

WHALE SERIES

Bifacial Solar Panel








78 M10L Half Cut Cells (N-Topcon)

TYPE: AS-(650-670)-78IIMB

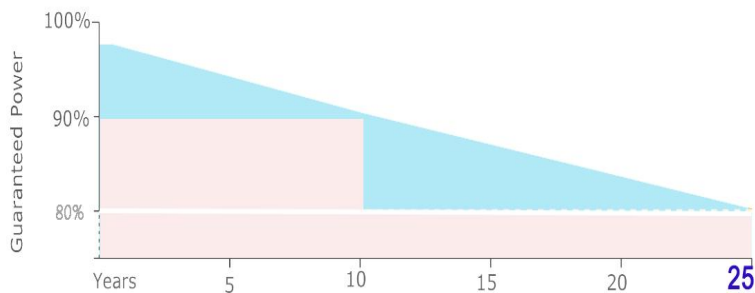
650W-670W

23.97% efficiency

ADVANTAGES & FEATURES

- 
HIGH SAVING
 Lower LCOE, reduced BOS cost shorter payback time
- 
HIGH EFFICIENCY
 Excellent module conversion efficiency of up to 23.97%
- 
LOW-LIGHT PERFORMANCE
 Advanced glass and cell surface textured design ensure excellent performance in low-light environment.
- 
PID RESISTANCE
 Excellent Anti-PID performance guarantees Limited power degradation for mass production
- 
IP68 JUNCTION BOX
 High waterproof level
- 
BIFACIAL TECHNOLOGY
 Up to 30% More Power Output than normal standard PV modules.
 Bi-Faciality Factor: $70 \pm 5\%$
- 
TOPCON AND HALF CUT CELLS
 Stable and Lower Temperature coefficient.

LINEAR GRAPH



Output Warranty
25 Years

Product Guarantee
12 Years

Power Degradation: < 2% For the First Year
< 0.5% / Year in 2~25 Years

CERTIFICATES

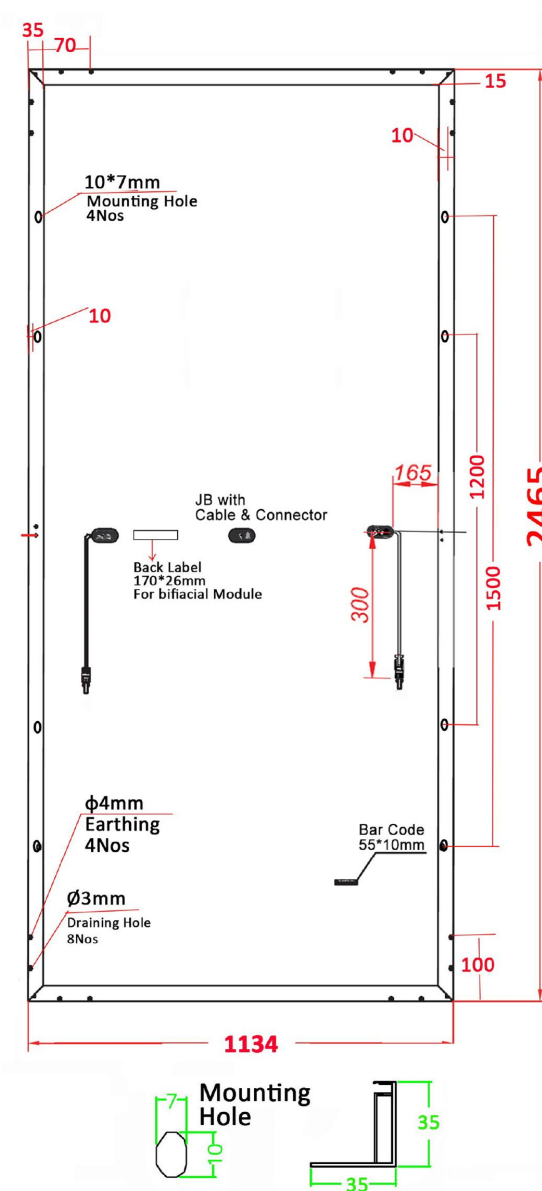


ELECTRICAL CHARACTERISTIC @STC

STC: 1000W/M ² , AM: 1.5, 25°C		STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Max. Power (Pmax)	(W)	650W	492W	655W	497W	660W	501W	665W	505W	670W	509W
Max. Power Voltage (Vmpp)	(V)	48.83	44.79	48.98	44.95	49.14	45.02	49.29	45.09	49.41	45.18
Max. Power Current (Impp)	(A)	13.34	10.98	13.39	11.03	13.45	11.08	13.50	11.13	13.56	11.18
Open Circuit Voltage (Voc)	(V)	55.92	52.56	56.09	52.73	56.26	52.81	56.43	52.88	56.59	52.96
Short Circuit Current (Isc)	(A)	14.12	11.72	14.17	11.77	14.22	11.83	14.28	11.89	14.35	11.96
Module Efficiency	(Eff%)	23.26%		23.43%		23.61%		23.79%		23.97%	

*STC (Standard Test Condition): Irradiance 1000W/m², Cell Temperature 25°C, Air Mass 1.5 *Measurement Tolerance (±3.0%)
*NOCT (Nominal Module Operating Temperature): Irradiance 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

DRAWING (IN MM)



TEMPERATURE COEFFICIENTS MAX. LIMITS

Temp Coefficients of Pm	-0.300%/°C	Max. System Voltage	1500VDC IEC
Temp Coefficients of Voc	-0.250%/°C	Operating Temp	-40°C to +85°C
Temp Coefficients of Isc	+0.300%/°C	Noct	45°C±2 °C

MECHANICAL CHARACTERISTICS

Cell Technology and size	N-Topcon 16BB, 183.75mmx91.1mm
Number of Cells (pcs)	156 Pcs Half Cut of M10-L (78*2)
Dimensions	2465x1134x35mm
Glass / Front Cover	3.2mm, High Transmission AR coated Safe Glass
Encapsulation	0.55mm,PID free EVA film, UV CUT & UV THROUGH
Rear Cover	0.32mm Transparent Back Sheet, High Light Transmission
Weight	30.2 kgs
Frame	Anodized Aluminum Alloy, Silver Color
Junction Box	IP68 Certified,3 Bypass diodes, split junction box
Cables & Connectors	4mm ² 12AWG, Length 300mm, MC4 compatible Connectors
Allowable Hail Load	227g steel ball dropped from 1m height
Surface Load	Snow Load 5400pa, Wind Load 2400pa
Series Fuse Rating:	30A Application Class: A Fire Rating Class: C

PACKAGING CONFIGURATION

Modules per Pallet: 31pcs	Modules per 40HQ Container: 620pcs
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IV CURVES

