FCC Test Report (BLE)

FCC ID	:	**A8IVOOMBOX-TRAVEL**
Applicant	:	Shenzhen DIVOOM Technology Co., Ltd. 1506 Block C, Tiley Central Plaza, Nanshan District, Shenzhen, Guangdong, China
Sample Description		
Product Name	:	**Rugged Portable Bluetooth Speaker**
Model No.	:	Voombox-Travel
Serial No.	:	N/A
Trademark	:	DIVOOM
Receipt Date	:	2014-04-01
Test Date	:	2014-04-01 to 2014-04-09
Issue Date	:	2014-04-09
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 : Winkey 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	:	Rugged Portable Bluetooth Speaker	
Models No.	:	Voombox-Travel	
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:

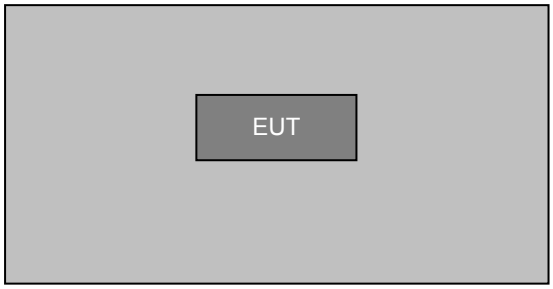
(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

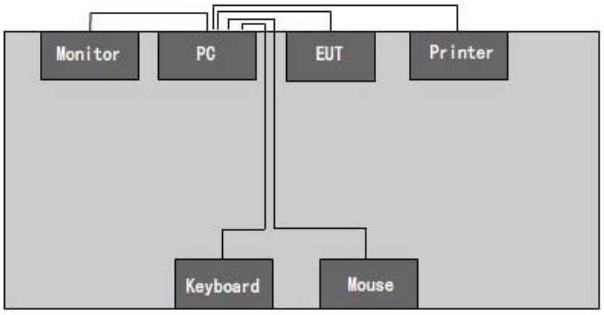
(2) Channel List:

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
Unshielding Detachable USB&AV Cable	0.5	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	Mar. 28, 2014	Mar. 27, 2015
2	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	Mar. 28, 2014	Mar. 27, 2015
3	Coaxial Cable	N/A	N/A	Mar. 28, 2014	Mar. 27, 2015
4	Coaxial Cable	N/A	N/A	Mar. 28, 2014	Mar. 27, 2015
5	Coaxial cable	N/A	N/A	Mar. 28, 2014	Mar. 27, 2015
6	Coaxial Cable	N/A	N/A	Mar. 28, 2014	Mar. 27, 2015
7	Coaxial Cable	N/A	N/A	Mar. 28, 2014	Mar. 27, 2015
8	Amplifier (10kHz-1.3GHz)	HP	8447D	Mar. 28, 2014	Mar. 27, 2015
9	Amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	Mar. 28, 2014	Mar. 27, 2015
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	Mar. 28, 2014	Mar. 27, 2015
11	Horn Antenna	ETS-LINDGREN	3160	Mar. 28, 2014	Mar. 27, 2015
12	Positioning Controller	UC	UC3000	N/A	N/A
13	Spectrum analyzer 9kHz-30GHz	Rohde & Schwarz	FSP	Mar. 28, 2014	Mar. 27, 2015

14	EMI Test Receiver	Rohde & Schwarz	ESPI	Mar. 28, 2014	Mar. 27, 2015
15	Loop antenna	Laplace instrument	RF300	Mar. 28, 2014	Mar. 27, 2015
16	Universal radio communication tester	Rhode & Schwarz	CMU200	Mar. 28, 2014	Mar. 27, 2015
17	Signal Analyzer	Rohde & Schwarz	FSIQ3	Mar. 28, 2014	Mar. 27, 2015
18	EMI Test Receiver	Rohde & Schwarz ESCI	ESCI	Mar. 28, 2014	Mar. 27, 2015
19	LISN	CHASE	MN2050D	Mar. 28, 2014	Mar. 27, 2015

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)

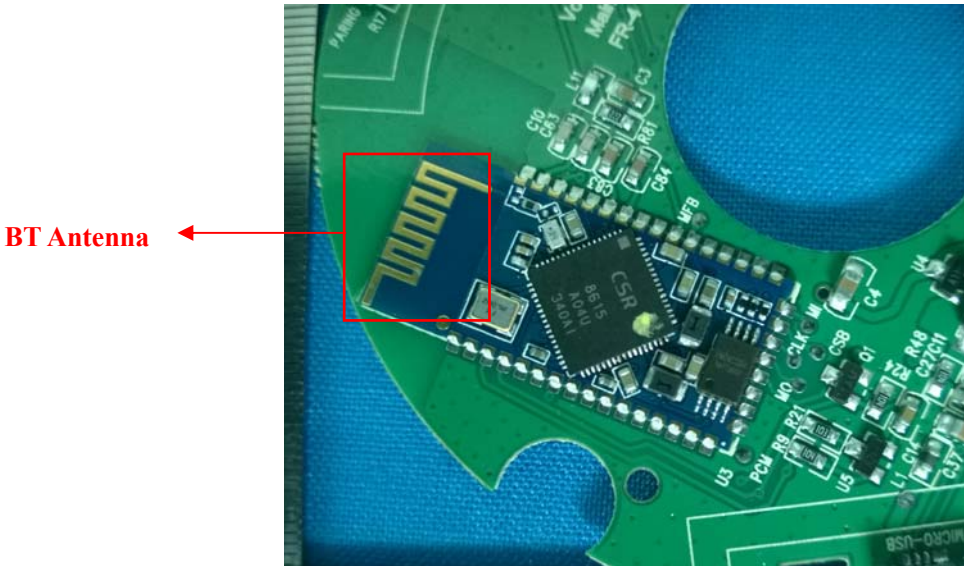
3.1.2 Requirement

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

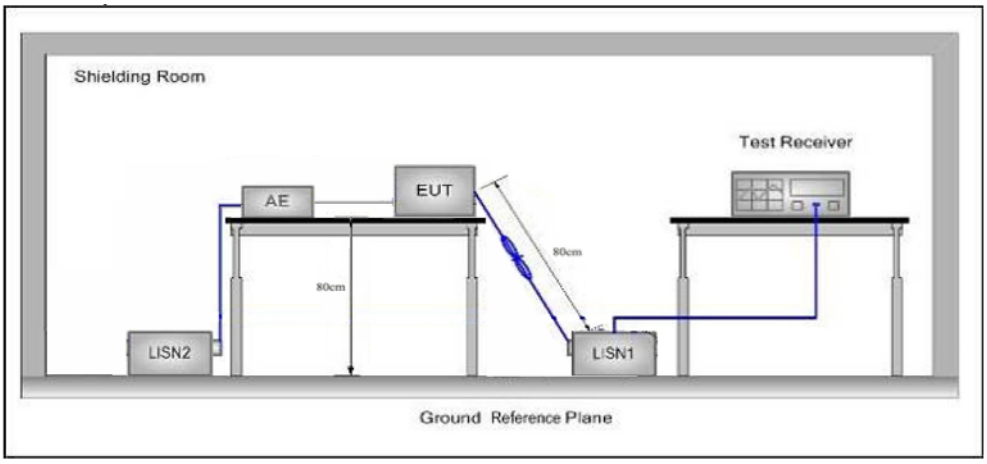
FCC Part15 Section 15.207

4.1.2 Test Limit

Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dBμV)	
	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 50Ω/50μH + 5Ω 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.

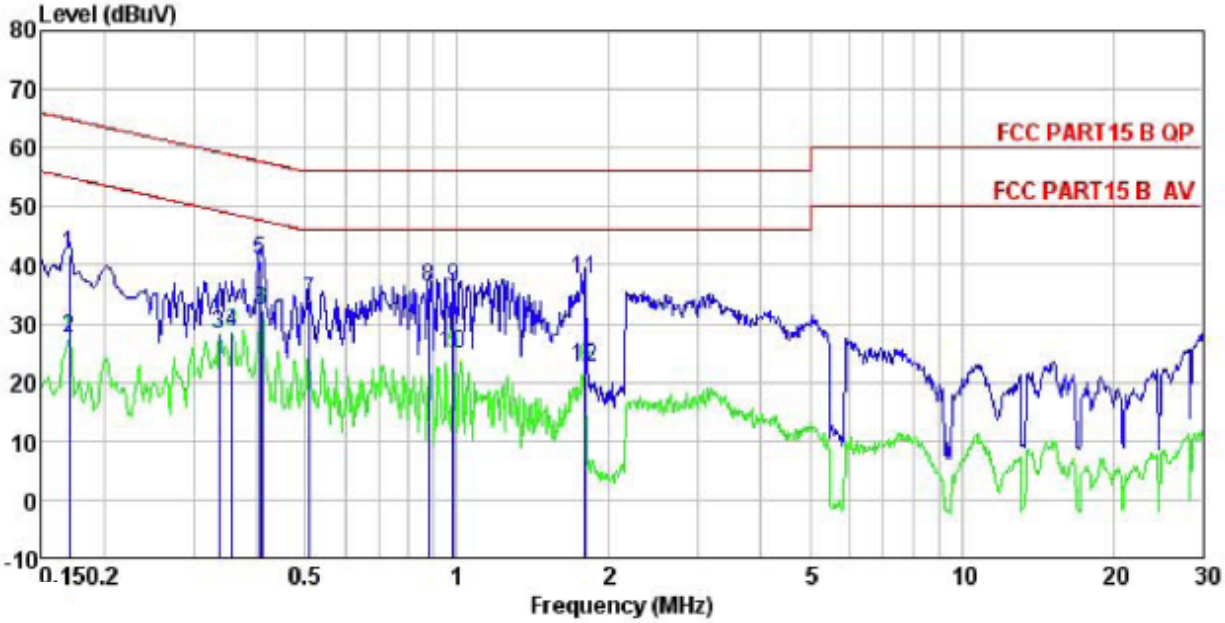
The Test Receiver setup: RBW=9kHz, VBW=30kHz, Sweep time= auto

4.4. Test Data

Please to see the following pages

Conducted Emission Test Data

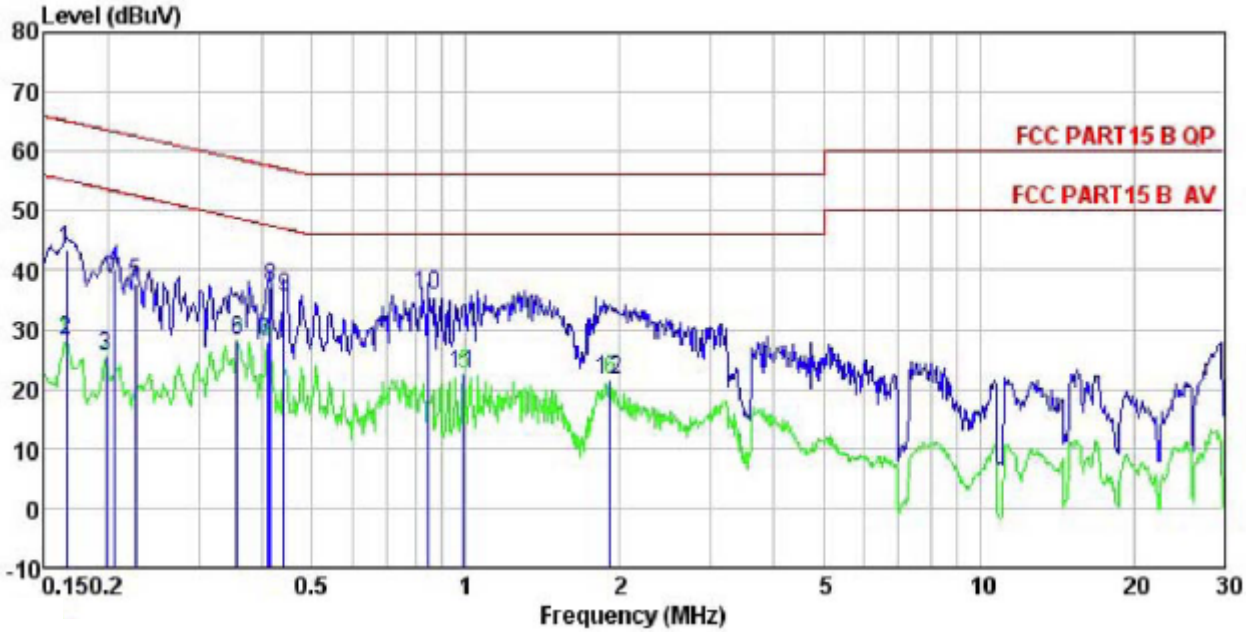
EUT:	Rugged Portable Bluetooth Speaker	M/N: Voombox-Travel
Operating Condition:	Charging & Playing mode	
Test Site:	Shielded room	
Operator:	Jason	
Test Specification:	AC120V/60Hz	
Polarization:	Line	
Note	Tem:25℃ Hum:50%	



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.170	30.90	10.25	0.78	41.93	64.94	-23.01	QP
2	0.170	16.34	10.25	0.78	27.37	54.94	-27.57	Average
3	0.337	17.21	10.25	0.73	28.19	49.27	-21.08	Average
4	0.358	17.41	10.25	0.73	28.39	48.78	-20.39	Average
5	0.406	29.98	10.26	0.72	40.96	57.73	-16.77	QP
6	0.410	21.11	10.26	0.72	32.09	47.64	-15.55	Average
7	0.510	22.89	10.27	0.76	33.92	56.00	-22.08	QP
8	0.880	25.13	10.19	0.83	36.15	56.00	-19.85	QP
9	0.984	25.02	10.20	0.87	36.09	56.00	-19.91	QP
10	0.984	13.90	10.20	0.87	24.97	46.00	-21.03	Average
11	1.800	26.38	10.26	0.95	37.59	56.00	-18.41	QP
12	1.800	11.39	10.26	0.95	22.60	46.00	-23.40	Average

Conducted Emission Test Data

EUT:	Rugged Portable Bluetooth Speaker	M/N: Voombox-Travel
Operating Condition:	Charging & Playing mode	
Test Site:	Shielded room	
Operator:	Jason	
Test Specification:	AC 120V/60Hz	
Polarization:	Neutral	
Note	Tem:25℃ Hum:50%	



	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.166	32.35	10.24	0.78	43.37	65.16	-21.79	QP
2	0.166	17.24	10.24	0.78	28.26	55.16	-26.90	Average
3	0.198	14.57	10.21	0.76	25.54	53.71	-28.17	Average
4	0.206	29.08	10.21	0.76	40.05	63.36	-23.31	QP
5	0.226	26.78	10.23	0.75	37.76	62.61	-24.85	QP
6	0.358	17.34	10.27	0.73	28.34	48.78	-20.44	Average
7	0.410	16.89	10.28	0.72	27.89	47.64	-19.75	Average
8	0.415	26.31	10.28	0.73	37.32	57.55	-20.23	QP
9	0.442	24.47	10.28	0.74	35.49	57.02	-21.53	QP
10	0.844	24.86	10.20	0.82	35.88	56.00	-20.12	QP
11	0.989	11.36	10.21	0.87	22.44	46.00	-23.56	Average
12	1.908	10.45	10.28	0.95	21.68	46.00	-24.32	Average

5. Conducted Peak Output Power Test

5.1. Test Standard and Limit

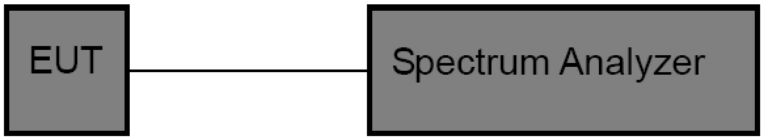
5.1.1 Test Standard

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

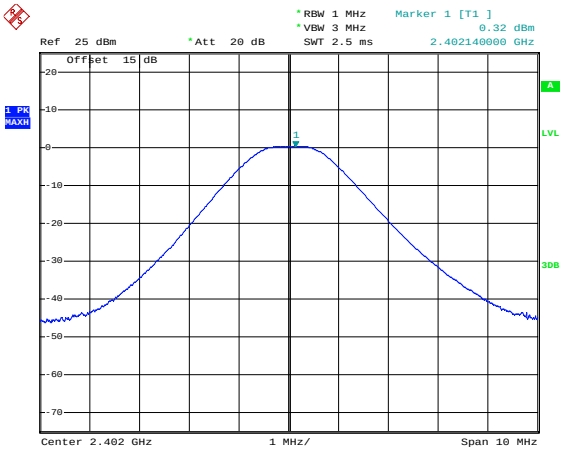
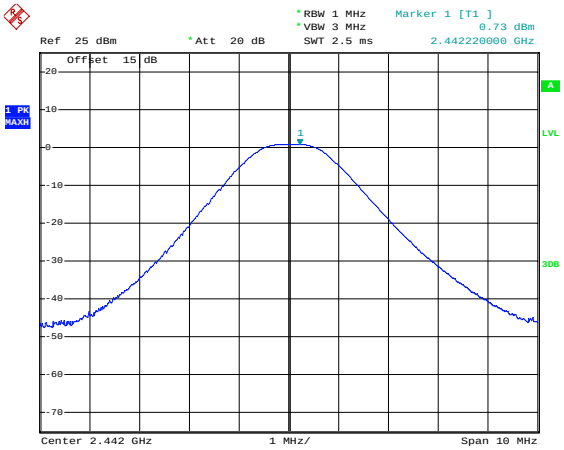
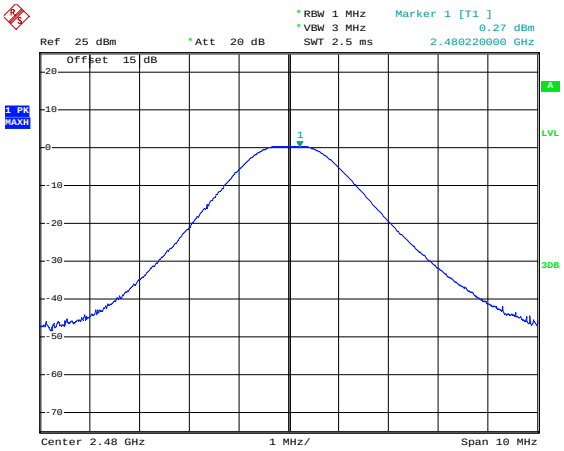


5.3. Test Procedure

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	0.32	30	PASSED
CH 20	2442	0.73	30	PASSED
CH 39	2480	0.27	30	PASSED
Remark: Test plot as follows				

Modulation mode	GFSK mode
2402MHz	 Date: 03.APR.2014 16:32:51
2442MHz	 Date: 03.APR.2014 16:36:02
2480MHz	 Date: 03.APR.2014 16:38:54

6. Occupy Bandwidth Test

6.1. Test Standard and Limit

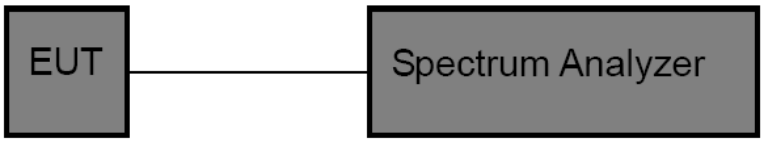
6.1.1 Test Standard

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



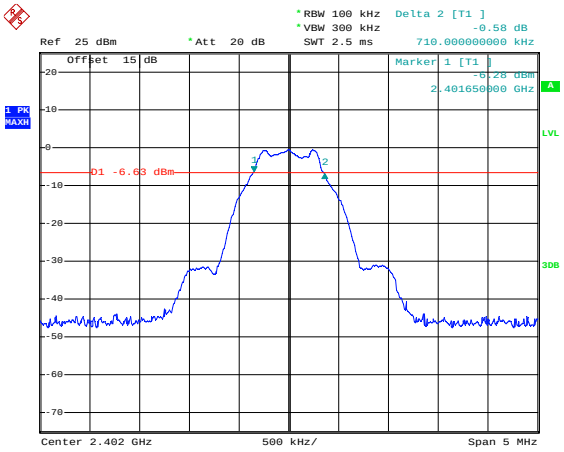
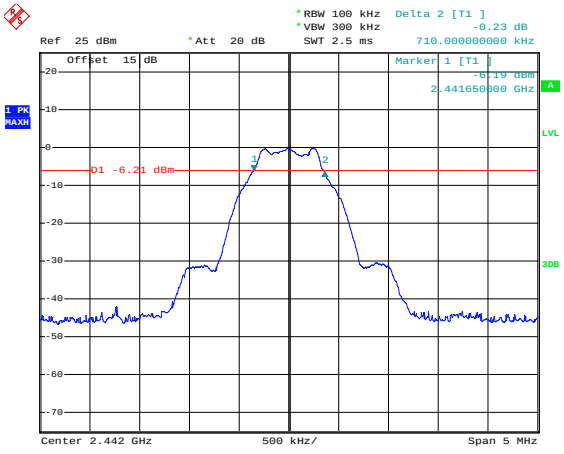
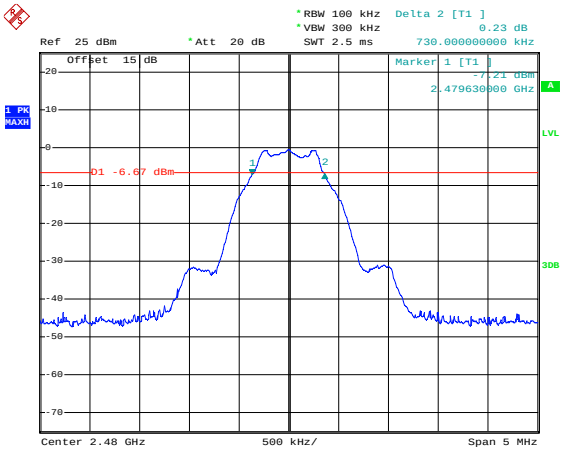
6.3. Test Procedure

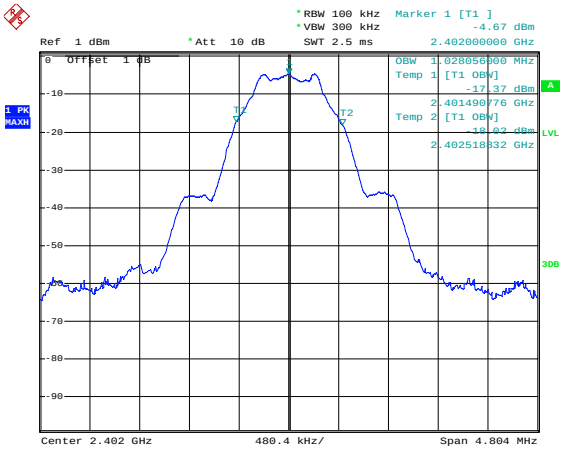
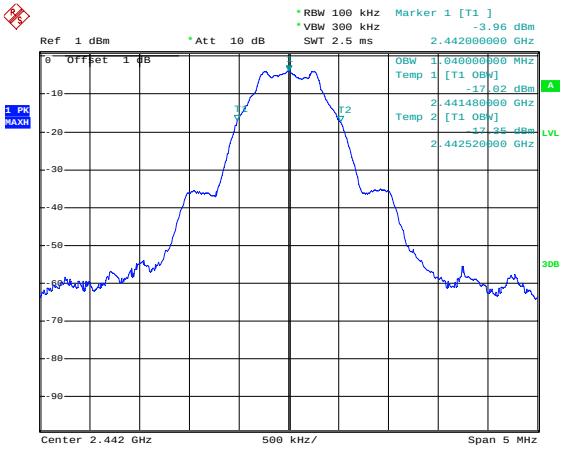
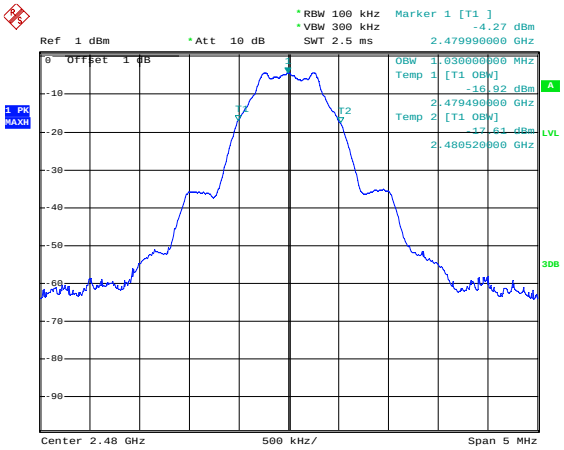
Refer to KDB558074 v03r01 (DTS Measure Guidance) Section 8.0

6.4. Test Data

Channel Number	Channel Frequency	6dB Bandwidth (kHz)	Limit(kHz)	Judgment
CH 00	2402(MHz)	710	>500	PASSED
CH 20	2442(MHz)	710	>500	PASSED
CH 39	2480(MHz)	730	>500	PASSED
Remark: Test plot as follows				

Channel Number	Channel Frequency	99% Occupy Bandwidth (kHz)	Limit(kHz)	Judgment
CH 00	2402(MHz)	1030	/	/
CH 20	2442(MHz)	1040	/	/
CH 39	2480(MHz)	1030	/	/
Remark: Test plot as follows				

6dB EBW **Modulation mode**	**GFSK mode**
2402MHz	
2442MHz	
2480MHz	

99% OBW **Modulation mode**	**GFSK**
2402MHz	 Date: 04.APR.2014 13:10:48
2442MHz	 Date: 04.APR.2014 13:09:58
2480MHz	 Date: 04.APR.2014 13:10:18

7. Power Spectral Density Test

7.1. Test Standard and Limit

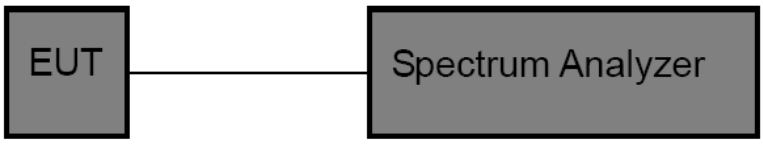
7.1.1 Test Standard

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

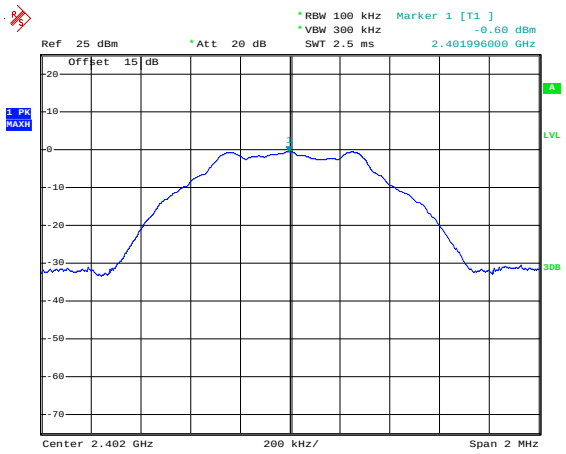
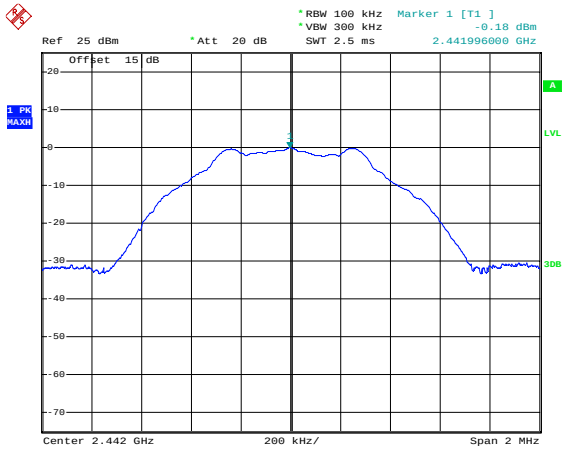
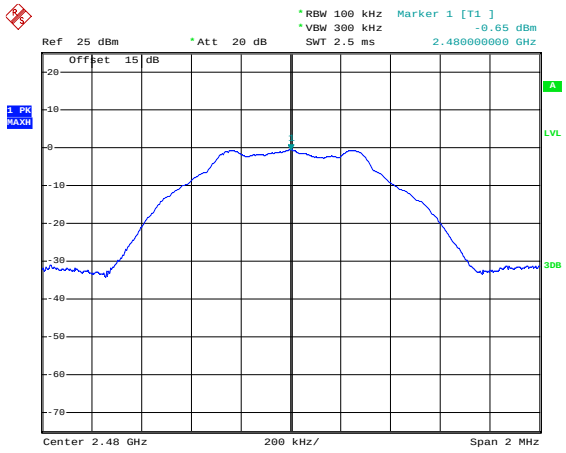


7.3. Test Procedure

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)	-0.60	8.0	PASSED
CH 20	2442(MHz)	-0.18	8.0	PASSED
CH 39	2480(MHz)	-0.65	8.0	PASSED
Remark: Test plot as follows				

Modulation mode	GFSK mode
2402MHz	
2442MHz	
2480MHz	

8. Band Edge Requirement (Conducted Emission Method)

8.1. Test Standard and Limit

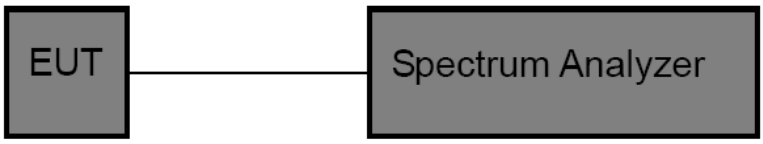
8.1.1 Test Standard

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

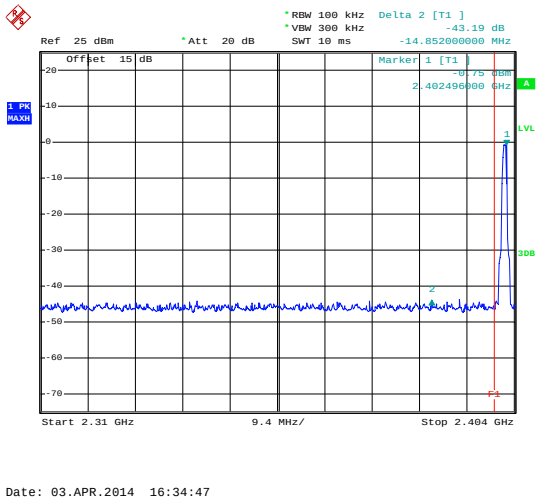
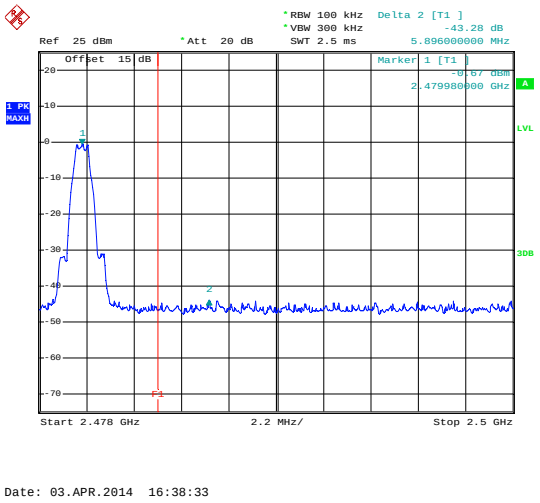


8.3. Test Procedure

Refer to KDB558074 v03r01 (DTS Measure Guidance) Section 12.0

8.4. Test Data

Test plot as follows

Modulation mode	GFSK
	
Lowest	Highest

9. Band Edge Requirement (Radiated Emission Method)

9.1. Test Standard and Limit

9.1.1 Test Standard

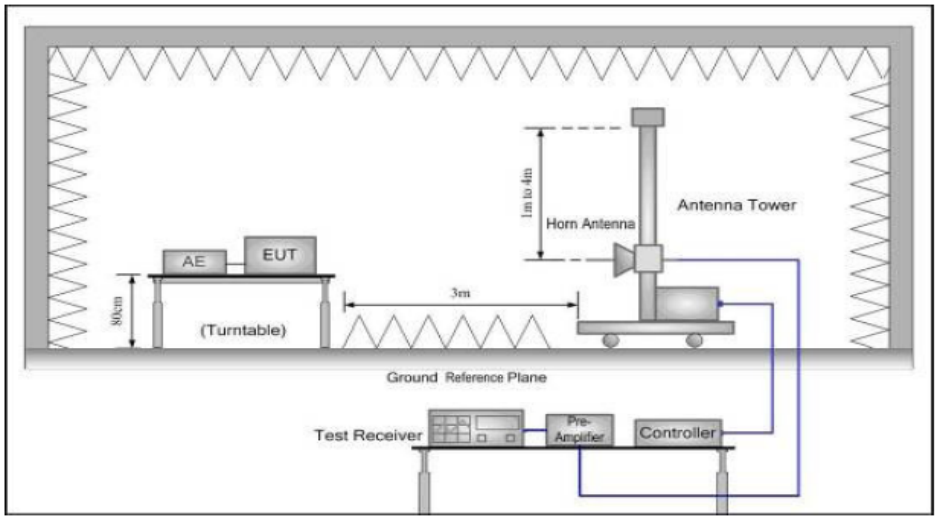
FCC Part15 C Section 15.209 and 15.205

9.1.2 Test Limit

Radiated Emission Test Limit

Frequency	Limit (dBμV/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 camber. 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

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	17.36	27.58	5.67	0.00	50.61	74.00	-23.39	H	PEAK
2400.00	17.93	27.58	5.67	0.00	38.82	74.00	-15.18	V	PEAK
2400.00	5.57	27.58	5.67	0.00	51.18	54.00	-22.82	H	AVG.
2400.00	5.60	27.58	5.67	0.00	38.35	54.00	-15.15	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	21.80	27.52	5.70	0.00	55.02	74.00	-18.98	H	PEAK
2483.50	21.90	27.52	5.70	0.00	55.02	74.00	-18.88	V	PEAK
2483.50	8.60	27.52	5.70	0.00	41.82	54.00	-12.18	H	AVG.
2483.50	8.81	27.52	5.70	0.00	41.82	54.00	-11.98	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

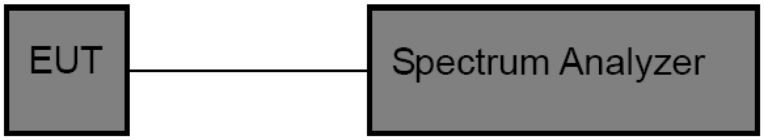
10.1.1 Test Standard

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.

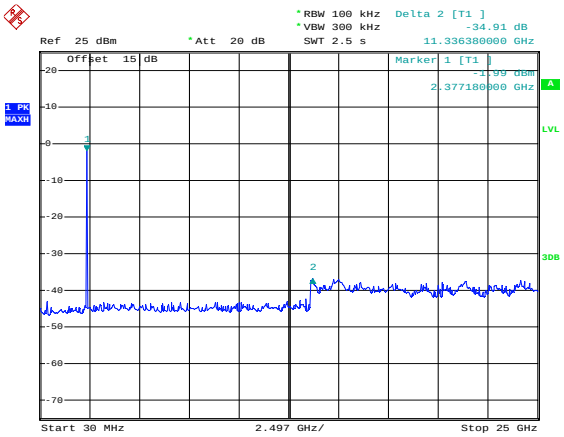
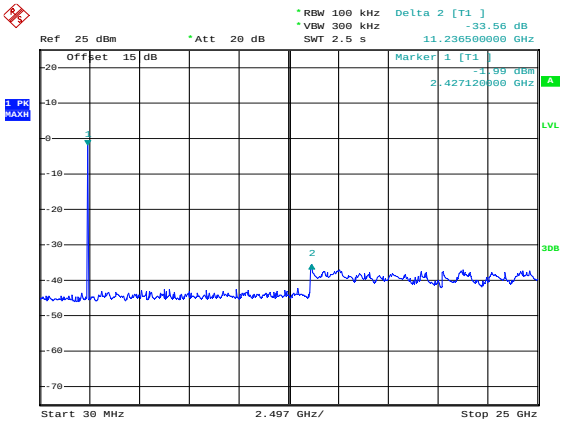
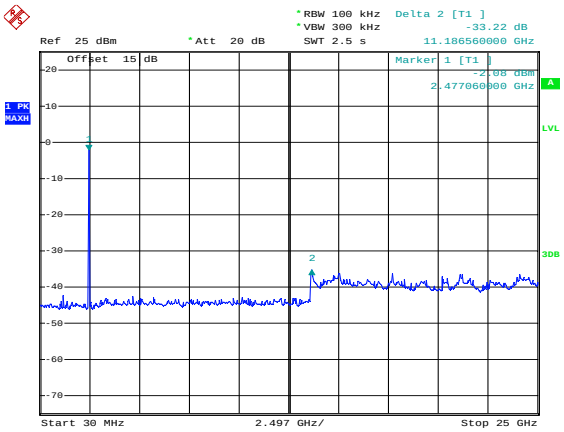
10.2. Test Setup



10.3. Test Procedure

Refer to KDB558074 v03r01 (DTS Measure Guidance) Section 11.0

10.4. Test Data

Modulation mode	GFSK	Frequency range	30MHz~25GHz
Lowest	 Date: 03.APR.2014 16:35:04		
Middle	 Date: 03.APR.2014 16:37:29		
Highest	 Date: 03.APR.2014 16:38:12		

11. Spurious Emission (Radiated Emission Method)

11.1. Test Standard and Limit

11.1.1 Test Standard

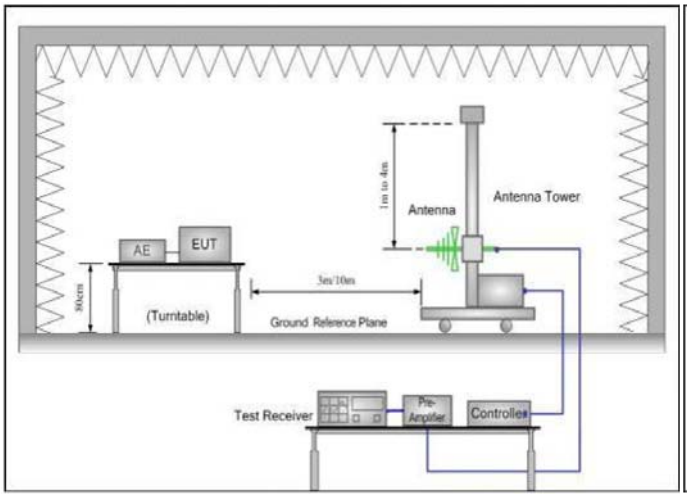
FCC Part15 C Section 15.209 and 15.205

11.1.2 Test Limit

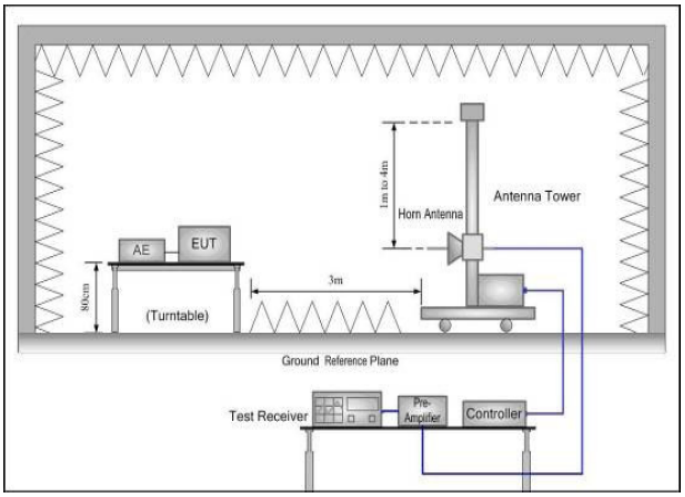
Frequency (MHz)	Limit (dBμV/m) At 3m Distance	
30MHz~88MHz	40	Quasi-peak
88MHz~216MHz	43.5	Quasi-peak
216MHz~960MHz	46	Quasi-peak
960MHz~1000MHz	54	Quasi-peak
Above 1000MHz	54	Average
	74	Peak
Remark: 1. The lower limit shall apply at the transition frequency.		

11.2. Test Setup

Below 1GHz



Above 1GHz



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 camber. 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.

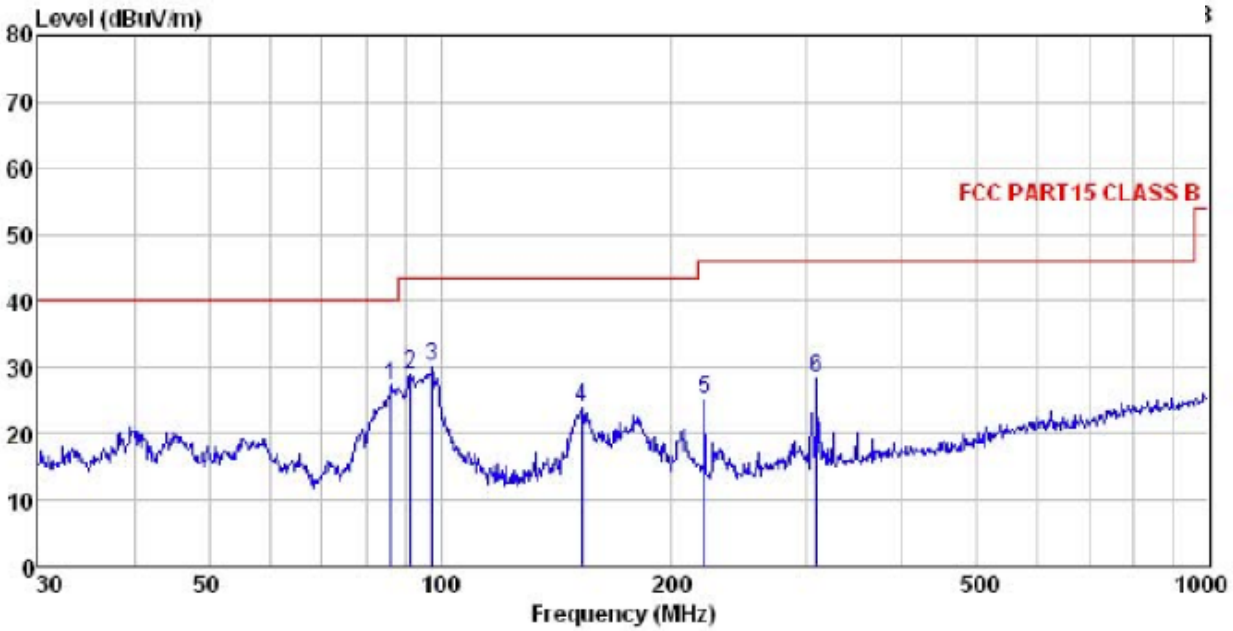
11.4. Test Data

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)

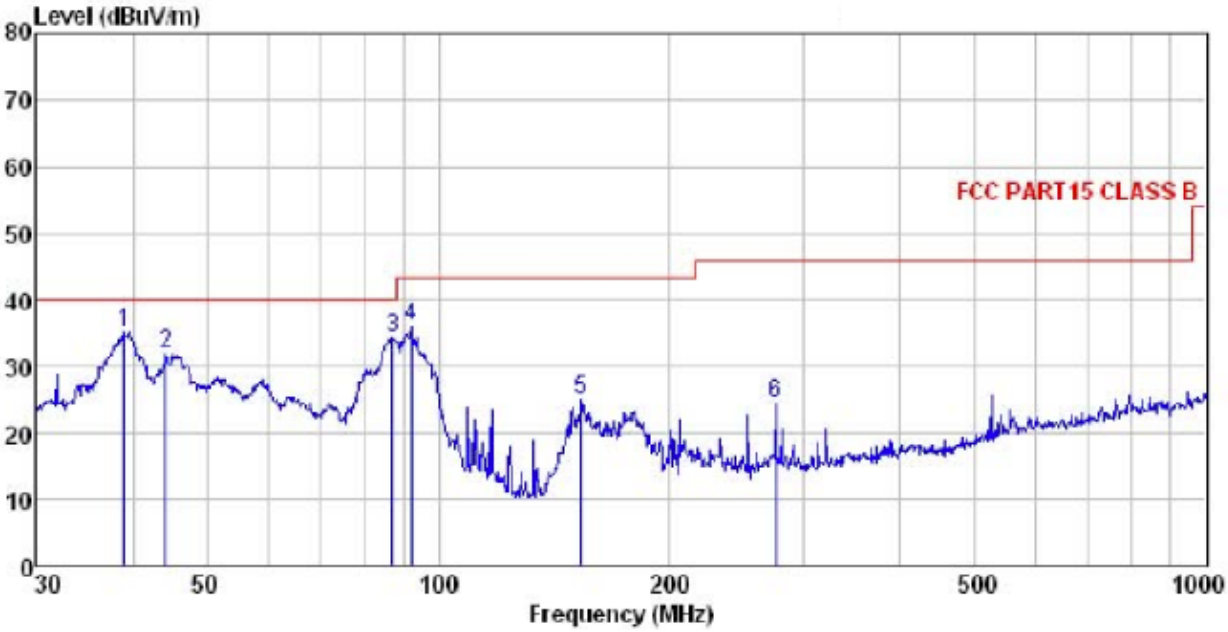
EUT:	Rugged Portable Bluetooth Speaker	M/N: Voombox-Travel
Operating Condition:	Bluetooth TX mode	
Test Site:	3m chamber	
Operator:	Jason	
Test Specification:	AC120V/60Hz	
Polarization:	Horizontal	
Note	Tem:23℃ Hum:50%	



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	86.200	44.57	10.74	1.91	30.09	27.13	40.00	-12.87	QP
2	91.495	44.73	12.24	2.03	30.07	28.93	43.50	-14.57	QP
3	97.456	45.27	13.00	1.98	30.09	30.16	43.50	-13.34	QP
4	152.664	42.54	8.39	2.53	29.44	24.02	43.50	-19.48	QP
5	220.617	40.89	11.20	2.85	29.72	25.22	46.00	-20.78	QP
6	308.913	41.55	13.17	2.97	29.48	28.21	46.00	-17.79	QP

Radiated Emission Test Data (Below 1GHz)

EUT:	Rugged Portable Bluetooth Speaker	M/N: Voombox-Travel
Operating Condition:	Bluetooth TX mode	
Test Site:	3m chamber	
Operator:	Jason	
Test Specification:	AC120V/60Hz	
Polarization:	Vertical	
Note	Tem:23℃ Hum:50%	



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	39.024	47.89	13.34	1.18	27.17	35.24	40.00	-4.76	QP
2	44.120	44.82	13.56	1.28	27.70	31.96	40.00	-8.04	QP
3	87.112	51.29	11.03	1.91	30.09	34.14	40.00	-5.86	QP
4	92.139	51.79	12.33	2.03	30.07	36.08	43.50	-7.42	QP
5	153.200	43.75	8.39	2.54	29.44	25.24	43.50	-18.26	QP
6	275.157	38.66	12.55	2.87	29.51	24.57	46.00	-21.43	QP

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	53.94	31.53	8.90	40.24	54.13	74.00	-19.87	V	PEAK
7206.00	49.74	36.47	10.59	41.24	55.56	74.00	-18.44	V	PEAK
9608.00	46.88	38.10	13.16	41.40	56.74	74.00	-17.26	V	PEAK
12010.00	*					74.00		V	PEAK
14412.00	*					74.00		V	PEAK
16814.00	*					74.00		V	PEAK
4804.00	54.02	31.53	8.90	40.24	54.21	74.00	-19.79	H	PEAK
7206.00	49.21	36.47	10.59	41.24	55.03	74.00	-18.97	H	PEAK
9608.00	46.72	38.10	13.16	41.40	56.58	74.00	-17.42	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	34.12	31.53	8.90	40.24	34.31	54.00	-19.69	V	AVG.
7206.00	29.34	36.47	10.59	41.24	35.16	54.00	-18.84	V	AVG.
9608.00	26.74	38.10	13.16	41.40	36.60	54.00	-17.40	V	AVG.
12010.00	*					54.00		V	AVG.
14412.00	*					54.00		V	AVG.
16814.00	*					54.00		V	AVG.
4804.00	34.22	31.53	8.90	40.24	34.41	54.00	-19.59	H	AVG.
7206.00	30.01	36.47	10.59	41.24	35.83	54.00	-18.17	H	AVG.
9608.00	26.45	38.10	13.16	41.40	36.31	54.00	-17.69	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.

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	54.23	31.58	8.98	40.15	54.64	74.00	-19.36	V	PEAK
7326.00	49.84	36.47	10.69	41.15	55.85	74.00	-18.15	V	PEAK
9768.00	46.35	38.45	13.37	41.71	56.46	74.00	-17.54	V	PEAK
12210.00	*					74.00		V	PEAK
14652.00	*					74.00		V	PEAK
17094.00	*					74.00		V	PEAK
4884.00	54.21	31.58	8.98	40.15	54.62	74.00	-19.38	H	PEAK
7326.00	49.21	36.47	10.69	41.15	55.22	74.00	-18.78	H	PEAK
9768.00	46.43	38.45	13.37	41.71	56.54	74.00	-17.46	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	34.54	31.58	8.98	40.15	34.95	54.00	-19.05	V	AVG.
7326.00	29.77	36.47	10.69	41.15	35.78	54.00	-18.22	V	AVG.
9768.00	26.47	38.45	13.37	41.71	36.58	54.00	-17.42	V	AVG.
12210.00	*					54.00		V	AVG.
14652.00	*					54.00		V	AVG.
17094.00	*					54.00		V	AVG.
4884.00	33.78	31.58	8.98	40.15	34.19	54.00	-19.81	H	AVG.
7326.00	29.41	36.47	10.69	41.15	35.42	54.00	-18.58	H	AVG.
9768.00	26.84	38.45	13.37	41.71	36.95	54.00	-17.05	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 – 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.

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	53.96	31.69	9.08	40.03	54.70	74.00	-19.30	V	PEAK
7440.00	49.14	36.60	10.80	41.05	55.49	74.00	-18.51	V	PEAK
9920.00	46.02	38.66	13.55	41.99	56.24	74.00	-17.76	V	PEAK
12400.00	*					74.00		V	PEAK
14880.00	*					74.00		V	PEAK
17360.00	*					74.00		V	PEAK
4960.00	53.68	31.69	9.08	40.03	54.42	74.00	-19.58	H	PEAK
7440.00	49.55	36.60	10.80	41.05	55.90	74.00	-18.10	H	PEAK
9920.00	46.75	38.66	13.55	41.99	56.97	74.00	-17.03	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	33.67	31.69	9.08	40.03	34.41	54.00	-19.59	V	AVG.
7440.00	29.41	36.60	10.80	41.05	35.76	54.00	-18.24	V	AVG.
9920.00	26.51	38.66	13.55	41.99	36.73	54.00	-17.27	V	AVG.
12400.00	*					54.00		V	AVG.
14880.00	*					54.00		V	AVG.
17360.00	*					54.00		V	AVG.
4960.00	33.68	31.69	9.08	40.03	34.42	54.00	-19.58	H	AVG.
7440.00	29.57	36.60	10.80	41.05	35.92	54.00	-18.08	H	AVG.
9920.00	26.44	38.66	13.55	41.99	36.66	54.00	-17.34	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.