Phono® Solar

TWINPLUS MODULE SERIES

HIGH EFFICIENCY MONO-PERC M4-9B-R

435-455W

OUTSTANDING PRODUCT PERFORMANCE

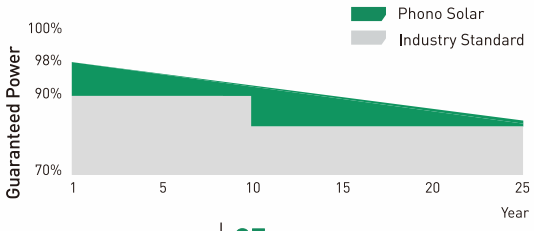
- Competitive high-temperature performance with ameliorated temperature coefficient
- Minimized power loss in cell connection
- Better performance under shading effect
- Decreased nominal operating cell temperature to 43 ± 2°C
- Higher power generation with multi-busbar and half-cut technology

TRUSTWORTHY QUALITY AND RELIABILITY

- Guaranteed 0~+5W positive tolerance secures reliable power output
- 5400Pa maximum snow load, 2400Pa maximum wind load
- Optimized electrical design lowers hot spot risk and operating current

PID RESISTANT

- Industry-leading cell processing technology and electrical design ensure solid PID resistance



12-year Product Warranty | **25-year** Linear Performance Warranty

MANAGEMENT SYSTEM CERTIFICATES

IEC 61215, IEC 61730
ISO 9001:2015 / Quality management system
ISO 14001:2015 / Standards for environmental management system
OHSAS 18001:2007 / International standards for occupational health & safety
IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules-guidelines for increased confidence in PV module design qualification and type approval

Bloomberg NEW ENERGY FINANCE Tier1

2019 TOP PERFORMER
PVEL | DNV·GL
PV MODULE RELIABILITY SCORECARD

www.phonosolar.com info@phonosolar.com

ELECTRICAL TYPICAL VALUES

Model	PS435M4-24/TH PS435M4H-24/TH		PS440M4-24/TH PS440M4H-24/TH		PS445M4-24/TH PS445M4H-24/TH		PS450M4-24/TH PS450M4H-24/TH		PS455M4-24/TH PS455M4H-24/TH	
Testing Condition	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT	STC	NOCT
Rated Power (Pmpp)	435	322	440	325	445	329	450	333	455	336
Rated Current (Impp)	10.66	8.61	10.73	8.67	10.80	8.73	10.87	8.78	10.94	8.84
Rated Voltage (Vmpp)	40.81	37.33	41.01	37.51	41.21	37.70	41.40	37.87	41.60	38.05
Short Circuit Current (Isc)	11.13	8.99	11.21	9.06	11.29	9.12	11.38	9.20	11.47	9.27
Open Circuit Voltage (Voc)	48.85	44.69	48.98	44.81	49.11	44.93	49.24	45.04	49.37	45.16
Module Efficency (%)	19.89		20.12		20.35		20.58		20.80	

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	Monocrystalline 166mm x 83mm
Dimension (L× W × H)	Length: 2103mm (82.80 inch) Width: 1040mm (40.94 inch) Height: 35mm (1.38 inch)
Weight	25.0kg (55.12 lbs)
Front Glass	3.2mm Toughened Glass
Frame	Anodized Aluminium Alloy
Cable	4mm² (IEC), Length:350mm (vertical) 1250mm (horizontal) or Customized Length
Junction Box	IP 68 Rated

TEMPERATURE RATINGS

Voltage Temperature Coefficient	-0.30%/'C
Current Temperature Coefficient	+0.05%/'C
Power Temperature Coefficient	-0.38%/'C
Tolerance	0~+5w
NOCT	43±2'C

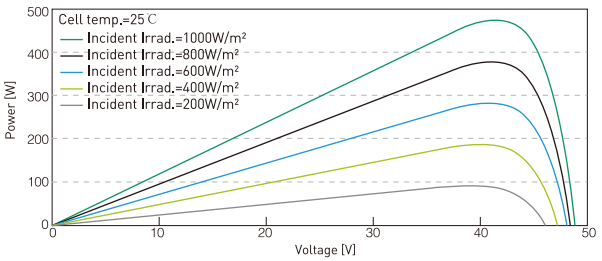
ABSOLUTE MAXIMUM RATING

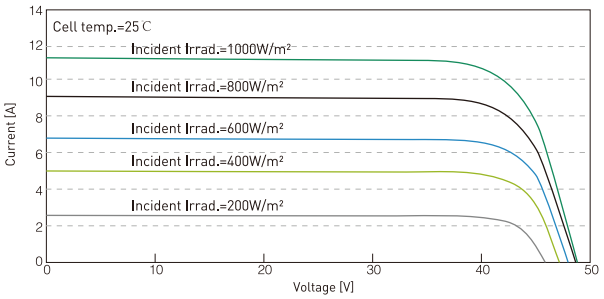
Operating Temperature	From -40 to +85'C
Hail Diameter @ 80km/h	Up to 25mm
Front Side Maximum Static Loading	5400Pa
Rear Side Maximum Static Loading	2400Pa
Maximum Series Fuse Rating	20A
PV Module Classification	II
Fire Rating (IEC 61730)	C
Module Fire Performance(UL 61730)	Type 4
Maximum System Voltage	DC 1500V/1000V

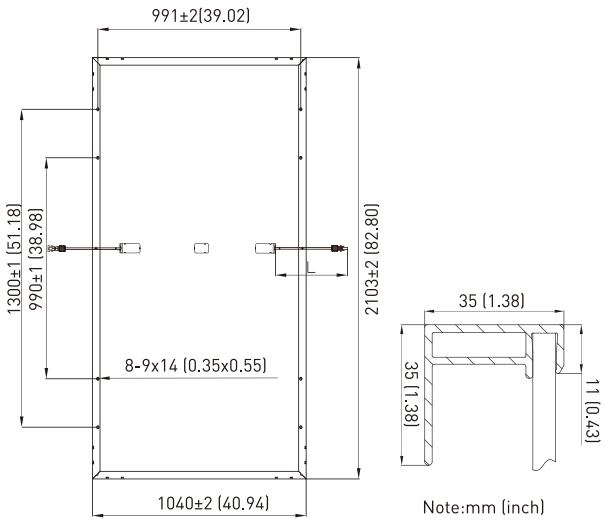
PACKING CONFIGURATION

Container	20' GP	40' HQ
Pieces/Container	255	682

ELECTRICAL CHARACTERISTICS







Phono® Solar

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.