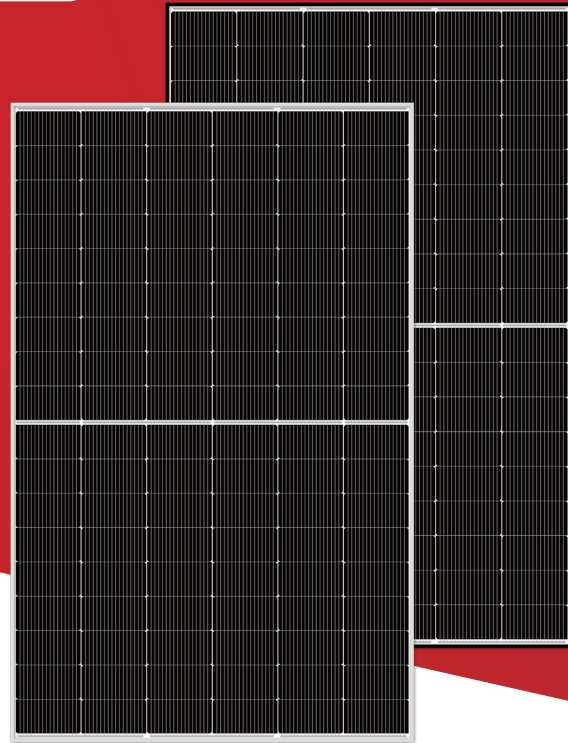


Tangra™ S HD

445-465W

N-type High Density Half-Cell Mono Module



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

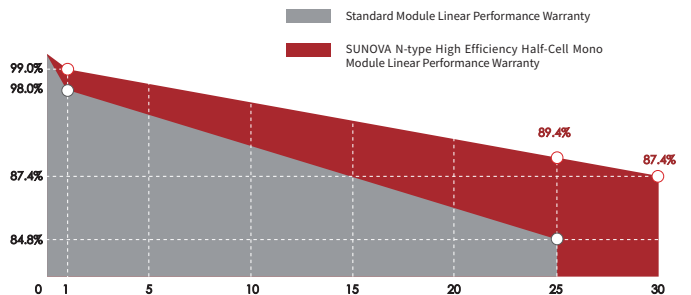


Certified to withstand 2400 Pa of wind load and 5400 Pa of snow load



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

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

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.

PERFORMANCE INSURANCE



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

ELECTRICAL CHARACTERISTICS

Model of modules	SS-445-54MDH-G10(T)		SS-450-54MDH-G10(T)		SS-455-54MDH-G10(T)		SS-460-54MDH-G10(T)		SS-465-54MDH-G10(T)	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum power — P_{mp} (W)	445	335	450	339	455	343	460	347	465	350
Open-circuit voltage — V_{oc} (V)	39.16	36.97	39.29	37.09	39.43	37.22	39.56	37.34	39.70	37.47
Short-circuit current — I_{sc} (A)	14.38	11.62	14.46	11.68	14.55	11.76	14.64	11.83	14.72	11.89
Maximum power voltage — V_{mp} (V)	33.06	30.95	33.20	31.08	33.35	31.22	33.48	31.34	33.62	31.47
Maximum power current — I_{mp} (A)	13.46	10.83	13.55	10.91	13.64	10.98	13.74	11.06	13.83	11.13
Module efficiency — η_m (%)	21.78		22.02		22.27		22.51		22.76	
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 size (L*W*H)	1802 x 1134 x 30mm
Weight	22.2kg
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	MC4 Compatible
Mechanical load	Snow load: 5400 Pa / Wind load: 2400 Pa

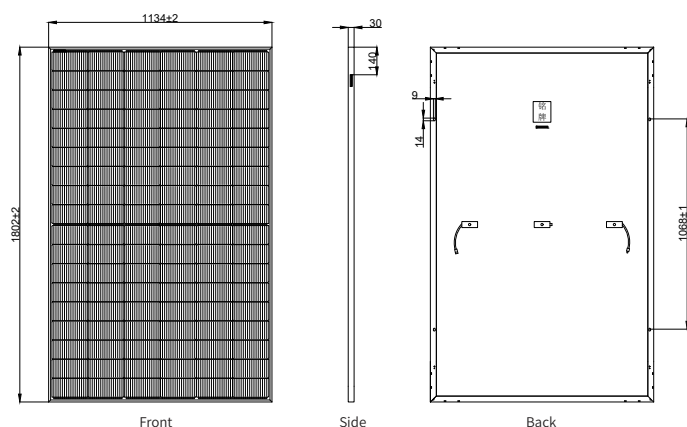
OPERATING PARAMETERS

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

PACKAGING CONFIGURATION

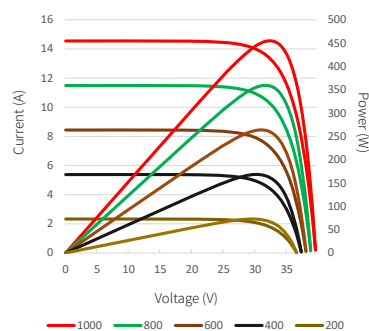
Container	40HQ
Quantity/pallet	36
Pallets/container	24
Quantity/container	864

MODULE DIMENSIONS (MM)



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

Characteristic Curves (460W)



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

