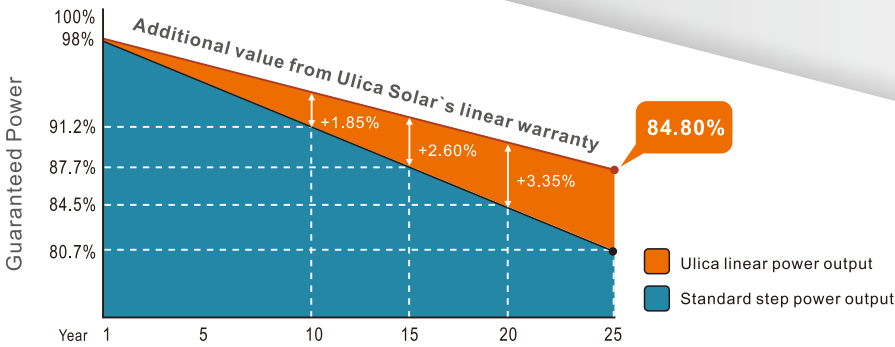
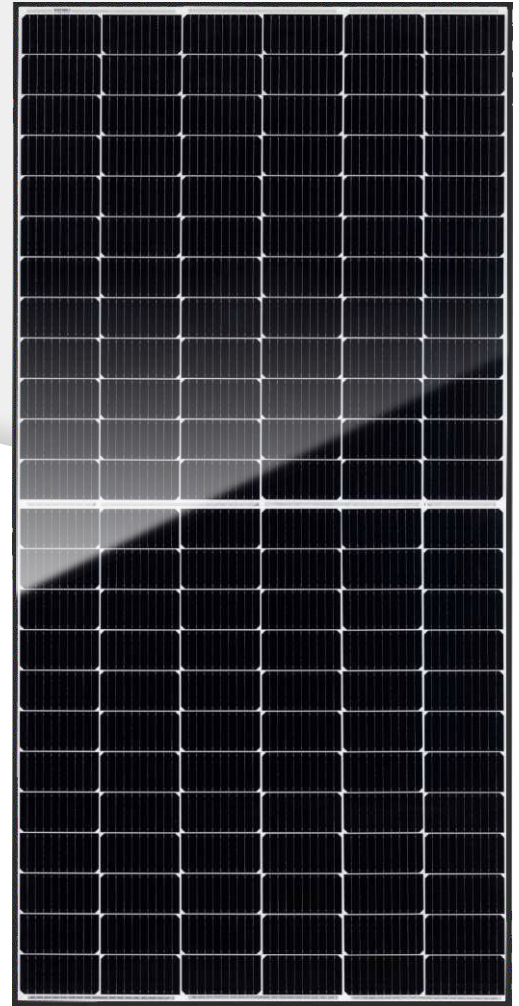


# MONO HALF-CUT MODULE UL-450 | 455 | 460M-144HV 450W~460W 1500V



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



CEC Listed



**About Ulica Solar:** As member of Shanshan Group (stock code: 600884) which is TOP500 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

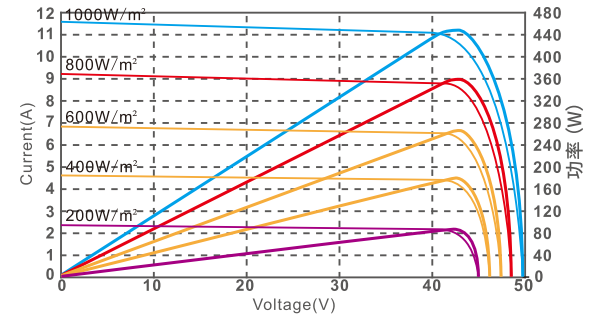
|                      |                  |
|----------------------|------------------|
| Pallet Size(L/W/H)   | 2134/1120/2490mm |
| Pallet Weight        | 1618Kg           |
| Pieces per Pallet    | 62pcs            |
| Pieces per Container | 682pcs           |

## INTERNATIONAL CERTIFICATES

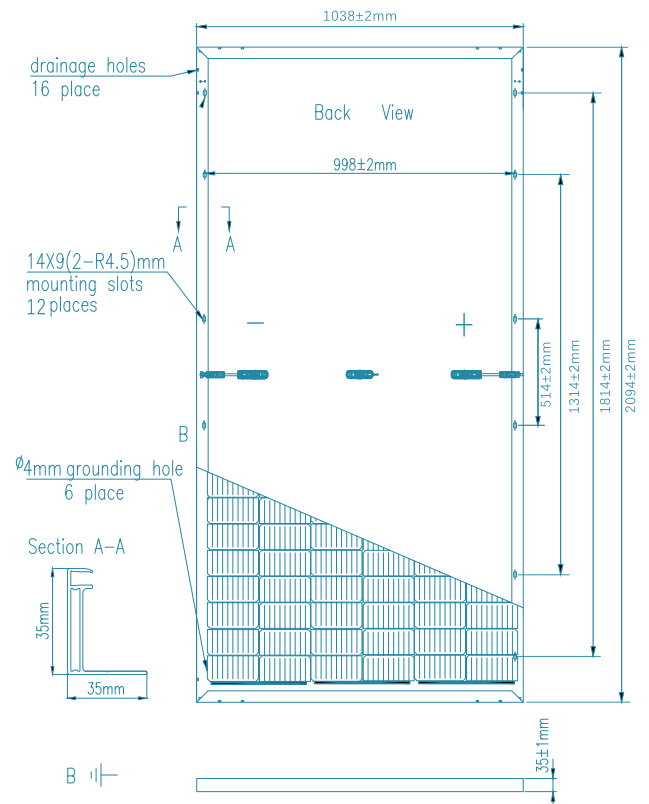
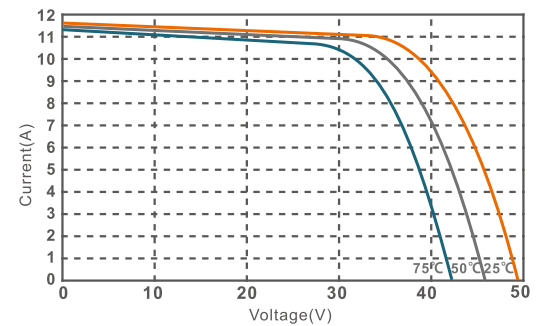
IEC 61215, IEC 61730  
 ISO 9001: 2015(Quality management systems)  
 ISO 14001: 2015 (Environmental management systems)  
 OHSAS 18001: 2015 (Occupational health and safety)

## 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.