FCC RADIO TEST REPORT
FCC ID: 2AML6BB898

Product：	Bluetooth earphone
Trade Name：	KINGRAY
Model Name：	BB898
Addition Model：	MG0478,BB897,BB890,BB491,BB497,BB498, KR166,KR600,KR658,KR385,KR875,BB959, BB960,BB959,BB565,EV6828,

Prepared for

KINGRAY ELECTRONICS Co., LTD

Building B, Ge Tailong Industrial Park , No.445, Bulong Rd , BanTian , LongGang , Shenzhen , China

Prepared by

Shenzhen Asia Test Technology Co.,Ltd.

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TEST RESULT CERTIFICATION

Manufacture's Name..... KINGRAY ELECTRONICS Co., LTD

Address ..... Adress :Building B, Ge Tailong Industrial Park , No.445, Bulong Rd , BanTian , LongGang , Shenzhen , China

Product description

Product name ..... Bluetooth earphone

Model and/or type reference BB898, MG0478,BB897,BB890,BB491,BB497,BB498,KR166, KR600,KR658,KR385,KR875,BB959,BB960,BB959,BB565,EV6828,

Rating(s) ..... DC 3.7V

Standards ..... FCC Part15.249

Test procedure ..... ANSI C63.10-2013

This device described above has been tested by ATT, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test.....

Date (s) of performance of tests ..... Jul. 02 2017 ~ Jul. 11 2017

Date of Issue..... Jul.11 2017

Test Result..... **Pass**

Reviewed by: Seal-Chen **Approved by:**

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Test	Test Requirement	Standard Paragraph	Result
Field Strength of Fundamental	FCC PART 15 C section 15.249 (a)	ANSI C63.10: Clause 6.6	PASS
Field Strength of Unwanted Emissions	FCC PART 15 C section 15.249 (a) section 15.249 (d)	ANSI C63.10: Clause 6.4, 6.6 and 6.7	PASS
Band Edges	FCC PART 15 C section 15.249 (d)	ANSI C63.10: Clause 6.9.2	PASS
Occupied Bandwidth	FCC PART 15 C section 15.215(c)	ANSI C63.10: Clause 6.9.1	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10: Clause 6.2	N/A
Antenna Requirement	FCC PART 15 C section 15.203	FCC PART 15 C section 15.203	PASS

1.1 TEST FACILITY

The test facility is recognized, certified or accredited by the following organizations:

.CNAS- Registration No: L6177

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2005 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on Apr. 18, 2013

.FCC- Registration No: 248337

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Dongguan Yaxu (AiT) Technology Limited have been registered by Federal Communications Commission (FCC) on Aug.29, 2014.

.Industry Canada(IC)-Registration No: IC6819A-1

The 3m Semi-Anechoic Chamber and 3m of Dongguan Yaxu (AiT) Technology Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Oct. 01, 2014.

.VCCI- Registration No: 2705

The 3m/10m Open Area Test Site, Shielding Room and 3m Chamber of Dongguan Yaxu (AiT) Technology Limited have been registered by Voluntary Control Council for Interference on Nov. 21, 2012. The Telecommunication Ports Conducted Disturbance Measurement of Dongguan Yaxu (AiT) Technology Limited have been registered by Voluntary Control Council for Interference on May. 13, 2013.

.TUV NORD

Dongguan Yaxu (AiT) Technology Limited has been assessed on Jun. 13, 2013 that it can carry out EMC tests by order and under supervision of TUV NORD.

.ITS- Registration No: TMPSHA031

Dongguan Yaxu (AiT) Technology Limited has been assessed and included in Intertek Shanghai TMP Program regarding Laboratory facilities and test equipment on Jul.22, 2012.

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

EUT Name:	Bluetooth earphone
Model No.:	BB898
Addition Model:	MG0478,BB897,BB890,BB491,BB497,BB498,KR166,KR600,KR658, KR385,KR875,BB959,BB960,BB959,BB565,EV6828,
Model Differences:	All models are identical except model name and colors.
Operation frequency:	2402 MHz to 2480 MHz
Bluetooth Version	BT 4.2
Number of channel:	79 channels
Modulation Type and Antenna Type:	GFSK PCB antenna
H/W No.:	V3.0
S/W No.:	V4.2
Antenna Gain:	0 dBi
Brand Name:	KINGRAY
Derivative model No.:	N/A
Power Supply Range:	DC 3.7V by battery
Power Cord:	N/A
Signal Cable:	N/A

Description of Channel:					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	**2402**	39	**2440**	77	2478
02	2403	40	2441	78	2479
03	2404	41	2442	79	**2480**
04	…	42	…		
05	…	43	…		
06	…	44	…		

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH1
Mode 2	CH39
Mode 3	CH79
Mode 4	Link

For Conductted Emission	
Final Test Mode	Description
Mode 4	Link

For Radiated Emission	
Final Test Mode	Description
Mode 1	CH1
Mode 2	CH39
Mode 3	CH79
Mode 4	Link

Note:

(1) The measurements are performed at the highest, middle, lowest available channels. The EUT use full-charge battery.

(2) Measurements are performed according to C63.10.

(3) The relevant RF Conducted Measurement is performed by a temporary antenna connector, please refer to the Equipment List for the detail

(4) Test perform on all mode, only records worse cases in the test report.

(5) The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitter signals.
Example:
Frequency used:2402 - 2480 MHz
79 Channels (Ch 1 - Ch 79)
Hopping Sequence in Data Mode
55,48,26,33,52,35,50,65,54,67,15,08,64,49,66,53,22,25,63,04,41,05,24,43,73,07,75,28,56,37,60,39,58,69,16,40,21,44
23,42,13,17,46,02,51,03,11,29,77,47,62,27,71,10,68,32,57 12,59,72,30,76,31,18,74,61,14,70,36,06,09,45,19,20,34,38
78,00,01

2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

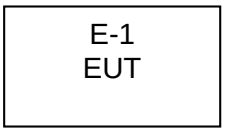
The Applicant provides communication tools software to control the EUT for staying in continous transmitting and receiving mode for testing. There are 79 channels of EUT, and the test carried out at the lowest channel, middle channel and highest channel .

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test software Version	Test program: CW6611D_V4.2		
Frequency	2402 MHz	2440 MHz	2480 MHz
Parameters	Default	Default	Default

2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Bluetooth earphone	N/A	BB898	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Equipment No.	Instrument	Manufacturer	Model Name	Serial Number	Specification	Cal. Data
1	Semi-anechoic chamber	Changzhou Chengyu	EC3088	N/A	9*6*6m	10/25/2016
2	Loop Antenna	TESEQ	HLA6120	35779	9kHz-30MHz	06/05/2017
3	Broadband antenna	R&S	VULB 9160	VULB91 60-516	30MHz-1500 MHz	10/25/2016
4	Horn antenna	R&S	BBHA 9120D	10087	1GHz-18GH z	06/05/2017
5	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	15GHz-26.5GH z	06/05/2017
6	Test receiver	R&S	ESCI	101686	9KHz-3GHz	10/25/2016
7	EMI Measuring Receiver	R&S	ESR	101660	9KHz-40GHz	10/25/2016
8	Multi-device controller	MF	MF-7868	MF78680 8762	N/A	10/25/2016
9	Amplifier	EM	EM-30180	060538	1GHz-18GH z	10/25/2016
10	Amplifier	Schwarzbeck	BBV 9719	BBV 9719-663	18GHz-26.5GH z	06/05/2017
11	Spectrum Analyzer	agilent	E4440B	US44300368	1GHz-26.5GH z	06/05/2017
12	Test receiver	R&S	ESCI	101689	9KHz-3GHz	10/25/2016
13	LISN	R&S	NSLK81 26	8126466	9k-30MHz	10/25/2016
14	LISN	Narda	L2-16B	5589756	9k-30MHz	10/25/2016
15	Radiated Cable 1#	FUJIKURA	5D-2W	01	30MHz-1GHz	10/25/2016
16	Radiated Cable 2#	FUJIKURA	10D2W	02	1GHz -25GHz	10/25/2016
17	Conducted Cable 1#	FUJIKURA	1D-2W	01	9KHz-30MHz	10/25/2016

18	SMA Antenna connector	Dosin	Dosin-SMA	N/A	N/A	10/25/2016
Note: The SMA antenna connector is soldered on the PCB board in order to perform conducted tests and this SMA antenna connector is listed in the equipment list. The Cal.Interval was one year						

3. ANTENNA REQUIREMENT

3.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 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.

3.2 EUT ANTENNA

The EUT antenna is PCB Antenna with 0dBi gain. It comply with the standard requirement.

3.3 CONDUCTED EMISSION MEASUREMENT

3.3.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	(dBuV)		Standard
	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

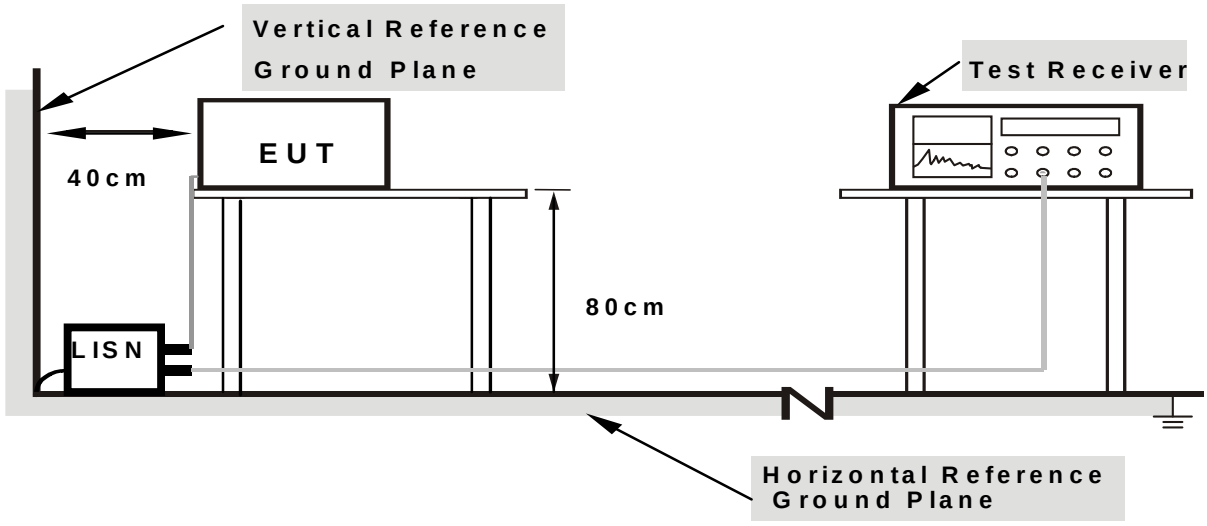
3.3.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.2.5 TEST RESULT

EUT：	Bluetooth earphone	Model Name. ：	BB898
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	N/A	Test Date :	N/A
Test Mode：	N/A	Phase :	N/A
Test Voltage ：			

NOTE：Bluetooth is not available during charging, so not need this test.

3.4 RADIATED EMISSION MEASUREMENT

3.4.1 Radiated Emission Limits (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/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

Note:

(1) The tighter limit applies at the band edges.

(2) Emission level (dBuV/m)=20log Emission level (uV/m).

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.249)

Frequency of Emission (MHz)	Field Strength of fundamental ((millivolts /meter)	Field Strength of Harmonics (microvolts/meter)
2400 - 2483.5	50	500

Notes:

(1) 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 to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.4.2 TEST PROCEDURE

1)9 kHz to 30 MHz emissions:
For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.10. The centre of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT, During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2)30 MHz to 1 GHz emissions:
For testing performed with the bi-log type antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

3)1 GHz to 25 GHz emissions:
Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2007 was used to perform radiated emission test above 1 GHz.
For testing performed with the horn antenna, testing was performed in accordance to ANSI C63.10. The measurement is performed with the EUT rotated 360º, the antenna height scan between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.
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.

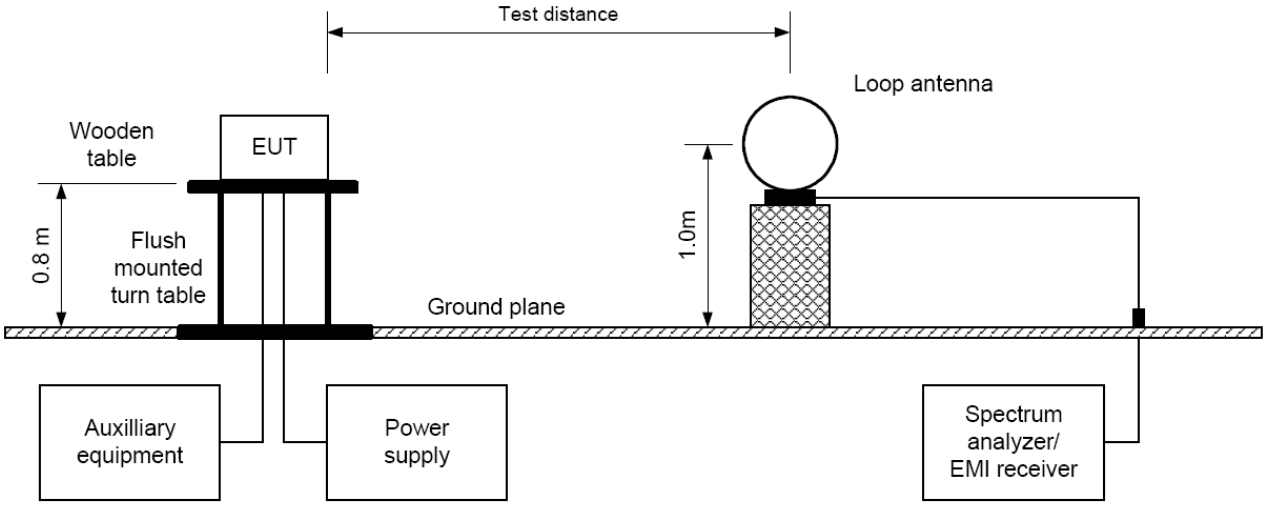
Both horizontal and vertical antenna polarities were testedand performed pretest to three orthogonal axis. The worst case emissions were reported.

3.4.3 DEVIATION FROM TEST STANDARD

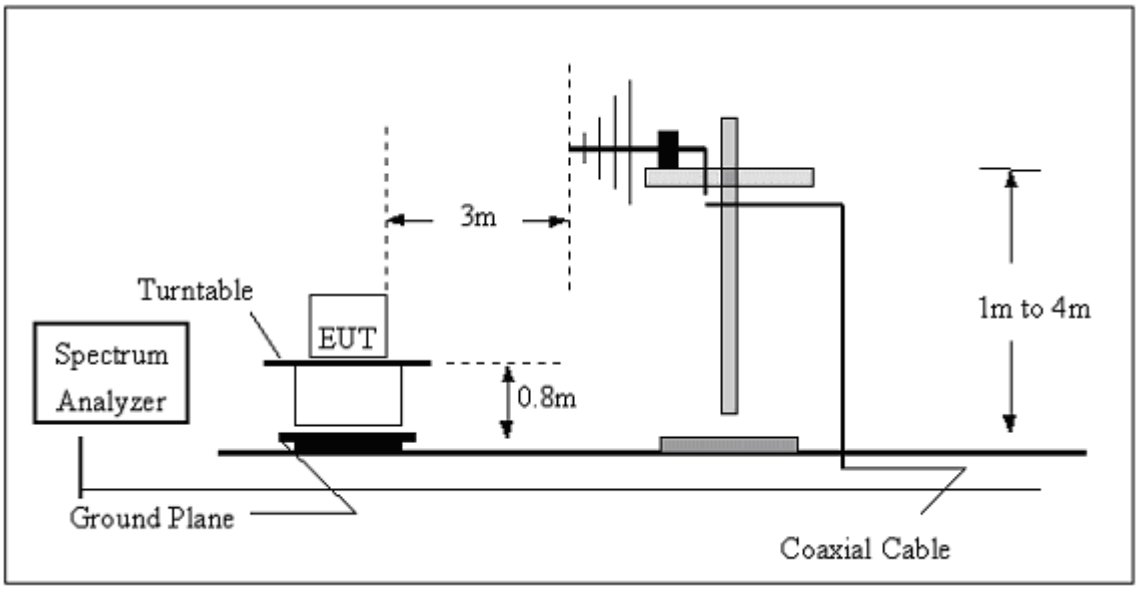
No deviation

3.4.4 TEST SETUP

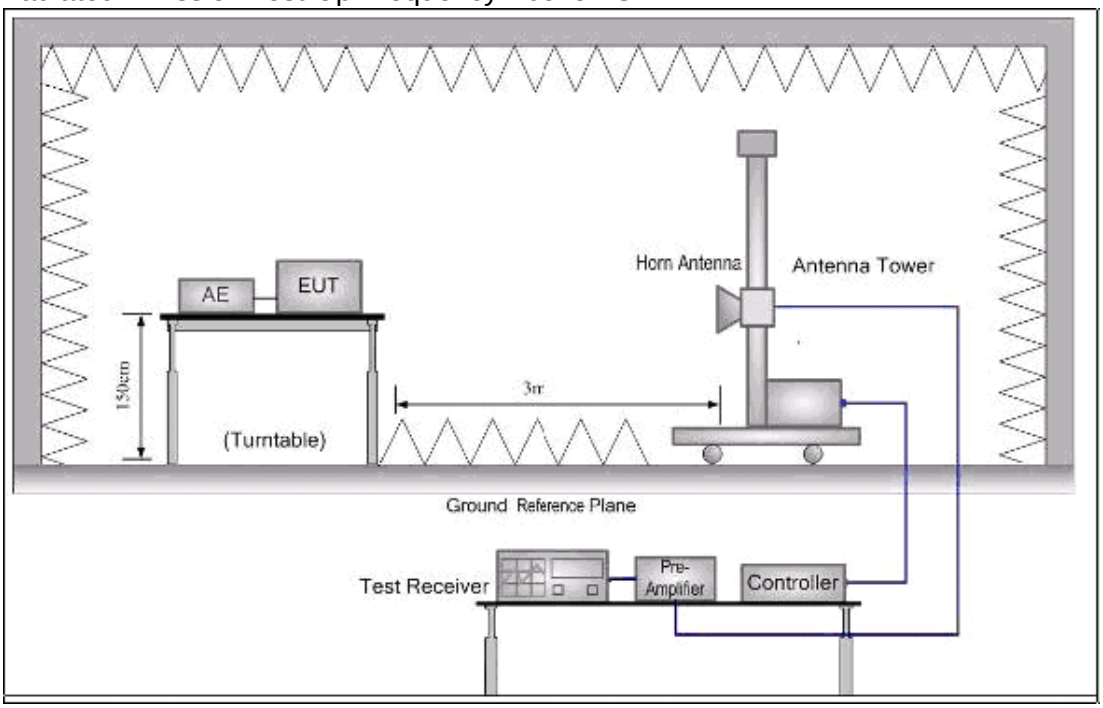
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



Field Strength of Fundamental

Frequency (MHz)	Reading Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	amplifier factor (dB)	Emission PK/AV (dBuV/m)	Horizontal /Vertical	Detector type	Limits PK/AV (dBuV/m)	Margin (dB)
2400	50.16	25.21	6.51	35.24	46.64	H	Peak	74	-27.36
2400	40.32	25.21	6.51	35.24	36.8	H	AVG	54	-17.2
2402	90.24	25.87	6.56	35.1	87.57	H	Peak	114	-26.43
2402	81.17	25.87	6.56	35.1	78.5	H	AVG	94	-15.5
2440	89.54	25.93	6.64	35.37	86.74	H	Peak	114	-27.26
2440	78.22	25.93	6.64	35.37	75.42	H	AVG	94	-18.58
2480	89.47	26.05	6.7	35.42	86.8	H	Peak	114	-27.2
2480	76.69	26.05	6.7	35.42	74.02	H	AVG	94	-19.98
2483.5	50.33	26.13	6.88	35.15	48.19	H	Peak	74	-25.81
2483.5	38.89	26.13	6.88	35.15	36.75	H	AVG	54	-17.25
2400	49.79	25.21	6.51	35.24	46.27	V	Peak	74	-27.73
2400	37.15	25.21	6.51	35.24	33.63	V	AVG	54	-20.37
2402	89.87	25.87	6.56	35.1	87.2	V	Peak	114	-26.8
2402	70.25	25.87	6.56	35.1	67.58	V	AVG	94	-26.42
2440	92.22	25.93	6.64	35.37	89.42	V	Peak	114	-24.58
2440	81.19	25.93	6.64	35.37	78.39	V	AVG	94	-15.61
2480	88.67	26.05	6.7	35.42	86	V	Peak	114	-28
2480	79.51	26.05	6.7	35.42	76.84	V	AVG	94	-17.16
2483.5	50.36	26.13	6.88	35.15	48.22	V	Peak	74	-25.78
2483.5	37.85	26.13	6.88	35.15	35.71	V	AVG	54	-18.29

For the band-edge test, both hopping-on mode and hopping-off mode had been pre-tested, and only the worst case was recorded in the test report.

3.4.5 TEST RESULTS (BELOW 30MHz)

EUT：	Bluetooth earphone	Model Name. ：	BB898
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

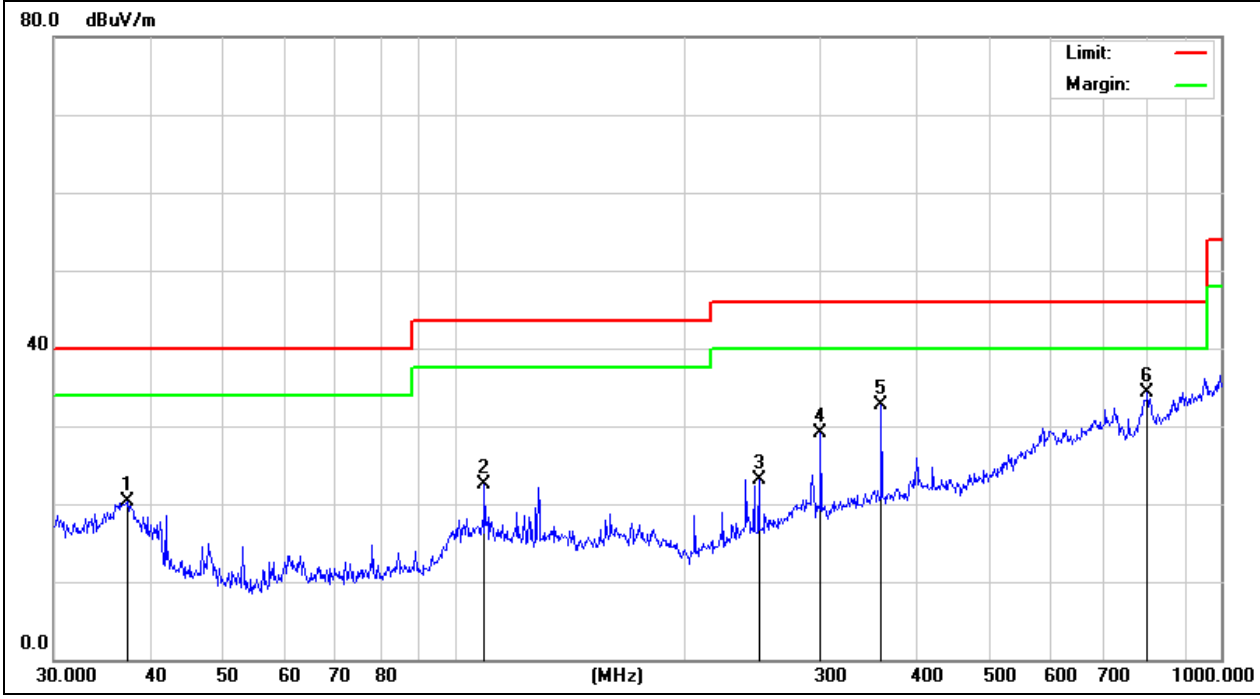
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.4.6 TEST RESULTS (BETWEEN 30 – 1000 MHZ)

EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH1	Polarization：	Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		37.4164	36.91	-16.70	20.21	40.00	-19.79	QP			
2		109.4116	36.00	-13.42	22.58	43.50	-20.92	QP			
3		249.4250	36.77	-13.63	23.14	46.00	-22.86	QP			
4		300.3672	38.70	-9.59	29.11	46.00	-16.89	QP			
5		360.4476	40.28	-7.59	32.69	46.00	-13.31	QP			
6	*	801.7862	30.94	3.30	34.24	46.00	-11.76	QP			

Remark:
Factor = Antenna Factor + Cable Loss.

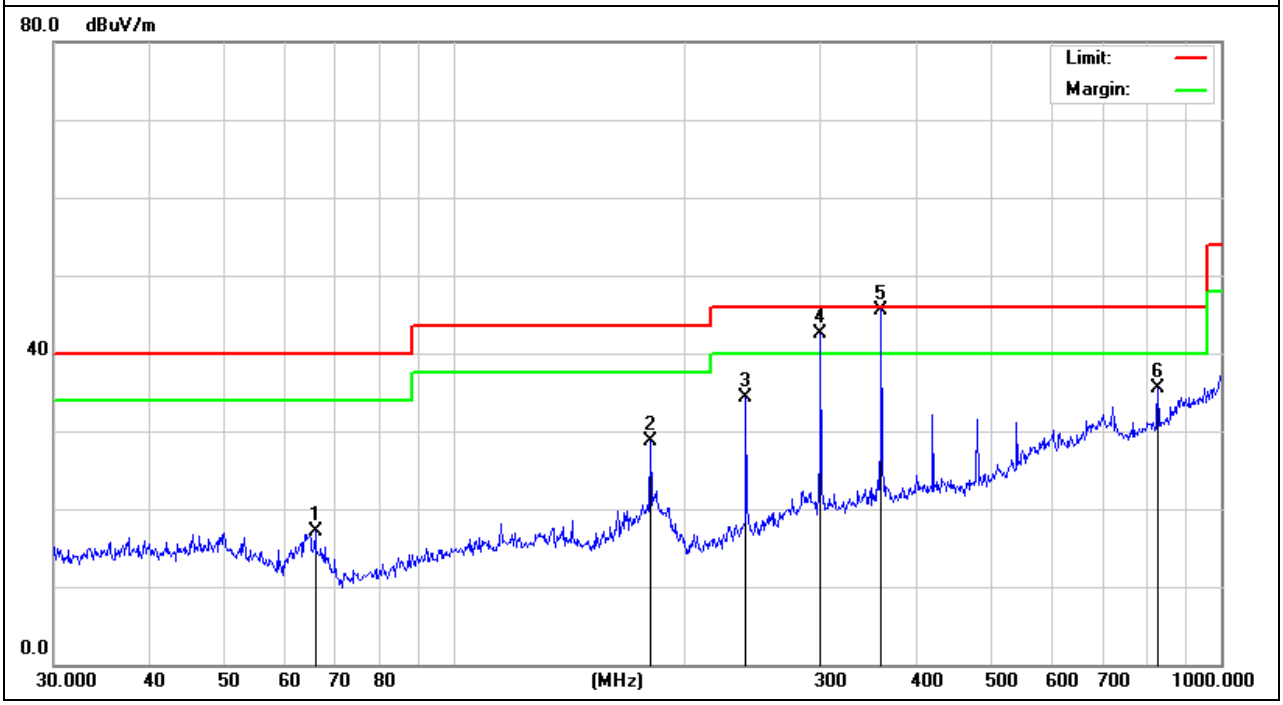


Note:test perform on all mode,"BT 2402" mode is the worst mode and has been reported.

EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH1	Polarization：	Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		65.8031	34.71	-17.65	17.06	40.00	-22.94	QP			
2		180.0165	40.87	-12.21	28.66	43.50	-14.84	QP			
3		239.9874	48.34	-14.07	34.27	46.00	-11.73	QP			
4	!	300.3672	52.17	-9.59	42.58	46.00	-3.42	QP			
5	*	360.4476	53.10	-7.59	45.51	46.00	-0.49	QP	100	0	
6		827.4934	34.76	0.80	35.56	46.00	-10.44	QP			

Remark:
Factor = Antenna Factor + Cable Loss.



Note:test perform on all mode,"BT 2402" mode is the worst mode and has been reported.

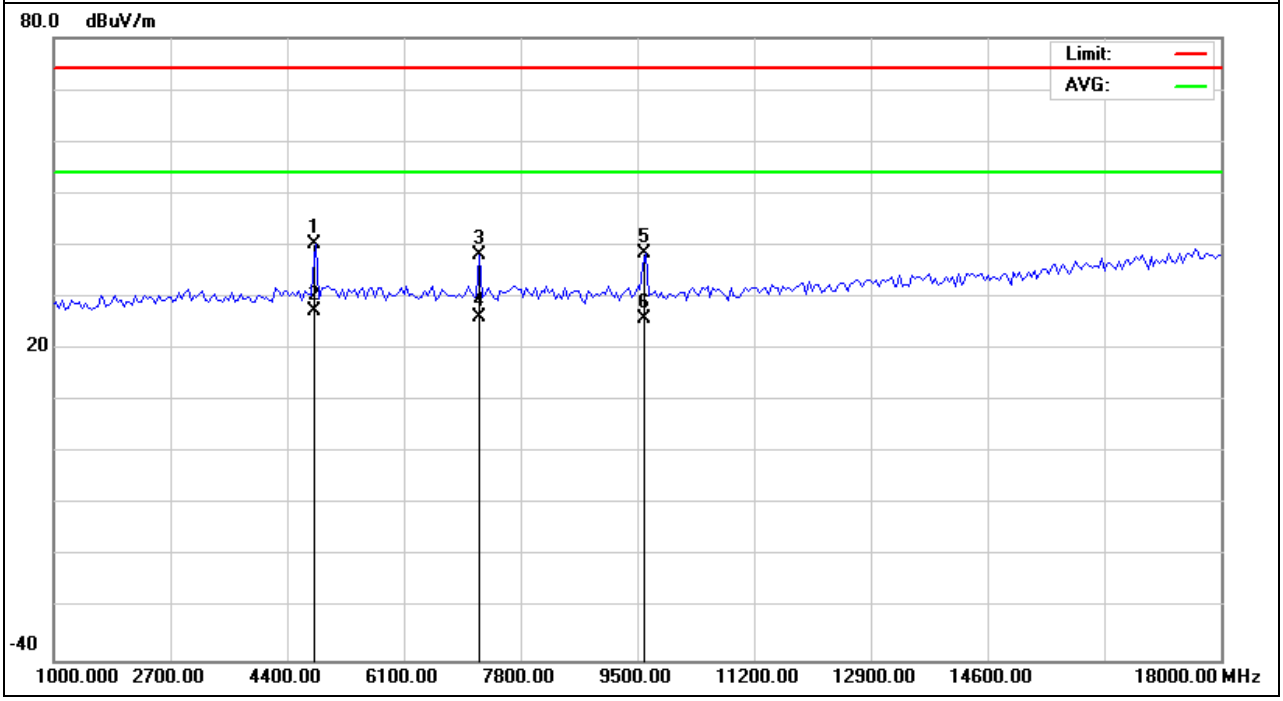
3.4.7 TEST RESULTS (ABOVE 1000 MHZ)

GFSK

EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH1	Polarization：	Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4804.000	32.18	8.12	40.30	74.00	-33.70	QP			
2	*	4804.000	19.24	8.12	27.36	54.00	-26.64	AVG			
3		7206.000	26.61	11.59	38.20	74.00	-35.80	QP			
4		7206.000	14.54	11.59	26.13	54.00	-27.87	AVG			
5		9608.000	21.11	17.49	38.60	74.00	-35.40	QP			
6		9608.000	8.49	17.49	25.98	54.00	-28.02	AVG			

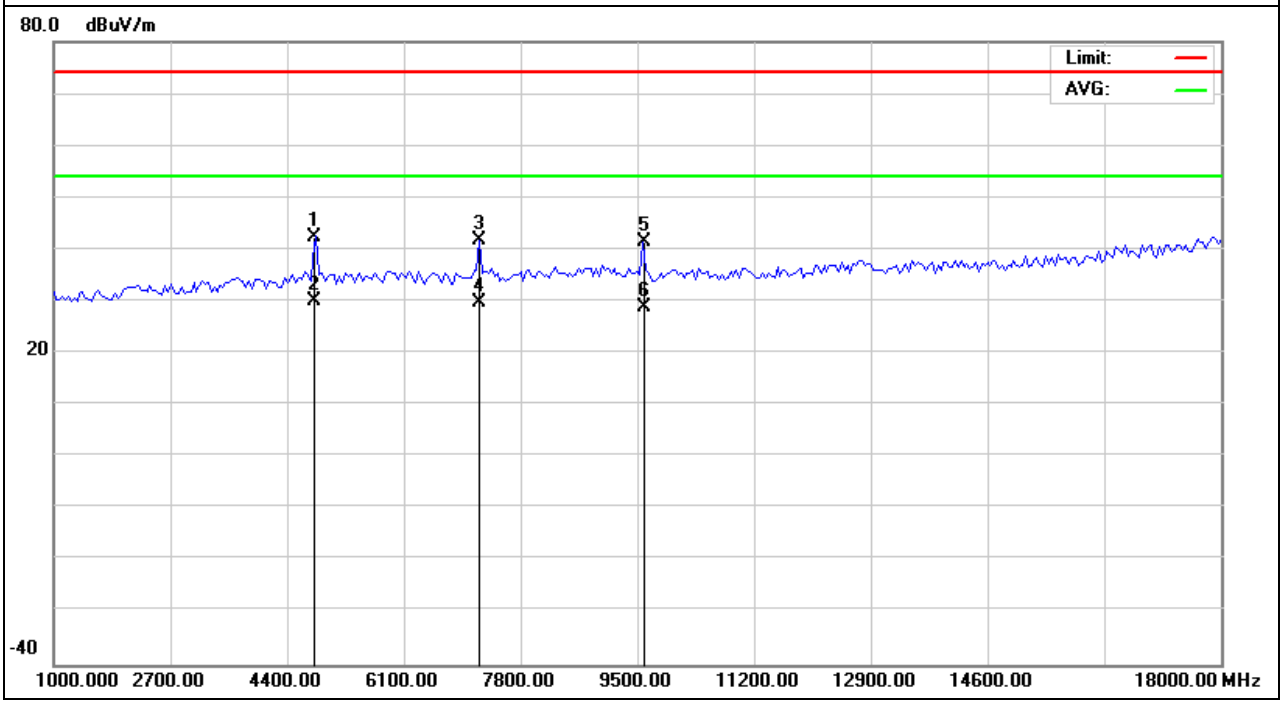
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH1	Polarization：	Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4804.000	34.38	8.12	42.50	74.00	-31.50	QP			
2	*	4804.000	22.03	8.12	30.15	54.00	-23.85	AVG			
3		7206.000	30.11	11.59	41.70	74.00	-32.30	QP			
4		7206.000	18.05	11.59	29.64	54.00	-24.36	AVG			
5		9608.000	24.11	17.49	41.60	74.00	-32.40	QP			
6		9608.000	11.27	17.49	28.76	54.00	-25.24	AVG			

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

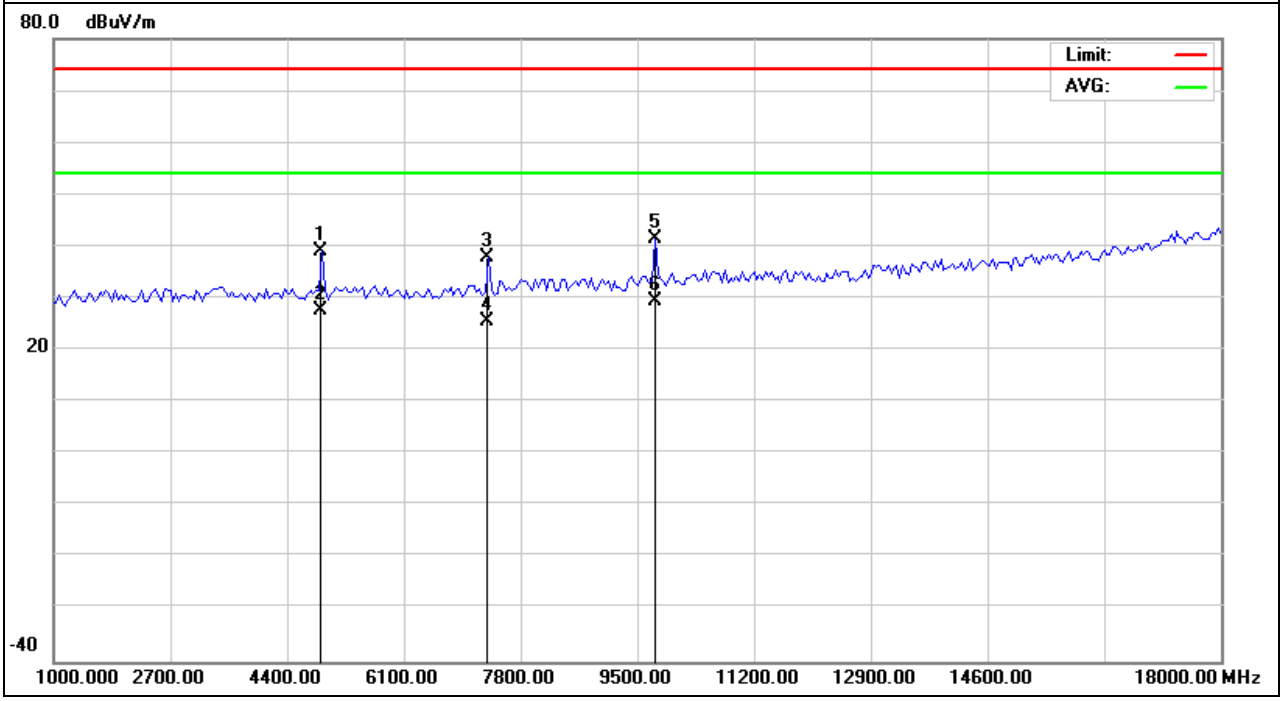


For the band-edge test, both hopping-on mode and hopping-off mode had been pre-tested, and only the worst case was recorded in the test report.

EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH40	Polarization：	Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4880.000	30.83	8.17	39.00	74.00	-35.00	QP			
2		4880.000	19.48	8.17	27.65	54.00	-26.35	AVG			
3		7320.000	25.80	12.10	37.90	74.00	-36.10	QP			
4		7320.000	13.36	12.10	25.46	54.00	-28.54	AVG			
5		9760.000	23.14	18.26	41.40	74.00	-32.60	QP			
6	*	9760.000	11.20	18.26	29.46	54.00	-24.54	AVG			

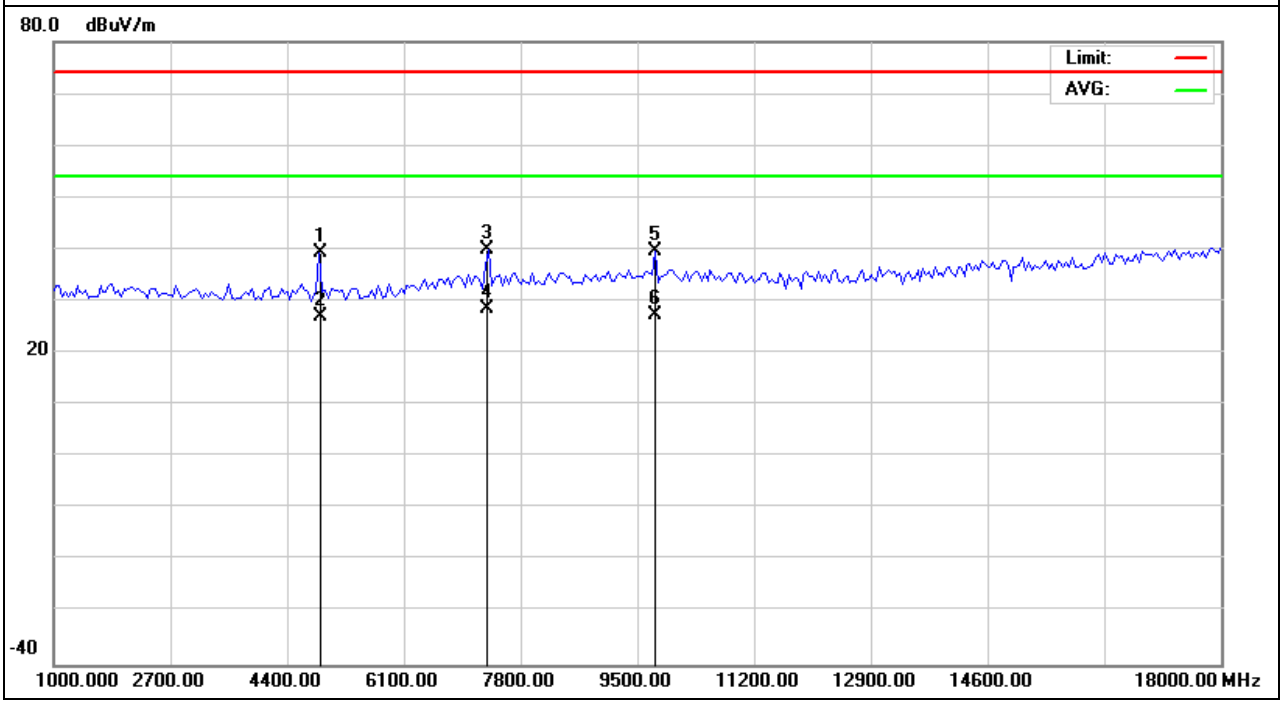
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH40	Polarization：	Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4880.000	31.23	8.17	39.40	74.00	-34.60	QP			
2		4880.000	18.96	8.17	27.13	54.00	-26.87	AVG			
3		7320.000	27.90	12.10	40.00	74.00	-34.00	QP			
4	*	7320.000	16.44	12.10	28.54	54.00	-25.46	AVG			
5		9760.000	21.44	18.26	39.70	74.00	-34.30	QP			
6		9760.000	8.95	18.26	27.21	54.00	-26.79	AVG			

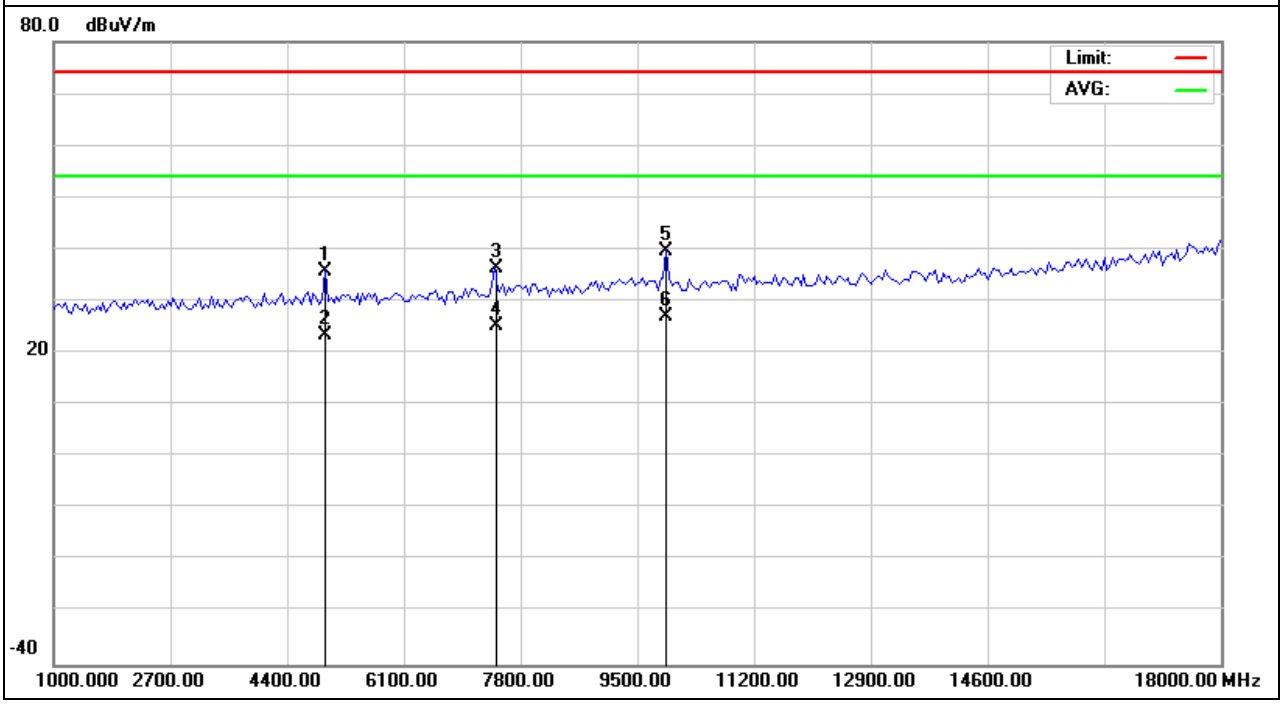
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH79	Polarization：	Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4960.000	27.69	8.21	35.90	74.00	-38.10	QP			
2		4960.000	15.33	8.21	23.54	54.00	-30.46	AVG			
3		7440.000	23.85	12.65	36.50	74.00	-37.50	QP			
4		7440.000	12.51	12.65	25.16	54.00	-28.84	AVG			
5		9920.000	20.72	19.08	39.80	74.00	-34.20	QP			
6	*	9920.000	8.07	19.08	27.15	54.00	-26.85	AVG			

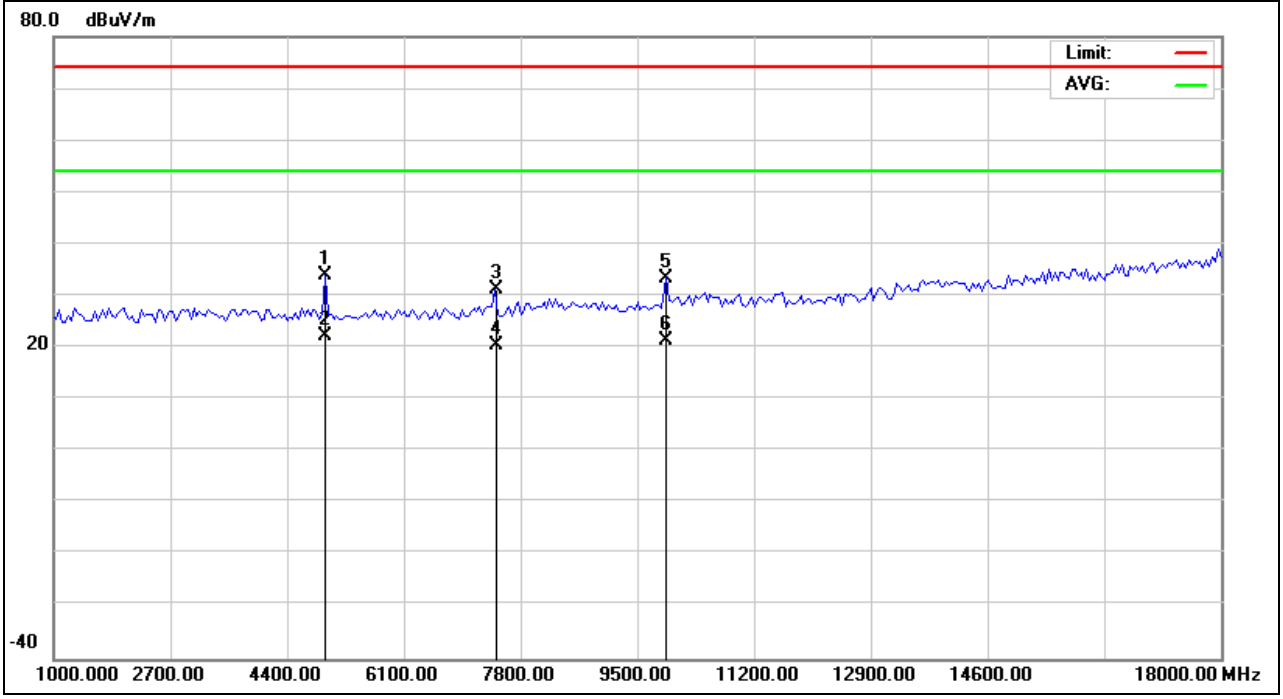
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	TX-CH79	Polarization：	Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		4960.000	25.79	8.21	34.00	74.00	-40.00	QP			
2	*	4960.000	13.95	8.21	22.16	54.00	-31.84	AVG			
3		7440.000	18.55	12.65	31.20	74.00	-42.80	QP			
4		7440.000	7.91	12.65	20.56	54.00	-33.44	AVG			
5		9920.000	14.42	19.08	33.50	74.00	-40.50	QP			
6		9920.000	2.38	19.08	21.46	54.00	-32.54	AVG			

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



For the band-edge test, both hopping-on mode and hopping-off mode had been pre-tested, and only the worst case was recorded in the test report.

4. BANDWIDTH TEST

4.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW≧RBW, Sweep time = Auto.

4.2 DEVIATION FROM STANDARD

No deviation.

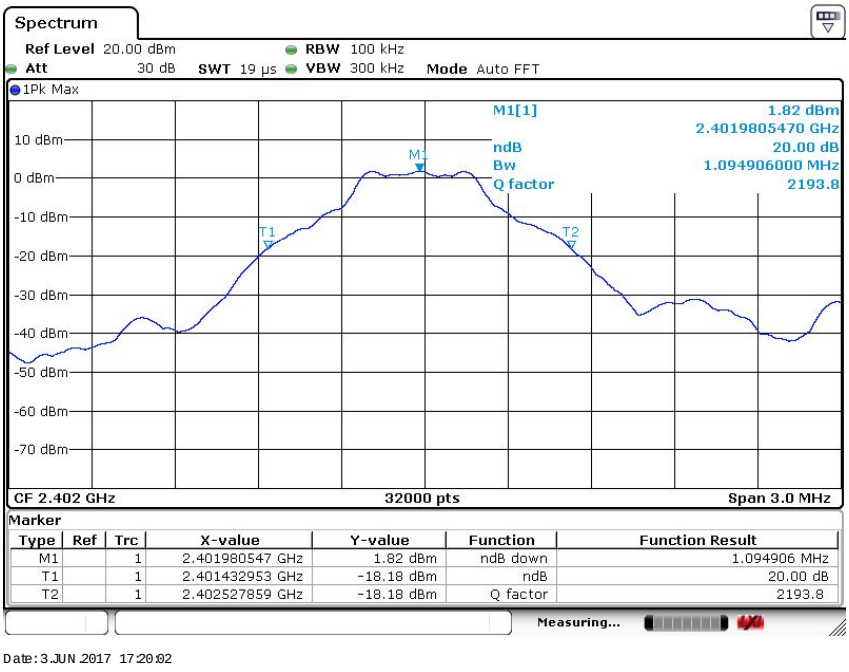
4.3 TEST SETUP

4.4 TEST RESULTS

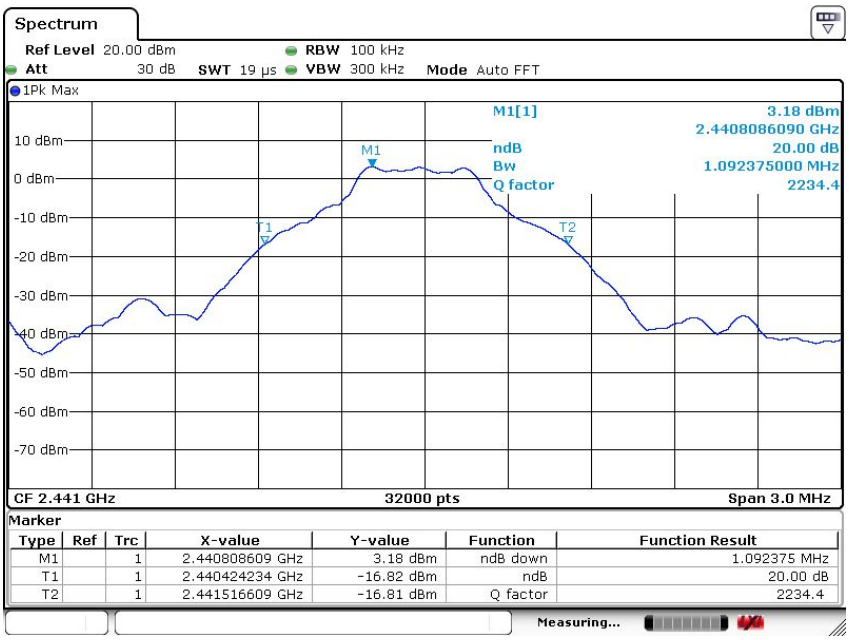
EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	CH01 / CH40 /CH79		

Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	1.0949	**PASS**
2441 MHz	1.0923	**PASS**
2480 MHz	1.0769	**PASS**

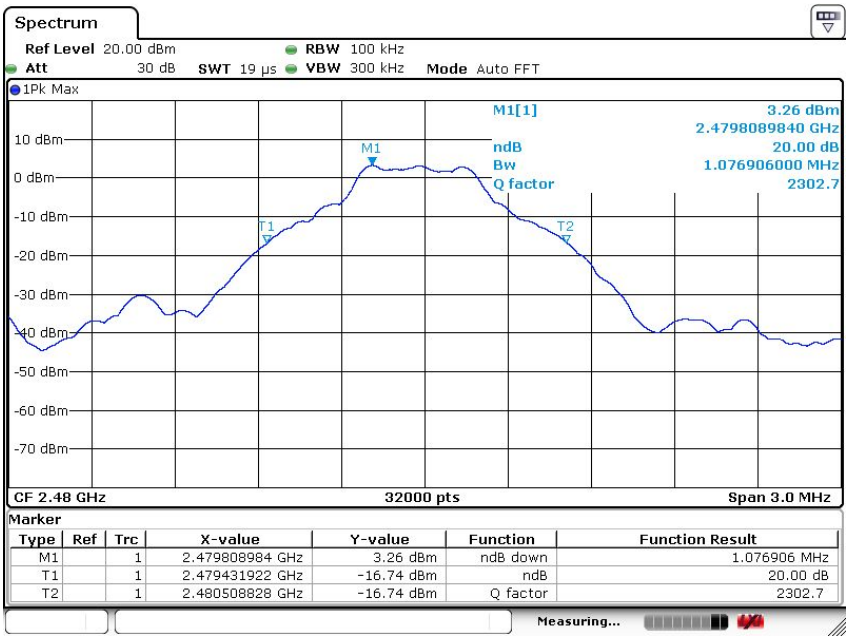
CH01



CH39


Spectrum
Ref Level 20.00 dBm
RBW 100 kHz
Att 30 dB
SWT 19 µs
VBW 300 kHz
Mode Auto FFT
1Pk Max
M1[1]
3.18 dBm
2.4408086090 GHz
ndB 20.00 dB
Bw 1.092375000 MHz
Q factor 2234.4
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 2.441 GHz
32000 pts
Span 3.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.440808609 GHz 3.18 dBm ndB down 1.092375 MHz
T1 1 2.440424234 GHz -16.82 dBm ndB 20.00 dB
T2 1 2.441516609 GHz -16.81 dBm Q factor 2234.4
Measuring...
Date: 3.JUN.2017 17:20:24

CH79


Spectrum
Ref Level 20.00 dBm
RBW 100 kHz
Att 30 dB
SWT 19 µs
VBW 300 kHz
Mode Auto FFT
1Pk Max
M1[1]
3.26 dBm
2.4798089840 GHz
ndB 20.00 dB
Bw 1.076906000 MHz
Q factor 2302.7
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
T1
T2
CF 2.48 GHz
32000 pts
Span 3.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.479808984 GHz 3.26 dBm ndB down 1.076906 MHz
T1 1 2.479431922 GHz -16.74 dBm ndB 20.00 dB
T2 1 2.480508828 GHz -16.74 dBm Q factor 2302.7
Measuring...
Date: 3.JUN.2017 17:20:41

5. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

APPLICABLE STANDARD

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 to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

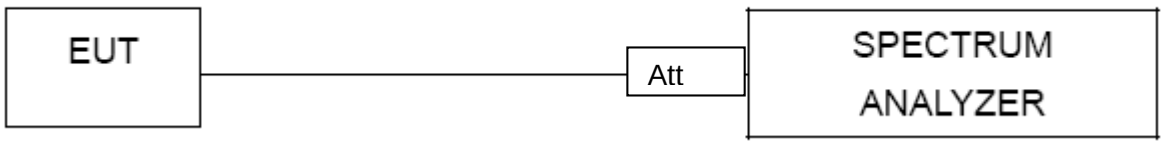
TEST PROCEDURE

a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
e) Repeat above procedures until all measured frequencies were complete.

5.1 DEVIATION FROM STANDARD

No deviation.

5.2 TEST SETUP



5.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.4 TEST RESULTS

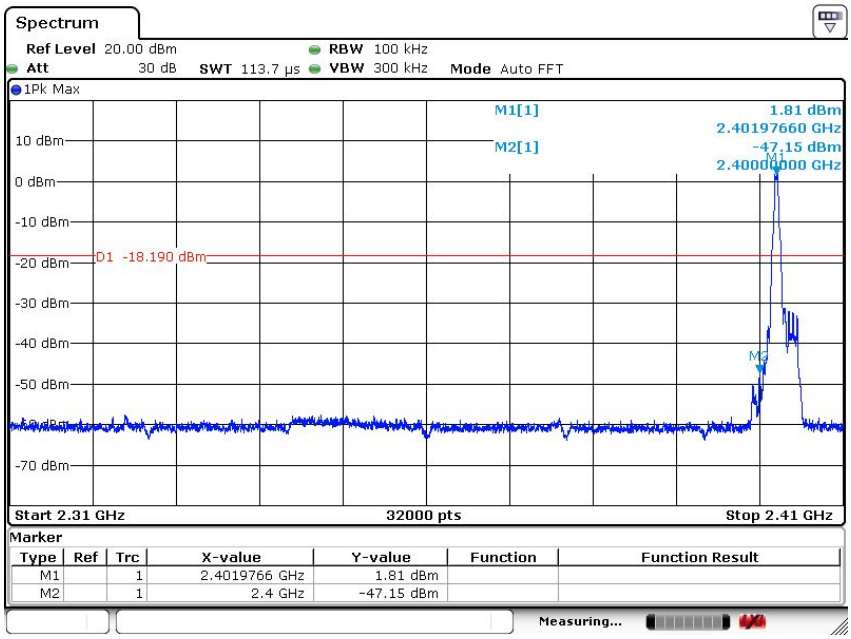
EUT：	Bluetooth earphone	Model Name ：	BB898
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	CH01 / CH39 /CH79		

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
2390	47.88	1.05	48.93	74	-25.07	peak	Vertical
2390	46.95	1.05	48	74	-26	peak	Horizontal
2483.5	50.33	1.29	51.62	74	-22.38	peak	Vertical
2483.5	46.68	1.29	47.97	74	-26.03	peak	Horizontal

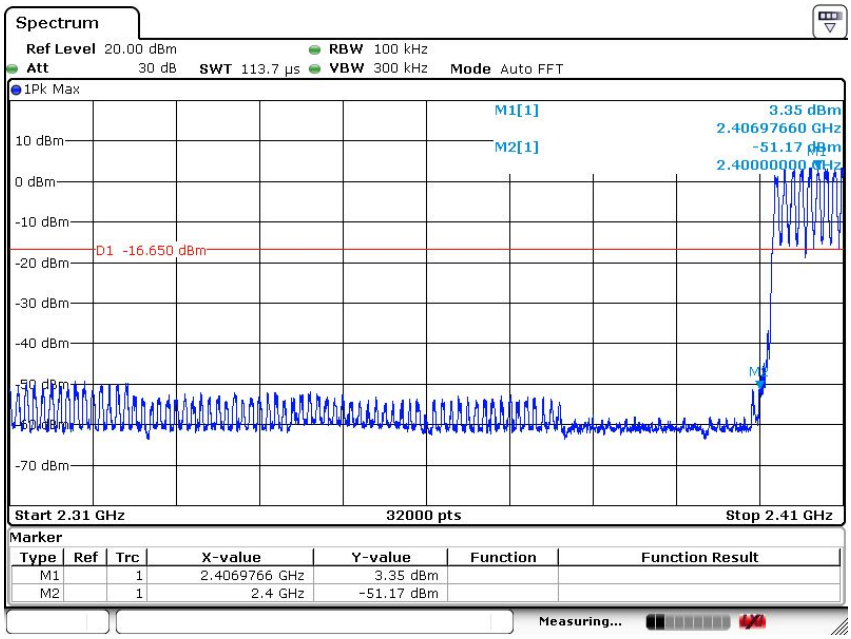
Note: When PK value is lower than the Average value limit, average not record.

For the band-edge test, both hopping-on mode and hopping-off mode had been pre-tested, and only the worst case was recorded in the test report.

Band Edge, Left Side

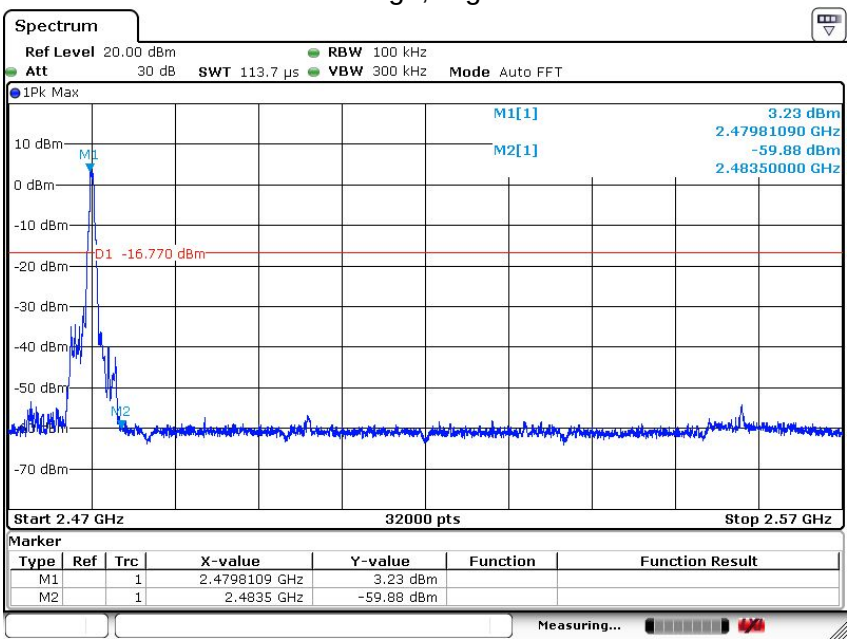


Date: 3.JUN.2017 17:16:02

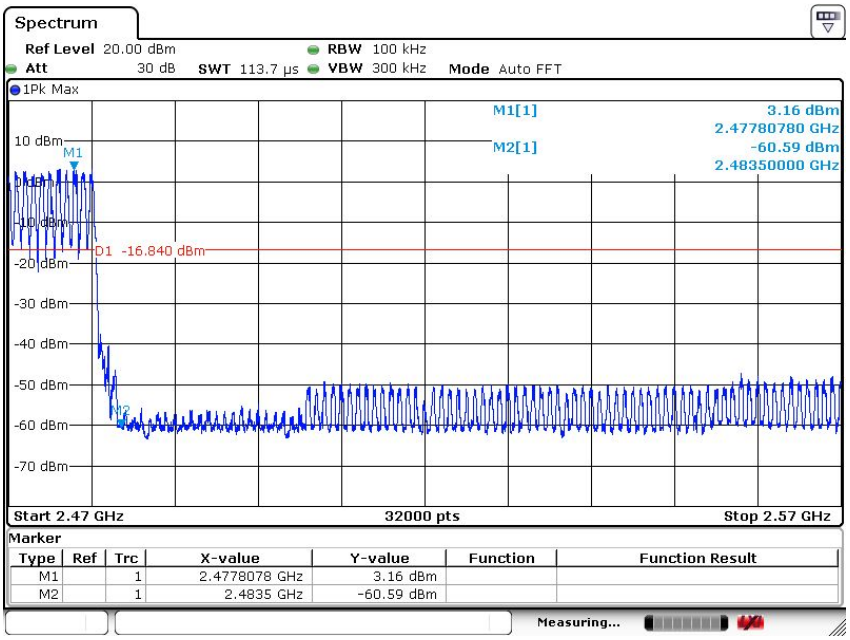


Date: 3.JUN.2017 17:17:33

Band Edge, Right Side



Date: 3.JUN.2017 17:18:54

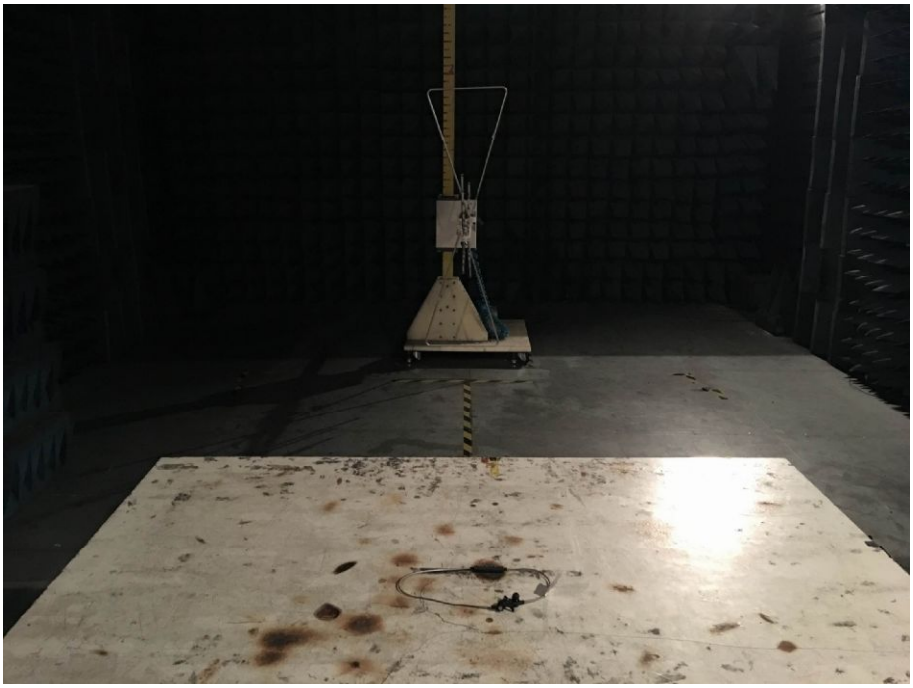


Date: 3.JUN.2017 17:18:12

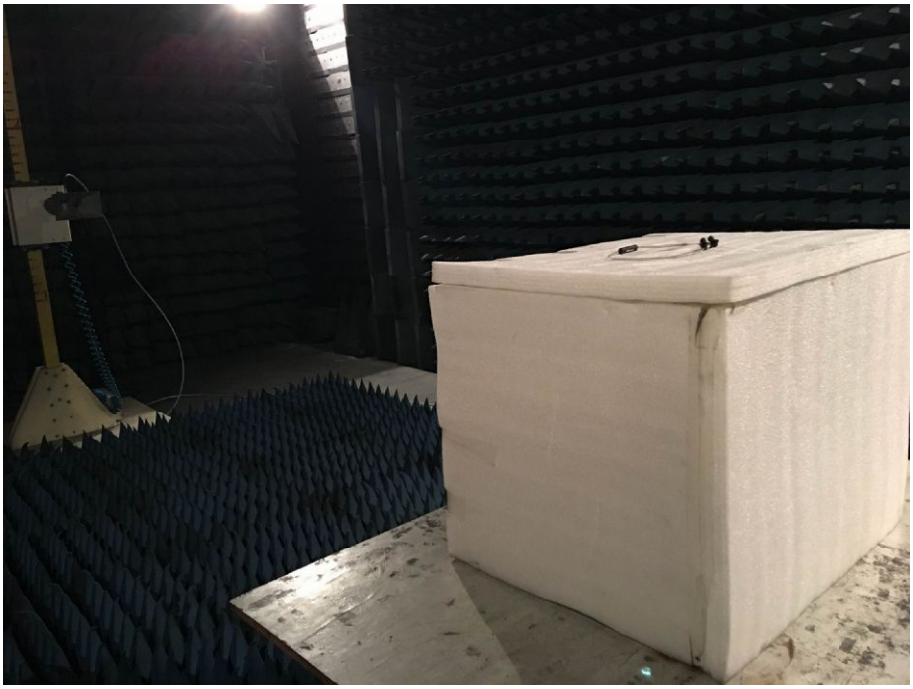
6. EUT TEST PHOTO

Radiated Measurement Photos

30-1000MHz



Above 1GHz



EUT

Photo 1

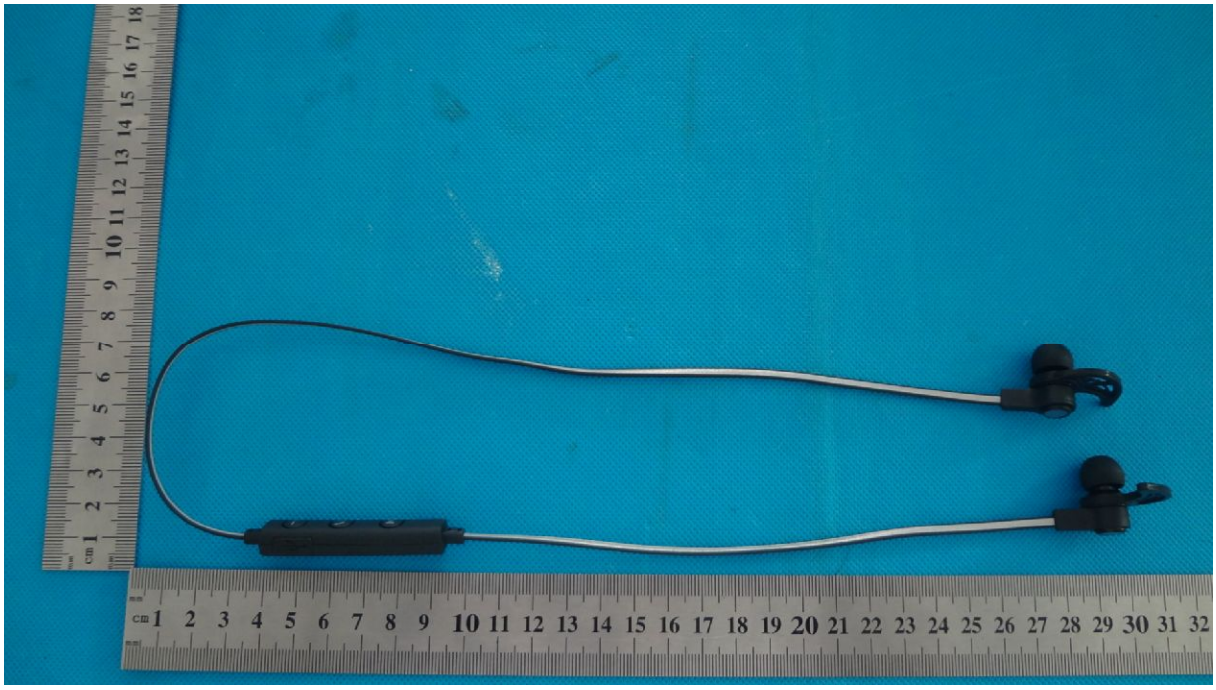


Photo 2

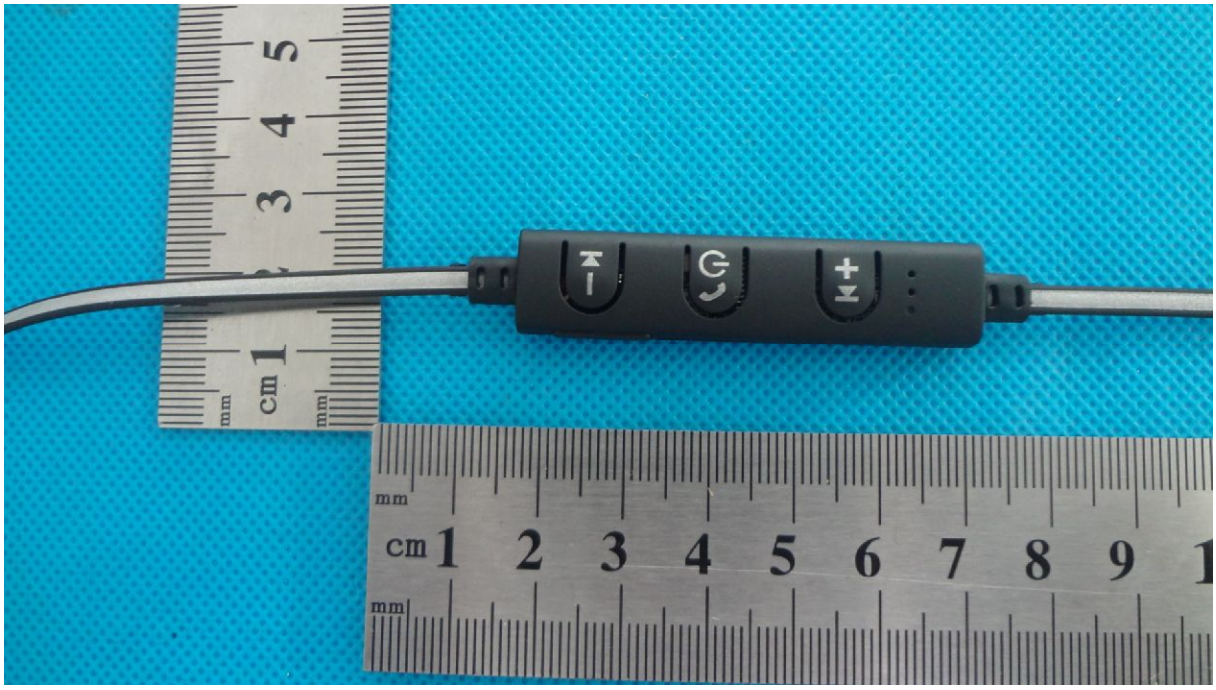


Photo 3

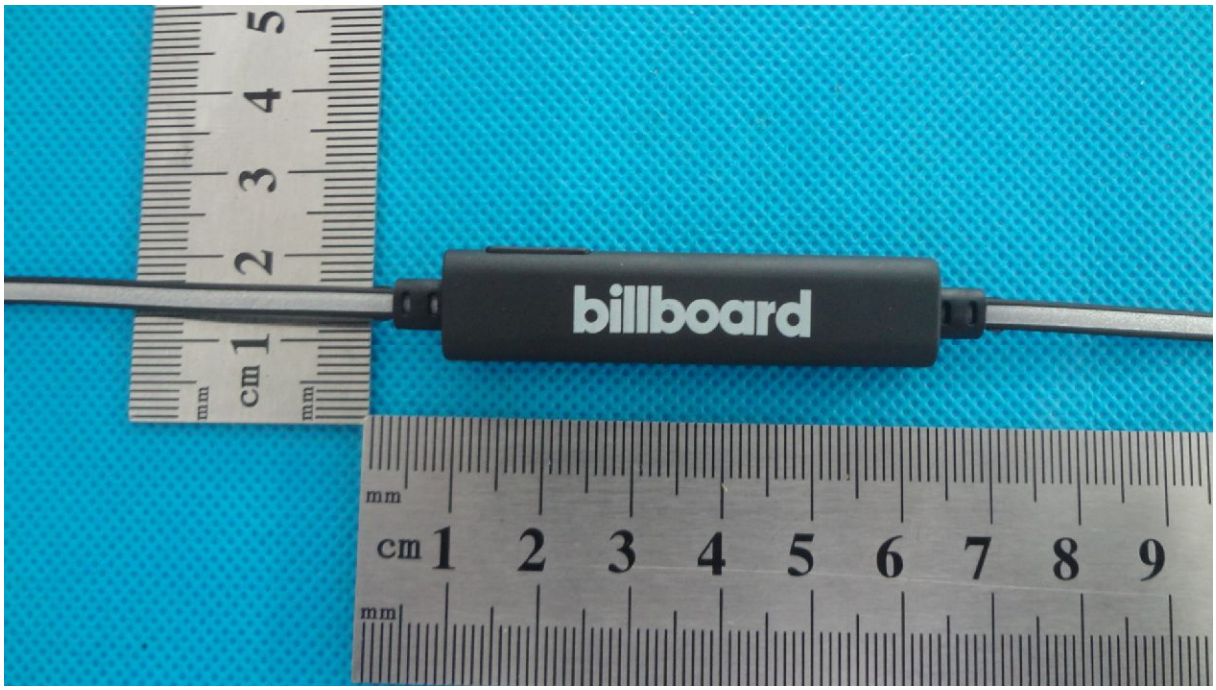


Photo 4

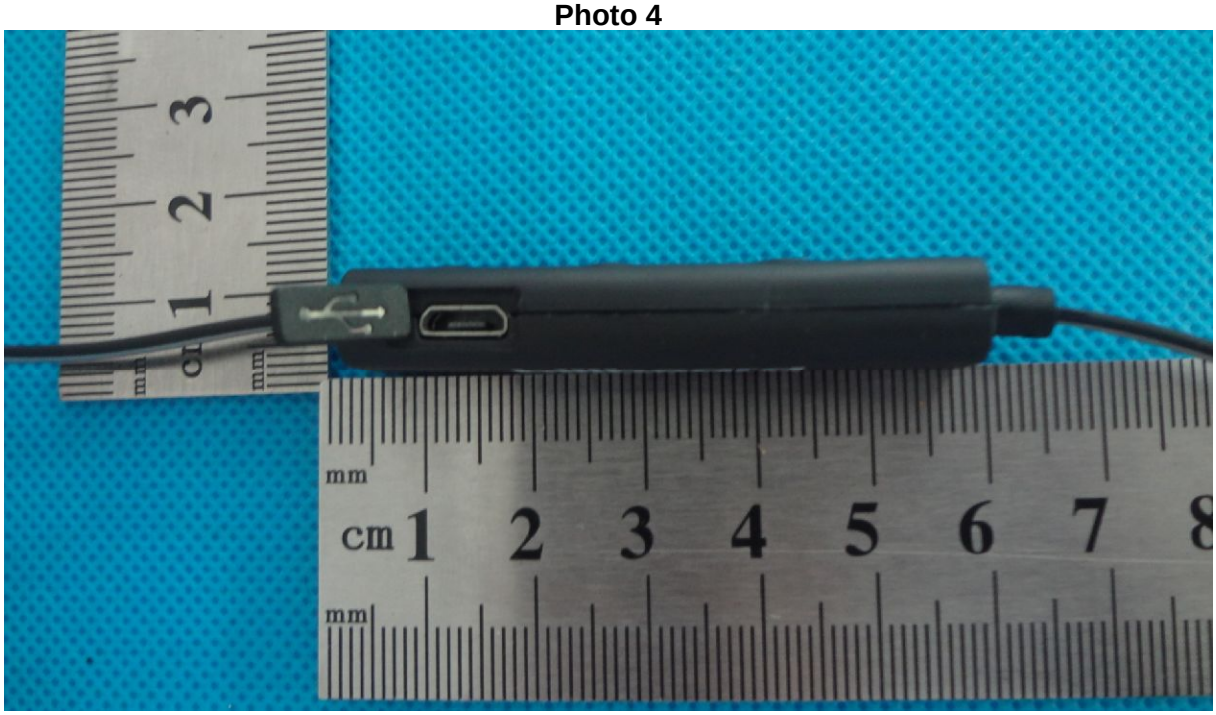


Photo 5

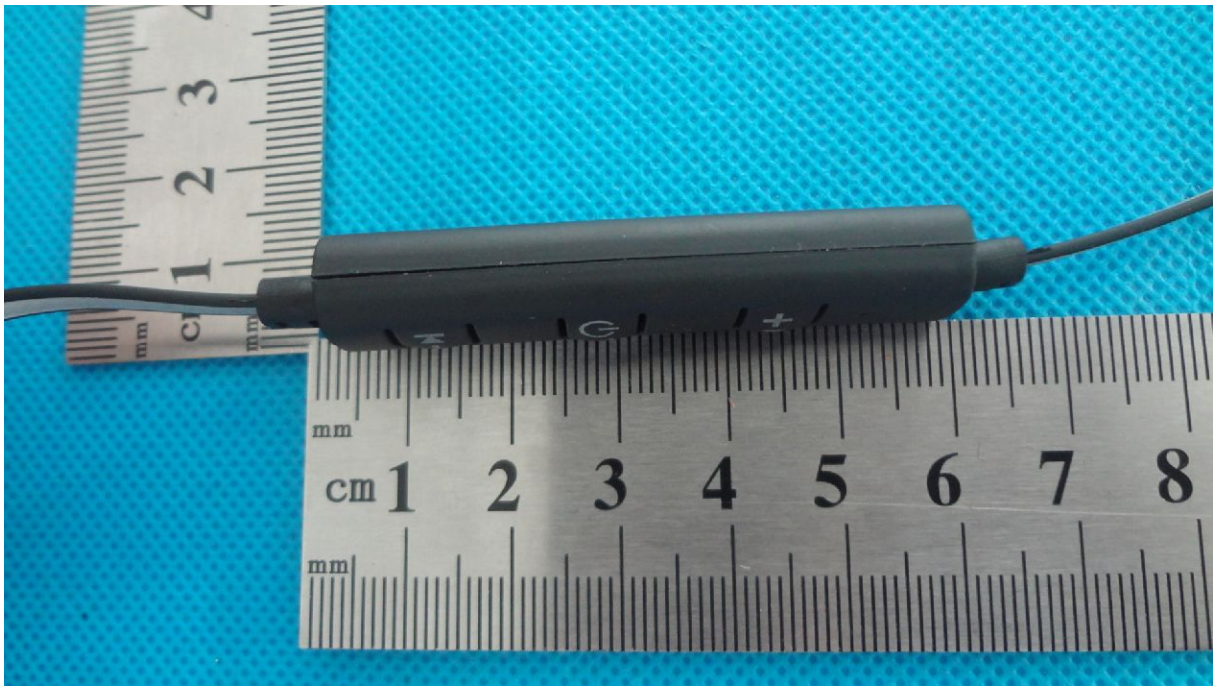


Photo 6

Photo 7

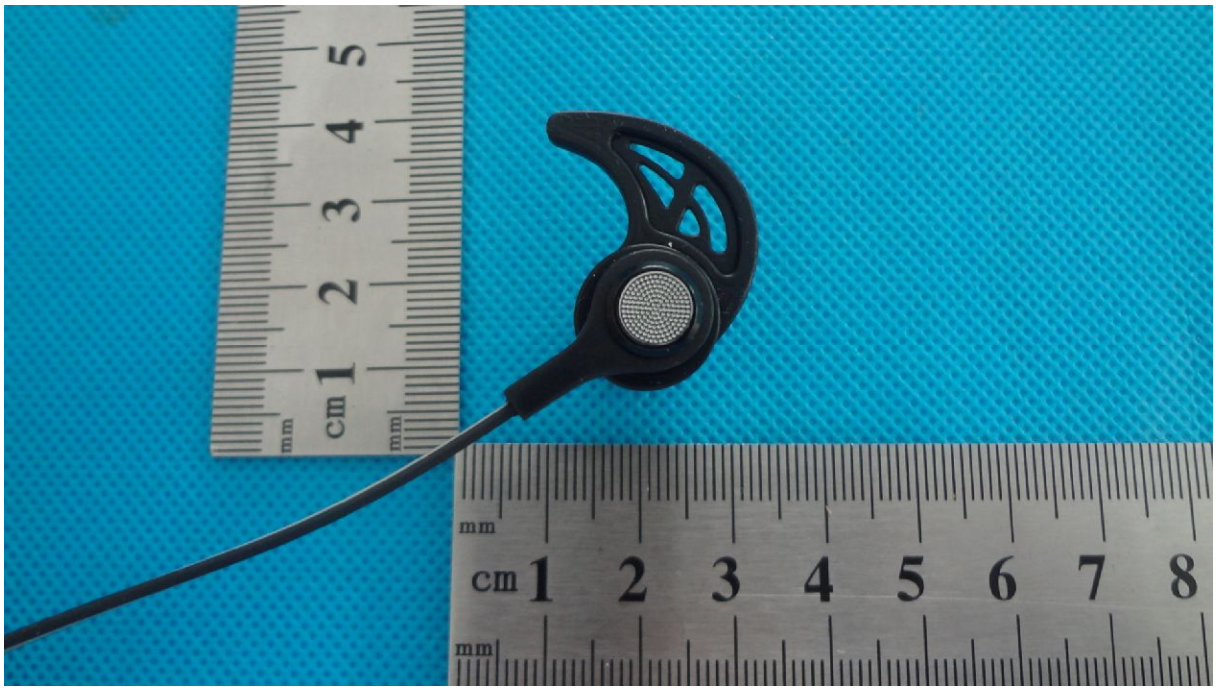


Photo 8

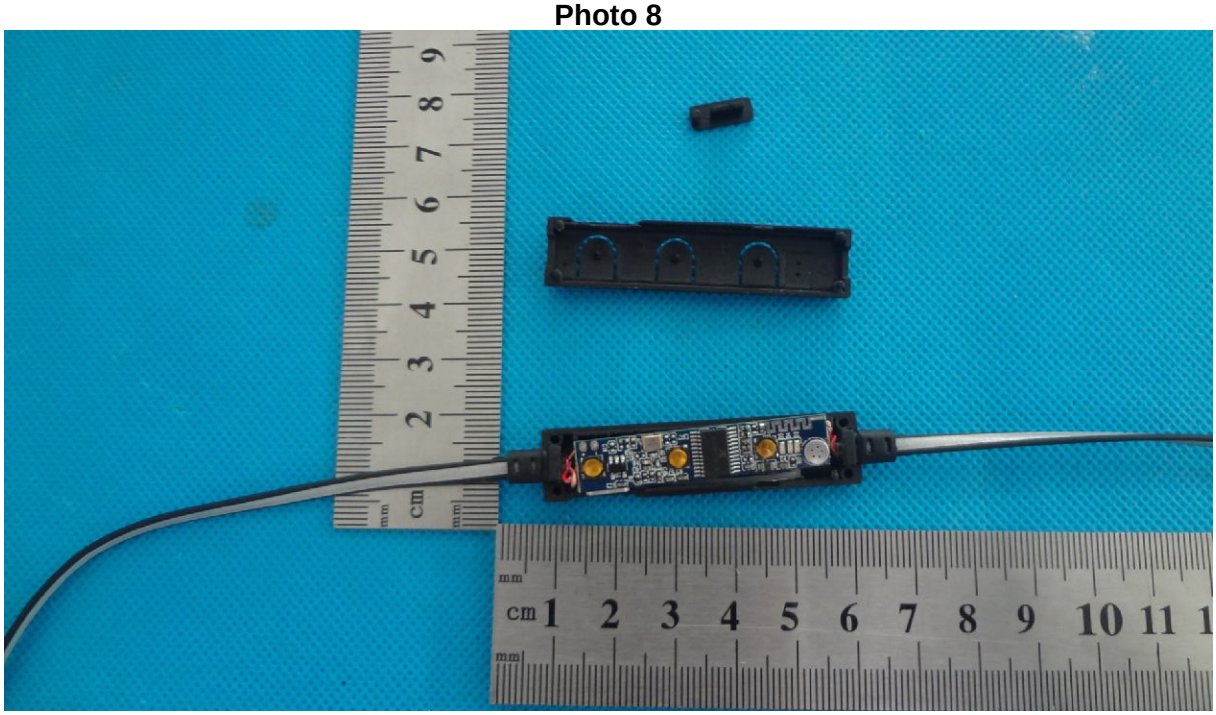


Photo 9

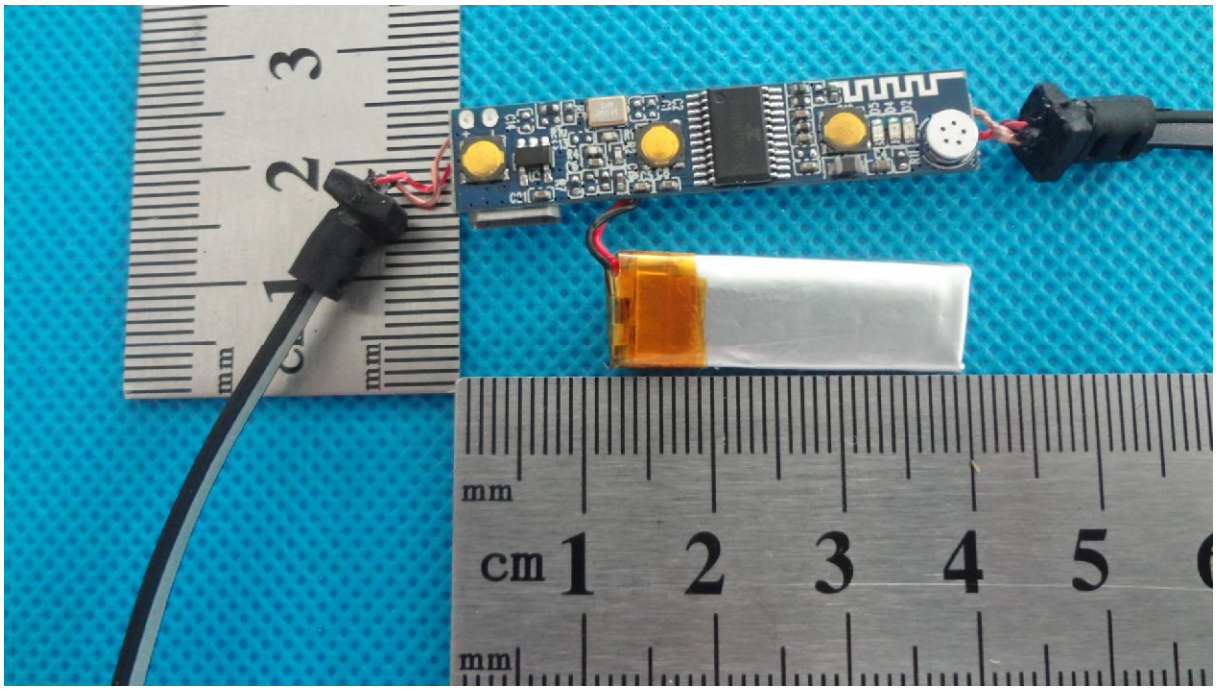


Photo 10