

FCC Test Report

Product Name	Bluetooth Speakerphone
Model No.	PHS040Wa
FCC ID.	BCE-PHS040WA

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

Date of Receipt	Dec. 06, 2019
Issued Date	Jan. 31, 2020
Report No.	19C0095R-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: Jan. 31, 2020

Report No.: 19C0095R-RFUSP01V00



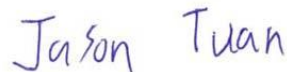
Product Name	Bluetooth Speakerphone
Applicant	GN Audio A/S
Address	Lautrupbjerg 7, 2750 Ballerup, Denmark
Manufacturer	GN Audio A/S
Model No.	PHS040Wa
FCC ID.	BCE-PHS040WA
EUT Rated Voltage	DC 3.8V (By battery) or DC 5V (By USB)
EUT Test Voltage	DC 3.8V (By battery)
Trade Name	Jabra
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C ANSI C63.4: 2014, ANSI C63.10: 2013
Test Result	Complied

Documented By :



(Senior Adm. Specialist / Genie Chang)

Tested By :



(Engineer / Jason Tuan)

Approved By :



(Director / Vincent Lin)

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Attachment 1: EUT Test Photographs

Attachment 2: EUT Detailed Photographs

1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Bluetooth Speakerphone
Trade Name	Jabra
Model No.	PHS040Wa
FCC ID.	BCE-PHS040WA
Frequency Range	2402-2480MHz
Channel Number	79
Type of Modulation	FHSS: GFSK(1Mbps) / $\pi/4$ DQPSK(2Mbps) / 8DPSK(3Mbps)
Antenna Type	Inverted F PCB antenna
Channel Control	Auto
Antenna Gain	Refer to the table "Antenna List"
USB Cable	Brand: Jabra, M/N: PHS040Wa, Shielded, 1m
USB Dongle	Brand: Jabra, M/N: END040W

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	Jabra	Speak 710 PHS040W	Inverted F PCB antenna	3.24dBi for 2.4GHz

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 Speakerphone with a built-in Bluetooth V4.2, 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 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.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK) Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) Mode 3: Transmit - 3Mbps (8DPSK) Mode 4: Charge
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1.3. Tested System Details

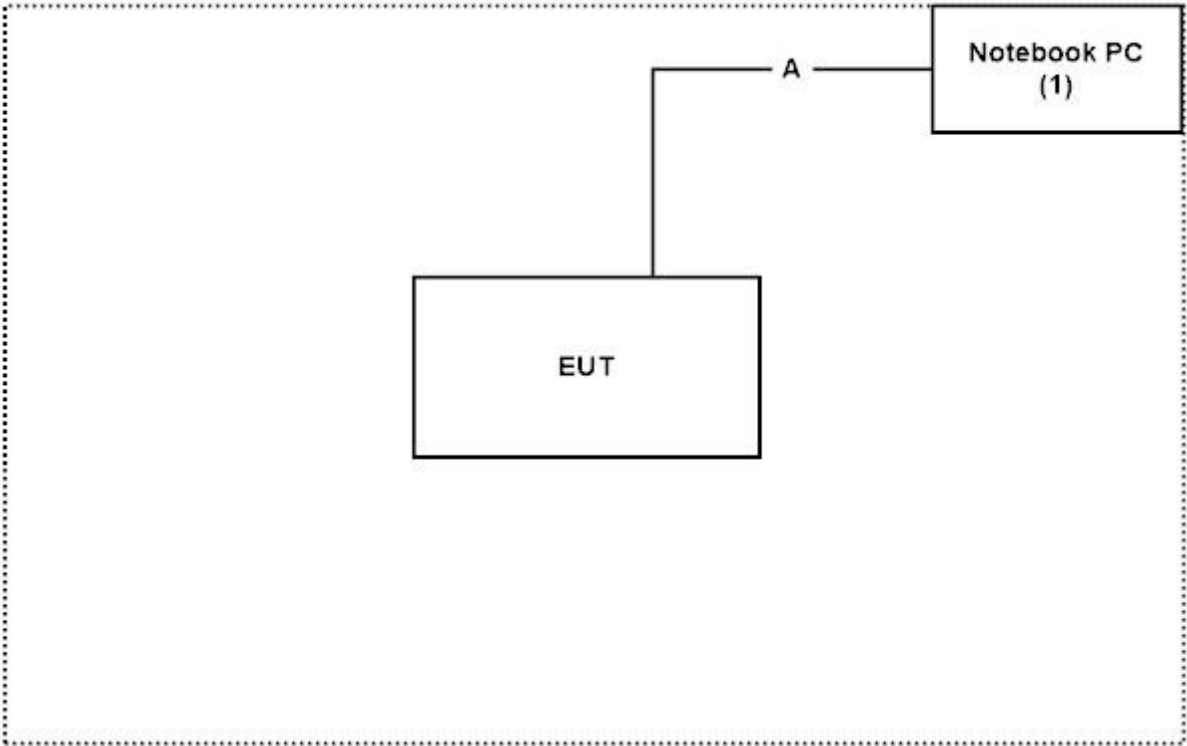
The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude 5580	GDZN7H2	Non-shielded, 0.8m
2	Adapter	SONY	CAA-0002016-TW	1262-3520.1	N/A

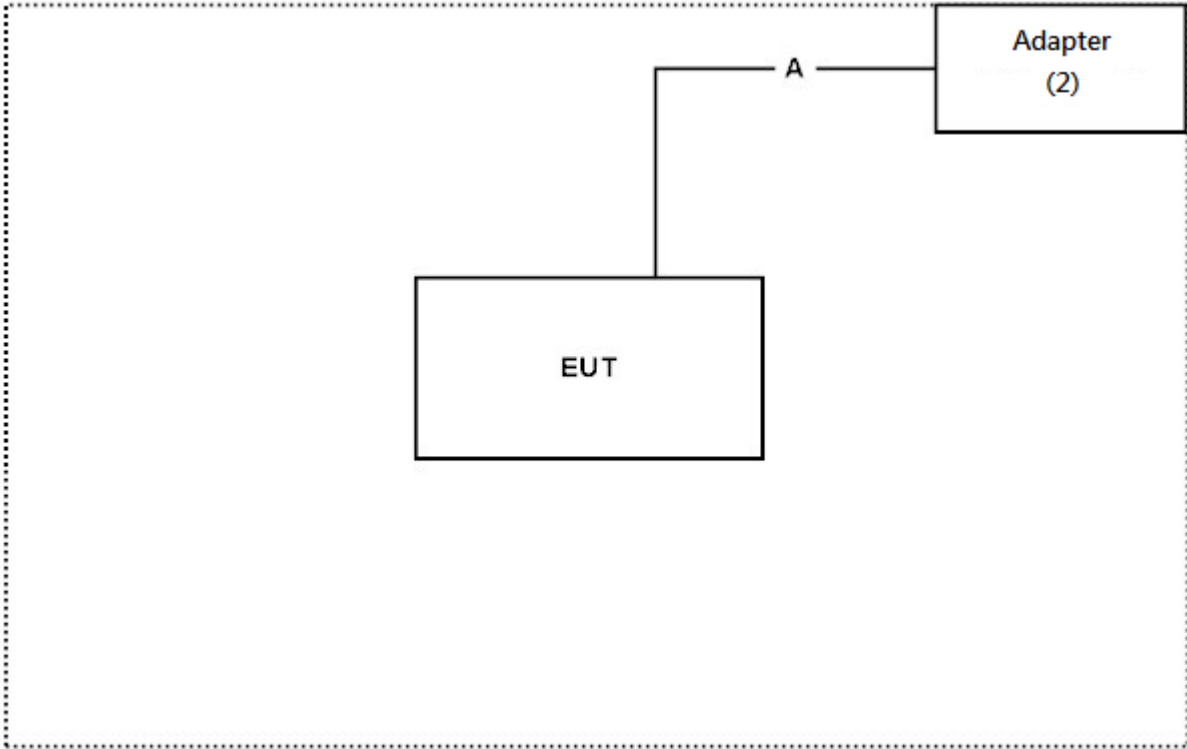
Signal Cable Type		Signal cable Description
A	USB Cable	Shielded, 1m

1.4. Configuration of Tested System

BT mode



Charge mode



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software “Blue test3, Ver.2.6.2” on the EUT.
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:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	23 °C
	Humidity (%RH)	10~90 %	66 %
Radiated Emission	Temperature (°C)	10~40 °C	22.8 °C
	Humidity (%RH)	10~90 %	61 %
Conductive	Temperature (°C)	10~40 °C	24.8 °C
	Humidity (%RH)	10~90 %	52.8 %

USA : FCC Registration Number: TW3023

Canada : IC Registration Number: 4075A

Site Description: Accredited by TAF
Accredited Number: 3023

Test Laboratory: DEKRA Testing and Certification Co., Ltd
Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451,
Taiwan, R.O.C.
Phone number: 886-2-8601-3788
Fax number: 886-2-8601-3789
Email address: info.tw@dekra.com
Website: <http://www.dekra.com.tw>

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2019/02/26	2020/02/25
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2019/09/25	2020/09/24
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2019/07/30	2020/07/29
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2019/07/30	2020/07/29
X	EMI Test Receiver	R&S	ESCS 30	100369	2019/11/19	2020/11/18
X	LISN	R&S	ENV216	101105	2019/04/10	2020/04/09
X	LISN	R&S	ESH3-Z5	836679/014	2019/04/10	2020/04/09
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2019/06/20	2020/06/19

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 SystemV9.0.5.

For Radiated measurements /Site3/CB8

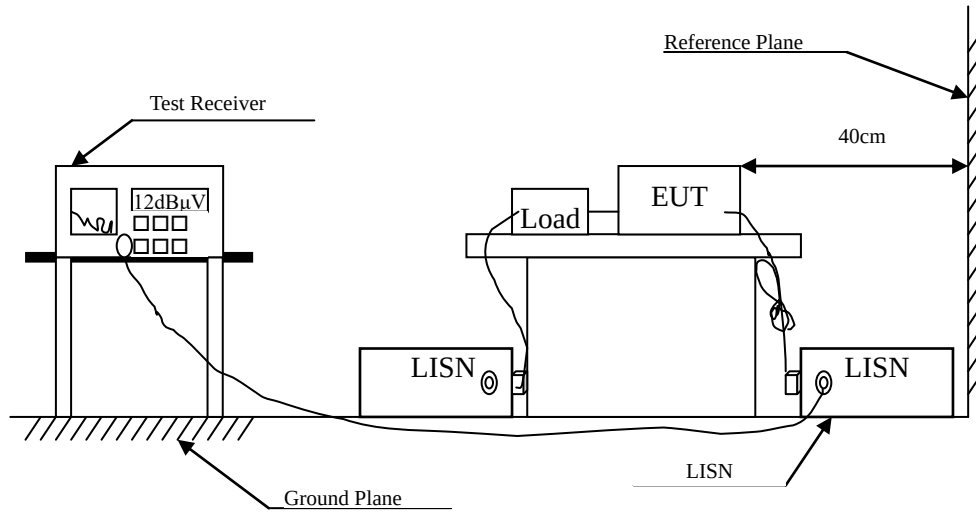
	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2019/03/11	2020/03/10
X	Loop Antenna	Teseq	HLA6121	37133	2019/10/15	2021/10/14
X	Bilog Antenna	Schaffner Chase	CBL6112B	2794	2019/06/23	2020/06/22
X	Coaxial Cable	DEKRA	L1907-001C	280280.F141.1 000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC001330	980254	2019/08/22	2020/08/21
X	Horn Antenna	ETS-LINDGREN	3117	00228113	2019/05/02	2020/05/01
X	Coaxial Cable	DEKRA	L1907-002C	280280.F141.1 000D	2019/07/10	2020/07/09
X	Amplifier	EMCI	EMC05820SE	980362	2019/06/26	2020/06/25
X	Amplifier	EMCI	EMC051845SE	SN980632	2019/08/08	2020/08/07
	Horn Antenna	Com-Power	AH-1840	101101	2019/10/31	2020/10/30
	Amplifier + Cable	EMCI	EMC184045SE	980369	2019/04/16	2020/04/15
	Bilog Antenna	Schaffner Chase	CBL6112B	2916	2019/06/23	2020/06/22
	Coaxial Cable	DEKRA	L1907-003C	00100A1B3A 120M	2019/07/10	2020/07/09
	Amplifier	EMCI	EMC001330	980255	2019/06/28	2020/06/27
X	Filter	MICRO-TRONICS	BRM50702	G270	2019/08/08	2020/08/07
	Filter	MICRO-TRONICS	BRM50716	G196	2019/08/08	2020/08/07

Note:

1. Loop Antenna is calibrated every two years, 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 :QuiTek EMI System V2.1.134.

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 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.

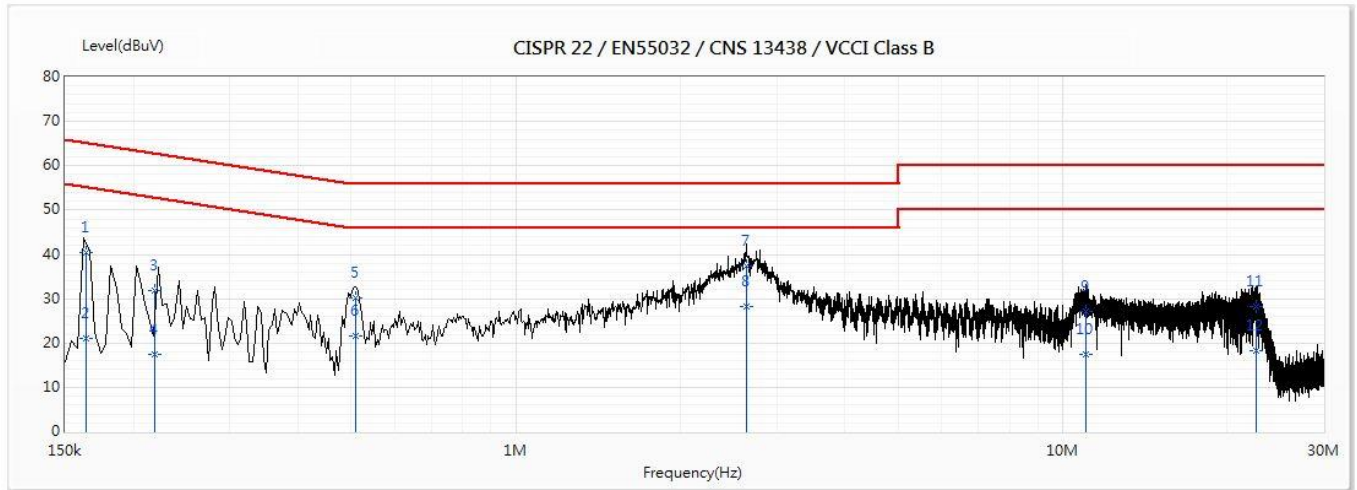
2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product : Bluetooth Speakerphone
 Test Item : Conducted Emission Test
 Test date : 2019/12/18
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Line 1



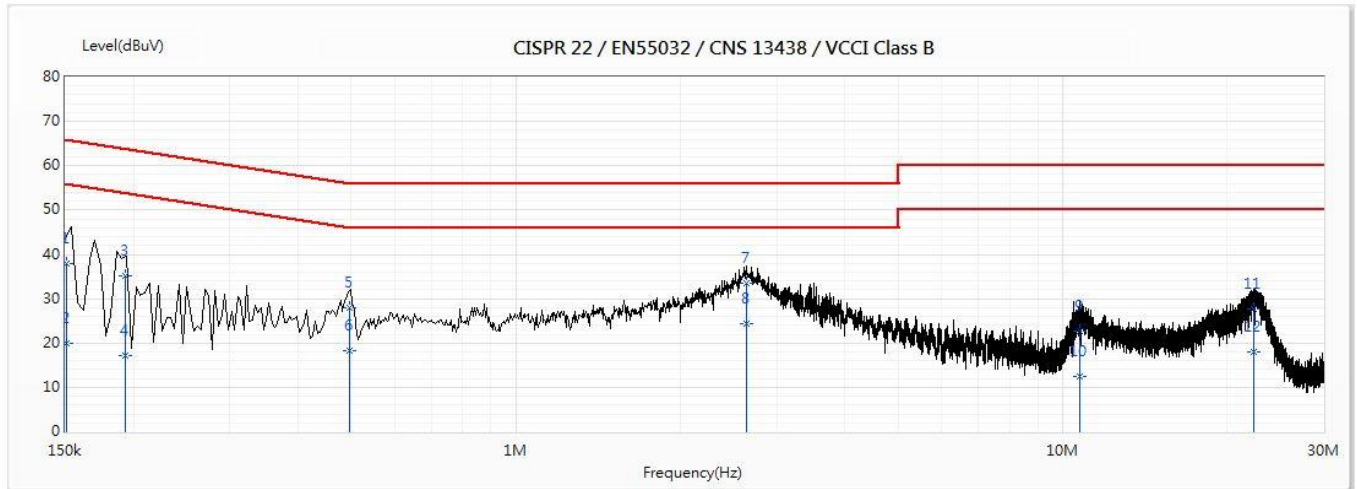
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Cable Loss (dB)	LISN (dB)	Detector Type
1	0.164	40.34	65.28	-24.93	30.65	0.12	9.57	QP
2	0.164	20.90	55.28	-34.37	11.21	0.12	9.57	AV
3	0.219	31.97	62.85	-30.88	22.28	0.12	9.57	QP
4	0.219	17.50	52.85	-35.35	7.81	0.12	9.57	AV
5	0.509	30.09	56.00	-25.91	20.39	0.13	9.57	QP
6	0.509	21.62	46.00	-24.38	11.92	0.13	9.57	AV
7	2.635	37.39	56.00	-18.61	27.59	0.22	9.58	QP
*8	2.635	28.19	46.00	-17.81	18.39	0.22	9.58	AV
9	11.019	27.13	60.00	-32.87	17.09	0.39	9.64	QP
10	11.019	17.53	50.00	-32.47	7.49	0.39	9.64	AV
11	22.563	28.11	60.00	-31.89	17.91	0.55	9.65	QP
12	22.563	18.18	50.00	-31.82	7.98	0.55	9.65	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.

Product : Bluetooth Speakerphone
 Test Item : Conducted Emission Test
 Test date : 2019/12/18
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Line 2



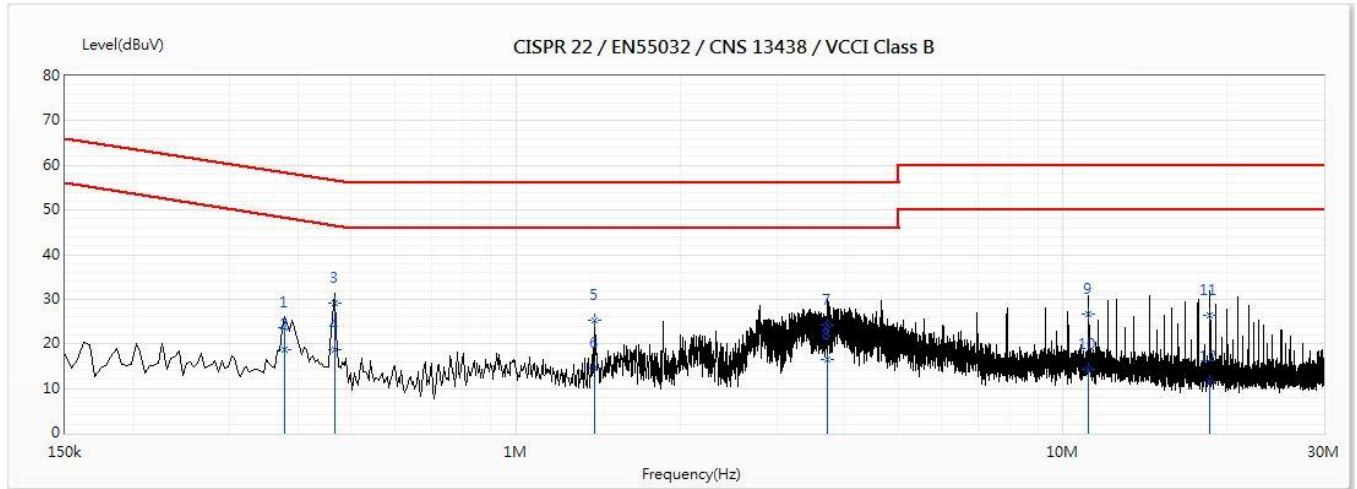
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Cable Loss (dB)	LISN (dB)	Detector Type
1	0.151	38.05	65.96	-27.92	28.32	0.12	9.61	QP
2	0.151	19.90	55.96	-36.07	10.17	0.12	9.61	AV
3	0.193	35.10	63.91	-28.81	25.38	0.12	9.60	QP
4	0.193	17.30	53.91	-36.61	7.58	0.12	9.60	AV
5	0.496	27.90	56.07	-28.18	18.17	0.13	9.60	QP
6	0.496	18.34	46.07	-27.73	8.61	0.13	9.60	AV
7	2.646	33.40	56.00	-22.60	23.56	0.22	9.62	QP
*8	2.646	24.37	46.00	-21.63	14.53	0.22	9.62	AV
9	10.763	22.81	60.00	-37.19	12.70	0.39	9.72	QP
10	10.763	12.59	50.00	-37.41	2.48	0.39	9.72	AV
11	22.345	27.73	60.00	-32.27	17.33	0.54	9.85	QP
12	22.345	17.96	50.00	-32.04	7.57	0.54	9.85	AV

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.

Product : Bluetooth Speakerphone
 Test Item : Conducted Emission Test
 Test date : 2020/01/30
 Test Mode : Mode 4: Charge

Line 1



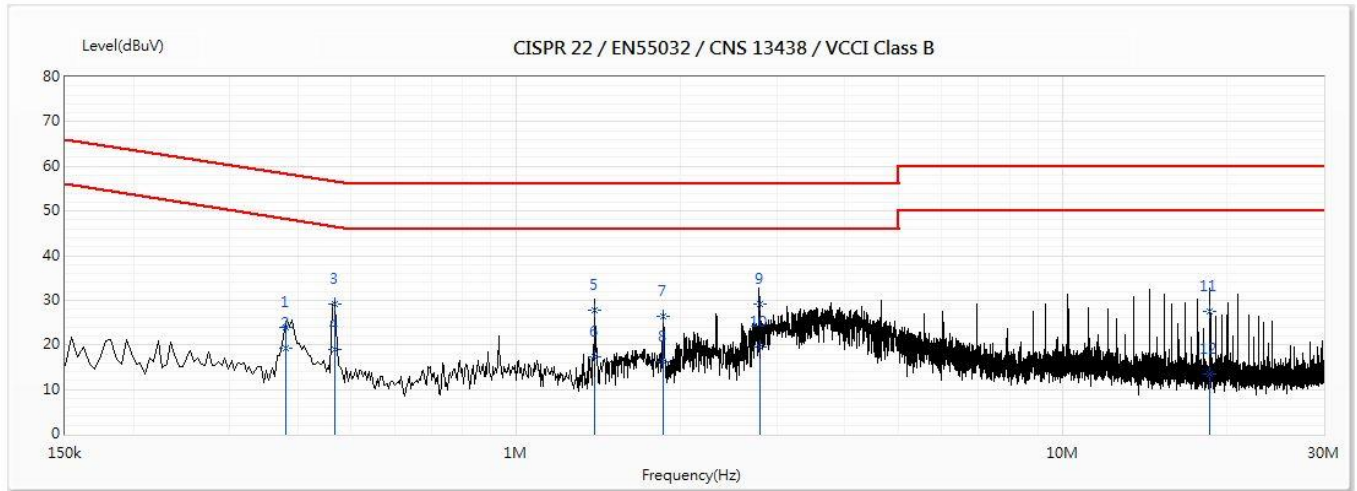
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Cable Loss (dB)	LISN (dB)	Detector Type
1	0.378	23.51	58.32	-34.81	13.81	9.70	QP	1
2	0.378	18.74	48.32	-29.59	9.04	9.70	AV	2
*3	0.466	29.15	56.58	-27.43	19.45	9.70	QP	*3
4	0.466	18.83	46.58	-27.76	9.13	9.70	AV	4
5	1.392	25.16	56.00	-30.84	15.41	9.75	QP	5
6	1.392	14.49	46.00	-31.51	4.74	9.75	AV	6
7	3.712	24.24	56.00	-31.76	14.40	9.84	QP	7
8	3.712	16.61	46.00	-29.39	6.78	9.84	AV	8
9	11.168	26.77	60.00	-33.23	16.73	10.04	QP	9
10	11.168	14.23	50.00	-35.77	4.19	10.04	AV	10
11	18.608	26.48	60.00	-33.52	16.32	10.16	QP	11
12	18.608	11.61	50.00	-38.39	1.45	10.16	AV	12

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.

Product : Bluetooth Speakerphone
 Test Item : Conducted Emission Test
 Test date : 2020/01/30
 Test Mode : Mode 4: Charge

Line 2



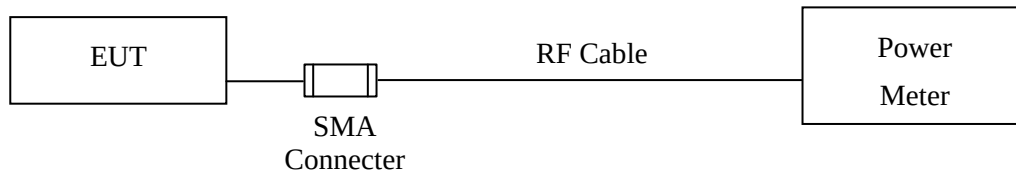
No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Cable Loss (dB)	LISN (dB)	Detector Type
1	0.38	23.86	58.27	-34.41	14.13	9.73	QP	1
2	0.38	19.35	48.27	-28.92	9.63	9.73	AV	2
3	0.466	29.23	56.58	-27.35	19.50	9.73	QP	3
4	0.466	18.91	46.58	-27.67	9.18	9.73	AV	4
5	1.396	27.72	56.00	-28.28	17.93	9.79	QP	5
6	1.396	17.24	46.00	-28.76	7.45	9.79	AV	6
7	1.86	26.47	56.00	-29.53	16.66	9.81	QP	7
8	1.86	16.15	46.00	-29.85	6.34	9.81	AV	8
9	2.791	29.10	56.00	-26.90	19.26	9.84	QP	9
*10	2.791	19.54	46.00	-26.46	9.69	9.84	AV	*10
11	18.608	27.50	60.00	-32.50	17.18	10.32	QP	11
12	18.608	13.43	50.00	-36.57	3.11	10.32	AV	12

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.

3. Peak Power Output

3.1. Test Setup



3.2. Limit

The maximum peak power shall be less 1Watt.

3.3. Test Procedure

Tested according to FHSS test procedure of KDB558074 section 9 b) for compliance to FCC 47CFR 15.247 requirements.

3.4. Uncertainty

± 1.19 dB

3.5. Test Result of Peak Power Output

Product : Bluetooth Speakerphone
Test Item : Peak Power Output
Test date : 2019/12/10
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit	Result
Channel 00	2402.00	9.15	1 Watt= 30 dBm	Pass
Channel 39	2441.00	9.25	1 Watt= 30 dBm	Pass
Channel 78	2480.00	9.44	1 Watt= 30 dBm	Pass

Product : Bluetooth Speakerphone
Test Item : Peak Power Output
Test date : 2019/12/10
Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit	Result
Channel 00	2402.00	8.50	1 Watt= 30 dBm	Pass
Channel 39	2441.00	8.80	1 Watt= 30 dBm	Pass
Channel 78	2480.00	9.05	1 Watt= 30 dBm	Pass

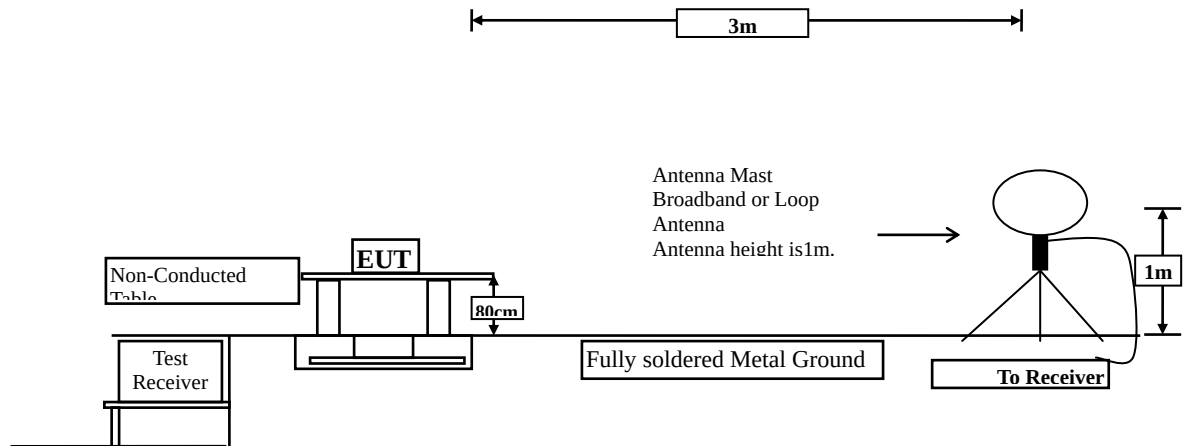
Product : Bluetooth Speakerphone
Test Item : Peak Power Output
Test date : 2019/12/10
Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit	Result
Channel 00	2402.00	8.67	1 Watt= 30 dBm	Pass
Channel 39	2441.00	8.91	1 Watt= 30 dBm	Pass
Channel 78	2480.00	9.15	1 Watt= 30 dBm	Pass

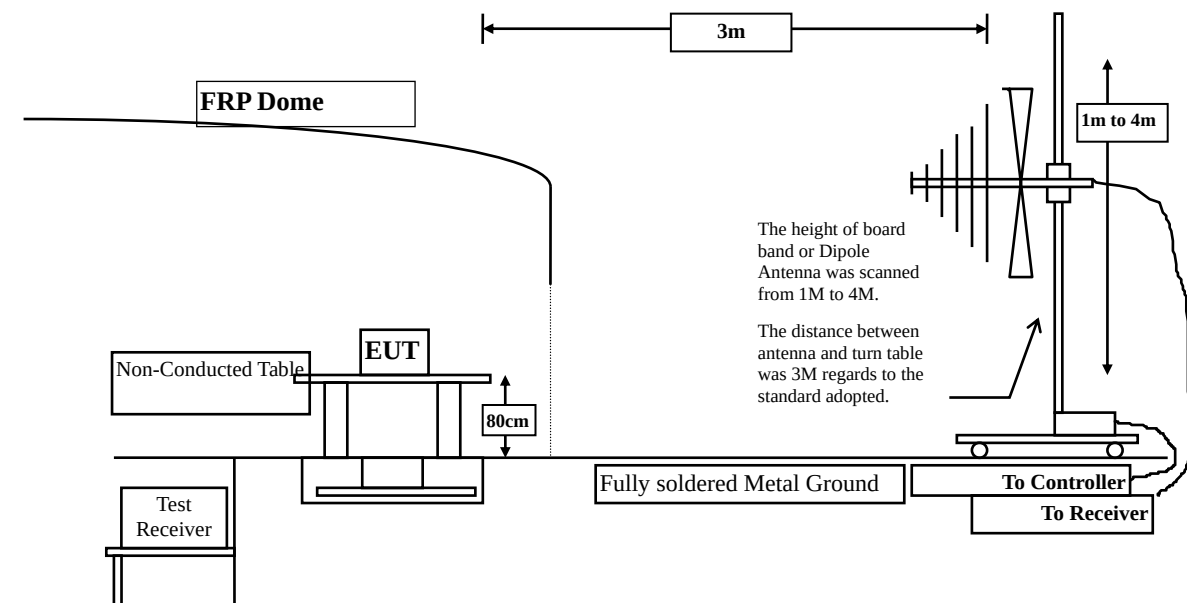
4. Radiated Emission

4.1. Test Setup

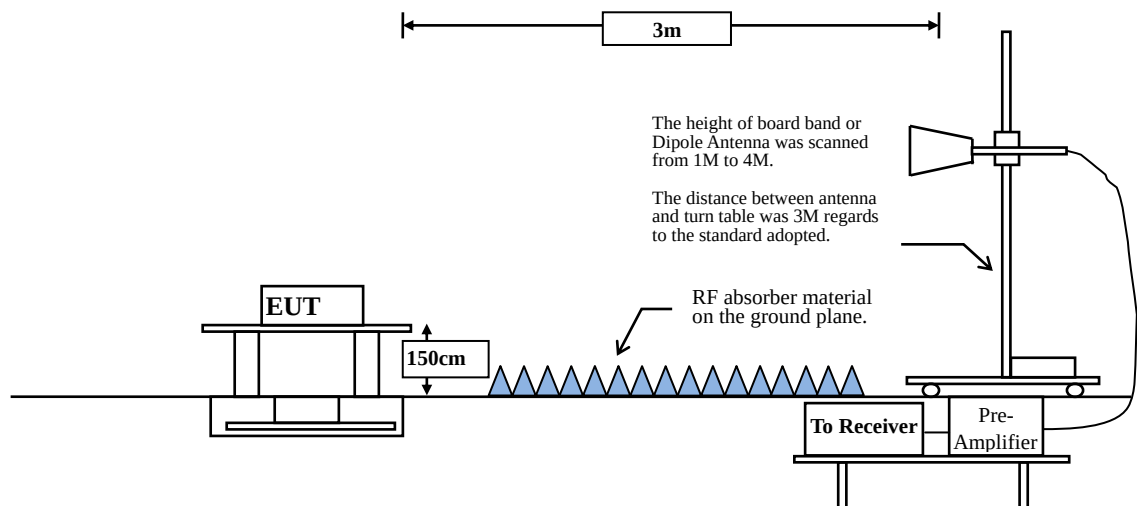
Under 30MHz



Below 1GHz



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 (dBμV) = 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 worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

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

4.4. Uncertainty

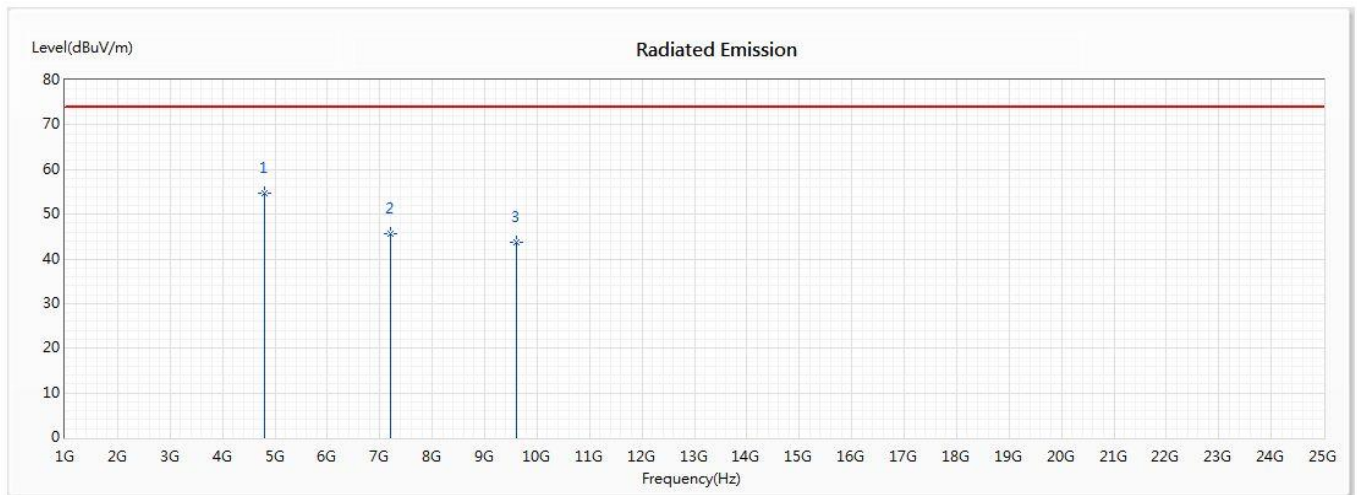
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Radiated Emission

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4804	54.70	74.00	-19.30	66.85	-12.15	PK
2	7206	45.60	74.00	-28.40	58.74	-13.14	PK
3	9608	43.83	74.00	-30.17	57.25	-13.42	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

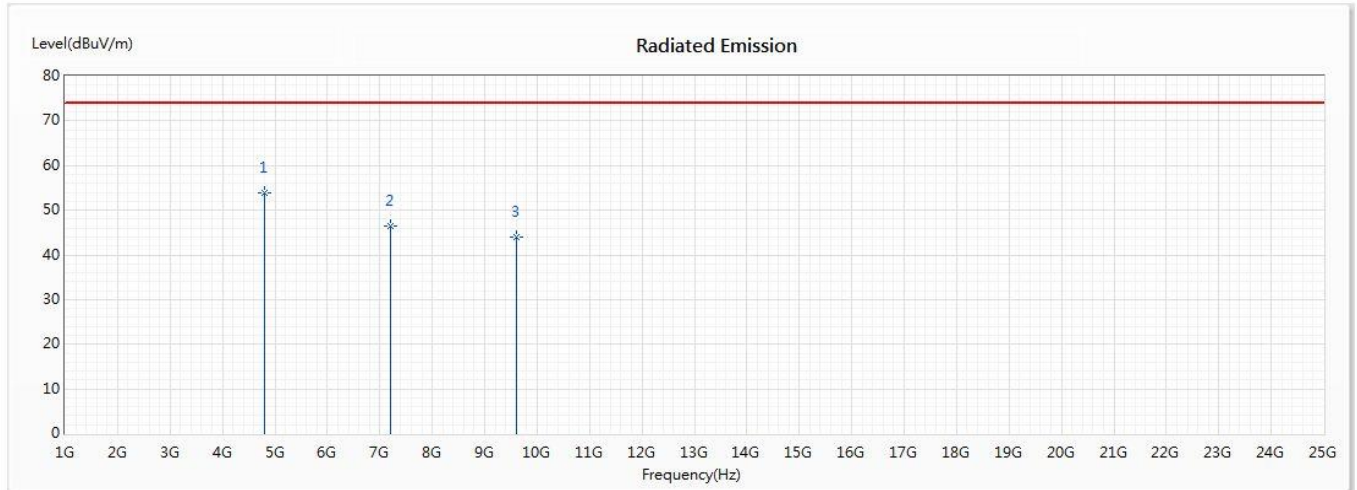
No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
1 (Average)	4804	54.700	-30.458	24.242	-29.758	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Vertical



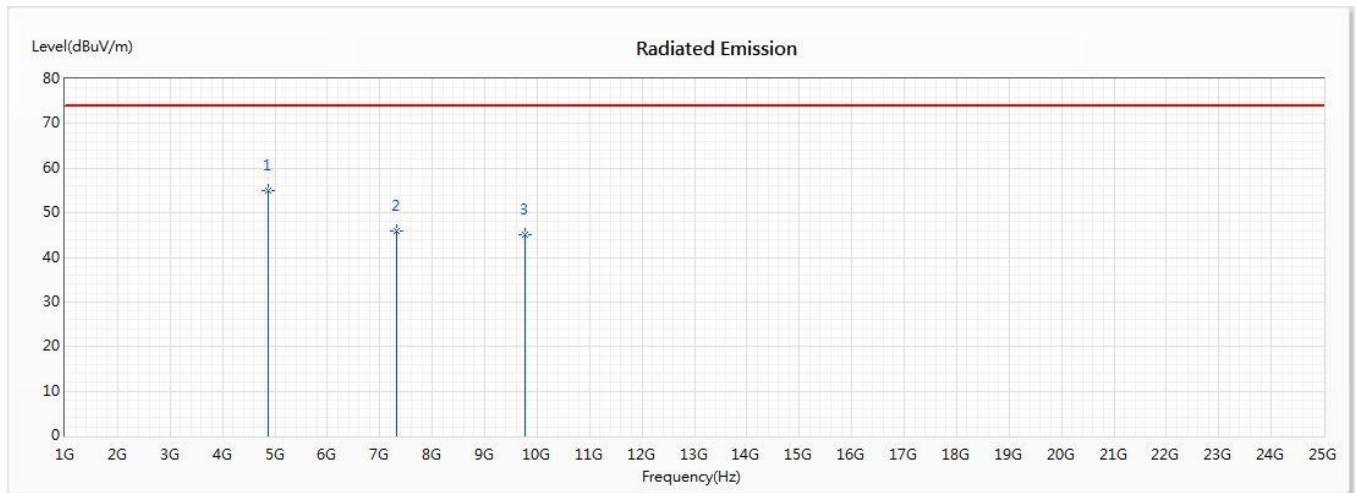
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4804	53.89	74.00	-20.11	66.04	-12.15	PK
2	7206	46.50	74.00	-27.50	59.64	-13.14	PK
3	9608	43.86	74.00	-30.14	57.28	-13.42	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4882	54.88	74.00	-19.12	66.47	-11.59	PK
2	7323	45.99	74.00	-28.01	59.56	-13.57	PK
3	9764	45.14	74.00	-28.86	57.66	-12.52	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

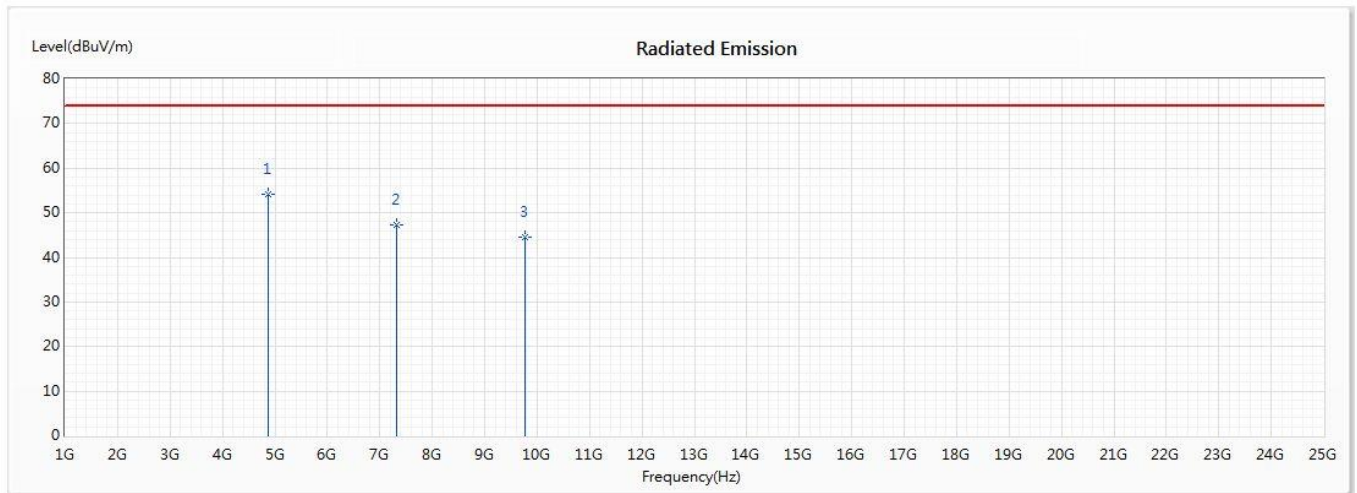
No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
1 (Average)	4882	54.880	-30.458	24.422	-29.578	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4882	54.29	74.00	-19.71	65.88	-11.59	PK
2	7323	47.23	74.00	-26.77	60.80	-13.57	PK
3	9764	44.60	74.00	-29.40	57.12	-12.52	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

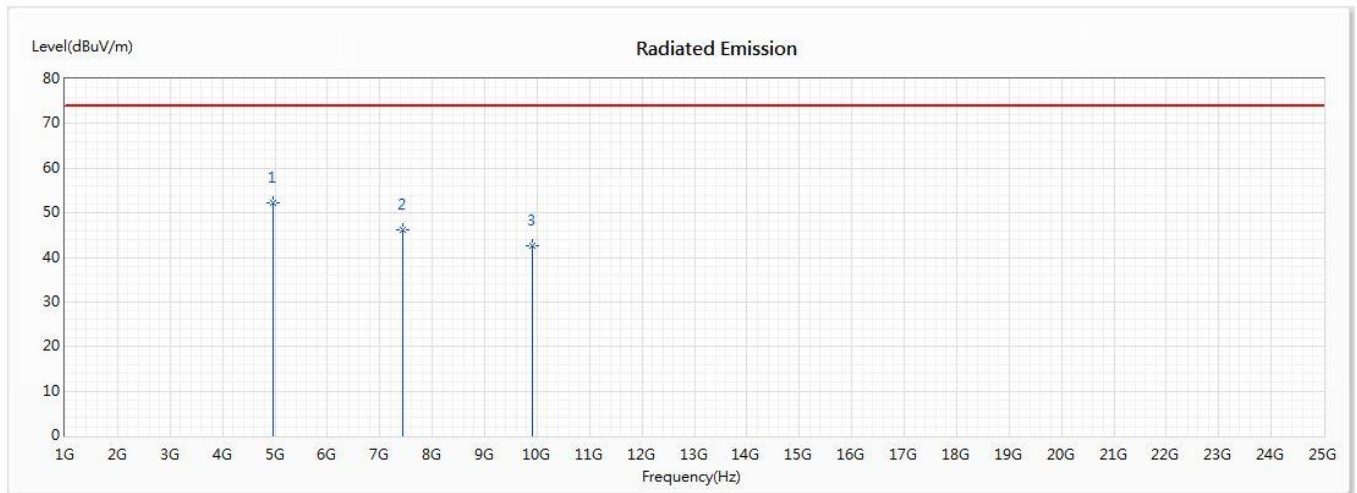
No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
1 (Average)	4882	54.29	-30.458	23.832	-30.168	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Horizontal



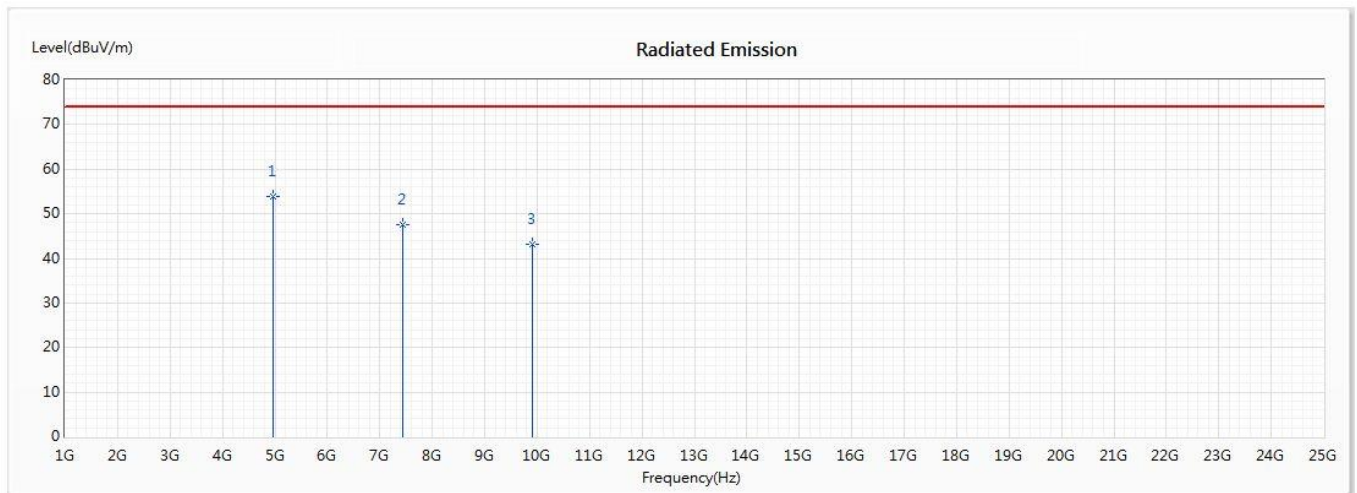
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4960	52.29	74.00	-21.71	63.18	-10.89	PK
2	7440	46.12	74.00	-27.88	60.74	-14.62	PK
3	9920	42.73	74.00	-31.27	56.96	-14.23	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Vertical



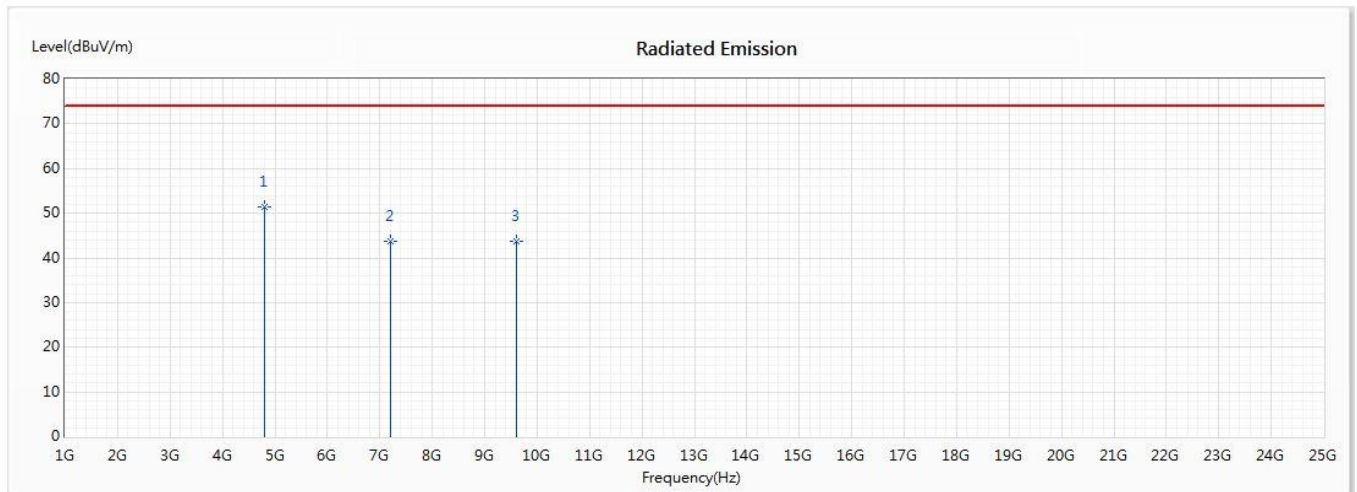
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4960	53.80	74.00	-20.20	64.69	-10.89	PK
2	7440	47.48	74.00	-26.52	62.10	-14.62	PK
3	9920	43.13	74.00	-30.87	57.36	-14.23	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2402MHz)

Horizontal



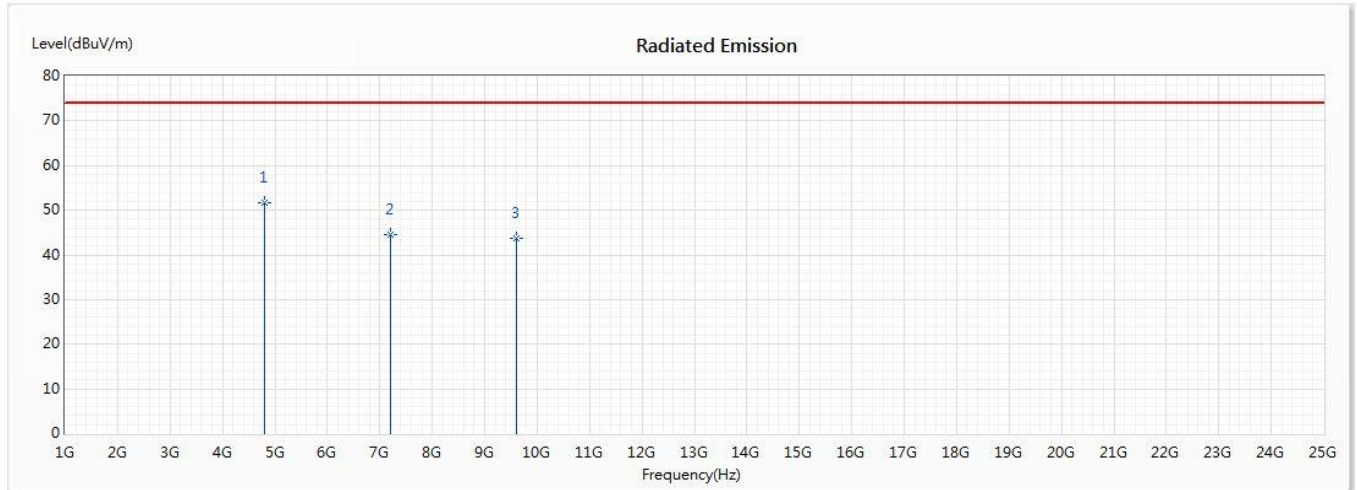
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4804	51.39	74.00	-22.61	63.54	-12.15	PK
2	7206	43.69	74.00	-30.31	56.83	-13.14	PK
3	9608	43.69	74.00	-30.31	57.11	-13.42	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2402MHz)

Vertical



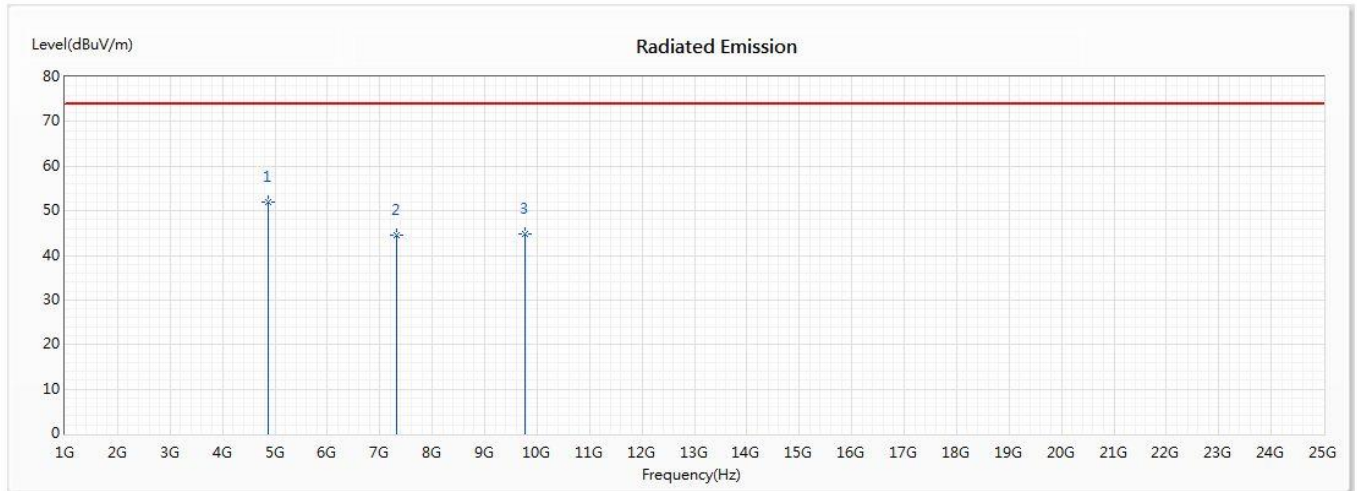
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4804	51.78	74.00	-22.22	63.93	-12.15	PK
2	7206	44.61	74.00	-29.39	57.75	-13.14	PK
3	9608	43.84	74.00	-30.16	57.26	-13.42	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2441MHz)

Horizontal



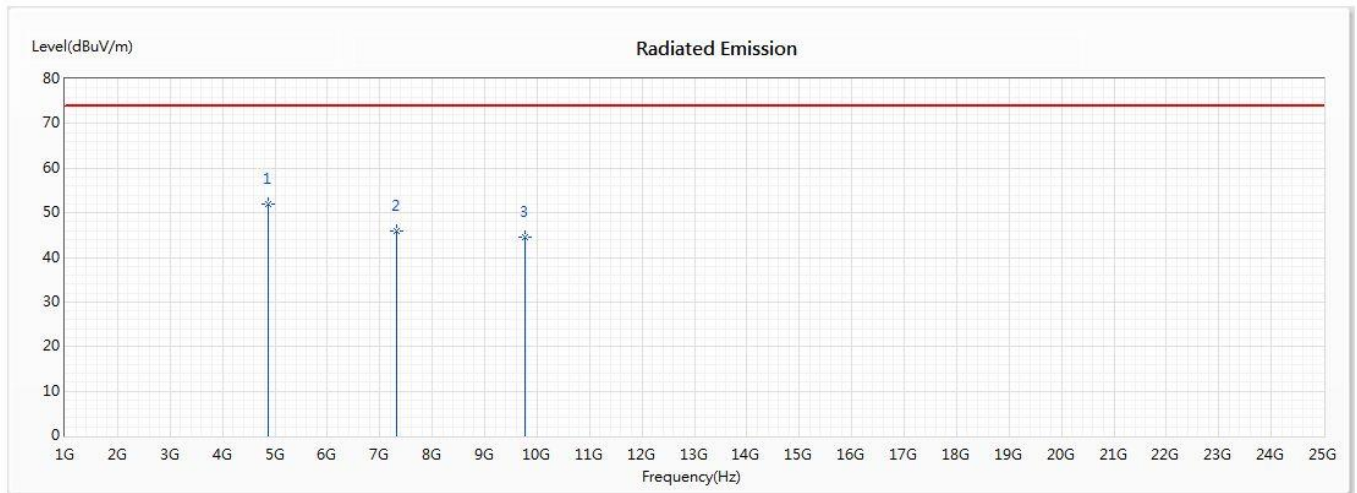
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4882	52.05	74.00	-21.95	63.64	-11.59	PK
2	7323	44.40	74.00	-29.60	57.97	-13.57	PK
3	9764	44.81	74.00	-29.19	57.33	-12.52	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2441MHz)

Vertical



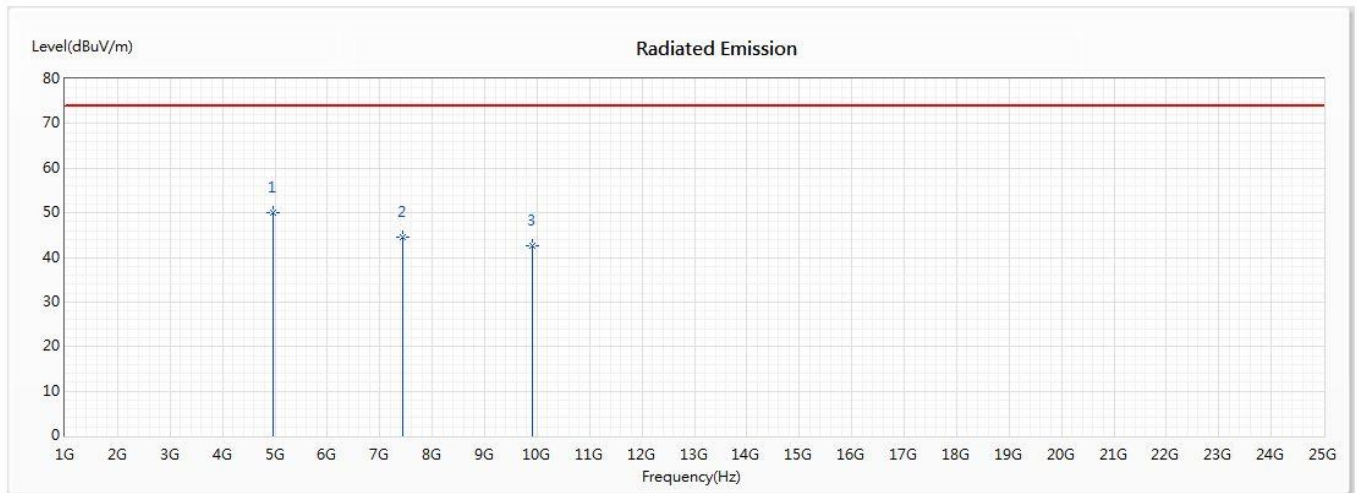
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4882	52.04	74.00	-21.96	63.63	-11.59	PK
2	7323	45.87	74.00	-28.13	59.44	-13.57	PK
3	9764	44.58	74.00	-29.42	57.10	-12.52	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2480MHz)

Horizontal



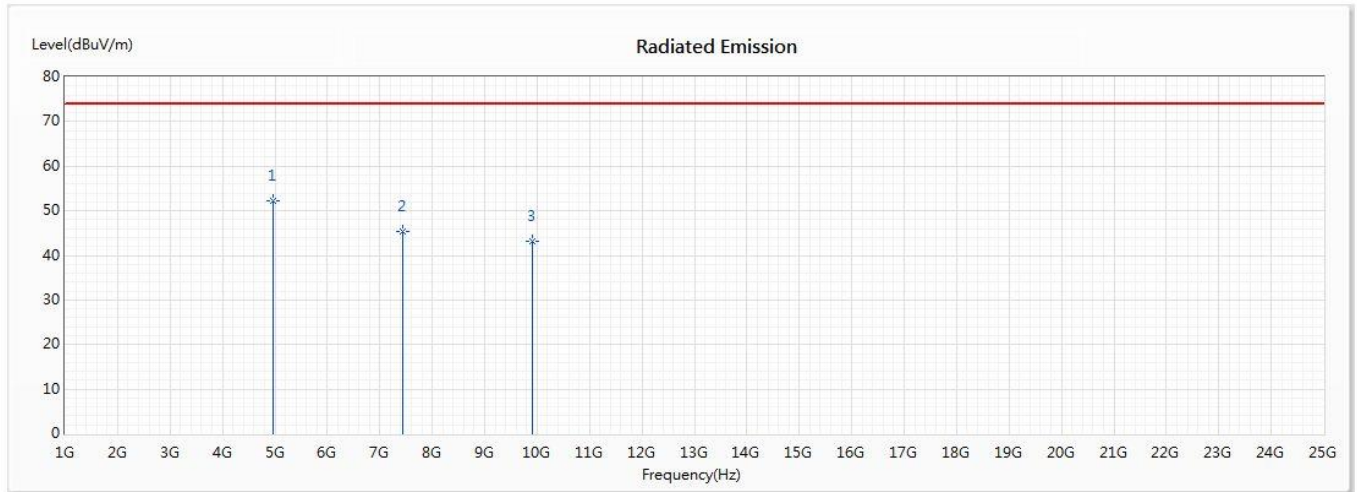
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4960	50.17	74.00	-23.83	61.06	-10.89	PK
2	7440	44.54	74.00	-29.46	59.16	-14.62	PK
3	9920	42.65	74.00	-31.35	56.88	-14.23	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK)(2480MHz)

Vertical



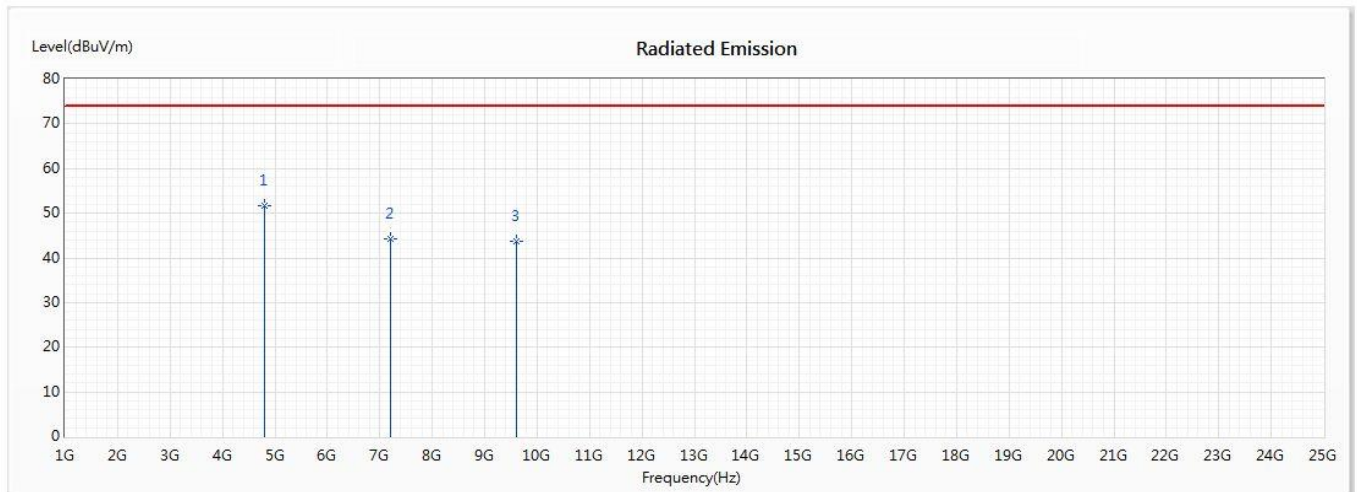
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4960	52.36	74.00	-21.64	63.25	-10.89	PK
2	7440	45.23	74.00	-28.77	59.85	-14.62	PK
3	9920	43.26	74.00	-30.74	57.49	-14.23	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)(2402MHz)

Horizontal



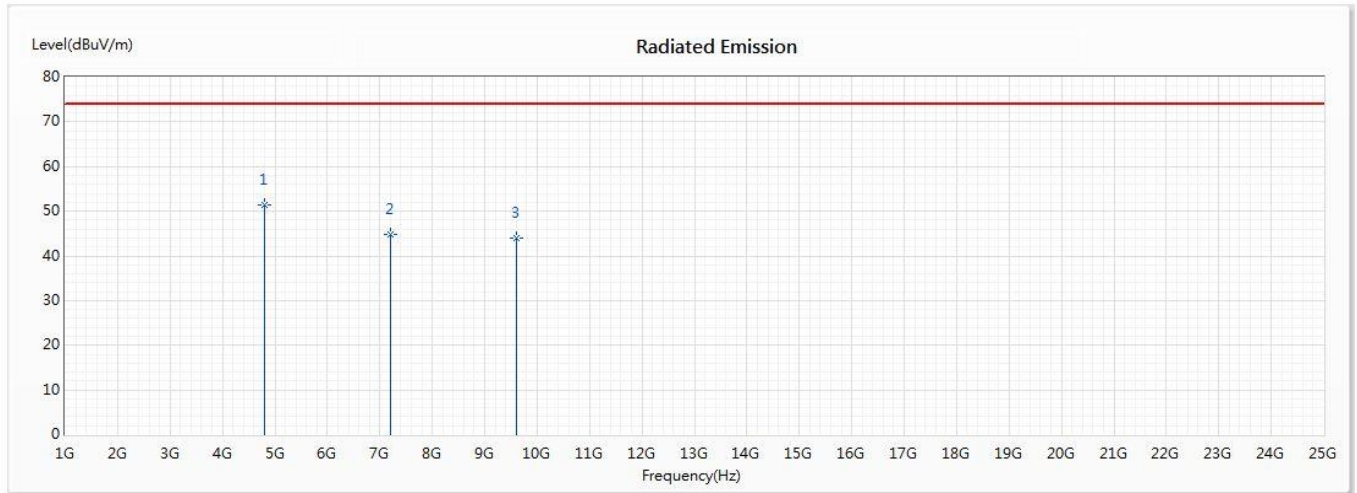
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4804	51.64	74.00	-22.36	63.79	-12.15	PK
2	7206	44.17	74.00	-29.83	57.31	-13.14	PK
3	9608	43.58	74.00	-30.42	57.00	-13.42	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)(2402MHz)

Vertical



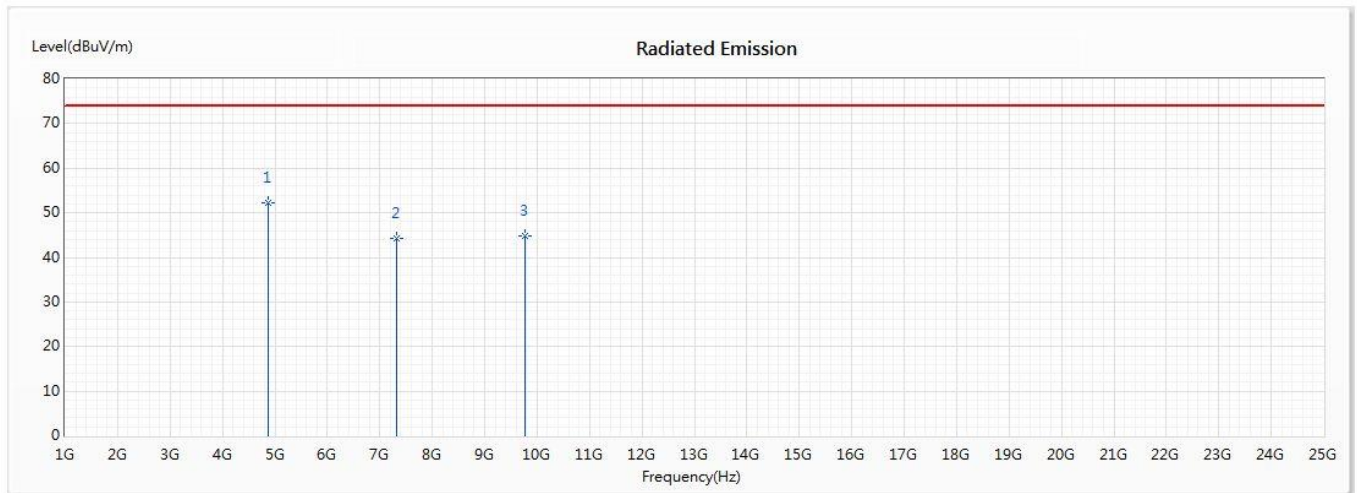
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4804	51.51	74.00	-22.49	63.66	-12.15	PK
2	7206	44.77	74.00	-29.23	57.91	-13.14	PK
3	9608	43.87	74.00	-30.13	57.29	-13.42	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Horizontal



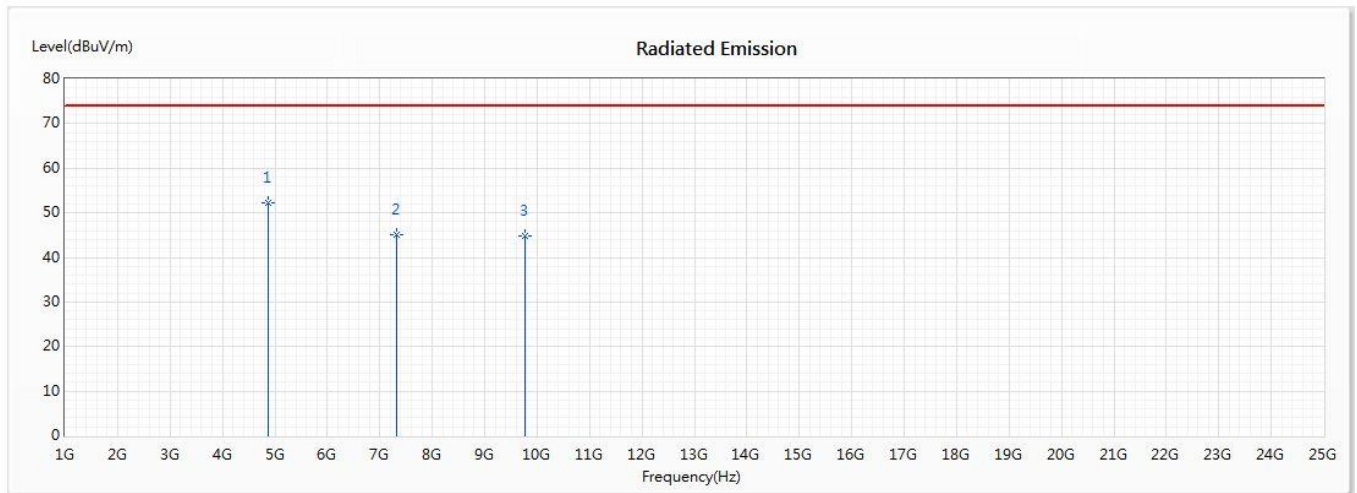
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4882	52.15	74.00	-21.85	63.74	-11.59	PK
2	7323	44.35	74.00	-29.65	57.92	-13.57	PK
3	9764	44.77	74.00	-29.23	57.29	-12.52	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Vertical



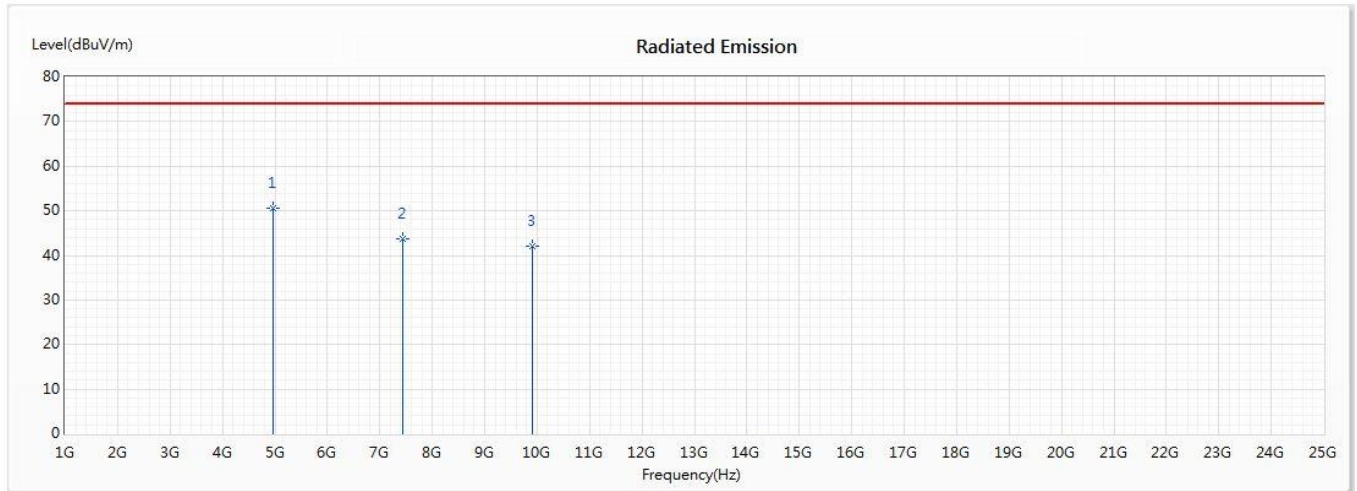
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4882	52.31	74.00	-21.69	63.90	-11.59	PK
2	7323	45.13	74.00	-28.87	58.70	-13.57	PK
3	9764	44.87	74.00	-29.13	57.39	-12.52	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2480MHz)

Horizontal



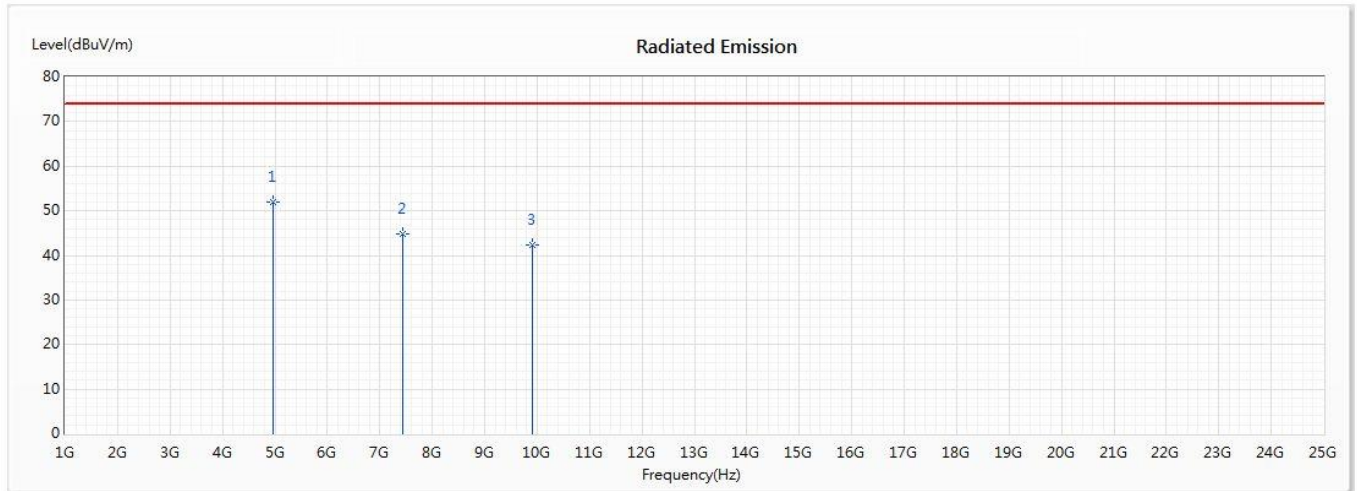
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4960	50.56	74.00	-23.44	61.45	-10.89	PK
2	7440	43.79	74.00	-30.21	58.41	-14.62	PK
3	9920	42.06	74.00	-31.94	56.29	-14.23	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : Harmonic Radiated Emission
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2480MHz)

Vertical



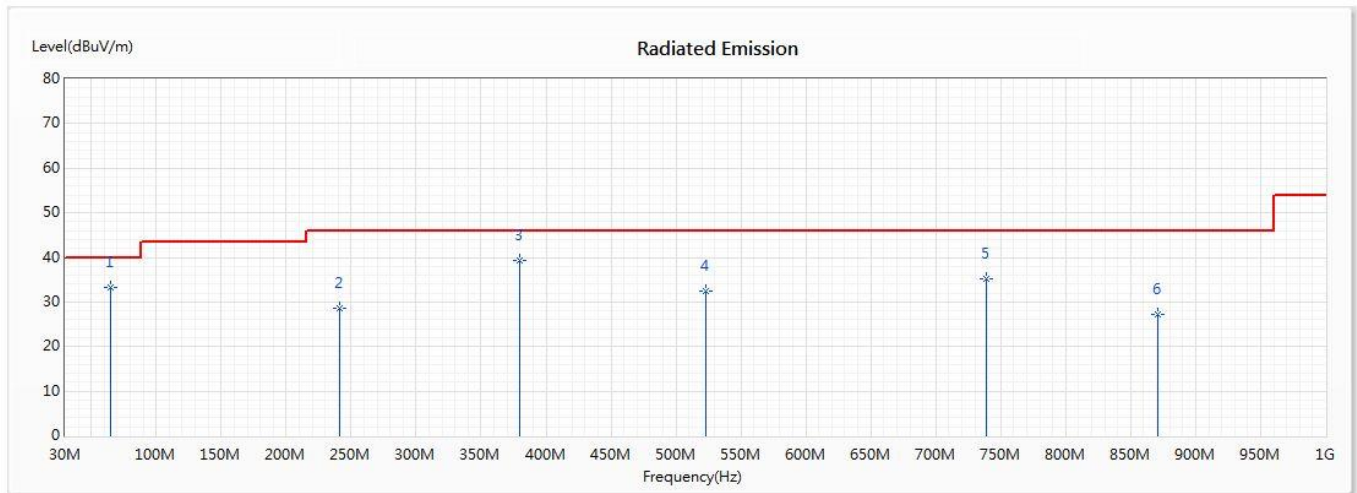
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	4960	51.92	74.00	-22.08	62.81	-10.89	PK
2	7440	44.68	74.00	-29.32	59.30	-14.62	PK
3	9920	42.33	74.00	-31.67	56.56	-14.23	PK

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. Emission Level = Reading Level + Correct Factor.
4. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : Bluetooth Speakerphone
 Test Item : General Radiated Emission
 Test date : 2019/12/12
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)

Horizontal



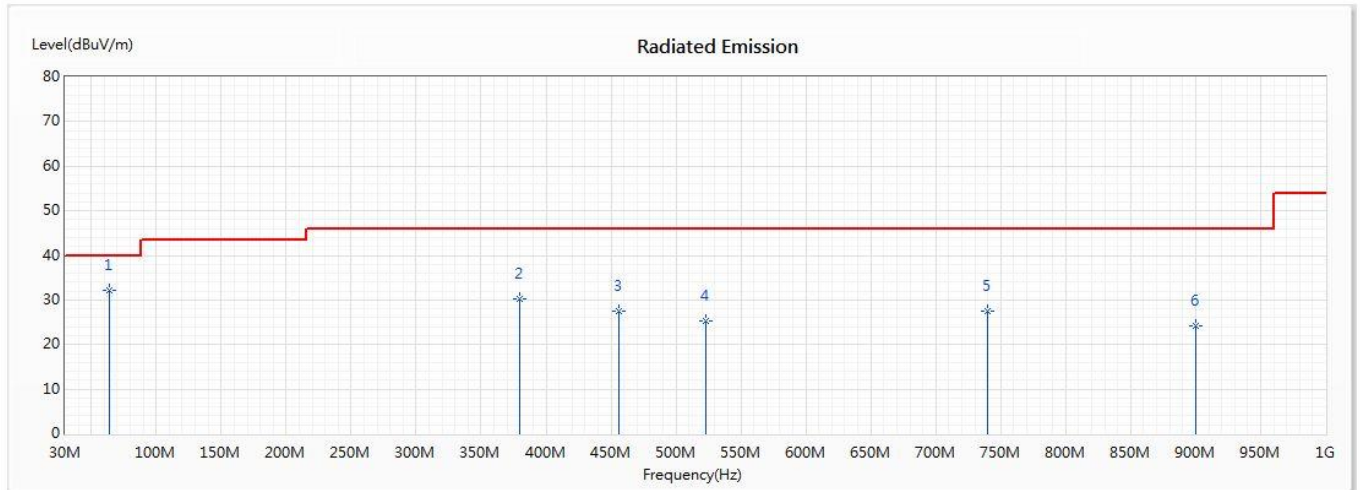
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	65.145	33.29	40.00	-6.71	53.92	-20.63	QP
2	240.87	28.59	46.00	-17.41	47.11	-18.52	QP
* 3	380.043	39.41	46.00	-6.59	51.43	-12.02	QP
4	523.435	32.39	46.00	-13.61	43.66	-11.27	QP
5	738.522	35.19	46.00	-10.81	40.94	-5.75	QP
6	870.667	27.29	46.00	-18.71	35.70	-8.41	QP

Note:

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

Product : Bluetooth Speakerphone
 Test Item : General Radiated Emission
 Test date : 2019/12/12
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)

Vertical



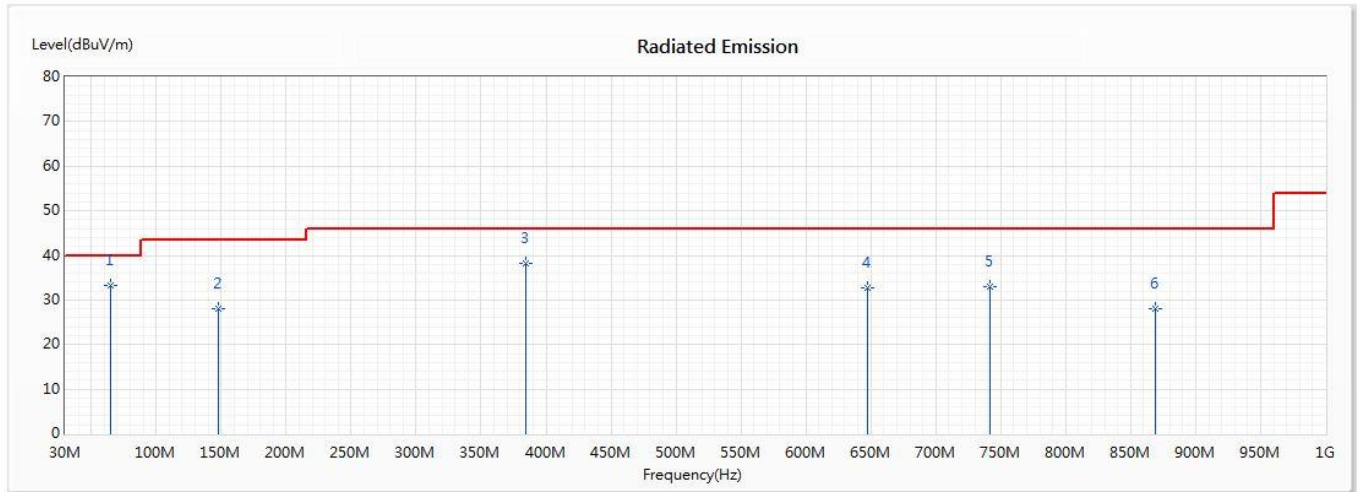
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	63.739	32.18	40.00	-7.82	52.50	-20.32	QP
2	380.043	30.29	46.00	-15.71	42.31	-12.02	QP
3	455.957	27.50	46.00	-18.50	37.85	-10.35	QP
4	523.435	25.17	46.00	-20.83	36.44	-11.27	QP
5	739.928	27.50	46.00	-18.50	33.02	-5.52	QP
6	900.188	24.27	46.00	-21.73	34.10	-9.83	QP

Note:

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

Product : Bluetooth Speakerphone
 Test Item : General Radiated Emission
 Test date : 2019/12/12
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2441MHz)

Horizontal



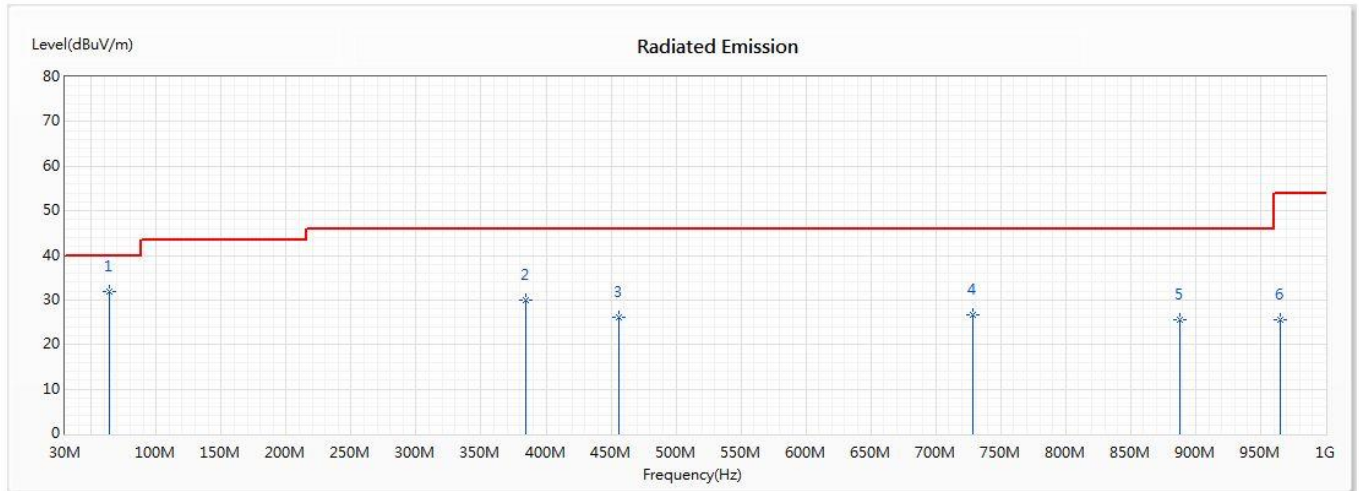
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	65.145	33.32	40.00	-6.68	53.95	-20.63	QP
2	148.087	27.91	43.50	-15.59	47.33	-19.42	QP
3	384.261	38.12	46.00	-7.88	50.50	-12.38	QP
4	647.145	32.66	46.00	-13.34	41.91	-9.25	QP
5	741.333	32.86	46.00	-13.14	38.53	-5.67	QP
6	869.261	27.99	46.00	-18.01	36.40	-8.41	QP

Note:

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

Product : Bluetooth Speakerphone
 Test Item : General Radiated Emission
 Test date : 2019/12/12
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2441MHz)

Vertical



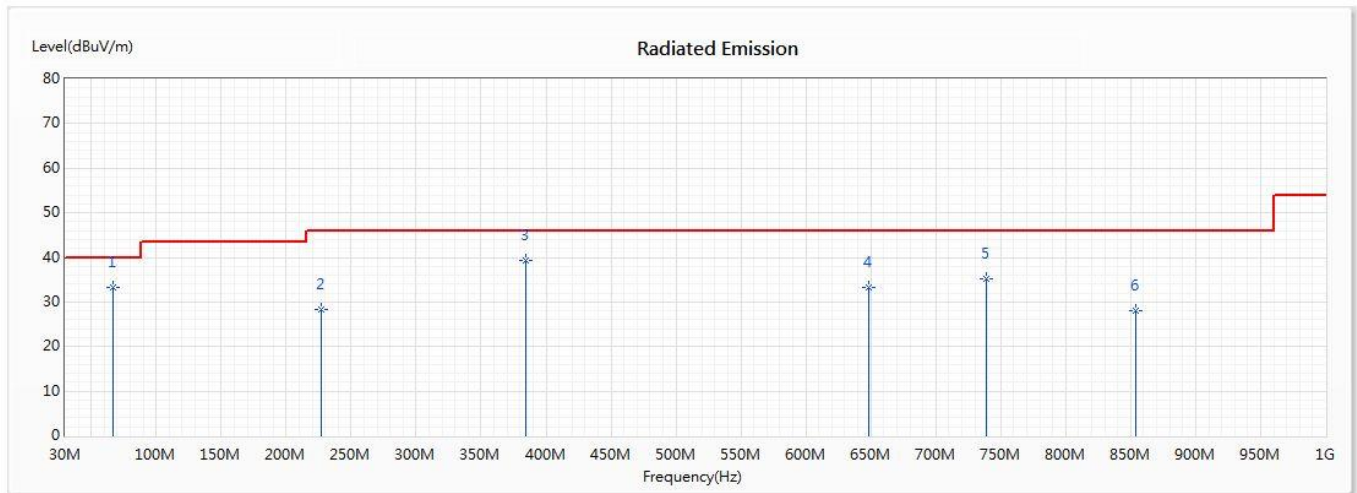
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	63.739	31.91	40.00	-8.09	52.23	-20.32	QP
2	384.261	29.97	46.00	-16.03	42.35	-12.38	QP
3	455.957	26.01	46.00	-19.99	36.36	-10.35	QP
4	728.681	26.72	46.00	-19.28	34.19	-7.47	QP
5	887.536	25.59	46.00	-20.41	34.52	-8.93	QP
6	964.855	25.47	54.00	-28.53	33.77	-8.30	QP

Note:

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

Product : Bluetooth Speakerphone
 Test Item : General Radiated Emission
 Test date : 2019/12/12
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Horizontal



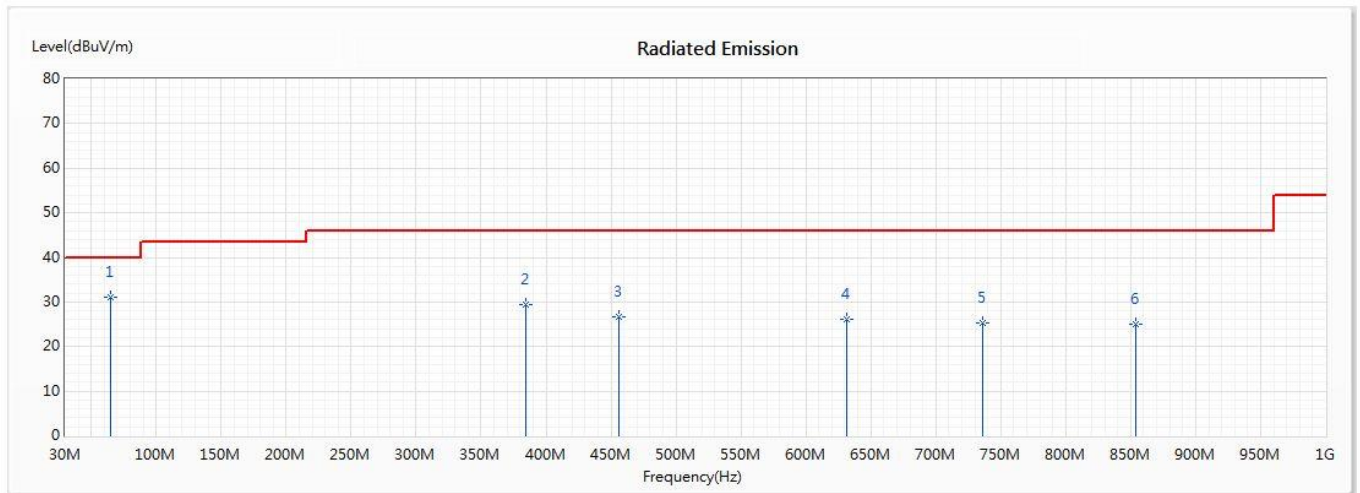
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	66.551	33.37	40.00	-6.63	54.06	-20.69	QP
2	226.812	28.37	46.00	-17.63	46.12	-17.75	QP
* 3	384.261	39.39	46.00	-6.61	51.77	-12.38	QP
4	648.551	33.32	46.00	-12.68	42.66	-9.34	QP
5	738.522	35.31	46.00	-10.69	41.06	-5.75	QP
6	853.797	28.12	46.00	-17.88	36.51	-8.39	QP

Note:

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

Product : Bluetooth Speakerphone
 Test Item : General Radiated Emission
 Test date : 2019/12/12
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2441MHz)

Vertical



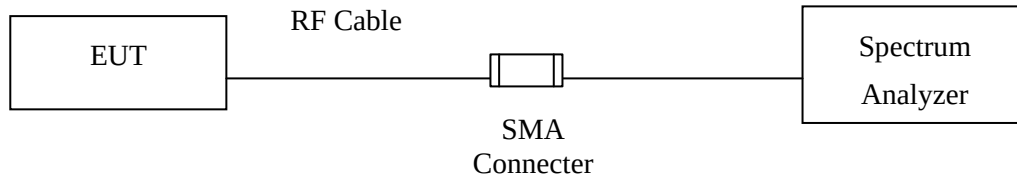
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
* 1	65.145	31.08	40.00	-8.92	51.71	-20.63	QP
2	384.261	29.49	46.00	-16.51	41.87	-12.38	QP
3	455.957	26.77	46.00	-19.23	37.12	-10.35	QP
4	631.681	26.09	46.00	-19.91	34.63	-8.54	QP
5	735.71	25.39	46.00	-20.61	31.63	-6.24	QP
6	853.797	24.99	46.00	-21.01	33.38	-8.39	QP

Note:

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

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

Tested according to FHSS test procedure of KDB558074 section 9 b) for compliance to FCC 47CFR 15.247 requirements.

5.4. Uncertainty

$\pm 1.20\text{dB}$

5.5. Test Result of RF Antenna Conducted Test

Product : Bluetooth Speakerphone
Test Item : RF Antenna Conducted Test
Test date : 2019/12/09
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Figure Channel 00:

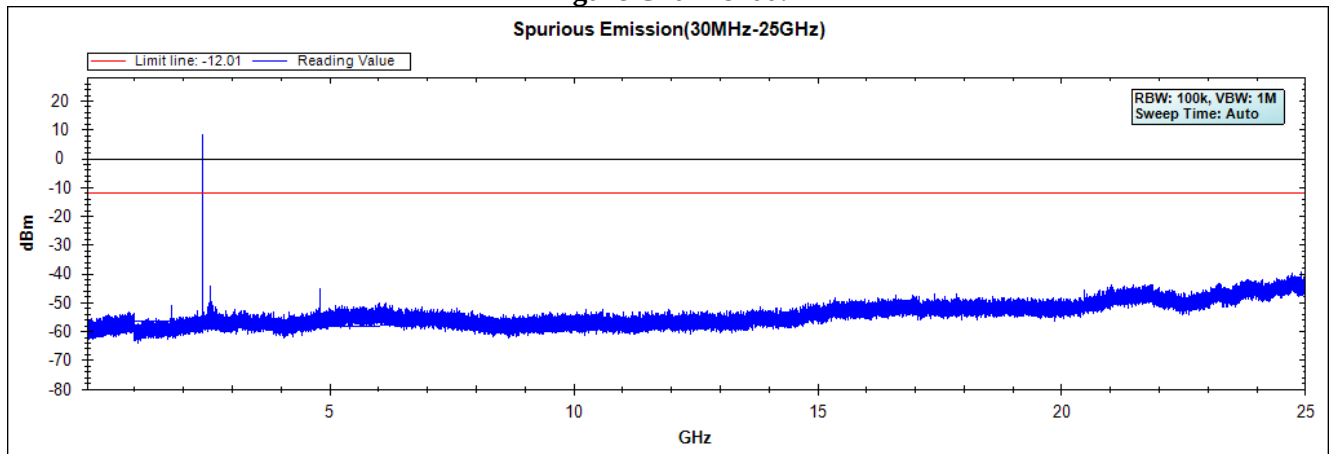


Figure Channel 39:

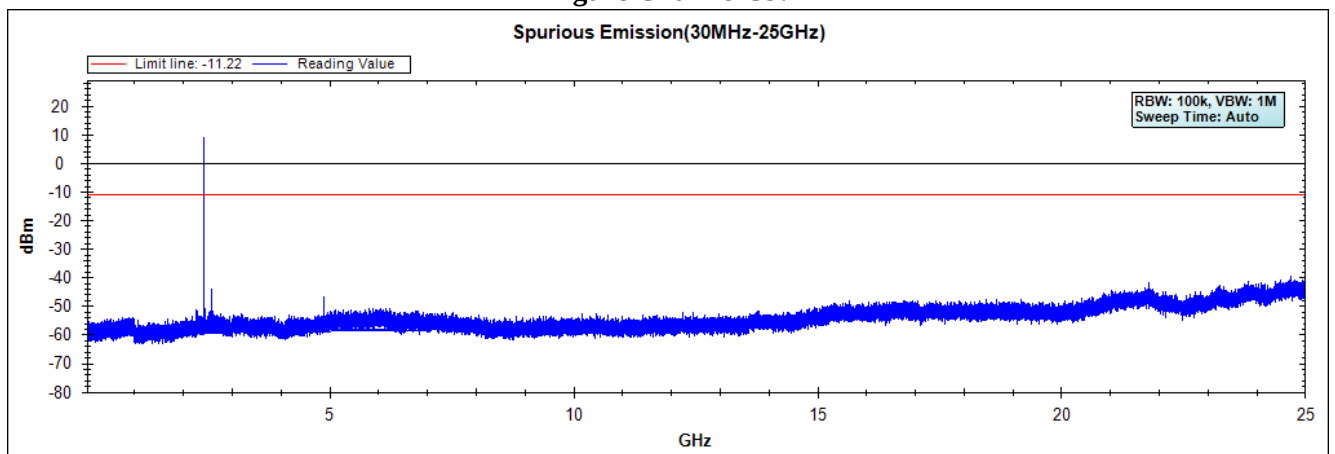
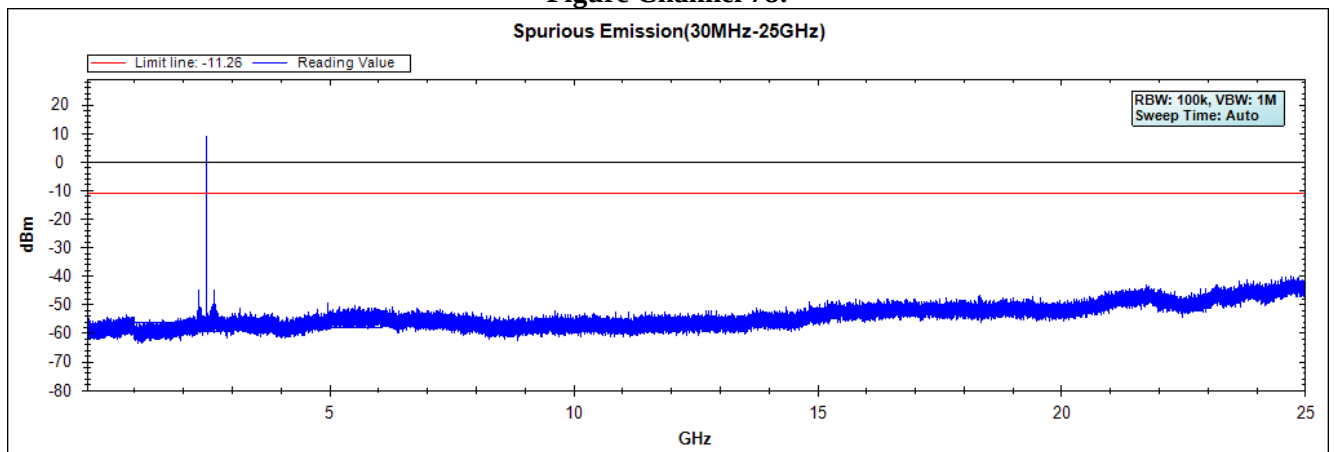
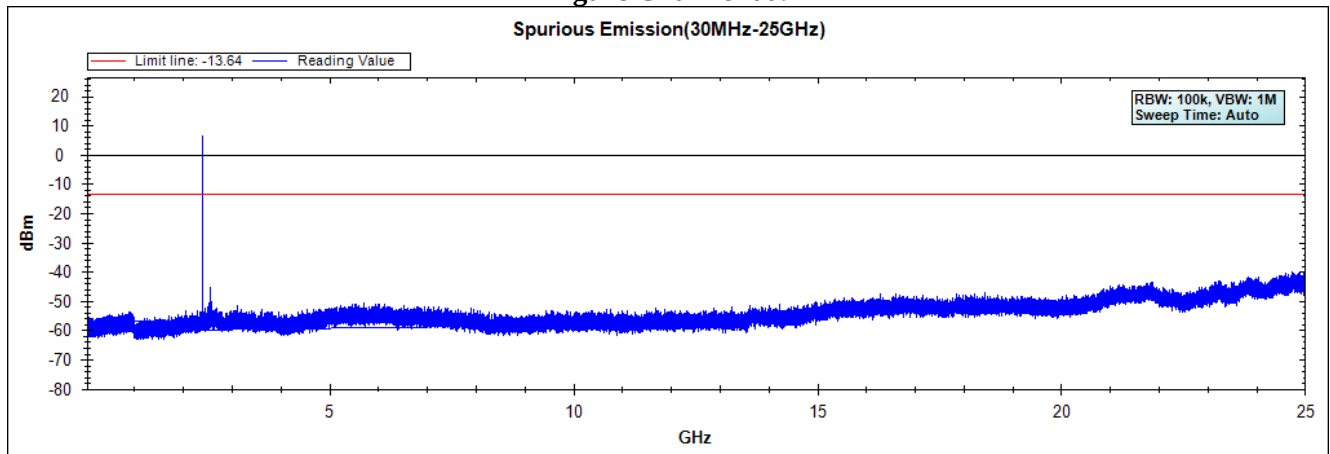
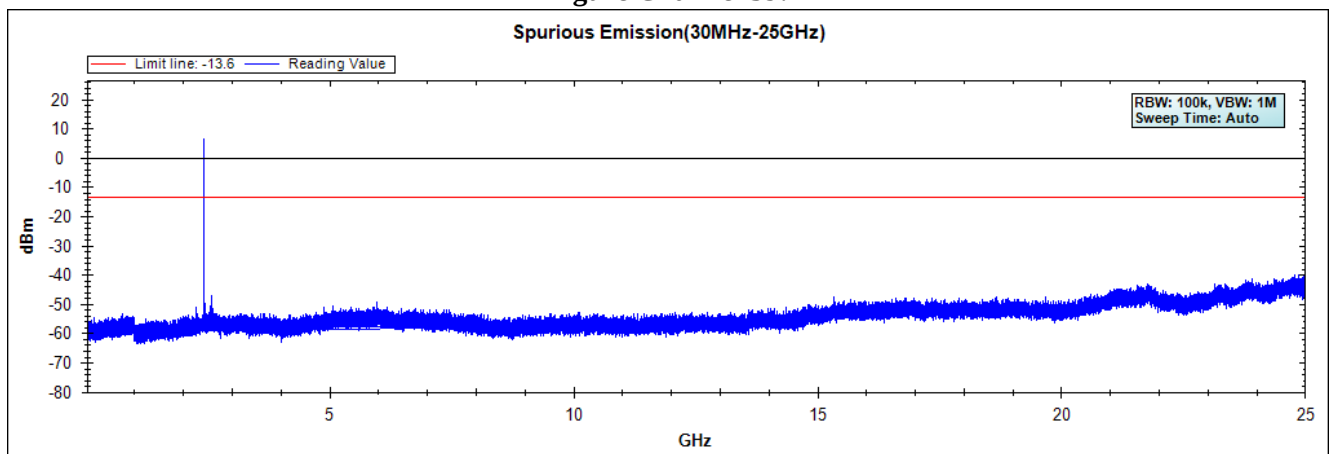
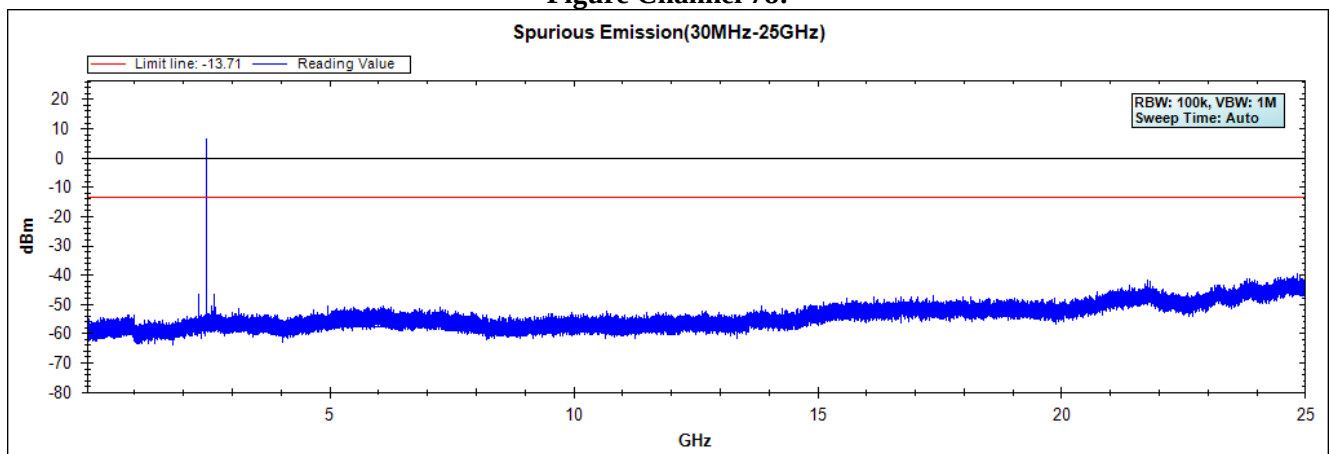


Figure Channel 78:



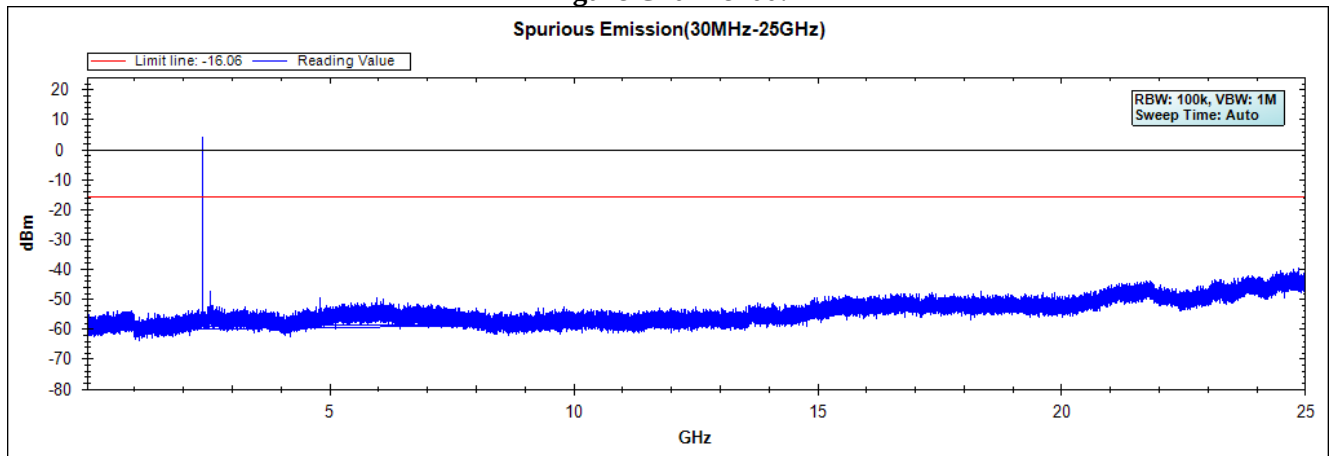
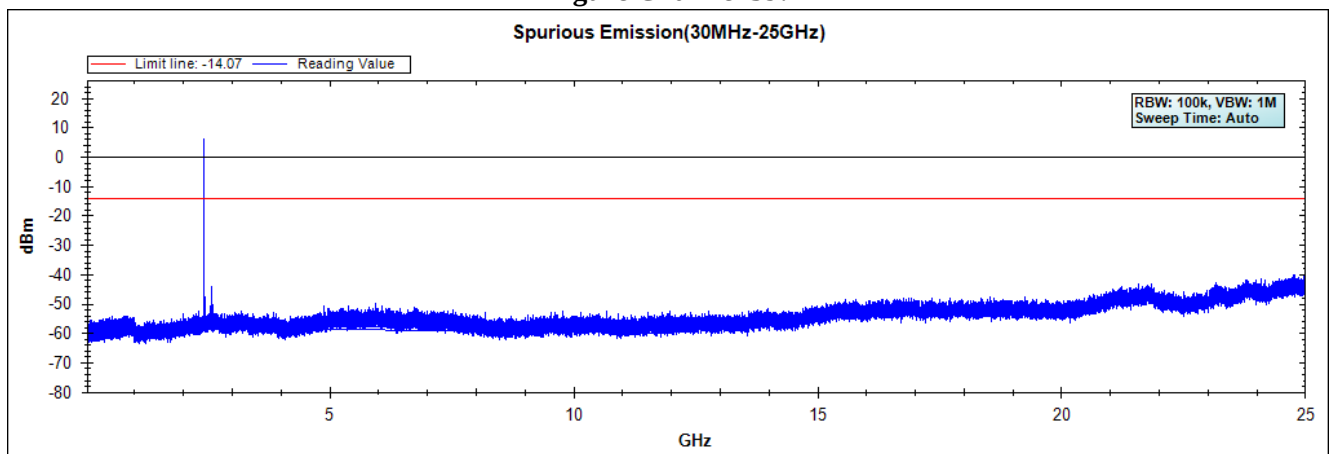
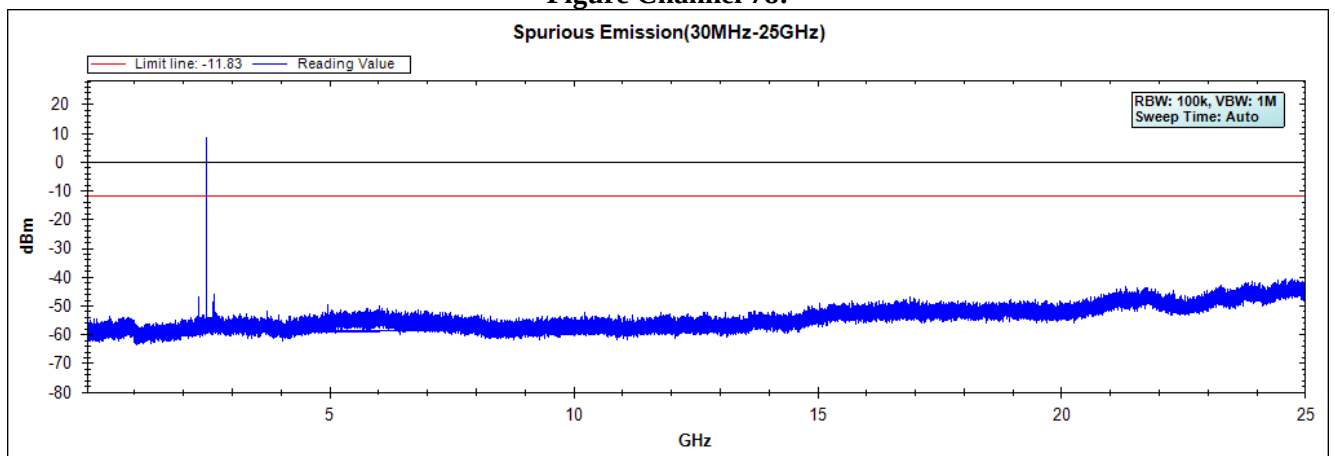
Note: The above test pattern is synthesized by multiple of the frequency range.

Product : Bluetooth Speakerphone
Test Item : RF Antenna Conducted Test
Test date : 2019/11/09
Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK)

Figure Channel 00:**Figure Channel 39:****Figure Channel 78:**

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

Product : Bluetooth Speakerphone
Test Item : RF Antenna Conducted Test
Test date : 2019/11/09
Test Mode : Mode 3: Transmit - 3Mbps (8DPSK)

Figure Channel 00:**Figure Channel 39:****Figure Channel 78:**

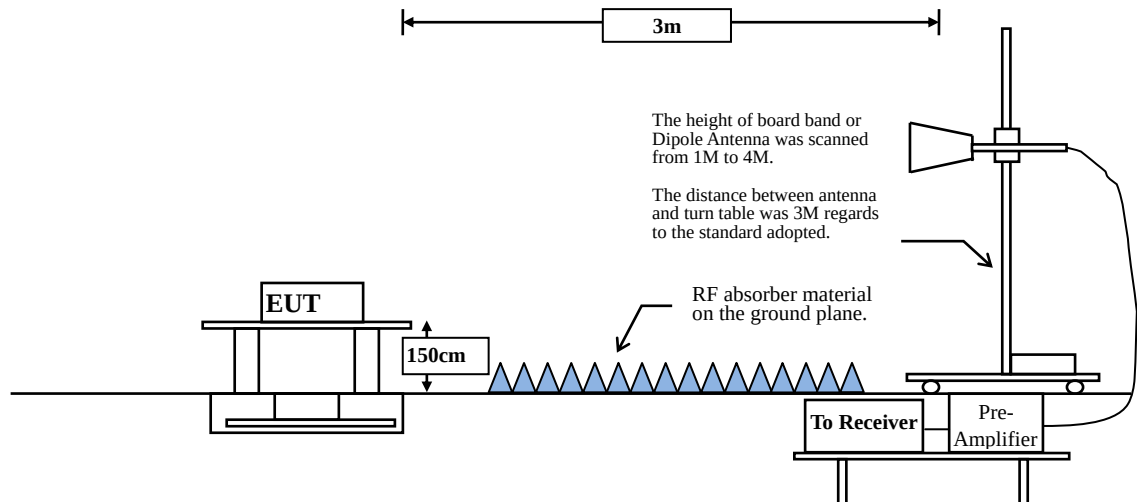
Note: The above test pattern is synthesized by multiple of the frequency range.

6. Band Edge

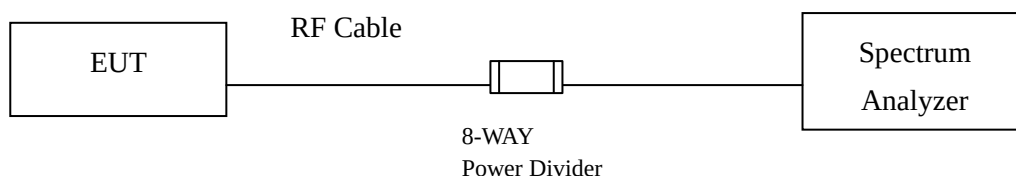
6.1. Test Setup

RF Radiated Measurement:

Above 1GHz



RF Conducted Measurement



6.2. Limit

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

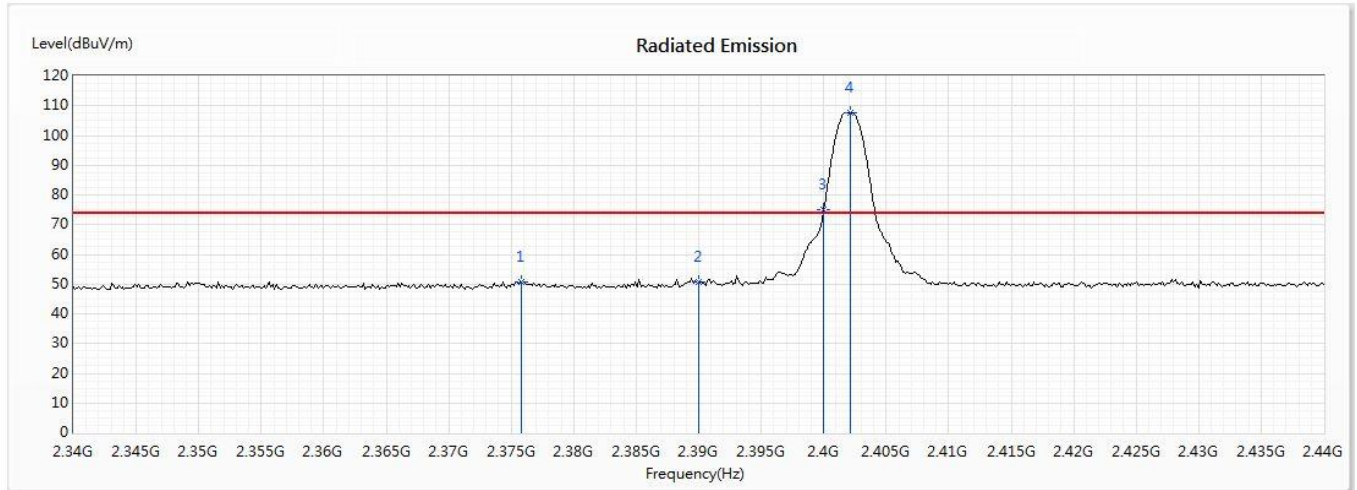
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

6.5. Test Result of Band Edge

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2375.797	50.84	74.00	-23.16	38.02	12.82	PK
2	2390	50.78	74.00	-23.22	37.89	12.89	PK
! 3	2400	74.95	--	--	61.99	12.96	PK
! 4	2402.174	107.80	--	--	94.83	12.97	PK

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. Emission Level = Reading Level + Correct Factor.

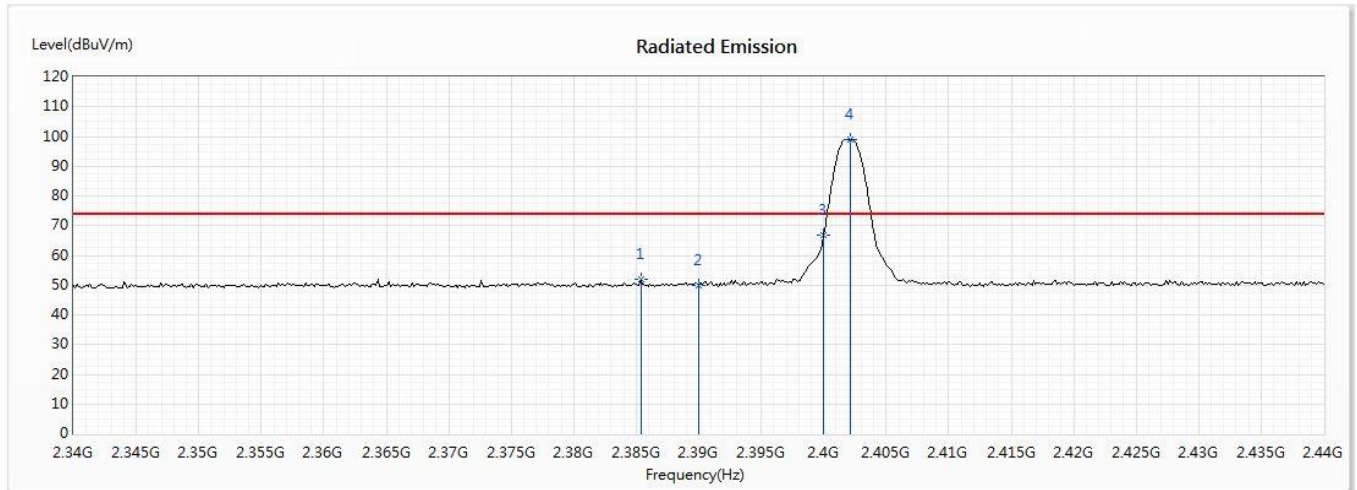
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
00 (Average)	2375.797	50.840	-30.458	20.382	-33.618	54.000
00 (Average)	2390	50.780	-30.458	20.322	-33.678	54.000
00 (Average)	2400	74.950	-30.458	44.492	--	--
00 (Average)	2402.174	107.800	-30.458	77.342	--	--

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2402MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2385.362	51.79	74.00	-22.21	38.92	12.87	PK
2	2390	50.07	74.00	-23.93	37.18	12.89	PK
3	2400	66.84	--	--	53.88	12.96	PK
! 4	2402.174	99.16	--	--	86.19	12.97	PK

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. Emission Level = Reading Level + Correct Factor.

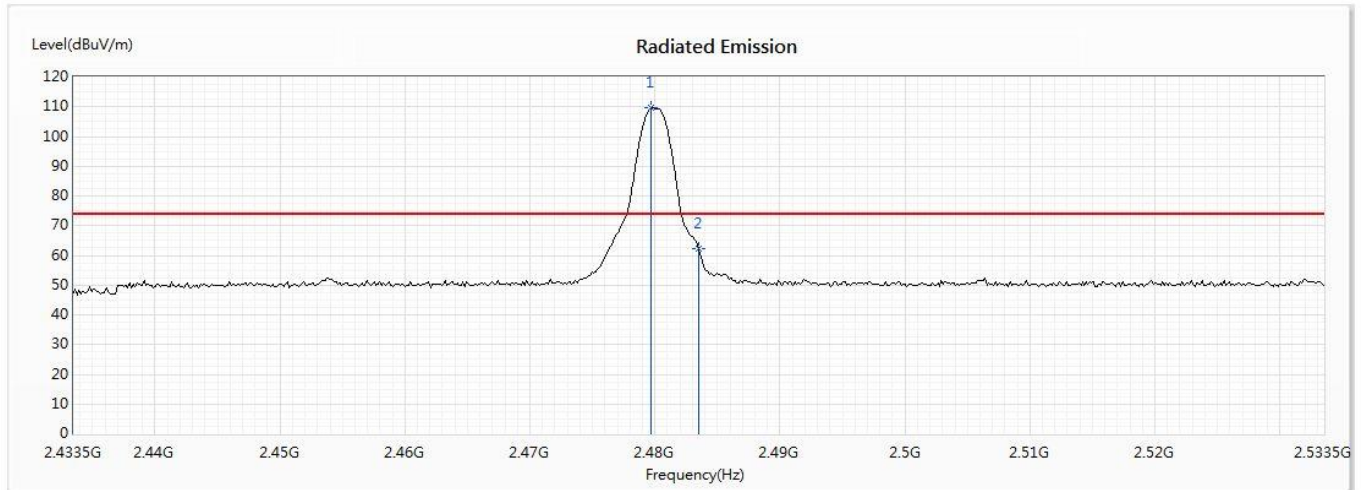
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
00 (Average)	2385.362	51.790	-30.458	21.332	-32.668	54.000
00 (Average)	2390	50.070	-30.458	19.612	-34.388	54.000
00 (Average)	2400	66.840	-30.458	36.382	--	--
00 (Average)	2402.174	99.160	-30.458	68.702	--	--

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2479.732	109.51	--	--	96.14	13.37	PK
2	2483.5	62.14	74.00	-11.86	48.76	13.38	PK

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. Emission Level = Reading Level + Correct Factor.

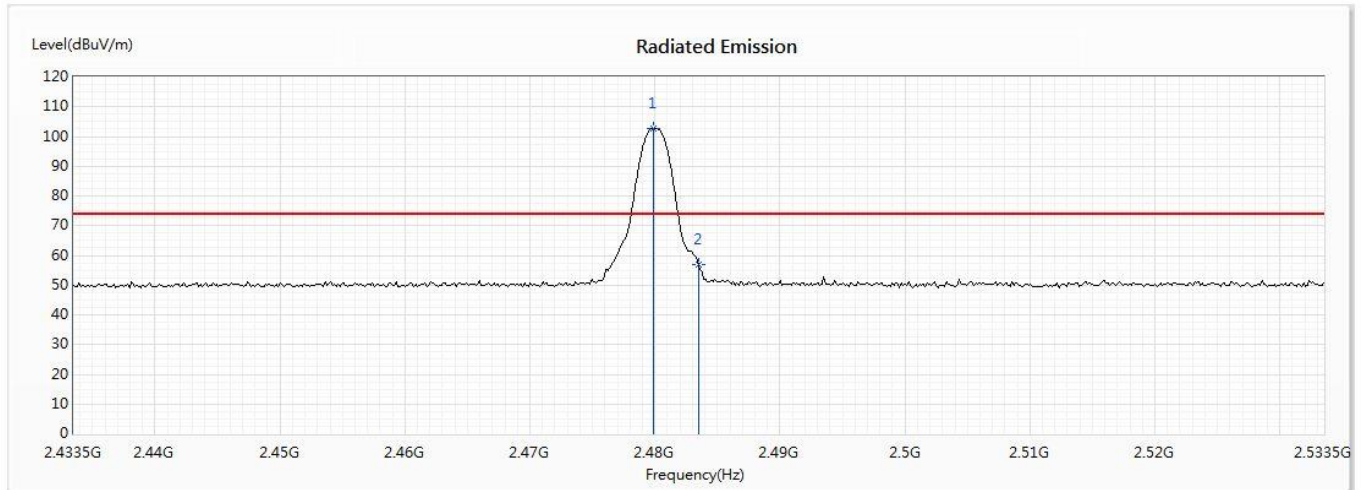
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
78 (Average)	2479.732	109.510	-30.458	79.052	--	--
78 (Average)	2483.5	62.140	-30.458	31.682	-22.318	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2480MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2479.877	102.60	--	--	89.23	13.37	PK
2	2483.5	57.09	74.00	-16.91	43.71	13.38	PK

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. Emission Level = Reading Level + Correct Factor.

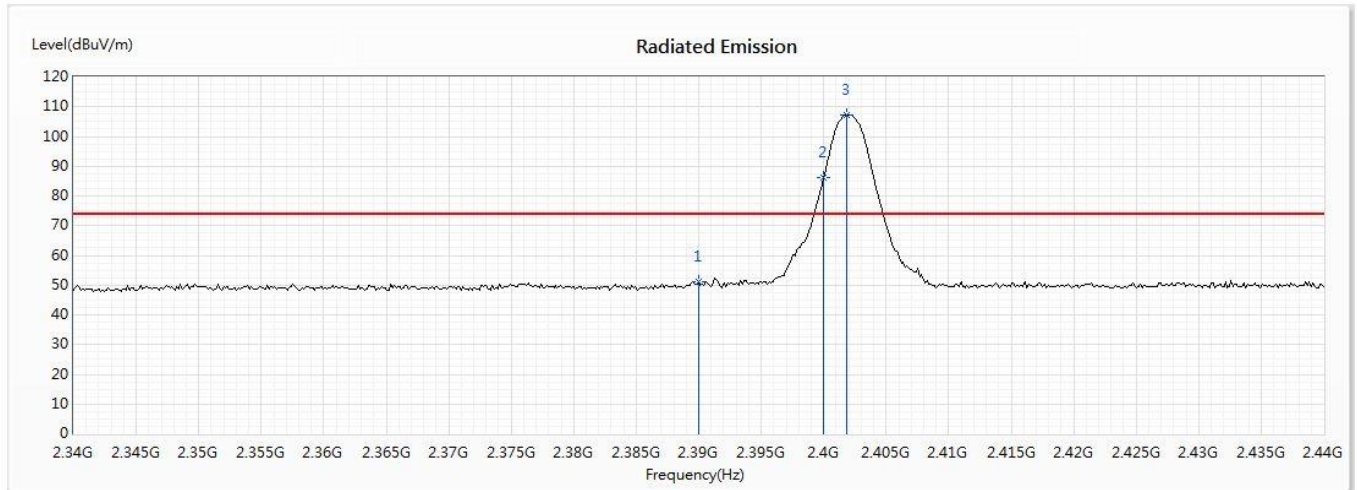
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
78 (Average)	2479.877	102.600	-30.458	72.142	--	--
78 (Average)	2483.5	57.090	-30.458	26.632	-27.368	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2402MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2390	51.16	74.00	-22.84	38.27	12.89	PK
! 2	2400	85.98	--	--	73.02	12.96	PK
! 3	2401.884	107.08	--	--	94.11	12.97	PK

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. Emission Level = Reading Level + Correct Factor.

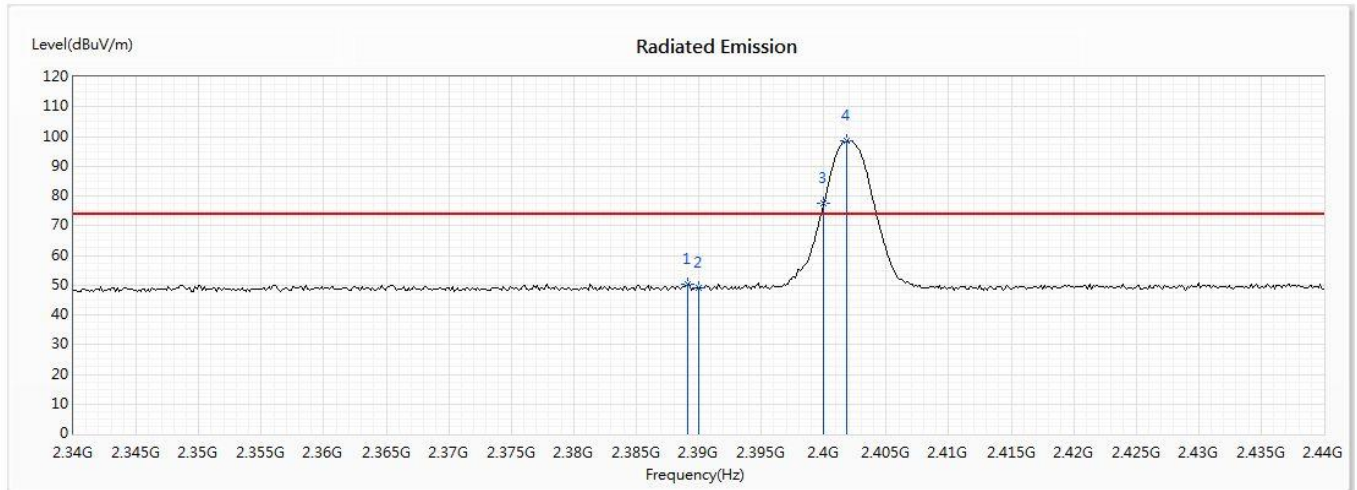
Channel No.	Frequency (MHz)	Peak Measurement (dB μ V/m)	Duty Cycle Factor (dB)	Measurement (dB μ V/m)	Margin (dB)	Limit (dBuV/m)
00 (Average)	2390	51.160	-31.057	20.103	-33.897	54.000
00 (Average)	2400	85.980	-31.057	54.923	--	--
00 (Average)	2401.884	107.080	-31.057	76.023	--	--

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2402MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2389.13	50.49	74.00	-23.51	37.60	12.89	PK
2	2390	48.92	74.00	-25.08	36.03	12.89	PK
! 3	2400	77.37	--	--	64.41	12.96	PK
! 4	2401.884	98.41	--	--	85.44	12.97	PK

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. Emission Level = Reading Level + Correct Factor.

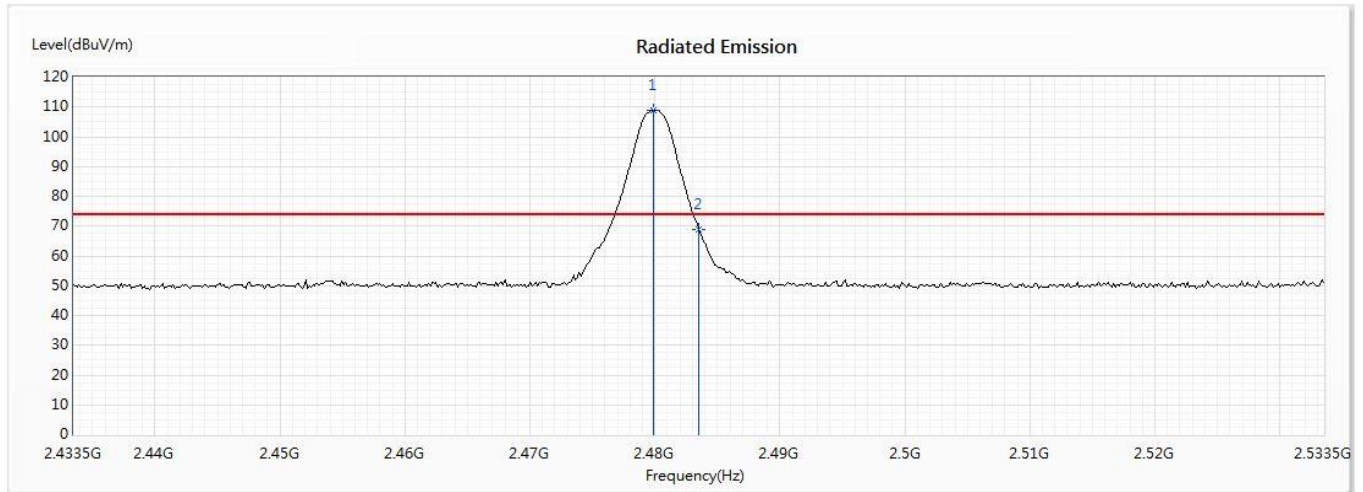
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
00 (Average)	2389.13	50.490	-31.057	19.433	-34.567	54.000
00 (Average)	2390	48.920	-31.057	17.863	-36.137	54.000
00 (Average)	2400	77.370	-31.057	46.313	--	--
00 (Average)	2401.884	98.410	-31.057	67.353	--	--

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2480MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2479.877	108.93	--	--	95.56	13.37	PK
2	2483.5	68.94	74.00	-5.06	55.56	13.38	PK

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. Emission Level = Reading Level + Correct Factor.

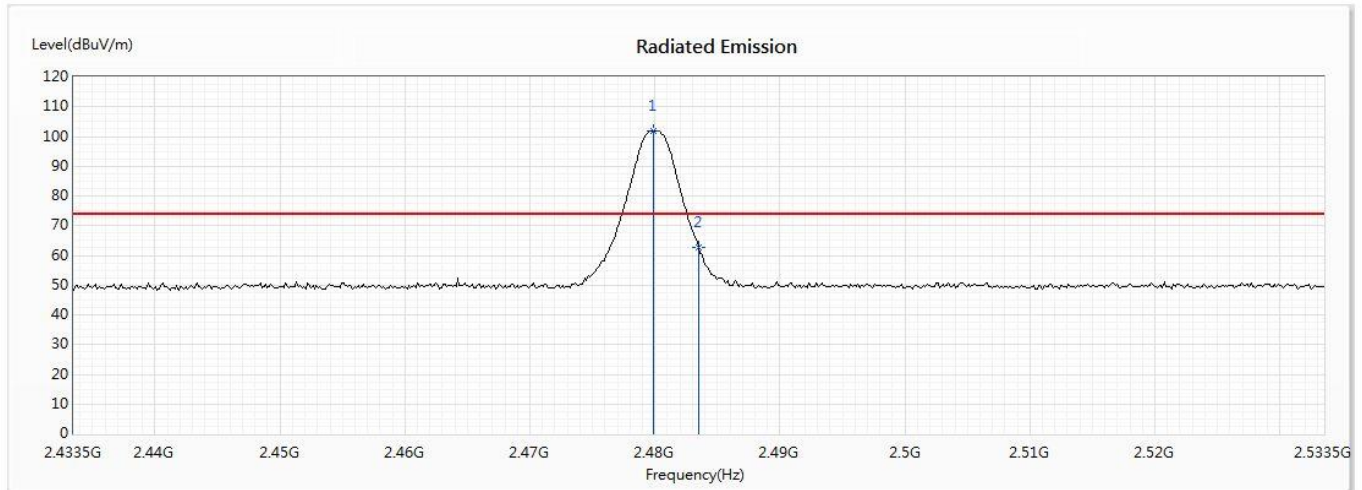
Channel No.	Frequency (MHz)	Peak Measurement (dB μ V/m)	Duty Cycle Factor (dB)	Measurement (dB μ V/m)	Margin (dB)	Limit (dBuV/m)
78 (Average)	2479.877	108.930	-31.057	77.873	--	--
78 (Average)	2483.5	68.940	-31.057	37.883	-16.117	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK) (2480MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2479.877	102.03	--	--	88.66	13.37	PK
2	2483.5	62.59	74.00	-11.41	49.21	13.38	PK

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. Emission Level = Reading Level + Correct Factor.

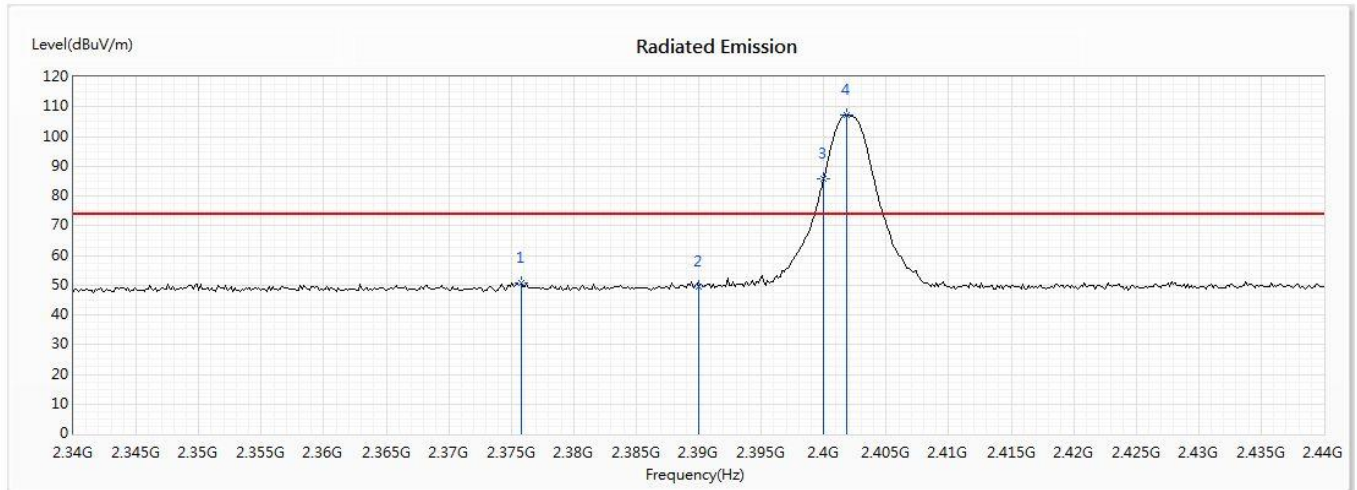
Channel No.	Frequency (MHz)	Peak Measurement (dB μ V/m)	Duty Cycle Factor (dB)	Measurement (dB μ V/m)	Margin (dB)	Limit (dBuV/m)
78 (Average)	2479.877	102.030	-31.057	70.973	--	--
78 (Average)	2483.5	62.590	-31.057	31.533	-22.467	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2402MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2375.797	50.54	74.00	-23.46	37.72	12.82	PK
2	2390	49.39	74.00	-24.61	36.50	12.89	PK
! 3	2400	85.96	--	--	73.00	12.96	PK
! 4	2401.884	107.09	--	--	94.12	12.97	PK

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. Emission Level = Reading Level + Correct Factor.

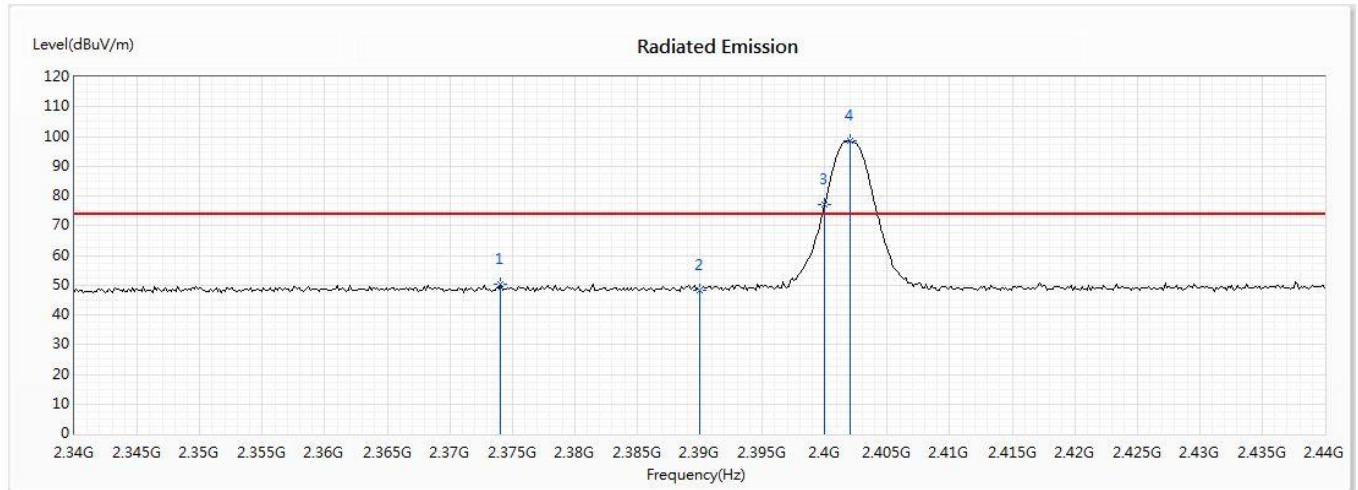
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
00 (Average)	2375.797	50.540	-30.458	20.082	-33.918	54.000
00 (Average)	2390	49.390	-30.458	18.932	-35.068	54.000
00 (Average)	2400	85.960	-30.458	55.502	--	--
00 (Average)	2401.884	107.090	-30.458	76.632	--	--

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2402MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
1	2374.058	50.49	74.00	-23.51	37.68	12.81	PK
2	2390	48.41	74.00	-25.59	35.52	12.89	PK
! 3	2400	77.27	--	--	64.31	12.96	PK
! 4	2402.029	98.41	--	--	85.44	12.97	PK

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. Emission Level = Reading Level + Correct Factor.

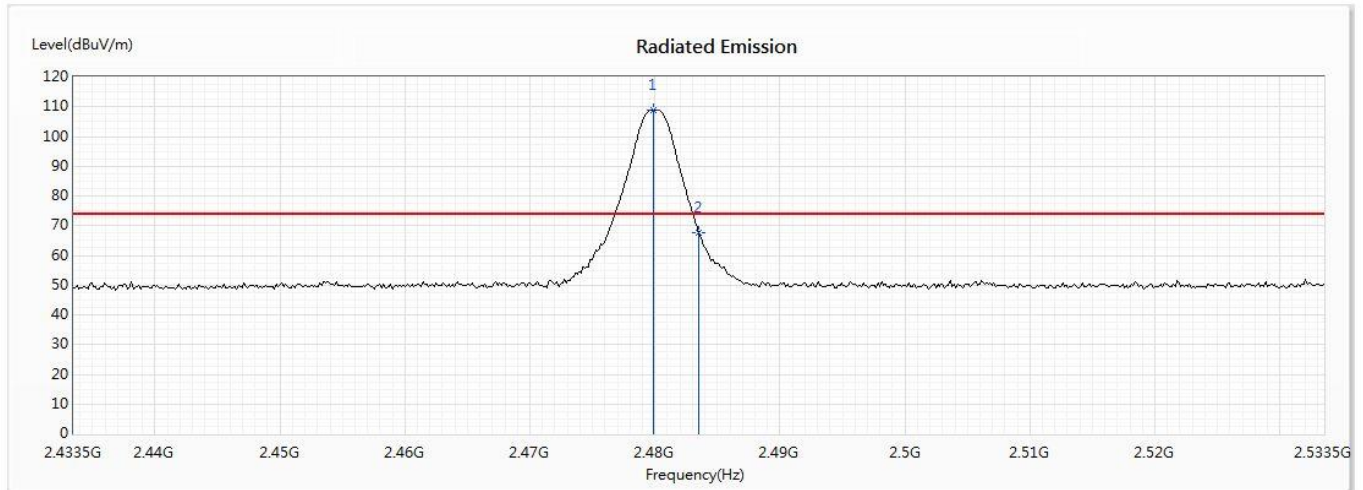
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
00 (Average)	2374.058	50.490	-30.458	20.032	-33.968	54.000
00 (Average)	2390	48.410	-30.458	17.952	-36.048	54.000
00 (Average)	2400	77.270	-30.458	46.812	--	--
00 (Average)	2402.029	98.410	-30.458	67.952	--	--

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2480MHz)

Horizontal



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2479.877	108.90	--	--	95.53	13.37	PK
2	2483.5	67.59	74.00	-6.41	54.21	13.38	PK

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. Emission Level = Reading Level + Correct Factor.

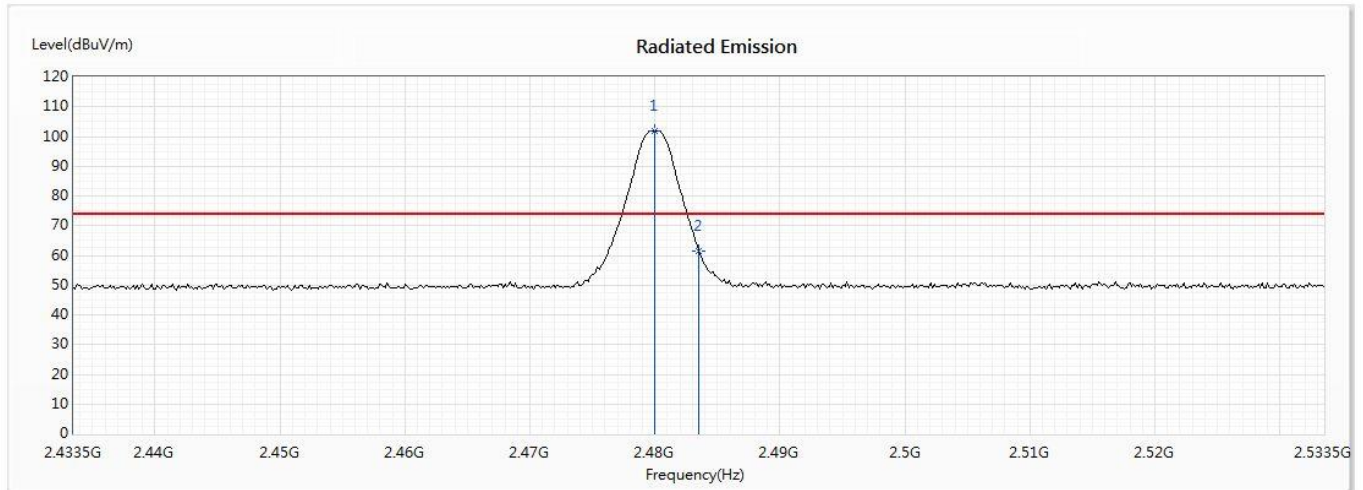
Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
78 (Average)	2479.877	108.900	-30.458	78.442	--	--
78 (Average)	2483.5	67.590	-30.458	37.132	-16.868	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test date : 2019/12/11
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (2480MHz)

Vertical



No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB/m)	Detector Type
! 1	2480.022	102.02	--	--	88.65	13.37	PK
2	2483.5	61.35	74.00	-12.65	47.97	13.38	PK

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. Emission Level = Reading Level + Correct Factor.

Channel No.	Frequency (MHz)	Peak Measurement (dBμV/m)	Duty Cycle Factor (dB)	Measurement (dBμV/m)	Margin (dB)	Limit (dBuV/m)
78 (Average)	2480.022	102.020	-30.458	71.562	--	--
78 (Average)	2483.5	61.350	-30.458	30.892	-23.108	54.000

Note:

1. Average Measurement=Peak Measurement + Duty Cycle Factor
2. The Duty Cycle is refer to section 11.

Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

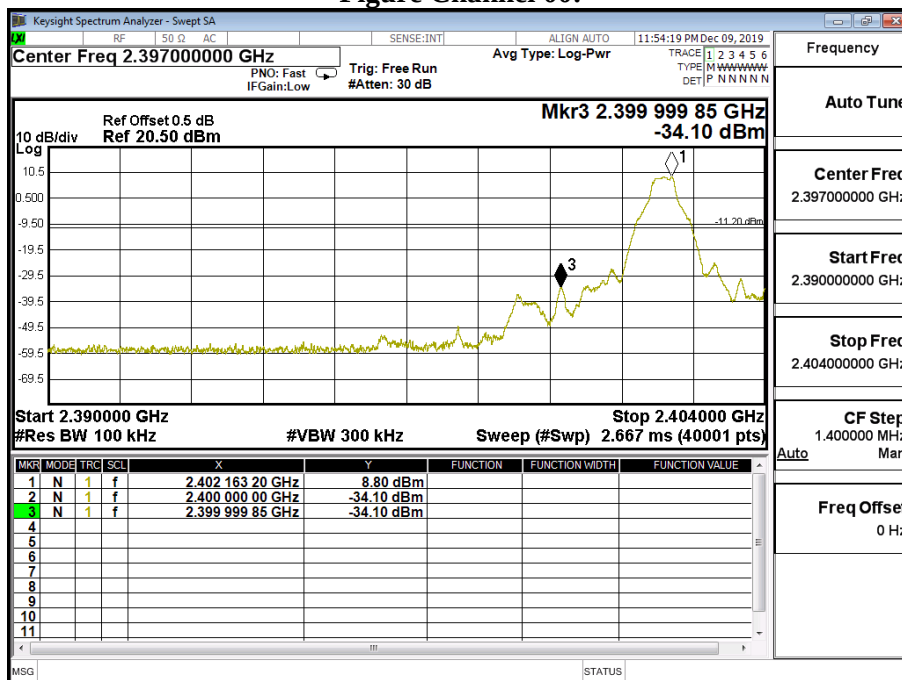
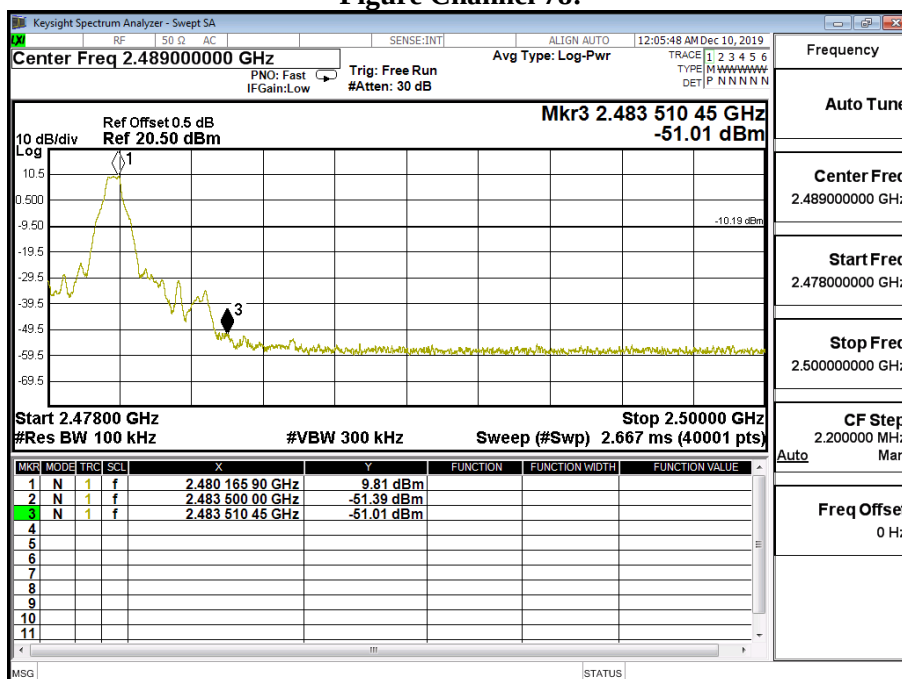


Figure Channel 78:



Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK)(Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

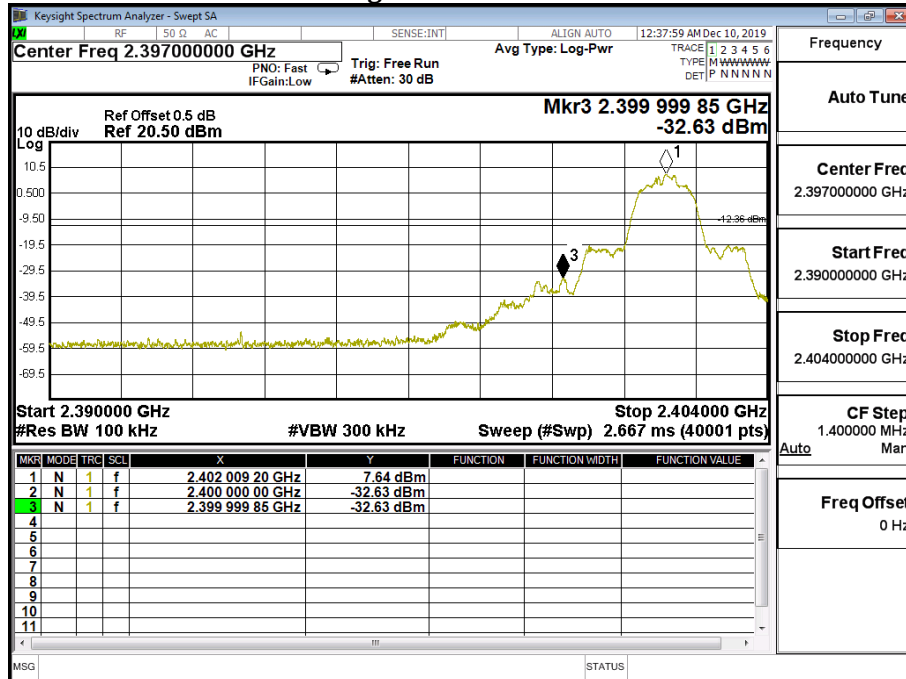
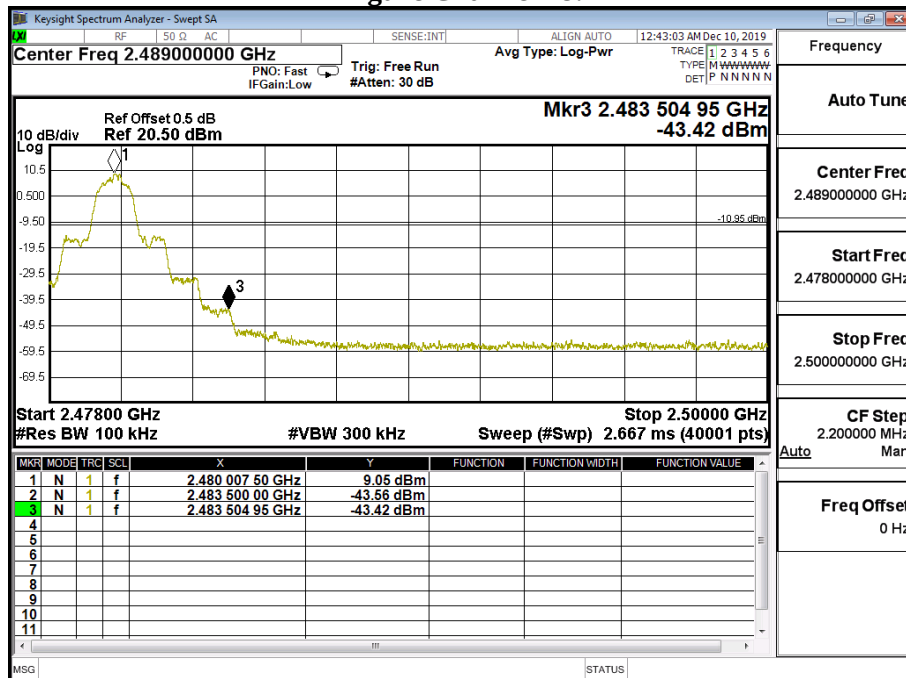


Figure Channel 78:



Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (Hopping off)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00:

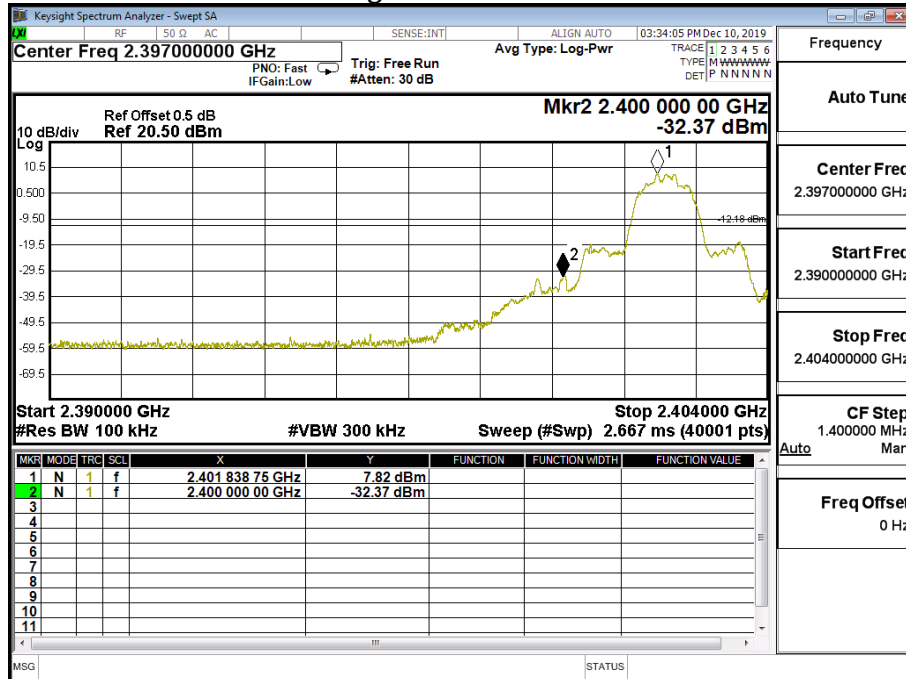
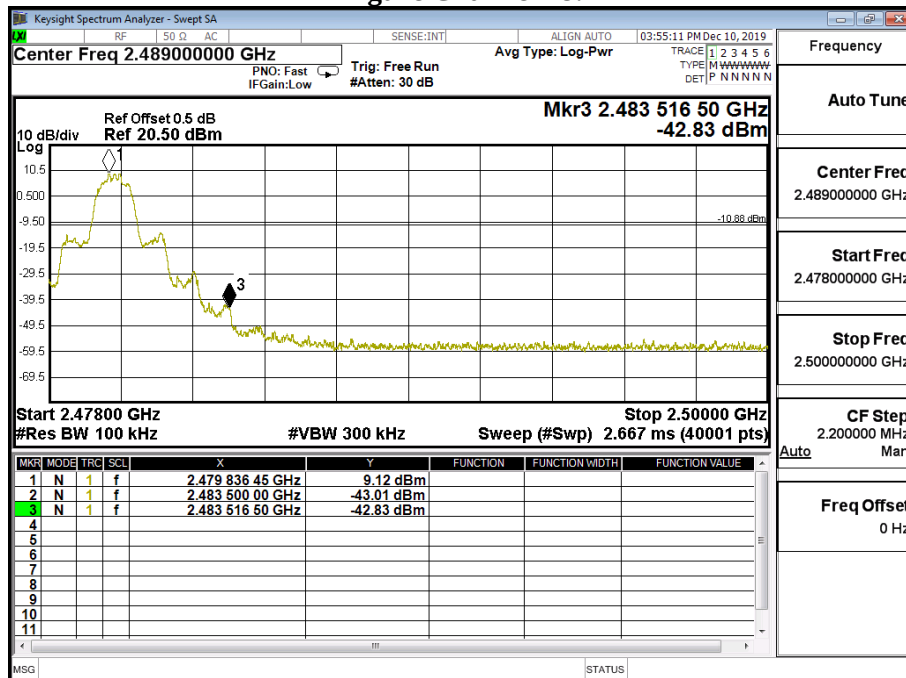


Figure Channel 78:



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

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

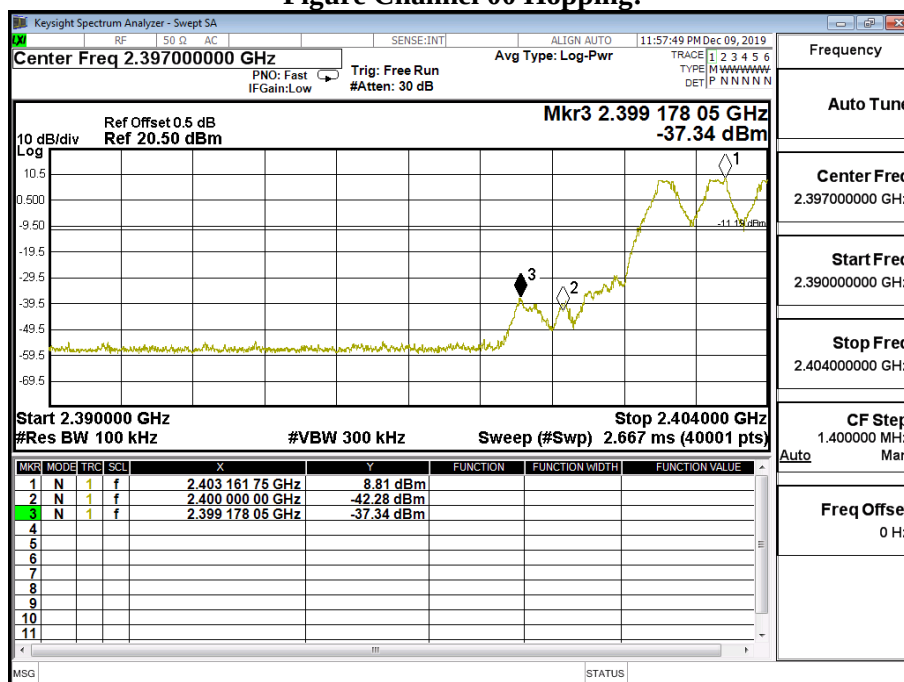
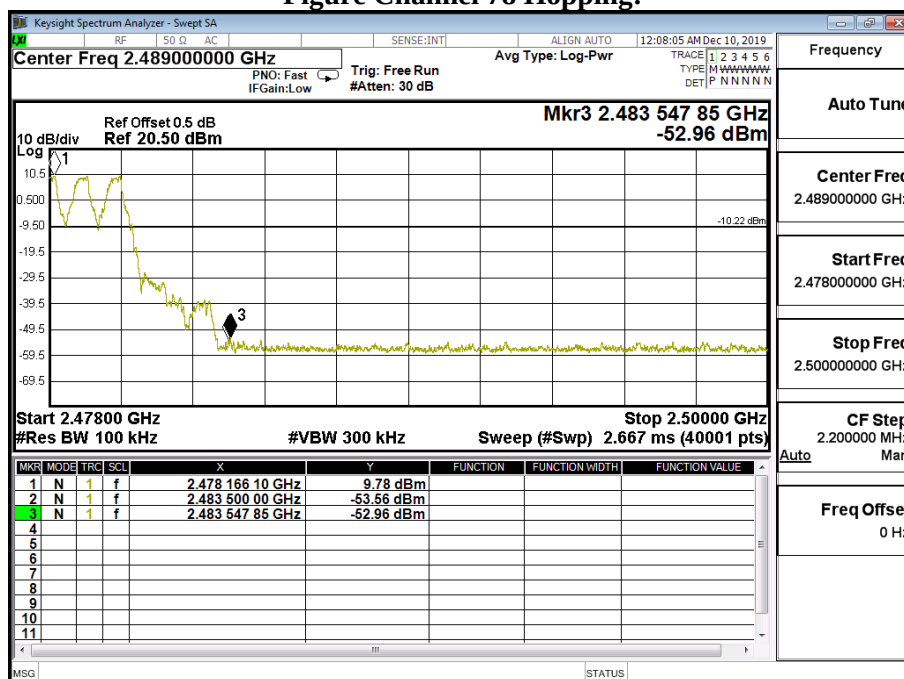


Figure Channel 78 Hopping:



Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test Mode : Mode 2: Transmit - 2Mbps ($\pi/4$ DQPSK)(Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

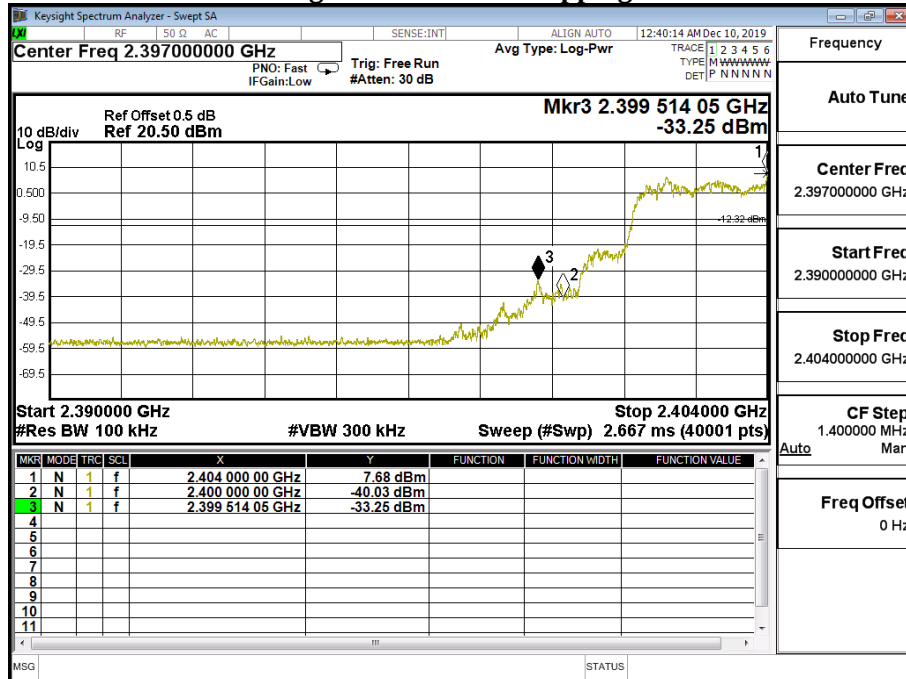
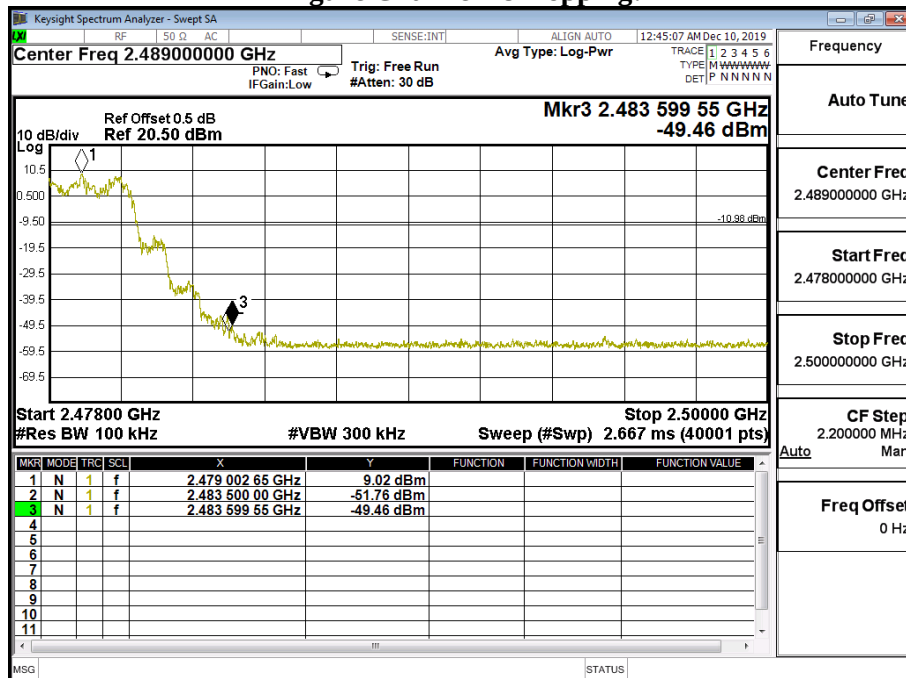


Figure Channel 78 Hopping:



Product : Bluetooth Speakerphone
 Test Item : Band Edge
 Test Mode : Mode 3: Transmit - 3Mbps (8DPSK) (Hopping on)

Measurement Level	Result
Δ (dB)	
> 20	PASS

Figure Channel 00 Hopping:

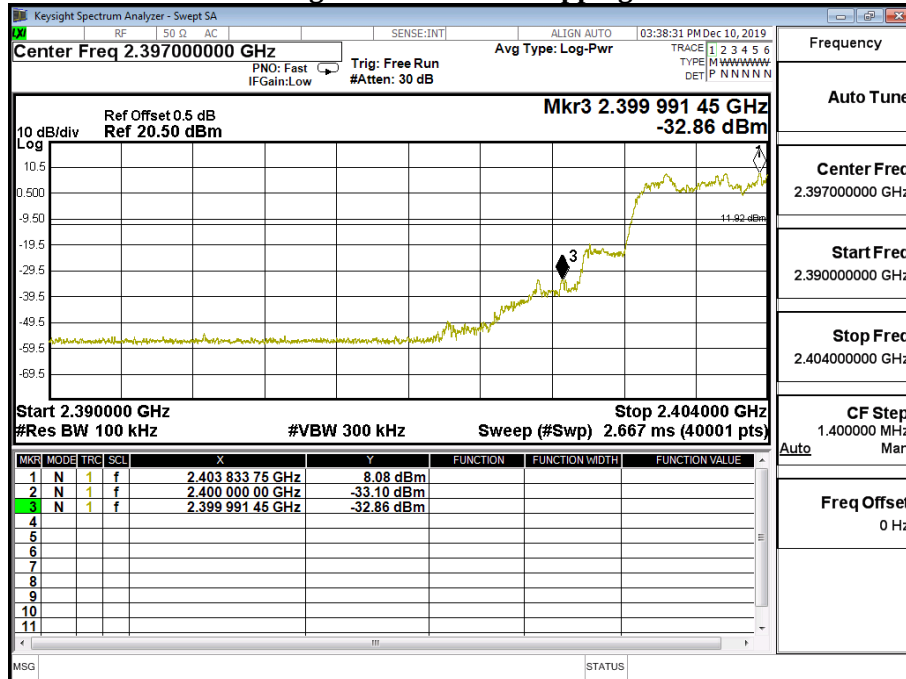
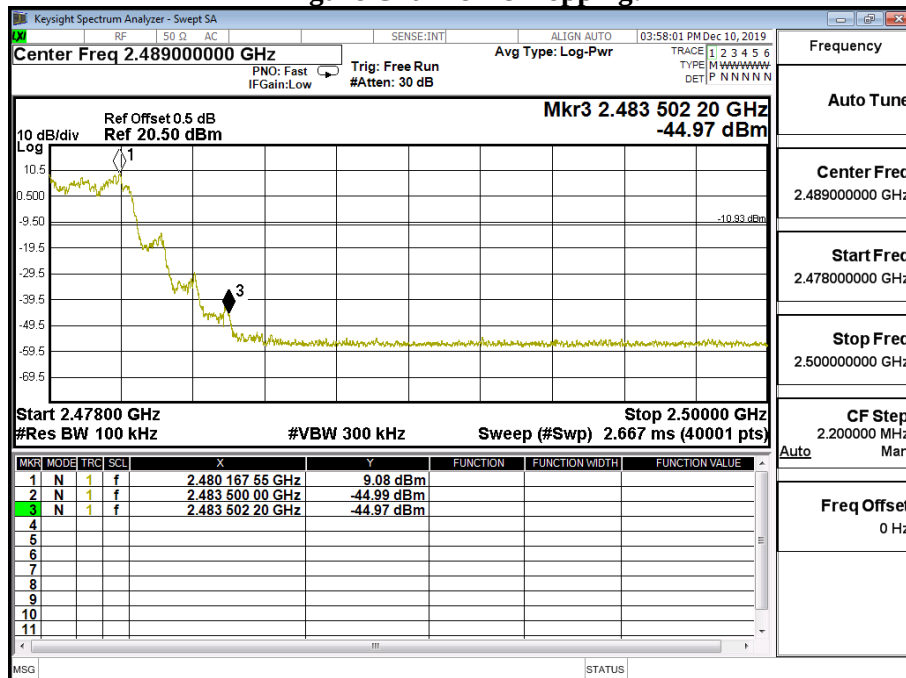
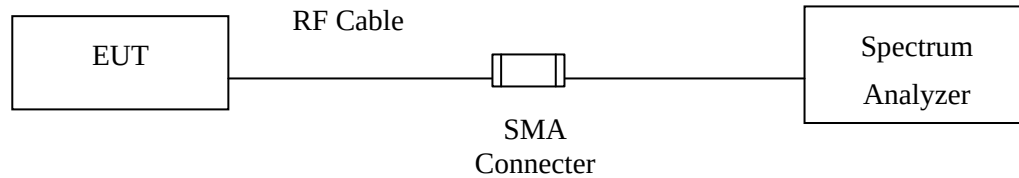


Figure Channel 78 Hopping:



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

Tested according to FHSS test procedure of KDB558074 section 9 (b for compliance to FCC 47CFR 15.247 requirements.

7.4. Uncertainty

N/A