APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Massage Chair
Model No.: EC-3205A, Osaki 4000XT

FCC ID: YMX-EC3205A

Prepared for	:	XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD
Address	:	(5/F) NO.168, QIANPU ROAD, SIMING DISTRICT, XIAMEN, CHINA
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.	:	ATE20190209
Date of Test	:	March 7-March 14, 2019
Date of Report	:	March 18, 2019

TABLE OF CONTENTS

Description Page

Test Report Certification

Applicant	:	XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD
Manufacturer	:	XIAMEN HEALTHCARE ELECTRONIC CO.,LTD.
Product	:	Massage Chair
Model No.	:	EC-3205A, Osaki 4000XT

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 :	March 7-March 14, 2019
Date of Report :	March 18, 2019

Prepared by : Star Yang

(Star Yang, Engineer)

Approved & Authorized Signer :

(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

Model Number	:	EC-3205A, Osaki 4000XT (Note: We hereby state that these models are identical in interior structure, electrical circuits and components, just model name is different. Therefore only model EC-3205A is for tests.)
Bluetooth version	:	V4.0 classic mode for single mode
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	2dBi
Antenna type	:	PCB Antenna
Modulation mode	:	GFSK, π/4 DQPSK, 8DPSK
Trade Mark	:	N/A
Power supply	:	AC 110-120V~ 60Hz
Applicant	:	XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD
Address	:	(5/F) NO.168, QIANPU ROAD, SIMING DISTRICT, XIAMEN, CHINA
Manufacturer	:	XIAMEN HEALTHCARE ELECTRONIC CO.,LTD.
Address	:	65-66#, 62-63#Building, Siming Zone, Tongan Industrial District, Xiamen City, Fujian Province, P.R.China

1.2.Accessory and Auxiliary Equipment

N/A

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	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 05, 2019	One Year
EMI Test Receiver	Rohde&Schwarz	ESR	101817	Jan. 05, 2019	One Year
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 05, 2019	One Year
Pre-Amplifier (Radiated Emission)	Compliance Direction	RSU-M2	38322	Jan. 05, 2019	One Year
Pre-Amplifier (Radiated Emission)	Agilent	8447D	294A10619	Jan. 05, 2019	One Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	One Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	One Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	One Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 05, 2019	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 05, 2019	One Year
RF Coaxial Cable (Conducted Emission)	SUHNER	N-2m	No.2	Jan. 05, 2019	One Year
RF Coaxial Cable (Radiated Emission)	SUHNER	N-5m	NO.3	Jan. 05, 2019	One Year
RF Coaxial Cable (Radiated Emission)	SUHNER	N-5m	NO.4	Jan. 05, 2019	One Year
RF Coaxial Cable (Radiated Emission)	SUHNER	N-1m	NO.5	Jan. 05, 2019	One Year
RF Coaxial Cable (Radiated Emission)	SUHNER	N-1m	NO.6	Jan. 05, 2019	One Year
Conducted Emission Measurement Software: ES-K1 V1.71					
Radiated Emission Measurement Software: EZ_EMC V1.1.4.2					

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

3.2.Configuration and peripherals

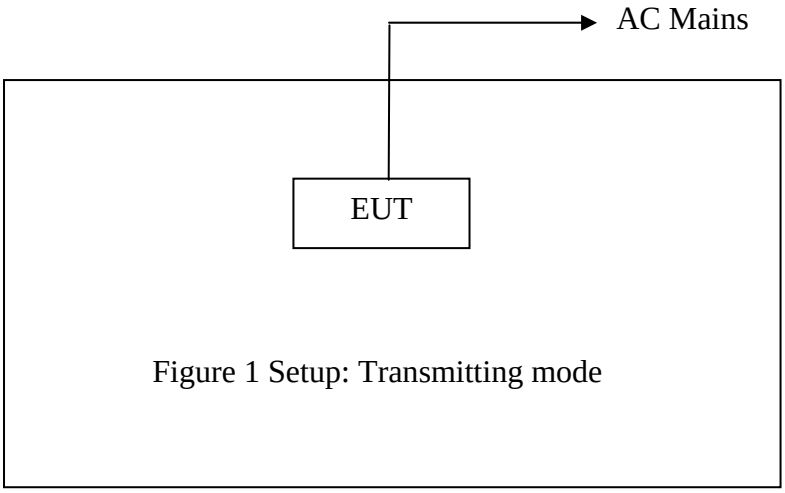


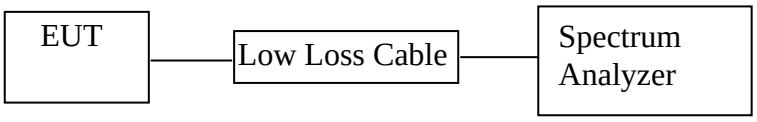
Figure 1 Setup: Transmitting mode

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 Limits 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)

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 Test

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.

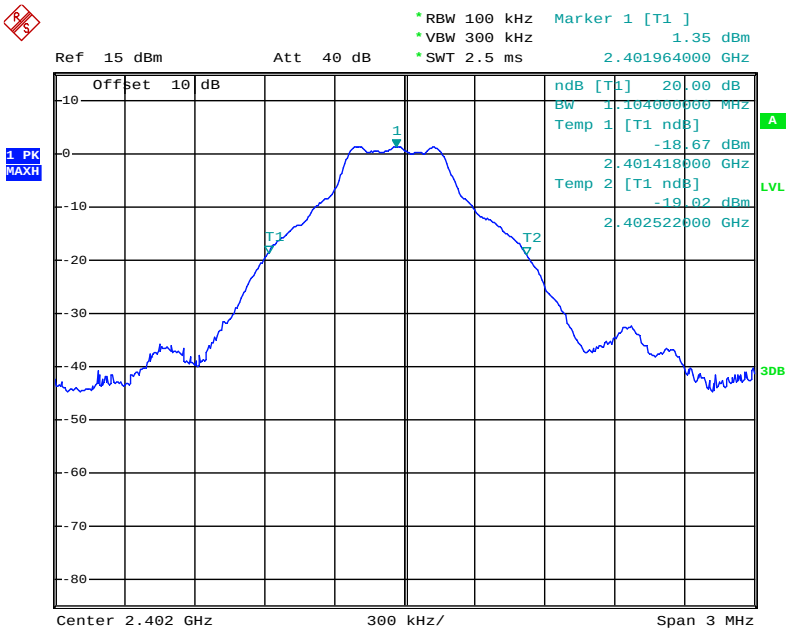
5.6.Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.104	1.362	1.344	Pass
Middle	2441	1.104	1.380	1.350	Pass
High	2480	1.098	1.368	1.350	Pass

The spectrum analyzer plots are attached as below.

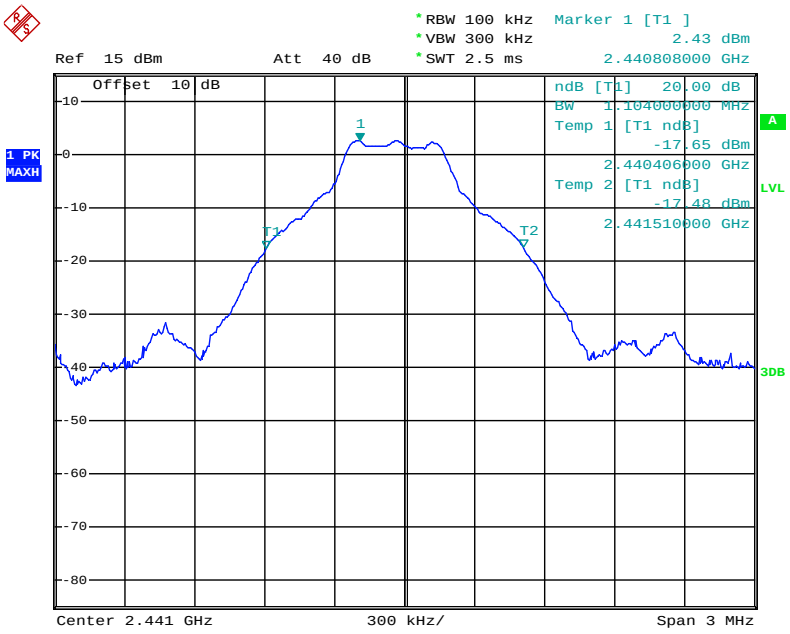
GFSK Mode

Low channel



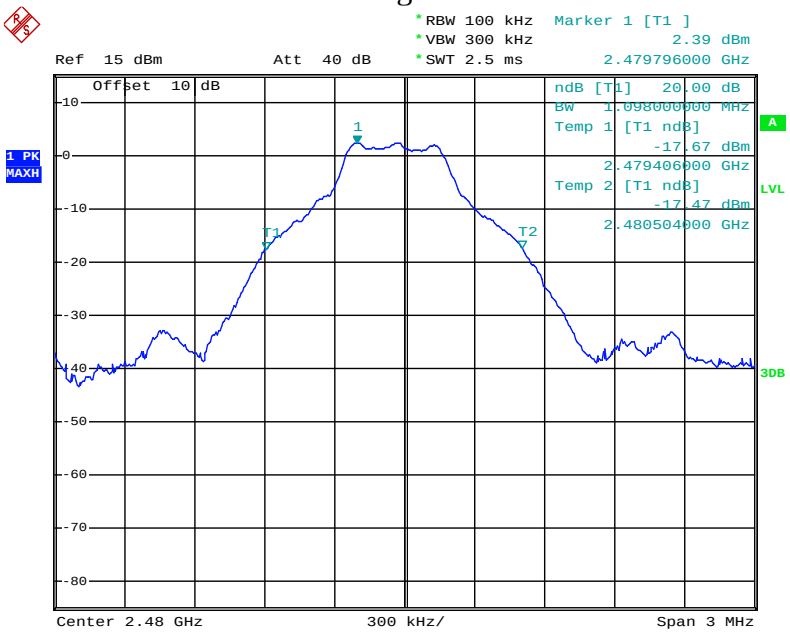
Date: 13.MAR.2019 09:33:12

Middle channel



Date: 13.MAR.2019 09:32:10

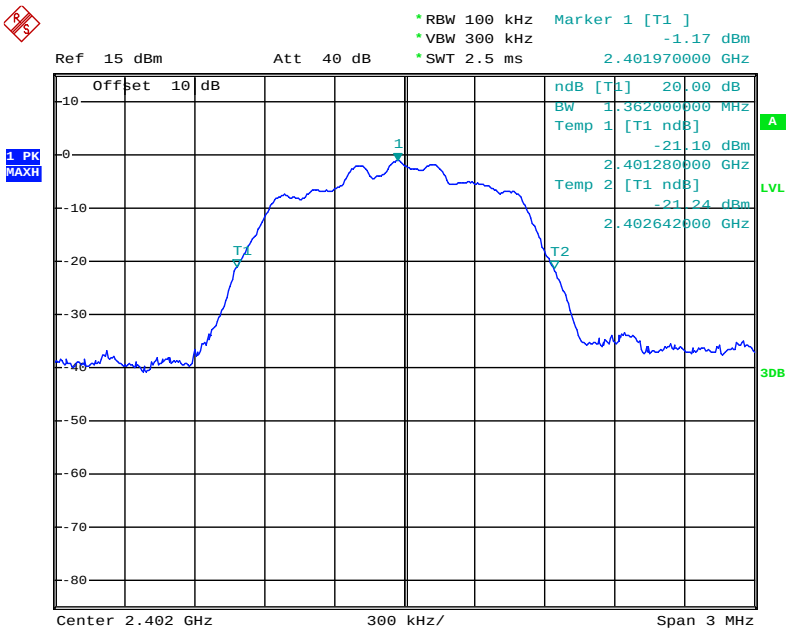
High channel



Date: 13.MAR.2019 09:30:51

Π/4-DQPSK Mode

Low channel



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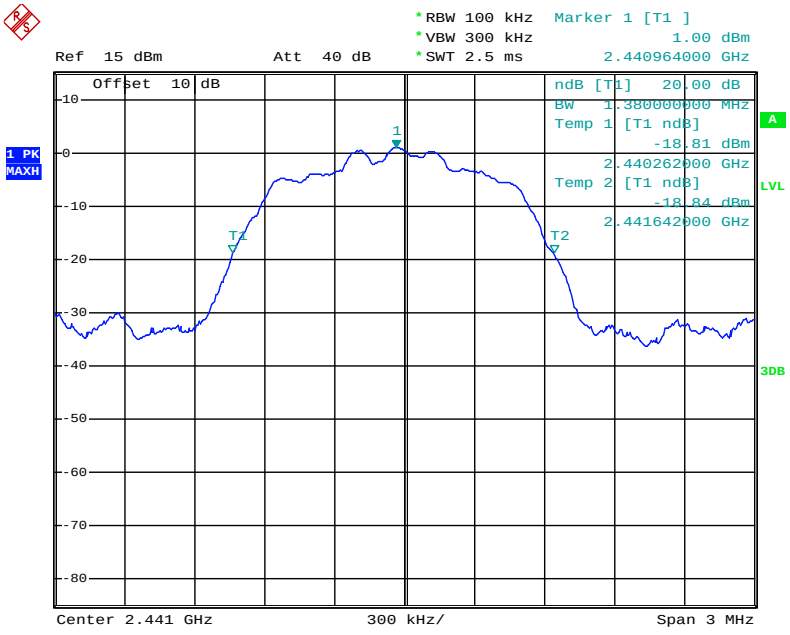
Middle channel



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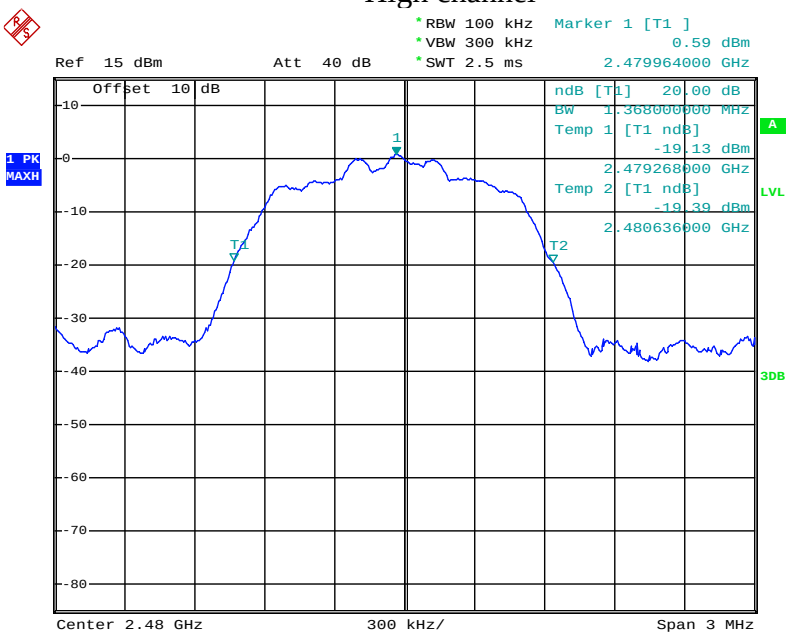
High channel



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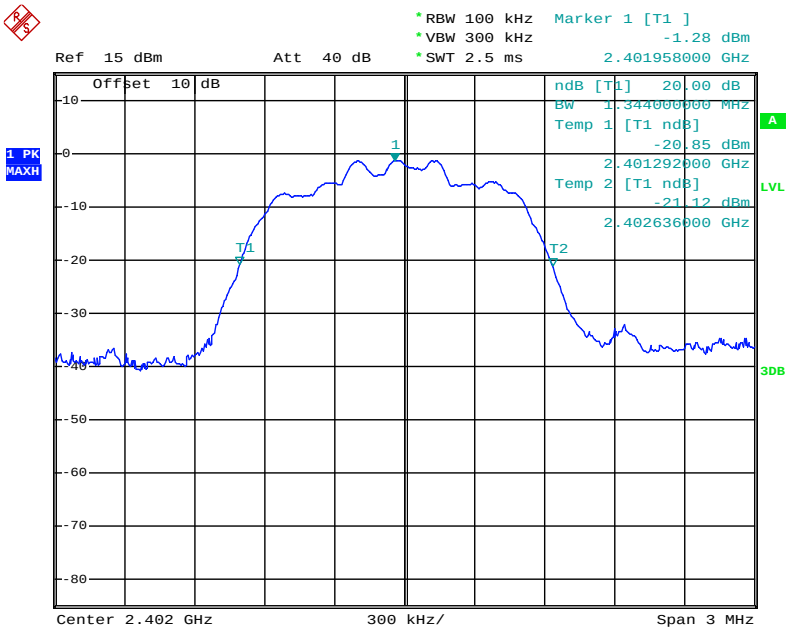
8DPSK Mode

Low channel



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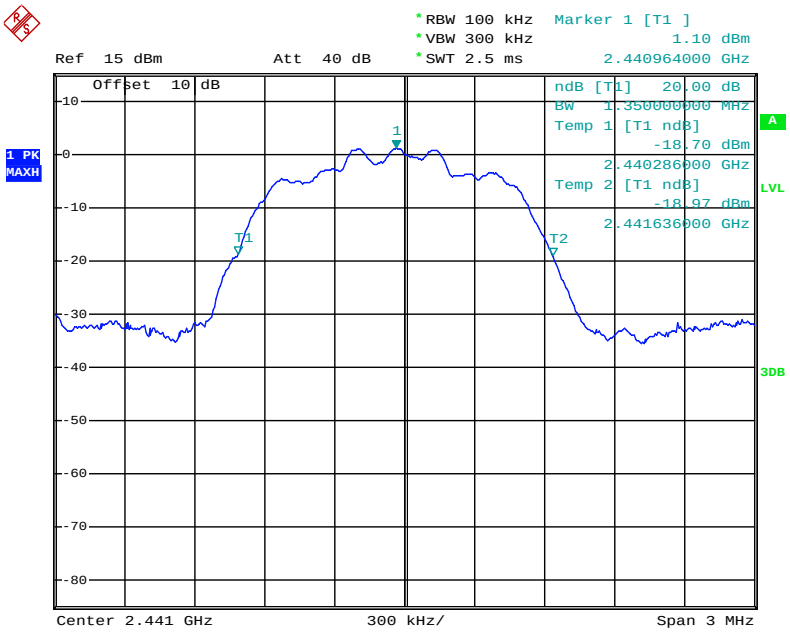
Middle channel



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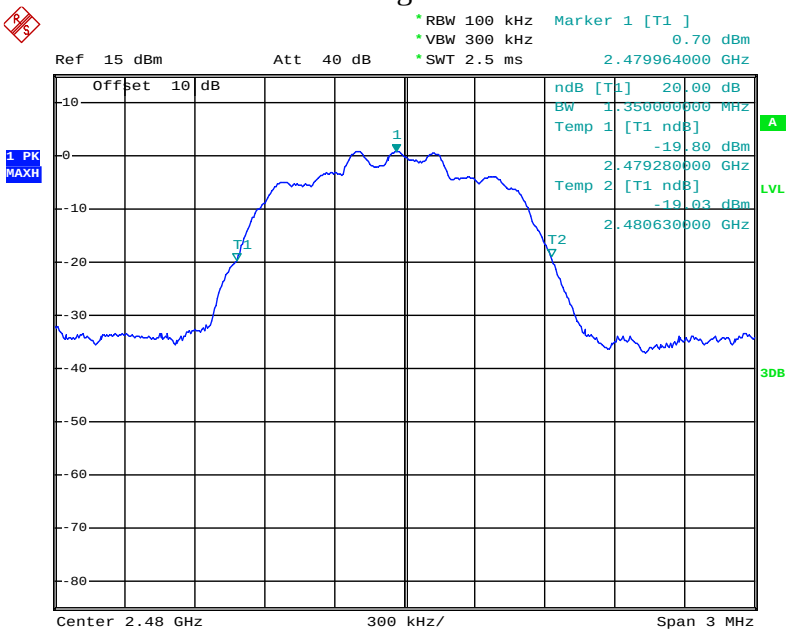
High channel



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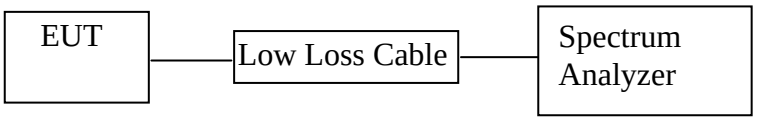
6. CARRIER FREQUENCY SEPARATION TEST

6.1.Block Diagram of Test Setup



6.2.The Requirement For 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 Test

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 3MHz.

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

6.5.4.Measurement the channel separation

6.6.Test Result

GFSK Mode

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.008	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			

∏/4-DQPSK Mode

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			

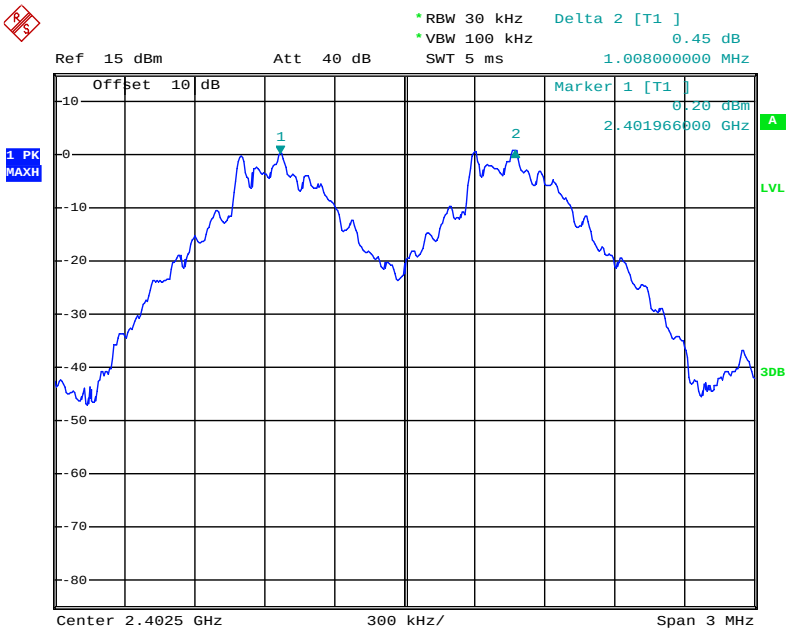
8DPSK Mode

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			

The spectrum analyzer plots are attached as below.

GFSK Mode

Low channel



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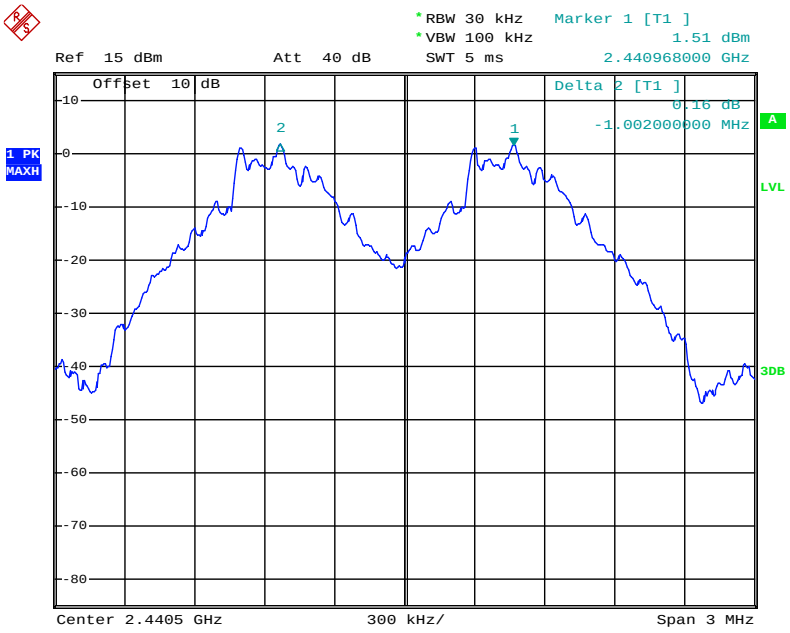
Middle channel



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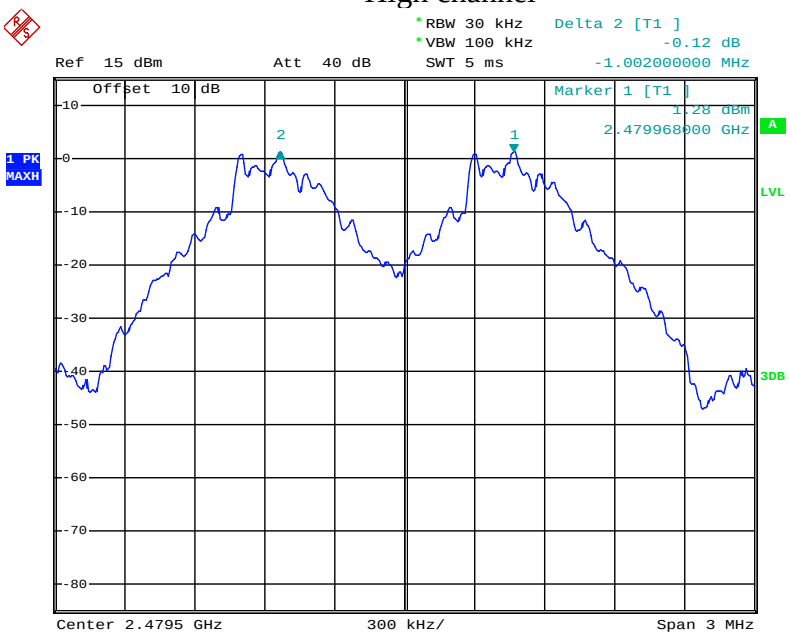
High channel



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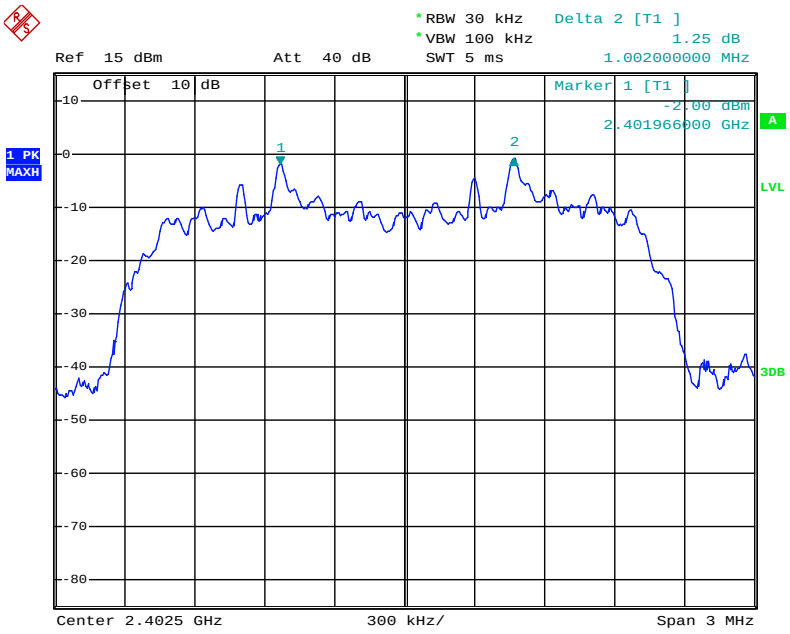
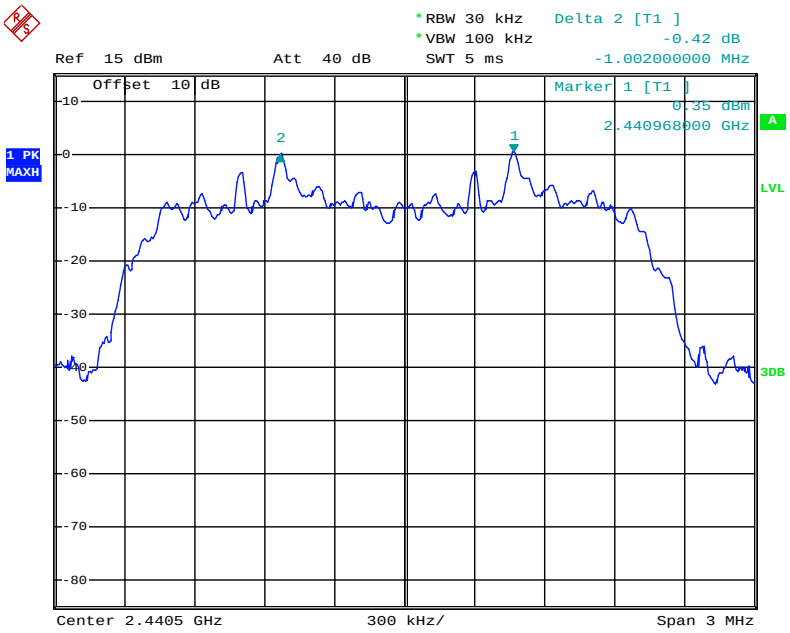
Π/4-DQPSK Mode

Low channel



Date: 13.MAR.2019 09:44:06

Middle channel



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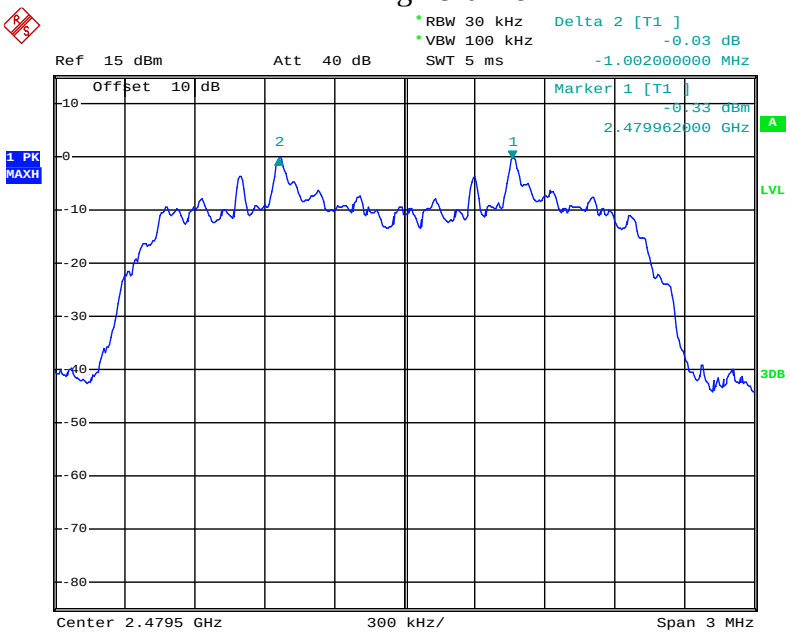
High channel



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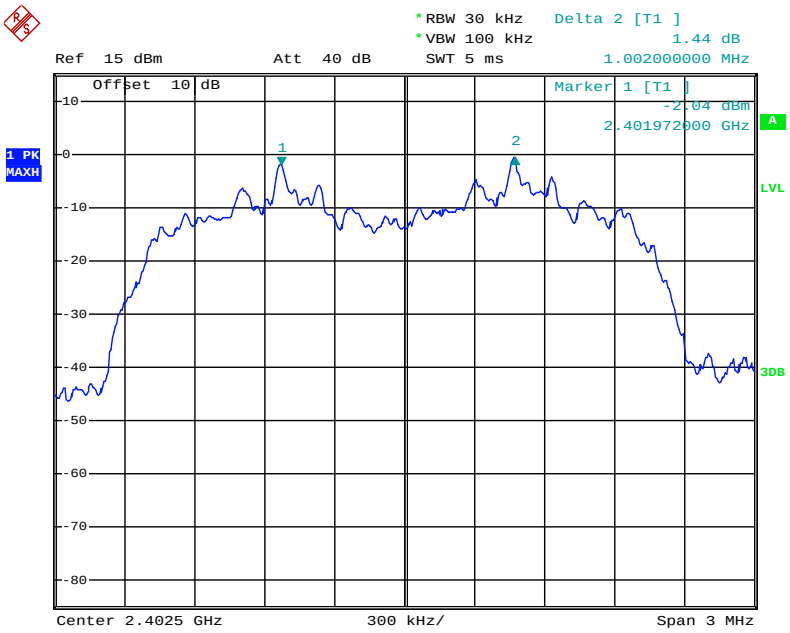
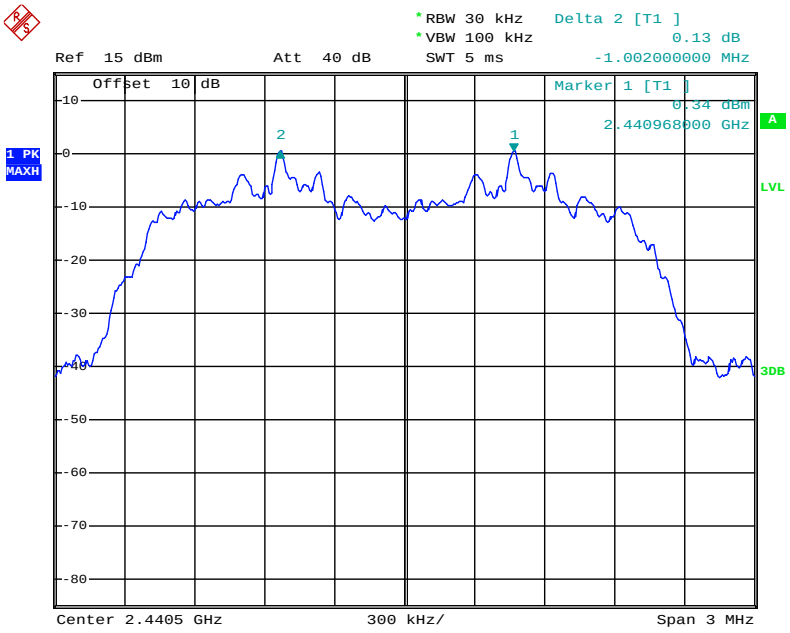
8DPSK Mode

Low channel



Date: 13.MAR.2019 09:43:22

Middle channel



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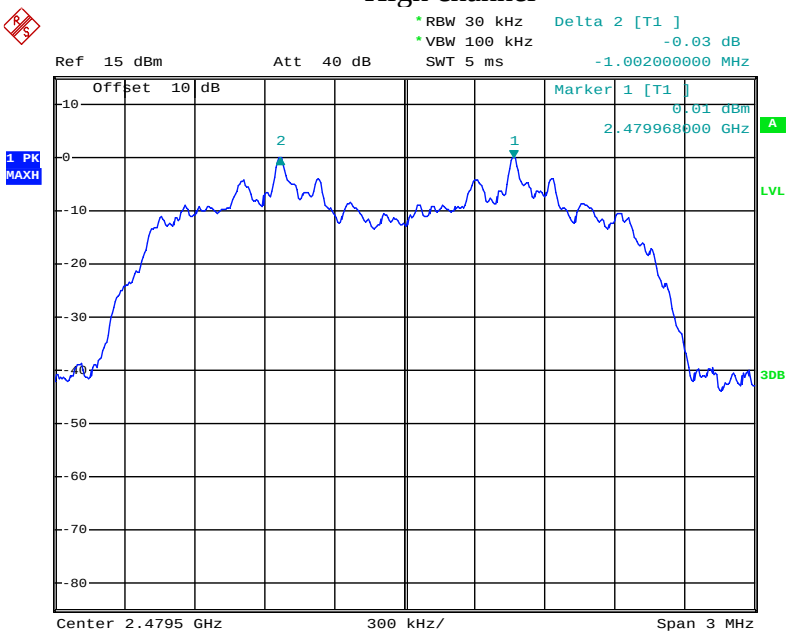
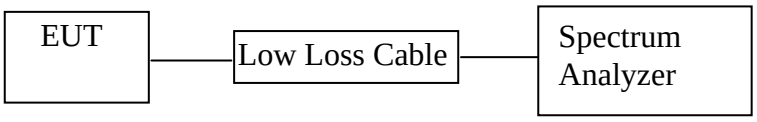
High channel



Date: 13.MAR.2019 09:41:32

7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Block Diagram of Test Setup



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

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.3.EUT Configuration on Test

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.

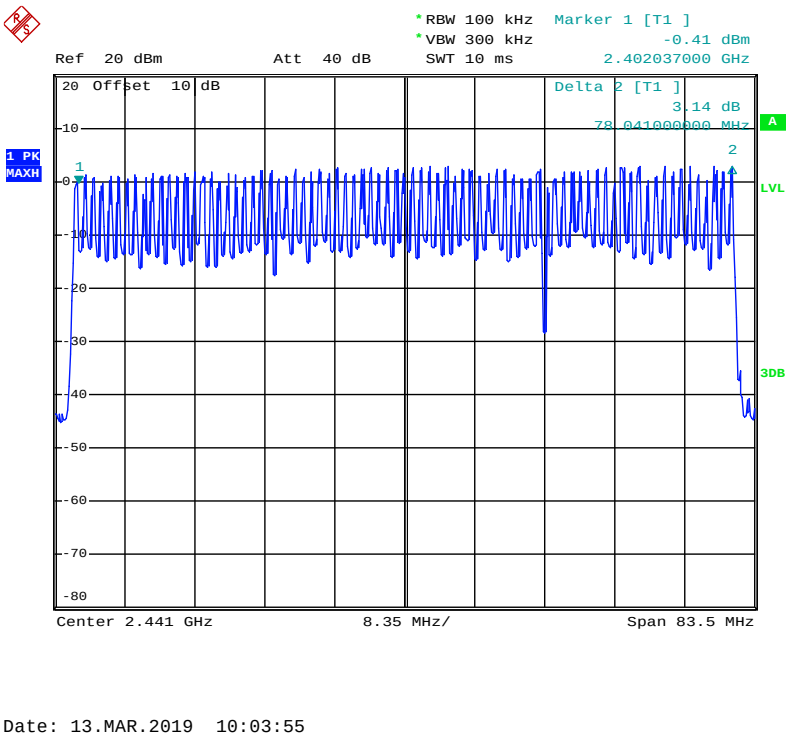
7.5.3.Max hold, view and count how many channel in the band.

7.6.Test Result

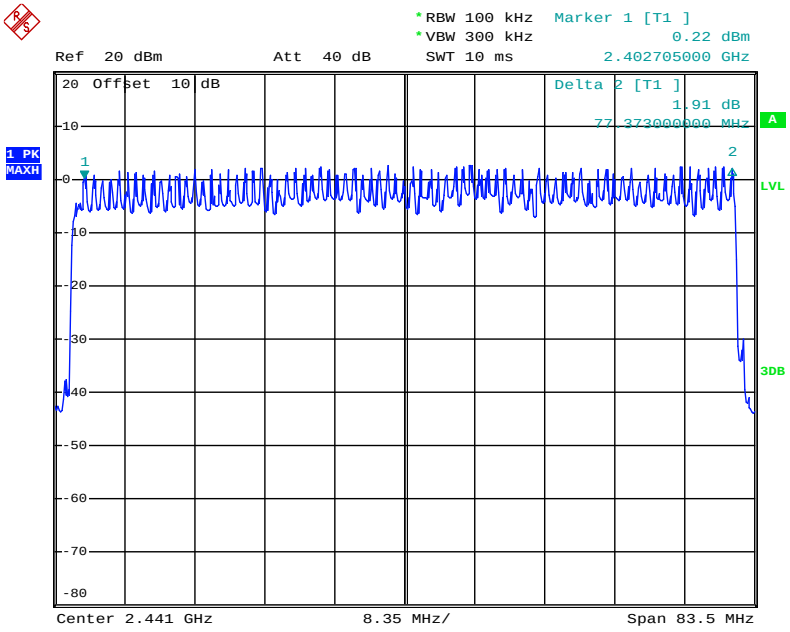
Total number of hopping channel	Measurement result(CH)	Limit(CH)	Result
	79	⩾15	Pass

The spectrum analyzer plots are attached as below.

Number of hopping channels (GFSK Mode)

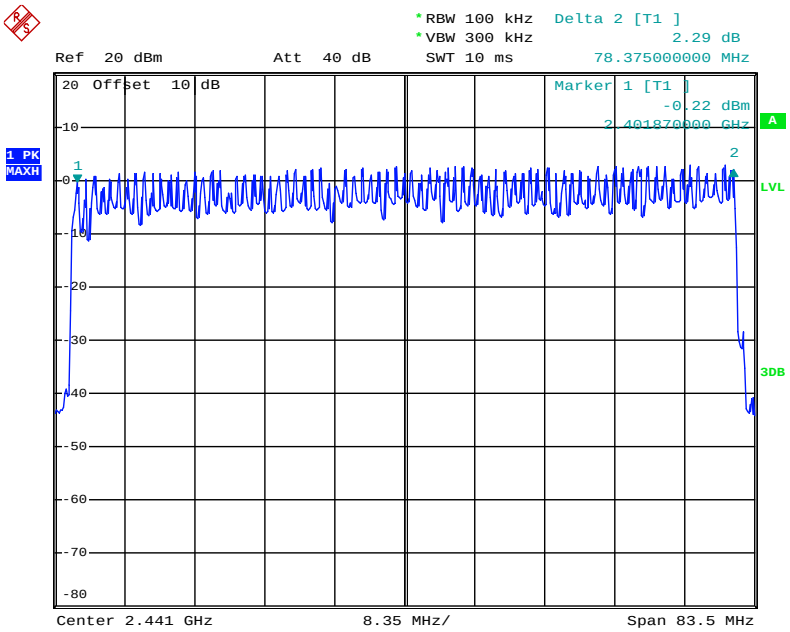


Number of hopping channels (Π/4-DQPSK Mode)



Date: 13.MAR.2019 10:02:49

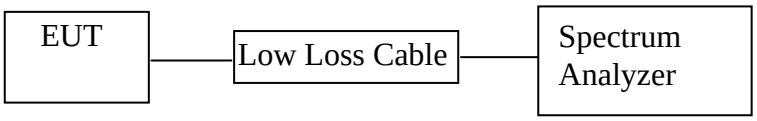
Number of hopping channels (8DPSK Mode)



Date: 13.MAR.2019 09:56:47

8. DWELL TIME TEST

8.1.Block Diagram of Test Setup



8.2.The Requirement For 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 Test

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

Pass.

GFSK Mode (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.430	137.6	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(2*79))×31.6		
DH3	2441	1.680	268.8	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(4*79))×31.6		
DH5	2441	2.960	315.7	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(6*79))×31.6		

Π/4-DQPSK Mode (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.450	144.0	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	2.960	315.7	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(6*79))×31.6		

8DPSK Mode (Worse case)

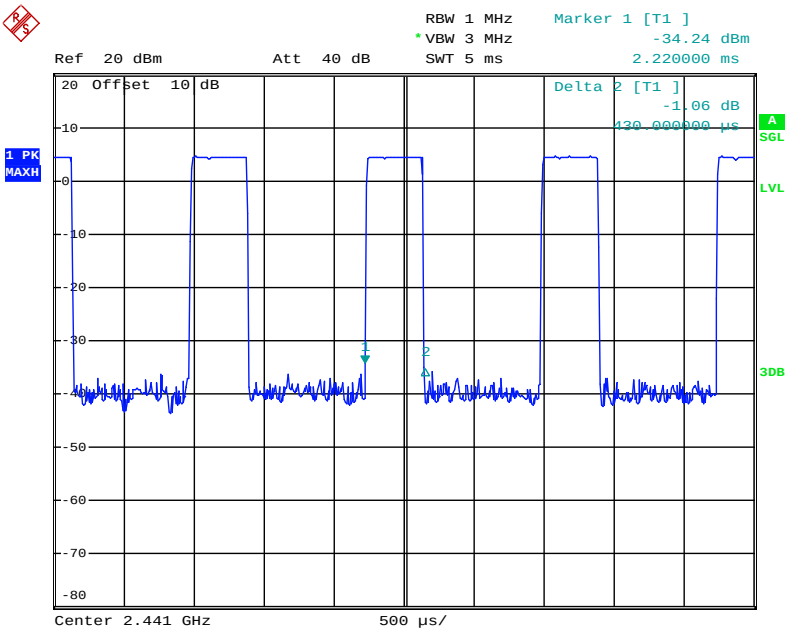
Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.440	140.8	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(2*79))×31.6		
DH3	2441	1.720	275.2	400
A period transmit time = 0.4 × 79 = 31.6		Dwell time = pulse time × (1600/(4*79))×31.6		
DH5	2441	2.990	318.9	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.

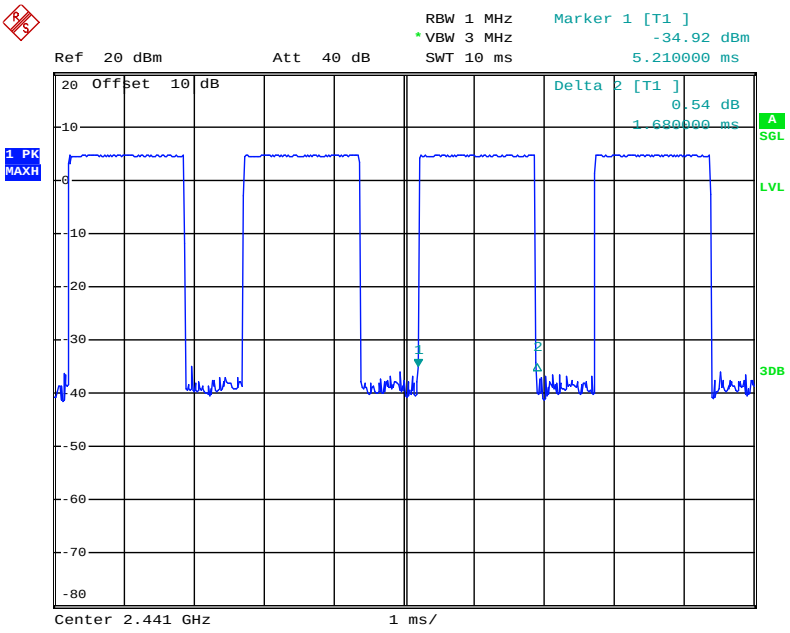
GFSK Mode

DH1 Middle channel



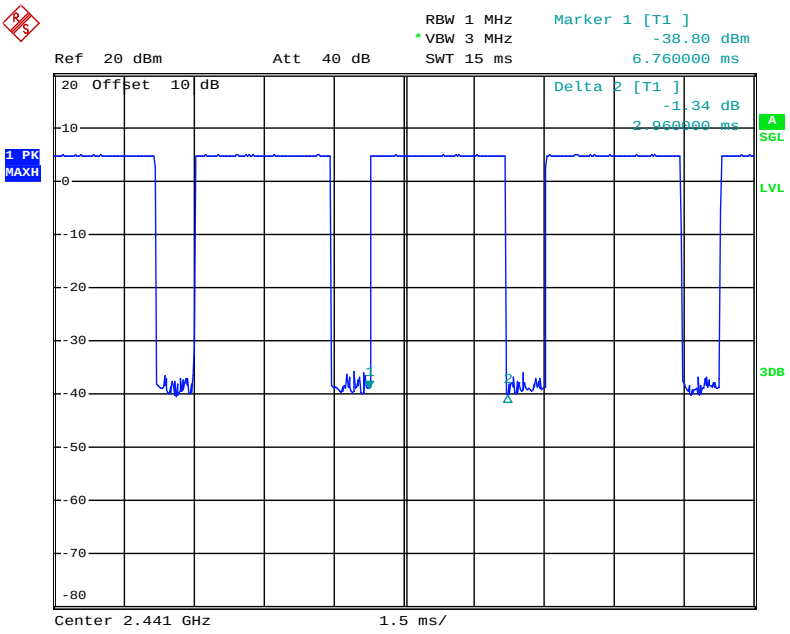
Date: 13.MAR.2019 11:11:03

DH3 Middle channel



Date: 13.MAR.2019 11:09:43

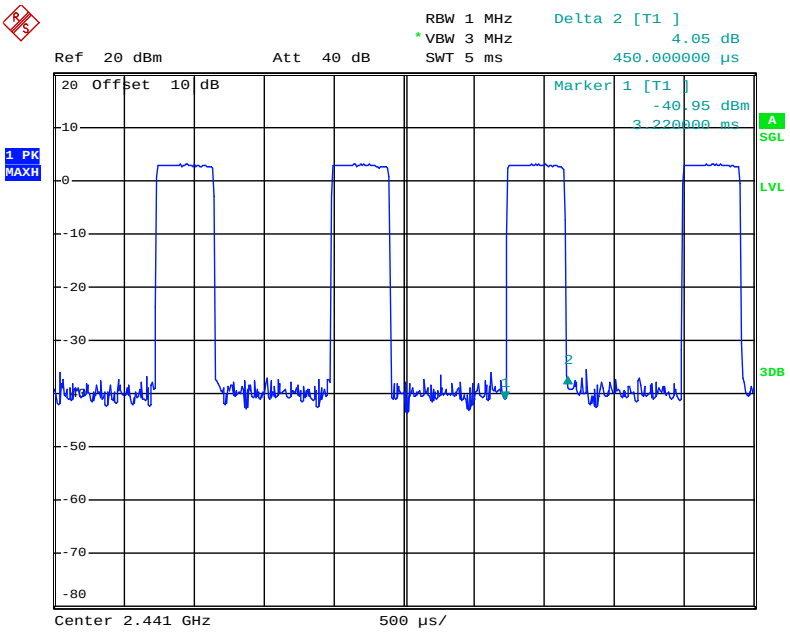
DH5 Middle channel



Date: 13.MAR.2019 11:08:29

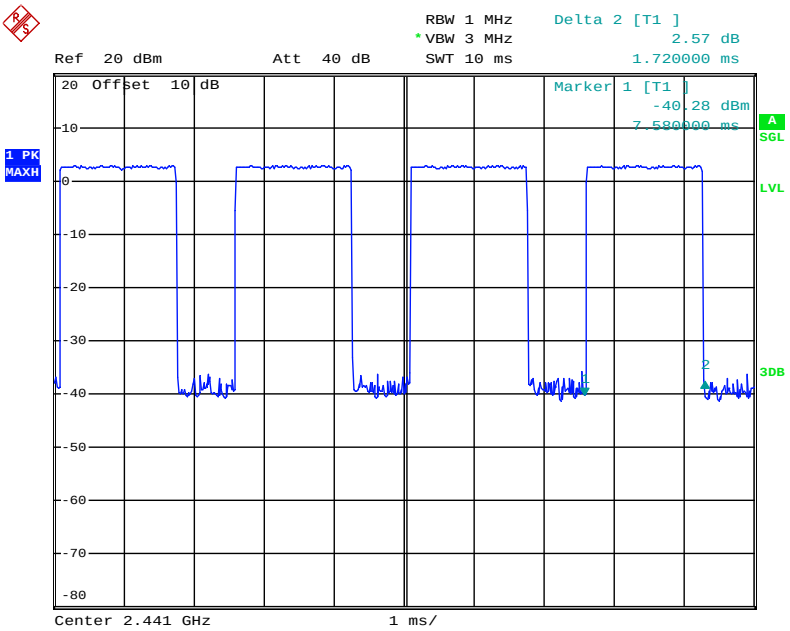
Π/4-DQPSK Mode

2-DH1 Middle channel



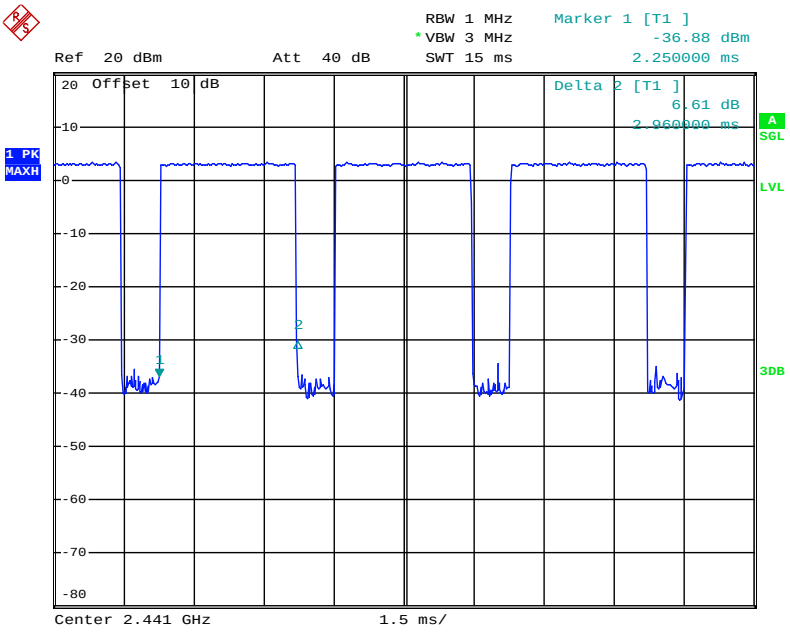
Date: 13.MAR.2019 13:46:14

2-DH3 Middle channel



Date: 13.MAR.2019 13:45:04

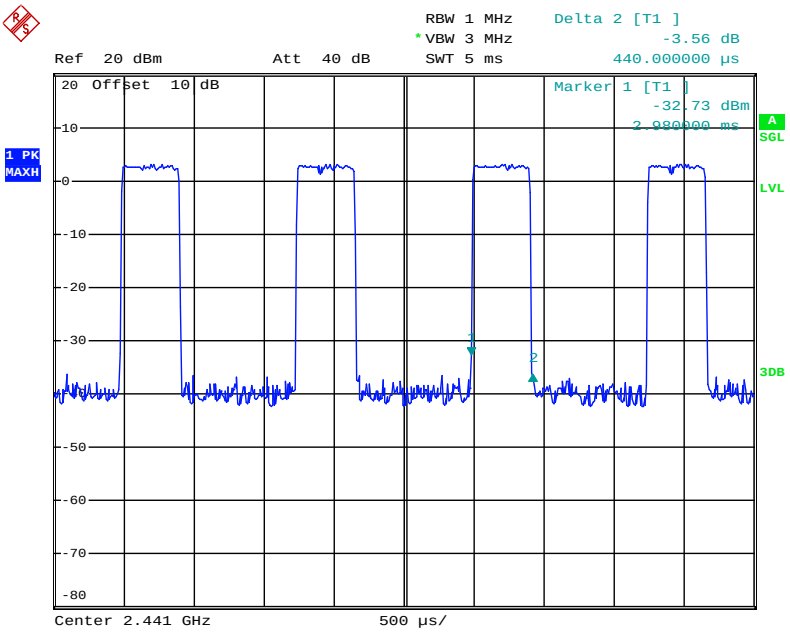
2-DH5 Middle channel



Date: 13.MAR.2019 13:43:16

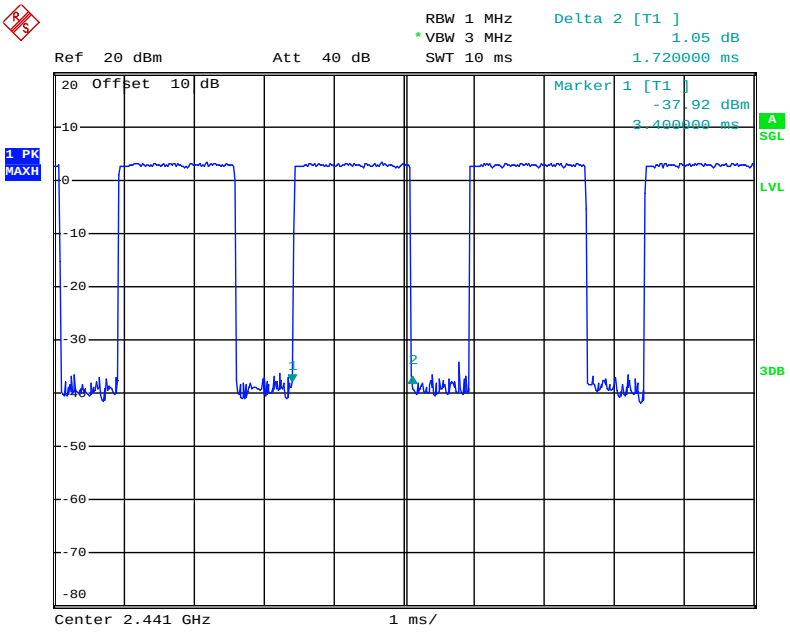
8DPSK Mode

3-DH1 Middle channel



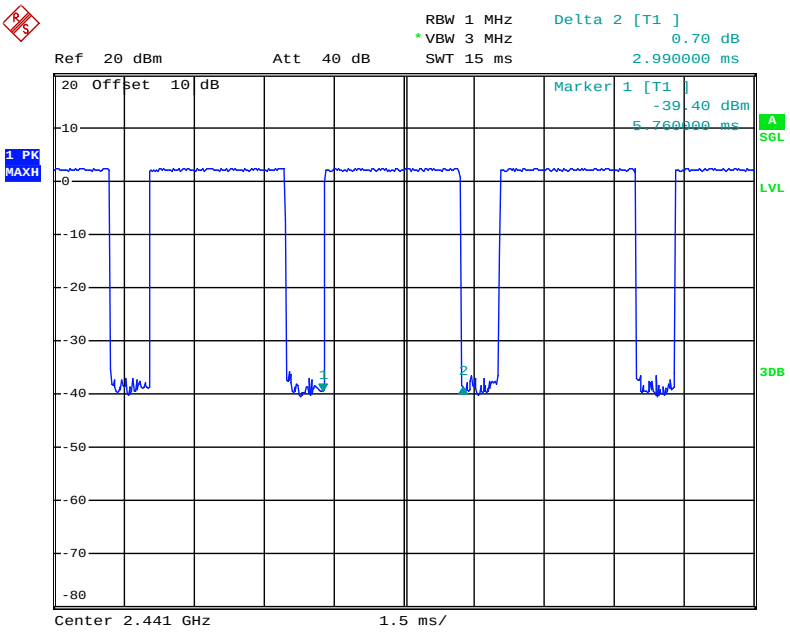
Date: 13.MAR.2019 14:00:26

3-DH3 Middle channel



Date: 13.MAR.2019 13:59:06

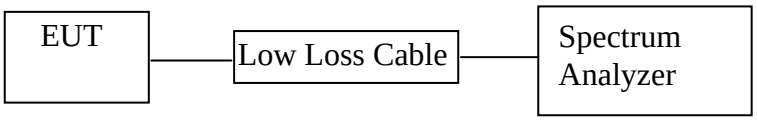
3-DH5 Middle channel



Date: 13.MAR.2019 13:56:07

9. MAXIMUM PEAK OUTPUT POWER TEST

9.1.Block Diagram of Test Setup



9.2.The Requirement For 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 Test

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

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits (dBm/W)	Result
Low	2402	2.02/0.0016	21 / 0.125	Pass
Middle	2441	2.57/0.0018	21 / 0.125	Pass
High	2480	2.42/0.0017	21 / 0.125	Pass

Π/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits (dBm/W)	Result
Low	2402	-0.23/0.0009	21 / 0.125	Pass
Middle	2441	1.69/0.0015	21 / 0.125	Pass
High	2480	1.41/0.0014	21 / 0.125	Pass

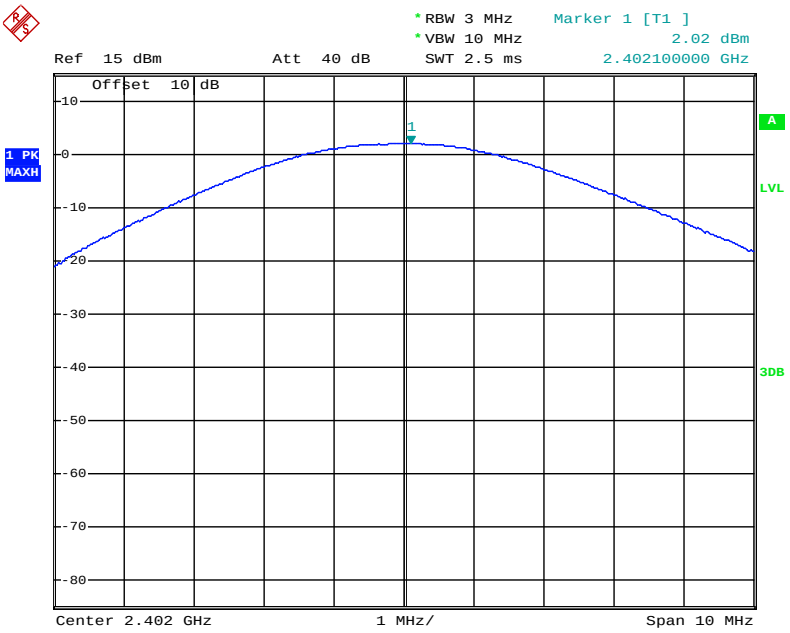
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits (dBm/W)	Result
Low	2402	0.38/0.0011	21 / 0.125	Pass
Middle	2441	1.87/0.0015	21 / 0.125	Pass
High	2480	1.60/0.0014	21 / 0.125	Pass

The spectrum analyzer plots are attached as below.

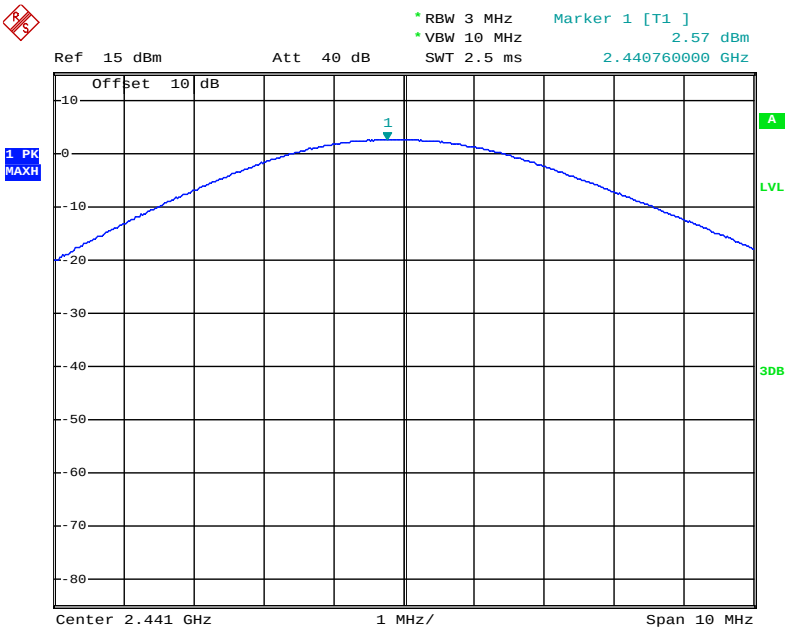
GFSK Mode

Low channel



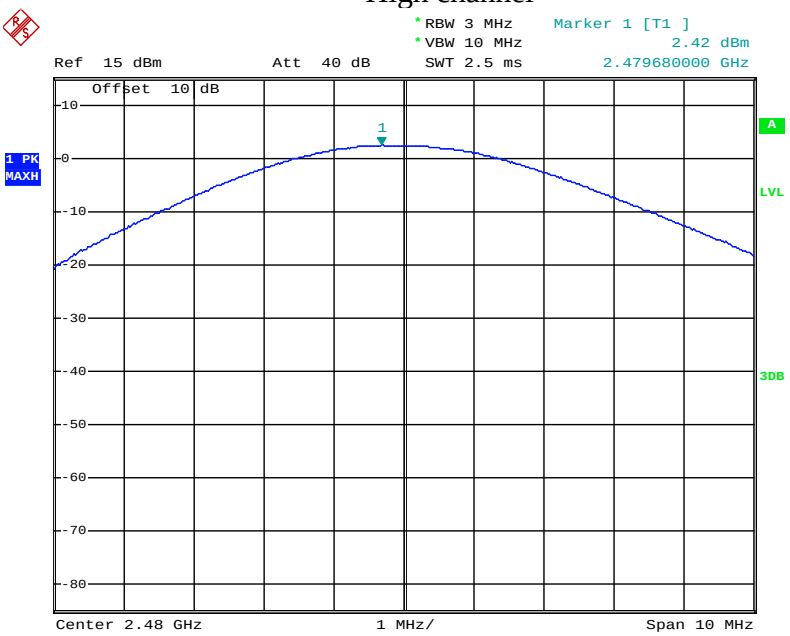
Date: 13.MAR.2019 09:19:24

Middle channel



Date: 13.MAR.2019 09:20:14

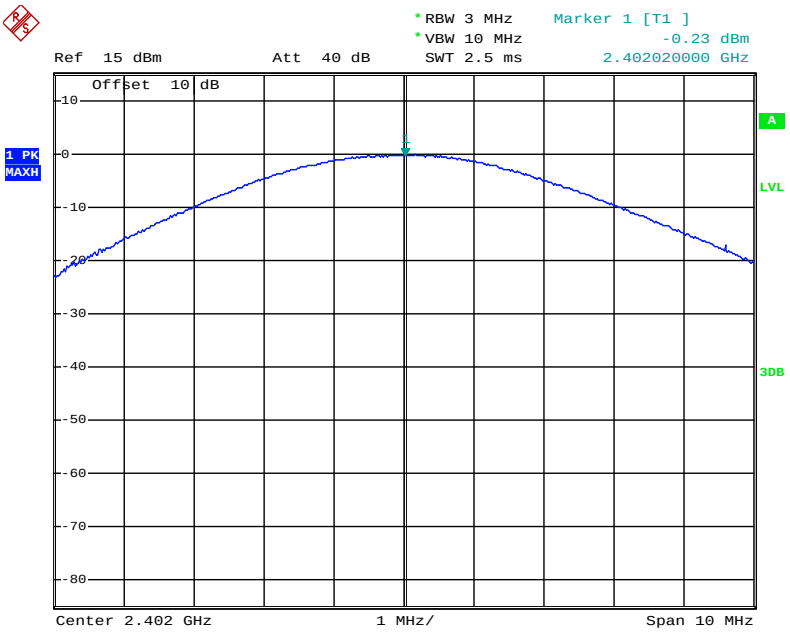
High channel



Date: 13.MAR.2019 09:20:35

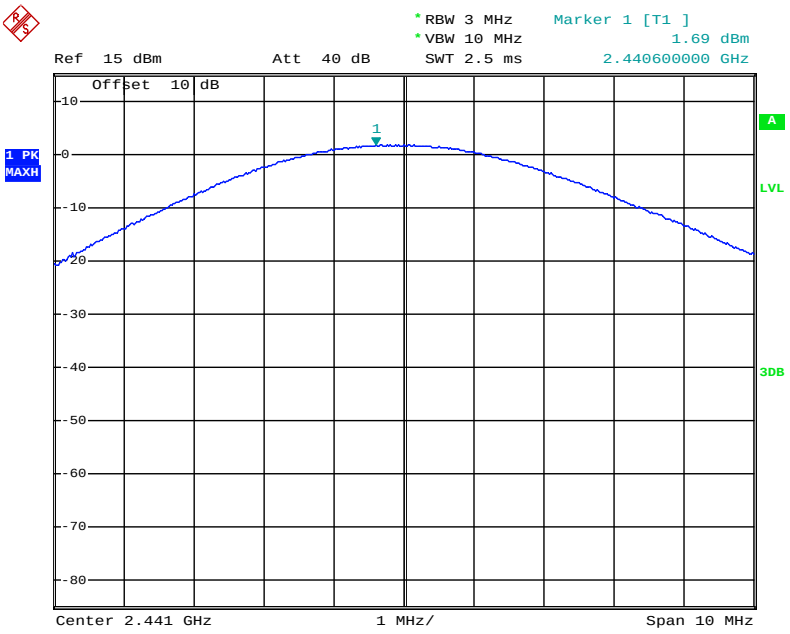
Π/4-DQPSK Mode

Low channel



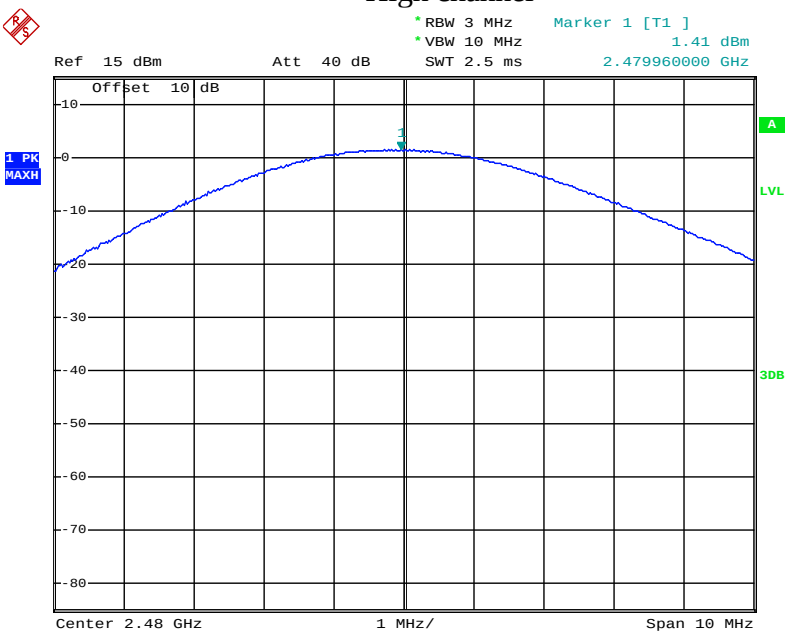
Date: 13.MAR.2019 09:22:35

Middle channel



Date: 13.MAR.2019 09:22:08

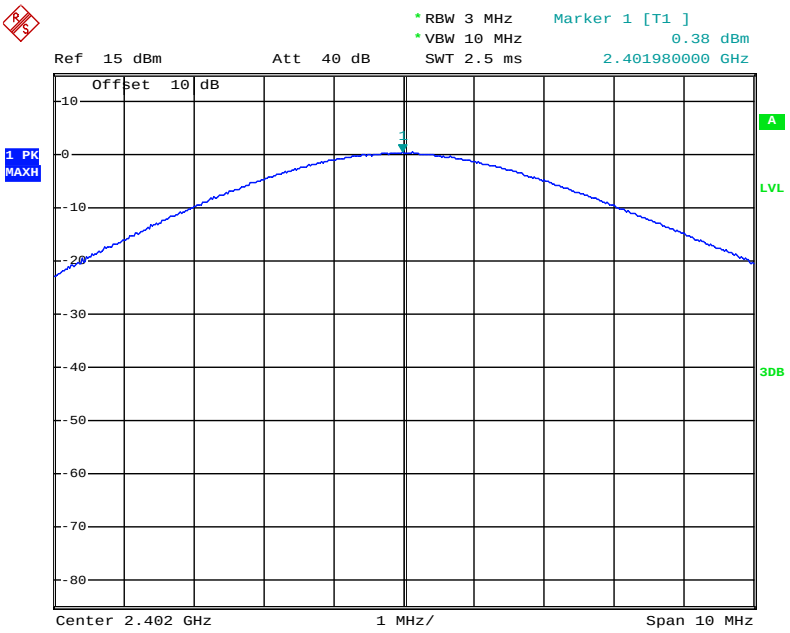
High channel



Date: 13.MAR.2019 09:21:43

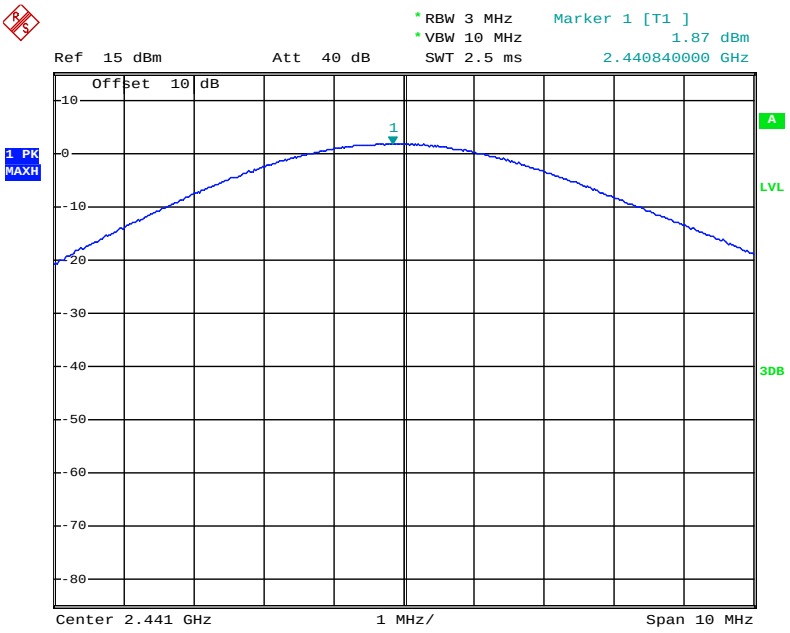
8DPSK Mode

Low channel



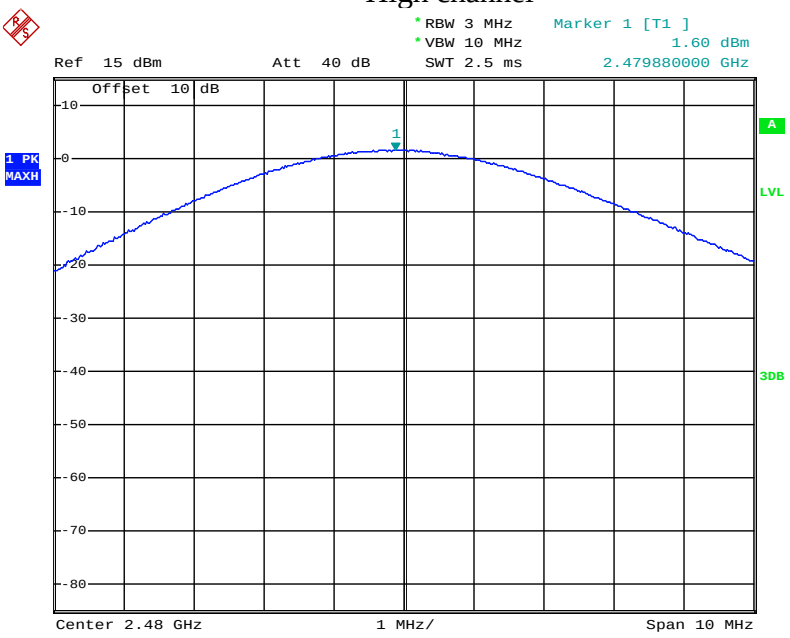
Date: 13.MAR.2019 09:23:25

Middle channel



Date: 13.MAR.2019 09:23:52

High channel

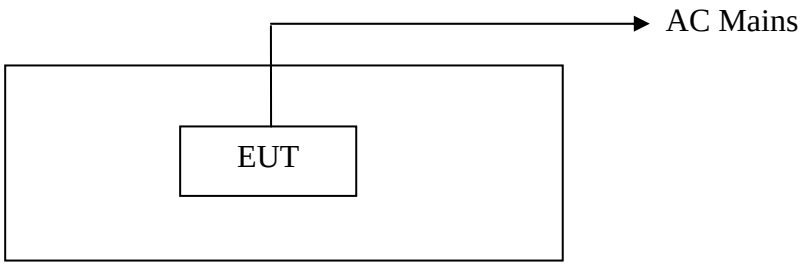


Date: 13.MAR.2019 09:24:18

10.RADIATED EMISSION TEST

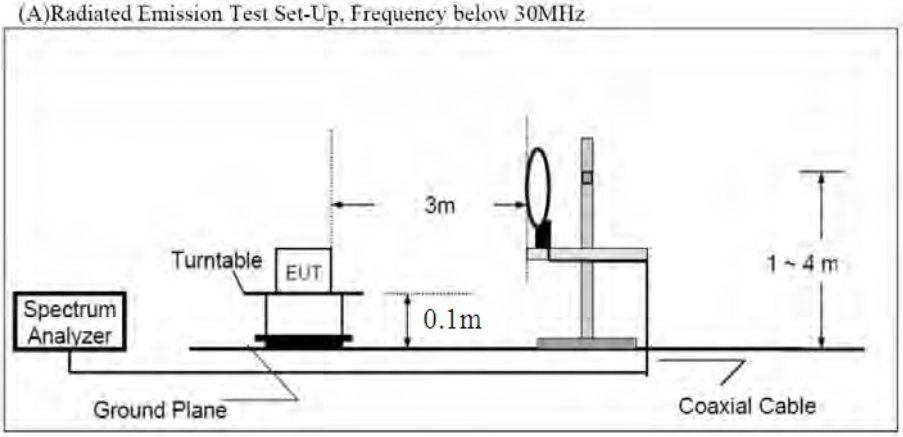
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

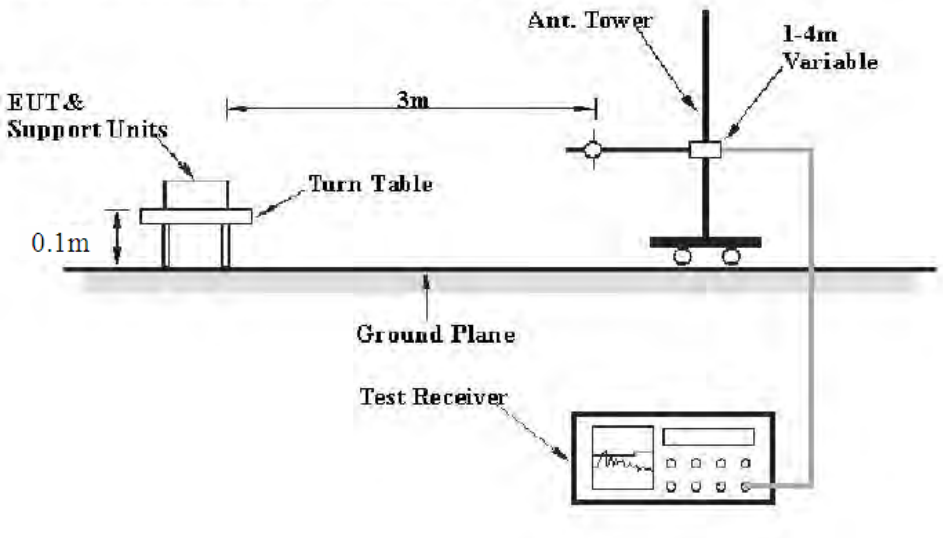


10.1.2.Semi-Anechoic Chamber Test Setup Diagram

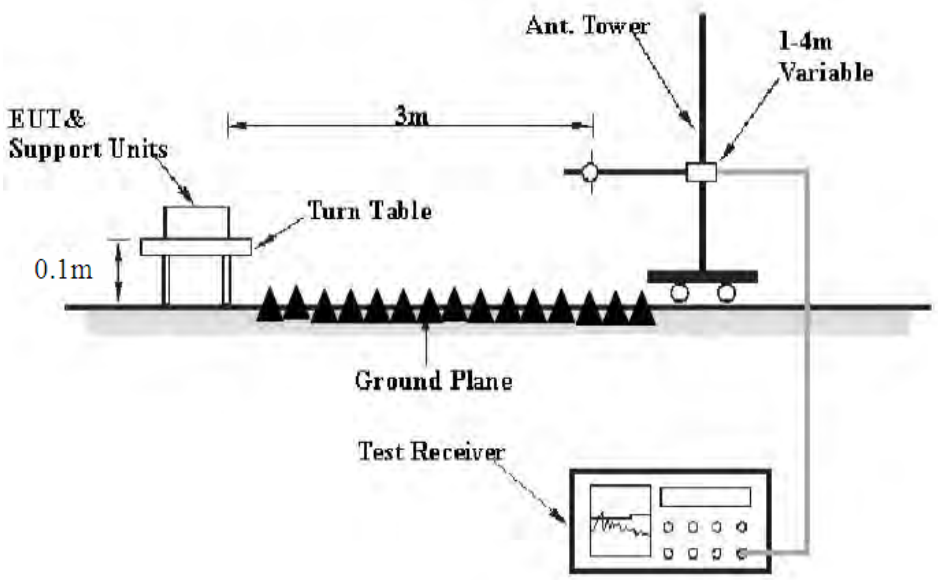
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(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.EUT Configuration on Test

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 0.1 meter high above ground. 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 worse 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	48.69	-13.35	35.34	46	-10.66	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.Test Results

Pass.

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

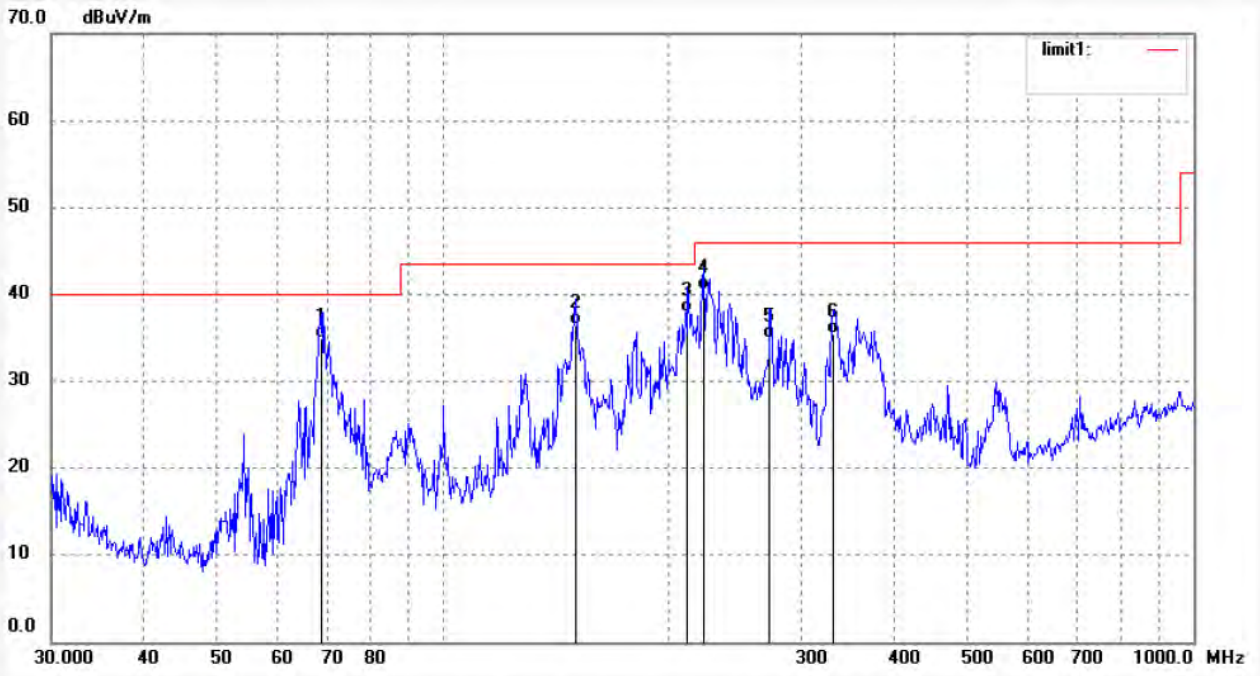
Below 1GHz

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 #522
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/03/09/
Time: 9/57/04
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



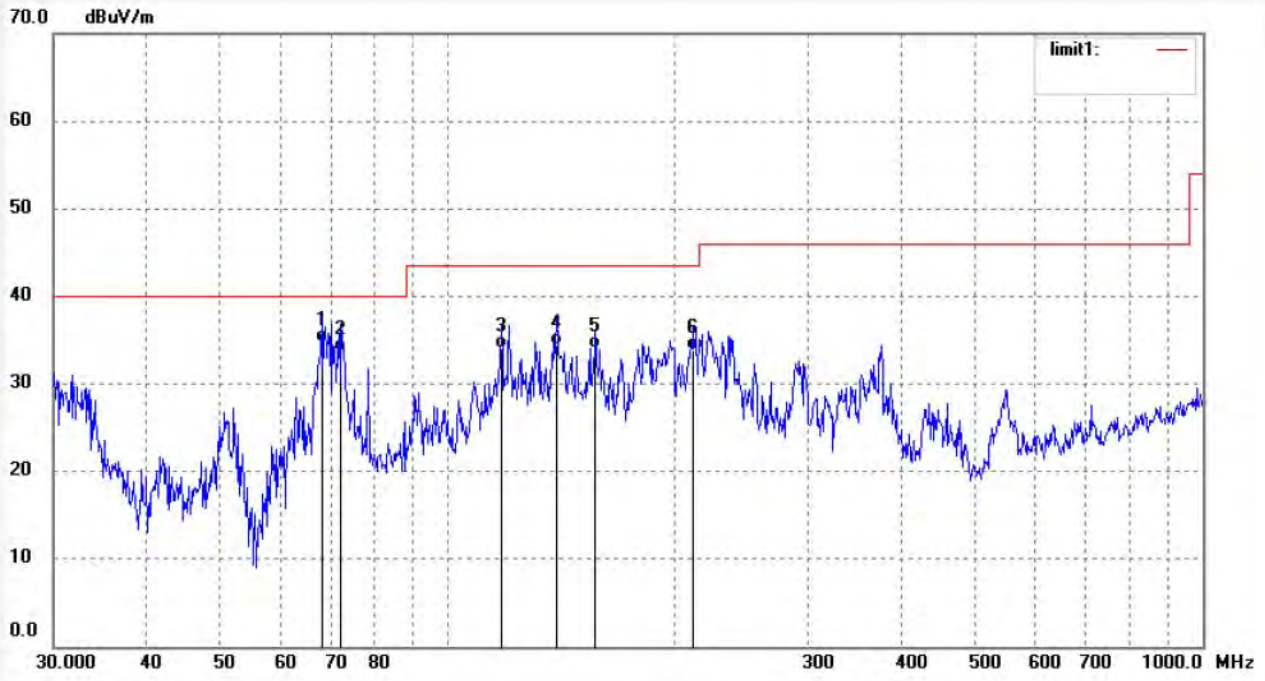
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	68.7450	62.37	-27.43	34.94	40.00	-5.06	QP	200	136	
2	150.4953	64.46	-28.01	36.45	43.50	-7.05	QP	200	221	
3	211.6111	62.03	-24.09	37.94	43.50	-5.56	QP	200	200	
4	222.2806	64.46	-23.98	40.48	46.00	-5.52	QP	200	92	
5	272.5246	57.45	-22.48	34.97	46.00	-11.03	QP	200	345	
6	330.6220	55.65	-20.13	35.52	46.00	-10.48	QP	200	106	

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 #521
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/09/
Time: 9/56/02
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



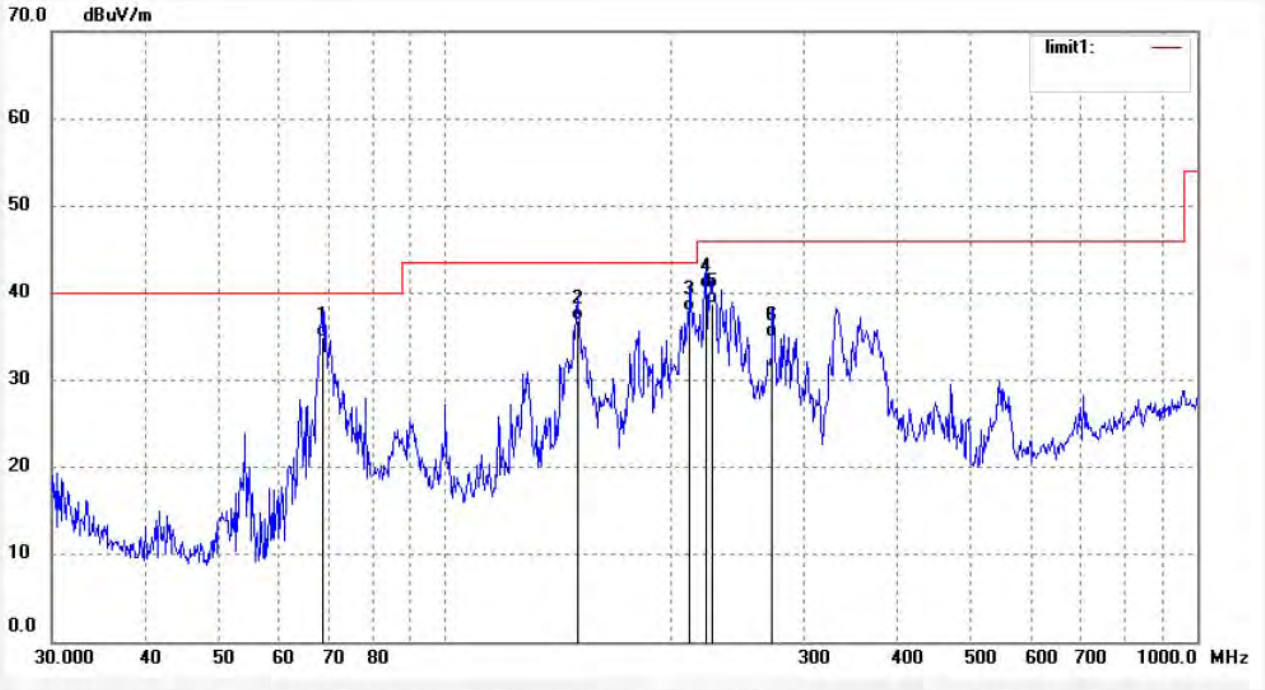
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	68.0241	62.13	-27.41	34.72	40.00	-5.28	QP	100	52	
2	72.2111	61.31	-27.58	33.73	40.00	-6.27	QP	100	334	
3	117.6814	61.37	-27.39	33.98	43.50	-9.52	QP	100	113	
4	139.3006	62.38	-27.94	34.44	43.50	-9.06	QP	100	92	
5	156.9764	61.37	-27.41	33.96	43.50	-9.54	QP	100	101	
6	211.6111	57.99	-24.09	33.90	43.50	-9.60	QP	100	302	

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 #523
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2441MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/03/09/
Time: 9/57/14
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	68.7450	62.34	-27.43	34.91	40.00	-5.09	QP	200	103	
2	150.4953	64.78	-28.01	36.77	43.50	-6.73	QP	200	144	
3	211.6111	62.01	-24.09	37.92	43.50	-5.58	QP	200	52	
4	222.2806	64.46	-23.98	40.48	46.00	-5.52	QP	200	231	
5	226.2202	62.64	-23.93	38.71	46.00	-7.29	QP	200	201	
6	272.5246	57.44	-22.48	34.96	46.00	-11.04	QP	200	92	

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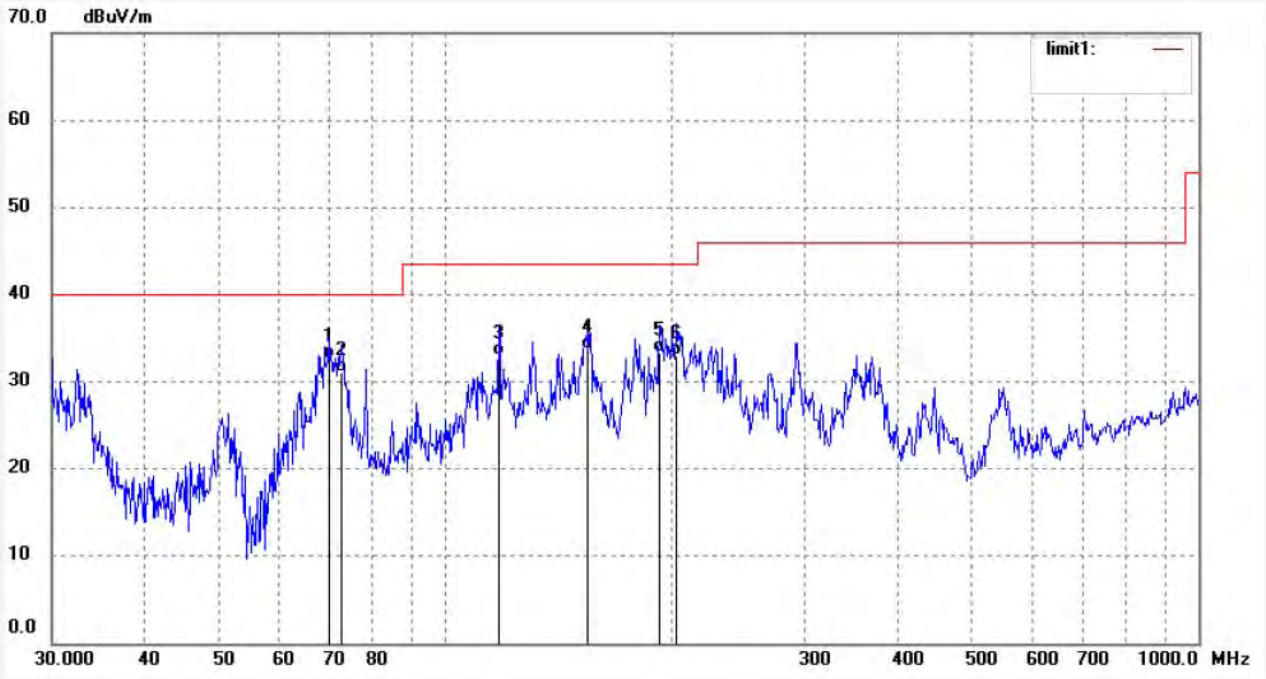
Job No.: FRANK2019 #524
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2441MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/09/
Time: 9/58/07
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	69.9632	60.12	-27.48	32.64	40.00	-7.36	QP	100	163	
2	72.7202	58.64	-27.60	31.04	40.00	-8.96	QP	100	91	
3	117.6814	60.37	-27.39	32.98	43.50	-10.52	QP	100	216	
4	154.2427	61.30	-27.68	33.62	43.50	-9.88	QP	100	332	
5	192.4590	58.15	-24.89	33.26	43.50	-10.24	QP	100	201	
6	202.8745	57.32	-24.25	33.07	43.50	-10.43	QP	100	195	

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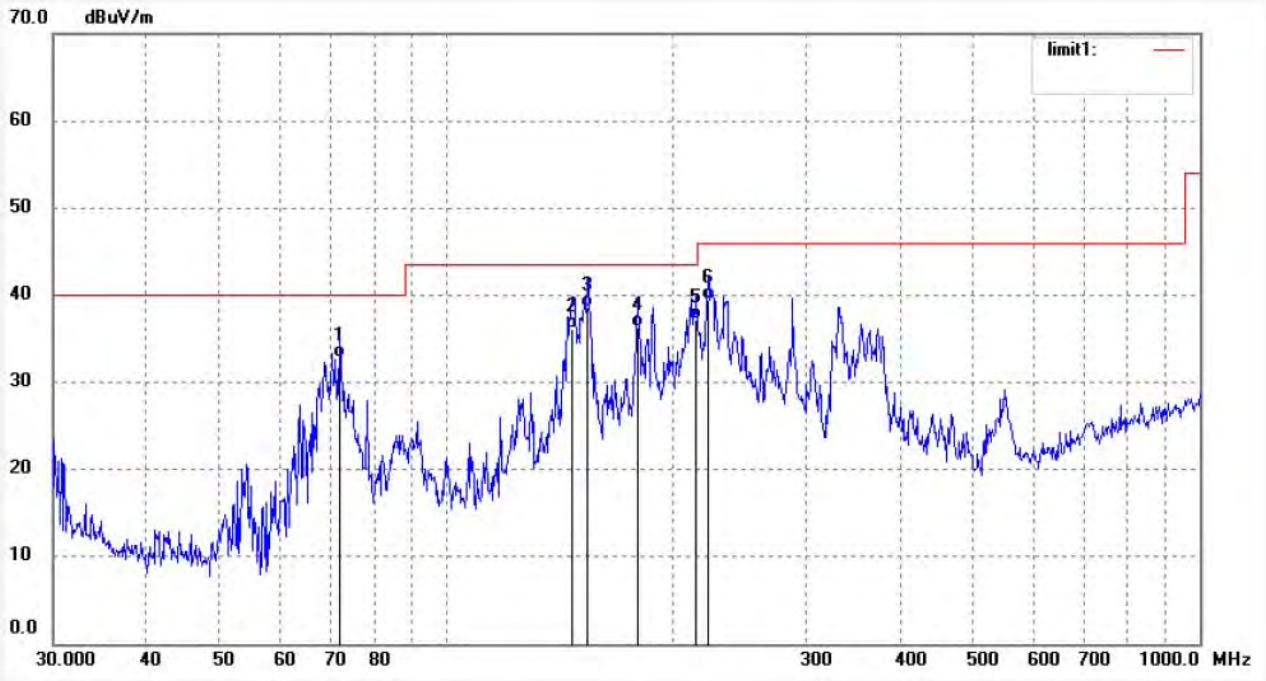
Job No.: FRANK2019 #526
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/03/09/
Time: 9/59/16
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	72.2111	60.45	-27.58	32.87	40.00	-7.13	QP	200	122	
2	146.8392	64.15	-28.06	36.09	43.50	-7.41	QP	200	33	
3	153.7017	66.35	-27.72	38.63	43.50	-4.87	QP	200	92	
4	179.3989	62.38	-26.08	36.30	43.50	-7.20	QP	200	216	
5	214.6063	61.30	-24.06	37.24	43.50	-6.26	QP	200	331	
6	222.2806	63.45	-23.98	39.47	46.00	-6.53	QP	200	196	

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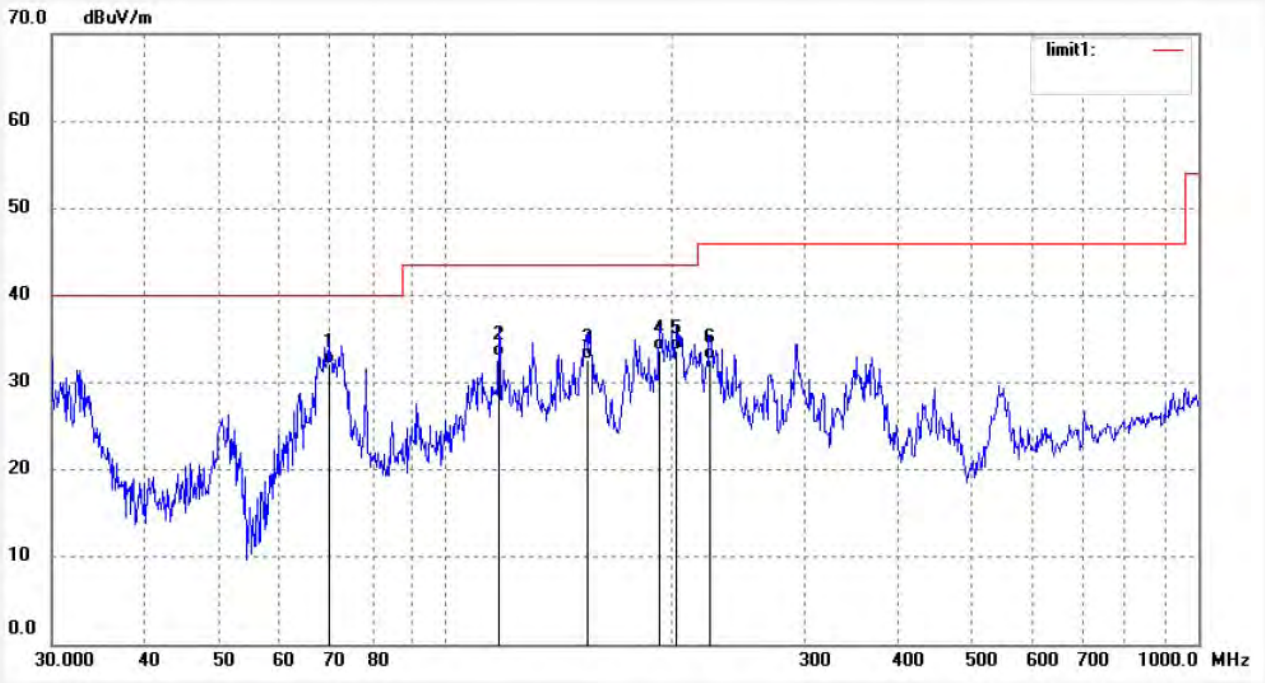
Job No.: FRANK2019 #525
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/09/
Time: 9/58/19
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	69.9632	59.66	-27.48	32.18	40.00	-7.82	QP	100	103	
2	117.6814	60.37	-27.39	32.98	43.50	-10.52	QP	100	219	
3	154.2427	60.34	-27.68	32.66	43.50	-10.84	QP	100	320	
4	192.4590	58.61	-24.89	33.72	43.50	-9.78	QP	100	119	
5	202.8745	57.99	-24.25	33.74	43.50	-9.76	QP	100	54	
6	224.6360	56.56	-23.94	32.62	46.00	-13.38	QP	100	216	

Above 1GHz

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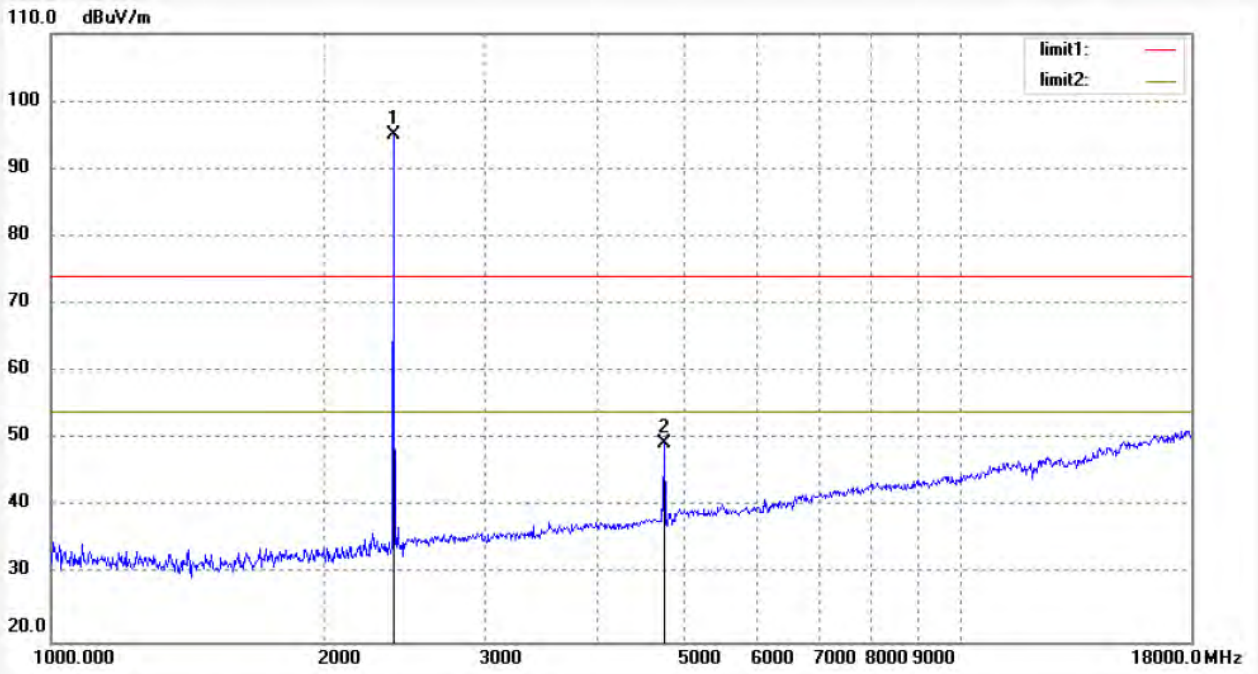
Job No.: FRANK2019 #537
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/11/02
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	101.33	-6.37	94.96	/	/	peak	250	331	
2	4804.057	48.69	0.70	49.39	74.00	-24.61	peak	250	109	

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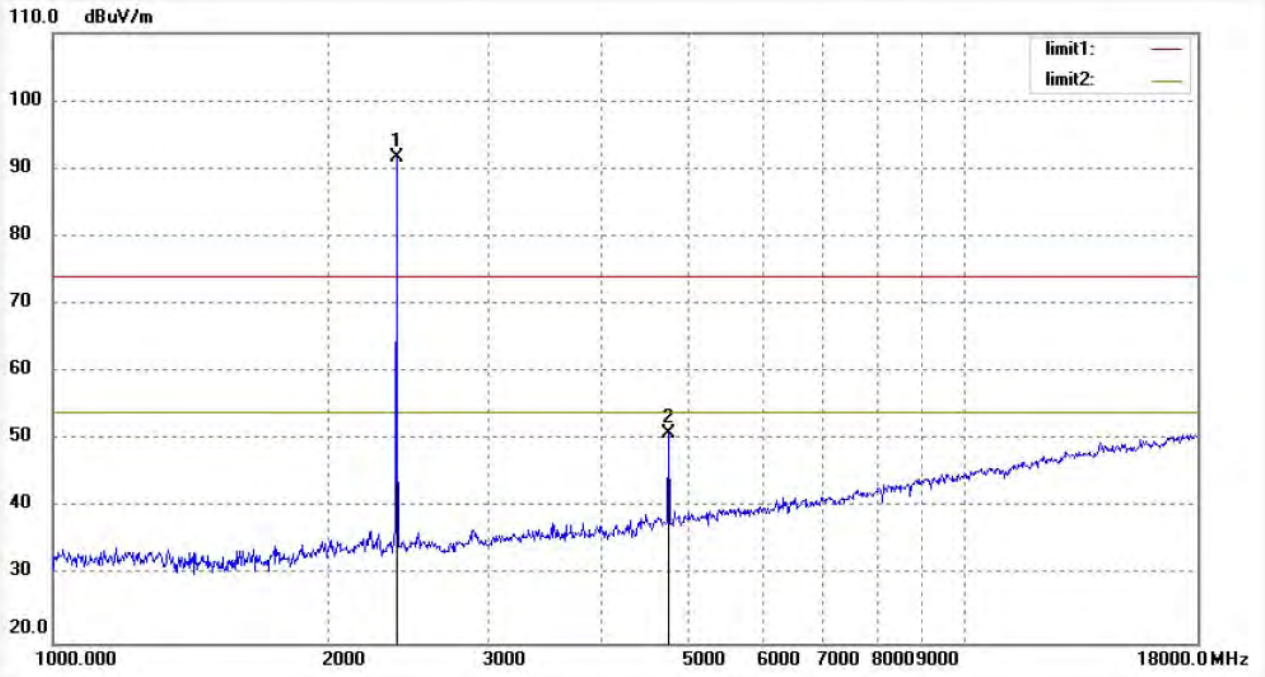
Job No.: FRANK2019 #538
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/12/14
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	98.01	-6.37	91.64	/	/	peak	150	219	
2	4804.057	50.23	0.70	50.93	74.00	-23.07	peak	150	93	

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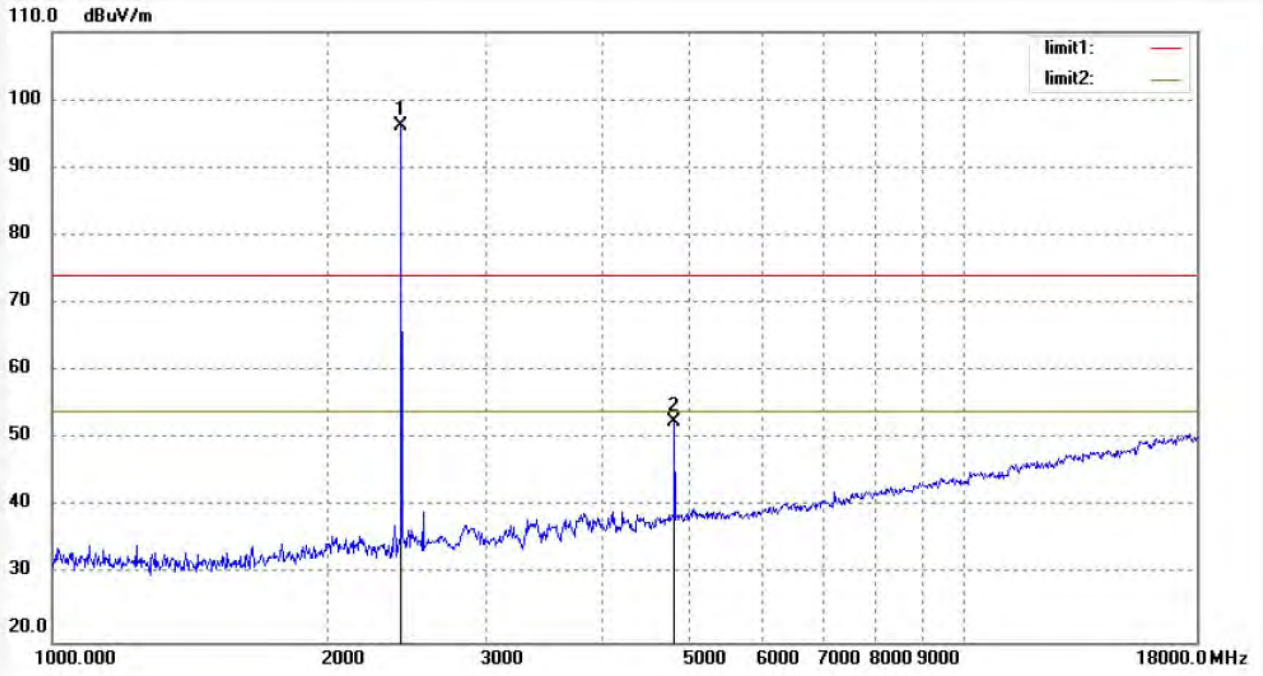
Job No.: FRANK2019 #540
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2441MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/14/39
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	102.40	-6.20	96.20	/	/	peak	250	146	
2	4882.024	51.41	1.07	52.48	74.00	-21.52	peak	250	198	

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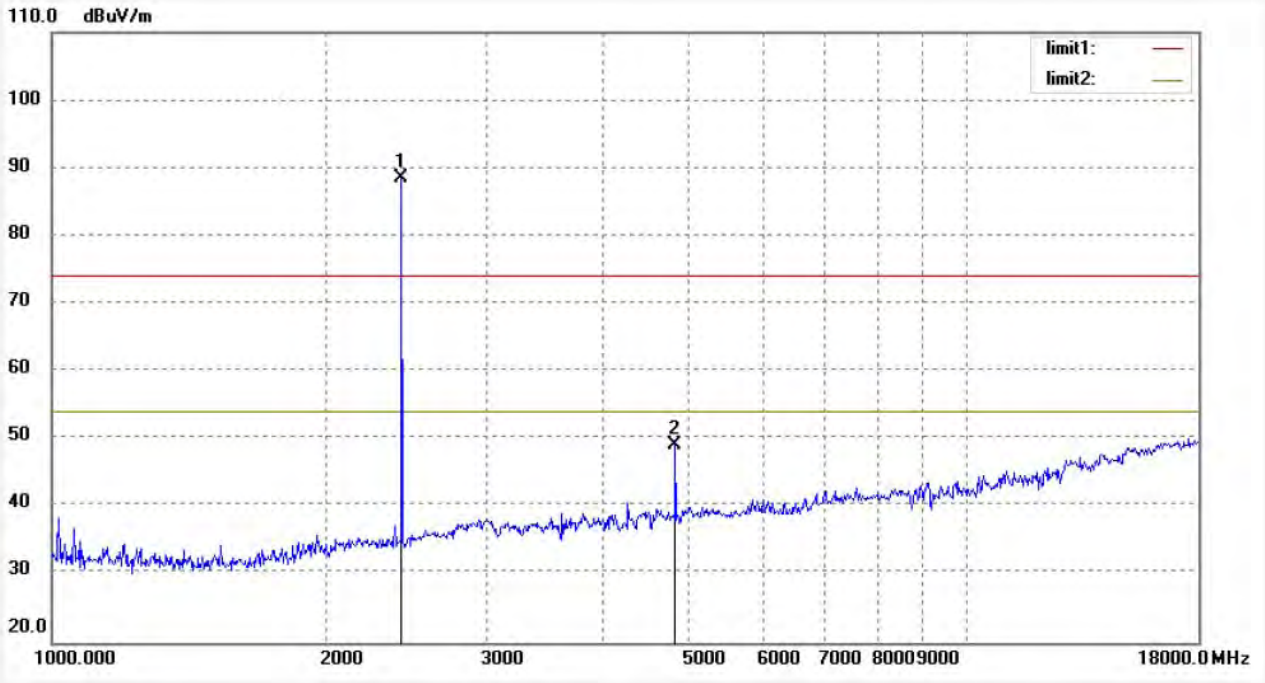
Job No.: FRANK2019 #539
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2441MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/13/35
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	94.82	-6.20	88.62	/	/	peak	150	221	
2	4882.024	48.18	1.07	49.25	74.00	-24.75	peak	150	301	

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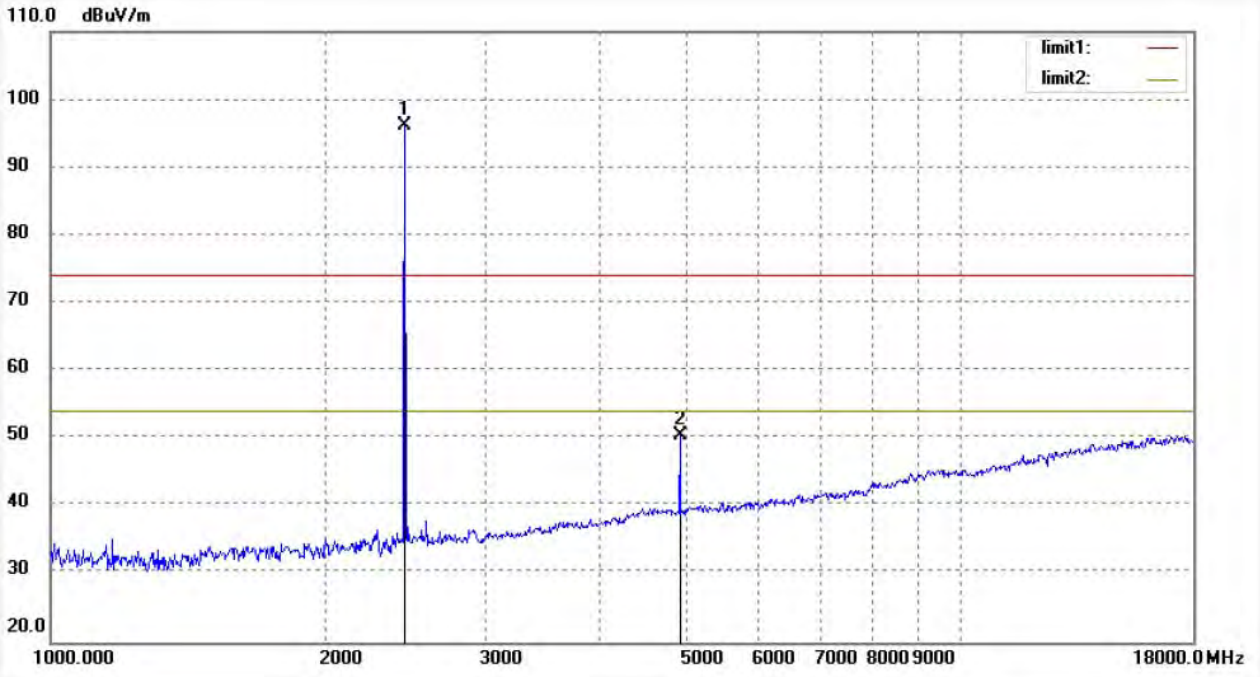
Job No.: FRANK2019 #541
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/15/59
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	102.25	-6.04	96.21	/	/	peak	250	119	
2	4960.044	48.98	1.50	50.48	74.00	-23.52	peak	250	302	

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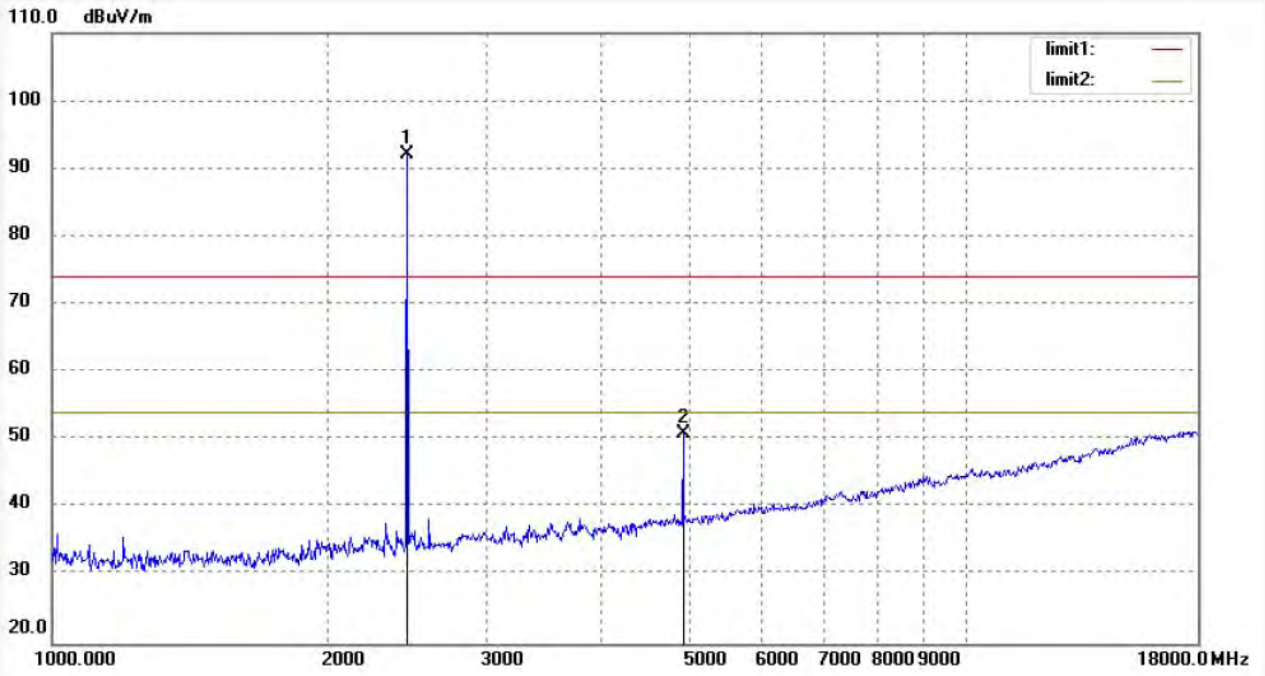
Job No.: FRANK2019 #542
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/17/12
Engineer Signature:
Distance: 3m

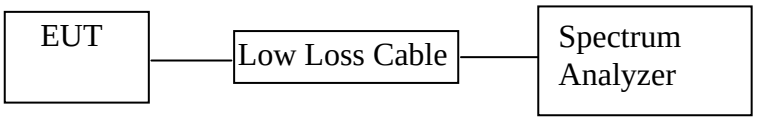
Note: Report NO.:ATE20190209



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	98.12	-6.04	92.08	/	/	peak	150	112	
2	4960.044	49.35	1.50	50.85	74.00	-23.15	peak	150	32	

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



11.2.The Requirement For 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 Test

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

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

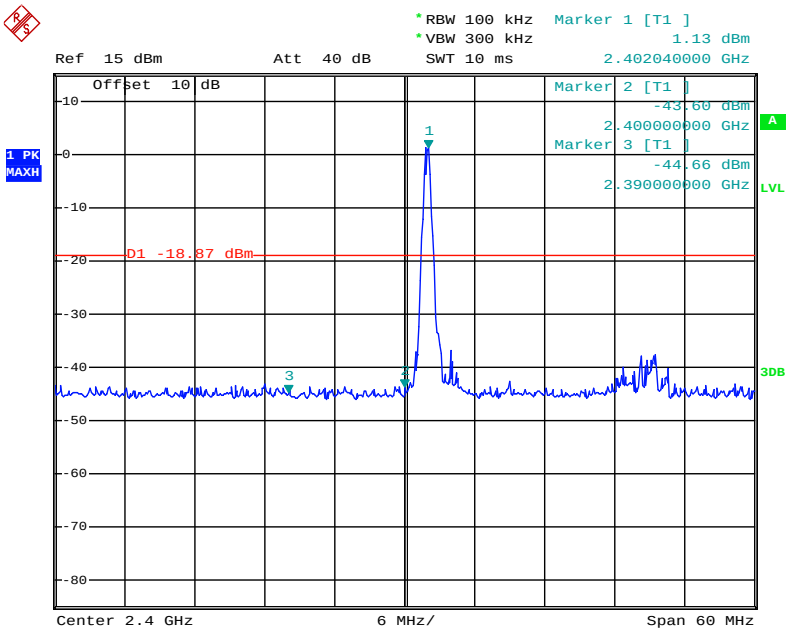
Conducted Band Edge Result

Non-hopping mode

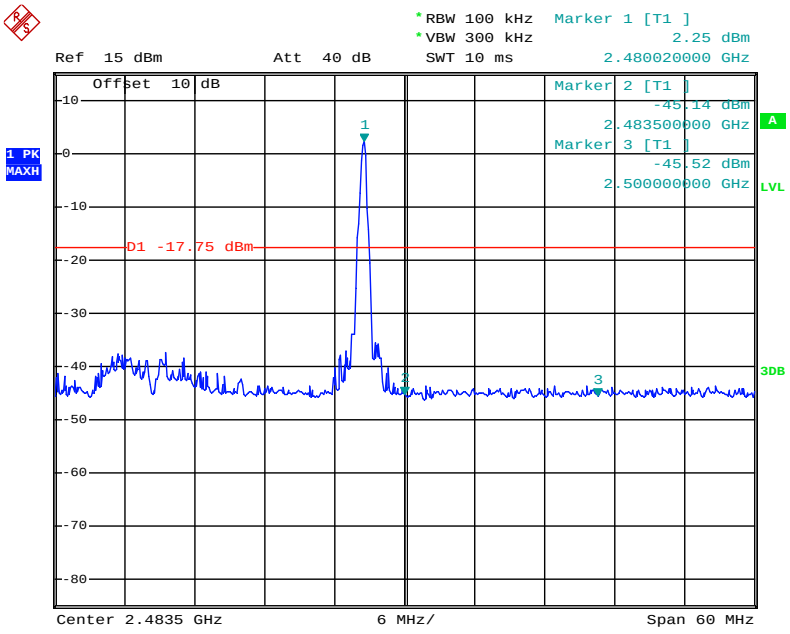
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)	Result
GFSK Mode			
2400.00	44.73	> 20dBc	Pass
2483.50	47.39	> 20dBc	Pass
Π/4-DQPSK Mode			
2400.00	45.33	> 20dBc	Pass
2483.50	47.63	> 20dBc	Pass
8DPSK Mode			
2400.00	44.82	> 20dBc	Pass
2483.50	45.31	> 20dBc	Pass

The spectrum analyzer plots are attached as below.

GFSK Mode

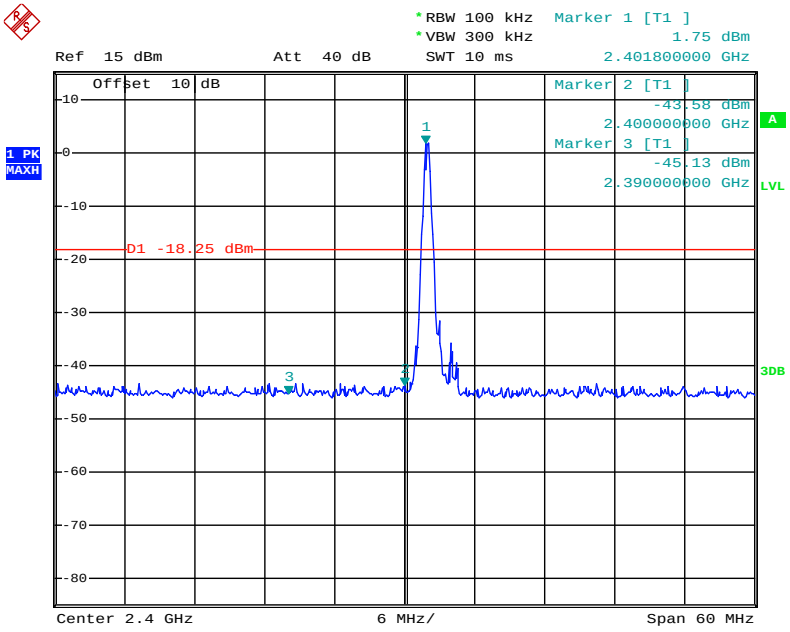


Date: 13.MAR.2019 09:49:14

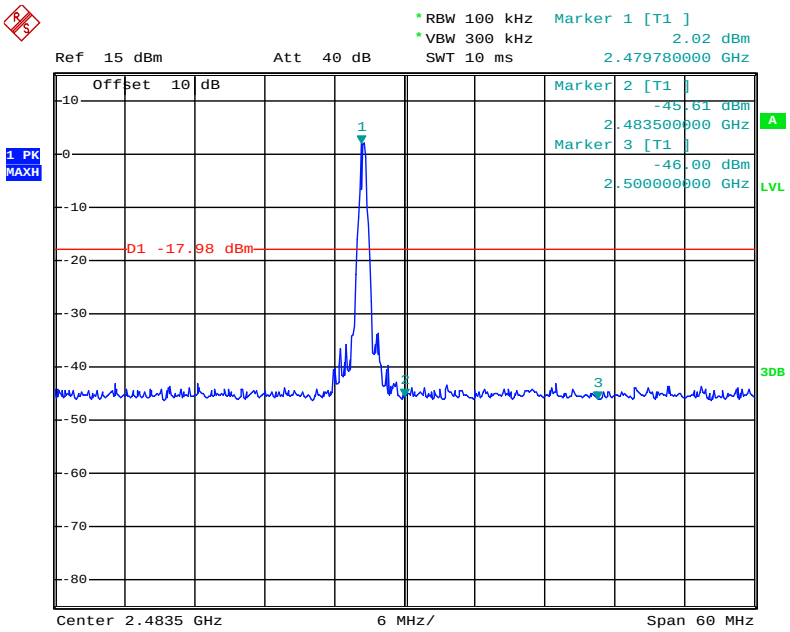


Date: 13.MAR.2019 09:51:20

Π/4-DQPSK Mode

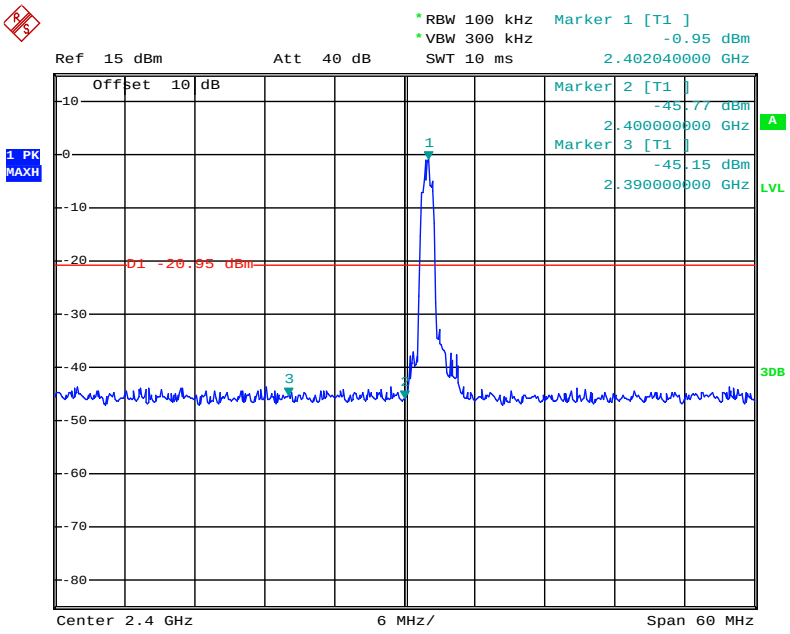


Date: 13.MAR.2019 09:54:25

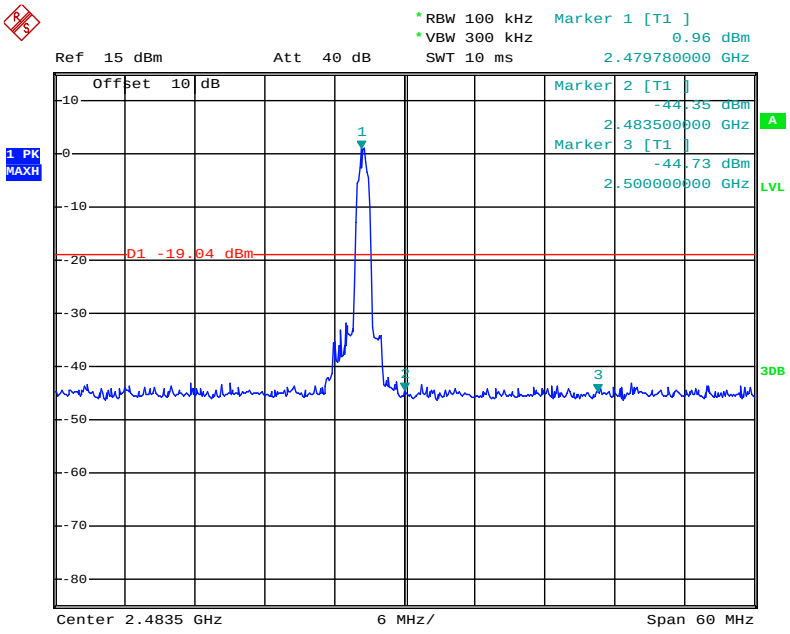


Date: 13.MAR.2019 09:53:29

8DPSK Mode



Date: 13.MAR.2019 09:55:02



Date: 13.MAR.2019 09:55:58

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 0.1 meter high above ground. 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.

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 (GFSK mode) emissions are reported.

The spectrum analyzer plots are attached as below.

Non-hopping mode

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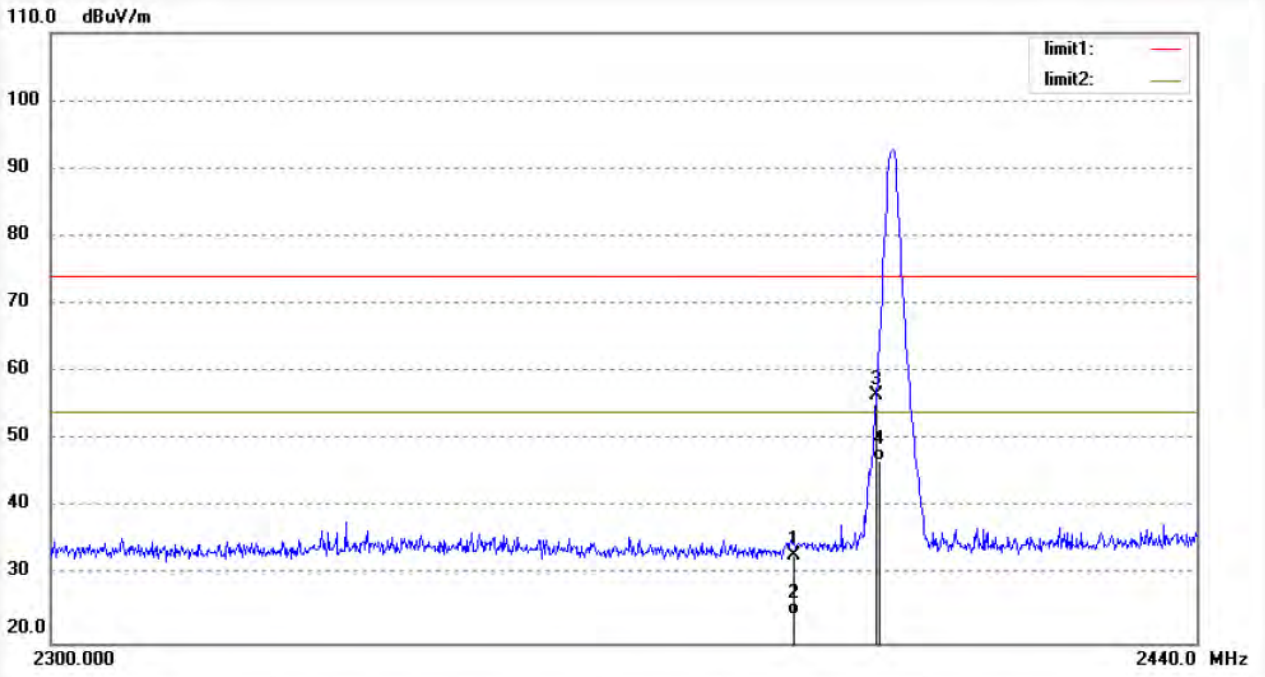
Job No.: FRANK2019 #544	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/14/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/20/49
EUT: Massage Chair	Engineer Signature:
Mode: TX2402MHz(GSFK)	Distance: 3m
Model: EC-3205A	
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd	

Note: Report NO.:ATE20190209



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	39.32	-6.32	33.00	74.00	-41.00	peak	250	146	
2	2390.000	30.45	-6.32	24.13	54.00	-29.87	AVG	250	92	
3	2400.000	62.73	-6.27	56.46	74.00	-17.54	peak	250	201	
4	2400.000	53.12	-6.27	46.85	54.00	-7.15	AVG	200	193	

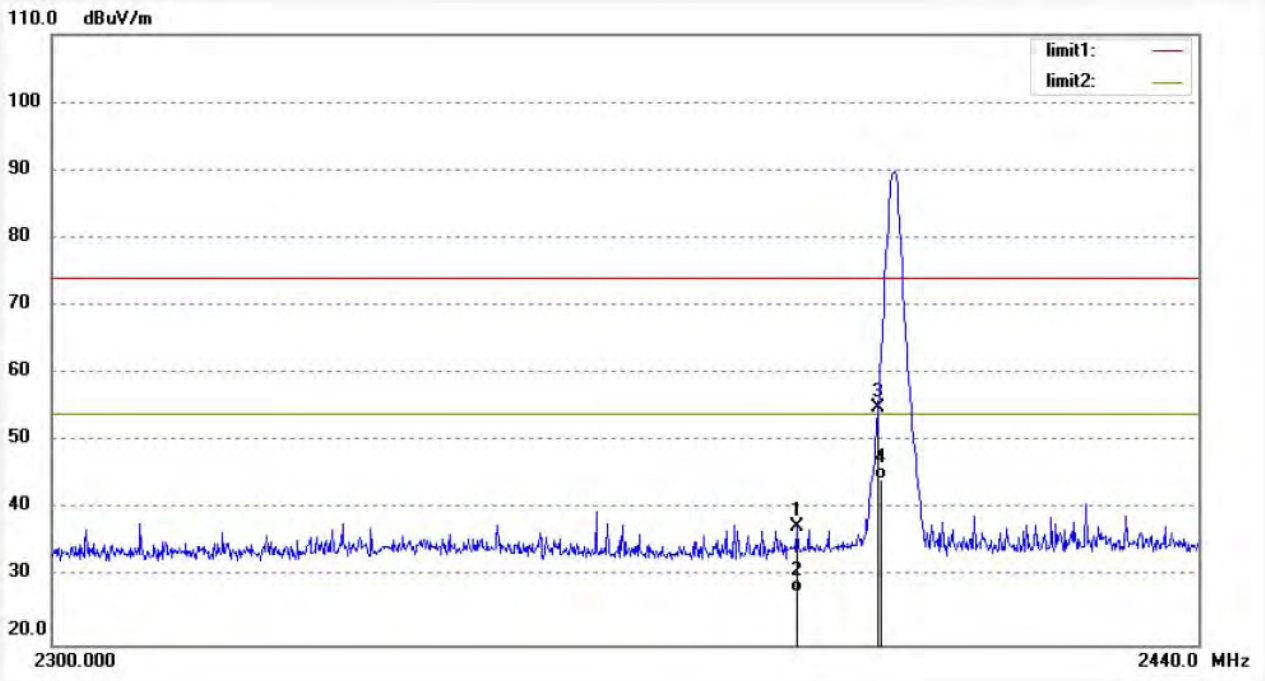
Note: Average measurement with peak detection at No.2&4

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 #543
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz(GSFK)
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/19/19
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	43.74	-6.32	37.42	74.00	-36.58	peak	150	41	
2	2390.000	34.15	-6.32	27.83	54.00	-26.17	AVG	150	211	
3	2400.000	61.30	-6.27	55.03	74.00	-18.97	peak	150	332	
4	2400.000	50.78	-6.27	44.51	54.00	-9.49	AVG	150	196	

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

ACCURATE TECHNOLOGY CO., LTD.
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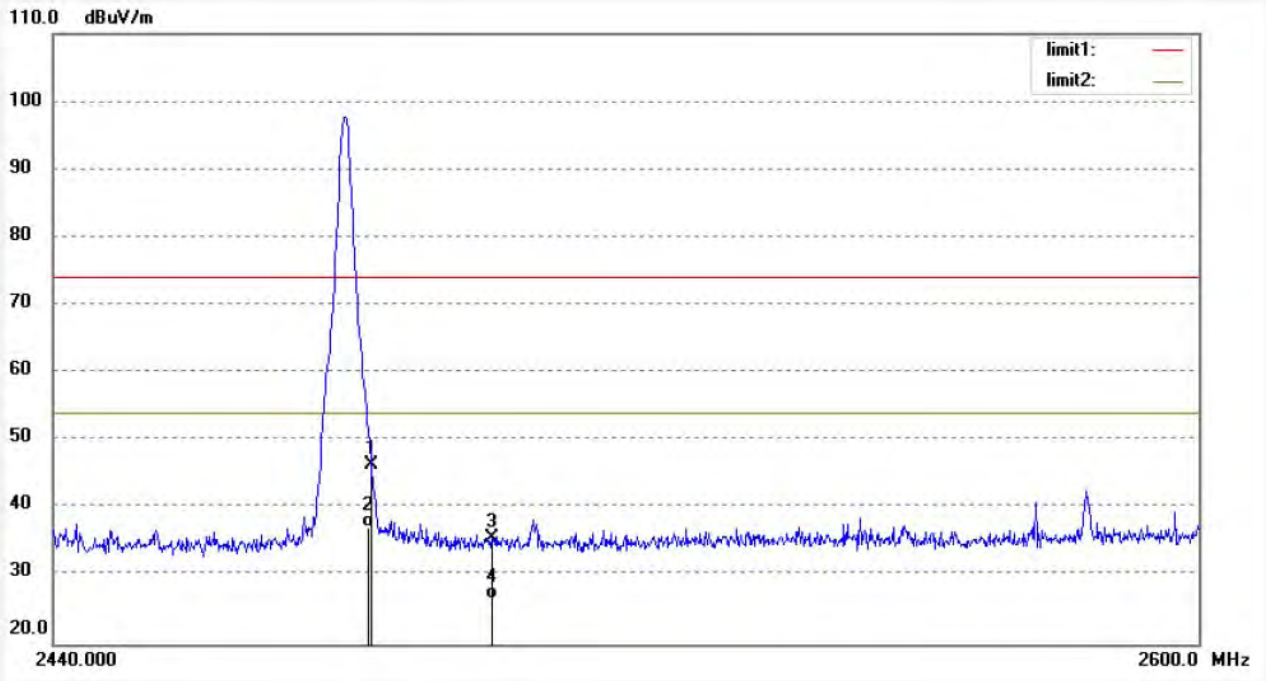
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019 #553
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(GFSK)
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/34/21
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	52.43	-5.89	46.54	74.00	-27.46	peak	250	218	
2	2483.500	43.12	-5.89	37.23	54.00	-16.77	AVG	200	64	
3	2500.000	41.48	-5.81	35.67	74.00	-38.33	peak	200	224	
4	2500.000	32.48	-5.81	26.67	54.00	-27.33	AVG	200	193	

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

ACCURATE TECHNOLOGY CO., LTD.
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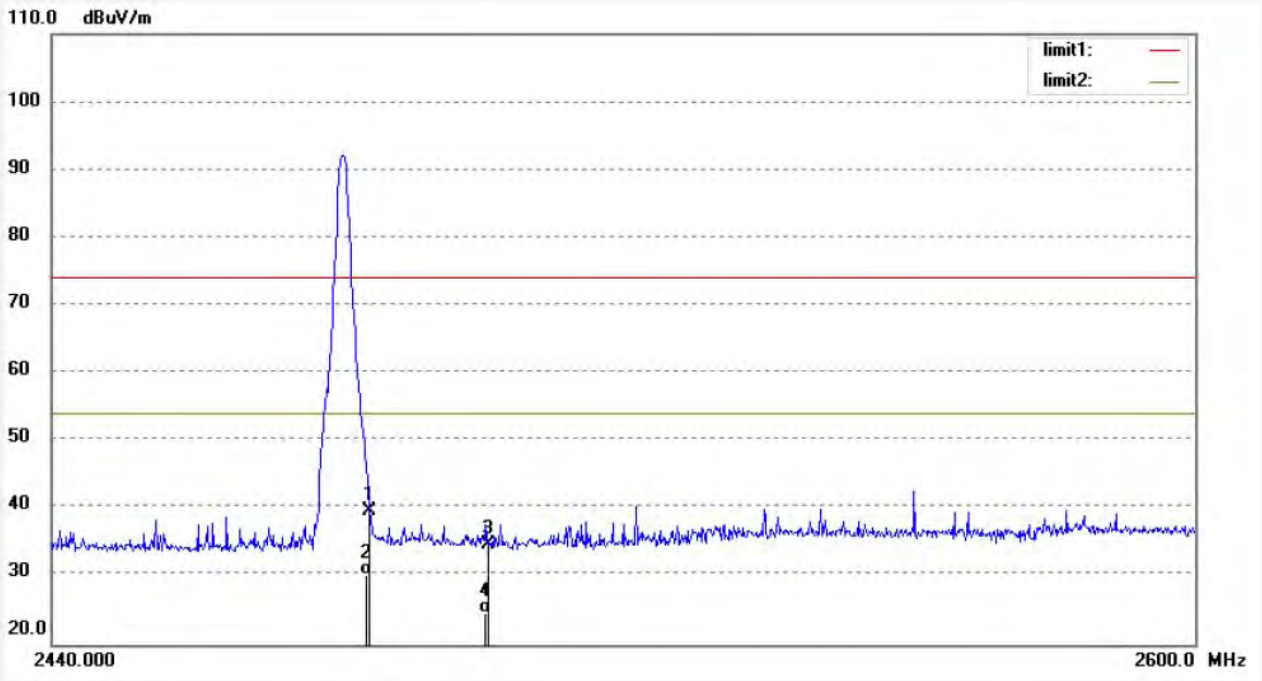
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019 #554
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(GFSK)
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/35/36
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	45.56	-5.89	39.67	74.00	-34.33	peak	150	66	
2	2483.500	36.15	-5.89	30.26	54.00	-23.74	AVG	150	21	
3	2500.000	40.51	-5.81	34.70	74.00	-39.30	peak	150	331	
4	2500.000	30.45	-5.81	24.64	54.00	-29.36	AVG	150	196	

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

Hopping mode

ACCURATE TECHNOLOGY CO., LTD.
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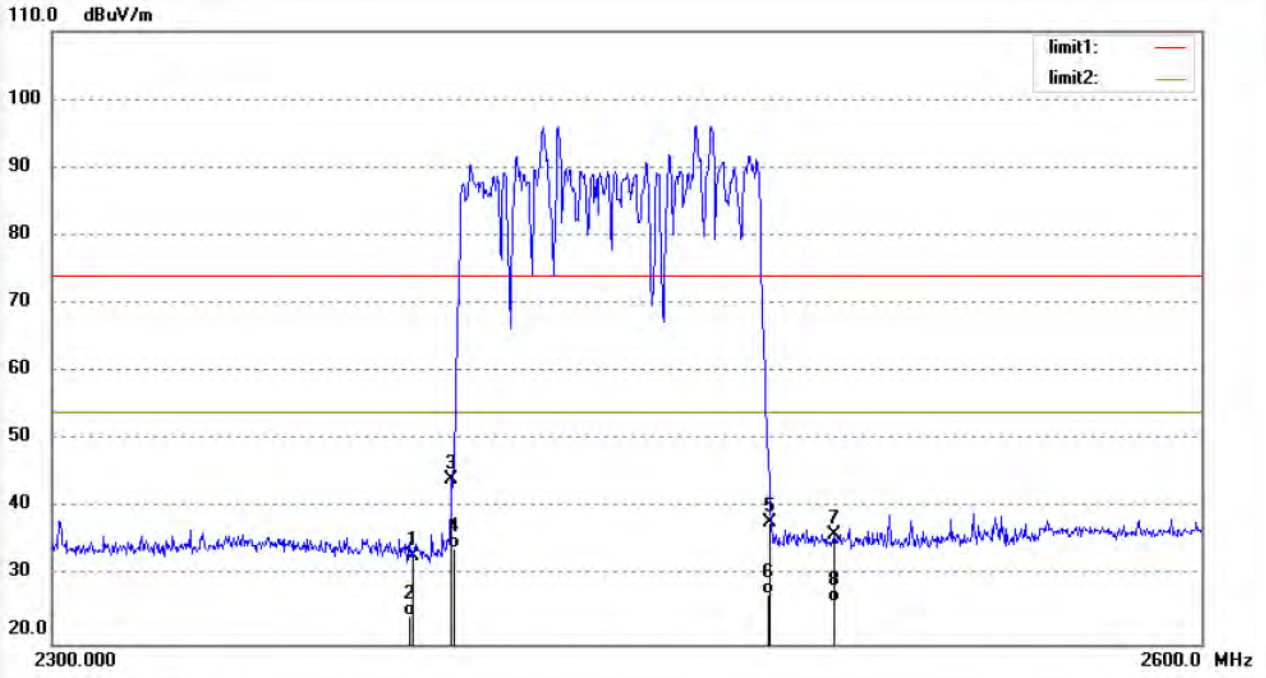
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: FRANK2019 #556
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: Hopping (GFSK)
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/40/18
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



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	39.24	-6.32	32.92	74.00	-41.08	peak	250	113	
2	2390.000	30.41	-6.32	24.09	54.00	-29.91	AVG	200	66	
3	2400.000	50.39	-6.27	44.12	74.00	-29.88	peak	250	116	
4	2400.000	40.31	-6.27	34.04	54.00	-19.96	AVG	200	302	
5	2483.500	43.78	-5.89	37.89	74.00	-36.11	peak	250	221	
6	2483.500	33.12	-5.89	27.23	54.00	-26.77	AVG	200	62	
7	2500.000	41.92	-5.81	36.11	74.00	-37.89	peak	250	219	
8	2500.000	32.04	-5.81	26.23	54.00	-27.77	AVG	250	103	

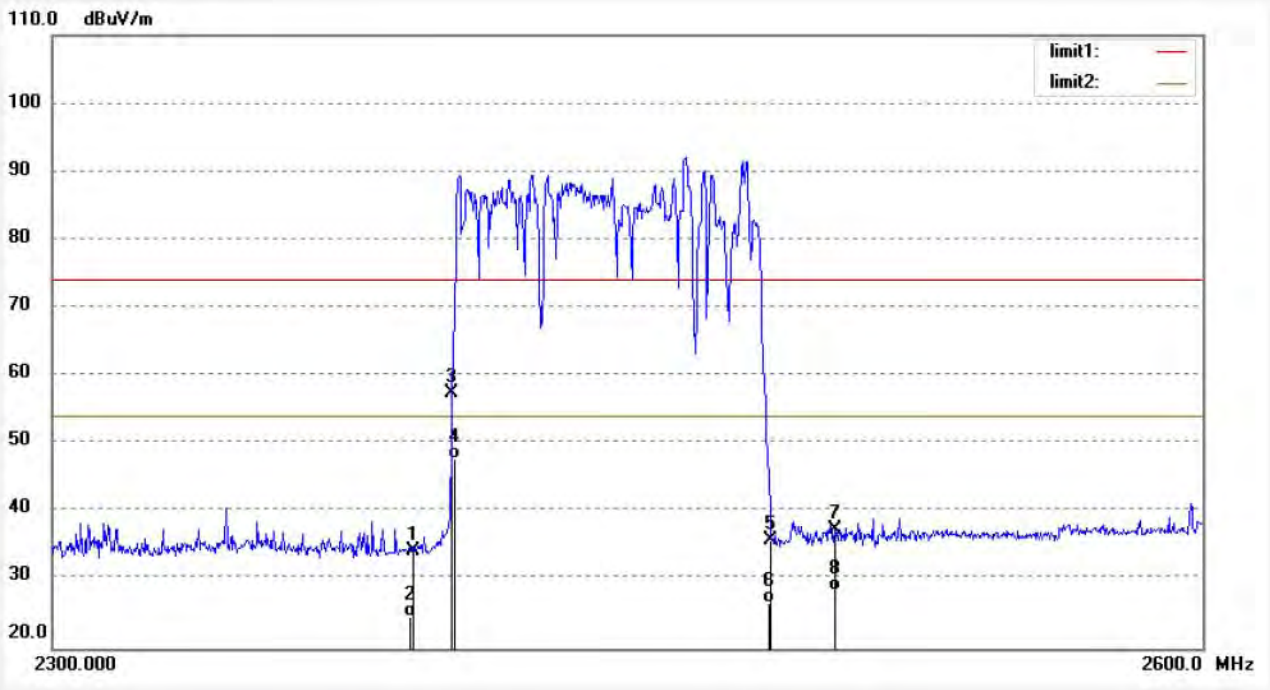
Note: Average measurement with peak detection at No.2&4&6&8

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 #555
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: Hopping (GFSK)
Model: EC-3205A
Manufacturer: XIAMEN HEALTHCARE LEECTRONIC Co.,Ltd

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/03/14/
Time: 9/38/45
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20190209



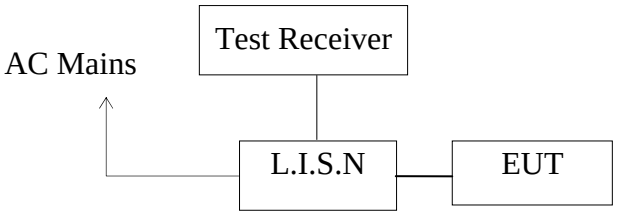
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	40.66	-6.32	34.34	74.00	-39.66	peak	150	92	
2	2390.000	31.01	-6.32	24.69	54.00	-29.31	AVG	150	221	
3	2400.000	63.75	-6.27	57.48	74.00	-16.52	peak	150	331	
4	2400.000	54.12	-6.27	47.85	54.00	-6.15	AVG	150	92	
5	2483.500	41.71	-5.89	35.82	74.00	-38.18	peak	150	221	
6	2483.500	32.45	-5.89	26.56	54.00	-27.44	AVG	150	103	
7	2500.000	43.15	-5.81	37.34	74.00	-36.66	peak	150	202	
8	2500.000	34.15	-5.81	28.34	54.00	-25.66	AVG	150	193	

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

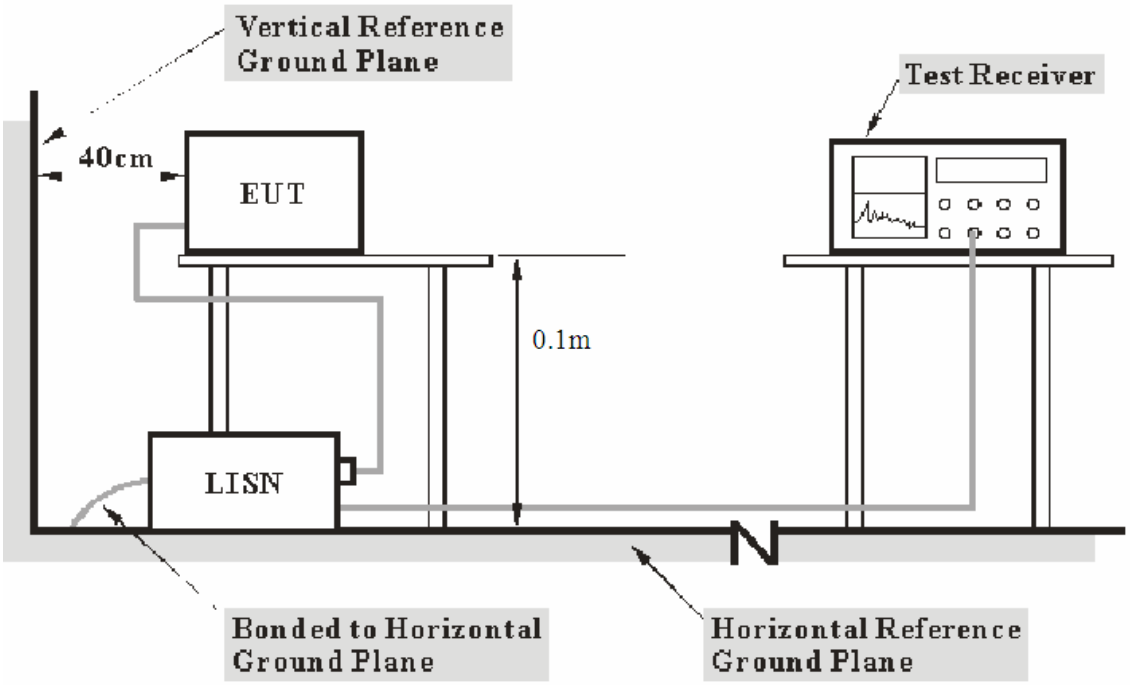
12. AC POWER LINE CONDUCTED EMISSION TEST

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 0.1m from other units and other metal planes support units.

12.2.Power Line Conducted Emission Test Limits

Frequency (MHz)	Conducted 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.EUT Configuration on Test

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 0.1m 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 (R & S ESCS30) 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	10.5	51.1	34.2	56.0	46.0	4.9	11.8	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.

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.

ACCURATE TECHNOLOGY CO.,LTD

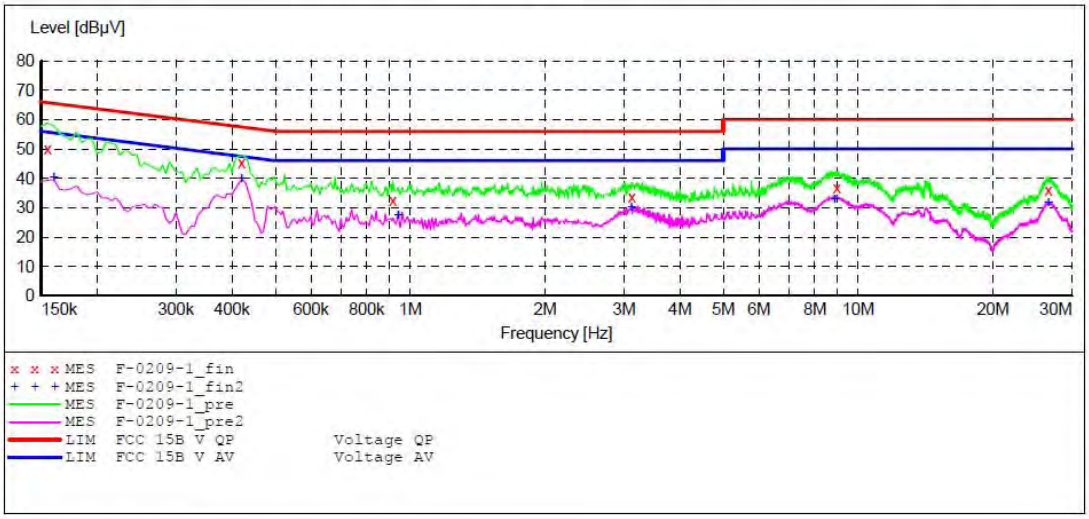
CONDUCTED EMISSION STANDARD FCC PART 15 C

EUT: Massage Chair M/N:EC-3205A
Manufacturer: XIAMEN HEALTHCARE ELECTRONIC CO.,LTD
Operating Condition: BT Communication
Test Site: 1#Shielding Room
Operator: Frank
Test Specification: L 120V/60Hz
Comment: Report NO.:ATE20190209
Start of Test: 3/6/2019 / 2:46:53PM

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-0209-1_fin"

3/6/2019 2:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.155000	50.00	10.5	66	15.7	QP	L1	GND
0.420000	45.40	10.7	57	12.0	QP	L1	GND
0.915000	32.30	10.8	56	23.7	QP	L1	GND
3.120000	33.50	11.1	56	22.5	QP	L1	GND
8.950000	36.80	11.3	60	23.2	QP	L1	GND
26.605000	36.00	11.5	60	24.0	QP	L1	GND

MEASUREMENT RESULT: "F-0209-1_fin2"

3/6/2019 2:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.160000	40.10	10.5	56	15.4	AV	L1	GND
0.420000	39.80	10.7	47	7.6	AV	L1	GND
0.940000	27.40	10.8	46	18.6	AV	L1	GND
3.120000	30.00	11.1	46	16.0	AV	L1	GND
8.860000	33.00	11.3	50	17.0	AV	L1	GND
26.575000	31.80	11.5	50	18.2	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

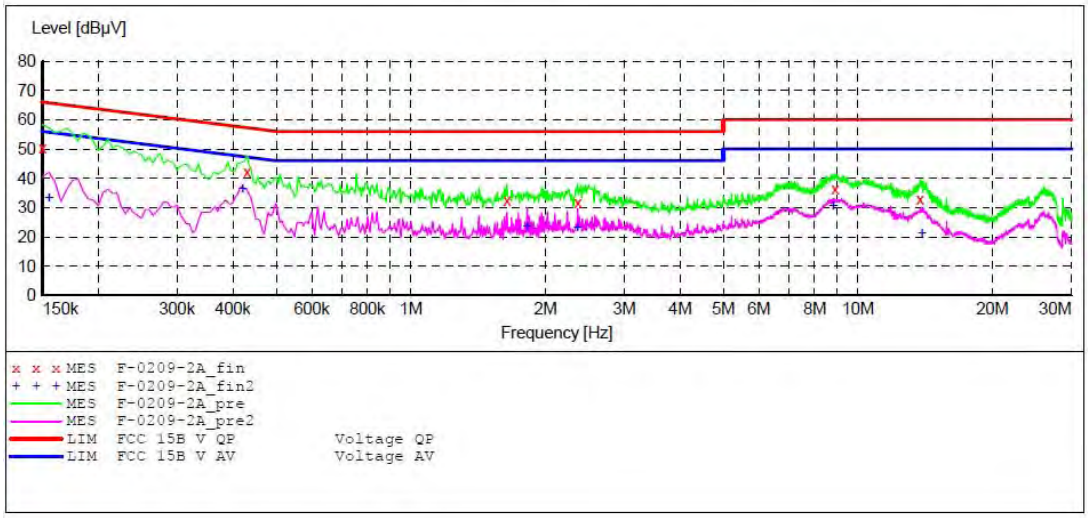
CONDUCTED EMISSION STANDARD FCC PART 15 C

EUT: Massage Chair M/N:EC-3205A
Manufacturer: XIAMEN HEALTHCARE ELECTRONIC CO.,LTD
Operating Condition: BT Communication
Test Site: 1#Shielding Room
Operator: Frank
Test Specification: N 120V/60Hz
Comment: Report NO.:ATE20190209
Start of Test: 3/7/2019 / 9:06:37AM

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-0209-2A_fin"

3/7/2019 9:09AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	50.30	10.5	66	15.7	QP	N	GND
0.430000	42.30	10.7	57	15.0	QP	N	GND
1.640000	32.30	10.9	56	23.7	QP	N	GND
2.360000	31.80	11.0	56	24.2	QP	N	GND
8.890000	36.30	11.3	60	23.7	QP	N	GND
13.765000	32.80	11.3	60	27.2	QP	N	GND

MEASUREMENT RESULT: "F-0209-2A_fin2"

3/7/2019 9:09AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.155000	33.10	10.5	56	22.6	AV	N	GND
0.420000	36.30	10.7	47	11.1	AV	N	GND
1.820000	23.60	11.0	46	22.4	AV	N	GND
2.360000	22.90	11.0	46	23.1	AV	N	GND
8.800000	30.30	11.3	50	19.7	AV	N	GND
13.900000	21.20	11.4	50	28.8	AV	N	GND

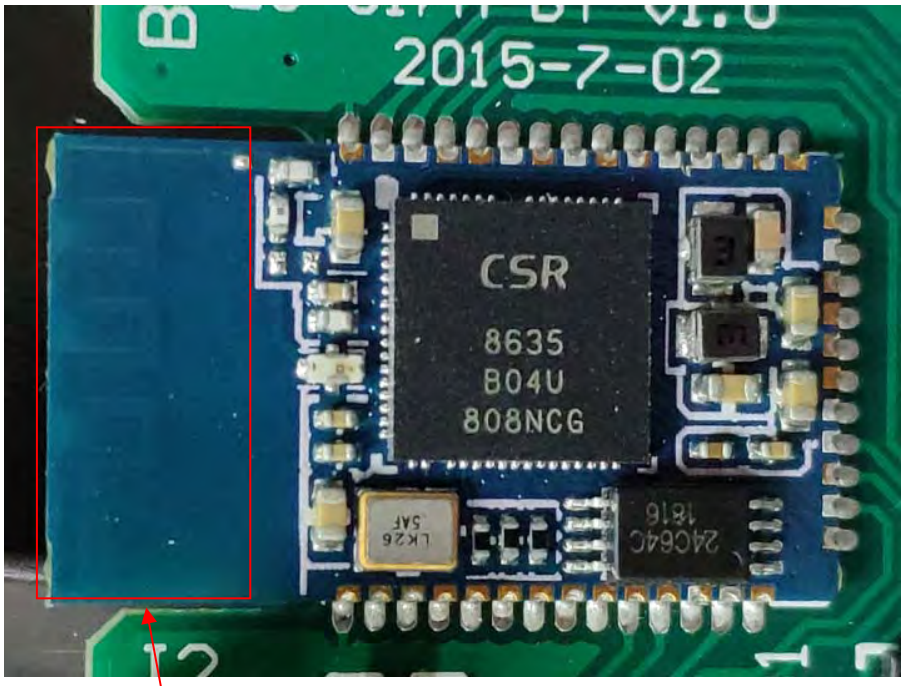
13. ANTENNA REQUIREMENT

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 2dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

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