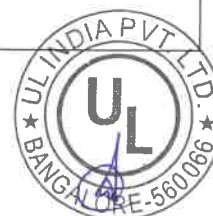


SUMMARY OF TEST REPORT No. 4788560221-BIS-S3 DATED(mm/dd/yyyy): 12/27/2018**ULR No: TC61681800000233F****(Number of pages in test report: Page no.1 to 43****TEST FORMAT AS PER IS/IEC 61730-2:2004 (First Edition) +A1:2011**

1. Name of manufacturer:	Icon Solar- En Power Technologies Private Limited
2. Product:	Photovoltaic (PV) Modules
3. Model:	<p>ISEN320 (Representative model)</p> <p>ISEN350, ISEN345, ISEN340, ISEN335, ISEN330, ISEN325, ISEN315, ISEN310, ISEN305, ISEN300, ISEN250, ISEN250X, ISEN200, ISEN150 (72 cell series)</p> <p>ISEN335X, ISEN330X, ISEN325X, ISEN320X, ISEN300X, ISEN250X, ISEN225X, ISEN220X, ISEN200X (144 cell series)</p> <p>ISEN300N, ISEN295, ISEN290, ISEN285, ISEN280 (66 cell series)</p> <p>ISEN275, ISEN270, ISEN265, ISEN260, ISEN255, ISEN250(60 cell series)</p> <p>ISEN250Y(120 cell series)</p> <p>ISEN250N, ISEN245, ISEN240, ISEN235, ISEN230, ISEN225(54 cell series)</p> <p>ISEN220, ISEN215, ISEN210, ISEN205, ISEN200 (48 cell series)</p> <p>ISEN200N, ISEN195, ISEN190 (44 cell series)</p> <p>ISEN185, ISEN180, ISEN175, ISEN170 (40 cell series)</p> <p>ISEN165, ISEN160, ISEN155, ISEN150, ISEN135, ISEN130, ISEN125, ISEN110, ISEN100, ISEN80, ISEN75, ISEN60, ISEN50, ISEN40, ISEN20, ISEN10(36 cell series)</p> <p>ISEN5, ISEN3 (18 cell series)</p>
4. Model differences provided (if applicable): Yes/No	YES
5. Model differences verified as per MNRE Guidelines for series formulation: Yes/No	YES



SUMMARY OF TEST REPORT No. 4788560221-BIS-S3 DATED(mm/dd/yyyy): 12/27/2018
ULR No: TC616818000000233F

6. Test Results:			
SL. NO.	TEST REQUIREMENTS	CLAUSE	VERDICT
1	MST 01 – Visual inspection	10.1	P
2	MST 11 – Accessibility test	10.2	P
3	MST 12 – Cut susceptibility test	10.3	P
4	MST 13 – Ground continuity test	10.4	P
5	MST 14 – Impulse voltage test	10.5	P
6	MST 16 – Dielectric withstand test	10.6	P
7	MST 21 – Temperature test	10.7	P
8	MST 23 – Fire test	10.8	P
9	MST 26 – Reverse current overload Test	10.9	P
10	MST 32 – Module breakage test	10.10	P
11	MST 17 – Wet leakage current test :	MST 17	P
12	MST 22 – Hot-spot test	MST 22	P
13	MST 34 – Mechanical load test	MST 34	P
14	MST 51a – Thermal cycling test (TC200)	MST 51a	P
15	MST 51b – Thermal cycling test (TC50) :	MST 51b	P
16	MST 52 – Humidity freeze test :	MST 52	P
17	MST 53 – Damp heat test :	MST 53	P
18	MST 54 – UV preconditioning test :	MST 54	P
-	Component tests	-	-
19	Partial discharge test	MST 15	N/A
20	Conduit bending test	MST 33	N/A
21	Terminal box knockout test	MST 44	N/A



SUMMARY OF TEST REPORT No. 4788560221-BIS-S3 DATED(mm/dd/yyyy): 12/27/2018
ULR No: TC61681800000233F

General Information:

1. 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:

1. Sample meets all relevant requirements of IS/IEC 61730-2:2004 (First Edition) +A1:2011.
- ~~2. 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/IEC 61730-2:2004 (First Edition) +A1:2011/~~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(mm/dd/yyyy): 12/27/2018

(Signature of Authorized person with stamp)




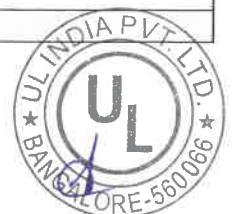
Test Report issued under the responsibility of:

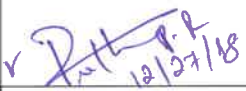
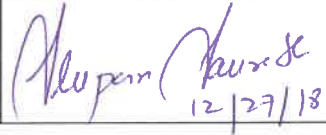


TEST REPORT IEC IS/61730-2 PV Module Safety Qualification Part 2: Requirements for testing	
Report Number.....:	4788560221-BIS-S3
ULR No.....:	TC616818000000233F
Date of issue.....(mm/dd/yyyy):	12/27/2018
Total number of pages.....	43
Name of Testing Laboratory preparing the Report.....:	UL India Pvt Ltd Laboratory Building, Kalyani Platina Campus, Survey. No. 129/4, EPIP Zone, Phase II, Whitefield, IN-560066, Bangalore, India
Applicant's name	Icon Solar- En Power Technologies Private Limited
Address.....:	319-320, Offizo, 3rd floor, Magneto Mall, G.E. Road., Raipur(C.G)-492001.
Test specification:	
Standard	IS/IEC 61730-2:2004 (First Edition) +A1:2011
Test procedure.....:	IS/IEC 61730-2:2004 (First Edition) +A1:2011
Non-standard test method	N/A
Test Report Form No.:	TRF No.IS/IEC61730-2_V1.0
Test Report Form(s) Originator	BIS
Master TRF	Dated 27.06.2018
General disclaimer:	
The test results presented in this report relate only to the object tested.	



Test item description.....:	Photovoltaic (PV) Module(s)
Trade Mark.....:	
Manufacturer.....:	Icon Solar- En Power Technologies Private Limited
Address.....:	319-320, Offizo, 3rd floor, , Magneto Mall, G.E. Road., Raipur(C.G)-492001.
Model/Type reference.....:	ISEN350, ISEN345, ISEN340, ISEN335, ISEN330, ISEN325, ISEN320, ISEN315, ISEN310, ISEN305, ISEN300, ISEN250, ISEN250X, ISEN200, ISEN150 ISEN335X, ISEN330X, ISEN325X, ISEN320X, ISEN300X ISEN250X, ISEN225X, ISEN220X, ISEN200X ISEN300N, ISEN295, ISEN290, ISEN285, ISEN280 ISEN275, ISEN270, ISEN265, ISEN260, ISEN255, ISEN250 ISEN250Y ISEN250N, ISEN245, ISEN240, ISEN235, ISEN230, ISEN225 ISEN220, ISEN215, ISEN210, ISEN205, ISEN200 ISEN200N, ISEN195, ISEN190 ISEN185, ISEN180, ISEN175, ISEN170 ISEN165, ISEN160, ISEN155, ISEN150, ISEN135, ISEN130, ISEN125, ISEN110, ISEN100, ISEN80, ISEN75, ISEN60, ISEN50, ISEN40, ISEN20, ISEN10 ISEN5, ISEN3
Ratings.....:	72, 144, 66, 60, 120, 54, 48, 44 Cell Series Maximum System Voltage: 1500V Maximum over current protection rating: 15A 40, 36 Cell Series Maximum System Voltage: 1000V Maximum over current protection rating: 15A 36 Cell Series Maximum System Voltage: 600V Maximum over current protection rating: 10A 18 cell series Maximum System Voltage: 48V Maximum over current protection rating: 5A See specific model rating in General Product information





Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):	
<input checked="" type="checkbox"/> Testing Laboratory:	
Testing location/address	UL India Pvt. Ltd. Laboratory Building, Kalyani Platina Campus, Survey. No. 129/4, EPIP Zone, Phase II, Whitefield, IN-560066, Bangalore, India
Tested by (name, function, signature)	Jyothi Swaroop  12/27/18
Approved by (name, function, signature)	Saurabh Sriparn  12/27/18
List of Attachments (including a total number of pages in each attachment): N/A	
Summary of testing:	
Tests performed (name of test and test clause): Model TEL24P320 from poly cell families were used for test purposes and all models are same in construction except number of cell, overall dimension, no of bypass diode and output power".	Testing location: UL India Pvt. Ltd. Laboratory Building, Kalyani Platina Campus, Survey. No. 129/4, EPIP Zone, Phase II, Whitefield, IN-560066, Bangalore, India
Visual Inspection (MST 01) (IEC 61730-2, 10.1)	UL India Pvt. Ltd. Laboratory Building, Kalyani Platina Campus, Survey. No. 129/4, EPIP Zone, Phase II, Whitefield, IN-560066, Bangalore, India
Maximum Power Determination (IEC 61215 2nd Ed.: 10.2)	
Performance at STC and NOTC - Solar Simulator (IEC 61215 2nd Ed.: 10.6)	
Visual Inspection - Follow Up (MST 01) (IEC 61730-2, 10.1)	
Module Breakage Test (MST 32) (IEC 61730-2: 10.10)	
Dielectric Withstand Test (IEC 61730-2: 10.6)	
Ground Continuity Test (MST 13) (IEC 61730-2: 10.4)	
Accessibility Test (MST 11) (IEC 61730-2: 10.2)	
Initial Wet Leakage Test (IEC 61215: 10.15)	
UV Preconditioning Test (IEC 61215 2nd Ed.: 10.10)	
Thermal Cycling Test - 50 Cycles (IEC 61215 2nd Ed.: 10.11)	
Humidity-Freeze Test (IEC 61215 2nd Ed.: 10.12)	



Robustness of Terminations Test (IEC 61215 2nd Ed.: 10.14)	
Damp-Heat Test (IEC 61215 2nd Ed.: 10.13)	
Wet Leakage Current Test (IEC 61215 2nd Ed.: 10.15)	
Mechanical Load Test (IEC 61215 2nd Ed.: 10.16)	
Thermal Cycling Test - 200 Cycles (IEC 61215 2nd Ed.: 10.11)	
Hot-Spot Endurance Test (IEC 61215 2nd Ed.: 10.9)	
Impulse Voltage Test (MST 14) (IEC 61730-2: 10.5)	
Cut Test (IEC 61730-2: 10.3)	
Accessibility Test (MST 11) (IEC 61730-2: 10.2)	
Visual Inspection Test - Follow Up (MST 01) (IEC 61730-2, 10.1)	
Bypass Diode Thermal Test (MST 25) (IEC 61215 2nd Ed.: 10.18)	
Temperature Test (MST 21) (IEC 61730-2: 10.7)	
Reverse Current Overload Test (MST 26) (IEC 61730-2: 10.9)	
Visual Inspection Test - Follow Up (MST 01) (IEC 61730-2, 10.1)	
MST 23 Fire test	



Copy of marking plate:

		Icon Solar-En Power Technologies Pvt.Ltd. Office Address : 319-320,Office,3rd Floor, Magneto Mall, G.E. Road,Raipur(C.G.) Pin: 492001 INDIA Tel: +91771-4085756 www.iconsolar-en.com
MODEL NO	ISEN320	
MAXIMUM POWER	(Pmax)	320 Wp ±3%
OPEN CIRCUIT VOLTAGE	(Voc)	45.00 V
SHORT CIRCUIT CURRENT	(Isc)	9.12 A
VOLTAGE AT MAXIMUM POWER	(Vmp)	36.59 V
CURRENT AT MAXIMUM POWER	(Imp)	8.75 A
MAXIMUM SYSTEM VOLTAGE	1500 V	
SERIES FUSE RATING	15 A	
MAXIMUM DESIGN LOAD	5400 Pa	
APPLICATION CLASS	CLASS A	
SAFETY CLASS	CLASS II	
POWER SORTING	0 - 5 W	
MODULE SERIAL NO : INSIDE OF THE MODULE IN FRONT		
 WARNING ELECTRICAL HAZARD THIS UNIT PRODUCES ELECTRICITY WHEN EXPOSED TO LIGHT. COVER GLASS BEFORE CONNECTING TO THE LOAD.		
POWER SPECIFICATION MEASURED AT STANDARD TEST CONDITION. (Cell Temperature 25°C, Irradiance 1000W/m ² & AM 1.5)		
Made in India		

10/18/2018

Note: Label date format (mm/dd/yyyy)



Test item particulars..... :	
Accessories and detachable parts included in the evaluation	Grounding Method1: Long frame rails are equipped with pre-drilled grounding holes in their centre. Stainless steel grounding bolts or grounding lugs
Mounting system used	Mounting: 1. Installation using the frame mounting holes using 4 pre-drilled mounting holes of Dia 10mm. M8 stainless steel hardware, spring washers, flat washer with torque 10Nm. 2. Using Pressure clamp: • Fixing on the long side: The clamps must be mounted along the frame at the position of the mounting hole, with a tolerance of 10% of the module total length to the edge of the frame. • Fixing on the short side: The clamps must be mounted along the frame at the edges of the module, with a tolerance of 25% of the module total width to the middle of the frame.
Other options included	N/A
Possible test case verdicts:	
- test case does not apply to the test object.....	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement.....	F (Fail)
Abbreviations used in the report:	
Pmax – Maximum power	PD – Partial Discharge
Vpm – Maximum power voltage	RTI – Relative Thermal Index
Ipm – Maximum power current	STC – Standard Test Conditions
Isc – Short circuit current	TC – Thermal Cycling
Voc – Open circuit voltage	CTI – Comparative Tracking Index
FF – Fill factor	MST – Module Safety Test
Testing	Refer individual test date
Date of receipt of test item	08/02/2018
Date (s) of performance of tests	10/12/2018 to 12/19/2018



General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p> <p>This Test Report Form is intended for the investigation of PV modules in accordance with IS/IS/IEC 61730-2. It can only be used together with IS/IEC 61730-1 Test Report.</p>	
Name and address of factory (ies)	Icon Solar- En Power Technologies Private Limited 319-320, 3rd floor, Offizo , Magneto Mall, G.E. Road., Raipur-492001



General product information:	
PV module type reference	ISEN350
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	350.23 W
Nominal open circuit voltage at (Voc)	45.78 V
Nominal short circuit current at (Isc)	9.69 A
Nominal maximum power voltage (Vpm).....	37.14 V
Nominal maximum power current (Ipm).....	9.43 A
PV module type reference	ISEN345
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	345.21 W
Nominal open circuit voltage at (Voc)	45.66 V
Nominal short circuit current at (Isc)	9.59 A
Nominal maximum power voltage (Vpm).....	37.04 V
Nominal maximum power current (Ipm).....	9.32 A
PV module type reference	ISEN340
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	340.12 W
Nominal open circuit voltage at (Voc)	45.52 V
Nominal short circuit current at (Isc)	9.50 A
Nominal maximum power voltage (Vpm).....	36.97 V
Nominal maximum power current (Ipm).....	9.20 A
PV module type reference	ISEN335
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	335.15 W
Nominal open circuit voltage at (Voc)	45.40 V
Nominal short circuit current at (Isc)	9.41 A
Nominal maximum power voltage (Vpm).....	36.87 V
Nominal maximum power current (Ipm).....	9.09 A
PV module type reference	ISEN330
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	330.10 W
Nominal open circuit voltage at (Voc)	45.25 V
Nominal short circuit current at (Isc)	9.31 A
Nominal maximum power voltage (Vpm).....	36.80 V
Nominal maximum power current (Ipm).....	8.97 A



PV module type reference	ISEN325
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	325.07 W
Nominal open circuit voltage at (Voc)	45.14 V
Nominal short circuit current at (Isc)	9.23 A
Nominal maximum power voltage (Vpm).....	36.69 V
Nominal maximum power current (Ipm).....	8.86 A
PV module type reference	ISEN320
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	320.16 W
Nominal open circuit voltage at (Voc)	45.00 V
Nominal short circuit current at (Isc)	9.12 A
Nominal maximum power voltage (Vpm).....	36.59 V
Nominal maximum power current (Ipm)	8.75 A
PV module type reference	ISEN315
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	315.17 W
Nominal open circuit voltage at (Voc)	44.85 V
Nominal short circuit current at (Isc)	9.02 A
Nominal maximum power voltage (Vpm).....	36.52 V
Nominal maximum power current (Ipm).....	8.63 A
PV module type reference	ISEN310
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)	310.02 W
Nominal open circuit voltage at (Voc)	44.70 V
Nominal short circuit current at (Isc)	8.93 A
Nominal maximum power voltage (Vpm).....	36.43 V
Nominal maximum power current (Ipm).....	8.51 A
PV module type reference.....	ISEN305
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	305.17 W
Nominal open circuit voltage at (Voc).....	44.59 V
Nominal short circuit current at (Isc).....	8.83 A
Nominal maximum power voltage (Vpm)	36.33 V
Nominal maximum power current (Ipm)	8.40 A



PV module type reference..... :	ISEN300
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	300.29 W
Nominal open circuit voltage at (Voc)..... :	44.45 V
Nominal short circuit current at (Isc)..... :	8.75 A
Nominal maximum power voltage (Vpm)..... :	36.18 V
Nominal maximum power current (Ipm)..... :	8.30 A
PV module type reference..... :	ISEN250
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	250.37 W
Nominal open circuit voltage at (Voc)..... :	44.46 V
Nominal short circuit current at (Isc)..... :	7.28 A
Nominal maximum power voltage (Vpm)..... :	36.18 V
Nominal maximum power current (Ipm)..... :	6.92 A
PV module type reference..... :	ISEN250X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	250.37 W
Nominal open circuit voltage at (Voc)..... :	44.46 V
Nominal short circuit current at (Isc)..... :	7.28 A
Nominal maximum power voltage (Vpm)..... :	36.18 V
Nominal maximum power current (Ipm)..... :	6.92 A
PV module type reference..... :	ISEN200
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	201.16 W
Nominal open circuit voltage at (Voc)..... :	44.41 V
Nominal short circuit current at (Isc)..... :	5.86 A
Nominal maximum power voltage (Vpm)..... :	36.18 V
Nominal maximum power current (Ipm)..... :	5.56 A
PV module type reference..... :	ISEN150
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	150.31 W
Nominal open circuit voltage at (Voc)..... :	44.46 V
Nominal short circuit current at (Isc)..... :	4.37 A
Nominal maximum power voltage (Vpm)..... :	36.22 V
Nominal maximum power current (Ipm)..... :	4.15 A



PV module type reference..... :	ISEN335X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	335.1 W
Nominal open circuit voltage at (Voc)..... :	45.4 V
Nominal short circuit current at (Isc)..... :	9.41 A
Nominal maximum power voltage (Vpm)..... :	36.87 V
Nominal maximum power current (Ipm)..... :	9.09 A
PV module type reference..... :	ISEN330X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	330.1 W
Nominal open circuit voltage at (Voc)..... :	45.25 V
Nominal short circuit current at (Isc)..... :	9.31 A
Nominal maximum power voltage (Vpm)..... :	36.8 V
Nominal maximum power current (Ipm)..... :	8.97 A
PV module type reference..... :	ISEN325X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	325.1 W
Nominal open circuit voltage at (Voc)..... :	45.14 V
Nominal short circuit current at (Isc)..... :	9.23 A
Nominal maximum power voltage (Vpm)..... :	36.69 V
Nominal maximum power current (Ipm)..... :	8.86 A
PV module type reference..... :	ISEN320X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	320.2 W
Nominal open circuit voltage at (Voc)..... :	45.00 V
Nominal short circuit current at (Isc)..... :	9.12 A
Nominal maximum power voltage (Vpm)..... :	36.59 V
Nominal maximum power current (Ipm)..... :	8.75 A
PV module type reference..... :	ISEN300X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	300.3 W
Nominal open circuit voltage at (Voc)..... :	88.90 V
Nominal short circuit current at (Isc)..... :	4.38 A
Nominal maximum power voltage (Vpm)..... :	72.36 V
Nominal maximum power current (Ipm)..... :	4.15 A



PV module type reference..... :	ISEN250X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	250.3 W
Nominal open circuit voltage at (Voc)..... :	89.19 V
Nominal short circuit current at (Isc)..... :	3.63 A
Nominal maximum power voltage (Vpm)..... :	72.56 V
Nominal maximum power current (Ipm)..... :	3.45 A
PV module type reference..... :	ISEN225X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	225.2 W
Nominal open circuit voltage at (Voc)..... :	91.09 V
Nominal short circuit current at (Isc)..... :	3.16 A
Nominal maximum power voltage (Vpm)..... :	73.61 V
Nominal maximum power current (Ipm)..... :	3.06 A
PV module type reference..... :	ISEN220X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	220.0 W
Nominal open circuit voltage at (Voc)..... :	90.6 V
Nominal short circuit current at (Isc)..... :	3.11 A
Nominal maximum power voltage (Vpm)..... :	73.32 V
Nominal maximum power current (Ipm)..... :	3.00 A
PV module type reference..... :	ISEN200X
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	200.4 W
Nominal open circuit voltage at (Voc)..... :	88.89 V
Nominal short circuit current at (Isc)..... :	2.92 A
Nominal maximum power voltage (Vpm)..... :	72.36 V
Nominal maximum power current (Ipm)..... :	2.77 A
PV module type reference..... :	ISEN300N
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	300.3 W
Nominal open circuit voltage at (Voc)..... :	41.43 V
Nominal short circuit current at (Isc)..... :	9.26 A
Nominal maximum power voltage (Vpm)..... :	33.67 V
Nominal maximum power current (Ipm)..... :	8.92 A



PV module type reference.....	ISEN295
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	295.1 W
Nominal open circuit voltage at (Voc).....	41.30 V
Nominal short circuit current at (Isc).....	9.16 A
Nominal maximum power voltage (Vpm)	33.57 V
Nominal maximum power current (Ipm)	8.79 A
PV module type reference.....	ISEN290
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	290.3 W
Nominal open circuit voltage at (Voc).....	41.16 V
Nominal short circuit current at (Isc).....	9.06 A
Nominal maximum power voltage (Vpm)	33.48 V
Nominal maximum power current (Ipm)	8.67 A
PV module type reference.....	ISEN285
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	285.2 W
Nominal open circuit voltage at (Voc).....	41.05 V
Nominal short circuit current at (Isc).....	8.97 A
Nominal maximum power voltage (Vpm)	33.36 V
Nominal maximum power current (Ipm)	8.55 A
PV module type reference.....	ISEN280
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	280.0 W
Nominal open circuit voltage at (Voc).....	40.93 V
Nominal short circuit current at (Isc).....	8.85 A
Nominal maximum power voltage (Vpm)	33.26 V
Nominal maximum power current (Ipm)	8.42 A
PV module type reference.....	ISEN275
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	275.0 W
Nominal open circuit voltage at (Voc).....	37.71 V
Nominal short circuit current at (Isc).....	9.31 A
Nominal maximum power voltage (Vpm)	30.62 V
Nominal maximum power current (Ipm)	8.98 A



PV module type reference..... :	ISEN270
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	270.2 W
Nominal open circuit voltage at (Voc)..... :	37.58 V
Nominal short circuit current at (Isc)..... :	9.19 A
Nominal maximum power voltage (Vpm)..... :	30.56 V
Nominal maximum power current (Ipm)..... :	8.84 A
PV module type reference..... :	ISEN265
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	265.3 W
Nominal open circuit voltage at (Voc)..... :	37.46 V
Nominal short circuit current at (Isc)..... :	9.09 A
Nominal maximum power voltage (Vpm)..... :	30.46 V
Nominal maximum power current (Ipm)..... :	8.71 A
PV module type reference..... :	ISEN260
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	260.2 W
Nominal open circuit voltage at (Voc)..... :	37.30 V
Nominal short circuit current at (Isc)..... :	9.01 A
Nominal maximum power voltage (Vpm)..... :	30.36 V
Nominal maximum power current (Ipm)..... :	8.57 A
PV module type reference..... :	ISEN255
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	255.2 W
Nominal open circuit voltage at (Voc)..... :	37.18 V
Nominal short circuit current at (Isc)..... :	8.84 A
Nominal maximum power voltage (Vpm)..... :	30.27 V
Nominal maximum power current (Ipm)..... :	8.43 A
PV module type reference..... :	ISEN250
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	250.3 W
Nominal open circuit voltage at (Voc)..... :	37.05 V
Nominal short circuit current at (Isc)..... :	8.75 A
Nominal maximum power voltage (Vpm)..... :	30.12 V
Nominal maximum power current (Ipm)..... :	8.31 A



PV module type reference.....	ISEN250Y
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	250.3 W
Nominal open circuit voltage at (Voc).....	74.10 V
Nominal short circuit current at (Isc).....	4.38 A
Nominal maximum power voltage (Vpm)	60.24 V
Nominal maximum power current (Ipm)	4.16 A
PV module type reference.....	ISEN250N
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	250.2 W
Nominal open circuit voltage at (Voc).....	34.01 V
Nominal short circuit current at (Isc).....	9.38 A
Nominal maximum power voltage (Vpm)	27.62 V
Nominal maximum power current (Ipm)	9.06 A
PV module type reference.....	ISEN245
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	245.2 W
Nominal open circuit voltage at (Voc).....	33.89 V
Nominal short circuit current at (Isc).....	9.24 A
Nominal maximum power voltage (Vpm)	27.52 V
Nominal maximum power current (Ipm)	8.91 A
PV module type reference.....	ISEN240
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	240.1 W
Nominal open circuit voltage at (Voc).....	33.75 V
Nominal short circuit current at (Isc).....	9.12 A
Nominal maximum power voltage (Vpm)	27.44 V
Nominal maximum power current (Ipm)	8.75 A
PV module type reference.....	ISEN235
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	235.1 W
Nominal open circuit voltage at (Voc).....	33.61 V
Nominal short circuit current at (Isc).....	8.98 A
Nominal maximum power voltage (Vpm)	27.31 V
Nominal maximum power current (Ipm)	8.61 A



PV module type reference..... :	ISEN230
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	230.3 W
Nominal open circuit voltage at (Voc)..... :	33.49 V
Nominal short circuit current at (Isc)..... :	8.89 A
Nominal maximum power voltage (Vpm)..... :	27.22 V
Nominal maximum power current (Ipm)..... :	8.46 A
PV module type reference..... :	ISEN225
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	225.2 W
Nominal open circuit voltage at (Voc)..... :	33.33 V
Nominal short circuit current at (Isc)..... :	8.75 A
Nominal maximum power voltage (Vpm)..... :	27.13 V
Nominal maximum power current (Ipm)..... :	8.3 A
PV module type reference..... :	ISEN220
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	220.1 W
Nominal open circuit voltage at (Voc)..... :	30.18 V
Nominal short circuit current at (Isc)..... :	9.31 A
Nominal maximum power voltage (Vpm)..... :	24.51 V
Nominal maximum power current (Ipm)..... :	8.98 A
PV module type reference..... :	ISEN215
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	215.1 W
Nominal open circuit voltage at (Voc)..... :	30.06 V
Nominal short circuit current at (Isc)..... :	9.17 A
Nominal maximum power voltage (Vpm)..... :	24.42 V
Nominal maximum power current (Ipm)..... :	8.81 A
PV module type reference..... :	ISEN210
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	210.1 W
Nominal open circuit voltage at (Voc)..... :	29.9 V
Nominal short circuit current at (Isc)..... :	9.04 A
Nominal maximum power voltage (Vpm)..... :	24.32 V
Nominal maximum power current (Ipm)..... :	8.64 A



PV module type reference.....	ISEN205
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	205.0 W
Nominal open circuit voltage at (Voc).....	29.76 V
Nominal short circuit current at (Isc).....	8.89 A
Nominal maximum power voltage (Vpm)	24.23 V
Nominal maximum power current (Ipm)	8.46 A
PV module type reference.....	ISEN200
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	200.6 W
Nominal open circuit voltage at (Voc).....	29.64 V
Nominal short circuit current at (Isc).....	8.74 A
Nominal maximum power voltage (Vpm)	24.14 V
Nominal maximum power current (Ipm)	8.31 A
PV module type reference.....	ISEN200N
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	200.3 W
Nominal open circuit voltage at (Voc).....	27.62 V
Nominal short circuit current at (Isc).....	9.27 A
Nominal maximum power voltage (Vpm)	22.43 V
Nominal maximum power current (Ipm)	8.93 A
PV module type reference.....	ISEN195
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	195.2 W
Nominal open circuit voltage at (Voc).....	27.49 V
Nominal short circuit current at (Isc).....	9.07 A
Nominal maximum power voltage (Vpm)	22.33 V
Nominal maximum power current (Ipm)	8.74 A
PV module type reference.....	ISEN190
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	190.2 W
Nominal open circuit voltage at (Voc).....	27.36 V
Nominal short circuit current at (Isc).....	8.96 A
Nominal maximum power voltage (Vpm)	22.25 V
Nominal maximum power current (Ipm)	8.55 A



PV module type reference..... :	ISEN185
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	185.0 W
Nominal open circuit voltage at (Voc)..... :	25.21 V
Nominal short circuit current at (Isc)..... :	9.37 A
Nominal maximum power voltage (Vpm)..... :	20.44 V
Nominal maximum power current (Ipm)..... :	9.05 A
PV module type reference..... :	ISEN180
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	180.1 W
Nominal open circuit voltage at (Voc)..... :	25.06 V
Nominal short circuit current at (Isc)..... :	9.22 A
Nominal maximum power voltage (Vpm)..... :	20.37 V
Nominal maximum power current (Ipm)..... :	8.84 A
PV module type reference..... :	ISEN175
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	175.0 W
Nominal open circuit voltage at (Voc)..... :	24.89 V
Nominal short circuit current at (Isc)..... :	9.01 A
Nominal maximum power voltage (Vpm)..... :	20.23 V
Nominal maximum power current (Ipm)..... :	8.65 A
PV module type reference..... :	ISEN170
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	170.2 W
Nominal open circuit voltage at (Voc)..... :	24.81 V
Nominal short circuit current at (Isc)..... :	8.89 A
Nominal maximum power voltage (Vpm)..... :	20.17 V
Nominal maximum power current (Ipm)..... :	8.44 A
PV module type reference..... :	ISEN165
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	165.4 W
Nominal open circuit voltage at (Voc)..... :	22.65 V
Nominal short circuit current at (Isc)..... :	9.33 A
Nominal maximum power voltage (Vpm)..... :	18.4 V
Nominal maximum power current (Ipm)..... :	8.99 A



PV module type reference.....	ISEN160
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	160.0 W
Nominal open circuit voltage at (Voc).....	22.5 V
Nominal short circuit current at (Isc).....	9.12 A
Nominal maximum power voltage (Vpm)	18.29 V
Nominal maximum power current (Ipm)	8.75 A
PV module type reference.....	ISEN155
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	155.5 W
Nominal open circuit voltage at (Voc).....	22.37 V
Nominal short circuit current at (Isc).....	8.95 A
Nominal maximum power voltage (Vpm)	18.21 V
Nominal maximum power current (Ipm)	8.54 A
PV module type reference.....	ISEN150
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	150.5 W
Nominal open circuit voltage at (Voc).....	22.23 V
Nominal short circuit current at (Isc).....	8.74 A
Nominal maximum power voltage (Vpm)	18.11 V
Nominal maximum power current (Ipm)	8.31 A
PV module type reference.....	ISEN135
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	135.1 W
Nominal open circuit voltage at (Voc).....	22.58 V
Nominal short circuit current at (Isc).....	7.67 A
Nominal maximum power voltage (Vpm)	18.33 V
Nominal maximum power current (Ipm)	7.37 A
PV module type reference.....	ISEN130
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax).....	130.4 W
Nominal open circuit voltage at (Voc).....	22.2 V
Nominal short circuit current at (Isc).....	7.59 A
Nominal maximum power voltage (Vpm)	18.09 V
Nominal maximum power current (Ipm)	7.21 A



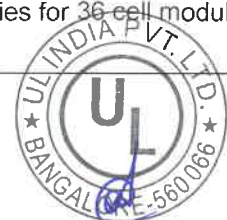
PV module type reference..... :	ISEN125
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	125.5 W
Nominal open circuit voltage at (Voc)..... :	22.2 V
Nominal short circuit current at (Isc)..... :	7.31 A
Nominal maximum power voltage (Vpm)..... :	18.09 V
Nominal maximum power current (Ipm)..... :	6.94 A
PV module type reference..... :	ISEN110
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	110.3 W
Nominal open circuit voltage at (Voc)..... :	22.42 V
Nominal short circuit current at (Isc)..... :	6.33 A
Nominal maximum power voltage (Vpm)..... :	18.23 V
Nominal maximum power current (Ipm)..... :	6.05 A
PV module type reference..... :	ISEN100
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	100.6 W
Nominal open circuit voltage at (Voc)..... :	22.2 V
Nominal short circuit current at (Isc)..... :	5.86 A
Nominal maximum power voltage (Vpm)..... :	18.09 V
Nominal maximum power current (Ipm)..... :	5.56 A
PV module type reference..... :	ISEN80
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	80.5 W
Nominal open circuit voltage at (Voc)..... :	22.1 V
Nominal short circuit current at (Isc)..... :	4.73 A
Nominal maximum power voltage (Vpm)..... :	18.02 V
Nominal maximum power current (Ipm)..... :	4.47 A
PV module type reference..... :	ISEN75
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	75.2 W
Nominal open circuit voltage at (Voc)..... :	22.18 V
Nominal short circuit current at (Isc)..... :	4.34 A
Nominal maximum power voltage (Vpm)..... :	18.07 V
Nominal maximum power current (Ipm)..... :	4.16 A



PV module type reference..... :	ISEN60
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	60.3 W
Nominal open circuit voltage at (Voc)..... :	22.13 V
Nominal short circuit current at (Isc)..... :	3.53 A
Nominal maximum power voltage (Vpm)..... :	18.04 V
Nominal maximum power current (Ipm)..... :	3.34 A
PV module type reference..... :	ISEN50
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	50.1 W
Nominal open circuit voltage at (Voc)..... :	22.2 V
Nominal short circuit current at (Isc)..... :	2.9 A
Nominal maximum power voltage (Vpm)..... :	18.09 V
Nominal maximum power current (Ipm)..... :	2.77 A
PV module type reference..... :	ISEN40
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	40.4 W
Nominal open circuit voltage at (Voc)..... :	22.18 V
Nominal short circuit current at (Isc)..... :	2.36 A
Nominal maximum power voltage (Vpm)..... :	18.02 V
Nominal maximum power current (Ipm)..... :	2.24 A
PV module type reference..... :	ISEN20
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	20.5 W
Nominal open circuit voltage at (Voc)..... :	22.08 V
Nominal short circuit current at (Isc)..... :	1.2 A
Nominal maximum power voltage (Vpm)..... :	18 V
Nominal maximum power current (Ipm)..... :	1.14 A
PV module type reference..... :	ISEN10
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	10.6 W
Nominal open circuit voltage at (Voc)..... :	22 V
Nominal short circuit current at (Isc)..... :	0.64 A
Nominal maximum power voltage (Vpm)..... :	18 V
Nominal maximum power current (Ipm)..... :	0.59 A



PV module type reference..... :	ISEN5
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	5.5 W
Nominal open circuit voltage at (Voc)..... :	11.06 V
Nominal short circuit current at (Isc)..... :	0.64 A
Nominal maximum power voltage (Vpm)..... :	9.02 V
Nominal maximum power current (Ipm)..... :	0.61 A
PV module type reference..... :	ISEN3
<u>Product Electrical Ratings at STC</u>	
Nominal maximum power (Pmax)..... :	3.3 W
Nominal open circuit voltage at (Voc)..... :	11.06 V
Nominal short circuit current at (Isc)..... :	0.39 A
Nominal maximum power voltage (Vpm)..... :	9.02 V
Nominal maximum power current (Ipm)..... :	0.37 A
<u>Product Safety Ratings</u>	For 72, 144 , 66, 60,120, 54, 48, 44 cell modules
Maximum systems operating voltage..... :	1500 V
Maximum over-current protection rating..... :	15 A
Safety application class..... :	Class A
Safety class in accordance with IEC 61140..... :	Class II
Fire safety class..... :	Class C
Recommended maximum series/parallel module configurations..... :	26 modules in series for 72 cell modules 27 modules in series for 144 cell modules 30 modules in series for 66 cell modules 32 modules in series for 60 cell modules 16 modules in series for 120 cell modules 35 modules in series for 54 cell modules 40 modules in series for 48 cell modules 47 modules I in series for 44 cell modules
<u>Product Safety Ratings</u>	For 40,36 cell modules
Maximum systems operating voltage..... :	1000 V
Maximum over-current protection rating..... :	15 A
Safety application class..... :	Class A
Safety class in accordance with IEC 61140..... :	Class II
Fire safety class..... :	Class C
Recommended maximum series/parallel module configurations..... :	32 modules in series for 40 cell modules 36 modules in series for 36 cell modules



Product Safety Ratings	For 36, 18 cell modules
Maximum systems operating voltage	600 V
Maximum over-current protection rating	10/5 A
Safety application class	Class A
Safety class in accordance with IEC 61140	Class II
Fire safety class	Class C
Recommended maximum series/parallel module configurations	22 modules in series for 36 cell modules 3 modules in series for 18 cell modules

Scope of Module Safety Qualification Testing:

Initial module safety qualification

Extension of module safety qualification

Original test report ref. no.:

Model differences and modification:

<input type="checkbox"/> Change in cell technology	<input type="checkbox"/> Change in cell interconnect materials/technique
<input type="checkbox"/> Modification to encapsulation system	<input checked="" type="checkbox"/> Modification to junction box/el. termination
<input type="checkbox"/> Modification to superstrate	<input type="checkbox"/> Change in el. circuit of an identical package
<input type="checkbox"/> Modification to backsheet/substrate	<input type="checkbox"/> Higher or lower output by 10 %
<input checked="" type="checkbox"/> Modification to frame/mounting structure	<input type="checkbox"/> Increase in module size
<input type="checkbox"/> Removal of frame	

- Note (1) Use the "General product information" field to give any information on model differences within a product type family covered by the test report.
- Note (2) Use the "General product information" field to describe the range of electrical and safety ratings, if the TRF covers a type family of modules.
- Note (3) Use Annex 1 to list the used materials and components of the module (manufacturer/supplier and type reference)



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict

3	Application Classes		
	The module has been evaluated for the following Application Class (Class A, B, C)	A	P

6	Sampling		
	<input checked="" type="checkbox"/> The modules tested (modules and laminate) were taken at random from a production batch and subjected to manufacturer's normal quality control and inspection for safety testing.		P
	<input type="checkbox"/> The modules tested (modules and laminate) were prototypes of a new design and not taken from a production batch.		N/A
	<input checked="" type="checkbox"/> Preconditioning of test samples was performed within IS 14286 (2010) or IS 16077:2013/IEC 61646:2008 performance testing.		P
	<input type="checkbox"/> Preconditioning of test samples was performed separately from IS 14286 (2010) or IS 16077:2013/IEC 61646:2008 performance testing.		N/A

List of test samples

Sample No.	Type / model	Remark
1738874	ISEN320	Icon Solar-En Power Technologies Pvt Ltd, S.N : ICON32036A0407211008 (Control module), For Full investigation
1838815	ISEN320	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON32036A0407211003, For Full investigation
1838816	ISEN320	Icon Solar-En Power Technologies Pvt Ltd, S.N: ICON32036A0407211007, For Full investigation
1838817	ISEN320	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON32036A0407211027, For Full investigation
1838818	ISEN320	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON32036A0407211026, For Full investigation
1838819	ISEN320	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON32036A0407211028, For Full investigation
1838820	ISEN320	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON32036A0407211001, For Full investigation
1778118	ISEN320X	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON320X360408072002 For hotspot, bypass , reverse current



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Clause	Requirement + Test	Result - Remark	Verdict
1838829	ISEN320	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON32036A0407211002 For Fire test	
1838830	ISEN320	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON32036A0407211013 For Fire test	
1838831	ISEN320	Icon Solar-En Power Technologies Pvt Ltd , S.N: ICON32036A0407211021 For Fire test	
Supplementary information: N/A			

9	Pass Criteria		
	The module under evaluation was judged to have passed all safety qualification test. The test samples met all of the criteria of each individual safety test.	See appended tables	P
Supplementary information:			

10	Test Procedures		
Safety qualification testing includes the following Module Safety Tests (MST) of IS/IEC 61730-2:			
10.1	MST 01 – Visual inspection..... :	see table 10.1	P
10.2	MST 11 – Accessibility test :	see table 10.2	P
10.3	MST 12 – Cut susceptibility test..... :	see table 10.3	P
10.4	MST 13 – Ground continuity test..... :	see table 10.4	P
10.5	MST 14 – Impulse voltage test..... :	see table 10.5	P
10.6	MST 16 – Dielectric withstand test..... :	see table 10.6	P
10.7	MST 21 – Temperature test :	see table 10.7	P
10.8	MST 23 – Fire test..... :	see table 10.8	P
10.9	MST 26 – Reverse current overload Test..... :	see table 10.9	P
10.10	MST 32 – Module breakage test..... :	see table 10.10	P
MST 17	MST 17 – Wet leakage current test..... :	see table MST 17	P
MST 22	MST 22 – Hot-spot test :	see report no.: 4788560221-BIS-S1	P
MST 34	MST 34 – Mechanical load test..... :	see report no.: 4788560221-BIS-S1	P
MST 51a	MST 51a – Thermal cycling test (TC200) :	see report no.: 4788560221-BIS-S1	P
MST 51b	MST 51b – Thermal cycling test (TC50) :	see report no.: 4788560221-BIS-S1	P



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Clause	Requirement + Test	Result - Remark	Verdict
MST 52	MST 52 – Humidity freeze test..... :	see report no.: 4788560221-BIS-S1	P
MST 53	MST 53 – Damp heat test :	see report no.: 4788560221-BIS-S1	P
MST 54	MST 54 – UV preconditioning test :	see report no.: 4788560221-BIS-S1	P
Component tests:			
11.1	MST 15 – Partial discharge test..... :	see table 11.1	N/A
11.2	MST 33 – Conduit bending test..... :	see table 11.2	N/A
11.3	MST 44 – Terminal box knockout test..... :	see table 11.3	N/A
Supplementary information:			

10.1	TABLE: Visual Inspection - MST 01 (Initial)		
Sample No.	Nature and position of findings		—
1738874	No visual defects		P
1838815	No visual defects		P
1838816	No visual defects		P
1838817	No visual defects		P
1838818	No visual defects		P
1838819	No visual defects		P
1838820	No visual defects		P
1778118	No visual defects		P
Supplementary information: Test Date: 10/16/2018			

10.2	TABLE: Accessibility Test - MST 11 (Initial)		
	Maximum system voltage [V _{dc}]..... :	1500V	—
Sample No.	Result [MΩ]		—
1838816	5000		P
1838817	5000		P
1838818	5000		P
1838819	5000		P
Supplementary information: 10/16/2018			



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
10.4	TABLE: Ground Continuity Test - MST 13 (Initial)		
	Maximum system voltage [V _{DC}].....:	1500	—
	Current applied [A].....:	37.5	—
	Location of designated grounding point.....:	Grounding hole on Long Side	—
	Location of second contacting point.....:	Grounding hole on opposite long side	—
Sample No.	Voltage [V _{DC}]	Resistance [mΩ]	—
1838816	0.23	6.13	P
1838817	0.22	5.86	P
1838818	0.21	5.60	P
1838819	0.25	6.66	P
Supplementary information: 10/16/2018			

10.6	TABLE: Dielectric Withstand Test - MST 16 (Initial)			
	Maximum system voltage [V _{DC}].....:	1500	—	
	Test voltage applied V _{TEST} [V _{DC}].....:	8000	—	
	Module area A [m ²].....:	1.94	—	
Sample No.	Dielectric breakdown	Insulation resistance at V _{TEST} [MΩ]	Insulation resistance x A [MΩ·m ²]	—
1838816	No	4.98	40	P
1838817	No	2.21	40	P
1838818	No	2.49	40	P
1838819	No	3.86	40	P
Supplementary information: Test Date: 10/16/2018				



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
MST 17	TABLE: Wet Leakage Current Test - MST 17 (Initial)		
	Maximum system voltage [V _{DC}]	1500	—
	Test voltage applied V _{TEST} [V _{DC}]	1500	—
	Module area A [m ²].....	1.94	—
	Resistivity of wetting agent [Ω.cm].....	2298	—
	Average wetting agent temperature [°C]	24.1	—
	Sample No.	Insulation resistance at V _{TEST} [GΩ]	Insulation resistance x A [MΩ.m ²]
	1838816	4.10	40
	1838817	3.27	40
	1838818	3.08	40
	1838819	2.38	40
Supplementary information: Test Date: 10/16/2018			

10.3	TABLE: Cut Susceptibility Test - MST 11		
	Applied force [N].....	8.9	—
	Sample No.		—
	1838816	<input checked="" type="checkbox"/> No exposure of active circuitry of the module	P
	1838817	<input checked="" type="checkbox"/> No exposure of active circuitry of the module	P
Supplementary information: Test Date: 12/18/2018			

10.1	TABLE: Visual Inspection - MST 01 (after Cut Susceptibility Test)		
	Sample No.	Nature and position of findings	—
	1838816	No visual defects	P
	1838817	No visual defects	P
Supplementary information: Test Date: 12/18/2018			

10.2	TABLE: Accessibility test - MST 11 (after cut susceptibility Test)		
	Maximum system voltage [V _{DC}]	1500	
	Sample No.	Nature and position of findings	—
	1838816	No measured resistance less than 1 MΩ between the test fixture and the module electric circuit. And no contact observed in live parts	P
	1838817	No measured resistance less than 1 MΩ between the test fixture and the module electric circuit. And no contact observed in live parts	P
Supplementary information: Test Date: 12/18/2018			



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
10.4	TABLE: Ground Continuity Test - MST 13 (after Cut Susceptibility Test)		
	Maximum system voltage [V _{DC}]	1500	—
	Current applied [A]	37.5	—
	Location of designated grounding point	Grounding hole on long side	—
	Location of second contacting point	Grounding hole on opposite long side	—
	Sample No.	Voltage [V _{DC}]	Resistance [mΩ]
	1838816	0.56	14.93
	1838817	0.67	17.86
Supplementary information: Test Date: 12/18/2018			

10.6	TABLE: Dielectric Withstand Test - MST 16 (after Cut Susceptibility Test)			
	Maximum system voltage [V _{DC}]	1500		—
	Test voltage applied V _{TEST} [V _{DC}]	8000		—
	Module area A [m ²]	1.94		—
	Sample No.	Dielectric breakdown	Insulation resistance at V _{TEST} [GΩ]	Insulation resistance x A [MΩ·m ²]
	1838816	No	1.08	40
	1838817	No	1.04	40
Supplementary information: Test Date: 12/18/2018				

MST 17	TABLE: Wet Leakage Current Test - MST 17 (after Cut Susceptibility Test)			
	Maximum system voltage [V _{DC}]	1500		—
	Test voltage applied V _{TEST} [V _{DC}]	1500		—
	Module area A [m ²]	1.94		—
	Resistivity of wetting agent [Ω·cm]	1879		—
	Average wetting agent temperature [°C]	24.1		—
	Sample No.	Insulation resistance at V _{TEST} [MΩ]	Insulation resistance x A [MΩ·m ²]	
	1838816	998	40	P
	1838817	967	40	P
Supplementary information: Test Date: 12/18/2018				



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
10.5	TABLE: Impulse Voltage Test - MST 14		
	Maximum system voltage [V _{DC}]	1500	—
	Impulse voltage [V].....	10000	—
	Thickness of conductive foil [mm].....	0.05	—
	Sample No.		—
	1838818	<input checked="" type="checkbox"/> No evidence of dielectric breakdown or surface tracking observed	P
Supplementary information: Test date: 12/18/2018			

10.1	TABLE: Visual Inspection - MST 01 (after Impulse Voltage Test)		
	Sample No.	Nature and position of findings	—
	1838818	No Visual defects	P
Supplementary information: Test date: 12/18/2018			

10.6	TABLE: Dielectric Withstand Test - MST 16 (after Impulse Voltage Test)				
	Maximum system voltage [V _{DC}].....	1500		—	
	Test voltage applied V _{TEST} [V _{DC}].....	8000		—	
	Module area A [m ²].....	1.94		—	
	Sample No.	Dielectric breakdown	Insulation resistance at V _{TEST} [GΩ]	Insulation resistance x A [MΩ.m ²]	—
	1838818	No	1.01	40	P
Supplementary information: Test date: 12/18/2018					



IS/IEC 61730-2:2004				
Clause	Requirement + Test	Result - Remark		Verdict
10.7	TABLE: Temperature Test - MST 21			
	Sample No.....	1838820		—
	Reference solar irradiance [W/m²].....	1000		—
	Reference ambient temperature [°C]	40		—
Measuring location	Component temperature T _{oBS} [°C]	Normalised temperature T _{coN} [°C]	Component temperature limit [°C]	—
Module open-circuited				
Module superstrate above the centre cell	63.60	76.30	Reference	P
Module substrate below the centre cell	63.40	76.10	120°C	P
Terminal enclosure interior surface	65.80	78.50	Reference	P
Terminal enclosure interior air space	68.20	80.90	Reference	P
Field wiring terminals	54.40	67.10	85°C	P
Insulation of the field wiring leads	43.20	55.90	90°C	P
External connector bodies	41.10	53.80	85°C	P
Diode bodies	63.20	73.70	193.7°C	P
Module superstrate above the centre cell	60.80	71.40	Reference	P
Module substrate below the centre cell	59.60	70.20	120°C	P
Terminal enclosure interior surface	65.00	75.60	Reference	P
Terminal enclosure interior air space	65.70	76.30	Reference	P
Field wiring terminals	50.50	61.10	85°C	P
Insulation of the field wiring leads	44.20	54.80	90°C	P
External connector bodies	43.90	54.50	85°C	P
Diode bodies	64.30	74.90	193.7°C	P



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
<p>Supplementary information: $T_{CON} = T_{OBS} + (40\text{ }^{\circ}\text{C} - T_{AMB})$, temperature limits are given in Table 9 of IS/IEC 61730-2.</p> <p>Note: Calculation for temperature test limit is based on following rational: $T_j = T_{case} + R_{THjc} \cdot I_D \cdot I_D$ Where: T_j is the diode junction temperature; T_{Case} is the measure diode case temperature; R_{THjc} is the manufacturer's value relating junction temperature to case temperature; I_D is the diode voltage; I_D is the diode current. Where, $I_D = I_{sc} \times 1.25 = 9.12 \times 1.25 = 11.4$ $T_{case} = T_j - R_{THjc} \cdot I_D \cdot I_D$ $T_{case} = 200 - 1.0 \cdot 0.55 \cdot 11.5 = 193.7^{\circ}\text{C}$</p> <p>Test Date: 11/27/2018</p>			



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
10.8	TABLE: Fire Test - MST 23		
	Module fire resistance class (A, B, C)	C	—
	No. of modules provided to create the test assembly	3	—
	Sample No.		—
	1838829	<input checked="" type="checkbox"/> Modules comply with the requirements for the fire resistance class	P
	1838830		P
	1838831		P
Supplementary information: Test Date: 12/12/2018 to 12/13/2018			

10.9	TABLE: Reverse Current Overload Test - MST 26		
	Module over-current protection rating [A]	15	—
	Test current [A]	20.25	—
	Range of applied voltage [V]	50.25 for 1838820 & 51.45 for 1778118	—
	Test duration	2 hours	—
	Sample No.		—
	1838820	<input checked="" type="checkbox"/> No flaming of the module <input checked="" type="checkbox"/> No flaming or charring of the cheesecloth <input checked="" type="checkbox"/> No flaming of the tissue paper	P
	1778118		
Supplementary information: Test Date: 11/30/2018			

MST 17	TABLE: Wet Leakage Current Test - MST 17 (after Reverse Current Overload Test)			
	Maximum system voltage [V _{DC}]	1500	—	
	Test voltage applied V _{TEST} [V _{DC}]	1500	—	
	Module area A [m ²]	1.94	—	
	Resistivity of wetting agent [Ω·cm]	2098		
	Average wetting agent temperature [°C]	24.2		
	Sample No.	Insulation resistance at V _{TEST} [GΩ]	Insulation resistance x A [MΩ·m ²]	—
	1838820	1.01	40.00	P
	1778118	1.08	40.00	
Supplementary information: Test Date: 11/30/2018				



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
10.10	TABLE: Module Breakage Test - MST 32		P
	Weight of impactor [kg]	45	—
	Thickness of sample [mm]	4.46(approx.)	—
	Mounting technique used.....	4 pre-drilled mounting holes of Dia 10mm. M8 stainless steel hardware, spring washers, flat washer with torque 10Nm.	—
	Module breakage	<input type="checkbox"/> No breakage <input type="checkbox"/> Breakage at 300 mm <input type="checkbox"/> Breakage at 450 mm <input checked="" type="checkbox"/> Breakage at 1220 mm	—
	Weight of particles in case of breakage [g]	<i>There is no particle coming out from the sample.</i>	—
	Sample No.		—
	1838815	<input checked="" type="checkbox"/> Breakage occurred, but no shear or opening large enough for a 76 mm diameter sphere to pass freely has developed.	P
		<input checked="" type="checkbox"/> Disintegration occurred, but the ten largest crack-free particles selected 5 min subsequent to the test did not weigh more in grams than 16 times the thickness of the sample in millimetres.	P
		<input checked="" type="checkbox"/> Breakage occurred, but no particles larger than 6.5 cm ² have been ejected from the sample.	P
Supplementary information: 11/19/2018			



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
11	Component Tests		N/A
	MST 15 - Partial discharge test	see table 11.1	—
	MST 33 - Conduit bending test.....	see table 11.2	—
	MST 44 - Terminal box knockout test.....	see table 11.3	—
11.1	TABLE: Partial Discharge Test - MST 15		N/A
	Manufacturer		—
	Type reference		—
	Materials and thicknesses		—
	Ambient temperature [°C]		—
	Relative humidity [%].....		—
	Test medium (air/oil)		
	Sample No.	PD inception voltage, U_i [V]	PD extinction voltage, U_e [V]
	Mean value of PD extinction voltage, $\bar{U}_{e, avg}$ [V]		
	Standard deviation of PD extinction voltage, σ [V]		
	Mean value minus standard deviation of PD extinction voltage [V]		
	Resulting maximum system voltage, U _{sys} [V]		
Supplementary information:			
Calculation of maximum system voltage:			
Safety factor	F ₁ = 1.2	(Basic safety factor)	
	F ₂ = 1	(Hysteresis factor)	
	F ₃ = 1.25	(Additional safety factor: reinforced insulation)	
Allowable maximum system voltage: U _{sys} = $\sqrt{2} \times (U_{e, avg} - \sigma) / (F_1 \times F_2 \times F_3) V_{DC}$			



IS/IEC 61730-2:2004			
Clause	Requirement + Test	Result - Remark	Verdict
11.2	TABLE: Conduit Bending Test - MST 33		N/A
	Manufacturer and type reference of conduit		—
	Trade size of conduit [mm]		—
	Distance between the ends of the conduit in the box		—
	Distance between supports		—
	Force load in accordance with Table 10 of IS/IEC 61730-2 [N]		—
	Sample No.		—
	<input type="checkbox"/> No rupture of the attachment walls of the junction box		
	<input type="checkbox"/> No separation of junction box from the conduit		
Supplementary information: Distance between supports = 760 mm + Distance between the ends of the conduit in the box			

11.3	TABLE: Terminal Box Knockout Test - MST 44		N/A
	Manufacturer of terminal box		—
	Type reference		—
	Number of knockouts in the junction box		—
	Force applied to knockout [N]		—
	Knockout No.		—
	<input type="checkbox"/> The knockout remains in place		
	<input type="checkbox"/> The clearance between knockout and opening is < 0.75 mm		
	<input type="checkbox"/> The knockout remains in place		
	<input type="checkbox"/> The clearance between knockout and opening is < 0.75 mm		
	<input type="checkbox"/> The knockout remains in place		
	<input type="checkbox"/> The clearance between knockout and opening is < 0.75 mm		
	<input type="checkbox"/> The knockout remains in place		
	<input type="checkbox"/> The clearance between knockout and opening is < 0.75 mm		
Supplementary information:			



ANNEX 1: PRODUCT DESCRIPTION SHEET (MANUFACTURERS AND TYPE REFERENCES)

A1.1	MODULE TYPE/S	
	ISEN350, ISEN345, ISEN340, ISEN335, ISEN330, ISEN325, ISEN320, ISEN315, ISEN310, ISEN305, ISEN300, ISEN250, ISEN250X, ISEN200, ISEN150 ISEN335X, ISEN330X, ISEN325X, ISEN320X, ISEN300X ISEN250X, ISEN225X, ISEN220X, ISEN200X ISEN300N, ISEN295, ISEN290, ISEN285, ISEN280 ISEN275, ISEN270, ISEN265, ISEN260, ISEN255, ISEN250 ISEN250Y ISEN250N, ISEN245, ISEN240, ISEN235, ISEN230, ISEN225 ISEN220, ISEN215, ISEN210, ISEN205, ISEN200 ISEN200N, ISEN195, ISEN190 ISEN185, ISEN180, ISEN175, ISEN170 ISEN165, ISEN160, ISEN155, ISEN150, ISEN135, ISEN130, ISEN125, ISEN110, ISEN100, ISEN80, ISEN75, ISEN60, ISEN50, ISEN40, ISEN20, ISEN10 ISEN5, ISEN3	
A1.2	MODULE DESIGN –DIMENSIONS	
	Module dimensions (L x W x H) [mm].....:	ISEN350 to ISEN300: 1964 x 986 x 35 ISEN250: 1524 x 986 x 35 ISEN250X: 1650 x986 x35 ISEN200:1336 x 986 x 35 ISEN150: 1486 x 666 x35 ISEN335X to ISEN300X: 1964 x 986 x 35 ISEN225X to ISEN200X: 1336 x 986 x 35 ISEN300N to ISEN280: 1806 x 986 x 35 ISEN275 to ISEN250:1650 x 986 x 35 ISEN250Y:1650 x 986 x 35 ISEN250N to ISEN225: 1486 x 986 x 35 ISEN220 to ISEN200: 1336 x 986 x 35 ISEN200N to ISEN190: 1806 x 666 x 35 ISEN185 to ISEN170: 1650 x 666 x 35 ISEN 165 to ISEN150: 1486 x 666 x 35 ISEN135 to ISEN125 : 1250 x 666 x 35 ISEN110: 1036 x 666 x 35 ISEN100: 980 x 666 x 35 ISEN80 to ISEN75: 800 x 666 x35 ISEN60: 610 x 666 x22 ISEN50: 548 x 666 x 22 ISEN40: 428 x 666 x 22 ISEN20: 432 x 356 x 22 ISEN10: 450 x 196 x22 ISEN5: 256 x 196 x 22 ISEN3: 242 x 142 x 22

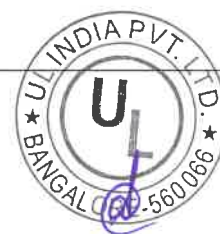


A1.3	SOLAR CELL	
	Cell type reference.....:	Polycrystalline solar cell, type 5BB manufactured by Sichuan Yingfa Solar Energy Technology Co., Ltd
	Cell dimensions L x W x T (\pm %) [mm].....:	156.75 X 156.75 \pm 0.25mm
	Cell thickness [μ m].....:	200 μ m \pm 20 μ m
	Cell area [cm ²].....:	245.70

A1.4	IDENTIFICATION OF MATERIALS	
	Front cover.....:	Manufactured by Gujarat Borosil LTD , Toughened glass, 3.2 mm \pm 0.2mm thick.
	Rear cover	Manufactured by Renewsys India Private LTD, Model: "Preserv A 275WN/ Preserv A125WN1 Rated RTI= 120°C, overall thickness is 0.30mm
	Encapsulation material	Ethyl-Vinyl-acetate (EVA), Manufactured by Renewsys India Private LTD, Type: Conserv P 360-14FC, thickness 0.45 \pm 5%.
	Frame parts.....:	Extruded aluminum frame, Manufactured by Alom Extrusions Ltd Aluminium Technology Co., Ltd(Haida Group), Type: 6063-T6
	Adhesive for frame	Type " HT906Z", manufactured by Shanghai Huitian New Material Co. Ltd. rated RTI=105°C, HAI=0, HWI=1, White color, minimum 3mm thickness, flame class is V-0.
	Cell connector.....:	Make: Xi'an Telison Electronic New Materials Co. Ltd Solder tin plated copper ribbons, Sn/Pb of 60%/40% composition
	String connector.....:	Make: Xi'an Telison Electronic New Materials Co. Ltd Solder tin plated copper ribbons, Sn/Pb of 60%/40% composition
	Soldering material.....:	Manufactured by Kester, Type: 952-S
	Fluxing agent	Manufactured by Kester, Type: 952-S
	Junction box.....:	Manufactured by Zhejiang Chuangyuan Photovoltaic Technology Co., Ltd. Type PV- CY802-D, Rated 1500 Vdc, 13.5A max, IP68 Manufactured by QC Solar(Suzhou) Corporation. Type QC102032, Rated 1000 Vdc, 14A max, IP68
	Cable.....:	Make: Zhejiang Chuangyuan Photovoltaic Technology Co., Ltd Type PV wire, Rated Sunlight resistant, 120°C wet or dry, 1500 V, H1Z2Z2-K, 1.40mm ²



	Connector	Make: Zhejiang Chuangyuan Photovoltaic Technology Co., Ltd Type PV-CY30L Connectors, rated for 1500Vdc and 30A max
	Bypass diode	Diode, manufactured by Yangzhou Yangjie Electronic Technology Co., Ltd , Type 30SQ045, rated 30A, 45V and Type 20SQ045, rated 20A, 45V
	Potting material	NA
	Adhesive for junction box	Type " HT906Z", manufactured by Shanghai Huitian New Material Co. Ltd. rated RTI=105°C, HAI=0, HWI=1, White color, minimum 3mm thickness, flame class is V-0.
	Additional material (e. g. fixing tape, insulation tape).....	N/A
A1.5	MODULE DESIGN - MINIMUM DISTANCES	
	Between cells.....	2.67
	Between cell and edge of laminate	12.66
	Between any current carrying part and edge of laminate	13.56
A1.6	MODULE DESIGN - ELECTRICAL CONFIGURATION	
	Total number of cells	ISEN350 to ISEN150: 72 ISEN335X to ISEN200X: 144 ISEN300N to ISEN280: 66 ISEN275 to ISEN250: 60 ISEN250Y:120 ISEN250N to ISEN225: 54 ISEN220 to ISEN200: 48 ISEN200N to ISEN190: 44 ISEN185 to ISEN170: 40 ISEN 165 to ISEN10: 36 ISEN5 to ISEN 3: 18
	Serial-parallel connection of cells	Cells all in Series/parallel according to design
	Cells per bypass diode	ISEN350 to ISEN150: 24 ISEN335X to ISEN320X: 24 ISEN300X:48 ISEN300N to ISEN280: 22 ISEN275 to ISEN250: 20 ISEN250Y:40 ISEN250N to ISEN225: 18 ISEN220 to ISEN200: 16 ISEN200N to ISEN190: 22 ISEN185 to ISEN170: 20 ISEN 165 to ISEN10: 18 ISEN5 to ISEN 3: N/A



	No. of bypass diodes	ISEN350 to ISEN150: 3 ISEN335X to ISEN320X: 3 ISEN300X: 3 ISEN300N to ISEN280: 3 ISEN275 to ISEN250: 3 ISEN250Y: 3 ISEN250N to ISEN225: 3 ISEN220 to ISEN200: 3 ISEN200N to ISEN190: 3 ISEN185 to ISEN170: 2 ISEN 165 to ISEN10: 2 ISEN5 to ISEN 3: 1
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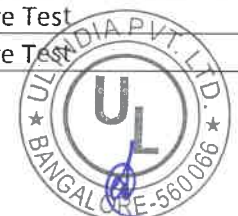


ANNEXURE 2: LIST OF MEASUREMENT EQUIPMENT

Description	Identification #	Application
FLASH SOLAR SIMULATOR	70472	Initial PIV Measurement
REFERENCE MODULE (PV LAB)	170515	Initial PIV Measurement
Datalogger, RH & Temperature	65675	Initial PIV Measurement
Datalogger, RH & Temperature	70683	Initial PIV Measurement
Measuring Tool, Ruler or Tape Measure	158581	Initial PIV Measurement
Apparatus, Dielectric Strength Test	68598	Dielectric Test
Datalogger, RH & Temperature	65675	Dielectric Test
Apparatus, Insulation Resistance Test	68600	Insulation Test
Datalogger, RH & Temperature	68612	Insulation Test
Apparatus, Insulation Resistance Test	68600	Wet Leakage Current Test
Datalogger, RH & Temperature	68612	Wet Leakage Current Test
EARTH CONTINUITY TESTER	127260	Ground Continuity test
Probe, Mechanical, Not Otherwise Specified	67371	Accessibility Test
Chamber, Climatic, Temp and RH	169223	Damp Heat Test
Chamber, Climatic, Temp and RH	70575	Damp Heat Test
Chamber, Climatic, Temp and RH	169223	Damp Heat Test
Chamber, Climatic, Temp and RH	72836	Thermal Cycling Test-200
Datalogger	68859	Thermal Cycling Test-200
Power Supply, DC	70584	Thermal Cycling Test-200
Power Supply, DC	72838	Thermal Cycling Test-200
Shunt, Current or Voltage	76424	Thermal Cycling Test-200
Shunt, Current or Voltage	76545	Thermal Cycling Test-200
Shunt, Current or Voltage	76350	Thermal Cycling Test-200
FLASH SOLAR SIMULATOR	70472	Post Test after TC-200
REFERENCE MODULE (PV LAB)	170515	Post Test after TC-200
Datalogger, RH & Temperature	65675	Post Test after TC-200
Datalogger, RH & Temperature	70683	Post Test after TC-200
Measuring Tool, Ruler or Tape Measure	158581	Post Test after TC-200
Apparatus, Dielectric Strength Test	68598	Post Test after TC-200
Datalogger, RH & Temperature	65675	Post Test after TC-200
Apparatus, Insulation Resistance Test	68600	Post Test after TC-200
Datalogger, RH & Temperature	68612	Post Test after TC-200
FLASH SOLAR SIMULATOR	70472	Post Test after Damp heat
REFERENCE MODULE (PV LAB)	170515	Post Test after Damp heat
Datalogger, RH & Temperature	65675	Post Test after Damp heat
Datalogger, RH & Temperature	70683	Post Test after Damp heat
Measuring Tool, Ruler or Tape Measure	158581	Post Test after Damp heat
Apparatus, Dielectric Strength Test	68598	Post Test after Damp heat
Datalogger, RH & Temperature	65675	Post Test after Damp heat
Apparatus, Insulation Resistance Test	68600	Post Test after Damp heat
Datalogger, RH & Temperature	68612	Post Test after Damp heat
Apparatus, Insulation Resistance Test	68600	Post Test after Damp heat
Datalogger, RH & Temperature	68612	Post Test after Damp heat



MECHANICAL LOADING FIXTURE	78238	Mechanical loading
Datalogger, RH & Temperature	65675	Mechanical loading
Weighing Device, Scale or Balance, Analog or Digital	49060	Mechanical loading
Power Supply, DC	70589	Mechanical loading
Apparatus, Impact, Drop	70574	Hail Impact Test
Power Supply, DC	70250	Hail Impact Test
FLASH SOLAR SIMULATOR	70472	Post test after hail test
REFERENCE MODULE (PV LAB)	170515	Post test after hail test
Datalogger, RH & Temperature	65675	Post test after hail test
Datalogger, RH & Temperature	70683	Post test after hail test
Measuring Tool, Ruler or Tape Measure	158581	Post test after hail test
Chamber, Climatic, Temp and RH	169217	Thermal Cycling 50
Datalogger, Temperature	84828	Thermal Cycling 50
Apparatus, Insulation Resistance Test	68600	Post TC-50 Insulation Test
Datalogger, RH & Temperature	68612	Post TC-50 Insulation Test
Chamber, Climatic, Temp and RH	71113	HF-10 Cycling
Datalogger	71520	HF-10 Cycling
FLASH SOLAR SIMULATOR	70472	Post HF-10 PIV
REFERENCE MODULE (PV LAB)	170515	Post HF-10 PIV
Force Gauge, Digital	88737	ROBUSTNESS OF TERMINATIONS TEST
Weight	156992	ROBUSTNESS OF TERMINATIONS TEST
Weight	156993	ROBUSTNESS OF TERMINATIONS TEST
Measuring Tool, Micrometer or Caliper, Digital or Analog	69884	ROBUSTNESS OF TERMINATIONS TEST
FLASH SOLAR SIMULATOR	70472	Post Tests after robustness of terminations
REFERENCE MODULE (PV LAB)	170515	Post Tests after robustness of terminations
Apparatus, Insulation Resistance Test	68600	Post Tests after robustness of terminations
Datalogger, RH & Temperature	68612	Post Tests after robustness of terminations
Chamber, Climatic, Temp	70192	Bypass Diode Thermal Test
Datalogger, RH & Temperature	65675	Bypass Diode Thermal Test
Power Supply, DC	70589	Bypass Diode Thermal Test
Datalogger	70817	Hotspot Test
CONTINUOUS SIMULATOR	71790	Hotspot Test
Timer, Digital or Analog	69762	Hotspot Test
Datalogger, RH & Temperature	65675	Hotspot Test
PYRANOMETER (PV LAB)	69889	Hotspot Test
CONTINUOUS SIMULATOR	71790	Temperature Test
Timer, Digital or Analog	69762	Temperature Test
Datalogger	70817	Temperature Test



Power Supply, DC	70250	Reverse Current Over Load Test
Timer, Digital or Analog, Wound or Battery Powered	159551	Reverse Current Over Load Test
Chamber, Conditioning, UV	74011	UV Preconditioning Test
Chamber, Conditioning, UV	171611	UV Preconditioning Test
Datalogger	80536	UV Preconditioning Test
MODULE BREAKAGE TESTER (PV LAB)	70748	Module Breakage Test
Generator, Immunity, Surge	68614	Impulse Voltage Test
HIGH VOLTAGE PROBE (1000:1)	127269	Impulse Voltage Test
CUT TEST TOOL (PV LAB)	69895	Cut Susceptibility Test
Timer, Digital or Analog, Wound or Battery Powered	159551	Cut Susceptibility Test
Datalogger, RH & Temperature	68610	Cut Susceptibility Test

-----END OF TRF-----

