



FCC Test Report (BLE)

FCC ID : **A8IVOOMBOXOUTDOOR**

Applicant : Shenzhen DIVOOM Technology Co., Ltd.
1506 Block C, Tiley Central Plaza, Nanshan District, Shenzhen,
Guangdong, China

Sample Description

Product Name : **Bluetooth speaker**

Model No. : Voombox-outdoor

Serial No. : N/A

Trademark : DIVOOM

Receipt Date : 2014-03-01

Test Date : 2014-03-01 to 2014-03-27

Issue Date : 2014-03-27

Test Standard(s) : **FCC CFR Title 47 Part 15 Subpart C Section 15.247**

Conclusions : **PASSED***

*In the configuration tested, the EUT complied with the standards specified above.

Test/Witness Engineer : *Jason Deng*

Approved & Authorized : *Winkay Wang*

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.



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1. General Information

1.1. Client Information

Applicant	:	Shenzhen DIVOOM Technology Co., Ltd.
Address	:	1506 Block C, Tiley Central Plaza, Nanshan District, Shenzhen, Guangdong, China
Manufacturer	:	Shenzhen DIVOOM Technology Co., Ltd.
Address	:	1506 Block C, Tiley Central Plaza, Nanshan District, Shenzhen, Guangdong, China

1.2. General Description of EUT (Equipment Under Test)

Product Name	:	Bluetooth speaker	
Models No.	:	Voombox-outdoor	
Serial No.	:	N/A	
Trademark	:	DIVOOM	
Product Description	:	Operation Frequency:	2402MHz~2480MHz
	:	Transfer Rate:	1 Mbits/s
	:	Number of Channel:	40 Channels
	:	Modulation Type:	GFSK
	:	Modulation Technology:	FHSS
	:	Antenna Type:	Integral PCB Antenna
	:	Antenna Gain:	0 dBi
Power Supply	:	USB DC 5V from PC, DC 3.7V from Li-ion battery	

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) Channel List:

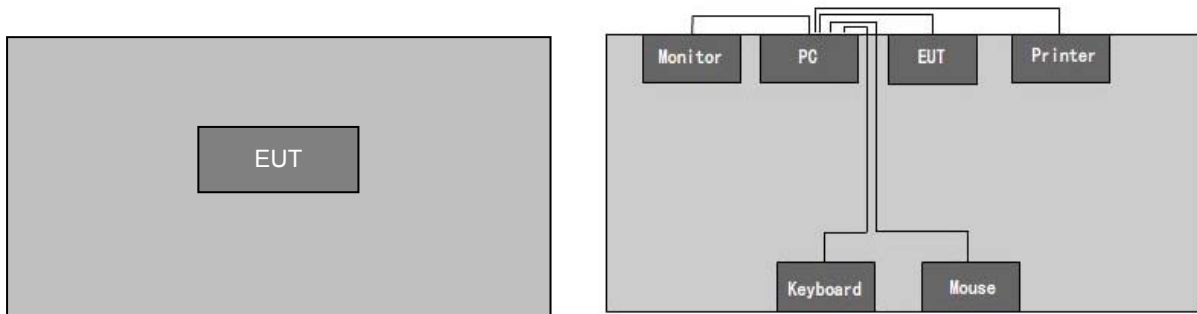
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	14	2430	28	2458
01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	19	2440	33	2468



06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	39	2480
12	2426	26	2454	/	/
13	2428	27	2456	/	/

Remark: Channel 0, 20 & 39 selected for GFSK.

1.3. Block Diagram Showing The Configuration of System Tested



1.4. Description of Support Units

Name	Model	Serial Number	Manufacturer
Printer	HP1020	CNCJ410726	HP
LCD Monitor	G205HV	10306738385	ACER
PC	ASPIREM1830	PTSF90C00305005CAC3000	ACER
Keyboard	SK-9625	KBUSB1580500037E0100	ACER
Mouse	MS.11200.014	M-UAY-ACR2	ACER

1.5. External I/O Cable

Cable Description	Length(m)	From/ Port	To
Shielding Detachable USB Cable	1.5	Host PC	Mouse
Shielding Detachable K/B Cable	1.5	Host PC	Keyboard
Shielding Detachable serial Cable	1.5	Host PC	Printer
Shielding Detachable VGA Cable	1.5	Host PC	LCD Monitor



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Unshielding Detachable USB Cable	0.5	EUT	Host PC
Unshielding Audio Cable	0.6	EUT	Host PC

1.6. Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

Test Mode	Description
Charging & Playing mode	Keep the EUT in Charging& Playing mode
Transmitting mode	Keep the EUT in Transmitting mode

Remark: The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

1.7. Test Instruments List

Item	Test Equipment	Manufacturer	Model No.	Cal. Date	Cal. Due date
1	Bilog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	May 25, 2013	May 24, 2014
2	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	May 30, 2013	May 29, 2014
3	Coaxial Cable	N/A	N/A	Apr. 01, 2013	Mar. 31, 2014
4	Coaxial Cable	N/A	N/A	Apr. 01, 2013	Mar. 31, 2014
5	Coaxial cable	N/A	N/A	Apr. 01, 2013	Mar. 31, 2014
6	Coaxial Cable	N/A	N/A	Apr. 01, 2013	Mar. 31, 2014
7	Coaxial Cable	N/A	N/A	Apr. 01, 2013	Mar. 31, 2014
8	Amplifier (10kHz-1.3GHz)	HP	8447D	Apr. 01, 2013	Mar. 31, 2014
9	Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	Jun. 09, 2013	Jun. 08, 2014
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	Apr. 01, 2013	Mar. 31, 2014
11	Horn Antenna	ETS-LINDGREN	3160	Mar. 30, 2013	Mar. 29, 2014
12	Positioning	UC	UC3000	N/A	N/A



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	Controller				
13	Spectrum analyzer 9kHz-30GHz	Rohde & Schwarz	FSP	May 29, 2013	May 28, 2014
14	EMI Test Receiver	Rohde & Schwarz	ESPI	Apr. 01, 2013	Mar. 31, 2014
15	Loop antenna	Laplace instrument	RF300	May 25, 2013	May 24, 2014
16	Universal radio communication tester	Rhode & Schwarz	CMU200	May 29, 2013	May 28, 2014
17	Signal Analyzer	Rohde & Schwarz	FSIQ3	May 29, 2013	May 28, 2014

1.8. Laboratory Location

Shenzhen Certification Technology Service Co., Ltd.

Address: 2F, Building B, East Area of Nanchang Second Industrial Zone, Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China

At the time of testing, the Laboratory is accredited. It is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 197647.

Tel:86-755-86375552 Fax: 86-755-26736857



2. Test Summary

Standard Section	Test Item	Judgment
15.203/15.247(c)	Antenna Requirement	PASSED
15.207	Conducted Emission	PASSED
15.247(b)(3)	Conducted Peak Output Power	PASSED
15.247(a)(2)	6dB Occupied Bandwidth	PASSED
15.247(e)	Power Spectral Density	PASSED
15.205/15.209	Spurious Emission	PASSED
15.247(d)	Band Edge	PASSED

Remark: "N/A" is an abbreviation for Not Applicable.

3. Antenna Requirement

3.1. Standard Requirement

3.1.1 Test standard

FCC Part15 Section 15.203 /247(c)

3.1.2 Requirement

1) 15.203 requirement:

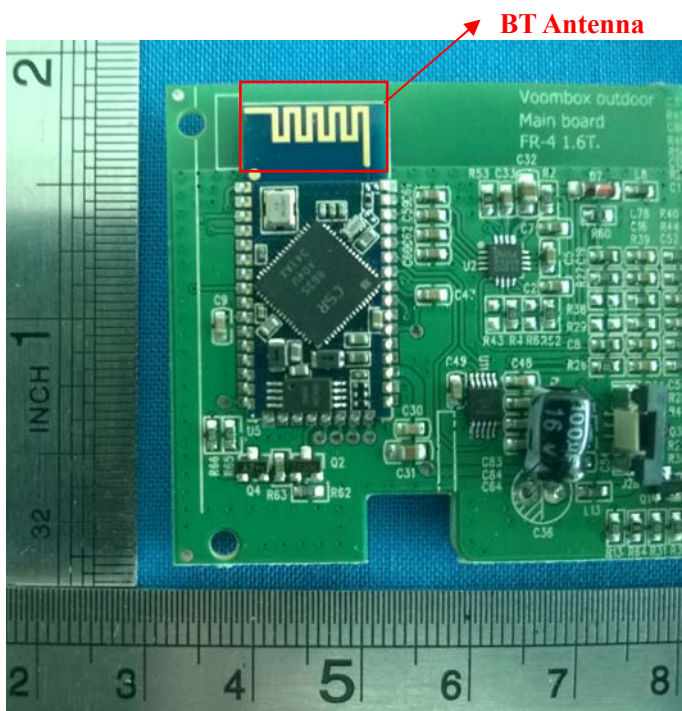
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

2) 15.247(c) (1)(i) requirement:

Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

3.2. Antenna Connected Construction

The bluetooth antenna is an integral antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.



4. Conducted Emission Test

4.1. Test Standard and Limit

4.1.1 Test Standard

FCC Part15 Section 15.207

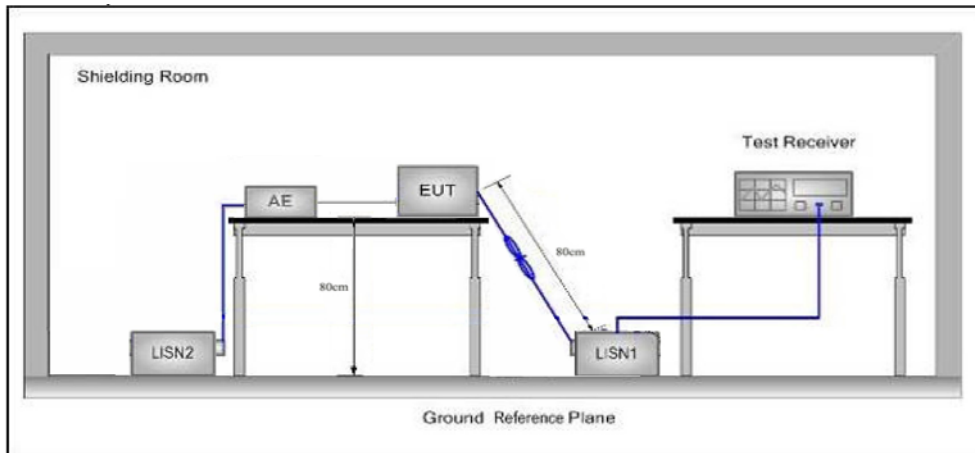
4.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Remark: (1) *Decreasing linearly with logarithm of the frequency.
(2) The lower limit shall apply at the transition frequencies.

4.2. Test Setup



4.3. Test Procedure

- 1) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50 \Omega / 50 \mu\text{H} + 5 \Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 2) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.

The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal



ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

The Test Receiver setup: RBW=9kHz, VBW=30kHz, Sweep time= auto

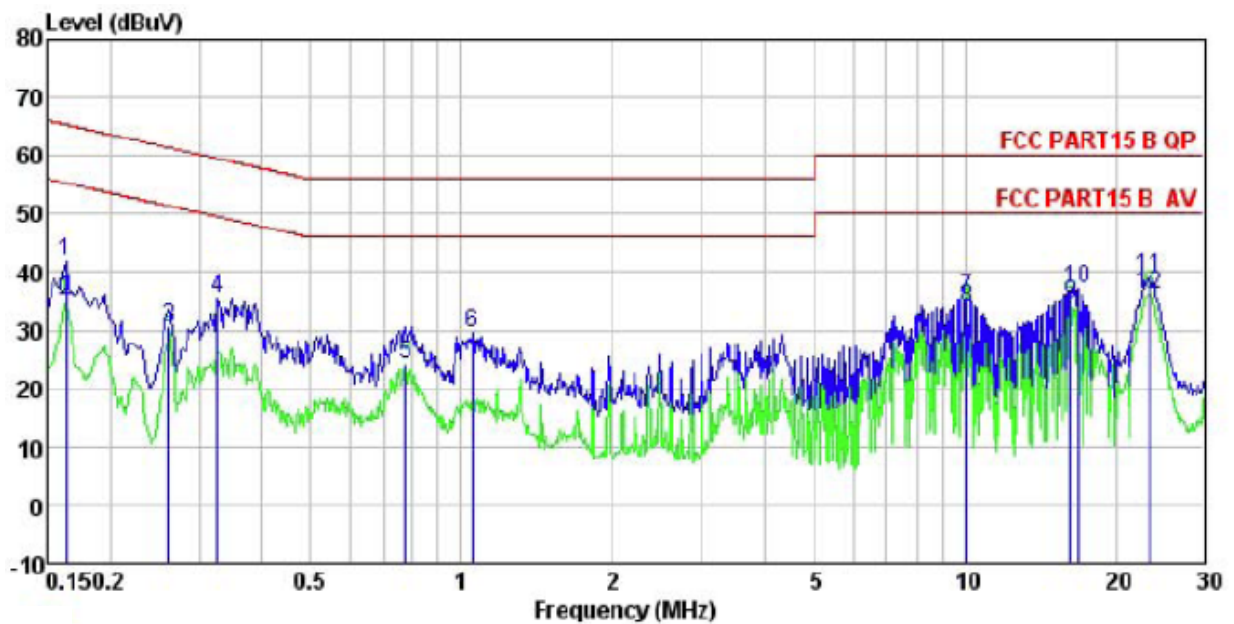
4.4. Test Data

Please to see the following pages



Conducted Emission Test Data

EUT: Bluetooth speaker M/N: Voombox-outdoor
 Operating Condition: Charging & Playing mode
 Test Site: Shielded room
 Operator: Jason
 Test Specification: AC120V/60Hz
 Polarization: Line
 Note: Tem:25°C Hum:50%

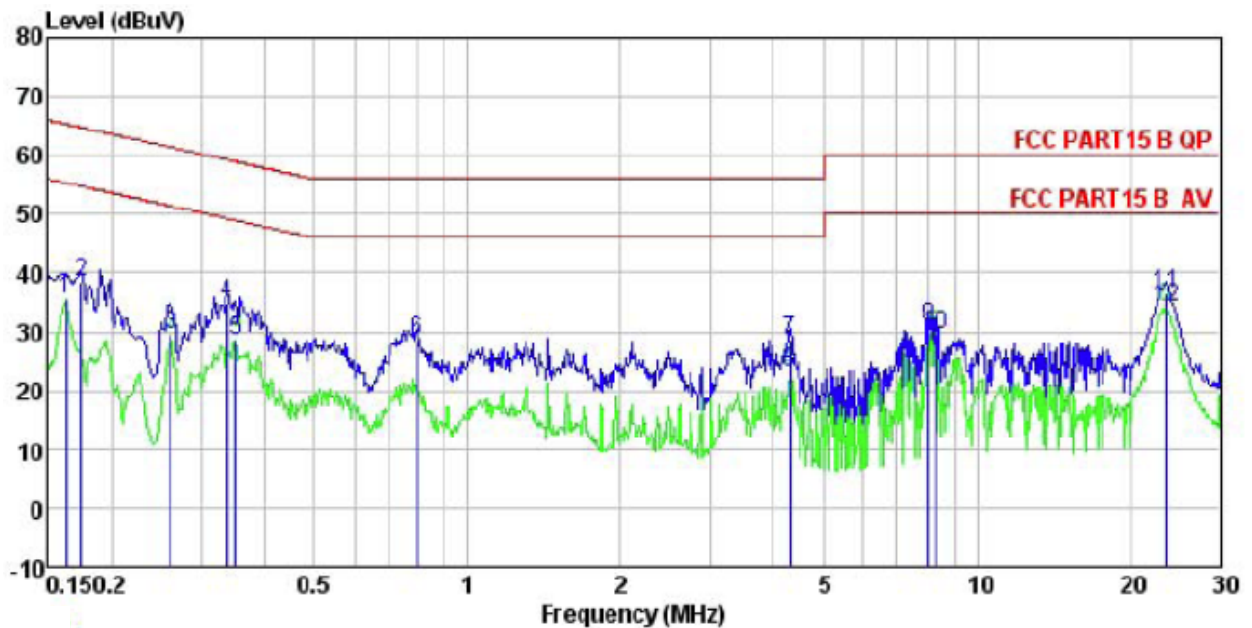


	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.162	30.62	10.26	0.78	41.66	65.34	-23.68	QP
2	0.162	24.09	10.26	0.78	35.13	55.34	-20.21	Average
3	0.262	19.46	10.24	0.75	30.45	51.38	-20.93	Average
4	0.327	24.61	10.25	0.73	35.59	59.53	-23.94	QP
5	0.771	13.17	10.17	0.80	24.14	46.00	-21.86	Average
6	1.049	18.48	10.20	0.88	29.56	56.00	-26.44	QP
7	10.072	24.24	10.22	0.94	35.40	60.00	-24.60	QP
8	10.072	22.61	10.22	0.94	33.77	50.00	-16.23	Average
9	16.226	23.32	10.26	0.91	34.49	50.00	-15.51	Average
10	16.839	25.83	10.27	0.91	37.01	60.00	-22.99	QP
11	23.387	27.64	10.48	0.89	39.01	60.00	-20.99	QP
12	23.387	24.77	10.48	0.89	36.14	50.00	-13.86	Average



Conducted Emission Test Data

EUT: Bluetooth speaker M/N: Voombox-outdoor
 Operating Condition: Charging & Playing mode
 Test Site: Shielded room
 Operator: Jason
 Test Specification: AC 120V/60Hz
 Polarization: Neutral
 Note: Tem:25°C Hum:50%



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.162	24.41	10.24	0.78	35.43	55.34	-19.91	Average
2	0.174	27.41	10.23	0.77	38.41	64.77	-26.36	QP
3	0.262	18.51	10.24	0.75	29.50	51.38	-21.88	Average
4	0.337	23.78	10.27	0.73	34.78	59.27	-24.49	QP
5	0.350	17.56	10.27	0.73	28.56	48.96	-20.40	Average
6	0.796	17.66	10.19	0.81	28.66	56.00	-27.34	QP
7	4.315	17.27	10.29	0.88	28.44	56.00	-27.56	QP
8	4.315	11.98	10.29	0.88	23.15	46.00	-22.85	Average
9	8.062	19.76	10.26	0.85	30.87	60.00	-29.13	QP
10	8.323	18.37	10.26	0.87	29.50	50.00	-20.50	Average
11	23.511	25.09	10.49	0.89	36.47	60.00	-23.53	QP
12	23.511	22.72	10.49	0.89	34.10	50.00	-15.90	Average



5. Conducted Peak Output Power Test

5.1. Test Standard and Limit

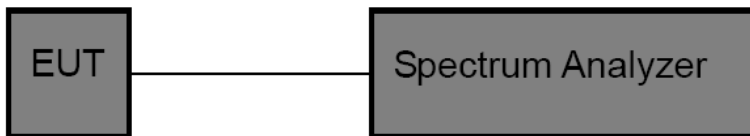
5.1.1 Test Standard

FCC Part15 C Section 15.247 (b)(3); KDB558074

5.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range (MHz)
Peak Output Power	30dBm	2400~2483.5

5.2. Test Setup



5.3. Test Procedure

Refer to KDB558074 v03r01 (DTS Measure Guidance) Section 9.1.

5.4. Test Data

Channel Number	Channel Frequency (MHz)	Test Result (dBm)	Limit (dBm)	Judgment
CH 00	2402	3.39	30	PASSED
CH 20	2442	4.91	30	PASSED
CH 39	2480	4.81	30	PASSED

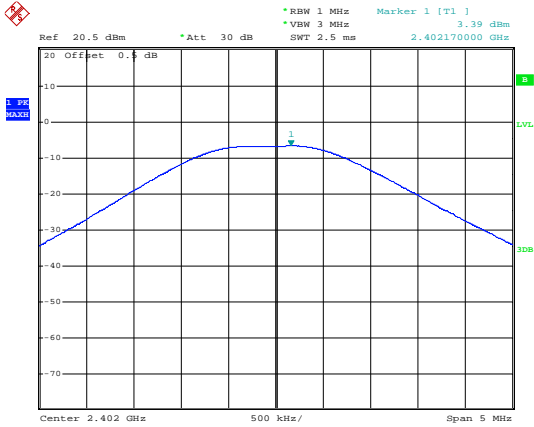
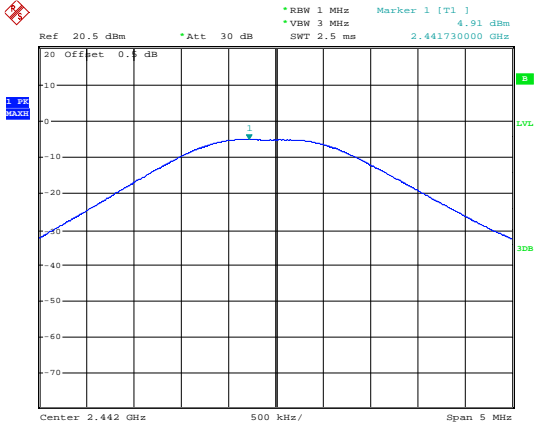
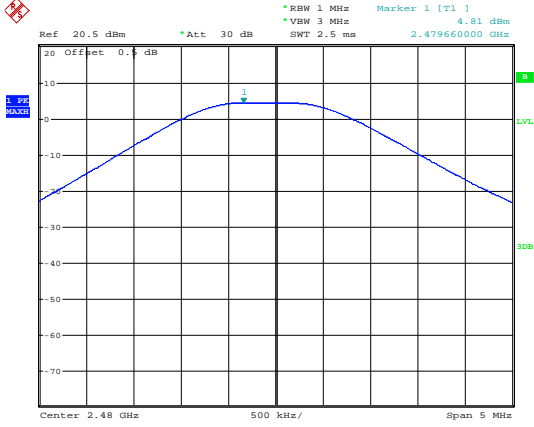
Remark: Test plot as follows



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Modulation mode	GFSK mode
2402MHz	 <p>Ref 20.5 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz SWT 2.5 ms Marker 1 [T1] 2.402170000 GHz 3.39 dBm</p> <p>20 Offset 0.1 dB</p> <p>PA MAX</p> <p>30dB</p> <p>LVL</p> <p>Center 2.402 GHz 500 kHz/ Span 5 MHz</p> <p>Date: 27.MAR.2014 19:41:20</p>
2442MHz	 <p>Ref 20.5 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz SWT 2.5 ms Marker 1 [T1] 2.441730000 GHz 4.91 dBm</p> <p>20 Offset 0.1 dB</p> <p>PA MAX</p> <p>30dB</p> <p>LVL</p> <p>Center 2.442 GHz 500 kHz/ Span 5 MHz</p> <p>Date: 27.MAR.2014 19:44:15</p>
2480MHz	 <p>Ref 20.5 dBm *Att 30 dB *RBW 1 MHz *VBW 3 MHz SWT 2.5 ms Marker 1 [T1] 2.479660000 GHz 4.81 dBm</p> <p>20 Offset 0.1 dB</p> <p>PA MAX</p> <p>30dB</p> <p>LVL</p> <p>Center 2.48 GHz 500 kHz/ Span 5 MHz</p> <p>Date: 27.MAR.2014 19:45:25</p>



6. Occupy Bandwidth Test

6.1. Test Standard and Limit

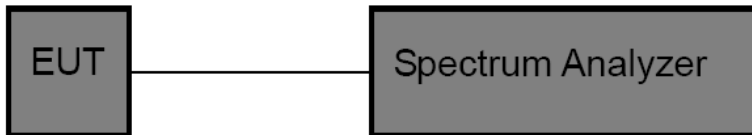
6.1.1 Test Standard

FCC Part15 C Section 15.247 (a)(2); KDB558074

6.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Test Item	Limit	Frequency Range (MHz)
Bandwidth	>500kHz	2400~2483.5

6.2. Test Setup



6.3. Test Procedure

Refer to KDB558074 v03r01 (DTS Measure Guidance) Section 8.0

6.4. Test Data

Channel Number	Channel Frequency	6dB Bandwidth (kHz)	Limit(kHz)	Judgment
CH 00	2402(MHz)	660	>500	PASSED
CH 20	2442(MHz)	660	>500	PASSED
CH 39	2480(MHz)	660	>500	PASSED
Remark: Test plot as follows				

Channel Number	Channel Frequency	99% Occupy Bandwidth (kHz)	Limit(kHz)	Judgment
CH 00	2402(MHz)	1060	/	/
CH 20	2442(MHz)	1060	/	/
CH 39	2480(MHz)	1060	/	/
Remark: Test plot as follows				



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6dB EBW Modulation mode	GFSK mode
2402MHz	<p>Date: 27.MAR.2014 19:56:08</p>
2442MHz	<p>Date: 27.MAR.2014 19:59:18</p>
2480MHz	<p>Date: 27.MAR.2014 20:03:27</p>



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99% OBW Modulation mode	GFSK
2402MHz	<p>Date: 27.MAR.2014 20:08:42</p>
2442MHz	<p>Date: 27.MAR.2014 20:11:46</p>
2480MHz	<p>Date: 27.MAR.2014 20:14:52</p>



7. Power Spectral Density Test

7.1. Test Standard and Limit

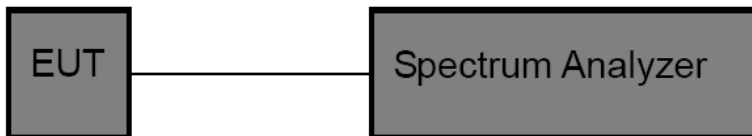
7.1.1 Test Standard

FCC Part15 C Section 15.247 (e); KDB558074

7.1.2 Test Limit

FCC Part 15 Subpart C(15.247)		
Section	Test Item	Limit
15.247(e)	Power Spectral Density Test	8dBm

7.2. Test Setup



7.3. Test Procedure

Refer to KDB558074 v03r01 (DTS Measure Guidance) Section 10.0

7.4. Test Data

Channel Number	Channel Frequency	Power Spectral Density (dBm)	Limit (dBm)	Judgment
CH 00	2402(MHz)	2.13	8.0	PASSED
CH 20	2442(MHz)	3.42	8.0	PASSED
CH 39	2480(MHz)	3.35	8.0	PASSED

Remark: Test plot as follows



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Modulation mode	GFSK mode
2402MHz	<p>Date: 27.MAR.2014 20:23:05</p>
2442MHz	<p>Date: 27.MAR.2014 20:25:08</p>
2480MHz	<p>Date: 27.MAR.2014 20:28:32</p>



8. Band Edge Requirement (Conducted Emission Method)

8.1. Test Standard and Limit

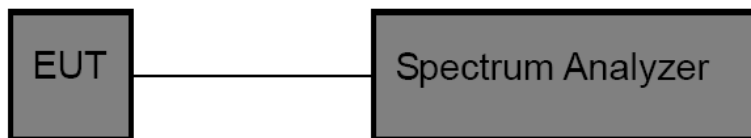
8.1.1 Test Standard

FCC Part15 C Section 15.247 (d); KDB558074

8.1.2 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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, based on either an RF conducted or a radiated measurement.

8.2. Test Setup



8.3. Test Procedure

Refer to KDB558074 v03r01 (DTS Measure Guidance) Section 12.0

8.4. Test Data

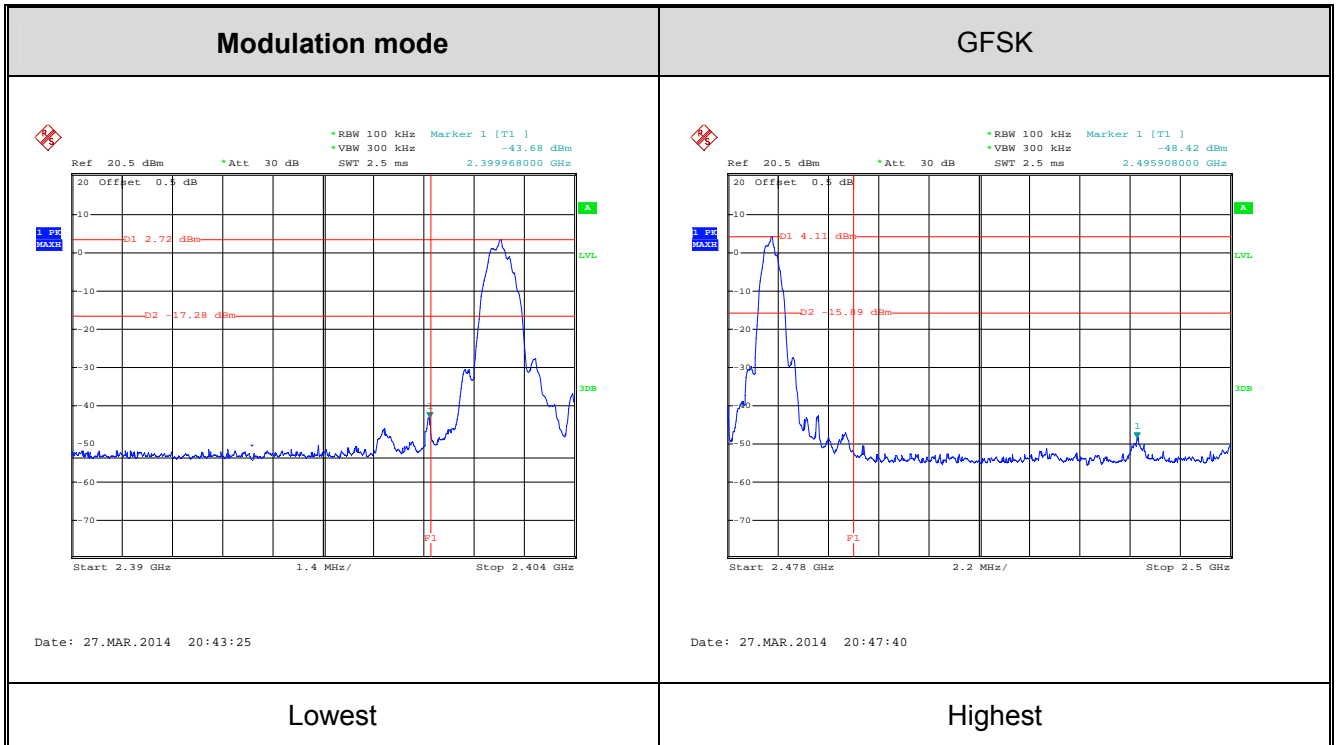
Test plot as follows



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9. Band Edge Requirement (Radiated Emission Method)

9.1. Test Standard and Limit

9.1.1 Test Standard

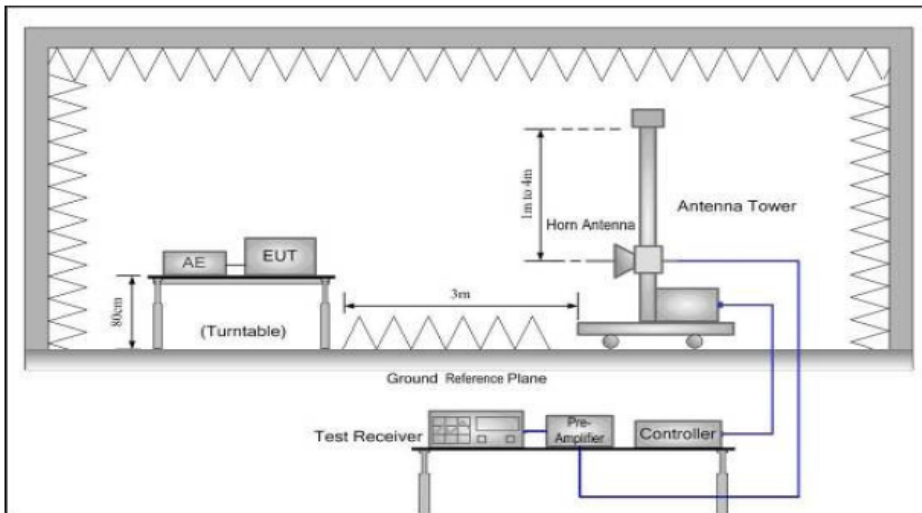
FCC Part15 C Section 15.209 and 15.205

9.1.2 Test Limit

Radiated Emission Test Limit

Frequency	Limit (dB μ V/m @3m)	Remark
Above 1GHz	54.00	Average value
	74.00	Peak value

9.2. Test Setup



9.3. Test Procedure

- 1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 antenna height 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) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. Peak Value: RBW=1MHz, VBW=3MHz; Average value: RBW=1MHz, VBW=10Hz



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6) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

9.4. Test Data

Remark:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.

Test mode: GFSK					Test channel: Lowest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
2400.00	19.04	27.58	5.67	0.00	52.29	74.00	-21.71	H	PEAK
2400.00	20.09	27.58	5.67	0.00	53.34	74.00	-20.66	V	PEAK
2400.00	12.13	27.58	5.67	0.00	45.38	54.00	-8.62	H	AVG.
2400.00	8.75	27.58	5.67	0.00	42.00	54.00	-12.00	V	AVG.
Test mode: GFSK					Test channel: Highest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
2483.50	23.83	27.52	5.70	0.00	57.05	74.00	-16.95	H	PEAK
2483.50	25.95	27.52	5.70	0.00	59.17	74.00	-14.83	V	PEAK
2483.50	13.81	27.52	5.70	0.00	47.03	54.00	-6.97	H	AVG.
2483.50	15.81	27.52	5.70	0.00	49.03	54.00	-4.97	V	AVG.

Remark:

1. Final Level = Read Level + Antenna Factor + Cable Loss - Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.



10. Spurious Emission (Conducted Emission Method)

10.1. Test Standard and Limit

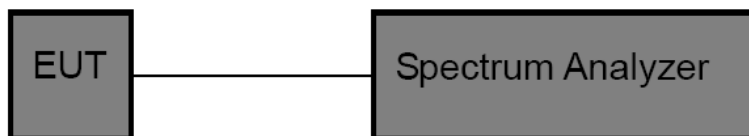
10.1.1 Test Standard

FCC Part15 C Section 15.247 (d); KDB558074

10.1.2 Test Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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, based on either an RF conducted or a radiated measurement.

10.2. Test Setup



10.3. Test Procedure

Refer to KDB558074 v03r01 (DTS Measure Guidance) Section 11.0

10.4. Test Data



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Modulation mode	GFSK	Frequency range	30MHz~25GHz
Lowest			
Middle			
Highest			

11. Spurious Emission (Radiated Emission Method)

11.1. Test Standard and Limit

11.1.1 Test Standard

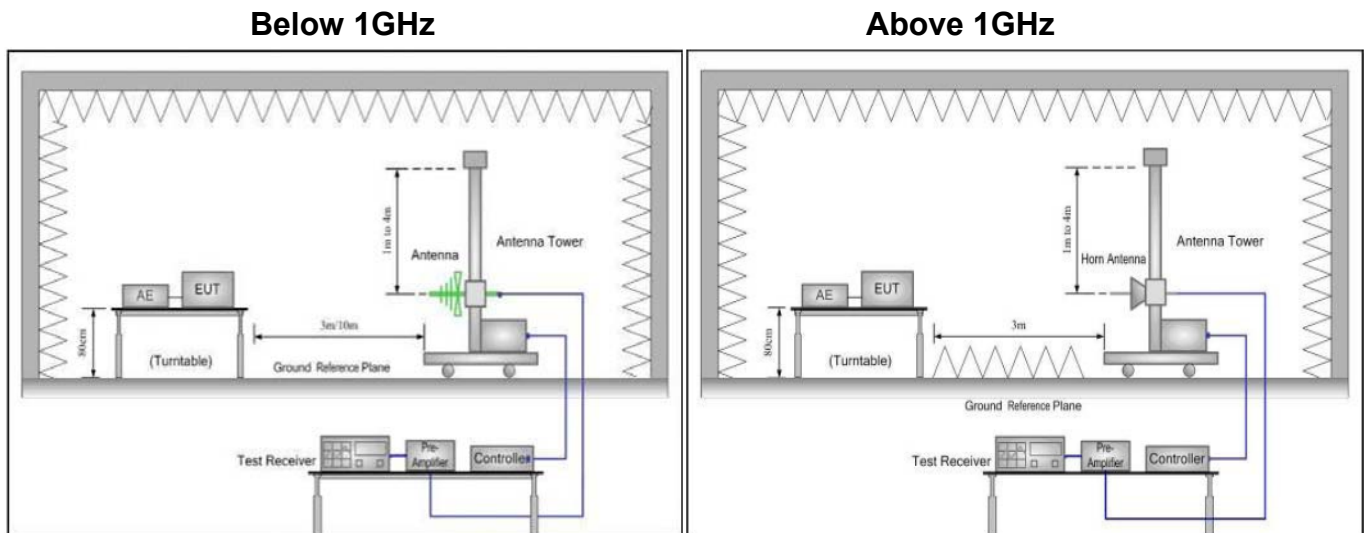
FCC Part15 C Section 15.209 and 15.205

11.1.2 Test Limit

Frequency (MHz)	Limit (dB μ V/m)	
	At 3m Distance	
30MHz~88MHz	40	Quasi-peak
88MHz~216MHz	43.5	Quasi-peak
216MHz~960MHz	46	Quasi-peak
960MHz~1000MHz	54	Quasi-peak
Above 1000MHz	54	Average
	74	Peak

Remark: 1. The lower limit shall apply at the transition frequency.

11.2. Test Setup



11.3. Test Procedure

- 1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 antenna height 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) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Peak value: RBW=1MHz, VBW=3MHz;

Average value: RBW=1MHz, VBW=10Hz;

QP Value: RBW=120kHz, VBW=300kHz

- 6) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

11.4. Test Data

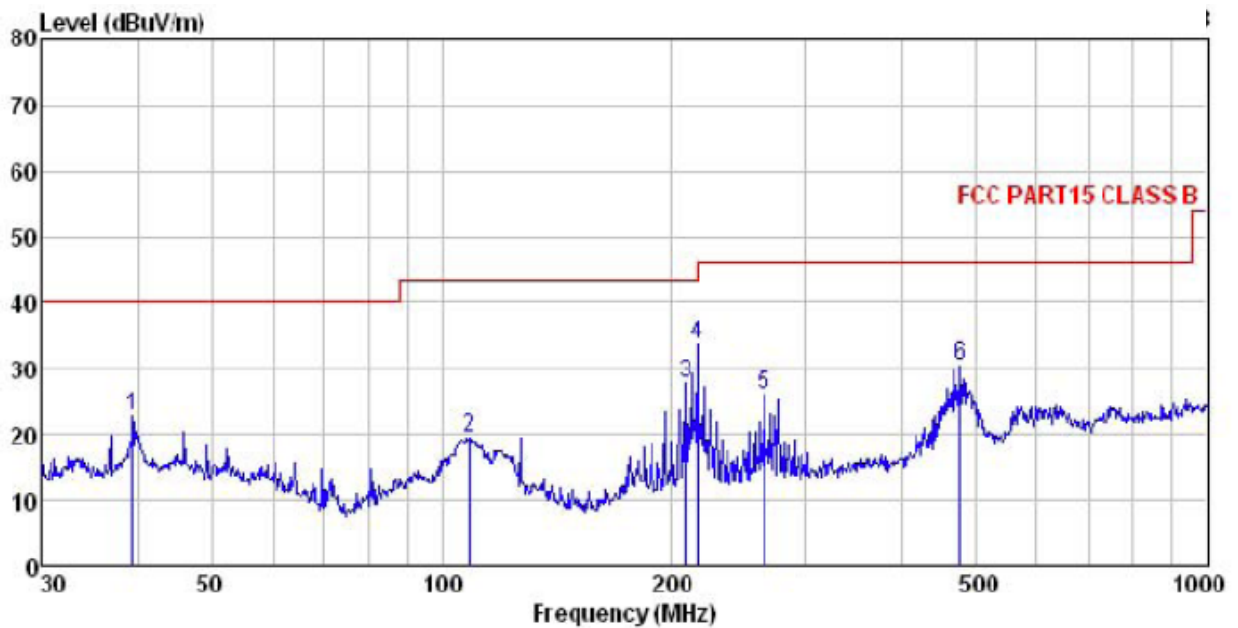
Remark:

1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case.
2. 9 kHz to 30 MHz is noise floor, so only shows the data of above 30MHz in this report.



Radiated Emission Test Data (Below 1GHz)

EUT:	Bluetooth speaker	M/N: Voombox-outdoor
Operating Condition:	Bluetooth TX mode	
Test Site:	3m chamber	
Operator:	Jason	
Test Specification:	AC120V/60Hz	
Polarization:	Horizontal	
Note	Tem:23°C Hum:50%	

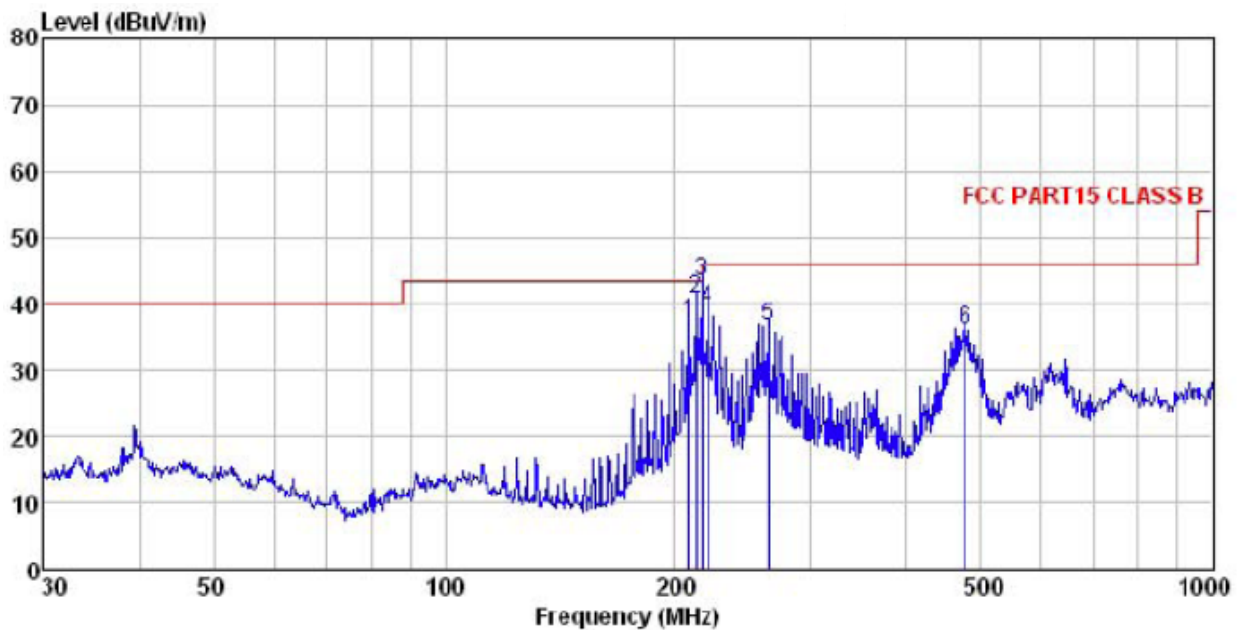


	ReadAntenna	Cable Preamp	Limit	Over				
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	39.437	35.20	13.44	1.21	27.21	22.64	40.00	-17.36 QP
2	108.647	35.07	12.39	2.03	29.91	19.58	43.50	-23.92 QP
3	207.850	43.92	10.80	2.86	29.78	27.80	43.50	-15.70 QP
4	216.024	49.58	11.07	2.85	29.74	33.76	46.00	-12.24 QP
5	263.819	40.62	12.17	2.85	29.55	26.09	46.00	-19.91 QP
6	477.169	41.37	16.01	3.42	30.52	30.28	46.00	-15.72 QP



Radiated Emission Test Data (Below 1GHz)

EUT:	Bluetooth speaker	M/N: Voombox-outdoor
Operating Condition:	Bluetooth TX mode	
Test Site:	3m chamber	
Operator:	Jason	
Test Specification:	AC120V/60Hz	
Polarization:	Vertical	
Note	Tem:23°C Hum:50%	



	ReadAntenna	Cable Preamp	Limit	Over					
Freq	Level Factor	Loss Factor	Line	Limit	Remark				
MHz	dBuV	dB/m	dB	dB					
1	207.850	53.18	10.80	2.86	29.78	37.06	43.50	-6.44	QP
2	212.270	56.81	10.93	2.86	29.75	40.85	43.50	-2.65	QP
3	216.024	59.27	11.07	2.85	29.74	43.45	46.00	-2.55	QP
4	219.845	54.95	11.17	2.85	29.72	39.25	46.00	-6.75	QP
5	263.819	51.08	12.17	2.85	29.55	36.55	46.00	-9.45	QP
6	477.169	47.10	16.01	3.42	30.52	36.01	46.00	-9.99	QP



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Radiated Emission Test Data (Above 1GHz)

Test mode: GFSK					Test channel: Lowest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
4804.00	54.12	31.53	8.90	40.24	54.31	74.00	-19.69	V	PEAK
7206.00	49.68	36.47	10.59	41.24	55.50	74.00	-18.50	V	PEAK
9608.00	46.78	38.10	13.16	41.40	56.64	74.00	-17.36	V	PEAK
12010.00	*					74.00		V	PEAK
14412.00	*					74.00		V	PEAK
16814.00	*					74.00		V	PEAK
4804.00	54.74	31.53	8.90	40.24	54.93	74.00	-19.07	H	PEAK
7206.00	49.32	36.47	10.59	41.24	55.14	74.00	-18.86	H	PEAK
9608.00	46.59	38.10	13.16	41.40	56.45	74.00	-17.55	H	PEAK
12010.00	*					74.00		H	PEAK
14412.00	*					74.00		H	PEAK
16814.00	*					74.00		H	PEAK
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
4804.00	35.62	31.53	8.90	40.24	35.81	54.00	-18.19	V	AVG.
7206.00	30.41	36.47	10.59	41.24	36.23	54.00	-17.77	V	AVG.
9608.00	27.51	38.10	13.16	41.40	37.37	54.00	-16.63	V	AVG.
12010.00	*					54.00		V	AVG.
14412.00	*					54.00		V	AVG.
16814.00	*					54.00		V	AVG.
4804.00	35.42	31.53	8.90	40.24	35.61	54.00	-18.39	H	AVG.
7206.00	30.84	36.47	10.59	41.24	36.66	54.00	-17.34	H	AVG.
9608.00	27.43	38.10	13.16	41.40	37.29	54.00	-16.71	H	AVG.
12010.00	*					54.00		H	AVG.
14412.00	*					54.00		H	AVG.
16814.00	*					54.00		H	AVG.

Remark:

1. Final Level = Read Level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.



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Radiated Emission Test Data (Above 1GHz)

Test mode: GFSK					Test channel: Middle				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
4884.00	54.36	31.58	8.98	40.15	54.77	74.00	-19.23	V	PEAK
7326.00	49.84	36.47	10.69	41.15	55.85	74.00	-18.15	V	PEAK
9768.00	46.51	38.45	13.37	41.71	56.70	74.00	-17.30	V	PEAK
12210.00	*					74.00		V	PEAK
14652.00	*					74.00		V	PEAK
17094.00	*					74.00		V	PEAK
4884.00	54.26	31.58	8.98	40.15	54.67	74.00	-19.33	H	PEAK
7326.00	49.35	36.47	10.69	41.15	55.36	74.00	-18.64	H	PEAK
9768.00	46.41	38.45	13.37	41.71	56.60	74.00	-17.40	H	PEAK
12210.00	*					74.00		H	PEAK
14652.00	*					74.00		H	PEAK
17094.00	*					74.00		H	PEAK
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
4884.00	35.12	31.58	8.98	40.15	35.53	54.00	-18.47	V	AVG.
7326.00	30.25	36.47	10.69	41.15	36.26	54.00	-17.74	V	AVG.
9768.00	27.41	38.45	13.37	41.71	37.60	54.00	-16.40	V	AVG.
12210.00	*					54.00		V	AVG.
14652.00	*					54.00		V	AVG.
17094.00	*					54.00		V	AVG.
4884.00	34.87	31.58	8.98	40.15	35.28	54.00	-18.72	H	AVG.
7326.00	30.46	36.47	10.69	41.15	36.47	54.00	-17.53	H	AVG.
9768.00	27.66	38.45	13.37	41.71	37.85	54.00	-16.15	H	AVG.
12210.00	*					54.00		H	AVG.
14652.00	*					54.00		H	AVG.
17094.00	*					54.00		H	AVG.

Remark:

1. Final Level = Read Level + Antenna Factor + Cable Loss – Pre-amplifier Factor
2. “*”, means this data is too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.



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Radiated Emission Test Data (Above 1GHz)

Test mode: GFSK					Test channel: Highest				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
4960.00	53.87	31.69	9.08	40.03	54.61	74.00	-19.39	V	PEAK
7440.00	49.23	36.60	10.80	41.05	55.58	74.00	-18.42	V	PEAK
9920.00	46.41	38.66	13.55	41.99	56.63	74.00	-17.37	V	PEAK
12400.00	*					74.00		V	PEAK
14880.00	*					74.00		V	PEAK
17360.00	*					74.00		V	PEAK
4960.00	53.64	31.69	9.08	40.03	54.38	74.00	-19.62	H	PEAK
7440.00	49.21	36.60	10.80	41.05	55.56	74.00	-18.44	H	PEAK
9920.00	46.32	38.66	13.55	41.99	56.54	74.00	-17.46	H	PEAK
12400.00	*					74.00		H	PEAK
14880.00	*					74.00		H	PEAK
17360.00	*					74.00		H	PEAK
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Level
4960.00	34.56	31.69	9.08	40.03	35.30	54.00	-18.70	V	AVG.
7440.00	30.55	36.60	10.80	41.05	36.90	54.00	-17.10	V	AVG.
9920.00	27.43	38.66	13.55	41.99	37.65	54.00	-16.35	V	AVG.
12400.00	*					54.00		V	AVG.
14880.00	*					54.00		V	AVG.
17360.00	*					54.00		V	AVG.
4960.00	34.46	31.69	9.08	40.03	35.30	54.00	-18.80	H	AVG.
7440.00	30.05	36.60	10.80	41.05	36.40	54.00	-17.60	H	AVG.
9920.00	27.41	38.66	13.55	41.99	37.63	54.00	-16.37	H	AVG.
12400.00	*					54.00		H	AVG.
14880.00	*					54.00		H	AVG.
17360.00	*					54.00		H	AVG.

Remark:

1. Final Level = Read Level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*”, means this data is the too weak instrument of signal is unable to test.
3. The emission levels of other frequencies are very lower than the limit and not show in test report.