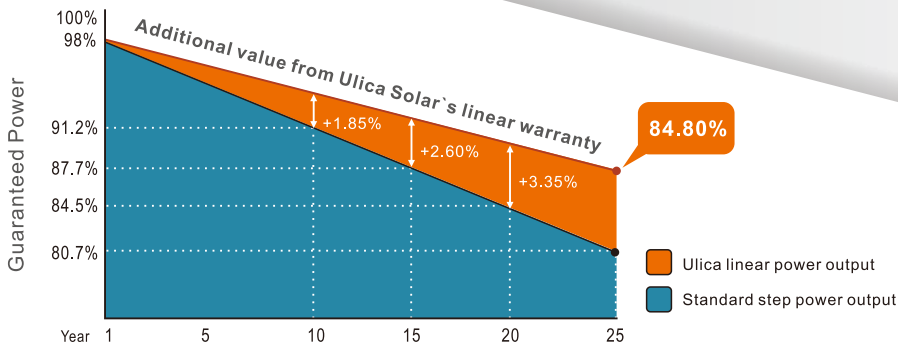
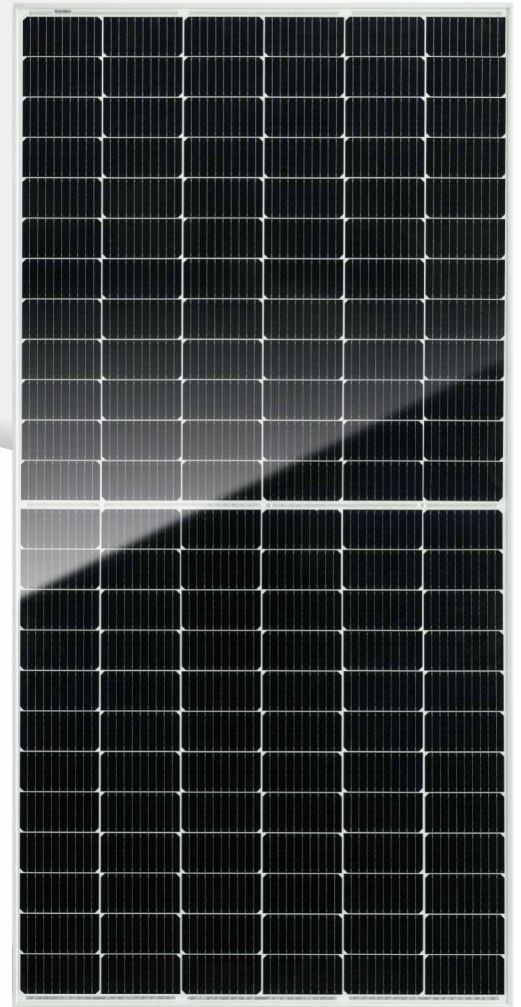


# MONO HALF-CUT MODULE UL-450 | 455 | 460M-144HV 450W~460W 1500V



**Global Tier 1 brand as announced by Bloomberg NEF**



**12% more power than conventional modules**



**Lower power degradation  
Lower internal current  
Lower hot spot temperature**



**Outstanding mechanical load resistance**  
3800 Pa wind load, 5400 Pa snow load



**Anti-PID (potential induced degradation)**  
Passed anti-PID test under 85% damp heat,  
85% relative humidity for 96 hours



**Great Durability against extreme conditions**  
Passed salt mist corrosion test, ammonia corrosion test,  
dust & sand test, fire test, all certified by TUV



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



**About Ulica Solar:** About Ulica Solar: As member of Shanshan Group (stock code: 600884) which is TOP50 Enterprise in China, Ulica Solar is the leading manufacturer of solar cells and solar panels in China since 2005, and has been continuously listed as the Tier 1 PV Module Manufacturer from Q1 2020 by Bloomberg NEF, with the annual capacity of 1.2GW, and own investment projects of 300MW.

# MONO UL-450 | 455 | 460M-144HV



## ELECTRICAL PERFORMANCE

Electrical Parameters Standard Test Conditions

Module Type	UL-450M-144HV			UL-455M-144HV			UL-460M-144HV		
Power Output	P <sub>max</sub>	W	450	455	460				
Power Tolerance	ΔP <sub>max</sub>	W	0/+5W						
Module Efficiency	η <sub>m</sub>	%	20.70	20.93	21.16				
Voltage at P <sub>max</sub>	V <sub>m</sub>	V	41.0	41.1	41.2				
Current at P <sub>max</sub>	I <sub>m</sub>	A	10.98	11.07	11.17				
Open-Circuit Voltage	V <sub>oc</sub>	V	49.8	49.9	50.0				
Short-Circuit Current	I <sub>sc</sub>	A	11.55	11.64	11.74				

STC:1000w/m<sup>2</sup> irradiance,25C module temperature,AM1.5

## THERMAL CHARACTERISTICS

Nominal Operating Cell Temperature	NOCT	°C	43±2
Temperature Coefficient of P <sub>max</sub>	γ	%/°C	-0.360
Temperature Coefficient of V <sub>oc</sub>	β <sub>voc</sub>	%/°C	-0.330
Temperature Coefficient of I <sub>sc</sub>	α <sub>isc</sub>	%/°C	+0.049

## OPERATING CONDITIONS

Max.System Voltage	DC1500V
Max.Series Fuse Rating	20A
Operating Temperature Range	-40°C~85°C
Max static snow load	5400Pa
Max static wind load	3800Pa
Application Class	A

## 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 or black
Junction Box(protection degree)	IP68
Cable(length/cross-sectional area)	400mm(or Customized Length)/4mm <sup>2</sup>
Plug Connector	MC4 compatible

## GENERAL CHARACTERISTICS

Dimension(L/W/H)	2094/1038/35mm
Weight	24kg

## PACKING CONFIGURATION

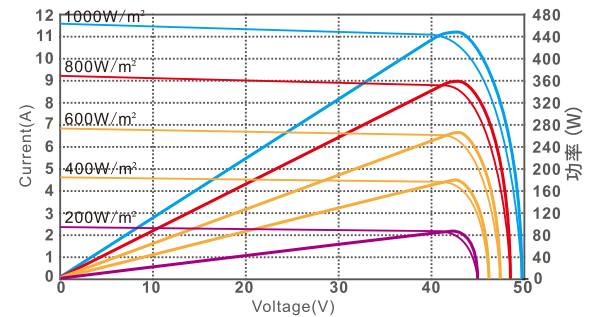
Pallet Size(L/W/H)	2134/1120/2490mm
Pallet Weight	1674kg
Pieces per Pallet	65pcs
Pieces per Container	715pcs

## INTERNATIONAL CERTIFICATES

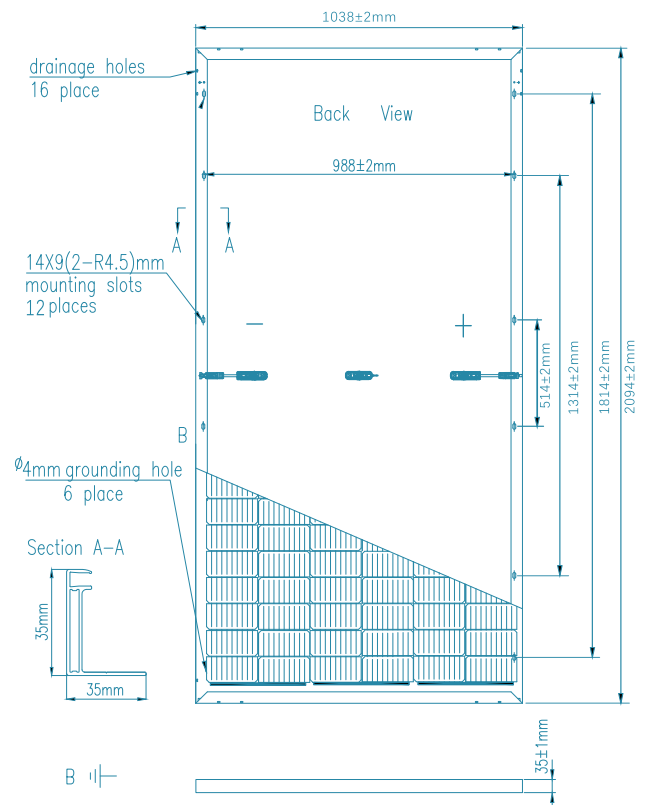
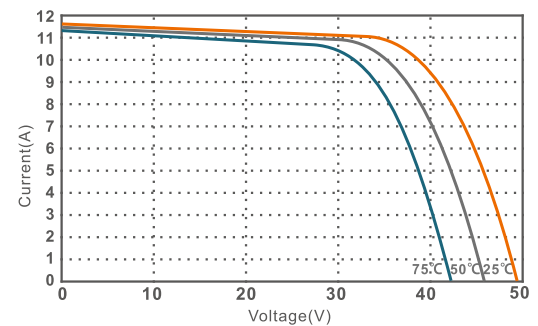
IEC 61215, IEC 61730  
 ISO 9001: 2015(Quality management systems)  
 ISO 14001: 2015 (Environmental management systems)  
 OHSAS 18001: 2015 (Occupational health and safety)

## I-V CURVE

I-V characteristics at different irradiances



I-V characteristics at different temperature



Please read the instruction entirely before handling, installing and operating Ulica Solar modules.

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