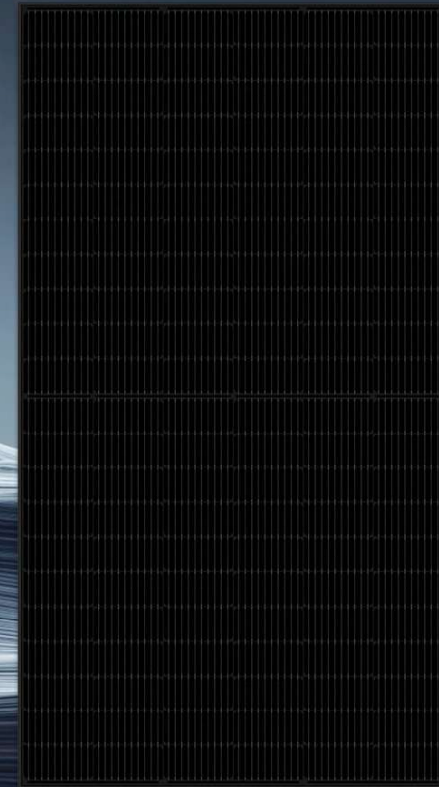




Vesta Upgraded Ultra Black

Lightweight and Remarkable Power



Vietnam Sunergy Joint Stock Company

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Vesta Ultra Black

Vesta Ultra Black defines superior aesthetics modules in creating full-screen elegant rooftop.

VSUN provides customized products and services to support diversified installation solutions. Vesta Ultra Black meets the needs of scenarios, which brings excellent power generation performance. Vesta Ultra Black solar solutions meet household electricity needs and reduce high electricity bills.

455W

Highest power output

80%

Bifaciality

23.0%

Module efficiency

-40°C+85°C

Temperature range

MBB TECHNOLOGY

With circular ribbon reduces current loss to improve efficiency and maximizing sunlight transmittance, long lasting protection in outdoor and perfect for home rooftop.

MBB technology with circular ribbon

Reducing current loss to improve efficiency

Anti-reflective coating glass

Maximizing sunlight transmittance

Half-cell technology

Reducing cell damage and bringing higher output

Bifacial cells

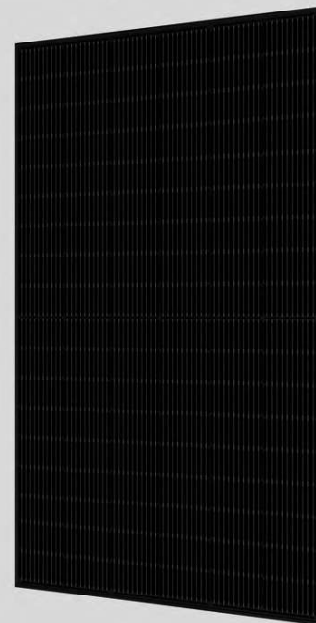
Converting more sunlight into electricity

High-quality back sheet

Long lasting protection in outdoor and perfect for home rooftop

Optimize degradation

Realize recycling and reuse to effectively alleviate the pressure on the ecological environment



WHY GO SOLAR

Low-Carbon Life

- Respond to the call for Net Zero
- Self-consumption new lifestyle

Increase Your Home Value

- Homes with solar power are more attractive to buyers
- Sell faster and at a higher price

Quality Assurance

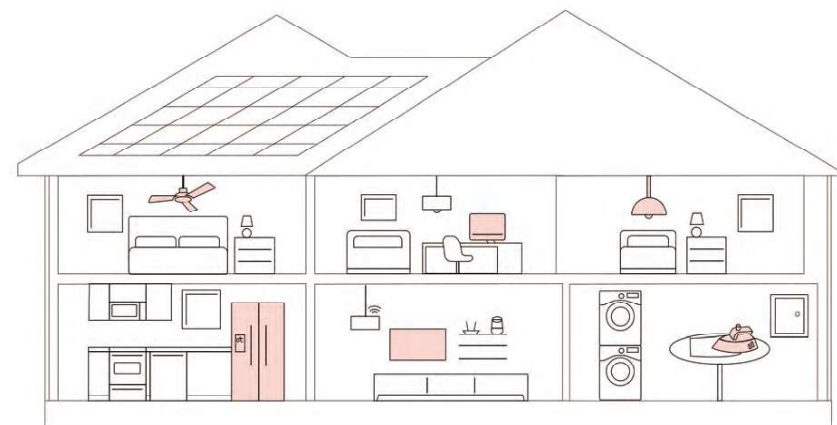
- Japanese Quality Control System
- One of the best warranties in the industry

High Investment Return

- Increase the property value
- Offset the utility bill

Home Energy Mix with a Solar System

1KW Load that would be MEL by
Solar rooftop system with battery backup



13 Hours Ceiling Fans
1 (75W)

31 Hours Lighting
4 LED Lights (8w)

6 Hours Refrigerator
1 (150W)

1 Hours Iron
1 (1,000W)

20 Hours Laptop
1 (50W)

10 Hours TV
1 (100W)

*Data of MEL is for reference only.



Home solar power 90%



Home solar 40%

Utility electricity 60%

*VSUN solar modules can still provide excellent power performance even at low-light conditions, such as cloudy days morning or evening times.

REASONS FOR CHOOSING VSUN SOLAR

Japanese Quality Management System

VSUN is a Japanese-invested solar solution provider, with a vertically integrated supply chain. We provide more than just the best products, including wafer, solar cell and modules. VSUN offers reliable and efficient solar products and services globally.

Global Supply Chain

VSUN forms vertical integrated processes to ensure a stable supply of raw materials required for each production process. It integrates multiple suppliers to benefit from the quality and cost control over the critical resources and products. With a network of reliable strategic global partners and suppliers, VSUN is dedicated to providing excellent products while ensuring the highest standards of reliability and quality.

Customized Service

Based on the requirement of project and service scope, VSUN provides customized service and improves comprehensive customer satisfaction, including customized product, solution of modules installation, packaging guideline, logistics solution and different application.

30-year Warranty Promise

VSUN provides one of the best warranties in the solar industry. VSUN provides 12-year product warranty & 30-year linear power output warranty with Munich RE reinsurance. Product warranty could be extended to 25-year according to customer needs.

ROOFTOP PROJECTS



WARRANTY

Product Warranty

VSUN ensures product quality at every step, which allows to provide one of the best warranties in the solar industry. With the Japanese quality control system, VSUN solar panels have low degradation rate, long duration and high reliability.

Performance Warranty

With Munich Re reinsurance
12-year
product warranty
30-year
Linear power output warranty.



The annual degradation is
-0.45% for PERC, while only
-0.4% for TopCon till the 30th year.

Module failure rate is less than **0.01%**
Simplified claims process.

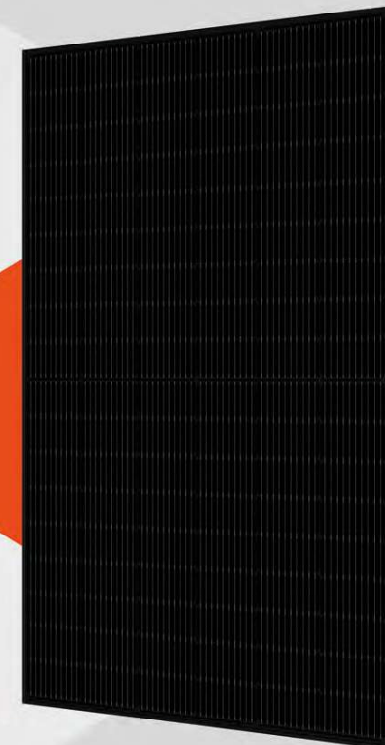
INSURANCE

An Independent Quality Insurance is Provided by



The Corporate Insurance Partner* Munich Re, offers risk management solutions on a global basis, to deliver better planning security for customers.

*Founded in Germany in 1880, the Munich Reinsurance Group is one of the largest risk management entities, primarily engaged in reinsurance and healthcare asset management.



VSUN450N-108BMH-DG-BB

VSUN450N-108BMH-DG-BB

VSUN445N-108BMH-DG-BB

VSUN440N-108BMH-DG-BB

VSUN435N-108BMH-DG-BB

VSUN430N-108BMH-DG-BB

VSUN425N-108BMH-DG-BB

450W

Highest power output

23.04%

Module efficiency

1.0%

First-year degradation warranty

0.40%

Annual degradation over 30 years

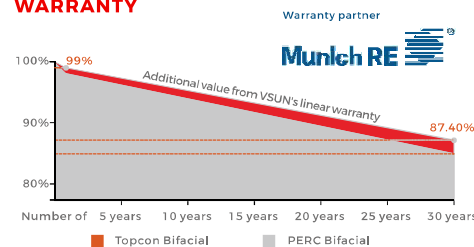
ABOUT VSUN

Invested by Fuji Solar, VSUN SOLAR is a solar solution provider with headquartered in Tokyo, Japan that offers reliability, high efficiency solar products and technology globally. VSUN is rated as BNEF Tier 1 PV module manufacturer, PVEL Lab "Best performer" and EcoVadis "Bronze Award".

PRODUCT CERTIFICATION



WARRANTY



Electrical Characteristics at Standard Test Conditions(STC)

Module Type	VSUN450N-108BMH-DG-BB	VSUN445N-108BMH-DG-BB	VSUN440N-108BMH-DG-BB	VSUN435N-108BMH-DG-BB	VSUN430N-108BMH-DG-BB	VSUN425N-108BMH-DG-BB
Maximum Power - Pmax (W)	450	445	440	435	430	425
Open Circuit Voltage - Voc (V)	39.92	39.64	39.38	39.12	38.84	38.56
Short Circuit Current - Isc (A)	13.96	13.9	13.85	13.8	13.75	13.7
Maximum Power Voltage - Vmpp (V)	33.87	33.61	33.37	33.13	32.88	32.64
Maximum Power Current - Imp (A)	13.29	13.24	13.18	13.13	13.08	13.02
Module Efficiency	23.04%	22.79%	22.53%	22.28%	22.02%	21.76%

Standard Test Conditions (STC): irradiance 1,000 W/m²; AM 1.5; module temperature 25°C. Pmax Sorting : 0~5W. Measuring Tolerance: ±3%.

Remark: Electrical data do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

Electrical Characteristics with different rear side power gain(reference to 450 front)

Pmax (W)	Voc (V)	Isc (A)	Vmpp (V)	Imp (A)	Pmax gain
473	39.92	14.66	33.87	13.95	5%
495	39.92	15.36	33.87	14.62	10%
540	40.00	16.75	33.79	15.95	20%
563	40.00	17.45	33.79	16.61	25%

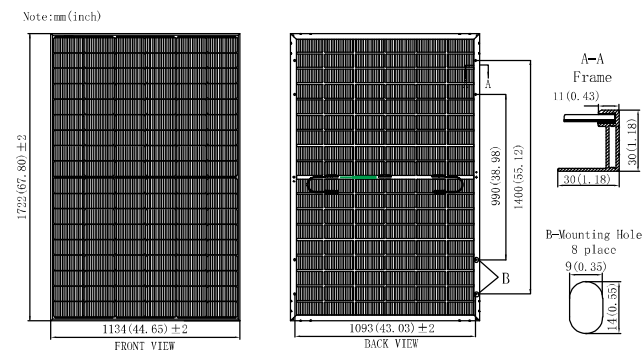
Material Characteristics

Dimensions	1722×1134×30mm (L×W×H) 67.80"×44.65"×1.18 inches (L×W×H)
Weight	24.7kg / 54.45lbs
Frame	Black anodized aluminum profile
Front Glass	AR-coating Semi-toughened glass, 2.0mm
Back Glass	Black Glazed & Semi-toughened glass, 2.0mm
Cells	12×9 pcs mono solar cells series strings
Junction Box	IP68, 3 diodes
Cable	Potrait: +300mm/~400mm (cable length can be customized) , 1×4mm ² or 12AWG

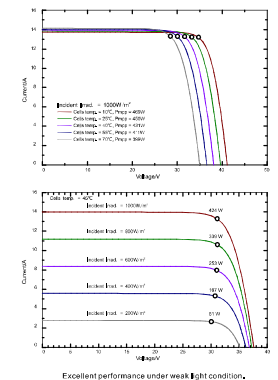
Packaging

Dimensions(L×W×H)	1760×1125×1253mm / 69.29"×44.29"×49.33inches
Quantity per pallet	36 pcs
Container 20'	216
Container 40'	468
Container 40'HC	936 or 756 for US

Dimensions



IV-Curves



KEY FEATURES

TOPcon TOPcon technology

Higher output power

MBB technology with Circular Ribbon

Positive tolerance offer

Bifacial cells, converting more sunlight into electricity

Better shading tolerance

Better temperature coefficient

Excellent PID Resistance

Lower LCOE

UL 61730 & CSA 61730
IEC 61215 & IEC 61730

VSUN450N-108MH-BB

VSUN450N-108MH-BB

VSUN440N-108MH-BB

VSUN430N-108MH-BB

VSUN445N-108MH-BB

VSUN435N-108MH-BB

VSUN425N-108MH-BB

450W

Highest power output

23.04%

Module efficiency

1.0%

First-year degradation warranty

0.40%

Annual degradation over 30 years

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Lower risk of hot spot



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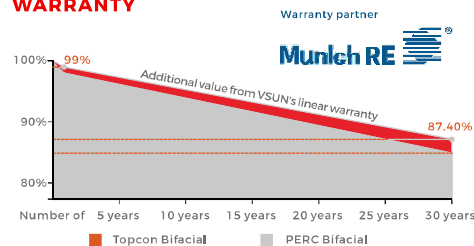


UL 61730 & CSA 61730
IEC 61215 & IEC 61730

PRODUCT CERTIFICATION



WARRANTY



Electrical Characteristics at Standard Test Conditions(STC)

Module Type	VSUN450N-108MH-BB	VSUN445N-108MH-BB	VSUN440N-108MH-BB	VSUN435N-108MH-BB	VSUN430N-108MH-BB	VSUN425N-108MH-BB
Maximum Power - Pmax (W)	450	445	440	435	430	425
Open Circuit Voltage - Voc (V)	39.92	39.64	39.38	39.12	38.84	38.56
Short Circuit Current - Isc (A)	13.96	13.9	13.85	13.8	13.75	13.7
Maximum Power Voltage - Vmpp (V)	33.87	33.61	33.37	33.13	32.88	32.64
Maximum Power Current - Impp (A)	13.29	13.24	13.18	13.13	13.08	13.02
Module Efficiency	23.04%	22.79%	22.53%	22.28%	22.02%	21.76%

Standard Test Conditions (STC): irradiance 1,000 W/m²; AM 1.5; module temperature 25°C. Pmax Sorting: 0-5W. Measuring Tolerance: ±3%.

Remark: Electrical data do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

Electrical Characteristics at Normal Operating Cell Temperature(NOCT)

Module Type	VSUN450N-108MH-BB	VSUN445N-108MH-BB	VSUN440N-108MH-BB	VSUN435N-108MH-BB	VSUN430N-108MH-BB	VSUN425N-108MH-BB
Maximum Power - Pmax (W)	338.8	335	331.2	327.6	324	320.2
Open Circuit Voltage - Voc (V)	37.6	37.3	37.1	36.9	36.6	36.3
Short Circuit Current - Isc (A)	11.27	11.23	11.19	11.14	11.1	11.06
Maximum Power Voltage - Vmpp (V)	31.6	31.4	31.1	30.9	30.7	30.5
Maximum Power Current - Impp (A)	10.72	10.68	10.64	10.59	10.56	10.51

Normal Operating Cell Temperature(NOCT) : irradiance 800W/m²; wind speed 1 m/s ; ambient temperature 20°C. Measuring Tolerance: ±3%.

Material Characteristics

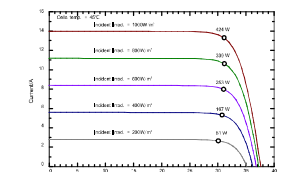
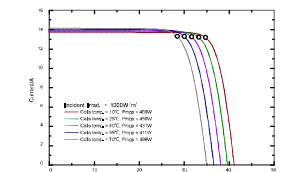
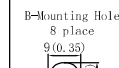
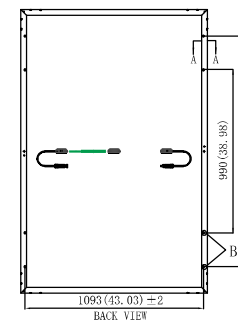
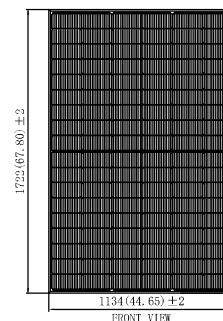
Dimensions	1722×1134×30mm (L×W×H) 67.80×44.65×1.18 inches (L×W×H)
Weight	21.4kg / 47.18lbs
Frame	Black anodized aluminum profile
Front Glass	AR-Coating toughened glass, 3.2 mm
Back sheet	Composite film
Cells	12×9 pcs mono solar cells series strings
Junction Box	IP68, 3 diodes
Cable	Potrait: +300mm/-400mm (cable length can be customized) , 1×4mm ² or 12AWG

Packaging

Dimensions(L×W×H)	1760×1125×1253mm / 69.29×44.29×49.33inches
Quantity per pallet	36 pcs
Container 20'	216
Container 40'	468
Container 40'HC	936 or 828 for US

Dimensions

Note: mm (inch)



Excellent performance under weak light condition.

VSUN
Innovative & Smart

12
YEAR
QUALITY ASSURANCE

30
YEAR
POWER OUTPUT GUARANTEE

Lighter dual-glass module VSUN450N-108BMH-DGL-BB

VSUN450N-108BMH-DGL-BB VSUN445N-108BMH-DGL-BB
VSUN440N-108BMH-DGL-BB VSUN435N-108BMH-DGL-BB
VSUN430N-108BMH-DGL-BB VSUN425N-108BMH-DGL-BB

450W

Highest power output

23.04%

Module efficiency

1.0%

First-year
degradation warranty

0.40%

Annual degradation
over 30 years

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Higher output power



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Better shading tolerance



Better temperature coefficient



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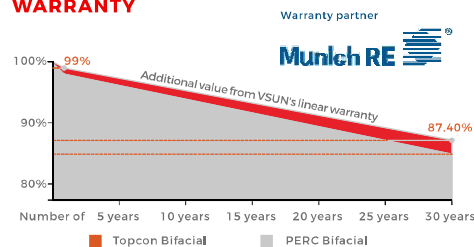


UL 61730 & CSA 61730
IEC 61215 & IEC 61730

PRODUCT CERTIFICATION



WARRANTY



Electrical Characteristics at Standard Test Conditions(STC)

Module Type	VSUN450N-108BMH-DGL-BB	VSUN445N-108BMH-DGL-BB	VSUN440N-108BMH-DGL-BB	VSUN435N-108BMH-DGL-BB	VSUN430N-108BMH-DGL-BB	VSUN425N-108BMH-DGL-BB
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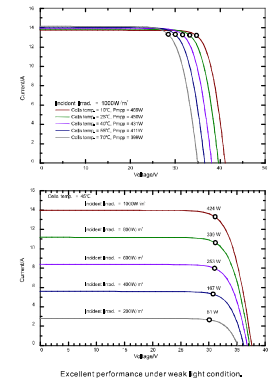
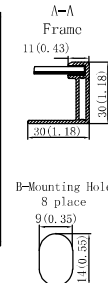
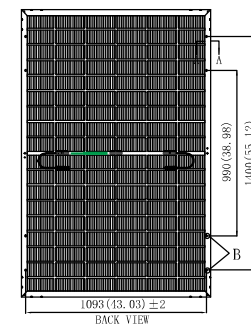
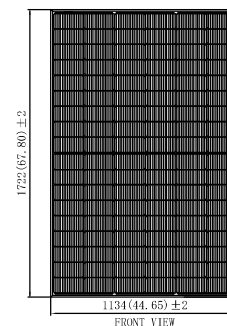
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