

TOPCon

N-Type Bifacial Dual Glass Modules Series

605 - 650 Wp • 156 Cells



Product Warranty

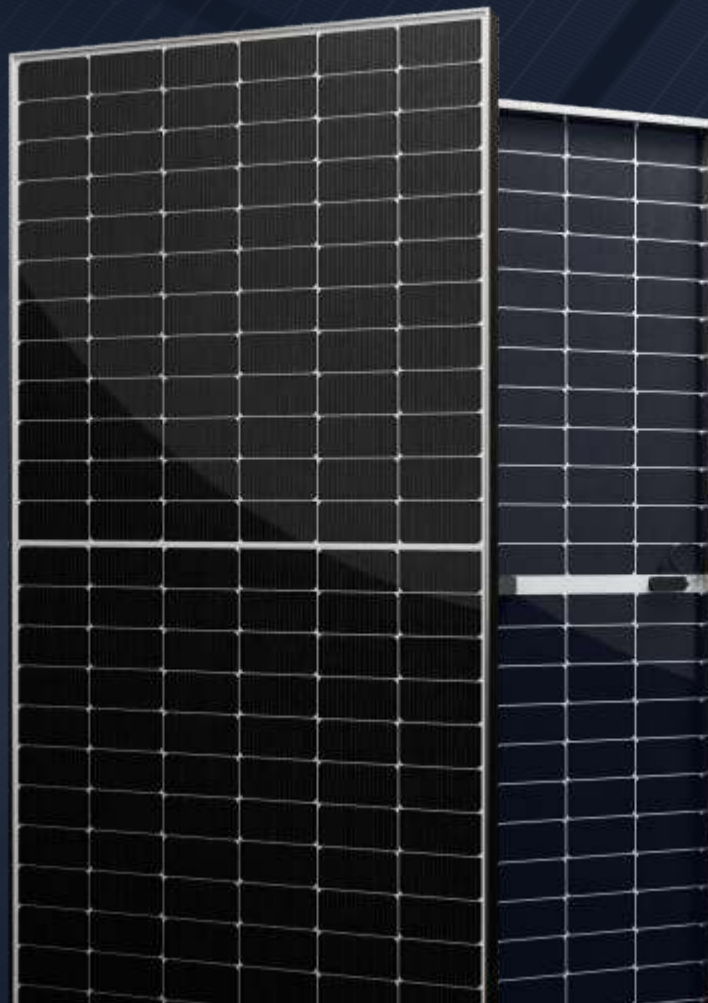
Ensuring long-term performance, reliability, and protection for your solar investment.



Performance Warranty

Assuring sustained energy output, efficiency, and reliability for decades to come.

*Module image shown is for illustrative purposes only.



650+ WP

Power Output up to



23.24 %

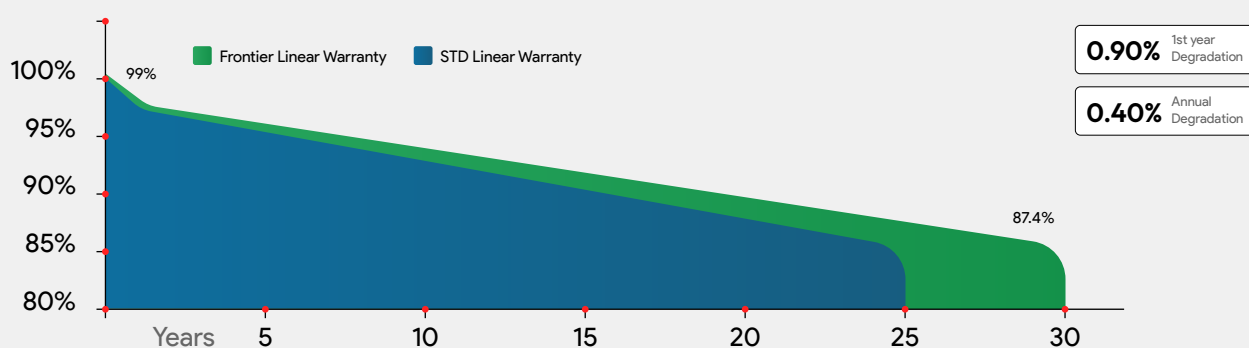
Efficiency up to



0~+4.99 W

Power Tolerance

Linear Performance Warranty



Highlights



Up to 30% Additional Power Gain

When compared with conventional P-Type Module.



Better Output in Low Irradiance

Delivers higher power output even during cloudy, foggy, or low-irradiance days.



Bi-faciality Factor 80 ± 5%

Captures additional energy from the rear side for improved total power output.



No LID Loss

Higher power generation



Better Temperature Co-efficient

Maintains higher energy output even in hot ambient conditions.

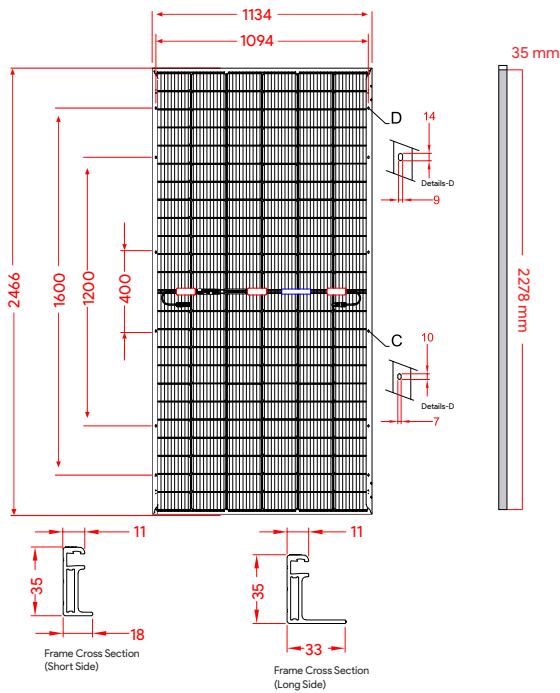


Reliable Performance over time

Full-automated facility with latest technology, durability & reliability.

Technical Data

Dimensions in mm

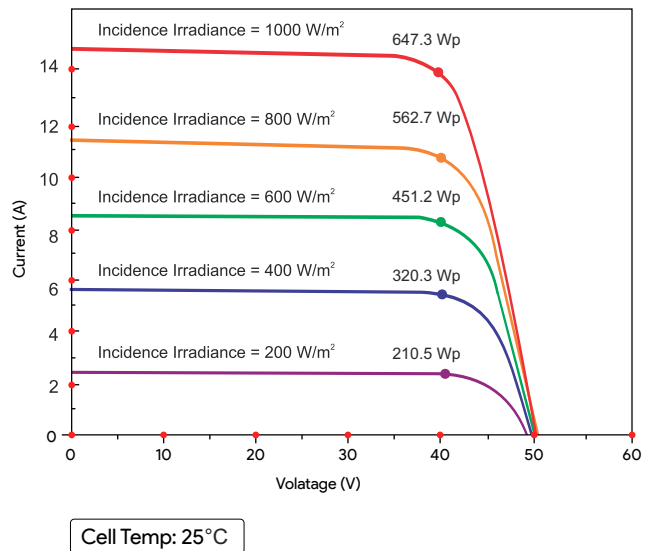


Note: All the dimensions are ± 2 mm Tolerance

Multi Irradiance Curve

Bifacial Module @ 645 Wp

I-V Curves



Electrical Characteristics - All Data Measured to STC (Only Front)*										
Peak Power, Pmax (Wp)	605	610	615	620	625	630	635	640	645	650
Maximum Voltage, Vmpp (V)	45.46	45.56	45.66	45.76	45.86	45.96	45.79	45.89	45.99	46.09
Maximum Current, Imp (A)	13.31	13.39	13.47	13.55	13.63	13.71	13.87	13.95	14.03	14.11
Open Circuit Voltage, Voc (V)	54.96	55.11	55.26	55.41	55.56	55.71	56.55	56.90	56.85	57.00
Short Circuit Current, Isc (A)	14.02	14.09	14.16	14.23	14.30	14.37	14.62	14.69	14.76	14.83
Module Efficiency (%)	21.65	21.83	22.01	22.18	22.36	22.54	22.69	22.88	23.05	23.24

*STC: Irradiance 1000 W/m², cell temperature 25°C, Air mass AM 1.5 according to EN 60904-3. Average efficiency reduction is approx. 3% at 200 W/m² according to EN 60904-1. Except Pmp, all other parameter have tolerance of $\pm 2\%$, measurement uncertainty $< 3\%$.

Temperature Coefficients & Operating Limits	
T _c of open circuit voltage (β)	-0.24% / °C
T _c of short circuit current (α)	+0.05% / °C
T _c of power (γ)	-0.30% / °C
Maximum system voltage	1500 VDC (IEC & UL)
NOCT	45°C $\pm 2^\circ$ C
Temperature Range	-40°C to +85°C

BI-FACIAL Output - Backside Power Gain										
10% Power Pmp	665.5	671	676.5	682	687.5	693	698.5	704	709.5	715
20% Power Pmp	726.0	732	738.0	744	750.0	756	762.0	768	774.0	780
30% Power Pmp	786.5	793	799.5	806	812.5	819	825.5	832	838.5	845

* Bifacial gains depends on the power plant design & albedo of installation site. Measuring Tolerance: $\pm 3\%$
 * Power Bifaciality = Pmax (Rear) / Pmax (Front) are tested under STC

Packaging Configuration			
Container	40' HQ	Pieces / Pallet	31
Pallets / Container	20	Pieces / Container	620

Frame Profile Dimensions	
Long	35x33 mm
Short	35x18 mm

Mechanical Characteristics	
External Dimensions	2466(± 2 mm) x 1134 (± 2 mm) x 35(± 2 mm)
Weight	38.5 ($\pm 3\%$) Kg
Solar Cells	10BB/16BB, TOPCon - Monocrystalline 91mm x 182mm ± 1 mm
Front Glass	2 mm, Semi Tempered, HS Glass
Rear Cover	2 mm, Semi Tempered, HS Glass
Frame	Anodized Aluminium Alloy
Junction Box	3 Split, IP 68 Rated
Connector	Mc4 Compatible
Design Mechanical Load	5400 Pa For Snow Load, 2400 Pa Wind Load
Fire Performance	TYPE 39 (UL 61730) Or Class C (IEC 61730)
Output Cable	4.0 mm ² 300 mm Length
Safety Factor for Mechanical Load	1.5
Maximum series fuse rating	30 A



Note:

- The specifications included in this datasheet are subject to change without notice.
- The Electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.

Caution: Please read safety and installation instructions before using the product.

Warranty & Certifications

- 15 Years of Product Warranty.**
- Performance Warranty: Power degradation $< 1.0\%$ in first year, $< 0.40\%$ / year in 2-30 years.**
- Approvals & Certificates: IS 14286 : 2010 / IEC 61215 : 2005, IS/IEC 61730 (PART 1) : 2004 & IS/IEC 61730 (PART 2) : 2004

Note: Please read Frontier Energies Pvt. Ltd.'s warranty documents thoroughly.

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