



# TUNGHSU

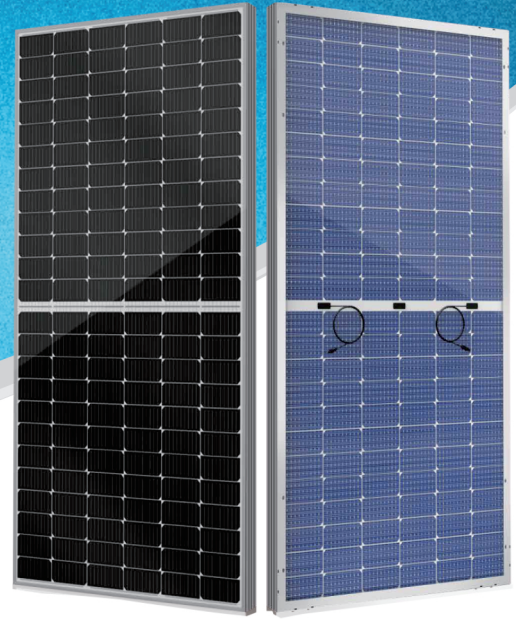
## star series

M6(166mm)

430W/435W/440W/445W/450W

144 CELLS MBB HALE-CELL MONO PV MOPULE

BIFACIAL DOUBLE GLASS



# 430-450W



High output power



Higher power generation



Highly reliability due to stringent quality control



Certified to withstand the most challenging environmental conditions

### Tungshu components with high efficiency and high reliability

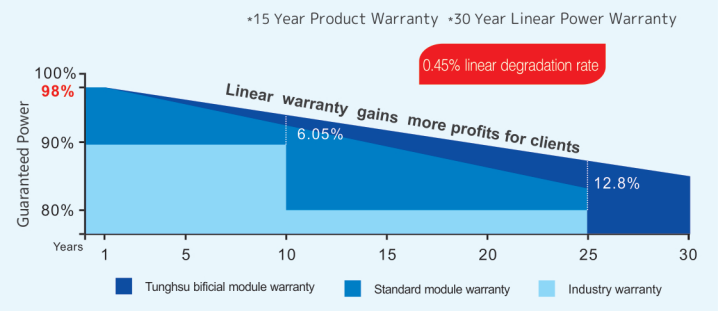
- \* Advanced production equipment, highly automated process control, world-class production technology
- \* The company has a product research and development laboratory that meets the new ISO/IEC international standards
- \* Excellent weak light performance, resistant to salt spray and ammonia corrosion.  
Passing the certification test of the PV standards.
- \* Certified by international quality management and environmental management system
- \* Application grade: A, Safe grade: II, Fireproofing grade: C

### Comprehensive Products And System Certificates

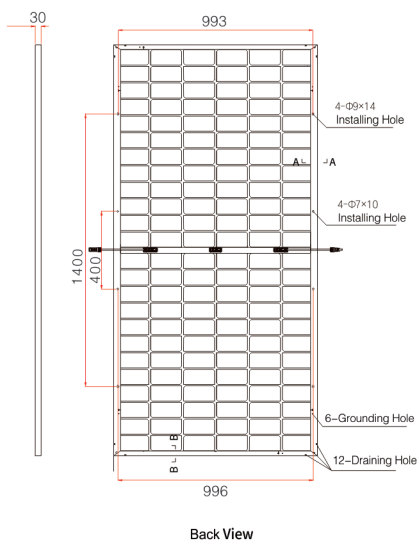
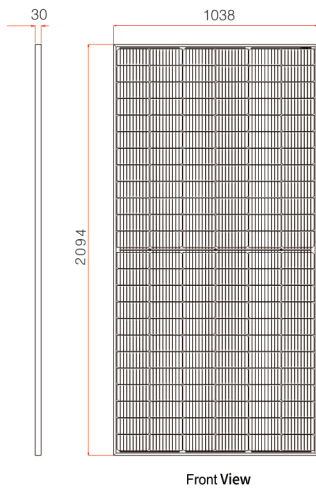
IEC61215/IEC61730/UL1703/IEC61701/IEC62716  
 ISO 9001: Quality Management System  
 ISO 14001: Environmental Management System  
 ISO 45001: Occupation Health and Safety Management System  
 GB/T 23001-2017: Management system with Integration of Information Technology and Industrialization



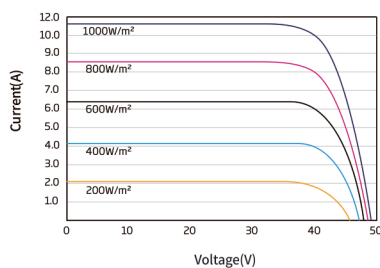
### Industry-leading linear warranty



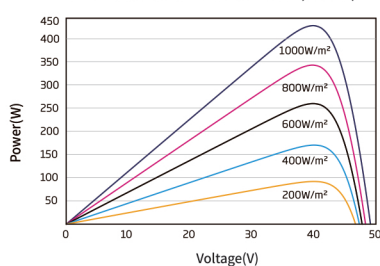
## DIMENSIONS OF PV MODULE(mm)



## I-V CURVES OF PV MODULE(435W)



## P-V CURVES OF PV MODULE(435W)



## ELECTRICAL DATA (STC)

Peak Power Watts- $P_{MAX}$ (Wp)	430	435	440	445	450
Power Output Tolerance- $P_{MAX}$ (W)			0~ +5		
Maximum Power Voltage- $V_{MPP}$ (V)	40.5	40.8	41.1	41.4	41.7
Maximum Power Current- $I_{MPP}$ (A)	10.62	10.67	10.71	10.75	10.80
Open Circuit Voltage- $V_{OC}$ (V)	48.7	48.9	49.1	49.3	49.5
Short Circuit Current- $I_{SC}$ (A)	11.20	11.24	11.28	11.32	11.36
Module Efficiency $\eta_m$ (%)	19.8	20.0	20.2	20.5	20.7

STC: Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25°C, Air Mass AM1.5.

## ELECTRICAL PARAMETERS AND DIFFERENT POWER GAIN BACK (Take 10% irradiation ratio as an example)

Maximum Power- $P_{MAX}$ (Wp)	457	479	500	522	544
Maximum Power Voltage- $V_{MPP}$ (V)	40.8	40.8	40.8	40.8	40.8
Maximum Power Current- $I_{MPP}$ (A)	11.20	11.74	12.27	12.80	13.34
Open Circuit Voltage- $V_{OC}$ (V)	49.0	49.1	49.2	49.3	49.4
Short Circuit Current- $I_{SC}$ (A)	11.80	12.36	12.93	13.49	14.05

Back gain: Under standard test conditions, the additional gain from the back and the front power depends on the installation and ground albedo parameters.

## ELECTRICAL DATA (NOCT)

Maximum Power- $P_{MAX}$ (Wp)	325	329	333	337	341
Maximum Power Voltage- $V_{MPP}$ (V)	38.2	38.5	38.8	39.0	39.1
Maximum Power Current- $I_{MPP}$ (A)	8.51	8.55	8.58	8.63	8.71
Open Circuit Voltage- $V_{OC}$ (V)	46.0	46.2	46.4	46.6	46.7
Short Circuit Current- $I_{SC}$ (A)	9.02	9.05	9.08	9.12	9.15

NOCT: Irradiance at 800W/m<sup>2</sup>, Ambient Temperature 20°C, Wind Speed 1m/s.

## MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	144cell(6x24)
Module Dimensions	2094x1038x30mm( 82.44x 40.87 x 1.18 inches)
Weight	27.5kg(60.62lb)
Front Glass	2.0mm (0.08inches), High Transmission, Tempered Coated Glass
Encapsulant Material	EVA/POE
Rear Glass	2.0mm(0.08inches) semi-tempered glass (white grid)
Frame	30mm (1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	4.0mm <sup>2</sup> ; 350mm photovoltaic special cable, or customized
Connector	MC4、QC4

## TEMPERATURE RATING

NOCT(Nominal Operating Cell Temperature)	41°C (± 3°C)
Temperature Coefficient of $P_{MAX}$	- 0.35%/°C
Temperature Coefficient of $V_{OC}$	- 0.25%/°C
Temperature Coefficient of $I_{SC}$	0.04%/°C

## LIMIT PARAMETERS

Operational Temperature	-40~ +85°C
Maximum System Voltage	1500V DC (IEC)
Max Series Fuse Rating	20A

(DO NOT connect Fuse in Combiner Box with two or more strings in parallel connection)

## WARRANTY

15 year Product Workmanship Warranty
30 year Linear Power Warranty

## PACKAGING CONFIGURATION

Modules per box: 35 pieces
Modules per 40' container: 770 pieces

