

Test Report of FCC Part 15 C for FCC Certificate

On Behalf of

Guangzhou Liwei Electronics Co.,Ltd

FCC ID: VO8-TF500
Product Description: Bluetooth Headset
Test Model No.: DT120S
Supplement Model: TF500,BH-X5

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Test by:

Reviewed By:



Owen Li



Edmund Zou

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: **Guangzhou Liwei Electronics Co.,Ltd**
Address of applicant: No.33 Zhenzhong North Rd,Shenshan Ind.Park BaiYun District,Guangzhou GuangDong,China

Manufacturer: **Guangzhou Liwei Electronics Co.,Ltd**
Address of manufacturer: No.33 Zhenzhong North Rd,Shenshan Ind.Park BaiYun District,Guangzhou GuangDong,China

General Description of E.U.T

Items	Description
EUT Description:	Bluetooth Headset
Test Model No.:	DT120S
Supplement Model:	TF500,BH-X5
Difference of Models:	They are same with PCB ,just different with feature
Type of Modulation:	FHSS
Frequency Band:	2402 MHz ~ 2480 MHz
Number of Channels:	79
Channel Bandwidth:	1 MHz
Antenna Type:	Integrated antenna, fixed on PCB
Antenna Gain:	0dBi
Rated Voltage:	3.7VDC from battery

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

1.2 Test Facility

All measurement required was performed at laboratory of Centre Testing International (ShenZhen) Corporation ,Location at Hongwei Industrial Zone, Baoan 70 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.: 510007

CENTRE TESTING INTERNATIONAL (SHENZHEN) CORPORATION,EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. Registration 338263, March 20, 2009.

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

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 placed on a 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.

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	07/19/2013
LISN	ETS-LINDGREN	3850/2	00051952	07/19/2013
LISN	R&S	ENV216	100098	07/19/2013
Voltage Probe	R&S	ESH2-Z3	100042	07/19/2013
Current Probe	R&S	EZ17	100106	07/19/2013
ISN	TESEQ GmbH	ISN T800	30297	04/04/2013

Control Room - Conducted disturbance Test (10m part)				
Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	R&S	ESCI	100435	07/19/2013
LISN	schwarzbeck	NNLK8121	8121-529	07/19/2013
Transient Limiter	ELECTRO-METRICS	EM-7600	806	03/29/2013
Voltage Probe	R&S	ESH2-Z3	100042	07/19/2013
Current Probe	R&S	EZ17	100106	07/19/2013
ISN	TESEQ GmbH	ISN T800	30297	04/04/2013

3M Semi-anechoic Chamber - Radiated disturbance Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
3M Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	3510	07/09/2013
Spectrum Analyzer	Agilent	E4440A	MY46185649	03/07/2013
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	07/21/2013
Multi device Controller	ETS-LINGREN	2090	00057230	N/A
Horn Antenna	ETS-LINGREN	3117	00057407	07/19/2013
Microwave Preamplifier	Agilent	8449B	3008A02425	03/29/2013

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	07/19/2013
Spectrum Analyzer	R&S	FSP40	100416	07/06/2013
EMI test receiver	R&S	ESIB40	2023282915	07/24/2013
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	484	07/21/2013

Horn Antenna	ETS-LINGREN	3117	00044562	07/07/2015
Microwave Preamplifier	Agilent	11909A	186871	07/06/2013
Microwave Preamplifier	HP	HP 8447F	2805A03379	07/06/2013
Microwave Preamplifier	CD	PAP-1G18G	2001	03/29/2013

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	03/29/2013
Flicker & Harmonic Tester	California instruments	PACS-1	72492	03/29/2013

Shielding Room No. 3 - ESD Test (IEC 61000-4-2)				
Equipment	Manufacturer	Model	Serial No.	Due Date
ESD Simulator	EM TEST	ESD30C	V0603101091	07/30/2013
ESD Simulator	TESEQ	NSG437	478	08/22/2013

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	07/09/2012
ESG Vector signal generators	Agilent	E4438C	MY45095744	03/07/2013
Power Amplifier	AR	150W1000	0322288	07/19/2013
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	401	07/21/2013

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	07/19/2013
Capacitive Clamp	EM-Test	C Clamp HFK	0306-43	07/19/2013
CDN for Telecom Port	EM-Test	CNV504S1	V0603101094	07/19/2013
EFT Generator	SCHAFFNER	NSG 2025	19878	03/29/2013
SURGE Generator	SCHAFFNER	NSG 2050	200313-135AR	03/29/2013
CDN	SCHAFFNER	CDN-131/133	34397	03/29/2013

Shielding Room No. 2 - Radio-frequency continuous conducted Immunity Test (IEC 61000-4-6)				
Equipment	Manufacturer	Model	Serial No.	Due Date
Signal Generator	IFR	2023B	202307/883	03/07/2013
Power Amplifier	AR	75A 250A	320297	03/29/2013
Attenuator	EM-Test	ATT6/75	0320837	07/19/2013

CDN	EM-Test	CDN M2/M3	0204-01	07/19/2013
EM-Clamp	EM-Test	EM101	35770	07/19/2013

Shielding Room No. 2 - Power-frequency magnetic fields Immunity Test (IEC 61000-4-8)				
Compact Generator	EM-Test	UCS500M/6B	V0603101093	07/19/2013
Induction Coil	EM-Test	MS100	0106-47	03/29/2013
Current Transformer	EM-Test	MC2630	0106-02	03/29/2013

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	03/29/2013
Electronic output switch	California instruments	EOS-1	72616	03/29/2013

2.5 List of auxiliary device

Equipment	Manufacturer	Model	Serial No.	Specification
Notebook	Lenovo	E46L	EB23971458	Input: DC20V (3.25A) Output: USB DC5V
Adapter	Lenovo	PA-1650-56LC	36001651	Input:100~240V (1.7A) 50-60Hz Output: DC20V (3.25A)

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.207	Conducted Emission	Pass
15.247(a)(1)	Hopping Channel Bandwidth	Pass
15.247(a)(1)	Hopping Channel Separation	Pass
15.247(a)(1)	Number of Hopping Frequency Used	Pass
15.247(a)(1)(iii)	Dwell Time of Each Frequency	Pass
15.247(b)(1)	Maximum Peak Output Power	Pass
15.247(d)	Band Edges Emission	Pass
15.247(d)	Spurious Radiated Emission	Pass
15.203/15.247(b)/(c)	Antenna Requirement	Pass

4. Conducted Emission Test

4.1 Applicable Standard

Section 15.247(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 μ H/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(μ V)	
	Quasi-peak	Average
0.15 to 0.50	79	66
0.50 to 30	73	60

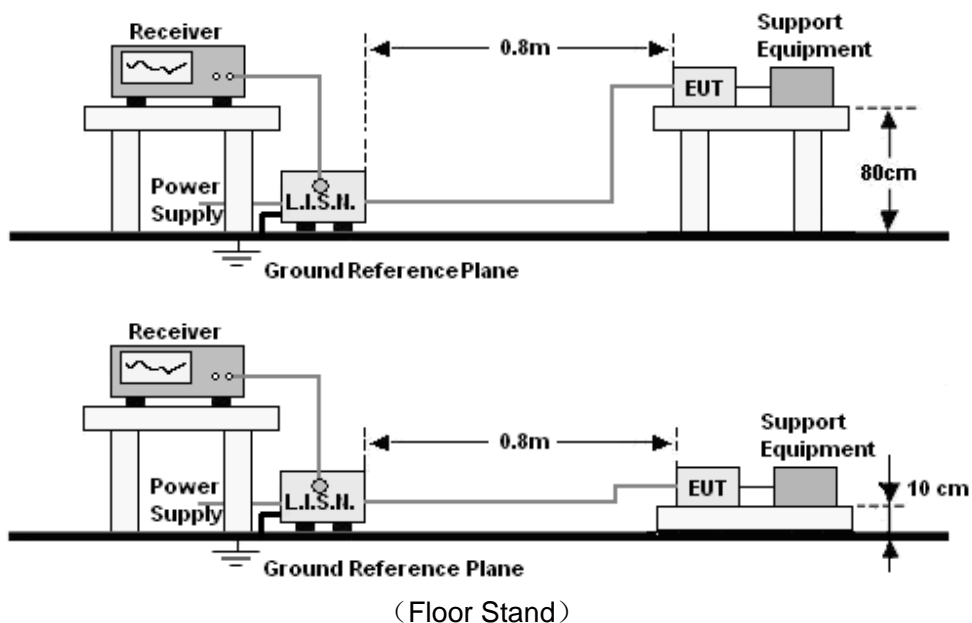
NOTE: The lower limit shall apply at the transition frequency.

Limits for Class B digital devices

Frequency range (MHz)	Limits dB(μ V)	
	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



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.

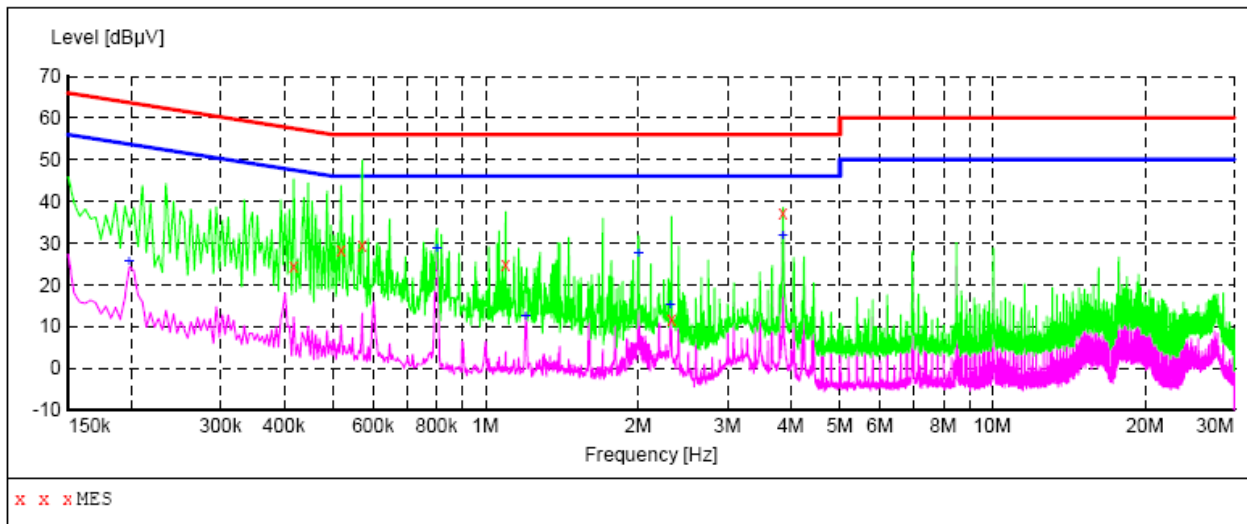
4.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset
Humidity (%RH) : 50~54	M/N: DT120S
Barometric Pressure (mbar) : 950~1000	Operation Condition: Charge Mode

The Test Data Of Conducted Emission

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: Charge Mode
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: Charge from USB of notebook
Comment: Line:L
Tem:23°C Hum:50%

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150k-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.418000	24.40	10.1	58	33.1	QP	-L-	---
0.518000	28.40	10.1	56	27.6	QP	-L-	---
0.570000	29.60	10.2	56	26.4	QP	-L-	---
1.094000	25.00	10.3	56	31.0	QP	-L-	---
2.326000	11.70	10.3	56	44.3	QP	-L-	---
3.862000	37.20	10.4	56	18.8	QP	-L-	---

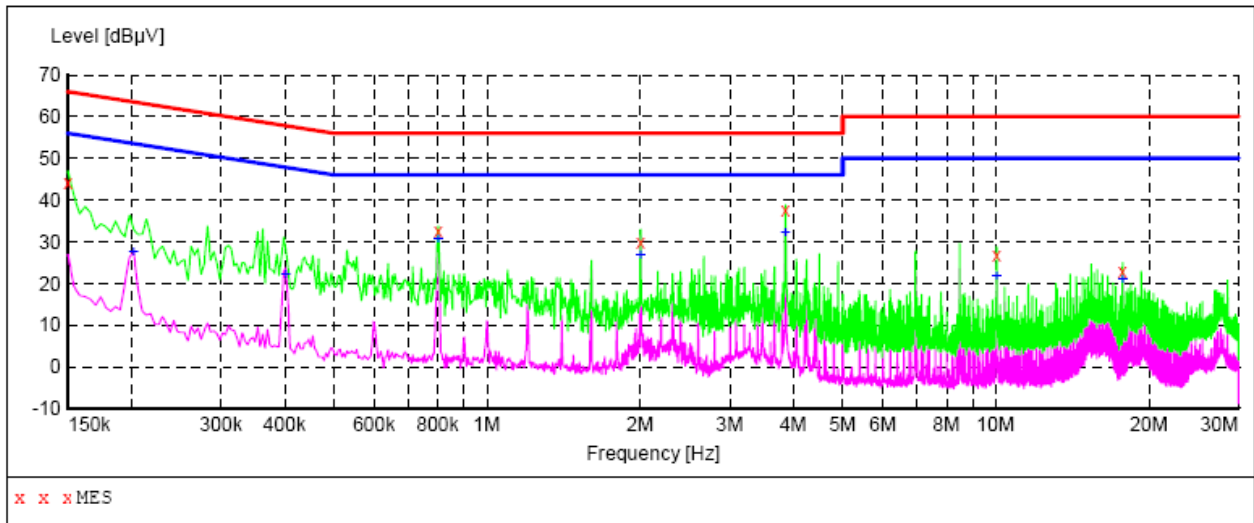
MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.198000	25.70	10.1	54	28.0	AV	-L-	---
0.802000	28.80	10.2	46	17.2	AV	-L-	---
1.198000	12.50	10.3	46	33.5	AV	-L-	---
2.002000	27.50	10.3	46	18.5	AV	-L-	---
2.318000	15.20	10.3	46	30.8	AV	-L-	---
3.862000	32.00	10.4	46	14.0	AV	-L-	---

The Test Data Of Conducted Emission

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: Charge Mode
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: Charge from USB of notebook
Comment: Line:N
Tem:23°C Hum:50%

SCAN TABLE: "Voltage (150K-30M) FIN"
Short Description: 150k-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	44.20	10.1	66	21.8	QP	-N-	---
0.802000	32.80	10.2	56	23.2	QP	-N-	---
2.002000	29.90	10.3	56	26.1	QP	-N-	---
3.862000	37.70	10.4	56	18.3	QP	-N-	---
10.038000	26.70	10.4	60	33.3	QP	-N-	---
17.754000	23.10	10.6	60	36.9	QP	-N-	---

MEASUREMENT RESULT:

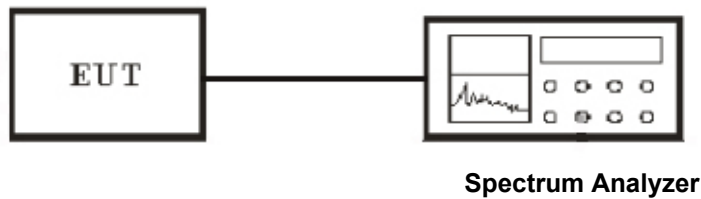
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.202000	27.50	10.1	54	26.0	AV	-N-	---
0.402000	22.10	10.1	48	25.7	AV	-N-	---
0.802000	30.50	10.2	46	15.5	AV	-N-	---
2.002000	26.90	10.3	46	19.1	AV	-N-	---
3.862000	32.10	10.4	46	13.9	AV	-N-	---
10.038000	21.90	10.4	50	28.1	AV	-N-	---
17.754000	21.00	10.6	50	29.0	AV	-N-	---

5. Test of Hopping Channel Bandwidth

5.1 Applicable Standard

Section 15.247(a)(1): 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.

5.2 EUT Setup



5.3 Test Equipment List and Details

See section 2.4.

5.4 Test Procedure

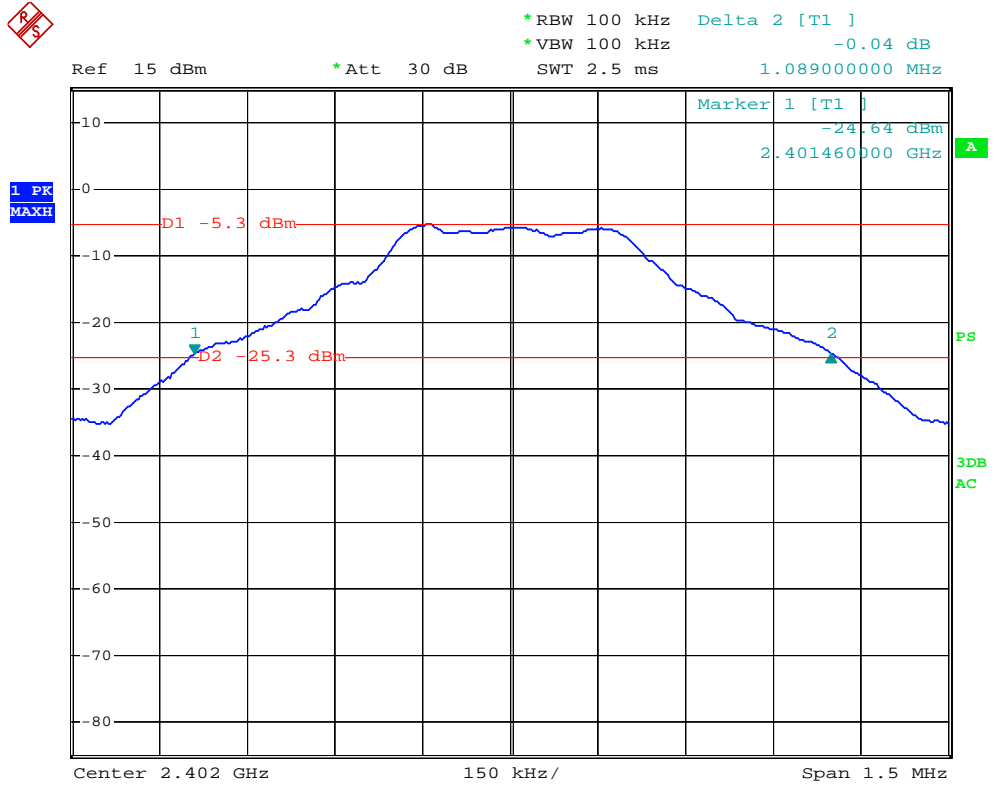
1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 30KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. The spectrum width with level higher than 20dB below the peak level.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

5.5 Test Result

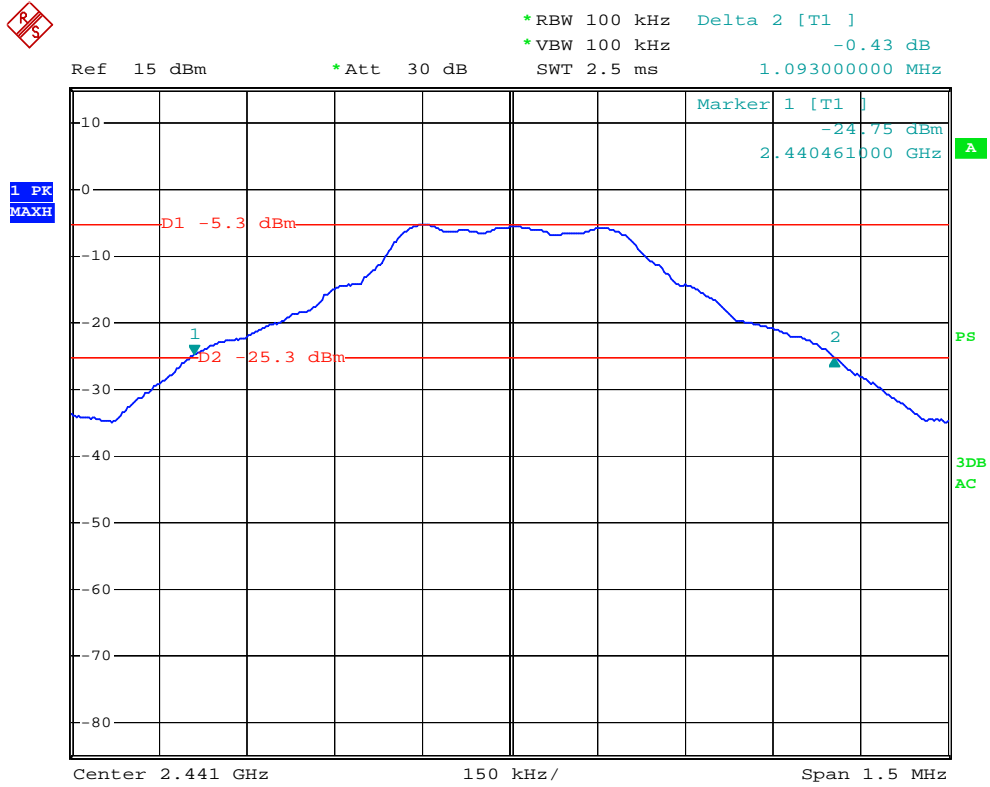
Temperature (°C) : 22~23	EUT: Bluetooth Headset
Humidity (%RH) : 50~54	M/N: DT120S
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Modulation Type	Channel No.	Frequency (MHz)	20dB Bandwidth (kHz)
FHSS	Low	2402	1089
FHSS	Middle	2441	1093
FHSS	High	2480	1086

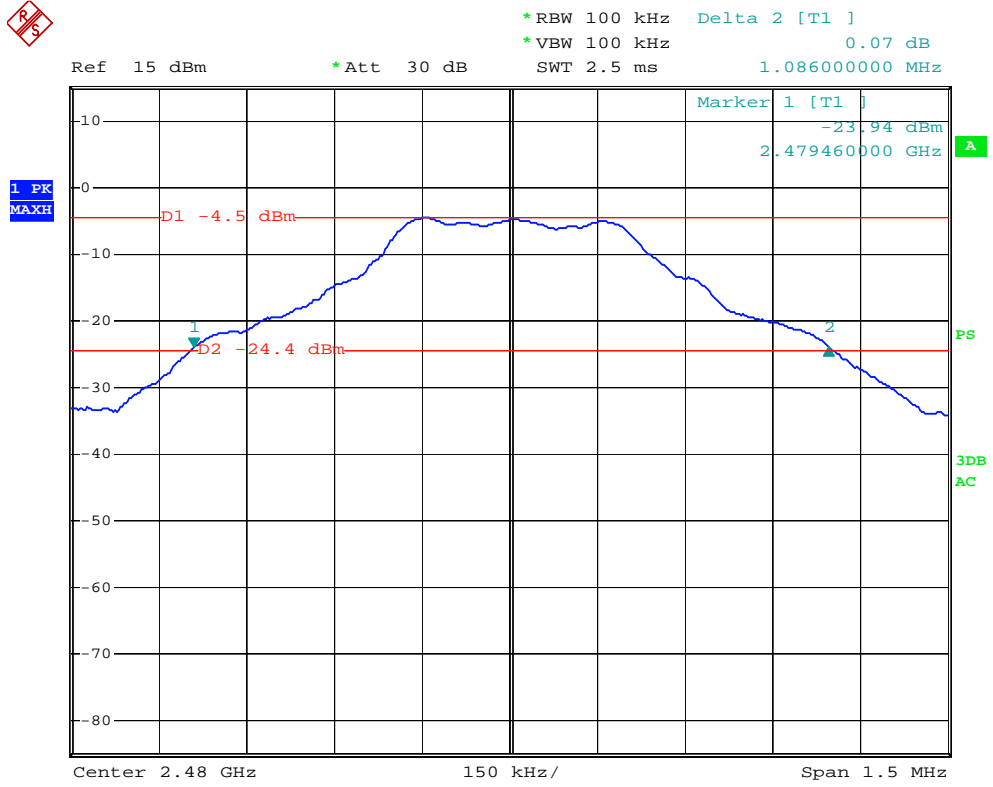
Channel Low :



Channel Middle :



Channel High:

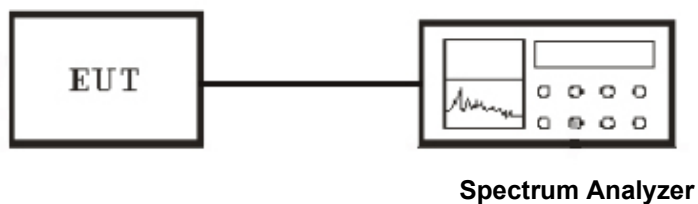


6. Test of Hopping Channel Separation

5.1 Applicable Standard

Section 15.247(a)(1): 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.

6.2 EUT Setup



6.3 Test Equipment List and Details

See section 2.4.

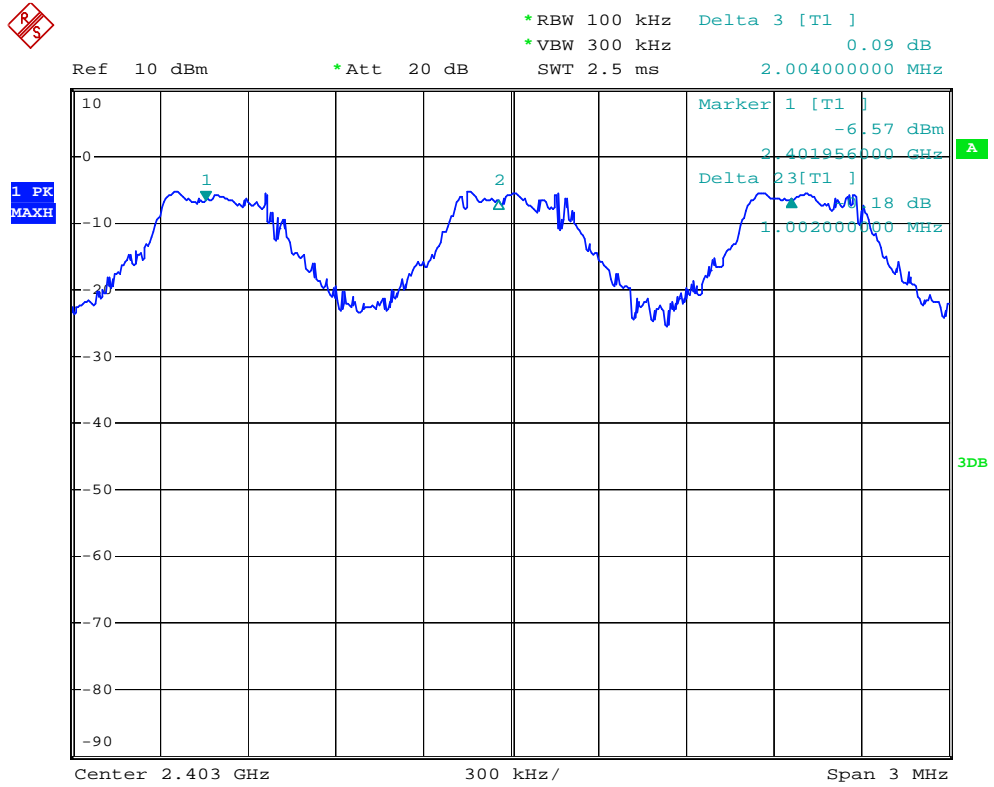
6.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. The Hopping Channel Separation is defined as the separation between 2 neighboring hopping frequencies.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

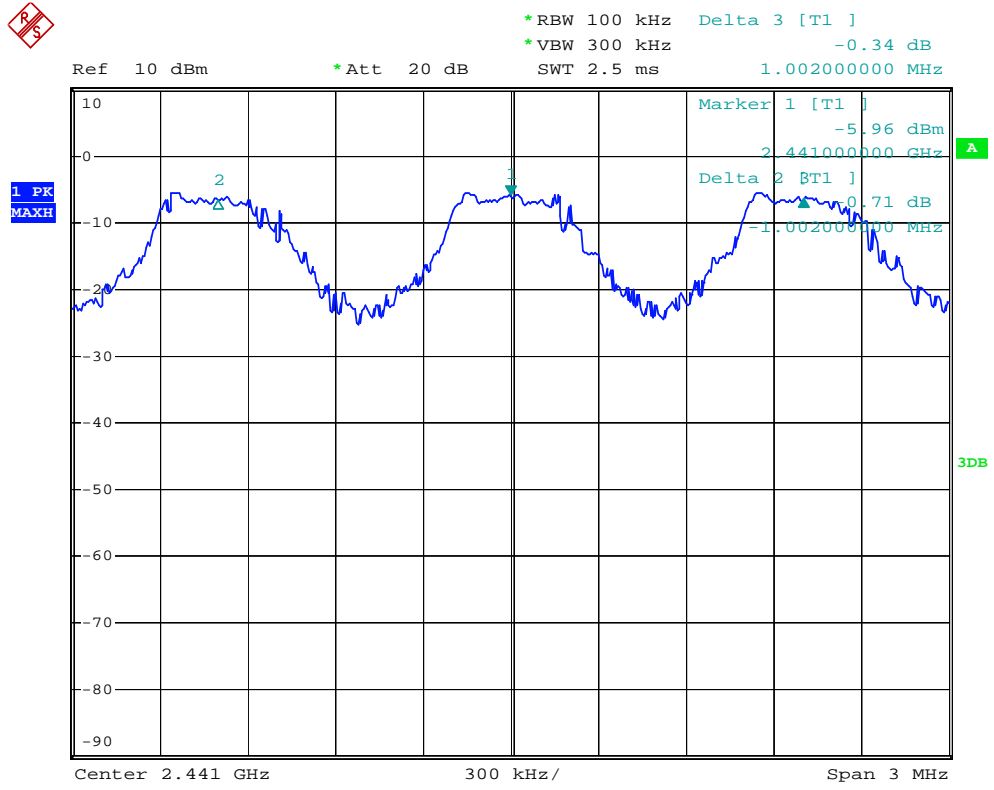
6.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset
Humidity (%RH) : 50~54	M/N: DT120S
Barometric Pressure (mbar) : 950~1000	Operation Condition: Normal Mode

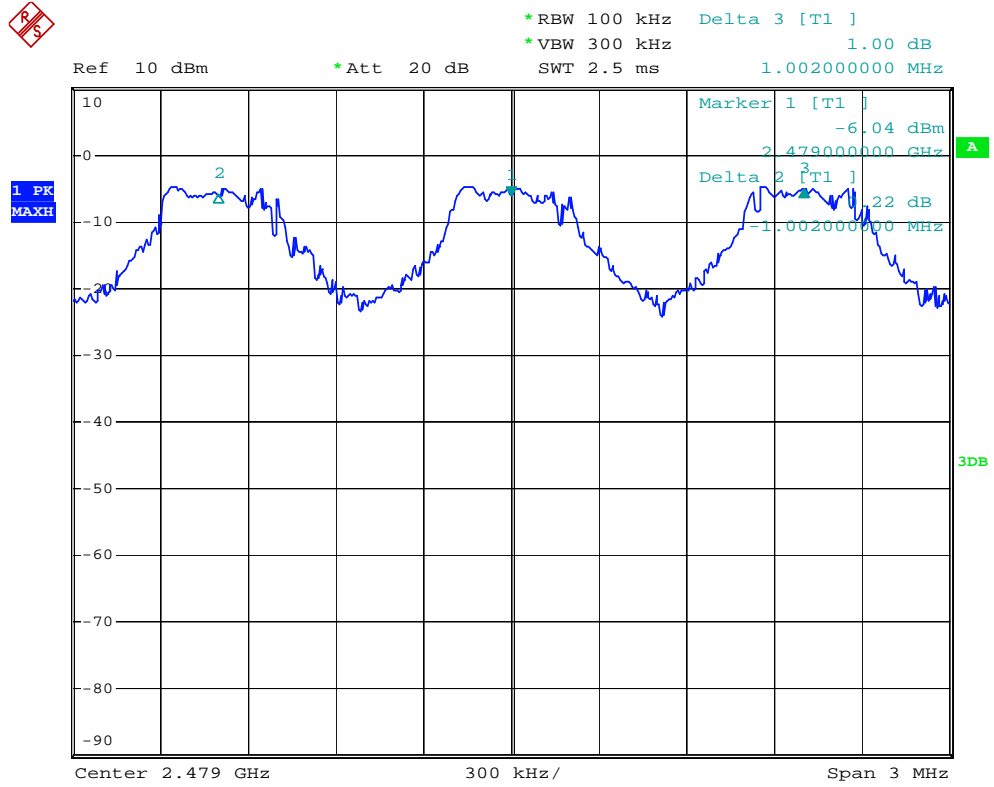
Channel Low :



Channel Middle :



Channel High :

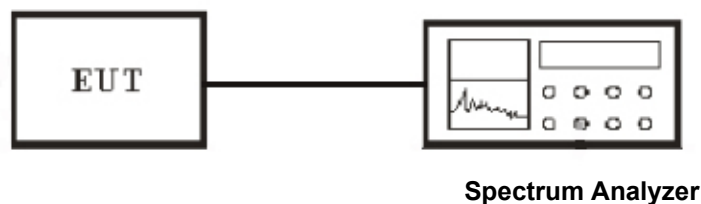


7. Test of Number of Hopping Frequency

7.1 Applicable Standard

Section 15.247(a)(1)(iii): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 15 non-overlapping hopping channels. Frequency hopping system which use fewer than 75 hopping frequencies may employ intelligent hopping techniques to avoid interference to other transmissions. Frequency hopping system may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 non-overlapping channels are used.

7.2 EUT Setup



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. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is Auto.
4. Observe frequency hopping in 2400MHz~2483.5MHz, there are at least 32 non-overlapping channels.
5. Repeat above 1~3 points for the middle and highest channel of the EUT.

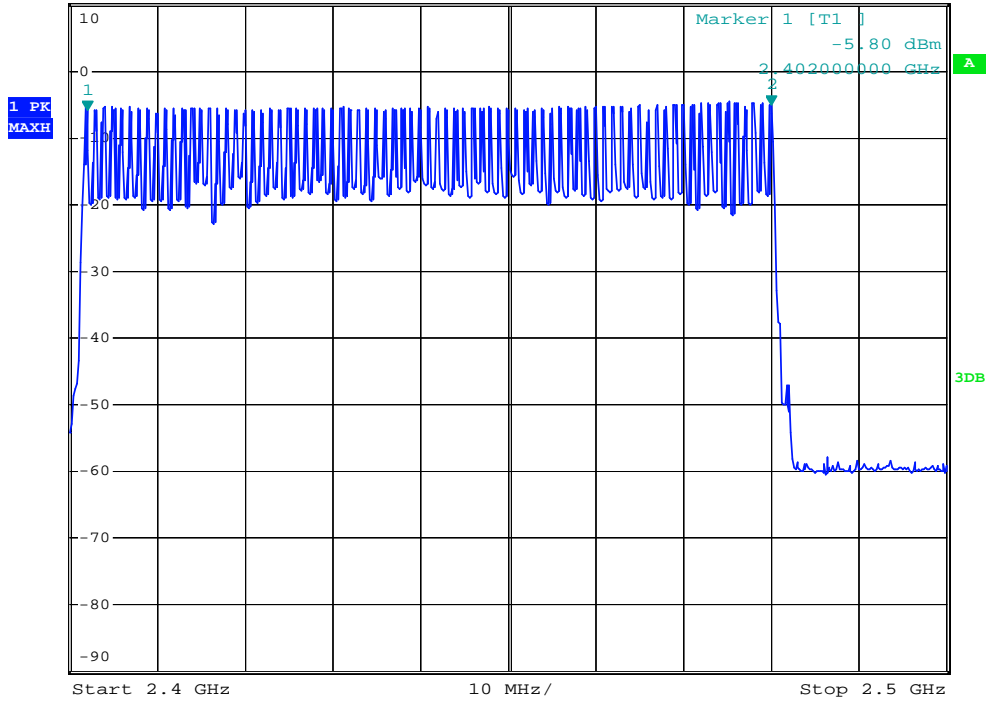
7.5 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset
Humidity (%RH) : 50~54	M/N: DT120S
Barometric Pressure (mbar) : 950~1000	Operation Condition: Normal Mode

Modulation Type	Frequency (MHz)	Number of Hopping Channels	Min. Limit (kHz)
FHSS	2402~2480	79	>15



Ref 10 dBm *Att 20 dB *RBW 100 kHz Marker 2 [T1]
*VBW 1 MHz -5.10 dBm
SWT 10 ms 2.48000000 GHz

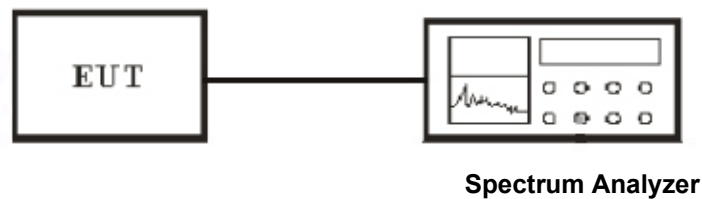


8. Test of Dwell Time of Each Frequency

8.1 Applicable Standard

Section 15.247(a)(1)(iii): For frequency hopping systems operating in the 2400-2483.5 MHz band The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4seconds multiplied by the number of hopping channels employed.

8.2 EUT Setup



7.3 Test Equipment List and Details

See section 2.4.

8.4 Test Procedure

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 1000kHz and VBW to 1000kHz.
3. Set Detector to Peak, Trace to Max Hold and Sweep Time is more than once pulse time.
4. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
5. Measure the maximum time duration of one single pulse.

8.5 Test Result

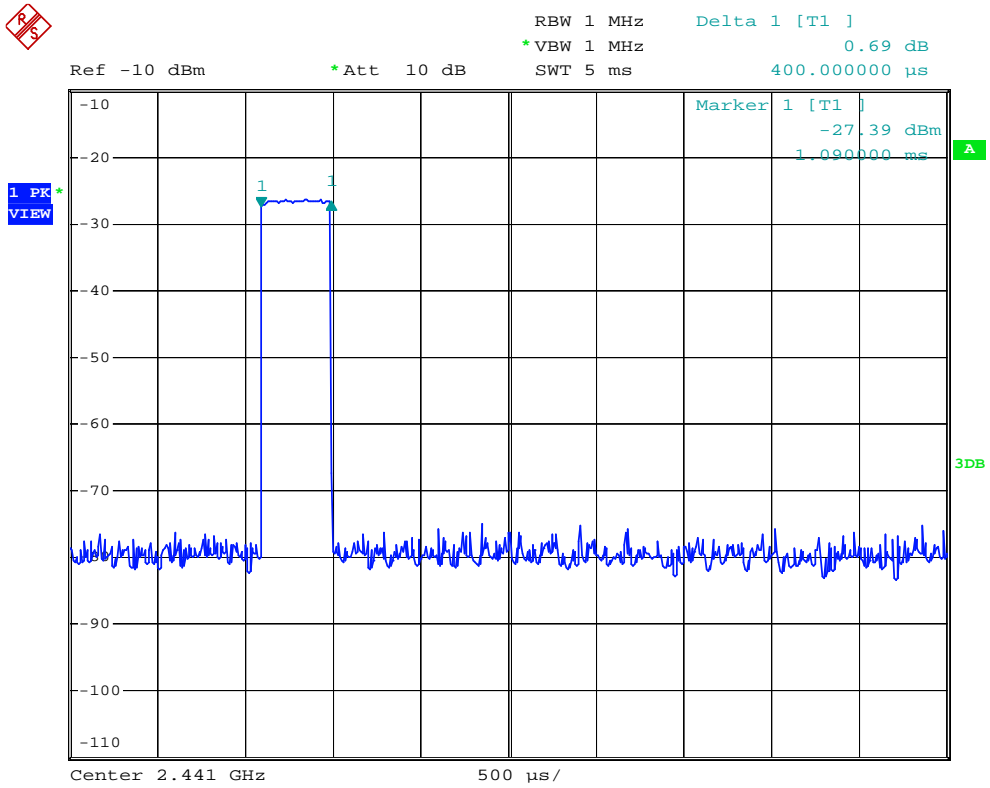
Temperature (°C) : 22~23	EUT: Bluetooth Headset
Humidity (%RH) : 50~54	M/N: DT120S
Barometric Pressure (mbar) : 950~1000	Operation Condition: Normal Mode

Note:The channel mid test data is the worst case in channel low,mid and high there modes test results

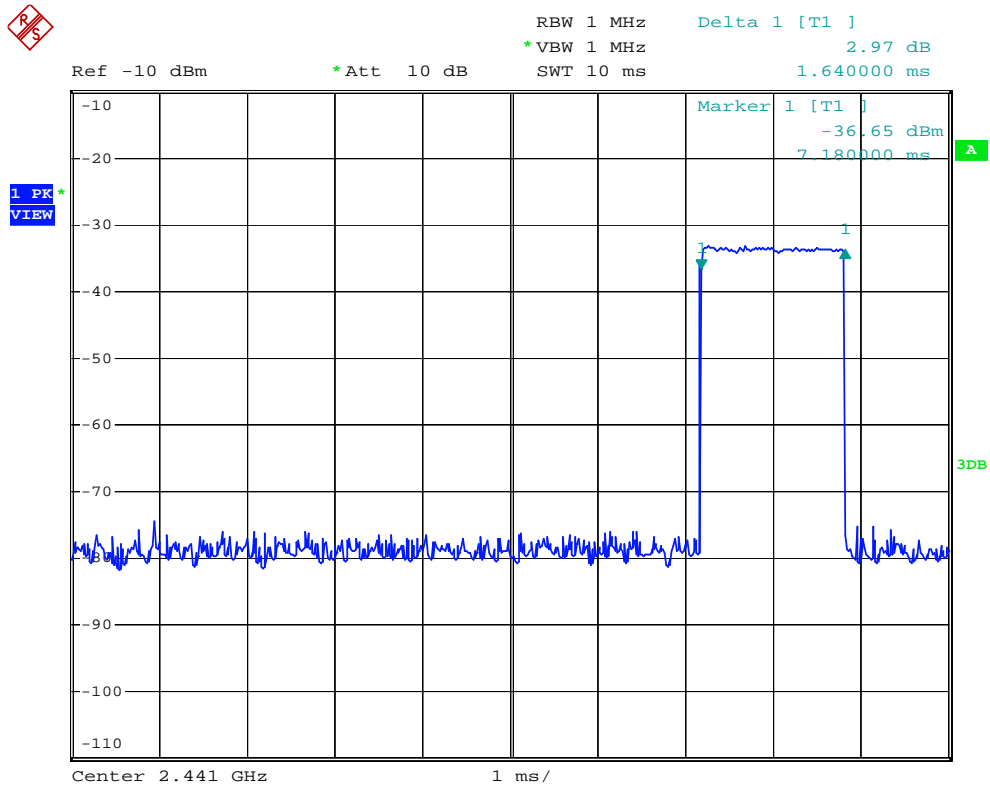
Test Data (Worset case)

Packet	Frequency (MHz)	Pulse Wide (ms)	Number of Hopping Pulses in 0.4*channel number	Dwell Time (ms)	Limit (ms)
DH1	2441	0.4	*(1600/(2*79))*31.6	128	400
DH3	2441	1.64	*(1600/(4*79))*31.6	262.4	400
DH5	2441	2.90	*(1600/(6*79))*31.6	309.3	400

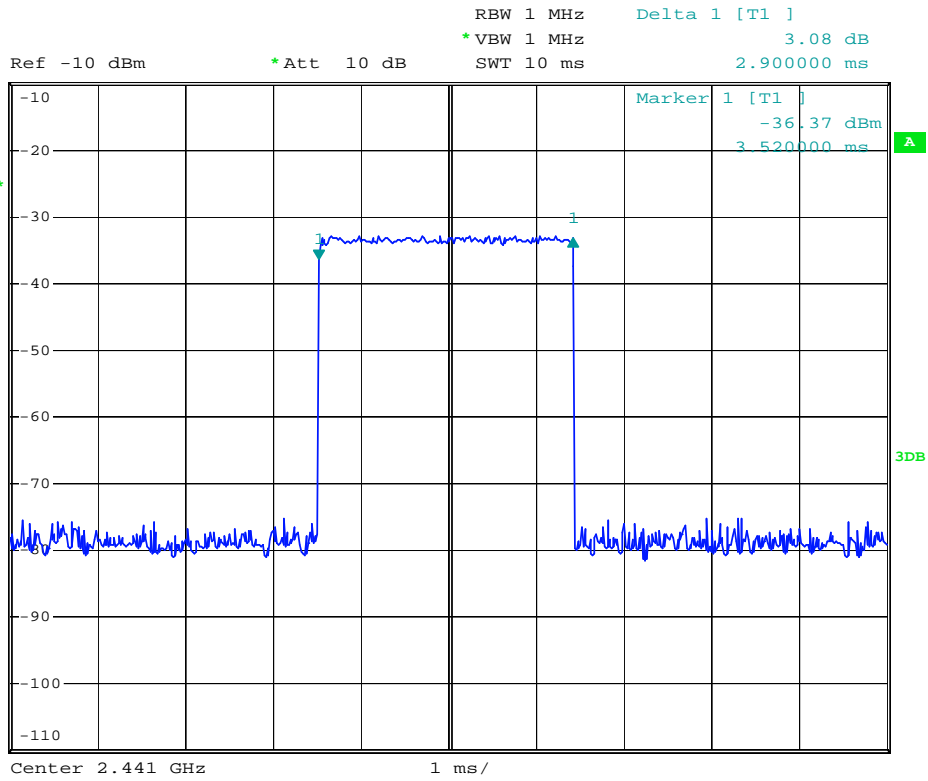
DH1:



DH3:



DH5:

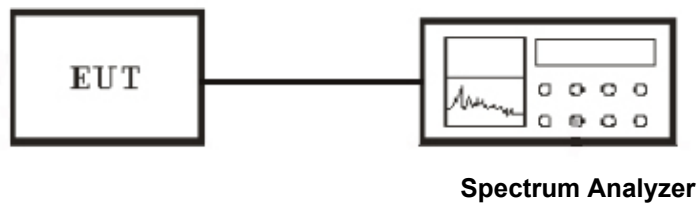


9. Test of Maximum Peak Output Power

9.1 Applicable Standard

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels and The maximum peak output power shall not exceed 1 watt. For all other frequency hopping systems in this frequency band, The maximum peak output power shall not exceed 0.125 watt.

9.2 EUT Setup



9.3 Test Equipment List and Details

See section 2.4.

9.4 Test Procedure

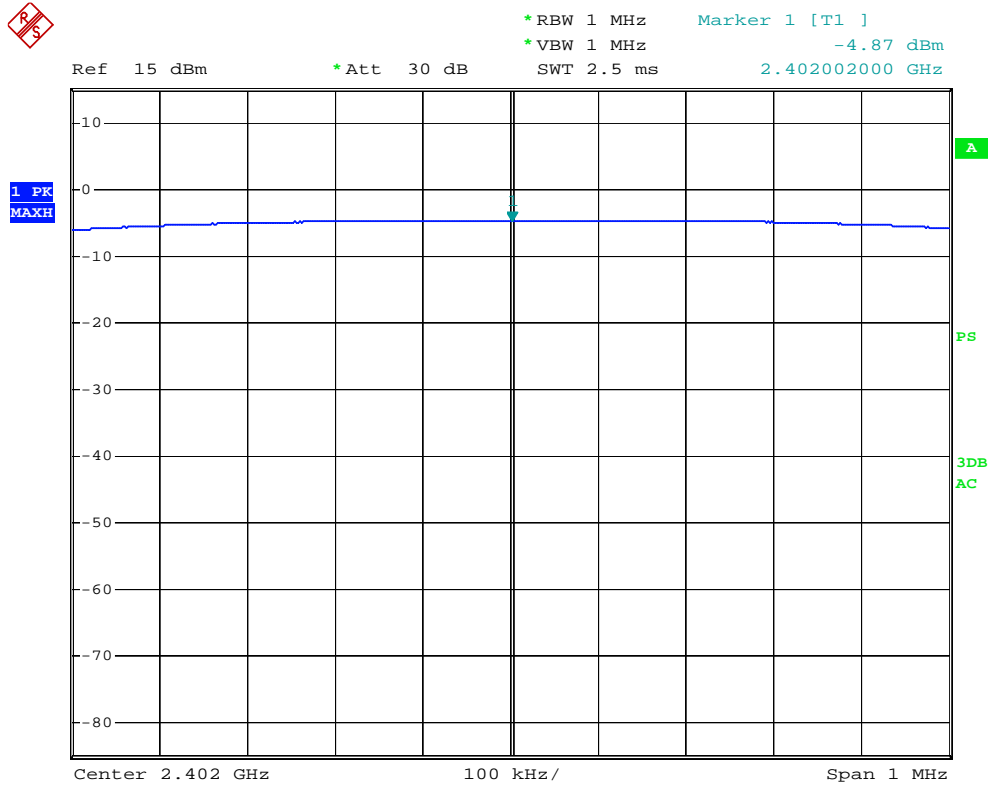
1. The transmitter output was connected to the peak power meter and recorded the peak value.
2. Peak power meter parameter set to auto attenuator and filter is the same as.
3. Repeated the 1 for the middle and highest channel of the EUT.

9.5 Test Result

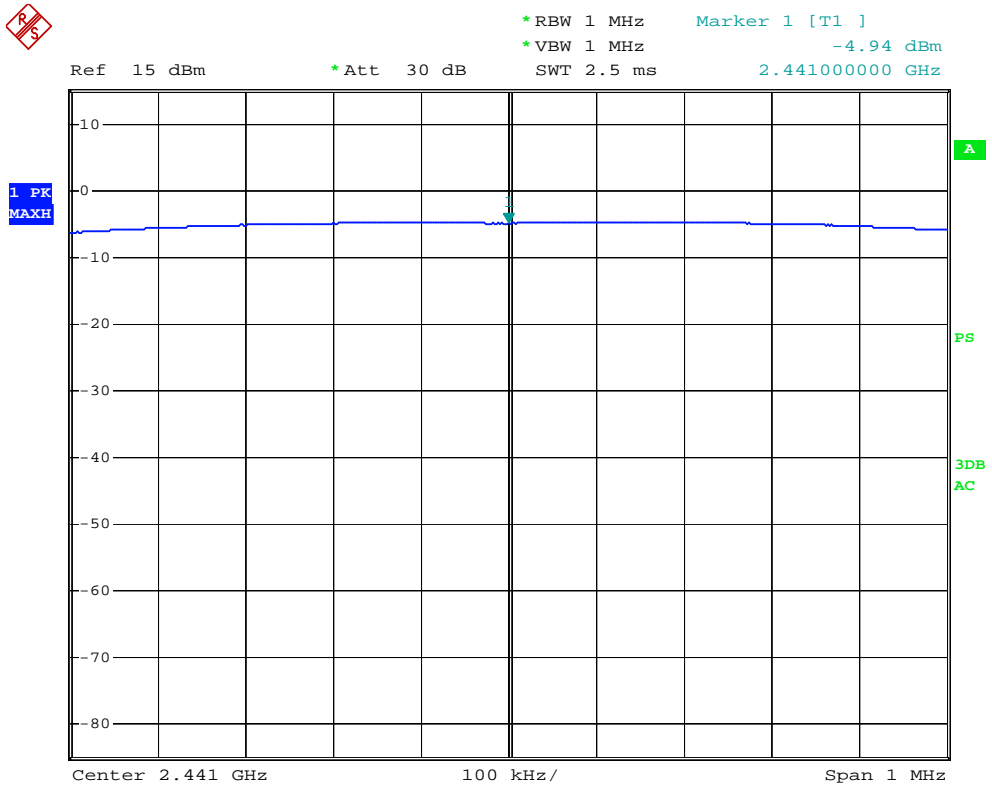
Temperature (°C) : 22~23	EUT: Bluetooth Headset
Humidity (%RH) : 50~54	M/N: DT120S
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Frequency (MHz)	Conducted Power (dBm)	Cable Loss (dB)	Output Power (dBm)	Limits (dBm)	Margin (dB)
L: 2402	-4.87	2.5	-2.39	30	32.39
M: 2441	-4.94	2.5	-2.44	30	32.44
H: 2480	-4.20	2.5	-1.70	30	31.70

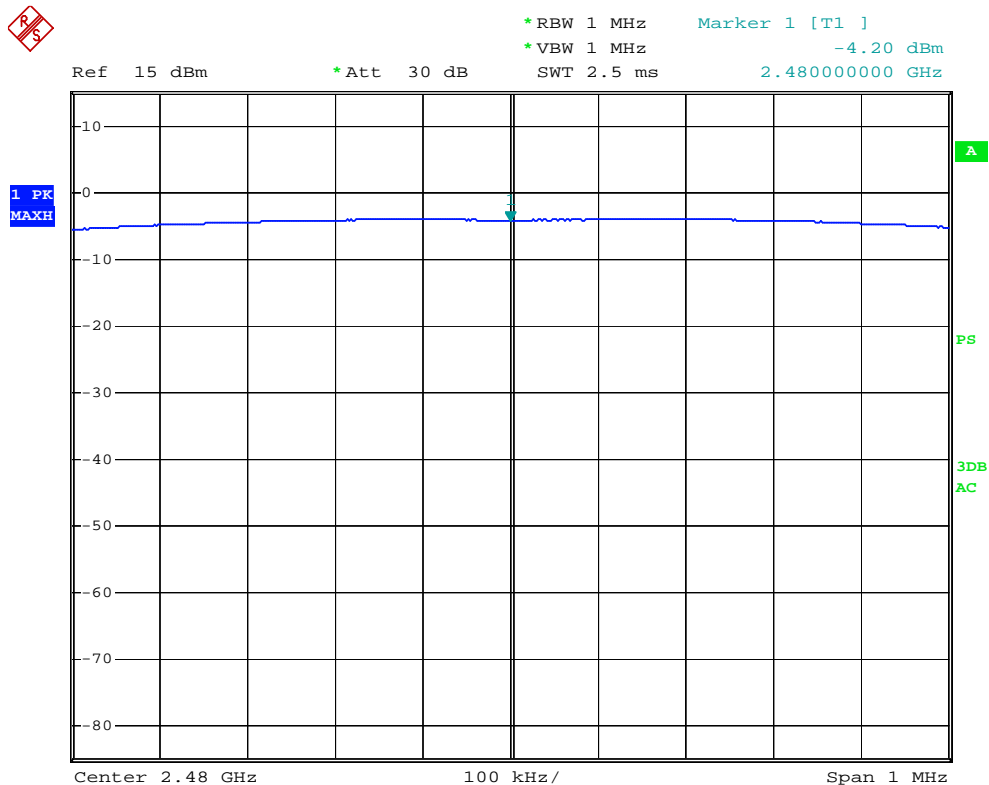
Channel Low :



Channel Middle :



Channel High :



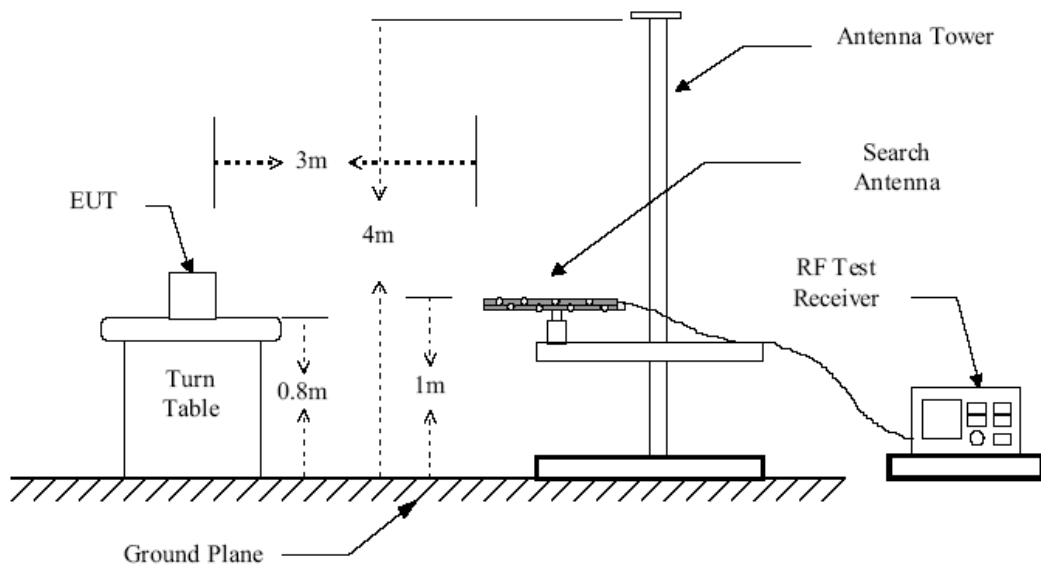
10. Test of Band Edges Emission

10.1 Applicable Standard

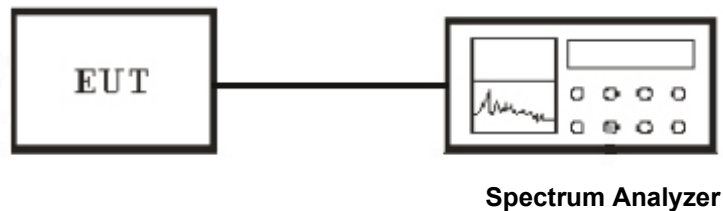
Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band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

10.2 EUT Setup

Radiated Measurement Setup



Conducted Measurement Setup



10.3 Test Equipment List and Details

See section 2.4.

10.4 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.

10.5 Test Result

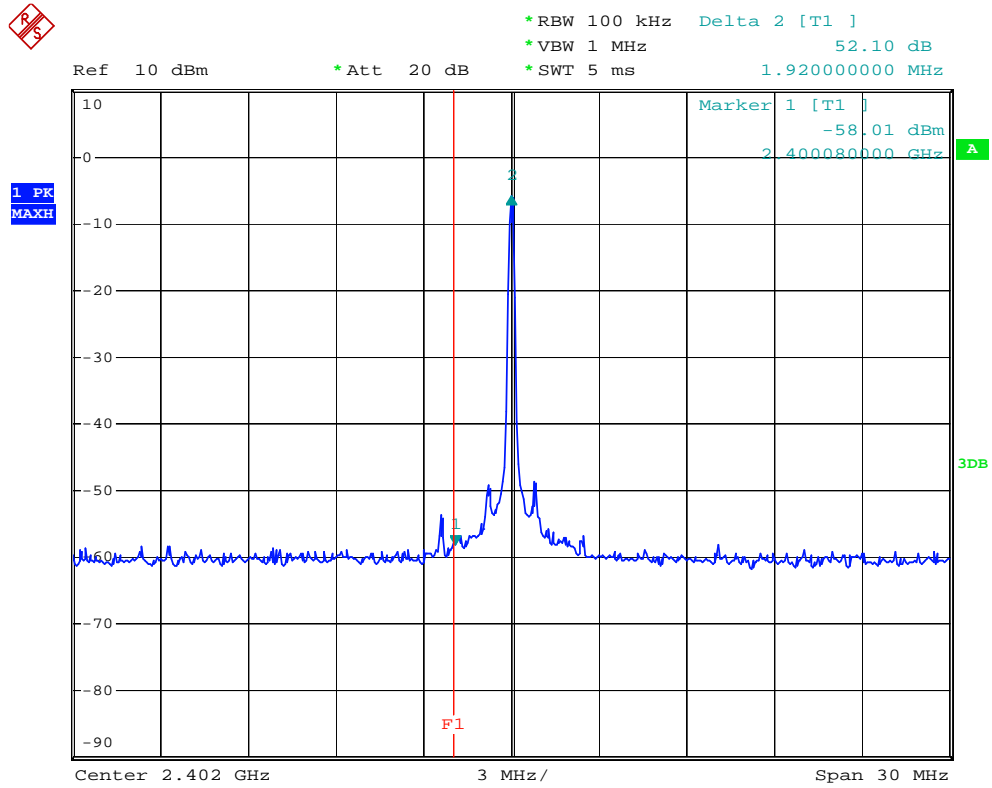
Temperature (°C) : 22~23	EUT: Bluetooth Headset
Humidity (%RH) : 50~54	M/N: DT120S
Barometric Pressure (mbar) : 950~1000	Operation Condition: Tx Mode

Note: Channel low, mid and high, 30MHz-25GHz conducted emissions all more than 20 dB below fundamental.

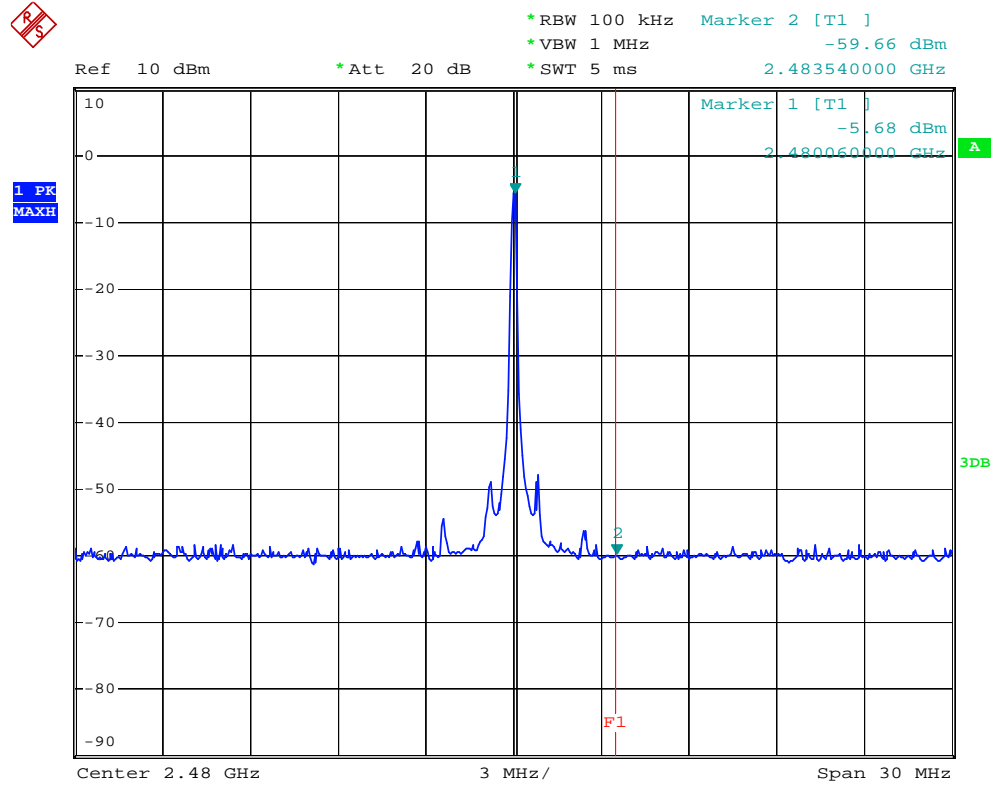
Radiated Test Result

Frequency(MHz)
<2400
>2483.5

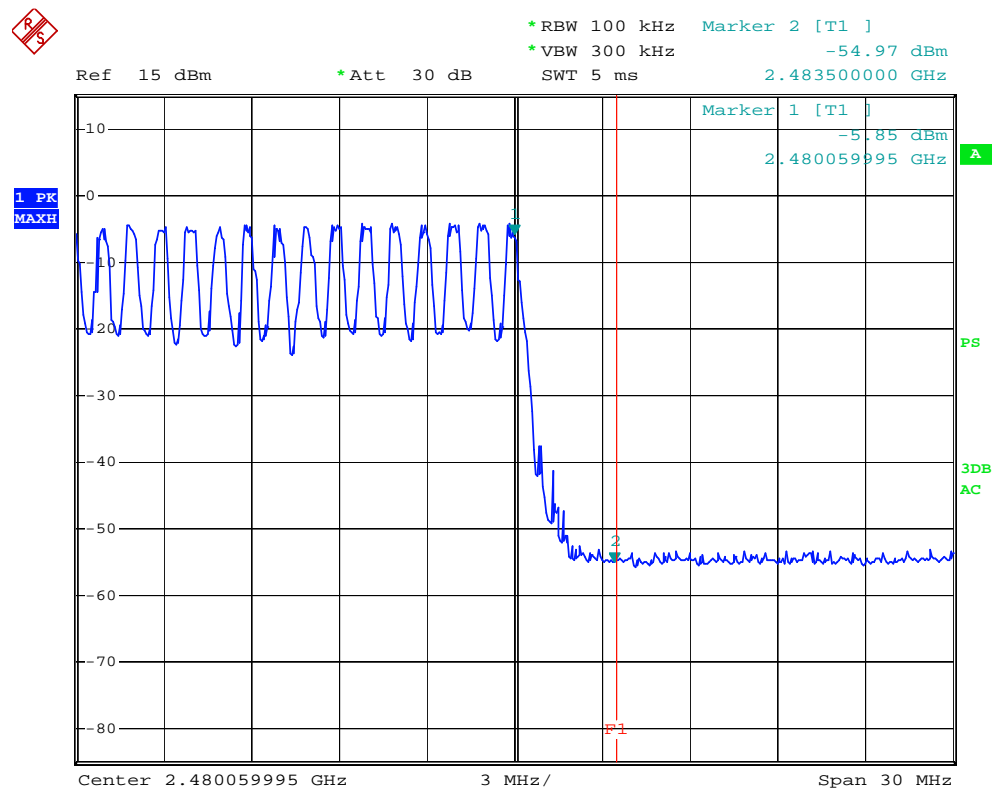
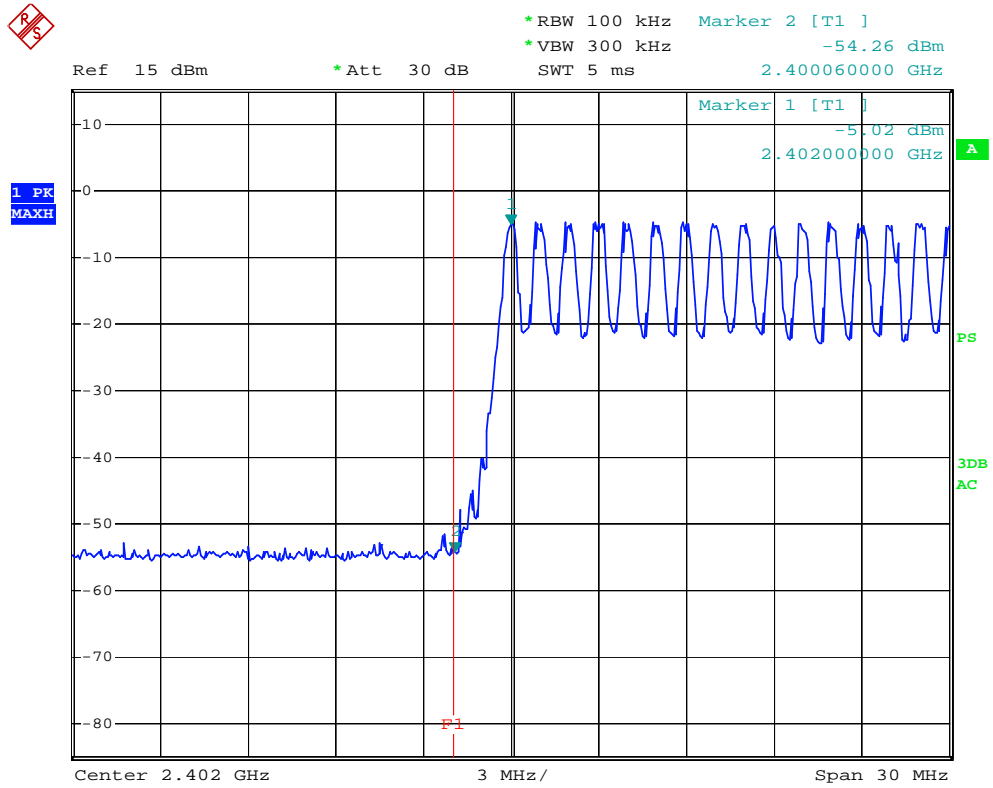
The worst frequency range of continual TX Low Channel



The worst frequency range of continual TX High Channel



The worst frequency range of Hopping Mode



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.

11.2 Limits

Limits for Class A digital devices

Frequency (MHz)	limits at 3m dB(μ V/m)
30-88	49.0
88-216	53.5
216-960	56.0
Above 960	59.5

- 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 A digital devices

Frequency (MHz)	limits at 10m dB(μ V/m)
30-88	39.0
88-216	43.5
216-960	46.5
Above 960	49.5

- 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 3m dB(μ V/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.

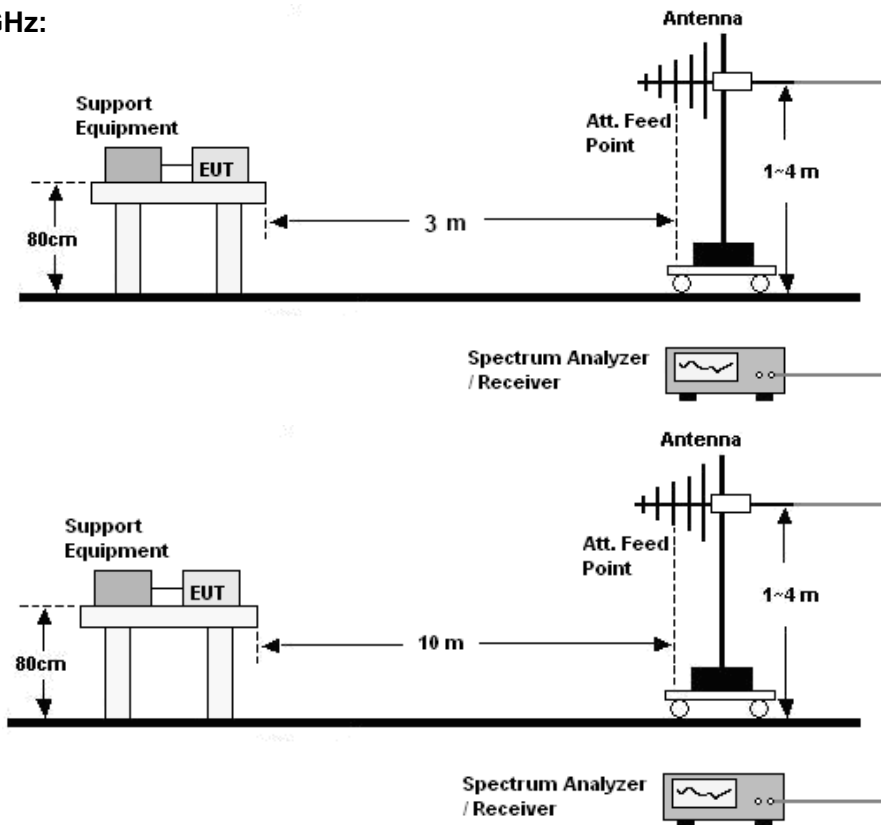
Limits for Class B digital devices

Frequency (MHz)	limits at 10m dB(μ V/m)
30-88	30.0
88-216	33.5
216-960	36.5
Above 960	39.5

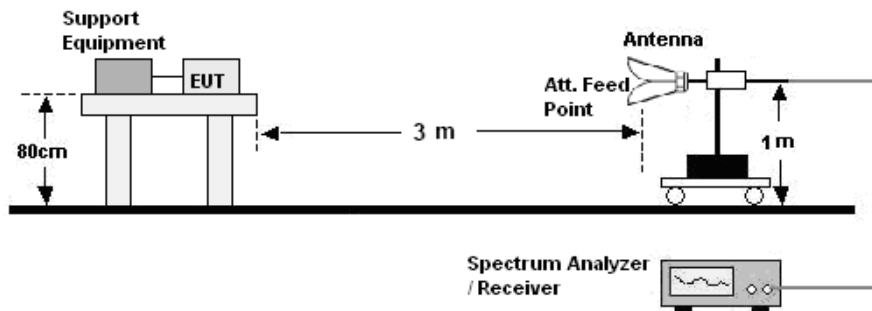
- NOTE:**
1. The lower limit shall apply at the transition frequency.
 2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
 3. The limits shown above are based on measuring equipment employing an average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

11.3 Radiated Measurement Setup

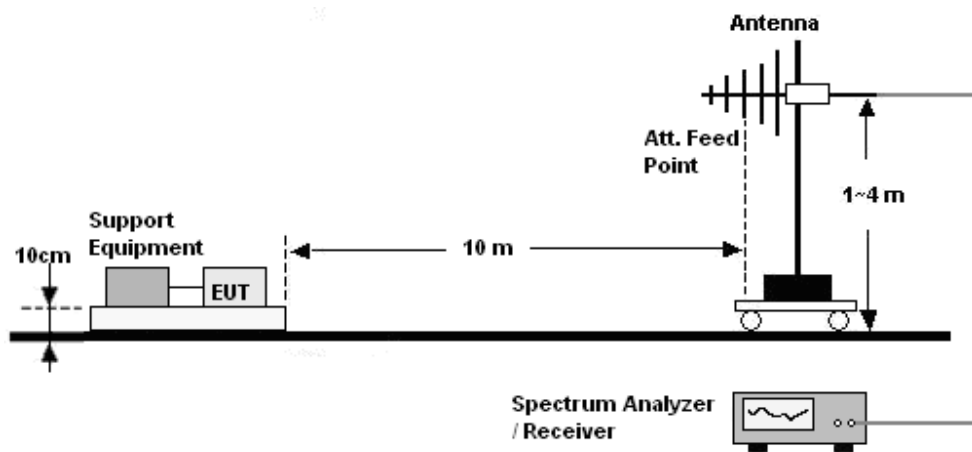
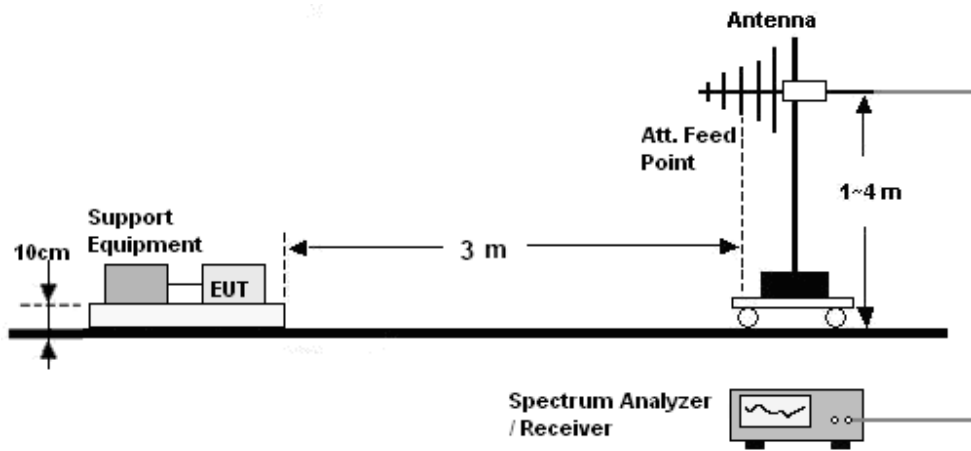
30MHz ~ 1GHz:



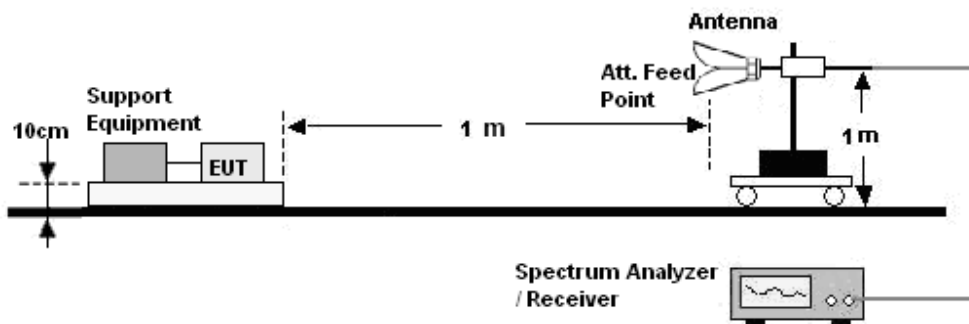
Above 1GHz:



30MHz ~ 1GHz (Floor Stand):



Above 1GHz(Floor Stand):



11.4 Test Equipment List and Details

See section 2.4.

11.5 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.

10.6 Test Result

Temperature (°C) : 22~23	EUT: Bluetooth Headset
Humidity (%RH) : 50~54	M/N: DT120S
Barometric Pressure (mbar) : 950~1000	Operation Condition: Normal operation

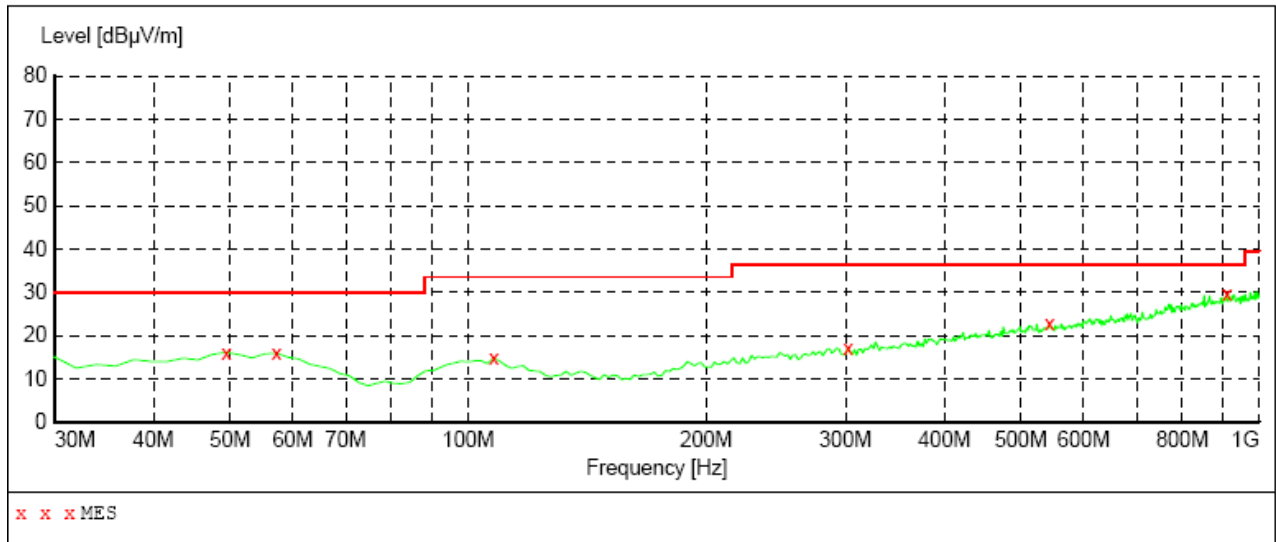
Note:The test data of (18-25GHz) emissions in BT TX Mode is just noise floor.

The Spurious Emission (30~1000MHz) Of Horizontal (Charge)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: Charge
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

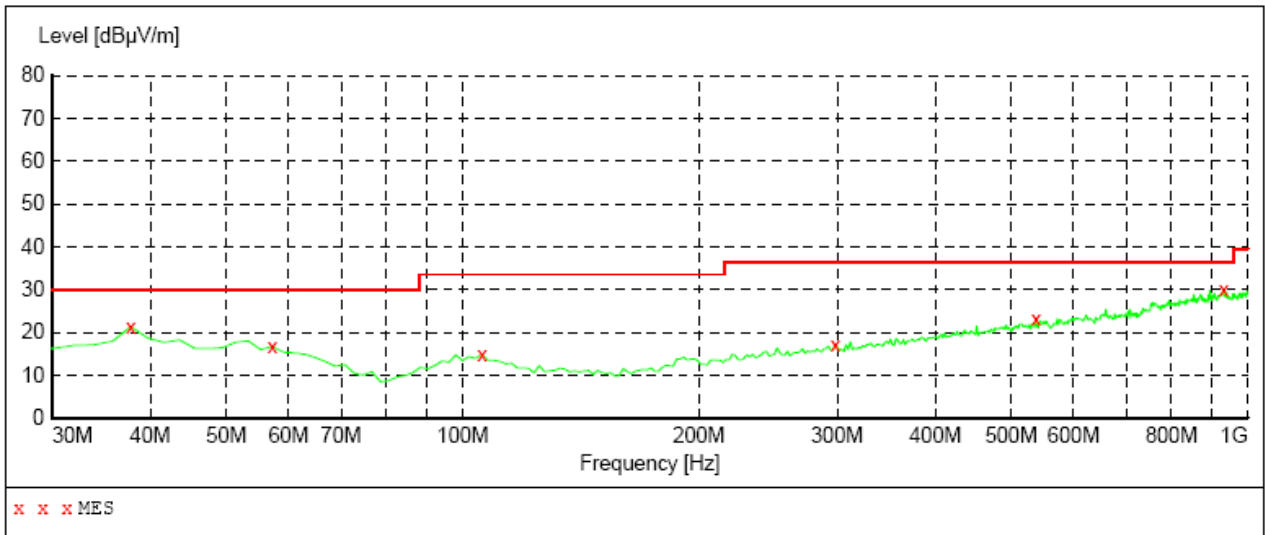
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
49.438878	16.10	-11.1	30.0	13.9	---	100.0	109.00	HORIZONTAL
57.214429	16.00	-10.8	30.0	14.0	---	200.0	360.00	HORIZONTAL
107.755511	14.80	-12.4	33.5	18.7	---	200.0	192.00	HORIZONTAL
302.144289	17.20	-9.3	36.5	19.3	---	200.0	22.00	HORIZONTAL
543.186373	22.80	-5.4	36.5	13.7	---	200.0	199.00	HORIZONTAL
910.581162	29.50	1.1	36.5	7.0	---	100.0	315.00	HORIZONTAL

The Spurious Emission (30~1000MHz) Of Vertical (Charge)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: Charge
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

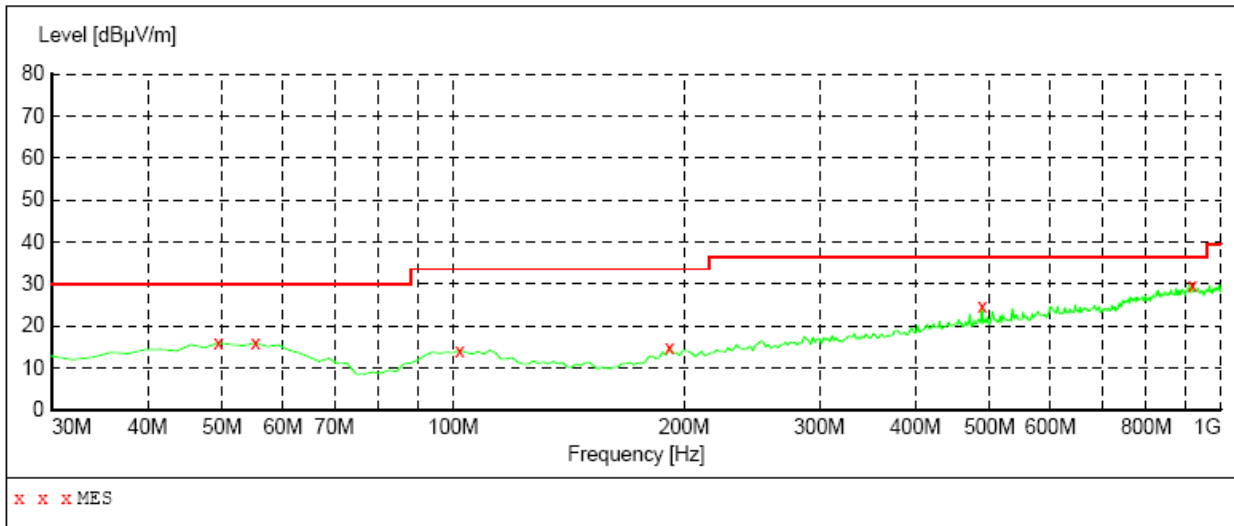
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
37.775551	21.40	-12.1	30.0	8.6	---	100.0	141.00	VERTICAL
57.214429	16.70	-10.8	30.0	13.3	---	100.0	0.00	VERTICAL
105.811623	14.90	-12.3	33.5	18.6	---	200.0	82.00	VERTICAL
298.256513	17.30	-9.3	36.5	19.2	---	200.0	154.00	VERTICAL
537.354709	23.10	-5.5	36.5	13.4	---	100.0	285.00	VERTICAL
931.963928	29.90	1.2	36.5	6.6	---	200.0	146.00	VERTICAL

The Spurious Emission (30~1000MHz) Of Horizontal (MP3 Model)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: MP3 Play
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

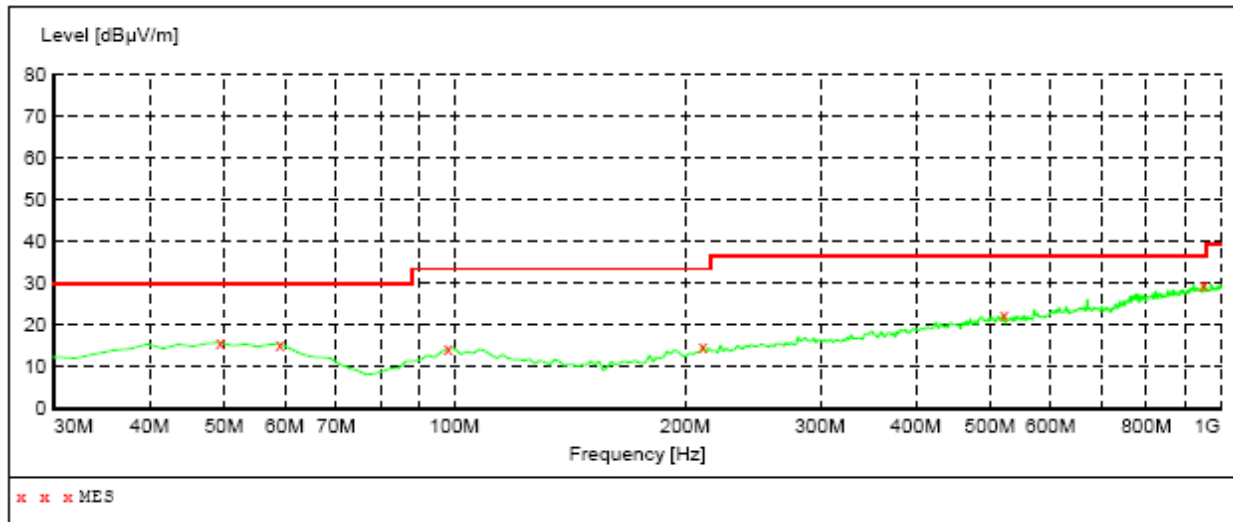
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
49.438878	16.00	-11.1	30.0	14.0	---	100.0	274.00	HORIZONTAL
55.270541	16.00	-10.8	30.0	14.0	---	200.0	131.00	HORIZONTAL
101.923848	14.20	-12.3	33.5	19.3	---	100.0	106.00	HORIZONTAL
191.342685	15.00	-12.2	33.5	18.5	---	200.0	44.00	HORIZONTAL
488.757515	24.70	-6.1	36.5	11.8	---	200.0	290.00	HORIZONTAL
918.356713	29.80	1.2	36.5	6.7	---	200.0	88.00	HORIZONTAL

The Spurious Emission (30~1000MHz) Of Vertical (MP3 Model)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: MP3 Play
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

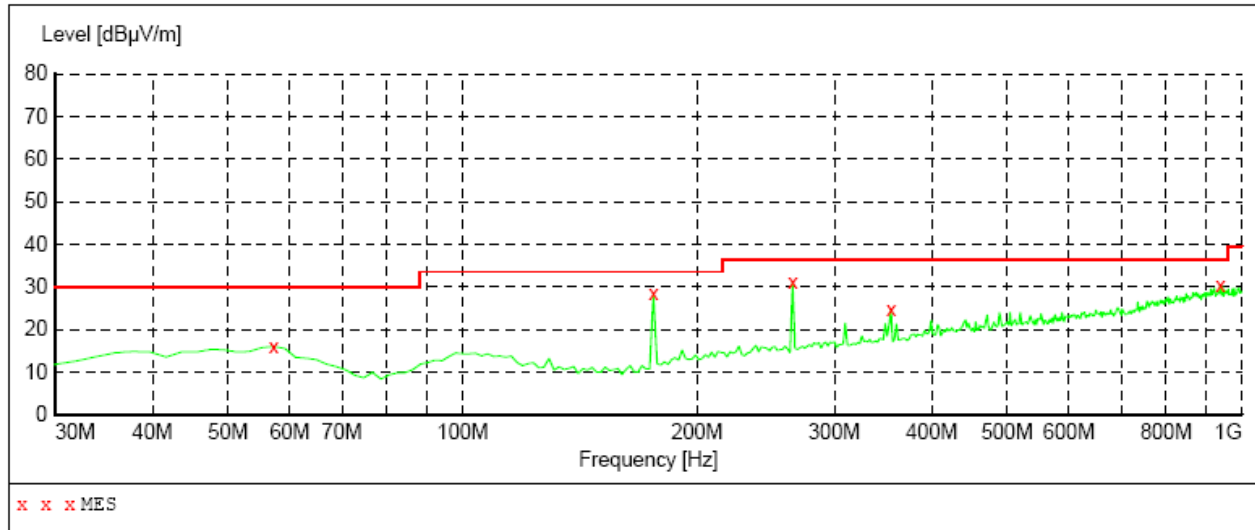
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
49.438878	15.90	-11.1	30.0	14.1	---	200.0	103.00	VERTICAL
59.158317	15.60	-11.3	30.0	14.4	---	200.0	268.00	VERTICAL
98.036072	14.40	-12.6	33.5	19.1	---	100.0	87.00	VERTICAL
210.781563	15.10	-12.4	33.5	18.4	---	100.0	80.00	VERTICAL
521.803607	22.50	-5.7	36.5	14.0	---	200.0	139.00	VERTICAL
949.458918	29.80	1.1	36.5	6.7	---	200.0	282.00	VERTICAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: FM Receive Channel Low
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

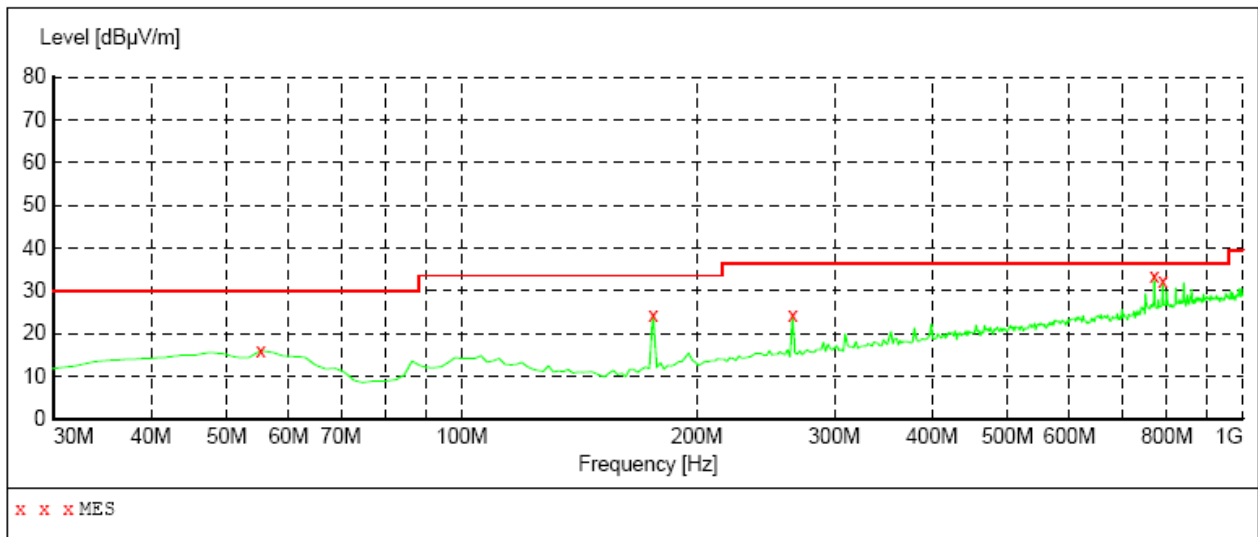
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
57.214429	16.00	-10.8	30.0	14.0	---	100.0	50.00	HORIZONTAL
175.791583	28.40	-14.6	33.5	5.1	---	200.0	135.00	HORIZONTAL
265.210421	31.10	-10.5	36.5	5.4	---	200.0	165.00	HORIZONTAL
354.629259	24.80	-8.2	36.5	11.7	---	200.0	105.00	HORIZONTAL
937.795591	30.20	1.1	36.5	6.3	---	100.0	289.00	HORIZONTAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: FM Receive Channel Low
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

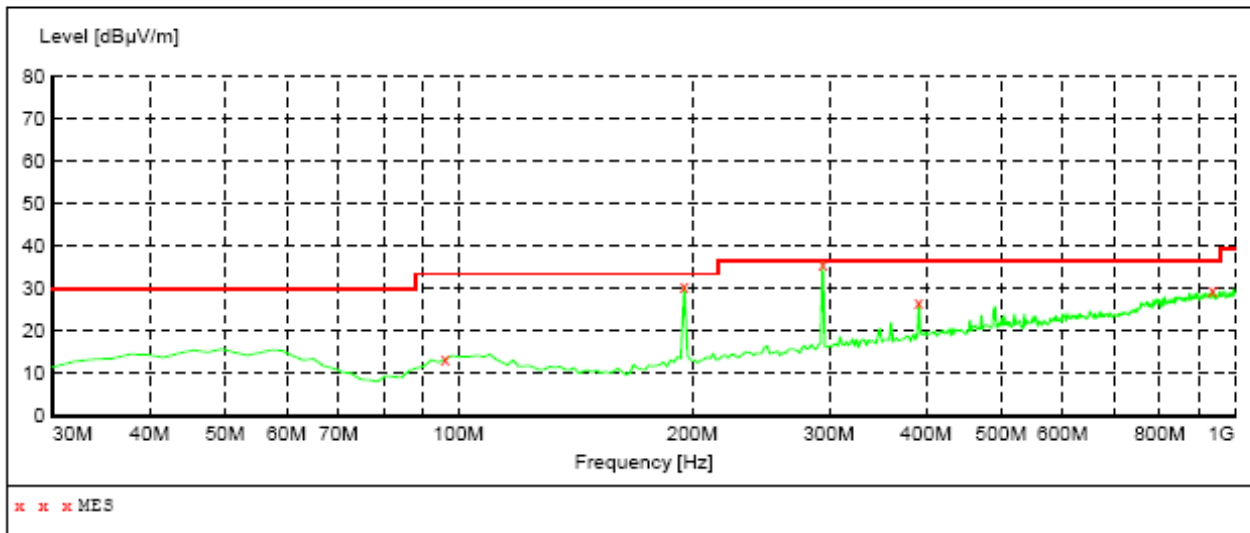
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
55.270541	16.00	-10.8	30.0	14.0	---	200.0	28.00	VERTICAL
175.791583	24.50	-14.6	33.5	9.0	---	100.0	294.00	VERTICAL
265.210421	24.20	-10.5	36.5	12.3	---	100.0	243.00	VERTICAL
770.621242	33.50	-0.9	36.5	3.0	---	200.0	12.00	VERTICAL
790.060120	32.20	-0.8	36.5	4.3	---	200.0	2.00	VERTICAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: FM Receive Channel Middle
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

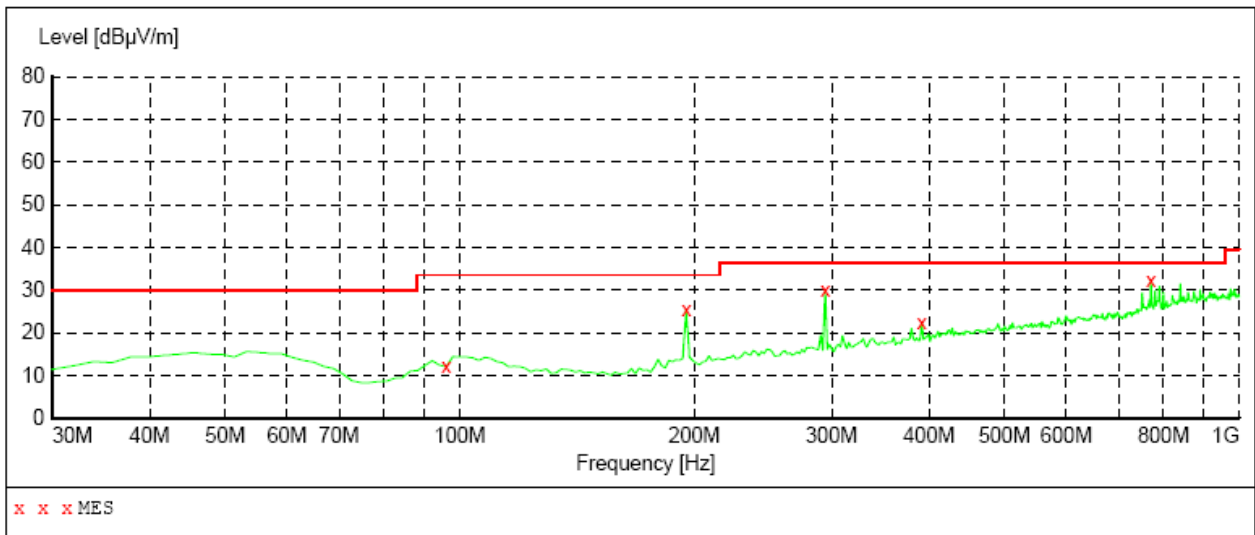
Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
96.092184	13.40	-12.8	33.5	20.1	---	200.0	304.00	HORIZONTAL
195.230461	30.70	-12.4	33.5	2.8	---	200.0	297.00	HORIZONTAL
294.368737	36.00	-9.4	36.5	0.5	---	200.0	268.00	HORIZONTAL
391.563126	26.60	-7.7	36.5	9.9	---	200.0	126.00	HORIZONTAL
935.851703	29.50	1.2	36.5	7.0	---	100.0	218.00	HORIZONTAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: FM Receive Channel Middle
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

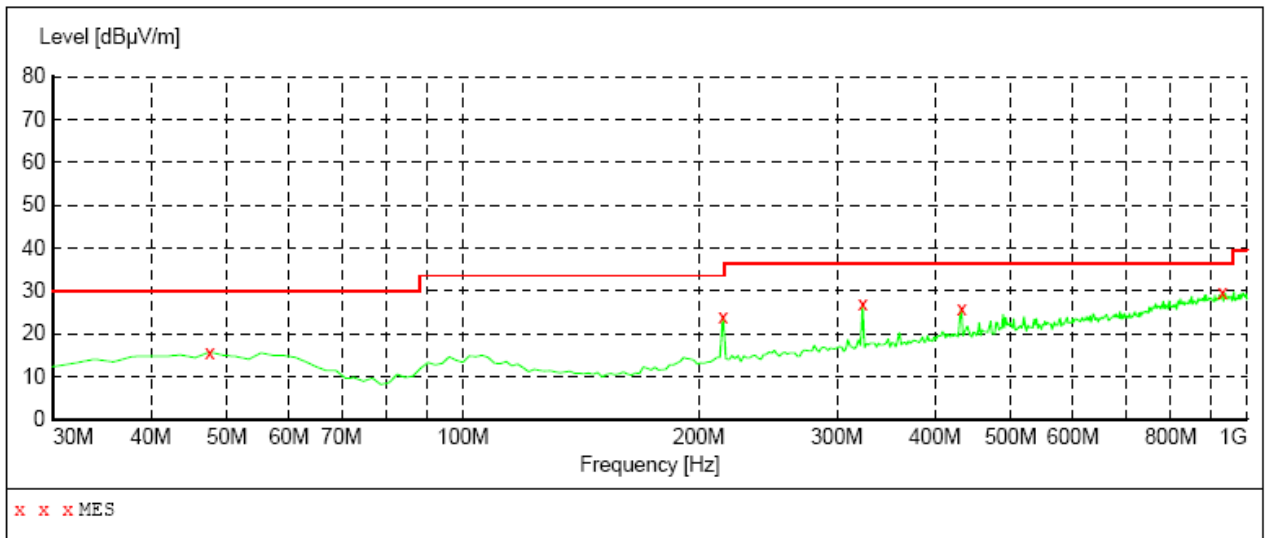
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
96.092184	12.00	-12.8	33.5	21.5	---	100.0	247.00	VERTICAL
195.230461	25.50	-12.4	33.5	8.0	---	100.0	291.00	VERTICAL
294.368737	29.90	-9.4	36.5	6.6	---	100.0	254.00	VERTICAL
391.563126	22.50	-7.7	36.5	14.0	---	100.0	226.00	VERTICAL
770.621242	32.20	-0.9	36.5	4.3	---	200.0	0.00	VERTICAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: FM Receive Channel High
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

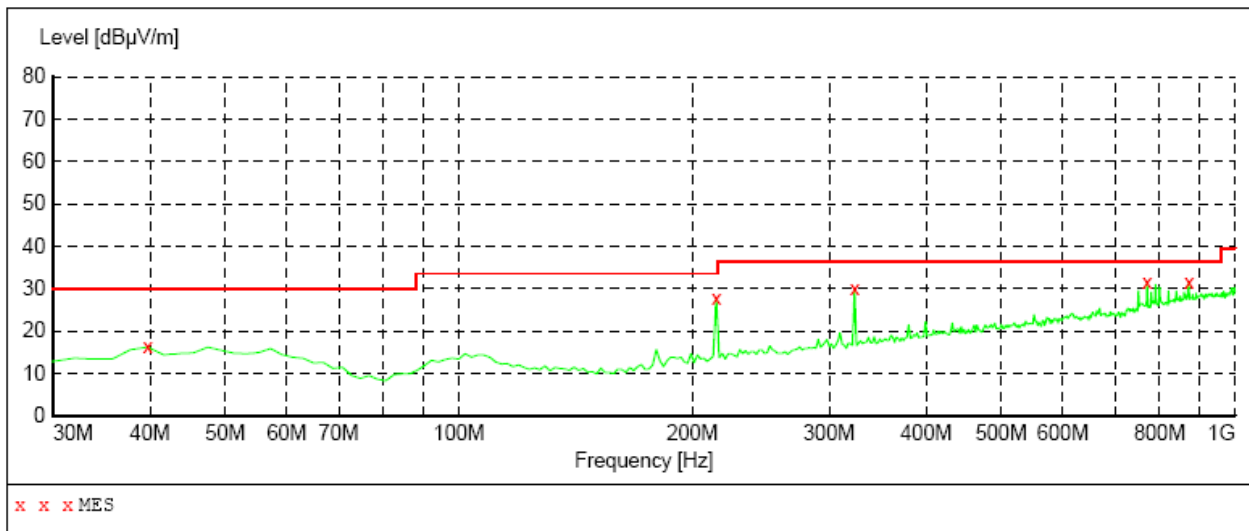
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
47.494990	15.70	-11.1	30.0	14.3	---	200.0	126.00	HORIZONTAL
214.669339	24.00	-12.2	33.5	9.5	---	200.0	280.00	HORIZONTAL
323.527054	26.80	-8.8	36.5	9.7	---	200.0	265.00	HORIZONTAL
432.384770	25.80	-6.8	36.5	10.7	---	200.0	163.00	HORIZONTAL
930.020040	29.70	1.3	36.5	6.8	---	100.0	357.00	HORIZONTAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: FM Receive Channel High
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

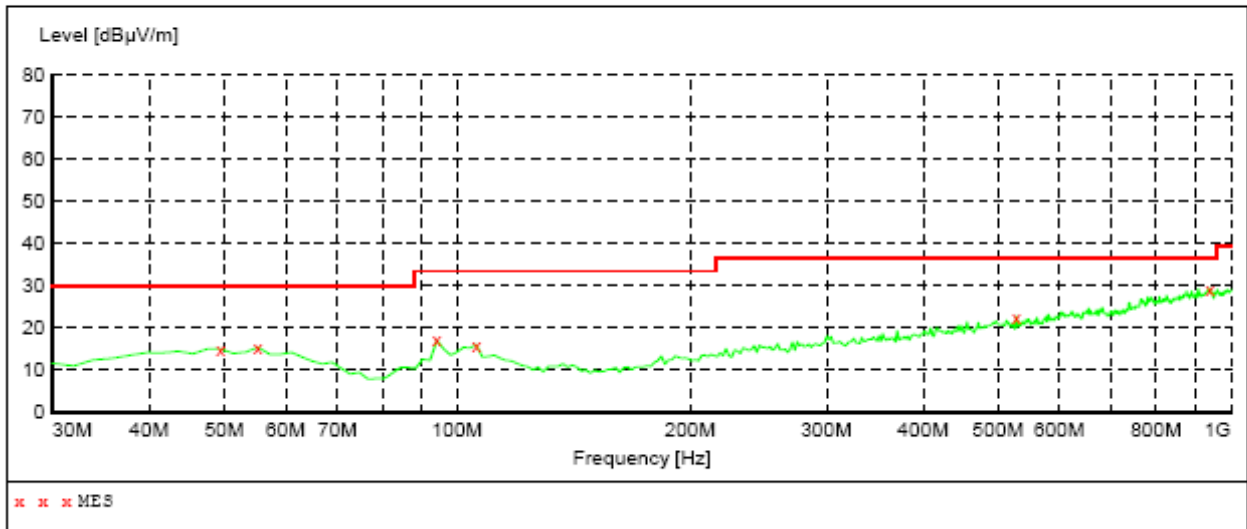
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
39.719439	16.20	-11.8	30.0	13.8	---	100.0	354.00	VERTICAL
214.669339	27.80	-12.2	33.5	5.7	---	100.0	254.00	VERTICAL
323.527054	30.00	-8.8	36.5	6.5	---	100.0	234.00	VERTICAL
770.621242	31.70	-0.9	36.5	4.8	---	200.0	13.00	VERTICAL
871.703407	31.70	0.5	36.5	4.8	---	200.0	360.00	VERTICAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel Low
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

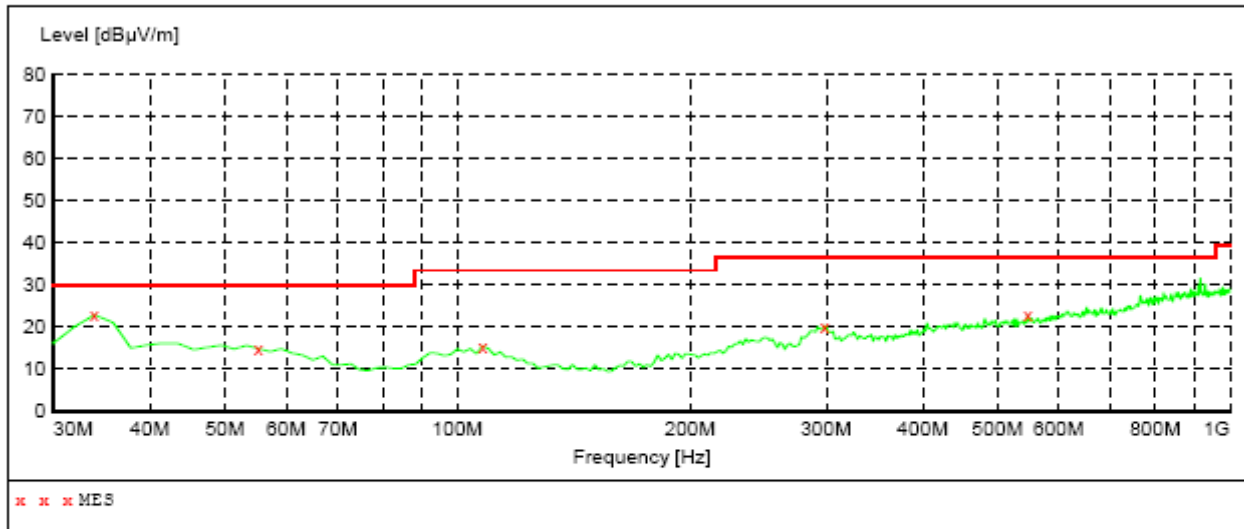
Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
49.438878	15.10	-11.1	30.0	14.9	---	100.0	364.00	HORIZONTAL
55.270541	15.50	-10.8	30.0	14.5	---	100.0	165.00	HORIZONTAL
94.148297	17.10	-13.3	33.5	16.4	---	100.0	93.00	HORIZONTAL
105.811623	16.10	-12.3	33.5	17.4	---	100.0	57.00	HORIZONTAL
527.635271	22.70	-5.7	36.5	13.8	---	100.0	366.00	HORIZONTAL
937.795591	29.40	1.1	36.5	7.1	---	100.0	288.00	HORIZONTAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel Low
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

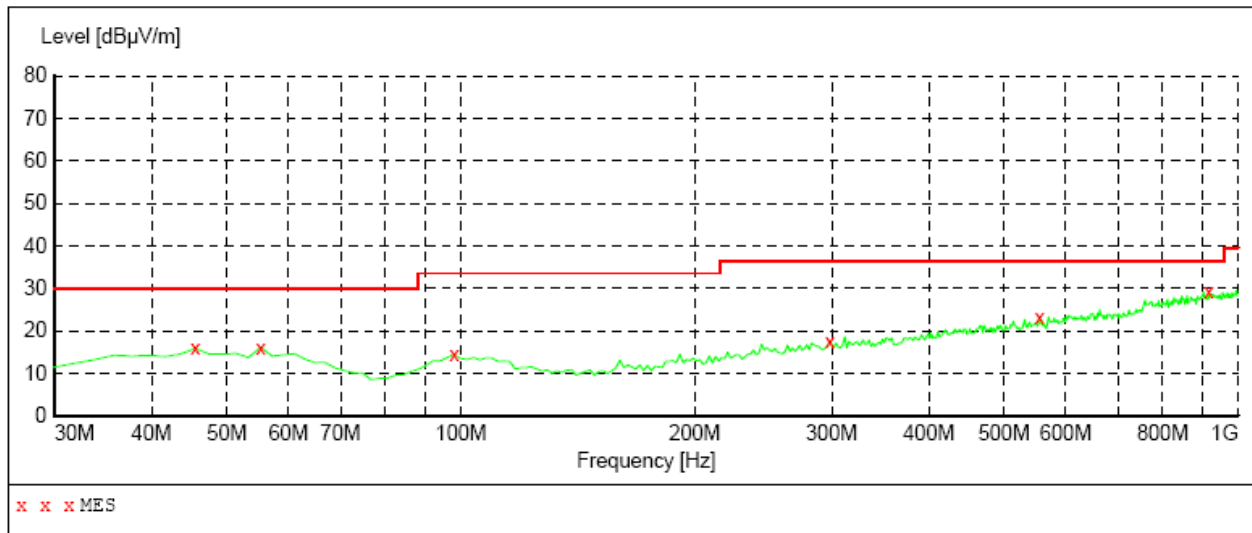
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
33.887776	22.90	-13.0	30.0	7.1	---	100.0	368.00	VERTICAL
55.270541	14.90	-10.8	30.0	15.1	---	100.0	142.00	VERTICAL
107.755511	15.60	-12.4	33.5	17.9	---	100.0	10.00	VERTICAL
298.256513	20.40	-9.3	36.5	16.1	---	100.0	179.00	VERTICAL
547.074148	22.80	-5.4	36.5	13.7	---	100.0	114.00	VERTICAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel Middle
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

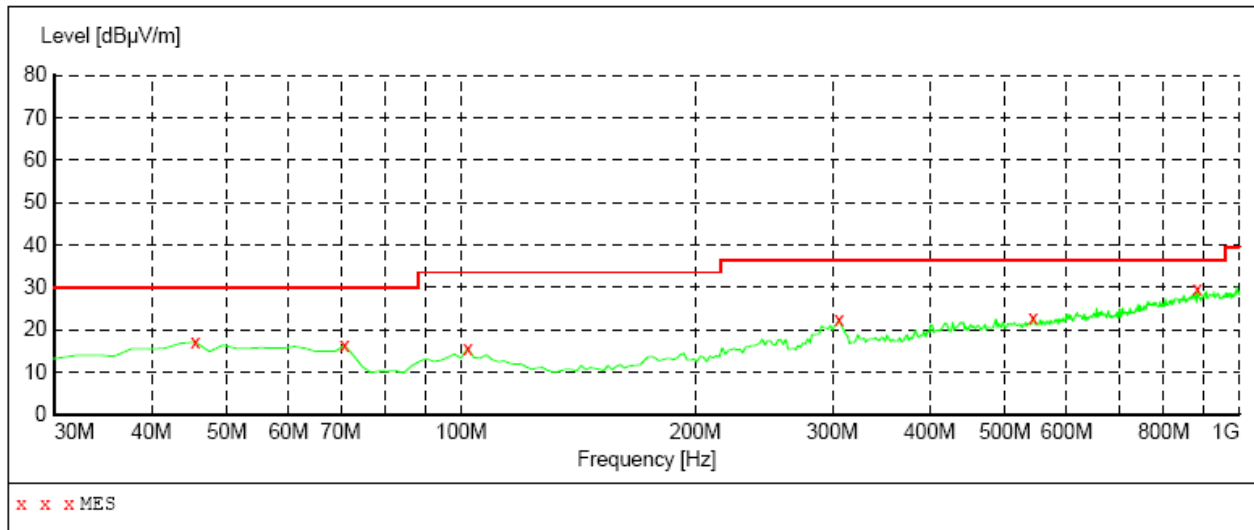
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.551102	15.90	-11.2	30.0	14.1	---	100.0	73.00	HORIZONTAL
55.270541	16.10	-10.8	30.0	13.9	---	100.0	174.00	HORIZONTAL
98.036072	14.40	-12.6	33.5	19.1	---	100.0	10.00	HORIZONTAL
298.256513	17.70	-9.3	36.5	18.8	---	100.0	160.00	HORIZONTAL
554.849699	23.20	-5.3	36.5	13.3	---	100.0	174.00	HORIZONTAL
916.412826	29.20	1.2	36.5	7.3	---	100.0	346.00	HORIZONTAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel Middle
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

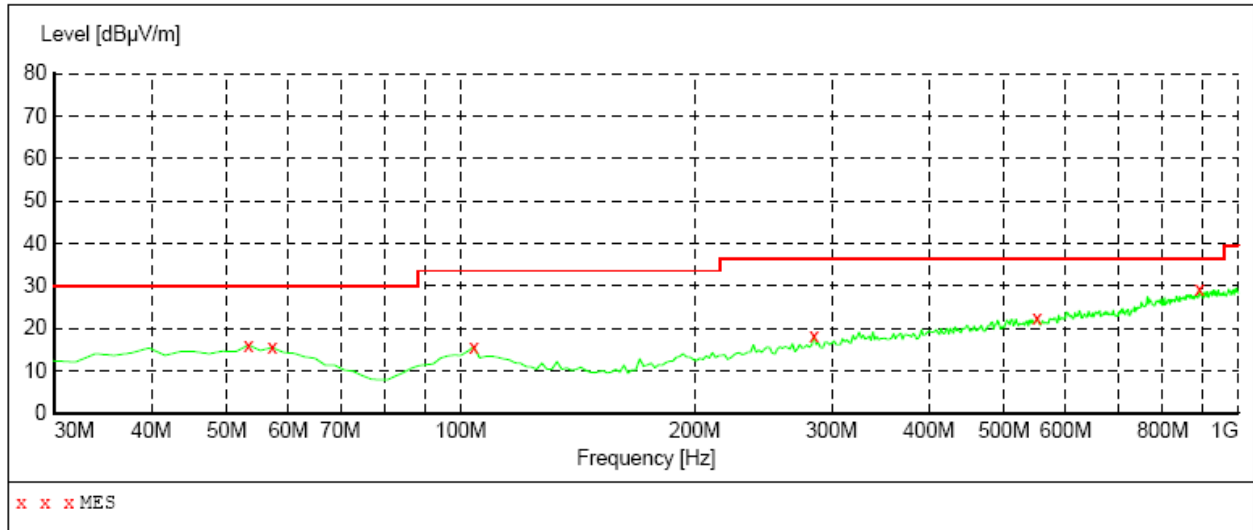
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.551102	17.10	-11.2	30.0	12.9	---	100.0	122.00	VERTICAL
70.821643	16.30	-15.8	30.0	13.7	---	100.0	51.00	VERTICAL
101.923848	15.60	-12.3	33.5	17.9	---	100.0	300.00	VERTICAL
306.032064	22.40	-9.2	36.5	14.1	---	100.0	355.00	VERTICAL
543.186373	22.90	-5.4	36.5	13.6	---	100.0	157.00	VERTICAL
883.366733	29.50	0.7	36.5	7.0	---	100.0	351.00	VERTICAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel High
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

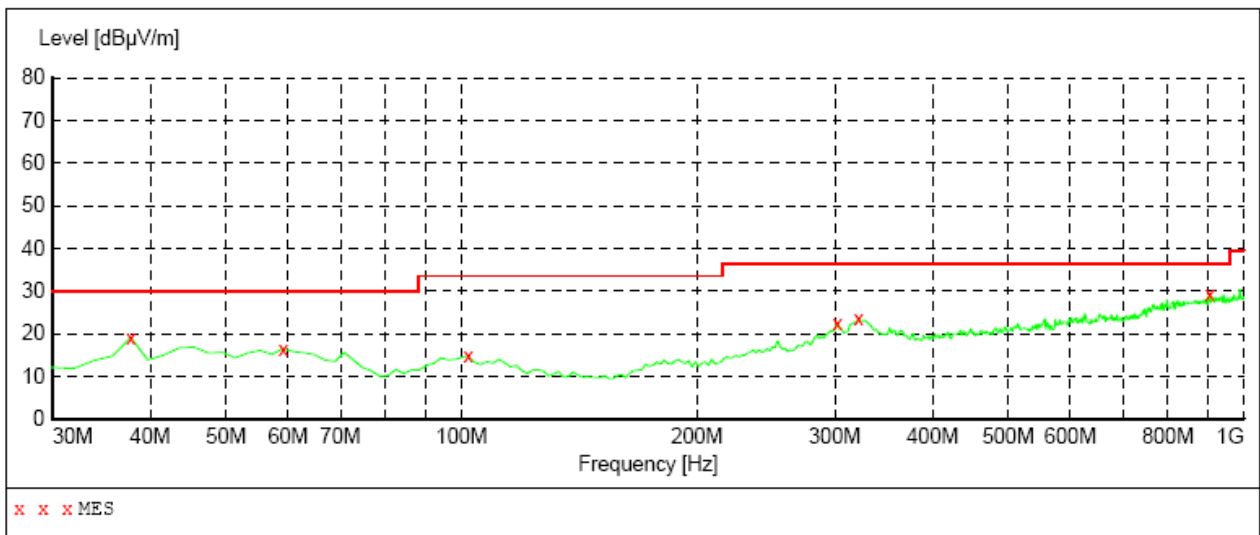
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.326653	16.10	-11.5	30.0	13.9	---	100.0	355.00	HORIZONTAL
57.214429	15.50	-10.8	30.0	14.5	---	100.0	273.00	HORIZONTAL
103.867735	15.60	-12.2	33.5	17.9	---	100.0	309.00	HORIZONTAL
284.649299	18.30	-9.6	36.5	18.2	---	100.0	223.00	HORIZONTAL
550.961924	22.30	-5.4	36.5	14.2	---	100.0	309.00	HORIZONTAL
891.142285	29.40	0.8	36.5	7.1	---	100.0	215.00	HORIZONTAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel High
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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

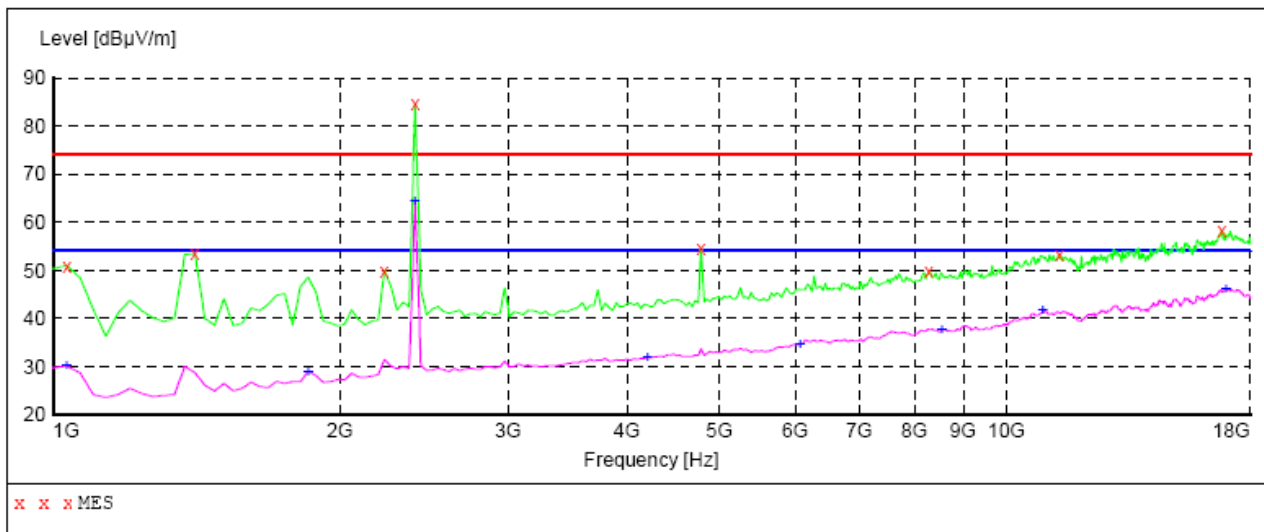


MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
37.775551	19.20	-12.1	30.0	10.8	---	100.0	368.00	VERTICAL
59.158317	16.50	-11.3	30.0	13.5	---	100.0	187.00	VERTICAL
101.923848	14.80	-12.3	33.5	18.7	---	100.0	165.00	VERTICAL
302.144289	22.50	-9.3	36.5	14.0	---	100.0	165.00	VERTICAL
321.583166	23.60	-8.9	36.5	12.9	---	100.0	165.00	VERTICAL
904.749499	29.10	1.0	36.5	7.4	---	100.0	223.00	VERTICAL

The Spurious Emission (Above 1GHz) Of Horizontal (BT TX Model L)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel Low
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%



MEASUREMENT RESULT:

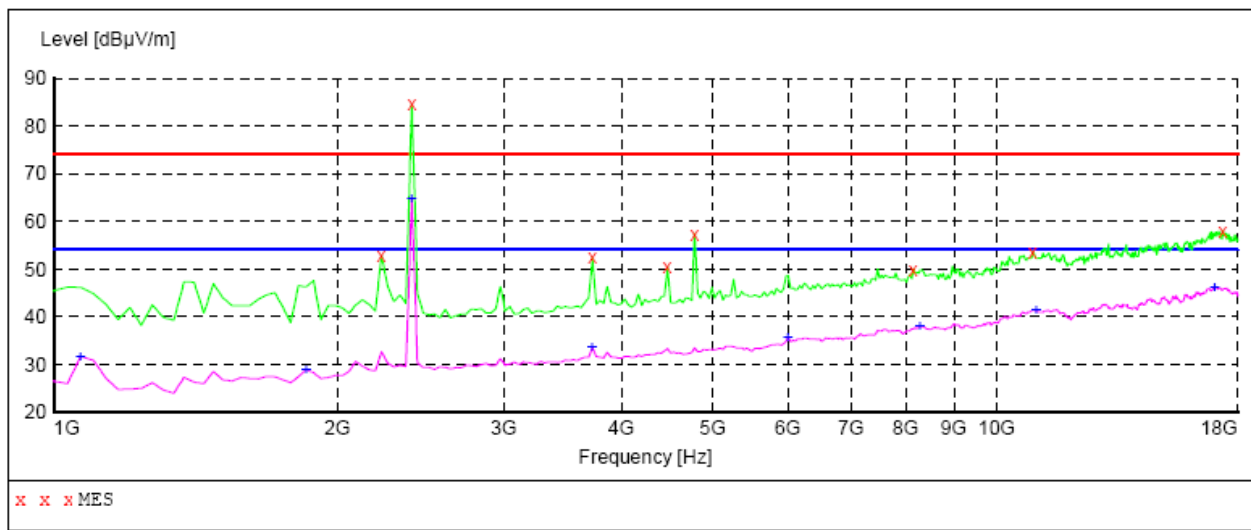
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1034.068136	51.00	-14.3	74.0	23.0	PK	100.0	135.00	HORIZONTAL
1408.817635	53.40	-13.5	74.0	20.6	PK	100.0	146.00	HORIZONTAL
2226.452906	49.90	-8.9	74.0	24.1	PK	100.0	207.00	HORIZONTAL
4781.563126	54.70	-4.8	74.0	19.3	PK	100.0	196.00	HORIZONTAL
8290.581162	49.70	-0.6	74.0	24.3	PK	100.0	83.00	HORIZONTAL
11356.713427	53.20	3.3	74.0	20.8	PK	100.0	40.00	HORIZONTAL
16807.615230	58.30	10.1	74.0	15.7	PK	100.0	217.00	HORIZONTAL

MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1034.068136	30.10	-14.3	54.0	23.9	AV	100.0	135.00	HORIZONTAL
1851.703407	29.00	-10.8	54.0	25.0	AV	100.0	124.00	HORIZONTAL
4202.404810	31.90	-5.6	54.0	22.1	AV	100.0	27.00	HORIZONTAL
6076.152305	34.70	-2.9	54.0	19.3	AV	100.0	177.00	HORIZONTAL
8563.126253	37.80	-0.5	54.0	16.2	AV	100.0	135.00	HORIZONTAL
10913.827655	41.60	3.2	54.0	12.4	AV	100.0	135.00	HORIZONTAL
16977.955912	46.20	10.3	54.0	7.8	AV	100.0	72.00	HORIZONTAL

The Spurious Emission (Above 1GHz) Of Vertical (BT TX Model L)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel Low
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%



MEASUREMENT RESULT:

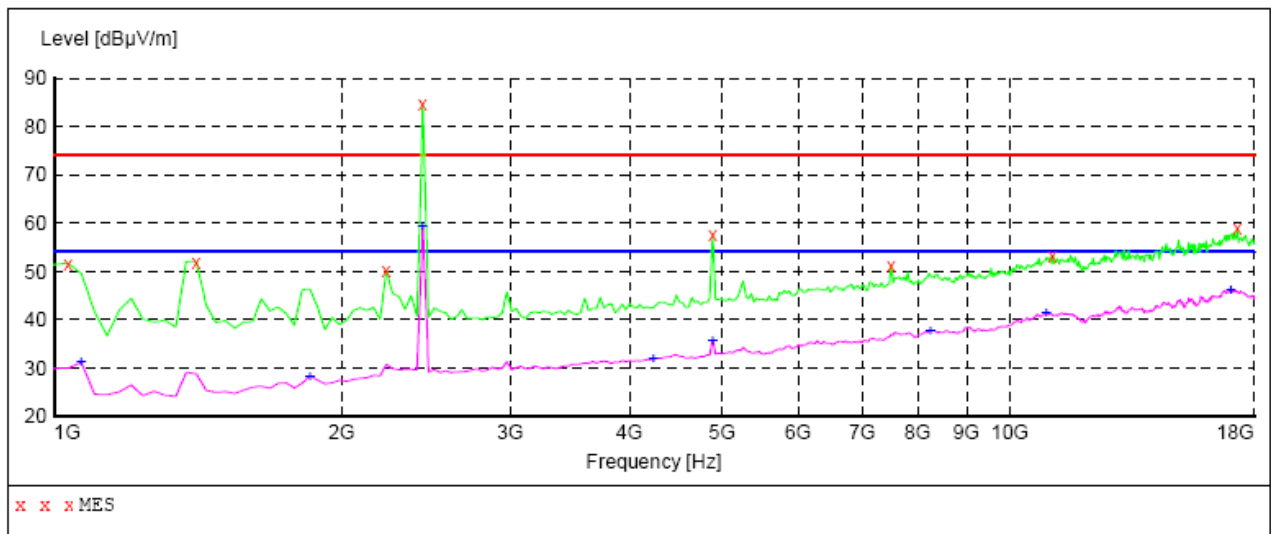
Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
2226.452906	52.80	-8.9	74.0	21.2	PK	100.0	182.00	VERTICAL
3725.450902	52.40	-6.3	74.0	21.6	PK	100.0	182.00	VERTICAL
4474.949900	50.40	-5.1	74.0	23.6	PK	100.0	206.00	VERTICAL
4781.563126	57.40	-4.8	74.0	16.6	PK	100.0	55.00	VERTICAL
8154.308617	50.00	-0.7	74.0	24.0	PK	100.0	172.00	VERTICAL
10913.827655	53.70	3.2	74.0	20.3	PK	100.0	87.00	VERTICAL
17352.705411	58.00	9.9	74.0	16.0	PK	100.0	366.00	VERTICAL

MEASUREMENT RESULT:

Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1068.136273	31.60	-14.2	54.0	22.4	AV	100.0	193.00	VERTICAL
1851.703407	28.80	-10.8	54.0	25.2	AV	100.0	161.00	VERTICAL
3725.450902	33.60	-6.3	54.0	20.4	AV	100.0	182.00	VERTICAL
6008.016032	35.80	-3.0	54.0	18.2	AV	100.0	161.00	VERTICAL
8290.581162	37.90	-0.6	54.0	16.1	AV	100.0	118.00	VERTICAL
11016.032064	41.50	3.4	54.0	12.5	AV	100.0	140.00	VERTICAL
17012.024048	46.30	10.3	54.0	7.7	AV	100.0	97.00	VERTICAL

The Spurious Emission (Above 1GHz) Of Horizontal (BT TX Model M)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel Middle
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%



MEASUREMENT RESULT:

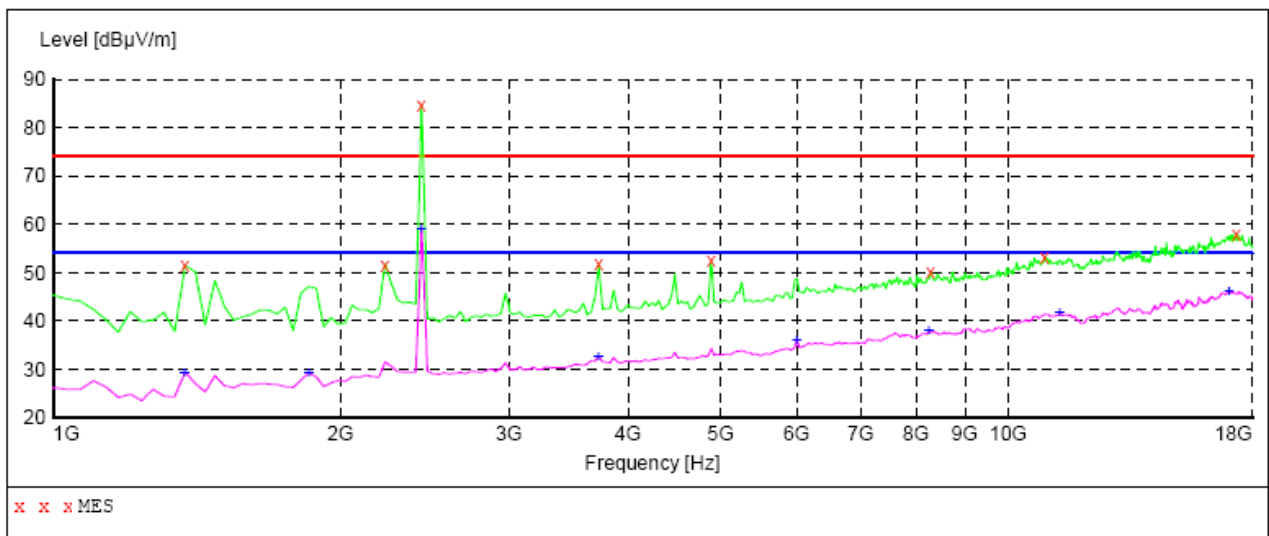
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1034.068136	51.70	-14.3	74.0	22.3	PK	100.0	166.00	HORIZONTAL
1408.817635	52.00	-13.5	74.0	22.0	PK	100.0	124.00	HORIZONTAL
2226.452906	50.10	-8.9	74.0	23.9	PK	100.0	198.00	HORIZONTAL
4883.767535	57.50	-4.8	74.0	16.5	PK	100.0	113.00	HORIZONTAL
7507.014028	51.20	-1.4	74.0	22.8	PK	100.0	177.00	HORIZONTAL
11084.168337	53.30	3.4	74.0	20.7	PK	100.0	187.00	HORIZONTAL
17284.569138	58.90	10.0	74.0	15.1	PK	100.0	166.00	HORIZONTAL

MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1068.136273	31.10	-14.2	54.0	22.9	AV	100.0	124.00	HORIZONTAL
1851.703407	28.30	-10.8	54.0	25.7	AV	100.0	145.00	HORIZONTAL
4236.472946	31.80	-5.5	54.0	22.2	AV	100.0	101.00	HORIZONTAL
4883.767535	35.80	-4.8	54.0	18.2	AV	100.0	113.00	HORIZONTAL
8256.513026	37.70	-0.6	54.0	16.3	AV	100.0	240.00	HORIZONTAL
10913.827655	41.50	3.2	54.0	12.5	AV	100.0	366.00	HORIZONTAL
17012.024048	46.10	10.3	54.0	7.9	AV	100.0	271.00	HORIZONTAL

The Spurious Emission (Above 1GHz) Of Vertical (BT TX Model M)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel Middle
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%



MEASUREMENT RESULT:

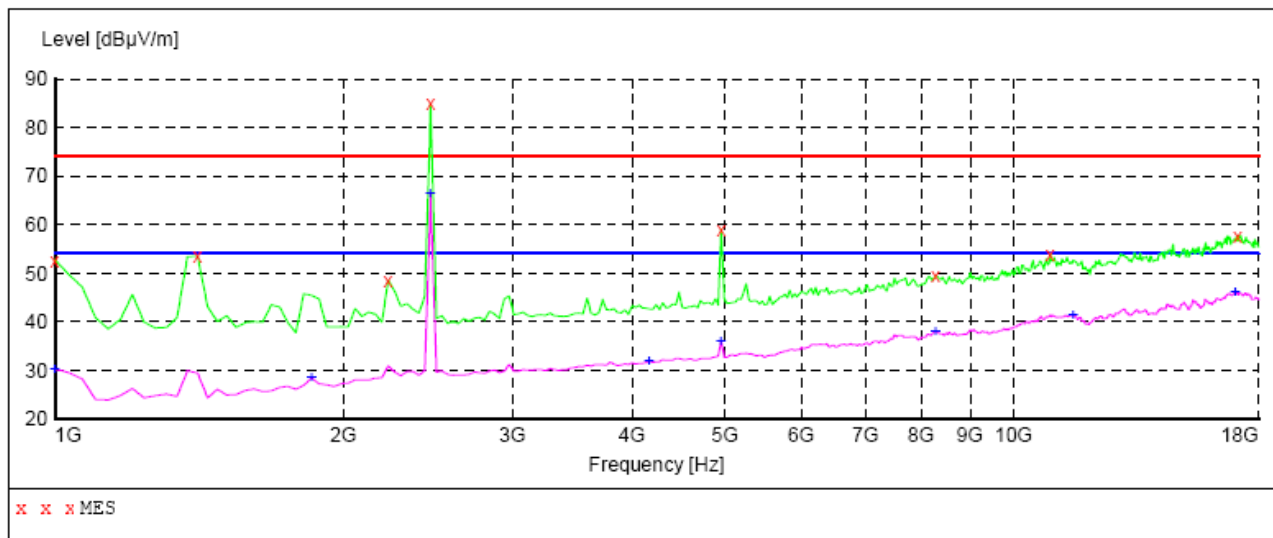
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1374.749499	51.40	-13.5	74.0	22.6	PK	100.0	145.00	VERTICAL
2226.452906	51.70	-8.9	74.0	22.3	PK	100.0	188.00	VERTICAL
3725.450902	51.80	-6.3	74.0	22.2	PK	100.0	177.00	VERTICAL
4883.767535	52.50	-4.8	74.0	21.5	PK	100.0	71.00	VERTICAL
8290.581162	50.10	-0.6	74.0	23.9	PK	100.0	177.00	VERTICAL
10913.827655	53.30	3.2	74.0	20.7	PK	100.0	284.00	VERTICAL
17318.637275	57.90	10.0	74.0	16.1	PK	100.0	28.00	VERTICAL

MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1374.749499	29.30	-13.5	54.0	24.7	AV	100.0	145.00	VERTICAL
1851.703407	29.10	-10.8	54.0	24.9	AV	100.0	145.00	VERTICAL
3725.450902	32.70	-6.3	54.0	21.3	AV	100.0	177.00	VERTICAL
6008.016032	36.10	-3.0	54.0	17.9	AV	100.0	156.00	VERTICAL
8256.513026	37.90	-0.6	54.0	16.1	AV	100.0	177.00	VERTICAL
11322.645291	41.70	3.3	54.0	12.3	AV	100.0	49.00	VERTICAL
17012.024048	46.20	10.3	54.0	7.8	AV	100.0	134.00	VERTICAL

The Spurious Emission (Above 1GHz) Of Horizontal (BT TX Model H)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel High
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%



MEASUREMENT RESULT:

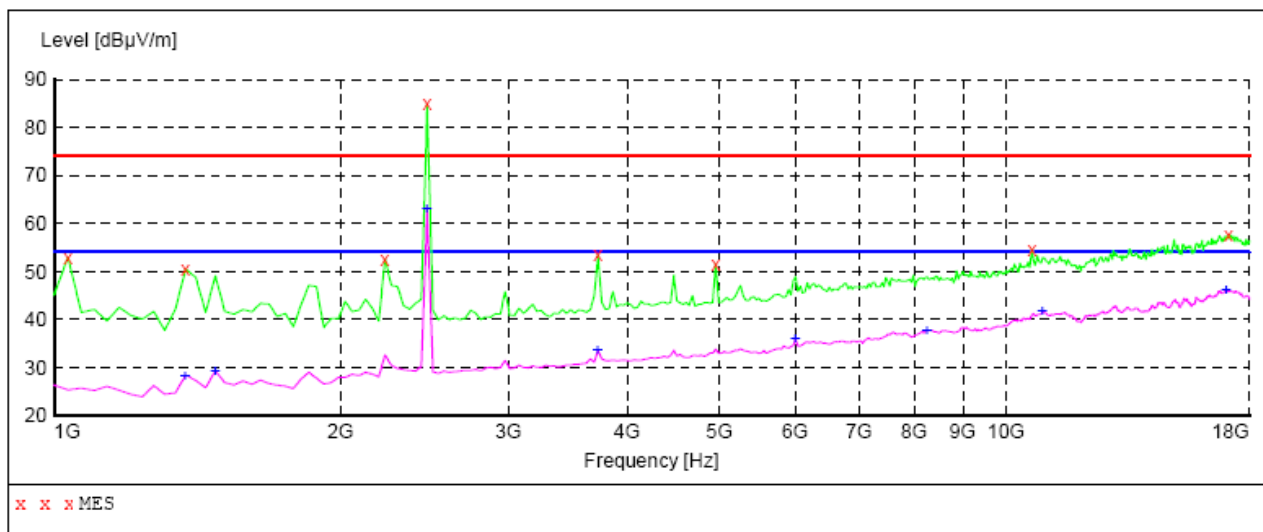
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1000.000000	52.70	-14.4	74.0	21.3	PK	100.0	123.00	HORIZONTAL
1408.817635	53.40	-13.5	74.0	20.6	PK	100.0	155.00	HORIZONTAL
2226.452906	48.50	-8.9	74.0	25.5	PK	100.0	207.00	HORIZONTAL
4951.903808	59.10	-4.7	74.0	14.9	PK	100.0	113.00	HORIZONTAL
8290.581162	49.40	-0.6	74.0	24.6	PK	100.0	92.00	HORIZONTAL
10913.827655	54.00	3.2	74.0	20.0	PK	100.0	155.00	HORIZONTAL
17114.228457	57.80	10.2	74.0	16.2	PK	100.0	145.00	HORIZONTAL

MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1000.000000	30.20	-14.4	54.0	23.8	AV	100.0	135.00	HORIZONTAL
1851.703407	28.40	-10.8	54.0	25.6	AV	100.0	145.00	HORIZONTAL
4168.336673	31.80	-5.6	54.0	22.2	AV	100.0	167.00	HORIZONTAL
4951.903808	36.00	-4.7	54.0	18.0	AV	100.0	113.00	HORIZONTAL
8290.581162	37.90	-0.6	54.0	16.1	AV	100.0	38.00	HORIZONTAL
11527.054108	41.40	3.2	54.0	12.6	AV	100.0	80.00	HORIZONTAL
17012.024048	46.00	10.3	54.0	8.0	AV	100.0	324.00	HORIZONTAL

The Spurious Emission (Above 1GHz) Of Vertical (BT TX Model H)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT TX Channel High
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%



MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1034.068136	52.90	-14.3	74.0	21.1	PK	100.0	276.00	VERTICAL
1374.749499	50.50	-13.5	74.0	23.5	PK	100.0	147.00	VERTICAL
2226.452906	52.50	-8.9	74.0	21.5	PK	100.0	179.00	VERTICAL
3725.450902	53.40	-6.3	74.0	20.6	PK	100.0	179.00	VERTICAL
4951.903808	51.60	-4.7	74.0	22.4	PK	100.0	18.00	VERTICAL
10641.282565	54.50	2.4	74.0	19.5	PK	100.0	82.00	VERTICAL
17114.228457	57.60	10.2	74.0	16.4	PK	100.0	361.00	VERTICAL

MEASUREMENT RESULT:

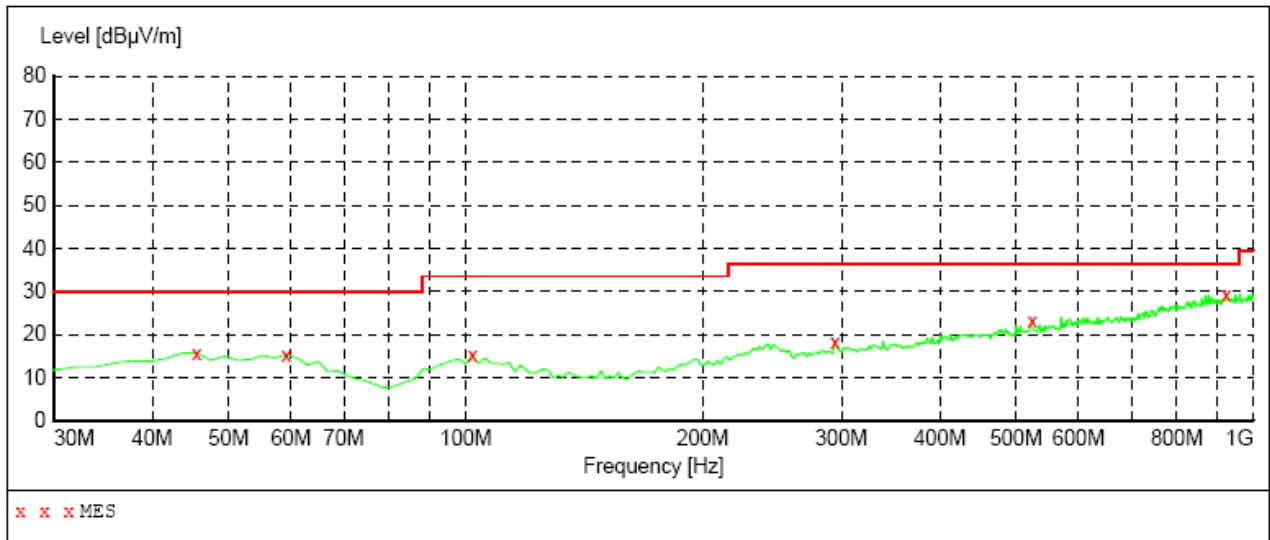
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1374.749499	28.30	-13.5	54.0	25.7	AV	100.0	147.00	VERTICAL
1476.953908	29.30	-13.3	54.0	24.7	AV	100.0	147.00	VERTICAL
3725.450902	33.60	-6.3	54.0	20.4	AV	100.0	179.00	VERTICAL
6008.016032	35.90	-3.0	54.0	18.1	AV	100.0	158.00	VERTICAL
8256.513026	37.70	-0.6	54.0	16.3	AV	100.0	254.00	VERTICAL
10913.827655	41.60	3.2	54.0	12.4	AV	100.0	39.00	VERTICAL
17012.024048	46.10	10.3	54.0	7.9	AV	100.0	361.00	VERTICAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT Receive Model
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%

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

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



MEASUREMENT RESULT:

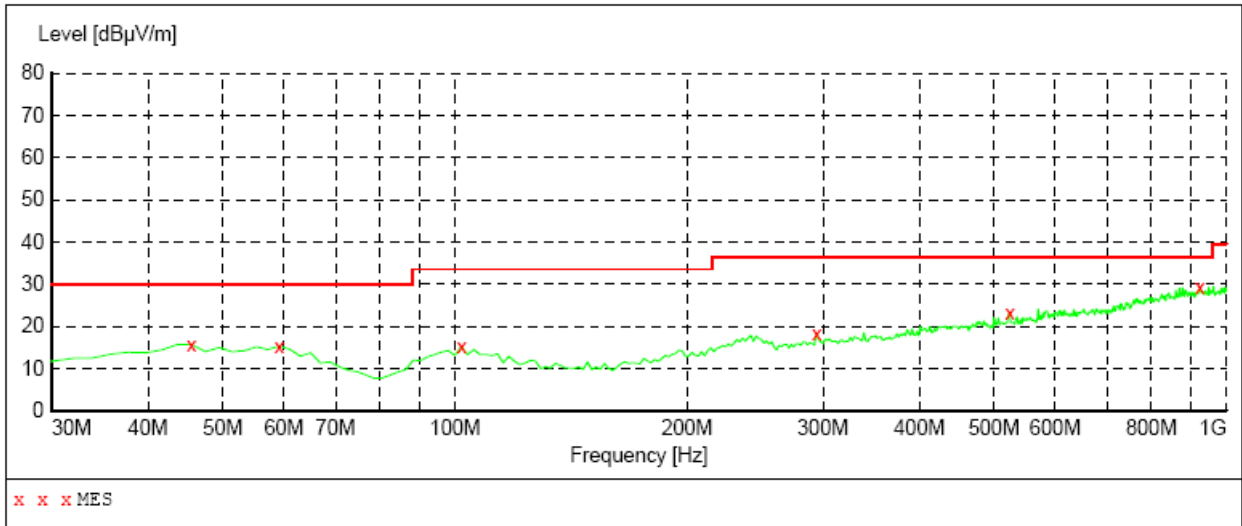
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.551102	15.70	-11.2	30.0	14.3	---	100.0	39.00	HORIZONTAL
59.158317	15.30	-11.3	30.0	14.7	---	100.0	10.00	HORIZONTAL
101.923848	15.20	-12.3	33.5	18.3	---	100.0	146.00	HORIZONTAL
294.368737	18.30	-9.4	36.5	18.2	---	100.0	211.00	HORIZONTAL
523.747495	23.20	-5.7	36.5	13.3	---	100.0	357.00	HORIZONTAL
924.188377	29.40	1.3	36.5	7.1	---	100.0	67.00	HORIZONTAL

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

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT Receive Model
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%

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

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

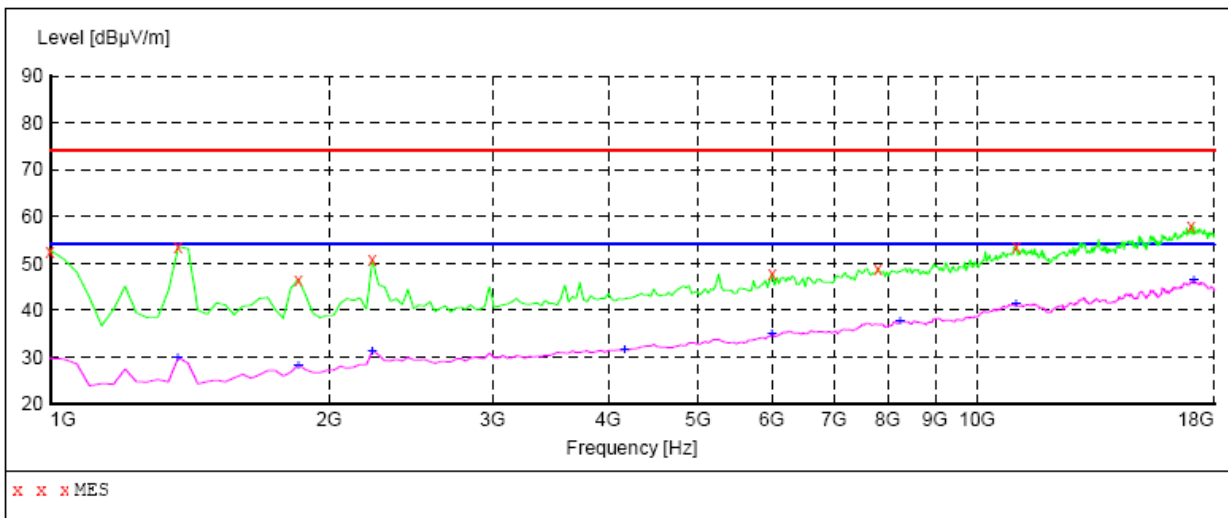


MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
45.551102	15.70	-11.2	30.0	14.3	---	100.0	39.00	HORIZONTAL
59.158317	15.30	-11.3	30.0	14.7	---	100.0	10.00	HORIZONTAL
101.923848	15.20	-12.3	33.5	18.3	---	100.0	146.00	HORIZONTAL
294.368737	18.30	-9.4	36.5	18.2	---	100.0	211.00	HORIZONTAL
523.747495	23.20	-5.7	36.5	13.3	---	100.0	357.00	HORIZONTAL
924.188377	29.40	1.3	36.5	7.1	---	100.0	67.00	HORIZONTAL

The Spurious Emission (Above 1GHz) Of Horizontal (BT Receive Model)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT Receive model
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Horizontal
Tem:23°C Hum:50%



MEASUREMENT RESULT:

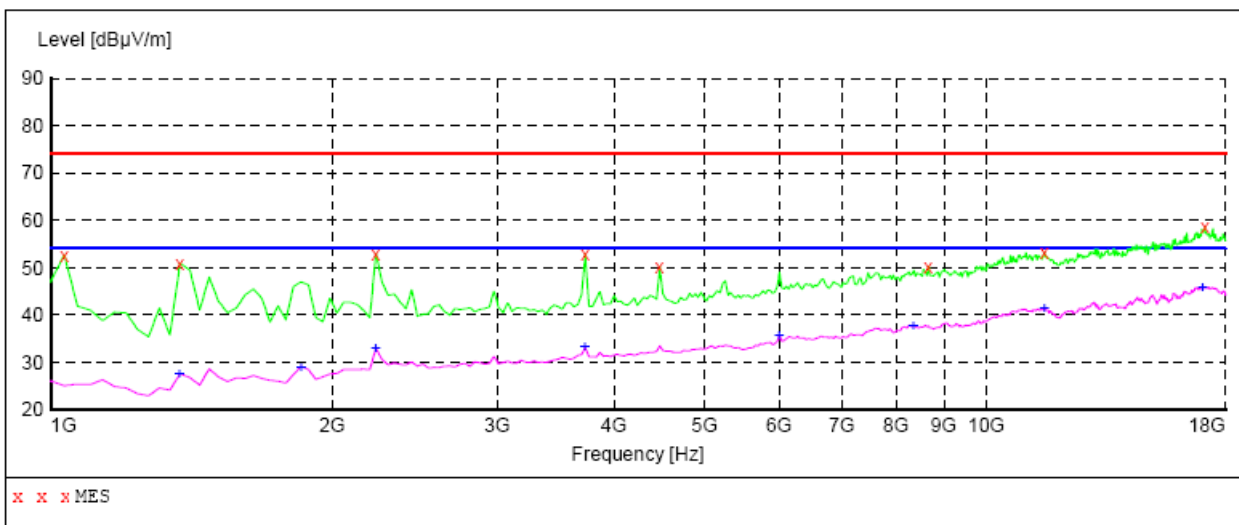
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1000.000000	52.70	-14.4	74.0	21.3	PK	100.0	129.00	HORIZONTAL
1374.749499	53.50	-13.5	74.0	20.5	PK	100.0	139.00	HORIZONTAL
1851.703407	46.60	-10.8	74.0	27.4	PK	100.0	129.00	HORIZONTAL
2226.452906	50.70	-8.9	74.0	23.3	PK	100.0	205.00	HORIZONTAL
6008.016032	47.90	-3.0	74.0	26.1	PK	100.0	150.00	HORIZONTAL
7813.627255	48.90	-1.0	74.0	25.1	PK	100.0	279.00	HORIZONTAL
11016.032064	53.40	3.4	74.0	20.6	PK	100.0	10.00	HORIZONTAL
17012.024048	58.00	10.3	74.0	16.0	PK	100.0	183.00	HORIZONTAL

MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1374.749499	29.90	-13.5	54.0	24.1	AV	100.0	139.00	HORIZONTAL
1851.703407	28.30	-10.8	54.0	25.7	AV	100.0	139.00	HORIZONTAL
2226.452906	31.30	-8.9	54.0	22.7	AV	100.0	205.00	HORIZONTAL
4168.336673	31.70	-5.6	54.0	22.3	AV	100.0	312.00	HORIZONTAL
6008.016032	35.10	-3.0	54.0	18.9	AV	100.0	150.00	HORIZONTAL
8256.513026	37.70	-0.6	54.0	16.3	AV	100.0	333.00	HORIZONTAL
11016.032064	41.30	3.4	54.0	12.7	AV	100.0	290.00	HORIZONTAL
17114.228457	46.40	10.2	54.0	7.6	AV	100.0	312.00	HORIZONTAL

The Spurious Emission (Above 1GHz) Of Vertical (BT Receive Model)

EUT: Bluetooth Headset
M/N: DT120S
Operating Condition: BT Receive model
Test Site: 10m CHAMBER
Operator: Owen Li
Test Specification: DC3.7V
Comment: Polarization: Vertical
Tem:23°C Hum:50%



MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1034.068136	52.70	-14.3	74.0	21.3	PK	100.0	101.00	VERTICAL
1374.749499	50.90	-13.5	74.0	23.1	PK	100.0	146.00	VERTICAL
2226.452906	52.90	-8.9	74.0	21.1	PK	100.0	188.00	VERTICAL
3725.450902	52.90	-6.3	74.0	21.1	PK	100.0	177.00	VERTICAL
4474.949900	50.20	-5.1	74.0	23.8	PK	100.0	210.00	VERTICAL
8665.330661	50.30	-0.4	74.0	23.7	PK	100.0	146.00	VERTICAL
11527.054108	53.20	3.2	74.0	20.8	PK	100.0	296.00	VERTICAL
17114.228457	58.60	10.2	74.0	15.4	PK	100.0	68.00	VERTICAL

MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1374.749499	27.50	-13.5	54.0	26.5	AV	100.0	146.00	VERTICAL
1851.703407	29.00	-10.8	54.0	25.0	AV	100.0	146.00	VERTICAL
2226.452906	32.90	-8.9	54.0	21.1	AV	100.0	188.00	VERTICAL
3725.450902	33.10	-6.3	54.0	20.9	AV	100.0	177.00	VERTICAL
6008.016032	35.80	-3.0	54.0	18.2	AV	100.0	156.00	VERTICAL
8358.717435	37.80	-0.6	54.0	16.2	AV	100.0	285.00	VERTICAL
11527.054108	41.30	3.2	54.0	12.7	AV	100.0	124.00	VERTICAL
17012.024048	45.90	10.3	54.0	8.1	AV	100.0	317.00	VERTICAL

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 Standard. The maximum Gain of the antenna lower than 6.0dBi and the antenna is integrated, fixed on PCB.