Test Report of FCC Part 15 C for FCC Certificate

On Behalf of

Shenzhen Aoni Electronic Industry Co., Ltd

FCC ID:	**Z63-BTHDP002**
Product Description:	**Bluetooth Headset**
Test Model:	**860, AUSDOM M05**
Supplement Model:	**304, 806, 872, 881, 883, 894, 895, 897, 843, 849, 850, 853, 861, 863, 866, AUSDOM M04, AUSDOM M06**
Brand:	**AUSDOM, AONI**

Applicant:	**ShenZhen Aoni Electronic Industry Co., Ltd.** No.5,Bldg.,Honghui Industrial Park, 2nd Liuxian Road, Bao'an District, Shenzhen, P.R.China
Manufacturer:	**ShenZhen Aoni Electronic Industry Co., Ltd.** No.5,Bldg.,Honghui Industrial Park, 2nd Liuxian Road, Bao'an District, Shenzhen, P.R.China
Prepared by:	**Shenzhen Laker Testing Technology Co.,Ltd** 4D, Block 1, Sunshine Huayi Building,Nanhai West Road, Nanshan, Shenzhen, China Tel: 86-755-86307736 Fax: 86-755-86307356

Report No.:	LK15DR-0168E-1
Issue Date:	April 22, 2015
Test Date:	April 15~22, 2015

Test by: Owen Li

Reviewed By: Edmund Zou

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	**ShenZhen Aoni Electronic Industry Co., Ltd.**
Address of applicant:	No.5,Bldg.,Honghui Industrial Park, 2nd Liuxian Road, Bao'an District, Shenzhen, P.R.China
Manufacturer:	**ShenZhen Aoni Electronic Industry Co., Ltd.**
Address of manufacturer:	No.5,Bldg.,Honghui Industrial Park, 2nd Liuxian Road, Bao'an District, Shenzhen, P.R.China

General Description of E.U.T

Items	Description
EUT Description:	Bluetooth Headset
Model No.:	860, AUSDOM M05 (The same one product owns two model names)
Supplement Model:	304, 806, 872, 881, 883, 894, 895, 897, 843, 849, 850, 853, 861, 863, 866, AUSDOM M04, AUSDOM M06
Trade mark:	AUSDOM, AONI
Type of Modulation:	GFSK
Frequency Band:	2402 MHz ~ 2480 MHz
Number of Channels:	40
Channel Bandwidth:	2 MHz
Antenna Type:	Integrated antenna，fixed on PCB
Antenna Gain:	-0.6dBi
Rated Voltage:	3.7V from battery and charged by USB DC5V
Bluetooth Version:	BT 4.0

***Note**:*

** The test data gathered are from the production sample provided by the manufacturer,*

** The 860 is all the same as AUSDOM M05,just di*fference in model name.

The 860 and AUSDOM M05 are the same as other models,just difference in external features,model number and trade mark serves as Marketing strategy.

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1.2Test Facility

All measurement required was performed at laboratory of Centre Testing International (ShenZhen) Corporation ,Location at Building C, Sienific Innovation Park,Tiegang Reservior, Xixiang, Baoan District, Shenzhen, Guangdong, The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

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

FCC – Registration No.: 565659

Centre Testing International (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 565659, expiration date is 01/27/2017.

IC Registration No.: 7408B

The 3m alternate test site of CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7408B on December 29，2009.

CNAS - Registration No.: L1910

CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION,. 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) for the competence in the field of testing.The acceptance letter from the CNAS is maintained in our files: Registration:L1910,January 12,2010.

1.3 Related Submittal(s) / Grant (s)

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.
The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.209, and 15.247 rules.

1.4 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted Emission	3.2
Radiated Emission	4.5

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2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 Part 15 Subpart C.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions The EUT is a placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m/10m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

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2.4 List of Measuring Equipments

Test equipments list of CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION.

Shielding Room No. 1 - Conducted disturbance Test				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
Receiver	R&S	ESCI	100009	07/19/2015
LISN	ETS-LINDGREN	3850/2	00051952	07/19/2015
LISN	R&S	ENV216	100098	07/19/2015
Voltage Probe	R&S	ESH2-Z3	100042	07/19/2015
Current Probe	R&S	EZ17	100106	07/19/2015
ISN	TESEQ GmbH	ISN T800	30297	07/04/2015

Control Room - Conducted disturbance Test (10m part)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
Receiver	R&S	ESCI	100435	07/19/2015
LISN	schwarzbeck	NNLK8121	8121-529	07/19/2015
Transient Limiter	ELECTRO-METRICS	EM-7600	806	07/29/2015
Voltage Probe	R&S	ESH2-Z3	100042	07/19/2015
Current Probe	R&S	EZ17	100106	07/19/2015
ISN	TESEQ GmbH	ISN T800	30297	07/04/2015
Horn Antenna	ETS-LINGREN	3117	00057407	07/19/2015

3M Semi-anechoic Chamber - Radiated disturbance Test				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2015
Spectrum Analyzer	Agilent	E4440A	MY46185649	07/07/2015
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	07/21/2015
Multi device Controller	ETS-LINGREN	2090	00057230	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	07/19/2015
Microwave Preamplifier	Agilent	8449B	3008A02425	07/29/2015

10M Semi-anechoic Chamber - Radiated disturbance Test				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
10M Chamber & Accessory Equipment	Rainford	--	--	07/06/2015
Receiver	R&S	ESCI	100435	07/19/2015
Spectrum Analyzer	R&S	FSP40	100416	07/06/2015
EMI test receiver	R&S	ESIB40	2023282915	07/24/2015

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TRILOG Broadband Antenna	schwarzbeck	VULB 9163	484	07/21/2015
Horn Antenna	ETS-LINGREN	3117	00044562	07/07/2015
Microwave Preamplifier	Agilent	11909A	186871	07/06/2015
Microwave Preamplifier	HP	HP 8447F	2805A03379	07/06/2015
Microwave Preamplifier	CD	PAP-1G18G	2001	07/29/2015

Shielding Room No. 2 - Harmonic / Flicker Test (EN 61000-3-2) / (EN 61000-3-3)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
5KVA AC POWER SOURCE	California instruments	5001iX-400-413	57344	07/29/2015
Flicker & Harmonic Tester	California instruments	PACS-1	72492	07/29/2015

Shielding Room No. 3 - ESD Test (IEC 61000-4-2)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
ESD Simulator	EM TEST	ESD30C	V0603101091	07/30/2015
ESD Simulator	TESEQ	NSG437	478	08/22/2015

3M Full-anechoic Chamber - Radio-frequency electromagnetic field Immunity Test (IEC 61000-4-3)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2015
ESG Vector signal generators	Agilent	E4438C	MY45095744	07/07/2015
Power Amplifier	AR	150W1000	0322288	07/19/2015
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	07/21/2015
Temperature & Humidity Chamber	ESPEC	DSW0540	ER-009	09/29/2015

Shielding Room No. 3 - EFT / Surges Test (IEC 61000-4-4) (IEC 61000-4-5)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
Compact Generator	EM-Test	UCS500M/6B	V0603101093	07/19/2015
Capacitive Clamp	EM-Test	C Clamp HFK	0306-43	07/19/2015
CDN for Telecom Port	EM-Test	CNV504S1	V0603101094	07/19/2015
EFT Generator	SCHAFFNER	NSG 2025	19878	07/29/2015
SURGE Generator	SCHAFFNER	NSG 2050	200313-135AR	07/29/2015
CDN	SCHAFFNER	CDN-131/133	34397	07/29/2015

Shielding Room No. 2 - Radio-frequency continuous conducted Immunity Test (IEC 61000-4-6)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**

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Signal Generator	IFR	2023B	202307/883	07/07/2015
Power Amplifier	AR	75A 250A	320297	07/29/2015
Attenuator	EM-Test	ATT6/75	0320837	07/19/2015
CDN	EM-Test	CDN M2/M3	0204-01	07/19/2015
EM-Clamp	EM-Test	EM101	35770	07/19/2015

Shielding Room No. 2 - Power-frequency magnetic fields Immunity Test (IEC 61000-4-8)				
Compact Generator	EM-Test	UCS500M/6B	V0603101093	07/19/2015
Induction Coil	EM-Test	MS100	0106-47	07/29/2015
Current Transformer	EM-Test	MC2630	0106-02	07/29/2015

Shielding Room No. 2 –Voltage dips and interruptions Test (IEC 61000-4-11)				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
5KVA AC POWER SOURCE	California instruments	5001iX-400-413	57344	07/29/2015
Electronic output switch	California instruments	EOS-1	72616	07/29/2015

2.5 List of auxiliary device

Equipment	Manufacturer	Model	Specification	Cert.
Notebook	Lenovo	E46L	Input: DC20V (3.25A) Output: USB DC5V	FCC DoC, CE,CCC
Adapter	Lenovo	PA-1650-56LC	Input:100~240V (1.7A)50-60Hz Output: DC20V (3.25A)	FCC DoC, CE,CCC

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3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.207(a)	Condcuted Emission Test	Pass
15.247(e)	Power Spectral Density	Pass
15.247(a)(2)	6dB Bandwidth	Pass
15.247(a)	Occupied Bandwidth	Pass
15.247(b)(1)	Maximum Peak Output Power	Pass
15.205	Emissions At Restricted Band	Pass
15.247(d),15.209	Spurious Radiated Emission	Pass
15.203	Antenna Requirement	Pass

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4. Condcuted Emission Test

4.1 Applicable Standard

Section 15.207(a): for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

4.2 Limits

Limits for Class A digital devices

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 to 0.50	79	66
0,50 to 30	73	60

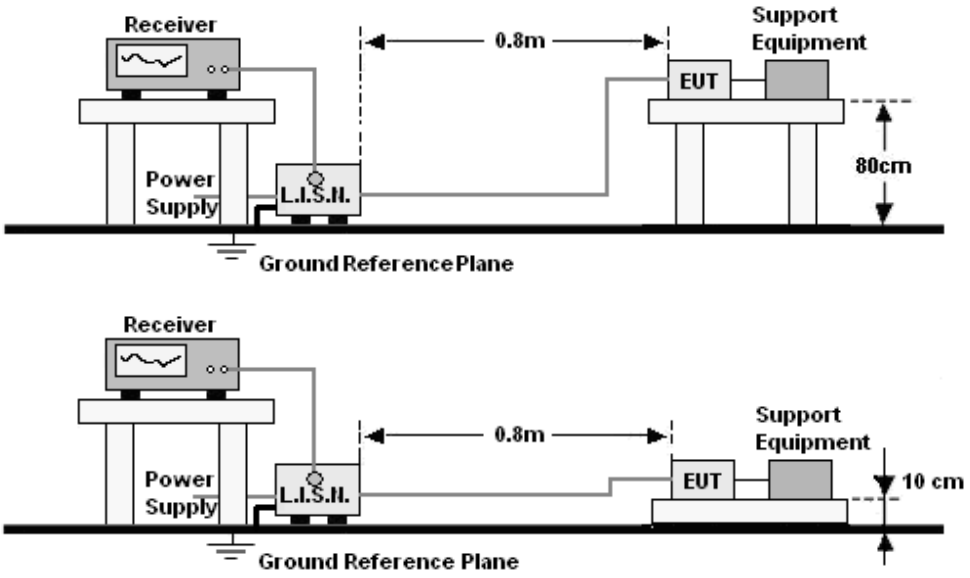
NOTE: The lower limit shall apply at the transition frequency.

Limits for Class B digital devices

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

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

4.3 EUT Test Setup



（Floor Stand）

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4.4 Procedure Of Conducted Emission Test

a. The Product was placed on a nonconductive table above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

4.5 Test Result

Temperature (℃) : 22~23	EUT: Bluetooth Headset
Humidity (%RH): 50~54	M/N:860
Barometric Pressure (mbar): 950~1000	Operation Condition: Charging and BT working

The charging and BT working mode test data worse than charging mode,so only record this mode test datas

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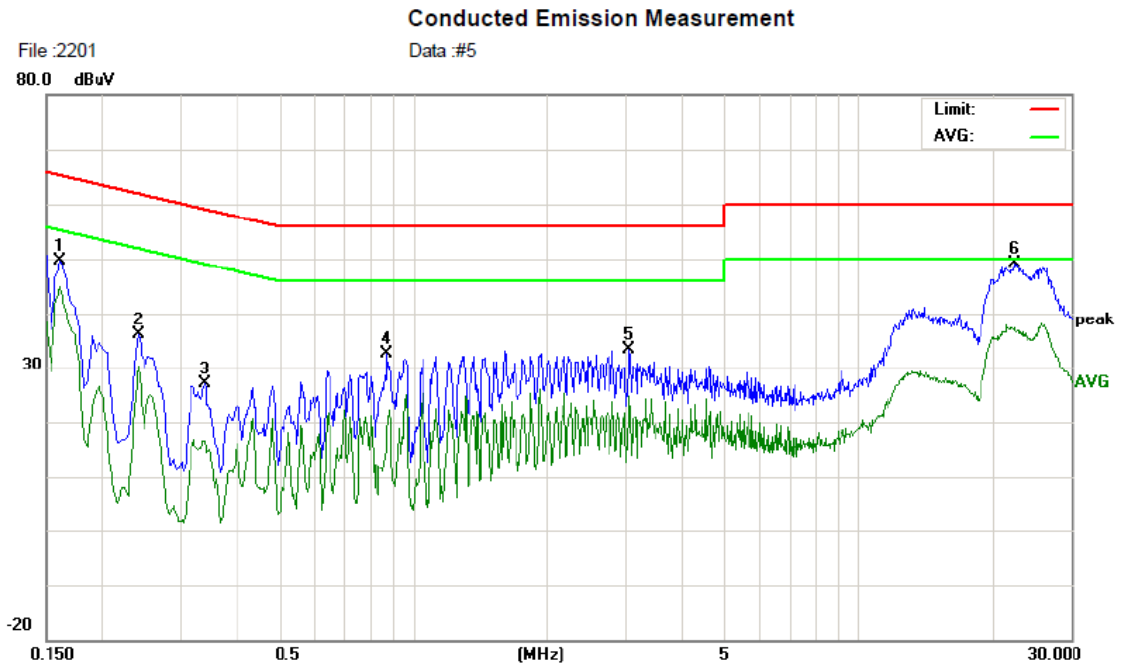
The Test Data Of Conducted Emission

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	Charging and BT working
Test Site:	CHAMBER
Operator:	Owen Li
Comment:	Line:L
	Tem:23℃ Hum:50%



No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1620	39.72		34.98	9.79	49.51		44.77	65.36	55.36	-15.85	-10.59	P	
2	0.2420	26.25		20.61	9.81	36.06		30.42	62.02	52.02	-25.96	-21.60	P	
3	0.3420	17.39		6.69	9.81	27.20		16.50	59.15	49.15	-31.95	-32.65	P	
4	0.8780	22.67		8.36	9.85	32.52		18.21	56.00	46.00	-23.48	-27.79	P	
5	3.0700	23.42		14.93	9.93	33.35		24.86	56.00	46.00	-22.65	-21.14	P	
6	22.3900	38.97		27.21	10.27	49.24		37.48	60.00	50.00	-10.76	-12.52	P	

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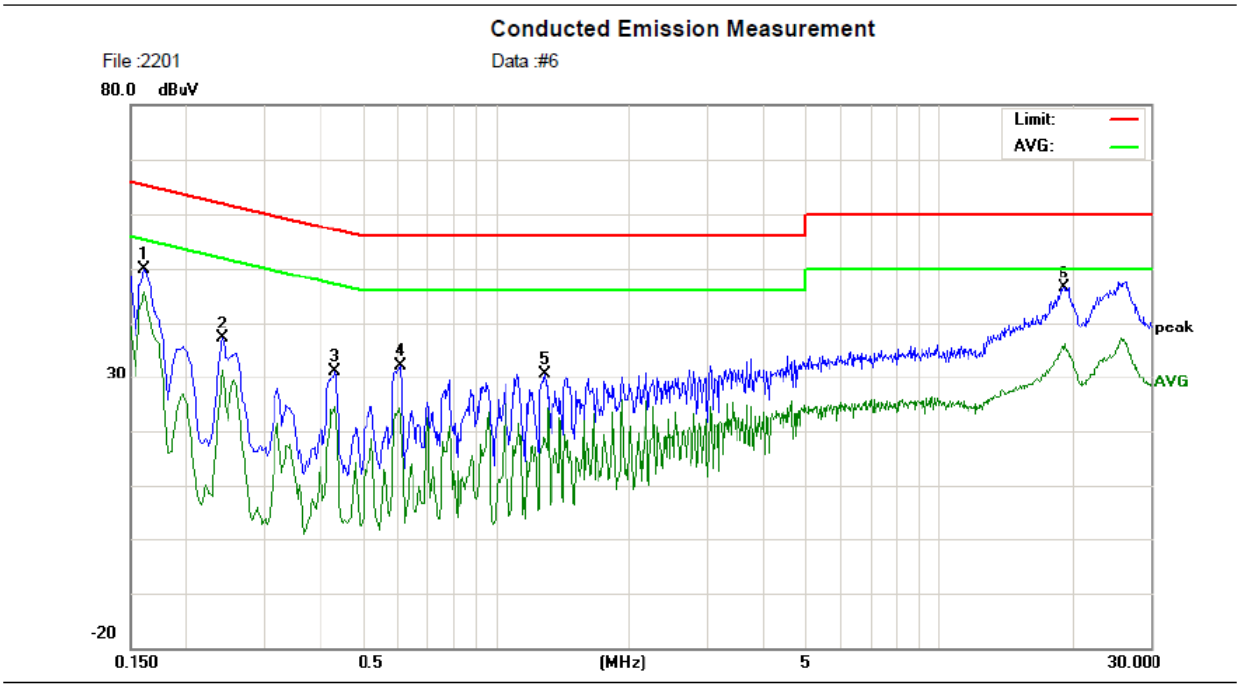
The Test Data Of Conducted Emission

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	Charging and BT working
Test Site:	CHAMBER
Operator:	Owen Li
Comment:	Line:N
	Tem:23℃ Hum:50%



No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1620	39.99		35.83	9.79	49.78		45.62	65.36	55.36	-15.58	-9.74	P	
2	0.2420	27.43		21.49	9.81	37.24		31.30	62.02	52.02	-24.78	-20.72	P	
3	0.4340	21.24		14.77	9.81	31.05		24.58	57.18	47.18	-26.13	-22.60	P	
4	0.6100	22.20		13.09	9.83	32.03		22.92	56.00	46.00	-23.97	-23.08	P	
5	1.2940	20.75		8.64	9.87	30.62		18.51	56.00	46.00	-25.38	-27.49	P	
6	19.1299	36.23		25.04	10.12	46.35		35.16	60.00	50.00	-13.65	-14.84	P	

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5. Power Spectral Density Measurement

5.1 Applicable Standard

According to §15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 EUT Setup

Spectrum Analyzer

5.3 Test Equipment List and Details

See section 2.4.

5.4 Test Procedure

1. The transmitter was connected directly to a Spectrum Analyzer through a directional couple.
2. The power was monitored at the coupler port with a Spectrum Analyzer. The power level was set to the maximum level.
3. Set the RBW = 3 kHz.
4. Set the VBW ≥ 3*RBW.
5. Set the span to 1.5 times the DTS channel bandwidth.
6. Detector = peak.
7. Sweep time = auto couple.
8. Trace mode = max hold.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum power level in any 3 kHz band segment within the fundamental EBW.

5.5 Test Result

Temperature (℃) : 22~23	EUT: Bluetooth Headset
Humidity (%RH): 50~54	M/N:860
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Modulation	Frequency (MHz)	Reading Level (dBm)	Max. Limit (dBm/3KHz)	Result
GFSK	2402	-34.03	8	Pass
	2440	-30.15	8	Pass
	2480	-29.89	8	Pass

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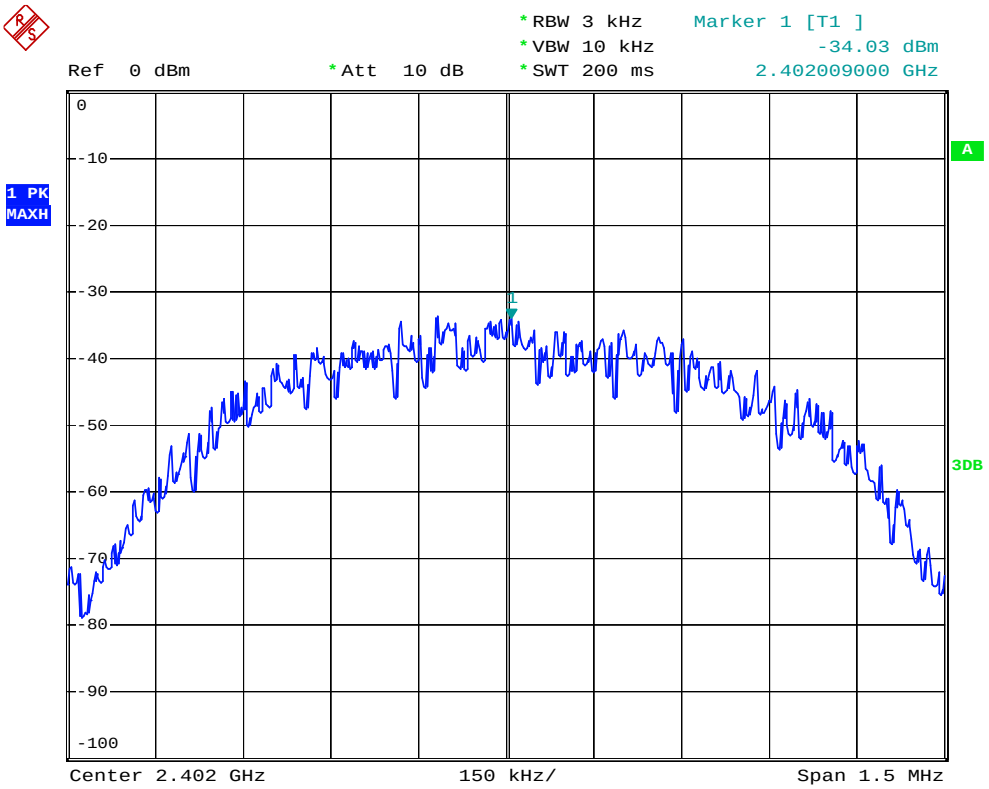
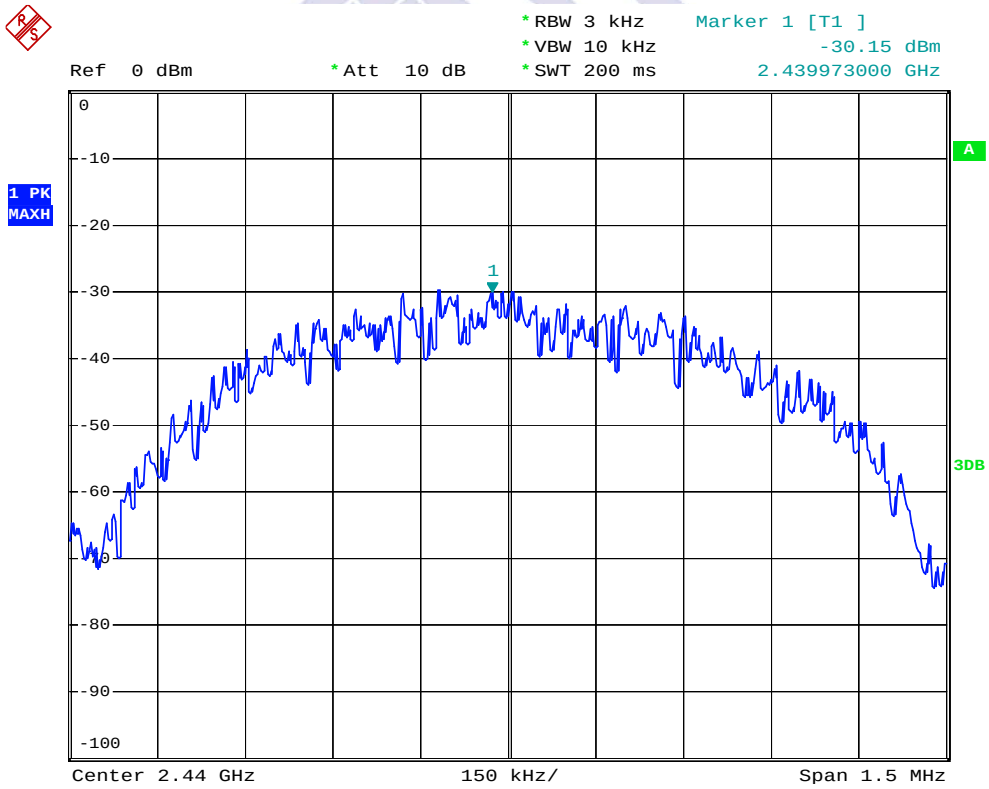
Low Channel, 2402MHz



Middle Channel, 2440MHz



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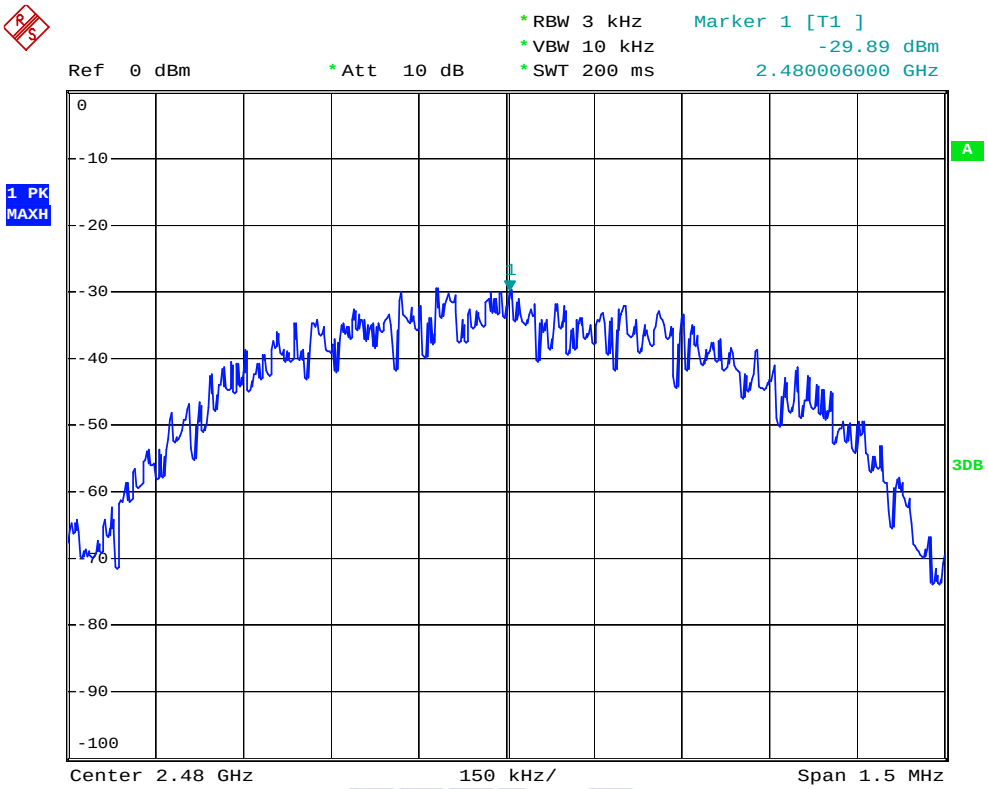
High Channel, 2480MHz



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6. 6dB Spectrum Bandwidth Measurement

6.1 Applicable Standard

According to §15.247(a)(2): For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

6.2 EUT Setup

Spectrum Analyzer

6.3 Test Equipment List and Details

See section 2.4.

6.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.

2. The resolution bandwidth and the video bandwidth were set according to KDB558074.

3. Set Detector to Peak, Trace to Max Hold and Sweep Time is 100ms.

6.5 Test Result

Temperature (℃) : 22~23	EUT: Bluetooth Headset
Humidity (%RH): 50~54	M/N:860
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Modulation Type	Frequency (MHz)	6dB Bandwidth (KHz)	Min. Limit (KHz)	Result
GFSK	2402	636.00	500	Pass
	2440	642.00	500	Pass
	2480	630.00	500	Pass

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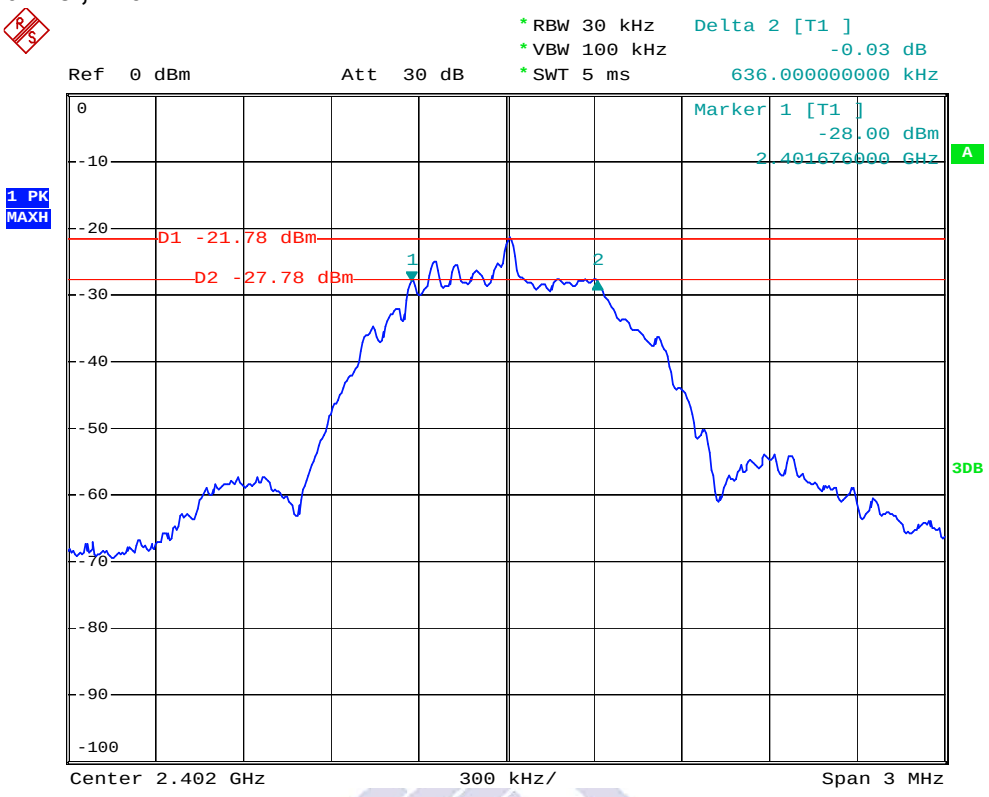
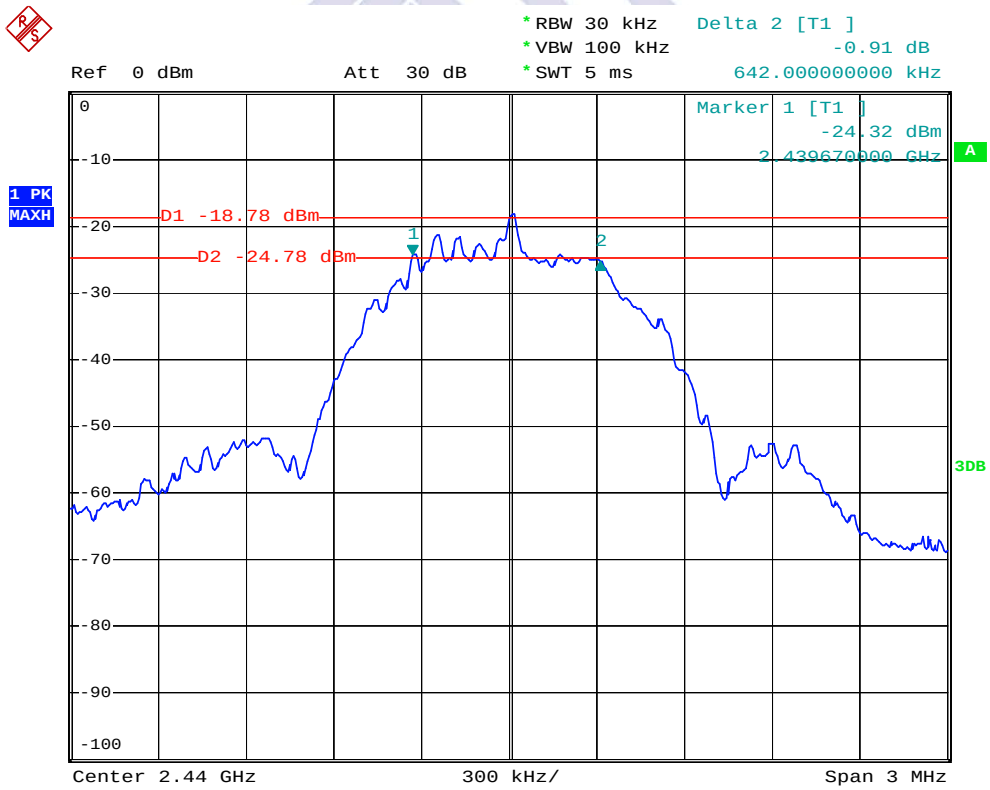
Low Channel, 2402MHz



Middle Channel, 2440MHz



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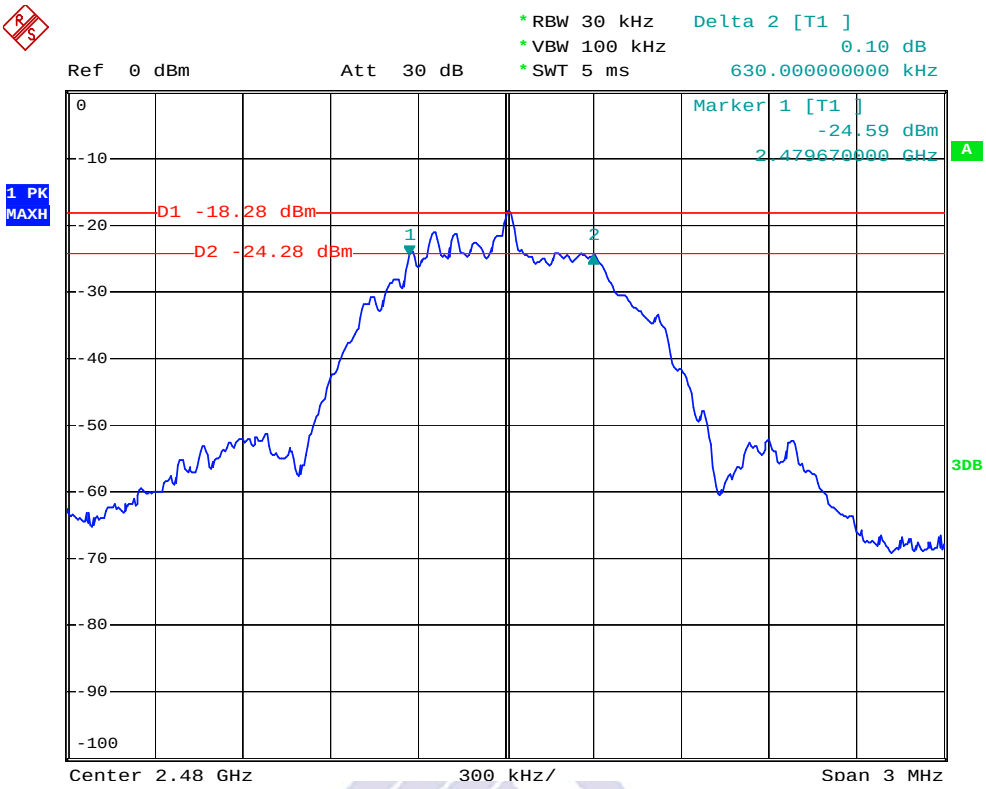
High Channel, 2480MHz



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7. Occupied Bandwidth

7.1 Applicable Standard

According to §15.247(a): Operation under the provisions of this section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

For systems using digital modulation techniques, the EUT may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

7.2 EUT Setup

Spectrum Analyzer

7.3 Test Equipment List and Details

See section 2.4.

7.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal bandwidth measurement function is utilized.

.3. Set Detector to Peak, Trace to Max Hold and Sweep Time is 100ms.

4. Set the Span >RBW.

7.5 Test Result

Temperature (℃) : 22~23	EUT: Bluetooth Headset
Humidity (%RH): 50~54	M/N: 860
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Channel	Frequency	99% OBW (MHz)
1	2402	1.104
20	2440	1.151
40	2480	1.106

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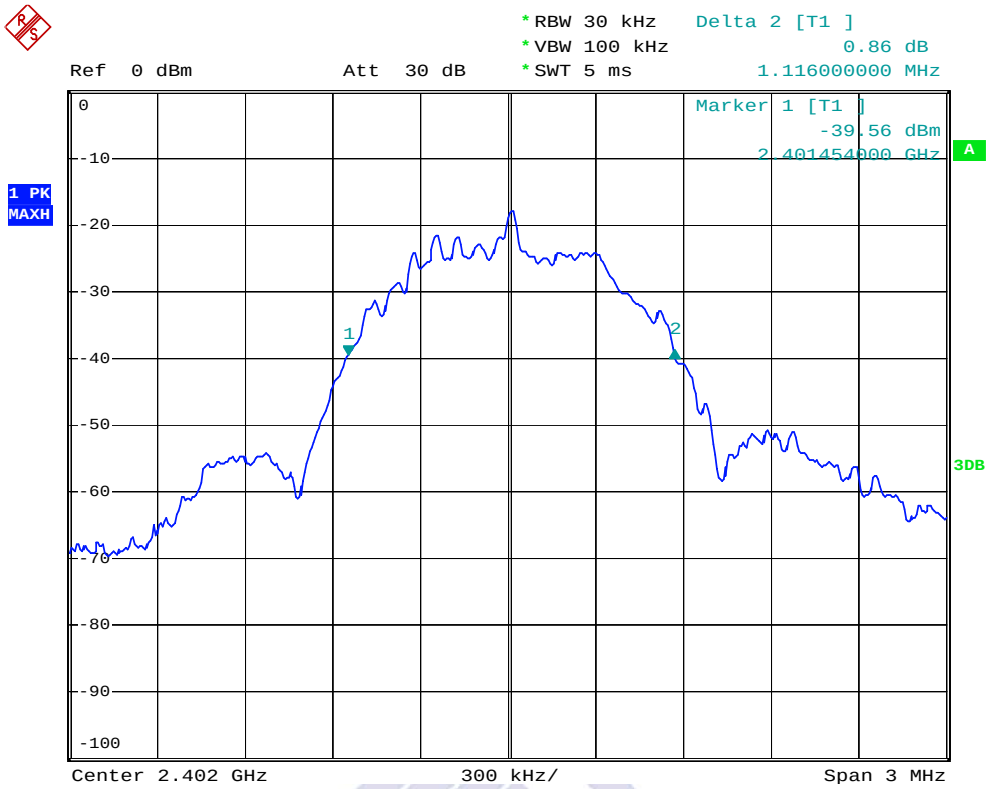
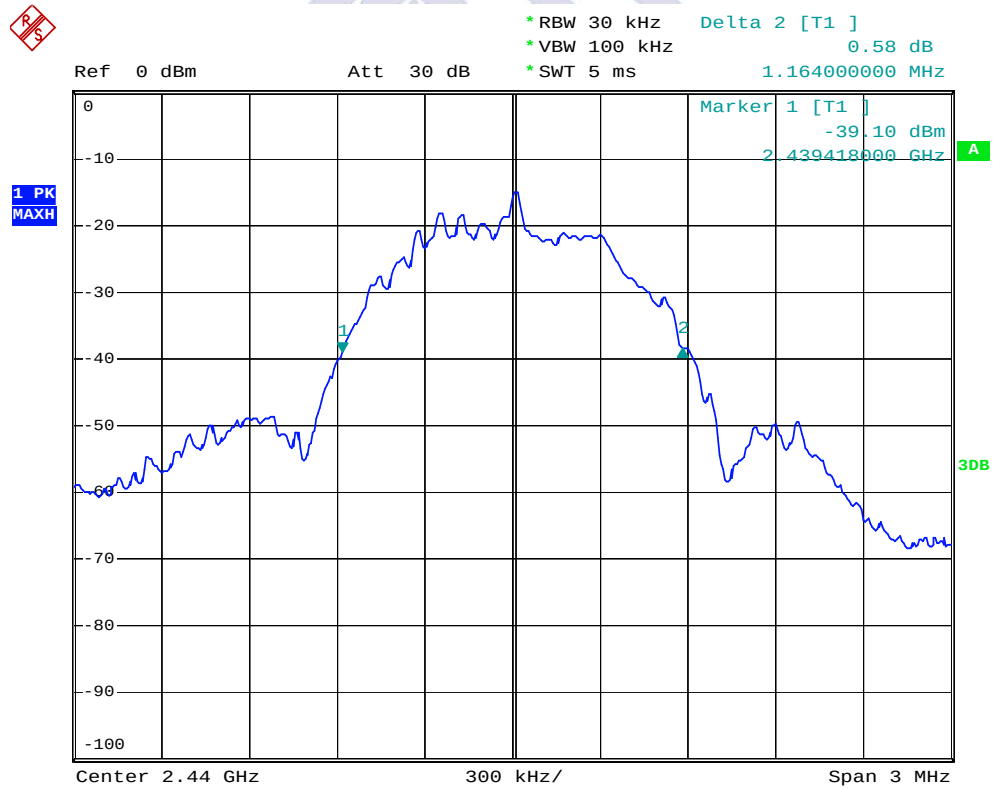
Low Channel:



Middle Channel:



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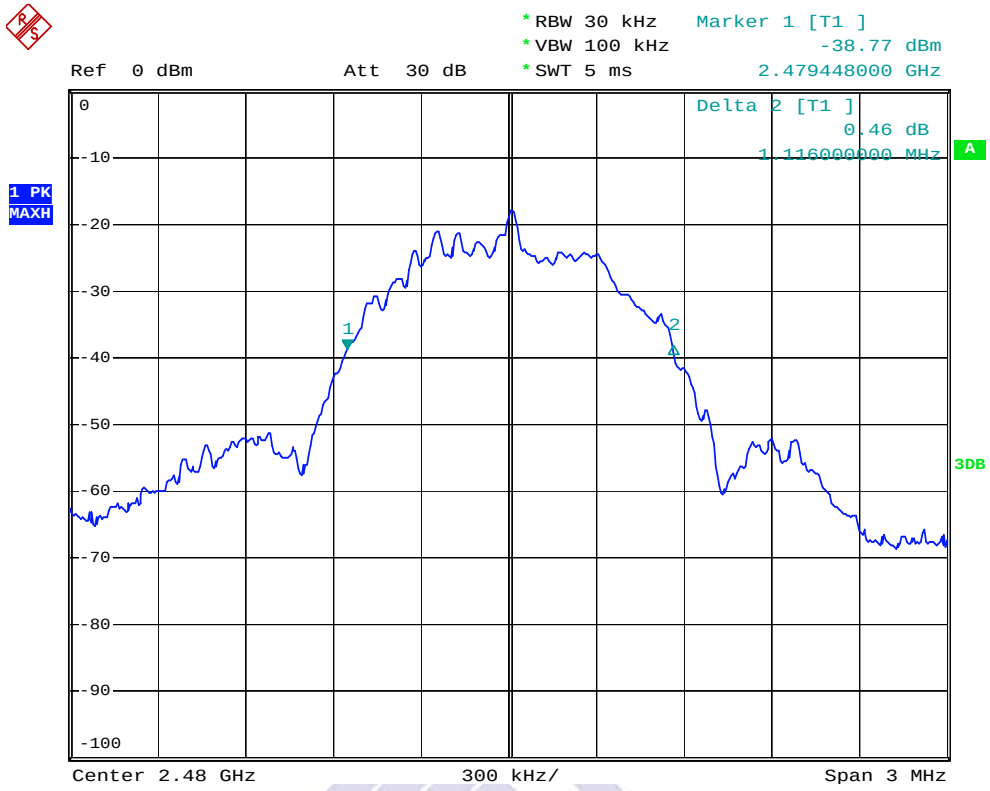
High Channel:



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8. Test of Maximum Peak Output Power

8.1 Applicable Standard

According to §15.247(b): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW.

According to §15.247(b)(3), for systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 Watt.

8.2 EUT Setup

Spectrum Analyzer

8.3 Test Equipment List and Details

See section 2.4.

8.4 Test Equipment List and Details

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 3MHz and VBW to 3MHz.Span to10MHz
3. Set Detector to Peak,

8.5 Test Result

Temperature (℃) : 22~23	EUT: Bluetooth Headset
Humidity (%RH): 50~54	M/N: 860
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode

Frequency (MHz)	Conducted Power (dBm)	Cable Loss (dB)	Antennal Gain (dB)	Output Power EIRP(dBm)	Output Power EIRP(mW)	Limits (mW)	Result
2402	0.12	2.30	-0.6	1.82	1.52	1000	Pass
2441	-0.67	2.33	-0.6	1.06	1.28	1000	Pass
2480	-1.92	2.57	-0.6	0.05	1.01	1000	Pass

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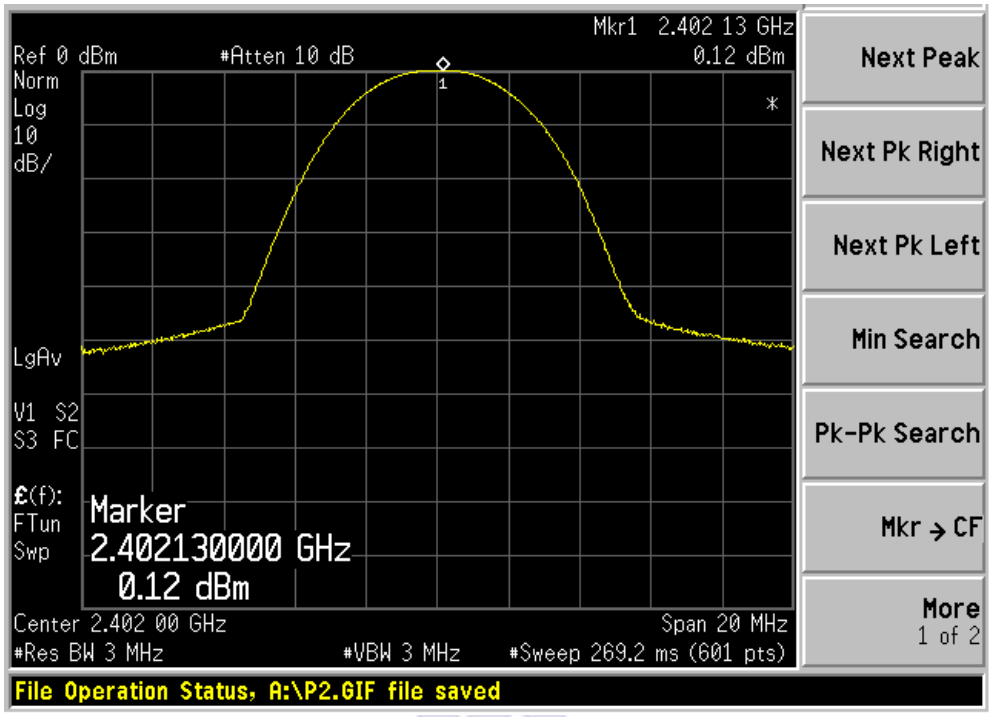
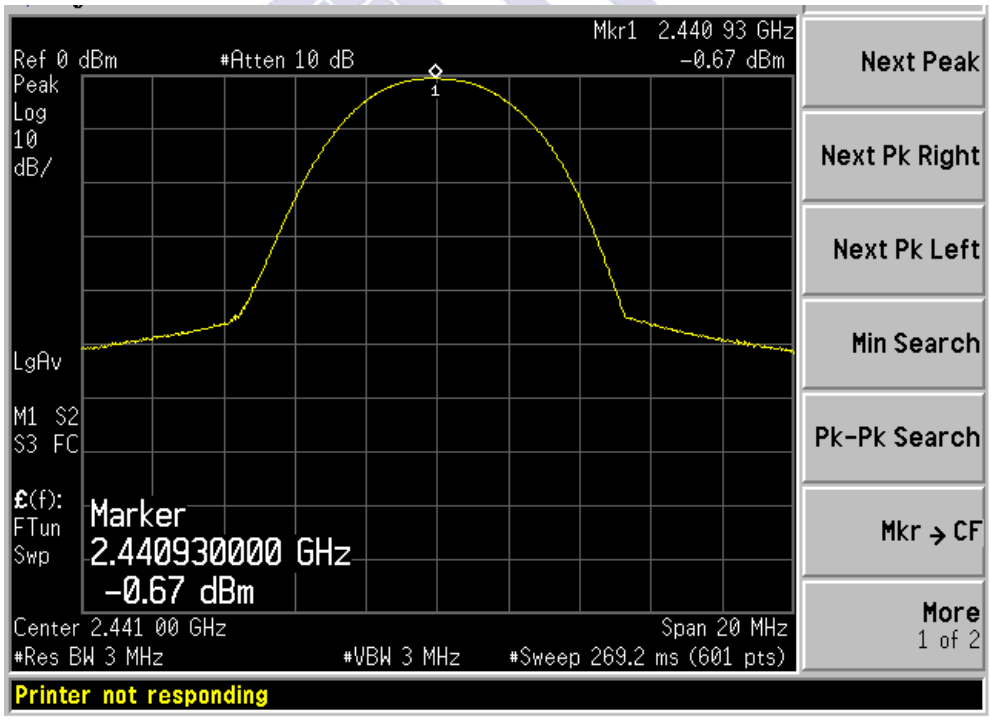
Low Channel(2402MHz)



Middle Channel(2441MHz)



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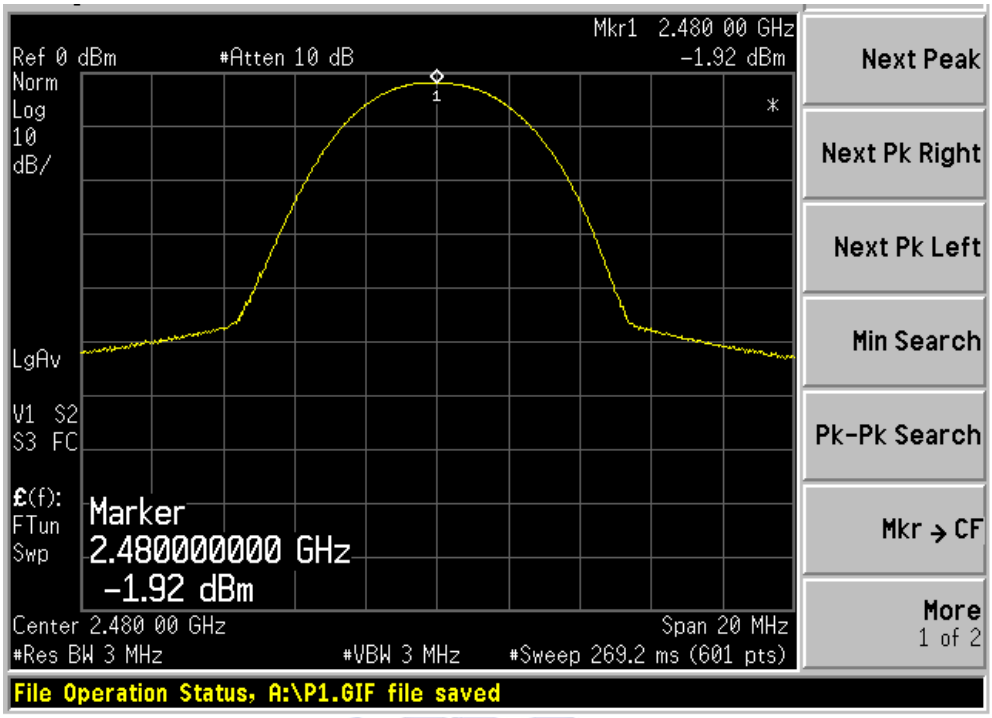
High Channel(2480MHz)



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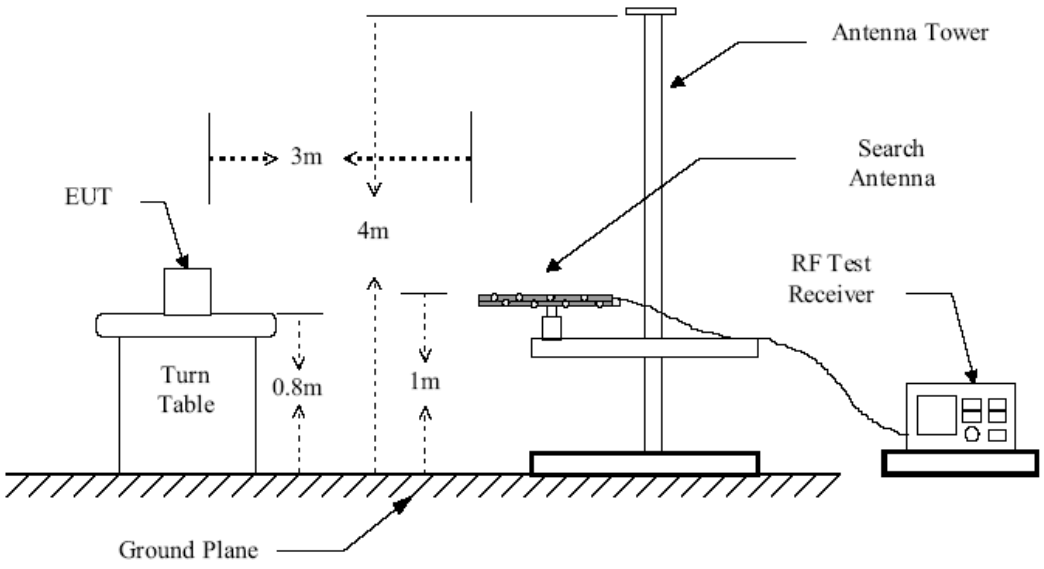
9. Test of Band Edges Emission

9.1 Applicable Standard

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

9.2 EUT Setup

Radiated Measurement Setup



Conducted Measurement Setup

Spectrum Analyzer

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9.3 Test Equipment List and Details

See section 2.4.

9.4 Test Procedure

Conducted Measurement

1. The transmitter is set to the lowest channel.

2. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.

3. Set both RBW and VBW of spectrum analyzer to 100KHz with convenient frequency span including 100MHz bandwidth from lower band edge. Then detector set to peak and max hold this trace.

4. The lowest band edges emission was measured and recorded.

5. The transmitter set to the highest channel and repeated 2~4.

Radiated Measurement

1. Configure the EUT according to ANSI C63.4-2003

2. 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 emission field strength of both horizontal and vertical polarization.

4. For band edge emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.

5. For band edge emission, use 1MHz VBW and 1MHz RBW for reading under AV and use 1MHz VBW and 1MHz RBW for reading under PK.

9.5 Test Result

Temperature (℃) : 22~23	EUT: Bluetooth Headset
Humidity (%RH): 50~54	M/N: 860
Barometric Pressure (mbar): 950~1000	Operation Condition: Tx Mode hopping mode

Radiated Test Result

Frequency(MHz)
<2400
>2483.5

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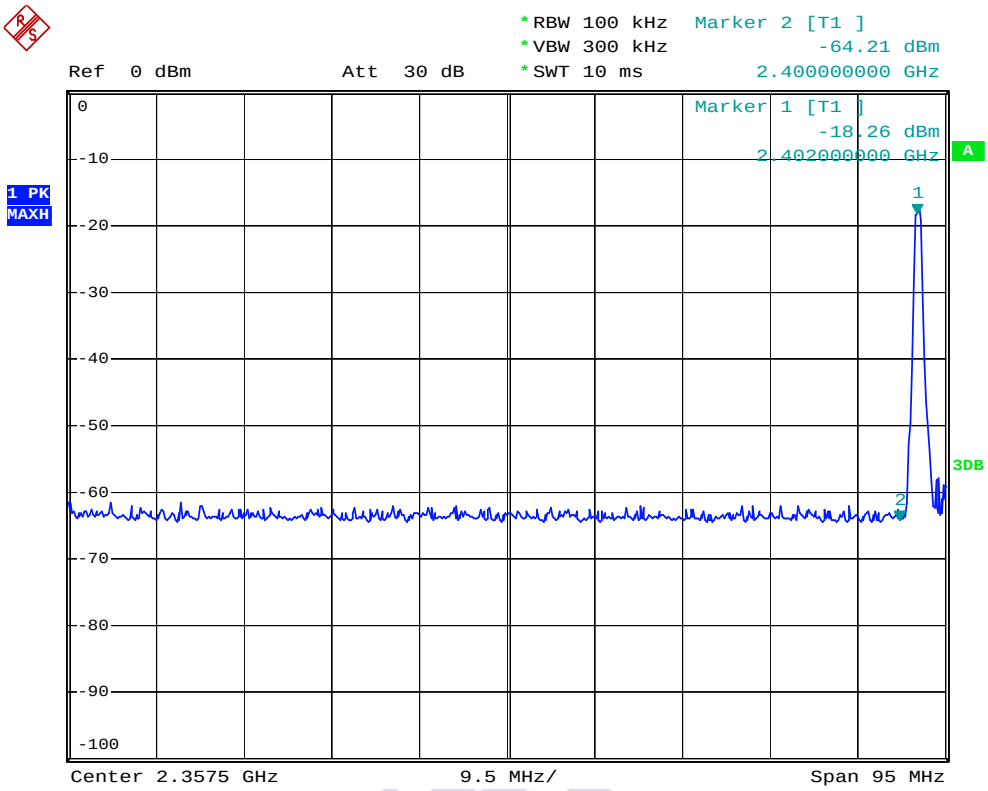

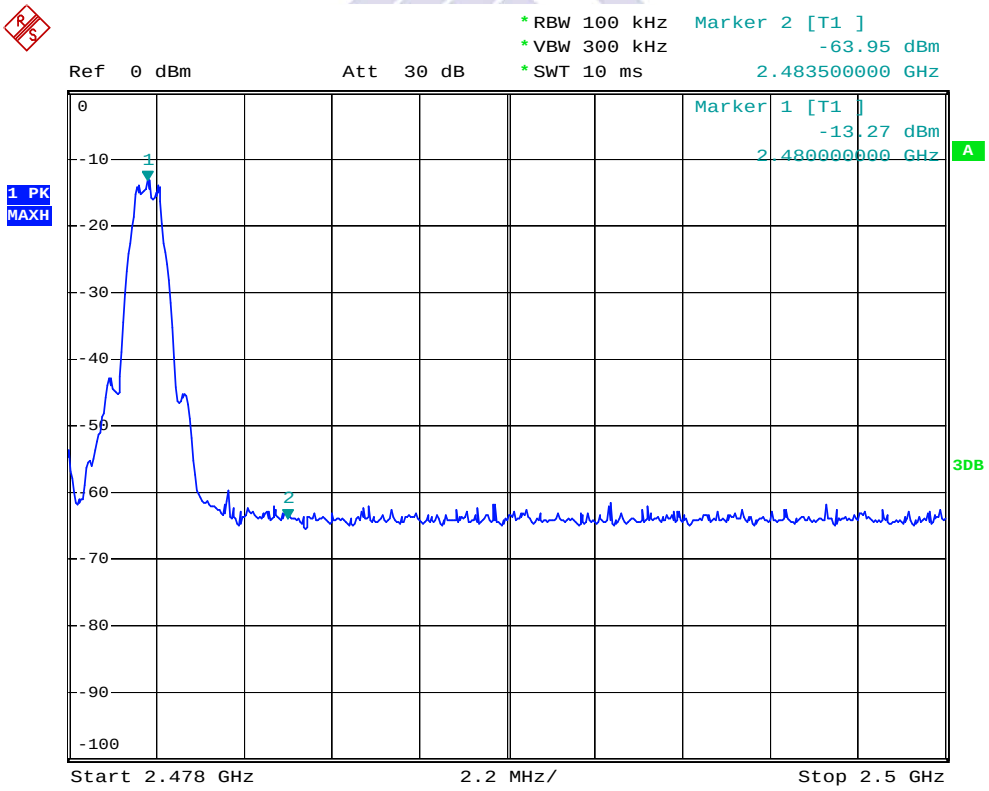

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10. spurious rf conducted emissions Measurement

10.1 Applicable Standard

Section 15.247(d): in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

10.2 Block Diagram Of Test Setup

Spectrum Analyzer

10.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set spectrum analyzer's RBW and VBW to applicable value with Peak in Max Hold.
3. Record the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the Product up through the 10th harmonic.

10.4 Test Result

Temperature (℃) : 22~23	EUT: Bluetooth Headset
Humidity (%RH): 50~54	M/N: 860
Barometric Pressure (mbar): 950~1000	Operation Condition: Normal operation

Please see the following plots.

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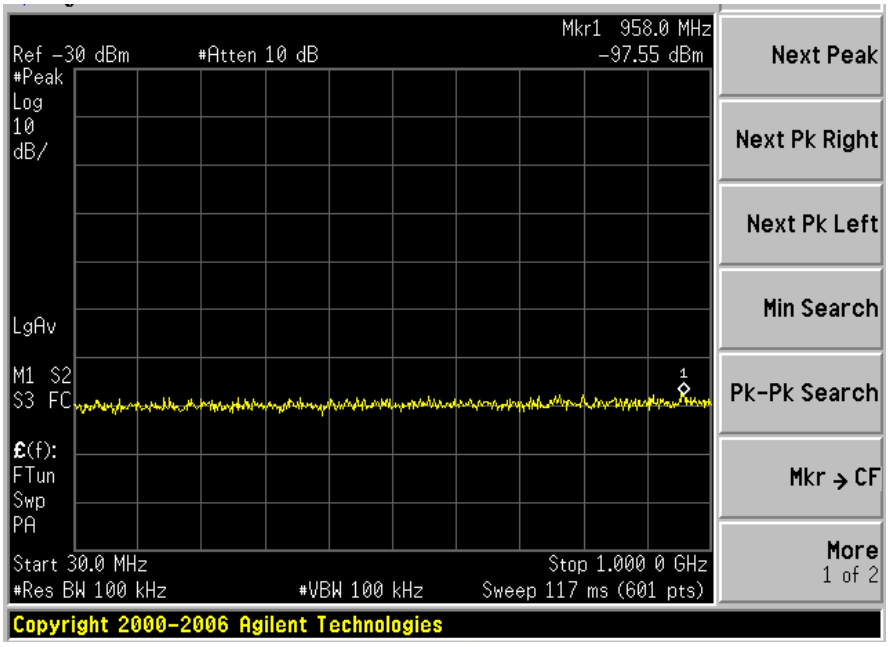
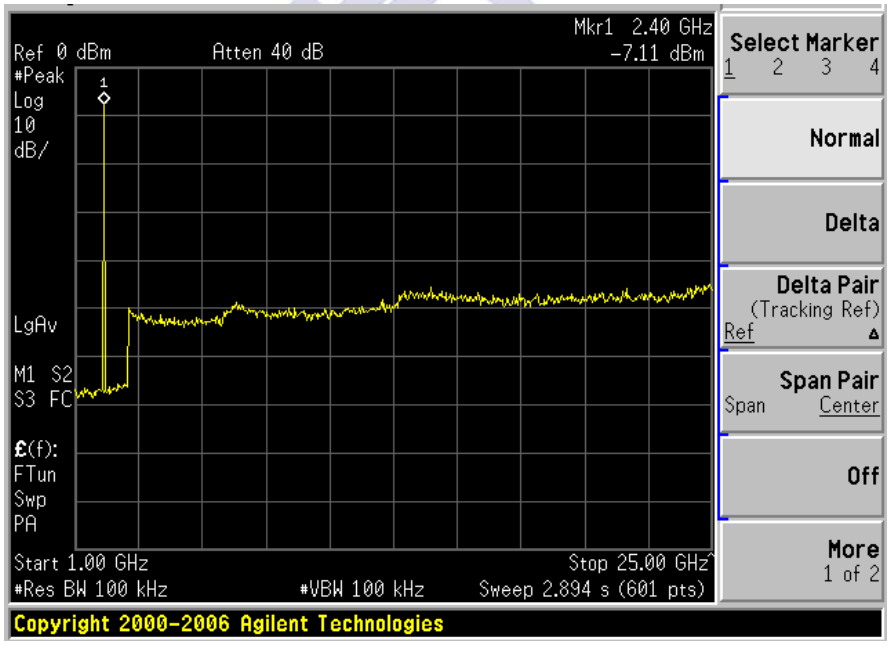
Low Channel(2402MHz)





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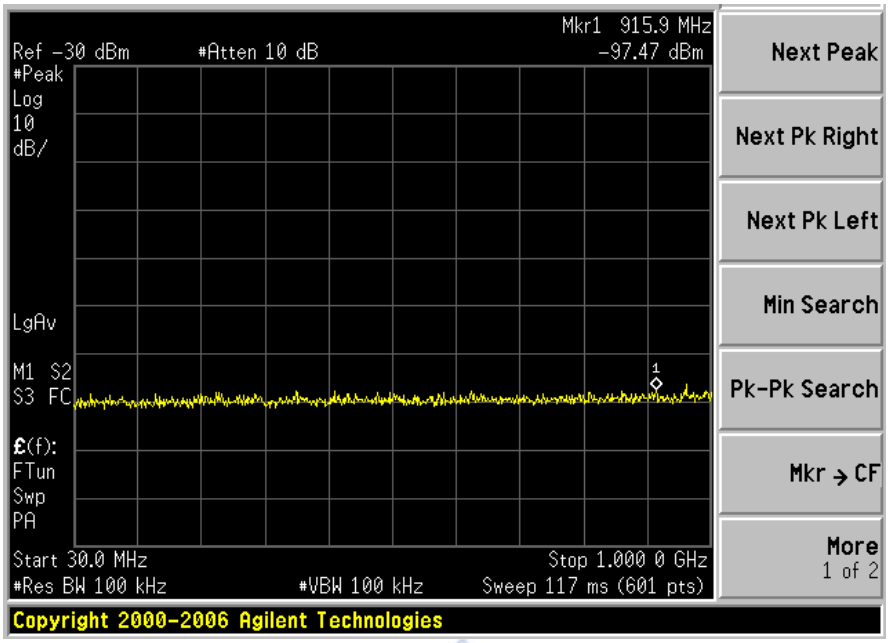
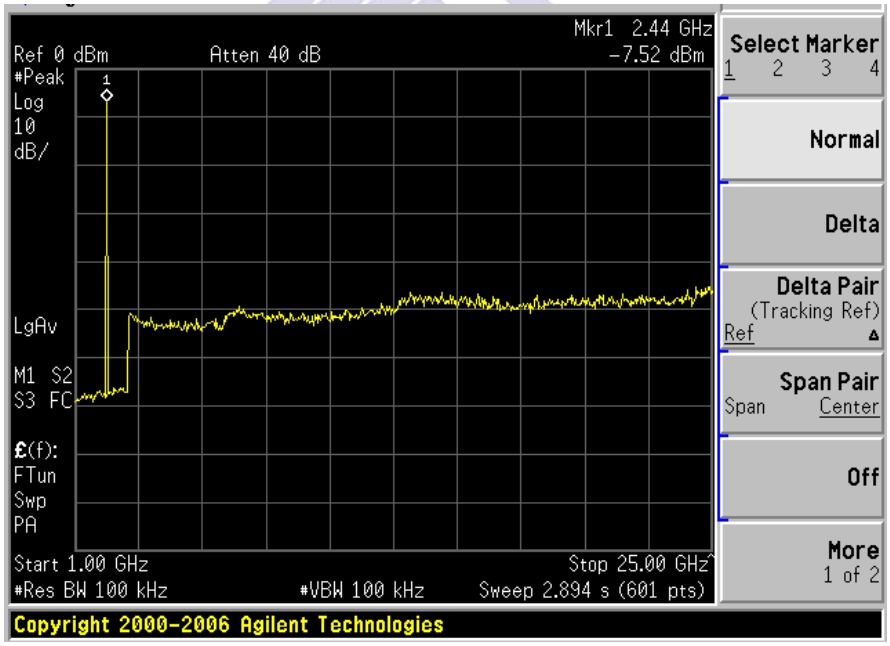
Middle Channel(2441MHz)





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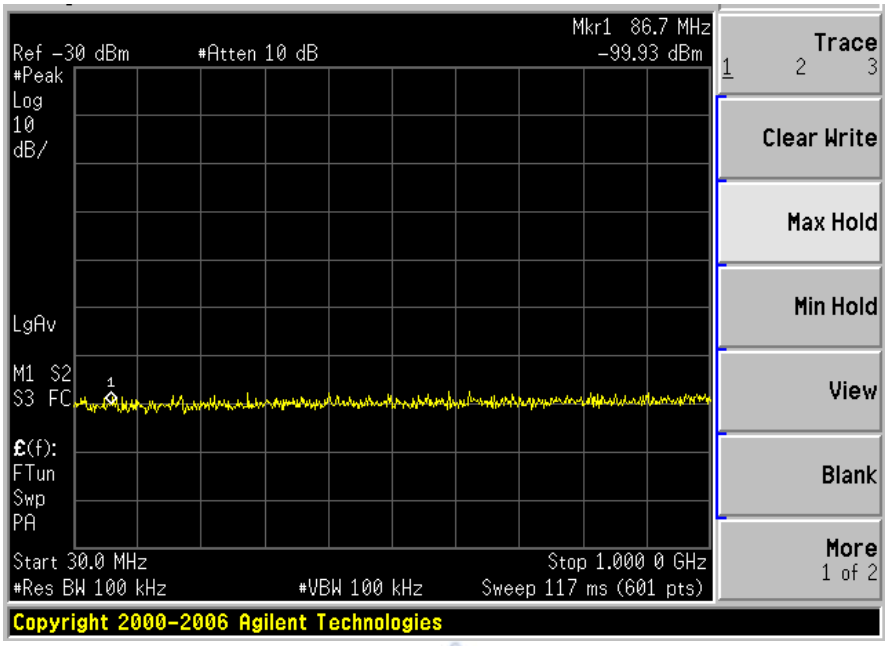
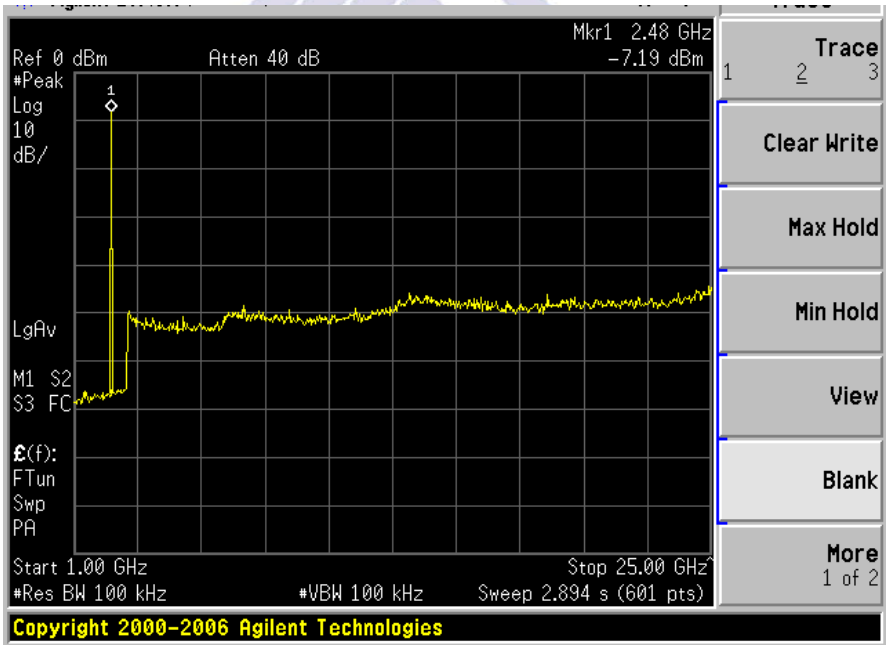
High Channel(2480MHz)





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11. Test of Spurious Radiated Emission

11.1 Applicable Standard

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. In addition, radiated emissions that fall in the restricted bands, as defined in Section 15.205, must also comply with the radiated emission limits specified in Section 15.209.

Limits for Class B digital devices

Frequency (MHz)	limits at 3m dB(μV/m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

NOTE: 1. The lower limit shall apply at the transition frequency.
2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

Limits for Class B digital devices

Frequency (MHz)	limits at 10m dB(μV/m)
30-88	30.0
88-216	33.5
216-960	56.0
Above 960	64.0

NOTE: 1. The lower limit shall apply at the transition frequency.
2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

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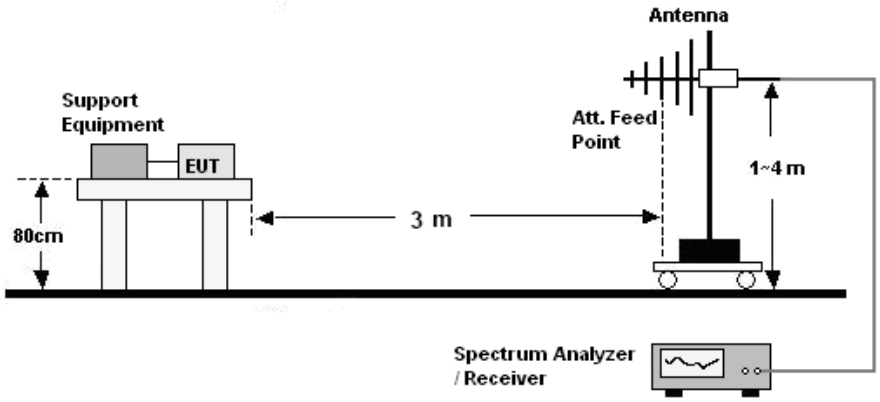
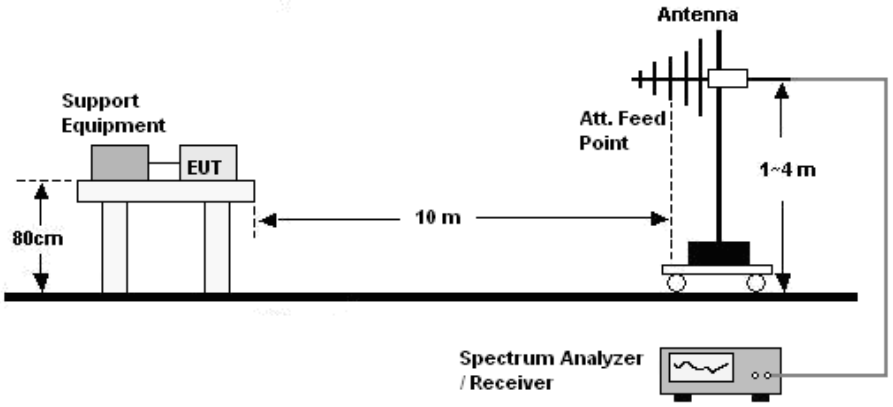
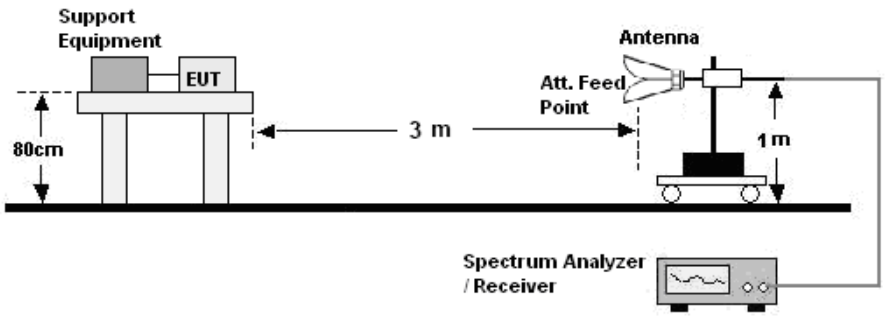
11.2 Radiated Measurement Setup

30MHz ~ 1GHz:





Above 1GHz:



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11.3 Test Equipment List and Details

See section 2.4.

10.4 Radiated Measurement Test Procedure

30MHz ~ 1GHz:

a. The Product was placed on the non-conductive turntable 0.8/0.1 m above the ground at a chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

a. The Product was placed on the non-conductive turntable 0.8/0.1 m above the ground at a chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

11.5 Test Result

Temperature (℃) : 22~23	EUT: Bluetooth Headset
Humidity (%RH): 50~54	M/N: 860
Barometric Pressure (mbar): 950~1000	Operation Condition: Normal operation

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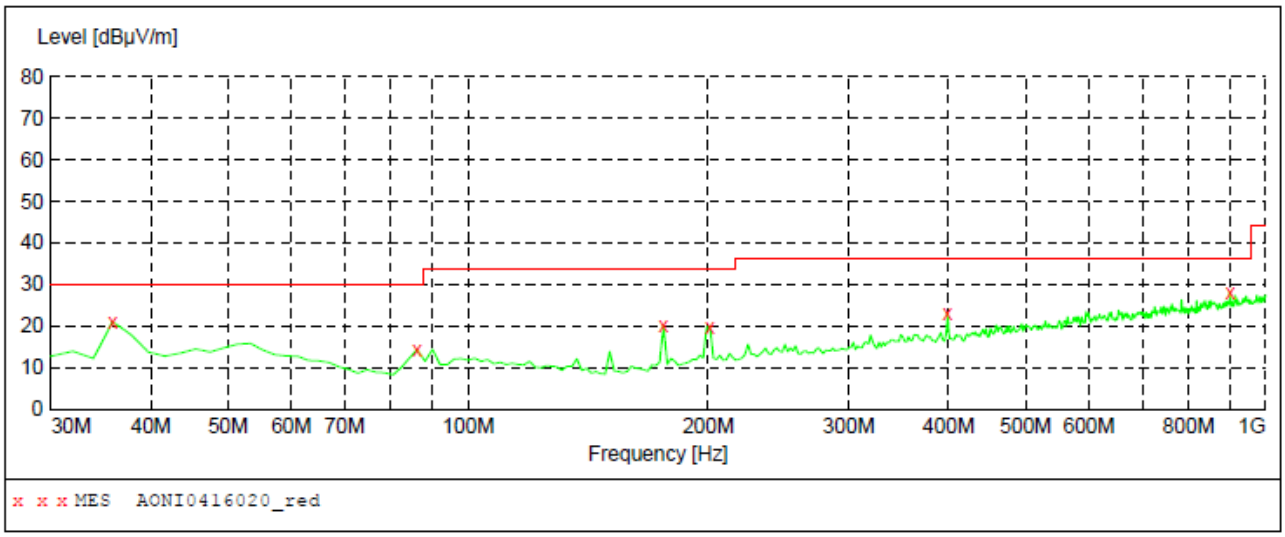
The Spurious Emission (30~1000MHz) Of Horizontal （Charging and BT working）

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	Charging and BT working
Test Site:	10m CHAMBER
Operator:	Owen Li
Test Specification:	USB Port Charging
Comment:	Polarization: Horizontal
	Tem:23℃ Hum:50%

SWEEP TABLE: "test (30M-1G) 8447F"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VBLU9163-401



MEASUREMENT RESULT: "AONI0416020_red"

4/16/2015 4:47PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
35.831663	21.00	-14.0	30.0	9.0	---	100.0	164.00	HORIZONTAL
86.372745	14.30	-15.8	30.0	15.7	---	100.0	363.00	HORIZONTAL
175.791583	20.10	-14.5	33.5	13.4	---	100.0	194.00	HORIZONTAL
201.062124	19.90	-12.3	33.5	13.6	---	100.0	10.00	HORIZONTAL
399.338677	23.00	-7.3	36.0	13.0	---	100.0	286.00	HORIZONTAL
902.805611	28.20	-0.4	36.0	7.8	---	100.0	347.00	HORIZONTAL

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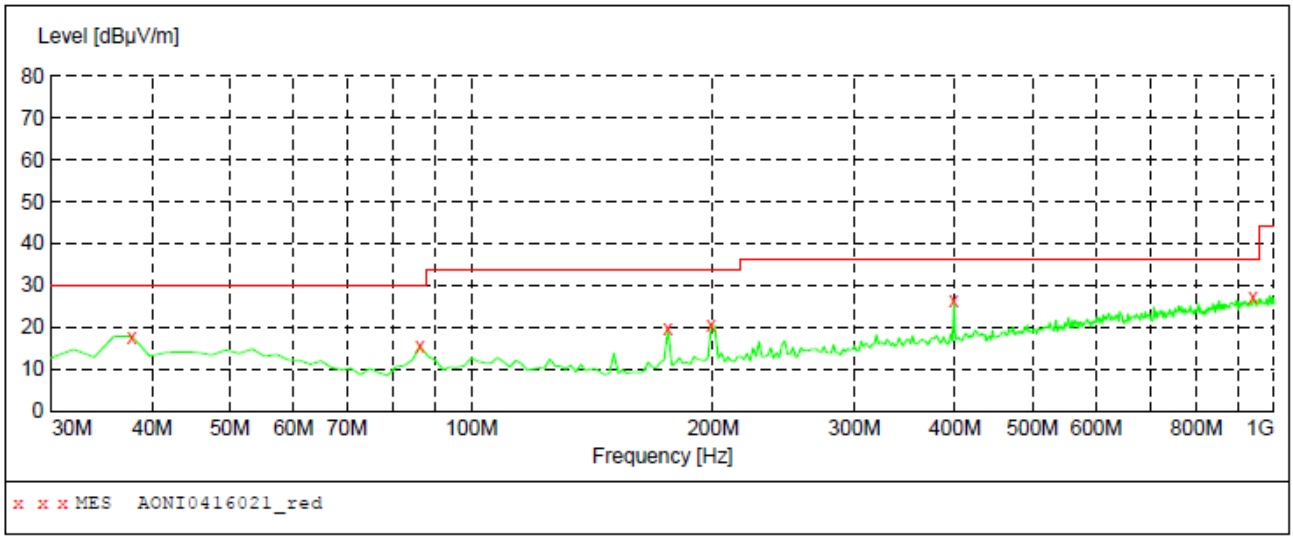
The Spurious Emission (30~1000MHz) Of Vertical （Charging and BT working）

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	Charging and BT working
Test Site:	10m CHAMBER
Operator:	Owen Li
Test Specification:	USB Port Charging
Comment:	Polarization: Vertical
	Tem:23℃ Hum:50%

SWEEP TABLE: "test (30M-1G) 8447F"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VBLU9163-401



MEASUREMENT RESULT: "AONI0416021_red"

4/16/2015 4:49PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
37.775551	17.80	-13.1	30.0	12.2	---	100.0	370.00	VERTICAL
86.372745	15.40	-15.8	30.0	14.6	---	100.0	347.00	VERTICAL
175.791583	19.60	-14.5	33.5	13.9	---	100.0	10.00	VERTICAL
199.118236	20.70	-12.4	33.5	12.8	---	100.0	74.00	VERTICAL
399.338677	26.20	-7.3	36.0	9.8	---	100.0	74.00	VERTICAL
941.683367	27.10	0.4	36.0	8.9	---	100.0	165.00	VERTICAL

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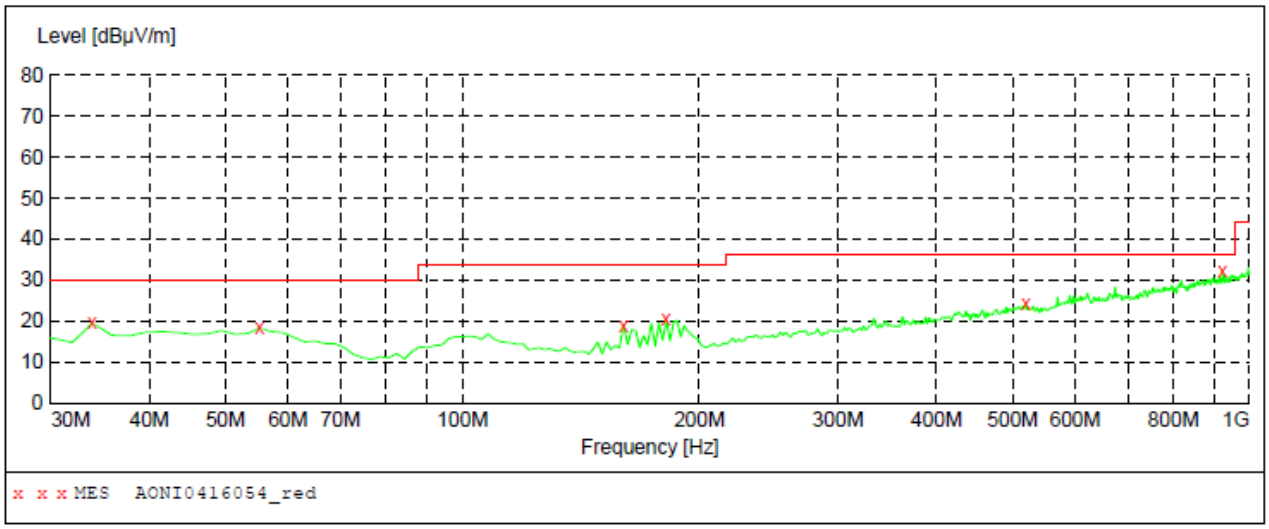
The Spurious Emission (30~1000MHz) Of Horizontal （BT TX Model L）

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	BT TX Channel Low
Test Site:	10m CHAMBER
Operator:	Owen Li
Test Specification:	DC 3.7V
Comment:	Polarization: Horizontal
	Tem:23℃ Hum:50%

SWEEP TABLE: "test (30M-1G) 8447F"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VBLU9163-484



MEASUREMENT RESULT: "AONI0416054_red"

4/16/2015 5:16PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
33.887776	19.50	-12.8	30.0	10.5	---	100.0	363.00	HORIZONTAL
55.270541	18.30	-10.9	30.0	11.7	---	100.0	43.00	HORIZONTAL
160.240481	19.00	-15.4	33.5	14.5	---	400.0	39.00	HORIZONTAL
181.623246	20.40	-13.9	33.5	13.1	---	400.0	221.00	HORIZONTAL
519.859719	24.20	-5.5	36.0	11.8	---	400.0	39.00	HORIZONTAL
924.188377	32.30	0.3	36.0	3.7	---	100.0	225.00	HORIZONTAL

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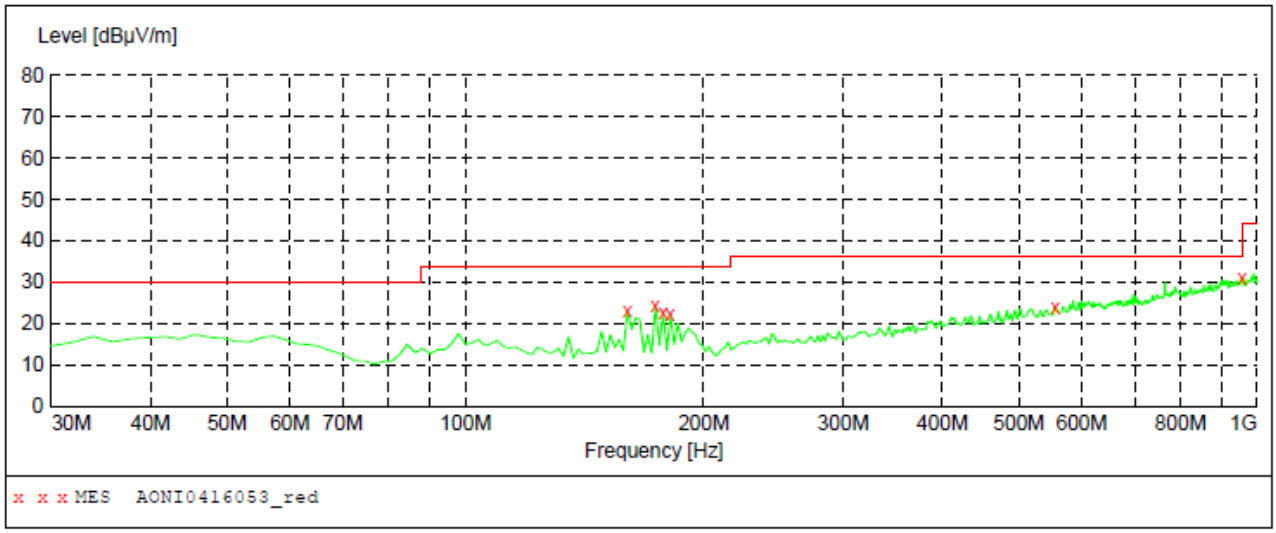
The Spurious Emission (30~1000MHz) Of Vertical （BT TX Model L）

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	BT TX Channel Low
Test Site:	10m CHAMBER
Operator:	Owen Li
Test Specification:	DC 3.7V
Comment:	Polarization: Vertical
	Tem:23℃ Hum:50%

SWEEP TABLE: "test (30M-1G) 8447F"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VBLU9163-484



MEASUREMENT RESULT: "AONI0416053_red"

4/16/2015 5:10PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
160.240481	22.90	-15.4	33.5	10.6	---	100.0	364.00	VERTICAL
173.847695	24.20	-14.6	33.5	9.3	---	100.0	349.00	VERTICAL
177.735471	22.70	-14.3	33.5	10.8	---	100.0	349.00	VERTICAL
181.623246	22.10	-13.9	33.5	11.4	---	100.0	44.00	VERTICAL
556.793587	24.00	-5.3	36.0	12.0	---	100.0	258.00	VERTICAL
957.234469	30.80	0.3	36.0	5.2	---	100.0	364.00	VERTICAL

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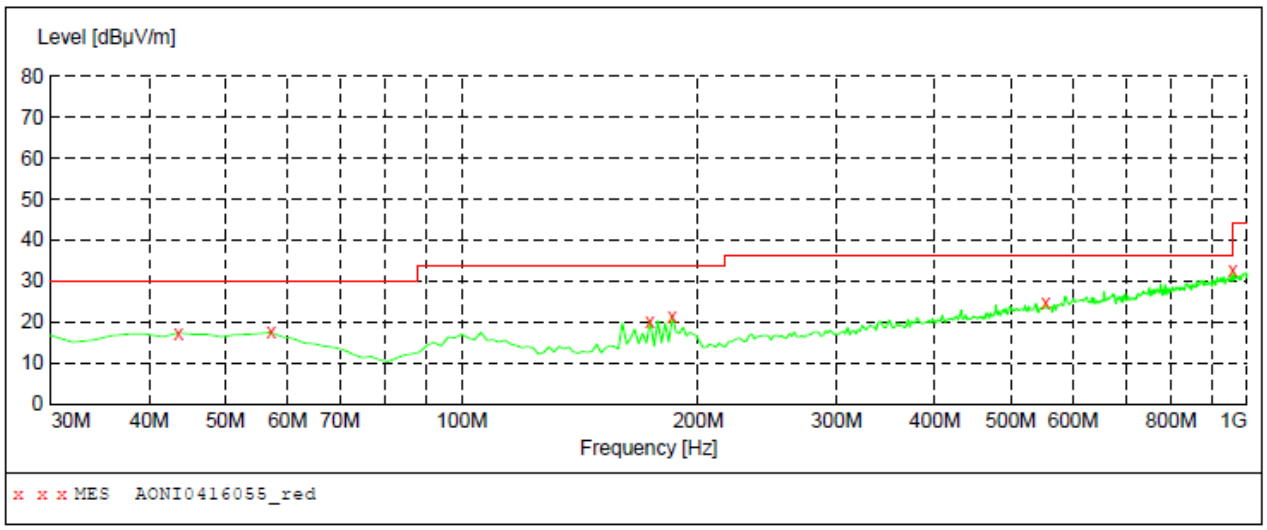
The Spurious Emission (30~1000MHz) Of Horizontal （BT TX Model M）

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	BT TX Channel Middle
Test Site:	10m CHAMBER
Operator:	Owen Li
Test Specification:	DC 3.7V
Comment:	Polarization: Horizontal
	Tem:23℃ Hum:50%

SWEEP TABLE: "test (30M-1G) 8447F"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VBLU9163-484



MEASUREMENT RESULT: "AONI0416055_red"

4/16/2015 5:23PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
43.607214	17.30	-11.2	30.0	12.7	---	100.0	164.00	HORIZONTAL
57.214429	17.40	-10.9	30.0	12.6	---	300.0	189.00	HORIZONTAL
173.847695	20.30	-14.6	33.5	13.2	---	400.0	222.00	HORIZONTAL
185.511022	21.30	-13.3	33.5	12.2	---	400.0	191.00	HORIZONTAL
554.849699	24.60	-5.3	36.0	11.4	---	400.0	70.00	HORIZONTAL
959.178357	32.60	0.3	36.0	3.4	---	200.0	74.00	HORIZONTAL

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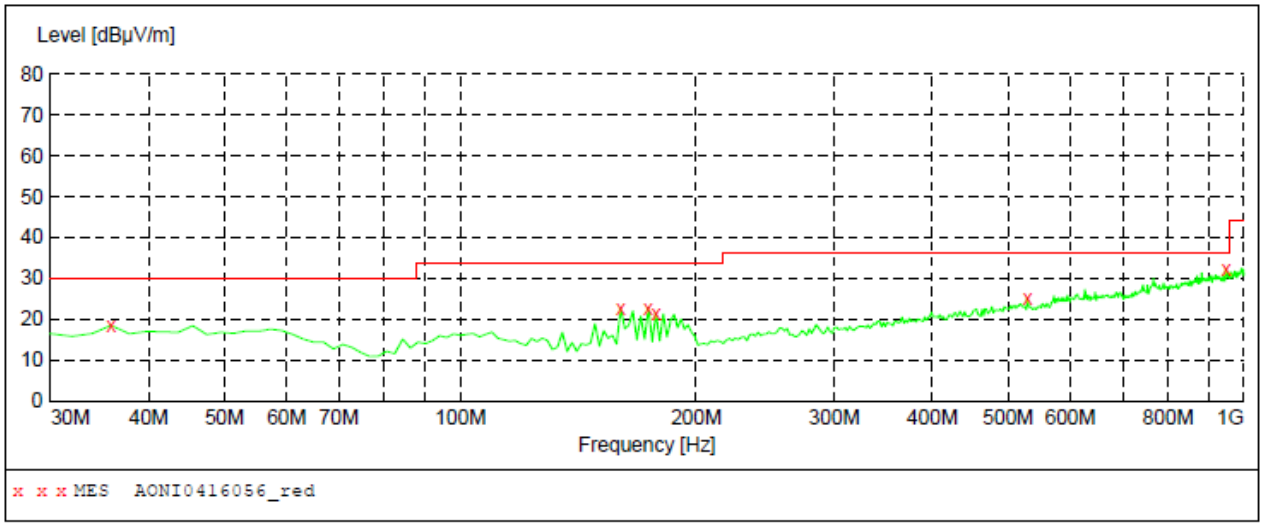
The Spurious Emission (30~1000MHz) Of Vertical （BT TX Model M）

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	BT TX Channel Middle
Test Site:	10m CHAMBER
Operator:	Owen Li
Test Specification:	DC 3.7V
Comment:	Polarization: Vertical
	Tem:23℃ Hum:50%

SWEEP TABLE: "test (30M-1G) 8447F"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VBLU9163-484



MEASUREMENT RESULT: "AONI0416056_red"

4/16/2015 5:29PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
35.831663	18.50	-12.2	30.0	11.5	---	200.0	20.00	VERTICAL
160.240481	22.60	-15.4	33.5	10.9	---	100.0	318.00	VERTICAL
173.847695	22.80	-14.6	33.5	10.7	---	100.0	363.00	VERTICAL
177.735471	21.50	-14.3	33.5	12.0	---	100.0	348.00	VERTICAL
529.579158	25.10	-5.5	36.0	10.9	---	400.0	344.00	VERTICAL
949.458918	32.40	0.2	36.0	3.6	---	100.0	165.00	VERTICAL

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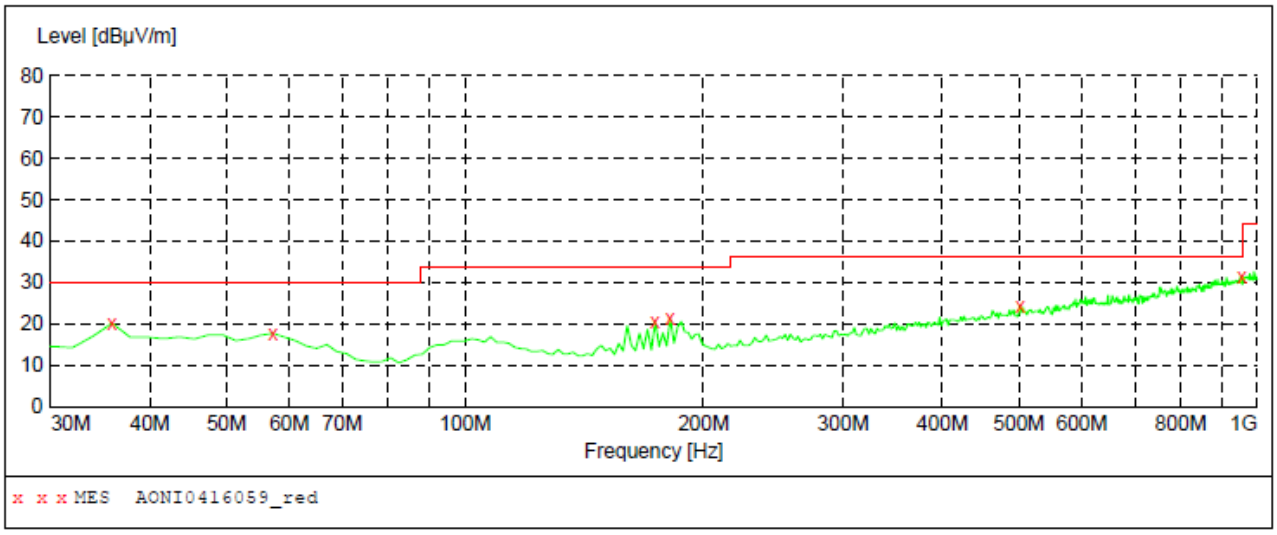
The Spurious Emission (30~1000MHz) Of Horizontal （BT TX Model H）

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	BT TX Channel High
Test Site:	10m CHAMBER
Operator:	Owen Li
Test Specification:	DC 3.7V
Comment:	Polarization: Horizontal
	Tem:23℃ Hum:50%

SWEEP TABLE: "test (30M-1G) 8447F"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VBLU9163-484



MEASUREMENT RESULT: "AONI0416059_red"

4/16/2015 5:49PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
35.831663	20.10	-12.2	30.0	9.9	---	200.0	20.00	HORIZONTAL
57.214429	17.70	-10.9	30.0	12.3	---	100.0	370.00	HORIZONTAL
173.847695	20.60	-14.6	33.5	12.9	---	400.0	228.00	HORIZONTAL
181.623246	21.30	-13.9	33.5	12.2	---	400.0	258.00	HORIZONTAL
502.364729	24.50	-5.9	36.0	11.5	---	400.0	167.00	HORIZONTAL
955.290581	31.40	0.3	36.0	4.6	---	400.0	167.00	HORIZONTAL

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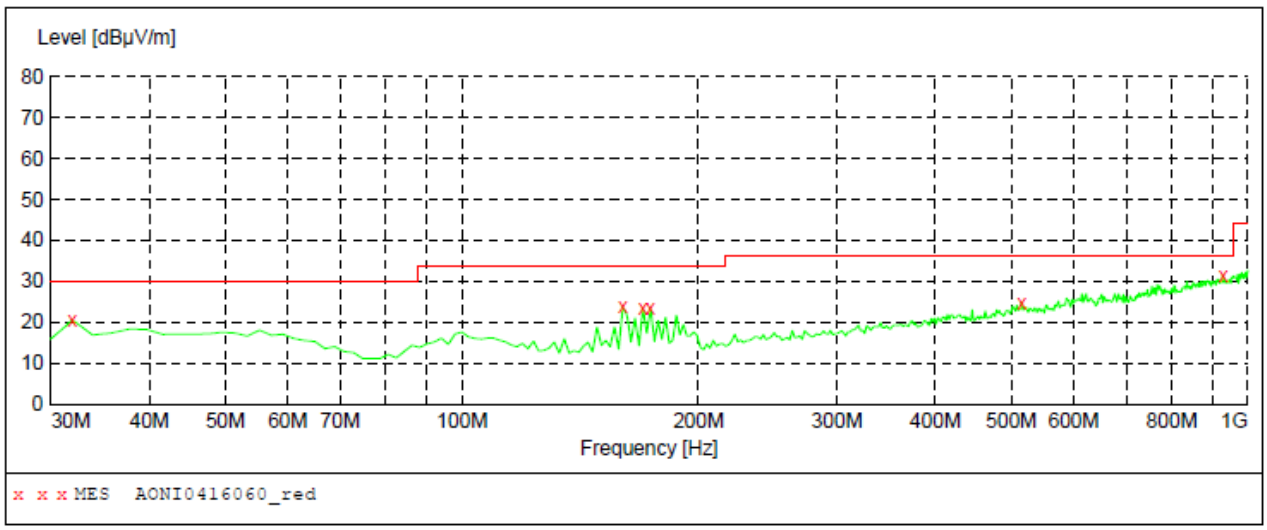
The Spurious Emission (30~1000MHz) Of Vertical （BT TX Model H）

EUT:	Bluetooth Headset
M/N:	860
Operating Condition:	BT TX Channel High
Test Site:	10m CHAMBER
Operator:	Owen Li
Test Specification:	DC 3.7V
Comment:	Polarization: Vertical
	Tem:23℃ Hum:50%

SWEEP TABLE: "test (30M-1G) 8447F"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	VBLU9163-484



MEASUREMENT RESULT: "AONI0416060_red"

4/16/2015 5:55PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.943888	20.50	-13.4	30.0	9.5	---	100.0	363.00	VERTICAL
160.240481	23.70	-15.4	33.5	9.8	---	100.0	363.00	VERTICAL
169.959920	23.50	-14.8	33.5	10.0	---	100.0	10.00	VERTICAL
173.847695	23.50	-14.6	33.5	10.0	---	100.0	10.00	VERTICAL
515.971944	24.90	-5.6	36.0	11.1	---	200.0	196.00	VERTICAL
930.020040	31.40	0.2	36.0	4.6	---	200.0	74.00	VERTICAL

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The Spurious Emission (Above 1GHz)

Test Results-(Measurement Distance: 3m)_Channel low							
Frequency (MHz)	Measurement value		Correction Factor (dB)	Limit		Antenna	Result
	PK (dBμV/m)	AV (dBμV/m)	(dB)	PK (dBμV/m)	AV (dBμV/m)	(H/V)	(P/F)
2402.000*	98.64	97.21	1.5	---	---	H	P
4804.000	44.35	43.74	3.7	74	54	H	P
7206.000	32.61	31.42	6.3	74	54	H	P
2402.000*	97.53	96.44	1.3	---	---	V	P
4804.000	42.31	41.89	3.4	74	54	V	P
7206.000	30.67	29.74	6.1	74	54	V	P

*: fundamental frequency

Remark:
1. According to the emissions below 18GHz, the data curve is lower than the limit, and the data between 18GHz to 25GHz will be lower than the limit, so they are not recorded in the report. All outside of operating frequency band and restricted band specified are below 15.209.
2. Calculation of result is:
   Measurement value(dBμV/m) = Reading Value(dBμV/m) + Correction Factor (dB)
3. The Measurement value must be less than limit,the result is Pass.

Test Results-(Measurement Distance: 3m)_Channel middle							
Frequency (MHz)	Measurement value		Correction Factor (dB)	Limit		Antenna	Result
	PK (dBμV/m)	AV (dBμV/m)	(dB)	PK (dBμV/m)	AV (dBμV/m)	(H/V)	(P/F)
2440.000*	99.04	98.72	1.8	---	---	H	P
4880.000	45.31	44.86	4.1	74	54	H	P
7320.000	33.62	33.05	6.8	74	54	H	P
2440.000*	97.23	96.45	1.7	---	---	V	P
4880.000	43.61	42.53	3.8	74	54	V	P
7320.000	31.78	30.67	6.5	74	54	V	P

*: fundamental frequency

Remark:
1. According to the emissions below 18GHz, the data curve is lower than the limit, and the data between 18GHz to 25GHz will be lower than the limit, so they are not recorded in the report. All outside of operating frequency band and restricted band specified are below 15.209.
2. Calculation of result is:
   Measurement value(dBμV/m) = Reading Value(dBμV/m) + Correction Factor (dB)
3. The Measurement value must be less than limit,the result is Pass.

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Test Results-(Measurement Distance: 3m)_Channel High							
Frequency (MHz)	Measurement value		Correction Factor (dB)	Limit		Antenna	Result
	PK (dBμV/m)	AV (dBμV/m)	(dB)	PK (dBμV/m)	AV (dBμV/m)	(H/V)	(P/F)
2480.000*	98.41	97.24	2.2	---	---	H	P
4960.000	44.63	43.72	4.4	74	54	H	P
7440.000	33.54	32.87	7.3	74	54	H	P
2480.000*	97.23	96.54	2.1	---	---	V	P
4960.000	42.19	41.68	4.0	74	54	V	P
7440.000	30.45	29.67	7.2	74	54	V	P

*: fundamental frequency

Remark:

1. According to the emissions below 18GHz, the data curve is lower than the limit, and the data between 18GHz to 25GHz will be lower than the limit, so they are not recorded in the report. All outside of operating frequency band and restricted band specified are below 15.209.
2. Calculation of result is:
   Measurement value(dBμV/m) = Reading Value(dBμV/m) + Correction Factor (dB)
3. The Measurement value must be less than limit,the result is Pass.

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12. ANTENNA REQUIREMENT

12.1 Standard Applicable

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Section 15.247(b)/(c):

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

12.2 Antenna Connected Construction

The antenna used in this product is complied with Standdard. The maximum Gain of the antenna lower than 6.0dBi and the antenna is integrated,fixed on PCB.

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APPENDIX A - External Photographs

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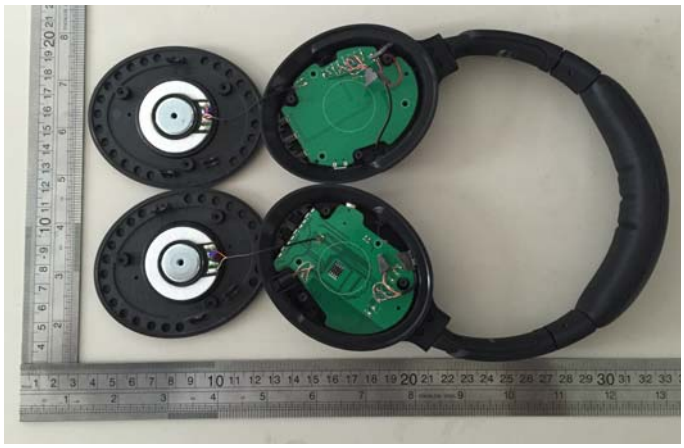
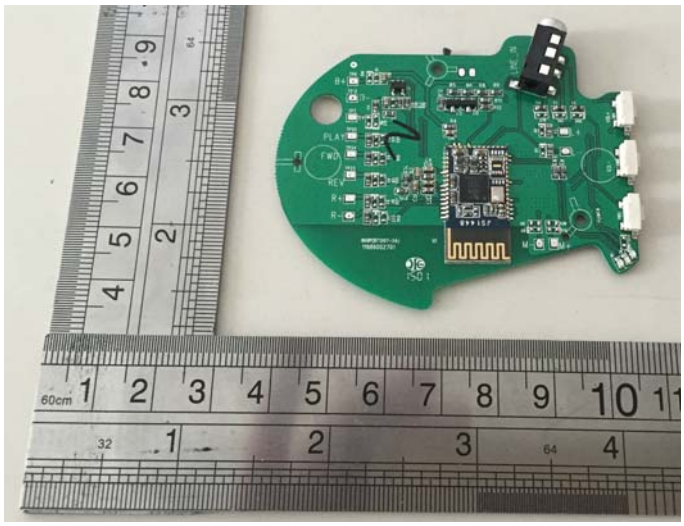
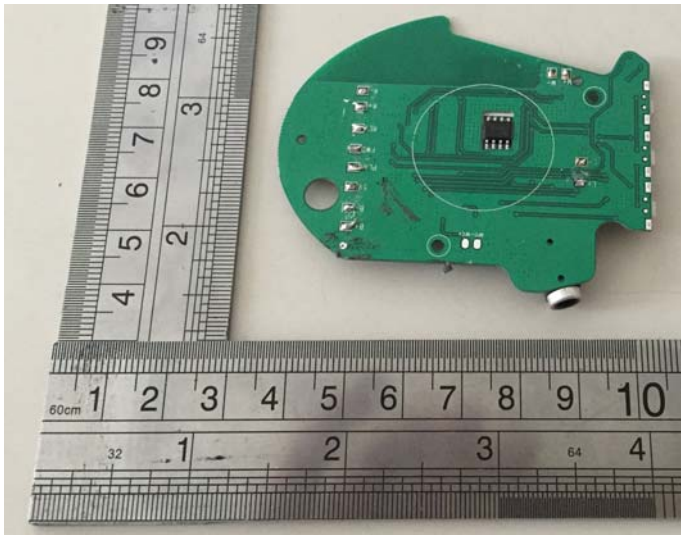
APPENDIX B - Internal Photographs

EUT –PCB View







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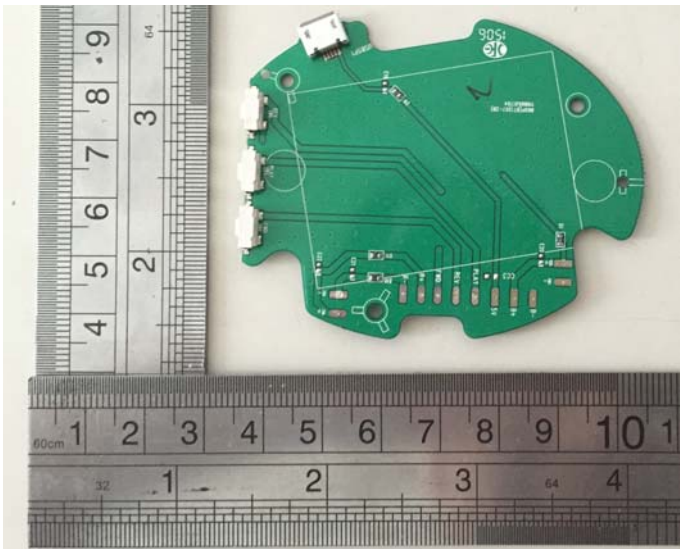
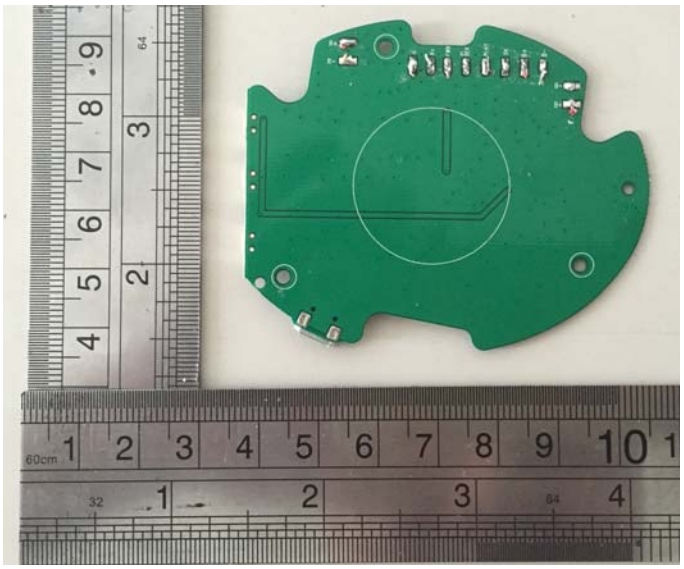
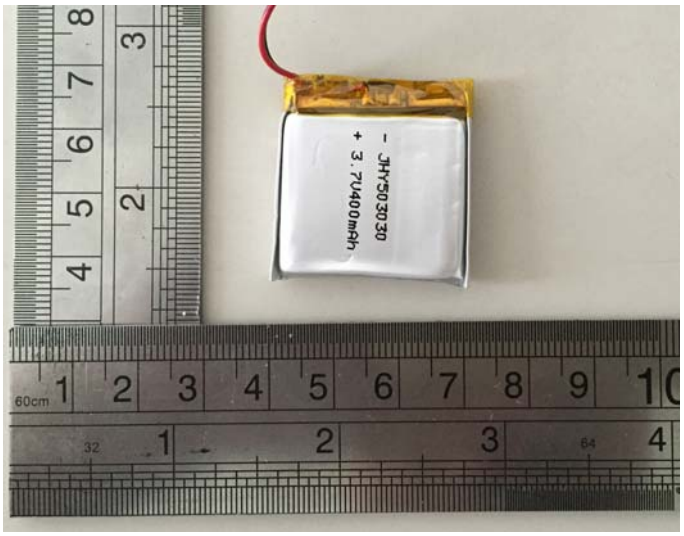




EUT –Battery View



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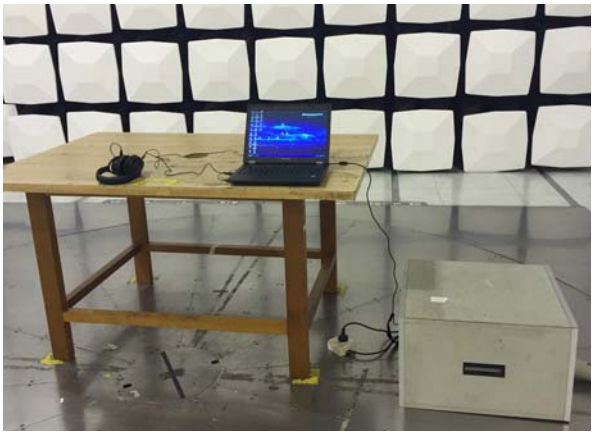
APPENDIX C - Test Setup Photographs

Conducted Emission Test



Radiated Emission Test

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