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DOC No. : MCIND/22-23/LB/ Plot 5 and 6, Swastik Industrial Estate, Vill: Sari, Tal:
089.V1 Sanand, Ahmedabad, Ahmadabad, Gujarat, India -
Telephone : +91 9871742221 382220
FAX : 41204299
E-Mail : puneet.kumar@mitsuic
hemicals.com
BO Code : NA

Test REPORT AS PER : IS 14286 (2010)**QR Code/Barcode : 131562CRS****REPORT NO : SC22SPI01032_2**

DATE : 19 Dec, 2022

PART A. PARTICULARS OF SAMPLE SUBMITTED

a) Customer Name & Address : UNIQUE SUN POWER LLP
BL NO. 2281/2/1/1, SUB PLOT. 1-A,
TADKESHWAR, NEAR ARETH MINNOR CANAL,
MANDVI, SURAT, NA, GUJARAT, India - 394170

b) Nature of sample : -

c) Grade/Variety/Type/Class Size etc : NA

d) Declare values, if any : -

e) Batch No. & Date of Manufacture : /

f) Quantity : 26

g) Date of Receipt : 19 Dec, 2022

h) BIS Seal : Verified by Sample Cell

i) IO's Signature : Verified by Sample Cell

j) Any other Information / Expiry Date, If any : /

k) Date of Commencement of Testing : 19 Dec, 2022

l) Date of Completion of Testing : 19 Dec, 2022

m) Section Code : 22ED759N

n) Section Report No. : 22ED759N_1_A1

o) Report Type : Revised

p) Reference Report No. : SC22SPI01032_1

q) Remarks : Please refer attached test report

Gita Kumari
OIC SAMPLE CELL
(Authorized Signatory)
Authorized on: 19 Dec, 2022 17:56 PM

1. Mitsui Chemicals India Pvt. Ltd.

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PART B. SUPPLEMENTARY INFORMATION

- | | |
|--|----------------|
| 1. Reference to sampling procedure, wherever applicable. | Not Applicable |
| 2. Supporting documents for the measurements taken and results derived like graphs, table sketches and or photographs as appropriate to test report, if any. | Yes |
| 3. Deviation from the test methods as prescribed in relevant ISS/Work instruction, if any. | Not Applicable |
| 3. NABL Report required ? | Yes |

Hebin Manuel
OIC Electrical
(Authorized Signatory)
Authorized on: 19 Dec, 2022 17:55 PM

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PART C. TEST RESULT

S.No.	Clause No Table No. Sl. No	Parameter - Method of test	Test Description	Min Limit	Max Limit	Unit	Result/ Observation
1	10.18	Bypass diode thermal' test	-	-	-	-	114.86 °C (The diode junction temperature did not exceed the diode manufacturer's maximum junction temperature limit. and the samples met the following requirements, 1. Visual Inspection test No Visual defects found 2. Maximum power determination Power degradation ≤ 5% 3. Insulation test - The measured insulation resistance was not less than 15.50 MΩ. For more details, please refer test report.
2	10.17	Hail test	-	-	-	-	The Hail test was completed on 14/12/2022. There was no evidence of mechanical damage during the test and the samples met the following requirements, 1. Visual Inspection test No Visual defects found 2. Maximum power determination Power degradation ≤ 5% 3. Insulation test -The measured insulation resistance was not less than 15.50 MΩ. For more details, please refer test report.
3	10.16	Mechanical load test	-	-	-	-	The mechanical load test was completed on 12/09/2022. There was no damage after the test, and the samples met the following requirements, 1. Visual Inspection test No Visual defects found 2. Maximum power determination, power degradation ≤ 5% 3. Insulation test -The measured insulation resistance was not less than 15.50 MΩ. For more details please refer test report.
4	10.15	Wet leakage current test	-	-	-	-	All the modules passed the initial and final wet leakage current test. For more details, please refer to the test report.

5	10.14	Robustness of termination test	-	-	-	-	<p>Test date: 14/12/2022. There was no evidence of a major defect after the Robustness of termination Test and the samples met the following requirements, 1. Visual Inspection test. No Visual defects found 2. Maximum power determination, Power degradation\leq5% 3. Insulation test- The measured insulation resistance was not less than 15.50 MΩ. For more details, please refer test report</p>
6	10.13	Damp heat test	-	-	-	-	<p>There was no evidence of a major defect in the Damp Heat Test and the samples met the following requirements, 1. Visual Inspection test. No Visual defects found 2. Maximum power determination, Power degradation\leq5% 3. Insulation test- The measured insulation resistance was not less than 15.50 MΩ 4. Wet Leakage current test- The measured insulation resistance was not less than 15.50 MΩ. For more details, please refer test report.</p>
7	10.12	Humidity freeze test	-	-	-	-	<p>There was no evidence of a major visual defect in the Humidity Freeze Test and the samples met the following requirements, 1. Visual Inspection test. No Visual defects found 2. Maximum power determination, Power degradation\leq5% 3. Insulation test- The measured insulation resistance was not less than 15.50 MΩ . For more details, please refer test report.</p>

8	10.11	Thermal cycling test	-	-	-	-	<p>There was no evidence of a major defect in the Thermal Cycling test and the samples met the following requirements, 1. Visual Inspection test. No Visual defects found 2. Maximum power determination, Power degradation $\leq 5\%$ 3. Insulation test- The measured insulation resistance was not less than 15.50 MΩ. For more details, please refer test report</p>
9	10.10	UV preconditioning	-	-	-	-	<p>There was no evidence of a major defect in UV exposure and the samples met the following requirements, 1. Visual Inspection test. No Visual defects found 2. Maximum power determination, Power degradation $\leq 5\%$ 3. Insulation test- The measured insulation resistance was not less than 15.50 MΩ. For more details, please refer test report</p>
10	10.9	Hot-spot endurance test	-	-	-	-	<p>There was no evidence of a major visual defect in the Hotspot test and the samples met the following requirements, 1. Visual Inspection test. No Visual defects found 2. Maximum power determination, Power degradation $\leq 5\%$ 3. Insulation test- The measured insulation resistance was not less than 15.50 MΩ 4. Wet Leakage current test- The measured insulation resistance was not less than 15.50 MΩ. For more details, please refer test report</p>

11	10.8	Outdoor exposure test	-	-	-	-	From 30/11/2022 to 06/12/2022. The module is exposed to required irradiation dosage. The samples met the following requirements, 1. Visual Inspection test - No Visual defects found 2. Maximum power determination - Power degradation \leq 5 % 3. Insulation test - The measured insulation resistance was not less than 15.50 M Ω . For more details, please refer test report.
12	10.7	Performance at low irradiance	-	-	-	-	The measured power at low irradiance value is 102.90W. (Module No.: MCIND/2022/0394). For more details, please refer test report.
13	10.6	Performance at STC and NOCT	-	-	-	-	The measured power at STC value is 539.91 W and NOCT value is 400.01W. (Module No.: MCIND/2022/0394). For more details, please refer test report.
14	10.5	Measurement of NOCT	-	-	-	-	The measured NOCT value is 47.00. (Module No. MCIND/2022/0394). For more details, please refer test report.
15	10.4	Measurement of temperature coefficients	-	-	-	-	Short circuit current α [%/°C]...: 0.022 Open circuit voltage β [%/°C]...: -0.172 Peak power δ [%/ °C] ...: -0.316 (Module no.: MCIND/2022/0394) For more details, please refer to the test report.
16	10.3	Insulation test	-	-	-	-	All modules passed the test. For more details. Please refer test report.
17	10.2	Maximum power determination	-	-	-	-	All Modules passed the test. Initial test date: 10/10/2022. Final test date: 16/12/2022. Please refer test report for more details.
18	10.1	Visual inspection	-	-	-	-	All the modules passed the visual inspection test. Test date: 10/10/2022. For more details, please refer to the test report.
19	4	Marking	-	-	-	-	All Markings are as per the standard criteria. For more information, please refer to the test report

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PART D. REMARKS

Please refer attached test report MCIND/22-23/LB/089.V1

Hebin Manuel
OIC Electrical
(Authorized Signatory)
Authorized on: 19 Dec, 2022 17:55 PM

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Test Report issued under the responsibility of:



SUMMARY OF REPORT No. MCIND/22-23/LB/089.V1, DATED (DD/MM/YYYY):

19/12/2022

ULR No. TC89062200000089F

(Number of pages in test report: Page no.1 to 88)

TEST FORMAT AS PER IS 14286:2010 (First Revision)

1. Name of manufacturer:	UNIQUE SUN POWER LLP
2. Product:	Crystalline Silicon Terrestrial Photovoltaic Modules (Si wafer based)
3. Test Request Number:	SC22SPI01032
4. Model:	<p>144 CELL FAMILY: Mono (Half-Cut Cell) SUN144P550 (Representative Model) SUN144P545, SUN144P540, SUN144P535, SUN144P530, SUN144P525, SUN144P520</p> <p>132 CELL FAMILY: Mono (Half-Cut Cell) SUN132P505, SUN132P500, SUN132P495, SUN132P490, SUN132P485, SUN132P480, SUN132P475, SUN132P470</p> <p>120 CELL FAMILY: Mono (Half-Cut Cell) SUN120P465, SUN120P460, SUN120P455, SUN120P450, SUN120P445, SUN120P440, SUN120P435</p> <p>108 CELL FAMILY: Mono (Half-Cut Cell) SUN108P420, SUN108P415, SUN108P410, SUN108P405, SUN108P400</p>
5. Model differences provided (if applicable): Yes/No	Yes
6. Model differences verified as per MNRE Guidelines for series formulation: Yes/No	Yes



TC-8906

ULR No : TC890622000000089F

Report No.: MCIND/22-23/LB/BIS/089.V1

7. Test Results:			
SL.NO.	TEST REQUIREMENTS	CLAUSE	VERDICT
1	Marking	4	P
2	Visual Inspection	10.1	P
3	Maximum Power Determination	10.2	P
4	Insulation Test	10.3	P
5	Measurement of Temperature Coefficient	10.4	P
6	Measurement of NOCT	10.5	P
7	Performance at STC & NOCT	10.6	P
8	Performance at low Irradiance	10.7	P
9	Outdoor Exposure Test	10.8	P
10	Hotspot Endurance Test	10.9	P
11	UV preconditioning	10.10	P
12	Thermal Cycling Test	10.11	P
13	Humidity Freeze Test	10.12	P
14	Damp Heat Test	10.13	P
15	Robustness and Termination Test	10.14	P
16	Wet Leakage Test	10.15	P
17	Mechanical Load Test	10.16	P
18	Hail Test	10.17	P
19	Bypass Diode Thermal Test	10.18	P

General Information:

- The conformity certificates of critical components are verified to ensure complete testing of product under test and details regarding harmonized IEC/UL Standards (where IS standards are not available) are also provided in the list of critical component.

CONCLUSION:

- Sample meets all relevant requirements of IS 14286:2010 (First Revision):
- ~~Sample fails to meet the following test requirements:~~

I, hereby, undertake that the verdict stated in the test reports for all the tests matches with the test results. The sample meets all relevant requirements of IS 14286:2010: ~~does not meet the requirements stated above at 2) of conclusion.~~ If any deviation is found, suitable punitive action may be taken by BIS.


Date (DD/MM/YYYY): 19/12/2022**(Signature of authorized person)**

This report is issued for test request number "SC22SPI00762". The lab couldn't upload the report due to a technical issue. Hence, the customer raised a new test request number "SC22SPI01032" to upload the reports.


This test report is uploaded under the test request number "SC22SPI01032" with the results of "SC22SPI00762".



TC-8906

ULR No : TC890622000000089F

Report No.: MCIND/22-23/LB/BIS/089.V1


TEST REPORT IS 14286: 2010 First Revision Crystalline Silicon Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval	
Report Number.	MCIND/22-23/LB/089.V1
ULR Number	TC890622000000089F
Discipline	Electronics Testing
Group	Miscellaneous Products (Solar PV Modules)
Test Request no	SC22SPI01032
Date of issue	19/12/2022
Total number of pages	88
Test Report QR Code	
Name of testing Laboratory	
Preparing the Report	Mitsui Chemicals India Private Limited
Applicant's name	UNIQUE SUN POWER LLP
Address	BL No. 2281/2/1/1, Sub Plot. 1-A, Tadkeshwar, Near Areth Minnor Canal, Mandvi, Surat, Gujarat – 394170
Test Specification:	
Standard	IS 14286: 2010
Test procedure	BIS
Non-standard test method	N/A
Master TRF	Dated 19.02.2018
General disclaimer:	
The test results presented in this report relate only to the object tested	



TC-8906

ULR No : TC890622000000089F

Report No.: MCIND/22-23/LB/BIS/089.V1

Test item description:	Crystalline Silicon Photovoltaic Modules (Si wafer based)
Trade mark:	
Manufacturer: Address:	UNIQUE SUN POWER LLP BL No. 2281/2/1/1, Sub Plot. 1-A, Tadkeshwar, Near Areth Minnor Canal, Mandvi, Surat, Gujarat - 394170
Model/Type reference:	<p>144 CELL FAMILY: Mono (Half-Cut Cell) SUN144P550 (Representative Model) SUN144P545, SUN144P540, SUN144P535, SUN144P530, SUN144P525, SUN144P520</p> <p>132 CELL FAMILY: Mono (Half-Cut Cell) SUN132P505, SUN132P500, SUN132P495, SUN132P490, SUN132P485, SUN132P480, SUN132P475, SUN132P470</p> <p>120 CELL FAMILY: Mono (Half-Cut Cell) SUN120P465, SUN120P460, SUN120P455, SUN120P450, SUN120P445, SUN120P440, SUN120P435</p> <p>108 CELL FAMILY: Mono (Half-Cut Cell) SUN108P420, SUN108P415, SUN108P410, SUN108P405, SUN108P400</p>

Ratings:	<p><u>Maximum System Voltage: 1500 VDC</u></p> <p><u>Maximum over current protection rating: 25 A</u></p> <p>144 CELL FAMILY: Mono (Half-Cut Cell) SUN144P550 (Representative Model) SUN144P545, SUN144P540, SUN144P535, SUN144P530, SUN144P525, SUN144P520</p> <p>132 CELL FAMILY: Mono (Half-Cut Cell) SUN132P505, SUN132P500, SUN132P495,</p>
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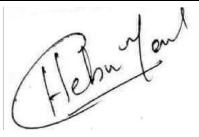


TC-8906

ULR No : TC890622000000089F

Report No.: MCIND/22-23/LB/BIS/089.V1

	<p>SUN132P490, SUN132P485, SUN132P480, SUN132P475, SUN132P470</p> <p>120 CELL FAMILY: Mono (Half-Cut Cell)</p> <p>SUN120P465, SUN120P460, SUN120P455, SUN120P450, SUN120P445, SUN120P440, SUN120P435</p> <p>108 CELL FAMILY: Mono (Half-Cut Cell)</p> <p>SUN108P420, SUN108P415, SUN108P410, SUN108P405, SUN108P400</p>
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Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	Testing laboratory	Mitsui Chemicals India Private Limited
Testing location/address:		Plot no. 5 & 6, Swastik Industrial Estate, Sarkhej-Bavla Highway, Village: Sari, Tal: Sanand, Ahmedabad- 382220, INDIA
Tested by (name + signature) :	Mr. Saran Bhaskar	
Reviewed by (name + signature):	Mr. Hebin Manuel	
Approved & Issued by (name + signature) :	Mr. Gowri Ganesh	