

FCC TEST REPORT(Bluetooth)
for
ASKA ELECTRONICS CO., LIMITED
Bluetooth Headphone

Model Number : F8

FCC ID: 2ACXHF8

Prepared for : ASKA ELECTRONICS CO., LIMITED
Address : ROOM A 11/F HO LEE COMMERCIAL BUILDING
38-44 D' AGUILAR STREET CENTRAL HK

Prepared by : Keyway Testing Technology Co., Ltd.
Address : Building 1, Baishun Industrial Zone, Zhangmutou Town,
Dongguan, Guangdong, China

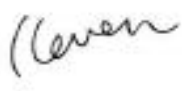
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Report No. : 16KWE124829F
Date of Test : Dec. 14~20, 2016
Date of Report : Dec. 21, 2016

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Keyway Testing Technology Co., Ltd.

Applicant:	ASKA ELECTRONICS CO., LIMITED		
Address:	ROOM A 11/F HO LEE COMMERCIAL BUILDING 38-44 D' AGUILAR STREET CENTRAL HK		
Manufacturer:	ASKA ELECTRONICS CO., LIMITED		
Address:	3F,building 19#,Road Da Ling Bian, Shahu Community,Tangxia Town,Dongguan, China		
E.U.T:	Bluetooth Headphone		
Model Number:	F8		
Trade Name:	ASKA	Serial No.:	-----
Date of Receipt:	Dec. 13, 2016	Date of Test:	Dec. 14~20, 2016
Test Specification:	FCC Part 15, Subpart C Section 15.247: 2016 ANSI C63.10:2013		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.		
	Issue Date: Dec. 21, 2016		
Tested by:	Reviewed by:	Approved by:	
 	 	 	
Keven Wu / Engineer	Mark Li / Supervisor	Andy Gao / Supervisor	
Other Aspects:			
None.			
Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested			
This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Keyway Testing Technology Co., Ltd.			

1. TEST SUMMARY

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emissions	15.205(a)/15.209	PASS
20dB Bandwidth	15.247(a)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Emissions from out of band	15.247(d)	PASS
Antenna Requirement	15.203	PASS

2.GENERAL PRODUCT INFORMATION

2.1. Product Function

Refer to Technical Construction Form and User Manual.

2.2. Description of Device (EUT)

Product Name:	Bluetooth Headphone
Model No.:	F8
Operation Frequency:	2402MHz ~2480MHz
Channel numbers:	79 Channels
Channel spacing	1MHz
Modulation technology:	BT(1Mbps): GFSK BT EDR(2Mbps): $\pi/4$ -DQPSK BT EDR(3Mbps): 8-DPSK
Bit Rate of Transmitter	1Mbps/2Mbps/3Mbps
Antenna Type:	PCB
Antenna gain:	1.0dBi
Power supply:	DC 3.7V or DC 5V from adapter

2.3. Difference between Model Numbers

None.

2.4. Independent Operation Modes

The basic operation modes are:

2.4.1. EUT work BT mode and Test mode as below:

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	BT link

2.5. Test Supporting System

N/A

2.6. Test Facilities

Lab Qualifications : 944 Shielded Room built by ETS-Lindgren, USA
Date of completion: March 28, 2011

966 Chamber built by ETS-Lindgren, USA
Date of completion: March 28, 2011

Certificated by TUV Rheinland, Germany.
Registration No.: UA 50207153
Date of registration: July 13, 2011

Certificated by UL, USA
Registration No.: 100567-237
Date of registration: September 1, 2011

Certificated by Intertek
Registration No.: 2011-RTL-L1-31
Date of registration: October 11, 2011

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

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

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

Name of Firm : Keyway Testing Technology Co., Ltd.

Site Location : Building 1, Baishun Industrial Zone, Zhangmutou
Town, Dongguan, Guangdong, China

2.7. List of Test and Measurement Instruments

2.7.1. For conducted emission at the mains terminals test

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

2.7.2. For radiated emission test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 09,16	Apr. 09,17
Bilog Antenna	ETS-LINDGREEN	3142D	135452	Apr. 09,16	Apr. 09,17
Spectrum Analyzer	Agilent	E4411B	MY4511304	Apr. 09,16	Apr. 09,17
3m Semi-anechoic Chamber	ETS-LINDGREEN	966	KW01	Apr. 09,16	Apr. 09,17
Signal Amplifier	SONOMA	310	187016	Apr. 09,16	Apr. 09,17
Signal Amplifier	Agilent	8449B	3008A00251	Apr. 09,16	Apr. 09,17
RF Cable	IMRO	IMRO-400	966 Cable 1#	N/A	N/A
MULTI-DEVICE Controller	ETS-LINDGREEN	2090	126913	N/A	N/A
Horn Antenna	SCHWARZBECK	BBHA9170	9170-068	Apr. 09,16	Apr. 09,17
Spectrum Analyzer	Agilent	E4408B	MY44211125	Apr. 09,16	Apr. 09,17
High Pass filter	Micro	HPM50111	324216	Apr. 09,16	Apr. 09,17
Constant temperature and humidity box	GF	GTH-800-40-1P	MAA9906-005	Apr. 09,16	Apr. 09,17
Attenuation	MCE	24-10-34	BN9258	Apr. 02,16	Apr. 02,17
Loop Antenna	ARA	PLA-1030/B	1029	Apr. 02,16	Apr. 02,17

3. TEST SET-UP AND OPERATION MODES

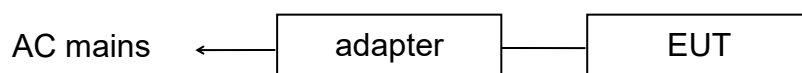
3.1. Principle of Configuration Selection

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

3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators

Conducted Emission:



Radiated Emission:



(EUT: Bluetooth Headphone)

3.3. Test Operation Mode and Test Software

None.

3.4. Special Accessories and Auxiliary Equipment

Adapter:	Model:BSY012U050200U U1USB INPUT:AC 100-240V, 50/60Hz, 0.3A OUTPUT:DC 5V/2A
----------	---

3.5. Countermeasures to Achieve EMC Compliance

None.

3.6. Test Environment:

Ambient conditions in the test laboratory:

Items	Actual
Temperature (°C)	21~23
Humidity (%RH)	50~65

4. MAXIMUM PEAK OUTPUT POWER

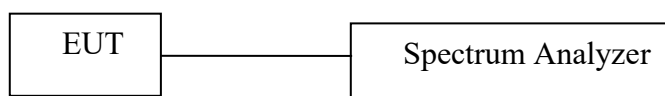
4.1. Limits

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

4.2. Test Procedure

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below
- b. Spectrum Setting : RBW > the 20 dB bandwidth of the emission being measured
 Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
 VBW $\geq$ RBW
 Sweep = auto
 Detector function = peak
 Trace = max hold

4.3. Test setup

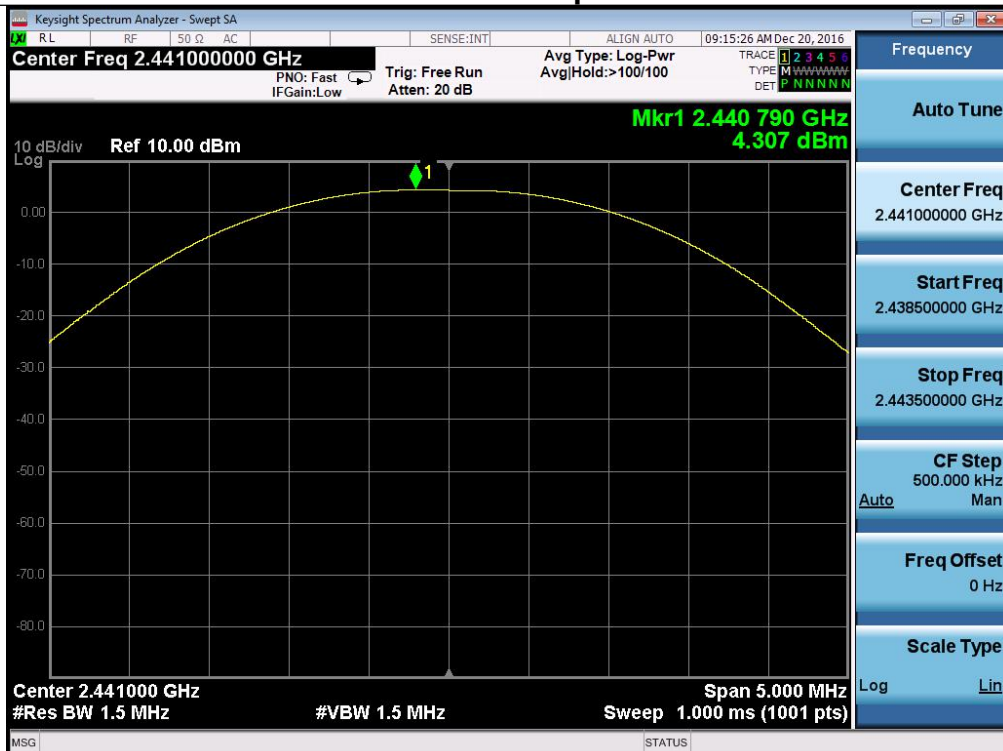


Test data			
1Mbps			
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
CH00	2402	3.722	30
CH39	2441	4.307	30
CH78	2480	5.679	30
2Mbps			
CH00	2402	2.914	20.96
CH39	2441	3.113	20.96
CH78	2480	4.687	20.96
3Mbps			
CH00	2402	3.044	20.96
CH39	2441	3.426	20.96
CH78	2480	4.924	20.96

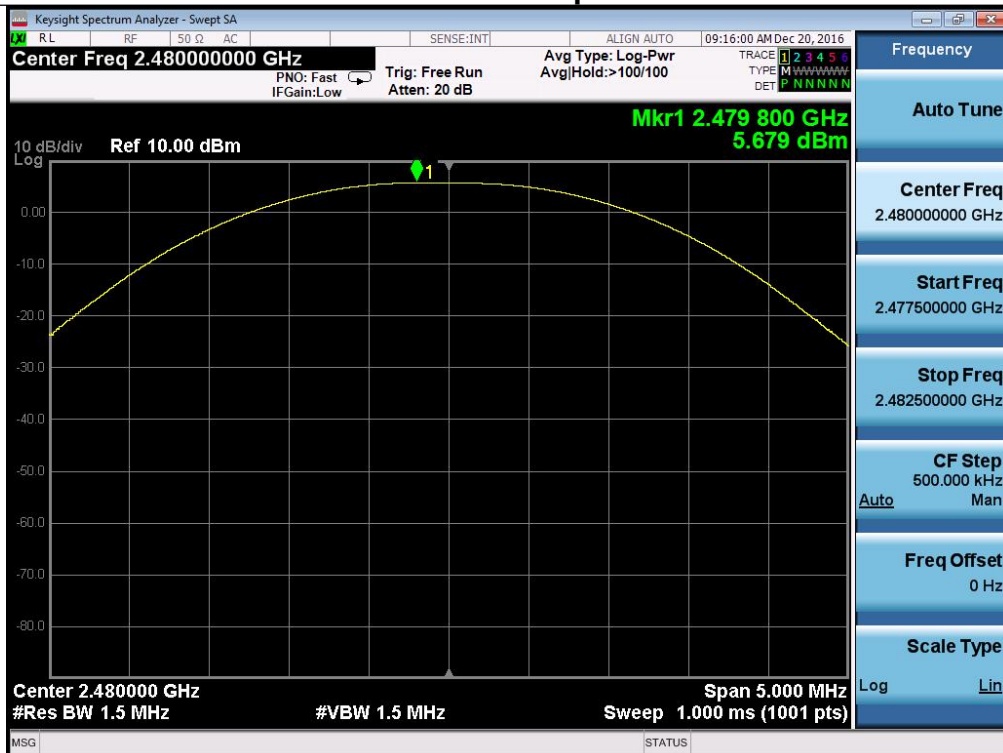
CH00 -1Mbps



CH39 -1Mbps



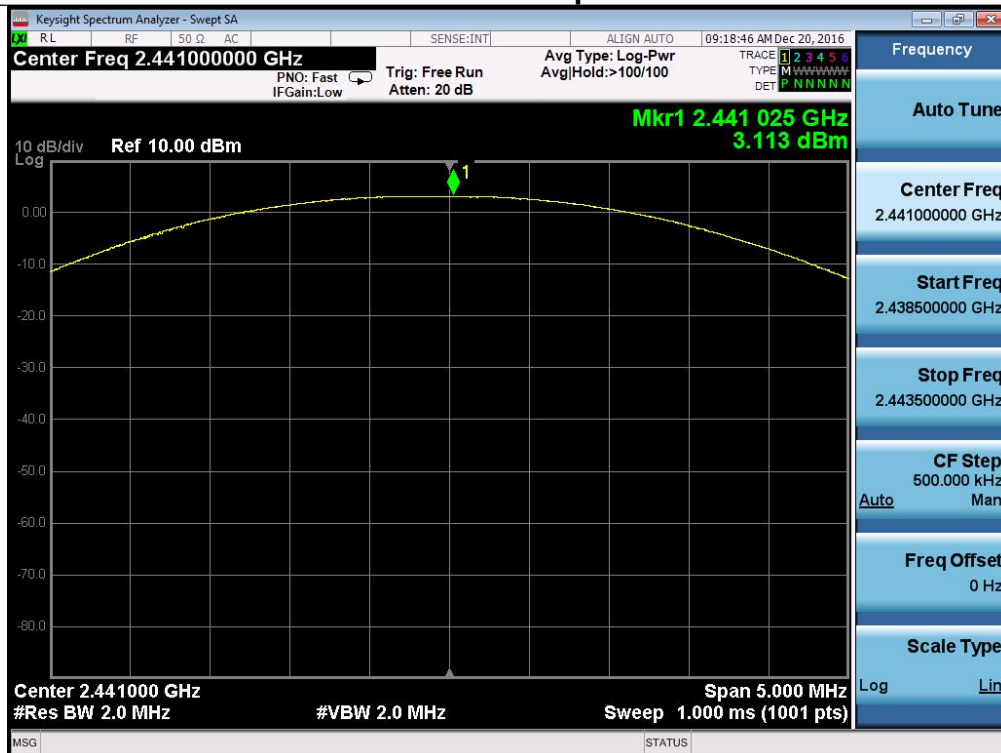
CH78 -1Mbps



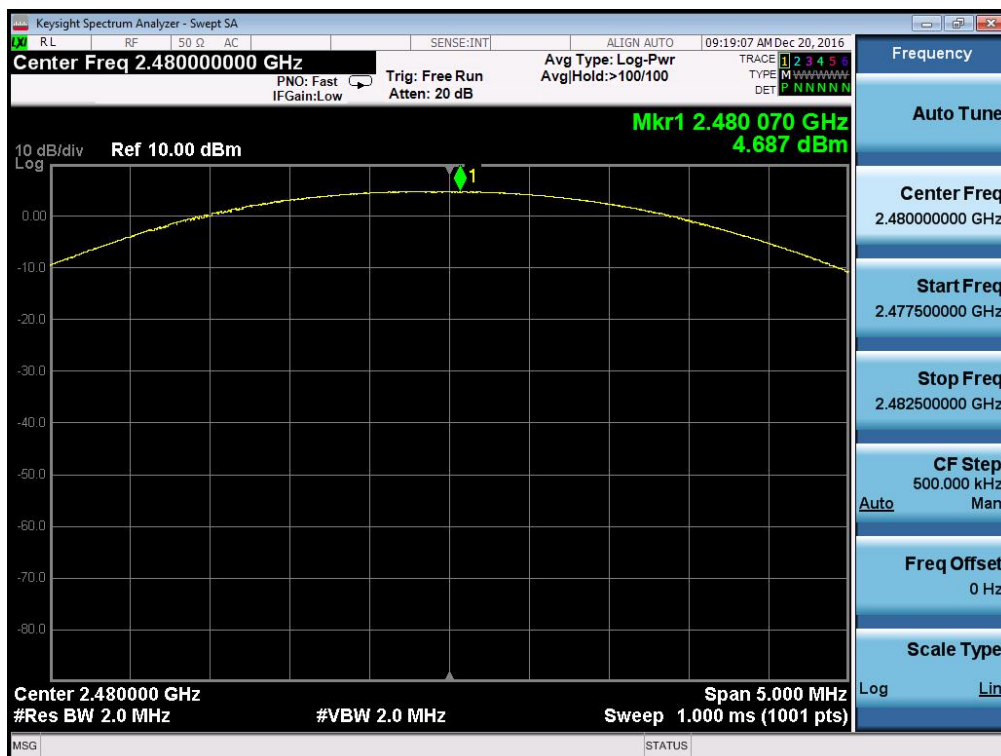
CH00 -2Mbps



CH39 -2Mbps



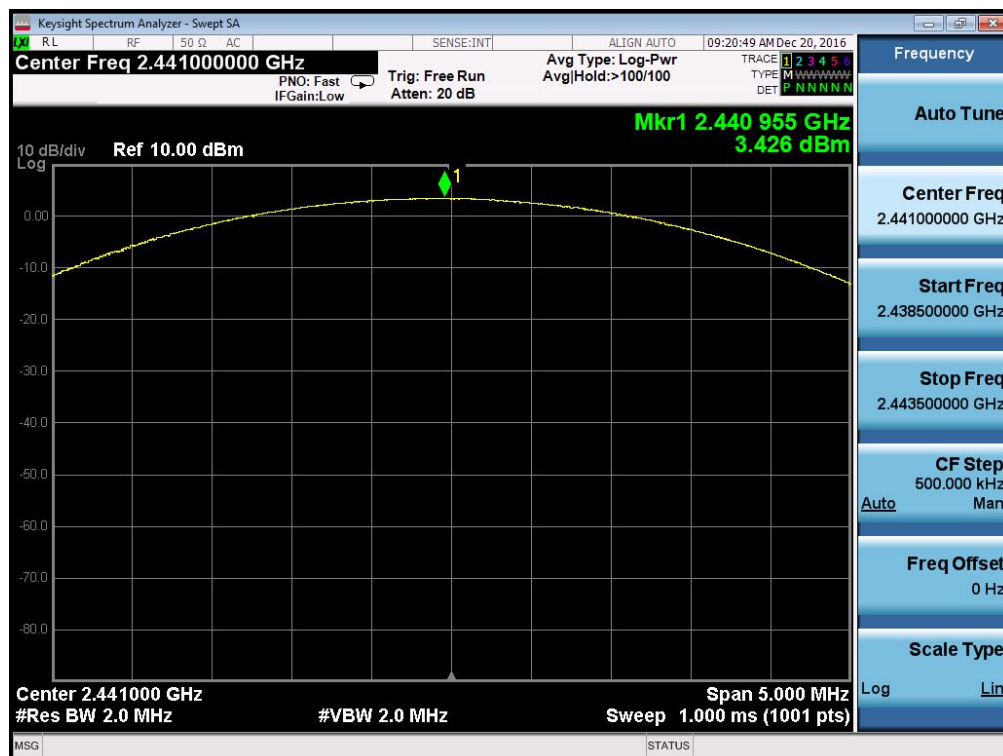
CH78 -2Mbps

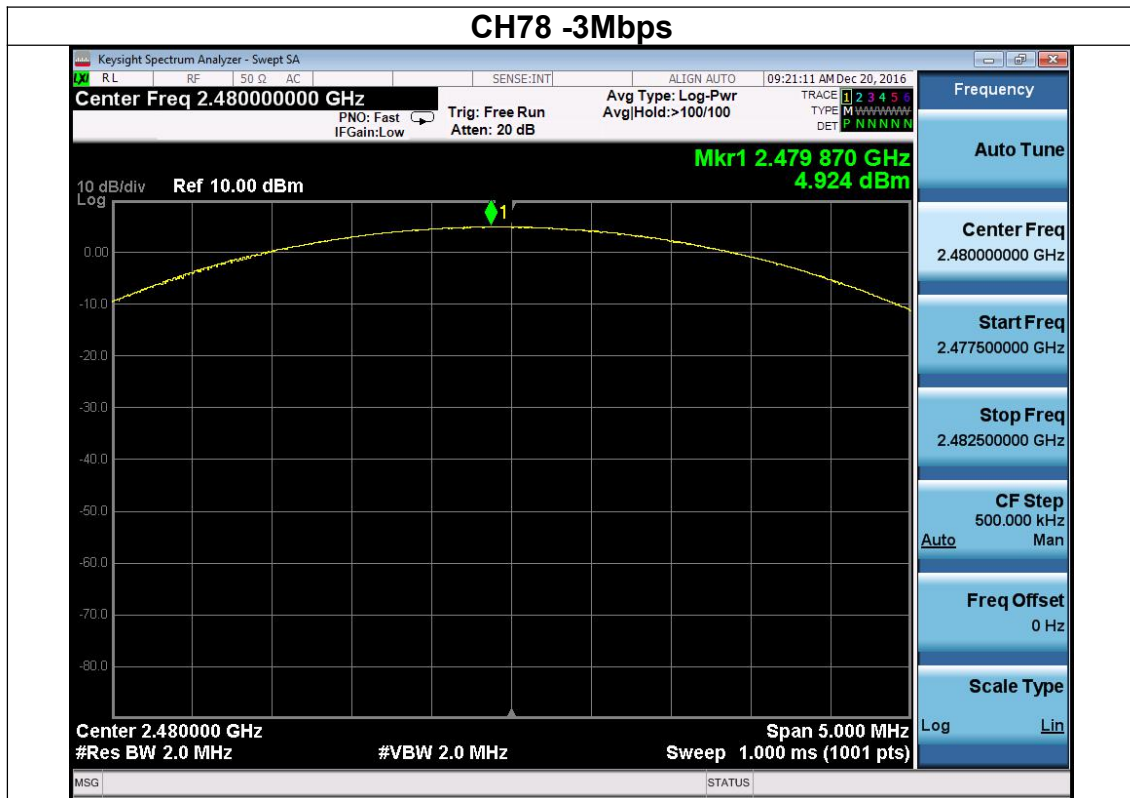


CH00 -3Mbps



CH39 -3Mbps





5. EMISSION TEST RESULTS

5.1. Conducted Emission at the Mains Terminals Test

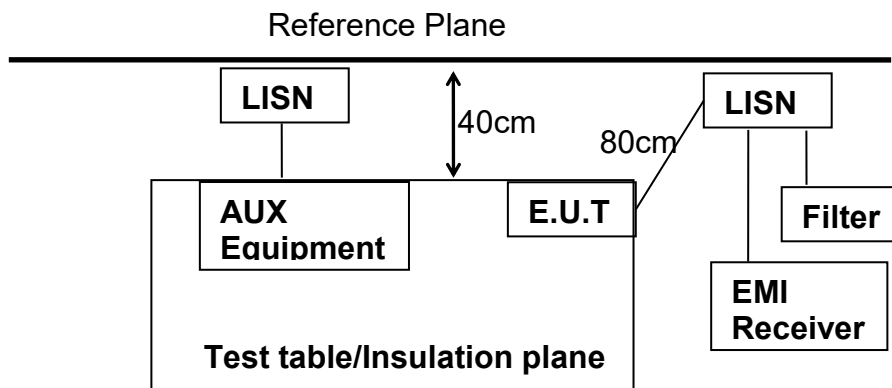
5.1.1. Limit 15.207 limits

Frequency MHz	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	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 MHz to 0,50 MHz.

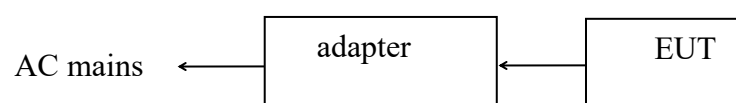
5.1.2. Test Setup

- 1.The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 0.8 m, the excess was folded back and forth parallel to the cable at the center so as to form a bundle no longer than 0.4 m.
- 2.The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.
- 3.The frequency range from 150 kHz to 30 MHz was investigated.
- 4.The bandwidth of the test receiver was set at 9 kHz.
- 5.Pretest for all mode, The test data of the worst case condition(s) was reported on the following page.



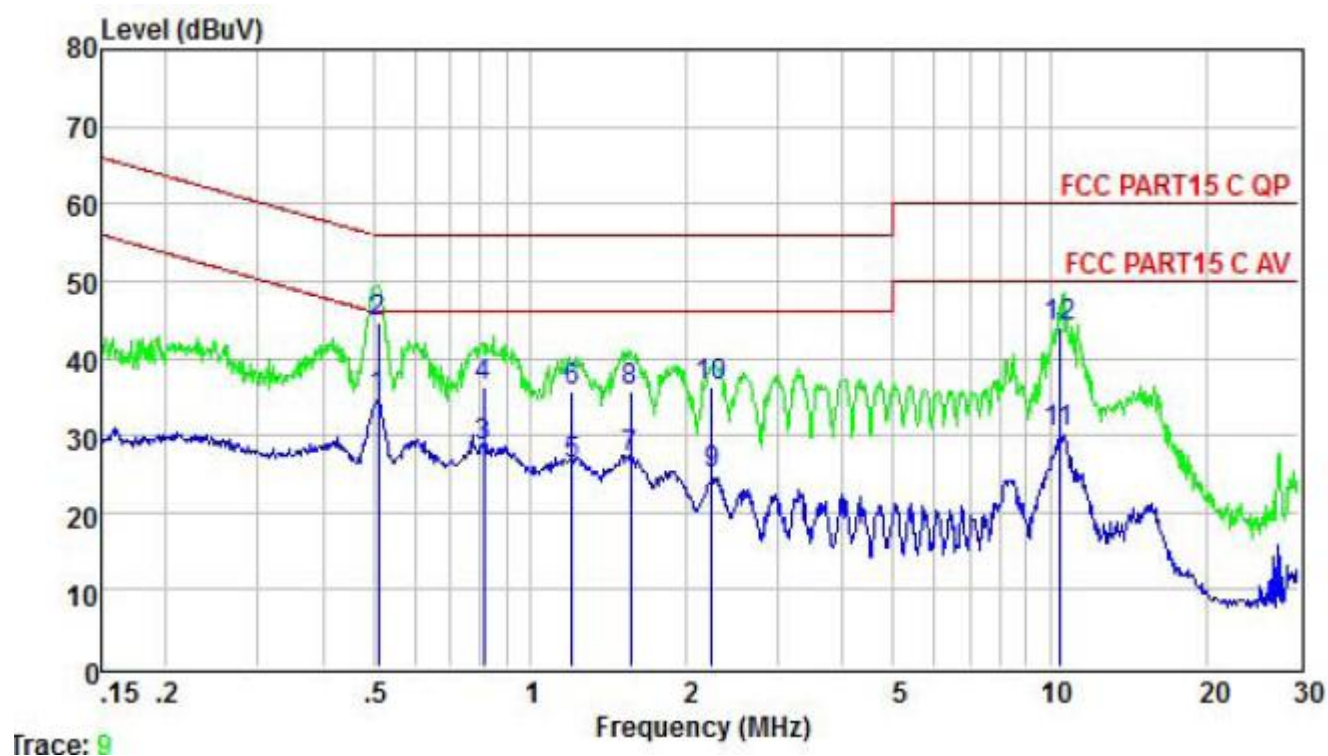
Remark: E.U.T. :Equipment Under Test
LISN: Line Impedance Stabilization Network
Test table height: 0.8m.

Test block



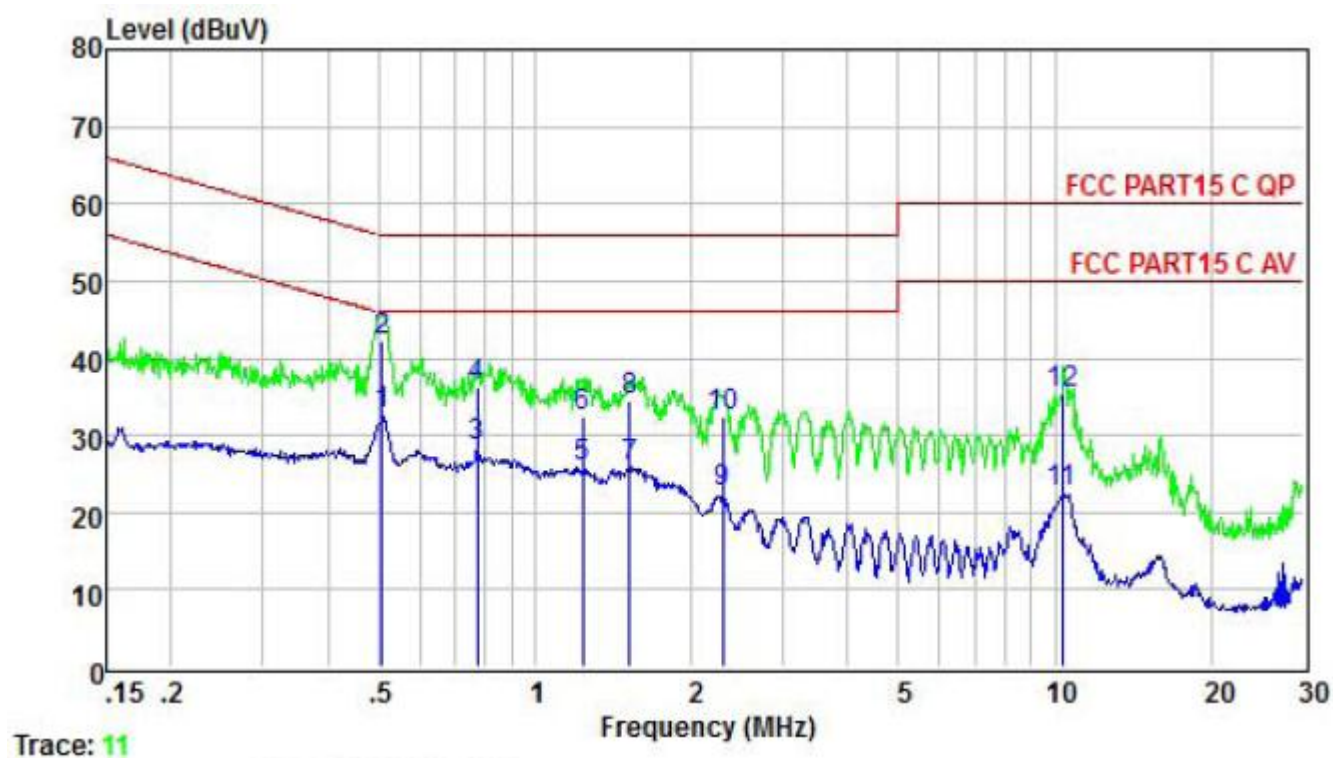
5.1.3. Test result

EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5.0V form Adapter AC 120V/60Hz	Test Mode :	Mode 4



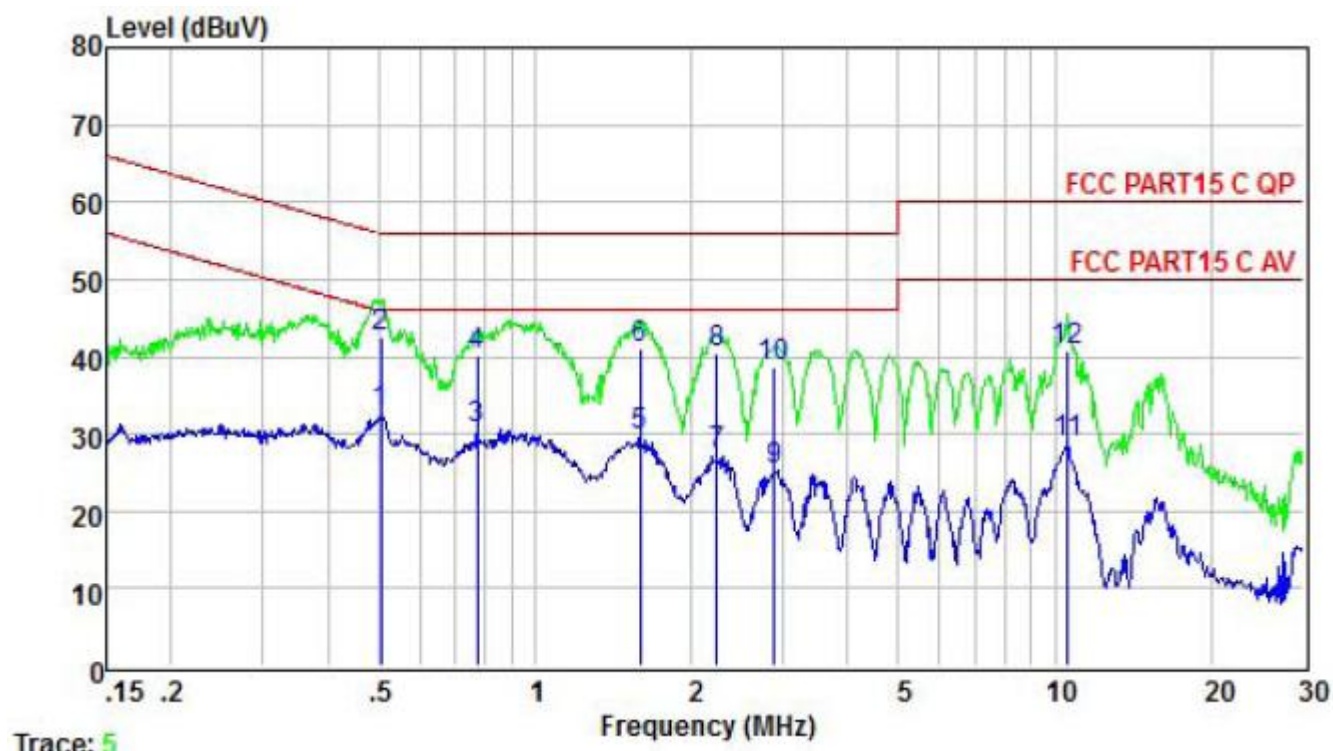
	Freq	Level	Limit	Over	Remark
	MHz	dBuV	dBuV	dB	
1	0.510	34.75	46.00	-11.25	Average
2	0.510	44.50	56.00	-11.50	QP
3	0.813	28.68	46.00	-17.32	Average
4	0.813	36.40	56.00	-19.60	QP
5	1.203	26.08	46.00	-19.92	Average
6	1.203	35.70	56.00	-20.30	QP
7	1.560	27.12	46.00	-18.88	Average
8	1.560	35.60	56.00	-20.40	QP
9	2.237	24.98	46.00	-21.02	Average
10	2.237	36.30	56.00	-19.70	QP
11	10.397	30.29	50.00	-19.71	Average
12	10.397	43.90	60.00	-16.10	QP

EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5.0V form Adapter AC 120V/60Hz	Test Mode :	Mode 4



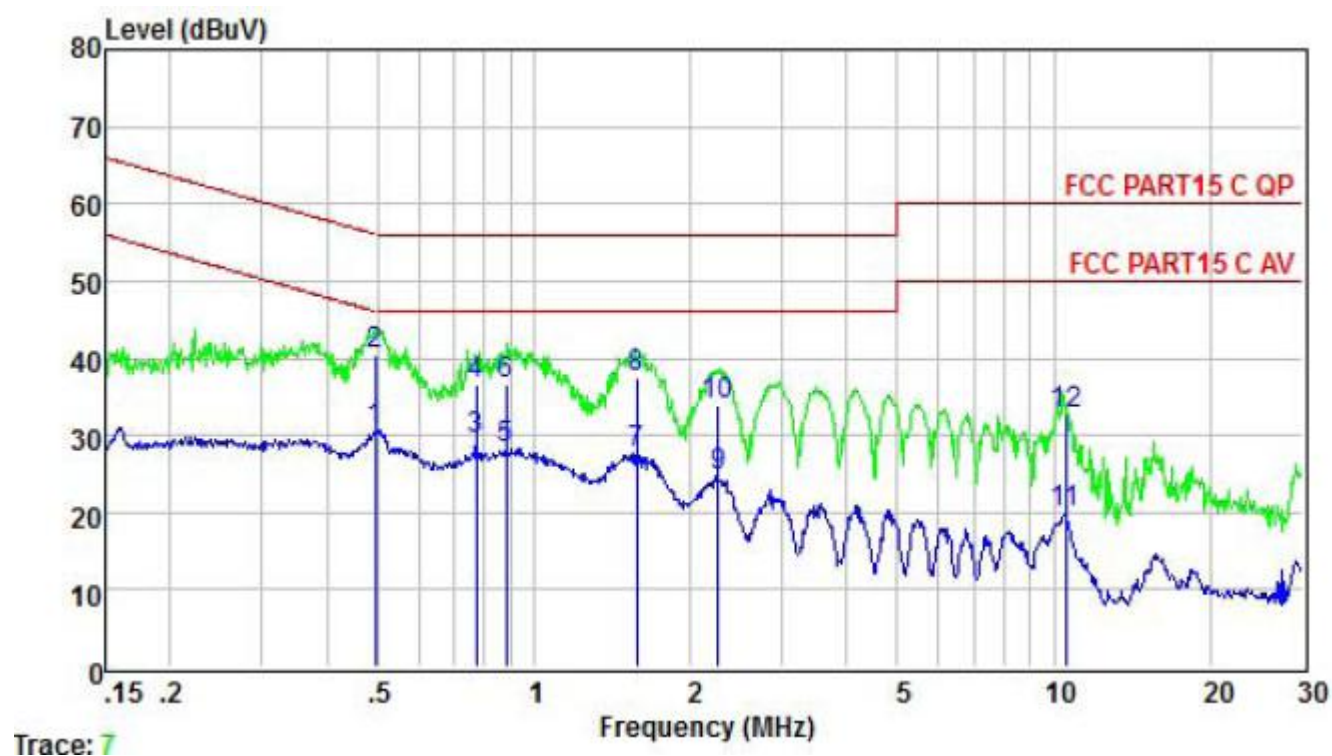
	Freq	Level	Limit	Over	Remark
	MHz	dBuV	Line	Limit	
1	0.507	32.61	46.00	-13.39	Average
2	0.507	42.10	56.00	-13.90	QP
3	0.775	28.50	46.00	-17.50	Average
4	0.775	36.30	56.00	-19.70	QP
5	1.236	25.91	46.00	-20.09	Average
6	1.236	32.50	56.00	-23.50	QP
7	1.519	25.82	46.00	-20.18	Average
8	1.519	34.60	56.00	-21.40	QP
9	2.297	22.62	46.00	-23.38	Average
10	2.297	32.30	56.00	-23.70	QP
11	10.288	22.48	50.00	-27.52	Average
12	10.288	35.40	60.00	-24.60	QP

EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5.0V form Adapter AC 240V/60Hz	Test Mode :	Mode 4



	Freq	Level	Limit	Over	
	MHz	dBuV	Line	Limit	Remark
			dBuV	dB	
1	0.505	32.64	46.00	-13.36	Average
2	0.505	42.67	56.00	-13.33	QP
3	0.775	30.52	46.00	-15.48	Average
4	0.775	40.13	56.00	-15.87	QP
5	1.593	29.63	46.00	-16.37	Average
6	1.593	41.17	56.00	-14.83	QP
7	2.237	27.39	46.00	-18.61	Average
8	2.237	40.34	56.00	-15.66	QP
9	2.884	25.32	46.00	-20.68	Average
10	2.884	38.67	56.00	-17.33	QP
11	10.564	28.95	50.00	-21.05	Average
12	10.564	40.61	60.00	-19.39	QP

EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5.0V form Adapter AC 240V/60Hz	Test Mode :	Mode 4



	Freq	Level	Limit	Over	Remark
	MHz	dBuV	Line	Limit	
			dBuV	dB	
1	0.497	30.68	46.05	-15.37	Average
2	0.497	40.31	56.05	-15.74	QP
3	0.775	29.44	46.00	-16.56	Average
4	0.775	36.70	56.00	-19.30	QP
5	0.885	28.31	46.00	-17.69	Average
6	0.885	36.50	56.00	-19.50	QP
7	1.577	27.63	46.00	-18.37	Average
8	1.577	37.40	56.00	-18.60	QP
9	2.261	24.73	46.00	-21.27	Average
10	2.261	33.90	56.00	-22.10	QP
11	10.508	19.84	50.00	-30.16	Average
12	10.508	32.70	60.00	-27.30	QP

5.2. Radiated Emission Test

5.2.1. Limit 15.209 limits

Frequency MHZ	Distance Meters	Filed Strengths Limit	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0dB(μV)/m(Peak) 54.0dB(μV)/m(Average)	

5.2.2. Restricted bands of operation

MHz	MHz	MHz	GHz
0.009-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	
All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209,all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.			

5.2.3. Test setup

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

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

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

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz, the EUT was placed on a turn table which was 1.5 m above the ground, for all test, used peak detector.

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

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

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

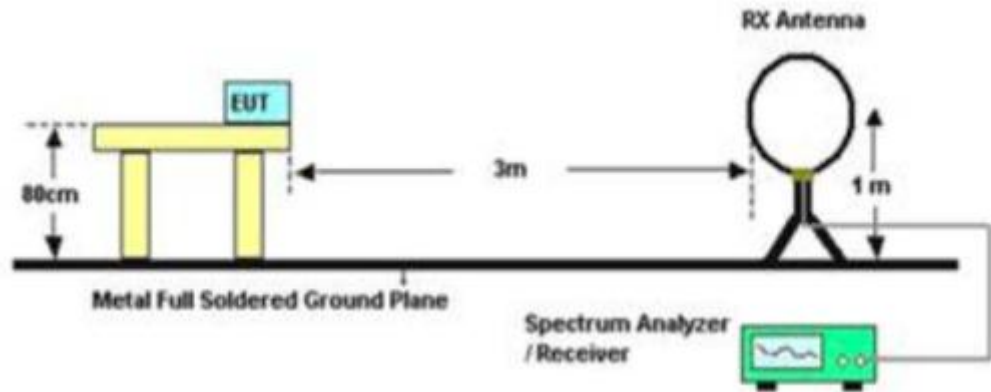
3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

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

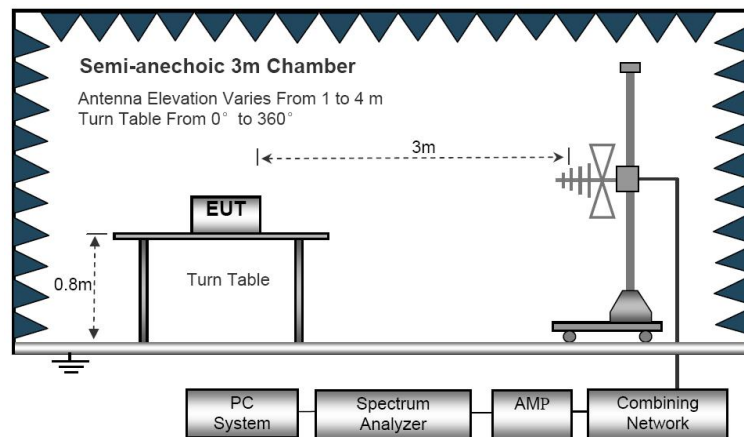
5. EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report (Z orientation).

6. We pretest all modulation, The worst was GFSK, the worst data was show in the report.

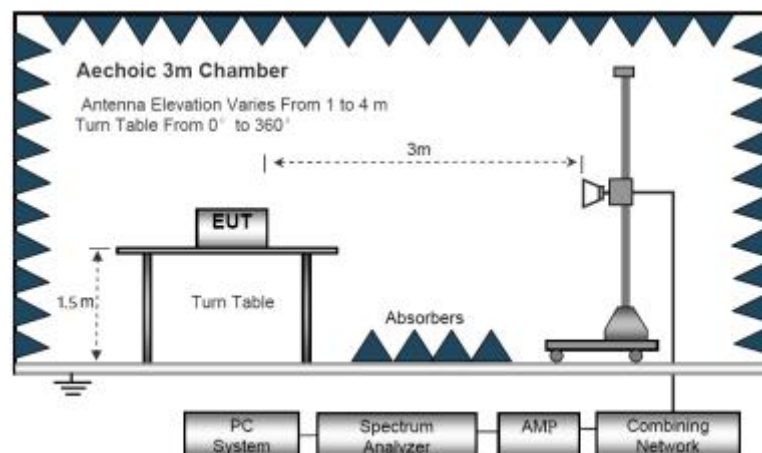
Radiated Emission Test-Up Frequency Below 30MHz



30MHz- 1GHz



Above 1GHz



EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX
Test Voltage :	DC 3.7V		

Below 30MHz

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

Note:

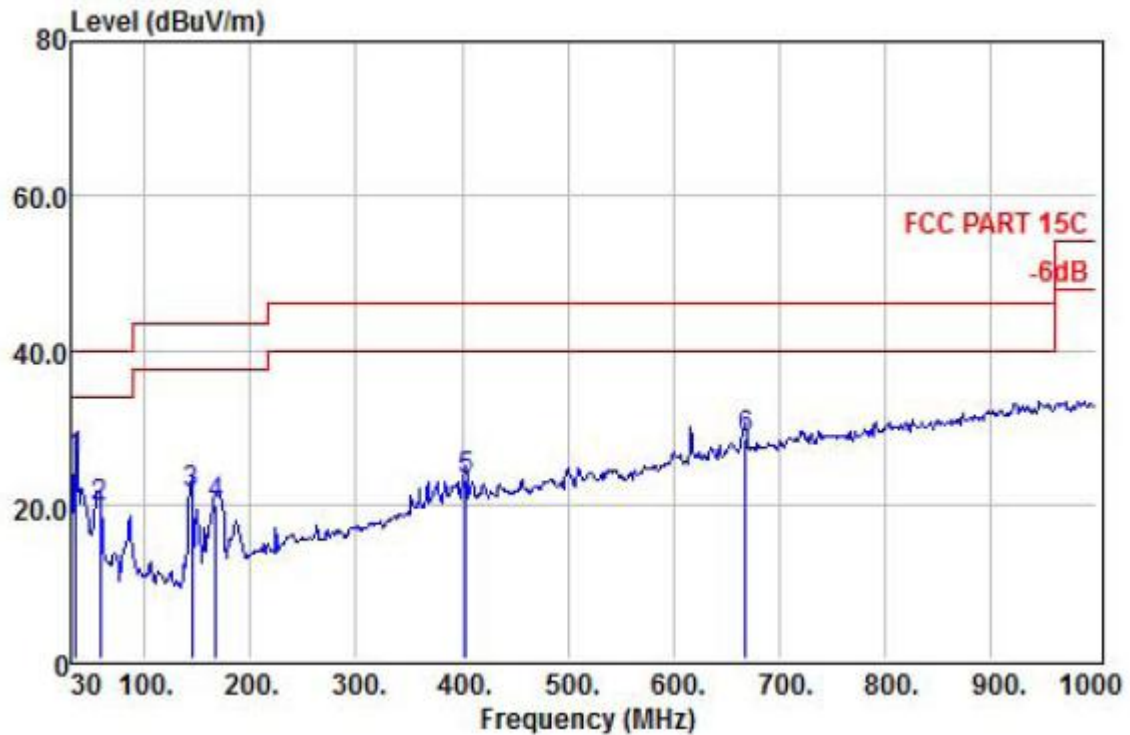
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})(\text{dB})$;

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

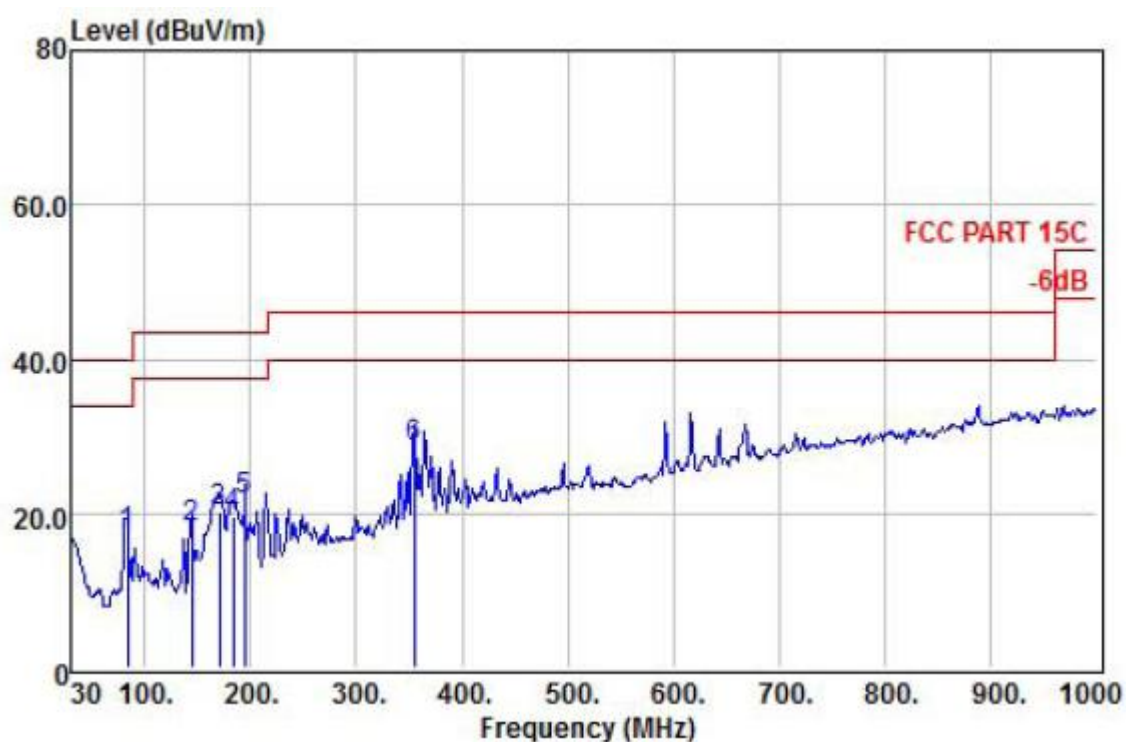
30MHz - 1GHz			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-GFSK-2480
Test Voltage :	DC 3.7V		

Vertical



	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz		dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	34.85	31.38	40.61	0.56	15.94	25.73	40.00	-14.27	QP
2	57.16	31.36	42.65	0.75	7.73	19.77	40.00	-20.23	QP
3	144.46	31.23	42.75	1.22	8.67	21.41	43.50	-22.09	QP
4	167.74	31.20	39.81	1.30	9.90	19.81	43.50	-23.69	QP
5	403.45	30.63	34.94	2.37	16.41	23.09	46.00	-22.91	QP
6	668.26	30.79	33.87	3.69	21.84	28.61	46.00	-17.39	QP

Horizontal



	Preamp	Read	CableAntenna			Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz		dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	83.35	31.35	39.38	0.94	8.37	17.34	40.00	-22.66 QP
2	144.46	31.23	39.36	1.22	8.67	18.02	43.50	-25.48 QP
3	170.65	31.19	39.98	1.30	10.12	20.21	43.50	-23.29 QP
4	183.26	31.15	39.11	1.39	10.30	19.65	43.50	-23.85 QP
5	194.90	31.11	40.78	1.46	10.54	21.67	43.50	-21.83 QP
6	354.95	30.64	40.99	2.18	15.92	28.45	46.00	-17.55 QP

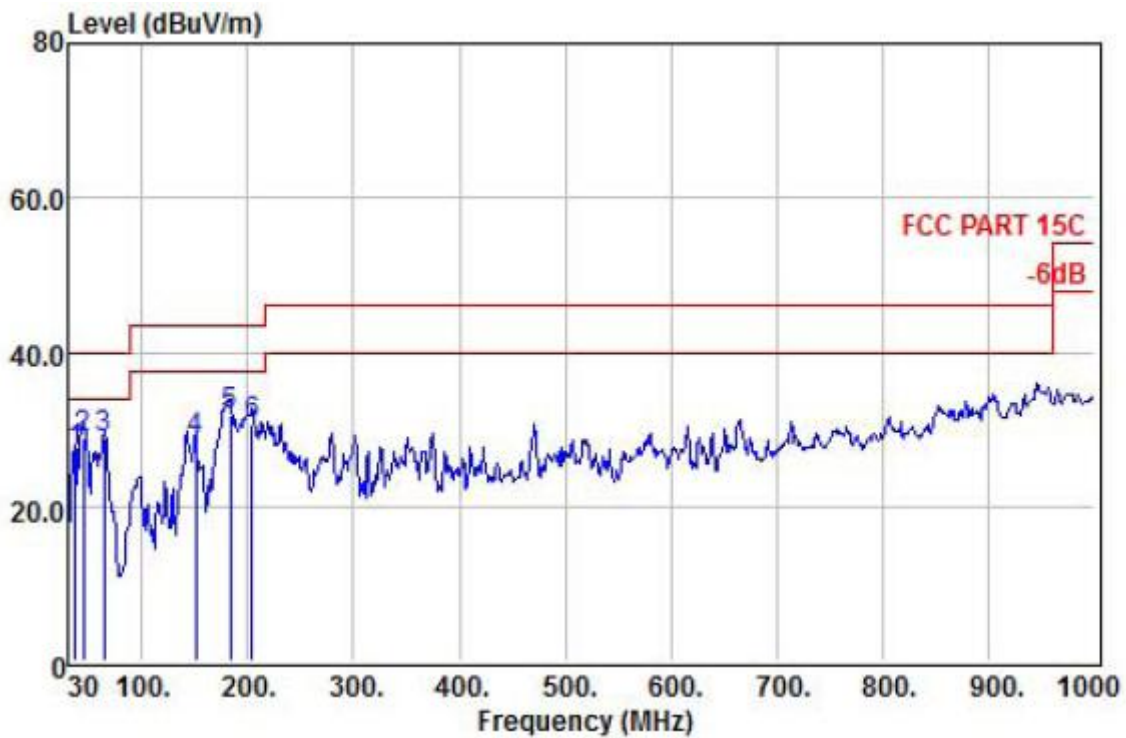
NOTE: 1.Absolute Level= ReadingLevel+antenna Factor+cable loss-preamp factor.

2. Over Limit= Absolute Level – Limit.

3. GFSK (CH78 channel) is the worst mode, only worst data is presented in the report.

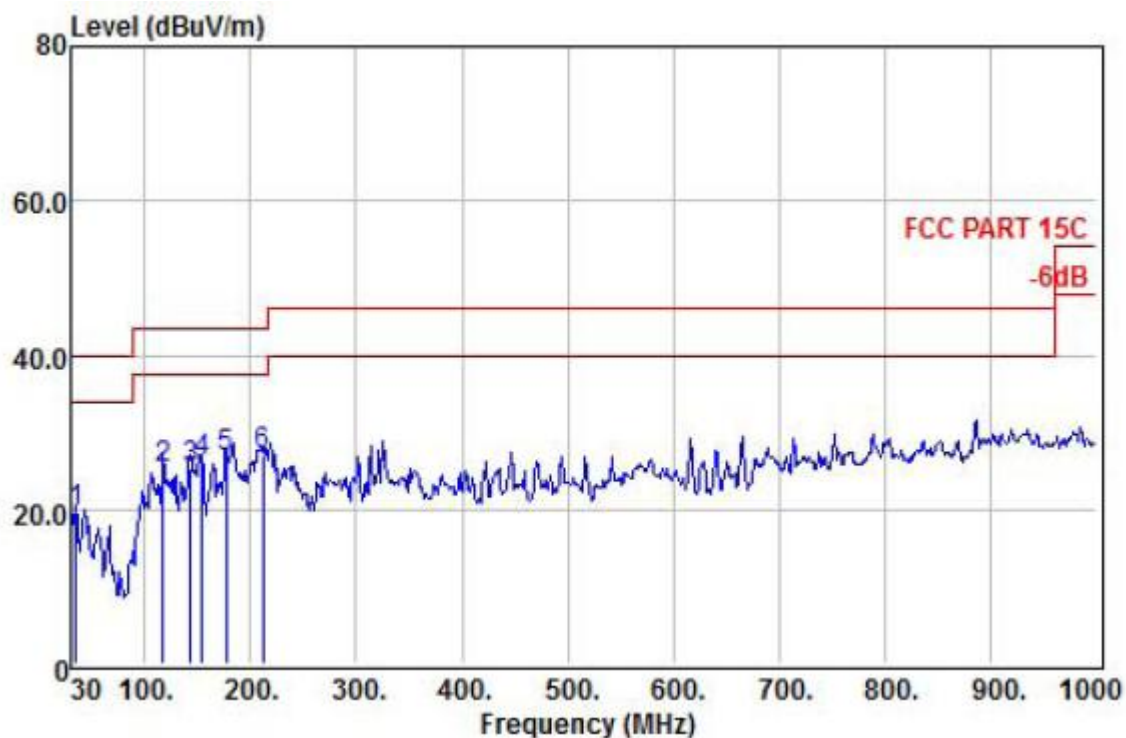
30MHz - 1GHz			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-Pi/4-DQPSK-2402
Test Voltage :	DC 3.7V		

Vertical



	Preamp Freq	Factor	Read Level	CableAntenna Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	36.79	31.36	42.96	0.56	14.79	26.95	40.00	-13.05	QP
2	44.55	31.40	48.69	0.56	11.03	28.88	40.00	-11.12	QP
3	63.95	31.32	51.90	0.75	7.38	28.71	40.00	-11.29	QP
4	151.25	31.25	49.67	1.22	9.02	28.66	43.50	-14.84	QP
5	183.26	31.15	51.41	1.39	10.30	31.95	43.50	-11.55	QP
6	203.63	31.09	49.23	1.46	11.17	30.77	43.50	-12.73	QP

Horizontal



		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	34.85	31.38	34.54	0.56	15.94	19.66	40.00	-20.34 QP
2	117.30	31.25	46.73	1.03	8.72	25.23	43.50	-18.27 QP
3	143.49	31.22	46.52	1.22	8.61	25.13	43.50	-18.37 QP
4	154.16	31.25	47.03	1.22	9.08	26.08	43.50	-17.42 QP
5	177.44	31.17	46.35	1.39	10.32	26.89	43.50	-16.61 QP
6	211.39	31.07	45.05	1.53	11.55	27.06	43.50	-16.44 QP

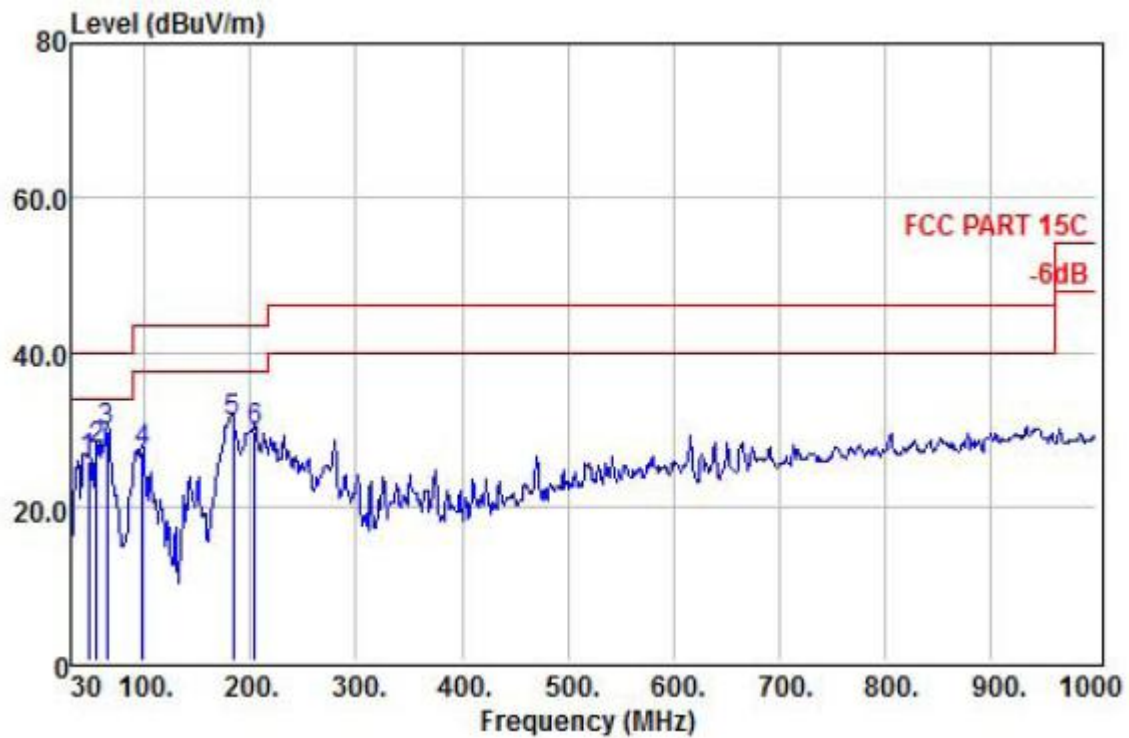
NOTE: 1. Absolute Level= ReadingLevel+antenna Factor+cable loss-preamp factor.

2. Over Limit= Absolute Level – Limit.

3. Pi/4-DQPSK (CH00 channel) is the worst mode, only worst data is presented in the report.

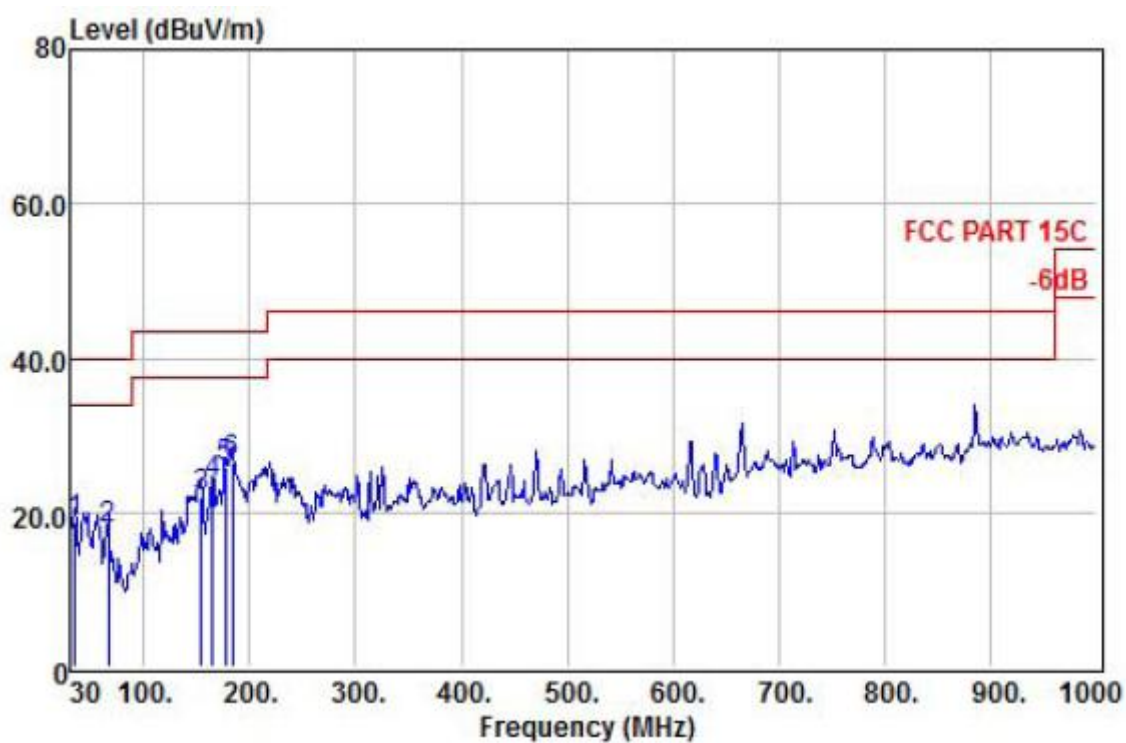
30MHz - 1GHz			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-8-DPSK-2402
Test Voltage :	DC 3.7V		

Vertical



	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	46.49	31.39	46.47	0.56	10.24	25.88	40.00	-14.12 QP
2	54.25	31.37	49.89	0.75	8.16	27.43	40.00	-12.57 QP
3	63.95	31.32	52.90	0.75	7.38	29.71	40.00	-10.29 QP
4	97.90	31.35	47.83	0.94	9.50	26.92	43.50	-16.58 QP
5	183.26	31.15	50.41	1.39	10.30	30.95	43.50	-12.55 QP
6	203.63	31.09	48.23	1.46	11.17	29.77	43.50	-13.73 QP

Horizontal



	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	34.85	31.38	33.54	0.56	15.94	18.66	40.00	-21.34	QP
2	66.86	31.31	40.84	0.85	7.44	17.82	40.00	-22.18	QP
3	154.16	31.25	43.03	1.22	9.08	22.08	43.50	-21.42	QP
4	164.83	31.21	44.10	1.30	9.63	23.82	43.50	-19.68	QP
5	177.44	31.17	45.35	1.39	10.32	25.89	43.50	-17.61	QP
6	183.26	31.15	46.08	1.39	10.30	26.62	43.50	-16.88	QP

NOTE: 1.Absolute Level= ReadingLevel+antenna Factor+cable loss-preamp factor.

2. Over Limit= Absolute Level – Limit.

3. 8-DPSK (CH00 channel) is the worst mode, only worst data is presented in the report.

Above 1GHz			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	1Mbps
Test Voltage :	DC 3.7V		

Frequency	Meter Reading	Antenna Factor	Cable loss	Preamplifier factor	Emission Level	Limits	Margin	Detector Type	Comment
(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
TX-2402									
4804	29.54	32.94	11.94	27.49	46.93	54	-7.07	Average	Vertical
4804	39.45	32.94	11.94	27.49	56.84	74	-17.16	peak	Vertical
7206	30.03	25.28	18.04	27.94	45.41	54	-8.59	Average	Vertical
7206	41.52	25.28	18.04	27.94	56.90	74	-17.10	peak	Vertical
4804	29.15	32.94	11.94	27.49	46.54	54	-7.46	Average	Horizontal
4804	40.11	32.94	11.94	27.49	57.50	74	-16.50	peak	Horizontal
7206	29.16	25.28	18.04	27.94	44.54	54	-9.46	Average	Horizontal
7206	41.23	25.28	18.04	27.94	56.61	74	-17.39	peak	Horizontal
TX-2441									
4882	29.42	32.11	12.15	27.53	46.15	54	-7.85	Average	Vertical
4882	39.65	32.11	12.15	27.53	56.38	74	-17.62	peak	Vertical
7323	30.32	24.33	18.09	27.96	44.78	54	-9.22	Average	Vertical
7323	41.52	24.33	18.09	27.96	55.98	74	-18.02	peak	Vertical
4882	30.48	32.11	12.15	27.53	47.21	54	-6.79	Average	Horizontal
4882	40.48	32.11	12.15	27.53	57.21	74	-16.79	peak	Horizontal
7323	29.37	24.33	18.09	27.96	43.83	54	-10.17	Average	Horizontal
7323	39.73	24.33	18.09	27.96	54.19	74	-19.81	peak	Horizontal
TX-2480									
4960	30.16	31.32	12.31	27.58	46.21	54	-7.79	Average	Vertical
4960	40.69	31.32	12.31	27.58	56.74	74	-17.26	peak	Vertical
7440	30.25	24.38	18.16	27.99	44.80	54	-9.20	Average	Vertical
7440	40.37	24.38	18.16	27.99	54.92	74	-19.08	peak	Vertical
4960	29.47	31.32	12.31	27.58	45.52	54	-8.48	Average	Horizontal
4960	40.69	31.32	12.31	27.58	56.74	74	-17.26	peak	Horizontal
7440	30.18	24.38	18.16	27.99	44.73	54	-9.27	Average	Horizontal
7440	40.38	24.38	18.16	27.99	54.93	74	-19.07	peak	Horizontal

NOTE: 1. Absolute Level = Reading Level + antenna Factor + cable loss - preamp factor.

2. Over Limit = Absolute Level - Limit.

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

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

Above 1GHz			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	2Mbps
Test Voltage :	DC 3.7V		

Frequency	Meter Reading	Antenna Factor	Cable loss	Preamplifier factor	Emission Level	Limits	Margin	Detector Type	Comment
(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
TX-2402									
4804	29.28	32.94	11.94	27.49	46.67	54	-7.33	Average	Vertical
4804	39.47	32.94	11.94	27.49	56.86	74	-17.14	peak	Vertical
7206	30.53	25.28	18.04	27.94	45.91	54	-8.09	Average	Vertical
7206	41.76	25.28	18.04	27.94	57.14	74	-16.86	peak	Vertical
4804	29.59	32.94	11.94	27.49	46.98	54	-7.02	Average	Horizontal
4804	40.26	32.94	11.94	27.49	57.65	74	-16.35	peak	Horizontal
7206	29.47	25.28	18.04	27.94	44.85	54	-9.15	Average	Horizontal
7206	41.31	25.28	18.04	27.94	56.69	74	-17.31	peak	Horizontal
TX-2441									
4882	29.63	32.11	12.15	27.53	46.36	54	-7.64	Average	Vertical
4882	39.68	32.11	12.15	27.53	56.41	74	-17.59	peak	Vertical
7323	30.34	24.33	18.09	27.96	44.80	54	-9.20	Average	Vertical
7323	40.68	24.33	18.09	27.96	55.14	74	-18.86	peak	Vertical
4882	31.63	32.11	12.15	27.53	48.36	54	-5.64	Average	Horizontal
4882	39.91	32.11	12.15	27.53	56.64	74	-17.36	peak	Horizontal
7323	28.42	24.33	18.09	27.96	42.88	54	-11.12	Average	Horizontal
7323	40.59	24.33	18.09	27.96	55.05	74	-18.95	peak	Horizontal
TX-2480									
4960	30.43	31.32	12.31	27.58	46.48	54	-7.52	Average	Vertical
4960	40.78	31.32	12.31	27.58	56.83	74	-17.17	peak	Vertical
7440	30.53	24.38	18.16	27.99	45.08	54	-8.92	Average	Vertical
7440	40.49	24.38	18.16	27.99	55.04	74	-18.96	peak	Vertical
4960	29.33	31.32	12.31	27.58	45.38	54	-8.62	Average	Horizontal
4960	40.86	31.32	12.31	27.58	56.91	74	-17.09	peak	Horizontal
7440	30.29	24.38	18.16	27.99	44.84	54	-9.16	Average	Horizontal
7440	40.25	24.38	18.16	27.99	54.80	74	-19.20	peak	Horizontal

NOTE: 1. Absolute Level = Reading Level + antenna Factor + cable loss - preamp factor.

2. Over Limit = Absolute Level - Limit.

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

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

Above 1GHz			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	3Mbps
Test Voltage :	DC 3.7V		

Frequency	Meter Reading	Antenna Factor	Cable loss	Preamplifier factor	Emission Level	Limits	Margin	Detector Type	Comment
(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
TX-2402									
4804	31.28	32.94	11.94	27.49	48.67	54	-5.33	Average	Vertical
4804	38.75	32.94	11.94	27.49	56.14	74	-17.86	peak	Vertical
7206	30.49	25.28	18.04	27.94	45.87	54	-8.13	Average	Vertical
7206	42.21	25.28	18.04	27.94	57.59	74	-16.41	peak	Vertical
4804	30.39	32.94	11.94	27.49	47.78	54	-6.22	Average	Horizontal
4804	40.58	32.94	11.94	27.49	57.97	74	-16.03	peak	Horizontal
7206	31.28	25.28	18.04	27.94	46.66	54	-7.34	Average	Horizontal
7206	40.69	25.28	18.04	27.94	56.07	74	-17.93	peak	Horizontal
TX-2441									
4882	31.36	32.11	12.15	27.53	48.09	54	-5.91	Average	Vertical
4882	40.61	32.11	12.15	27.53	57.34	74	-16.66	peak	Vertical
7323	31.39	24.33	18.09	27.96	45.85	54	-8.15	Average	Vertical
7323	41.28	24.33	18.09	27.96	55.74	74	-18.26	peak	Vertical
4882	30.36	32.11	12.15	27.53	47.09	54	-6.91	Average	Horizontal
4882	39.74	32.11	12.15	27.53	56.47	74	-17.53	peak	Horizontal
7323	30.28	24.33	18.09	27.96	44.74	54	-9.26	Average	Horizontal
7323	38.47	24.33	18.09	27.96	52.93	74	-21.07	peak	Horizontal
TX-2480									
4960	30.18	31.32	12.31	27.58	46.23	54	-7.77	Average	Vertical
4960	41.15	31.32	12.31	27.58	57.20	74	-16.80	peak	Vertical
7440	31.28	24.38	18.16	27.99	45.83	54	-8.17	Average	Vertical
7440	42.72	24.38	18.16	27.99	57.27	74	-16.73	peak	Vertical
4960	30.34	31.32	12.31	27.58	46.39	54	-7.61	Average	Horizontal
4960	40.88	31.32	12.31	27.58	56.93	74	-17.07	peak	Horizontal
7440	31.76	24.38	18.16	27.99	46.31	54	-7.69	Average	Horizontal
7440	41.27	24.38	18.16	27.99	55.82	74	-18.18	peak	Horizontal

NOTE: 1. Absolute Level = Reading Level + antenna Factor + cable loss - preamp factor.

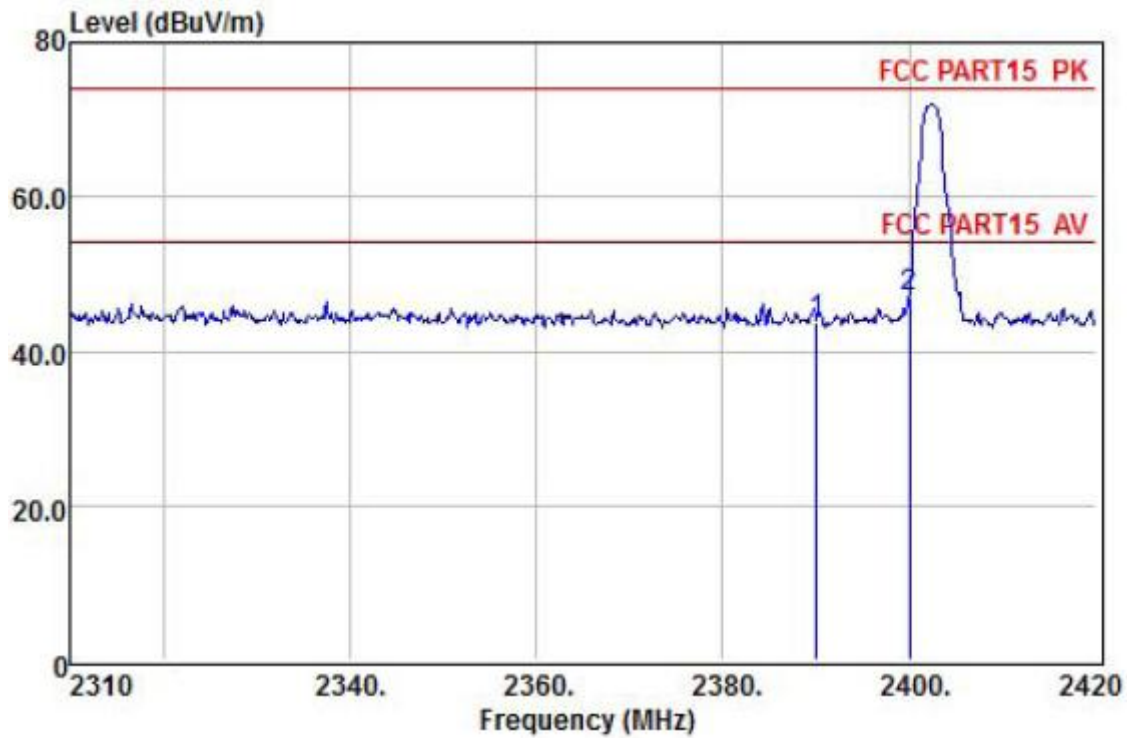
2. Over Limit = Absolute Level - Limit.

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

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

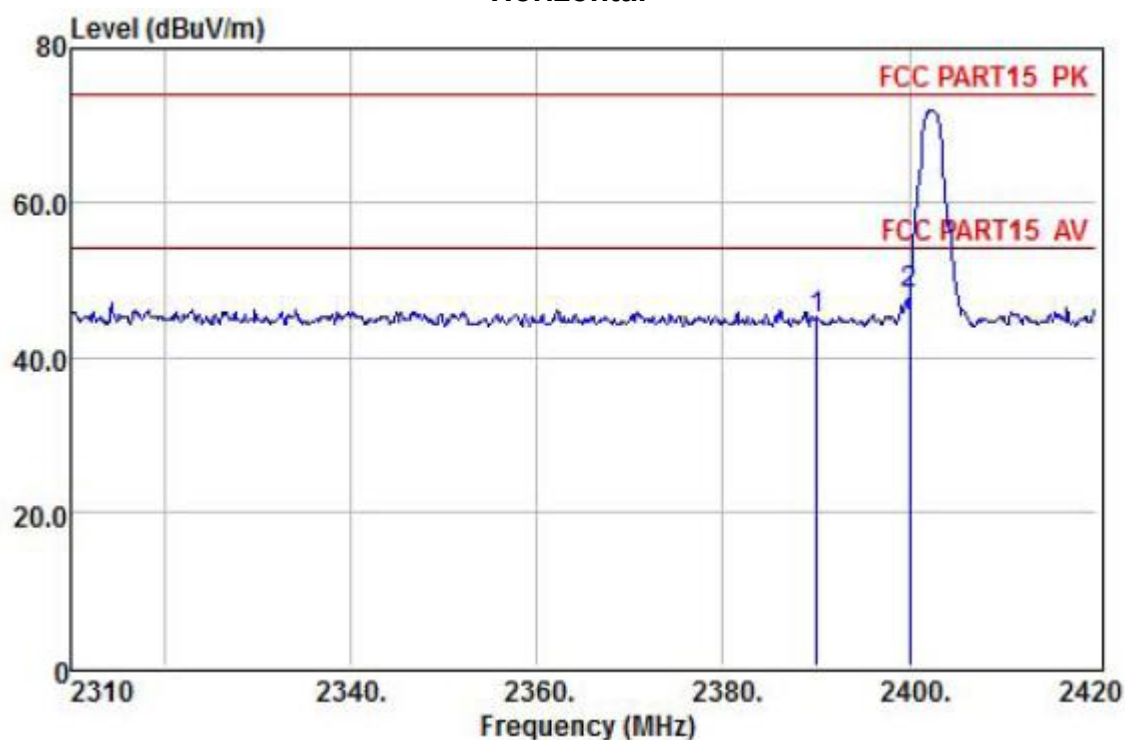
For radiated Bandedge test as follows:

1M bps			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-2402
Test Voltage :	DC 3.7V		

Vertical

	Preamp Freq	Factor	Read Level	CableAntenna Loss Factor	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	2390.00	26.32	33.52	7.79	28.72	43.71	74.00	-30.29 Peak
2	2400.00	26.32	36.74	7.79	28.72	46.93	74.00	-27.07 Peak

Horizontal



	Preamp Freq	Factor	Read Level	CableAntenna Loss Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB	
1	2390.00	26.32	34.86	7.79	28.72	45.05	74.00	-28.95 Peak
2	2400.00	26.32	38.08	7.79	28.72	48.27	74.00	-25.73 Peak

NOTE: 1.Absolute Level= Reading Level+antenna Factor+cable loss-preamp factor,

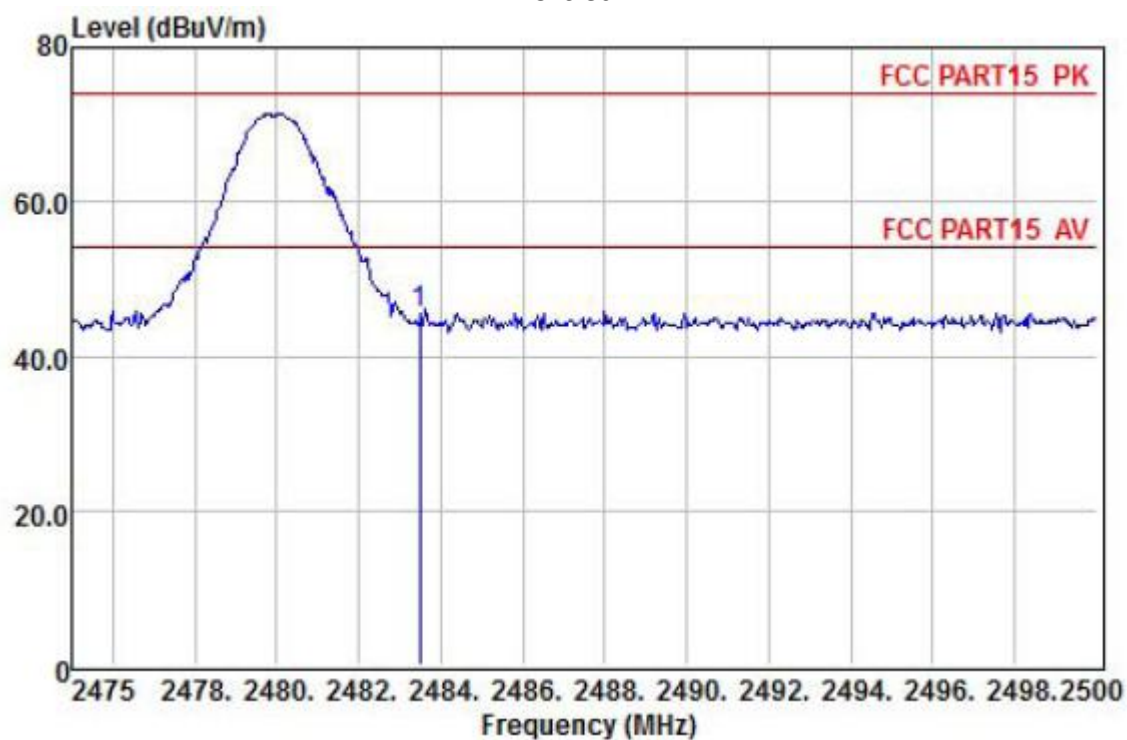
Over Limit= Absolute Level – Limit;

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

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

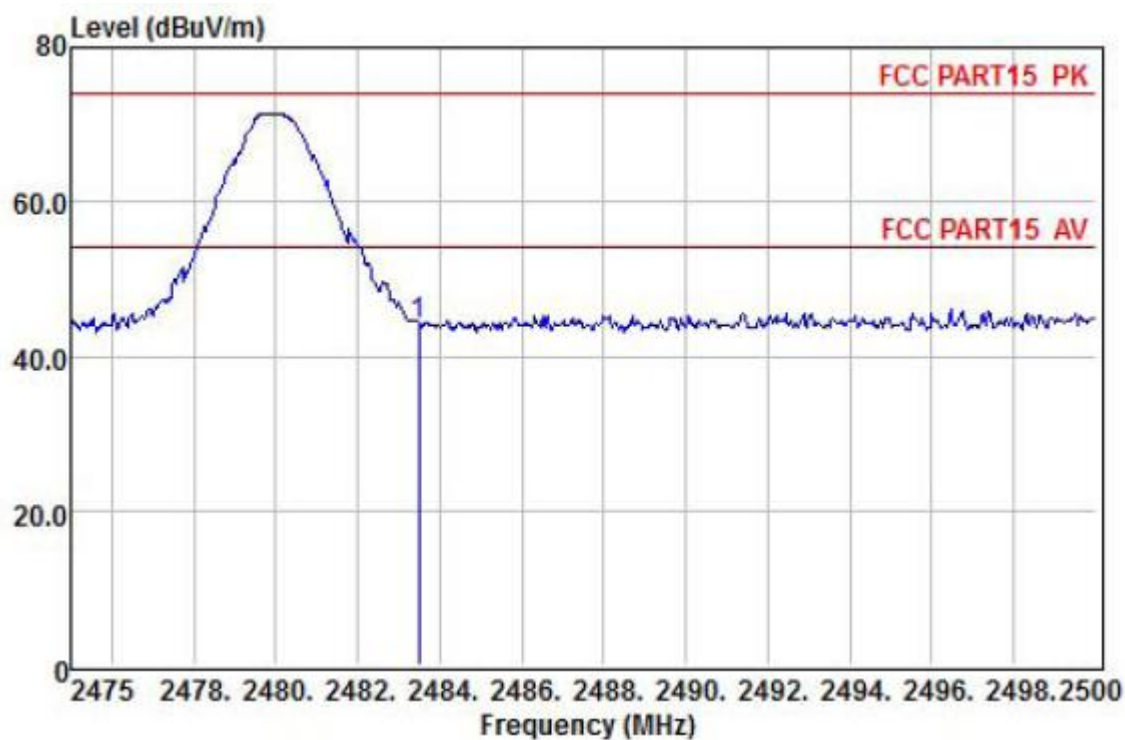
1M bps			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-2480
Test Voltage :	DC 3.7V		

Vertical



	Freq	Preamp Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	2483.50	26.34	34.87	8.14	28.79	45.46	74.00	-28.54	Peak

Horizontal



	Preamp Freq	Factor	Read Level	CableAntenna Loss Factor	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	2483.50	26.34	33.55	8.14	28.79	44.14	74.00	-29.86	Peak

NOTE: 1.Absolute Level= Reading Level+antenna Factor+cable loss-preamp factor,

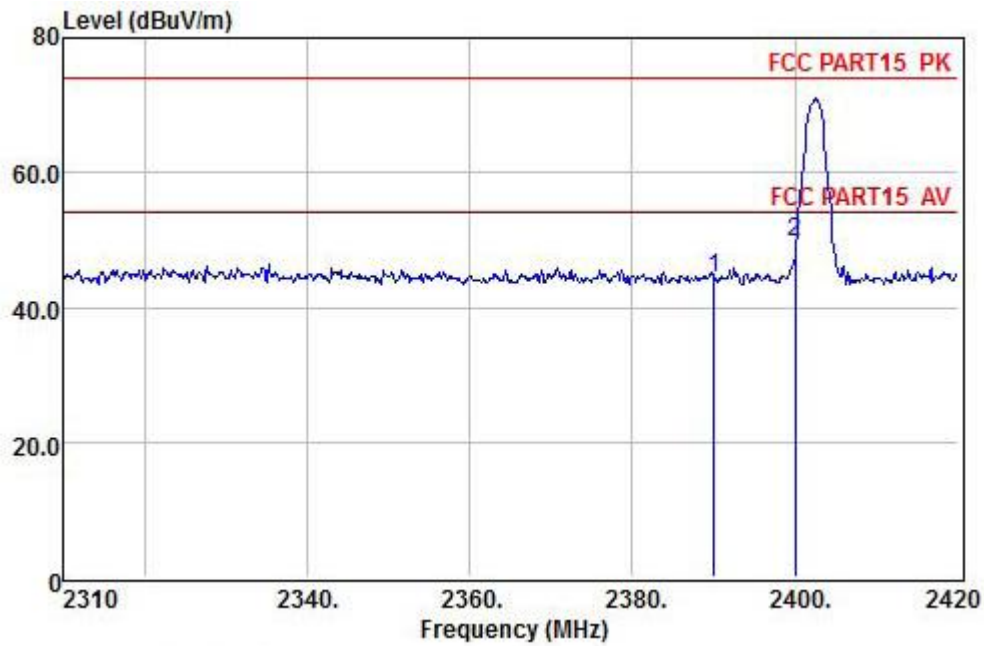
Over Limit= Absolute Level – Limit;

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

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

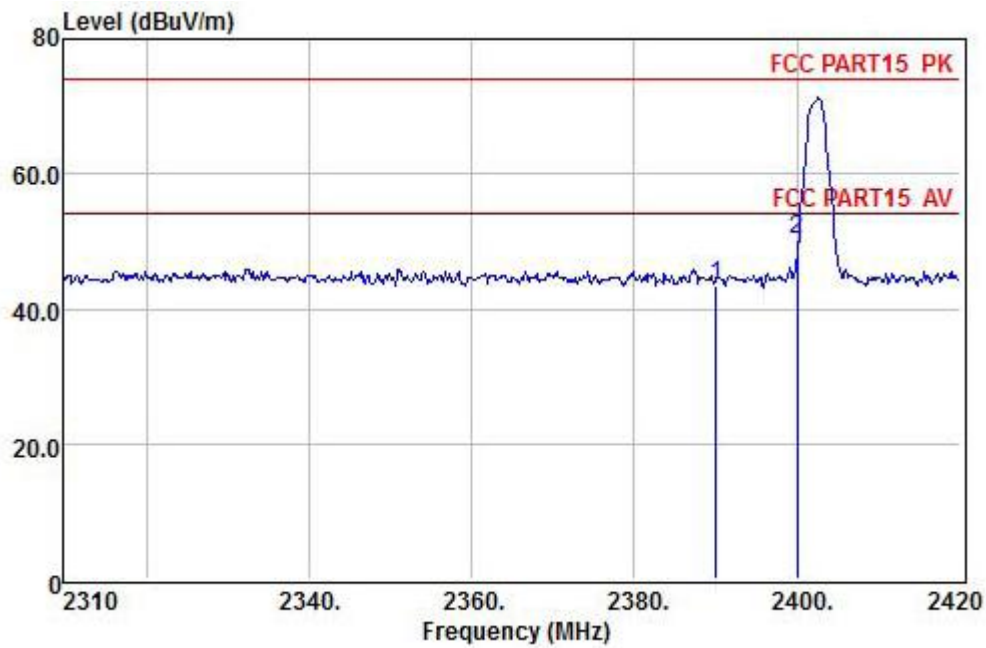
2M bps			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-2402
Test Voltage :	DC 3.7V		

Vertical



	Preamp Freq	Factor	Read Level	CableAntenna Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	2390.00	26.32	34.07	7.79	28.72	44.26	74.00	-29.74	Peak
2	2400.00	26.32	39.37	7.79	28.72	49.56	74.00	-24.44	Peak

Horizontal



		Preamp	Read	CableAntenna			Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	2390.00	26.32	33.36	7.79	28.72	43.55	74.00	-30.45	Peak
2	2400.00	26.32	40.01	7.79	28.72	50.20	74.00	-23.80	Peak

NOTE: 1.Absolute Level= Reading Level+antenna Factor+cable loss-preamp factor,

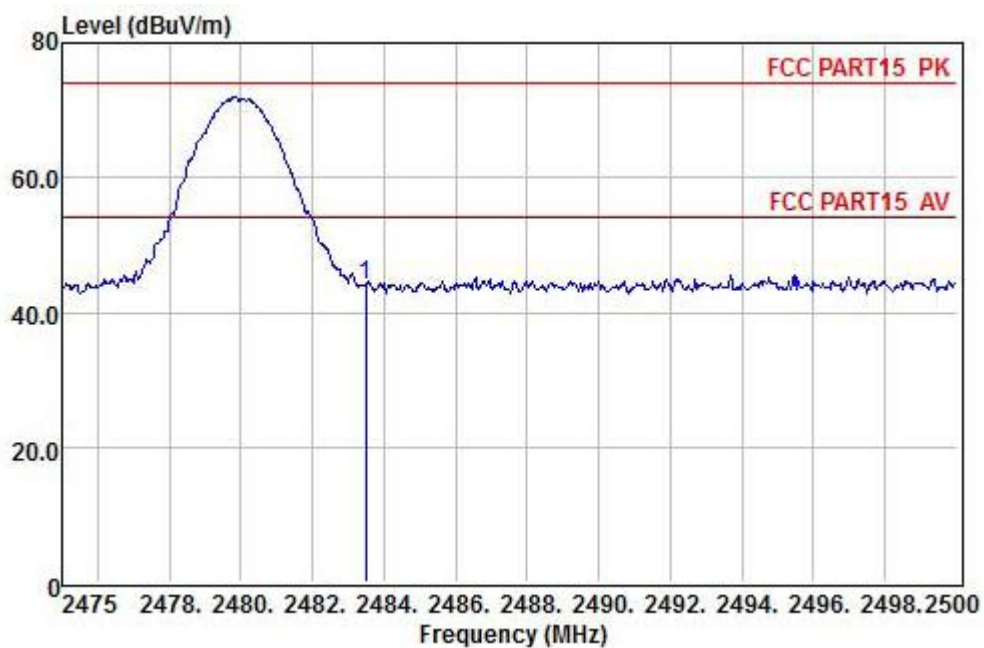
Over Limit= Absolute Level – Limit;

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

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

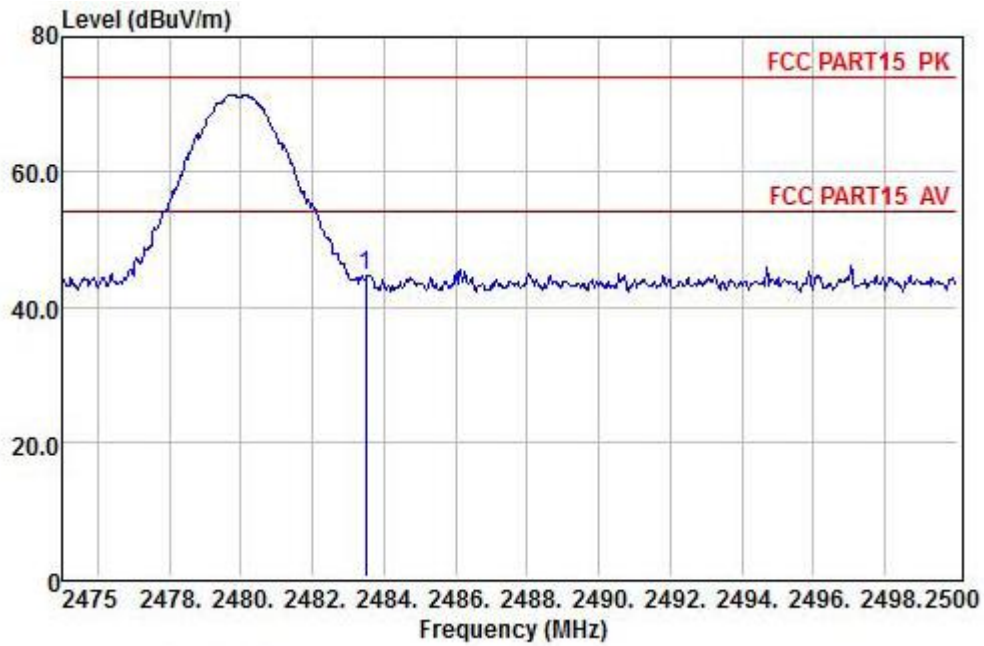
2M bps			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-2480
Test Voltage :	DC 3.7V		

Vertical



	Freq	Preamp Factor	Read Level	Cable Loss	Antenna Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	2483.50	26.34	33.34	8.14	28.79	43.93	74.00	-30.07	Peak

Horizontal



		Preamp	Read	CableAntenna			Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	2483.50	26.34	33.90	8.14	28.79	44.49	74.00	-29.51	Peak

NOTE: 1.Absolute Level= Reading Level+antenna Factor+cable loss-preamp factor,

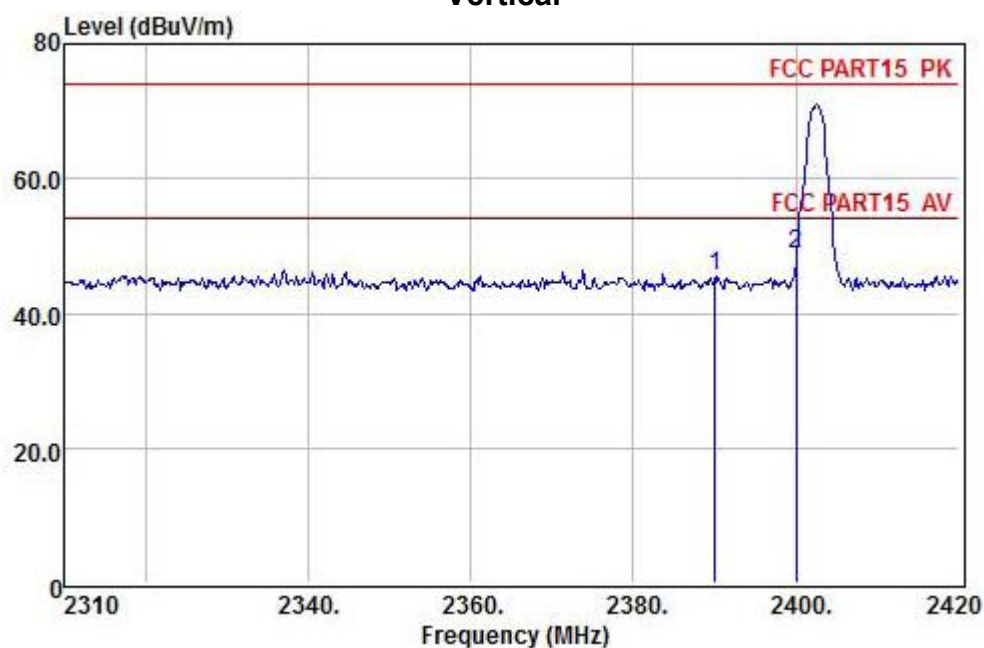
Over Limit= Absolute Level – Limit;

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

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

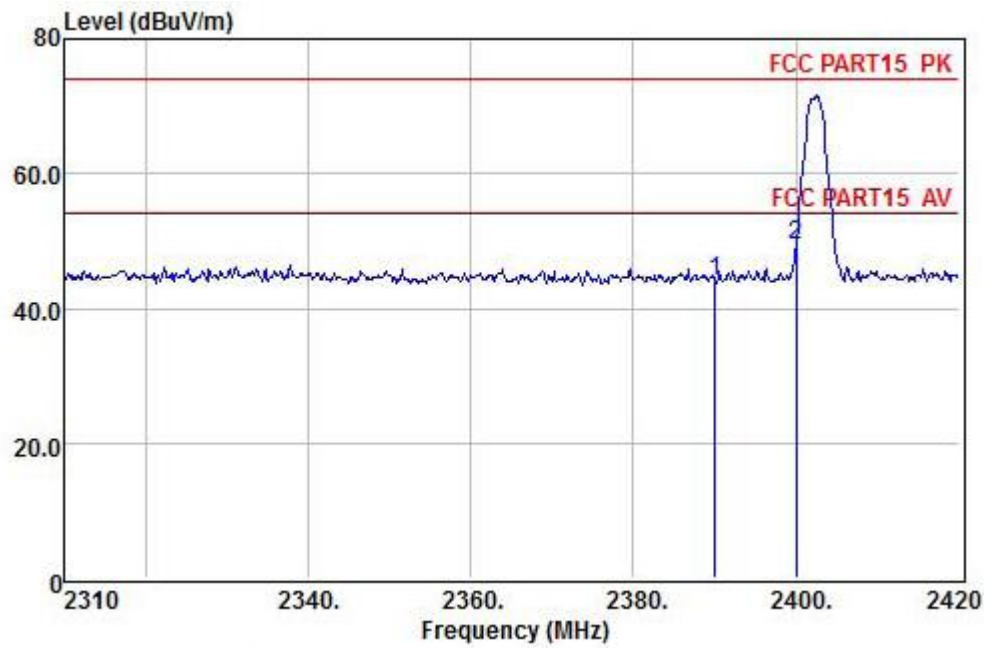
3M bps			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-2402
Test Voltage :	DC 3.7V		

Vertical



	Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m
1	2390.00	26.32	35.18	7.79	28.72	45.37	74.00
2	2400.00	26.32	38.59	7.79	28.72	48.78	74.00

Horizontal



	Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dB
					dBuV/m	dBuV/m	dB
1	2390.00	26.32	33.81	7.79	28.72	44.00	74.00 -30.00 Peak
2	2400.00	26.32	39.30	7.79	28.72	49.49	74.00 -24.51 Peak

NOTE: 1.Absolute Level= Reading Level+antenna Factor+cable loss-preamp factor,

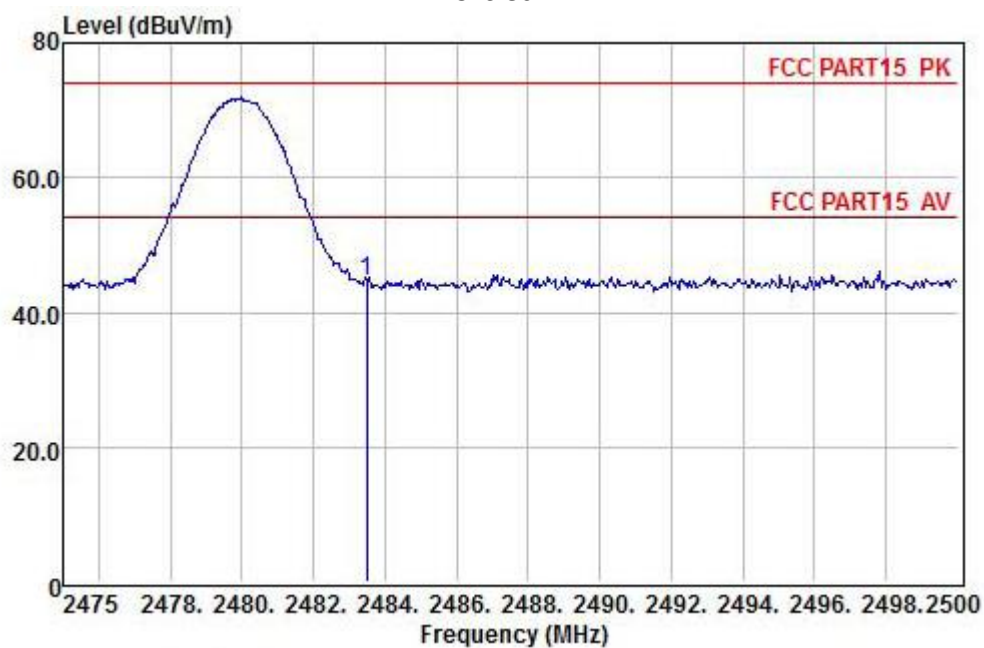
Over Limit= Absolute Level – Limit;

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

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

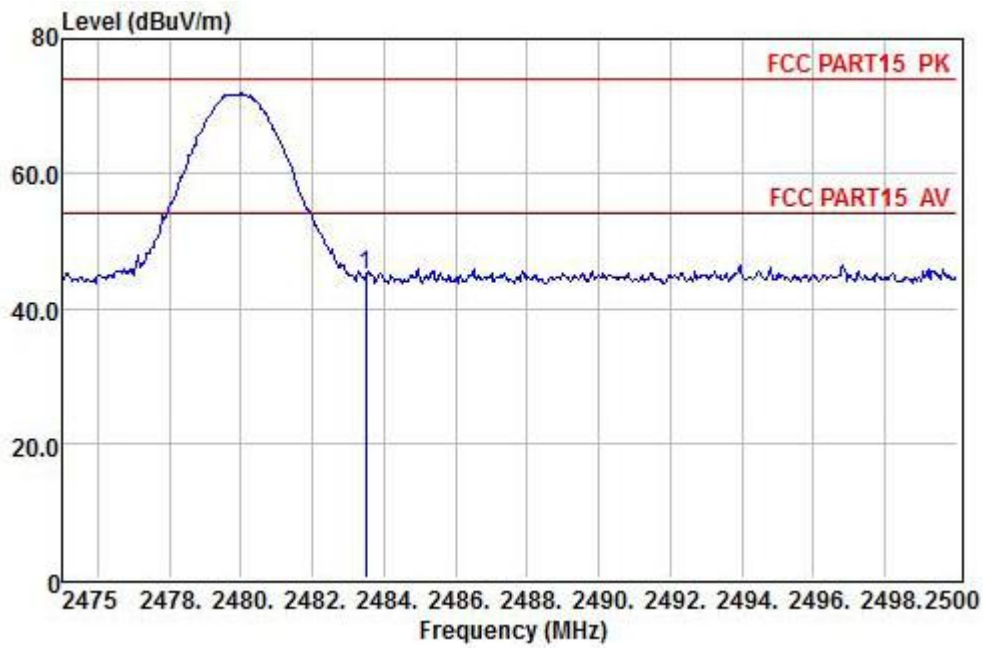
3M bps			
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	20 °C	Relative Humidity :	48%
Pressure :	1010hPa	Test Mode :	TX-2480
Test Voltage :	DC 3.7V		

Vertical



	Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line
	MHz		dBuV	dB	dB/m	dBuV/m	dBuV/m
		dB					dB
1	2483.50	26.34	34.04	8.14	28.79	44.63	74.00
							-29.37
							Peak

Horizontal



		Preamp	Read	CableAntenna			Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	2483.50	26.34	34.25	8.14	28.79	44.84	74.00	-29.16	Peak

NOTE: 1.Absolute Level= Reading Level+antenna Factor+cable loss-preamp factor,

Over Limit= Absolute Level – Limit;

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

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

Spurious Emission in Restricted Band:(1-25G)

All the modulation modes have been tested and all other emissions more than 20dB below the limit, the worst result was report as below:

Polar (H/V)	Frequency	Meter Reading	Antenna Factor	Cable loss	Preamp factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1Mbps Non-hopping									
Vertical	3262	36.18	30.26	10.68	26.63	50.49	74	-23.51	Pk
Horizontal	3262	37.57	30.26	10.68	26.63	51.88	74	-22.12	PK
Vertical	4032	35.42	31.55	10.52	27.02	50.47	74	-23.53	Pk
Horizontal	4032	34.49	31.55	10.52	27.02	49.54	74	-24.46	PK
1Mbps hopping									
Vertical	3351	34.37	30.34	10.78	26.67	48.82	74	-25.18	Pk
Horizontal	3351	35.41	30.34	10.78	26.67	49.86	74	-24.14	PK
Vertical	4130	36.21	30.69	10.95	27.08	50.77	74	-23.23	Pk
Horizontal	4130	35.48	30.69	10.95	27.08	50.04	74	-23.96	PK

6. 20DB BANDWIDTH

6.1. Limits

According to FCC Section 15.247(a)(1), the 20dB bandwidth is known as the 99% emission bandwidth, or 20dB bandwidth($10 \cdot \log 1\% = 20\text{dB}$)taking the RF output power

6.2. Test setup

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum, During the measurement, the Bluetooth module of the EUT is activated and controlled by the software, and is set to operate under test mode transmitting.

2. Set the spectrum analyzer:

Span: approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel

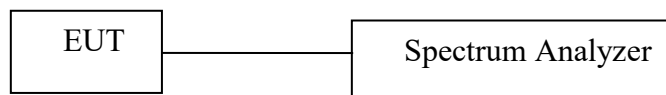
RBW $\geq 1\%$ of the 20dB bandwidth

VBW $\geq$ RBW

Sweep=auto

Detector function=peak

Trace=max hold



Test data:

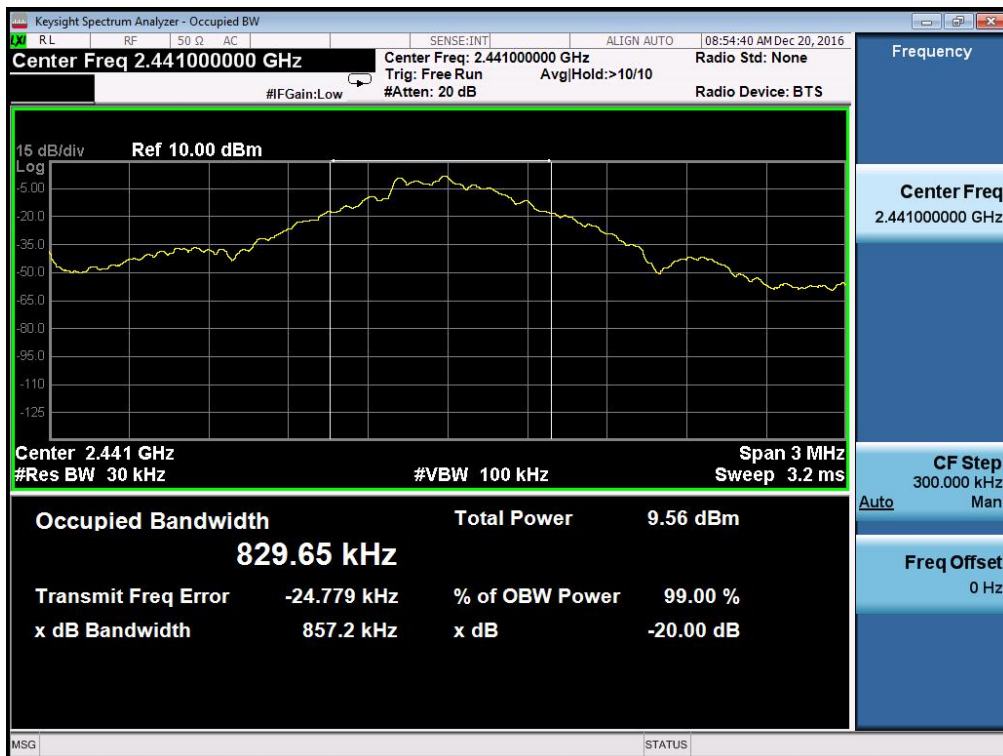
EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /C78(1Mbps)		

Frequency	20dB Bandwidth (kHz)	Result
2402 MHz	908.8	PASS
2441 MHz	857.2	PASS
2480 MHz	869.8	PASS

Test plot as follows:



CH39 -1Mbps

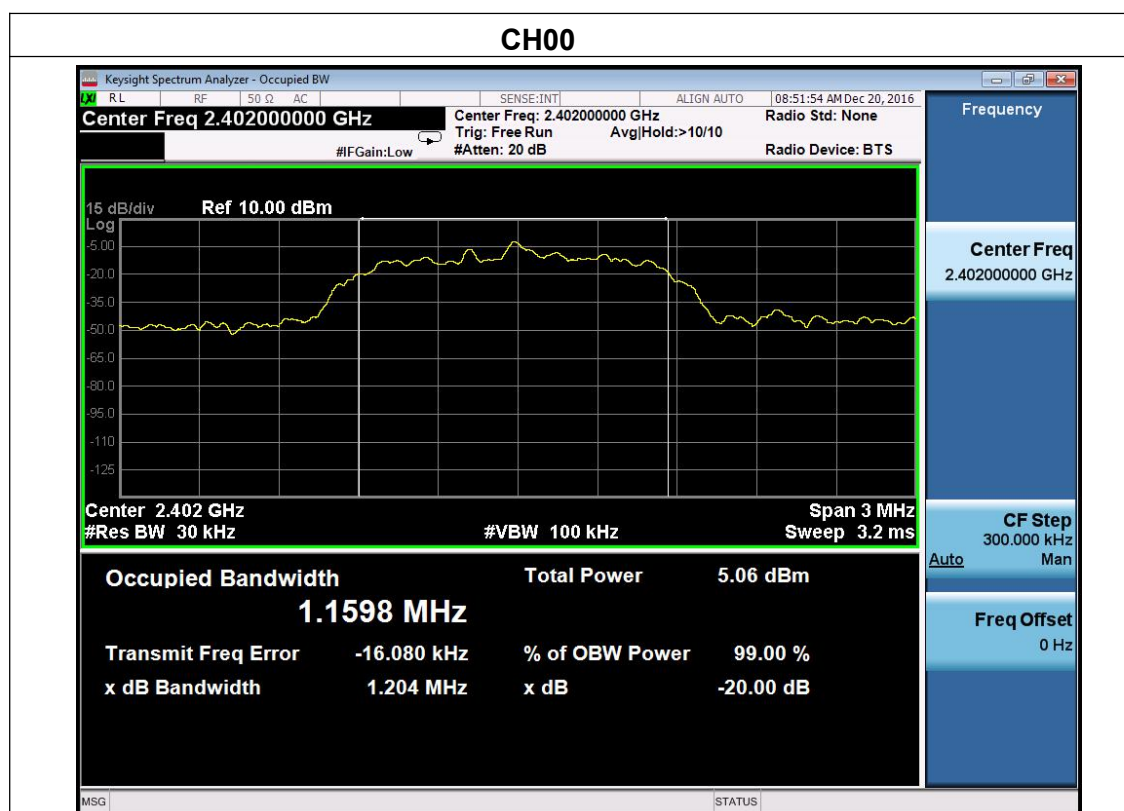


CH78 -1Mbps

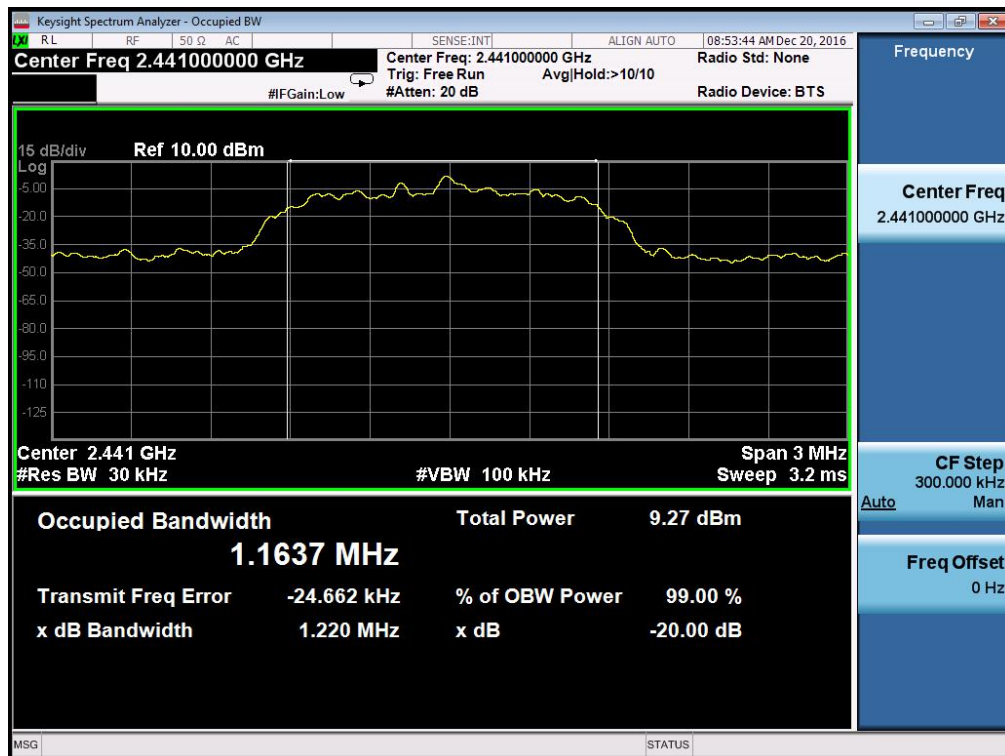


EUT :	Bluetooth Headphone	Model Name :	F8
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /C78(2Mbps)		

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.204	PASS
2441 MHz	1.220	PASS
2480 MHz	1.221	PASS



CH39



CH78

