# PARADEA

HIGH EFFICIENCY BI-FACIAL GLASS-GLASS PV MODULES

Mono PERC N-TYPE HJT

MODEL:
**PARADEA VSMDH.60.AAA.05**

# 590-615W

SUBSTRATE
**GLASS** ●
MESH GLASS ●

FRAME TYPE
**ALUMINIUM** ●

FRAME VARIANT
**SILVER** ●
BLACK ●

| MAXIMUM EFFICIENCY % | CELL TYPE | PRODUCT WARRANTY | PERFORMANCE WARRANTY |
|---|---|---|---|
| 21.73 | G12 HALF CUT | 12 YEARS | 30 YEARS |


## RELIABILITY IS IMPROVED

- Higher corrosion resistance to severe conditions of sand dust, concentrated ammonia and salt mist
- Low risk of module warping & micro cracking

## HIGHLY AUTOMATED PRODUCTION LINE

- Multi stage EL and digitalised visual inspection results in lower defect rates
- Implemented engineering excellence ensures top notch quality

## LOWER LCOE

- Lower balance of systems cost
- Improves value proposition of the product with competitive ROI

## PROLONGED SAFETY ASSURANCE

- IP68 with potting JB provides higher level of water ingress protection
- High insulation resistance for ensuring electrical safety

## SUPERIOR HAIL TEST PERFORMANCE

- ø 45mm hail test passed from third party laboratory with impact velocity up to 27m/s

## PRODUCT CERTIFICATES

## SYSTEM CERTIFICATES^

IEC 61215 : 2021, IEC 61730, UL 61215, UL 61730, IS 14286, IS/IEC 61730, IEC 61701, IEC 62716, IEC 60068-2-68, CAN-CSA

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION:

- ISO 9001:2015/ Quality Management System
- ISO 14001:2015/ Environmental Management System
- ISO 45001:2018/ Occupational Health and Safety Management System
- SA 8000 :2014/ Social Accountability International

Monocrystalline Solar PV Modules, Bifacial, G12 MonoPerc

DCR CONTENT MODULE AVAILABLE

vikramsolar
CREATING CLIMATE FOR CHANGE

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CREATING CLIMATE FOR CHANGE

Mono PERC N-TYPE HJT

# TECHNICAL DATA
## PARADEA 590-615W

THIS DATASHEET IS APPLICABLE FOR: **PARADEA VSMDH.60.AAA.05 (AAA=590-615)**

## ELECTRICAL PARAMETERS | STC[1,2]

| | | | | | | |
|---|---|---|---|---|---|---|
| Peak Power $P_{max}$ (Wp) | 590 | 595 | 600 | 605 | 610 | 615 |
| Maximum Voltage $V_{mpp}$ (V) | 34.3 | 34.5 | 34.7 | 34.9 | 35.1 | 35.3 |
| Maximum Current $I_{mpp}$ (A) | 17.21 | 17.26 | 17.31 | 17.36 | 17.41 | 17.46 |
| Open Circuit Voltage $V_{oc}$ (V) | 41.3 | 41.5 | 41.7 | 41.9 | 42.1 | 42.3 |
| Short Circuit Current $I_{sc}$ (A) | 18.22 | 18.27 | 18.32 | 18.37 | 18.42 | 18.47 |
| Module Efficiency (%) | 20.85 | 21.02 | 21.2 | 21.38 | 21.55 | 21.73 |

1)STC:1000 W/M² IRRADIANCE, 25°C CELL TEMPERATURE, AM1.5G SPECTRUM ACCORDING TO EN 60904-3 | 2) TOLERANCE OF RATING AT STC ($P_{MPP}$ / $I_{SC}$ / $V_{OC}$) [%] : 0-3/±5/±5| ELECTRICAL MEASUREMENT UNCERTAINTY IS WITHIN ± 2%

## ELECTRICAL PARAMETERS | NOCT[3]

| | | | | | | |
|---|---|---|---|---|---|---|
| Peak Power $P_{max}$ (Wp) | 440.4 | 443.9 | 447.9 | 451.7 | 455.5 | 459.3 |
| Maximum Voltage $V_{mpp}$ (V) | 31.7 | 31.9 | 32.1 | 32.2 | 32.3 | 32.4 |
| Maximum Current $I_{mpp}$ (A) | 13.88 | 13.92 | 13.97 | 14.01 | 14.06 | 14.10 |
| Open Circuit Voltage $V_{oc}$ (V) | 38.5 | 38.7 | 38.9 | 39.0 | 39.1 | 39.2 |
| Short Circuit Current $I_{sc}$ (A) | 14.72 | 14.76 | 14.79 | 14.84 | 14.88 | 14.91 |

3)NOCT IRRADIANCE 800 W/M², AMBIENT TEMPERATURE 20°C, WIND SPEED 1 M/SEC

## ELECTRICAL PARAMETERS | BNPI[4,5]

| | | | | | | |
|---|---|---|---|---|---|---|
| Peak Power $P_{max}$ (Wp) | 646 | 651 | 657 | 662 | 668 | 673 |
| Maximum Voltage $V_{mpp}$ (V) | 34.3 | 34.5 | 34.7 | 34.9 | 35.1 | 35.3 |
| Maximum Current $I_{mpp}$ (A) | 18.84 | 18.89 | 18.95 | 19.00 | 19.06 | 19.11 |
| Open Circuit Voltage $V_{oc}$ (V) | 41.3 | 41.5 | 41.7 | 41.9 | 42.1 | 42.3 |
| Short Circuit Current $I_{sc}$ (A) | 19.94 | 20.00 | 20.05 | 20.11 | 20.16 | 20.22 |

4) BNPI: 1000W/M²+ϕ.135, BIFACILITY COEFF. (ϕ) AT BNPI $P_{MAX}$, $I_{SC}$ IS 70±10% & FOR $V_{OC}$ IS 99±10% , AM 1.5, 25°C | 5) TOLERANCE OF RATING AT BNPI ($P_{MPP}$/ $I_{SC}$/ $V_{OC}$) [%] : 0-3/±5/±5

## 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 |

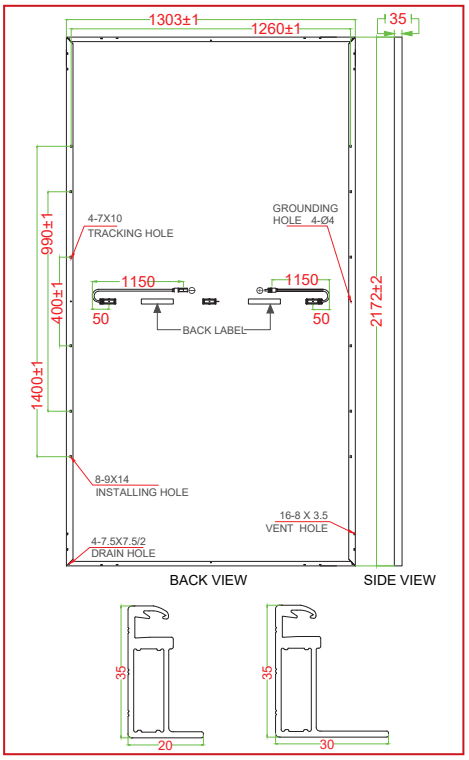
## MECHANICAL DATA

| | |
|---|---|
| Length × Width × Height | 2172 X 1303 X 35 mm (85.51 x 51.30 x 1.38 inches) |
| Weight | 36.3 Kg (80.03lbs) |
| Junction Box | IP 68, Split Junction Box with individual bypass diodes |
| Cable & Connectors# | 1200 mm (+ve terminal) and 1200 mm (-ve terminal) length cables, Staubli EVO connectors |
| Application Class | Class A (Safety class II) |
| Superstrate## | 2.0 mm (0.098 inches) High transmission ARC Semi-tempered glass (low iron content) |
| Cells | 60 Mono PERC (120 half-cells ) P-Type bifacial solar cells |
| Substrate | 2.0 mm (0.098 inches) High transmission heat strengthened glass/ mesh glass#* (low iron content) |
| Frame | Anodized aluminium |
| Mechanical Load Test | 5400 Pa (Snow load), 2400 Pa (Wind load) |
| Cell Encapsulant | EVA/EPE |
| Maximum Series Fuse Rating | 30 A |
| Hail Test | Ø 45mm \| Impact Velocity up to 27m/s |

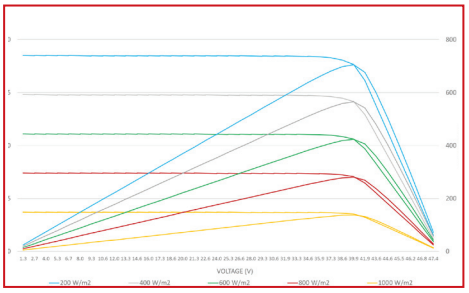
## WARRANTY

| | |
|---|---|
| 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 |

## DIMENSIONS IN MM

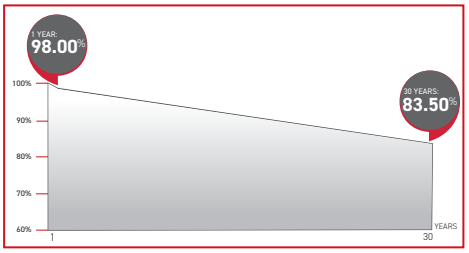



## TYPICAL I-V CURVES[7]



7) 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) | 18 |
| Quantity/Container (40'HC) | 558 |

^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 | *As per applicable product | #*With additional Cost & Lead Time subject to availability | STC : Standard Testing Condition | BNPI : Bifacial Nameplate Irradiance | NOCT : Nominal Operating Cell Temperature

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.


sales@vikramsolar.com www.vikramsolar.com