



# TN182\*210 435-460W FULL BLACK

High efficiency bifacial modules

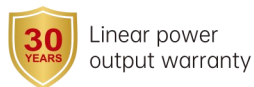
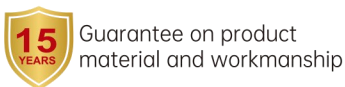
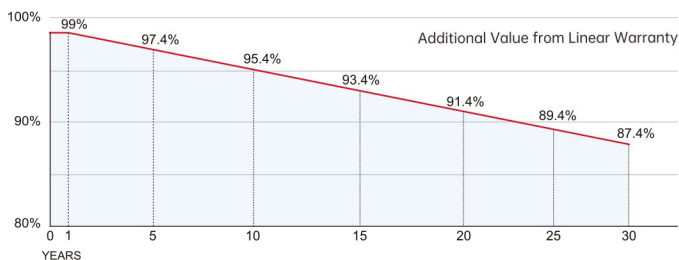
## • QUALITY SYSTEM

ISO9001 / ISO14001 / ISO45001

## • PRODUCT CERTIFICATION

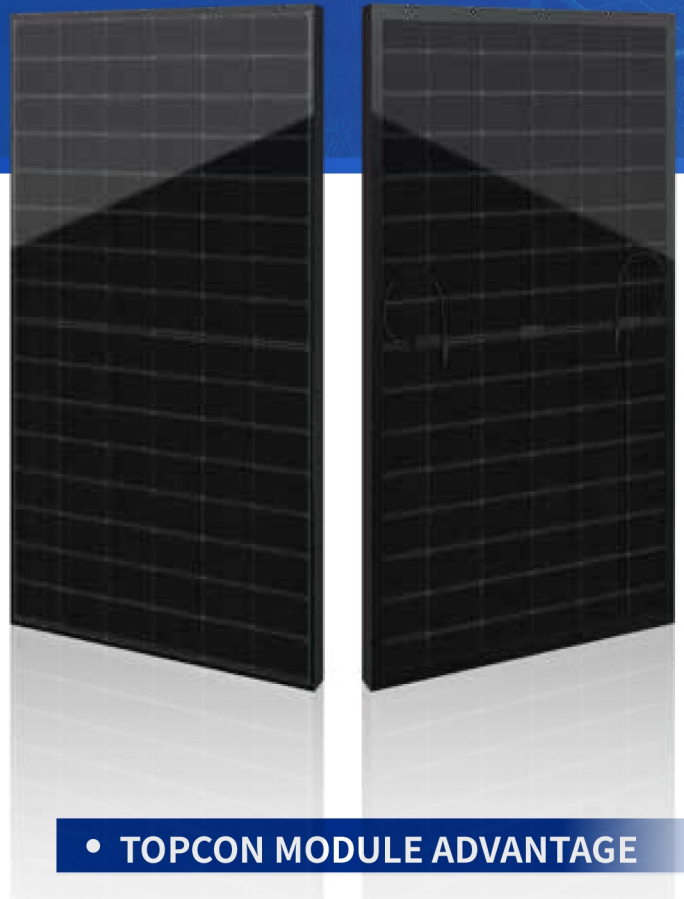


## • WARRANTY



## • TOPCON MODULE ADVANTAGE

- Multi-Busbar technology
- High module efficiency
- Lower annual attenuation  
Longer warranty
- Reduce hot spot effect
- capacity
- Excellent low-light
- LCOE
- Higher bifaciality

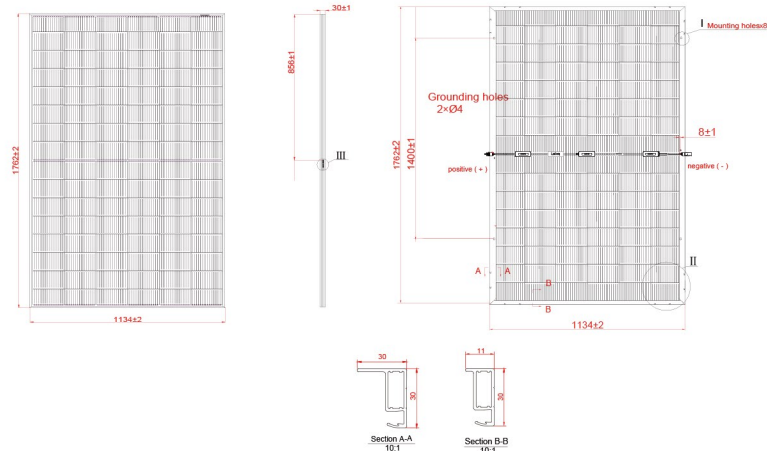




**Mechanical Specifications**

External Dimension	1762 x 1134 x 30 mm
Weight	24.9 kg
Solar Cells	TOPCon 182 x 105mm (96pcs)
Front / Back Glass	2.0mm AR coating semi-tempered glass, low iron
Frame	Black anodized aluminium alloy
Junction Box	IP68, 3 diodes
Output Cables	4.0mm <sup>2</sup> , 250mm(+)/350mm(-) or Customized Length

**Technical drawing**



**Packing Configuration**

Container	20'GP	40'HQ
Pieces per Pallet	36	36
Pallets per Container	6	26
Pieces per Container	216	936

**Electrical Characteristics**

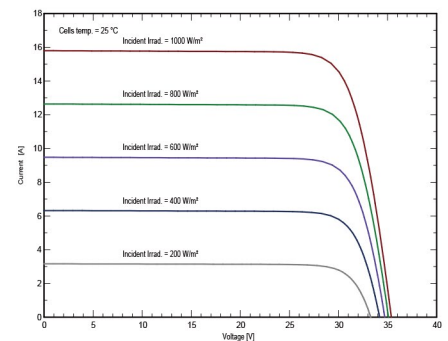
Module Type	435		440		445		450		455		460	
	Front STC	Front BNPI	Front STC	Front BNPI	Front STC	Front BNPI	Front STC	Front BNPI	Front STC	Front BNPI	Front STC	Front BNPI
Maximum Power -P <sub>mp</sub> (W)	435	482	440	488	445	493	450	499	455	504	460	510
Open Circuit Voltage -V <sub>oc</sub> (V)	35.18	35.26	35.38	35.46	35.58	35.66	35.78	35.86	35.98	36.06	36.18	36.26
Short Circuit Current -I <sub>sc</sub> (A)	15.75	17.45	15.80	17.51	15.85	17.56	15.90	17.62	15.95	17.67	16.00	17.73
Maximum Power Voltage -V <sub>mp</sub> (V)	29.21	29.29	29.41	29.49	29.61	29.69	29.81	29.89	30.01	30.09	30.21	30.29
Maximum Power Current -I <sub>mp</sub> (A)	14.90	16.46	14.97	16.53	15.03	16.61	15.10	16.68	15.17	16.75	15.23	16.83
Module Efficiency STC-η <sub>m</sub> (%)	21.77		22.02		22.27		22.52		22.77		23.02	
Power Tolerance(W)	(0,+4.99)											

STC: Irradiance 1000 W/m<sup>2</sup> module temperature 25°C AM=1.5 Power measurement tolerance: +/-3%; Voltage measurement tolerance: +/-3%; Current measurement tolerance: +/-4%  
BNPI: front 1000 W/m<sup>2</sup> rear 135 W/m<sup>2</sup> Power measurement tolerance: +/-3%; Voltage measurement tolerance: +/-3%; Current measurement tolerance: +/-4%

**Rear Side Power Gain(450W)**

Power Gain	10%	15%	20%	25%	30%
Maximum Power -P <sub>mp</sub> (W)	495	518	540	563	585
Open Circuit Voltage -V <sub>oc</sub> (V)	35.78	35.78	35.78	35.78	35.78
Short Circuit Current -I <sub>sc</sub> (A)	17.49	18.29	19.08	19.88	20.67
Maximum Power Voltage -V <sub>mp</sub> (V)	29.81	29.81	29.81	29.81	29.81
Maximum Power Current -I <sub>mp</sub> (A)	16.61	17.37	18.12	18.88	19.63

**I-V Curve**



**Temperature Ratings**

Pmax Temperature Coefficient	-0.29 %/°C
Voc Temperature Coefficient	-0.25 %/°C
Isc Temperature Coefficient	+0.046 %/°C

**Application Conditions**

Maximum System Voltage	1500V DC
Maximum Series Fuse Rating	30 A
Operating Temperature	-40~+85 °C
Nominal Operating Cell Temperature	45±2 °C
Bifaciality	80%±5%
Mechanical Load	Front side 5400 Pa / Back side 2400 Pa

