



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

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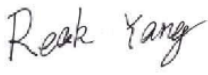
DECLARATION

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 Class B 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)

Trade Name	: DIVOOM
EUT	: DIVOOM Bluetooth Speaker
Model No.	: Timebox-mini
DIFF.	: N/A
Antenna Type	: Intergel Antenna, Maximum Gain is 0dBi
Radio Technology	: Bluetooth 4.0 BLE
Operation Frequency	: 2402-2480MHz
Channel number	: 40 Channels
Modulation type	: GFSK
Power Supply	: DC 3.7V From Battery, DC 5V From USB Port
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 Description of Test Facility

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

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

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

2 EMC Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last Cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGRE N	N/A	SEL0017	2016.09.29	1 Year
Spectrum analyzer	Agilent	E4407B	MY4951005 5	2016.09.29	1 Year
Signal Analyzer	Agilent	N9020A	MY4991000 60	2016.09.29	1 Year
Receiver	R&S	ESCI	1166.5950K0 3-1011	2016.09.29	1 Year
Receiver	R&S	ESCI	101165	2016.09.29	1 Year
Bilog Antenna	SCHWARZBEC K	VULB 9168	9168-438	2016.09.30	2Year
Horn Antenna	SCHWARZBEC K	BBHA 9120 D	BBHA 9120 D(1201)	2016.09.30	2Year
Horn Antenna	SCHWARZBEC K	BBHA 9170	BBHA 9170 D(1432)	2016.09.30	2Year
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-2000M Hz)	309972/4	2016.09.29	1 Year
Cable	Resenberger	SUCOFLEX 104(1 GHz-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	SCHWARZBEC K	BBV9743	9743-019	2016.09.29	1 Year
Pre-amplifier	Quietek	AP-180C	CHM-06020 12	2016.09.29	1 Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2017.01.16	1 Year
L.I.S.N.#2	ROHDE&SCHW ARZ	ENV216	101043	2017.01.16	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

Note: For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement.
Antenna Connector Impedance: 50Ω , Cable Loss: 1.0 dB

3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard ANSI C63.10:2013 using a 50 u H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25°C with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard ANSI C63.10:2013 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25°C with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF + CABLE = FS

33.20 dBuV + 10.36 dB + 0.9 dB= 44.46 dBuV/m @ 3m

ANSI STANDARD ANSI C63.10:2013 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard ANSI C63.10:2013 with the EUT 40 cm from the vertical ground wall.

4 Summary of Measurement

4.1 Summary of test result

Test Item	Test Requirement	Standards Paragraph	Result
Spurious Emission	FCC PART 15:2017	Section 15.247&15.209	Compliance
Conduction Emission	FCC PART 15:2017	Section 15.207	Compliance
Bandwidth Test	FCC PART 15:2017	Section 15.247	Compliance
Peak Power	FCC PART 15:2017	Section 15.247	Compliance
Power Density	FCC PART 15:2017	Section 15.247	Compliance
Band Edge	FCC PART 15:2017	Section 15.247	Compliance
Antenna Requirement	FCC PART 15:2017	Section 15.203	Compliance

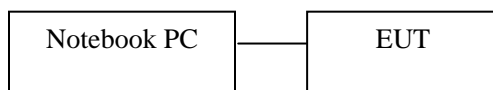
Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power

4.2 Test connection

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



4.3 Assistant equipment of EUT and used for test

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

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

4.4 Test mode

The test software(RTLBTAPP) was used to control EUT work in Continuous TX 100% duty cycle mode, and select test channel, wireless mode.

Tested mode, channel, and data rate information		
Mode	Channel	Frequency (MHz)
GFSK	Low :CH1	2402
	Middle: CH19	2440
	High: CH40	2480

4.5 Test Conditions

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

4.6 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)	3.90 dB	Polarize: V
	3.92dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.26 dB	Polarize: H
	4.28 dB	Polarize: V
Uncertainty for radio frequency	1×10^{-9}	
Uncertainty for DC and low frequency voltages	0.06%	

5 Spurious Emission

5.1 Radiation Emission

5.1.1 Radiation Emission Limits(15.209)

Frequencies (MHz)	Field Strength (microrvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

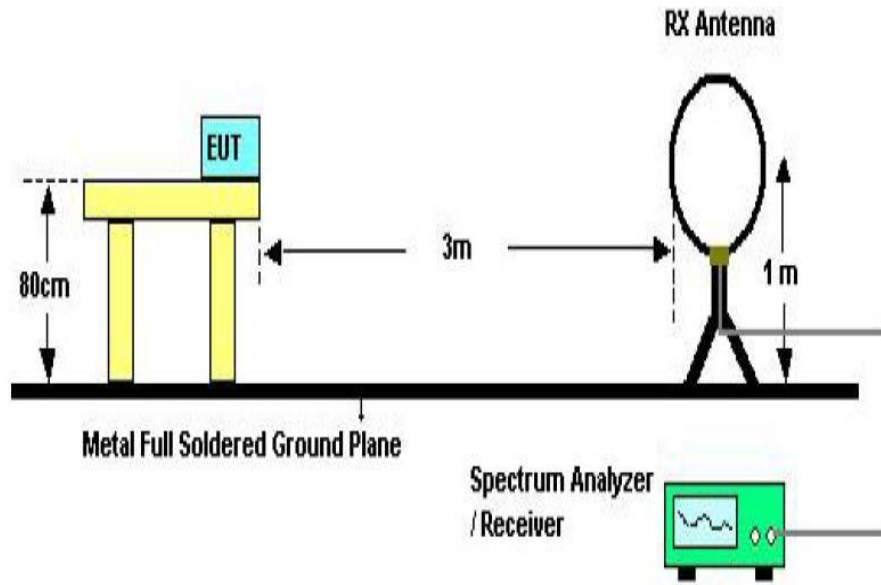
Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

NOTE:

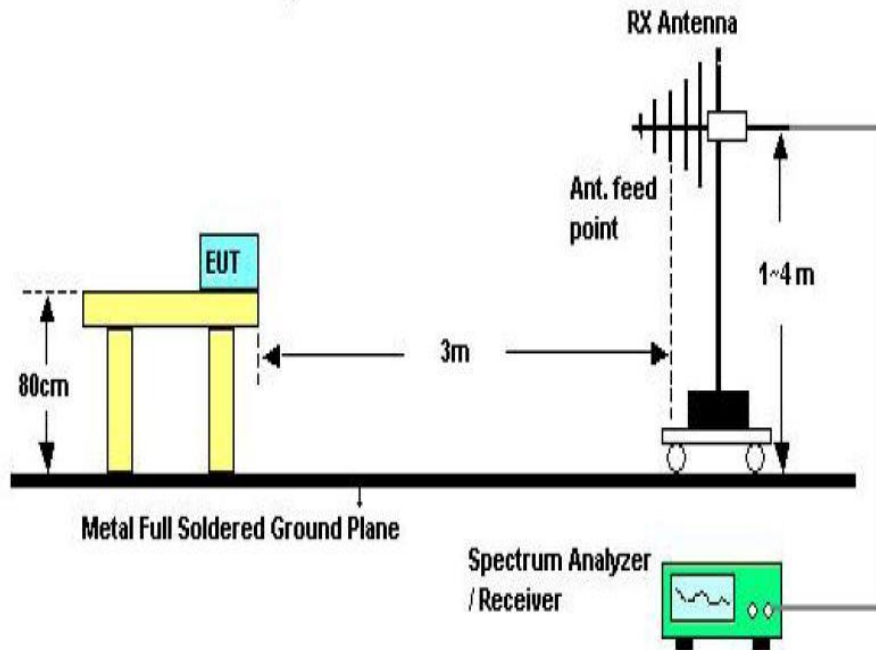
- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(uv/m)

5.1.2 Test Setup

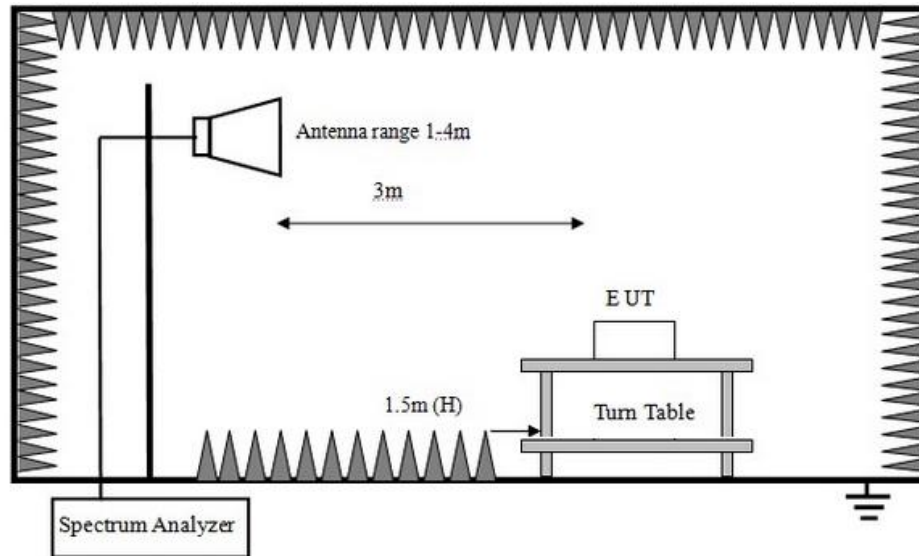
See the next page



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

5.1.3 Test Procedure

- a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above1GHz testing, The table was rotated 360 degrees to determine the position of the highest radiation
- b) The Test antenna shall vary between 1m and 4m,Both Horizontal and Vertical antenna are set of make measurement. For the radiated emission test above 1GHz: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.
- c) The initial step in collecting conducted emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Qusia Peak Detector mode

premeasured

- d) If Peak value comply with QP limit Below 1GHz.The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
- e) For the actual test configuration, please see the test setup photo.
- f) Test for all x, y, z axes is performed and only the worst case of X xes was recorded in the test report.

5.1.4 Test Equipment Setting For emission test Result

9KHz~150KHz	RBW 200Hz	VBW1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHz~1GHz	RBW 120KHz	VBW 300KHz
Above 1GHz	RBW 1MHz	VBW 3MHz

5.1.5 Test Condition

Continual Transmitting in maximum power.

5.1.6 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

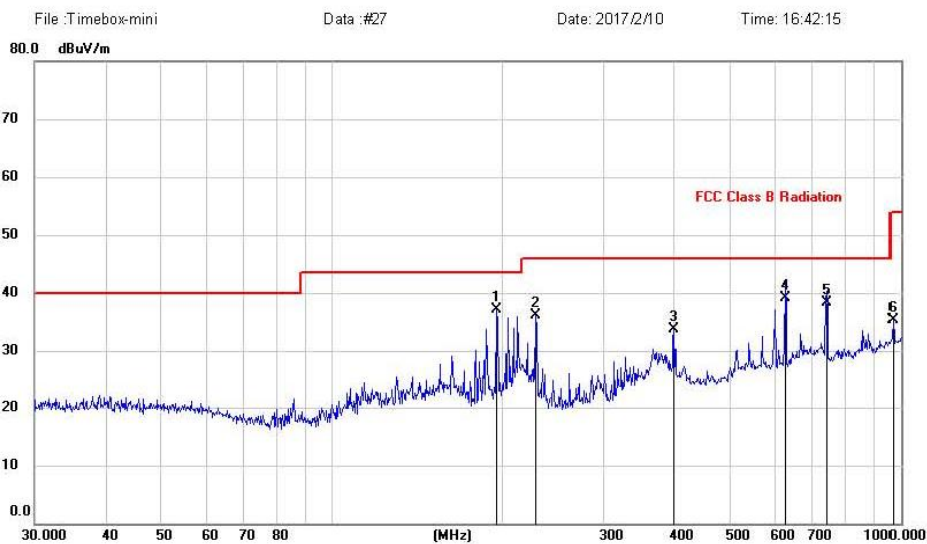
Note: The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Remark: Only show the test data of the worst Channel in this report.

From 30MHz to 1000MHz: Conclusion: PASS

Site: LAB	Polarization: <i>Horizontal</i>	Temperature: 23.9
Limit: FCC Class B Radiation	Power: DC 3.7V	Humidity: 46 %
EUT: DIVOOM Bluetooth Speaker	Distance: 3m	
M/N: 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	*	195.8216	26.51	10.58	37.09	43.50	-6.41	peak	
2		227.6904	24.36	11.68	36.04	46.00	-9.96	peak	
3		399.0300	18.25	15.42	33.67	46.00	-12.33	peak	
4		627.2738	19.42	19.78	39.20	46.00	-6.80	QP	
5		742.2586	17.21	21.19	38.40	46.00	-7.60	QP	
6		972.3373	11.58	23.77	35.35	54.00	-18.65	peak	

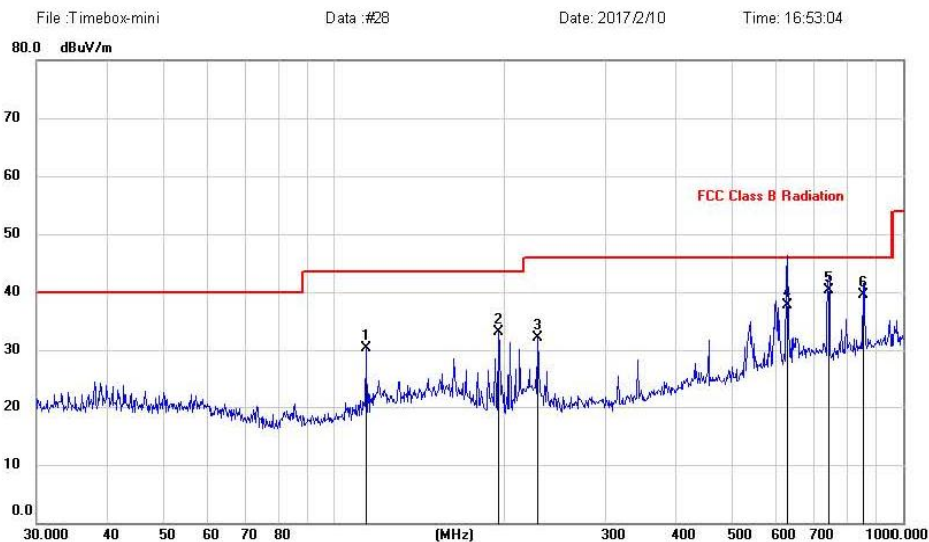
Note: 1. *:Maximum data; x:Over limit; !:over margin.
 2. Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Site: LAB
 Limit: FCC Class B Radiation
 EUT: DIVOOM Bluetooth Speaker
 M/N: Timebox-mini
 Mode: Tx 2402MHz
 Note:

Polarization: **Vertical**
 Power: DC 3.7V
 Distance: 3m

Temperature: 23.9
 Humidity: 46 %

Radiated Emission Measurement



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Antenna Height cm	Table Degree	Detector	Comment
1		113.7142	18.33	11.91	30.24	43.50	-13.26			peak	
2		195.8217	22.56	10.58	33.14	43.50	-10.36			peak	
3		227.6904	20.37	11.68	32.05	46.00	-13.95			peak	
4		627.2738	18.02	19.78	37.80	46.00	-8.20			QP	
5	*	742.2586	19.11	21.19	40.30	46.00	-5.70			peak	
6		854.0247	17.02	22.58	39.60	46.00	-6.40			QP	

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

Notes: Above is below 1GHz test data. This report only shall the worst case mode for TX 2402MHz.

From 1G-25GHz

EUT	DIVOOM Bluetooth Speaker	Model Name	Timebox-mini
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 3.7V From Battery
Test Mode	TX Low		

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	43.52	33.95	10.18	34.26	53.39	74	20.61	PK
2	4804	32.49	33.95	10.18	34.26	42.36	54	11.64	AV
3	7206	/							
4	9608	/							
5	12010	/							
Antenna Polarity: Horizontal									
1	4804	44.02	33.95	10.18	34.26	53.89	74	20.11	PK
2	4804	33.61	33.95	10.18	34.26	43.48	54	10.52	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=3MHz, Sweep time=Auto, Detector: RMS 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.									

EUT	DIVOOM Bluetooth Speaker	Model Name	Timebox-mini
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 3.7V From Battery
Test Mode	TX Mid		

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	4880	44.29	33.93	10.2	34.29	54.13	74	19.87	PK
2	4880	33.34	33.93	10.2	34.29	43.18	54	10.82	AV
3	7320	/							
4	9760	/							
5	12200	/							
Antenna Polarity: Horizontal									
1	4880	46.19	33.93	10.2	34.29	56.03	74	17.97	PK
2	4880	35.25	33.93	10.2	34.29	45.09	54	8.91	AV
3	7320	/							
4	9760	/							
5	12200	/							
<p>Note:</p> <p>1, Measuring frequency from 1GHz to 25GHz</p> <p>2,Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK</p> <p>2,Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS</p> <p>3, Result = Read level + Antenna factor + cable loss-Amp factor</p> <p>4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.</p>									

EUT	DIVOOM Bluetooth Speaker	Model Name	Timebox-mini
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 3.7V From Battery
Test Mode	TX High		

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	42.68	33.98	10.22	34.25	52.63	74	21.37	PK
2	4960	32.05	33.98	10.22	34.25	42	54	12	AV
3	7440	/							
4	9920	/							
5	12400	/							
Antenna Polarity: Horizontal									
1	4960	43.57	33.98	10.22	34.25	53.52	74	20.48	PK
2	4960	32.28	33.98	10.22	34.25	42.23	54	11.77	AV
3	7440	/							
4	9920	/							
5	12400	/							
<p>Note:</p> <p>1, Measuring frequency from 1GHz to 25GHz</p> <p>2, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK</p> <p>2,Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS</p> <p>3, Result = Read level + Antenna factor + cable loss-Amp factor</p> <p>4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.</p>									

6 POWER LINE CONDUCTED EMISSION

6.1 Conducted Emission Limits(15.207)

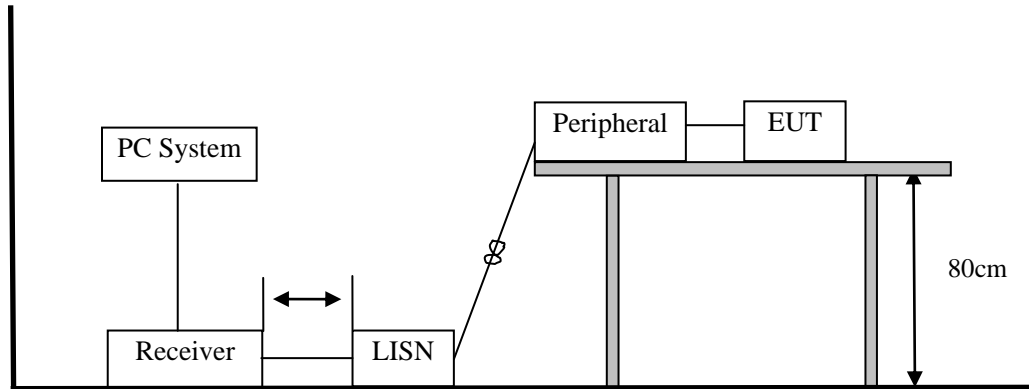
Frequency MHz	Limits dB(μ V)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

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

3.The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

6.2 Test Setup



6.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10:2013 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCI) is set at 9 kHz.

6.4 Test Results

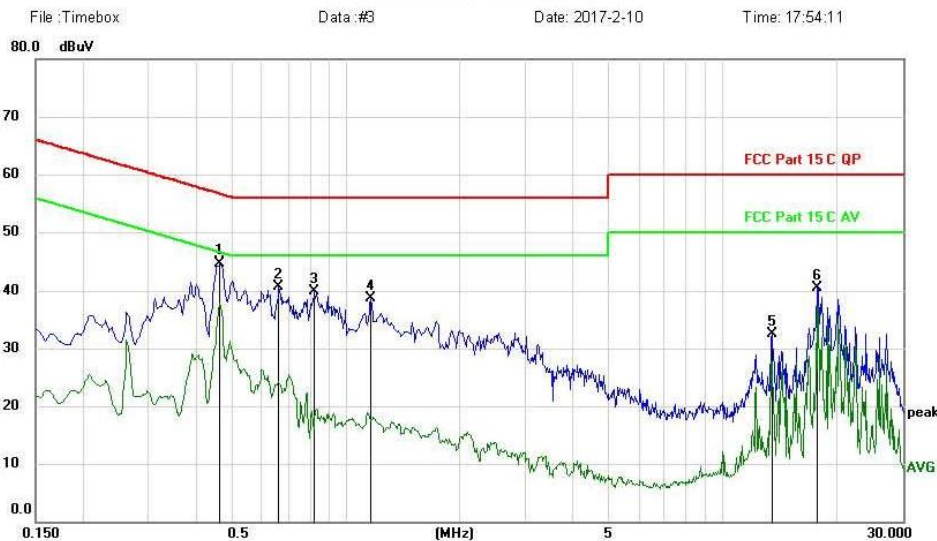
PASS. (See below detailed test data)

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: **L1** Temperature: 24.3
 Limit: FCC Part 15 C QP Power: DC5V Humidity: 54 %
 EUT: DIVOOM Bluetooth speaker
 M/N: 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	*	0.4650	34.92	9.78	44.70	56.60	-11.90	peak	
2		0.6675	30.98	9.80	40.78	56.00	-15.22	peak	
3		0.8250	30.12	9.81	39.93	56.00	-16.07	peak	
4		1.1605	28.82	9.84	38.66	56.00	-17.34	peak	
5		13.4205	22.11	10.34	32.45	60.00	-27.55	peak	
6		17.7005	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

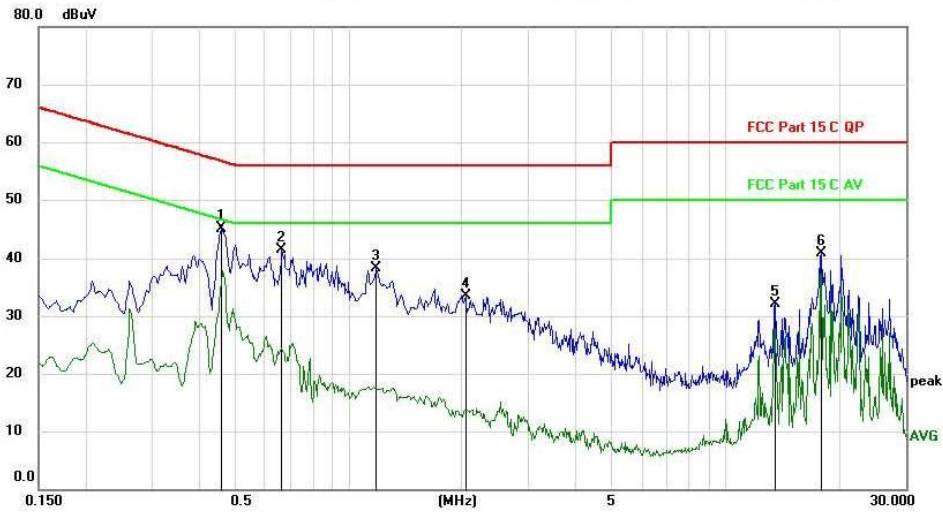
Site: LAB
 Limit: FCC Part 15 C QP
 EUT: DIVOOM Bluetooth speaker
 M/N: Timebox-Mini
 Mode: Charging + Link
 Note:

Phase: **N**
 Power: DC5V

Temperature: 24.3
 Humidity: 54 %

Conducted Emission Measurement

File :Timebox Data :#4 Date: 2017-2-10 Time: 17:58:33



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		0.6675	31.76	9.80	41.56	56.00	-14.44	peak	
3		1.1805	28.55	9.85	38.40	56.00	-17.60	peak	
4		2.0405	23.61	9.92	33.53	56.00	-22.47	peak	
5		13.4205	21.78	10.34	32.12	60.00	-27.88	peak	
6		17.9404	30.50	10.46	40.96	60.00	-19.04	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

7 Conducted Maximum Output Power

7.1 Test limit

Please refer section RSS-247 & 15.247.

7.2 Test Procedure

Details see the KDB558074 Meas Guidance V03r05

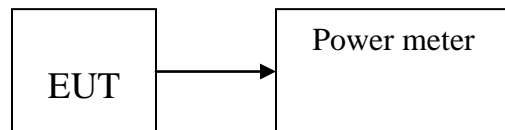
7.2.1 Place the EUT on the table and set it in transmitting mode.

7.2.2 Measure out each mode and each bands peak output power of EUT.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

Details see the KDB558074 DTS Meas Guidance V03r05

7.3 Test Setup



7.4 Test Results

PASS

Detailed information please see the following page.

Channel	Frequency (MHz)	PK Output Power (dBm)	PK Output Power (mW)	Limit (dBm)
CH1	2402	1.795	1.512	21
CH20	2440	2.333	1.711	21
CH40	2480	0.894	1.229	21

8 PEAK POWER SPECTRAL DENSITY

8.1 Test limit

8.1.1 Please refer section RSS-247 & 15.247.

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

8.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

8.2 Method of measurement

Details see the KDB558074 DTS Meas Guidance V03r05

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

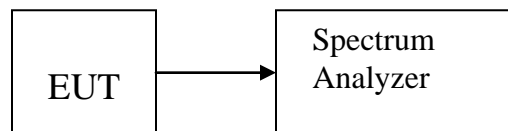
8.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

8.2.3 Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, span=5-30%EBW, detail see the test plot.

8.2.4 Record the max reading.

8.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

8.3 Test Setup



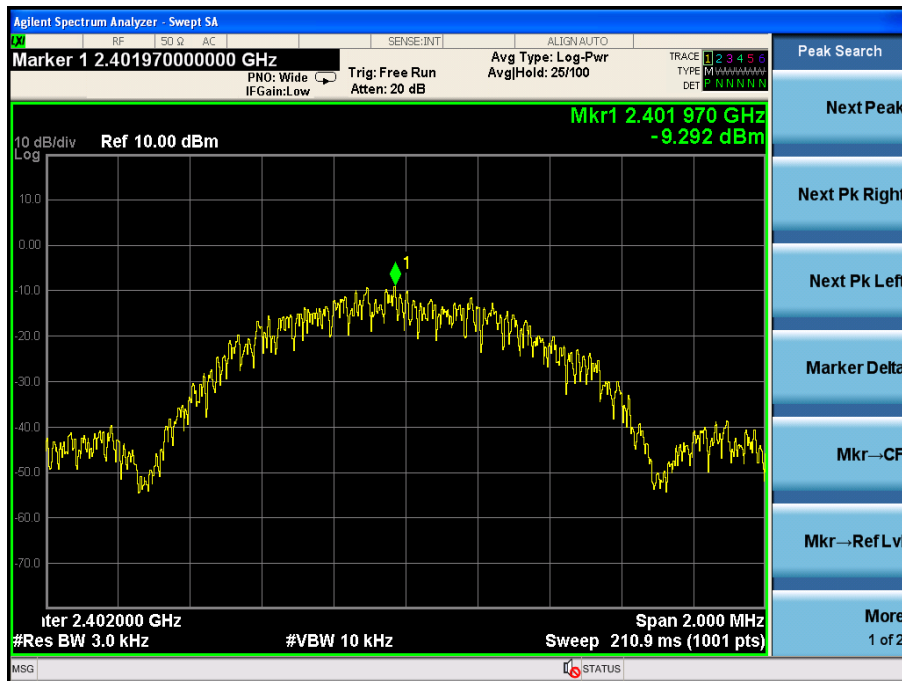
8.4 Test Results

PASS.

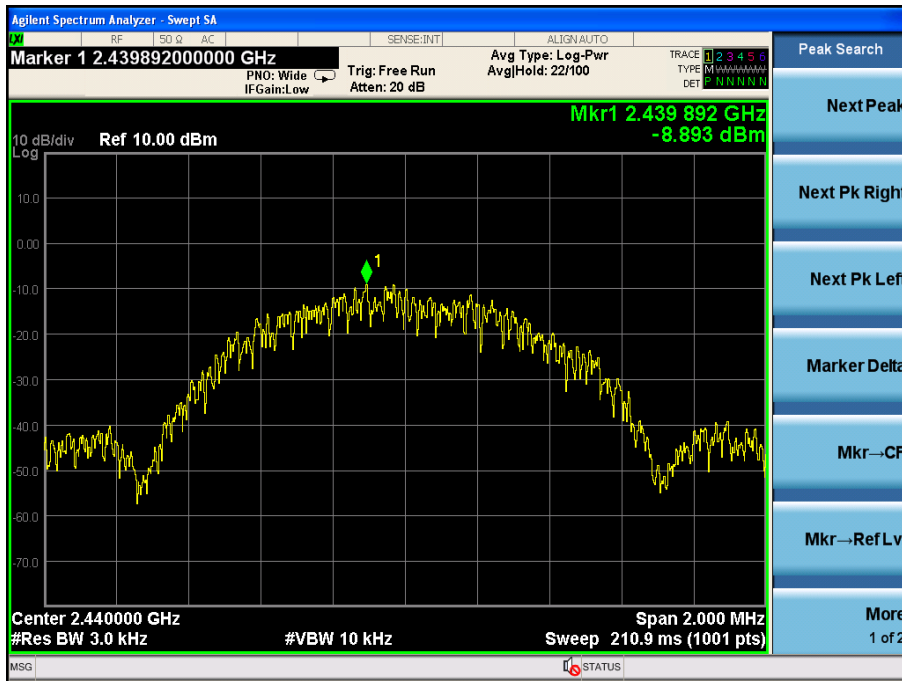
Detailed information please see the following page.

Channel	Frequency (MHz)	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
CH1	2402	-9.292	8	PASS
CH20	2440	-8.893	8	PASS
CH40	2480	-8.608	8	PASS

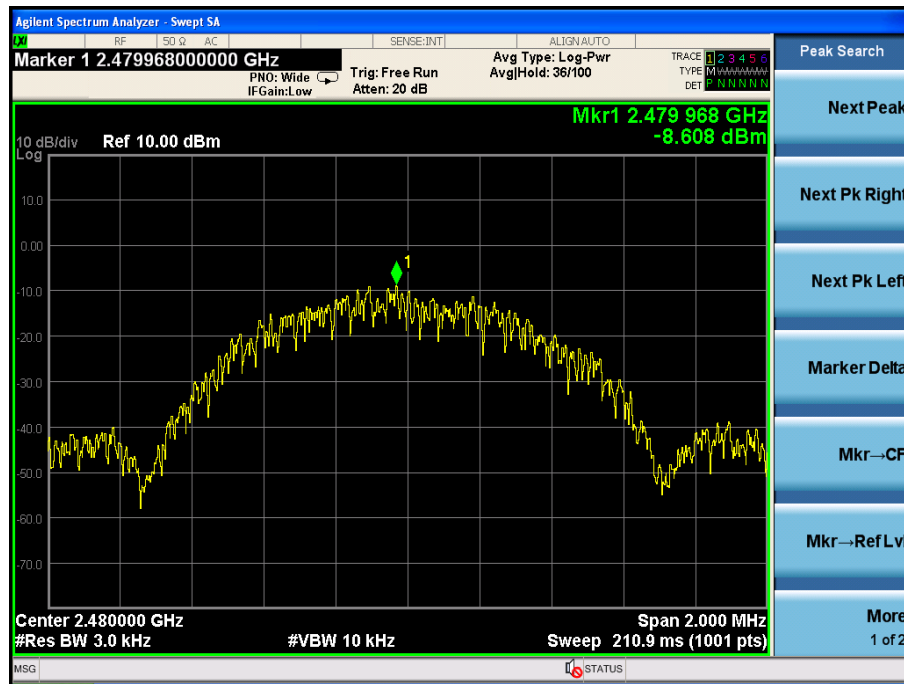
CH Low :



CH Mid:



CH Hig:



9 Bandwidth

9.1 Test limit

Please refer section RSS-247 & 15.247

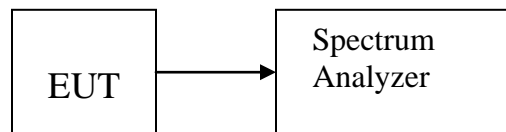
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

9.2 Method of measurement

Details see the KDB558074 V03r05 Meas Guidance

- a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
- b) The test receiver set $RBW = 1-5 \% EBW$, $VBW \geq 3RBW$, Sweep time set auto, detail see the test plot.

9.3 Test Setup



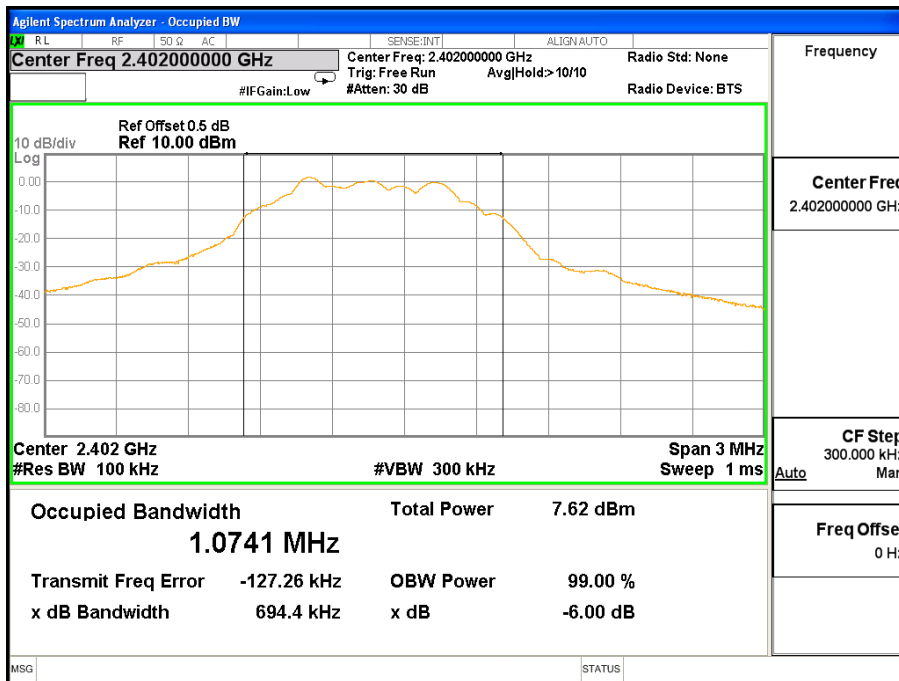
9.4 Test Results

PASS.

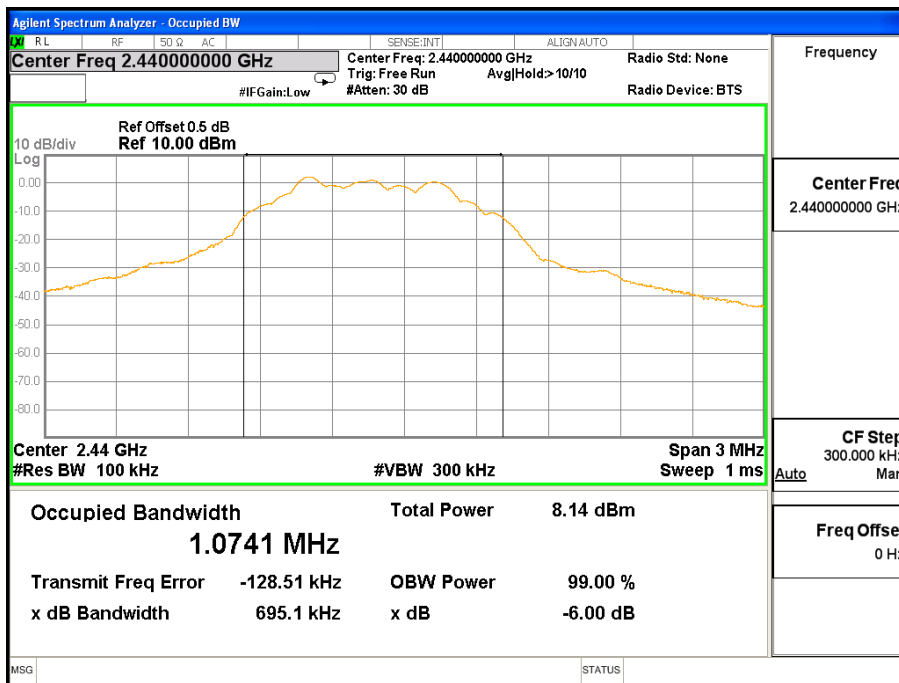
Detailed information please see the following page.

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
CH1	2402	0.694	0.5	PASS
CH20	2440	0.695	0.5	PASS
CH40	2480	0.694	0.5	PASS

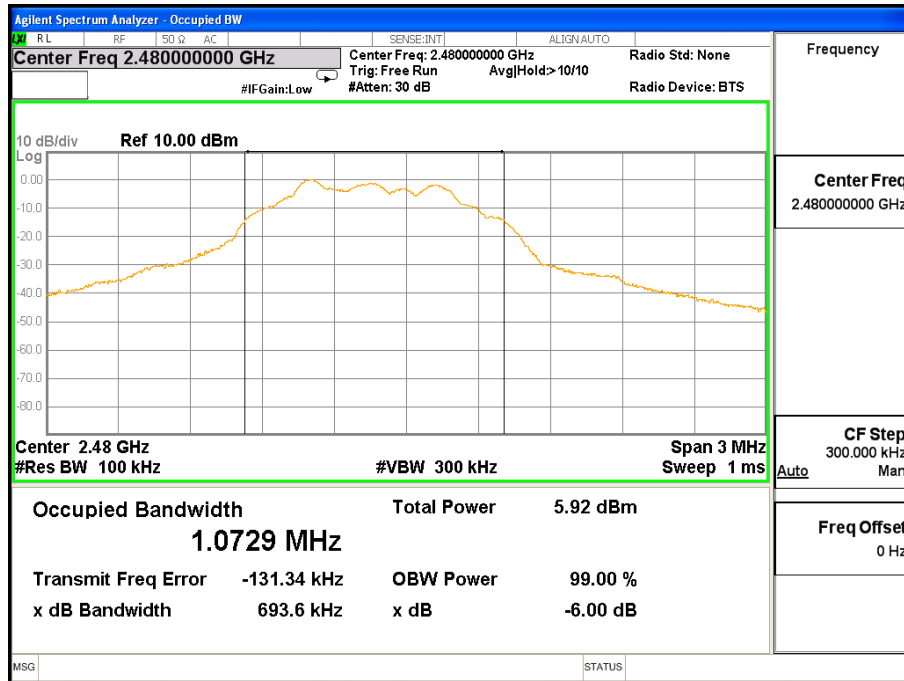
:
CH Low :



CH Mid :



CH High :



10 Band Edge Check

10.1 Test limit

Please refer section RSS-GEN&15.247.

10.2 Test Procedure

12.2.1 Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission

12.2.2 Check the spurious emissions out of band.

12.2.3 RBW 1MHz ,VBW 3MHz ,peak detector for peak value , RBW 1MHz ,VBW 3MHz ,RMS detector for AV value.

10.3 Test Setup

Same as 5.2.2.

10.4 Test Result

PASS.

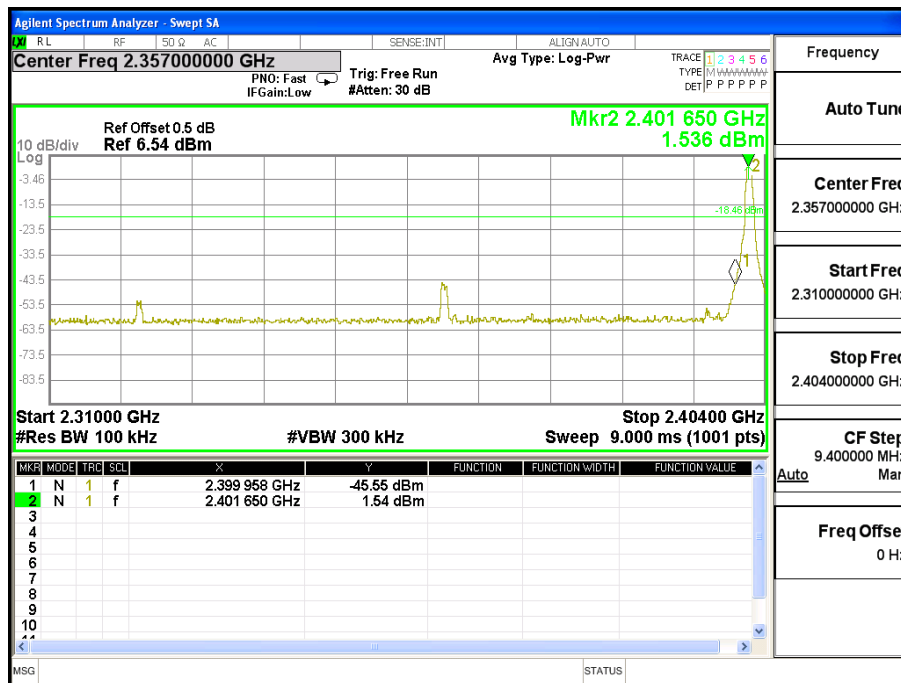
Detailed information please see the following page.

Radiated Method:
GFSK

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-14 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx Low								
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	41.21	27.62	3.92	34.97	37.78	74	36.22	PK
2390	--	27.62	3.94	34.97	--	54	--	AV
Antenna Polarity: Horizontal								
2390	42.22	27.62	3.92	34.97	38.79	74	35.21	PK
2390	--	27.62	3.94	34.97	--	54	--	AV
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=3MHz, Sweep time=Auto, Detector: RMS								
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.								

Band Edge Test result								
EUT: DIVOOM Bluetooth Speaker					M/N: Timebox-mini			
Power: DC 3.7V From Battery								
Test date: 2017-2-14 Test site: 3m Chamber Tested by: Reak								
Test mode: Tx High								
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	44.37	27.89	4	34.97	41.29	74	32.71	PK
2483.5		--	--	--	--	54	--	AV
Antenna Polarity: Horizontal								
2483.5	43.64	27.89	4	34.97	40.56	74	33.44	PK
2483.5		--	--	--	--	54	--	AV
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=3MHz, Sweep time=Auto, Detector: RMS								
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



11 Antenna Requirement

11.1 Standard Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

11.2 Antenna Connected Construction

The antenna is PCB antenna and no consideration of replacement. Please see EUT photo for details.

11.3 Result

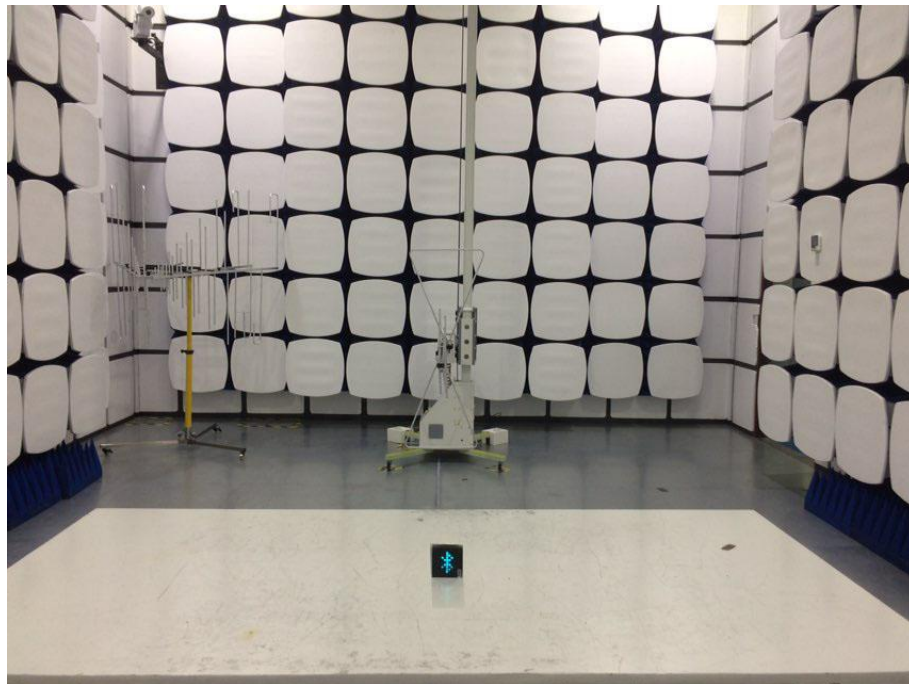
The EUT antenna is PCB Antenna. It comply with the standard requirement.

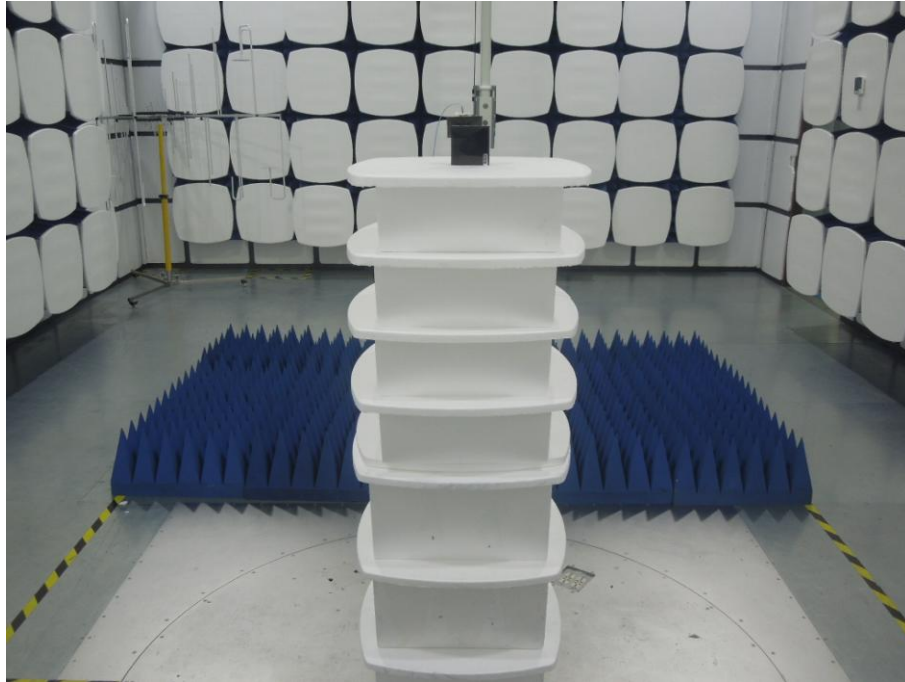
12 Photographs of Setup

12.1 Photos of Conducted Emission test

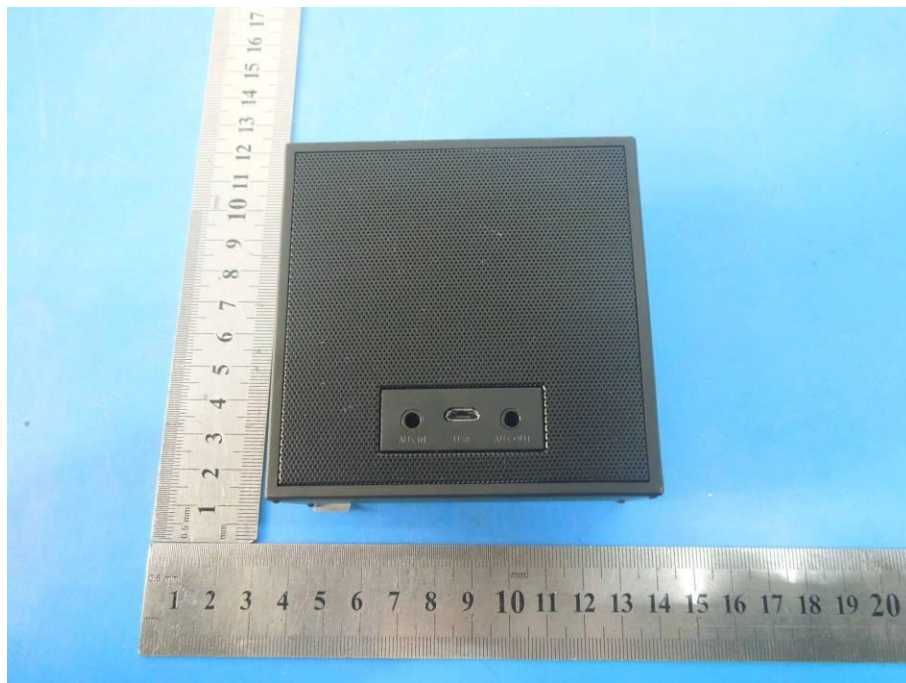
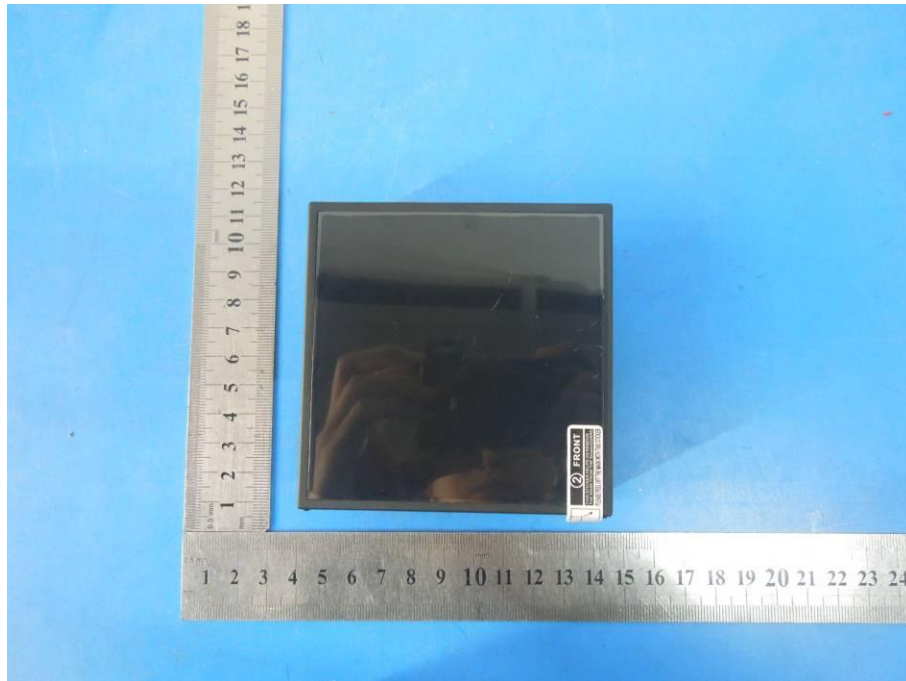


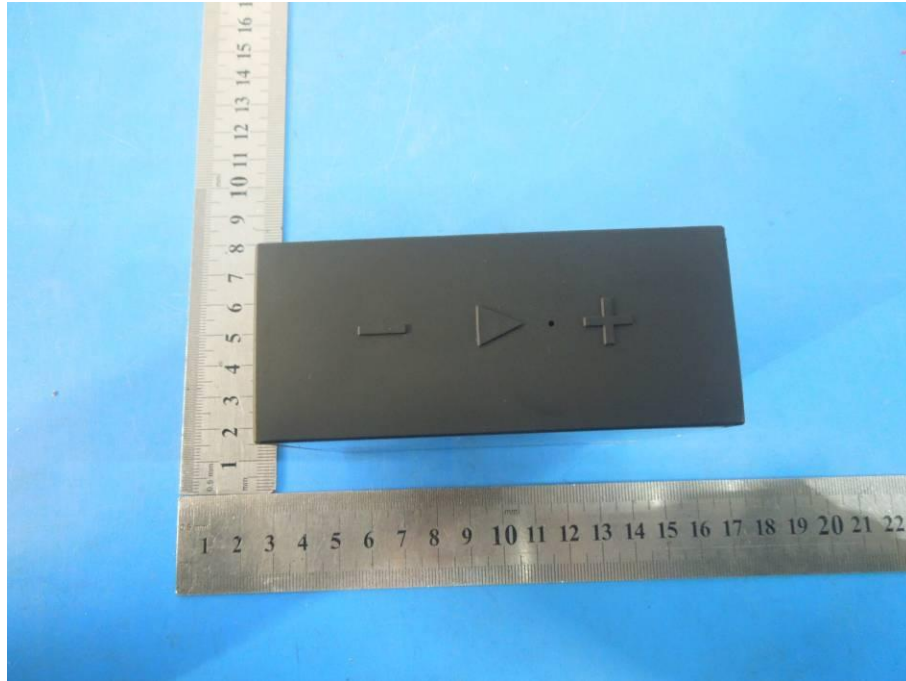
12.2 Photos of Radiated emission

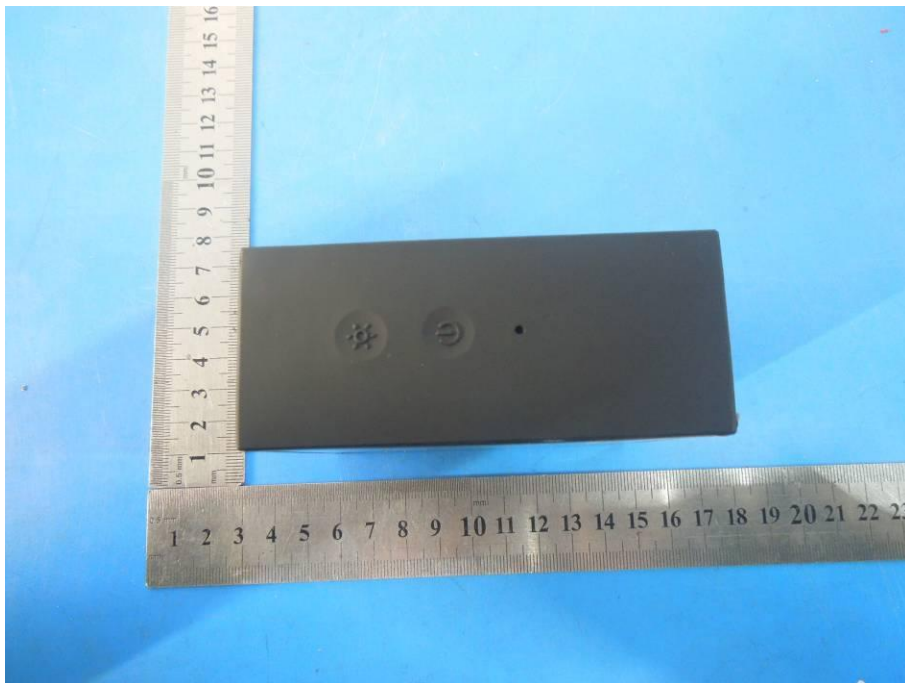
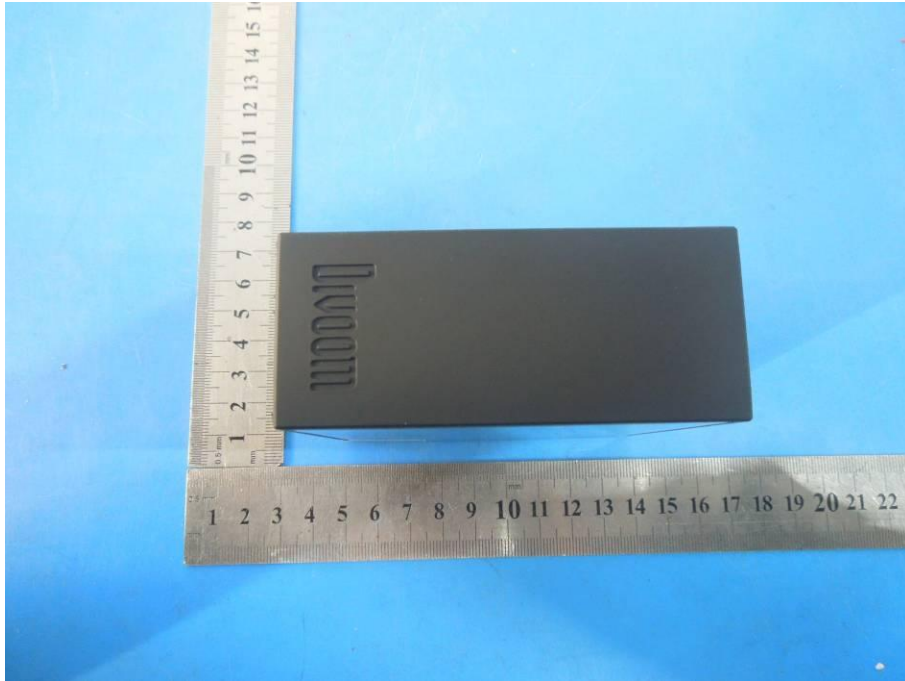


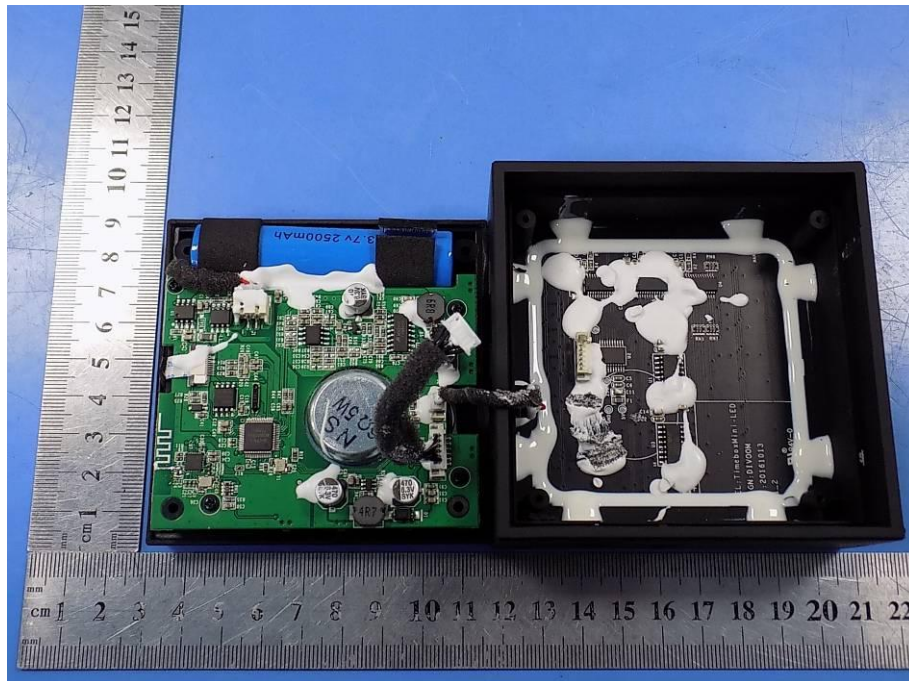
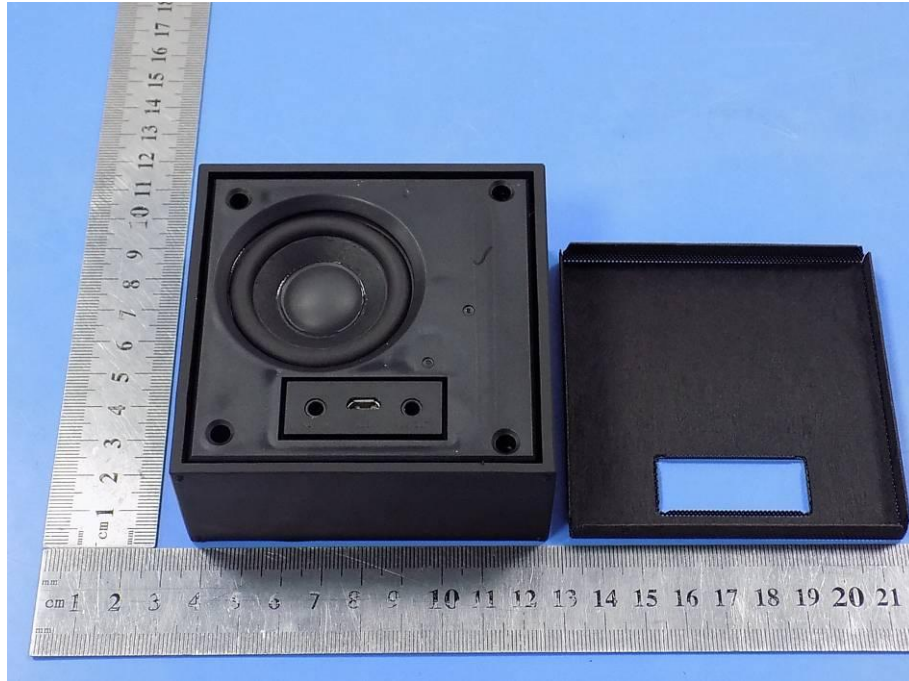


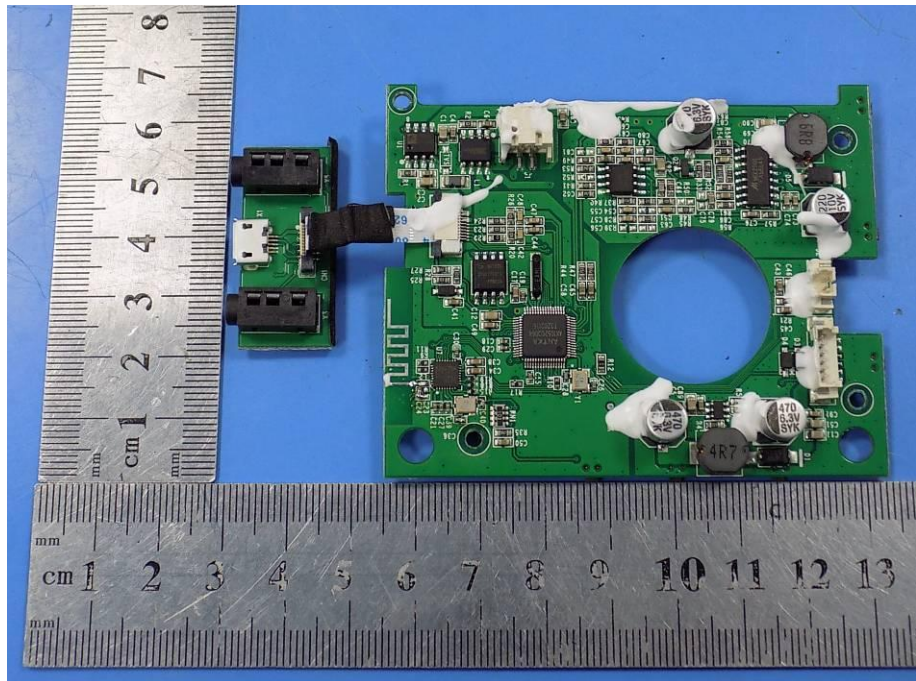
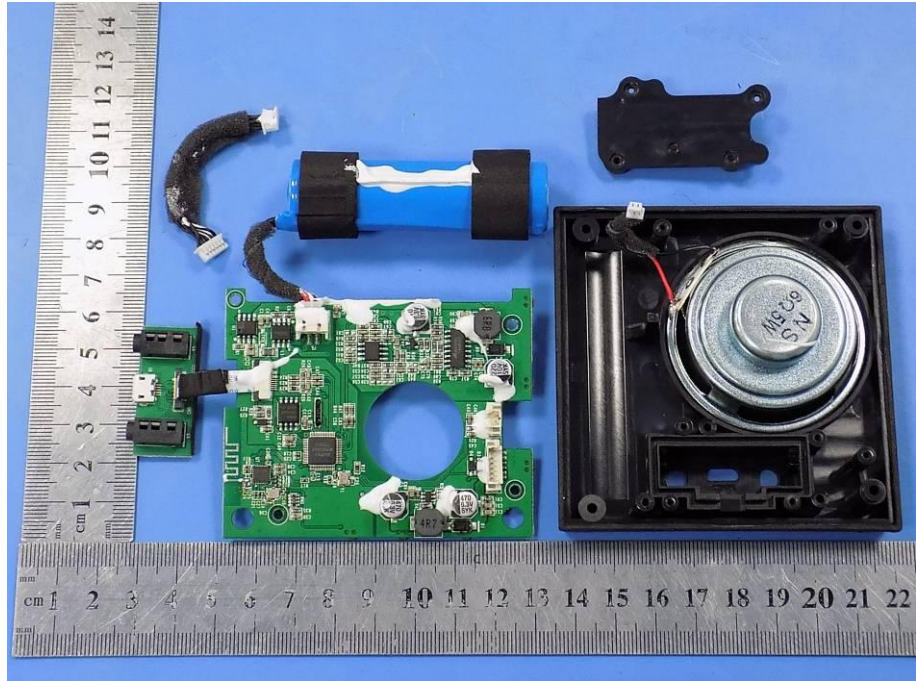
13 Photographs of EUT

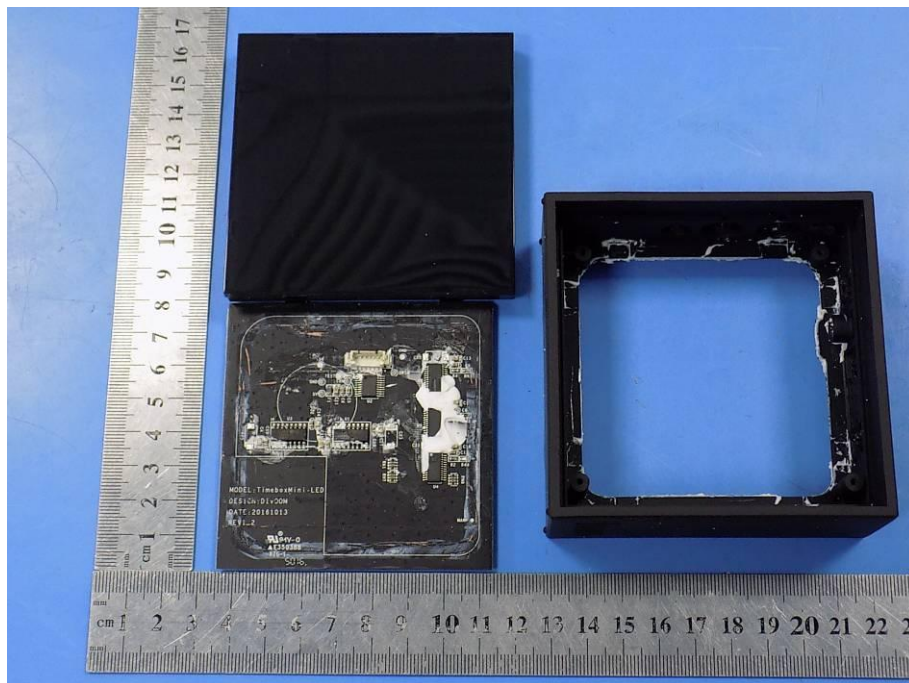
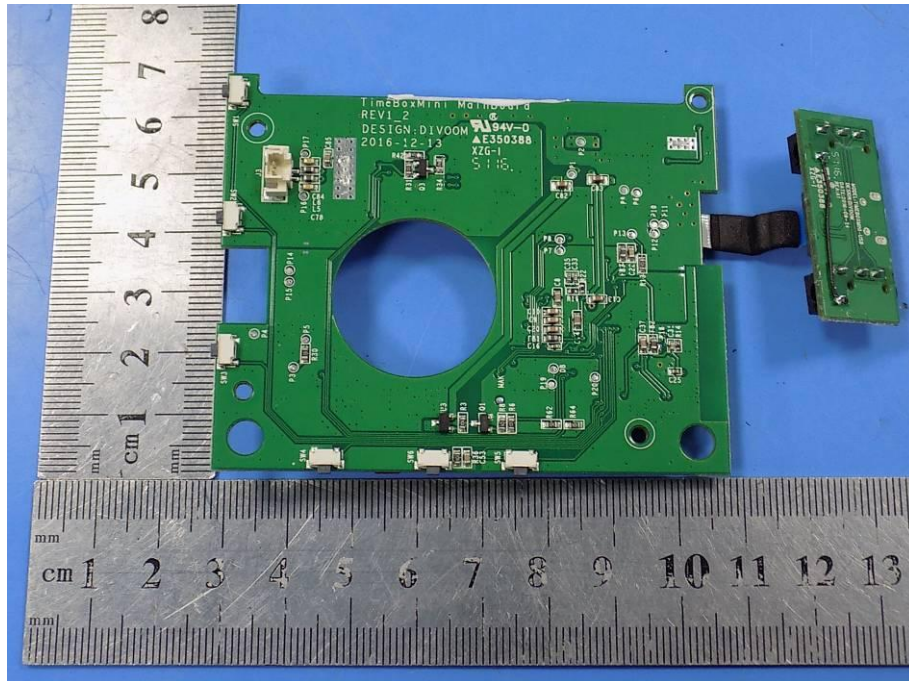


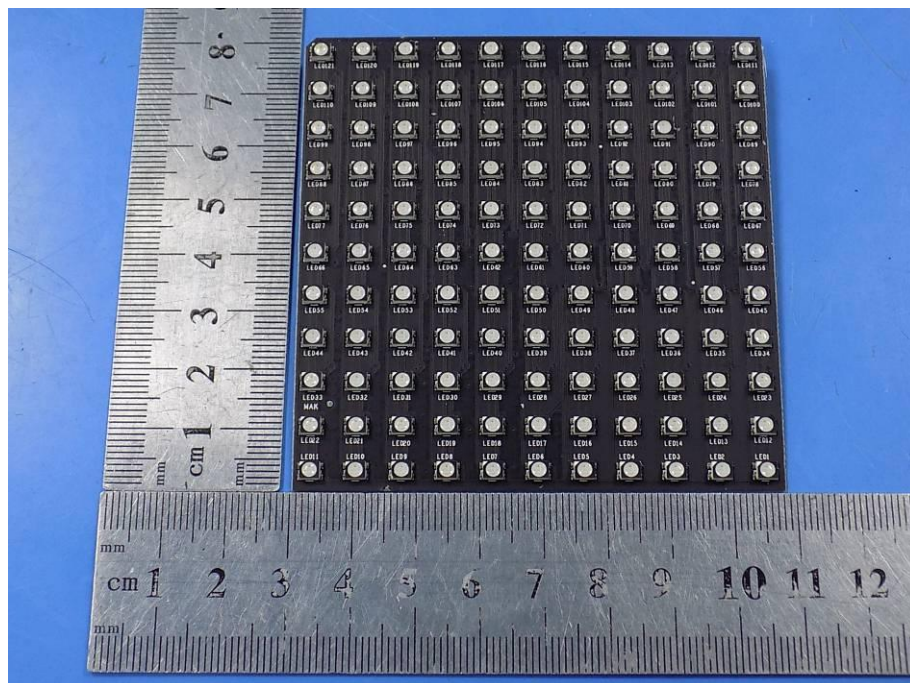
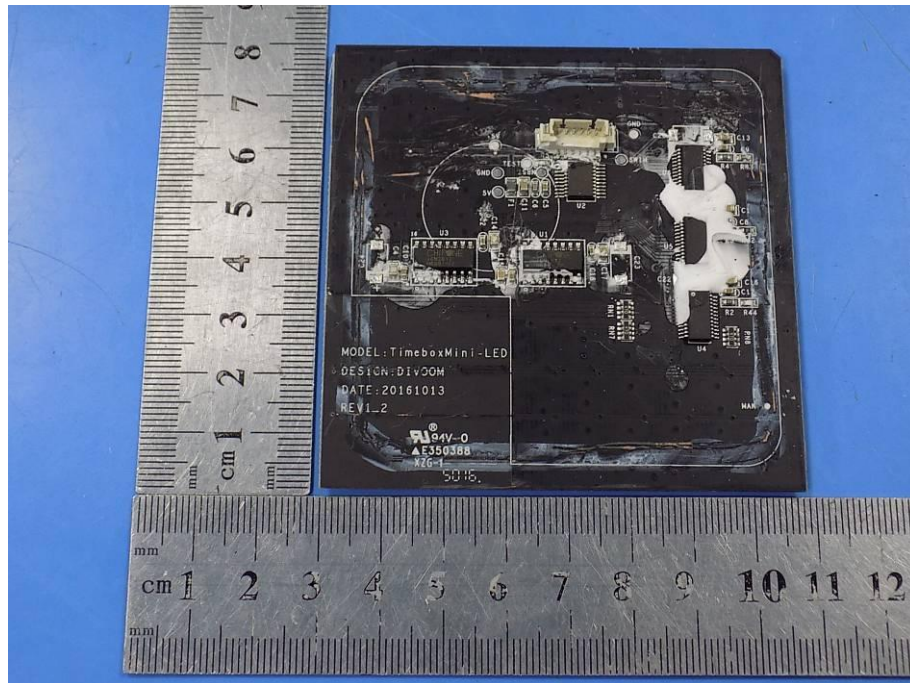












-----END OF REPORT-----