FCC TEST REPORT

for

GOLD FINGERS TECHNOLOGY CO., LTD

Bluetooth Earphone

Model Number:BTH103

Serial Number: BTH101, BTH102

FCC ID: 2AIZH-BTH103

Prepared for : GOLD FINGERS TECHNOLOGY CO., LTD
Address : Rm303, Bldg Xiagu, MeiShengChuangGu Tech Park, No.10, Rd Longchang, Bao'an District, Shenzhen, China
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Report No. : 16KWE084265F
Date of Test : Aug. 12~Aug.29, 2016
Date of Report : Aug. 30, 2016

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Keyway Testing Technology Co., Ltd.

Applicant: **Address:**	GOLD FINGERS TECHNOLOGY CO., LTD Rm303, Bldg Xiagu, MeiShengChuangGu Tech Park, No.10, Rd Longchang, Bao'an District, Shenzhen, China		
Manufacturer: **Address:**	GOLD FINGERS TECHNOLOGY CO., LTD Rm303, Bldg Xiagu, MeiShengChuangGu Tech Park, No.10, Rd Longchang, Bao'an District, Shenzhen, China		
E.U.T:	Bluetooth Earphone		
Model Number:	BTH103		
Serial Model:	BTH101, BTH102		
Trade Name:	N/A	**Serial No.:**	------
Date of Receipt:	Aug. 11, 2016	**Date of Test:**	Aug. 12~Aug.29, 2016
Test Specification:	FCC Part 15, Subpart C Section 15.247: 2015 ANSI C63.10:2013 KDB558074 D01 DTS Meas Guidance v03r05		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.		

Issue Date: Aug. 30, 2016

Tested by:	Reviewed by:	Approved by:
Keven Wu / Engineer	Mike Xu / Supervisor	Andy Gao / Supervisor

Other Aspects:

None.

Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested

1.TEST SUMMARY

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emissions	15.205(a) 15.209 15.247(d)	PASS
6dB&99% Bandwidth	15.247(a)(2)	PASS
Power density	15.247(e)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Emissions from out of band	15.247(d)	PASS
Antenna Requirement	15.203	PASS

2.GENERAL PRODUCT INFORMATION

2.1. Product Function

Refer to Technical Construction Form and User Manual.

2.2. Description of Device (EUT)

Product Name:	Bluetooth Earphone
Model No.:	BTH103
Serial Model:	BTH101, BTH102
Model Difference	All the models are the same circuit and RF module, except the model names and appearance.
Operation Frequency:	BT: 2402MHz~2480MHz
Channel numbers:	BT: 40 Channels
Modulation technology:	BT: GFSK
Antenna Type:	Ceramic Antenna
Antenna gain:	1.0dBi
Power supply:	DC 3.7V or DC 5V from adapter
Adapter	I/P:AC 100~240V 50/60Hz 0.15A O/P:DC 5V 1A

2.3. Independent Operation Modes

The basic operation modes are:

2.3.1. EUT work BT mode, and Test Mode as below:

Final Test Mode	Description
Mode 1	CH00
Mode 2	CH19
Mode 3	CH39
Mode 4	Link Mode

Remark: According to ANSI C63.10 standards, the test results are both the “worst case” and “worst setup”

2.4. TEST SITES

2.4.1. Test Facilities

Lab Qualifications : Certificated by Industry Canada
Registration No.: 9868A
Date of registration: December 8, 2011

Certificated by FCC, USA
Registration No.: 370994
Date of registration: February 21, 2012

Certificated by CNAS China
Registration No.: CNAS L5783
Date of registration: August 8, 2012

2.5. List of Test and Measurement Instruments

2.5.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 09,16	Apr. 09,17
Artificial Mains Network	Rohde&Schwarz	ENV216	101315	Apr. 09,16	Apr. 09,17
Artificial Mains Network (AUX)	Rohde&Schwarz	ENV216	101314	Apr. 09,16	Apr. 09,17
RF Cable	FUJIKURA	3D-2W	944 Cable	Apr. 09,16	Apr. 09,17

2.5.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 09,16	Apr. 09,17
Bilog Antenna	ETS-LINDGREEN	3142D	135452	Apr. 09,16	Apr. 09,17
Spectrum Analyzer	Agilent	E4411B	MY4511304	Apr. 09,16	Apr. 09,17
3m Semi-anechoic Chamber	ETS-LINDGREEN	966	KW01	Apr. 09,16	Apr. 09,17
Signal Amplifier	SONOMA	310	187016	Apr. 09,16	Apr. 09,17
Signal Amplifier	Agilent	8449B	3008A00251	Apr. 09,16	Apr. 09,17
RF Cable	IMRO	IMRO-400	966 Cable 1#	N/A	N/A
MULTI-DEVICE Controller	ETS-LINDGREEN	2090	126913	N/A	N/A
Horn Antenna	SCHWARZBECK	BBHA9170	9170-068	Apr. 09,16	Apr. 09,17
Spectrum Analyzer	Agilent	E4407B	MY44211125	Apr. 09,16	Apr. 09,17
High Pass filter	Micro	HPM50111	324216	Apr. 09,16	Apr. 09,17
Constant temperature and humidity box	GF	GTH-800-40-1P	MAA9906-005	Apr. 09,16	Apr. 09,17
Attenuation	MCE	24-10-34	BN9258	Apr. 02,16	Apr. 02,17
Loop Antenna	ARA	PLA-1030/B	1029	Apr. 02,16	Apr. 02,17
Power Meter	Anritsu	ML2495A	1204003	Apr. 24,16	Apr. 24,17
Power Sensor	Anritsu	MA2411B	1126150	Apr. 24,16	Apr. 24,17

3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators

3.3. Special Accessories and Auxiliary Equipment

Adapter:	Manufacturer:Cenique Infotainment Group Limited I/P:AC 100~240V 50/60Hz 0.15A O/P:DC 5V 1A DC Line:Unshielded,detachable 1.2m

4. EMISSION TEST RESULTS

4.1. Conducted Emission at the Mains Terminals Test

4.1.1. Limit 15.207 limits

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 50

4.1.2. Test Setup

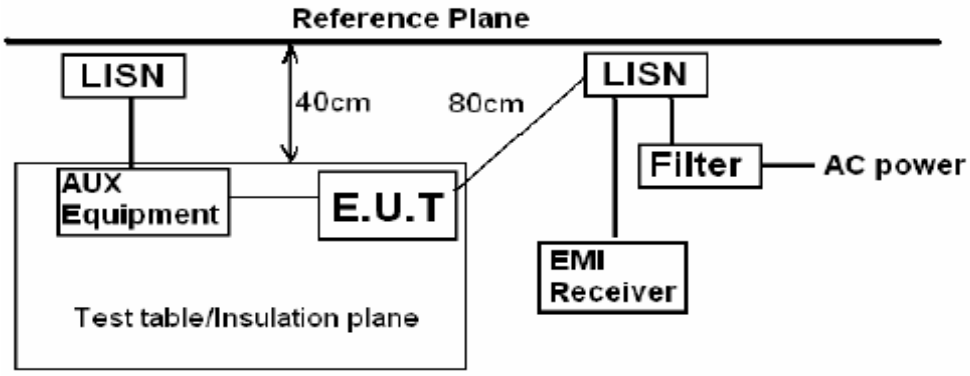
The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 0.8 m, the excess was folded back and forth parallel to the cable at the centre so as to form a bundle no longer than 0.4 m.

The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.

The frequency range from 150 kHz to 30 MHz was investigated.

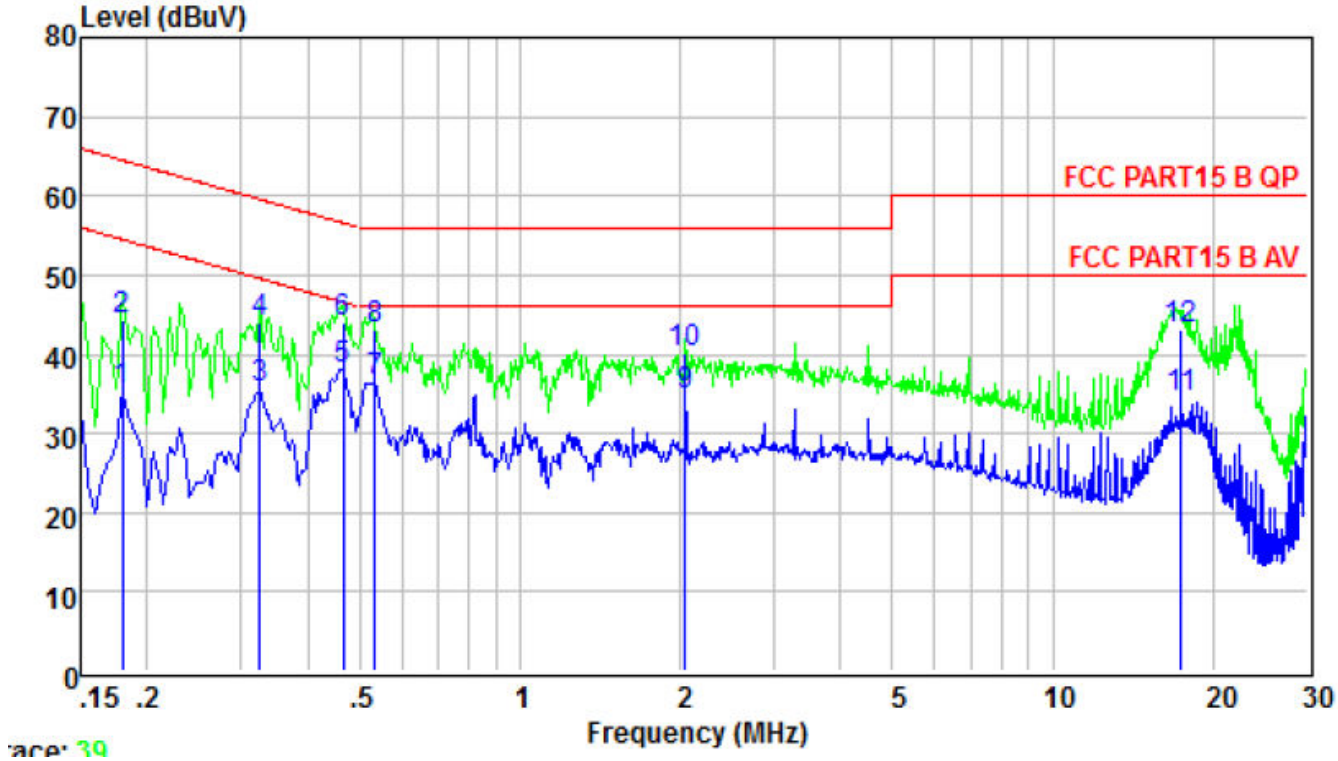
The bandwidth of the test receiver was set at 9 kHz.

Pretest for all mode, The test data of the worst case condition(s) was reported on the following page.



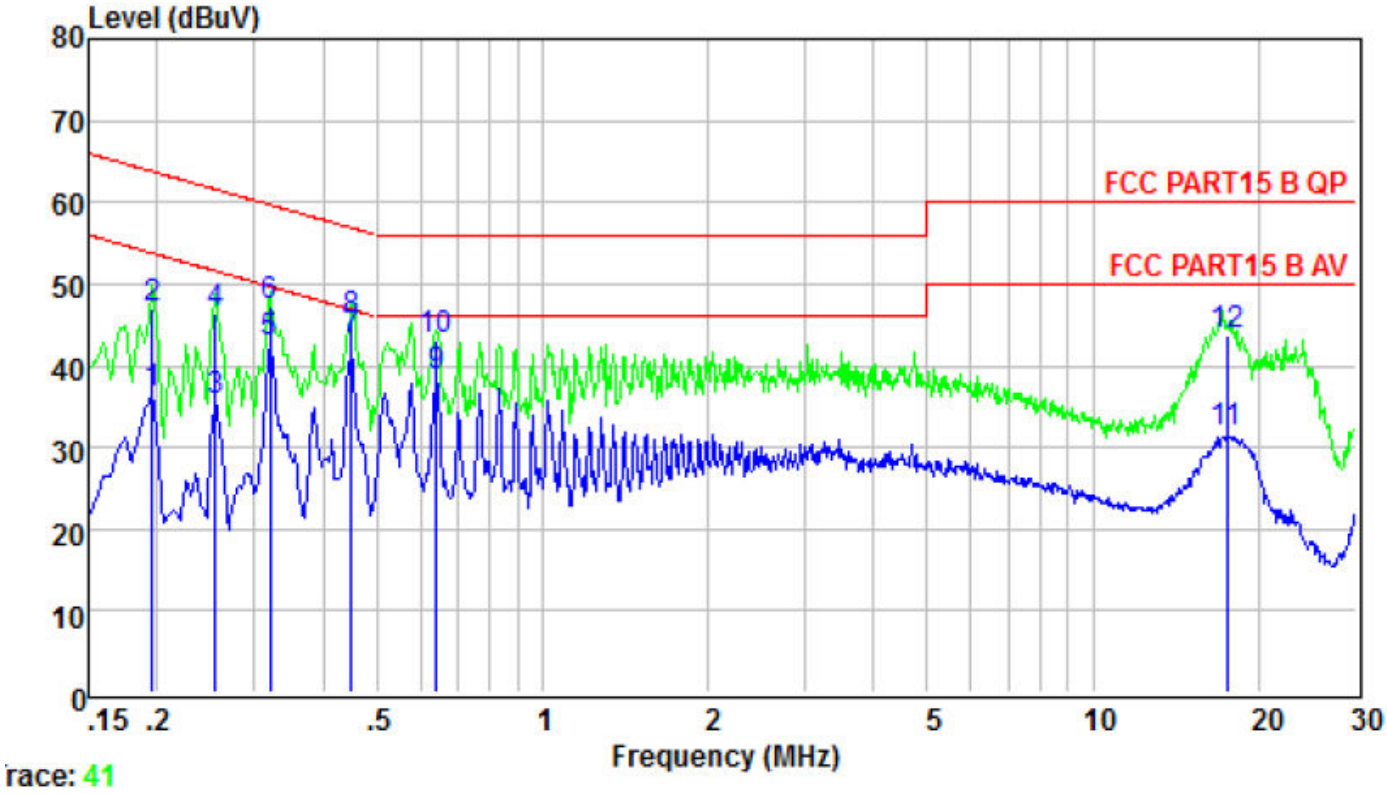
Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

EUT：	Bluetooth Earphone	Model Name ：	BTH103
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from adapter AC 120V/60Hz	Test Mode：	Mode 4



	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.180	35.26	54.50	-19.24	Average
2	0.180	44.26	64.50	-20.24	QP
3	0.325	35.65	49.57	-13.92	Average
4	0.325	43.88	59.57	-15.69	QP
5	0.466	38.18	46.58	-8.40	Average
6	0.466	44.13	56.58	-12.45	QP
7	0.535	36.52	46.00	-9.48	Average
8	0.535	43.03	56.00	-12.97	QP
9	2.044	34.89	46.00	-11.11	Average
10	2.044	40.01	56.00	-15.99	QP
11	17.383	34.36	50.00	-15.64	Average
12	17.383	43.03	60.00	-16.97	QP

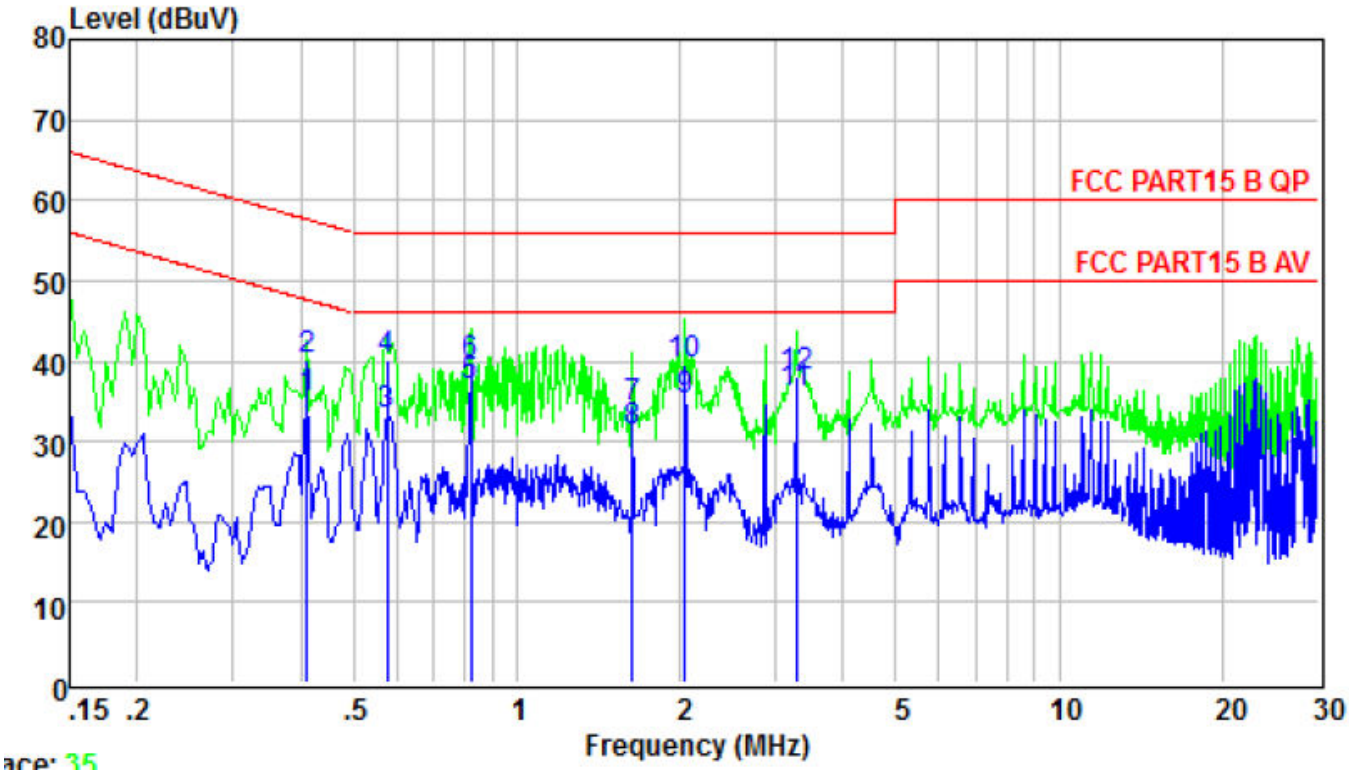
EUT：	Bluetooth Earphone	Model Name ：	BTH103
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from adapter AC 120V/60Hz	Test Mode：	Mode 4



race: 41

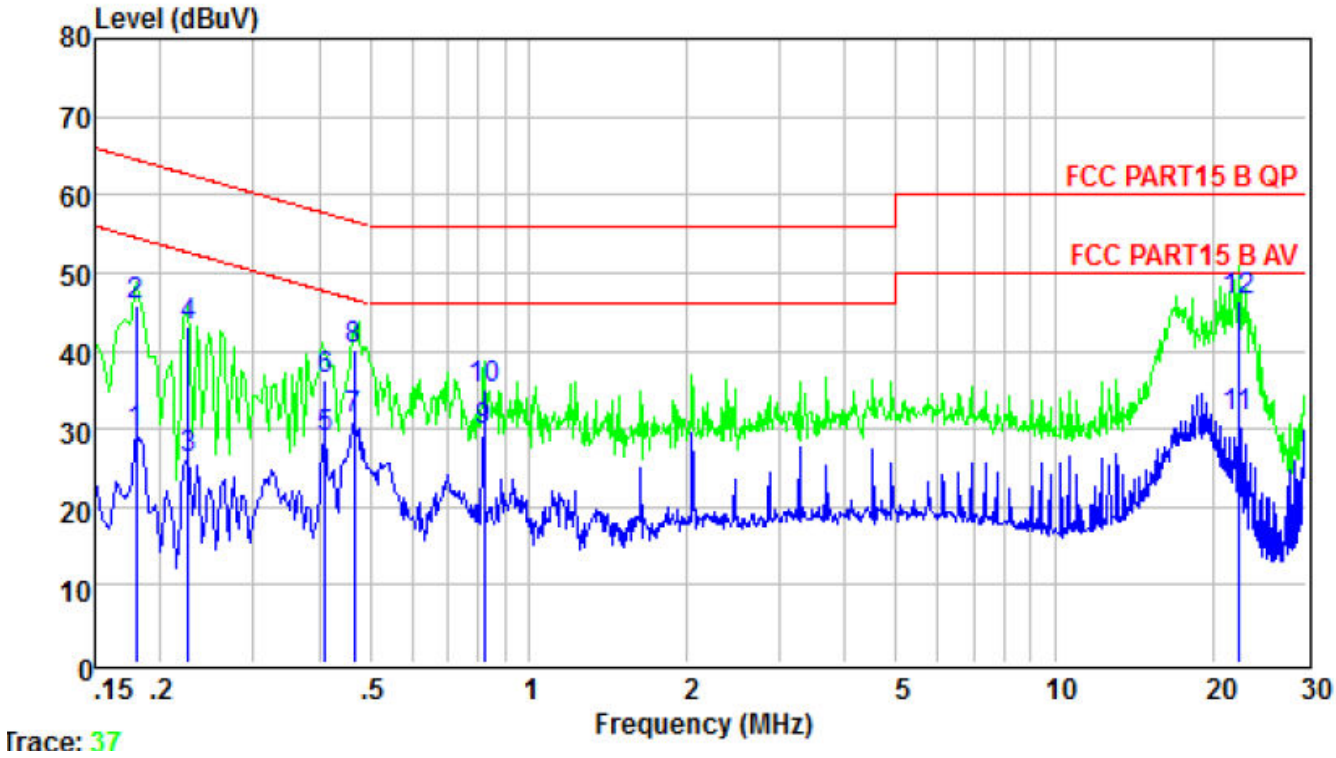
	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.195	36.62	53.80	-17.18	Average
2	0.195	47.10	63.80	-16.70	QP
3	0.255	35.77	51.60	-15.83	Average
4	0.255	46.26	61.60	-15.34	QP
5	0.320	42.68	49.71	-7.03	Average
6	0.320	47.20	59.71	-12.51	QP
7	0.449	43.00	46.89	-3.89	Average
8	0.449	45.50	56.89	-11.39	QP
9	0.641	38.78	46.00	-7.22	Average
10	0.641	43.03	56.00	-12.97	QP
11	17.475	31.82	50.00	-18.18	Average
12	17.475	43.58	60.00	-16.42	QP

EUT：	Bluetooth Earphone	Model Name ：	BTH103
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from adapter AC 240V/60Hz	Test Mode：	Mode 4



	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.410	35.48	47.64	-12.16	Average
2	0.410	40.03	57.64	-17.61	QP
3	0.576	33.36	46.00	-12.64	Average
4	0.576	40.10	56.00	-15.90	QP
5	0.822	37.00	46.00	-9.00	Average
6	0.822	39.70	56.00	-16.30	QP
7	1.636	34.09	46.00	-11.91	Average
8	1.636	31.10	56.00	-24.90	QP
9	2.044	34.97	46.00	-11.03	Average
10	2.044	39.70	56.00	-16.30	QP
11	3.276	35.89	46.00	-10.11	Average
12	3.276	38.12	56.00	-17.88	QP

EUT：	Bluetooth Earphone	Model Name ：	BTH103
Temperature：	26 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from adapter AC 240V/60Hz	Test Mode：	Mode 4



	Freq	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.180	29.46	54.50	-25.04	Average
2	0.180	45.69	64.50	-18.81	QP
3	0.226	26.27	52.61	-26.34	Average
4	0.226	43.21	62.61	-19.40	QP
5	0.410	28.80	47.64	-18.84	Average
6	0.410	36.24	57.64	-21.40	QP
7	0.466	31.22	46.58	-15.36	Average
8	0.466	40.13	56.58	-16.45	QP
9	0.822	29.81	46.00	-16.19	Average
10	0.822	35.15	56.00	-20.85	Peak
11	22.298	31.62	50.00	-18.38	Average
12	22.298	46.26	60.00	-13.74	QP

4.2. Radiated Emission Test

4.2.1. Limit 15.209 limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		μV/m	dB(μV)/m
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)	

4.2.2. Restricted bands of operation

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])

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.

4.2.3. Test setup

The EUT was placed on a turn table which was 0.8 m(above 1GHz, the table was 1.5m) above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz, Both PK and AV measure, PK detector is used.

The frequency range from 30MHz to 10^{th} harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

Notes: 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading-Preamp Factor.

2. Measurement Uncertainty: ±3.2 dB at a level of confidence of 95%.

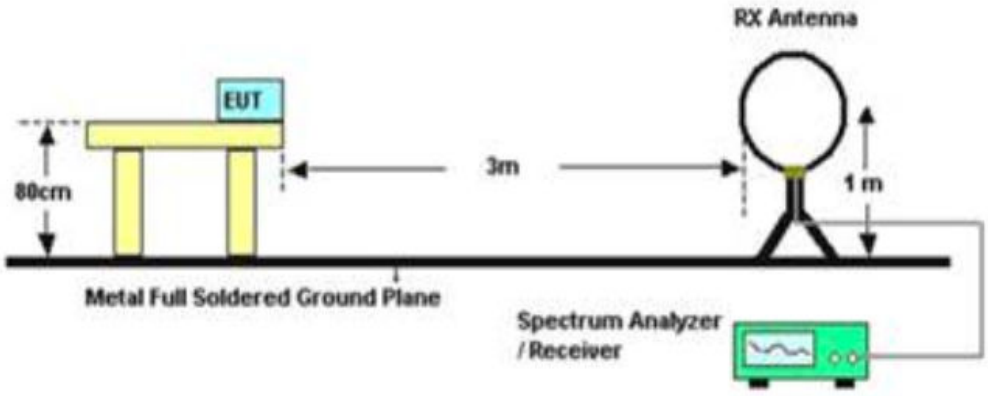
3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

4. For emissions below 1GHz, pretest for all mode, The test data of the worst case condition(s) was reported on the following pages.

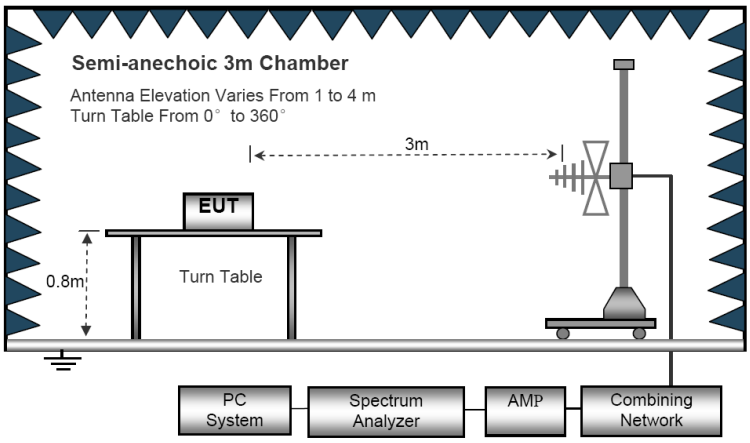
5. For Both PK and AV value above 1GHz, PK detector is used.

6. EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report (Z orientation).

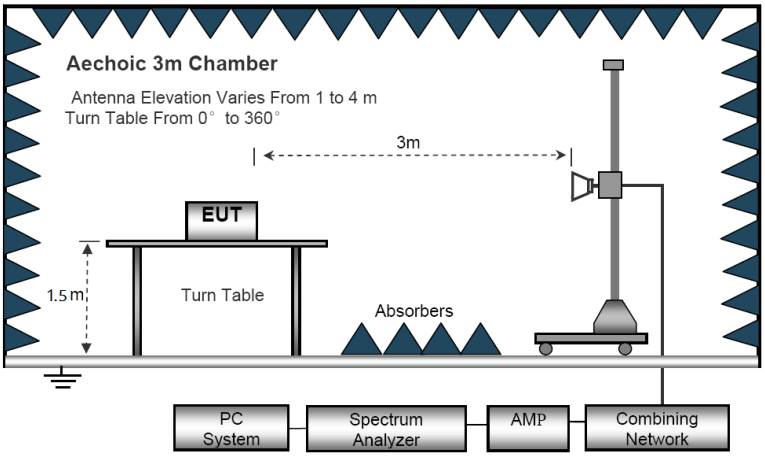
Radiated Emission Test-Up Frequency Below 30MHz



30MHz- 1GHz



Above 1GHz



Below 30MHz

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

Note:

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

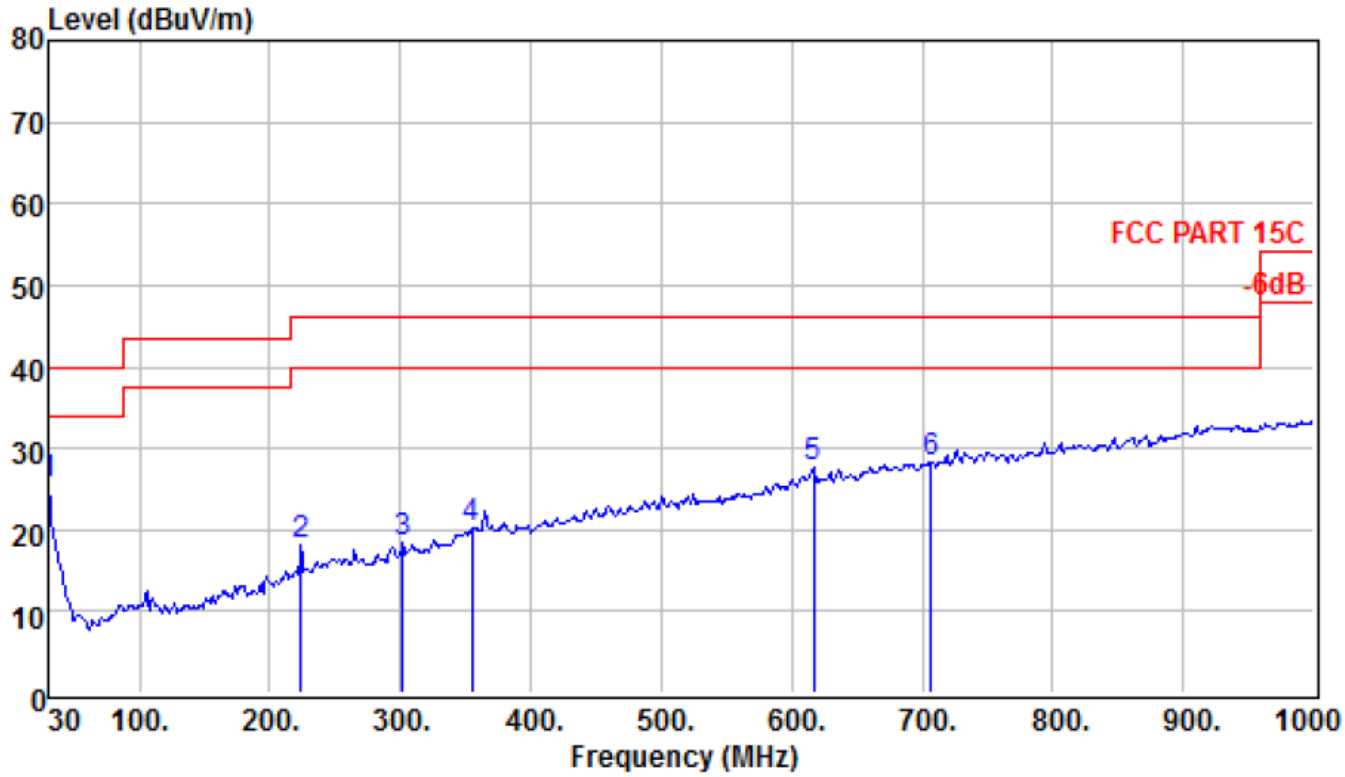
Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

EUT：	Bluetooth Earphone	Model Name ：	BTH103
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010hPa	Test Mode：	TX
Test Voltage ：	DC 3.7V		

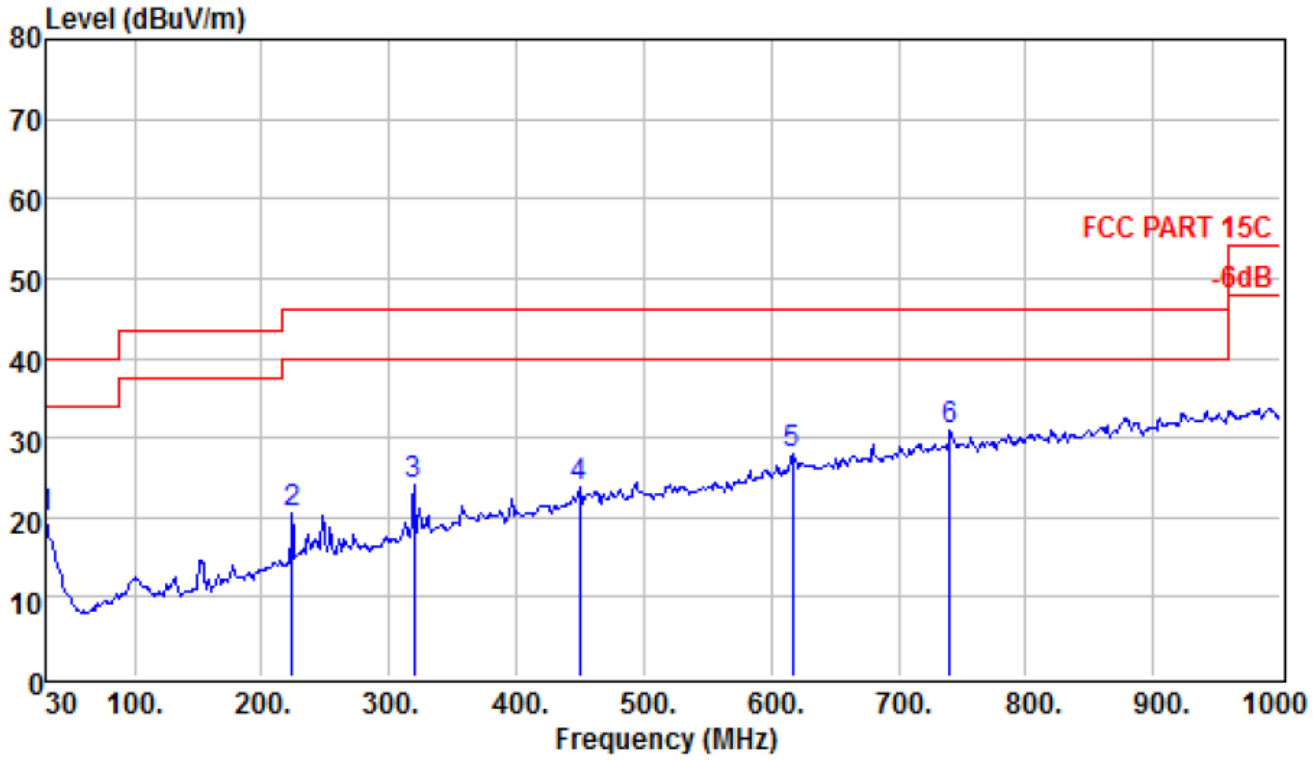
30- 1GHz

Vertical



	Freq	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1	30.000	37.64	31.41	0.56	18.80	25.59	40.00	-14.41	QP
2	224.000	35.34	30.95	1.53	12.15	18.07	46.00	-27.93	QP
3	301.600	33.46	30.92	1.94	13.84	18.32	46.00	-27.68	QP
4	354.950	32.84	30.64	2.18	15.92	20.30	46.00	-25.70	QP
5	616.850	33.79	30.64	3.38	21.07	27.60	46.00	-18.40	QP
6	707.060	33.02	30.66	3.88	22.10	28.34	46.00	-17.66	QP

Horizontal



	Freq	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1	30.000	31.98	31.41	0.56	18.80	19.93	40.00	-20.07	QP
2	224.000	37.80	30.95	1.53	12.15	20.53	46.00	-25.47	QP
3	319.060	38.51	30.85	2.02	14.33	24.01	46.00	-21.99	QP
4	449.040	34.18	30.61	2.62	17.58	23.77	46.00	-22.23	QP
5	616.850	34.05	30.64	3.38	21.07	27.86	46.00	-18.14	QP
6	740.040	34.86	30.67	4.04	22.72	30.95	46.00	-15.05	QP

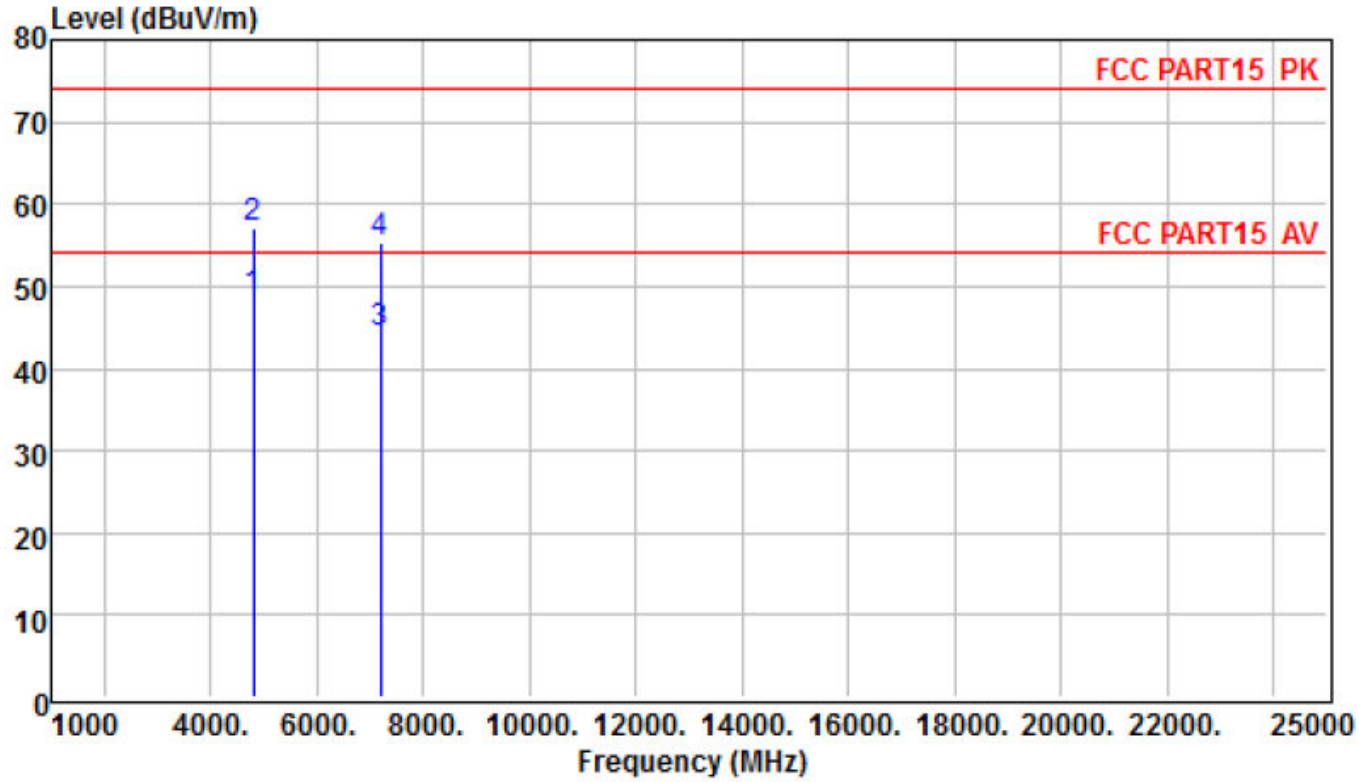
NOTE:

Absolute Level= ReadingLevel+antenna Factor+cable loss-preamp factor,
Over Limit= Absolute Level – Limit
Mode 1 is the worst mode. Only worst case is presented in the report .

Above 1GHz

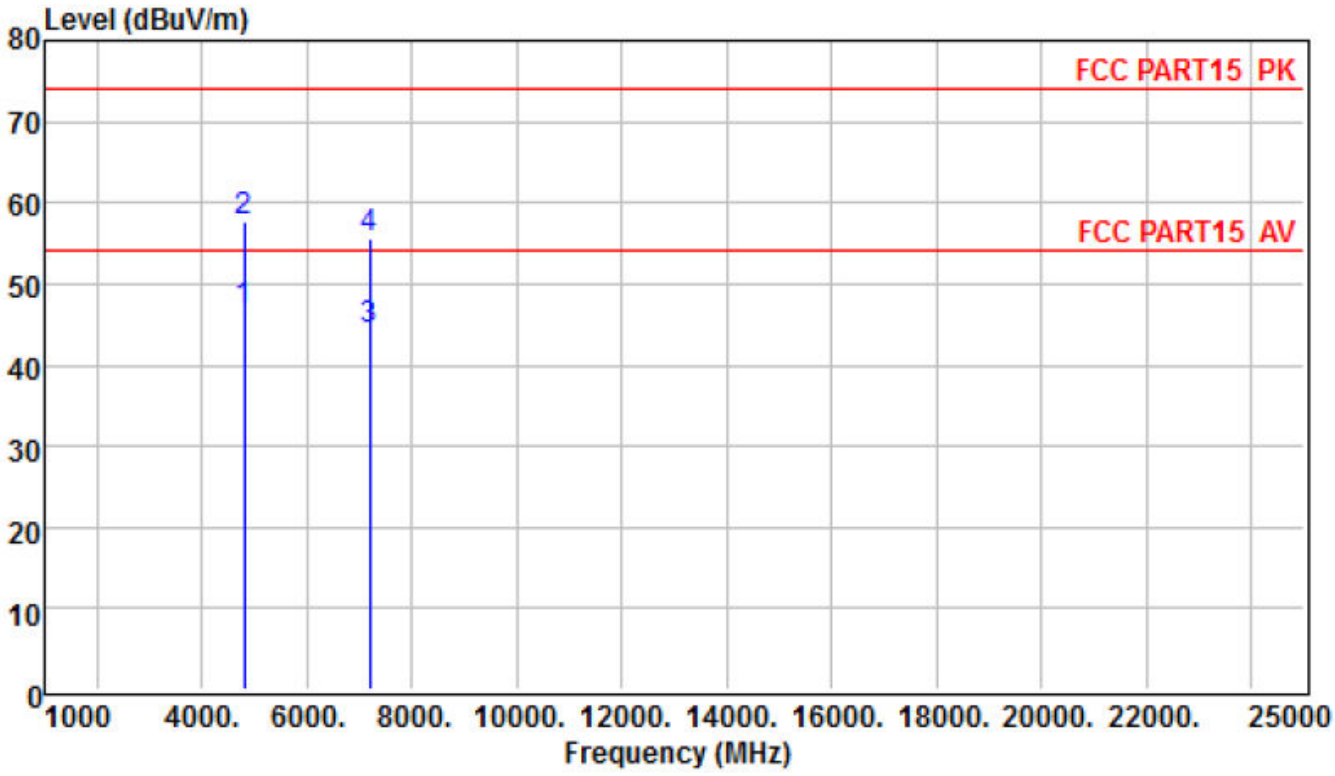
EUT：	Bluetooth Earphone	Model Name ：	BTH103
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010hPa	Test Mode：	TX-2402
Test Voltage ：	DC 3.7V		

Vertical



	Freq	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4804.000	31.13	27.49	11.96	32.94	48.54	54.00	-5.46	Average
2	4804.000	39.56	27.49	11.96	32.94	56.97	74.00	-17.03	Peak
3	7206.000	30.25	27.94	16.61	25.28	44.20	54.00	-9.80	Average
4	7206.000	41.33	27.94	16.61	25.28	55.28	74.00	-18.72	Peak

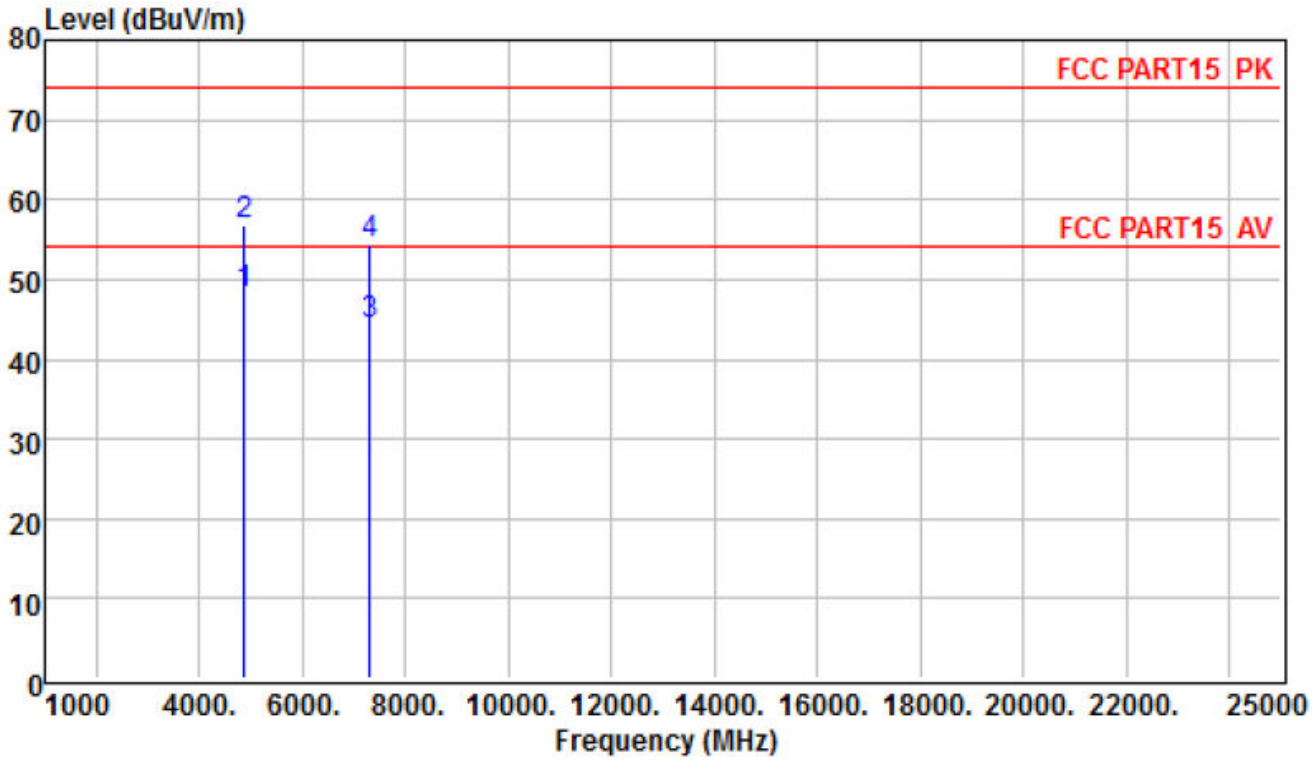
Horizontal



	Freq	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4804.000	29.33	27.49	11.96	32.94	46.74	54.00	-7.26	Average
2	4804.000	40.23	27.49	11.96	32.94	57.64	74.00	-16.36	Peak
3	7206.000	30.23	27.94	16.61	25.28	44.18	54.00	-9.82	Average
4	7206.000	41.64	27.94	16.61	25.28	55.59	74.00	-18.41	Peak

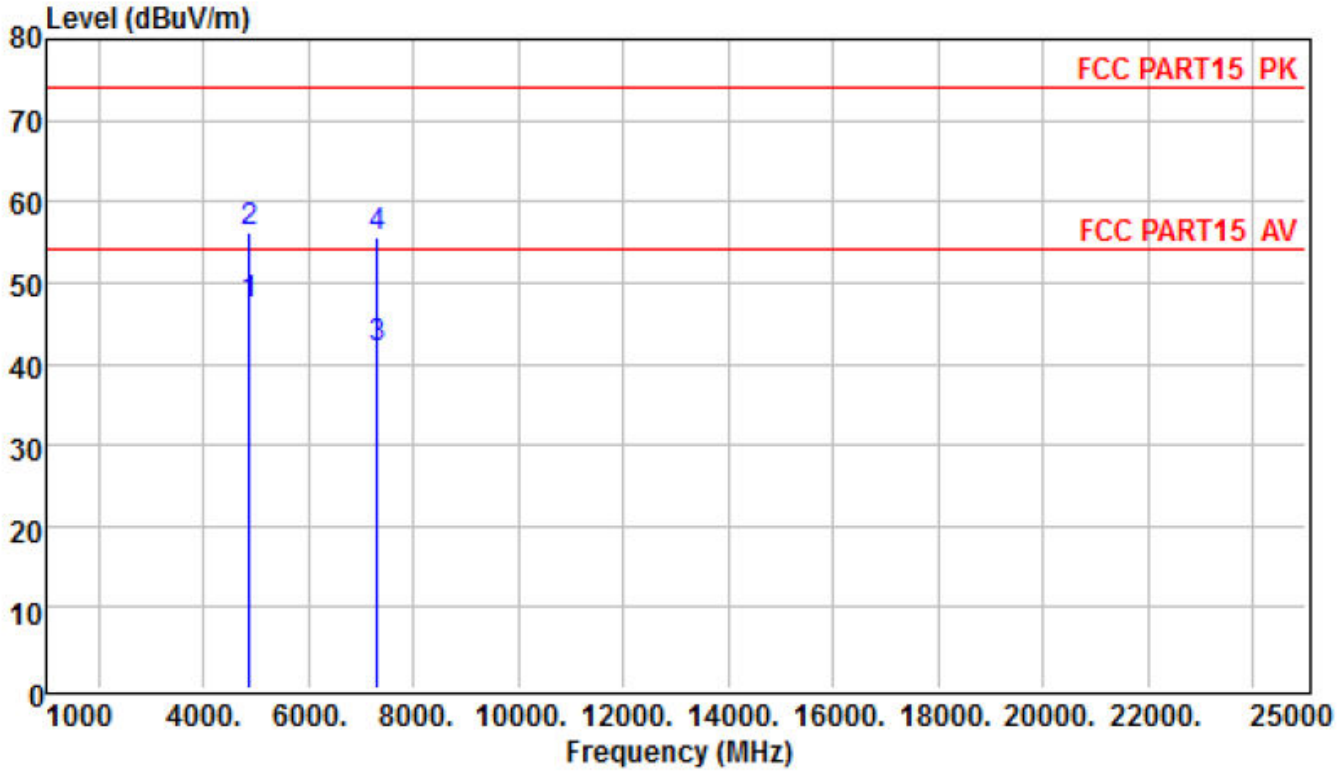
EUT：	Bluetooth Earphone	Model Name ：	BTH103
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010hPa	Test Mode：	TX-2440
Test Voltage ：	DC 3.7V		

Vertical



	Freq	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4880.000	31.45	27.53	12.14	32.11	48.17	54.00	-5.83	Average
2	4880.000	40.11	27.53	12.14	32.11	56.83	74.00	-17.17	Peak
3	7320.000	31.31	27.96	16.62	24.33	44.30	54.00	-9.70	Average
4	7320.000	41.54	27.96	16.62	24.33	54.53	74.00	-19.47	Peak

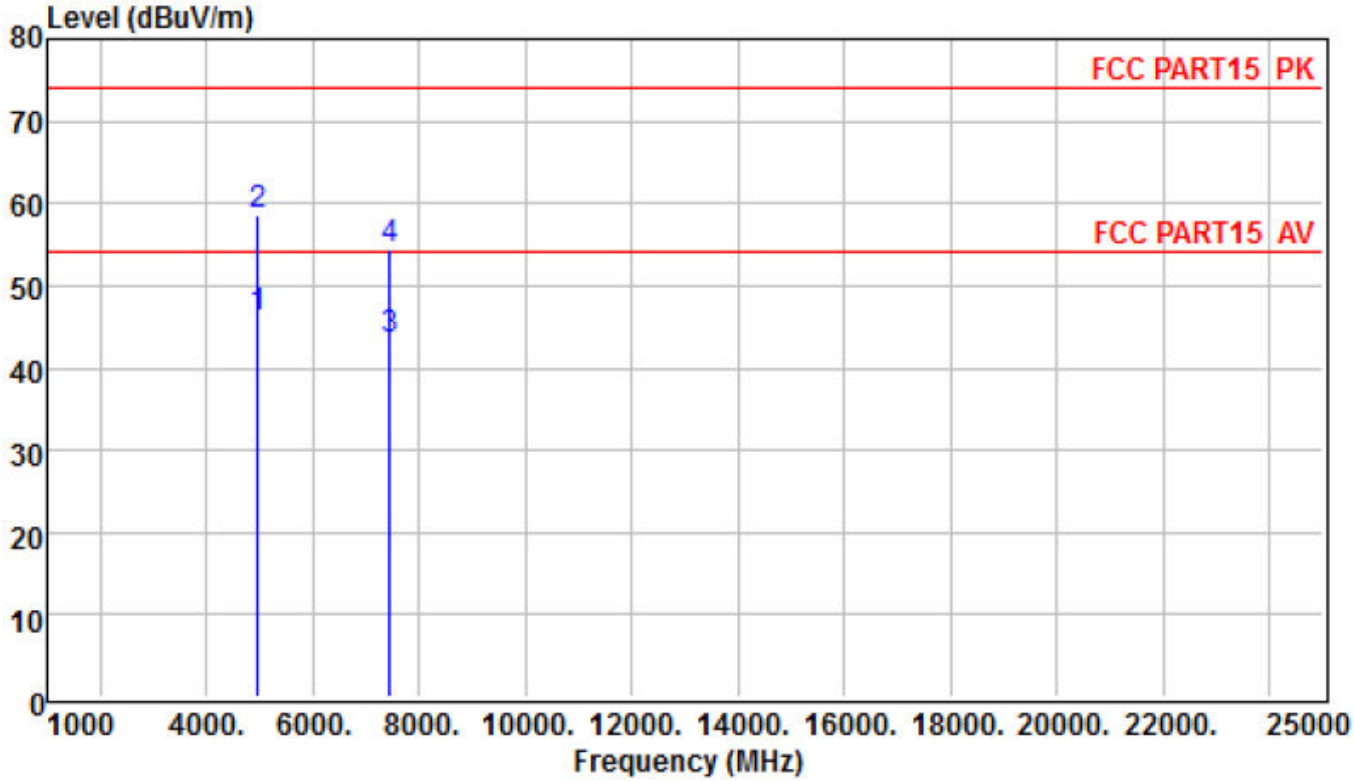
Horizontal



	Freq	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4880.000	30.45	27.53	12.14	32.11	47.17	54.00	-6.83	Average
2	4880.000	39.56	27.53	12.14	32.11	56.28	74.00	-17.72	Peak
3	7320.000	28.83	27.96	16.62	24.33	41.82	54.00	-12.18	Average
4	7320.000	42.54	27.96	16.62	24.33	55.53	74.00	-18.47	Peak

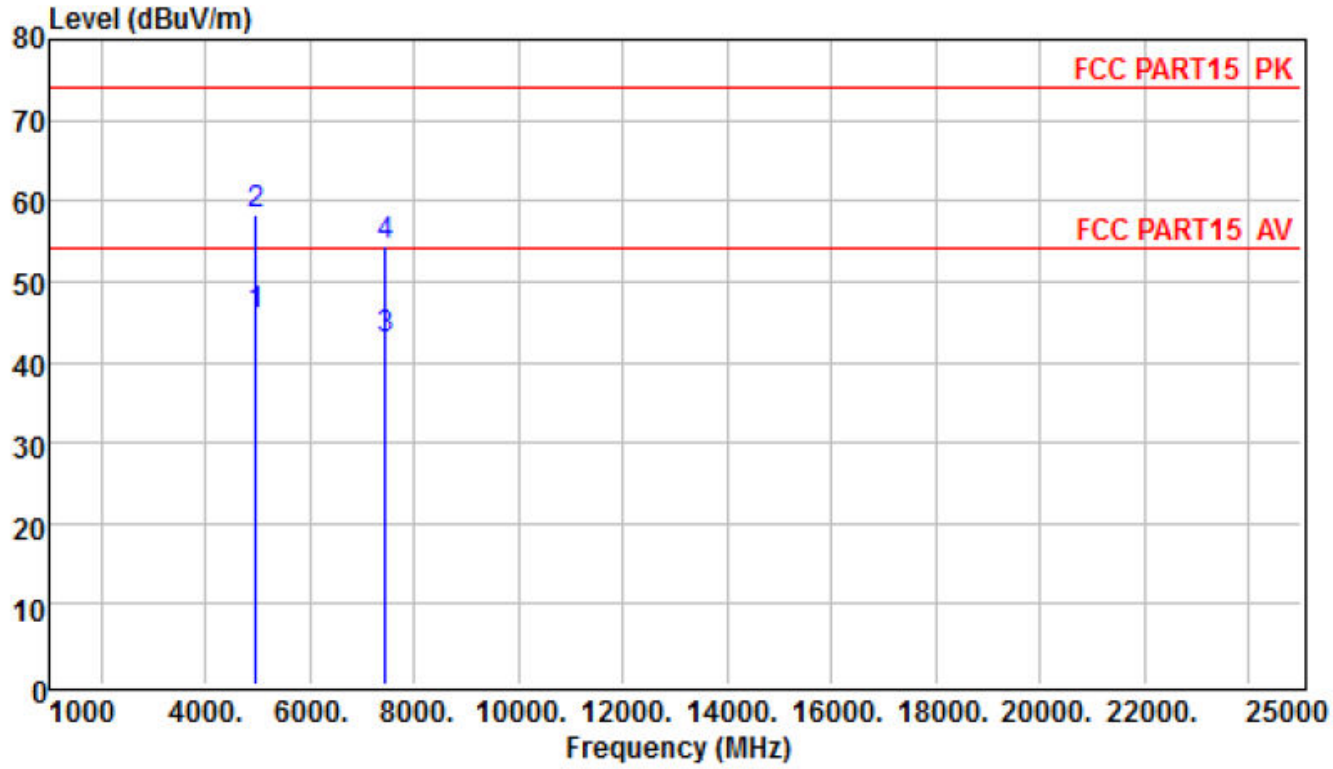
EUT：	Bluetooth Earphone	Model Name ：	BTH103
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010hPa	Test Mode：	TX-2480
Test Voltage ：	DC 3.7V		

Vertical



	Freq	Read Level	Preamp Factor	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4960.000	30.12	27.58	12.36	31.32	46.22	54.00	-7.78	Average
2	4960.000	42.34	27.58	12.36	31.32	58.44	74.00	-15.56	Peak
3	7440.000	30.34	27.99	16.62	24.38	43.35	54.00	-10.65	Average
4	7440.000	41.54	27.99	16.62	24.38	54.55	74.00	-19.45	Peak

Horizontal



	Freq	Read Level	Preamp Factor	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4960.000	29.74	27.58	12.36	31.32	45.84	54.00	-8.16	Average
2	4960.000	42.13	27.58	12.36	31.32	58.23	74.00	-15.77	Peak
3	7440.000	29.77	27.99	16.62	24.38	42.78	54.00	-11.22	Average
4	7440.000	41.32	27.99	16.62	24.38	54.33	74.00	-19.67	Peak

NOTE:

Absolute Level= ReadingLevel+antenna Factor+cable loss-preamp factor,

Over Limit= Absolute Level – Limit

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has not to be reported.

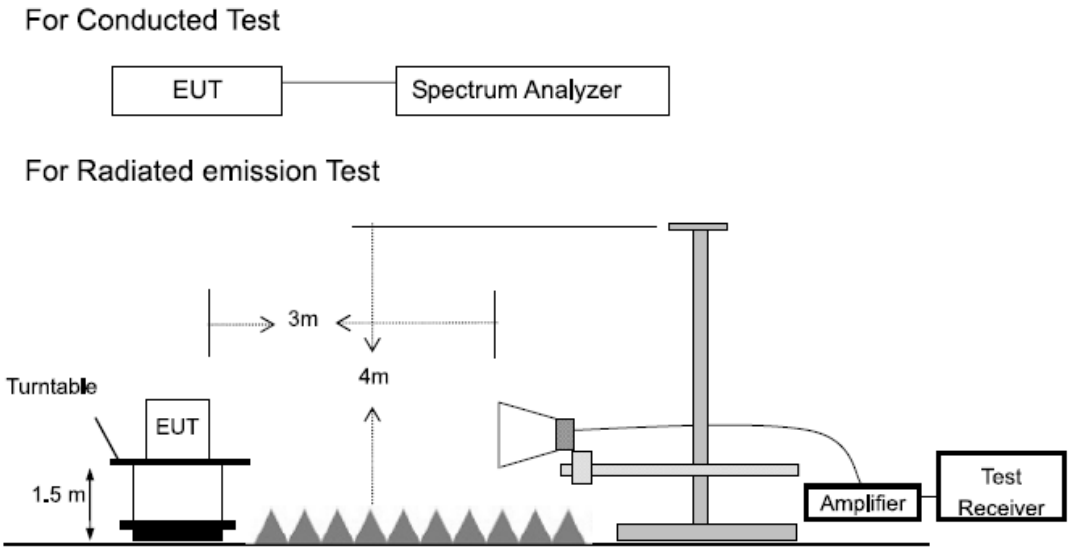
5. BAND EDGE COMPLIANCE TEST

5.1. Limits

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

5.2. Test setup

.



5.3. TEST Procedure

For Conducted Test

1. The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100KHz. The video bandwidth is set to 300KHz.
2. The spectrum from 30MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

EMI Test Receiver	Setting
Attenuation	Auto
RBW	100KHz
VBW	300KHz
Detector	Peak
Trace	Max hold

For Radiated emission Test

The EUT was placed on a styrofoam table which is 1.5m above ground plane.

The measurement procedure at the ban edges was simplified by performing the measurement in just one plot. Both, the in-band-emission and the unwanted emission were be encompassed by the span. After trace stabilization, the maximum peak was be determined by a peak detector and the value was marked by an appropriate limit line. The second limit line, which is 20dB below the first, marks the limit for the emissions in the unrestricted band. A maximum-peak-detector marks the highest emission in the unrestricted band next to the band edge.

The measurements were performed at the lower end of the 2.4GHz band.

Use the following spectrum analyzer settings:

For Restricted Band, When spectrum scanned above 1GHz setting resolution bandwidth 1MHz, video bandwidth 3MHz:

EMI Test Receiver	Setting
Attenuation	Auto
RBW	1MHz
VBW	3MHz
Detector	Peak
Trace	Max hold

For Non-Restricted Band, When spectrum scanned above 1GHz setting resolution bandwidth 100KHz, video bandwidth 300KHz:

EMI Test Receiver	Setting
Attenuation	Auto
RBW	100KHz
VBW	300KHz
Detector	Peak
Trace	Max hold

For radiated test as follows:

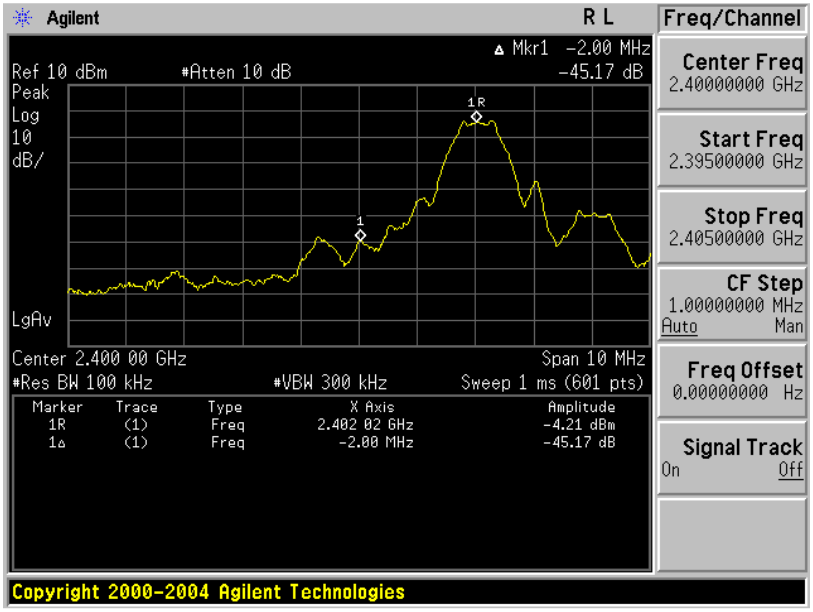
Frequency	Meter Reading	antenna Factor	cable loss	preamp factor	Emission Level	Limits	Margin	Detector Type	Comment
(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
2390	35.22	30.44	8.94	26.32	48.28	74	-25.72	peak	Vertical
2390	34.23	30.44	8.94	26.32	47.29	74	-26.71	peak	Horizontal
2483.5	36.42	30.05	9.07	26.34	49.2	74	-24.8	peak	Vertical
2483.5	35.73	30.05	9.07	26.34	48.51	74	-25.49	peak	Horizontal

If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

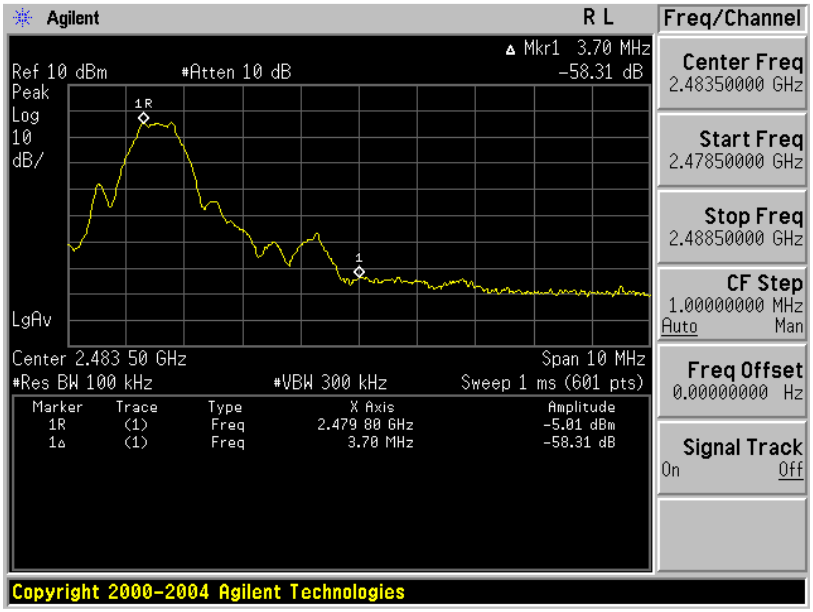
conduction band-edge

Frequency Band	Delta Peak to band emission (dBc)	＞Limit (dBc)	Result
Left-band	45.17	20	Pass
Right-band	58.31	20	Pass

Left Side



Right Side



6. 6DB OCCUPY BANDWIDTH

6.1. Limits

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

6.2. TEST PROCEDURE

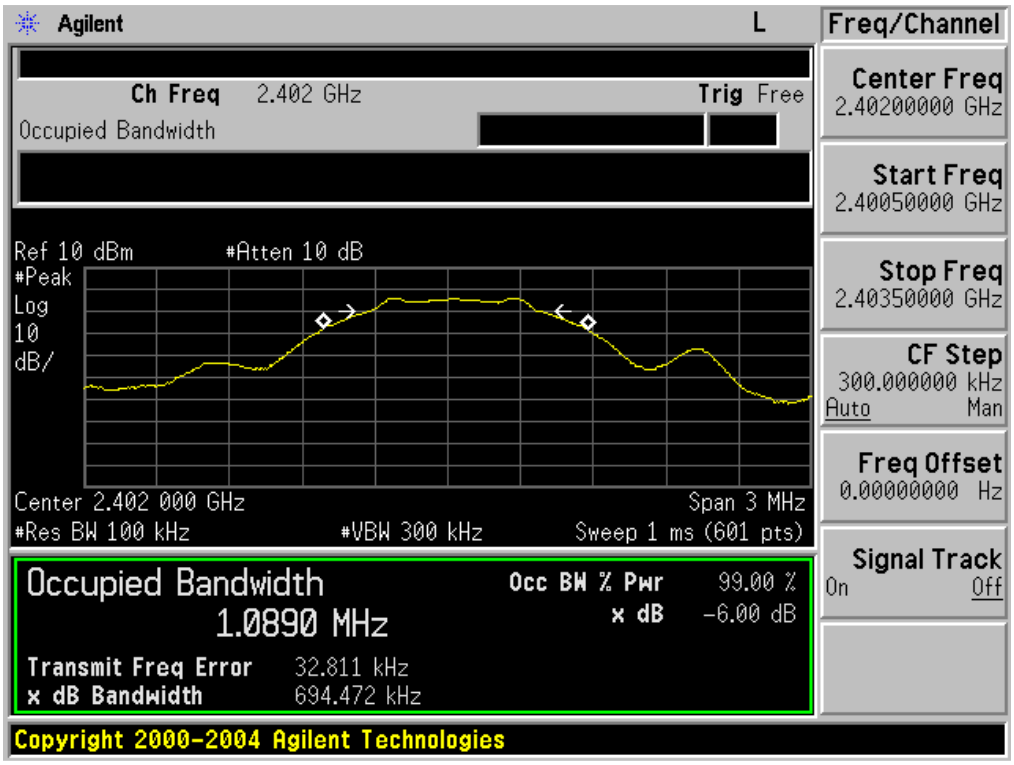
1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test data:

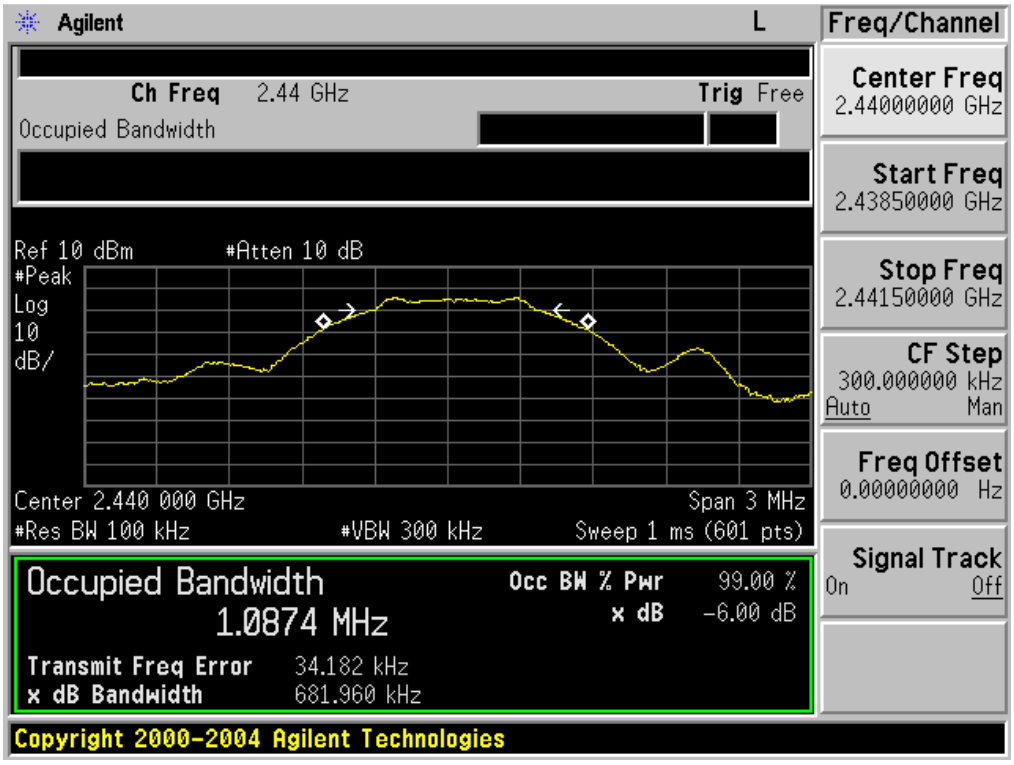
Channel Frequency (MHz)	6dB Bandwidth (KHz)	Limit (KHz)	Result
2402	694.472	500	Pass
2440	681.960	500	Pass
2480	692.785	500	Pass

Test plot as follows:

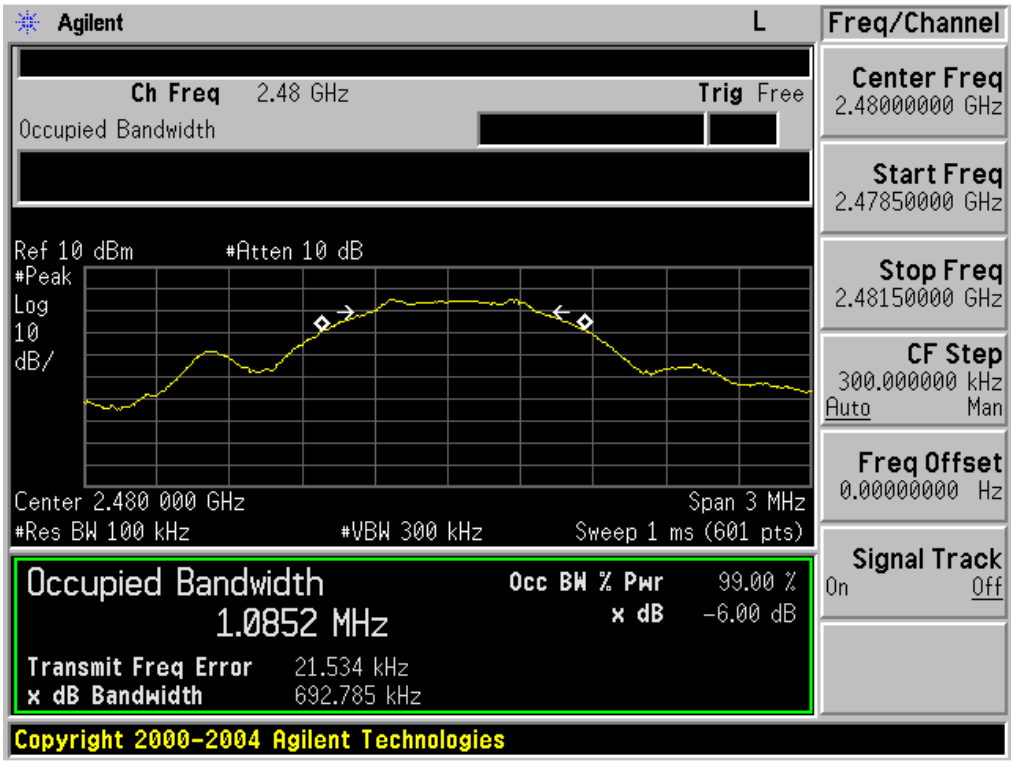
2402MHz



2440 MHz



2480 MHz


Agilent
L
Freq/Channel
Ch Freq 2.48 GHz
Trig Free
Occupied Bandwidth
Center Freq
2.48000000 GHz
Start Freq
2.47850000 GHz
Stop Freq
2.48150000 GHz
CF Step
300.000000 kHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Ref 10 dBm
#Atten 10 dB
#Peak
Log
10
dB/
Center 2.480 000 GHz
Span 3 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1 ms (601 pts)
Occupied Bandwidth
1.0852 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error 21.534 kHz
x dB Bandwidth 692.785 kHz
Copyright 2000-2004 Agilent Technologies

7. OUTPUT POWER TEST

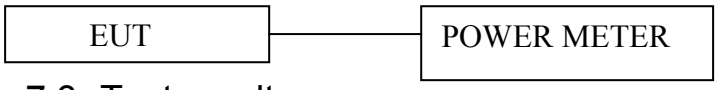
7.1. Limits

For systems using digital modulation in the 2400~2483.5MHz, The out put Power shall not exceed 1W (30dBm)

7.2. Test setup

1. The Transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the power value.
3. Repeat above procedures on all channels needed to be tested.

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



7.3. Test result

Frequency (MHz)	Maximum Conducted Output Power (dBm)	Limit (dBm)
2402	-3.57	30
2440	-3.76	30
2480	-4.29	30

8. POWER SPECTRAL DENSITY TEST

8.1. Limits

For digitally modulated systems, the 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.

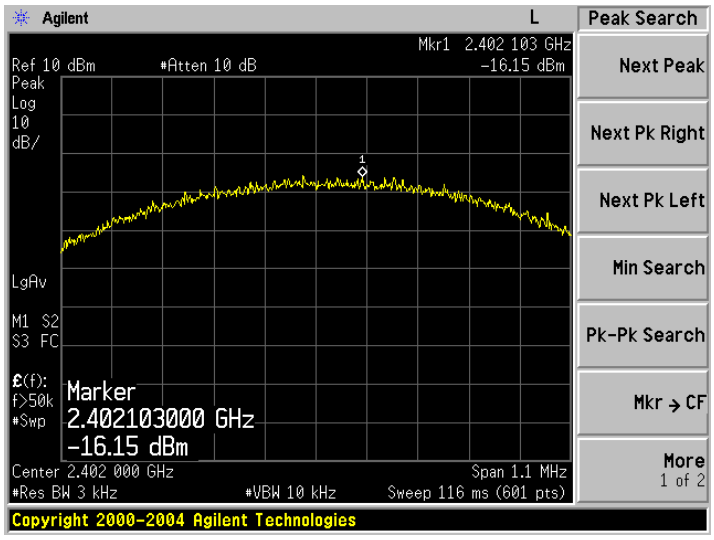
8.2. Test setup

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 RBW
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

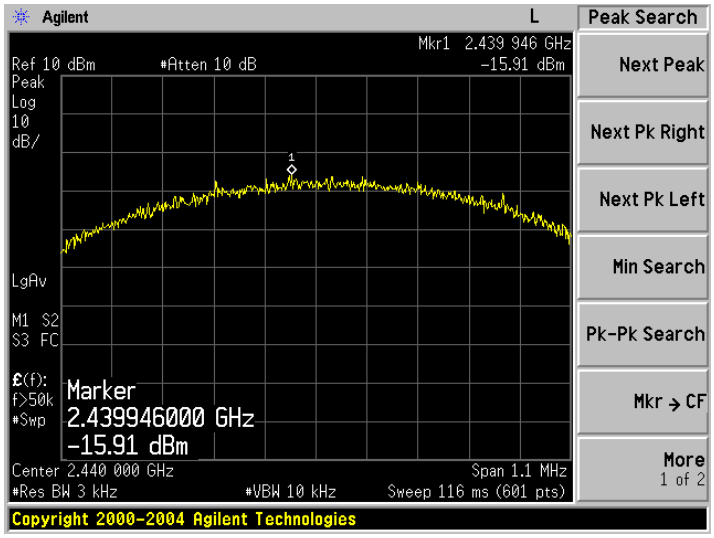
8.3. Test result

Channel Frequency (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2402	-16.15	8	Pass
2440	-15.91	8	Pass
2480	-16.27	8	Pass

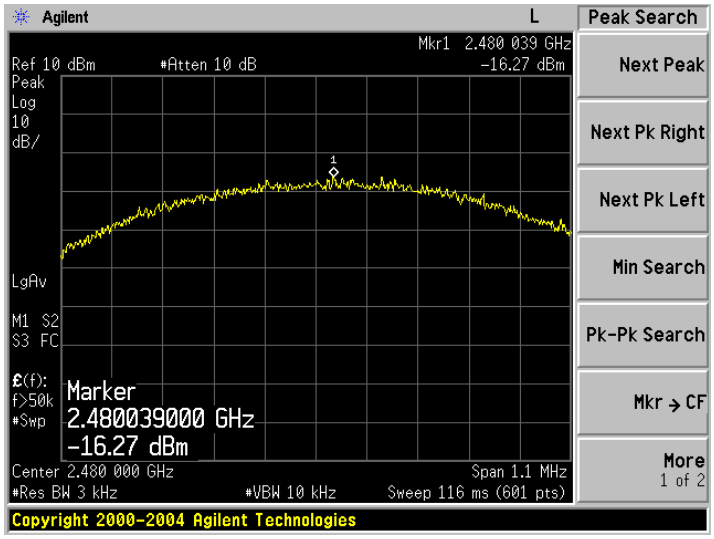
TX CH00



TX CH 19



TX CH39



9. ANTENNA REQUIREMENTS

9.1. Limits

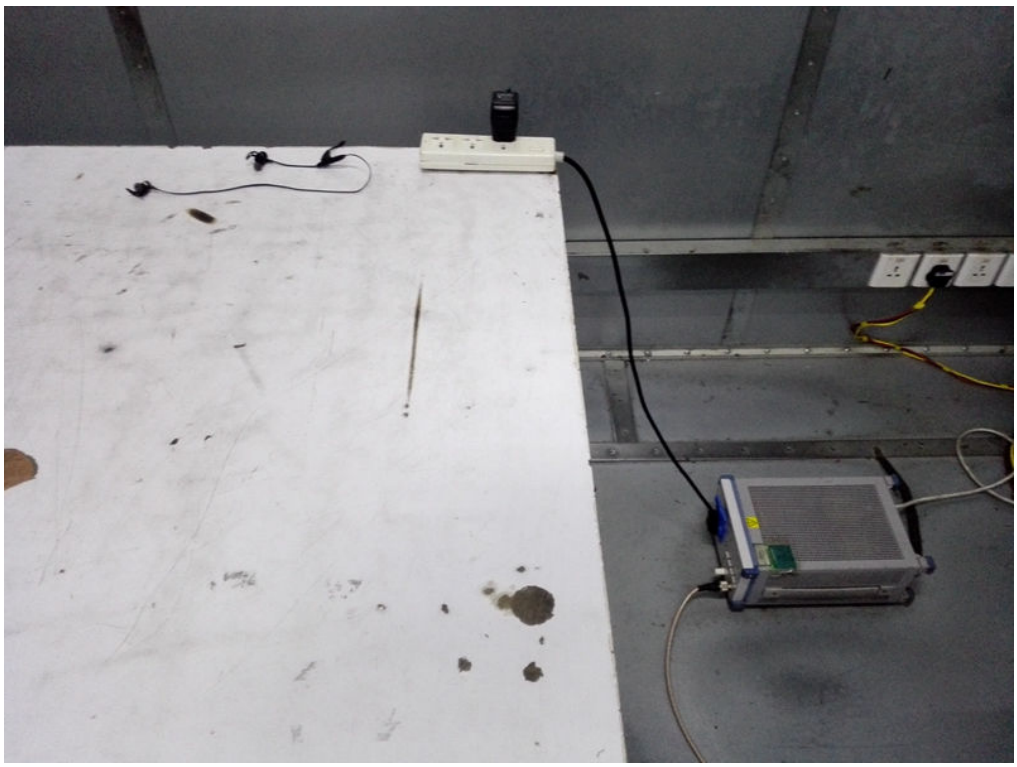
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional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

9.2. Result

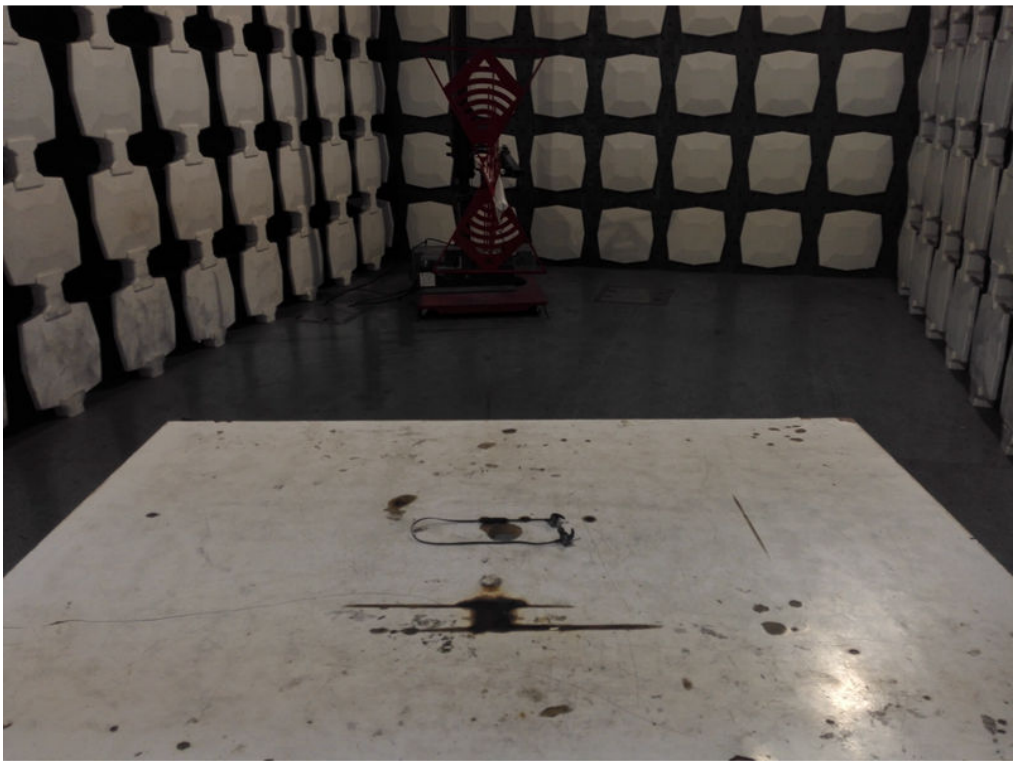
The antennas used for this product is Ceramic antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 1.0dBi.

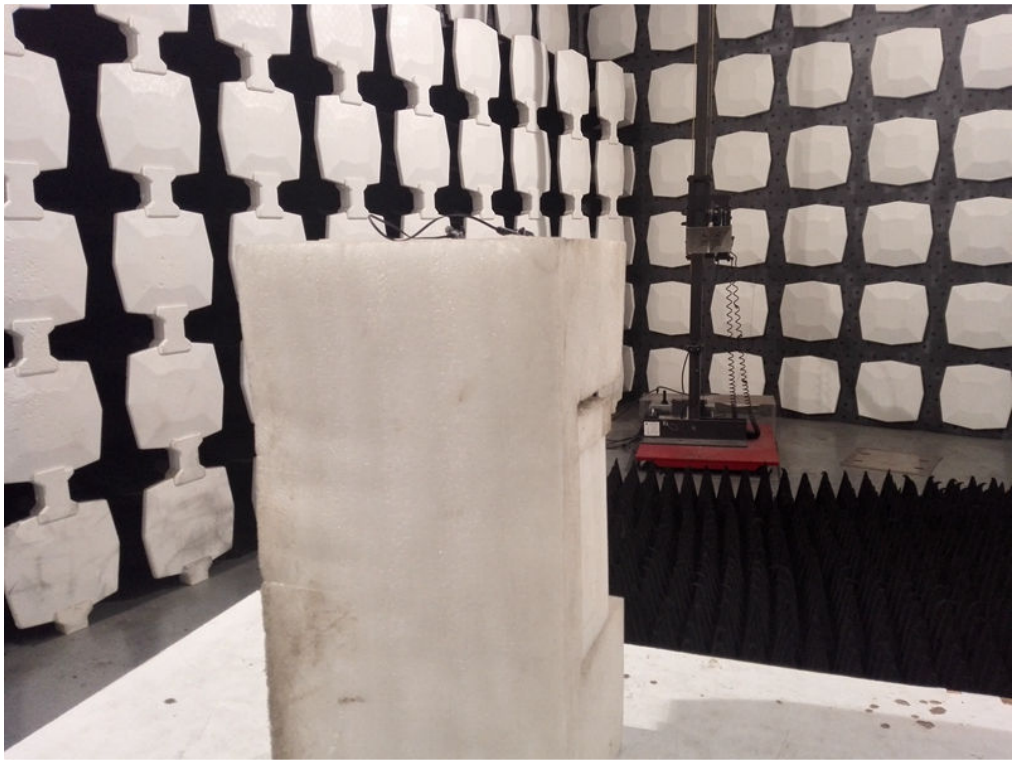
10.PHOTOGRAPHS OF TEST SET-UP

Conducted Emission



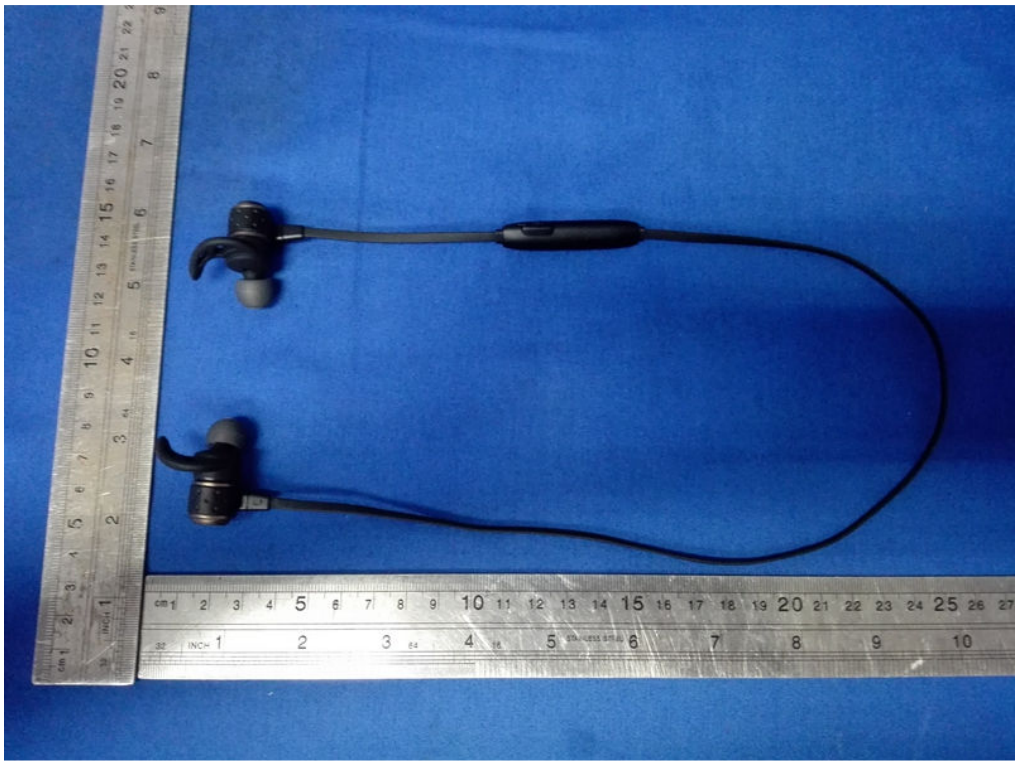
Radiated Emission Test



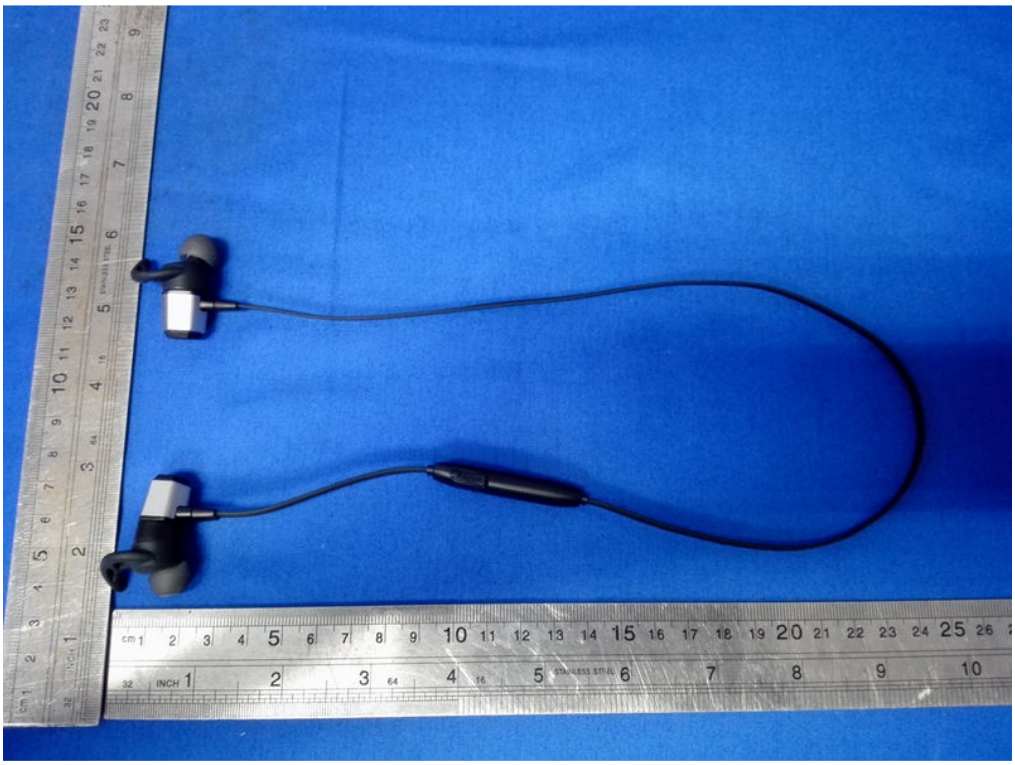


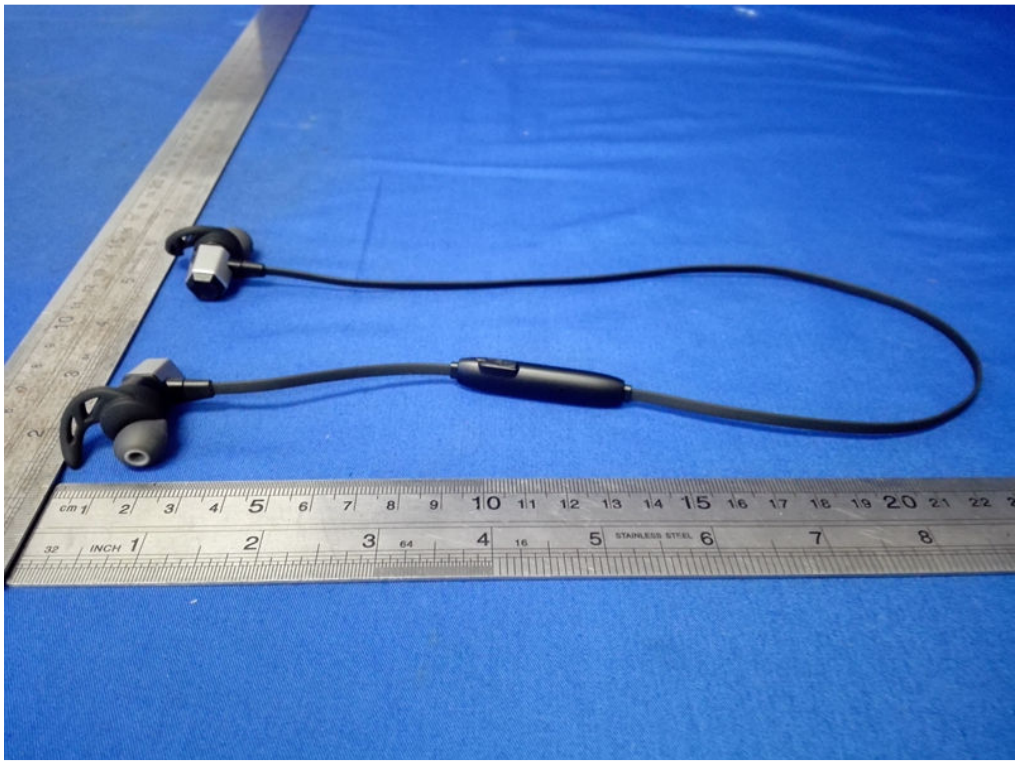
11. PHOTOGRAPHS OF THE EUT

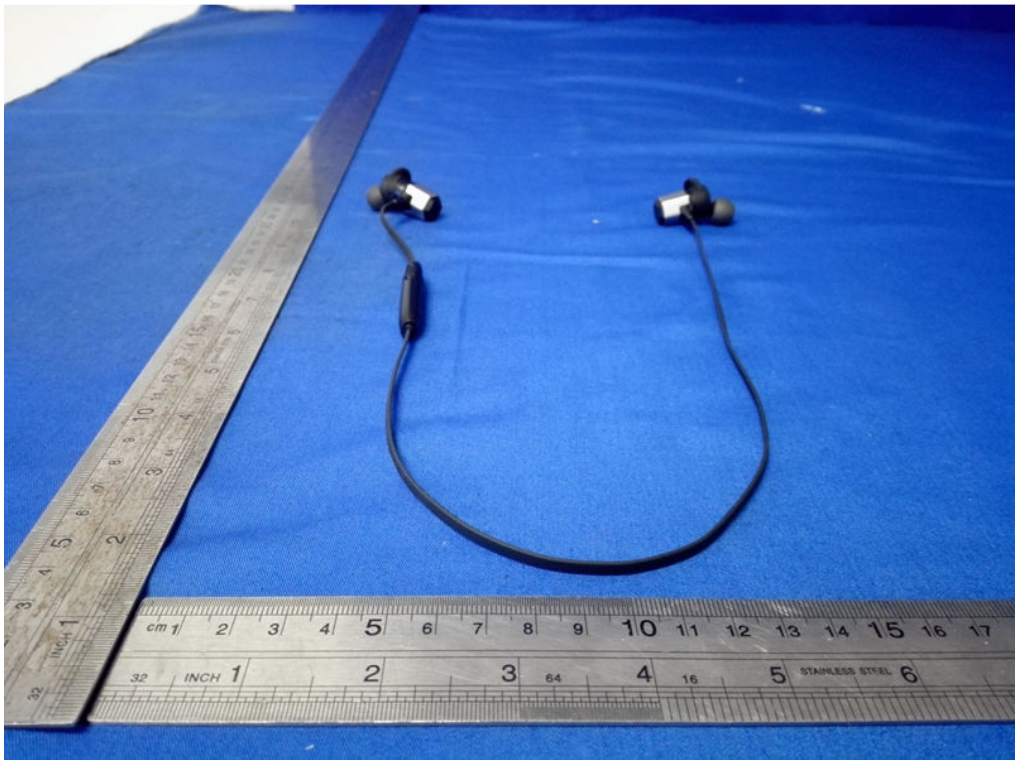
BTH101

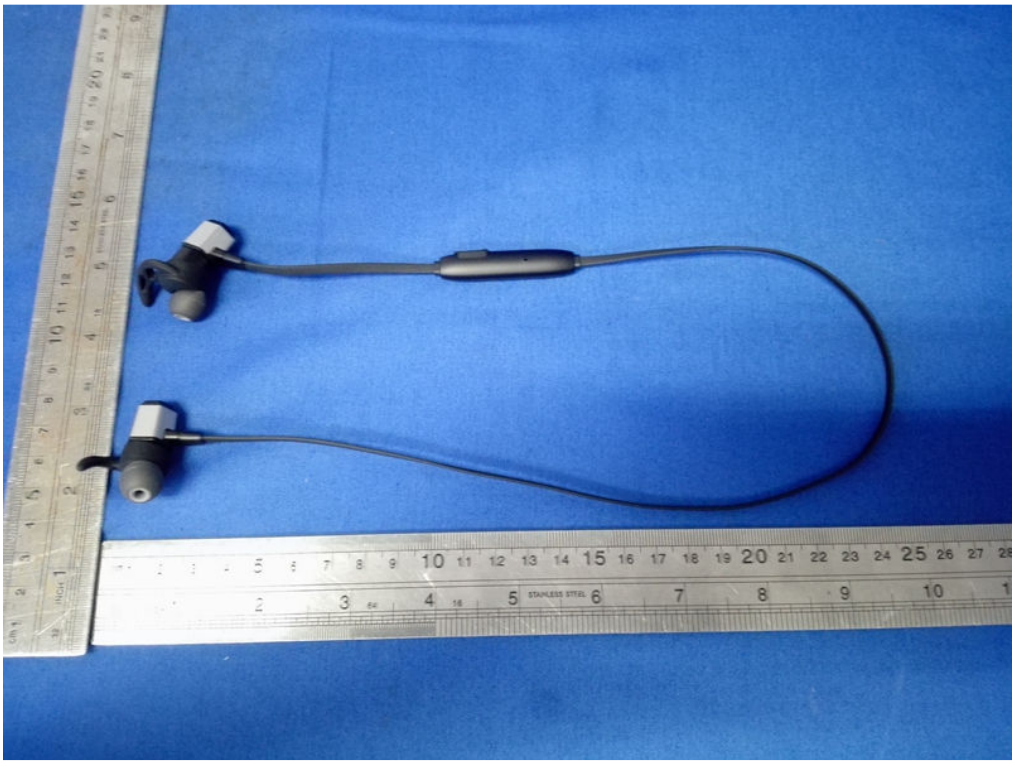


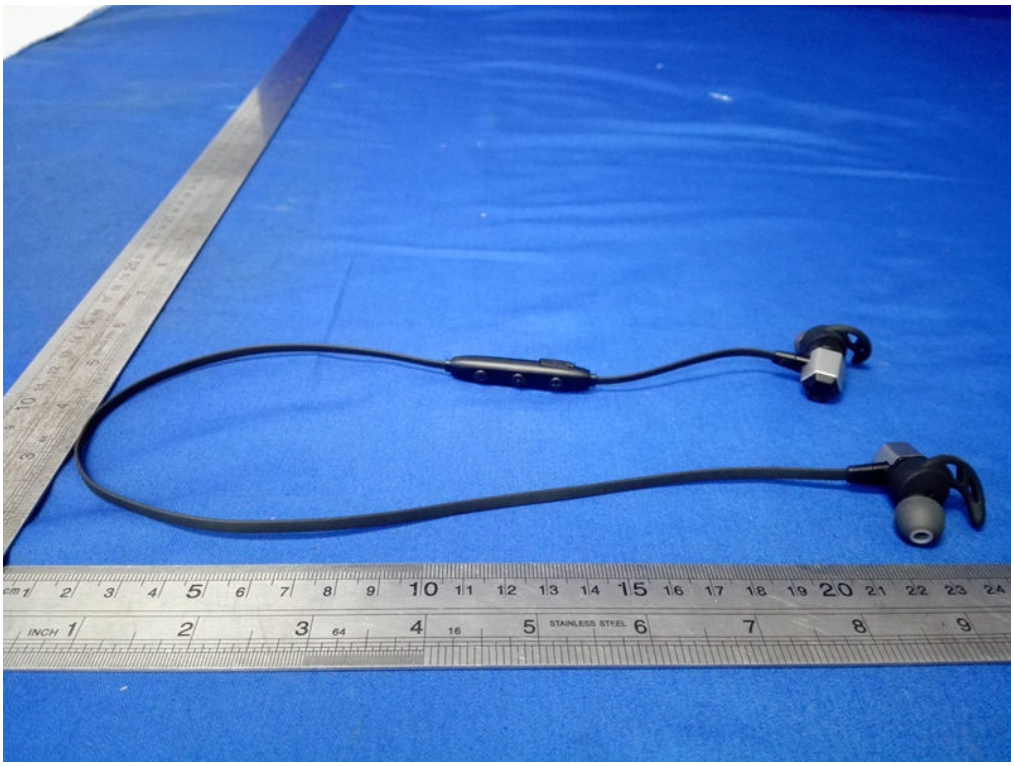
BTH102



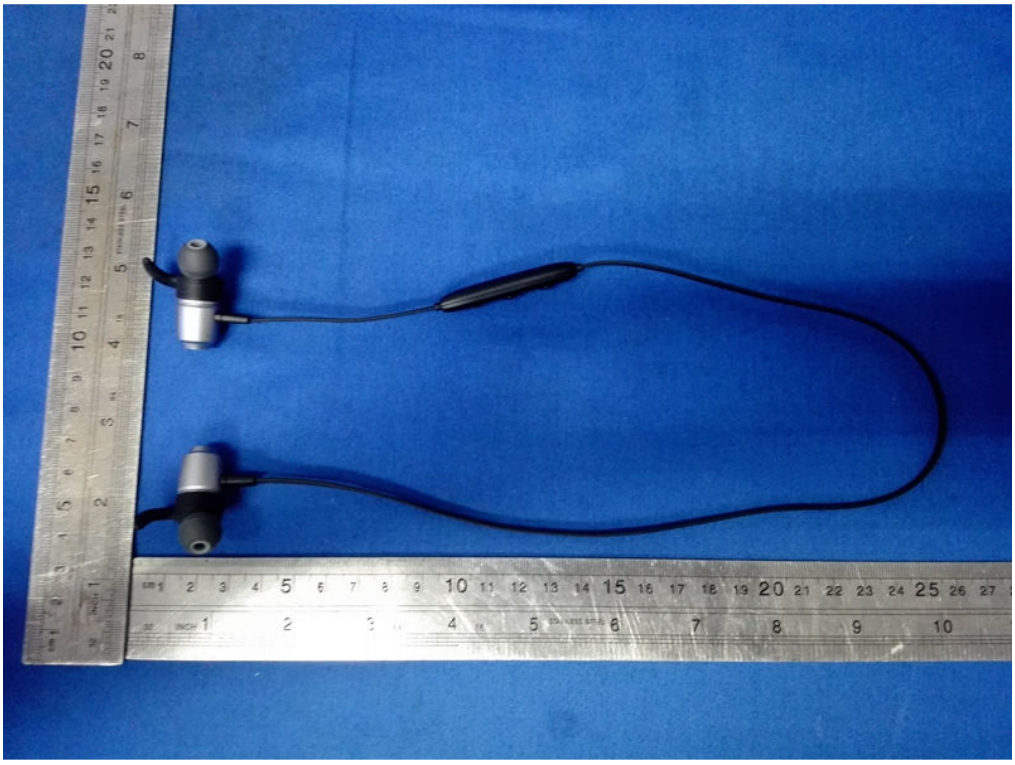


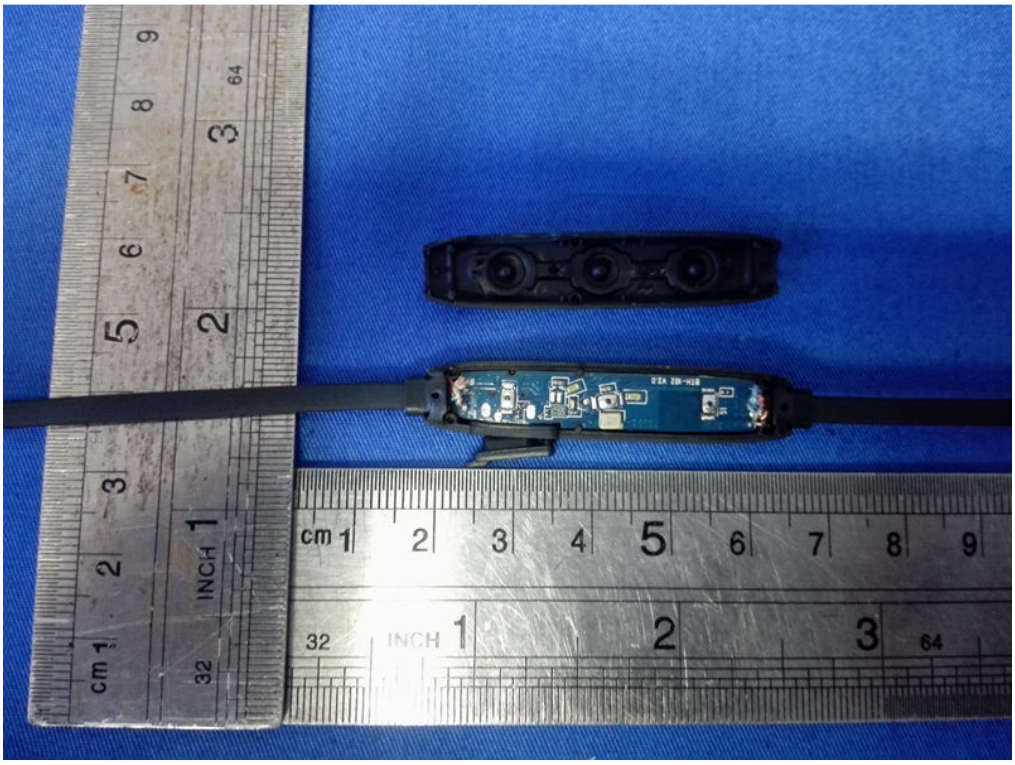


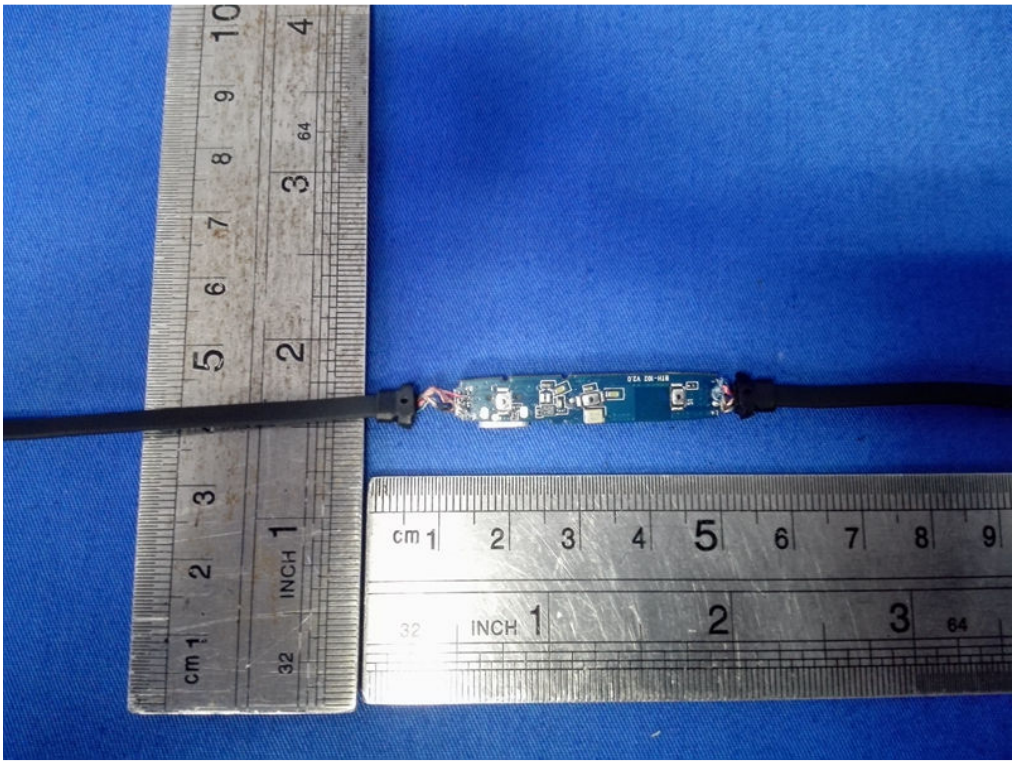


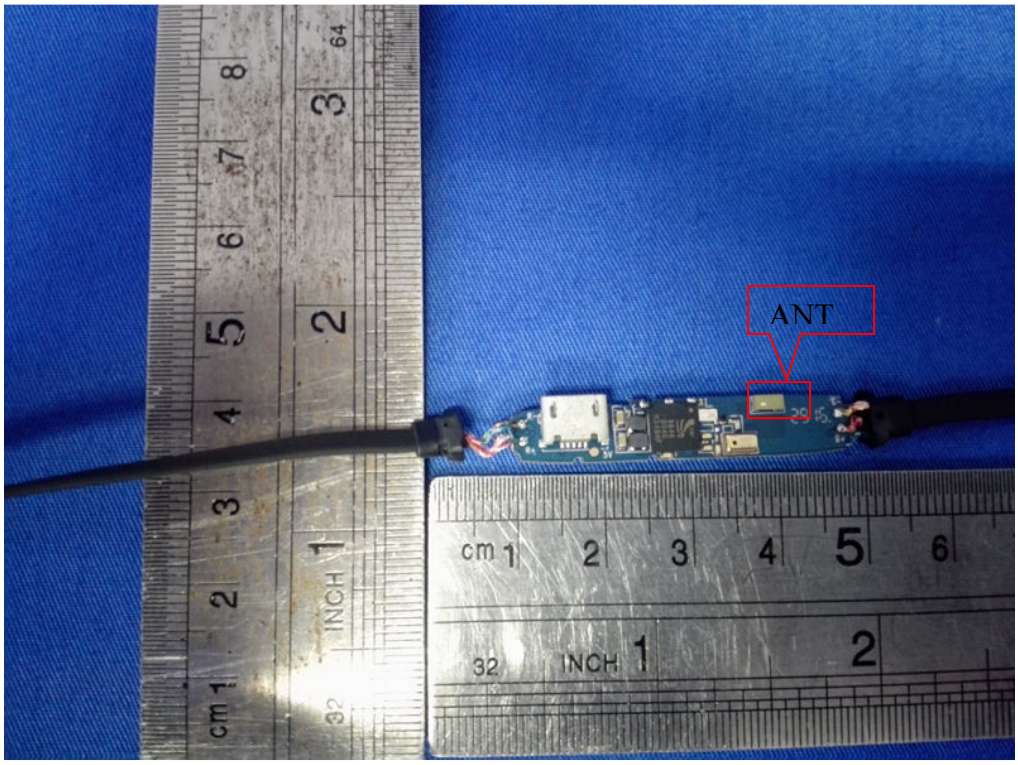


BTH103





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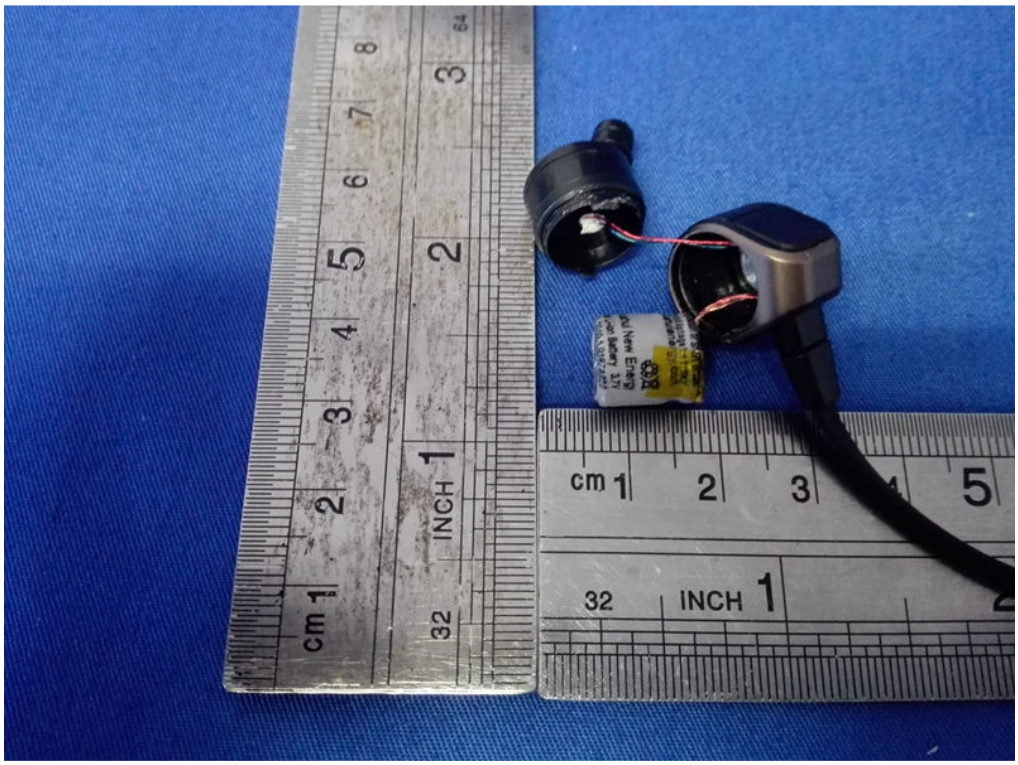

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