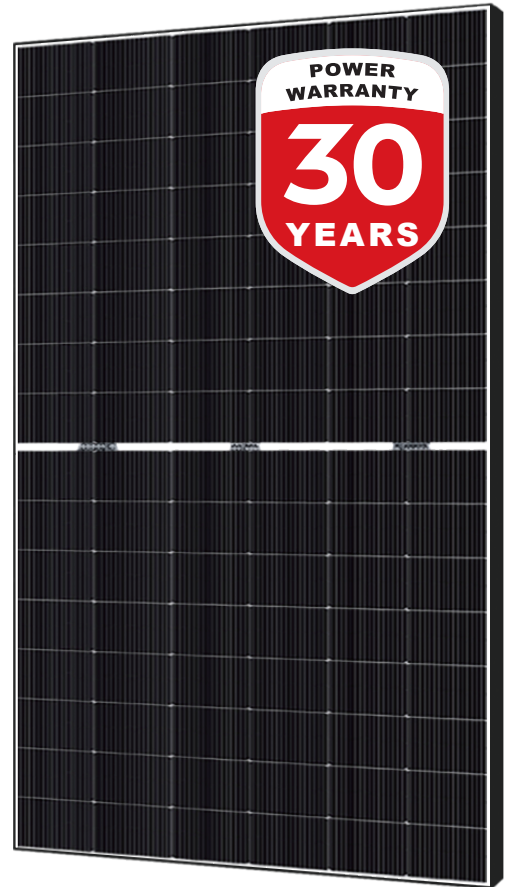
- Double glass
- Black frame
- Bifacial Transparent

25 Yr quality guarantee | 30 Yr power warranty

■ SUNPRO TOPCon module (Additional value from 30-year warranty)
 ■ Common module



*SUNPRO Standard tiered warranty



WARRANTY & GUARANTEE

Linear output power guarantee
25 years: 89.4% power output
30 years: 87.4% power output



WITHSTAND STRONG

Snow load 5400Pa
Wind load 2400Pa



PID RESISTANCE

Power positive tolerance 0~+5W.
The attenuation probability of PID phenomenon is minimized through battery production technology optimization and material control



R&D AND PRODUCTION

Advanced production line. Bifaciality>80%, effectively improves backside power generation. The leading solar cell cutting process and multi busbar design with SUNPRO Technology.



HIGH EFFICIENCY

N-type, Components have better reliability and lower LID/LETID attenuation. Efficiency can reach 22.52%. Excellent low light performance. Higher power output under the conditions of haze, overcast, etc.

Electrical parameters at standard test conditions (STC:AM=1.5, 1000W/m², Cells Temperature 25°C)

Typical type

	425W	430W	435W	440W	445W	450W
Max power(Pmax)	425	430	435	440	445	450
Max power voltage(Vmp)	28.76	28.98	29.22	29.46	29.69	29.93
Max power current(Imp)	14.78	14.84	14.89	14.94	14.99	15.04
Open circuit voltage(Voc)	34.5	34.77	35.03	35.28	35.54	35.8
Short circuit current(Isc)	15.65	15.7	15.77	15.82	15.86	15.9
Module Efficiency(%)	21.27	21.52	21.77	22.02	22.27	22.52
Max system voltage	DC 1500V(TÜV)					
Maximum Series Fuse Rating	30A					

Electrical Characteristics with 15% Rear Side Power Gain

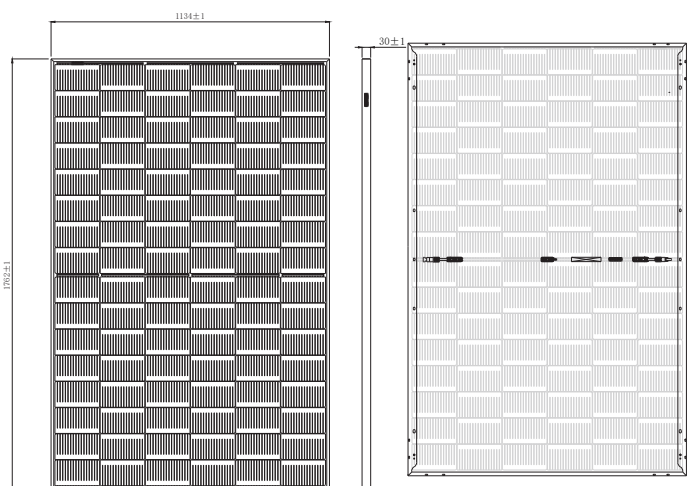
Front power Pmax/W	425W	430W	435W	440W	445W	450W
Total power Pmax/W	488.75	494.5	500.25	506	511.75	517.5
Vmp/V(Total)	28.76	28.98	29.22	29.46	29.69	29.93
Imp/A(Total)	16.99	17.06	17.12	17.18	17.24	17.29
Voc/V(Total)	34.5	34.77	35.03	35.28	35.54	35.8
Isc/A(Total)	18	18.06	18.14	18.19	18.24	18.29

Electrical parameters at NMOT test conditions

(Irradiance 800W/m², Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s)

Typical type	425W	430W	435W	440W	445W	450W
Max power(Pmax)	320.1	324.2	328.3	332.5	336.5	340.7
Max power voltage(Vmp)	26.9	27.2	27.4	27.6	27.9	28.1
Max power current(Imp)	11.90	11.93	11.99	12.03	12.06	12.11
Open circuit voltage(Voc)	32.6	32.9	33.1	33.4	33.7	33.9
Short circuit current(Isc)	12.60	12.64	12.70	12.74	12.77	12.80

DIMENSIONS AND STRUCTURE



Mechanical Data

Dimensions	1762×1134×30mm
Weight	23.8kg
Glass	(F) 2.0mm ultra clear embossed double layer colorless glass (B) 2.0mm glazed tempered glass
Output cables	4mm ² , symmetrical lengths 1100mm
Connectors	MC4 compatible IP68
Cell type	N type Mono-Crystalline , 182.2mm×105mm
Number of cells	96cells (Half-Cell)

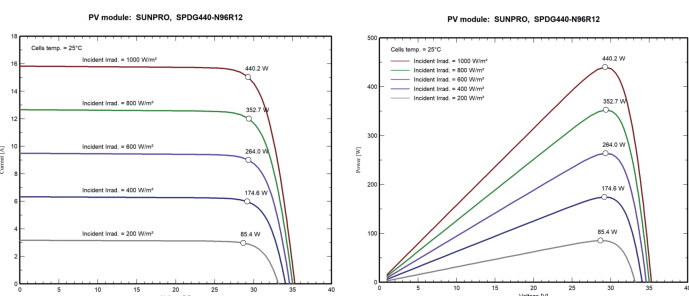
Temperature Characteristics

Temp.Coeff.of Isc(TK Isc)	0.045%/°C
Temp.Coeff.of Voc(TK Voc)	-0.25%/°C
Temp.Coeff.of Pmax(TK Pmax)	-0.30%/°C
Operating temperature	-40~+85°C
Normal operating cell temperature	45±2°C

Packing Configuration

Container	40'HQ
Pieces per pallet	36
Pallets per container	26
Pieces per container	936

I-V CHARACTERISTICS AT DIFFERENT IRRADIATION



Tests, Certifications and Warranties

Standard tests	IEC 61215, IEC 61730
System certs	ISO 9001, ISO14001, ISO45001
Certifications	TÜV, CE, WEEE
Extreme wind and snow loads testing	Withstand extreme wind(2400 Pascal) and snow loads(5400 Pascal)
Power tolerance	0~+5W
Junction box	IP 68
Warranties	25 years product warranty and 30 years 87.4% of power



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