

# BIFACIAL TOPCON MONOCRYSTALLINE 96TNB12R



- ◆ TT460-96TNB12R 460 Wp
- ◆ TT455-96TNB12R 455 Wp
- ◆ TT450-96TNB12R 450 Wp
- ◆ TT445-96TNB12R 445 Wp
- ◆ TT440-96TNB12R 440 Wp
- ◆ TT435-96TNB12R 435 Wp
- ◆ TT430-96TNB12R 430 Wp
- ◆ TT425-96TNB12R 425 Wp



## High Conversion Efficiency

High panel efficiency to guarantee high power output



## Self-Cleaning And Anti-Reflection Glass

Coating glass for self-cleaning reduces surface dust



## Outstanding Low Irradiation Glass

Outstanding panel performance even in weak light conditions



## Excellent Durability

Wind load up to 2400 Pa, Snow load up to 5400 Pa



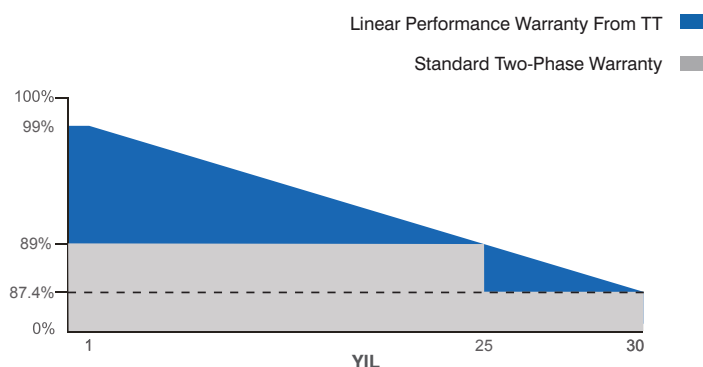
## 0~+5W Positive Power Tolerance



## Easy Installation



## Dual-Sided Power Generation



# Half-Cut

DOUBLE GLASS



ISO 9001:2015, ISO 14001:2015, ISO 45001:2018



30 Years Performance Warranty



25 Years Product Warranty

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| Model Type                         | TT425<br>96TNB12R | TT430<br>96TNB12R | TT435<br>96TNB12R | TT440<br>96TNB12R | TT445<br>96TNB12R | TT450<br>96TNB12R | TT455<br>96TNB12R | TT460<br>96TNB12R |
|------------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Peak Power ( $P_{max}$ )           | 425 Wp            | 430 Wp            | 435 Wp            | 440 Wp            | 445 Wp            | 450 Wp            | 455 Wp            | 460 Wp            |
| Module Efficiency                  | 21.27             | 21.52             | 21.77             | 22.02             | 22.27             | 22.52             | 22.77             | 23.02             |
| Maximum Power Voltage ( $V_{mp}$ ) | 28.82             | 29.02             | 29.22             | 29.42             | 29.62             | 29.82             | 30.02             | 30.22             |
| Maximum Power Current ( $I_{mp}$ ) | 14.75             | 14.82             | 14.89             | 14.96             | 15.03             | 15.10             | 15.16             | 15.23             |
| Open Circuit Voltage ( $V_{oc}$ )  | 34.33             | 34.53             | 34.73             | 34.93             | 35.13             | 35.33             | 35.53             | 35.73             |
| Short Circuit Current ( $I_{sc}$ ) | 15.70             | 15.77             | 15.84             | 15.91             | 15.98             | 16.05             | 16.12             | 16.19             |
| Power Tolerance                    | 0~+5W             |                   |                   |                   |                   |                   |                   |                   |
| Maximum System Voltage             | 1500V DC          |                   |                   |                   |                   |                   |                   |                   |
| Operating Temperature              | -40 ~ +85°C       |                   |                   |                   |                   |                   |                   |                   |
| Protection Class                   | Class II          |                   |                   |                   |                   |                   |                   |                   |
| Maximum Series Fuse Rating         | 25A               |                   |                   |                   |                   |                   |                   |                   |

## MECHANICAL SPECIFICATIONS

|                                |              |
|--------------------------------|--------------|
| Cell Dimensions (mm)           | 182.3x105    |
| Cells per Module (pcs)         | 96 (6x16)    |
| Weight (kg)                    | 23,9         |
| Panel Dimensions (mm)          | 1762x1134x30 |
| Max. Wind/Snow Load (Pa)       | 2400/5400    |
| Junction Box                   | IP68         |
| Junction Box Cable Length (mm) | 300-1300     |
| Glass Thickness (mm)           | 2.0 - 2.0    |

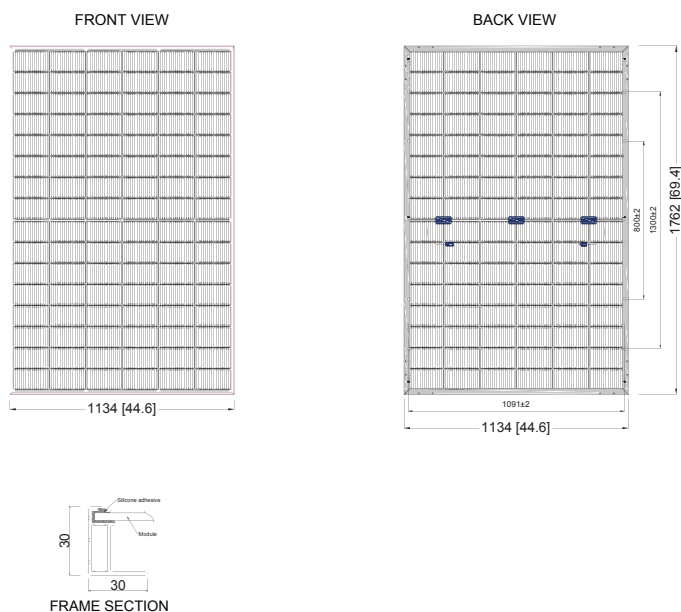
## TEMPERATURE CHARACTERISTICS

|                               |            |
|-------------------------------|------------|
| Temp. Coeff. of ( $I_{sc}$ )  | 0.041%/°C  |
| Temp. Coeff. of ( $V_{oc}$ )  | -0.250%/°C |
| Temp. Coeff. of ( $P_{max}$ ) | -0.310%/°C |

## PACKING CONFIGURATION

|                      |        |
|----------------------|--------|
| Container            | 40' HC |
| Pieces per Pallet    | 36     |
| Pieces per Container | 936    |
| Pallet Per Container | 26     |

## PHYSICAL CHARACTERISTICS



## REAR SIDE POWER GAIN

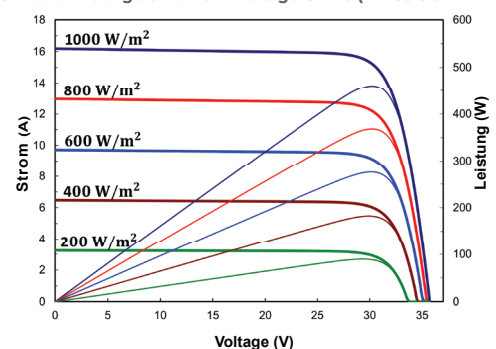
(10% rear side power gain)

## Rear Power Gain

|                                    | 425    | 430    | 435    | 440    | 445    | 450    | 455    | 460    |
|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Maximum Power ( $P_{max}$ )        | 467.50 | 473.00 | 478.50 | 484.00 | 489.50 | 495.00 | 500.50 | 506.00 |
| Short Circuit Current ( $I_{sc}$ ) | 17.27  | 17.35  | 17.42  | 17.50  | 17.58  | 17.66  | 17.73  | 17.80  |
| Open Circuit Voltage ( $V_{oc}$ )  | 37.76  | 37.98  | 38.20  | 38.42  | 38.64  | 38.86  | 39.08  | 39.30  |
| Maximum Power Current ( $I_{mp}$ ) | 16.23  | 16.30  | 16.38  | 16.46  | 16.53  | 16.61  | 16.68  | 16.75  |
| Maximum Power Voltage ( $V_{mp}$ ) | 31.70  | 31.92  | 32.14  | 32.36  | 32.58  | 32.80  | 33.02  | 33.24  |

## ELECTRICAL CHARACTERISTICS

Current - Voltage &amp; Power - Voltage Curve (TT455-96TNB12R)



\* The specifications are obtained under the standard test conditions: 1000W/m<sup>2</sup> solar irradiance, 1.5 Air Mass and cell temperature of 25°C. Measurement uncertainty for all panels is 6%. The actual transactions will be subject to the contracts. These parameters are for reference only and it is not a part of the contracts. The technical specifications in this document may vary. For more information, refer to the "Installation Manual".

\* For roof, facades and installations on similar surfaces, solar panels should be mounted over a fire-resistant covering suitable for this application, with adequate ventilation between the back of the solar panels and the mounting surface. Improper installations are hazardous and may spark a fire. Solar panels must not be mounted on structures and roofs which are made of not fire-resistant materials such as plastic layer, transparent plastic, PVC or similar materials without any fire-protection layer. Usage and installation not in accordance with the guidelines as outlined in the installation manual will terminate the warranty. Please refer to the installation manual and the warranty documents for further details.

\* TommaTech® GmbH reserves the right to change the specification of products without prior notice.