

APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
FUJIAN YIHE ELECTRONICS CO., LTD.

Massage Chair
Model No.: YH8230L INFINITY AURA

FCC ID: 2ASBG-YH8230L

Prepared for : FUJIAN YIHE ELECTRONICS CO., LTD.
Address : JIAN ROAD, QINXIYANG INDUSTRIAL PARK, FUAN,
FUJIAN 355000 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. : ATE20190339
Date of Test : April 12-18, 2019
Date of Report : April 24, 2019

TABLE OF CONTENTS

Description	Page
Test Report Certification	
TABLE OF CONTENTS	2
1. GENERAL INFORMATION	5
1.1. Description of Device (EUT)	5
1.2. Accessory and Auxiliary Equipment	5
1.3. Description of Test Facility	6
1.4. Measurement Uncertainty	6
2. MEASURING DEVICE AND TEST EQUIPMENT	7
3. OPERATION OF EUT DURING TESTING	8
3.1. Operating Mode	8
3.2. Configuration and peripherals	8
4. TEST PROCEDURES AND RESULTS	9
5. 20DB BANDWIDTH TEST	10
5.1. Block Diagram of Test Setup	10
5.2. The Requirement For Section 15.247(a)(1)	10
5.3. EUT Configuration on Test	10
5.4. Operating Condition of EUT	10
5.5. Test Procedure	10
5.6. Test Result	11
6. CARRIER FREQUENCY SEPARATION TEST	16
6.1. Block Diagram of Test Setup	16
6.2. The Requirement For Section 15.247(a)(1)	16
6.3. EUT Configuration on Test	16
6.4. Operating Condition of EUT	16
6.5. Test Procedure	17
6.6. Test Result	17
7. NUMBER OF HOPPING FREQUENCY TEST	23
7.1. Block Diagram of Test Setup	23
7.2. The Requirement For Section 15.247(a)(1)(iii)	23
7.3. EUT Configuration on Test	23
7.4. Operating Condition of EUT	23
7.5. Test Procedure	23
7.6. Test Result	24
8. DWELL TIME TEST	26
8.1. Block Diagram of Test Setup	26
8.2. The Requirement For Section 15.247(a)(1)(iii)	26
8.3. EUT Configuration on Test	26
8.4. Operating Condition of EUT	26
8.5. Test Procedure	26
8.6. Test Result	27
9. MAXIMUM PEAK OUTPUT POWER TEST	33
9.1. Block Diagram of Test Setup	33

9.2.	The Requirement For Section 15.247(b)(1)	33
9.3.	EUT Configuration on Test	33
9.4.	Operating Condition of EUT	33
9.5.	Test Procedure	33
9.6.	Test Result	34
10.	RADIATED EMISSION TEST	40
10.1.	Block Diagram of Test Setup	40
10.2.	The Limit For Section 15.247(d)	41
10.3.	Restricted bands of operation	42
10.4.	Configuration of EUT on Test	42
10.5.	Operating Condition of EUT	43
10.6.	Test Procedure	43
10.7.	Data Sample	44
10.8.	Test Results	44
11.	BAND EDGE COMPLIANCE TEST	57
11.1.	Block Diagram of Test Setup	57
11.2.	The Requirement For Section 15.247(d)	57
11.3.	EUT Configuration on Test	57
11.4.	Operating Condition of EUT	57
11.5.	Test Procedure	58
11.6.	Test Result	58
12.	AC POWER LINE CONDUCTED EMISSION TEST	69
12.1.	Block Diagram of Test Setup	69
12.2.	Power Line Conducted Emission Test Limits	70
12.3.	Configuration of EUT on Test	70
12.4.	Operating Condition of EUT	70
12.5.	Test Procedure	70
12.6.	Data Sample	71
12.7.	Test Results	71
13.	ANTENNA REQUIREMENT	74
13.1.	The Requirement	74
13.2.	Antenna Construction	74

Test Report Certification

Applicant : FUJIAN YIHE ELECTRONICS CO., LTD.
Manufacturer : FUJIAN YIHE ELECTRONICS CO., LTD.
Product : Massage Chair
Model No. : YH8230L INFINITY AURA

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 :

April 12-18, 2019

Date of Report :

April 24, 2019

Prepared by :

(Bob Wang, Engineer)

Approved & Authorized Signer :

(Sean Liu, Manager)



1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Model Number	:	YH8230L INFINITY AURA
Bluetooth version	:	V5.0
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	79
Antenna Gain(Max)	:	2dBi
Antenna type	:	Integral Antenna
Modulation mode	:	GFSK, $\pi/4$ DQPSK, 8DPSK
Trade Mark	:	N/A
Power supply	:	AC 120V~60Hz
Applicant	:	FUJIAN YIHE ELECTRONICS CO., LTD.
Address	:	JIAN ROAD, QINXIYANG INDUSTRIAL PARK, FUAN, FUJIAN 355000 CHINA
Manufacturer	:	FUJIAN YIHE ELECTRONICS CO., LTD.
Address	:	JIAN ROAD, QINXIYANG INDUSTRIAL PARK, FUAN, FUJIAN 355000 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 (ISED) 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	WHKX3.6/18 G-10SS	N/A	Jan. 05, 2019	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -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

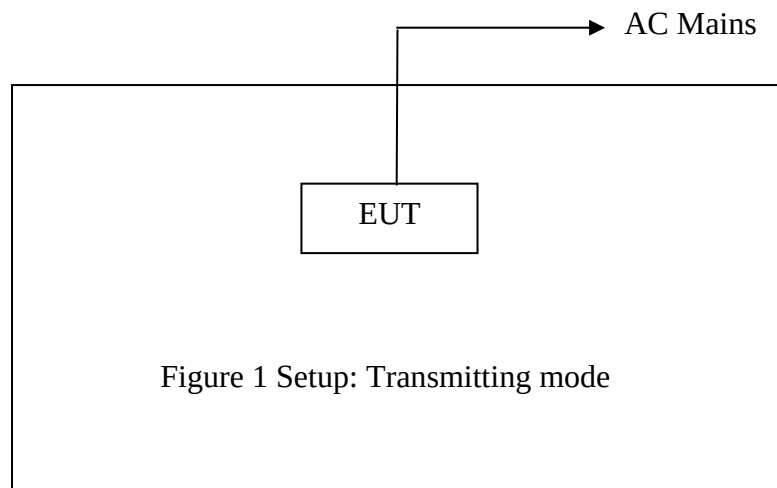
Low Channel: 2402MHz

Middle Channel: 2441MHz

High Channel: 2480MHz

Hopping

3.2. Configuration and peripherals



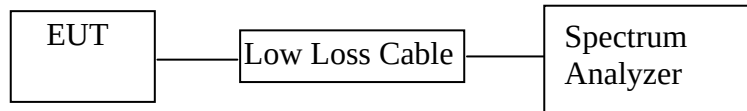
Note: The power was switched from 85% to 115%, and the worse case data was recorded.

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)

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.

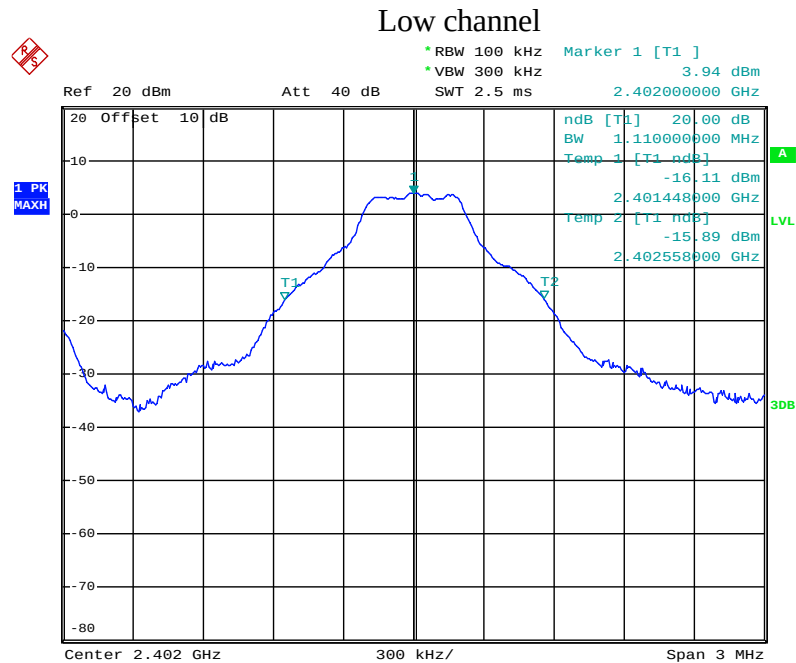
5.5.3. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.6.Test Result

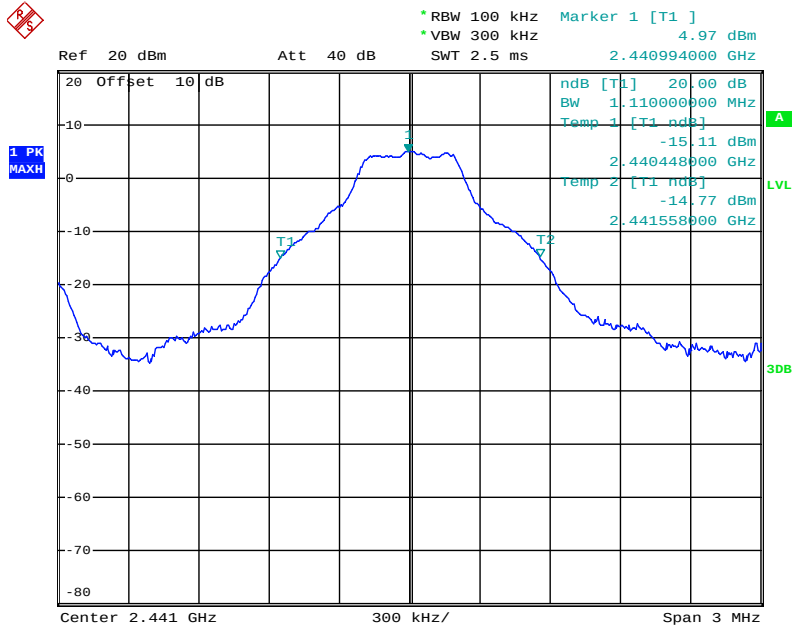
Channel	Frequency (MHz)	GFSK 20dB Bandwidth (MHz)	$\Pi/4$ -DQPSK 20dB Bandwidth (MHz)	8DPSK 20dB Bandwidth (MHz)	Result
Low	2402	1.11	1.374	1.338	Pass
Middle	2441	1.11	1.368	1.338	Pass
High	2480	1.116	1.374	1.344	Pass

The spectrum analyzer plots are attached as below.

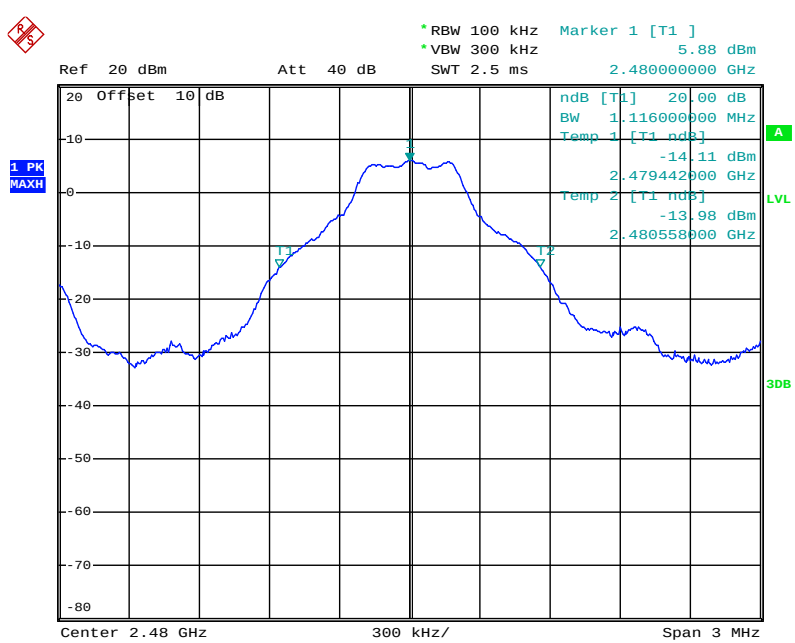
GFSK Mode



Middle channel

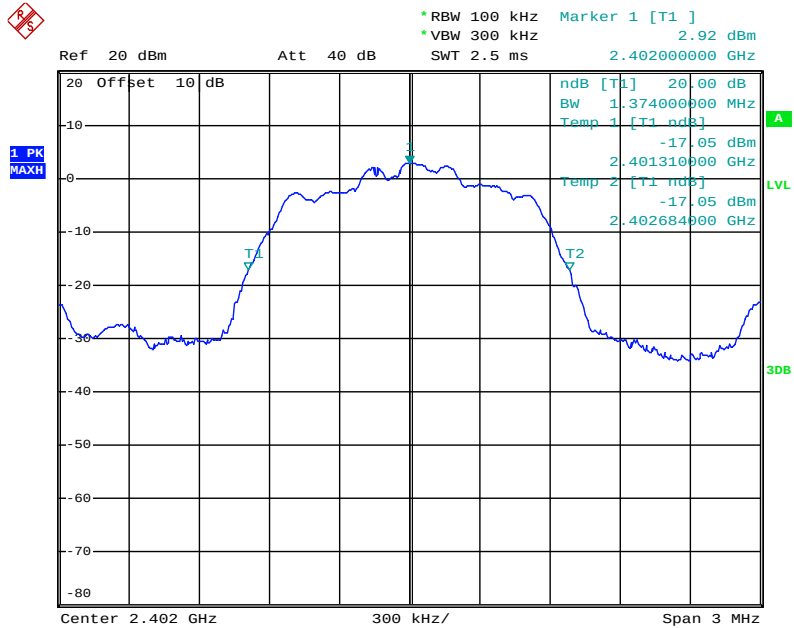


High channel

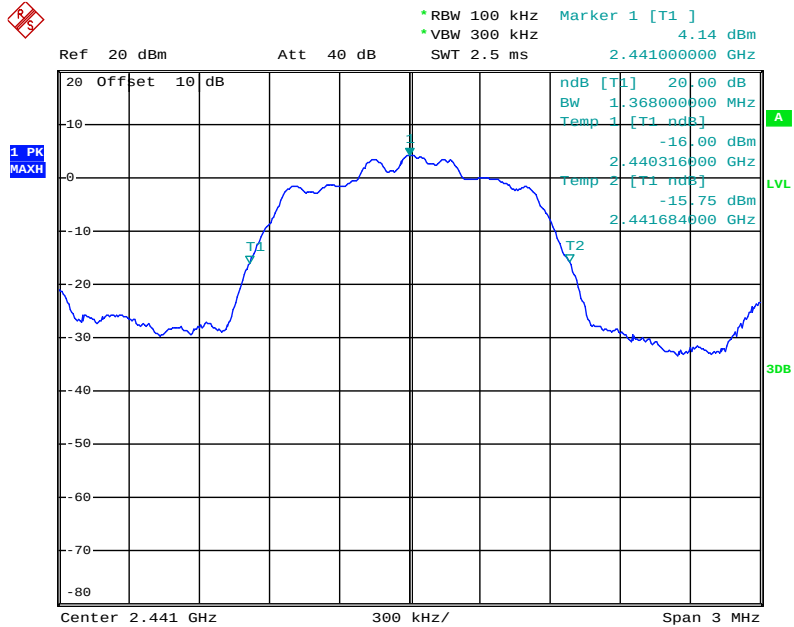


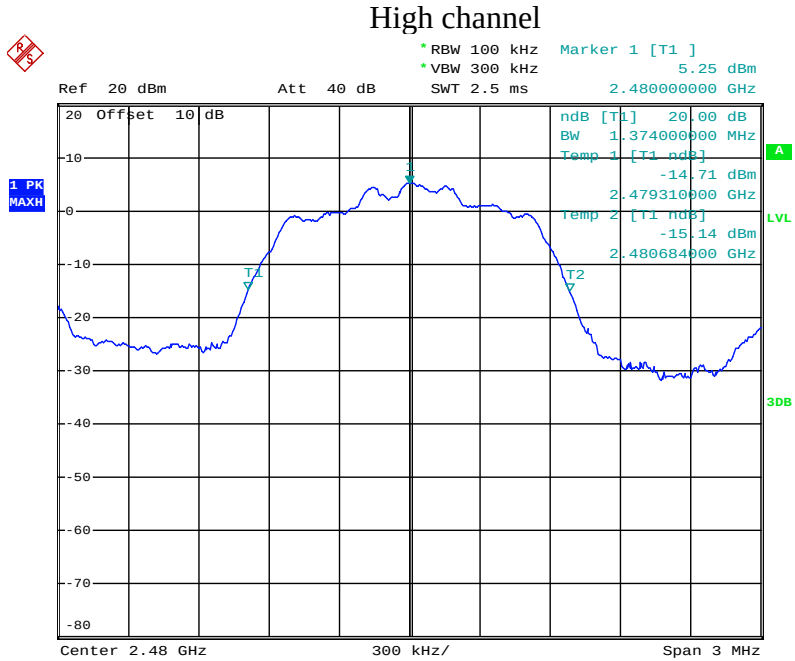
Π/4-DQPSK Mode

Low channel

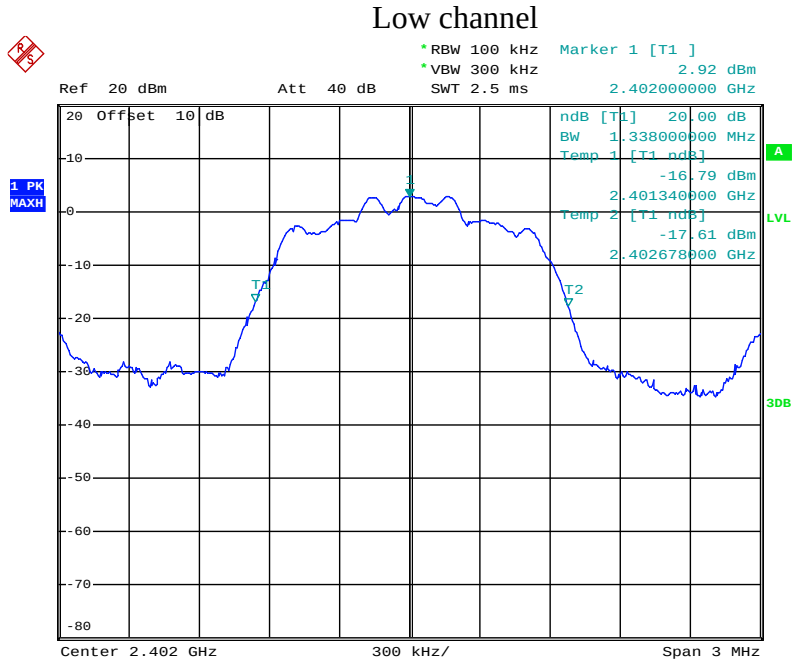


Middle channel

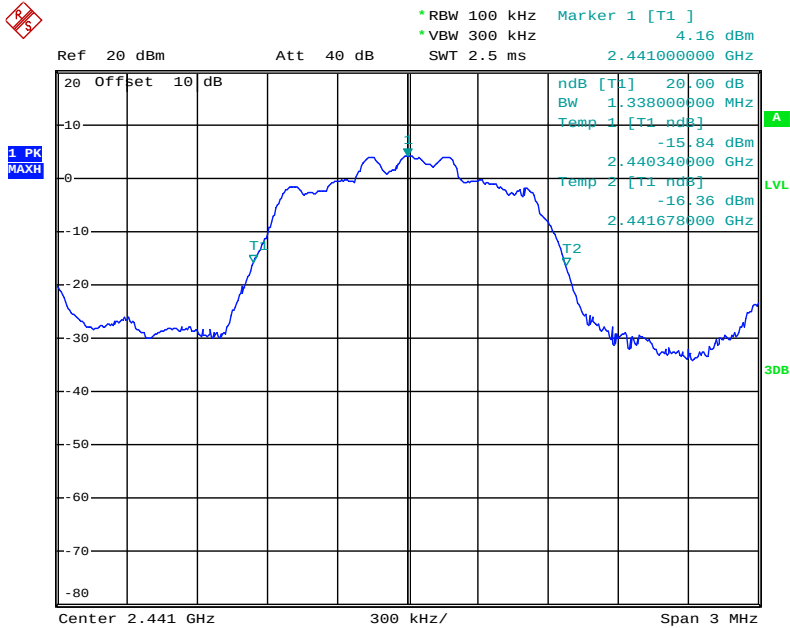




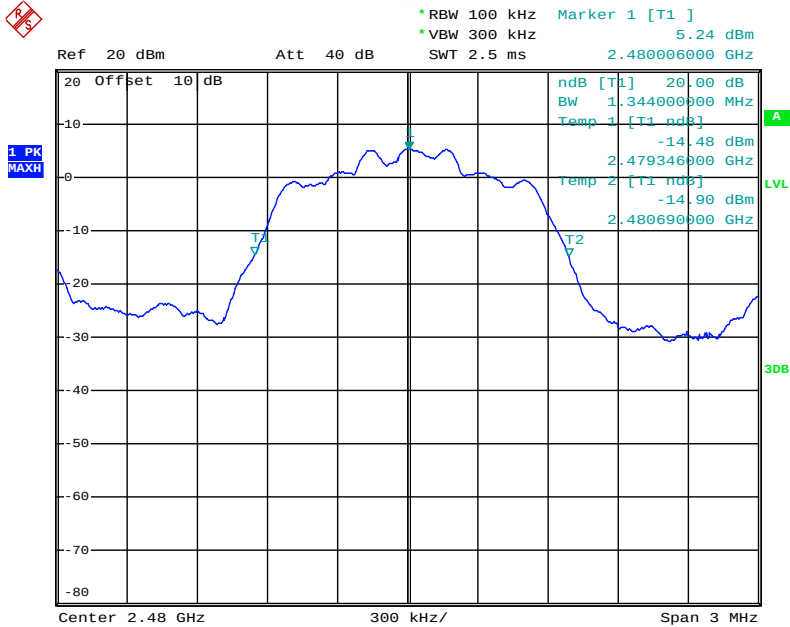
8DPSK Mode



Middle channel



High channel



6. CARRIER FREQUENCY SEPARATION TEST

6.1. Block Diagram of Test Setup



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

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

6.3. EUT Configuration on 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	0.996	25KHz or 2/3*20dB bandwidth	Pass
	2403			
Middle	2440	1.002	25KHz or 2/3*20dB bandwidth	Pass
	2441			
High	2479	0.996	25KHz or 2/3*20dB bandwidth	Pass
	2480			

Π/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	0.996	25KHz or 2/3*20dB bandwidth	Pass
	2480			

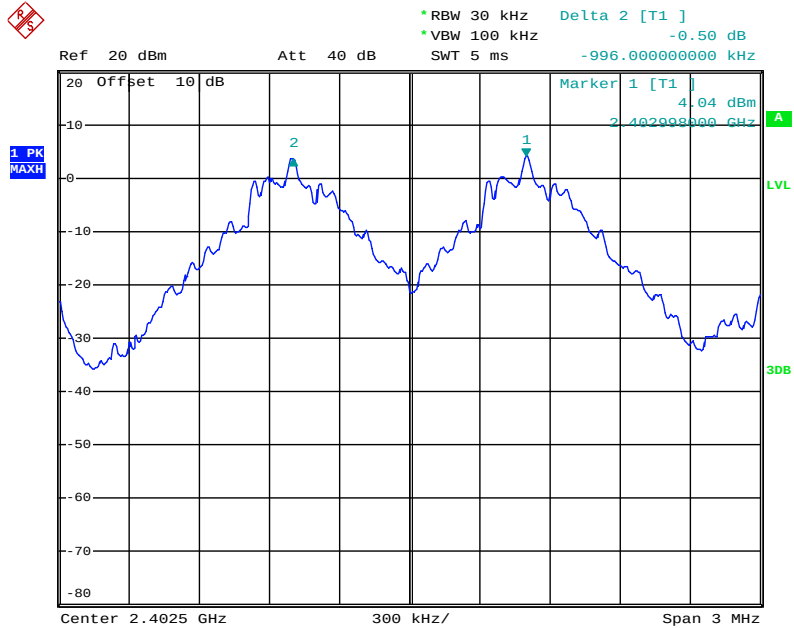
8DPSK Mode

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			

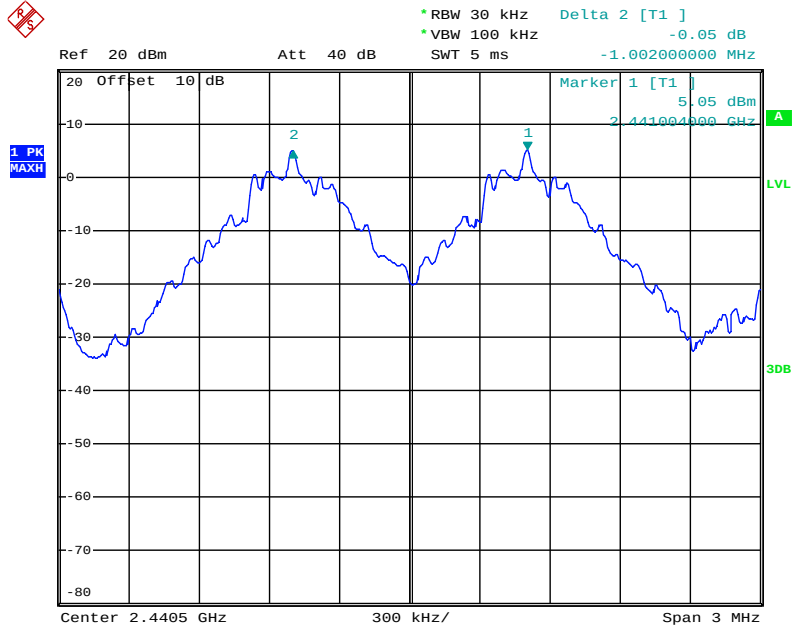
The spectrum analyzer plots are attached as below.

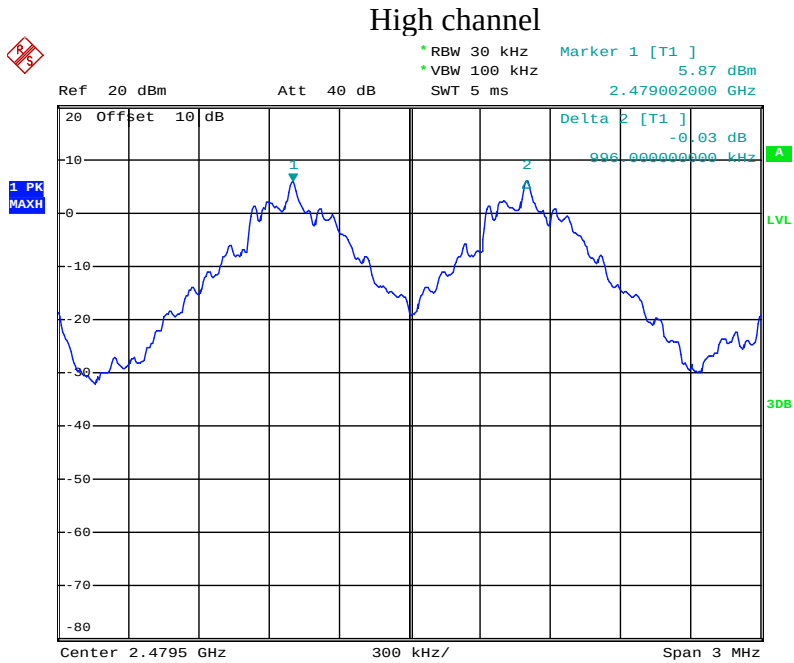
GFSK Mode

Low channel

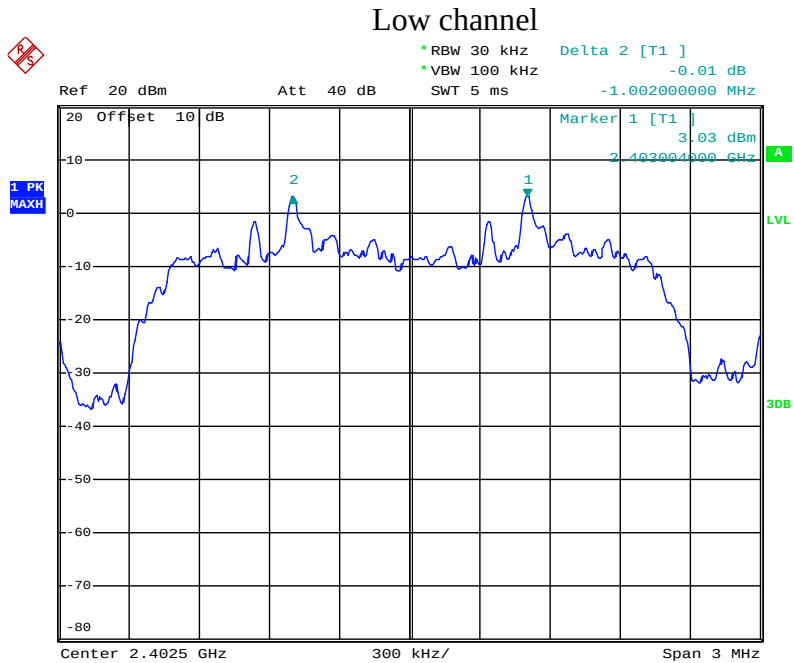


Middle channel

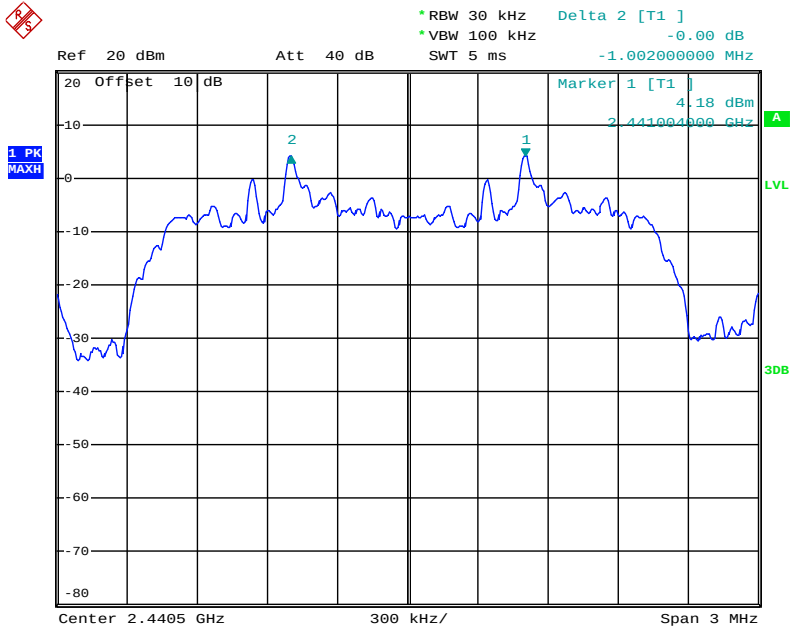




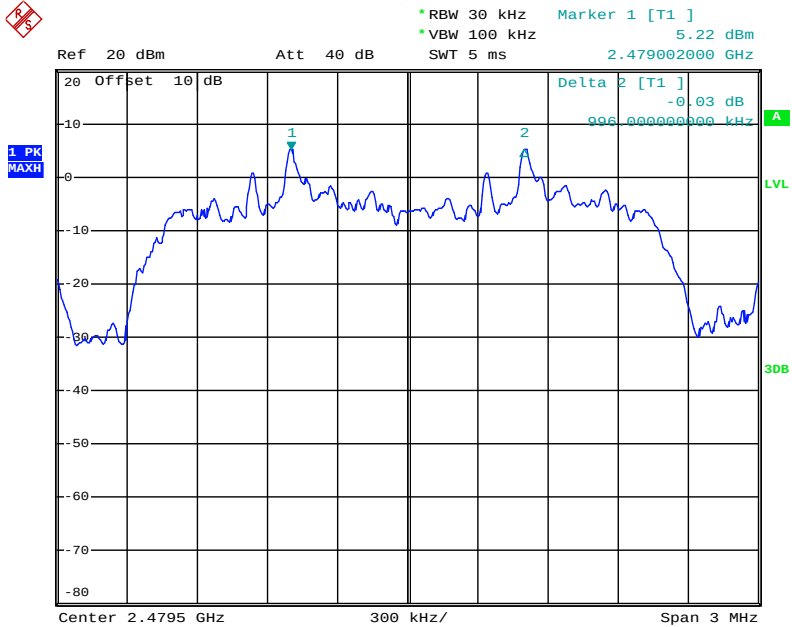
Π/4-DQPSK Mode



Middle channel

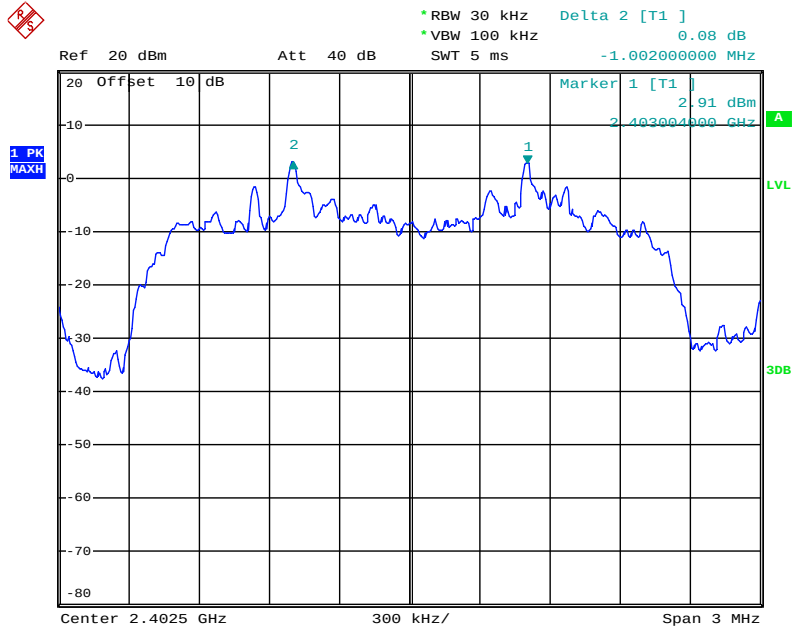


High channel

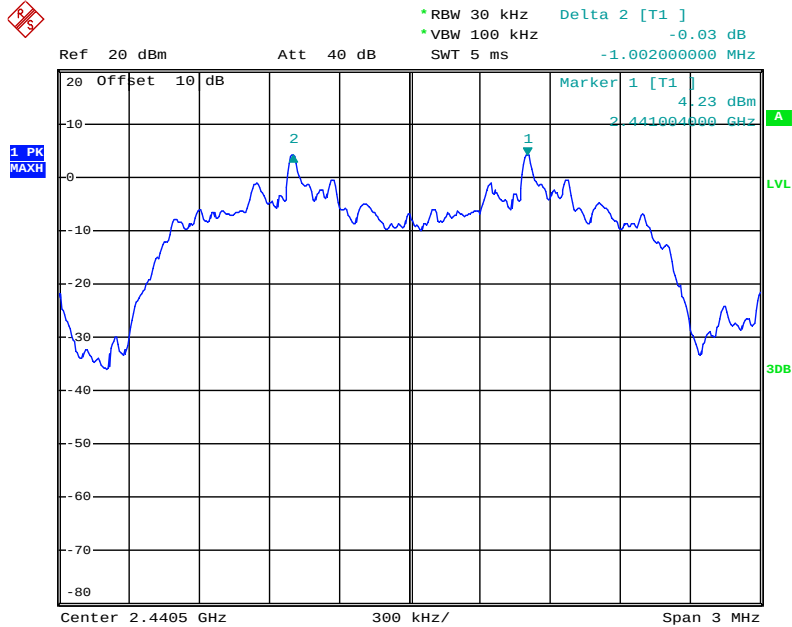


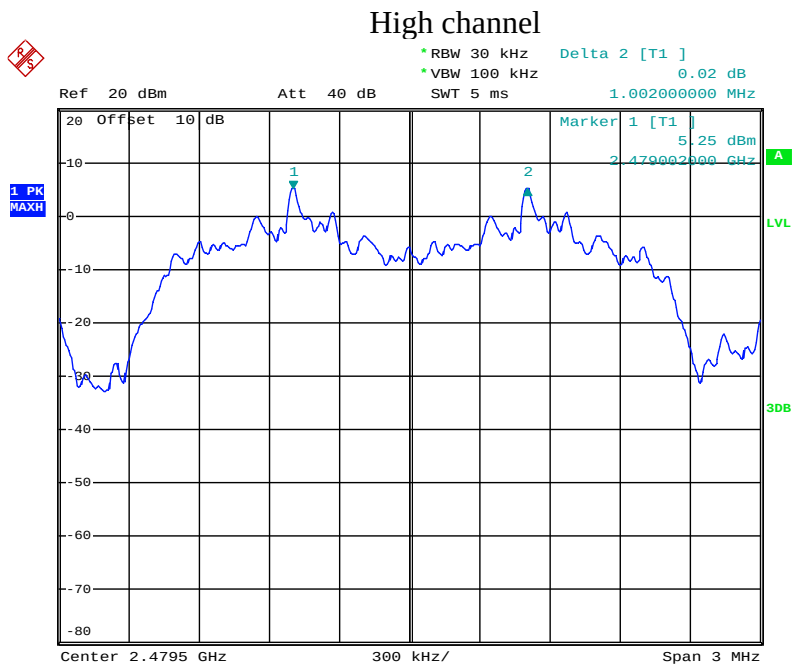
8DPSK Mode

Low channel



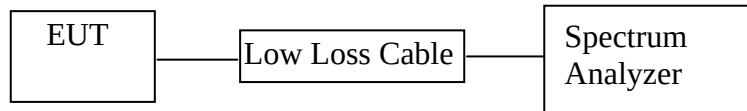
Middle channel





7. NUMBER OF HOPPING FREQUENCY TEST

7.1. Block Diagram of Test Setup



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

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

7.3. EUT Configuration on 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.

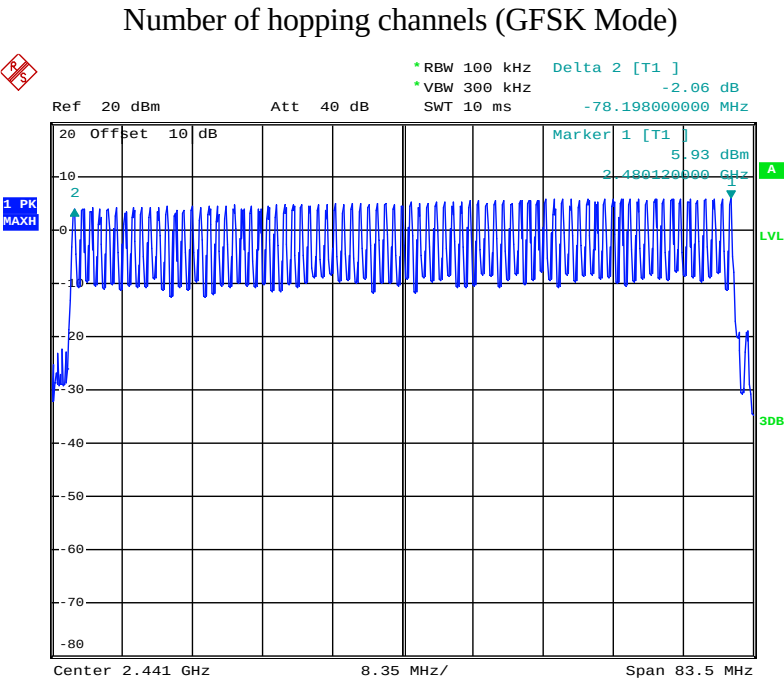
7.5.2. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz.

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

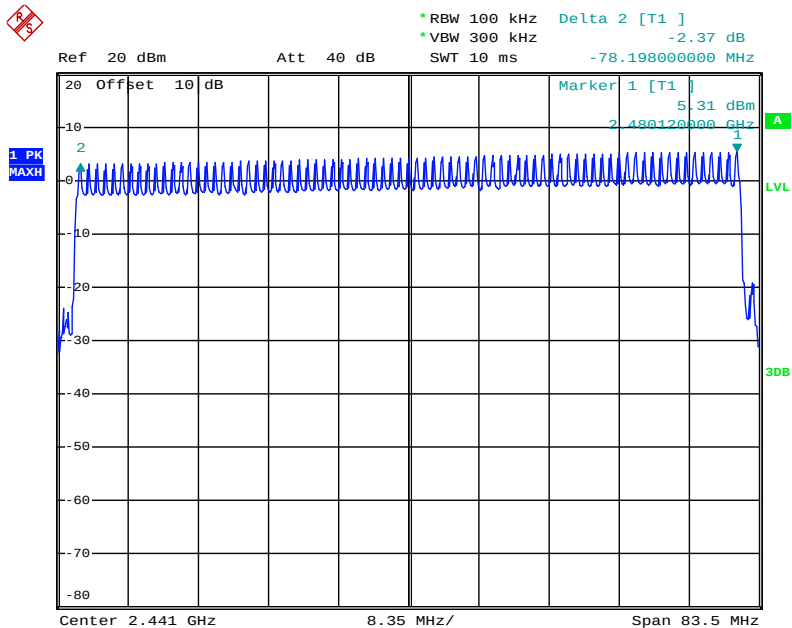
7.6.Test Result

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

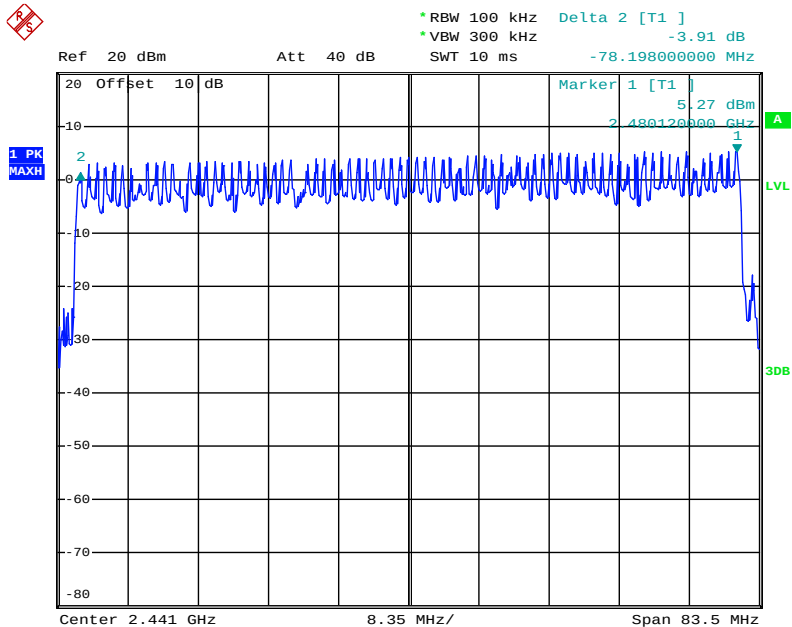
The spectrum analyzer plots are attached as below.



Number of hopping channels ($\Pi/4$ -DQPSK Mode)

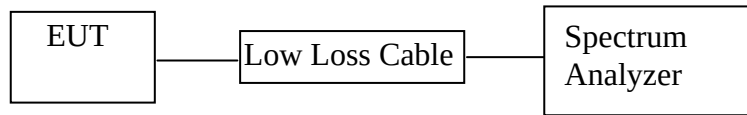


Number of hopping channels (8DPSK Mode)



8. DWELL TIME TEST

8.1. Block Diagram of Test Setup



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

Section 15.247(a)(1)(iii): Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

8.3. EUT Configuration on 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	0.44	140.8	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2441	1.71	273.6	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2441	3.01	321.1	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

$\Pi/4$ -DQPSK Mode (Worse case)

Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.45	144.0	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2441	1.73	276.8	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2441	3.02	322.1	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

8DPSK Mode (Worse case)

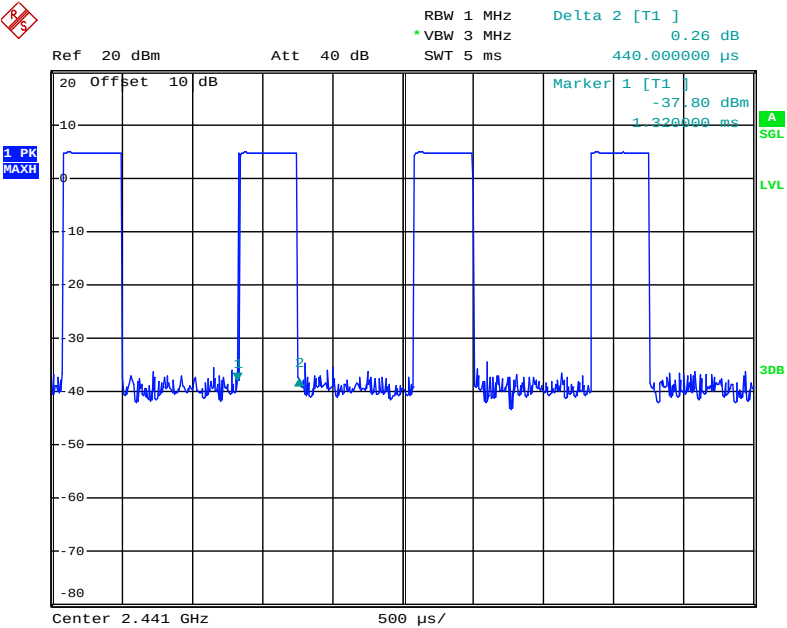
Mode	Channel Frequency (MHz)	Pulse Time (ms)	Dwell Time (ms)	Limit (ms)
DH1	2441	0.45	144.0	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(2 \times 79)) \times 31.6$				
DH3	2441	1.73	276.8	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(4 \times 79)) \times 31.6$				
DH5	2441	2.99	318.9	400
A period transmit time = $0.4 \times 79 = 31.6$ Dwell time = pulse time $\times (1600/(6 \times 79)) \times 31.6$				

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

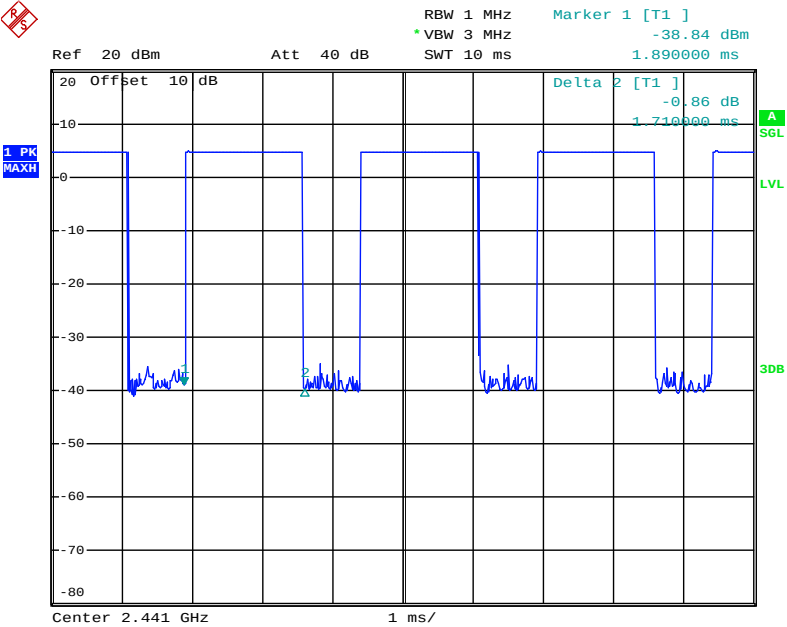
The spectrum analyzer plots are attached as below.

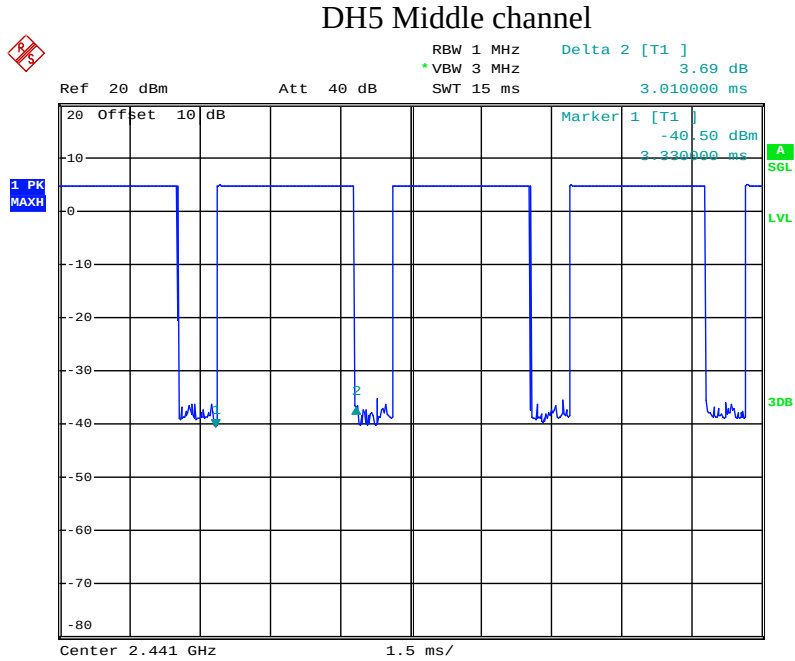
GFSK Mode

DH1 Middle channel

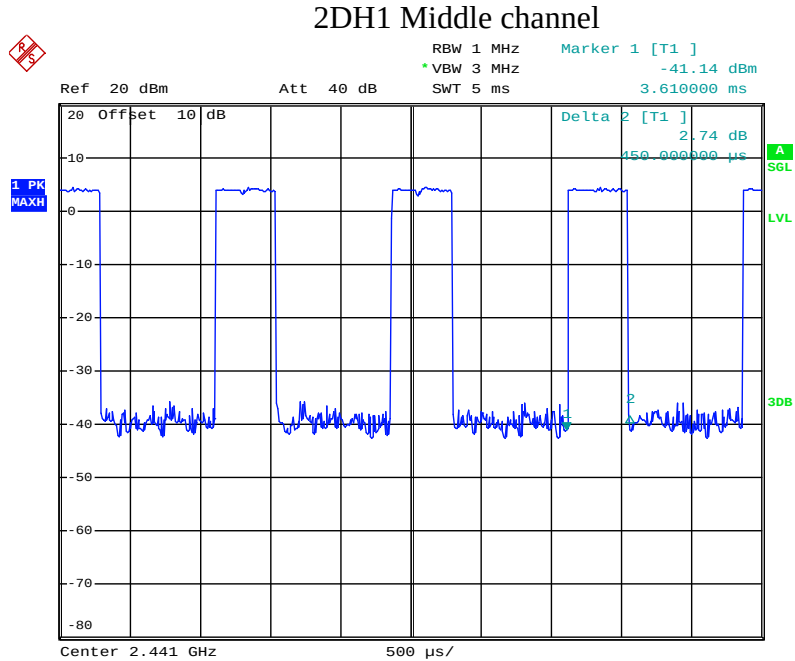


DH3 Middle channel

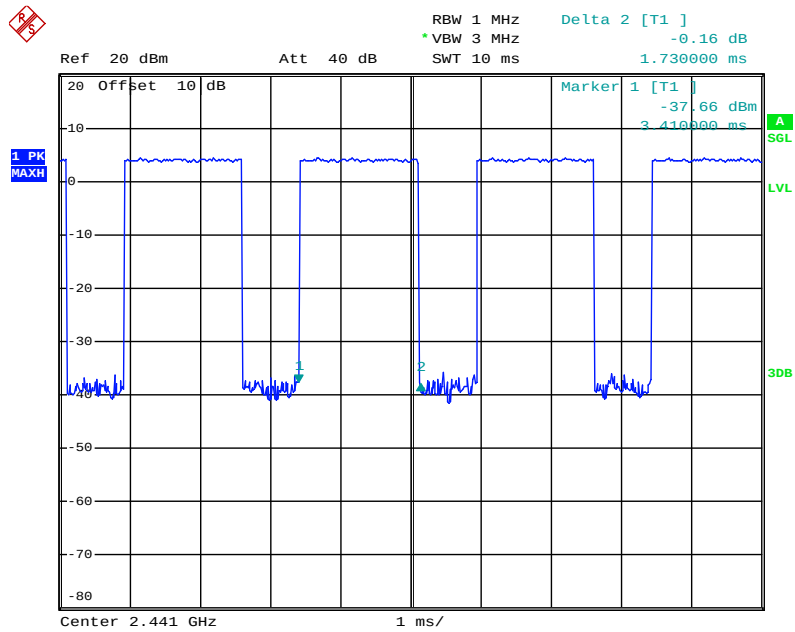




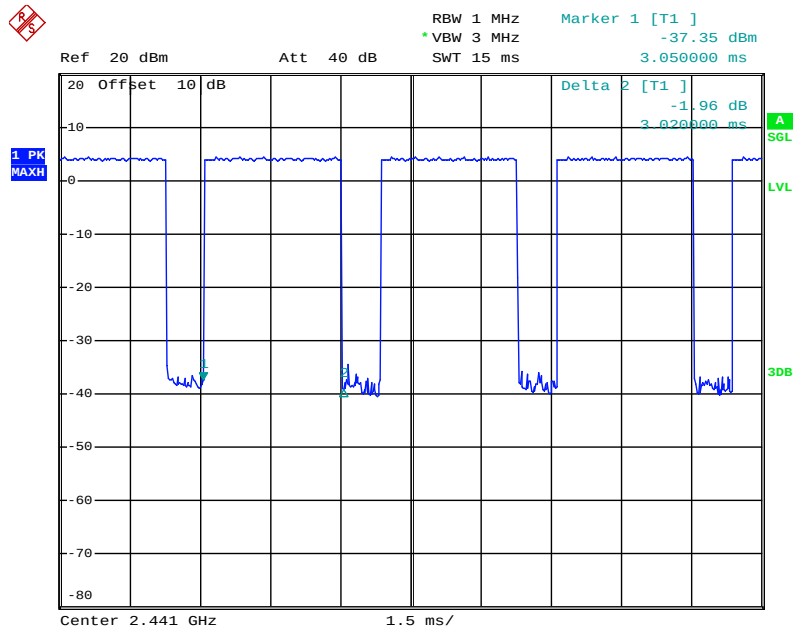
$\Pi/4$ -DQPSK



2DH3 Middle channel

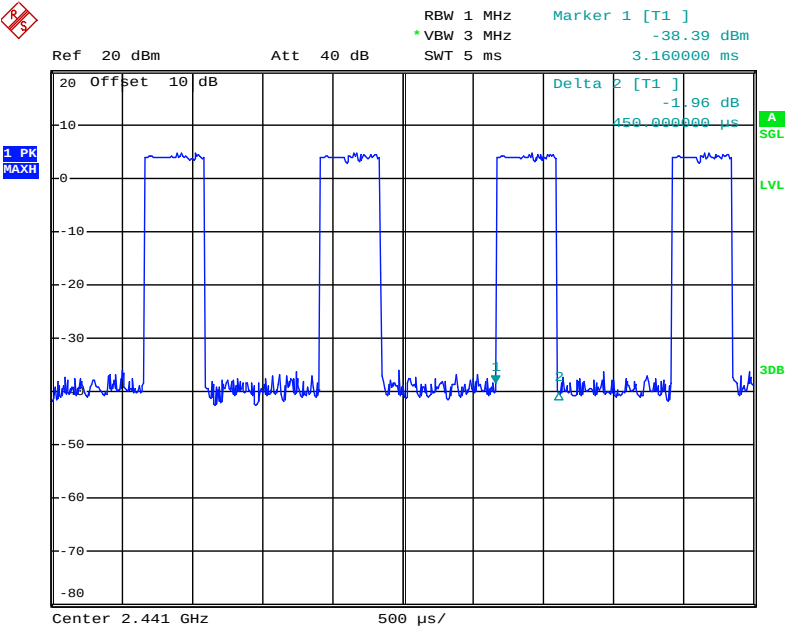


2DH5 Middle channel

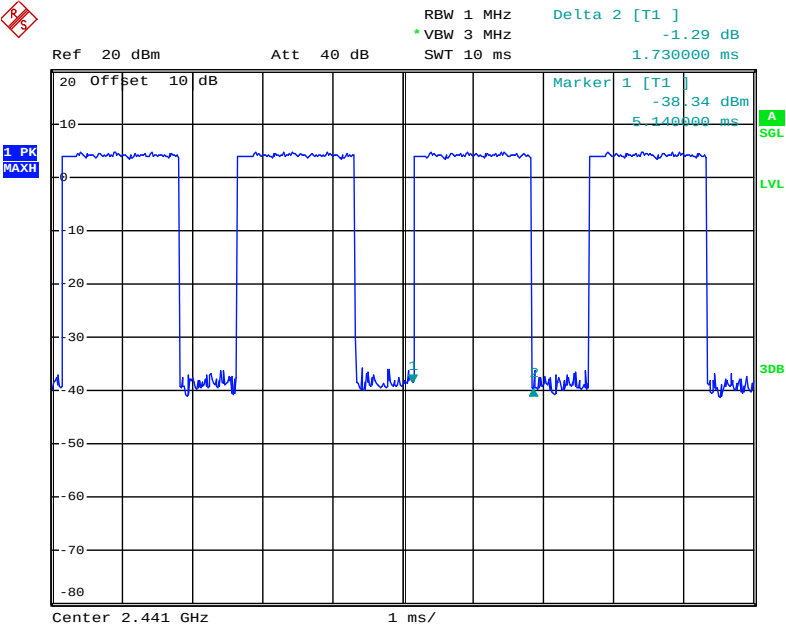


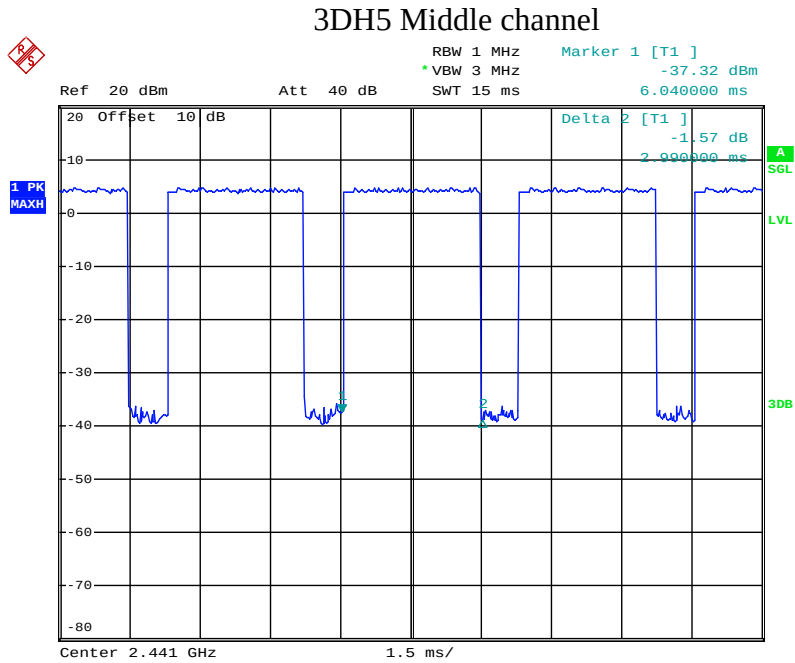
8DPSK

3DH1 Middle channel



3DH3 Middle channel





9. MAXIMUM PEAK OUTPUT POWER TEST

9.1. Block Diagram of Test Setup



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

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

9.3. EUT Configuration on 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	4.07/0.0026	21 / 0.125	Pass
Middle	2441	5.11/0.0032	21 / 0.125	Pass
High	2480	5.90/0.0039	21 / 0.125	Pass

Π/4-DQPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W	Result
Low	2402	3.86/0.0024	21 / 0.125	Pass
Middle	2441	5.05/0.0032	21 / 0.125	Pass
High	2480	5.75/0.0038	21 / 0.125	Pass

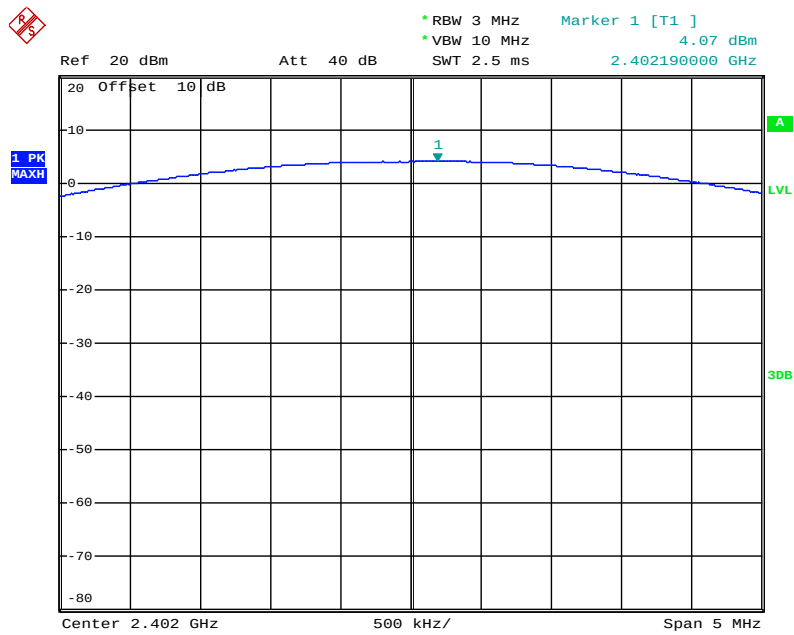
8DPSK Mode

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits dBm / W	Result
Low	2402	4.23/0.0026	21 / 0.125	Pass
Middle	2441	5.32/0.0034	21 / 0.125	Pass
High	2480	6.03/0.0040	21 / 0.125	Pass

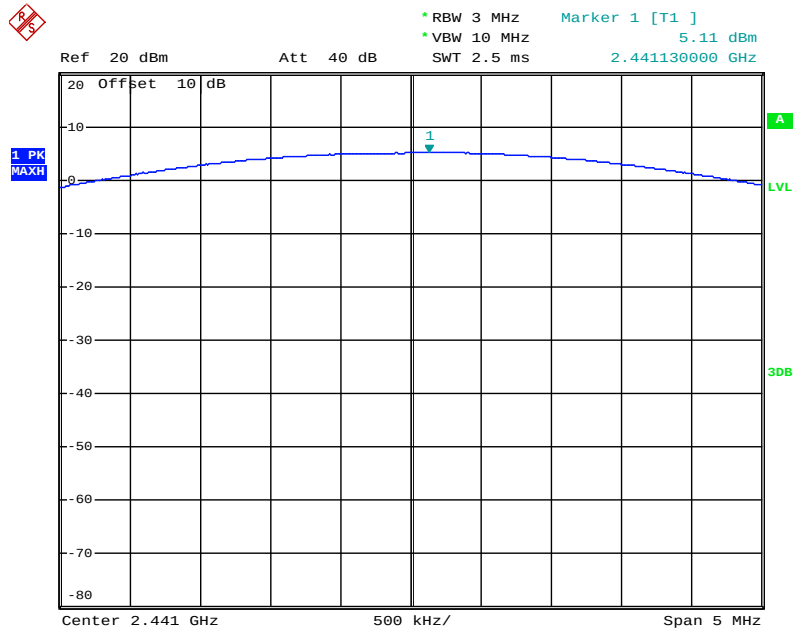
The spectrum analyzer plots are attached as below.

GFSK Mode

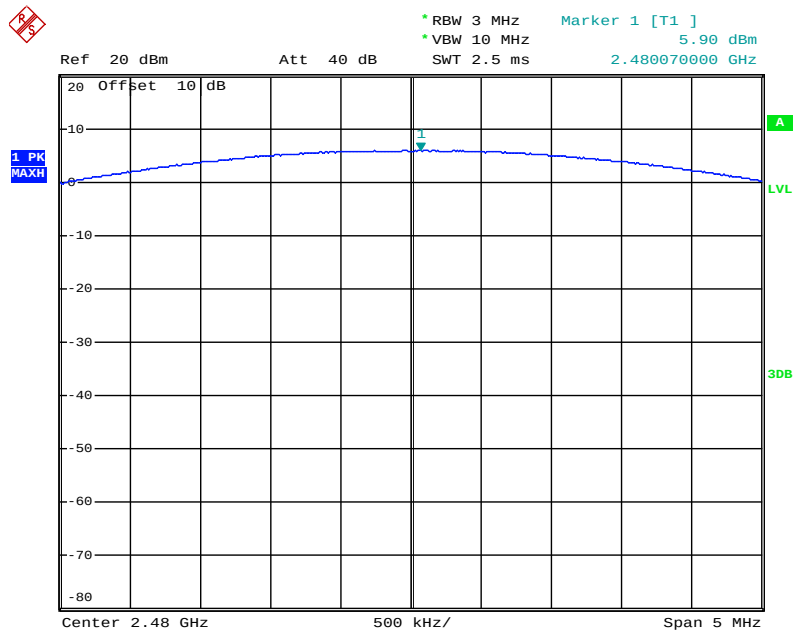
Low channel



Middle channel

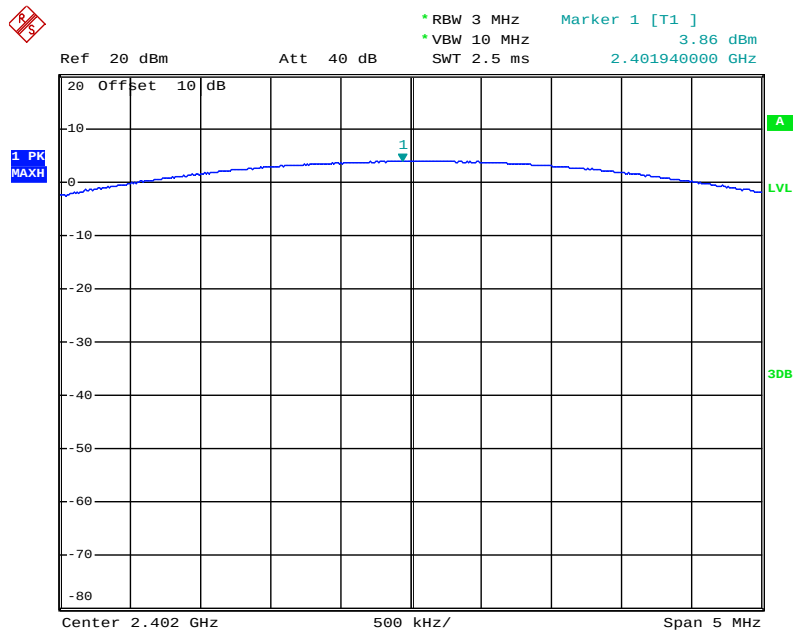


High channel

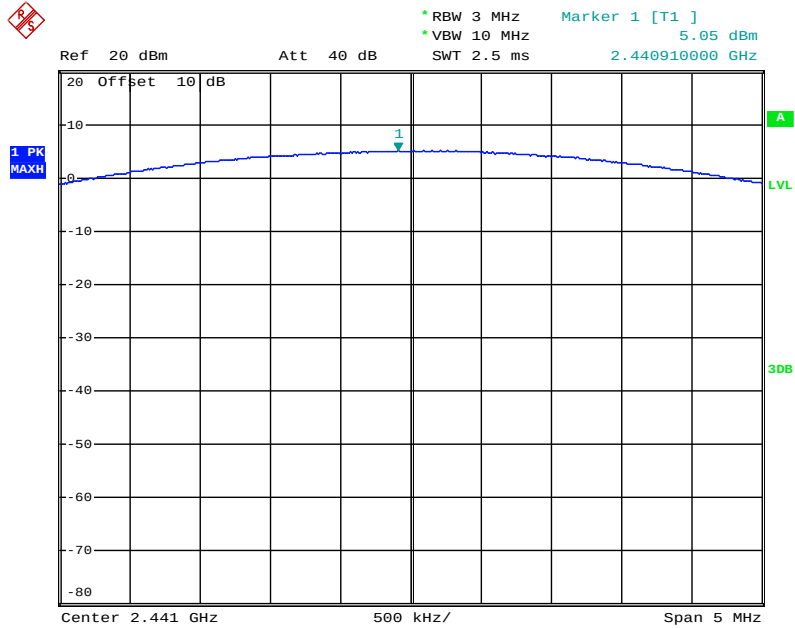


II/4-DQPSK Mode

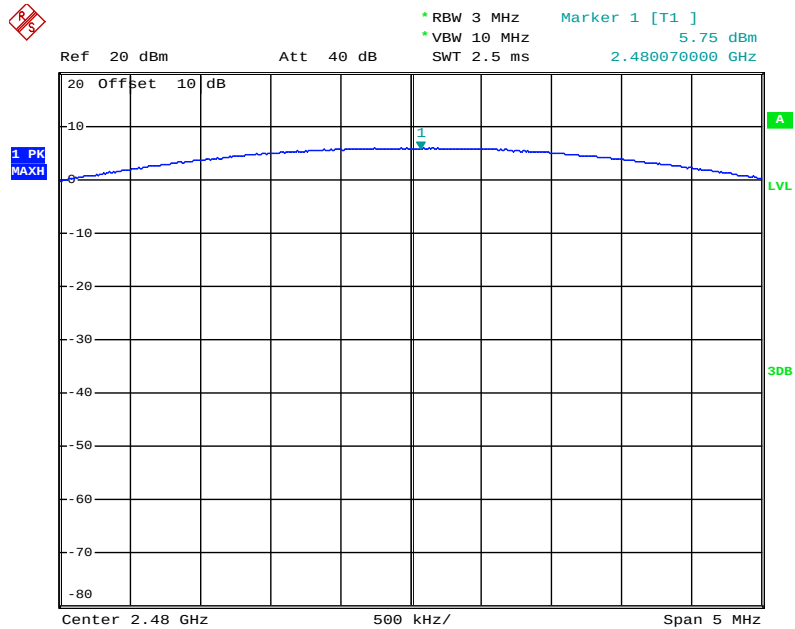
Low channel



Middle channel

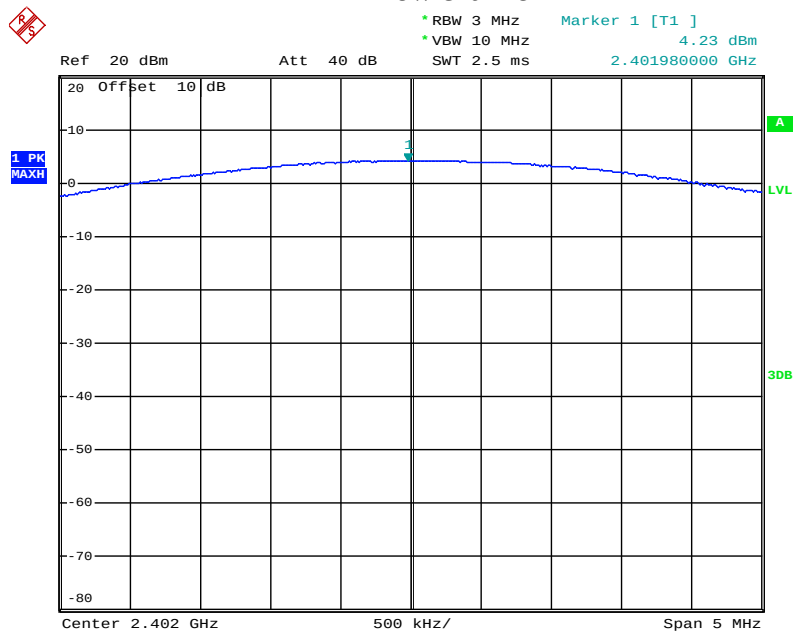


High channel

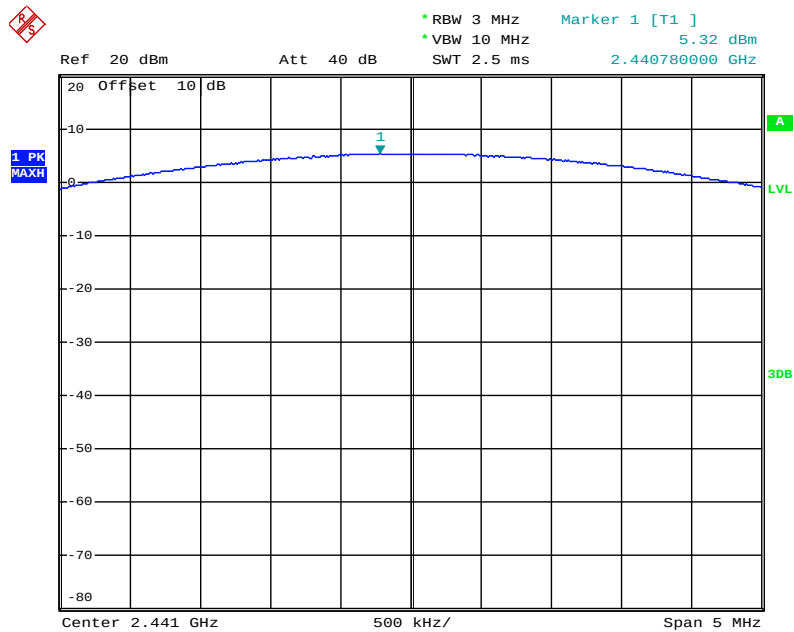


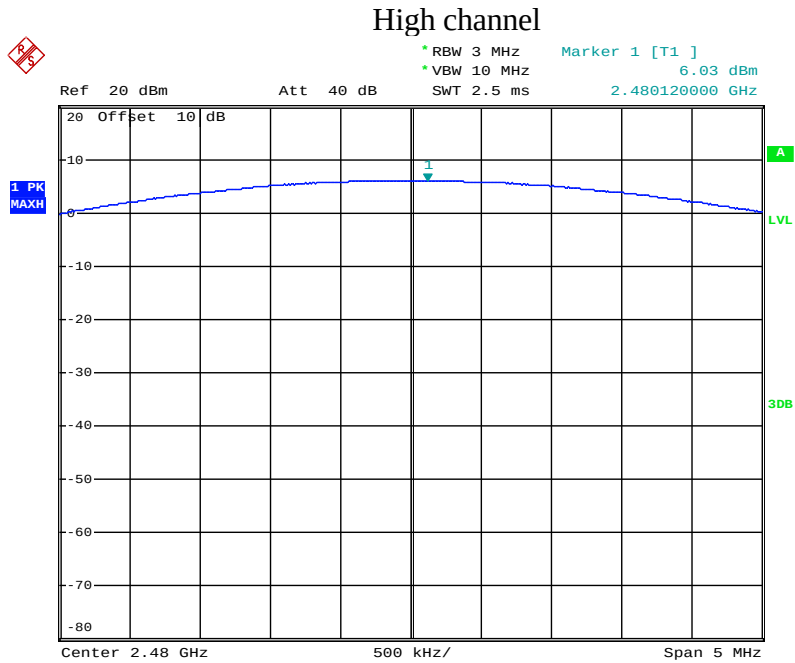
8DPSK Mode

Low channel



Middle channel

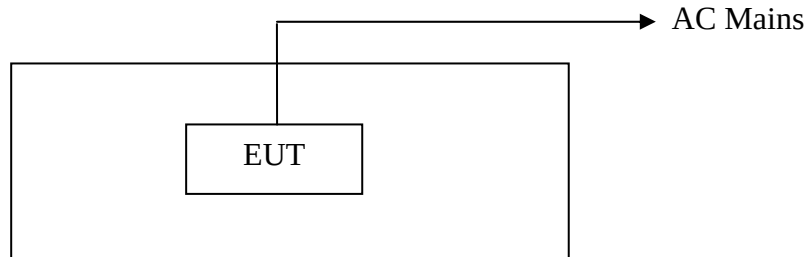




10.RADIATED EMISSION TEST

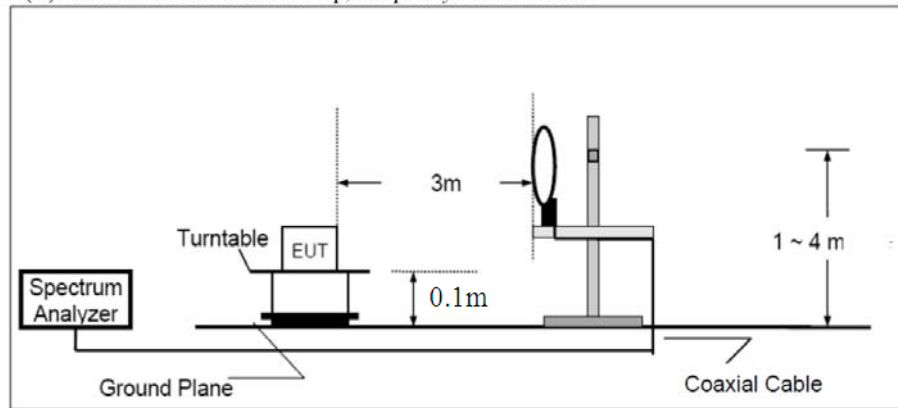
10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

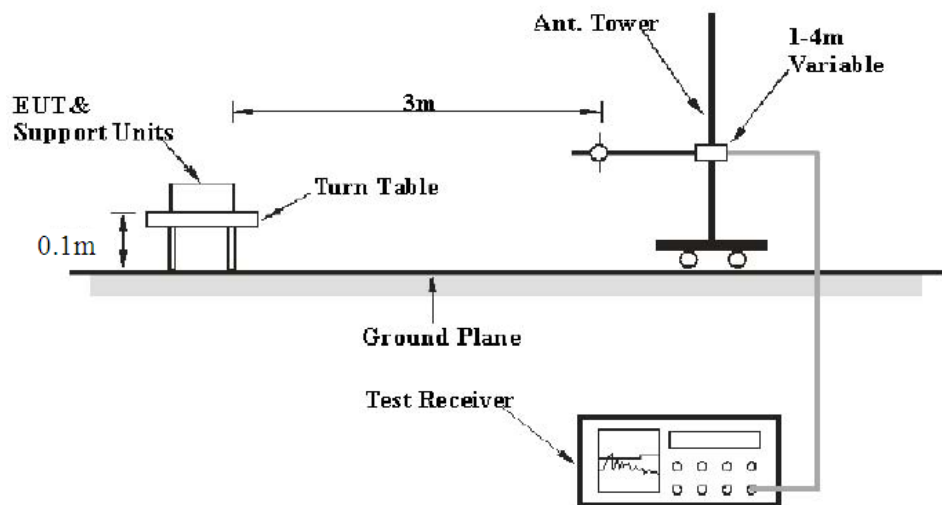


10.1.2.Semi-Anechoic Chamber Test Setup Diagram

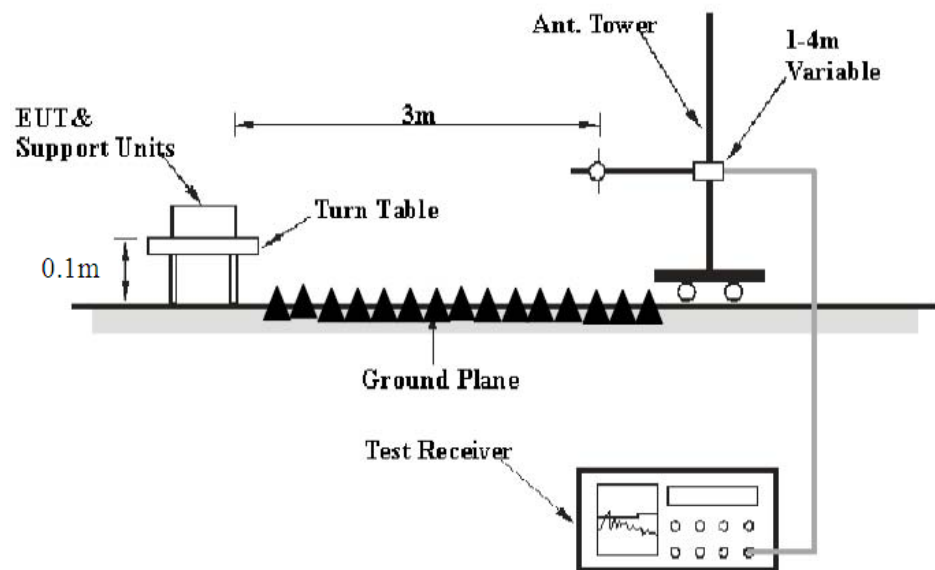
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(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			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 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 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 worst-case emissions are reported.

10.7.Data Sample

Frequency (MHz)	Reading (dBμv)	Factor (dB/m)	Result (dBμv/m)	Limit (dBμv/m)	Margin (dB)	Remark
X.XX	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 (8DPSK mode) for all test mode.

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

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

The spectrum analyzer plots are attached as below.

Below 1GHz



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp2019 #91

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2402MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Horizontal

Power Source: AC 120V/60Hz

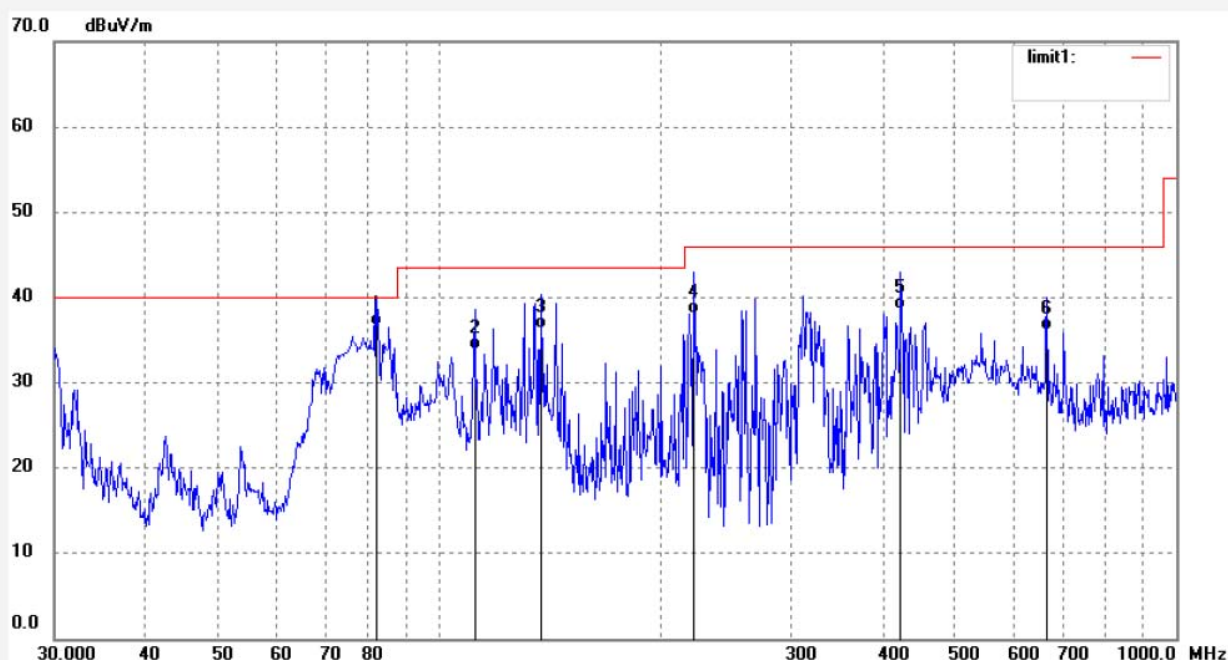
Date: 2019/04/16

Time: 15:14:16

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	82.2362	64.03	-27.43	36.60	40.00	-3.40	QP	100	165	
2	111.6398	61.10	-27.30	33.80	43.50	-9.70	QP	100	263	
3	137.3565	64.19	-27.89	36.30	43.50	-7.20	QP	100	123	
4	221.5010	61.99	-23.99	38.00	46.00	-8.00	QP	100	196	
5	422.8116	56.57	-17.97	38.60	46.00	-7.40	QP	100	251	
6	667.6024	48.41	-12.21	36.20	46.00	-9.80	QP	100	136	



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.: jp2019 #92

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2402MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Vertical

Power Source: AC 120V/60Hz

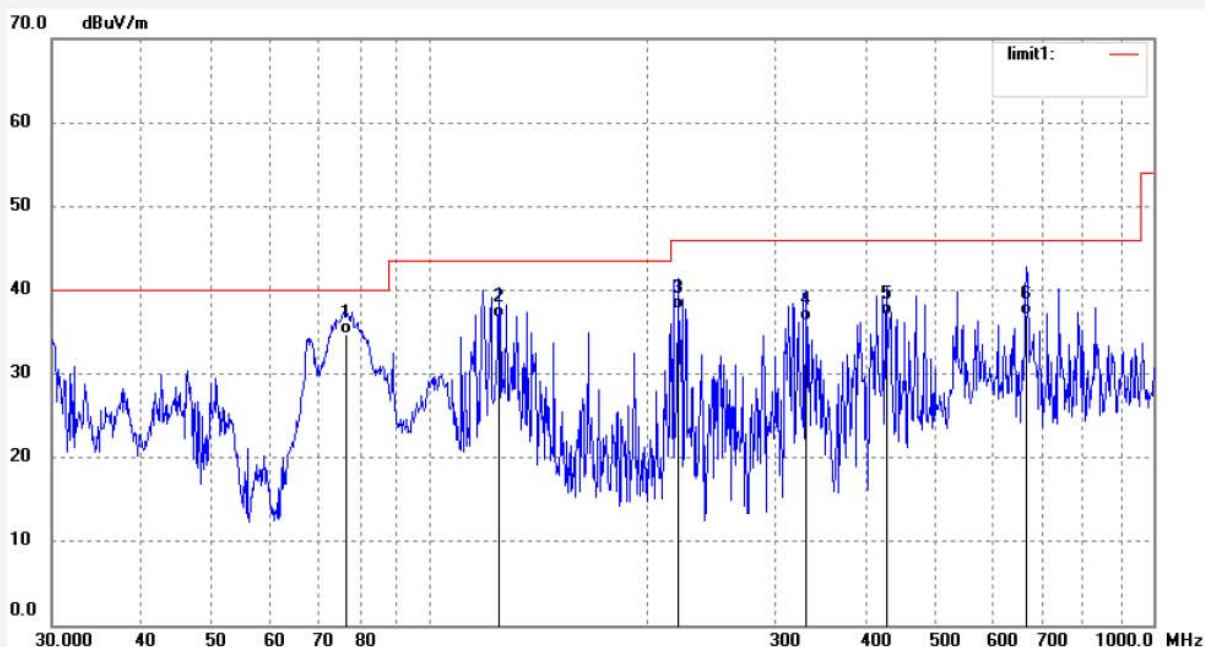
Date: 2019/04/16

Time: 15:19:39

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339

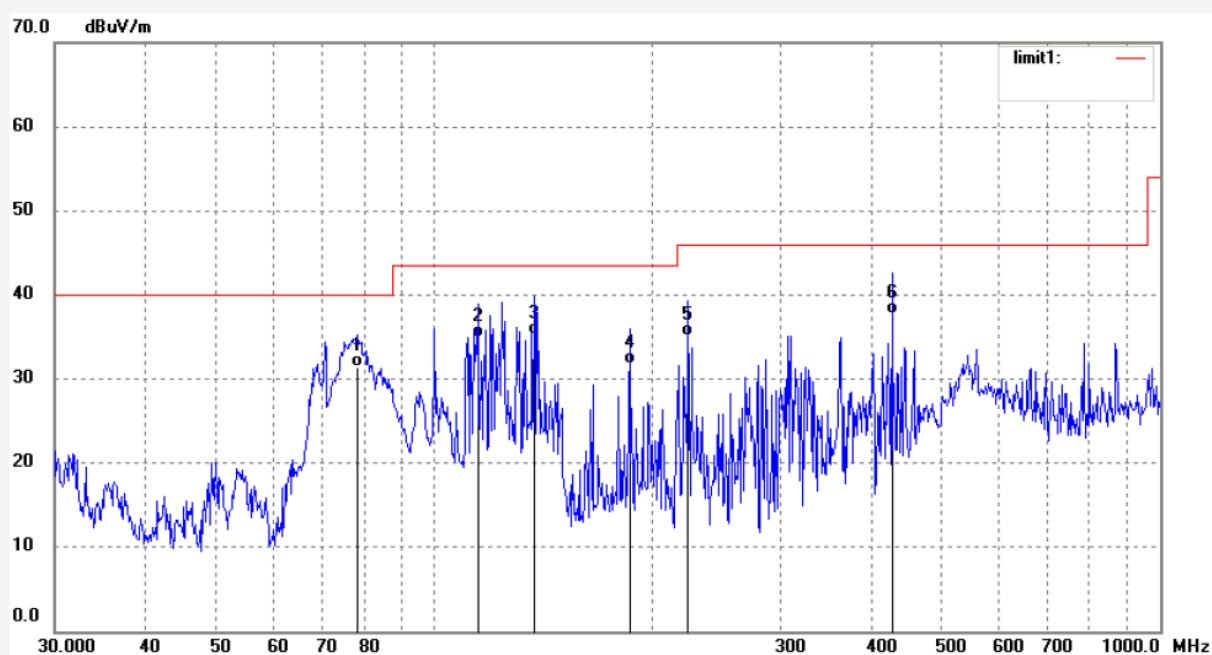


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	76.6556	62.40	-27.60	34.80	40.00	-5.20	QP	100	123	
2	124.4868	64.18	-27.58	36.60	43.50	-6.90	QP	100	263	
3	219.9499	61.72	-24.02	37.70	46.00	-8.30	QP	100	189	
4	330.6220	56.43	-20.13	36.30	46.00	-9.70	QP	100	196	
5	427.2919	54.87	-17.87	37.00	46.00	-9.00	QP	100	236	
6	667.6024	49.31	-12.21	37.10	46.00	-8.90	QP	100	285	

Job No.: jp2019 #93
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX 2441MHz
Model: YH8230L INFINITY AURA
Manufacturer: YIHE

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2019/04/16
Time: 15:23:39
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190339



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	78.5644	58.99	-27.49	31.50	40.00	-8.50	QP	100	136	
2	114.8224	62.26	-27.36	34.90	43.50	-8.60	QP	100	195	
3	137.3565	63.19	-27.89	35.30	43.50	-8.20	QP	100	203	
4	185.8143	57.28	-25.48	31.80	43.50	-11.70	QP	100	196	
5	223.8481	59.06	-23.96	35.10	46.00	-10.90	QP	100	175	
6	427.2919	55.67	-17.87	37.80	46.00	-8.20	QP	100	185	



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

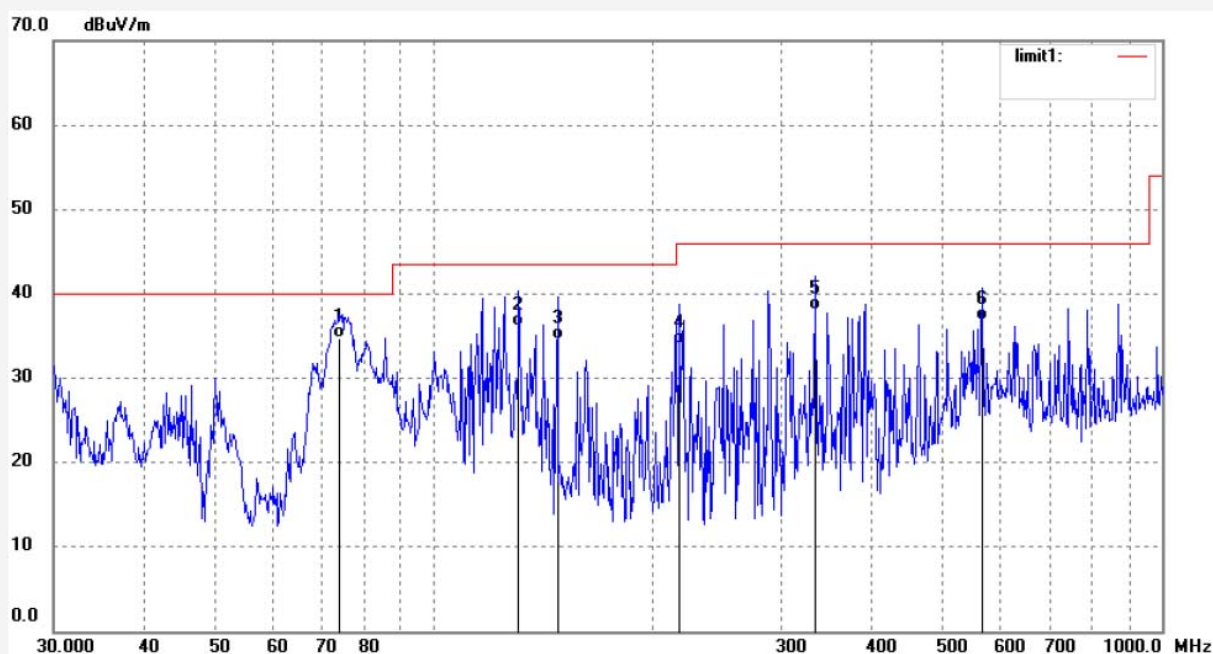
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp2019 #95
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX 2441MHz
Model: YH8230L INFINITY AURA
Manufacturer: YIHE

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2019/04/16
Time: 15:26:13
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190339



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	74.0092	62.36	-27.66	34.70	40.00	-5.30	QP	100	123	
2	130.7633	63.83	-27.73	36.10	43.50	-7.40	QP	100	265	
3	147.8746	62.55	-28.05	34.50	43.50	-9.00	QP	100	196	
4	216.8803	58.14	-24.04	34.10	46.00	-11.90	QP	100	195	
5	334.1254	57.94	-19.94	38.00	46.00	-8.00	QP	100	232	
6	565.9776	51.35	-14.45	36.90	46.00	-9.10	QP	100	163	

Job No.: jp2019 #96

Standard: FCC Class B 3M Radiated

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2480MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Vertical

Power Source: AC 120V/60Hz

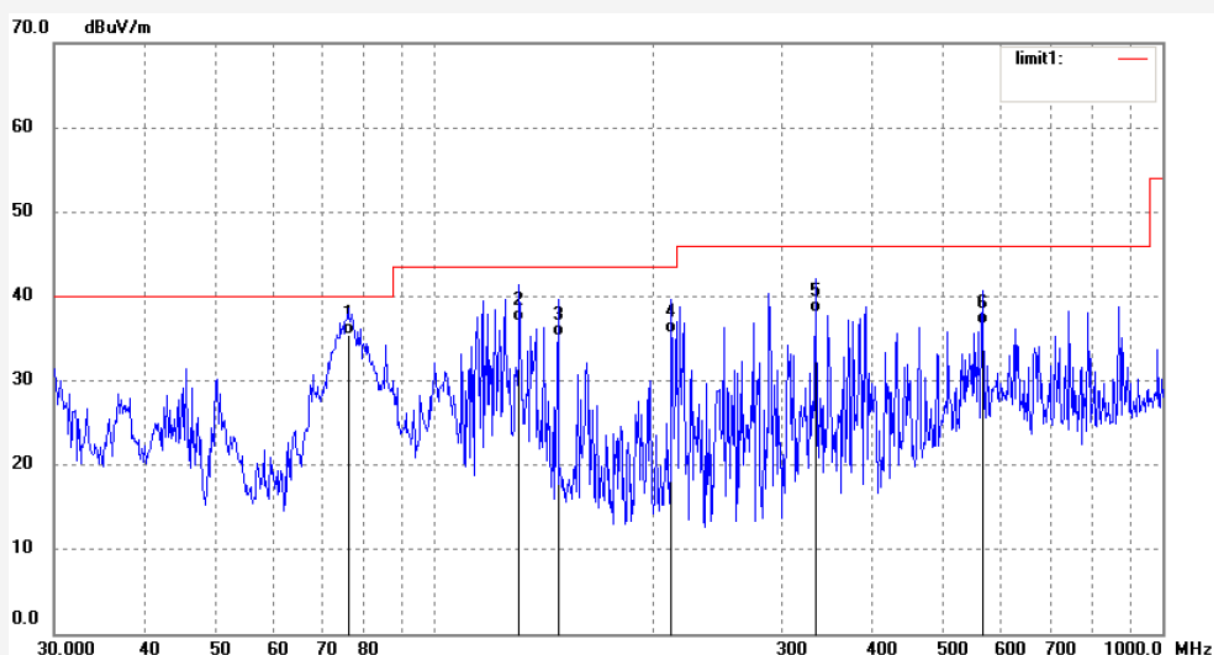
Date: 2019/04/16

Time: 15:29:15

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	76.1189	63.14	-27.64	35.50	40.00	-4.50	QP	100	165	
2	130.7633	64.83	-27.73	37.10	43.50	-6.40	QP	100	147	
3	147.8746	63.25	-28.05	35.20	43.50	-8.30	QP	100	198	
4	211.6111	59.69	-24.09	35.60	43.50	-7.90	QP	100	285	
5	334.1254	57.94	-19.94	38.00	46.00	-8.00	QP	100	136	
6	565.9776	51.05	-14.45	36.60	46.00	-9.40	QP	100	156	



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 1# Chamber

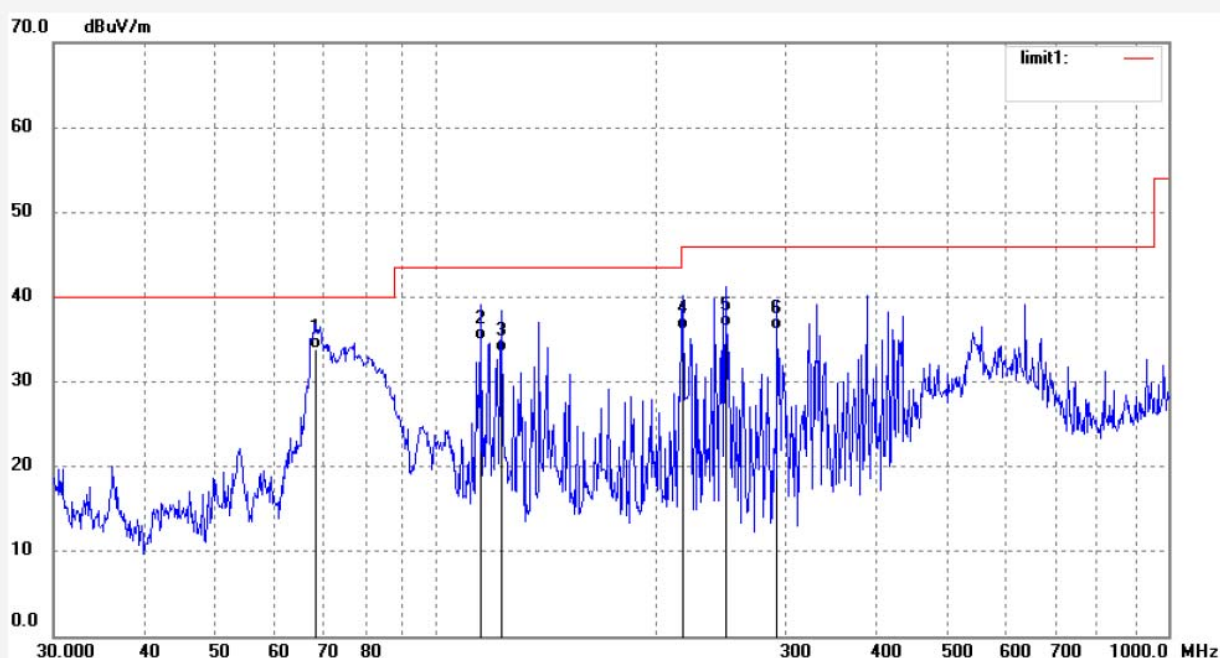
Tel:+86-0755-26503290

Fax:+86-0755-26503396

Job No.: jp2019 #97
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX 2480MHz
Model: YH8230L INFINITY AURA
Manufacturer: YIHE

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2019/04/16
Time: 15:32:08
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190339



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	68.5037	61.22	-27.42	33.80	40.00	-6.20	QP	100	195	
2	115.2266	62.35	-27.35	35.00	43.50	-8.50	QP	100	236	
3	122.7493	61.03	-27.53	33.50	43.50	-10.00	QP	100	198	
4	216.8803	60.24	-24.04	36.20	46.00	-9.80	QP	100	153	
5	248.7318	60.15	-23.65	36.50	46.00	-9.50	QP	100	185	
6	292.3643	57.66	-21.56	36.10	46.00	-9.90	QP	100	263	

Above 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.: jp2019 #108

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2402MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Vertical

Power Source: AC 120V/60Hz

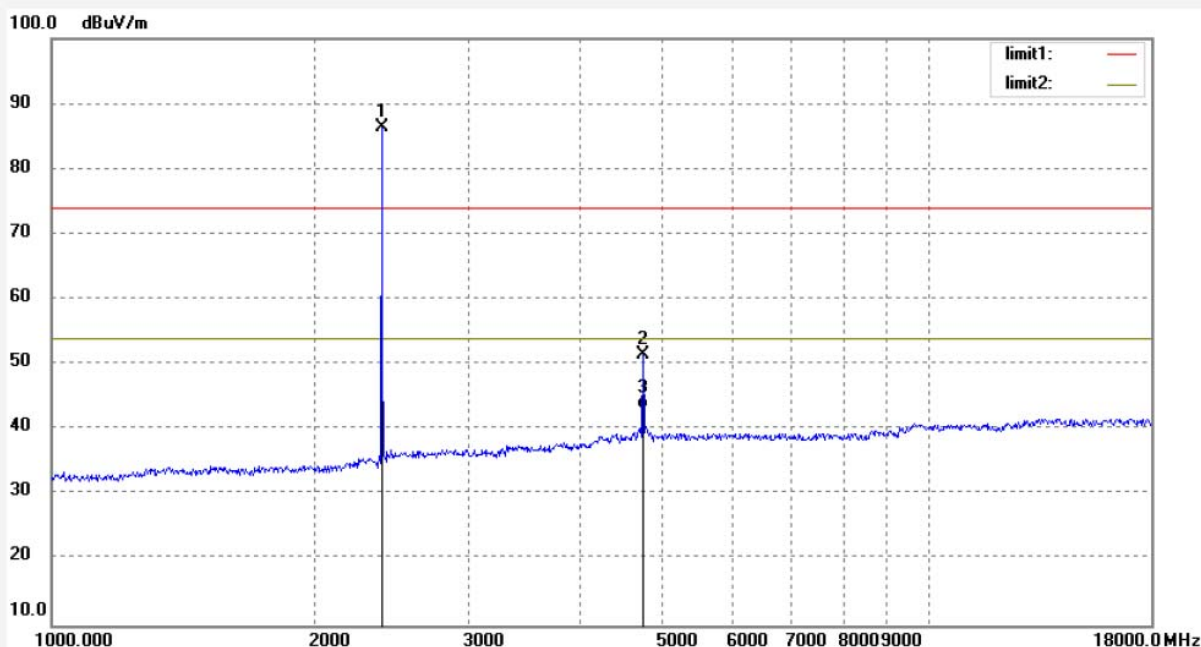
Date: 19/04/18/

Time: 9/30/10

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	92.78	-6.37	86.41			peak	100	246	
2	4804.000	50.85	0.70	51.55	74.00	-22.45	peak	100	123	
3	4804.000	42.60	0.70	43.30	54.00	-10.70	AVG	100	123	



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.: jp2019 #109

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2402MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Horizontal

Power Source: AC 120V/60Hz

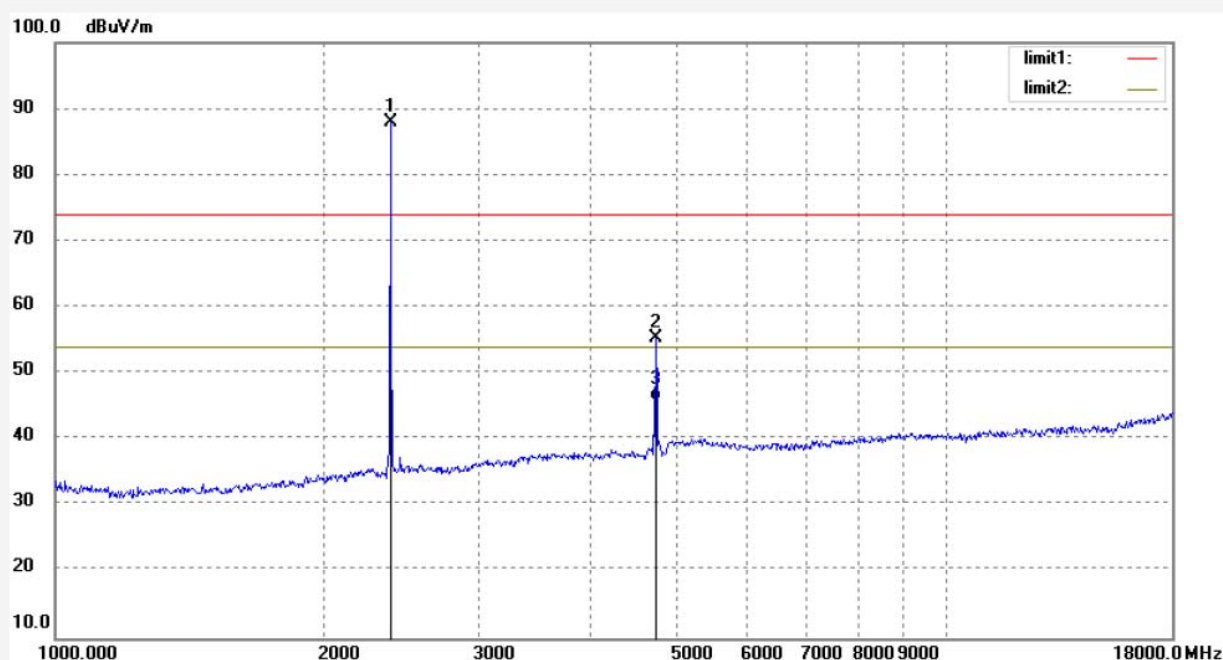
Date: 19/04/18/

Time: 9/33/26

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	94.39	-6.37	88.02			peak	100	222	
2	4804.000	54.70	0.70	55.40	74.00	-18.60	peak	100	326	
3	4804.000	45.30	0.70	46.00	54.00	-8.00	AVG	100	326	



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.: jp2019 #110

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2441MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Horizontal

Power Source: AC 120V/60Hz

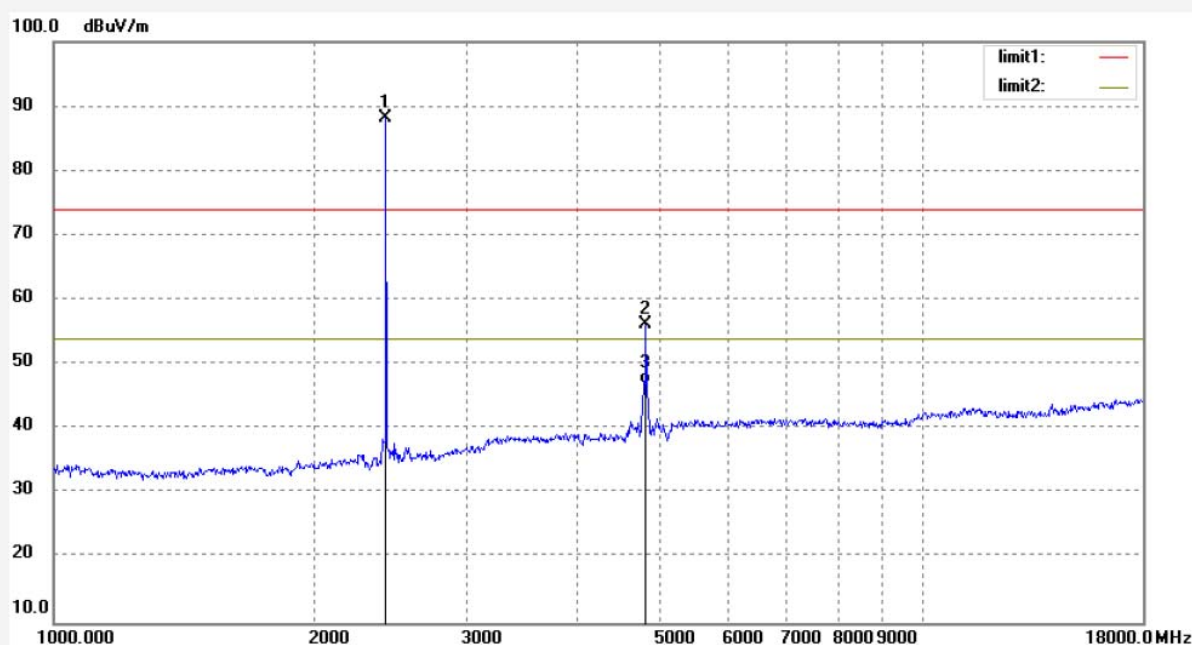
Date: 19/04/18/

Time: 9/35/50

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	94.33	-6.20	88.13			peak	100	110	
2	4882.000	55.25	1.07	56.32	74.00	-17.68	peak	100	75	
3	4882.000	45.93	1.07	47.00	54.00	-7.00	AVG	100	75	



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.: jp2019 #111

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2441MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Vertical

Power Source: AC 120V/60Hz

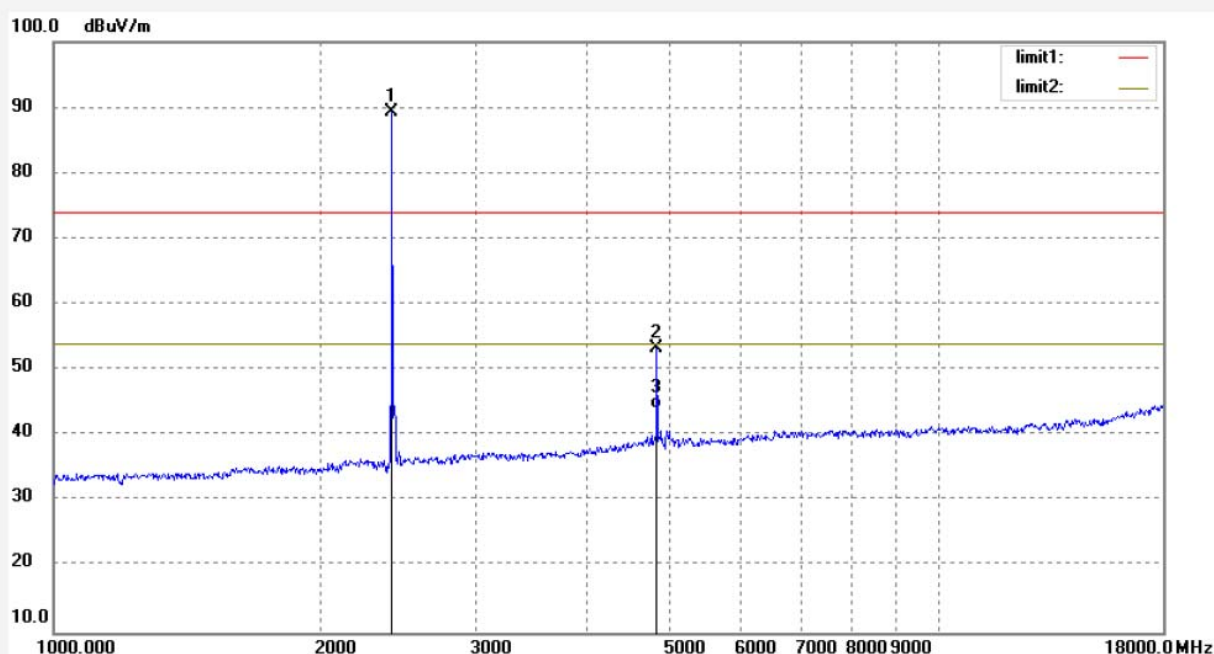
Date: 19/04/18/

Time: 9/38/20

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	95.53	-6.20	89.33			peak	100	321	
2	4882.000	52.15	1.07	53.22	74.00	-20.78	peak	100	136	
3	4882.000	42.93	1.07	44.00	54.00	-10.00	AVG	100	136	



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.: jp2019 #112

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2480MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Vertical

Power Source: AC 120V/60Hz

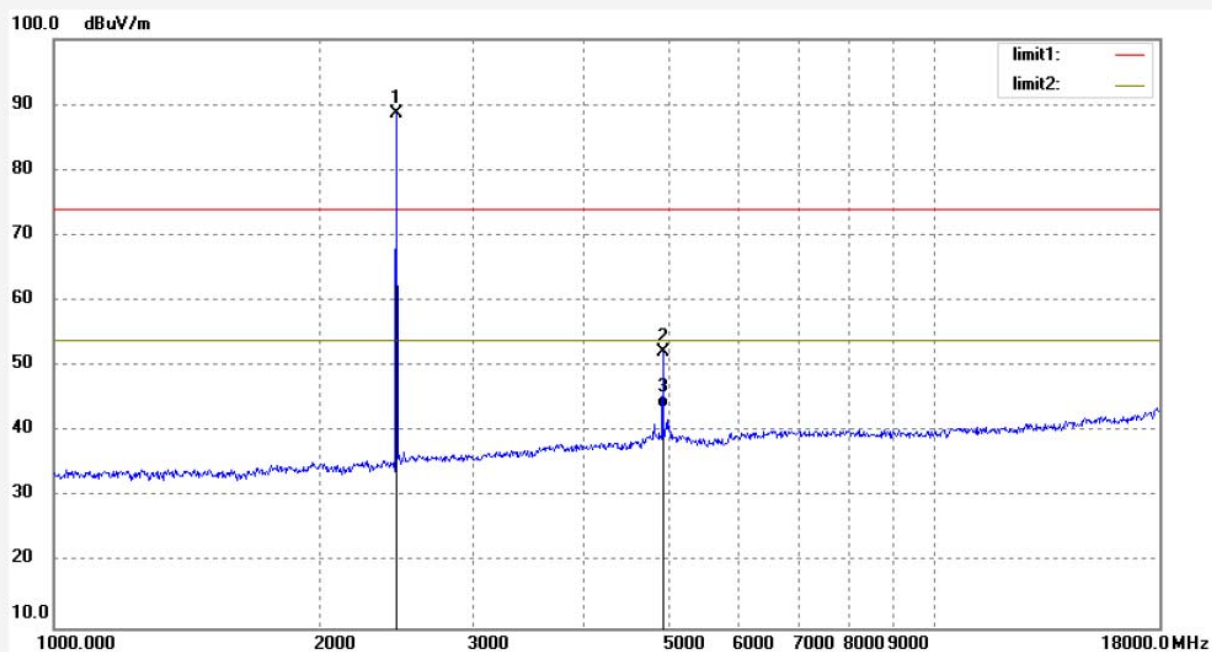
Date: 19/04/18/

Time: 9/41/37

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	94.69	-6.04	88.65			peak	100	211	
2	4960.000	50.61	1.50	52.11	74.00	-21.89	peak	100	146	
3	4960.000	42.10	1.50	43.60	54.00	-10.40	AVG	100	146	

Job No.: jp2019 #113

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2480MHz

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Horizontal

Power Source: AC 120V/60Hz

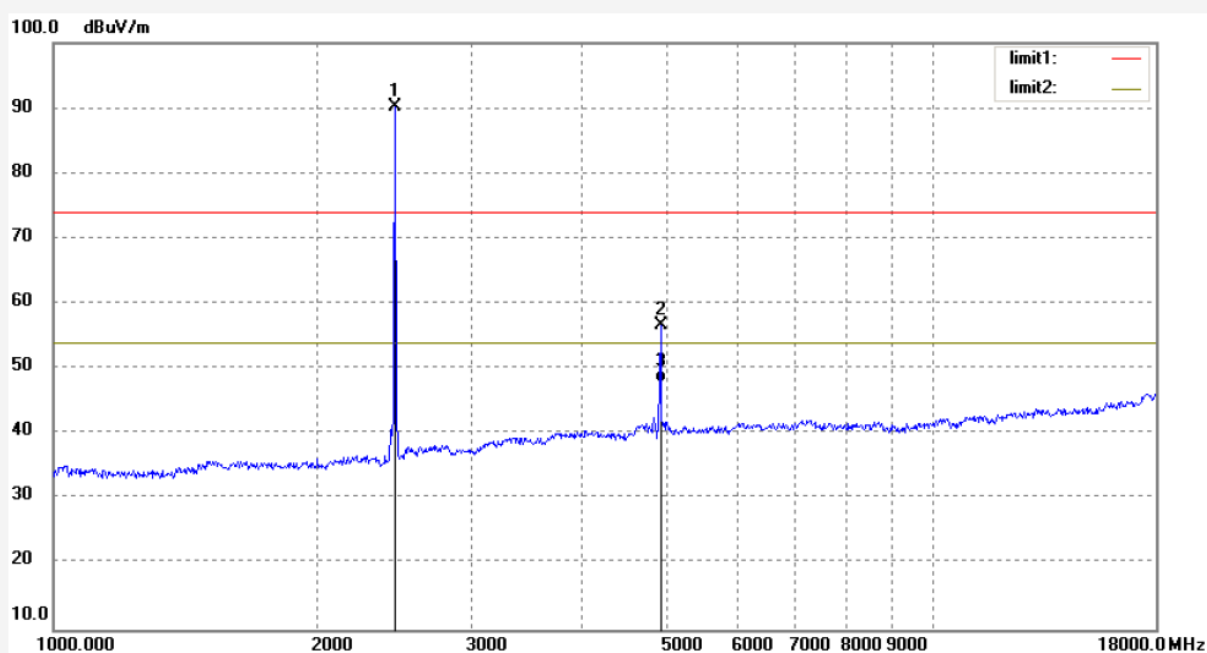
Date: 19/04/18/

Time: 9/44/46

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	96.18	-6.04	90.14			peak	100	263	
2	4960.000	55.22	1.50	56.72	74.00	-17.28	peak	100	136	
3	4960.000	46.50	1.50	48.00	54.00	-6.00	AVG	100	136	

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



11.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

11.3.EUT Configuration on 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 were 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.

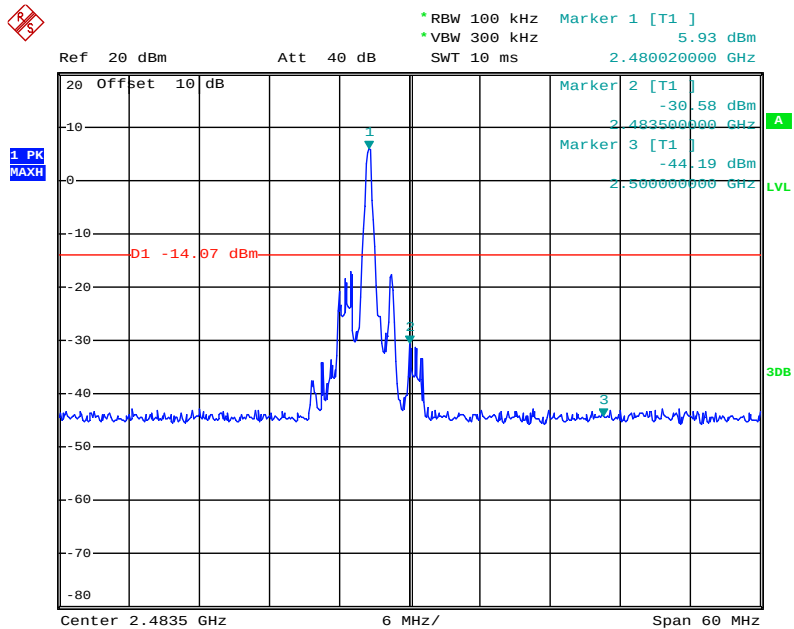
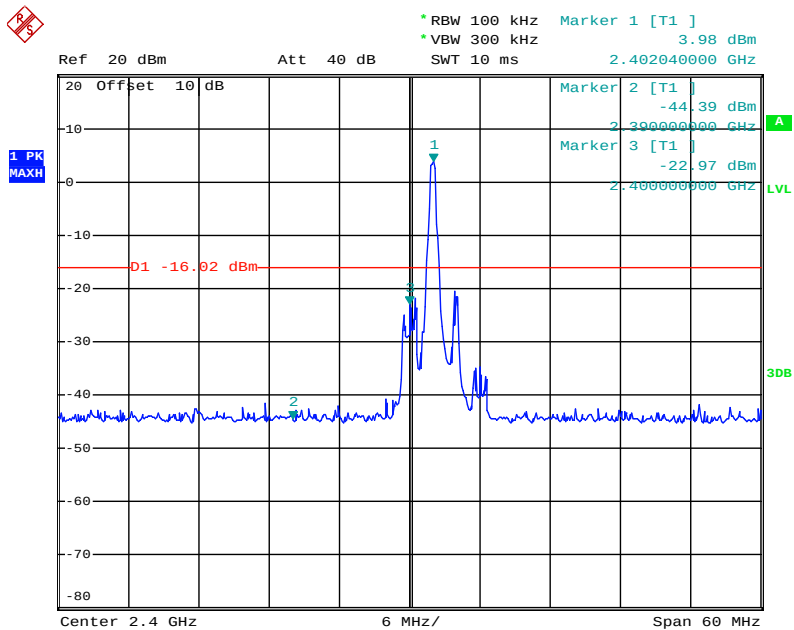
Conducted Band Edge Result

Non-hopping mode

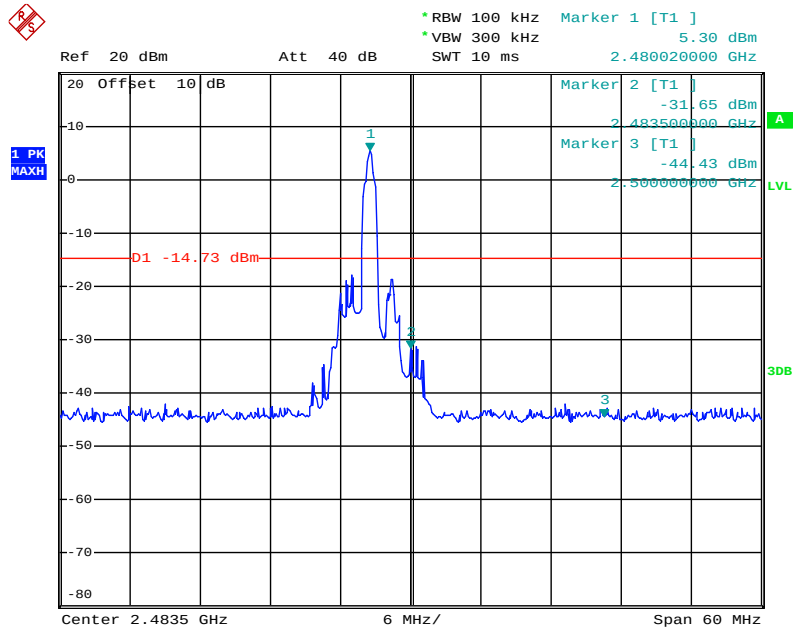
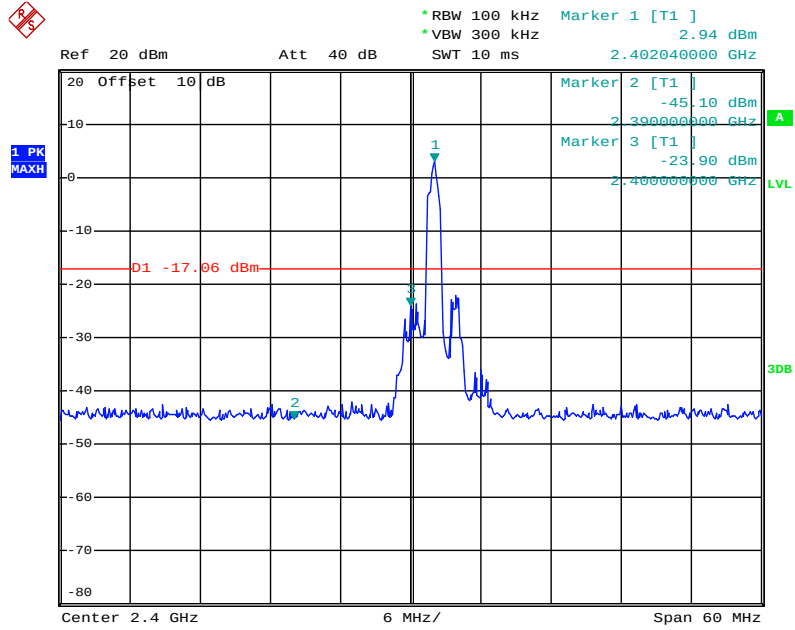
Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)	Result
GFSK Mode			
2400.00	18.99	> 20dBc	Pass
2483.50	24.65	> 20dBc	Pass
Π/4-DQPSK Mode			
2400.00	20.96	> 20dBc	Pass
2483.50	26.35	> 20dBc	Pass
8DPSK Mode			
2400.00	21.23	> 20dBc	Pass
2483.50	25.12	> 20dBc	Pass

The spectrum analyzer plots are attached as below.

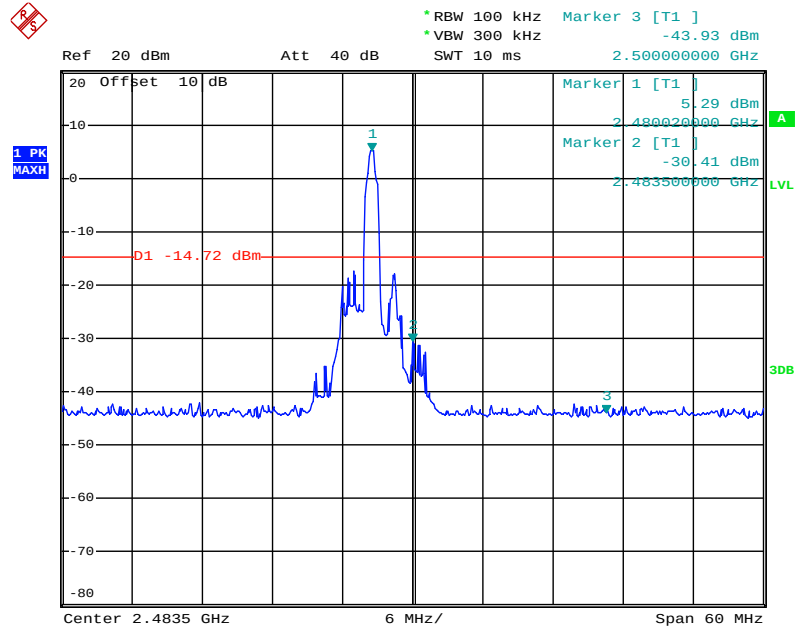
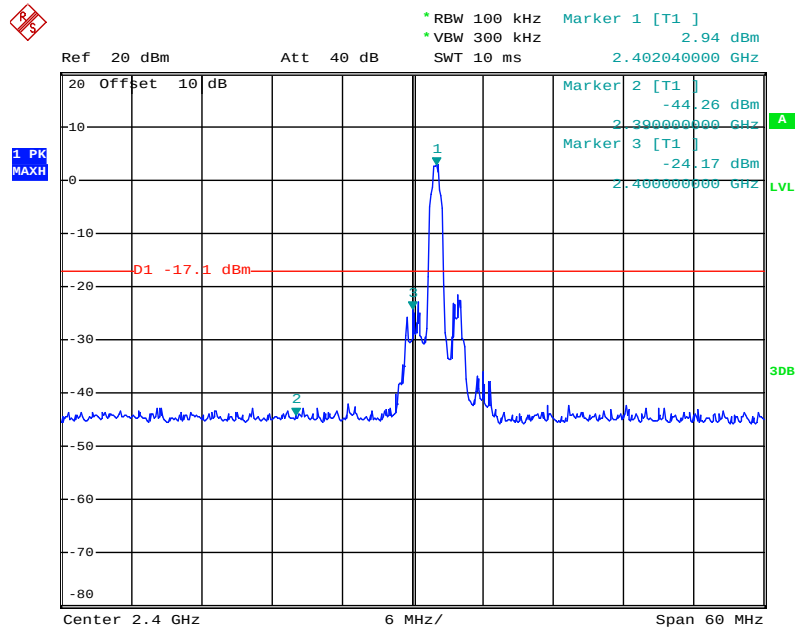
GFSK Mode



$\Pi/4$ -DQPSK Mode



8DPSK Mode



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



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.: jp2019 #117

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2402MHz(GFSK)

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Horizontal

Power Source: AC 120V/60Hz

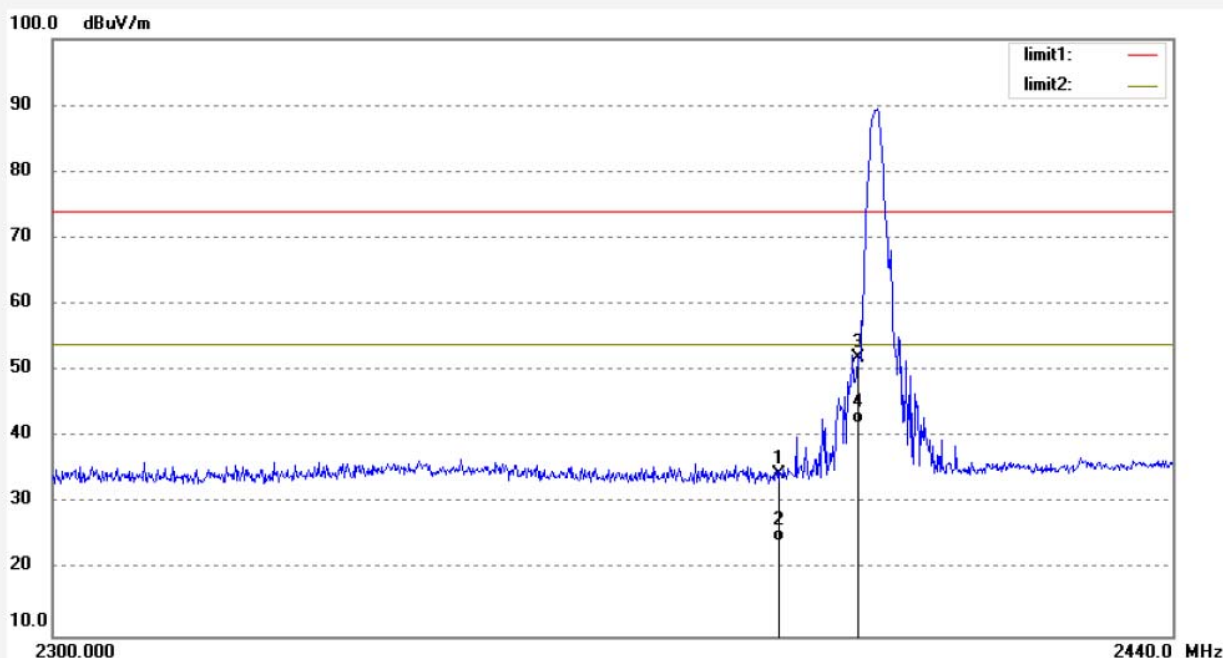
Date: 19/04/18/

Time: 9/56/25

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	40.68	-6.32	34.36	74.00	-39.64	peak	100	245	
2	2390.000	30.62	-6.32	24.30	54.00	-29.70	AVG	100	245	
3	2400.000	58.21	-6.27	51.94	74.00	-22.06	peak	100	196	
4	2400.000	48.27	-6.27	42.00	54.00	-12.00	AVG	100	196	

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



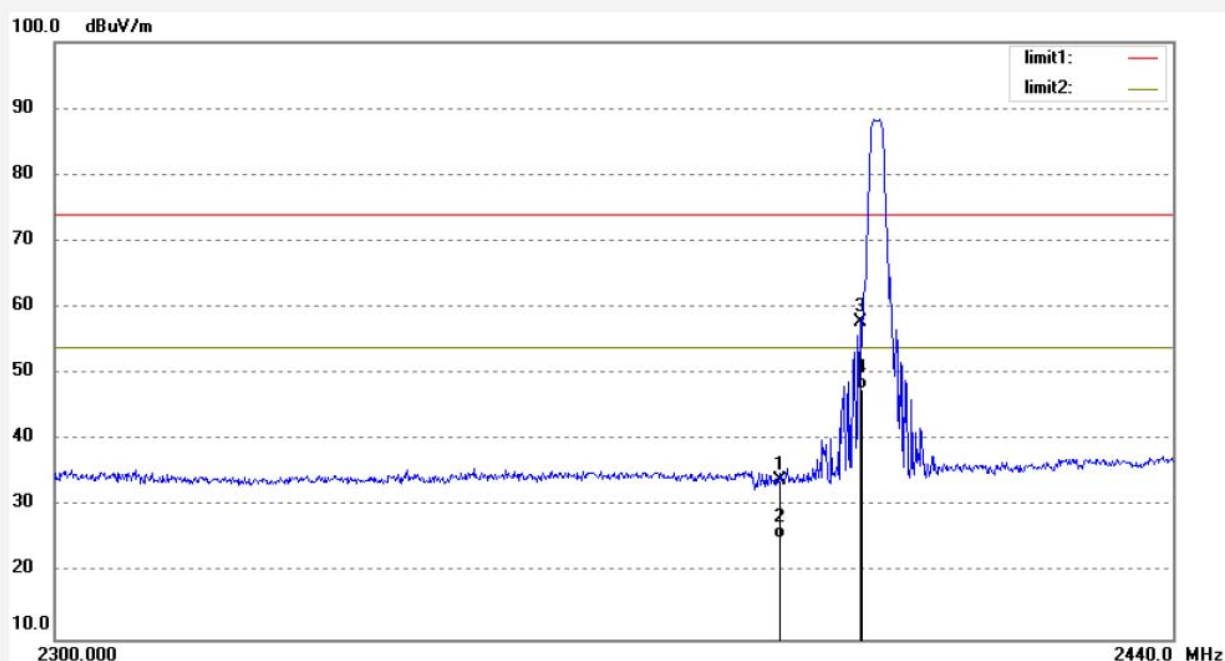
ACCURATE TECHNOLOGY CO., LTD.

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.: jp2019 #116	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/04/18/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/53/53
EUT: Massage Chair	Engineer Signature: Ben
Mode: TX 2402MHz(GFSK)	Distance: 3m
Model: YH8230L INFINITY AURA	
Manufacturer: YIHE	

Note: Report NO.:ATE20190339



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	40.26	-6.32	33.94	74.00	-40.06	peak	100	132	
2	2390.000	31.62	-6.32	25.30	54.00	-28.70	AVG	100	132	
3	2400.000	64.00	-6.27	57.73	74.00	-16.27	peak	100	163	
4	2400.000	54.07	-6.27	47.80	54.00	-6.20	AVG	100	163	

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

Job No.: jp2019 #115

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2480MHz(GFSK)

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Horizontal

Power Source: AC 120V/60Hz

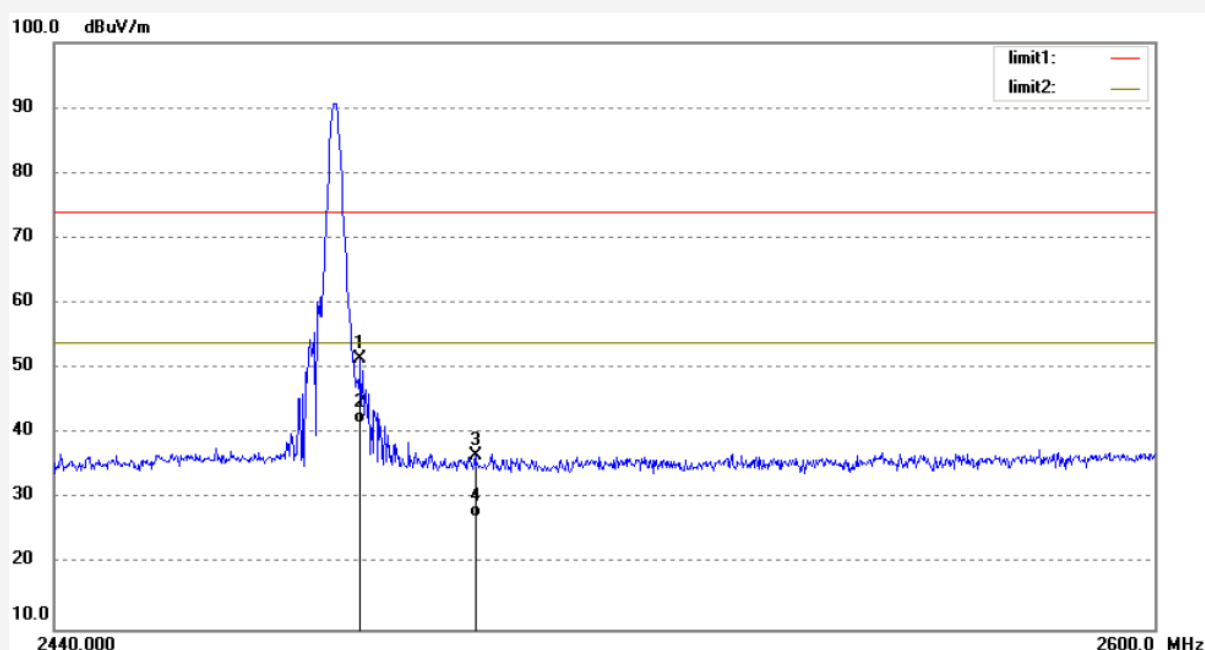
Date: 19/04/18/

Time: 9/50/52

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	57.34	-5.89	51.45	74.00	-22.55	peak	100	103	
2	2483.500	47.59	-5.89	41.70	54.00	-12.30	AVG	100	103	
3	2500.000	42.38	-5.81	36.57	74.00	-37.43	peak	100	123	
4	2500.000	32.91	-5.81	27.10	54.00	-26.90	AVG	100	123	

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.: jp2019 #114

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: TX 2480MHz(GFSK)

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Vertical

Power Source: AC 120V/60Hz

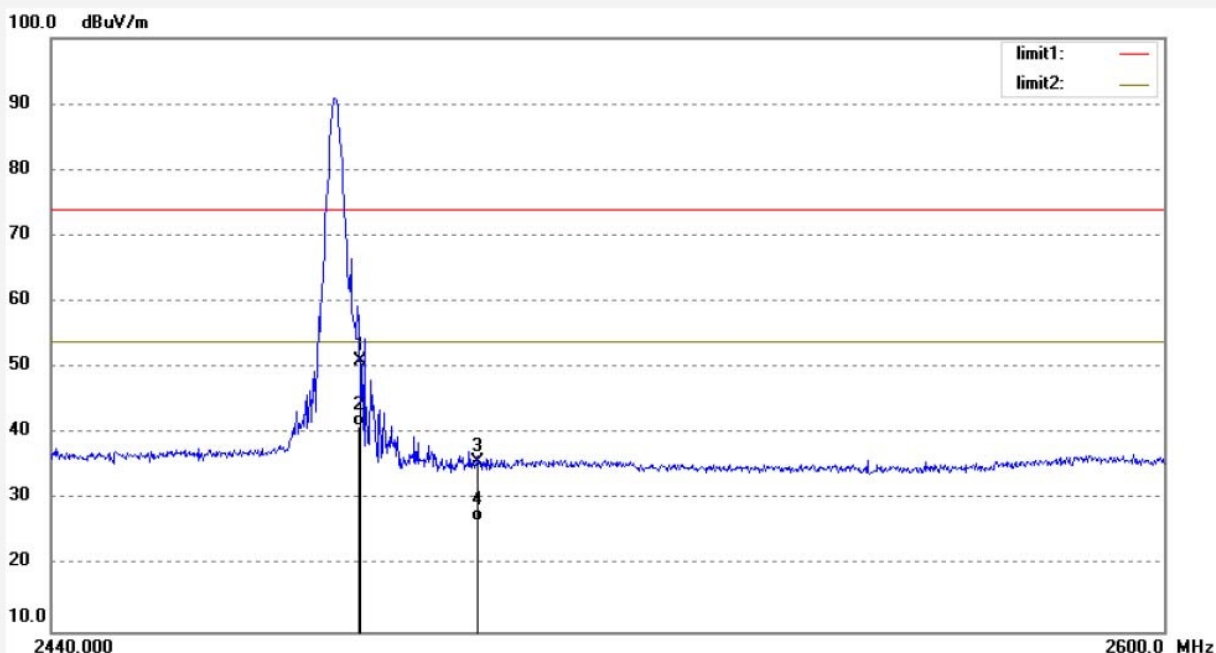
Date: 19/04/18/

Time: 9/47/23

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



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	56.90	-5.89	51.01	74.00	-22.99	peak	100	236	
2	2483.500	46.99	-5.89	41.10	54.00	-12.90	AVG	100	236	
3	2500.000	41.62	-5.81	35.81	74.00	-38.19	peak	100	165	
4	2500.000	32.61	-5.81	26.80	54.00	-27.20	AVG	100	165	

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

Hopping mode



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.: jp2019 #118

Standard: FCC PK

Test item: Radiation Test

Temp.(C)/Hum.(%) 25 C / 55 %

EUT: Massage Chair

Mode: HOPPING(GFSK)

Model: YH8230L INFINITY AURA

Manufacturer: YIHE

Polarization: Horizontal

Power Source: AC 120V/60Hz

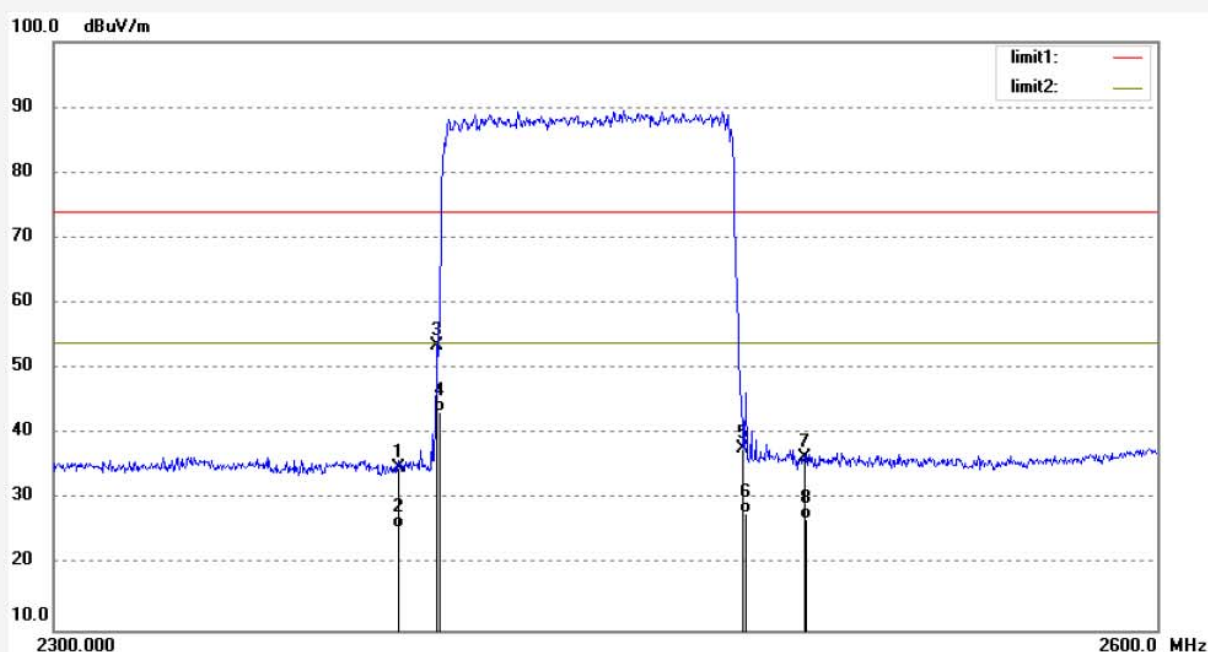
Date: 19/04/18/

Time: 9/59/25

Engineer Signature: Ben

Distance: 3m

Note: Report NO.:ATE20190339



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	41.15	-6.32	34.83	74.00	-39.17	peak	100	213	
2	2390.000	31.92	-6.32	25.60	54.00	-28.40	AVG	100	213	
3	2400.000	59.83	-6.27	53.56	74.00	-20.44	peak	100	176	
4	2400.000	49.67	-6.27	43.40	54.00	-10.60	AVG	100	176	
5	2483.500	43.69	-5.89	37.80	74.00	-36.20	peak	100	136	
6	2483.500	33.89	-5.89	28.00	54.00	-26.00	AVG	100	136	
7	2500.000	42.35	-5.81	36.54	74.00	-37.46	peak	100	96	
8	2500.000	32.81	-5.81	27.00	54.00	-27.00	AVG	100	96	

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



ACCURATE TECHNOLOGY CO., LTD.

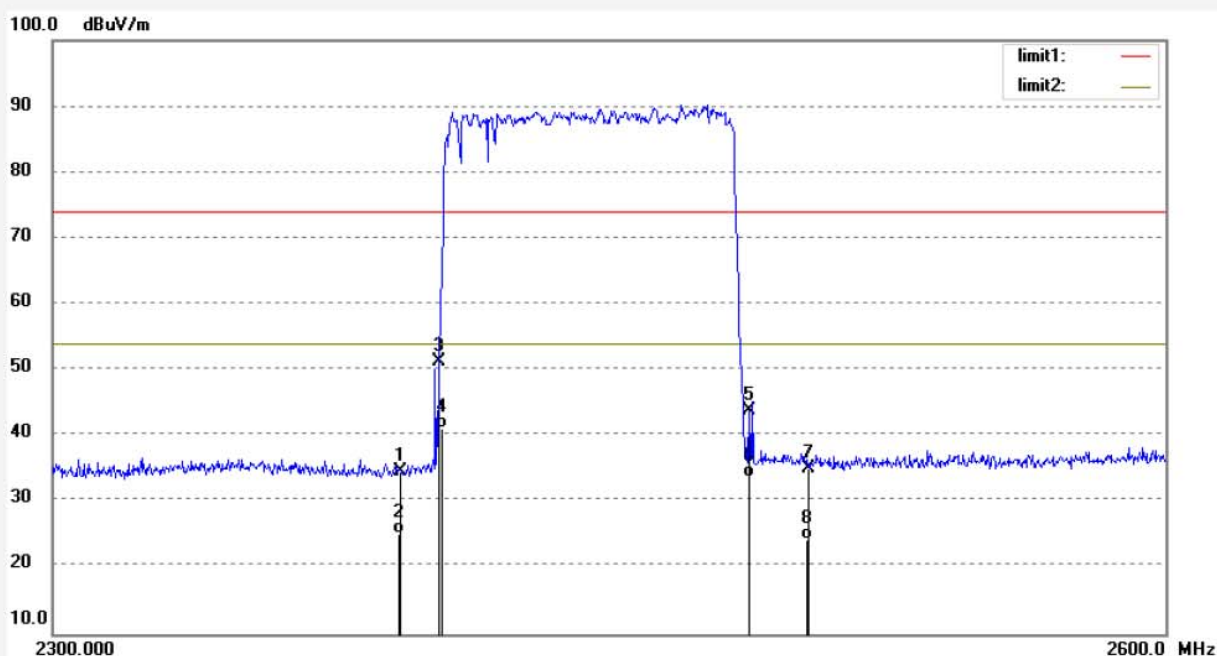
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

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

Job No.: jp2019 #119
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: HOPPING(GFSK)
Model: YH8230L INFINITY AURA
Manufacturer: YIHE

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 19/04/18/
Time: 10/02/37
Engineer Signature: Ben
Distance: 3m

Note: Report NO.:ATE20190339



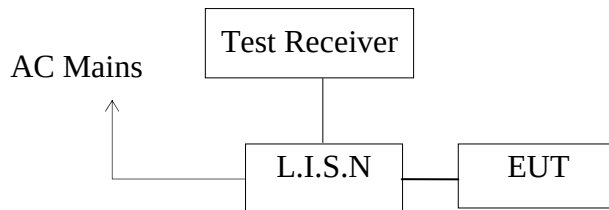
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	41.03	-6.32	34.71	74.00	-39.29	peak	100	85	
2	2390.000	31.62	-6.32	25.30	54.00	-28.70	AVG	100	85	
3	2400.000	57.64	-6.27	51.37	74.00	-22.63	peak	100	193	
4	2400.000	47.37	-6.27	41.10	54.00	-12.90	AVG	100	193	
5	2483.500	49.80	-5.89	43.91	74.00	-30.09	peak	100	295	
6	2483.500	39.69	-5.89	33.80	54.00	-20.20	AVG	100	295	
7	2500.000	40.87	-5.81	35.06	74.00	-38.94	peak	100	236	
8	2500.000	30.21	-5.81	24.40	54.00	-29.60	AVG	100	236	

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

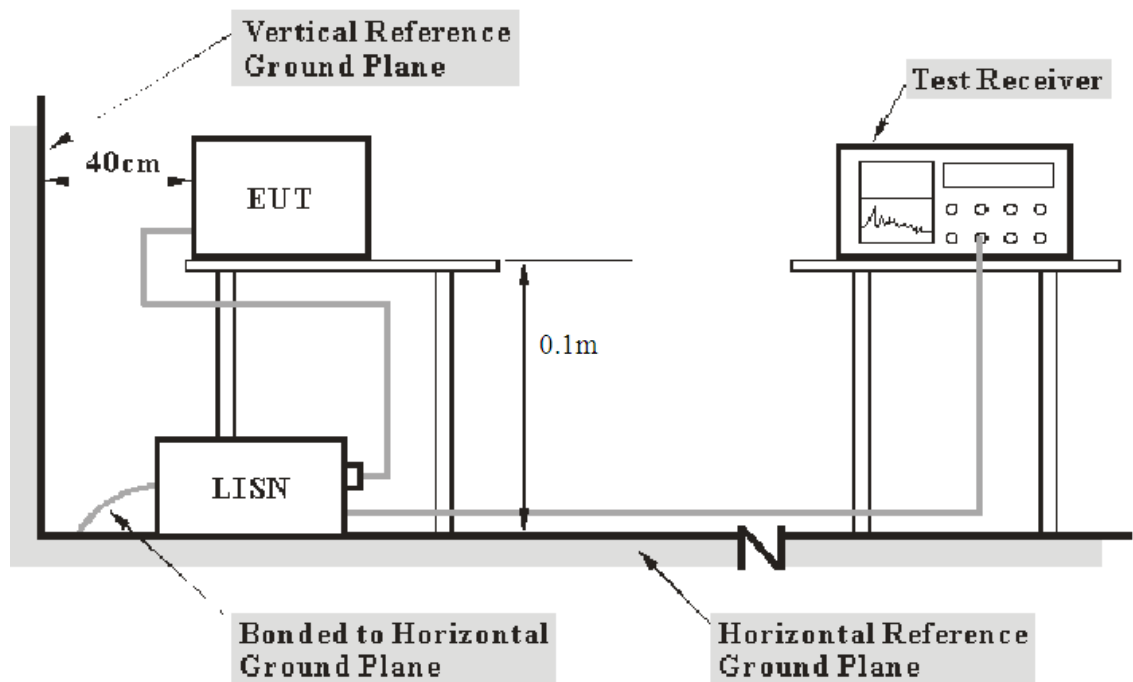
12.AC POWER LINE CONDUCTED EMISSION TEST

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(μ V)	
	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 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.

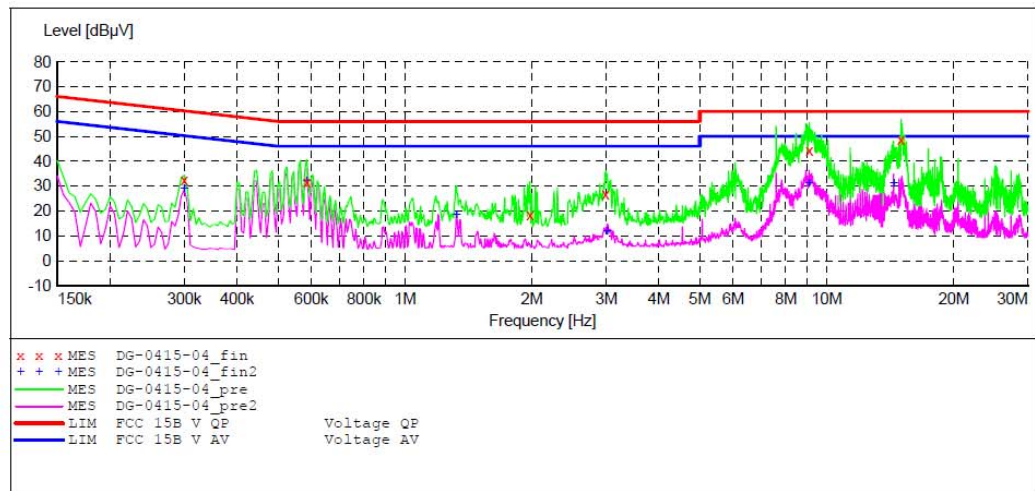
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Massage Chair M/N:YH8230L INFINITY AURA
 Manufacturer: YIHE
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: Ben
 Test Specification: L 120V/60Hz
 Comment: Report NO.:ATE20190339
 Start of Test: 4/15/2019 / 11:12:20AM

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

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "DG-0415-04_fin"

4/15/2019 11:15AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.300000	32.60	10.6	60	27.6	QP	L1	GND
0.585000	31.30	10.7	56	24.7	QP	L1	GND
1.980000	18.30	11.0	56	37.7	QP	L1	GND
2.990000	26.50	11.1	56	29.5	QP	L1	GND
9.110000	44.30	11.3	60	15.7	QP	L1	GND
15.025000	48.50	11.4	60	11.5	QP	L1	GND

MEASUREMENT RESULT: "DG-0415-04_fin2"

4/15/2019 11:15AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.300000	28.80	10.6	50	21.4	AV	L1	GND
0.585000	32.10	10.7	46	13.9	AV	L1	GND
1.325000	18.60	10.9	46	27.4	AV	L1	GND
3.020000	11.70	11.1	46	34.3	AV	L1	GND
9.090000	30.90	11.3	50	19.1	AV	L1	GND
14.425000	30.90	11.4	50	19.1	AV	L1	GND

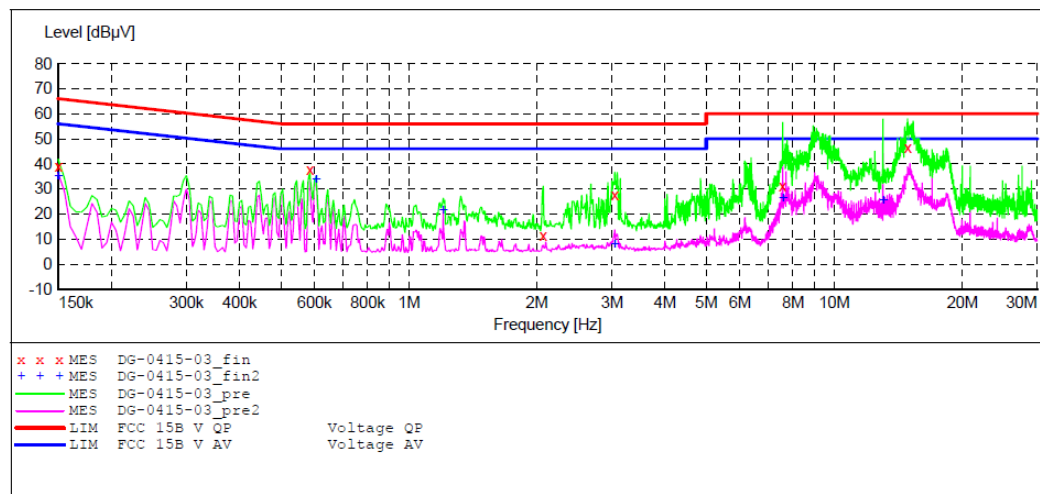
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Massage Chair M/N:YH8230L INFINITY AURA
 Manufacturer: YIHE
 Operating Condition: BT Communication
 Test Site: 1#Shielding Room
 Operator: Ben
 Test Specification: N 120V/60Hz
 Comment: Report NO.:ATE20190339
 Start of Test: 4/15/2019 / 11:08:11AM

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

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "DG-0415-03_fin"

4/15/2019 11:11AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	38.90	10.5	66	27.1	QP	N	GND
0.585000	37.70	10.7	56	18.3	QP	N	GND
2.070000	11.10	11.0	56	44.9	QP	N	GND
3.050000	27.40	11.1	56	28.6	QP	N	GND
7.570000	31.00	11.2	60	29.0	QP	N	GND
14.890000	46.30	11.4	60	13.7	QP	N	GND

MEASUREMENT RESULT: "DG-0415-03_fin2"

4/15/2019 11:11AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	35.10	10.5	56	20.9	AV	N	GND
0.605000	33.70	10.7	46	12.3	AV	N	GND
1.205000	21.50	10.9	46	24.5	AV	N	GND
3.050000	7.90	11.1	46	38.1	AV	N	GND
7.570000	26.40	11.2	50	23.6	AV	N	GND
13.030000	25.50	11.3	50	24.5	AV	N	GND

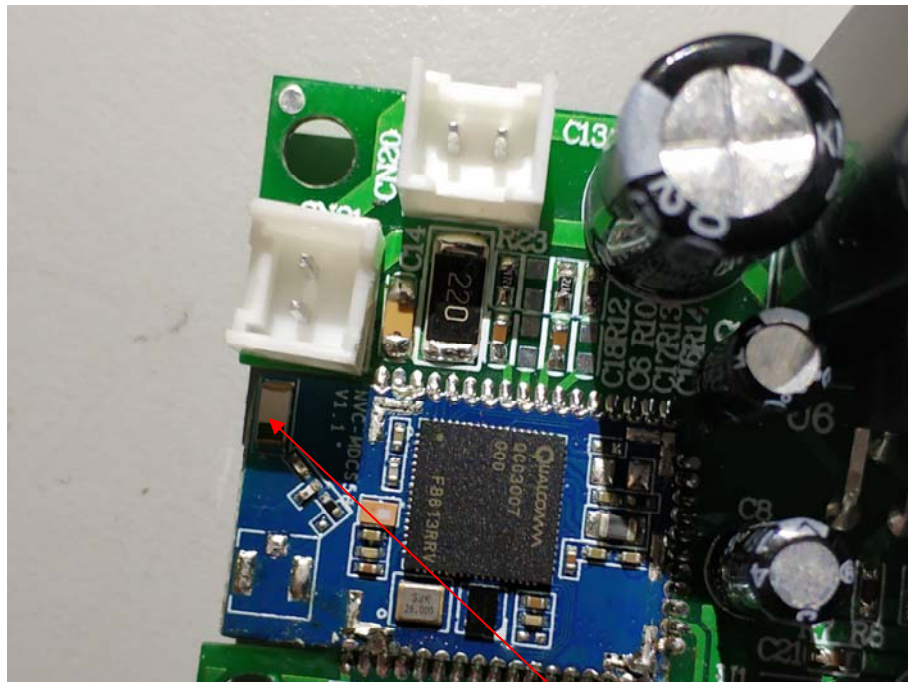
13.ANTENNA REQUIREMENT

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 *****