

Technical Report No.: 704062502315-00

Date: 2025-06-05

Client: Name: JA Solar Technology Co., Ltd. (114228)
Address: No. 123 Xinxing Road, 055550 Ningjin County, Hebei Province, PEOPLE'S REPUBLIC OF CHINA
Contact person: Ms. Gong Wenli

Manufacturer: Name: JA Solar Technology Co., Ltd. (114228)
Address: No. 123 Xinxing Road, 055550 Ningjin County, Hebei Province, PEOPLE'S REPUBLIC OF CHINA
Contact person: Ms. Gong Wenli

Factory: Name: 1. Shanghai JA Solar Technology Co., Ltd. (072092)
Address: No. 118, Lane 3111, West Huancheng Road, Fengxian District, 201401, Shanghai, PEOPLE'S REPUBLIC OF CHINA
Contact person: Ms. Wenli Gong
Name: 2. Hefei JA Solar Technology Co., Ltd (079395)
Address: No. 999, Changning Road, Hi-tech Zone, 230088 Hefei City, Anhui Province, PEOPLE'S REPUBLIC OF CHINA
Contact person: Mr. Jian Zhou
Name: 3. JA Solar (Xingtai) Co., Ltd (095903)
Address: No. 1688, Chang An Road, Xingtai Economic Development Area, 054000 Xingtai City, Hebei Province, PEOPLE'S REPUBLIC OF CHINA
Contact person: Mr. Zhongke Jiang
Name: 4. JA Solar New Energy Yangzhou Co., Ltd. (108746)
Address: No.1, Jinhui Road, Economic Development Zone, 225131 Yangzhou City, Jiangsu Province, PEOPLE'S REPUBLIC OF CHINA
Contact person: Ms. Mengcen Zhao
Name: 5. Yiwu JA Solar Technology Co., Ltd. (109998)



Address: No.165, Tongze Road, Yiting Town, 322000 Yiwu City, Zhejiang Province, PEOPLE'S REPUBLIC OF CHINA

Contact person: Mr. Lijun Huang
Name: 6. JA SOLAR VIET NAM COMPANY LIMITED (112017)

Address: Lot G, Quang Chau Industrial Park, Quang Chau Ward, Viet Yen Town, 236110 Bac giang province, VIETNAM

Contact person: Mr. Jiang Ma
Name: 7. JA Solar New Energy Yangzhou Co., Ltd. (Jingshan Park) (114922)

Address: No. 123, Jinshan Road, Economic Development Zone, 225131 Yangzhou City, Jiangsu Province, PEOPLE'S REPUBLIC OF CHINA

Contact person: Ms. Mengcen Zhao
Name: 8. DongTai JA Solar Technology Co., Ltd. (121678)

Address: No. 8 Zaofeng North Road, Dongtai High-tech Zone, Dongtai City, 224248 Yancheng City, Jiangsu Province, PEOPLE'S REPUBLIC OF CHINA

Contact person: Ms. Zhixia Zhu
Name: 9. Inner Mongolia JA Solar PV Technology Co., Ltd. (123101)

Address: No.21, Zhuangbei Avenue, Xin Guihua Area, Equipment Park, Qingshan District, 014000 Baotou, Inner Mongolia Autonomous Region, PEOPLE'S REPUBLIC OF CHINA

Contact person: Mr. Shizhao Wang
Name: 10. QuJing JA Solar Technology Co., Ltd. (123430)

Address: North of Nanhai Avenue and East of Shaoxi Road, Qujing Economic and Technological Development Zone, 655000 Qujing City, Yunnan Province, PEOPLE'S REPUBLIC OF CHINA

Contact person: Mr. Shihao Luo
Name: 11. Ordos JA Solar Technology Co., Ltd. (127131)

Address: Room 2007, Office Building, High-tech Development Zone, Dongsheng District Equipment

Manufacturing Base, 017000 Ordos City, Inner Mongolia, PEOPLE'S REPUBLIC OF CHINA

Contact person: Ms. Yunxia Fu
Name: 12. Inner Mongolia JA Naoer New Energy Co., Ltd. (128635)
Address: Room 620, Office Building of the Management Committee, No. 1 Fuyuan Road, North Economic and Technological Development Zone, Bayannur City 015000, Inner Mongolia Autonomous Region, PEOPLE'S REPUBLIC OF CHINA

Contact person: Mr. Wei Li
Name: 13. JA Solar AZ, LLC (127728)
Address: 1975 South 99th Avenue, Phoenix AZ 85353, USA

Test object: Contact person: Mr. Junping Li
Product: Photovoltaic modules

Model: See clause 1.4

Trade mark: 

Test specification: IEC 61215-2:2021, Clause 4.1 Visual inspection (MQT 01)
IEC 61215-2:2021, Clause 4.3 Insulation test (MQT 03)
IEC 61215-2:2021, Clause 4.6 Performance at STC (MQT 06.1)
IEC 61215-2:2021, Clause 4.15 Wet leakage current test (MQT 15)
IEC 61215-2:2021, Clause 4.17 Hail test (MQT 17)
IEC 61215-2:2021, Clause 4.19 Stabilization (MQT 19.1)
Electroluminescence test

Purpose of examination:

- Testing and evaluation (visual / partial) according to the test specification

Test result: The test results show that the presented product is in compliance with the above listed test specifications.

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1. Description of the test object

1.1 Picture(s)

N/A

1.2 Function

Manufacturer's specification for intended use:

The PV modules for electricity generation systems with max. voltage of 1500 V DC

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1.3 Consideration of the foreseeable use

- Not applicable
- Covered through the applied standard
- Covered by the following comment*
- Covered by attached risk analysis

*

1.4 Technical Data

Sample #	Type	Series number
Sample #1 (GDP250334-1)	JAM54D41-450/LR	2530105531104994
Sample #2 (GDP250334-2)	JAM54D41-450/LR	2530105531105028 Control module

Applicable Modules (due to similar construction):

JAM54D41-xxx/LR, JAM54D40-xxx/LR, JAM54D40-xxx/MR, series, xxx is standing for rated output power at STC,

JAM54D40-xxx/LR have the similar construction with tested model JAM54D41-450/LR, except for different colour of encapsulant,

JAM54D40-xxx/MR have the similar construction with JAM54D40-xxx/LR, except for different dimensions of solar cells.

2. Order

2.1 Date of Purchase Order, Customer's Reference

The order dated 2025-05-21

2.2 Test Sample(s)

- Reception date(s): 2025-04-18
- Location(s) of reception: Yangzhou Opto-Electrical Products Testing Institute Co., Ltd.
No. 10 Kaifa West Road, Yangzhou, Jiangsu, China
- Condition of test sample(s): In good condition

2.3 Testing

- Testing date(s): 2025-05-23 to 2025-05-29
- Location(s) of testing: Yangzhou Opto-Electrical Products Testing Institute Co., Ltd.
No. 10 Kaifa West Road, Yangzhou, Jiangsu, China

2.4 Points of Non-Compliance or Exceptions of the Test Procedure

- N/A

3. Test Results

- Decision rule according to ILAC-G8:09/2019 clause 4.2.1 Binary statement for simple acceptance rule or IEC Guide 115:2023, clause 4.3.3 Simple acceptance was applied.



3.1 Positive Test Results

- See below details

TABLE 01: MQT 01 Visual inspection		P
Test Date [YYYY-MM-DD]..... :	2025-05-23	—
Sample No.	Nature and position of initial findings – comments or attach photos	—
1	No major visual defects found	P
2	No major visual defects found	P
Supplementary information: N/A		

TABLE 02: MQT 19.1 ini: Initial stabilization		P					
TABLE 02.1: MQT 06.1 ini: Performance at STC before initial stabilization		P					
Test Date [YYYY-MM-DD]..... :	2025-05-23	—					
Test method..... :	<input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Natural sunlight	—					
Sample #	I_{sc} [A]	V_{oc} [V]	I_{mp} [A]	V_{mp} [V]	P_{max} [W]	FF [%]	Result
1	13.948	40.056	13.072	34.201	447.047	80.01	P
2	13.918	40.074	13.150	34.079	448.141	80.35	P
Supplementary information: N/A							

TABLE 02.4: MQT 19.1: Initial Stabilization procedure							
Light exposure method..... :	<input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Natural sunlight						
Stabilization criterion x per IEC 61215-1-x..... :	0.01						
Sample #	1	Test Date (YYYY-MM-DD) start/end..... :	2025-05-23 / 2025-05-25				
Test cycle	Integrated irradiation (kWh/m ²)	Irradiance (W/m ²)	Module temperature (°C)	Resistive load	P_{max} (W) at the end of cycle	$(P_{max} - P_{min}) / P_{average}$ (%)	Stable (Yes/No)
Initial	—	—	—	—	447.047	—	—
1	5	800-1000	50±10	MPPT	446.916	—	—
2	5	800-1000	50±10	MPPT	446.413	0.14	Yes
3							
4						—	—

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Sample #	2	Test Date (YYYY-MM-DD) start/end			2025-05-23 / 2025-05-25		
Test cycle	Integrated irradiation (kWh/m ²)	Irradiance (W/m ²)	Module temperature (°C)	Resistive load	P _{max} (W) at the end of cycle	(P _{max} - P _{min}) / P _{average} (%)	Stable (Yes/No)
Initial	—	—	—	—	448.141	—	—
1	5	800-1000	50±10	MPPT	447.816	—	—
2	5	800-1000	50±10	MPPT	446.970	0.26	Yes
3							
4						—	—

Supplementary information: N/A	
<input type="checkbox"/> Other stabilization procedures	
Sample #	Test Date (YYYY-MM-DD) start/end
—	—
—	—
—	—
Test method description: N/A	
Supplementary information: N/A	

TABLE 03: MQT 06.1 ini: Performance at STC after initial stabilization										P
Test Date [YYYY-MM-DD]					2025-05-25					—
P _{max} (lab) lower limit (W)					See table below: P _{max} [W] – Min calc.					—
\bar{P}_{max} (Lab) lower limit (W)					—					—
Voc(lab) upper limit (V)					See table below: Voc [V] Max. calc.					—
Isc (lab) upper limit (A)					See table below: Isc [A] Max. calc.					—
Test method					<input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Natural sunlight					—
Sample #	Isc [A]		Voc [V]		Imp [A]	Vmp [V]	Pmax [W]		FF [%]	Result
	Meas.	Max. calc.	Meas.	Max. calc.			Meas.	Min. calc.		
1	13.968	—	39.956	—	13.174	33.885	446.413	—	79.99	P
2	13.928	—	39.977	—	13.144	34.007	446.970	—	80.28	P



Average	—	446.692	—	—	P
Supplementary information: The limit values are calculated considering manufacturer's tolerances t of rated nameplate values and laboratory measurement uncertainties m .					

TABLE 04: MQT 03: Initial Insulation test					P
Test Date [YYYY-MM-DD].....:	2025-05-25				—
Test Voltage applied [V]	8000/1500				—
Size of module [m²]	2.0				—
Required Resistance [MΩ].....:	20.02				—
Sample #	Measured	Dielectric breakdown			Result
	MΩ	Yes (description)	No		
1	>10000	No Dielectric breakdown	x		P
2	>10000	No Dielectric breakdown	x		P
Supplementary information: the maximum measuring limit of the equipment is 10000 MΩ.					

TABLE 05: MQT 15: Initial Wet leakage current test					P
Test Date [YYYY-MM-DD].....:	2025-05-25				—
Test Voltage applied [V].....:	1500				—
Solution temperature [°C].....:	23.7				—
Solution resistivity [Ω cm]	2912				—
Size of module [m²]	2.0				—
Sample #	Required Resistance [MΩ]	Measured [MΩ]			Result
1	20.02	>10000			P
2	20.02	>10000			P
Supplementary information: the maximum measuring limit of the equipment is 10000 MΩ.					

TABLE 06: MQT 17 - Hail impact test							P
Test Date [YYYY-MM-DD].....:	2025-05-27						—
Sample #	1						—
Ice ball size [mm]	1	2	3	4	5	6	—
	35.6	35.8	35.2	34.9	34.6	34.3	

	7	8	9	10	11	/	
	35.2	35.2	34.5	34.4	35.5	/	
Ice ball weight [g]..... :	1	2	3	4	5	6	—
	20.42	20.45	20.52	20.71	20.43	20.54	
	7	8	9	10	11	/	
	20.55	20.72	20.83	20.75	20.63	/	
Ice ball velocity [m/s]..... :	1	2	3	4	5	6	—
	26.52	26.74	26.26	26.62	26.45	26.86	
	7	8	9	10	11	/	
	26.53	26.64	26.76	26.57	26.64	/	
Number of impact locations	11						—

Supplementary information: (impact location descriptions)

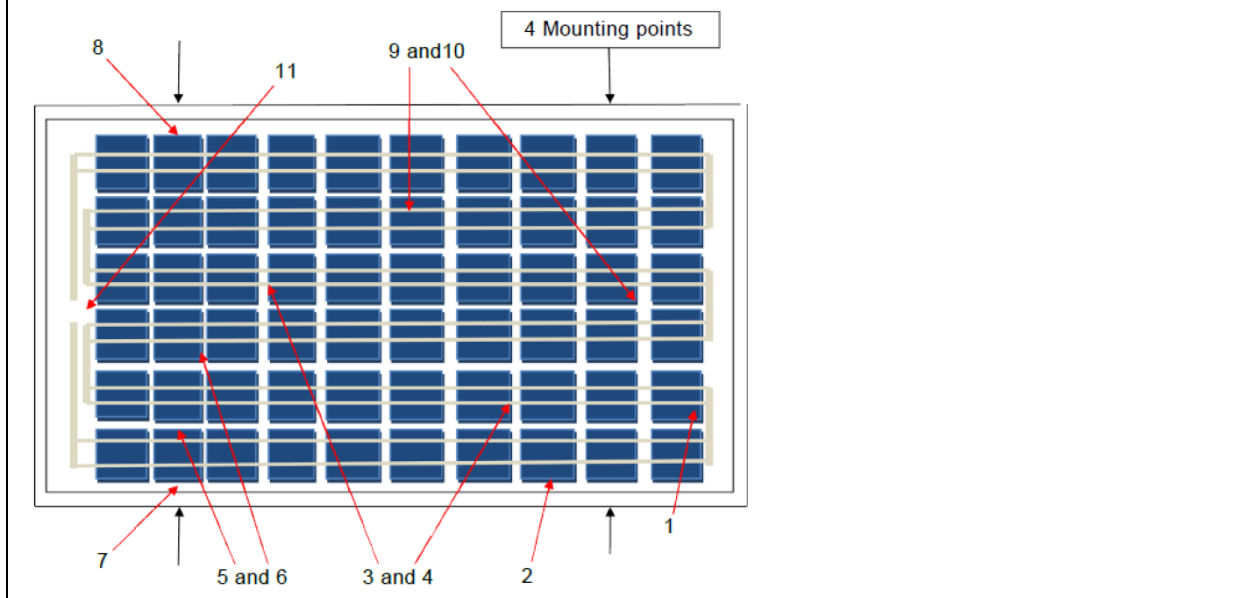


TABLE 07: MQT 01 - Visual inspection after hail impact test		P
Test Date [YYYY-MM-DD]..... :	2025-05-27	—
Sample #	Nature and position of initial findings – comments or attach photos	—
1	No major visual defects found	P
Supplementary information: N/A		

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TABLE 08: MQT 03: Initial Insulation test after hail impact test				P
Test Date [YYYY-MM-DD].....:	2025-05-27			—
Test Voltage applied [V]	8000/1500			—
Size of module [m ²]	2.0			—
Required Resistance [MΩ].....:	20.032			—
Sample #	Measured	Dielectric breakdown		Result
	MΩ	Yes (description)	No	
1	>10000	No Dielectric breakdown	x	P
Supplementary information: the maximum measuring limit of the equipment is 10000 MΩ.				

TABLE 09: MQT 15 - Wet leakage current test after hail impact test				P
Test Date [YYYY-MM-DD]..... :	2025-05-27			—
Test Voltage applied [V].....:	1500			—
Solution temperature [°C].....:	23.6			—
Solution resistivity [Ω cm]	2861			—
Size of module [m ²]	2.0			—
Sample #	Measured [MΩ]	Required Resistance [MΩ]		Result
1	>10000	20.02		P
Supplementary information: the maximum measuring limit of the equipment is 10000 MΩ.				

TABLE 10: MQT 06.1: Final Performance at STC									P
Test Date [YYYY-MM-DD]..... :	2025-05-29								—
Test method.....:	<input checked="" type="checkbox"/> Simulator <input type="checkbox"/> Natural sunlight								—
Sample #	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmax [W]	FF [%]	Pmax [W] (Lab_GateNo.1)	Power Degradation [%]	Result
1	13.947	40.067	13.080	34.023	445.021	79.64	446.413	-0.312	P
2	13.921	40.066	13.153	34.070	448.123	80.34	446.970	0.258	P
Supplementary information: N/A									

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3.2 Points of Non-Compliance according to the test specification

None

4. Test History

Report no. / Rev. No.	Date	History
N/A	N/A	N/A

5. Remarks

5.1 General

N/A

5.2 Factory surveillance cycle

Your production facility is currently on the following surveillance cycle.

- Annual (12 month)
- Bi-Annual (6 month)
- Quarterly (3 month)
- N/A

5.3 Additional information for routine tests to be performed by the factory(ies)

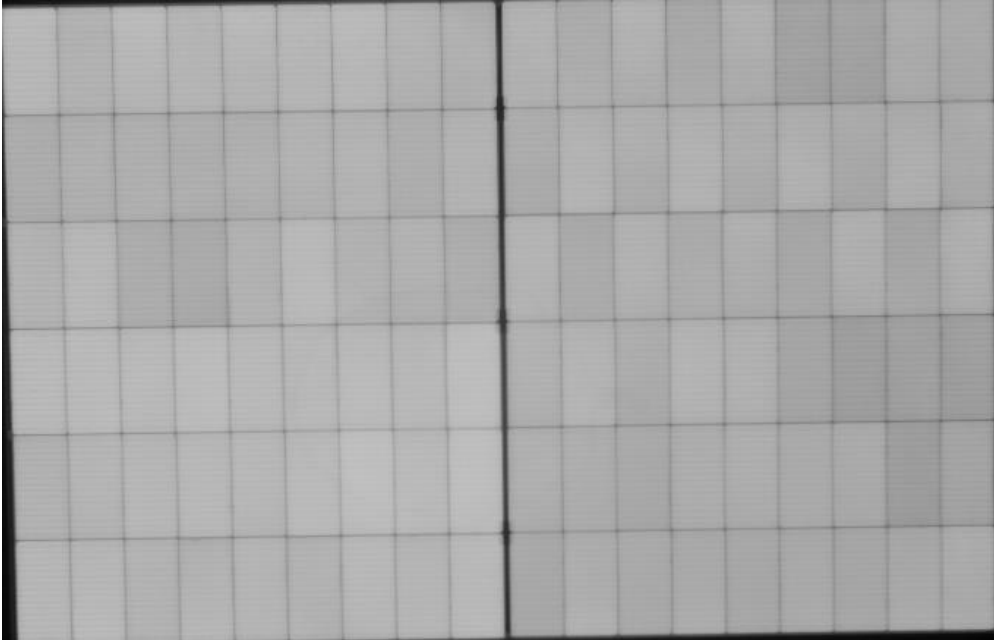
Routine tests for electrical appliances / equipment:

Routine test requirements for production are described in N/A

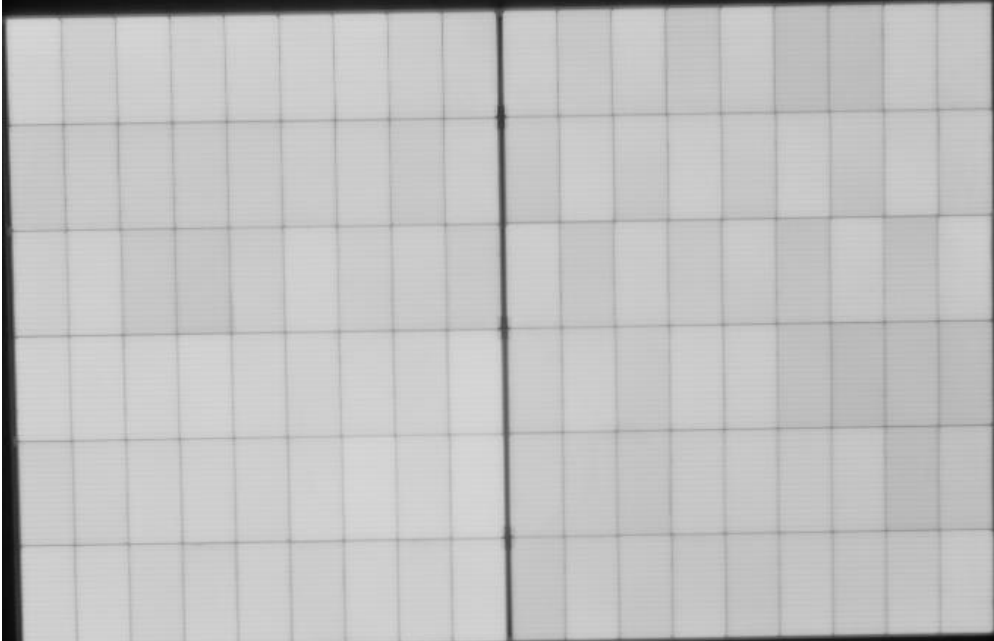


6. Documentation

Appendix 2: EL-images
Sample No.: 1-Initial



Sample No.: 1-Final



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Shanghai 200070, P. R. China
Telephone: +86 21 6141-0100



Appendix 2: List of measurement equipment

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date
1	Visual inspection	SB24042	2024-11-19	2025-11-18
2	Performance at STC	SB18003	2024-10-12	2025-10-11
3	Insulation test Wet leakage current test	SB23002	2025-04-17	2026-04-16
4	Wet leakage current test	SB23003	2025-04-17	2026-04-16
6	Hail test	SB08076	2024-08-12	2025-08-11

Appendix 3: Statement of the estimated uncertainty of the test results

The power measurement uncertainty is $U(P_{max})=2.4\%$, $U(V_{oc})=0.7\%$, $U(I_{sc})=2.2\%$ ($K=2$).

7. Summary

The test specification(s) is (are) met.

TÜV SÜD Certification and Testing (China)Co., Ltd. Shanghai Branch

Tested by: Rongwei Jing *Jing Rongwei*
printed name, function & signature

Approved by: Ning Tang
printed name, function & signature