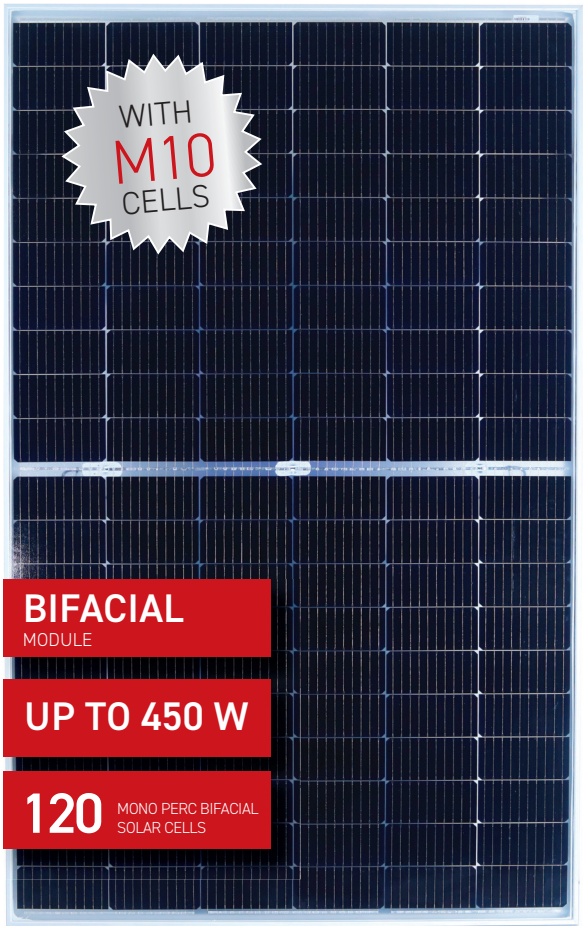
PARADEA

HIGH EFFICIENCY BI-FACIAL GLASS-GLASS PV MODULES

420-450W

MAXIMUM EFFICIENCY %	POSITIVE POWER TOLERANCE WP	CELLS	MODULE TECHNOLOGY
20.82	0~+4.99	M10 120	HALF CUT & MICRO GAP DESIGN WITH IMPROVED SHADE TOLERANCE



- **RELIABILITY IS IMPROVED** with minimum exposure to corrosion from sand & salt mist with low risk of module warping & micro cracking
- Bifacial gain of **UP TO 25%** with dual glass module, capable of energy generation with both direct and reflected sunlight
- Additional Power yield with **30 YEARS OF PRODUCT LIFETIME** with 0.5% annual power degradation
- **LCOE IS CUT BACK** with **LESS BOS COST** which improves value proposition of the product with competitive **ROI**
- **TWO PEAK PERFORMANCE TIME,** during sun rise and sun set with optimum utilization of dual facial generation
- Hassle-free installation with ability to **INSTALL VERTICALLY IN EAST WEST DIRECTION**, with improved soiling resistant
- Implementation of bypass diodes in split JB series-parallel connections enable the module to perform in **PARTIAL SHADOW CONDITIONS** with respect to full-cell module
- **LOWER INTERNAL RESISTANCE** boosts module power helping to achieve minimal power loss with respect to previous variant modules

FRAME	SUPERSTRATE	SUBSTRATE
SILVER	GLASS	GLASS

APPLICATIONS

- On-grid large scale utility systems
- On-grid rooftop industrial and commercial systems
- Rooftop residential systems

vikramsolar
CREATING CLIMATE FOR CHANGE

Monocrystalline Solar PV Modules, Bifacial, MBB, M10 Half-Cell, PARADEA VSMDH.60.AAA.05

vikramsolar
CREATING CLIMATE FOR CHANGE

TECHNICAL DATA
PARADEA 420-450W

THIS DATASHEET IS APPLICABLE FOR: **PARADEA VSMDH.60.AAA.05 (AAA=420-450)**

Electrical Data[1,2] All data refers to STC (AM 1.5, 1000 W/m², 25°C)

Peak Power P_{max} (Wp)	420	425	430	435	440	445	450
Maximum Voltage V_{mpp} (V)	34.3	34.5	34.7	34.8	34.9	35	35.1
Maximum Current I_{mpp} (A)	12.25	12.32	12.41	12.52	12.62	12.72	12.83
Open Circuit Voltage V_{oc} (V)	40.6	40.8	41	41.1	41.2	41.3	41.4
Short Circuit Current I_{sc} (A)	12.9	12.99	13.11	13.21	13.31	13.41	13.51
Module Efficiency (%)	19.43	19.66	19.89	20.13	20.36	20.59	20.82

1) STC:1000 W/m² irradiance, 25°C cell temperature, AM1.5g spectrum according to EN 60904-3. | 2) Power measurement uncertainty is within +/- 2%.

Electrical Parameters at NOCT[3]

Power (W)	313.3	317	320	324	327	331	334
V@P_{max} (V)	31.7	31.8	31.9	32	32.1	32.2	32.3
I@P_{max} (A)	9.88	9.96	10.04	10.11	10.19	10.27	10.35
V_{oc} (V)	37.8	38	38.1	38.2	38.3	38.3	38.4
I_{sc} (A)	10.42	10.52	10.62	10.7	10.78	10.86	10.94

3) NOCT irradiance 800 W/m², ambient temperature 20°C, wind speed 1 m/sec

Equivalent Bifacial Output

Bifacial Gain	Overall Power output (W)						
5%	441	446	452	457	462	467	473
10%	462	468	473	479	484	490	495
15%	483	489	495	500	506	512	518
20%	504	510	516	522	528	534	540
25%	525	531	538	544	550	556	563

Temperature Coefficients (Tc) permissible operating conditions

Tc of Open Circuit Voltage ( )	-0.27%/°C
Tc of Short Circuit Current ( )	0.050%/°C
Tc of Power ( )	-0.35%/°C
Maximum System Voltage	1500V
NOCT	45°C ± 2°C
Temperature Range	-40°C to + 85°C

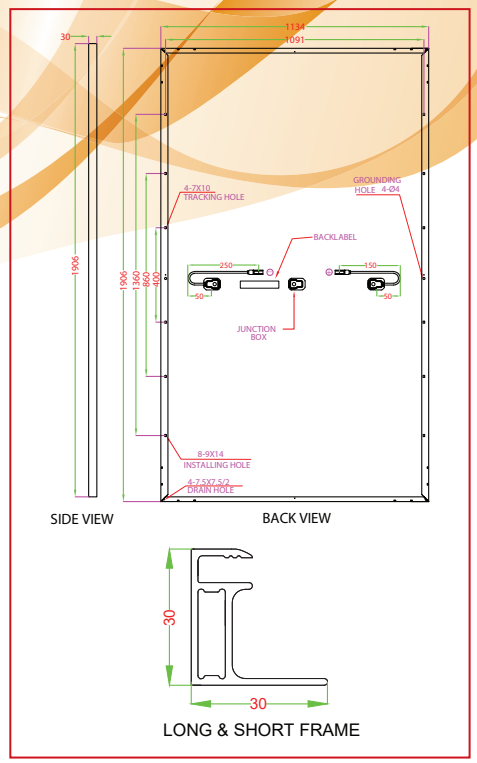
Mechanical Data

Length × Width × Height	1906 × 1134 × 30mm (75.04 × 44.65 × 1.18 inches)
Weight	27.6 Kg (60.84 lbs)
Junction Box	IP68, Split Junction Box with individual bypass diodes
Cable & Connectors#	200 mm (+ve terminal) and 300 mm(-ve terminal) length cables,MC4 Compatible/MC4 Connectors
Application Class	Class A (Safety class II)
Superstrate##	2.0 mm (0.098 inches) high transmission low iron content, semi-tempered glass, AR coated
Cells	60 Mono PERC (120 half-cells) P-Type Bifacial solar cells
Substrate	2.0 mm (0.098 inches) high transmission low iron content, heat strengthened glass
Frame	Anodized aluminium frame with twin wall profile
Mechanical Load Test	5400 Pa (Snow load), 2400 Pa (Wind load)
Cell Encapsulant	Polyolefin (POE)
Maximum Series Fuse Rating	25 A

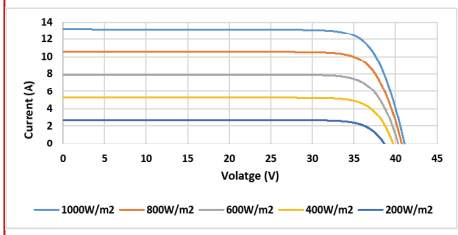
Warranty and Certifications

Product Warranty**	12 years
Performance Warranty**	Linear Power Warranty for 30 years with 2% for 1st year degradation and 0.5% from year 2 to year 30
Approvals and Certificates^	IEC 61215 : 2016, IEC 61730 : 2016, IEC 61701, IEC 62716, IEC 60068-2-68, IS/IEC 61730, IS 14286, IEC 62804, CE, CEC (California), UL 61215, UL 61730, CAN-CSA

Dimensions in mm

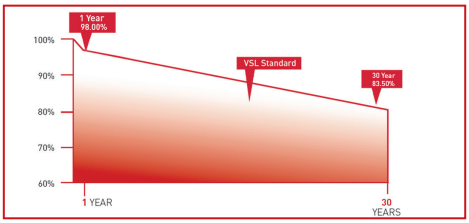


Typical I-V Curves[4]



4) Average relative efficiency reduction of 5% at 200 W/m² according to EN 60904-1.

Performance Warranty



Packaging Information

Quantity /Pallet	36
Pallets/Container (40'HC)	24
Quantity/Container (40'HC)	864

^ All (^) certifications under progress. | ** Refer to Vikram Solar's warranty document for terms and conditions. | # 400mm (15.75 inches), 1000mm (39.37 inches), 1200mm (47.24 inches) cable lengths are also available | ## Anti-glare Glass is also available

CAUTION: READ SAFETY AND INSTALLATION MANUAL BEFORE USING THE PRODUCT.

sales@vikramsolar.com www.vikramsolar.com