APPLICATION CERTIFICATION FCC Part 15C
On Behalf of

XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Massage Chair

Model No.: EC-628M

FCC ID: YMX-EC628M

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
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Report No.	:	ATE20180569
Date of Test	:	April 20-May 31, 2018
Date of Report	:	June 11, 2018

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Test Report Certification

Applicant	:	XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD
Manufacturer	:	XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD
EUT Description	:	Massage Chair
Model No.	:	EC-628M
Trade Name	:	n.a.

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247:2017
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 : April 20-May 31, 2018
Date of Report: June 11, 2018

Prepared by : (Bob Wang, Engineer)

Approved & Authorized Signer : (Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Massage Chair
Model Number	:	EC-628M
Bluetooth version	:	BT V4.0 (Because of firmware limitation, this device only supports Bluetooth V4.0(BR+EDR mode) without the BLE mode）
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain	:	2.0 dBi
Modulation mode	:	GFSK, π /4 DQPSK, 8DPSK
Antenna type	:	PCB Antenna
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 COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD
Address	:	(5/F) NO.168, QIANPU ROAD, SIMING DISTRICT, XIAMEN, China
Date of sample receiver	:	April 17, 2018
Date of Test	:	April 20-May 31, 2018
Sample No.	:	1800445

1.2.Carrier Frequency of Channels

Channel	Frequceny (MHz)	Channel	Frequceny (MHz)	Channel	Frequceny (MHz)	Channe l	Frequceny (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

1.3.Accessory and Auxiliary Equipment

N/A

1.4.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

1.5.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. 06, 2018	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 06, 2018	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 06, 2018	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 06, 2018	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 06, 2018	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 06, 2018	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 06, 2018	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 06, 2018	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 06, 2018	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 06, 2018	1 Year

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

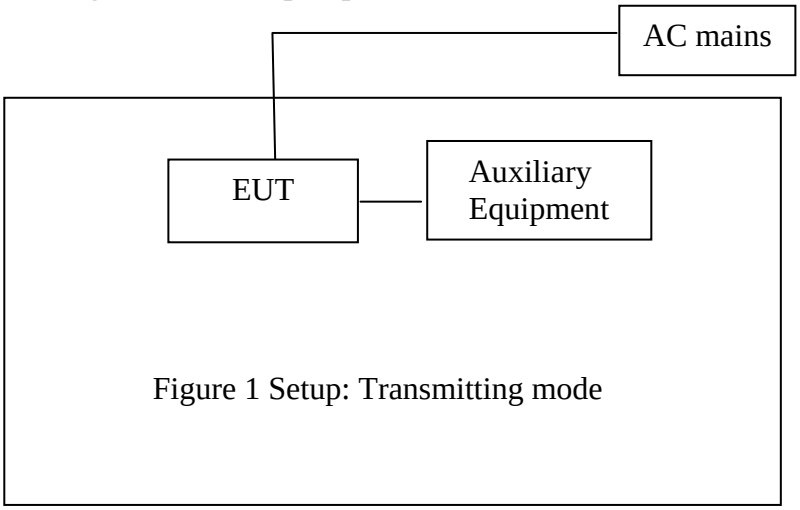


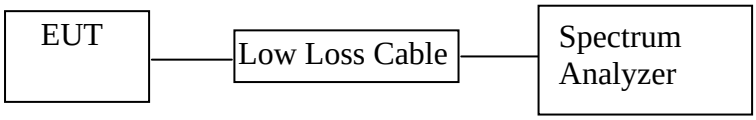
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission Test	Compliant
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 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1.Block Diagram of Test Setup



(EUT: Massage Chair)

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 30 kHz and VBW to 100 kHz.

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

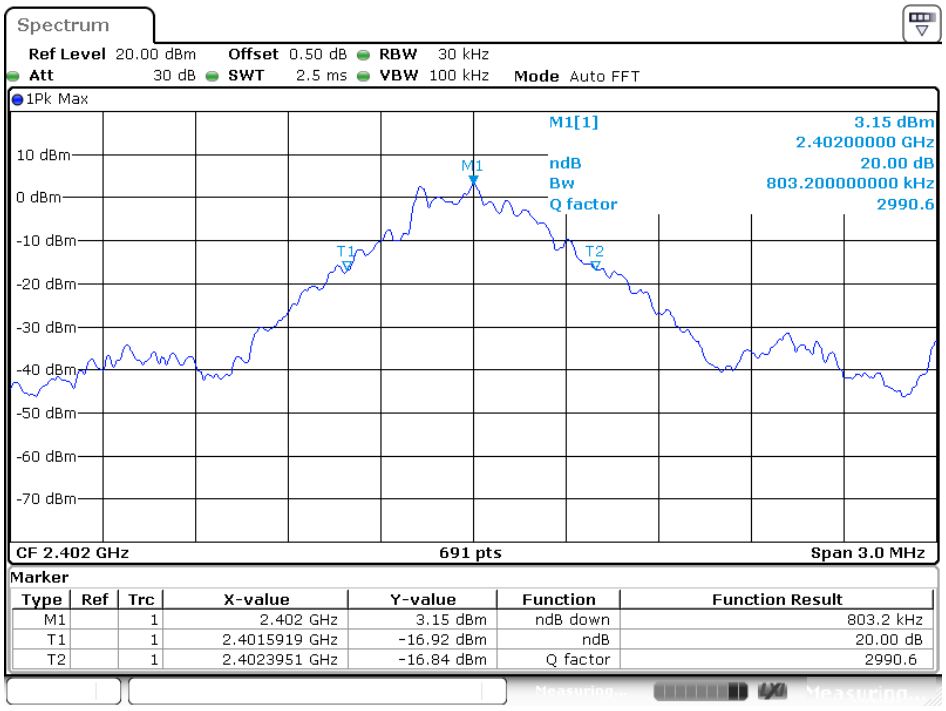
5.6.Test Result

Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	Π/4-DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	0.803	1.220	1.207	Pass
Middle	2441	0.803	1.220	1.207	Pass
High	2480	0.803	1.224	1.211	Pass

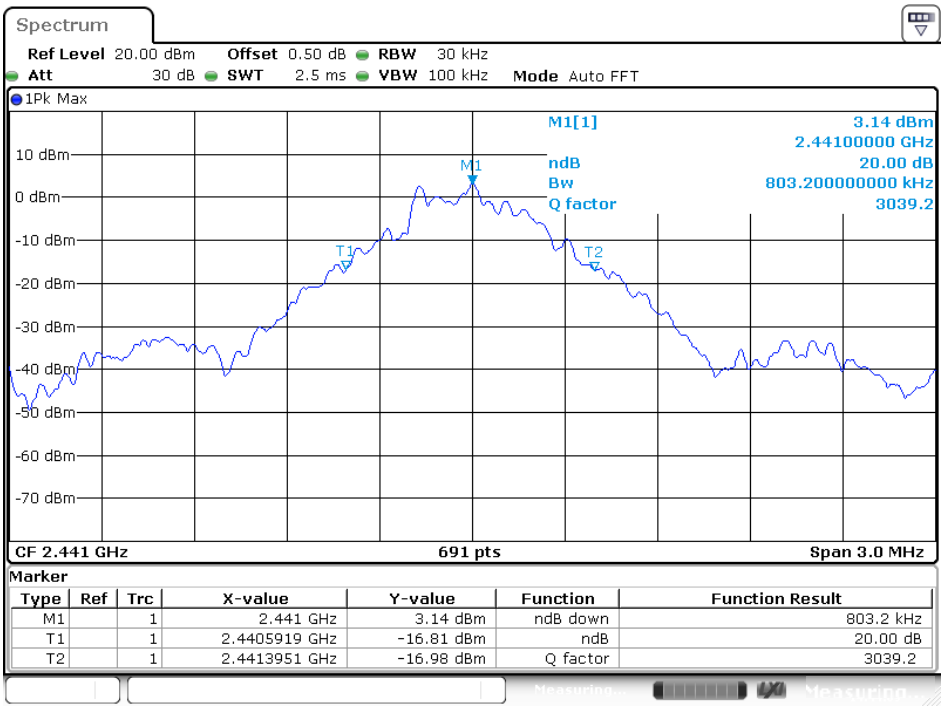
The spectrum analyzer plots are attached as below.

GFSK Mode

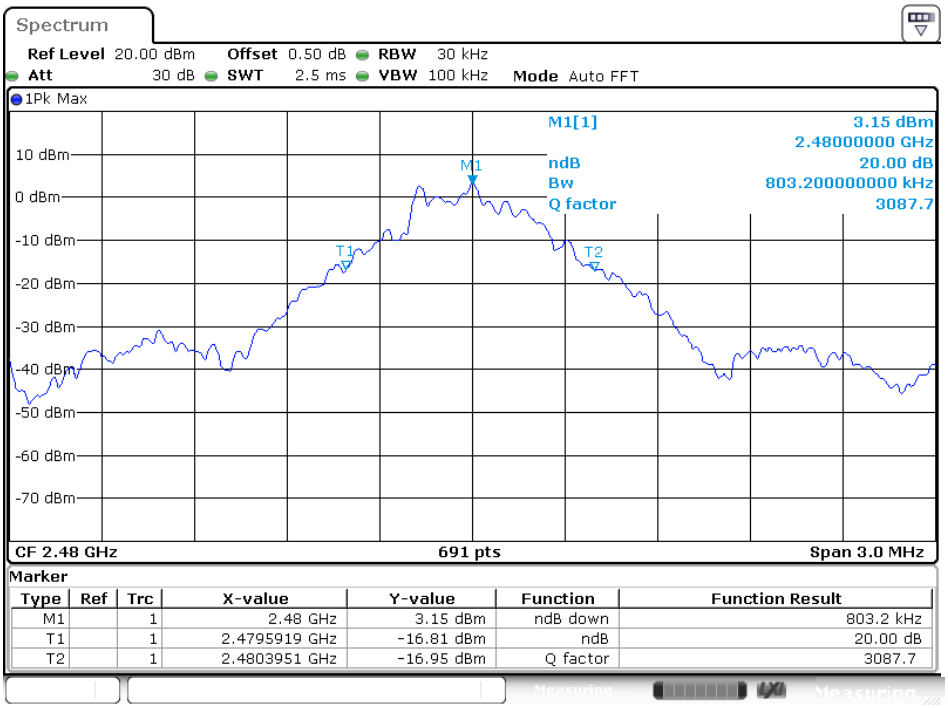
Low channel



Middle channel

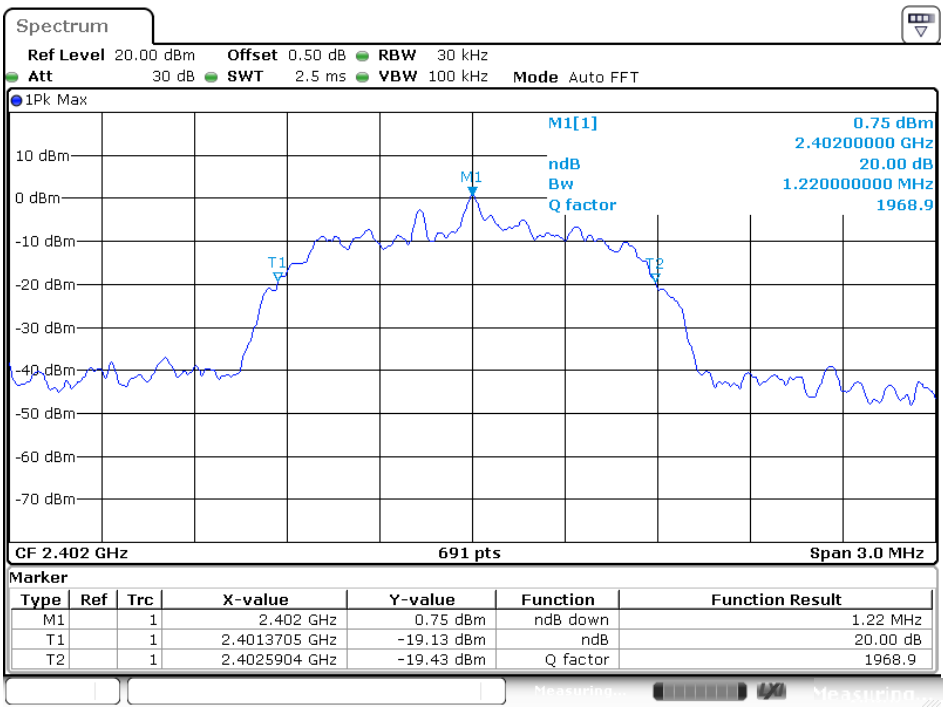


High channel

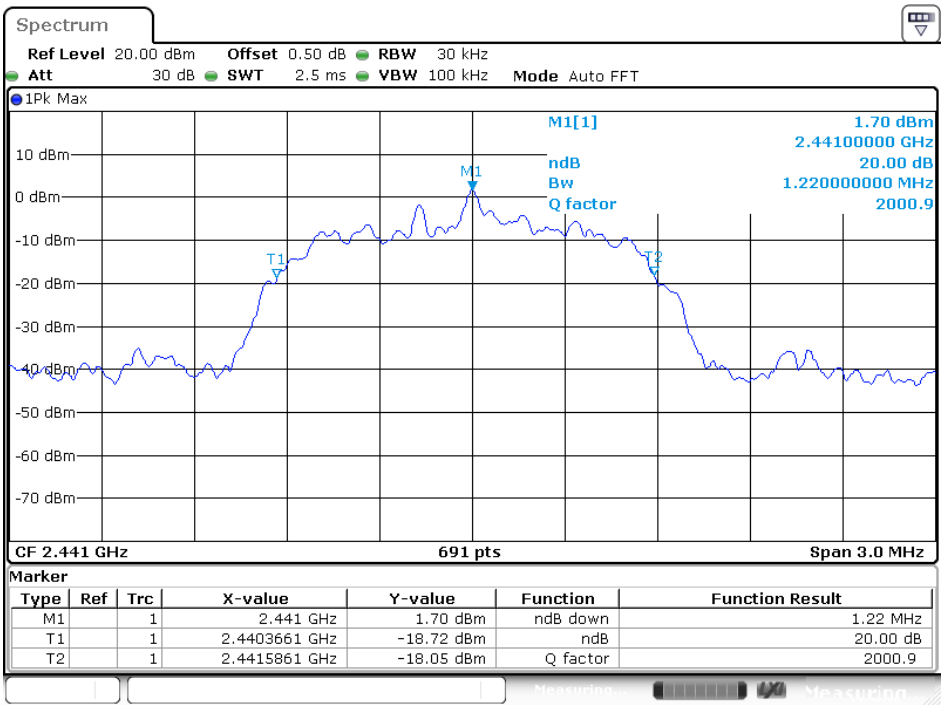


Π/4-DQPSK Mode

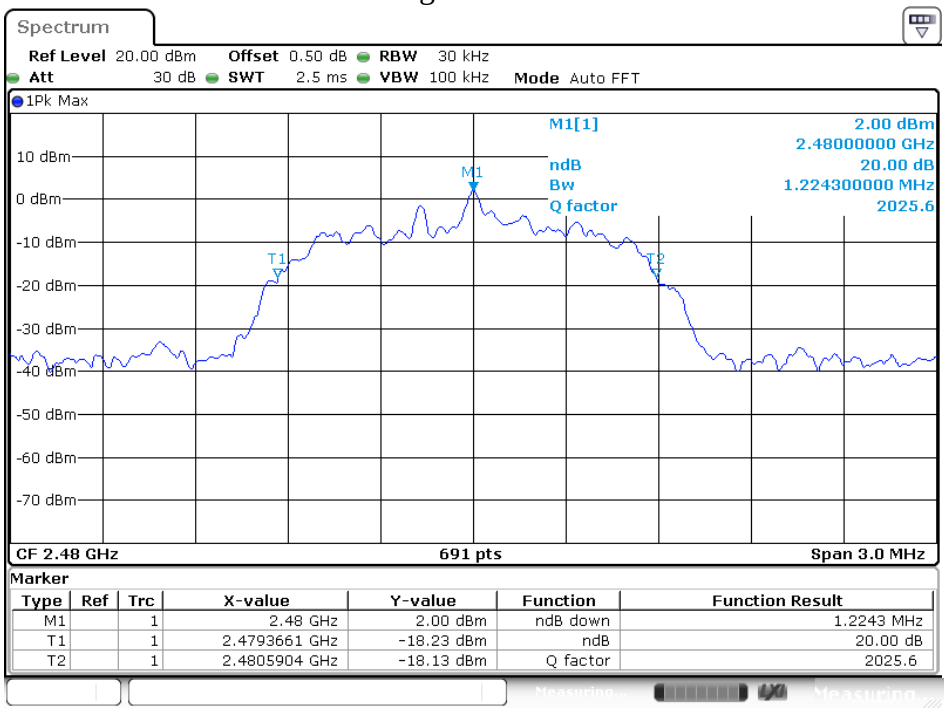
Low channel



Middle channel

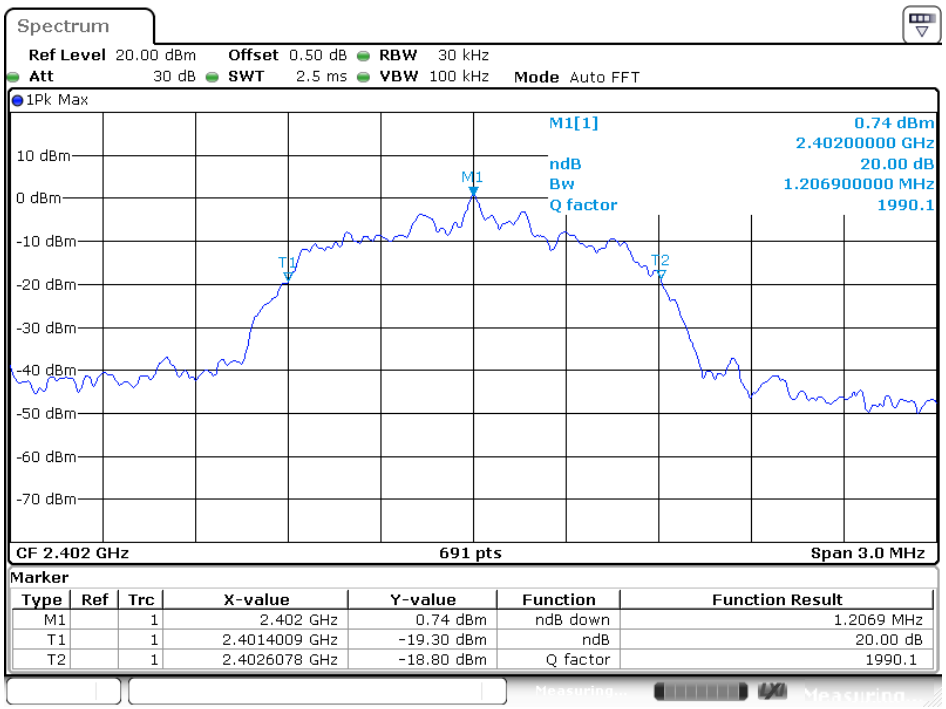


High channel

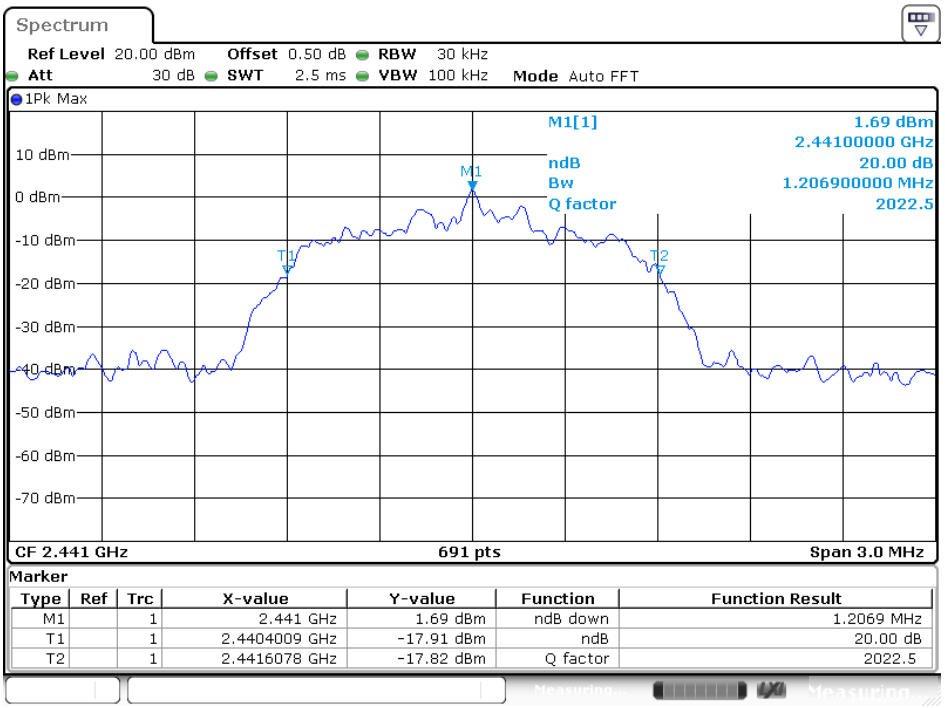


8DPSK Mode

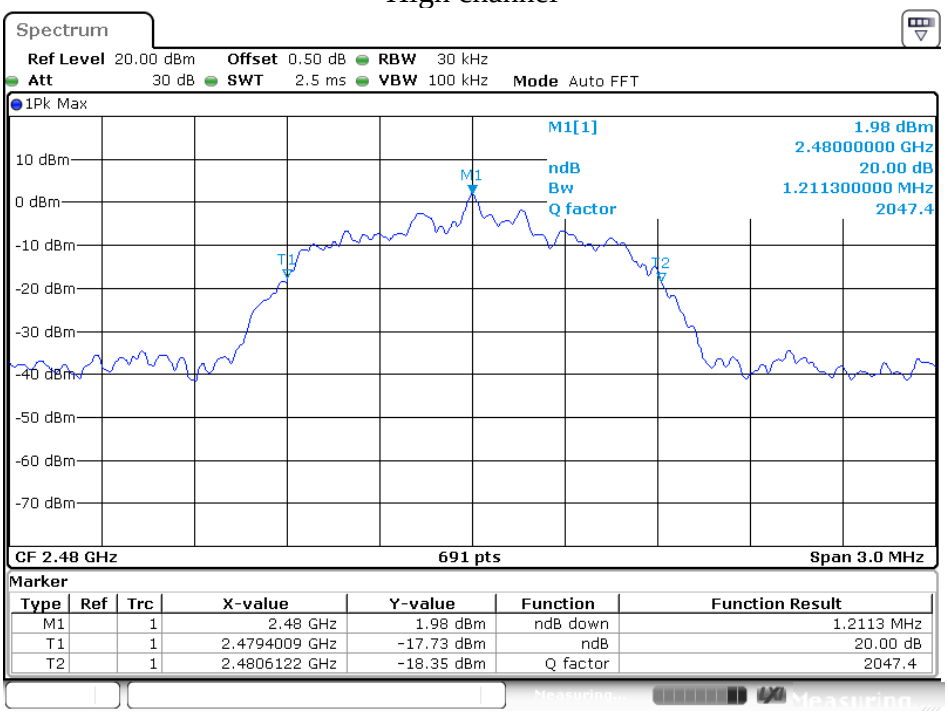
Low channel



Middle channel

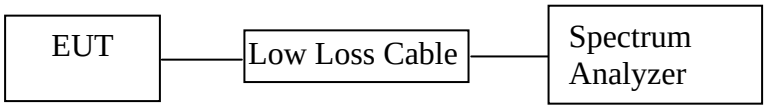


High channel



6. CARRIER FREQUENCY SEPARATION TEST

6.1.Block Diagram of Test Setup



(EUT: Massage Chair)

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 pseudorandomly 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 2MHz.

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

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.0014	≥0.803	PASS
	2403			
Middle	2440	1.0014	≥0.803	PASS
	2441			
High	2479	1.0014	≥0.803	PASS
	2480			

Π/4-DQPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.0029	≥0.813	PASS
	2403			
Middle	2440	1.0029	≥0.813	PASS
	2441			
High	2479	1.0029	≥0.816	PASS
	2480			

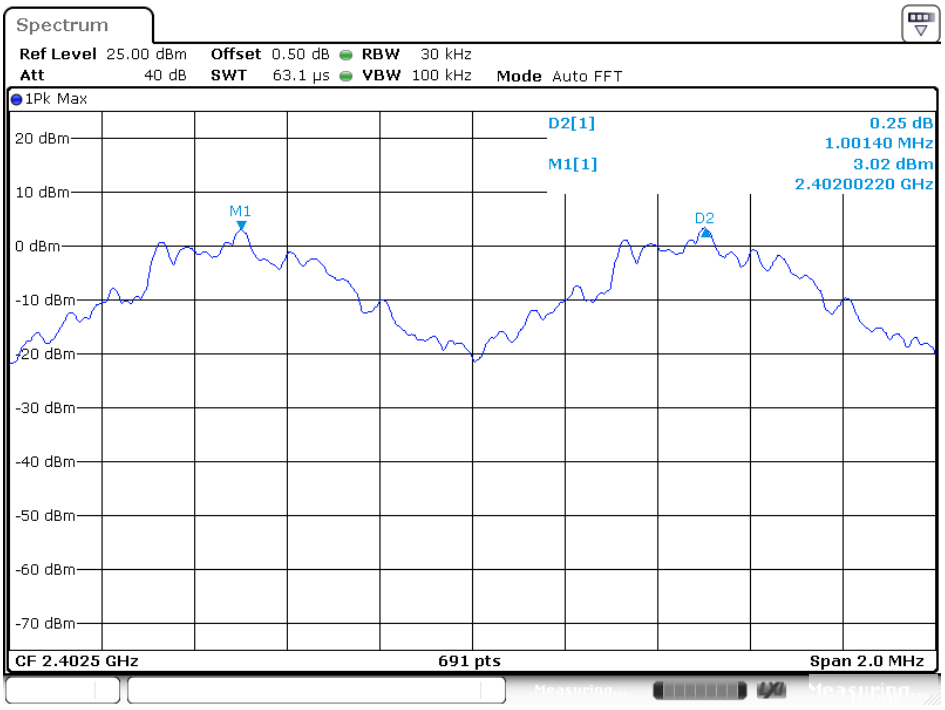
8DPSK

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2402	1.0029	≥0.805	PASS
	2403			
Middle	2440	1.0029	≥0.805	PASS
	2441			
High	2479	1.0029	≥0.807	PASS

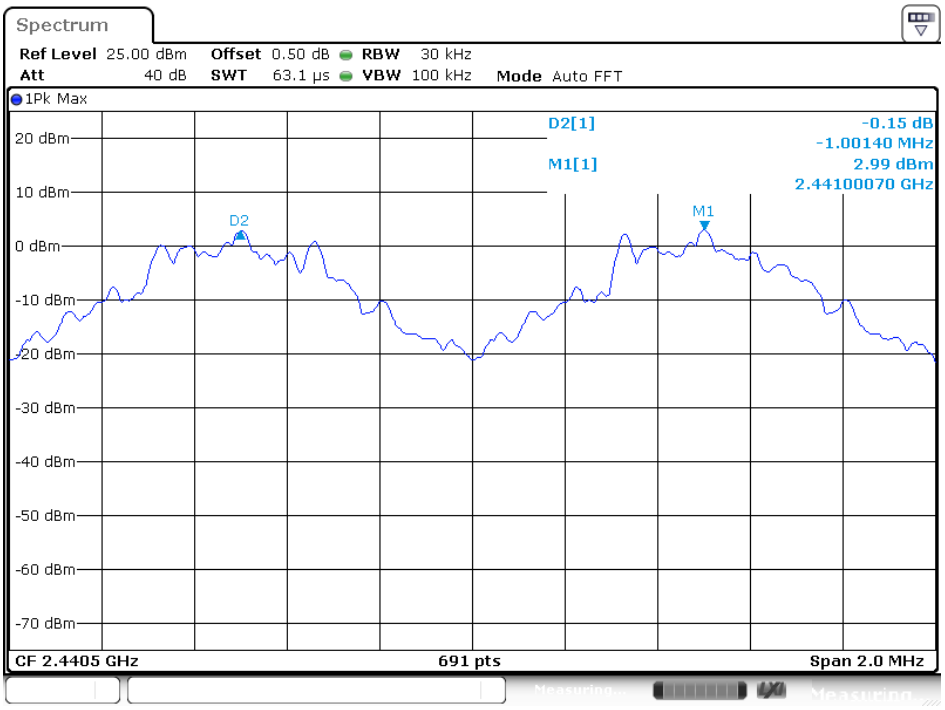
The spectrum analyzer plots are attached as below.

GFSK Mode

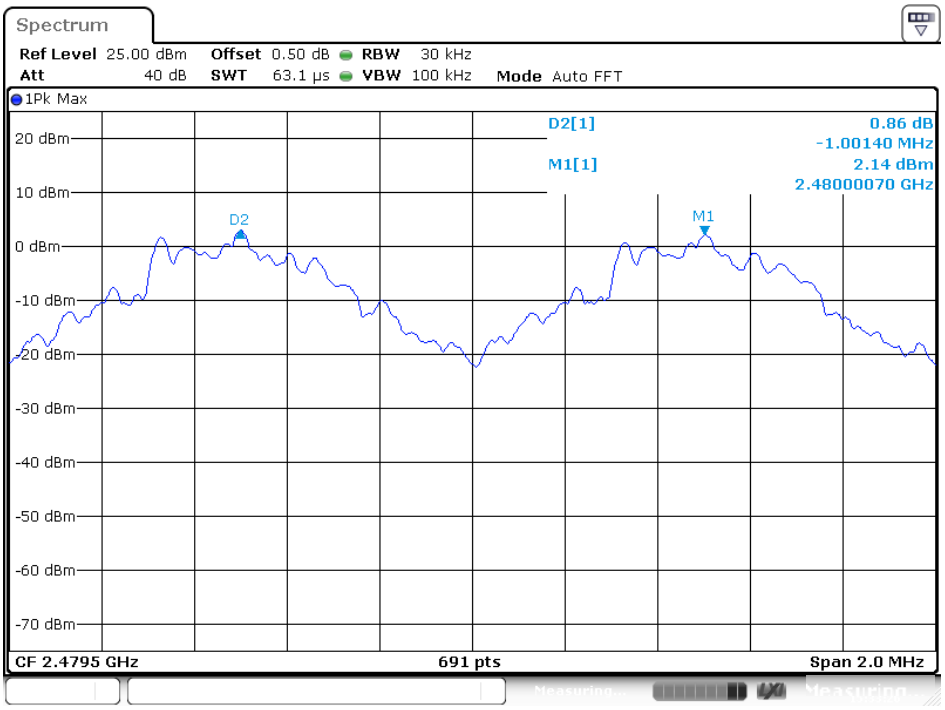
Low channel



Middle channel

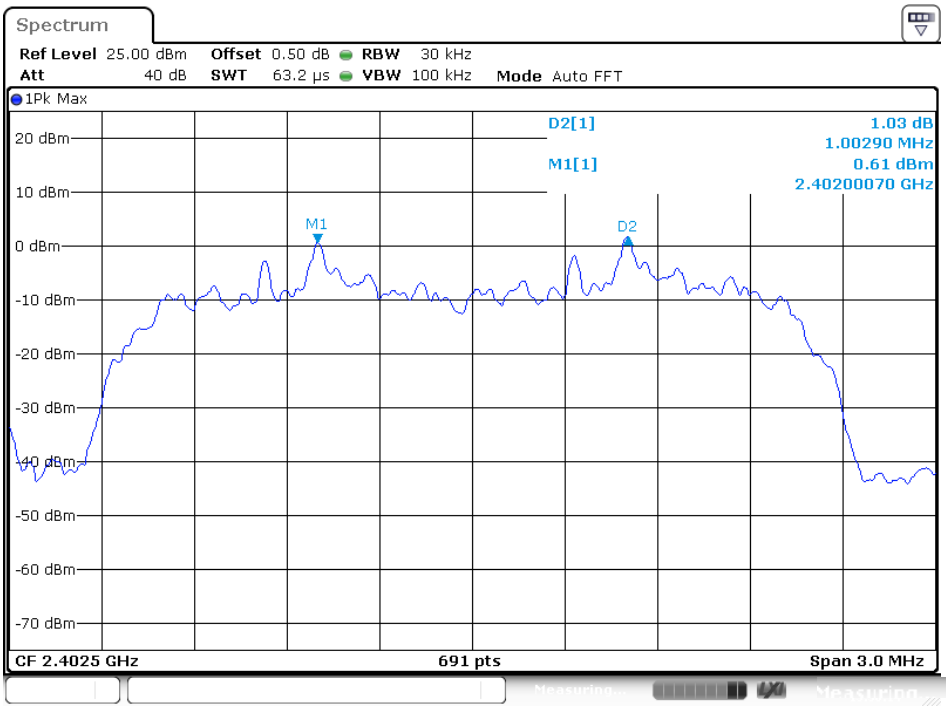


High channel

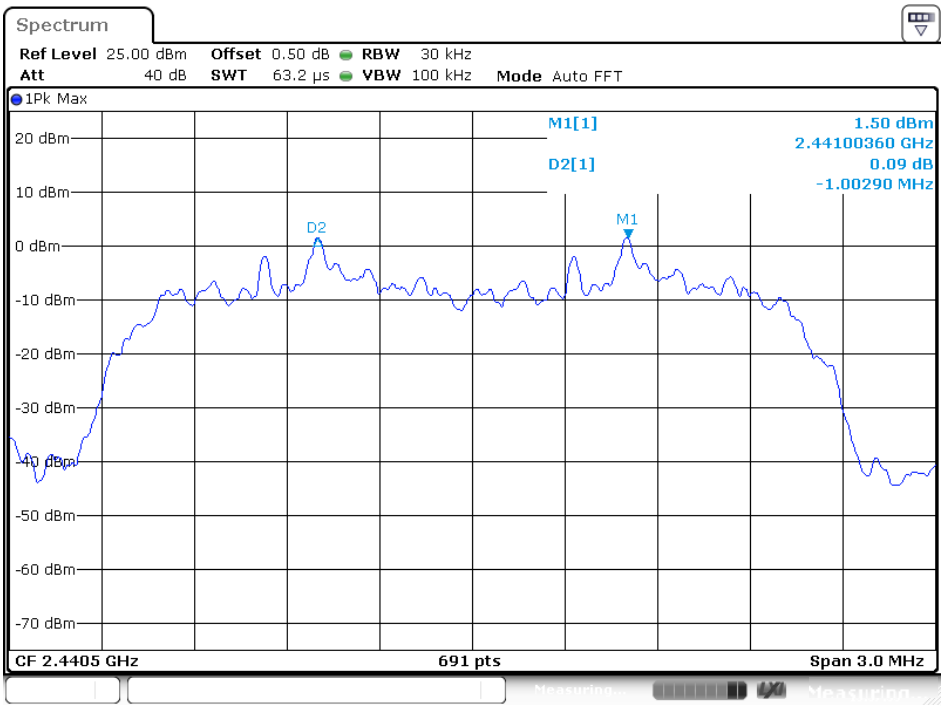


Π/4-DQPSK Mode

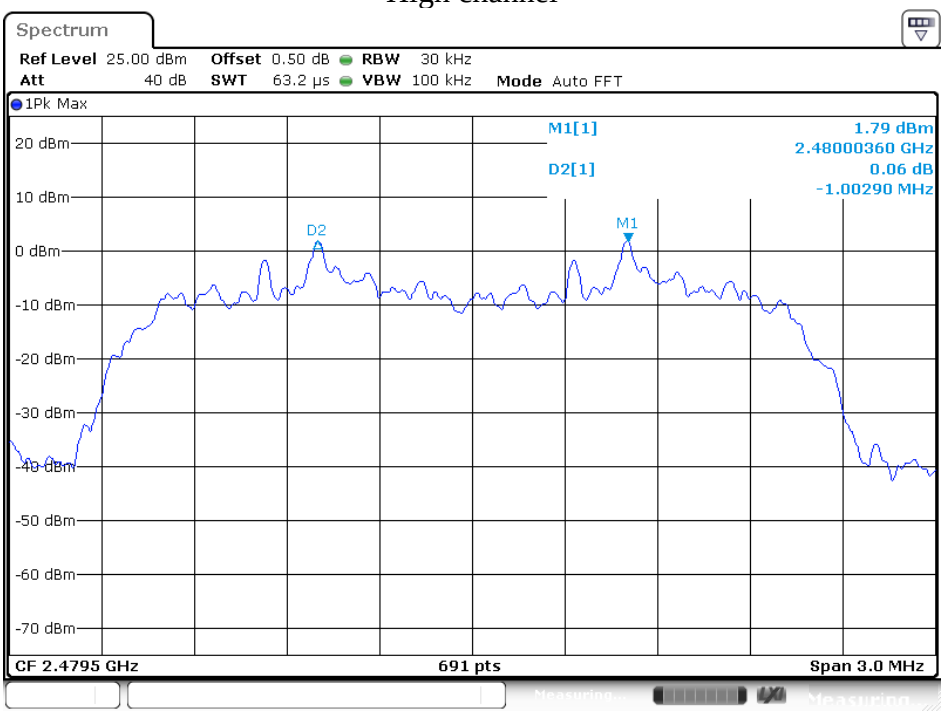
Low channel



Middle channel

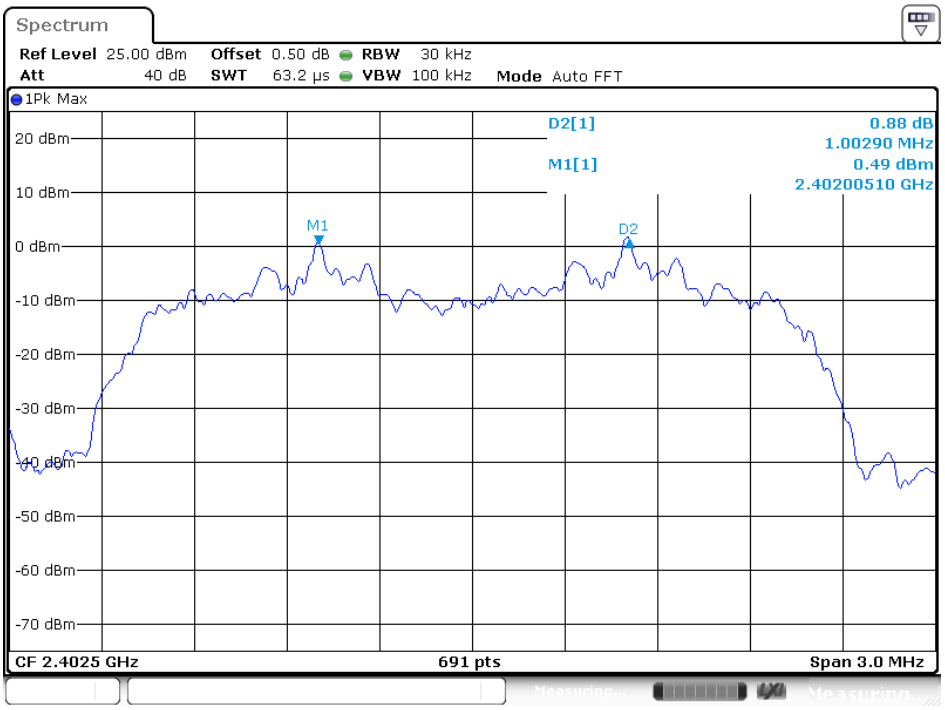


High channel

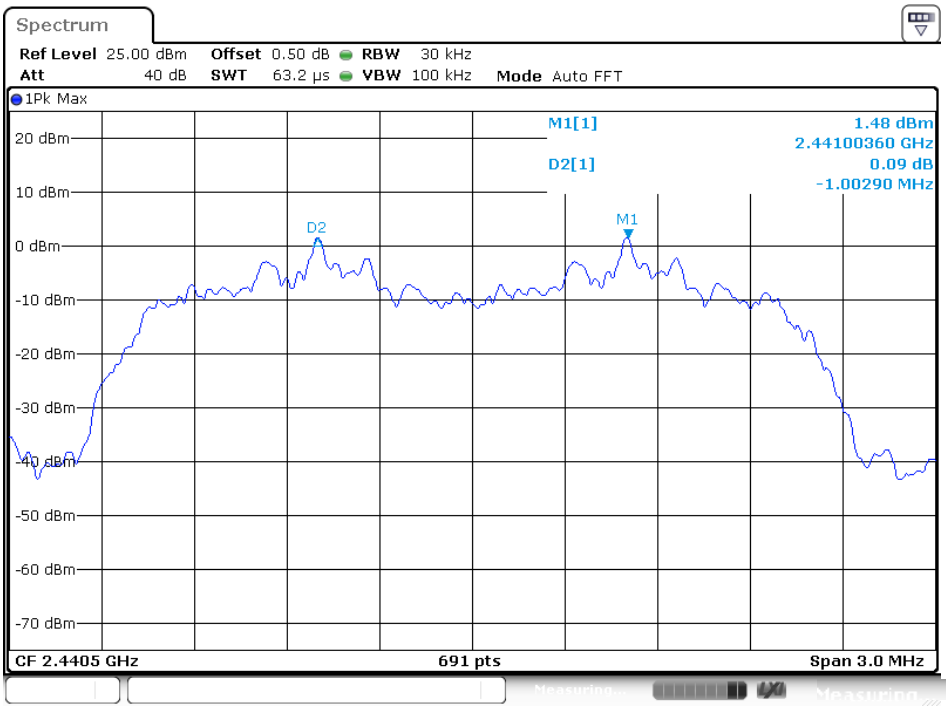


8DPSK Mode

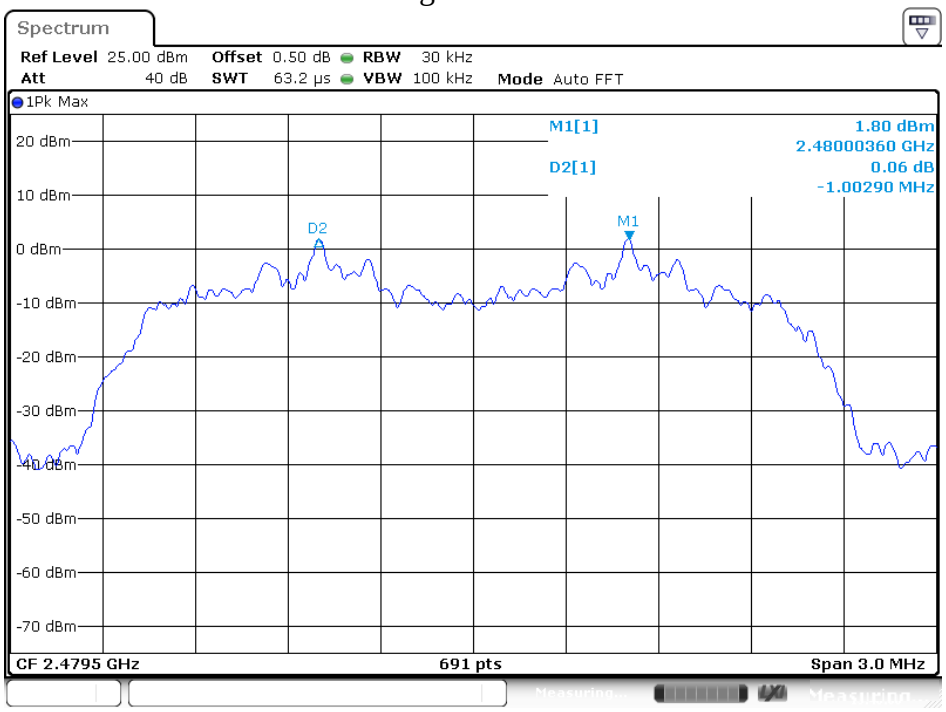
Low channel



Middle channel

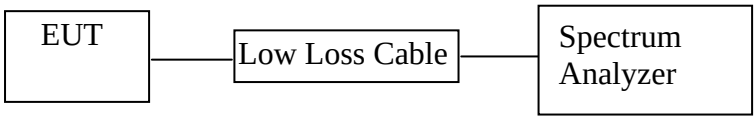


High channel



7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Block Diagram of Test Setup



(EUT: Massage Chair)

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.

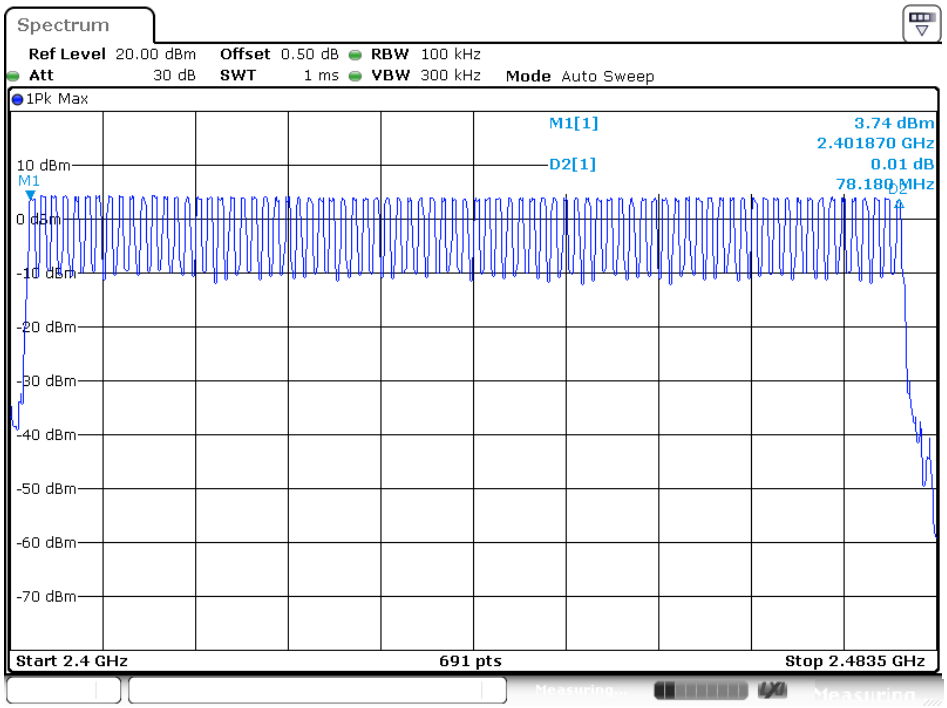
7.5.3.Max hold, view and count how many channel in the band.

7.6.Test Result

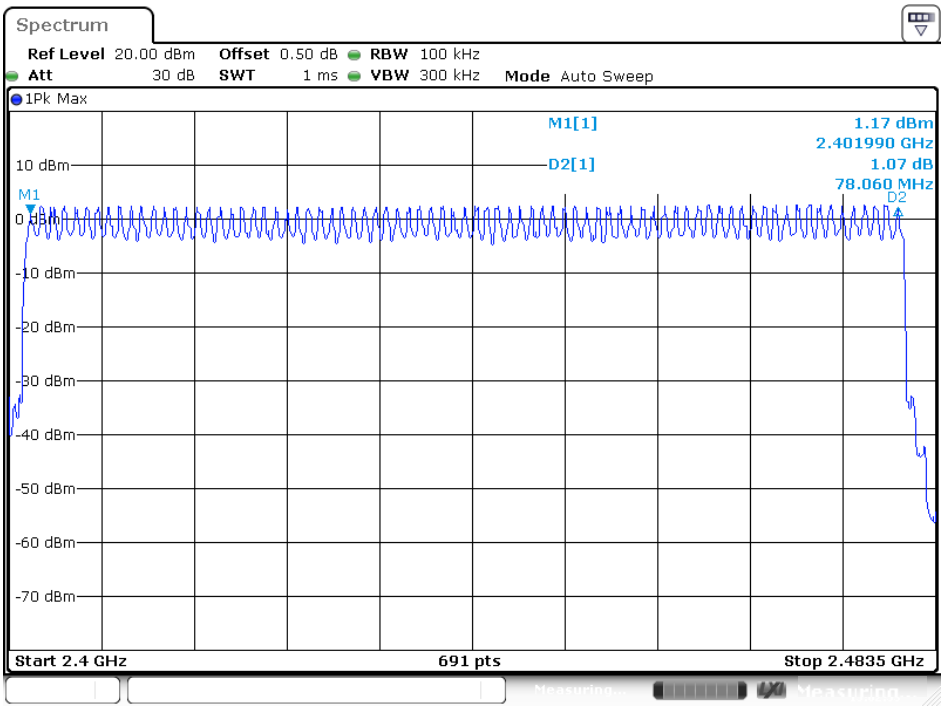
Total number of hopping channel	Measurement result(CH)	Limit(CH)
	79	⩾15

The spectrum analyzer plots are attached as below.

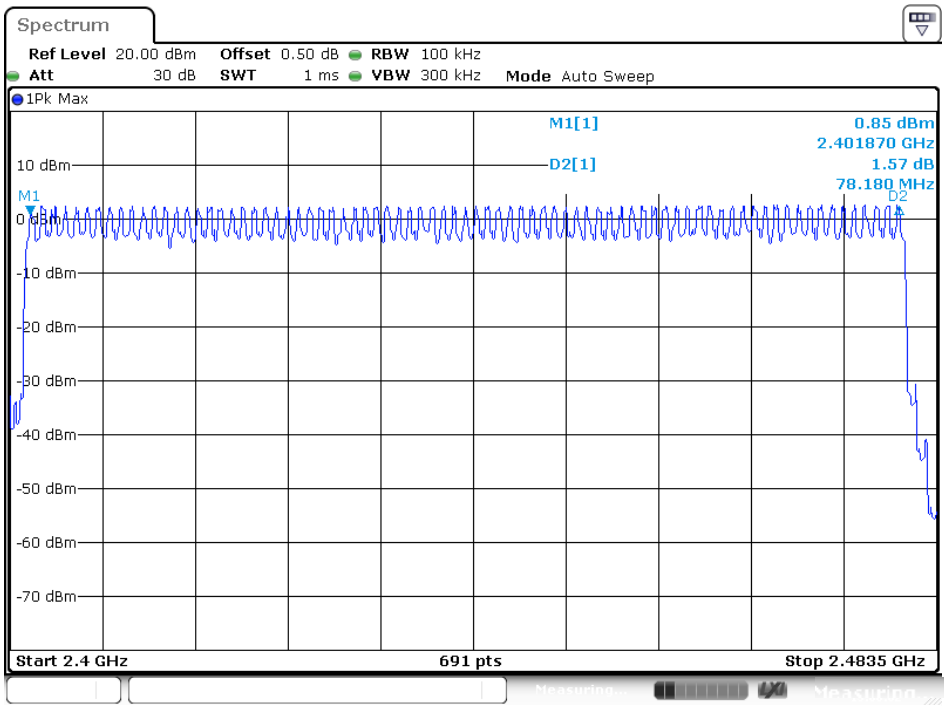
Number of hopping channels(GFSK)



Number of hopping channels(Π/4-DQPSK)

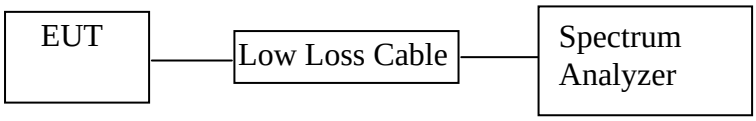


Number of hopping channels(8DPSK)



8. DWELL TIME TEST

8.1.Block Diagram of Test Setup



(EUT: Massage Chair)

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

GFSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.428	136.96	400
	2441	0.438	140.16	400
	2480	0.442	141.44	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.746	279.36	400
	2441	1.790	286.40	400
	2480	1.761	281.76	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	2.978	317.65	400
	2441	2.978	317.65	400
	2480	3.000	320.00	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

Π/4-DQPSK

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.446	142.72	400
	2441	0.442	141.44	400
	2480	0.438	140.16	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.714	274.24	400
	2441	1.714	274.24	400
	2480	1.728	276.48	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	3.000	320.00	400
	2441	3.022	322.35	400
	2480	2.978	317.65	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

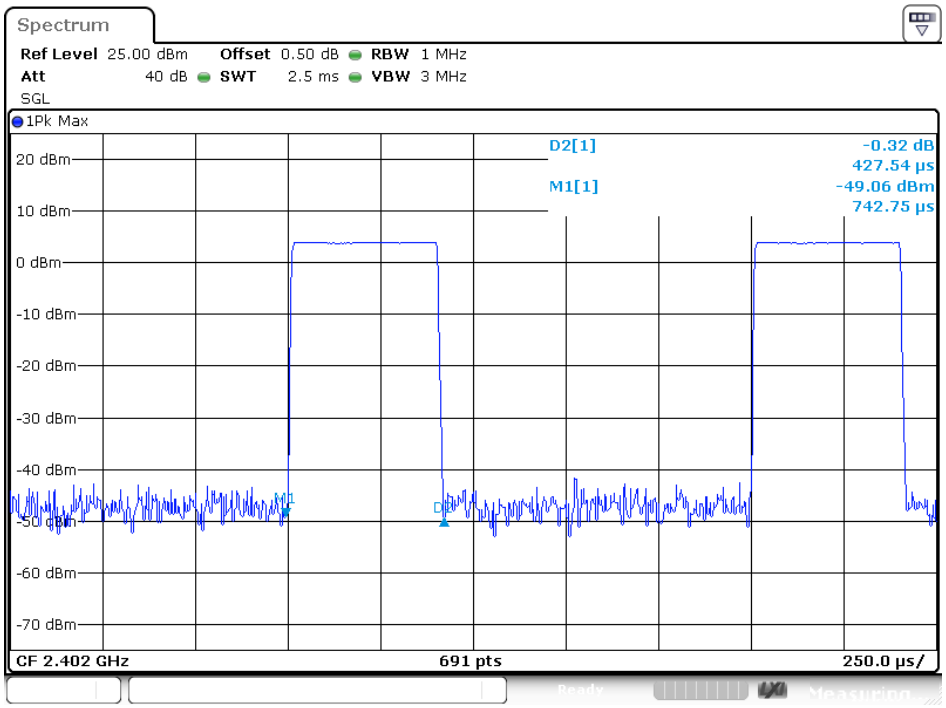
8DPSK Mode

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2402	0.449	143.68	400
	2441	0.446	142.72	400
	2480	0.446	142.72	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(2*79))×31.6				
DH3	2402	1.736	277.76	400
	2441	1.721	275.36	400
	2480	1.736	277.76	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(4*79))×31.6				
DH5	2402	3.040	324.27	400
	2441	2.975	317.33	400
	2480	3.062	326.61	400
A period transmit time = 0.4 × 79 = 31.6 Dwell time = pulse time × (1600/(6*79))×31.6				

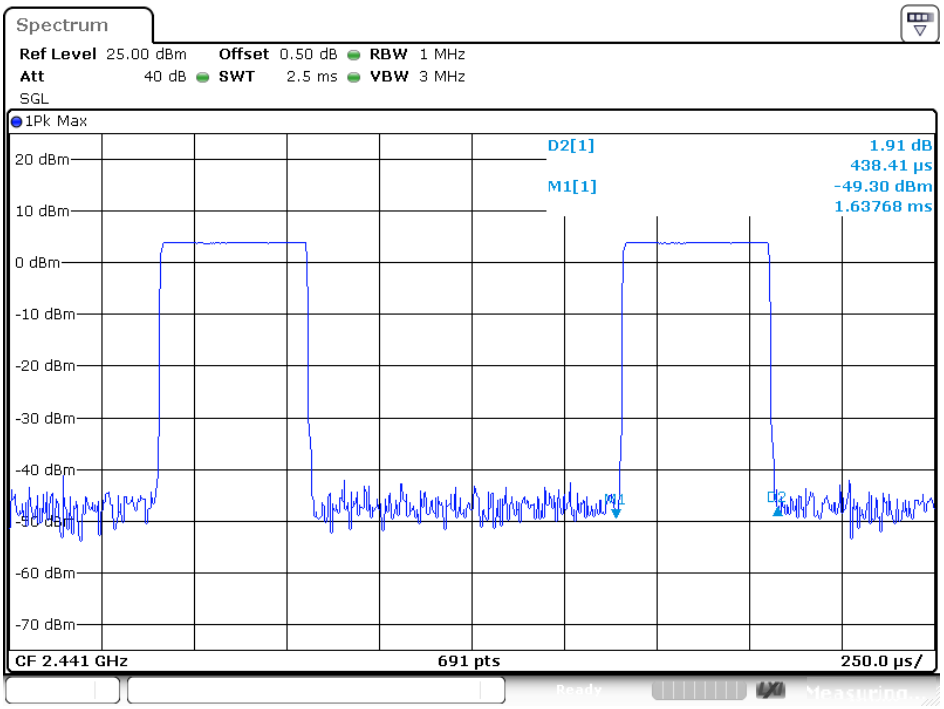
The spectrum analyzer plots are attached as below.

GFSK Mode

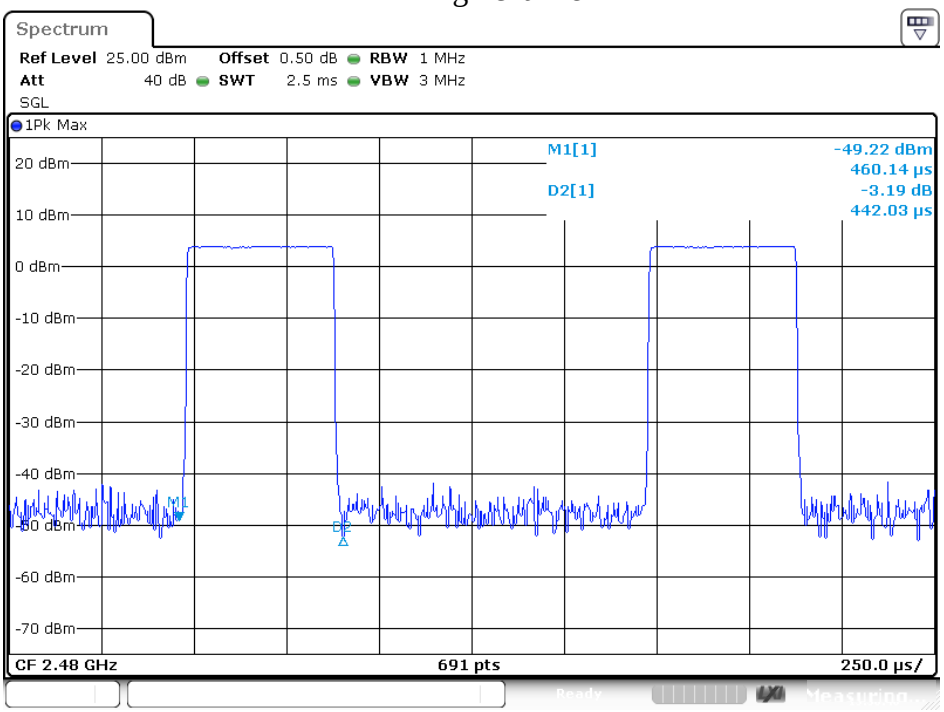
DH1 Low channel



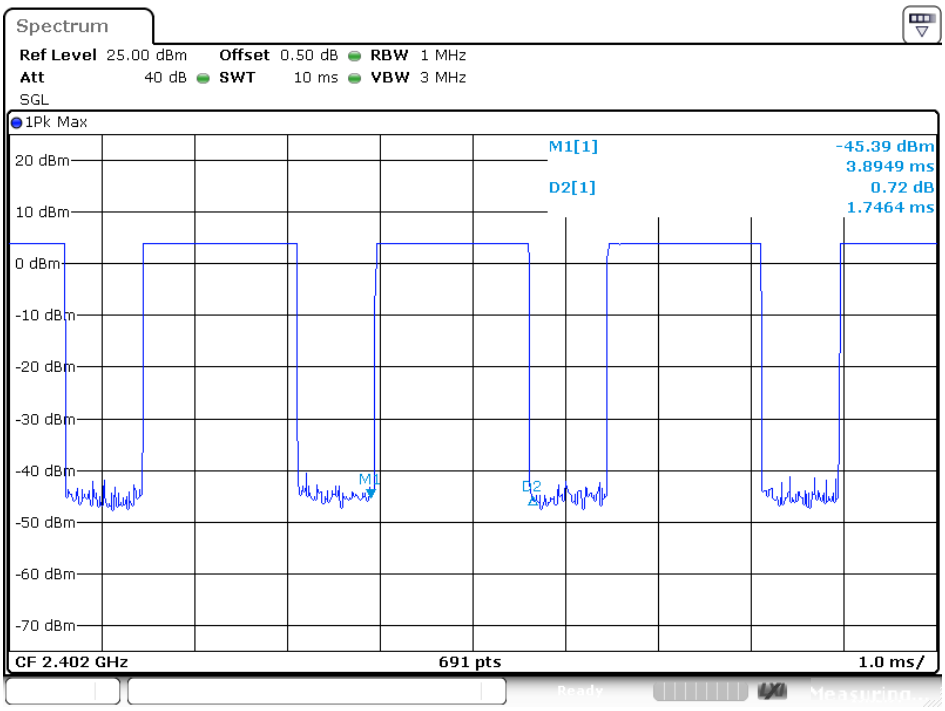
DH1 Middle channel



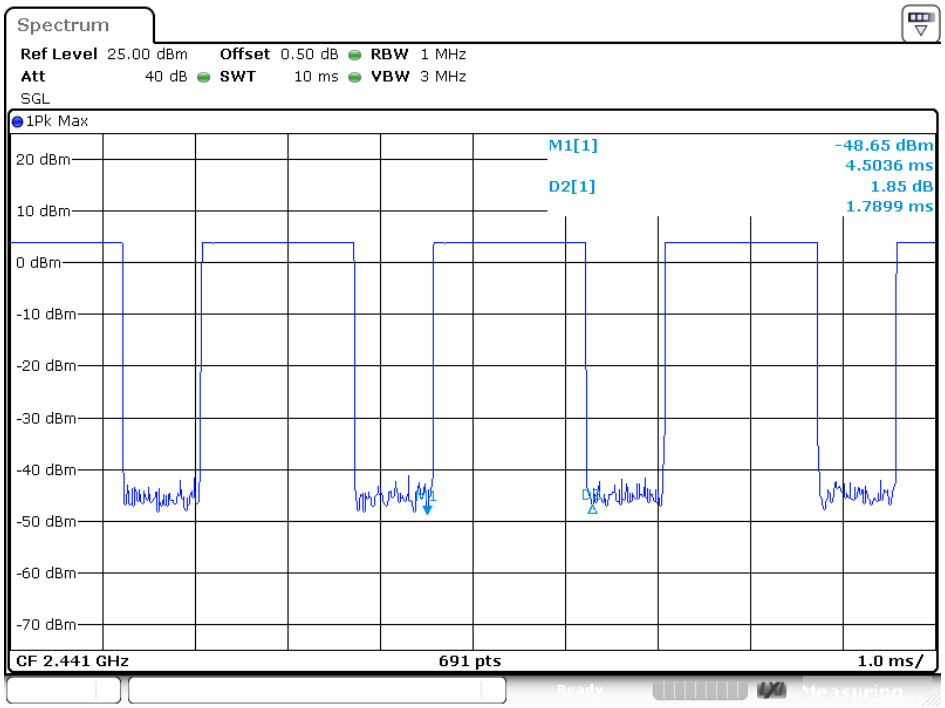
DH1 High channel



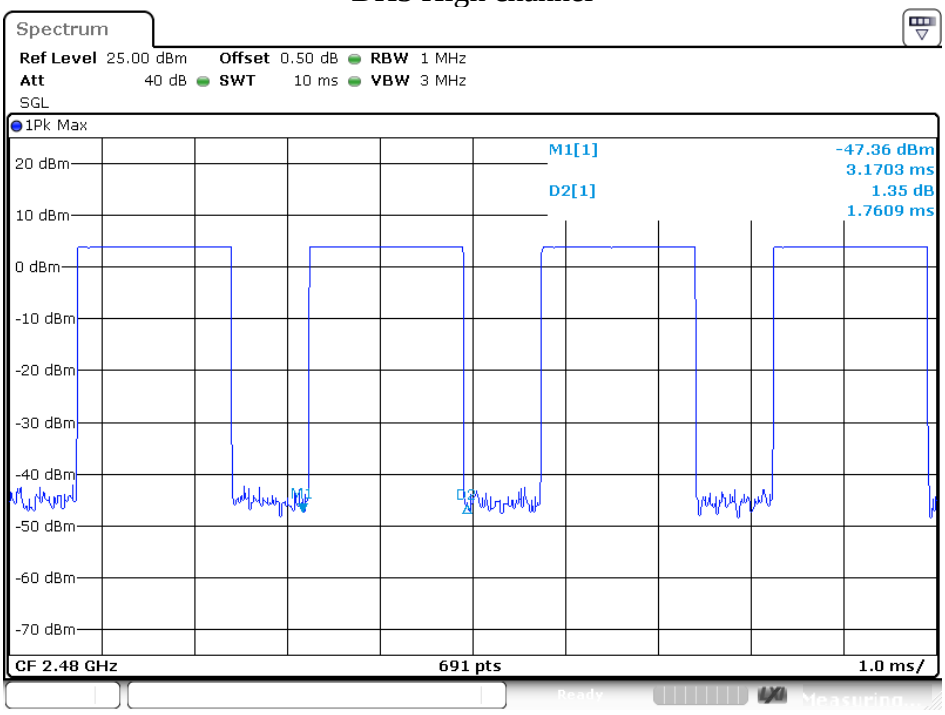
DH3 Low channel



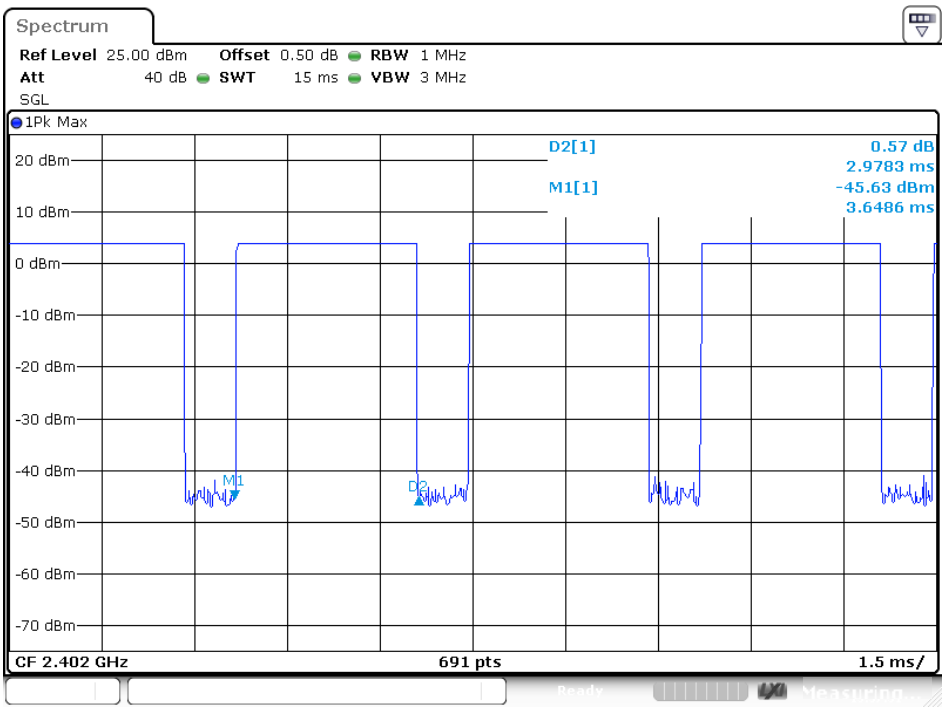
DH3 Middle channel



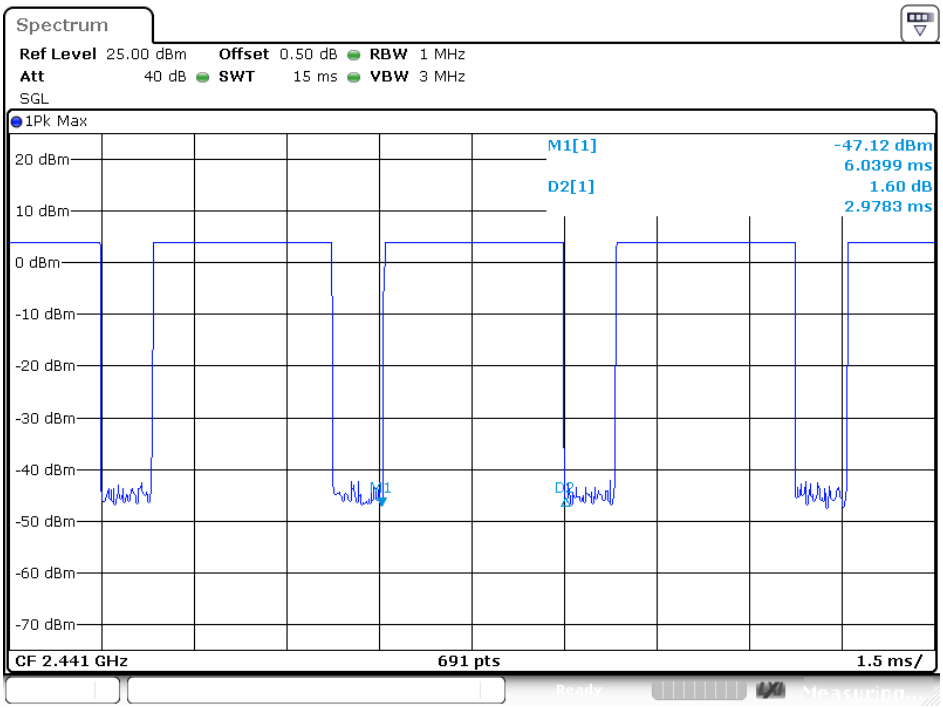
DH3 High channel



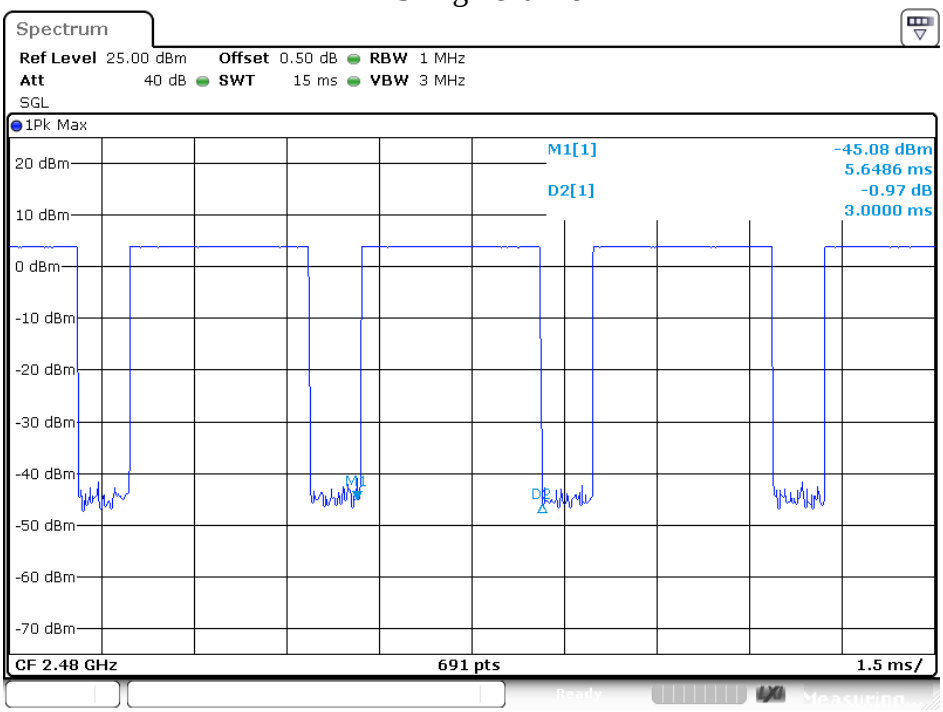
DH5 Low channel



DH5 Middle channel

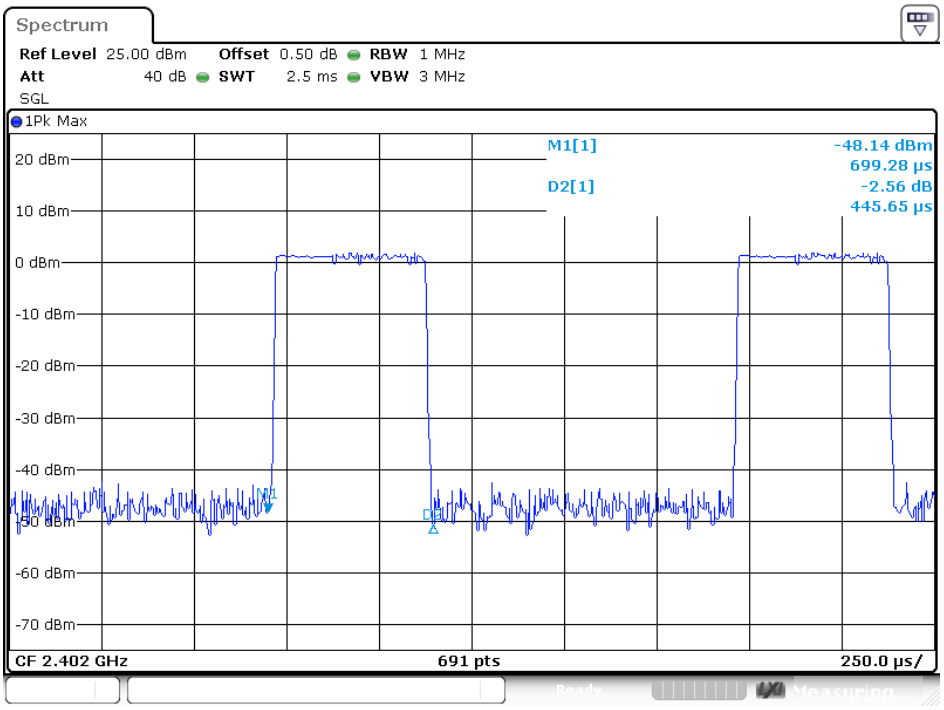


DH5 High channel

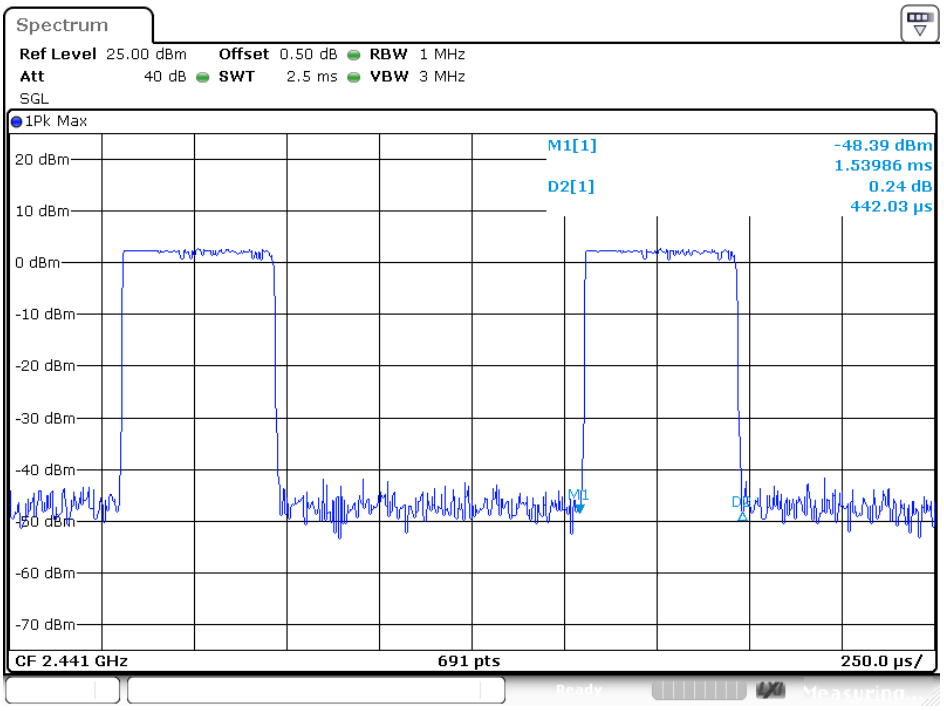


Π/4-DQPSK

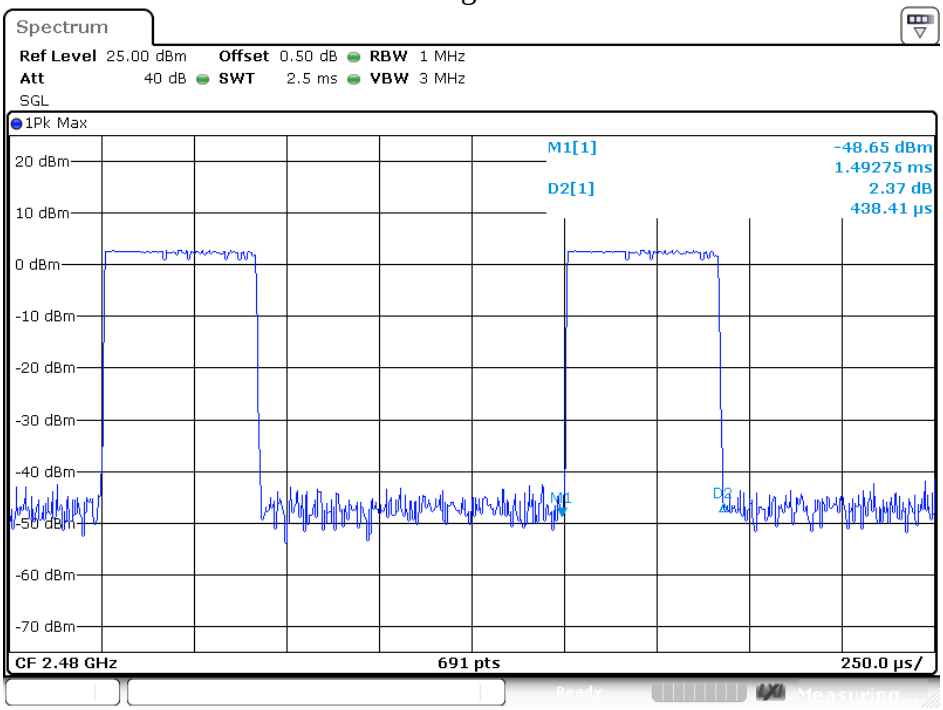
2DH1 Low channel



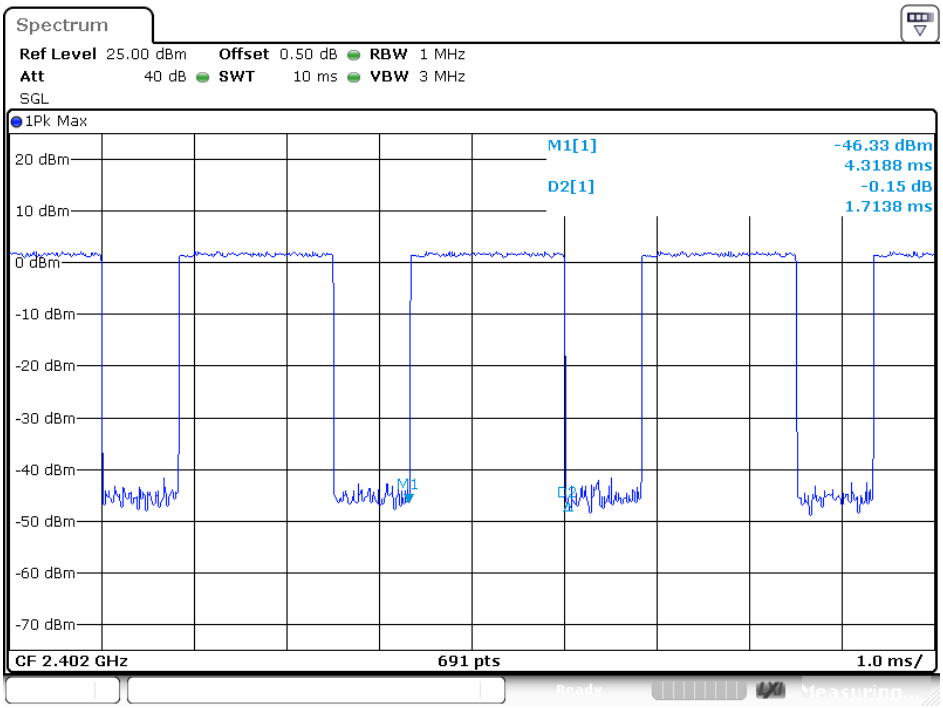
2DH1 Middle channel



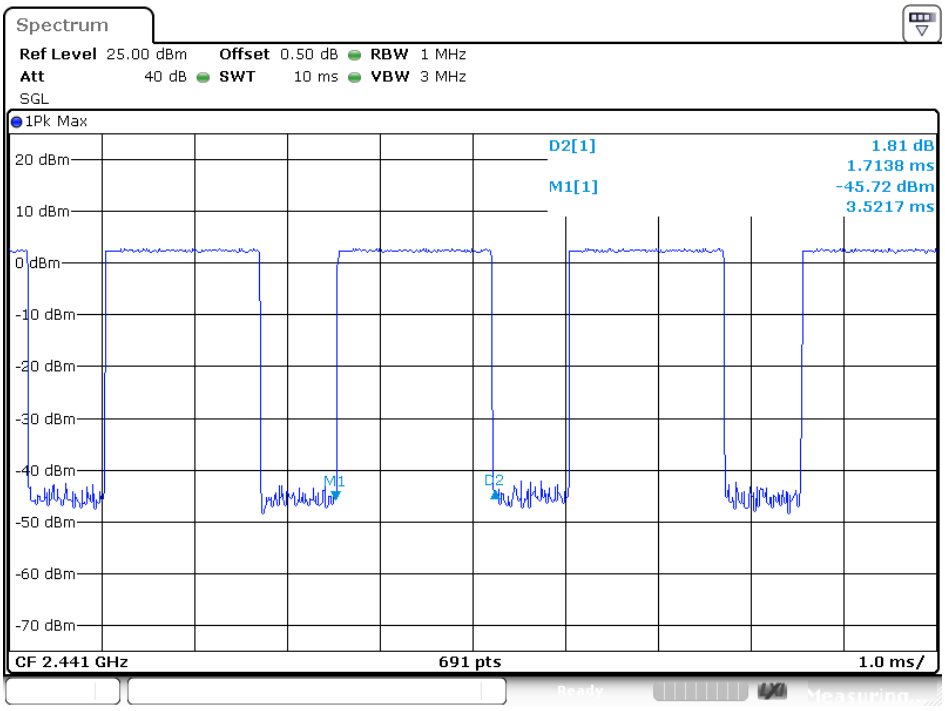
2DH1 High channel



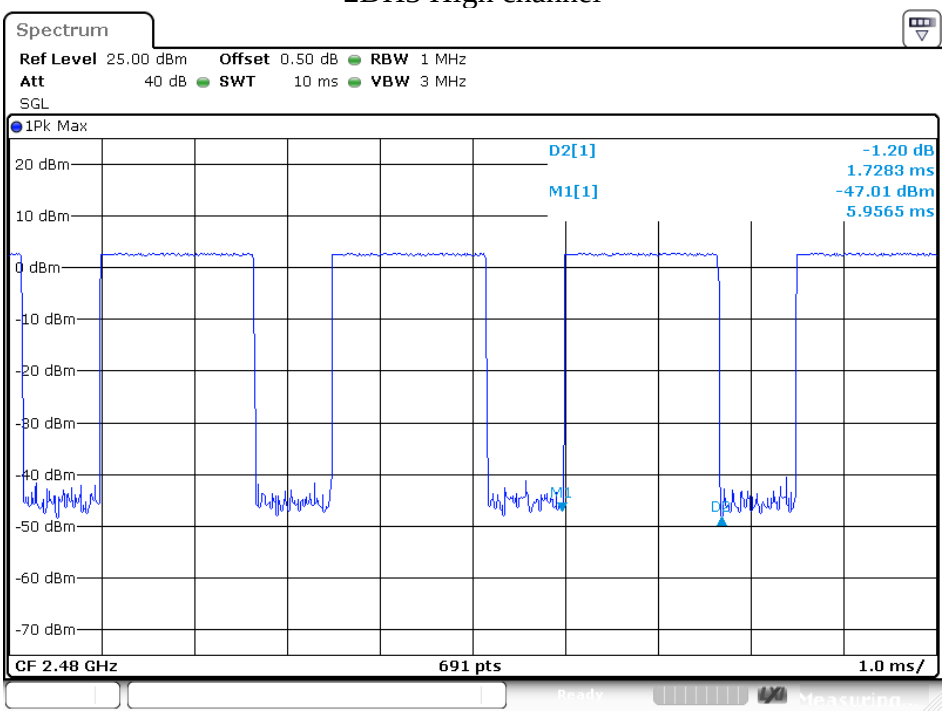
2DH3 Low channel



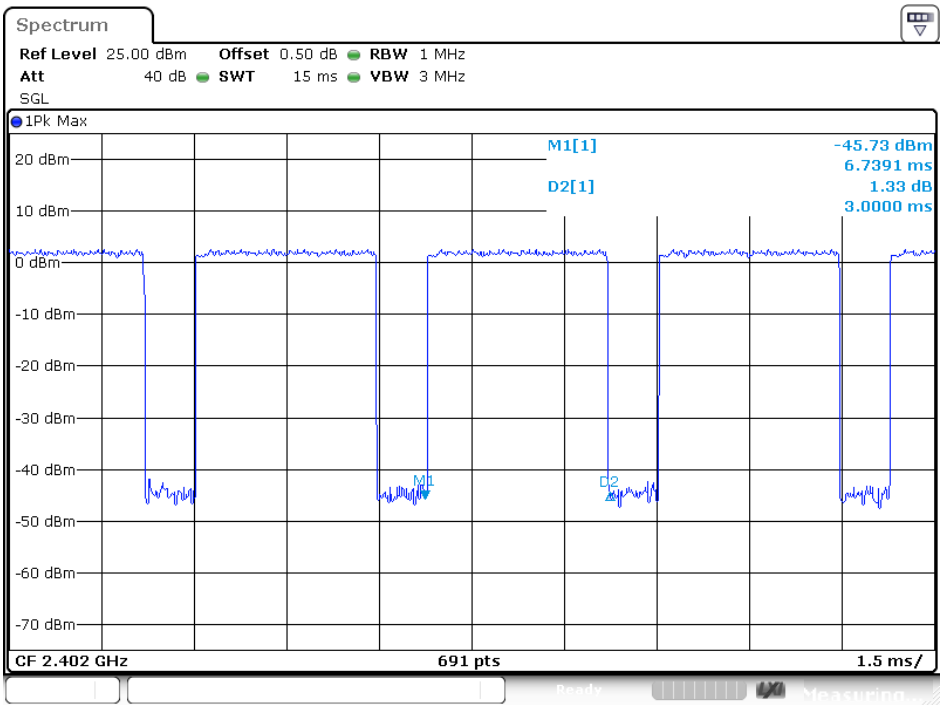
2DH3 Middle channel



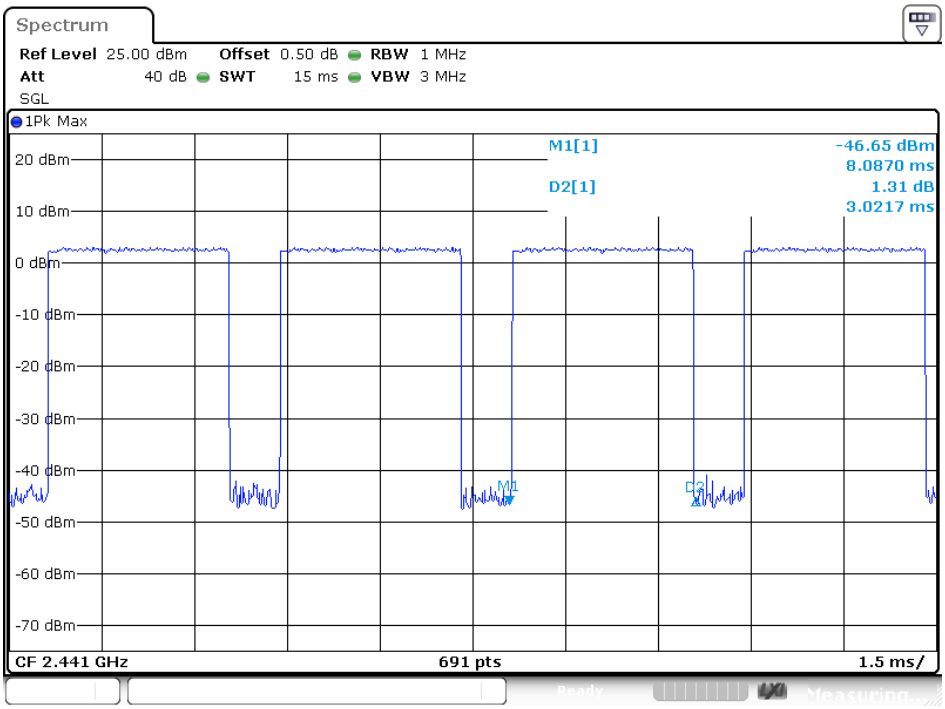
2DH3 High channel



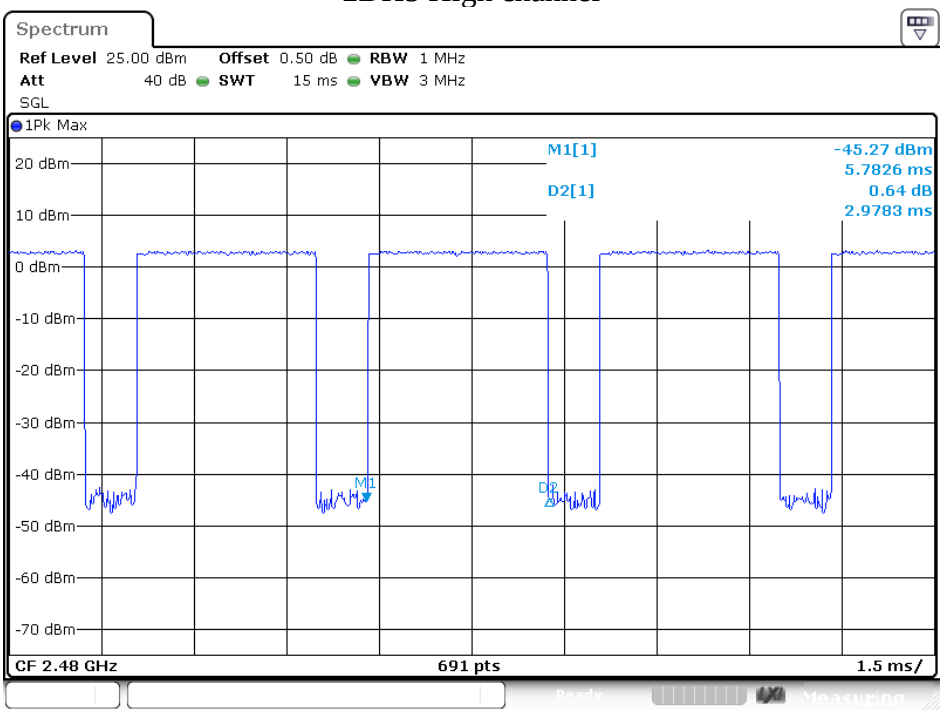
2DH5 Low channel



2DH5 Middle channel

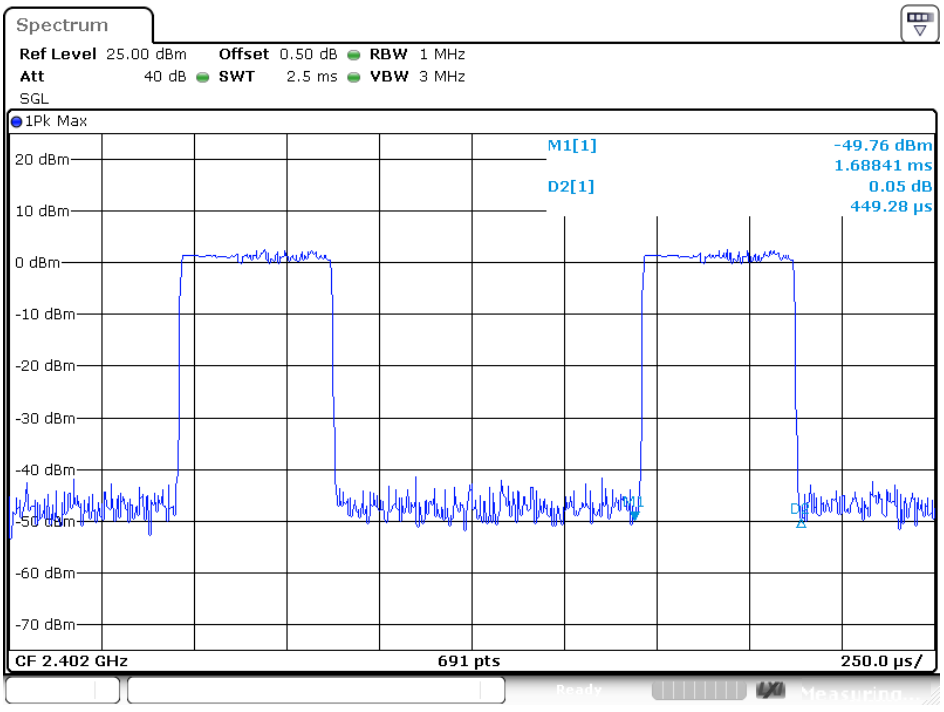


2DH5 High channel

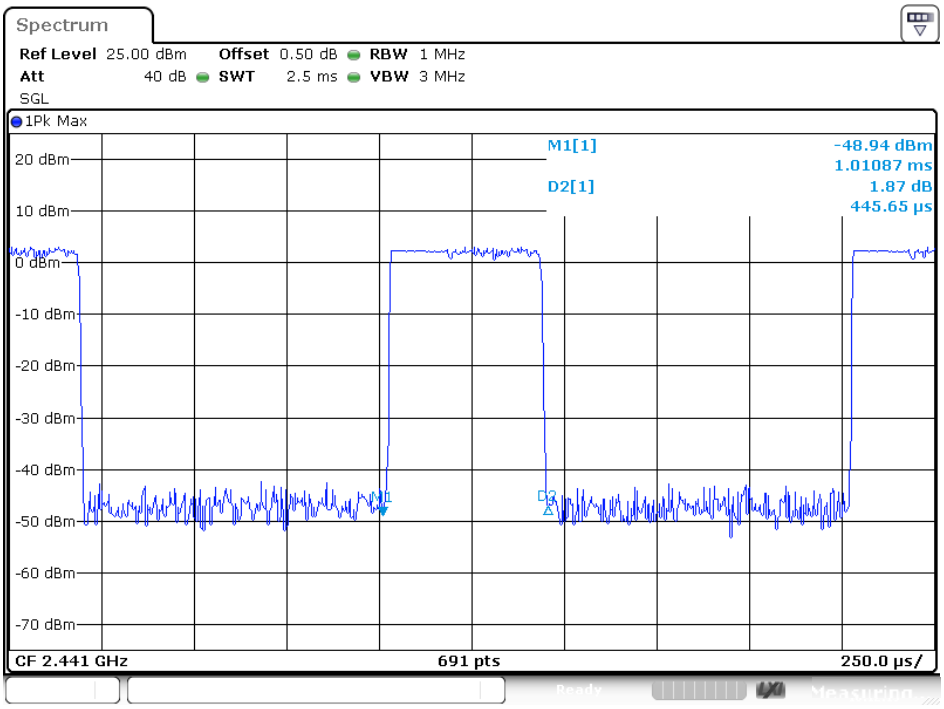


8DPSK Mode

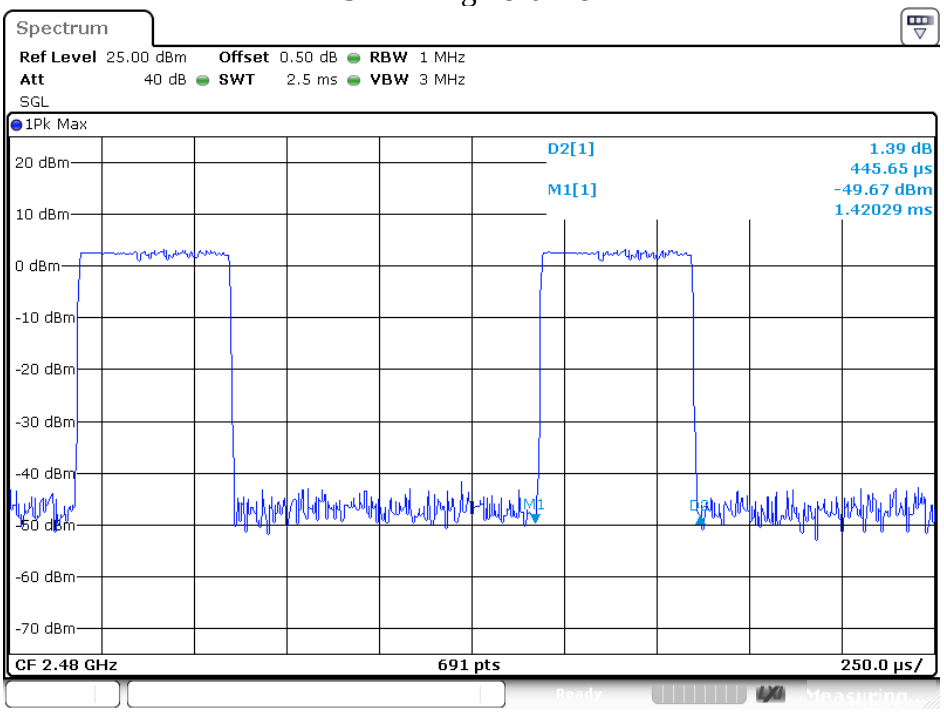
3DH1 Low channel



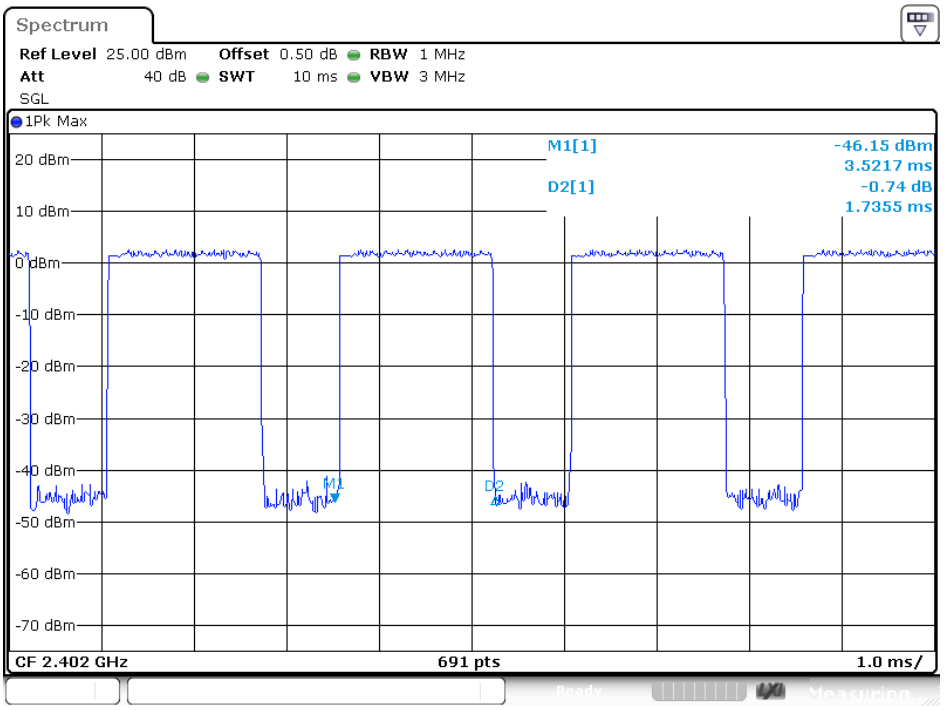
3DH1 Middle channel



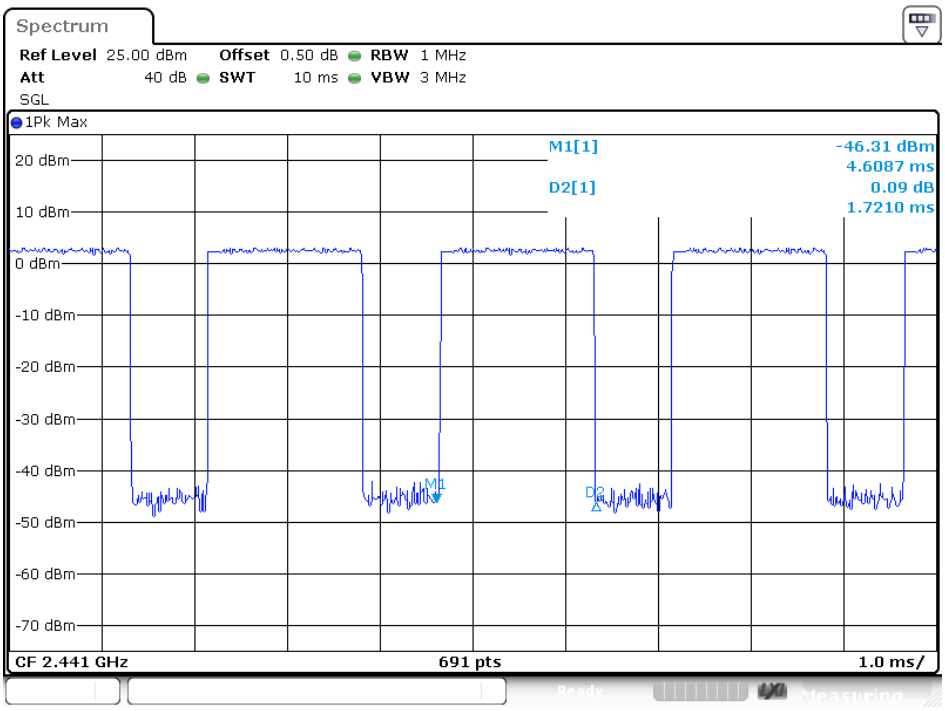
3DH1 High channel



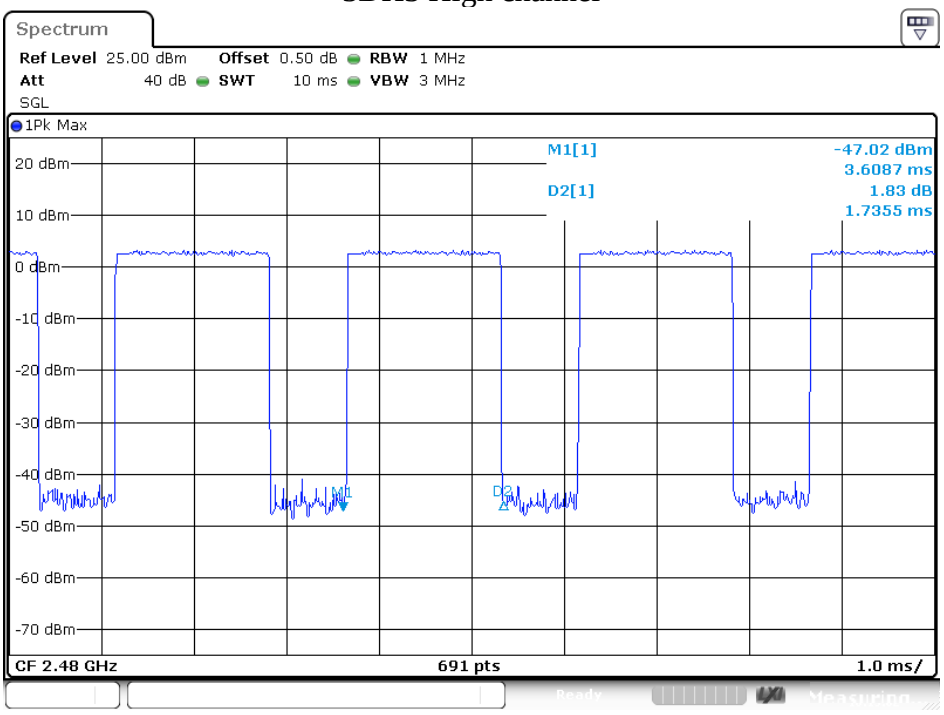
3DH3 Low channel



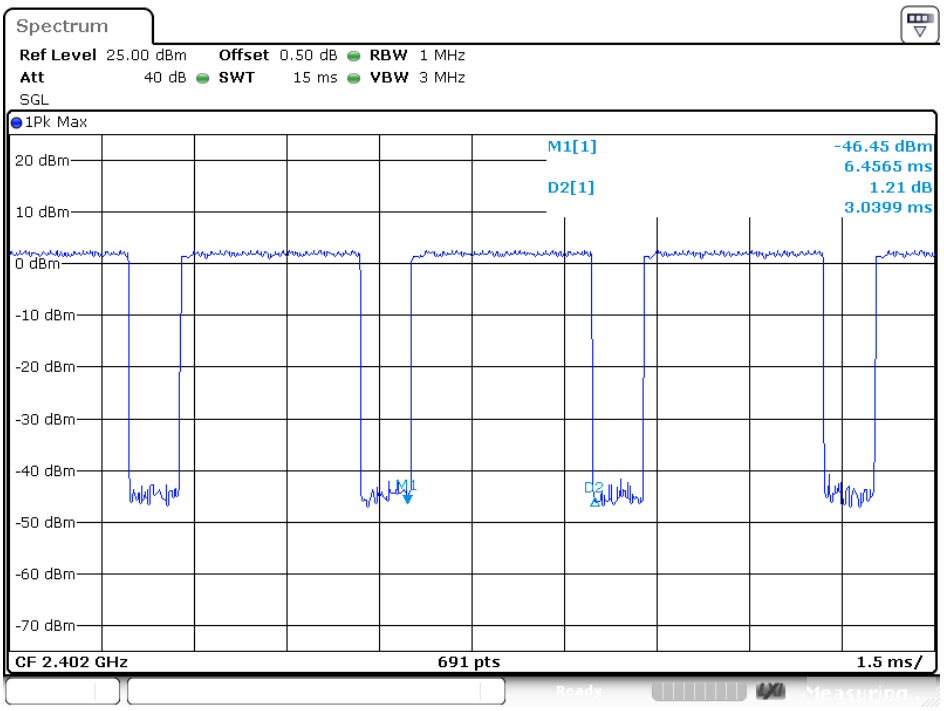
3DH3 Middle channel



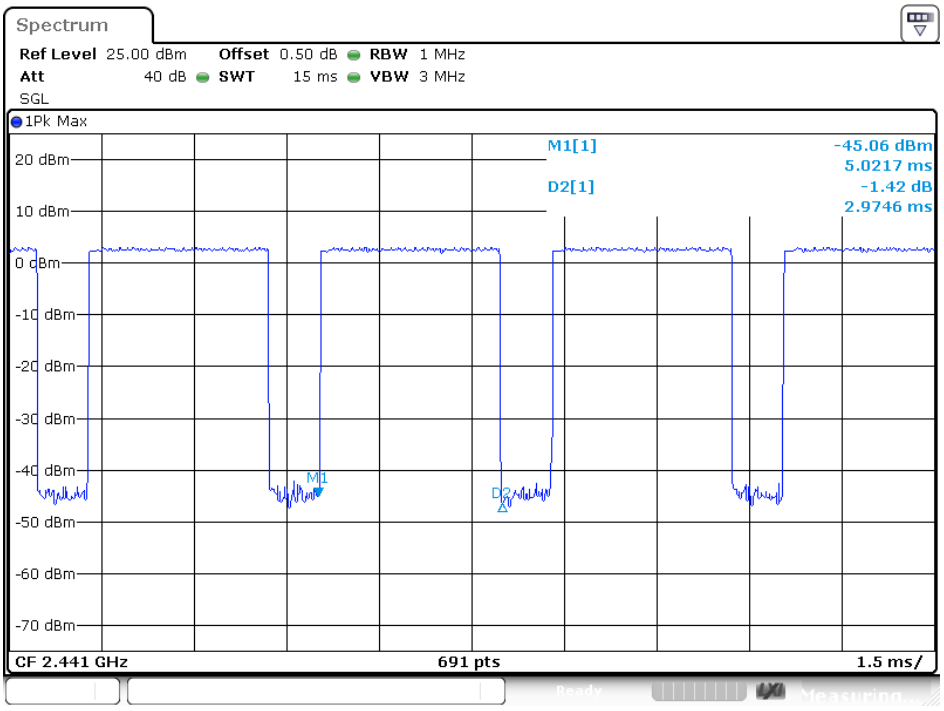
3DH3 High channel



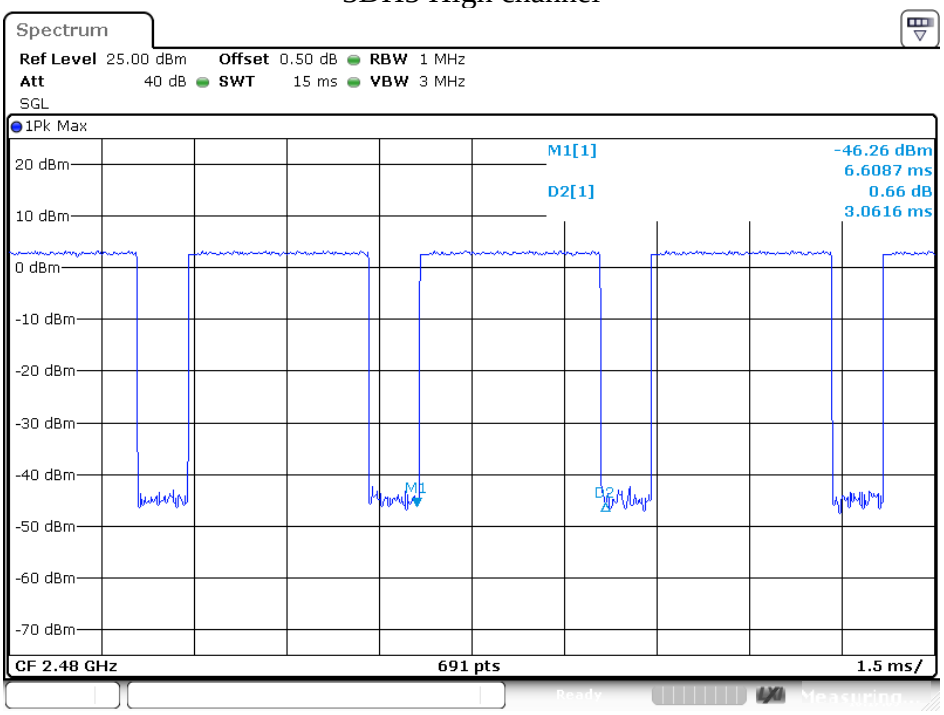
3DH5 Low channel



3DH5 Middle channel

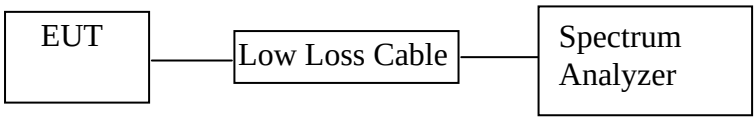


3DH5 High channel



9. MAXIMUM PEAK OUTPUT POWER TEST

9.1.Block Diagram of Test Setup



(EUT: Massage Chair)

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 1MHz and VBW to 3MHz for GFSK mode

9.5.3.Set RBW of spectrum analyzer to 3MHz and VBW to 10MHz for other mode

9.5.4.Measurement the maximum peak output power.

9.6.Test Result

GFSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	4.28/0.0027	30 / 1.0
Middle	2441	4.24/0.0027	30 / 1.0
High	2480	4.10/0.0026	30 / 1.0

∏/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	3.36/0.0022	21 / 0.125
Middle	2441	3.78/0.0024	21 / 0.125
High	2480	4.06/0.0025	21 / 0.125

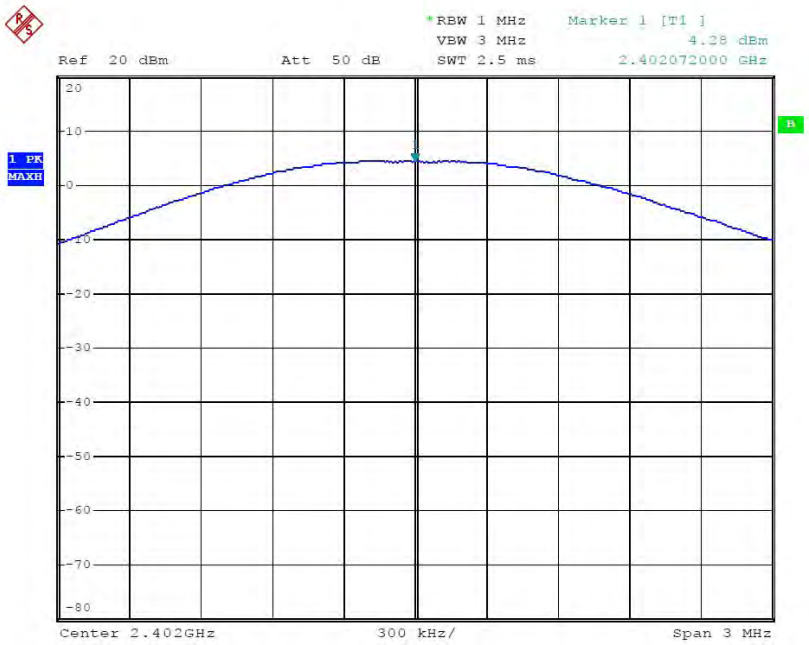
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W
Low	2402	3.78/0.0024	21 / 0.125
Middle	2441	3.94/0.0025	21 / 0.125
High	2480	4.15/0.0026	21 / 0.125

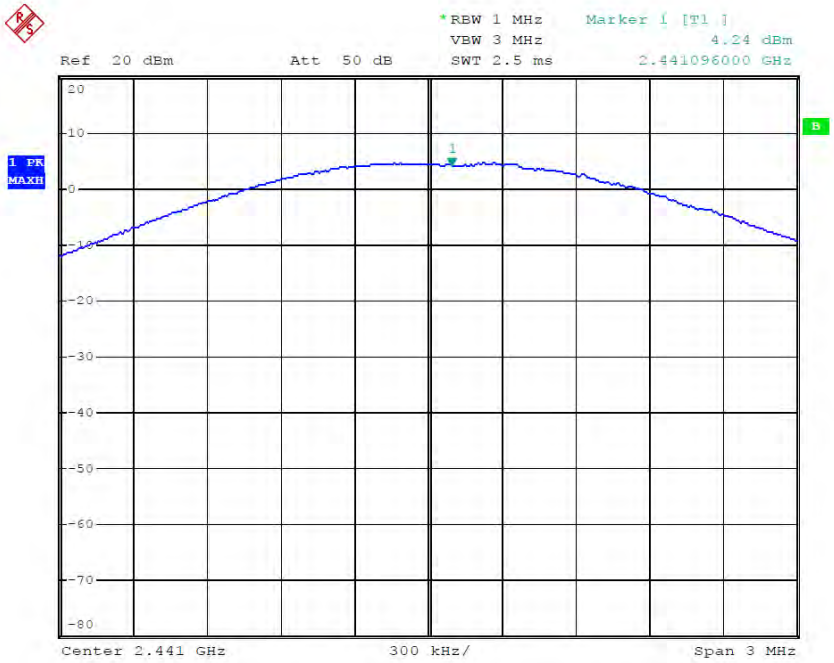
The spectrum analyzer plots are attached as below.

GFSK Mode

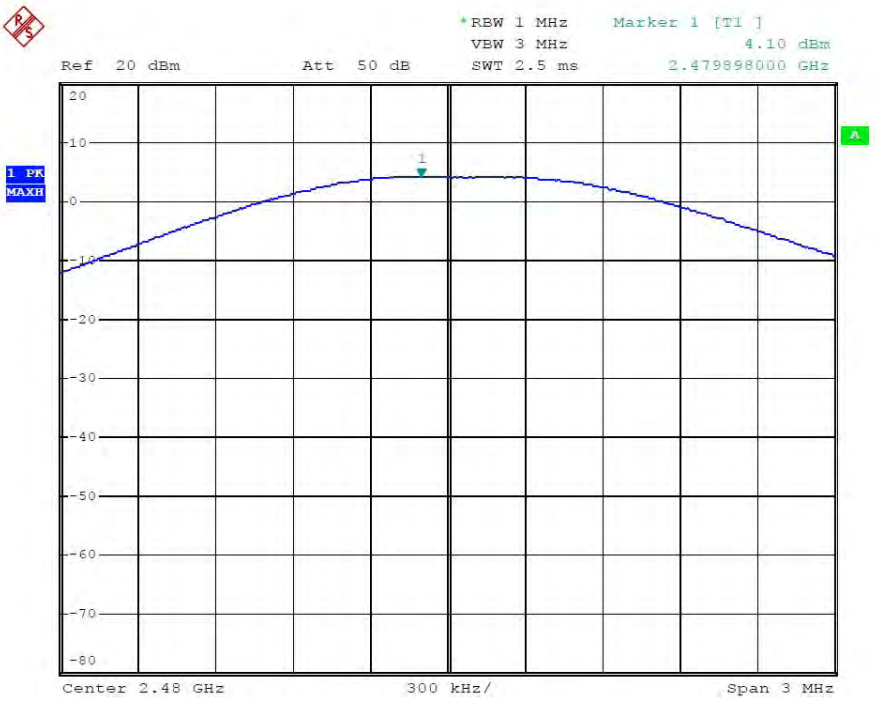
Low channel



Middle channel

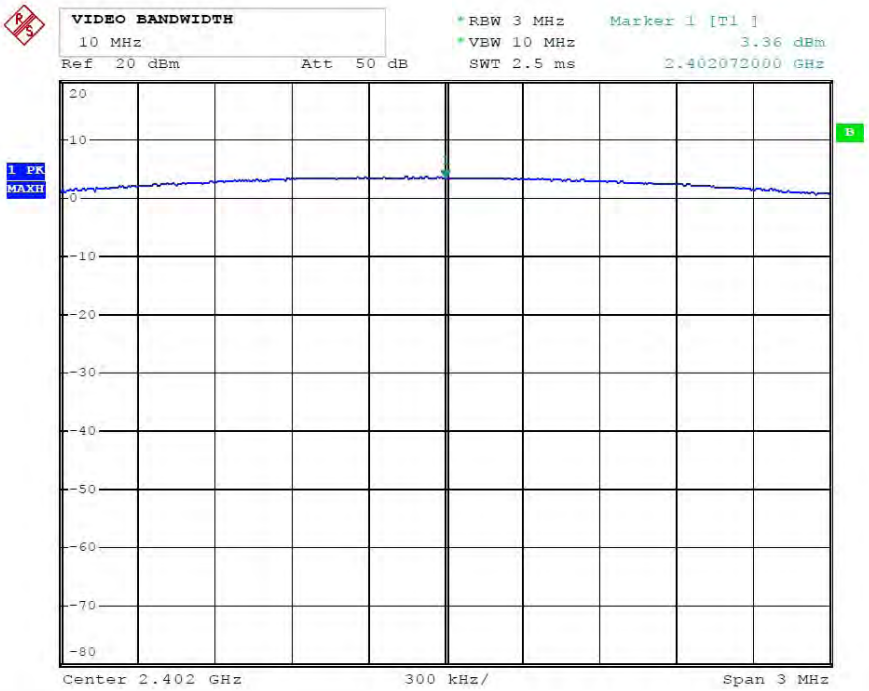


High channel

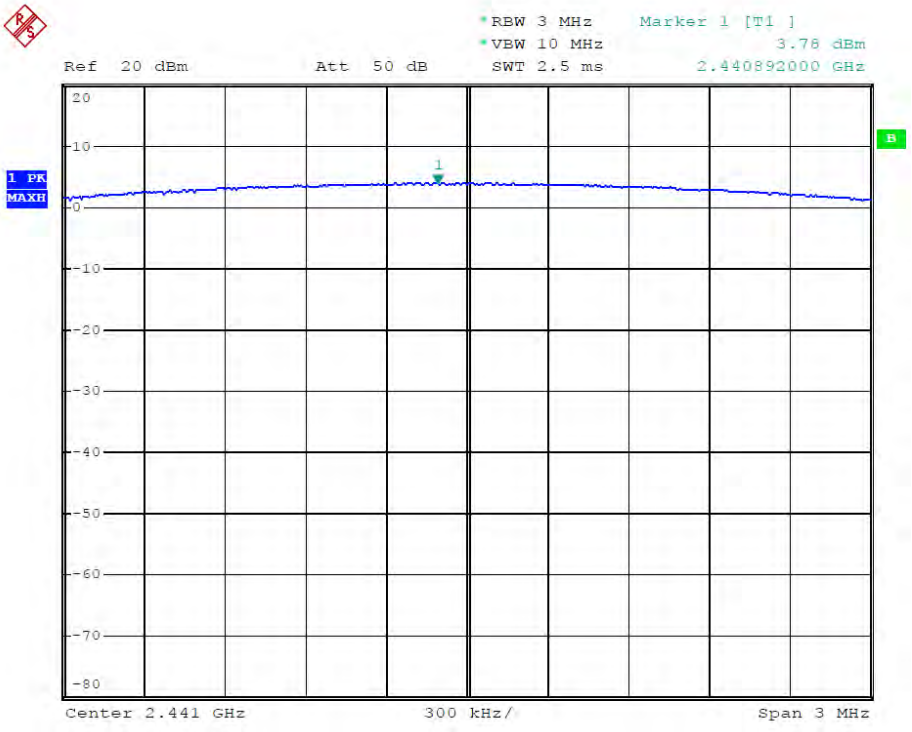


Π/4-DQPSK Mode

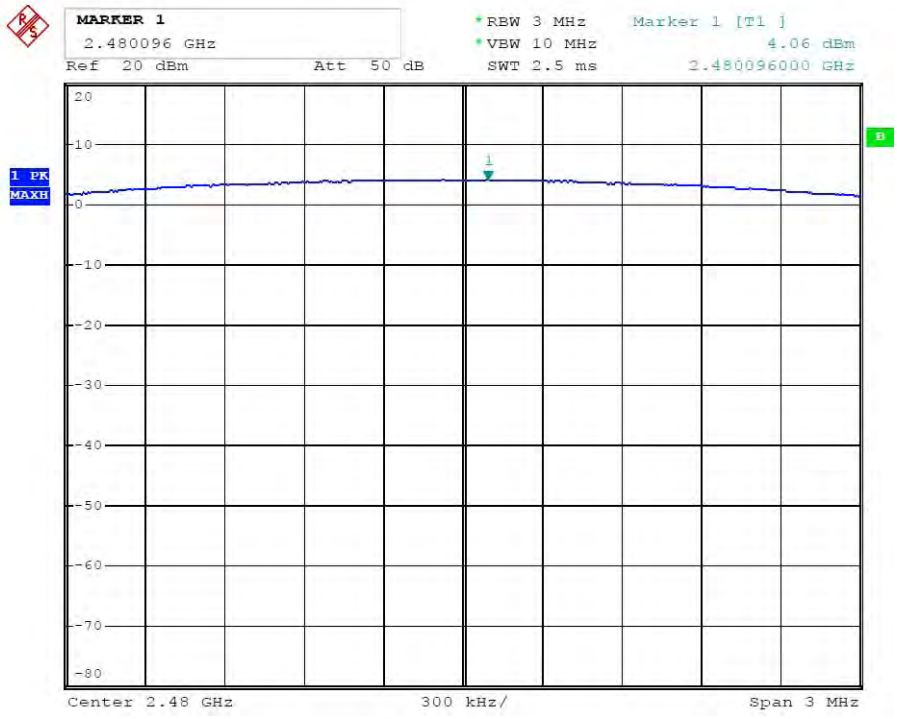
Low channel



Middle channel

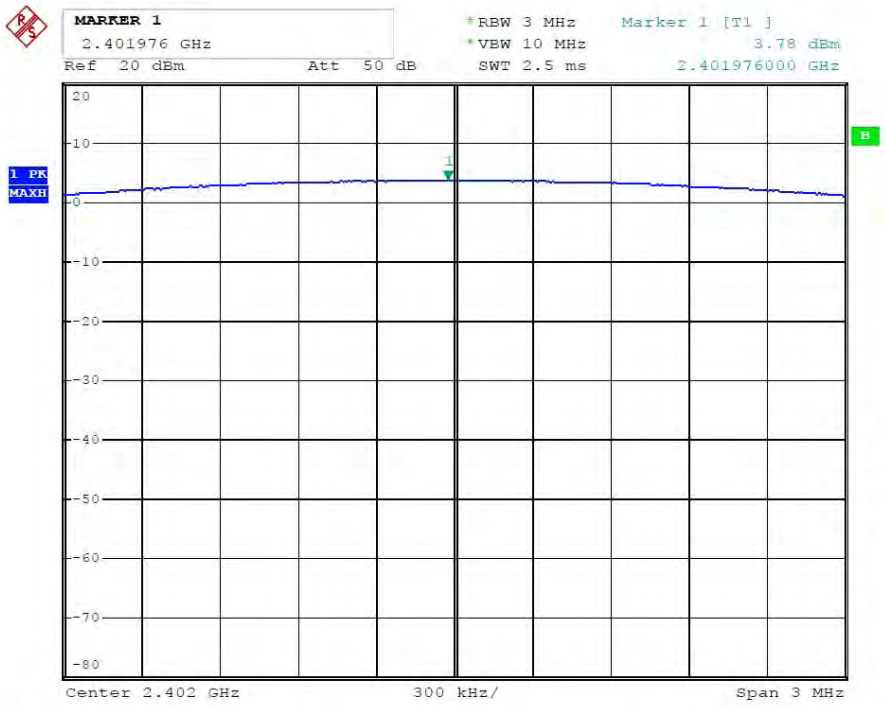


High channel

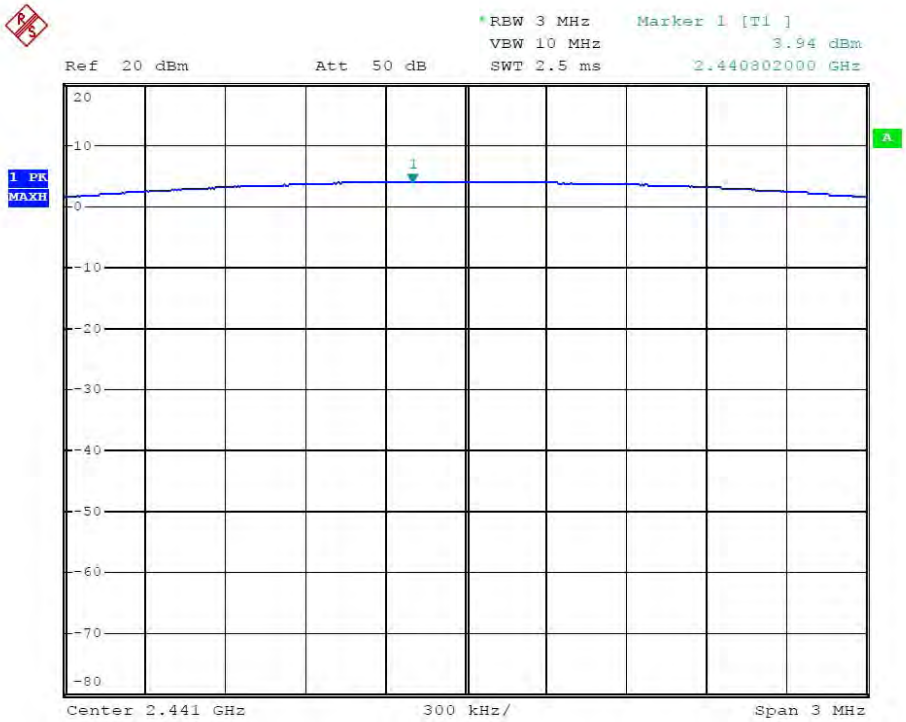


8DPSK Mode

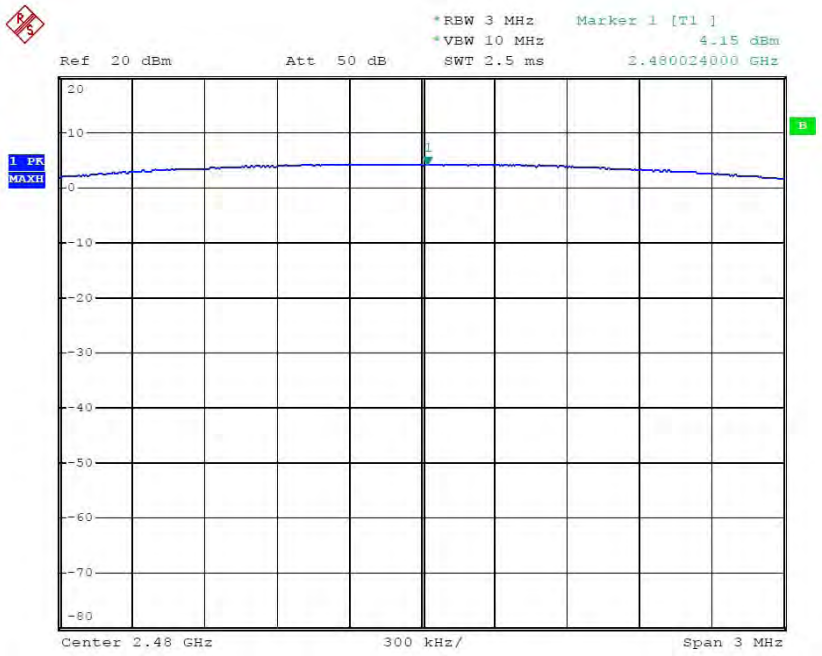
Low channel



Middle channel



High channel



10.RADIATED EMISSION TEST

10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

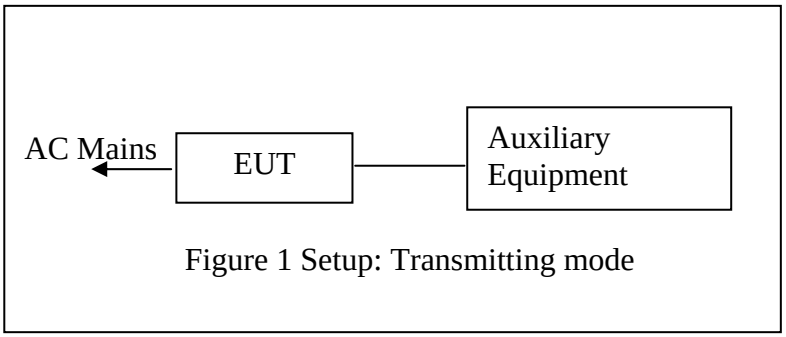
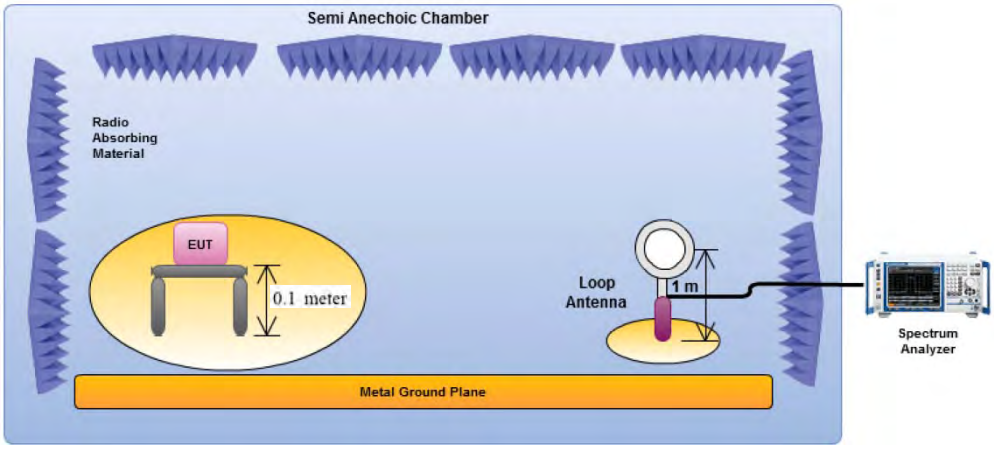


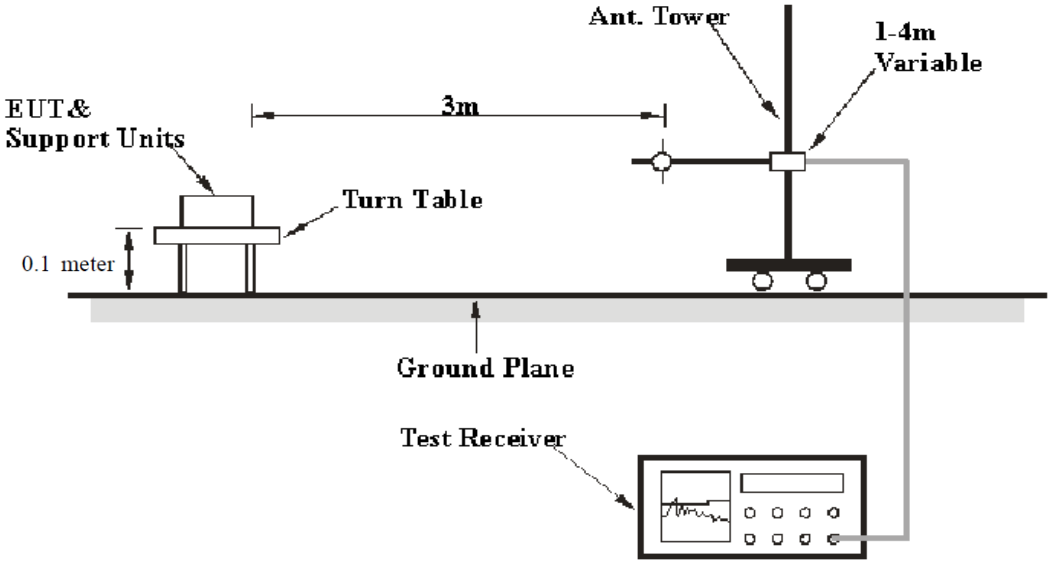
Figure 1 Setup: Transmitting mode

10.1.2.Semi-Anechoic Chamber Test Setup Diagram

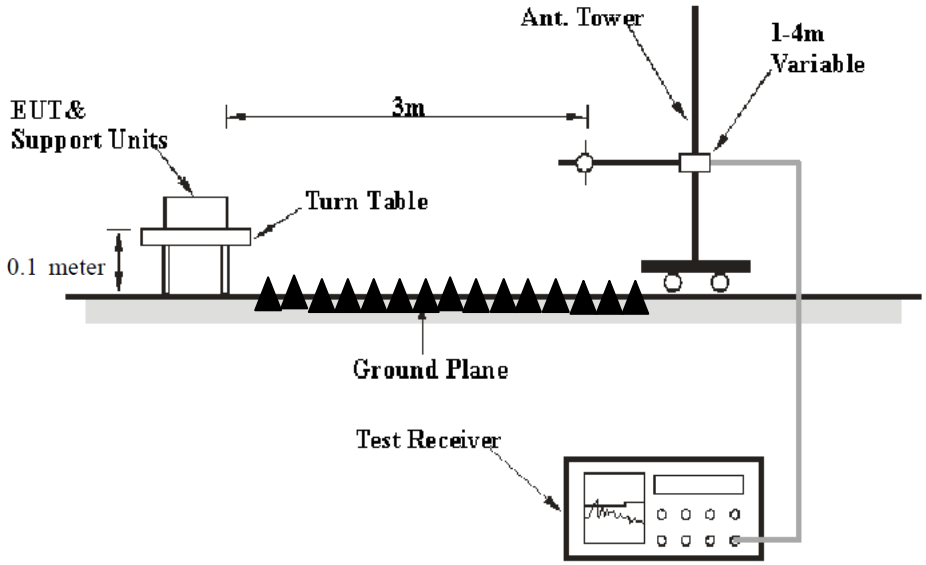
Below 30MHz



Below 1GHz:



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.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.1 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. The EUT was tested in 3 orthogonal planes.

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.

10.6.Data Sample

Frequency(MHz)	Reading (dBμv)	Factor (dB/m)	Result (dBμv/m)	Limit (dBμv/m)	Margin (dB)	Remark
xx.xxxx	29.46	-12.53	16.93	40.00	-23.07	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.

10.7.The Field Strength of Radiation Emission Measurement Results

PASS.

Note:

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

2. Emissions attenuated more than 20 dB below the permissible value are not reported.

3. *: Denotes restricted band of operation.

4. The radiation emissions from 9kHz-30MHz and 18-26.5GHz are not reported, because the test values lower than the limits of 20dB.

Adapter 1 test data: Below 1GHz

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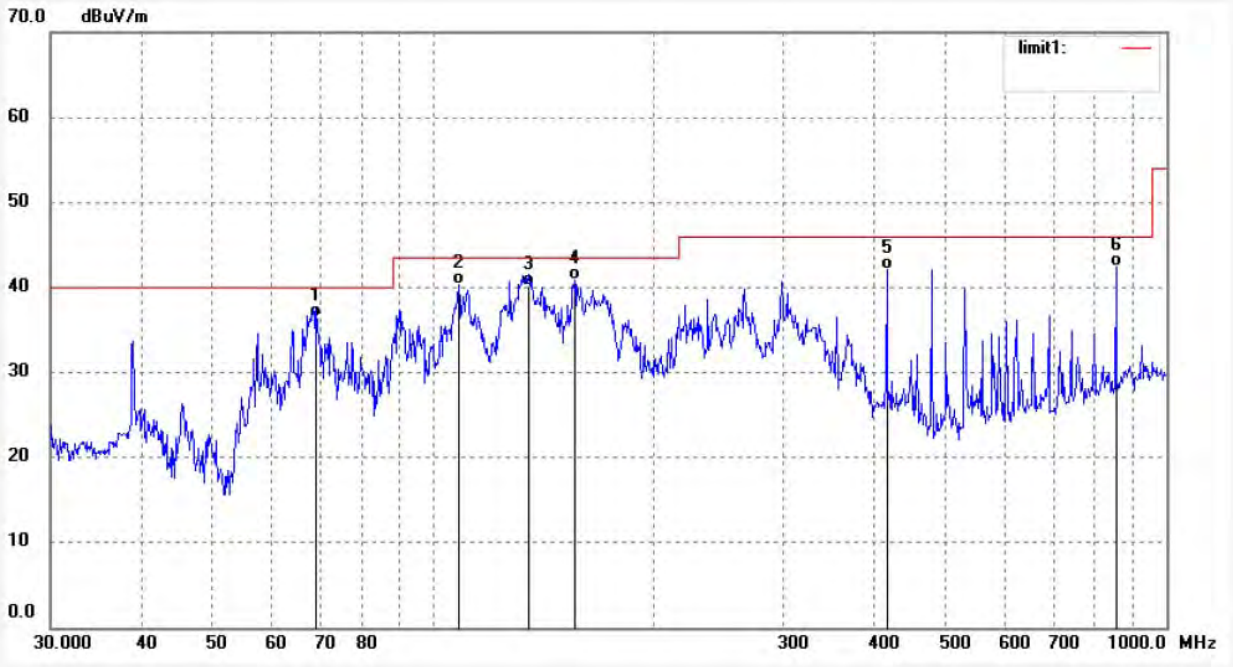
Fax:+86-0755-26503396

Job No.: frank test #352	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2018-5-31
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14:50:39
EUT: Massage Chair	Engineer Signature: frank
Mode: TX2402MHz	Distance:
Model: EC-628M	
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD	

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	69.2296	59.26	-22.82	36.44	40.00	-3.56	QP	100	141	
2	108.1645	61.73	-21.36	40.37	43.50	-3.13	QP	100	232	
3	134.9643	62.15	-21.92	40.23	43.50	-3.27	QP	100	46	
4	155.8771	62.73	-21.79	40.94	43.50	-2.56	QP	100	310	
5	415.4485	55.78	-13.74	42.04	46.00	-3.96	QP	100	64	
6	853.7545	47.42	-5.01	42.41	46.00	-3.59	QP	100	100	

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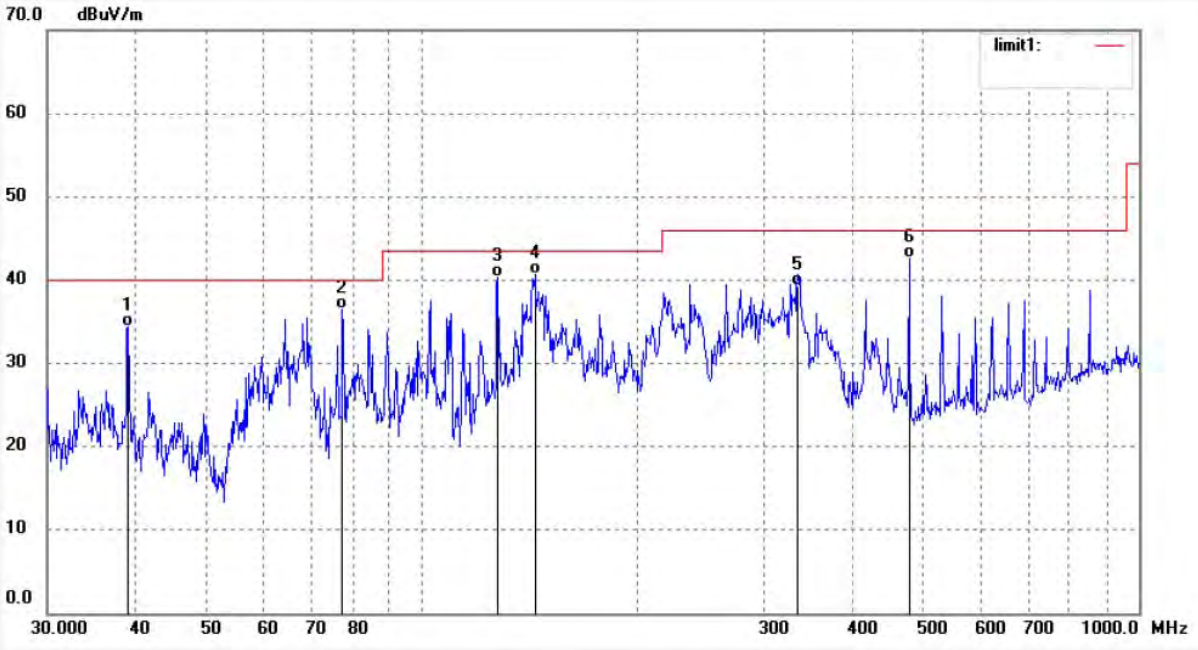
Job No.: frank test #353
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2018-5-31
Time: 14:57:22
Engineer Signature: frank
Distance:

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	38.9080	53.22	-18.75	34.47	40.00	-5.53	QP	100	159	
2	77.4680	59.48	-23.00	36.48	40.00	-3.52	QP	100	115	
3	127.5865	61.90	-21.64	40.26	43.50	-3.24	QP	100	110	
4	143.7760	62.87	-22.20	40.67	43.50	-2.83	QP	100	121	
5	334.1254	54.45	-15.16	39.29	46.00	-6.71	QP	100	120	
6	478.1394	55.12	-12.49	42.63	46.00	-3.37	QP	100	123	

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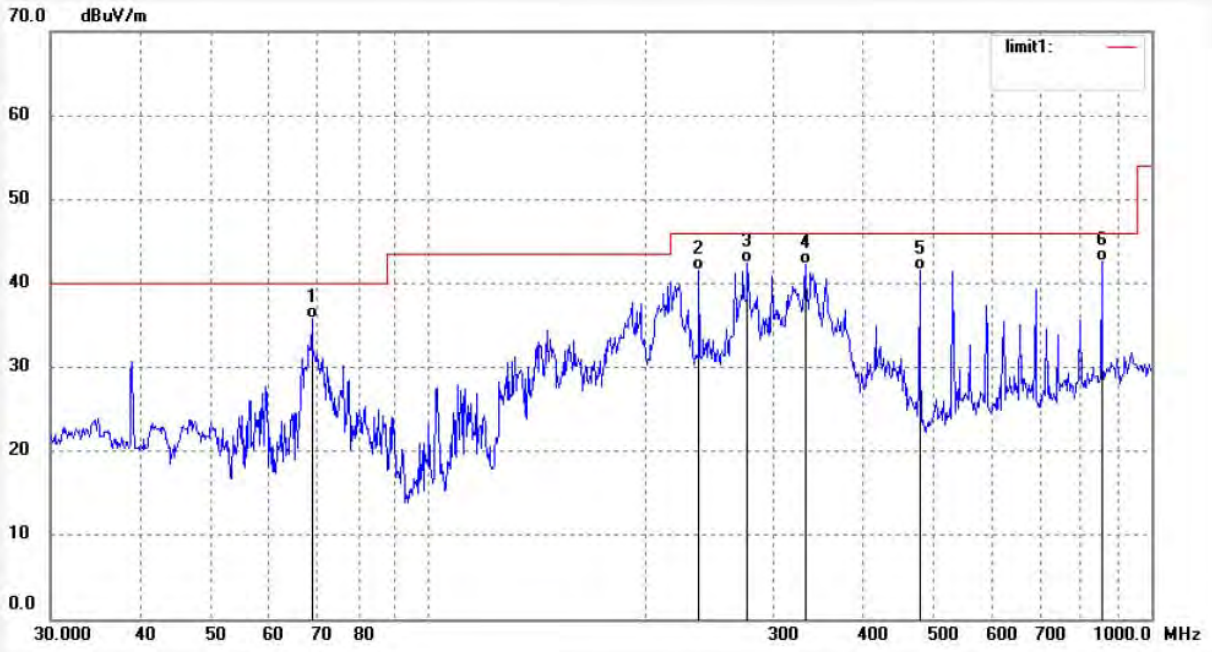
Job No.: frank test #354
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2441MHz
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2018-5-31
Time: 14:59:11
Engineer Signature: frank
Distance:

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	68.9869	58.59	-22.81	35.78	40.00	-4.22	QP	100	103	
2	236.7925	59.90	-18.27	41.63	46.00	-4.37	QP	100	210	
3	276.3817	59.32	-16.91	42.41	46.00	-3.59	QP	100	43	
4	331.7857	57.53	-15.29	42.24	46.00	-3.76	QP	100	108	
5	478.1394	54.01	-12.49	41.52	46.00	-4.48	QP	100	49	
6	853.7545	47.64	-5.01	42.63	46.00	-3.37	QP	100	61	

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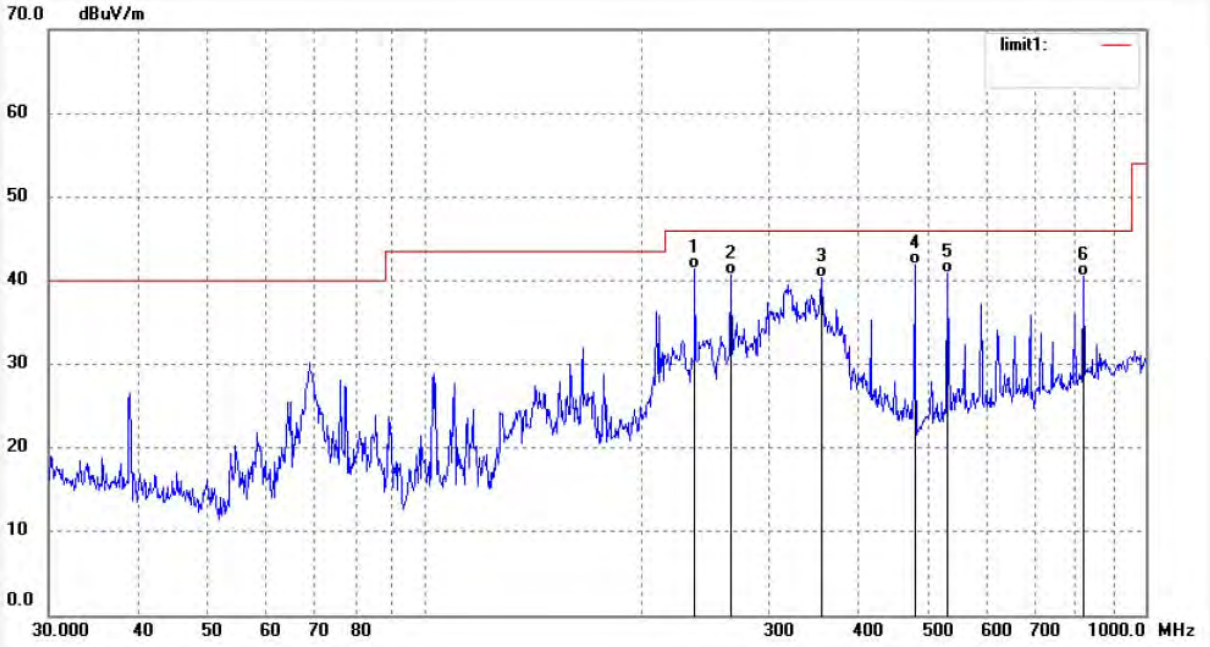
Job No.: frank test #355
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2441MHz
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2018-5-31
Time: 15:03:59
Engineer Signature: frank
Distance:

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	236.7924	59.61	-18.27	41.34	46.00	-4.66	QP	200	113	
2	265.9035	57.87	-17.25	40.62	46.00	-5.38	QP	200	140	
3	354.6911	54.82	-14.47	40.35	46.00	-5.65	QP	200	45	
4	478.1394	54.36	-12.49	41.87	46.00	-4.13	QP	200	198	
5	531.2910	52.36	-11.53	40.83	46.00	-5.17	QP	200	120	
6	818.5062	46.11	-5.58	40.53	46.00	-5.47	QP	200	130	

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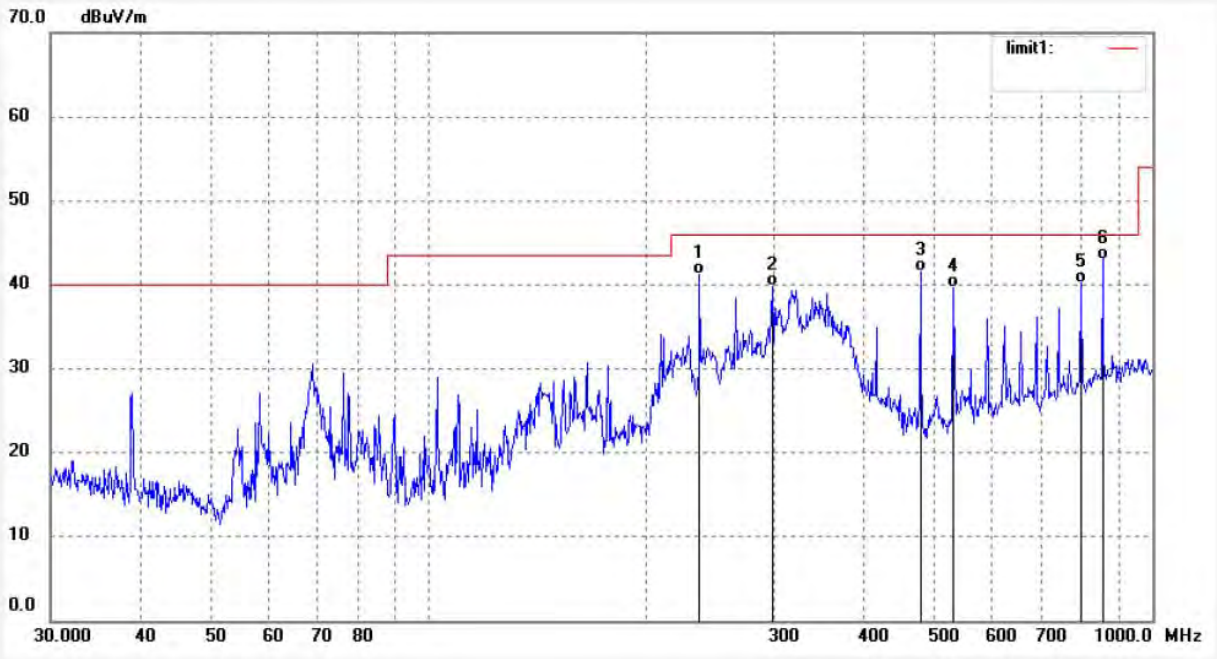
Job No.: frank test #356
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2018-5-31
Time: 15:10:54
Engineer Signature: frank
Distance:

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	236.7928	59.42	-18.27	41.15	46.00	-4.85	QP	200	320	
2	298.5932	56.07	-16.30	39.77	46.00	-6.23	QP	200	40	
3	478.1394	54.12	-12.49	41.63	46.00	-4.37	QP	200	106	
4	531.2910	51.12	-11.53	39.59	46.00	-6.41	QP	200	51	
5	795.8192	46.03	-5.95	40.08	46.00	-5.92	QP	200	266	
6	853.7547	48.00	-5.01	42.99	46.00	-3.01	QP	200	164	

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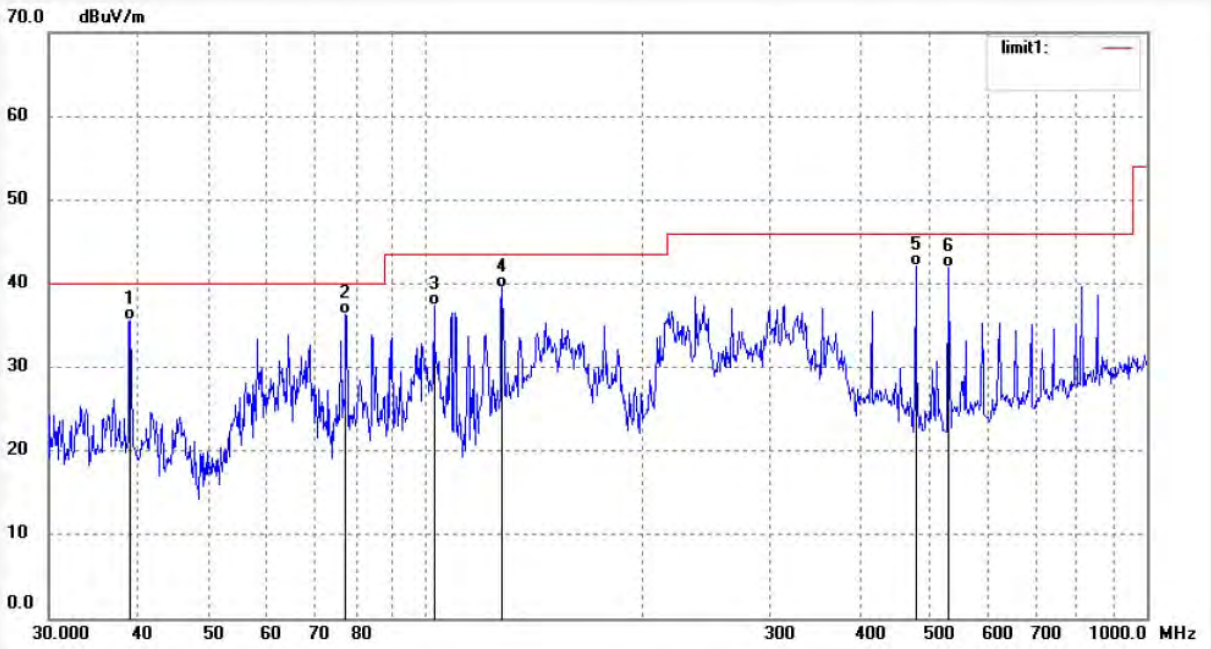
Job No.: frank test #357
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2018-5-31
Time: 15:13:51
Engineer Signature: frank
Distance:

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	38.9080	54.31	-18.75	35.56	40.00	-4.44	QP	100	156	
2	77.4680	59.23	-23.00	36.23	40.00	-3.77	QP	100	49	
3	102.6115	59.16	-21.80	37.36	43.50	-6.14	QP	100	155	
4	127.5865	61.19	-21.64	39.55	43.50	-3.95	QP	100	40	
5	478.1394	54.63	-12.49	42.14	46.00	-3.86	QP	100	125	
6	531.2910	53.44	-11.53	41.91	46.00	-4.09	QP	100	135	

Above 1GHz

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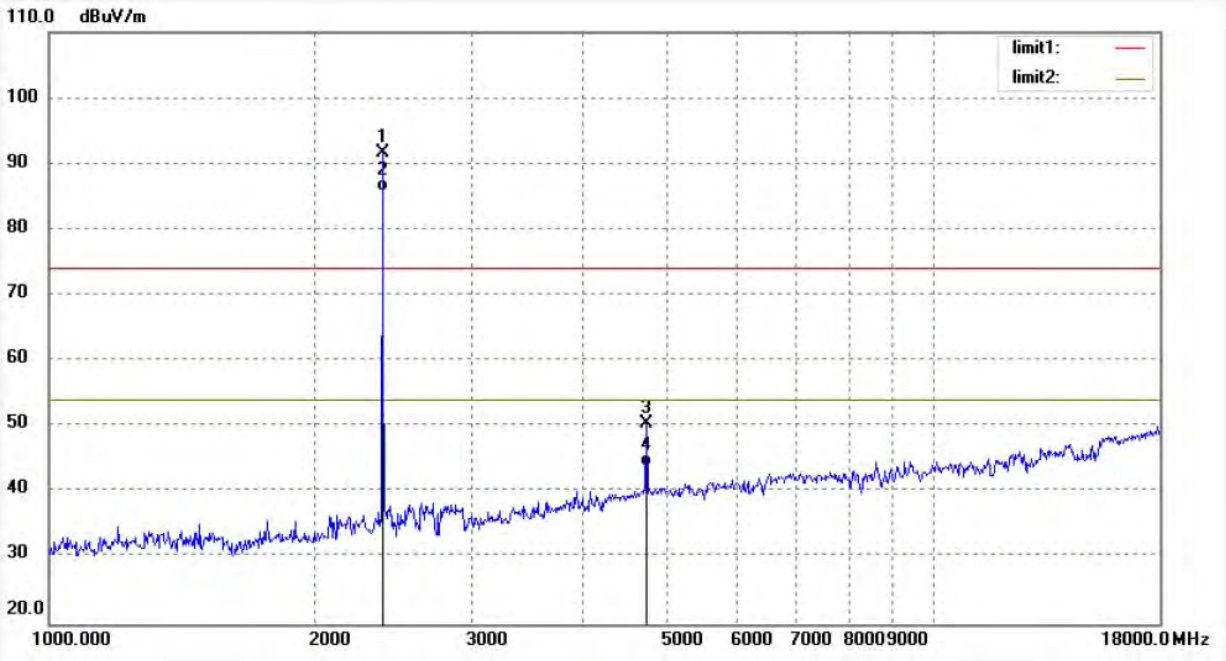
Job No.: frank test #360
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 14/01/12
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	95.93	-4.37	91.56			peak	200	138	
2	2402.000	90.12	-4.37	85.75			AVG	200	152	
3	4804.000	47.78	2.70	50.48	74.00	-23.52	peak	200	214	
4	4804.000	41.15	2.70	43.85	54.00	-10.15	AVG	200	103	

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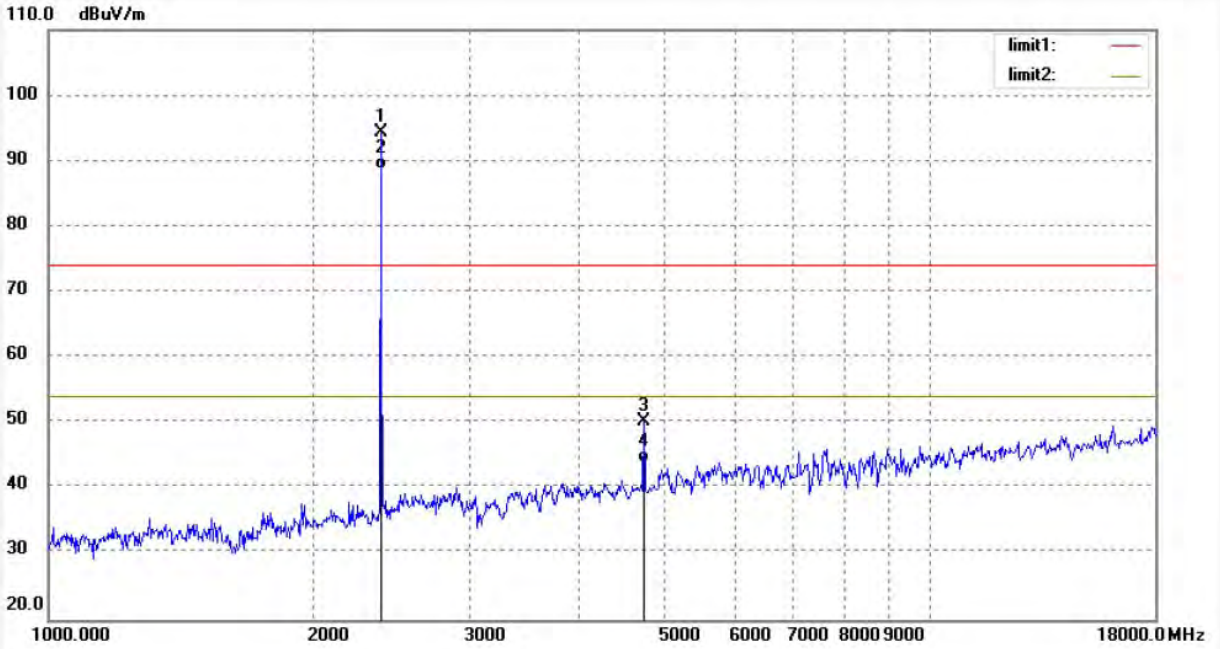
Job No.: frank test #361
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 14/07/12
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	98.77	-4.37	94.40			peak	250	122	
2	2402.000	93.13	-4.37	88.76			AVG	250	211	
3	4804.000	47.55	2.70	50.25	74.00	-23.75	peak	250	81	
4	4804.000	41.15	2.70	43.85	54.00	-10.15	AVG	250	247	

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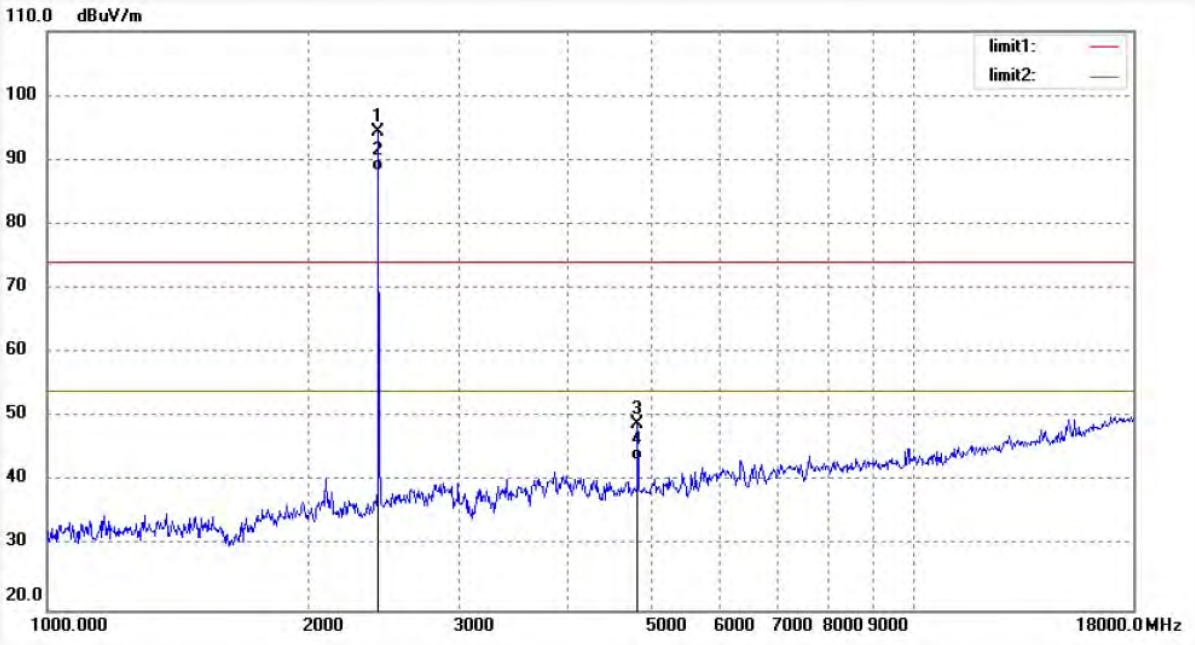
Job No.: frank test #362
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2441MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 14/11/19
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.000	98.62	-4.20	94.42			peak	250	132	
2	2441.000	92.50	-4.20	88.30			AVG	200	222	
3	4882.000	45.81	3.07	48.88	74.00	-25.12	peak	250	94	
4	4882.000	40.12	3.07	43.19	54.00	-10.81	AVG	200	201	

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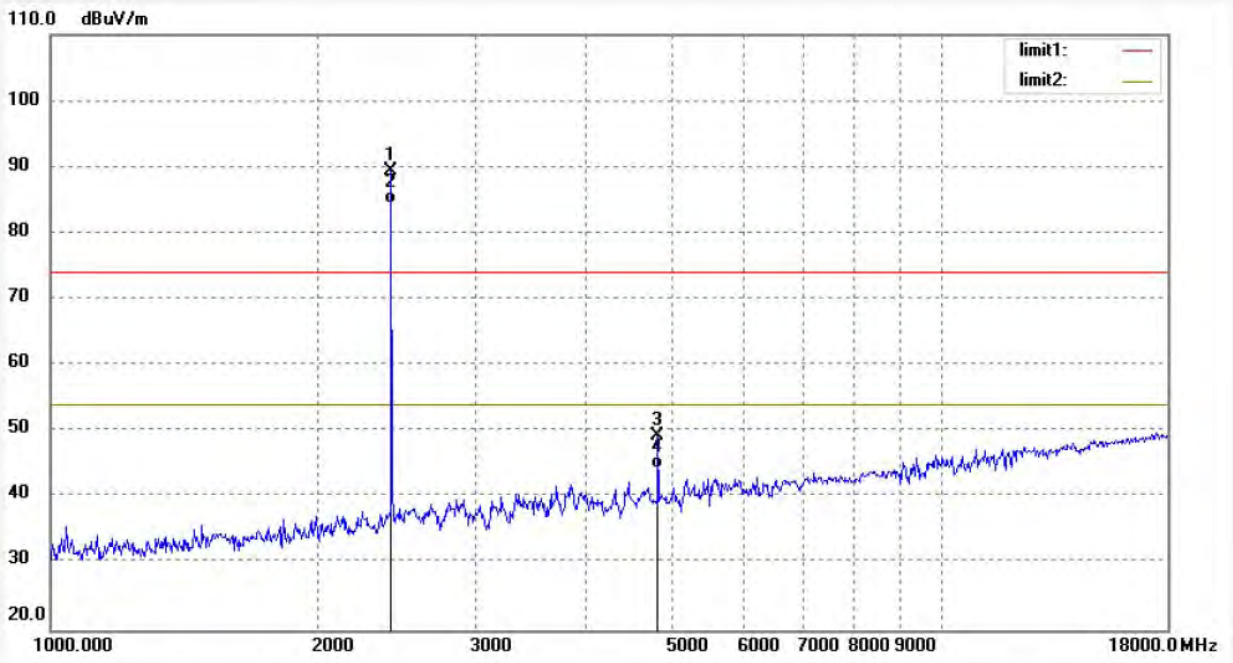
Job No.: frank test #363
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2441MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 14/16/33
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2441.000	93.68	-4.20	89.48			peak	200	315	
2	2441.000	88.65	-4.20	84.45			AVG	200	93	
3	4882.000	46.37	3.07	49.44	74.00	-24.56	peak	200	61	
4	4882.000	41.32	3.07	44.39	54.00	-9.61	AVG	250	109	

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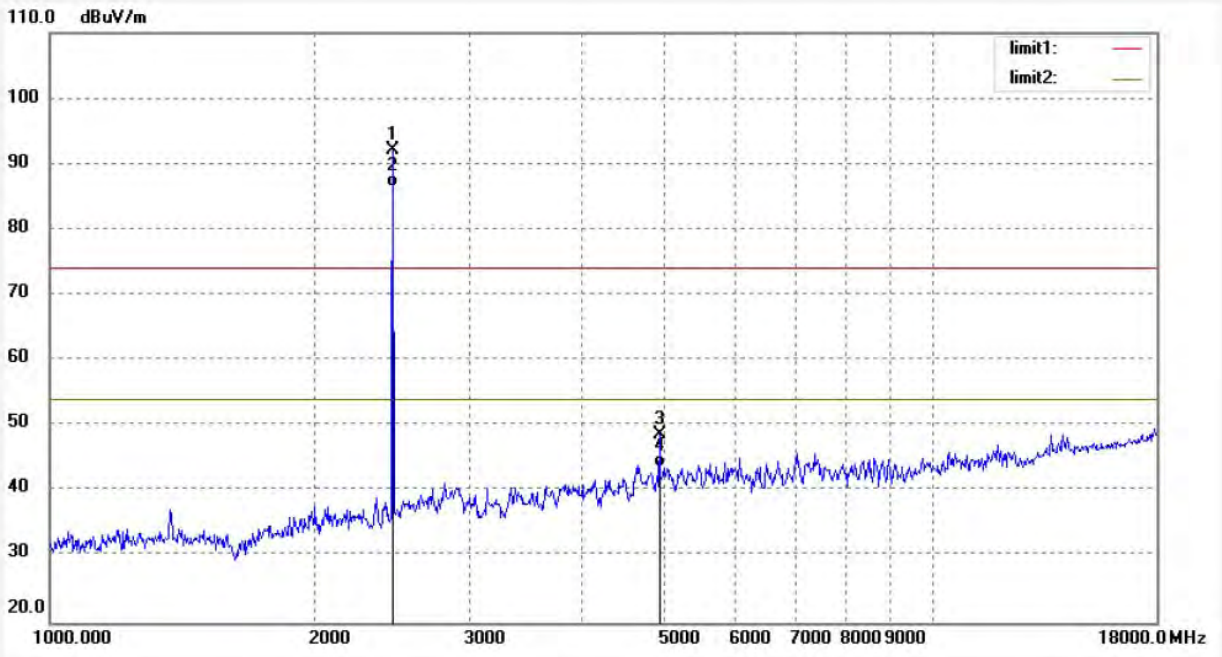
Job No.: frank test #364
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 14/21/17
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	96.25	-4.04	92.21			peak	200	130	
2	2480.000	90.50	-4.04	86.46			AVG	200	208	
3	4960.000	45.11	3.50	48.61	74.00	-25.39	peak	250	69	
4	4960.000	40.21	3.50	43.71	54.00	-10.29	AVG	250	341	

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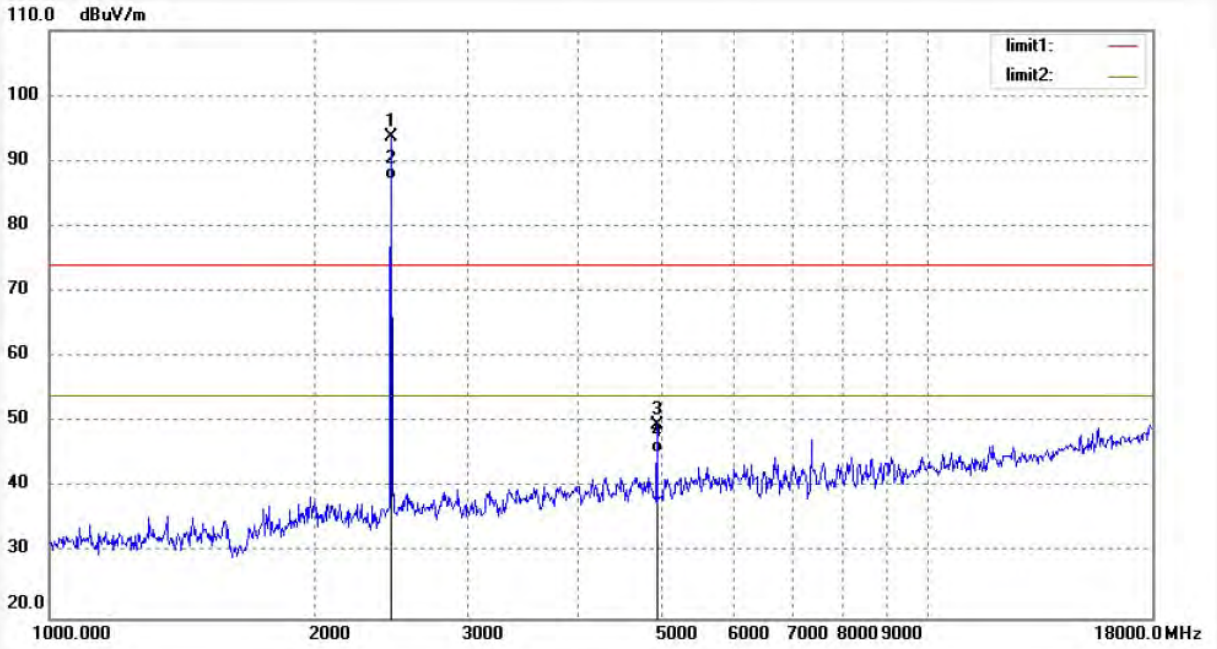
Job No.: frank test #365
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 14/25/12
Engineer Signature: Frank
Distance: 3m

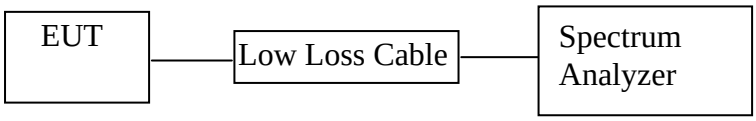
Note: Report NO.:ATE20180569



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	97.75	-4.04	93.71			peak	250	197	
2	2480.000	91.15	-4.04	87.11			AVG	250	93	
3	4960.000	46.10	3.50	49.60	74.00	-24.40	peak	150	123	
4	4960.000	41.80	3.50	45.30	54.00	-8.70	AVG	200	48	

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



(EUT: Massage Chair)

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.

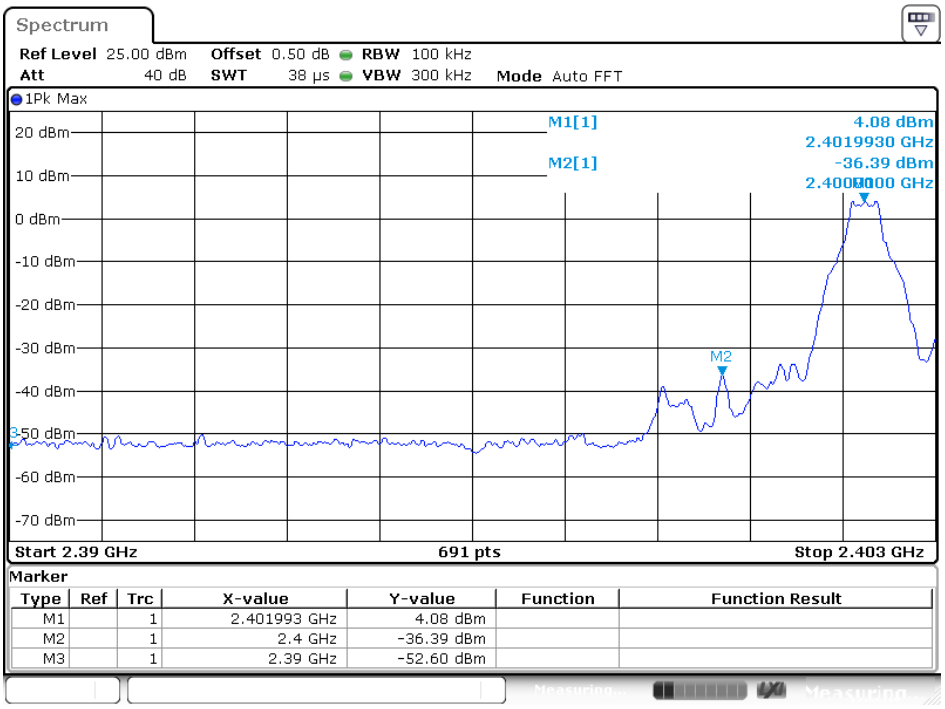
11.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz with convenient frequency span including 100 kHz bandwidth from band edge.

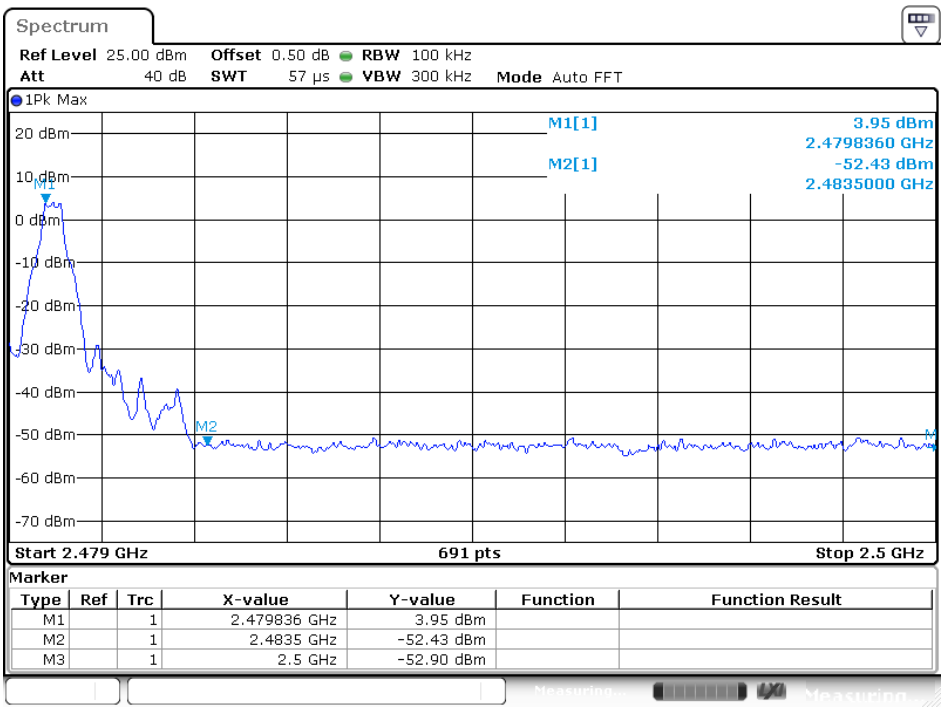
11.5.3.The band edges was measured and recorded.

11.6.Test Result

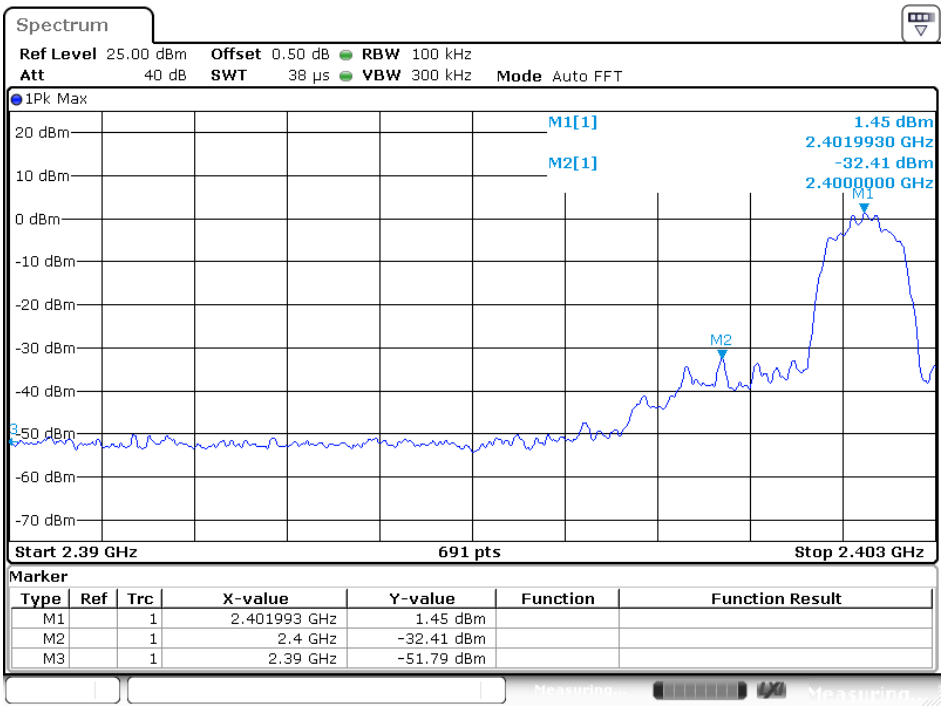
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)
GFSK		
2400.00	40.47	> 20dBc
2483.50	56.38	> 20dBc
Π/4-DQPSK Mode		
2400.00	33.86	> 20dBc
2483.50	53.11	> 20dBc
8DPSK		
2400.00	34.13	> 20dBc
2483.50	51.72	> 20dBc

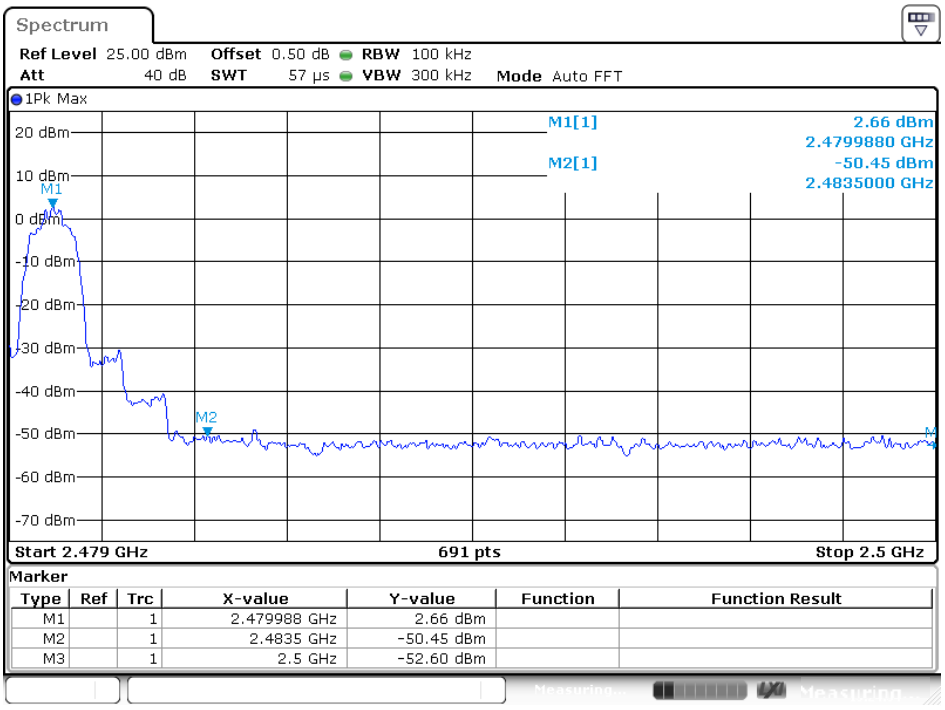
GFSK


Spectrum
Ref Level 25.00 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 4.08 dBm
2.4019930 GHz
M2[1] -36.39 dBm
2.4000000 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.39 GHz
691 pts
Stop 2.403 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.401993 GHz 4.08 dBm
M2 1 2.4 GHz -36.39 dBm
M3 1 2.39 GHz -52.60 dBm

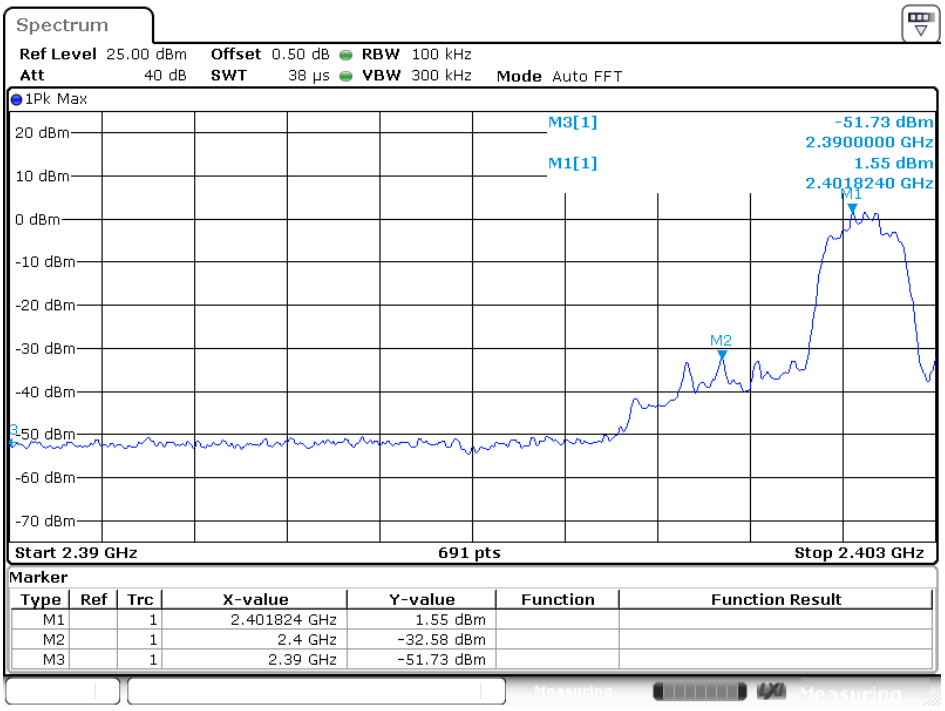

Spectrum
Ref Level 25.00 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 57 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 3.95 dBm
2.4798360 GHz
M2[1] -52.43 dBm
2.4835000 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.479 GHz
691 pts
Stop 2.5 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.479836 GHz 3.95 dBm
M2 1 2.4835 GHz -52.43 dBm
M3 1 2.5 GHz -52.90 dBm

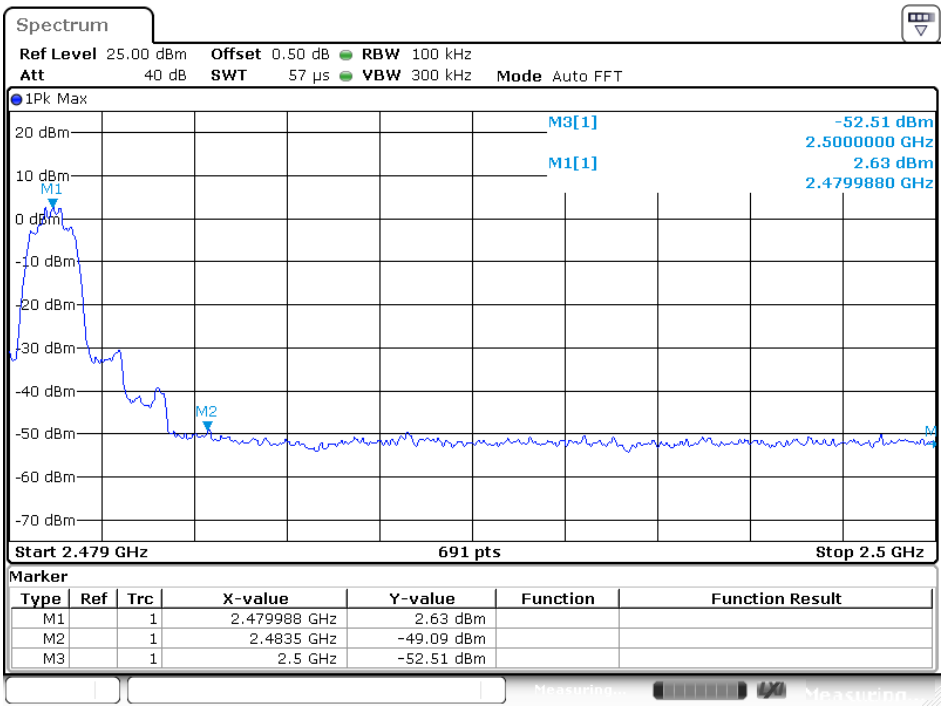
Π/4-DQPSK Mode





8DPSK


Spectrum
Ref Level 25.00 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 38 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M3[1] -51.73 dBm
2.3900000 GHz
M1[1] 1.55 dBm
2.4018240 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.39 GHz 691 pts Stop 2.403 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.401824 GHz 1.55 dBm
M2 1 2.4 GHz -32.58 dBm
M3 1 2.39 GHz -51.73 dBm


Spectrum
Ref Level 25.00 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 57 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M3[1] -52.51 dBm
2.5000000 GHz
M1[1] 2.63 dBm
2.4799880 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 2.479 GHz 691 pts Stop 2.5 GHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.479988 GHz 2.63 dBm
M2 1 2.4835 GHz -49.09 dBm
M3 1 2.5 GHz -52.51 dBm

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(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 worst-case emissions are reported.

Non-hopping mode

ACCURATE TECHNOLOGY CO., LTD.
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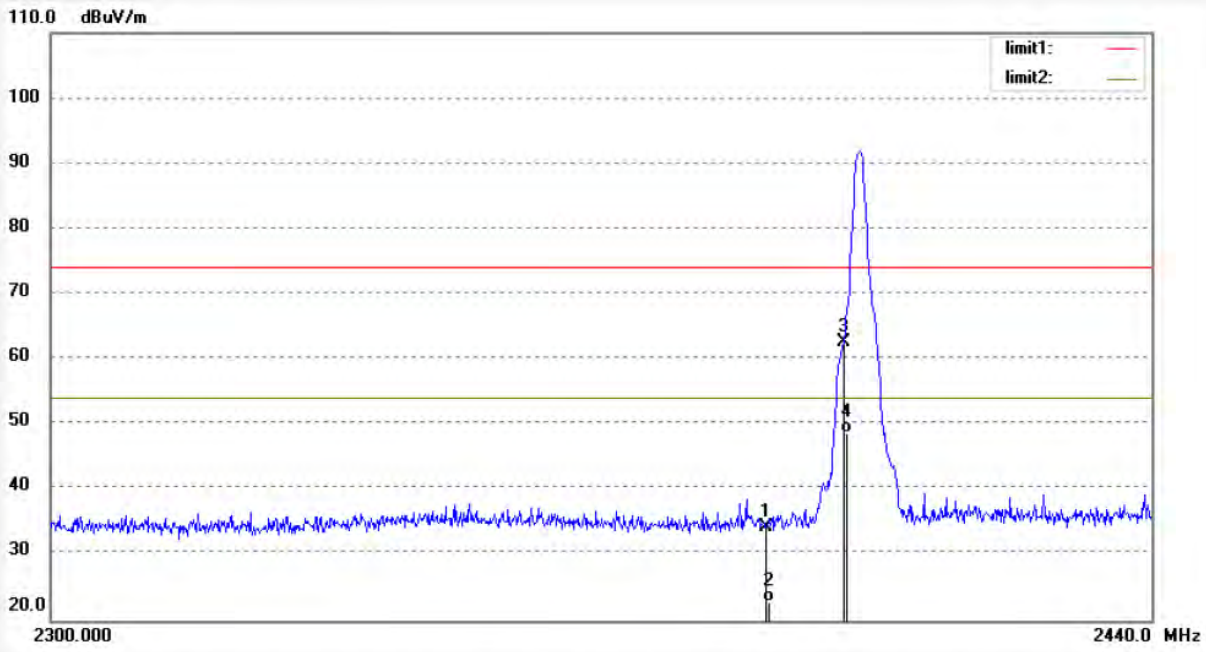
Fax:+86-0755-26503396

Job No.: frank test #382	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 18/05/04/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 16/11/35
EUT: Massage Chair	Engineer Signature: Frank
Mode: TX2402MHz(GFSK)	Distance: 3m
Model: EC-628M	
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD	

Note: Report NO.:ATE20180569



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	38.70	-4.32	34.38	74.00	-39.62	peak	250	132	
2	2390.000	27.15	-4.32	22.83	54.00	-31.17	AVG	250	97	
3	2400.000	66.96	-4.27	62.69	74.00	-11.31	peak	250	45	
4	2400.000	53.00	-4.27	48.73	54.00	-5.27	AVG	250	102	

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

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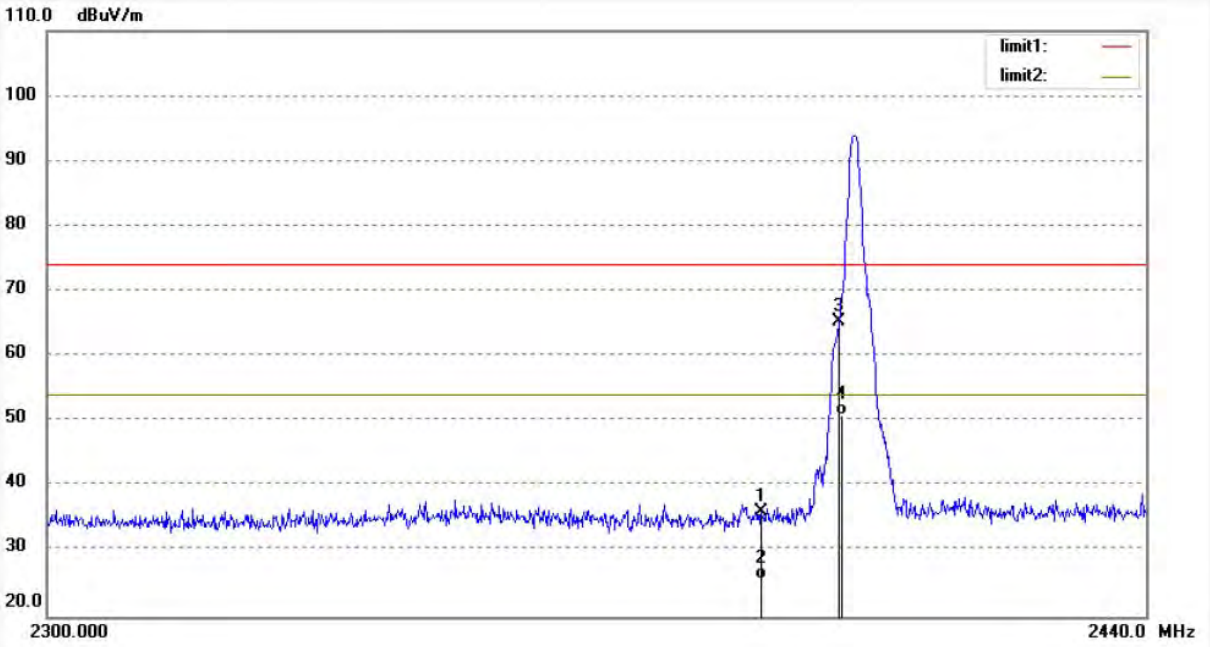
Job No.: frank test #384
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/15/28
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	40.31	-4.32	35.99	74.00	-38.01	peak	250	132	
2	2390.000	30.12	-4.32	25.80	54.00	-28.20	AVG	250	185	
3	2400.000	69.53	-4.27	65.26	74.00	-8.74	peak	250	58	
4	2400.000	55.15	-4.27	50.88	54.00	-3.12	AVG	250	241	

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

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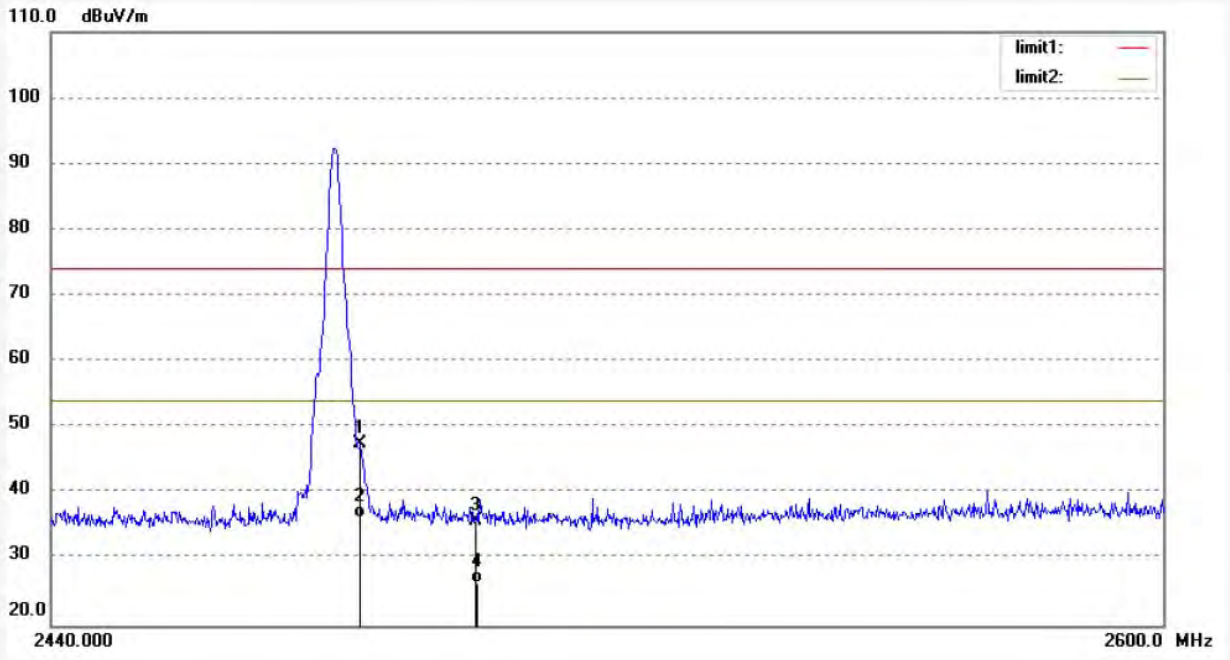
Fax:+86-0755-26503396

Job No.: frank test #385
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/20/51
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	51.44	-3.89	47.55	74.00	-26.45	peak	250	194	
2	2483.500	40.30	-3.89	36.41	54.00	-17.59	AVG	250	259	
3	2500.000	39.66	-3.81	35.85	74.00	-38.15	peak	250	94	
4	2500.000	30.12	-3.81	26.31	54.00	-27.69	AVG	250	267	

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

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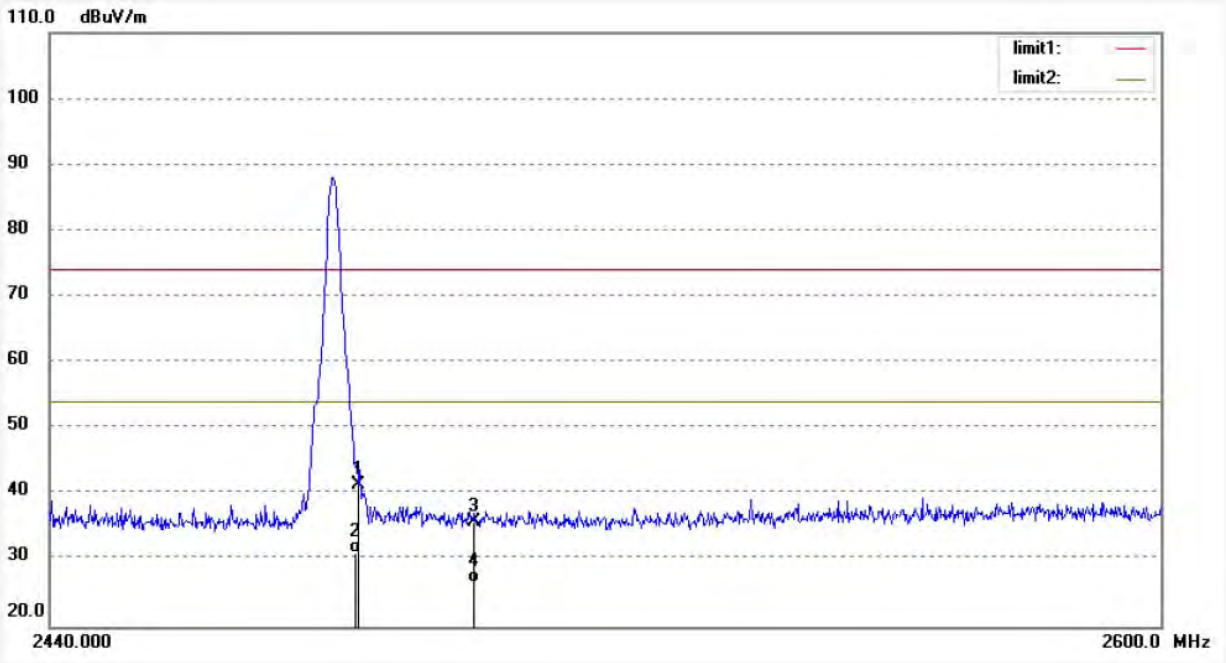
Fax:+86-0755-26503396

Job No.: frank test #386
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/24/56
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	45.27	-3.89	41.38	74.00	-32.62	peak	250	121	
2	2483.500	35.12	-3.89	31.23	54.00	-22.77	AVG	250	321	
3	2500.000	39.66	-3.81	35.85	74.00	-38.15	peak	250	94	
4	2500.000	30.45	-3.81	26.64	54.00	-27.36	AVG	250	204	

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

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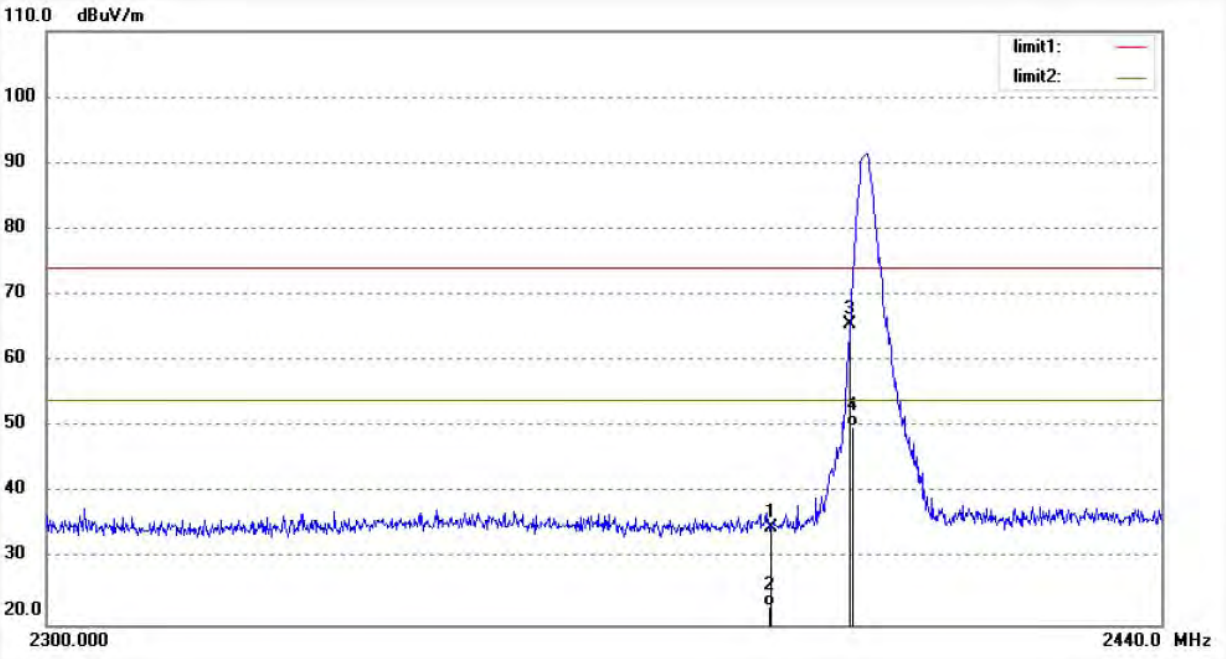
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank test #381
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz(∏/4-DQPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 15/55/58
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	38.95	-4.32	34.63	74.00	-39.37	peak	250	210	
2	2390.000	27.15	-4.32	22.83	54.00	-31.17	AVG	250	254	
3	2400.000	69.84	-4.27	65.57	74.00	-8.43	peak	250	108	
4	2400.000	54.23	-4.27	49.96	54.00	-4.04	AVG	250	121	

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

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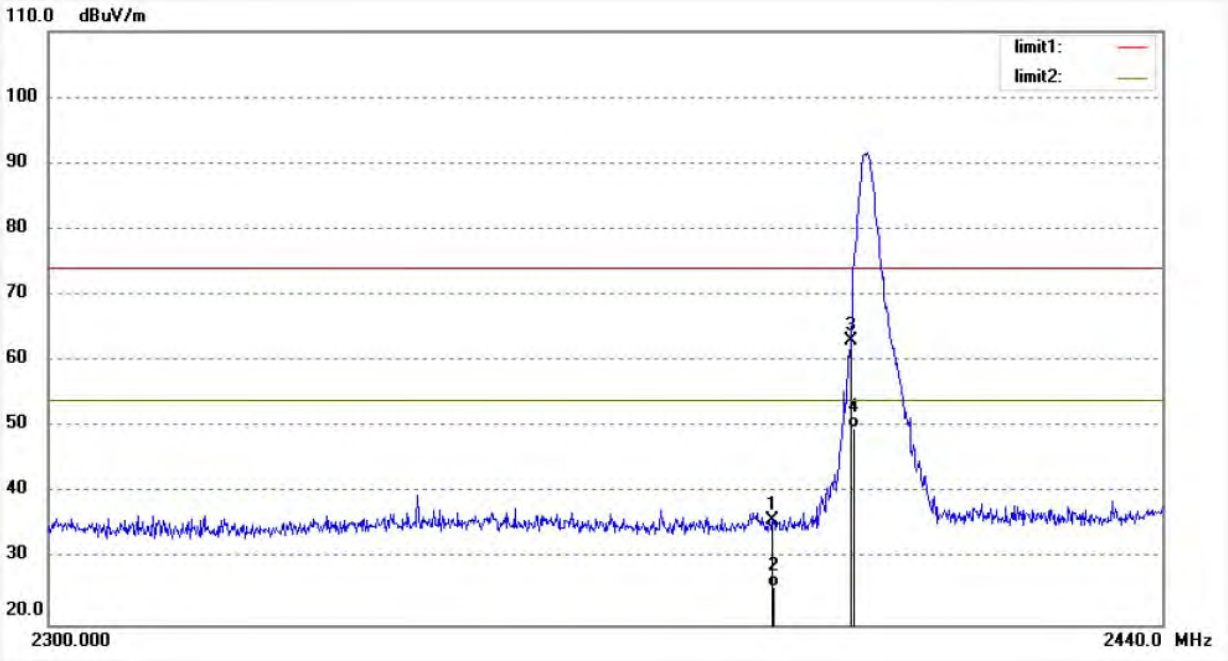
Fax:+86-0755-26503396

Job No.: frank test #381
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz(∏/4-DQPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/03/52
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	40.11	-4.32	35.79	74.00	-38.21	peak	250	122	
2	2390.000	30.00	-4.32	25.68	54.00	-28.32	AVG	250	61	
3	2400.000	67.39	-4.27	63.12	74.00	-10.88	peak	250	109	
4	2400.000	54.00	-4.27	49.73	54.00	-4.27	AVG	250	232	

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

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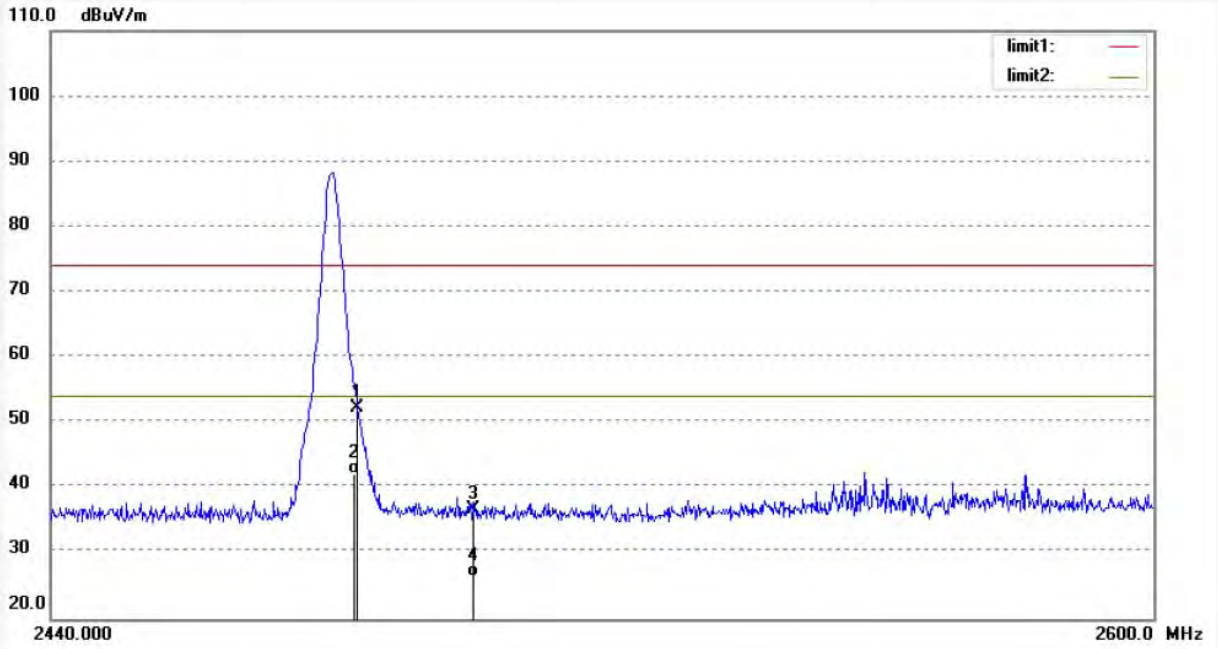
Fax:+86-0755-26503396

Job No.: frank test #387
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(∏/4-DQPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/29/19
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	56.27	-3.89	52.38	74.00	-21.62	peak	250	12	
2	2483.500	46.12	-3.89	42.23	54.00	-11.77	AVG	250	103	
3	2500.000	40.48	-3.81	36.67	74.00	-37.33	peak	250	57	
4	2500.000	30.12	-3.81	26.31	54.00	-27.69	AVG	200	124	

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

ACCURATE TECHNOLOGY CO., LTD.
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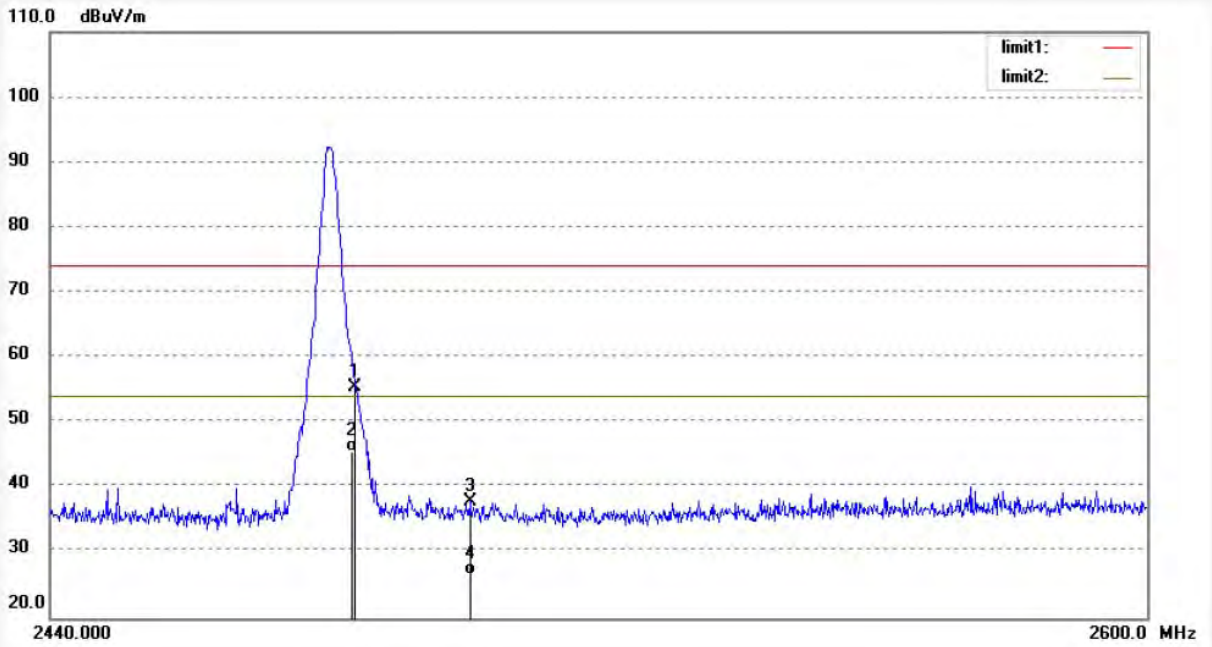
Fax:+86-0755-26503396

Job No.: frank test #388
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(∏/4-DQPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/32/14
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	59.29	-3.89	55.40	74.00	-18.60	peak	250	123	
2	2483.500	49.48	-3.89	45.59	54.00	-8.41	AVG	250	22	
3	2500.000	41.59	-3.81	37.78	74.00	-36.22	peak	250	167	
4	2500.000	30.48	-3.81	26.67	54.00	-27.33	AVG	250	154	

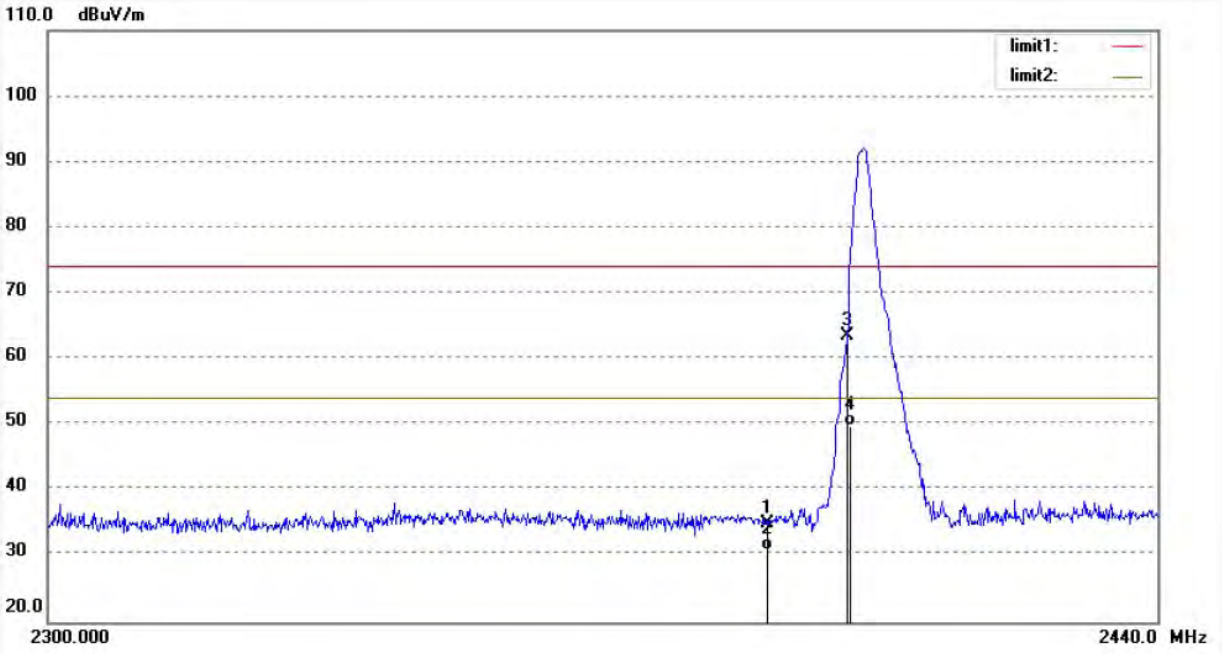
Note: Average measurement with peak detection at No.2&4

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.: frank test #379
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz(8DPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 15/46/28
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	39.31	-4.32	34.99	74.00	-39.01	peak	250	138	
2	2390.000	35.15	-4.32	30.83	54.00	-23.17	AVG	250	214	
3	2400.000	67.71	-4.27	63.44	74.00	-10.56	peak	250	59	
4	2400.000	54.01	-4.27	49.74	54.00	-4.26	AVG	250	211	

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

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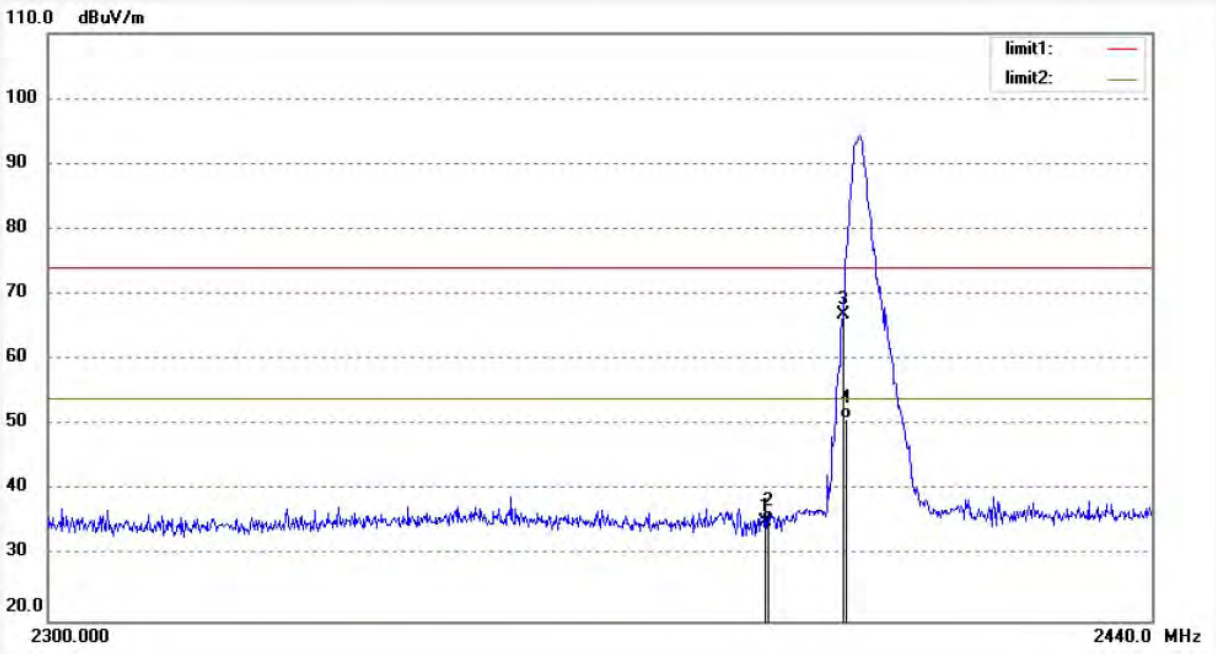
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank test #380
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2402MHz(8DPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 15/50/54
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	39.40	-4.32	35.08	74.00	-38.92	peak	250	122	
2	2390.000	39.40	-4.32	35.08	54.00	-18.92	AVG	250	84	
3	2400.000	71.24	-4.27	66.97	74.00	-7.03	peak	250	211	
4	2400.000	55.12	-4.27	50.85	54.00	-3.15	AVG	250	100	

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

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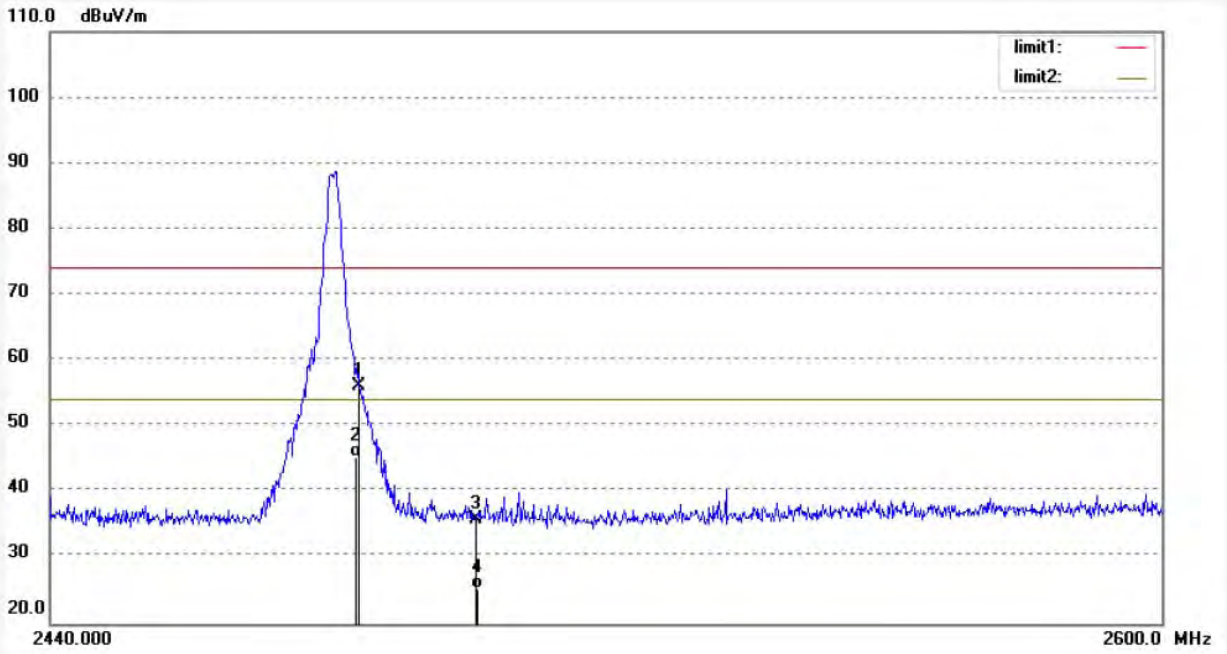
Fax:+86-0755-26503396

Job No.: frank test #389
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(8DPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/36/28
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	59.97	-3.89	56.08	74.00	-17.92	peak	250	184	
2	2483.500	49.15	-3.89	45.26	54.00	-8.74	AVG	250	19	
3	2500.000	39.62	-3.81	35.81	74.00	-38.19	peak	250	201	
4	2500.000	29.15	-3.81	25.34	54.00	-28.66	AVG	250	215	

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

ACCURATE TECHNOLOGY CO., LTD.
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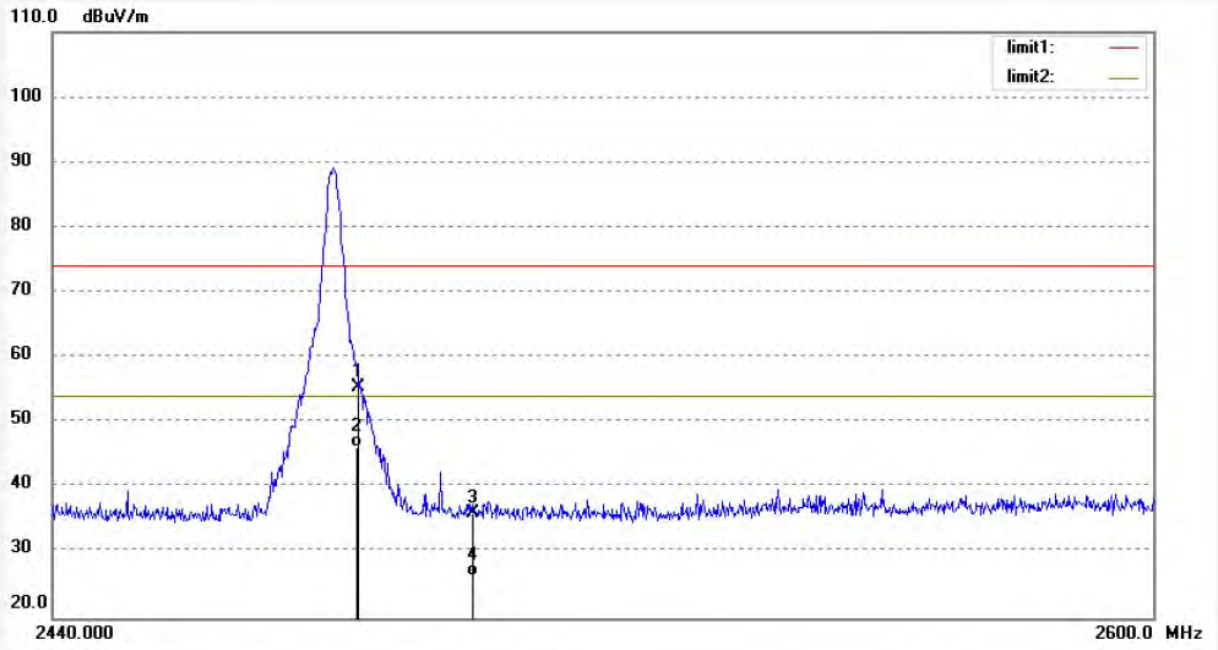
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank test #390
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX2480MHz(8DPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/40/32
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	59.28	-3.89	55.39	74.00	-18.61	peak	250	123	
2	2483.500	50.12	-3.89	46.23	54.00	-7.77	AVG	250	225	
3	2500.000	39.96	-3.81	36.15	74.00	-37.85	peak	250	164	
4	2500.000	30.15	-3.81	26.34	54.00	-27.66	AVG	250	92	

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

Hopping mode

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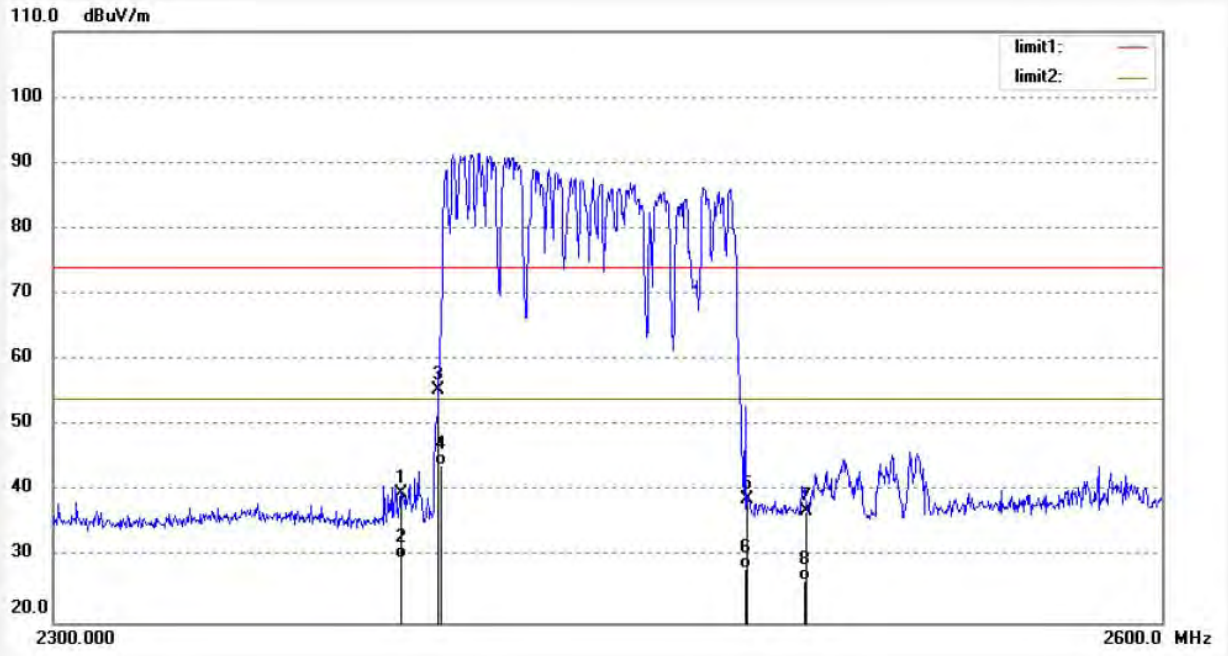
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank test #391
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: HOPPING(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/45/55
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	43.95	-4.32	39.63	74.00	-34.37	peak	250	121	
2	2390.000	34.12	-4.32	29.80	54.00	-24.20	AVG	250	13	
3	2400.000	59.68	-4.27	55.41	74.00	-18.59	peak	250	101	
4	2400.000	48.15	-4.27	43.88	54.00	-10.12	AVG	200	127	
5	2483.500	42.62	-3.89	38.73	74.00	-35.27	peak	200	195	
6	2483.500	32.15	-3.89	28.26	54.00	-25.74	AVG	200	125	
7	2500.000	40.83	-3.81	37.02	74.00	-36.98	peak	200	111	
8	2500.000	30.12	-3.81	26.31	54.00	-27.69	AVG	250	320	

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

ACCURATE TECHNOLOGY CO., LTD.
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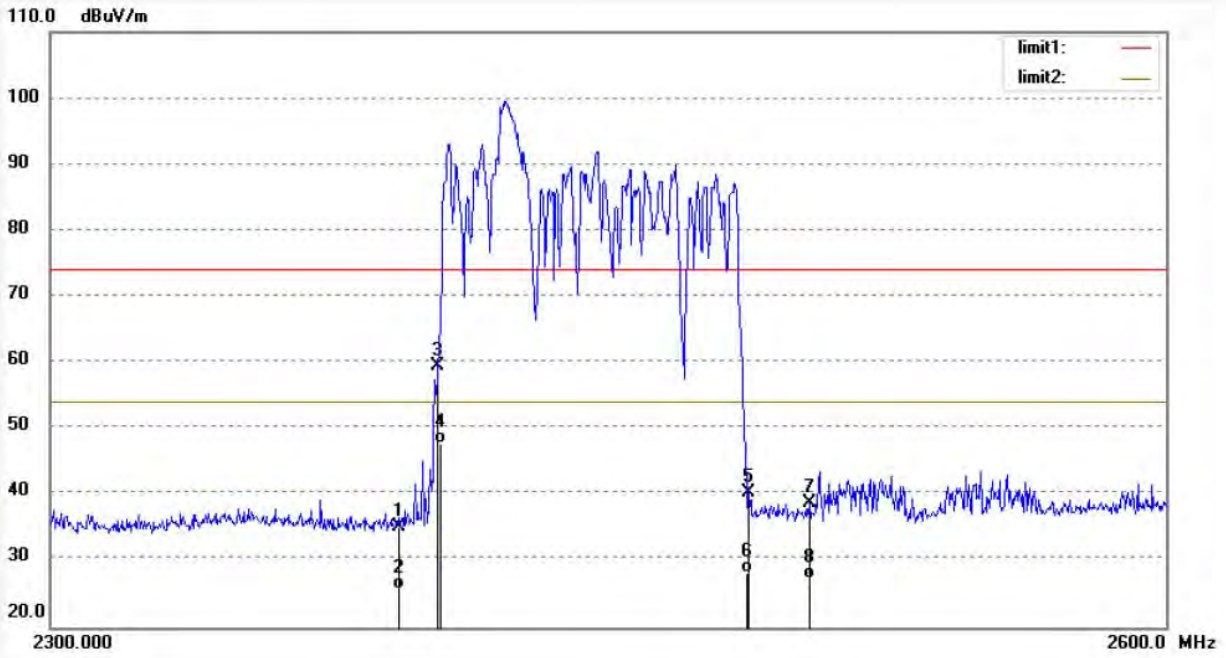
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank test #392
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: HOPPING(GFSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 16/50/13
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	39.40	-4.32	35.08	74.00	-38.92	peak	200	138	
2	2390.000	30.12	-4.32	25.80	54.00	-28.20	AVG	200	94	
3	2400.000	63.70	-4.27	59.43	74.00	-14.57	peak	200	251	
4	2400.000	52.12	-4.27	47.85	54.00	-6.15	AVG	200	103	
5	2483.500	44.19	-3.89	40.30	74.00	-33.70	peak	250	158	
6	2483.500	32.12	-3.89	28.23	54.00	-25.77	AVG	250	149	
7	2500.000	42.57	-3.81	38.76	74.00	-35.24	peak	250	201	
8	2500.000	31.15	-3.81	27.34	54.00	-26.66	AVG	200	321	

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

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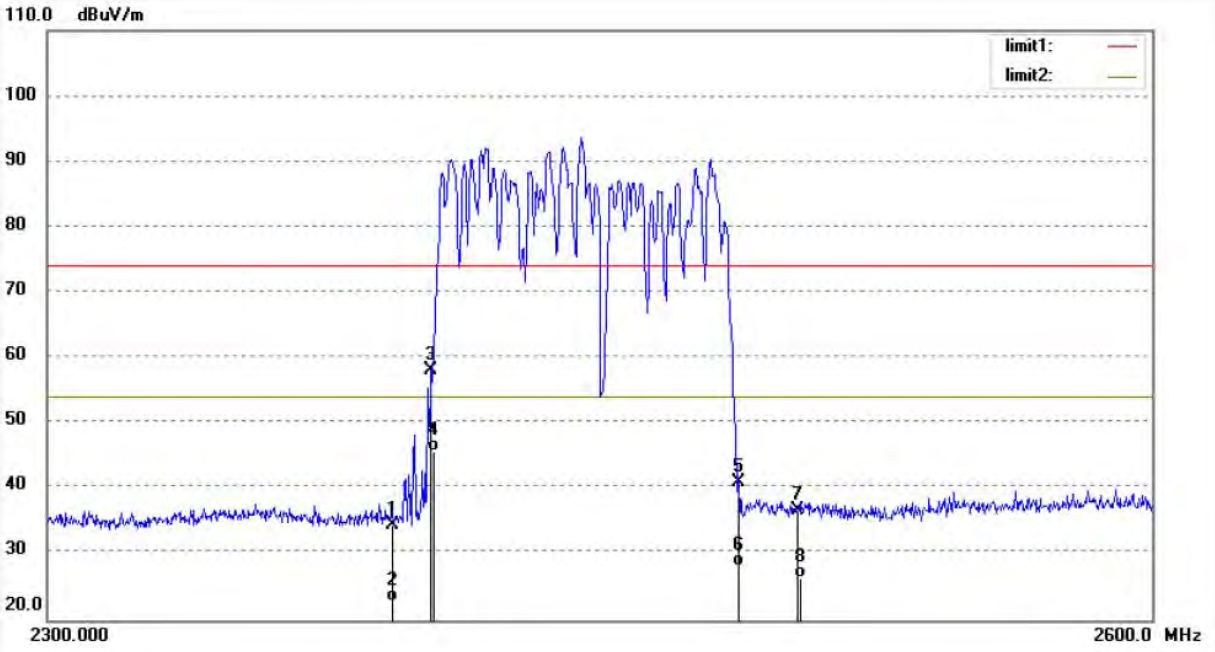
Fax:+86-0755-26503396

Job No.: frank test #393
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: HOPPING(∏/4-DQPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 17/57/29
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	38.87	-4.32	34.55	74.00	-39.45	peak	250	132	
2	2390.000	27.13	-4.32	22.81	54.00	-31.19	AVG	300	195	
3	2400.000	62.30	-4.27	58.03	74.00	-15.97	peak	300	28	
4	2400.000	50.12	-4.27	45.85	54.00	-8.15	AVG	250	312	
5	2483.500	44.90	-3.89	41.01	74.00	-32.99	peak	200	182	
6	2483.500	32.15	-3.89	28.26	54.00	-25.74	AVG	250	97	
7	2500.000	40.61	-3.81	36.80	74.00	-37.20	peak	250	83	
8	2500.000	30.18	-3.81	26.37	54.00	-27.63	AVG	250	156	

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

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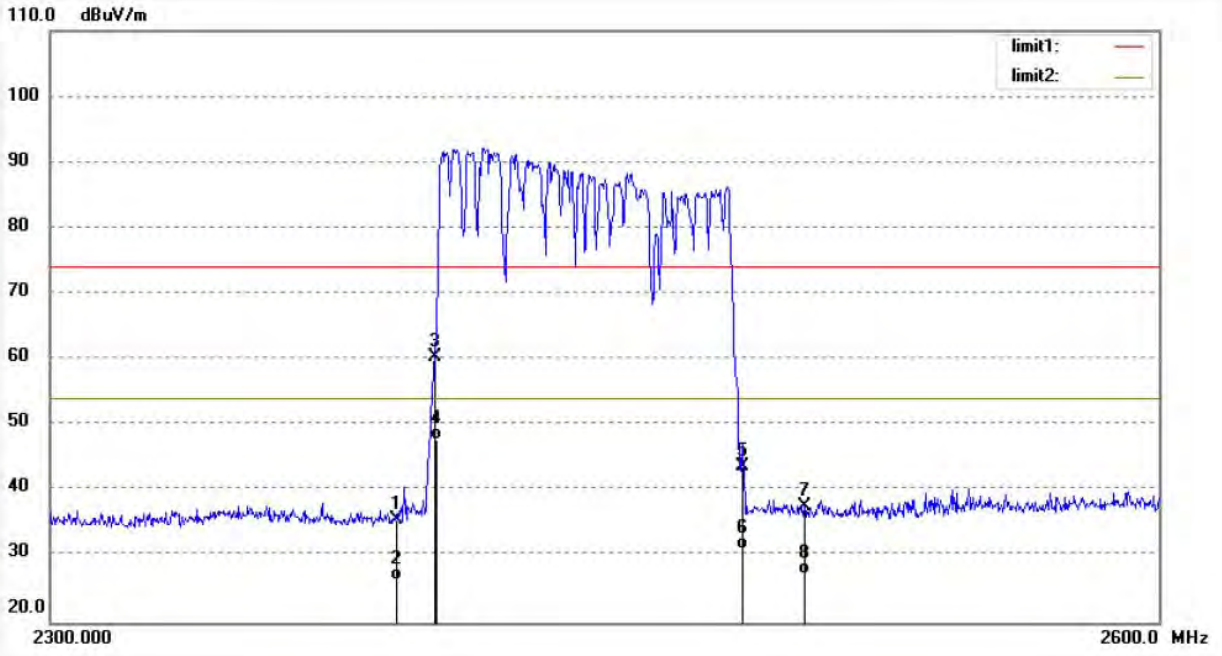
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank test #394
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: HOPPING(∏/4-DQPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 17/00/26
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	39.85	-4.32	35.53	74.00	-38.47	peak	200	159	
2	2390.000	30.65	-4.32	26.33	54.00	-27.67	AVG	150	138	
3	2400.000	64.60	-4.27	60.33	74.00	-13.67	peak	200	29	
4	2400.000	52.15	-4.27	47.88	54.00	-6.12	AVG	150	101	
5	2483.500	47.57	-3.89	43.68	74.00	-30.32	peak	200	321	
6	2483.500	35.12	-3.89	31.23	54.00	-22.77	AVG	200	168	
7	2500.000	41.42	-3.81	37.61	74.00	-36.39	peak	200	95	
8	2500.000	31.21	-3.81	27.40	54.00	-26.60	AVG	200	112	

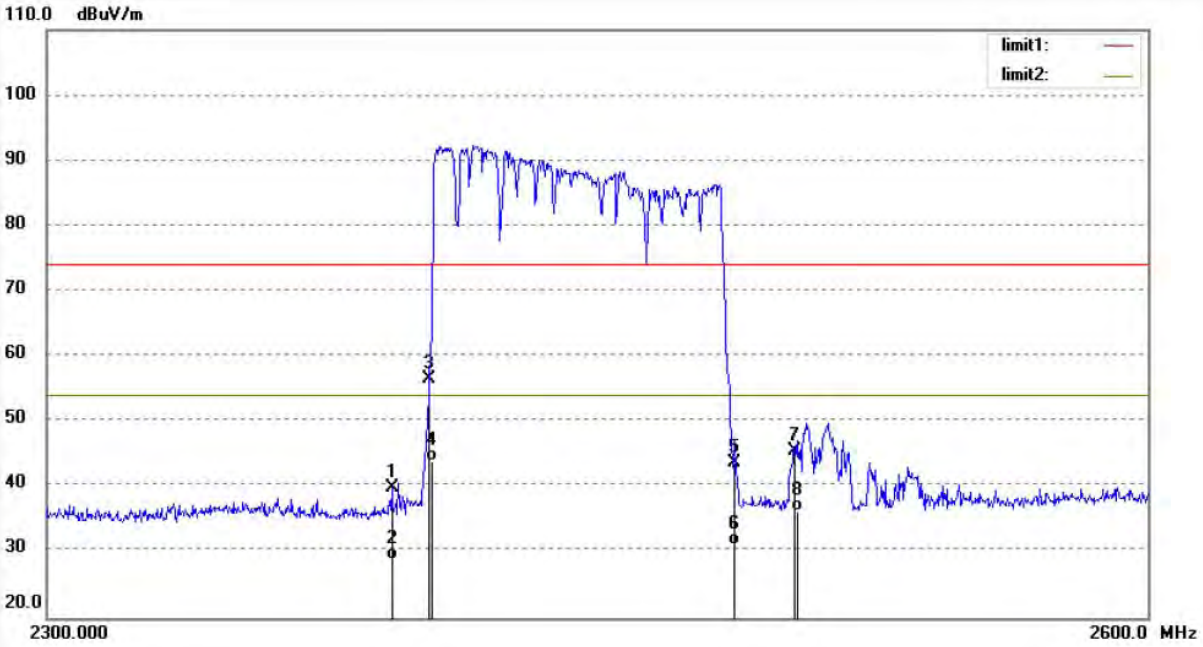
Note: Average measurement with peak detection at No.2&4&6&8

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.: frank test #395
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: HOPPING(8DPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 17/06/12
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



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	44.19	-4.32	39.87	74.00	-34.13	peak	150	270	
2	2390.000	33.15	-4.32	28.83	54.00	-25.17	AVG	150	351	
3	2400.000	60.83	-4.27	56.56	74.00	-17.44	peak	250	75	
4	2400.000	48.15	-4.27	43.88	54.00	-10.12	AVG	250	130	
5	2483.500	47.57	-3.89	43.68	74.00	-30.32	peak	250	91	
6	2483.500	35.12	-3.89	31.23	54.00	-22.77	AVG	250	156	
7	2500.000	49.40	-3.81	45.59	74.00	-28.41	peak	250	150	
8	2500.000	40.12	-3.81	36.31	54.00	-17.69	AVG	250	122	

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,
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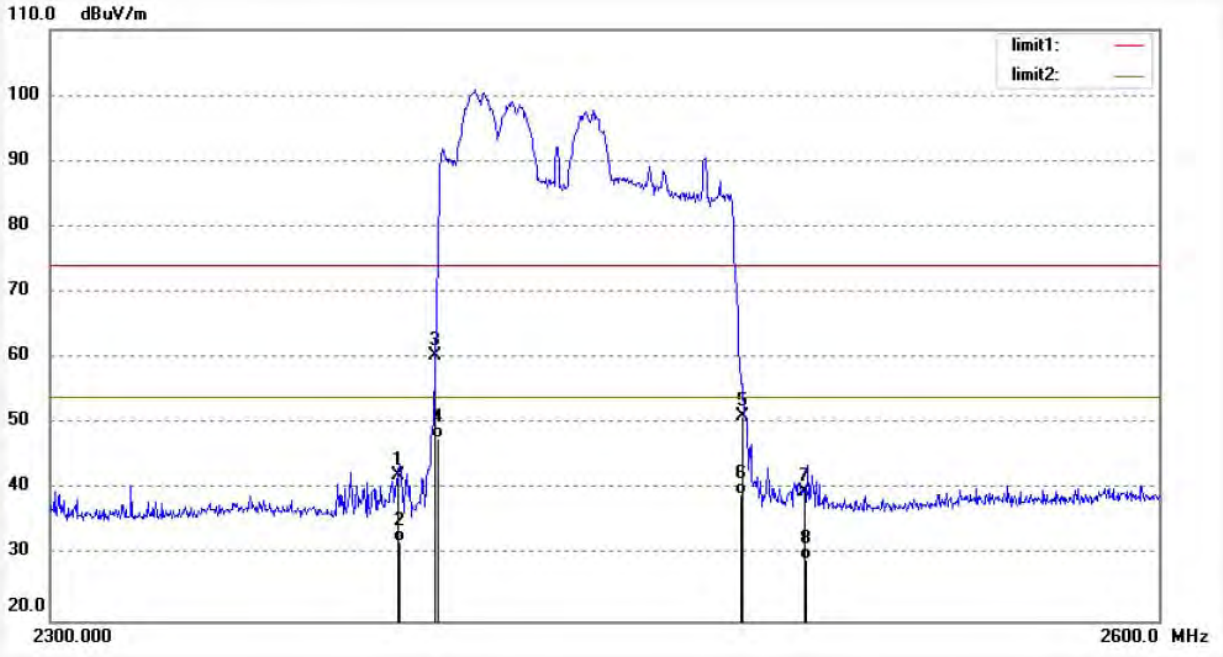
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: frank test #396
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: HOPPING(8DPSK)
Model: EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 18/05/04/
Time: 17/15/03
Engineer Signature: Frank
Distance: 3m

Note: Report NO.:ATE20180569



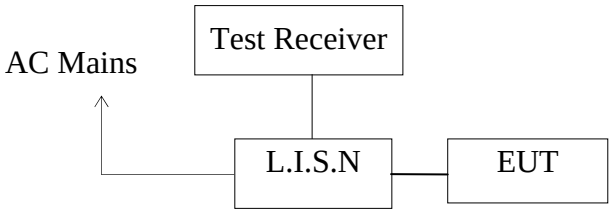
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	46.50	-4.32	42.18	74.00	-31.82	peak	250	76	
2	2390.000	36.45	-4.32	32.13	54.00	-21.87	AVG	300	210	
3	2400.000	64.65	-4.27	60.38	74.00	-13.62	peak	300	320	
4	2400.000	52.12	-4.27	47.85	54.00	-6.15	AVG	250	154	
5	2483.500	55.07	-3.89	51.18	74.00	-22.82	peak	250	56	
6	2483.500	43.12	-3.89	39.23	54.00	-14.77	AVG	250	54	
7	2500.000	43.54	-3.81	39.73	74.00	-34.27	peak	250	125	
8	2500.000	33.12	-3.81	29.31	54.00	-24.69	AVG	250	214	

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

12. AC POWER LINE CONDUCTED EMISSION FOR FCC PART 15 SECTION 15.207(A)

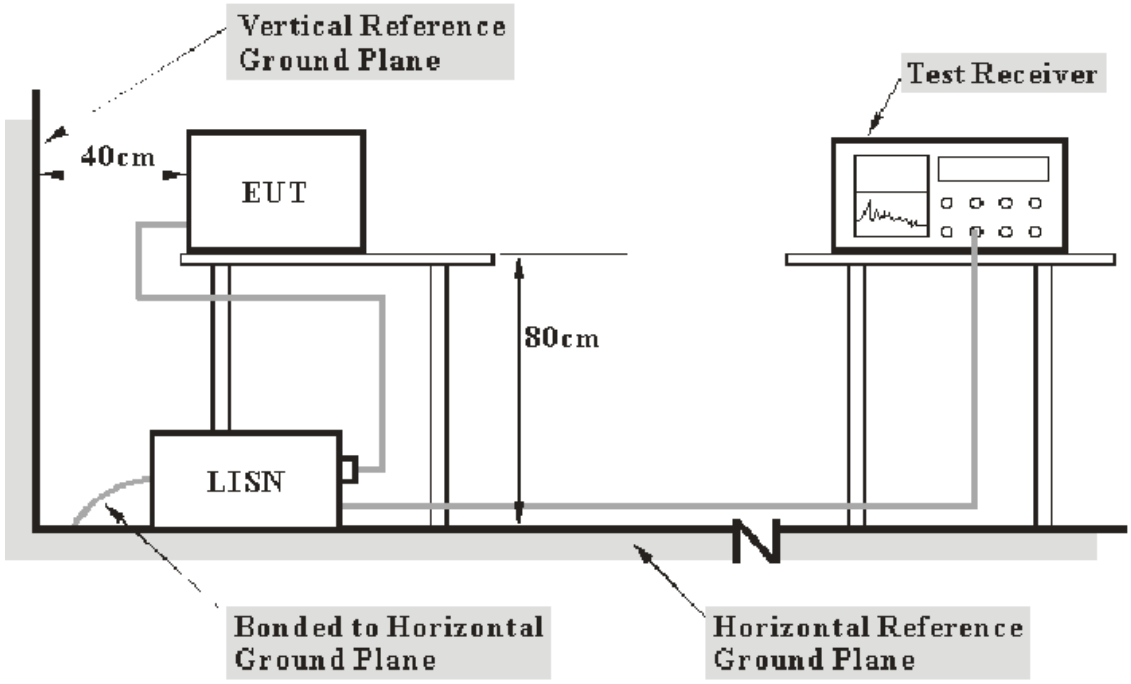
12.1. Block Diagram of Test Setup

12.1.1. Block diagram of connection between the EUT and simulators



(EUT: Massage Chair)

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 0.1m 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)
xx.xxxx	11.6	42.60	27.90	60.0	50.0	-17.4	-22.1	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.Power Line Conducted Emission Measurement Results

PASS.

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

Test mode : BT communicating (AC 120V/60Hz)
EUT mode : EC-628M

MEASUREMENT RESULT: "F-0569-2_fin"

4/20/2018 3:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	0.70	10.5	66	65.3	QP	N	GND
0.630000	32.60	10.8	56	23.4	QP	N	GND
1.900000	24.80	11.0	56	31.2	QP	N	GND
3.160000	26.00	11.1	56	30.0	QP	N	GND
9.490000	28.10	11.3	60	31.9	QP	N	GND
21.445000	26.90	11.4	60	33.1	QP	N	GND

MEASUREMENT RESULT: "F-0569-2_fin2"

4/20/2018 3:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	-4.60	10.6	49	53.3	AV	N	GND
0.630000	32.00	10.8	46	14.0	AV	N	GND
1.900000	23.30	11.0	46	22.7	AV	N	GND
3.160000	23.80	11.1	46	22.2	AV	N	GND
9.490000	18.00	11.3	50	32.0	AV	N	GND
21.580000	24.60	11.4	50	25.4	AV	N	GND

MEASUREMENT RESULT: "F-0569-1_fin"

4/20/2018 3:20PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	0.50	10.5	66	65.5	QP	L1	GND
0.630000	32.60	10.8	56	23.4	QP	L1	GND
1.900000	24.60	11.0	56	31.4	QP	L1	GND
4.430000	15.70	11.1	56	40.3	QP	L1	GND
9.500000	21.00	11.3	60	39.0	QP	L1	GND
21.490000	26.60	11.4	60	33.4	QP	L1	GND

MEASUREMENT RESULT: "F-0569-1_fin2"

4/20/2018 3:20PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	-4.70	10.6	49	53.4	AV	L1	GND
0.630000	33.00	10.8	46	13.0	AV	L1	GND
1.900000	24.50	11.0	46	21.5	AV	L1	GND
4.420000	6.50	11.1	46	39.5	AV	L1	GND
9.500000	12.50	11.3	50	37.5	AV	L1	GND
21.235000	17.60	11.4	50	32.4	AV	L1	GND

Emissions attenuated more than 20 dB below the permissible value are not reported.

The spectral diagrams are attached as below.

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CONDUCTED EMISSION STANDARD FCC PART 15C

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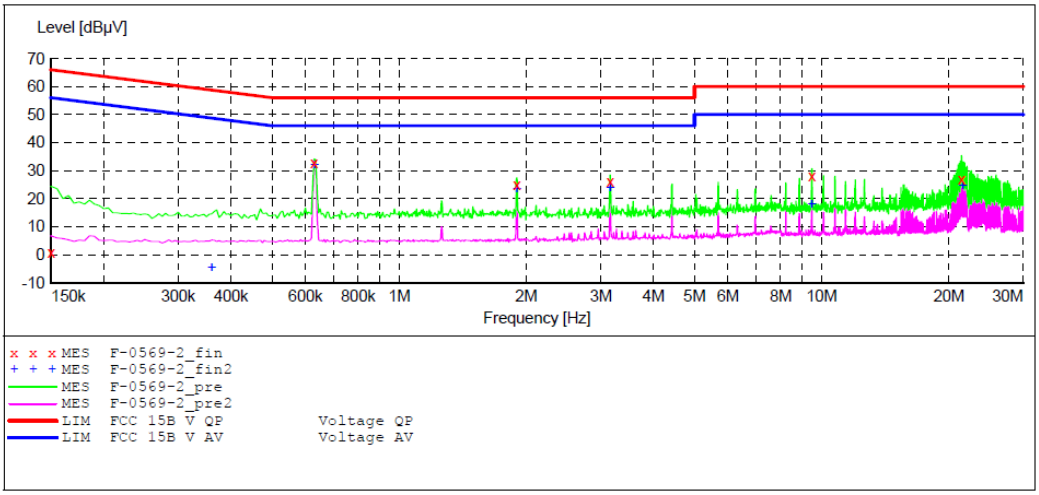
EUT:                  Massage Chair   M/N:EC-628M
Manufacturer:         XIAMEN COMFORT SCIENCE&TECHNOLOGY GROUP CO.,LTD
Operating Condition:  BT communicating
Test Site:            1#Shielding Room
Operator:             Frank
Test Specification:   N  120V/60Hz
Comment:              Report No.:ATE20180569
Start of Test:        4/20/2018 / 3:21:22PM
```

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-0569-2_fin"

4/20/2018 3:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	0.70	10.5	66	65.3	QP	N	GND
0.630000	32.60	10.8	56	23.4	QP	N	GND
1.900000	24.80	11.0	56	31.2	QP	N	GND
3.160000	26.00	11.1	56	30.0	QP	N	GND
9.490000	28.10	11.3	60	31.9	QP	N	GND
21.445000	26.90	11.4	60	33.1	QP	N	GND

MEASUREMENT RESULT: "F-0569-2_fin2"

4/20/2018 3:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	-4.60	10.6	49	53.3	AV	N	GND
0.630000	32.00	10.8	46	14.0	AV	N	GND
1.900000	23.30	11.0	46	22.7	AV	N	GND
3.160000	23.80	11.1	46	22.2	AV	N	GND
9.490000	18.00	11.3	50	32.0	AV	N	GND
21.580000	24.60	11.4	50	25.4	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

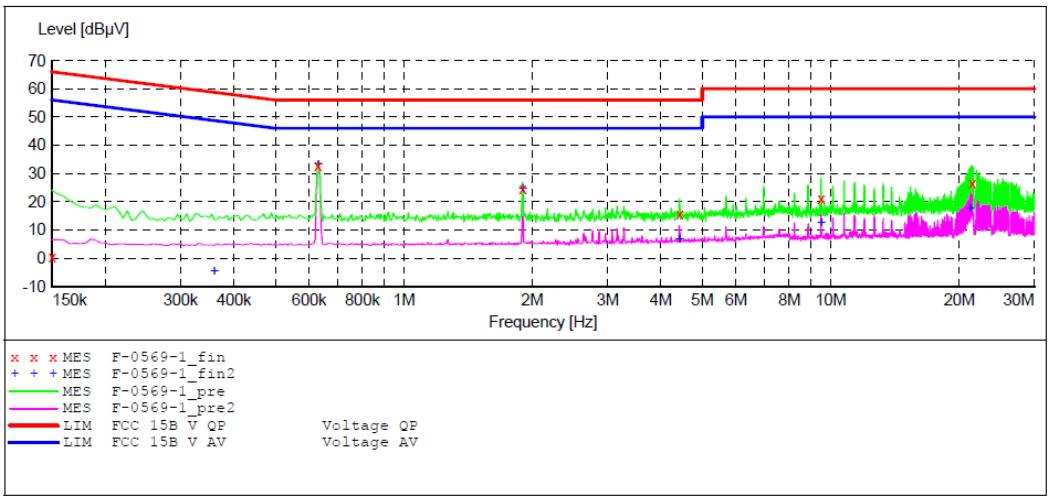
CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: Massage Chair M/N:EC-628M
Manufacturer: XIAMEN COMFORT SCIENCE&TECHNOLOGY GROUP CO.,LTD
Operating Condition: BT communicating
Test Site: 1#Shielding Room
Operator: Frank
Test Specification: L 120V/60Hz
Comment: Report No.:ATE20180569
Start of Test: 4/20/2018 / 3:17:09PM

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-0569-1_fin"

4/20/2018 3:20PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	0.50	10.5	66	65.5	QP	L1	GND
0.630000	32.60	10.8	56	23.4	QP	L1	GND
1.900000	24.60	11.0	56	31.4	QP	L1	GND
4.430000	15.70	11.1	56	40.3	QP	L1	GND
9.500000	21.00	11.3	60	39.0	QP	L1	GND
21.490000	26.60	11.4	60	33.4	QP	L1	GND

MEASUREMENT RESULT: "F-0569-1_fin2"

4/20/2018 3:20PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	-4.70	10.6	49	53.4	AV	L1	GND
0.630000	33.00	10.8	46	13.0	AV	L1	GND
1.900000	24.50	11.0	46	21.5	AV	L1	GND
4.420000	6.50	11.1	46	39.5	AV	L1	GND
9.500000	12.50	11.3	50	37.5	AV	L1	GND
21.235000	17.60	11.4	50	32.4	AV	L1	GND

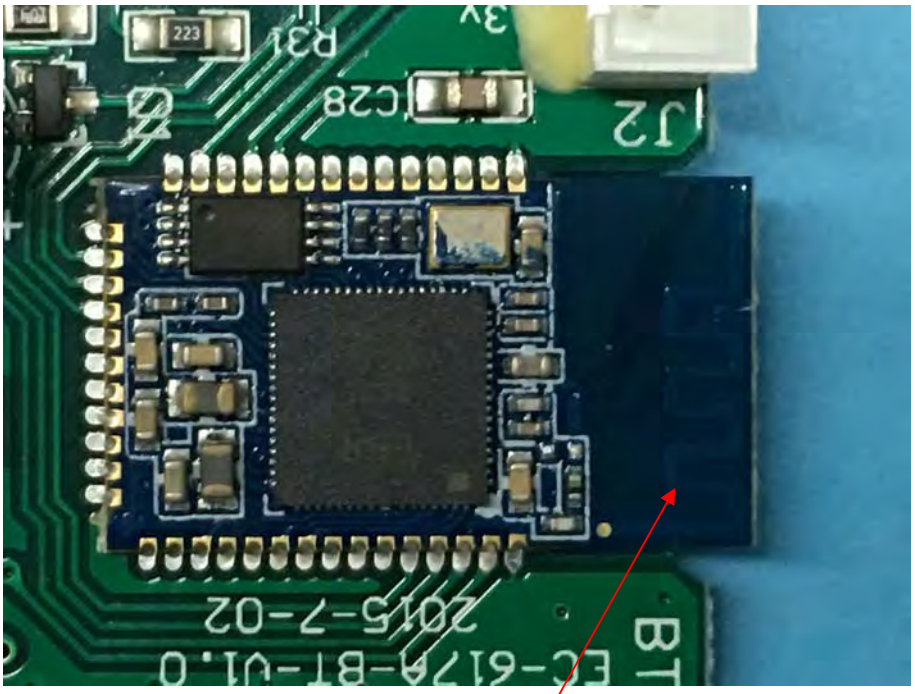
13. ANTENNA REQUIREMENT

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 2.0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

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