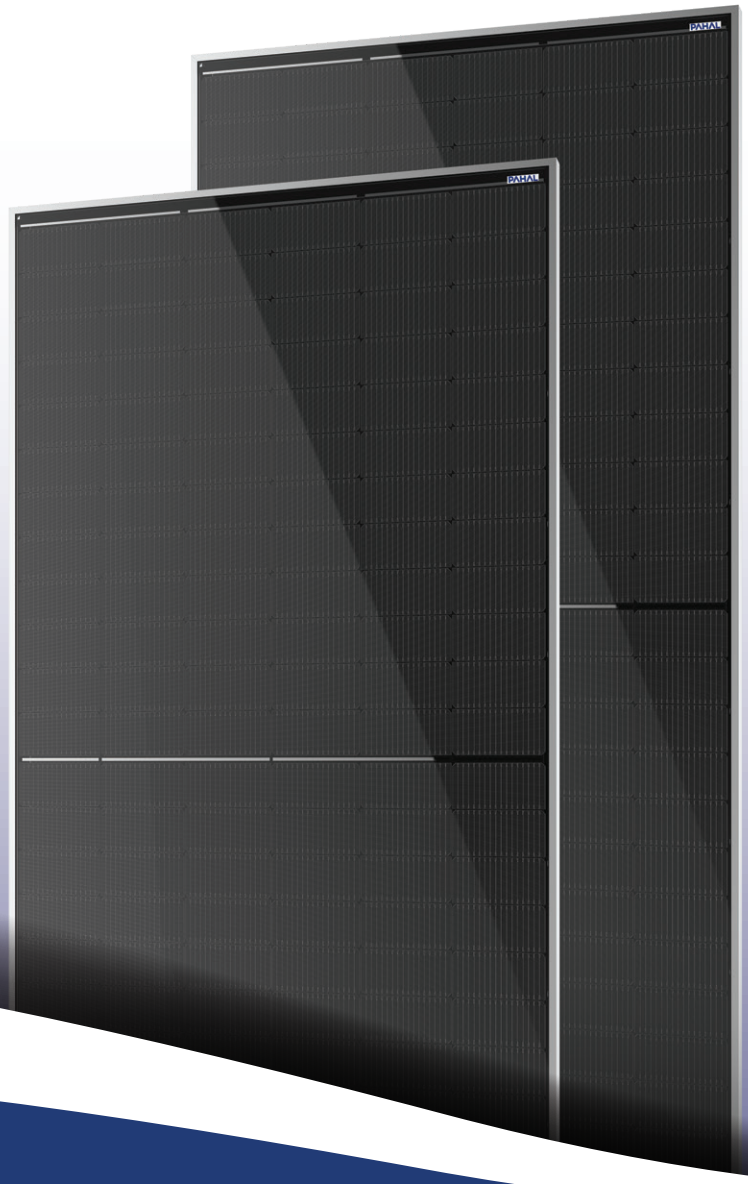
PAHAL
SOLAR
AI Powered Solar PV Module Manufacturer

INDIA'S FIRST

AI BASED SOLAR PV MODULE MANUFACTURER | 2GW



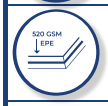
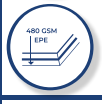
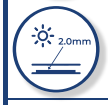
ALMM
LISTED

www.pahalsolar.com

PAHAL SOLAR
AI Powered Solar PV Module Manufacturer

WHY PAHAL SOLAR ?

Clarity in Comparison, Confidence in Performance

Description	Pahal Solar Module		Other Module Manufacturer		Impact/Effect
Cell		Cell efficiency ≥ **25.4%.**		Cell efficiency **24.9% to 25.2%.**	Usage of **high-quality A-grade** cells improves generation.
					Longer module **lifespan** against **UV, high temperature**, and **weathering**.
Aluminium Frame		**40mm** frame height.		**28-35mm** frame height.	**Lower height** reduces mechanical **strength**.
		Anodizing thickness ≥ **15µm.**		Anodizing ≤ **8-12µm.**	**Less anodizing** increases **rust risk** over time period.
		Frame set weight ≥ **3kg. ***		Frame set weight **2.0-2.7kg.**	**Lower weight** reduces module **strength—micro-cracks** due to **bending, resulting in decreasing generation.**
		Frame thickness **1.5mm (±0.2mm)**.		Thickness **1.0-1.2mm (±0.2mm).**	Thinner frame reduces structural **strength** against **wind load**.
Encapsulant (EPE)		**Higher GSM EPE** used.		**Lower GSM** used.	**Lower GSM** increases **hotspot risk** over time period.
		Front: **520 GSM.**		**420 GSM EPE** front and **390 GSM EPE** back.	Moisture penetration causes **de-lamination.**
		Back: **480 GSM.**		**390 GSM EPE** front and **390 GSM EVA** back.	**Lower GSM** leads to **faster de-gradation.**
Solar Glass		**HTAR** (High Transmission Anti-Reflective) coated glass.		**ARC** (Anti-Reflective Coated) glass.	HTAR glass lets **0.4-0.5%** more **photons through, resulting in improving generation.**
		Front: **2.0mm** thick.		Front: **2.0mm** thick.	HTAR coating is **stronger** and more **UV resistant.**
		Back: **2.0mm** thick.		Back: **1.8mm** thick.	
		Back side **white grid printed glass.**		No grid printing.	White grid **returns photons** to the cell, **boosting generation**.
Ribbon		High quality PV Ribbon **Ø 0.26mm**.		Ribbon **Ø 0.24mm.**	**Thinner ribbon** increases **resistance** and **voltage drop**, reducing **power output.**
Production Line		**100% AI-based** latest advanced technology.		**AI technology** is generally **not used** in the manufacturing process.	**AI technology** based manufacturing **improve solar panel quality.**
Research & Development (R&D)		State of the art **in-house R&D** laboratory.		**Limited R & D** Infrastructure.	Ongoing research enables **top-quality module supply in the market.**
					Strict testing ensures **long-term module quality.**

● The materials may change due to technology and other reasons as required . * Depands on frame thickness 1.5mm (±0.2mm).

PAHAL SOLAR
AI Powered Solar PV Module Manufacturer

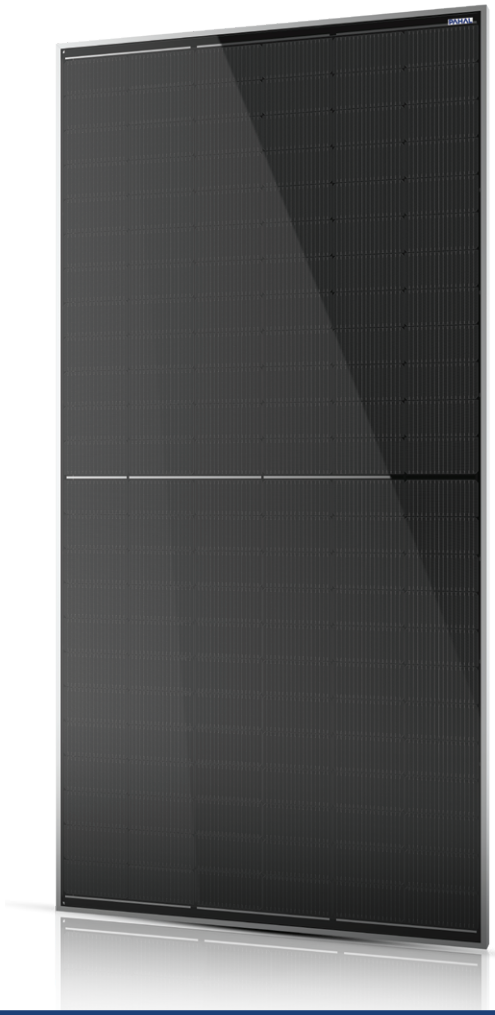
About Us

Pahal Solar is a leading Indian renewable energy company, specializing in the manufacturing of high-efficiency solar PV modules and providing end-to-end sustainable energy solutions.

With an advanced 2 GW manufacturing facility, equipped with fully automated and AI-driven production lines, Pahal Solar ensures global standard practices in quality control, efficiency, and durability. Our modules are certified by national and international testing laboratories, ensuring compliance with the highest benchmarks of performance and safety.

Advantage Pahal

- Advanced Manufacturing Excellence
- Superior Quality & Reliability
- Customer-Centric Approach
- Commitment to Sustainability
- Strong Warranty & Bankability
- Assured Product Performance & Long-Term Value
- World-Class Research & Development with Innovation



SCAN FOR DATASHEET

SCAN FOR COMPARISON

DCR | NON-DCR VARIANTS AVAILABLE

UPCOMING PROJECTS

(+) 2 GW Module Manufacturing + **2 GW Cell Manufacturing** + **Frame Manufacturing**

PAHAL SOLAR

AI Powered Solar PV Module Manufacturer

CORPORATE & UNIT - 2

Block No. 267/B, 271/B, 272/B/H,
Samarthya Bellavista, Olpad-sayan Road,
Olpad, Atodara, Surat-394130 Gujarat, India.

UNIT - 1

189-Block No.71 Opp to Shiv Shakti Estate,
Olpad-sayan Road, Olpad Surat-394540,
Gujarat, India.

LINKEDIN FACEBOOK INSTAGRAM GOOGLE REVIEW

+91 90816 13100

info@pahalsolar.com

www.pahalsolar.com

PAHAL SOLAR
AI Powered Solar PV Module Manufacturer

N-TYPE TOPCon M10R GLASS TO GLASS

570Wp - 610Wp

ELECTRICAL PARAMETERS*

PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)

(Standard Test Environment : Irradiance 1000w/m2, Cell Temperature 25°c, Spectrum AM 1.5 Test Condition Is Based On The Front Side)

MODEL NUMBER	PSN_GB570	PSN_GB575	PSN_GB580	PSN_GB585	PSN_GB590	PSN_GB595	PSN_GB600	PSN_GB605	PSN_GB610
CAPACITY RATING Pmax (Wp)	570	575	580	585	590	595	600	605	610
+ve Power Tolerance(w)	0~5	0~5	0~5	0~5	0~5	0~5	0~5	0~5	0~5
Rated Voltage Vmp (V)	44.86	45.05	45.24	45.43	45.62	45.81	46.00	46.19	46.38
Rated Current Imp (A)	12.72	12.77	12.83	12.88	12.94	12.99	13.05	13.10	13.16
Open Circuit Voltage (Voc)	53.54	53.70	53.86	54.02	54.18	54.34	54.50	54.66	54.82
Short Circuit Current (Isc)	13.47	13.52	13.57	13.62	13.67	13.72	13.77	13.82	13.87
Module Efficiency (%)	22.07	22.26	22.45	22.65	22.84	23.03	23.23	23.42	23.61
Fill Factor (FF)	79.10	79.25	79.40	79.55	79.69	79.84	79.98	80.13	80.27

PERFORMANCE UNDER NOMINAL OPERATING CELL TEMPERATURE (NOCT)

(Standard Test Environment : Irradiance 800w/m2, Ambient Temperature 20°c, Spectrum AM 1.5, Wind Speed 1 m/s Test Condition Is Based On The Front Side)

MODEL NUMBER	PSN_GB570	PSN_GB575	PSN_GB580	PSN_GB585	PSN_GB590	PSN_GB595	PSN_GB600	PSN_GB605	PSN_GB610
CAPACITY RATING Pmax (Wp)	432	436	439	443	447	451	455	458	462
Rated Voltage Vmp (V)	42.86	43.04	43.22	43.40	43.58	43.76	43.95	44.13	44.31
Rated Current Imp (A)	10.08	10.12	10.17	10.21	10.25	10.30	10.34	10.39	10.43
Open Circuit Voltage (Voc)	51.15	51.30	51.45	51.61	51.76	51.91	52.07	52.22	52.37
Short Circuit Current (Isc)	10.68	10.72	10.76	10.80	10.83	10.87	10.91	10.95	10.99
Module Efficiency (%)	16.72	16.87	17.01	17.16	17.30	17. 45	17.59	17.74	17.89
Fill Factor (FF)	79.10	79.25	79.40	79.55	79.69	79.84	79.98	80.13	80.27

BI-FACIAL: PMAX WITH REARSIDE POWER GAIN*

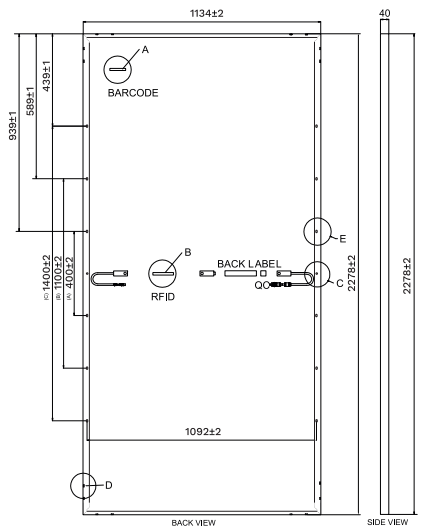
Additional Power Gain From Rear Side Compared To Power Of Front Side At Stc Depend On Mounting Structure (Height, Tilt Angle, Etc) And Reflectivity Of Ground.

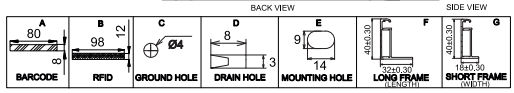
	MODEL NUMBER	PSN_GB570	PSN_GB575	PSN_GB580	PSN_GB585	PSN_GB590	PSN_GB595	PSN_GB600	PSN_GB605	PSN_GB610
5%	Power Output (W)	599	604	609	614	620	625	630	635	641
	Module Efficiency (%)	23.17	23.37	23.57	23.78	23.98	24.18	24.39	24.59	24.79
10%	Power Output (W)	627	633	638	644	649	655	660	666	671
	Module Efficiency (%)	24.27	24.48	24.70	24.91	25.12	25.34	25.55	25.76	25.98
15%	Power Output (W)	656	661	667	673	679	684	690	696	702
	Module Efficiency (%)	25.37	25.60	25.82	26.04	26.27	26.49	26.71	26.93	27.16
20%	Power Output (W)	684	690	696	702	708	714	720	726	732
	Module Efficiency (%)	26.48	26.71	26.94	27.18	27.41	27.64	27.87	28.10	28.34
25%	Power Output (W)	713	719	725	731	738	744	750	756	763
	Module Efficiency (%)	27.58	27.82	28.07	28.31	28.55	28.79	29.03	29.28	29.52
30%	Power Output (W)	741	748	754	761	767	774	780	787	793
	Module Efficiency (%)	28.68	28.94	29.19	29.44	29.69	29.94	30.19	30.45	30.70

[Bi-Faciality factor: 80% ± 10%]

MECHANICAL SPECIFICATIONS

Matrix/No. of Cells	2* (12*6)/144 Half-Cut Cells
Cell Type	N-type Topcon Bifacial Solar Cell
Module Size (LXWXH) mm	2278 X 1134 X 40
Module Weight (KG)	33Kg
Frame	Anodized Aluminium Alloy (Silver Color), Type: 6005-T6
Glass Type	HTAR Coating, Thickness of 2.0mm(F)+2.0mm(B) White Grid Printing
Encapsulant	EPE/POE (PID free and UV Resistant)
Junction Box/Connector	Split JB – IP68 (3 bypass diodes) , MC4 Compatible
Cables	400mm or customized length including connectors(4 mm²)
Application Class Rating	Class A (Safety class II)
Fire safety class	Class C (IEC 61730)
Mechanical Load Test	5400 Pa (Front) / 2400 Pa (Back)
X-Pitch (mm)	1092mm
Y-Pitch (mm)	A) 400 (B)1100 (C)1400





*All Dimensions Are In mm

OPERATING CONDITIONS

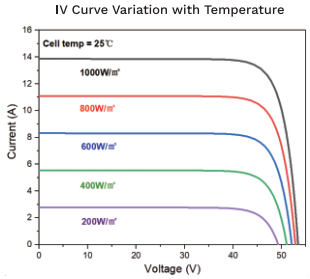
Operating Temperature (°C)	-40 °C to +85 °C
Max. System Voltage (V)	1500 VDC
Max. Series Fuse Rating (A)	30 A
NOCT Temperature (°C)	45 ± 2 °C

TEMPERATURE CO-EFFICIENTS

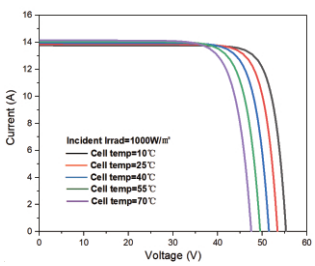
Temperature Coefficients of Pmax (W/°C)	-0.2697%/°C
Temperature Coefficients of Voc(V/°C)	-0.2231%/°C
Temperature Coefficients of Isc(A/°C)	0.0370%/°C

I-V CURVE

IV Curve Variation with Temperature



IV Curve Variation with Irradiance



PACKING STANDARD

FRAME SIZE	40 mm		
Vehicle	19ft	32ft	40ft
No. of Modules	192	432	528
No. of Pallets	8	16	22
Module per Pallet / Weight	24/819	24/819	24/819

Caution: Please read safety and installation instructions before using the product. *Warranty: Linear performance warranty for 30 years, with degradation up to 1% in 1st year and 0.4 % / year from year 2 to year 30. Please read Pahal Solar warranty documents thoroughly. Disclaimer: Specifications included in the datasheet are subject to change without prior notice owing to continuous innovation in the Product Development and R&D Activities. PAHAL SOLAR PVT. LTD. reserves the right to make any adjustments to the information described here. Dataset contained in this specification do not form a representative of a single module data. @T&C Apply.

PAHAL SOLAR
AI Powered Solar PV Module Manufacturer

N-TYPE TOPCon G12R GLASS TO GLASS

605Wp - 650Wp

ELECTRICAL PARAMETERS*

PERFORMANCE UNDER STANDARD TEST CONDITIONS (STC)

(Standard Test Environment : Irradiance 1000w/m2, Cell Temperature 25°c, Spectrum AM 1.5 Test Condition Is Based On The Front Side)

MODEL NUMBER	PSN_GRC605	PSN_GRC610	PSN_GRC615	PSN_GRC620	PSN_GRC625	PSN_GRC630	PSN_GRC635	PSN_GRC640	PSN_GRC645	PSN_GRC650
CAPACITY RATING Pmax (Wp)	605	610	615	620	625	630	635	640	645	650
+ve Power Tolerance(w)	0~5	0~5	0~5	0~5	0~5	0~5	0~5	0~5	0~5	0~5
Rated Voltage Vmp (V)	40.10	40.24	40.38	40.52	40.66	40.80	40.94	41.08	41.22	41.36
Rated Current Imp (A)	15.10	15.17	15.24	15.31	15.38	15.45	15.52	15.59	15.66	15.73
Open Circuit Voltage (Voc)	47.54	47.74	47.94	48.14	48.34	48.54	48.74	48.94	49.14	49.34
Short Circuit Current (Isc)	15.98	16.04	16.10	16.16	16.22	16.28	16.34	16.40	16.43	16.52
Module Efficiency (%)	22.40	22.58	22.77	22.95	23.14	23.32	23.51	23.69	23.88	24.06
Fill Factor (FF)	79.69	79.70	79.72	79.73	79.74	79.76	79.77	79.78	79.79	79.80

PERFORMANCE UNDER NOMINAL OPERATING CELL TEMPERATURE (NOCT)

(Standard Test Environment : Irradiance 800w/m2, Ambient Temperature 20°c, Spectrum AM 1.5, Wind Speed 1 m/s Test Condition Is Based On The Front Side)

MODEL NUMBER	PSN_GRC605	PSN_GRC610	PSN_GRC615	PSN_GRC620	PSN_GRC625	PSN_GRC630	PSN_GRC635	PSN_GRC640	PSN_GRC645	PSN_GRC650
CAPACITY RATING Pmax (Wp)	459	462	466	470	474	477	481	485	489	493
Rated Voltage Vmp (V)	38.15	38.29	38.42	38.55	38.69	38.82	38.91	39.09	39.22	39.35
Rated Current Imp (A)	12.02	12.07	12.13	12.19	12.24	12.30	12.35	12.41	12.46	12.52
Open Circuit Voltage (Voc)	45.23	45.42	45.61	45.80	45.99	46.18	46.37	46.56	46.75	46.94
Short Circuit Current (Isc)	12.72	12.77	12.82	12.87	12.91	12.96	13.01	13.06	13.11	13.15
Module Efficiency (%)	16.98	17.12	17.25	17.39	17.53	17.67	17.81	17.96	18.10	18.24
Fill Factor (FF)	79.69	79.70	79.72	79.73	79.74	79.76	79.77	79.78	79.79	79.80

BI-FACIAL: PMAX WITH REARSIDE POWER GAIN*

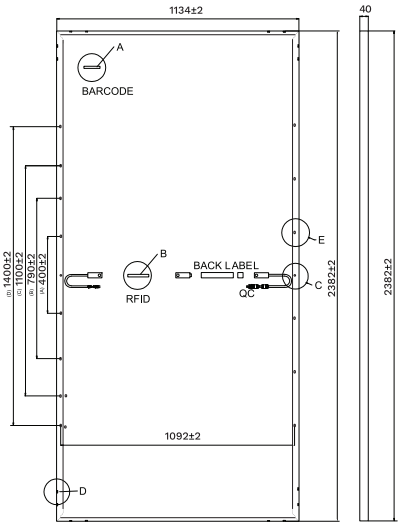
Additional Power Gain From Rear Side Compared To Power Of Front Side At Stc Depend On Mounting Structure (Height, Tilt Angle, Etc) And Reflectivity Of Ground.

	MODEL NUMBER	PSN_GRC605	PSN_GRC610	PSN_GRC615	PSN_GRC620	PSN_GRC625	PSN_GRC630	PSN_GRC635	PSN_GRC640	PSN_GRC645	PSN_GRC650
5%	Power Output (W)	635	641	646	651	656	662	667	672	677	683
	Module Efficiency (%)	23.52	23.71	23.91	24.10	24.29	24.49	24.68	24.88	25.07	25.27
10%	Power Output (W)	666	671	677	682	688	693	699	704	710	715
	Module Efficiency (%)	24.64	24.84	25.04	25.25	25.45	25.66	25.86	26.06	26.27	26.47
15%	Power Output (W)	696	702	707	713	719	725	730	736	742	748
	Module Efficiency (%)	25.76	25.97	26.18	26.40	26.61	26.82	27.03	27.25	27.46	27.67
20%	Power Output (W)	726	732	738	744	750	756	762	768	774	780
	Module Efficiency (%)	26.88	27.10	27.32	27.54	27.77	27.99	28.21	28.43	28.65	28.88
25%	Power Output (W)	756	763	769	775	781	788	794	800	806	813
	Module Efficiency (%)	28.00	28.23	28.46	28.69	28.92	29.15	29.39	29.62	29.85	30.08
30%	Power Output (W)	787	793	800	806	813	819	826	832	839	845
	Module Efficiency (%)	29.12	29.36	29.60	29.84	30.08	30.32	30.56	30.80	31.04	31.28

[Bi-Faciality factor: 80% ± 10%]

MECHANICAL SPECIFICATIONS

Matrix/No. of Cells	2* (11*6)/132 Half-Cut Cells
Cell Type	N-type Topcon Bifacial Solar Cell
Module Size (LXWXH) mm	2382 X 1134 X 40
Module Weight (KG)	34.6Kg
Frame	Anodized Aluminium Alloy (Silver Color), Type: 6005-T6
Glass Type	HTAR Coating, Thickness of 2.0mm(F)+2.0mm(B) White Grid Printing
Encapsulant	EPE/POE(PID free and UV Resistant)
Junction Box/Connector	Split JB – IP68 (3 bypass diodes) , MC4 Compatible
Cables	400mm or customized length including connectors(4 mm²)
Application Class Rating	Class A (Safety class II)
Fire safety class	Class C (IEC 61730)
Mechanical Load Test	5400 Pa (Front) / 2400 Pa (Back)
X-Pitch (mm)	1092mm
Y-Pitch (mm)	A) 400 (B)790 (C)1100 (D)1400



*All Dimensions Are In mm

OPERATING CONDITIONS

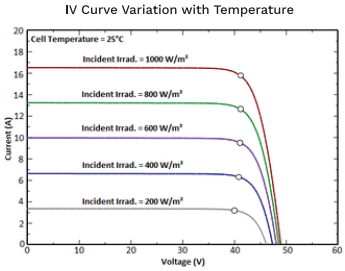
Operating Temperature (°C)	-40 °C to +85 °C
Max. System Voltage (V)	1500 VDC
Max. Series Fuse Rating (A)	35 A
NOCT Temperature (°C)	45 ± 2 °C

TEMPERATURE CO-EFFICIENTS

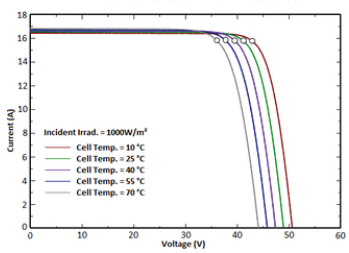
Temperature Coefficients of Pmax (W/°C)	-0.2925%/°C
Temperature Coefficients of Voc(V/°C)	-0.2492%/°C
Temperature Coefficients of Isc(A/°C)	0.0450%/°C

I-V CURVE

IV Curve Variation with Temperature



IV Curve Variation with Irradiance



PACKING STANDARD

FRAME SIZE	40 mm		
Vehicle	19ft	32ft	40ft
No. of Modules	192	432	528
No. of Pallets	8	16	22
Module per Pallet / Weight	24/850	24/850	24/850

Caution: Please read safety and installation instructions before using the product. *Warranty: Linear performance warranty for 30 years, with degradation up to 1% in 1st year and 0.4 % / year from year 2 to year 30. Please read Pahal Solar warranty documents thoroughly. Disclaimer: Specifications included in the datasheet are subject to change without prior notice owing to continuous innovation in the Product Development and R&D Activities. PAHAL SOLAR PVT. LTD. reserves the right to make any adjustments to the information described here. Dataset contained in this specification do not form a representative of a single module data. @T&C Apply.