

FCC TEST REPORT

Product Name: Multi-functional Sterilization Box

Trademark:



Model Number: LYL-XDB-01
LYL-XDB-02, LYL-XDXB-03, LYL-XDXB-04, LYL-XDXB-05,
LYL-DGNXDX

Prepared For: GUANGDONG LIANGYUELIANG PHOTOELECTRIC
TECHNOLOGY CO., LTD

Address: Floor 6 Building 6, Changfu Urban Creative Industrial Park
XiaoXian Road, Shishan Town, Nanhai District, Foshan City,
Guangdong China

Manufacturer: GUANGDONG LIANGYUELIANG PHOTOELECTRIC
TECHNOLOGY CO., LTD

Address: Floor 6 Building 6, Changfu Urban Creative Industrial Park
XiaoXian Road, Shishan Town, Nanhai District, Foshan City,
Guangdong China

Prepared By: Shenzhen BCTC Testing Co., Ltd.

Address: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial,
Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an
District, Shenzhen, China

Sample Received Date: Mar. 24, 2020

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

Issue Date: Mar. 30, 2020

Report No.: BCTC2003001394E

Test Standards 47 CFR FCC Part 15 Subpart B

Test Results PASS

Compiled by:



Blake Cai

Reviewed by:



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
BCTC2003001394E	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-XDB-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

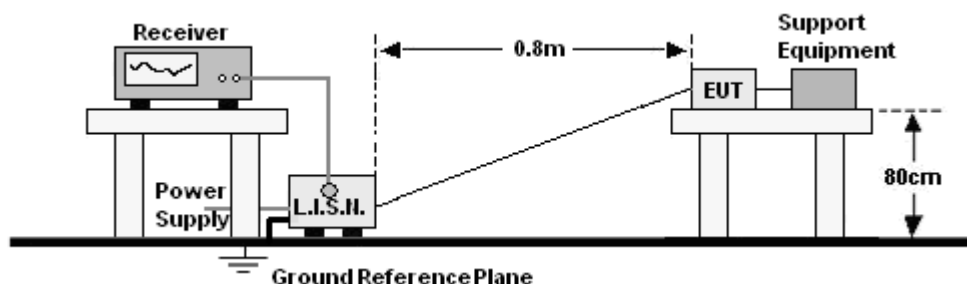
Disturbance voltages Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun.12, 2020
LISN	R&S	ENV216	101375	Jun. 13, 2019	Jun.12, 2020
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

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.

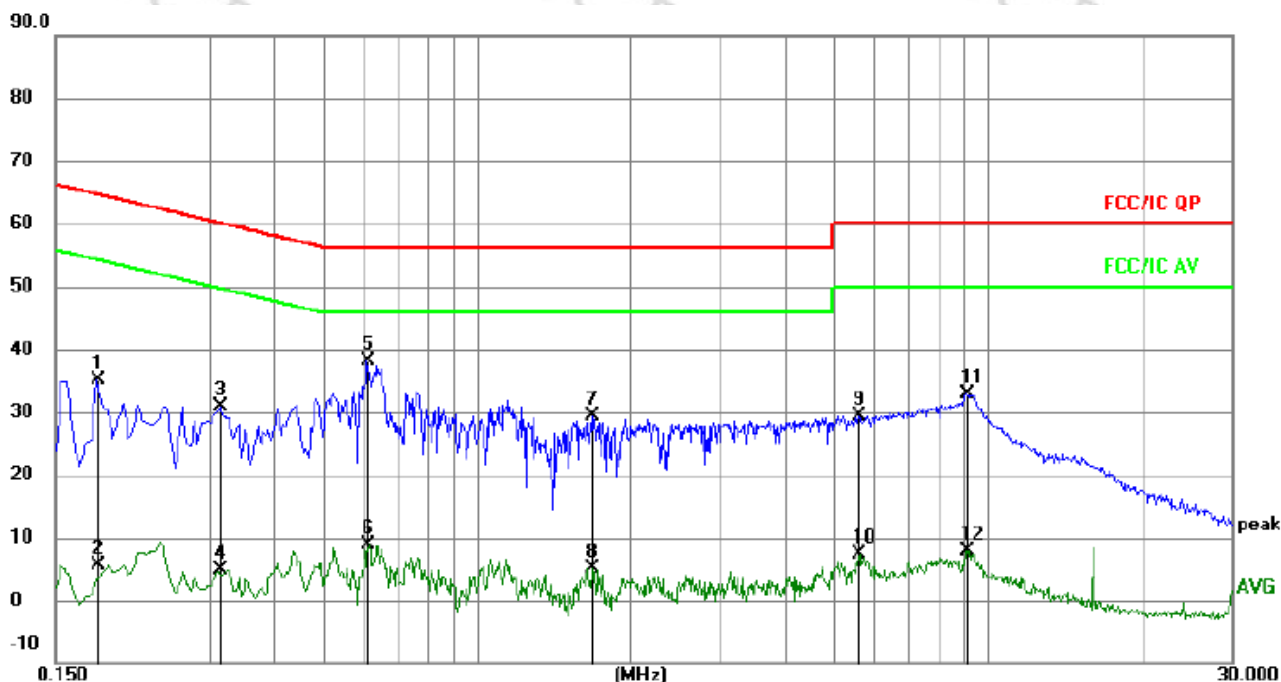
6.3 Test procedure

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.

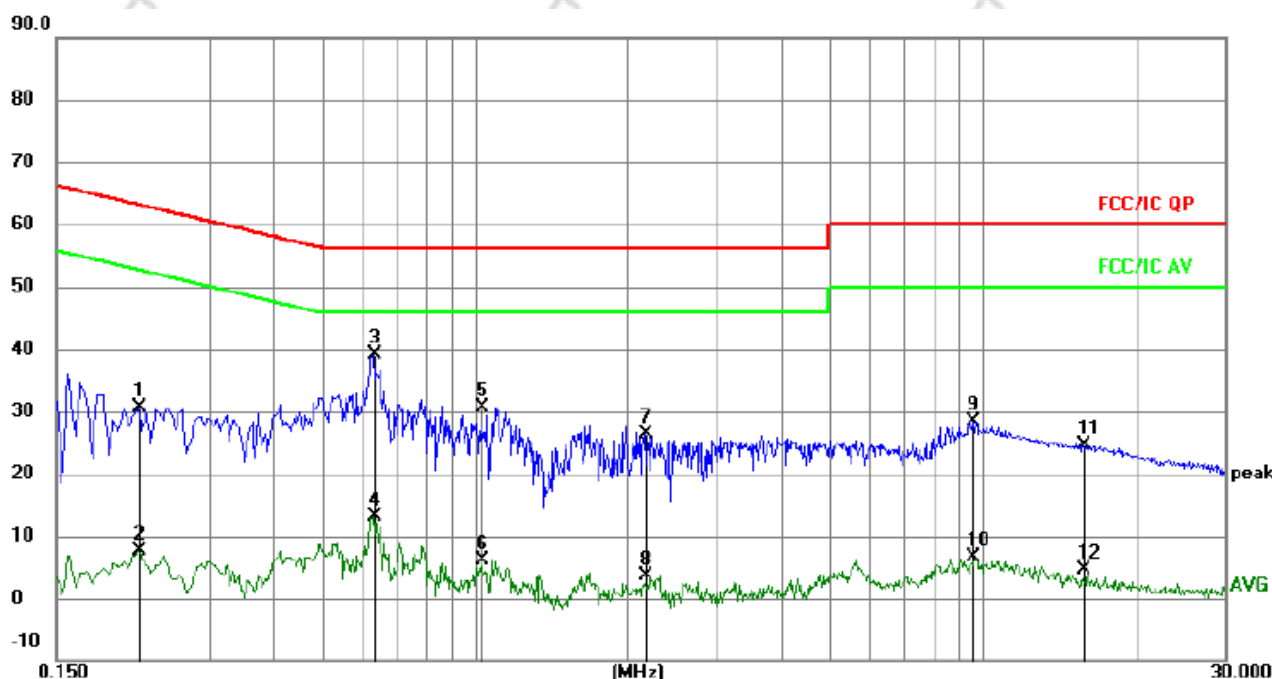
6.4 Test Result

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



No.	Mk.	Freq. MHz	Reading Level	Correct Factor	Measure- ment	Limit	Over	
1		0.1806	25.57	9.48	35.05	64.46	-29.41	QP
2		0.1806	-3.75	9.48	5.73	54.46	-48.73	AVG
3		0.3149	21.34	9.57	30.91	59.84	-28.93	QP
4		0.3149	-4.61	9.57	4.96	49.84	-44.88	AVG
5	*	0.6108	28.19	9.96	38.15	56.00	-17.85	QP
6		0.6108	-1.09	9.96	8.87	46.00	-37.13	AVG
7		1.6891	19.69	9.58	29.27	56.00	-26.73	QP
8		1.6891	-4.41	9.58	5.17	46.00	-40.83	AVG
9		5.5936	19.69	9.78	29.47	60.00	-30.53	QP
10		5.5936	-2.28	9.78	7.50	50.00	-42.50	AVG
11		9.0592	23.17	9.70	32.87	60.00	-27.13	QP
12		9.0592	-1.86	9.70	7.84	50.00	-42.16	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		0.2175	21.26	9.48	30.74	62.91	-32.17	QP	
2		0.2175	-1.88	9.48	7.60	52.91	-45.31	AVG	
3	*	0.6315	29.12	9.89	39.01	56.00	-16.99	QP	
4		0.6315	3.35	9.89	13.24	46.00	-32.76	AVG	
5		1.0320	21.02	9.57	30.59	56.00	-25.41	QP	
6		1.0320	-3.45	9.57	6.12	46.00	-39.88	AVG	
7		2.1660	16.89	9.60	26.49	56.00	-29.51	QP	
8		2.1660	-6.04	9.60	3.56	46.00	-42.44	AVG	
9		9.6000	18.80	9.69	28.49	60.00	-31.51	QP	
10		9.6000	-3.18	9.69	6.51	50.00	-43.49	AVG	
11		15.8010	14.83	9.71	24.54	60.00	-35.46	QP	
12		15.8010	-5.17	9.71	4.54	50.00	-45.46	AVG	

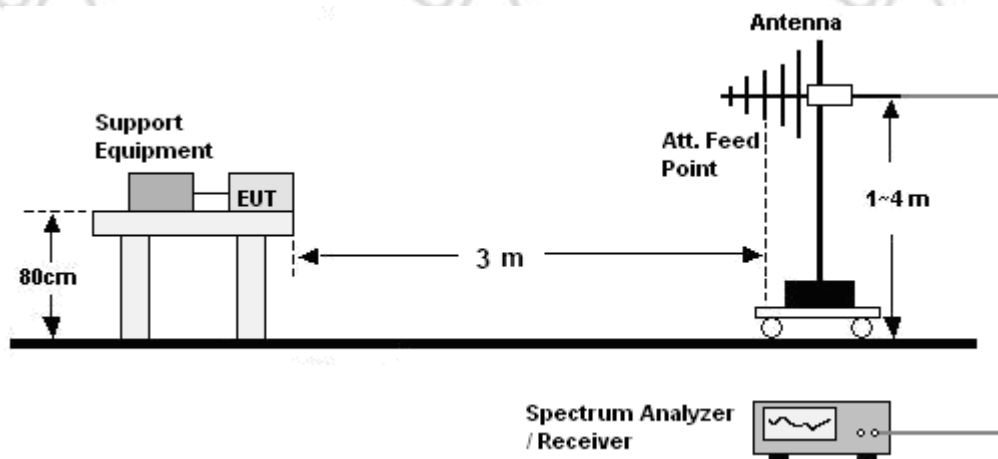
Remark:

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(μ V/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:

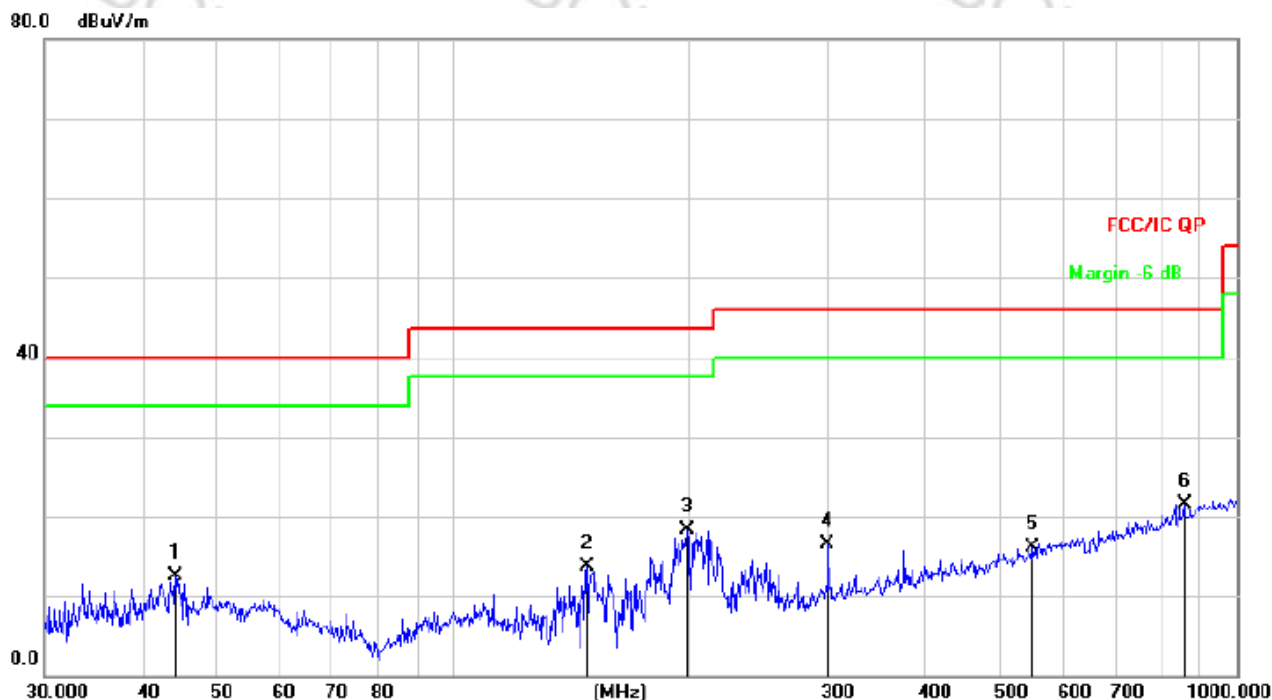
- a. The Product was placed on the nonconductive turntable 0.8 m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 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

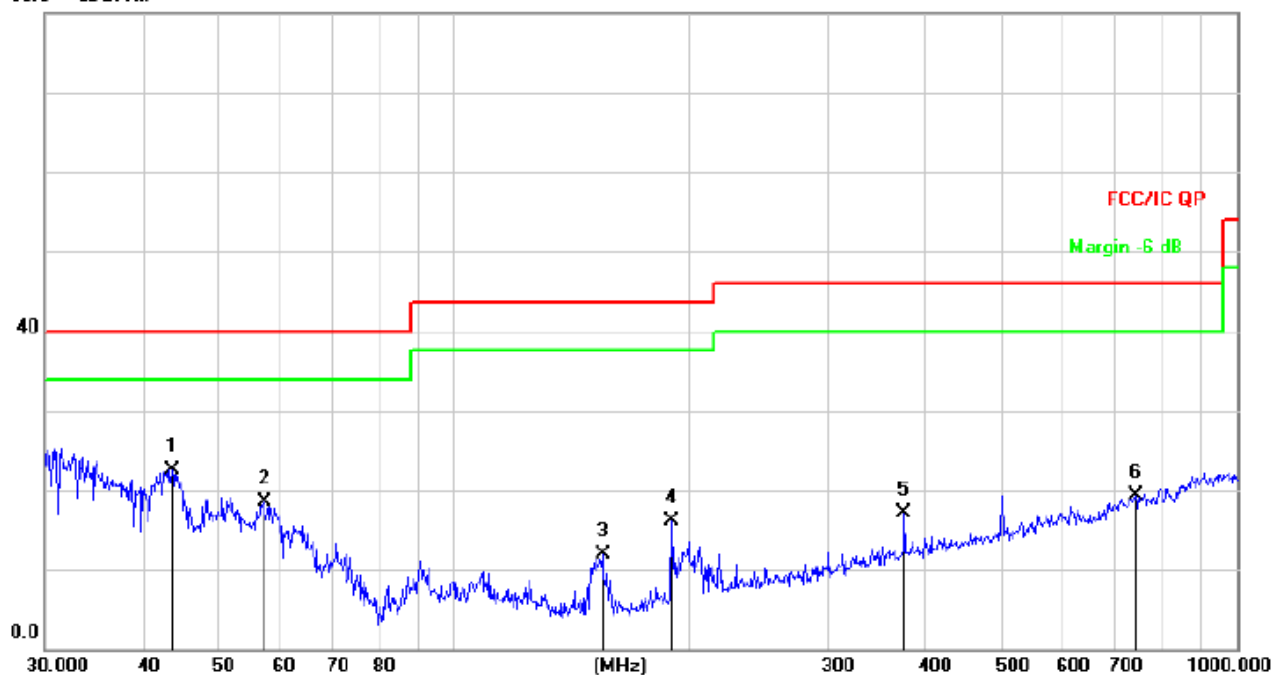
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Horizontal
Test Voltage :	AC 120V/60Hz	Test Mode:	Working



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		44.1202	27.63	-15.18	12.45	40.00	-27.55	QP		
2		147.9214	33.02	-19.37	13.65	43.50	-29.85	QP		
3		198.5880	34.70	-16.39	18.31	43.50	-25.19	QP		
4		300.3672	30.14	-13.59	16.55	46.00	-29.45	QP		
5		549.0195	23.81	-7.70	16.11	46.00	-29.89	QP		
6	*	857.0247	23.85	-2.38	21.47	46.00	-24.53	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	*	43.6584	37.72	-15.21	22.51	40.00	-17.49	QP		
2		57.1914	34.07	-15.61	18.46	40.00	-21.54	QP		
3		154.8204	31.07	-19.19	11.88	43.50	-31.62	QP		
4		189.7385	33.15	-16.96	16.19	43.50	-27.31	QP		
5		375.9385	28.73	-11.64	17.09	46.00	-28.91	QP		
6		742.2587	23.73	-4.46	19.27	46.00	-26.73	QP		

Remark:

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

8. EUT PHOTOGRAPHS

EUT Photo 1



EUT Photo 2



9. EUT TEST SETUP PHOTOGRAPHS

Conducted emission



Radiated emission



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