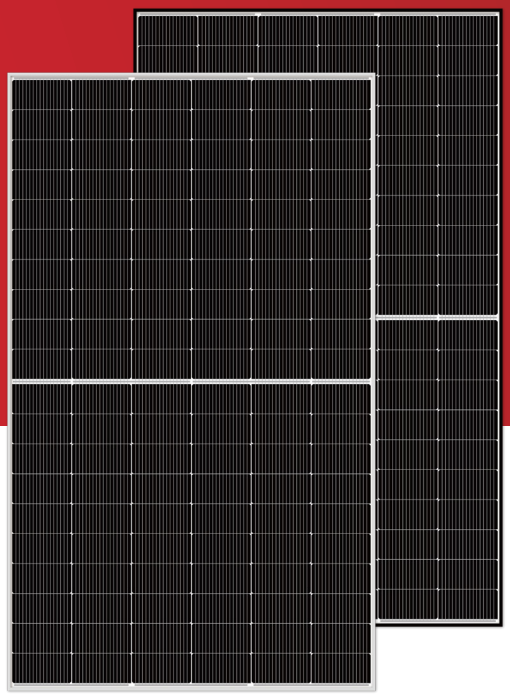
THORNOVA solar SUNOVA SOLAR | TIER 1 BloombergNEF

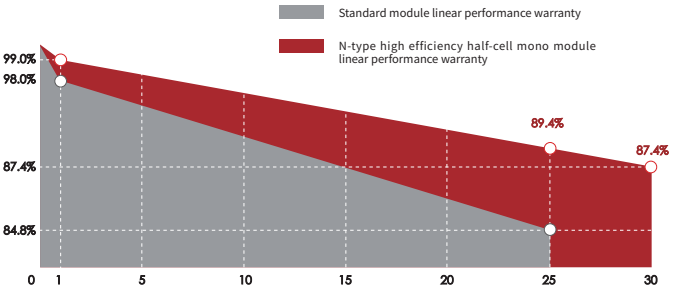
Tangra™ S
470-490W

N-type high efficiency 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

WARRANTY INSURANCE

Ariel Re · LLOYD'S Underwriters · Munich RE · 中国平安 PING AN P&C INSURANCE CO CN SZN

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

COMPREHENSIVE CERTIFICATES

TÜV NORD · CE · INMETRO

ISO 9001: Quality Management System
ISO 14001: Environmental Management System Standard
ISO 45001: International Occupational Health and Safety Assessment System Standard
SA8000: 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.

ELECTRICAL CHARACTERISTICS

120cells

Model of modules	SS-470-60MDH(T)		SS-475-60MDH(T)		SS-480-60MDH(T)		SS-485-60MDH(T)		SS-490-60MDH(T)	
	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Maximum power — P_{mp} (W)	470	350	475	354	480	357	485	361	490	365
Open-circuit voltage — V_{oc} (V)	42.88	40.48	43.01	40.60	43.14	40.72	43.27	40.84	43.42	40.99
Short-circuit current — I_{sc} (A)	13.43	10.85	13.51	10.92	13.58	10.97	13.65	11.03	13.74	11.10
Maximum power voltage — V_{mp} (V)	36.75	34.40	36.86	34.51	36.97	34.61	37.09	34.72	37.20	34.82
Maximum power current — I_{mp} (A)	12.79	10.18	12.89	10.26	12.98	10.33	13.08	10.41	13.18	10.49
Module efficiency — η_m (%)	21.8		22.0		22.2		22.5		22.7	
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/m^2, Cell Temperature 25 °C , Spectra at AM1.5
NOCT (Nominal Operating Cell Temperature): Irradiance 800W/m^2, Ambient Temperature 20°C , Spectra at AM1.5, Wind at 1m/s

STRUCTURAL CHARACTERISTICS

Module dimensions (L*W*H)	1903 x 1134 x 30mm
Weight	24 kg
Number of cells	120 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 🌬

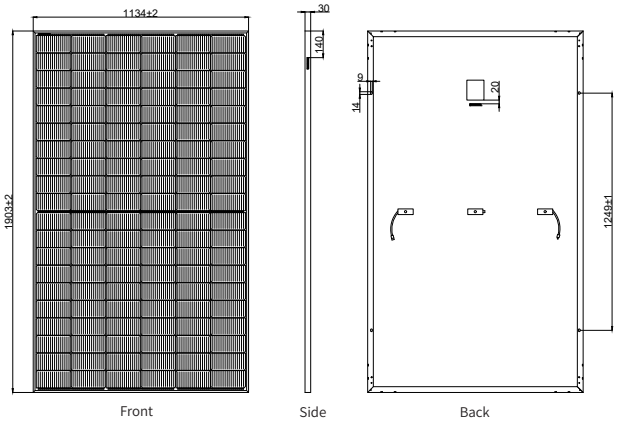
TEMPERATURE PERFORMANCE RATINGS

TANGRA 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

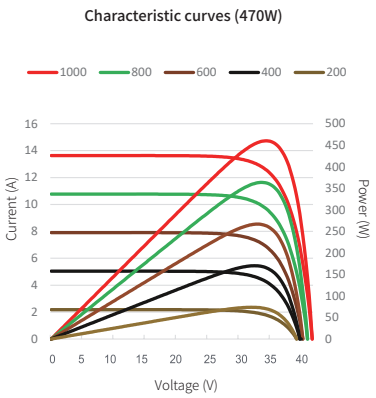
PACKAGING CONFIGURATION

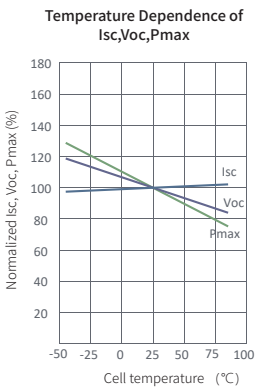
Container	40HQ
Quantity/pallet	36
Pallets/container	24
Quantity/container	864

MODULE DIMENSIONS (MM)



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





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