

FCC - TEST REPORT

Report Number : **60.790.16.111.02E01** Date of Issue : September 21, 2017

Model : Wae Outdoor 04Plus FM

Product Type : Bluetooth Speaker

Applicant : Guillemot Corporation S.A.

Address : Place du Granier BP 97143, 35571 Chantepie, FRANCE

Production Facility : Guillemot Corporation S.A.

Address : Place du Granier BP 97143, 35571 Chantepie, FRANCE

Test Result : Positive Negative

Total pages including Appendices : 32

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2. Details about the Test Laboratory

Details about the Test Laboratory

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
 Building 12&13, Zhiheng Wisdomland Business Park,
 Nantou Checkpoint Road 2, Nanshan District,
 Shenzhen City, 518052,
 P. R. China

FCC Registration Number: 514049

Telephone: 86 755 8828 6998
 Fax: 86 755 8828 5299

3. Description of Equipment Under Test

Description of the Equipment Under Test

Product: Bluetooth Speaker

Model no.: Wae Outdoor 04Plus FM

Rating: 1) 3.7VDC (1 x 3.7VDC Rechargeable battery)
 2) 5.0VDC (USB port)

4. Summary of Test Standards

Test Standards	
FCC Part 15 Subpart B 10-1-16 Edition	Unintentional Radiators

5. Summary of Test Results

Emission Tests				
FCC Part 15 Subpart B				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.109 Radiated Emission 30MHz-1000MHz	7-13	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.107 Conduct Emission 150kHz-30MHz	14-20	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. General Remarks

Remarks

NIL

SUMMARY:

- All tests according to the regulations cited on page 5 were

■ - Performed

□ - **Not** Performed

- The Equipment Under Test

■ - **Fulfills** the general approval requirements.

□ - **Does not** fulfill the general approval requirements.

Sample Received Date: July 3, 2017

Testing Start Date: July 4, 2017

Testing End Date: August 11, 2017

- TÜV SÜD HONG KONG LTD. -

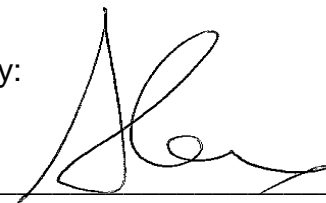
Reviewed by:



CHAN Kwong Ngai
EMC Test Engineer



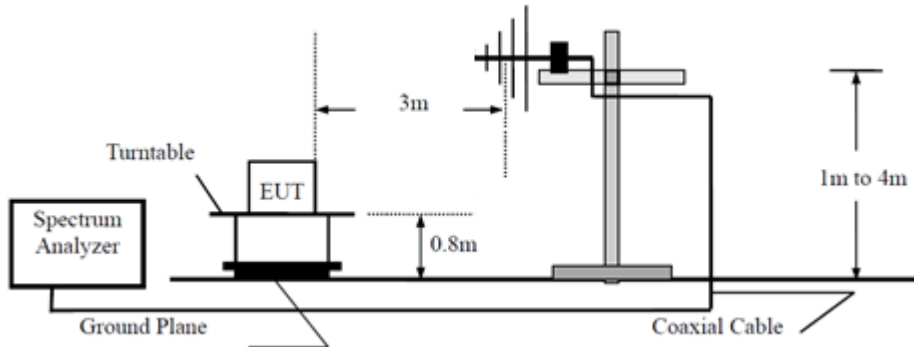
Prepared by:



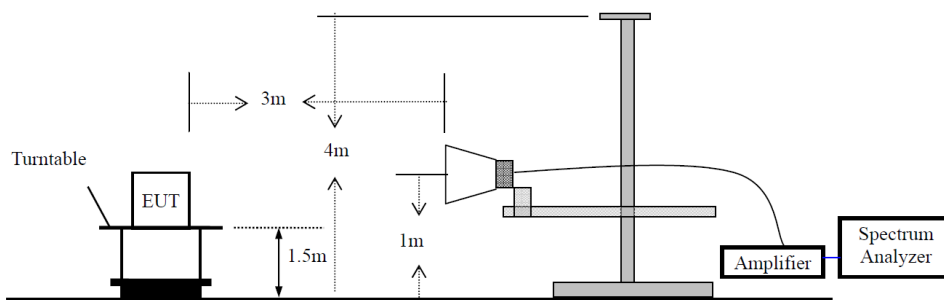
Alex CHAN
EMC Project Engineer

7. Test Setups

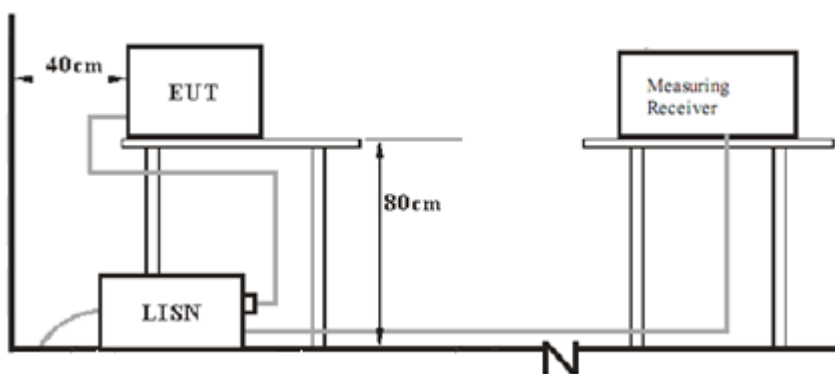
7.1. Below 1GHz



7.2. Above 1GHz



7.3. AC Power Line Conducted Emission test setups



8. Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO. (SHIELD)	S/N (LENGTH)	PARAMETERS
Notebook	---	---	-	---
Adapter	Apple Inc	A1357	1.2 M	input: 100-240VAC, 0.45A, 50-60Hz output: 5.1VDC, 2.1A

The device was charging form external adapter

9. Emission Test Results

9.1. Conducted Emission Test

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

Limit

According to §15.107, conducted emissions limit as below:

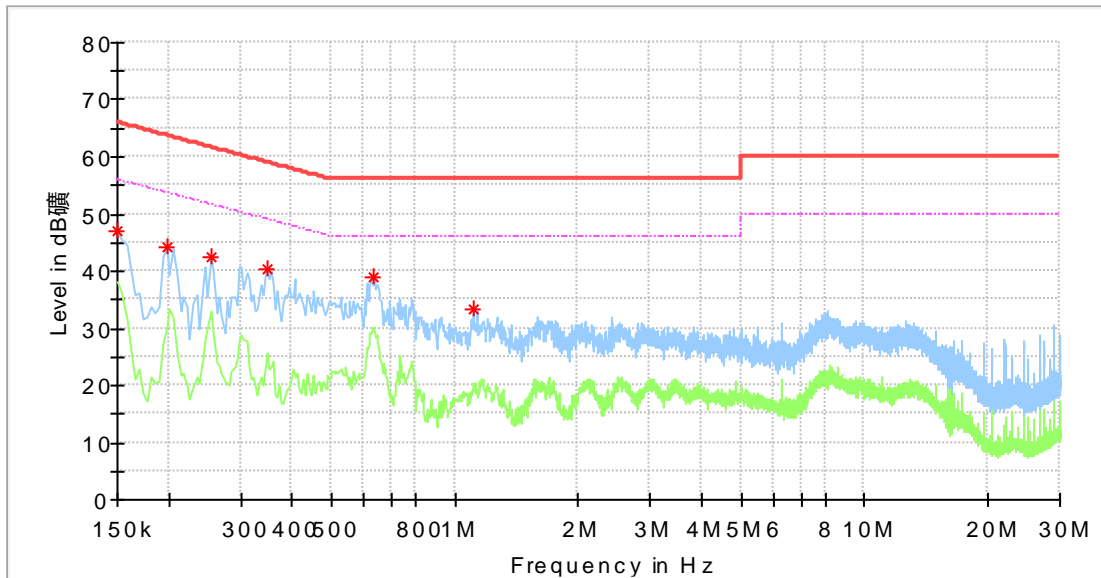
Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

*Decreasing linearly with logarithm of the frequency

Conducted Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: Charging
 Test Specification: AC Mains, L Line
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

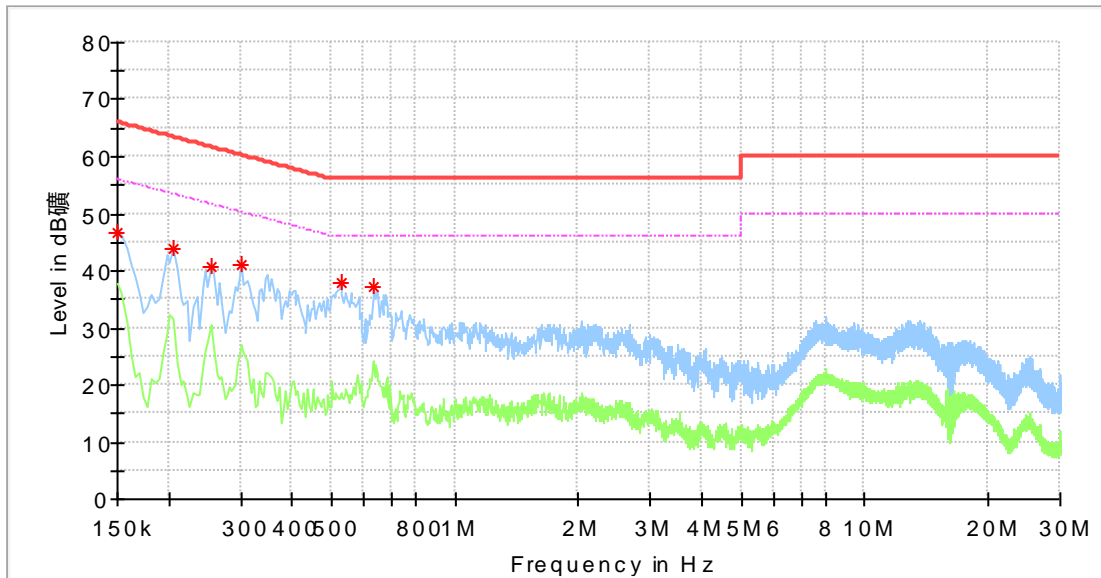


Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.182000	38.68	---	64.39	-25.71
0.218000	39.20	---	62.89	-23.70
0.254000	38.16	---	61.63	-23.46
0.626000	34.60	---	56.00	-21.40
2.154000	24.84	---	56.00	-31.16
8.002000	30.93	---	60.00	-29.07

Conducted Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: Charging
 Test Specification: AC Mains, N Line
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
☒	Passed
☐	Not Passed



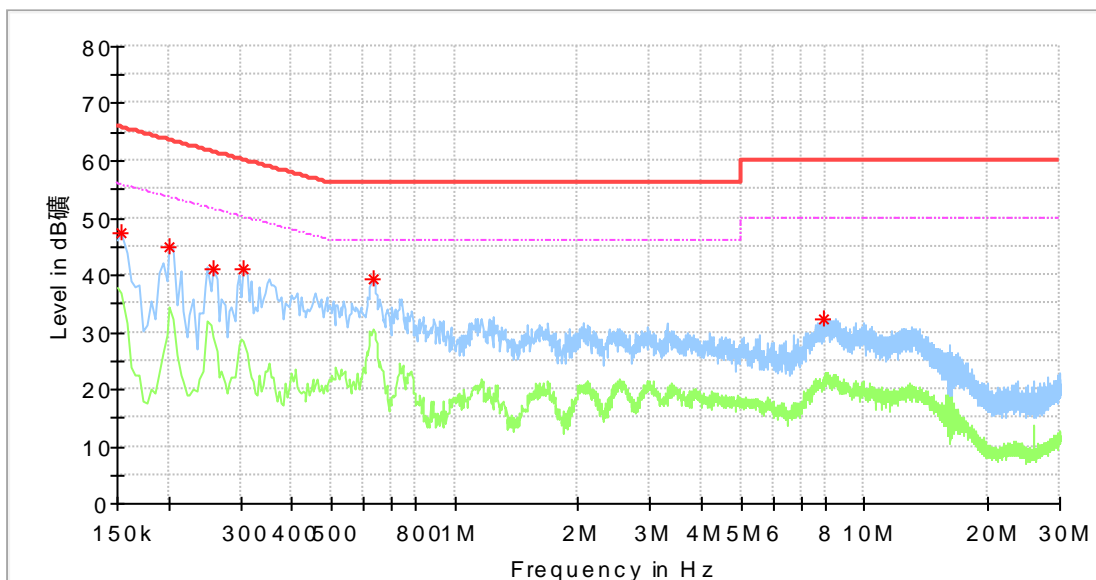
Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.150000	46.69	---	66.00	-19.31
0.206000	43.88	---	63.37	-19.48
0.254000	40.73	---	61.63	-20.89
0.302000	41.09	---	60.19	-19.10
0.526000	37.73	---	56.00	-18.27
0.634000	37.29	---	56.00	-18.71



Conducted Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: FM
 Test Specification: AC Mains, L Line
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

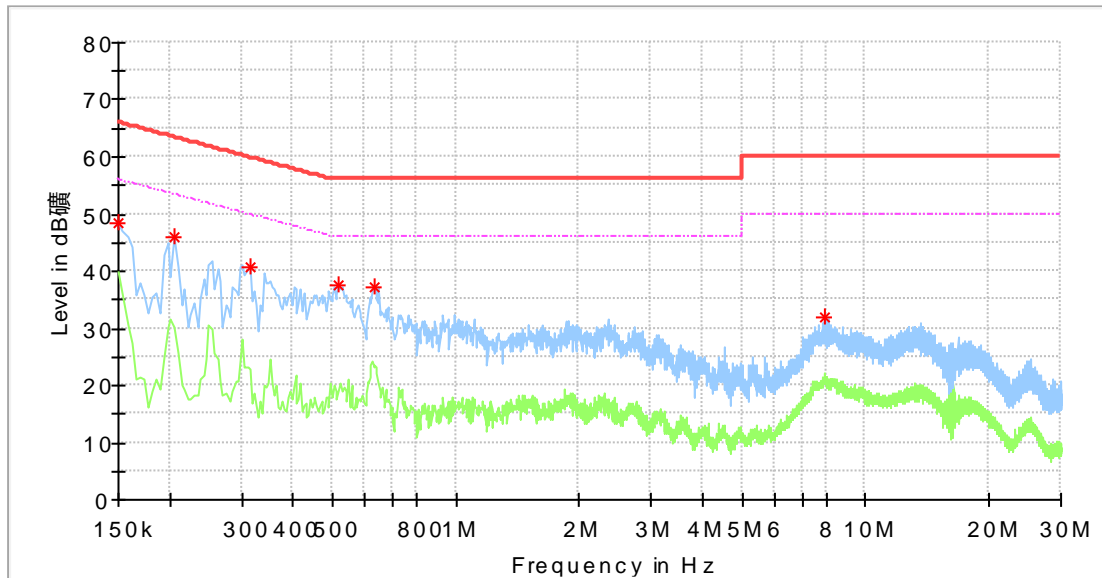


Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.154000	47.33	---	65.78	-18.45
0.202000	44.98	---	63.53	-18.55
0.258000	40.91	---	61.50	-20.58
0.306000	40.96	---	60.08	-19.11
0.630000	39.15	---	56.00	-16.85
7.990000	32.45	---	60.00	-27.55

Conducted Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: FM
 Test Specification: AC Mains, N Line
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

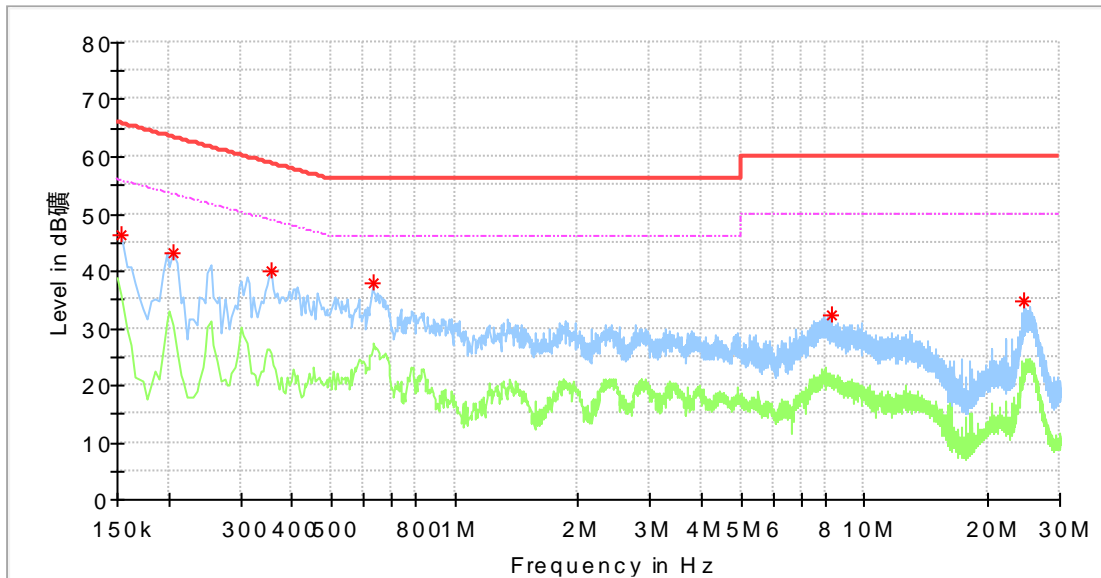


Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.150000	48.42	---	66.00	-17.58
0.206000	45.81	---	63.37	-17.56
0.314000	40.63	---	59.86	-19.23
0.518000	37.41	---	56.00	-18.59
0.634000	37.29	---	56.00	-18.71
7.966000	32.02	---	60.00	-27.98

Conducted Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: AUX-IN
 Test Specification: AC Mains, L Line
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
☒	Passed
☐	Not Passed



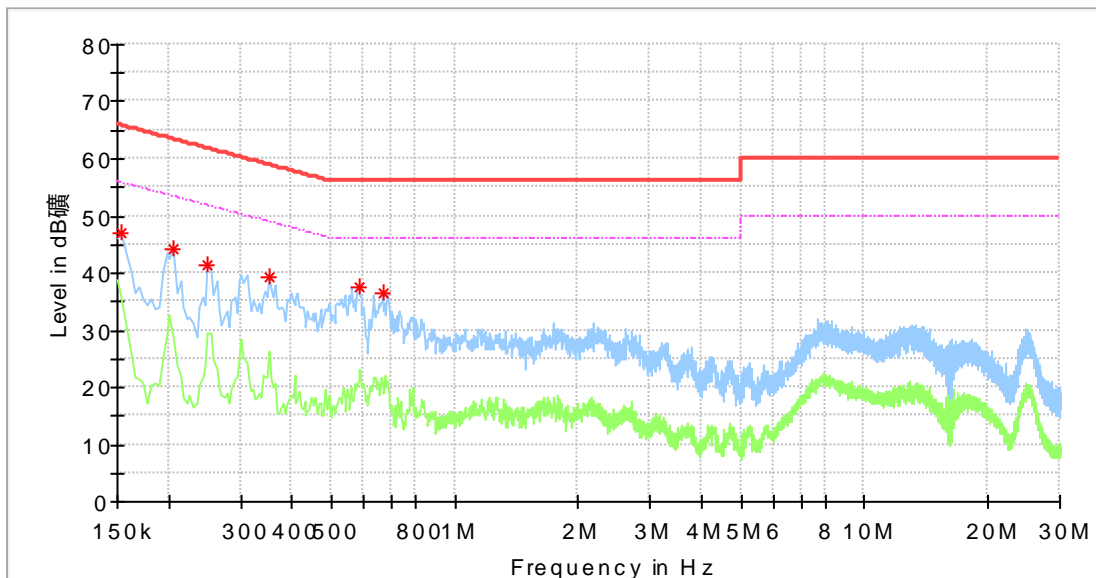
Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.154000	46.35	---	65.78	-19.44
0.206000	43.29	---	63.37	-20.07
0.358000	40.11	---	58.77	-18.67
0.630000	37.94	---	56.00	-18.06
8.314000	32.45	---	60.00	-27.55
24.518000	34.67	---	60.00	-25.33



Conducted Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: AUX-IN
 Test Specification: AC Mains, N Line
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.154000	46.91	---	65.78	-18.87
0.206000	44.25	---	63.37	-19.11
0.250000	41.29	---	61.76	-20.47
0.354000	39.31	---	58.87	-19.56
0.582000	37.55	---	56.00	-18.45
0.666000	36.60	---	56.00	-19.40

9.2. Radiated Emission Test 30MHz – 1000MHz

Test Method

- 1: The EUT was placed on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2: The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
- 3: The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4: For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5: Use the following spectrum analyzer settings According to C63.10:
For Above 1GHz
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 1MHz, VBW \geq RBW for peak measurement and VBW = 10Hz for average measurement,
Sweep = auto, Detector function = peak, Trace = max hold.

For Below 1GHz

Use the following spectrum analyzer settings:

- Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 KHz, VBW \geq RBW for peak measurement, Sweep = auto, Detector function = peak,
Trace = max hold.

Note:

- 1: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
- 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).
- 4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz

Limits

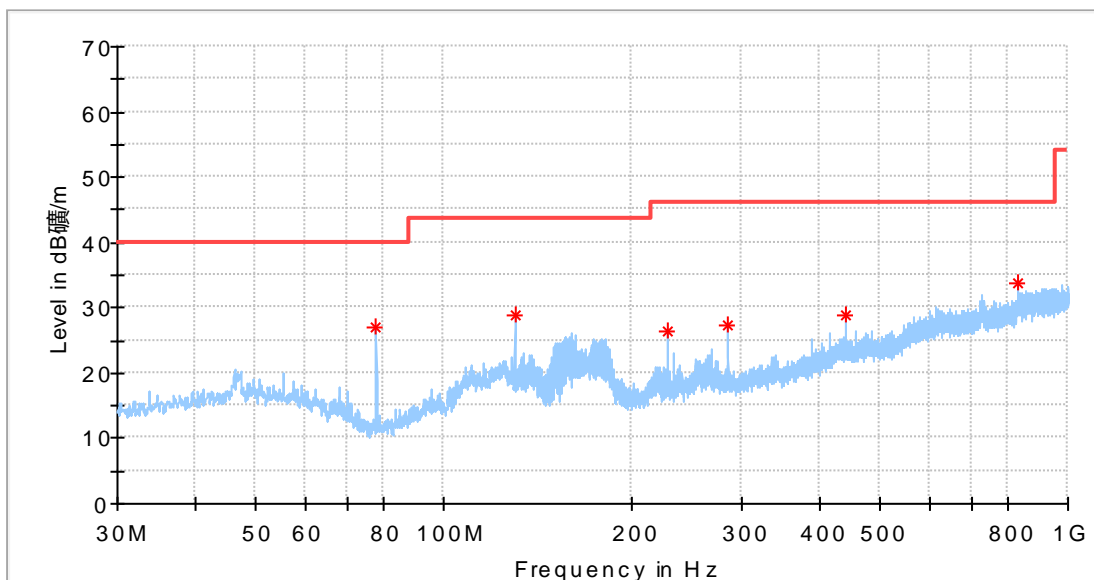
The radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section 15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dB μ V/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

Radiated Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: Charging
 Test Specification: Antenna: Horizontal
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



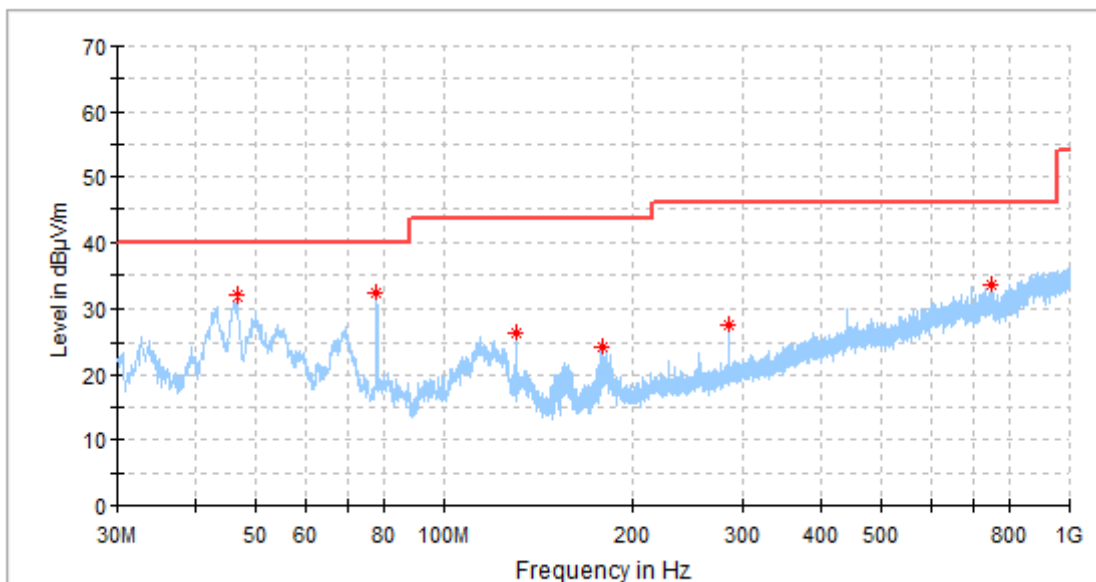
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
77.954375	26.95	40.00	-13.05
129.970625	28.85	43.50	-14.65
228.001250	26.50	46.00	-19.50
285.958750	27.43	46.00	-18.57
442.007500	28.94	46.00	-17.06
831.523125	33.63	46.00	-12.37



Radiated Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: Charging
 Test Specification: Antenna: Vertical
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

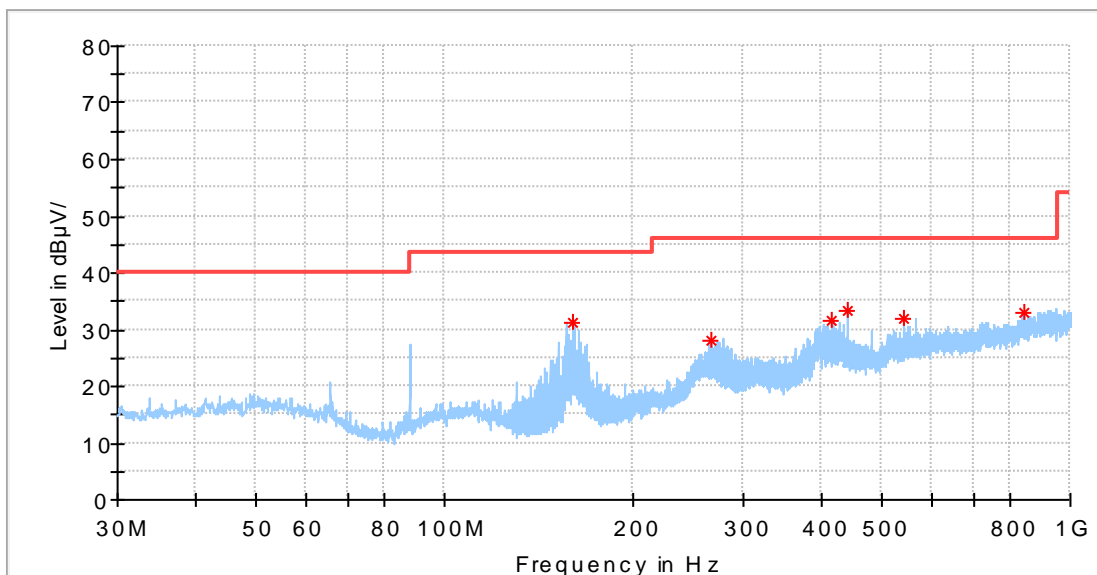


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
46.671875	32.06	40.00	-7.94
77.999062	32.63	40.00	-7.37
129.970625	26.37	43.50	-17.13
179.016250	24.40	43.50	-19.10
285.958750	27.76	46.00	-18.24
748.103125	33.42	46.00	-12.58

Radiated Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: FM
 Test Specification: Antenna: Horizontal
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

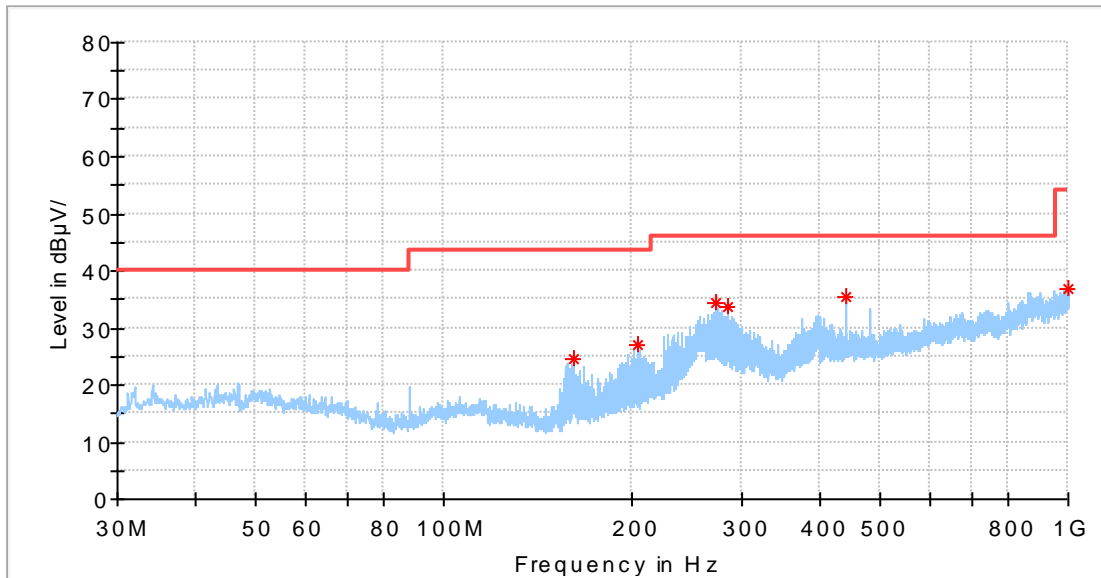


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
160.707500	31.31	43.5	-12.19
267.528750	28.06	46	-17.94
416.908750	31.61	46	-14.39
442.007500	33.34	46	-12.66
542.281250	32.05	46	-13.95
845.406250	33.07	46	-12.93

Radiated Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: FM
 Test Specification: Antenna: Vertical
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

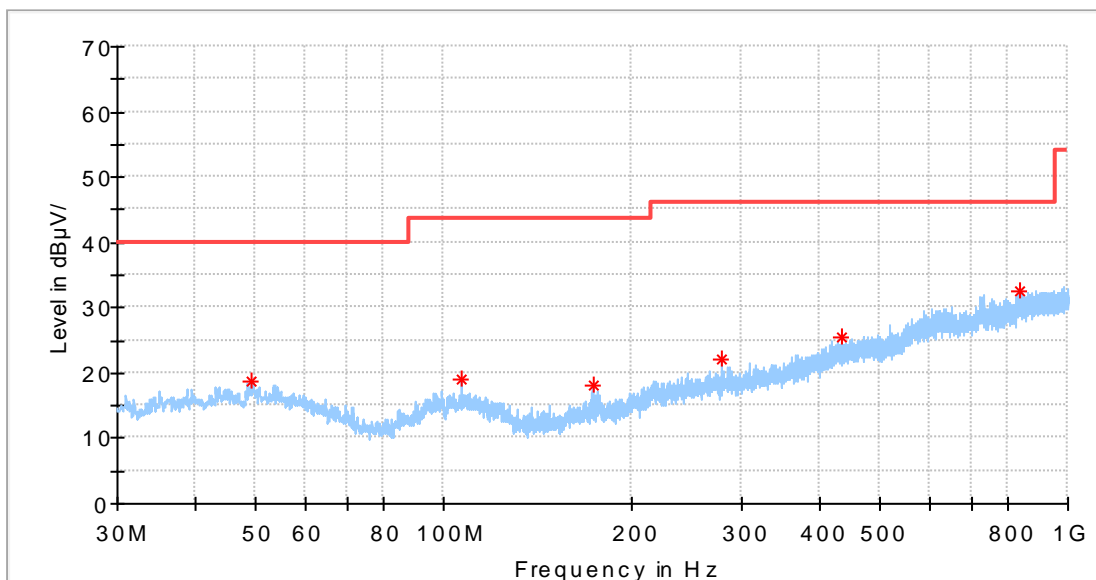


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
160.950000	24.64	43.5	-18.86
204.903125	27.02	43.5	-16.48
272.318125	34.31	46	-11.69
285.958750	33.67	46	-12.33
442.007500	35.61	46	-10.39
997.575000	36.76	54	-17.24

Radiated Emission

EUT: Wae Outdoor 04Plus FM
 Op Condition: AUX-IN
 Test Specification: Antenna: Horizontal
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

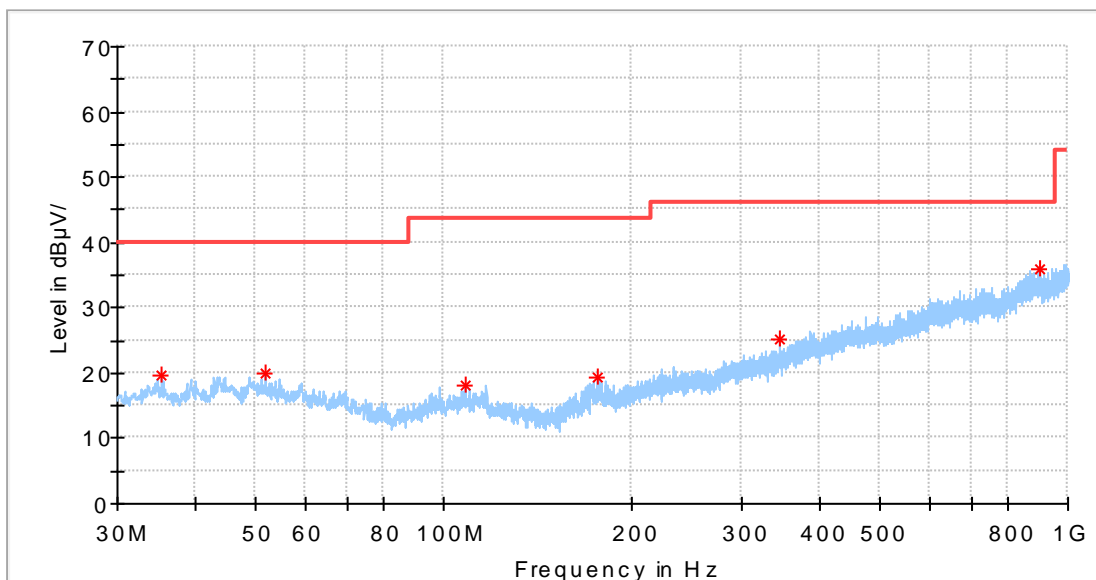


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
49.096875	18.65	40.00	-21.35
106.811875	19.03	43.50	-24.47
173.256875	18.19	43.50	-25.31
278.926250	22.25	46.00	-23.75
433.156250	25.52	46.00	-20.48
834.554375	32.67	46.00	-13.33

Radiated Emission

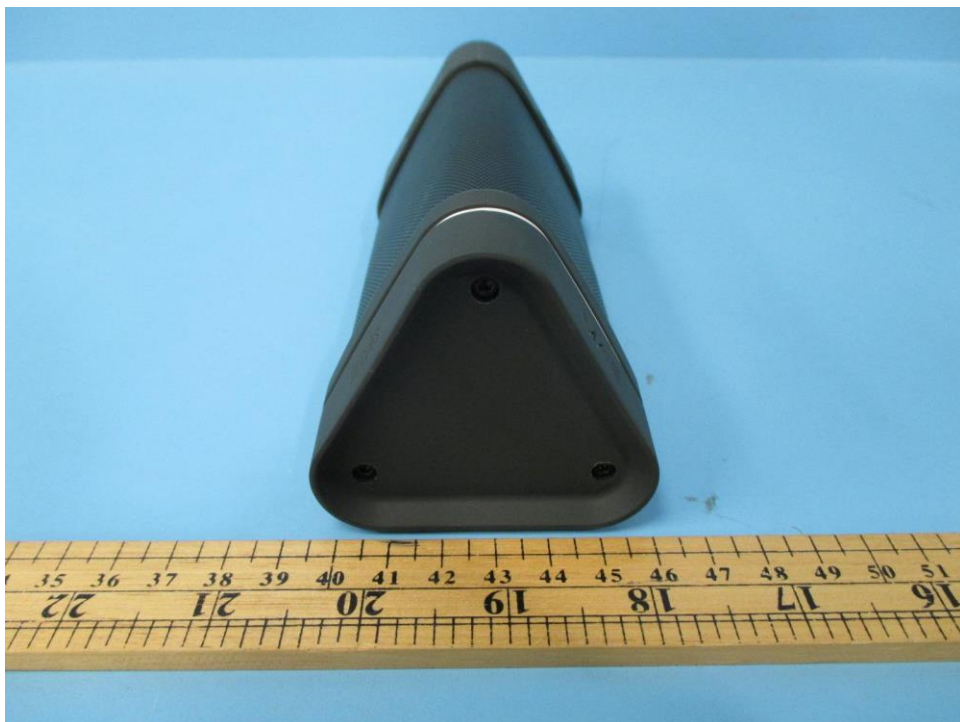
EUT: Wae Outdoor 04Plus FM
 Op Condition: AUX-IN
 Test Specification: Antenna: Vertical
 Comment: 120VAC, 60Hz (From external adaptor)

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

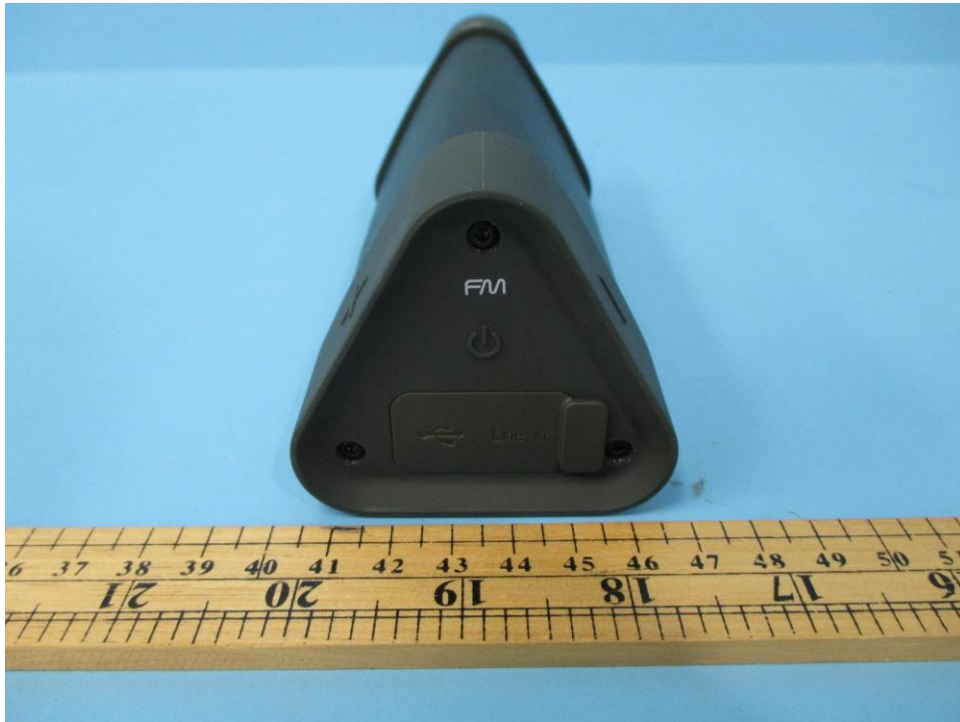


Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
35.395625	19.66	40.00	-20.34
51.764375	19.96	40.00	-20.04
108.266875	18.03	43.50	-25.47
177.015625	19.35	43.50	-24.15
344.704375	25.20	46.00	-20.80
900.756875	35.99	46.00	-10.01

10. Appendix A - Photographs of EUT



Appendix A



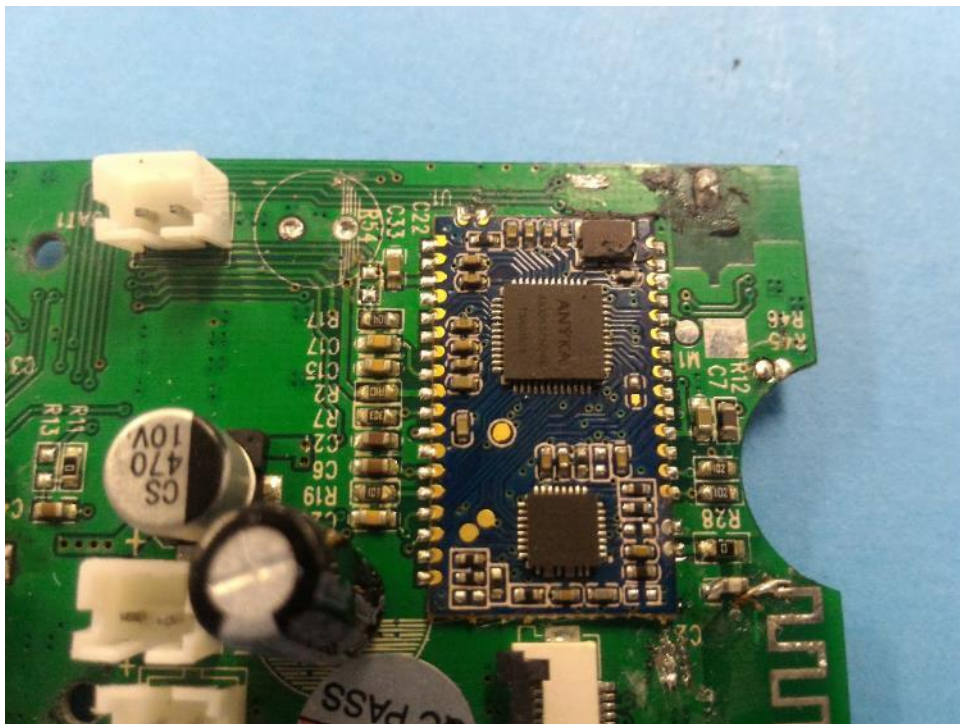
Appendix A



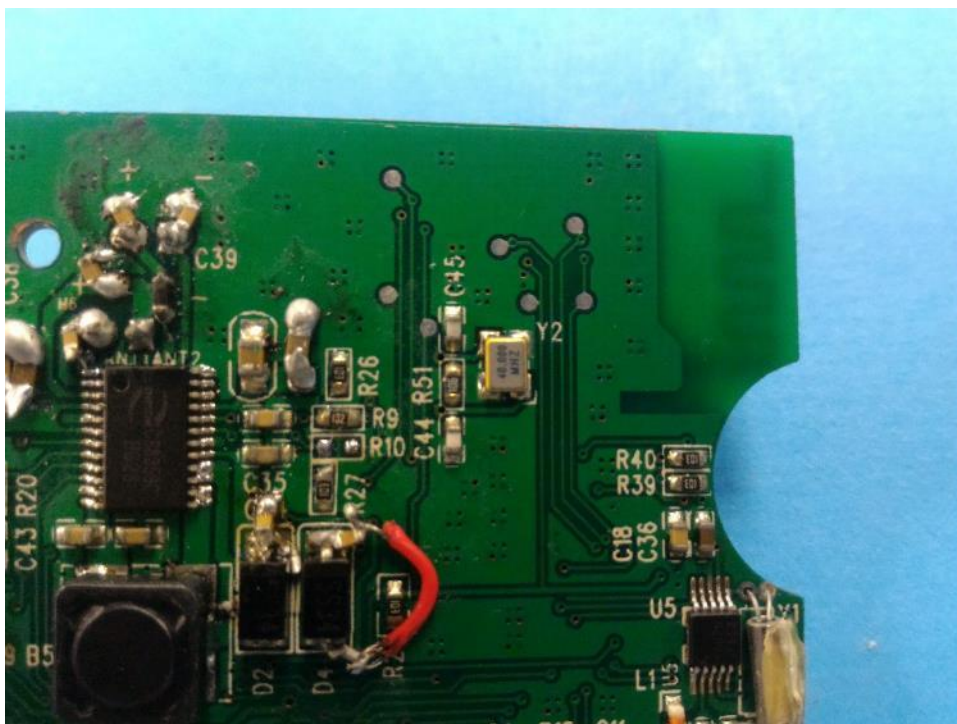
Appendix A



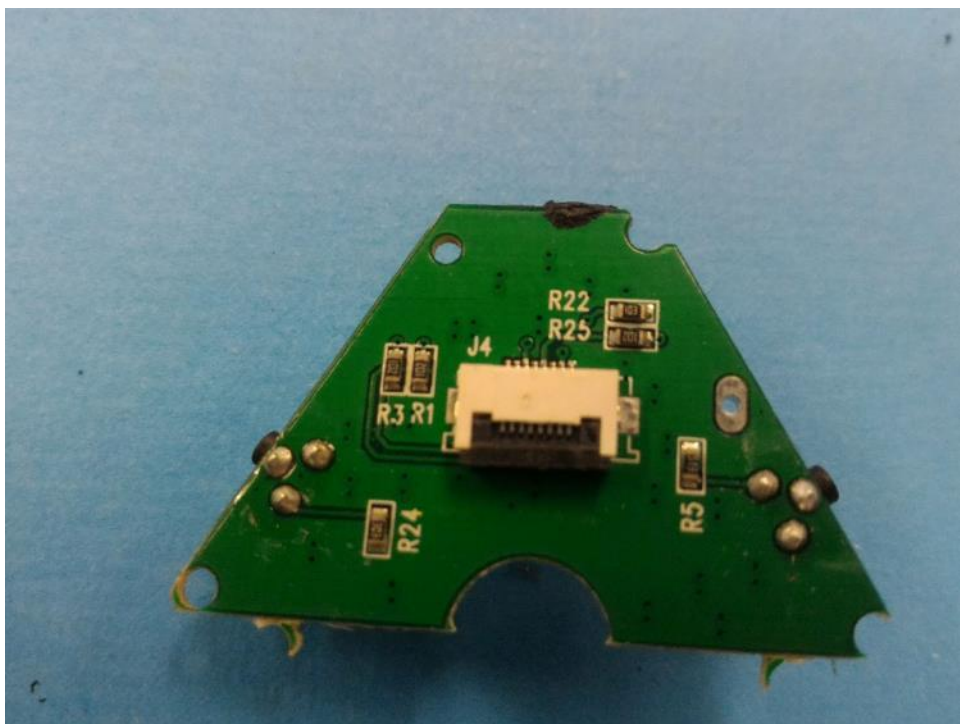
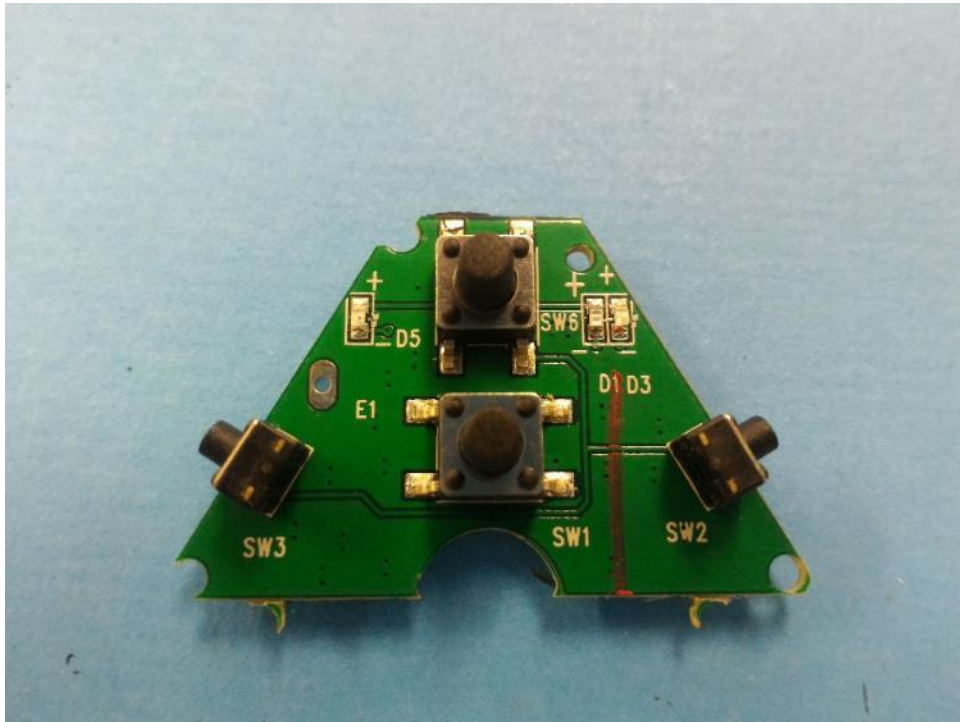
Appendix A



Appendix A



Appendix A



Appendix A

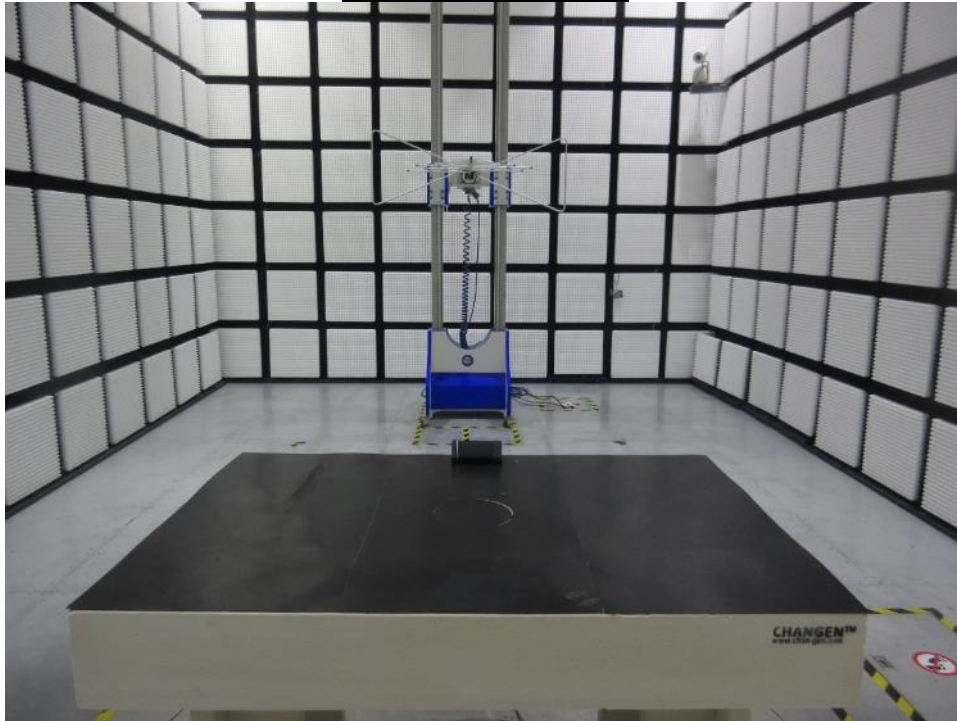


Appendix A



11. Appendix B - Setup Photographs of EUT

Radiated Emission



Conducted Emission



12. Test Equipment Site List

Radiated emission Test – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	07-July-18
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	07-July-18
Horn Antenna	Rohde & Schwarz	HF907	102294	07-July-18
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	07-July-18
3m Semi-anechoic chamber	TDK	9X6X6	----	14-July-20

Conducted emission Test – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	14-July-18
LISN	Rohde & Schwarz	ENV4200	100249	14-July-18
LISN	Rohde & Schwarz	ENV216	100326	14-July-18
ISN	Rohde & Schwarz	ENY81	100177	14-July-18
ISN	Rohde & Schwarz	ENY81-CAT6	101664	14-July-18
High Voltage Probe	Rohde & Schwarz	TK9420(VT94 20)	9420-58	14-July-18
RF Current probe	Rohde & Schwarz	EZ-17	100816	14-July-18



13. Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.83dB; Vertical: 4.91dB;
Uncertainty for Conducted Emission 150kHz-30MHz	3.50dB