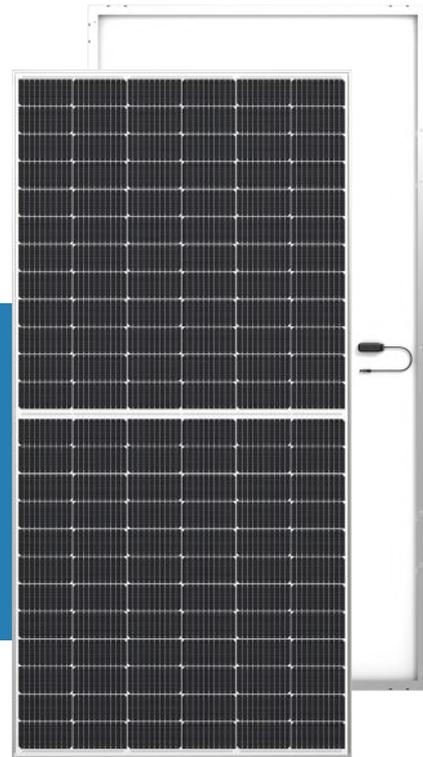


# DuDrive Series

## TSHM-144HW 440-450

### High Efficiency Mono PERC Half-cell Solar Module (166)



#### ABOUT BEYONDSUN

Founded in 2008, Beyondsun is the world's leading PV manufacturer and one-stop solution provider. With multiple manufacturing bases and more than 8 branches around the world, our business covers cells, modules, aluminum frame and PV projects. With its advantages of continuous technological innovation, strong financial performance, and well-established global sales and service networks, Beyondsun has been highly recognized by its global partners. Until now, Beyondsun has distributed more than 8 GW PV products to over 30 countries all over the world. We are committed to collaborate with our partners in driving renewable energy together.



#### HIGHER MODULE EFFICIENCY

Brings 5-10W power gain due to half-cut production system



#### MORE ENERGY YIELD

Lower NMOT and better temperature coefficient by lower cell series resistance, helps boost energy yield



#### LOWER OPERATING TEMPERATURE, MORE RELIABLE

Lower operating temperature and hot spot temperature during the sunny day, making the module prevail during the sunny days



#### BETTER SHADING TOLERANCE

Thanks to paralleling circuit design, more power generated under shading condition and during morning & evening time



#### BETTER MICRO CRACK RESISTANCE

Minimize the impact by micro crack by limiting cell damage and potentially extending area by half-cut module architecture



#### 1500V SYSTEM VOLTAGE

Approved IEC1500Vdc system voltage, saving on BoS cost

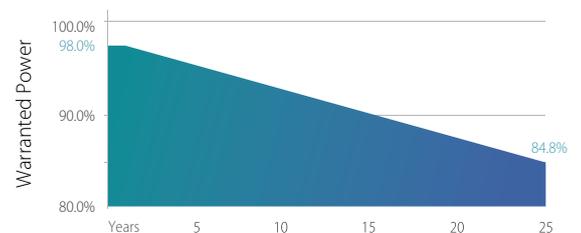
#### QUALIFICATIONS & CERTIFICATES

- IEC 61215 / IEC 61730
- ISO 9001: Quality Management System
- ISO 14001: Environment Management System
- OHSAS 18001: Occupational Health and Safety



#### INDUSTRY LEADING WARRANTY

- 25-Year** Linear Performance Warranty
- 12-Year** Product Material & Workmanship Warranty
- LLOYD'S** Product & Performance Insured by LLOYD'S



#### THE IDEAL SOLUTION FOR



Ground-mounted projects



Commercial / industrial rooftop projects

# DuDrive Series TSHM-144HW 440-450

## ELECTRICAL PARAMETERS @ STC\*

| Module Type                   | TSHM440-144HW | TSHM445-144HW | TSHM450-144HW |
|-------------------------------|---------------|---------------|---------------|
| Max. Power Output Pmax (W)    | 440           | 445           | 450           |
| Power Tolerance               | 0~+3%         | 0~+3%         | 0~+3%         |
| Max. Power Voltage Vmp (V)    | 41.67         | 41.87         | 42.06         |
| Max. Power Current Imp (A)    | 10.56         | 10.63         | 10.70         |
| Open Circuit Voltage Voc (V)  | 50.05         | 50.26         | 50.43         |
| Short Circuit Current Isc (A) | 11.22         | 11.29         | 11.36         |
| Module Efficiency (%)         | 20.24         | 20.47         | 20.70         |

\*STC (Standard Test Condition): Irradiance 1000W/m<sup>2</sup>, Cell Temperature 25 °C, Air Mass 1.5

## ELECTRICAL PARAMETERS @ NMOT\*

|                               |       |       |       |
|-------------------------------|-------|-------|-------|
| Max. Power Output Pmax (W)    | 331   | 334   | 338   |
| Max. Power Voltage Vmp (V)    | 38.82 | 39.01 | 39.19 |
| Max. Power Current Imp (A)    | 8.52  | 8.57  | 8.63  |
| Open Circuit Voltage Voc (V)  | 47.57 | 47.77 | 47.93 |
| Short Circuit Current Isc (A) | 9.05  | 9.10  | 9.16  |

\*NMOT (Nominal Module Operating Temperature), Irradiance of 800W/ m<sup>2</sup>, Spectrum AM 1.5, Ambient Temperature 20°C, Wind Speed 1m/s

## TEMPERATURE COEFFICIENTS

|                                 |             |
|---------------------------------|-------------|
| Temperature Coefficients of Pmp | -0.36%/°C   |
| Temperature Coefficients of Voc | -0.29%/°C   |
| Temperature Coefficients of Isc | +0.048 %/°C |
| NMOT                            | 41°C±3°C    |

## MECHANICAL PARAMETERS

|                   |                                                    |
|-------------------|----------------------------------------------------|
| Cell Type         | Mono, 166×83mm                                     |
| Cell Arrangement  | 144 pcs (2×(6×12))                                 |
| Dimension (L×W×H) | 2094×1038×35mm                                     |
| Weight            | 26kg                                               |
| Front Cover       | 3.2mm Tempered Glass                               |
| Frame             | Anodized Aluminium Alloy                           |
| Junction Box      | IP68, 3 bypass diodes                              |
| Cable             | 4mm <sup>2</sup> solar cable, 350mm (customizable) |
| Connector         | MC4 compatible                                     |

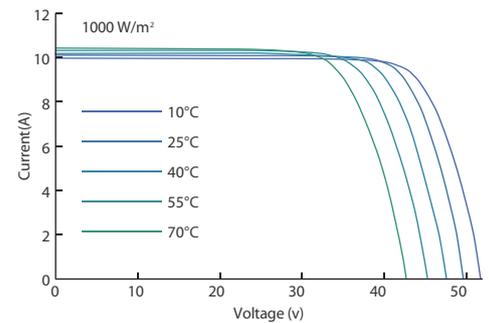
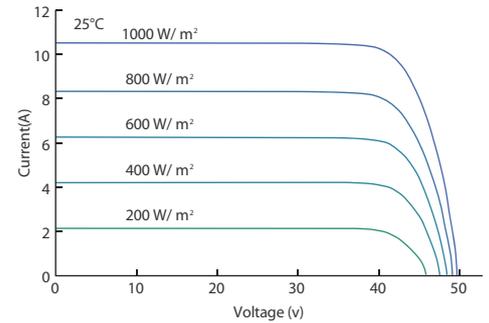
## OPERATING PARAMETERS

|                                |           |
|--------------------------------|-----------|
| Maximum System Voltage(V)      | 1500(DC)  |
| Operating Temperature(°C)      | -40~+85   |
| Max. Wind Load / Snow Load(Pa) | 2400/5400 |
| Max. Over Current(A)           | 25        |
| Application Class              | Class A   |
| Fire Rating                    | Class C   |

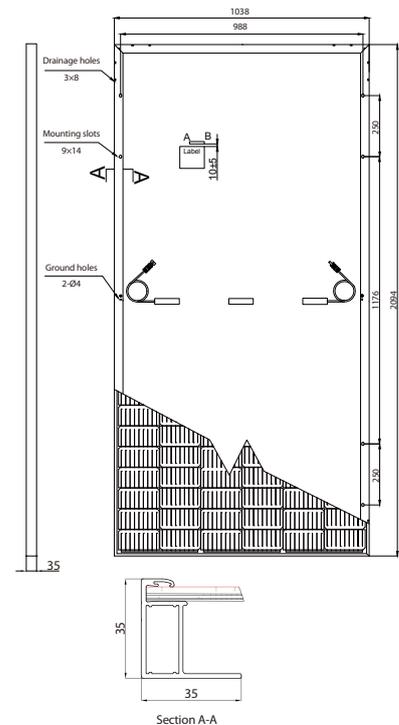
## PACKAGE INFORMATION

|                   |                     |
|-------------------|---------------------|
| Quantity / Pallet | 30 pcs              |
| Container 40'HQ   | 22 pallets, 660 pcs |

## I-V CURVES



## TECHNICAL DRAWINGS



\*The specification and key features described in this datasheet may deviate slightly and are not guaranteed. Due to ongoing innovation, R&D enhancement, Zhejiang Beyondsun Green Energy Technology Co., Ltd. reserves the right to make any adjustment to the information described herein at any time without notice. Please always obtain the most recent version of the datasheet which shall be duly incorporated into the binding contract made by the parties governing all transactions related to the purchase and sale of the products described herein.