

PARADEA

HIGH EFFICIENCY BI-FACIAL GLASS-GLASS PV MODULES

580-605W

MAXIMUM EFFICIENCY %

21.30

POSITIVE POWER TOLERANCE WP

0~+4.99

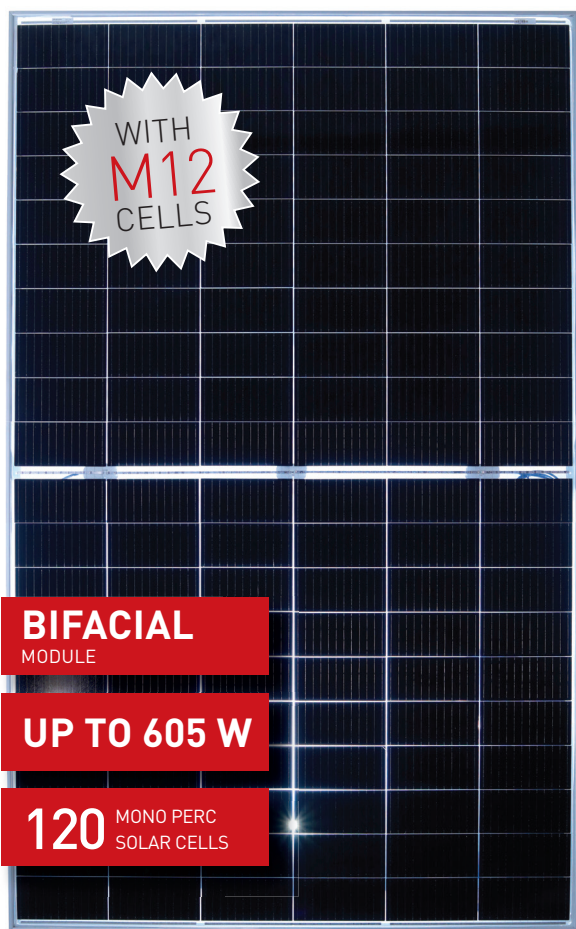
CELLS

M12 120

MODULE TECHNOLOGY

**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

SILVER

SUPERSTRATE

GLASS

SUBSTRATE

GLASS

APPLICATIONS

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

THIS DATASHEET IS APPLICABLE FOR: PARADEA VSMDH.60.AAA.05 (AAA= 580-605)

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

| | | | | | | |
|------------------------------------|-------|-------|-------|-------|-------|-------|
| Peak Power P_{max} (Wp) | 580 | 585 | 590 | 595 | 600 | 605 |
| Maximum Voltage V_{mpp} (V) | 33.9 | 34.1 | 34.3 | 34.5 | 34.7 | 34.9 |
| Maximum Current I_{mpp} (A) | 17.11 | 17.16 | 17.21 | 17.25 | 17.30 | 17.34 |
| Open Circuit Voltage V_{oc} (V) | 40.7 | 40.9 | 41.1 | 41.3 | 41.5 | 41.7 |
| Short Circuit Current I_{sc} (A) | 18.24 | 18.29 | 18.34 | 18.38 | 18.43 | 18.47 |
| Module Efficiency η (%) | 20.42 | 20.59 | 20.77 | 20.95 | 21.12 | 21.30 |

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 NOCT³

| | | | | | | |
|------------------|-------|-------|-------|-------|-------|-------|
| Power [W] | 432.6 | 436.4 | 440.4 | 443.7 | 447.7 | 451.3 |
| $V@P_{\max}$ [V] | 31.2 | 31.4 | 31.5 | 31.7 | 31.9 | 32.1 |
| $I@P_{\max}$ [A] | 13.86 | 13.91 | 13.97 | 13.99 | 14.04 | 14.08 |
| V_{oc} [V] | 37.9 | 38.1 | 38.3 | 38.5 | 38.7 | 38.8 |
| I_{sc} [A] | 14.74 | 14.78 | 14.82 | 14.85 | 14.89 | 14.92 |

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% | 609 | 614 | 620 | 625 | 630 | 635 |
| 10% | 638 | 644 | 649 | 655 | 660 | 666 |
| 15% | 667 | 673 | 679 | 684 | 690 | 696 |
| 20% | 696 | 702 | 708 | 714 | 720 | 726 |
| 25% | 725 | 731 | 738 | 744 | 750 | 756 |

Temperature Coefficients (Tc) permissible operating conditions

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

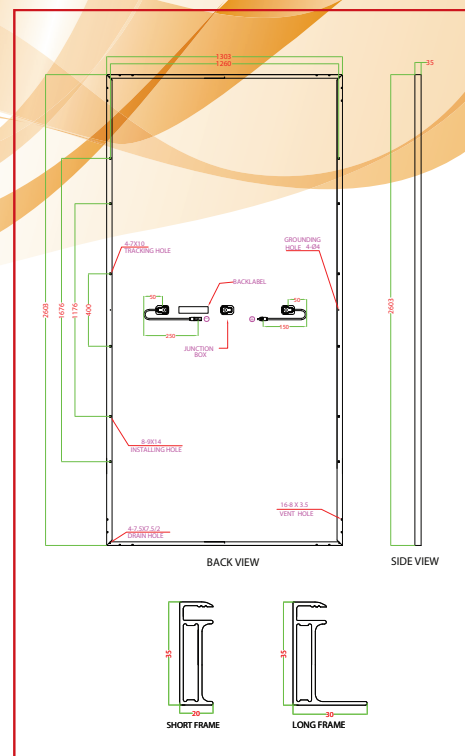
Mechanical Data

| | |
|---|--|
| Length × Width × Height | 2180 X 1303 X 35 mm [85.83 x 51.30 x 1.38 inches] |
| Weight | 36.08 Kg (79.54 lbs) |
| Junction Box | IP 68, 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, 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 | 30 A |

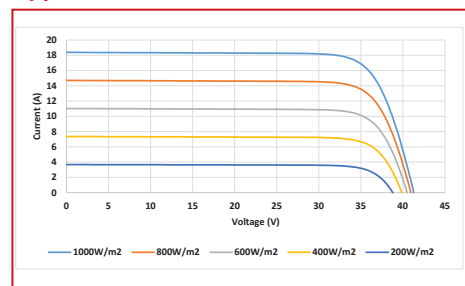
Warranty and Certifications

| | |
|-----------------------------|--|
| Product Warranty** | 12 years |
| Performance | 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 61730-1, IS/IEC 61730-2, IS 14286, IEC 62804, CE, CEC (California), UL 61215, UL 61730, CAN-CSA |

Dimensions in mm

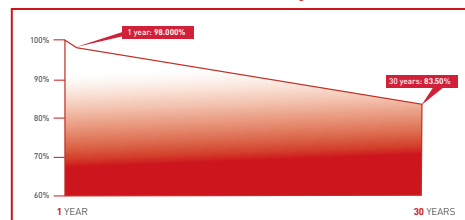


Typical I-V Curves⁴



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

Performance Warranty



Packaging Information

| | |
|----------------------------|-----|
| Quantity /Pallet | 31 |
| Pallets/Container (40'HC) | 16 |
| Quantity/Container (40'HC) | 496 |

^ 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.

Specifications included in this datasheet are subject to change without notice. Electrical data without guarantee. Please confirm your exact requirement with the company representative while placing your order.

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