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CIN NO U21014UP1987PTC008956

TC-6468

TEST REPORT

TEST REPORT NO:	URS/LAB/02/RID/24-25/6757	DATE OF ISSUE:	12/09/2024
ULR NUMBER	TC646824100007001F		

NAME OF LABORATORY:	URS PRODUCTS AND TESTING PRIVATE LIMITED
ADDRESS OF LABORATORY:	A-29, Sector 5, Noida-201301, India
TESTING LOCATION:	A-29, Sector 5, Noida-201301, India

CUSTOMER NAME:	Icon Solar- En Power Technologies Private Limited
CUSTOMER ADDRESS:	PH No.09, Gram Dighari Mandir Hasaud, Teh Arang Chattisgarh Raipur, 492001

TEST ITEM DESCRIPTION			
PRODUCT NAME:	Solar PV Module		
DATE OF RECEIPT	26/06/2024	SAMPLE CONDITION:	OK
RECEIPT NUMBER	URS/LAB/PID/24-25/E2F18173	NO. OF SAMPLE	4
TRADE MARK	EN-ICON Harvesting the sun	SERIAL NUMBER	See page no.7
MODEL	**Model Tested:** ISEN600-Bi **Series Model:** **156 Half cut cell family with system voltage 1500V** ISEN595-Bi, ISEN590-Bi, ISEN585-Bi, ISEN580-Bi, ISEN575-Bi, ISEN570-Bi, ISEN565-Bi, ISEN560-Bi, **144 Half cut cell family with system voltage 1500V** ISEN555-Bi, ISEN550-Bi, ISEN545-Bi, ISEN540-Bi, ISEN535-Bi, ISEN530-Bi, ISEN525-Bi, ISEN520-Bi, **132 Half cut cell family with system voltage 1500V** ISEN505-Bi, ISEN500-Bi, ISEN495-Bi, ISEN490-Bi, ISEN485-Bi, ISEN480-Bi, **120 Half cut cell family with system voltage 1500V** ISEN460-Bi, ISEN455-Bi, ISEN450-Bi, ISEN445-Bi, ISEN440-Bi, ISEN435-Bi, ISEN430-Bi, ISEN425-Bi, ISEN420-Bi, **108 Half cut cell family with system voltage 1500V** ISEN410-Bi, ISEN405-Bi, ISEN400-Bi, ISEN395-Bi, ISEN390-Bi, ISEN385-Bi, ISEN380-Bi		
RATINGS/SPECIFICATION	See the marking Label (Page no. 05)		
NAME OF MANUFACTURER	Icon Solar- En Power Technologies Private Limited		
ADDRESS OF MANUFACTURER	PH No.09, Gram Dighari Mandir Hasaud, Teh Arang Chattisgarh Raipur, 492001		

TESTED BY

Vikas
Analyst

AUTHORIZED SIGNATURE

NILESH BALASAHEB ASWAR
Lab Manager

ISSUED BY

Paras Singh
Vice President (Technical)

Note: 1.
This test report is valid only for the sample(s) tested in our laboratory. 2. The test report is not permitted to be duplicated/reproduced in part or in extract in any circumstances. 3. URS lab is not responsible for authenticity of photocopied or reproduced test report. 4. The test results reoprted in this report are valid at the time of and under the stated conditions of measurements. 5. The remnant(Tested Samples)shall be destoryed after 07days from the date of testing unless specified otherwise in writing. 6. Any correction/erasure shall invalidate the test report. 7. This test report pertains to the test(s) carried out as requested by the customer. 8. This test report shall not be utilized for any legal purpose and shall not be produced in the court of low & no responsibility would be attached to URS Lab 9. URS reports, in general, are formally released in soft copy through reports@urs-labs.com , client portal, unless client will specifically request with sign & stamped letter with the intent to issue test reports in hard copy form. URS will not acknowledge for the reports said to be released through other means such as what's app. Test Reports for specific schemes such as BIS CRS/LRS schemes, are issued as per specific scheme requirements.

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ULR: TC646824100007001F
CUSTOMER NAME: ICON SOLAR-EN POWER TECHNOLOGIES PRIVATE LIMITED **CUSTOMER CITY:** RAIPUR

TEST SPECIFICATION			
TEST METHOD / STANDARD	IEC TS 62804-1:2015		
TEST START DATE	26/06/2024	TEST END DATE	12/09/2024
ENVIRONMENTAL CONDITIONS	15-35°C,45-75%Rh		

CONCLUSION	
TEST RESULT	The test result Conforms to the requirement of the standard/test protocol based on the obtained test values/results mentioned in this test report.
REMARK	Compliance statement in this report has been made considering decision rule as inherent in its test standard and latest version of ILAC G-8.

TESTED BY

Vikas
Analyst

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Lab Manager

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ULR: TC646824100007001F
CUSTOMER NAME: ICON SOLAR-EN POWER TECHNOLOGIES PRIVATE LIMITED **CUSTOMER CITY:** RAIPUR

TEST REPORT **IEC TS 62804 -1: 2015** **Photovoltaic (PV) modules – Test methods for the detection of potential – induced degradation – Part 1: crystalline silicon**	
Report Reference No.....: Date of issue.....: Total number of pages.....:	URS/LAB/02/RID/24-25/6757 12/09/2024 18
Testing Laboratory.....: Address.....:	URS PRODUCTS AND TESTING PRIVATE LIMITED A-29, Sector 5, Noida-201301, India
Applicant's name.....: Address.....:	Icon Solar- En Power Technologies Private Limited PH No.09, Gram Dighari Mandir Hasaud, Teh Arang Chattisgarh Raipur, 492001
Test specification.....: Standard.....:	 IEC TS 62804 -1: 2015
Test item description.....:	Solar PV Module
Trade Mark/Brand.....:	EN-ICON Harvesting the sun
Manufacturer.....:	Icon Solar- En Power Technologies Private Limited
Factory.....:	PH No.09, Gram Dighari Mandir Hasaud, Teh Arang Chattisgarh Raipur, 492001
Model/Type reference.....:	**Model Tested:** ISEN600-Bi **Series Model:** **156 Half cut cell family with system voltage 1500V** ISEN595-Bi, ISEN590-Bi, ISEN585-Bi, ISEN580-Bi, ISEN575-Bi, ISEN570-Bi, ISEN565-Bi, ISEN560-Bi, **144 Half cut cell family with system voltage 1500V** ISEN555-Bi, ISEN550-Bi, ISEN545-Bi, ISEN540-Bi, ISEN535-Bi, ISEN530-Bi, ISEN525-Bi, ISEN520-Bi, **132 Half cut cell family with system voltage 1500V** ISEN505-Bi, ISEN500-Bi, ISEN495-Bi, ISEN490-Bi, ISEN485-Bi, ISEN480-Bi, **120 Half cut cell family with system voltage 1500V** ISEN460-Bi, ISEN455-Bi, ISEN450-Bi, ISEN445-Bi, ISEN440-Bi, ISEN435-Bi, ISEN430-Bi, ISEN425-Bi, ISEN420-Bi, **108 Half cut cell family with system voltage 1500V** ISEN410-Bi, ISEN405-Bi, ISEN400-Bi, ISEN395-Bi, ISEN390-Bi, ISEN385-Bi, ISEN380-Bi
Ratings.....:	See copy of Marking label and General product information.

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Summary of testing:	
Tests performed (name of test and test clause):	URS PRODUCTS AND TESTING PRIVATE LIMITED A-29, Sector 5, Noida-201301, India
Preconditioning	
10.1 Visual Inspection (Initial)	
10.2 Maximum Power Determination (Initial)	
10.15 Wet leakage current test (Initial)	
MST Ground Continuity Test	
PID stress test method (a) 3 cycles (1 cycle = 96h)	
10.2 Maximum Power Determination (Final)	
10.15 Wet leakage current test (Final)	
10.1 Visual Inspection (Final)	

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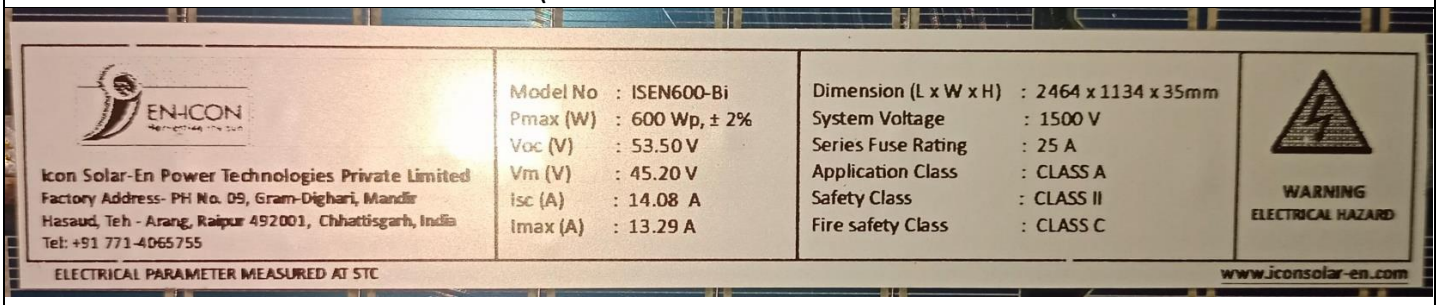
Copy of Marking Plate
(Model No. Tested: ISEN600-Bi



Polarity marking on Junction Box

Polarity marking on Connectors

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GENERAL INFORMATION	
Test item particulars:	
Accessories and detachable parts included in the evaluation.....:	N/A
Options included.....:	N/A
Abbreviations used in the report:	
Vmp–Maximum power voltage	Imp–Maximum power current
Voc–Open circuit voltage	Isc-Short circuit current
FF–Fill Factor	Pmp –Maximum power
STC –Standard Test Conditions	
Possible test case verdicts: -test case does not apply to the test object.....:	N/A (Not Applicable)
-test object does meet the requirement.....:	Pass (P)
-test object does not meet the requirement.....:	Fail (F)

General remarks:
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.
"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

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CUSTOMER NAME: ICON SOLAR-EN POWER TECHNOLOGIES PRIVATE LIMITED **CUSTOMER CITY:** RAIPUR

General Product Information:

PV module type reference.....: ISEN600-Bi

Product Electrical Ratings at STC

Nominal maximum power (Pmax).....: 600W

Nominal open circuit voltage at (Voc).....: 53.50V

Nominal short circuit current at (Isc).....: 14.08A

Nominal maximum power voltage (Vpm).....: 45.20V

Nominal maximum power current (Ipm).....: 13.29A

Product Safety Ratings

Maximum system voltage.....: 1500V

Maximum over-current protection rating.....: 25A

Safety application class.....: A

Safety class in accordance with IS 61140.....: II

Fire safety class.....: Class C

Recommended maximum series/parallel module configurations.....: Maximum number of modules in series depends on the system design, type of inverter used on and environment condition.

Module group assignment:

Model	Sample #	Sample No. & Serial number
ISEN600-Bi	1	1 & ICON600B1006081033
	2	2 & ICON600B1006081034
	3	3 & ICON600B1006081035
	4	4 & ICON600B1006081036

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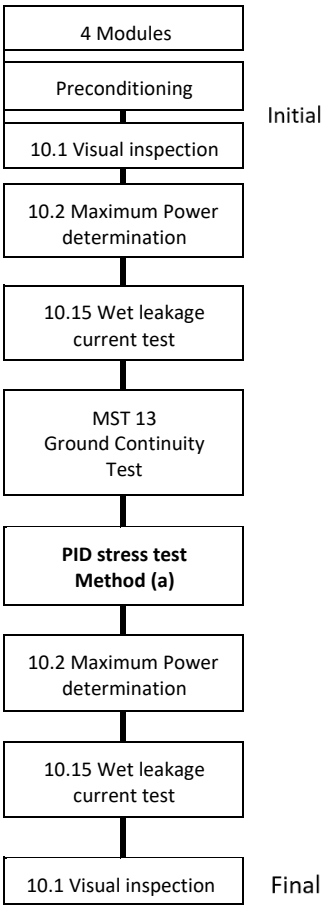
10	TEST PROCEDURES

TEST PROCEDURES



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Clause	Requirement + Test	Result-Remark	Verdict
4	MARKING		P
	Name, monogram or symbol of manufacturer.....:	Icon Solar- En Power Technologies Private Limited	P
	Type or model number.....:	ISEN600-Bi	P
	Serial number.....:	Marked	P
	Polarity of terminals or leads.....:	Marked	P
	Maximum system voltage.....:	1500V	P
	The date and place of manufacture.....:	Marked (Date traceable from serial number)	P

	Initial examination	All Modules	-
10	Preconditioning.....:	5.0 kWh/m^2	P
10.1	Visual inspection.....:	See table 10.1 Initial	P
10.2	Maximum power determination.....:	See table 10.2 Initial	P
10.15	Wet leakage current test.....:	See table 10.15 Initial	P
MST 13	Ground continuity test.....:	See table MST 13 Initial	P
4.3.2	PID stress test method (a).....:	See table PID stress test method (a)	P
10.2	Maximum power determination.....:	See table 10.2 Final	P
10.15	Wet leakage current test.....:	See table 10.15 Final	P
10.1	Visual inspection.....:	See table 10.1 Final	P

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Clause	Requirement + Test	Result-Remark	Verdict

10.1 Initial	**TABLE: Visual inspection (Initial)**		P
Test Date [MM/DD/YYYY].....:	07/02/2024		-
Sample #	Nature and position of initial findings – comments or attach photos		-
1	No defect found		P
2	No defect found		P
3	No defect found		P
4	No defect found		p
Supplementary information: Nil			

10.2 Initial	**TABLE: Maximum power determination (Initial)**					P
Test Date [MM/DD/YYYY].....:	07/02/2024					-
Module temperature [°C].....:	25					-
Irradiance [W/m²].....:	1000					-
Sample#	Voc[V]	Vmp [V]	Isc [A]	Imp [A]	Pmp [W]	FF[%]
1	53.48	45.19	14.07	13.30	601.03	79.87
2	53.45	45.21	14.09	13.28	600.39	79.72
3	53.48	45.25	14.05	13.25	599.56	79.79
4	53.41	45.18	14.07	13.27	599.54	79.78
Supplementary information: Nil						

10.15 Initial	**TABLE: Wet leakage current test (Initial)**			P
Test Date [MM/DD/YYYY].....:	07/02/2024			-
Test Voltage applied [V].....:	1500			-
Solution resistivity [Ω cm].....:	<3500 at 22 ± 3°C	2532		-
Surface tension [Nm^{-1}].....:	<0.03 at 22 ± 3°C	-		-
Solution temperature [°C].....:	24.6			-
Sample#	Measured[GΩ]	Limit[MΩ]		Result
1	6.15	14.34		P
2	6.85	14.34		P
3	6.08	14.34		P
4	5.25	14.34		p
Supplementary information: Area of module 2.79 [m²].				

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Paras Singh
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CUSTOMER NAME: ICON SOLAR-EN POWER TECHNOLOGIES PRIVATE LIMITED **CUSTOMER CITY:** RAIPUR

Clause	Requirement + Test	Result-Remark	Verdict

10.4 Initial	**TABLE: Ground Continuity Test - MST 13 (Initial)**		P
	Test Date [MM/DD/YYYY].....:	07/02/2024	-
	Maximum system voltage [V_{DC}].....:	1500V	-
	Current applied [A].....:	62.5	-
	Location of designated grounding point.....:	Ground holes on the sides of the frame	-
	Location of second contacting point.....:	Greatest physical displacement from the grounding point.	-
Sample No.	Voltage [V_{DC}]	Resistance [mΩ]	-
1	0.35	5.600	P
2	0.39	6.240	P
3	0.37	5.920	P
4	0.42	6.720	P
Supplementary information: Nil			

6.9.2	**TABLE: Potential Induced Degradation Test**		P
Test Date [MM/DD/YYYY].....:		07/04/2024 to 07/17/2024	-
Test Condition.....:		Method A	-
Duration.....:		288 hrs (for 3 cycles of 96 hrs)	-
Sample#	-		Result
1	1500		P
2	1500		P
3	1500		P
4	1500		p
Supplementary information: Area of module 2.79 [m^2].			

10.2 Final	**TABLE: Maximum power determination After PID Test**							P
Test Date [MM/DD/YYYY].....:			07/18/2024					-
Module temperature [°C].....:			25					-
Irradiance [W/m^2].....:			1000					-
Sample#	Voc[V]	Vmp[V]	Isc[A]	Imp[A]	Pmp [W]	FF[%]	Degradation [%]	Limit[%]
1	52.59	44.56	14.01	13.21	588.64	79.89	-2.06	- 5
2	52.48	44.53	14.05	13.22	588.69	79.84	-1.95	- 5
3	52.52	44.49	14.08	13.19	586.82	79.36	-2.12	- 5
4	52.42	44.45	14.04	13.18	585.85	79.60	-2.28	- 5
Supplementary information: Nil								

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Clause	Requirement + Test	Result-Remark	Verdict

10.15 Final	**TABLE: Wet leakage current test After PID Test**			P
Test Date [MM/DD/YYYY].....:		07/18/2024		-
Test Voltage applied [V].....:		1500		-
Solution resistivity [Ω cm].....:		<3500 at 22 ± 3°C	2512	-
Surface tension [Nm^{-1}].....:		<0.03 at 22 ± 3°C	-	-
Solution temperature [°C].....:		23.4		-
Sample#	Measured[GΩ]	Limit[MΩ]		Result
1	4.75	14.34		P
2	4.17	14.34		P
3	4.67	14.34		P
4	4.75	14.34		p
Supplementary information: Area of module 2.79 [m^2].				

10.1 Final	**TABLE: Visual inspection After PID Test**		P
Test Date [MM/DD/YYYY].....:	07/18/2024		-
Sample #	Nature and position of initial findings – comments or attach photos		-
1	No visual defect		P
2	No visual defect		P
3	No visual defect		P
4	No visual defect		p
Supplementary information: Nil			

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List of Annexes

Annex 1: Statement of the estimated uncertainty of the test results
Annex 2: PRODUCT DESCRIPTION SHEET (MANUFACTURERS AND TYPE REFERENCES)
Annex 3: Photographs of EUT

Annex 1: Statement of the estimated uncertainty of the test results

For Pmp – Measurement uncertainty is ±2.4%
For Isc – Measurement uncertainty is ±2.3%
For Voc – Measurement uncertainty is ±2.0%

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Annex 2: PRODUCT DESCRIPTION SHEET (MANUFACTURERS AND TYPE REFERENCES)

A1.1	MODULE TYPE/S
	Model Tested: ISEN600-Bi

A1.2	MODULE DESIGN –DIMENSIONS	
	Module dimensions (L x W x H) [mm].....:	2464*1134*35 for 156 half cut cell family 2278*1134*35 for 144 half cut cell family 2094*1134*35 for 132 half cut cell family 1908*1134*35 for 120 half cut cell family 1722*1134*35 for 108 half cut cell family

A1.3	SOLAR CELL	
	Cell type reference.....:	**Main:** 182.2 MONO PERC SOLAR CELL PIRANHA P-TYPE BI-FACIAL, Manufactured by: Premier Energies **Alternate**: WS182MP10, Manufactured by: Websol Energy System Limited
	Cell dimensions L x W x T (± %) [mm].....:	**Main**: 91.1mm *182.2mm (±0.25 mm) **Alternate**: 91.1mm *182.2mm (±0.5 mm)
	Cell thickness [µm].....:	**Main**: 145 ± 25 µm **Alternate**: 150 ± 15 µm
	Cell area [cm²].....:	**Main**: 165.984 **Alternate**: 165.984

A1.4	IDENTIFICATION OF MATERIALS	
	Front cover.....:	Solar Glass Tempered AR Coated; THICKNESS: 3.2mm ±0.2mm; Manufactured by: BOROSIL RENEWABLES LTD.
	Rear cover.....:	PRESERV 1- 300 TF; THICKNESS: 360 µm, Rated voltage: 1500V, FSI :29.5, RTI 140°C and 150°C Manufactured by: Renewsys India Private LTD.
	Encapsulation material.....:	T601FC/ B601FC, Thickness: 0.60mm; Manufactured by: Sunlink Photovoltaic Pvt. Ltd.
	Frame parts.....:	Material/Coating: Alloy 6063, T6, Thickness: 35mm; Manufactured by Sudarshan Alluminium India Limited
	Mounting parts.....:	As per installation manual
	Adhesive for frame.....:	Fasto SM30, White colour; Manufactured by FASTO ADVANCE MATERIALS INDIA PVT. LTD.

TESTED BY AUTHORIZED SIGNATURE ISSUED BY

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Analyst

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TC-6468

TEST REPORT NO.: URS/LAB/02/RID/24-25/6757 **DATE OF ISSUE:** 12/09/2024
ULR: TC646824100007001F
CUSTOMER NAME: ICON SOLAR-EN POWER TECHNOLOGIES PRIVATE LIMITED **CUSTOMER CITY:** RAIPUR

	Cell connector.....:	Solder tin plated copper ribbons, Sn60%/Pb40% Dimensions [mm]: 0.32 mm; Manufactured by: GEBA CABLES & WIRES INDIA PRIVATE LIMITED
	String connector.....:	Busbar, Sn60%/Pb40%, Dimensions [mm]: 4x 0.40mm & 6x 0.40mm, Manufactured by: GEBA CABLES & WIRES INDIA PRIVATE LIMITED
	Fluxing agent.....:	952-S, Low-Solids, No-Clean Liquid Flux, Manufactured by Kester
	Junction box.....:	GXSB-01, Rated voltage: 1.5KVDC, Rated Current: 25A, IP68, Ambient Temperature: -40°C to +85°C, Manufactured by GENX PV INDIA PRIVATE LIMITED. Certified by TUV SUD; certificate no.: B1157770002
	Cable	BIRLA UNISTAR solar cable 1CX4.0mm2, Rated voltage: 1.8 kV DC (Max.), Temperature: - 40°C to +90°C, Max. temperature at conductor:120°C, Manufactured by VINDHYA TELELINKS LIMITED Certificate no.: R 60148057, Tested by TUV Rheinland.
	Connector.....:	GXC-01, Rated voltage: 1500VDC, Rated current: 40A, IP68, Ambient Temperature: -40°C to 85°C, Manufactured by GENX PV INDIA PRIVATE LIMITED. Certificate no.: B 115777 0001 Rev. 00, Tested by TUV SUD.
	Bypass diode.....:	MK5045, Tj [°C]: -55 to +200°C, V_{RMS}: 31.5V; I_{FSM}: 400A; RΘJC: 2°C/W, Manufactured by GENX PV INDIA PRIVATE LIMITED.
	Potting material.....:	Fasto SP70, White colour; Manufactured by FASTO ADVANCE MATERIALS INDIA PVT. LTD.
	Adhesive for junction box.....:	Fasto SM30, White colour; Manufactured by FASTO ADVANCE MATERIALS INDIA PVT. LTD.
	Soldering Material.....:	N/A
	Additional material (e. g. insulation tape)...:	N/A

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A1.5	MODULE DESIGN - MINIMUM DISTANCES	
	Between cells.....:	Top to bottom: 1.4mm Along the side: 1.8mm
	Between cell and edge of laminate.....:	13.5mm
	Between any current carrying part and edge of laminate...:	14mm

A1.6	MODULE DESIGN - ELECTRICAL CONFIGURATION	
	Total number of cells.....:	156; 144; 132; 120; 108
	Serial-parallel connection of cells.....:	Series parallel
	Cells per bypass diode.....:	52 for 156 half cut cell family 48 for 144 half cut cell family 44 for 132 half cut cell family 40 for 120 half cut cell family 36 for 108 half cut cell family
	No. of bypass diodes.....:	3

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

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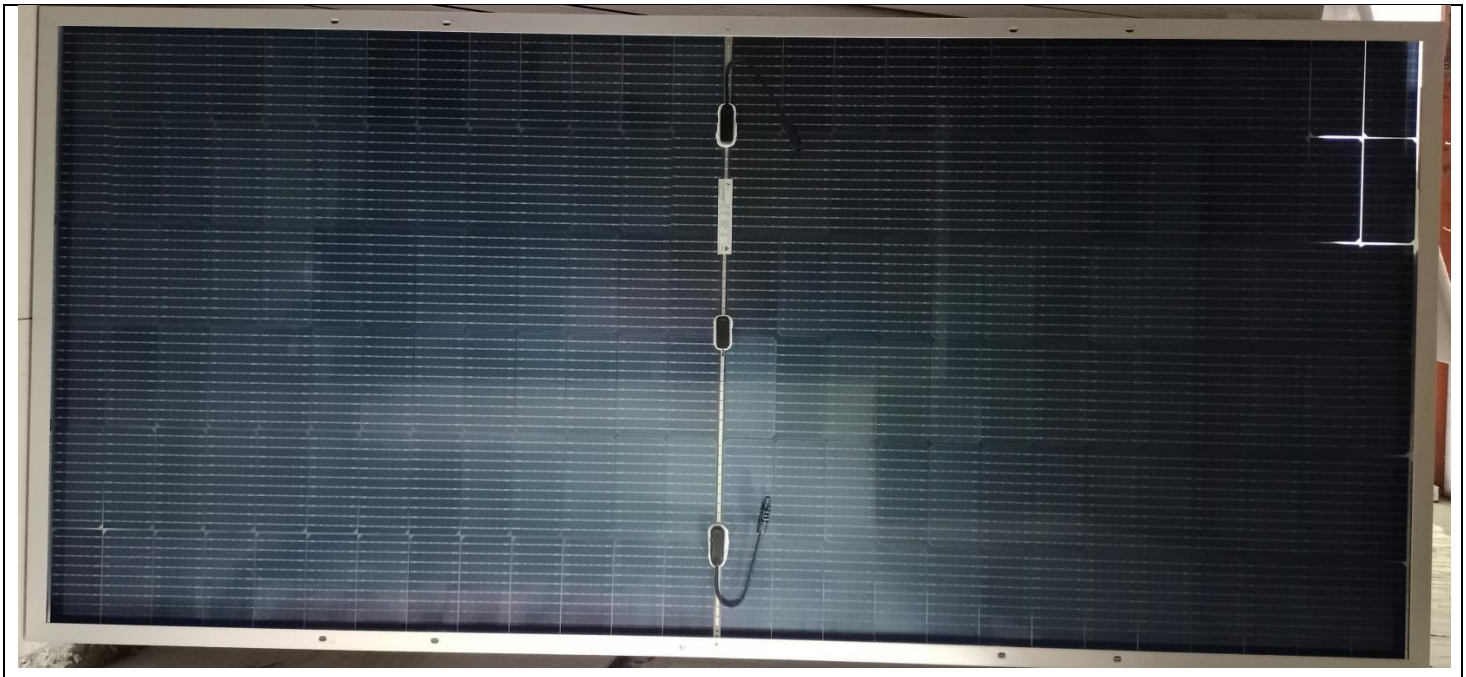
Annex 3: Photographs of EUT



Rear view

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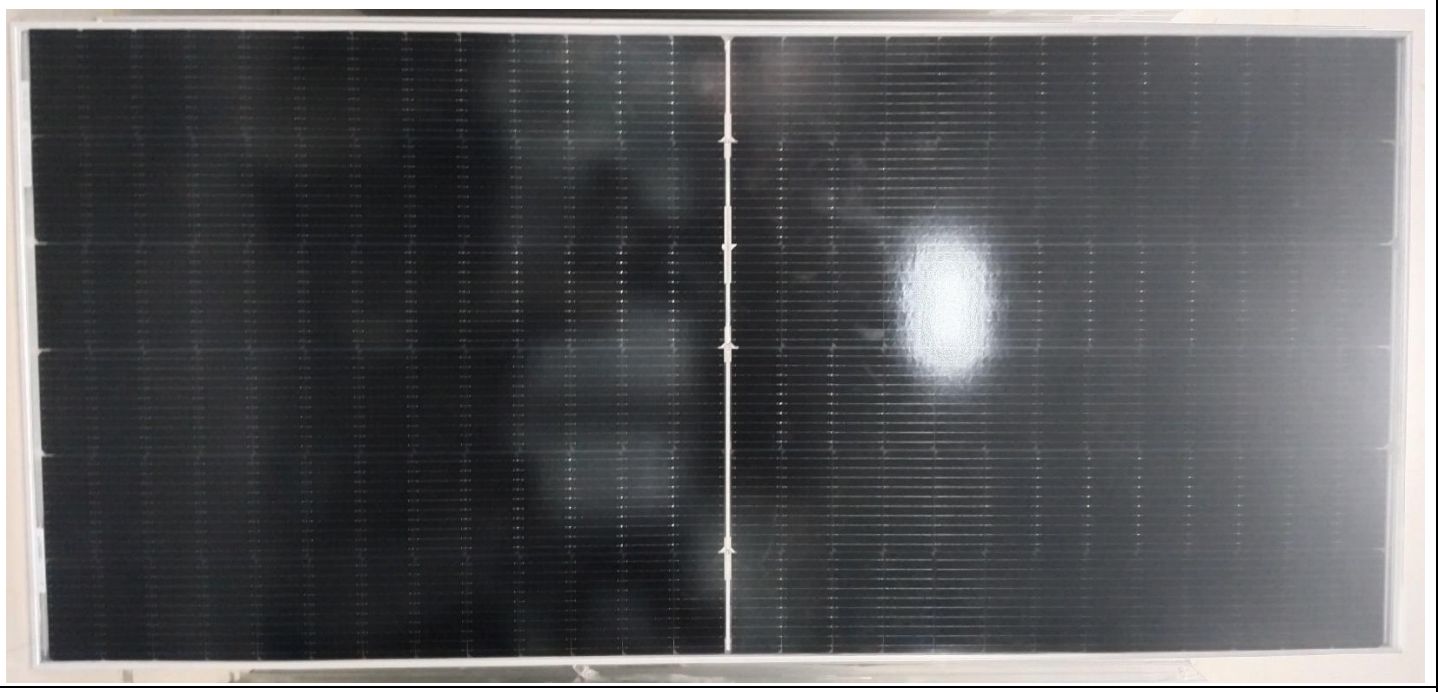

Front view

--END OF REPORT--

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