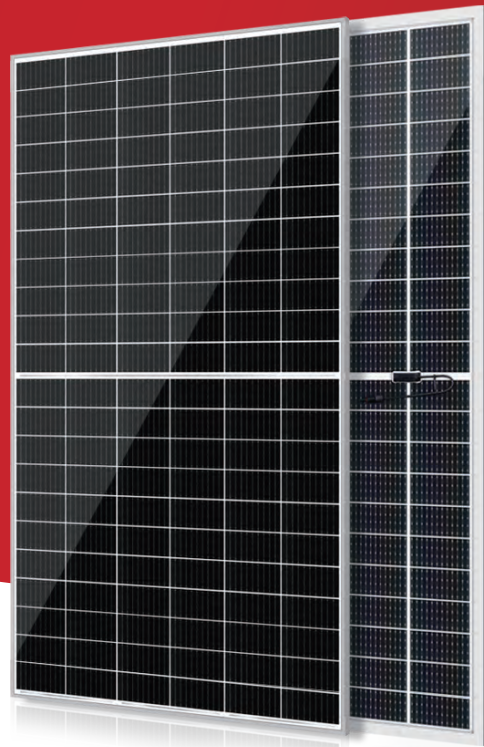


ONYX

# 645-665W

High Efficiency PERC Bifacial Module



Bifacial technology enables additional energy harvesting from rear side (up to 30%)



Excellent low irradiance performance.



Better light trapping and current collection to improve module power output and reliability.



Industry leading lowest thermal co-efficient of power.



Optimized electrical design and lower operating current for reduced hot spot loss and better temperature coefficient.

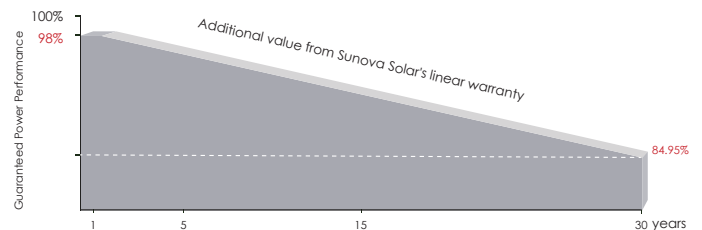


Certified to withstand: wind load (2400 Pa) and snow load (5400 Pa).



100% triple EL test enabling remarkable reduction of hidden crack rate of modules

## LINEAR PERFORMANCE WARRANTY



**30** years

Product Workmanship Warranty

**30** years

Output Power Warranty

## COMPREHENSIVE CERTIFICATES



## ELECTRICAL DATA(STC)

| Model Number                        | ES645M66-S3-BF | ES650M66-S3-BF | ES655M66-S3-BF | ES660M66-S3-BF | ES665M66-S3-BF |
|-------------------------------------|----------------|----------------|----------------|----------------|----------------|
| Peak Power Watts- $P_{MAX}(Wp)^*$   | 645            | 650            | 655            | 660            | 665            |
| Power Output Tolerance              | 0~5W           |                |                |                |                |
| Open Circuit Voltage- $V_{oc}(V)$   | 45.30          | 45.50          | 45.70          | 45.90          | 46.10          |
| Short Circuit Current- $I_{sc}(A)$  | 18.31          | 18.50          | 18.40          | 18.45          | 18.50          |
| Maximum Power Voltage- $V_{MPP}(V)$ | 37.50          | 37.70          | 37.90          | 38.10          | 38.30          |
| Maximum Power Current- $I_{MPP}(A)$ | 17.23          | 17.27          | 17.31          | 17.35          | 17.39          |
| Efficiency(%)                       | 20.80          | 20.90          | 21.10          | 21.20          | 21.40          |

STC :Irradiance 1000w/m<sup>2</sup>,Cell Temperature 25°C,Measure Tolerance :+/- 3%

## ELECTRICAL DATA(NOCT)

|                                     |       |       |       |       |       |
|-------------------------------------|-------|-------|-------|-------|-------|
| Maximum Power- $P_{MAX}(Wp)^*$      | 488   | 492   | 495   | 499   | 504   |
| Open Circuit Voltage- $V_{oc}(V)$   | 42.70 | 42.90 | 43.00 | 43.20 | 43.40 |
| Short Circuit Current- $I_{sc}(A)$  | 14.75 | 14.79 | 14.83 | 14.87 | 14.91 |
| Maximum Power Voltage- $V_{MPP}(V)$ | 34.90 | 35.10 | 35.20 | 35.40 | 35.60 |
| Maximum Power Current- $I_{MPP}(A)$ | 13.98 | 14.01 | 14.05 | 14.10 | 14.16 |

NOCT:Irradiance at 800W/m<sup>2</sup>,Ambient Temperature 20°C,Wind Speed 1m/s

## MECHANICAL DATA

|                      |  |
|----------------------|--|
| Dimensions           | 2384 x 1303 x 35 mm  |
| Weight               | 38kg   |
| Cell Type            | Monocrystalline  |
| Cell Number          | 132  |
| Front Glass          | 2.0 mm, High Transmission,<br>AR Coated Heat Strengthened Glass                                      |
| Encapsulant material | POE/EVA  |
| Back Glass           | 2.0mm, Heat Strengthened Glass (White Grid Glass)  |
| Frame                | 35mm Anodized Aluminium Alloy  |
| J-Box                | IP 68 rated  |
| Cables               | Photovoltaic Technology Cable 4.0mm <sup>2</sup><br>Portrait: 350/350 mm<br>Length can be customized |
| Connector            | MC4 EVO2 / MC4 Compatible  |

## TEMPERATURE RATINGS

|  |            |
|--|------------|
| NOCT(Nominal Operating Cell Temperature) | 43°C(±3°C) |
| Temperature Coefficient of $P_{MAX}$     | -0.34%/°C  |
| Temperature Coefficient of $V_{oc}$      | -0.25%/°C  |
| Temperature Coefficient of $I_{sc}$      | -0.04%/°C  |

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

## WARRANTY

|                                       |
|---------------------------------------|
| 30 years Product Workmanship Warranty |
| 30 years Output Power Warranty        |

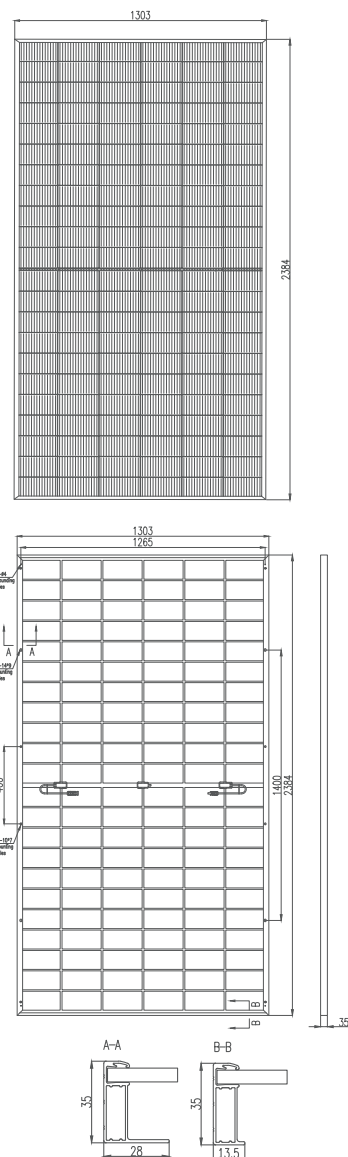
## MAXIMUM RATINGS

|                         |             |
|-------------------------|-------------|
| Operational Temperature | -40~±85 °C  |
| Front/Rear Side Load    | 5400/2400pa |
| Max Series Fuse Rating  | 35A         |
| Max System Voltage      | 1500V (IEC) |
| Fire Rating             | Class 1     |

## PACKAGING CONFIGURATION

|                                     |
|-------------------------------------|
| Modules per box:31 pieces           |
| Modules per 40'container:558 pieces |

## DIMENSIONS OF PV MODULE(mm)



## CURVES OF PV MODULE

