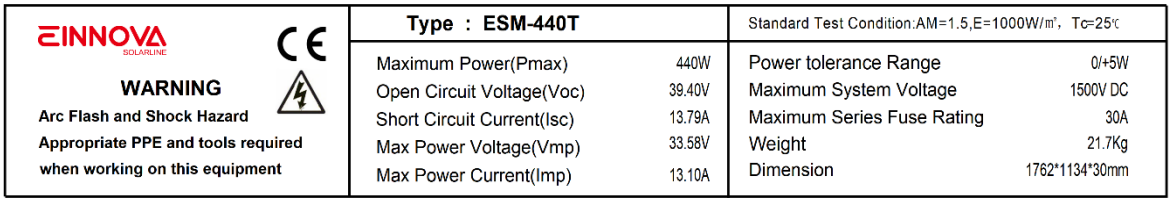
Technical Report No.: 704062448201-01

Date: 2024-06-11

Client:	Einnova Solarline Energy Corp. Limited (Nanjing) (076043) Room 818, Building 1, No. 58, Yunjin Road, Jianye District, 210000 Nanjing City, Jiangsu Province, PEOPLE'S REPUBLIC OF CHINA Contact person: Ms. Vicky Chen
Manufacturer:	Einnova Solarline Energy Corp. Limited (Nanjing) (076043) Room 818, Building 1, No. 58, Yunjin Road, Jianye District, 210000 Nanjing City, Jiangsu Province, PEOPLE'S REPUBLIC OF CHINA Contact person: Ms. Vicky Chen
Factory:	Einnova Solarline Energy Corp. Limited (Anhui) Building No. 4, Qingxi industrial park phase two, Hanshan County, Ma Anshan City, Anhui, China Contact person: Nicky Zhang
Test object:	Product: Crystalline Silicon Photovoltaic modules Model: See clause 1.4
Test specification:	IEC 61215-2:2021, Clause 4.1 Visual Inspection (MQT 01) IEC 61215-2:2021, Clause 4.6 Performance at STC (MQT 06.1) IEC 61215-2:2021, Clause 4.3 Insulation test (MQT 03) IEC 61215-2:2021, Clause 4.15 Wet leakage current test (MQT 15) IEC 61215-2:2021, Clause 4.17 Hail test (MQT 17)
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.

1. Description of the test object

1.1 Picture(s)



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 No.	Module serial No.	Model	Remark
Sample 1 (HA2024TL-0793-001X)	SA2024031900629	ESM-440T	35mm Hail test

2. Order

2.1 Date of Purchase Order, Customer's Reference

The order dated 2024-04-03

2.2 Test Sample(s)

- Reception date(s): 2024-05-30
- Location(s) of reception: Changzhou HuaYang Inspection and Testing Technology Co., Ltd
  No.8 Lanxiang Road, Wujin Economic Development Zone, Changzhou, Jiangsu, China
- Condition of test sample(s): In good condition

2.3 Testing

- Testing date(s): 2024-06-03
- Location(s) of testing: Changzhou HuaYang Inspection and Testing Technology Co., Ltd
  No.8 Lanxiang Road, Wujin Economic Development Zone, Changzhou, Jiangsu, China

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

- None

3. Test Results

- “Decision rule according to IEC Guide 115:2023, clause 4.3.3 was applied.”

3.1 Positive Test Results

- See below details

TABLE 01: MQT 01 Visual inspection		P
Test Date [YYYY-MM-DD]..... :	2024-06-03	—
Sample No.	Nature and position of initial findings – comments or attach photos	—
1	No major visual defects found	P
Supplementary information: N/A		

TABLE 02: MQT 06.1 ini: Performance at STC (initial)							P
Test Date [YYYY-MM-DD].....:	2024-06-03						—
Test method.....:	☒ Simulator ☐ Natural sunlight						—
Sample #	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmax [W]	FF [%]	Result
1 (Front)	12.812	38.657	12.158	33.043	401.719	81.11	—
1 (Rear)	10.536	38.351	9.042	34.363	310.724	76.90	—
1 (BNPI)	14.225	38.709	13.373	33.157	443.406	80.52	—
Supplementary information: N/A							

TABLE 03: MQT 03 ini: Initial Insulation test				
Test Date [YYYY-MM-DD].....:	2024-06-03			—
Test Voltage applied [V] .....:	8000/1500			—
Size of module [m²].....:	2.0			—
Required Resistance [MΩ].....:	20.0			—
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 10000MΩ.				

TABLE 04: MQT 15 ini: Initial Wet leakage current test		P
Test Date [YYYY-MM-DD] .....:	2024-06-03	—

Test Voltage applied [V].....:	1500	—
Solution temperature [°C].....:	21.3	—
Size of module [m²].....:	2.0	—

Sample #	Required Resistance [MΩ]	Measured [MΩ]	Result
1	20.0	4510	P
Supplementary information: Solution resistivity 2439 [Ω·cm]			

TABLE 05: MQT 17 - Hail impact test							P
Test Date [YYYY-MM-DD]..... :	2024-06-03						—
Sample #	1						—
Ice ball size [mm] ..... :	1	2	3	4	5	6	—
	34.9	35.3	34.3	34.0	35.1	35.5	
	7	8	9	10	11	/	
	34.8	35.1	34.2	34.7	34.4	/	
Ice ball weight [g] ..... :	1	2	3	4	5	6	—
	19.8	20.6	19.9	20.5	20.9	20.5	
	7	8	9	10	11	/	
	20.4	20.5	20.0	19.8	20.6	/	
Ice ball velocity [m/s]..... :	1	2	3	4	5	6	—
	27.3	26.1	26.7	26.0	27.7	27.0	
	7	8	9	10	11	/	
	26.6	26.3	26.9	27.2	26.4	/	
Number of impact locations ..... :	11						—
Supplementary information: (impact location descriptions)							

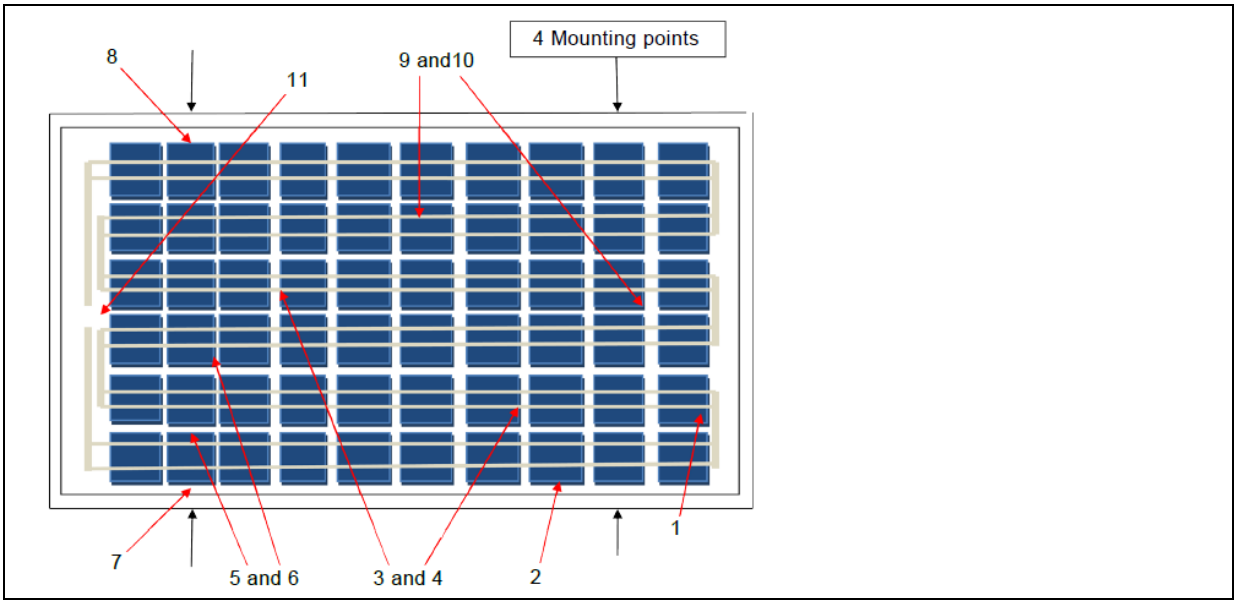

TABLE 06: MQT 01 - Visual inspection (Final)		P
Test Date [YYYY-MM-DD].....:	2024-06-03	—
Sample No.	Nature and position of initial findings – comments or attach photos	—
1	No major visual defects found	P
Supplementary information: N/A		

TABLE 07: MQT 03 - Insulation test (Final)				P
Test Date [YYYY-MM-DD].....:	2024-06-03			—
Test Voltage applied [V] .....:	8000/1500			—
Size of module [m²].....:	2.0			—
Required Resistance [MΩ].....:	20.0			—
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 10000MΩ.				

TABLE 08: MQT 15 - Wet leakage current test (Final)		P
Test Date [YYYY-MM-DD] .....:	2024-06-03	—

Test Voltage applied [V].....:	1500	—
Solution temperature [°C].....:	21.3	—
Size of module [m²].....:	2.0	—

Sample #	Required Resistance [MΩ]	Measured [MΩ]	Result
1	20.0	3860	P
Supplementary information: Solution resistivity 2438 [Ω·cm]			

TABLE 09: MQT 06.1 - Final Performance at STC									P
Test Date [YYYY-MM-DD].....:	2024-06-03								—
Test method.....:	☒ Simulator ☐ Natural sunlight								—
Sample #	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmax [W]	FF [%]	Pmax [W] (Lab _GateNo.1)	Power Degradation [%]	Result
1 (Front)	12.802	38.584	12.085	33.083	399.825	80.94	401.719	-0.47	P
1 (Rear)	10.489	38.253	9.068	34.145	309.631	77.17	310.724	-0.35	P
1 (BNPI)	14.210	38.631	13.302	33.176	441.313	80.39	443.406	-0.47	P
Supplementary information: The IV curves didn't show any additional kinks or other unusual characteristics as compared to the initial IV curve.									

3.2 Points of Non-Compliance according to the test specification

- None

4. Test History

N/A

www.tuvsud.com

TÜV SÜD Certification and Testing (China) Co., Ltd.
Shanghai Branch
SMN
No. 151 Heng Tong Road,
Shanghai 200070, P. R. China
Telephone: +86 21 6141-0100

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 1**:** List of measurement equipment

No.	Description	Main testing Equipment	Calibrate until
1	Visual inspection	Illumination photometer HYJC-YS-070	2024-06-20
2	Performance at STC	Module pulse simulator HYJC-YS-021	2025-01-23
3	Insulation test Wet leakage current test	Programmable control voltage insulation meter HYJC-YS-155	2024-08-07
4	Wet leakage current test	Conductance meter HYJC-YS-171	2024-08-07
6	Hail test	Hail tester HYJC-YS-036	2025-04-02
All equipment used for tests having a significant effect on the accuracy or validity of the result of the test is calibrated before being put into service.			

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

The power measurement uncertainty is U(Pmax)=2.05%, U(Voc)=0.97%, U(Isc)=2.0% (K=2).

7. Summary

“The test specifications are met”

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

Tested by: Rongwei Jing

printed name, function & signature

Approved by: Ning Tang

printed name, function & signature