



Shenzhen Certification Technology Service Co., Ltd.
2F, Building B, East Area of Nanchang Second Industrial
Zone, Gushu 2nd Road, Bao'an District, Shenzhen
518126, P.R. China

TEST REPORT

FCC ID: 2AC5H-MB3

Applicant : Acoustic Professor Technology Co.LTD
Address : C Building, No.13 Fu Tang Road, Tang Xia Youg Second
Industry Zone, Song Gang Town, Bao An District, Shen Zhen,
China

Equipment Under Test (EUT):

Name : Bluetooth speaker
Model : MB3(X5), MB4(W5), MB5(M5), MB3S(X5), SB1, UB1

In Accordance with: FCC PART 15, SUBPART C : 2013 (Section 15.247)

Report No : CST-TCB140829052
Date of Test : August 30- September 03, 2014
Date of Issue : September 03, 2014

Test Result: **PASS**

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

Authorized Signature

A handwritten signature in black ink, appearing to read "Mark Zhu".

(Mark Zhu)

General Manager

The manufacturer 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 Certification Technology Service Co., Ltd. Or test done by Shenzhen Certification Technology Service Co., Ltd. Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen Certification Technology Service Co., Ltd. Approvals in writing.

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1. General Information

1.1. Description of Device (EUT)

EUT : Bluetooth speaker
Model No. : MB3(X5),MB4(W5),MB5(M5),MB3S(X5),SB1,UB1
DIFF. : All models are the same except for the appearance(color difference).
Trade mark : N/A

Power supply : DC 5.0V Supply by battery
Adapter : NIL

Radio : Bluetooth 3.0+EDR
Technology :
Operation frequency : 2402-2480MHz
Modulation : GFSK, $\pi/4$ DQPSK,8- DPSK
Antenna Type : PCB Antenna, max gain 4 dBi for BT.

Applicant : Acoustic Professor Technology Co.LTD
Address : C Building,No.13 Fu Tang Road, Tang Xia Youg Second Industry Zone,Song Gang Town, Bao An District, Shen Zhen, China

Manufacturer : Acoustic Professor Technology Co.LTD
Address : C Building,No.13 Fu Tang Road, Tang Xia Youg Second Industry Zone,Song Gang Town, Bao An District, Shen Zhen, China

1.2. Accessories of device (EUT)

Accessories 1 : NIL
Type : NIL

1.3. Test Lab information

Shenzhen Certification Technology Service Co., Ltd.
2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
FCC Registered No.:197647
IC Registered No.: 8528B

2. Summary of test

2.1. Summary of test result

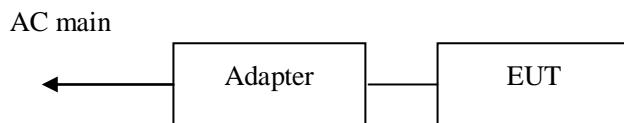
Description of Test Item	Standard	Results
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.4 :2003	PASS
Bandwidth	FCC Part 15: 15.215 ANSI C63.4 :2003	PASS
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.4 :2003	PASS
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2003	PASS
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.4 :2003	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.4 :2003	PASS
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.4 :2003	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.4 :2003	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
Note: Test with the test procedure ASTTestTool.		

2.2. Assistant equipment used for test

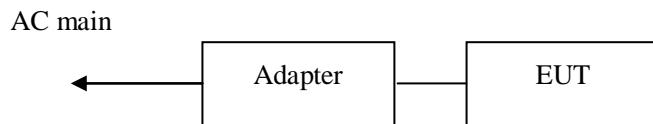
Description	:	NIL
Manufacturer	:	NIL
Model No.	:	NIL
Input	:	NIL
Output	:	NIL

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 set into BT test mode by adb.exe software before test.



2, For Power Line Conducted Emissions Test: EUT was connected to power adapter by 1m USB line



2.4. Test mode

The test software “ASTTestTool.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	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10^{-9}	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2°C	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

2.7. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	Nov. 16, 13	1 Year
Spectrum analyzer	Agilent	E4407B	MY49510055	Oct. 30, 13	1 Year
Receiver	R&S	ESCI	101165	Oct. 30, 13	1 Year
Receiver	R&S	ESCI	101202	Oct. 30, 13	1 Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	Mar.11, 14	1 Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	Mar.11, 14	1 Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	Mar.11, 14	1 Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	Mar.12, 13	1 Year
L.I.S.N.	SCHWARZBECK	NSLK8126	8126466	Oct. 30, 13	1 Year
Cable	Resenberger	SUCOFLEX 104	MY6562/4	Oct. 30, 13	1 Year
Cable	Resenberger	SUCOFLEX 104	309972/4	Oct. 30, 13	1 Year
Cable	Resenberger	SUCOFLEX 104	329112/4	Oct. 30, 13	1 Year
Power Meter	Anritsu	ML2487A	6K00001491	Oct. 30, 13	1 Year
Power sensor	Anritsu	ML2491A	32516	Oct. 30, 13	1 Year
Pre-amplifier	SCHWARZBECK	BBV9743	9743-019	Oct. 30, 13	1 Year
Pre-amplifier	Quietek	AP-180C	CHM-0602012	Oct. 30, 13	1 Year
Base station	Agilent	E5515C	GB44300243	Oct. 30, 13	1 Year
Temperature controller	Terchy	MHQ	120	Oct. 30, 13	1 Year
Power divider	Anritsu	K240C	020346	Oct. 30, 13	1 Year
Signal Generator	ROHDE&SCHWA	CMU200	116785	Oct. 30, 13	1 Year

	RZ				
Attenuator	Agilent	8491B	MY39262165	Oct. 30, 13	1 Year
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54080020	2014.01.19	1 Year
X-series USB Peak and Average Power Sensor	Agilent	U2021XA	MY54110001	2014.01.19	1 Year
4 Ch.Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	TW54063507	2014.01.19	1 Year

3. Maximum Peak Output power

3.1. Limit

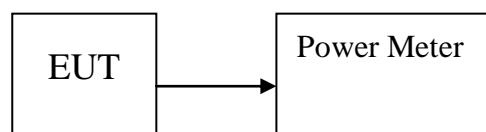
Please refer section 15.247.

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 peak power detection.

3.3. Test Setup



3.4. Test Result

EUT: Bluetooth speaker		M/N: MB3(X5)			
Test date: 2014-09-02		Test site: RF site		Tested by: Peter	
Mode	Freq (MHz)	PK Output Power (dBm)	PK Output Power (mW)	Limit (dBm)	Margin (dB)
GFSK	2402	-1.58	0.70	30	31.58
	2441	-1.62	0.69	30	31.62
	2480	-1.57	0.70	30	31.57
$\pi/4$ DQPSK,	2402	-1.75	0.67	30	31.75
	2441	-1.82	0.66	30	31.82
	2480	-1.86	0.65	30	31.86
8- DPSK	2402	-3.56	0.44	30	33.56
	2441	-3.58	0.44	30	33.58
	2480	-3.68	0.43	30	33.68
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

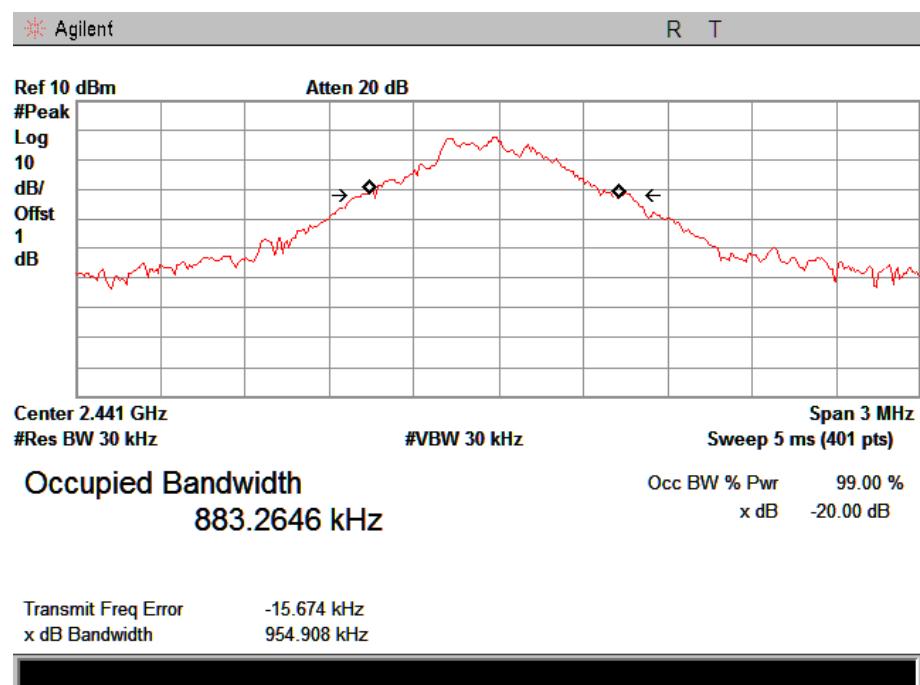
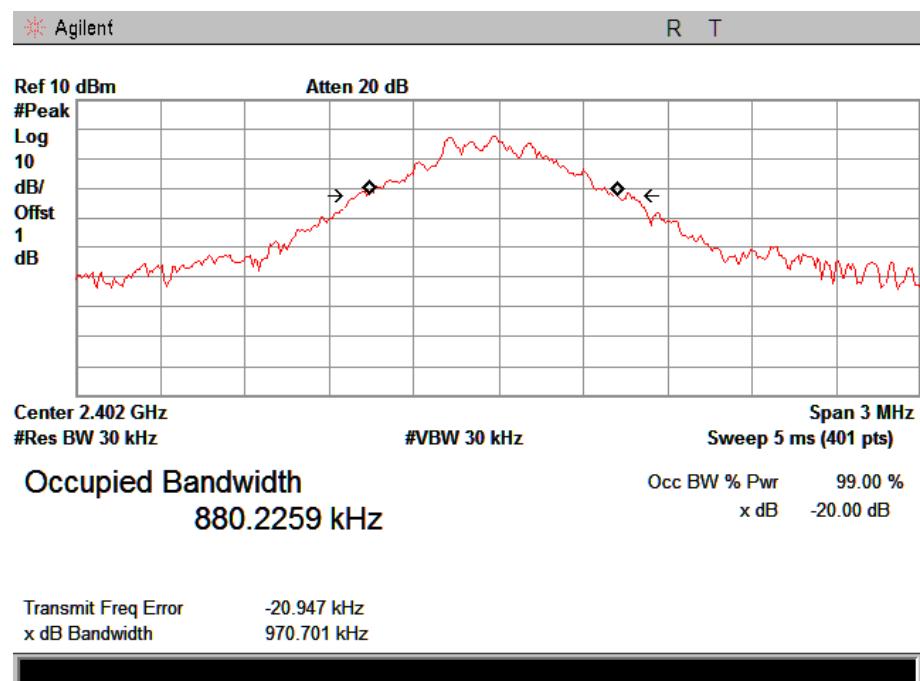
The transmitter output was coupled to a spectrum analyzer via a antenna. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 30kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

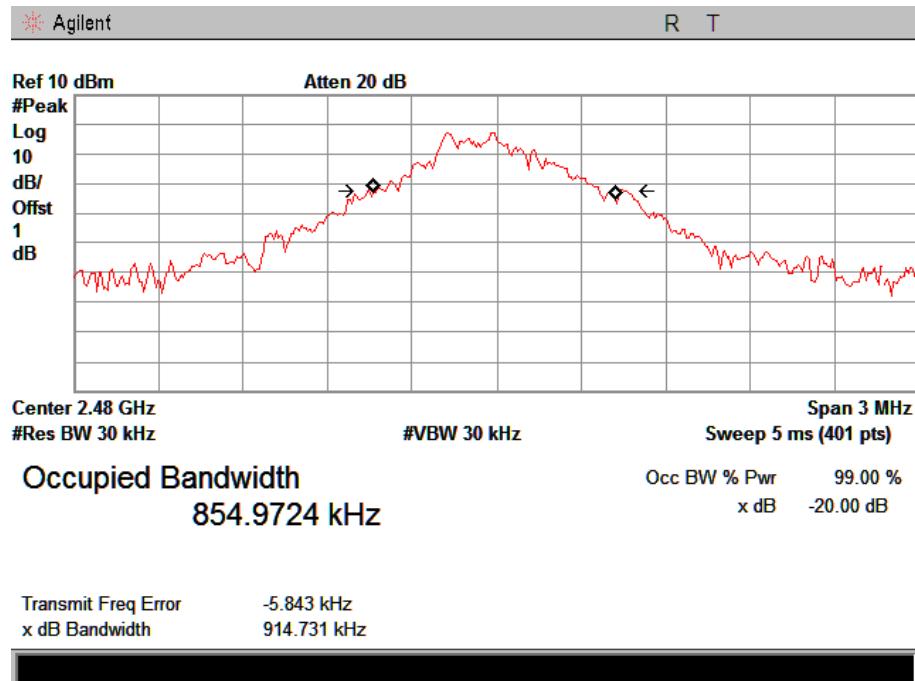
4.3. Test Result

EUT: Bluetooth speaker		M/N: MB3(X5)		
Test date: 2014-09-02		Test site: RF site	Tested by: Peter	
Mode	Freq (MHz)	20dB Bandwidth (MHz)	Limit (kHz)	Conclusion
GFSK	2402	0.971	/	PASS
	2441	0.955	/	PASS
	2480	0.915	/	PASS
$\pi /4$ DQPSK	2402	1.216	/	PASS
	2441	1.223	/	PASS
	2480	1.220	/	PASS
8- DPSK	2402	1.220	/	PASS
	2441	1.223	/	PASS
	2480	1.215	/	PASS

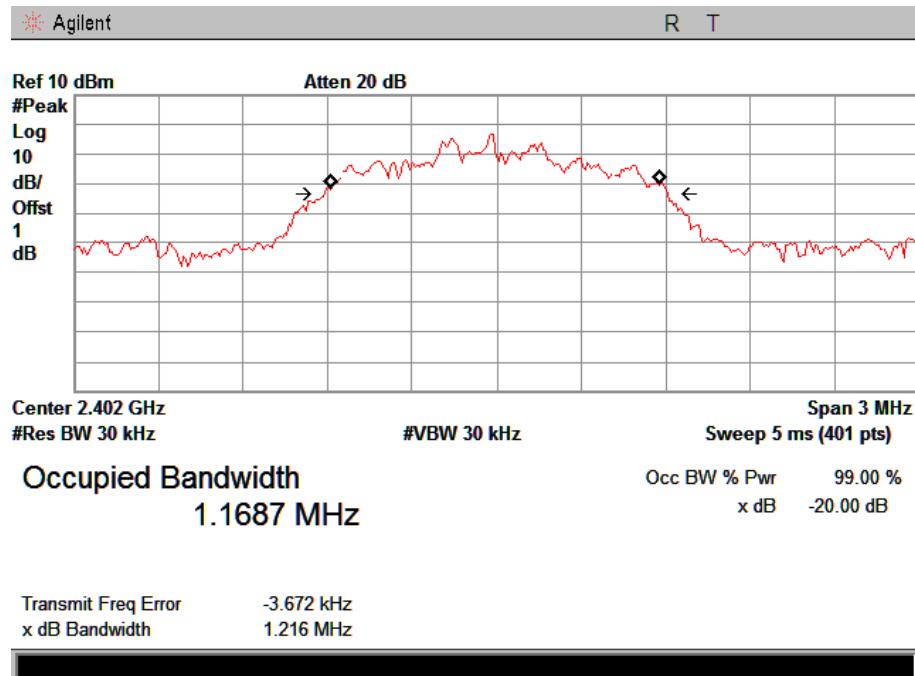
Orginal Test data For 20dB bandwidth

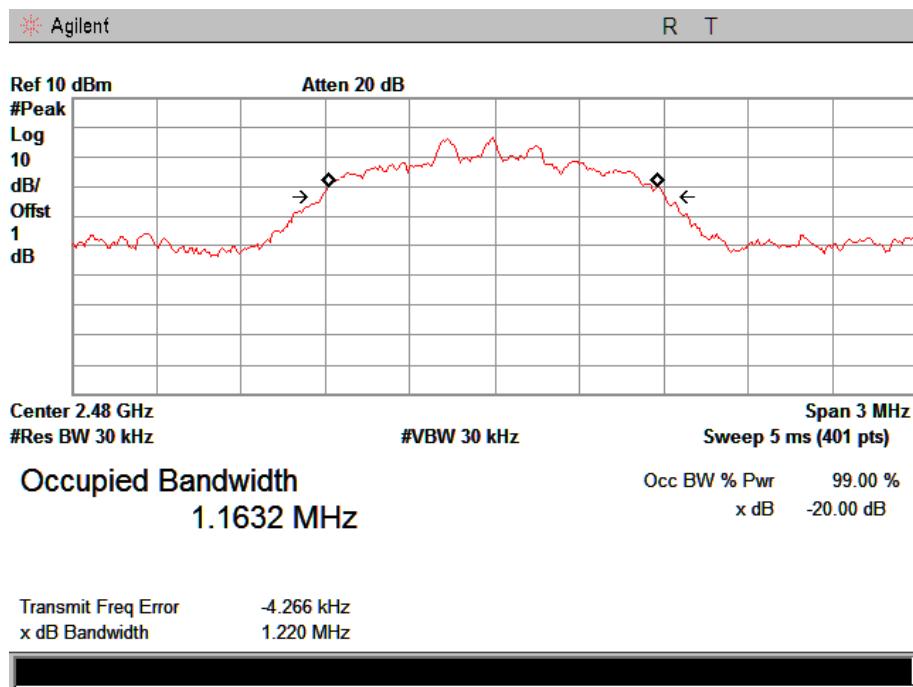
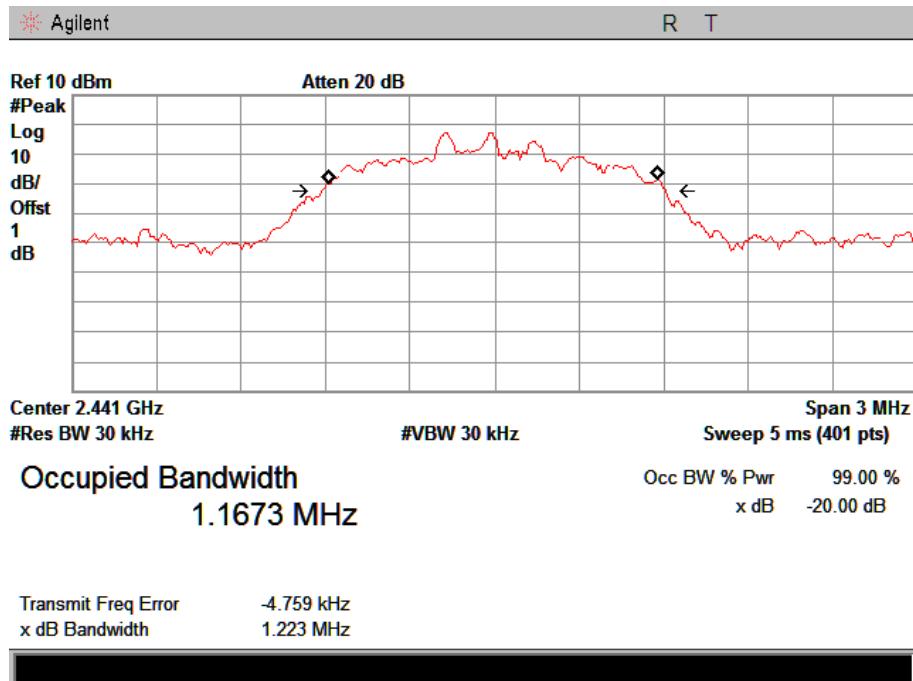
GFSK:



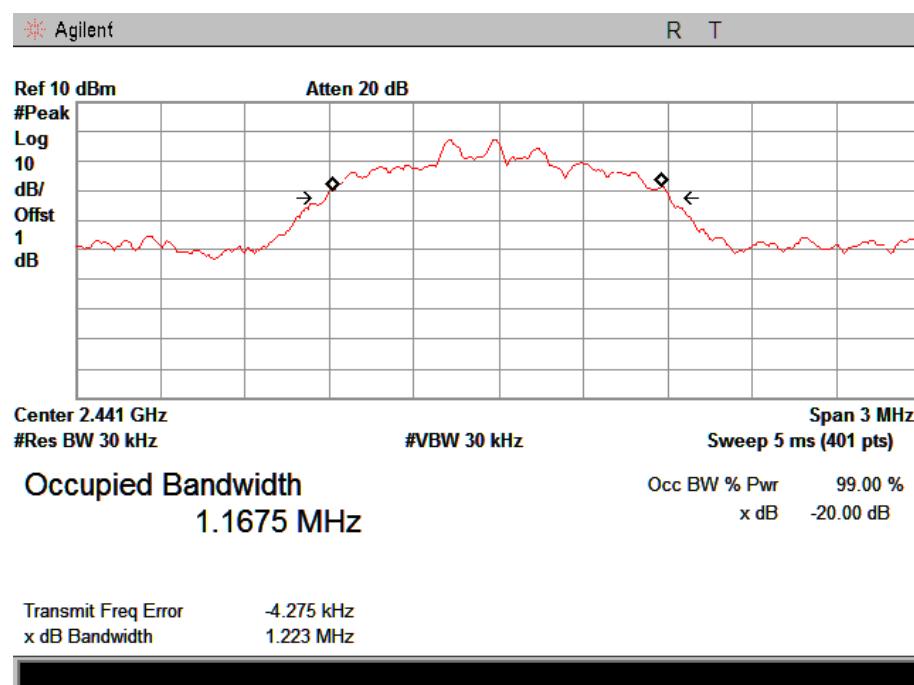
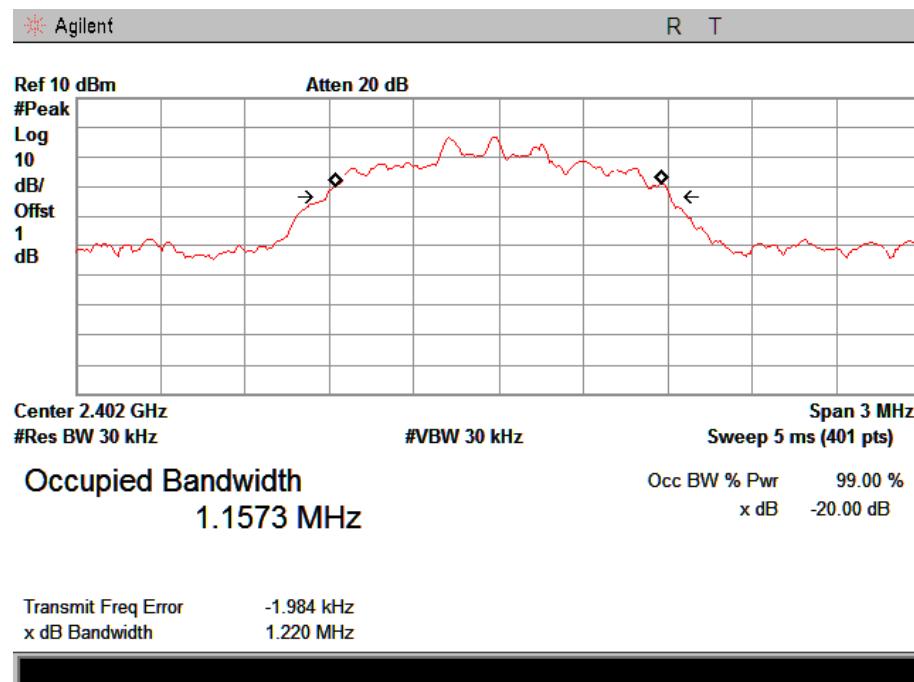


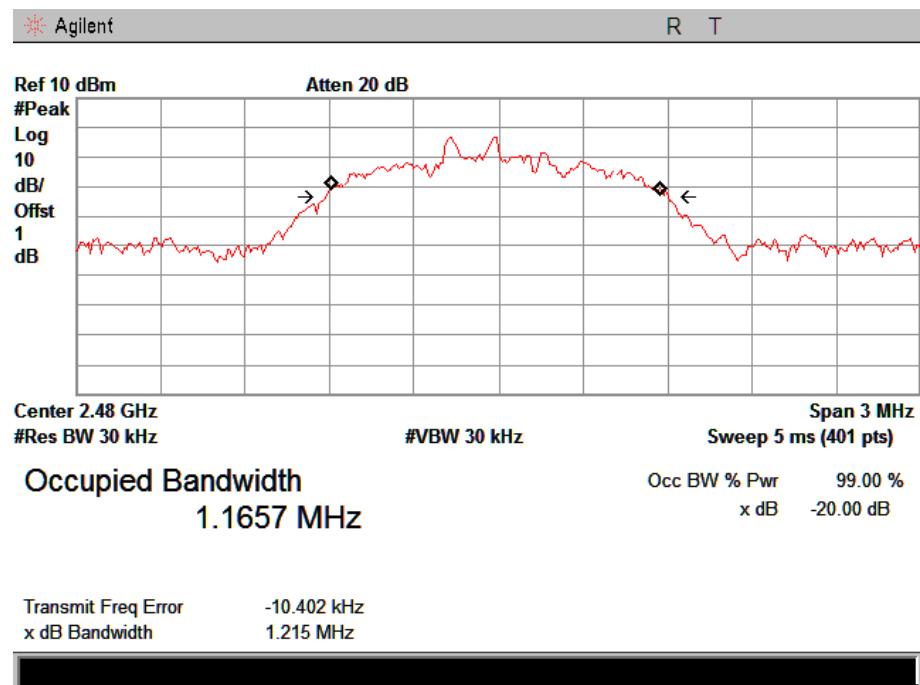
$\pi/4$ DQPSK:





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

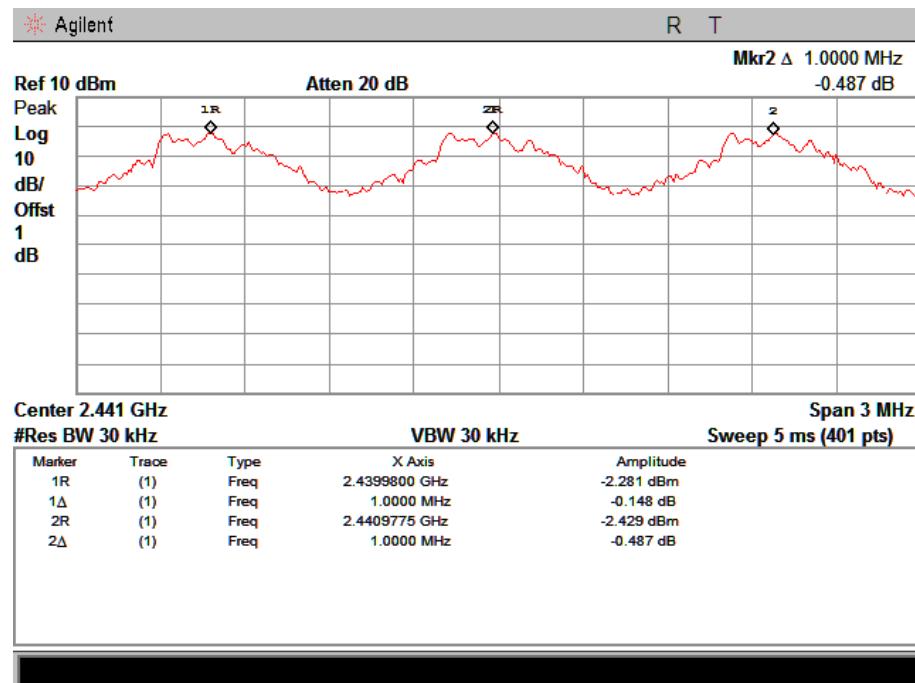
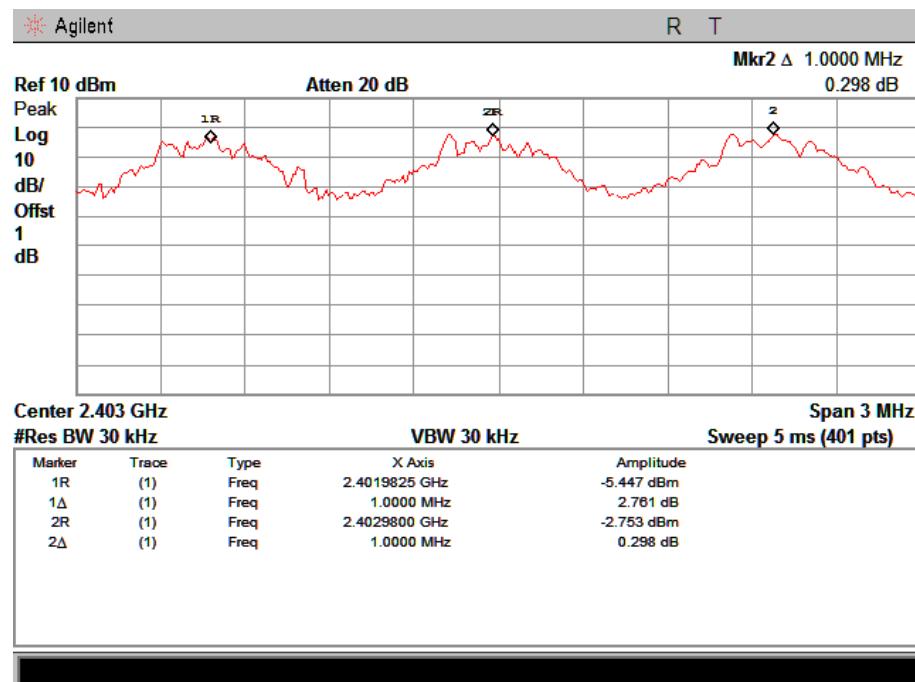
The transmitter output was coupled to a spectrum analyzer via a antenna. The carrier frequency was measured by spectrum analyzer with 30kHz RBW and 30kHz VBW.

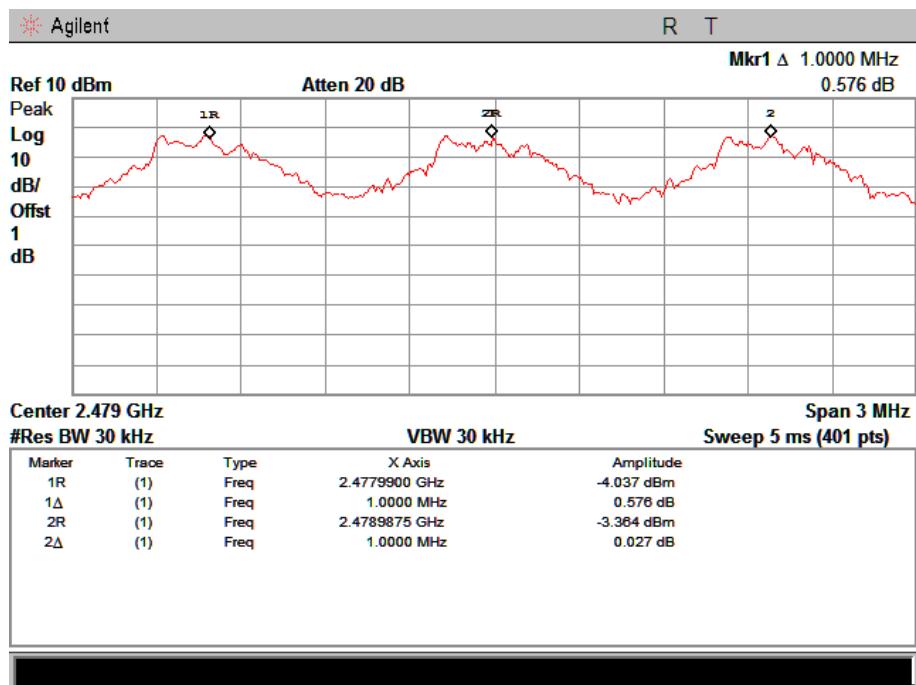
5.3. Test Result

EUT: Bluetooth speaker M/N: MB3(X5)				
Test date: 2014-09-02	Test site: RF site	Tested by: Simple		
Mode/Channel	Channel separation (MHz)	20dB Bandwidth (MHz)	Limit (MHz) 2/3 20dB bandwidth	Conclusion
GFSK/2402	1.0000	0.971	0.647	PASS
GFSK/2441	1.0000	0.955	0.637	PASS
GFSK/2480	1.0000	0.915	0.610	PASS
$\pi/4$ DQPSK /2402	1.0075	1.216	0.811	PASS
$\pi/4$ DQPSK /2441	1.0000	1.223	0.815	PASS
$\pi/4$ DQPSK /2480	1.0000	1.220	0.813	PASS
8- DPSK /2402	1.0150	1.220	0.813	PASS
8- DPSK /2441	1.0000	1.223	0.815	PASS
8- DPSK /2480	1.0000	1.215	0.810	PASS

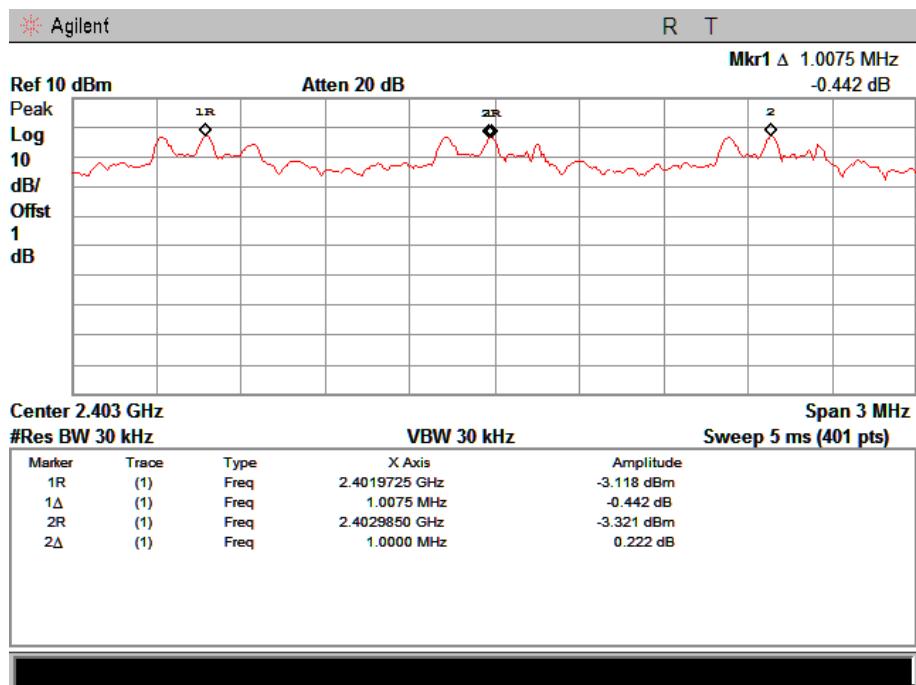
Orginal test data for channel separation

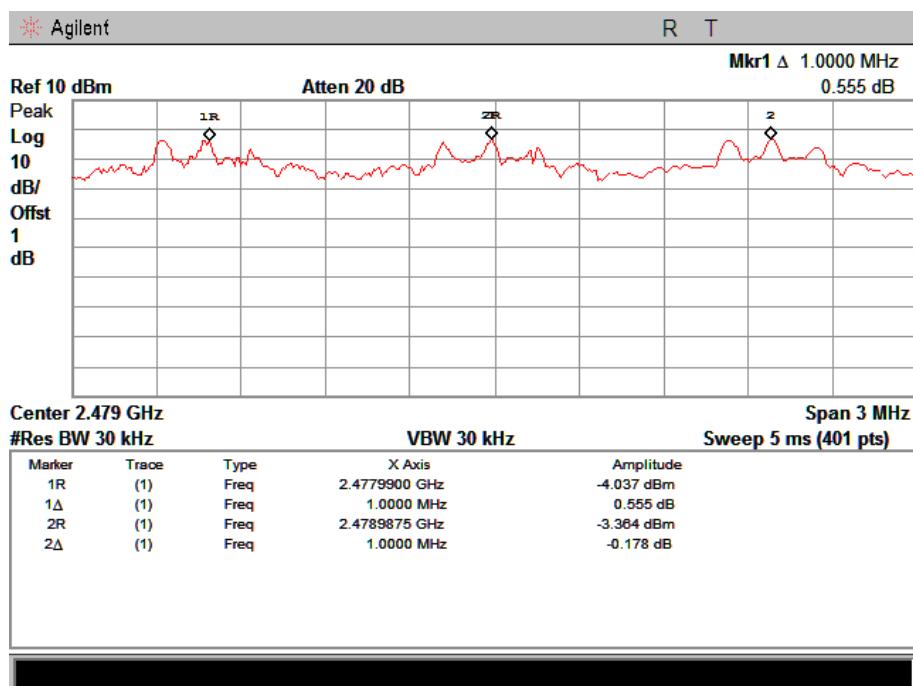
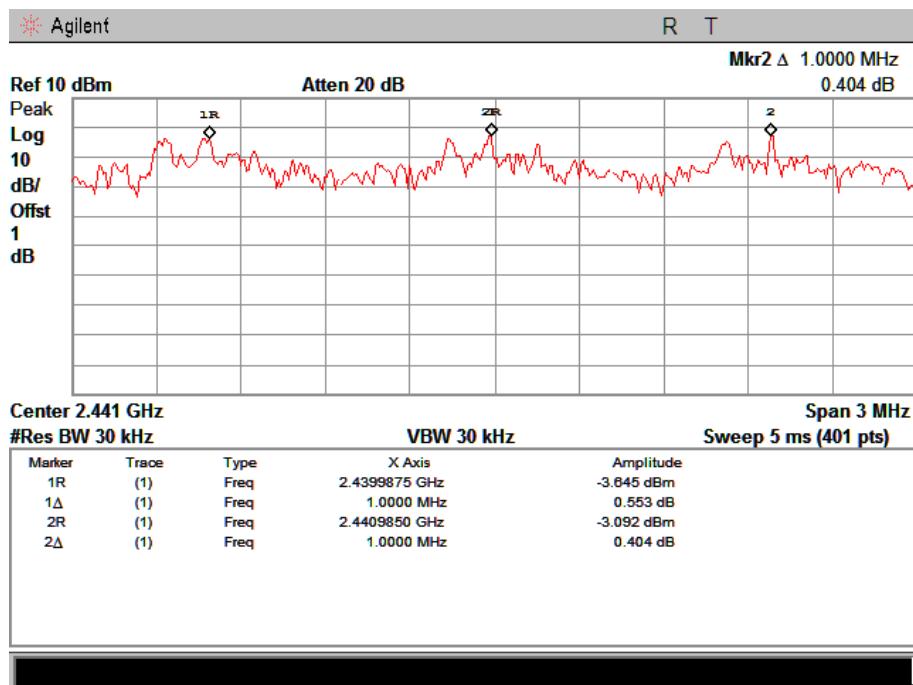
GFSK



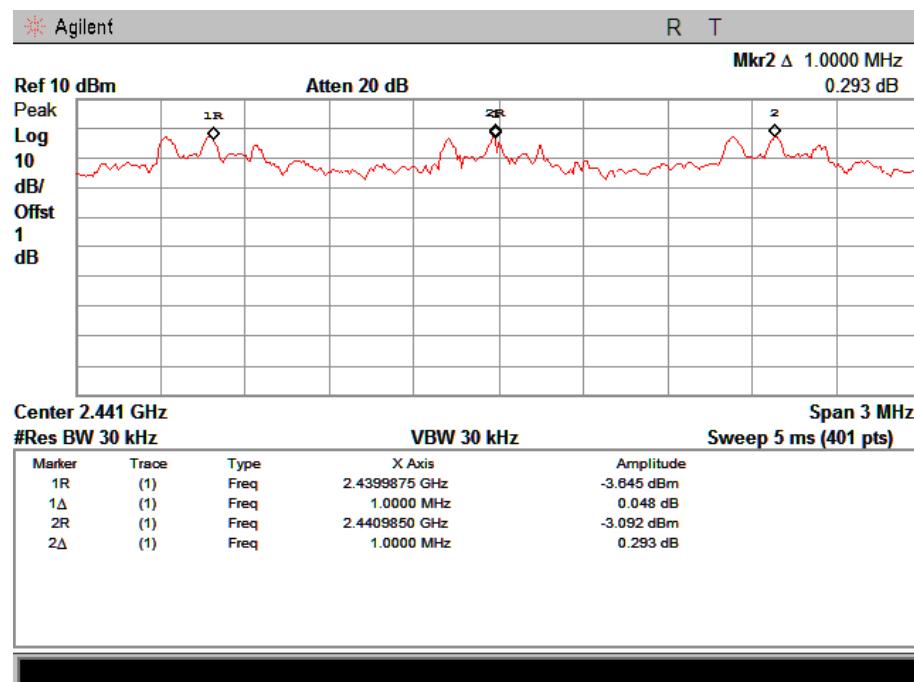
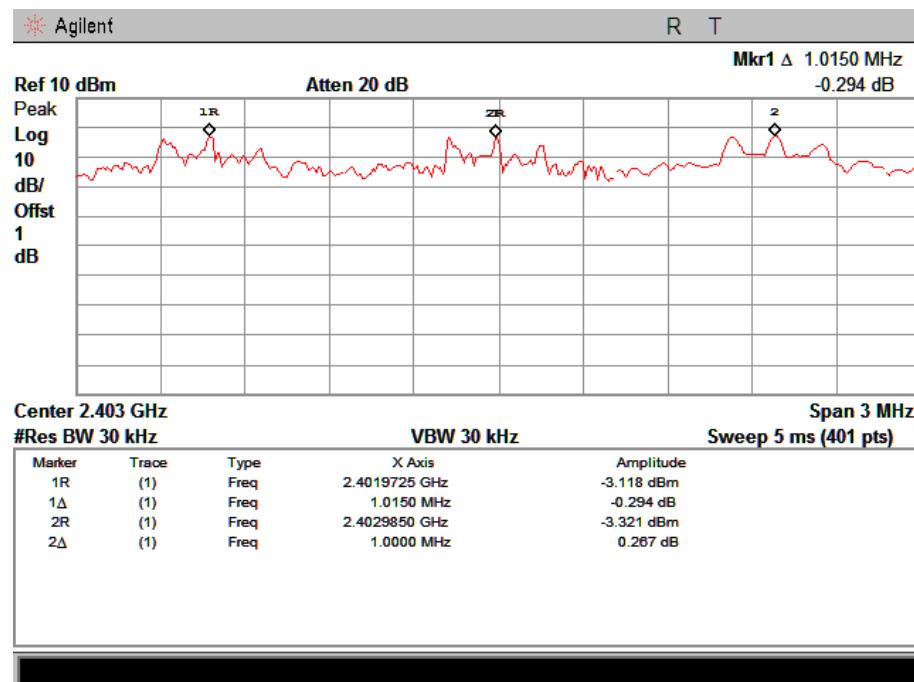


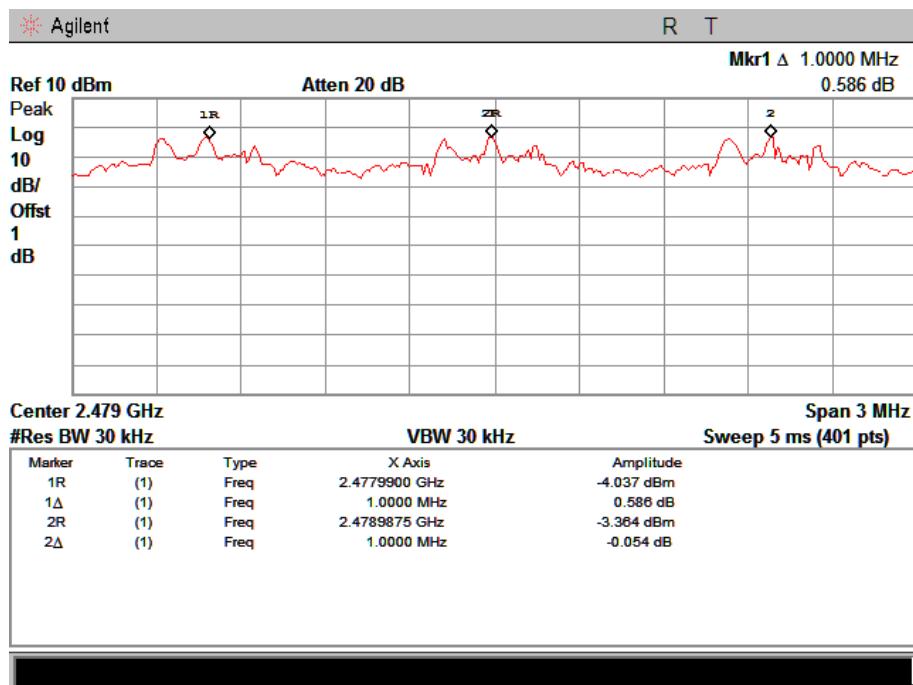
$\pi/4$ DQPSK





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

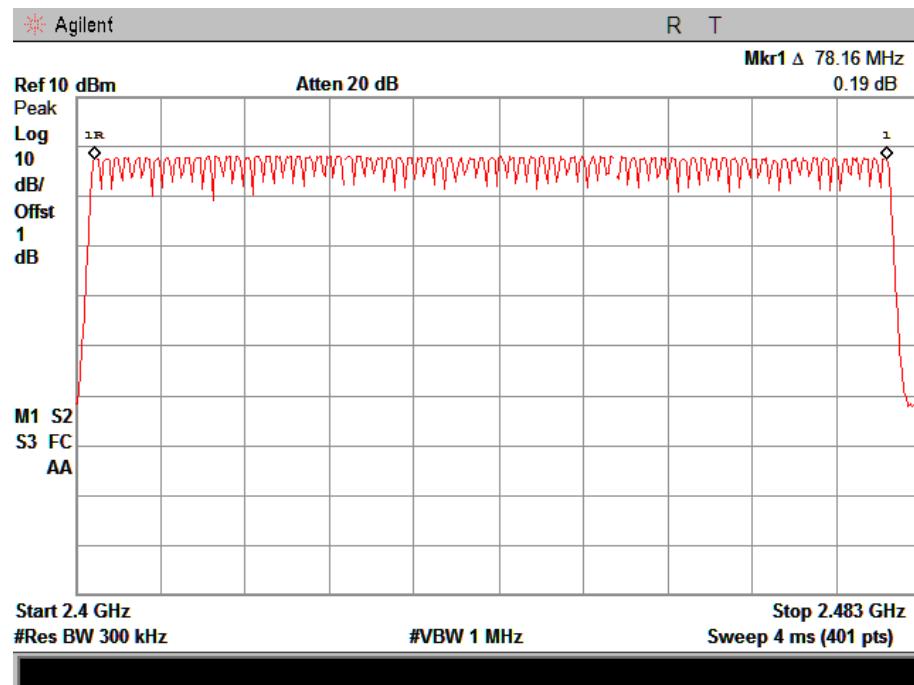
6.2. Test Procedure

The transmitter output was coupled to a spectrum analyzer via a antenna. The number of hopping channel was measured by spectrum analyzer with 300kHz RBW and 1MHz VBW.

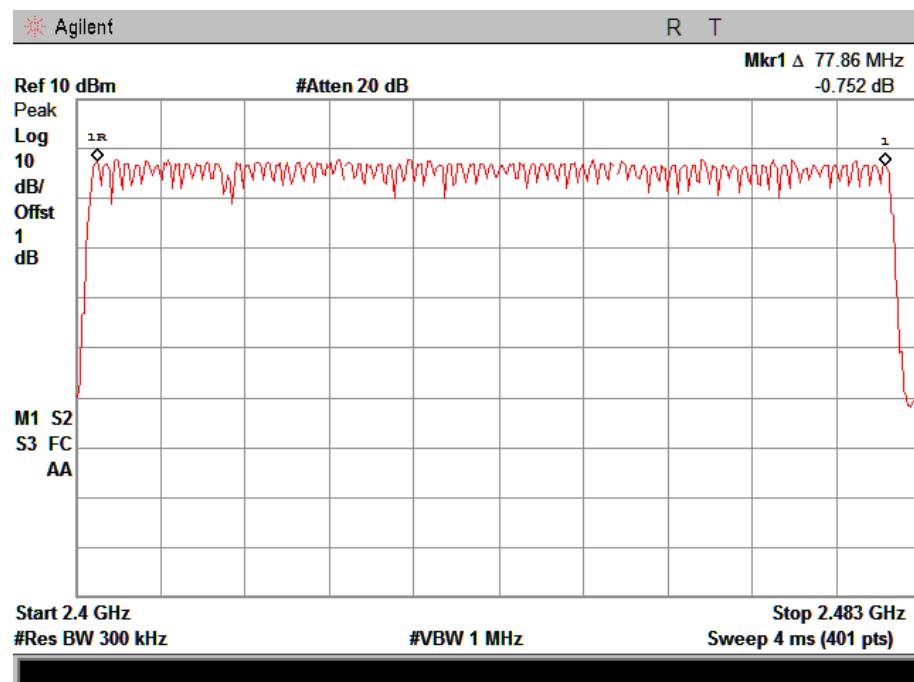
6.3. Test Result

EUT: Bluetooth speaker M/N: MB3(X5)			
Test date: 2014-09-02		Test site: RF site	Tested by: Peter
Mode	Number of hopping channel	Limit	Conclusion
GFSK	79	>15	PASS
$\pi/4$ DQPSK	79	>15	PASS
8- DPSK	79	>15	PASS

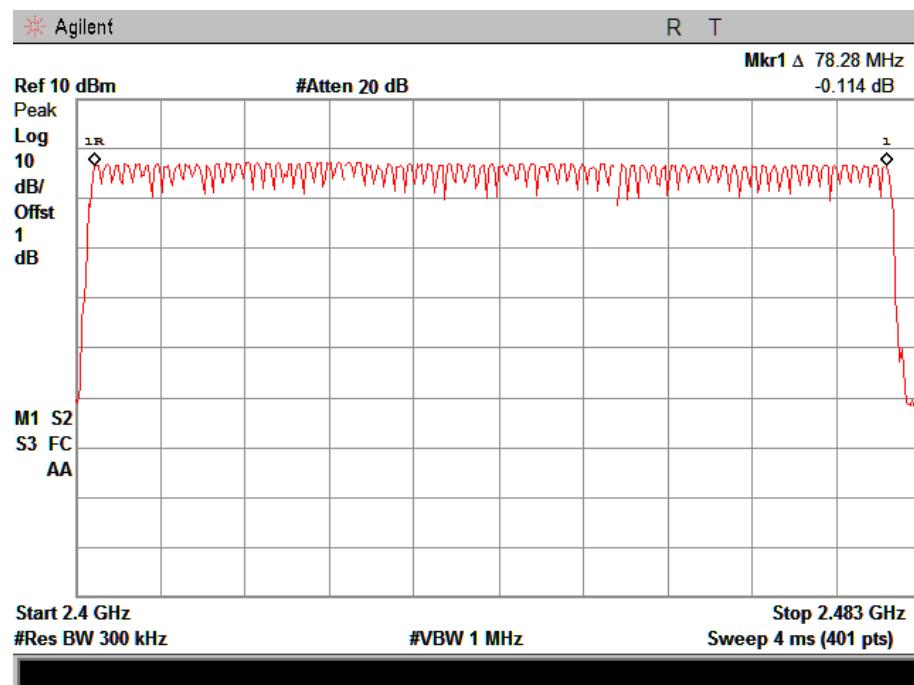
Original test data for hopping channel number
GFSK



$\pi/4$ DQPSK



8- DQPSK



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 greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channel 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 frequency measured were complete.

7.3. Test Results

PASS.

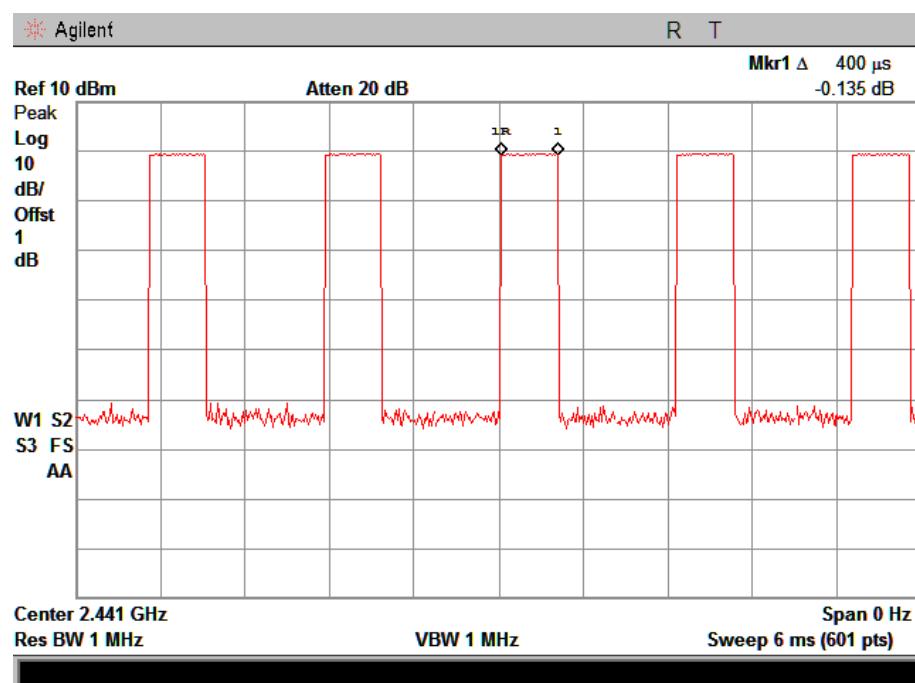
Detailed information please see the following page.

EUT: Bluetooth speaker		M/N: MB3(X5)				
Test date: 2014-09-02		Test site: RF site		Tested by: Peter		
Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Conclusion
GFSK	DH1	2441	0.4	0.256	<0.4	PASS
	DH3	2441	1.64	0.350	<0.4	PASS
	DH5	2441	2.9	0.371	<0.4	PASS
$\pi/4$ DQPSK	DH1	2441	0.41	0.262	<0.4	PASS
	DH3	2441	1.64	0.350	<0.4	PASS
	DH5	2441	2.9	0.371	<0.4	PASS
8-DQPSK	DH1	2441	0.38	0.243	<0.4	PASS
	DH3	2441	1.64	0.350	<0.4	PASS
	DH5	2441	2.89	0.370	<0.4	PASS

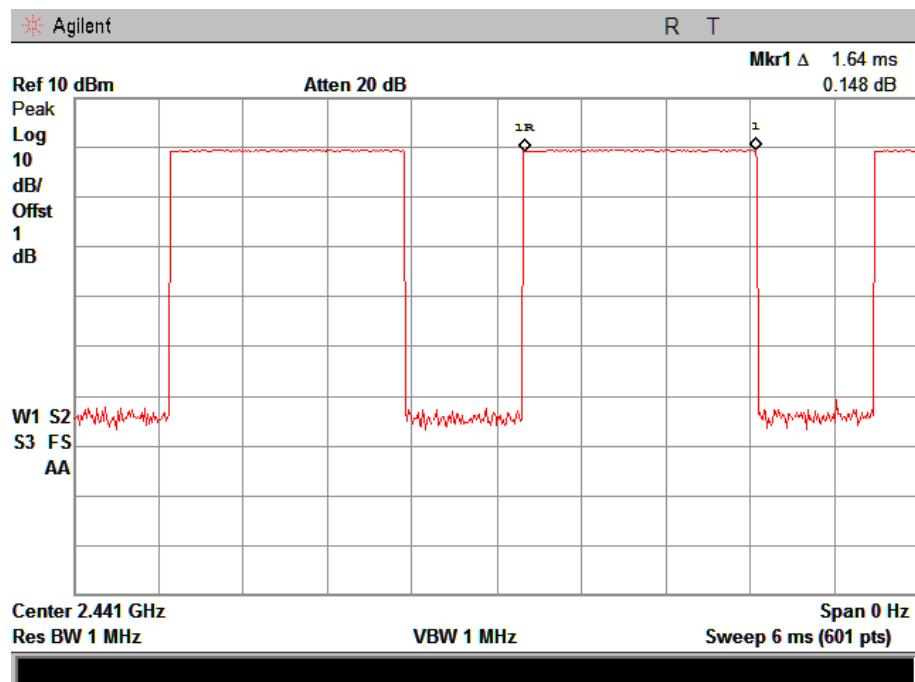
Note: 1 A period time = 0.4 (s) * 79 = 31.6(s)
2 DH1 time slot = Pulse Duration * (1600/(1*79)) * A period time
DH3 time slot = Pulse Duration * (1600/(3*79)) * A period time
DH5 time slot = Pulse Duration * (1600/(5*79)) * A period time

GFSK

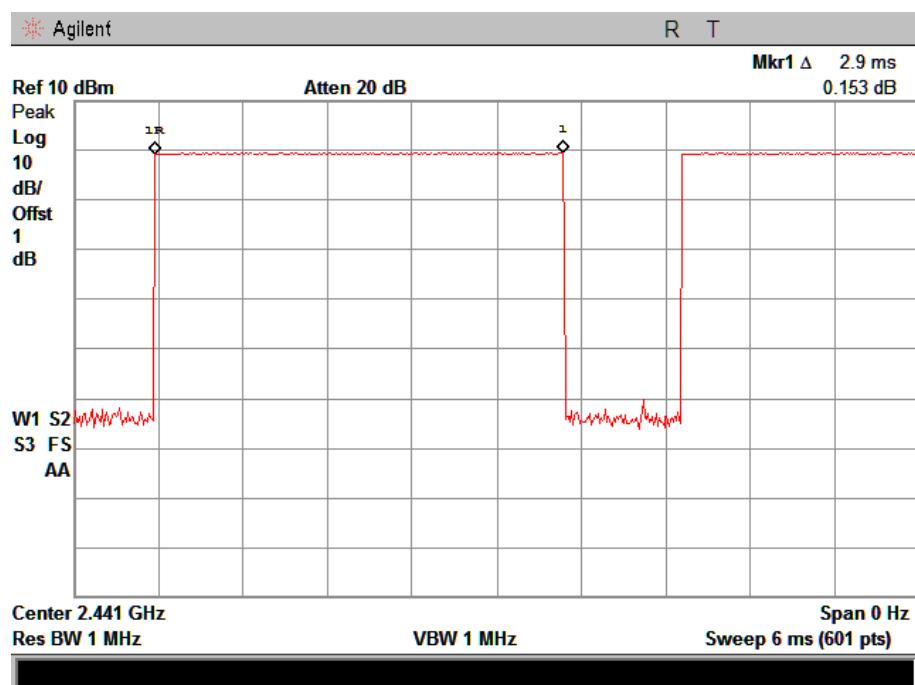
DH1:



DH3:



DH5



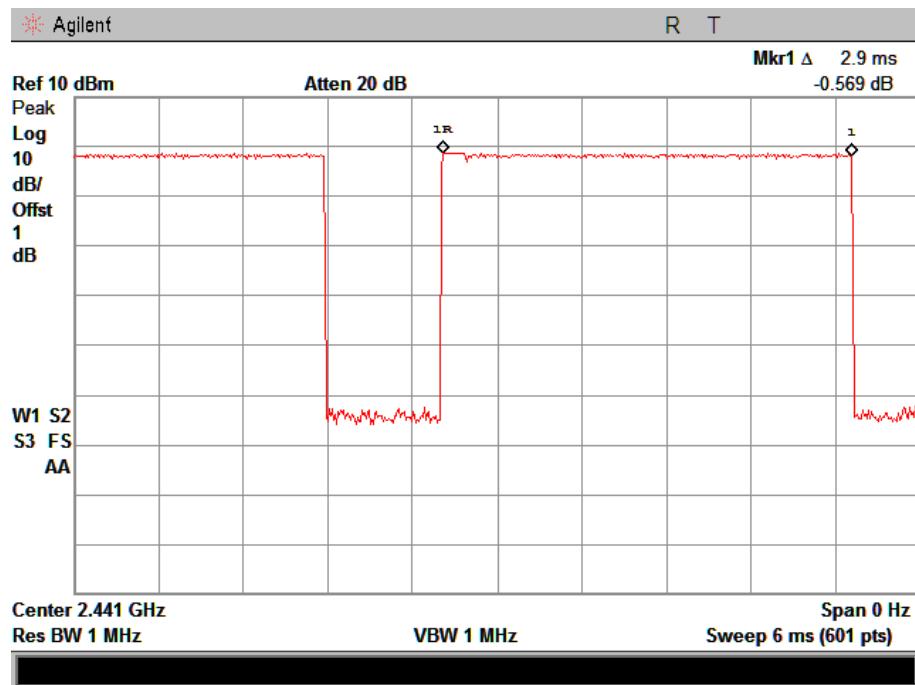
$\pi/4$ DQPSK
DH1



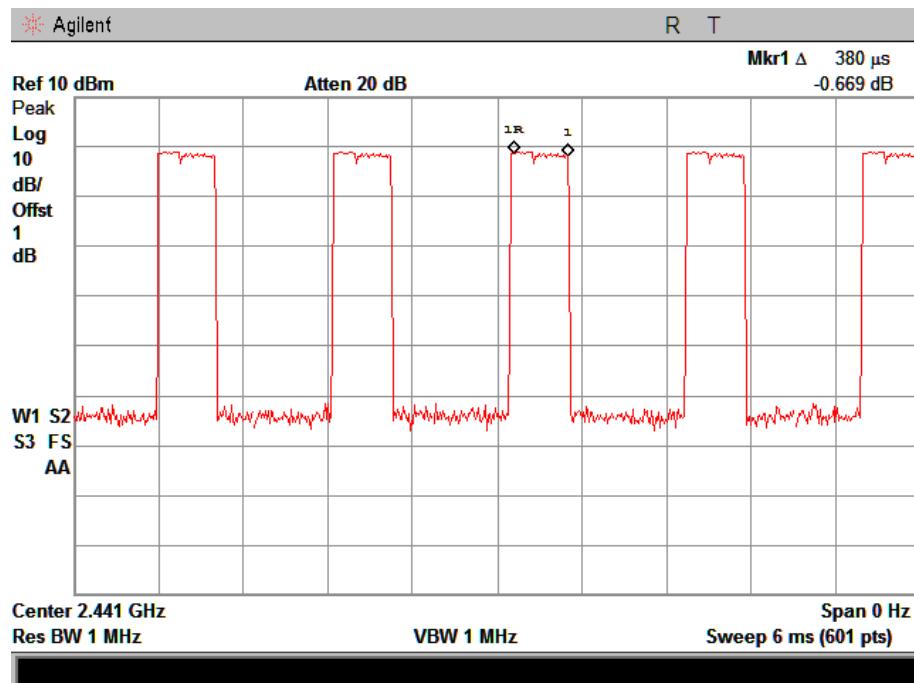
DH3



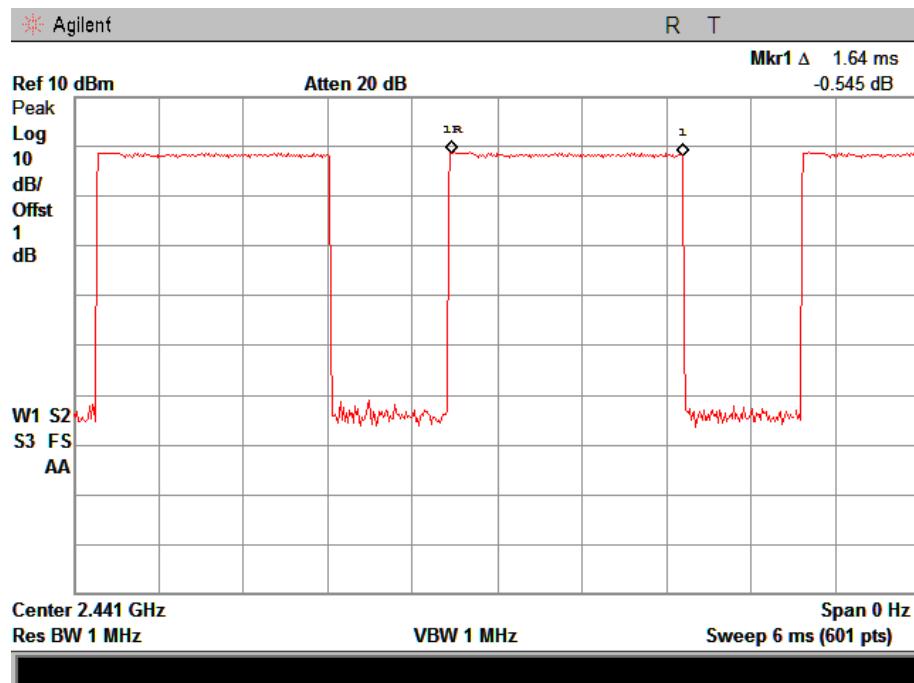
DH5



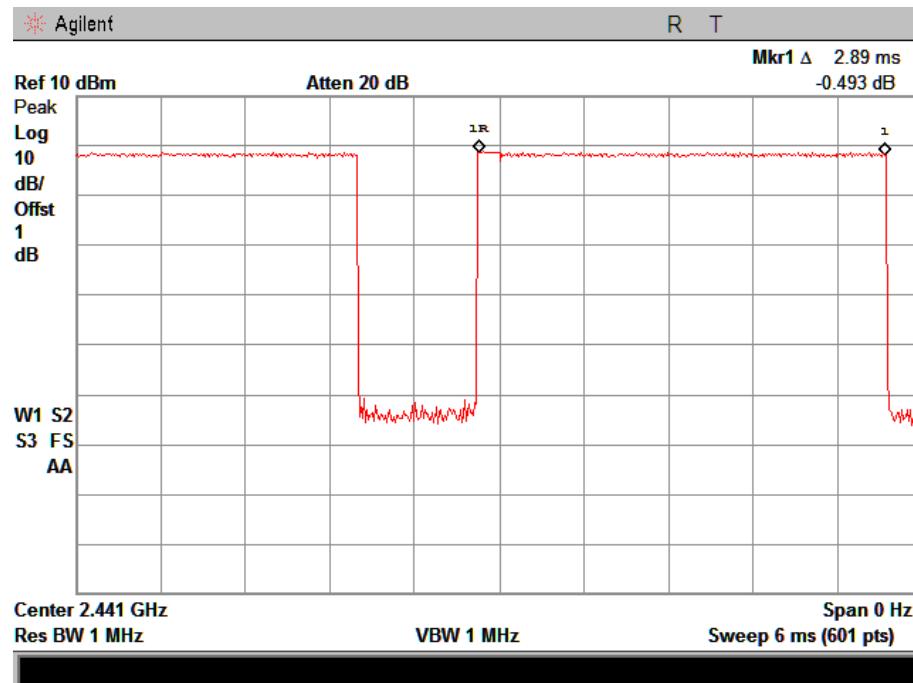
8- DQPSK
DH1



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

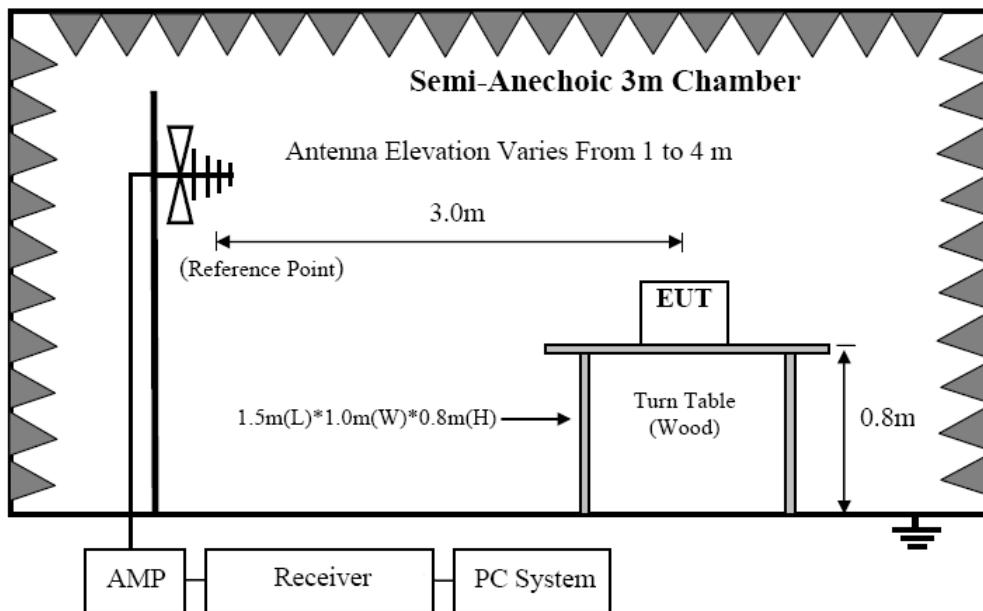
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 -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

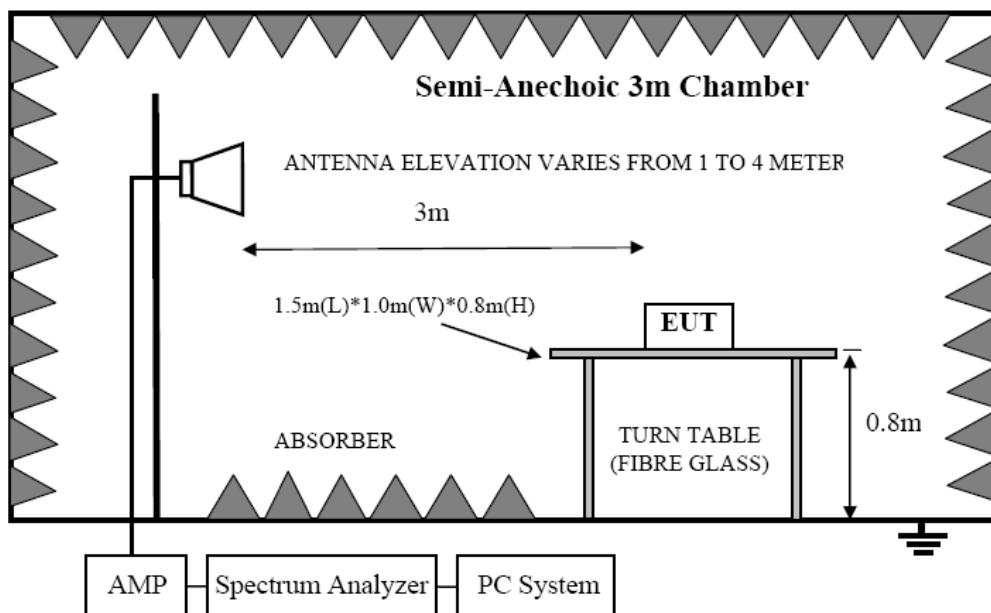
FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		µV/m	dB(µV)/m
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(µV)/m (Peak) 54.0 dB(µV)/m (Average)	

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 2003 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.

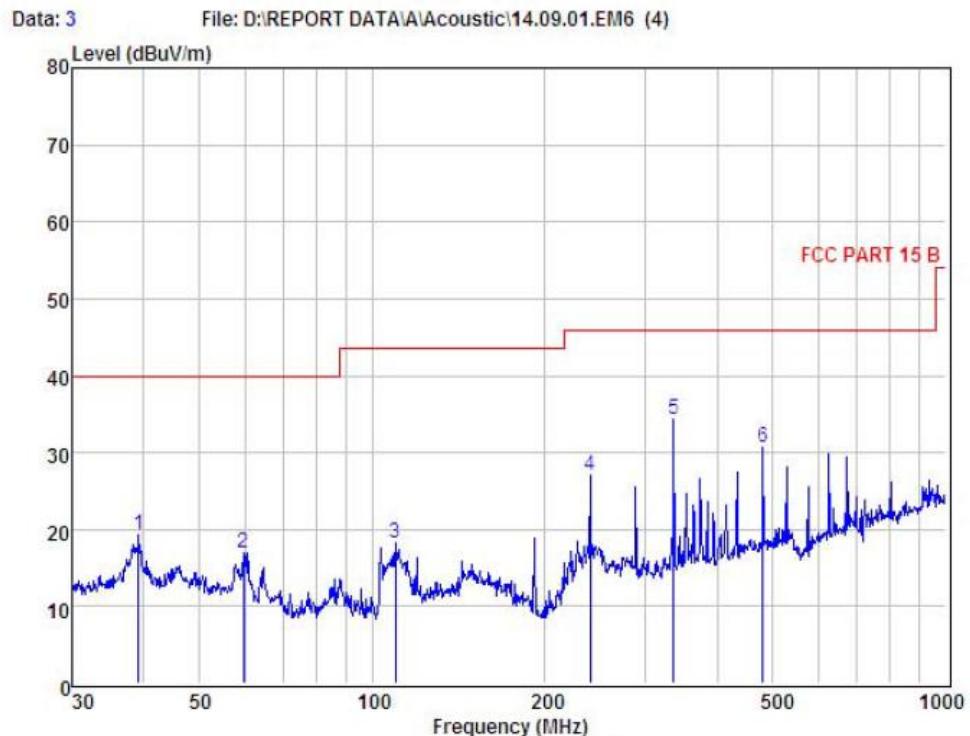
From 9KHz to 30MHz: Conclusion: PASS

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



Shenzhen Certification Technology Service Co., Ltd.
2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com



Condition	:	FCC PART 15 B	3m	POL: HORIZONTAL					
EUT	:	Bluetooth speaker							
Model No	:								
Test Mode	:	TX							
Power	:	DC 5V							
Test Engineer	:	Gemini							
Remark	:								
Temp	:	24.2°C							
Hum	:	54%							
Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	39.16	30.91	14.07	25.81	0.13	19.30	40.00	-20.70	QP
2	59.65	31.89	12.75	27.87	0.24	17.01	40.00	-22.99	QP
3	109.80	33.50	11.13	26.86	0.38	18.15	43.50	-25.35	QP
4	239.99	41.17	11.45	26.07	0.53	27.08	46.00	-18.92	QP
5	336.04	44.19	13.61	24.25	0.78	34.33	46.00	-11.67	QP
6	480.53	38.16	16.28	24.57	0.81	30.68	46.00	-15.32	QP

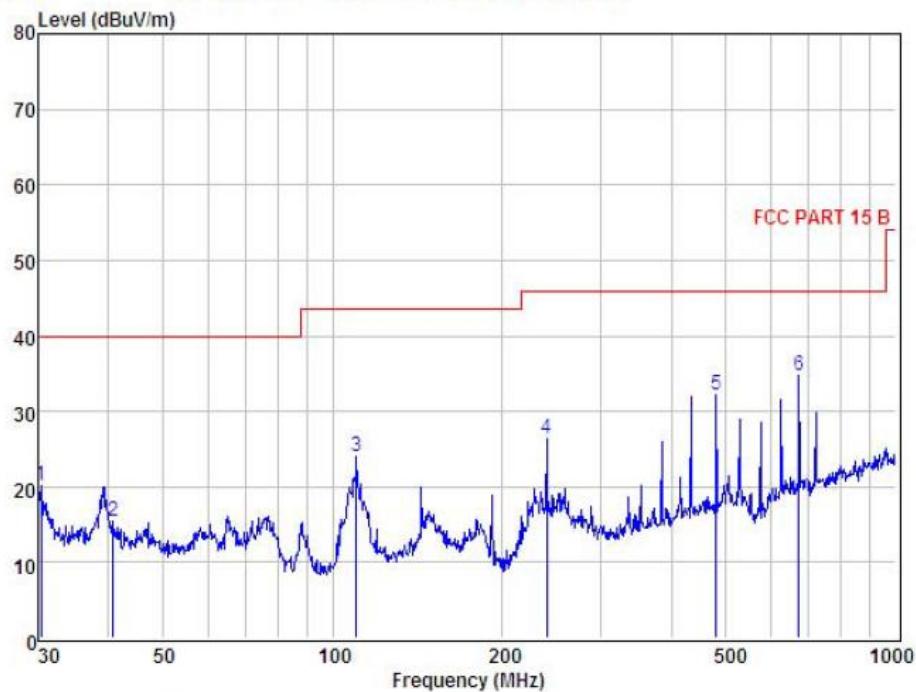
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

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



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2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com

Data: 4 File: D:\REPORT DATA\A\Acoustic\14.09.01.EM6 (4)



Condition : FCC PART 15 B 3m POL: VERTICAL
EUT : Bluetooth speaker
Model No :
Test Mode : TX
Power : DC 5V
Test Engineer : Gemini
Remark :
Temp : 24.2°C
Hum : 54%

Item	Freq	Read	Antenna	Preamp	Cable	Level	Limit	Margin	Remark
		Level	Factor	Factor	Loss				
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	30.32	32.25	13.22	25.43	0.03	20.07	40.00	-19.93	QP
2	40.70	26.94	14.07	25.81	0.18	15.38	40.00	-24.62	QP
3	110.18	39.04	11.32	26.86	0.41	23.91	43.50	-19.59	QP
4	239.99	40.40	11.45	26.07	0.53	26.31	46.00	-19.69	QP
5	480.53	39.61	16.28	24.57	0.81	32.13	46.00	-13.87	QP
6	672.84	39.84	19.38	25.77	1.22	34.67	46.00	-11.33	QP

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: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber Tested by: Peter								
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	45.38	33.95	10.18	34.26	55.25	74	18.75	PK
2	4804	34.68	33.95	10.18	34.26	44.55	54	9.45	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	41.28	33.95	10.18	34.26	51.15	74	22.85	PK
2	4804	34.02	33.95	10.18	34.26	43.89	54	10.11	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 emissison Test result									
EUT: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber					Tested by: Peter			
Test mode: GFSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	42.39	33.93	10.2	34.29	52.23	74	21.77	PK
2	4882	31.19	33.93	10.2	34.29	41.03	54	12.97	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	41.92	33.93	10.2	34.29	51.76	74	22.24	PK
2	4882	33.08	33.93	10.2	34.29	42.92	54	11.08	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: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber					Tested by: Peter			
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	43.46	33.98	10.22	34.25	53.41	74.00	20.59	PK
2	4960	31.82	33.98	10.22	34.25	41.77	54.00	12.23	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	42.89	33.98	10.22	34.25	52.84	74	21.16	PK
2	4960	33.18	33.98	10.22	34.25	43.13	54	10.87	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: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber					Tested by: Peter			
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	33.21	33.95	10.18	34.26	43.08	54	10.92	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	42.28	33.95	10.18	34.26	52.15	74.00	21.85	PK
2	4804	33.56	33.95	10.18	34.26	43.43	54.00	10.57	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 emissison Test result									
EUT: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber Tested by: Peter								
Test mode: π /4 DQPSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	43.05	33.93	10.2	34.29	52.89	74	21.11	PK
2	4882	32.25	33.93	10.2	34.29	42.09	54	11.91	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	42.24	33.93	10.2	34.29	52.08	74	21.92	PK
2	4882	32.85	33.93	10.2	34.29	42.69	54	11.31	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: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber					Tested by: Peter			
Test mode: π /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	43.25	33.98	10.22	34.25	53.2	74	20.8	PK
2	4960	32.06	33.98	10.22	34.25	42.01	54	11.99	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	43.25	33.98	10.22	34.25	53.2	74	20.8	PK
2	4960	32.85	33.98	10.22	34.25	42.8	54	11.2	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.									

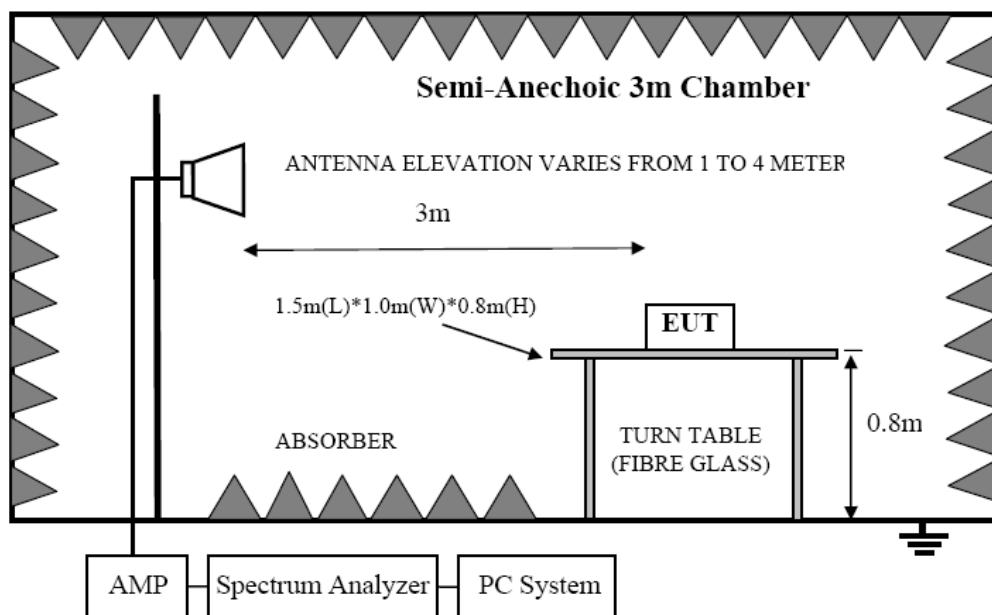
1GHz—25GHz Radiated emission Test result									
EUT: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber					Tested by: Peter			
Test mode: 8- DQPSK Tx CH1 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4804	43.15	33.95	10.18	34.26	53.02	74	20.98	PK
2	4804	32.76	33.95	10.18	34.26	42.63	54	11.37	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	43.15	33.95	10.18	34.26	53.02	74	20.98	PK
2	4804	32.85	33.95	10.18	34.26	42.72	54	11.28	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 emissison Test result									
EUT: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber Tested by: Peter								
Test mode: 8- DQPSK Tx CH40 2441MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4882	42.88	33.93	10.2	34.29	52.72	74	21.28	PK
2	4882	32.19	33.93	10.2	34.29	42.03	54	11.97	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	41.89	33.93	10.20	34.29	51.73	74.00	22.27	PK
2	4882	33.06	33.93	10.20	34.29	42.90	54.00	11.10	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: Bluetooth speaker	M/N: MB3(X5)								
Power: DC 5.0V From battery									
Test date: 2014-09-03	Test site: 3m Chamber					Tested by: Peter			
Test mode: 8- 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	42.77	33.98	10.22	34.25	52.72	74	21.28	PK
2	4960	32.06	33.98	10.22	34.25	42.01	54	11.99	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	42.68	33.98	10.22	34.25	52.63	74	21.37	PK
2	4960	32.63	33.98	10.22	34.25	42.58	54	11.42	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.									

9. Band Edge Compliance

9.1. Block Diagram of Test Setup



9.2. Limit

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz and 5725MHz to 5850MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

9.3. Test Procedure

Same with clause 6.3 except change investigated frequency range from 2310MHz to 2415MHz, 2475MHz to 2500MHz.

9.4. Test Result

NOTE : The Band Edge is showed the maximum power data of all mode(GFSK, $\Pi/4$ DQPSK, 8-DPSK)

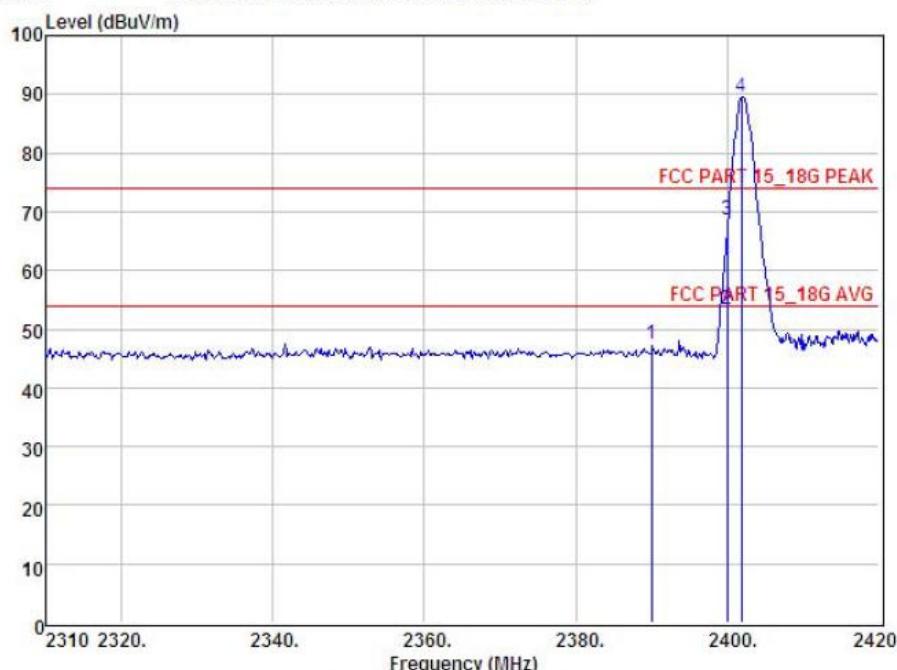
PASS. (See below detailed test data)

GFSK
CH LOW :



Shenzhen Certification Technology Service Co., Ltd.
2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com

Data: 1 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No :
Test Mode : GFSK-TX 2402
Power :
Test Engineer :
Remark :
Temp : 24.2°C
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	50.96	27.62	34.97	3.92	47.53	74.00	-26.47	Peak
2	2400.00	56.70	27.62	34.97	3.94	53.29	54.00	-0.71	Average
3	2400.00	72.05	27.62	34.97	3.94	68.64	74.00	-5.36	Peak
4	2401.85	92.86	27.62	34.97	3.94	89.45	74.00	15.45	Peak

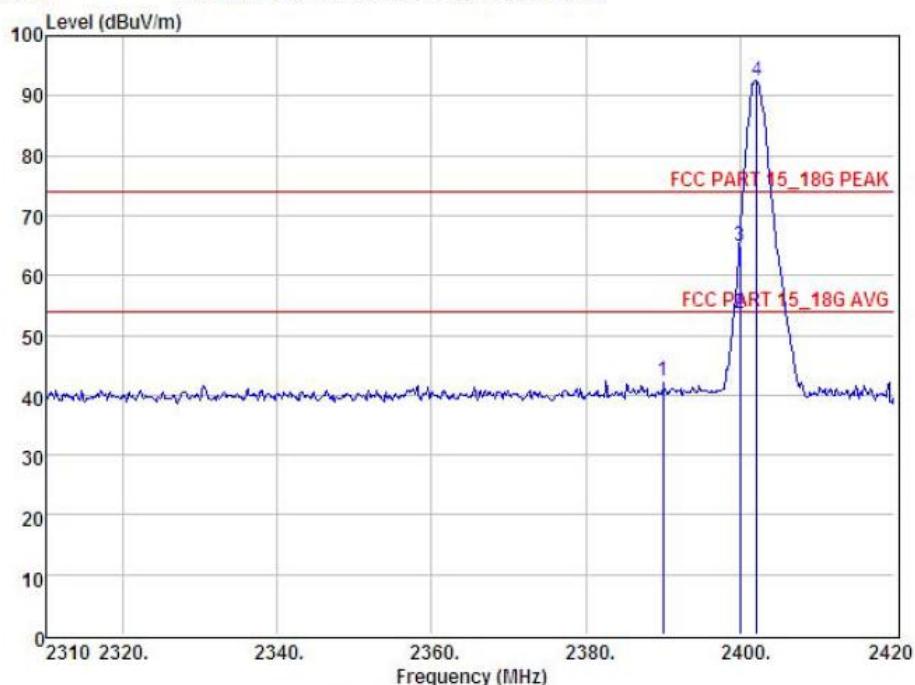
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



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Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com

Data: 2

File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : GFSK-TX 2402

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	45.69	27.62	34.97	3.92	42.26	74.00	-31.74	Peak
2	2400.00	57.00	27.62	34.97	3.94	53.59	54.00	-0.41	Average
3	2400.00	68.20	27.62	34.97	3.94	64.79	74.00	-9.21	Peak
4	2402.18	95.80	27.62	34.97	3.94	92.39	74.00	18.39	Peak

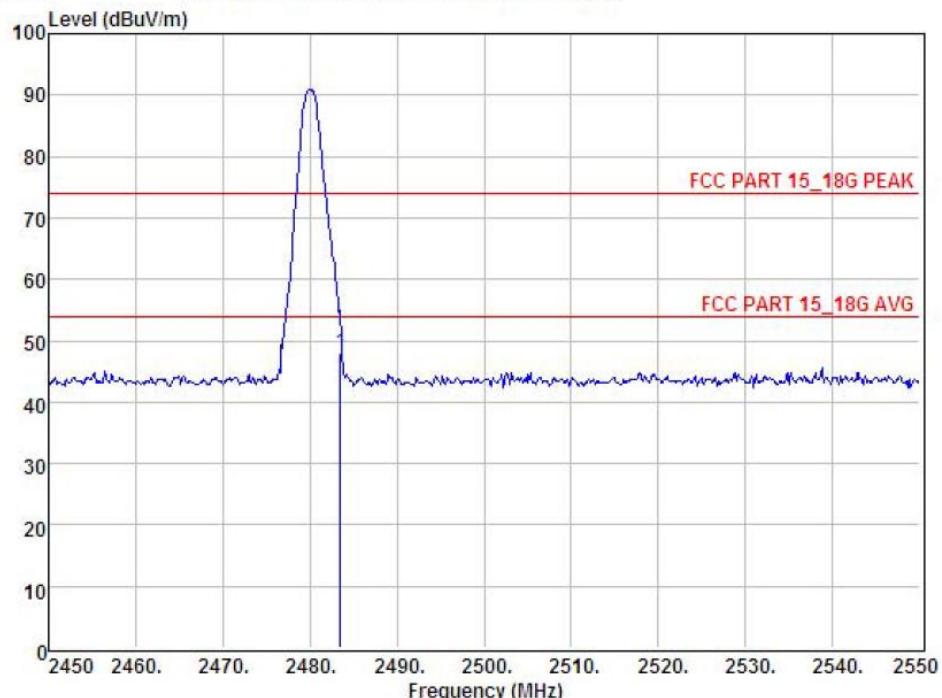
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

CH High :



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Website: <http://www.cessz.com> Email: Service@cessz.com

Data: 4 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

EUT :

Model No :

Test Mode : GFSK-TX 2480

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

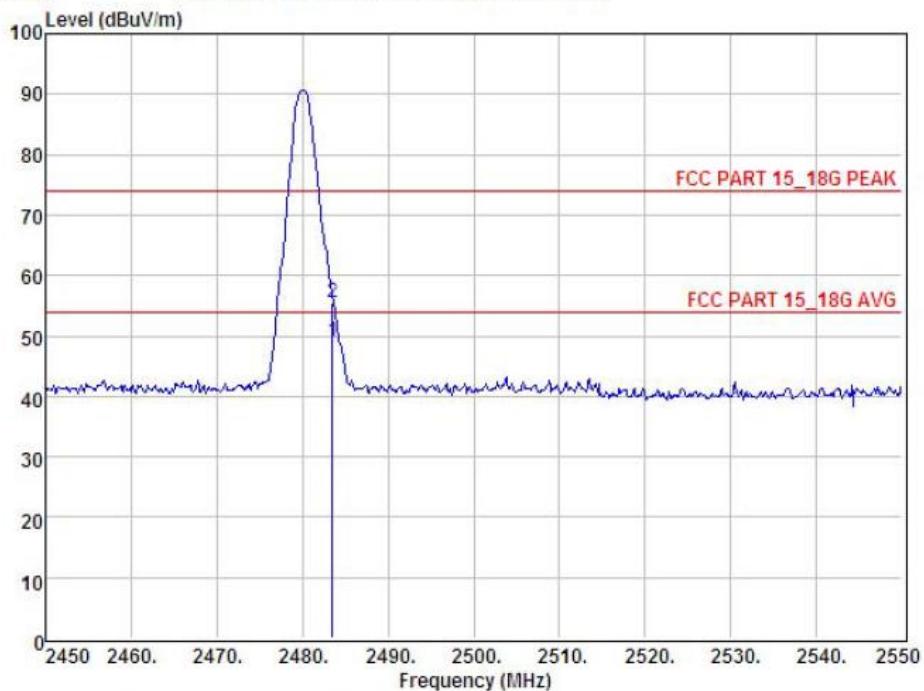
Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	51.29	27.59	34.97	4.00	47.91	74.00	-26.09	Peak

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



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Tel: 4006786199 FAX: +86-755-26736857
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Data: 3 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : GFSK-TX 2480

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	52.35	27.59	34.97	4.00	48.97	54.00	-5.03	Average
2	2483.50	58.98	27.59	34.97	4.00	55.60	74.00	-18.40	Peak

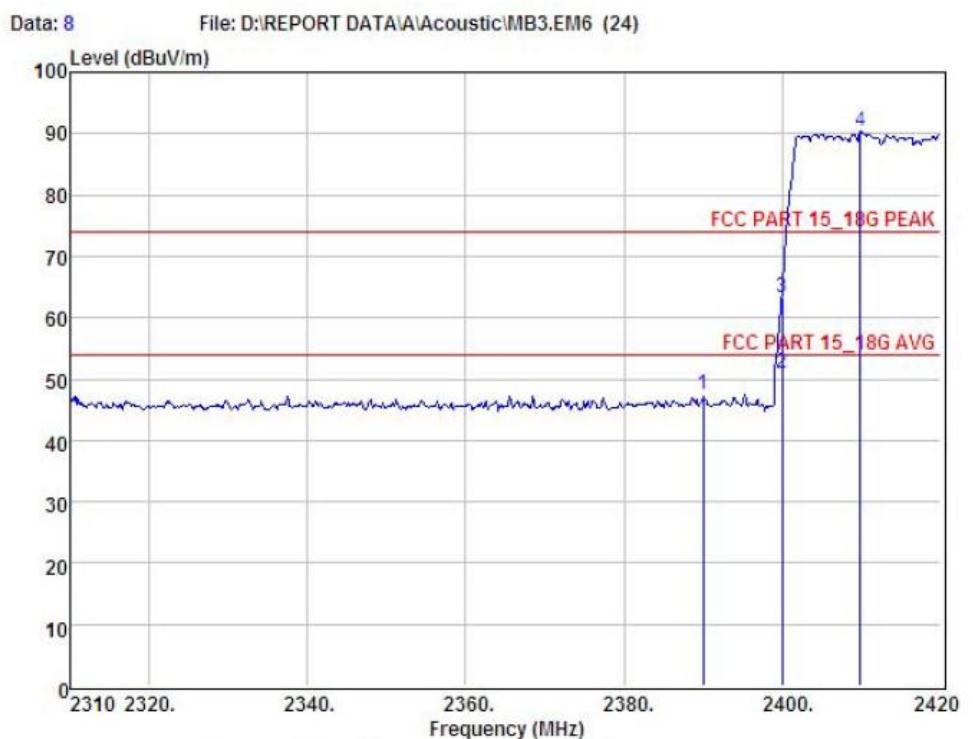
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

Hopping

Low



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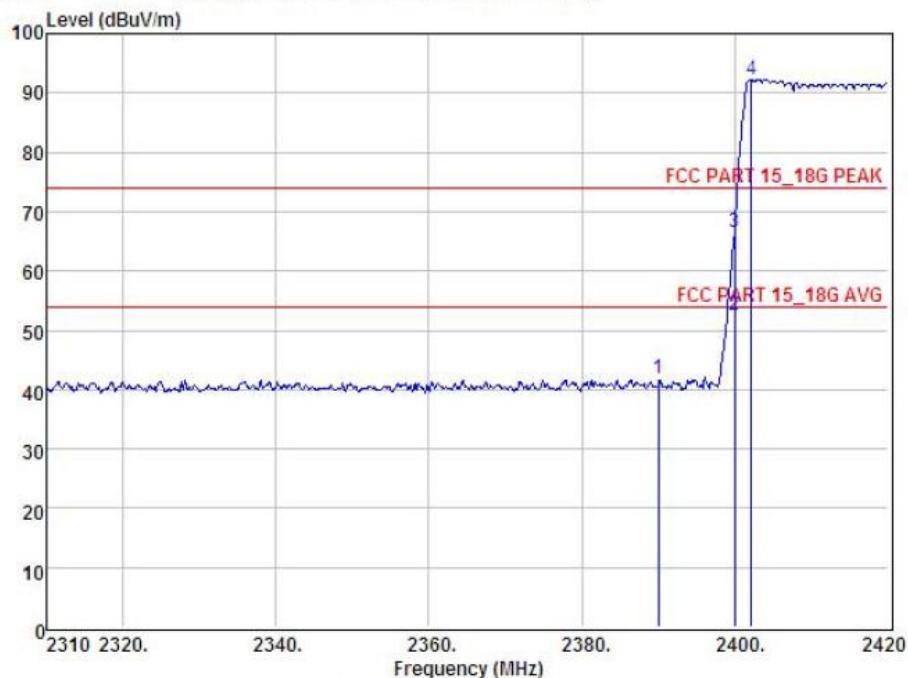
Condition	:	FCC PART 15_18G PEAK 3m	POL:	HORIZONTAL					
EUT	:								
Model No	:								
Test Mode	:	GFSK-IX Hopping							
Power	:								
Test Engineer	:								
Remark	:								
Temp	:	24.2°C							
Hum	:	54%							
Item	Freq	Read Level	Antenna Factor	Preamplifier Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	51.01	27.62	34.97	3.92	47.58	74.00	-26.42	Peak
2	2400.00	54.36	27.62	34.97	3.94	50.95	54.00	-3.05	Average
3	2400.00	66.57	27.62	34.97	3.94	63.16	74.00	-10.84	Peak
4	2409.88	93.71	27.61	34.97	3.94	90.29	74.00	16.29	Peak

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



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2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com

Data: 7 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : GFSK-TX Hopping

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

Item	Freq	Read	Antenna	Preampl	Cable	Level	Limit	Margin	Remark
		Level	Factor	Factor	Cable Loss	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	dB				
1	2390.00	45.14	27.62	34.97	3.92	41.71	74.00	-32.29	Peak
2	2400.00	56.00	27.62	34.97	3.94	52.59	54.00	-1.41	Average
3	2400.00	70.00	27.62	34.97	3.94	66.59	74.00	-7.41	Peak
4	2402.18	95.74	27.62	34.97	3.94	92.33	74.00	18.33	Peak

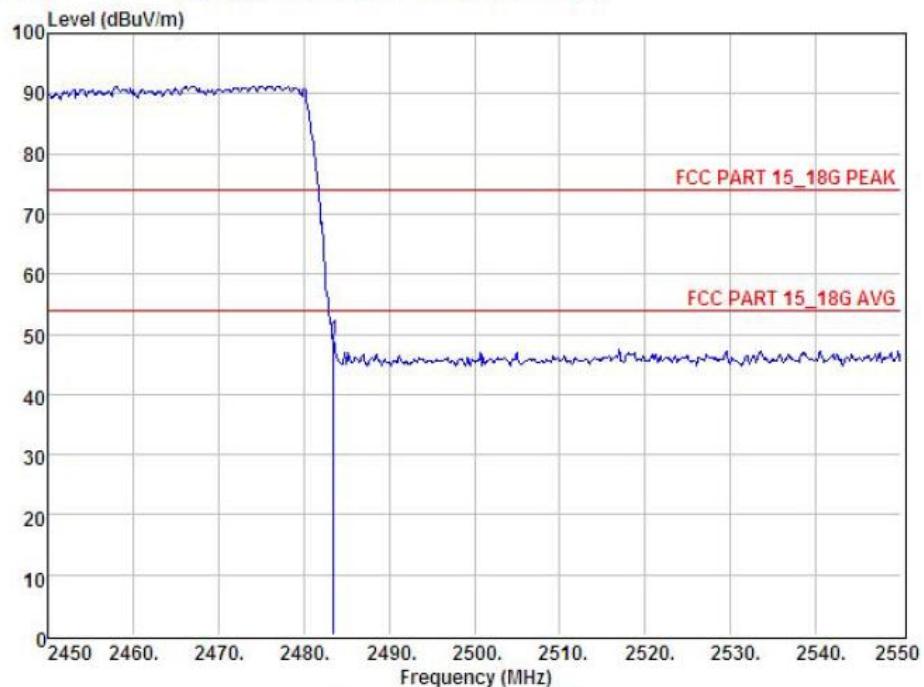
Remark: Level = Read Level + Antenna Factor - Preampl Factor + Cable Loss

High



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Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com

Data: 6 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

EUT :

Model No :

Test Mode : GFSK-TX Hopping

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

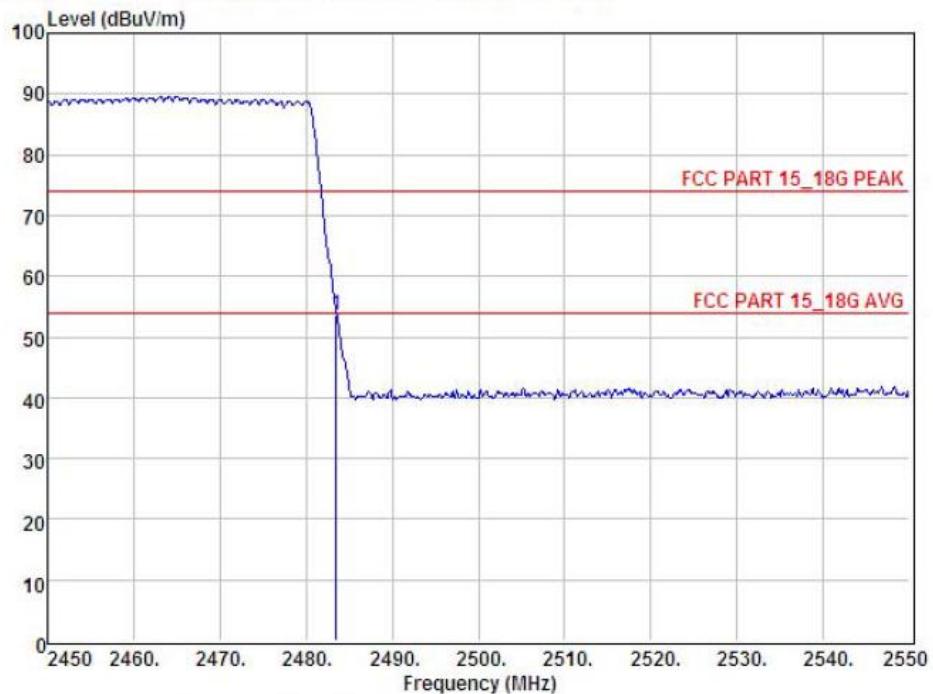
Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	52.42	27.59	34.97	4.00	49.04	74.00	-24.96	Peak

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



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Tel: 4006786199 FAX: +86-755-26736857
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Data: 5 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : GFSK-TX Hopping

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	57.09	27.59	34.97	4.00	53.71	74.00	-20.29	Peak

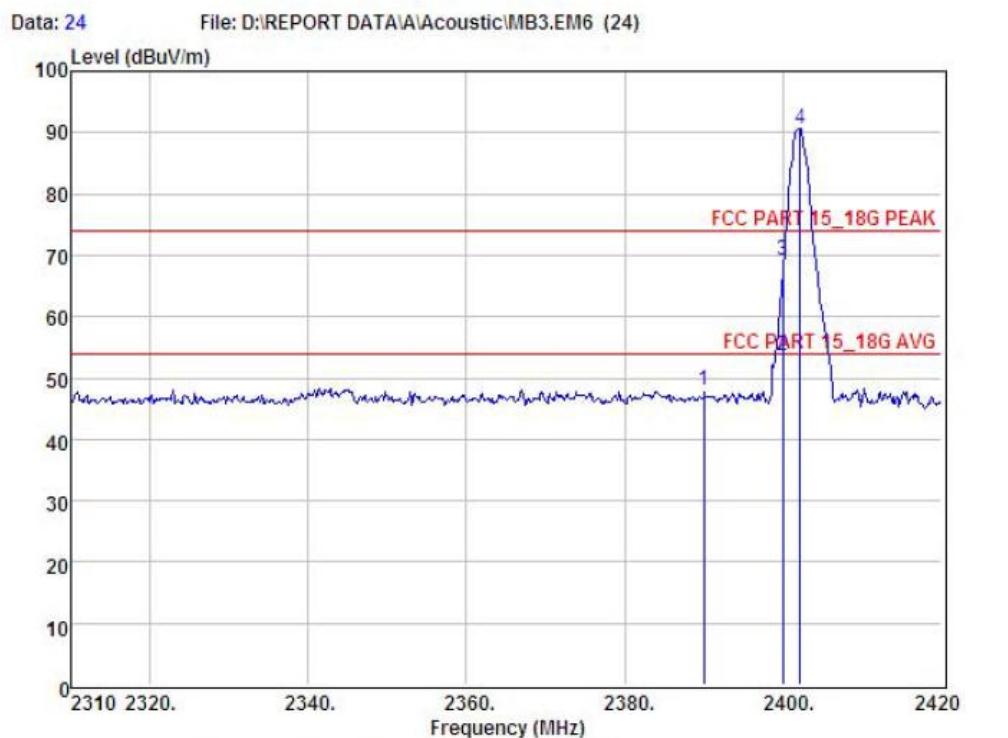
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

$\pi/4$ DQPSK

Low



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Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
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Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

EUT :

Model No :

Test Mode : $\pi/4$ DQPSK-2402

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	51.35	27.62	34.97	3.92	47.92	74.00	-26.08	Peak
2	2400.00	57.15	27.62	34.97	3.94	53.74	54.00	-0.26	Average
3	2400.00	72.48	27.62	34.97	3.94	69.07	74.00	-4.93	Peak
4	2402.18	94.05	27.62	34.97	3.94	90.64	74.00	16.64	Peak

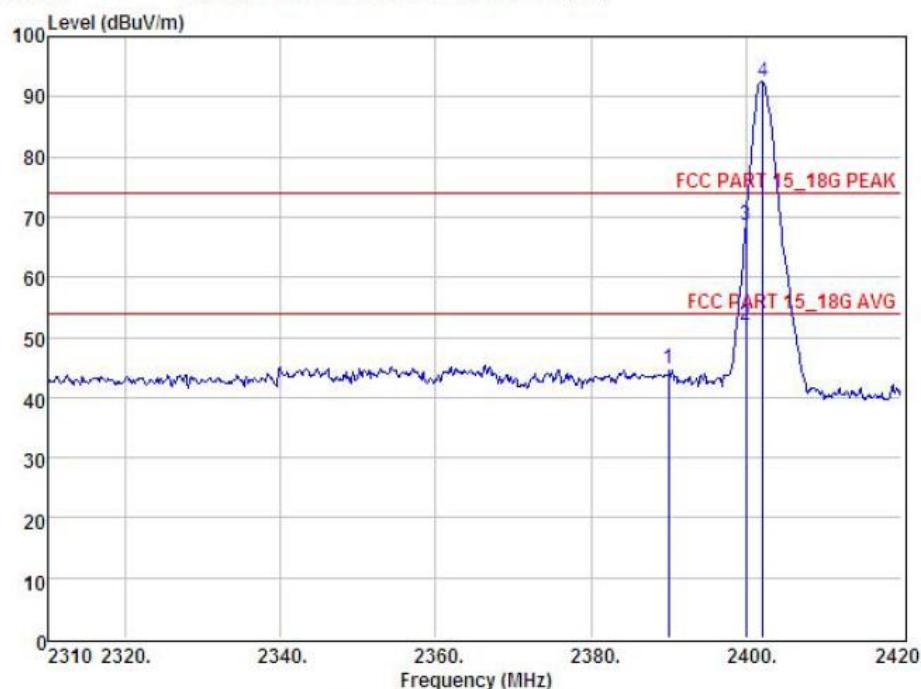
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



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Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
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Data: 23

File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : pi/4 DQPSK-2402

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	48.11	27.62	34.97	3.92	44.68	74.00	-29.32	Peak
2	2400.00	55.40	27.62	34.97	3.94	51.99	54.00	-2.01	Average
3	2400.00	71.94	27.62	34.97	3.94	68.53	74.00	-5.47	Peak
4	2402.18	95.83	27.62	34.97	3.94	92.42	74.00	18.42	Peak

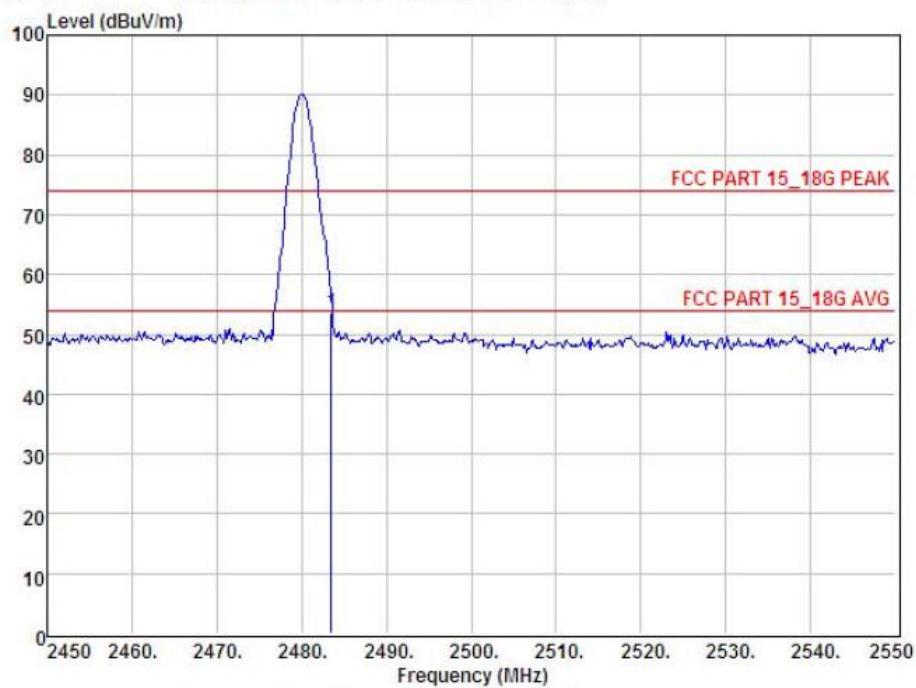
Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

High



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Tel: 4006786199 FAX: +86-755-26736857
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Data: 22 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

EUT :

Model No :

Test Mode : pi/4 DQPSK-2480

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

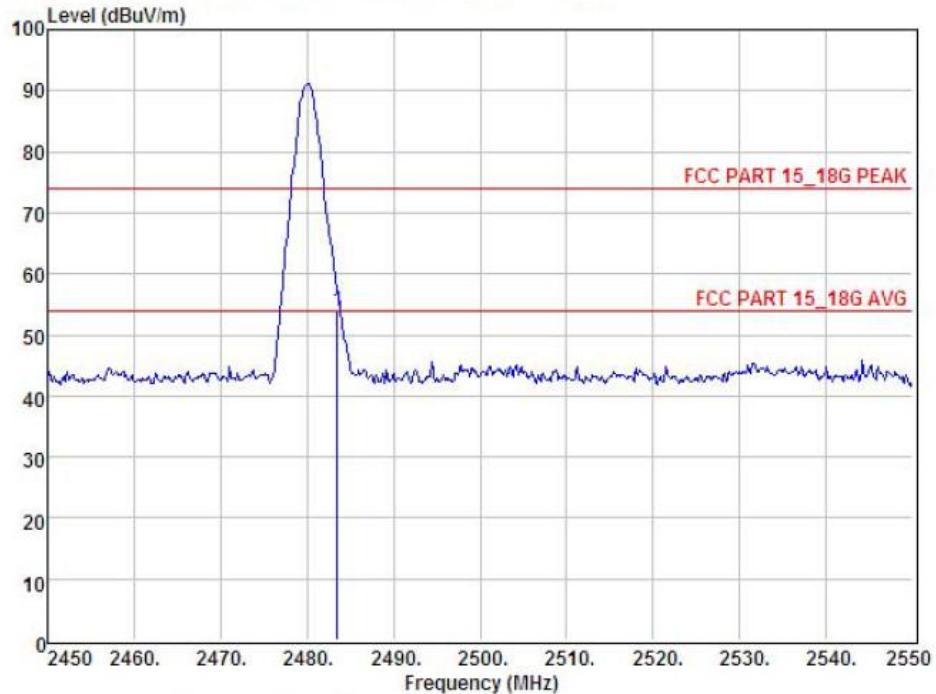
Item	Freq	Read Level	Antenna Factor	Preampl Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	57.12	27.59	34.97	4.00	53.74	74.00	-20.26	Peak

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



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Tel: 4006786199 FAX: +86-755-26736857
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Data: 21 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : pi/4 DQPSK-2480

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

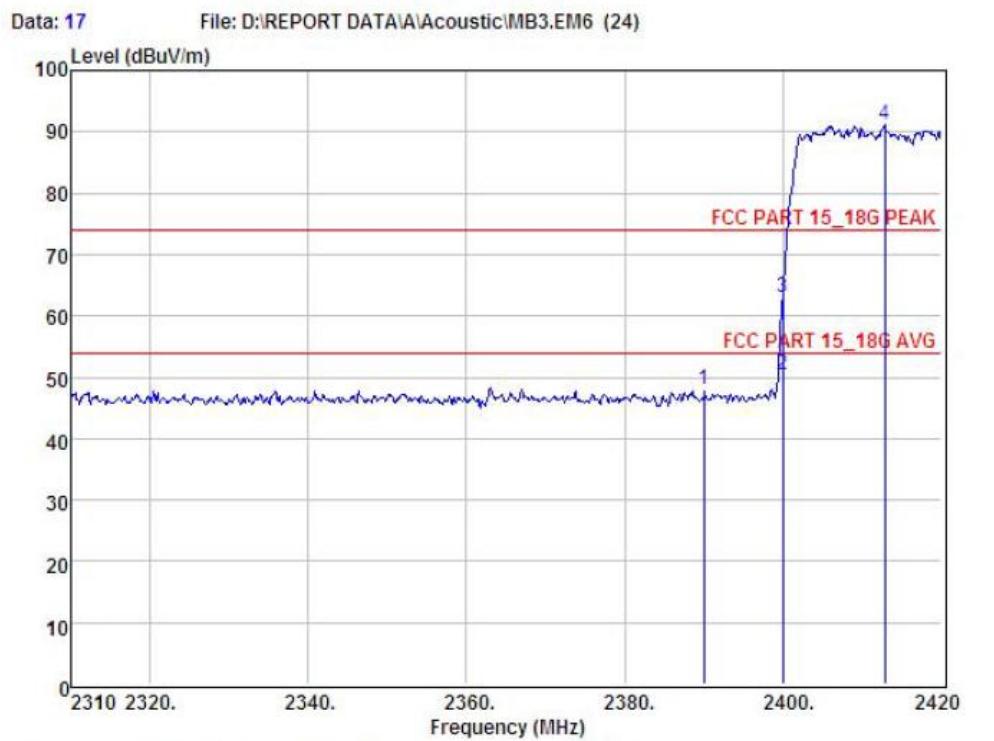
Item	Freq	Read Level	Antenna Factor	Preamplifier Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	57.36	27.59	34.97	4.00	53.98	74.00	-20.02	Peak

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

Hopping
Low



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2F, Building B, East Area of Nanchang Second Industrial Zone,
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Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

EUT :

Model No :

Test Mode : pi/4 DQPSK-TX Hopping

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

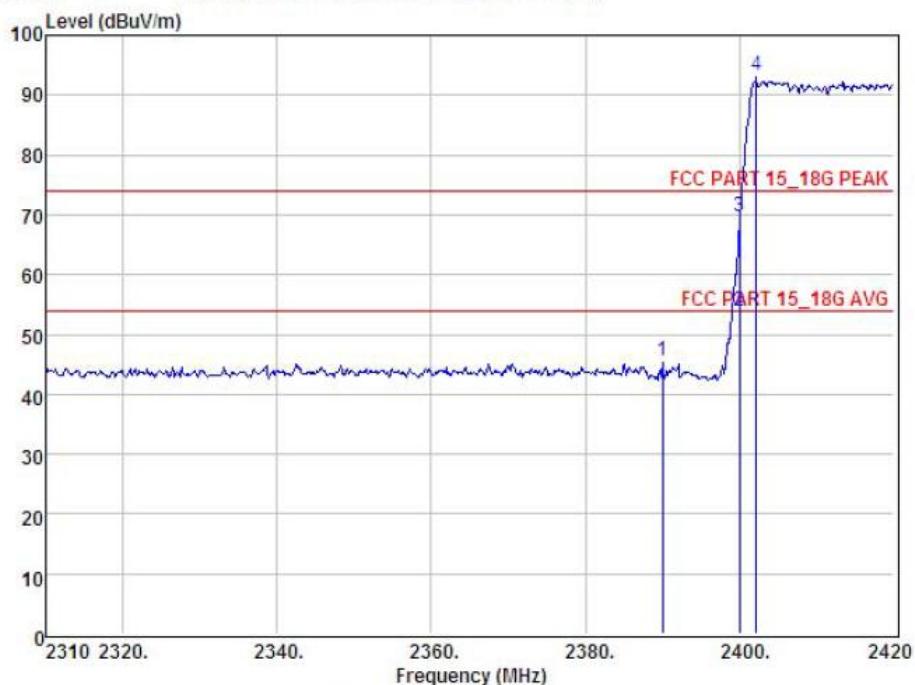
Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	51.54	27.62	34.97	3.92	48.11	74.00	-25.89	Peak
2	2400.00	53.86	27.62	34.97	3.94	50.45	54.00	-3.55	Average
3	2400.00	66.36	27.62	34.97	3.94	62.95	74.00	-11.05	Peak
4	2412.85	94.45	27.61	34.97	3.95	91.04	74.00	17.04	Peak

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



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Tel: 4006786199 FAX: +86-755-26736857
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Data: 18 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : pi/4 DQPSK-TX Hopping

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

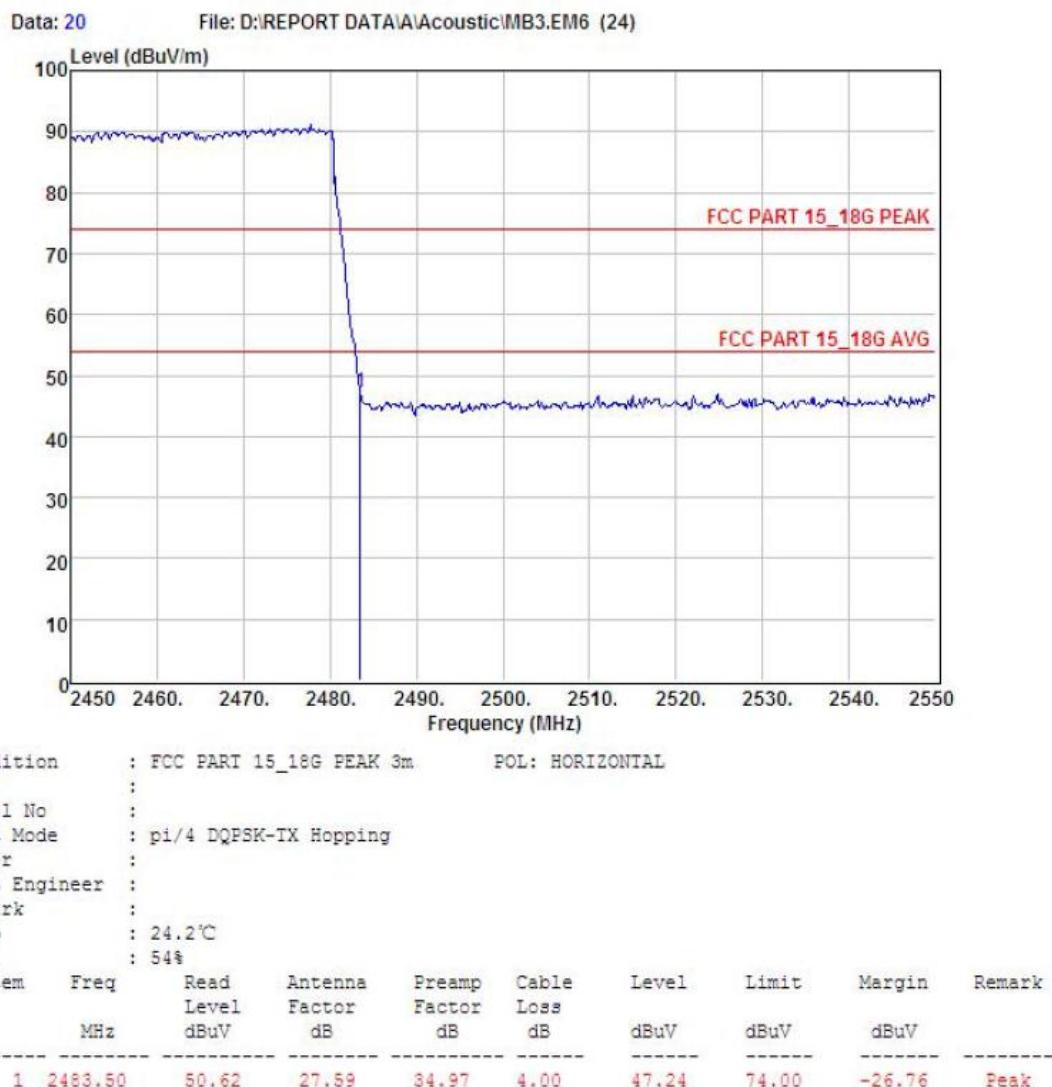
Item	Freq	Read	Antenna	Preamp	Cable	Level	Limit	Margin	Remark
		Level	Factor	Factor	Cable	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	Loss				
1	2390.00	48.91	27.62	34.97	3.92	45.48	74.00	-28.52	Peak
2	2400.00	57.20	27.62	34.97	3.94	53.79	54.00	-0.21	Average
3	2400.00	73.17	27.62	34.97	3.94	69.76	74.00	-4.24	Peak
4	2402.18	96.70	27.62	34.97	3.94	93.29	74.00	19.29	Peak

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

High



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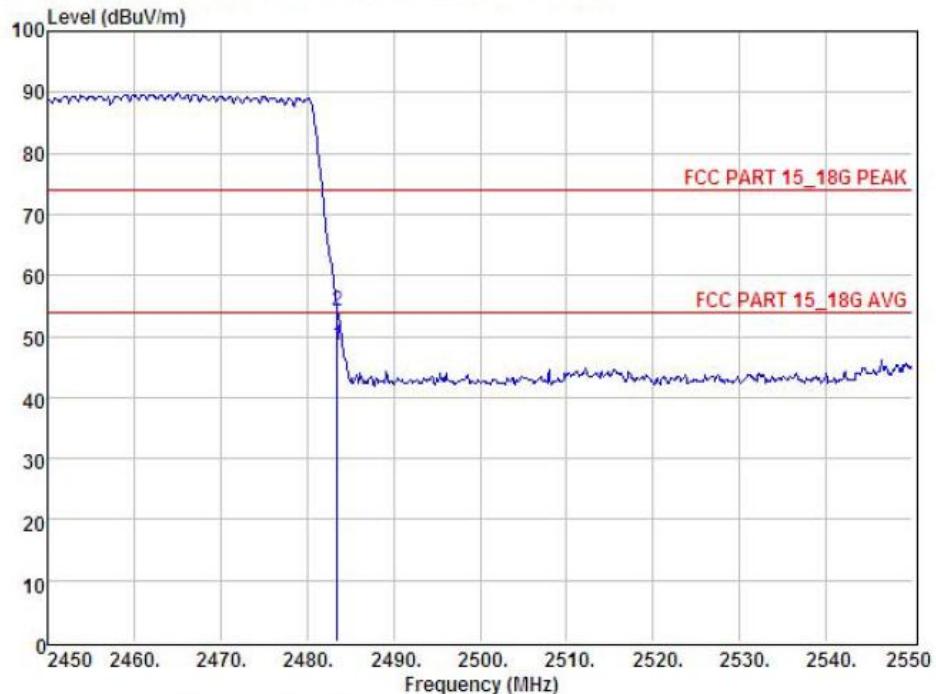


Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



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Tel: 4006786199 FAX: +86-755-26736857
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Data: 19 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : pi/4 DQPSK-IX Hopping

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preampl Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	51.89	27.59	34.97	4.00	48.51	54.00	-5.49	Average
2	2483.50	57.67	27.59	34.97	4.00	54.29	74.00	-19.71	Peak

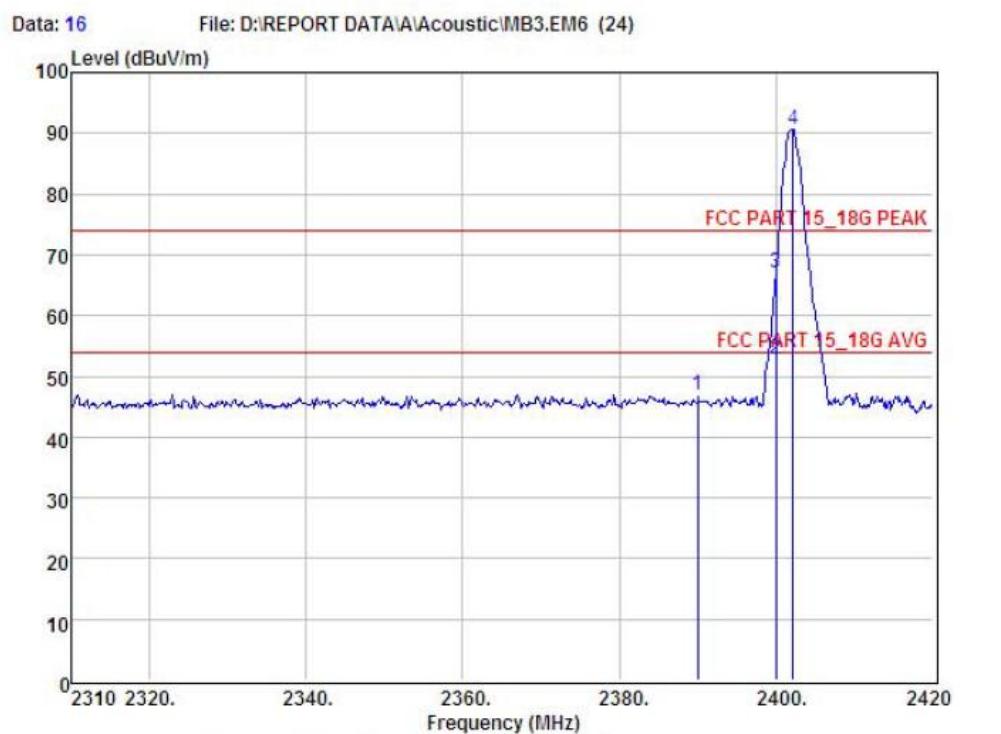
Remark: Level = Read Level + Antenna Factor - Preampl Factor + Cable Loss

8- DQPSK

Low



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Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL

EUT :

Model No :

Test Mode : 8-DPSK-TX 2402

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

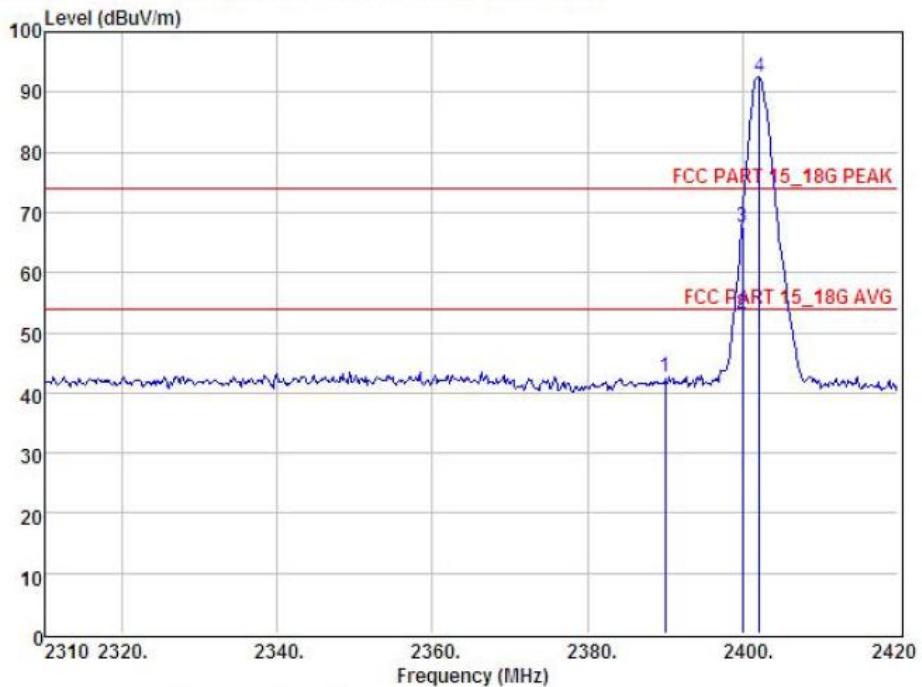
Item	Freq	Read	Antenna	Preampl	Cable	Level	Limit	Margin	Remark
		Level	Factor	Factor	Loss				
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2390.00	50.35	27.62	34.97	3.92	46.92	74.00	-27.08	Peak
2	2400.00	56.15	27.62	34.97	3.94	52.74	54.00	-1.26	Average
3	2400.00	70.48	27.62	34.97	3.94	67.07	74.00	-6.93	Peak
4	2402.18	94.05	27.62	34.97	3.94	90.64	74.00	16.64	Peak

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



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Tel: 4006786199 FAX: +86-755-26736857
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Data: 15 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : 8-DPSK-TX 2402

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

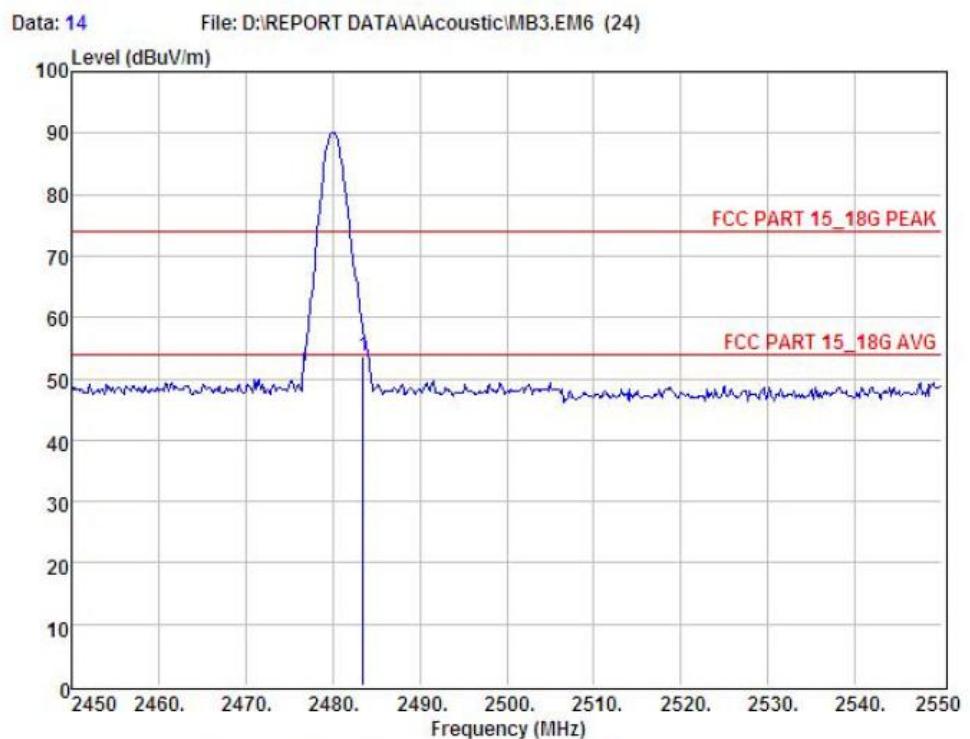
Item	Freq	Read	Antenna	Preamp	Cable	Level	Limit	Margin	Remark
		Level	Factor	Factor	Cable Loss	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	dB				
1	2390.00	46.11	27.62	34.97	3.92	42.68	74.00	-31.32	Peak
2	2400.00	56.40	27.62	34.97	3.94	52.99	54.00	-1.01	Average
3	2400.00	70.94	27.62	34.97	3.94	67.53	74.00	-6.47	Peak
4	2402.18	95.83	27.62	34.97	3.94	92.42	74.00	18.42	Peak

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

High



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Condition : FCC PART 15_18G PEAK 3m POL: HORIZONTAL
EUT :
Model No :
Test Mode : 8-DPSK-TX 2480
Power :
Test Engineer :
Remark :
Temp : 24.2°C
Hum : 54%

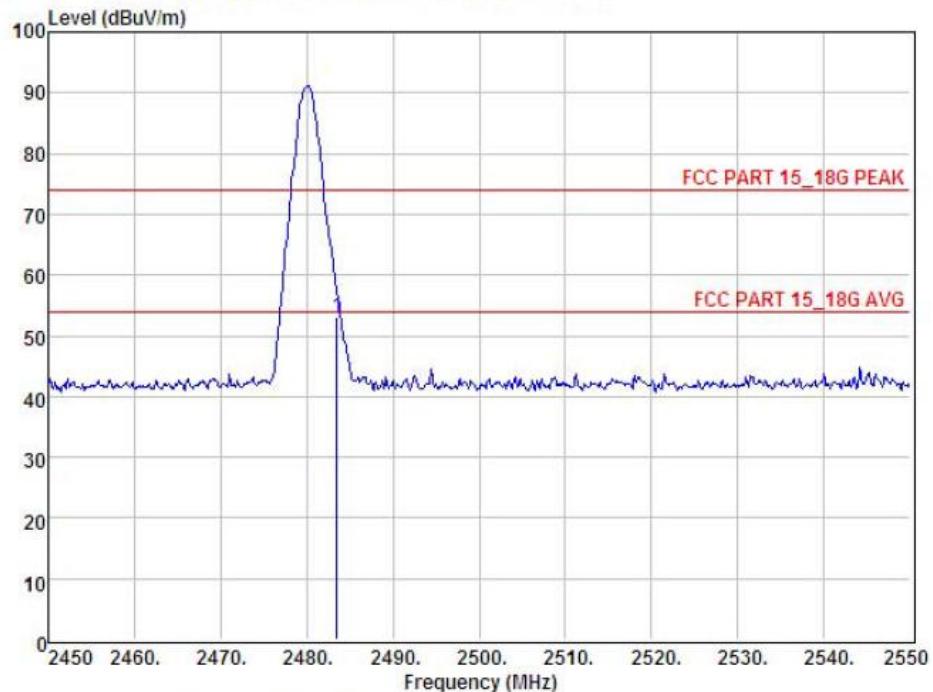
Item	Freq	Read Level	Antenna Factor	Preamplifier Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	57.12	27.59	34.97	4.00	53.74	74.00	-20.26	Peak

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



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2F, Building B, East Area of Nanchang Second Industrial Zone
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com

Data: 13 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



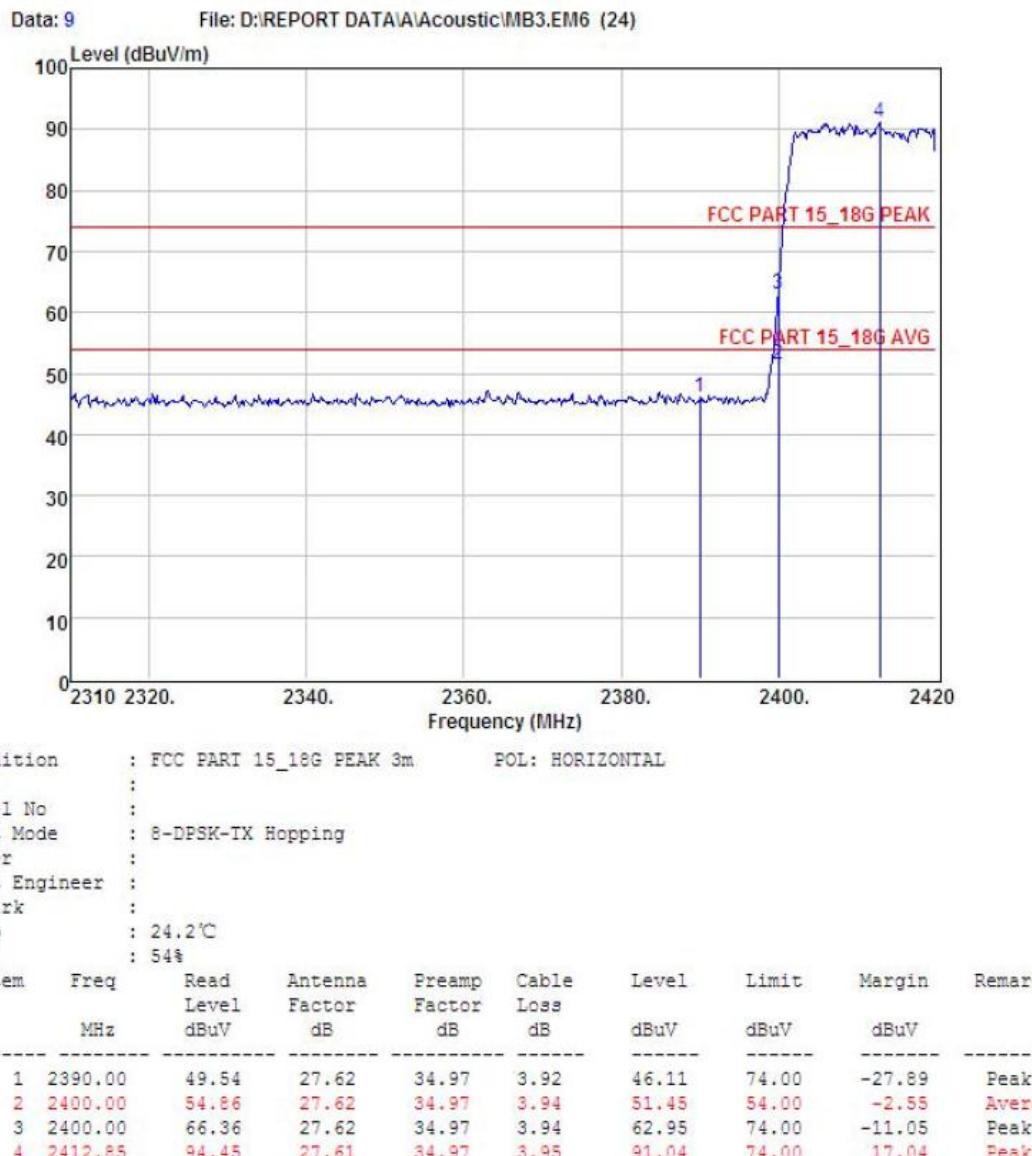
Condition	:	FCC PART 15_18G PEAK 3m	POL:	VERTICAL					
EUT	:								
Model No	:								
Test Mode	:	8-DPSK-TX 2480							
Power	:								
Test Engineer	:								
Remark	:								
Temp	:	24.2°C							
Hum	:	54%							
Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	56.36	27.59	34.97	4.00	52.98	74.00	-21.02	Peak

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

Hopping
Low



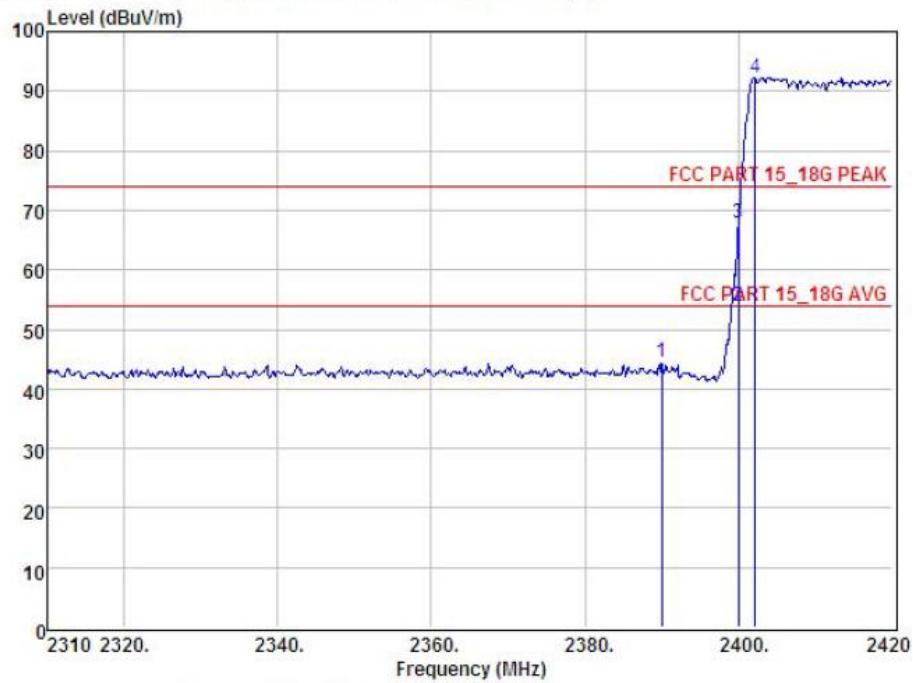
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Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com





Shenzhen Certification Technology Service Co., Ltd.
2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
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Data: 10 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : 8-DPSK-TX Hopping

Power :

Test Engineer :

Remark :

Temp : 24.2°C

Hum : 54%

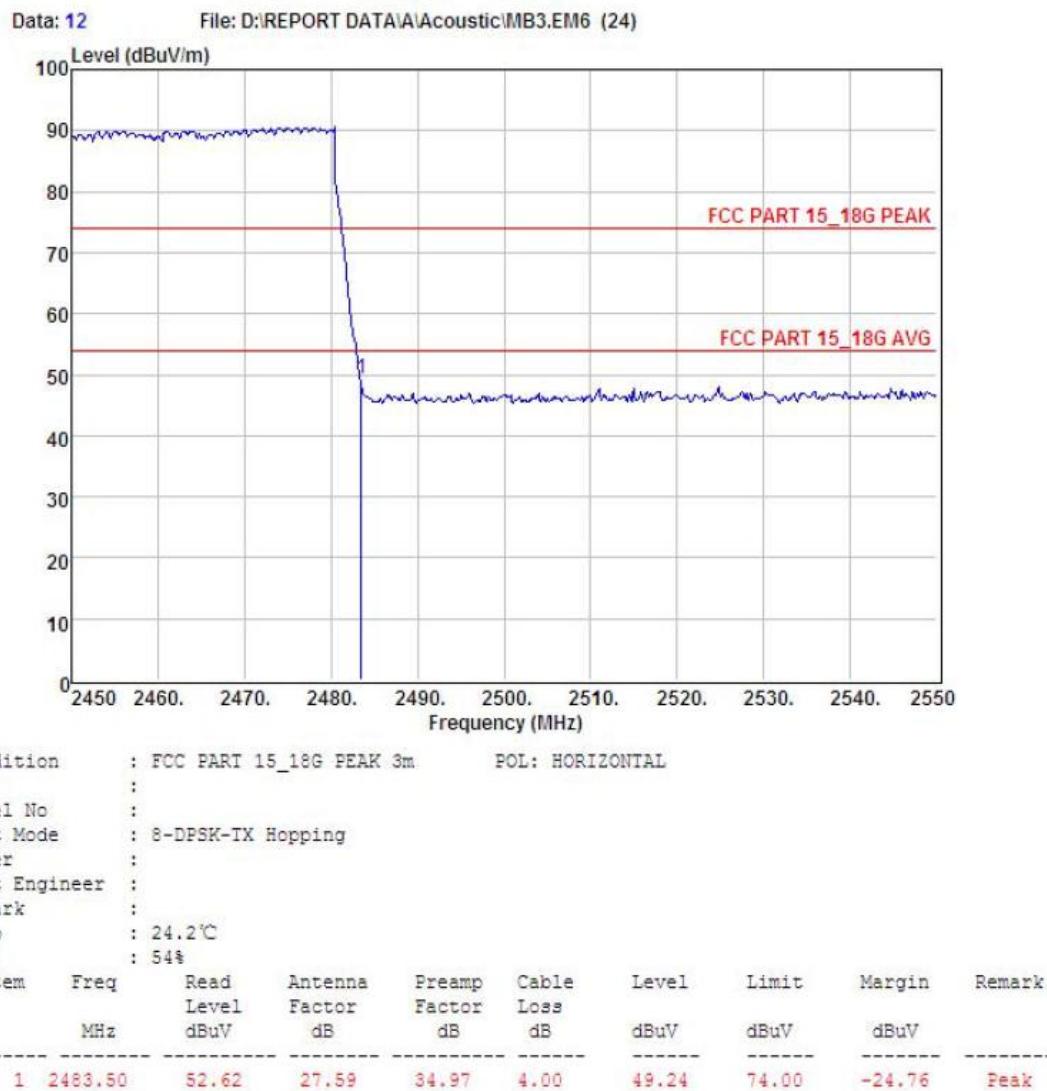
Item	Freq	Read	Antenna	Preamp	Cable	Level	Limit	Margin	Remark
		Level	Factor	Factor	Loss	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	dB				
1	2390.00	47.91	27.62	34.97	3.92	44.48	74.00	-29.52	Peak
2	2400.00	57.40	27.62	34.97	3.94	53.99	54.00	-0.01	Average
3	2400.00	71.17	27.62	34.97	3.94	67.76	74.00	-6.24	Peak
4	2402.18	95.70	27.62	34.97	3.94	92.29	74.00	18.29	Peak

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

High



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2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com

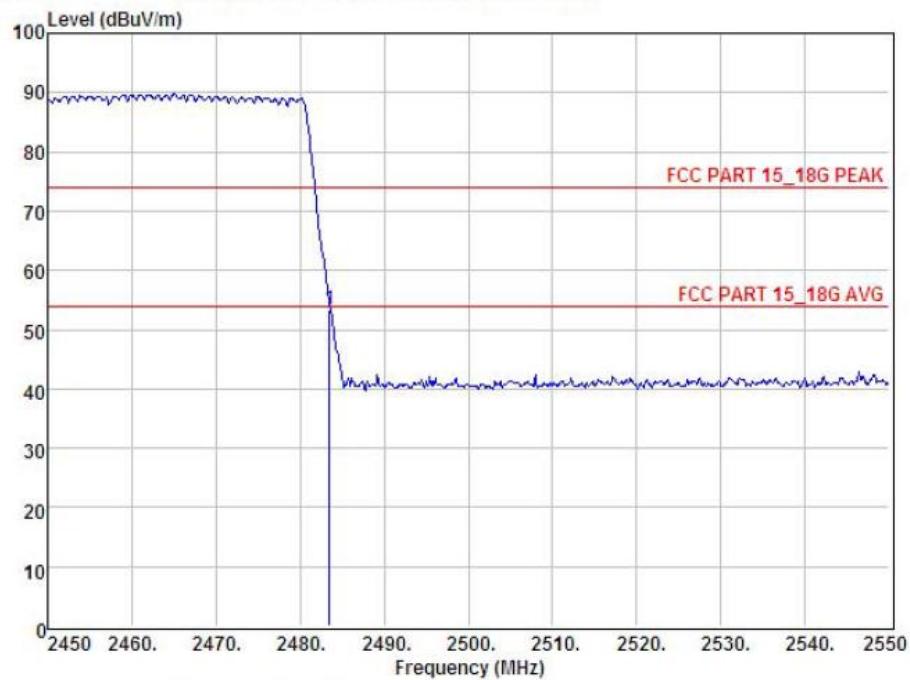


Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



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2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 FAX: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com

Data: 11 File: D:\REPORT DATA\A\Acoustic\MB3.EM6 (24)



Condition : FCC PART 15_18G PEAK 3m POL: VERTICAL

EUT :

Model No :

Test Mode : 8-DPSK-TX Hopping

Power :

Test Engineer :

Remark :

Temp : 24.2°C

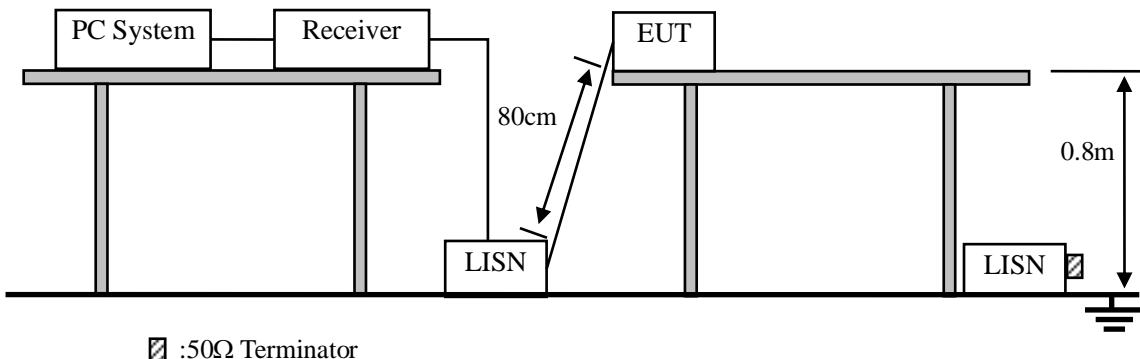
Hum : 54%

Item	Freq	Read Level	Antenna Factor	Preamplifier Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	2483.50	56.67	27.59	34.97	4.00	53.29	74.00	-20.71	Peak

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

10. Power Line Conducted Emissions

10.1. Block Diagram of Test Setup



10.2. Limit

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

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

10.3. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
- (2) Setup the EUT and simulator as shown in 10.1
- (3) The EUT Power connected to the power mains through a power adapter and a line impedance stabilization network (L.I.S.N1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. 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 2003 on conducted Emission test.
- (4) The bandwidth of test receiver is set at 10KHz.
- (5) The frequency range from 150 KHz to 30MHz is checked.

10.4. Test Result

PASS. (See below detailed test data)

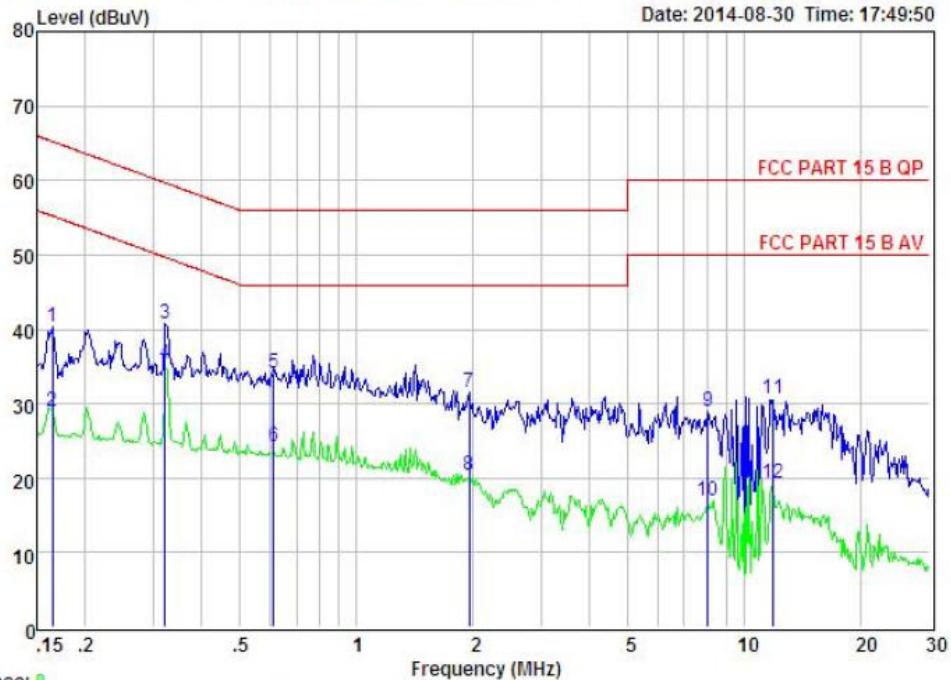


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2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 Fax: +86-755-26736857
Website: <http://www.cessz.com> Email:Service@cessz.com

Data: 7

File: E:\TEST REPORT\A\Acoustic\08.30.EM6 (8)

Date: 2014-08-30 Time: 17:49:50



Trace: 8

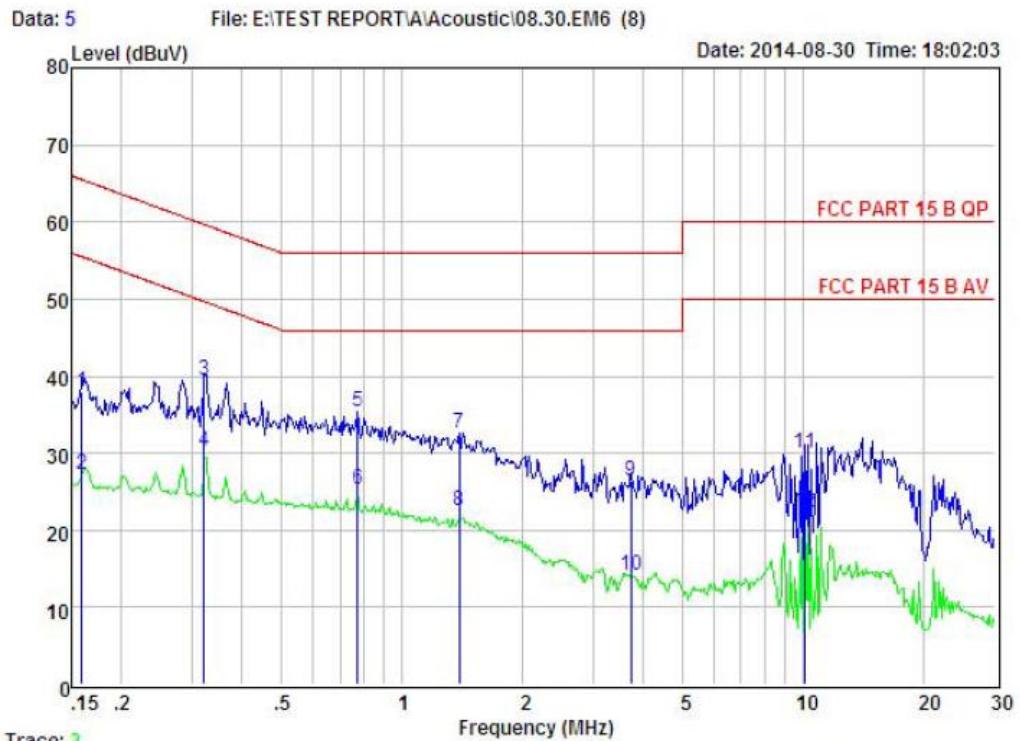
Condition : FCC PART 15 B QP POL: LINE Temp: 24 °C Hum: 56 %
EUT : Bluetooth speaker
Model No : MB3
Test Mode : Working
Power : AC 120V/60Hz
Test Engineer:
Remark :

Item	Freq	Read	LISN	Preamp	Cable	Level	Limit	Margin	Remark
	MHz	dBuV	Factor	Factor	dB	dB	dBuV	dBuV	
1	0.164	30.58	0.03	-9.72	0.10	40.43	65.25	-24.82	QP
2	0.164	19.10	0.03	-9.72	0.10	28.95	55.25	-26.30	Average
3	0.322	30.87	0.03	-9.72	0.10	40.72	59.66	-18.94	QP
4	0.322	25.60	0.03	-9.72	0.10	35.45	49.66	-14.21	Average
5	0.611	24.15	0.03	-9.72	0.10	34.00	56.00	-22.00	QP
6	0.611	14.30	0.03	-9.72	0.10	24.15	46.00	-21.85	Average
7	1.949	21.70	0.06	-9.70	0.10	31.56	56.00	-24.44	QP
8	1.949	10.50	0.06	-9.70	0.10	20.36	46.00	-25.64	Average
9	8.062	19.24	0.14	-9.47	0.16	29.01	60.00	-30.99	QP
10	8.062	7.13	0.14	-9.47	0.16	16.90	50.00	-33.10	Average
11	11.807	20.74	0.25	-9.47	0.22	30.68	60.00	-29.32	QP
12	11.807	9.30	0.25	-9.47	0.22	19.24	50.00	-30.76	Average

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss



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2F, Building B, East Area of Nanchang Second Industrial Zone,
Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
Tel: 4006786199 Fax: +86-755-26736857
Website: <http://www.cessz.com> Email: Service@cessz.com



Item	Freq	Read	LISN	Preamp	Cable	Level	Limit	Margin	Remark
			Factor	Factor	Lose	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	dB				
1	0.159	28.06	0.03	-9.72	0.10	37.91	65.52	-27.61	QP
2	0.159	17.36	0.03	-9.72	0.10	27.21	55.52	-28.31	Average
3	0.322	29.52	0.03	-9.72	0.10	39.37	59.66	-20.29	QP
4	0.322	20.30	0.03	-9.72	0.10	30.15	49.66	-19.51	Average
5	0.775	25.52	0.00	-9.71	0.10	35.33	56.00	-20.67	QP
6	0.775	15.60	0.00	-9.71	0.10	25.41	46.00	-20.59	Average
7	1.388	22.79	0.05	-9.71	0.10	32.65	56.00	-23.35	QP
8	1.388	12.60	0.05	-9.71	0.10	22.46	46.00	-23.54	Average
9	3.720	16.46	0.08	-9.69	0.12	26.35	56.00	-29.65	QP
10	3.720	4.30	0.08	-9.69	0.12	14.19	46.00	-31.81	Average
11	10.072	20.20	0.18	-9.52	0.21	30.11	60.00	-29.89	QP
12	10.072	12.30	0.18	-9.52	0.21	22.21	50.00	-27.79	Average

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

Note: If QP Result comply with AV limit, AV Result is deemed to comply with AV limit

11. Antenna Requirements

11.1. Limit

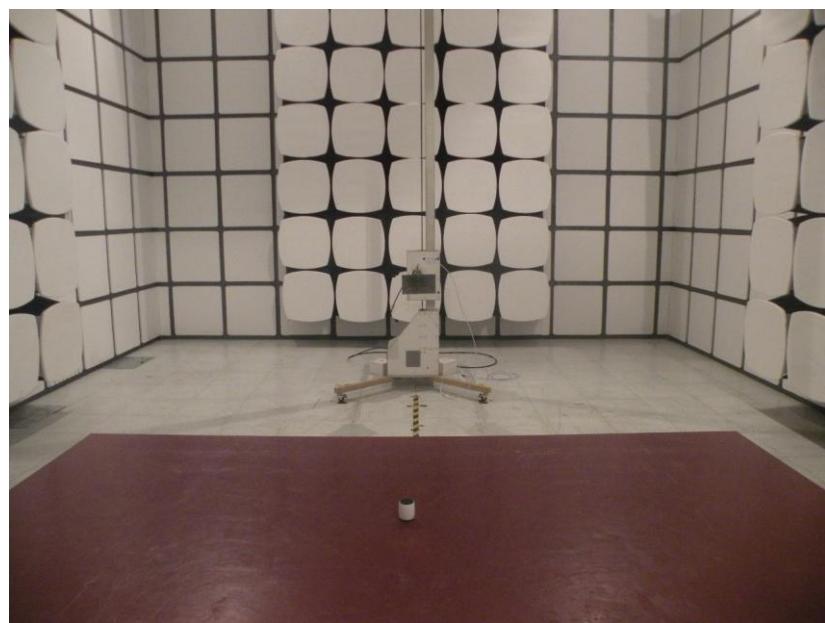
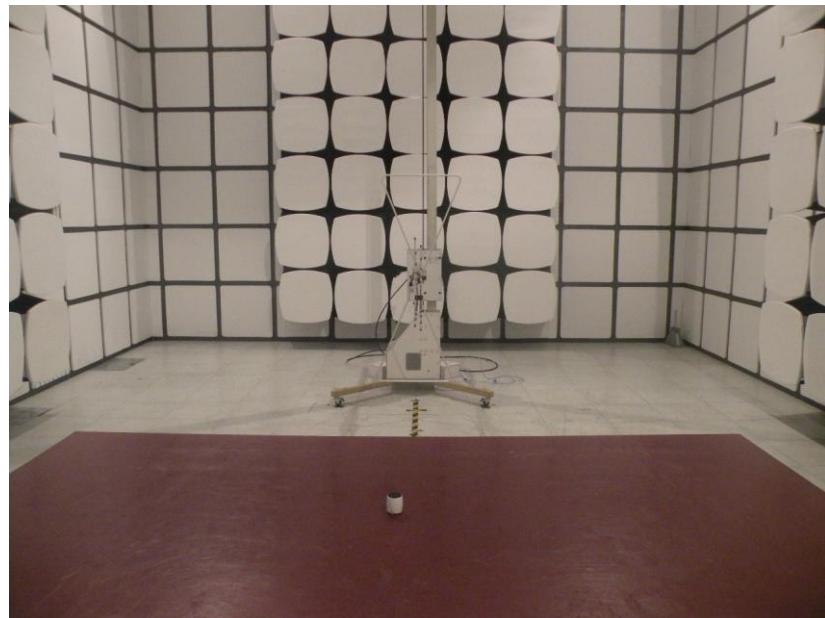
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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.

11.2. Result

The antennas used for this product are PCB Antenna for Bluetooth, 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 4dBi for Bluetooth.

12. Test setup photo

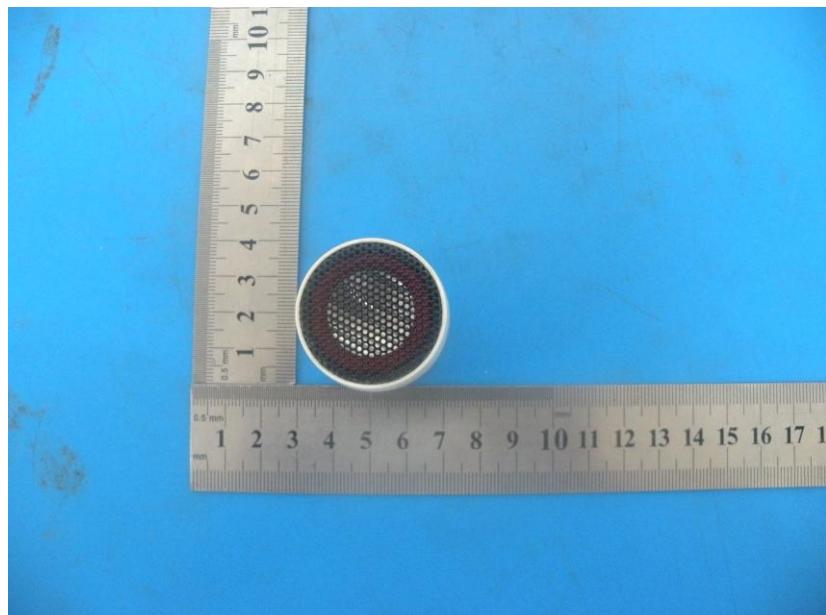
12.1. Photos of Radiated emission

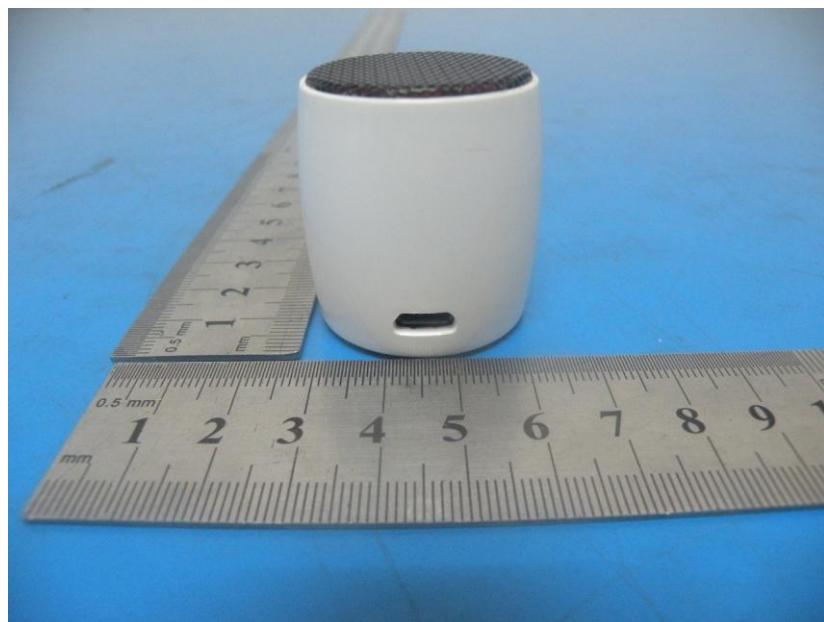
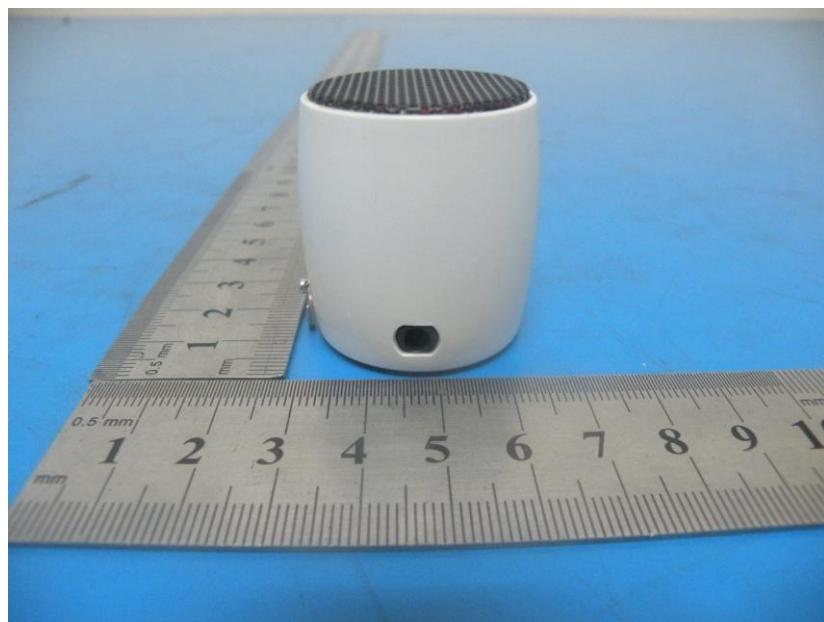


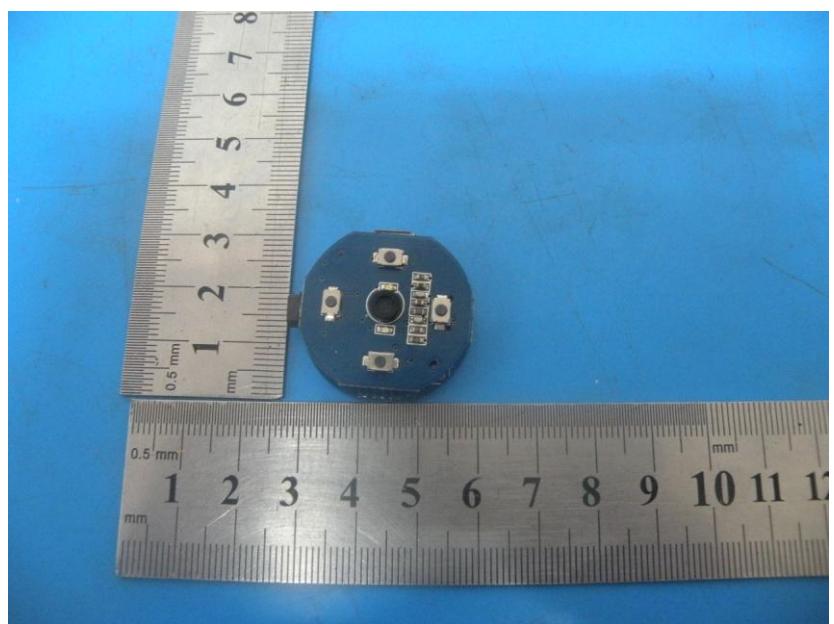
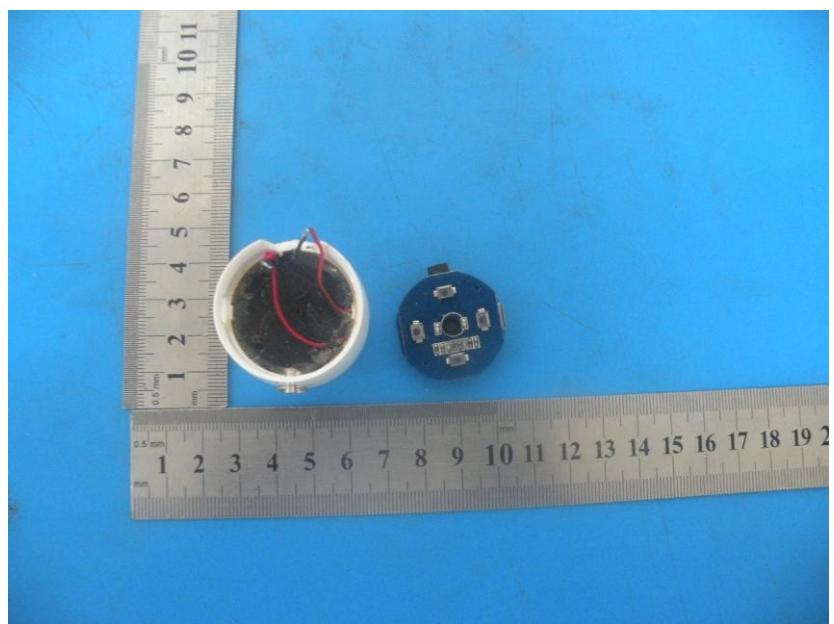
12.2.Photos of Conducted Emission test

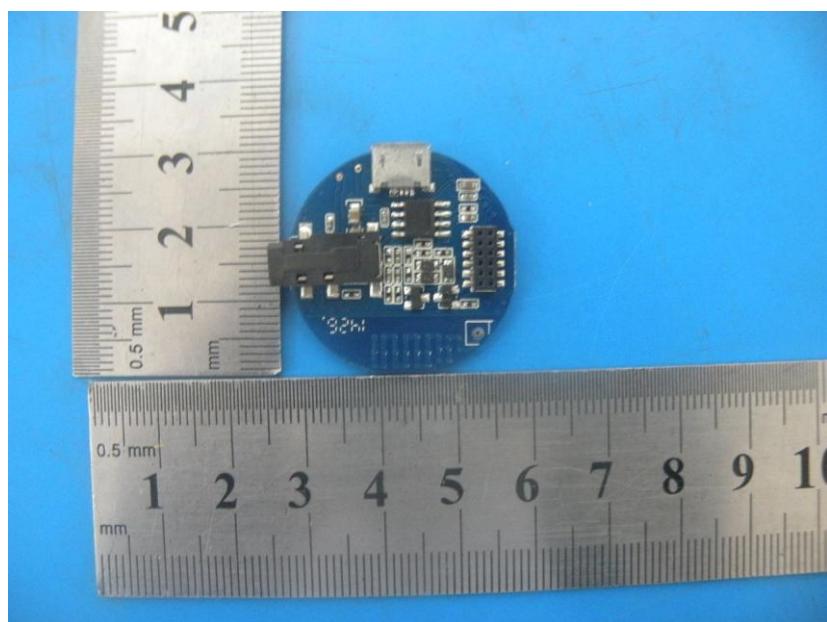
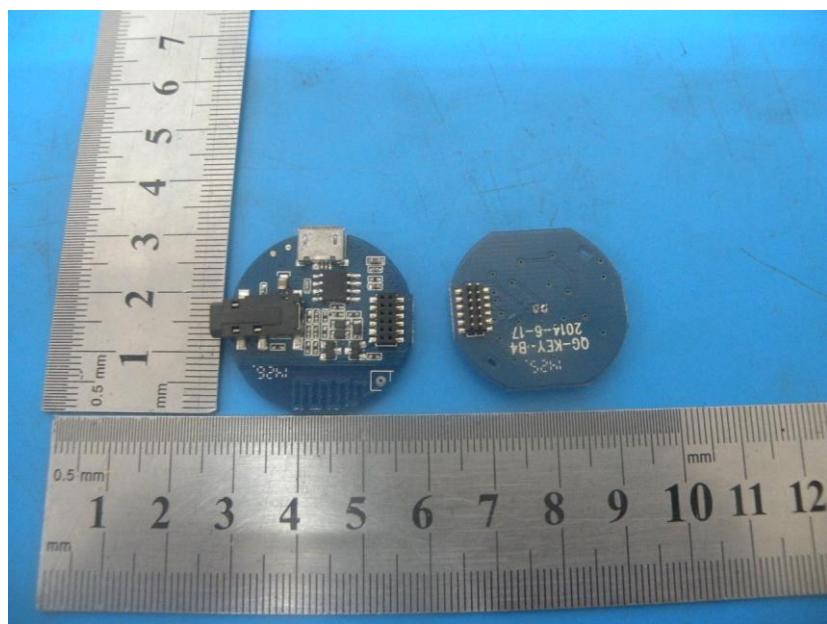


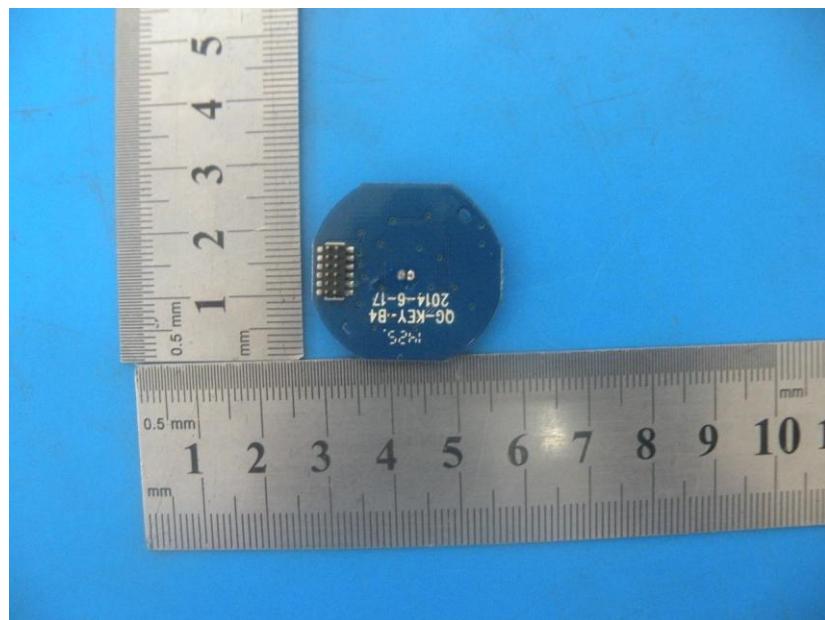
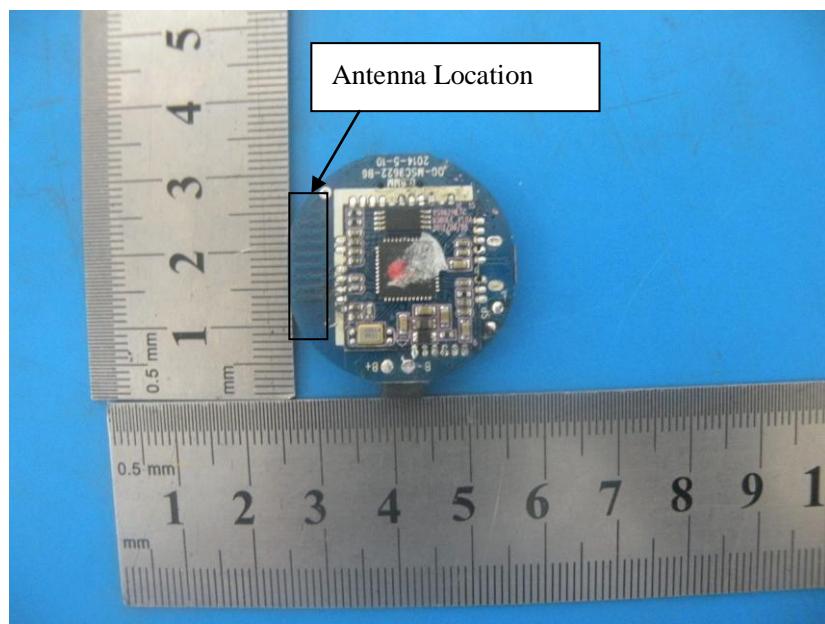
13.Photos of EUT

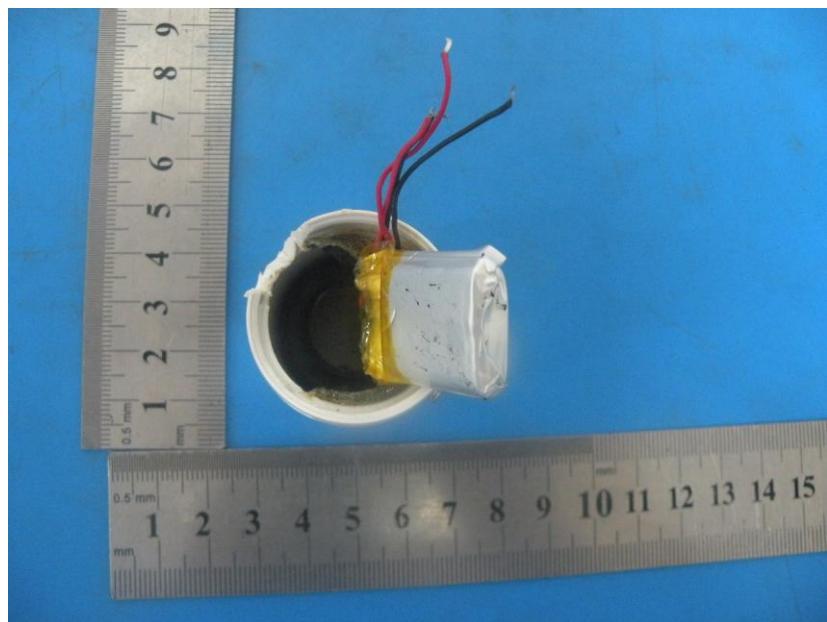
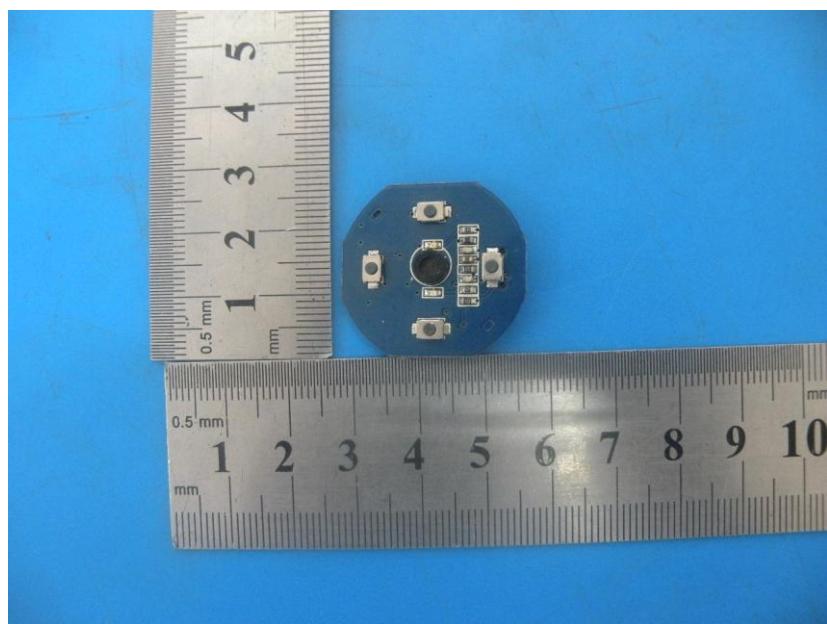


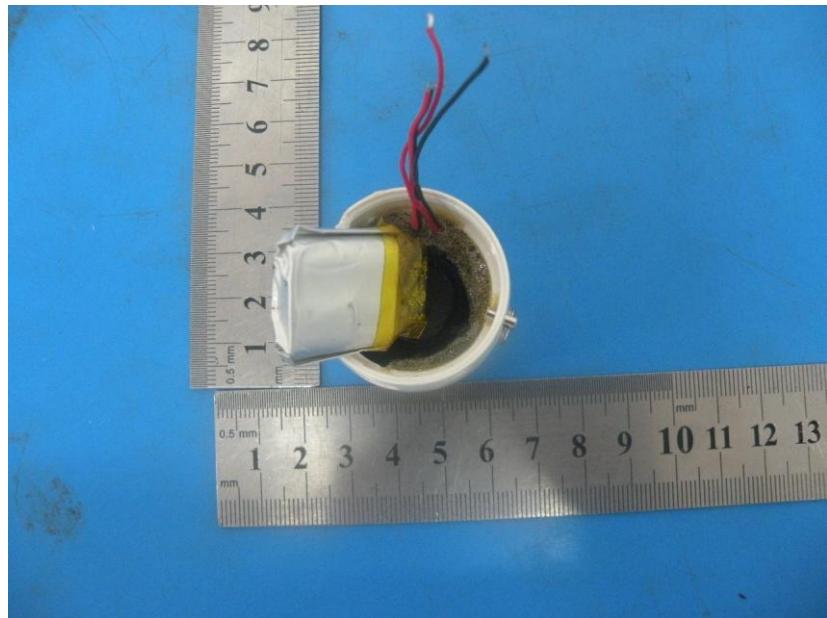












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