



Test Report

Report No.: SHG23100062

Applicant :



Sample Name :

Photovoltaic Modules

Report Date :

2023-10-18



英格尔检测技术服务(上海)有限公司



Applicant : HR SOLAR SOLUTION PRIVATE LIMITED

Address : Raghudebpur, NH-6, Panchla, Block-Uluberia-II, Howrah - 711 322, West Bengal, India

Website : www.hrsolarsolution.com

Sample information:

Sample Name : Photovoltaic Module

Sample No. : Please see the page 4

Sample Amount : 1

Manufacture : /

Sample acquisition : Sent by client

Sample Received Date : 2023-07-07

Sample test date : 2023-10-12 ~2023-10-13

Test content:

Test specification : Performance test of module under different irradiance and temperature

Test standard : IEC 61215-2: 2021 Crystalline silicon terrestrial photovoltaic (PV) modules – Design qualification and type approval
IEC 61853-1:2011 Photovoltaic (PV) module performance testing and energy rating - Part 1: Irradiance and temperature performance measurements and power rating

Test results : Please see the report for details

Test location : 155 Pingbei Road Minhang District, Shanghai, China

Test Engineer : 牛群

Remark : /

Compiled by:

(王博)

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(王珊珊)

Approved by:

(Authorized signatory:徐型辉)



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Sample Information

Sample#	Serial Number	Module Type	Remarks /Constructional Characteristics	Major Test Items
1	23065400200042	H540M144 (2279x1134x35)	Photovoltaic Module	Performance test of module under different irradiance and temperature
Supplementary information: /				



Test Results

Performance test of module under different irradiance and temperature

Serial number of test sample		23065400200042					
Test time		2023-10-12 ~ 2023-10-13					
Temperature (°C)	Irradiance (W/m ²)	P _{max} (W)	I _{mpp} (A)	V _{mpp} (V)	V _{oc} (V)	I _{sc} (A)	FF (%)
15	100	54.03	1.321	40.91	46.85	1.370	84.18
	200	107.74	2.622	41.08	48.24	2.718	82.17
	400	219.65	5.221	42.07	49.31	5.471	81.43
	500	274.62	6.509	42.19	49.61	6.841	80.92
	600	332.66	7.821	42.53	50.05	8.212	80.94
	800	447.62	10.541	42.46	50.49	10.985	80.71
	1000	557.00	13.060	42.65	50.98	13.701	79.75
25	100	52.47	1.321	39.70	45.76	1.375	83.38
	200	104.68	2.627	39.85	46.86	2.735	81.69
	400	214.78	5.258	40.84	48.13	5.507	81.04
	600	325.01	7.929	40.99	48.82	8.266	80.53
	800	434.71	10.547	41.22	49.32	11.026	79.95
	1000	543.24	13.118	41.41	49.69	13.792	79.27
	1100	597.73	14.509	41.20	49.85	15.172	79.04
50	400	197.70	5.235	37.77	45.16	5.538	79.04
	600	300.69	7.841	38.35	46.04	8.312	78.57
	800	401.64	10.466	38.37	46.49	11.090	77.90
	1000	500.37	13.027	38.41	46.80	13.886	77.00
	1100	550.55	14.422	38.17	46.99	15.277	76.69
75	600	272.20	7.890	34.50	42.55	8.388	76.27
	800	363.91	10.534	34.55	43.06	11.191	75.51
	1000	459.70	13.176	34.89	43.85	14.003	74.87
	1100	505.24	14.414	35.05	44.01	15.410	74.50

Test Uncertainty

The total measuring uncertainty of P_{mpp} is ≤ 3.09% (k=2)

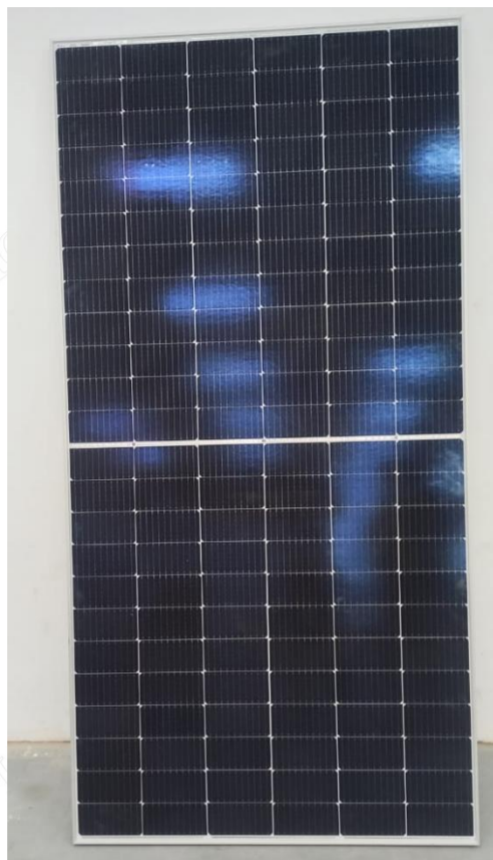
The total measuring uncertainty of I_{sc} is ≤ 2.18% (k=2)

The total measuring uncertainty of V_{oc} is ≤ 1.35% (k=2)



Module Photos

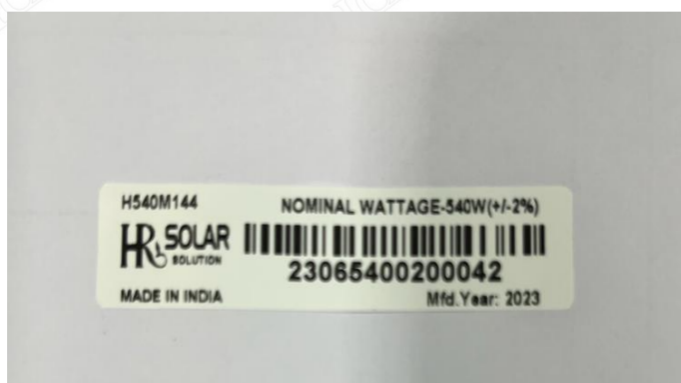
H335P72



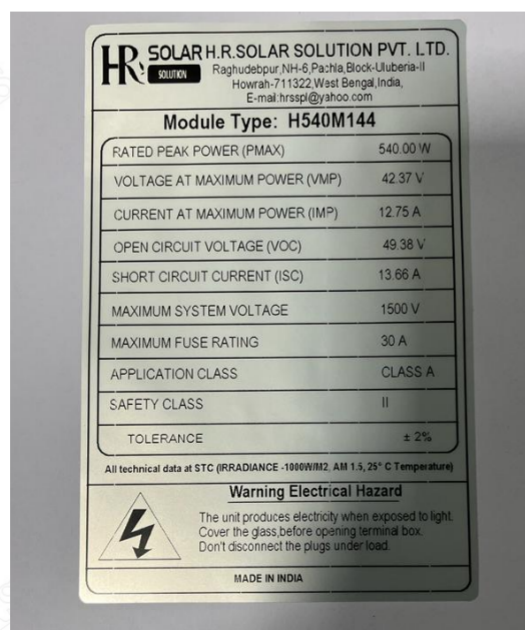
Front view of test sample



Rear view of test sample



Serial number of test sample



Label



Module family list

Model type: H540M144

No.	Model Name	System Voltage [V]	Electrical Ratings.				
			Pmpp[W]	Voc[V]	Isc[A]	Vmpp[V]	Impp[A]
1	H545M144	1500	545	49.5	13.73	42.51	12.83
2	H540M144	1500	540	49.4	13.66	42.37	12.75
3	H535M144	1500	535	49.3	13.58	42.22	12.68
4	H530M144	1500	530	49.1	13.50	42.05	12.61
5	H525M144	1500	525	49	13.42	41.89	12.54
6	H520M144	1500	520	48.9	13.36	41.74	12.47
7	H515M144	1500	515	48.7	13.29	41.58	12.39
8	H510M144	1500	510	48.6	13.21	41.44	12.31
9	H505M144	1500	505	48.5	13.14	41.29	12.24
10	H500M144	1500	500	48.3	13.07	41.13	12.16



Equipment List

NO.	Equipment	Serial number	Expiry date	remark
1	Pulsed solar simulator measurement	E-108-01PV	2024/08/06	/
3	Temperature chamber	E-055-01PV	2024/08/17	/
4	Radiation thermometer	E-088-02PV	2024/03/02	/

Photos are limited used in this Report

*****End of Report *****

Report additional information:

1. Without permission of the test center this test report is not permitted to be duplicated in extracts.
2. Informing the test center in 15 days since you receive the report when you don't agree, otherwise it is not accepted.
3. The test center is not responsible for the confirmation of the sample/manufacture information provided by the client.
4. The entrust inspection is responsible for the received sample only.
5. The test report has been partially written in English.