

# 415-440W

SUBSTRATE  
**GLASS** ●  
 MESH GLASS ●

FRAME TYPE  
**ALUMINIUM** ●  
 STEEL ●

FRAME VARIANT  
 SILVER ●  
**BLACK** ●

MAXIMUM EFFICIENCY %  
**22.53**

CELL TYPE  
**M10 HALF CUT**

PRODUCT WARRANTY  
**12** YEARS

PERFORMANCE WARRANTY  
**30** YEARS



### SUITED FOR ROOFTOP INSTALLATION

- Light weight modules
- Aesthetically appealing with higher efficiency



### IMPROVED LONGEVITY

- Excellent anti-PID performance via optimized process and materials control
- Lower susceptibility to LID & LeTID



### PROLONGED SAFETY ASSURANCE

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



### HIGHLY AUTOMATED PRODUCTION LINE

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



### PREMIUM PERFORMANCE PARAMETERS

- N-TYPE solar cell upto 80% bifaciality, brings higher energy yield from rear side
- Lower temperature coefficient minimizing generation losses at high temperature

#### 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

THIS DATASHEET IS APPLICABLE FOR: HYPERSOL VSM DH.54.AAA.05 (AAA=415-440)

### ELECTRICAL PARAMETERS | STC<sup>1,2</sup>

Peak Power P <sub>max</sub> (Wp)	415	420	425	430	435	440
Maximum Voltage V <sub>mpp</sub> (V)	31.3	31.5	31.7	31.9	32.2	32.4
Maximum Current I <sub>mpp</sub> (A)	13.28	13.35	13.42	13.48	13.52	13.59
Open Circuit Voltage V <sub>oc</sub> (V)	37.3	37.5	37.7	37.9	38.1	38.3
Short Circuit Current I <sub>sc</sub> (A)	13.92	13.98	14.04	14.1	14.16	14.22
Module Efficiency (%)	21.25	21.51	21.76	22.02	22.28	22.53

<sup>1</sup>STC: 1000 W/M<sup>2</sup> IRRADIANCE, 25°C CELL TEMPERATURE, AM1.5G SPECTRUM ACCORDING TO EN 60904-3 | <sup>2</sup> TOLERANCE OF RATING AT STC (P<sub>max</sub> / I<sub>sc</sub> / V<sub>oc</sub>) [%]: 0-3/+5/+5 | ELECTRICAL MEASUREMENT UNCERTAINTY IS WITHIN ± 2%

### ELECTRICAL PARAMETERS | NOCT<sup>3</sup>

Peak Power P <sub>max</sub> (Wp)	313	317	321	324	328	331
Maximum Voltage V <sub>mpp</sub> (V)	29.3	29.6	29.8	29.9	30.2	30.4
Maximum Current I <sub>mpp</sub> (A)	10.68	10.72	10.76	10.81	10.85	10.89
Open Circuit Voltage V <sub>oc</sub> (V)	35.1	35.3	35.5	35.7	35.9	36.1
Short Circuit Current I <sub>sc</sub> (A)	11.24	11.29	11.34	11.39	11.44	11.49

<sup>3</sup> NOCT IRRADIANCE 800 W/M<sup>2</sup>, AMBIENT TEMPERATURE 20°C, WIND SPEED 1 M/SEC

### ELECTRICAL PARAMETERS | BNPI<sup>4,5</sup>

Peak Power P <sub>max</sub> (Wp)	460	465	471	476	482	488
Maximum Voltage V <sub>mpp</sub> (V)	31.3	31.5	31.7	31.9	32.2	32.4
Maximum Current I <sub>mpp</sub> (A)	14.71	14.79	14.87	14.94	14.98	15.06
Open Circuit Voltage V <sub>oc</sub> (V)	37.3	37.5	37.7	37.9	38.1	38.3
Short Circuit Current I <sub>sc</sub> (A)	15.42	15.49	15.56	15.62	15.69	15.76

<sup>4</sup> BNPI: 1000W/M<sup>2</sup> \*q: 135, BIFACILITY COEFF. (q) AT BNPI P<sub>max</sub>, I<sub>sc</sub> IS 75±5% & FOR V<sub>oc</sub> IS 99±10%, AM 1.5, 25°C | <sup>5</sup> TOLERANCE OF RATING AT BNPI (P<sub>max</sub> / I<sub>sc</sub> / V<sub>oc</sub>) [%]: 0-3/+5/+5

### TEMPERATURE COEFFICIENTS (Tc) PERMISSIBLE OPERATING CONDITIONS

Tc of Open Circuit Voltage (β)	-0.26%/°C
Tc of Short Circuit Current (α)	0.046%/°C
Tc of Power (γ)	-0.30%/°C
Maximum System Voltage	1500V
NOCT	45°C ± 2°C
Temperature Range	-40°C to + 85°C

### MECHANICAL DATA

Length × Width × Height	1722 X 1134 X 30 mm (67.28 x 44.65 x 1.18 inches)
Weight	25.10 Kg (55.33lbs)
Junction Box	IP 68, Split Junction Box with individual bypass diodes
Cable & Connectors <sup>#</sup>	1200 mm (+ve terminal) and 1200 mm (-ve terminal) length cables, Staubli Evo Connectors
Application Class	Class A (Safety class II)
Superstrate <sup>#</sup>	2.0 mm (0.098 Inches) high transmission ARC semi-tempered glass (Low iron content)
Cells	54 (108 half-cells) 16BB N-TYPE Bifacial solar cells
Substrate	2.0 mm (0.098 Inches) high transmission heat strengthened glass/ mesh glass <sup>#</sup> (Low iron content)
Frame	Anodized aluminium/ Alloy steel frame <sup>#</sup>
Mechanical Load Test	5400 Pa (Snow load), 2400 Pa (Wind load)
Cell Encapsulant	EPE/ EVA
Maximum Series Fuse Rating	30 A
Hail Test <sup>*</sup>	Ø 45mm   Impact Velocity up to 27m/s

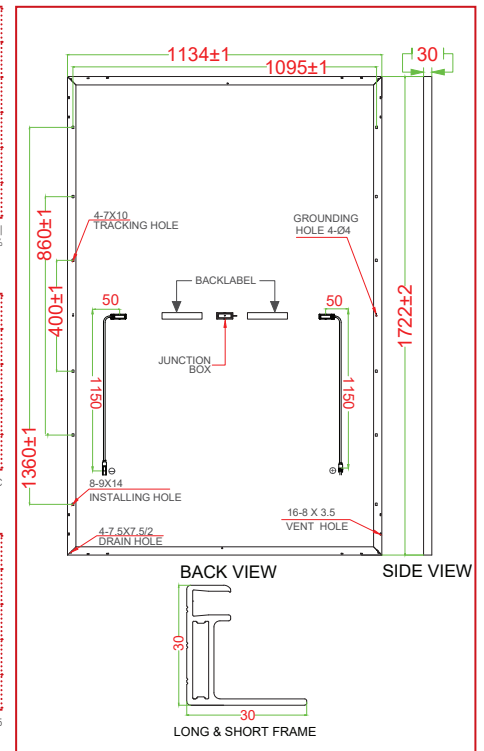
### WARRANTY

Product Warranty <sup>**</sup>	12 years
Performance Warranty <sup>**</sup>	Linear Power Warranty for 30 years with 1% for 1st year degradation and 0.4% from year 2 to year 30

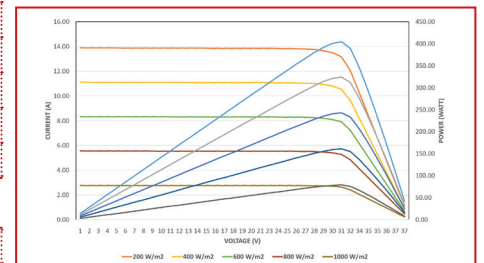
**CAUTION: READ SAFETY AND INSTALLATION MANUAL BEFORE USING THE PRODUCT.**

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### DIMENSIONS IN MM

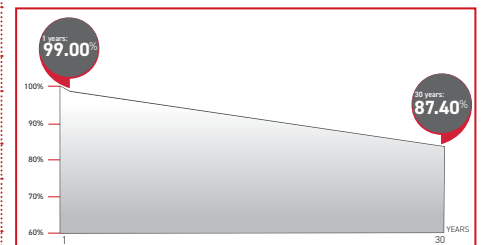


### TYPICAL I-V CURVES<sup>6</sup>



<sup>6</sup> AVERAGE RELATIVE EFFICIENCY REDUCTION OF 5% AT 200 W/M<sup>2</sup> ACCORDING TO EN 60904-1

### PERFORMANCE WARRANTY



### PACKAGING INFORMATION

Quantity /Pallet	36
Pallets/Container (40'HC)	26
Quantity/Container (40'HC)	936

<sup>\*</sup>All (\*) certifications under progress. | <sup>\*\*</sup>Refer to Vikram Solar's warranty document for terms and conditions. | <sup>#</sup>1000mm(39.37 inches), 1300mm(51.12 inches), 1400mm (55.12 inches) cable lengths are also available. | <sup>†</sup>Anti-glare Glass is also available. | <sup>‡</sup>As per applicable product. | <sup>§</sup>With additional Cost & Lead Time subject to availability. | STC - Standard Testing Condition | BNPI - Bifacial Nameplate Irradiance | NOCT - Nominal Operating Cell Temperature