



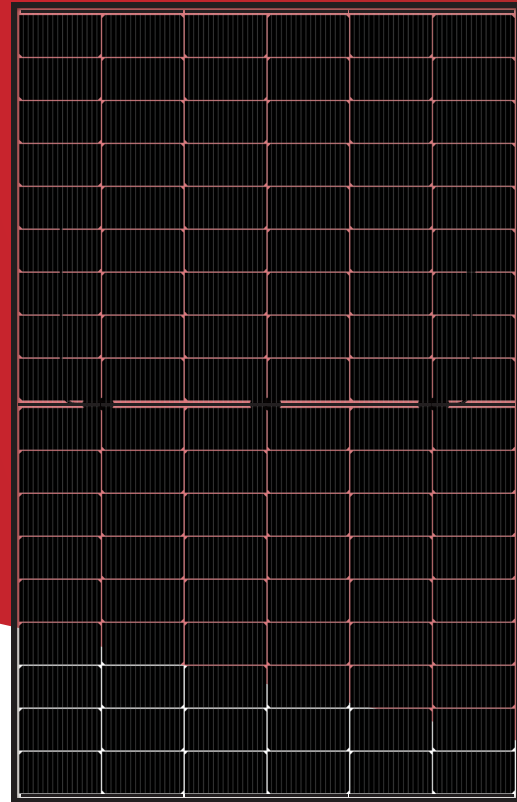
# SUNOVA SOLAR

Leading one-stop PV Supplier

## Tangra™ S Pro Black

# 410-430W

N-type Bifacial Double Glass Mono Module  
(FULL BLACK)



Bifacial technology enables additional energy harvesting from rear side (up to 30%)



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.



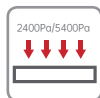
Better light trapping and current collection to improve module power output and reliability.



Industry leading lowest thermal co-efficient of power.



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

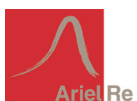


Certified to withstand: wind load (2400 Pa) and snow load (5400 Pa).



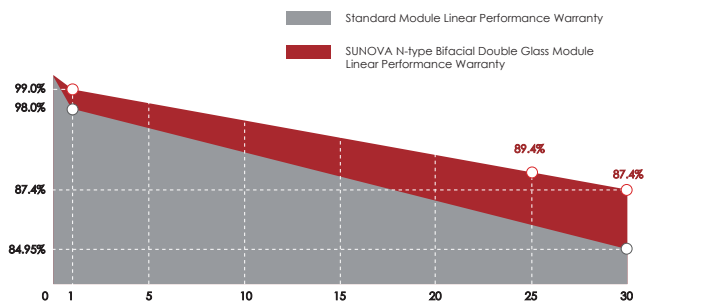
100% triple EL test enabling remarkable reduction of hidden crack rate of modules

### PERFORMANCE INSURANCE



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

### LINEAR PERFORMANCE WARRANTY



**25** years

Product quality & process guarantee

\*Conditions applied, for residential rooftop project only.

**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

SA 8000: 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.

## ELECTRIC CHARACTERISTICS

Model of modules	SS-BG410-54MDH(T)		SS-BG415-54MDH(T)		SS-BG420-54MDH(T)		SS-BG425-54MDH(T)		SS-BG430-54MDH(T)	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum power — $P_{mp}$ (W)	410	305	415	309	420	313	425	317	430	320
Open-circuit voltage — $V_{oc}$ (V)	37.31	35.22	37.42	35.32	37.58	35.48	37.75	35.63	38.07	35.94
Short-circuit current — $I_{sc}$ (A)	13.80	11.15	13.87	11.20	13.93	11.25	13.99	11.30	14.00	11.31
Maximum power voltage — $V_{mp}$ (V)	31.38	29.38	31.59	29.57	31.91	29.87	32.22	30.16	32.49	30.41
Maximum power current — $I_{mp}$ (A)	13.07	10.40	13.14	10.45	13.16	10.48	13.19	10.50	13.24	10.53
Module efficiency — $\eta_m$ (%)	21.0%		21.3%		21.5%		21.8%		22.0%	

**STC** (Standard Testing Conditions): Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25 °C, Spectra at AM1.5

**NOCT** (Nominal Operating Cell Temperature): Irradiance 800W/m<sup>2</sup>, 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 ( $P_{max}$ ) (W)	454	460	465	471	476
Open Circuit Voltage ( $V_{oc}$ ) (V)	37.31	37.42	37.58	37.75	38.07
Short Circuit Current ( $I_{sc}$ ) (A)	15.29	15.36	15.43	15.50	15.52
MPP Voltage ( $V_{mp}$ ) (V)	31.38	31.59	31.91	32.22	32.49
MPP Current ( $I_{mp}$ ) (A)	14.48	14.56	14.59	14.61	14.67

## STRUCTURAL CHARACTERISTICS

Module size (L*W*H)	1722 x 1134 x 30 mm
Weight	24.2 kg
Cell	108 cells, N-type Monocrystalline 182 x 91 mm
Front glass	2.0mm, Anti-Reflection Coating
Back glass	2.0mm, Heat Strengthened Glass
Frame	Black anodized aluminum alloy
Junction box	IP68, 3 diodes
Output wire	4.0 mm <sup>2</sup>
Wire length	300mm/customized
Connector	MC4 Compatible
Packing Specification	36pcs/Pallet; 936 pcs/40'HQ

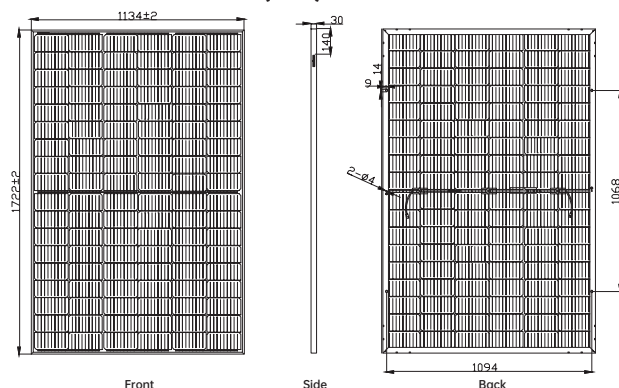
## OPERATING PARAMETERS

Power tolerance (W)	(0,+5)
Maximum system voltage (V)	1500
Maximum rated fuse current (A)	30
Current operating temperature (°C)	-40~+85 °C
Mechanical load	5400 Pa / 2400 Pa

## TEMPERATURE RATINGS

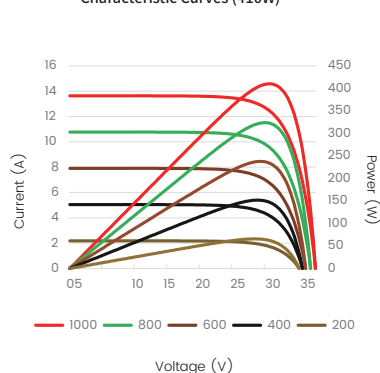
Temperature coefficient ( $P_{max}$ )	-0.32%/°C
Temperature coefficient ( $V_{oc}$ )	-0.26%/°C
Temperature coefficient ( $I_{sc}$ )	+0.046%/°C
Nominal operating cell temperature	43±2 °C

## MODULE DIMENSIONS (MM)

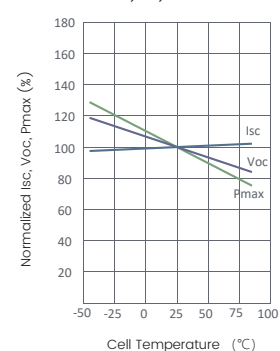


\* The unmarked tolerance is ±1 mm  
Length shown in mm

Characteristic Curves (410W)



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



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