



TEST REPORT

FCC ID: A8ITIMEBOX-MINI

For

Shenzhen Divoom Technology Co.,LTD

DIVOOM Bluetooth Speaker

Model No. : Timebox-mini

Trade Name : DIVOOM

Prepared for : Shenzhen Divoom Technology Co.,LTD
Address : 1st floor, 5th building, xinlianhe industrial park, jincheng road,
shajing town, bao'an, shenzhen, china.

Prepared by : Shenzhen Alpha Product Testing Co., Ltd.
Address : Building B, East Area of Nanchang Second, Industrial Zone, Gushu 2nd Road,
Bao'an, Shenzhen, China

Report No. : T1870045 07

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DECLARATION

Applicant : Shenzhen Divoom Technology Co.,LTD
 Manufacturer : Shenzhen Divoom Technology Co.,LTD
 Product : DIVOOM Bluetooth Speaker
 (A) Model No. : Timebox-mini
 (B) Trade Name : DIVOOM
 (C) Power supply : DC 3.7V From Battery, DC 5V From USB Port

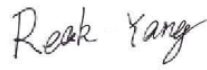
Measurement Standard Used:


FCC Rules and Regulations Part 15 Subpart C Section 15.247: 2017, ANSI C63.10:2013

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Reak Yang 
 Test Engineer

Approved by (name + signature).....: Simple Guan 
 Project Manager

Date of issue..... : February 15, 2017

1. General Information

1.1. Description of Device (EUT)

EUT	:	DIVOOM Bluetooth Speaker
Model No.	:	Timebox-mini
DIFF.	:	N/A
Trade mark	:	DIVOOM
Power supply	:	DC 3.7V From Battery, DC 5V From USB Port
Radio Technology	:	Bluetooth 4.0 + EDR
Operation frequency	:	2402-2480MHz
Modulation	:	GFSK, $\pi/4$ DQPSK, 8- DPSK for BDR+EDR GFSK for LTE
Antenna Type	:	Integrated Antenna, max gain 0Bi.
Software version	:	10100
Hardware version	:	TimeBoxMini-MainBoard-Rev1_3
Applicant	:	Shenzhen Divoom Technology Co.,LTD
Address	:	1st floor, 5th building, xinlianhe industrial park, jincheng road, shajing town, bao'an, shenzhen, china.
Manufacturer	:	Shenzhen Divoom Technology Co.,LTD
Address	:	1st floor, 5th building, xinlianhe industrial park, jincheng road, shajing town, bao'an, shenzhen, china.

1.2. Accessories of device (EUT)

Accessories 1 : 3.5mm audio cable
Type : N/A
Accessories 1 : USB charging cable
Type : N/A

1.3. Test Lab information

Shenzhen Alpha Product Testing Co., Ltd.

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

March 25, 2015 File on Federal Communication Commission
Registration Number: 203110

July 18, 2014 Certificated by IC
Registration Number: 12135A

2. Summary of test

2.1. Summary of test result

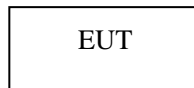
Description of Test Item	Standard	Results
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1) ANSI C63.10 :2013	PASS
Bandwidth	FCC Part 15: 15.215 ANSI C63.10 :2013	PASS
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1) ANSI C63.10 :2013	PASS
Number Of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10 :2013	PASS
Dwell Time	FCC Part 15: 15.247(a)(1)(iii) ANSI C63.10 :2013	PASS
Radiated Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10 :2013	PASS
Band Edge Compliance	FCC Part 15: 15.247(d) ANSI C63.10 :2013	PASS
Power Line Conducted Emissions	FCC Part 15: 15.207 ANSI C63.10 :2013	PASS
Antenna requirement	FCC Part 15: 15.203	PASS
Note: The Bluetooth tool used in related tests can meet the Bluetooth standard.		

2.2. Assistant equipment used for test

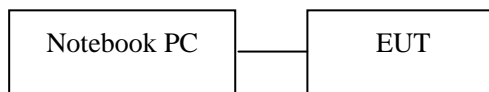
Description	:	Notebook PC
Manufacturer	:	ACER
Model No.	:	ZQT
NOTE: FCC DOC approved.		
Description	:	AC Adapter of Notebook PC
Manufacturer	:	Chicony Power Technology Co., Ltd.
Model No.	:	A11-065N1A

2.3. Block Diagram

1, For radiated emissions test: EUT was with the fully-charged battery, placed on a turn table, which is 0.8 meter high above ground for below 1GHz, 1.5 meter high above ground for above 1GHz. EUT was be set into BT test mode by software before test.



2, For Power Line Conducted Emissions Test



2.4. Test mode

The test software(RTLBTAPP) 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)
π /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	2.71dB	
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)	3.90dB	Polarize: V
	3.92dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.28dB	Polarize: H
	4.26dB	Polarize: V
Uncertainty for radio frequency	1×10 ⁻⁹	
Uncertainty for conducted RF Power	0.16dB	
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	2016.09.29	1 Year
Spectrum analyzer	Agilent	E4407B	MY49510055	2016.09.29	1 Year
Signal Analyzer	Agilent	N9020A	MY499100060	2016.09.29	1 Year
Receiver	R&S	ESCI	1166.5950K03-1011	2016.09.29	1 Year
Receiver	R&S	ESCI	101165	2016.09.29	1 Year
Bilog Antenna	SCHWARZBECK	VULB 9168	9168-438	2016.09.30	2 Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2016.09.30	2 Year
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170 D(1432)	2016.09.30	2 Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2016.09.30	1 Year
Cable	Resenberger	SUCOFLEX 104(9KHz-30MHz)	MY6562/4	2016.09.29	1 Year
Cable	Resenberger	SUCOFLEX 104(9KHz-2000MHz)	309972/4	2016.09.29	1 Year
Cable	Resenberger	SUCOFLEX 104(1GHz-26.5GHz)	329112/4	2016.09.29	1 Year
Power Meter	Anritsu	ML2487A	6K00001491	2016.09.29	1 Year
Power sensor	Anritsu	ML2491A	32516	2016.09.29	1 Year
Pre-amplifier	SCHWARZBECK	BBV9743	9743-019	2016.09.29	1 Year
Pre-amplifier	Quietek	AP-180C	CHM-0602012	2016.09.29	1 Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2016.09.29	1 Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2016.09.29	1 Year

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Equipment	Manufacture	Model No.	Serial No.	Test Location	Frequency Rang
Cable	Resenberger	SUCOFLEX 104	309972/4	Radiation	9KHz-2GHz
Cable	Resenberger	SUCOFLEX 104	329112/4	Radiation	1GHz-26.5G Hz
<p>Note: For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement.</p> <p>Antenna Connector Impedance: 50Ω , Cable Loss: 1.0 dB</p>					

3. Maximum Peak Output power

3.1. Limit

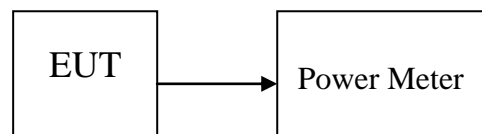
Please refer section 15.247.

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

Disconnect the PCB antenna from the EUT and solder a temporary antenna connector 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: DIVOOM Bluetooth Speaker		M/N: Timebox-mini			
Test date: 2017-2-12		Test site: RF site		Tested by: Reak	
Mode	Freq (MHz)	PK Output Power (dBm)	PK Output Power (mW)	Limit (dBm)	Margin (dB)
GFSK	2402	0.297	1.071	21	20.703
	2441	0.792	1.200	21	20.208
	2480	-0.678	0.855	21	21.678
$\pi/4$ DQPSK,	2402	1.696	1.478	21	19.304
	2441	2.269	1.686	21	18.731
	2480	0.807	1.204	21	20.193
8- DPSK	2402	2.023	1.593	21	18.977
	2441	2.483	1.771	21	18.517
	2480	0.994	1.257	21	20.006
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.

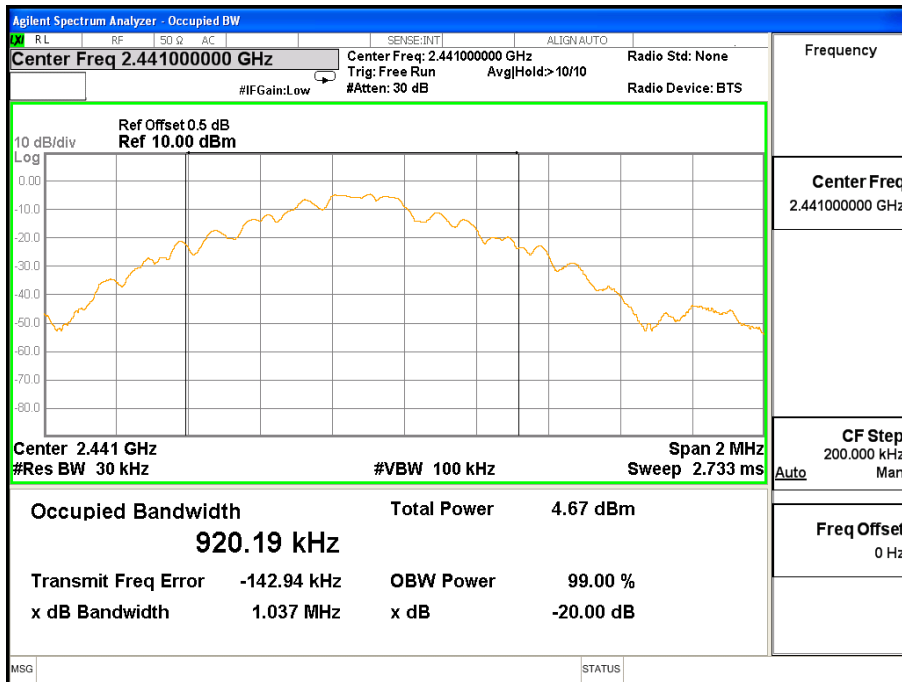
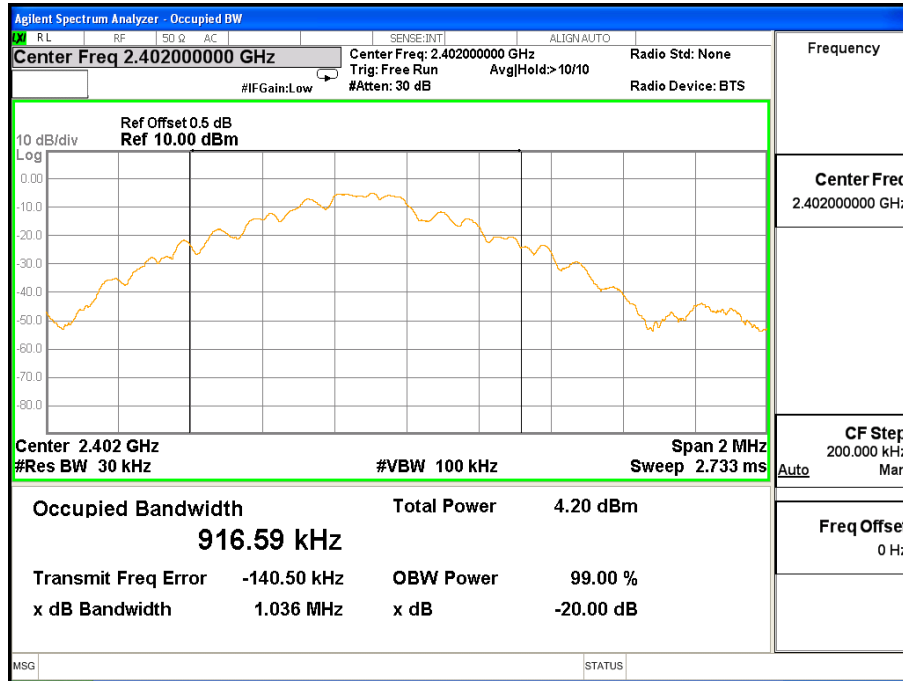
4.2. Test Procedure

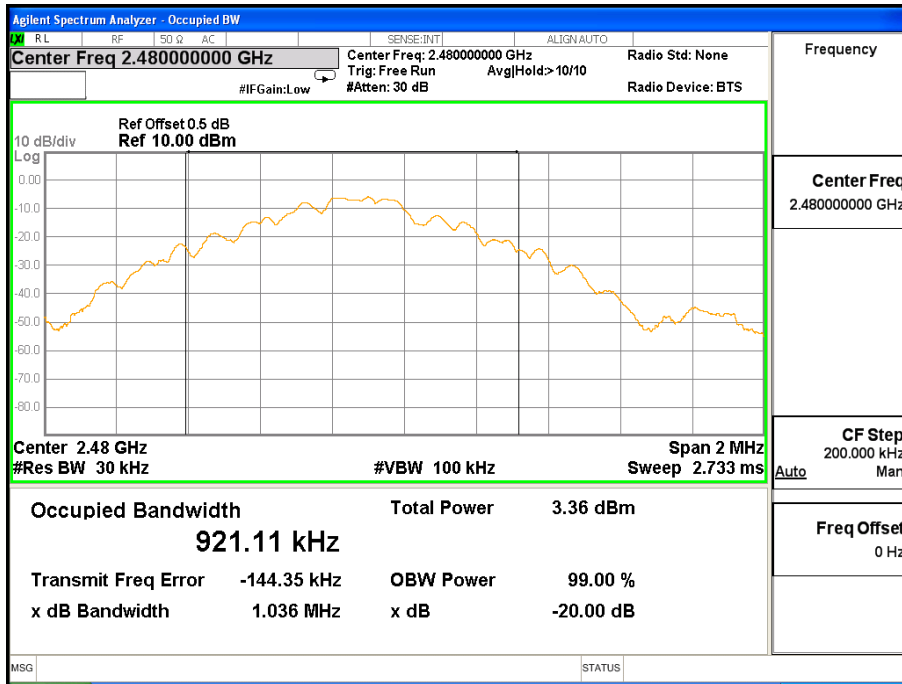
Disconnect the PCB antenna from the EUT and solder a temporary antenna connector to a spectrum analyzer. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

4.3. Test Result

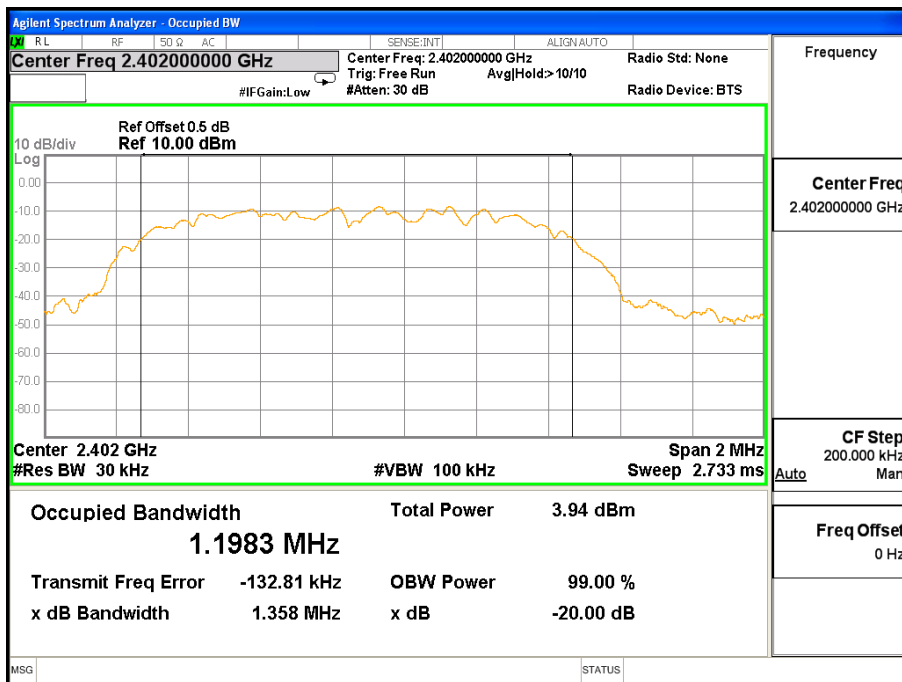
EUT: DIVOOM Bluetooth Speaker M/N: Timebox-mini				
Test date: 2017-2-12		Test site: RF site		Tested by: Reak
Mode	Freq (MHz)	20dB Bandwidth (KHz)	Limit (kHz)	Conclusion
GFSK	2402	1036	/	PASS
	2441	1037	/	PASS
	2480	1036	/	PASS
π /4 DQPSK	2402	1358	/	PASS
	2441	1363	/	PASS
	2480	1366	/	PASS
8- DPSK	2402	1297	/	PASS
	2441	1301	/	PASS
	2480	1302	/	PASS

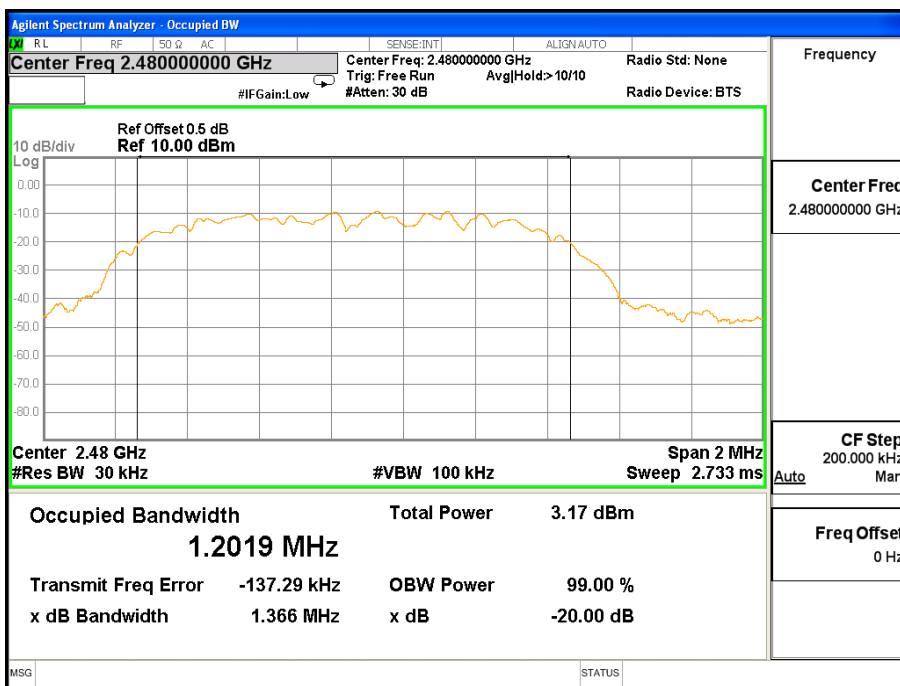
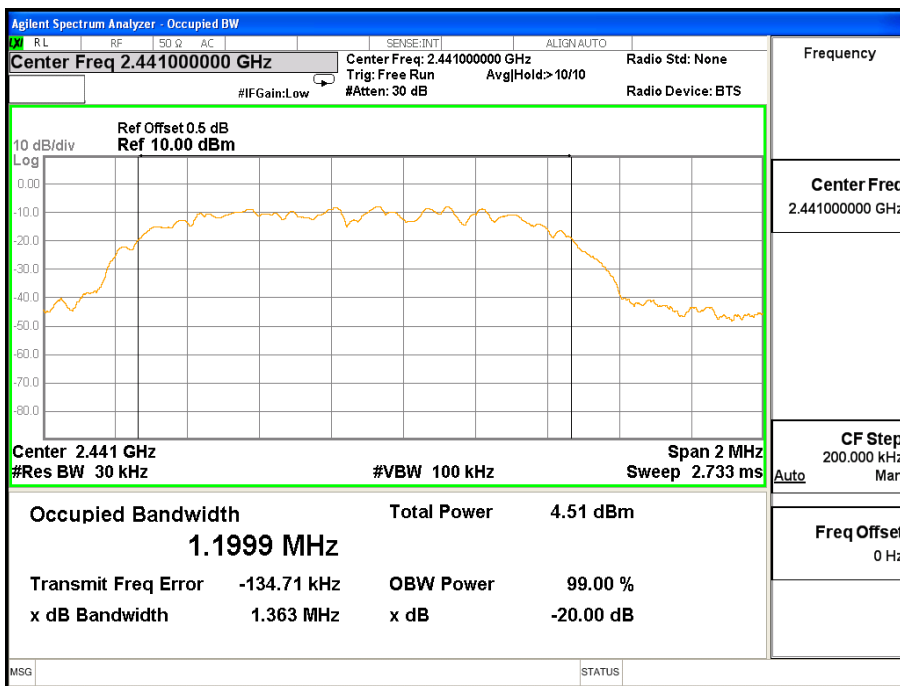
Original Test data For 20dB bandwidth
GFSK:



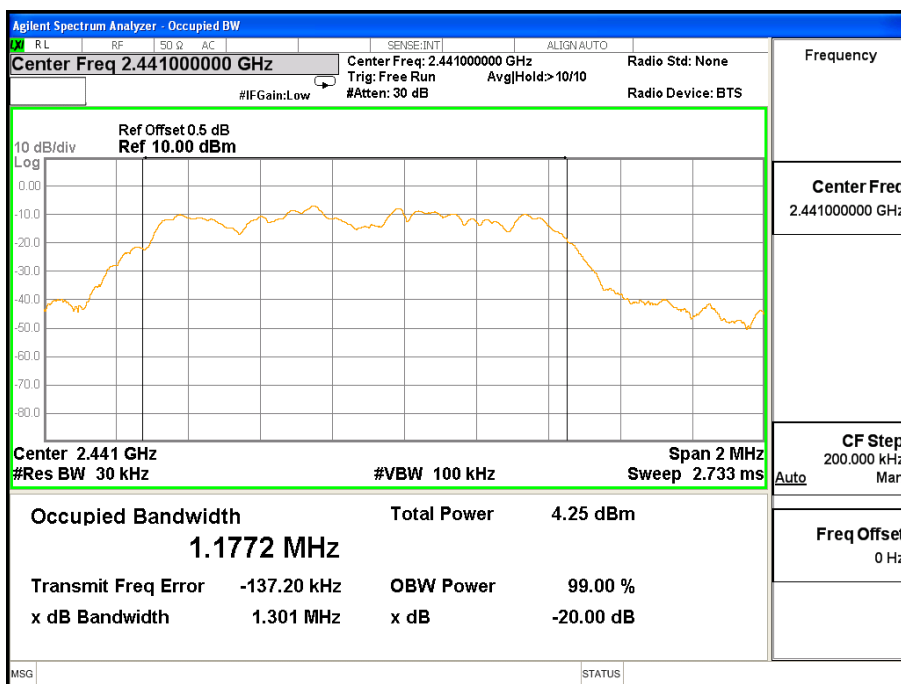
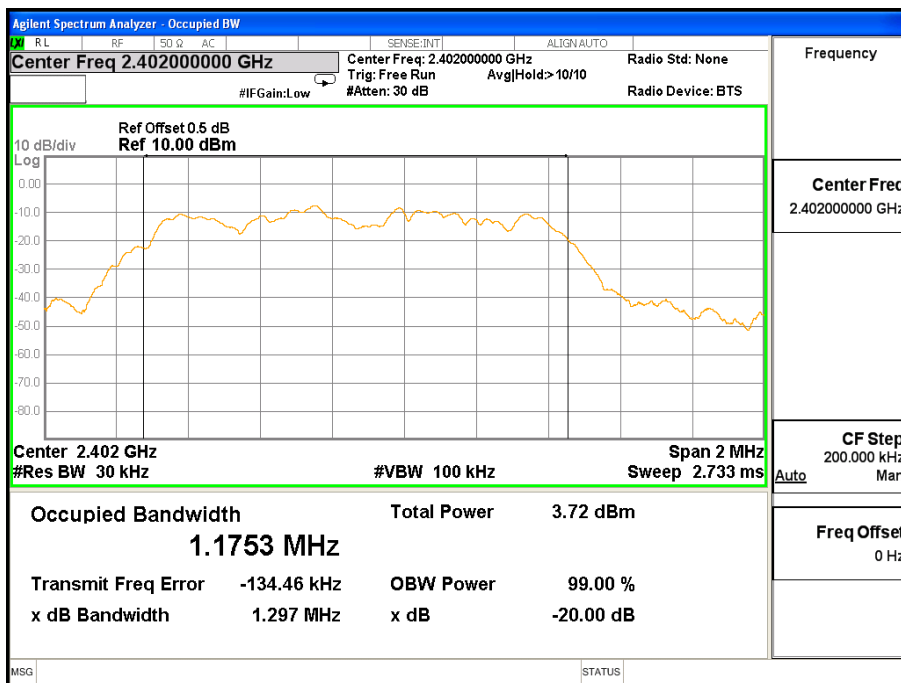


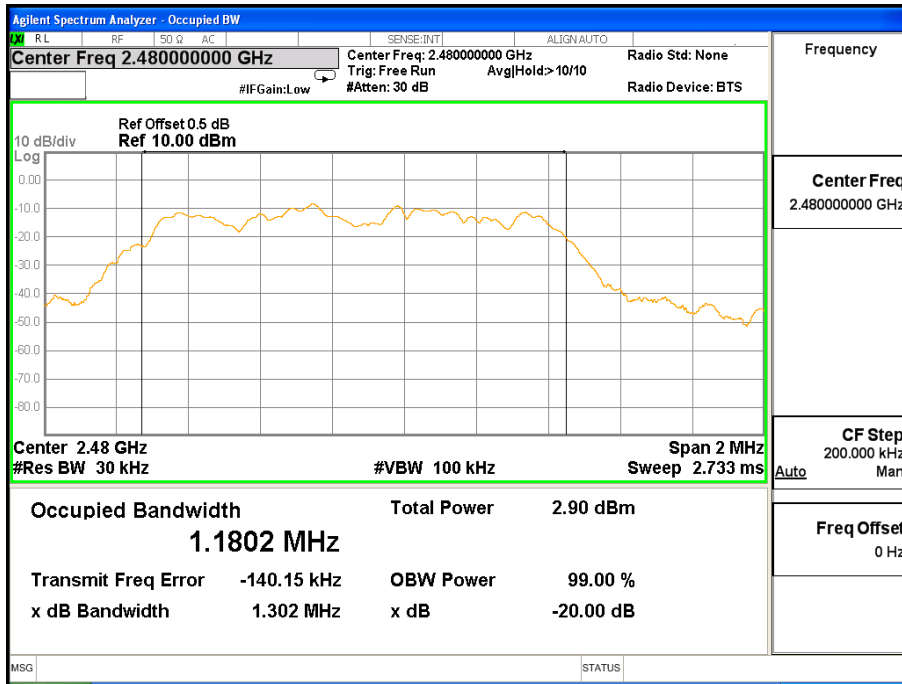
π /4 DQPSK:





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

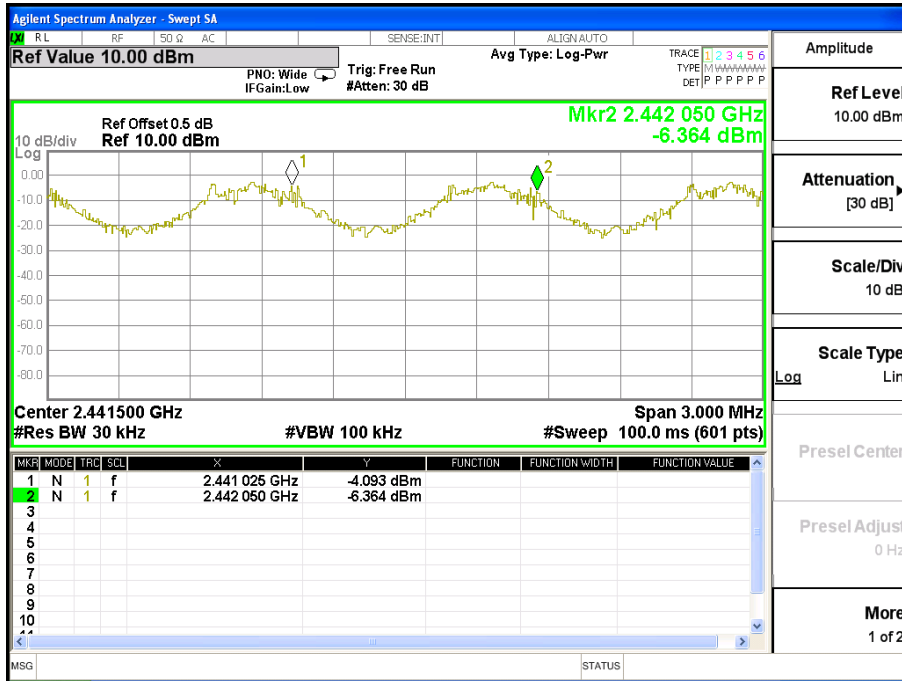
5.2. Test Procedure

Disconnect the PCB antenna from the EUT and solder a temporary antenna connector to a spectrum analyzer. The carrier frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW.

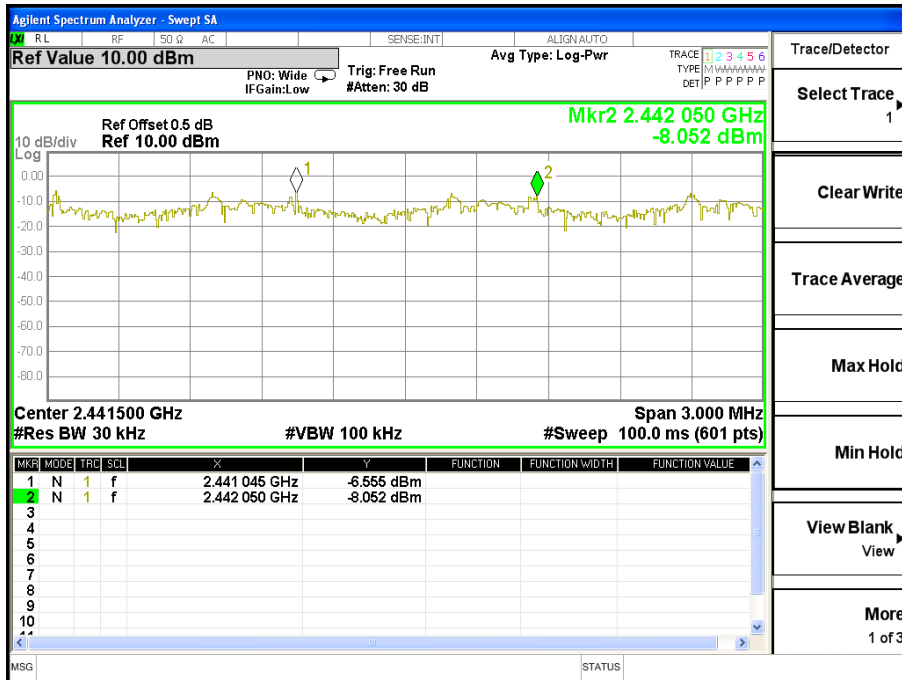
5.3. Test Result

EUT: DIVOOM Bluetooth Speaker M/N: Timebox-mini				
Test date: 2017-2-12		Test site: RF site		Tested by: Reak
Mode/Channel	Channel separation (MHz)	20dB Bandwidth (KHz)	Limit (KHz) 2/3 20dB bandwidth	Conclusion
GFSK	1.025	1037	691.333	PASS
π /4 DQPSK	1.005	1366	910.667	PASS
8- DPSK	1.025	1302	868	PASS

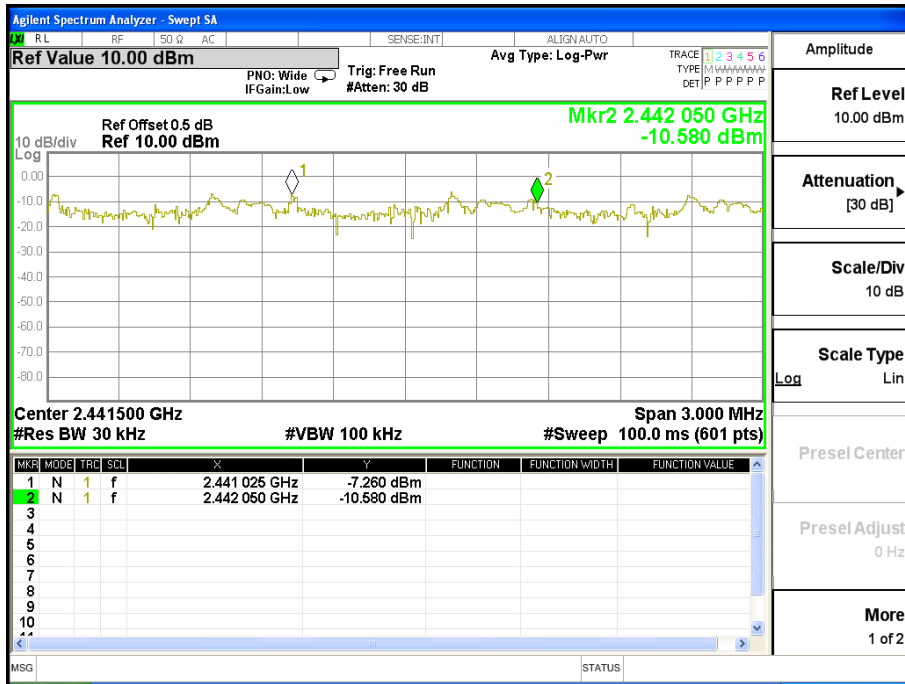
Original test data for channel separation
GFSK



$\pi/4$ 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

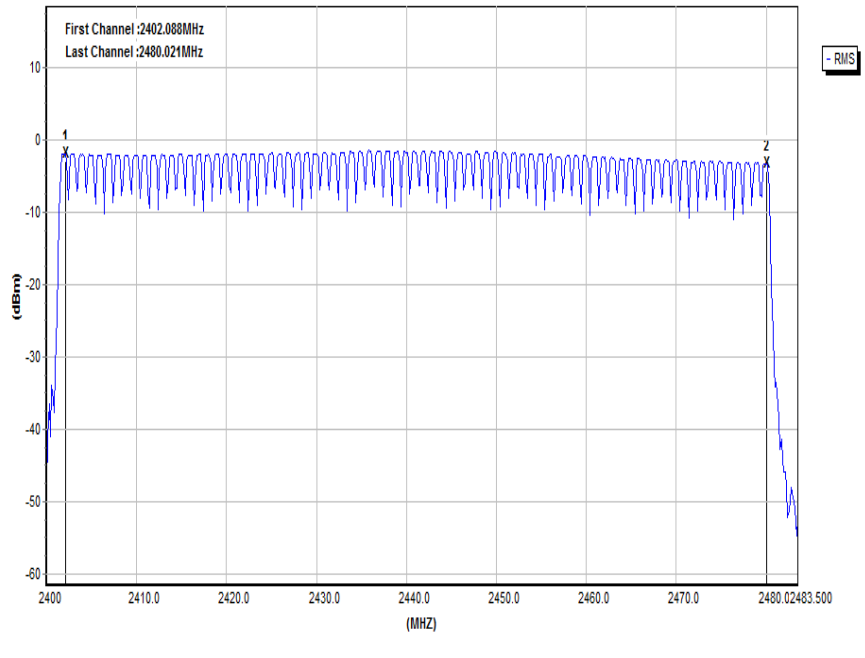
6.2. Test Procedure

Disconnect the PCB antenna from the EUT and solder a temporary antenna connector to spectrum analyzer. The number of hopping channel was measured by spectrum analyzer with 300kHz RBW and 1MHz VBW.

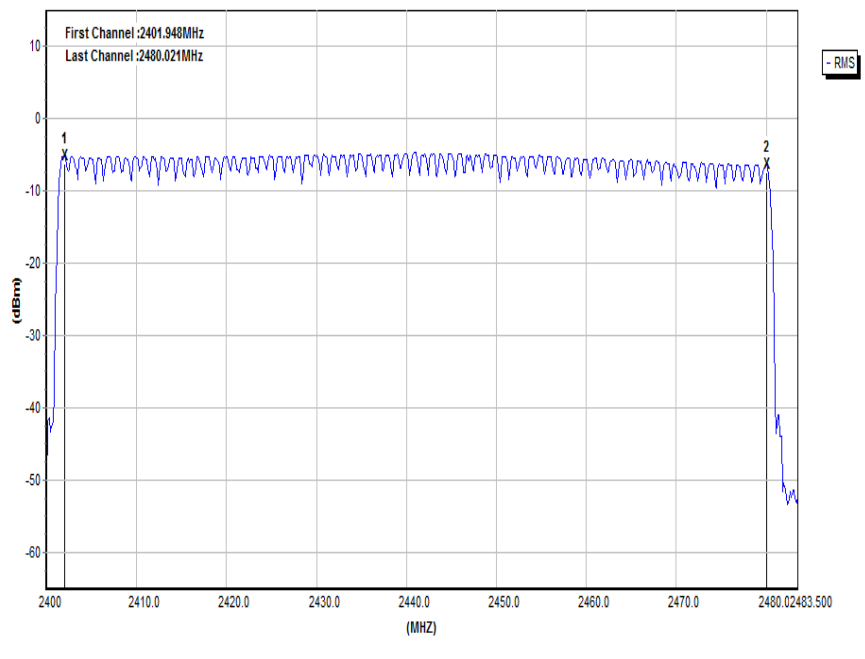
6.3. Test Result

EUT: DIVOOM Bluetooth Speaker M/N: Timebox-mini			
Test date: 2017-2-12		Test site: RF site	Tested by: Reak
Mode	Number of hopping channel	Limit	Conclusion
GFSK	79	>15	PASS
π /4 DQPSK	79	>15	PASS
8- DPSK	79	>15	PASS

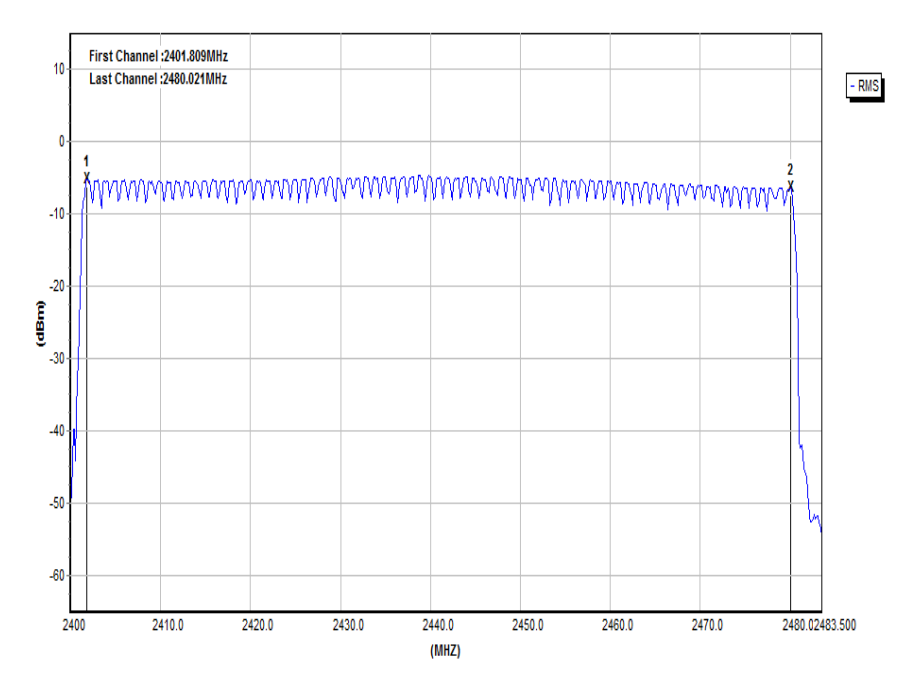
Original test data for hopping channel number
GFSK



$\pi/4$ 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 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 = 1MHz, VBW = 3MHz, Span = 0Hz, Sweep = auto.

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

7.3. Test Results

PASS.

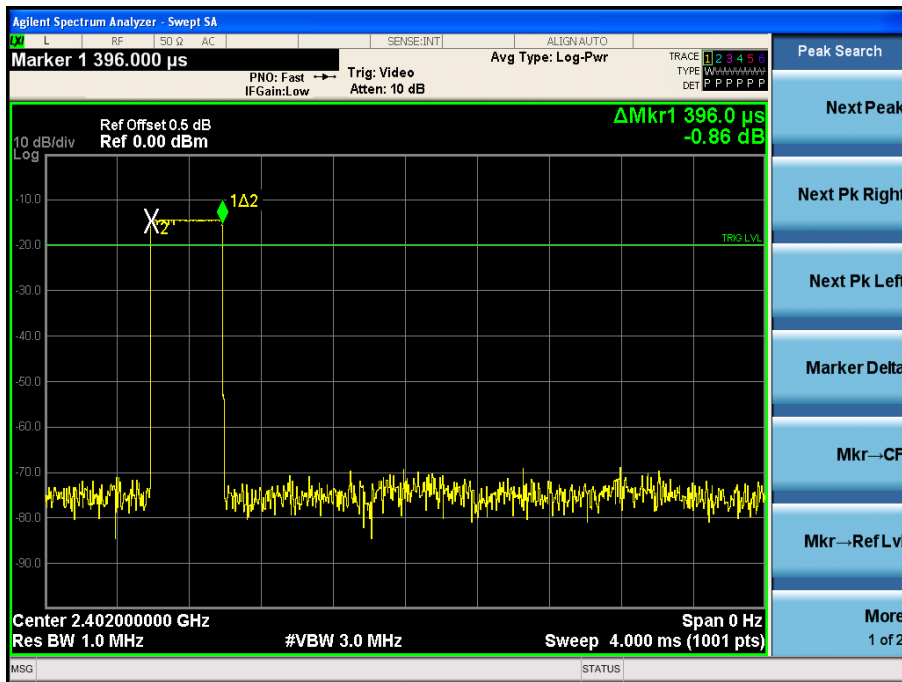
Detailed information please see the following page.

EUT: DIVOOM Bluetooth Speaker M/N: Timebox-mini						
Test date: 2017-2-12		Test site: RF site		Tested by: Reak		
Mode	Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limit (s)	Conclusion
GFSK	DH1	2402	0.396	0.253	<0.4	PASS
	DH3	2402	1.644	0.351	<0.4	PASS
	DH5	2402	2.892	0.370	<0.4	PASS
$\pi/4$ DQPSK	DH1	2402	0.392	0.251	<0.4	PASS
	DH3	2402	1.636	0.349	<0.4	PASS
	DH5	2402	2.88	0.369	<0.4	PASS
8- DPSK	DH1	2402	0.4	0.256	<0.4	PASS
	DH3	2402	1.648	0.352	<0.4	PASS
	DH5	2402	2.888	0.370	<0.4	PASS

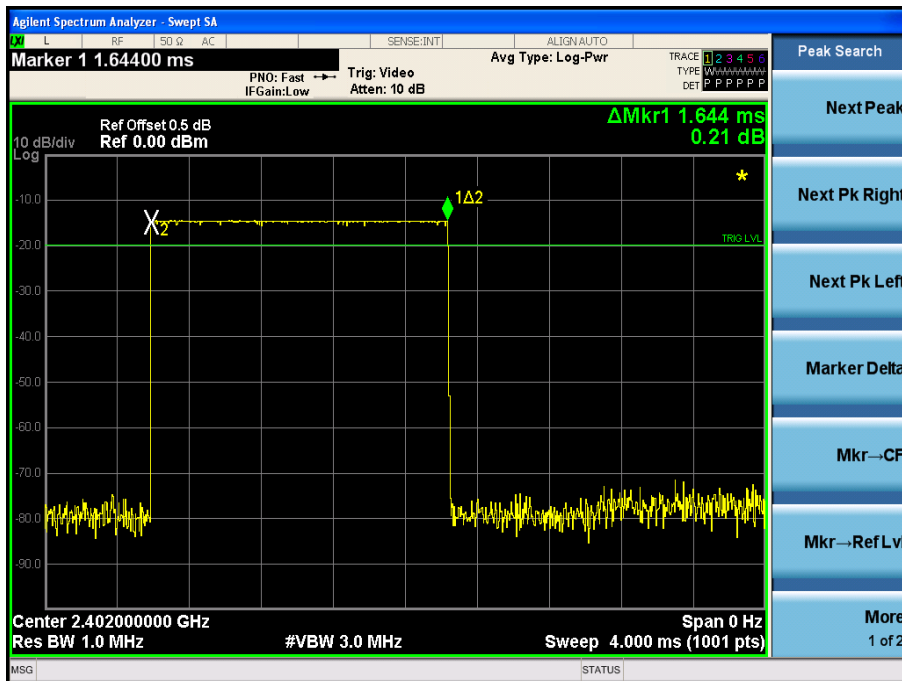
Note: 1 A period time = 0.4 (s) * 79 = 31.6(s)
2 DH1 time slot = Pulse Duration * (1600/(1*79)) * A period time/1000
DH3 time slot = Pulse Duration * (1600/(3*79)) * A period time/1000
DH5 time slot = Pulse Duration * (1600/(5*79)) * A period time/1000

GFSK

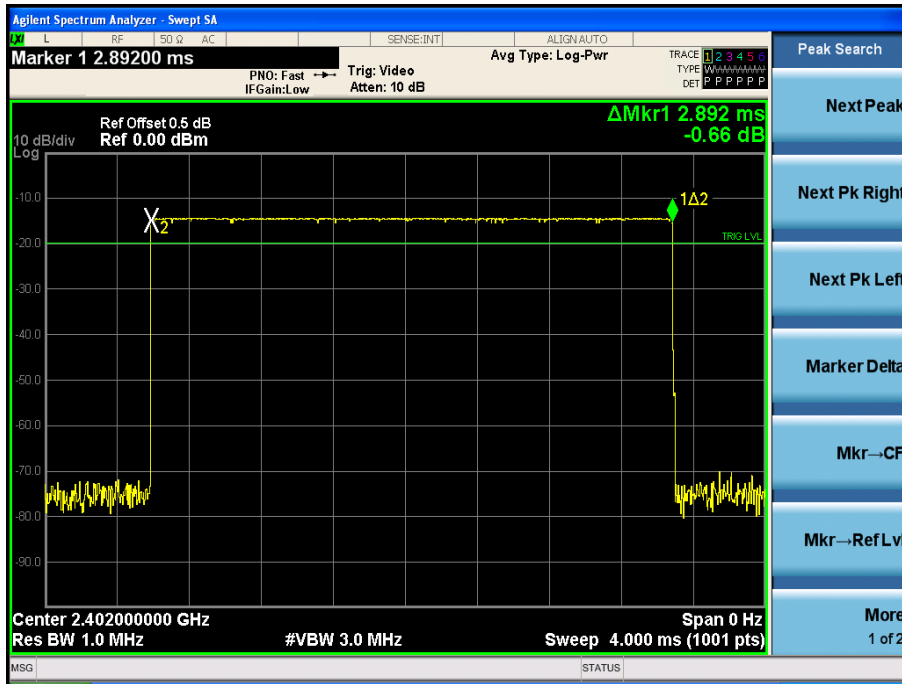
DH1:



DH3:

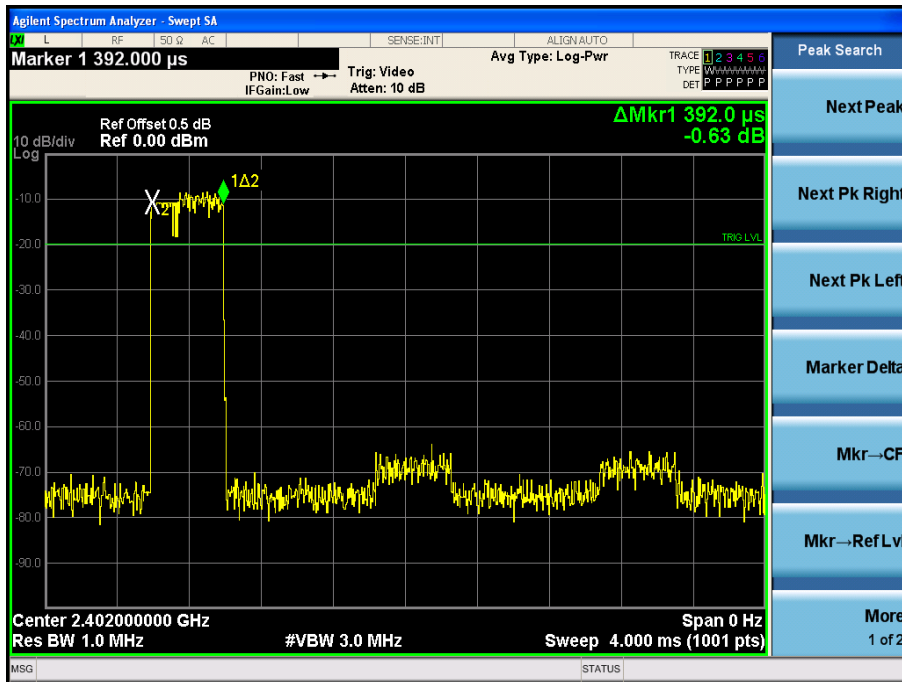


DH5

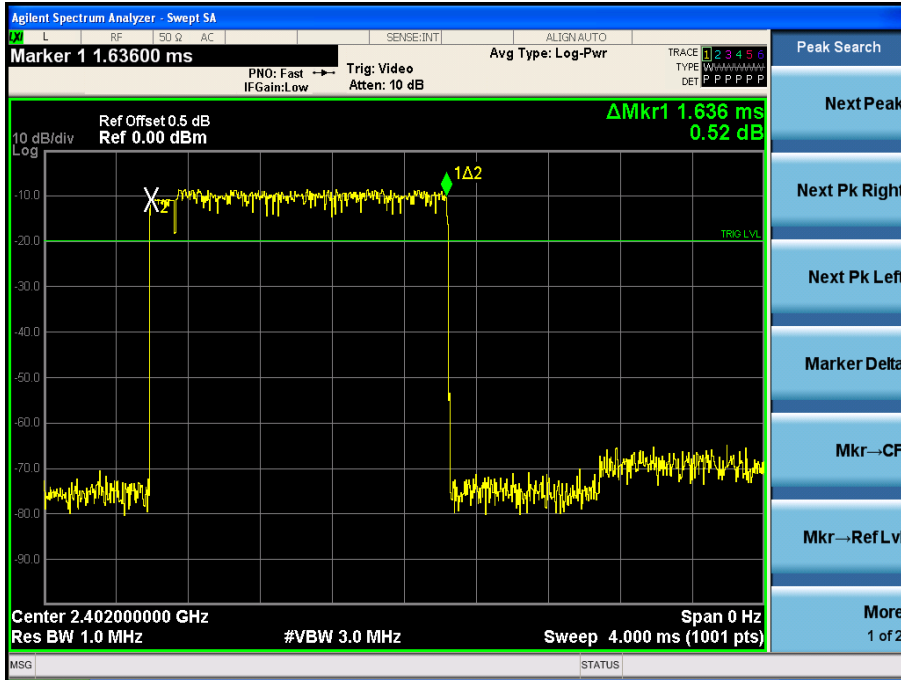


$\pi/4$ DQPSK

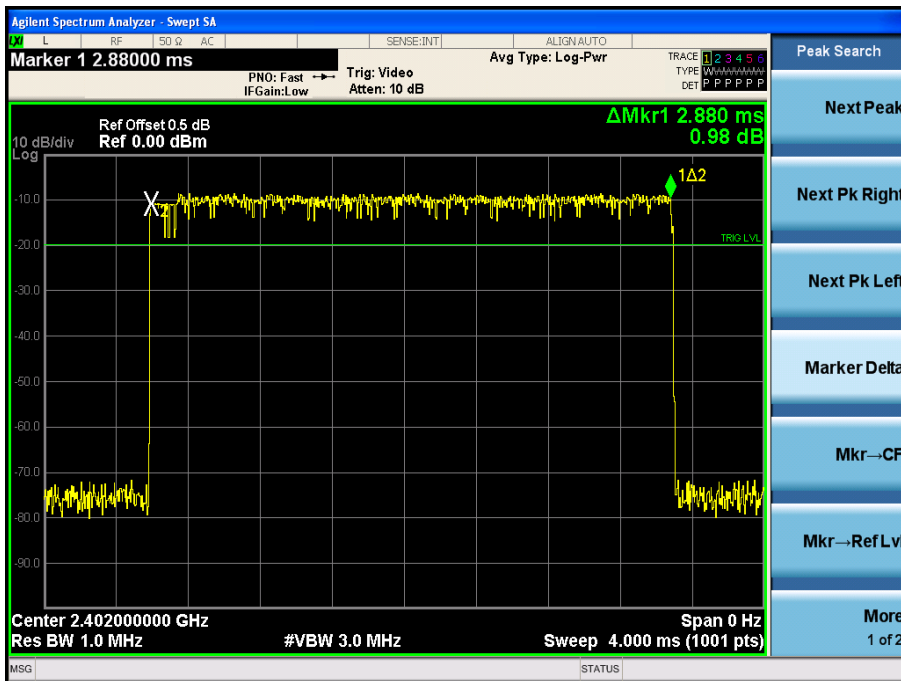
DH1



DH3

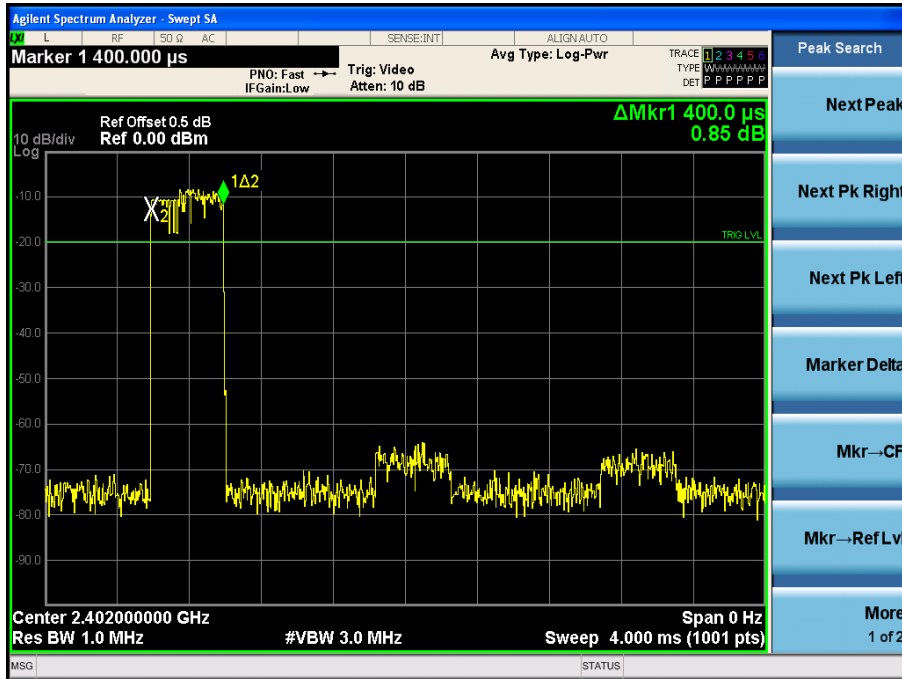


DH5

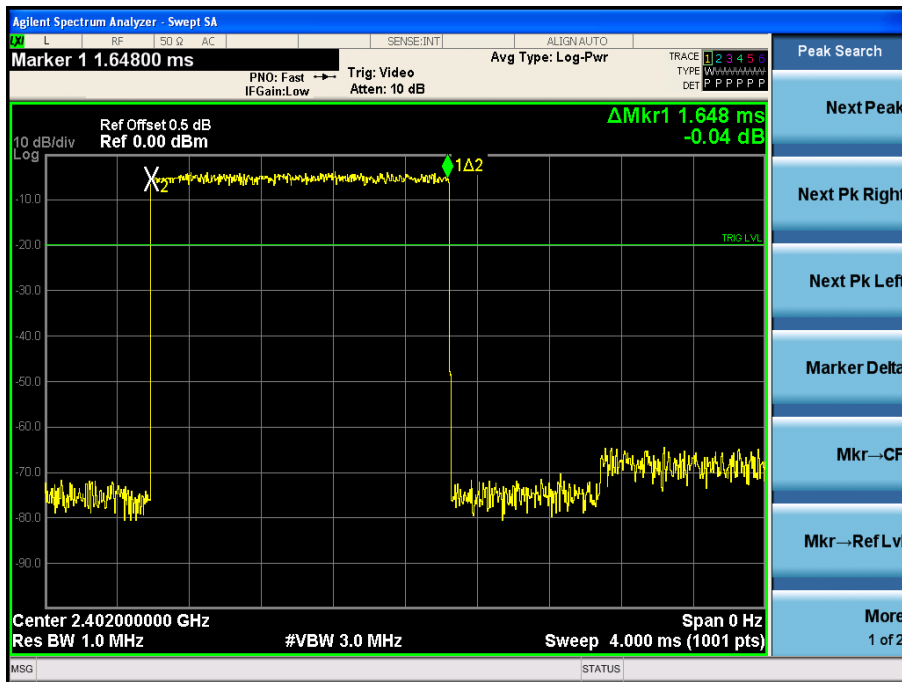


8- DPSK:

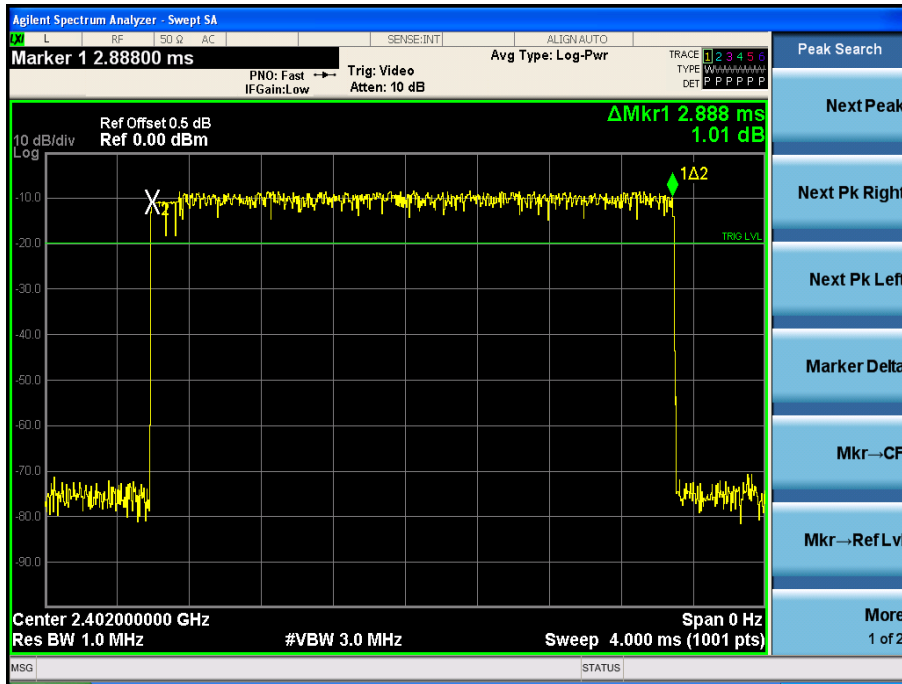
DH1:



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

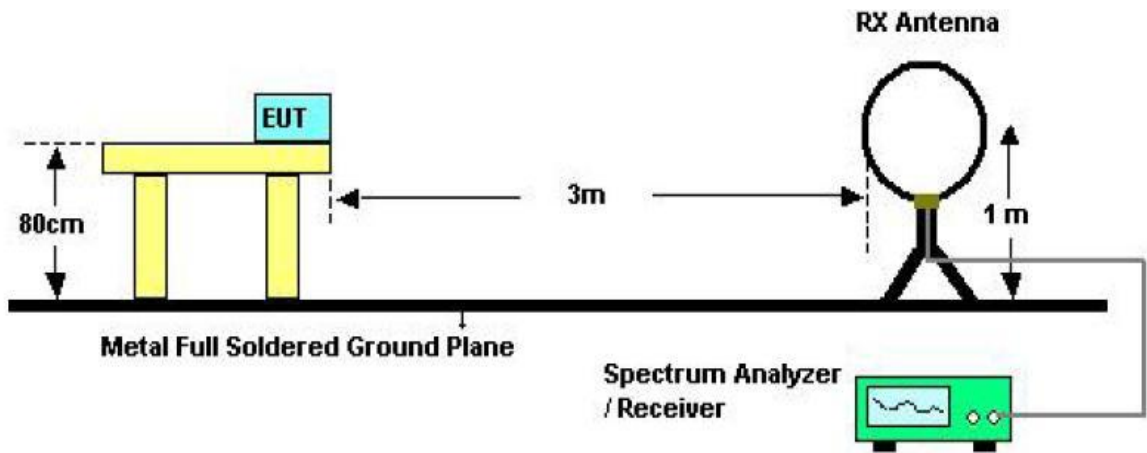
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 -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

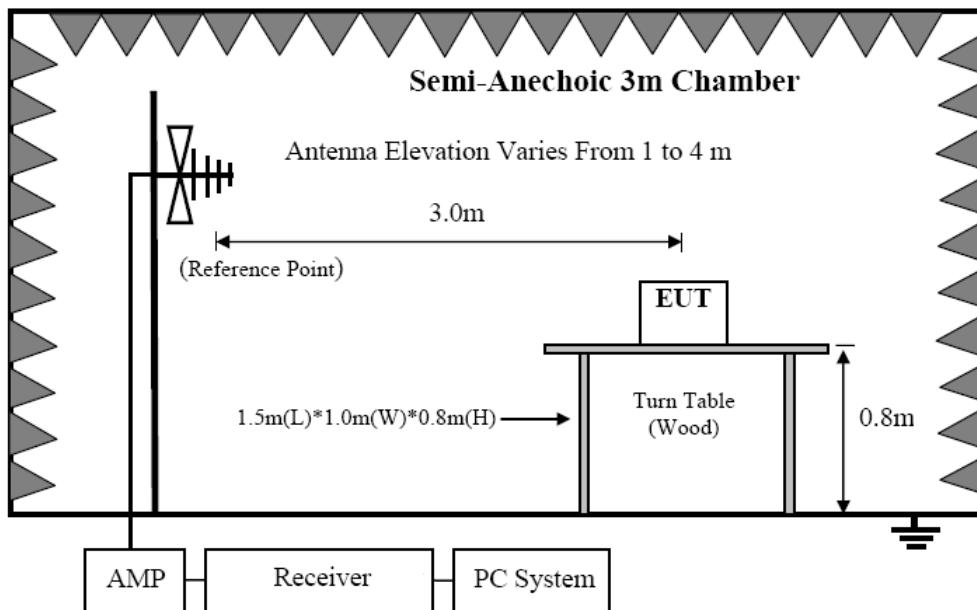
FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 dB(μV)/m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

8.2. Block Diagram of Test setup

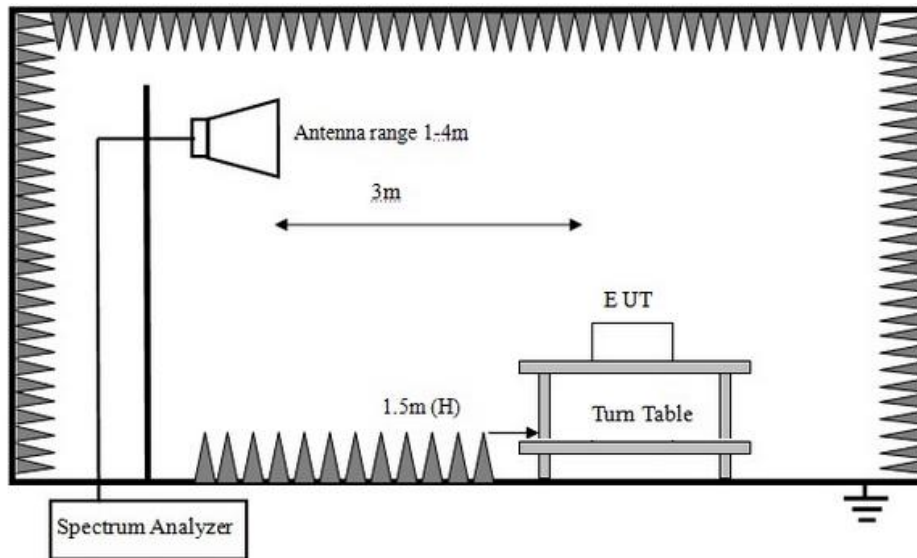
8.2.1 In 3m Anechoic Chamber Test Setup Diagram for below 30MHz



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



8.2.3 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 for below 1GHz, 1.5m above the ground plane for above 1GHz 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 C63.10 :2013on 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. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement

antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

8.4. Test Result

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

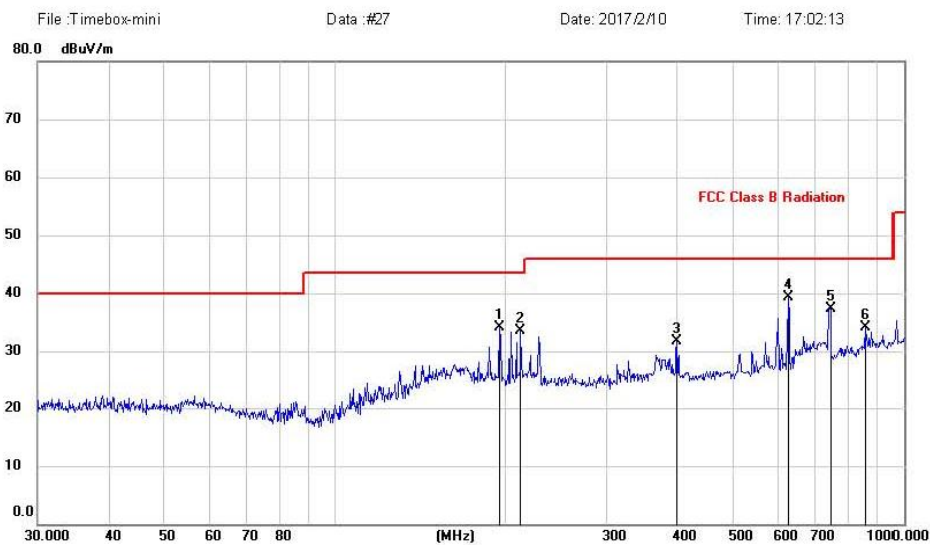
From 9KHz to 30MHz: Conclusion: PASS

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

Site: LAB	Polarization: Horizontal	Temperature: 23.9
Limit: FCC Class B Radiation	Power: DC 3.7V	Humidity: 46 %
EUT: DIVOOM Bluetooth Speaker	Distance: 3m	
MN: Timebox-mini		
Mode:Tx 2402MHz		
Note:		

Radiated Emission Measurement



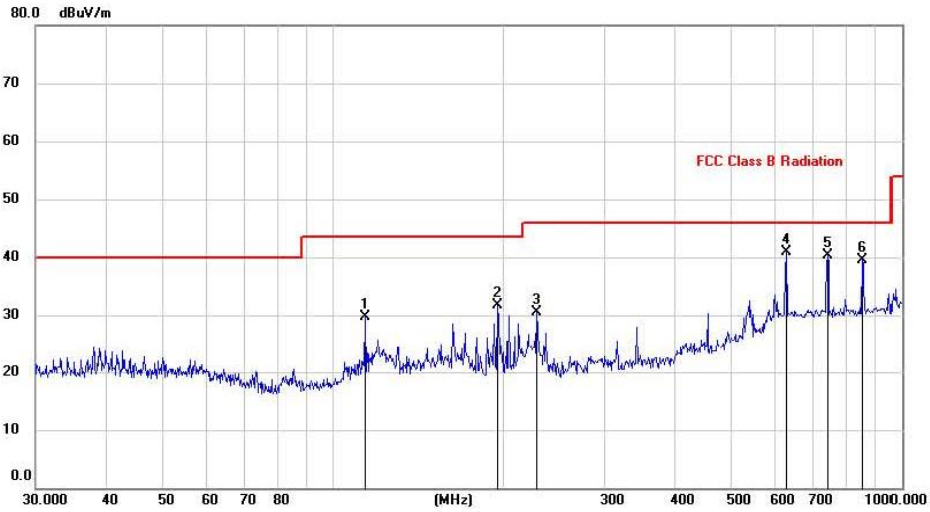
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1		195.8214	23.51	10.58	34.09	43.50	-9.41	peak	
2		212.2692	22.59	10.83	33.42	43.50	-10.08	peak	
3		399.0300	16.25	15.42	31.67	46.00	-14.33	peak	
4	*	627.2738	19.52	19.78	39.30	46.00	-6.70	peak	
5		747.4823	16.09	21.27	37.36	46.00	-8.64	peak	
6		860.0351	11.62	22.46	34.08	46.00	-11.92	peak	

Note: 1. *:Maximum data; x:Over limit; !:over margin.
 2. Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Site: LAB	Polarization: Vertical	Temperature: 23.9
Limit: FCC Class B Radiation	Power: DC 3.7V	Humidity: 46 %
EUT: DIVOOM Bluetooth Speaker	Distance: 3m	
MN: Timebox-mini		
Mode: Tx 2402MHz		
Note:		

Radiated Emission Measurement

File :Timebox-mini Data :#28 Date: 2017/2/10 Time: 17:09:58



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree degree	Comment
1		113.7142	17.83	11.91	29.74	43.50	-13.76	peak		
2		195.8214	21.06	10.58	31.64	43.50	-11.86	peak		
3		227.6904	18.87	11.68	30.55	46.00	-15.45	peak		
4	*	627.2738	21.08	19.78	40.86	46.00	-5.14	peak		
5		742.2586	19.16	21.19	40.35	46.00	-5.65	peak		
6		854.0247	16.85	22.58	39.43	46.00	-6.57	peak		

Note:1. *:Maximum data; x:Over limit; !:over margin.
 2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna 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: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
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	42.54	33.95	10.18	34.26	52.41	74	21.59	PK
2	4804	32.33	33.95	10.18	34.26	42.2	54	11.8	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	43.68	33.95	10.18	34.26	53.55	74	20.45	PK
2	4804	33.51	33.95	10.18	34.26	43.38	54	10.62	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: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
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	42.69	33.93	10.2	34.29	52.53	74	21.47	PK
2	4882	32.72	33.93	10.2	34.29	42.56	54	11.44	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	43.55	33.93	10.2	34.29	53.39	74	20.61	PK
2	4882	33.16	33.93	10.2	34.29	43	54	11	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: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
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	43.06	33.98	10.22	34.25	53.01	74	20.99	PK
2	4960	32.59	33.98	10.22	34.25	42.54	54	11.46	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	43.98	33.98	10.22	34.25	53.93	74	20.07	PK
2	4960	33.62	33.98	10.22	34.25	43.57	54	10.43	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: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
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	44.32	33.95	10.18	34.26	54.19	74	19.81	PK
2	4804	33.82	33.95	10.18	34.26	43.69	54	10.31	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	45.62	33.95	10.18	34.26	55.49	74	18.51	PK
2	4804	35.17	33.95	10.18	34.26	45.04	54	8.96	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: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
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	44.92	33.98	10.2	34.25	54.85	74	19.15	PK
2	4882	34.67	33.98	10.2	34.25	44.6	54	9.4	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	45.63	33.93	10.2	34.29	55.47	74	18.53	PK
2	4882	35.21	33.93	10.2	34.29	45.05	54	8.95	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: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
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	43.26	33.98	10.22	34.25	53.21	74	20.79	PK
2	4960	33.01	33.98	10.22	34.25	42.96	54	11.04	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	44.35	33.98	10.22	34.25	54.3	74	19.7	PK
2	4960	34.03	33.98	10.22	34.25	43.98	54	10.02	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.									

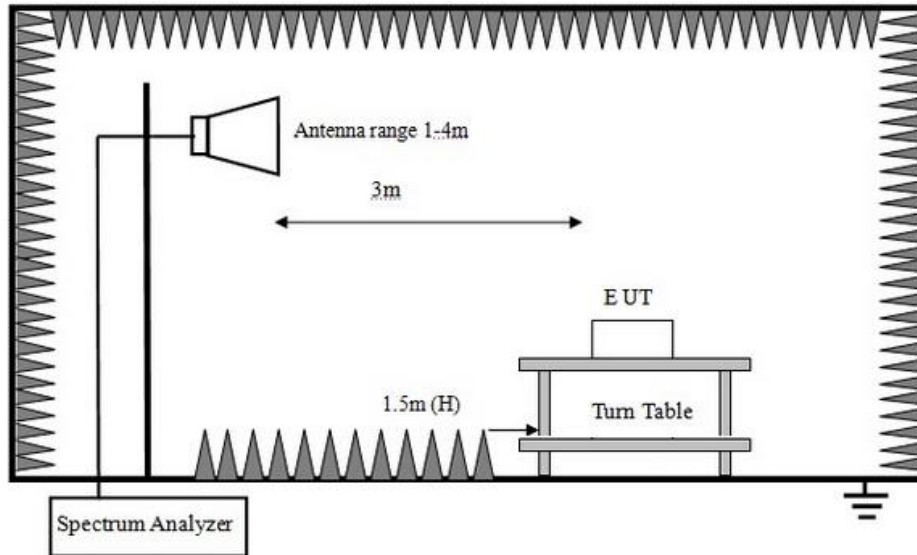
1GHz—25GHz Radiated emission Test result									
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
Test mode: 8- DPSK Tx CH1 2402MHz									
Antenna polarity: Vertical									
No	Freq (MHz)	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	43.56	33.95	10.18	34.26	53.43	74	20.57	PK
2	4804	33.17	33.95	10.18	34.26	43.04	54	10.96	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	44.23	33.95	10.18	34.26	54.1	74	19.9	PK
2	4804	33.82	33.95	10.18	34.26	43.69	54	10.31	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: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
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	43.24	33.93	10.2	34.29	53.08	74	20.92	PK
2	4882	32.76	33.93	10.2	34.29	42.6	54	11.4	AV
3	7323	/							
4	9764	/							
5	12205	/							
Antenna Polarity: Horizontal									
1	4882	43.92	33.93	10.2	34.29	53.76	74	20.24	41.48
2	4882	33.39	33.93	10.2	34.29	43.23	54	10.77	31.09
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: DIVOOM Bluetooth Speaker					M/N: Timebox-mini				
Power: DC 3.7V From Battery									
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak									
Test mode: 8- DPSK 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	42.62	33.98	10.22	34.25	52.57	74	21.43	PK
2	4960	32.23	33.98	10.22	34.25	42.18	54	11.82	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	43.52	33.98	10.22	34.25	53.47	74	20.53	PK
2	4960	33.16	33.98	10.22	34.25	43.11	54	10.89	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 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

9.3. Test Procedure

All restriction band and non- restriction band have been tested , only worse case is reported.

9.4. Test Result

PASS. (See below detailed test data)

Radiated Method

GFSK (CH Low)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx CH Low 2402MHz								
Antenna polarity: Vertical								
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
2390	43.29	27.62	3.92	34.97	39.86	74	34.14	PK
Antenna Polarity: Horizontal								
2390	46.38	27.62	3.92	34.97	42.95	74	31.05	PK
Note:								
1, 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.								

GFSK (CH High)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx CH High 2480MHz								
Antenna polarity: Vertical								
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
2483.5	43.49	27.89	4	34.97	40.41	74	33.59	PK
Antenna Polarity: Horizontal								
2483.5	45.37	27.89	4	34.97	42.29	74	31.71	PK
Note:								
1, 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.								

GFSK (Hopping Low)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx								
Antenna polarity: Vertical								
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
2390	42.55	27.62	3.92	34.97	39.12	74	34.88	PK
Antenna Polarity: Horizontal								
2390	45.79	27.62	3.92	34.97	42.36	74	31.64	PK
Note:								
1, 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.								

GFSK (Hopping High)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx								
Antenna polarity: Vertical								
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
2483.5	43.18	27.89	4	34.97	40.1	74	33.9	PK
Antenna Polarity: Horizontal								
2483.5	45.72	27.89	4	34.97	42.64	74	31.36	PK
Note:								
1, 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.								

π /4 DQPSK (CH Low)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx CH Low 2402MHz								
Antenna polarity: Vertical								
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
2390	43.18	27.62	3.92	34.97	39.75	74	34.25	PK
Antenna Polarity: Horizontal								
2390	44.37	27.62	3.92	34.97	40.94	74	33.06	PK
Note:								
1, 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.								

$\pi/4$ DQPSK (CH High)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx CH High 2480MHz								
Antenna polarity: Vertical								
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
2483.5	43.26	27.89	4	34.97	40.18	74	33.82	PK
Antenna Polarity: Horizontal								
2483.5	45.74	27.89	4	34.97	42.66	74	31.34	PK
Note:								
1, 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.								

$\pi/4$ DQPSK (Hopping Low)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13			Test site: 3m Chamber			Tested by: Reak		
Test mode: Tx								
Antenna polarity: Vertical								
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
2390	42.81	27.62	3.92	34.97	39.38	74	34.62	PK
Antenna Polarity: Horizontal								
2390	44.29	27.62	3.92	34.97	40.86	74	33.14	PK
Note:								
1, 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.								

π /4 DQPSK (Hopping High)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13			Test site: 3m Chamber		Tested by: Reak			
Test mode: Tx								
Antenna polarity: Vertical								
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
2483.5	43.53	27.89	4	34.97	40.45	74	33.55	PK
Antenna Polarity: Horizontal								
2483.5	46.31	27.89	4	34.97	43.23	74	30.77	PK
Note:								
1, 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.								

8- DPSK (CH Low)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx CH Low 2402MHz								
Antenna polarity: Vertical								
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
2390	42.37	27.62	3.92	34.97	38.94	74	35.06	PK
Antenna Polarity: Horizontal								
2390	44.95	27.62	3.92	34.97	41.52	74	32.48	PK
Note:								
1, 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.								

8- DPSK (CH High)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx CH High 2480MHz								
Antenna polarity: Vertical								
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
2483.5	43.85	27.89	4	34.97	40.77	74	33.23	PK
Antenna Polarity: Horizontal								
2483.5	46.33	27.89	4	34.97	43.25	74	30.75	PK
Note:								
1, 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.								

8- DPSK (Hopping Low)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx								
Antenna polarity: Vertical								
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
2390	43.76	27.62	3.92	34.97	40.33	74	33.67	PK
Antenna Polarity: Horizontal								
2390	45.91	27.62	3.92	34.97	42.48	74	31.52	PK
Note:								
1, 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.								

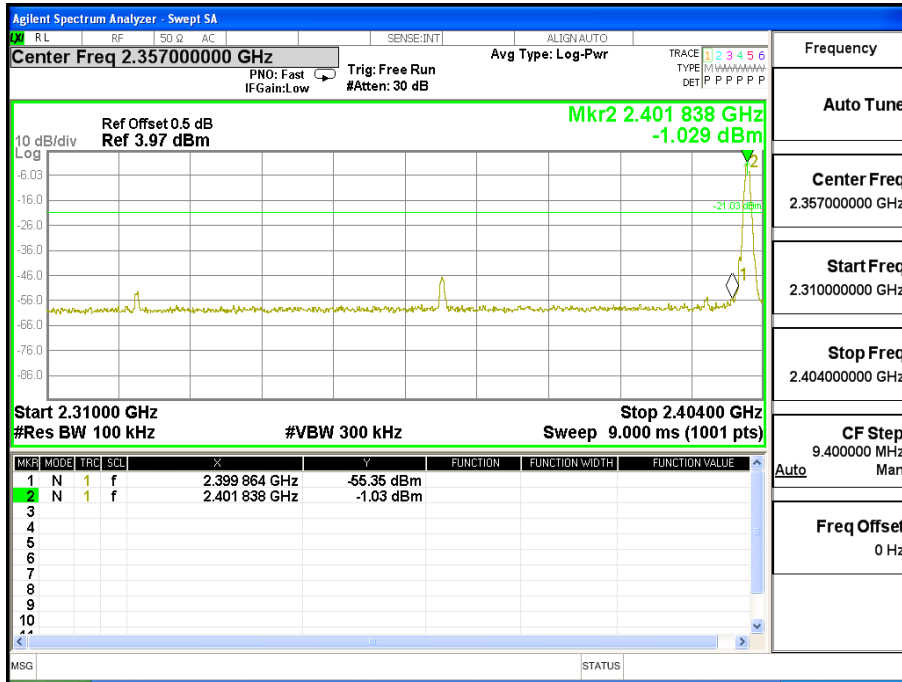
8- DPSK (Hopping High)

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-13 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx								
Antenna polarity: Vertical								
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
2483.5	43.16	27.89	4	34.97	40.08	74	33.92	PK
Antenna Polarity: Horizontal								
2483.5	45.28	27.89	4	34.97	42.2	74	31.8	PK
Note:								
1, 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.								

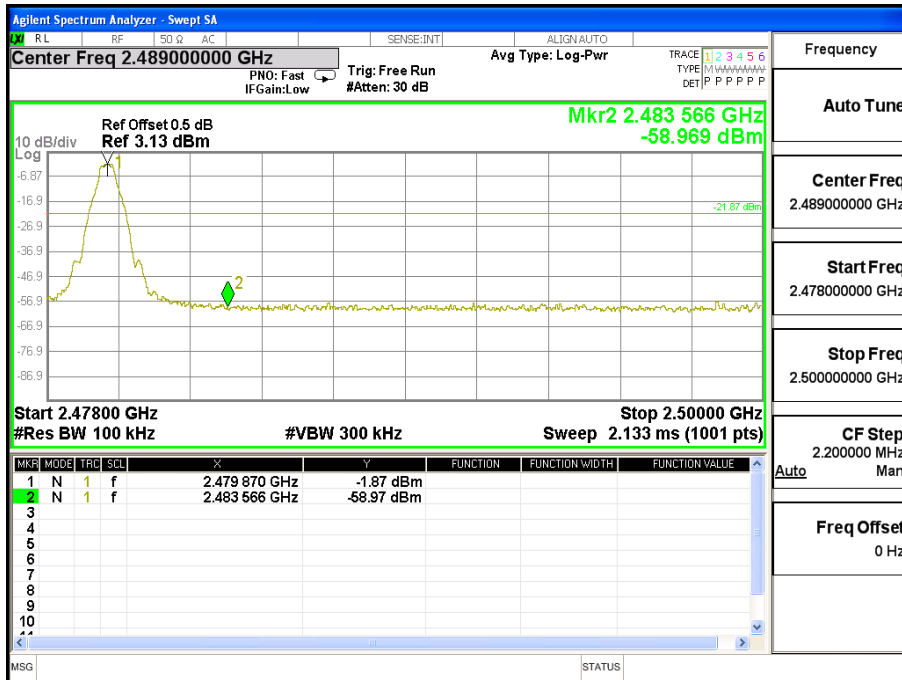
Conducted Method

GFSK

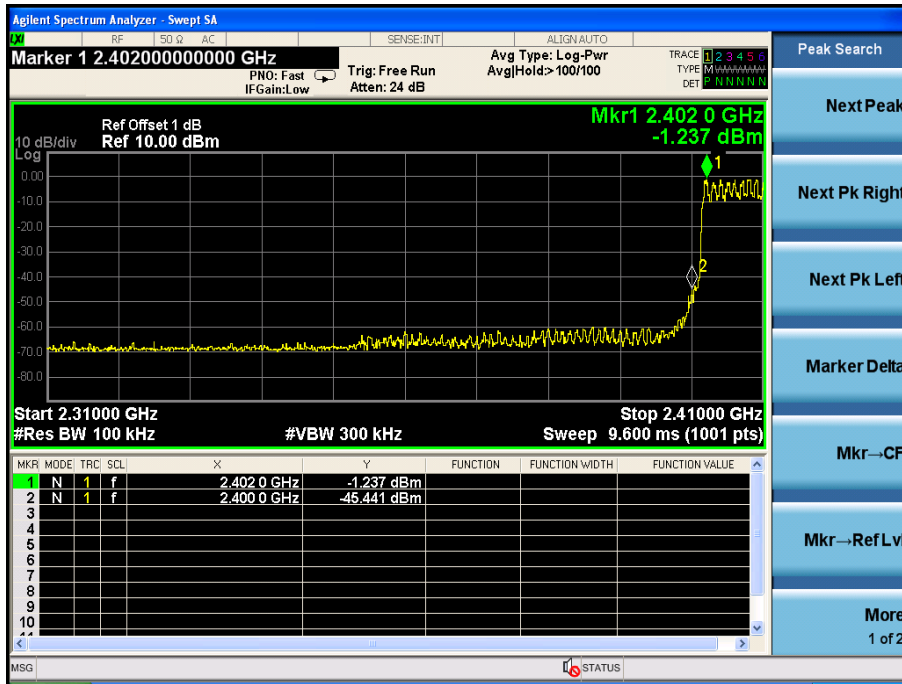
CH LOW :



CH High :



Hopping
Low

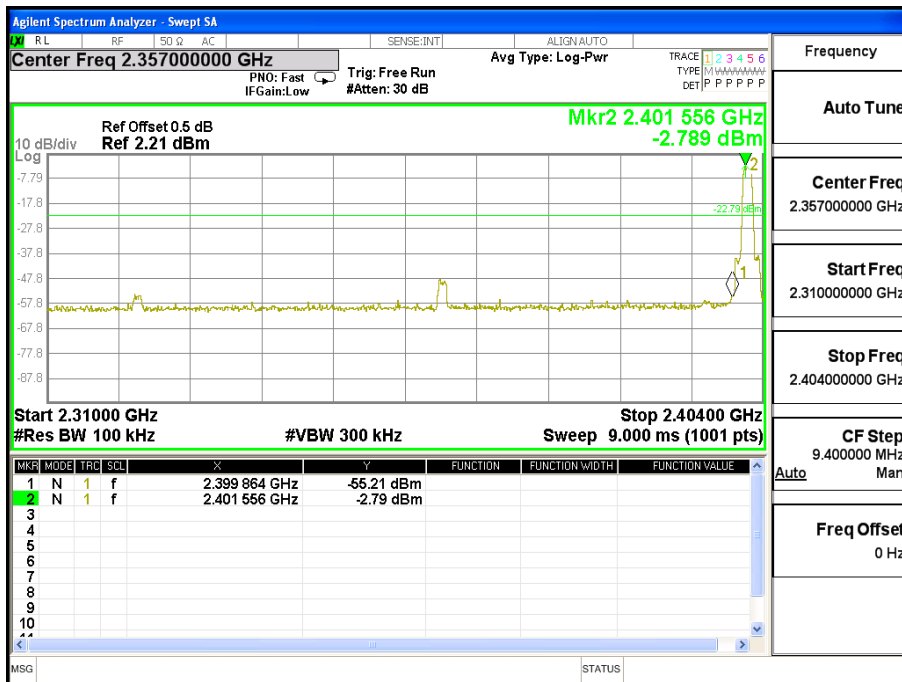


High

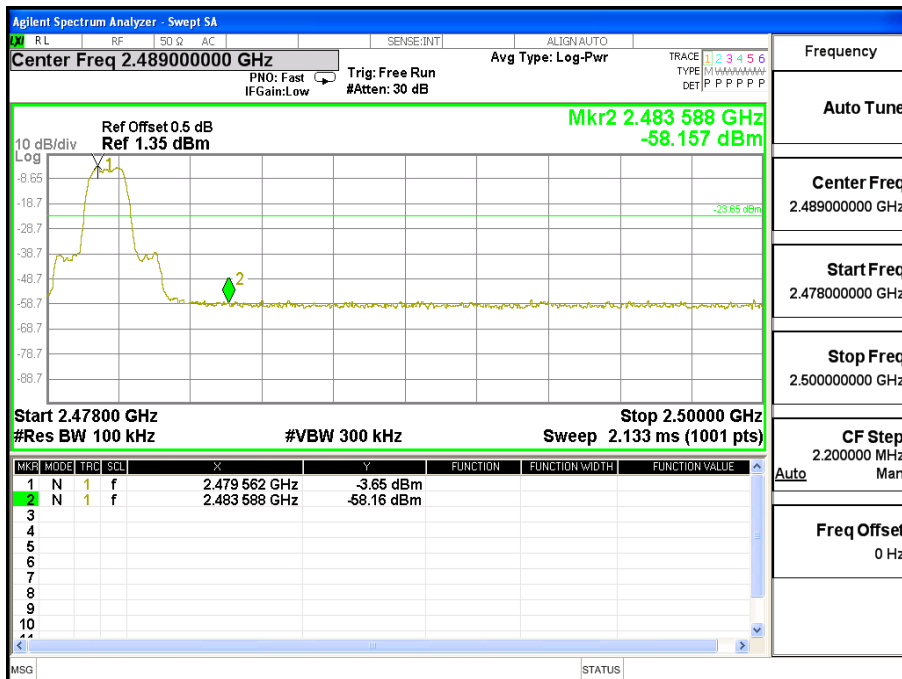


$\pi/4$ DQPSK

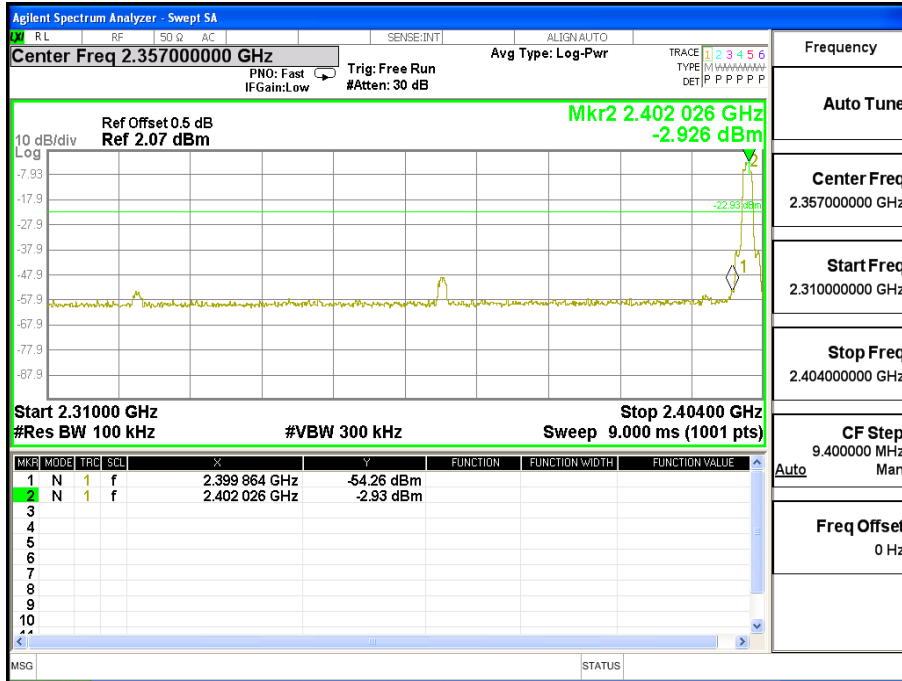
Low



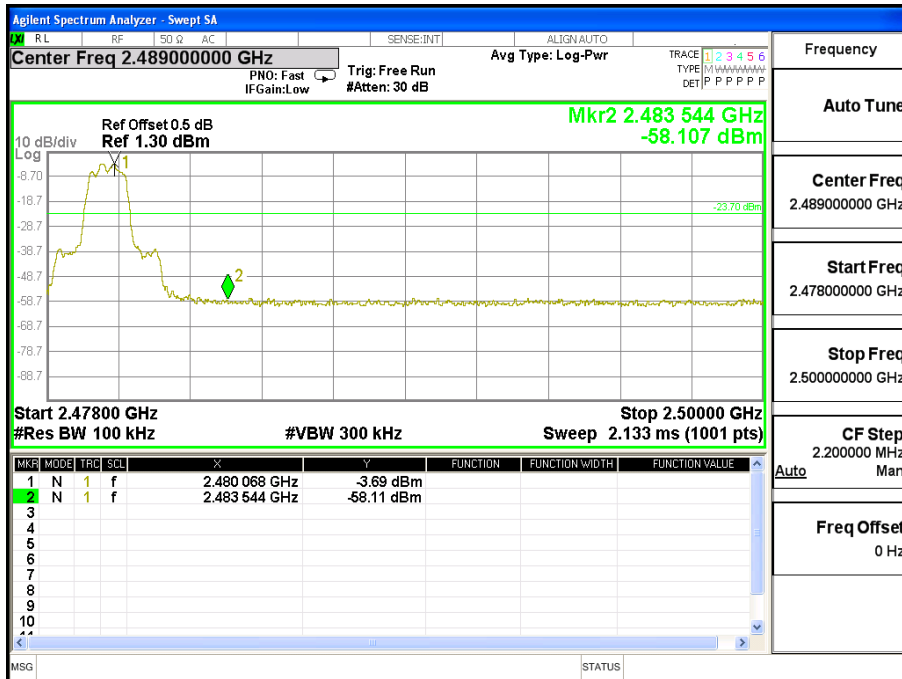
High



8- DPSK:
Low

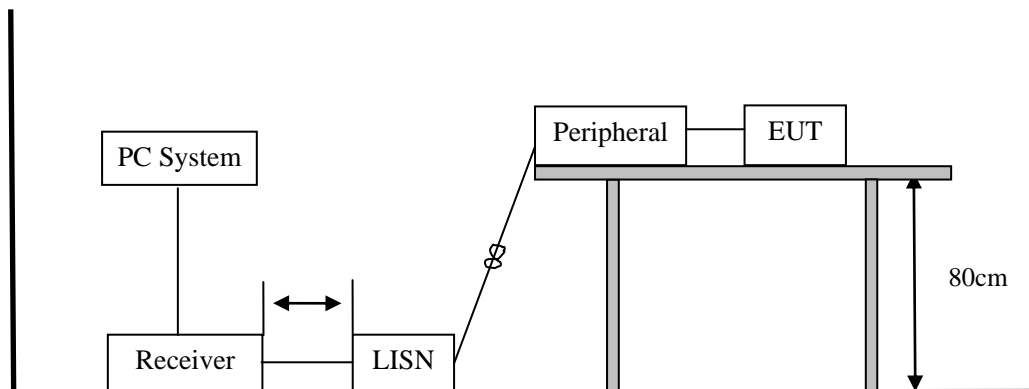


High



10. Power Line Conducted Emissions

10.1. Block Diagram of Test Setup



10.2. Limit

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

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 notebook PC or 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 C63.10 :2013on 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

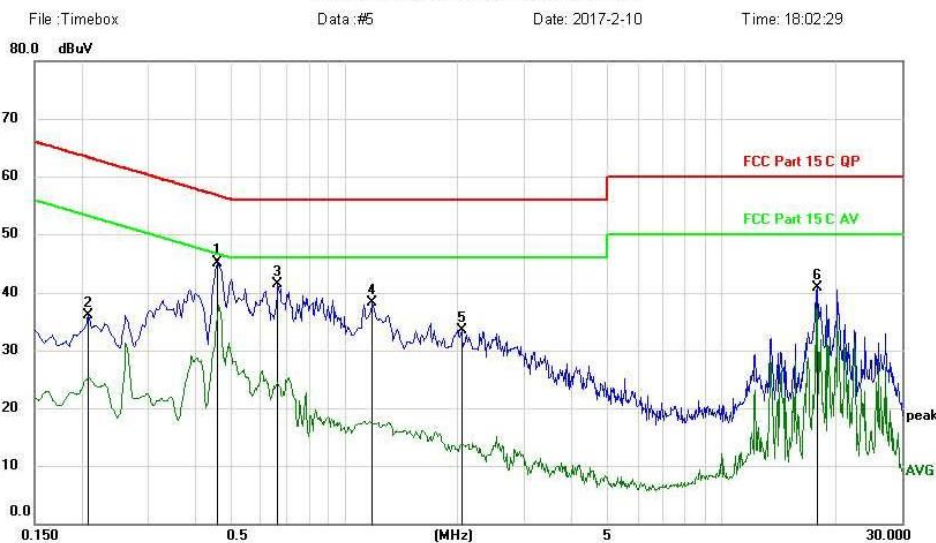
PASS. (See below detailed test data)

Note: 1.If QP Result comply with AV limit, AV Result is deemed to comply with AV limit

2.The EUT connect with PC and adapter modes are tested, find out that it connect with PC to charge is the worse mode, we only show this mode.

Site: LAB Phase: N Temperature: 24.3
 Limit: FCC Part 15 C QP Power: DC5V Humidity: 54 %
 EUT: DIVOOM Bluetooth speaker
 MN: Timebox-Mini
 Mode: Charging + Link
 Note:

Conducted Emission Measurement



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.4605	35.34	9.78	45.12	56.68	-11.56	peak	
2		0.2085	26.34	9.74	36.08	63.26	-27.18	peak	
3		0.6674	31.76	9.80	41.56	56.00	-14.44	peak	
4		1.1804	28.55	9.85	38.40	56.00	-17.60	peak	
5		2.0404	23.61	9.92	33.53	56.00	-22.47	peak	
6		17.9404	30.50	10.46	40.96	60.00	-19.04	peak	

*:Maximum data x:Over limit !:over margin (Reference Only)

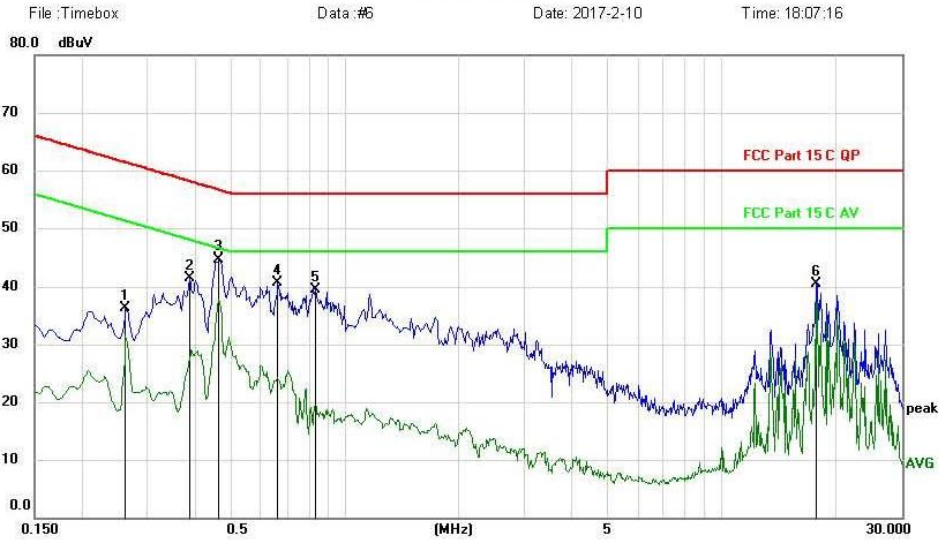
Note: Measurement=Reading Level+Correc Factor, Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Site: LAB
 Limit: FCC Part 15 C QP
 EUT: DIVOOM Bluetooth speaker
 MN: Timebox-Mini
 Mode: Charging + Link
 Note:

Phase: **L1**
 Power: DC5V

Temperature: 24.3
 Humidity: 54 %

Conducted Emission Measurement



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2625	26.54	9.76	36.30	61.35	-25.05	peak	
2		0.3885	31.70	9.77	41.47	58.10	-16.63	peak	
3	*	0.4650	34.92	9.78	44.70	56.60	-11.90	peak	
4		0.6674	30.98	9.80	40.78	56.00	-15.22	peak	
5		0.8339	29.73	9.81	39.54	56.00	-16.46	peak	
6		17.7004	29.95	10.46	40.41	60.00	-19.59	peak	

*:Maximum data x:Over limit l:over margin (Reference Only)

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

11. Antenna Requirements

11.1. Limit

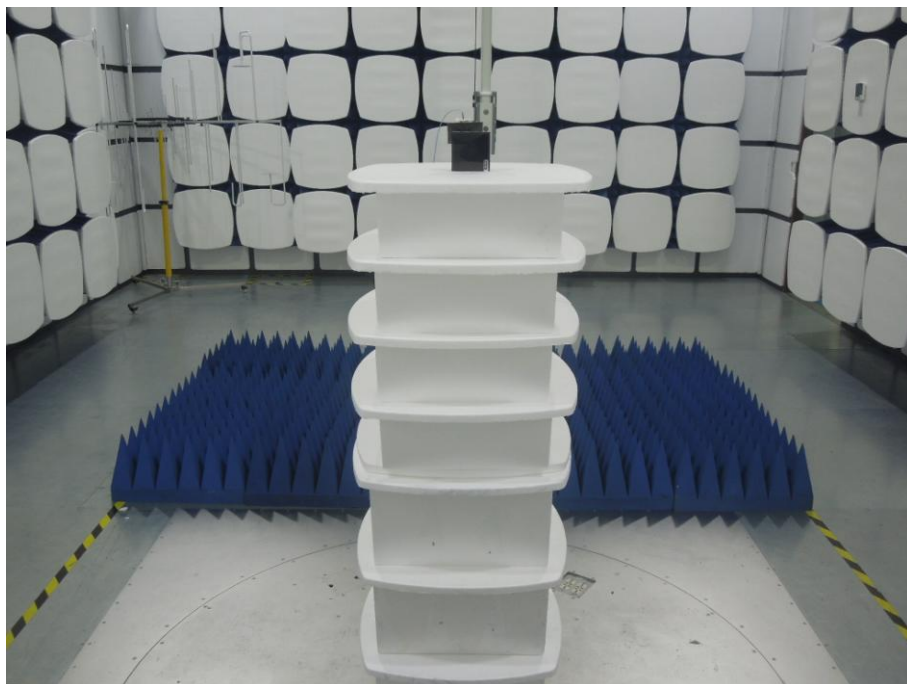
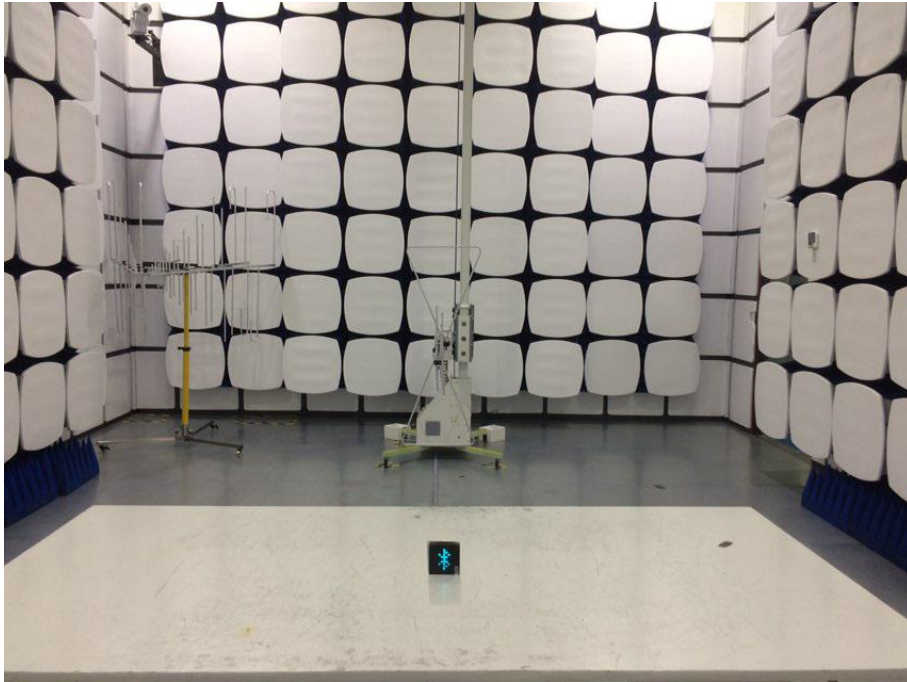
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional 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 0dBi for Bluetooth.

12. Test setup photo

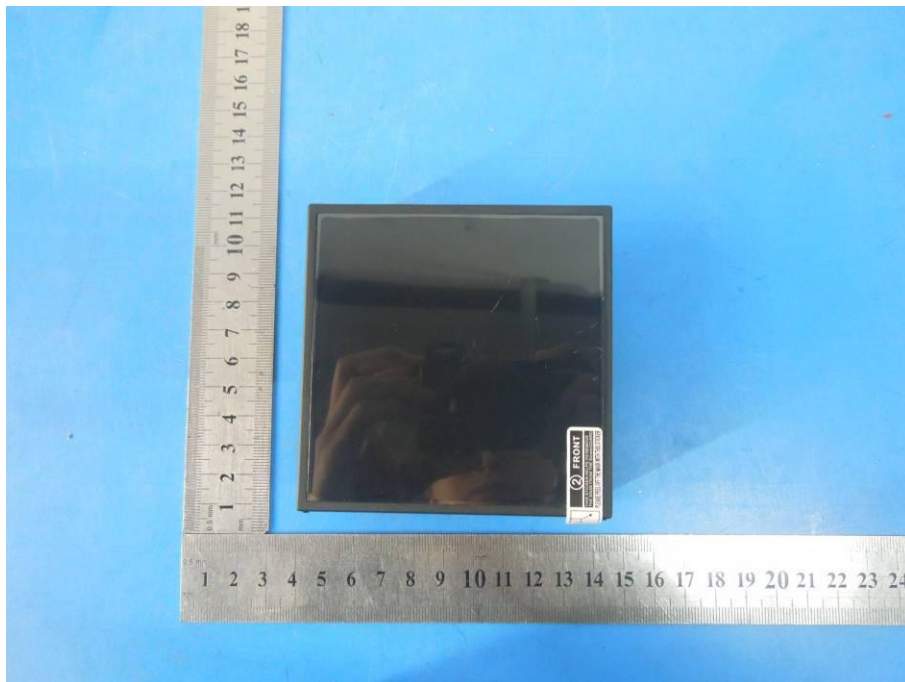
12.1. Photos of Radiated emission

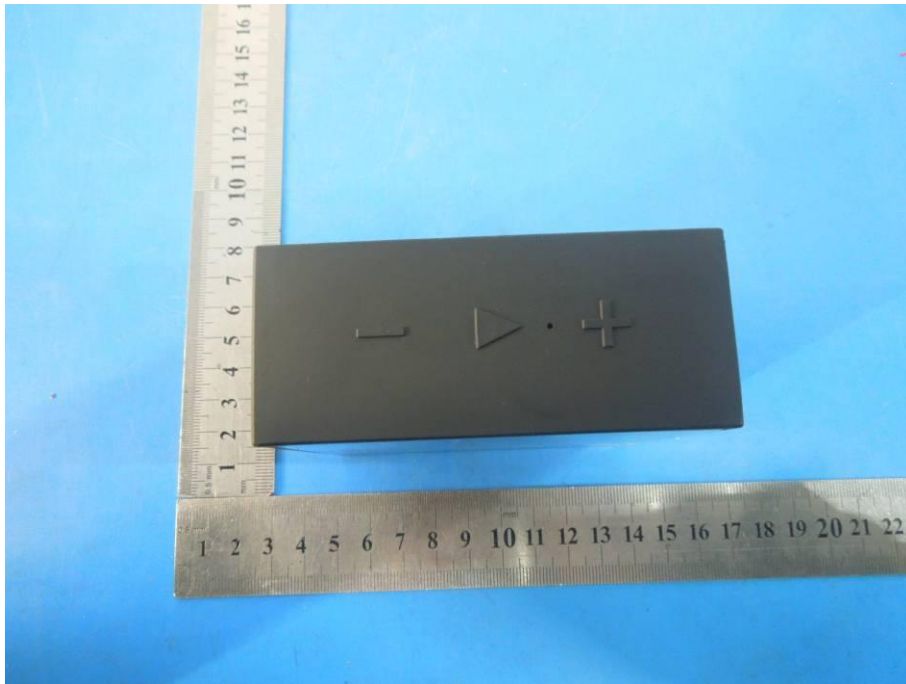


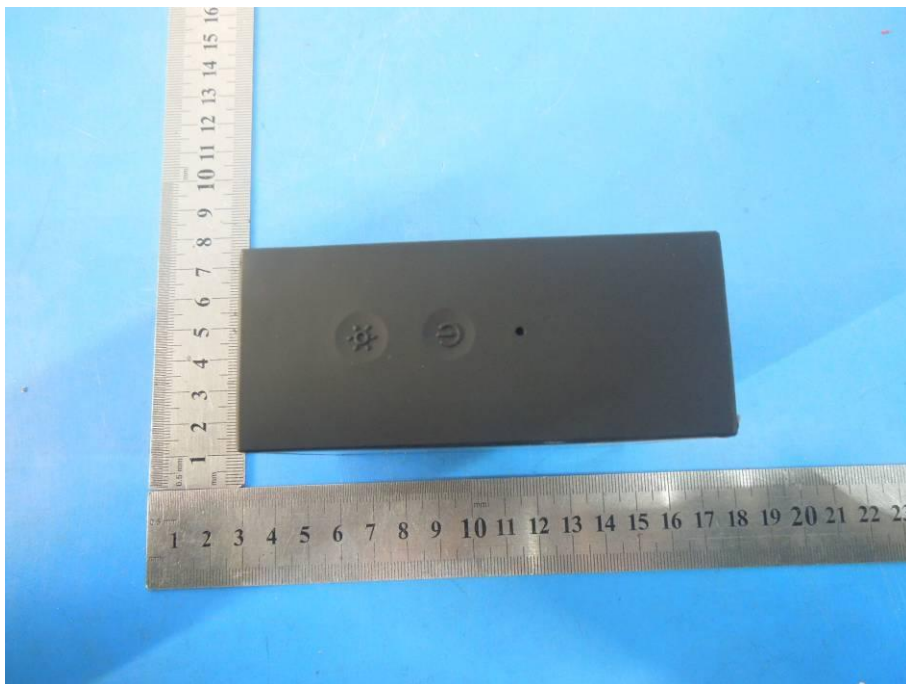
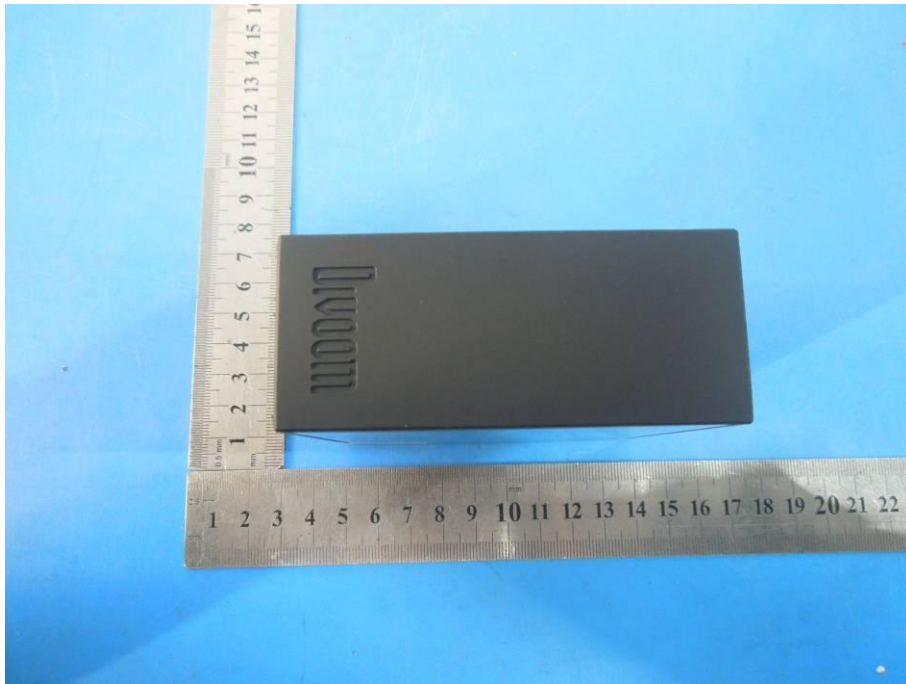
12.2.Photos of Conducted Emission test

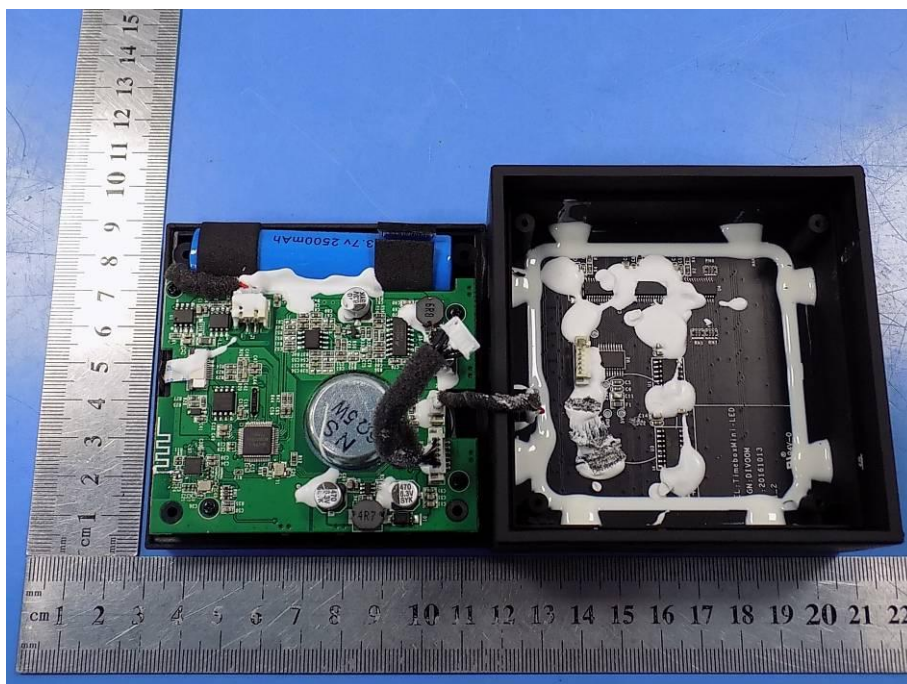
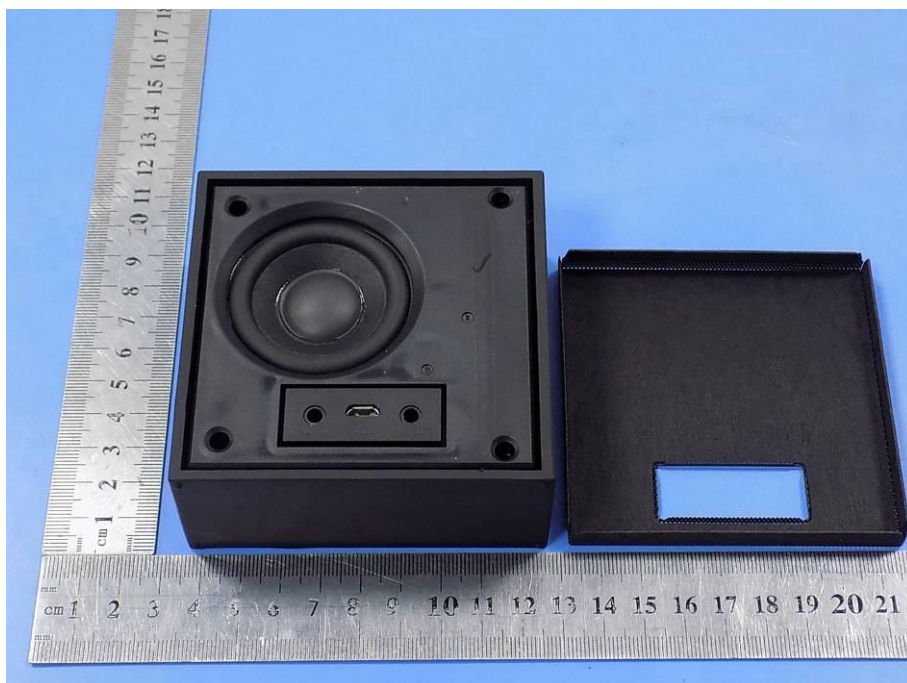


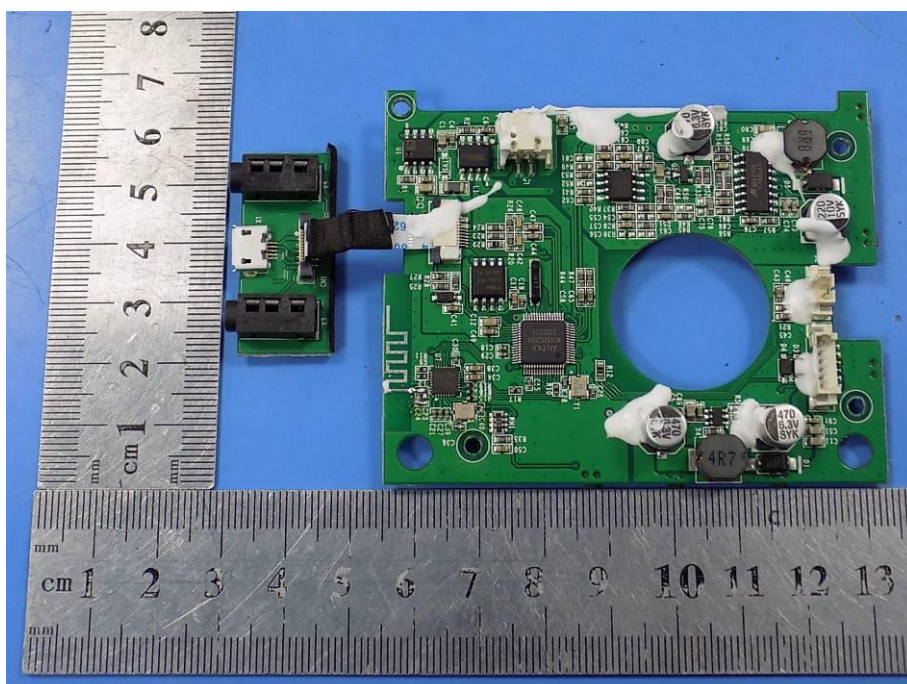
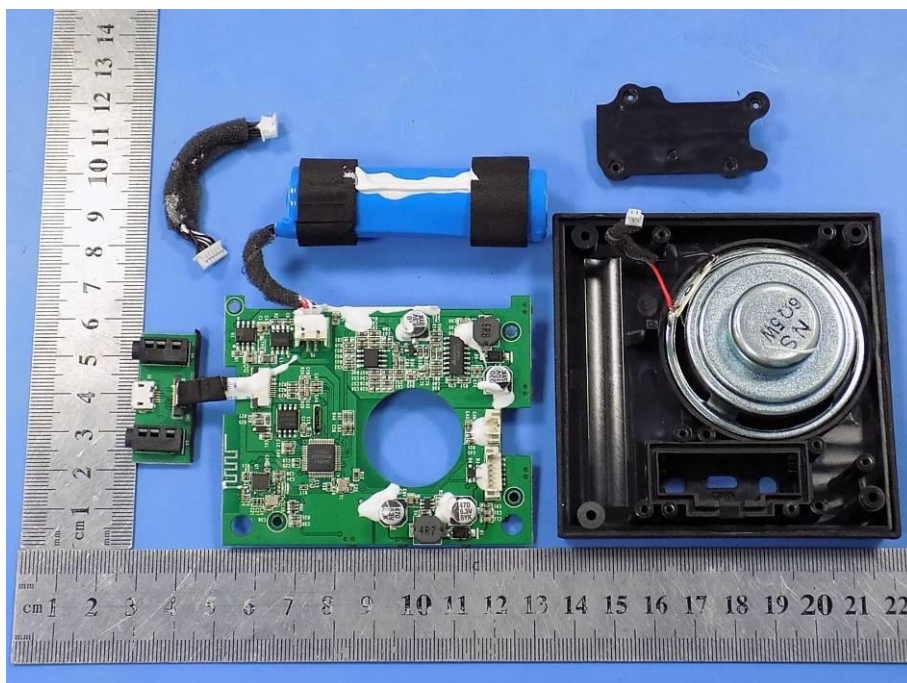
13. Photos of EUT

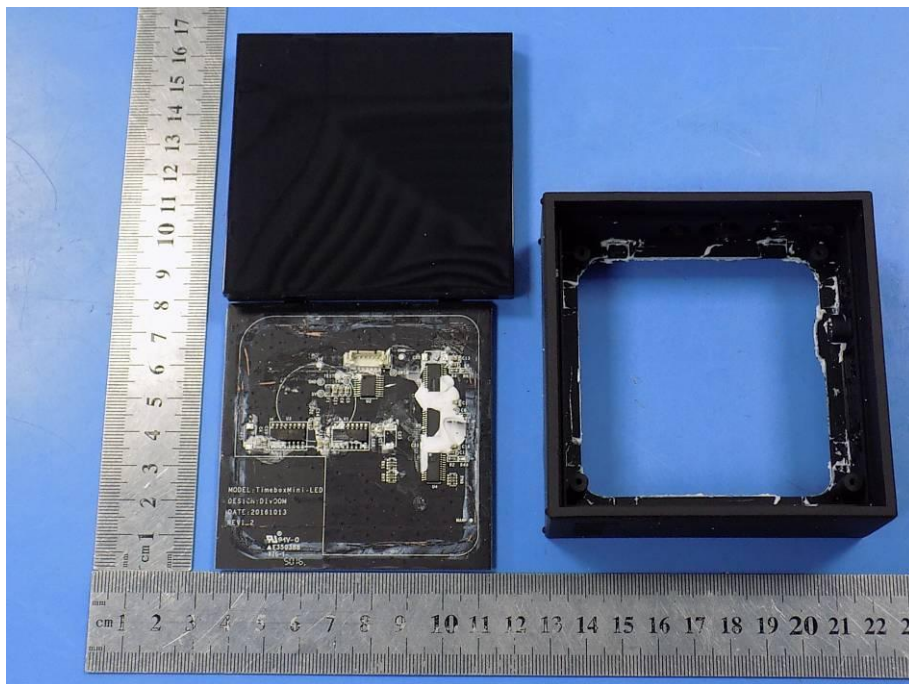
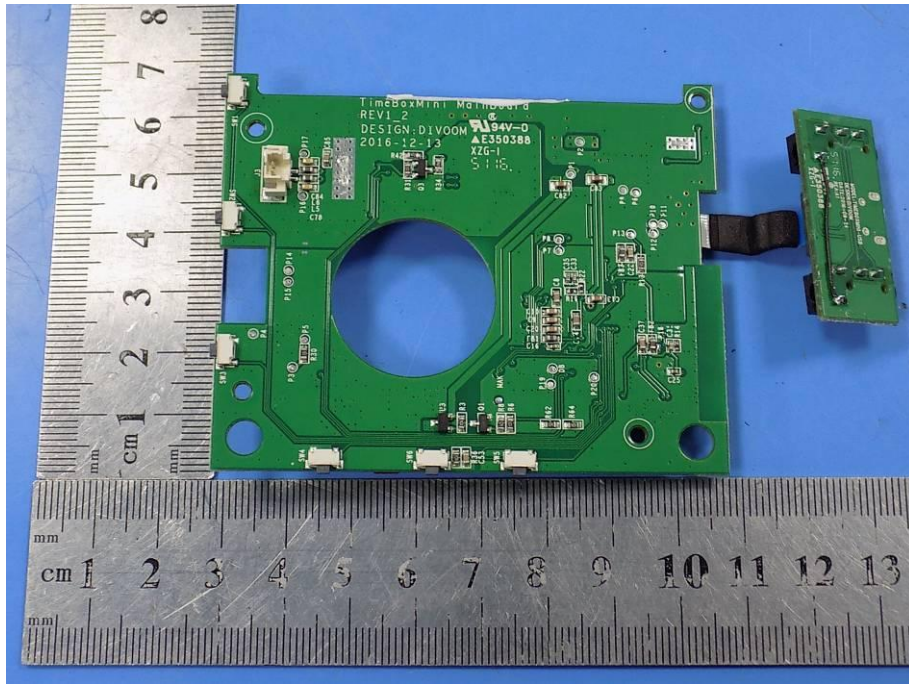


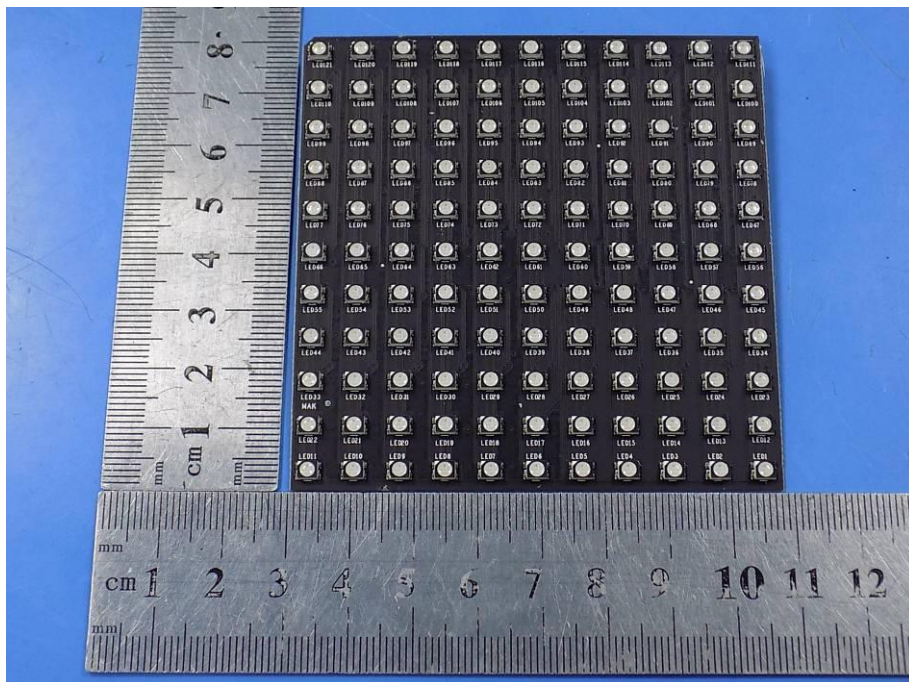
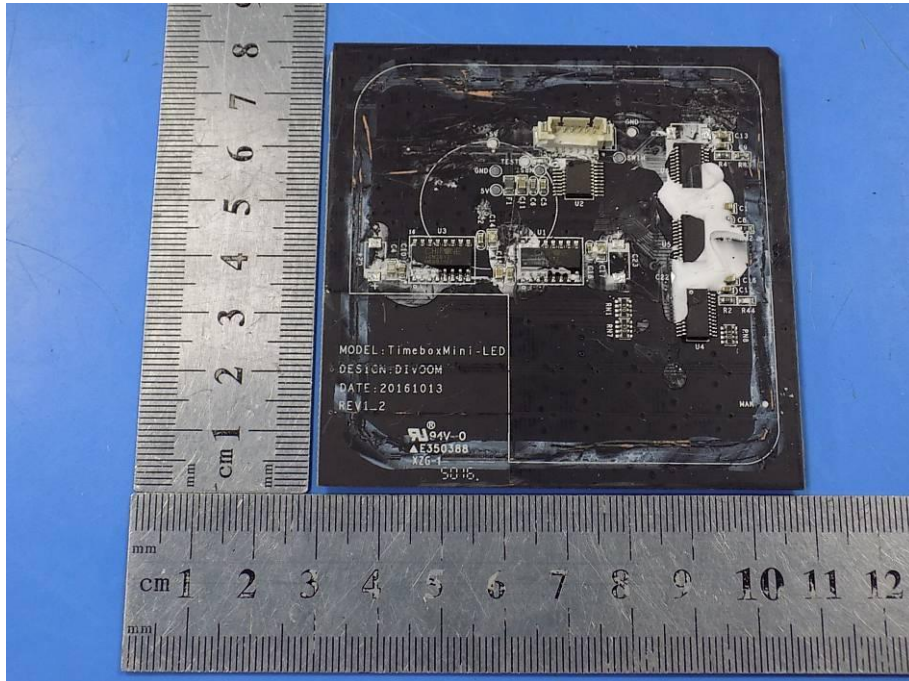












-----END OF REPORT-----