FCC Test Report

Product Name	Wireless Headphones
Model No.	ATH-CKS550XBT
FCC ID.	JFZCKS550XBT

Applicant	Audio-Technica Corporation
Address	2-46-1 Nishi-naruse, Machida, Tokyo,194-8666

Date of Receipt	Apr. 11, 2018
Issued Date	May 17, 2018
Report No.	1840085R-RFUSP01V00
Report Version	V1.0

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
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Test Report

Issued Date: May 17, 2018
Report No.: 1840085R-RFUSP01V00

Product Name	Wireless Headphones
Applicant	Audio-Technica Corporation
Address	2-46-1 Nishi-naruse, Machida, Tokyo,194-8666
Manufacturer	Audio-Technica Corporation
Factory	DongGuan Tokyo Electronics Co., LTD.
Model No.	ATH-CKS550XBT
FCC ID.	JFZCKS550XBT
EUT Rated Voltage	DC 3.7V (Power by Battery) or DC 5V (Power by USB)
EUT Test Voltage	DC 5V (Power by USB)
Trade Name	Audio-Technica Corporation
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :

(Senior Adm. Specialist / Joanne Lin)

Tested By :

(Engineer / Steven Tsai)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Wireless Headphones
Trade Name	Audio-Technica Corporation
Model No.	ATH-CKS550XBT
FCC ID.	JFZCKS550XBT
Frequency Range	2402 – 2480MHz
Channel Number	79
Type of Modulation	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	Chip Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	MITSUBISHI	AM03DP-ST01	Chip Antenna	1.2dBi for 2.4 GHz

Note: The antenna of EUT is conforming to FCC 15.203.

Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

Note:

1. The EUT is a Wireless Headphones with built-in Bluetooth transceiver.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
5. Bluetooth operation was evaluated at both 1Mb/s and 3Mb/s data rates. 2Mb/s data rate was found, through pre-testing, to produce emissions similar to those for 3Mb/s.

Test Mode	Mode 1: Transmit - 1Mbps Mode 2: Transmit - 3Mbps

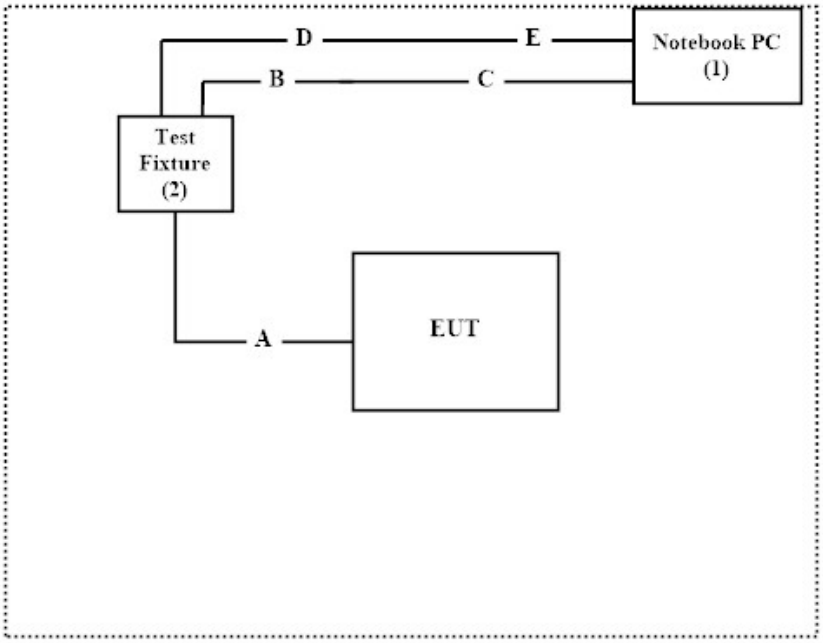
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Inspiron 15 3000	GT5JPJ2	N/A
2	Test Fixture	N/A	N/A	N/A	N/A

Signal Cable Type		Signal cable Description
A	USB Signal Cable	Non-Shielded, 0.37m
B	USB Cable	Non-Shielded, 0.3m
C	USB Cable	Shielded, 1.8m
D	RS-232 Cable	Shielded, 0.8m
E	RS-232 to USB Cable	Shielded, 0.7m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Blue Test v2.6.2” on the Notebook PC.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
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Accredited Number: 3023

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New Taipei City 24457, Taiwan.
TEL: 886-2-2602-7968 / FAX : 866-2-2602-3286
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.7. List of Test Equipment

For Conduction measurements /ASR1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	EMI Test Receiver	R&S	ESR7	101601	2018.02.08	2019.02.07
X	Two-Line V-Network	R&S	ENV216	101306	2018.03.09	2019.03.08
X	Two-Line V-Network	R&S	ENV216	101307	2018.03.20	2019.03.19
X	Coaxial Cable	Quietek	RG400_BNC	RF001	2017.05.24	2018.05.23

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

For Conducted measurements /ASR4

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Spectrum Analyzer	R&S	FSV30	103464	2018.01.23	2019.01.22
X	Power Meter	Anritsu	ML2496A	1548003	2017.12.11	2018.12.10
X	Power Sensor	Anritsu	MA2411B	1531024	2017.12.11	2018.12.10
X	Power Sensor	Anritsu	MA2411B	1531025	2017.12.11	2018.12.10
	Bluetooth Tester	R&S	CBT	101238	2018.01.18	2019.01.17

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : DEKRA Conduction Test System V9.0.1

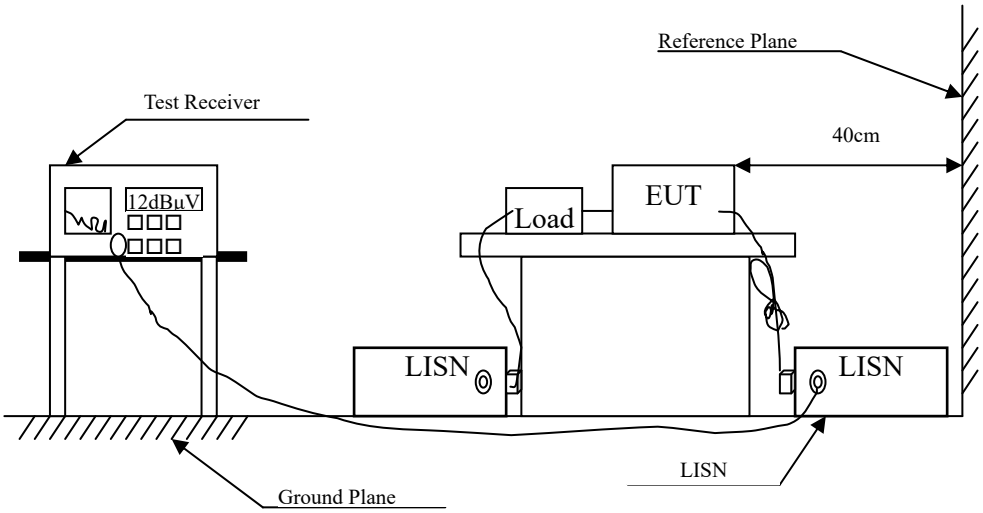
For Radiated measurements /ACB1

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	AMETEK	HLA6121	49611	2018.01.26	2019.01.25
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2018.04.02	2019.04.01
X	Horn Antenna	ETS-Lindgren	3117	00203800	2017.11.10	2018.11.09
X	Horn Antenna	Com-Power	AH-840	101087	2017.05.24	2018.05.23
X	Pre-Amplifier	EMCI	EMC001330	980316	2017.05.16	2018.05.15
X	Pre-Amplifier	EMCI	EMC051835SE	980311	2017.05.17	2018.05.16
X	Pre-Amplifier	EMCI	EMC05820SE	980310	2017.05.17	2018.05.16
X	Pre-Amplifier	EMCI	EMC184045SE	980314	2017.05.17	2018.05.16
X	Filter	MICRO TRONICS	BRM50702	G251	2017.08.30	2018.08.29
	Filter	MICRO TRONICS	BRM50716	G188	2017.08.30	2018.08.29
X	EMI Test Receiver	R&S	ESR7	101602	2017.12.11	2018.12.10
X	Spectrum Analyzer	R&S	FSV40	101148	2018.02.08	2019.02.07
X	Coaxial Cable	SUHNER	SUCOFLEX 106	RF002	2017.05.25	2018.05.24
X	Mircoflex Cable	HUBER SUHNER	SUCOFLEX 102	MY3381/2	2017.08.11	2018.08.10

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version : QuieTek EMI 2.0 V2.1.113

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBμV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

2.4. Uncertainty

±2.35dB

2.5. Test Result of Conducted Emission

Product : Wireless Headphones
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 2: Transmit - 3Mbps (2441MHz)
Test Date : 2018/05/15

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 1					
Quasi-Peak					
0.159	9.631	34.582	44.213	-21.530	65.743
0.202	9.680	28.779	38.460	-26.054	64.514
0.454	9.697	28.690	38.387	-18.927	57.314
1.313	9.730	22.014	31.744	-24.256	56.000
3.037	9.780	17.005	26.785	-29.215	56.000
24.576	10.100	12.368	22.468	-37.532	60.000
Average					
0.159	9.631	19.003	28.634	-27.109	55.743
0.202	9.680	16.990	26.671	-27.843	54.514
0.454	9.697	22.319	32.016	-15.298	47.314
1.313	9.730	15.629	25.359	-20.641	46.000
3.037	9.780	10.379	20.159	-25.841	46.000
24.576	10.100	8.294	18.394	-31.606	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product	:	Wireless Headphones
Test Item	:	Conducted Emission Test
Power Line	:	Line 2
Test Mode	:	Mode 2: Transmit - 3Mbps (2441MHz)
Test Date	:	2018/05/15

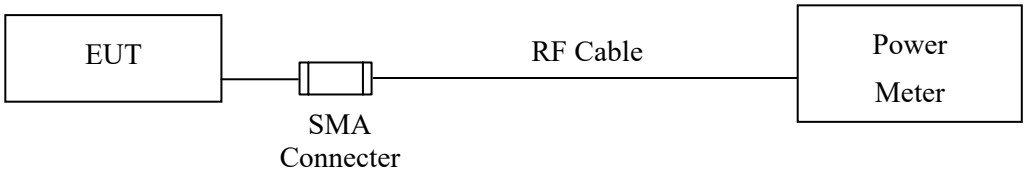
Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV	Margin dB	Limit dBμV
LINE 2					
Quasi-Peak					
0.157	9.618	34.174	43.791	-22.009	65.800
0.202	9.679	28.178	37.857	-26.657	64.514
0.454	9.689	29.002	38.690	-18.624	57.314
1.313	9.730	17.748	27.478	-28.522	56.000
13.542	9.995	17.943	27.938	-32.062	60.000
17.736	10.070	16.952	27.022	-32.978	60.000
Average					
0.157	9.618	16.762	26.379	-29.421	55.800
0.202	9.679	12.106	21.786	-32.728	54.514
0.454	9.689	22.216	31.905	-15.409	47.314
1.313	9.730	11.141	20.871	-25.129	46.000
13.542	9.995	12.891	22.886	-27.114	50.000
17.736	10.070	11.279	21.349	-28.651	50.000

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limit

The maximum peak power shall be less 1Watt.

3.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

3.4. Uncertainty

±0.86 dB

3.5. Test Result of Peak Power Output

Product : Wireless Headphones
Test Item : Peak Power Output
Test Mode : Mode 1: Transmit - 1Mbps
Test Date : 2018/05/11

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	4.43	1 Watt= 30 dBm	Pass
Channel 39	2441.00	4.48	1 Watt= 30 dBm	Pass
Channel 78	2480.00	4.41	1 Watt= 30 dBm	Pass

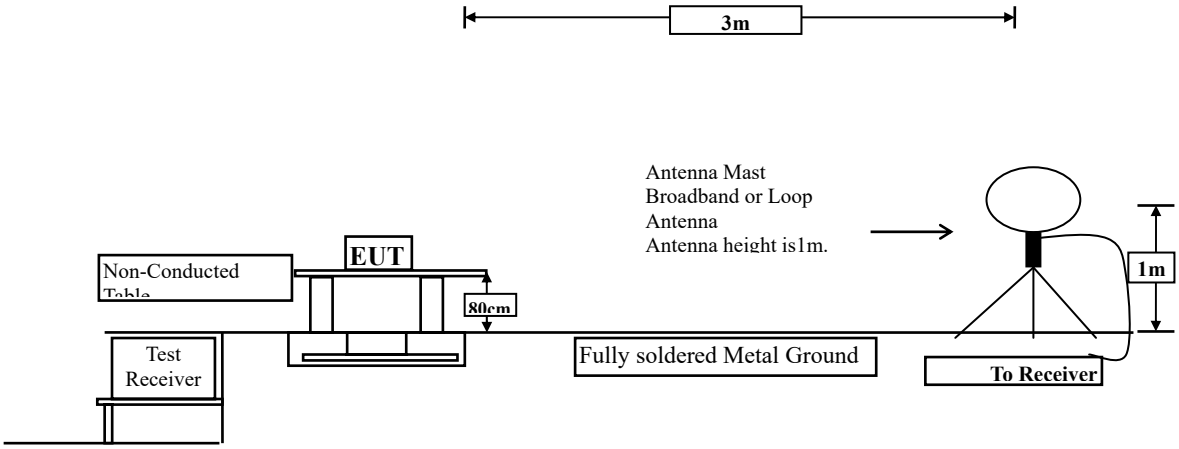
Product : Wireless Headphones
Test Item : Peak Power Output
Test Mode : Mode 2: Transmit - 3Mbps
Test Date : 2018/05/11

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	4.38	1 Watt= 30 dBm	Pass
Channel 39	2441.00	4.44	1 Watt= 30 dBm	Pass
Channel 78	2480.00	4.30	1 Watt= 30 dBm	Pass

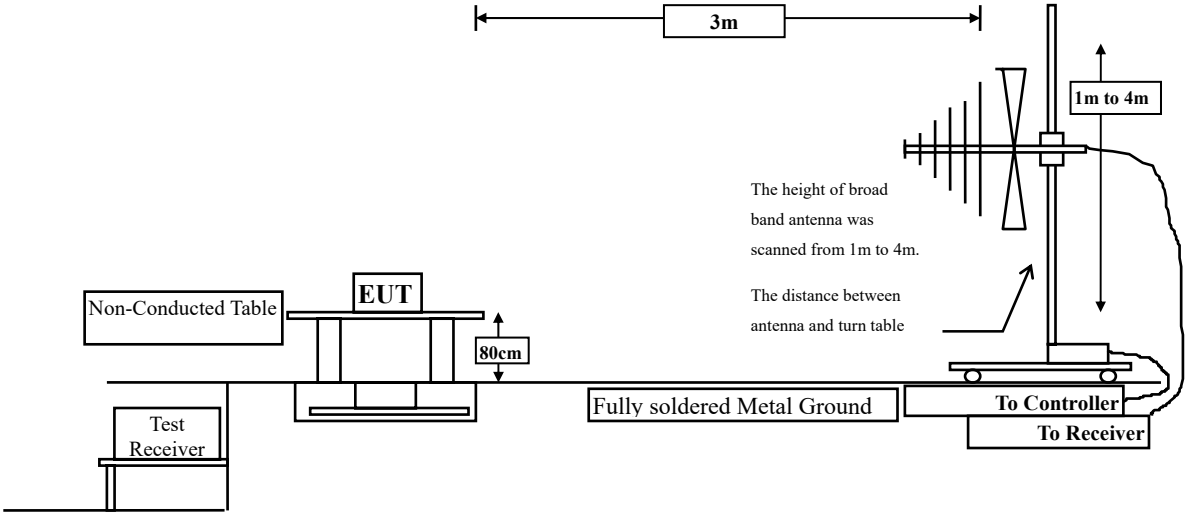
4. Radiated Emission

4.1. Test Setup

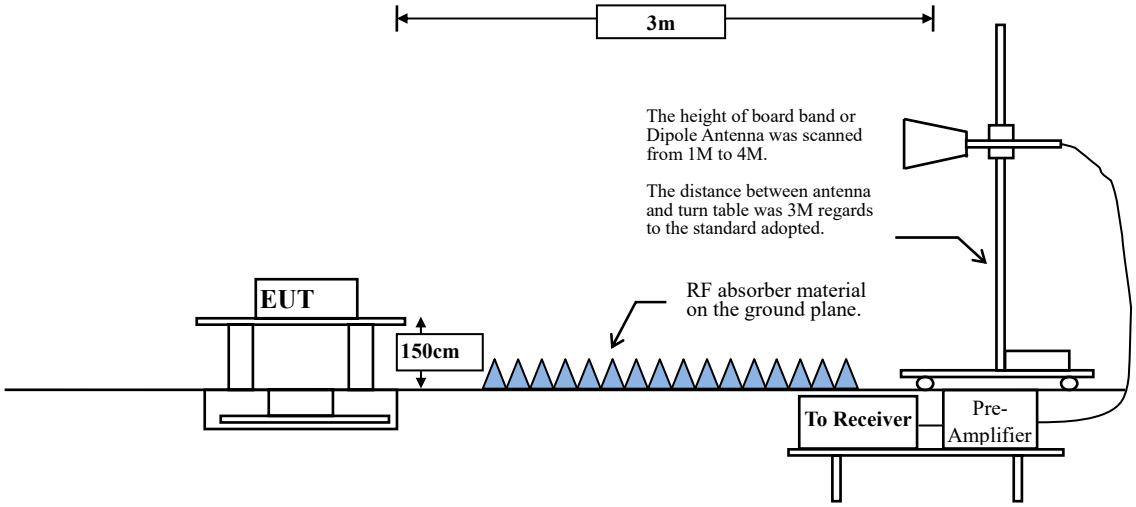
Radiated Emission Under 30MHz



Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



4.2. Limits

➢ **General Radiated Emission Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks:
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Uncertainty

Horizontal polarization：

30-300MHz: ±4.08dB；300M-1GHz: ±3.86dB；1-18GHz: ±3.77dB；18-40GHz: ±3.98dB

Vertical polarization：

30-300MHz: ±4.81dB；300M-1GHz: ±3.87dB；1-18GHz：±3.83dB；18-40GHz: ±3.98dB

4.5. Test Result of Radiated Emission

Product : Wireless Headphones
Test Item : Harmonic Radiated Emission
Test Mode : Mode 1: Transmit - 1Mbps(2402MHz)
Test Date : 2018/05/14

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4804.000	-2.875	60.670	57.796	-16.204	74.000
7206.000	0.384	56.570	56.954	-17.046	74.000
9608.000	2.338	44.500	46.838	-27.162	74.000
Average Detector:					
4804.000	-2.875	52.650	49.776	-4.224	54.000
7206.000	0.384	47.720	48.104	-5.896	54.000
Vertical					
Peak Detector:					
4804.000	-2.875	57.310	54.436	-19.564	74.000
7206.000	0.384	55.900	56.284	-17.716	74.000
9608.000	2.338	44.930	47.268	-26.732	74.000
Average Detector:					
4804.000	-2.875	49.420	46.546	-7.454	54.000
7206.000	0.384	46.950	47.334	-6.666	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Wireless Headphones
Test Item	:	Harmonic Radiated Emission
Test Mode	:	Mode 1: Transmit - 1Mbps(2441MHz)
Test Date	:	2018/05/14

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4882.000	-2.812	60.080	57.268	-16.732	74.000
7323.000	0.464	58.710	59.174	-14.826	74.000
9764.000	2.615	45.940	48.554	-25.446	74.000
Average Detector:					
4882.000	-2.812	52.010	49.198	-4.802	54.000
7323.000	0.464	50.000	50.464	-3.536	54.000
Vertical					
Peak Detector:					
4882.000	-2.812	57.300	54.488	-19.512	74.000
7323.000	0.464	57.380	57.844	-16.156	74.000
9764.000	2.615	44.130	46.744	-27.256	74.000
Average Detector:					
4882.000	-2.812	48.860	46.048	-7.952	54.000
7323.000	0.464	48.440	48.904	-5.096	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Wireless Headphones
Test Item	:	Harmonic Radiated Emission
Test Mode	:	Mode 1: Transmit - 1Mbps (2480MHz)
Test Date	:	2018/05/14

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4960.000	-2.791	60.790	57.999	-16.001	74.000
7440.000	0.499	58.350	58.849	-15.151	74.000
9920.000	2.917	45.700	48.617	-25.383	74.000
Average Detector:					
4960.000	-2.791	52.680	49.889	-4.111	54.000
7440.000	0.499	49.600	50.099	-3.901	54.000
Vertical					
Peak Detector:					
4960.000	-2.791	57.850	55.059	-18.941	74.000
7440.000	0.499	57.370	57.869	-16.131	74.000
9920.000	2.917	44.590	47.507	-26.493	74.000
Average Detector:					
4960.000	-2.791	49.950	47.159	-6.841	54.000
7440.000	0.499	48.260	48.759	-5.241	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Headphones
Test Item : Harmonic Radiated Emission
Test Mode : Mode 2: Transmit - 3Mbps (2402MHz)
Test Date : 2018/05/14

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4804.000	-2.875	58.470	55.596	-18.404	74.000
7206.000	0.384	55.350	55.734	-18.266	74.000
9608.000	2.338	44.290	46.628	-27.372	74.000
Average Detector:					
4804.000	-2.875	47.230	44.356	-9.644	54.000
7206.000	0.384	43.210	43.594	-10.406	54.000
Vertical					
Peak Detector:					
4804.000	-2.875	55.420	52.546	-21.454	74.000
7206.000	0.384	52.530	52.914	-21.086	74.000
9608.000	2.338	43.090	45.428	-28.572	74.000
Average Detector:					
--					54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Wireless Headphones
Test Item	:	Harmonic Radiated Emission
Test Mode	:	Mode 2: Transmit - 3Mbps (2441MHz)
Test Date	:	2018/05/14

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4882.000	-2.812	57.320	54.508	-19.492	74.000
7323.000	0.464	55.810	56.274	-17.726	74.000
9764.000	2.615	44.660	47.274	-26.726	74.000
Average Detector:					
4882.000	-2.812	46.190	43.378	-10.622	54.000
7323.000	0.464	43.260	43.724	-10.276	54.000
Vertical					
Peak Detector:					
4882.000	-2.812	55.000	52.188	-21.812	74.000
7323.000	0.464	54.420	54.884	-19.116	74.000
9764.000	2.615	44.430	47.044	-26.956	74.000
Average Detector:					
7323.000	0.464	41.760	42.224	-11.776	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	Wireless Headphones
Test Item	:	Harmonic Radiated Emission
Test Mode	:	Mode 2: Transmit - 3Mbps (2480MHz)
Test Date	:	2018/05/14

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
Peak Detector:					
4960.000	-2.791	58.820	56.029	-17.971	74.000
7440.000	0.499	55.570	56.069	-17.931	74.000
9920.000	2.917	44.580	47.497	-26.503	74.000
Average Detector:					
4960.000	-2.791	47.370	44.579	-9.421	54.000
7440.000	0.499	42.890	43.389	-10.611	54.000
Vertical					
Peak Detector:					
4960.000	-2.791	54.470	51.679	-22.321	74.000
7440.000	0.499	54.260	54.759	-19.241	74.000
9920.000	2.917	43.560	46.477	-27.523	74.000
Average Detector:					
7440.000	0.499	41.900	42.399	-11.601	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : Wireless Headphones
Test Item : General Radiated Emission
Test Mode : Mode 1: Transmit - 1Mbps (2441MHz)
Test Date : 2018/05/14

Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
104.507	-15.080	47.528	32.448	-11.052	43.500
239.464	-11.898	56.073	44.174	-1.826	46.000
335.058	-9.102	44.116	35.014	-10.986	46.000
451.739	-6.138	42.159	36.020	-9.980	46.000
832.710	0.090	33.838	33.928	-12.072	46.000
997.188	2.178	34.540	36.719	-17.281	54.000
Vertical					
79.203	-15.137	44.317	29.180	-10.820	40.000
239.464	-11.898	45.758	33.859	-12.141	46.000
443.304	-6.338	40.184	33.846	-12.154	46.000
600.754	-3.062	35.044	31.982	-14.018	46.000
834.116	0.107	34.637	34.744	-11.256	46.000
1000.000	2.220	32.063	34.283	-19.717	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

Product : Wireless Headphones
Test Item : General Radiated Emission
Test Mode : Mode 2: Transmit - 3Mbps (2441MHz)
Test Date : 2018/05/14

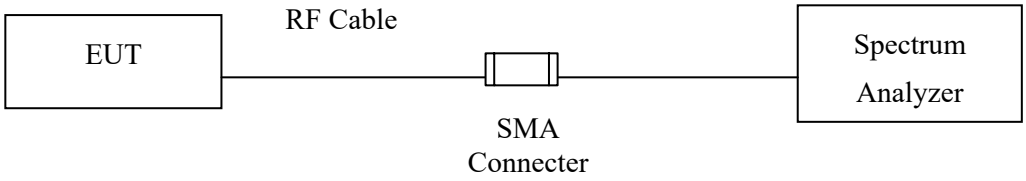
Frequency MHz	Correct Factor dB	Reading Level dBμV	Measurement Level dBμV/m	Margin dB	Limit dBμV/m
Horizontal					
74.986	-14.362	42.719	28.357	-11.643	40.000
117.159	-13.328	45.075	31.747	-11.753	43.500
239.464	-11.898	56.124	44.225	-1.775	46.000
375.826	-8.022	42.580	34.558	-11.442	46.000
451.739	-6.138	41.070	34.931	-11.069	46.000
831.304	0.072	34.236	34.308	-11.692	46.000
Vertical					
79.203	-15.137	44.692	29.555	-10.445	40.000
239.464	-11.898	44.911	33.012	-12.988	46.000
451.739	-6.138	39.176	33.037	-12.963	46.000
575.449	-3.656	35.633	31.976	-14.024	46.000
855.203	0.379	31.200	31.579	-14.421	46.000
997.188	2.178	33.225	35.404	-18.596	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF Antenna Conducted Test

5.1. Test Setup



5.2. Limits

According to FCC 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

5.4. Uncertainty

±1.23dB

5.5. Test Result of RF Antenna Conducted Test

Product	:	Wireless Headphones
Test Item	:	RF Antenna Conducted Test
Test Mode	:	Mode 1: Transmit - 1Mbps
Test Date	:	2018/05/11

Figure Channel 00:

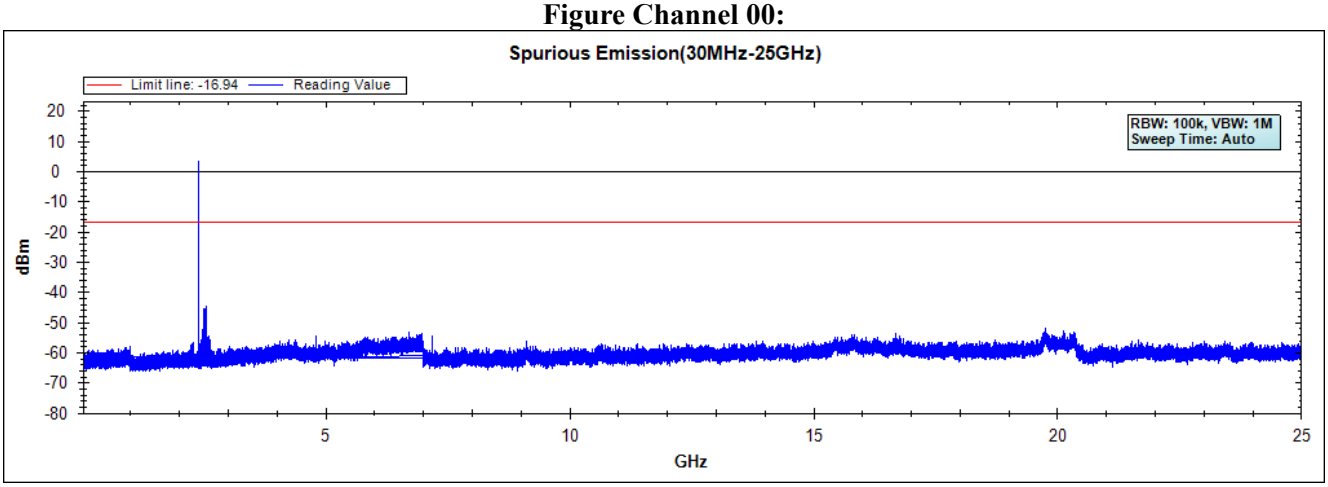


Figure Channel 39:

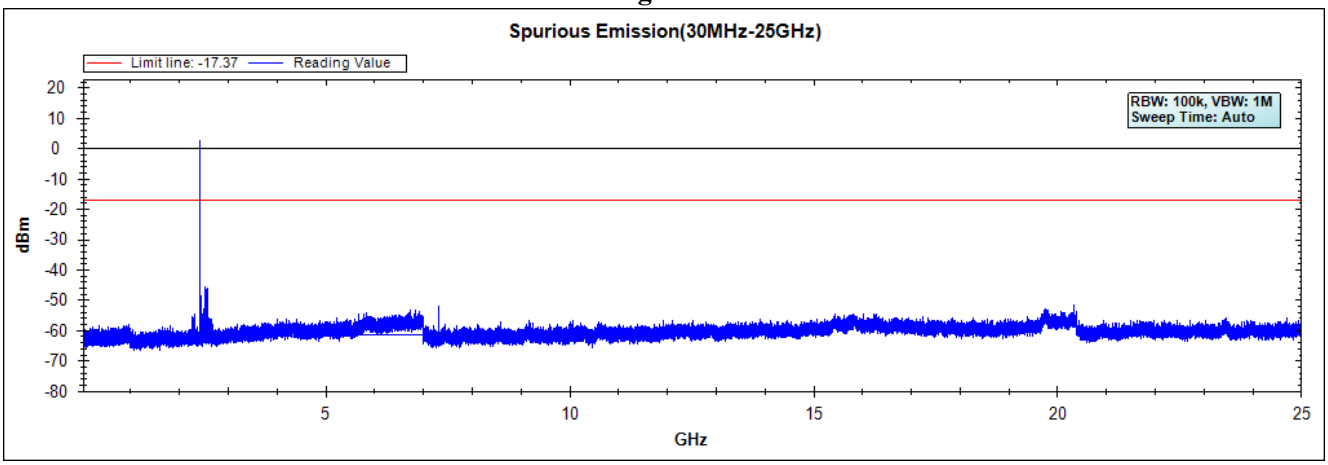
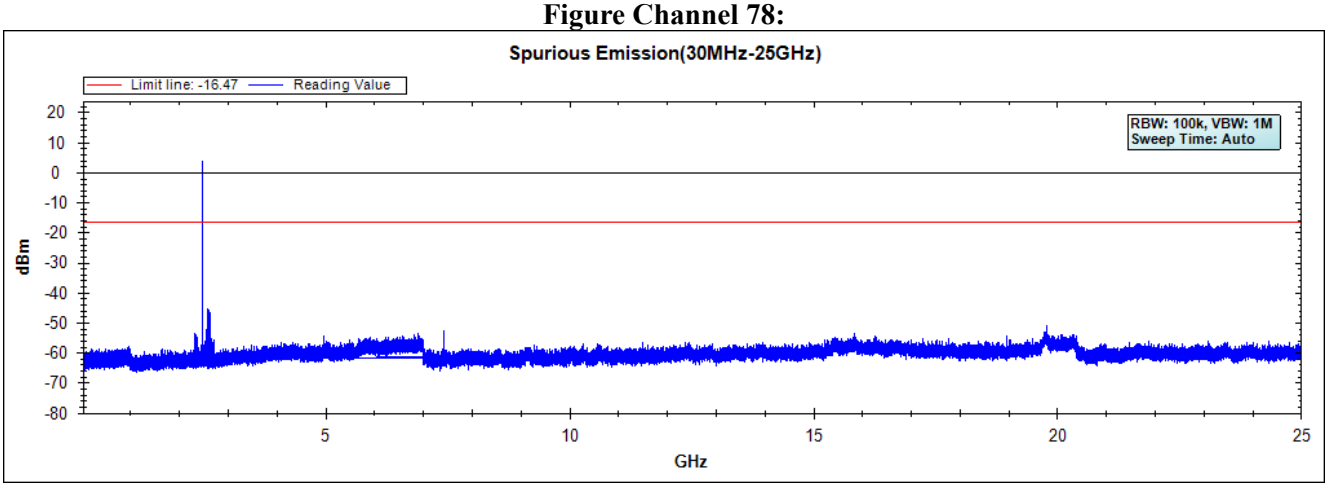


Figure Channel 78:



Note: The above test pattern is synthesized by multiple of the frequency range.

Product	:	Wireless Headphones
Test Item	:	RF Antenna Conducted Test
Test Mode	:	Mode 2: Transmit - 3Mbps
Test Date	:	2018/05/11

Figure Channel 00:

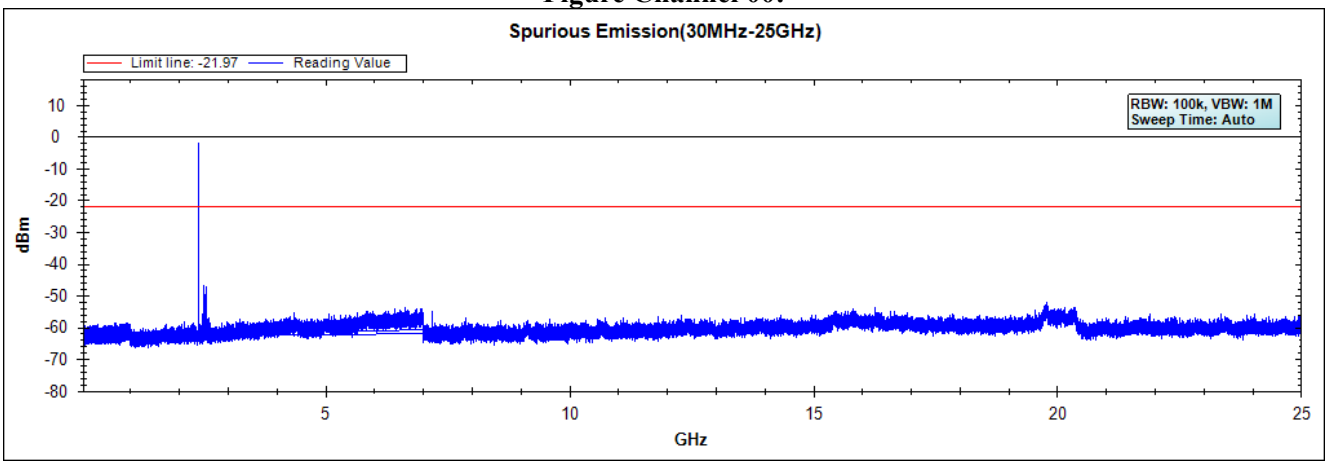


Figure Channel 39:

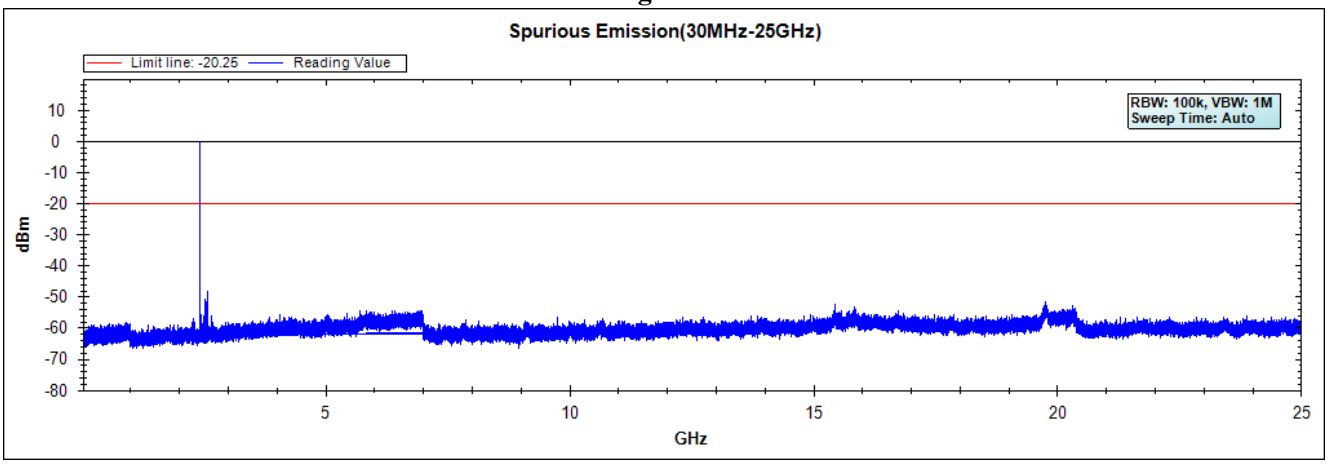
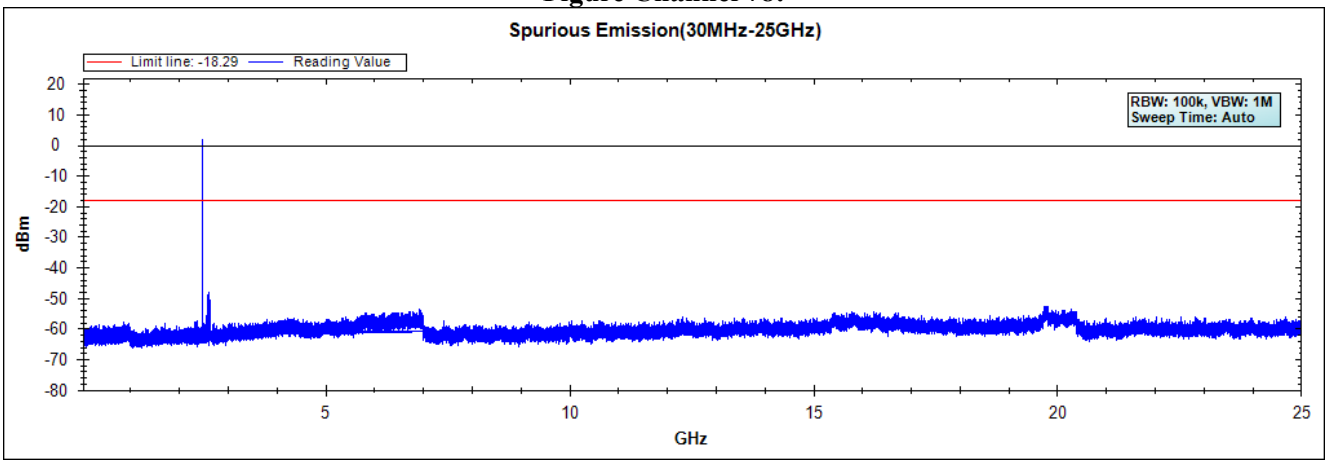


Figure Channel 78:

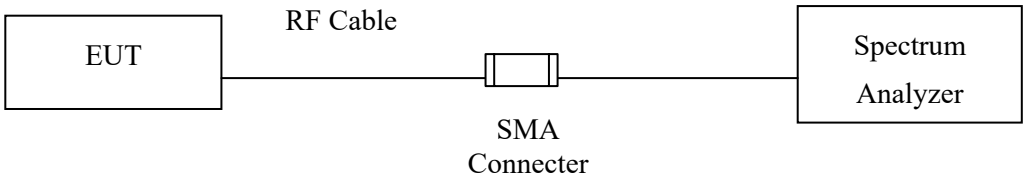


Note: The above test pattern is synthesized by multiple of the frequency range.

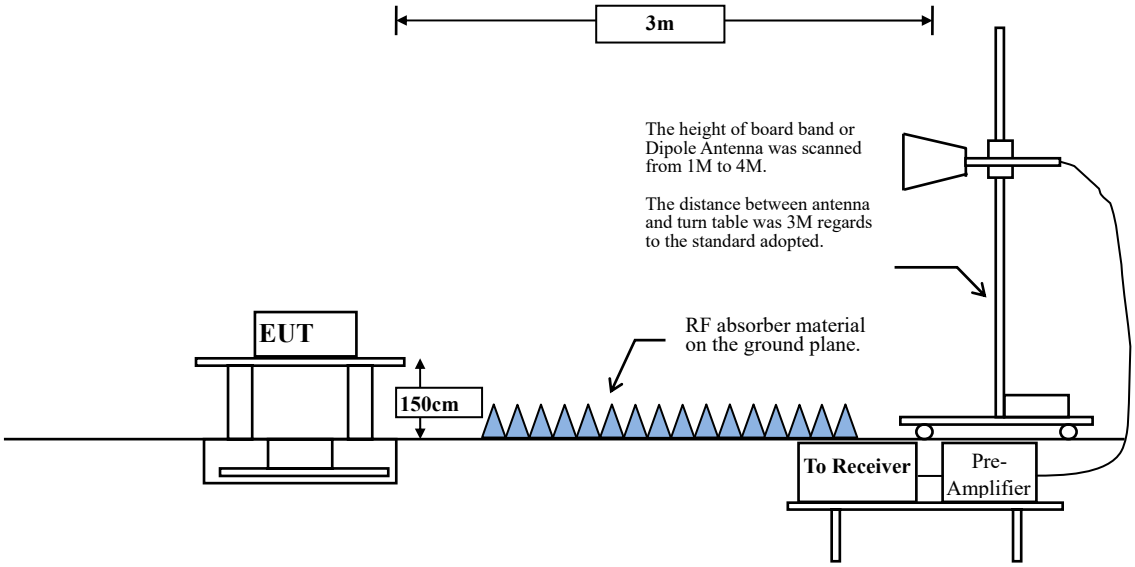
6. Band Edge

6.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:



6.2. Limit

According to FCC 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 measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.
Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.
The bandwidth setting below 1GHz and above 1GHz on the field strength meter is 120 kHz and 1MHz, respectively.

6.4. Uncertainty

Conducted: ±1.23dB
Radiated:
Horizontal polarization：1-18GHz: ±3.77dB
Vertical polarization：1-18GHz : ±3.83dB

6.5. Test Result of Band Edge

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 1Mbps (2402MHz)
Test Date : 2018/05/14

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Peak)	2386.232	12.137	35.646	47.784	74.00	54.00	Pass
00 (Peak)	2390.000	12.148	35.264	47.412	74.00	54.00	Pass
00 (Peak)	2400.000	12.176	55.337	67.513	--	--	Pass
00 (Peak)	2402.174	12.182	89.683	101.865	--	--	--
00 (Average)	2375.942	12.108	19.509	31.617	74.00	54.00	Pass
00 (Average)	2390.000	12.148	16.660	28.808	74.00	54.00	Pass
00 (Average)	2400.000	12.176	39.955	52.131	--	--	Pass
00 (Average)	2402.029	12.182	74.054	86.235	--	--	--

Figure Channel 00: Horizontal (Peak)

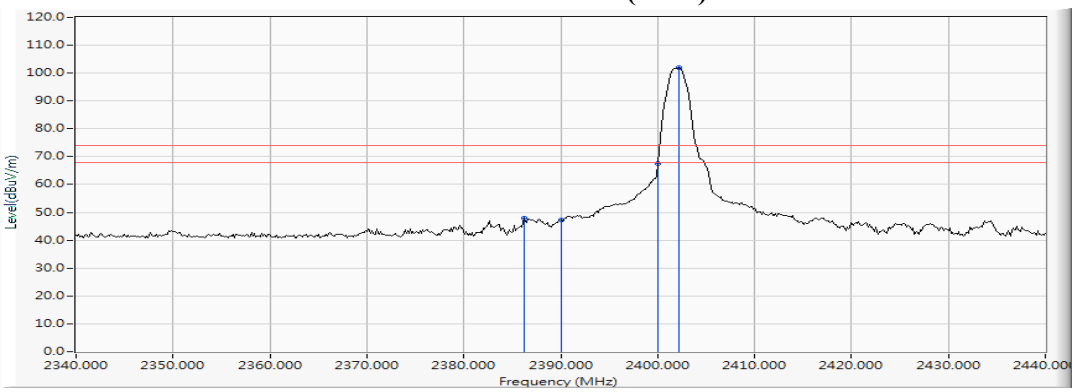
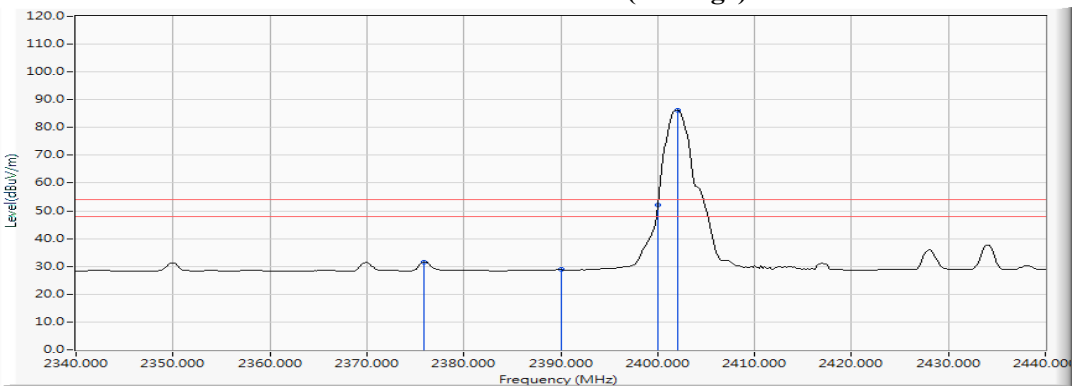


Figure Channel 00: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 1Mbps (2402MHz)
Test Date : 2018/05/14

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Peak)	2388.986	12.145	33.249	45.394	74.00	54.00	Pass
00 (Peak)	2390.000	12.148	29.069	41.217	74.00	54.00	Pass
00 (Peak)	2400.000	12.176	48.199	60.375	--	--	Pass
00 (Peak)	2402.174	12.182	82.369	94.551	--	--	--
00 (Average)	2390.000	12.148	16.339	28.487	74.00	54.00	Pass
00 (Average)	2400.000	12.176	34.179	46.355	--	--	Pass
00 (Average)	2402.029	12.182	68.232	80.413	--	--	--

Figure Channel 00: VERTICAL (Peak)

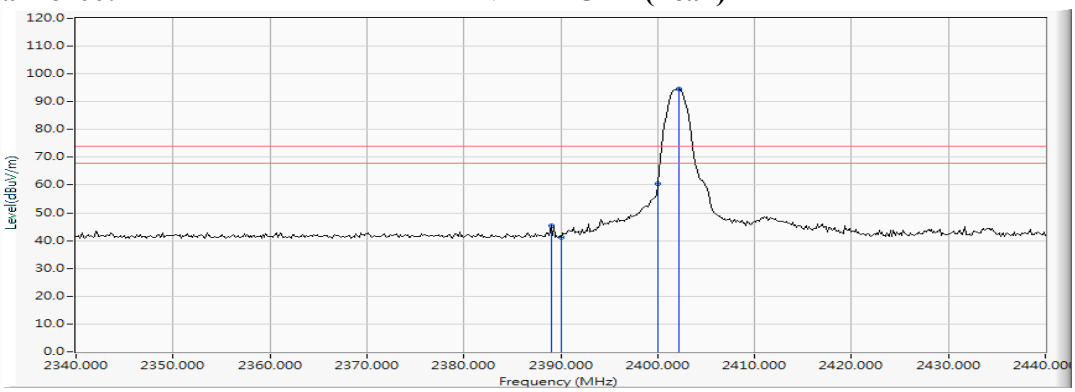
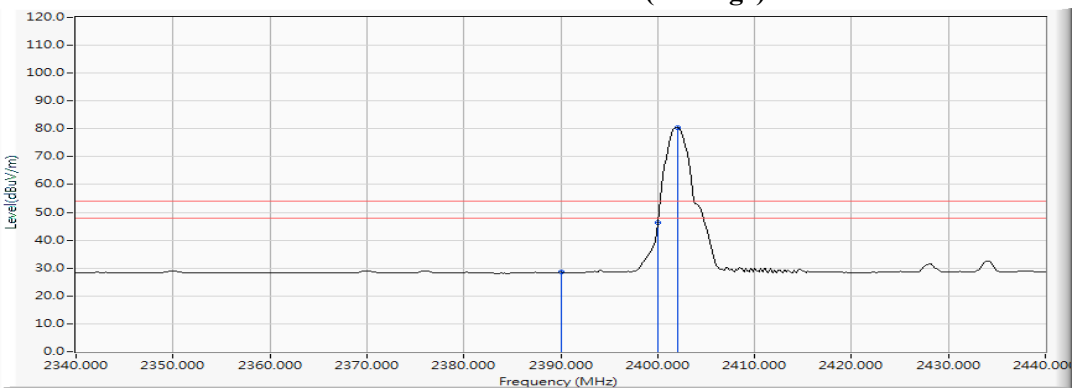


Figure Channel 00: VERTICAL (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 1Mbps (2480MHz)
Test Date : 2018/05/14

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Peak)	2479.877	12.393	91.994	104.387	--	--	--
78 (Peak)	2483.500	12.403	57.382	69.785	74.00	54.00	Pass
78 (Average)	2480.022	12.393	75.801	88.194	--	--	--
78 (Average)	2483.500	12.403	29.115	41.518	74.00	54.00	Pass

Figure Channel 78: Horizontal (Peak)

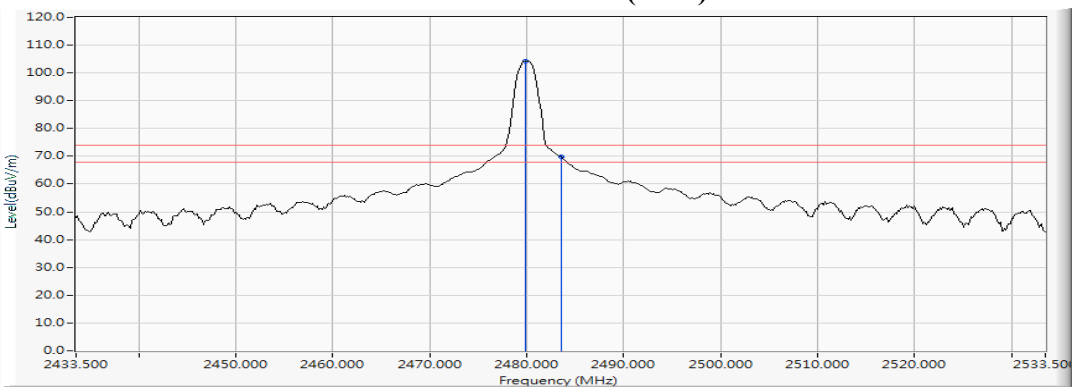
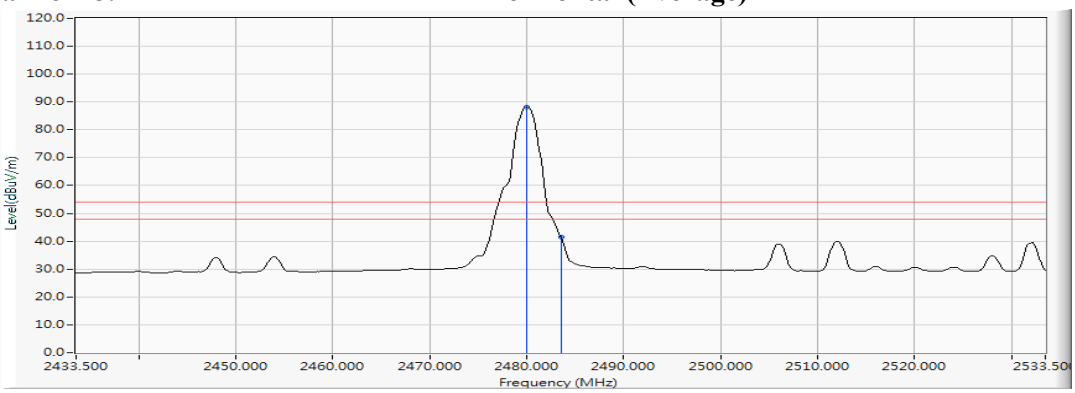


Figure Channel 78: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 1Mbps (2480MHz)
Test Date : 2018/05/14

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Peak)	2479.732	12.392	83.783	96.175	--	--	--
78 (Peak)	2483.500	12.403	49.199	61.602	74.00	54.00	Pass
78 (Average)	2480.022	12.393	69.262	81.655	--	--	--
78 (Average)	2483.500	12.403	23.877	36.280	74.00	54.00	Pass

Figure Channel 78: VERTICAL (Peak)

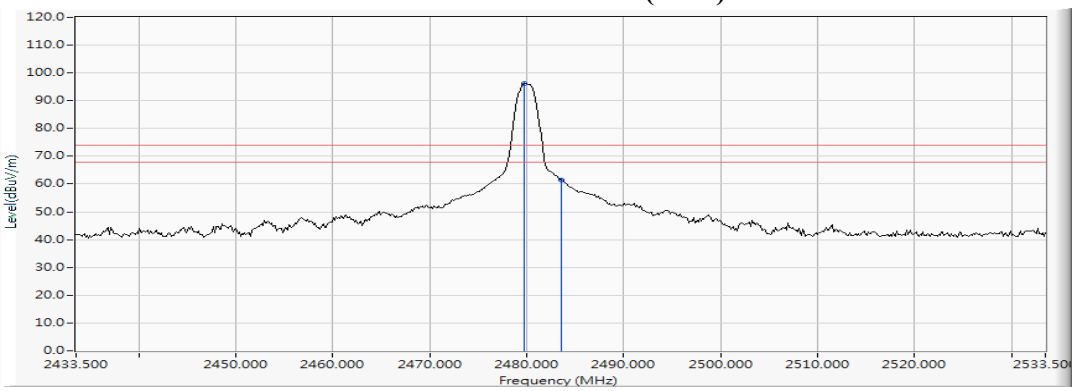
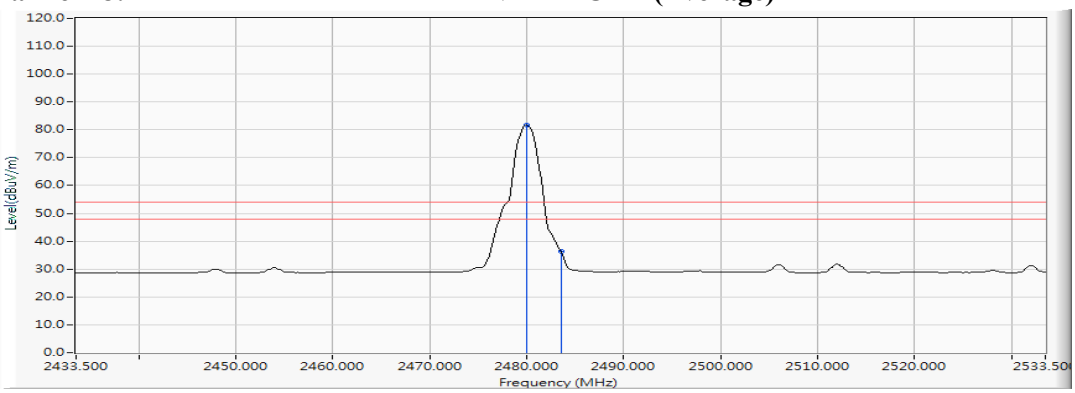


Figure Channel 78: VERTICAL (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 3Mbps (2402MHz)
Test Date : 2018/05/14

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Peak)	2369.710	12.090	31.953	44.043	74.00	54.00	Pass
00 (Peak)	2390.000	12.148	29.909	42.057	74.00	54.00	Pass
00 (Peak)	2400.000	12.176	60.436	72.612	--	--	Pass
00 (Peak)	2402.029	12.182	88.883	101.064	--	--	--
00 (Average)	2370.000	12.090	18.610	30.701	74.00	54.00	Pass
00 (Average)	2390.000	12.148	16.513	28.661	74.00	54.00	Pass
00 (Average)	2400.000	12.176	43.646	55.822	--	--	Pass
00 (Average)	2402.029	12.182	70.820	83.001	--	--	--

Figure Channel 00: Horizontal (Peak)

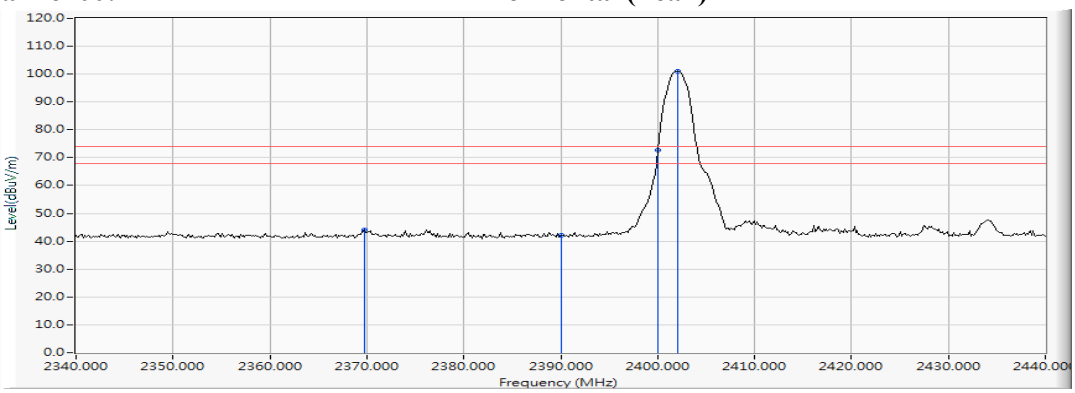
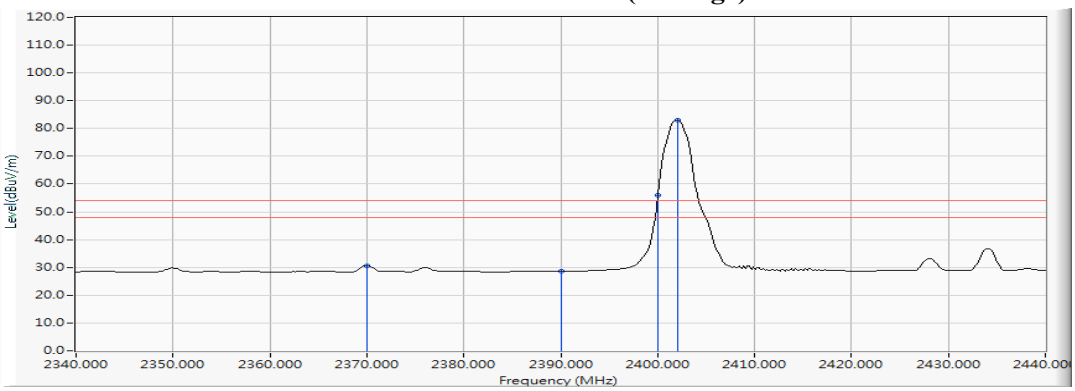


Figure Channel 00: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 3Mbps (2402MHz)
Test Date : 2018/05/14

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
00 (Peak)	2389.565	12.147	35.168	47.315	74.00	54.00	Pass
00 (Peak)	2390.000	12.148	29.422	41.570	74.00	54.00	Pass
00 (Peak)	2400.000	12.176	53.185	65.361	--	--	Pass
00 (Peak)	2402.029	12.182	81.530	93.711	--	--	--
00 (Average)	2390.000	12.148	16.157	28.305	74.00	54.00	Pass
00 (Average)	2400.000	12.176	38.038	50.214	--	--	Pass
00 (Average)	2402.029	12.182	64.892	77.073	--	--	--

Figure Channel 00: VERTICAL (Peak)

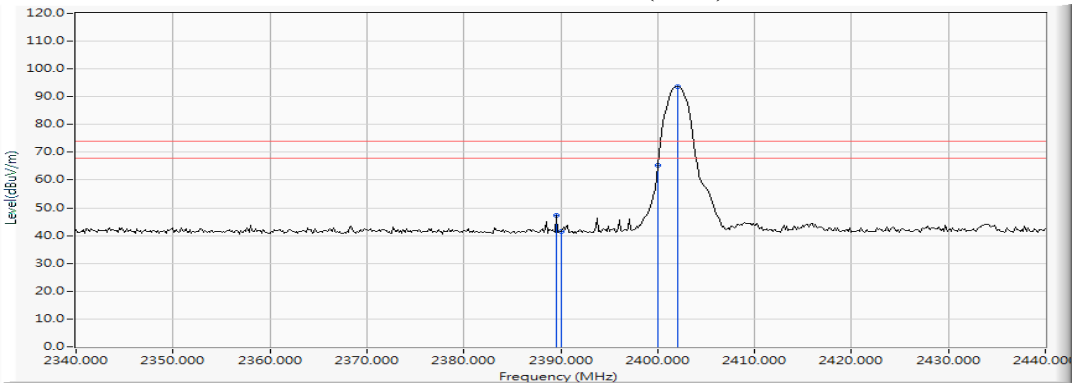
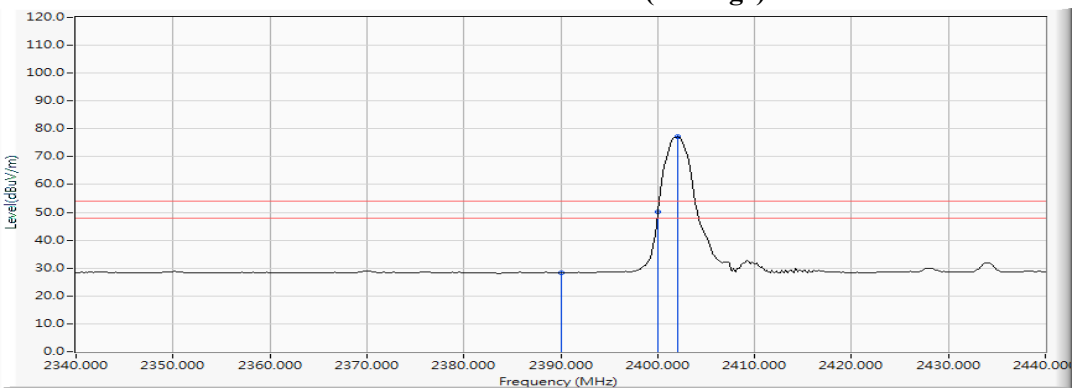


Figure Channel 00: VERTICAL (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 3Mbps (2480MHz)
Test Date : 2018/05/14

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Peak)	2480.022	12.393	91.163	103.556	--	--	--
78 (Peak)	2483.500	12.403	43.853	56.256	74.00	54.00	Pass
78 (Average)	2480.022	12.393	72.344	84.737	--	--	--
78 (Average)	2483.500	12.403	26.093	38.496	74.00	54.00	Pass
78 (Average)	2512.051	12.473	26.232	38.705	74.00	54.00	Pass

Figure Channel 00: Horizontal (Peak)

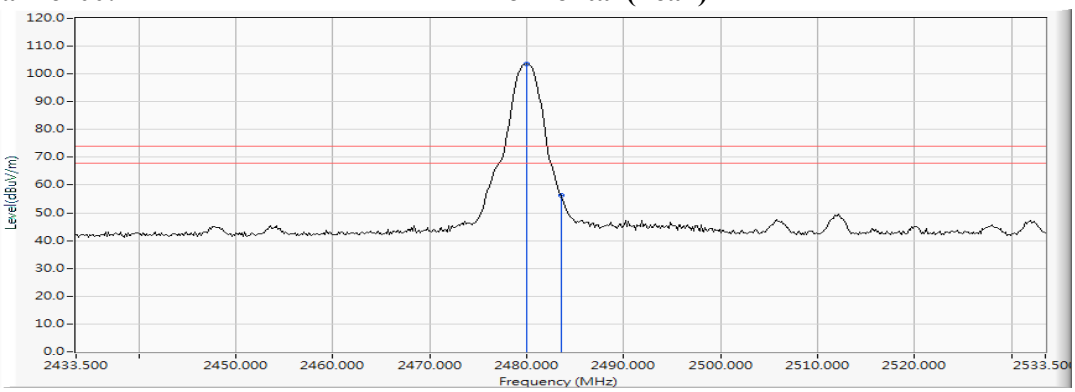
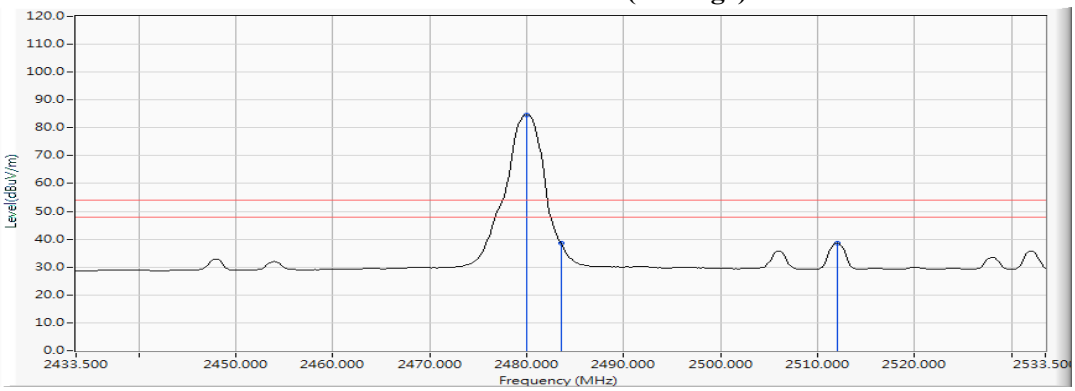


Figure Channel 00: Horizontal (Average)



Note:
1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product	:	Wireless Headphones
Test Item	:	Band Edge
Test Mode	:	Mode 2: Transmit - 3Mbps (2480MHz)
Test Date	:	2018/05/14

RF Radiated Measurement (VERTICAL):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Peak Limit (dBμV/m)	Average Limit (dBμV/m)	Result
78 (Peak)	2480.022	12.393	82.992	95.385	--	--	--
78 (Peak)	2483.500	12.403	35.909	48.312	74.00	54.00	Pass
78 (Average)	2480.022	12.393	65.795	78.188	--	--	--
78 (Average)	2483.500	12.403	20.953	33.356	74.00	54.00	Pass

Figure Channel 78: VERTICAL (Peak)

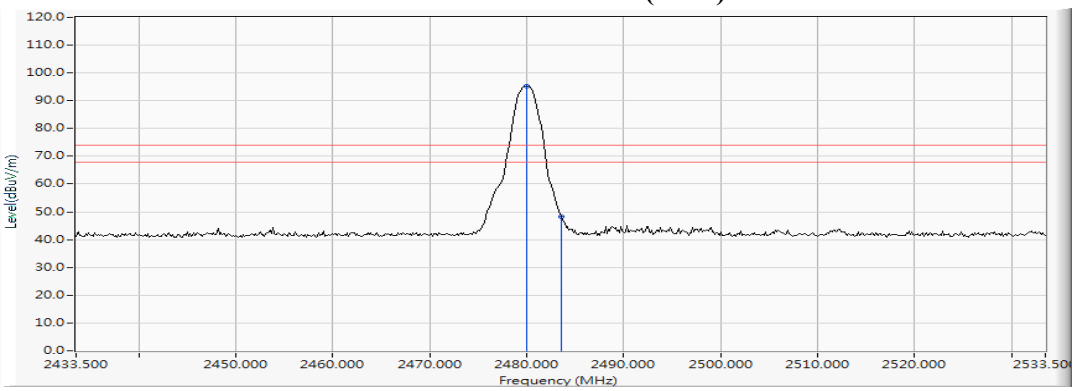
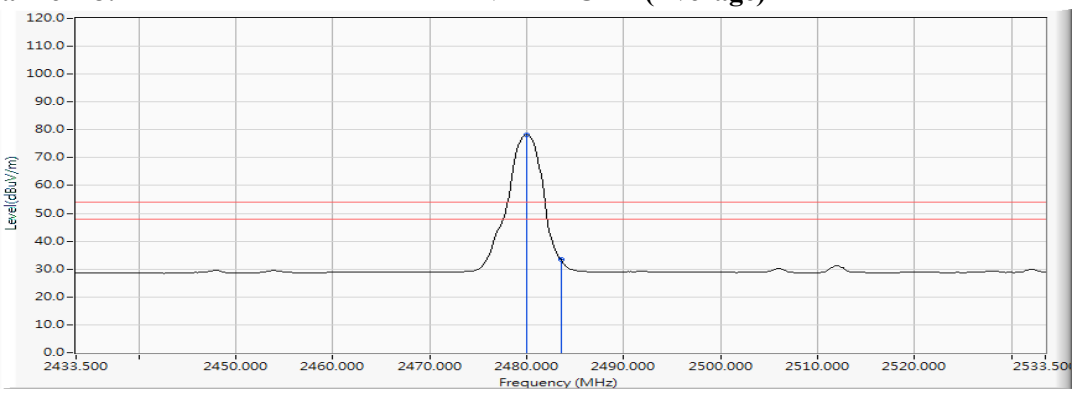


Figure Channel 78: VERTICAL (Average)



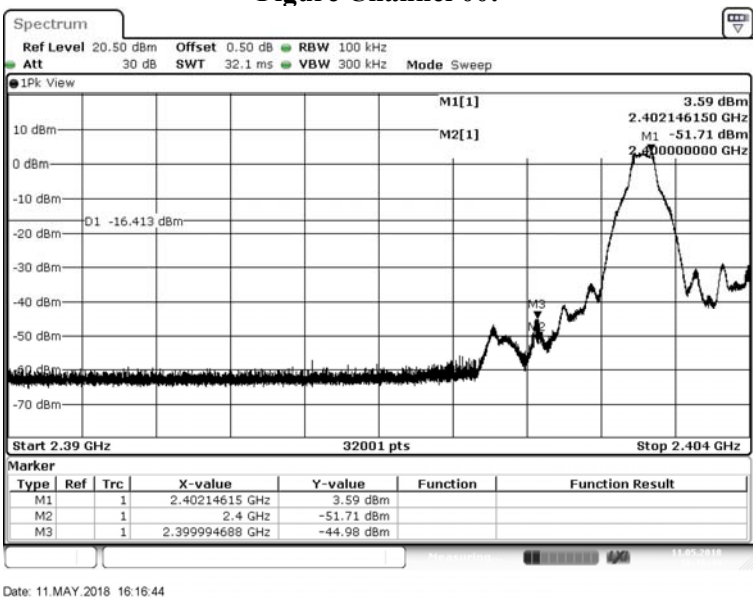
Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. " * ", means this data is the worst emission level.
5. Measurement Level = Reading Level + Correction Factor.
6. The average measurement was not performed when the peak measured data is under the limit of average detection.

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 1Mbps(Hopping off)

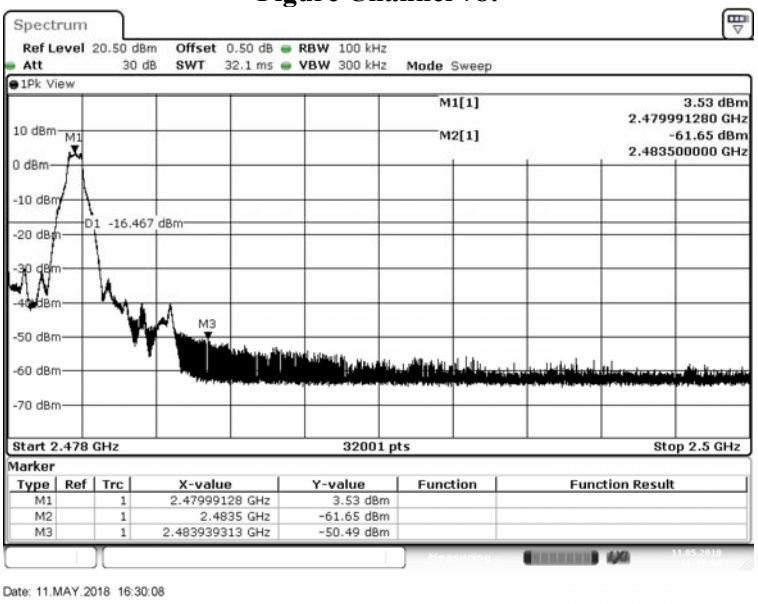
Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 00:



Date: 11.MAY.2018 16:16:44

Figure Channel 78:



Date: 11.MAY.2018 16:30:08

Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 3Mbps (Hopping off)

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 00:

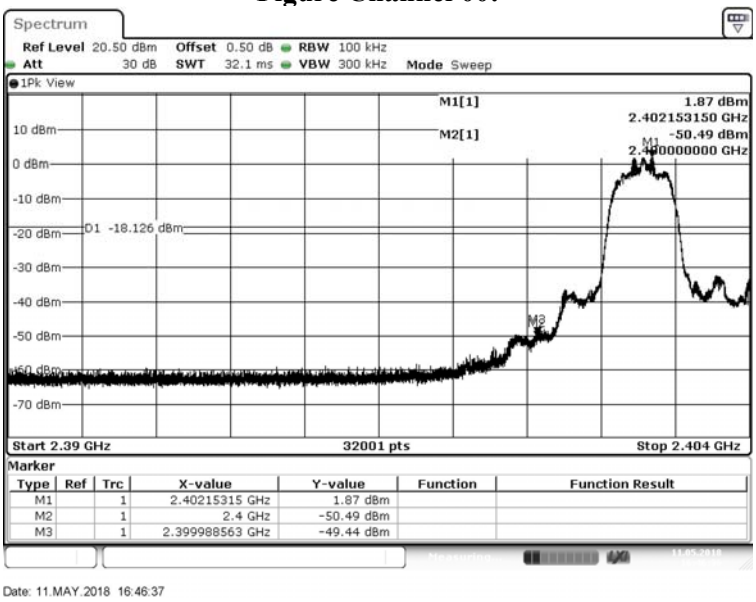
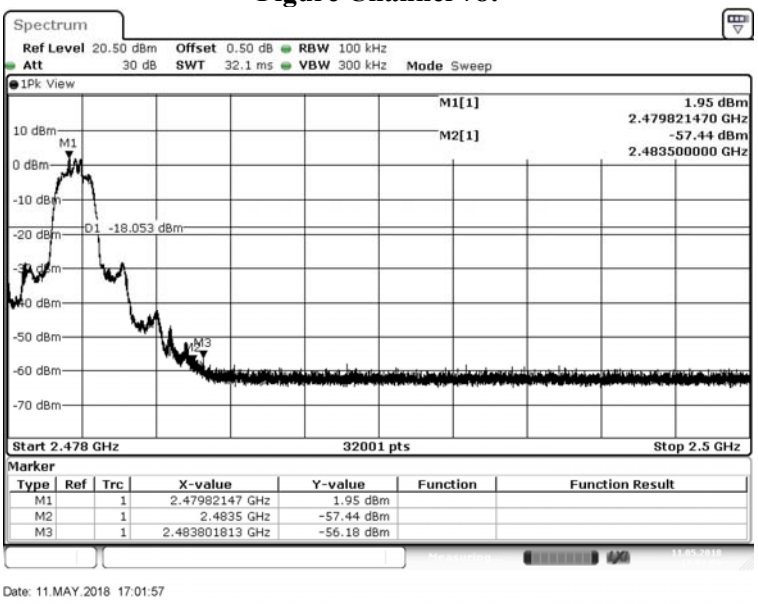


Figure Channel 78:



Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 1: Transmit - 1Mbps(Hopping on)

Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel Hopping:

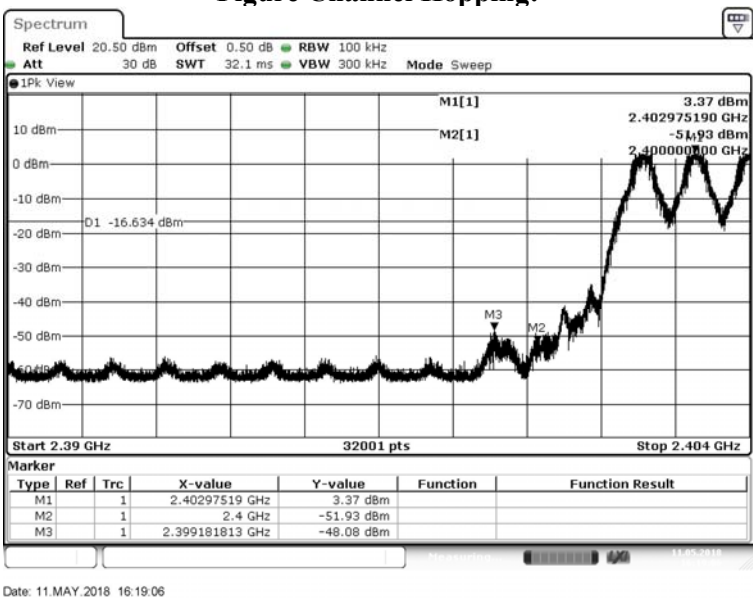
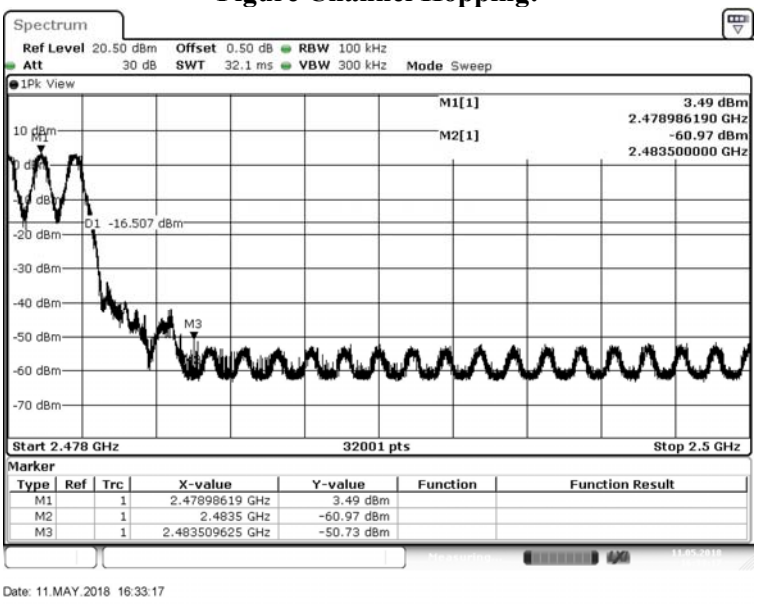


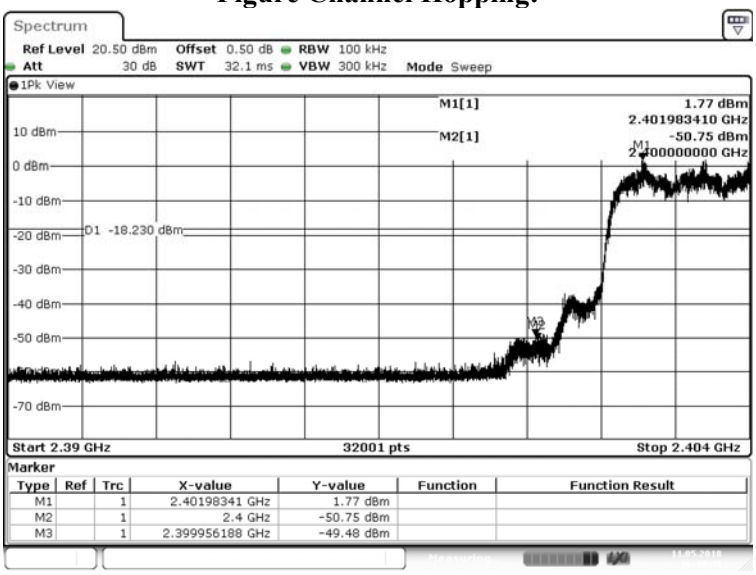
Figure Channel Hopping:



Product : Wireless Headphones
Test Item : Band Edge
Test Mode : Mode 2: Transmit - 3Mbps (Hopping on)

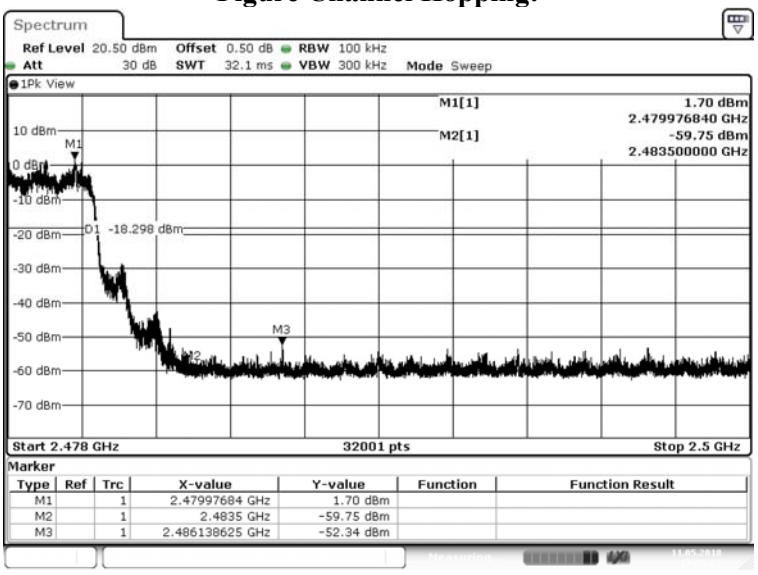
Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel Hopping:



Date: 11.MAY.2018 16:49:46

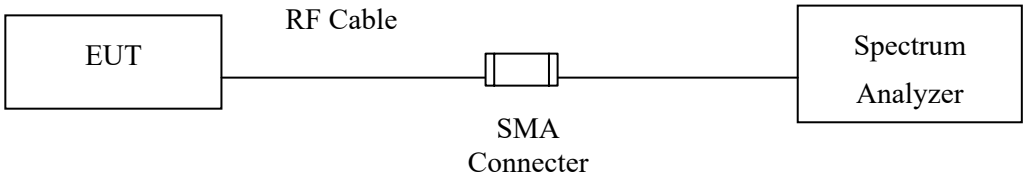
Figure Channel Hopping:



Date: 11.MAY.2018 17:05:23

7. Channel Number

7.1. Test Setup



7.2. Limit

Frequency hopping systems operating in the 2400-2483.5 MHz bands shall use at least 75 hopping frequencies.

7.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

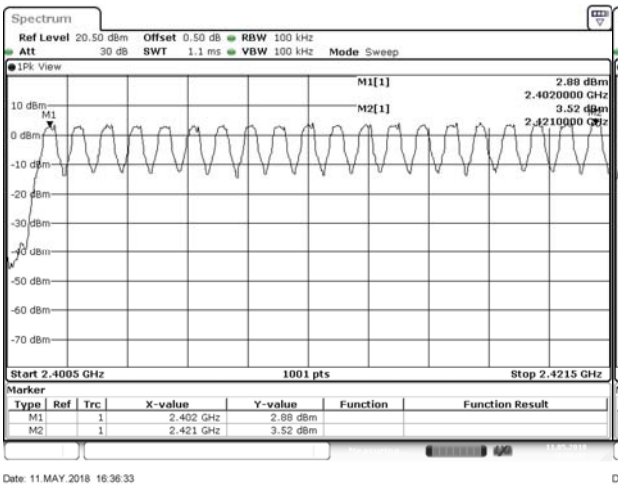
N/A

7.5. Test Result of Channel Number

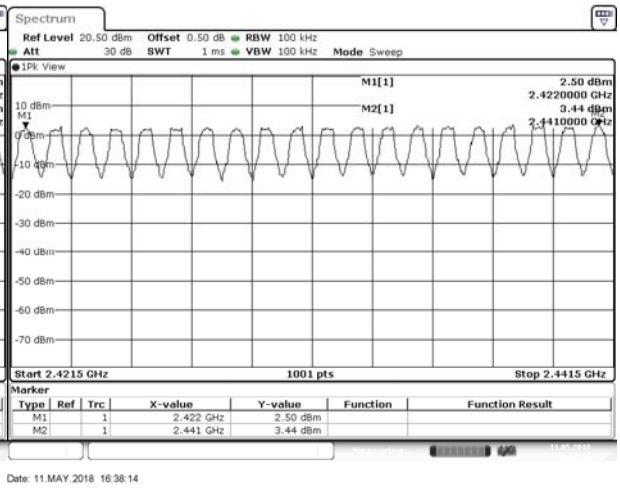
Product : Wireless Headphones
Test Item : Channel Number
Test Mode : Mode 1: Transmit - 1Mbps

Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

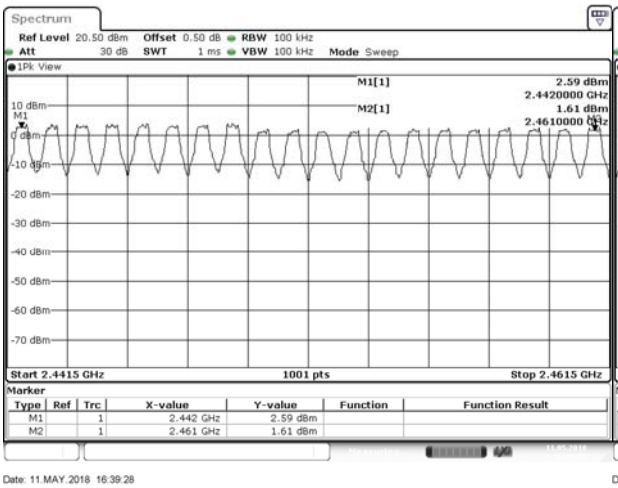
2402-2421MHz



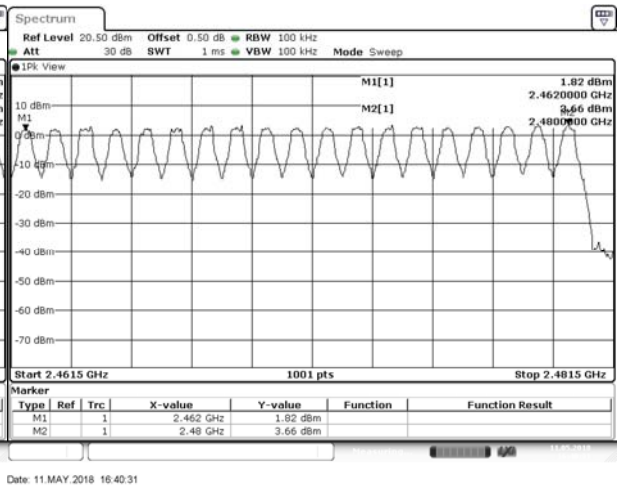
2422-2441MHz



2442-2461MHz



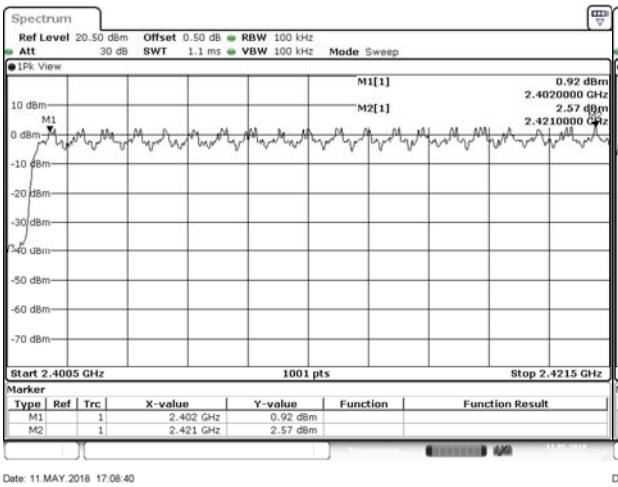
2462-2480MHz



Product : Wireless Headphones
Test Item : Channel Number
Test Mode : Mode 2: Transmit - 3Mbps

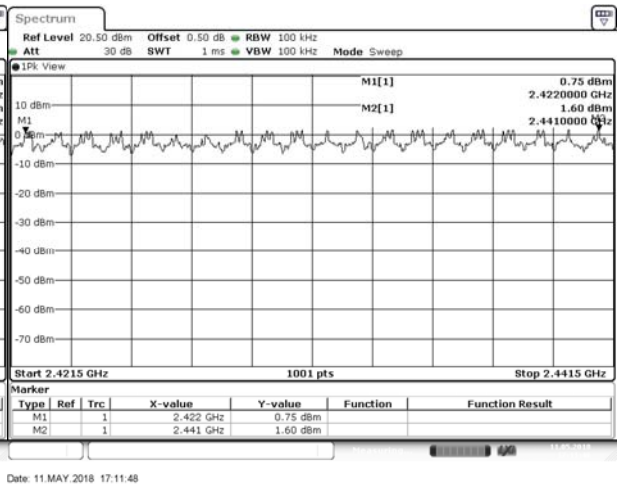
Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

2402-2421MHz



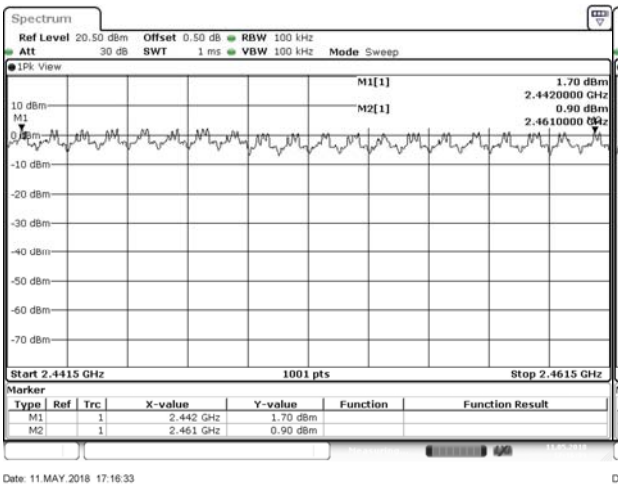
Date: 11.MAY.2018 17:08:40

2422-2441MHz



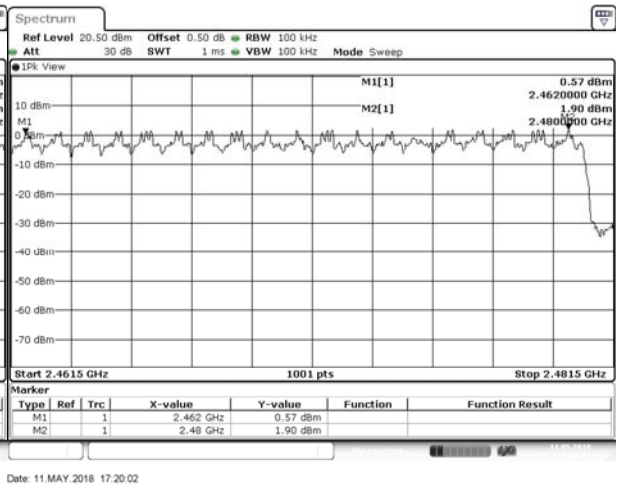
Date: 11.MAY.2018 17:11:48

2442-2461MHz



Date: 11.MAY.2018 17:16:33

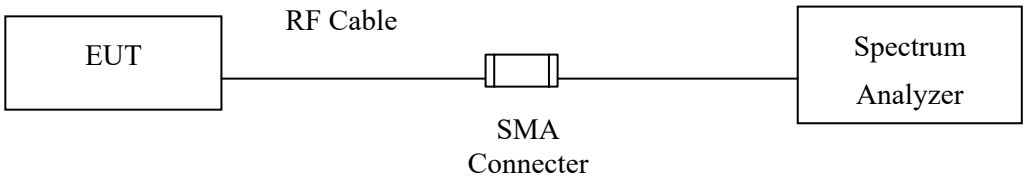
2462-2480MHz



Date: 11.MAY.2018 17:20:02

8. Channel Separation

8.1. Test Setup



8.2. Limit

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.

8.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

8.4. Uncertainty

±279.2Hz

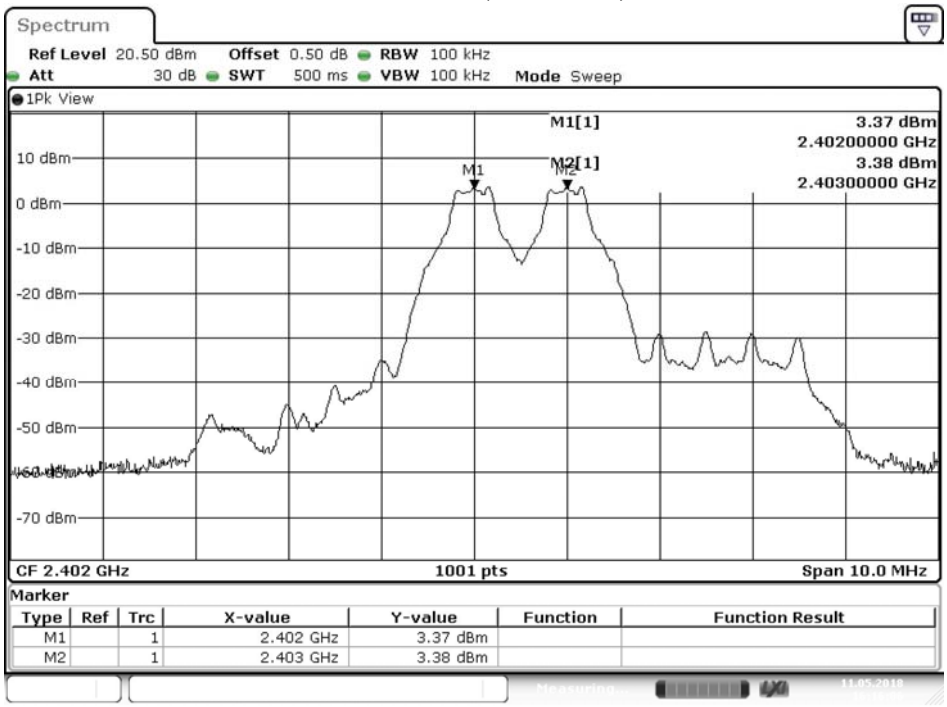
8.5. Test Result of Channel Separation

Product : Wireless Headphones
Test Item : Channel Separation
Test Mode : Mode 1: Transmit - 1Mbps

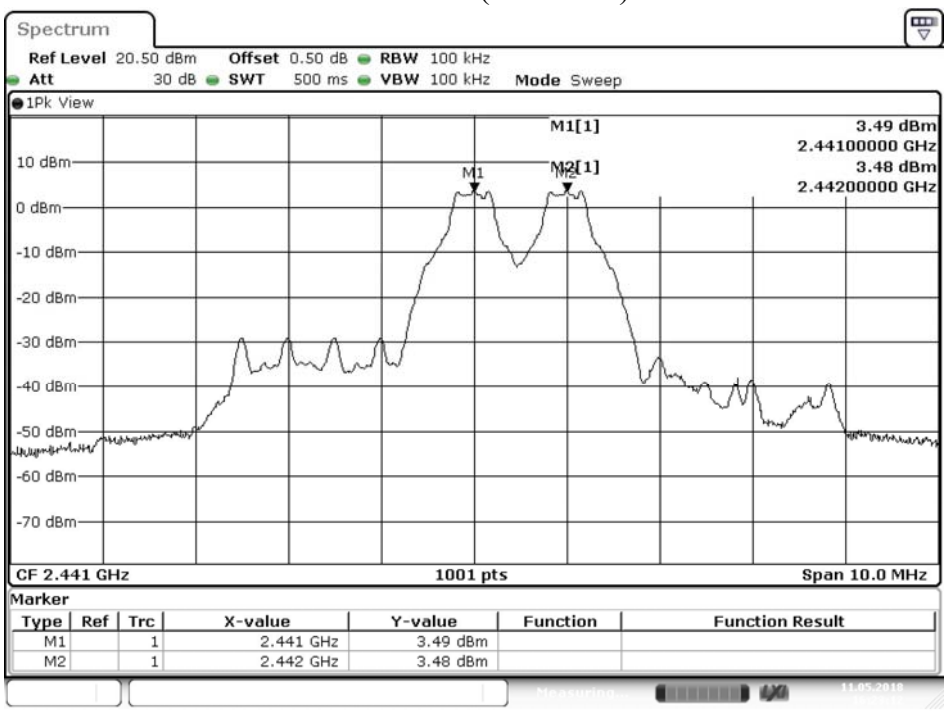
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	638.0	Pass
39	2441	1000	>25 kHz	636.0	Pass
78	2480	1000	>25 kHz	636.0	Pass

NOTE: The 20dB Bandwidth is refer to section 10.

Channel 00 (2402MHz)

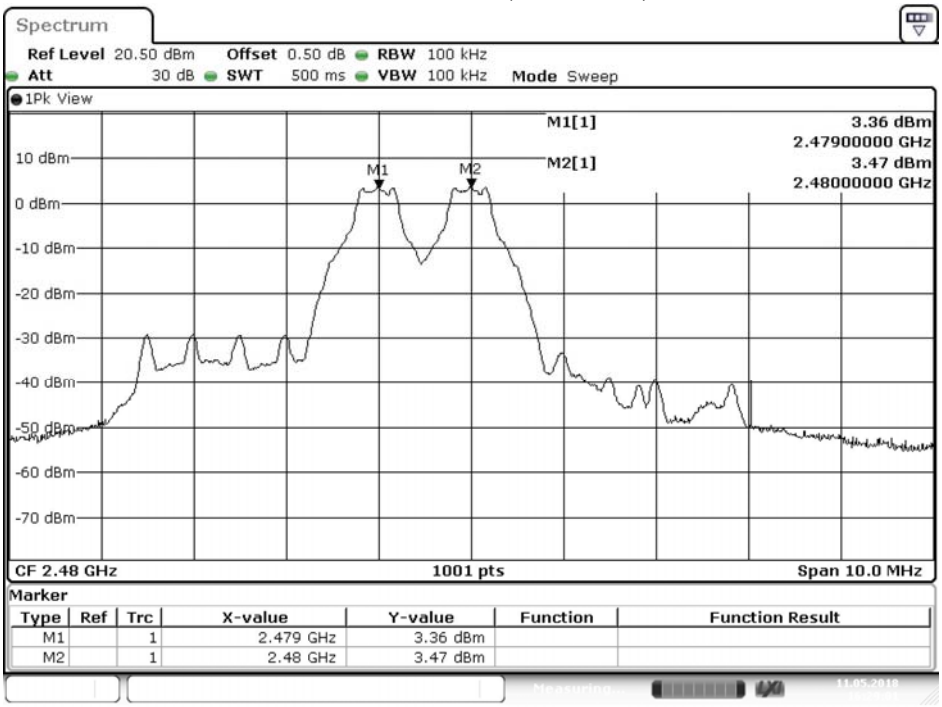


Channel 39 (2441MHz)



Date: 11.MAY.2018 16:23:12

Channel 78 (2480MHz)



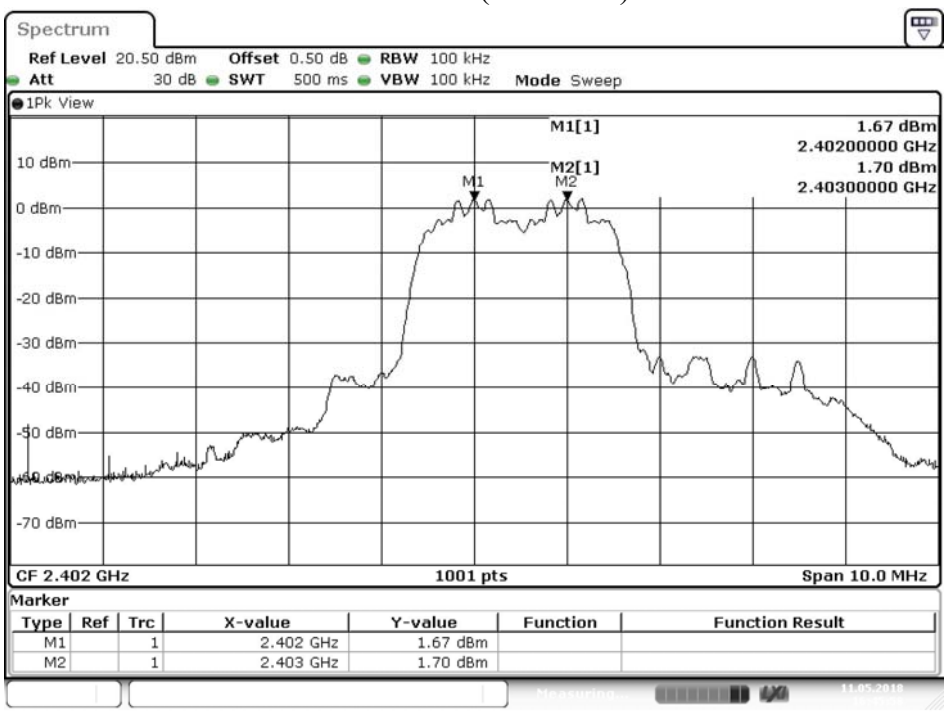
Date: 11.MAY.2018 16:29:02

Product : Wireless Headphones
Test Item : Channel Separation
Test Mode : Mode 2: Transmit - 3Mbps

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Limit (kHz)	Limit of (2/3)*20dB Bandwidth (kHz)	Result
00	2402	1000	>25 kHz	842.0	Pass
39	2441	1000	>25 kHz	838.0	Pass
78	2480	1000	>25 kHz	838.0	Pass

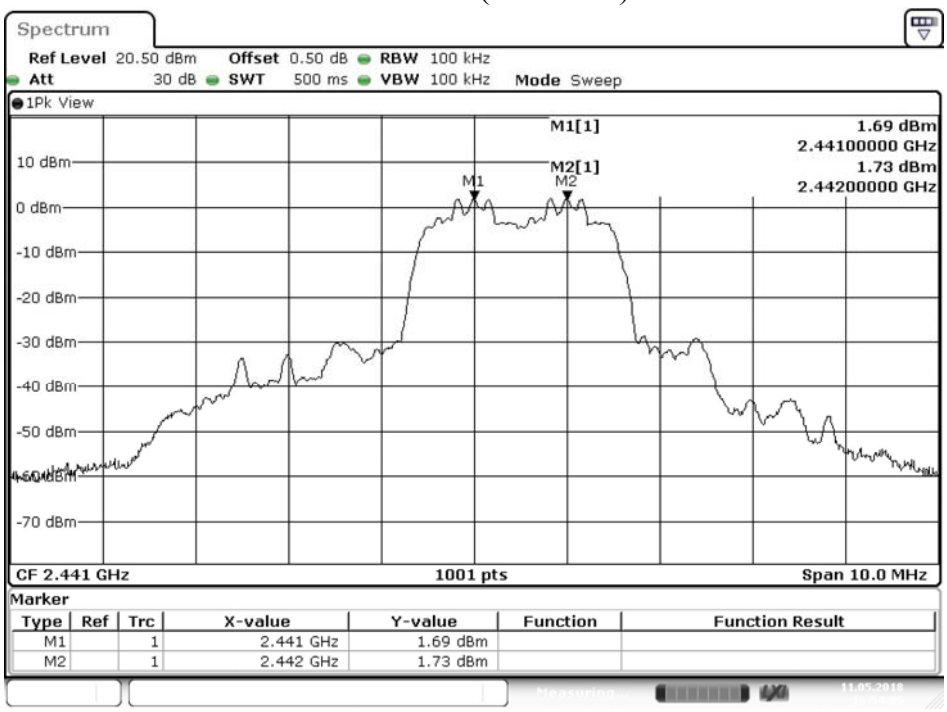
NOTE: The 20dB Bandwidth is refer to section 10.

Channel 00 (2402MHz)



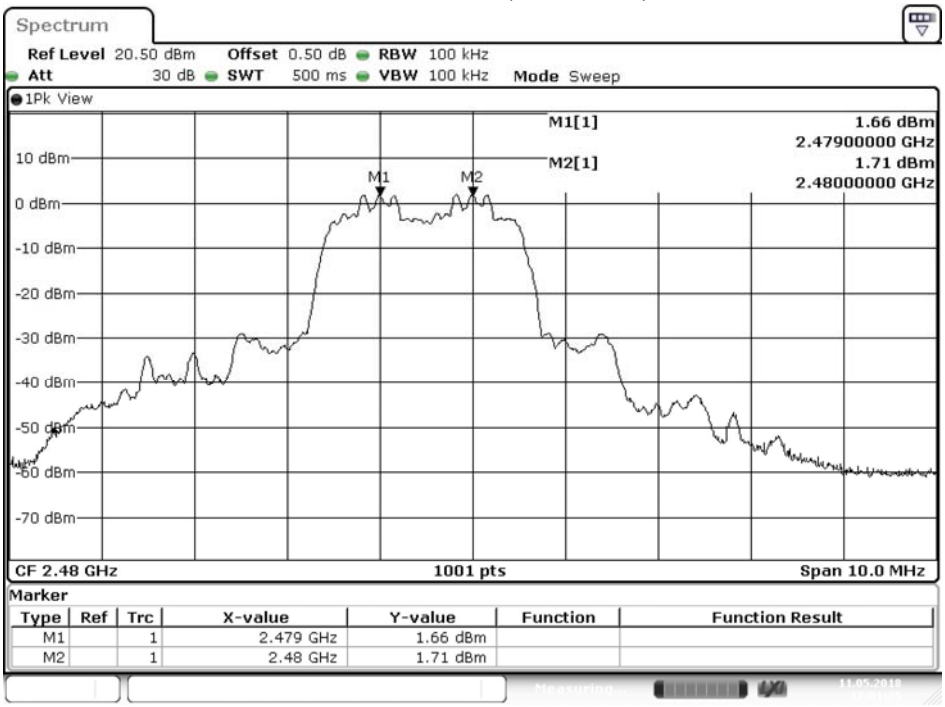
Date: 11.MAY.2018 16:45:58

Channel 39 (2441MHz)



Date: 11.MAY.2018 16:54:10

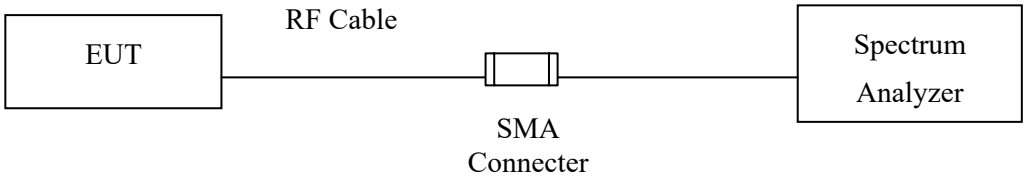
Channel 78 (2480MHz)



Date: 11.MAY.2018 17:01:25

9. Dwell Time

9.1. Test Setup



9.2. Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

9.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

9.4. Uncertainty

±2.31msec

9.5. Test Result of Dwell Time

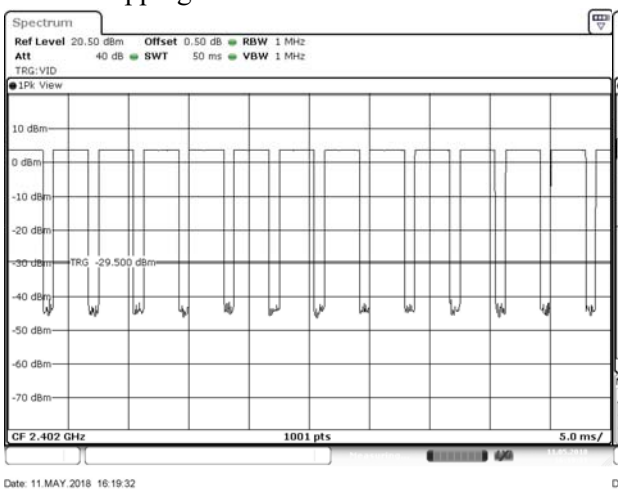
Product : Wireless Headphones
Test Item : Dwell Time
Test Mode : Mode 1: Transmit - 1Mbps (Channel 00,39,78)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.897	13	50	0.75	0.301	0.4	Pass
2441	2.887	13	50	0.75	0.300	0.4	Pass
2480	2.897	13	50	0.75	0.301	0.4	Pass

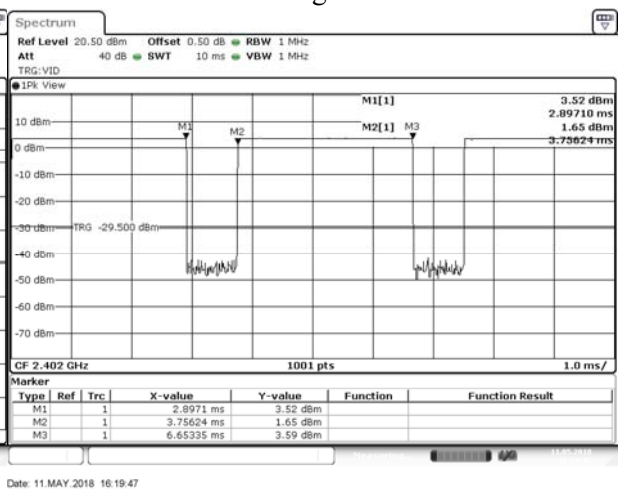
Duty cycle = ((Time slot length(ms)*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) * (79*0.4)

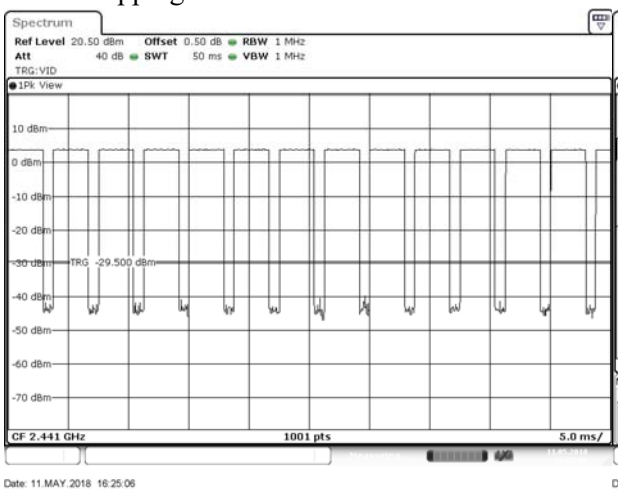
CH 00 Hopping of Number



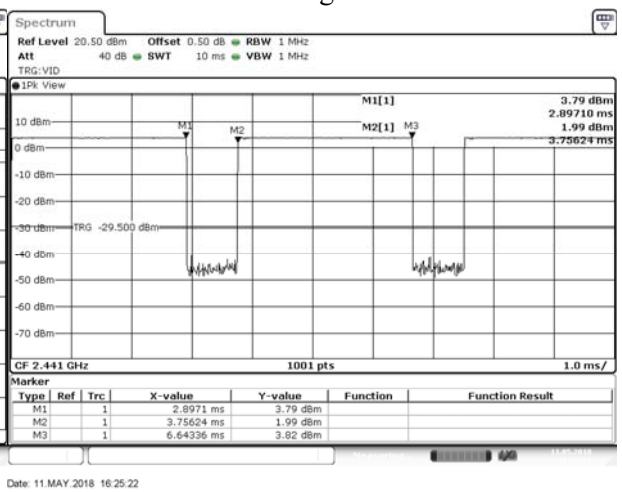
CH 00 Time slot length



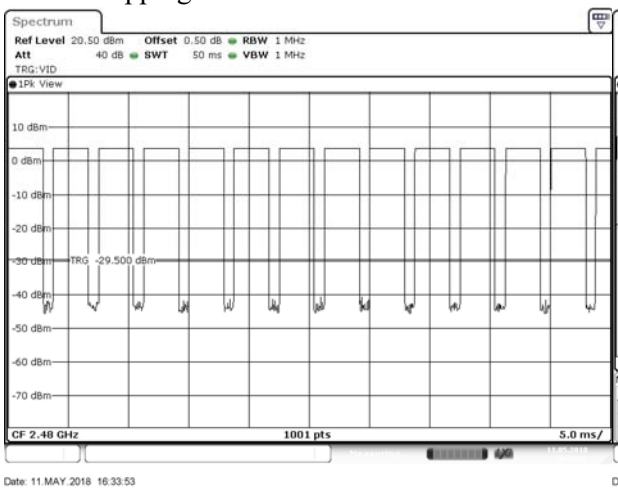
CH39 Hopping of Number



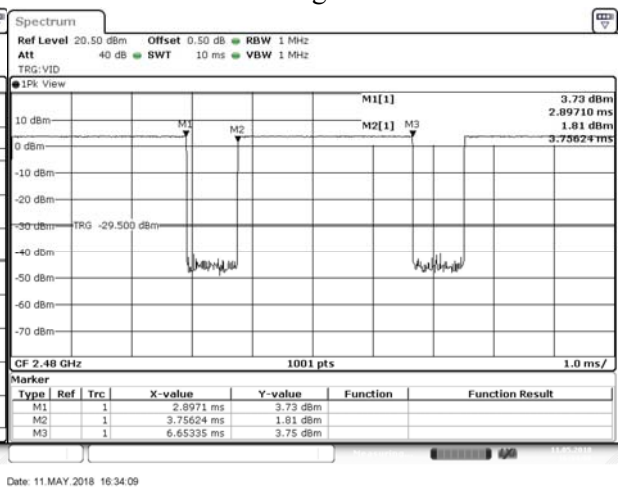
CH 39 Time slot length



CH 78 Hopping of Number



CH 78 Time slot length



Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

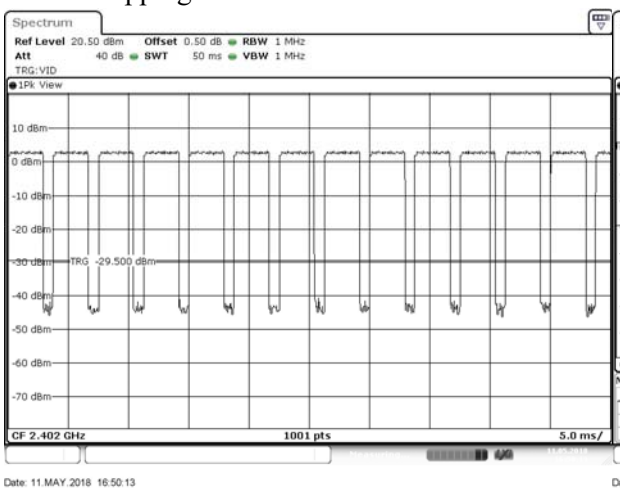
Product : Wireless Headphones
Test Item : Dwell Time
Test Mode : Mode 2: Transmit - 3Mbps (Channel 00,39,78)

Frequency (MHz)	Time slot length (ms)	Hopping of Number	Sweep time (ms)	Duty cycle	Dwell Time (Sec)	Limit (Sec)	Result
2402	2.897	13	50	0.75	0.301	0.4	Pass
2441	2.897	13	50	0.75	0.301	0.4	Pass
2480	2.897	13	50	0.75	0.301	0.4	Pass

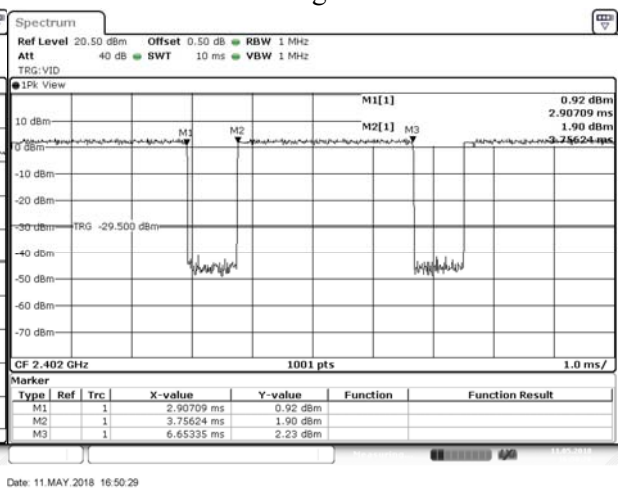
Duty cycle =((Time slot length(ms)*Hopping of Number) / Sweep time (ms)

Dwell time = (Duty cycle /79) * (79*0.4)

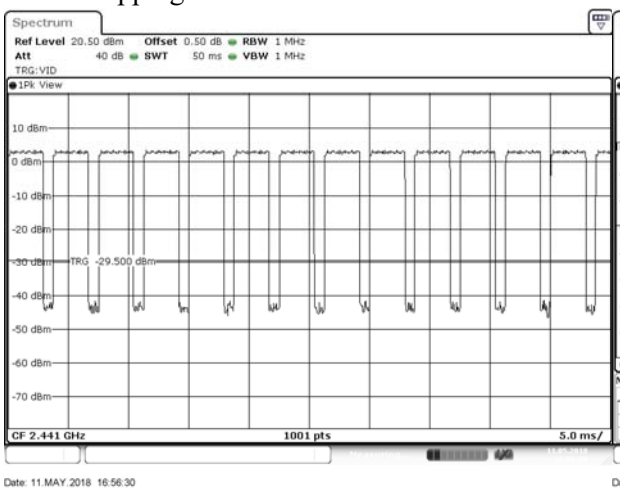
CH 00 Hopping of Number



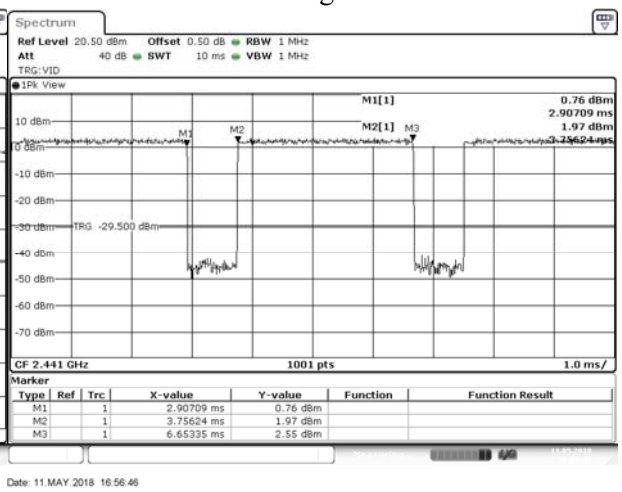
CH 00 Time slot length



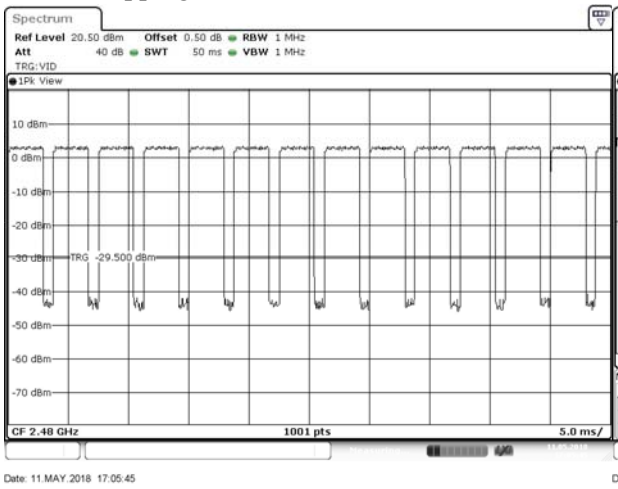
CH39 Hopping of Number



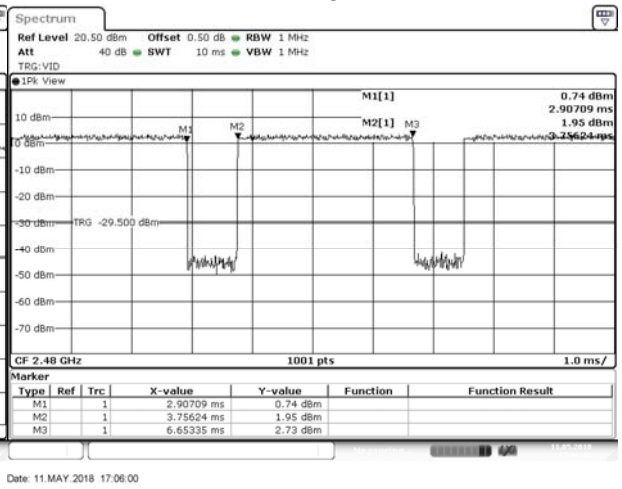
CH 39 Time slot length



CH 78 Hopping of Number



CH 78 Time slot length

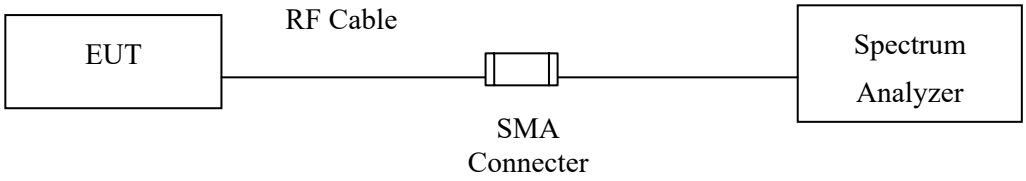


Note:

The dwell times of the packet type of DH1, DH3, and DH5 are tested. Only the worst case is shown on the report.

10. Occupied Bandwidth

10.1. Test Setup



10.2. Limits

N/A

10.3. Test Procedure

The EUT was setup to ANSI C63.4, 2014; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

10.4. Uncertainty

±279.2Hz

10.5. Test Result of Occupied Bandwidth

Product : Wireless Headphones
Test Item : Occupied Bandwidth Data
Test Mode : Mode 1: Transmit - 1Mbps

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	957	--	NA
39	2441	954	--	NA
78	2480	954	--	NA

Figure Channel 00:

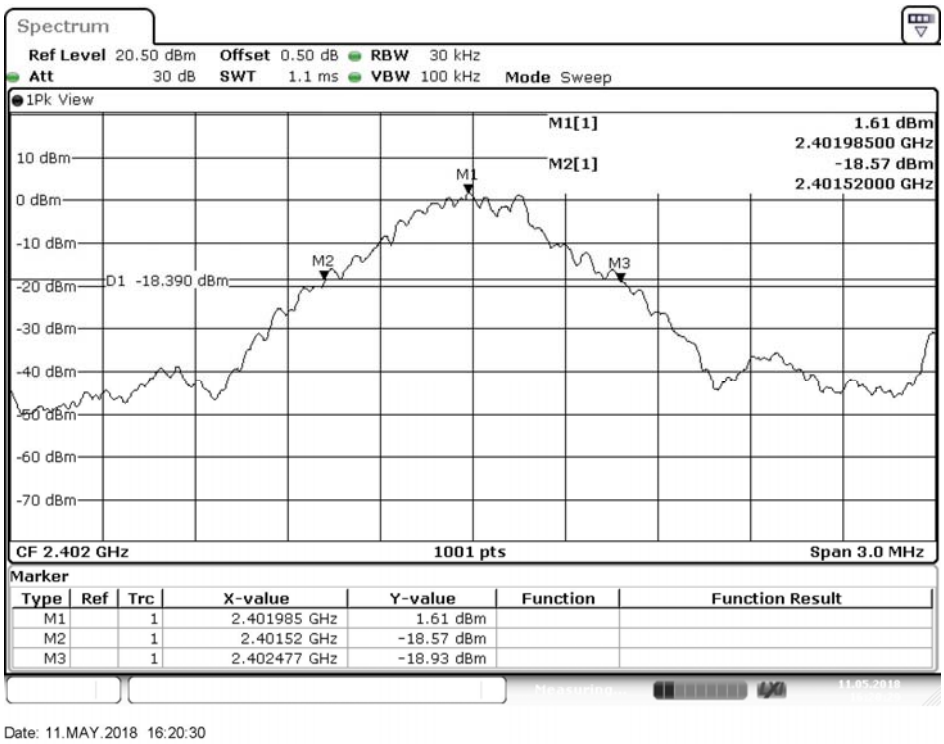
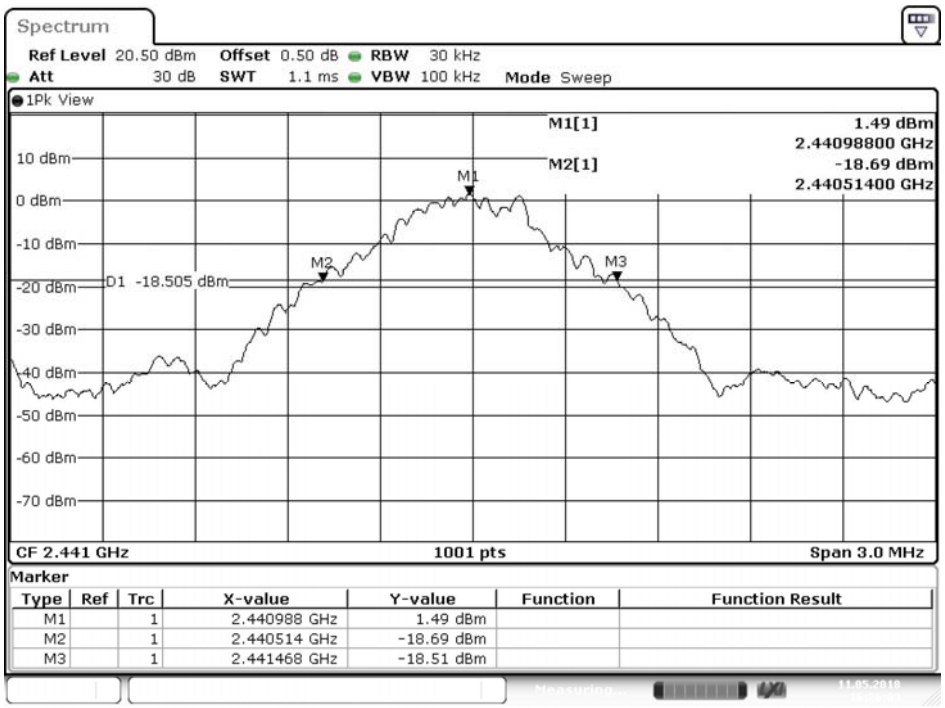
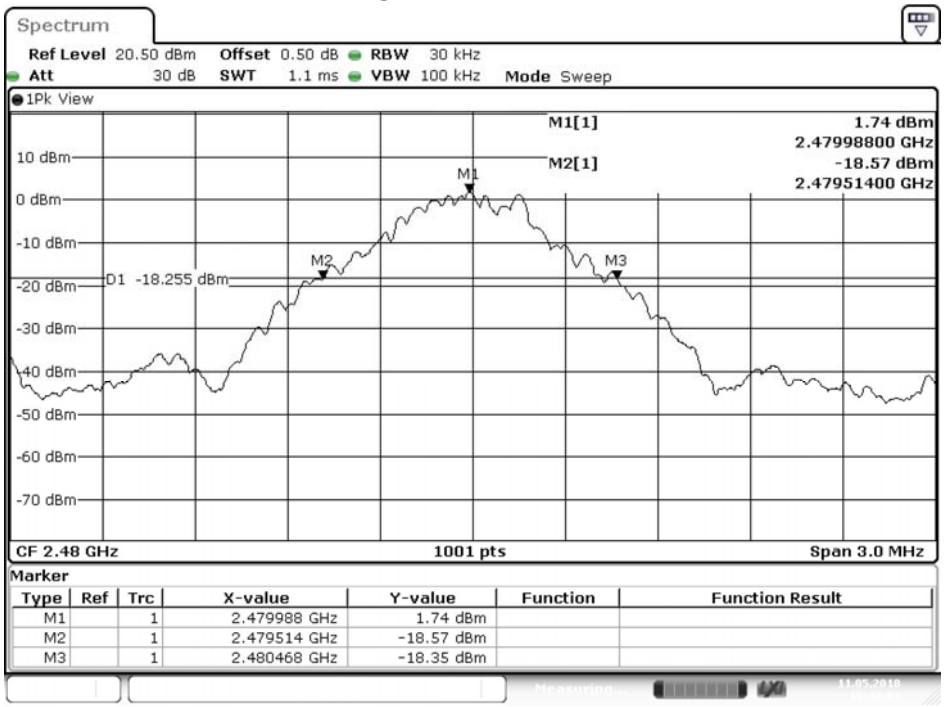


Figure Channel 39:



Date: 11.MAY.2018 16:26:03

Figure Channel 78:



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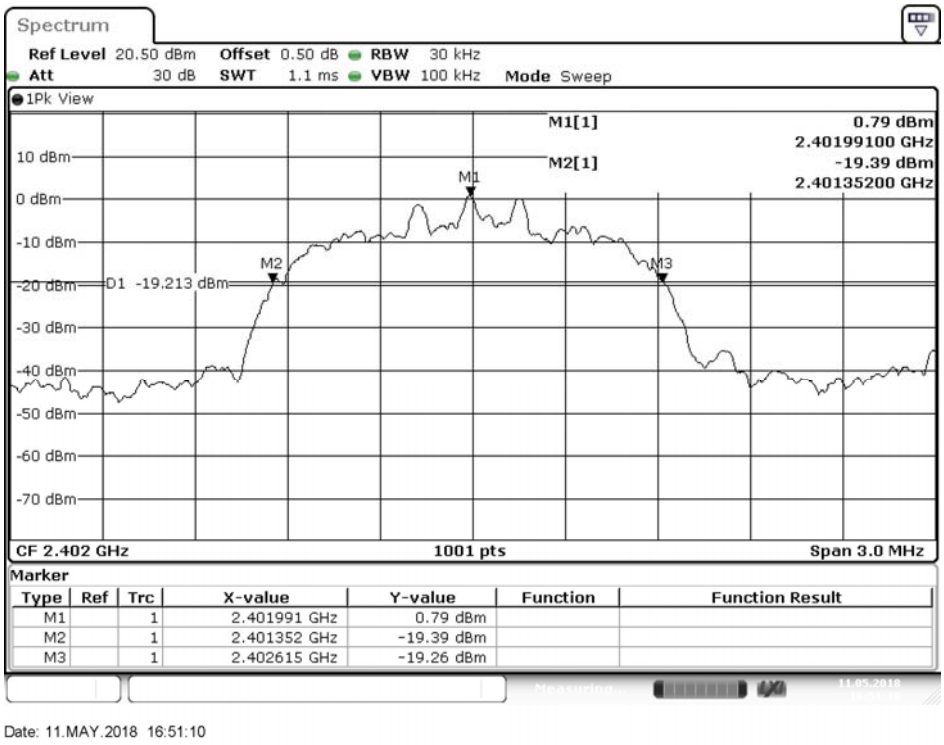
Product : Wireless Headphones
Test Item : Occupied Bandwidth Data
Test Mode : Mode 2: Transmit - 3Mbps

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1263	--	NA
39	2441	1257	--	NA
78	2480	1257	--	NA

Figure Channel 00:



Date: 11.MAY.2018 16:51:10

Figure Channel 39:

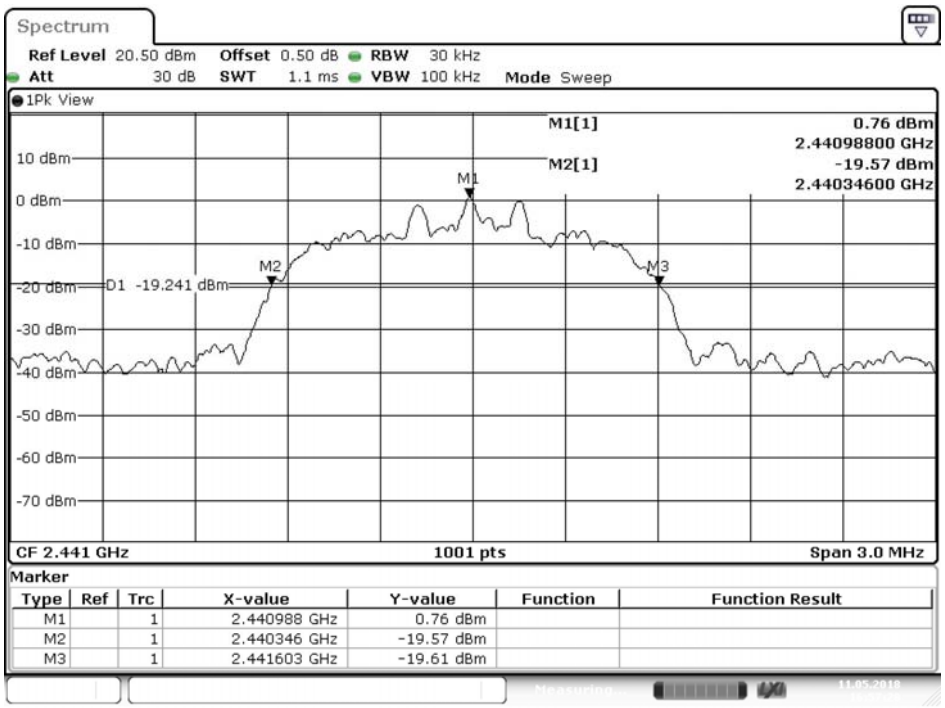


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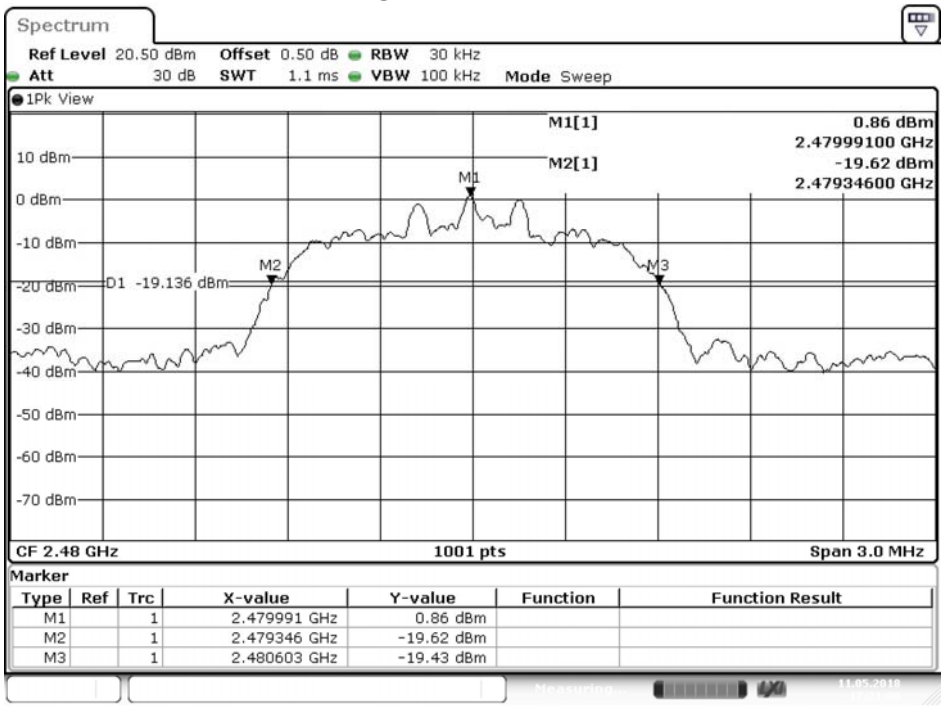
Figure Channel 78:



Date: 11.MAY.2018 17:21:01

11. EMI Reduction Method During Compliance Testing

No modification was made during testing.