APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Consonance Technology Corporation

Bluetooth Headphone Cable

Model No.: XX, X1 Wireless, X2 Wireless, X3 Wireless, Storm Wireless, BTC-100, DUO Wireless, X1i/X1h, X2i/X2h, X3i/X3h, X4i/X4h, X5i/X5h, X6i/X6h, BT-WP1, BT-WP2, BT-WP3, BT-WP4, Wave Wireless, XX Extreme

FCC ID: 2AH9D-XX

Prepared for	:	Consonance Technology Corporation
Address	:	4F, No.150, Nan-Jing East Rd., Sec 4, Taipei City 105, Taiwan R.O.C.
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
Address	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China Tel: (0755) 26503290 Fax: (0755) 26503396

Report No.	:	ATE20190070
Date of Test	:	January 21-January 25, 2019
Date of Report	:	January 28, 2019

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Description Page

Test Report Certification

Applicant	:	Consonance Technology Corporation
Manufacturer	:	Consonance Technology Corporation
EUT	:	Bluetooth Headphone Cable
Model No.	:	XX, X1 Wireless, X2 Wireless, X3 Wireless, Storm Wireless, BTC-100, DUO Wireless, X1i/X1h, X2i/X2h, X3i/X3h, X4i/X4h, X5i/X5h, X6i/X6h, BT-WP1, BT-WP2, BT-WP3, BT-WP4, Wave Wireless, XX Extreme

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2013

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test : January 21-January 25, 2019
Date of Report : January 28, 2019

Test Engineer : (Frank Lü, Engineer)

Prepared by : (Steven Yang, Engineer)

Approved & Authorized Signer : (Martin Lü, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

Model Number	:	XX, X1 Wireless, X2 Wireless, X3 Wireless, Storm Wireless, BTC-100, DUO Wireless, X1i/X1h, X2i/X2h, X3i/X3h, X4i/X4h, X5i/X5h, X6i/X6h, BT-WP1, BT-WP2, BT-WP3, BT-WP4, Wave Wireless, XX Extreme (Note: Above models are identical in schematic, structure and critical components except for model name different, So we prepare XX for test.)
Bluetooth version	:	V4.2 (BR+EDR)
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	2.12dBi
Antenna type	:	Ceramic antenna
Modulation mode	:	GFSK, π/4 DQPSK, 8DPSK
Hardware version	:	V1.0
Software version	:	V4.2
Power Supply	:	DC 3.7V (Powered by Lithium battery) or DC 5V (Powered by charging port)
Applicant	:	Consonance Technology Corporation
Address	:	4F, No.150, Nan-Jing East Rd., Sec 4, Taipei City 105, Taiwan R.O.C.
Manufacturer	:	Consonance Technology Corporation
Address	:	4F, No.150, Nan-Jing East Rd., Sec 4, Taipei City 105, Taiwan R.O.C.

1.2.Accessory and Auxiliary Equipment

AC/DC Power Adapter: (provided by laboratory)	:	Model:TEKA006-0501000UKU
		Input: 100-240V~50/60Hz 0.3A
		Output: DC 5V/1A

1.3.Description of Test Facility

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358 Listed by Innovation, Science and Economic Development Canada (ISEDC) The Registration Number is 5077A-2 Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193 Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	:	Shenzhen Accurate Technology Co., Ltd.
Site Location	:	1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.4.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 05, 2019	1 Year
EMI Test Receiver	Rohde& Schwarz	ESR	101817	Jan. 05, 2019	1 Year
Spectrum Analyzer	Rohde&Schwarz	FSV40	101495	Jan. 05, 2019	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 05, 2019	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 05, 2019	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.3	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.4	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.5	Jan. 05, 2019	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.6	Jan. 05, 2019	1 Year
Temporary antenna connector	NTGS	14AE	N/A	Jan. 21, 2019	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: Transmitting mode
Low Channel: 2402MHz
Middle Channel: 2441MHz
High Channel: 2480MHz
Hopping

Note: The equipment under test (EUT) was tested under fully-charged battery.
The Bluetooth has been tested under continuous transmission mode.

EUT is connected to a computer through the usb-serial controller tool and Use test software to set the test mode.
Test software is (Airoha.AB152x_verC_LabTestTool)

3.2.Configuration and peripherals

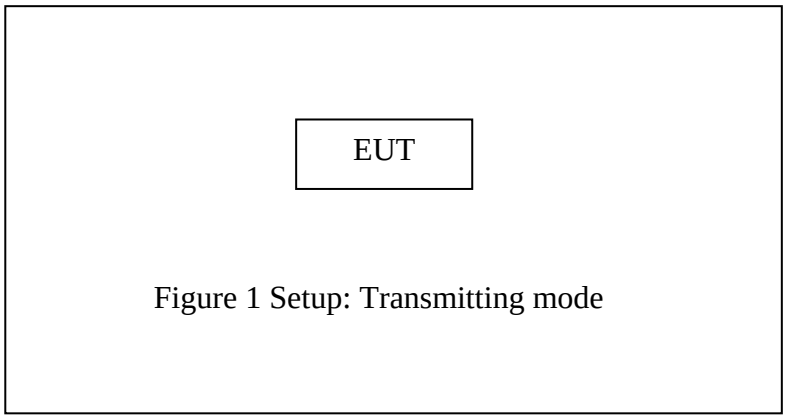


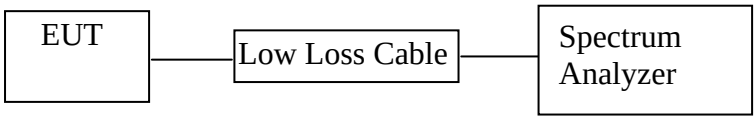
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.207	AC Power Line Conducted Emissions Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1.Block Diagram of Test Setup



5.2.The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

5.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.4.Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

5.5.Test Procedure

5.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

5.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

5.5.3.The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.6.Test Result

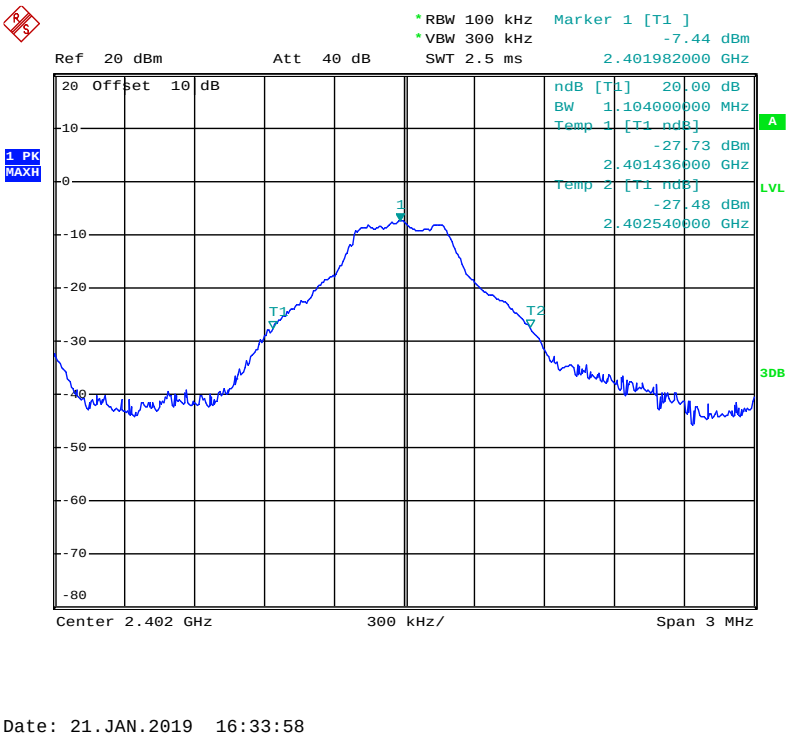
Test Lab: Shielding room
Test Engineer: Frank

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.104	1.464	1.458	Pass
Middle	2441	1.110	1.458	1.434	Pass
High	2480	1.122	1.446	1.410	Pass

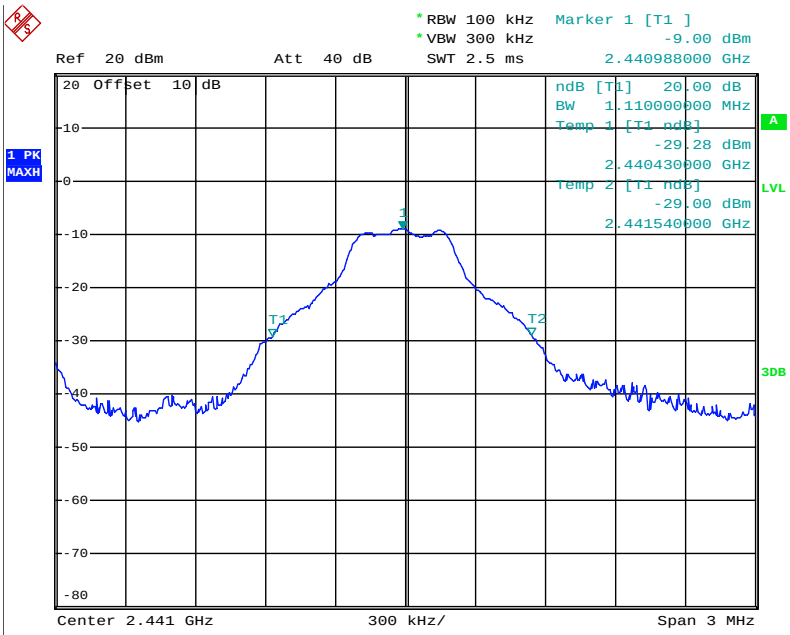
The spectrum analyzer plots are attached as below.

GFSK Mode

Low channel



Middle channel



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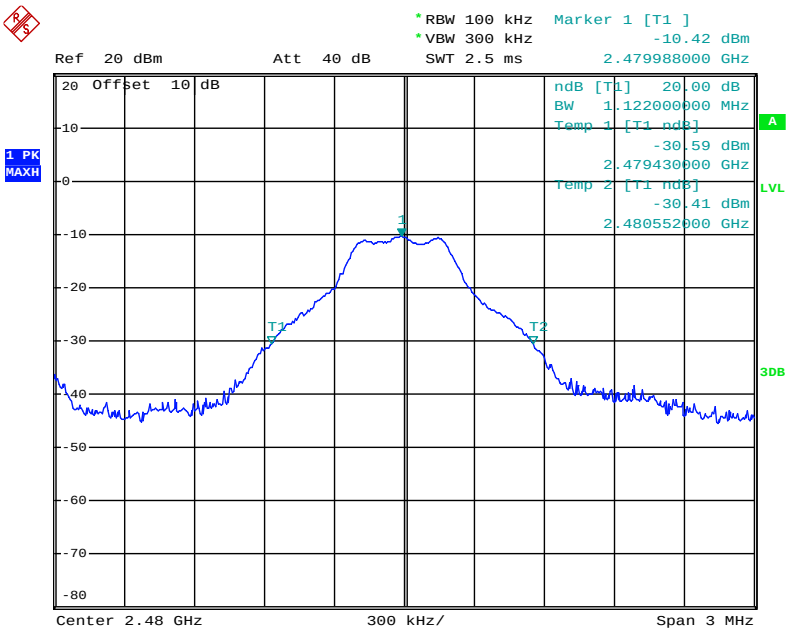
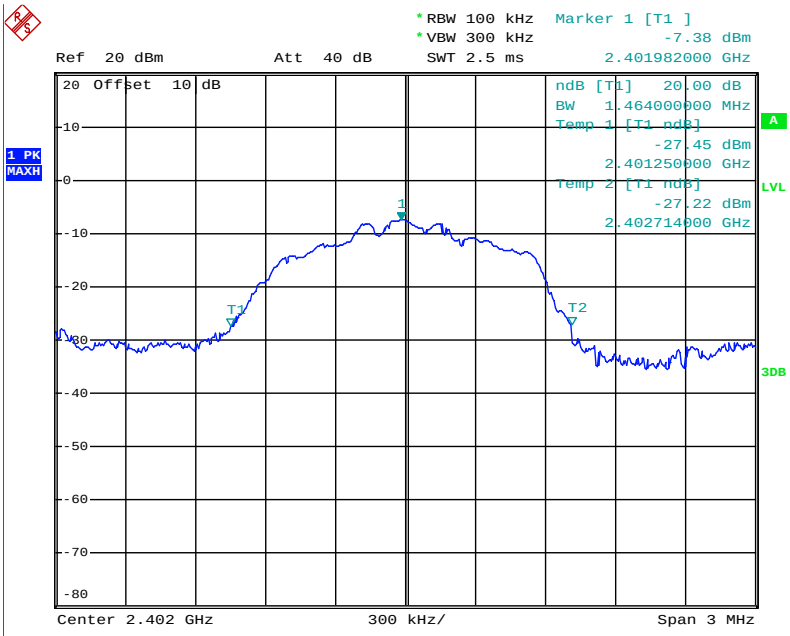
High channel



Date: 21.JAN.2019 16:35:14

Π/4-DQPSK Mode

Low channel



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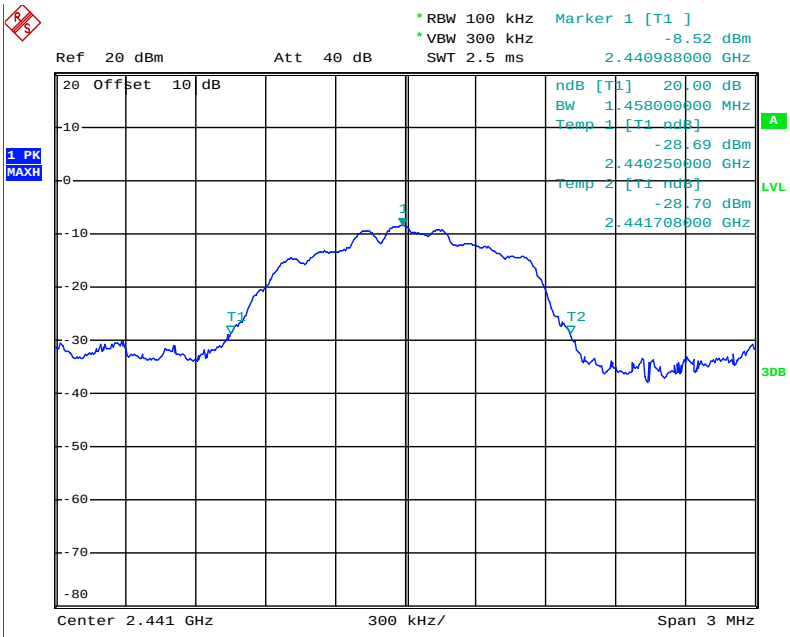
Middle channel



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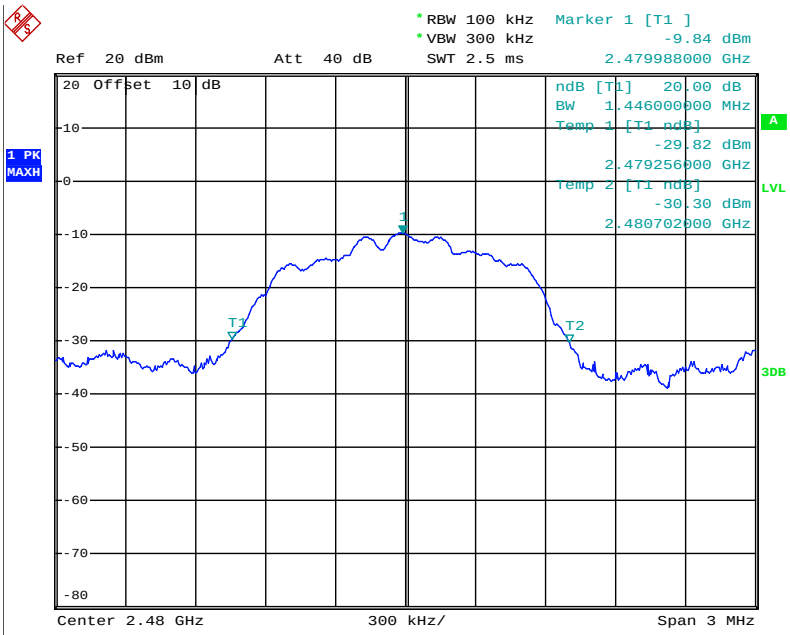
High channel



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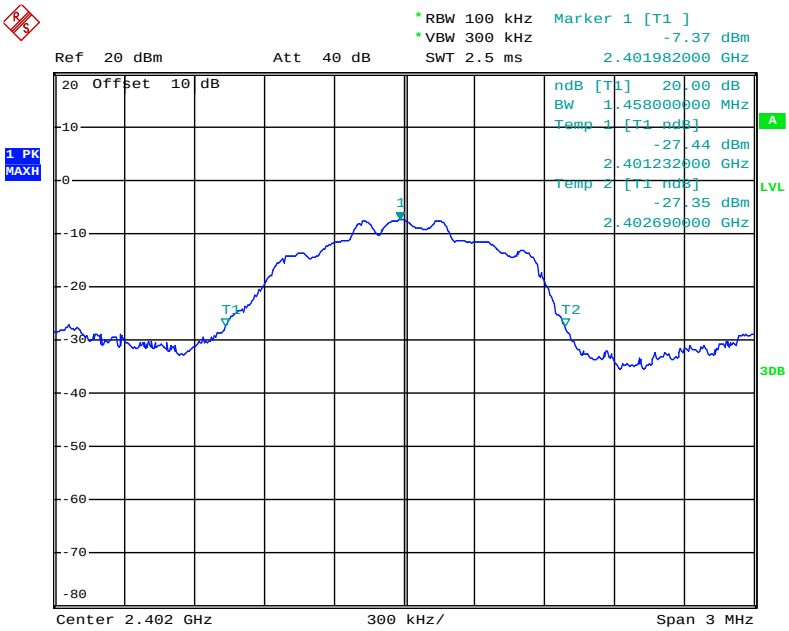
8DPSK Mode

Low channel



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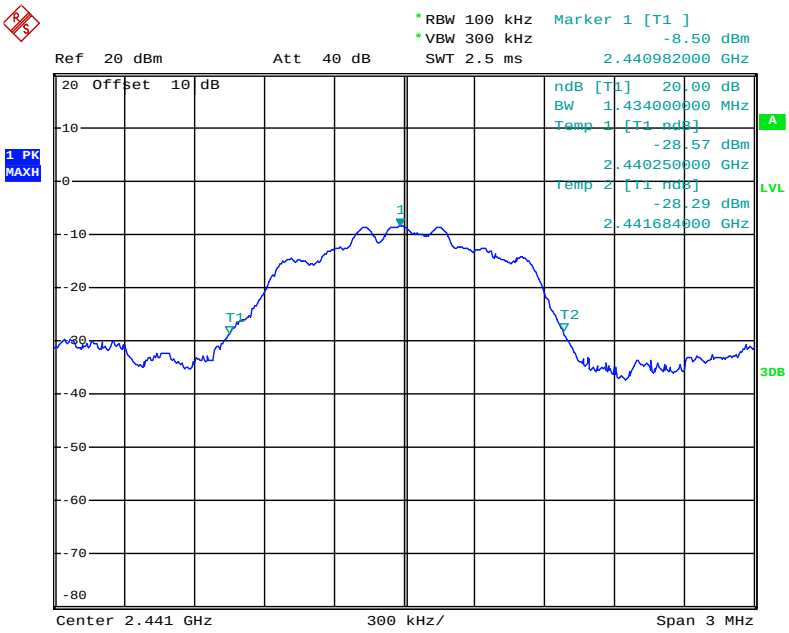
Middle channel



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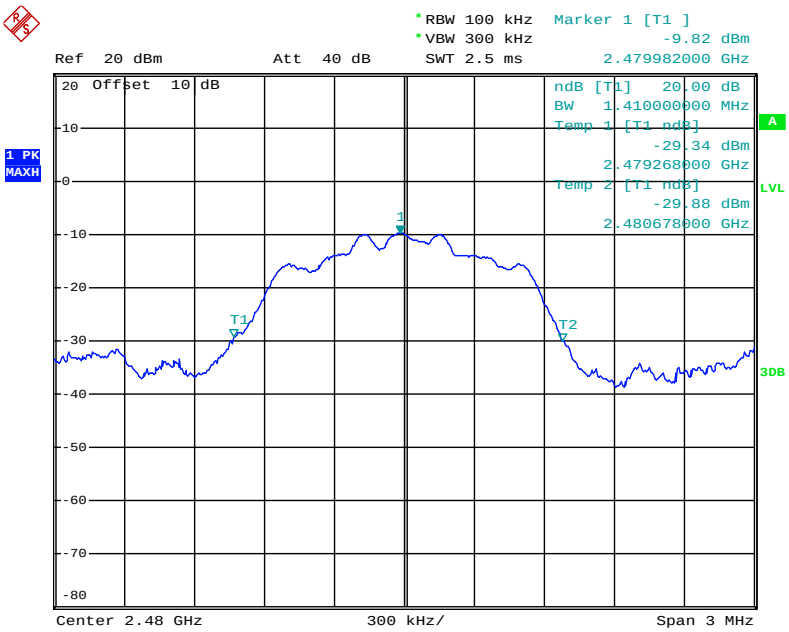
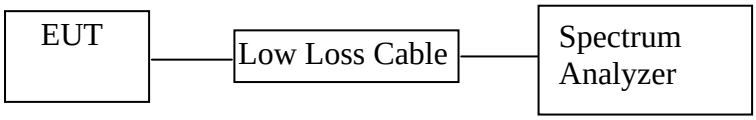
High channel



Date: 21.JAN.2019 16:38:44

6. CARRIER FREQUENCY SEPARATION TEST

6.1.Block Diagram of Test Setup



6.2.The Requirement For Section 15.247(a)(1)

Section 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

6.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4.Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 6.1.

6.4.2.Turn on the power of all equipment.

6.4.3.Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

6.5.Test Procedure

6.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

6.5.2.Set RBW of spectrum analyzer to 30 kHz and VBW to 100 kHz. Adjust Span to 3 MHz.

6.5.3.Set the adjacent channel of the EUT Maxhold another trace.

6.5.4.Measurement the channel separation

6.6.Test Result

Test Lab: Shielding room
Test Engineer: Frank

GFSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	0.996	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2480			

Π/4-DQPSK

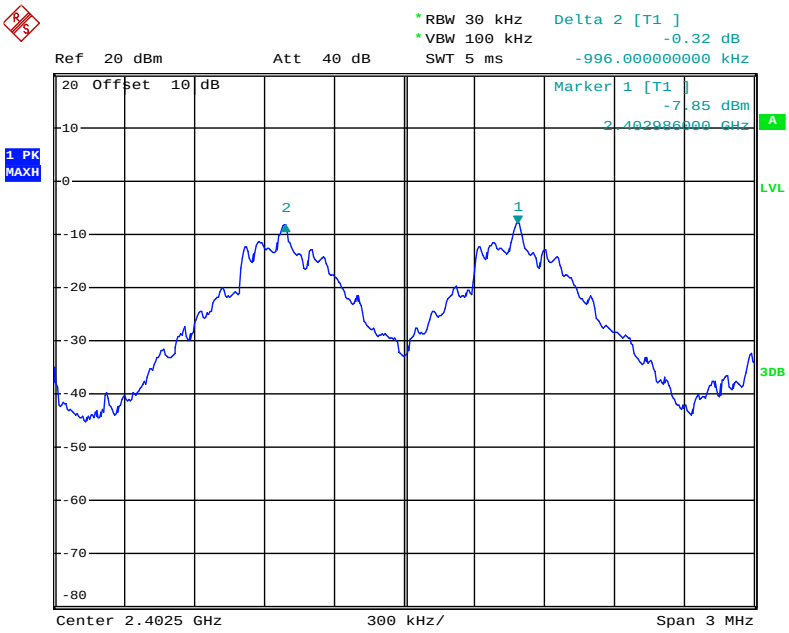
Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2480			

8DPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2480			

GFSK Mode

Low channel



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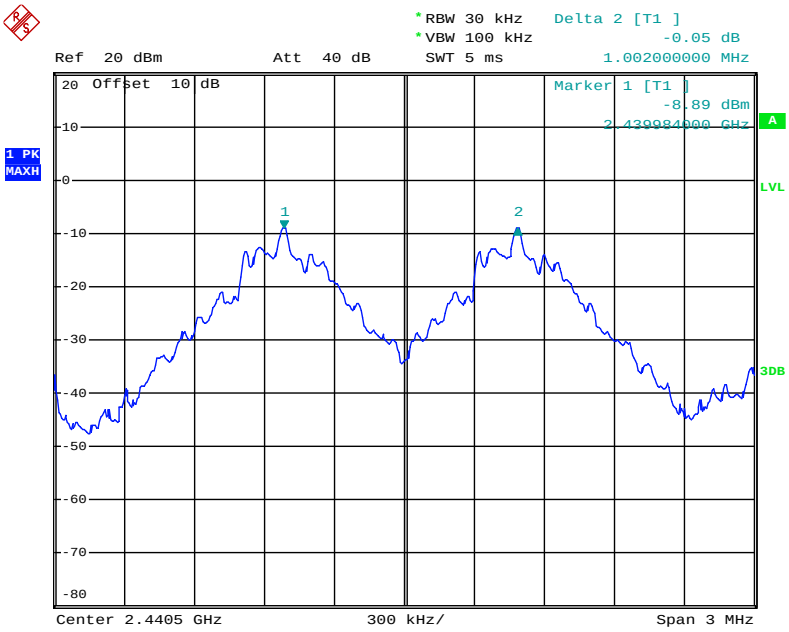
Middle channel



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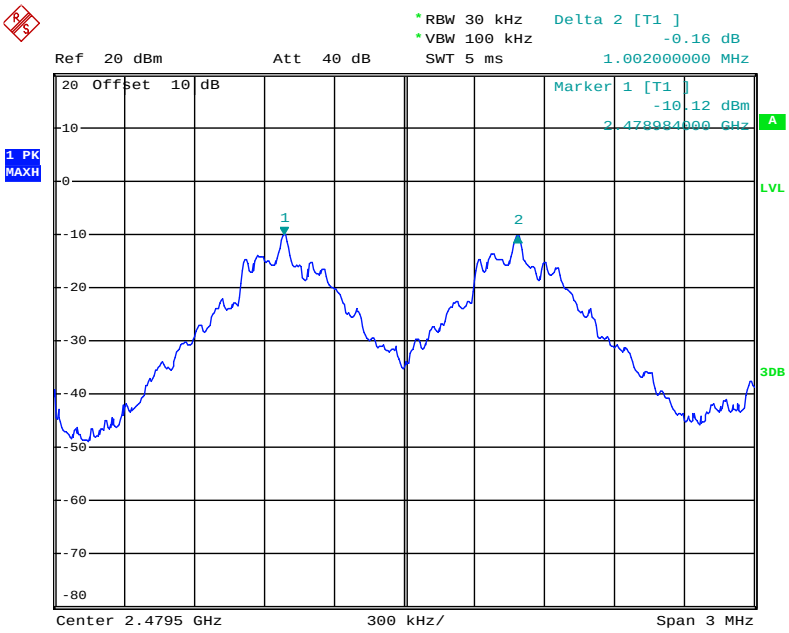
High channel



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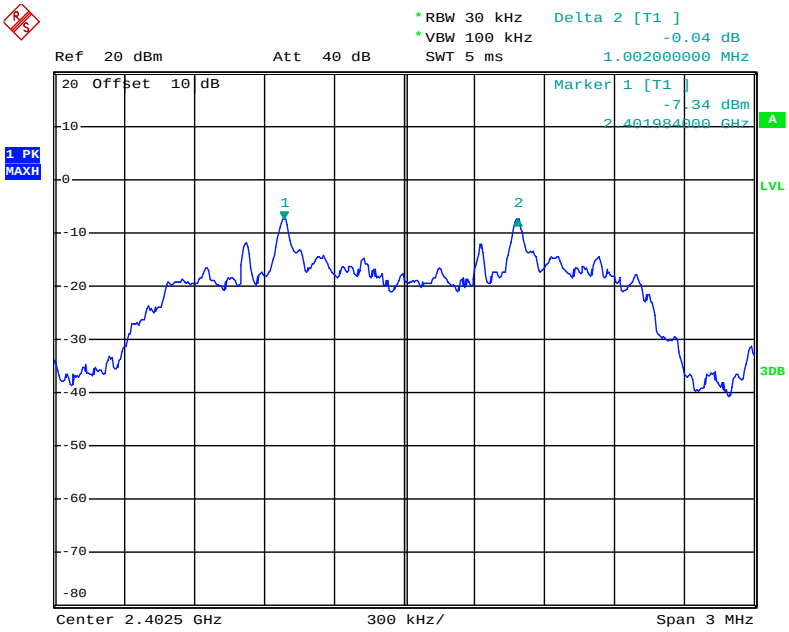
Π/4-DQPSK Mode

Low channel



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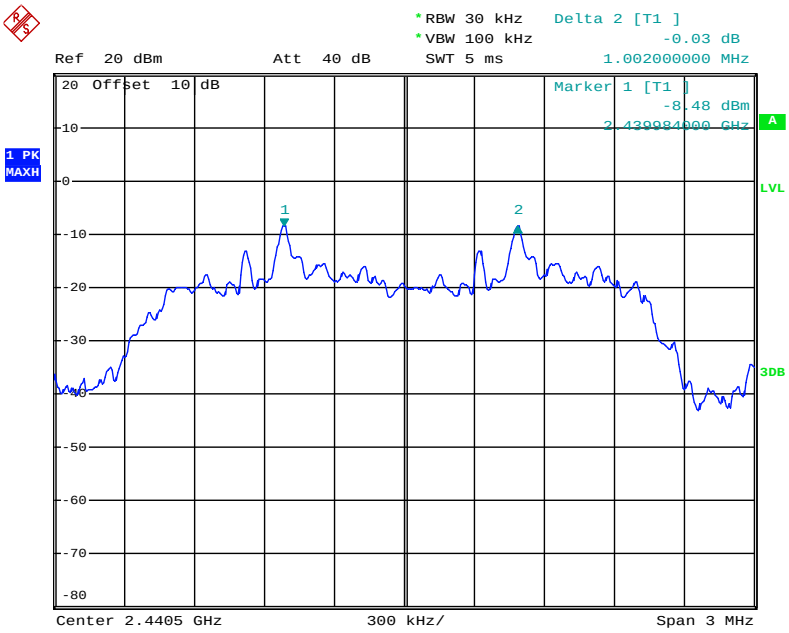
Middle channel



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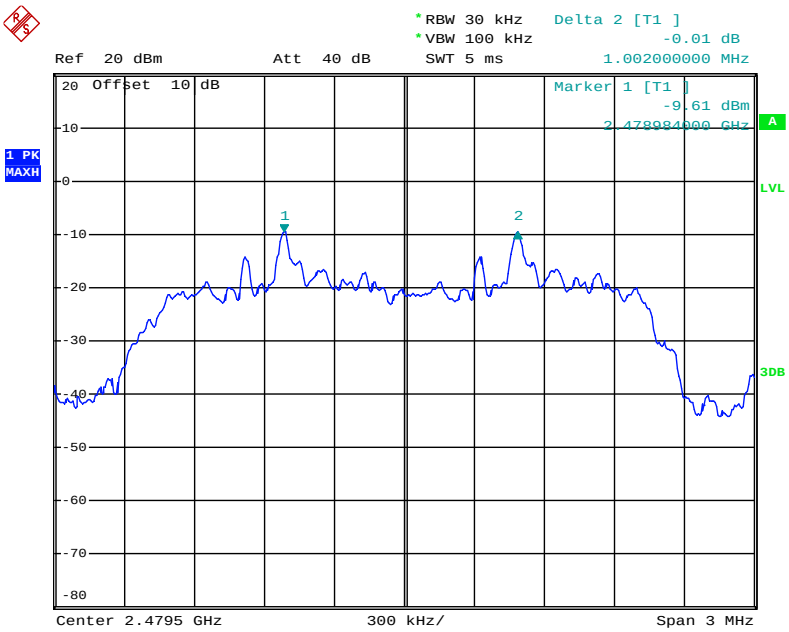
High channel



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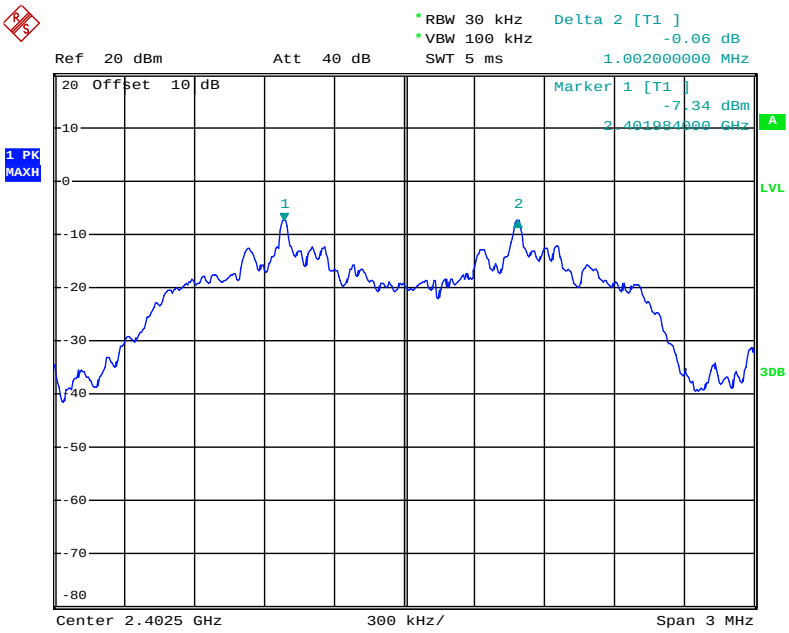
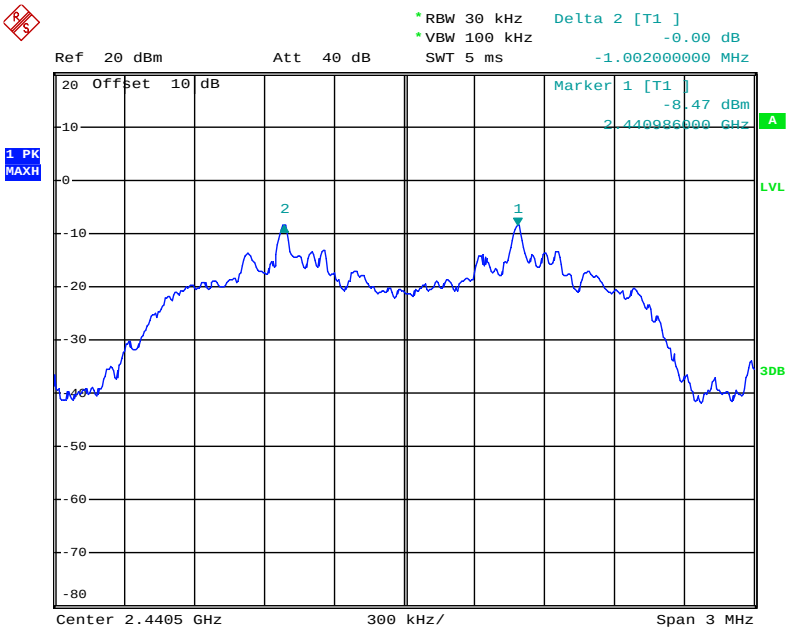
8DPSK Mode

Low channel



Date: 21.JAN.2019 17:14:32

Middle channel



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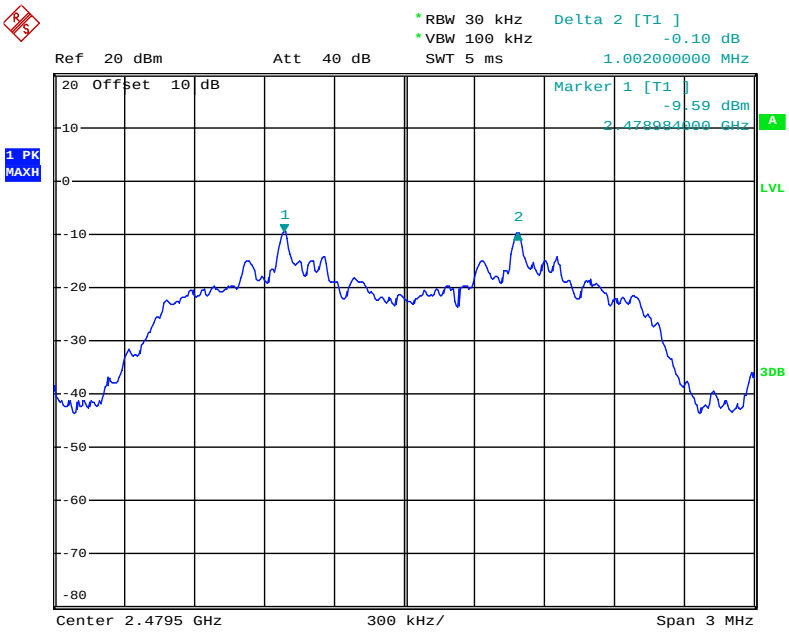
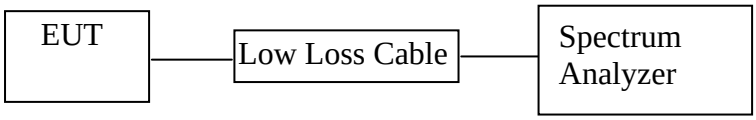
High channel



Date: 21.JAN.2019 17:15:32

7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Block Diagram of Test Setup



7.2.The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4.Operating Condition of EUT

7.4.1.Setup the EUT and simulator as shown as Section 7.1.

7.4.2.Turn on the power of all equipment.

7.4.3.Let the EUT work in TX (Hopping on) modes measure it.

7.5.Test Procedure

7.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2.Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz.

7.5.3.Max hold, view and count how many channel in the band.

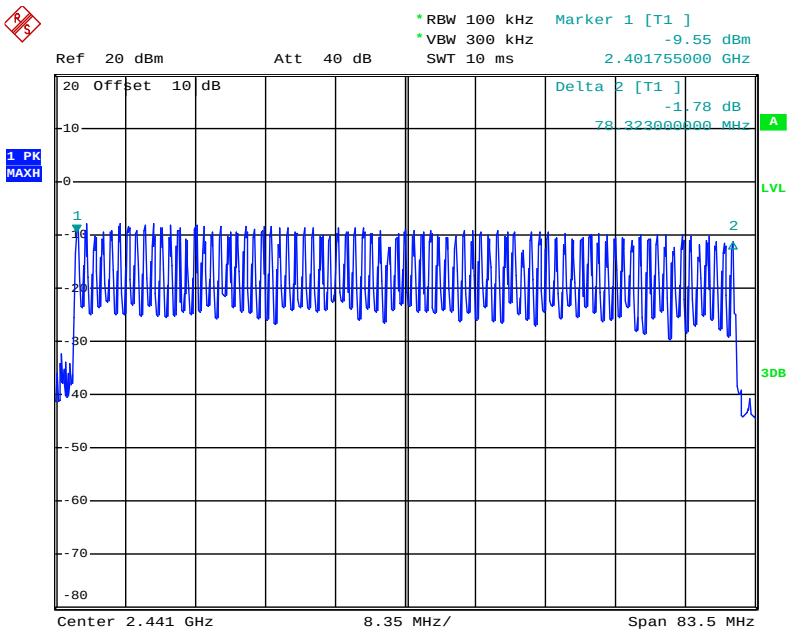
7.6.Test Result

Test Lab: Shielding room
Test Engineer: Frank

Total number of hopping channel	Measurement result(CH)	Limit(CH)	Result
	79	⩾15	Pass

The spectrum analyzer plots are attached as below.

Number of hopping channels (GFSK Mode)



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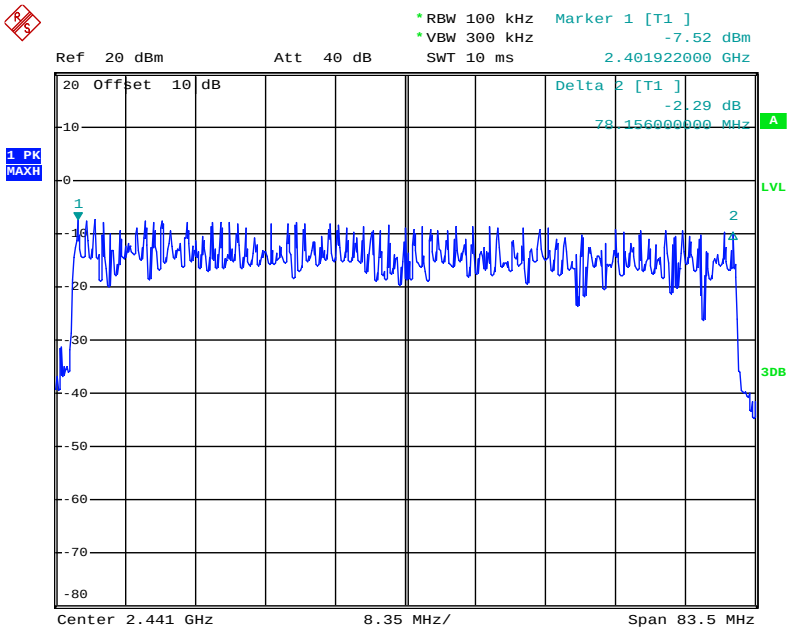
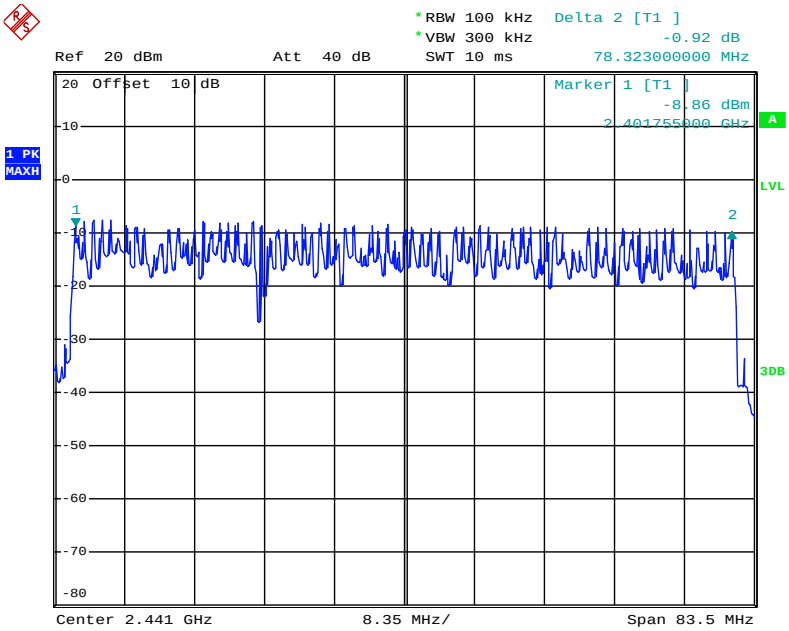
Number of hopping channels (Π/4-DQPSK Mode)



Date: 21.JAN.2019 17:09:20

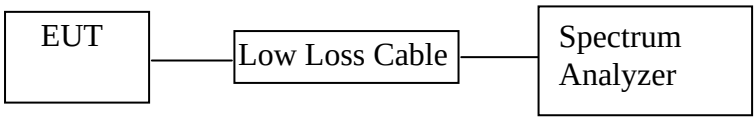
Number of hopping channels (8DPSK Mode)



Date: 21.JAN.2019 17:10:11

8. DWELL TIME TEST

8.1.Block Diagram of Test Setup



8.2.The Requirement For Section 15.247(a)(1)(iii)

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. 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. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4.Operating Condition of EUT

8.4.1.Setup the EUT and simulator as shown as Section 8.1.

8.4.2.Turn on the power of all equipment.

8.4.3.Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

8.5.Test Procedure

8.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.2.Set center frequency of spectrum analyzer = operating frequency.

8.5.3.Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span=0Hz, Adjust Sweep=5ms, 10ms, 15ms. Get the pulse time.

8.5.4.Repeat above procedures until all frequency measured were complete.

8.6.Test Result

Test Lab: Shielding room
Test Engineer: Frank

GFSK Mode (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.440	140.8	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(2*79))×31.6		
DH3	2441	1.720	275.2	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(4*79))×31.6		
DH5	2441	3.010	321.1	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(6*79))×31.6		

Π/4-DQPSK (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
2DH1	2441	0.450	144.0	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(2*79))×31.6		
2DH3	2441	1.740	278.4	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(4*79))×31.6		
2DH5	2441	3.020	322.1	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(6*79))×31.6		

8DPSK Mode (Worse case)

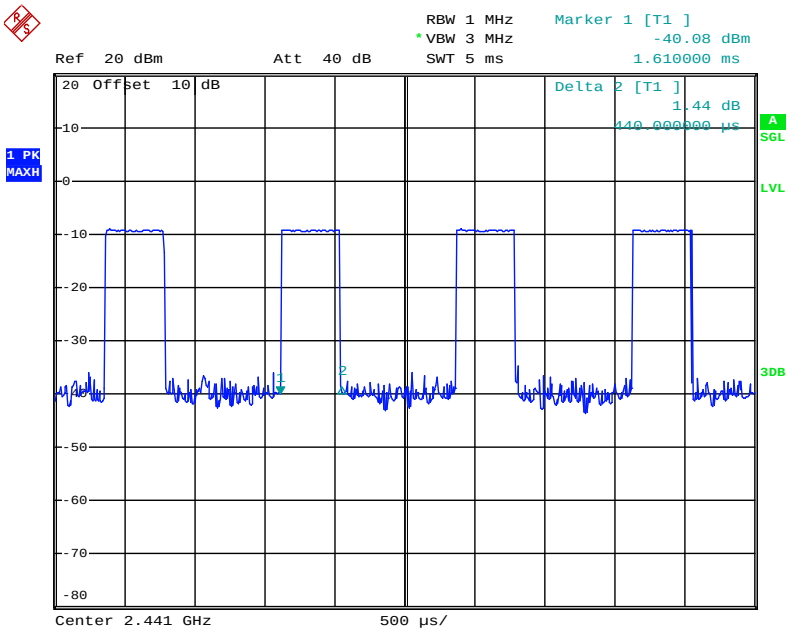
Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
3DH1	2441	0.450	144.0	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(2*79))×31.6		
3DH3	2441	1.750	280.0	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(4*79))×31.6		
3DH5	2441	2.970	316.8	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(6*79))×31.6		

Note: We tested GFSK mode and Π/4-DQPSK & 8DPSK mode the low, middle and high channel and recorded the Worse case data for all test mode.

The spectrum analyzer plots are attached as below.

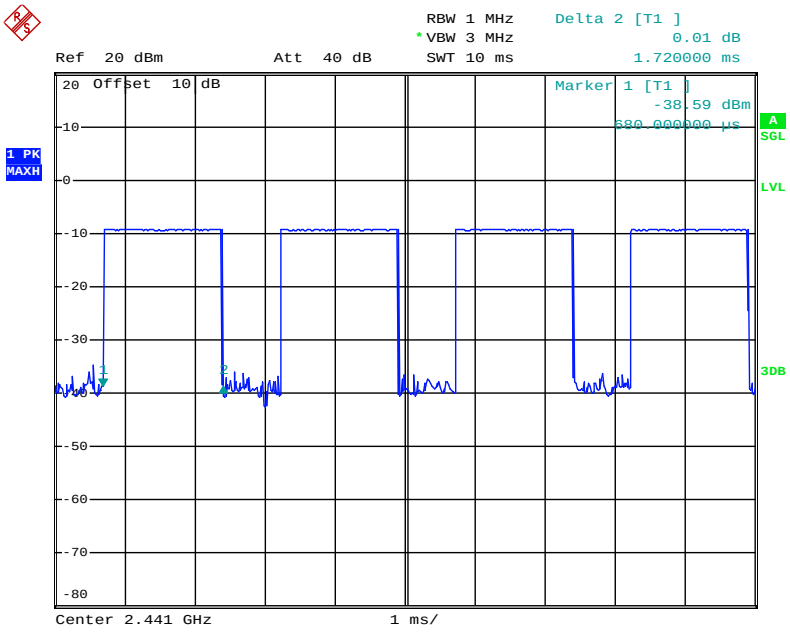
GFSK Mode

DH1 Middle channel



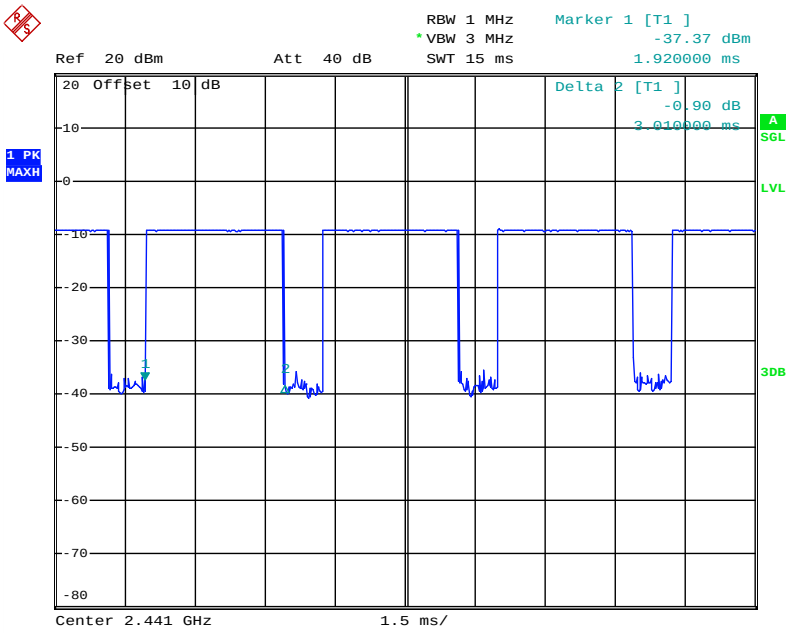
Date: 21.JAN.2019 17:20:09

DH3 Middle channel



Date: 21.JAN.2019 17:18:58

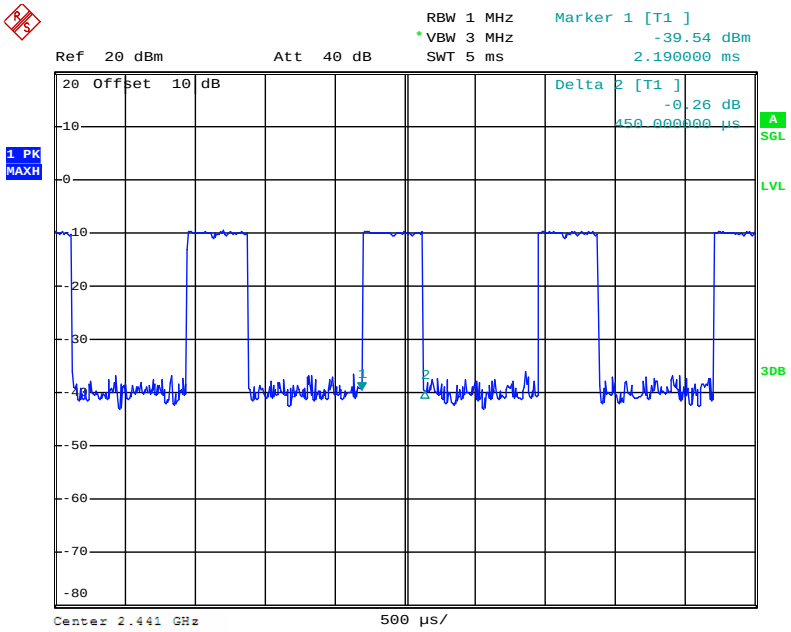
DH5 Middle channel



Date: 21.JAN.2019 17:18:34

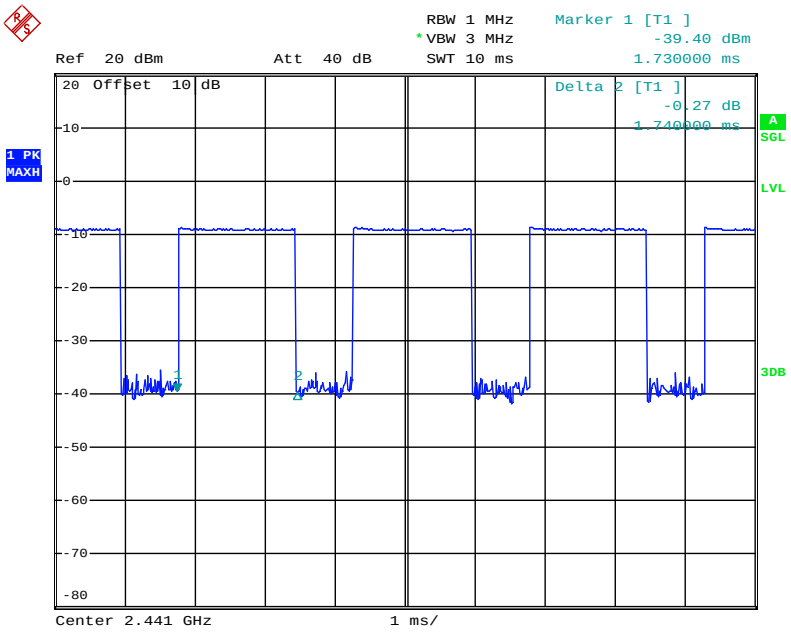
Π/4-DQPSK Mode

2DH1 Middle channel



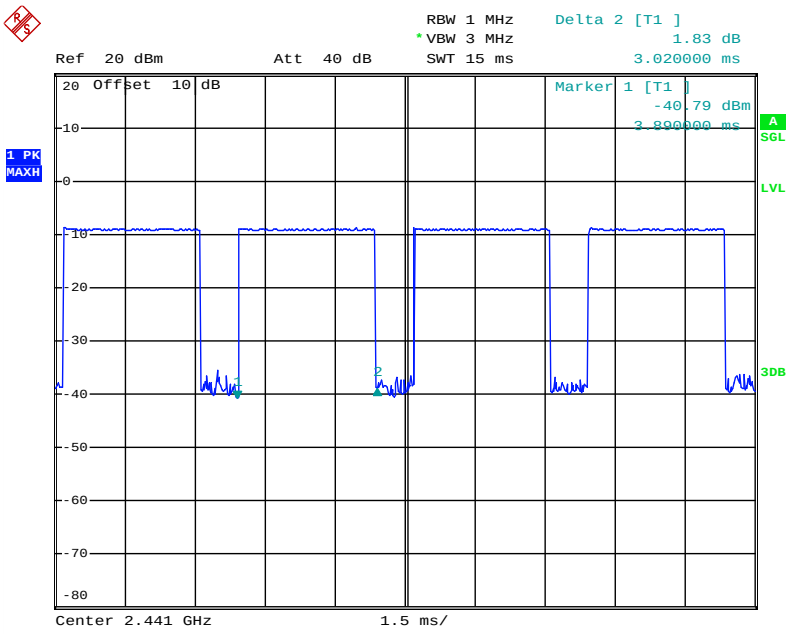
Date: 21.JAN.2019 17:29:56

2DH3 Middle channel



Date: 21.JAN.2019 17:25:24

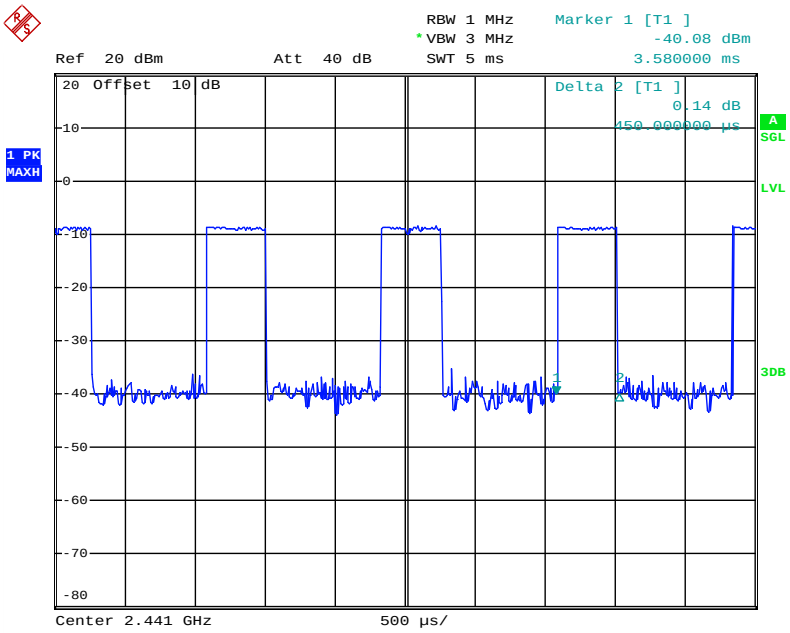
2DH5 Middle channel



Date: 21.JAN.2019 17:24:51

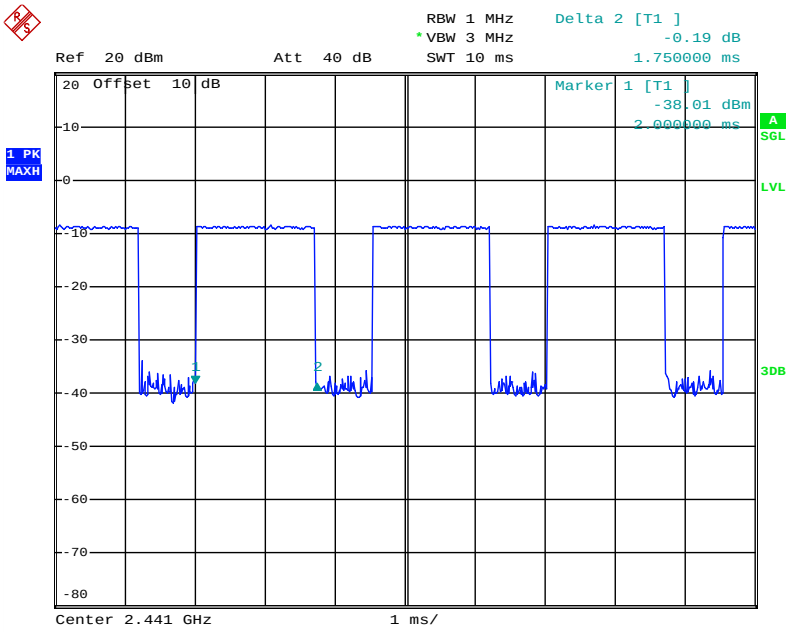
8DPSK Mode

3DH1 Middle channel



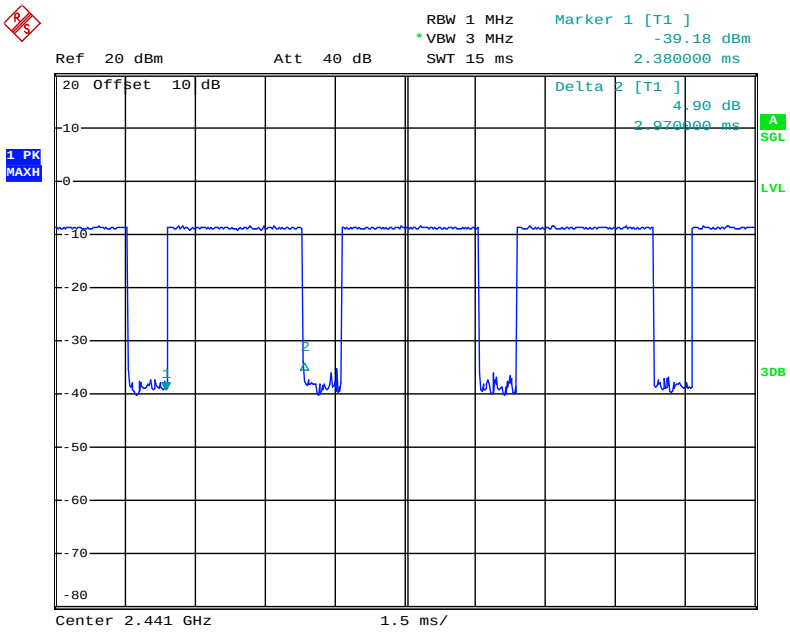
Date: 21.JAN.2019 17:34:50

3DH3 Middle channel



Date: 21.JAN.2019 17:34:23

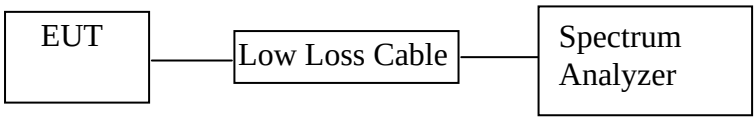
3DH5 Middle channel



Date: 21.JAN.2019 17:33:58

9. MAXIMUM PEAK OUTPUT POWER TEST

9.1.Block Diagram of Test Setup



9.2.The Requirement For Section 15.247(b)(1)

Section 15.247(b)(1): For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

9.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4.Operating Condition of EUT

9.4.1.Setup the EUT and simulator as shown as Section 9.1.

9.4.2.Turn on the power of all equipment.

9.4.3.Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

9.5.Test Procedure

9.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

9.5.2.Set RBW of spectrum analyzer to 3MHz and VBW to 10MHz.

9.5.3.Measurement the maximum peak output power.

9.6.Test Result

Test Lab: Shielding room
Test Engineer: Frank

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-5.79/0.0003	21 / 0.125
Middle	2441	-6.86/0.0002	21 / 0.125
High	2480	-7.93/0.0002	21 / 0.125

∏/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-5.31/0.0003	21 / 0.125
Middle	2441	-6.43/0.0002	21 / 0.125
High	2480	-7.14/0.0002	21 / 0.125

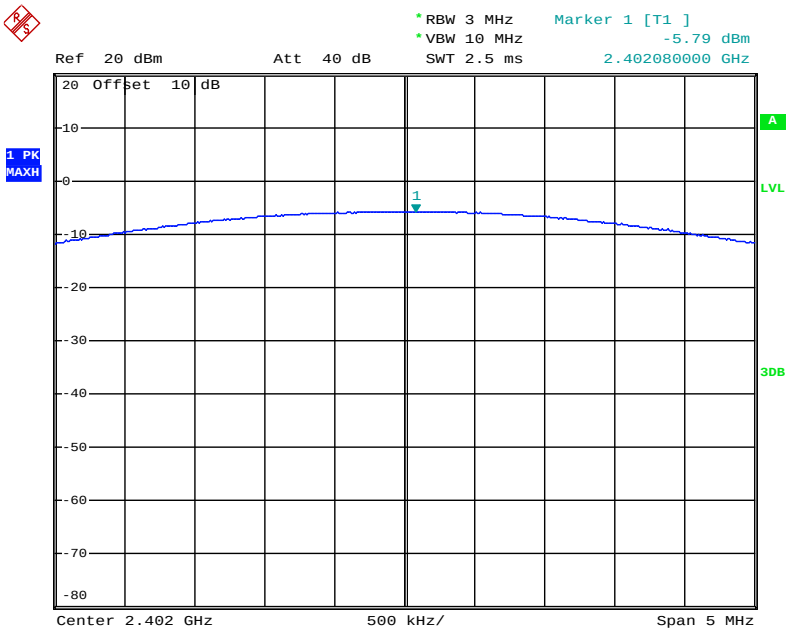
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	-5.06/0.0003	21 / 0.125
Middle	2441	-6.53/0.0002	21 / 0.125
High	2480	-7.41/0.0002	21 / 0.125

The spectrum analyzer plots are attached as below.

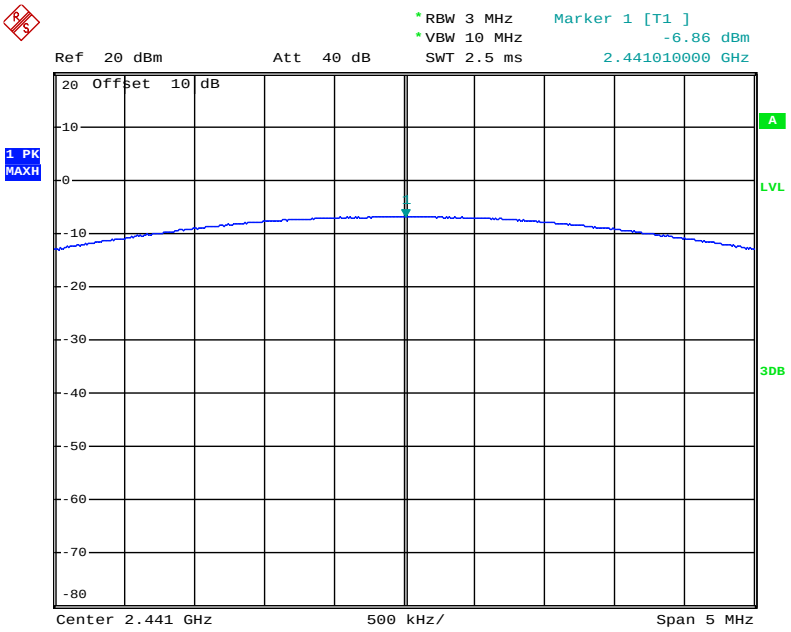
GFSK Mode

Low channel



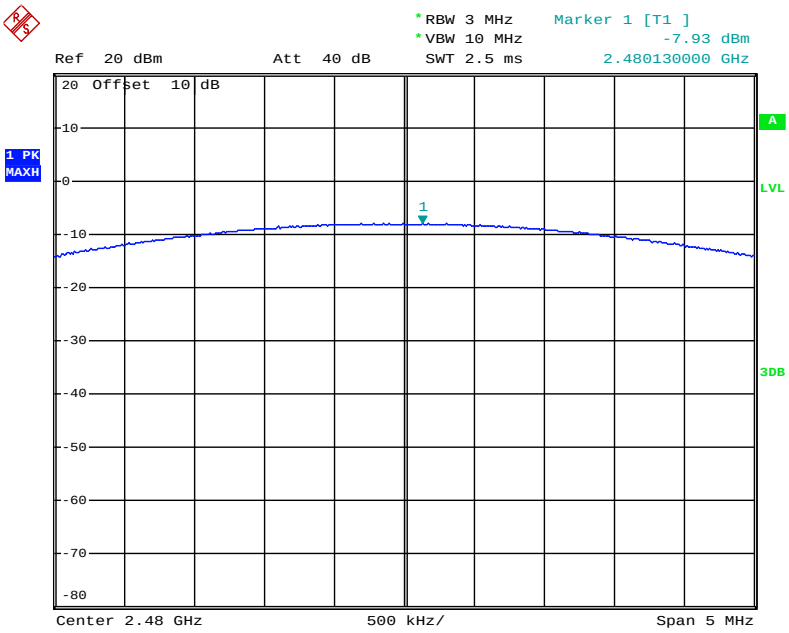
Date: 24.JAN.2019 09:50:44

Middle channel



Date: 24.JAN.2019 09:51:24

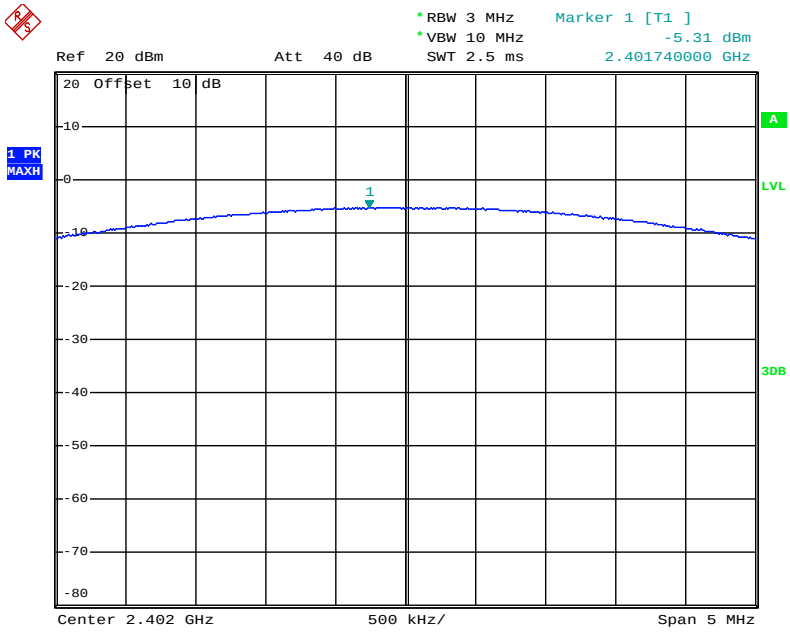
High channel



Date: 24.JAN.2019 09:51:55

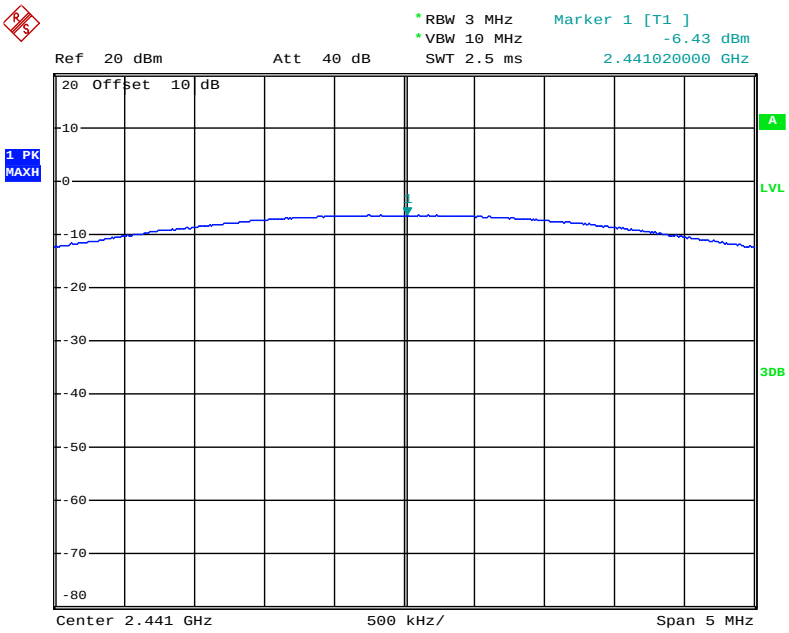
Π/4-DQPSK Mode

Low channel



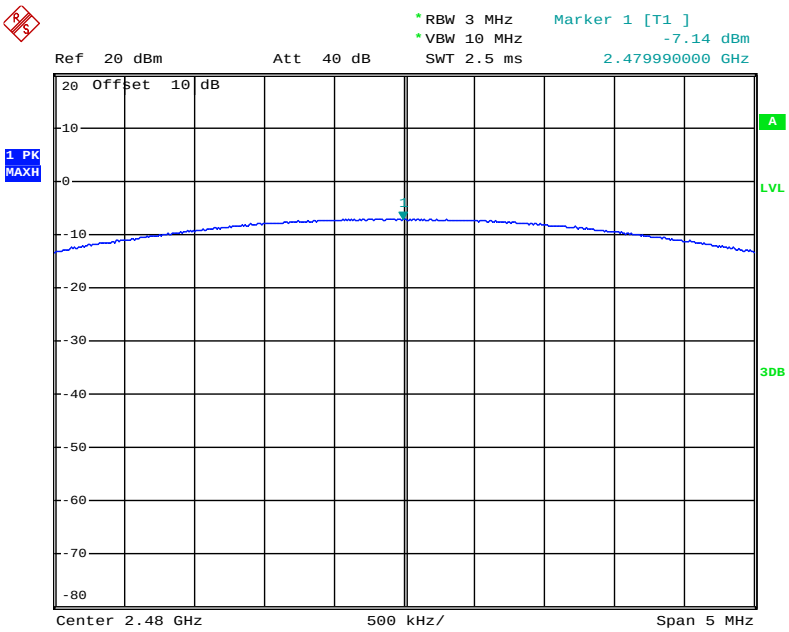
Date: 24.JAN.2019 09:53:04

Middle channel



Date: 24.JAN.2019 09:52:44

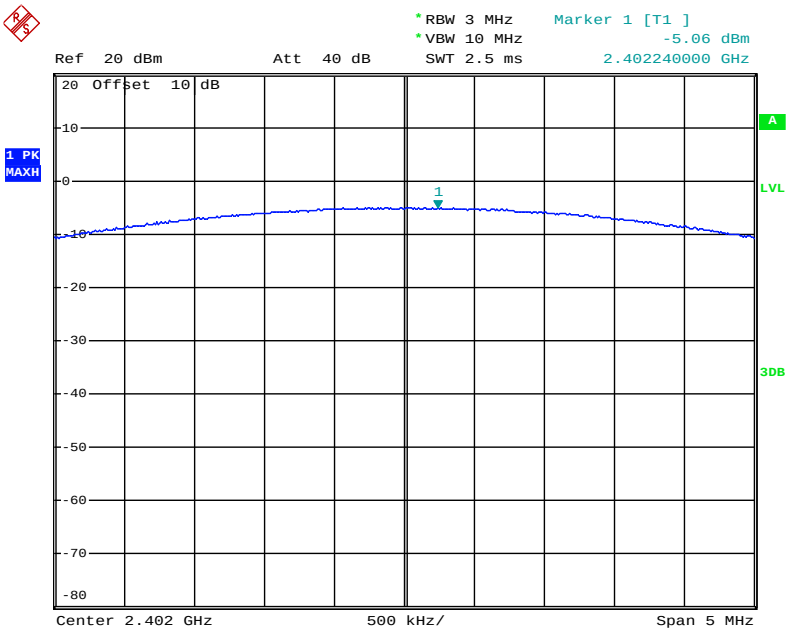
High channel



Date: 24.JAN.2019 09:52:23

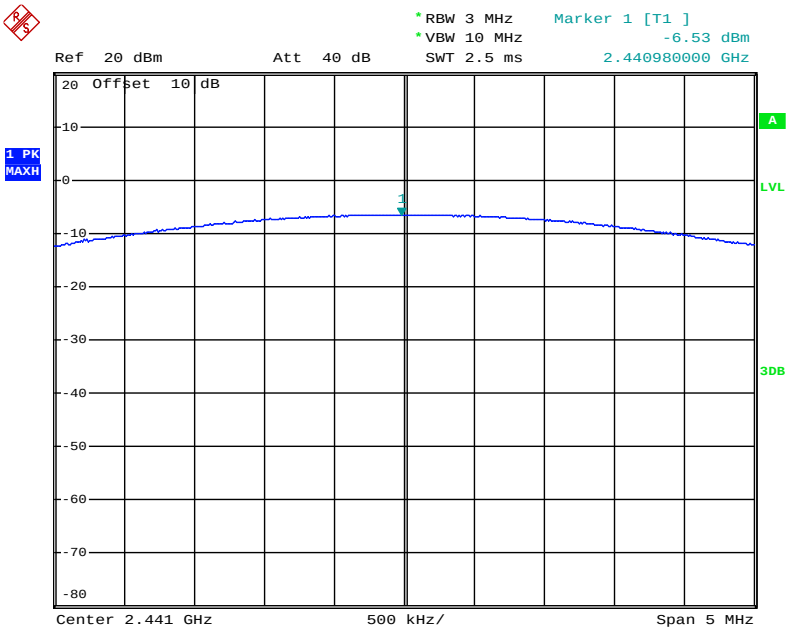
8DPSK Mode

Low channel



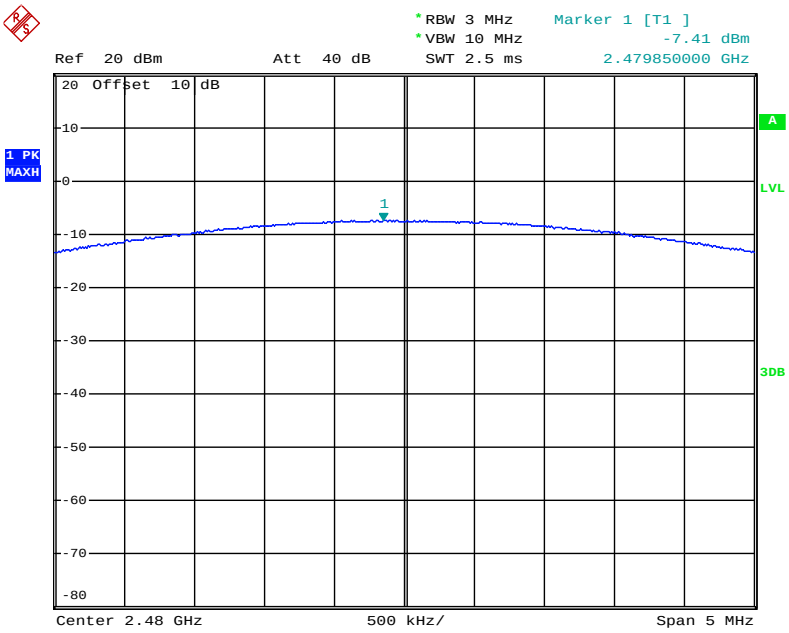
Date: 24.JAN.2019 09:53:25

Middle channel



Date: 24.JAN.2019 09:53:51

High channel



Date: 24.JAN.2019 09:54:12

10.RADIATED EMISSION TEST

10.1.Block Diagram of Test Setup

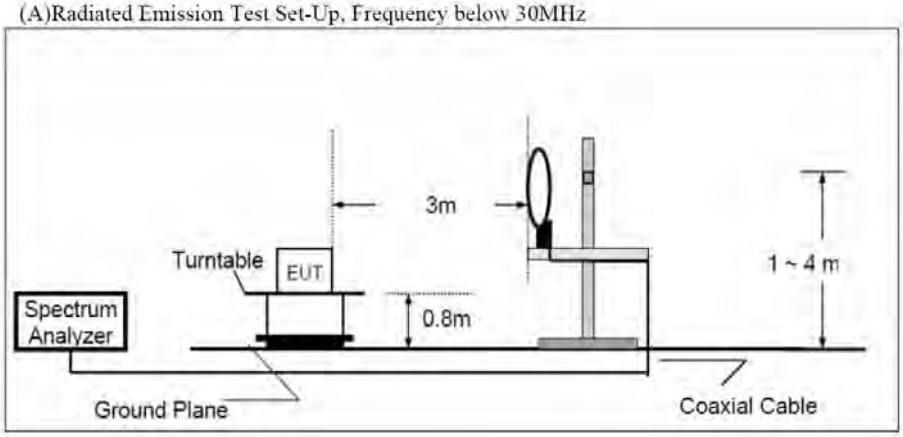
10.1.1.Block diagram of connection between the EUT and peripherals

EUT

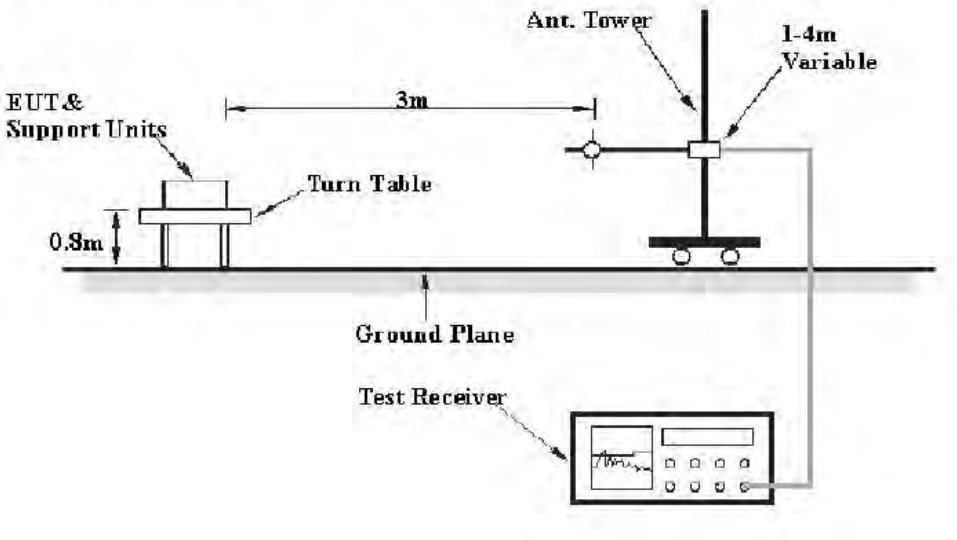
Figure 1 Setup: Transmitting mode

10.1.2.Semi-Anechoic Chamber Test Setup Diagram

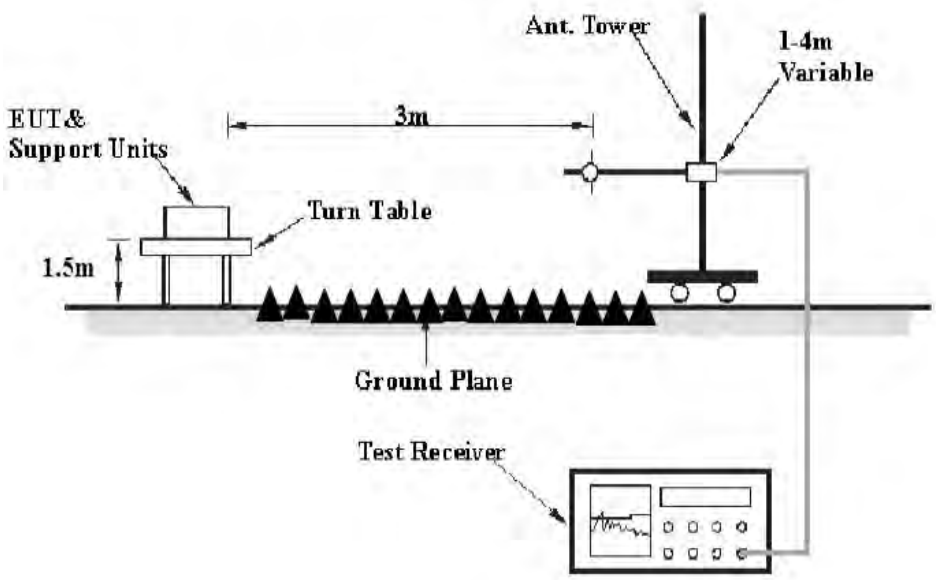
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B)Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



10.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, 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, as permitted under paragraph (b)(3) of this section, 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).

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4.Configuration of EUT on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.5. Operating Condition of EUT

10.5.1. Setup the EUT and simulator as shown as Section 10.1.

10.5.2. Turn on the power of all equipment.

10.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2441MHz, and 2480MHz TX frequency to transmit.

10.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the Worse case position data was reported.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

10.7.Data Sample

Frequency (MHz)	Reading (dBμv)	Factor (dB/m)	Result (dBμv/m)	Limit (dBμv/m)	Margin (dB)	Remark
X.XX	28.66	-15.19	13.47	40.0	-26.53	QP

Frequency(MHz) = Emission frequency in MHz
Reading(dBμv) = Uncorrected Analyzer/Receiver reading
Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain
Result(dBμv/m) = Reading(dBμv) + Factor(dB/m)
Limit (dBμv/m) = Limit stated in standard
Margin (dB) = Result(dBμv/m) - Limit (dBμv/m)
QP = Quasi-peak Reading

Calculation Formula:
Margin(dB) = Result (dBμV/m)–Limit(dBμV/m)
Result(dBμV/m)= Reading(dBμV)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

10.8.Tetst Results

Pass.
Test Lab: 3m Anechoic chamber
Test Engineer: Frank

Note: 1.We tested GFSK mode, Π/4-DQPSK Mode & 8DPSK mode and recorded the Worse case data (8DPSK mode) for all test mode.

2. Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and 18 to 26.5GHz.

The spectrum analyzer plots are attached as below.

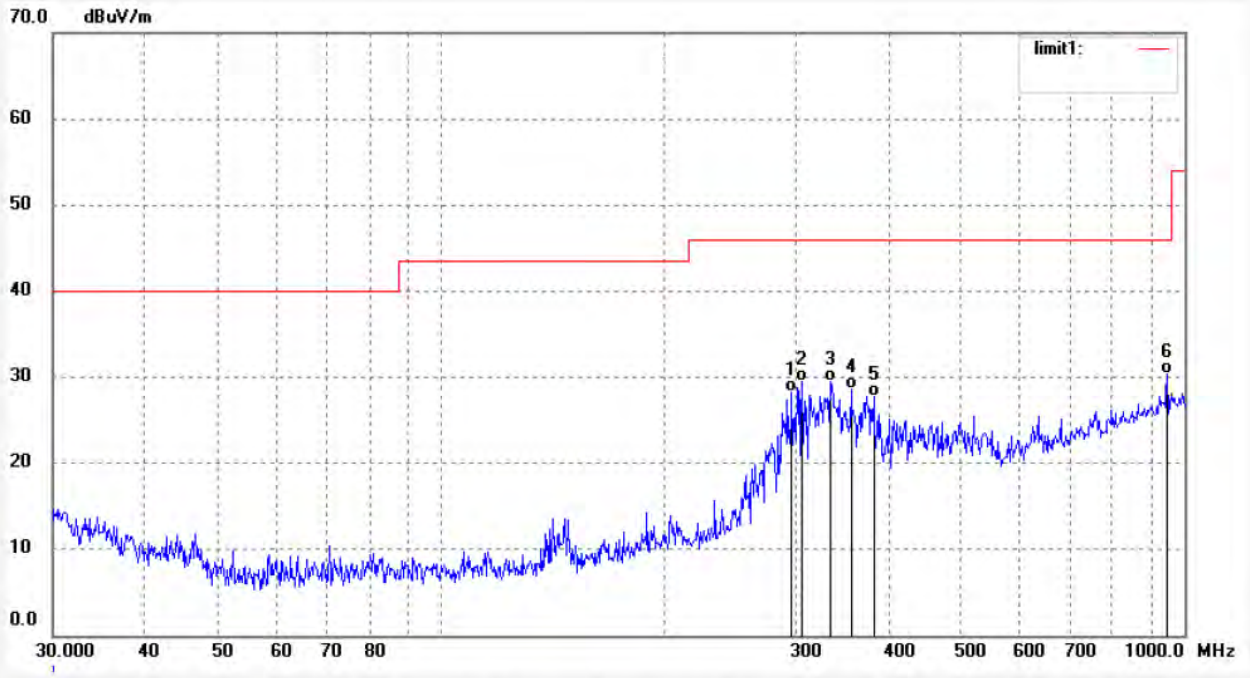
Below 1GHz

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019 #275
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2402MHz
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/01/25/
Time: 13/29/13
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



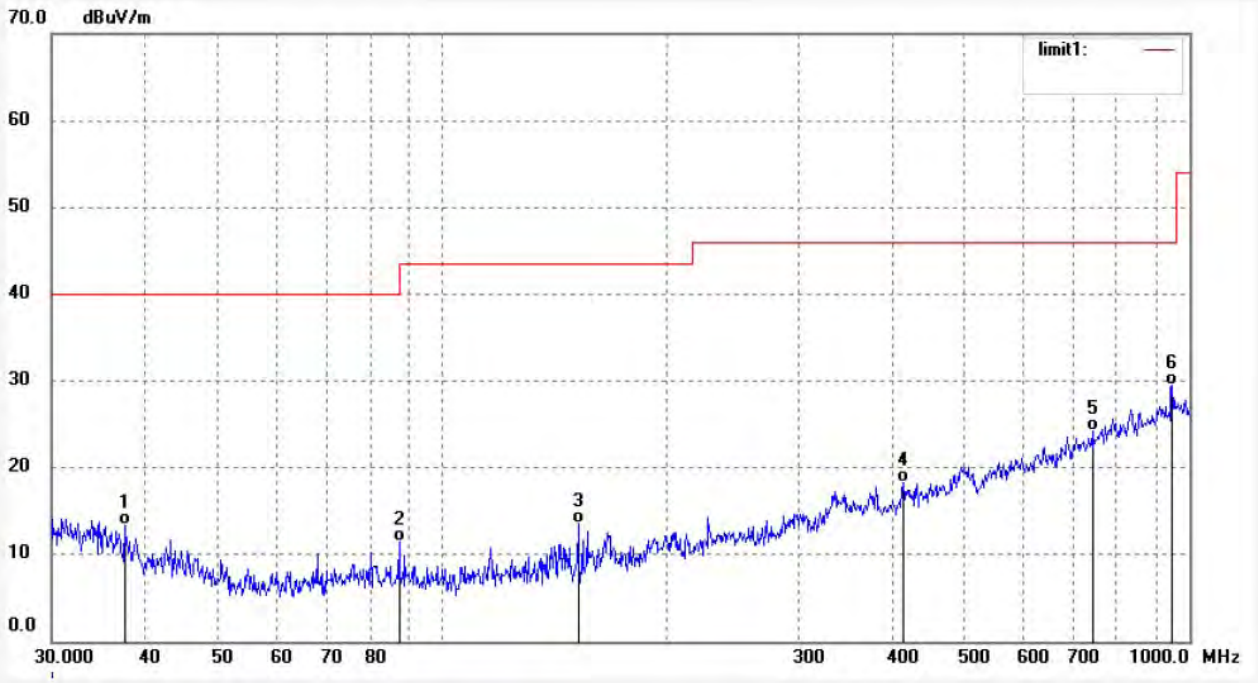
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	296.5022	49.61	-21.36	28.25	46.00	-17.75	QP	200	201	
2	306.0282	50.48	-21.04	29.44	46.00	-16.56	QP	200	321	
3	334.1254	49.45	-19.94	29.51	46.00	-16.49	QP	200	66	
4	355.9397	47.63	-19.09	28.54	46.00	-17.46	QP	200	146	
5	381.8519	46.30	-18.60	27.70	46.00	-18.30	QP	200	52	
6	948.6608	36.69	-6.35	30.34	46.00	-15.66	QP	200	132	

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019 #274
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2402MHz
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/01/25/
Time: 13/28/24
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	37.5647	35.90	-22.55	13.35	40.00	-26.65	QP	100	103	
2	87.6050	38.86	-27.44	11.42	40.00	-28.58	QP	100	212	
3	152.0902	41.49	-27.87	13.62	43.50	-29.88	QP	100	19	
4	413.9912	36.34	-18.06	18.28	46.00	-27.72	QP	100	221	
5	741.8155	34.69	-10.51	24.18	46.00	-21.82	QP	100	312	
6	948.6608	35.84	-6.35	29.49	46.00	-16.51	QP	100	210	

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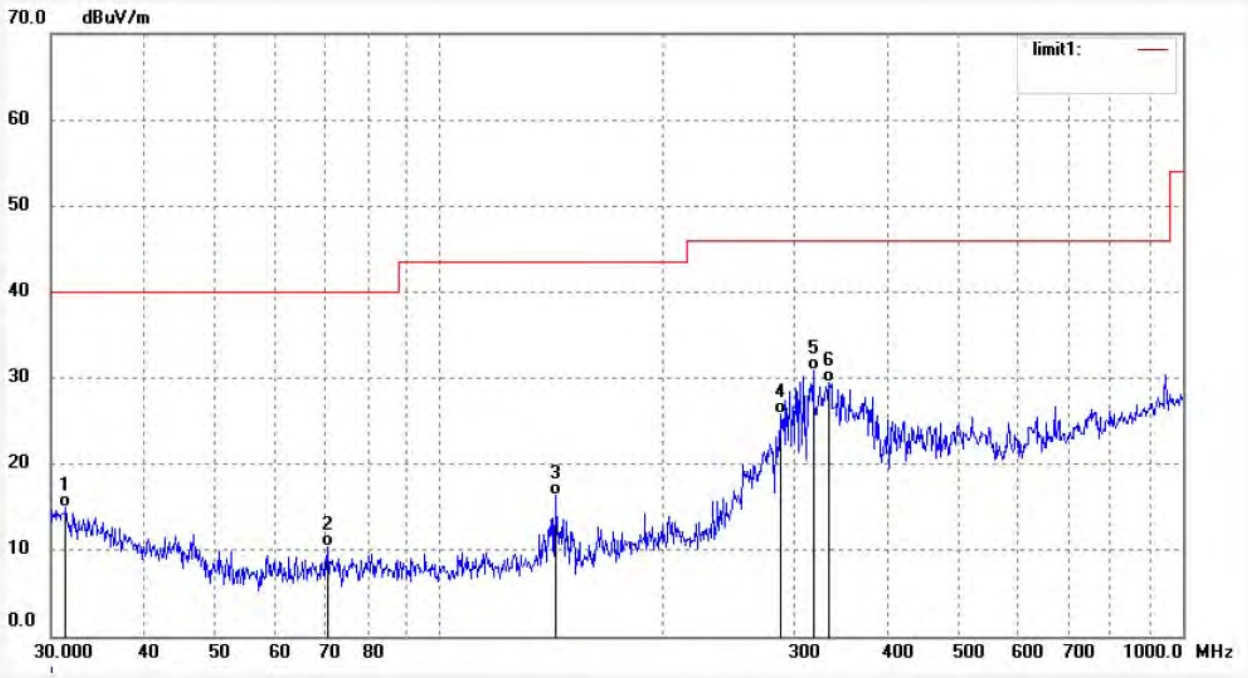
Job No.: FRANK2019 #276
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2441MHz
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/01/25/
Time: 13/29/29
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.4021	35.45	-20.55	14.90	40.00	-25.10	QP	200	201	
2	70.7047	37.99	-27.52	10.47	40.00	-29.53	QP	200	331	
3	143.2717	44.41	-28.00	16.41	43.50	-27.09	QP	200	210	
4	287.2727	47.58	-21.79	25.79	46.00	-20.21	QP	200	63	
5	318.0874	51.58	-20.68	30.90	46.00	-15.10	QP	200	116	
6	334.1254	49.45	-19.94	29.51	46.00	-16.49	QP	200	302	

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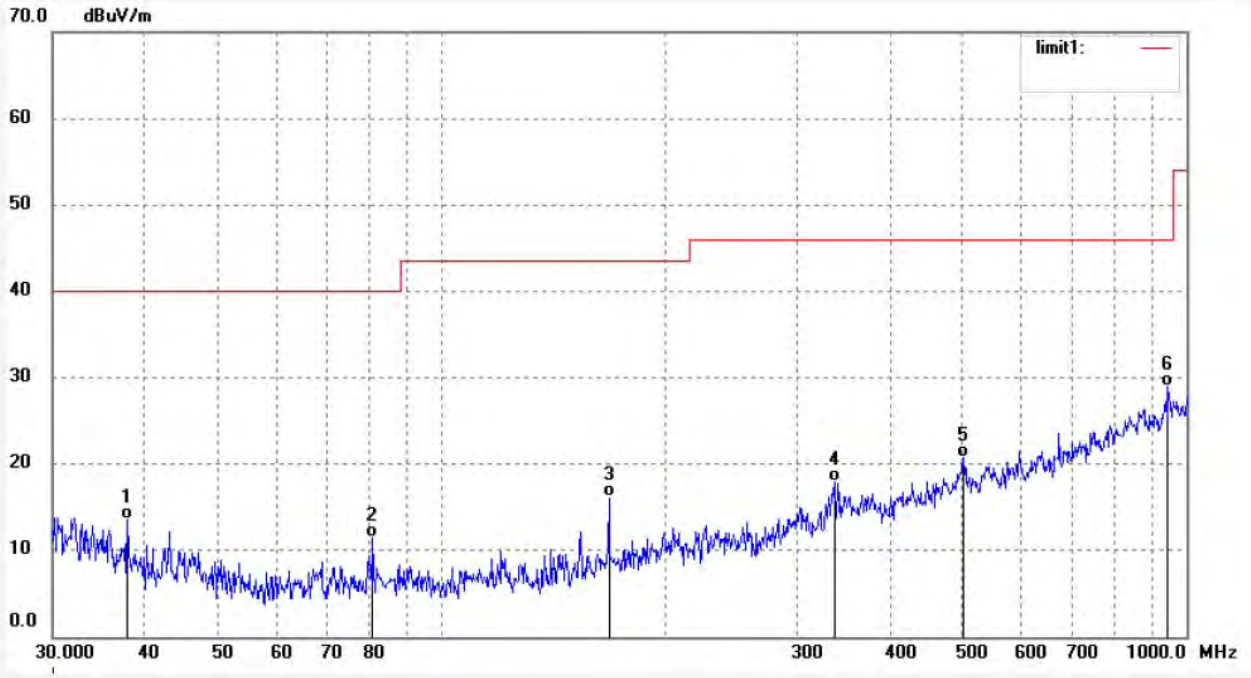
Job No.: FRANK2019 #277
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2441MHz
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/01/25/
Time: 13/29/51
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	37.8297	36.15	-22.67	13.48	40.00	-26.52	QP	100	302	
2	80.8041	38.78	-27.40	11.38	40.00	-28.62	QP	100	111	
3	167.8136	42.33	-26.23	16.10	43.50	-27.40	QP	100	62	
4	337.6659	37.68	-19.81	17.87	46.00	-28.13	QP	100	113	
5	502.2472	37.00	-16.26	20.74	46.00	-25.26	QP	100	301	
6	945.3336	35.38	-6.41	28.97	46.00	-17.03	QP	100	187	

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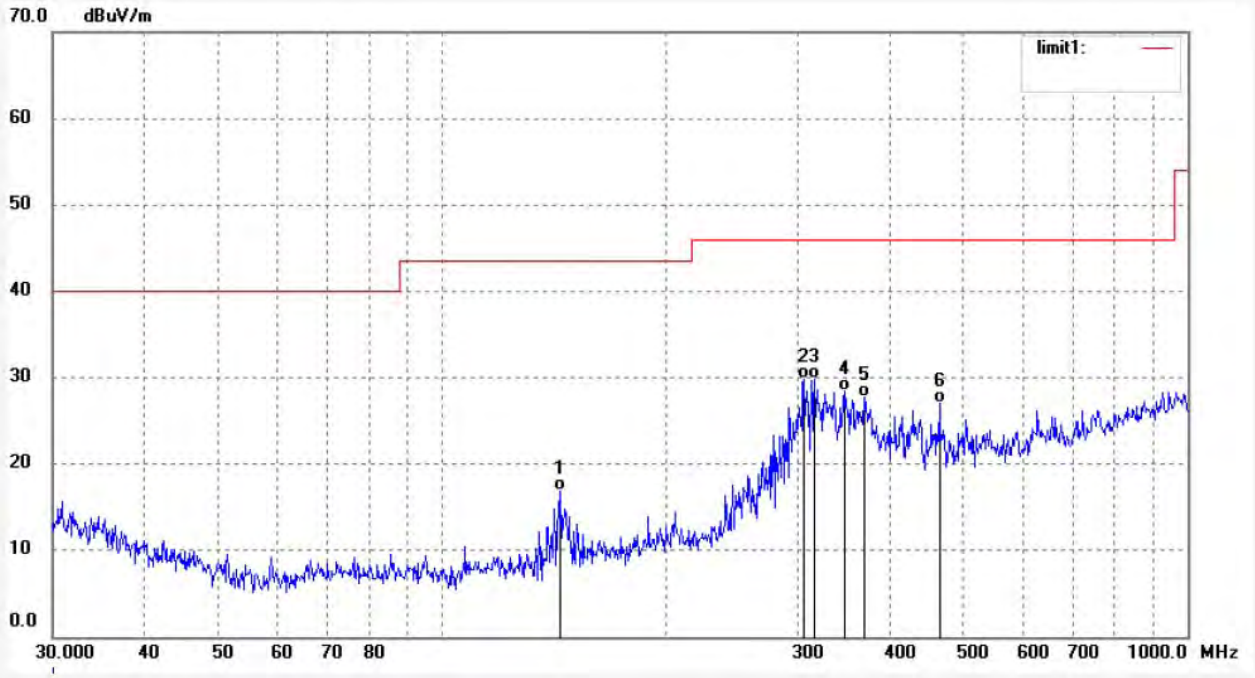
Job No.: FRANK2019 #279
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2480MHz
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/01/25/
Time: 13/31/01
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	144.2820	44.92	-28.03	16.89	43.50	-26.61	QP	200	322	
2	306.0282	50.92	-21.04	29.88	46.00	-16.12	QP	200	92	
3	315.8599	50.62	-20.76	29.86	46.00	-16.14	QP	200	191	
4	346.0740	47.89	-19.46	28.43	46.00	-17.57	QP	200	66	
5	368.6681	46.60	-18.80	27.80	46.00	-18.20	QP	200	316	
6	464.8867	43.94	-16.83	27.11	46.00	-18.89	QP	200	207	

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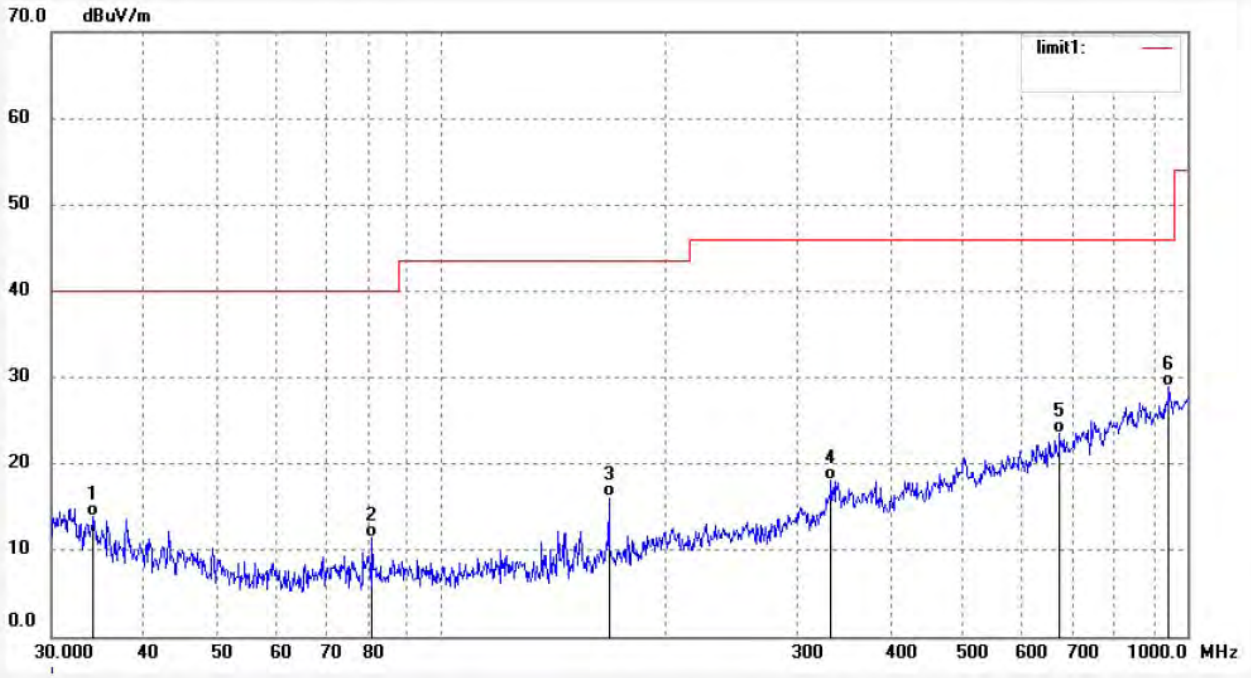
Job No.: FRANK2019 #278
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2480MHz
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/01/25/
Time: 13/30/06
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	34.1649	35.23	-21.25	13.98	40.00	-26.02	QP	100	201	
2	80.8041	38.78	-27.40	11.38	40.00	-28.62	QP	100	110	
3	167.8136	42.33	-26.23	16.10	43.50	-27.40	QP	100	66	
4	332.9534	38.02	-19.99	18.03	46.00	-27.97	QP	100	92	
5	674.6766	35.66	-12.05	23.61	46.00	-22.39	QP	100	22	
6	945.3336	35.38	-6.41	28.97	46.00	-17.03	QP	100	103	

Above 1GHz

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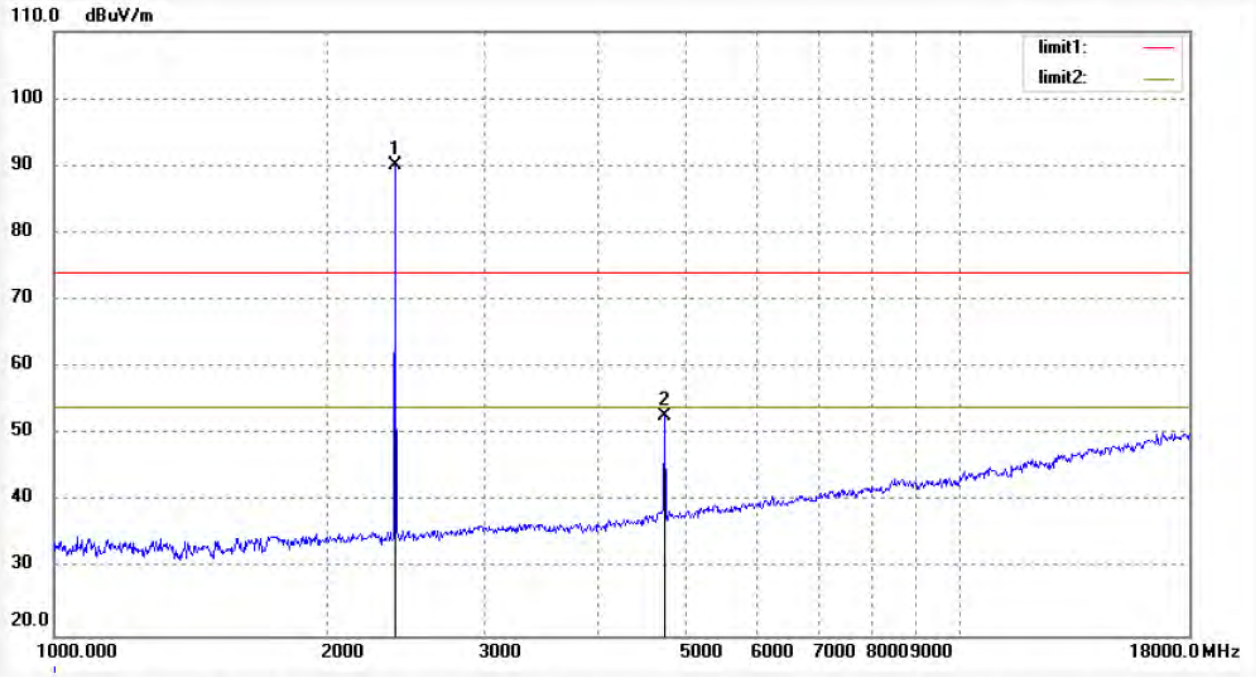
Job No.: FRANK2019 #303	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/01/25/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/26/21
EUT: Bluetooth Headphone Cable	Engineer Signature:
Mode: TX2402MHz	Distance: 3m
Model: XX	
Manufacturer: Consonance Technology Corporation	

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.019	96.44	-6.37	90.07	/	/	peak	200	165	
2	4804.057	52.06	0.70	52.76	74.00	-21.24	peak	200	310	

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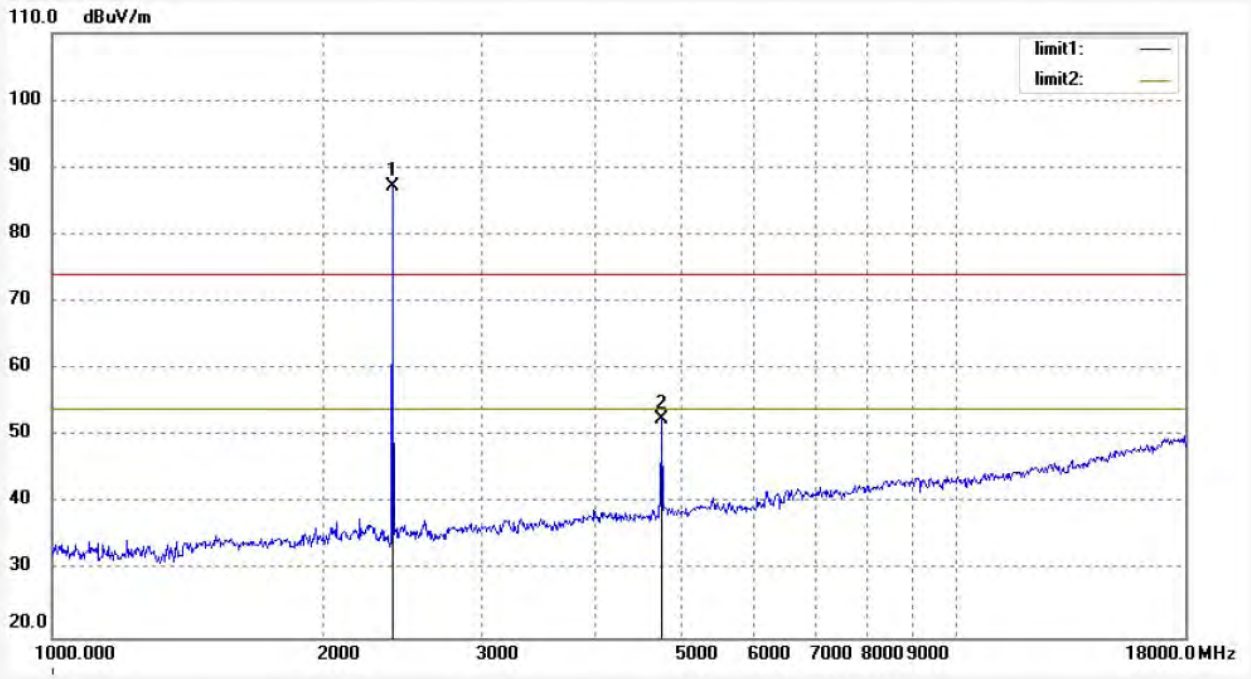
Job No.: FRANK2019 #302
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2402MHz
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/01/25/
Time: 14/24/27
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.019	93.54	-6.37	87.17	/	/	peak	150	201	
2	4804.157	51.79	0.70	52.49	74.00	-21.51	peak	150	93	

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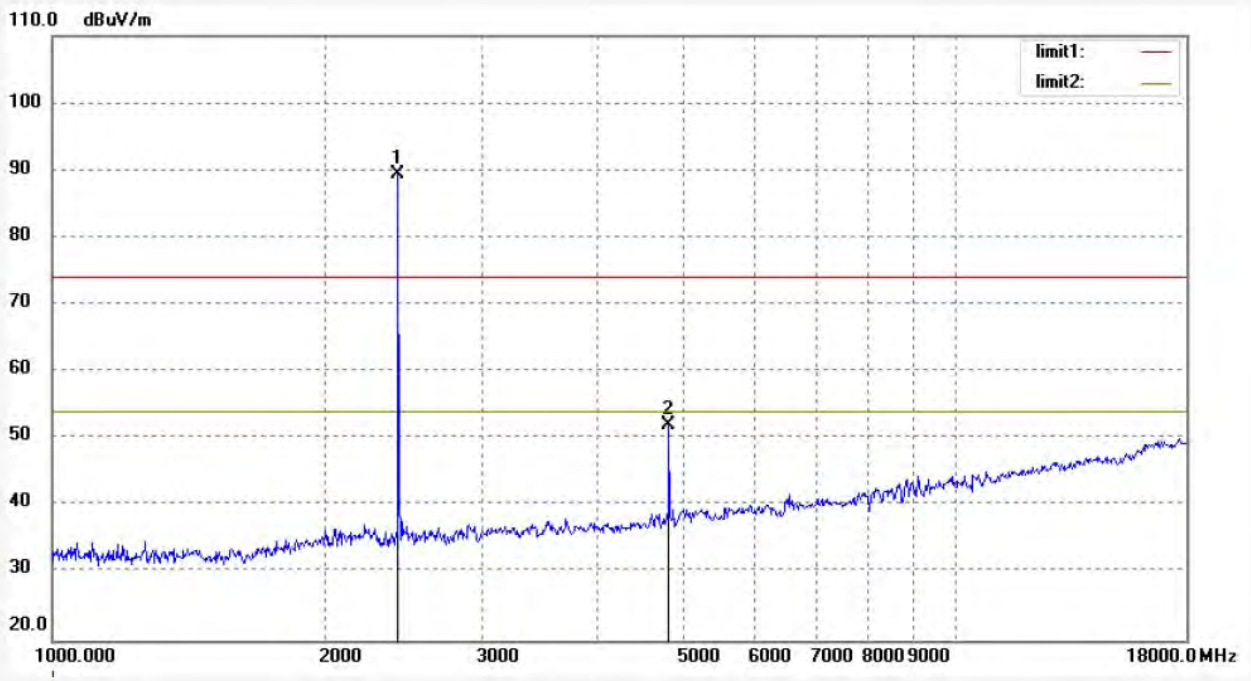
Job No.: FRANK2019 #300	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/01/25/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/22/02
EUT: Bluetooth Headphone Cable	Engineer Signature:
Mode: TX2441MHz	Distance: 3m
Model: XX	
Manufacturer: Consonance Technology Corporation	

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.021	95.55	-6.20	89.35	/	/	peak	200	195	
2	4882.124	51.09	1.07	52.16	74.00	-21.84	peak	200	164	

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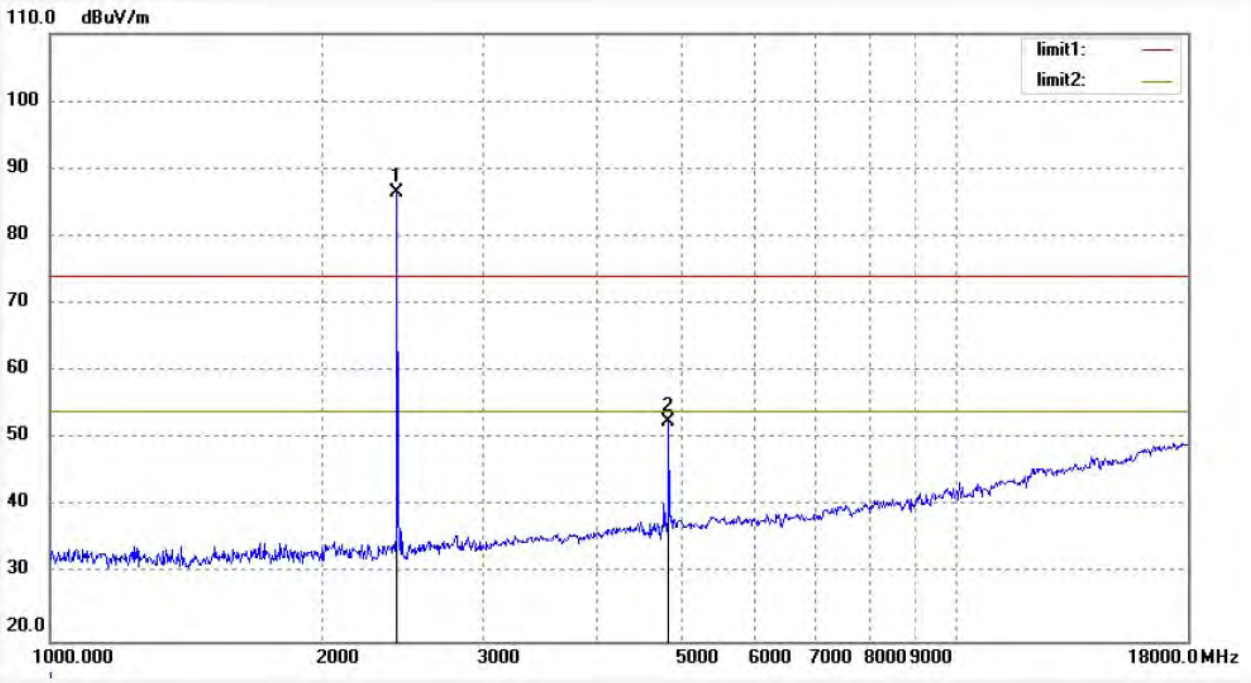
Job No.: FRANK2019 #301	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/01/25/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/23/07
EUT: Bluetooth Headphone Cable	Engineer Signature:
Mode: TX2441MHz	Distance: 3m
Model: XX	
Manufacturer: Consonance Technology Corporation	

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.121	92.67	-6.20	86.47	/	/	peak	150	154	
2	4882.024	51.47	1.07	52.54	74.00	-21.46	peak	150	32	

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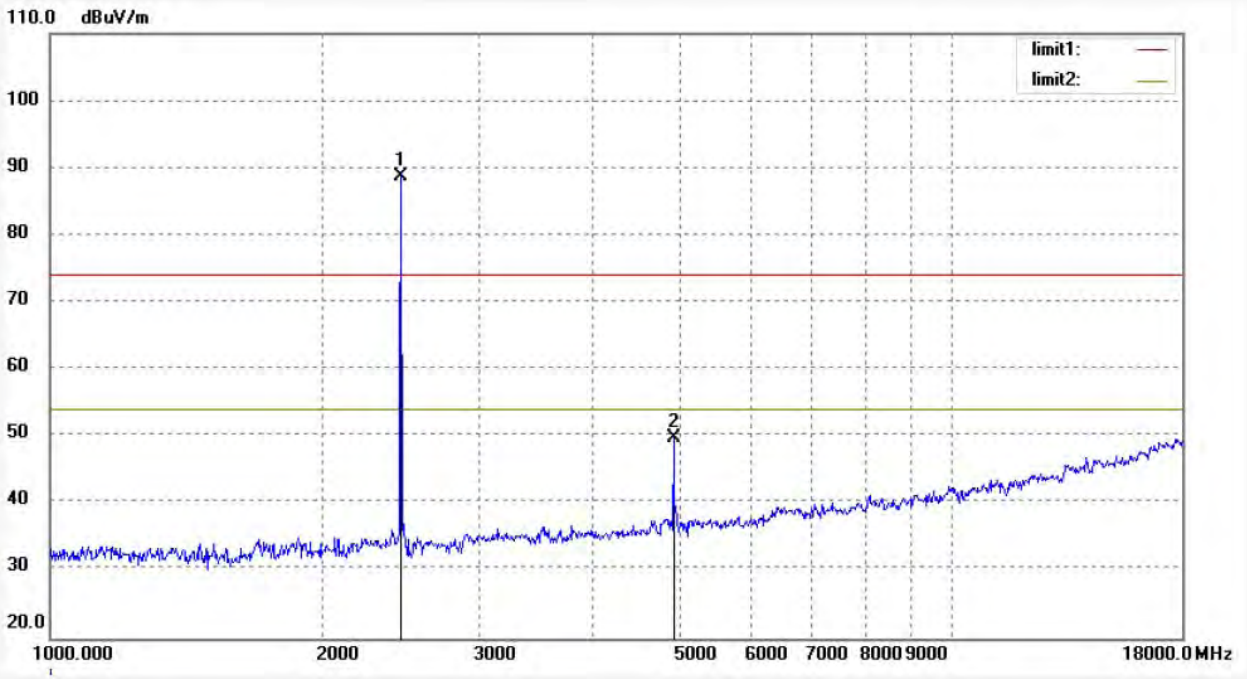
Job No.: FRANK2019 #299
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2480MHz
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/01/25/
Time: 14/20/42
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	94.81	-6.04	88.77	/	/	peak	200	116	
2	4960.144	48.33	1.50	49.83	74.00	-24.17	peak	250	302	

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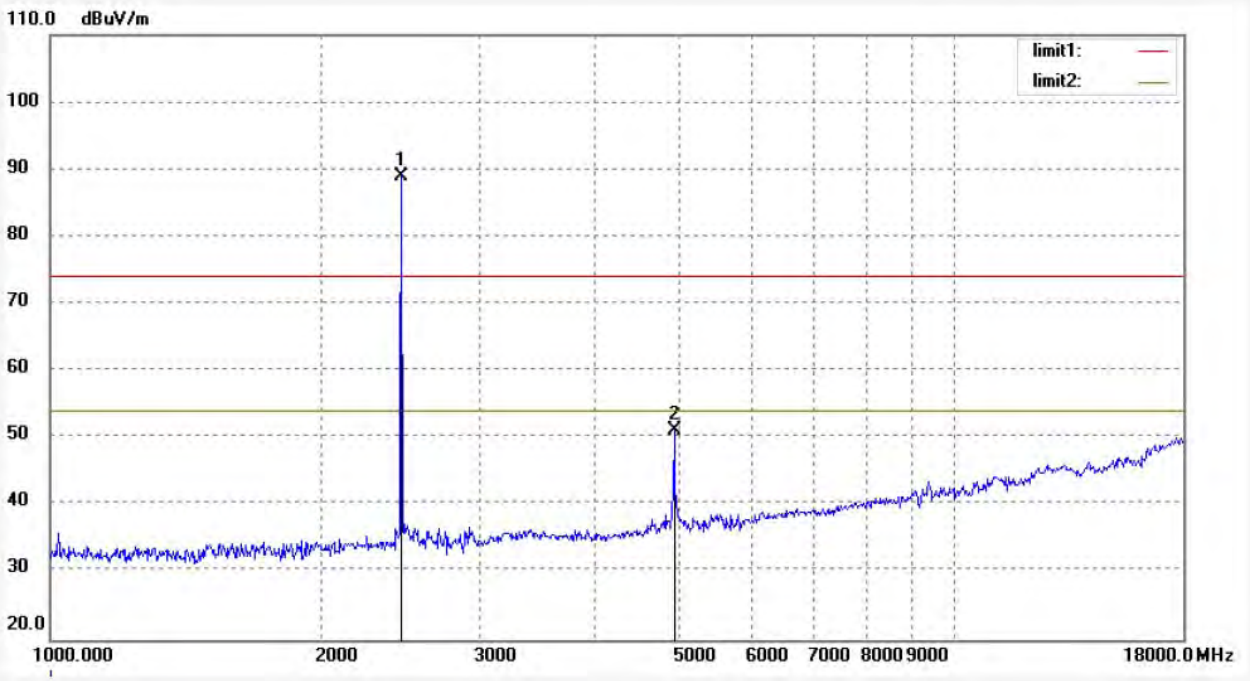
Job No.: FRANK2019 #298	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/01/25/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/19/30
EUT: Bluetooth Headphone Cable	Engineer Signature:
Mode: TX2480MHz	Distance: 3m
Model: XX	
Manufacturer: Consonance Technology Corporation	

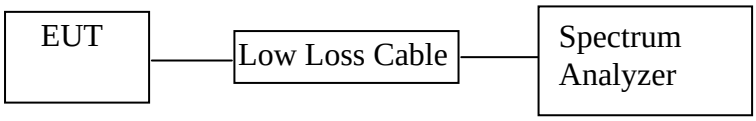
Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	94.97	-6.04	88.93	/	/	peak	150	112	
2	4960.044	49.74	1.50	51.24	74.00	-22.76	peak	150	302	

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



11.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, 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, as permitted under paragraph (b)(3) of this section, 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).

11.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

11.4.Operating Condition of EUT

11.4.1.Setup the EUT and simulator as shown as Section 11.1.

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

11.5.Test Procedure

11.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.

11.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

11.5.3.The band edges was measured and recorded.

11.6.Test Result

Test Lab: Shielding room
Test Engineer: Frank

Note: Both hopping-on mode and hopping-off mode had been pre-tested, and only the Worse case was recorded in the test report.

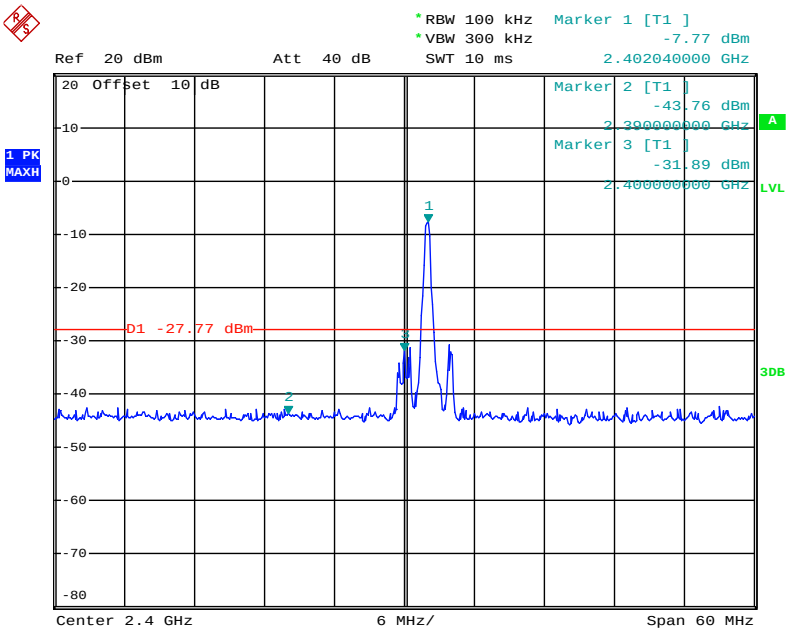
Conducted Band Edge Result

Non-hopping mode

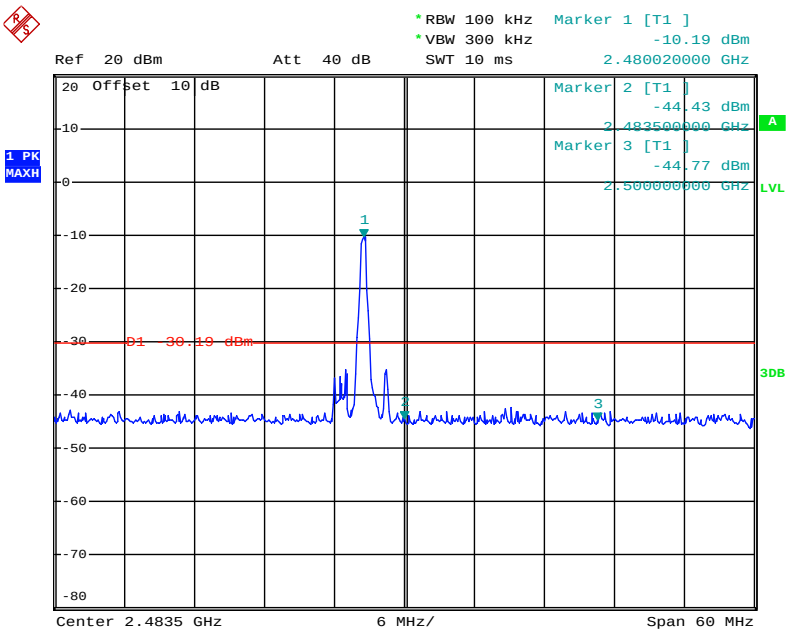
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)	Result
GFSK Mode			
2400.00	24.12	> 20dBc	Pass
2483.50	34.24	> 20dBc	Pass
Π/4-DQPSK Mode			
2400.00	23.09	> 20dBc	Pass
2483.50	35.05	> 20dBc	Pass
8DPSK Mode			
2400.00	23.73	> 20dBc	Pass
2483.50	33.72	> 20dBc	Pass

The spectrum analyzer plots are attached as below.

GFSK Mode

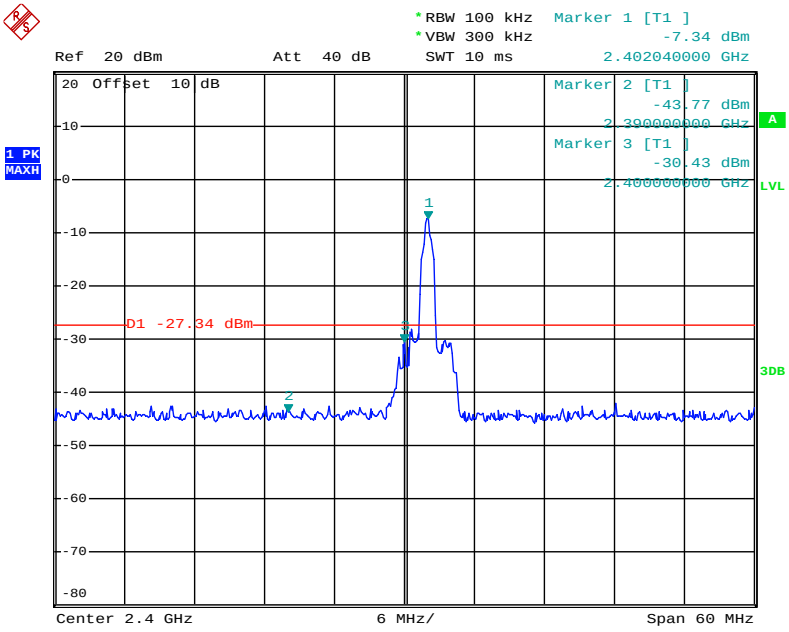


Date: 21.JAN.2019 17:02:45

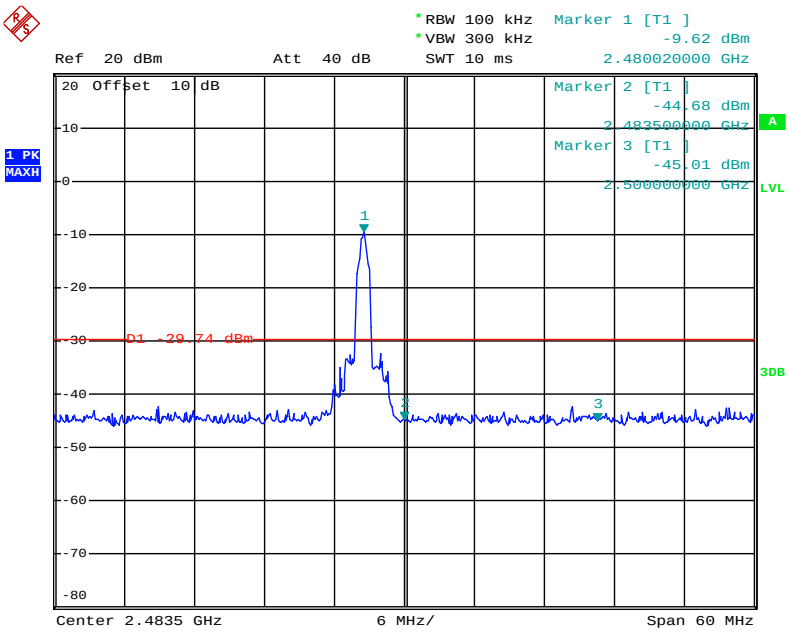


Date: 21.JAN.2019 17:06:23

Π/4-DQPSK Mode

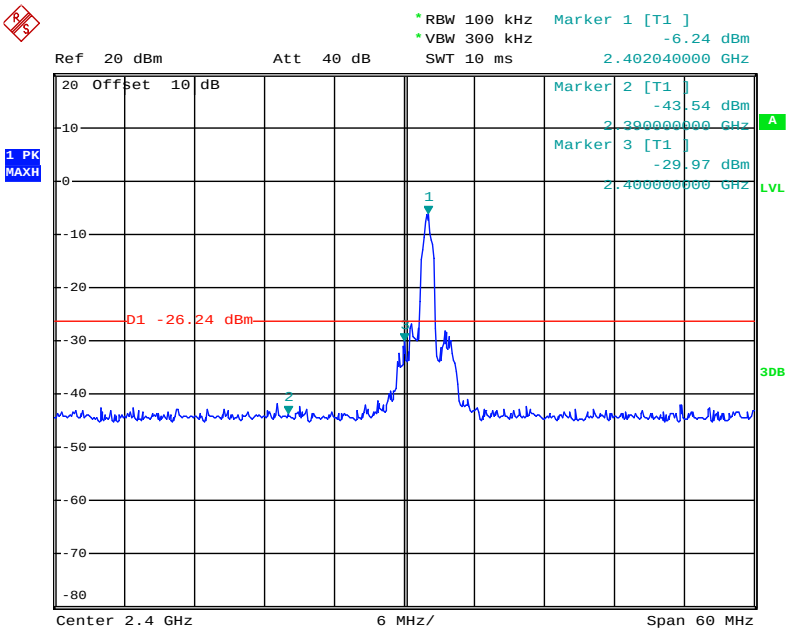


Date: 21.JAN.2019 17:03:34

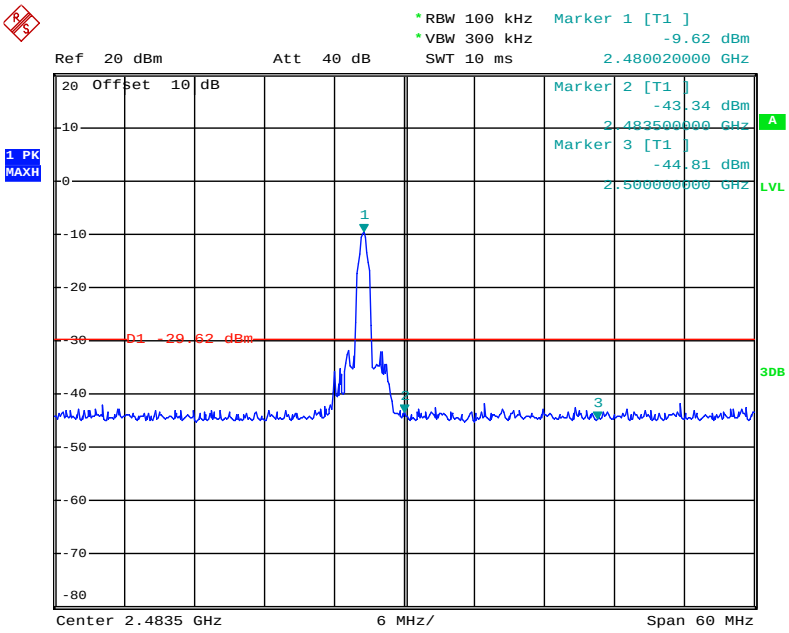


Date: 21.JAN.2019 17:05:52

8DPSK Mode



Date: 21.JAN.2019 17:04:26



Date: 21.JAN.2019 17:05:22

Radiated Band Edge Result

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

   Result = Reading + Corrected Factor
3. Display the measurement of peak values.

Test Procedure:

The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

Let the EUT work in TX (Hopping off, Hopping on) modes measure it.
We select 2402MHz, 2480MHz TX frequency to transmit(Hopping off mode).
We select 2402-2480MHz TX frequency to transmit(Hopping on mode).

During the radiated emission test, the spectrum analyzer was set with the following configurations:
1.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
2.The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
3.All modes of operation were investigated and the worse case (8DPSK Mode) emissions are reported.

Test Lab: 3m Anechoic chamber
Test Engineer: Frank

The spectrum analyzer plots are attached as below.

Non-hopping mode

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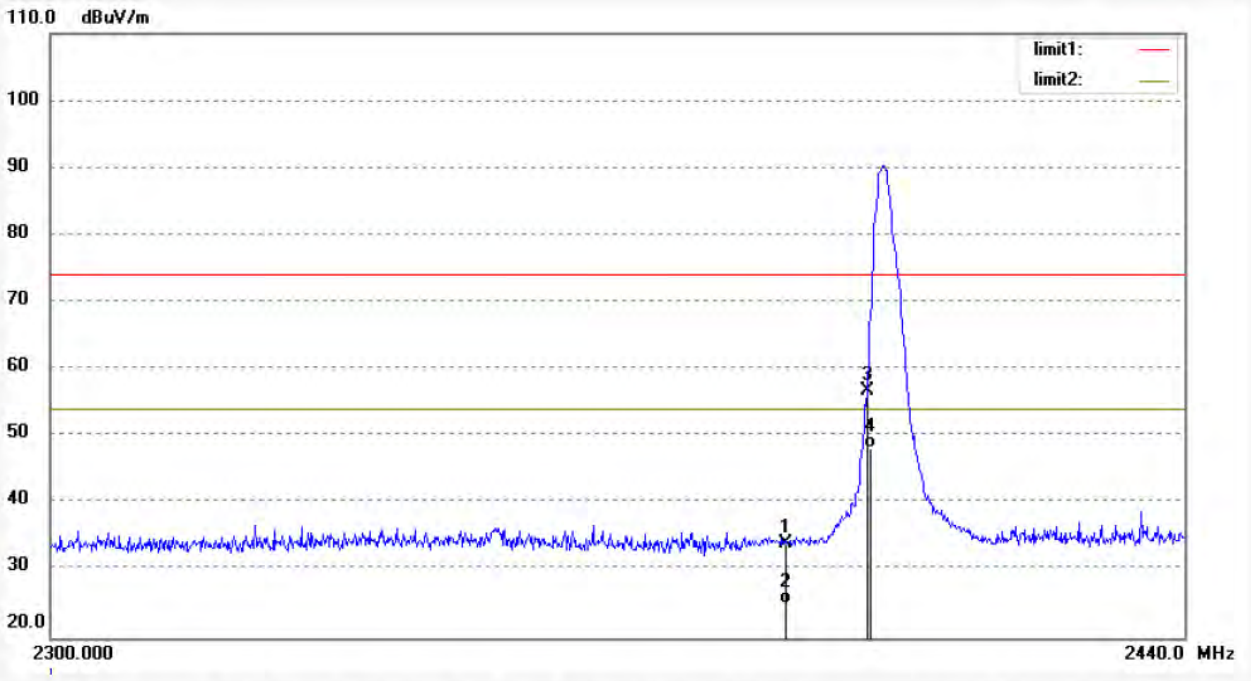
Job No.: FRANK2019 #308	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/01/25/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/36/42
EUT: Bluetooth Headphone Cable	Engineer Signature:
Mode: TX2402MHz(8DPSK)	Distance: 3m
Model: XX	
Manufacturer: Consonance Technology Corporation	

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	40.44	-6.32	34.12	74.00	-39.88	peak	250	62	
2	2390.000	31.45	-6.32	25.13	54.00	-28.87	AVG	250	229	
3	2400.000	63.05	-6.27	56.78	74.00	-17.22	peak	250	210	
4	2400.000	54.45	-6.27	48.18	54.00	-5.82	AVG	250	129	

Note: Average measurement with peak detection at No.2&4

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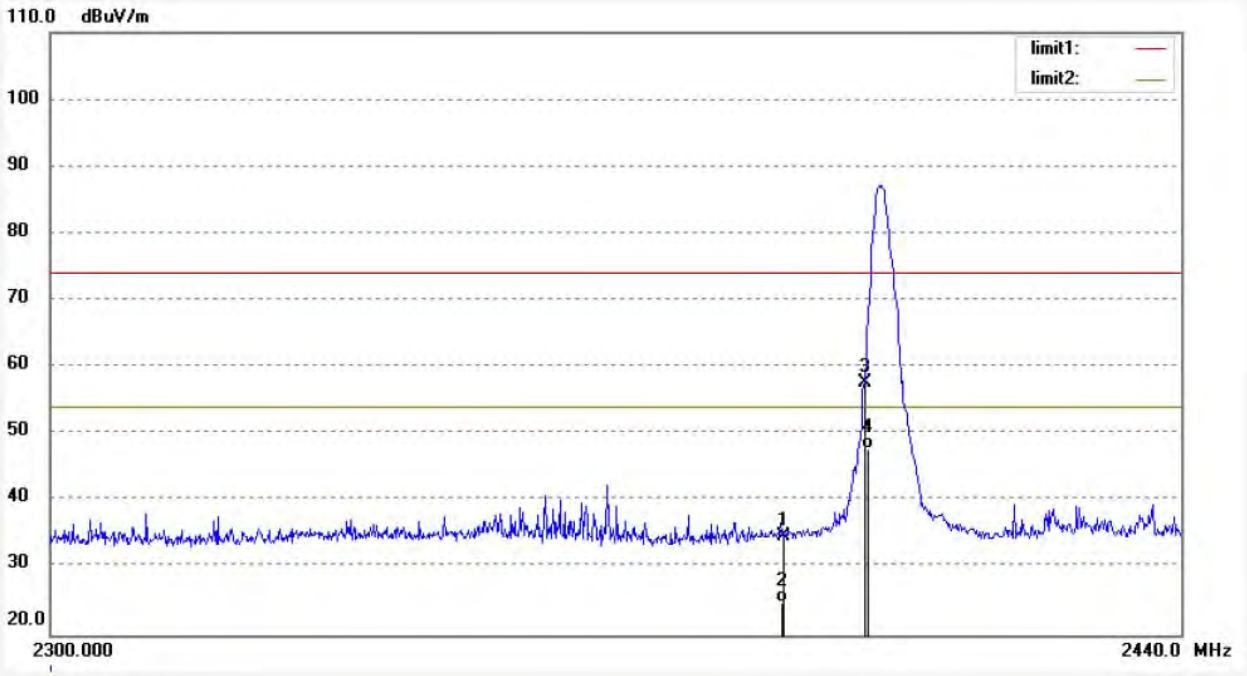
Fax:+86-0755-26503396

Job No.: FRANK2019 #309	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/01/25/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/39/08
EUT: Bluetooth Headphone Cable	Engineer Signature:
Mode: TX2402MHz(8DPSK)	Distance: 3m
Model: XX	
Manufacturer: Consonance Technology Corporation	

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	41.03	-6.32	34.71	74.00	-39.29	peak	150	211	
2	2390.000	31.12	-6.32	24.80	54.00	-29.20	AVG	150	92	
3	2400.000	64.01	-6.27	57.74	74.00	-16.26	peak	150	331	
4	2400.000	54.05	-6.27	47.78	54.00	-6.22	AVG	150	201	

Note: Average measurement with peak detection at No.2&4

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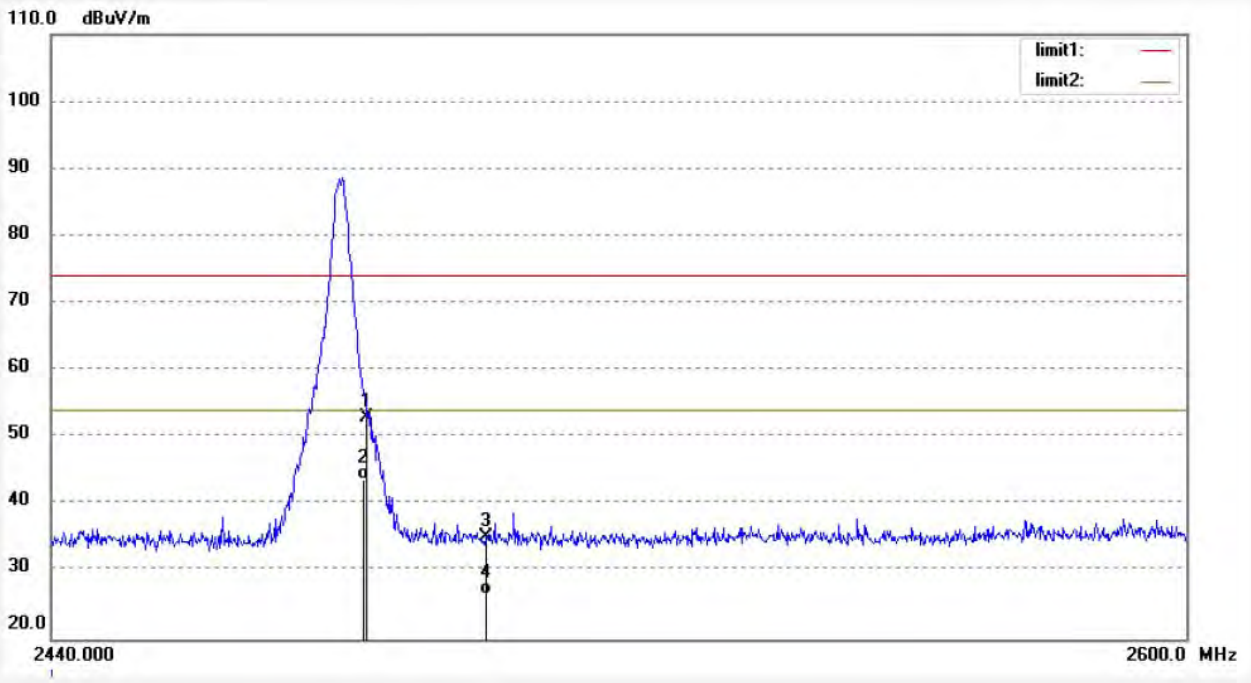
Job No.: FRANK2019 #311
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2480MHz(8DPSK)
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/01/25/
Time: 14/43/21
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	58.79	-5.89	52.90	74.00	-21.10	peak	250	94	
2	2483.500	49.54	-5.89	43.65	54.00	-10.35	AVG	250	62	
3	2500.000	41.05	-5.81	35.24	74.00	-38.76	peak	250	132	
4	2500.000	32.25	-5.81	26.44	54.00	-27.56	AVG	250	11	

Note: Average measurement with peak detection at No.2&4

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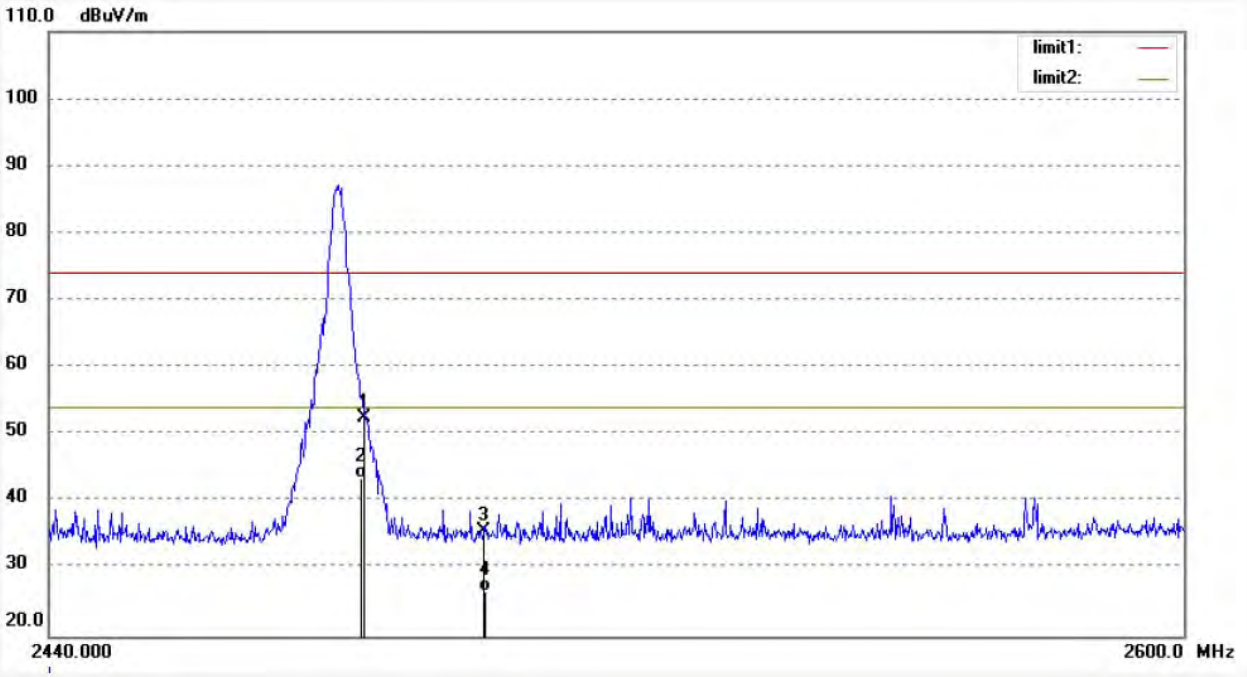
Job No.: FRANK2019 #310
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: TX2480MHz(8DPSK)
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/01/25/
Time: 14/41/28
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	58.33	-5.89	52.44	74.00	-21.56	peak	150	213	
2	2483.500	49.32	-5.89	43.43	54.00	-10.57	AVG	150	96	
3	2500.000	41.37	-5.81	35.56	74.00	-38.44	peak	150	119	
4	2500.000	32.45	-5.81	26.64	54.00	-27.36	AVG	150	302	

Note: Average measurement with peak detection at No.2&4

Hopping mode

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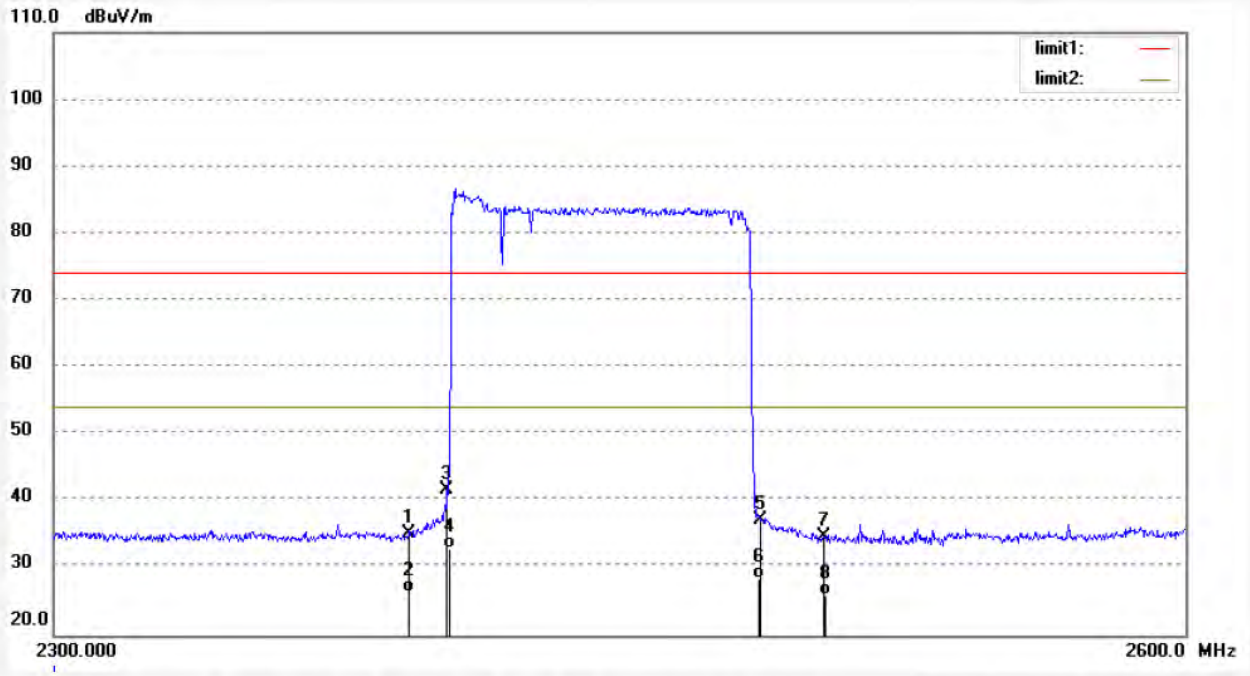
Job No.: FRANK2019 #321	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/01/25/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 15/14/36
EUT: Bluetooth Headphone Cable	Engineer Signature:
Mode: HOPPING(D8PSK)	Distance: 3m
Model: XX	
Manufacturer: Consonance Technology Corporation	

Note: Report NO.:ATE20190070



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	41.59	-6.32	35.27	74.00	-38.73	peak	200	264	
2	2390.000	32.62	-6.32	26.30	54.00	-27.70	AVG	200	112	
3	2400.000	48.03	-6.27	41.76	74.00	-32.24	peak	200	92	
4	2400.000	39.16	-6.27	32.89	54.00	-21.11	AVG	200	102	
5	2483.500	43.19	-5.89	37.30	74.00	-36.70	peak	200	45	
6	2483.500	34.26	-5.89	28.37	54.00	-25.63	AVG	200	96	
7	2500.000	40.47	-5.81	34.66	74.00	-39.34	peak	200	116	
8	2500.000	31.66	-5.81	25.85	54.00	-28.15	AVG	200	302	

Note: Average measurement with peak detection at No.2&4&6&8

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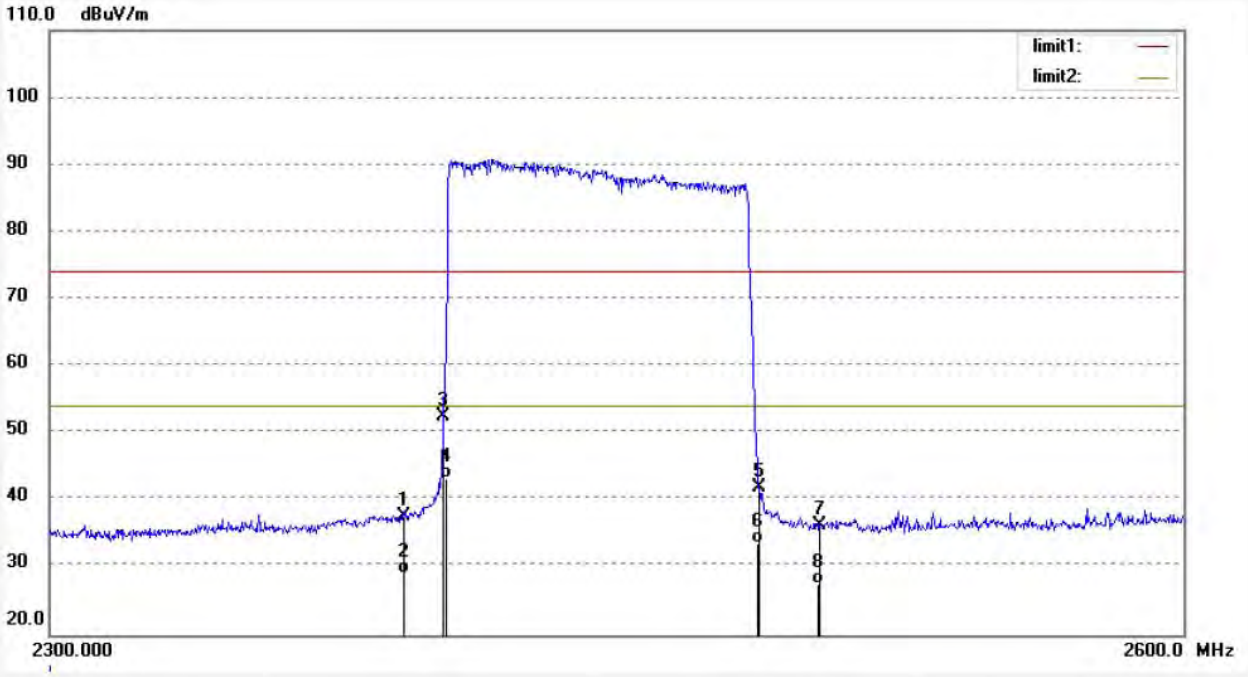
Job No.: FRANK2019 #322
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Bluetooth Headphone Cable
Mode: HOPPING(D8PSK)
Model: XX
Manufacturer: Consonance Technology Corporation

Polarization: Vertical
Power Source: DC 3.7V
Date: 19/01/25/
Time: 15/22/40
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190070



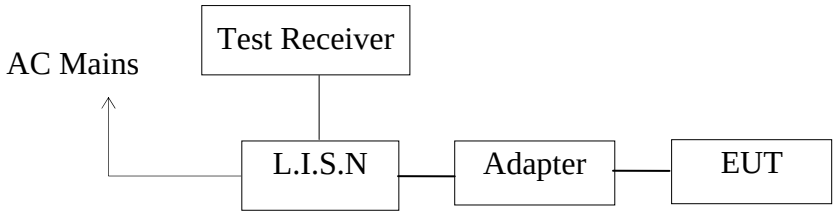
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	44.09	-6.32	37.77	74.00	-36.23	peak	150	302	
2	2390.000	35.41	-6.32	29.09	54.00	-24.91	AVG	150	119	
3	2400.000	58.72	-6.27	52.45	74.00	-21.55	peak	150	93	
4	2400.000	49.45	-6.27	43.18	54.00	-10.82	AVG	150	120	
5	2483.500	47.87	-5.89	41.98	74.00	-32.02	peak	150	332	
6	2483.500	39.45	-5.89	33.56	54.00	-20.44	AVG	150	201	
7	2500.000	42.04	-5.81	36.23	74.00	-37.77	peak	150	56	
8	2500.000	33.45	-5.81	27.64	54.00	-26.36	AVG	150	156	

Note: Average measurement with peak detection at No.2&4&6&8

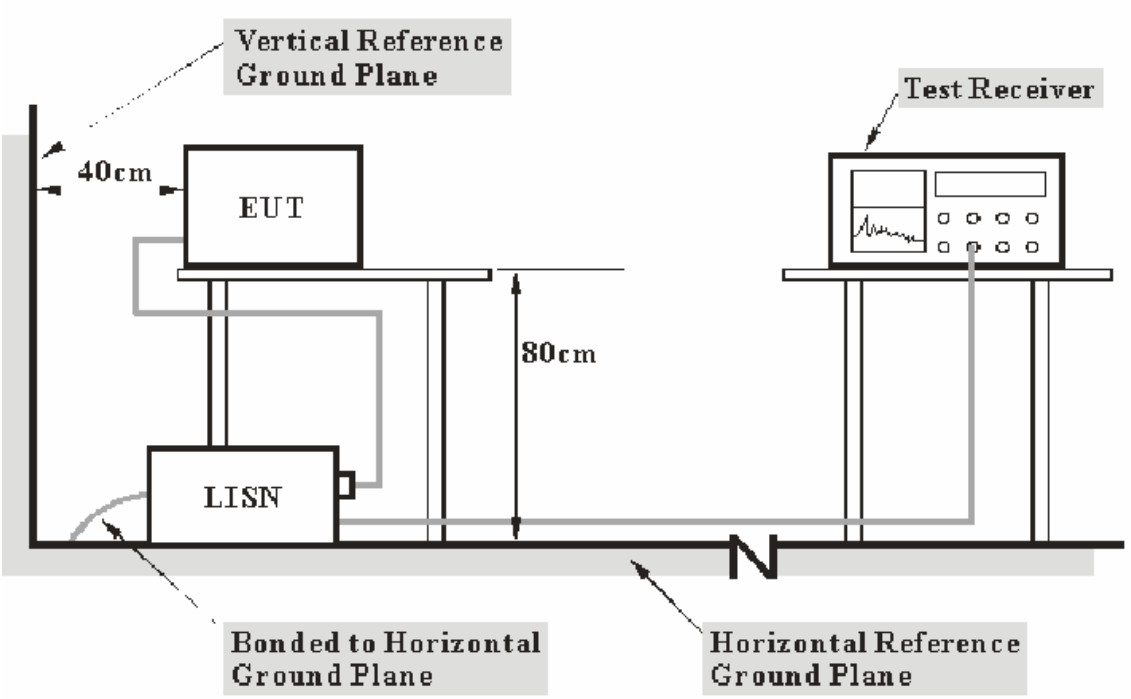
12. AC POWER LINE CONDUCTED EMISSION TEST

12.1. Block Diagram of Test Setup

12.1.1. Block diagram of connection between the EUT and simulators



12.1.2. Test System Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

12.2.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies. NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

12.3.Configuration of EUT on Measurement

The equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 12.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in test mode and measure it.

12.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement.

The bandwidth of test receiver is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

12.6.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dBμV)	Average Level (dBμV)	QuasiPeak Limit (dBμV)	Average Limit (dBμV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.6	25.3	17.0	59.0	49.0	33.4	31.7	Pass

Frequency(MHz) = Emission frequency in MHz
Transducer value(dB) = Insertion loss of LISN + Cable Loss
Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value
Limit (dBμV) = Limit stated in standard
Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:
Margin = Limit (dBμV) - Level (dBμV)

12.7.Test Results

Pass.
Test Lab: 3m Anechoic chamber
Test Engineer: Frank

The frequency range from 150kHz to 30MHz is checked.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.
Emissions attenuated more than 20 dB below the permissible value are not reported.

All data was recorded in the Quasi-peak and average detection mode.

The spectral diagrams are attached as below.

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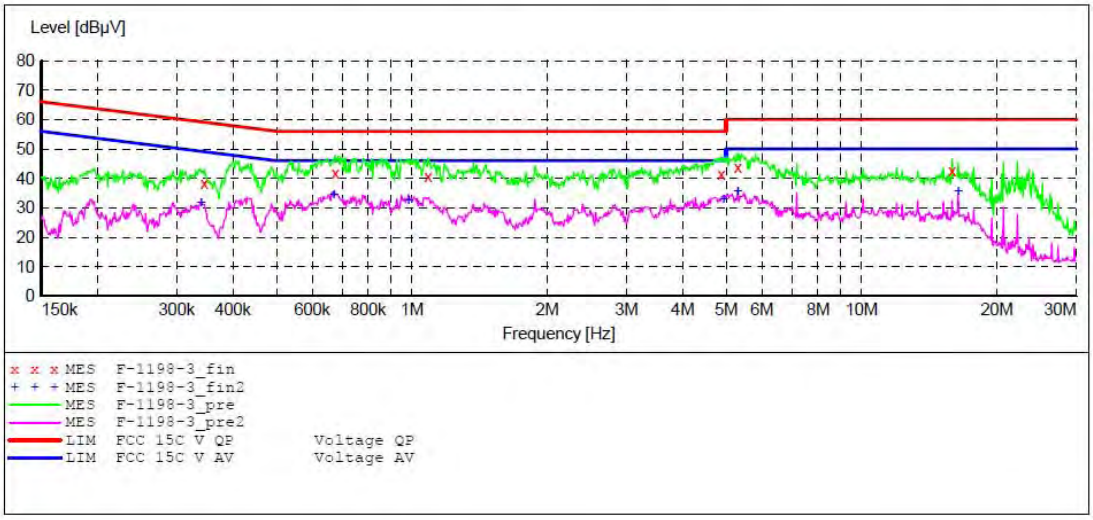
CONDUCTED EMISSION STANDARD FCC PART 15 C

```
EUT:                  Bluetooth Headphone Cable M/N:XX
Manufacturer:         Consonance Technology Corporation
Operating Condition:  BT Communication
Test Site:            1#Shielding Room
Operator:             Frank
Test Specification:   N  240V/60Hz
Comment:              Report NO.:ATE20190070
Start of Test:        2019-1-24 / 9:59:24
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "F-1198-3_fin"

2019-1-24 10:01

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.345491	38.10	10.6	59	21.0	QP	N	GND
0.675618	41.90	10.8	56	14.1	QP	N	GND
1.086458	40.60	10.9	56	15.4	QP	N	GND
4.874037	41.30	11.1	56	14.7	QP	N	GND
5.300255	43.80	11.2	60	16.2	QP	N	GND
15.887948	42.60	11.4	60	17.4	QP	N	GND

MEASUREMENT RESULT: "F-1198-3_fin2"

2019-1-24 10:01

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.340018	31.70	10.6	49	17.5	AV	N	GND
0.670245	34.20	10.8	46	11.8	AV	N	GND
0.983264	32.60	10.8	46	13.4	AV	N	GND
4.932760	33.00	11.2	46	13.0	AV	N	GND
5.300255	35.70	11.2	50	14.3	AV	N	GND
16.403538	35.50	11.4	50	14.5	AV	N	GND

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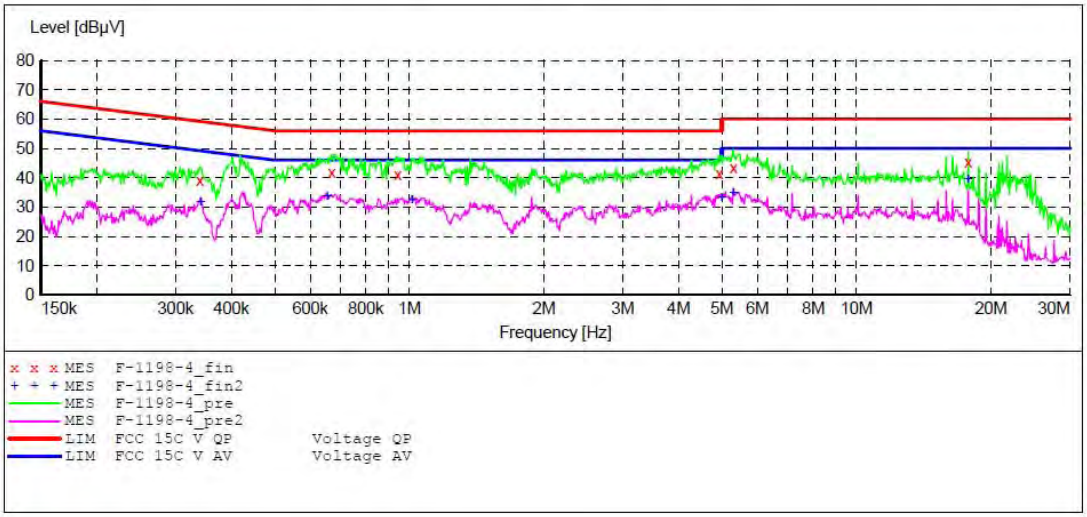
CONDUCTED EMISSION STANDARD FCC PART 15 C

```
EUT:                 Bluetooth Headphone Cable M/N:XX
Manufacturer:        Consonance Technology Corporation
Operating Condition: BT Communication
Test Site:           1#Shielding Room
Operator:            Frank
Test Specification:  L  240V/60Hz
Comment:             Report NO.:ATE20190070
Start of Test:       2019-1-24 / 10:02:15
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "F-1198-4_fin"

2019-1-24 10:05

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.340018	39.20	10.6	59	20.0	QP	L1	GND
0.670245	41.90	10.8	56	14.1	QP	L1	GND
0.941021	41.00	10.8	56	15.0	QP	L1	GND
4.932760	41.50	11.2	56	14.5	QP	L1	GND
5.300255	43.30	11.2	60	16.7	QP	L1	GND
17.766905	45.20	11.4	60	14.8	QP	L1	GND

MEASUREMENT RESULT: "F-1198-4_fin2"

2019-1-24 10:05

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.341378	31.70	10.6	49	17.5	AV	L1	GND
0.654382	33.60	10.8	46	12.4	AV	L1	GND
1.015172	32.60	10.8	46	13.4	AV	L1	GND
4.992190	33.20	11.2	46	12.8	AV	L1	GND
5.300255	34.80	11.2	50	15.2	AV	L1	GND
17.766905	39.60	11.4	50	10.4	AV	L1	GND

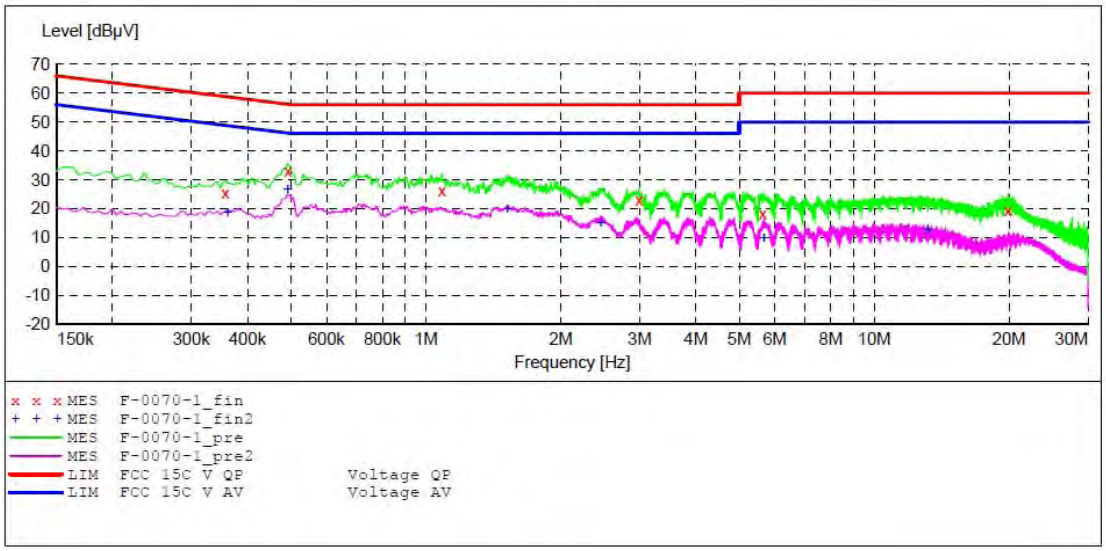
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15 C

```
EUT:                  Bluetooth Headphone Cable M/N:XX
Manufacturer:         Consonance Technology Corporation
Operating Condition:  BT Communication
Test Site:            1#Shielding Room
Operator:             Frank
Test Specification:   L  120V/60Hz
Comment:              Report NO.:ATE20190070
Start of Test:        2019-1-24 / 9:28:58
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:            _SUB_STD_VTERM2 1.70
  Start      Stop       Step      Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width               Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz   QuasiPeak 1.0 s     9 kHz    NSLK8126 2008
                                  Average
```



MEASUREMENT RESULT: "F-0070-1_fin"

2019-1-24 9:32

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.357000	25.50	10.9	59	33.3	QP	L1	GND
0.492000	32.90	11.0	56	23.2	QP	L1	GND
1.086000	26.20	11.1	56	29.8	QP	L1	GND
2.989500	22.90	11.3	56	33.1	QP	L1	GND
5.640000	18.10	11.5	60	41.9	QP	L1	GND
19.905000	19.50	11.7	60	40.5	QP	L1	GND

MEASUREMENT RESULT: "F-0070-1_fin2"

2019-1-24 9:32

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.361500	18.40	10.9	49	30.3	AV	L1	GND
0.492000	26.50	11.0	46	19.6	AV	L1	GND
1.518000	19.90	11.2	46	26.1	AV	L1	GND
2.454000	14.90	11.3	46	31.1	AV	L1	GND
5.680500	9.90	11.5	50	40.1	AV	L1	GND
13.168500	12.60	11.6	50	37.4	AV	L1	GND

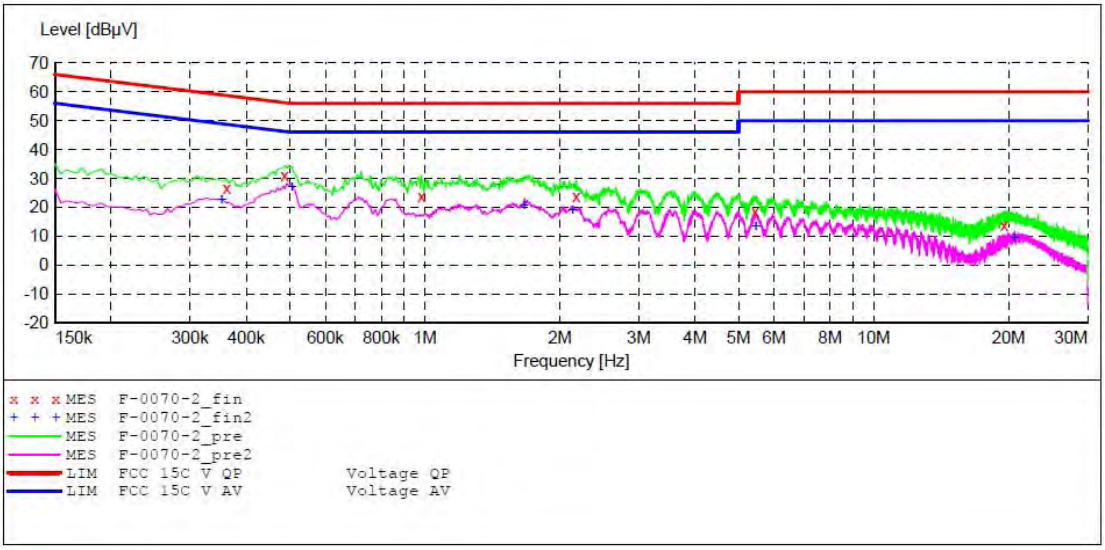
ACCURATE TECHNOLOGY CO.,LTD

CONDUCTED EMISSION STANDARD FCC PART 15 C

```
EUT:                  Bluetooth Headphone Cable M/N:XX
Manufacturer:         Consonance Technology Corporation
Operating Condition:  BT Communication
Test Site:            1#Shielding Room
Operator:             Frank
Test Specification:   N  120V/60Hz
Comment:              Report NO.:ATE20190070
Start of Test:        2019-1-24 / 9:32:54
```

SCAN TABLE: "V 150K-30MHz fin"

```
  Short Description:                _SUB_STD_VTERM2 1.70
  Start      Stop       Step        Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width                 Time      Bandw.
  150.0 kHz  30.0 MHz   4.5 kHz     QuasiPeak 1.0 s     9 kHz    NSLK8126 2008
                                    Average
```



MEASUREMENT RESULT: "F-0070-2_fin"

2019-1-24 9:35

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.361500	26.50	10.9	59	32.2	QP	N	GND
0.487500	30.90	11.0	56	25.3	QP	N	GND
0.982500	23.80	11.1	56	32.2	QP	N	GND
2.175000	23.90	11.3	56	32.1	QP	N	GND
5.437500	18.50	11.5	60	41.5	QP	N	GND
19.540500	13.80	11.7	60	46.2	QP	N	GND

MEASUREMENT RESULT: "F-0070-2_fin2"

2019-1-24 9:35

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.352500	22.60	10.9	49	26.3	AV	N	GND
0.505500	27.10	11.0	46	18.9	AV	N	GND
1.666500	20.70	11.2	46	25.3	AV	N	GND
2.134500	18.90	11.3	46	27.1	AV	N	GND
5.460000	13.50	11.5	50	36.5	AV	N	GND
20.625000	9.40	11.7	50	40.6	AV	N	GND

13. ANTENNA REQUIREMENT

13.1. The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

13.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is 2.12dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.

******* End of Test Report *******