SUBSTITUTION REQUEST FORM

TO: Tim Ryan SPS, Josh Lauderdale

PROJECT: Solar Addition Linwood Elementary

SPECIFICATION ITEM:

Section	Page	Paragraph	Description
263105	6	2.1	Solar Panel Manufacturers

Substitution approval is an acceptance of only the manufacturer and product for general conformance with the design concept reflected in the Contract Documents. The A/E has made no attempt to verify specific performance data, or to check the details of the proposed substitution as to special features, capacities, physical dimensions or code and/or regulatory compliance, all of which remain the responsibility of the person/entity submitting the proposed substitution.

The undersigned requests consideration of the following:

PROPOSED SUBSTITUTION: ZNshine ZXM7-SH108

Attached data includes product description, specifications, drawings, photographs, performance and test data, adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The undersigned certifies that the following paragraphs, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on the Drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitutions.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be **locally** available for the proposed substitution.

The undersigned further certifies that the function, appearance, and quality of the proposed substitution are *equivalent or superior* to the specified item.

The undersigned agrees, that, if this page is reproduced, the terms and conditions for substitutions found in the Bidding Documents apply to this request.

Submitted by:

Gavin Tenold
Name (Printed)

Signature

Northwest Renewables
Firm Name

2613 W 8TH
Address

Spokane WA 99224
City, State, Zip

4/5/2023
Date

(509) 570-4449
Telephone

For use by the A/E:

[X] Accepted [ ] Accepted as noted

[ ] Not Accepted [ ] Received too late

Josh Lauderdale, MW Engineers
By

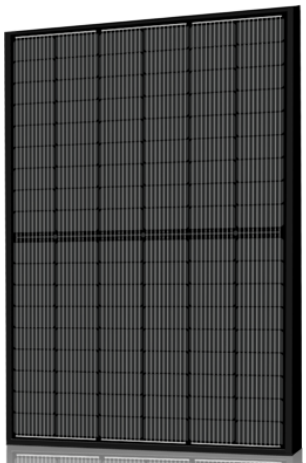
04/05/2023
Date

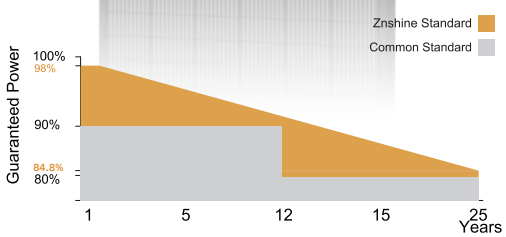
Remarks

ZNSHINESOLAR

ZXM7-SH108 Series

10BB HALF-CELL Black Monocrystalline PERC PV Module





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

390-410W
POWER RANGE

20.97%
MAXIMUM EFFICIENCY

0.55%
YEARLY DEGRADATION

12 YEARS PRODUCT WARRANTY

25 YEARS OUTPUT GUARANTEE

IEC 61215/IEC 61730/IEC 61701/IEC 62716/UL6 1730

ISO 14001: Environmental Management System

ISO 9001: Quality Management System

ISO45001: Occupational Health and Safety Management System

*As there are different certification requirements in different markets.please contact your local znshine 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 Managerment System

Warranted reliability and stringent quality assurances well beyond certified requirements.

Improved Aesthetics

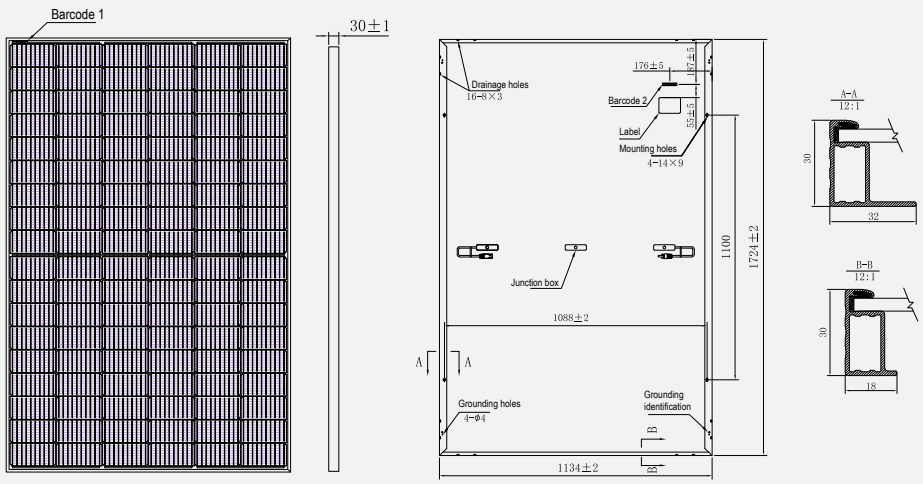
Compared to conventional modules,this full black modules have a more uniform appearance and superior aesthetics.

Founded in 1988, ZNShine solar is a world's leading high-tech PV module manufacturer.With the advanced production lines, the company boasts module capacity of 6GW. Bloomberg has listed ZNShine as a global Tier 1 PV module maker. Today Znshine has distributed its sales to more than 60 countries around the globe.

ZXM7-SH108 Series | Znshinesolar 10BB HALF-CELL Black Monocrystalline PERC PV Module

ZNSHINESOLAR

DIMENSIONS OF PV MODULE(mm)

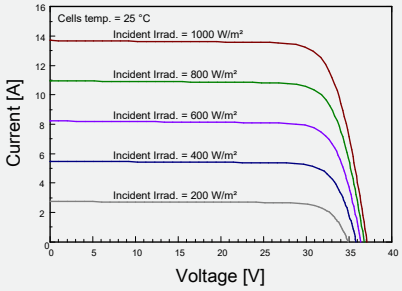


Front View

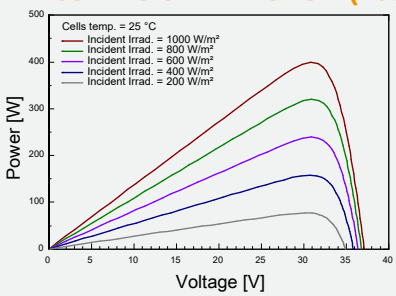
Back View

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

I-V CURVES OF PV MODULE(400W)



P-V CURVES OF PV MODULE(400W)



ELECTRICAL CHARACTERISTICS | STC*

Nominal Power Watt Pmax(W)*	390	395	400	405	410
Maximum Power Voltage Vmp(V)	30.50	30.70	30.90	31.10	31.30
Maximum Power Current Imp(A)	12.79	12.87	12.95	13.03	13.10
Open Circuit Voltage Voc(V)	36.70	36.90	37.10	37.30	37.50
Short Circuit Current Isc(A)	13.56	13.63	13.70	13.77	13.84
Module Efficiency (%)	19.95	20.20	20.46	20.72	20.97

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

MECHANICAL DATA

Solar cells	Mono PERC
Cells orientation	108（6×18）
Module dimension	1724×1134×30 mm (With Frame)
Weight	20.5±1 .0 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)	291.50	295.20	299.00	302.70	306.30
Maximum Power Voltage Vmpp(V)	28.30	28.50	28.70	28.90	29.10
Maximum Power Current Impp(A)	10.29	10.35	10.41	10.47	10.53
Open Circuit Voltage Voc(V)	34.30	34.50	34.70	34.80	35.00
Short Circuit Current Isc(A)	10.95	11.01	11.06	11.12	11.18

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

TEMPERATURE RATINGS*

NMOT	44℃ ±2℃
Temperature coefficient of Pmax	-0.35%/℃
Temperature coefficient of Voc	-0.29%/℃
Temperature coefficient of Isc	0.05%/℃

WORKING CONDITIONS

Maximum system voltage	1500 V DC
Operating temperature	-40℃~+85℃
Maximum series fuse	25 A
Front Side Maximum Static Loading	Up to 5400 Pa
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)	936

*Customized packaging is available upon request.

Add：1#, Zhixi Industrial Zone，JintanJiangsu 213251，P.R. China　Tel：+86 519 6822 0233　E-mail：info@znshinesolar.com

Note: Specifications included in this datasheet are subject to change without notice.ZNSHINE reserves the right of final interpretation © ZNSHINE SOLAR 2022 | Version: ZXM7-SH108 2202.E

No special undertaking or warranty for the suitability of special purpose or being installed in extraordinary surroundings is granted unless as otherwise specifically committed by manufacturer in contract document