

TEST REPORT

Application No.: SHCR2202000375HS
Applicant: Lumi United Technology Co., Ltd.
Address of Applicant: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Manufacturer: Lumi United Technology Co., Ltd.
Address of Manufacturer: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Factory: Siterwell Electronics Co., Limited
Address of Factory: No.666 Qingfeng Road, Jiangbei District, Ningbo, 315034, Zhejiang Province, China
Equipment Under Test (EUT):
EUT Name: Smart Radiator Thermostat E1
Model No.: SRTS-A01
Trade Mark: Aqara
Standard(s) : EN IEC 61000-6-3: 2021
 EN IEC 61000-6-1: 2019
Date of Receipt: 2022-02-25
Date of Test: 2022-02-25 to 2022-02-28
Date of Issue: 2022-04-02

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan

Parlam Zhan
Laboratory Manager



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Revision Record			
Version	Description	Date	Remark
00	Original	2022-04-02	

Authorized for issue by:			
		<i>Wade Zhang</i>	

		Wade Zhang/Project Engineer	
		<i>Parlam Zhan</i>	

		Parlam Zhan/Reviewer	



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2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Radiated Emissions (30MHz-1GHz)	EN IEC 61000-6-3: 2021	CISPR 16-2-3	Table 3.1	Pass

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN IEC 61000-6-1: 2019	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-6GHz)		EN IEC 61000-4-3: 2020	3V/m, 80%, 1kHz Amp. Mod.	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply:	DC 3V
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4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
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The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission at mains port using AMN	2.6dB (9kHz to 150kHz)
		2.4dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	1.8dB (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	4.2dB (150kHz to 30MHz)
4	Radiated Power	3.2dB
5	Radiated emission	4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
6	Radiated disturbance (disturbance current in a LLAS)	2.4dB (9kHz to 30MHz)

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.



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4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

• **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

None

4.6 Abnormalities from Standard Conditions

None

4.7 EMS Monitor

Visual: Working status of EUT.



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5 Equipment List

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2021/12/20	2022/12/19
EMI test receiver	Rohde & Schwarz	ESR7	SHEM201-1	2021/4/15	2022/4/14
CONTROLLER	INNCO	CO2000	SHEM047-1	N/A	N/A
ANTENNA MAST	INNCO	MA400-EP	SHEM047-2	N/A	N/A
TURN DEVICE	INNCO	DE 3600-RH	SHEM047-3	N/A	N/A
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VULB9168	SHEM048-1	2021/9/21	2023/9/20
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VULB9168	SHEM202-1	2021/5/7	2023/5/6
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2020/5/25	2023/5/24
Pre-amplifier	HP	8447D	SHEM236-1	2021/5/27	2022/5/26
Pre-amplifier	HP	8447D	SHEM143-1	2021/12/20	2022/12/19
RE test Cable	/	/	SHEM173-1&SHEM174-1	2022/1/7	2023/1/6
Test Software	ESE	e3	Version: 6.111221a	N/A	N/A

Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Electrostatic Discharge Simulator	TESEQ	NSG 437	SHEM041-2	2021/8/13	2022/8/12
Electrostatic Discharge Simulator	3CTEST	EDS20H	SHEM199-1	2021/9/29	2022/9/28

Radiated Immunity (80MHz-6GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMB100A	SHEM194-1	2021/12/20	2022/12/19
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2021/4/15	2022/4/14
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2021/4/15	2022/4/14
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Antenna	SCHWARZBECK	STLP9149	SHEM131-1	N/A	N/A
Amplifier	MILMEGA	AS0840-55-55	SHEM133-1	2021/12/20	2022/12/19
Amplifier	MILMEGA	80RF1000-250	SHEM132-1	2021/12/20	2022/12/19
Amplifier	Rohde & Schwarz	BBA150-E60	SHEM171-1	2021/12/20	2022/12/19
Power meter sensor	Rohde & Schwarz	NRP-Z22	SHEM136-1	2021/4/15	2022/4/14
ElectroMagnetic Field Probe	ETS-Lindgren	HI-6105	SHEM134-1	2021/8/6	2022/8/5
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2020/5/25	2023/5/24



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Test Software	Rohde & Schwarz	EMC32	Version: 10.20.01	N/A	N/A
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General used equipment

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Digital pressure meter	YONGZHI	DYM3-01	SHEM082-1	2021-01-22	2024-01-21
Temperature&humidity recorder	ShangHai weather meter work	ZJ 1-2B	SHEM042-1~6	2021-09-07	2022-09-06
Digital Multimeter	FLUKE	17B	SHEM043-3	2021-09-04	2022-09-03
Autoformer regulator	Guangzhou bao de	TDGC2-5KVA	SHEM150-1	N/A	N/A
Multi-purpose tong tester	FLUKE	316	SHEM001-1	2021-12-20	2022-12-19



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6 Emission Test Results

6.1 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN IEC 61000-6-3: 2021

Test Method: CISPR 16-2-3

Measurement Distance: 3m

Limit:

Test Distance: 10m

30MHz-230MHz 30 dB(μV/m) quasi-peak

230MHz-1GHz 37 dB(μV/m) quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30MHz to 1000MHz

Test Distance: 3m

30MHz-230MHz 40 dB(μV/m) quasi-peak

230MHz-1GHz 47 dB(μV/m) quasi-peak

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30MHz to 1000MHz

6.1.1 E.U.T. Operation

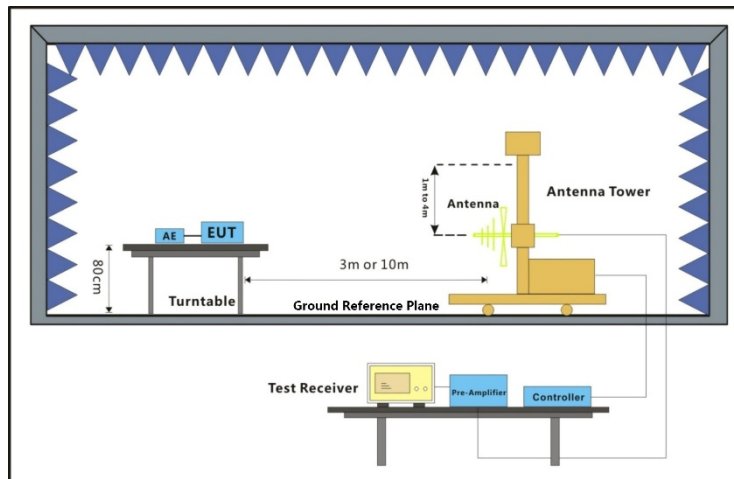
Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Normal Working_Keep the EUT working continuously.

6.1.3 Test Setup Diagram



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6.1.4 Measurement Procedure and Data

Frequency range: 30MHz-1GHz

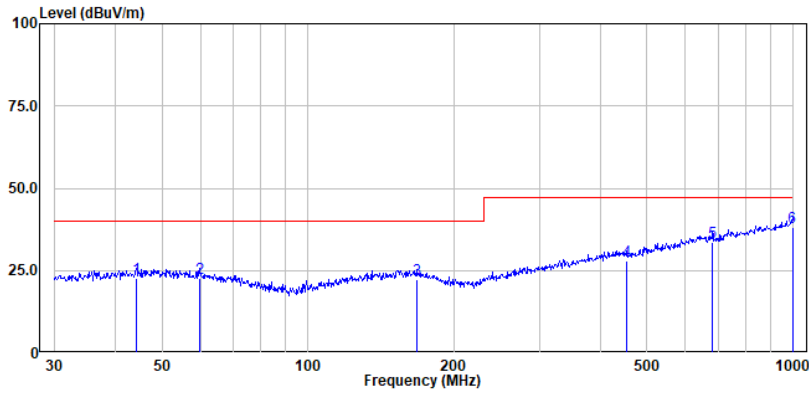
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. The red line show in graphic is the limit in standard used in this section.

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor



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Test Mode: 00; Polarity: Horizontal



Antenna Polarity :Horizontal
EUT/Project :0375HS
Test mode :00

No.	Freq (MHz)	Read level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	44.28	7.88	14.13	0.64	22.65	40.00	-17.35	QP
2	59.86	8.51	13.36	0.77	22.64	40.00	-17.36	QP
3	167.24	7.67	13.25	1.27	22.19	40.00	-17.81	QP
4	452.72	8.45	17.31	2.21	27.97	47.00	-19.03	QP
5	682.35	9.47	21.16	2.88	33.51	47.00	-13.49	QP
6	996.50	9.63	25.10	3.36	38.09	47.00	-8.91	QP

Notes: Emission Level = Read Level +Antenna Factor + Cable loss

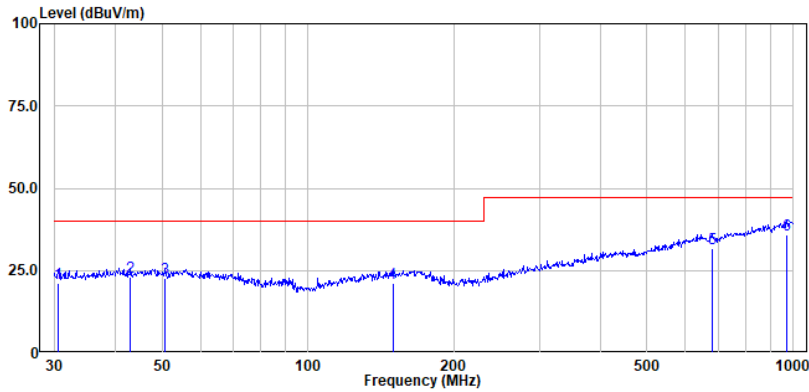


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SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. Testing Center EMC Laboratory
NO.588 West Jindu Road, Songjiang District, Shanghai, China 201612
中国·上海·松江区金都西路588号 邮编: 201612

(86-21) 61915666 (86-21) 61915678 www.sgsgroup.com.cn
(86-21) 61915666 (86-21) 61915678 e.sgs.china@sgs.com

Test Mode: 00; Polarity: Vertical



Antenna Polarity :Vertical
EUT/Project :0375HS
Test mode :00

No.	Freq (MHz)	Read level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	30.64	8.14	12.38	0.46	20.98	40.00	-19.02	QP
2	43.05	8.28	13.93	0.63	22.84	40.00	-17.16	QP
3	50.59	7.69	14.06	0.72	22.47	40.00	-17.53	QP
4	149.49	6.89	13.21	1.20	21.30	40.00	-18.70	QP
5	679.96	7.79	21.19	2.87	31.85	47.00	-15.15	QP
6	968.93	8.11	24.58	3.32	36.01	47.00	-10.99	QP

Notes: Emission Level = Read Level +Antenna Factor + Cable loss



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7 Immunity Test Results

Performance Criteria Description in EN IEC 61000-6-1:2019

Criterion A

The EUT shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Criterion B

The EUT shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Criterion C

Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.



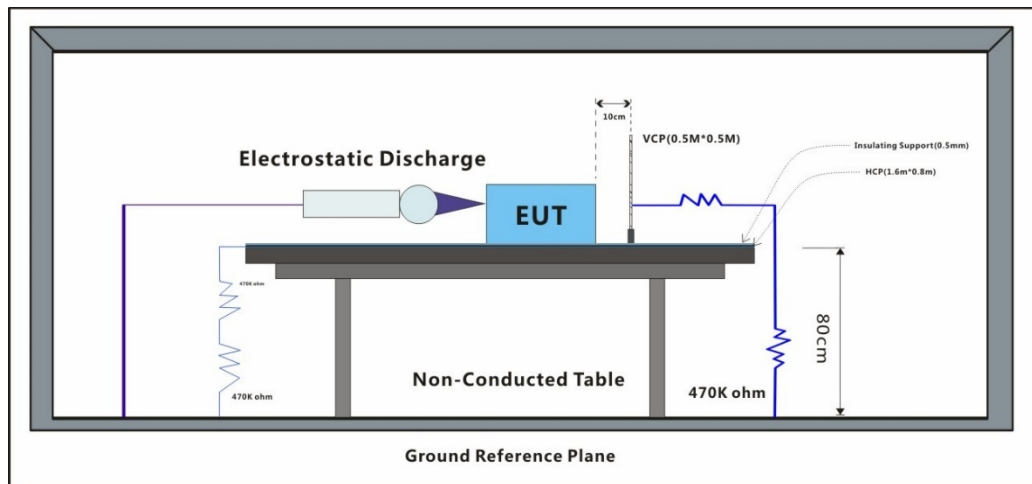
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7.1 Electrostatic Discharge

Test Requirement: EN IEC 61000-6-1: 2019

Test Method: EN 61000-4-2:2009

7.1.1 Test Setup Diagram



7.1.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.1.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Normal Working_Keep the EUT working continuously.

7.1.4 Test Condition and Results:

- Performance Criterion: B
- Discharge Impedance: 330Ω/150pF
- Number of Discharge: Minimum 10 times at each test point
- Discharge Mode: Single Discharge
- Discharge Period: 1 second minimum
- Test Point: 1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side



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Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

A: No degradation in the performance of the EUT was observed



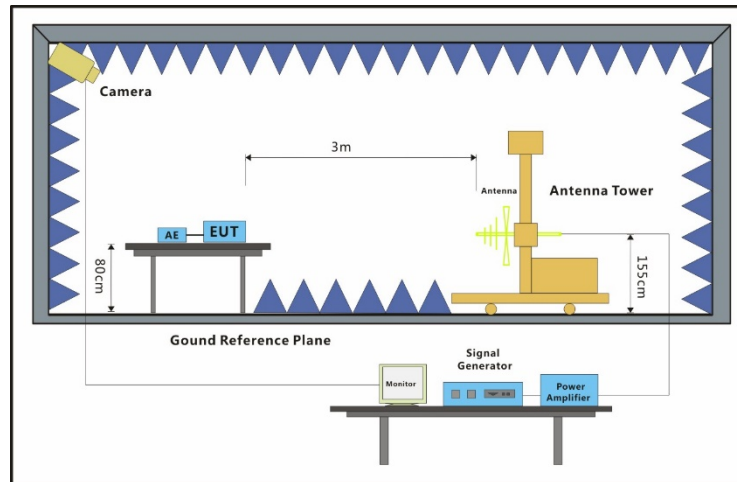
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7.2 Radiated Immunity (80MHz-6GHz)

Test Requirement: EN IEC 61000-6-1: 2019

Test Method: EN IEC 61000-4-3: 2020

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.2.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Normal Working_Keep the EUT working continuously.

7.2.4 Test Condition and Results:

Performance Criterion:A

Antenna Polarisation:Vertical and Horizontal

Modulation:1kHz,80% Amp. Mod,1% increment

Frequency Range:80MHz to 1GHz, 1.4GHz to 6GHz



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Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	3s	A
80MHz-1GHz	3	Back	3s	A
80MHz-1GHz	3	Left	3s	A
80MHz-1GHz	3	Right	3s	A
80MHz-1GHz	3	Top	3s	A
80MHz-1GHz	3	Underside	3s	A
1.4GHz-6GHz	3	Front	3s	A
1.4GHz-6GHz	3	Back	3s	A
1.4GHz-6GHz	3	Left	3s	A
1.4GHz-6GHz	3	Right	3s	A
1.4GHz-6GHz	3	Top	3s	A
1.4GHz-6GHz	3	Underside	3s	A

A: No degradation in the performance of the EUT was observed



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8 Photographs

Refer to the < Photographs >

-- End of the Report --



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