



# Half-Cut MonoPerc Fotovoltaik (PV) Modül 450-460W

11 BB

## Overviews

-  TSE and TUV Certified
-  PID Free Feature with Low Degradation
-  High Resistance to Environmental and Mechanical Conditions
-  A++ Low Measurement Uncertainty with Pasan Solar Simulator
-  Touchless Production with Latest Technology Kuka Robots



### Electroluminescence Imaging:

Micro crack control in 3 separate processes with high resolution and quality in accordance with IEC 60904-13 standard



### Ammonia Corrosion Test:

Minimum degradation against NH<sub>3</sub> Ammonia gas according to IEC 62716 standards



**A++ Solar Simulator:** According to IEC 60904-9 standard, more accurate and stable I-V characteristic measurement results with  $\pm 1\%$  low measurement uncertainty with A++ Pasan Solar Simulator



### PID

### Potential Induced Degradation:

PID Free condition with 0.8% power degradation according to IEC 62804 standard



### Salt - Mist Corrosion Test:

Level 4 corrosion resistance according to EC 61701 standards, superior corrosion resistance with 0.2% degradation



### Low Radiation Performance:

Superior low light performance under 200W/m<sup>2</sup> irradiance according to IEC 61215-2 standard on cloudy days



5400Pa

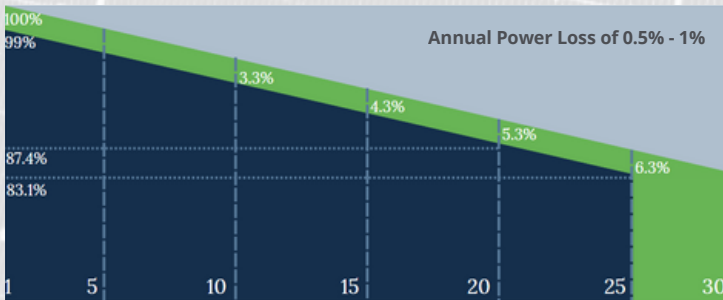
### Static and Dynamic Mechanical Load

**Resistance:** Superior mechanical load resistance against wind and snow loads with 0.2% degradation in 2400Pa/5400Pa test loads according to IEC 61215-2 standards



LID  
LeTID

**LID ve LeTID:** Maximum efficiency with optimized temperature coefficients against radiation and heat and low operating temperature



## High Performance Guarantee

We strictly control every step of the production process, from product component supply, and offer efficient and sustainable products with risk analysis, preventive activities, accredited above-standard tests.

- 12 Year Product Warranty
- Above 85% Power Performance for Up to 30 Years





Electrical Parameters in STC

TYPE	450W	455W	460W
Rated Maximum Power (Pmax) [W]	450	455	460
Open Circuit Voltage (Voc) [V]	41.53	41.71	41.89
Maximum Power Voltage (Vmpp) [V]	34.55	34.73	34.90
Short Circuit Current (Isc) [A]	13.77	13.85	13.92
Maximum Power Current (Impp) [A]	13.01	13.11	13.19
Module Efficiency[%]	20.75	20.96	21.22
Measurement Uncertainty	Pmax±% 1.4, Isc±% 1, Voc±% 0,6		

System Parameters

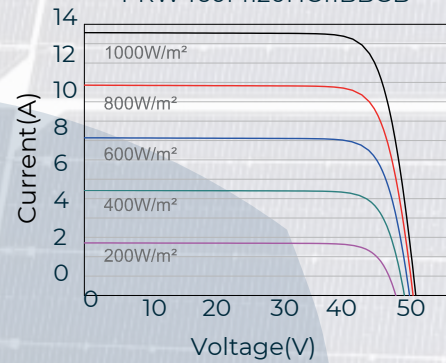
Positive Power Tolerance [W]	0 / +5W
Temperature Coefficient Isc ( $\alpha_{Isc}$ )	+0.045% / °C
Temperature Coefficient Voc ( $\beta_{Voc}$ )	-0.269% / °C
Temperature Coefficient Pmpp ( $\gamma_{Pmpp}$ )	-0.341% / °C
Operating Temperature [°C]	-40 / +85
NOCT [°C]	45±2°C, 800W/m², 20°C, AM 1.5 Rüzgar 1 m/s
Max System Voltage	1500V DC
Maximum Series Fuse Rating	25A

Components and Mechanical Properties

Solar Cell	Mono PERC M10 11BB
Glass	3.2 mm, High Transmittance, AR Coated Heat Strengthened Glass
Weight	23.5 KG ± 1
Dimensions	1909±2mmx1134±2mmx35±1mm
Cable Cross Section Size	4mm² (IEC), 12 AWG(UL)
Number of Cells	120(6x20)
Junction Box	3 Diodes with IP68 Class
Connector	MC4-EV02 / QC 4.10
Cable Length (Including Connector)	300mm-1300mm <small>Cable length may vary depending on the installation method.</small>
Maximum Static Load, Front/Rear	5400Pa/2400Pa Test Load (1.5 Safety Factor)
Safety Class / Fire Performance	II / IEC Class C

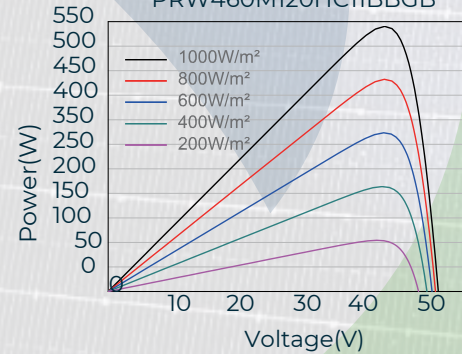
**Irradiance Curve**

PRW460M120HC11BBGB



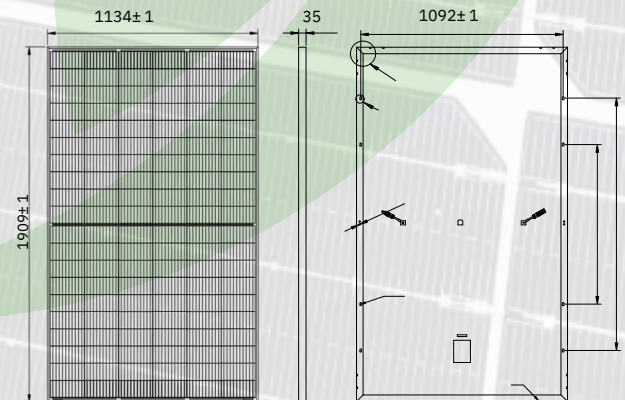
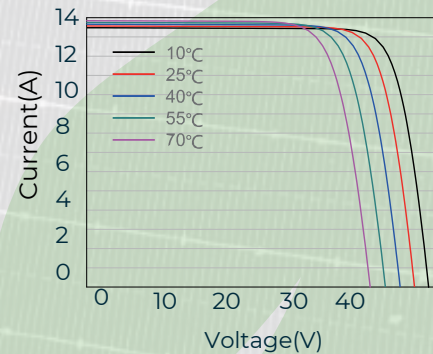
**Power-Voltage Curve**

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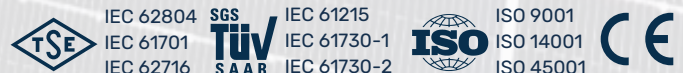


**Current Voltage Curve**

PRW460M120HC11BBGB



**System And Product Certificates**



Standard Test Conditions (STC) Irradiance 1000W/m², Cell Temperature 25°C (±2°C). AM 1.5G

The information in this document may change depending on innovation processes. Prowatt Energy reserves the right to make changes to this information.