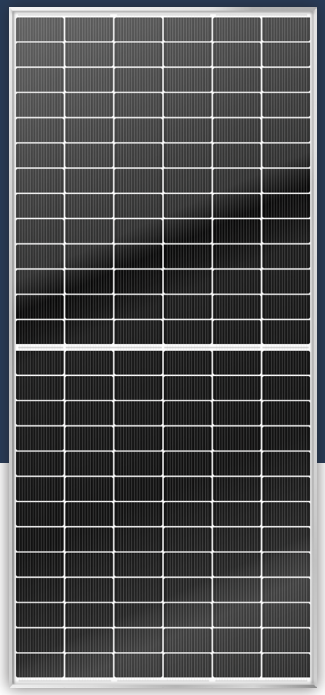
THORNOVA solar | TIER 1 BloombergNEF

615-640 W

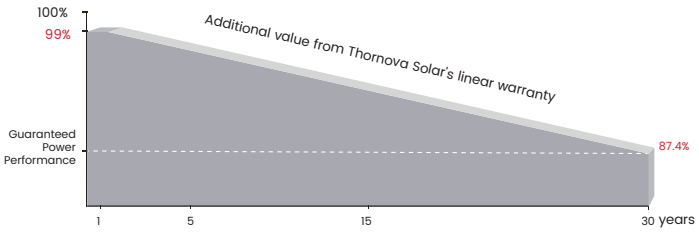
High efficiency bifacial single glass module

TS-BWT78



- Bifacial technology allows for the harvesting of up to an additional 25% energy from the rear side of the module.
- 30 years lifespan brings 10-30% additional power generation comparing with conventional P-type module.
- N-type solar cell has no LID naturally which can increase power generation.
- Excellent low irradiance performance.
- Enhanced light trapping and optimized current collection contribute to the improvement of both module power output and reliability.
- Industry leading lowest thermal coefficient of power.
- Design optimized for lower operating current, resulting in minimized hot spot loss and improved temperature coefficient.
- Certified to withstand: wind load (2400 Pa) and snow load (5400 Pa).
- 100% triple EL test enables remarkable reduction of module hidden crack rate.

LINEAR PERFORMANCE WARRANTY



15 years
Product quality & process guarantee

30 years
Linear power guarantee

0.40 %
Annual degradation Over 30 years

RE INSURANCE

Munich RE

Ariel Re

* Optional performance warranty insurance. Please contact our local sales staff for more information.

COMPREHENSIVE CERTIFICATES

Intertek

ISO 9001: Quality Management System
ISO 14001: Environmental Management System Standard
ISO 45001: International Occupational Health and Safety Assessment System Standard

* Different markets have different certification requirements. Also, the products are under rapid innovation. Please confirm the certification status with regional sales representatives.

ELECTRICAL CHARACTERISTICS

2×78cells

Model of modules	TS-BWT78(615)		TS-BWT78(620)		TS-BWT78(625)		TS-BWT78(630)		TS-BWT78(635)		TS-BWT78(640)	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Peak power - P_{mp} (W)	615	471	620	475	625	479	630	482	635	486	640	489
Open circuit voltage - V_{oc} (V)	55.79	53.42	55.99	53.61	56.18	53.79	56.37	53.97	56.56	54.15	56.75	54.33
Short circuit current - I_{sc} (A)	13.69	11.04	13.74	11.08	13.79	11.12	13.84	11.16	13.89	11.20	13.94	11.24
MPP voltage - V_{mp} (V)	47.24	45.23	47.44	45.42	47.61	45.59	47.80	45.77	47.99	45.95	48.18	46.13
MPP current - I_{mp} (A)	13.02	10.41	13.07	10.45	13.13	10.50	13.18	10.54	13.23	10.57	13.28	10.60
Module efficiency - η_m (%)	22.0		22.2		22.4		22.5		22.7		22.9	

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25 ℃, Spectra at AM1.5
NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20℃, Spectra at AM1.5, Wind at 1m/s

ELECTRICAL CHARACTERISTICS WITH DIFFERENT POWER BIN (REFERENCE TO 13.5% IRRADIANCE RATIO)

Peak power - P_{mp} (W)	681	687	693	698	704	709
Open circuit voltage - V_{oc} (V)	55.92	56.14	56.33	56.54	56.75	56.75
Short circuit current - I_{sc} (A)	15.09	15.14	15.2	15.28	15.33	15.45
MPP voltage - V_{mp} (V)	47.24	47.44	47.61	47.8	47.99	48.18
MPP current - I_{mp} (A)	14.42	14.48	14.55	14.6	14.66	14.72
Irradiance ratio (rear/front)	13.5 %					

STRUCTURAL CHARACTERISTICS

Module dimension (L*W*H)	2465 x 1134 x 35 mm(97.05 x 44.65 x 1.38 inch)
Weight	29.0 kg (63.93 lbs)
Number of cells	156 cells
Cell	N-type monocrystalline
Glass	Tempered, 3.2 mm AR, High transmittance, Low iron
Backsheet	Transparent white mesh backsheet
Frame	Anodized aluminum alloy
Junction box	IP68, 3 diodes
Output wire	4.0 mm²
Wire length	300 mm / 1200 mm / Customized length
Connector	MC4 - EVO2
Packing specification	31 pcs/Pallet; 496 pcs/40'HQ

OPERATING PARAMETERS

Power tolerance (W)	(0,+5)
Maximum system voltage (V)	1500
Maximum rated fuse current (A)	30
Current operating temperature (℃)	-40~+85 ℃
Bifaciality	80±5%

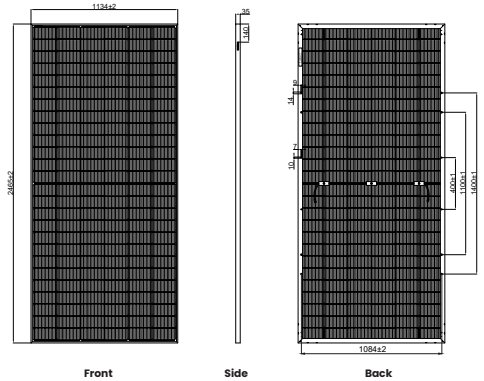
MECHANICAL LOADING

Front side maximum static loading (Pa)	5400
Rear side maximum static loading (Pa)	2400
Hailstone test (mm)	35

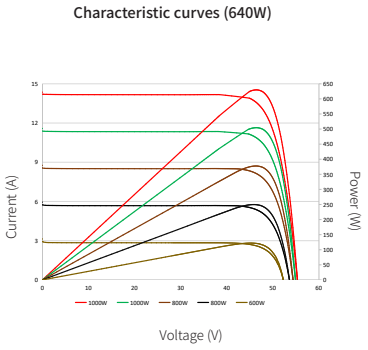
TEMPERATURE RATINGS

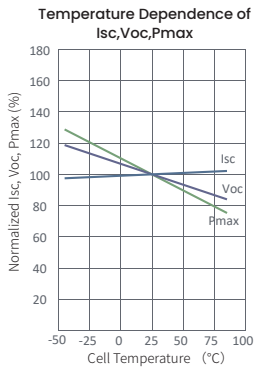
Temperature coefficient (P_{max})	-0.29 %/℃
Temperature coefficient (V_{oc})	-0.28 %/℃
Temperature coefficient (I_{sc})	+0.04 %/℃
Nominal operating cell temperature	45±2 ℃

MODULE DIMENSIONS (MM)



*** The unmarked tolerance is ±1 mm**
Length shown in mm





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