

FCC CERTIFICATION TEST REPORT

FOR

Applicant	:	Dongguan iMushroom Audio Co.,Ltd
Address	:	No.21, Nanxing Three Road, Nanfang Industrial Park, Beizha Village, Humen Town, Dongguan, Guangdong, China
Equipment under Test	:	Bluetooth Speaker
Model No	:	BTSP12, W-03,W-03-1,W-03II,W-02,W-02-1,W-02II, SOG-03,SOG-03II,SOG-06,SOG-06II,SOG-08,SOG-08II
Trade Mark	:	N/A
FCC ID:	:	2ACRS-W03
Manufacturer	:	Dongguan iMushroom Audio Co., Ltd
Address	:	No.21, Nanxing Three Road, Nanfang Industrial Park, Beizha Village, Humen Town, Dongguan, Guangdong, China

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

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REPORT

TABLE OF CONTENTS

	Test report declares.....	4
1.	Summary of test results	5
2.	General test information	6
2.1.	Description of EUT	6
2.2.	Accessories of EUT	6
2.3.	Assistant equipment used for test.....	6
2.4.	Block diagram of EUT configuration for test	6
2.5.	Test environment conditions	7
2.6.	Test laboratory.....	7
2.7.	Measurement uncertainty	8
3.	6dB Bandwidth and 99% bandwidth.....	9
3.1.	Test equipment	9
3.2.	Block diagram of test setup	9
3.3.	Limits	9
3.4.	Test Procedure.....	9
3.5.	Test Result.....	9
3.6.	Original test data	10
4.	Maximum Peak Output Power	12
4.1.	Test equipment	12
4.2.	Block diagram of test setup	12
4.3.	Limits	12
4.4.	Test Procedure.....	12
4.5.	Test Result.....	12
4.6.	Original test data	13
5.	Power Spectral Density	15
5.1.	Test equipment	15
5.2.	Block diagram of test setup	15
5.3.	Limits	15
5.4.	Test Procedure.....	15
5.5.	Test Result.....	15
5.6.	Original test data	16
6.	Emissions in non-restricted frequency bands	18
6.1.	Test equipment	18
6.2.	Block diagram of test setup	18
6.3.	Limits	18
6.4.	Test Procedure.....	18

6.5.	Test Result.....	19
6.6.	Original test data	19
7.	Emissions in restricted frequency bands	24
7.1.	Test equipment	24
7.2.	Block diagram of test setup	24
7.3.	Limit	26
7.4.	Test Procedure.....	27
7.5.	Test result	28
8.	Band Edge Compliance	43
8.1.	Test equipment	43
8.2.	Block diagram of test setup	43
8.3.	Limit	43
8.4.	Test Procedure.....	44
8.5.	Test result	44
9.	Power Line Conducted Emission	49
9.1.	Test equipment	49
9.2.	Block diagram of test setup	49
9.3.	Power Line Conducted Emission Limits(Class B).....	49
9.4.	Test Procedure.....	49
9.5.	Test Result.....	50
10.	Antenna Requirements	53
10.1.	Limit	53
10.2.	Result.....	53
11.	Test setup photograph	54
12.	Photos of the EUT	56

TEST REPORT DECLARE

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FCC ID	:	2ACRS-W03
Trade Mark	:	N/A
Manufacturer	:	Dongguan iMushroom Audio Co., Ltd
Address	:	No.21, Nanxing Three Road, Nanfang Industrial Park, Beizha Village, Humen Town, Dongguan, Guangdong, China

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C: 2012

Test procedure used: ANSI C63.10:2009, ANSI C63.4:2009, KDB 558074:v03r01

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No:	DDT-RE140550		
Date of Test:	2014/6/26~2014/6/30	Date of Report:	2014/07/17

Prepared By:


Leo Liu/Engineer

Approved By:

Jamy Yu/EMC Manager

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

1. Summary of test results

The EUT have been tested according to the applicable standards as referenced below.		
Description of Test Item	Standard	Results
6dB Bandwidth	FCC Part 15: 15.247 KDB558074	PASS
Peak Output Power	FCC Part 15: 15.247 KDB558074	PASS
Power Spectral Density	FCC Part 15: 15.247 KDB558074	PASS
Emissions in non-restricted frequency bands	ANSI C63.4:2009 KDB558074	PASS
Transmitter spurious emission	ANSI C63.4:2009 FCC Part 15: 15.247 ANSI C63.10: 2009 KDB558074	PASS
Band Edge Compliance	ANSI C63.4:2009 FCC Part 15: 15.247 ANSI C63.10: 2009 KDB558074	PASS
Power Line Conducted Emission	FCC Part 15: 15.207 ANSI C63.4:2009	PASS
Antenna requirement	FCC Part 15: 15.203	PASS

2. General test information

2.1. Description of EUT

EUT* Name	:	Bluetooth Speaker
Model Number	:	BTSP12,W-03,W-03-1,W-03II,W-02,W-02-1,W-02II, SOG-03,SOG-03II,SOG-06,SOG-06II,SOG-08,SOG-08II
Difference of Model	:	Thoes model only have difference cabinet color
EUT function description	:	Please reference user manual of this device
Power supply	:	DC 5V from PC and DC 3.7V from battery
Radio Specification	:	Bluetooth V4.0
Operation frequency	:	2402MHz -2480MHz
Modulation	:	GFSK
Data rate	:	1Mbps
Antenna Type	:	Integrated PCB antenna, Maximum Gain: 0dBi
Date of Receipt	:	2014/6/26
Sample Type	:	Series production

Note 1: EUT is the ab. of equipment under test.

Note 2: This report only for Bluetooth LE mode of EUT,for Bluetooth BDR and EDR mode was reported in another test report: DDT-RE140549

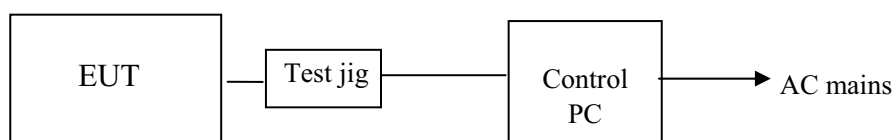
2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number or Type	Serial No.	Other
/	/	/	/	/

2.3. Assistant equipment used for test

Description of Assistant equipment	Manufacturer	Model number or Type	EMC Compliance	Other
Notebook	DELL	Latitude D610	FCC	00045-534-136-300

2.4. Block diagram of EUT configuration for test



EUT's Bluetooth module was connected to a special test jig provided by manufacturer which has a standard RSS-232 connector to connect to control PC, and the control PC will run a special test software "BlueSuite2.4.8" provided by manufacturer to control EUT work in test mode as blow table.

Tested mode, channel, information		
Mode	Channel	Frequency (MHz)
GFSK	CH0	2402
	CH19	2440
	CH39	2480
Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.		

2.5. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25℃
Humidity range:	40-75%
Pressure range:	86-106kPa

2.6. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808 Tel: +86-0769-22891499 <http://www.dgddt.com>

FCC Registration Number: 270092 Industry Canada site registration number: 10288A-1

2.7. Measurement uncertainty

Test Item	Uncertainty
Occupied Channel Bandwidth	$\pm 1\%$
Uncertainty for radio frequency	1×10^{-9}
RF Output power, conducted	$\pm 0.6\text{dB}$
Power Spectral Density, Conducted	$\pm 1.2\text{dB}$
Unwanted Emissions, Conducted	$\pm 0.6\text{dB}$
Temperature	$\pm 0.2^{\circ}\text{C}$
Humidity	$\pm 1\%$
DC and Low frequency voltage	$\pm 0.5\%$
Time	$\pm 1\%$
Duty Cycle	$\pm 1\%$
Uncertainty for Radiation Emission test (30MHz-1GHz)	3.14 dB (Polarize: V)
	3.16 dB (Polarize: H)
Uncertainty for Radiation Emission test (1GHz to 25GHz)	2.08dB(Polarize: V)
	2.56dB (Polarize: H)
Uncertainty for Conduction emission test(150KHz-30MHz)	2.44dB
Uncertainty for Radiation Emission test (9KHz-150KHz)	3.89dB
Uncertainty for Radiation Emission test (150KHz-30MHz)	3.21dB

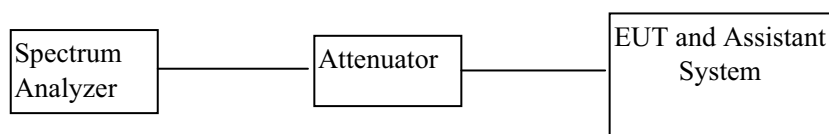
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

3. 6dB Bandwidth

3.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum analyzer	R&S	FSU	1166.1660.26	2013/11/13	1 Year
2	Attenuator	Mini-Circuits	BW-S10W2	101109	2013/11/13	1 Year
3	RF Cable	Micable	C10-01-01-1	100309	2013/11/13	1 Year

3.2. Block diagram of test setup



3.3. Limits

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 KHz

3.4. Test Procedure

- (1) Configure EUT and assistant system according clause 2.4 and 3.2
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (3) Configure EUT work in test mode as stated in clause 2.4.
- (4) Set the spectrum analyzer as follows:

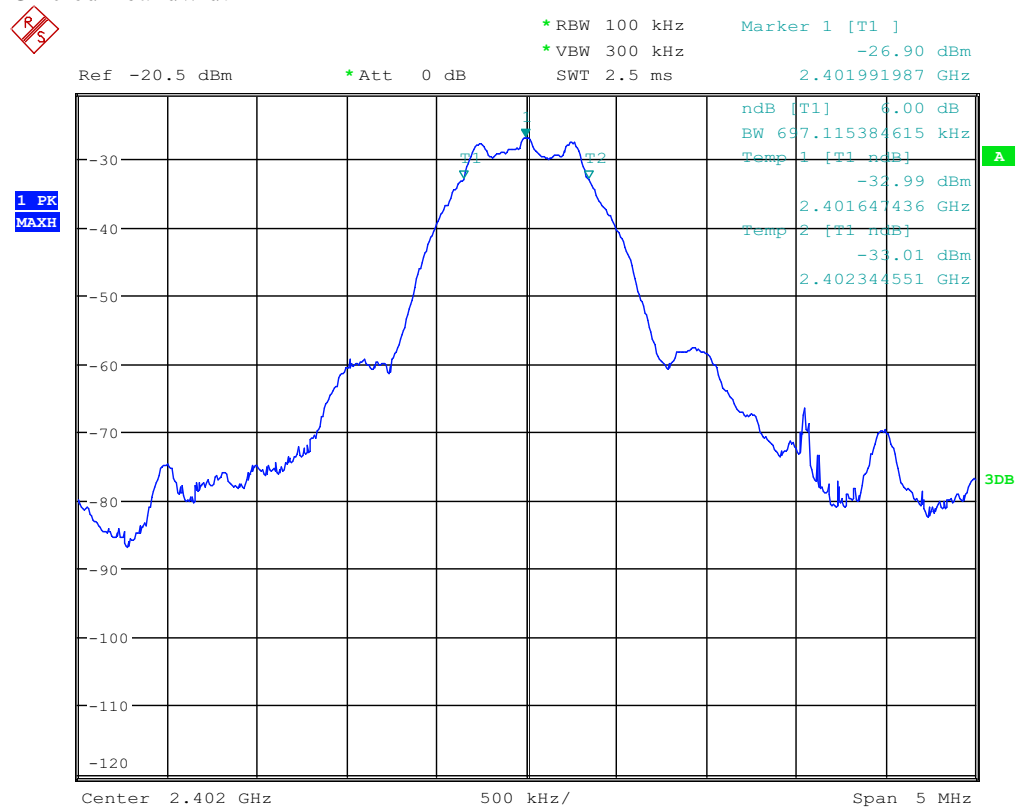
RBW:	100KHz
VBW:	300KHz
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold
- (5) Allow the trace to stabilize, measure the 6dB and 99% bandwidth of signal.

3.5. Test Result

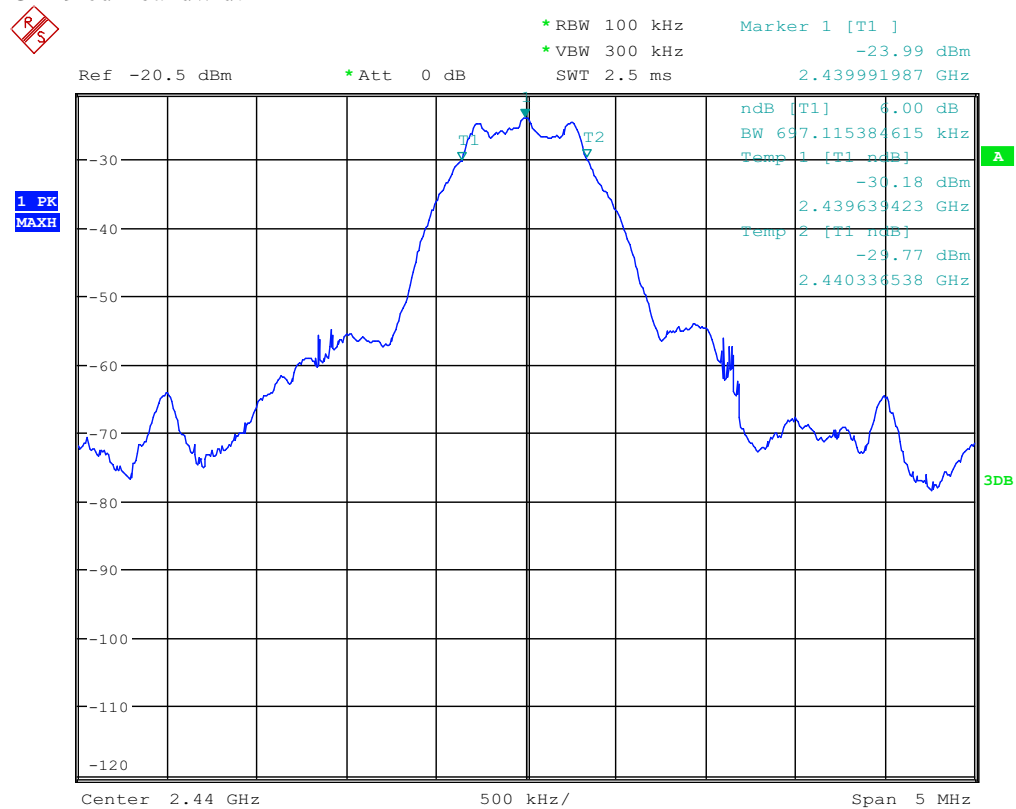
EUT: Bluetooth Speaker		M/N: BTSP12		
Mode	Channel	6dB bandwidth Result (MHz)	6 dB width Limit (MHz)	Conclusion
GFSK	CH0	0.697	>0.5	PASS
	CH19	0.697	>0.5	PASS
	CH39	0.697	>0.5	PASS
Test Date : 2014/6/29		Test Engineer: Leo Liu		

3.6. Original test data

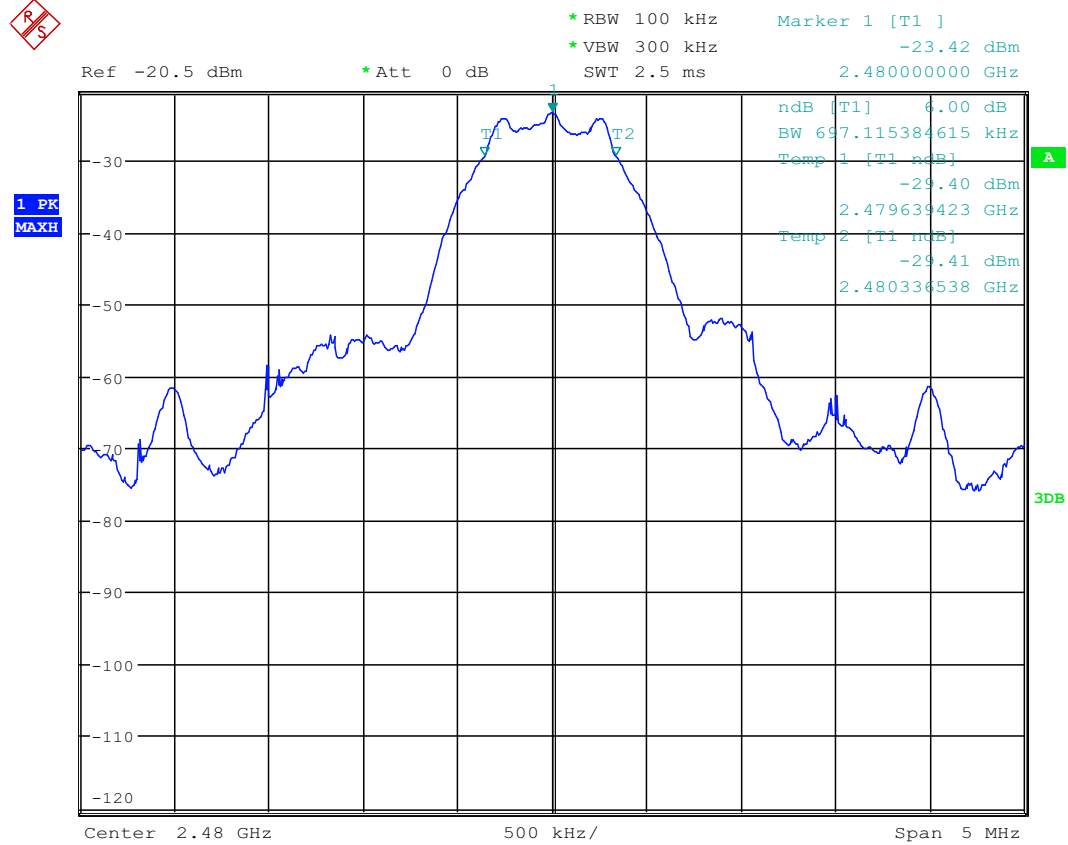
CH0 6dB bandwidth



CH19 6dB bandwidth



CH39 6dB bandwidth



4. Maximum Peak Output Power

4.1. Test equipment

Same with 3.1

4.2. Block diagram of test setup

Same with 3.2

4.3. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.4. Test Procedure

- (1) Configure EUT and assistant system according clause 2.4 and 3.2
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (3) Configure EUT work in test mode as stated in clause 2.4.
- (4) Set the spectrum analyzer as follows:

RBW:	1MHz
VBW:	3MHz
Span	>1.5x 6dB bandwidth
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

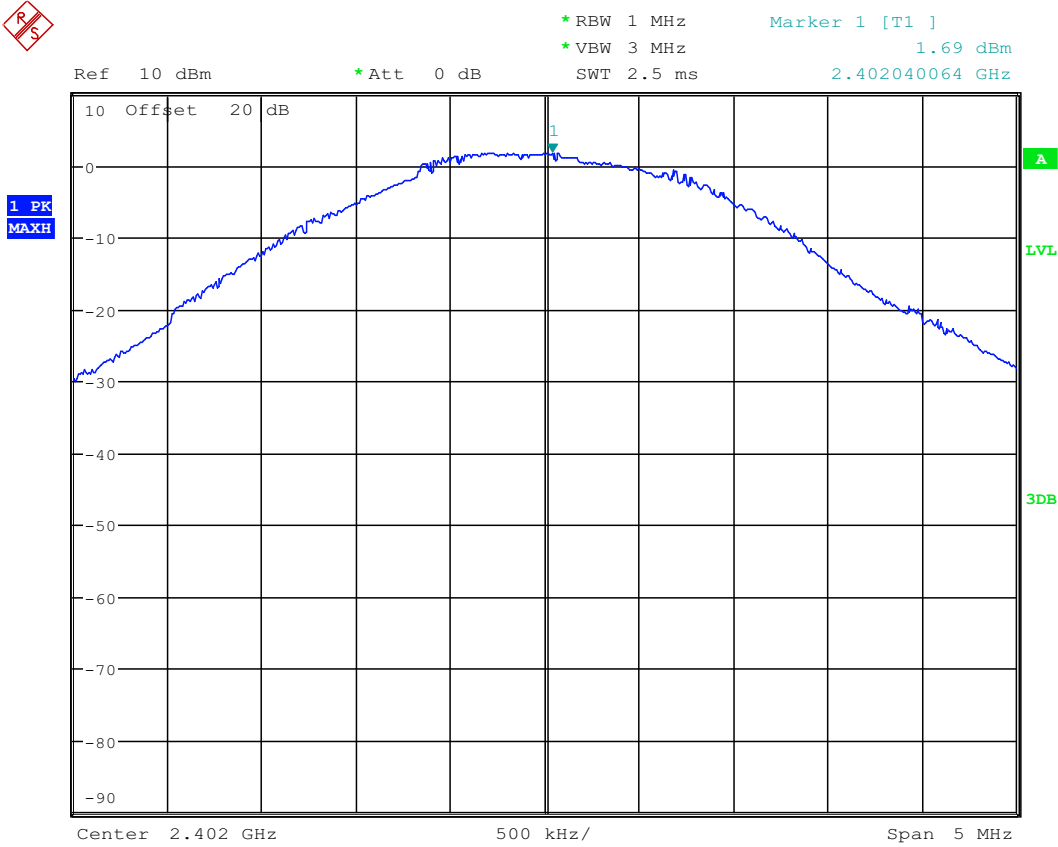
- (5) Allow the trace to stabilize, Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges measure out the PK output power.

4.5. Test Result

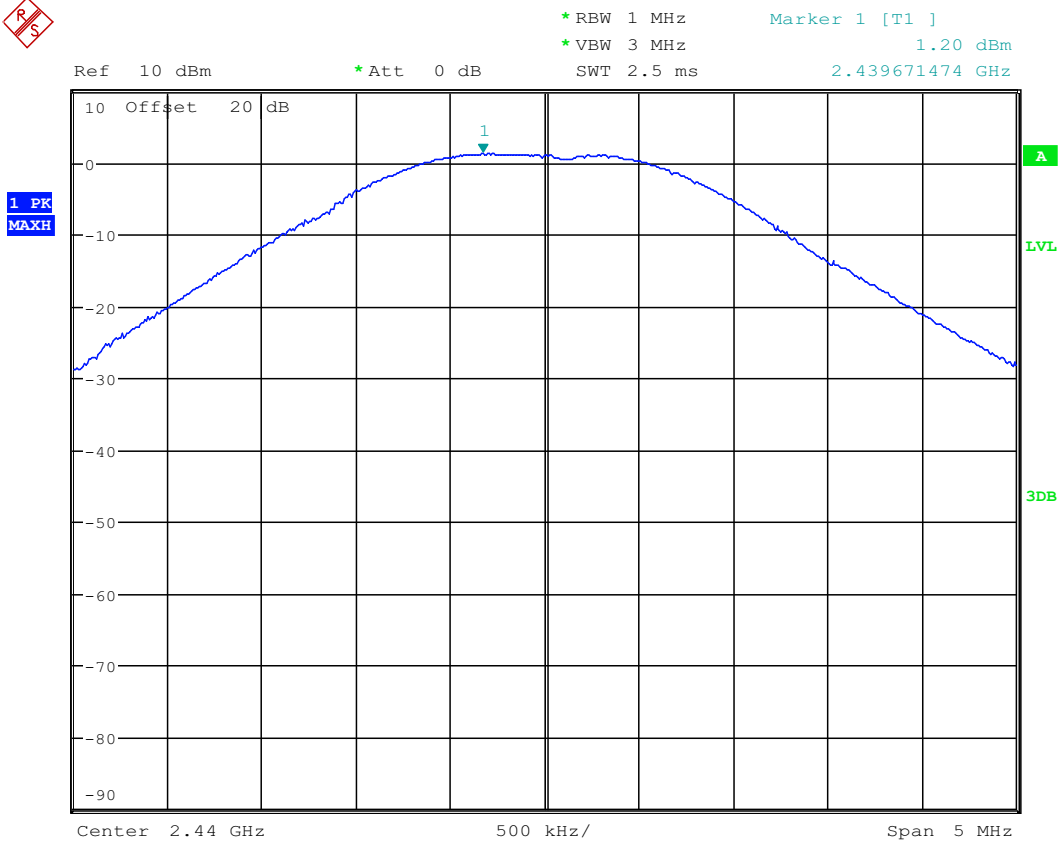
EUT: Bluetooth Speaker M/N: BTSP12					
Mode	Freq (MHz)	Peak Output Power (dBm)	Limit (dBm)	Margin (dB)	Conclusion
GFSK	2402	1.69	30	28.31	PASS
	2440	1.20	30	28.80	PASS
	2480	1.59	30	28.41	PASS
Test Date : 2014/06/29			Test Engineer : Leo Liu		

4.6. Original test data

CH0:



CH19:





Ref 10 dBm * Att 0 dB SWT 2.5 ms 2.479655449 GHz



5. Power Spectral Density

5.1. Test equipment

Same with 3.1

5.2. Block diagram of test setup

Same with 3.2

5.3. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

5.4. Test Procedure

- (1) Configure EUT and assistant system according clause 2.4 and 5.2
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (3) Configure EUT work in test mode as stated in clause 2.4.
- (4) Set the spectrum analyzer as follows:

Center frequency	DTS Channel center frequency
RBW:	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW:	$\geq 3\text{RBW}$
Span	1.5times the DTS bandwidth
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

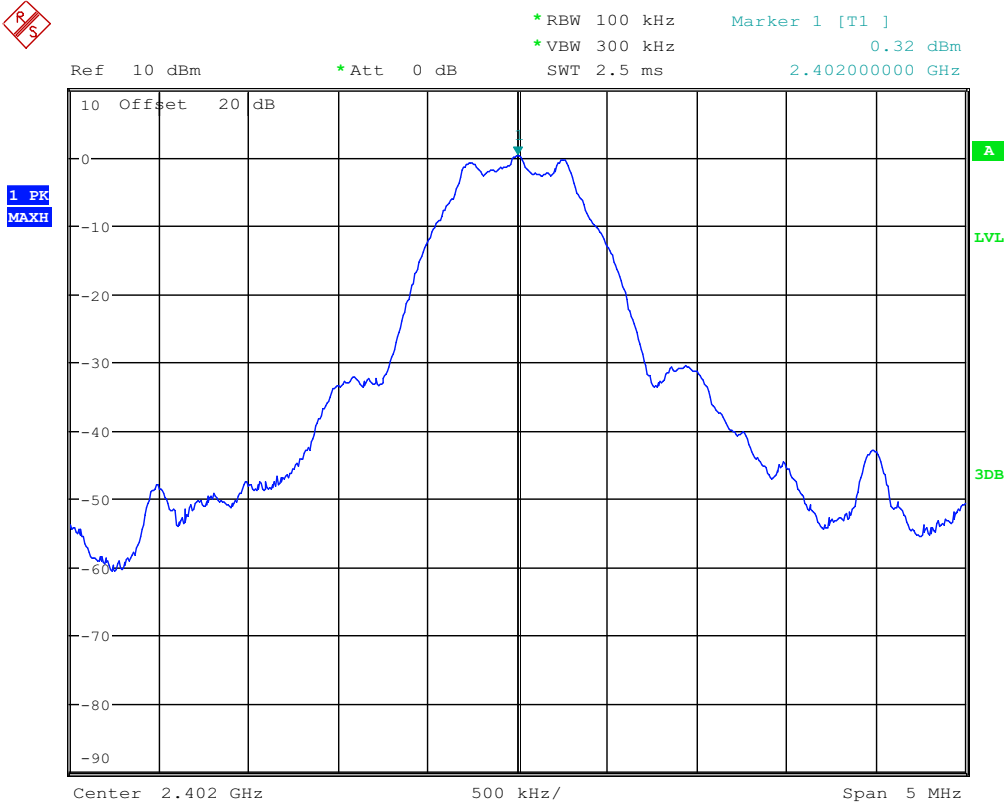
- (5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
- (6) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.5. Test Result

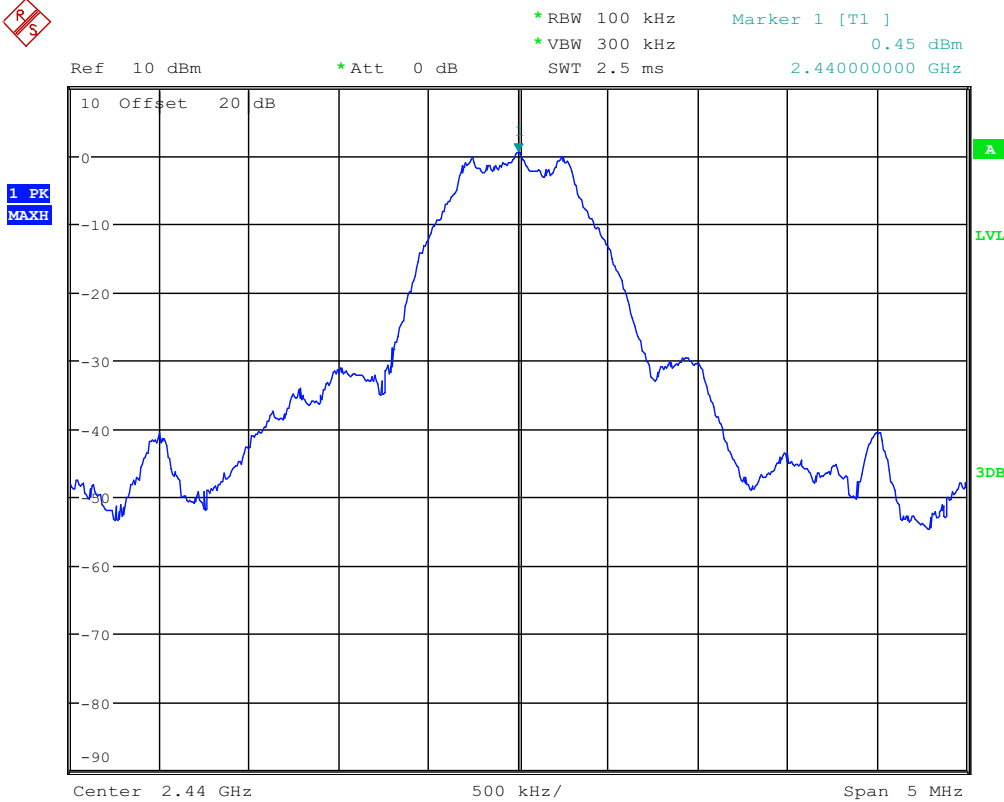
EUT: Bluetooth Speaker M/N: BTSP12		
EUT Set Mode	Channel	Result
GFSK	CH0	0.32dBm/100KHz
	CH19	0.45dBm/100KHz
	CH39	0.55dBm/100KHz
Limit: <8dBm/3KHz		Conclusion: PASS
Test Date : 2014-06-29		Test Engineer : Leo Liu

5.6. Original test data

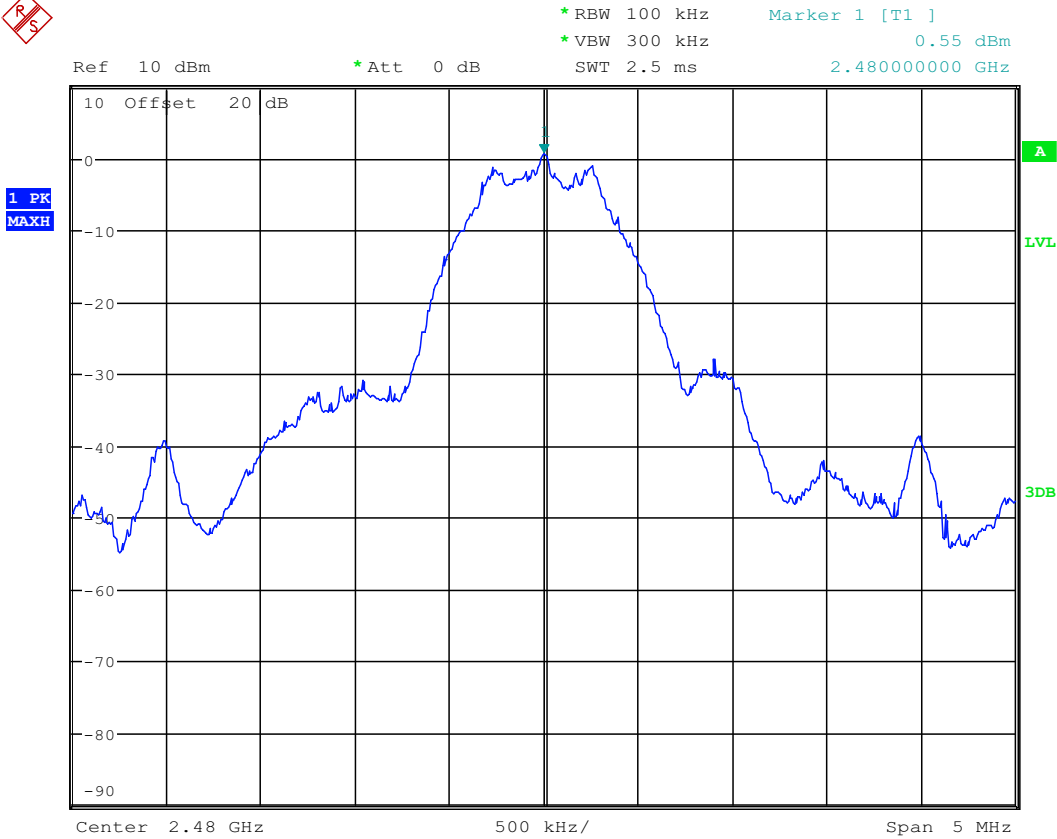
CH0:



CH19



CH39



6. Emissions in non-restricted frequency bands

6.1. Test equipment

Same with 3.1

6.2. Block diagram of test setup

Same with 3.2

6.3. Limits

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

6.4. Test Procedure

(1) Configure EUT and assistant system according clause 2.4 and 6.2

(2) Connect EUT's antenna output to spectrum analyzer by RF cable.

(3) Configure EUT work in test mode as stated in clause 2.4.

(4) Establish a reference level by using the following procedure:

Center frequency	DTS Channel center frequency
RBW:	100KHz
VBW:	300KHz
Span	1.5times the DTS bandwidth
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

(5) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.

(6) Set the spectrum analyzer as follows:

RBW:	100KHz
VBW:	300KHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{span/RBW}$
Detector Mode:	Peak
Sweep time:	auto
Trace mode	Max hold

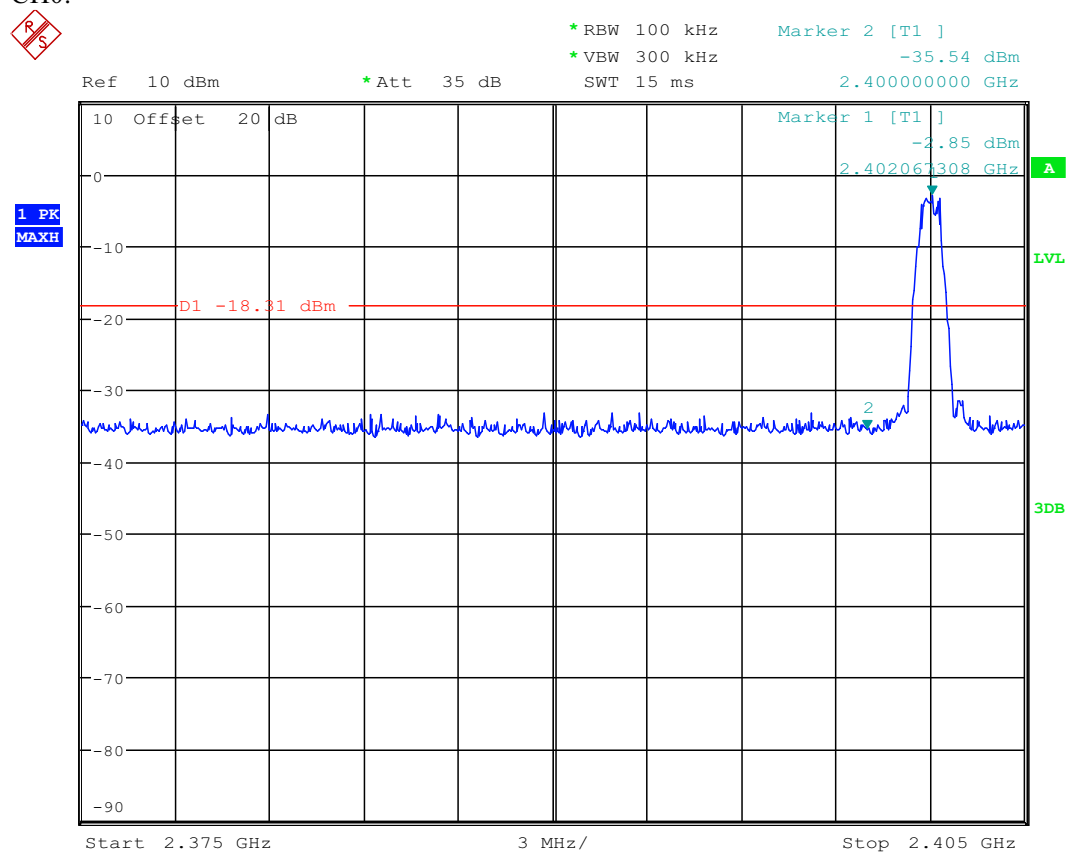
(7) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

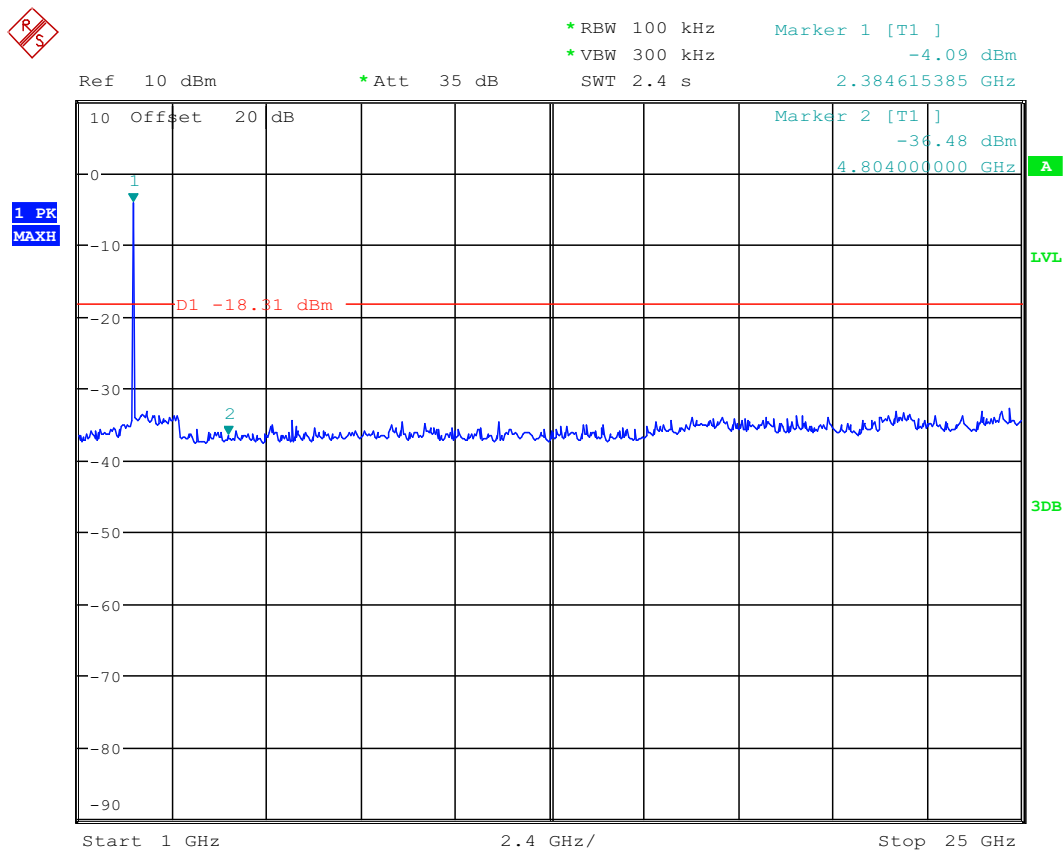
6.5. Test Result

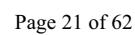
EUT: Bluetooth Speaker M/N: BTSP12			
EUT Set Mode	CH or Frequency	Measured Range	Result (dBm)
GFSK	CH0	30MHz-1GHz	PASS
		1GHz-25GHz	PASS
		2.375GHz-2.405GHz	PASS
	CH19	30MHz-1GHz	PASS
		1GHz-25GHz	PASS
	CH39	30MHz-1GHz	PASS
		1GHz-25GHz	PASS
		2.475GHz-2.5GHz	PASS
Test Date : 2014-06-29		Test Engineer : Leo Liu	

6.6. Original test data

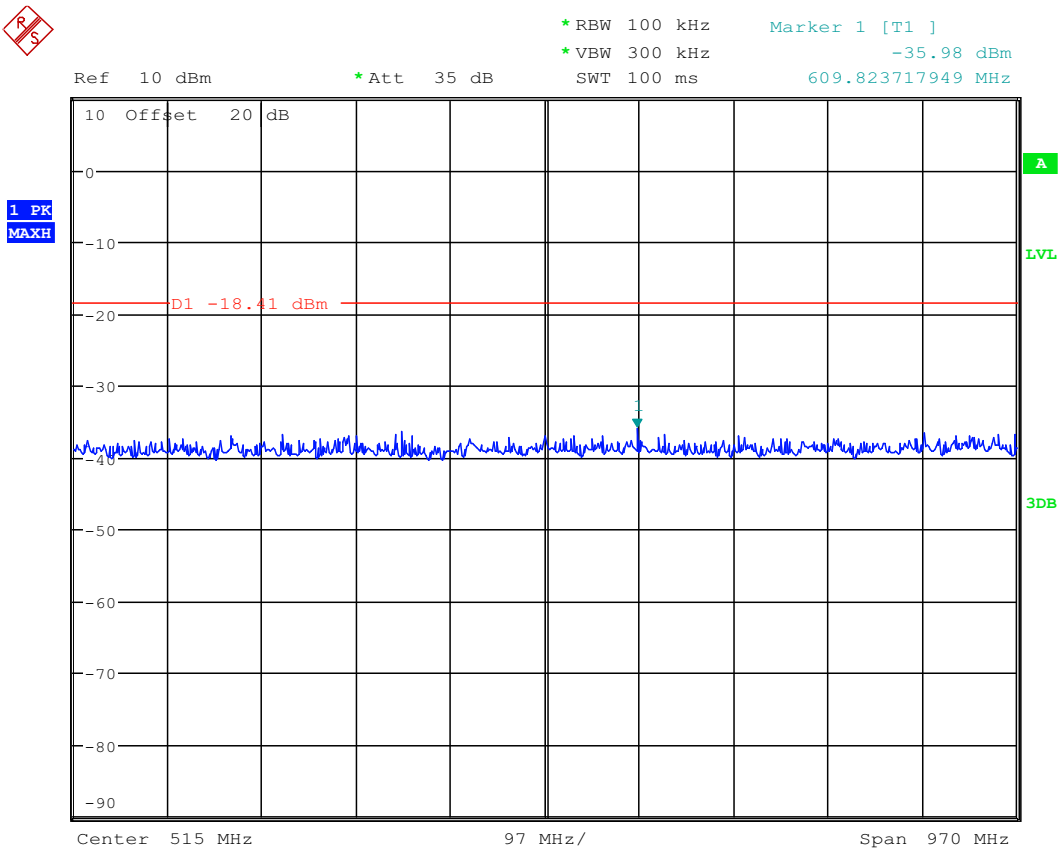
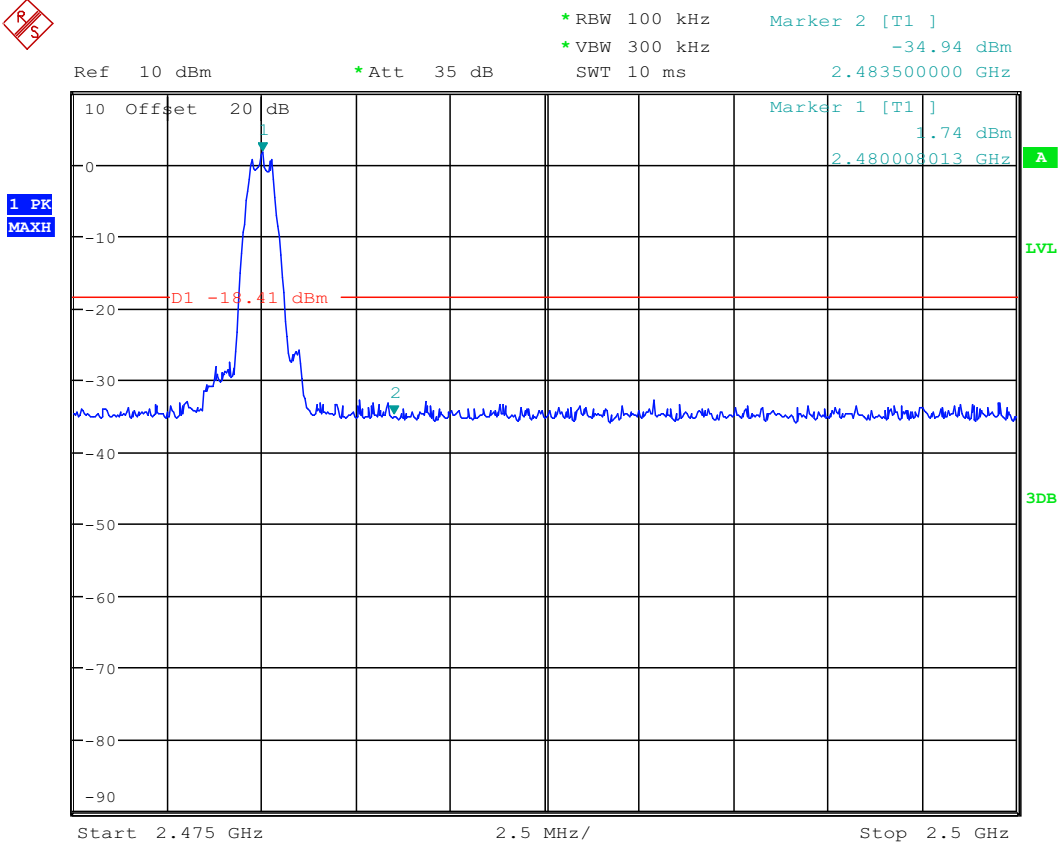
CH0:

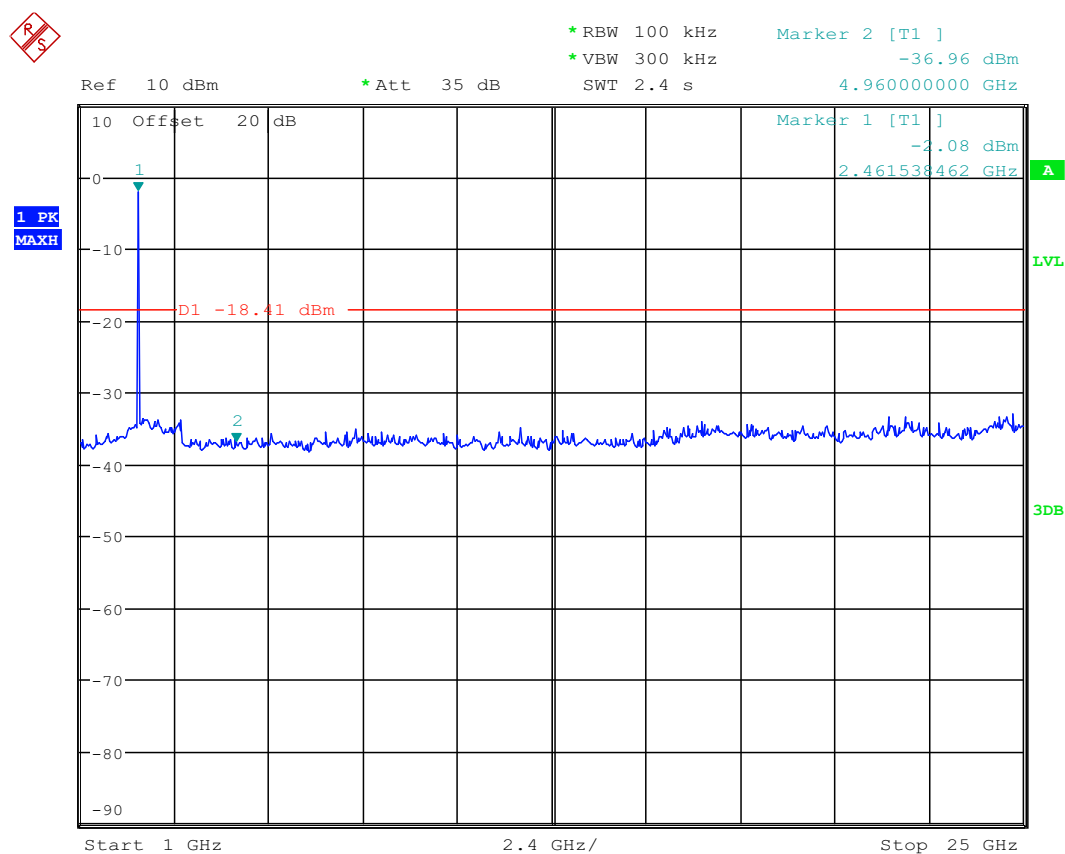






CH39:





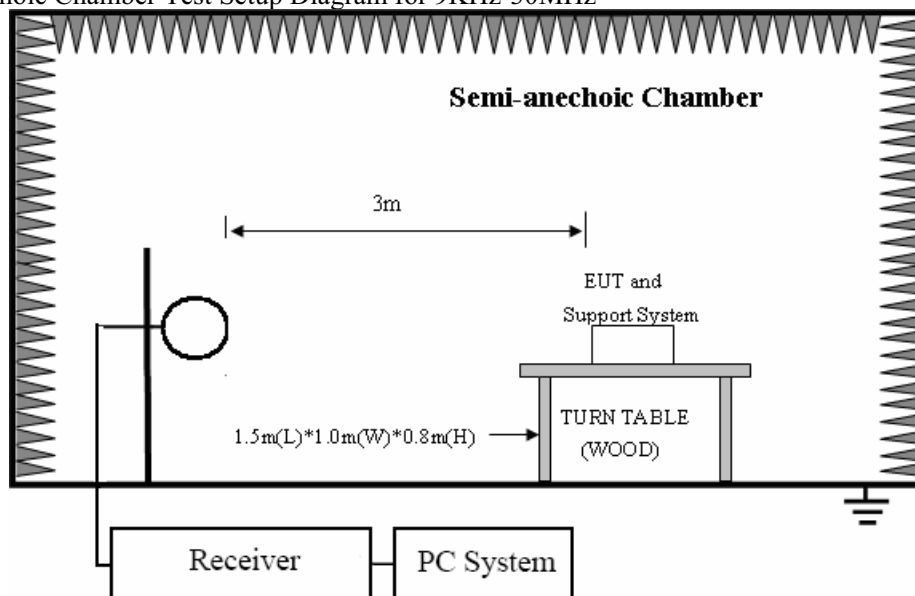
7. Emissions in restricted frequency bands

7.1. Test equipment

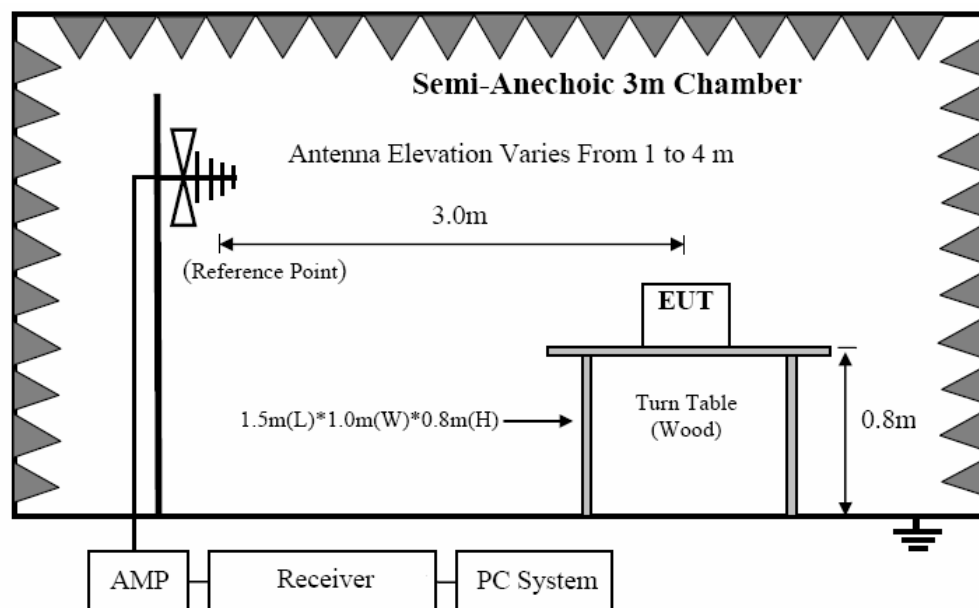
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESU8	100316	2013/11/13	1 Year
2	Spectrum analyzer	R&S	FSU	1166.1660.26	2013/11/13	1 Year
3	Loop antenna	TESEQ	HLA6120	20129	2013/11/16	1 Year
4	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2013/11/16	1 Year
5	Double Ridged Horn Antenna	R&S	HF907	100276	2013/11/16	1 Year
6	Horn Antenna	EMCO	3116	00060095	2013/11/16	1 Year
7	Pre-amplifier	A.H.	PAM0-0118	360	2013/11/13	1 Year
8	Pre-amplifier	A.H.	PAM-1840VH	562	2013/11/13	1 Year
9	RF Cable	R&S	R01	10403	2013/11/13	1 Year
10	RF Cable	R&S	R02	10512	2013/11/13	1 Year

7.2. Block diagram of test setup

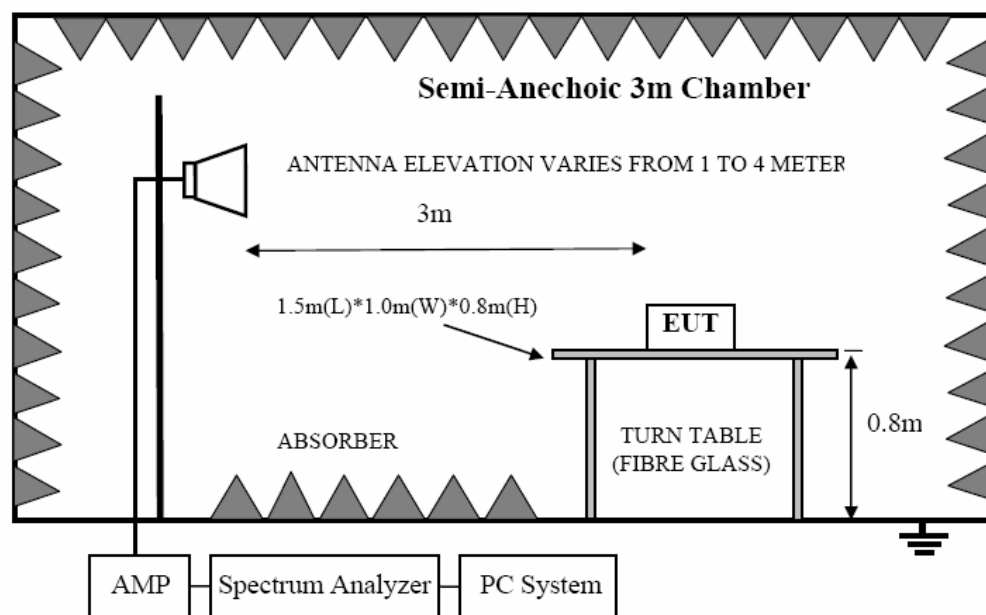
In 3m Anechoic Chamber Test Setup Diagram for 9KHz-30MHz



In 3m Anechoic Chamber Test Setup Diagram for 30MHz-1GHz



In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

7.3. Limit

7.3.1 FCC 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

7.3.2 FCC 15.209 Limit.

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(KHz)	67.6-20log(F)
0.490 ~ 1.705	30	24000/F(KHz)	87.6-20log(F)
1.705 ~ 30.0	30	30	29.54
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Note: (1) The emission limits shown in the above table are based on measurements employing a CISPR QP detector except for the frequency bands 9-90KHz, 110-490KHz and above 1000MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

(2) At frequencies below 30MHz, measurement may be performed at a distance closer than that specified, and the limit at closer measurement distance can be extrapolated by below formula:

$$\text{Limit}_{3m}(\text{dB}\mu\text{V}/\text{m}) = \text{Limit}_{30m}(\text{dB}\mu\text{V}/\text{m}) + 40\text{Log}(30\text{m}/3\text{m})$$

7.3.3 Limit for this EUT

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

7.4. Test Procedure

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) Setup EUT and assistant system according clause 2.4 and 7.2
- (3) Test antenna was located 3m from the EUT on an adjustable mast, and the antenna used as below table.

Test frequency range	Test antenna used
9KHz-30MHz	Active Loop antenna
30MHz-1GHz	Trilog Broadband Antenna
1GHz-18GHz	Double Ridged Horn Antenna(1GHz-18GHz)
18GHz-40GHz	Horn Antenna(18GHz-40GHz)

According ANSI C63.10:2009 clause 6.4.4.2 and 6.5.3, for measurements below 30 MHz, the loop antenna was positioned with its plane vertical from the EUT and rotated about its vertical axis for maximum response at each azimuth position around the EUT. And the loop antenna also be positioned with its plane horizontal at the specified distance from the EUT. The center of the loop is 1 m above the ground. for measurement above 30MHz, the Trilog Broadband Antenna or Horn Antenna was located 3m from EUT, Measurements were made with the antenna positioned in both the horizontal and vertical planes of Polarization, and the measurement antenna was varied from 1 m to 4 m. in height above the reference ground plane to obtain the maximum signal strength.

- (4) Below pre-scan procedure was first performed in order to find prominent frequency spectrum radiated emissions from 9KHz to 25GHz:

- (a) Scanning the peak frequency spectrum with the antenna specified in step (3), and the EUT was rotated 360 degree, the antenna height was varied from 1m to 4m(Except loop antenna, it's fixed 1m above ground.)

- (b) Change work frequency or channel of device if practicable.

- (c) Change modulation type of device if practicable.

- (d) Change power supply range from 85% to 115% of the rated supply voltage

- (e) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions.

Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 9KHz to 30MHz and 18GHz to 25GHzso below final test was performed with frequency range from 30MHz to 18GHz.

- (5) For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2009 on Radiated Emission test.
- (6) The emissions from 9KHz to 1GHz were measured based on CISPR QP detector except for the

frequency bands 9-90KHz, 110-490KHz, for emissions from 9KHz-90KHz, 110KHz-490KHz and above 1GHz were measured based on average detector, for emissions above 1GHz, peak emissions also be measured and need comply with Peak limit.

- (7) The emissions from 9KHz to 1GHz, QP or average values were measured with EMI receiver with below RBW

Frequency band	RBW
9KHz-150KHz	200Hz
150KHz-30MHz	9KHz
30MHz-1GHz	120KHz

- (8) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure; RBW is set at 1MHz, VBW is set at 10Hz for Average measure (according ANSI C63.10:2009 clause 4.2.3.2.3 procedure for average measure). Peak detector is used for both PK and AV value test.

7.5. Test result

PASS. (See below detailed test result)

All the emissions except fundamental emission from 9KHz to 25GHz were comply with 15.209 limit.

Note1: According exploratory test no any obvious emission were detected from 9KHz to 30MHz and 18GHz to 25GHz, so the final test was performed with frequency range from 30MHz to 18GHz and recorded in below.

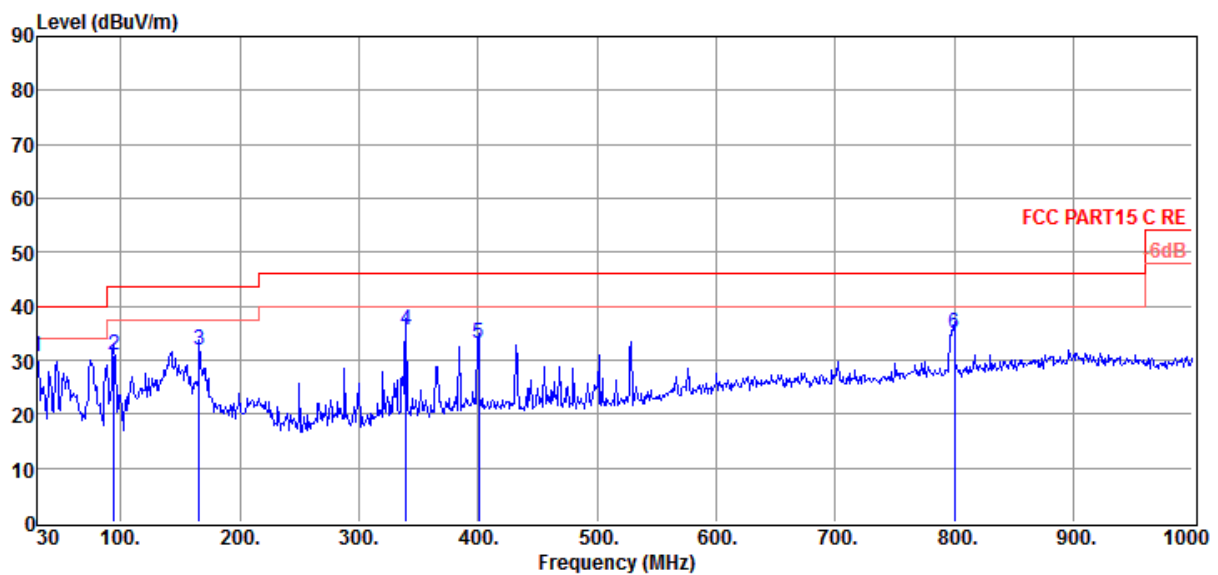
Note2: For emissions below 1GHz, according exploratory explorer test, when change Tx mode and channel, have no distinct influence on emissions level, so for emissions below 1GHz, the final test was only performed with EUT working in GFSK, Tx 2440MHz mode.

Note3: For emissions above 1GHz. If peak results comply with AV limit, AV Result is deemed to comply with AV limit.

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2014 Report Data\QD140304\RE.EM6**
Test Date : 2014-06-30 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH19
Condition : Temp:24.5'C,Humi:55%,
Press:100.1kPa **Antenna/Distance** : VULB 9163 2014-05/3m/HORIZONTAL
Memo :

Data: 3



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	30.00	17.97	11.60	0.91	30.48	40.00	-9.52	QP	HORIZONTAL
2	94.02	17.33	12.00	1.46	30.79	43.50	-12.71	QP	HORIZONTAL
3	165.80	21.20	8.57	2.00	31.77	43.50	-11.73	QP	HORIZONTAL
4	339.43	18.59	14.23	2.86	35.68	46.00	-10.32	QP	HORIZONTAL
5	400.54	13.88	15.90	3.23	33.01	46.00	-12.99	QP	HORIZONTAL
6	800.18	9.91	20.40	4.69	35.00	46.00	-11.00	QP	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss

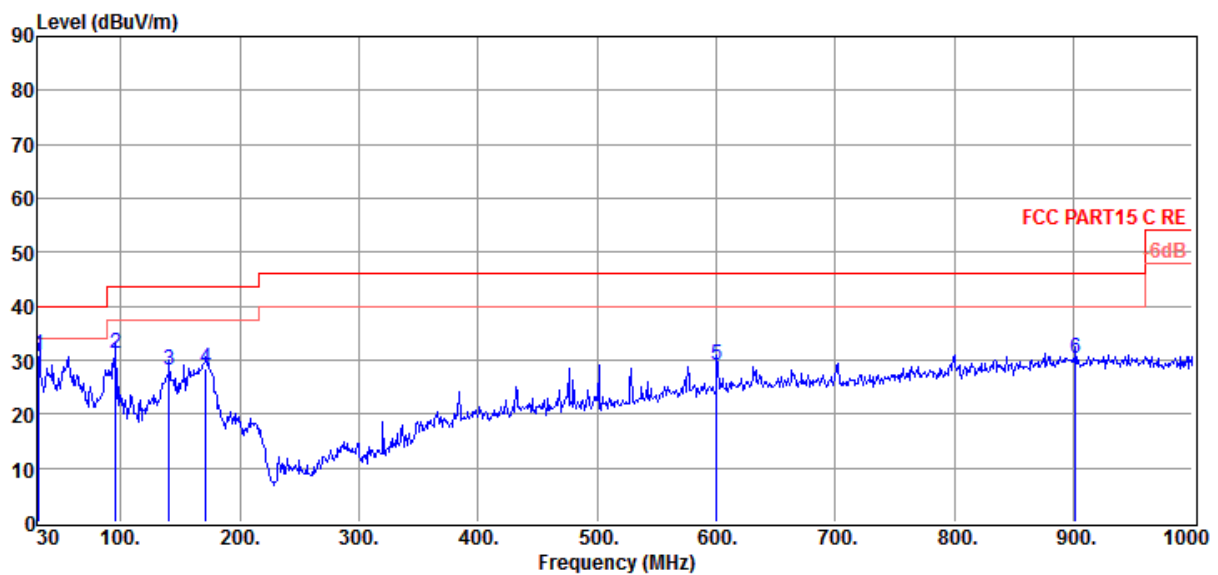
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit

3. Test setup: RBW: 120kHz, VBW: 300kHz, Sweep time: auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2014 Report Data\QD140304\RE.EM6**
Test Date : 2014-06-30 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH19
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : VULB 9163 2014-05/3m/VERTICAL
Memo :

Data: 4



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	30.97	18.09	11.95	0.92	30.96	40.00	-9.04	QP	VERTICAL
2	95.96	17.67	12.00	1.47	31.14	43.50	-12.36	QP	VERTICAL
3	140.58	17.40	8.90	1.70	28.00	43.50	-15.50	QP	VERTICAL
4	171.62	17.68	8.83	2.03	28.54	43.50	-14.96	QP	VERTICAL
5	600.36	6.86	18.20	3.97	29.03	46.00	-16.97	QP	VERTICAL
6	902.03	3.36	22.08	4.96	30.40	46.00	-15.60	QP	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss

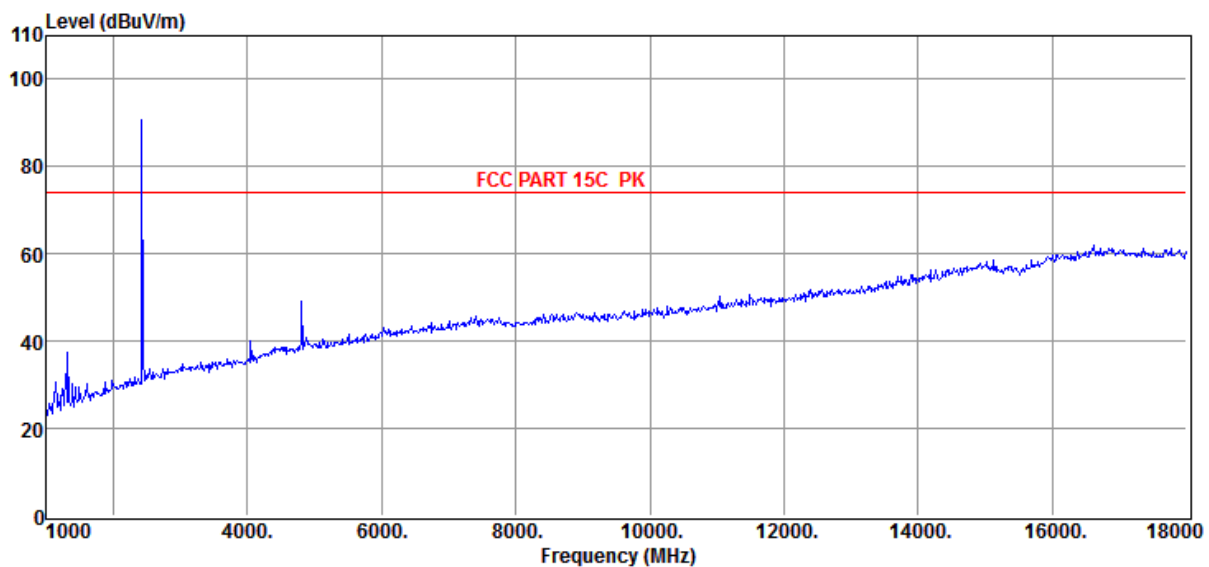
2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit

3. Test setup: RBW: 120kHz, VBW: 300kHz, Sweep time: auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH0
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo :

Data: 33



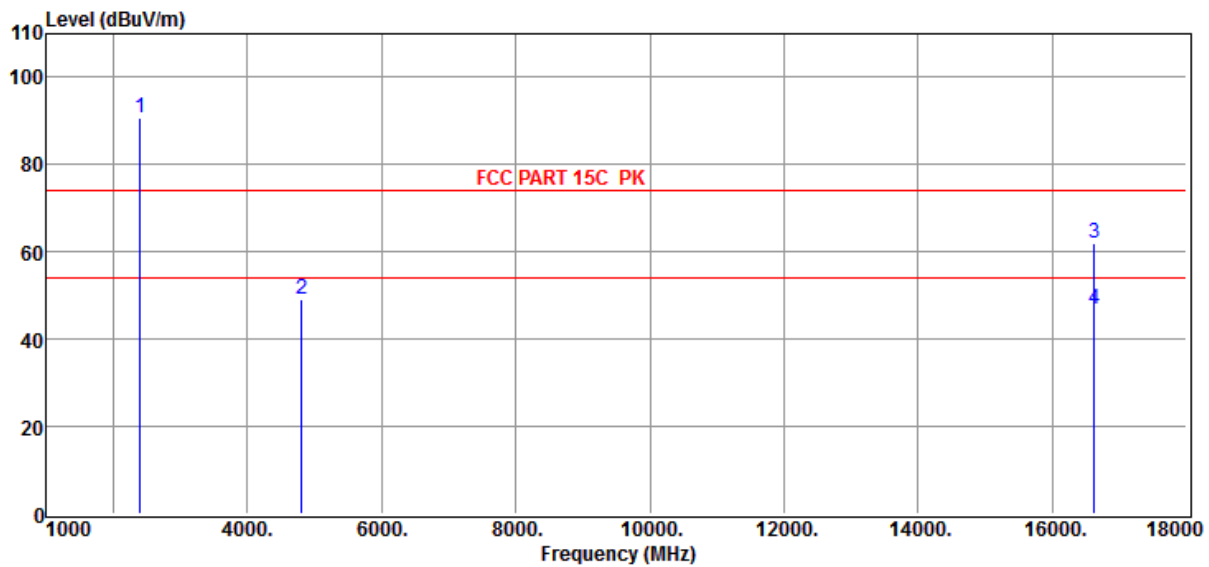
Item	Freq	Read Level	Antenna Factor	PRM Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBμV)	(dB/m)	dB	dB	(dBμV/m)	(dBμV/m)	(dB)		

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH0
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo :

Data: 34



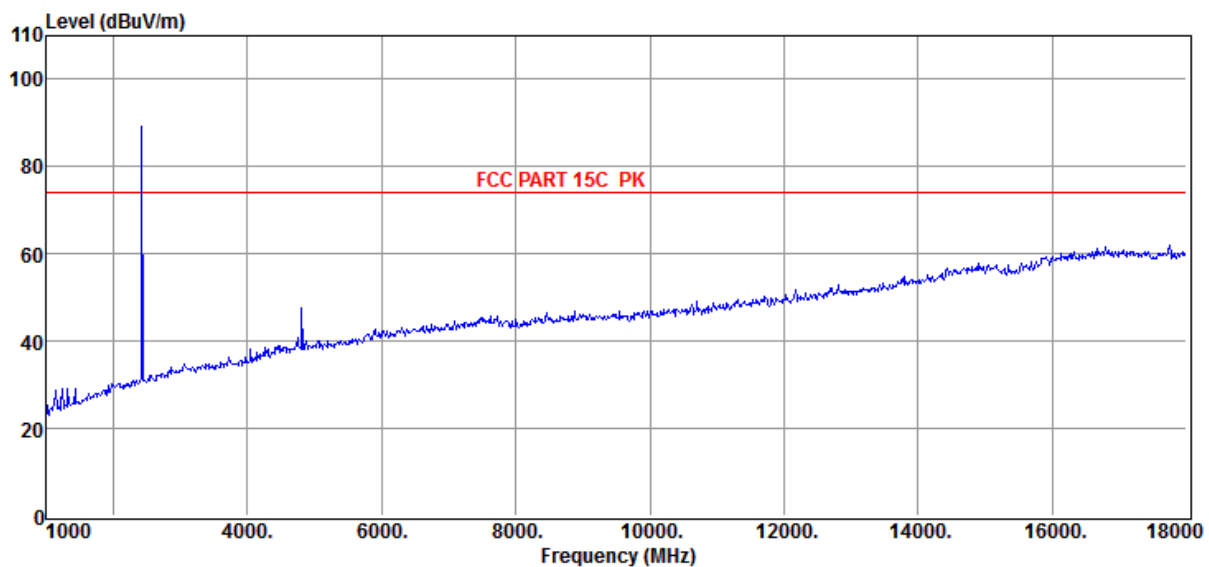
Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2402.00	95.76	29.99	43.49	8.35	90.61	74.00	16.61	Peak	VERTICAL
2	4804.00	45.92	35.40	44.06	12.07	49.33	74.00	-24.67	Peak	VERTICAL
3	16623.00	34.92	43.68	41.20	24.40	61.80	74.00	-12.20	Peak	VERTICAL
4	16623.00	20.13	43.68	41.20	24.40	47.01	54.00	-6.99	Average	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2014 Report Data\QD140304\RF.EM6**
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH0
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL
Memo :

Data: 35



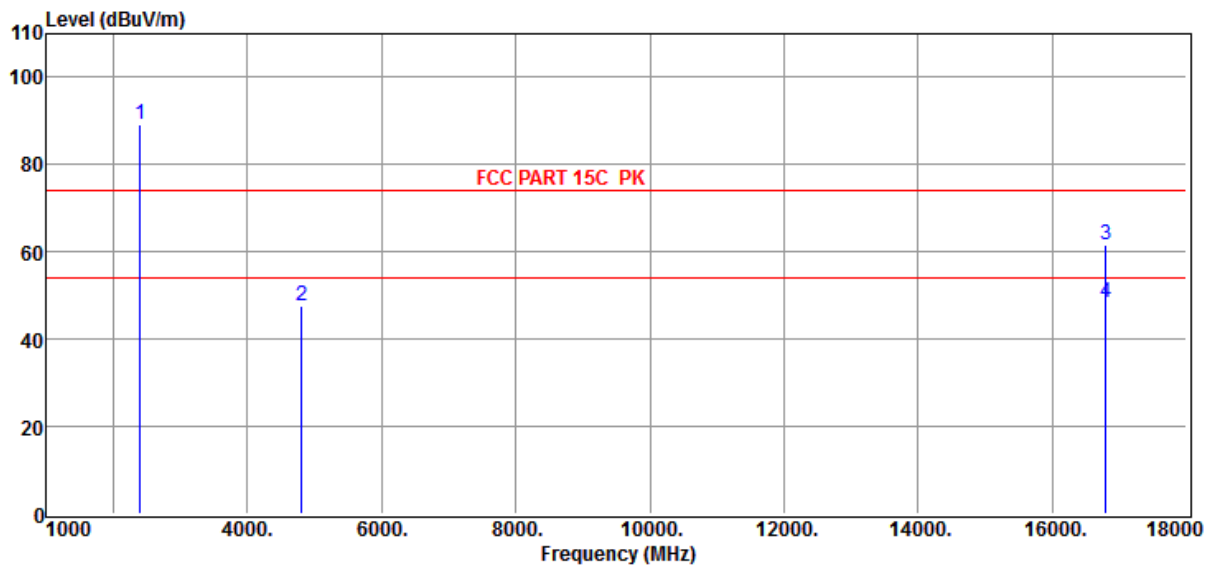
Item	Freq	Read Level	Antenna Factor	PRM Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBμV)	(dB/m)	dB	dB	(dBμV/m)	(dBμV/m)	(dB)		

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH0
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL
Memo :

Data: 36



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2402.00	94.53	29.99	43.49	8.35	89.38	74.00	15.38	Peak	HORIZONTAL
2	4804.00	44.09	35.40	44.06	12.07	47.50	74.00	-26.50	Peak	HORIZONTAL
3	16793.00	34.06	43.64	41.26	25.00	61.44	74.00	-12.56	Peak	HORIZONTAL
4	16793.00	21.04	43.64	41.26	25.00	48.42	54.00	-5.58	Average	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

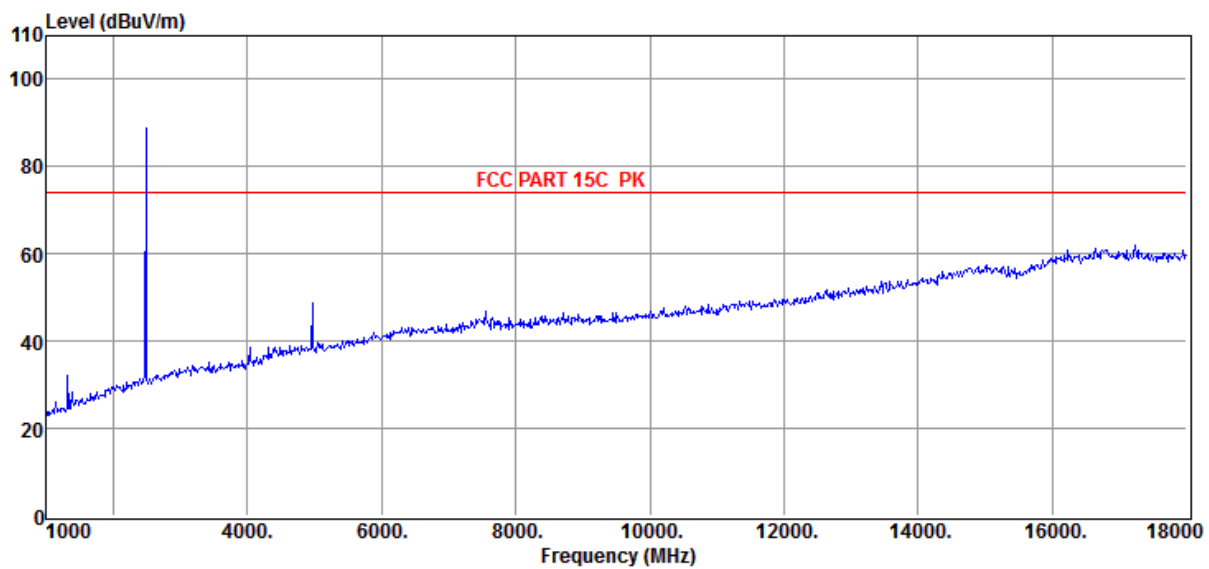
2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2014 Report Data\QD140304\RF.EM6**
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH39
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL
Memo :

Data: 41



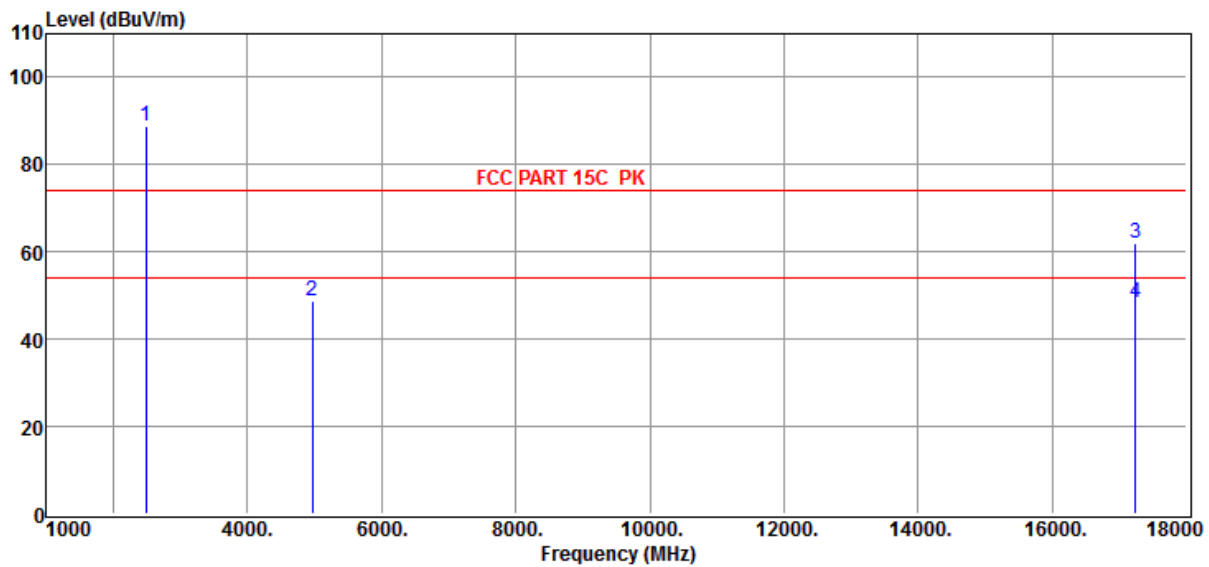
Item	Freq	Read Level	Antenna Factor	PRM Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBμV)	(dB/m)	dB	dB	(dBμV/m)	(dBμV/m)	(dB)		

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH39
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL
Memo :

Data: 42



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2480.00	93.73	30.25	43.50	8.50	88.98	74.00	14.98	Peak	HORIZONTAL
2	4960.00	45.08	35.64	44.01	12.02	48.73	74.00	-25.27	Peak	HORIZONTAL
3	17235.00	34.42	43.23	41.05	25.47	62.07	74.00	-11.93	Peak	HORIZONTAL
4	17235.00	20.64	43.23	41.05	25.47	48.29	54.00	-5.71	Average	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

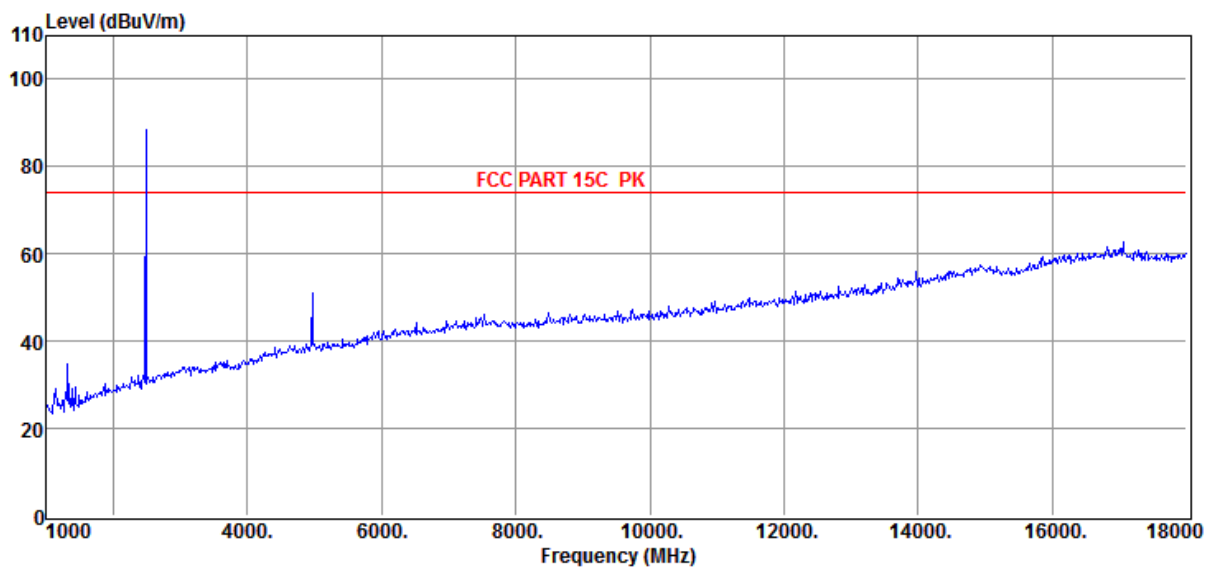
2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2014 Report Data\QD140304\RF.EM6**
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH39
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo :

Data: 43



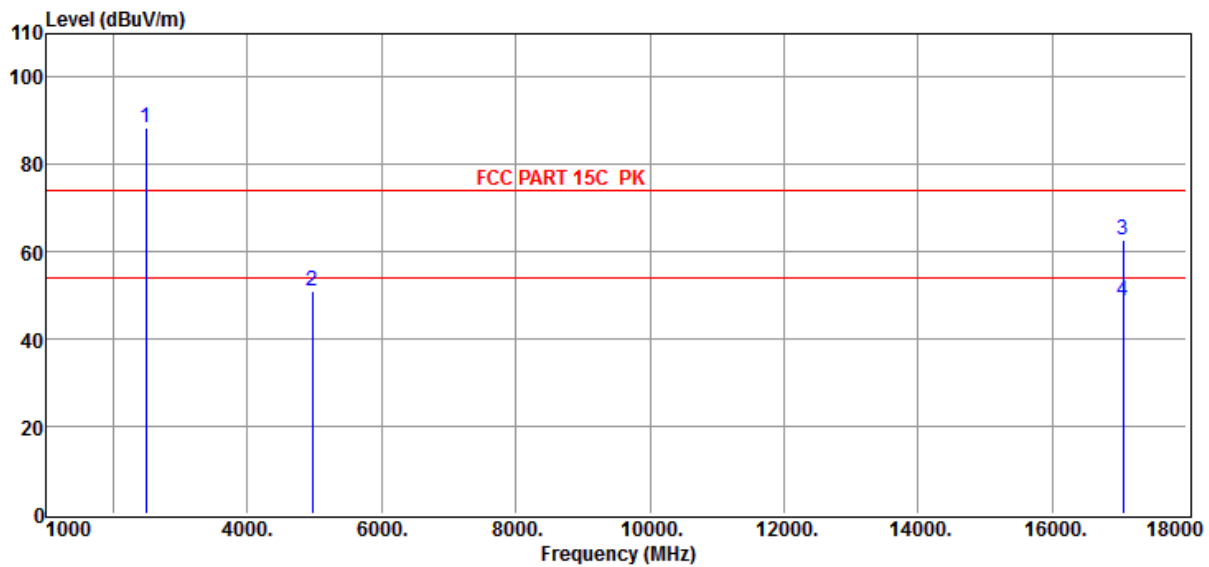
Item	Freq	Read Level	Antenna Factor	PRM Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBμV)	(dB/m)	dB	dB	(dBμV/m)	(dBμV/m)	(dB)		

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH39
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo :

Data: 44



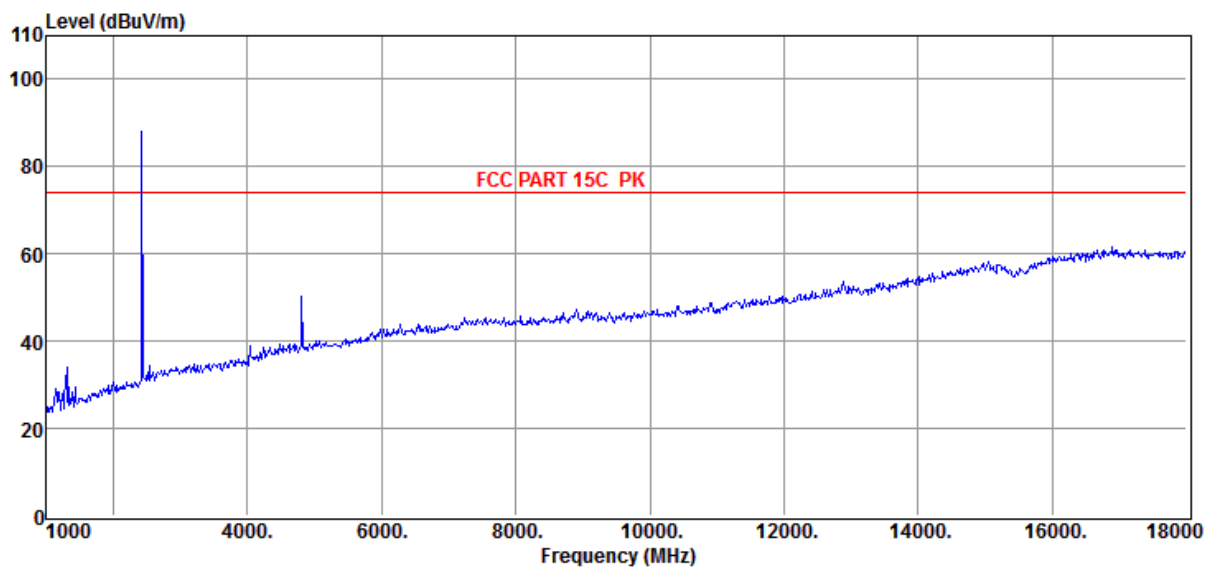
Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2480.00	93.27	30.25	43.50	8.50	88.52	74.00	14.52	Peak	VERTICAL
2	4960.00	47.44	35.64	44.01	12.02	51.09	74.00	-22.91	Peak	VERTICAL
3	17048.00	35.08	43.52	41.27	25.47	62.80	74.00	-11.20	Peak	VERTICAL
4	17048.00	21.04	43.52	41.27	25.47	48.76	54.00	-5.24	Average	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2014 Report Data\QD140304\RF.EM6**
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH19
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo :

Data: 45



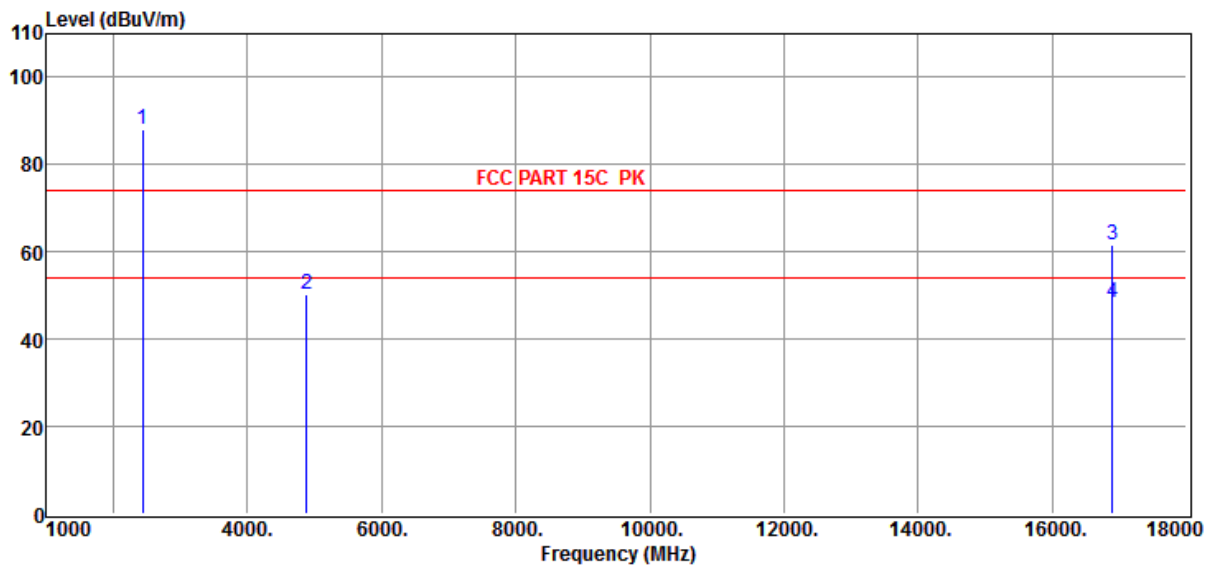
Item	Freq	Read Level	Antenna Factor	PRM Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBμV)	(dB/m)	dB	dB	(dBμV/m)	(dBμV/m)	(dB)		

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH19
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo :

Data: 46



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2440.00	93.00	30.14	43.49	8.40	88.05	74.00	14.05	Peak	VERTICAL
2	4880.00	46.67	35.51	44.03	12.04	50.19	74.00	-23.81	Peak	VERTICAL
3	16895.00	33.53	43.62	41.28	25.60	61.47	74.00	-12.53	Peak	VERTICAL
4	16895.00	20.48	43.62	41.28	25.60	48.42	54.00	-5.58	Average	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

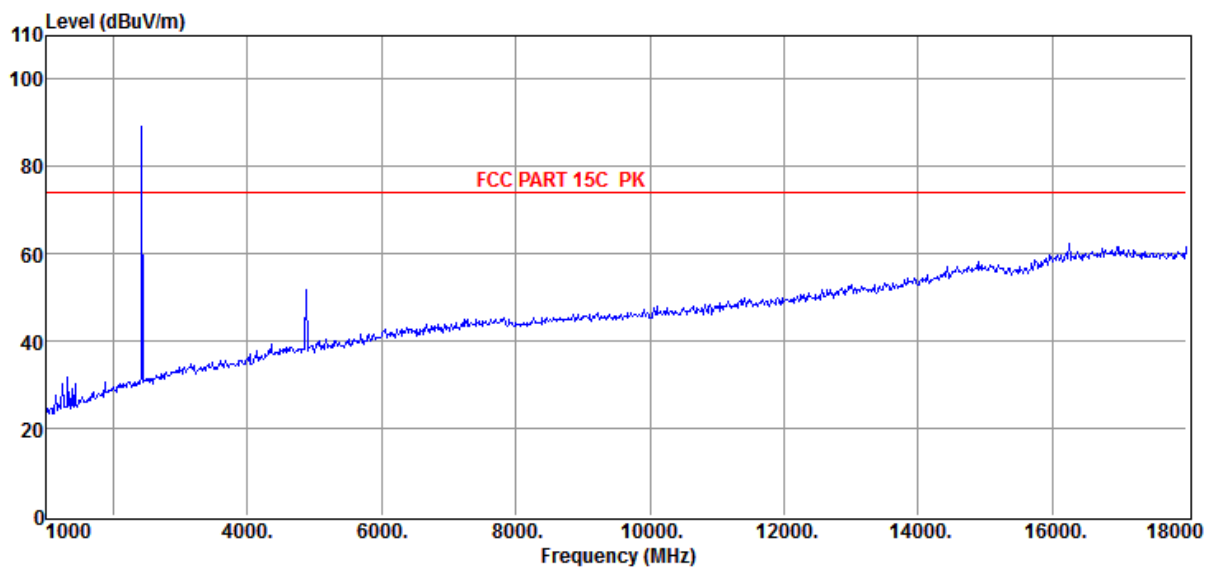
2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2014 Report Data\QD140304\RF.EM6**
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH19
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL
Memo :

Data: 47



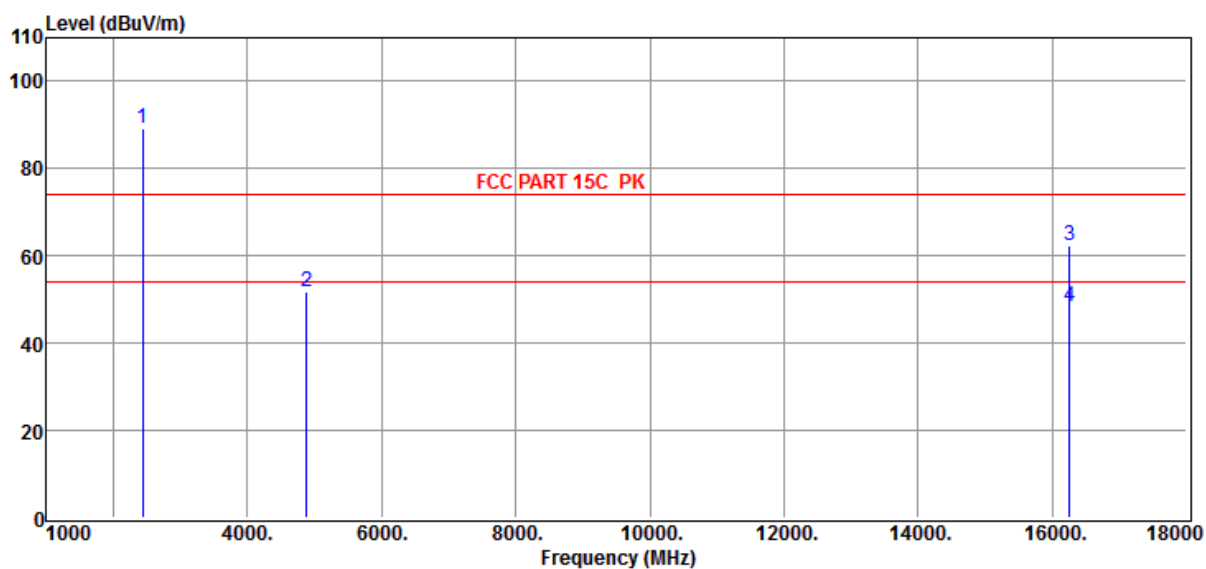
Item	Freq	Read Level	Antenna Factor	PRM Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBμV)	(dB/m)	dB	dB	(dBμV/m)	(dBμV/m)	(dB)		

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH19
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL
Memo :

Data: 48



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2440.00	94.29	30.14	43.49	8.40	89.34	74.00	15.34	Peak	HORIZONTAL
2	4880.00	48.34	35.51	44.03	12.04	51.86	74.00	-22.14	Peak	HORIZONTAL
3	16249.00	35.75	43.40	40.97	24.30	62.48	74.00	-11.52	Peak	HORIZONTAL
4	16249.00	21.56	43.40	40.97	24.30	48.29	54.00	-5.71	Average	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

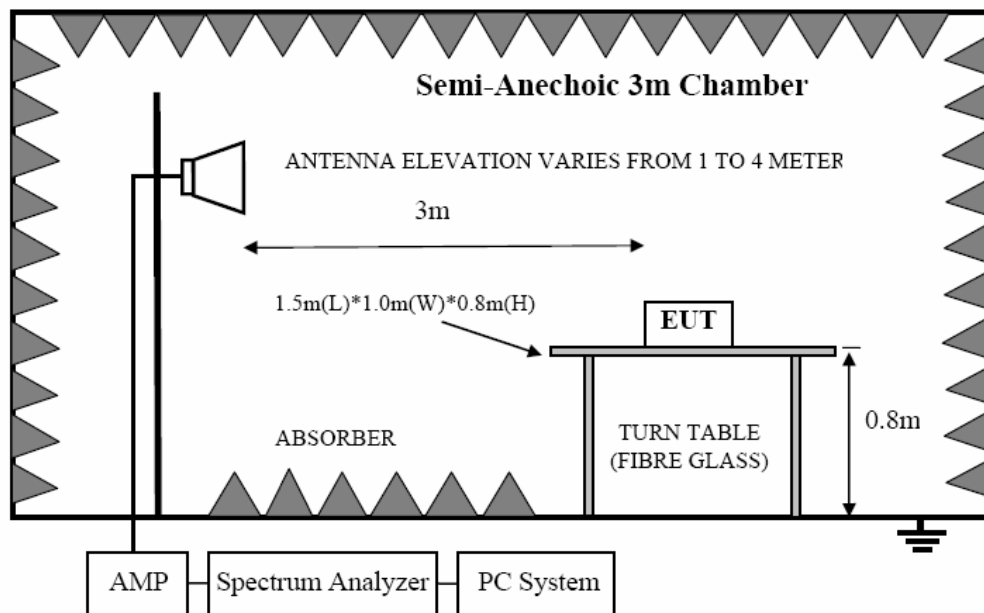
3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

8. Band Edge Compliance

8.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI Test Receiver	R&S	ESU8	100316	2013/11/13	1 Year
2	Spectrum analyzer	R&S	FSU	1166.1660.26	2013/11/13	1 Year
3	Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-462	2013/11/16	1 Year
4	Double Ridged Horn Antenna	R&S	HF907	100276	2013/11/16	1 Year
5	Pre-amplifier	A.H.	PAM0-0118	360	2013/11/13	1 Year
6	RF Cable	R&S	R01	10403	2013/11/13	1 Year
7	RF Cable	R&S	R02	10512	2013/11/13	1 Year

8.2. Block diagram of test setup



8.3. Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz and all other restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

8.4. Test Procedure

All restriction band have been tested, only worse case is reported

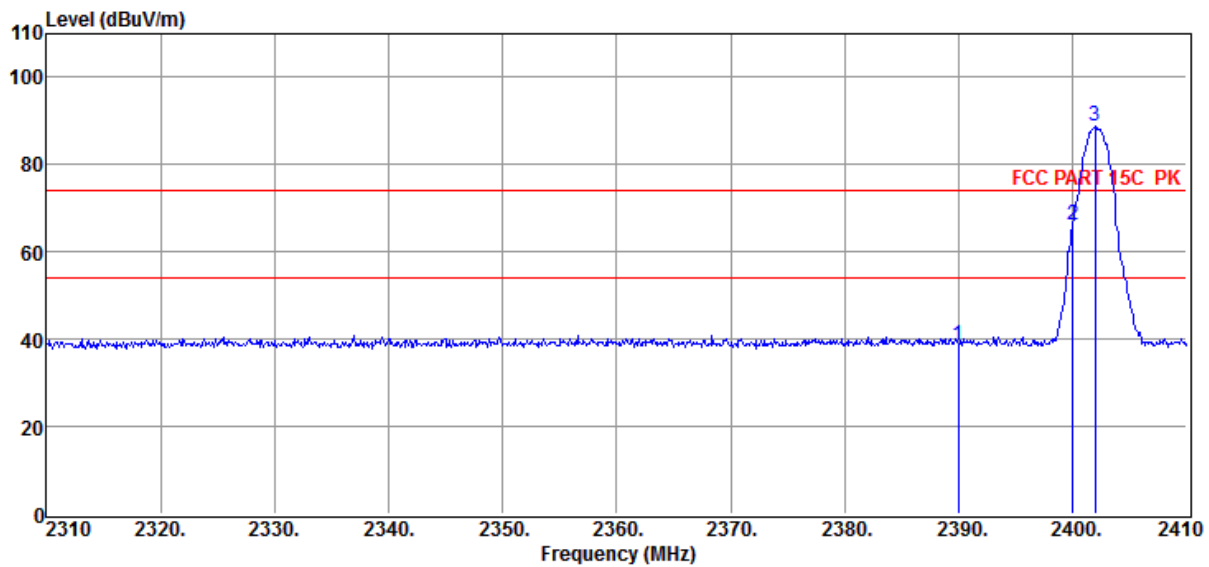
8.5. Test result

PASS. (See below detailed test result)

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH0
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL
Memo :

Data: 37



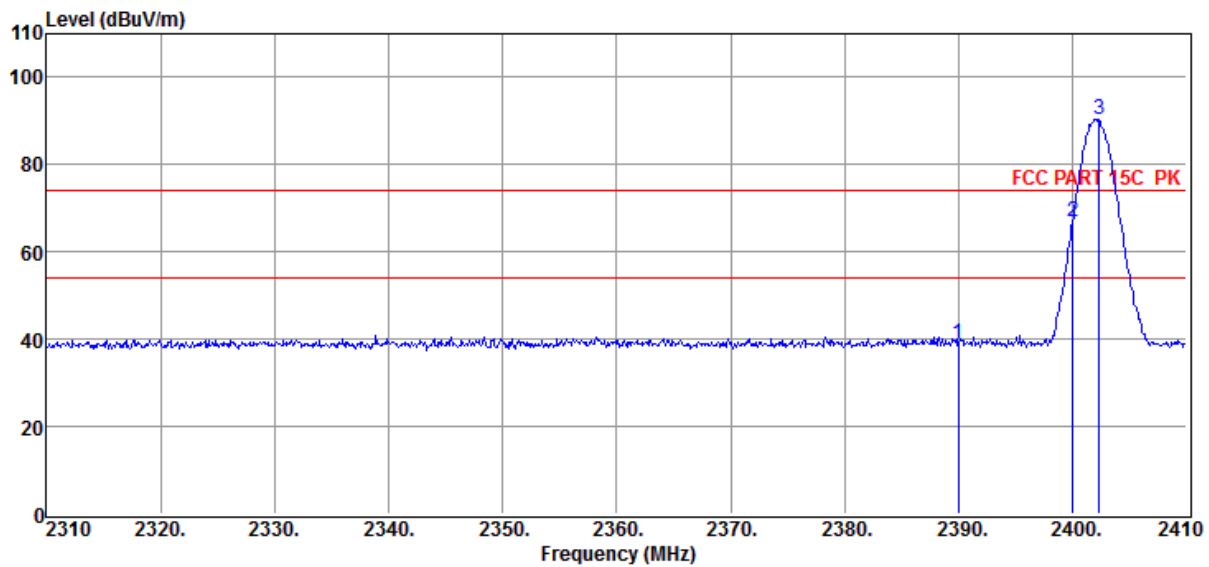
Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2390.00	43.85	29.99	43.48	8.35	38.71	74.00	-35.29	Peak	HORIZONTAL
2	2400.00	71.45	29.99	43.49	8.35	66.30	74.00	-7.70	Peak	HORIZONTAL
3	2402.00	94.12	29.99	43.49	8.35	88.97	74.00	14.97	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH0
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo :

Data: 38



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2390.00	44.06	29.99	43.48	8.35	38.92	74.00	-35.08	Peak	VERTICAL
2	2400.00	72.01	29.99	43.49	8.35	66.86	74.00	-7.14	Peak	VERTICAL
3	2402.30	95.62	29.99	43.49	8.35	90.47	74.00	16.47	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

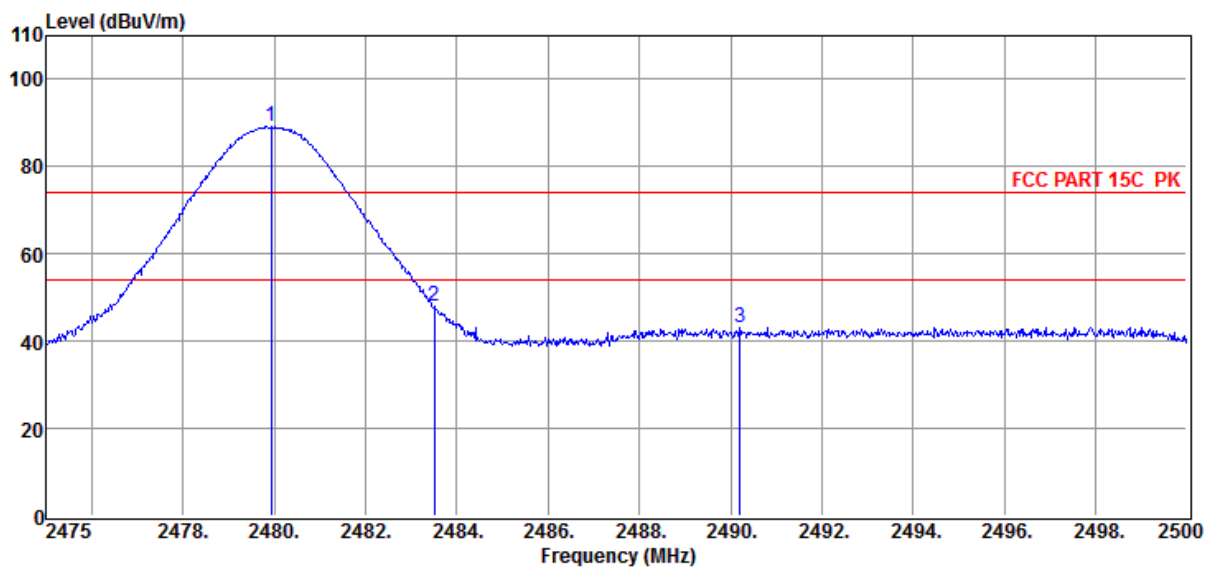
2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:\2014 Report Data\QD140304\RF.EM6**
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH39
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/VERTICAL
Memo :

Data: 39



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2479.93	93.84	30.25	43.50	8.50	89.09	74.00	15.09	Peak	VERTICAL
2	2483.50	52.89	30.25	43.50	8.50	48.14	74.00	-25.86	Peak	VERTICAL
3	2490.20	47.82	30.30	43.50	8.50	43.12	74.00	-30.88	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor

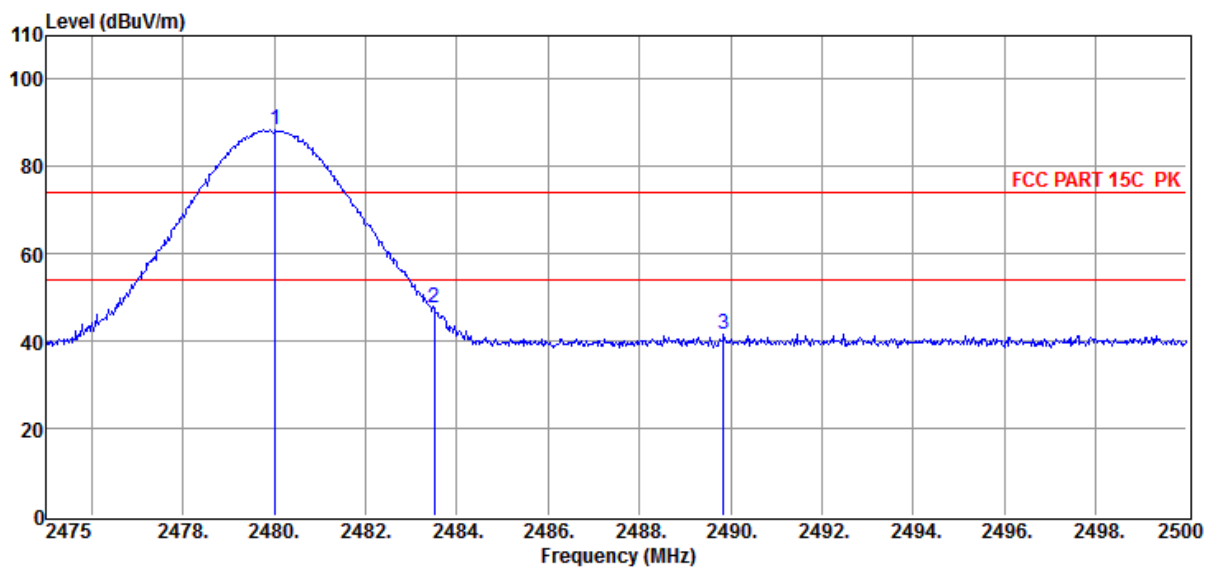
2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

TR-4-E-009 Radiated Emission Test Result

Test Site : DDT 3m Chamber **E:** \2014 Report Data\QD140304\RF.EM6
Test Date : 2014-06-29 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH39
Condition : Temp:24.5'C,Humi:55%,
 Press:100.1kPa **Antenna/Distance** : 2013 HF907/3m/HORIZONTAL
Memo :

Data: 40



Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	2480.03	93.23	30.25	43.50	8.50	88.48	74.00	14.48	Peak	HORIZONTAL
2	2483.50	52.30	30.25	43.50	8.50	47.55	74.00	-26.45	Peak	HORIZONTAL
3	2489.85	46.09	30.30	43.50	8.50	41.39	74.00	-32.61	Peak	HORIZONTAL

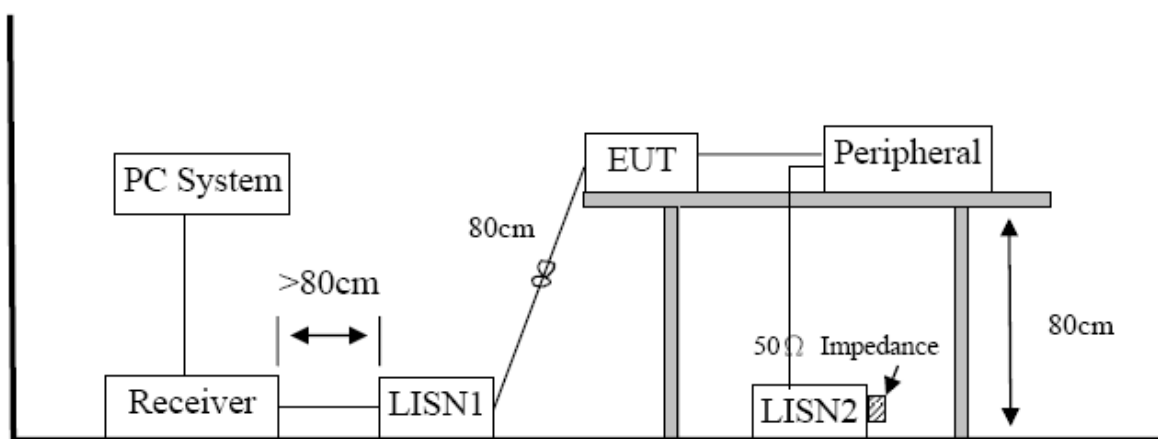
Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor
 2. If Peak Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 1MHz, VBW: 3MHz, Sweep time:auto

9. Power Line Conducted Emission

9.1. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	R&S	ESU8	100316	2013/11/13	1 Year
2	LISN 1	R&S	ENV216	101109	2013/11/13	1 Year
3	LISN 2	R&S	ESH2-Z5	100309	2013/11/13	1 Year
4	Pulse Limiter	R&S	ESH3-Z2	101242	2013/11/13	1 Year

9.2. Block diagram of test setup



9.3. Power Line Conducted Emission Limits(Class B)

Frequency	Quasi-Peak Level dB(μ V)	Average Level dB(μ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Note 1: * Decreasing linearly with logarithm of frequency.

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

9.4. Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

9.5. Test Result

PASS. (See below detailed test result)

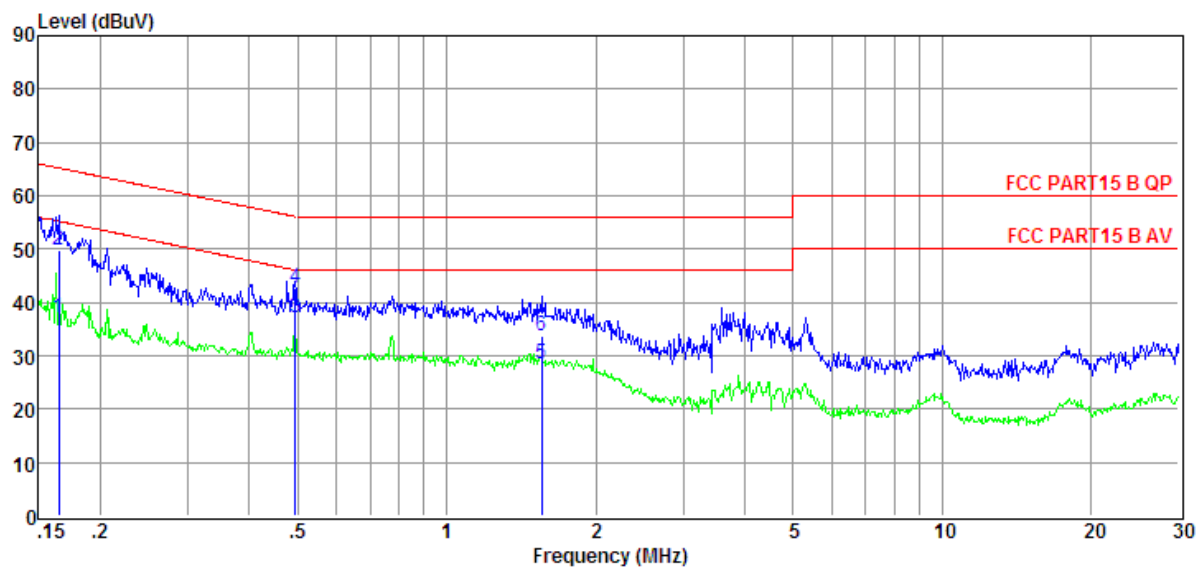
Note1: All emissions not reported below are too low against the prescribed limits.

Note2: Blue “-----” means Peak detection; Green “-----” means average detection

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room **E:\2014 report data\QD140304\CE.EM6**
Test Date : 2014-06-30 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH19
Condition : Temp:24.5'C,Humi:55%,
Press:100.1kPa **LISN** : 2013 ENV216/LINE
Memo :

Data : 6



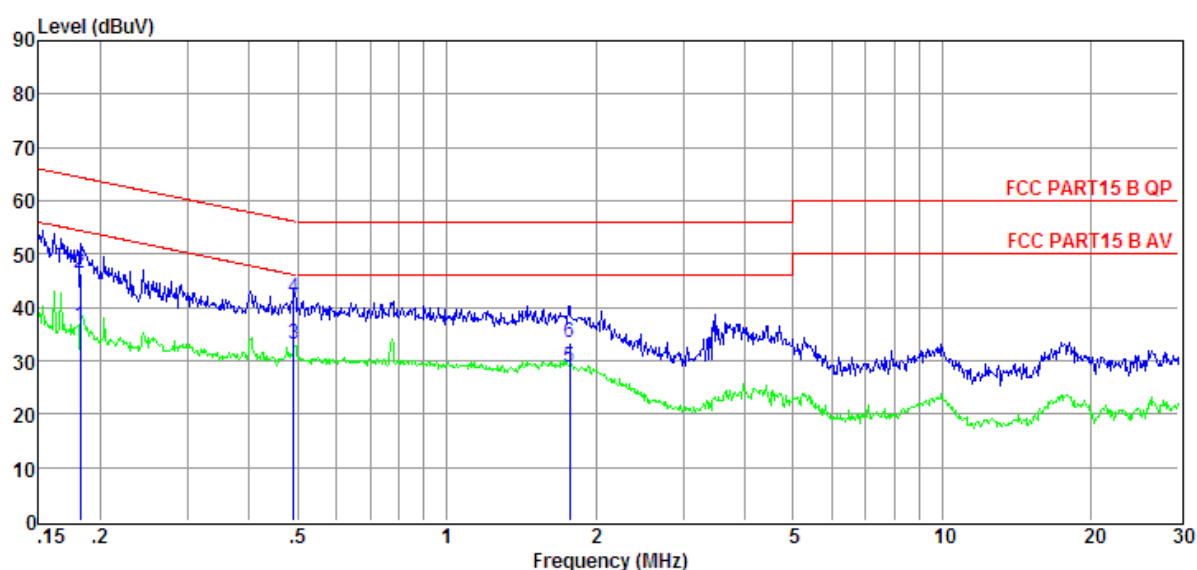
Item	Freq	Read Level	LISN Factor	Cable Loss	Pulse Limiter Factor	Result Level	Limit Line	Over Limit	Detector	Phase
(Mark)	(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV)	(dBμV)	(dB)		
1	0.17	17.69	9.61	0.01	9.84	37.15	55.21	-18.06	Average	LINE
2	0.17	30.28	9.61	0.01	9.84	49.74	65.21	-15.47	QP	LINE
3	0.49	17.71	9.63	0.03	9.87	37.24	46.10	-8.86	Average	LINE
4	0.49	23.03	9.63	0.03	9.87	42.56	56.10	-13.54	QP	LINE
5	1.55	9.02	9.63	0.06	9.87	28.58	46.00	-17.42	Average	LINE
6	1.55	14.30	9.63	0.06	9.87	33.86	56.00	-22.14	QP	LINE

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss
 2. If QP Result comply with AV limit, AV Result is deemed to comply with AV limit
 3. Test setup: RBW: 200Hz(9kHz—150kHz) , 9kHz(150kHz—30MHz), Step size:4kHz, Scan time: auto

TR-4-E-010 Conducted Emission Test Result

Test Site : DDT 1# Shield Room **E:\2014 report data\QD140304\CE.EM6**
Test Date : 2014-06-30 **Tested By** : Leo
EUT : Bluetooth Speaker **Model Number** : BTSP12
Power Supply : DC 5V from PC **Test Mode** : Tx mode GFSK CH19
Condition : Temp:24.5'C,Humi:55%,
Press:100.1kPa **LISN** : 2013 ENV216/NEUTRAL
Memo :

Data : 8



Item (Mark)	Freq (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.18	16.93	9.59	0.02	9.85	36.39	54.37	-17.98	Average	NEUTRAL
2	0.18	27.06	9.59	0.02	9.85	46.52	64.37	-17.85	QP	NEUTRAL
3	0.49	13.66	9.61	0.03	9.87	33.17	46.14	-12.97	Average	NEUTRAL
4	0.49	22.26	9.61	0.03	9.87	41.77	56.14	-14.37	QP	NEUTRAL
5	1.77	9.26	9.61	0.06	9.86	28.79	46.00	-17.21	Average	NEUTRAL
6	1.77	13.78	9.61	0.06	9.86	33.31	56.00	-22.69	QP	NEUTRAL

Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss

2. If QP Result comply with AV limit, AV Result is deemed to comply with AV limit

3. Test setup: RBW: 200Hz(9kHz—150kHz) , 9kHz(150kHz—30MHz), Step size:4kHz, Scan time: auto

10. Antenna Requirements

10.1. Limit

For intentional device, according to FCC 47 CFR Section 15.203, 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. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2. Result

The antennas used for this product is Integrated PCB antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 0dBi.