

# Black Jade<sup>Flow</sup> series

Double Glass Bifacial N-Type TOPCon Solar Module

## 435~460W

Model: UL-\*\*\*M-96DDGN

Maximum Efficiency: **23.02%**



### Bifacial Mono Module

Bifaciality: 80±5%



### Longer Term Reliability

Passed the IEC63209-1:2021 standard test (With testing standards 2 to 3 times stricter than regular IEC requirements)



### Outstanding Mechanical load Resistance

2mm+2mm front and back sides tempered glass, sturdy and durable, resistant to hail impact, with a snow load of 5400Pa and a wind load of 2400Pa



### Anti-PID(Potential induced degradation)

Passed anti-PID test under 85°C damp heat 85% relative humidity for 192 hours



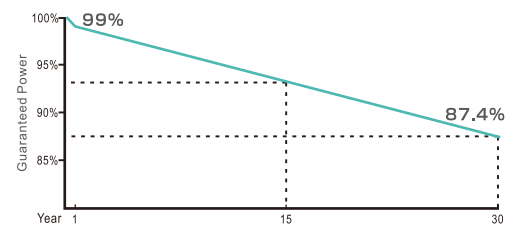
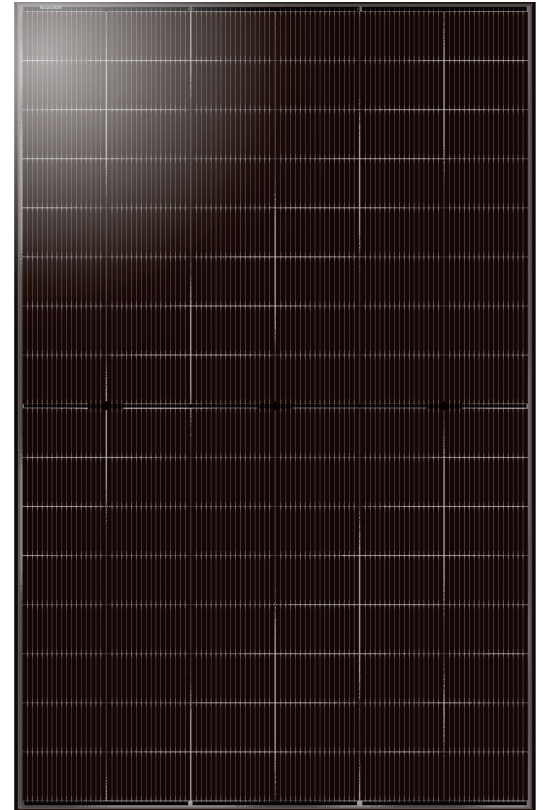
### Lower LCOE

Lower shading and resistive loss Lower temperature coefficient



### Full-Scenario Resilience

Proven through rigorous resistance tests for salt mist, ammonia corrosion, sand & dust



**15** Year Product Warranty    **1%** Power Degradation In the first Year  
**30** Year Linear Power Warranty    **0.4%** Linear Power Degradation



CEC Listed



IEC 61215, IEC 61730

ISO 9001: 2015(Quality management systems)

ISO 14001: 2015 (Environmental management systems)

ISO45001: 2018 (Occupational health and safety)

EN 13501-1 & EN 13501-5(Fire Test)



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# DOUBLE GLASS BIFACIAL 435~460W



## ELECTRICAL SPECIFICATIONS

| Module Type                | UL-435M-96DDGN |       |       | UL-440M-96DDGN |       | UL-445M-96DDGN |       | UL-450M-96DDGN |       | UL-455M-96DDGN |       | UL-460M-96DDGN |       |
|----------------------------|----------------|-------|-------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|----------------|-------|
|                            | STC*           | NOCT* |       | STC*           | NOCT* | STC*           | NOCT* | STC*           | NOCT* | STC*           | NOCT* | STC*           | NOCT* |
| Maximum Power(Pmax)        | W              | 435   | 330   | 440            | 333   | 445            | 337   | 450            | 341   | 455            | 345   | 460            | 349   |
| Maximum Power Voltage(Vmp) | V              | 29.21 | 26.87 | 29.35          | 27.00 | 29.48          | 27.12 | 29.61          | 27.24 | 29.75          | 27.37 | 29.85          | 27.46 |
| Maximum Power Current(Imp) | A              | 14.89 | 12.27 | 14.99          | 12.35 | 15.09          | 12.43 | 15.20          | 12.52 | 15.30          | 12.60 | 15.41          | 12.69 |
| Open-circuit Voltage(Voc)  | V              | 34.70 | 31.58 | 34.84          | 31.70 | 35.00          | 31.85 | 35.14          | 31.98 | 35.29          | 32.11 | 35.36          | 32.18 |
| Short-circuit Current(Isc) | A              | 15.95 | 12.87 | 16.00          | 12.91 | 16.05          | 12.95 | 16.10          | 12.99 | 16.15          | 13.03 | 16.23          | 13.09 |
| Module Efficiency STC      | %              | 21.77 |       | 22.02          |       | 22.27          |       | 22.52          |       | 22.77          |       | 23.02          |       |

\*STC:Cell temperature:25°C,Irradiance:1000W/m<sup>2</sup>,Air mass:1.5G,Power measurement tolerance: ±3%  
 \*NOCT:Air temperature:20°C,Irradiance:800W/m<sup>2</sup>,Air mass:1.5G,Wind speed:1m/s

## OPERATING PARAMETERS

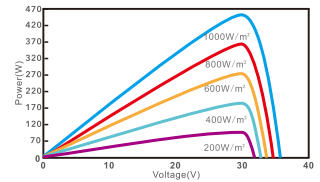
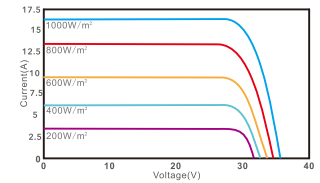
|                                    |               |
|------------------------------------|---------------|
| Operating Temperature              | -40°C~85°C    |
| Maximum system voltage             | DC 1500V(IEC) |
| Maximum series fuse rating         | 30A           |
| Nominal operating cell temperature | 43±2°C        |
| Power tolerance                    | 0~+5Watt      |

## TEMPERATURE RATINGS

|                                 |           |
|---------------------------------|-----------|
| Temperature coefficient of Pmax | -0.29%/°C |
| Temperature coefficient of Voc  | -0.25%/°C |
| Temperature coefficient of Isc  | 0.046%/°C |

## I-V CURVE

I-V characteristics at different irradiances (reference to 460 W)



## REAR SIDE POWER GAIN(REFERENCE TO 460W FRONT SIDE)

|           |       |       |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-------|-------|
| Pmax/W    | 460   | 483   | 506   | 529   | 552   | 575   | 598   |
| Pmax gain | 0%    | 5%    | 10%   | 15%   | 20%   | 25%   | 30%   |
| Voc/V     | 35.36 | 35.36 | 35.36 | 35.36 | 35.36 | 35.36 | 35.36 |
| Isc/A     | 16.23 | 17.04 | 17.85 | 18.66 | 19.48 | 20.29 | 21.10 |
| Vmp/V     | 29.85 | 29.85 | 29.85 | 29.85 | 29.85 | 29.85 | 29.85 |
| Imp/A     | 15.41 | 16.18 | 16.95 | 17.72 | 18.49 | 19.26 | 20.03 |

## SPECIFICATIONS

|                                    |                                                                                                   |  |  |  |  |  |
|------------------------------------|---------------------------------------------------------------------------------------------------|--|--|--|--|--|
| Cell Type                          | N-type TOPCon Mono Half Cell                                                                      |  |  |  |  |  |
| No.of cells                        | 96(6×8×2)                                                                                         |  |  |  |  |  |
| Dimensions                         | 1762*1134*30mm                                                                                    |  |  |  |  |  |
| Weight                             | 24.2kg                                                                                            |  |  |  |  |  |
| Front Glass                        | 2.0mm,Anti-Reflection Coating,High Transmission,Low Iron,Tempered Glass                           |  |  |  |  |  |
| Back Glass                         | 2.0mm,High Transmission,Low Iron,Tempered Glass                                                   |  |  |  |  |  |
| Frame                              | Anodized Aluminium Alloy                                                                          |  |  |  |  |  |
| Junction Box                       | IP68,3 diodes                                                                                     |  |  |  |  |  |
| Connector                          | MC4 Compatible or Original:MC4-EVO2A or others                                                    |  |  |  |  |  |
| Cable Length (Including Connector) | 4mm <sup>2</sup> Short Cable:(+)400/(-)200mm or Long Cable:(+)1200/(-)1200mm or Customized Length |  |  |  |  |  |

## PACKAGING INFORMATION



37 Pcs/Pallet



74 Pcs/Stack



Length:1775mm



Width:1140mm



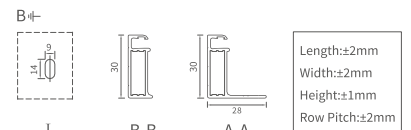
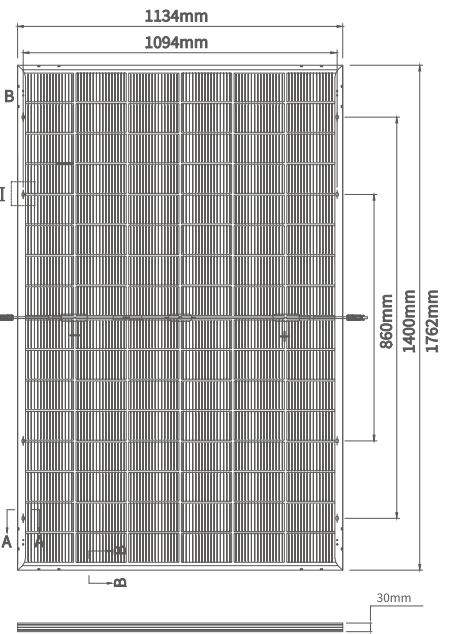
Height:2550mm



Weight:1855kg/Stack



13 Stacks/40'HQ  
962 pcs/40'HQ



Specifications included in this datasheet are subject to change without notice.

Ulica Solar reserves the right of final interpretation.

Version number: UL-1762-96DDGNTH-30-EN-V3.2