

Tangra™ S Pro HD C Black

435-450W

Composite frame

N-type monochrome module made of high-density double-sided glass



Bifacial technology allows additional energy to be extracted from the back of the module (up to 30%)



30-year **lifespan** provides an additional 10-30% of power compared to a conventional P-type module



N-type cells **have a lower luminous degradation**, which obviously affects the performance of the



Excellent **performance** at low irradiance



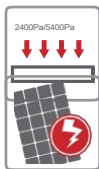
Improved light capture and conversion to electricity for increased power and reliability



One of **the lowest** power temperature coefficients on the market



Optimised electrical design



Maximum static load Snow pressure: 5400 Pa
Wind pressure: 2400 Pa

Full triple EL tests for maximum reduction of **microcracks** and tests and photos

PERFORMANCE INSURANCE



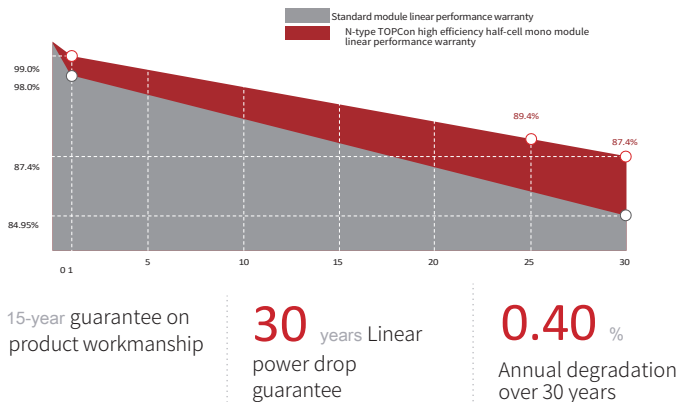
Warranty partner



中国平安
PING AN
P & C INSURANCE CO CN SZN

* Optional warranty insurance. Contact us for more information.

LINEAR GUARANTEE



COMPREHENSIVE CERTIFICATION

viewability of these



ISO 9001: Quality management standard
ISO 14001: Environmental management standard
ISO 45001: Health and safety system management
SA8000: standard 2014 Social responsibility

* Different markets **require different** certification. At the **same** time, our products **are subject to constant** innovation. **Please** confirm certification with your regional sales representative.

ELECTRICAL CHARACTERISTICS

96 cells

Module type	TS-BGT48(435)-G11		TS-BGT48(440)-G11		TS-BGT48(445)-G11		TS-BGT48(450)-G11	
	STC	NMOT	STC	NMOT	STC	NMOT	STC	NMOT
Maximum power - $P_{(mp)}$ (W)	435	327	440	331	445	335	450	338
Circuit voltage - $V_{(oc)}$ (V)	34.49	32.77	34.67	32.94	34.85	33.11	35.03	33.28
Short-circuit current - $I_{(sc)}$ (A)	15.90	12.84	15.95	12.88	16.00	12.92	16.05	12.96
Voltage at maximum power point - $V_{(mp)}$ (V)	29.54	27.51	29.72	27.68	29.90	27.88	30.08	27.96
Current at maximum power point - $I_{(mp)}$ (A)	14.73	11.89	14.81	11.96	14.89	12.02	14.97	12.09
Module efficiency - $\eta_{(m)}$ (%)	21.8		22.0		22.3		22.5	

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

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

ADDED VALUE OF OUR PRODUCTS (INCLUDING 13.5% REFLECTED RADIATION)

Maximum power (P_{max}) (W)	482	488	493	499
Circuit voltage (V_{oc}) (V)	34.49	34.67	34.85	35.03
Short-circuit current (I_{sc}) (A)	17.62	17.67	17.73	17.78
Maximum power point voltage (V_{mp}) (V)	29.54	29.72	29.90	30.08
Current at maximum power point (I_{mp}) (A)	16.32	16.41	16.50	16.59

PRODUCT CHARACTERISTICS

Product dimensions (length*sh*h)	1762 x 1134 x 30 mm
Weight	24.3±1kg
Cell	96 cells, N-type monocrystalline
Front glass	2.0 mm toughened anti-reflective glass
Rear glass	2.0 mm toughened glass
Frame	Black GFRP (glass fibre reinforced polymer)
Junction box	IP68, 3 bypass diodes
Cable	4.0 mm ²
Cable length	300mm / 1200mm or longer on request
Connectors	Compatible with MC4
Packing configuration	36 pcs./pallet, 936 pcs./40'HQ

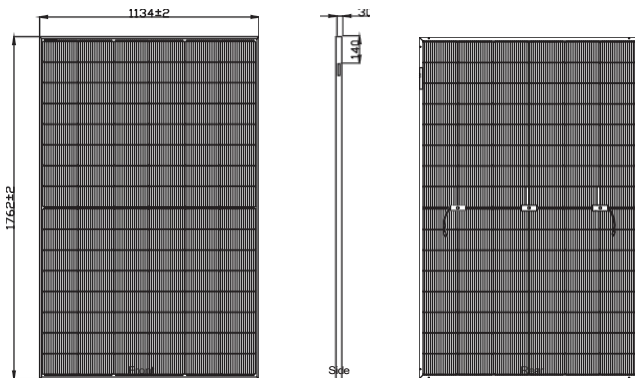
WORKING PARAMETERS

Power tolerance (W)	(0,+5)
Maximum system voltage (V)	1500
Maximum nominal current for series connection (A)	30
Operating temperature (°C)	-40~+85 °C
Maximum load	5400 Pa☀ / 2400 Pa☁

TEMPERATURE COEFFICIENTS

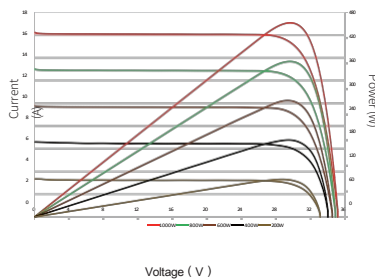
Temperature coefficient (P_{max})	-0.30 %/°C
Temperature coefficient (V_{oc})	-0.28 %/°C
Temperature coefficient (I_{sc})	+0.04 %/°C
Nominal Module Operating Temperature	43±2 °C

MODULE DIMENSIONS (mm)

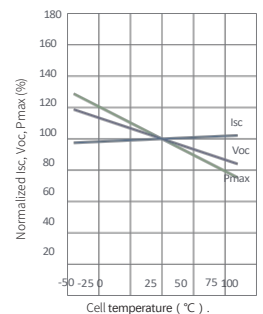


* Unmarked tolerance is ±1 mm, Length given in mm. * Only for mounting on bracket

Current-voltage characteristics (445W)



Power variation characteristic as a function of cell temperature



Scan the QR code to
get more information

Web: www.thornovasolar.com

E-mail: info@thornovasolar.com

* The technical specifications contained in this data sheet may vary from region to region. Thornova Solar do not guarantee their full accuracy. Due to continuous innovation, research, development and product improvement, Thornova Solar reserve the right to change the information contained in this data sheet at any time without prior notice. Customers are encouraged to purchase the latest version of this data sheet and include it as an integral part of a legally binding contract ratified by both parties. The translation of this data sheet into Chinese (or any other language) is for illustrative purposes only. In the event of any discrepancy between the English version and the Chinese version (or other language versions), the English version will be binding.