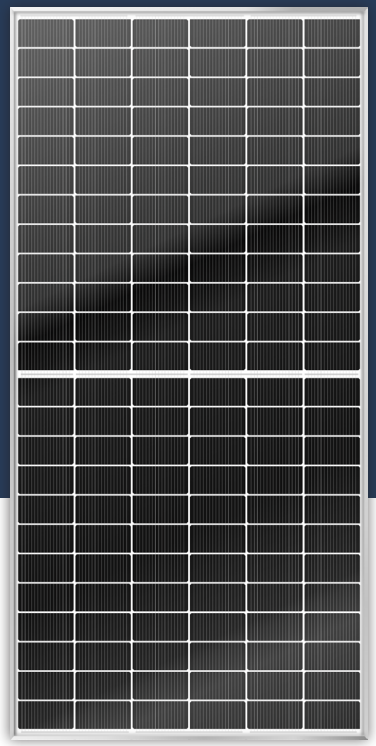
THORNOVA solar | TIER 1 BloombergNEF

Tangra™ M Pro

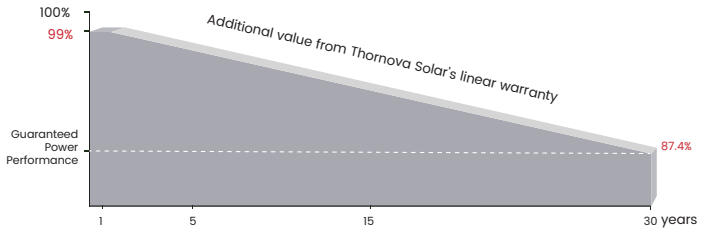
N-Type High efficiency Bifacial Dual Glass Module

TS-BGT72(580-600)



- Bifacial technology allows for the harvesting of up to an additional 30% 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 warranty

30 years
Linear power warranty

0.40 %
Annual degradation Over 30 years

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.

RE INSURANCE

Warranty partner

Munich RE | Ariel Re

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

ELECTRICAL CHARACTERISTICS

2×72cells

Model of modules	TS-BGT72(580)		TS-BGT72(585)		TS-BGT72(590)		TS-BGT72(595)		TS-BGT72(600)	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Peak power - P_{mp} (W)	580	444	585	448	590	452	595	456	600	460
Open circuit voltage - V_{oc} (V)	51.97	49.76	52.16	49.94	52.35	50.12	52.54	50.30	52.73	50.48
Short circuit current - I_{sc} (A)	13.80	11.12	13.85	11.16	13.90	11.20	13.95	11.24	14.00	11.28
MPP voltage - V_{mp} (V)	44.04	42.17	44.22	42.34	44.40	42.51	44.58	42.68	44.76	42.85
MPP current - I_{mp} (A)	13.17	10.53	13.23	10.58	13.29	10.63	13.35	10.68	13.41	10.73
Module efficiency - η_m (%)	22.5		22.6		22.8		23.0		23.2	

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25 ℃, Spectra at AM1.5
NMOT (Nominal Module Operating 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)	643	648	654	659	665
Open circuit voltage - V_{oc} (V)	51.97	52.16	52.35	52.54	52.73
Short circuit current - I_{sc} (A)	15.29	15.35	15.40	15.46	15.51
MPP voltage - V_{mp} (V)	44.04	44.22	44.40	44.58	44.76
MPP current - I_{mp} (A)	14.59	14.66	14.72	14.79	14.86
Irradiance ratio (rear/front)	13.5 %				

STRUCTURAL CHARACTERISTICS

Module dimension (L*W*H)	89.69 x 44.65 x 1.38 inch (2278 x 1134 x 35 mm)
Weight	69.45 lbs (31.5 kg)
Number of cells	144 cells
Cell	N-type monocrystalline (M10)
Glass	(F)2.0mm, Anti-Reflection Coating (B)2.0mm, Heat Strengthened Glass
Frame	Anodized aluminum alloy
Junction box	IP68, 3 bypass diodes
Output wire	4.0 mm²
Wire length	300 mm / 1200 mm / Customized length
Connector	MC4 - EVO2
Packing specification	31 pcs/Pallet; 558 pcs/40'HQ

OPERATING PARAMETERS

Power tolerance (W)	(0,+5)
Maximum system voltage (V)	1500
Maximum rated fuse current (A)	30
Current operating temperature (°C)	-40~+185 °F (-40~+85 °C)
Bifaciality	80±10 %

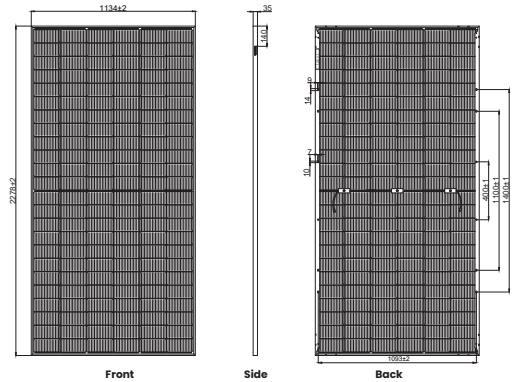
MECHANICAL LOADING

Front side maximum static loading (Pa)	5400
Rear side maximum static loading (Pa)	2400
Hailstone test (mm)	40

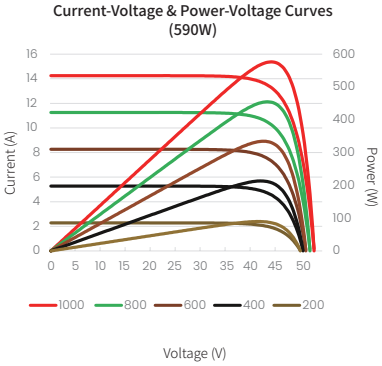
TEMPERATURE RATINGS

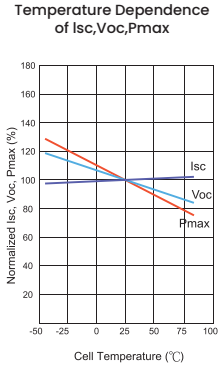
Temperature coefficient (P_{max})	-0.29 %/K
Temperature coefficient (V_{oc})	-0.28 %/K
Temperature coefficient (I_{sc})	+0.04 %/K
Nominal Module Operating Temperature	109.4±35.6 °F (43±2 °C)

MODULE DIMENSIONS (MM)



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





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