HYPERSOL

HIGH EFFICIENCY N-TOPCon PV MODULES

Mono PERC | **nTOPCon** | HJT

MODEL:
HYPERSOL VSMDH.54.AAA.05

415-440W

SUBSTRATE	FRAME TYPE	FRAME VARIANT
GLASS ●	**ALUMINIUM** ●	SILVER ●
MESH GLASS ●	STEEL ●	**BLACK** ●

MAXIMUM EFFICIENCY %	CELL TYPE	PRODUCT WARRANTY	PERFORMANCE WARRANTY
22.55	M10 **HALF CUT**	12 YEARS	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

- Topcon solar cell upto 85% 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

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CREATING CLIMATE FOR CHANGE

Monocrystalline Solar Pv Modules, Bifacial, M10 nTOPCon

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TECHNICAL DATA
HYPERSOL 415-440W

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

ELECTRICAL PARAMETERS | STC[1,2]

Peak Power P_{max} (Wp)	415	420	425	430	435	440
Maximum Voltage V_{mpp} (V)	31.3	31.5	31.7	31.9	32.2	32.4
Maximum Current I_{mpp} (A)	13.28	13.35	13.42	13.48	13.52	13.59
Open Circuit Voltage V_{oc} (V)	37.3	37.5	37.7	37.9	38.1	38.3
Short Circuit Current I_{sc} (A)	13.92	13.98	14.04	14.1	14.16	14.22
Module Efficiency (%)	21.27	21.54	21.79	22.02	22.29	22.55

1)STC:1000 W/M^2 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)	313	317	321	324	328	331
Maximum Voltage V_{mpp} (V)	29.3	29.6	29.8	29.9	30.2	30.4
Maximum Current I_{mpp} (A)	10.68	10.72	10.76	10.81	10.85	10.89
Open Circuit Voltage V_{oc} (V)	35.1	35.3	35.5	35.7	35.9	36.1
Short Circuit Current I_{sc} (A)	11.24	11.29	11.34	11.39	11.44	11.49

3) NOCT IRRADIANCE 800 W/M^2, AMBIENT TEMPERATURE 20°C, WIND SPEED 1 M/SEC

ELECTRICAL PARAMETERS | BNPI[4,5]

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

4) BNPI: 1000W/M^2+ϕ.135, BIFACILITY COEFF. (ϕ) AT BNPI P_{MAX}, I_{SC} IS 80±5% & 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)	-0.26%/°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

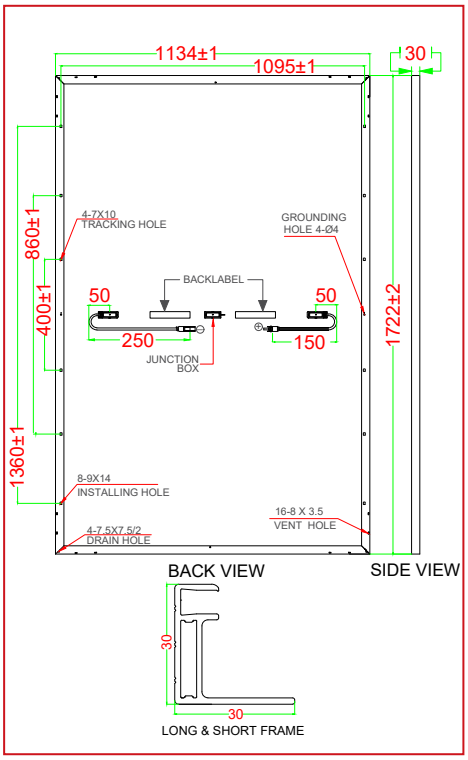
MECHANICAL DATA

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#	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 ARC semi-tempered glass (Low iron content)
Cells	54 (108 half-cells) 16BB TOPCon n-Type Bifacial solar cells
Substrate	2.0 mm (0.098 Inches) high transmission heat strengthened glass/ mesh glass#* (Low iron content)
Frame	Anodized aluminium/ Alloy steel frame#*
Mechanical Load Test	5400 Pa (Snow load), 2400 Pa (Wind load)
Cell Encapsulant	EPE/ EVA
Maximum Series Fuse Rating	30 A
Hail Test^	Ø 45mm | Impact Velocity up to 27m/s

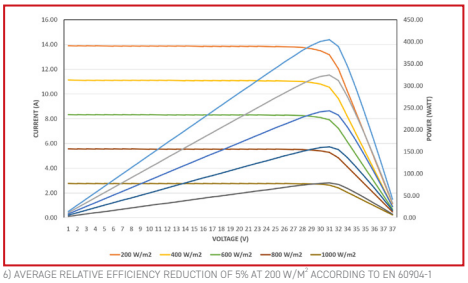
WARRANTY

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

DIMENSIONS IN MM

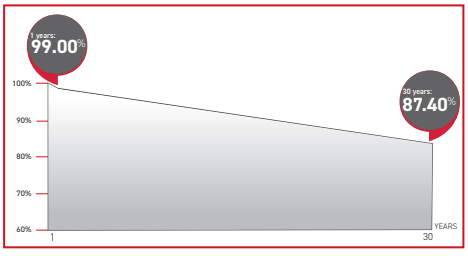


TYPICAL I-V CURVES[6]



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

PERFORMANCE WARRANTY



PACKAGING INFORMATION

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

^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