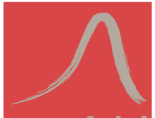


**Tier1**

BloombergNEF



Ariel Re

Lloyd's Syndicate 1910



ISO14001

ISO9001

ISO45001

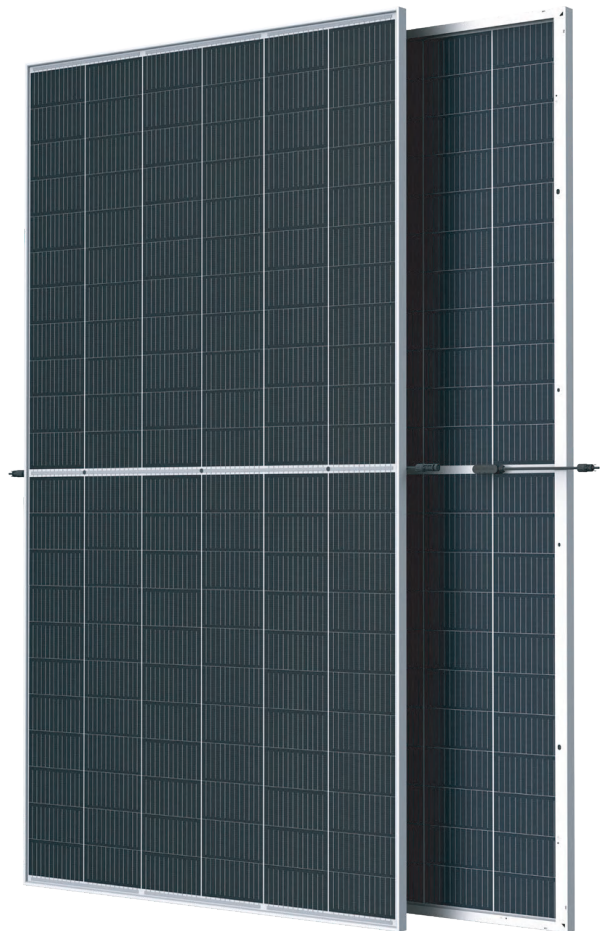
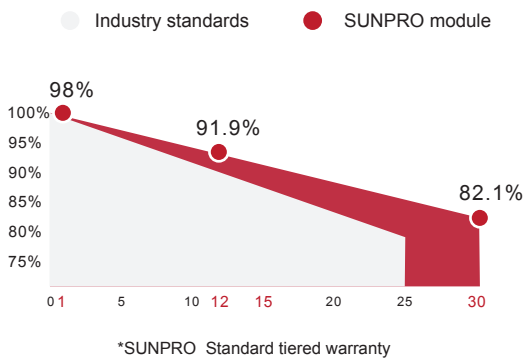


## M12 HIEFF TWIN MONO

### SPDGxxx-132M12

- Double glass (xxx=640~670W)
- Black frame
- Full black

15 Yr quality guarantee | 30Yr power warranty



#### WARRANTY & GUARANTEE

Linear output power guarantee  
12 years: 91.9% power output  
30 years: 82.1% power output



#### WITHSTAND STRONG

Snow load 5400Pa  
Wind load 2400Pa



#### TWO-SIDED BENEFITS

High efficiency solar cells.  
Effective working area of both sides >92%, with significant power increase. Capture more sunlight and turn it into electricity



#### R&D AND PRODUCTION

Advanced production line.  
The leading solar cell cutting process and multi busbar design with SUNPRO Technology.



#### HIGH EFFICIENCY

Efficiency can reach 24.80%. 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/m<sup>2</sup>, Cells Temperature 25°C)

### Typical type

	640W	645W	650W	655W	660W	665W	670W
Max power(Pmax)	640	645	650	655	660	665	670
Max power voltage(Vmp)	36.97	37.18	37.38	37.58	37.79	38.01	38.22
Max power current(Imp)	17.31	17.35	17.39	17.43	17.47	17.50	17.53
Open circuit voltage(Voc)	44.85	45.06	45.27	45.48	45.69	45.91	46.13
Short circuit current(Isc)	18.36	18.40	18.44	18.48	18.52	18.56	18.60
Module Efficiency(%)	20.60	20.76	20.92	21.09	21.25	21.41	21.57
Max system voltage	DC 1500V(TUV)						
Maximum Series Fuse Rating	30A						

### Electrical parameters at NMOT test conditions

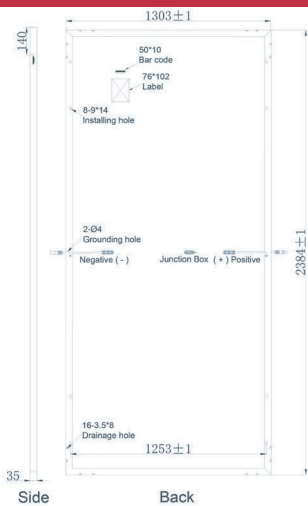
(Irradiance 800W/m<sup>2</sup>, Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s)

Typical type	650W	655W	660W	665W	670W
Max power(Pmax)	529.7	533.6	537.8	541.8	545.7
Max power voltage(Vmp)	38.1	38.3	38.5	38.7	38.9
Max power current(Imp)	13.89	13.93	13.97	14.00	14.03
Open circuit voltage(Voc)	45.5	45.7	45.9	46.1	46.4
Short circuit current(Isc)	14.72	14.76	14.80	14.83	14.86

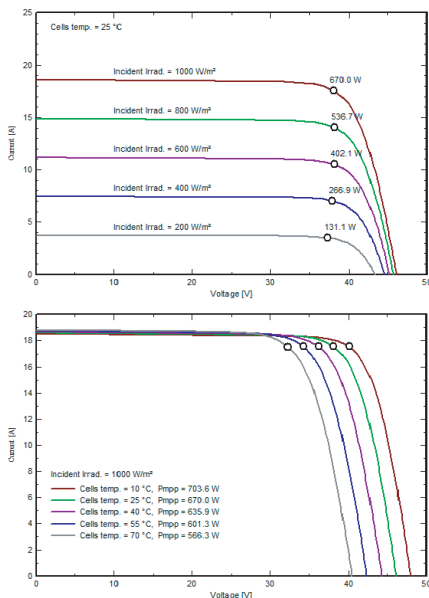
### Electrical Characteristics with 15% Rear Side Power Gain

Front power Pmax/W	640W	645W	650W	655W	660W	665W	670W
Total power Pmax/W	736	741.75	747.5	753.5	759	764.75	770.5
Vmp/V(Total)	36.97	37.18	37.38	37.58	37.79	38.01	38.22
Imp/A(Total)	19.91	19.95	20.00	20.04	20.08	20.12	20.16
Voc/V(Total)	44.85	45.06	45.27	45.48	45.69	45.91	46.13
Isc/A(Total)	21.11	21.16	21.21	21.25	21.30	21.34	21.39

### DIMENSIONS AND STRUCTURE



### I-V CHARACTERISTICS AT DIFFERENT IRRADIATION



### Mechanical Data

Dimensions	2384x1303x35mm
Weight	35 kg
Glass	(F) 2.0 mm High Transmission, AR Coated Heat Strengthened Glass (B) 2.0 mm High Transmission, AR Coated Heat Strengthened Glass
Output cables	4mm <sup>2</sup> , symmetrical lengths 1300mm
Connectors	MC4 compatible IP68
Cell type	Mono-Crystalline PERC, 12BB, 210x105mm
Number of cells	132 cells ( Half-Cell )

### Temperature Characteristics

### Packing Configuration

Temp.Coeff.of Isc(TK Isc)	0.049%/°C	Container	40'HQ
Temp.Coeff.of Voc(TK Voc)	-0.27%/°C	Pieces per pallet	31
Temp.Coeff.of Pmax(TK Pmax)	-0.35%/°C	Pallets per container	17
Operating temperature	-40~+85°C	Pieces per container	527
Normal operating cell temperature	44±2°C		

### Tests, Certifications and Warranties

Standard tests	IEC 61215, IEC 61730, IEC 61701, IEC 62716, PPP 58042B
System certs	ISO 9001, ISO14001, ISO45001, TUV
Certifications	TUV, AMMONIA AND SALT MIST CORROSION, ANTI-PID, CE, WEEE, INMERTRO
Extreme wind and snow loads testing	Withstand extreme wind(2400 Pascal) and snow loads(5400 Pascal)
Power tolerance	0~+3%
Junction box	IP 68
Warranties	15 years product warranty and 30 years 82.1% of power