

FCC Test Report

Product Name	Bluetooth Headset
Model No.	HSC070W
FCC ID.	BCE-HSC070W

Applicant	GN Audio A/S
Address	Lautrupbjerg 7,DK-2750 Ballerup,Denmark.

Date of Receipt	Sep. 25, 2017
Issued Date	Oct. 03, 2017
Report No.	1790338R-RFUSP01V00
Report Version	V1.0



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: Oct. 03, 2017

Report No.: 1790338R-RFUSP01V00



Product Name	Bluetooth Headset
Applicant	GN Audio A/S
Address	Lautrupbjerg 7,DK-2750 Ballerup,Denmark.
Manufacturer	GN Audio A/S
Model No.	HSC070W
FCC ID.	BCE-HSC070W
EUT Rated Voltage	DC 3.8V (Power by Battery) or DC 5V (Power by USB)
EUT Test Voltage	DC 5V (Power by USB)
Trade Name	Jabra
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2016 ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

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Tested By : Ivan Chuang
(Senior Engineer / Ivan Chuang)

Approved By : 
(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Bluetooth Headset
Trade Name	Jabra
Model No.	HSC070W
FCC ID.	BCE-HSC070W
Frequency Range	2402 – 2480MHz
Channel Number	79
Type of Modulation	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	IFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
USB Cable	Non-shielded, 1.5m

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Jabra	HSC070W	IFA Antenna	-4.64 dBi 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 Bluetooth Headset with built-in Bluetooth V4.0 、 V2.1+EDR transceiver, this report for Bluetooth V2.1+EDR.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth V2.1+EDR 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
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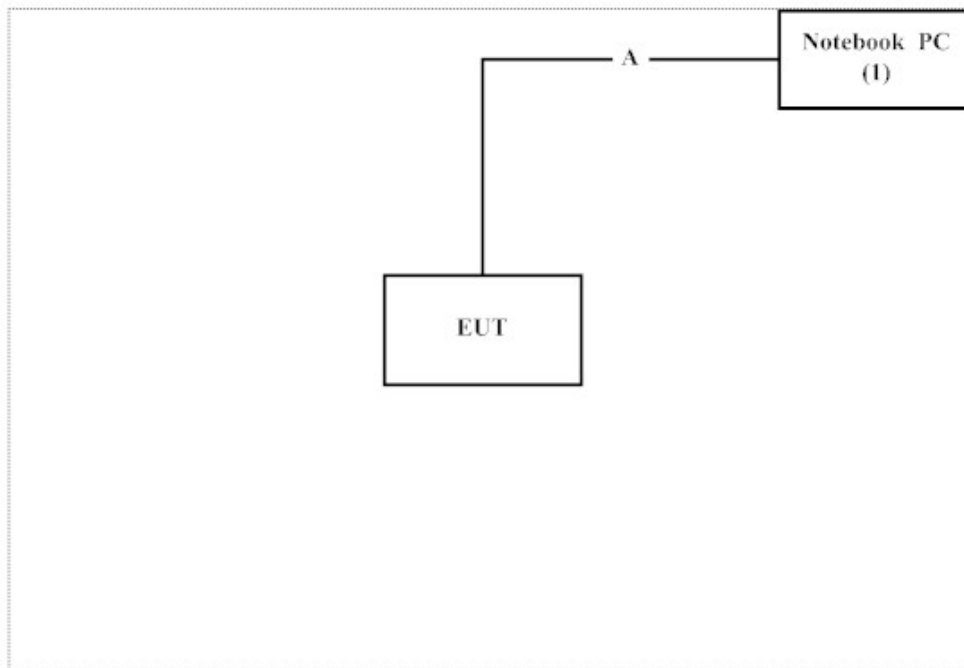
1.3. Tested System Details

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	P62G	416FJC2	N/A

Signal Cable Type	Signal cable Description
A	USB Cable
	Non-Shielded, 1.5m

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 3 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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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	2017.01.06	2018.01.05
X	Two-Line V-Network	R&S	ENV216	101306	2017.02.16	2018.02.15
X	Two-Line V-Network	R&S	ENV216	101307	2017.03.17	2018.03.16
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	2017.01.09	2018.01.08
X	Power Meter	Anritsu	ML2496A	1548003	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531024	2016.12.15	2017.12.14
X	Power Sensor	Anritsu	MA2411B	1531025	2016.12.15	2017.12.14
	Bluetooth Tester	R&S	CBT	101238	2017.01.03	2018.01.02

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 Conduction Test System V8.0.110

For Radiated measurements /ACB1

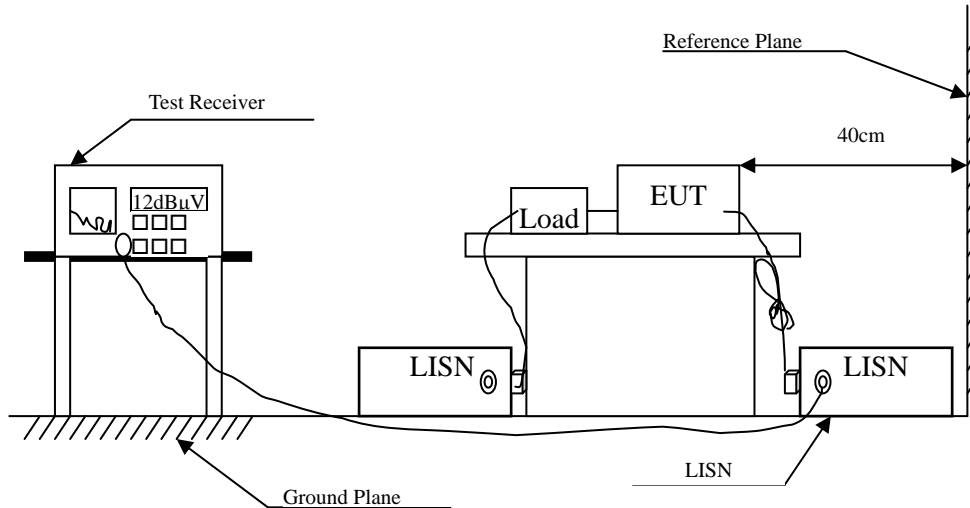
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Data	Due. Data
X	Loop Antenna	TESEQ	HLA6121	37133	2016.03.18	2018.03.17
X	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-674	2017.02.13	2018.02.12
X	Horn Antenna	ETS-Lindgren	3117	00203800	2016.10.13	2017.10.12
X	Horn Antenna	Com-Power	AH-840	101087	2017.05.24	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	G249	2017.08.11	2018.08.10
	Filter	MICRO TRONICS	BRM50716	G187	2017.08.16	2018.08.15
X	EMI Test Receiver	R&S	ESR7	101602	2016.12.15	2017.12.14
X	Spectrum Analyzer	R&S	FSV40	101148	2017.01.24	2018.01.23
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. Loop Antenna is calibrated every two year, the other 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 (dB μ V) 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 investigated 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 : Bluetooth Headset
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 2: Transmit - 3Mbps (2441MHz)
 Test Date : 2017/09/27

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 1					
Quasi-Peak					
0.153	9.617	40.659	50.276	-15.638	65.914
0.480	9.698	29.662	39.360	-17.211	56.571
0.720	9.710	13.933	23.643	-32.357	56.000
3.500	9.795	23.974	33.769	-22.231	56.000
9.585	9.927	23.956	33.883	-26.117	60.000
21.379	10.080	8.980	19.060	-40.940	60.000
Average					
0.153	9.617	25.925	35.542	-20.372	55.914
0.480	9.698	19.996	29.694	-16.877	46.571
0.720	9.710	6.653	16.363	-29.637	46.000
3.500	9.795	13.339	23.134	-22.866	46.000
9.585	9.927	18.732	28.659	-21.341	50.000
21.379	10.080	1.777	11.857	-38.143	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 : Bluetooth Headset
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 2: Transmit - 3Mbps (2441MHz)
 Test Date : 2017/09/27

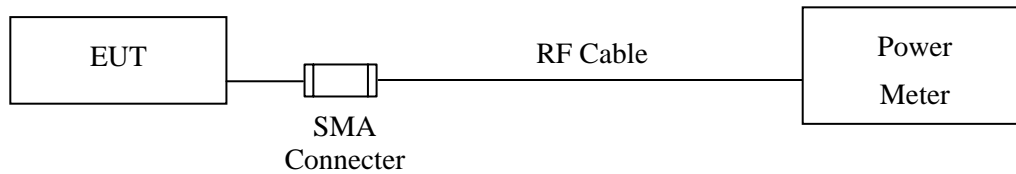
Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V	Margin dB	Limit dB μ V
LINE 2					
Quasi-Peak					
0.155	9.613	39.614	49.227	-16.630	65.857
0.510	9.691	24.207	33.898	-22.102	56.000
0.649	9.699	8.073	17.773	-38.227	56.000
3.500	9.795	22.420	32.215	-23.785	56.000
9.700	9.928	16.124	26.052	-33.948	60.000
21.347	10.114	9.373	19.487	-40.513	60.000
Average					
0.155	9.613	22.815	32.428	-23.429	55.857
0.510	9.691	16.749	26.440	-19.560	46.000
0.649	9.699	1.920	11.620	-34.380	46.000
3.500	9.795	12.341	22.136	-23.864	46.000
9.700	9.928	10.759	20.687	-29.313	50.000
21.347	10.114	4.037	14.151	-35.849	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 : Bluetooth Headset
Test Item : Peak Power Output
Test Mode : Mode 1: Transmit - 1Mbps
Test Date : 2017/09/27

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	7.86	1 Watt= 30 dBm	Pass
Channel 39	2441.00	7.84	1 Watt= 30 dBm	Pass
Channel 78	2480.00	7.68	1 Watt= 30 dBm	Pass

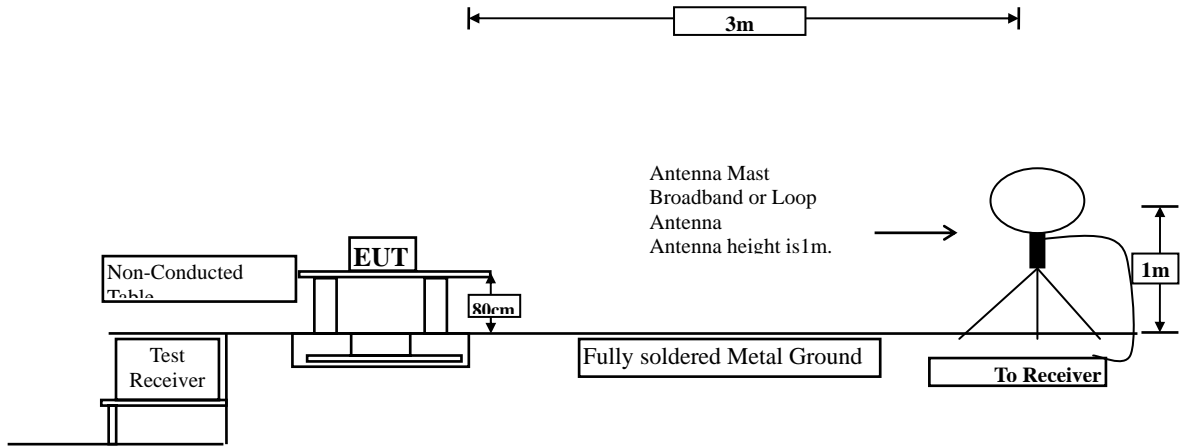
Product : Bluetooth Headset
Test Item : Peak Power Output
Test Mode : Mode 2: Transmit - 3Mbps
Test Date : 2017/09/27

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	7.94	1 Watt= 30 dBm	Pass
Channel 39	2441.00	8.02	1 Watt= 30 dBm	Pass
Channel 78	2480.00	7.95	1 Watt= 30 dBm	Pass

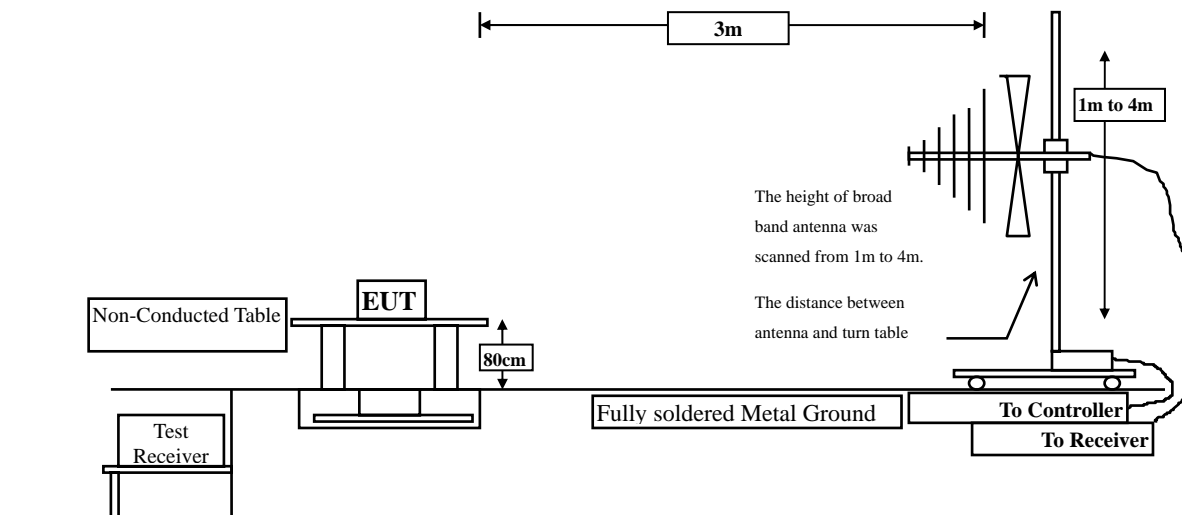
4. Radiated Emission

4.1. Test Setup

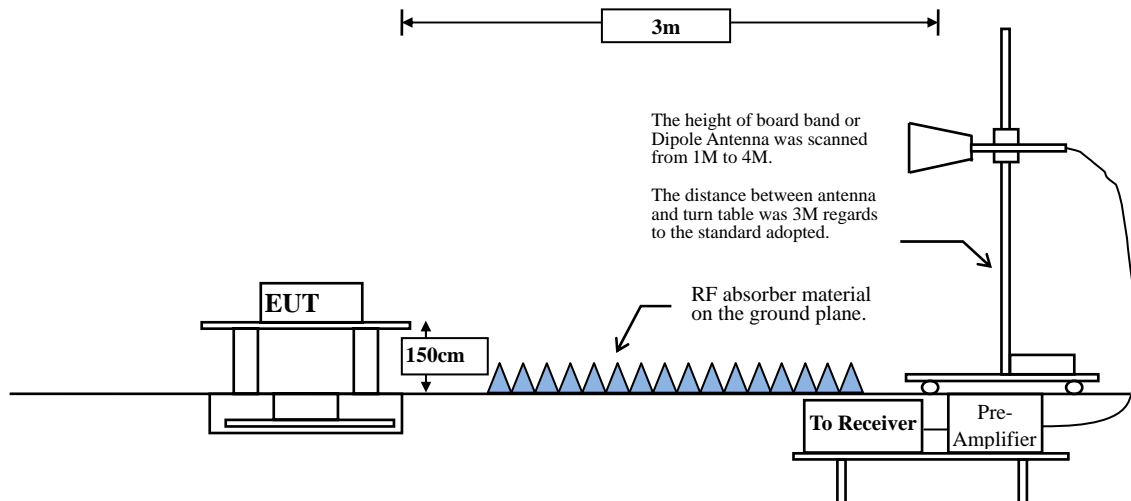
Radiated Emission Under 30MHz



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 from 9kHz - 10th Harmonic of fundamental was investigated.

4.4. Uncertainty

Horizontal polarization :

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

Vertical polarization :

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

4.5. Test Result of Radiated Emission

Product : Bluetooth Headset
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 1: Transmit - 1Mbps(2402MHz)
 Test Date : 2017/09/29

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4804.000	-6.114	62.040	55.926	-18.074	74.000
7206.000	-3.112	55.470	52.358	-21.642	74.000
9608.000	-0.801	46.320	45.520	-28.480	74.000
Average					
Detector:					
4804.000	-6.114	53.840	47.726	-6.274	54.000
Vertical					
Peak Detector:					
4804.000	-6.114	59.210	53.096	-20.904	74.000
7206.000	-3.112	52.690	49.578	-24.422	74.000
9608.000	-0.801	46.170	45.370	-28.630	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 : Bluetooth Headset
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 1: Transmit - 1Mbps(2441MHz)
 Test Date : 2017/09/29

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4882.000	-6.066	61.790	55.724	-18.276	74.000
7323.000	-3.022	55.040	52.018	-21.982	74.000
9764.000	-0.522	46.040	45.517	-28.483	74.000
Average					
Detector:					
4882.000	-6.066	53.720	47.654	-6.346	54.000
Vertical					
Peak Detector:					
4882.000	-6.066	59.340	53.274	-20.726	74.000
7323.000	-3.022	51.590	48.568	-25.432	74.000
9764.000	-0.522	46.550	46.027	-27.973	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 : Bluetooth Headset
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 1: Transmit - 1Mbps(2480MHz)
 Test Date : 2017/09/29

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4960.000	-6.055	62.710	56.655	-17.345	74.000
7440.000	-2.861	52.640	49.778	-24.222	74.000
9920.000	-0.306	45.410	45.104	-28.896	74.000
Average					
Detector:					
4960.000	-6.055	54.560	48.505	-5.495	54.000
Vertical					
Peak Detector:					
4960.000	-6.055	60.340	54.285	-19.715	74.000
7440.000	-2.861	49.850	46.988	-27.012	74.000
9920.000	-0.306	45.970	45.664	-28.336	74.000
Average					
Detector:					
4960.000	-6.055	52.380	46.325	-7.675	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 : Bluetooth Headset
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 2: Transmit - 3Mbps(2402MHz)
 Test Date : 2017/09/29

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4804.000	-6.114	60.670	54.556	-19.444	74.000
7206.000	-3.112	52.210	49.098	-24.902	74.000
9608.000	-0.801	45.760	44.960	-29.040	74.000
Average Detector:					
4804.000	-6.114	50.050	43.936	-10.064	54.000
Vertical					
Peak Detector:					
4804.000	-6.114	57.610	51.496	-22.504	74.000
7206.000	-3.112	49.750	46.638	-27.362	74.000
9608.000	-0.801	46.190	45.390	-28.610	74.000
Average Detector:					
--					54.000

Note:

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

Product : Bluetooth Headset
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 2: Transmit - 3Mbps (2441MHz)
 Test Date : 2017/09/29

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4882.000	-6.066	60.180	54.114	-19.886	74.000
7323.000	-3.022	52.940	49.918	-24.082	74.000
9764.000	-0.522	46.360	45.837	-28.163	74.000
Average Detector:					
4882.000	-6.066	49.690	43.624	-10.376	54.000
Vertical					
Peak Detector:					
4882.000	-6.066	57.850	51.784	-22.216	74.000
7323.000	-3.022	51.050	48.028	-25.972	74.000
9764.000	-0.522	46.170	45.647	-28.353	74.000
Average Detector:					
--					54.000

Note:

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

Product : Bluetooth Headset
 Test Item : Harmonic Radiated Emission
 Test Mode : Mode 2: Transmit - 3Mbps (2480MHz)
 Test Date : 2017/09/29

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
Peak Detector:					
4960.000	-6.055	60.760	54.705	-19.295	74.000
7440.000	-2.861	49.390	46.528	-27.472	74.000
9920.000	-0.306	45.040	44.734	-29.266	74.000
Average Detector:					
4960.000	-6.055	49.890	43.835	-10.165	54.000
Vertical					
Peak Detector:					
4960.000	-6.055	58.680	52.625	-21.375	74.000
7440.000	-2.861	47.860	44.998	-29.002	74.000
9920.000	-0.306	45.660	45.354	-28.646	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 : Bluetooth Headset
 Test Item : General Radiated Emission
 Test Mode : Mode 1: Transmit - 1Mbps (2441MHz)
 Test Date : 2017/09/28

Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
107.319	-14.849	48.920	34.071	-9.429	43.500
215.565	-13.426	37.696	24.271	-19.229	43.500
403.942	-7.979	31.975	23.995	-22.005	46.000
606.377	-4.017	30.198	26.181	-19.819	46.000
751.174	-2.075	30.810	28.735	-17.265	46.000
950.797	0.229	30.365	30.595	-15.405	46.000
Vertical					
79.203	-15.468	52.234	36.766	-3.234	40.000
360.362	-8.975	34.358	25.383	-20.617	46.000
479.855	-6.356	32.306	25.950	-20.050	46.000
728.681	-2.496	30.305	27.809	-18.191	46.000
853.797	-0.917	30.764	29.847	-16.153	46.000
967.667	0.451	30.412	30.863	-23.137	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 : Bluetooth Headset
 Test Item : General Radiated Emission
 Test Mode : Mode 2: Transmit - 3Mbps (2441MHz)
 Test Date : 2017/09/29

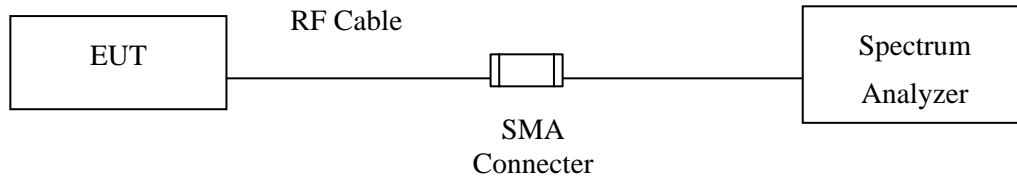
Frequency MHz	Correct Factor dB	Reading Level dB μ V	Measurement Level dB μ V/m	Margin dB	Limit dB μ V/m
Horizontal					
107.319	-14.849	49.310	34.461	-9.039	43.500
263.362	-11.772	36.162	24.390	-21.610	46.000
443.304	-7.016	32.442	25.426	-20.574	46.000
656.986	-3.655	29.774	26.119	-19.881	46.000
807.406	-1.605	31.130	29.524	-16.476	46.000
949.391	0.212	30.467	30.680	-15.320	46.000
Vertical					
79.203	-15.468	51.996	36.528	-3.472	40.000
360.362	-8.975	34.132	25.157	-20.843	46.000
541.710	-5.370	30.040	24.670	-21.330	46.000
679.478	-3.338	31.287	27.949	-18.051	46.000
855.203	-0.898	29.885	28.987	-17.013	46.000
970.478	0.488	30.694	31.181	-22.819	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

$\pm 1.23\text{dB}$

5.5. Test Result of RF Antenna Conducted Test

Product : Bluetooth Headset
 Test Item : RF Antenna Conducted Test
 Test Mode : Mode 1: Transmit - 1Mbps
 Test Date : 2017/09/27

Figure Channel 00:

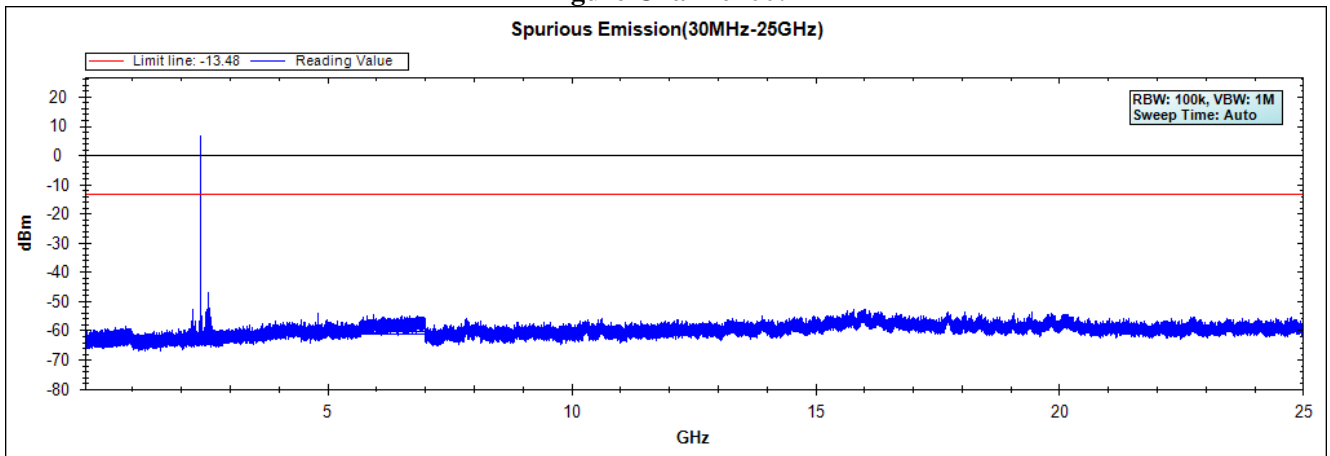


Figure Channel 39:

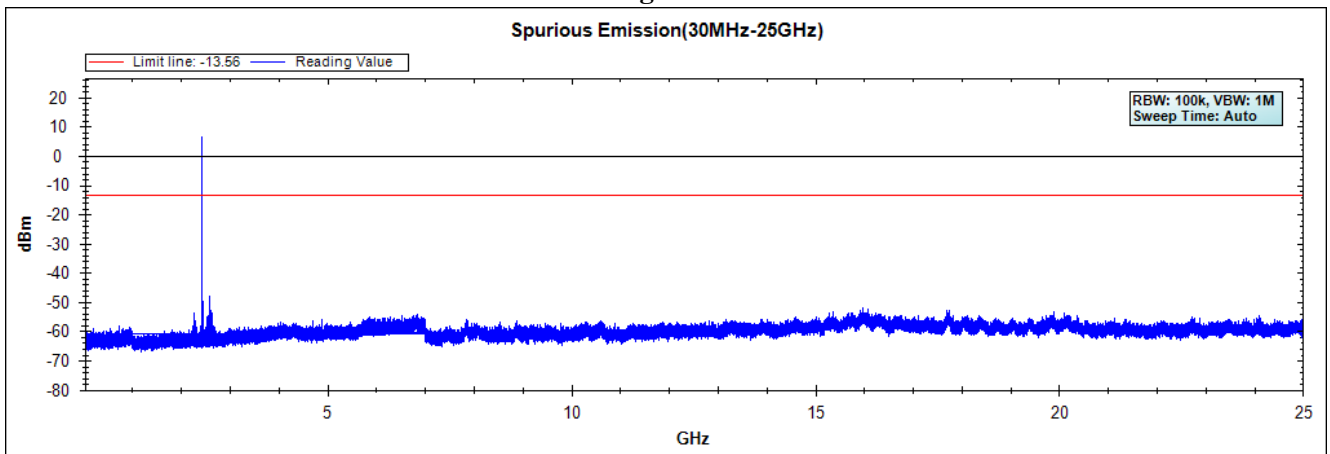
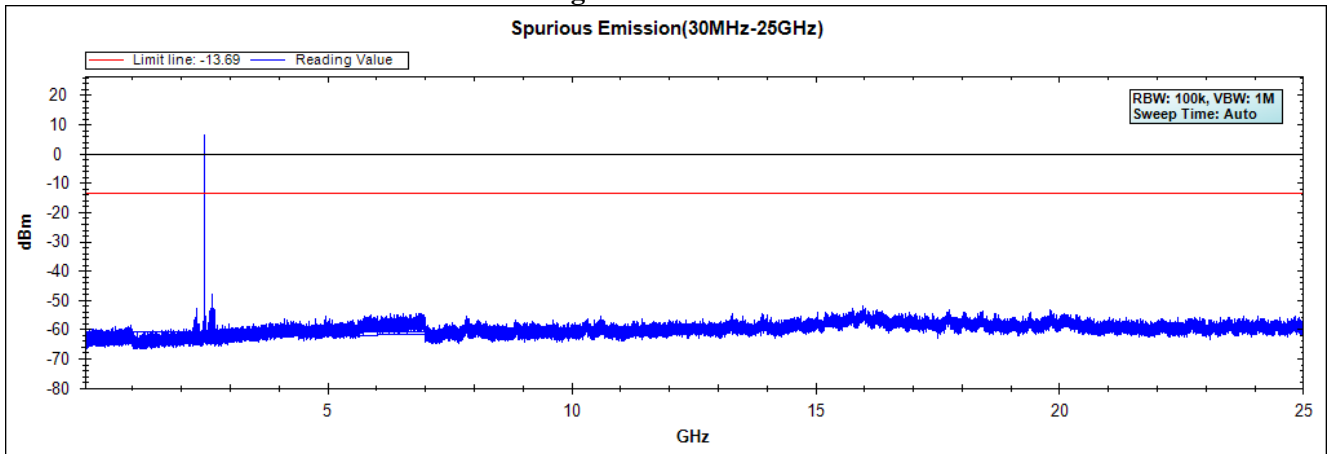


Figure Channel 78:



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

Product : Bluetooth Headset
Test Item : RF Antenna Conducted Test
Test Mode : Mode 2: Transmit - 3Mbps
Test Date : 2017/09/27

Figure Channel 00:

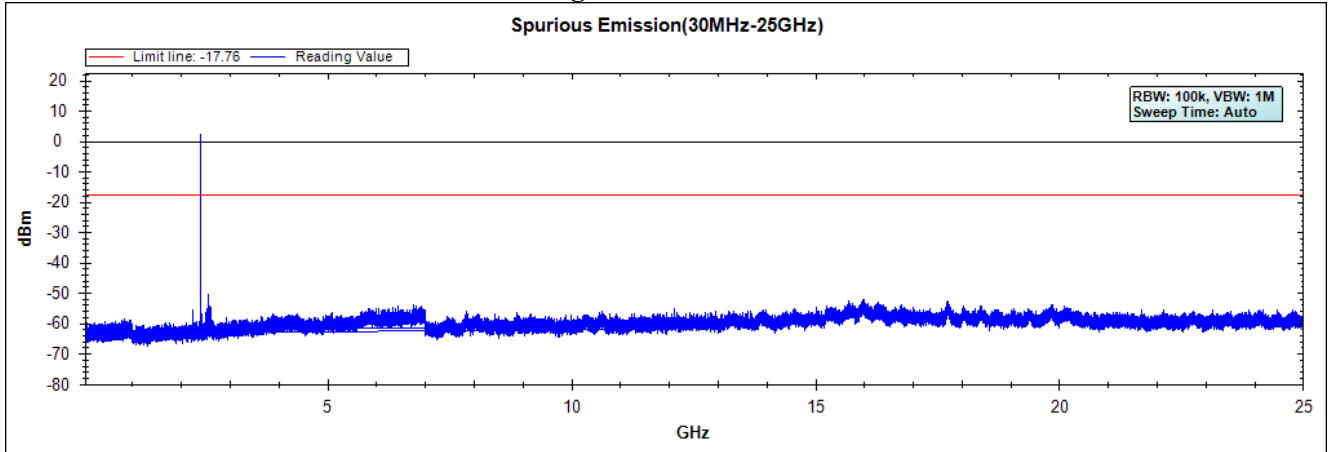


Figure Channel 39:

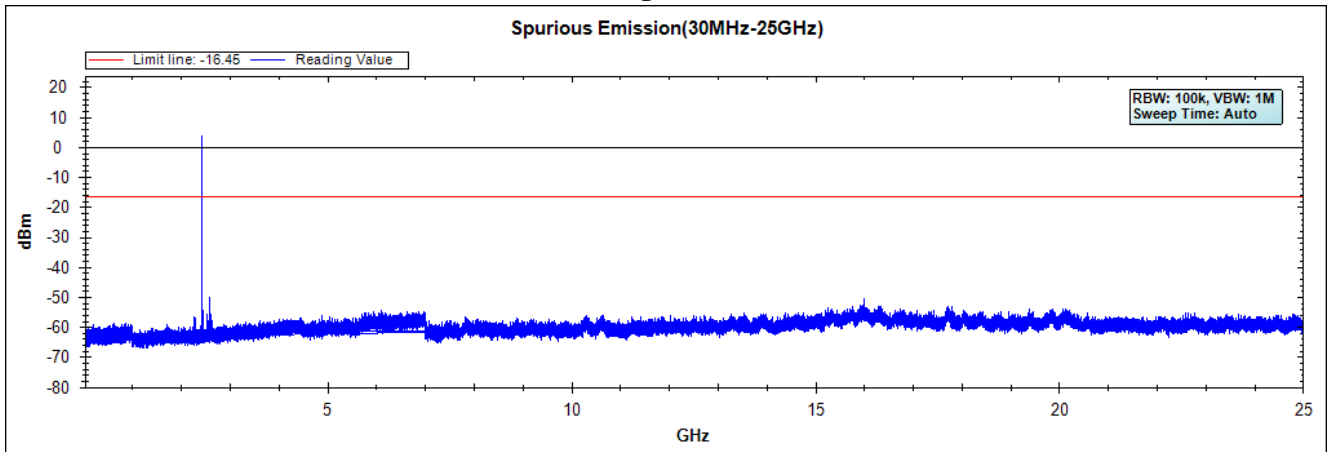
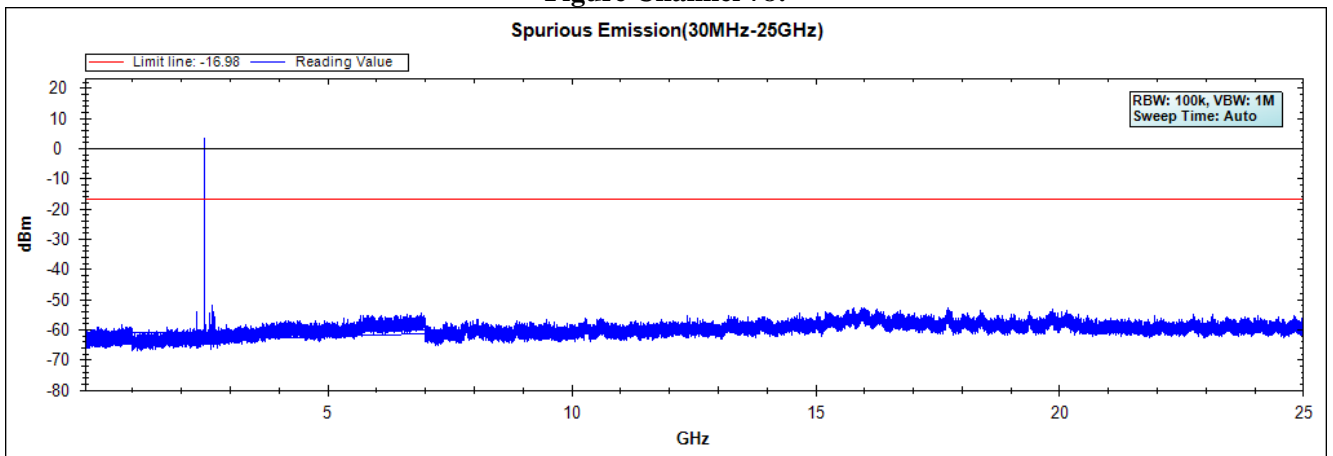


Figure Channel 78:

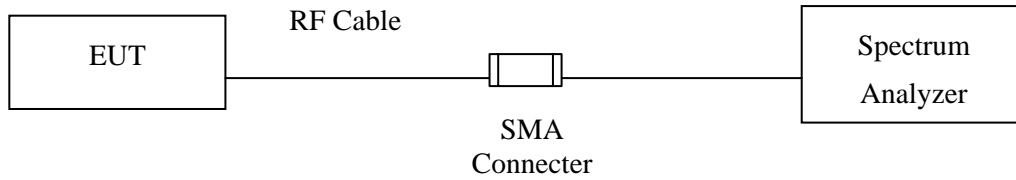


Note: The above test pattern is synthesized by multiple of the frequency range.

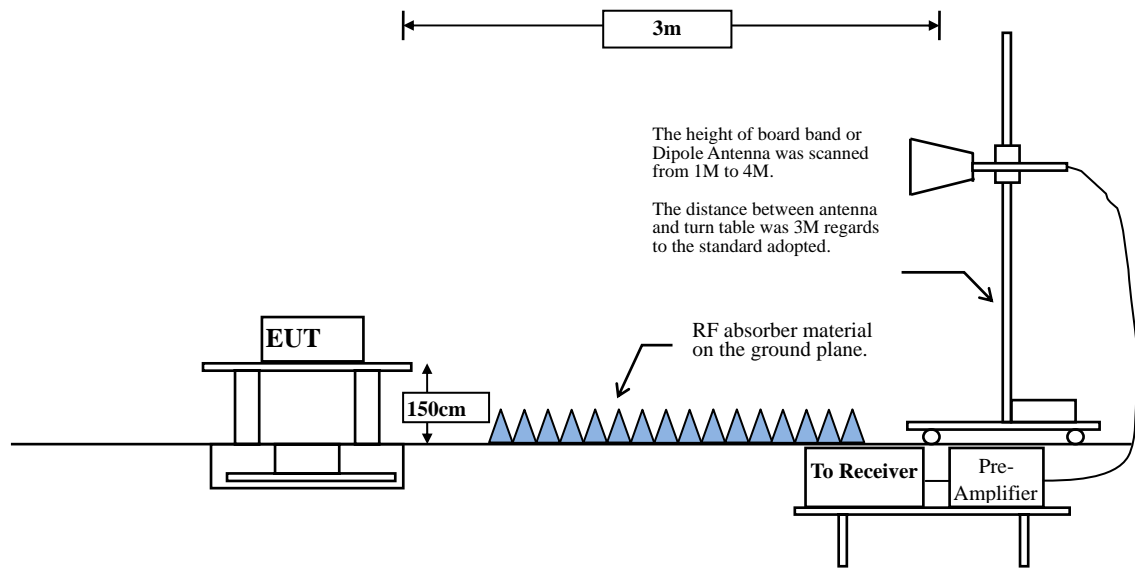
6. Band Edge

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: ± 1.23 dB

Radiated:

Horizontal polarization : 1-18GHz: ± 3.77 dB

Vertical polarization : 1-18GHz : ± 3.83 dB

6.5. Test Result of Band Edge

Product : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit - 1Mbps (2402MHz)
 Test Date : 2017/09/27

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)	2376.087	10.205	35.083	45.288	74.00	54.00	Pass
00 (Peak)	2390.000	10.262	34.107	44.369	74.00	54.00	Pass
00 (Peak)	2400.000	10.304	59.763	70.066	--	--	Pass
00 (Peak)	2402.174	10.312	93.574	103.886	--	--	--
00 (Average)	2375.942	10.205	24.857	35.062	74.00	54.00	Pass
00 (Average)	2390.000	10.262	18.976	29.238	74.00	54.00	Pass
00 (Average)	2400.000	10.304	44.465	54.768	--	--	Pass
00 (Average)	2402.029	10.312	77.506	87.818	--	--	--

Figure Channel 00: Horizontal (Peak)

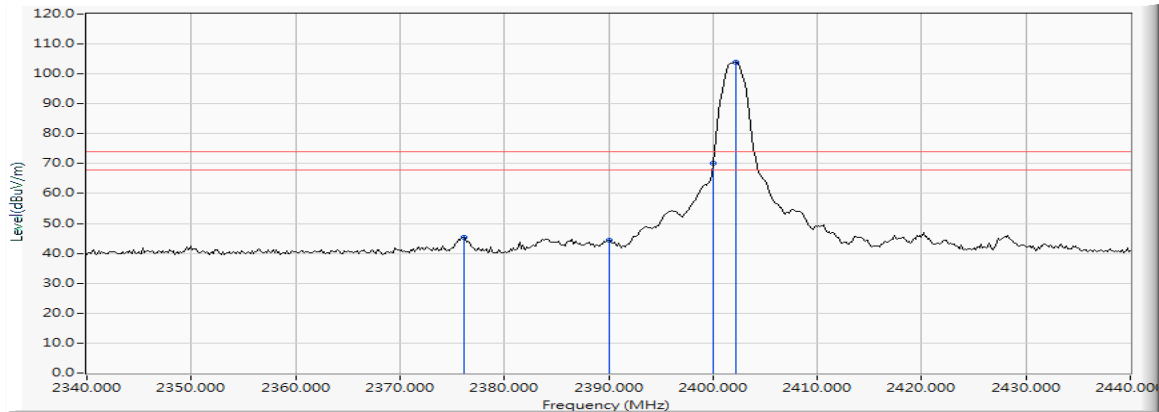
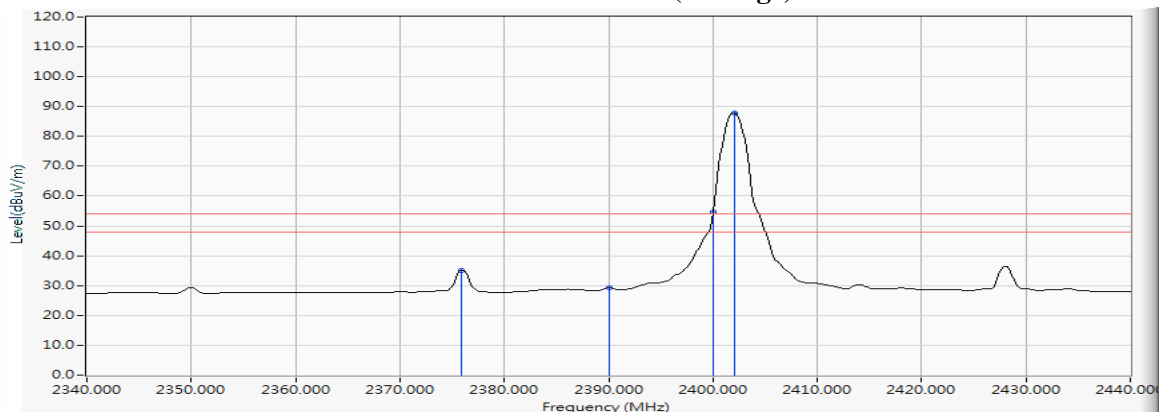


Figure Channel 00: Horizontal (Average)



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 : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit - 1Mbps (2402MHz)
 Test Date : 2017/09/27

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)	2383.913	10.236	37.342	47.578	74.00	54.00	Pass
00 (Peak)	2390.000	10.262	35.239	45.501	74.00	54.00	Pass
00 (Peak)	2400.000	10.304	58.630	68.933	--	--	Pass
00 (Peak)	2402.174	10.312	92.364	102.676	--	--	--
00 (Average)	2375.942	10.205	26.559	36.764	74.00	54.00	Pass
00 (Average)	2390.000	10.262	19.214	29.476	74.00	54.00	Pass
00 (Average)	2400.000	10.304	43.489	53.792	--	--	Pass
00 (Average)	2402.029	10.312	76.580	86.892	--	--	--

Figure Channel 00: VERTICAL (Peak)

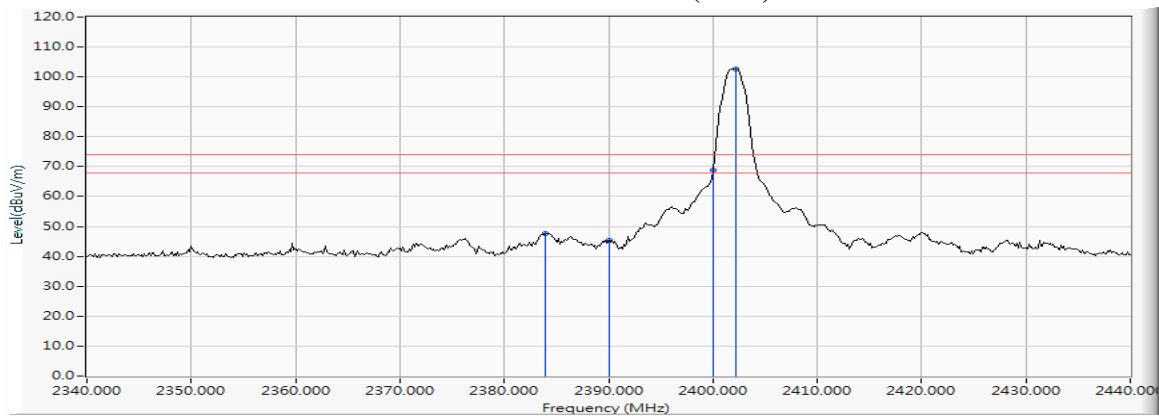
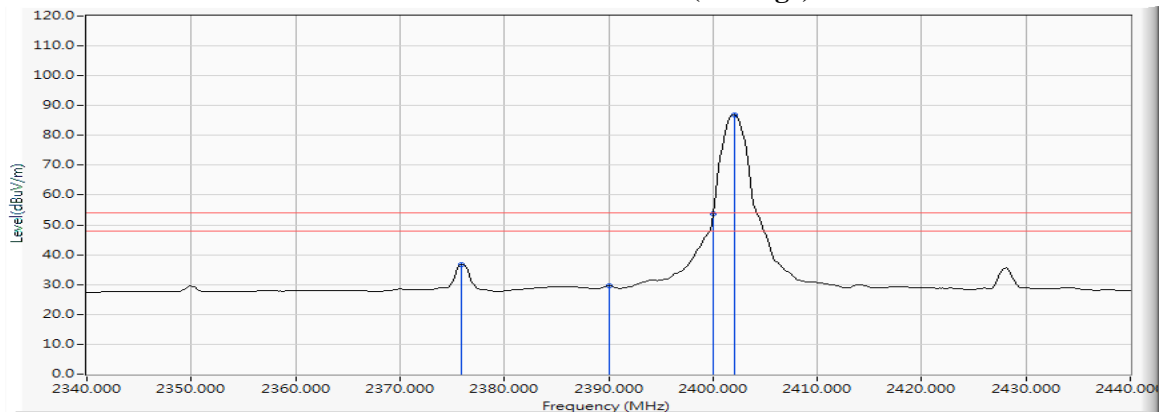


Figure Channel 00: VERTICAL (Average)



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 : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit - 1Mbps (2480MHz)
 Test Date : 2017/09/27

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	10.628	89.533	100.160	--	--	--
78 (Peak)	2483.500	10.640	47.687	58.328	74.00	54.00	Pass
78 (Average)	2480.022	10.628	74.335	84.963	--	--	--
78 (Average)	2483.500	10.640	27.498	38.139	74.00	54.00	Pass

Figure Channel 78: Horizontal (Peak)

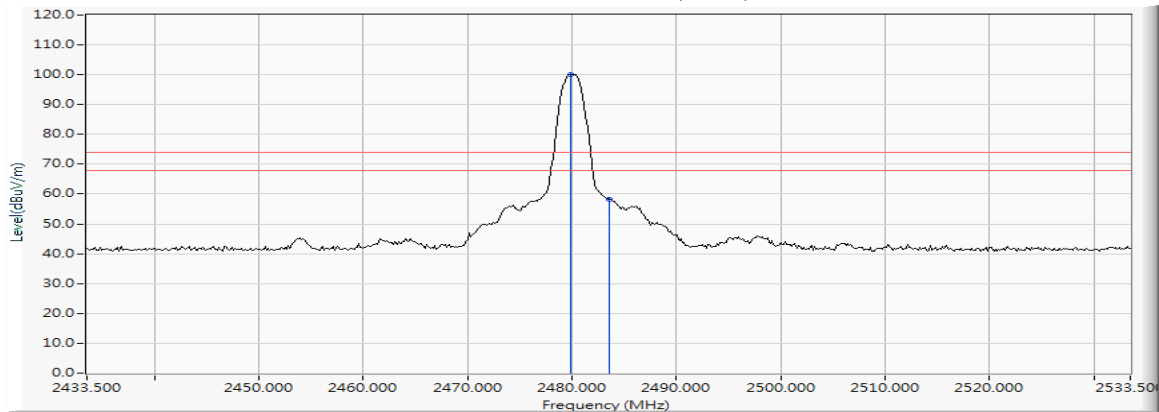
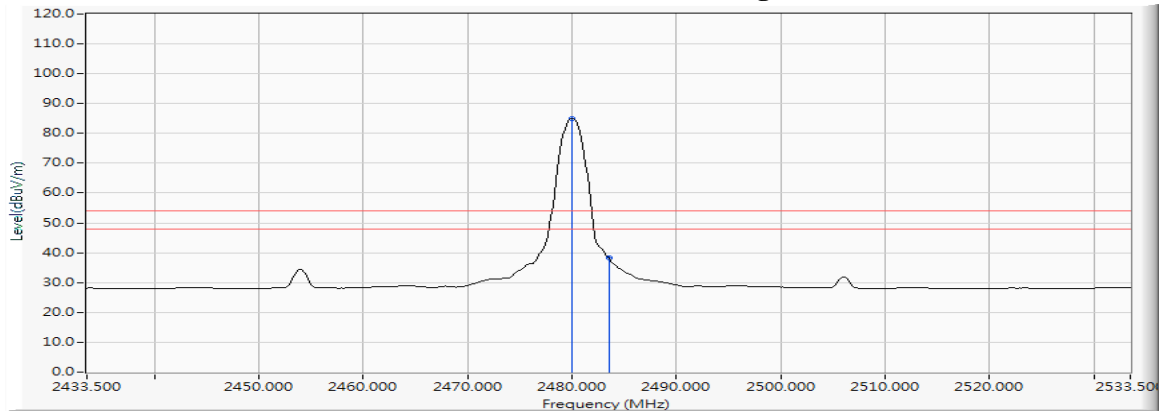


Figure Channel 78: Horizontal (Average)



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 : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit - 1Mbps (2480MHz)
 Test Date : 2017/09/27

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)	2479.877	10.628	89.076	99.703	--	--	--
78 (Peak)	2483.500	10.640	47.577	58.218	74.00	54.00	Pass
78 (Average)	2480.022	10.628	73.892	84.520	--	--	--
78 (Average)	2483.500	10.640	27.197	37.838	74.00	54.00	Pass

Figure Channel 78: VERTICAL (Peak)

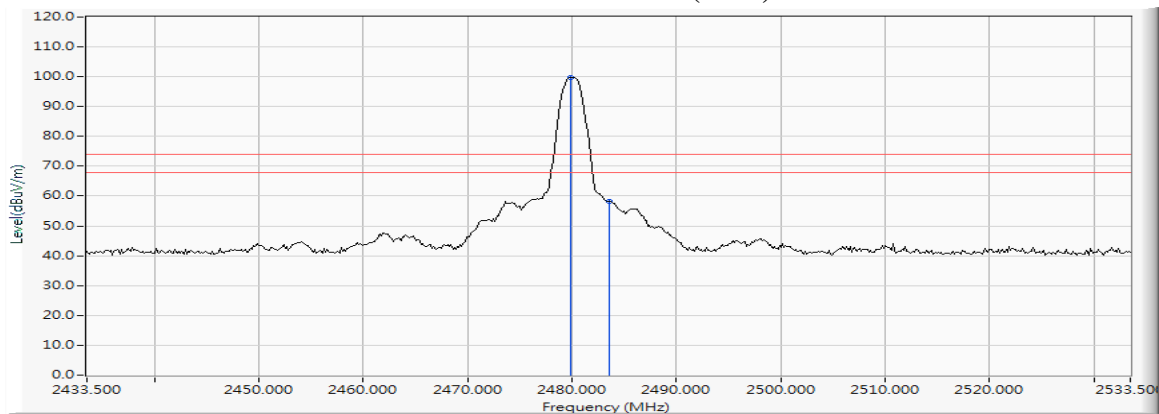
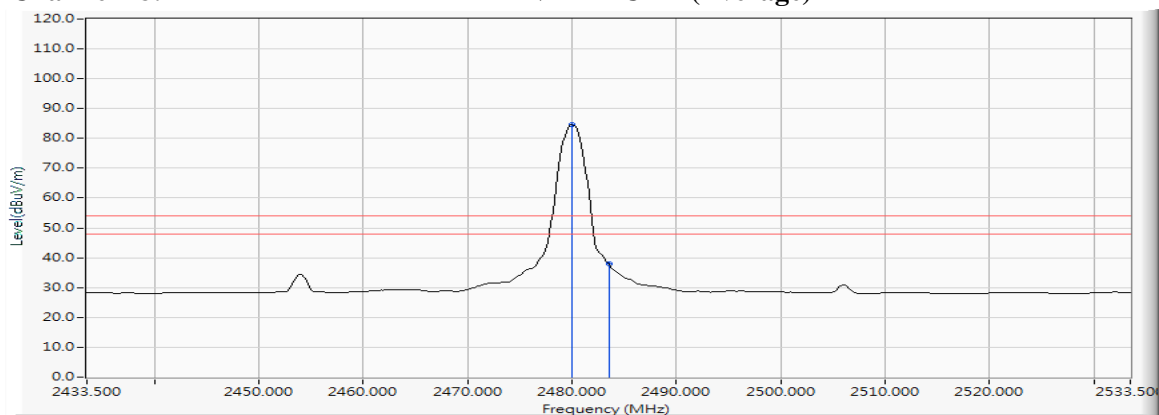


Figure Channel 78: VERTICAL (Average)



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 : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 2: Transmit - 3Mbps (2402MHz)
 Test Date : 2017/09/27

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)	2375.797	10.204	34.441	44.645	74.00	54.00	Pass
00 (Peak)	2390.000	10.262	32.776	43.038	74.00	54.00	Pass
00 (Peak)	2400.000	10.304	68.940	79.243	--	--	Pass
00 (Peak)	2402.029	10.312	92.391	102.703	--	--	--
00 (Average)	2376.087	10.205	21.978	32.183	74.00	54.00	Pass
00 (Average)	2390.000	10.262	18.428	28.690	74.00	54.00	Pass
00 (Average)	2400.000	10.304	48.114	58.417	--	--	Pass
00 (Average)	2401.884	10.311	74.664	84.975	--	--	--

Figure Channel 00: Horizontal (Peak)

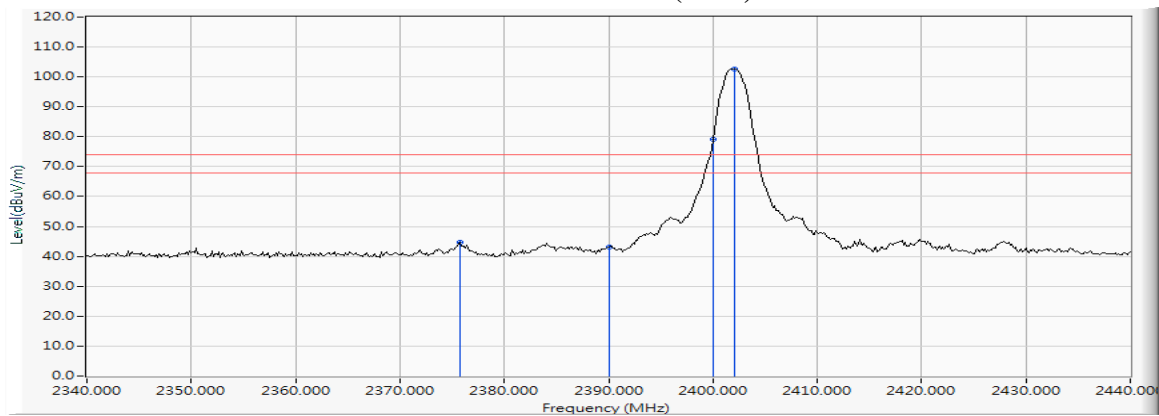
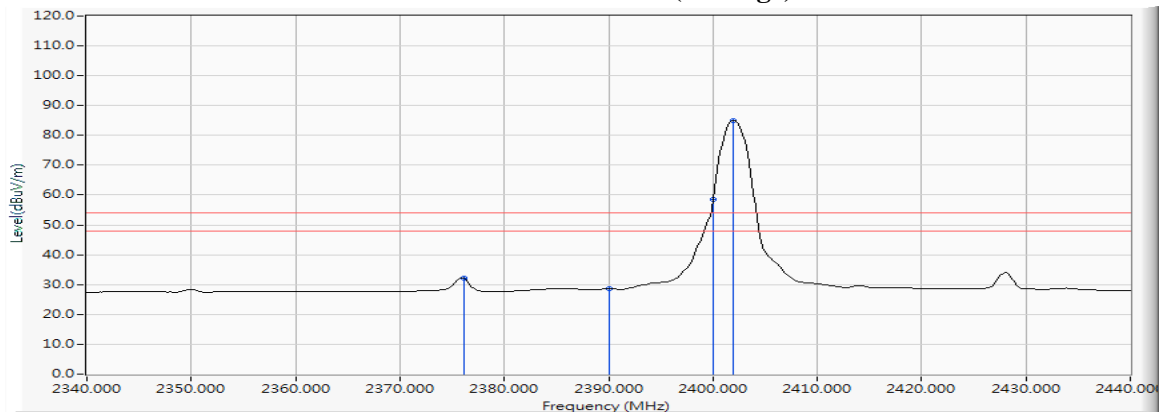


Figure Channel 00: Horizontal (Average)



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 : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 2: Transmit - 3Mbps (2402MHz)
 Test Date : 2017/09/27

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)	2383.623	10.235	36.205	46.440	74.00	54.00	Pass
00 (Peak)	2390.000	10.262	33.415	43.677	74.00	54.00	Pass
00 (Peak)	2400.000	10.304	67.489	77.792	--	--	Pass
00 (Peak)	2402.029	10.312	90.963	101.275	--	--	--
00 (Average)	2376.087	10.205	23.556	33.761	74.00	54.00	Pass
00 (Average)	2390.000	10.262	18.657	28.919	74.00	54.00	Pass
00 (Average)	2400.000	10.304	47.013	57.316	--	--	Pass
00 (Average)	2402.029	10.312	73.558	83.870	--	--	--

Figure Channel 00: VERTICAL (Peak)

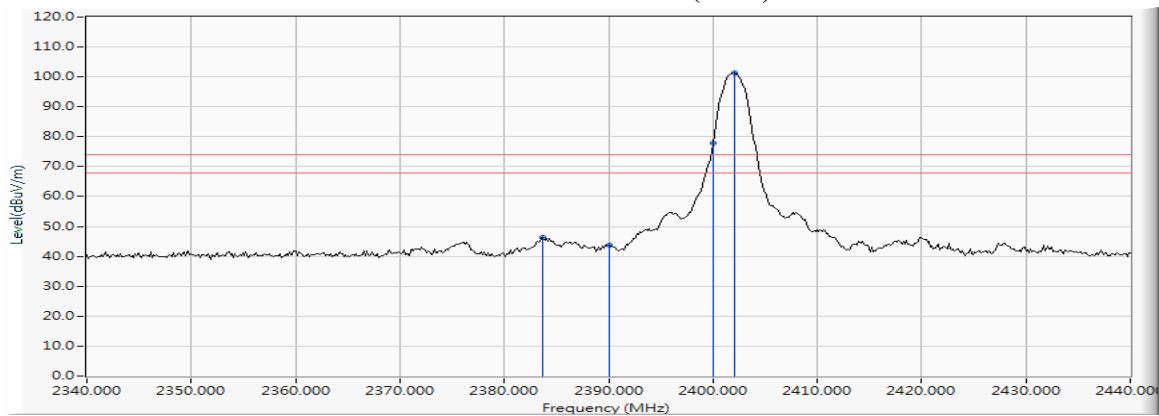
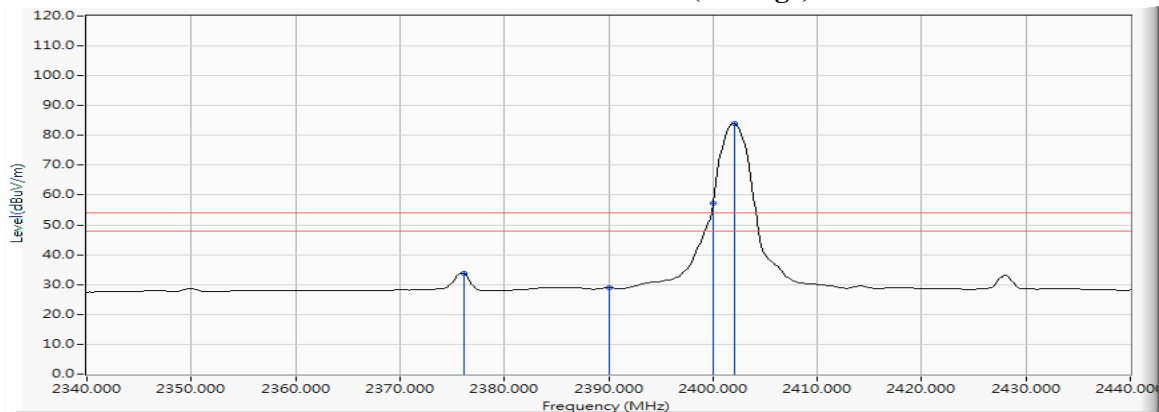


Figure Channel 00: VERTICAL (Average)



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 : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 2: Transmit - 3Mbps (2480MHz)
 Test Date : 2017/09/27

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	10.628	88.643	99.271	--	--	--
78 (Peak)	2483.500	10.640	46.287	56.928	74.00	54.00	Pass
78 (Average)	2480.022	10.628	71.758	82.386	--	--	--
78 (Average)	2483.500	10.640	26.260	36.901	74.00	54.00	Pass

Figure Channel 00: Horizontal (Peak)

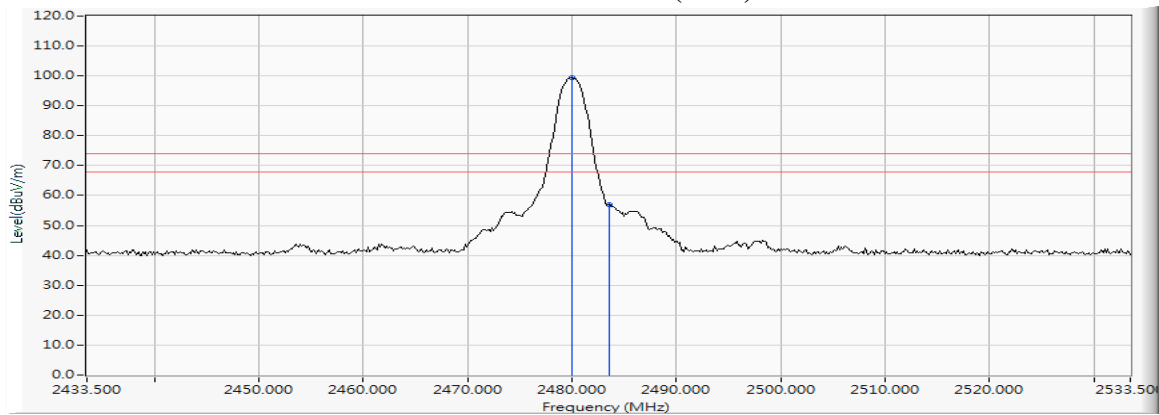
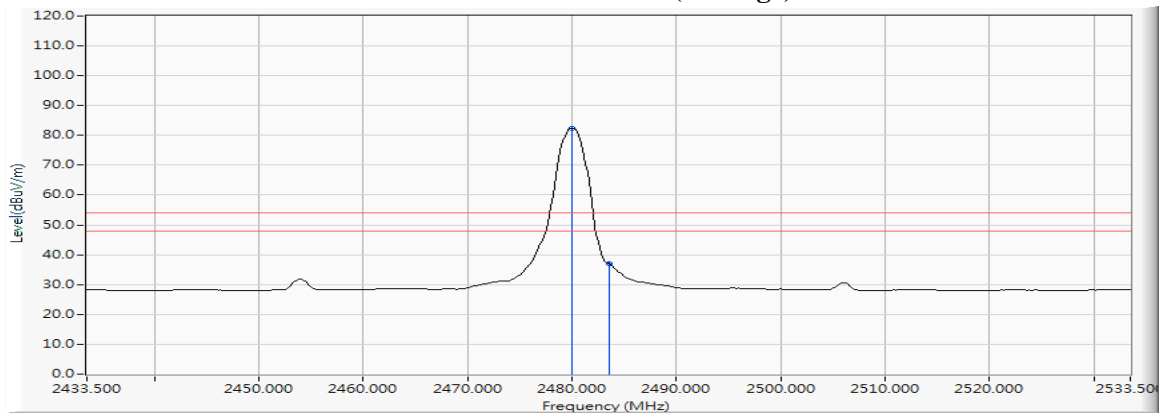


Figure Channel 00: Horizontal (Average)



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 : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 2: Transmit - 3Mbps (2480MHz)
 Test Date : 2017/09/27

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	10.628	88.091	98.719	--	--	--
78 (Peak)	2483.500	10.640	45.930	56.571	74.00	54.00	Pass
78 (Peak)	2483.935	10.644	46.041	56.684	74.00	54.00	Pass
78 (Average)	2480.022	10.628	71.243	81.871	--	--	--
78 (Average)	2483.500	10.640	26.107	36.748	74.00	54.00	Pass

Figure Channel 78: VERTICAL (Peak)

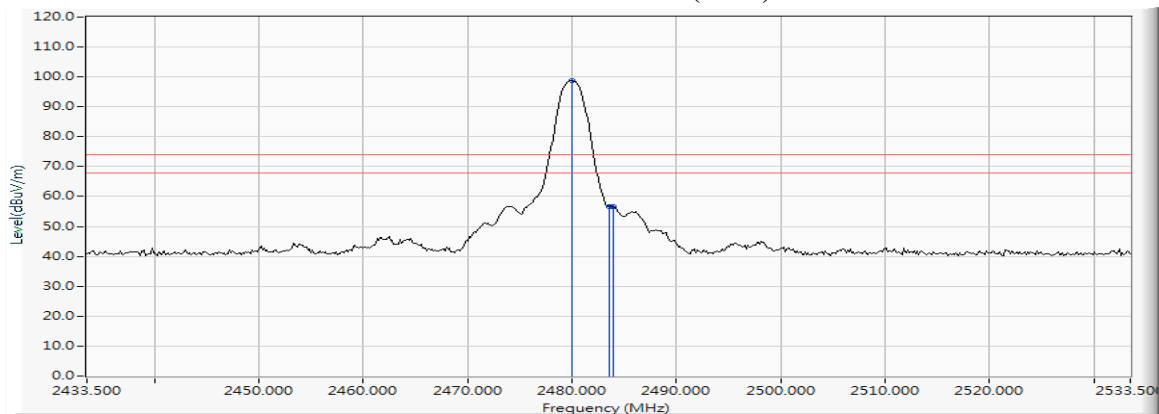
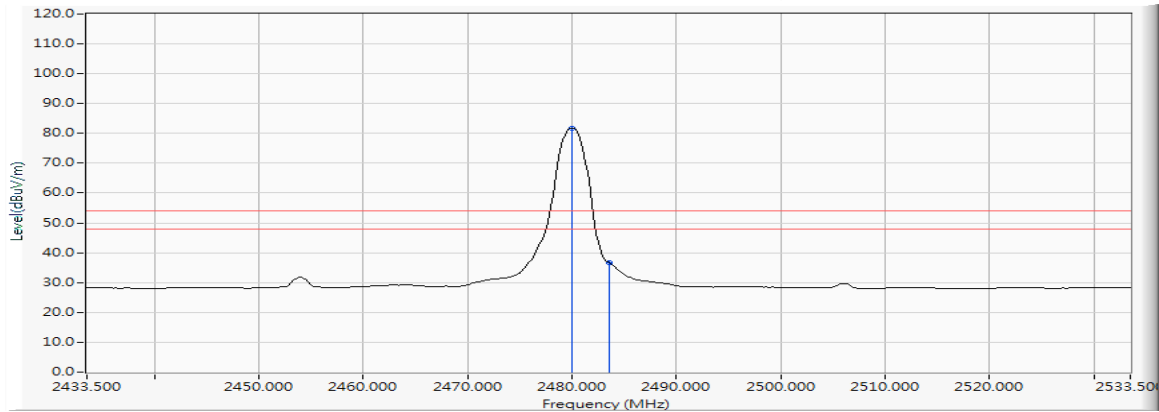


Figure Channel 78: VERTICAL (Average)



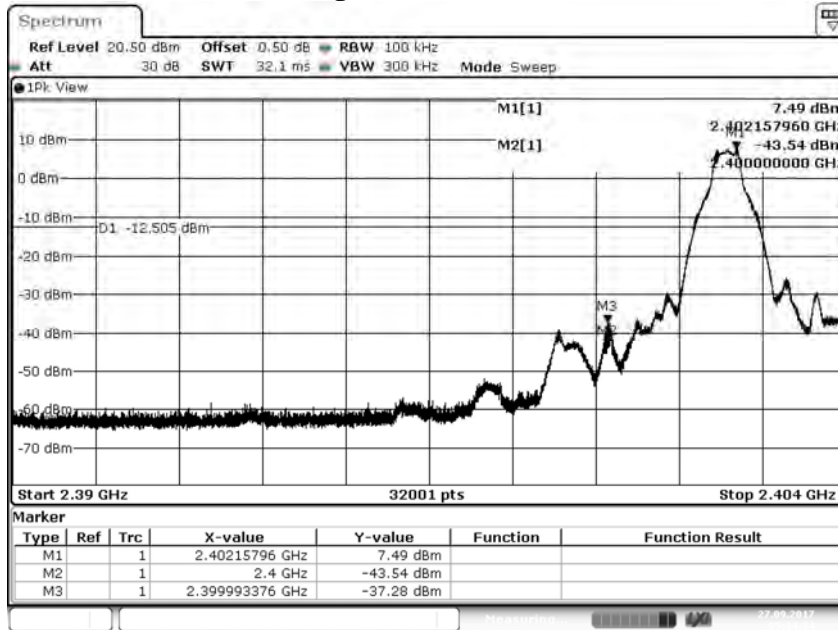
Note:

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 : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit - 1Mbps(Hopping off)

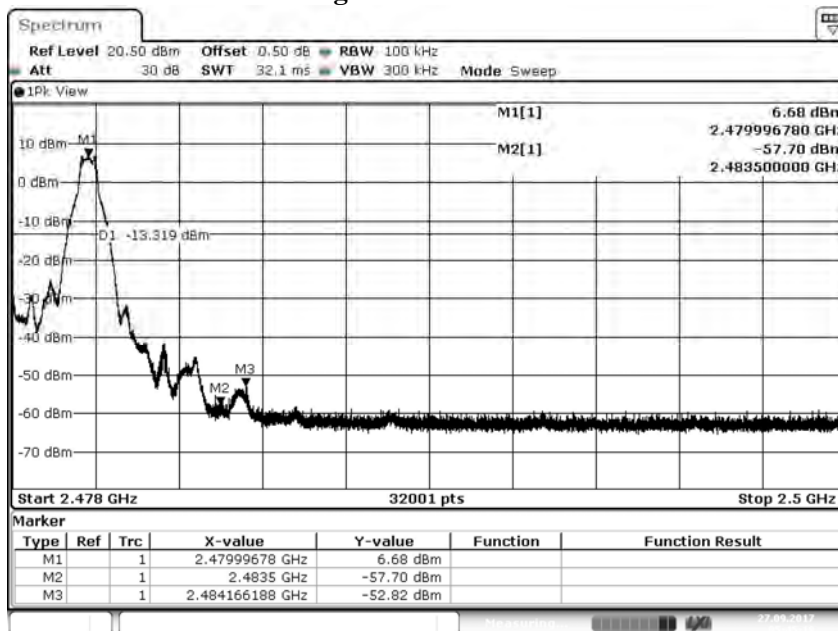
Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:



Date: 27.SEP.2017 05:34:34

Figure Channel 78:

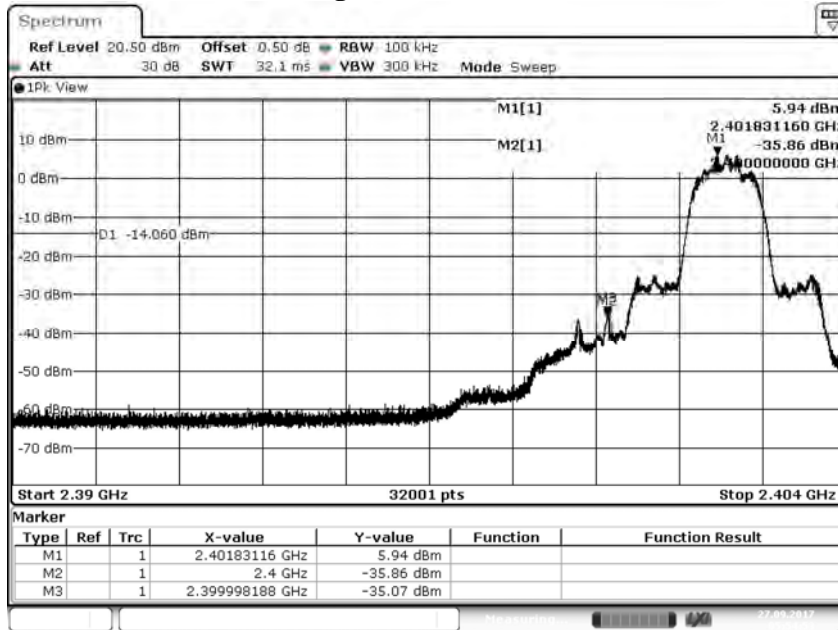


Date: 27.SEP.2017 05:45:18

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

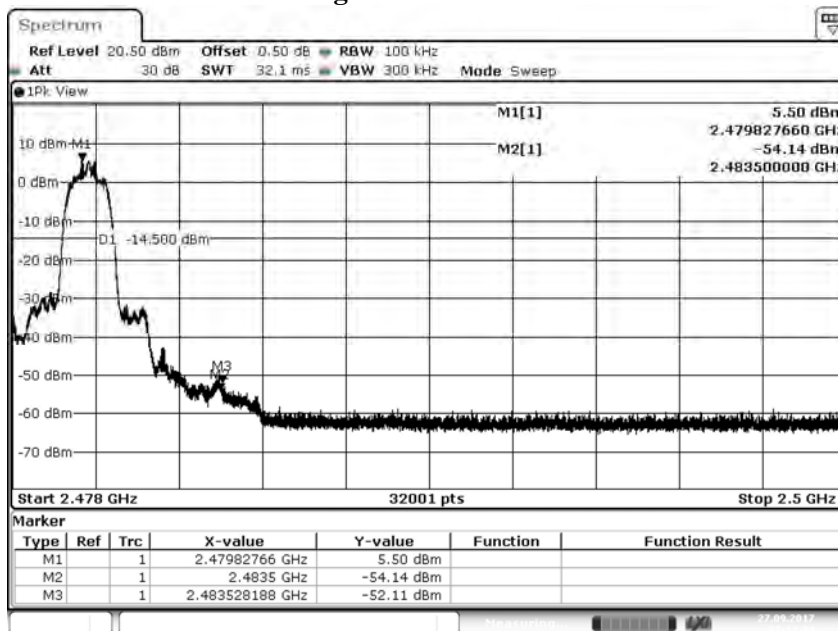
Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel 00:



Date: 27.SEP.2017 05:54:53

Figure Channel 78:

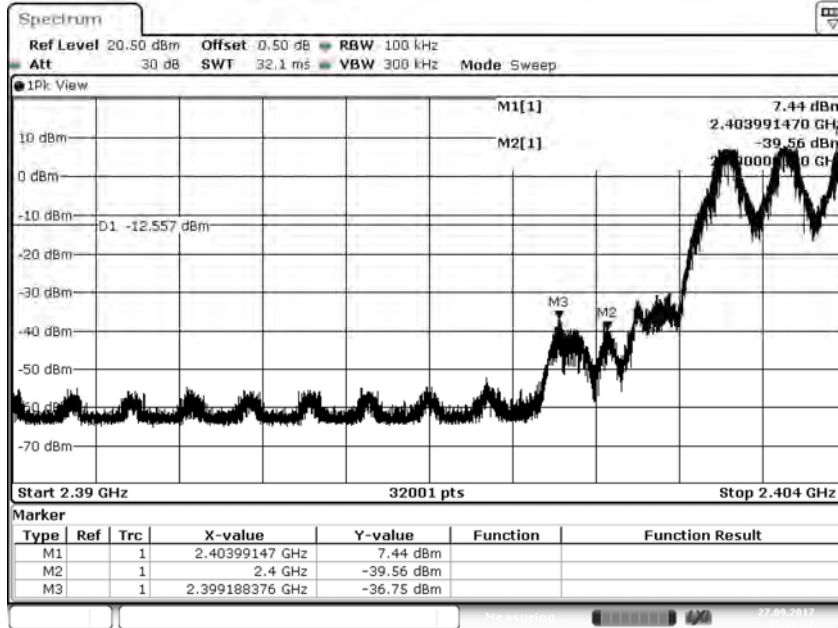


Date: 27.SEP.2017 07:12:35

Product : Bluetooth Headset
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit - 1Mbps(Hopping on)

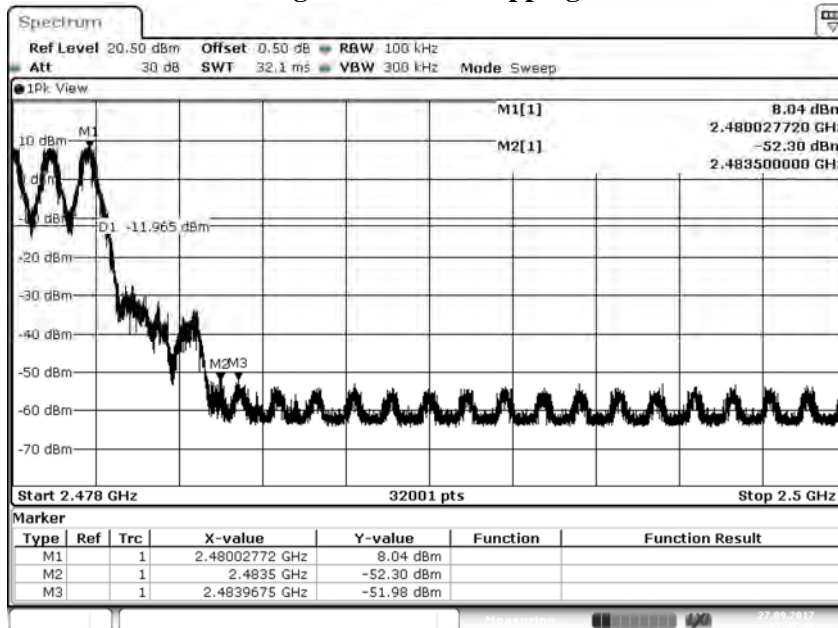
Measurement Level Δ (dB)	Result
> 20	PASS

Figure Channel Hopping:



Date: 27.SEP.2017 05:36:37

Figure Channel Hopping:

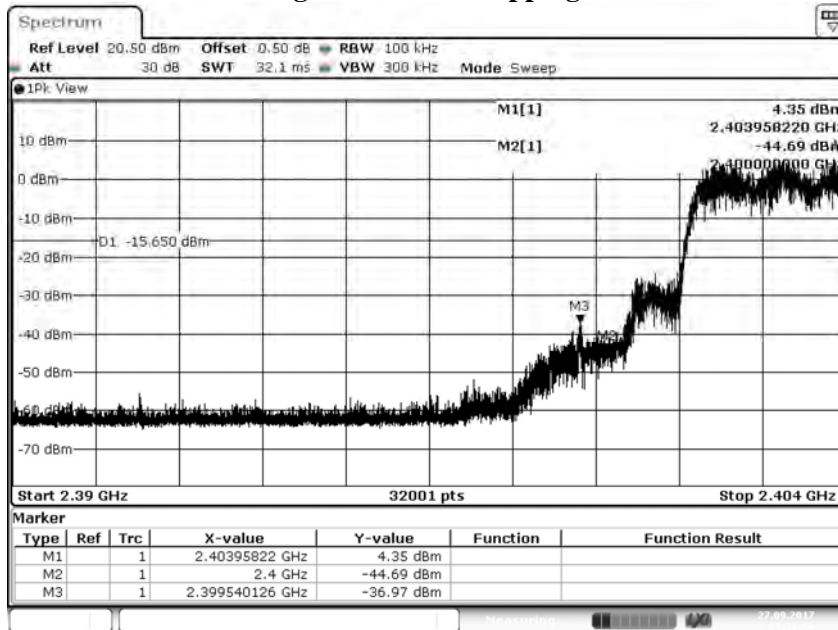


Date: 27.SEP.2017 05:47:40

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

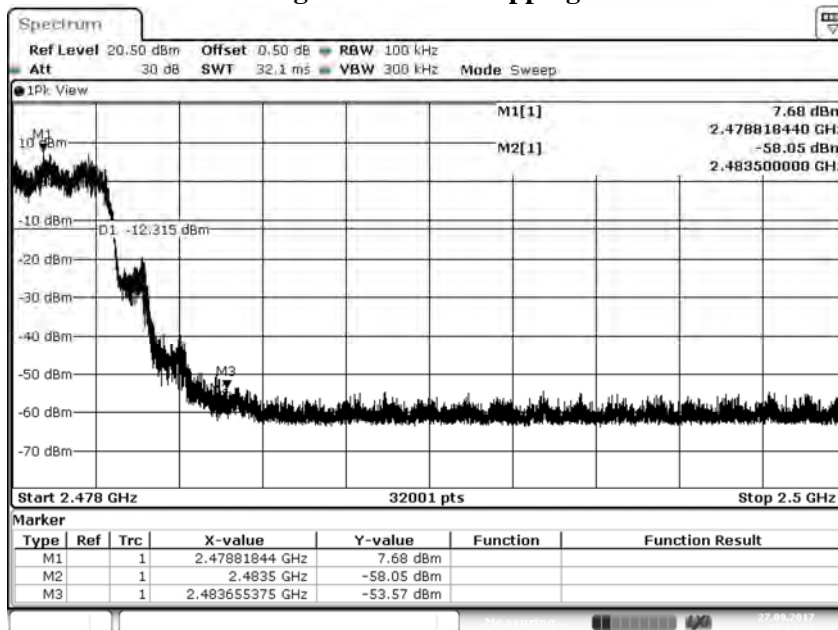
Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel Hopping:



Date: 27.SEP.2017 05:56:57

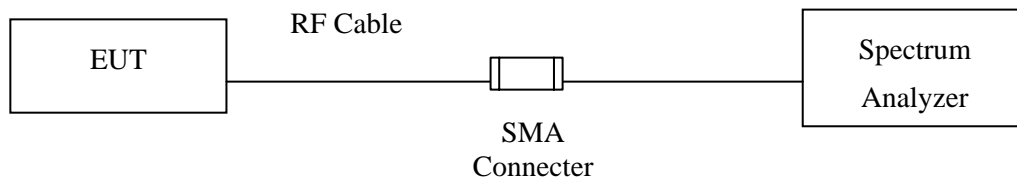
Figure Channel Hopping:



Date: 27.SEP.2017 07:14:54

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

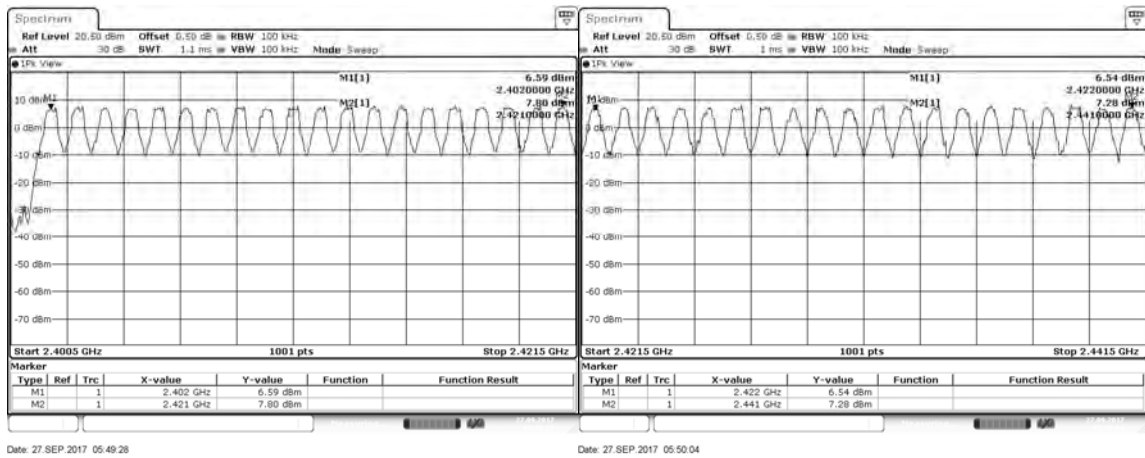
N/A

7.5. Test Result of Channel Number

Product : Bluetooth Headset
 Test Item : Channel Number
 Test Mode : Mode 1: Transmit - 1Mbps

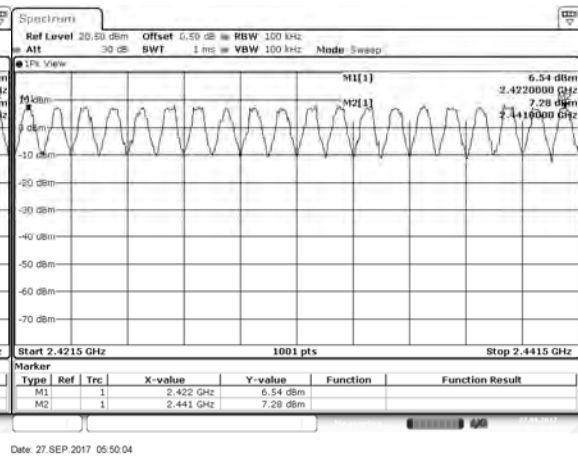
Frequency Range (MHz)	Measurement (Hopping Channel)	Required Limit (Hopping Channel)	Result
2402 ~ 2480	79	>75	Pass

2402-2421MHz



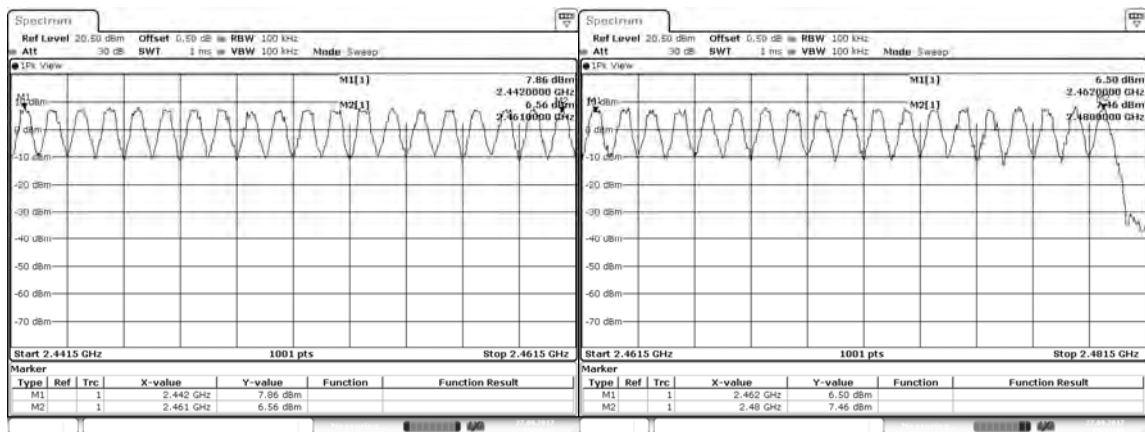
Date: 27 SEP 2017 05:49:28

2422-2441MHz



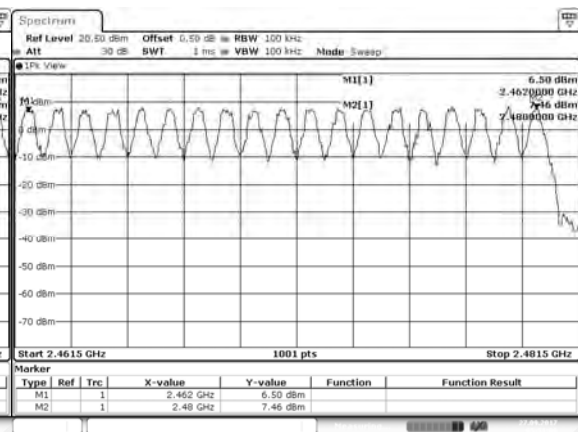
Date: 27 SEP 2017 05:50:04

2442-2461MHz



Date: 27 SEP 2017 05:50:33

2462-2480MHz

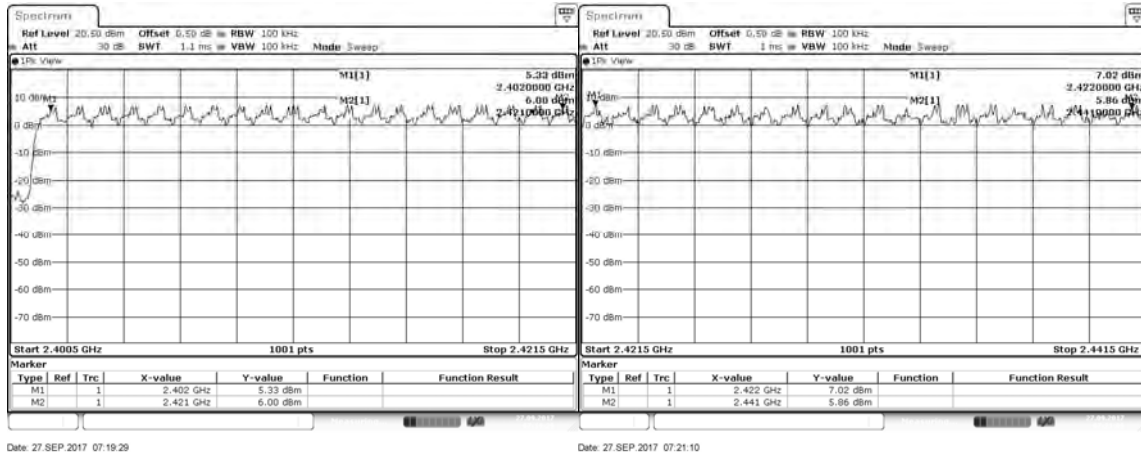


Date: 27 SEP 2017 05:51:01

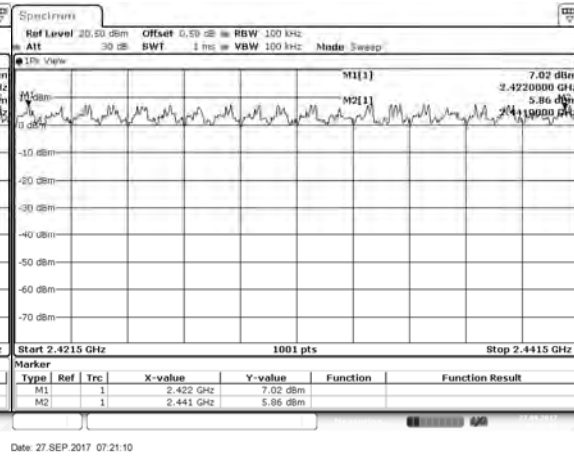
Product : Bluetooth Headset
 Test Item : Channel Number
 Test Mode : Mode 2: Transmit - 3Mbps

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

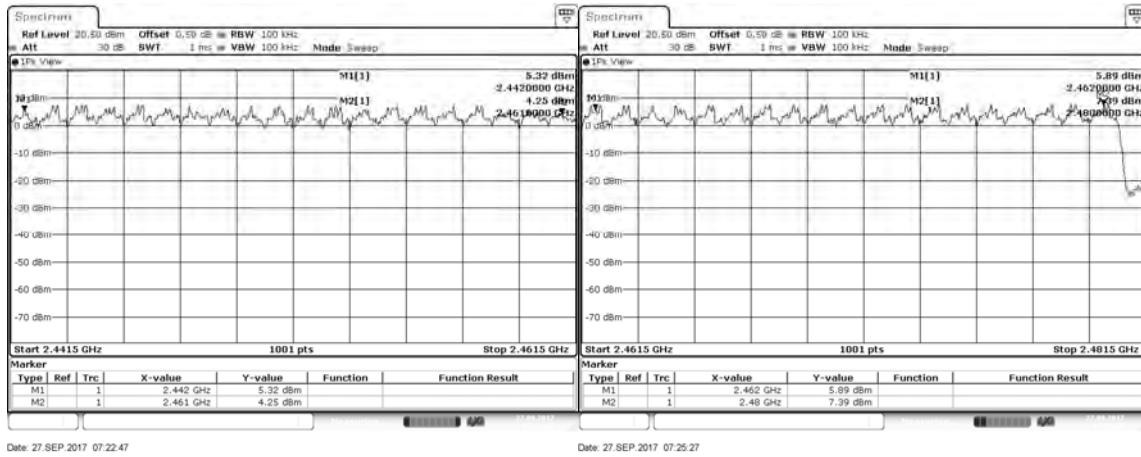
2402-2421MHz



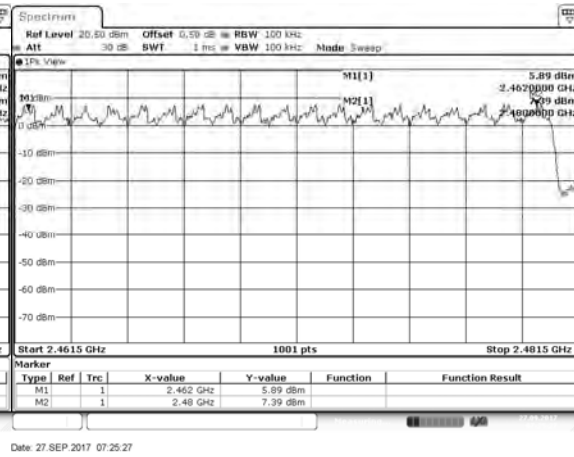
2422-2441MHz



2442-2461MHz

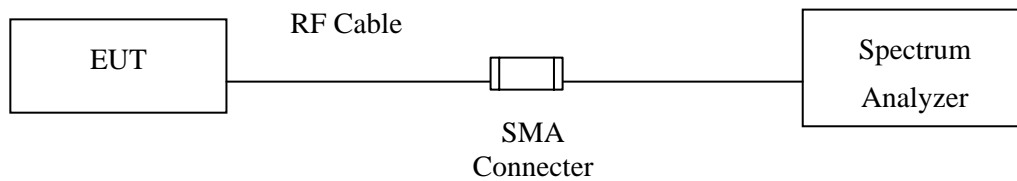


2462-2480MHz



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

$\pm 279.2\text{Hz}$

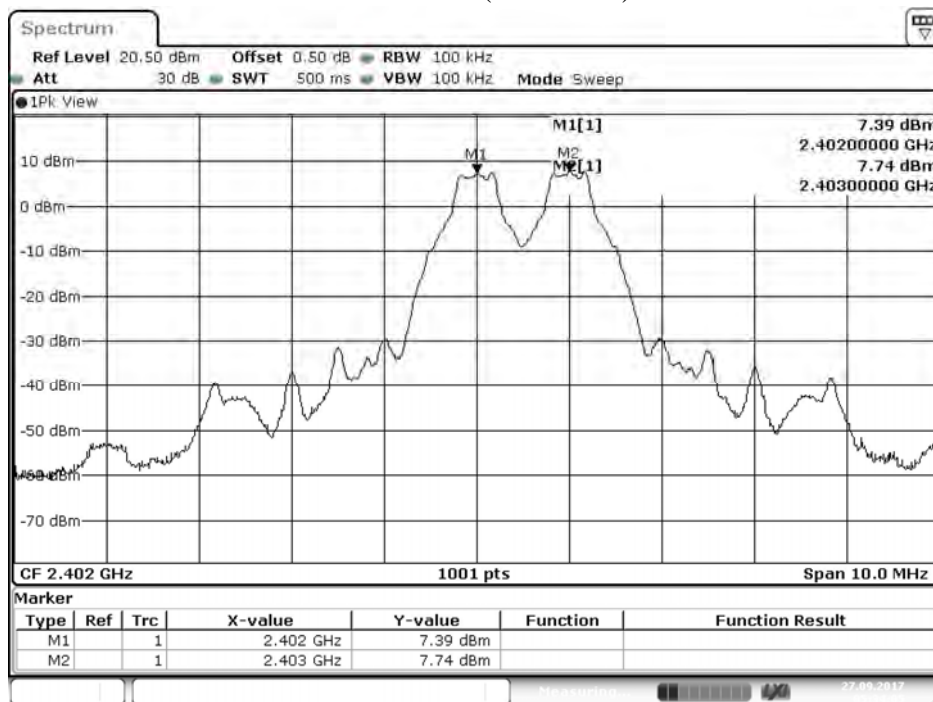
8.5. Test Result of Channel Separation

Product : Bluetooth Headset
 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	632.0	Pass
39	2441	1000	>25 kHz	630.0	Pass
78	2480	1000	>25 kHz	630.0	Pass

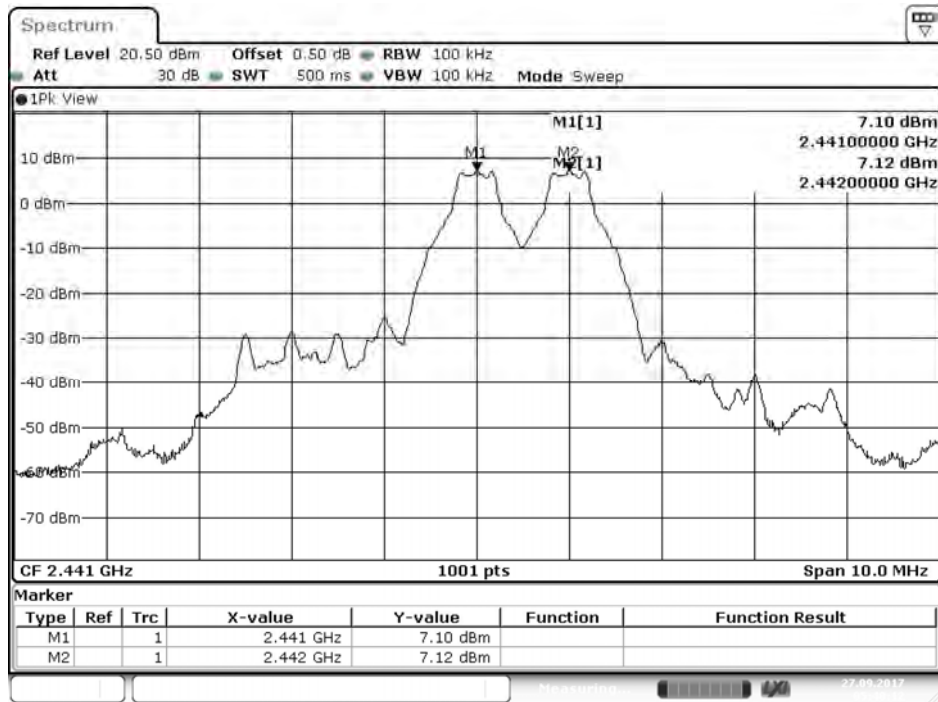
NOTE: The 20dB Bandwidth is refer to section 10.

Channel 00 (2402MHz)



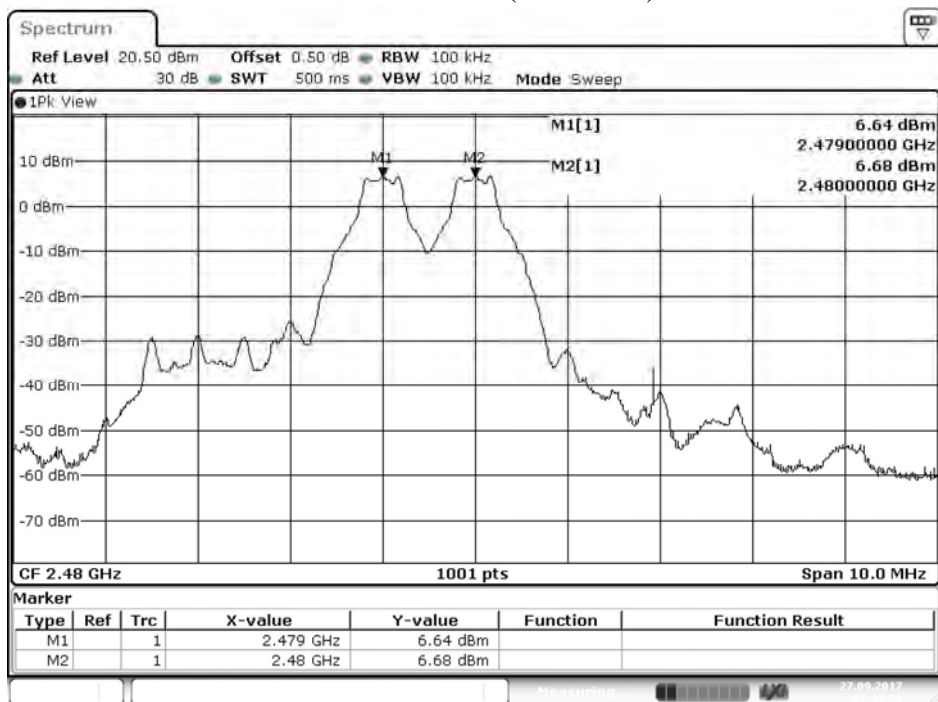
Date: 27.SEP.2017 05:34:06

Channel 39 (2441MHz)



Date: 27.SEP.2017 05:40:12

Channel 78 (2480MHz)



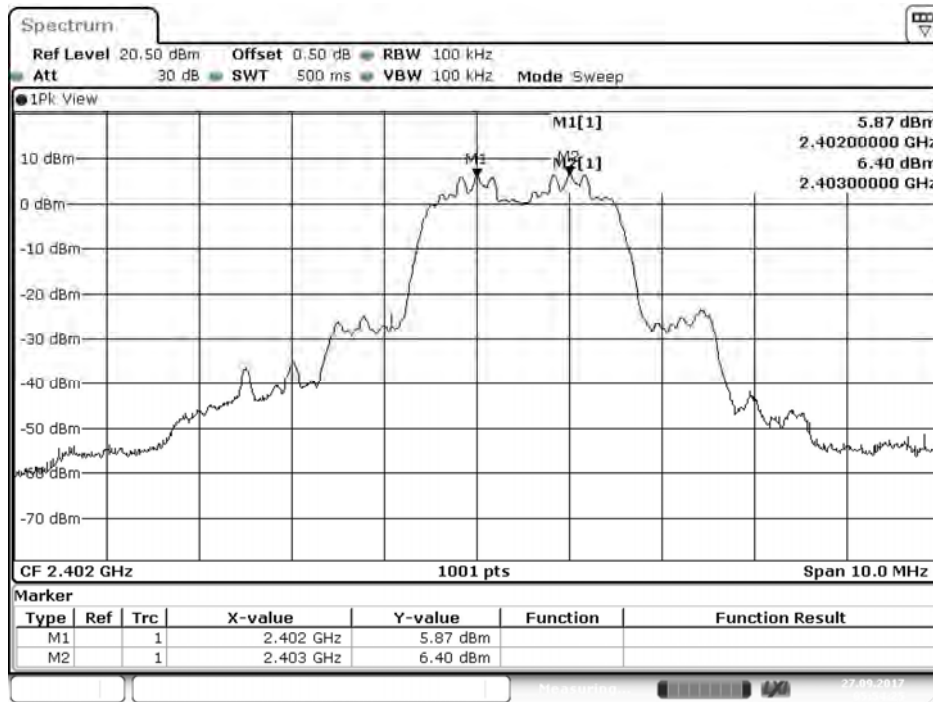
Date: 27.SEP.2017 05:44:53

Product : Bluetooth Headset
 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	840.0	Pass
78	2480	1000	>25 kHz	840.0	Pass

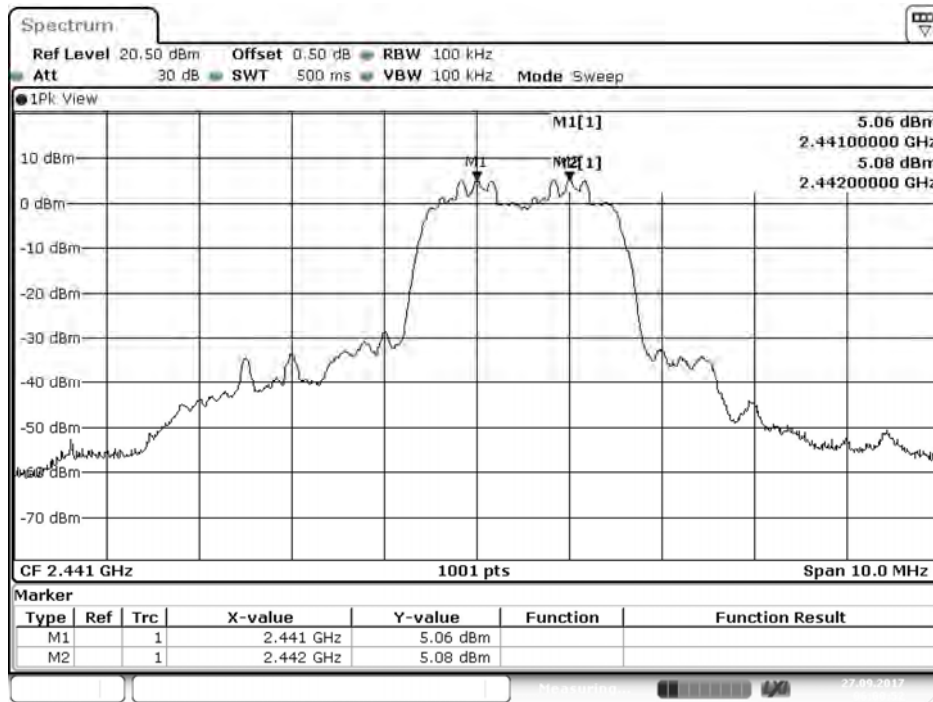
NOTE: The 20dB Bandwidth is refer to section 10.

Channel 00 (2402MHz)



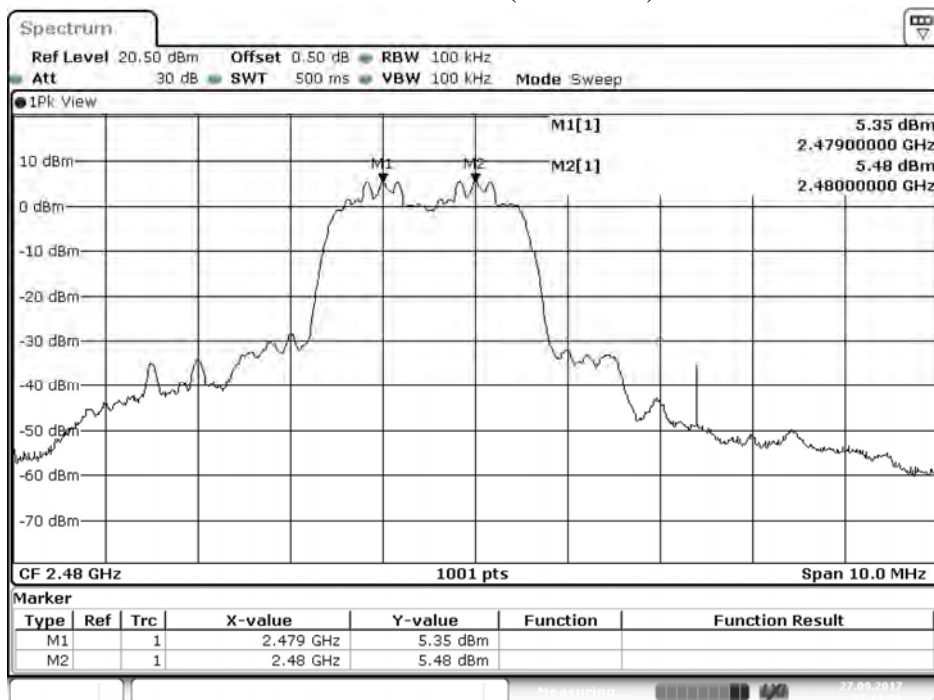
Date: 27.SEP.2017 05:54:26

Channel 39 (2441MHz)



Date: 27.SEP.2017 06:00:52

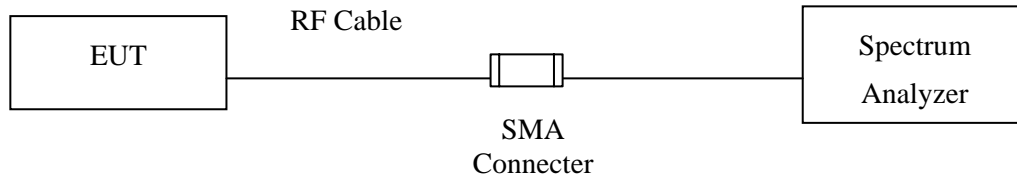
Channel 78 (2480MHz)



Date: 27.SEP.2017 07:11:01

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

± 2.31 msec

9.5. Test Result of Dwell Time

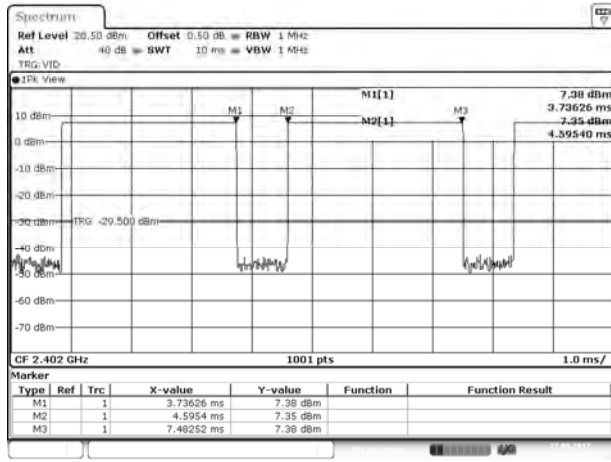
Product : Bluetooth Headset
 Test Item : Dwell Time
 Test Mode : Mode 1: Transmit - 1Mbps (Channel 00,39,78)

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

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

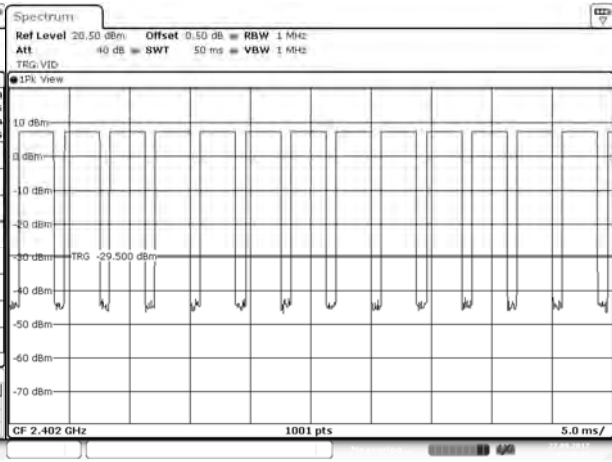
Dwell time = (Duty cycle /79) * (79*0.4)

CH 00 Hopping of Number



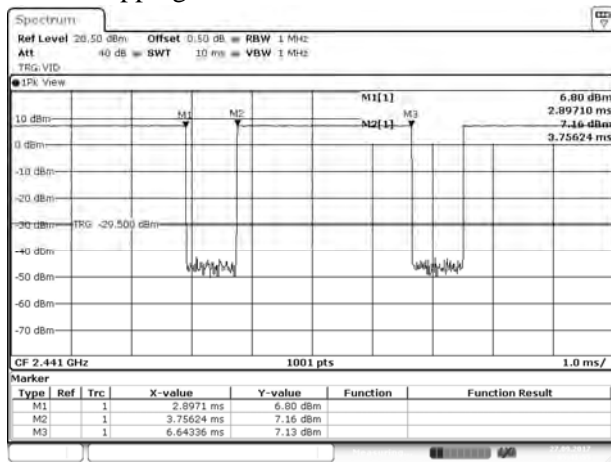
Date: 27.SEP.2017 05:37:11

CH 00 Time slot length



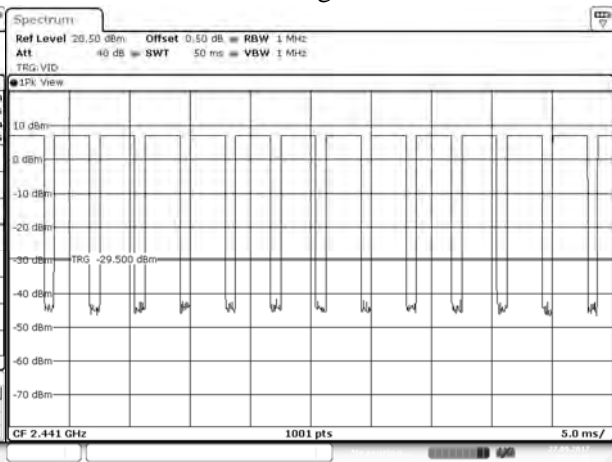
Date: 27.SEP.2017 05:36:56

CH39 Hopping of Number



Date: 27.SEP.2017 05:41:56

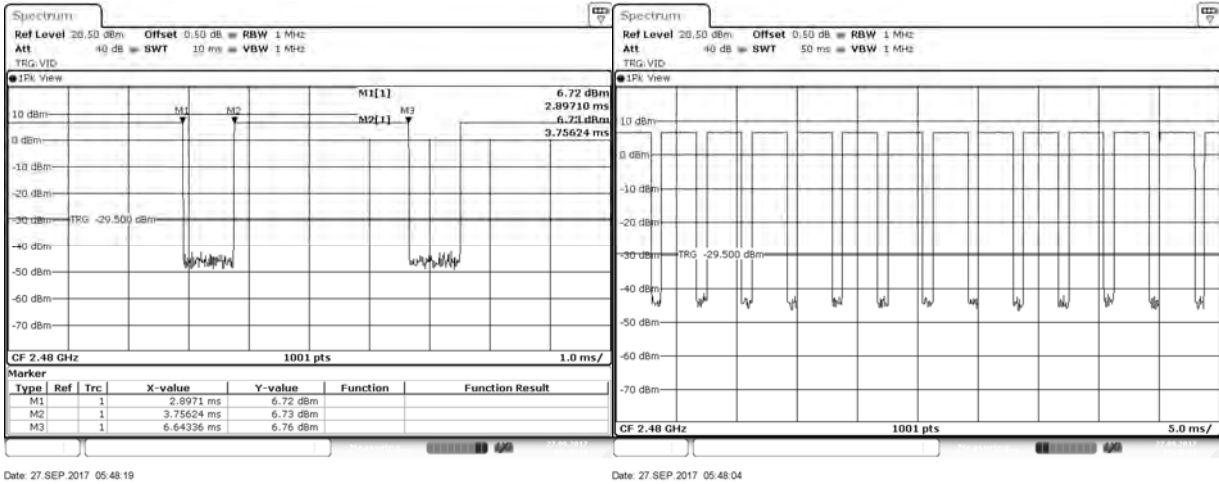
CH 39 Time slot length



Date: 27.SEP.2017 05:41:40

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.

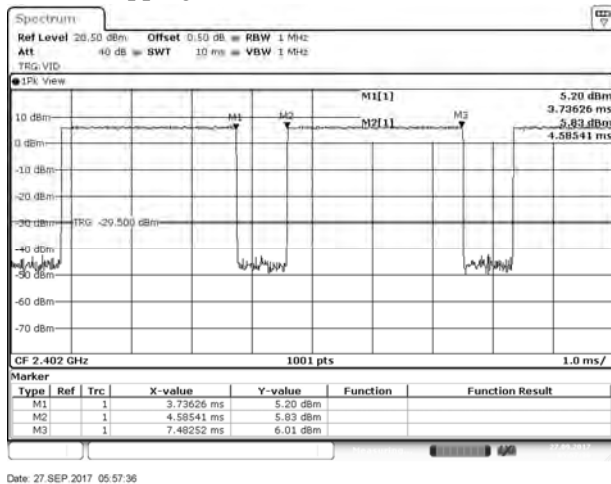
Product : Bluetooth Headset
 Test Item : Dwell Time
 Test Mode : Mode 2: Transmit - 3Mbps (Channel 00,39,78)

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	2.907	13	50	0.76	0.302	0.4	Pass
2480	2.907	13	50	0.76	0.302	0.4	Pass

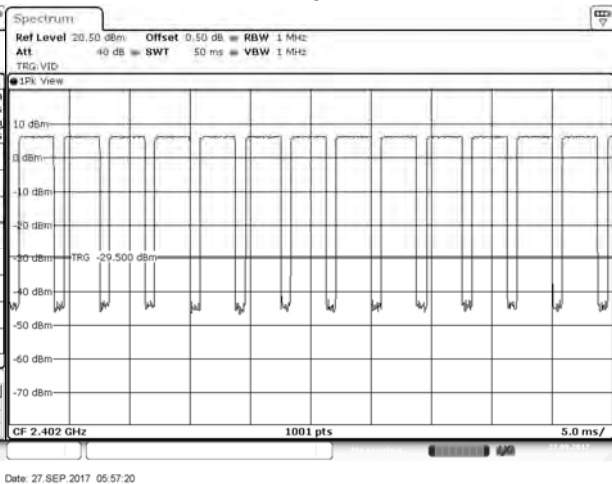
Duty cycle = ((Time slot length(ms)*Hopping of Number) / Sweep time (ms))

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

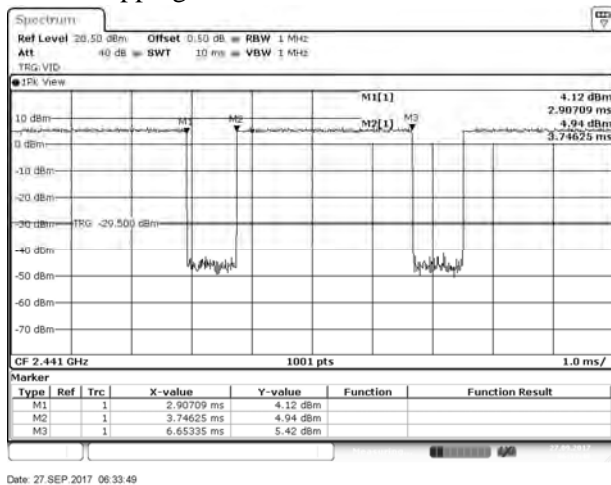
CH 00 Hopping of Number



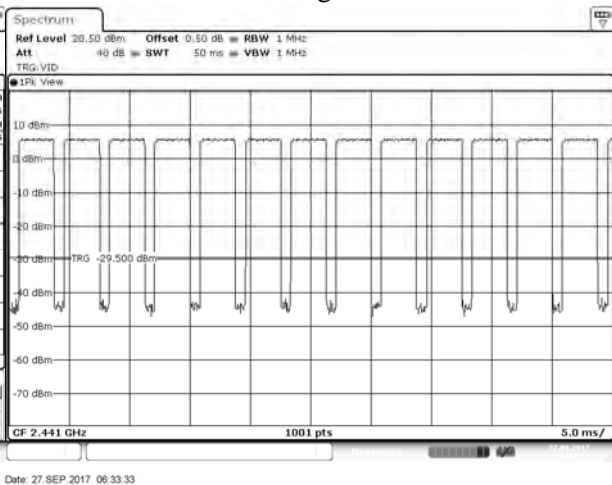
CH 00 Time slot length



CH39 Hopping of Number

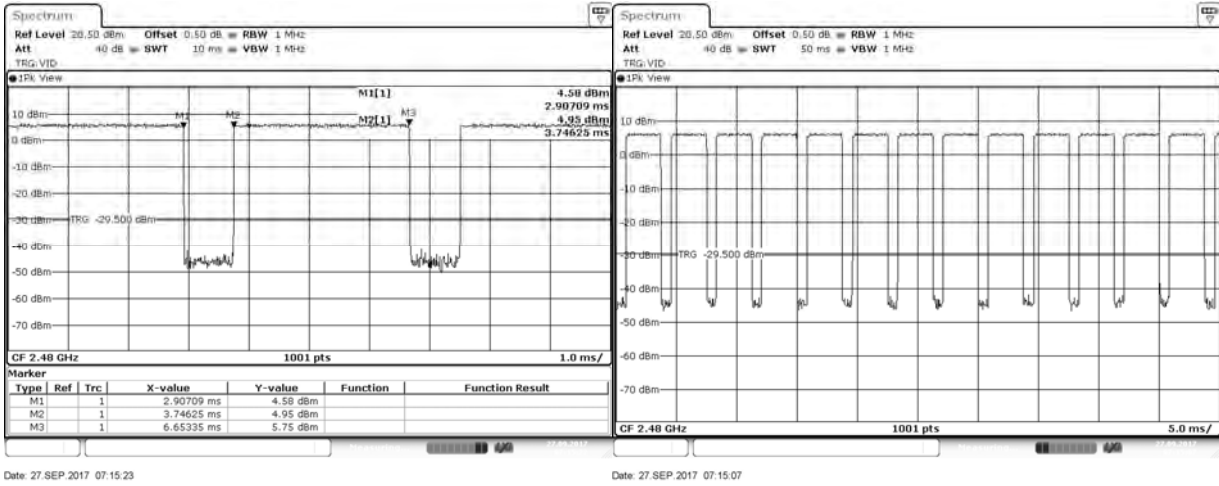


CH 39 Time slot length



CH 78 Hopping of Number

CH 78 Time slot length

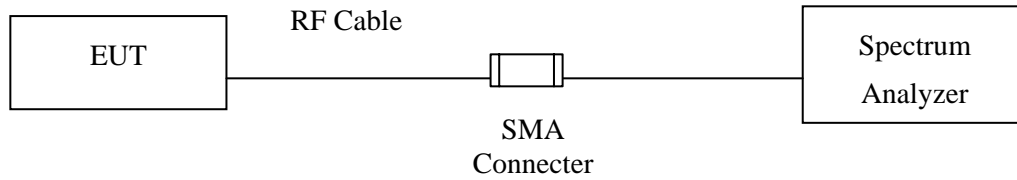


Note:

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

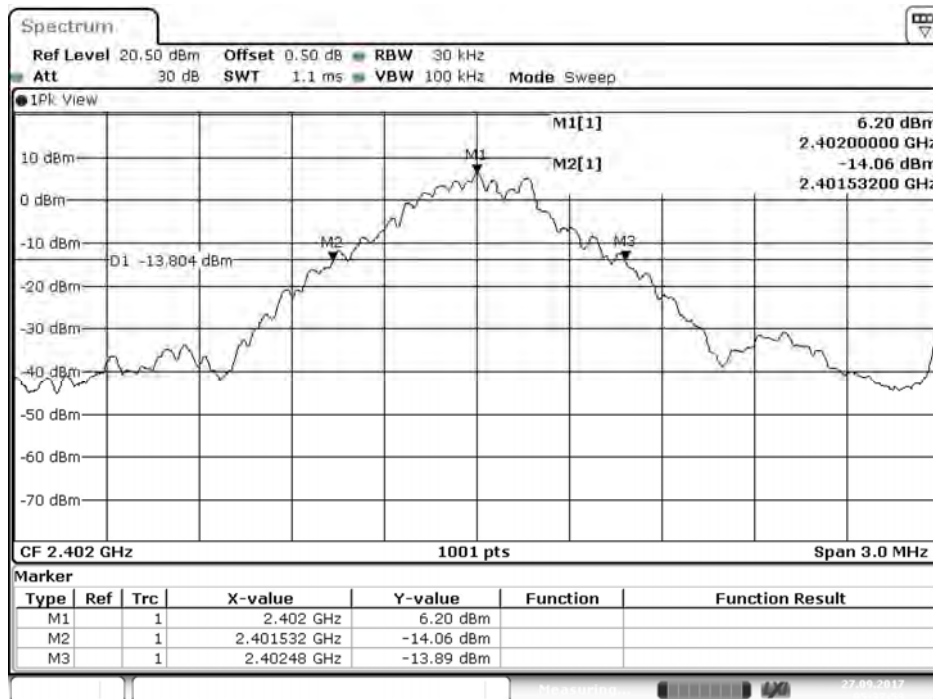
$\pm 279.2\text{Hz}$

10.5. Test Result of Occupied Bandwidth

Product : Bluetooth Headset
 Test Item : Occupied Bandwidth Data
 Test Mode : Mode 1: Transmit - 1Mbps

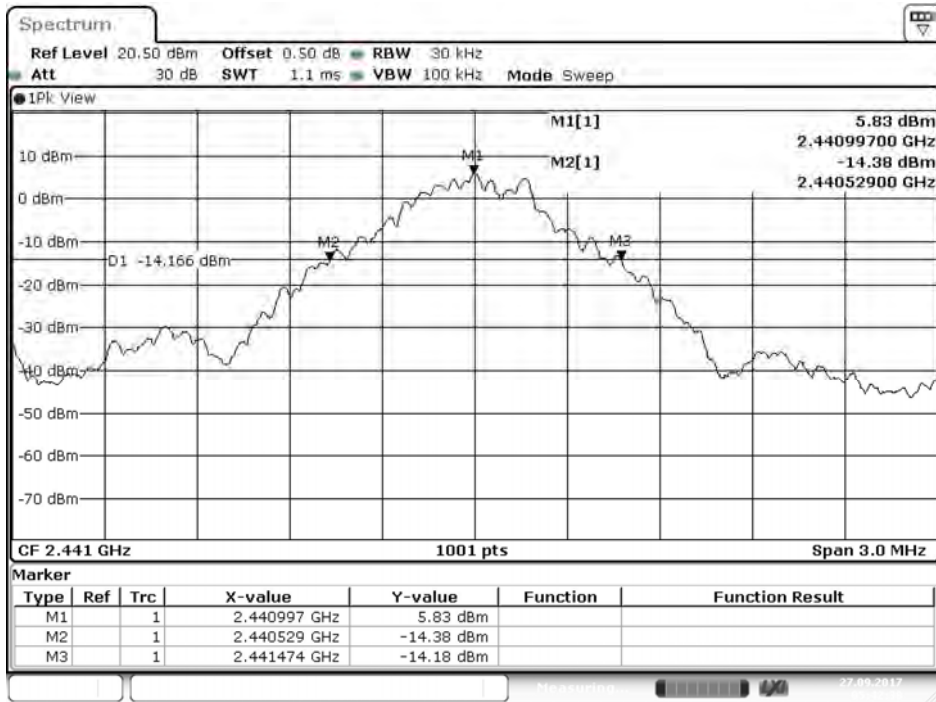
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	948	--	NA
39	2441	945	--	NA
78	2480	945	--	NA

Figure Channel 00:



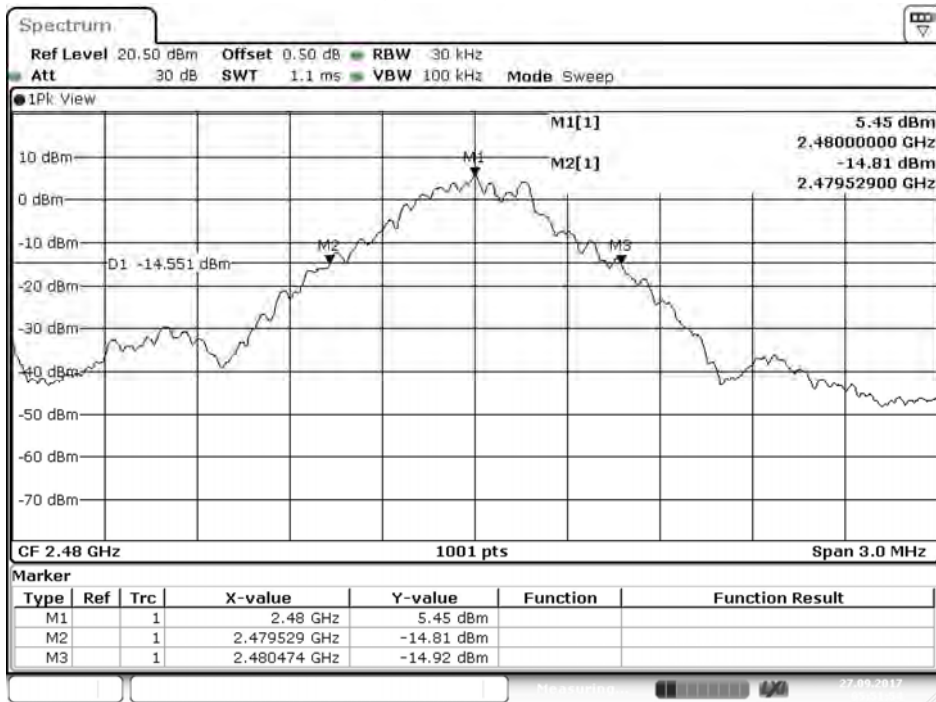
Date: 27.SEP.2017 05:37:53

Figure Channel 39:



Date: 27.SEP.2017 05:42:38

Figure Channel 78:

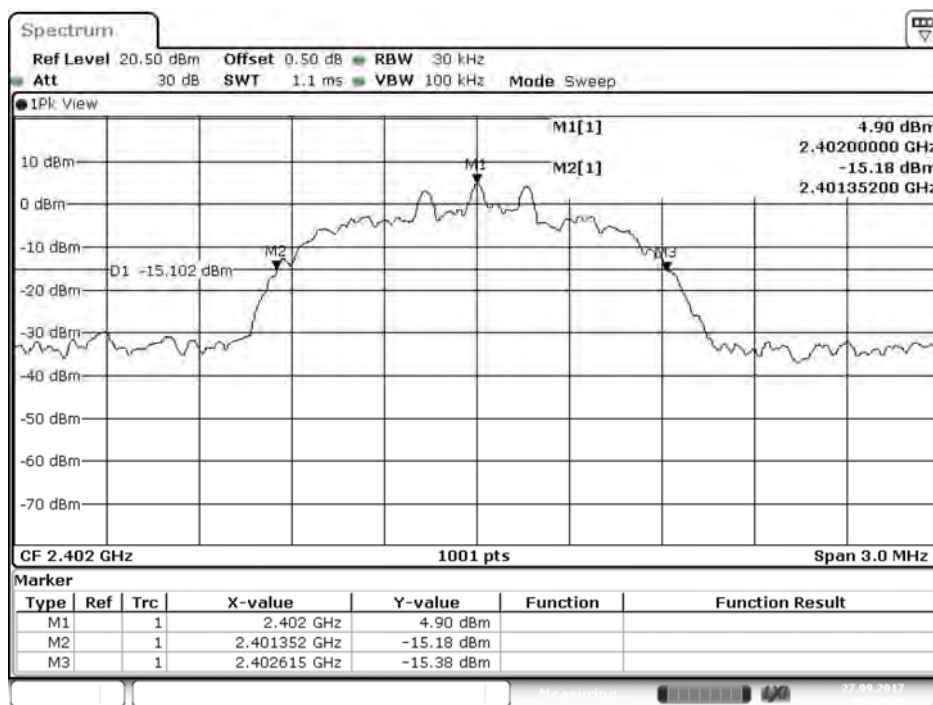


Date: 27.SEP.2017 05:51:54

Product : Bluetooth Headset
 Test Item : Occupied Bandwidth Data
 Test Mode : Mode 2: Transmit - 3Mbps

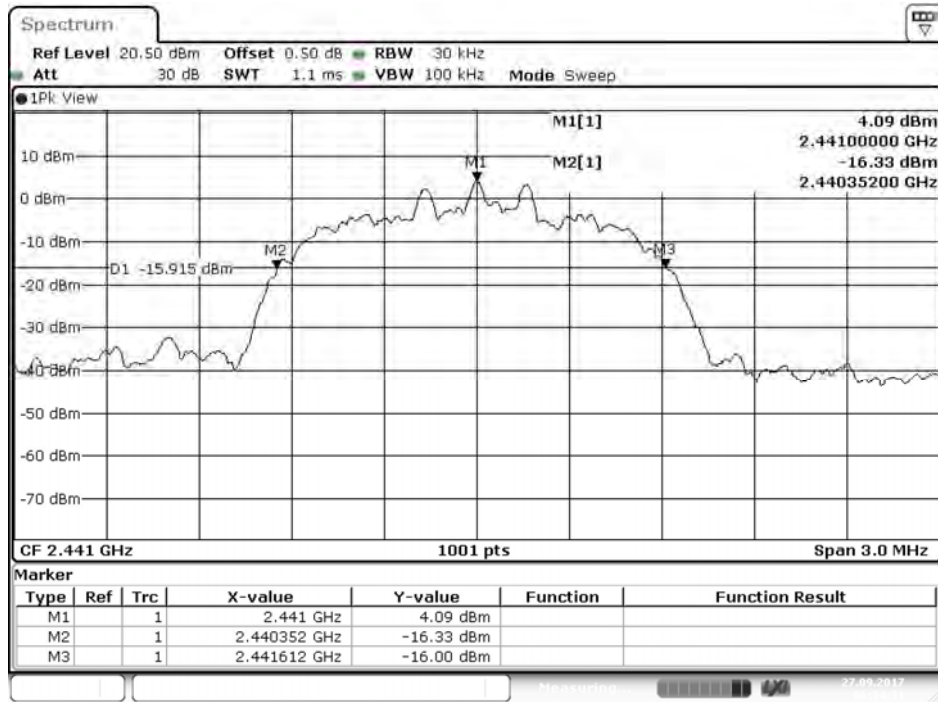
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1263	--	NA
39	2441	1260	--	NA
78	2480	1260	--	NA

Figure Channel 00:



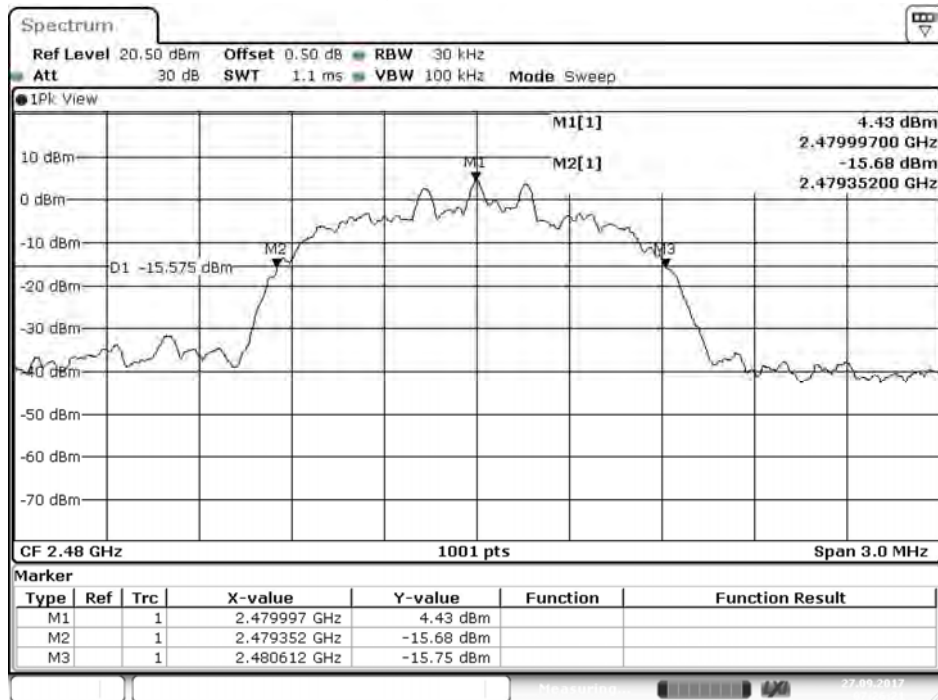
Date: 27.SEP.2017 05:58:20

Figure Channel 39:



Date: 27.SEP.2017 06:34:31

Figure Channel 78:



Date: 27.SEP.2017 07:26:21

11. EMI Reduction Method During Compliance Testing

No modification was made during testing.