

Zosma™ S Black

High efficiency bifacial single glass PERC module

TS-BB54(400-415)



Bifacial technology allows for the harvesting of up to an additional 25% energy from the rear side of the module.



Excellent low irradiance performance.



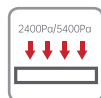
Enhanced light trapping and optimized current collection contribute to the improvement of both module power output and reliability.



Industry leading lowest thermal coefficient of power.



Design optimized for lower operating current, resulting in minimized hot spot loss and improved temperature coefficient.

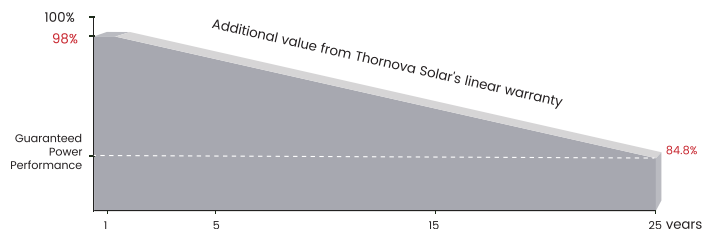


Certified to withstand:
wind load (2400 Pa) and
snow load (5400 Pa).



100% triple EL test
enables remarkable reduction of
module hidden crack rate.

LINEAR PERFORMANCE WARRANTY



up to **25** years
Product quality &
process guarantee

25 years
Linear power
guarantee

0.55 %
Annual degradation
Over 30 years

COMPREHENSIVE CERTIFICATES

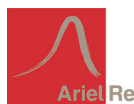


- ISO 9001: Quality Management System
- ISO 14001: Environmental Management System Standard
- ISO 45001: International Occupational Health and Safety Assessment System Standard

* 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



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

ELECTRIC CHARACTERISTICS

2x54cells

Model of modules	TS-BB54(400)		TS-BB54(405)		TS-BB54(410)		TS-BB54(415)	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Peak power - P_{mp} (W)	400	298	405	302	410	306	415	310
Open circuit voltage - V_{oc} (V)	37.18	35.10	37.33	35.24	37.68	35.57	37.79	35.67
Short circuit current - I_{sc} (A)	13.39	10.82	13.44	10.86	13.59	10.98	13.72	11.08
MPP voltage - V_{mp} (V)	31.42	29.41	31.55	29.54	31.84	29.81	31.94	29.90
MPP current - I_{mp} (A)	12.74	10.14	12.84	10.22	12.88	10.25	13.01	10.35
Module efficiency - η_m (%)	20.5		20.7		21.0		21.3	

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

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

Peak power - P_{mp} (W)	438	443	449	458
Open circuit voltage - V_{oc} (V)	37.18	37.33	37.68	37.79
Short circuit current - I_{sc} (A)	14.66	14.71	14.87	15.02
MPP voltage - V_{mp} (V)	31.42	31.55	31.84	31.94
MPP current - I_{mp} (A)	13.94	14.05	14.10	14.33
Irradiance ratio (rear/front)	13.5 %			

STRUCTURAL CHARACTERISTICS

Module dimension (L*W*H)	67.80 x 44.65 x 1.38 inch (1722 x 1134 x 35 mm)
Weight	45.19 lbs (20.5 kg)
Number of cells	108 cells
Cell	PERC monocrystalline (M10)
Glass	Tempered, 3.2 mm AR, High transmittance, Low iron
Backsheet	Transparent black mesh backsheet
Frame	Black anodized aluminum alloy
Junction box	IP68, 3 diodes
Output wire	4.0 mm ²
Wire length (Including Connector)	(+): 400 mm, (-): 200 mm or Customized Length
Connector	MC4 - EVO2
Packing specification	31 pcs/Pallet; 806 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	70±5 %

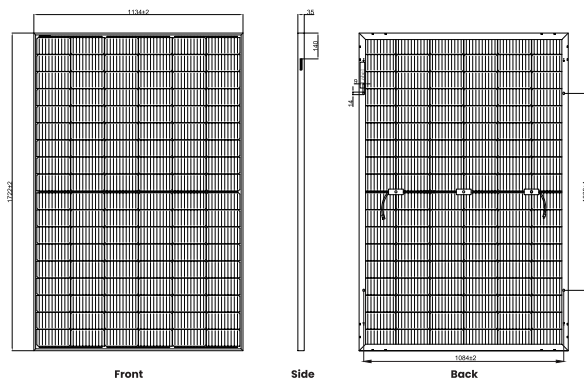
MECHANICAL LOADING

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

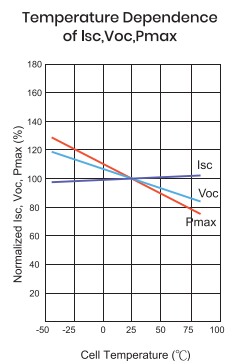
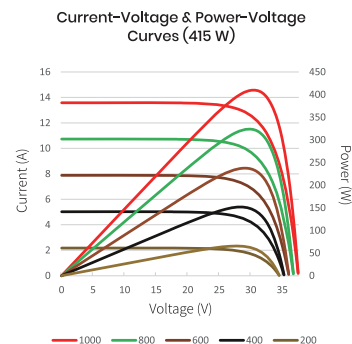
TEMPERATURE RATINGS

Temperature coefficient (P_{max})	-0.33 %/K
Temperature coefficient (V_{oc})	-0.26 %/K
Temperature coefficient (I_{sc})	+0.06 %/K
Nominal operating cell temperature	113±35.6 °F (45±2 °C)

MODULE DIMENSIONS (MM)



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



Scan the QR code to
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E-mail: info@thornovasolar.com

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