FCC Test Report

Report No.: AGC03804160201FE03

FCC ID	:	2AEUUBH20
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Bluetooth Earphone
BRAND NAME	:	ilive
MODEL NAME	:	SAEB16,IAEB16,BH20,BH40,BH41,BH42,BH43,BH44,BH45,BH46,BH47,BH48,BH49
CLIENT	:	ShenZhen HongFa Technology Co., Ltd.
DATE OF ISSUE	:	Apr.23, 2016
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr.23, 2016	Valid	Original Report

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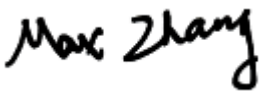
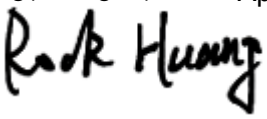
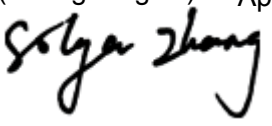
1. VERIFICATION OF CONFORMITY

Applicant	ShenZhen HongFa Technology Co., Ltd.
Address	319# Building, King Design Industrial Park, NanShan Avenue, NanShan District, Shenzhen China.
Manufacturer	ShenZhen HongFa Technology Co., Ltd.
Address	319# Building, King Design Industrial Park, NanShan Avenue, NanShan District, Shenzhen China.
Product Designation	Bluetooth Earphone
Brand Name	ilive
Test Model	SAEB16
Series Model	IAEB16 ,BH20,BH40,BH41,BH42,BH43,BH44,BH45,BH46,BH47, BH48,BH49
Model Difference	All the same except for the model name.
Date of test	Apr.05, 2016 to Apr.06, 2016
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BR/RF

We hereby certify that:
The above equipment was tested by Dongguan Precise Testing Service Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.249.

Tested by 
Max Zhang(Zhang Yi) Apr.23, 2016

Reviewed by 
Rock Huang(Huang Dinglue) Apr.23, 2016

Approved by 
Solger Zhang(Zhang Hongyi) Apr.23, 2016
Authorized Officer

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	2.402 GHz to 2.480GHz
Maximum field strength	88.53dBuV/m(AV)@3m
Bluetooth Version	V4.1
Modulation	GFSK, π /4-DQPSK, 8DPSK
Number of channels	79 for BR/EDR
Antenna Gain	0dBi
Antenna Designation	PCB Antenna (Met 15.203 Antenna requirement)
Hardware Version	EB20-9623-B6
Software Version	EB20-9623-Soft-B6
Power Supply	DC 3.7V by battery or DC5V by USB port
Note:The USB port is used for charging and can't be exchange data with PC.	

2.2. TABLE OF CARRIER FREQUENCY

BR/EDR channel List

Frequency Band	Channel Number	Frequency
2400~2483.5MHZ	0	2402MHZ
	1	2403MHZ
	:	:
	38	2440 MHZ
	39	2441 MHZ
	40	2442 MHZ
	:	:
	77	2479 MHZ
	78	2480 MHZ

3. 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	±3.18dB
2	All emissions,radiated	±3.91dB
3	Temperature	±0.5°C
4	Humidity	±2%

4. DESCRIPTION OF TEST MODES

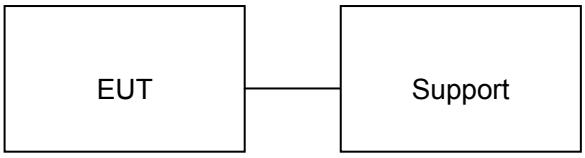
NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK
4	Low channel π /4-DQPSK
5	Middle channel π /4-DQPSK
6	High channel π /4-DQPSK
7	Low channel 8DPSK
8	Middle channel 8DPSK
9	High channel 8DPSK
10	BT Link with charging

Note:
1. All the test modes can be supply by battery, only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3.The EUT used fully-charged battery when tested.

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure :



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Bluetooth Earphone	SAEB16	2AEUUBH20	EUT
2	PC	SONY	E1412AYCW	A.E
3	Control box	N/A	N/A	A.E
4	Adapter	N/A	Kx-500100	Support

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.249	Radiated Emission	Compliant
§15.249	Band Edges	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Compliant

6. TEST FACILITY

Site	Dongguan Precise Testing Service Co., Ltd.
Location	Building D, Baoding Technology Park,Guangming Road2, Dongcheng District, Dongguan, Guangdong, China.
FCC Registration No.	371540
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.10:2013.

ALL TEST EQUIPMENT LIST

Radiated Emission Test Site					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
EMI Test Receiver	Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Trilog Broadband Antenna (25M-1GHz)	SCHWARZBECK	VULB9160	9160-3355	July 4, 2015	July 3, 2016
Signal Amplifier	SCHWARZBECK	BBV 9475	9745-0013	July 4, 2015	July 3, 2016
RF Cable	SCHWARZBECK	AK9515E	96221	July 4, 2015	July 3, 2016
3m Anechoic Chamber	CHENGYU	966	PTS-001	June 6, 2015	June 5, 2016
MULTI-DEVICE Positioning Controller	Max-Full	MF-7802	MF780208339	N/A	N/A
Active loop antenna (9K-30MHz)	Schwarzbeck	FMZB1519	1519-038	June 6, 2015	June 5, 2016
Spectrum analyzer	Agilent	E4407B	MY46185649	June 6, 2015	June 5, 2016
Horn Antenna (1G-18GHz)	SCHWARZBECK	BBHA9120D	9120D-1246	June 6, 2015	June 5, 2016
Horn Ant (18G-40GHz)	Schwarzbeck	BBHA 9170	9170-181	June 6, 2015	June 5, 2016

Conducted Emission Test Site					
Name of Equipment	**Manufacturer**	**Model Number**	**Serial Number**	**Last Calibration**	**Due Calibration**
EMI Test Receiver	- Rohde & Schwarz	ESCI	101417	July 4, 2015	July 3, 2016
Artificial Mains Network	Narda	L2-16B	000WX31025	July 8, 2015	July 7, 2016
Artificial Mains Network (AUX)	Narda	L2-16B	000WX31026	July 8, 2015	July 7, 2016
RF Cable	SCHWARZBECK	AK9515E	96222	July 4, 2015	July 3, 2016
Shielded Room	CHENGYU	843	PTS-002	June 6,2015	June 5,2016

7. RADIATED EMISSION

7.1TEST LIMIT

Standard FCC15.249

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
900-928MHz	50	500
2400-2483.5MHz	50	500
5725-5875MHz	50	500
24.0-24.25GHz	250	2500

Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μV/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
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	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark： (1) Emission level dBμV = 20 log Emission level μV/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.

   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.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

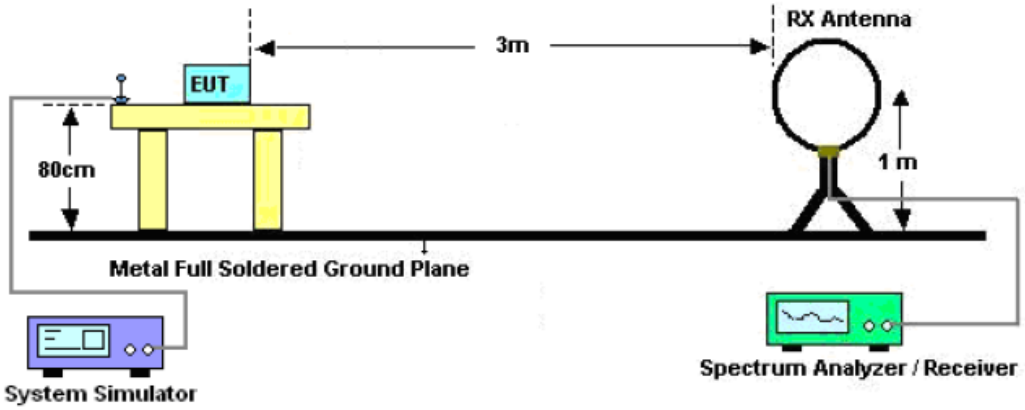
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
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
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/1MHz for Peak, 1MHz/10Hz for Average

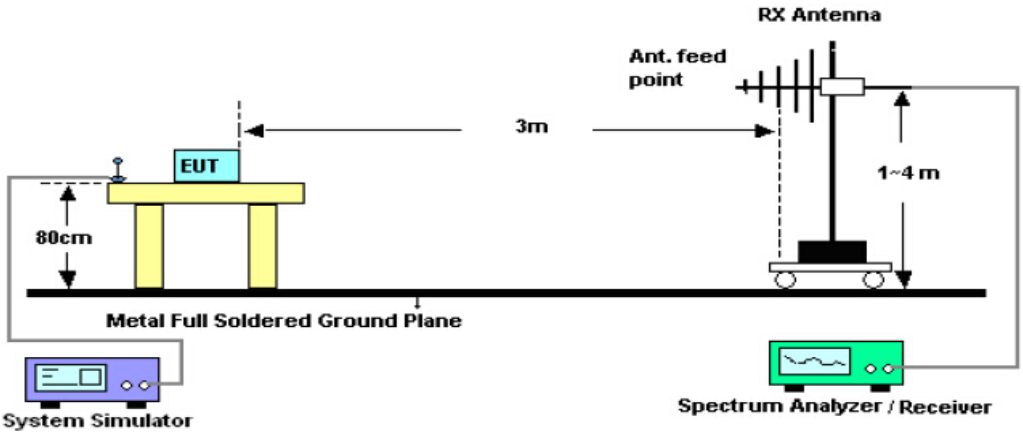
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

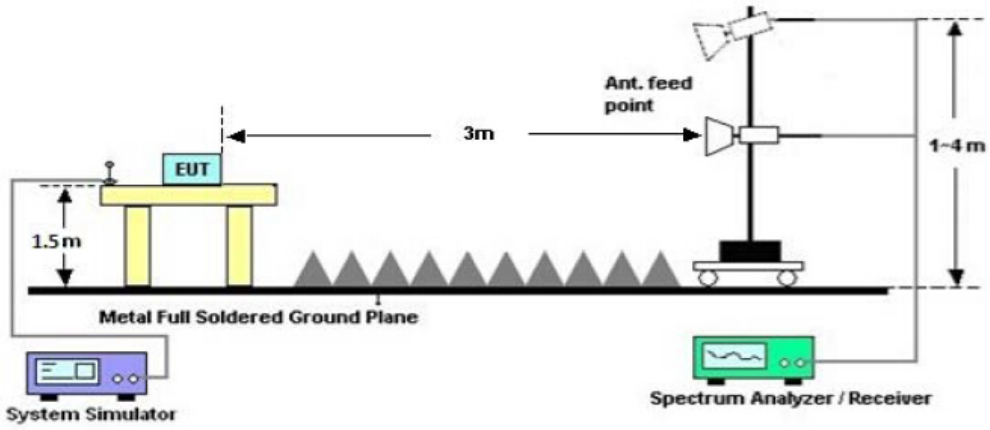
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



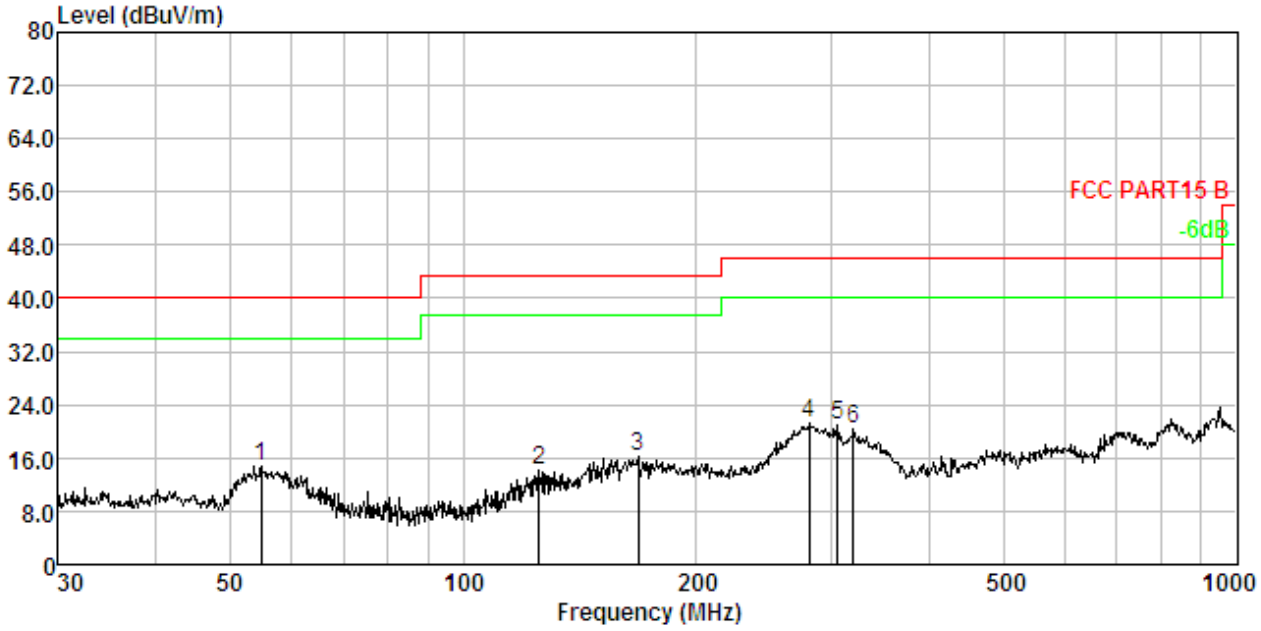
7.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION 30MHz- 1GHZ

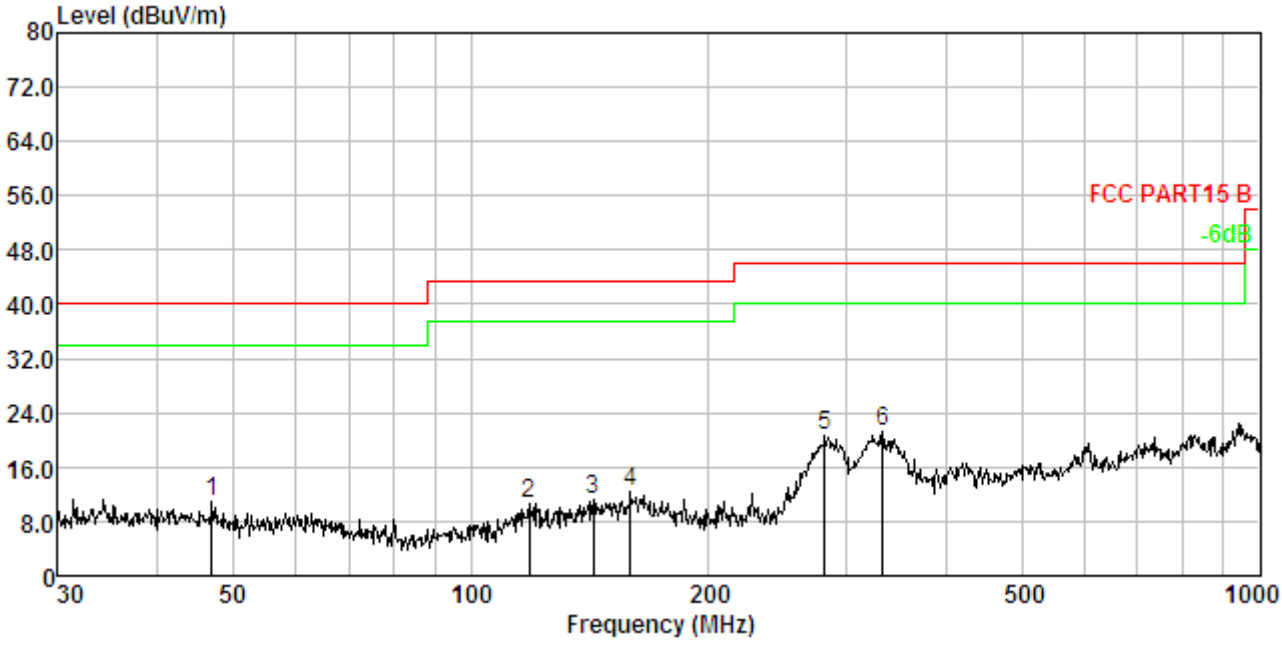
EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	Mode 1	Polarization：	Horizontal



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	54.835	1.60	11.91	31.36	30.18	14.69	40.00	-25.31	Peak
2.	125.446	2.35	12.36	29.89	30.47	14.13	43.50	-29.37	Peak
3.	168.414	2.62	13.42	30.66	30.57	16.13	43.50	-27.37	Peak
4.	280.024	3.08	12.81	36.25	30.75	21.39	46.00	-24.61	Peak
5.	304.610	3.15	13.30	35.42	30.78	21.09	46.00	-24.91	Peak
6.	319.937	3.20	13.65	34.43	30.79	20.49	46.00	-25.51	Peak

RESULT: PASS

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC3.7V
Test Mode ：	Mode 1	Polarization：	Vertical



No.	Freq MHz	Cable Loss dB	ANT Factor dB/m	Receiver Reading dBuV	Preamp Factor dB	Emission Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark
1.	46.995	1.46	12.85	26.81	30.13	10.99	40.00	-29.01	Peak
2.	118.601	2.30	11.90	26.91	30.45	10.66	43.50	-32.84	Peak
3.	142.824	2.47	13.52	25.74	30.51	11.22	43.50	-32.28	Peak
4.	159.225	2.57	13.88	26.41	30.55	12.31	43.50	-31.19	Peak
5.	281.008	3.08	12.83	35.37	30.75	20.53	46.00	-25.47	Peak
6.	332.519	3.23	13.93	34.82	30.81	21.17	46.00	-24.83	Peak

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Margin=Result-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

The mode 1 is the worst case, and only the data of the worst case recorded in this test report.

FIELD STRENGTH OF FUNDAMENTAL

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	GFSK	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.013	98.45	-9.37	89.08	114	-24.92	peak
2402.013	95.24	-9.37	85.87	94	-8.13	AVG
2440.016	98.76	-9.63	89.13	114	-24.87	peak
2440.016	95.71	-9.63	86.08	94	-7.92	AVG
2480.021	100.87	-9.61	91.26	114	-22.74	peak
2480.021	98.14	-9.61	88.53	94	-5.47	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	GFSK	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.013	96.48	-9.37	87.11	114	-26.89	peak
2402.013	93.21	-9.37	83.84	94	-10.16	AVG
2440.016	96.75	-9.63	87.12	114	-26.88	peak
2440.016	94.13	-9.63	84.5	94	-9.5	AVG
2480.021	98.54	-9.61	88.93	114	-25.07	peak
2480.021	96.07	-9.61	86.46	94	-7.54	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	π /4-DQPSK	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.013	96.78	-9.37	87.41	114	-26.59	peak
2402.013	93.51	-9.37	84.14	94	-9.86	AVG
2440.016	96.27	-9.63	86.64	114	-27.36	peak
2440.016	94.39	-9.63	84.76	94	-9.24	AVG
2480.021	97.45	-9.61	87.84	114	-26.16	peak
2480.021	94.71	-9.61	85.1	94	-8.9	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	π /4-DQPSK	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.013	94.16	-9.37	84.79	114	-29.21	peak
2402.013	92.02	-9.37	82.65	94	-11.35	AVG
2440.016	94.42	-9.63	84.79	114	-29.21	peak
2440.016	92.16	-9.63	82.53	94	-11.47	AVG
2480.021	94.54	-9.61	84.93	114	-29.07	peak
2480.021	91.18	-9.61	81.57	94	-12.43	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	8DPSK	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.013	94.79	-9.37	85.42	114	-28.58	peak
2402.013	92.88	-9.37	83.51	94	-10.49	AVG
2440.016	94.97	-9.63	85.34	114	-28.66	peak
2440.016	92.85	-9.63	83.22	94	-10.78	AVG
2480.021	95.33	-9.61	85.72	114	-28.28	peak
2480.021	92.07	-9.61	82.46	94	-11.54	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Modulation ：	8DPSK	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
2402.013	93.17	-9.37	83.8	114	-30.2	peak
2402.013	92.07	-9.37	82.7	94	-11.3	AVG
2440.016	93.88	-9.63	84.25	114	-29.75	peak
2440.016	91.56	-9.63	81.93	94	-12.07	AVG
2480.021	94.06	-9.61	84.45	114	-29.55	peak
2480.021	91.77	-9.61	82.16	94	-11.84	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

RADIATED EMISSION ABOVE 1GHZ

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4804.026	50.86	3.74	54.6	74	-19.4	peak
4804.026	45.33	3.74	49.07	54	-4.93	AVG
7206.039	43.79	8.14	51.93	74	-22.07	peak
7206.039	37.45	8.14	45.59	54	-8.41	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4804.026	49.25	3.74	52.99	74	-21.01	peak
4804.026	43.87	3.74	47.61	54	-6.39	AVG
7206.039	42.37	8.14	50.51	74	-23.49	peak
7206.039	37.68	8.14	45.82	54	-8.18	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 2	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4880.032	51.86	3.76	55.62	74	-18.38	peak
4880.032	46.27	3.76	50.03	54	-3.97	AVG
7320.048	44.15	8.17	52.32	74	-21.68	peak
7320.048	38.79	8.17	46.96	54	-7.04	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 2	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4880.032	49.26	3.76	53.02	74	-20.98	peak
4880.032	44.13	3.76	47.89	54	-6.11	AVG
7320.048	43.88	8.17	52.05	74	-21.95	peak
7320.048	37.59	8.17	45.76	54	-8.24	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960.042	52.54	3.83	56.37	74	-17.63	peak
4960.042	46.79	3.83	50.62	54	-3.38	AVG
7440.063	45.27	8.21	53.48	74	-20.52	peak
7440.063	39.16	8.21	47.37	54	-6.63	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
4960.042	51.23	3.83	55.06	74	-18.94	peak
4960.042	44.18	3.83	48.01	54	-5.99	AVG
7440.063	42.84	8.21	51.05	74	-22.95	peak
7440.063	37.18	8.21	45.39	54	-8.61	AVG
Remark:						
Factor = Antenna Factor + Cable Loss – Pre-amplifier.						

Note: Other emissions from 8G to 25 GHz are considered as ambient noise. No recording in the test report.
Factor=Antenna Factor + Cable loss - Amplifier gain, Margin=Measurement-Limit.
The “Factor” value can be calculated automatically by software of measurement system.
The GFSK modulation was the worst case and only the data of worst recorded in this report.

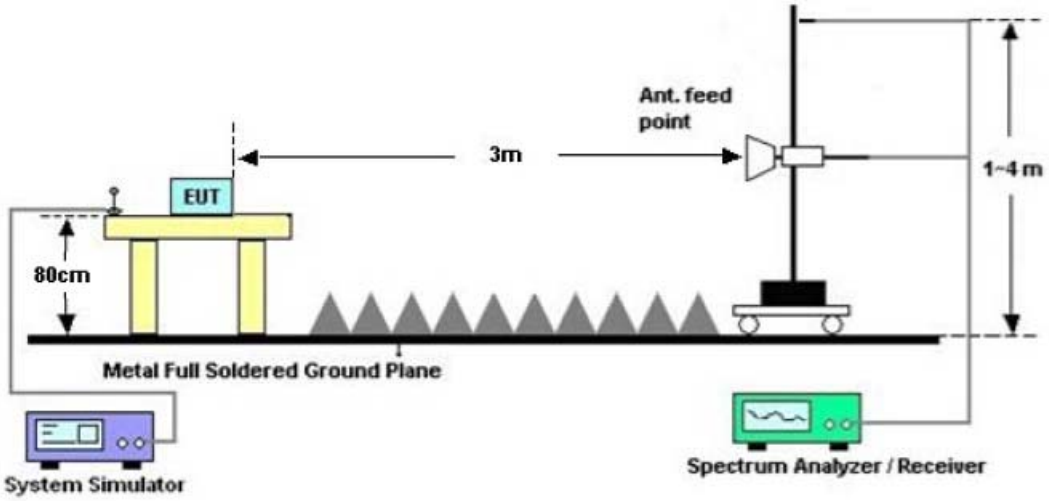
8. BAND EDGE EMISSION

8.1. MEASUREMENT PROCEDURE

1. The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.
2. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission: (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz ; VBW=1/on time(1KHz) / Sweep=AUTO
3. Other procedures refer to clause 7.2.

8.2 TEST SETUP

RADIATED EMISSION TEST SETUP



8.3 RADIATED TEST RESULT

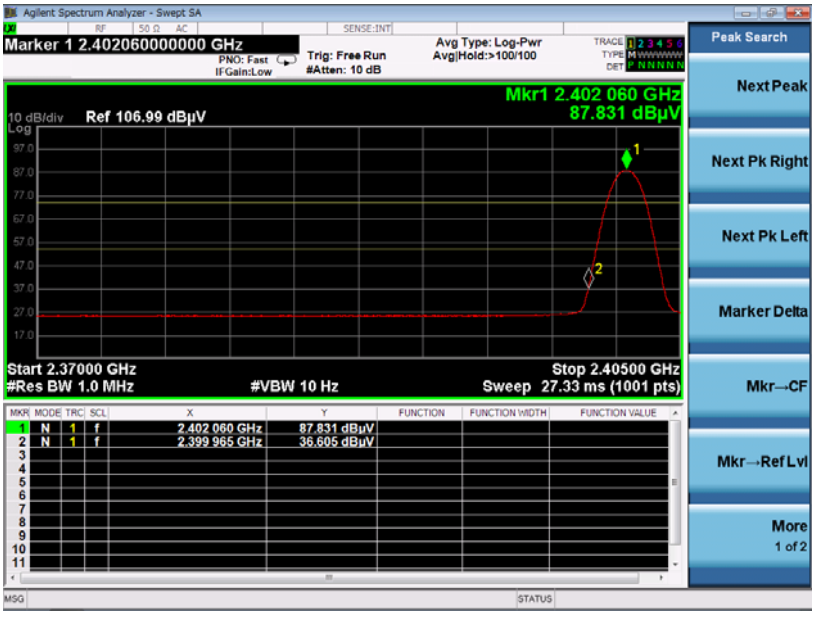
Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the “Input Correction” of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.
3. The mode 1 was the worst case and only the data of worst recorded in this report.

EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization：	Horizontal

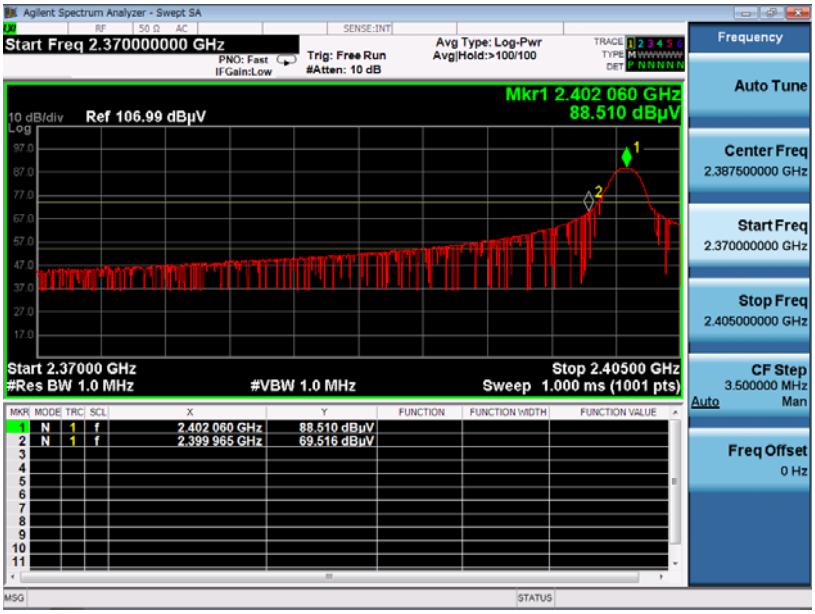
PK Value

AV Value

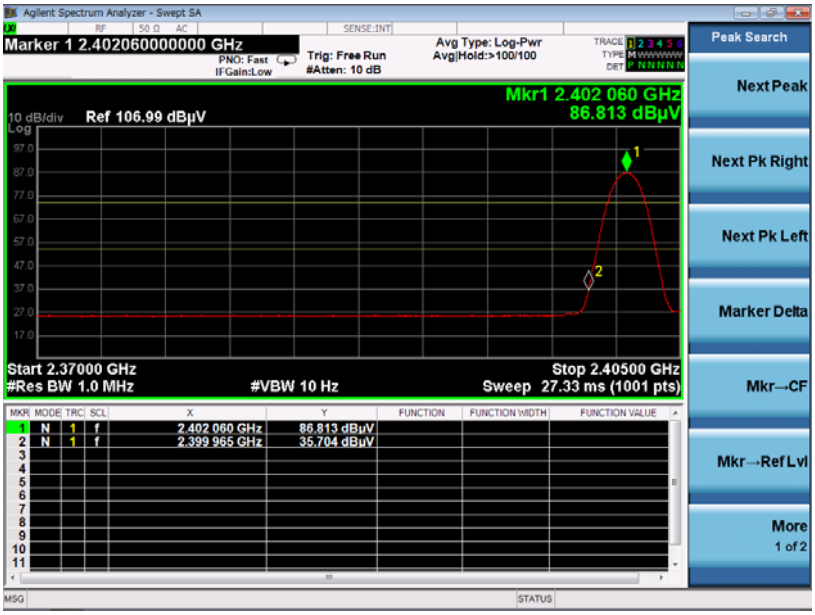


EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization：	Vertical

PK Value

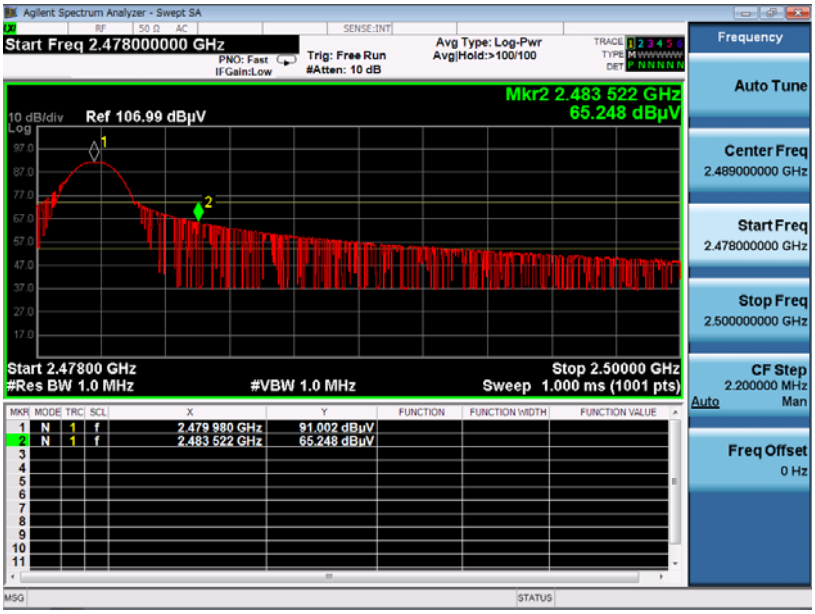


AV Value

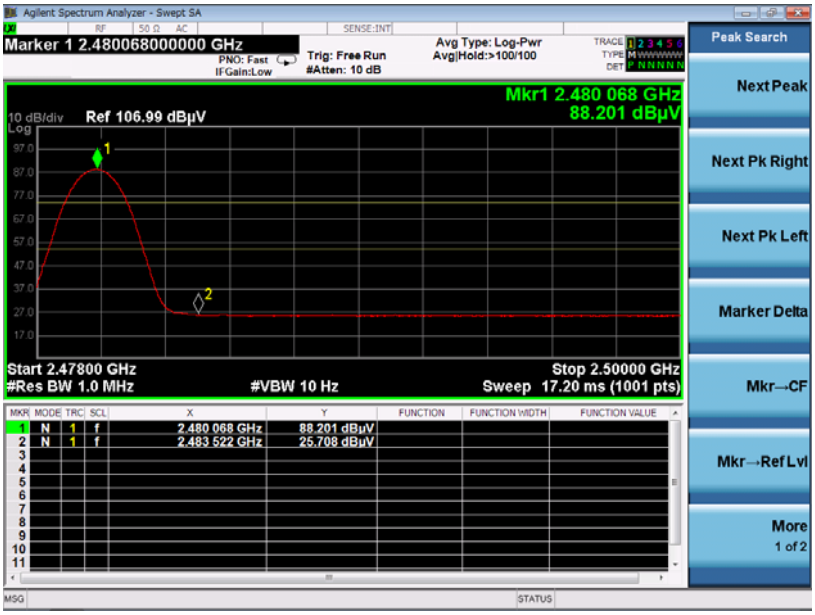


EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization：	Horizontal

PK Value

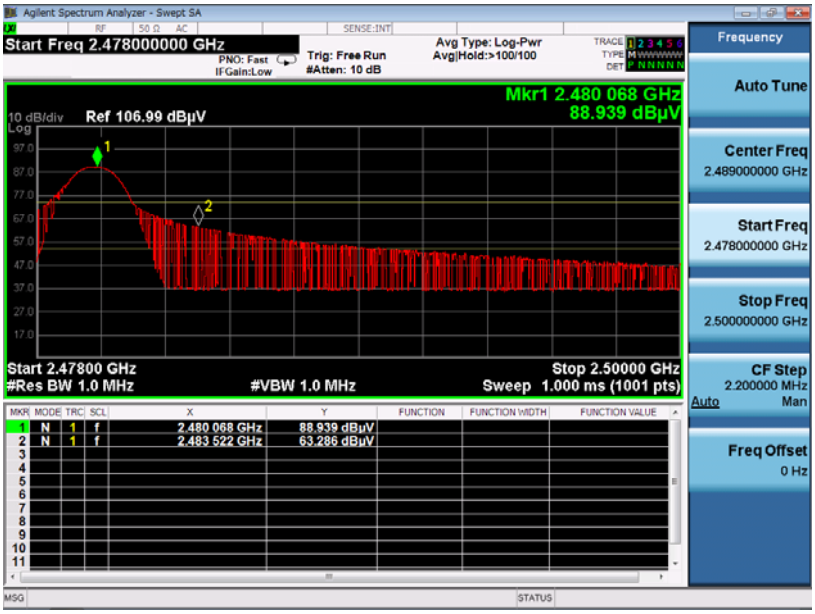


AV Value

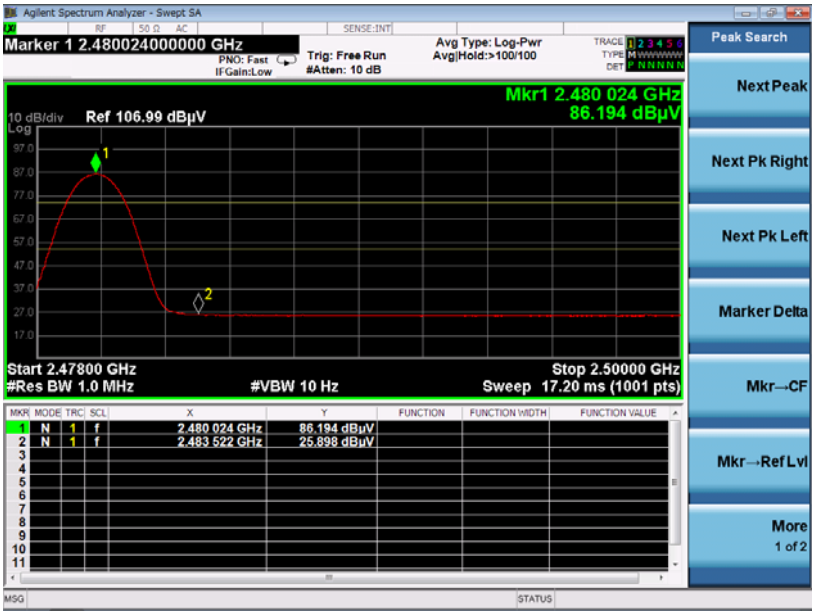


EUT：	Bluetooth Earphone	Model Name. ：	SAEB16
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 3	Polarization：	Vertical

PK Value



AV Value

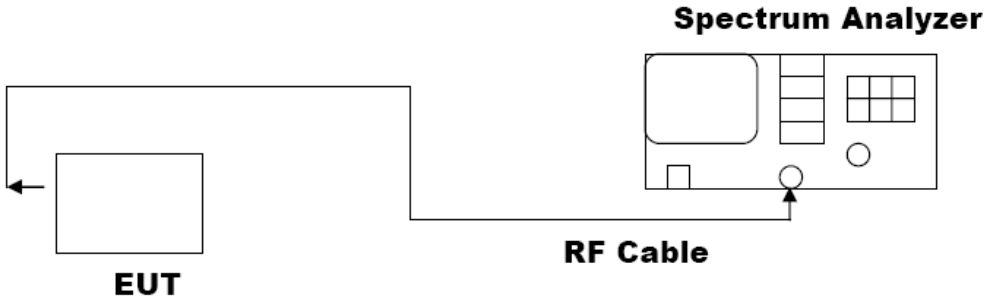


9. 20DB BANDWIDTH

9.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 1% of SPAN, VBW≥ 3×RBW.
4. Set SPA Trace 1 Max hold, then View.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

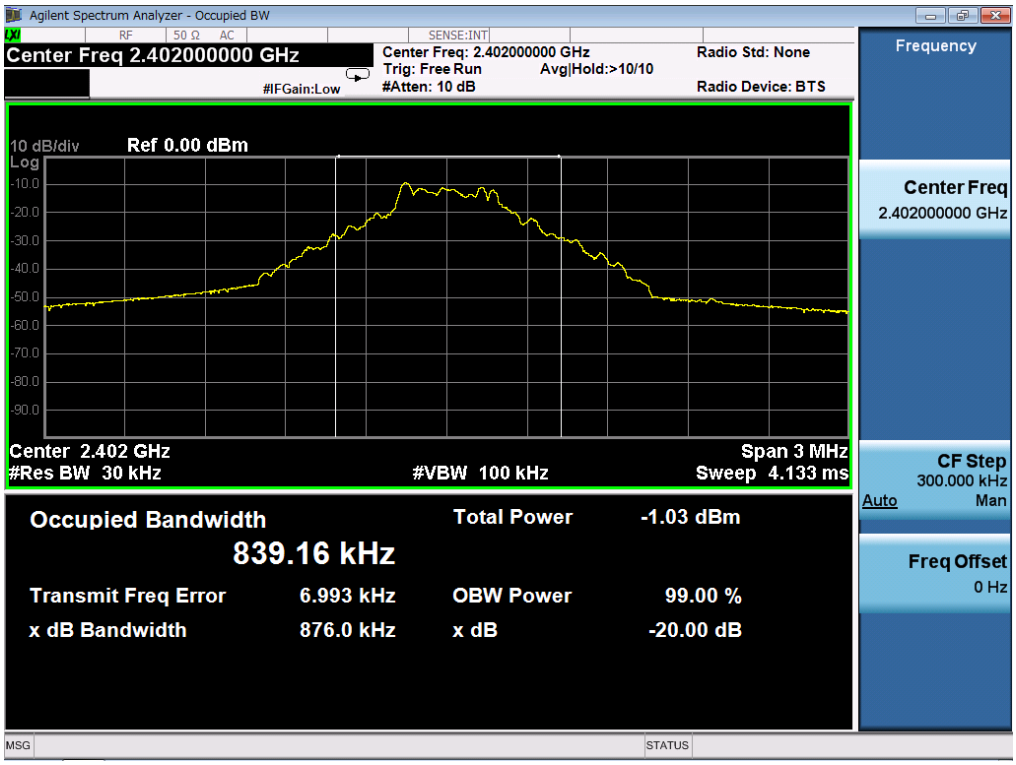


9.3. MEASUREMENT RESULTS

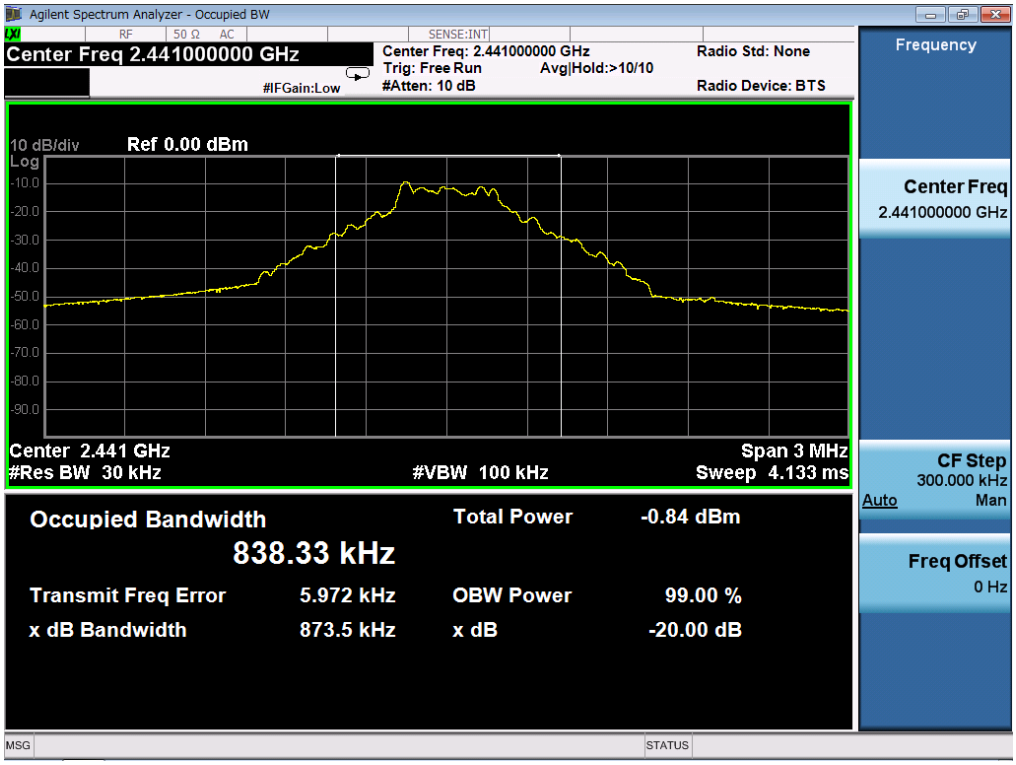
TEST ITEM	20DB BANDWIDTH
TEST MODULATION	GFSK for BR/EDR

Test Data (MHz)		Criteria
Low Channel	0.8760	PASS
Middle Channel	0.8735	PASS
High Channel	0.8645	PASS

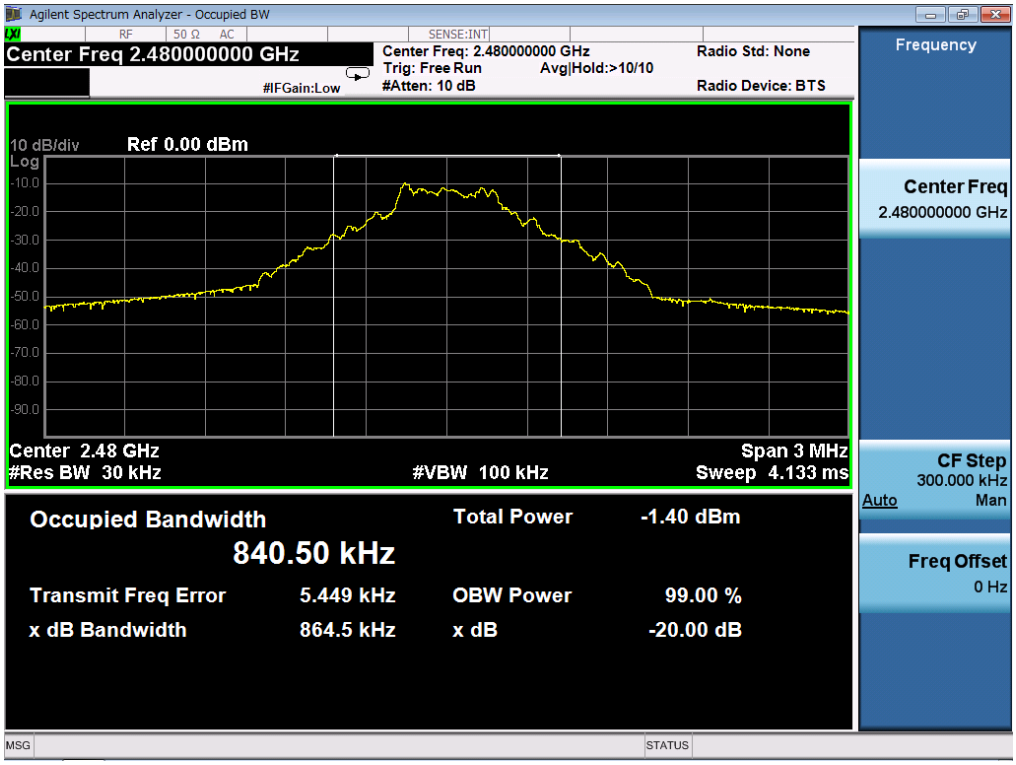
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



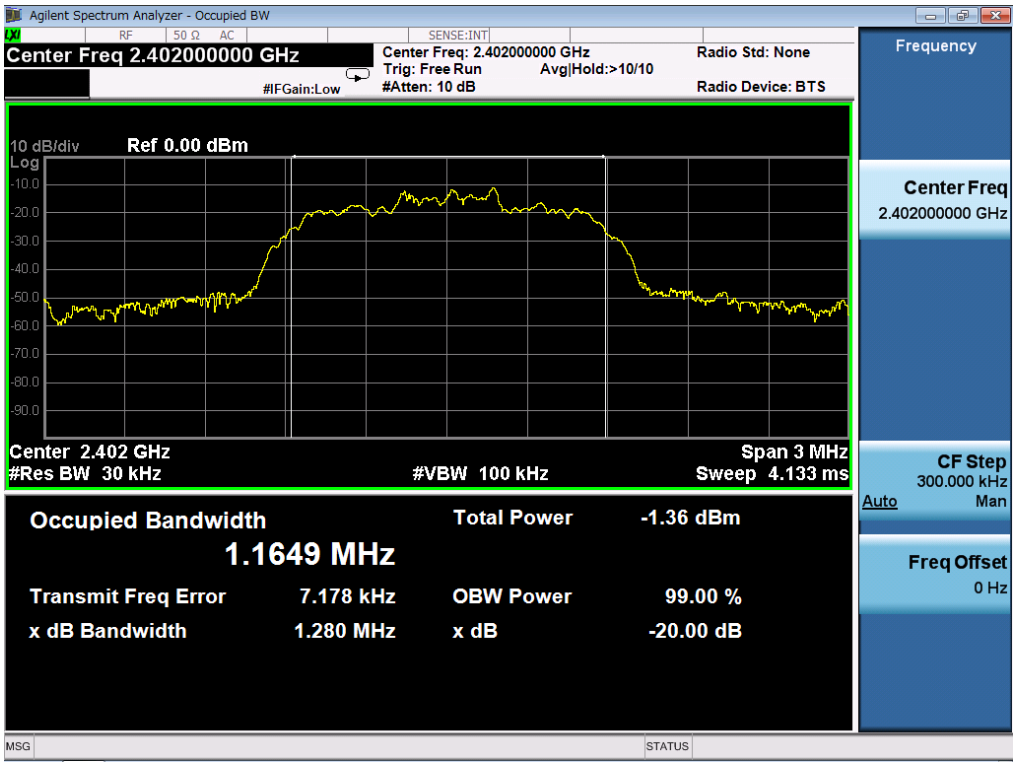
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



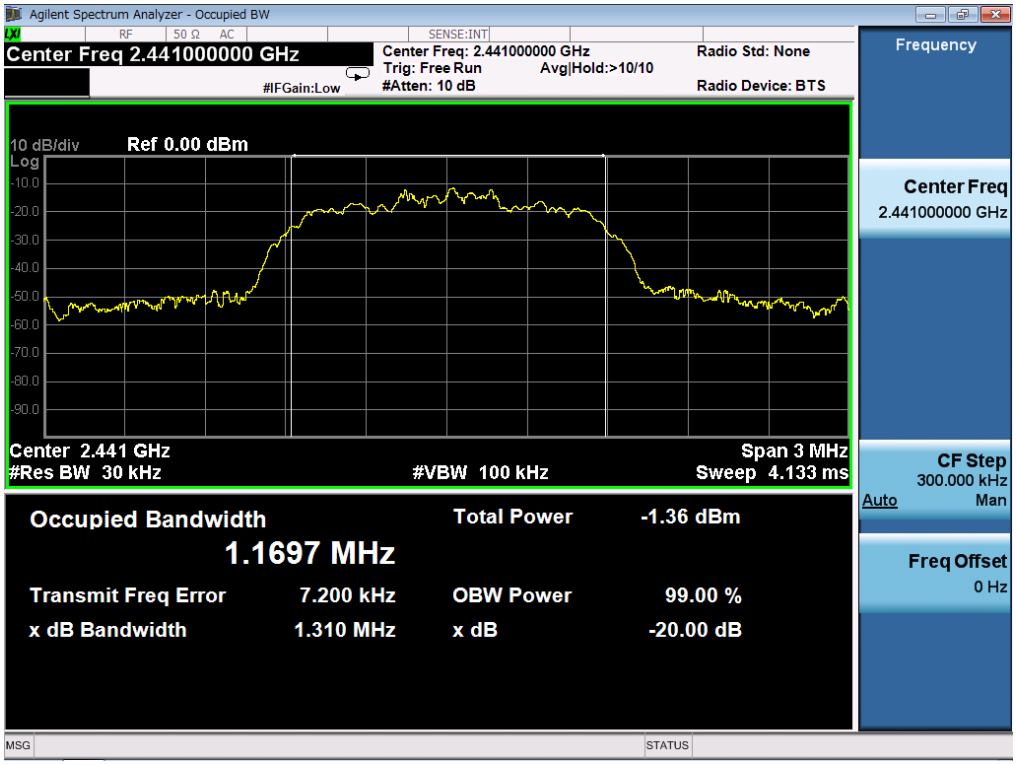
TEST ITEM	20DB BANDWIDTH
TEST MODULATION	π /4-DQPSK for BR/EDR

Test Data (MHz)		Criteria
Low Channel	1.280	PASS
Middle Channel	1.310	PASS
High Channel	1.281	PASS

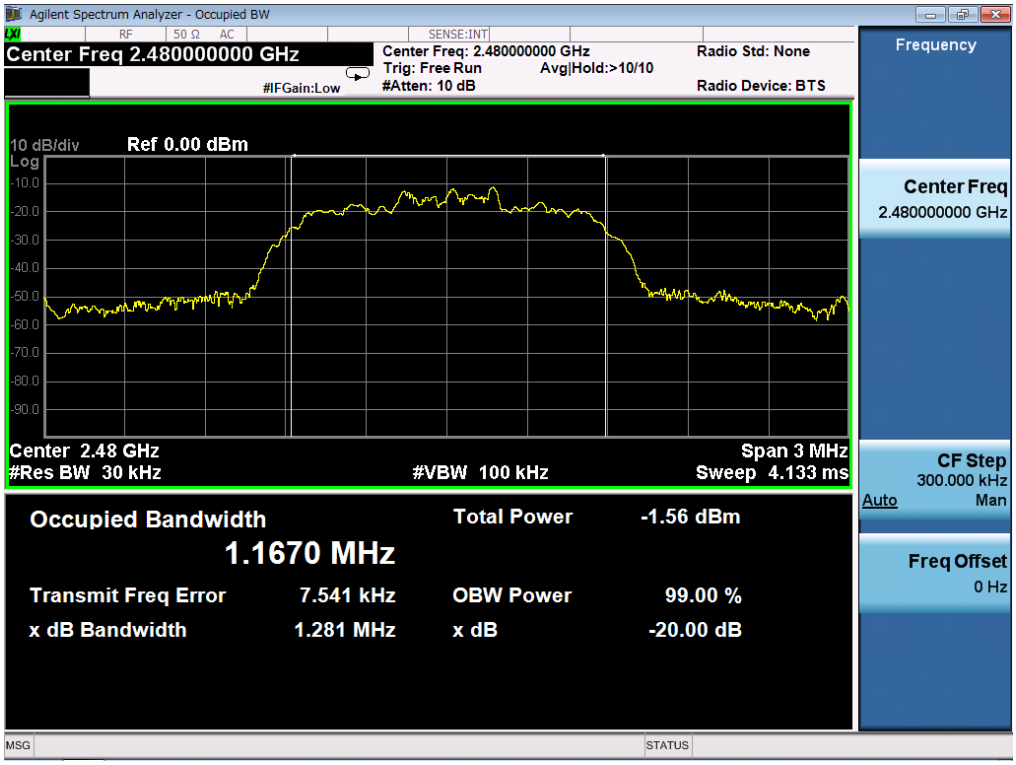
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



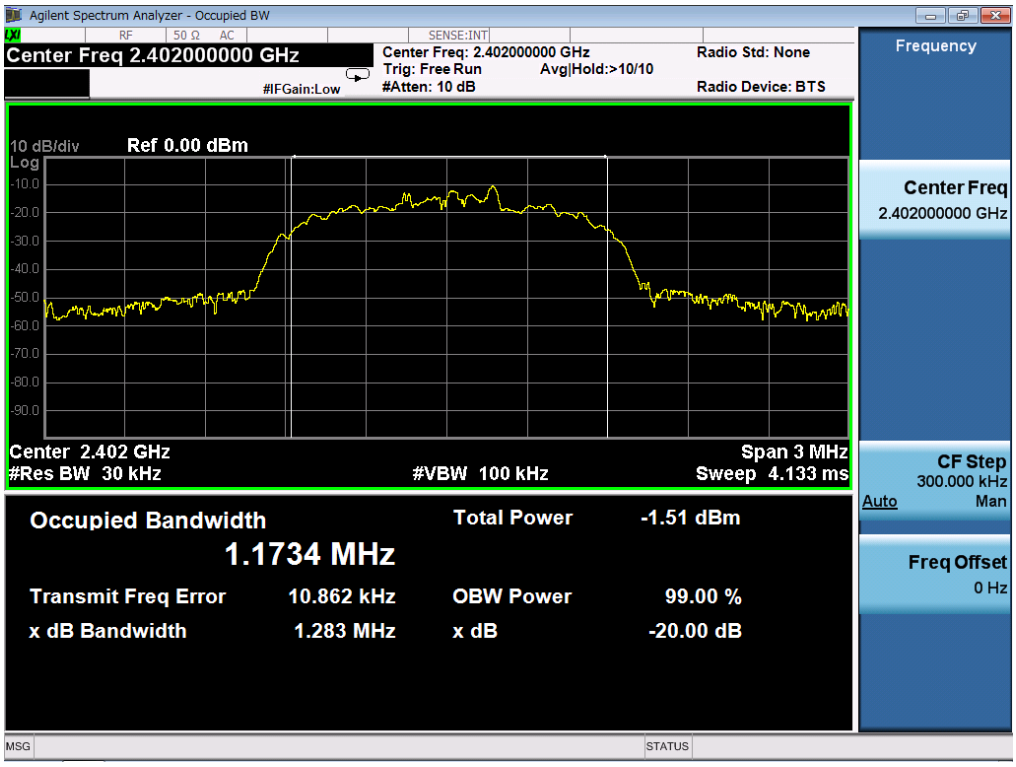
TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



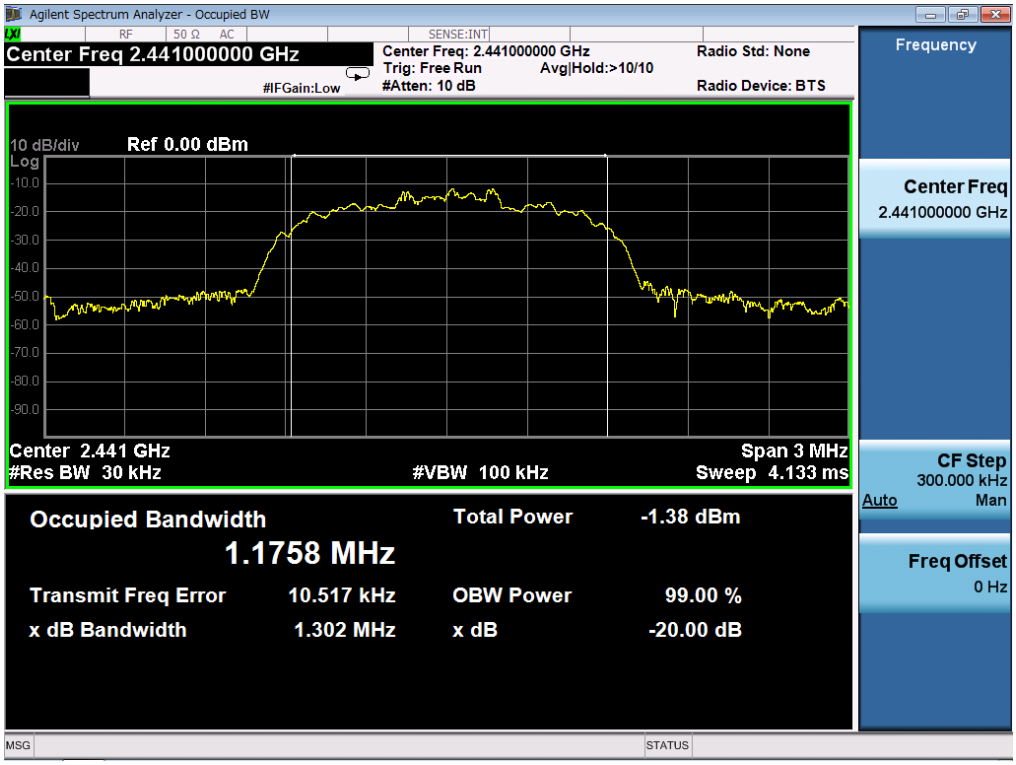
TEST ITEM	20DB BANDWIDTH
TEST MODULATION	8DPSK for BR/EDR

Test Data (MHz)		Criteria
Low Channel	1.283	PASS
Middle Channel	1.302	PASS
High Channel	1.289	PASS

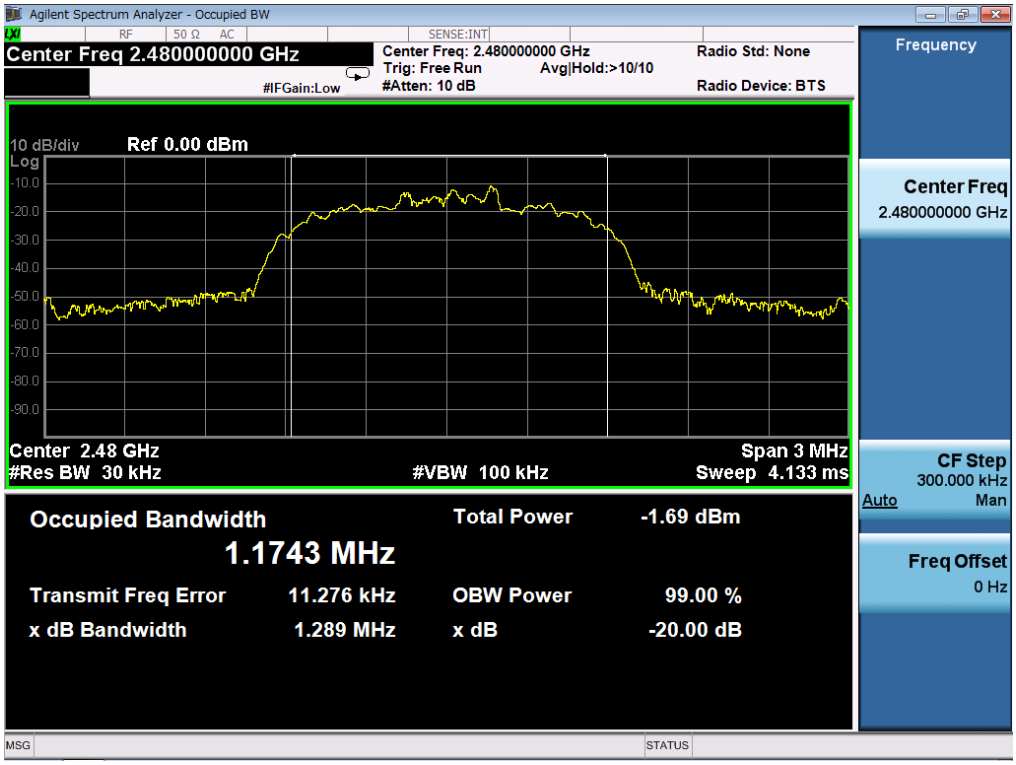
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



10. FCC LINE CONDUCTED EMISSION TEST

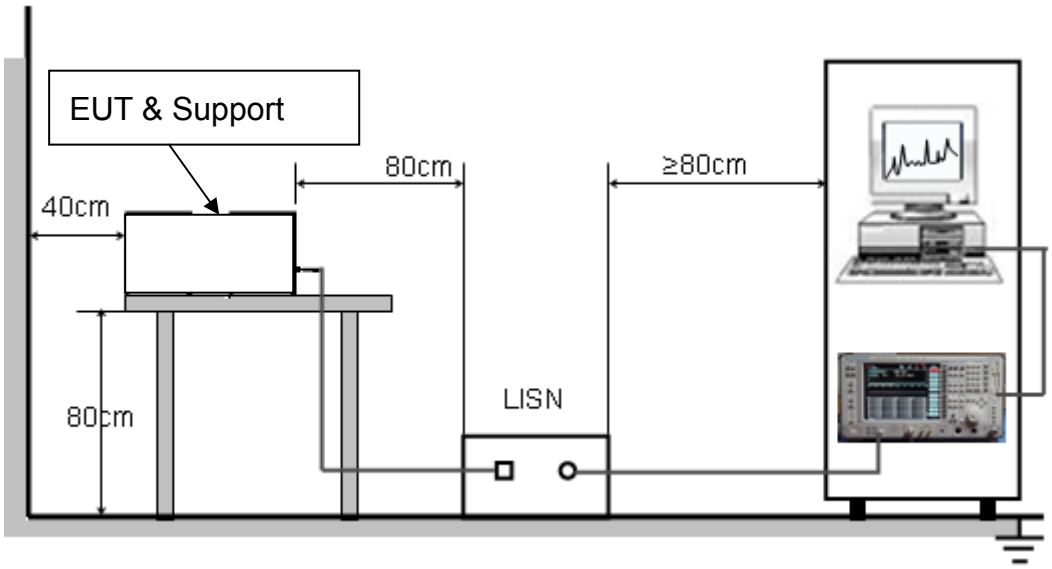
10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

10.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



10.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN..
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

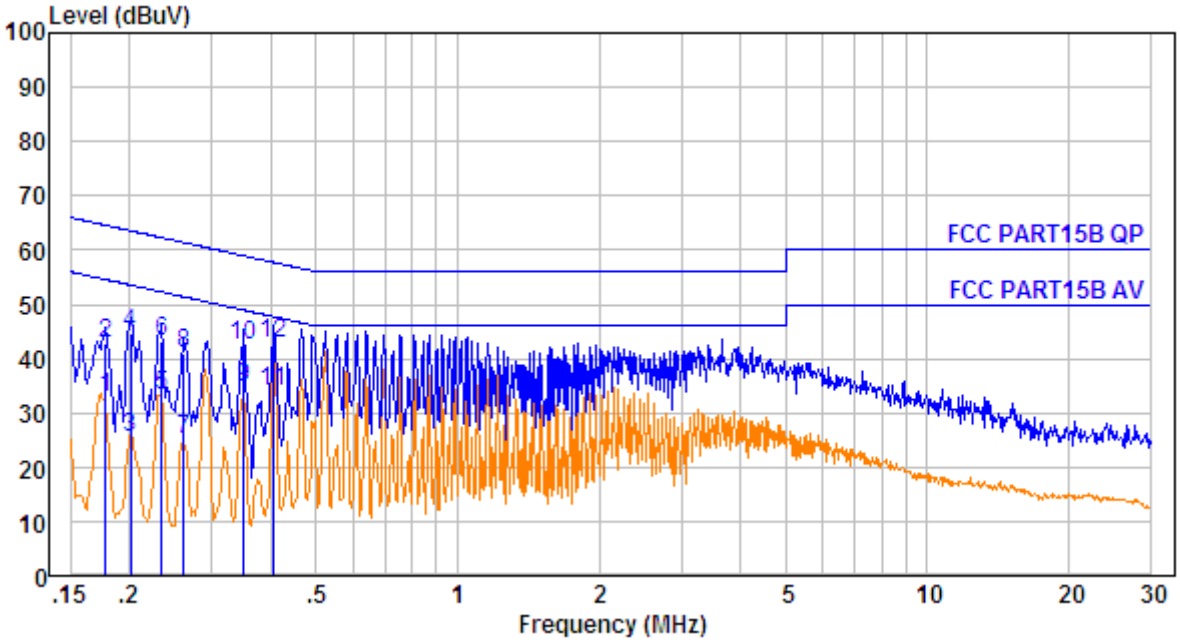
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

10.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported.

10.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

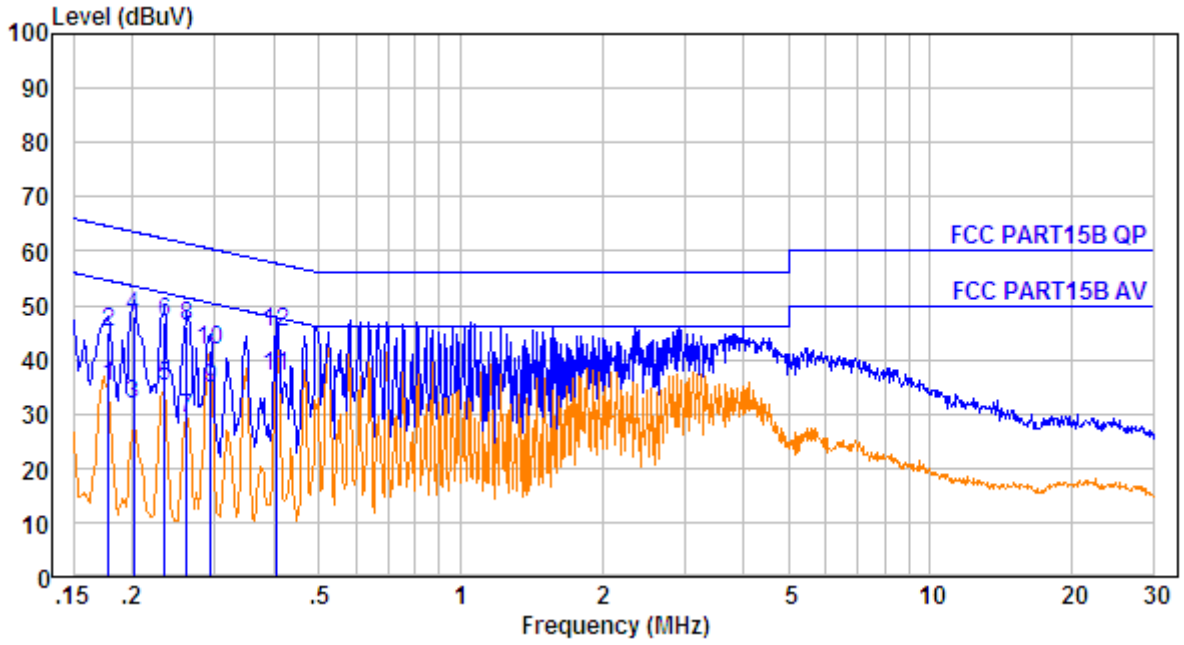
LINE CONDUCTED EMISSION TEST LINE 1-L



No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.178	10.61	0.60	21.52	32.73	54.59	-21.86	Average
2.	0.178	10.61	0.60	31.52	42.73	64.59	-21.86	Peak
3.	0.202	10.61	0.60	14.40	25.61	53.54	-27.93	Average
4.	0.202	10.61	0.60	33.40	44.61	63.54	-18.93	Peak
5.	0.234	10.62	0.60	22.05	33.27	52.30	-19.03	Average
6.	0.234	10.62	0.60	32.05	43.27	62.30	-19.03	Peak
7.	0.262	10.62	0.60	13.84	25.06	51.38	-26.32	Average
8.	0.262	10.62	0.60	29.84	41.06	61.38	-20.32	Peak
9.	0.350	10.63	0.60	23.27	34.50	48.96	-14.46	Average
10.	0.350	10.63	0.60	31.27	42.50	58.96	-16.46	Peak
11.	0.406	10.64	0.60	22.75	33.99	47.73	-13.74	Average
12.	0.406	10.64	0.60	31.75	42.99	57.73	-14.74	Peak

RESULT: PASS

Line Conducted Emission Test Line 2-N

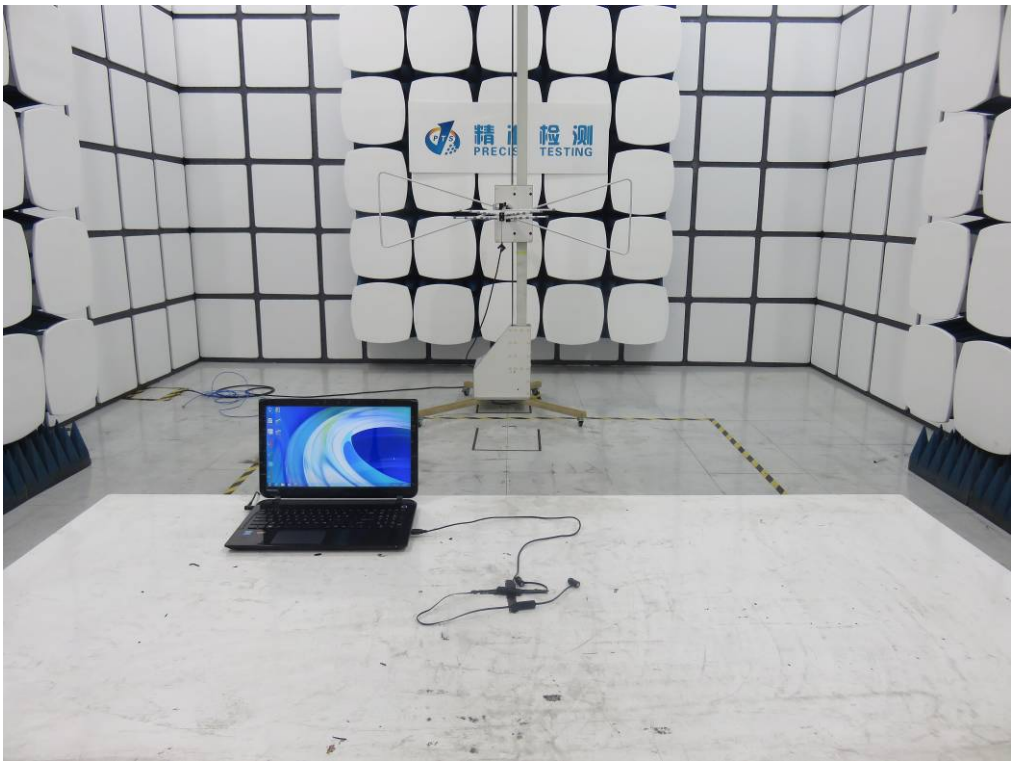


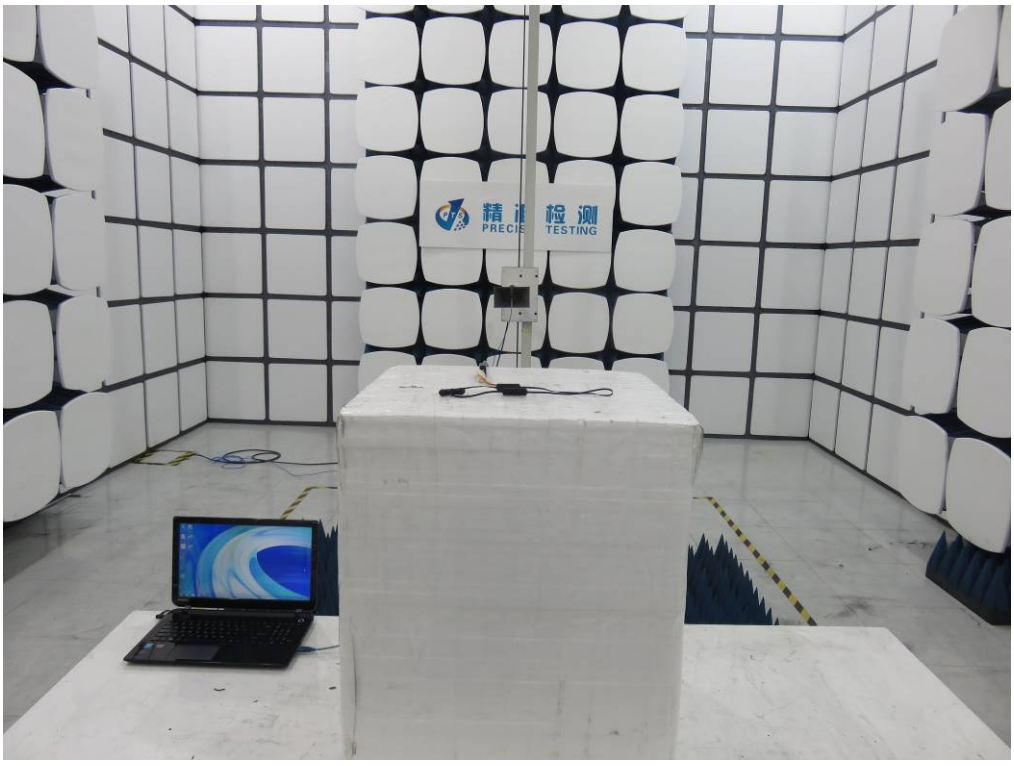
No.	Freq MHz	Cable Loss dB	AMN Factor dB	Receiver Reading dBuV	Emission Level dBuV	Limit dBuV	Over Limit dB	Remark
1.	0.178	10.61	0.60	23.84	35.05	54.59	-19.54	Average
2.	0.178	10.61	0.60	33.84	45.05	64.59	-19.54	Peak
3.	0.202	10.61	0.60	20.60	31.81	53.54	-21.73	Average
4.	0.202	10.61	0.60	36.60	47.81	63.54	-15.73	Peak
5.	0.234	10.62	0.60	23.78	35.00	52.30	-17.30	Average
6.	0.234	10.62	0.60	35.78	47.00	62.30	-15.30	Peak
7.	0.262	10.62	0.60	17.87	29.09	51.38	-22.29	Average
8.	0.262	10.62	0.60	34.87	46.09	61.38	-15.29	Peak
9.	0.294	10.63	0.60	23.42	34.65	50.41	-15.76	Average
10.	0.294	10.63	0.60	30.42	41.65	60.41	-18.76	Peak
11.	0.406	10.64	0.60	25.78	37.02	47.73	-10.71	Average
12.	0.406	10.64	0.60	33.78	45.02	57.73	-12.71	Peak

RESULT: PASS

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC RADIATED EMISSION TEST SETUP



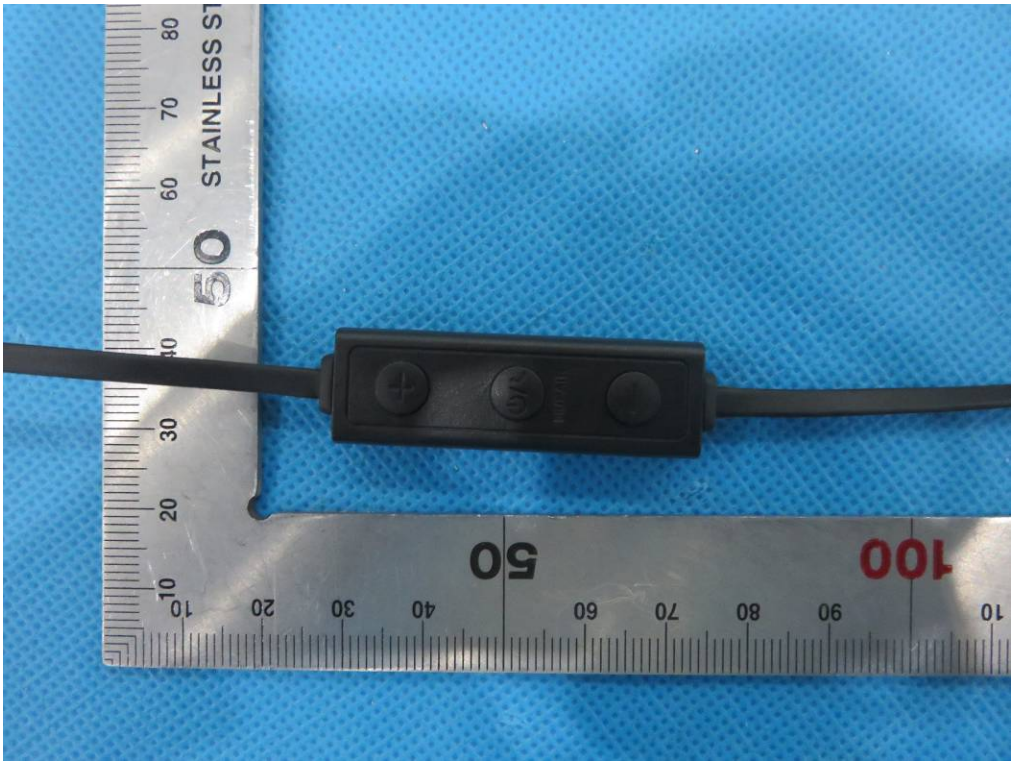


FCC LINE CONDUCTED EMISSION TEST SETUP

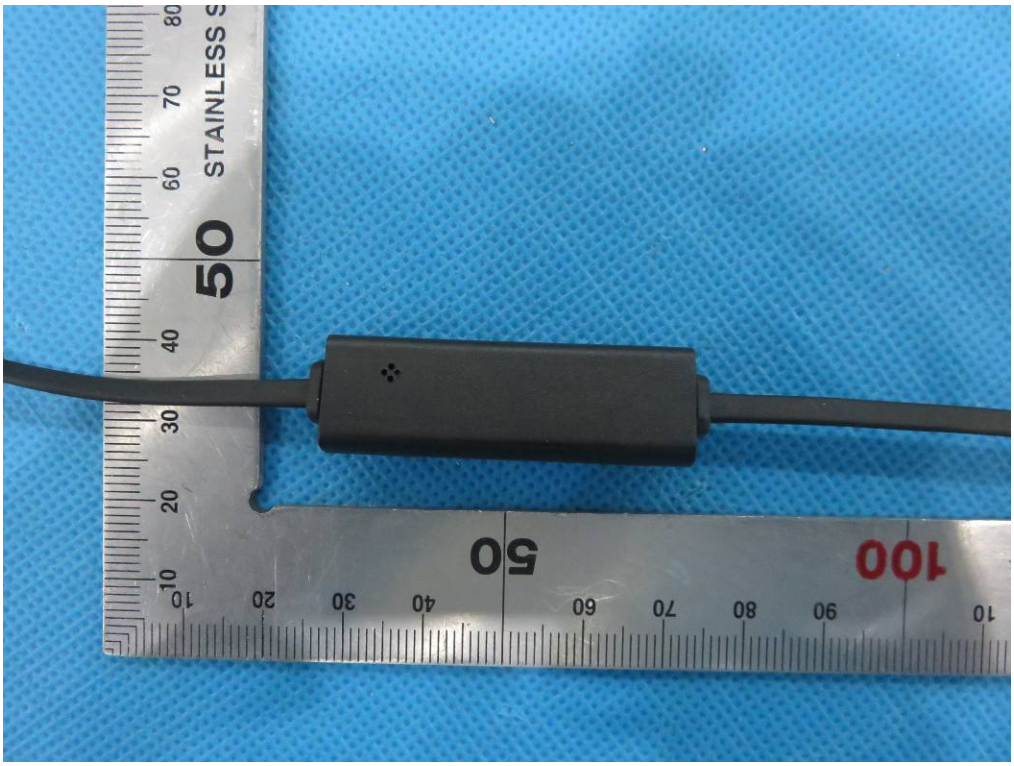
APPENDIX B: PHOTOGRAPHS OF EUT

TOTAL VIEW OF EUT

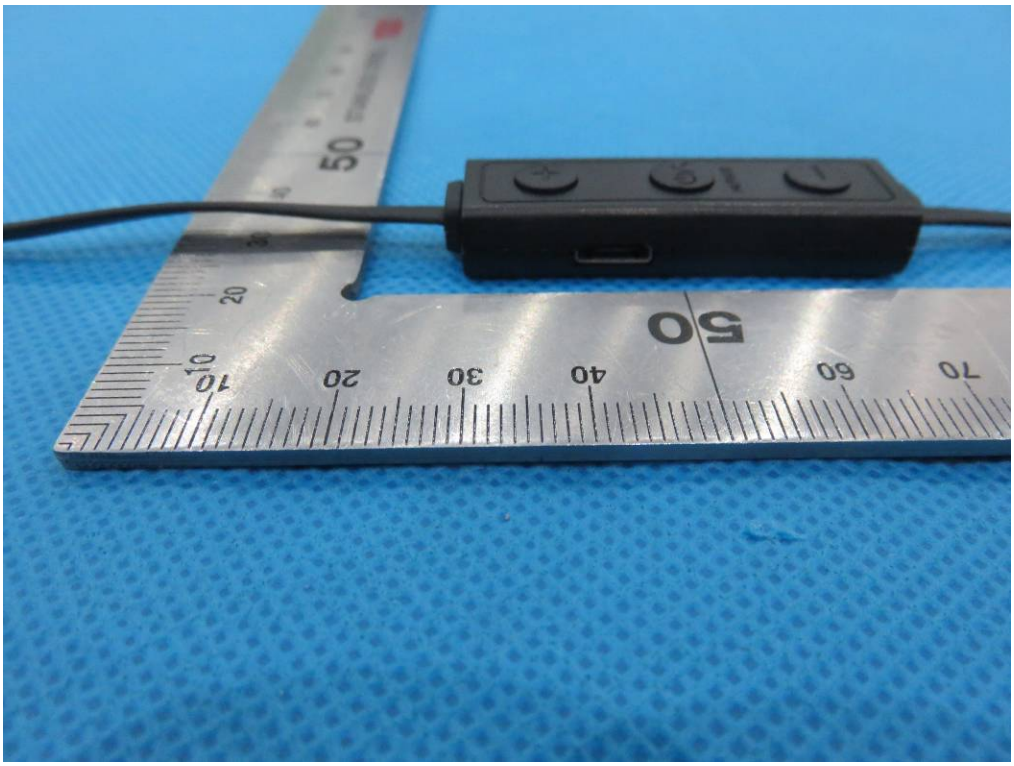
PART VIEW OF EUT-1



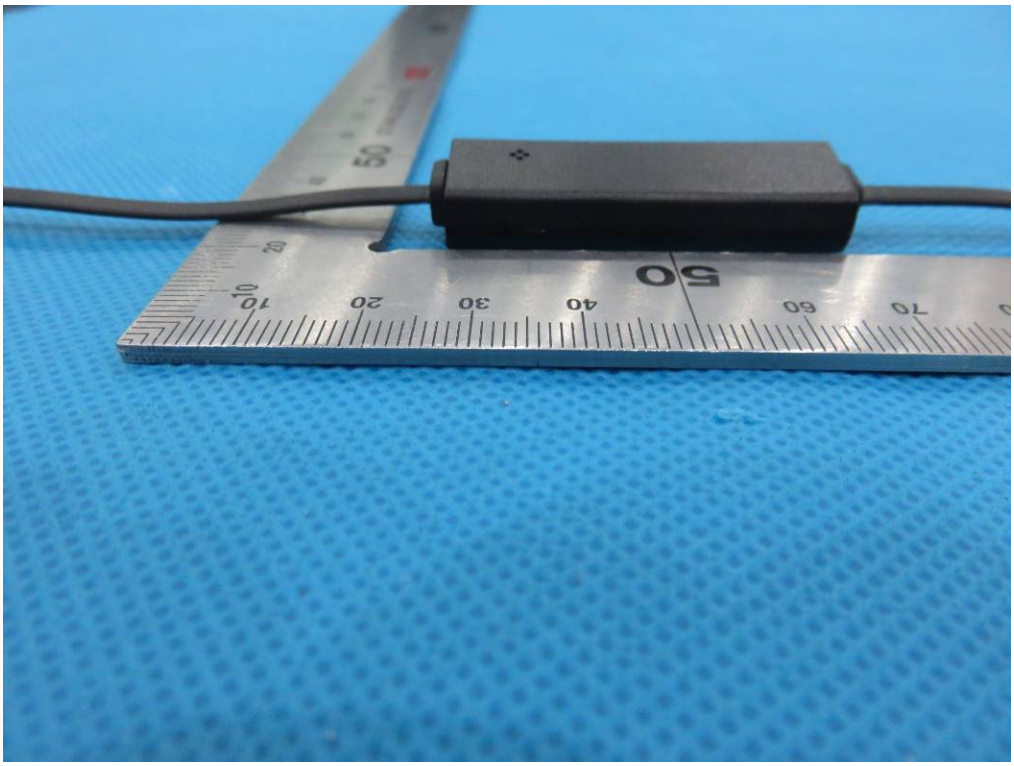
PART VIEW OF EUT-2



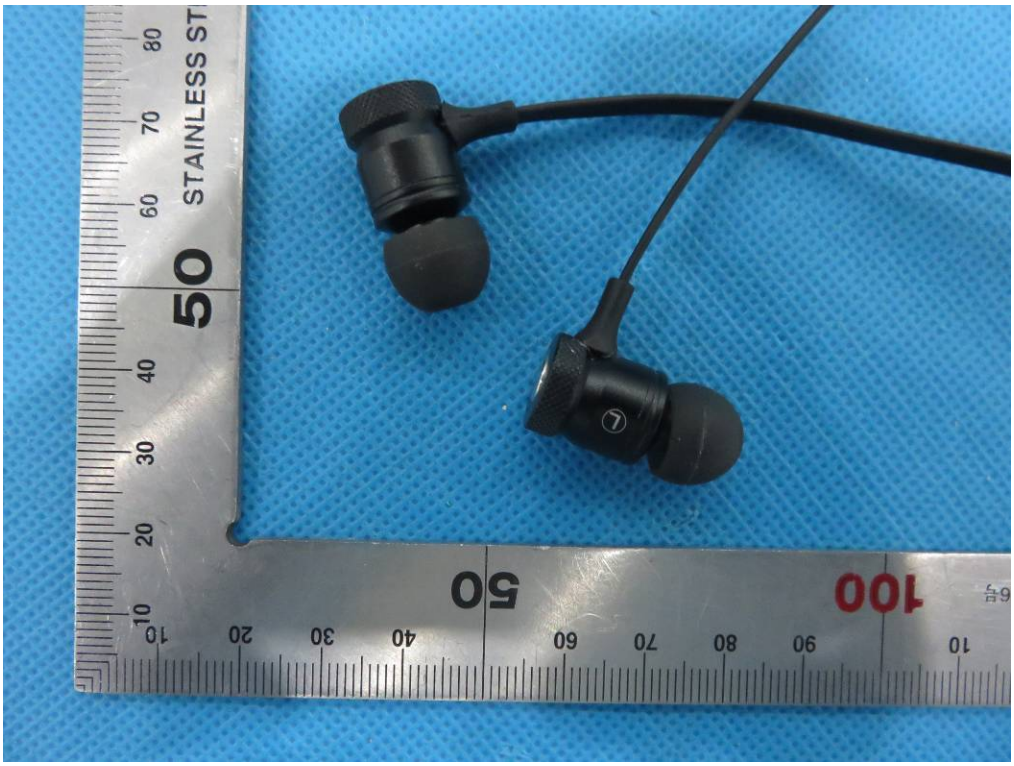
PART VIEW OF EUT-3



PART VIEW OF EUT-4



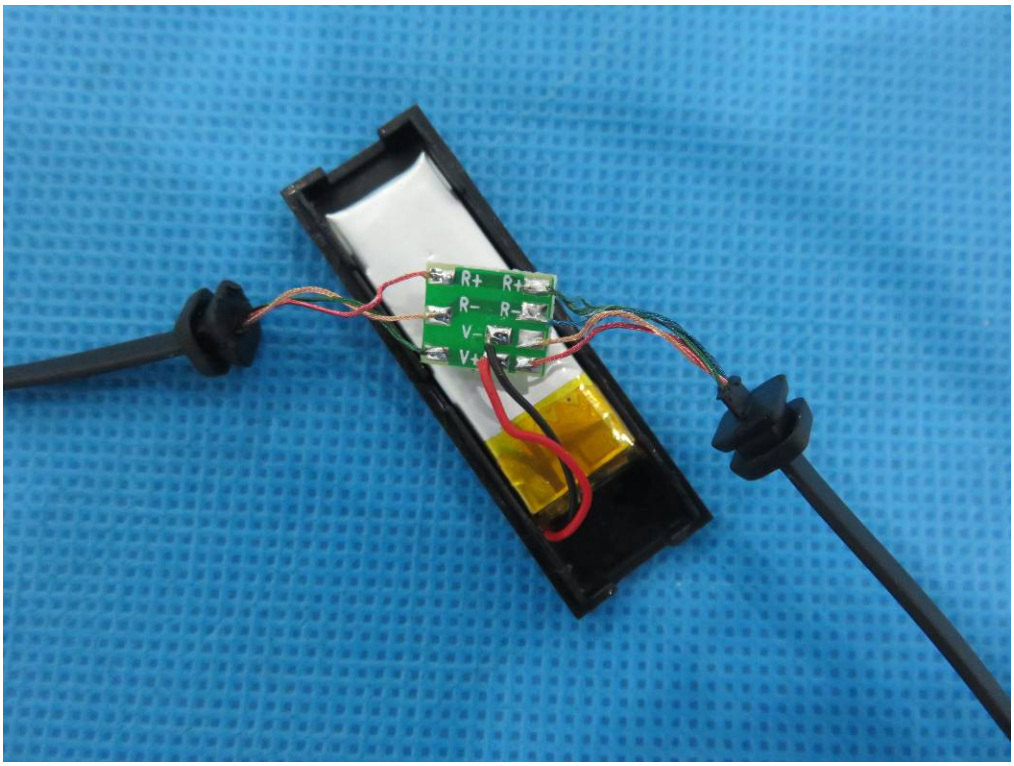
PART VIEW OF EUT-5



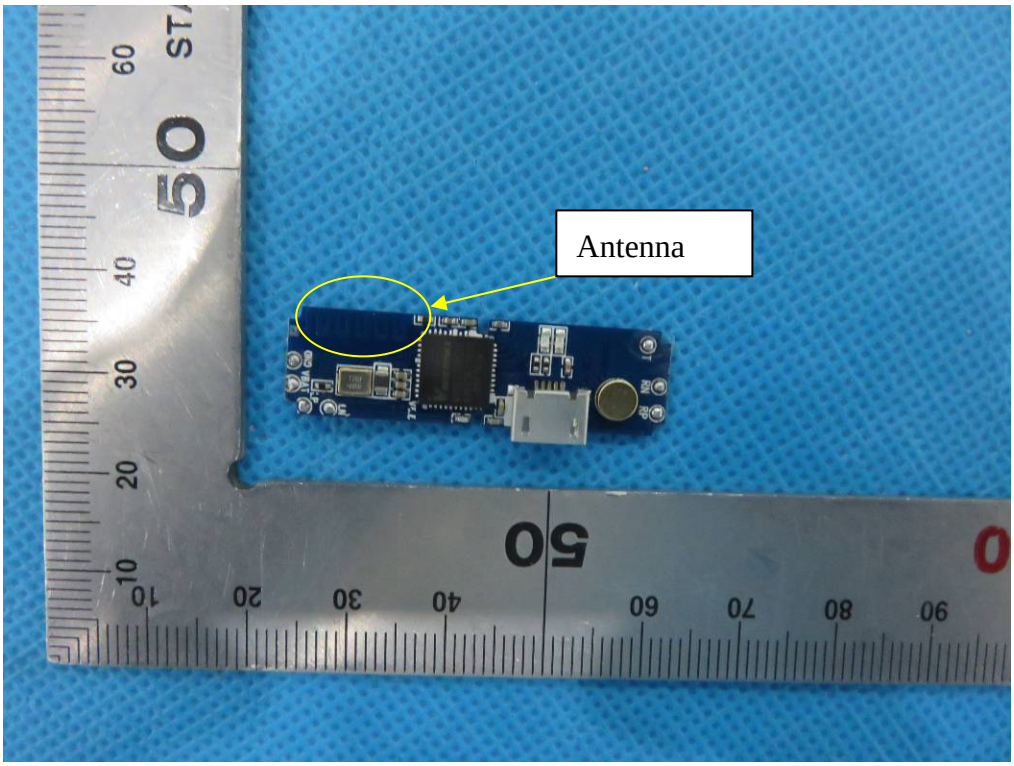
PART VIEW OF EUT-6

OPEN VIEW OF EUT-1

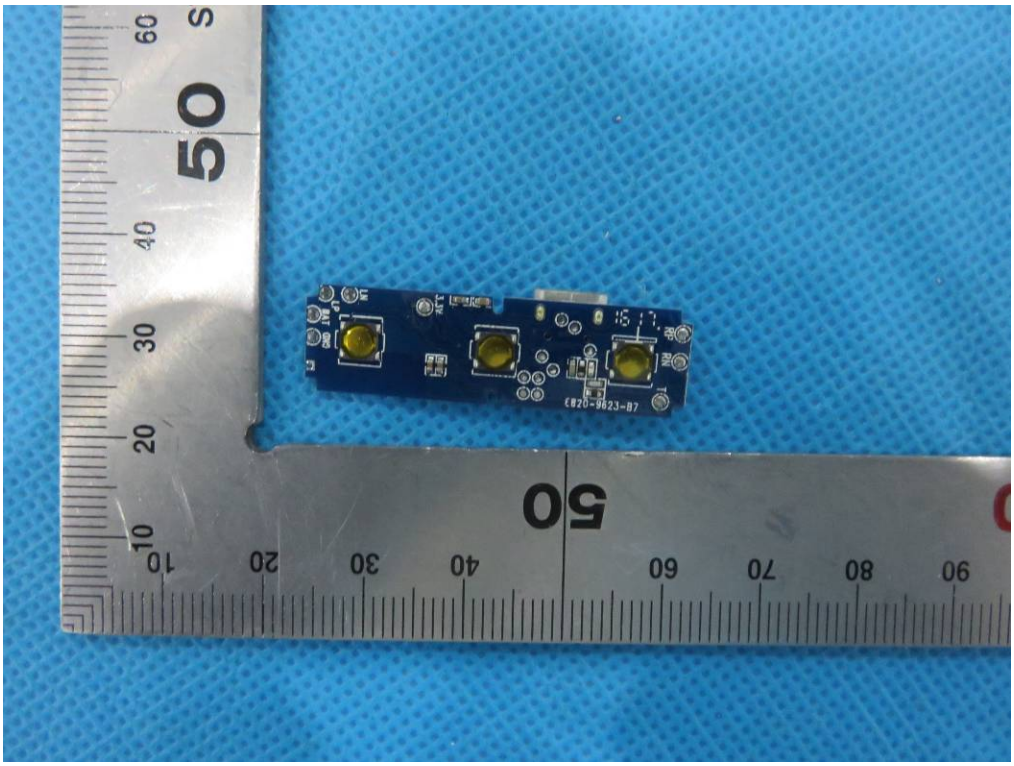
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-2



----END OF REPORT----