

MAJOR ADVANTAGES

N-Type Technology
Half-Cut Cells
Double Glass
Full Black Design
Bifacial

DIMENSIONS

Size: 1762 (+-2) x 1134 (+-2) x
30 (+-1) mm
Weight: 22.5 Kg

PANEL EFFICIENCY

Maximum Efficiency: 22.8 %
Positive power tolerance: 0~+5W

LINEAR PERFORMANCE WARRANTY

Product warranty: 25 years
Linear power warranty: 30 years
1st year power degradation: <1%
Year 2-30 power degradation:
<0.4%

I. Solar Panel 455 W Bifacial

The solar panel that outperforms, outlasts, and elevates every roof. N-Type ultra-low degradation technology, extreme double-glass durability, bifacial gain, and full-black elegance for 30 years of exceptional production.



- **N-Type Technology**
+2% efficiency vs standard panels, zero light-induced degradation. Guaranteed stable production for 30 years, even at +35°C.
- **Half-Cut Cells**
+2-3% real-world yield gain. If one half is shaded, the other keeps producing at full power. Less overheating = extended lifespan.
- **Double Glass**
Extreme durability: 30-year warranty instead of 20-25. Withstands wind >2400 Pa, snow >5400 Pa, salt, and chemicals. Zero corrosion.
- **Full Black Design**
Perfect architectural integration. Elegant, uniform appearance that enhances your roof and property value.
- **Bifacial**
Up to +25% additional production via the rear side.
Accelerated return on investment by 6 to 12 months.

Electrical Parameters at STC

Maximum Power (Wp): 455W
Open Circuit Voltage (Voc): 39.50V
Short Circuit Current (Isc): 14.56A
Maximum Power Voltage (Vm): 33.00V
Maximum Power Current (Im): 13.79A
Module Efficiency: 22.80%

Maximum Series Fuse: 30A
Watts Positive Tolerance: 0~+5W
Number of Diodes: 3

MBB HALF-CUT

RECTANGLE SOLAR CELL

188x94 mm, 108 cells

CERTIFICATIONS

IEC61215, IEC61730, IEC61701,

IEC61215-2

LOAD CAPACITIES

Cover of the module (Glass):

3600PA (IEC61215) (snow)

Front & Back of the module:

2400PA (IEC61215) (wind)

OPERATING

TEMPERATURE

-40°C to +85°C

IP68

SKU

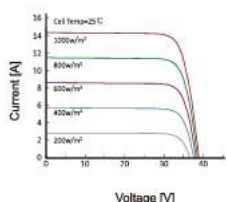
101-Pan-455

Orders or additional information:

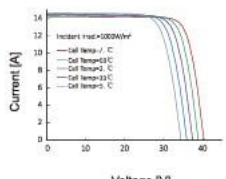
www.enerstein-solar.com

contact@forge-solar.com

Solar Panel 455 W - Electrical Characteristics



Module characteristics at constant module temperatures of 25°C and variable levels of irradiance



Module characteristics at variable module temperatures and constant module irradiance of 1.000 W/m²

10 % irradiation ratio:

Maximum Power (Wp): 491W

Open Circuit Voltage (Voc): 39.50V

Short Circuit Current (Isc): 15.73A

Maximum Power Voltage (Vm): 32.99V

Maximum Power Current (Im): 14.89A

Irradiation Ratio (Rear/Front): 10%

Standard Test Conditions: 1000W/m², 25°C,

AM 1.5

Maximum System Voltage: 1500V/DC

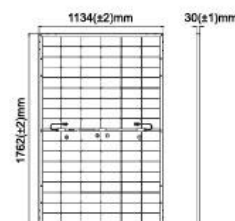
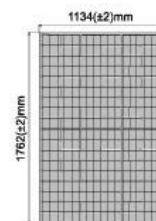
Temperature-Coefficient Isc: +0.046%/°C

Temperature-Coefficient Voc: -0.26%/°C

Temperature-Coefficient Pmpp: -0.30%/°C

Operating Temperature: -40°C to +85°C

Normal Operating Cell Temperature: 45+/-2



Mechanical characteristics

Front/Back Cover (Material/Thickness): Low-iron tempered glass

2.0/2.0 mm

Cell (Quantity/Material/Dimensions): 108 (6x18)/monocrystalline

silicon

Frame (Material/Color): Aluminum hollow-chamber frame on each

side anodized aluminum alloy/Black

Cables & Plug Connectors: 4mm², 300 mm in length, or

customized

Module Weight: 22.5 Kg

Module Dimensions (L/W/H): 1762 (+/-) x 1134 (+/-) x 30 (+/-)mm

Application Class: Class A

Electrical Protection Class: Class II

Fire Safety Class: Class A

* **Bifaciality=** Pmax,Rear/Rated Pmax, Front

* Specifications in the datasheet are subject to change without notice

RELATED PRODUCTS

II. Inverter Off-Grid Hybrid 5kW

III. LFP Battery: 16kW

IV. Full Solution Solar Car Port