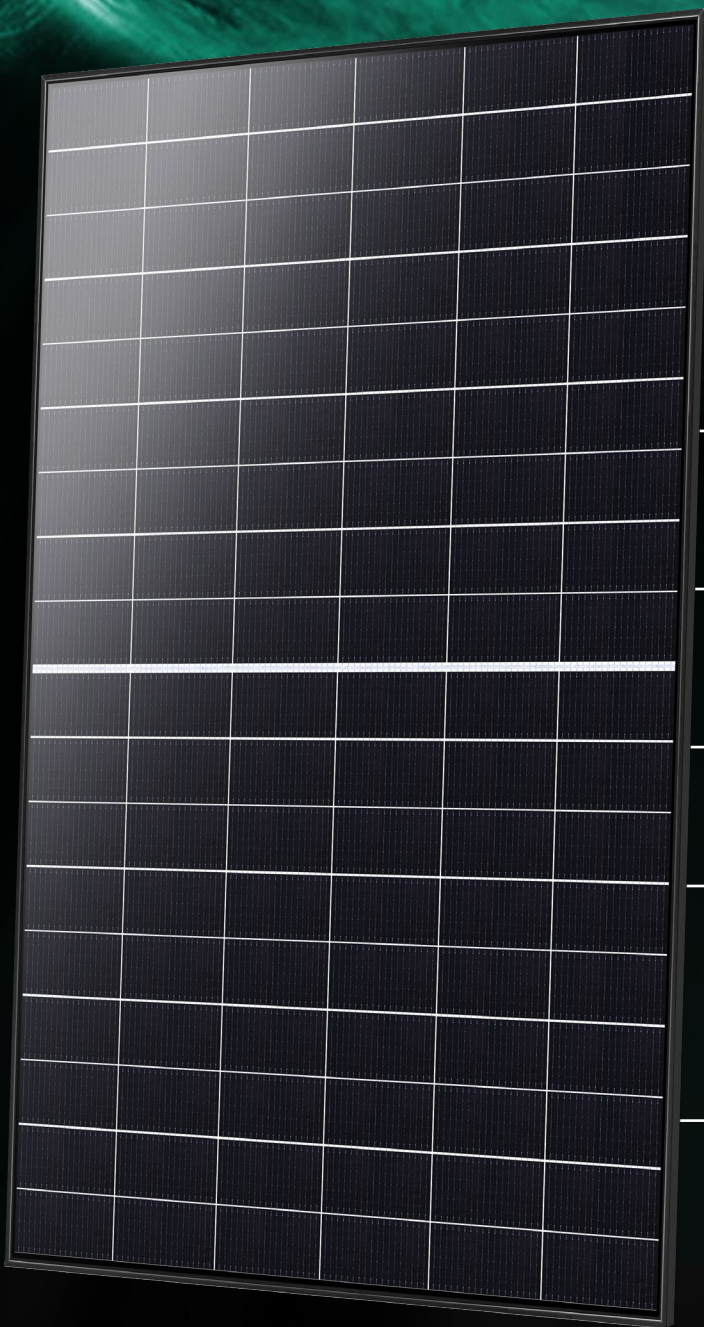


PHONO

Helios

Engineered to Thrive in Australia



5 Design Decisions to Make a Difference

1

HJT Hybrid Cells Combine the Best of Modern Solar Technology

2

More Power Per Panel:
Up to 22.53% Efficiency for
maximum savings

3

More Power for Decades
with Lower Degradation

4

Dual Glass Design for
Guaranteed Durability

5

More Warranted Power for
your Solar Investment:



30 Year Product
Warranty*



30 Year Performance
Warranty

435/440W | Dual Glass Bi-Facial N.HJT

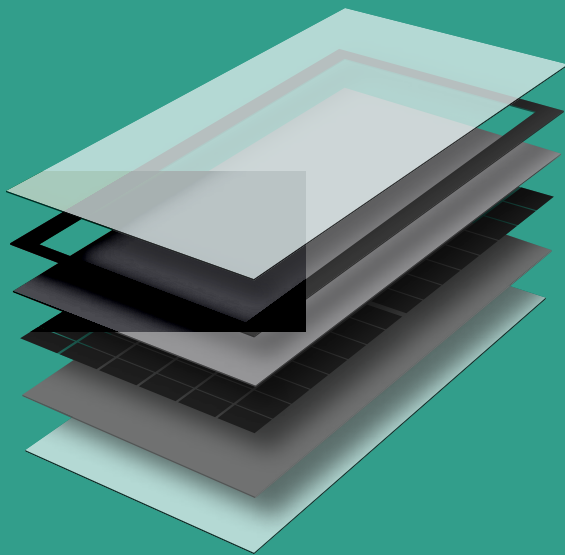
Helios

HJT Hybrid Cells

1 Five Layers for Harvesting More Energy

Heterojunction solar cells use a three-layered structure to harvest more. One crystalline N-type silicon wafer surrounded by two thin amorphous silicon layers that we then protect with two layers of toughened glass.

This design boosts efficiency up to 22.53% by capturing at each layer. The top layer harvests bonus sunlight before it reaches the crystalline layer, and the lower layer absorbs any light that passes through.



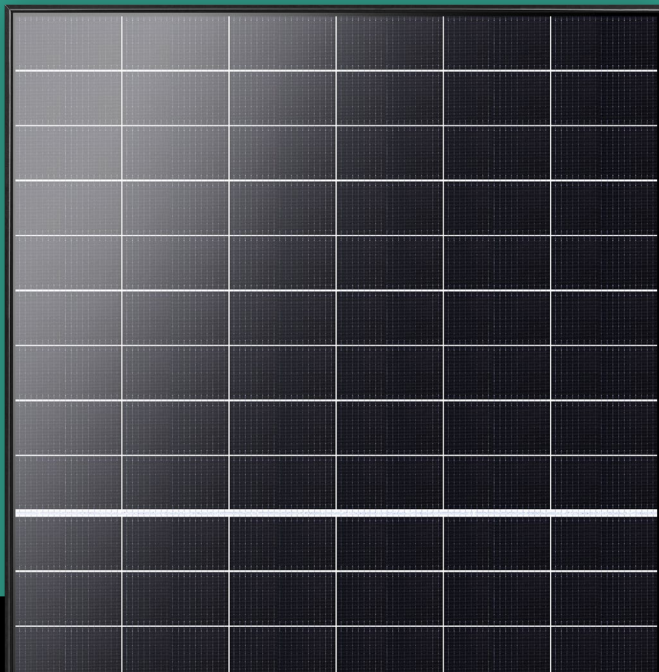
1. Toughened Glass

2. Amorphous Silicon Layers

3. N-Type Mono Wafer

4. Amorphous Silicon Layers

5. Toughened Glass



2 Higher Power Density at the Hottest Times

- **4% MORE** Power than PERC (*standard cell technology*)
- HJT Cells have world leading efficiency
- Outstanding power temperature coefficient of **-0.26%/ °C** provides greater performance in hotter conditions

3 More Power for Decades with Lower Degradation

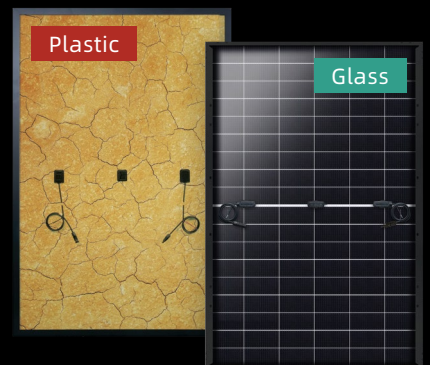
- 30-year linear performance warranty to 88% at year 30

4 Tougher Dual Glass Design

Solar Panels have a major warranty issue in Australia because plastic solar panel backsheets degrade.

Dual Glass replaces the plastic backsheet with **Glass**.

Phono were Pioneers in Engineering Dual Glass Design for Australian Residential Applications.



5 Warranty



30 Year
Product
Warranty*



30 Year
Performance
Warranty

Make a secure investment

Electrifying your Australian home with solar is critical to reducing your power bills and achieving green goals as a nation.

From Manufacturer to installer, we are invested in your secure solar future. Sumec is guaranteeing this longevity with 30 year manufacturer warranties.

4 Layers of protection



Engineered for Australian Conditions

80% of Australians live close to the coast and solar modules for Australia need to be engineered for varying harsh conditions.



Salt Mist Certification

To the Highest Severity Level



Cyclone Tested

Rated for Wind Regions like NT



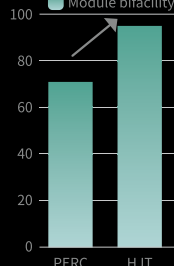
Increased Hail Testing

For increased resilience

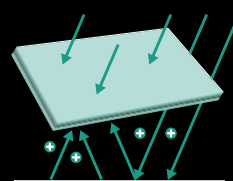
Dual Glass & Bifacial Technology

Bifacial solar panels absorb power from the front and the back of the solar panel. Up to **25% more power yield** can be gained in optimal install conditions.

Module bifaciality



Higher Bifaciality Performance with HJT



Power generation increased further by 3 - 6% with HJT compared to previous Bifacial PERC Technology.

Electrical Typical Values

Model	PS435M8G FH-18/VSH		PS440M8G FH-18/VSH	
	STC	NOCT	STC	NOCT
Testing Condition	STC	NOCT	STC	NOCT
Rated Power (Pmpp)	435	331	440	335
Rated Current (Imp)	12.89	10.39	12.94	10.43
Rated Voltage (Vmpp)	33.75	31.84	34.01	32.08
Short Circuit Current (Isc)	13.35	10.76	13.4	10.8
Open Circuit Voltage (Voc)	40.06	38.23	40.33	38.49
Module Efficiency (%)	22.28		22.53	

STC (Standard Testing Conditions): Irradiance 1000W/m², AM 1.5, Cell Temperature 25°C. NOCT (Nominal Operation Cell Temperature): Irradiance 800W/m², Ambient Temperature 20°C, Spectra at AM1.5, Wind at 1m/s

Mechanical Characteristics

Cell Type	HJT Monocrystalline
Dimension (L x W x H)	Length: 1722mm
	Width: 1134mm
	Height: 30mm
Weight	22.0kg
Glass	1.6mm/1.6mm toughened glass
Frame	Anodized Aluminium Alloy
Cable (Including Connector)	1100mm
Junction Box	IP 68 Rated
Connectors	EVO2 Connector, MC4

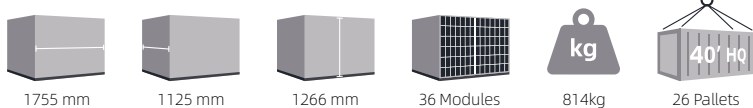
Temperature Ratings

Voltage Temperature Coefficient	-0.24%/°C
Current Temperature Coefficient	+0.04%/°C
Power Temperature Coefficient	-0.26%/°C
Bin Tolerance	0~+5W
NOCT	44±2°C
Bifaciality	85±5%

Absolute Maximum Rating

Operating Temperature	From -40 to + 85°C
Hail Diameter @ 97.9km/h	Up to 35mm
Maximum Test Load Two Rails (push/pull)	6500Pa/3600Pa
Maximum Test Load Three Rails (push/pull)	8500Pa/6000Pa
Maximum Series Fuse Rating	25A
PV Module Classification	Class II
Maximum System Voltage	DC 1500V

Packing Configuration

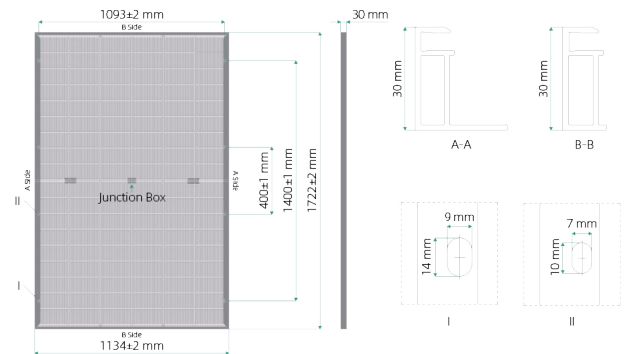
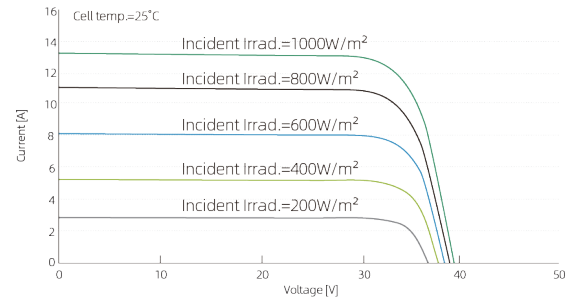
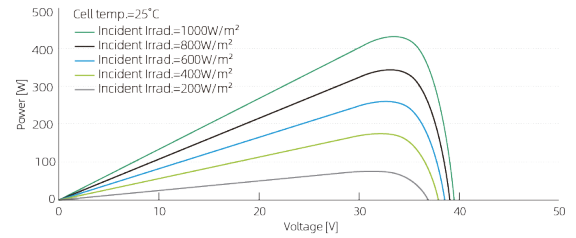


Bifacial Electrical Values

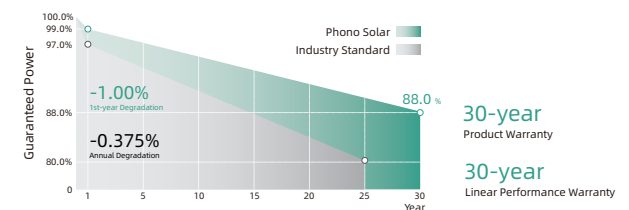
	435	440
Back Power Gain	BNPI	BNPI
Pmax/W	480	485
Module Efficiency (%)	24.58	24.84
Voc/V	40.06	40.33
Isc/A	14.73	14.77
Vmp/V	33.75	34.01
Imp/A	14.23	14.27

BSTC: Front side irradiation 1000W/m², back side reflection irradiation 135W/m², AM 1.5, ambient temperature 25°C

Electrical Characteristics



Linear Performance Warranty



30-year linear performance warranty to 88% at year 30. This amounts to 1% degradation in the first year, 0.375% annually. | *30 year Product Warranty applies to Residential System Installations. Commercial System Installations are eligible for 25 year Product Warranty. Please see our warranty document for full terms, conditions and details.

PHONO SOLAR TECHNOLOGY CO., LTD. reserves the right to make necessary adjustments to the information described herein at any time without further notice. The specifications and certificates contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. Please be sure to use the most recent version of data.

Manufactured In China
Engineered for Australia

