工業技術研究院
Industrial Technology
Research Institute

Testing Laboratory
2295

Test Report

Date Issued : 2019-03-28
Report No . : 10807C00338-3-1-02
Version : A

Service Item : PV module
Brand Name : WINAICO
Model(Item No./Style) : WST-305M6
Serial No. : W192629171230813

Client
Company Name : Win Win Precision Technology Co., Ltd
Address : No.180, Sec. 2, Gongdao 5th Rd., East Dist., Hsinchu City 300, Taiwan (R.O.C.)

Result of Service Item, performed by ITRI Laboratory, is specified on the next/ following page(s).
This report, including a signature page and content, is a total of 8 pages.
The validity of this report no longer exists if signature page and content are separated.

財團法人工業技術研究院 檢測業務報告章 Industrial Technology Research Institute

Tzeng-Yow Lin
General Director
Center for Measurement Standards

Hung-Sen Wu
Approved Signatory

2019/03/28 16:43:41 636893882210486242

Commission Information:

Sample name：PV module
Brand name：WINAICO
Model no.：WST-305M6
Sample serial no.：W192629171230813
Date of receipt：Februay 11, 2019
Sampling procedure：Production sample

Laboratory Information:

Lab. name: Photovoltaics Test Laboratory
Address of Lab.: RM.168, Bldg.21, No.195, Sec.4, Chung Hsing Rd., Chu Tung, Hsin Chu, Taiwan 310, R.O.C.
Tel: +886-3-5913881
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Lab. Approved Signatory Charlie Wu

Testing Lab. Head Hung-Sen Wu

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Test Results and Descriptions

I. Test Results

1. Module Group Assignment

Sample #	Sample Group ID	Model no.	Sample S/N
10807C00338-05	A	WST-305M6	W192629171230813
Note : Module size is 1,665 mm × 1,000 mm × 35 mm. Module area is 1.6650 m^2.			

2. Description of test procedure

Group ID	Test Procedure
A	10.2 - EL –10.16 – 10.2 - EL

3. List of test results

	Initial examination	**1 module**
10.2	Maximum Power Determination	See table 10.2 Initial
EL	Electrical Luminance	See table EL Initial

Group A	**1 Module**	**Sample Group ID A**
10.16	Static mechanical load test	See table 10.16

	Final examination	**1 module**
10.2	Maximum Power Determination	See table 10.2 Final
EL	Electrical Luminance	See table EL Final

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4. Data of test results

10.2 Initial	TABLE: Maximum Power Determination (Initial)					
Test Date	2019/03/11					
Module temperature [°C]	25.0					
Radiant source	☒ Solar simulator, ☐ Natural sunlight					
Irradiance [W/m^2]	1,000					
Sample#	V_{oc} [V]	I_{sc} [A]	V_{mpp} [V]	I_{mpp} [A]	P_{max} [W]	FF [%]
10807C00338-05	39.86	9.82	32.98	9.33	307.6	78.58
Supplementary information: N/A						

EL Initial	TABLE: Electrical Luminance (Initial)	
Sample #	Test Date	Remark
10807C00338-05	2019/03/11	Refer to Figure 4
Supplementary information: Sample 04 Electrical Luminance photos is provided by WINAICO.		

10.16	TABLE: Static mechanical load test	
Sample #	10807C00338-05	
Test Date	2019/03/12	
Mounting method	Refer to Figure 6	
Load applied to	front side	back side
Mechanical load [Pa]	2,400	2,400
First cycle bending at module center(mm)	34	54
Intermittent open-circuit (yes/no)	no	no
Mechanical load [Pa]	2,400	2,400
Second cycle bending at module center(mm)	35	54
Intermittent open-circuit (yes/no)	no	no
Mechanical load [Pa]	6,500	2,400
Third cycle bending at module center(mm)	47	54
Intermittent open-circuit (yes/no)	no	no
Supplementary information: (1) The manufacturer uses the suction cup to complete the ML test. (2) The aluminum extrusion size is 40 mm × 40 mm × 1.8 mm (W×H×T), refer to Figure 7.		

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10.2 Final	TABLE: Maximum Power Determination (Final)						
Test Date	2019/03/14						
Module temperature [°C]	25.0						
Radiant source	☒ Solar simulator, ☐ Natural sunlight						
Irradiance [W/m^2]	1,000						
Sample#	V_{oc} [V]	I_{sc} [A]	V_{mpp} [V]	I_{mpp} [A]	P_{max} [W]	FF [%]	Deviation[%]
10807C00338-05	39.82	9.76	32.85	9.19	301.9	77.65	-1.9
Supplementary information: N/A							

EL Final	TABLE: Electrical Luminance (Final)	
Sample #	Test Date	Remark
10807C00338-05	2019/03/14	Refer to Figure 5
Supplementary information: N/A		

II. Descriptions

1. Date and Location of Test

The test was performed at RM.168, Bldg.21, No.195, Sec.4, Chung Hsing Rd., Chu Tung, Hsin Chu, Taiwan 310, R.O.C., during the period from March 11, 2019 to March 14, 2019.

2. Test Methods

2.1 The test items and test methods listed in this report have been approved by the commissioners and commissioned parties and then been adopted for the test.

2.2 The test items were carried out according to IEC 61215 : 2005.

3. Equipment of test

Standard Equipment	Serial No.	Traceability Unit	Report No.	Traceability Date	Due Date
PV reference cell	101-2008	CMS (TAF 2436)	10707C02241-1-1-04A	2018/06/15	2019/06/14
PS Load	1289	CMS	10707C04344-1-1-04A	2018/12/06	2019/12/05
PT100	#01	CMS (TAF0016)	10707C03475-1-1-03A	2018/09/20	2019/09/19
Load Cell	412490	MTC (TAF1734)	M07-09-061-01	2018/09/18	2019/09/17

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4. Environmental conditions

The test was performed under the following environmental conditions.

Ambient temperature: (25 ± 15) ℃

Relative humidity: (60 ± 20) %

5. Relative expanded uncertainty

5.1 Relative expanded uncertainty was evaluated according to "Measurement system validation procedure for maximum power measurement system", 07-3-98-0593, 4th edition, ITRI, 2015.

5.2 Relative expanded uncertainty is the product of the relative combined standard uncertainty and the coverage factor ($k = 2$), corresponding to a confidence level of approximately 95 %, I_{sc} = 2.6 %, V_{oc} = 0.63 %, I_{mp} = 2.6 %, V_{mp} = 0.72 %, P_{max} = 2.7 %, FF = 0.89 %.

III. References

1. Measurement system validation procedure for maximum power measurement system, 07-3-98-0593, 4th edition, ITRI, 2015.

2. IEC 61215 : 2005, 2nd edition, Crystalline silicon terrestrial photovoltaic (PV) modules-Design qualification and type approval.

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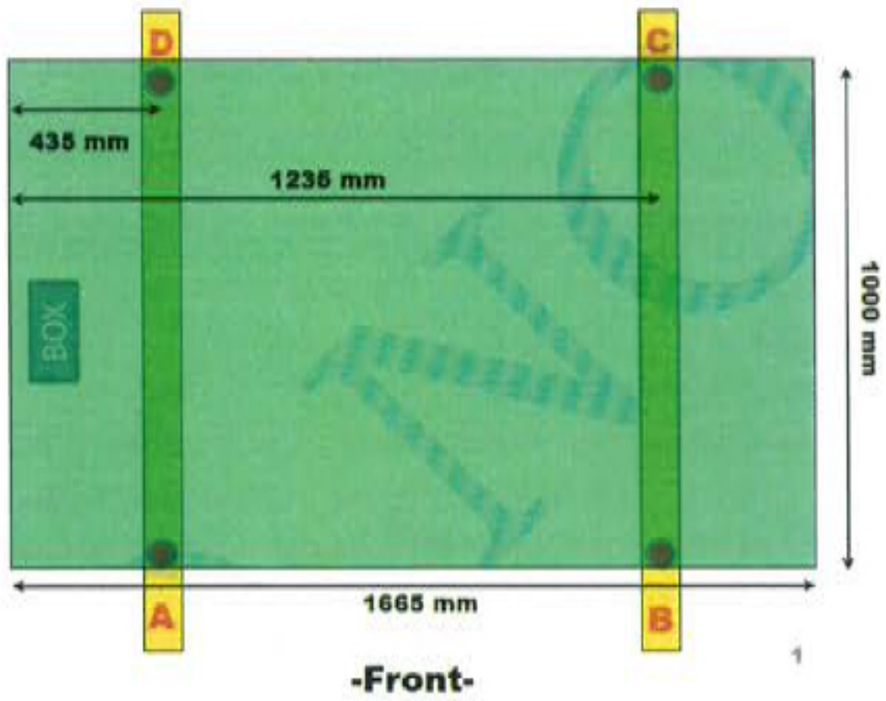

Figure 6 Module mounting setup

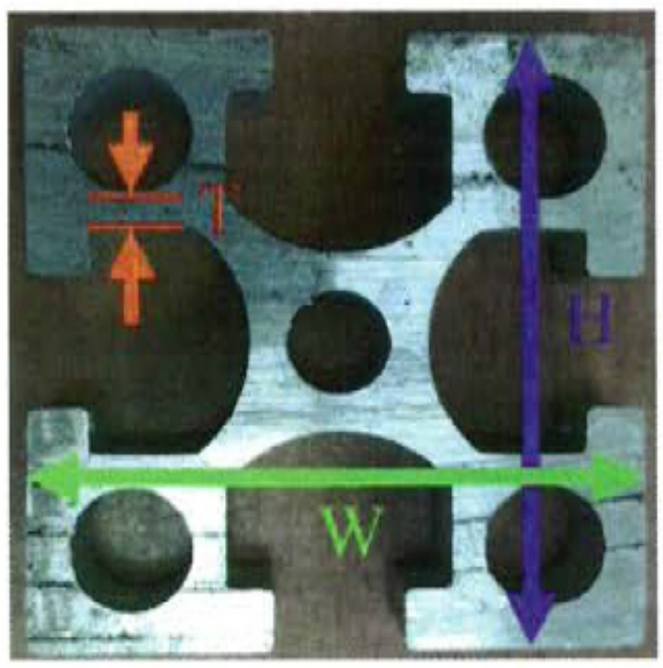

Figure 7 Aluminum extrusion diagram

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