APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
Xiamen Annmacare Science & Technology Co., Ltd.

Massage Chair

Model No.: Signature 3D

FCC ID: 2ANXT-9600

Prepared for	:	Xiamen Annmacare Science & Technology Co., Ltd.
Address	:	1-5/F, No.112 Siming Industrial Park, Tong'an Industrial Concentration Zone, Xiamen, Fujian, China, 361199.
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
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Report No.	:	ATE20171986
Date of Test	:	Sep. 26, 2017-Oct. 15, 2017
Date of Report	:	Oct. 16, 2017

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Test Report Certification

Applicant	:	Xiamen Annmacare Science & Technology Co., Ltd.
Address	:	1-5/F, No.112 Siming Industrial Park, Tong'an Industrial Concentration Zone, Xiamen, Fujian, China, 361199
Manufacturer	:	Xiamen Annmacare Science & Technology Co., Ltd.
Address	:	1-5/F, No.112 Siming Industrial Park, Tong'an Industrial Concentration Zone, Xiamen, Fujian, China, 361199
Product	:	Massage Chair
Model No.	:	Signature 3D
Trade name	:	Brookstone

Measurement Procedure Used:

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

The EUT was tested according to DTS test procedure of Apr 05, 2017 KDB558074 D01 DTS Meas Guidance v04 for compliance to FCC 47CFR 15.247 requirements

The device described above is tested by 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 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 ACCURATE TECHNOLOGY CO. LTD.

Date of Test : Sep. 26, 2017-Oct. 15, 2017
Date of Report: Oct. 16, 2017

Prepared by : (Tim Zhang, Engineer)

Approved & Authorized Signer : (Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Massage Chair
Model Number	:	Signature 3D
Bluetooth version	:	BT V4.0 LE
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	40
Antenna Gain	:	0dBi
Antenna type	:	PCB Antenna
Power Supply	:	AC 120V/60Hz
Modulation mode	:	GFSK
Applicant	:	Xiamen Annmacare Science & Technology Co., Ltd.
Address	:	1-5/F, No.112 Siming Industrial Park, Tong'an Industrial Concentration Zone, Xiamen, Fujian, China, 361199
Manufacturer	:	Xiamen Annmacare Science & Technology Co., Ltd.
Address	:	1-5/F, No.112 Siming Industrial Park, Tong'an Industrial Concentration Zone, Xiamen, Fujian, China, 361199
Date of sample received	:	Sep. 26, 2017
Date of Test	:	Sep. 26, 2017-Oct. 15, 2017

1.2.Carrier Frequency of Channels

Channel	Frequceny (MHz)	Channel	Frequceny (MHz)	Channel	Frequceny (MHz)	Channe l	Frequceny (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

1.3.Special Accessory and Auxiliary Equipment

PC	Manufacturer: LENOVO M/N: 4290-RT8 S/N: R9-FW93G 11/08

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. 07, 2017	Jan. 06, 2018
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 07, 2017	Jan. 06, 2018
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 07, 2017	Jan. 06, 2018
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 07, 2017	Jan. 06, 2018
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 07, 2017	Jan. 06, 2018
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 13, 2017	Jan. 12, 2018
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 13, 2017	Jan. 12, 2018
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 13, 2017	Jan. 12, 2018
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 13, 2017	Jan. 12, 2018
Open Switch and Control Unit	Rohde&Schwarz	OSP120 + OSP-B157	101244 + 100866	Jan. 07, 2017	Jan. 06, 2018
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 07, 2017	Jan. 06, 2018
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 07, 2017	Jan. 06, 2018
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 07, 2017	Jan. 06, 2018
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 07, 2017	Jan. 06, 2018

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **BLE Transmitting mode**
Low Channel: 2402MHz
Middle Channel: 2440MHz
High Channel: 2480MHz

3.2.Configuration and peripherals

EUT

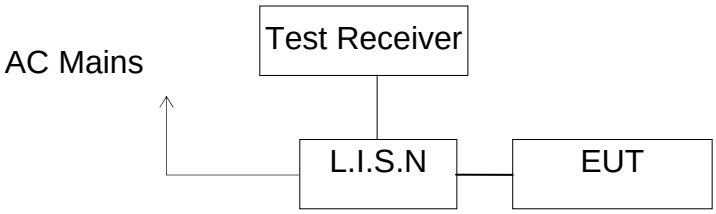
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.247(a)(2)	6dB Bandwidth Test	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
Section 15.247(b)(3)	Maximum Peak Output Power Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.247(d) Section 15.209	Radiated Spurious Emission Test	Compliant
Section 15.247(d)	Conducted Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. POWER LINE CONDUCTED MEASUREMENT

5.1.Block Diagram of Test Setup



(EUT: Massage Chair)

5.2.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.		

5.3.Configuration of EUT on Measurement

The following 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.

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 test mode and measure it.

5.5.Test Procedure

The EUT is put on the plane 0.8 m 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.

5.6.DATA SAMPLE

Frequency (MHz)	Quasi Peak Level (dBμv)	Average Level (dBμv)	Transducer value (dB)	QuasiPeak Result (dBμv)	Average Result (dBμv)	Quasi Peak Limit (dBμv)	Average Limit (dBμv)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	29.4	18.3	11.1	40.5	29.4	56.0	56.0	15.5	16.6	Pass

Transducer value = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Level/Average Level + Transducer value
Limit = Limit stated in standard

Calculation Formula:

Margin = Limit – Reading level value – Transducer value

5.7.Power Line Conducted Emission Measurement Results

PASS.

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

Test mode : BT Operation(worse case)
Test Voltage: 120V/60Hz

MEASUREMENT RESULT: "1985-1_fin"

10/13/2017 3:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	30.30	10.6	59	28.4	QP	L1	GND
0.620000	46.30	10.8	56	9.7	QP	L1	GND
1.130000	36.40	10.9	56	19.6	QP	L1	GND
2.370000	35.20	11.0	56	20.8	QP	L1	GND
7.920000	38.20	11.2	60	21.8	QP	L1	GND
21.475000	27.50	11.4	60	32.5	QP	L1	GND

MEASUREMENT RESULT: "1985-1_fin2"

10/13/2017 3:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	20.70	10.6	49	28.0	AV	L1	GND
0.620000	37.60	10.8	46	8.4	AV	L1	GND
0.940000	25.40	10.8	46	20.6	AV	L1	GND
3.000000	24.00	11.1	46	22.0	AV	L1	GND
7.920000	30.90	11.2	50	19.1	AV	L1	GND
24.880000	21.40	11.5	50	28.6	AV	L1	GND

MEASUREMENT RESULT: "1985-2_fin"

10/13/2017 3:52PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	30.20	10.6	59	28.5	QP	N	GND
0.645000	40.60	10.8	56	15.4	QP	N	GND
0.925000	35.60	10.8	56	20.4	QP	N	GND
2.230000	33.90	11.0	56	22.1	QP	N	GND
7.920000	38.30	11.2	60	21.7	QP	N	GND
24.910000	29.00	11.5	60	31.0	QP	N	GND

MEASUREMENT RESULT: "1985-2_fin2"

10/13/2017 3:52PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	20.70	10.6	49	28.0	AV	N	GND
0.645000	31.00	10.8	46	15.0	AV	N	GND
0.925000	25.00	10.8	46	21.0	AV	N	GND
2.240000	24.20	11.0	46	21.8	AV	N	GND
7.920000	30.90	11.2	50	19.1	AV	N	GND
24.910000	23.10	11.5	50	26.9	AV	N	GND

Emissions attenuated more than 20 dB below the permissible value are not reported.
The spectral diagrams are attached as below.

ACCURATE TECHNOLOGY CO.,LTD

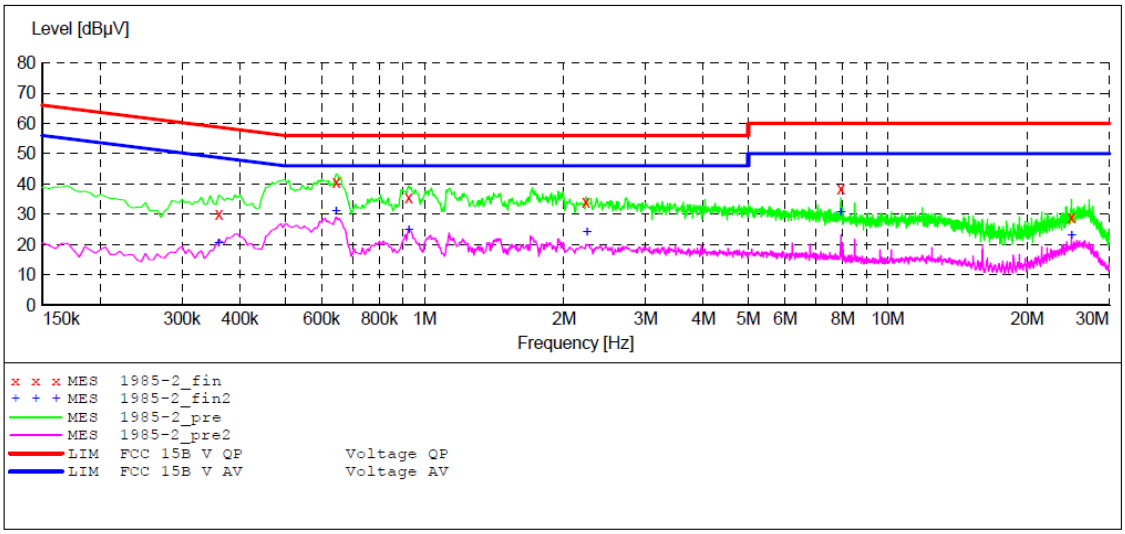
CONDUCTED EMISSION STANDARD FCC PART 15B

EUT: Massage Chair M/N:Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co.,Ltd
Operating Condition: BT OPERATION
Test Site: 1#Shielding Room
Operator: Frank
Test Specification: N 120V/60Hz
Comment: Report NO.:ATE20171985
Start of Test: 10/13/2017 / 3:51:18PM

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: "1985-2_fin"

10/13/2017 3:52PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	30.20	10.6	59	28.5	QP	N	GND
0.645000	40.60	10.8	56	15.4	QP	N	GND
0.925000	35.60	10.8	56	20.4	QP	N	GND
2.230000	33.90	11.0	56	22.1	QP	N	GND
7.920000	38.30	11.2	60	21.7	QP	N	GND
24.910000	29.00	11.5	60	31.0	QP	N	GND

MEASUREMENT RESULT: "1985-2_fin2"

10/13/2017 3:52PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	20.70	10.6	49	28.0	AV	N	GND
0.645000	31.00	10.8	46	15.0	AV	N	GND
0.925000	25.00	10.8	46	21.0	AV	N	GND
2.240000	24.20	11.0	46	21.8	AV	N	GND
7.920000	30.90	11.2	50	19.1	AV	N	GND
24.910000	23.10	11.5	50	26.9	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

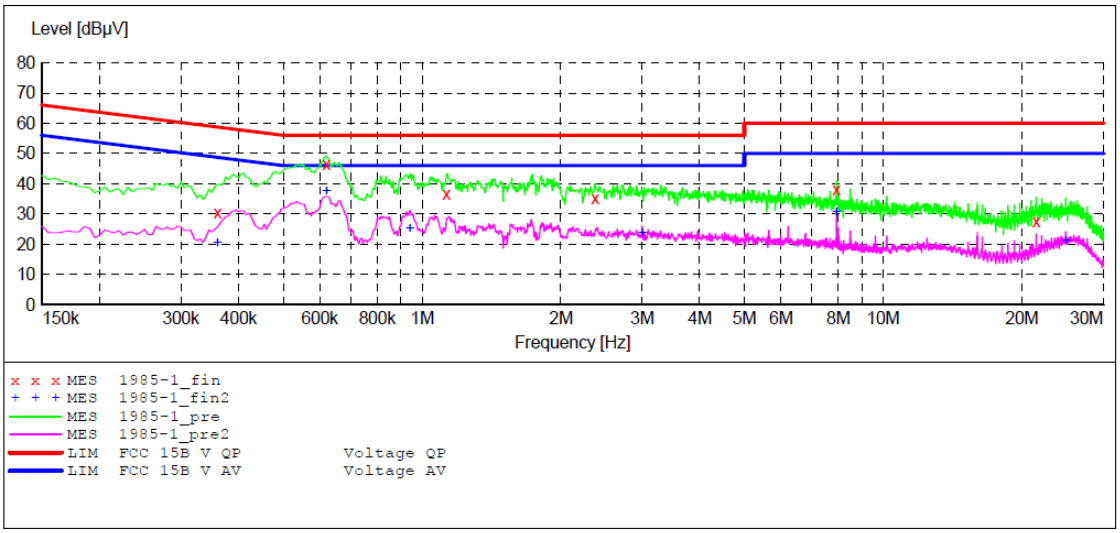
CONDUCTED EMISSION STANDARD FCC PART 15B

```
EUT:                    Massage Chair   M/N:Signature   3D
Manufacturer:           Xiamen Annmacare Science & Technology Co.,Ltd
Operating Condition:    BT OPERATION
Test Site:              1#Shielding Room
Operator:               Frank
Test Specification:     L  120V/60Hz
Comment:                Report NO.:ATE20171985
Start of Test:          10/13/2017 / 3:49:53PM
```

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

Short Description: SUB STD VTERM2 1.70

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



MEASUREMENT RESULT: "1985-1_fin"

10/13/2017 3:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	30.30	10.6	59	28.4	QP	L1	GND
0.620000	46.30	10.8	56	9.7	QP	L1	GND
1.130000	36.40	10.9	56	19.6	QP	L1	GND
2.370000	35.20	11.0	56	20.8	QP	L1	GND
7.920000	38.20	11.2	60	21.8	QP	L1	GND
21.475000	27.50	11.4	60	32.5	QP	L1	GND

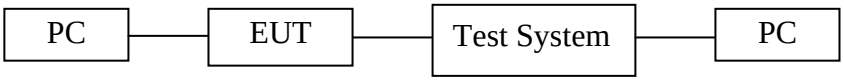
MEASUREMENT RESULT: "1985-1_fin2"

10/13/2017 3:50PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	20.70	10.6	49	28.0	AV	L1	GND
0.620000	37.60	10.8	46	8.4	AV	L1	GND
0.940000	25.40	10.8	46	20.6	AV	L1	GND
3.000000	24.00	11.1	46	22.0	AV	L1	GND
7.920000	30.90	11.2	50	19.1	AV	L1	GND
24.880000	21.40	11.5	50	28.6	AV	L1	GND

6. 6DB BANDWIDTH MEASUREMENT

6.1.Block Diagram of Test Setup



(EUT: Massage Chair)

6.2.The Requirement For Section 15.247(a)(2)

Section 15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.3.EUT Configuration on Measurement

The equipment is 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 modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, 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 100 kHz and VBW to 300 kHz.

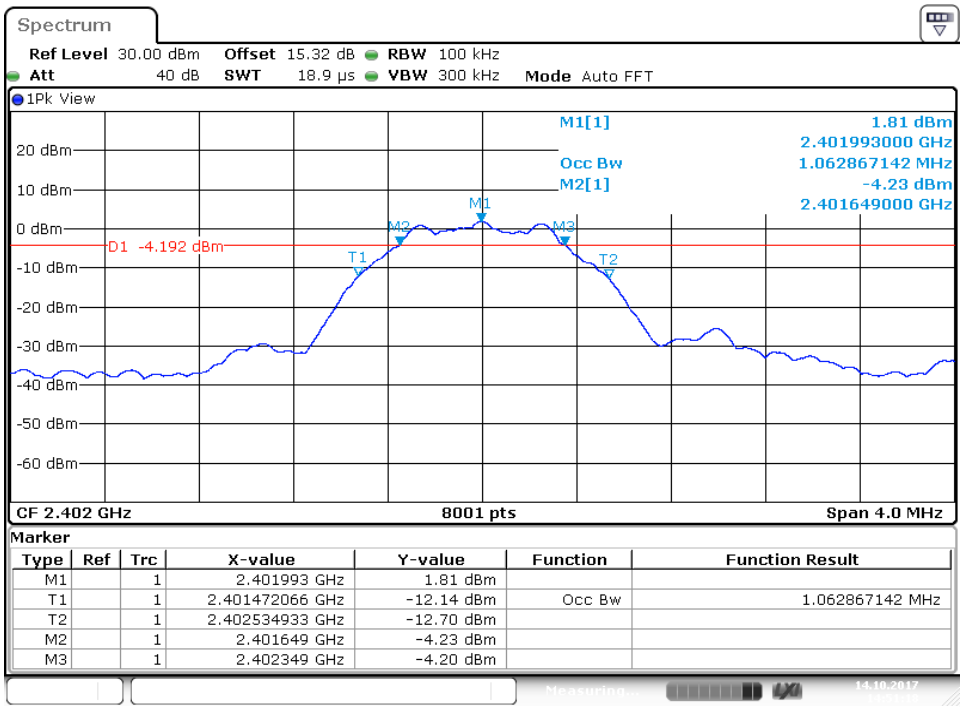
6.5.3.The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

6.6.Test Result

Channel	Frequency (MHz)	6 dB Bandwith (MHz)	Minimum Limit(MHz)	PASS/FAIL
0	2402	0.700	0.5	PASS
19	2440	0.698	0.5	PASS
39	2480	0.698	0.5	PASS

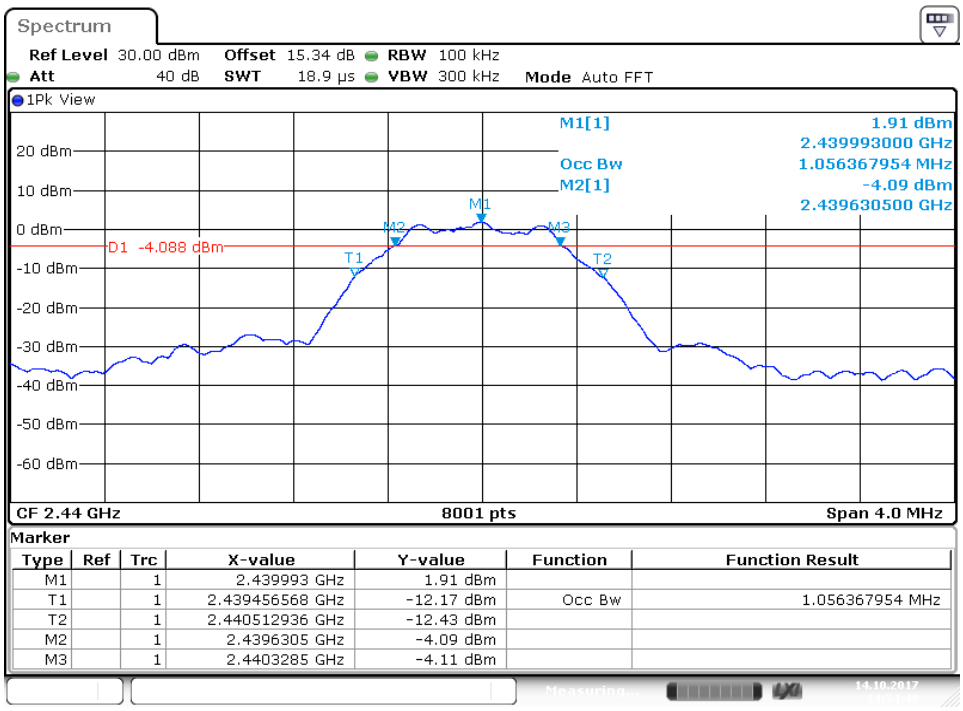
The spectrum analyzer plots are attached as below.

channel 0



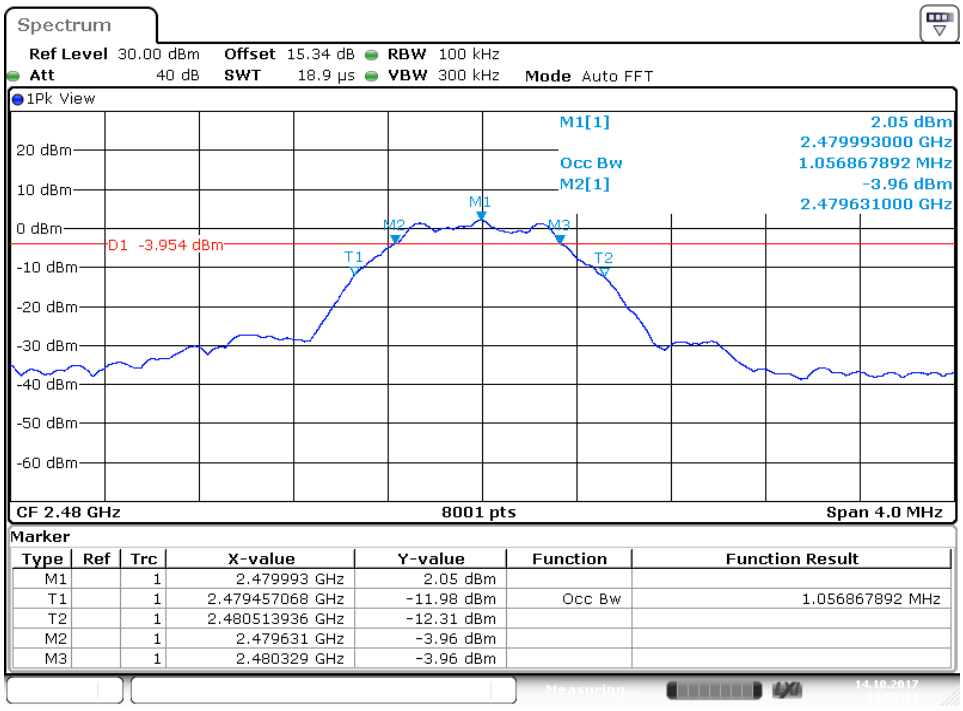
Date: 14.OCT.2017 14:51:18

channel 19



Date: 14.OCT.2017 14:54:47

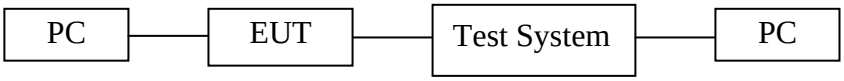
channel 39



Date: 14.OCT.2017 14:58:01

7. MAXIMUM PEAK OUTPUT POWER

7.1.Block Diagram of Test Setup



(EUT: Massage Chair)

7.2.The Requirement For Section 15.247(b)(3)

Section 15.247(b)(3): For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt.

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 modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

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 RBW of spectrum analyzer to 1 MHz and VBW to 3 MHz.

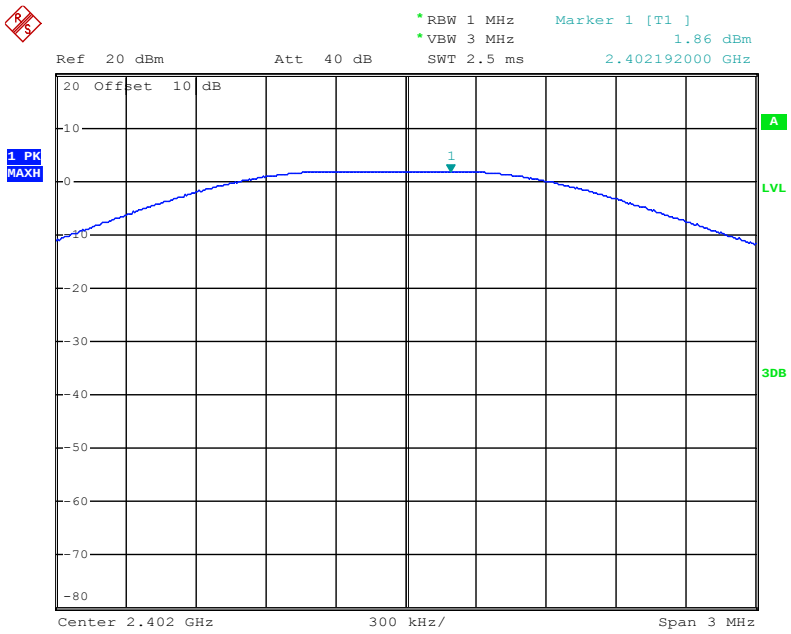
7.5.3.Measurement the maximum peak output power.

7.6.Test Result

Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Limit (dBm)	Pass / Fail
0	2402	1.86	30	PASS
19	2440	1.95	30	PASS
39	2480	1.91	30	PASS

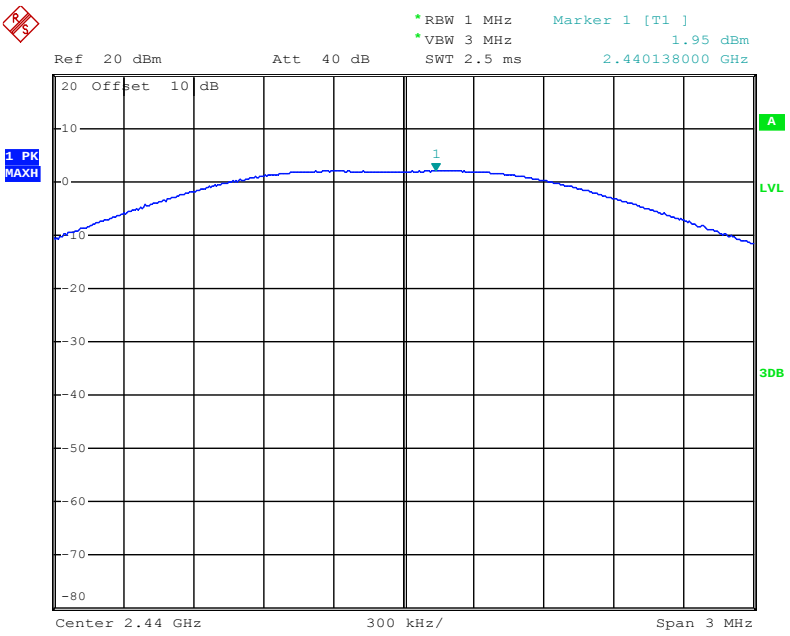
The spectrum analyzer plots are attached as below.

channel 0



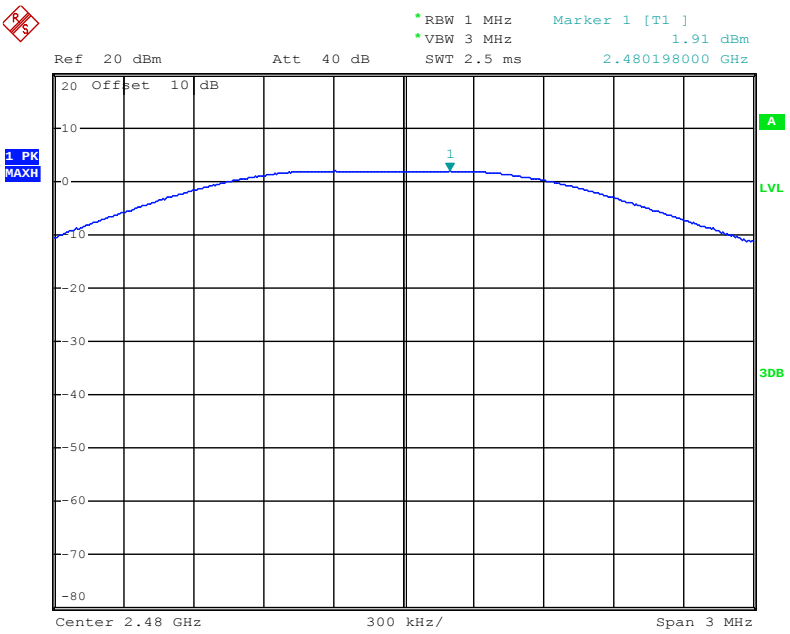
Date: 29.SEP.2017 09:34:50

channel 19



Date: 29.SEP.2017 09:35:29

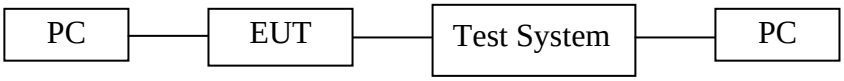
channel 39



Date: 29.SEP.2017 09:36:52

8. POWER SPECTRAL DENSITY MEASUREMENT

8.1.Block Diagram of Test Setup



(EUT: Massage Chair)

8.2.The Requirement For Section 15.247(e)

Section 15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

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 modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, 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.Measurement Procedure PKPSD:

8.5.3.This procedure must be used if maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit, and is optional if the maximum (average) conducted output power was used to demonstrate compliance.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat.

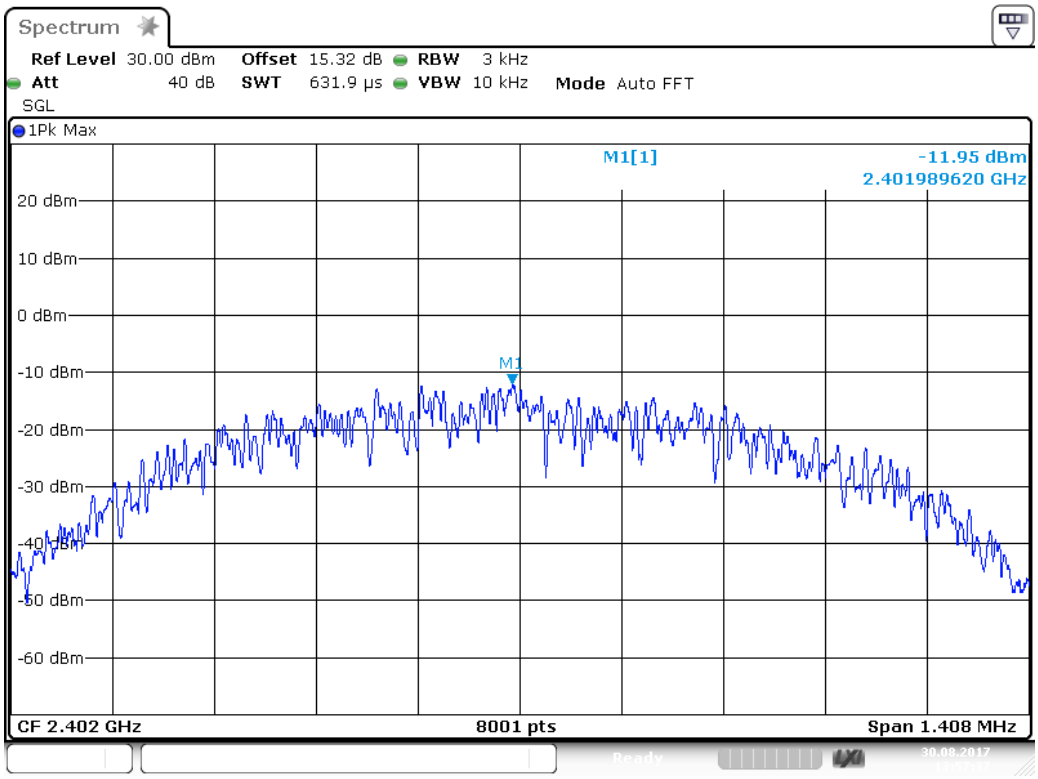
8.5.4.Measurement the maximum power spectral density.

8.6.Test Result

CHANNEL NUMBER	FREQUENCY (MHz)	PSD (dBm/3KHz)	LIMIT (dBm/3KHz)	PASS/FAIL
0	2402	-11.95	8	PASS
19	2440	-11.81	8	PASS
39	2480	-11.70	8	PASS

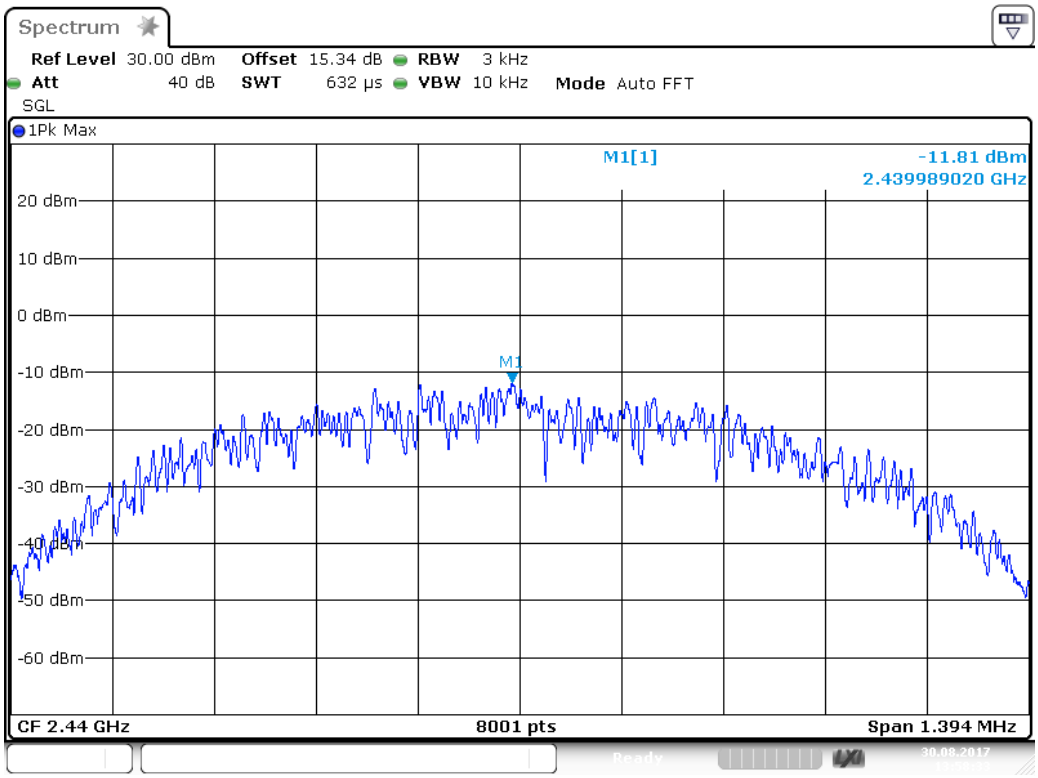
The spectrum analyzer plots are attached as below.

channel 0



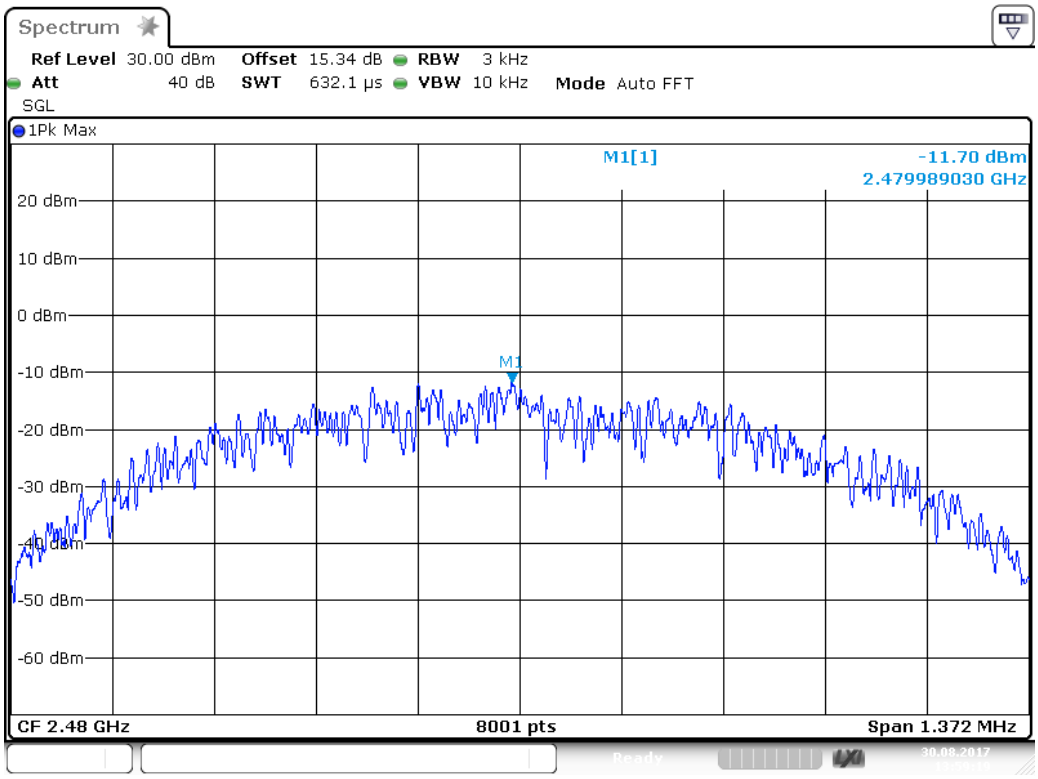
Date: 30.AUG.2017 13:57:37

channel 19



Date: 30.AUG.2017 13:58:33

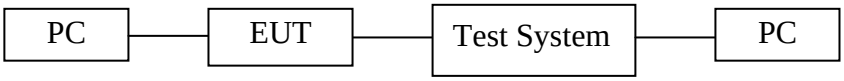
channel 39



Date: 30.AUG.2017 13:59:18

9. BAND EDGE COMPLIANCE TEST

9.1.Block Diagram of Test Setup



(EUT: Massage Chair)

9.2.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).

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 modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

9.5.Test Procedure

Conducted Band Edge:

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

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

9.5.3. Radiate Band Edge:

9.5.4.The EUT is placed on a turntable, which is 0.1m above the ground plane and worked at highest radiated power.

9.5.5.The turntable was rotated for 360 degrees to determine the position of maximum emission level.

9.5.6.EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

9.5.7.Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

9.5.8.RBW=1MHz, VBW=1MHz

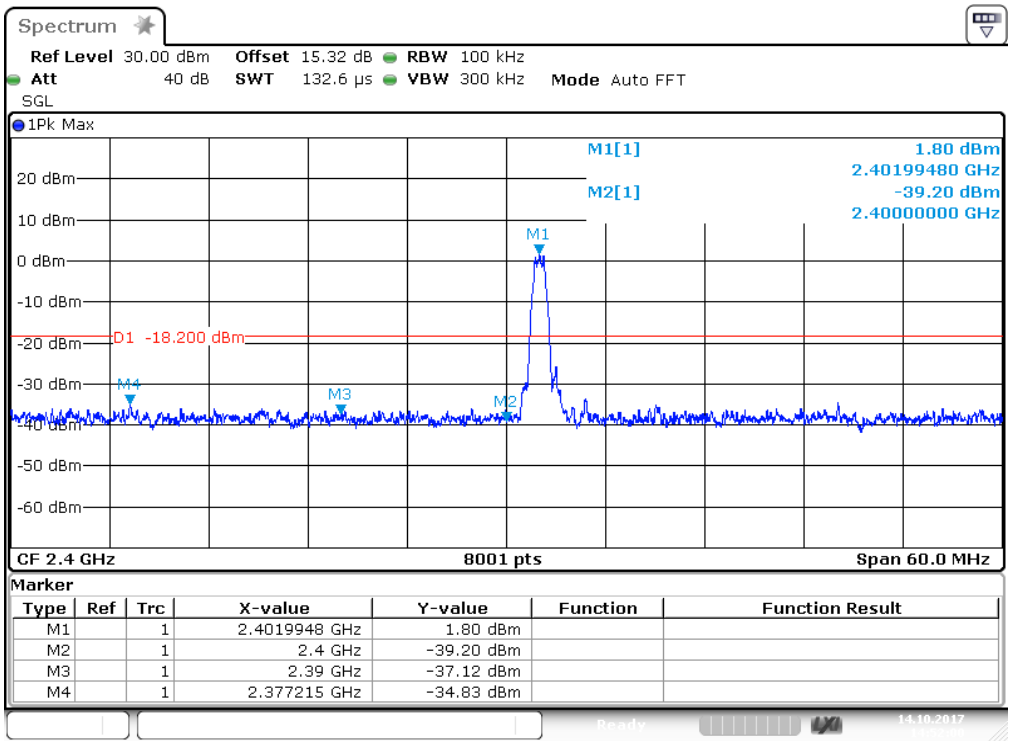
9.5.9.The band edges was measured and recorded.

9.6.Test Result

Pass

Channel	Frequency	Delta peak to band emission	Limit(dBc)
0	2.4GHz	41.00	20
39	2.4835GHz	41.40	20

channel 0

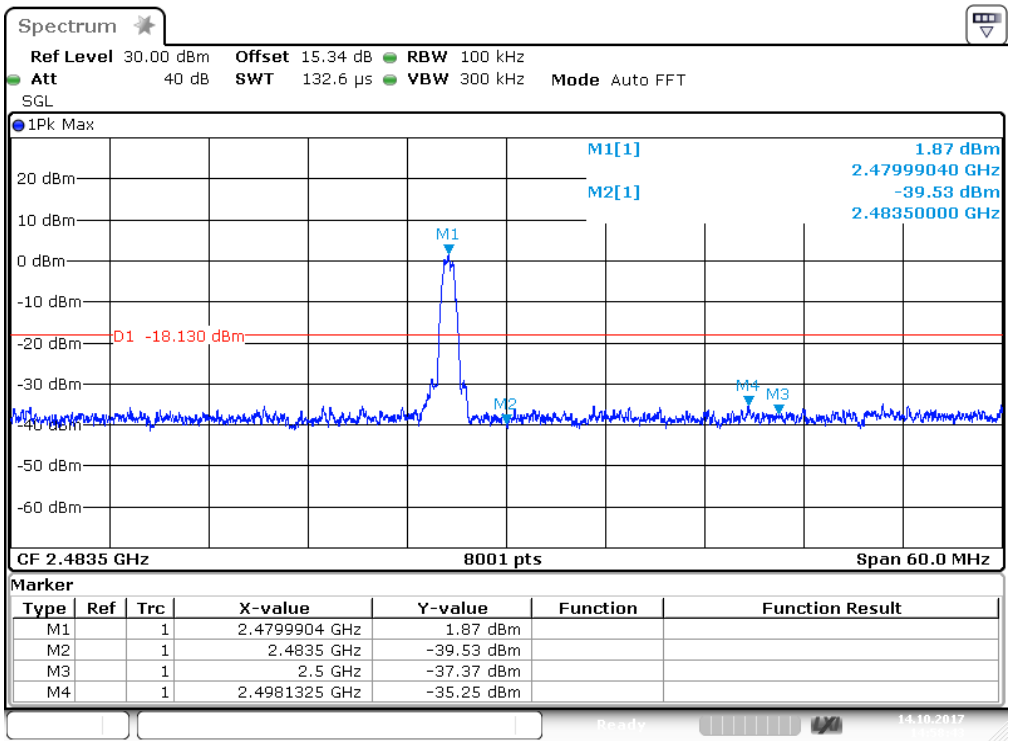


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4019948 GHz	1.80 dBm		
M2		1	2.4 GHz	-39.20 dBm		
M3		1	2.39 GHz	-37.12 dBm		
M4		1	2.377215 GHz	-34.83 dBm		

Date: 14.OCT.2017 14:52:00

channel 39



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.4799904 GHz	1.87 dBm		
M2		1	2.4835 GHz	-39.53 dBm		
M3		1	2.5 GHz	-37.37 dBm		
M4		1	2.4981325 GHz	-35.25 dBm		

Date: 14.OCT.2017 14:58:42

Radiated Band Edge Result

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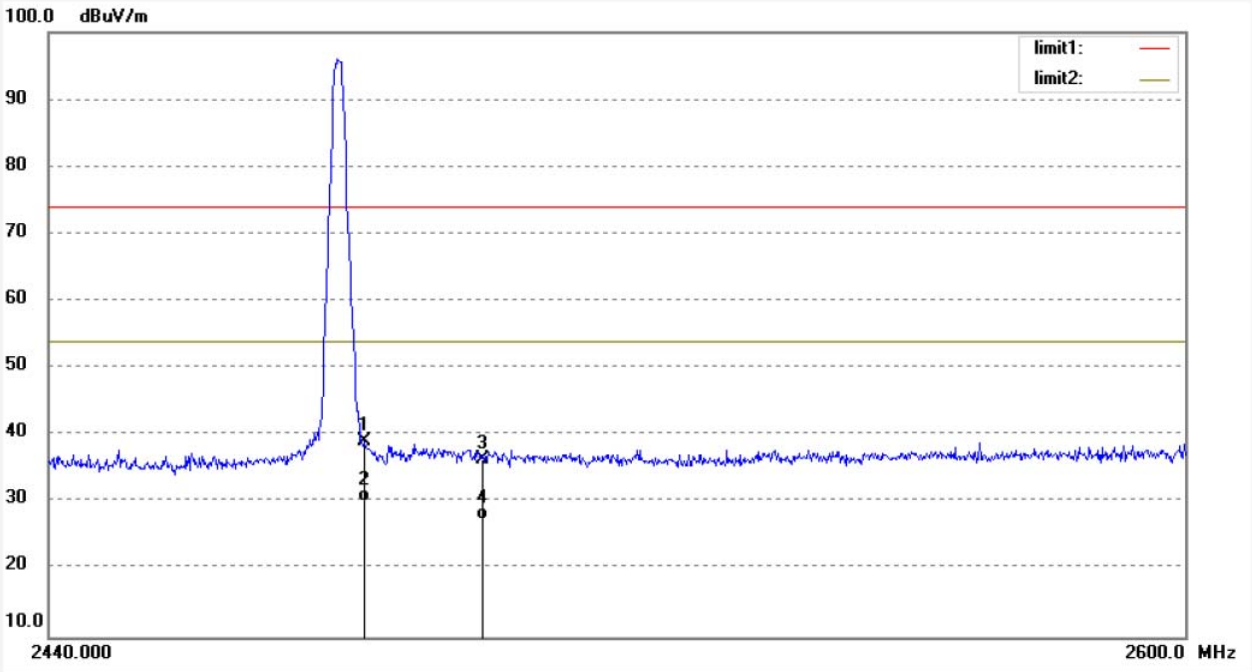
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: CORNLEY #155	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/10/13
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14:11:11
EUT: Massage Chair	Engineer Signature:
Mode: TX 2480MHz	Distance: 3m
Model: Signature 3D	
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd	

Note: Report NO.:ATE20171986



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	44.61	-5.51	39.10	74.00	-34.90	peak	151	237	
2	2483.500	35.74	-5.51	30.23	54.00	-23.77	AVG	151	238	
3	2500.000	41.88	-5.50	36.38	74.00	-37.62	peak	152	32	
4	2500.000	32.93	-5.50	27.43	54.00	-26.57	AVG	152	31	

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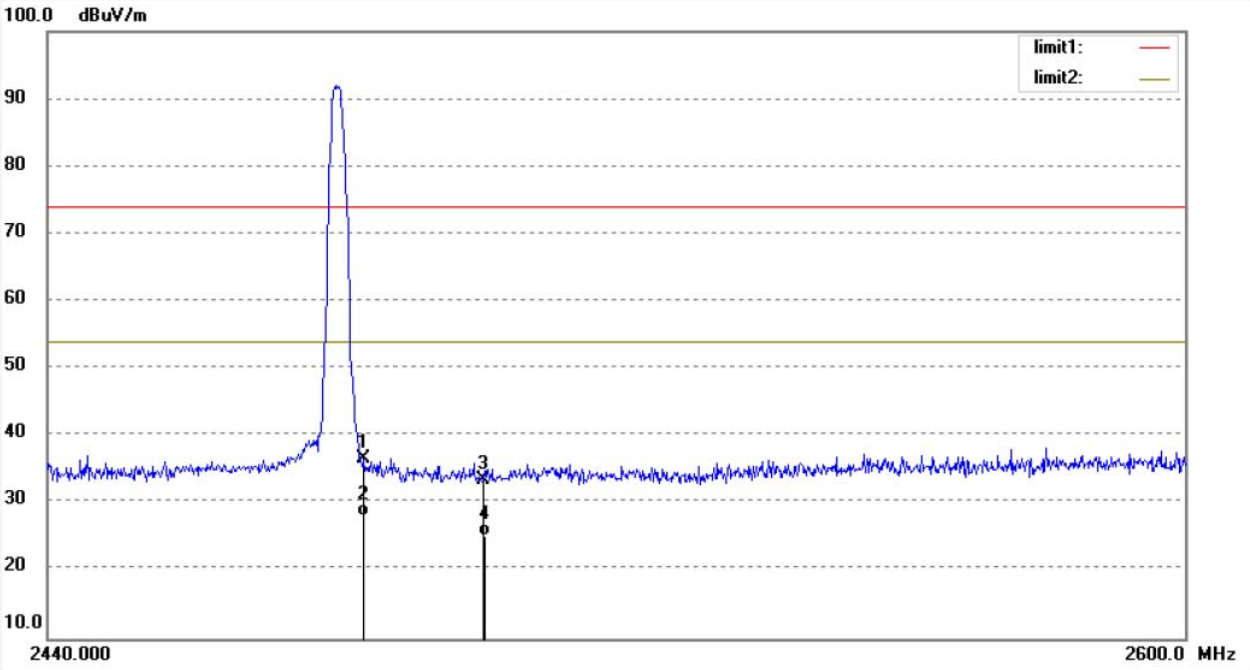
Fax:+86-0755-26503396

Job No.: CORNLEY #154	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/10/13
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14:09:44
EUT: Massage Chair	Engineer Signature:
Mode: TX 2480MHz	Distance: 3m
Model: Signature 3D	
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd	

Note: Report NO.:ATE20171986



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	42.11	-5.51	36.60	74.00	-37.40	peak	151	38	
2	2483.500	33.57	-5.51	28.06	54.00	-25.94	AVG	151	39	
3	2500.000	39.12	-5.50	33.62	74.00	-40.38	peak	152	36	
4	2500.000	30.69	-5.50	25.19	54.00	-28.81	AVG	152	37	

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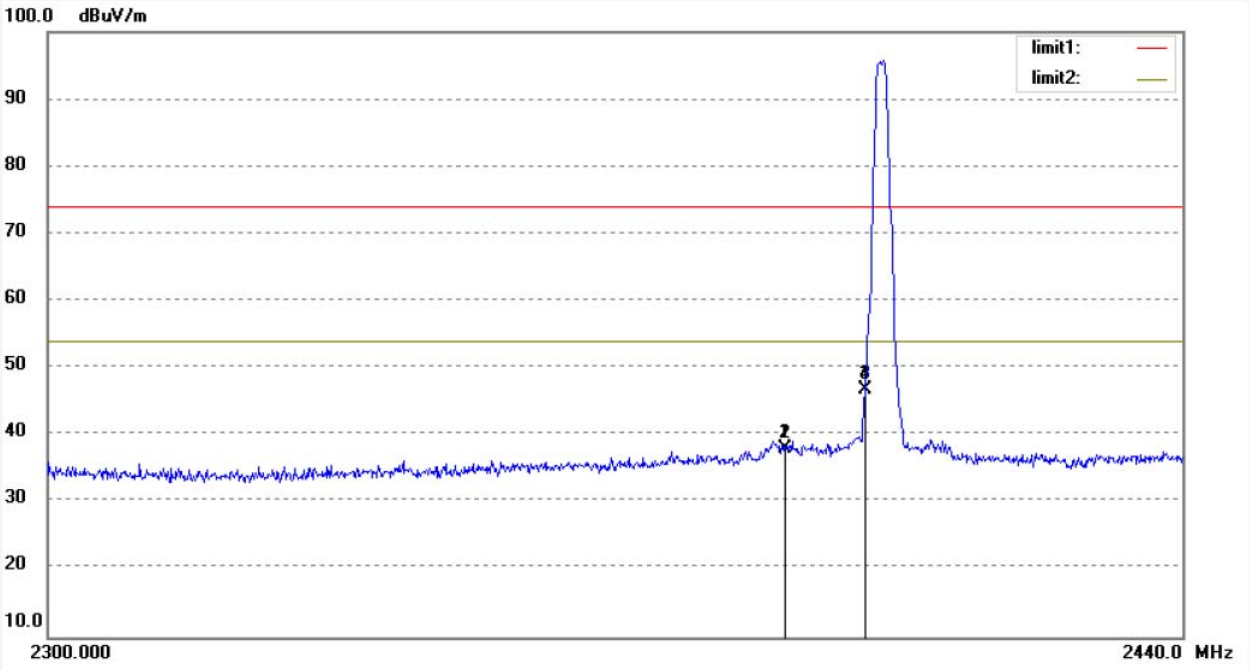
Fax:+86-0755-26503396

Job No.: CORNLEY #147
Standard: FCC PK
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX 2402MHz
Model: Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/10/13
Time: 13:55:24
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171986



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	43.84	-5.89	37.95	74.00	-36.05	peak	151	320	
2	2390.000	43.84	-5.89	37.95	74.00	-36.05	peak	150	318	
3	2400.000	52.66	-5.80	46.86	74.00	-27.14	peak	150	23	
4	2400.000	52.66	-5.80	46.86	74.00	-27.14	peak	151	22	

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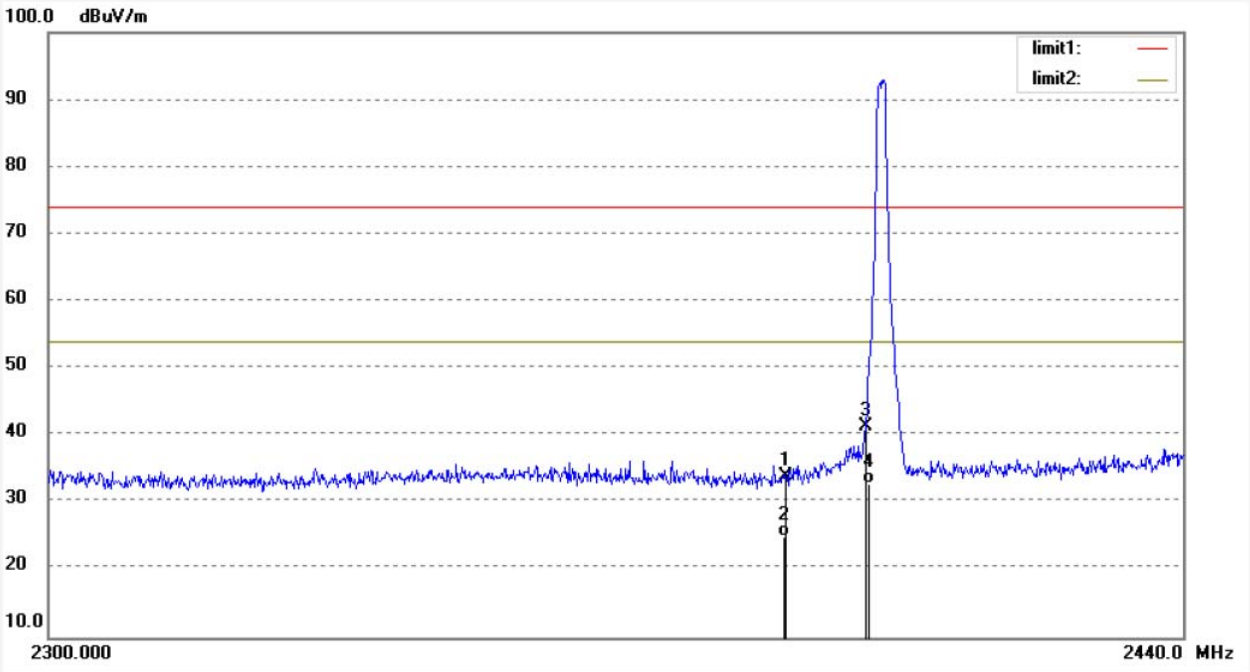
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: CORNLEY #146	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/10/13
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 13:54:14
EUT: Massage Chair	Engineer Signature:
Mode: TX 2402MHz	Distance: 3m
Model: Signature 3D	
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd	

Note: Report NO.:ATE20171986



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	39.81	-5.89	33.92	74.00	-40.08	peak	150	29	
2	2390.000	30.87	-5.89	24.98	54.00	-29.02	AVG	150	30	
3	2400.000	47.11	-5.80	41.31	74.00	-32.69	peak	150	62	
4	2400.000	38.64	-5.80	32.84	54.00	-21.16	AVG	150	63	

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

10.RADIATED SPURIOUS EMISSION TEST

10.1.Block Diagram of Test Setup

10.1.1.Block diagram of connection between the EUT and peripherals

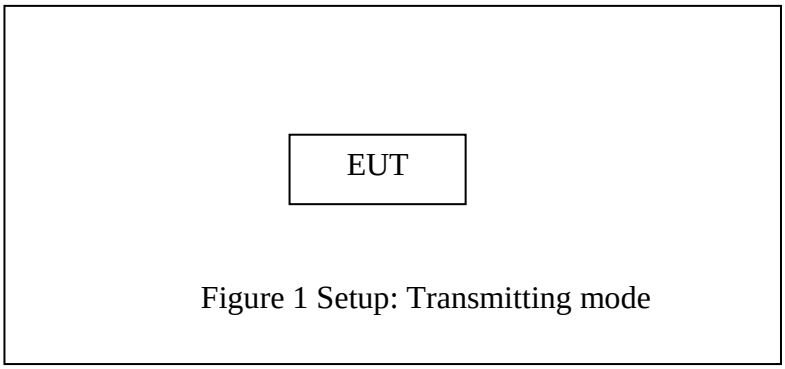
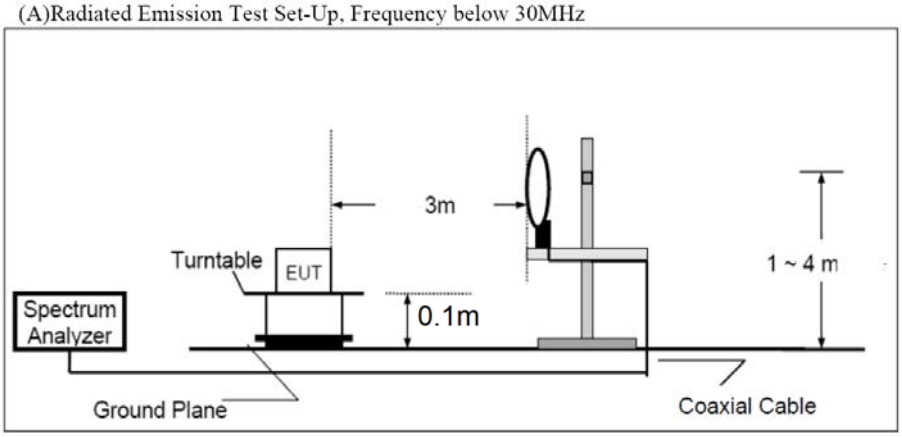


Figure 1 Setup: Transmitting mode

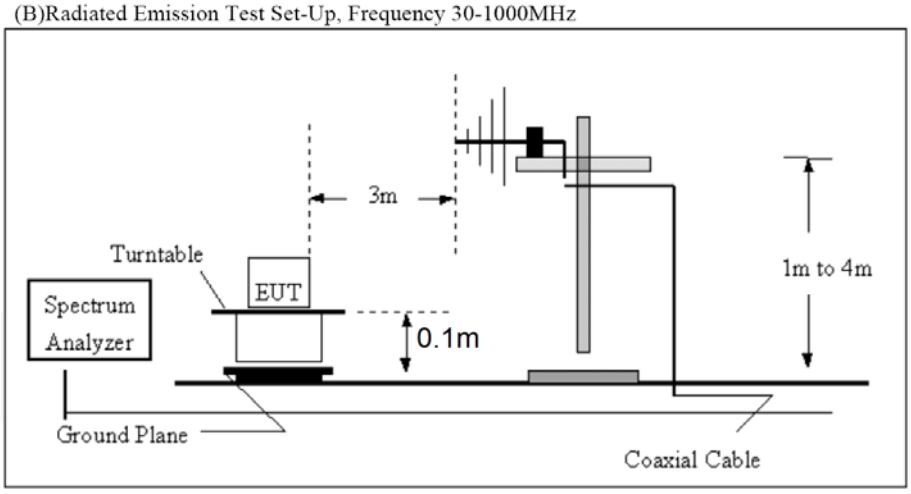
(EUT: Massage Chair)

10.1.2.Semi-Anechoic Chamber Test Setup Diagram

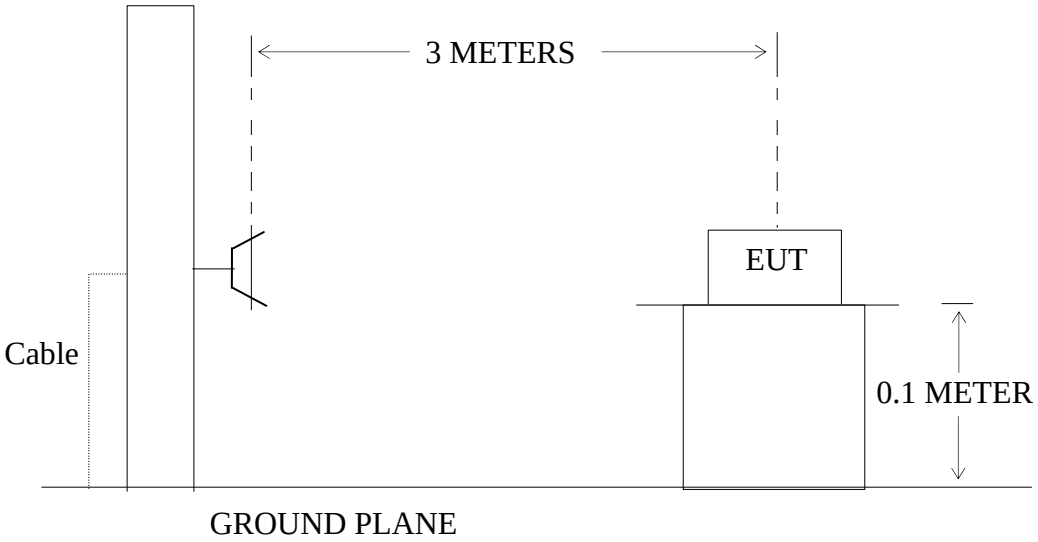
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



(B)Radiated Emission Test Set-Up, Frequency 30-1000MHz



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



10.2.The Limit For Section 15.247(d)

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

10.3.Restricted bands of operation

10.3.1.FCC Part 15.205 Restricted bands of operation

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

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

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

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

10.4.Configuration of EUT on Measurement

The equipment are 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, 2440MHz, 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(Below 1GHz). 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.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9 kHz to 25GHz is checked.
The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading. The basic equation calculation is as follows:
Result = Reading + Corrected Factor
Where Corrected Factor = Antenna Factor + Cable Loss – Amplifier Gain

10.7.The Field Strength of Radiation Emission Measurement Results

PASS.

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

3. The radiation emissions from 9kHz-30MHz and 18-25GHz are not reported, because the test values lower than the limits of 20dB.

Below 1GHz

ACCURATE TECHNOLOGY CO., LTD.
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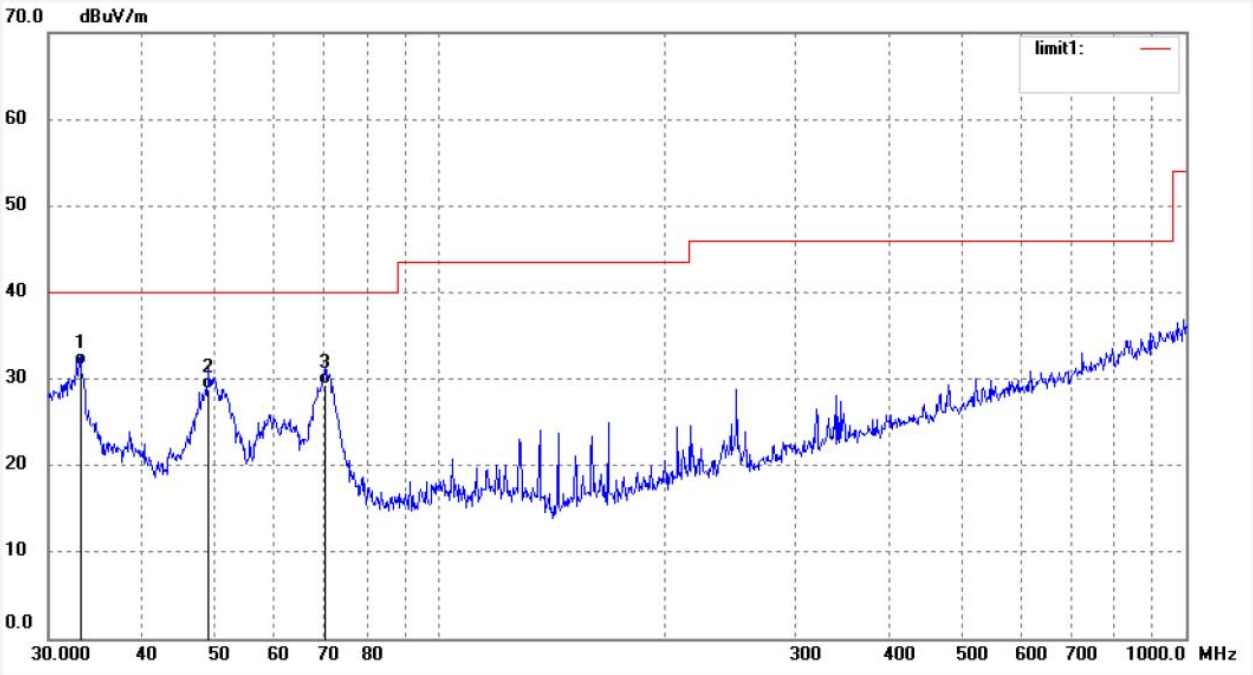
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: Frank2017 #306	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/10/13
Temp.(C)/Hum.(%) 23 C / 48 %	Time: 17:12:57
EUT: Massage Chair	Engineer Signature:
Mode: TX 2402MHz	Distance: 3m
Model: Signature 3D	
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd.	

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.0950	41.78	-10.24	31.54	40.00	-8.46	QP	200	320	
2	49.1865	41.46	-12.59	28.87	40.00	-11.13	QP	200	127	
3	70.3365	45.45	-16.12	29.33	40.00	-10.67	QP	200	54	

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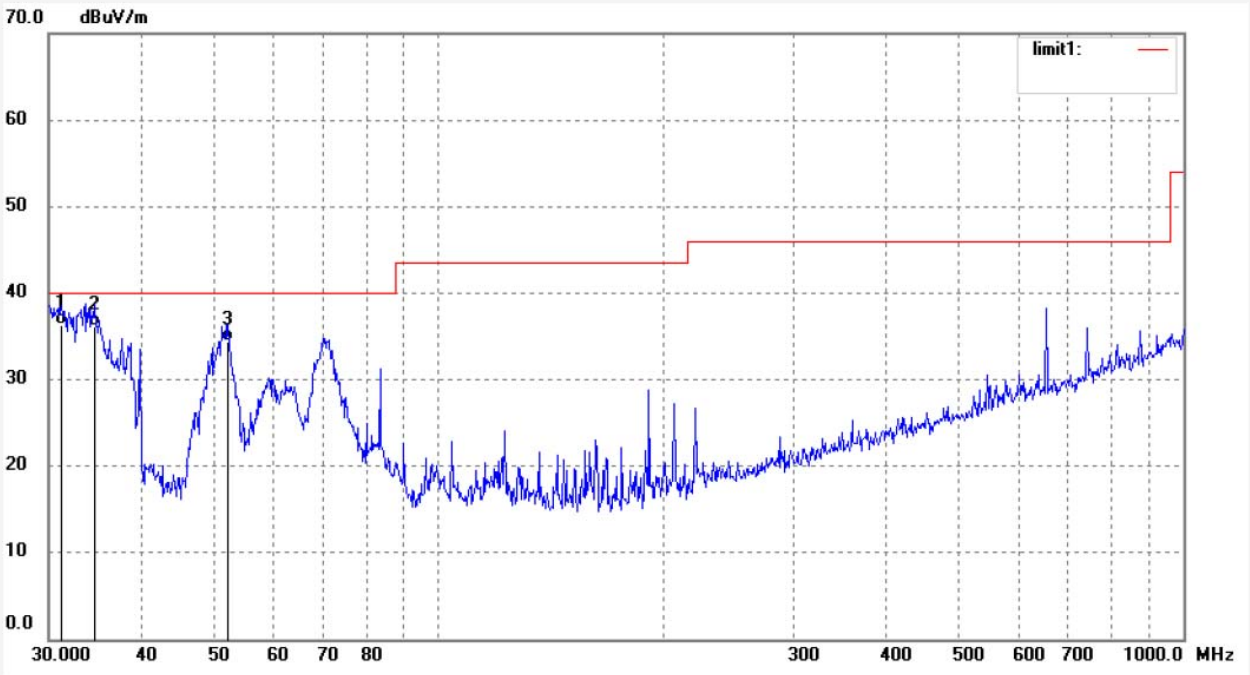
Fax:+86-0755-26503396

Job No.: Frank2017 #307
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Massage Chair
Mode: TX 2402MHz
Model: Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd.

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/10/13
Time: 17:21:03
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.1798	45.57	-9.27	36.30	40.00	-3.70	QP	100	249	
2	34.5173	46.45	-10.28	36.17	40.00	-3.83	QP	100	105	
3	52.2079	47.15	-12.74	34.41	40.00	-5.59	QP	100	43	

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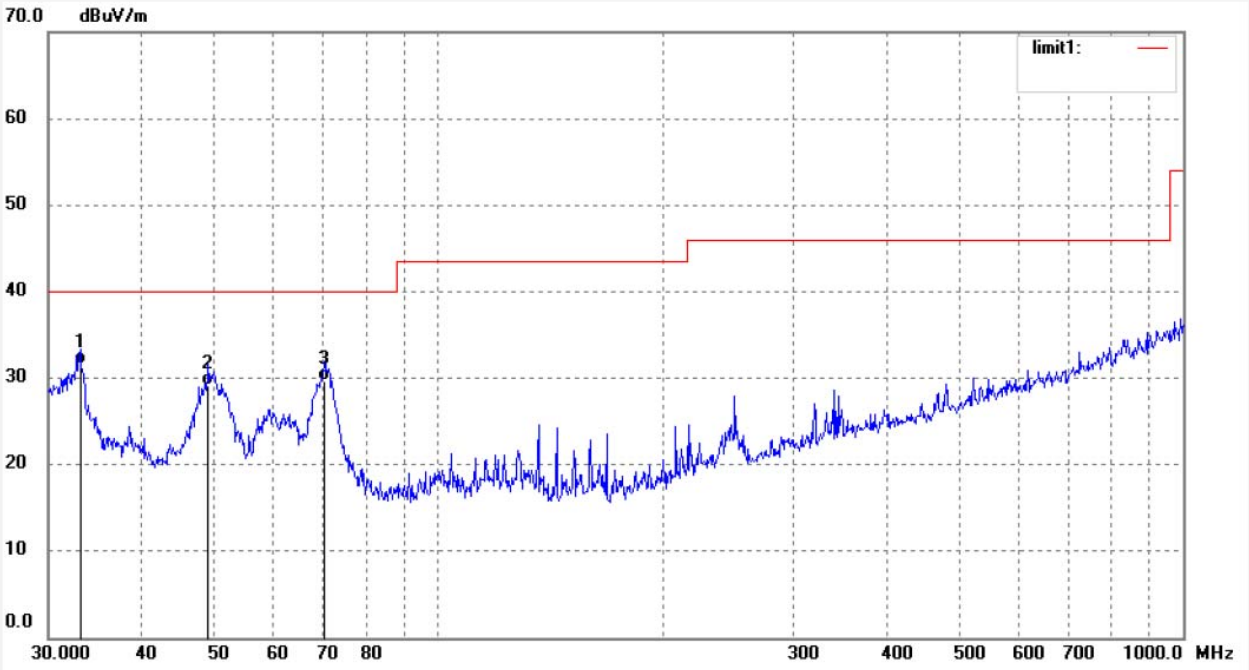
Job No.: Frank2017 #308
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Massage Chair
Mode: TX 2440MHz
Model: Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd.

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/10/13
Time: 17:32:57
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.0950	41.91	-10.24	31.67	40.00	-8.33	QP	200	168	
2	49.1865	41.76	-12.59	29.17	40.00	-10.83	QP	200	162	
3	70.3365	45.85	-16.12	29.73	40.00	-10.27	QP	200	79	

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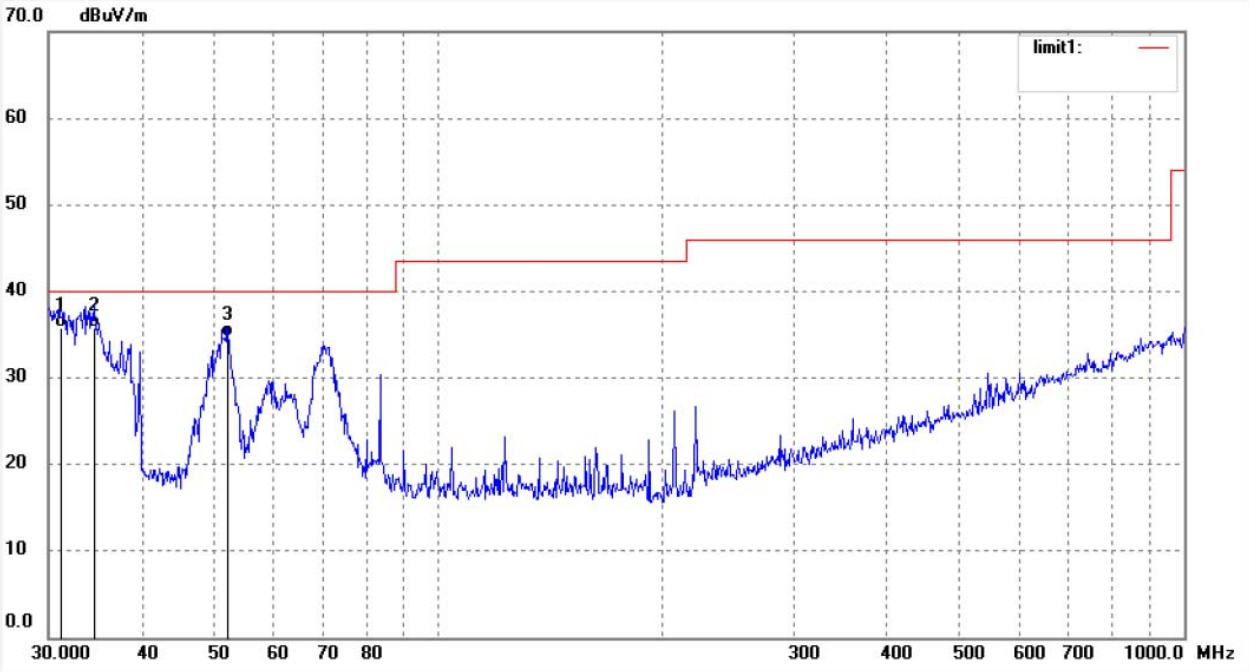
Job No.: Frank2017 #309	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/10/13
Temp.(C)/Hum.(%) 23 C / 48 %	Time: 17:42:03
EUT: Massage Chair	Engineer Signature:
Mode: TX 2440MHz	Distance: 3m
Model: Signature 3D	
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd.	

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.1798	44.99	-9.27	35.72	40.00	-4.28	QP	100	73	
2	34.5173	45.98	-10.28	35.70	40.00	-4.30	QP	100	320	
3	52.2079	47.54	-12.74	34.80	40.00	-5.20	QP	100	164	

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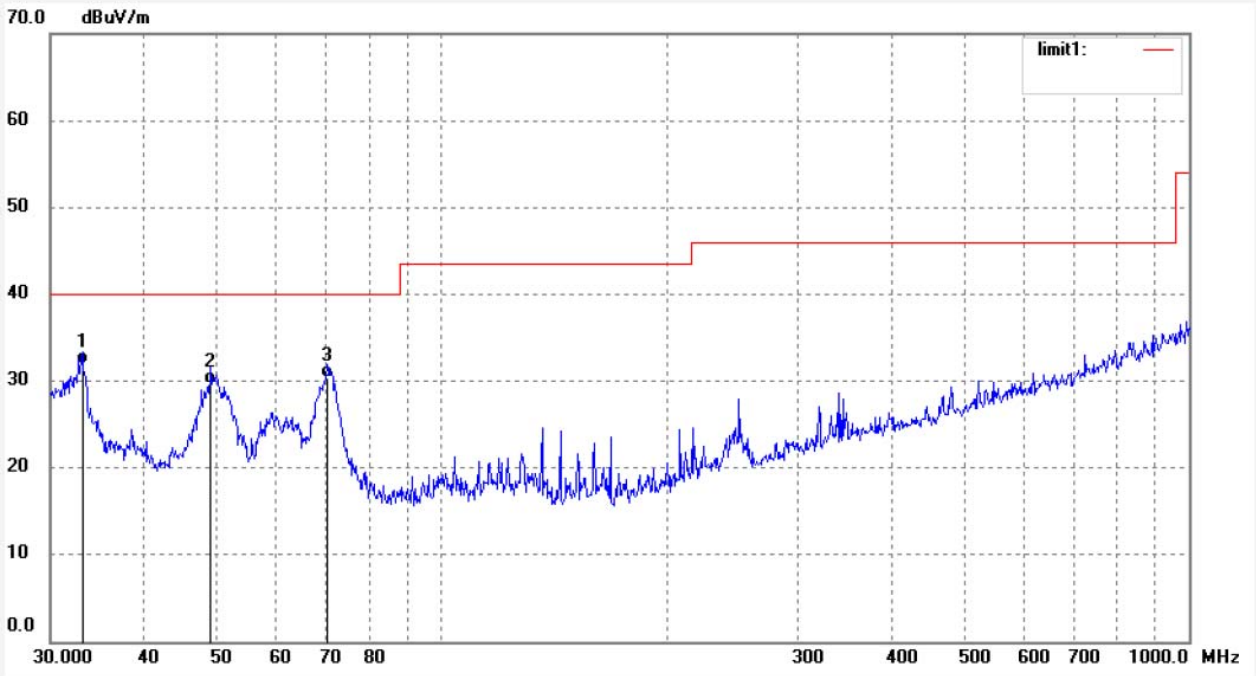
Job No.: Frank2017 #310	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/10/13
Temp.(C)/Hum.(%) 23 C / 48 %	Time: 17:53:57
EUT: Massage Chair	Engineer Signature:
Mode: TX 2480MHz	Distance: 3m
Model: Signature 3D	
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd.	

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.0950	42.13	-10.24	31.89	40.00	-8.11	QP	200	283	
2	49.1865	42.30	-12.59	29.71	40.00	-10.29	QP	200	73	
3	70.3365	46.45	-16.12	30.33	40.00	-9.67	QP	200	12	

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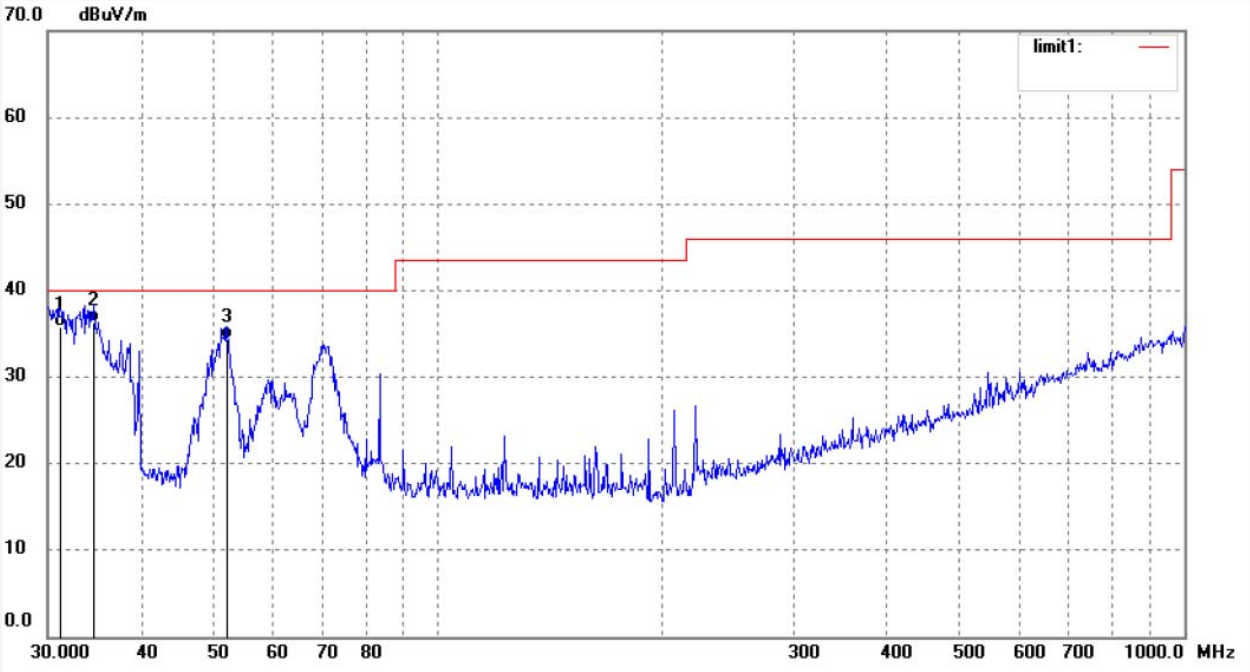
Job No.: Frank2017 #311
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Massage Chair
Mode: TX 2480MHz
Model: Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co., Ltd.

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/10/13
Time: 18:01:03
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.1798	45.13	-9.27	35.86	40.00	-4.14	QP	100	183	
2	34.5173	46.54	-10.28	36.26	40.00	-3.74	QP	100	267	
3	52.2079	47.21	-12.74	34.47	40.00	-5.53	QP	100	210	

Above 1GHz

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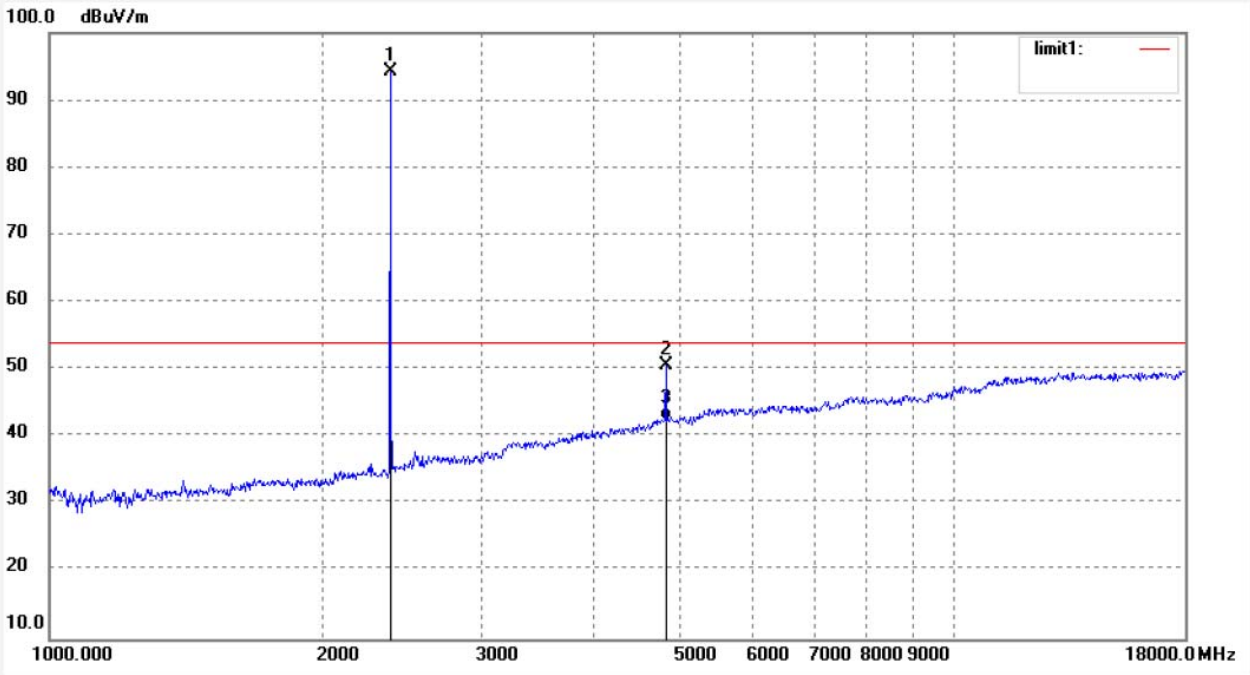
Job No.: CORNLEY #148	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/10/13
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 13:57:50
EUT: Massage Chair	Engineer Signature:
Mode: TX 2402MHz	Distance: 3m
Model: Signature 3D	
Manufacturer: Xiamen Annmacare Science & Technology Co., LTD.	

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.164	100.32	-5.98	94.34			peak	151	29	
2	4804.328	47.00	3.53	50.53	74.00	-23.47	peak	150	301	
3	4804.328	38.96	3.53	42.49	54.00	-11.51	AVG	150	300	

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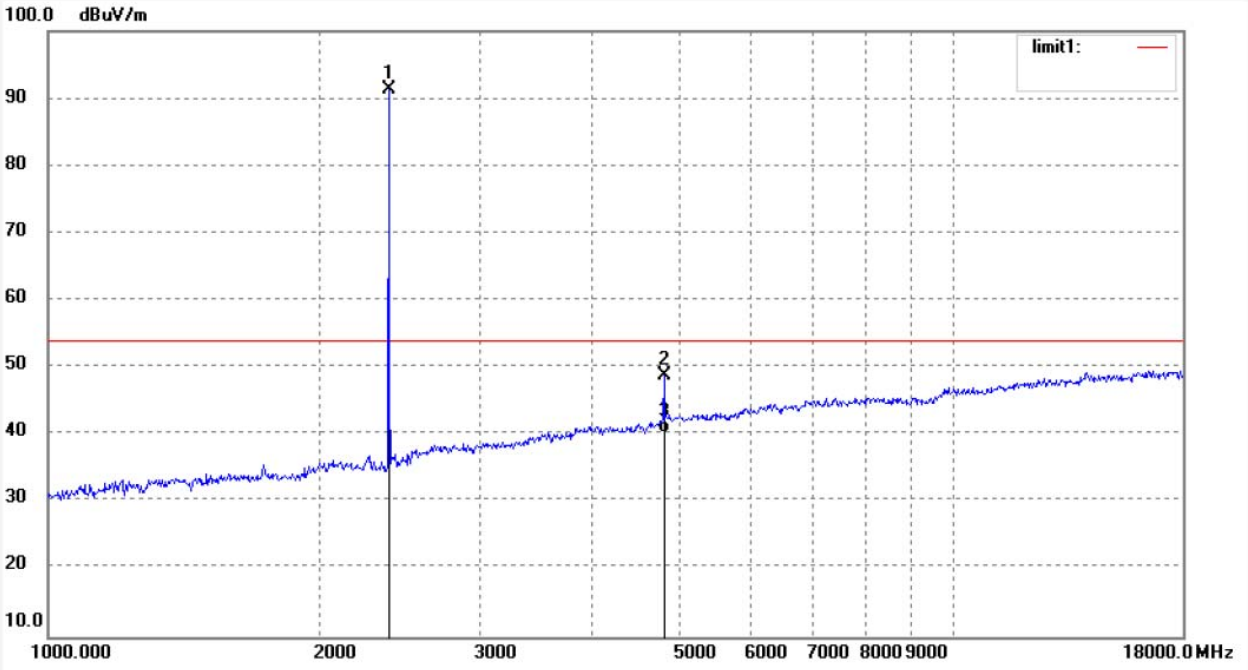
Job No.: CORNLEY #149
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX 2402MHz
Model: Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co., LTD.

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/10/13
Time: 13:59:41
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.164	97.32	-5.98	91.34			peak	153	45	
2	4804.328	45.39	3.53	48.92	74.00	-25.08	peak	153	319	
3	4804.328	36.81	3.53	40.34	54.00	-13.66	AVG	153	318	

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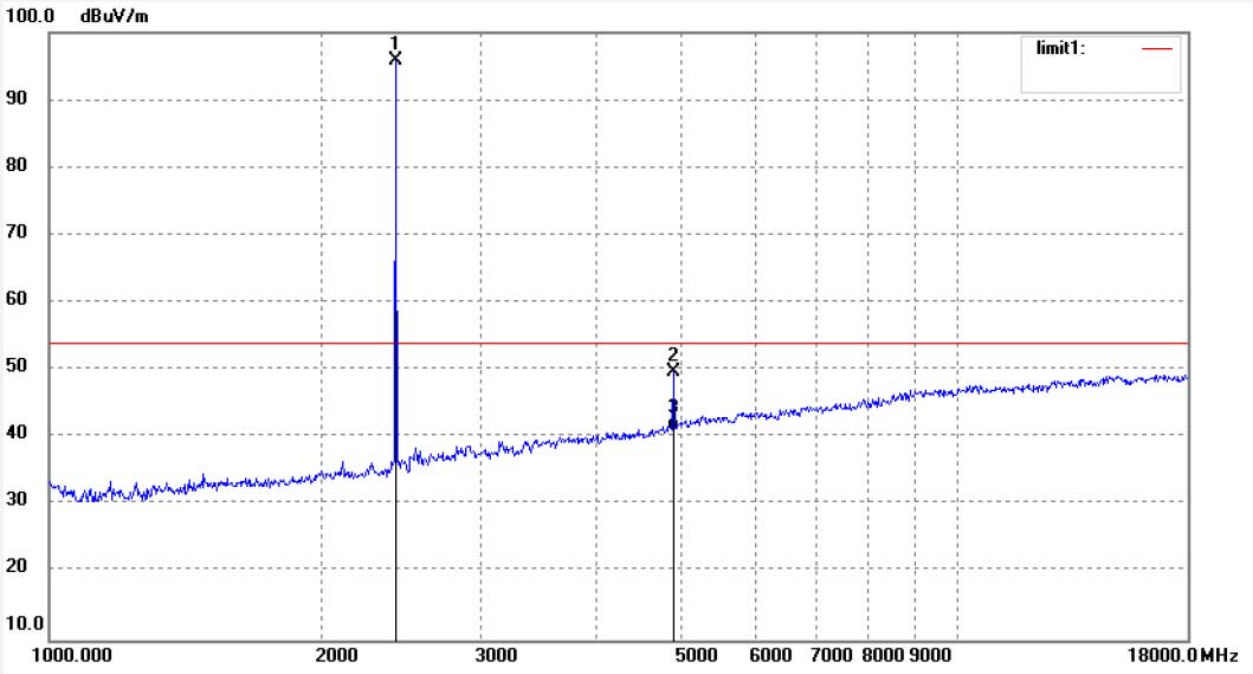
Job No.: CORNLEY #151
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX 2440MHz
Model: Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co., LTD.

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/10/13
Time: 14:03:33
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.000	101.50	-5.76	95.74			peak	150	301	
2	4880.000	45.38	4.32	49.70	74.00	-24.30	peak	151	79	
3	4880.000	36.74	4.32	41.06	54.00	-12.94	AVG	151	80	

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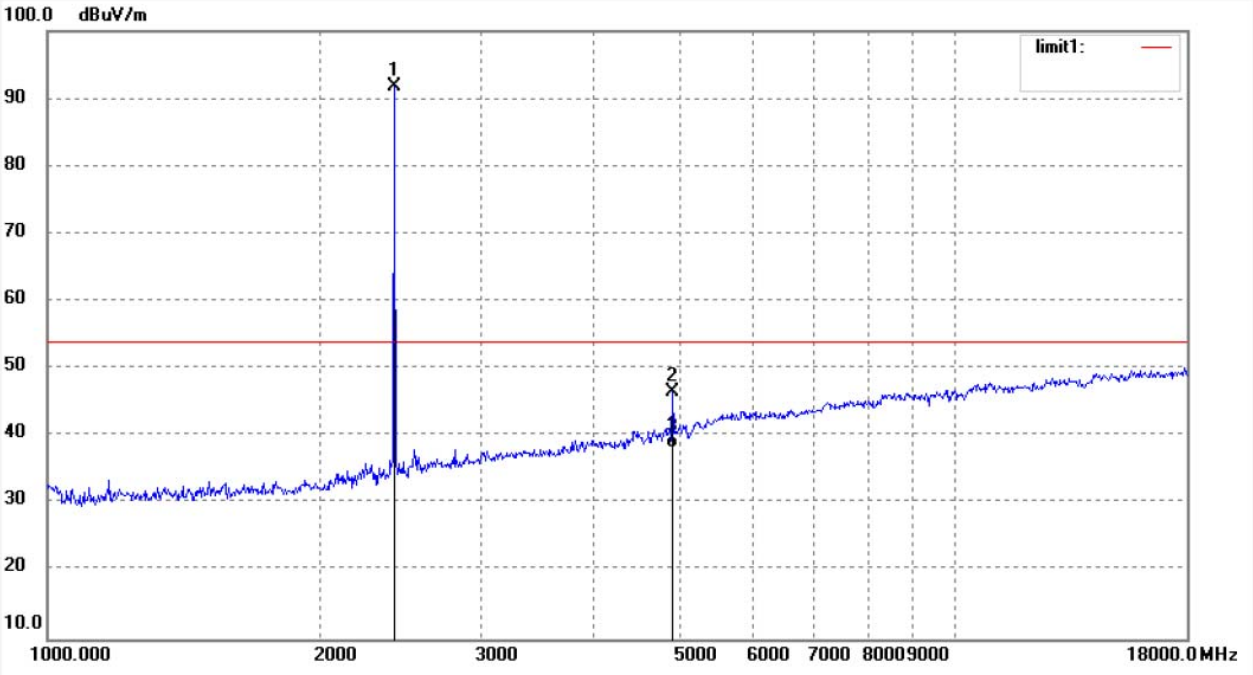
Job No.: CORNLEY #150
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX 2440MHz
Model: Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co., LTD.

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2017/10/13
Time: 14:01:48
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.000	97.47	-5.76	91.71			peak	150	278	
2	4880.000	42.24	4.32	46.56	74.00	-27.44	peak	151	280	
3	4880.000	33.85	4.32	38.17	54.00	-15.83	AVG	151	281	

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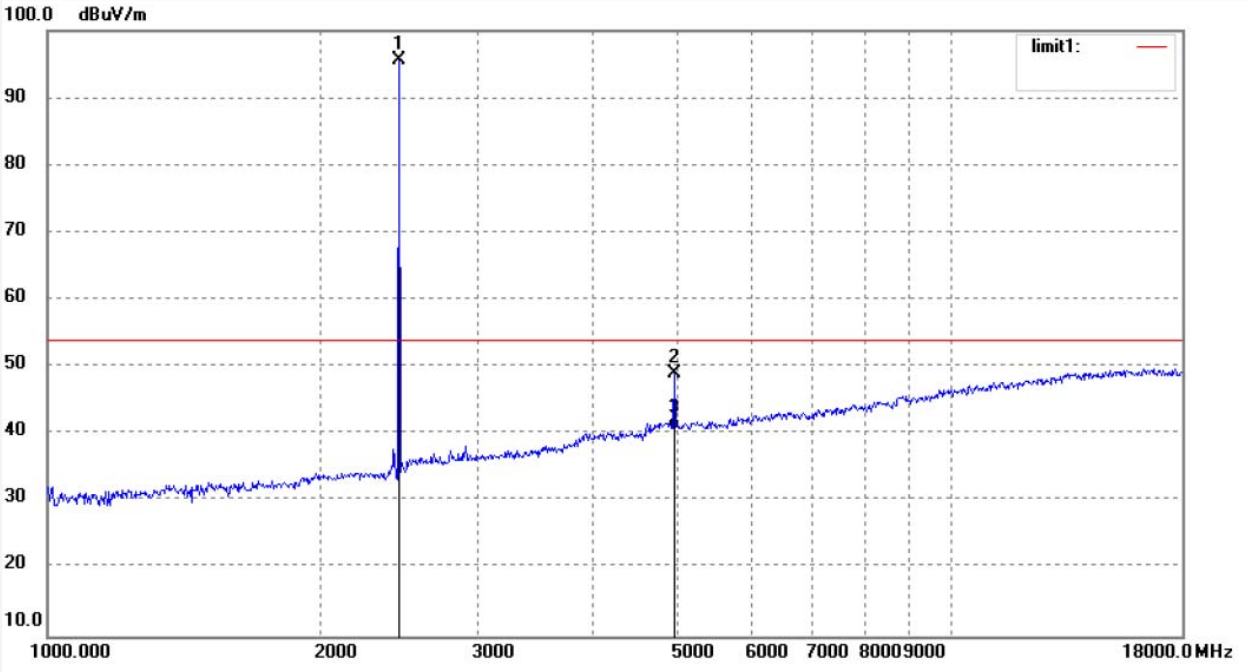
Job No.: CORNLEY #152
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: Massage Chair
Mode: TX 2480MHz
Model: Signature 3D
Manufacturer: Xiamen Annmacare Science & Technology Co., LTD.

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2017/10/13
Time: 14:05:54
Engineer Signature:
Distance: 3m

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	101.06	-5.55	95.51			peak	151	82	
2	4960.068	44.36	4.69	49.05	74.00	-24.95	peak	150	263	
3	4960.068	35.93	4.69	40.62	54.00	-13.38	AVG	150	262	

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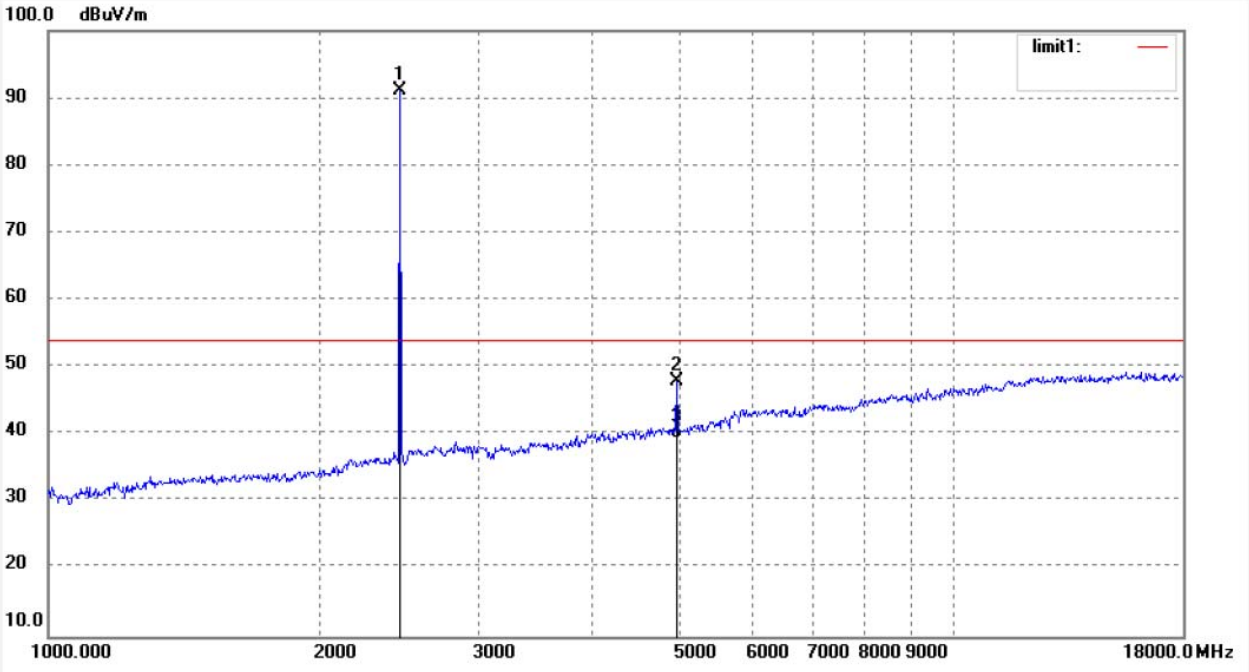
Job No.: CORNLEY #153	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2017/10/13
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14:07:41
EUT: Massage Chair	Engineer Signature:
Mode: TX 2480MHz	Distance: 3m
Model: Signature 3D	
Manufacturer: Xiamen Annmacare Science & Technology Co., LTD.	

Note: Report NO.:ATE20171986



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.034	96.62	-5.55	91.07			peak	151	37	
2	4960.068	43.07	4.77	47.84	74.00	-26.16	peak	150	273	
3	4960.068	34.51	4.77	39.28	54.00	-14.72	AVG	150	274	

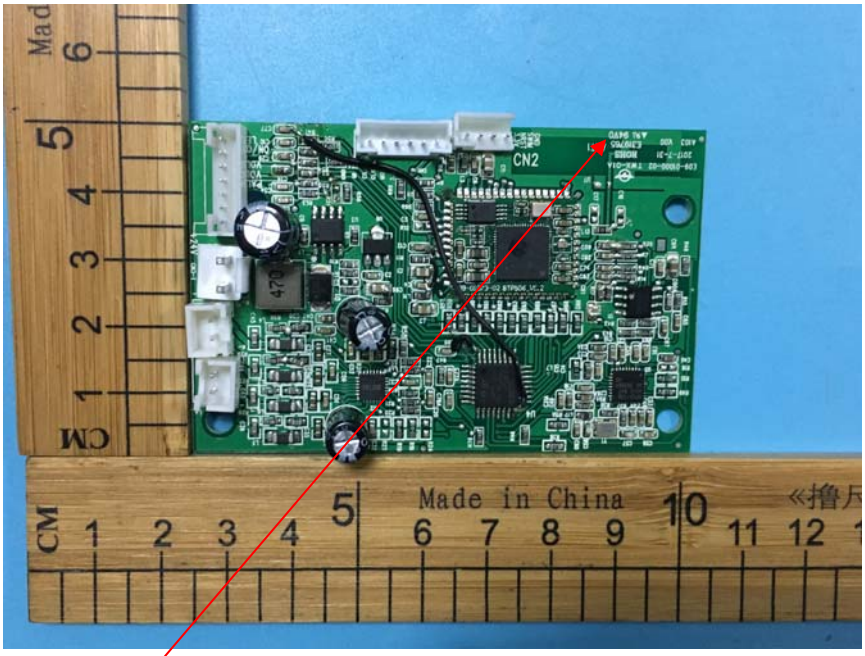
11. ANTENNA REQUIREMENT

11.1. 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.

11.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna