



TEST REPORT

**SGS-CSTC
Standards Technical Services
(Shanghai) Co., Ltd.**

**No.588 West Jindu Road,
Songjiang District,
Shanghai, China**



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Report reference no.: SHES230601056171-01
Date of issue.....: Jun. 13, 2023
Total number of pages: 20
Testing laboratory: SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
Address: 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Applicant's name.....: LUXEN SOLAR ENERGY CO., LTD.
Address: No. 1, Haiyue Road, Suxitong Technologies & Industries Park, Nantong City, Jiangsu Province, P. R. China

Test specification: Clause MQT 01, MQT 02, MQT 03, MQT 15 of IEC 61215-2:2016

Test item description: Photovoltaic (PV) module(s)

Trade mark.....: 

Manufacturer: LUXEN SOLAR ENERGY CO., LTD.
 No. 1, Haiyue Road, Suxitong Technologies & Industries Park, Nantong City, Jiangsu Province, P. R. China

Model/Type reference: LNET-670M,
 LNET-665MD,
 LNET-690ND

Ratings: Refer to marking plate of sample



Signature

Tested by: Janine Tian



Signature

Approved by: Van Hua



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List of tests performed

Test item	Requirement + Test	Result	Verdict
1	Visual inspection	See Table 1	P
2	Maximum power determination	See Table 2	P
3	Insulation test	See Table 3	P
4	Wet leakage current test	See Table 4	P

Pre-conditioning has been performed with an irradiance dose of 5.0 kWh/m².



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Summary of testing

Submitted samples are tested according to Clause MQT 01, MQT 02, MQT 03, MQT 15 of IEC 61215-2:2016. The test results are present within this test report.

Tests performed (name of test and test clause):

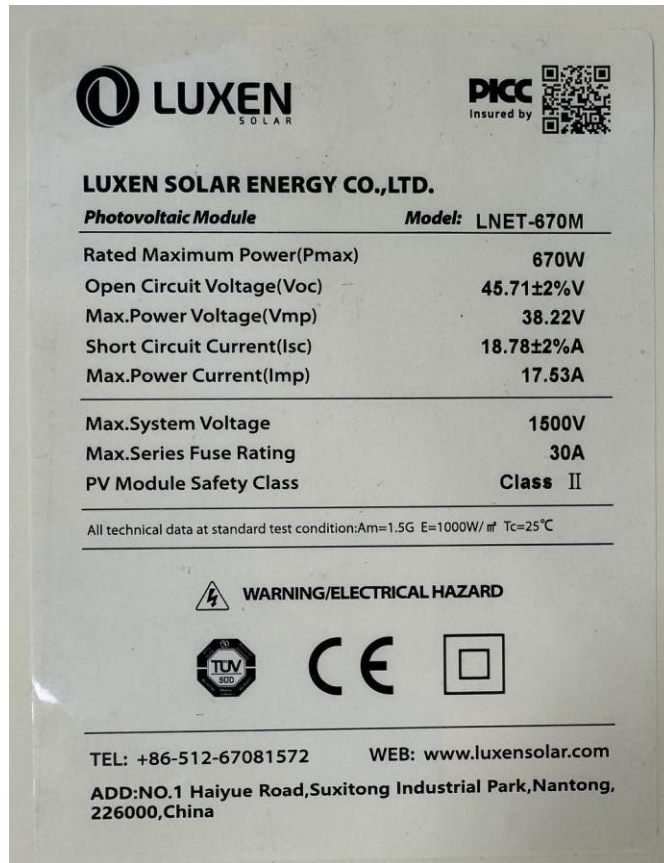
IEC 61215-2-2016:
 Visual inspection (MQT 01)
 Performance at STC (MQT 02)
 Insulation test (MQT 03)
 Wet leakage current test (MQT 15)

Testing location:

Guoce Testing Technology (suzhou) Co., Ltd.
 Building 11, No. 18, Yaofeng East Road, Mudu Town,
 Wuzhong District, Suzhou, Jiangsu, 215151, China

Copy of marking plate / device under test:

Module Type: LNET-670M



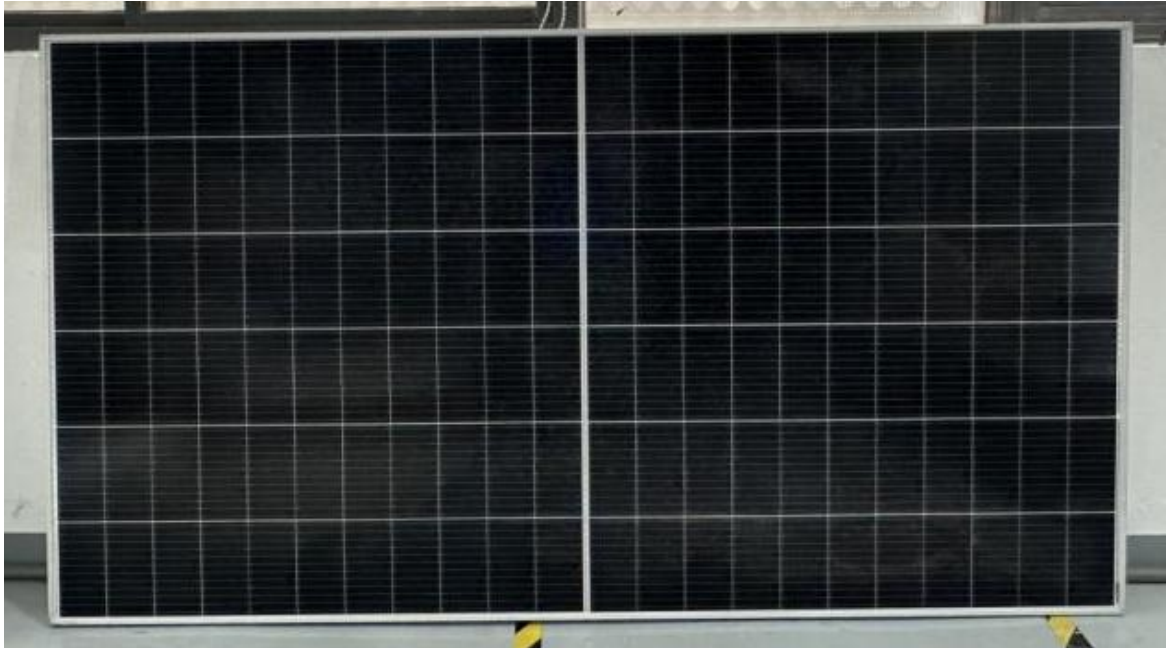
Marking plate of Sample



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 Testing Center E&C Division

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Front view of sample



Rear view of sample

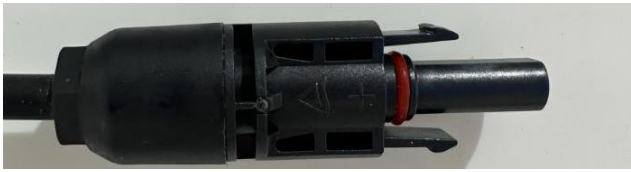


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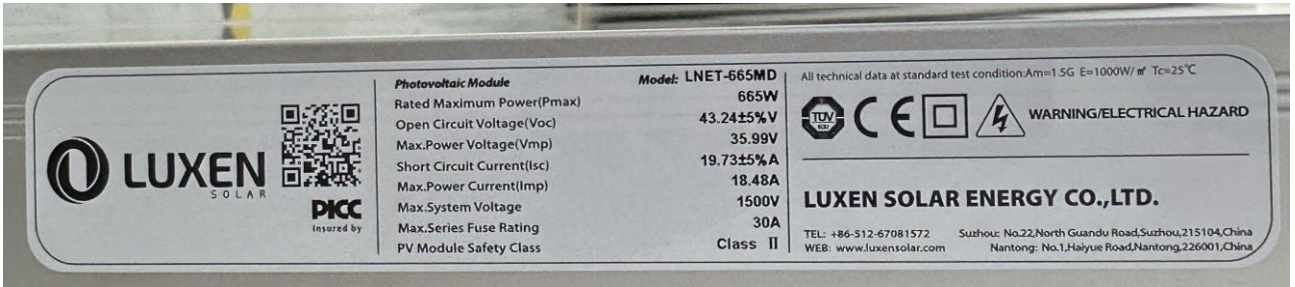


Connector

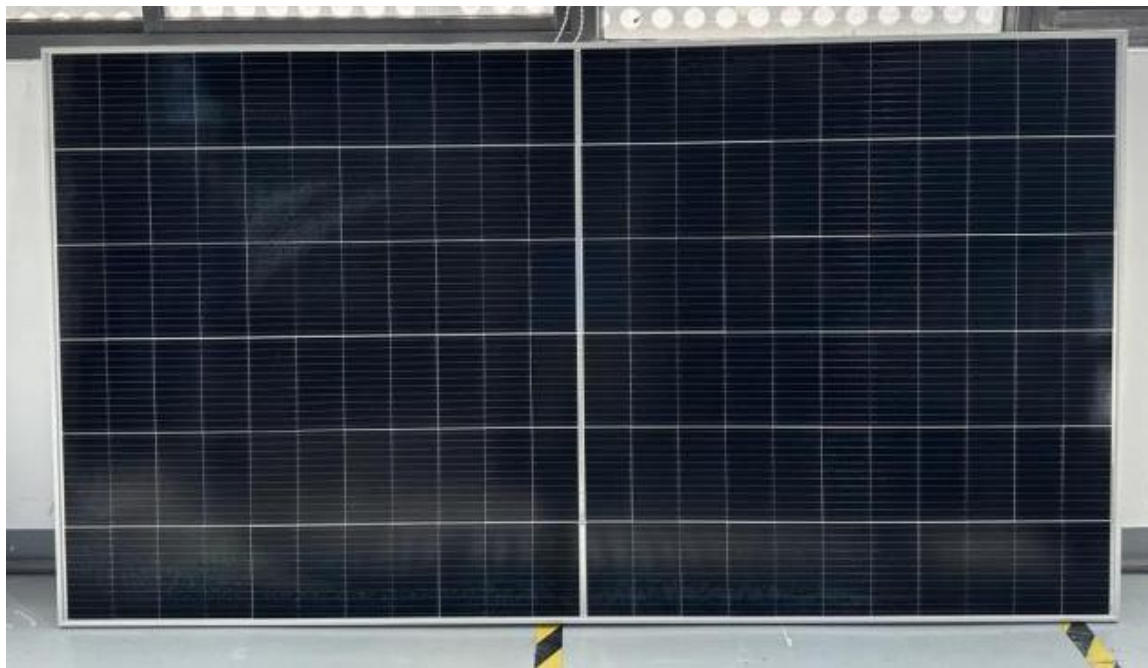


Junction Box

Module Type: LNET-665MD



Marking plate of Sample



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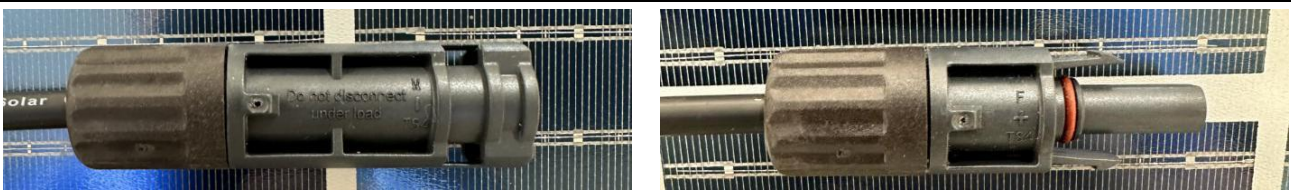
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Front view of sample



Rear view of sample



Connector



Junction Box

Module Type: LNET-690ND

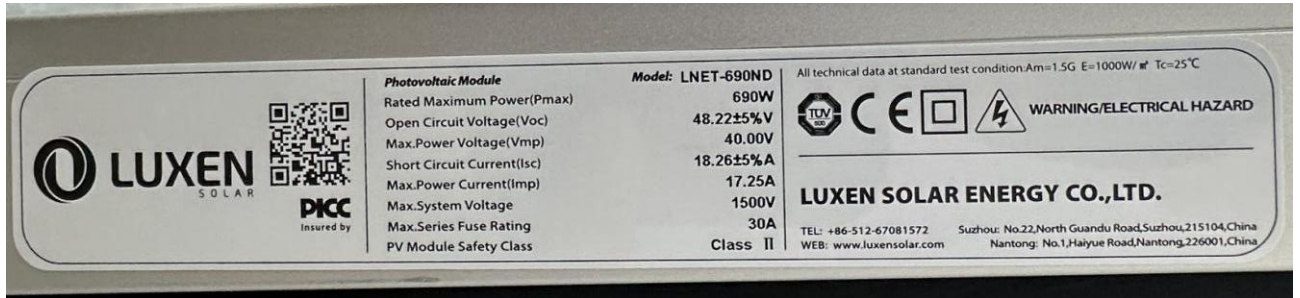


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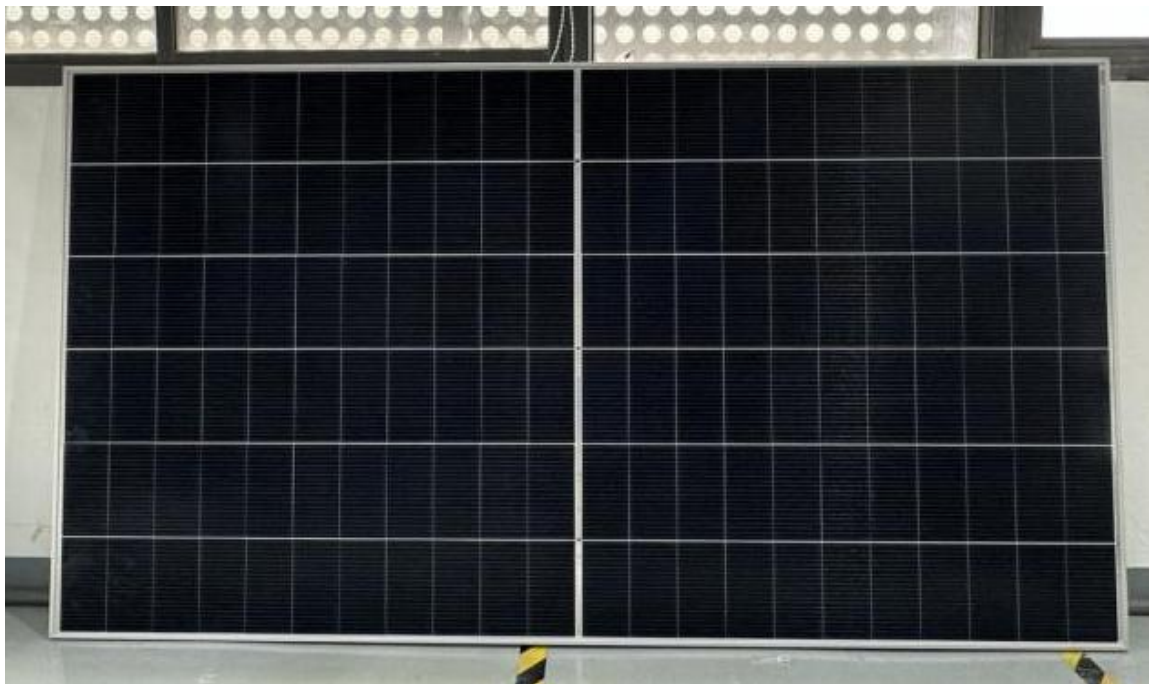
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Marking plate of Sample



Front view of sample



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Rear view of sample



Connector



Junction Box

Possible test case verdicts

- Test case does not apply to the test object	N/A
- Test object does meet the requirement	Pass (P)
- Test object does not meet the requirement	Fail (F)



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 "(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.
 List of test equipment must be kept on file and available for review.
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 Contents:
 1) The main report
 2) Appendix 1: List of measurement equipment
 3) Appendix 2: Statement of the estimated uncertainty of the test results

General product information

The product is photovoltaic (PV) module.

Description of module construction

Model	Cell Type	No. of cells	Dimension [mm]
LNET-670M	Mono-crystalline	132	2384x1303x35
LNET-665MD	Mono-crystalline	132	2384x1303x35
LNET-690ND	Mono-crystalline	132	2384x1303x35

Technical Data

Type/Model	Voc [V]	Vmp [V]	Isc [A]	Imp [A]	Pmp [W]	Max.System Voltage [V]
LNET-670M	45.71	38.22	18.78	17.53	670	1500
LNET-665MD	43.24	35.99	19.73	18.48	665	1500
LNET-690ND	48.20	40.00	18.26	17.25	690	1500

Type/Model	Module Efficiency [%]	Energy Efficiency Class



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LNET-670M	21.57	A
LNET-665MD	21.41	A
LNET-690ND	22.21	A
Supplementary information: Energy efficiency >13.5%: Class A.		
Energy efficiency classes	A>13.5%	
	13%<B≤13.5%	
	12%<C≤13%	
	11%<D≤12%	
	E<11%	



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1. Sampling procedure

<input type="checkbox"/> Random sampling from production (e.g. during factory audit (FA) or inline inspection)
<input type="checkbox"/> Random sampling from the warehouse, container or transportation boxes
<input checked="" type="checkbox"/> Modules have been submitted by the manufacturer/ client without random sampling by SGS

2. Test sample

Sample #	Model Type	Serial Number
01	LNET-670M	2960639192201091
02		2960639192201093
03	LNET-665MD	M01220800449306
04		M01220800458634
05	LNET-690ND	SO23062YC018118
06		SO23062YC018212

3. Test specification and test result

TABLE 1: MQT 01 Visual inspection		
Test Date [YYYY-MM-DD]	: 2023-06-08	—
Sample #	Nature and position of initial findings	Verdict
01	No Major visual defects	P
02	No Major visual defects	P
03	No Major visual defects	P
04	No Major visual defects	P
05	No Major visual defects	P
06	No Major visual defects	P
Supplementary information: N/A		

TABLE 2: MQT 02 Maximum power determination		
Test Date [YYYY-MM-DD]:	2023-06-08	—
Test method	<input checked="" type="checkbox"/> indoor <input type="checkbox"/> outdoor	—



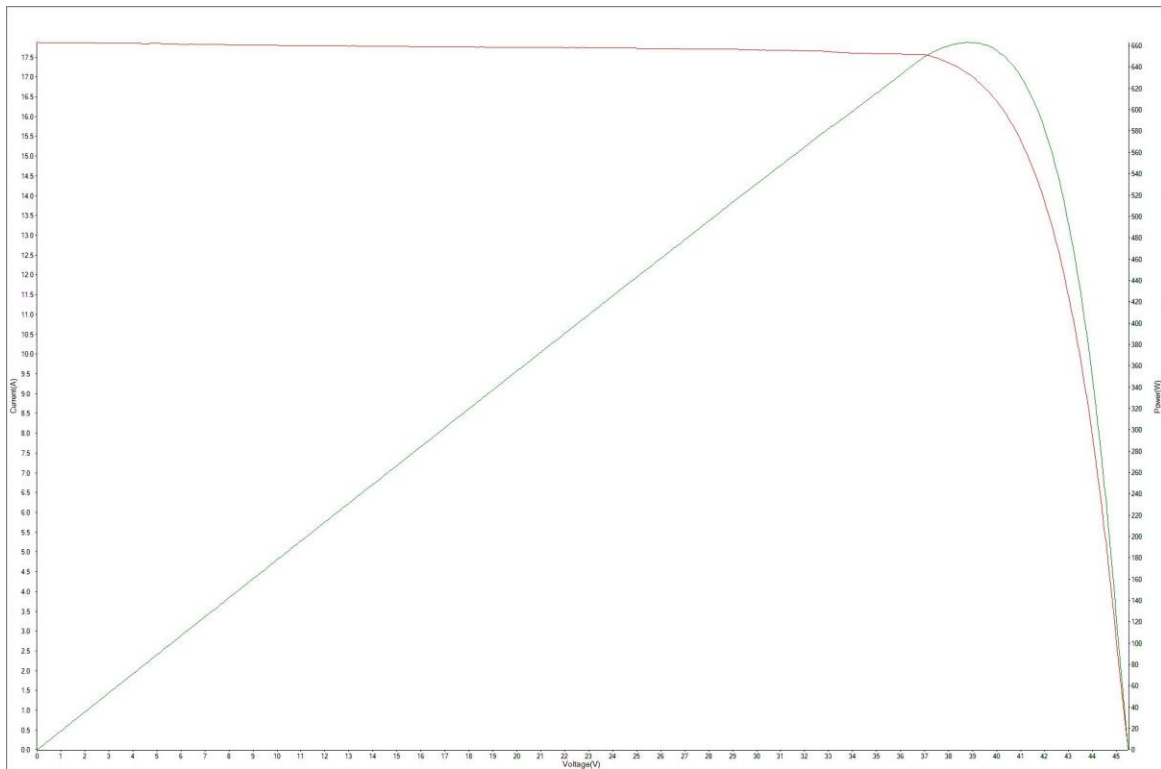
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Module temperature [°C]:			Corrected to 25.0			—
Irradiance [W/m ²]:			Corrected to 1000			—
Sample #	Voc [V]	Vmp [V]	Isc [A]	Imp [A]	Pmp [W]	FF [%]
01	45.47	38.87	17.87	17.06	663.1	81.58
02	45.44	38.82	17.86	17.04	661.6	81.51
03-F	45.76	38.60	17.82	17.05	658.1	80.71
03-B	45.25	39.01	12.85	11.67	455.4	78.32
04-F	45.81	38.49	17.89	17.08	657.6	80.25
04-B	45.18	38.90	12.84	11.68	454.5	78.32
05-F	46.81	39.16	17.98	17.10	669.7	79.58
05-B	46.49	39.45	13.71	12.66	499.4	78.34
06-F	46.92	39.11	18.04	17.18	671.9	79.36
06-B	46.43	39.38	13.71	12.67	498.9	78.36

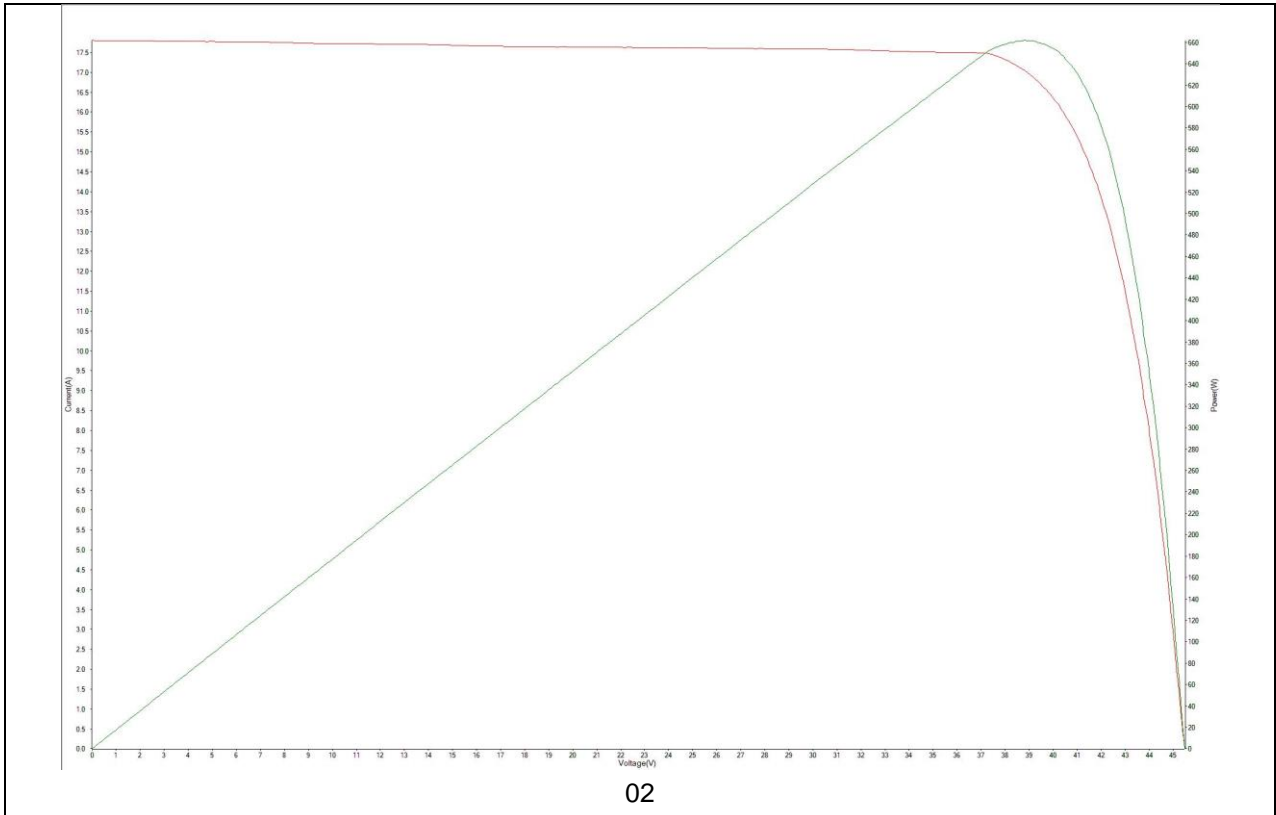
IV Curve:



01



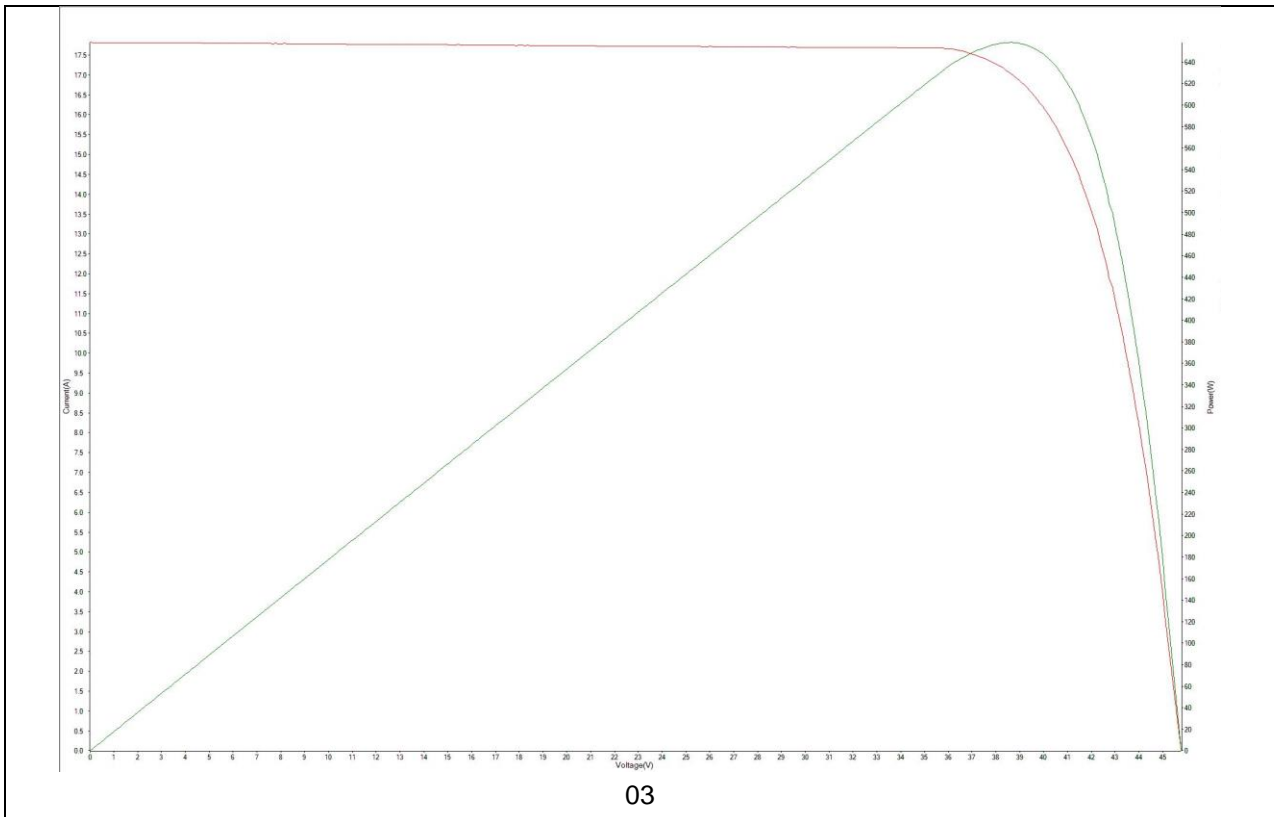
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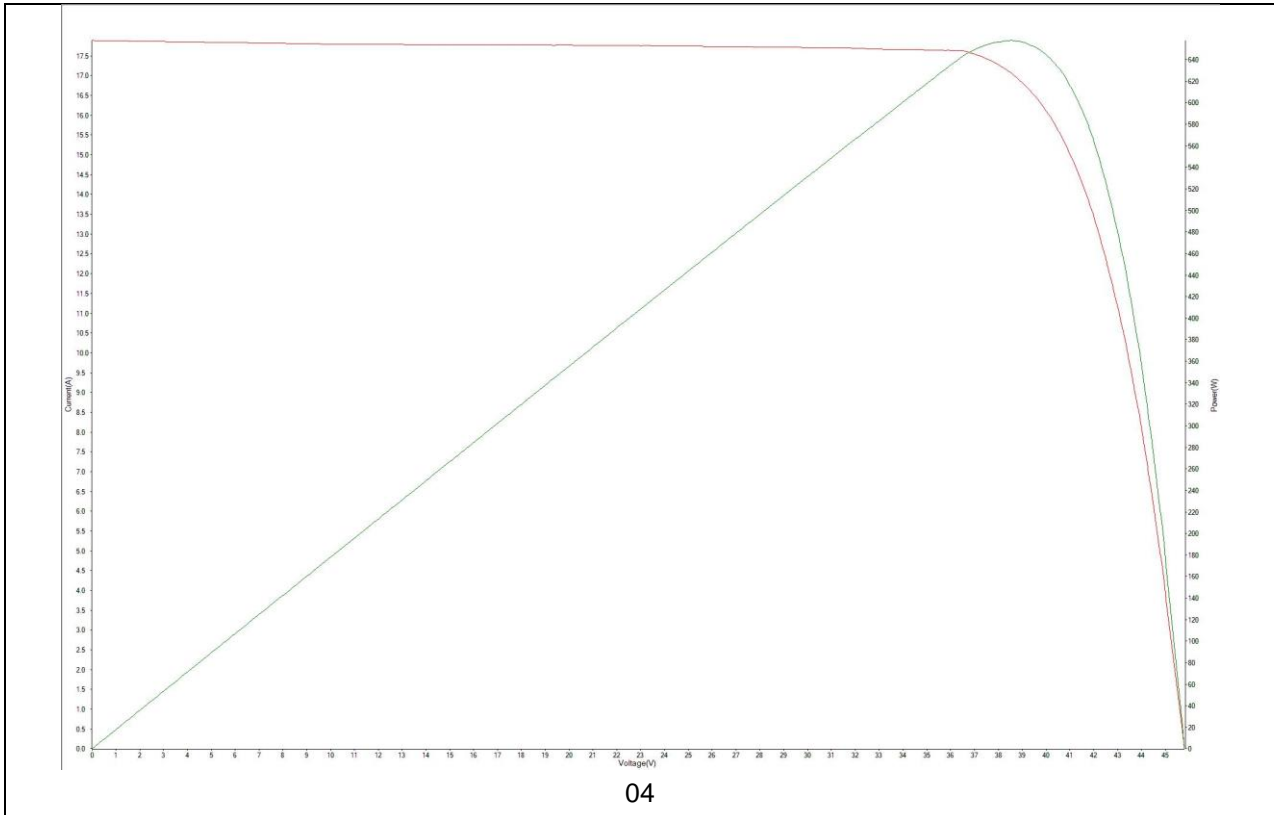
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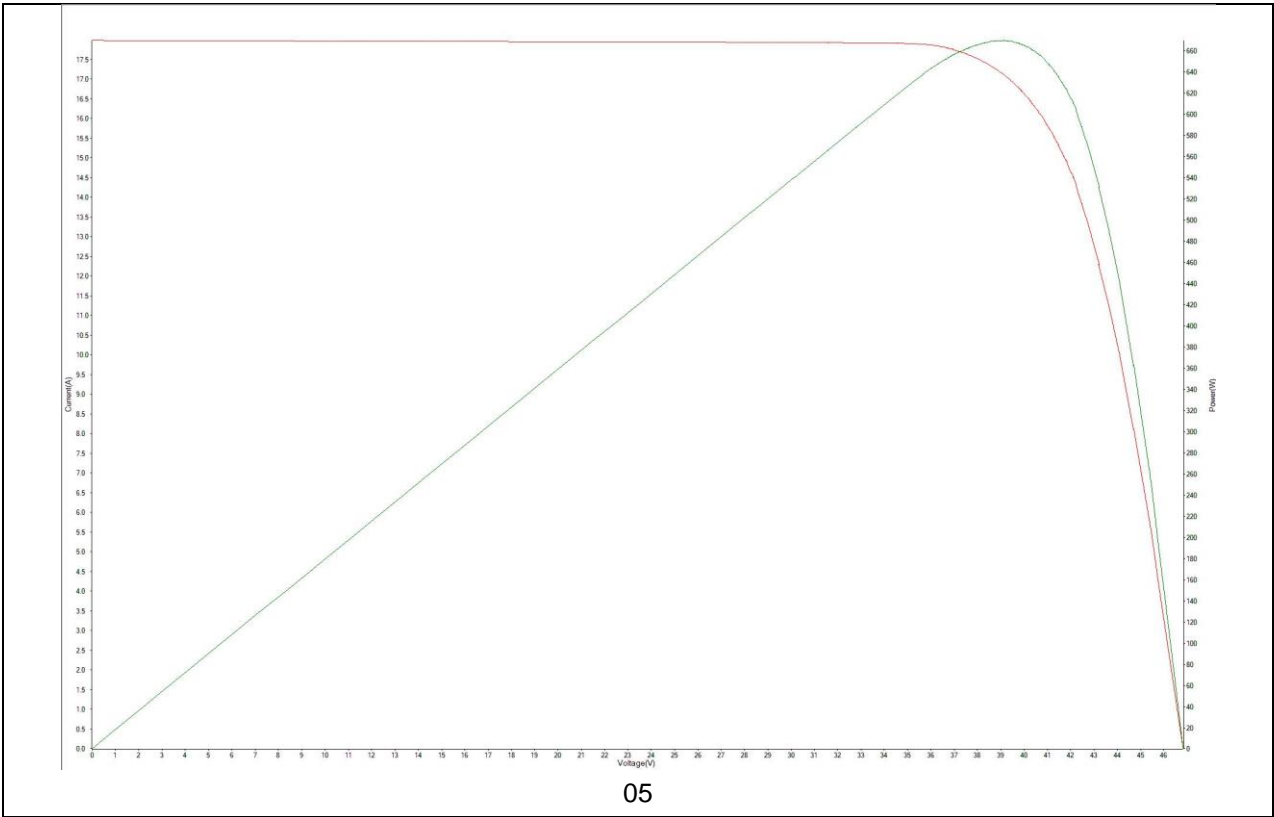
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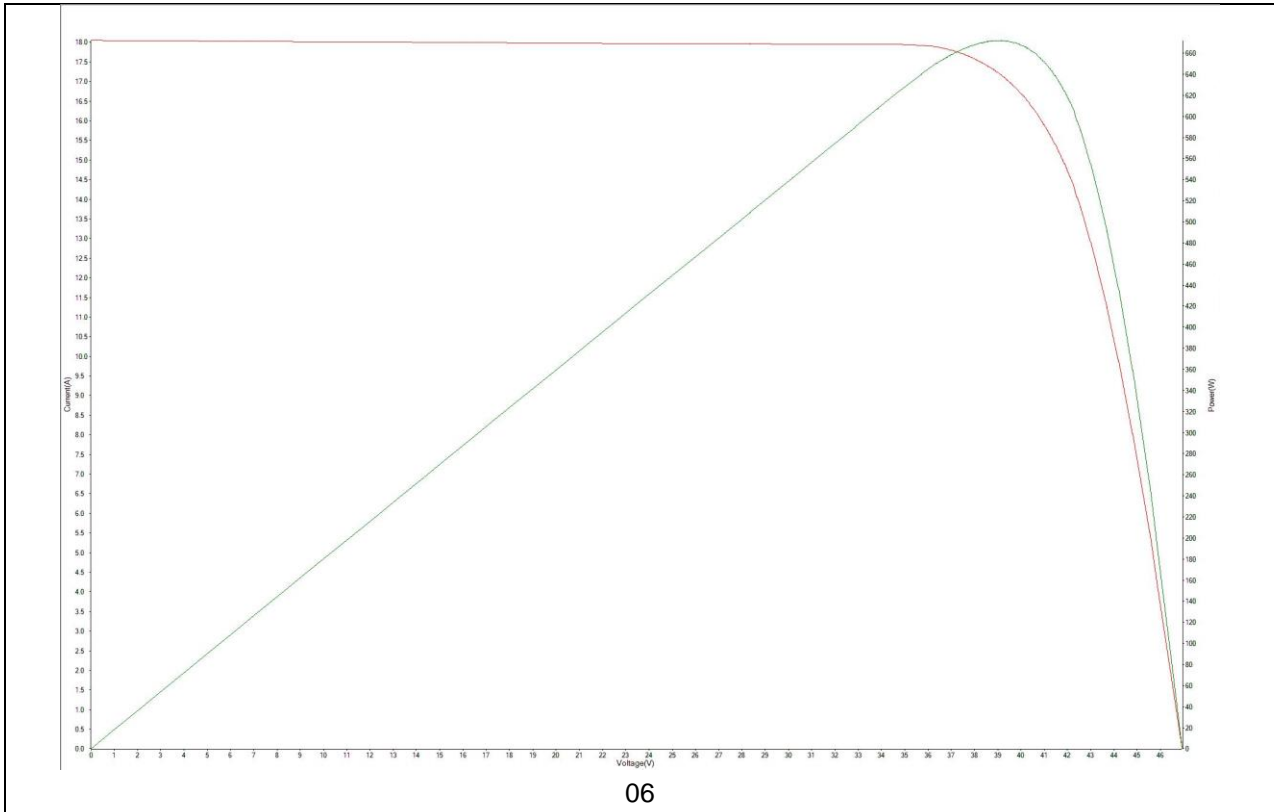
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Supplementary information: Refer to Appendix 2: Statement of the estimated uncertainty of the test verdicts. The discrepancy between the labelled power value and the measured value shall not exceed the limit of -5%~10%.

TABLE 3: MQT 03 Insulation test					
Test Date [YYYY-MM-DD]		2023-06-09		—	
Test Voltage applied [V]		4000V 1min/1500V 2min		—	
Size of module [m ²]		3.11		—	
Sample #	Measured	Required Resistance	Dielectric breakdown		Result
	MΩ	MΩ	Yes (description)	No	
01	27493	≥12.86	—	No	P
02	25796	≥12.86	—	No	P
03	25765	≥12.86	—	No	P
04	27846	≥12.86	—	No	P
05	22104	≥12.86	—	No	P



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06	19590	≥12.86	—	No	P
Supplementary information: Minimum requirement acc. to IEC 61215:2016 is 40 MΩ *m².					

TABLE 4: MQT 15 Wet leakage current test			
Test Date [YYYY-MM-DD]	:	2023-06-09	—
Test Voltage applied [V]	:	1500V 2min	—
Solution resistivity [Ω cm)	:	1967	—
Solution temperature [°C]	:	24.2	—
Size of module [m²]	:	3.11	—
Sample #	Required Resistance [MΩ]	Measured [MΩ]	Result
01	≥12.86	11475	P
02	≥12.86	14285	P
03	≥12.86	15969	P
04	≥12.86	13683	P
05	≥12.86	12072	P
06	≥12.86	13304	P
Supplementary information: Minimum requirement acc. to IEC 61215:2016 is 40 MΩ *m².			

Appendix 1: List of measurement equipments



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Clause	Measurement / testing	Testing / measuring equipment / material used	Equipment ID	Calibration due date
4.1 10.2	Visual inspection	Luminometer	PM6612L	2024.02.13
4.3 10.13	Insulation test	Withstanding voltage/Insulation resistance tester	GCYQ-AG-18	2023.08.18
4.6	Performance at STC	Pulsed Solar Simulator	GIV-20A2616	2023.08.02
4.15 10.14	Wet leakage current test	Withstanding voltage/ Insulation resistance tester	GCYQ-AG-18	2023.08.18
		Conductive meter	GCYQ-AG-07	2023.11.01

Appendix 2: Statement of the estimated uncertainty of the test results

The estimated uncertainty fulfils the requirements from the CTL decision sheet DSH 251B / 2009.

----- End of Test Report -----



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