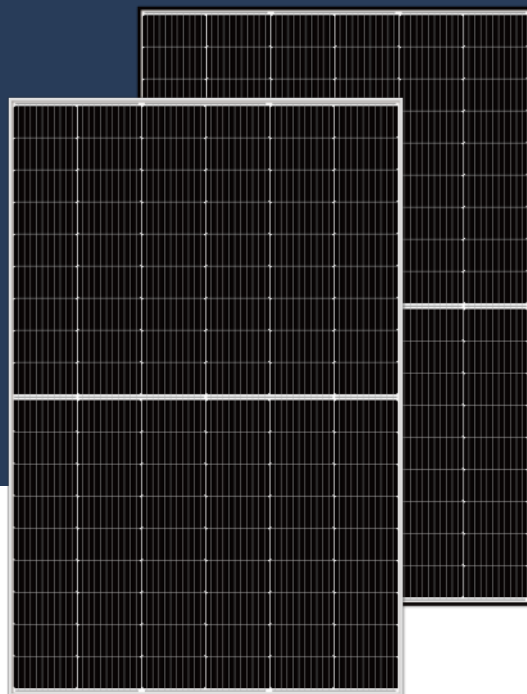


425-440W

N-type high efficiency half-cell mono module

TS-BBT54



30-year lifespan delivers 10-30% more power compared with conventional P-type modules



The natural lack of LID in the N-type solar cell can increase power generation



Excellent low irradiance performance



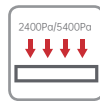
Better light trapping and current collection to improve module power output and reliability



Industry-leading, lowest thermal coefficient



Optimized electrical design and lower operating current for reduced hot spot loss and better temperature



Certified to withstand 2400 Pa of wind load and 5400 Pa of snow load



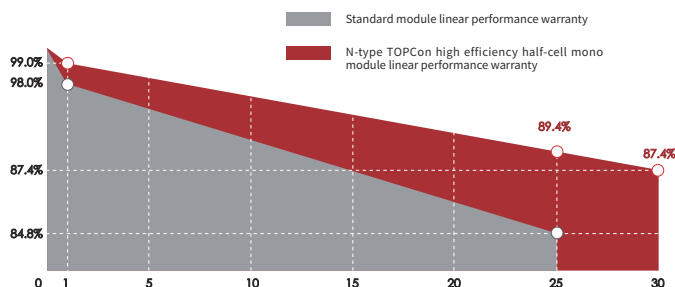
100% triple EL test, which greatly reduces the hidden cracks rate

WARRANTY INSURANCE



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

LINEAR PERFORMANCE WARRANTY



15 years Product quality & process guarantee

30 years Linear power guarantee

0.40% Annual degradation

COMPREHENSIVE CERTIFICATES



- ISO 9001: Quality Management System
- ISO 14001: Environmental Management System Standard
- ISO 45001: International Occupational Health and Safety Assessment System Standard
- SA8000: 2014 Social Accountability Management System

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

ELECTRICAL CHARACTERISTICS

Model of modules	TS-BBT54(425)		TS-BBT54(430)		TS-BBT54(435)		TS-BBT54(440)	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum power — P_{mp} (W) $\pm 3\%$	425	317	430	320	435	324	440	328
Open-circuit voltage — V_{oc} (V) $\pm 3\%$	38.64	36.47	38.77	36.60	38.90	36.72	39.03	36.84
Short-circuit current — I_{sc} (A) $\pm 3\%$	13.48	10.89	13.57	10.96	13.65	11.03	13.73	11.09
Maximum power voltage — V_{mp} (V)	33.07	30.96	33.20	31.08	33.34	31.21	33.48	31.34
Maximum power current — I_{mp} (A)	12.85	10.23	12.95	10.31	13.05	10.38	13.15	10.46
Module efficiency — η_m (%)	21.8		22.0		22.3		22.5	
Power tolerance (W)	(0,+5)							
Maximum system voltage (V)	1500							
Maximum rated fuse current (A)	25							
Current operating temperature (°C)	-40~+85 °C							

STC (Standard Testing Conditions): Irradiance 1000W/m², Cell Temperature 25 °C, Spectra at AM1.5

NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m², Ambient Temperature 20°C, Spectra at AM1.5, Wind at 1m/s

STRUCTURAL CHARACTERISTICS

Module dimensions (L*W*H)	1722 x1134 x 30 mm
Weight	21.5 kg
Number of cells	108 cells
Cell	N-type monocrystalline
Glass	Tempered, 3.2 mm AR, high transmittance, low iron
Frame	Anodized aluminum alloy (Silver/Black)
Junction box	IP68, 3 bypass diodes
Output wire	4.0 mm ²
Wire length	300mm/1200mm/customized
Connector	PV-KST4-EVO 2/xy_UR,PV-KBT4-EVO 2/xy_UR
Connector Manufacturer	Staubli Electrical Connectors AG
Mechanical load	Snow load: 5400 Pa */ Wind load: 2400 Pa ☑

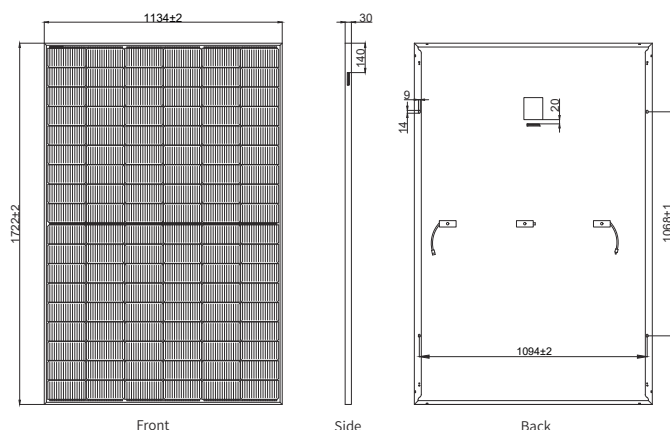
TEMPERATURE PERFORMANCE RATINGS

TANGRA temperature coefficient (P_{max})	-0.30 %/°C
Temperature coefficient (V_{oc})	-0.28 %/°C
Temperature coefficient (I_{sc})	+0.04 %/°C
Nominal operating cell temperature	43±2 °C
Fire safety class	C

PACKAGING CONFIGURATION

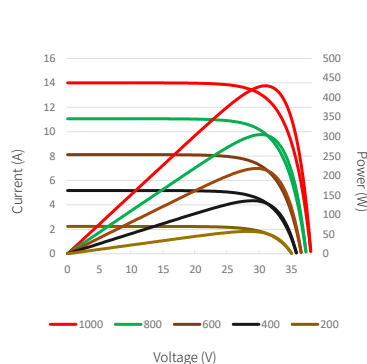
Container	40HQ
Quantity/pallet	36
Pallets/container	26
Quantity/container	936

MODULE DIMENSIONS (MM)

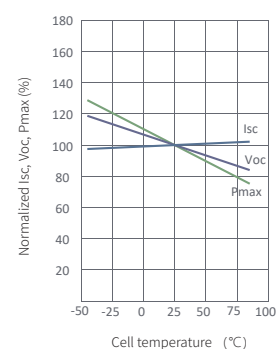


* The unmargin is ± 1 mm
Length shown in mm

Characteristic curves (430W)



Temperature Dependence of I_{sc} , V_{oc} , P_{max}



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E-mail: info@thornovasolar.com

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