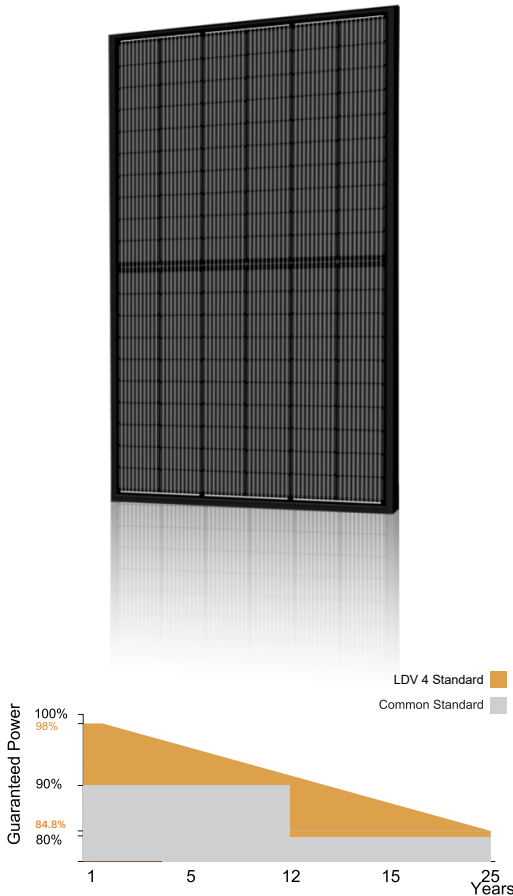


M120-450SF BB F2

10BB HALF-CELL Black Monocrystalline PERC PV Module



435-460W

POWER RANGE

21.32%

MAXIMUM EFFICIENCY

0.55%

YEARLY DEGRADATION



12 YEARS PRODUCT WARRANTY



25 YEARS OUTPUT GUARANTEE



IEC 61215/IEC 61730/IEC 61701/IEC 62716

ISO 14001: Environmental Management System

ISO 9001: Quality Management System

ISO45001: Occupational Health and Safety Management System

*Please check the valid version of Limited Product Warranty which is officially released by ZNSHINE PV-TECH Co.,Ltd.

*As there are different certification requirements in different markets, please contact your local znsline sales representative for the specific certificates applicable to the products in the region in which the products are to be used.

KEY FEATURES



Excellent Cells Efficiency

MBB technology reduce the distance between busbars and finger grid line which is benefit to power increase.



Better Weak Illumination Response

More power output in weak light condition, such as haze, cloudy, and early morning.



Anti PID

Ensured PID resistance through the quality control of cell manufacturing process and raw materials.



Adapt To Harsh Outdoor Environment

Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity environment.



TIER 1

Global, Tier 1 bankable brand, with independently certified advanced automated manufacturing.



Excellent Quality Management System

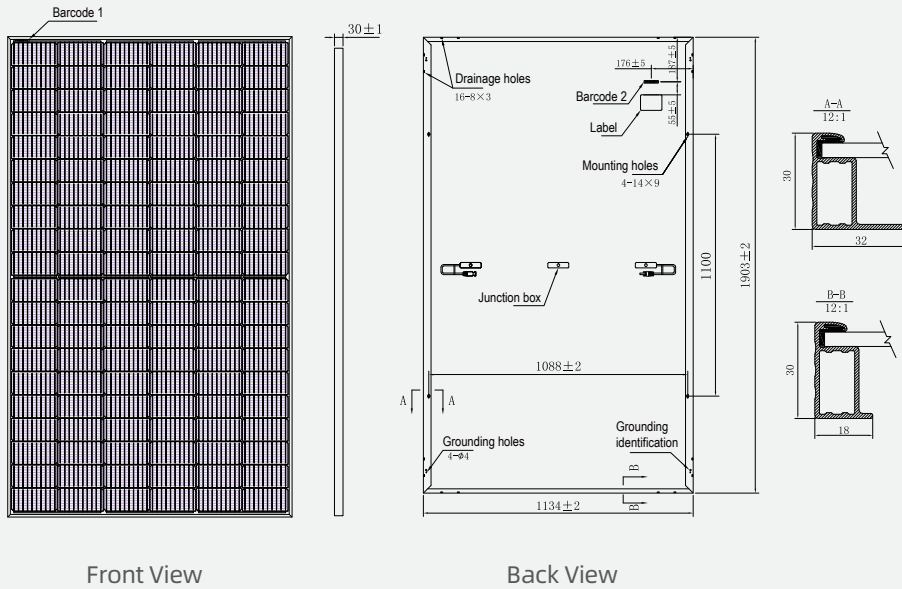
Warranted reliability and stringent quality assurances well beyond certified requirements.



Improved Aesthetics

Compared to conventional modules, this full black modules have a more uniform appearance and superior aesthetics.

DIMENSIONS OF PV MODULE(mm)

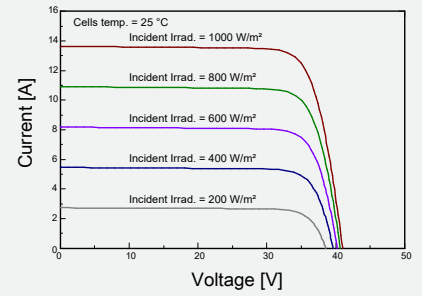


Front View

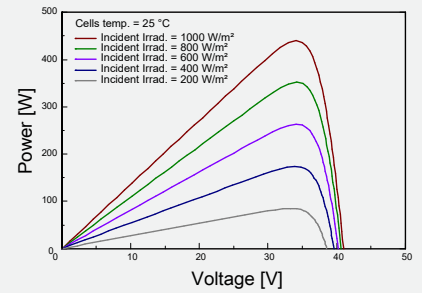
Back View

*Remark: customized frame color and cable length available upon request

I-V CURVES OF PV MODULE(440W)



P-V CURVES OF PV MODULE(440W)



ELECTRICAL CHARACTERISTICS | STC*

Nominal Power Watt Pmax(W)*	435	440	445	450	455	460
Maximum Power Voltage Vmp(V)	33.90	34.10	34.30	34.50	34.70	34.90
Maximum Power Current Imp(A)	12.84	12.91	12.98	13.05	13.12	13.19
Open Circuit Voltage Voc(V)	40.80	41.00	41.20	41.40	41.60	41.80
Short Circuit Current Isc(A)	13.57	13.64	13.71	13.78	13.85	13.92
Module Efficiency (%)	20.16	20.39	20.62	20.85	21.08	21.32

*The data above is for reference only and the actual data is in accordance with the practical testing
 *STC (Standard Test Condition): Irradiance 1000W/m², Module Temperature 25±2°C, AM 1.5
 *Measuring uncertainty: ±3%, all the electrical characteristics such as Power, Im, Vm and FF are within ±3% tolerance.

MECHANICAL DATA

Solar cells	Mono PERC
Cells orientation	120 (6x20)
Module dimension	1903x1134x30 mm (With Frame)
Weight	23±1 kg
Glass	3.2mm, High Transmission, AR Coated Tempered Glass
Junction box	IP 68, 3 diodes
Cables	4 mm² ,350 mm (With Connectors)
Connectors*	MC4-compatible

*Please refer to regional datasheet for specified connector

ELECTRICAL CHARACTERISTICS | NMOT

Maximum Power Pmax(Wp)	325.20	328.90	332.60	336.40	340.10	343.80
Maximum Power Voltage Vmpp(V)	31.50	31.70	31.90	32.10	32.30	32.50
Maximum Power Current Impp(A)	10.31	10.37	10.43	10.48	10.54	10.59
Open Circuit Voltage Voc(V)	38.10	38.30	38.50	38.70	38.90	39.00
Short Circuit Current Isc(A)	10.96	11.02	11.07	11.13	11.18	11.24

*NMOT: Irradiance 800W/m², Ambient Temperature 20°C, AM 1.5, Wind Speed 1m/s

TEMPERATURE RATINGS

NMOT	44°C ±2°C	Maximum system voltage	1500 V DC
Temperature coefficient of Pmax	-0.35%/°C	Operating temperature	-40°C~+85°C
Temperature coefficient of Voc	-0.29%/°C	Maximum series fuse	25 A
Temperature coefficient of Isc	0.05%/°C	Front Side Maximum Static Loading	Up to 5400 Pa

WORKING CONDITIONS

Rear Side Maximum Static Loading Up to 2400 Pa

*Remark: Do not connect Fuse in Combiner Box with two or more strings in parallel connection

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

*Caution: Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

PACKAGING CONFIGURATION *

Piece/Box	36
Piece/Container(40'HQ)	864

*Customized packaging is available upon request.