



# DELHI TEST HOUSE

Plot No. 50, Phase - IV, Sector-57, HSIDC Industrial Area, Behind Parnami Hospital, Kundli, Sonipat-131028 (Haryana)

Telefax : 0130-2116529

e-mail :kundli@delhitesthouse.com, ag@delhitesthouse.com Website : www.delhitesthouse.com



Discipline: Electronics, Group: Miscellaneous Products

ULR – TC53752410000062F

Test Report No.: 242429231031KUNE31000

Page 1 of 12

Issue date: 04/01/2024

<b>TEST REPORT</b> <b>IEC TS 62804-1-1:2020</b> <b>Photovoltaic (PV) Modules</b> <b>(Potential-Induced Degradation)</b>		
<b>Report Reference No.</b> .....	242429231031KUNE31000	
<b>Date of issue</b> .....	04/01/2024	
<b>Total number of pages</b> .....	12	
<b>Testing Laboratory</b> .....	Delhi Test House Address..... Plot No-50, Phase-IV, Sector-57, HSIIDC Kundli-131028, Haryana, India	
<b>Manufacturer's name</b> .....	SUNIFY SOLAR LLP Address..... SURVEY NO. 624P1, NEAR HANUMAN TEMPLE, SARVAD, PIPALIYA MALIYA HIGHWAY, MORBI GUJARAT, INDIA - 363660	
<b>Test specification:</b>		
Standard .....	Testing according to IEC TS 62804-1-1:2020	
Test procedure .....	Compliance Report	
Non-standard test method.....	N/A	
<b>Test item description</b> .....	SOLAR PHOTOVOLTAIC MODULE	
Trade Mark .....		
Model/Type reference.....	<p><b>(156 Cells Family and Max. system voltage 1500V)</b>  <b>Representative Model:</b> SS156C585M  <b>Series models:</b> SS156C580M, SS156C575M, SS156C570M, SS156C565M</p> <p><b>(144 Cells Family and Max. system voltage 1500V)</b>            SS144C560M, SS144C555M, SS144C550M, SS144C545M,            SS144C540M, SS144C535M, SS144C530M, SS144C525M,            SS144C520M, SS144C515M, SS144C510M, SS144C505M</p> <p><b>(132 Cells Family and Max. system voltage 1500V)</b> SS132C500M,            SS132C495M, SS132C490M, SS132C485M, SS132C480M</p>	
Sample received condition .....	<input checked="" type="checkbox"/> Good <input type="checkbox"/> other	
<b>General disclaimer:</b> The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. During giving the conformity statement laboratory do not considering M U in account. General terms & condition given at the back of test report.		
<b>Tested by:</b>	<b>Approved by / Authorized Signatory:</b>	<b>Issued by:</b>
 <b>Dhruv Rohilla</b> <b>(Sr. Test Engineer)</b>	 <b>Ashish Goel</b> <b>(Director)</b>	 <b>Pawan Rohilla</b> <b>(Customer Executive)</b>
(Name / Designation)	(Name / Designation)	(Name / Designation)
Date: 04/01/2024	Date: 04/01/2024	Date: 04/01/2024

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## Table – List of Attachments

Attachment No.	Attachment Description	No. of pages in Attachment
Attachment - I	List of measurement equipment	1 (Page 9)
Attachment - II	Photo Document	1 (Page 11)

## Summary of testing:

Tests performed (name of test and test clause):	Results
MQT 01 Visual Inspection	P
MQT 15 Wet leakage Current test	P
MQT 13 Damp heat test	P
Voltage stress test (PID)	P
MQT 15 Wet leakage Current test	P
MQT 01 Visual Inspection	P

## Annex 1: List of measurement equipment

Description	Identification	Application
Visual inspection test setup	582	Visual inspection test
PID Tester	961	Voltage stress test
Wet leakage test setup	232	Wet leakage current test
Measuring tape	621	Wet leakage current test
Damp Heat Chamber	704	Environmental chamber
Measuring tape	271	For dimension of PV Modules.

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### Description of module construction:

Sample.....:	Random sampling from production <input checked="" type="checkbox"/>
	Prototype submitted by client <input type="checkbox"/>

### MODULE TYPES:

CRYSTALLINE SILICON TERRESTRIAL PHOTOVOLTAIC (PV) MODULES (SI WAFER BASED)

### MODULE DESIGN –DIMENSIONS

Module dimensions (L x W x H) [mm]...: 2465 x 1134 x 35

### IDENTIFICATION OF MATERIALS.....:

Front Cover.....:	Low Iron Solar Textured Glass (Tempered), Nominal Thickness: 3.2 mm, Manufactured by GUJARAT BOROSIL LIMITED
Rear Cover.....:	FFC-JW30(plus), Rated Voltage: 1500 VDC, Rated insulation Voltage: 8000 V, Thickness: 315µm, TI electrical:124°C and TI mechanical 124°C, Manufactured by: Jolywood (Suzhou) Sunwatt Co., Ltd., Tested by TUV Rheinland (Certificate no: R 50484166) & (PD Test Report No. 15079266 005)
Encapsulation material.....:	CONSERV P UVT 14FC(Glass Side), CONSERV P 360-14FC (Backsheet Side). Thickness: 0.60 mm± 5% (CONSERV P UVT 14FC), Thickness: 0.55 mm± 5% (CONSERV P 360-14FC), Manufactured by: RENEWSYS INDIA PRIVATE LIMITED
Frame.....:	6063-T6, High Strength Alloy, Thickness 35mm, Manufactured by M.R. INDUSTRIES
Dimensions (l x w x h) [mm].....:	
Module area [m <sup>2</sup> ].....:	2.79
Minimum distance between current-carrying parts and module edge [mm]	15.0
<b>Cells</b>	
Cell (include type).....:	S18210BB023, P-type mono-crystalline silicon wafer-PERC, Manufactured by: Jiangsu Longheng new energy Co., Ltd.
Cells(1 x w) [mm].....:	(182mm x 91mm) ±0.5mm
Cell thickness [µm].....:	170µm±17µm
Cell area[cm <sup>2</sup> ].....:	165.62
Number of cells. ....:	156 cells
<b>Components and other</b>	
Cells per bypass diode.....:	52 cells
Type of bypass diode.....:	40PV045, VRRM 45V,IF(AV): 40A, Tj: 200°C, R8J-C: 0.8°C/W, Manufactured by Cixi Sinwo Solar Technology Co. Ltd
No. of bypass diode.....:	3
Cell-and string connectors.....:	Cell connectors: SnPb 60/40, Diameter: 0.32mm, Manufactured by: NEOCAB PV
	String connectors: SnPb 60/40, Dimension: 6.00 X 0.36mm, Manufactured by: NEOCAB PV
Junction box.....:	(3 no's used) ST 618 Rated Voltage: 1500V, Rated Current: 30A, IP68, Rated Impulse Voltage: 16kV, Manufactured by: Cixi Sinwo Solar Technology Co., Ltd, Tested by TUV SUD (Test Report No. 70.407.15.119.02-05)

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Cable.....:	1X4.0 mm <sup>2</sup> , Rated Voltage: 1500V. Application Class: A, Protection Class II, Ambient Temperature: -40°C to -85°C, Max. Temperature at conductor: 120°C, Manufactured Cixi Sinwo Solar Technology Co., Ltd. Certified by TUV SUD (Certificate No: 092685 0005 Rev 011
Connectors.....:	ST4, Rated Voltage: 1500V, Application Class: A, Protection Class II, IP 68, Ambient Temperature: -40°C to +85°C, Manufactured by Cixi Sinwo Solar Technology Co., Ltd., Certified by TUV SUD(Certificate No.. B 092685 0004 Rev. 03
Adhesives (frame).....:	RTV ADSIL PV 655, White RTV silicone sealant, Manufactured by Adarsha Specialty Chemicals Pvt Ltd.
Adhesives (junction box).....:	ADSIL PV 555 N. White RTV silicone sealant, Manufactured by Adarsha Specialty Chemicals Pvt Ltd.
Potting material (junction box).....:	ADSIL JB 597, White RTV silicone sealant. Manufactured by Adarsha Specialty Chemicals Pvt Ltd.
Others.....:	Soldering flux: 952-S, Zero Halogen, Low-Solid Liquid Flux for Photovoltaic Assembly, Manufactured by: Kester

**Note:** Bill of material are same for all family models.






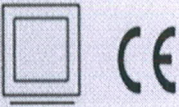

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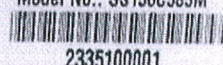


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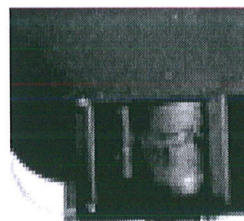
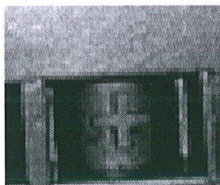
**Copy of marking Label on backside of the Module model: SS156C585M**

		<b>SUNIFY SOLAR LLP</b> Survey No.624P1,Near Hanuman Temple,Sarvad,Pipaliya Maliya Highway,Morbi Gujarat,India-363660	
<b>MODULE TYPE : SS156C585M</b>			
<b>ELECTRICAL RATINGS</b>		IS 14286:2010/IEC 61215:2005 IS/IEC 61730 (Part 1):2004 IS/IEC 61730 (Part 2):2004	
Rated Power (Pmax)	585 W	 R-72005800 www.bis.gov.in    	
Rated Voltage (Vmp)	45.75V		
Rated Current (Imp)	12.8A		
Open Circuit Voltage (Voc)	53.35V		
Short Circuit Current (Isc)	13.42A		
Output Tolerance	± 2%		
Series Fuse Rating	25A		
Safety Class Rating	CLASS II		
Application Class Rating	CLASS A		
Maximum System Voltage	1500V		
Module Weight	31 KG		
Module Dimensions	2465MM X 1134MM		
Safety fire class	C		
All Values are measured at STC (1000W/m <sup>2</sup> Spectrum AM 1.5, Temp 25°C)			
<b>WARNING/ ELECTRICAL HAZARD</b>			
	When Ever Solar Modules are incorporated with the solar irradiance, it can produce Electricity. Therefore always cover the solar modules with non transparent material before interfering with the junction box. Don't Walk/step over/ sit on the module And don't drop solid object on module.		
solar@sunifysolar.in +91-8141455503		www.sunifysolar.in	

**Label below glass laminate**

	Nominal Wattage: 585±2%	Model No.: SS156C585M
	MADE IN INDIA	
	Mfg Year:2023	2335100001

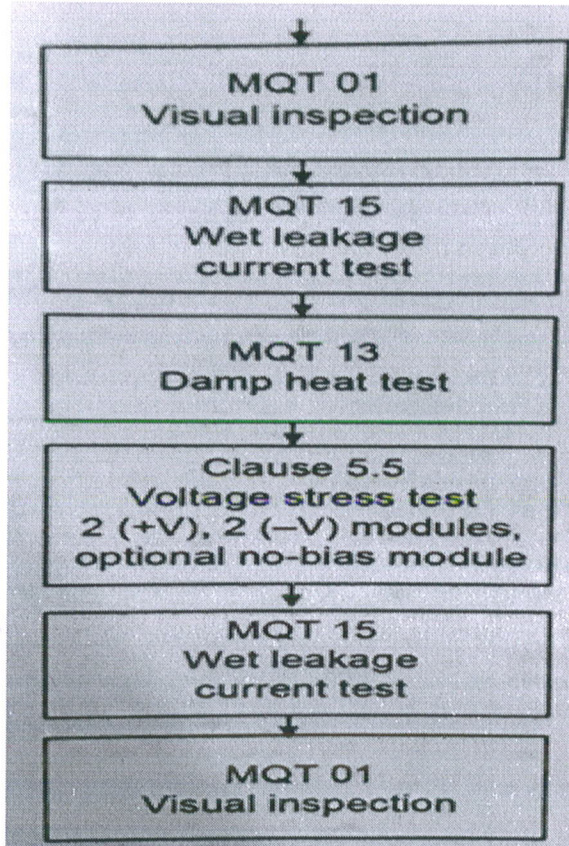
**Polarity on terminals / leads**



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## Test Procedure



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MQT 01	TABLE: (Initial) Visual inspection	P
Test Date.....:	01/11/2023	—
Sample		—
1	No visual defects found	P
2	No visual defects found	P
3	No visual defects found	P
4	No visual defects found	P
Supplementary information:		

MQT 15	TABLE: Wet leakage current test (Initial)	P	
Test Date.....:	02/11/2023	—	
Test Voltage applied [V].....:	1500VDC	—	
Solution resistivity [ $\Omega$ cm].....:	< 3,500 $\Omega$ cm at 22 $\pm$ 3°C	2145 $\Omega$ at 22.9°C	
Sample #	Measured [G $\Omega$ ]	Limit [M $\Omega$ ]	Result
1	3.221	14.33	P
2	3.238	14.33	P
3	3.252	14.33	P
4	3.234	14.33	P
Supplementary information: Size of module [m <sup>2</sup> ]: 2.79			

MQT 13	TABLE: Damp heat 1000 test	P
Test Date.....:	02/11/2023 to 20/12/2023	—
Total hours .....	1000 + 48	—
Temperature of Chamber [°C].....:	85°C $\pm$ 2°C	—
Relative humidity of Chamber [RH %].....:	85 $\pm$ 2%	
Total cycle [Days].....:	46	P
Supplementary information:		

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MQT 01		TABLE: Visual inspection	P
Test Date.....:	20/12/2023		—
Sample			—
1	No visual defects found		P
2	No visual defects found		P
3	No visual defects found		P
4	No visual defects found		P
Supplementary information:			

MQT 15		TABLE: Wet leakage current test	P
Test Date.....:	20/12/2023		—
Test Voltage applied [V].....:	1500VDC		—
Solution resistivity [ $\Omega$ cm].....:	< 3,500 $\Omega$ cm at 22 $\pm$ 3°C   2158 $\Omega$ at 23.3°C		—
Sample #	Measured [ $G\Omega$ ]	Limit [ $M\Omega$ ]	Result
1	3.146	14.33	P
2	3.121	14.33	P
3	3.092	14.33	P
4	3.108	14.33	P
Supplementary information: Size of module [ $m^2$ ]: 2.79			

Clause 5.5		TABLE: Voltage stress test	P
Test Date.....:	22/12/2023 to 01/01/2024		—
Sample serial Number.....:	2400700001, 2400700002, 2400700003, 2400700004		—
Dwell [240h $\pm$ 2].....:	240		—
Temperature [ $^{\circ}C$ ].....:	85		—
Humidity [RH%].....:	85		—
Voltage [V].....:	-1500		—
Total Cycle [Days].....:	10		—
Supplementary information:			

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MQT 15		TABLE: Wet leakage current test		P
Test Date.....:		01/01/2024		—
Test Voltage applied [V].....:		1500VDC		—
Solution resistivity [ $\Omega$ cm].....:		< 3,500 $\Omega$ cm at 22 $\pm$ 3°C	2214 $\Omega$ at 23.0°C	—
Sample #	Measured [ $G\Omega$ ]	Limit [ $M\Omega$ ]		Result
1	3.014	14.33		P
2	3.028	14.33		P
3	3.006	14.33		P
4	3.010	14.33		P
Supplementary information: Size of module [ $m^2$ ]: 2.79				

MQT 01		TABLE: Visual inspection		P
Test Date.....:		03/01/2024		—
Sample				—
1	No visual defects found			P
2	No visual defects found			P
3	No visual defects found			P
4	No visual defects found			P
Supplementary information:				

### Attachment – I: List of measurement equipment

Description	Identification #	Application
Visual inspection test setup	582	Visual inspection test
PID Tester	961	Voltage stress test
Wet leakage test setup	232	Wet leakage current test
Measuring tape	621	Wet leakage current test
Damp Heat Chamber	704	Environmental chamber

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## Annex 1: Enclosures

Figure A.1

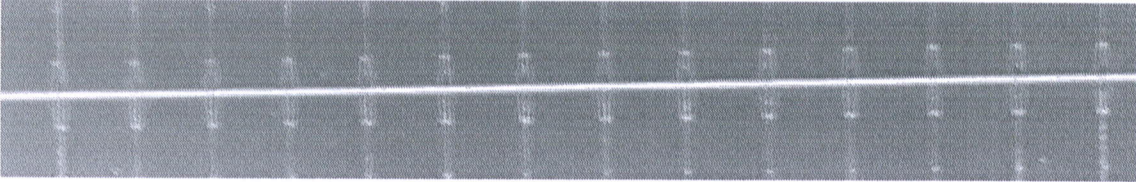


Figure A.2



Figure A.3



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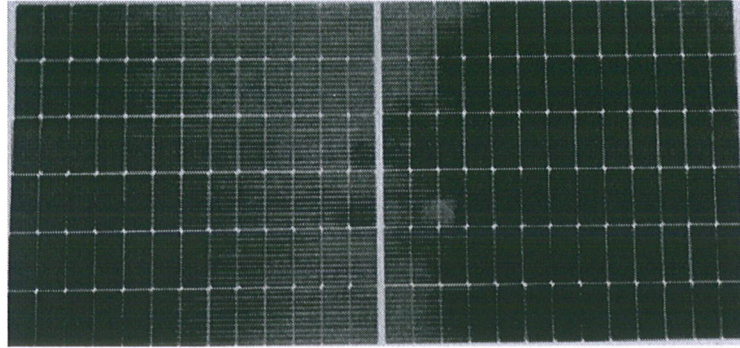
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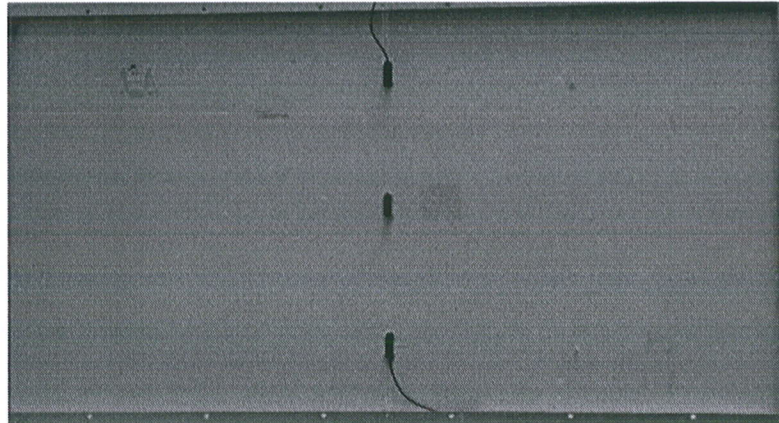
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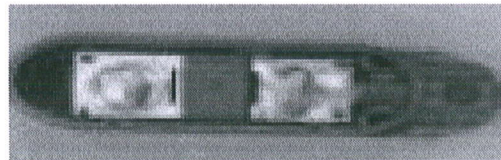
**Attachment - II**  
**Photo Document**  
**Front view of PV module**



**Rear view of PV module**



**Internal view of Junction box**



**Date of Starting of test: 31/10/2023**

**Date of Completion of test: 04/01/2024**

-For report verification email to report\_verify@delhitesthouse.com

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- The results listed refer only to tested samples and applicable parameters, Endorsement to product is neither inferred no implied.
- Total liability of our Test House is limited to the invoiced amount.
- Samples will be destroyed after 10days from the date of test certificate unless otherwise specified.
- This report is not to be reproduced wholly or in part and cannot be used as an evidence in the court of Law and should not be used in any advertising media without our special permission in writing.
- Report refer to the sample submitted to us and not drawn by DELHI TEST HOUSE, unless mentioned otherwise.

For More Information, Visit :  
[www.delhittesthouse.com](http://www.delhittesthouse.com)

**End of Report**

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