

Technical Report No.: 704062213426-00

Date: 2022-08-24

Client: Anhui Huasun Energy Co.,Ltd.
No. 99, Qingliu Road, Xuancheng Economic and Technological
Development Zone, Xuanzhou District, Xuancheng City, Anhui
Province,China

Factory: Anhui Huasun Energy Co.,Ltd.
No. 99, Qingliu Road, Xuancheng Economic and Technological
Development Zone, Xuanzhou District, Xuancheng City, Anhui
Province,China

Test object: Product: Photovoltaic modules
Model: See clause 1.4

Test specification: IEC 61215-2:2016, visual inspection (MQT 01)
IEC 61215-2:2016, performance at STC (MQT 06)
IEC 61215-2:2016, Insulation test (MQT 03)
IEC 61215-2:2016, Wet leakage current (MQT 15)
IEC 61215-2:2016, Hail test (MQT 17)

Purpose of examination: Testing and evaluation (visual / partial) according to the test specification

Test result: The test result show that the presented product is in compliance with the
specific requirements.

Any use for advertising purposes must be granted in writing. This technical report may only be quoted in full. This report is the result of a single examination of the object in question. It does not imply a general statement regarding the quality of products from regular production. For further details please see testing and certification regulation, chapter A-3.4.

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

Manufacturer's specification for predictive use:

N/A

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.	Serial number	Type	Dimension
GDP220508-1	HAA22060503330	HS-B120DN385	1750x1033x5 mm

2. Order

2.1 Date of Purchase Order, Customer's Reference

2022-08-05

2.2 Test Sample(s)

- Reception date(s):
- 2022-08-08
- Location(s) of reception:

Yangzhou Opto-Electrical Products Testing Institute.
No. 10 West Kaifa Road, Yangzhou, 225009 Jiangsu, P. R. China.

- Condition of test sample(s):
In good condition

2.3 Date(s) of Testing 2022-08-09 ~ 2022-08-16

2.4 Location(s) of Testing Yangzhou Opto-Electrical Products Testing Institute.
No. 10 West Kaifa Road, Yangzhou, 225009 Jiangsu, P. R. China.

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

- N/A

3. Test Results

- “Decision rule according to IEC Guide 115:2021, clause 4.4.3, 4.5.1 was applied.”
- “Decision rule (based on ILAC-G8) for an upper specification limit (A lower limit or specification with an up-per and a lower limit is treated similarly.):
 - Compliance with the requirement: If a specification limit is not breached by a measurement result plus the expanded uncertainty with a 95% coverage probability, then compliance with the specification will be stated (e.g. Pass).

3.1 Positive Test Results

3.1.1	TABLE: Visual inspection		P
Test Date [YYYY/MM/DD].....:	2022-08-09		—
Sample No.	Nature and position of initial findings – comments or attach photos	Verdict	
GDP220508-1	No major visual defects		P
Supplementary information:N/A			

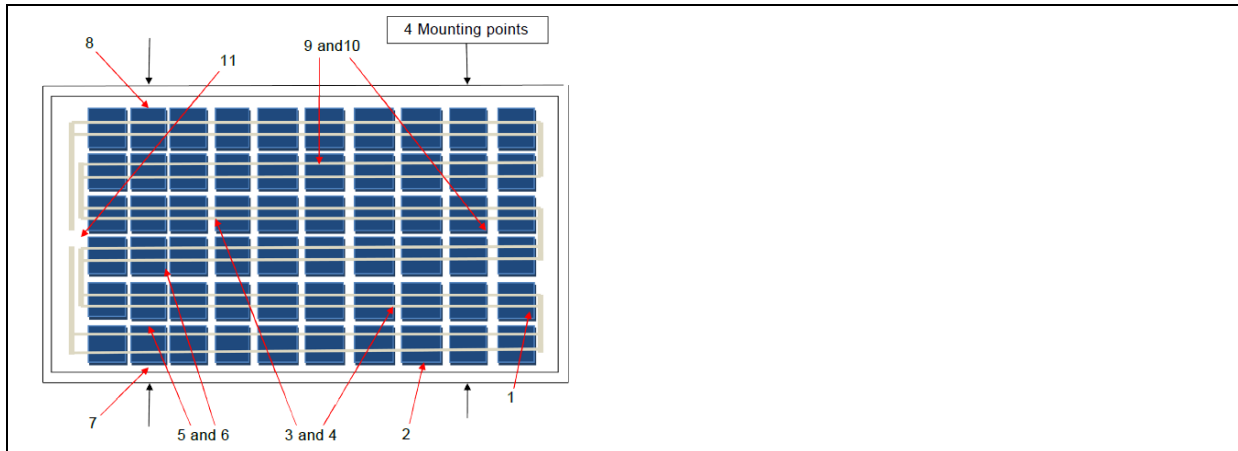
3.1.2	TABLE:Performacne at STC					
Test Date [YYYY-MM-DD]:	2022-08-09					
Irradiance (W/m ²)	1000					
Module temperature [°C]	25					
Sample No	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmp [W]	FF [%]
GDP220508-1	10.511	44.694	9.969	38.227	381.068	81.09
Supplementary information:N/A						

3.1.3	Initial Insulation test			P
Test Date [YYYY-MM-DD]..... :	2022-08-09			—
Test Voltage applied [V]	8000/1500			—
Size of module [m ²]	1.81			—
Required Resistance [MΩ].....:	22.1			—
Sample #	Measured	Dielectric breakdown		Result
	MΩ	Yes (description)	No	
GDP220508-1	> 5000	No Dielectrical breakdown	x	P
Supplementary information: The maximum resistance measurement range is 5000M Ω.				

3.1.4	Initial Wet leakage current test		P
Test Date [YYYY-MM-DD].....:	2022-08-09		—
Test Voltage applied [V].....:	1500		—

Solution resistivity [Ωcm]	< 3,500 $\Omega\text{ cm}$ at 22 \pm 2°C	2956	—
Solution temperature [°C]	22.6		—
Size of module [m ²].....	1.81		—
Sample #	Required Resistance [M Ω]	Measured [M Ω]	Result
GDP220508-1	22.1	582.4	P
Supplementary information:N/A			

3.1.5	Hail impact test						P
Test Date [YYYY-MM-DD]	2022-08-15						—
Sample #	GDP220508-1						—
Ice ball size [mm].....	1	2	3	4	5	6	—
	34.8	34.7	34.7	34.9	34.5	34.7	
	7	8	9	10	11	/	
	34.4	34.5	34.8	34.7	34.7	/	
Ice ball weight [g]	1	2	3	4	5	6	—
	20.45	20.37	20.27	20.55	20.19	20.36	
	7	8	9	10	11	/	
	20.24	20.31	20.62	20.56	20.61	/	
Ice ball velocity [m/s]	1	2	3	4	5	6	—
	27.01	26.86	27.18	27.24	26.91	26.85	
	7	8	9	10	11	/	
	26.99	27.25	27.14	27.06	27.42	/	
Number of impact locations.....	11						—
Supplementary information:1)Ice ball diameter:35mm \pm 5 %.2)impact location descriptions)							



3.1.6	TABLE: Visual inspection(Final)		P
Test Date [YYYY-MM-DD].....:	2022-08-16		—
Sample No.	Nature and position of initial findings – comments or attach photos	Verdict	
GDP220508-1	No major visual defects	P	
Supplementary information:N/A			

3.1.7	TABLE: Performacne at STC (Final)							P
Test Date [YYYY-MM-DD].....:	2022-08-16							—
Module temperature [°C].....:	25							—
Irradiance [W/m²].....:	1000							—
Sample #	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmp [W]	FF [%]	Degradation [%]	Limit [%]
GDP220508-1	10.500	44.680	9.952	38.198	380.146	81.03	-0.24%	-5
Supplementary information: N/A								

3.1.8	Insulation test (Final)		P
Test Date [YYYY-MM-DD]..... :	2022-08-16		—
Test Voltage applied [V]	8000/1500		—
Size of module [m²]	1.81		—
Required Resistance [MΩ].....:	22.1		—
Sample #	Measured	Dielectric breakdown	Result

	MΩ	Yes (description)	No	
GDP220508-1	>5000	No Dielectrical breakdown	x	P
Supplementary information: The maximum resistance measurement range is 5000M Ω.				

3.1.9	Wet leakage current test (Final)		P
Test Date [YYYY-MM-DD].....:	2022-08-16		—
Test Voltage applied [V]	1500		—
Solution resistivity [Ωcm)	< 3,500 Ω cm at 22 ± 2°C	2963	—
Solution temperature [°C]	22.8		—
Size of module [m²].....:	1.81		—
Sample #	Required Resistance [MΩ]	Measured [MΩ]	Result
GDP220508-1	22.1	523.7	P
Supplementary information:N/A			

3.2 Points of Non-Compliance according to the test specification

- None

4. Remarks

The user manual has been examined according to the minimum requirements described in the product standard. The manufacturer is responsible for the accuracy of further particulars as well as of the composition and layout.

4.1 Factory surveillance cycle

N/A

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

Routine tests for electrical appliances / equipment:

N/A

5. Documentation

Appendix 1 Equipments list

Description	Equipment ID	Calibration due date
Pulsed Solar Simulator	SB12001	2023.01.15

Appendix 2 Statement of the estimated uncertainty of the test results

Pmax measurement uncertainty: 2.06% (K=2)

Voc measurement uncertainty: 1.30% (K=2)

Isc measurement uncertainty: 1.92% (K=2)

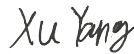
6. Summary

The test specification is met.

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

Tested by:

Yang Xu



Printed name,function & signature

Approved by:

Guangxia Fu

Printed name,function & signature