

Under Shanshan Group, Top 500 Enterprise in China, Ningbo Ulica Solar Co., Ltd. produces our own high quality solar cells and modules starting from August 2005. Our product range covers all from off-grid panels to on-grid panels, both mono-crystalline and poly-crystalline, suitable for all types of installation from residential to commercial projects



12% more power than conventional modules



Lower power degradation
Lower internal current
Lower hot spot temperature



Cell crack risk limited in small region,
enhance the module reliability



Outstanding mechanical load resistance
Snow load 5400Pa (Frontside), and Wind load 3800Pa (Backside)



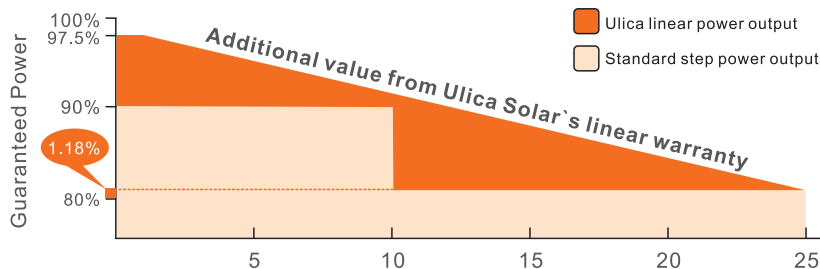
High performance under low light conditions
Cloudy days, Rainy days



Double EL test before and after lamination
Highly control the micro cracks and invisible defects.



World famous insurance
CHUBB(USA), Solar Insurance&Finance(Netherlands)

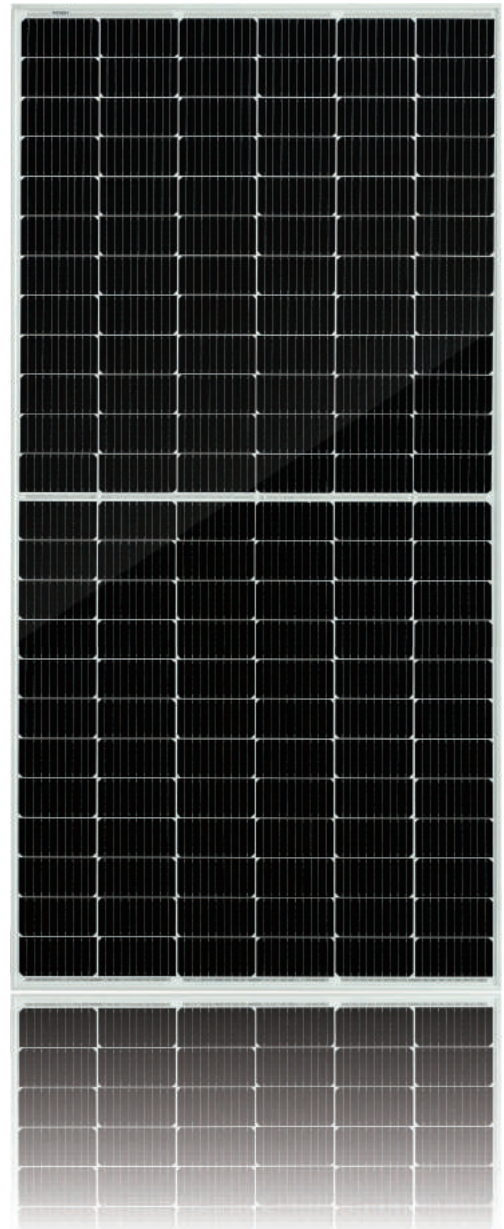


12-year Limited Product Warranty

25-year Limited Performance Warranty

Certificate Holder Name : Ningbo Ulica Solar Co.,Ltd

MONO HALF-CELL PERC



MONO 450W/455W/460W



ELECTRICAL PERFORMANCE

Electrical Parameters Standard Test Conditions

Module Type			UL-450M-144HV	UL-455M-144HV	UL-460M-144HV
Power Output	P _{max}	W	450	455	460
Power Tolerance	ΔP _{max}	W		±3%	
Module Efficiency	η _m	%	20.37	20.6	20.82
Voltage at P _{max}	V _m	V	41.0	41.2	41.4
Current at P _{max}	I _m	A	10.98	11.04	11.11
Open-Circuit Voltage	V _{oc}	V	49.8 ±4%	50.0 ±4%	50.2 ±4%
Short-Circuit Current	I _{sc}	A	11.55 ±4%	11.62 ±4%	11.69 ±4%

STC: 1000W/m² irradiance, 25°C module temperature, AM1.5

Remark: Sorting tolerance as 0~+5W in our factory.

THERMAL CHARACTERISTICS

Nominal Operating Cell Temperature	NOCT	°C	43±2
Temperature Coefficient of P _{max}	γ	%/°C	-0.360
Temperature Coefficient of V _{oc}	β _{voc}	%/°C	-0.290
Temperature Coefficient of I _{sc}	α _{isc}	%/°C	+0.049

OPERATING CONDITIONS

Max. System Voltage	1500V
Max. Series Fuse Rating	20A
Operating Temperature Range	-40°C~85°C
Max static snow load	5400Pa
Max static wind load	3800Pa
Safety Class	II
Fire class rating	Class C

CONSTRUCTION MATERIALS

Front Cover(material/type/thickness)	low-iron tempered glass/3.2mm
Cell(quantity/material/type/dimension)	144/monocrystalline/166X83mm
Encapsulant(material)	ethylene vinyl acetate(EVA)
Frame(material/anodization color)	anodized aluminum alloy/silver
Junction Box(protection degree)	IP68
Cable(length/cross-sectional area)	400mm/4mm ²
Plug Connector	DC1500,PV-ZH202B/PV-JM601A/PV-JM608/PV-CY03L, Made in China

GENERAL CHARACTERISTICS

Dimension(L/W/H)	2108x1048x35mm
Weight	24kg

PACKING CONFIGURATION

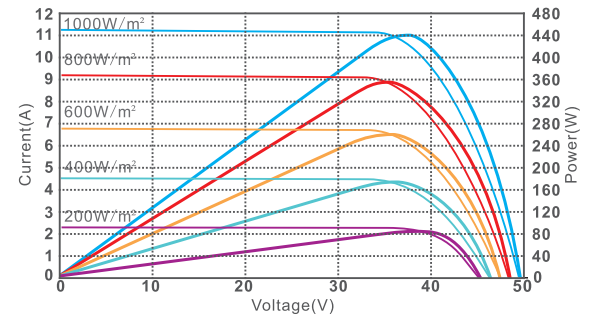
Pallet Size(L/W/H)	2150/1120/2500mm
Pallet Weight	1455kg
Pieces per Pallet	54pcs
Pieces per Container	548pcs

INTERNATIONAL CERTIFICATES

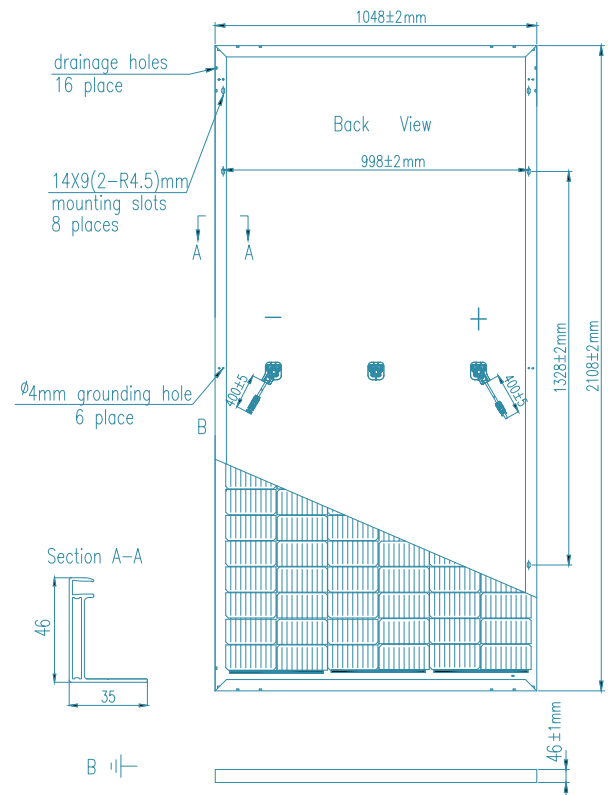
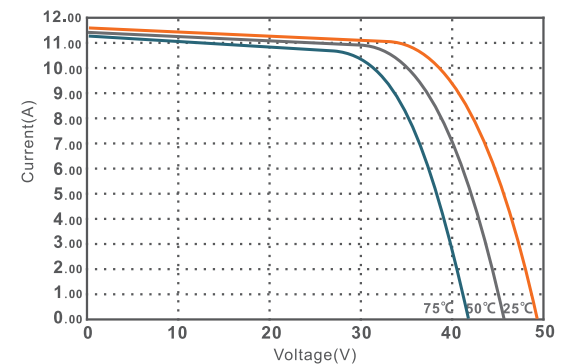
- TÜV SÜD, CE, JET, MCS, CQC, IMERTRO
- ISO9001:2015
- ISO14001:2015
- BS OHSAS 18001:2007

I-V CURVE

I-V characteristics at different irradiances



I-V characteristics at different temperature



Please read the installation manual in this entirety before handing, installing, and operating Ulica Solar modules.

Due to continuous Innovation, research and improvement, the specification is subject to change without prior notice.