
FCC RADIO TEST REPORT

FCC ID: 2AF5YCL-680

Applicant : Shenzhen YINLAIKE Electronic Technology CO., Ltd
Address : Room 3213 Nan Guang Jie Jia Building Futian District
Shenzhen China

Equipment Under Test (EUT):

Name : Multifunction Speaker
Model : CL-680
Trade Name : cooligg

Standards : FCC PART 15, SUBPART C : 2014 (Section 15.247)
Report No : CTB150910011Q
Date of Test : September 25- 30, 2015
Date of Issue : October 09, 2015

Tset Result : **PASS**

In the configuration tested, the EUT complied with the standards specified above
Authorized Signature



(Simon Lee)

General Manager

The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Shenzhen CTB Testing Technology Co., Ltd. Or test done by Shenzhen CTB Testing Technology Co., Ltd. Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen CTB Testing Technology Co., Ltd Approvals in writing.

Contents

1. General Information.....	4
1.1. Description of Device (EUT).....	4
1.2. Accessories of device (EUT)	5
1.3. Test Lab information	5
2. Summary of test.....	6
2.1. Summary of test result	6
2.2. Assistant equipment used for test.....	6
2.3. Block Diagram	7
2.4. Test mode	7
2.5. Test Conditions.....	7
2.6. Measurement Uncertainty (95% confidence levels, k=2)	8
2.7. Test Equipment.....	9
3. Maximum ΔV Output power.....	10
3.1. Limit.....	10
3.2. Test Procedure	10
3.3. Test Setup	10
3.4. Test Result.....	10
4. Bandwidth.....	11
4.1. Limit.....	11
4.2. Test Procedure	11
4.3. Test Result.....	11
5. Carrier Frequency Separation.....	15
5.1. Limit.....	15
5.2. Test Procedure	15
5.3. Test Result.....	15
6. Number Of Hopping Channel.....	17
6.1. Limit.....	17
6.2. Test Procedure	17
6.3. Test Result.....	17
7. Dwell Time.....	19
7.1. Test limit	19
7.2. Test Procedure.....	19
7.3. Test Results	19
8. Radiated emissions.....	24
8.1. Limit.....	24
8.2. Block Diagram of Test setup.....	25
8.3. Test Procedure	25
8.4. Test Result.....	26
9. Band Edge Compliance.....	38
9.1. Block Diagram of Test Setup	38
9.2. Limit.....	38
9.3. Test Procedure	38

9.4. Test Result.....	38
10. Power Line Conducted Emissions.....	57
10.1. Block Diagram of Test Setup	57
10.2. Limit.....	57
10.3. Test Procedure.....	57
10.4. Test Result.....	57
11. Antenna Requirements.....	60
11.1. Limit.....	60
11.2. Result.....	60
12. Test setup photo.....	61
12.1. Photos of Radiated emission	61
12.2. Photos of Conducted Emission test.....	62
13. Photos of EUT	63

1. General Information

1.1. Description of Device (EUT)

EUT	:	Multifunction Speaker
Model No.	:	CL-680
Trade mark	:	cooligg
Power supply	:	DC 12V From Adapter For Charge or DC 3.7V From lithium battery.
Radio Technology	:	Bluetooth 2.1+EDR
Operation frequency	:	2402-2480MHz
Modulation	:	GFSK, $\pi/4$ DQPSK, 8- DPSK
Antenna Type	:	Integrated Antenna, max gain 0dBi.
Applicant	:	Shenzhen YINLAIKE Electronic Technology CO., Ltd
Address	:	Room 3213 Nan Guang Jie Jia Building Futian District Shenzhen China
Manufacturer	:	Dongguan Earson Audio Technology Co., Ltd.
Address	:	No.2-1 Chuangye Industrial Road, Chuangye Industrial Area, guanqiaojiao Community, Wanjiang District, dongguan City, guangdong

1.2. Accessories of device (EUT)

Accessories 1 : NIL

Type : NIL

1.3. Test Lab information

Shenzhen CTB Testing Technology Co., Ltd.

10th floor, West Logistics Information Center Building, Fuyong Town ,
Bao'an District, Shenzhen City, P.R.C

FCC Registered No.: 671575

2. Summary of test

2.1. Summary of test result

Description of Test Item	Standard	Results
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.4 :2009	PASS
Bandwidth	FCC Part 15: 15.215 ANSI C63.4 :2009	PASS
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.4 :2009	PASS
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2009	PASS
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2009	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.4 :2009	PASS
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.4 :2009	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.4 :2009	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
Note: Test with the test procedure Bluetool.		

2.2. Assistant equipment used for test

Description	:	AC to DC Power
Manufacturer	:	Wen-Hua
Model No.	:	WYJ-100V10A

REMARK:FCC VOC APPROVED

2.3. Block Diagram

1, For radiated emissions test: EUT was placed on a turn table, which is 0.8 meter high above ground. EUT was be set into BT test mode by adb.exe software before test.



2.4. Test mode

The test software “CSR.exe” was used to control EUT work in Continuous TX mode, and select test channel, wireless mode.

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
GFSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
$\pi / 4$ DQPSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
8- DPSK	Low :CH1	2402
	Middle: CH40	2441
	High: CH79	2480

2.5. Test Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa

2.6. Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.40dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.15 dB	Polarize: V
	2.56dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.2dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.12dB	Polarize: H
	2.52dB	Polarize: V
Uncertainty for radio frequency	1×10^{-9}	
Uncertainty for conducted RF Power	0.66dB	
Uncertainty for temperature	0.2°C	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.05%	

2.7. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Cal. Due day	Cal Interval
3m Semi-Anechoic Chamber	Frankonia	N/A	N/A	2016.04.09	1Year
EMI Test receiver	Rohde&Schwarz	ESCS30	100085	2016.04.09	1Year
Signal Analyzer	Agilent	N9010A	MY48030494	2016.08.15	1 Year
Bilog Antenna	SCHAFFNER CHASE	CBL6143	N/A	2016.04.09	1Year
Horn Antenna	SCHAFFNER CHASE	BBHA 9120D	BBHA 9120 D(1206)	2016.04.09	1Year
Amplifier	EM	EM-30180	060568	2016.04.09	1Year
Power Meter	R&S	NRVS	101496	2016.08.15	1Year
Power sensor	R&S	URV5-Z4	0396.1862.08	2016.08.15	1Year
Coaxial Cable	SZHTW	N/A	C-01	2016.04.09	1Year
Coaxial Cable	SZHTW	N/A	C-02	2016.04.09	1Year
Coaxial Cable	SZHTW	N/A	C-03	2016.04.09	1Year
Test Receiver	Rohde&Schwarz	ESCS30	100086	2016.04.09	1 Year
L.I.S.N.	Schwarzbeck	NSLK8126	8126466	2016.04.09	1 Year
50 Ω Coaxial Switch	Anritsu	MP59B	6200264326	2016.04.09	1 Year

3. Maximum Conducted Output power

3.1. Limit

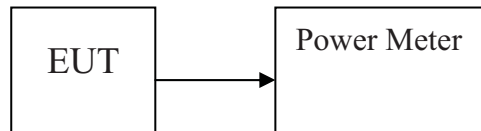
Please refer section 15.247.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W

3.2. Test Procedure

The transmitter output is connected to the RF Power Meter. The RF Power Meter is set to the Average power detection.

3.3. Test Setup



3.4. Test Result

EUT: Multifunction Speaker			M/N: CL-680		
Test date: 2015-09-25		Test site: RF site		Tested by: Mason	
Mode	Freq (MHz)	AVG Output Power (dBm)	AVG Output Power (mW)	Limit (dBm)	Margin (dB)
GFSK	2402	2.35	1.72	21	18.65
	2441	2.30	1.70	21	18.70
	2480	2.19	1.66	21	18.81
$\pi/4$ DQPSK,	2402	1.76	1.50	30	28.24
	2441	1.82	1.52	30	28.18
	2480	1.60	1.45	30	28.40
8- DPSK	2402	1.49	1.41	30	28.51
	2441	1.42	1.39	30	28.58
	2480	1.53	1.42	30	28.47
Conclusion: PASS					

4. Bandwidth

4.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

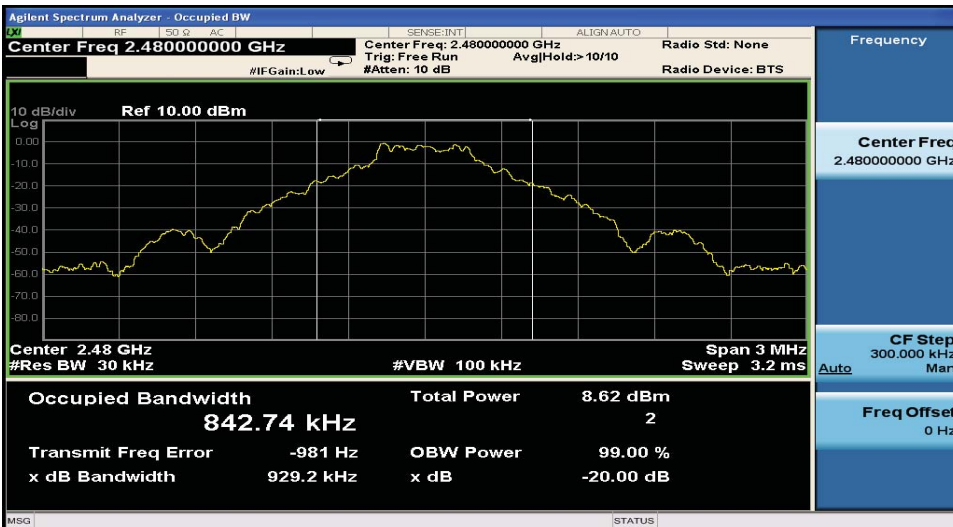
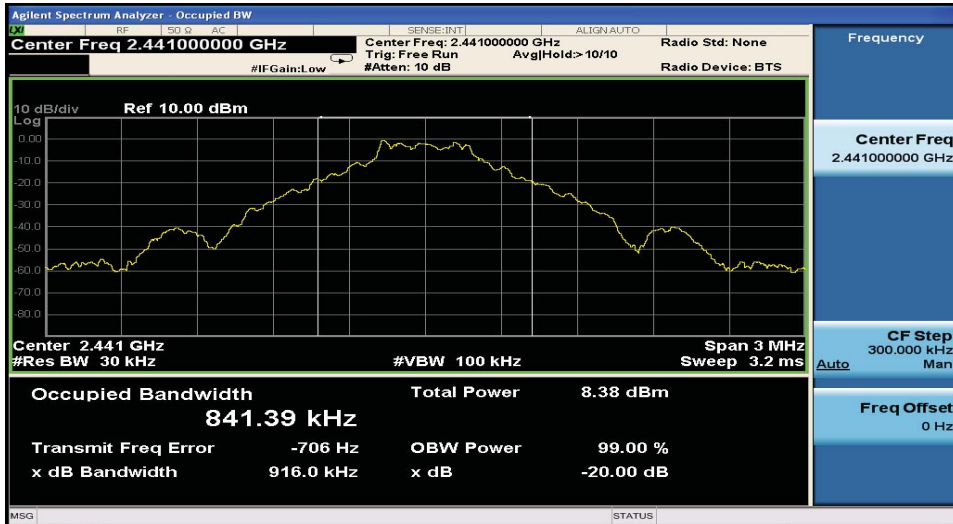
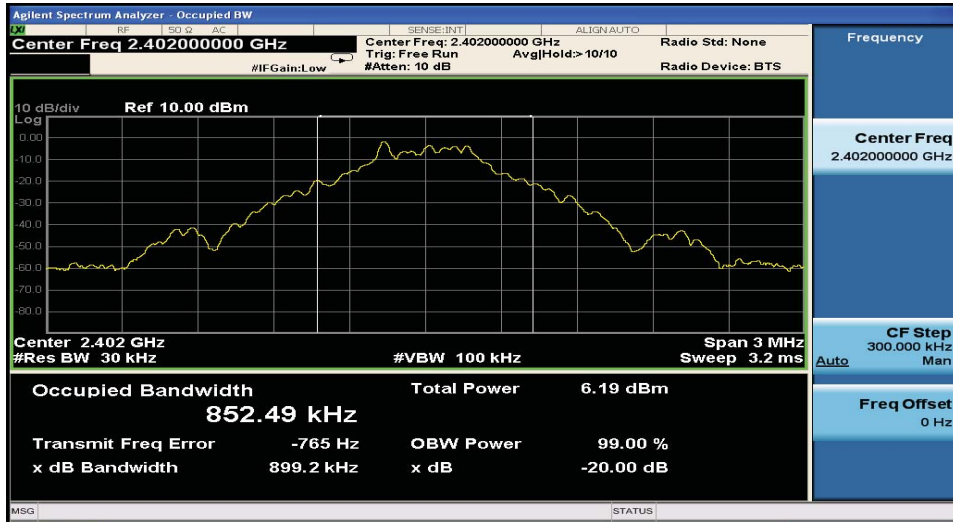
4.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB. Peak detector is used .

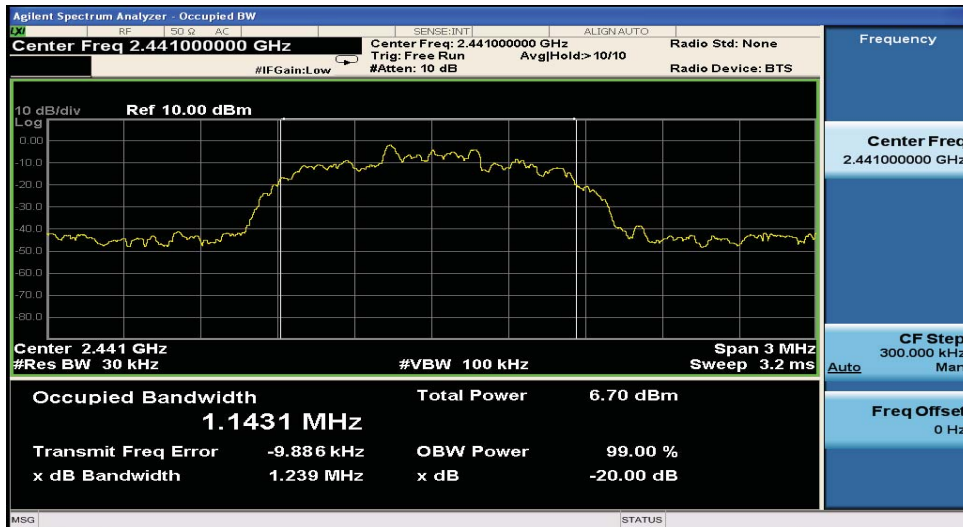
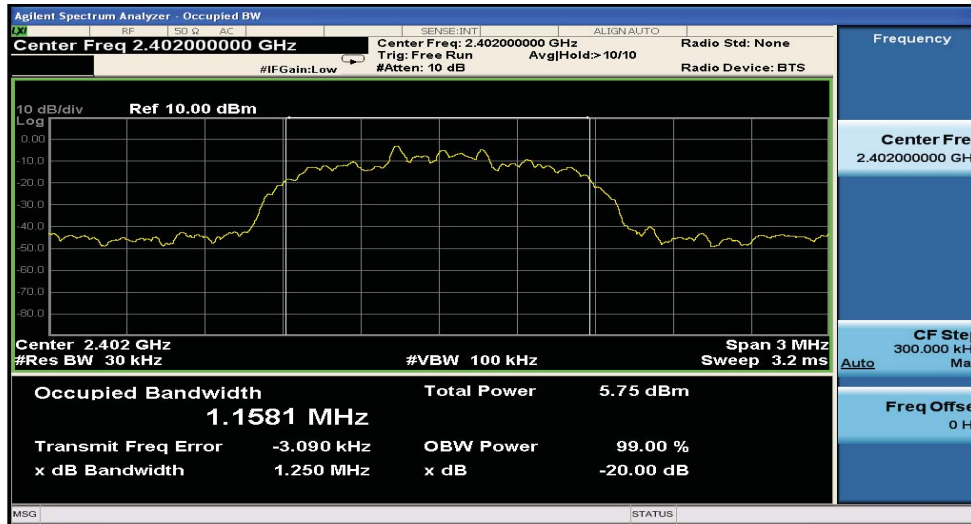
4.3. Test Result

EUT: Multifunction Speaker		M/N: CL-680		
Test date: 2015-09-28		Test site: RF site		Tested by: Mason
Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
GFSK	2402	0.899	/	PASS
	2441	0.916	/	PASS
	2480	0.929	/	PASS
$\pi/4$ DQPSK	2402	1.250	/	PASS
	2441	1.239	/	PASS
	2480	1.253	/	PASS
8- DPSK	2402	1.260	/	PASS
	2441	1.263	/	PASS
	2480	1.252	/	PASS

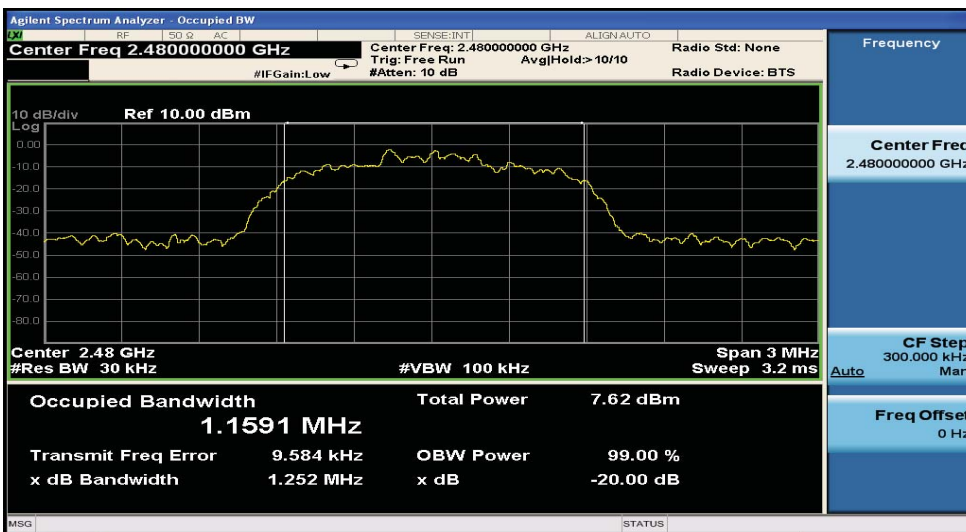
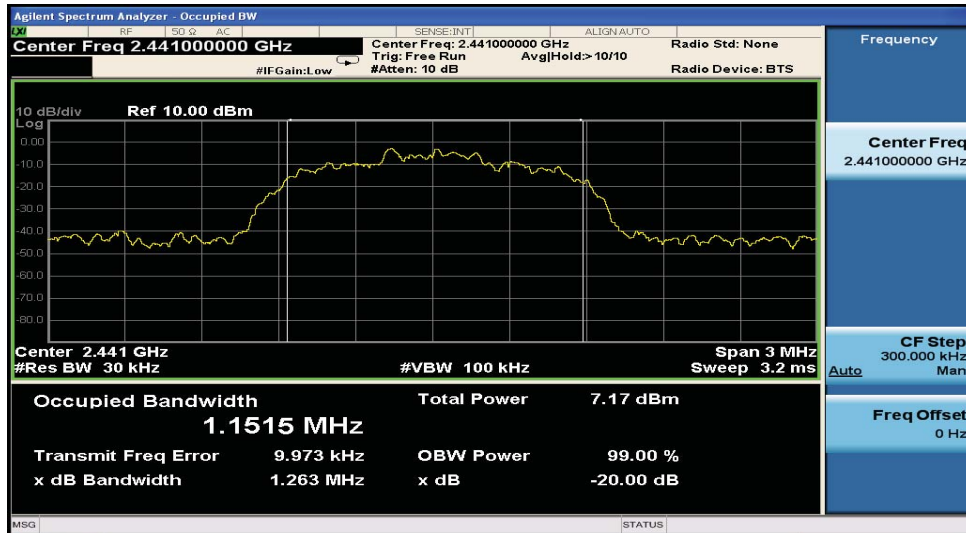
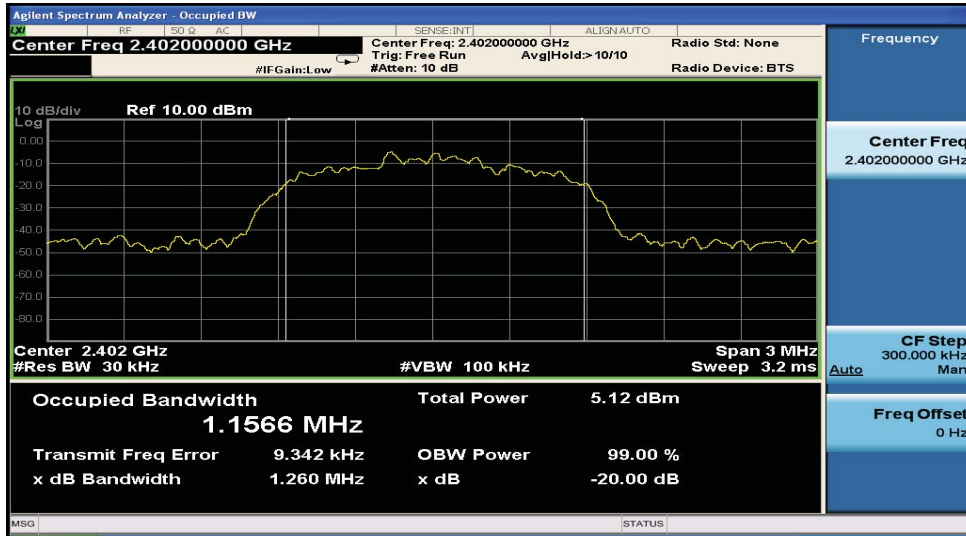
Original Test data For 20dB bandwidth
GFSK:



$\pi/4$ DQPSK:



8- DPSK



5. Carrier Frequency Separation

5.1. Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW

5.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The carrier frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW.

5.3. Test Result

EUT: Multifunction Speaker			M/N: CL-680	
Test date: 2015-09-28		Test site: RF site		Tested by: Mason
Mode/Channel	Channel separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz) 2/3 20dB bandwidth	Conclusion
GFSK	1.002	0.929	0.619	PASS
$\pi/4$ DQPSK	1.012	1.253	0.835	PASS
8- DPSK	1.001	1.263	0.842	PASS

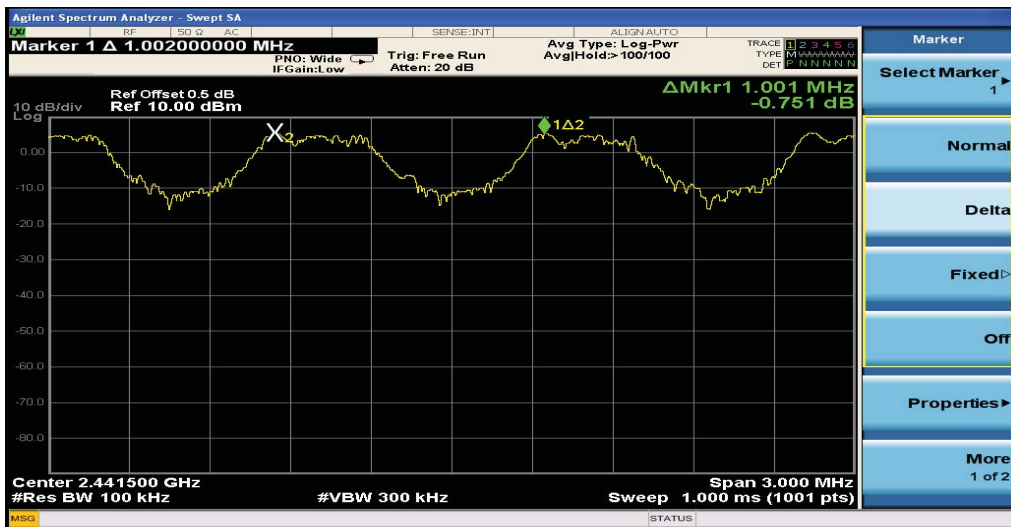
Original test data for channel separation
GFSK



$\pi/4$ DQPSK



8- DPSK



6. Number Of Hopping Channel

6.1. Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels

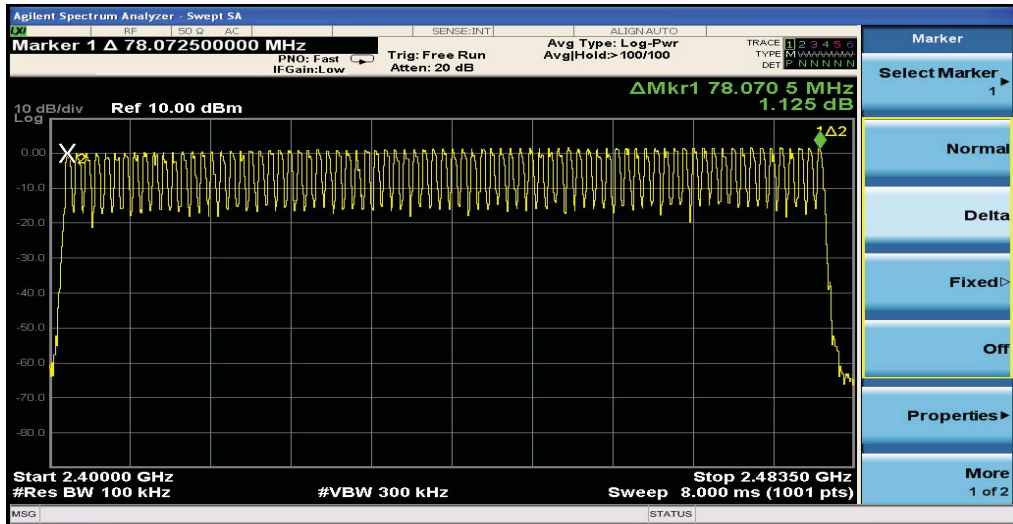
6.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The number of hopping channel was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW.

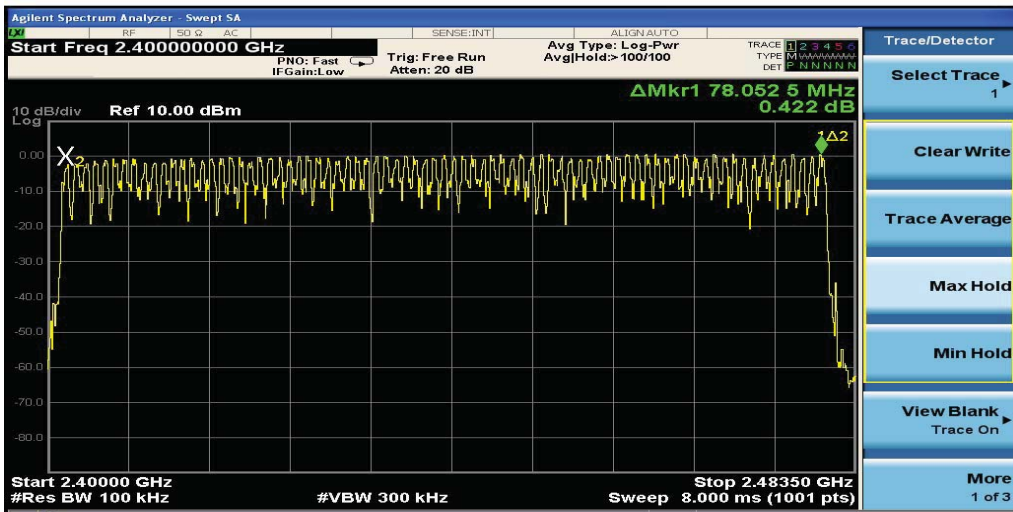
6.3. Test Result

EUT: Multifunction Speaker		M/N: CL-680	
Test date: 2015-09-28		Test site: RF site	Tested by: Mason
Mode	Number of hopping channel	Limit	Conclusion
GFSK	79	>15	PASS
$\pi/4$ DQPSK	79	>15	PASS
8- DPSK	79	>15	PASS

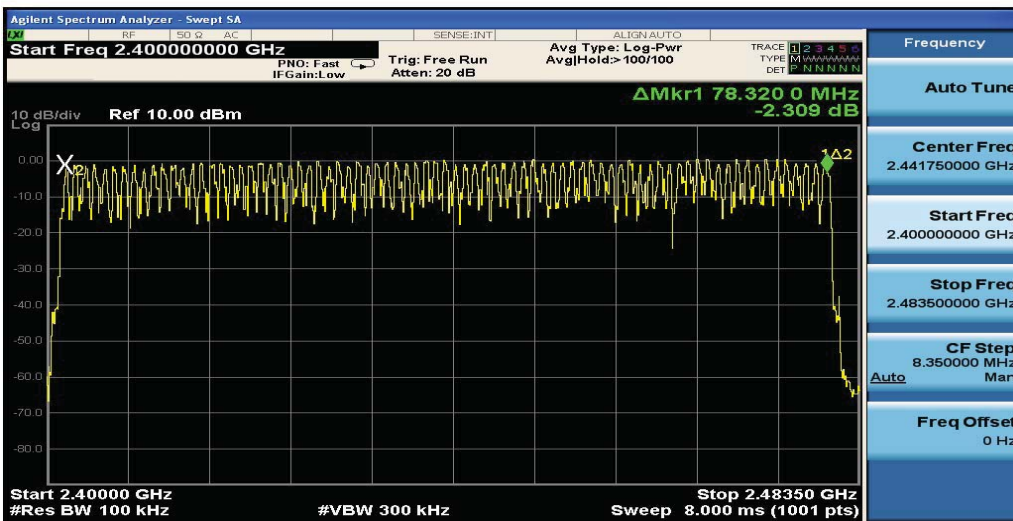
Original test data for hopping channel number
GFSK



$\pi/4$ DQPSK



8- DPSK



7. Dwell Time

7.1. Test limit

Please refer section 15.247

According to §15.247(a)(1)(iii), Frequency hopping systems operating in the 2400MHz-2483.5 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channels employed.

7.2. Test Procedure

7.2.1. Place the EUT on the table and set it in transmitting mode.

7.2.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

7.2.3. Set center frequency of spectrum analyzer = operating frequency.

7.2.4. Set the spectrum analyzer as RBW, VBW=1MHz, Span = 0Hz, Sweep = auto.

7.2.5. Repeat above procedures until all frequencies measured were complete.

7.3. Test Results

PASS.

Detailed information please see the following page.

EUT: Multifunction Speaker			M/N: CL-680			
Test date: 2015-09-28		Test site: RF site		Tested by: Mason		
Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Conclusion
GFSK	DH1	2441	0.365	0.234	<0.4	PASS
	DH3	2441	1.610	0.343	<0.4	PASS
	DH5	2441	2.857	0.366	<0.4	PASS
$\pi/4$	DH1	2441	0.374	0.239	<0.4	PASS
	DH3	2441	1.620	0.346	<0.4	PASS
DQPSK	DH5	2441	2.870	0.368	<0.4	PASS
8- DPSK	DH1	2441	0.376	0.241	<0.4	PASS
	DH3	2441	1.640	0.350	<0.4	PASS
	DH5	2441	2.860	0.366	<0.4	PASS

Note: 1, A period time = $0.4 \text{ (s)} * 79 = 31.6 \text{ (s)}$

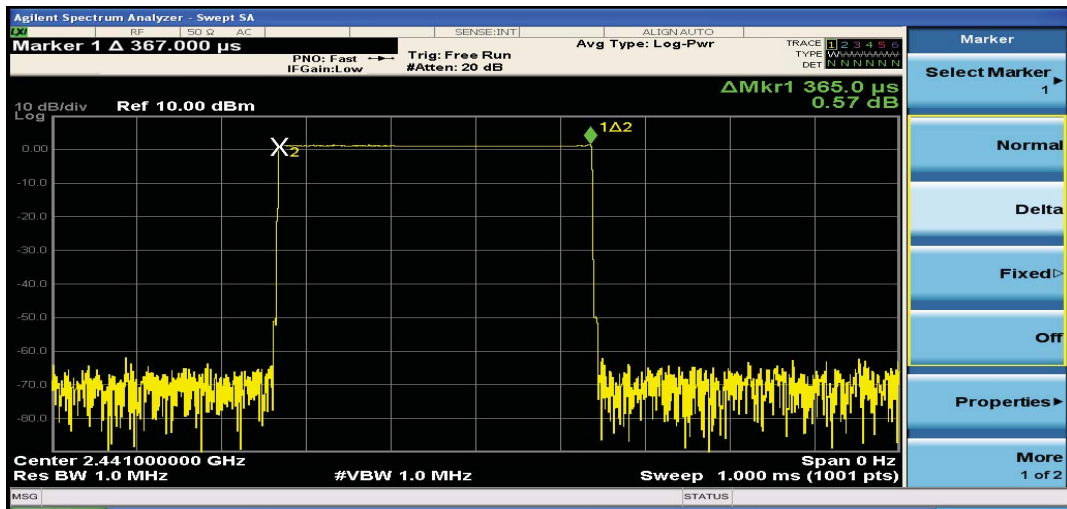
2, DH1 time slot = $\text{Pulse Duration} * (1600 / (1 * 79)) * \text{A period time}$

DH3 time slot = $\text{Pulse Duration} * (1600 / (3 * 79)) * \text{A period time}$

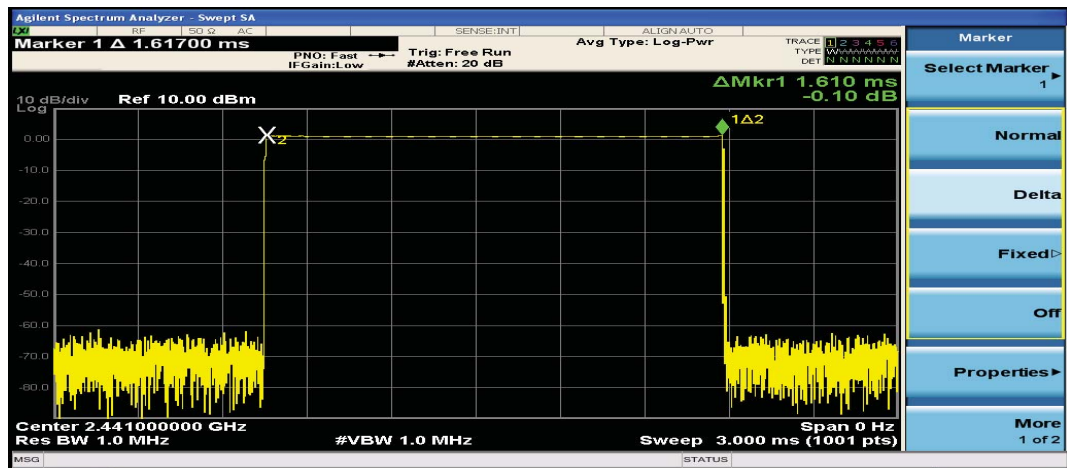
DH5 time slot = $\text{Pulse Duration} * (1600 / (5 * 79)) * \text{A period time}$

GFSK

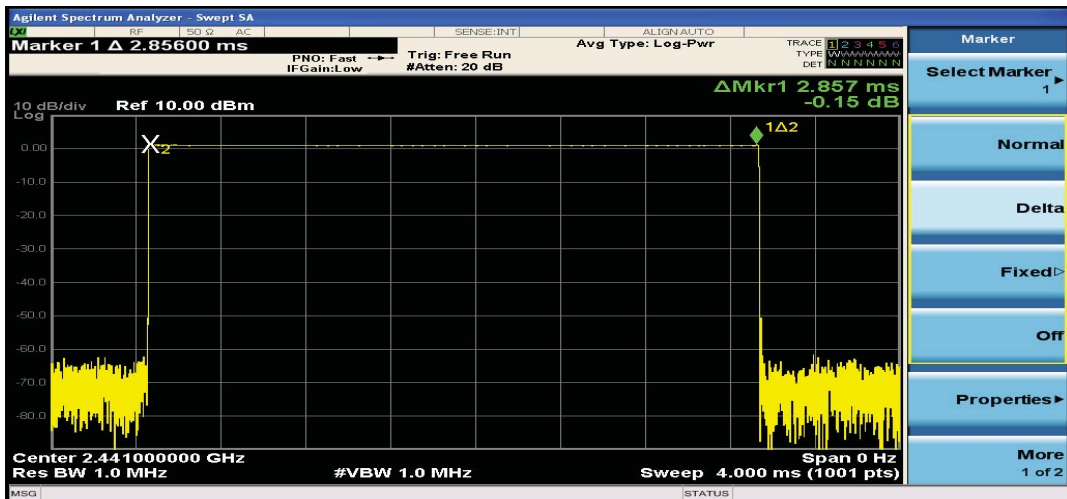
DH1:



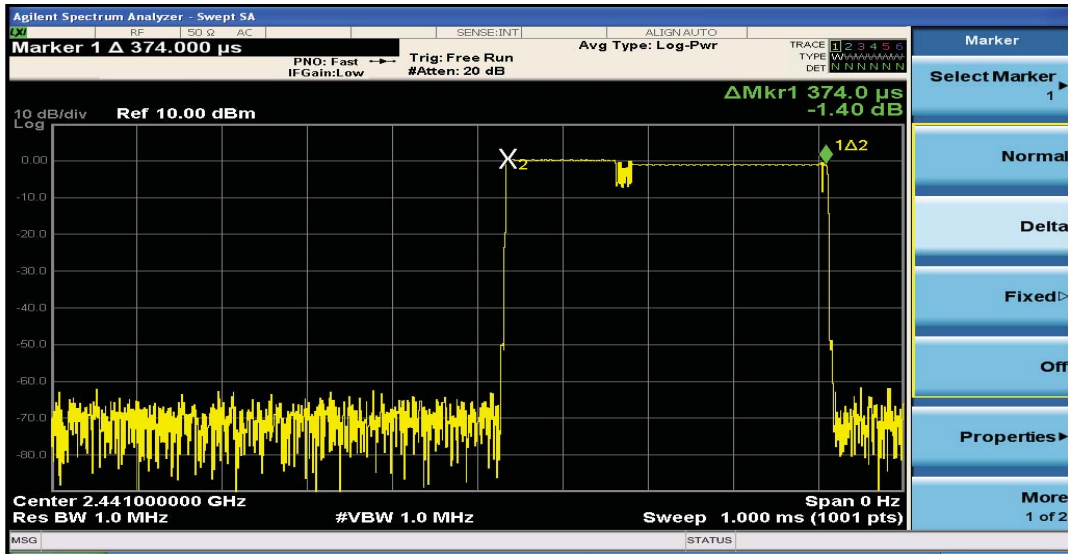
DH3:



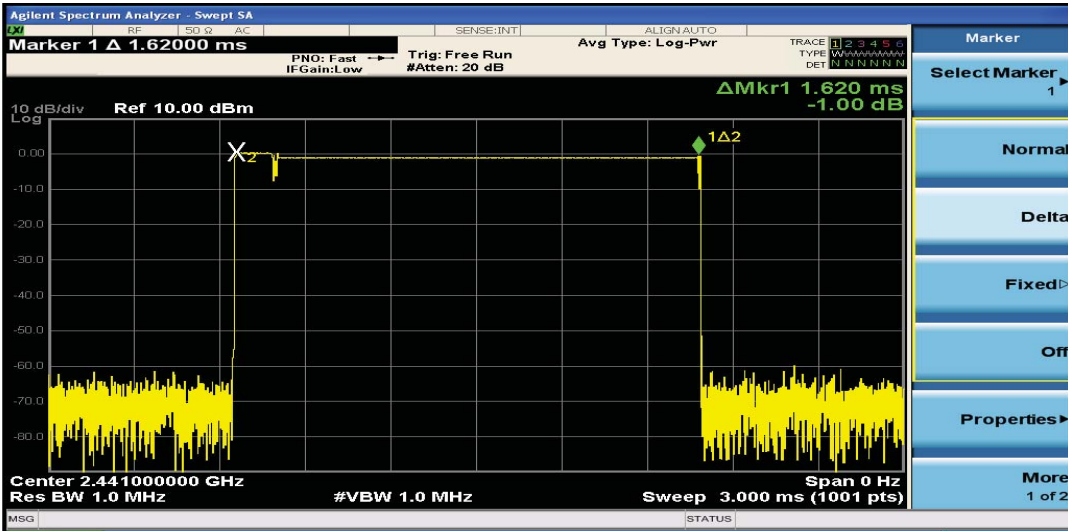
DH5



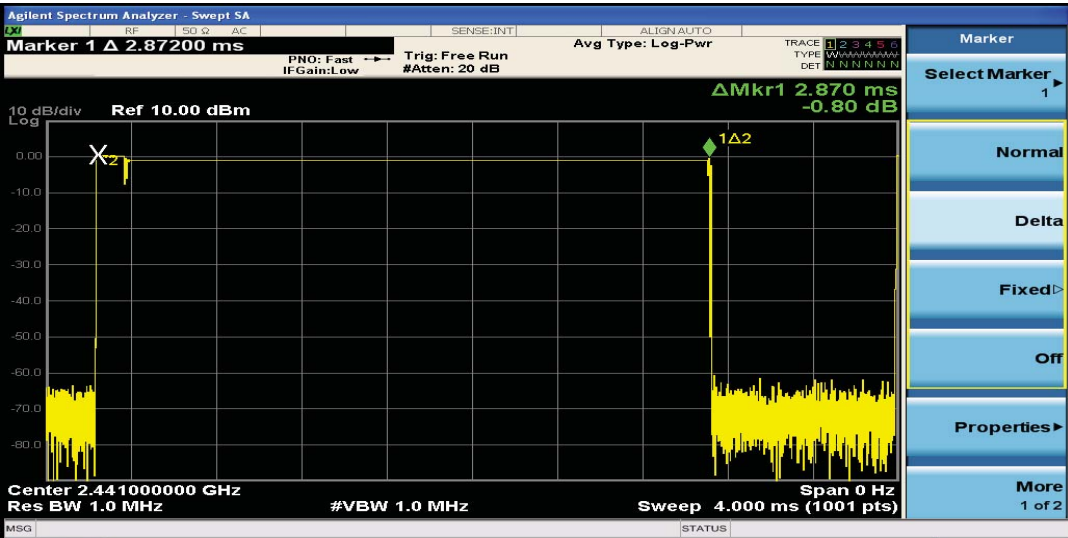
$\pi/4$ DQPSK
DH1



DH3



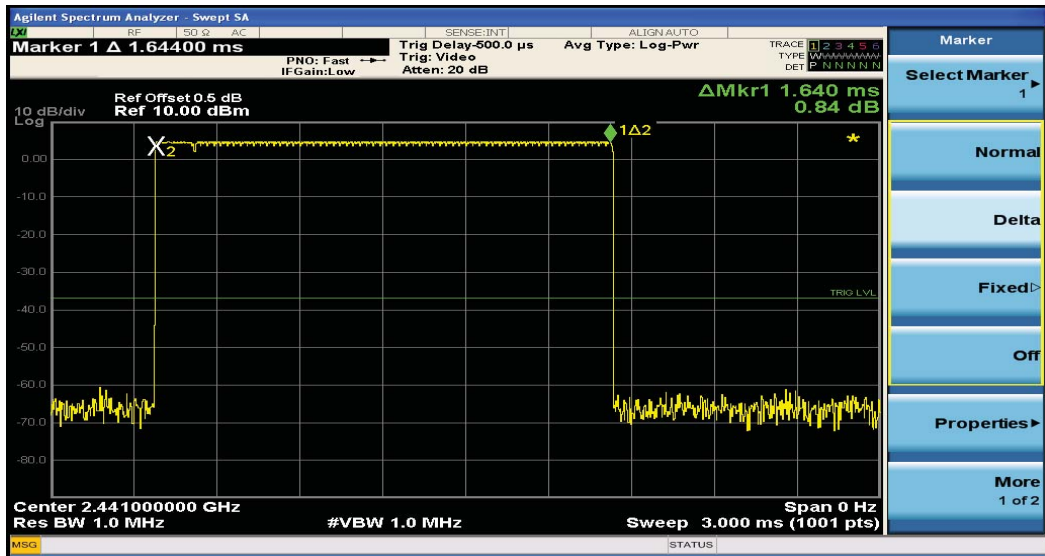
DH5



8- DPSK
DH1



DH3



DH5



8. Radiated emissions

8.1. Limit

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.

15.205 Restricted frequency band

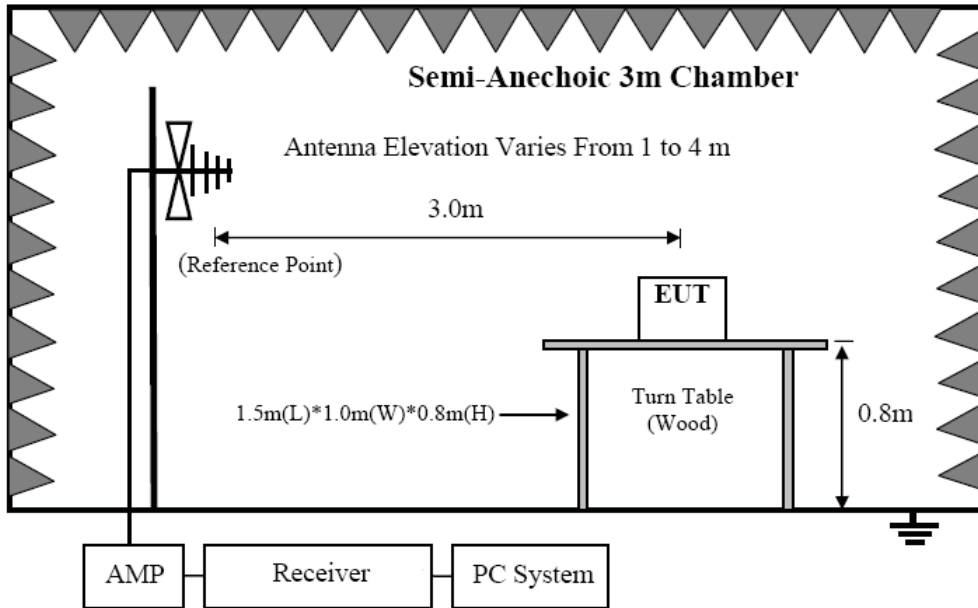
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 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)

15.209 Limit

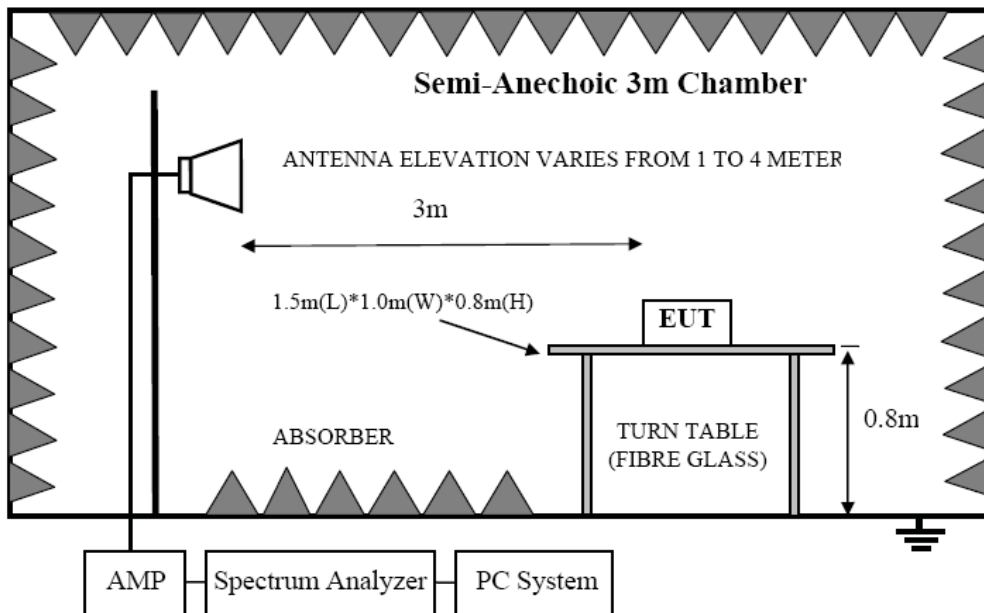
FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

8.2. Block Diagram of Test setup

8.2.1. In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



8.2.2. 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.

8.3. 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 simulator as shown in section 1.4 and 6.1

- (3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
 - (a) Change work frequency or channel of device if practicable.
 - (b) Change modulation type of device if practicable.
 - (c) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement produces highest emissions
- (4) Spectrum frequency from 9KHz to 25GHz (tenth harmonic of fundamental frequency) was investigated
- (5) For final emissions measurements at each frequency of interest, the EUT were 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 C63.4 2009 on Radiated Emission test.
- (6) 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.

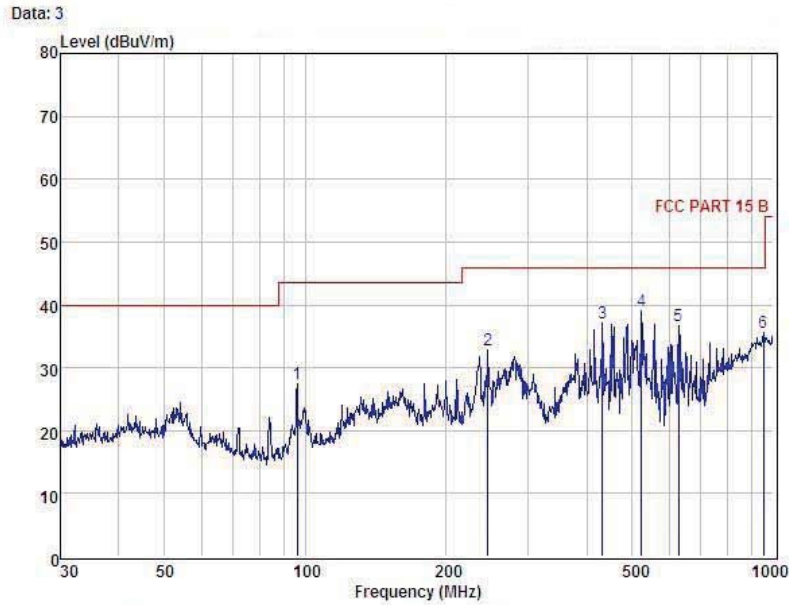
8.4. Test Result

We have scanned the 10th harmonic from 9KHz to the EUT.
Detailed information please see the following page.

From 9KHz to 30MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

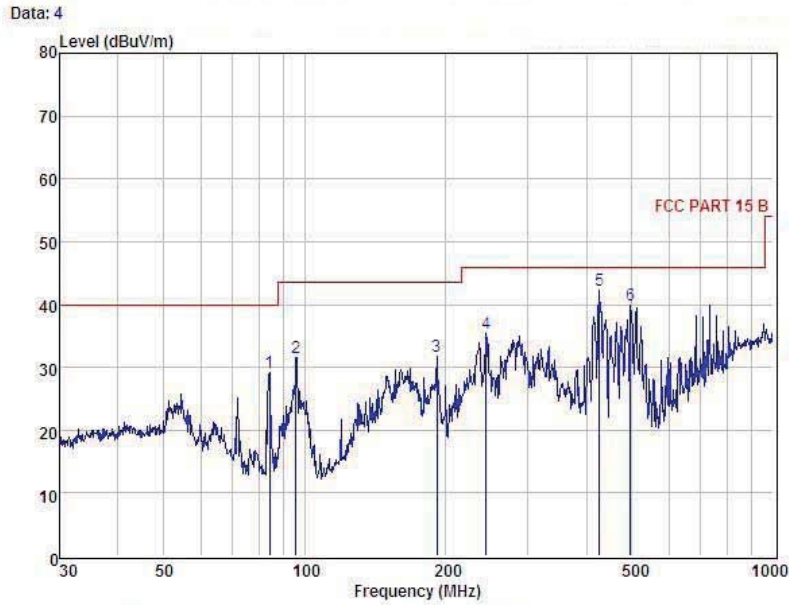
From 30MHz to 1000MHz: Conclusion: PASS



Condition : FCC PART 15 B 3m POL: VERTICAL
 EUT : Multifunction Speaker
 Model No : CL-680
 Test Mode : GFSK Low CH TX Mode
 Power : DC 3.7V From Battery
 Test Engineer :
 Remark :
 Temp : 24°C
 Hum : 32%

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	96.10	47.36	9.87	30.19	0.41	27.45	43.50	-16.05	Peak
2	245.95	48.87	11.52	28.24	0.72	32.87	46.00	-13.13	Peak
3	431.03	48.09	15.53	27.18	0.73	37.17	46.00	-8.83	Peak
4	522.72	48.49	16.93	27.25	0.81	38.98	46.00	-7.02	Peak
5	627.27	42.72	18.82	25.79	0.98	36.73	46.00	-9.27	Peak
6	952.09	36.35	22.15	24.97	1.99	35.52	46.00	-10.48	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



```

Condition : FCC PART 15 B      3m      POL: HORIZONTAL
EUT       : Multifunction Speaker
Model No  : CL-680
Test Mode : GFSK Low CH IX Mode
Power     : DC 3.7V From Battery
Test Engineer :
Remark    :
Temp      : 24°C
Hum       : 32%
    
```

Item	Freq MHz	Read Level dBuV	Antenna Factor dB	Preamp Factor dB	Cable Loss dB	Level dBuV	Limit dBuV	Margin dBuV	Remark
1	84.11	49.71	9.35	30.09	0.26	29.23	40.00	-10.77	Peak
2	95.76	51.44	9.87	30.19	0.41	31.53	43.50	-11.97	Peak
3	191.75	49.83	10.36	28.94	0.58	31.83	43.50	-11.67	Peak
4	244.23	51.52	11.50	28.25	0.66	35.43	46.00	-10.57	Peak
5	426.52	53.30	15.38	27.07	0.67	42.28	46.00	-3.72	Peak
6	495.93	49.63	16.46	27.18	1.07	39.98	46.00	-6.02	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Remark: All modes have been tested, and only worst data of GFSK mode, Channel 2402MHz was listed in this report.

1GHz—25GHz Radiated emission Test result									
EUT: Multifunction Speaker					M/N: CL-680				
Power: DC 3.7V From battery									
Test date: 2015-09-25			Test site: 3m Chamber			Tested by: Mason			
Test mode: GFSK Tx CH1 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss (dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804	43.25	33.95	10.18	34.26	53.12	74	20.88	PK
2	4804	33.23	33.95	10.18	34.26	43.10	54	10.90	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	44.38	33.95	10.18	34.26	54.25	74	19.75	PK
2	4804	34.52	33.95	10.18	34.26	44.39	54	9.61	AV
3	7206	/							
4	9608	/							
5	12010	/							
Note:									
1, Measuring frequency from 1GHz to 25GHz									
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK									
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK									
3, Result = Read level + Antenna factor + cable loss-Amp factor									
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emission Test result									
EUT: Multifunction Speaker					M/N: CL-680				
Power: DC 3.7V From battery									
Test date: 2015-09-25					Test site: 3m Chamber			Tested by: Mason	
Test mode: GFSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	44.14	33.93	10.2	34.29	53.98	74	20.02	PK
2	4882	34.53	33.93	10.2	34.29	44.37	54	9.63	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	43.81	33.93	10.2	34.29	53.65	74	20.35	PK
2	4882	32.34	33.93	10.2	34.29	42.18	54	11.82	AV
3	7323	/							
4	9764	/							
5	12205	/							
Note:									
1, Measuring frequency from 1GHz to 25GHz									
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK									
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK									
3, Result = Read level + Antenna factor + cable loss-Amp factor									
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emission Test result									
EUT: Multifunction Speaker					M/N: CL-680				
Power: DC 3.7V From battery									
Test date: 2015-09-25			Test site: 3m Chamber			Tested by: Mason			
Test mode: GFSK Tx CH79 2480MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960	43.92	33.98	10.22	34.25	53.87	74	20.13	PK
2	4960	32.26	33.98	10.22	34.25	42.21	54	11.79	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	44.35	33.98	10.22	34.25	54.30	74	19.70	PK
2	4960	34.21	33.98	10.22	34.25	44.16	54	9.84	AV
3	7440	/							
4	9920	/							
5	12400	/							
Note:									
1, Measuring frequency from 1GHz to 25GHz									
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK									
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK									
3, Result = Read level + Antenna factor + cable loss-Amp factor									
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emission Test result									
EUT: Multifunction Speaker					M/N: CL-680				
Power: DC 3.7V From battery									
Test date: 2015-09-25			Test site: 3m Chamber			Tested by: Mason			
Test mode: $\pi/4$ DQPSK Tx CH1 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804	44.35	33.95	10.18	34.26	54.22	74	19.78	PK
2	4804	34.82	33.95	10.18	34.26	44.66	54	9.34	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	45.16	33.95	10.18	34.26	55.03	74	18.97	PK
2	4804	35.72	33.95	10.18	34.26	45.59	54	8.41	AV
3	7206	/							
4	9608	/							
5	12010	/							
Note:									
1, Measuring frequency from 1GHz to 25GHz									
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK									
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK									
3, Result = Read level + Antenna factor + cable loss-Amp factor									
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emission Test result									
EUT: Multifunction Speaker					M/N: CL-680				
Power: DC 3.7V From battery									
Test date: 2015-09-25					Test site: 3m Chamber			Tested by: Mason	
Test mode: $\pi/4$ DQPSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	42.95	33.93	10.2	34.29	52.79	74	21.21	PK
2	4882	33.17	33.93	10.2	34.29	43.01	54	10.99	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	44.61	33.93	10.2	34.29	54.45	74	19.55	PK
2	4882	32.54	33.93	10.2	34.29	42.38	54	11.62	AV
3	7323	/							
4	9764	/							
5	12205	/							
Note:									
1, Measuring frequency from 1GHz to 25GHz									
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK									
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK									
3, Result = Read level + Antenna factor + cable loss-Amp factor									
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emission Test result									
EUT: Multifunction Speaker					M/N: CL-680				
Power: DC 3.7V From battery									
Test date: 2015-09-25			Test site: 3m Chamber			Tested by: Mason			
Test mode: $\pi/4$ DQPSK Tx CH79 2480MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4960	43.39	33.98	10.22	34.25	53.34	74	20.66	PK
2	4960	33.14	33.98	10.22	34.25	43.09	54	10.91	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	44.82	33.98	10.22	34.25	54.77	74	19.23	PK
2	4960	32.97	33.98	10.22	34.25	42.92	54	11.08	AV
3	7440	/							
4	9920	/							
5	12400	/							
Note:									
1, Measuring frequency from 1GHz to 25GHz									
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK									
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK									
3, Result = Read level + Antenna factor + cable loss-Amp factor									
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emission Test result									
EUT: Multifunction Speaker					M/N: CL-680				
Power: DC 3.7V From battery									
Test date: 2015-09-25					Test site: 3m Chamber			Tested by: Mason	
Test mode: 8- DPSK Tx CH1 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804	44.65	33.95	10.18	34.26	54.52	74	19.48	PK
2	4804	33.27	33.95	10.18	34.26	43.14	54	10.86	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	43.94	33.95	10.18	34.26	53.81	74	20.19	PK
2	4804	32.88	33.95	10.18	34.26	42.75	54	11.25	AV
3	7206	/							
4	9608	/							
5	12010	/							
Note:									
1, Measuring frequency from 1GHz to 25GHz									
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK									
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK									
3, Result = Read level + Antenna factor + cable loss-Amp factor									
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									

1GHz—25GHz Radiated emission Test result									
EUT: Multifunction Speaker					M/N: CL-680				
Power: DC 3.7V From battery									
Test date: 2015-09-25					Test site: 3m Chamber			Tested by: Mason	
Test mode: 8- DPSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	43.71	33.93	10.2	34.29	53.55	74	20.45	PK
2	4882	33.24	33.93	10.2	34.29	43.08	54	10.92	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	44.05	33.93	10.2	34.29	53.89	74	20.11	PK
2	4882	34.37	33.93	10.2	34.29	44.21	54	9.79	AV
3	7323	/							
4	9764	/							
5	12205	/							
Note:									
1, Measuring frequency from 1GHz to 25GHz									
2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK									
2, Spectrum Set for AV measure: RBW=1MHz, VBW=10Hz, Sweep time=Auto, Detector: PK									
3, Result = Read level + Antenna factor + cable loss-Amp factor									
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.									