

FCC TEST REPORT

Product Name: UV Sterilization Lamp

Trademark:



Model Number: LYL-ZWXTD-01
LYL-ZWXTD-02, LYL-ZWXTD-03, LYL-ZWXTD-04,
LYL-ZWXTD-05,LYL-ZWXTD-06

Prepared For: GUANGDONG LIANGYUELIANG PHOTOELECTRIC
TECHNOLOGY CO., LTD

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Guangdong China

Manufacturer: GUANGDONG LIANGYUELIANG PHOTOELECTRIC
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Sample Received Date: Mar. 24, 2020

Sample tested Date: Mar. 24, 2020 to Mar. 30,2020

Issue Date: Mar. 30, 2020

Report No.: BCTC2003001392E

Test Standards 47 CFR FCC Part 15 Subpart B

Test Results PASS

Compiled by:



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Eric Yang

Approved by:



Zero Zhou/Manager

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
BCTC2003001392E	Mar. 30, 2020	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	Test Item	Test result
FCC 15.107	Conducted Emission	Pass
FCC 15.109	Radiated Emission	Pass

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test item	Value (dB)
Conducted Emission (150kHz-30MHz)	3.20
Radiated Emission(30MHz~1GHz)	4.80
Radiated Emission(1GHz~6GHz)	4.90

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Ratings: AC120V 60Hz

Model difference: All models are identical except for the appearance color, the test model is LYL-ZWXTD-01 and the test results are applicable to other tests.

Cable of Product

No.	Cable Type	Quantity	Provider	Length (m)	Specification	Note
1	--	--	Applicant	---	Shielded	With a ferrite ring in mid Detachable
2	--	--	BCTC	--	Unshielded	--

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

No	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	---	---	---	---	---	---

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Test Mode

Test item	Test Mode	Test Voltage
Conducted Emission (150KHz-30MHz) Class B	Working	AC 120V/60Hz*
Radiated mission(30MHz-1GHz) Class B	Working	AC 120V/60Hz
All test mode were tested and passed, only Conducted Emissions, Radiated Emissions shows (*) is the worst case mode which were recorded in this report.		

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

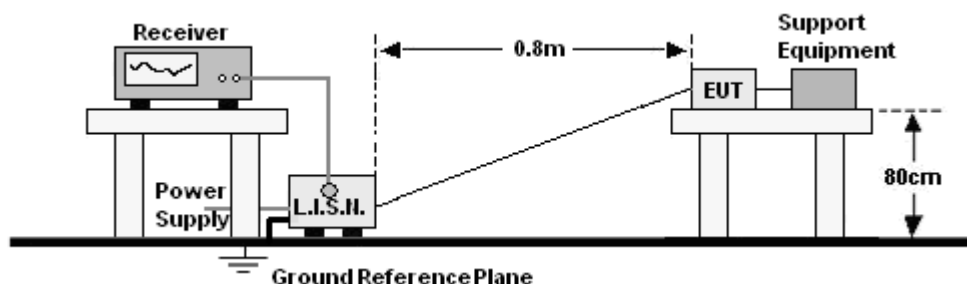
Disturbance voltages Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun.12, 2020
LISN	R&S	ENV216	101375	Jun. 13, 2019	Jun.12, 2020
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

Radiated disturbance Test (966 chamber)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	Jun. 19, 2018	Jun. 18, 2021
Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun. 12, 2020
Receiver	R&S	ESRP	101154	Jun. 13, 2019	Jun. 12, 2020
Amplifier	Schwarzbeck	BBV9744	9744-0037	Jun. 25, 2019	Jun. 24, 2020
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163-942	Jun. 22, 2019	Jun. 21, 2020
Horn Antenna	SCHWARZBECK	BBHA9120 D	1201	Jun. 22, 2019	Jun. 21, 2020
Amplifier	Schwarzbeck	BBV9718	9718-309	Jun. 25, 2019	Jun. 24, 2020
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

6. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

6.1 Block Diagram Of Test Setup

For mains ports:



6.2 Limit

Limits for Class B devices

(MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56*	56 to 46*
0,50 to 5	56	46
5 to 30	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

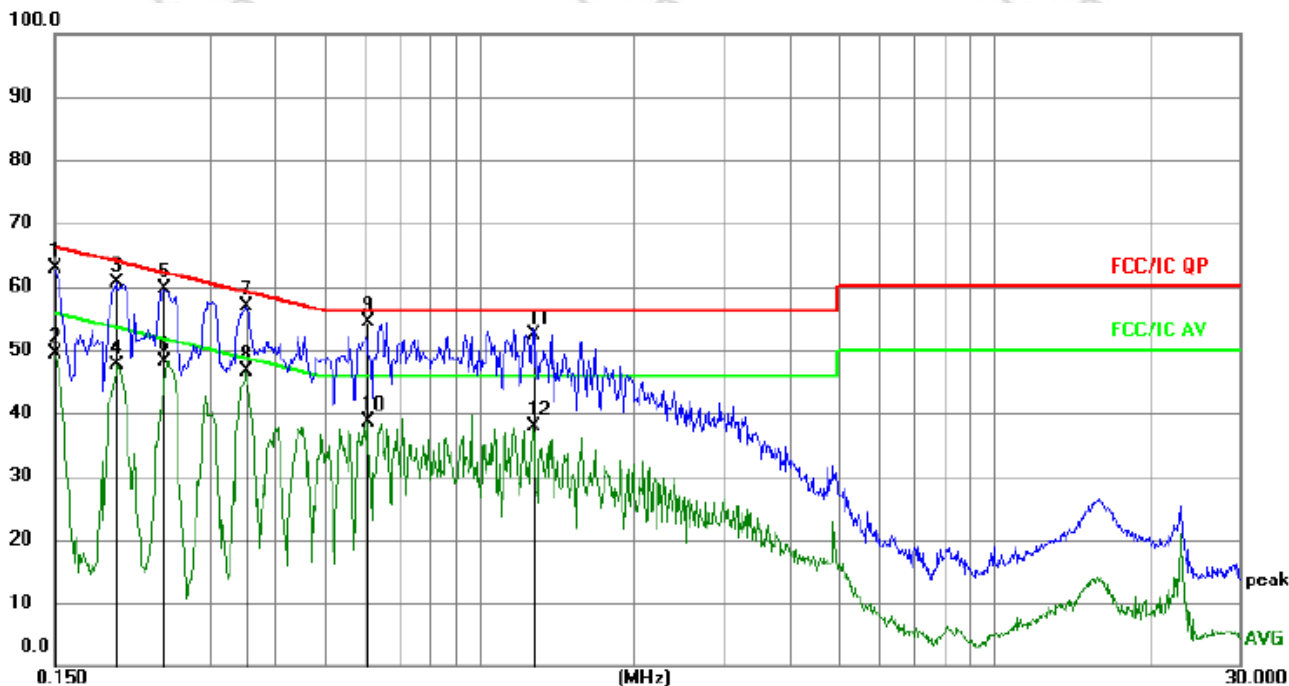
6.3 Test procedure

For mains ports:

- The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

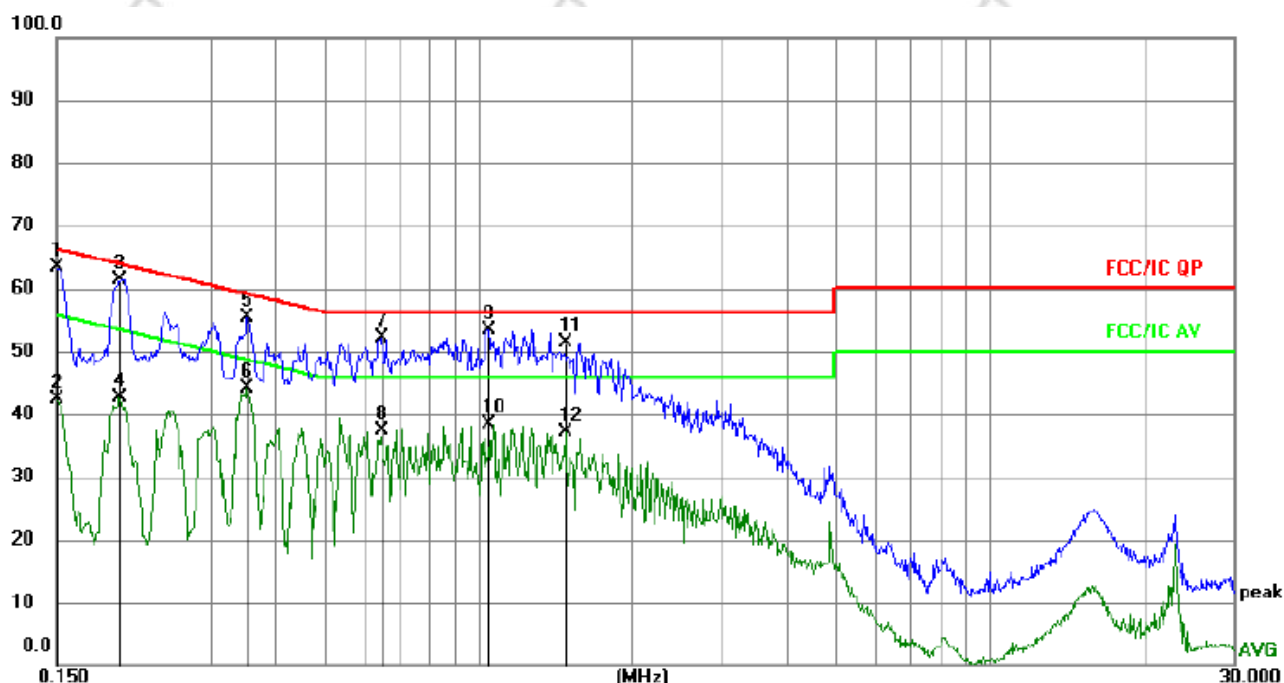
6.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC 120V/60Hz	Test Mode:	Working



No.	Mk.	Freq. MHz	Reading Level dBm	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	53.28	9.52	62.80	66.00	-3.20	QP	
2		0.1500	39.84	9.52	49.36	56.00	-6.64	AVG	
3		0.1975	51.26	9.46	60.72	63.72	-3.00	QP	
4		0.1975	38.07	9.46	47.53	53.72	-6.19	AVG	
5		0.2445	50.21	9.51	59.72	61.94	-2.22	QP	
6		0.2445	38.70	9.51	48.21	51.94	-3.73	AVG	
7		0.3525	47.43	9.54	56.97	58.90	-1.93	QP	
8		0.3525	37.05	9.54	46.59	48.90	-2.31	AVG	
9	*	0.6089	44.43	9.97	54.40	56.00	-1.60	QP	
10		0.6089	28.62	9.97	38.59	46.00	-7.41	AVG	
11		1.2749	42.83	9.58	52.41	56.00	-3.59	QP	
12		1.2749	28.25	9.58	37.83	46.00	-8.17	AVG	

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC 120V/60Hz	Test Mode:	Working



No.	Mk.	Freq. MHz	Reading Level	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1500	53.78	9.52	63.30	66.00	-2.70	QP	
2		0.1500	32.84	9.52	42.36	56.00	-13.64	AVG	
3	*	0.1995	52.04	9.46	61.50	63.63	-2.13	QP	
4		0.1995	33.07	9.46	42.53	53.63	-11.10	AVG	
5		0.3525	45.95	9.54	55.49	58.90	-3.41	QP	
6		0.3525	34.55	9.54	44.09	48.90	-4.81	AVG	
7		0.6449	42.18	9.84	52.02	56.00	-3.98	QP	
8		0.6449	27.60	9.84	37.44	46.00	-8.56	AVG	
9		1.0454	43.91	9.57	53.48	56.00	-2.52	QP	
10		1.0454	28.84	9.57	38.41	46.00	-7.59	AVG	
11		1.4819	41.90	9.58	51.48	56.00	-4.52	QP	
12		1.4819	27.66	9.58	37.24	46.00	-8.76	AVG	

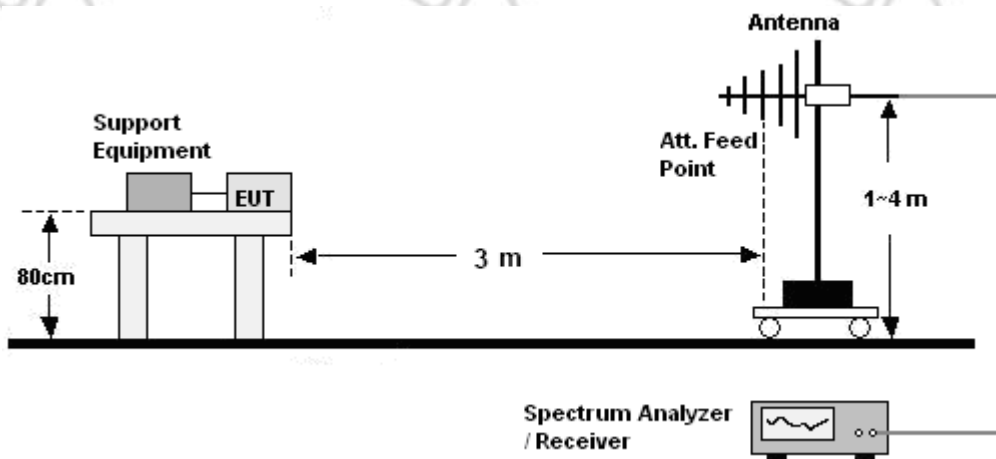
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

7. RADIATION EMISSION TEST

7.1 Block Diagram Of Test Setup

30MHz ~ 1GHz:



7.2 Limit

Limits for Class B devices

Frequency (MHz)	limits at 3m dB(μV/m)		
	QP Detector	PK Detector	AV Detector
30-88	40.0	--	--
88-216	43.5	--	--
216-960	46.0	--	--
960 to 1000	54.0	--	--
Above 1000	--	74.0	54.0

Note: The lower limit shall apply at the transition frequencies.

7.3 Test Procedure

30MHz ~ 1GHz:

- a. The Product was placed on the nonconductive turntable 0.8 m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

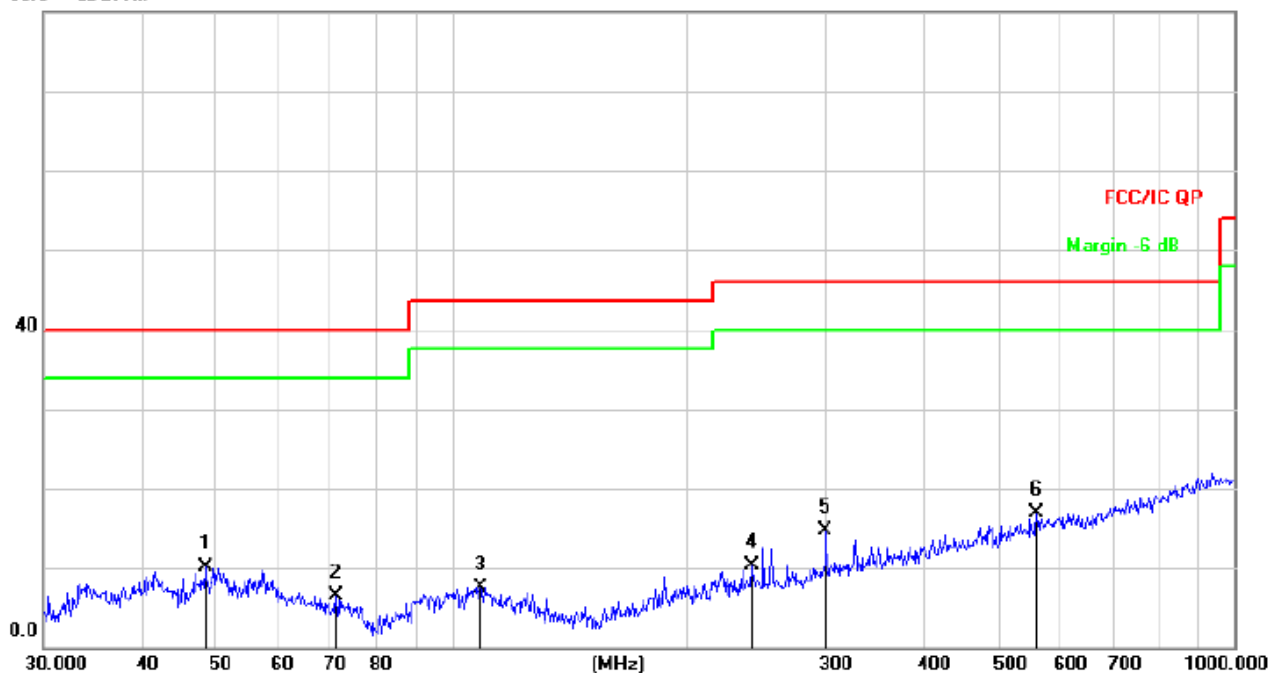
Remark:

The highest frequency of the internal sources of the EUT is less than 108 MHz, so the measurement shall only be made up to 1 GHz.

7.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Horizontal
Test Voltage :	AC 120V/60Hz	Test Mode:	Working

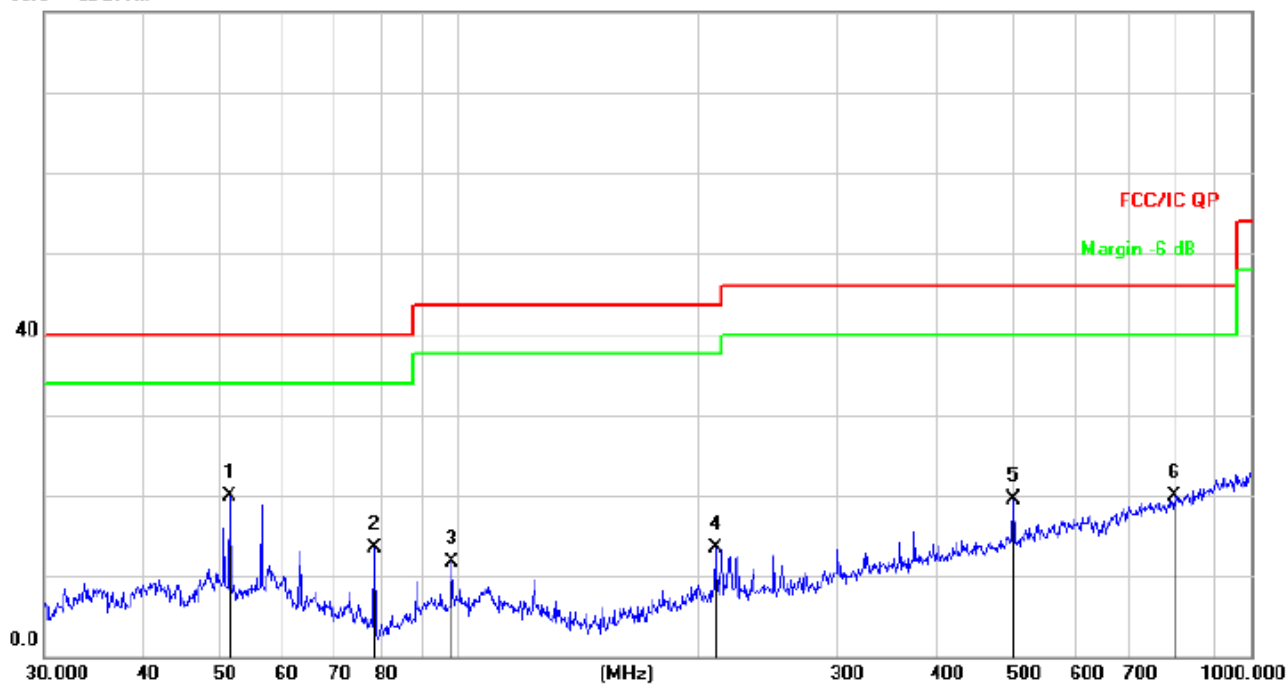
80.0 dBuV/m



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		48.3318	24.98	-14.94	10.04	40.00	-29.96	QP		
2		71.0803	24.89	-18.43	6.46	40.00	-33.54	QP		
3		108.6470	24.37	-16.84	7.53	43.50	-35.97	QP		
4		241.6763	25.68	-15.34	10.34	46.00	-35.66	QP		
5		300.3672	28.25	-13.59	14.66	46.00	-31.34	QP		
6	*	558.7302	24.45	-7.48	16.97	46.00	-29.03	QP		

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Vertical
Test Voltage :	AC 120V/60Hz	Test Mode:	Working

90.0 dBuV/m



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1	*	51.4807	34.82	-15.01	19.81	40.00	-20.19	QP		
2		78.4133	33.53	-20.06	13.47	40.00	-26.53	QP		
3		98.1419	28.39	-16.62	11.77	43.50	-31.73	QP		
4		210.7860	29.58	-16.05	13.53	43.50	-29.97	QP		
5		501.1790	28.46	-8.91	19.55	46.00	-26.45	QP		
6		798.9797	23.60	-3.65	19.95	46.00	-26.05	QP		

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

8. EUT PHOTOGRAPHS

EUT Photo 1



EUT Photo 2



EUT Photo 3



EUT Photo 4

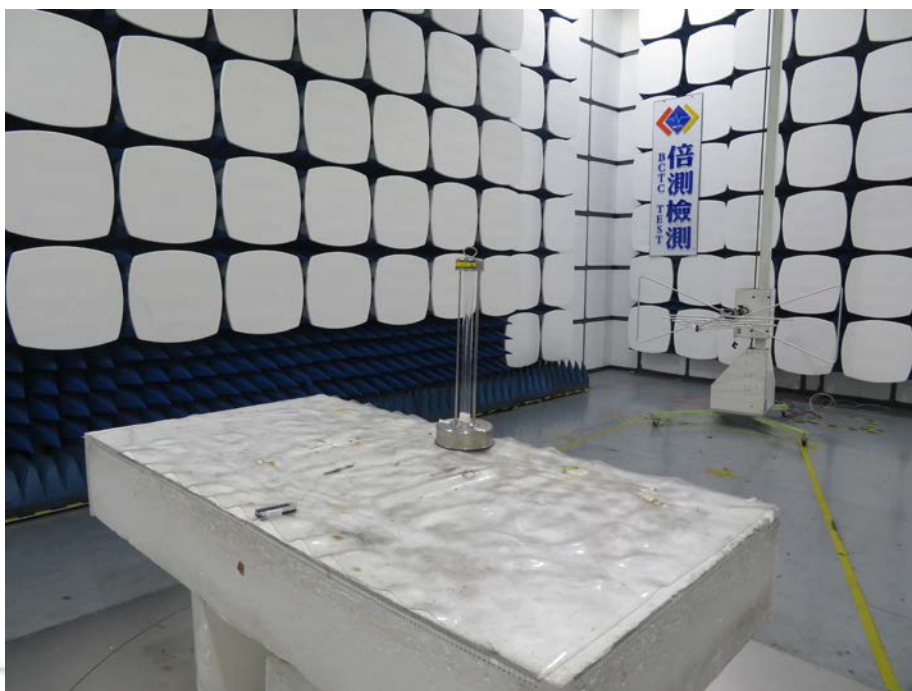


9. EUT TEST SETUP PHOTOGRAPHS

Conducted emission



Radiated emission



***** END OF REPORT *****