APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
DEI Sales Inc. dba Definitive Technology

5.1 Home Theater Sound Bar and Wireless Subwoofer System
Model No.: STUDIO ADVANCE SUBWOOFER

FCC ID: IPUSTUADVSUB

Prepared for	:	DEI Sales Inc. dba Definitive Technology
Address	:	One Viper Way, Vista, California, United States 92081
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
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Report No.	:	ATE20182049
Date of Test	:	March 12-April 5, 2019
Date of Report	:	April 9, 2019

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Test Report Certification

Applicant	:	DEI Sales Inc. dba Definitive Technology
Address	:	One Viper Way, Vista, California, United States 92081
Manufacturer	:	DEI Sales Inc. dba Definitive Technology
Address	:	One Viper Way, Vista, California, United States 92081
Factory	:	Zhao Yang Electronic (Shenzhen) Co., Ltd
Address	:	Building 2, De Yong Jia Industrial Park, Guang Qiao Road, Yu Lv Community, Gong Ming Street, Guang Ming New District, Shenzhen, 518132, China
Product	:	5.1 Home Theater Sound Bar and Wireless Subwoofer System
Model No.	:	STUDIO ADVANCE SUBWOOFER

Measurement Procedure Used:

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

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

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

Date of Test :	March 12-April 5, 2019
Date of Report :	April 9, 2019

Prepared by : _____
(Star Yang, Engineer)

Approved & Authorized Signer : _____
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	5.1 Home Theater Sound Bar and Wireless Subwoofer System
Model Number	:	STUDIO ADVANCE SUBWOOFER
Frequency Range	:	2403.5-2477.3MHz
Number of Channels	:	49
Modulation mode	:	FSK
Antenna Gain	:	3.3dBi
Antenna type	:	PCB Antenna
Power Supply	:	100-240Vac 50/60Hz 200W
Trade Mark	:	D.(DEFINITIVE TECHNOLOGY)

1.2. Frequency Table

Channel #	Center Frequency (GHz)	Channel #	Center Frequency (GHz)
Center Frequencies (Channel Table)			
1	2.4035	26	2.4420
2	2.4051	27	2.4435
3	2.4066	28	2.4450
4	2.4081	29	2.4466
5	2.4097	30	2.4481
6	2.4112	31	2.4496
7	2.4128	32	2.4512
8	2.4143	33	2.4527
9	2.4158	34	2.4543
10	2.4174	35	2.4558
11	2.4189	36	2.4573
12	2.4204	37	2.4589
13	2.4220	38	2.4604
14	2.4235	39	2.4619
15	2.4251	40	2.4635
16	2.4266	41	2.4650
17	2.4281	42	2.4666
18	2.4297	43	2.4681
19	2.4312	44	2.4696
20	2.4327	45	2.4712
21	2.4343	46	2.4727
22	2.4358	47	2.4742
23	2.4374	48	2.4758
24	2.4389	49	2.4773
25	2.4404		

1.3. Accessory and Auxiliary Equipment

N/A

1.4.Description of Test Facility

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

1.5.Measurement Uncertainty

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

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

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

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: Transmitting mode
Low Channel: 2403.5MHz
Middle Channel: 2440.4MHz
High Channel: 2477.3MHz
Hopping

3.2.Configuration and peripherals

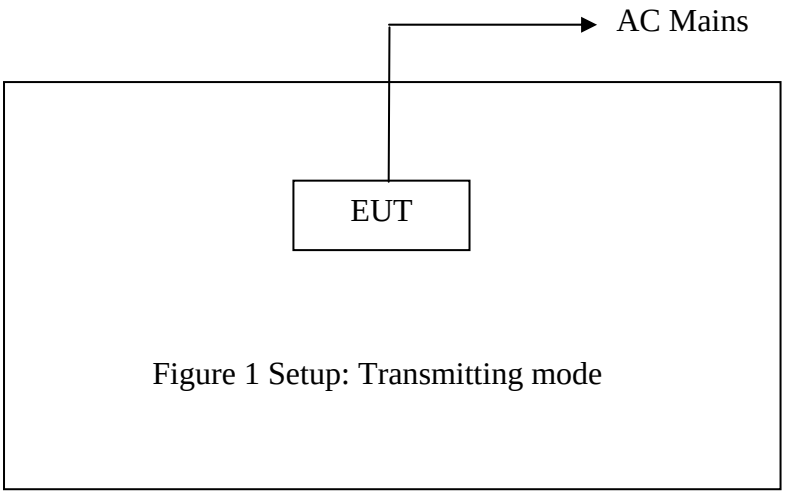


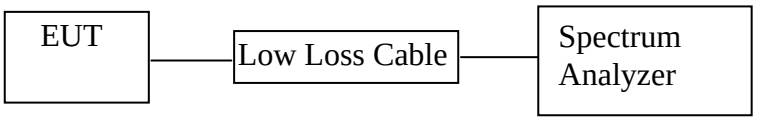
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.247(a)(1)	20dB Bandwidth Test	Compliant
Section 15.247(a)(1)	Carrier Frequency Separation Test	Compliant
Section 15.247(a)(1)(iii)	Number Of Hopping Frequency Test	Compliant
Section 15.247(a)(1)(iii)	Dwell Time Test	Compliant
Section 15.247(b)(1)	Maximum Peak Output Power Test	Compliant
Section 15.247(d) Section 15.209	Radiated Emission Test	Compliant
Section 15.247(d) Section 15.205	Band Edge Compliance Test	Compliant
Section 15.207	AC Power Line Conducted Emissions Limits Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1.Block Diagram of Test Setup



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

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

5.3.EUT Configuration on Test

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

5.4.Operating Condition of EUT

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

5.4.2.Turn on the power of all equipment.

5.4.3.Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2403.5, 2440.4, 2477.3MHz.

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.

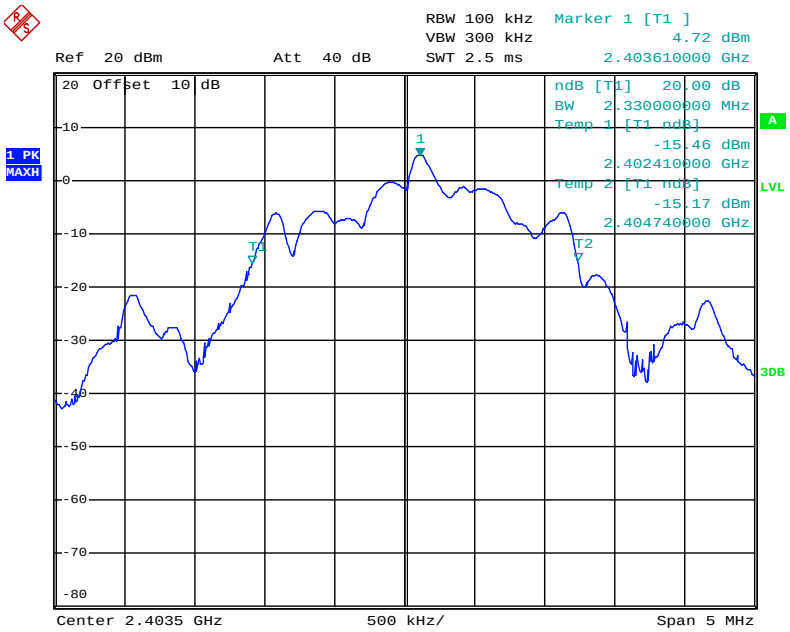
5.5.3.The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

5.6.Test Result

Channel	Frequency (MHz)	20dB Bandwidth (MHz)	Result
Low	2403.5	2.33	Pass
Middle	2440.4	2.31	Pass
High	2477.3	2.32	Pass

The spectrum analyzer plots are attached as below.

Low channel



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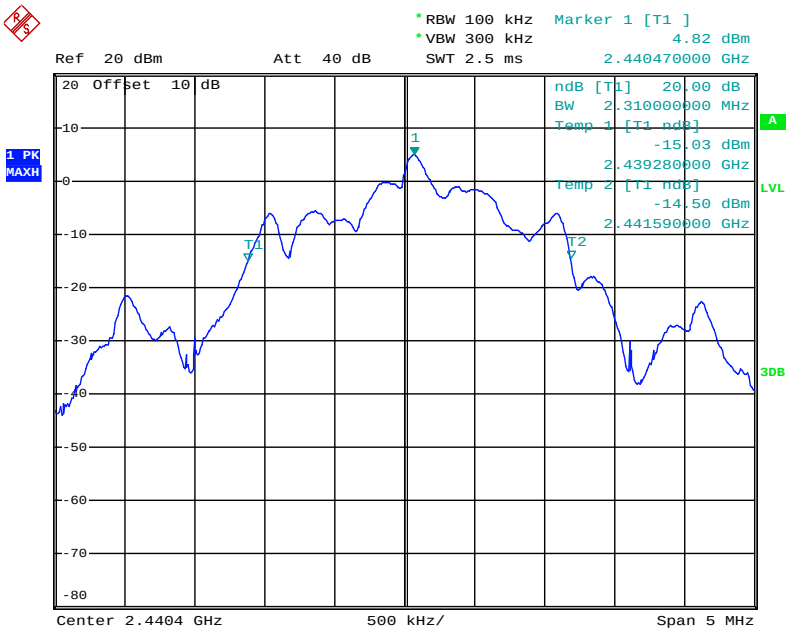
Middle channel



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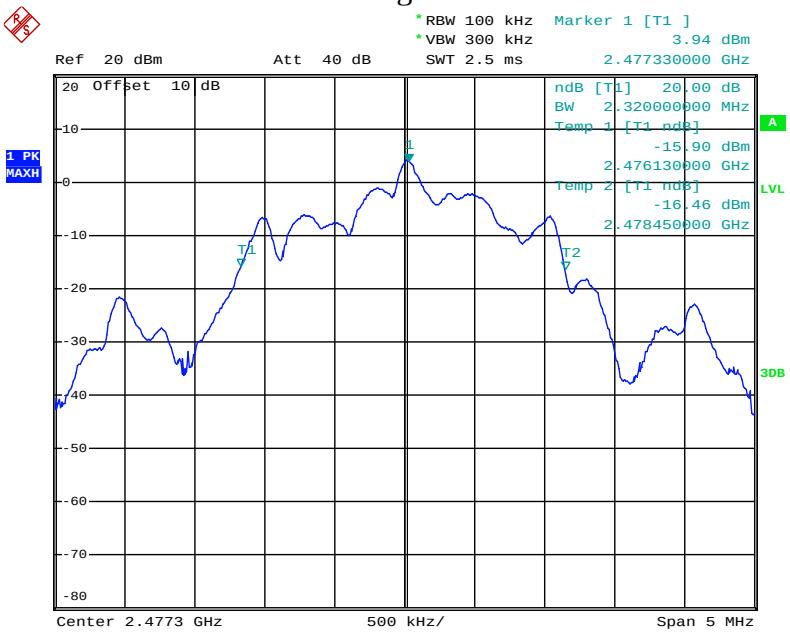
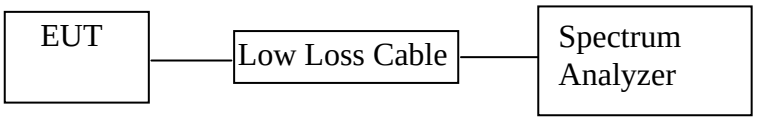
High channel



Date: 1.APR.2019 12:36:54

6. CARRIER FREQUENCY SEPARATION TEST

6.1.Block Diagram of Test Setup



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

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

6.3.EUT Configuration on Test

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

6.4.Operating Condition of EUT

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

6.4.2.Turn on the power of all equipment.

6.4.3.Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2403.5, 2440.4, 2477.3MHz.

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. Adjust Span to 3MHz.

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

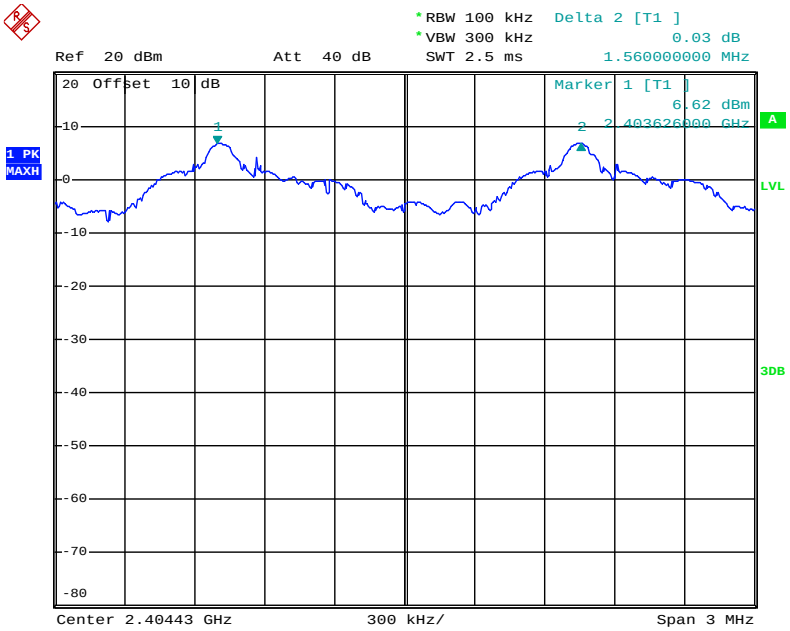
6.5.4.Measurement the channel separation

6.6.Test Result

Channel	Frequency (MHz)	Channel Separation(MHz)	Limit (MHz)	Result
Low	2403.5	1.560	＞1.553	Pass
	2405.1			
Middle	2440.4	1.560	＞1.540	Pass
	2442.0			
High	2475.8	1.560	＞1.547	Pass
	2477.3			

The spectrum analyzer plots are attached as below.

Low channel



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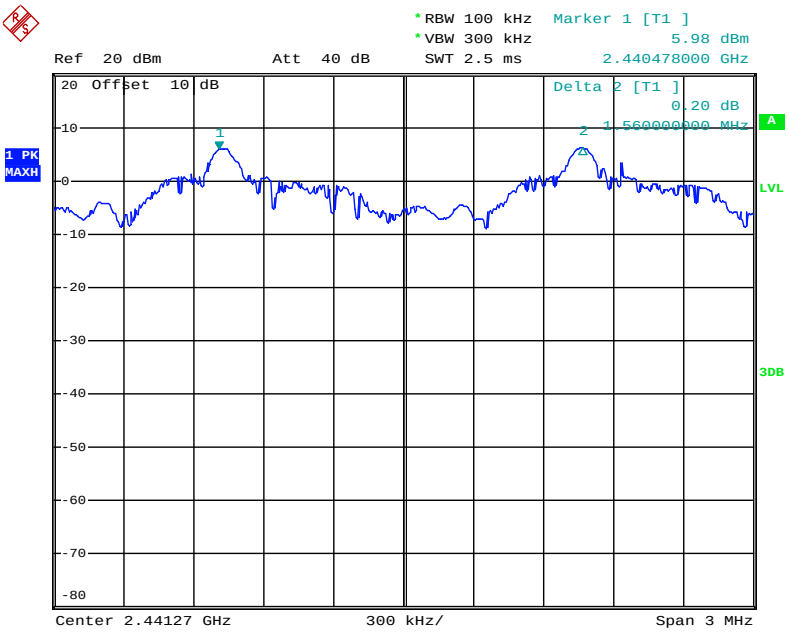
Middle channel



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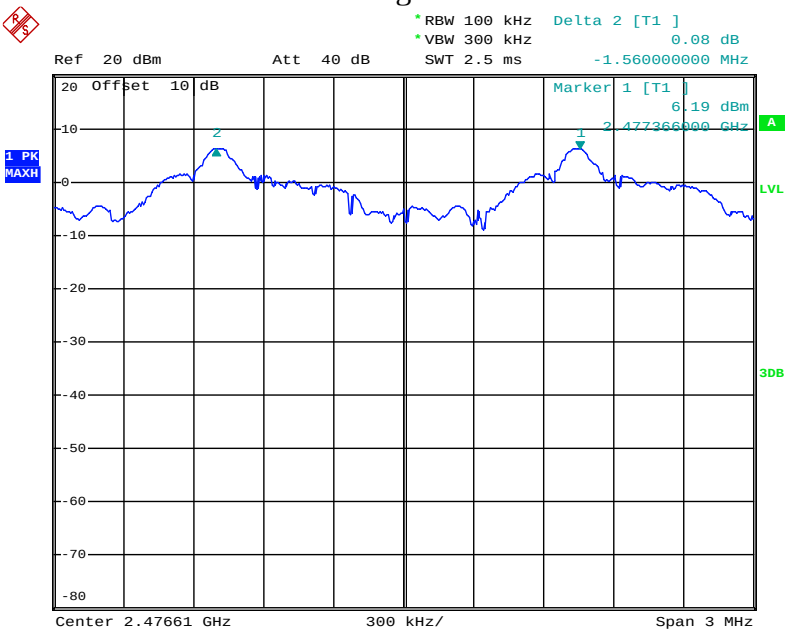
High channel



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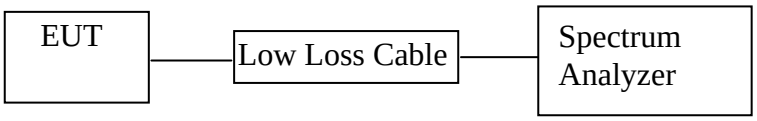
7. NUMBER OF HOPPING FREQUENCY TEST

7.1.Block Diagram of Test Setup



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

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

7.3.EUT Configuration on Test

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

7.4.Operating Condition of EUT

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

7.4.2.Turn on the power of all equipment.

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

7.5.Test Procedure

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

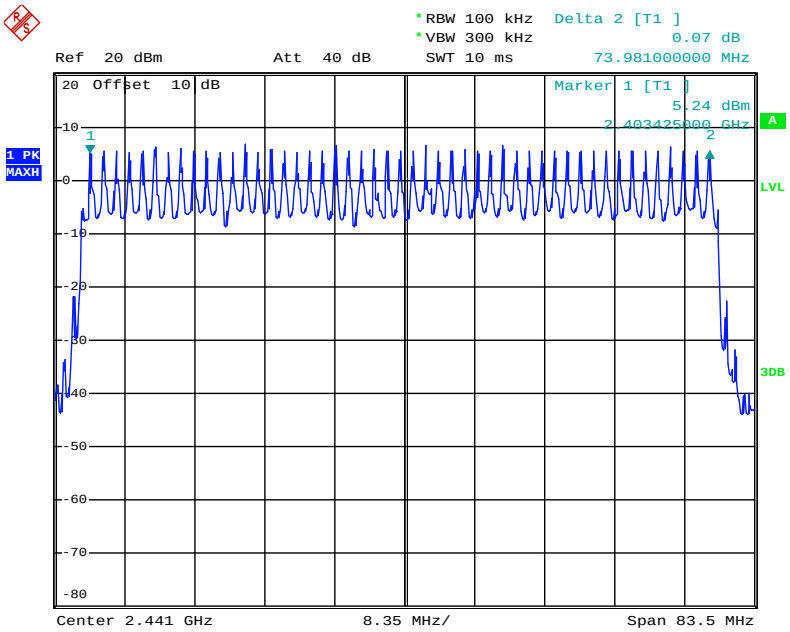
7.5.2.Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz.

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

7.6.Test Result

Total number of hopping channel	Measurement result(CH)	Limit(CH)	Result
	49	⩾15	Pass

The spectrum analyzer plots are attached as below.



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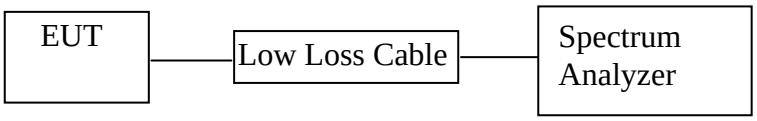
8. DWELL TIME TEST

8.1.Block Diagram of Test Setup



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

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

8.3.EUT Configuration on Test

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

8.4.Operating Condition of EUT

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

8.4.2.Turn on the power of all equipment.

8.4.3.Let the EUT work in TX (Hopping on) modes measure it. The transmit frequency are 2403.5, 2440.4, 2477.3MHz.

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=50ms. Get the pulse time.

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

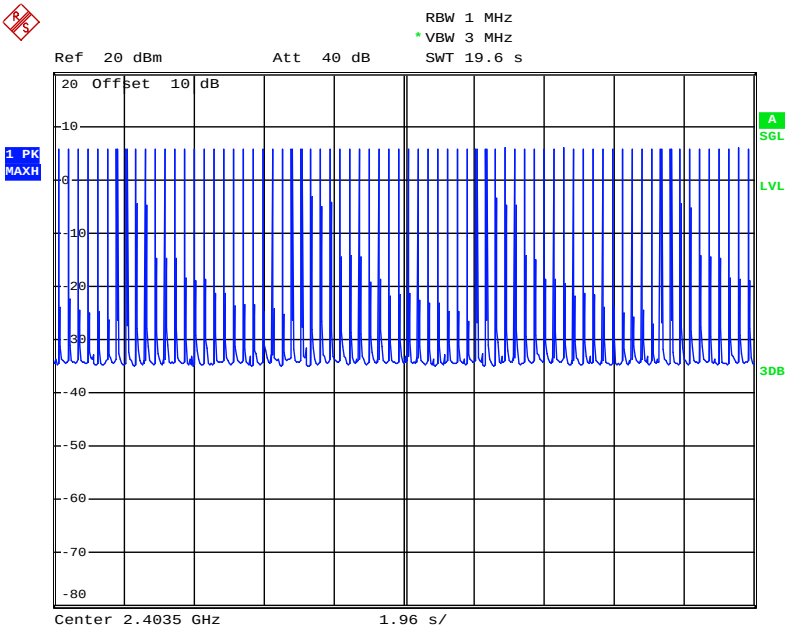
8.6.Test Result

Pass.

Frequency (MHz)	The number of channels under the sweep time of 0.4* 49	Occupied time for each channel (ms)	Dwell time (ms)	Limit (ms)
2403.5	72	4.400	316.80	⩽400
2440.4	72	4.360	313.92	⩽400
2477.3	73	4.400	321.20	⩽400

The spectrum analyzer plots are attached as below.

Low channel



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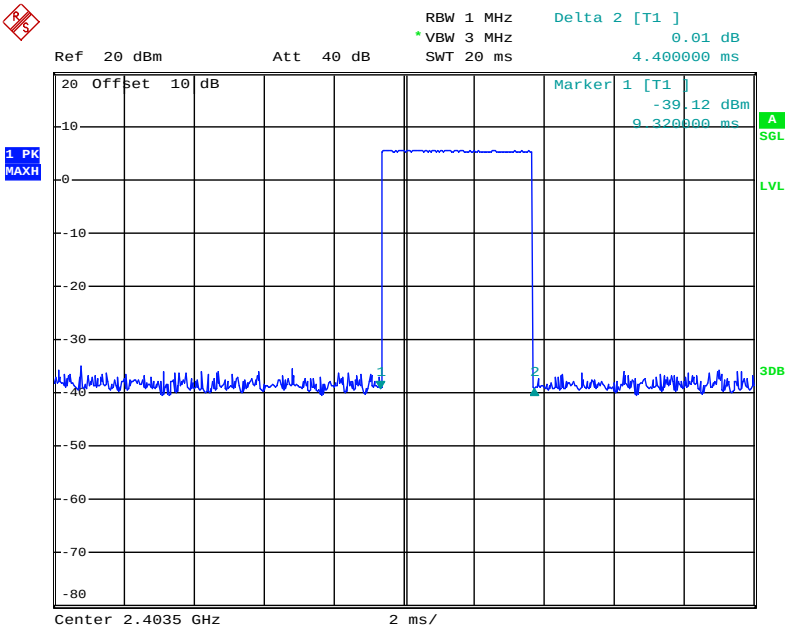

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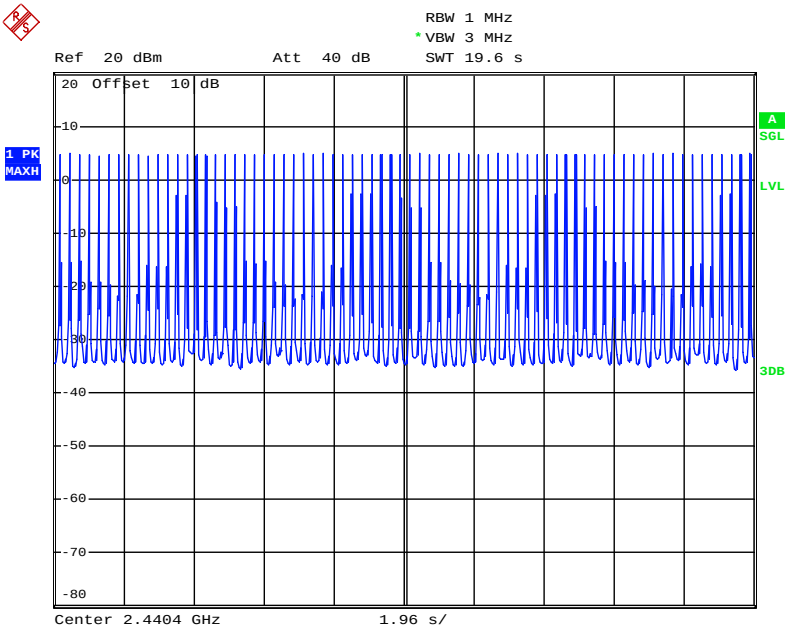
Middle channel



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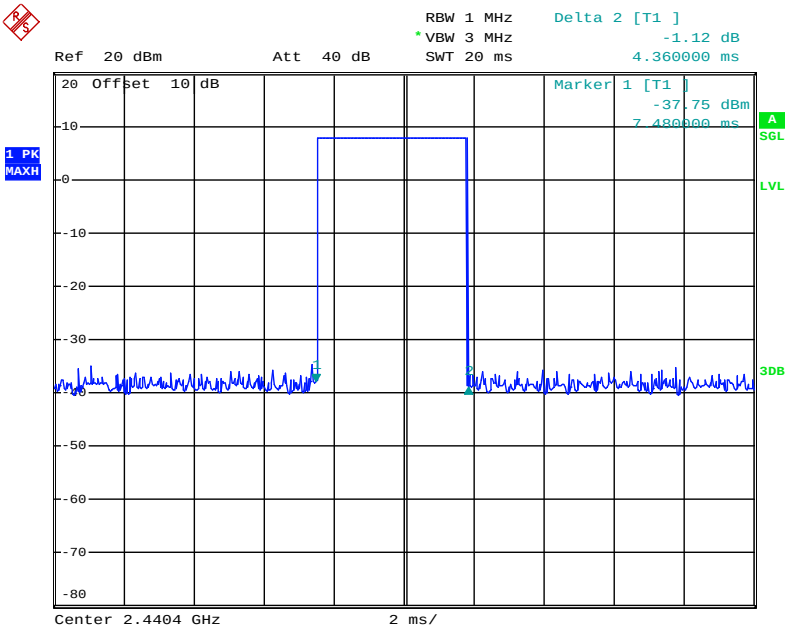

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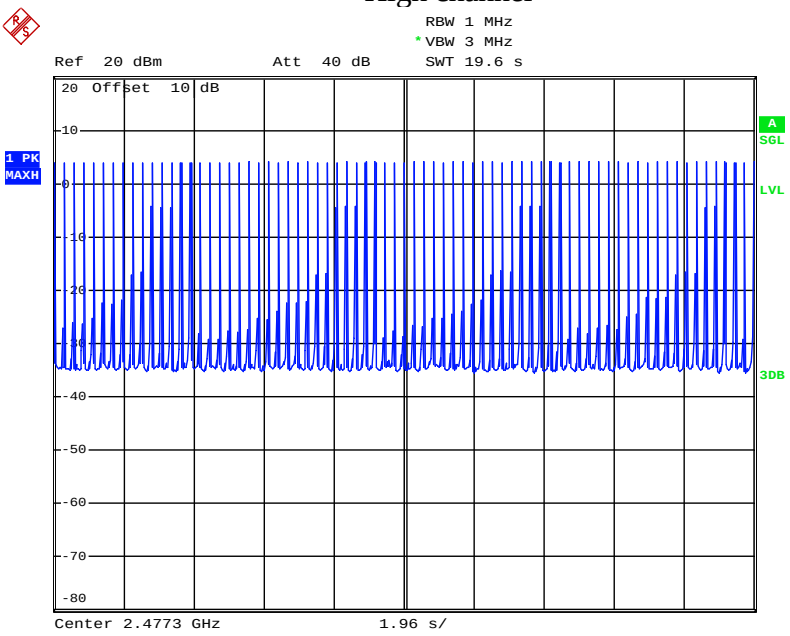
High channel



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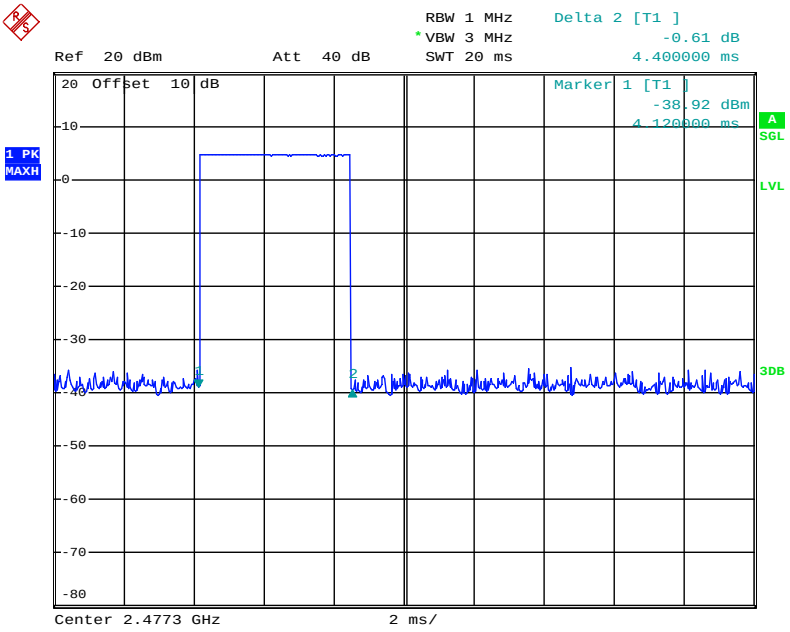

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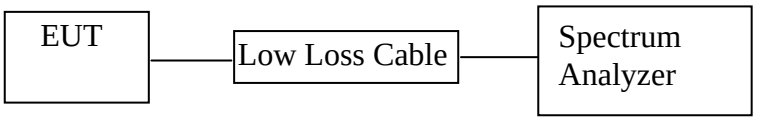
9. MAXIMUM PEAK OUTPUT POWER TEST

9.1.Block Diagram of Test Setup



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

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

9.3.EUT Configuration on Test

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

9.4.Operating Condition of EUT

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

9.4.2.Turn on the power of all equipment.

9.4.3.Let the EUT work in TX (Hopping off) modes measure it. The transmit frequency are 2403.5, 2440.4, 2477.3MHz.

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.

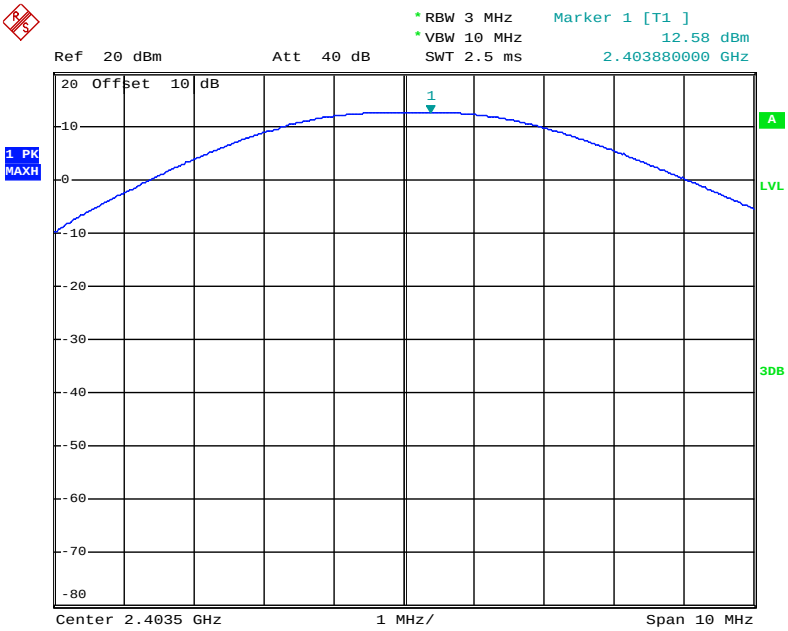
9.5.3.Measurement the maximum peak output power.

9.6.Test Result

Channel	Frequency (MHz)	Peak Output Power (dBm/W)	Limits (dBm/W)	Result
Low	2403.5	12.58/0.018	21 / 0.125	Pass
Middle	2440.4	12.85/0.019	21 / 0.125	Pass
High	2477.3	12.82/0.019	21 / 0.125	Pass

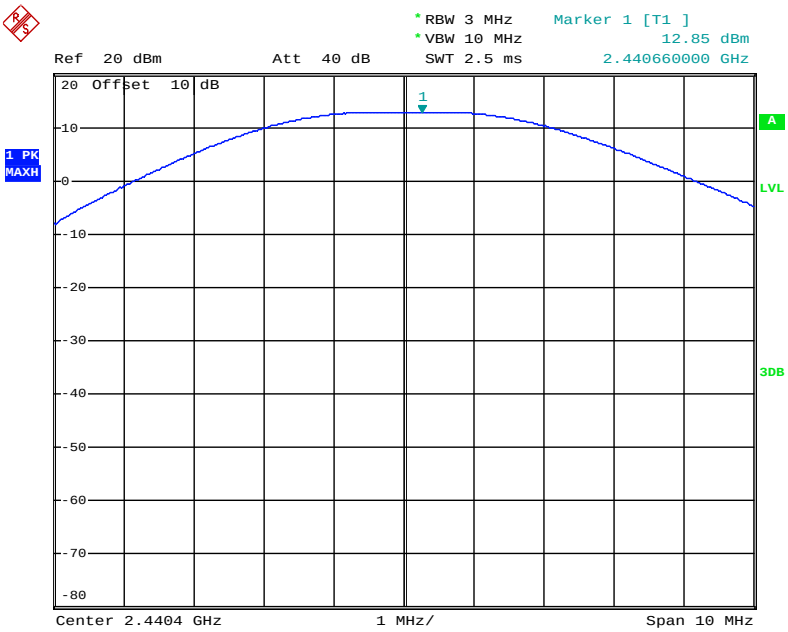
The spectrum analyzer plots are attached as below.

Low channel



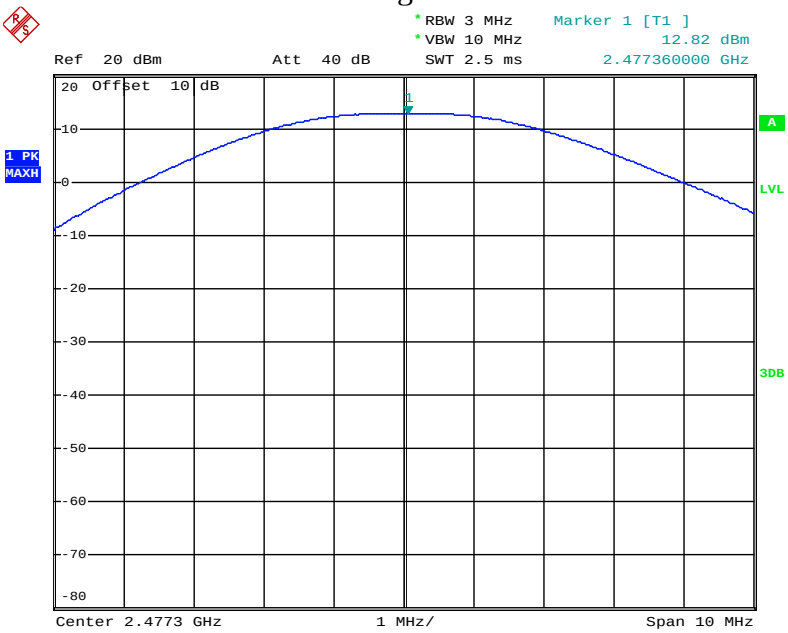
Date: 5.APR.2019 15:34:46

Middle channel



Date: 5.APR.2019 15:35:15

High channel

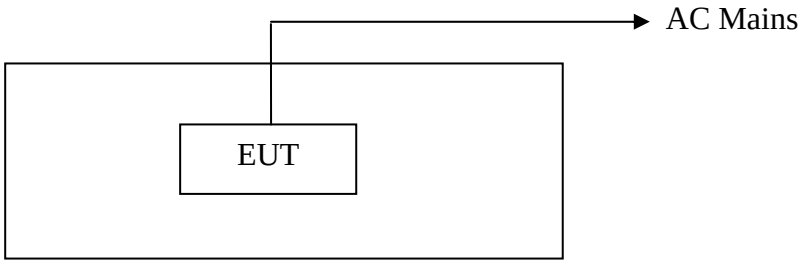


Date: 5.APR.2019 15:33:52

10. RADIATED EMISSION TEST

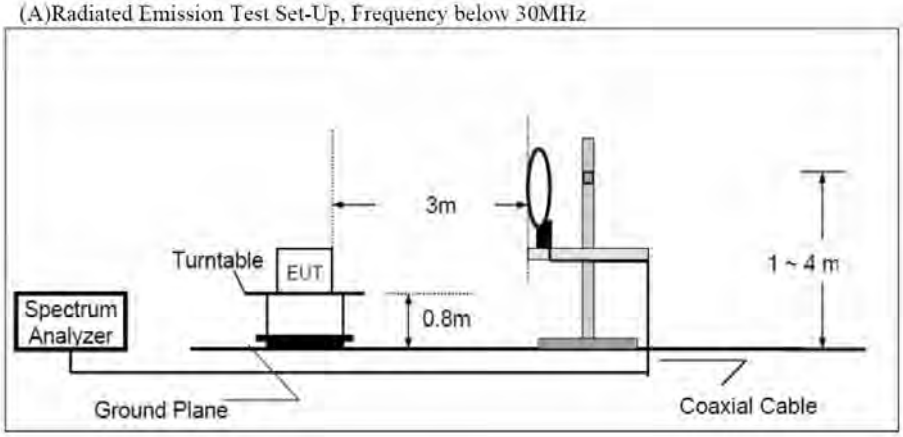
10.1. Block Diagram of Test Setup

10.1.1. Block diagram of connection between the EUT and peripherals

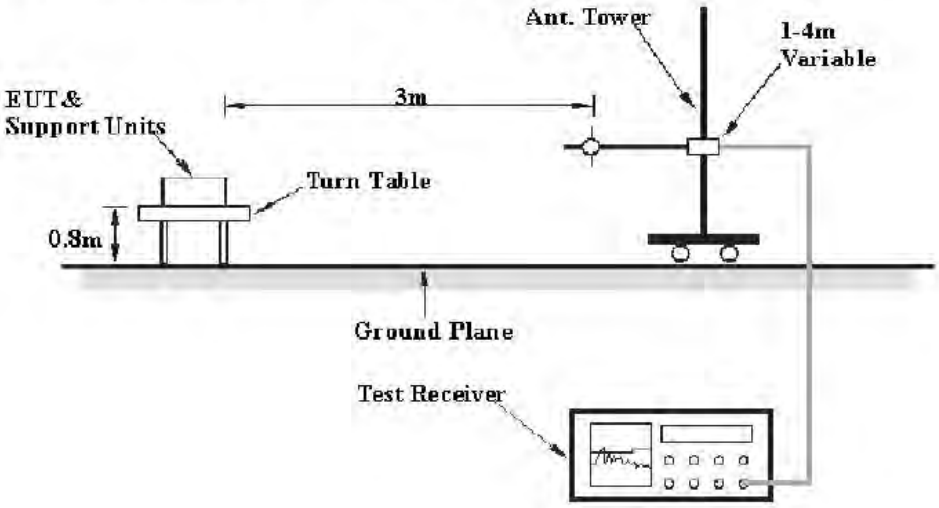


10.1.2. Semi-Anechoic Chamber Test Setup Diagram

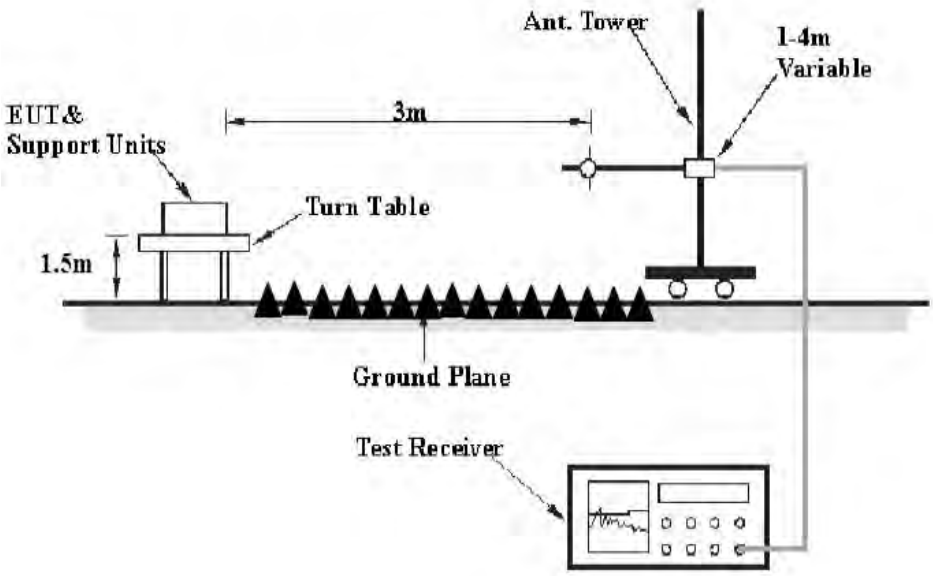
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



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



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



10.2.The 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).

10.3. The limits for Section 15.209(a)

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100 **	3
88–216	150 **	3
216–960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54–72 MHz, 76–88 MHz, 174–216 MHz or 470–806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

10.4. EUT Configuration on Test

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

10.5. Operating Condition of EUT

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

10.5.2. Turn on the power of all equipment.

10.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2403.5, 2440.4, 2477.3MHz.

10.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter(Below 1GHz) and 1.5m(above 1GHz) 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 bilog 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 interface cables must be manipulated according to ANSI C63.10: 2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

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

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.

2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.

3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.

4. All modes of operation were investigated and the worse case emissions are reported.

10.7.Data Sample

Frequency (MHz)	Reading (dBμv)	Factor (dB/m)	Result (dBμv/m)	Limit (dBμv/m)	Margin (dB)	Remark
X.XX	48.69	-13.35	35.34	46	-10.66	QP

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

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

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

10.8.Test Results

Pass.

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

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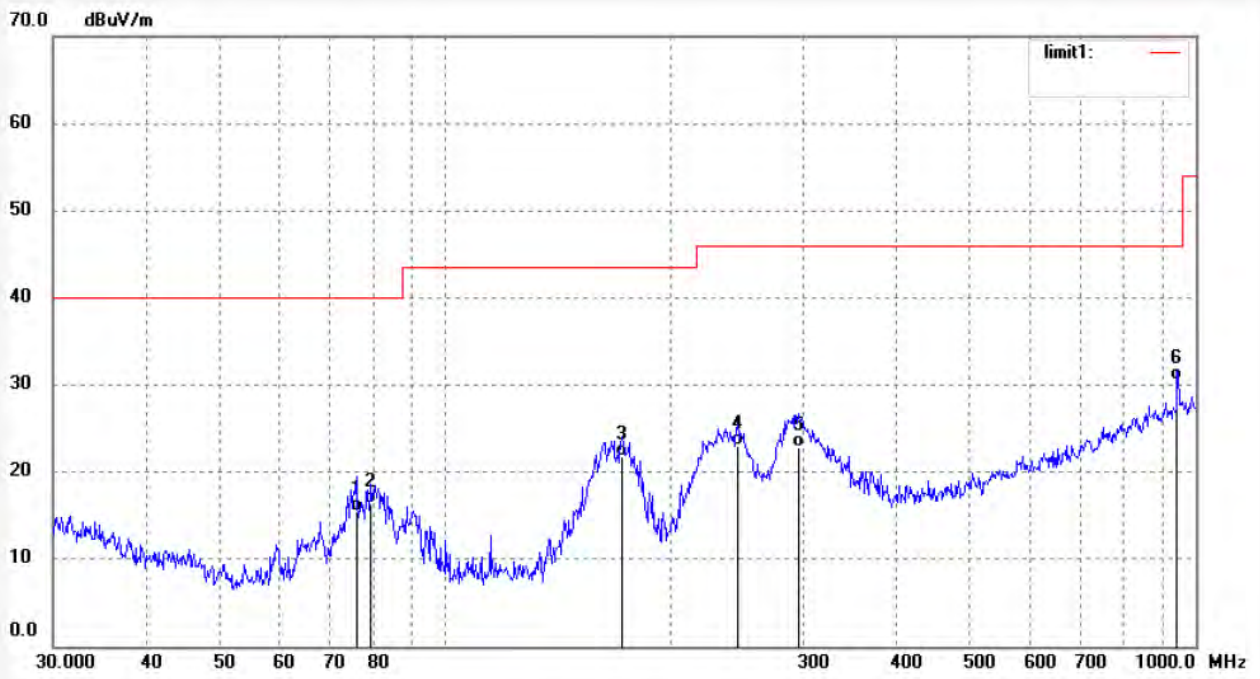
Job No.: FRANK2019 #714	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/04/36
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2403.5MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report No.: ATE20182049



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	43.20	-27.64	15.56	40.00	-24.44	QP	200	111	
2	79.6764	43.87	-27.42	16.45	40.00	-23.55	QP	200	242	
3	171.9921	48.02	-26.20	21.82	43.50	-21.68	QP	200	144	
4	245.2606	46.62	-23.67	22.95	46.00	-23.05	QP	200	256	
5	295.4623	44.30	-21.39	22.91	46.00	-23.09	QP	200	230	
6	945.3336	36.92	-6.41	30.51	46.00	-15.49	QP	200	257	

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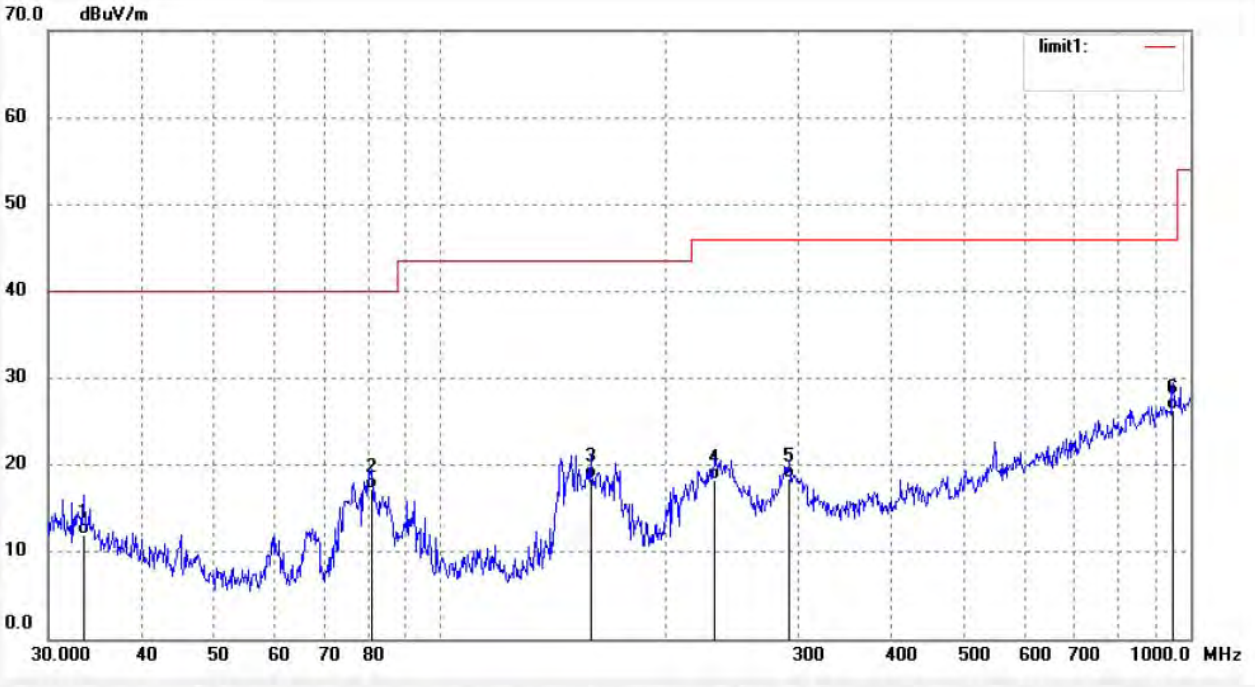
Job No.: FRANK2019 #715	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/05/20
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2403.5MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report No.: ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.4520	33.10	-21.06	12.04	40.00	-27.96	QP	100	147	
2	81.0885	44.70	-27.42	17.28	40.00	-22.72	QP	100	201	
3	158.6399	45.60	-27.22	18.38	43.50	-25.12	QP	100	144	
4	231.8531	42.10	-23.85	18.25	46.00	-27.75	QP	100	256	
5	292.3643	40.10	-21.56	18.54	46.00	-27.46	QP	100	304	
6	948.6609	32.69	-6.35	26.34	46.00	-19.66	QP	100	55	

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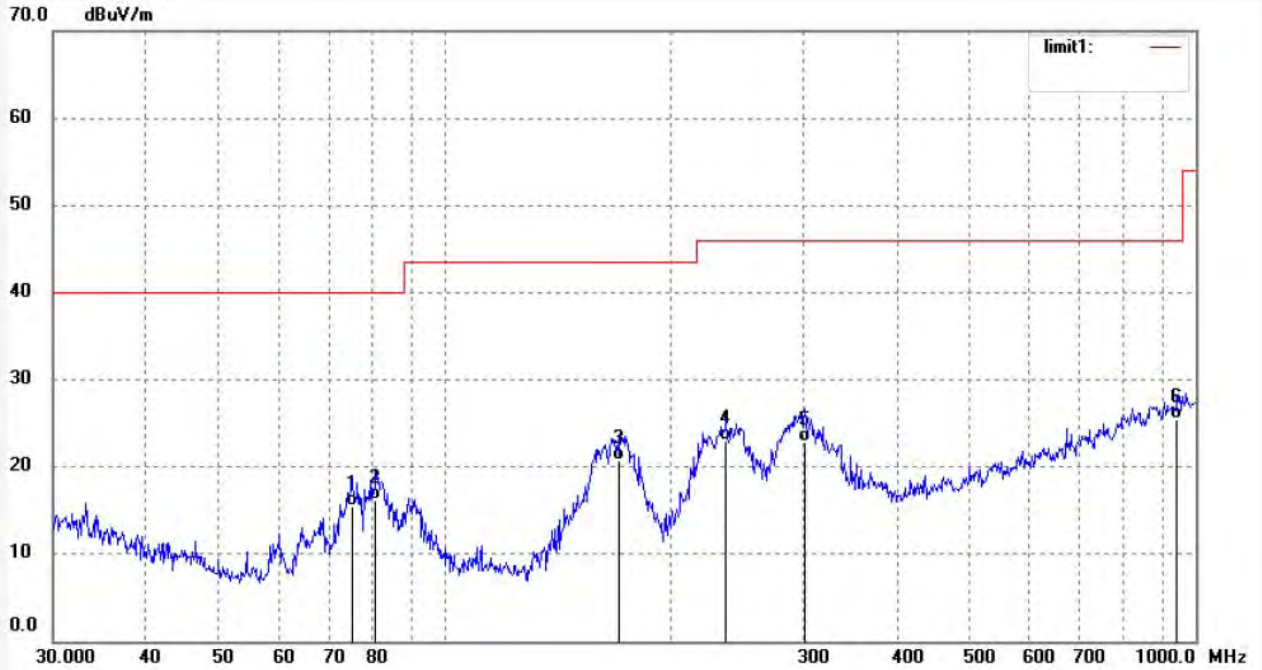
Job No.: FRANK2019 #717	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/08/49
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2440.4MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report No.: ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	75.0566	43.21	-27.70	15.51	40.00	-24.49	QP	200	14	
2	80.8041	43.50	-27.40	16.10	40.00	-23.90	QP	200	235	
3	170.7878	46.82	-26.08	20.74	43.50	-22.76	QP	200	125	
4	236.7927	46.77	-23.78	22.99	46.00	-23.01	QP	200	145	
5	301.7572	44.01	-21.17	22.84	46.00	-23.16	QP	200	222	
6	945.3336	31.82	-6.41	25.41	46.00	-20.59	QP	200	325	

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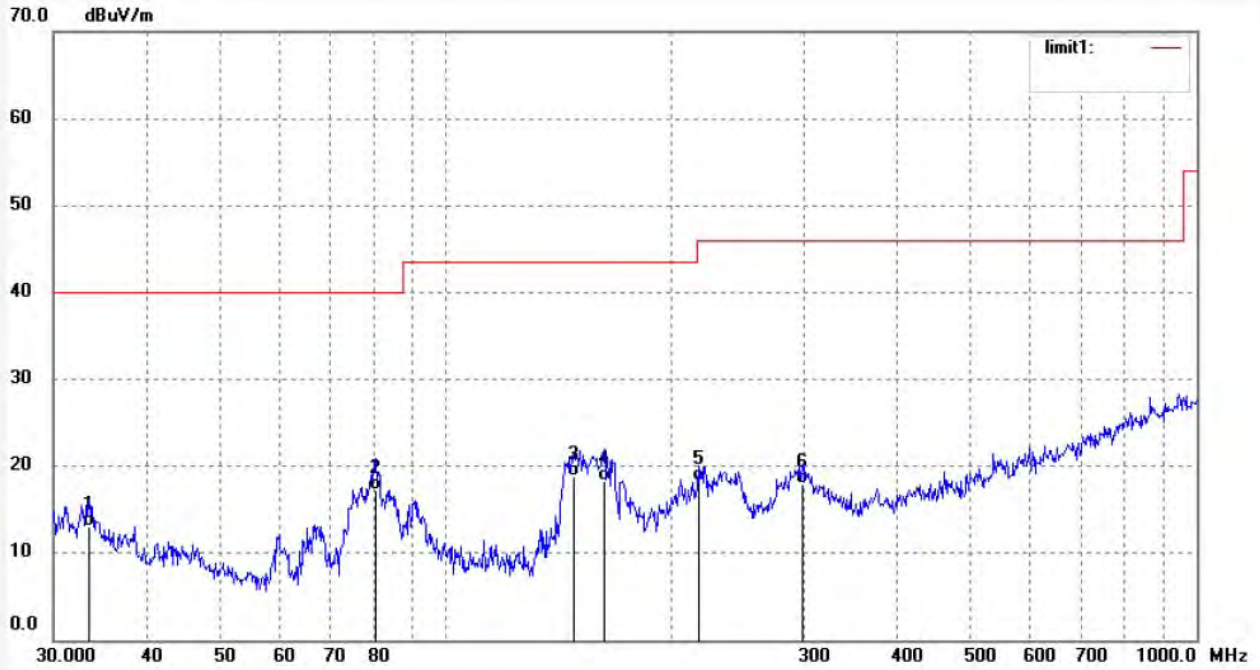
Job No.: FRANK2019 #716	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/06/31
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2440.4MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report No.: ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.4520	34.10	-21.06	13.04	40.00	-26.96	QP	150	145	
2	80.5207	44.66	-27.41	17.25	40.00	-22.75	QP	150	233	
3	147.8746	46.82	-28.05	18.77	43.50	-24.73	QP	150	47	
4	162.5900	45.10	-26.80	18.30	43.50	-25.20	QP	150	103	
5	216.8803	42.36	-24.04	18.32	46.00	-27.68	QP	100	125	
6	298.5932	39.25	-21.28	17.97	46.00	-28.03	QP	150	300	

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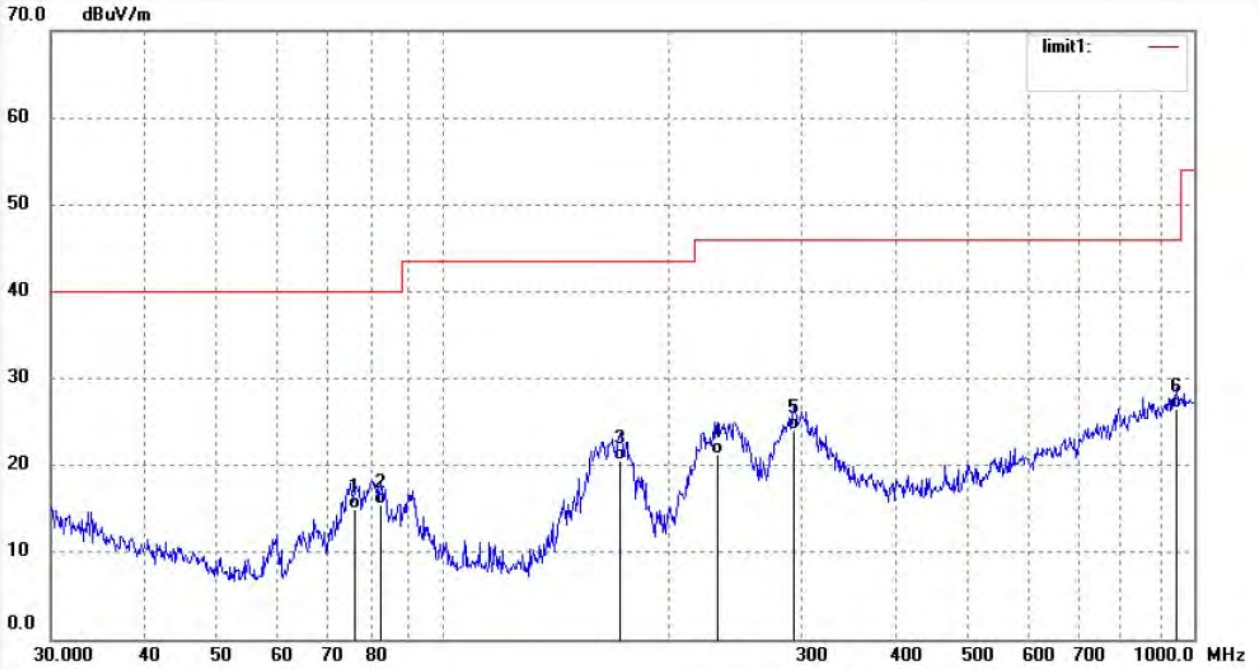
Job No.: FRANK2019 #718	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/10/51
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2477.3MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report No.: ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	76.3869	42.54	-27.61	14.93	40.00	-25.07	QP	200	87	
2	82.5257	42.92	-27.43	15.49	40.00	-24.51	QP	200	46	
3	171.9922	46.82	-26.20	20.62	43.50	-22.88	QP	200	114	
4	231.8531	45.17	-23.85	21.32	46.00	-24.68	QP	200	236	
5	293.3933	45.55	-21.51	24.04	46.00	-21.96	QP	200	251	
6	948.6610	32.94	-6.35	26.59	46.00	-19.41	QP	200	301	

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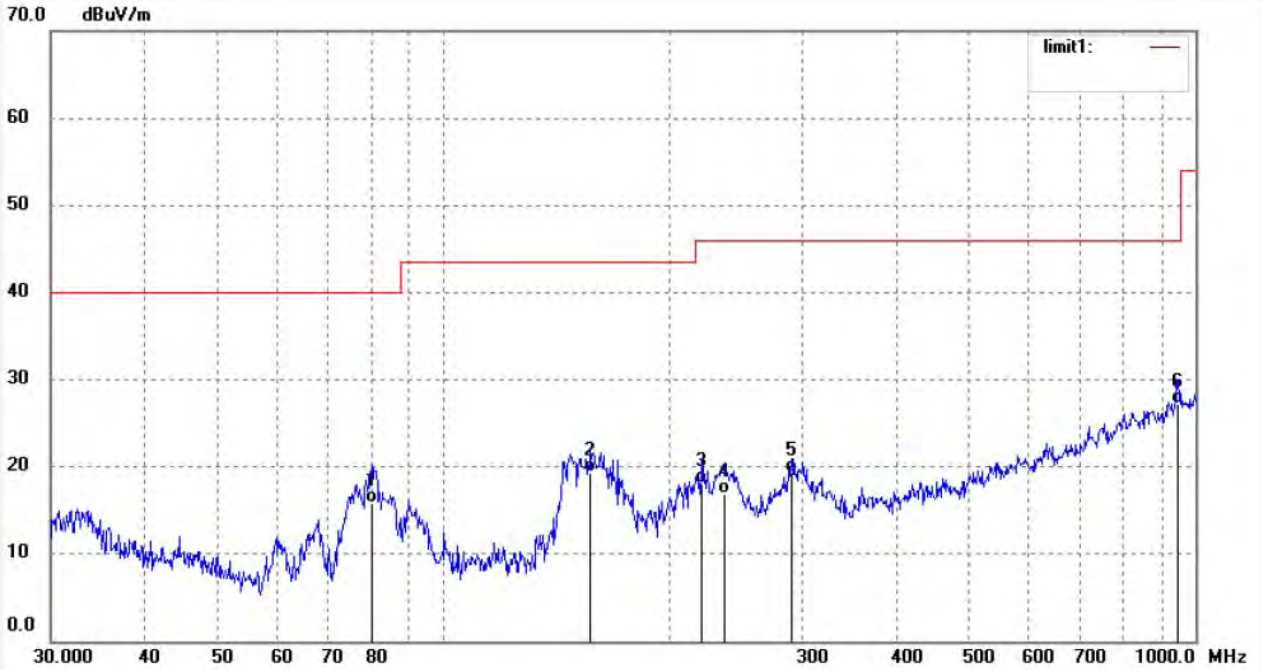
Job No.: FRANK2019 #719	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 14/11/59
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2477.3MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report No.: ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	80.2382	43.20	-27.40	15.80	40.00	-24.20	QP	100	345	
2	156.9764	46.82	-27.41	19.41	43.50	-24.09	QP	100	284	
3	220.7240	42.15	-24.02	18.13	46.00	-27.87	QP	100	147	
4	235.9621	40.68	-23.79	16.89	46.00	-29.11	QP	100	52	
5	290.3170	40.93	-21.65	19.28	46.00	-26.72	QP	100	111	
6	948.6609	33.55	-6.35	27.20	46.00	-18.80	QP	100	275	

Above 1GHz

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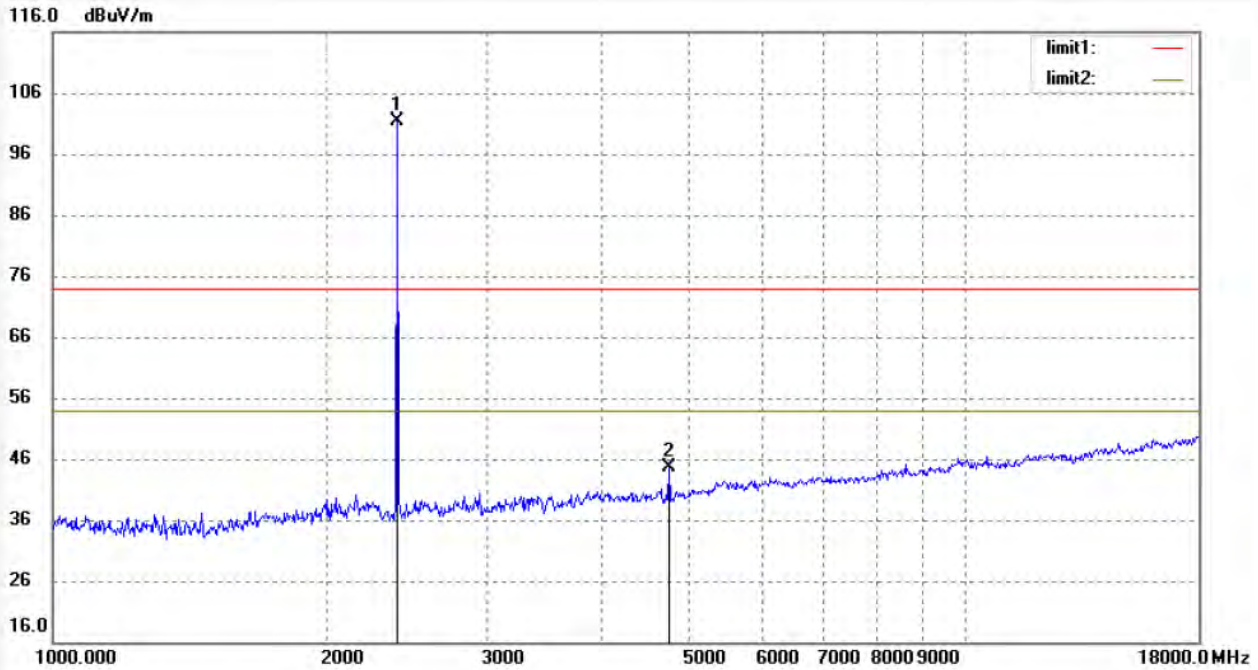
Job No.: FRANK2019 #658	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/38/27
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2403.5MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2403.509	107.78	-6.33	101.45	/	/	peak	250	226	
2	4807.057	43.81	0.70	44.51	74.00	-29.49	peak	250	103	

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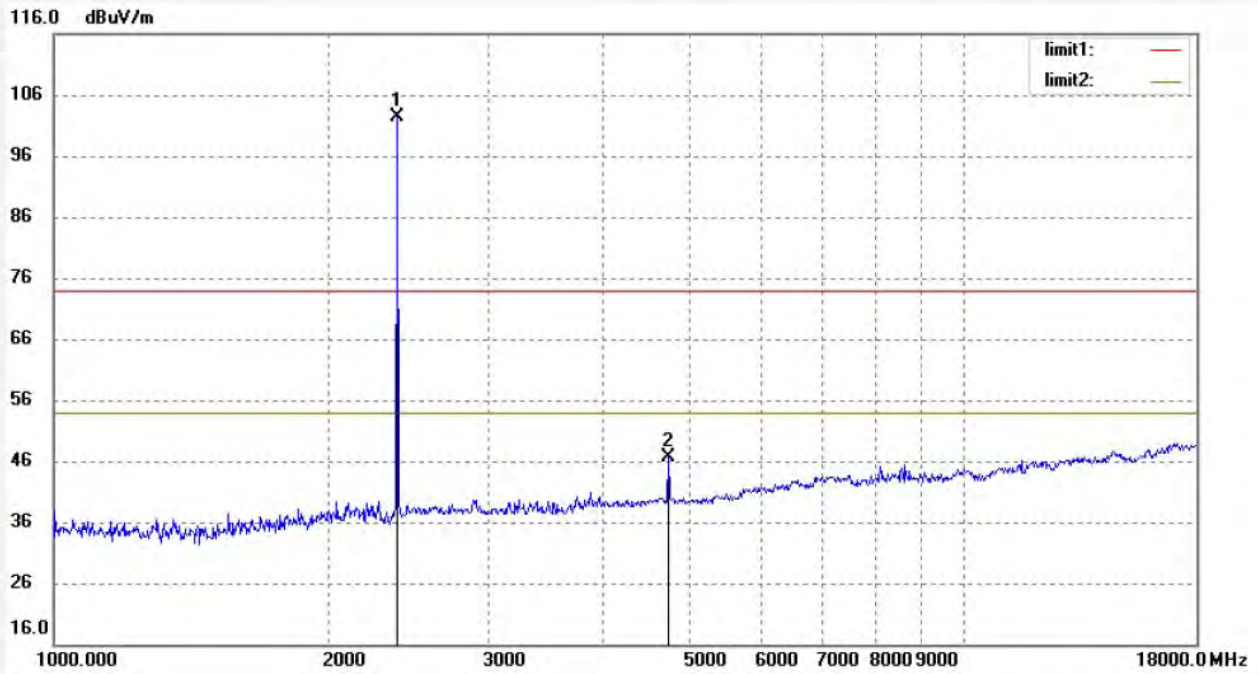
Job No.: FRANK2019 #657	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/37/33
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2403.5MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2403.559	108.68	-6.33	102.35	/	/	peak	150	211	
2	4807.057	46.02	0.70	46.72	74.00	-27.28	peak	150	103	

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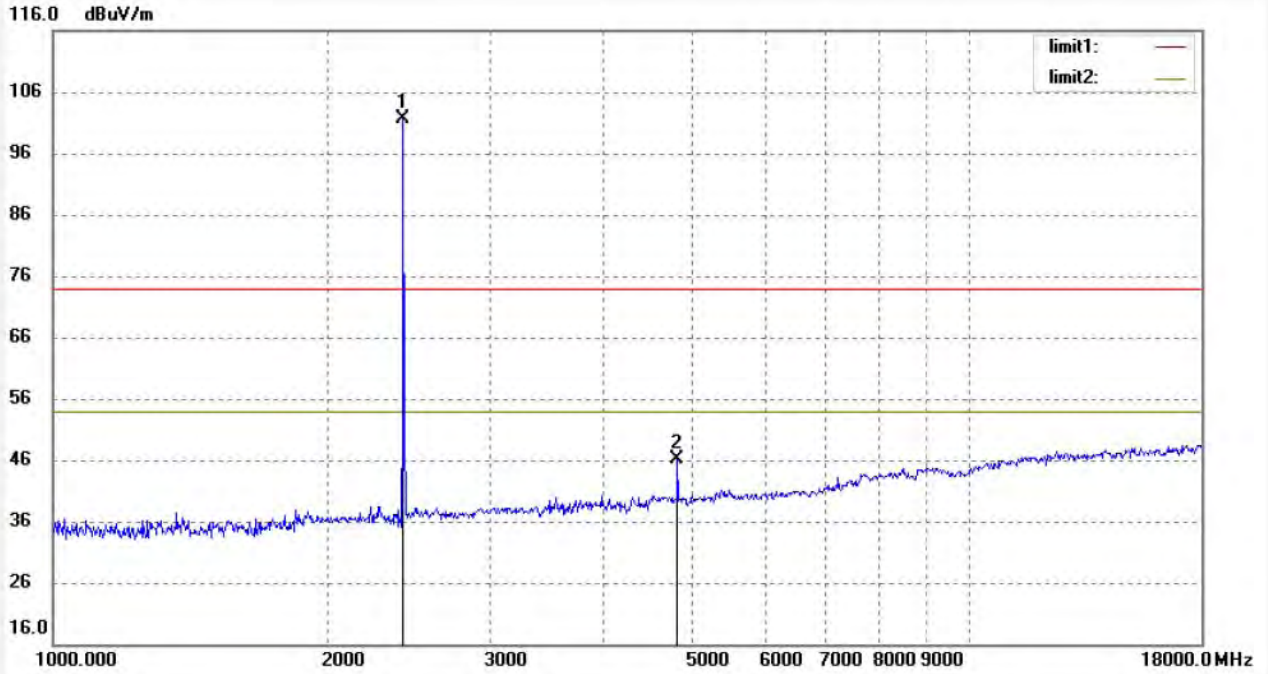
Job No.: FRANK2019 #659	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/39/34
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2440.4MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.421	107.76	-6.20	101.56	/	/	peak	250	259	
2	4880.824	45.03	1.07	46.10	74.00	-27.90	peak	250	103	

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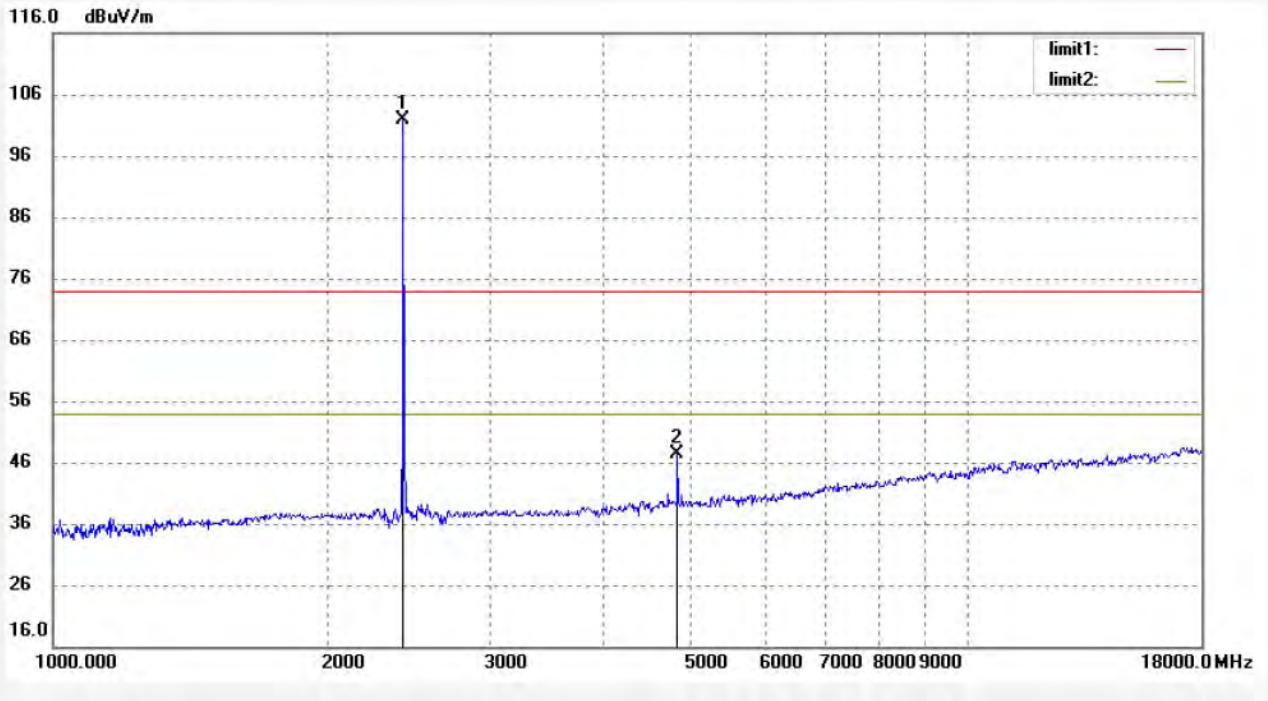
Job No.: FRANK2019 #660	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/40/52
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2440.4MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.421	108.01	-6.20	101.81	/	/	peak	150	55	
2	4880.824	46.39	1.07	47.46	74.00	-26.54	peak	150	109	

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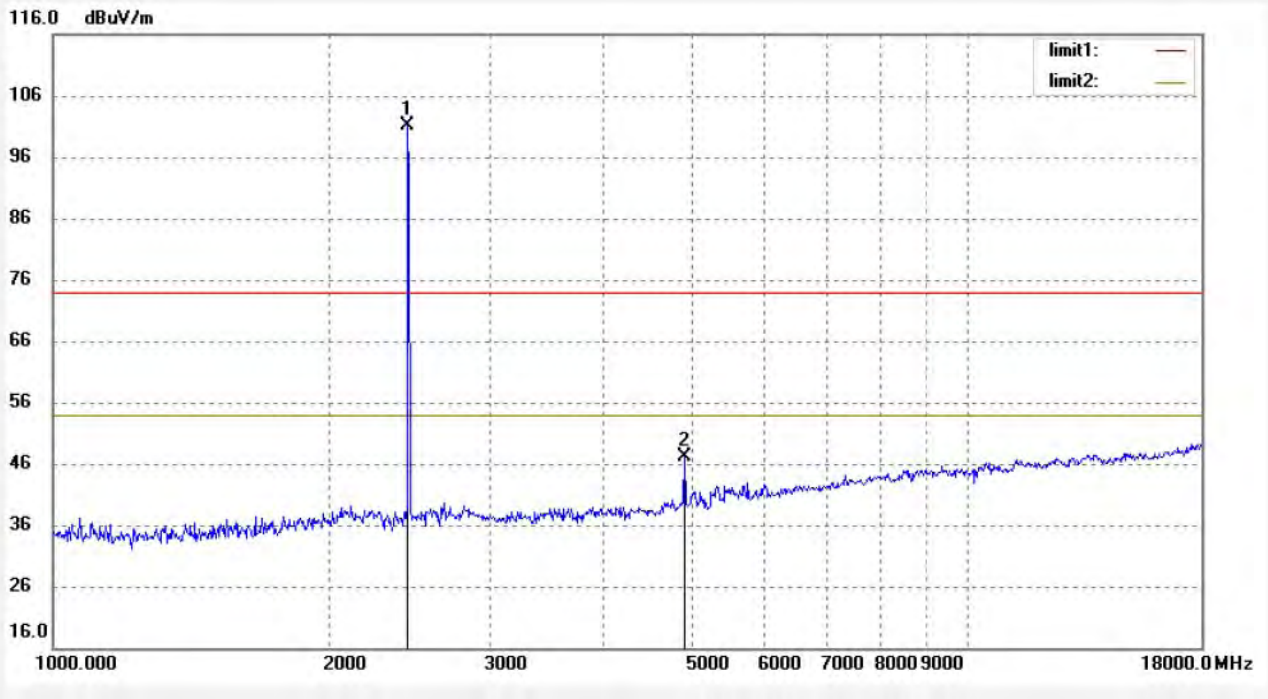
Job No.: FRANK2019 #662	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/42/54
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2477.3MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2477.310	107.27	-6.07	101.20	/	/	peak	250	147	
2	4958.660	45.60	1.43	47.03	74.00	-26.97	peak	250	109	

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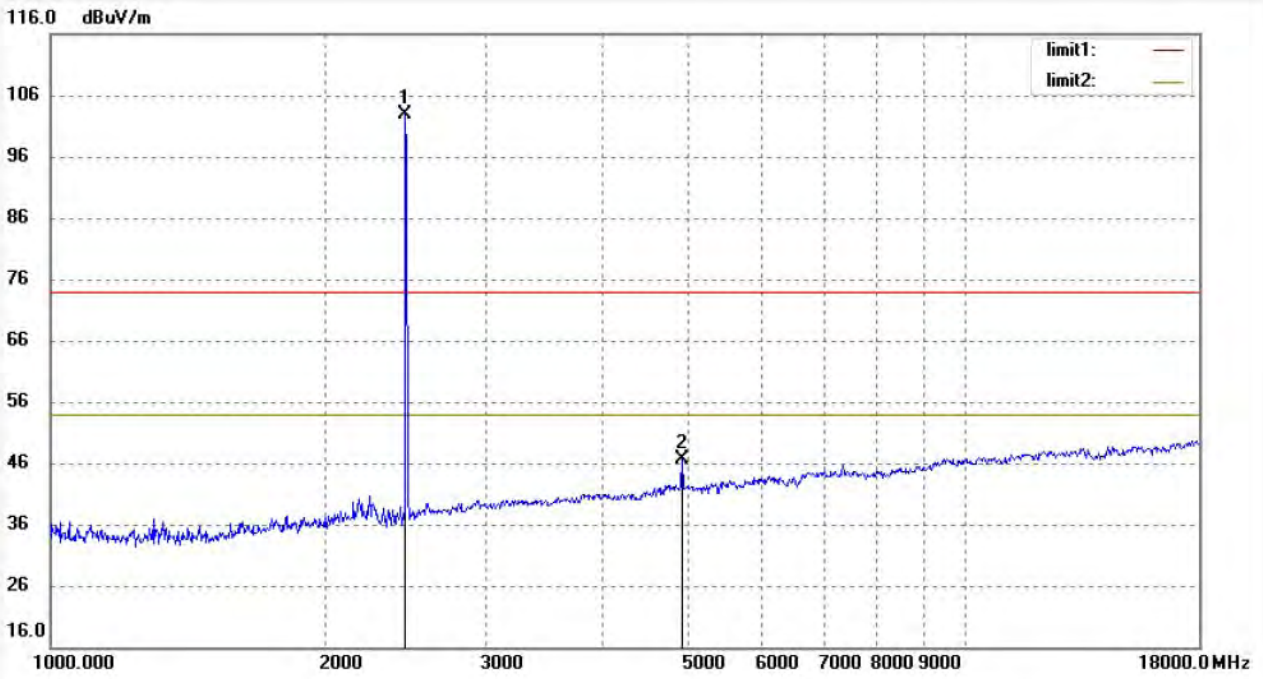
Job No.: FRANK2019 #661	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/41/58
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2477.3MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

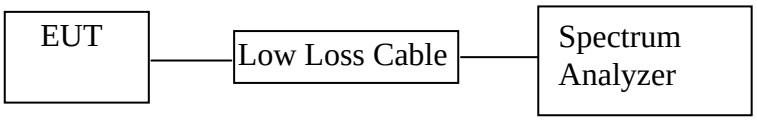
Note: Report NO.:ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2477.310	109.07	-6.07	103.00	/	/	peak	150	229	
2	4958.602	45.23	1.43	46.66	74.00	-27.34	peak	150	103	

11.BAND EDGE COMPLIANCE TEST

11.1.Block Diagram of Test Setup



11.2.The Requirement For Section 15.247(d)

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

11.3.EUT Configuration on Test

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

11.4.Operating Condition of EUT

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

11.4.2.Turn on the power of all equipment.

11.4.3.Let the EUT work in TX (Hopping off, Hopping on) modes measure it. The transmit frequency are 2403.5, 2477.3MHz.

11.5.FCC Part 15.205 Restricted bands of operation

(b) 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

(c) 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.

11.6.Test Procedure

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

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

11.6.3.The band edges was measured and recorded.

11.7.Test Result

Conducted Band Edge Result

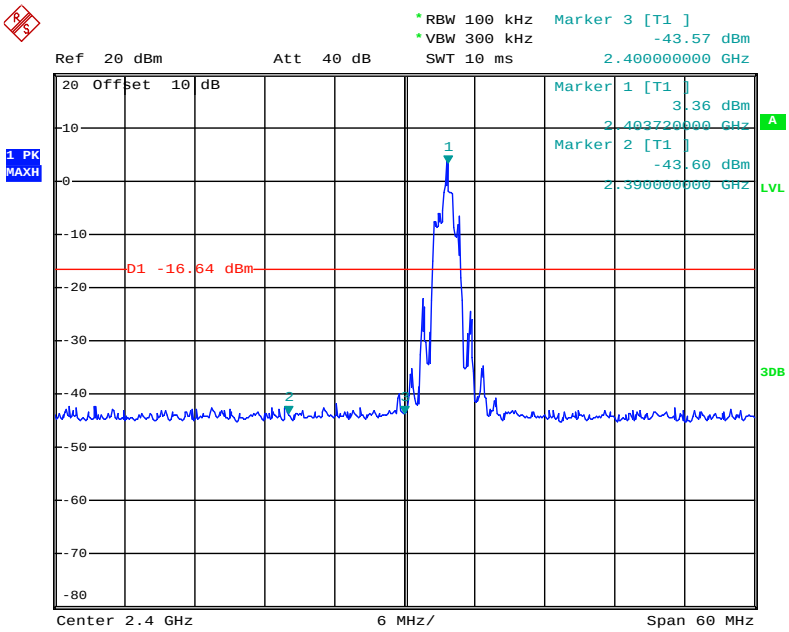
Note: Both hopping-on mode and hopping-off mode had been pre-tested, and only the worst case was recorded in the test report.

Non-hopping mode

Frequency (MHz)	Result of Band Edge (dBc)	Limit of Band Edge (dBc)	Result
2403.5	46.93	> 20dBc	Pass
2477.3	48.41	> 20dBc	Pass

The spectrum analyzer plots are attached as below.

Low channel



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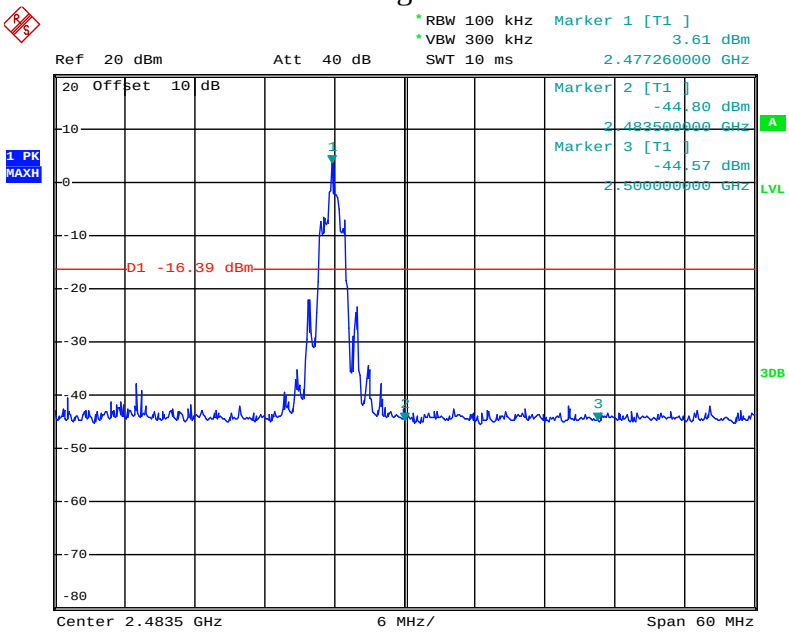
High channel



Date: 4.APR.2019 10:39:42

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 0.8 meter(Below 1GHz) and 1.5m(above 1GHz) 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 2403.5-2477.3MHz TX frequency to transmit(Hopping off mode).
We select 2403.5-2477.3MHz 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 emissions are reported.

The spectrum analyzer plots are attached as below.

Non-hopping mode

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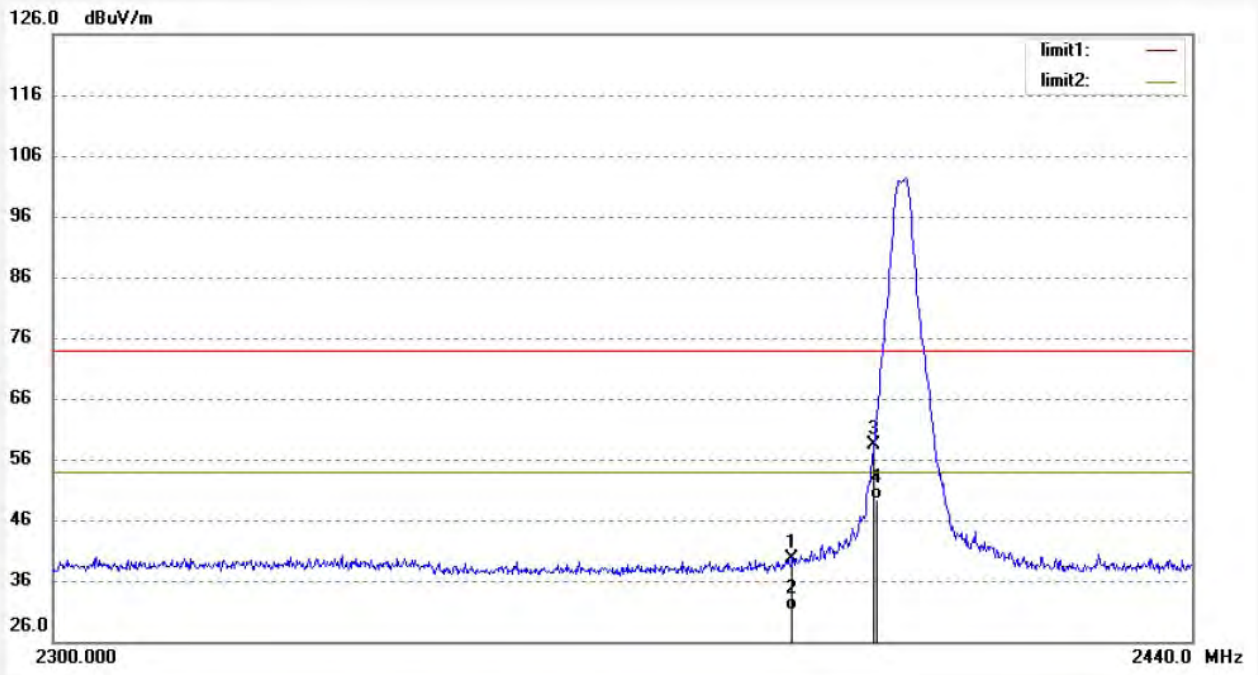
Job No.: FRANK2019 #666	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/51/36
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2403.5MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	46.06	-6.32	39.74	74.00	-34.26	peak	200	41	
2	2390.000	37.45	-6.32	31.13	54.00	-22.87	AVG	200	93	
3	2400.000	64.59	-6.27	58.32	74.00	-15.68	peak	200	221	
4	2400.000	55.75	-6.27	49.48	54.00	-4.52	AVG	200	103	

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

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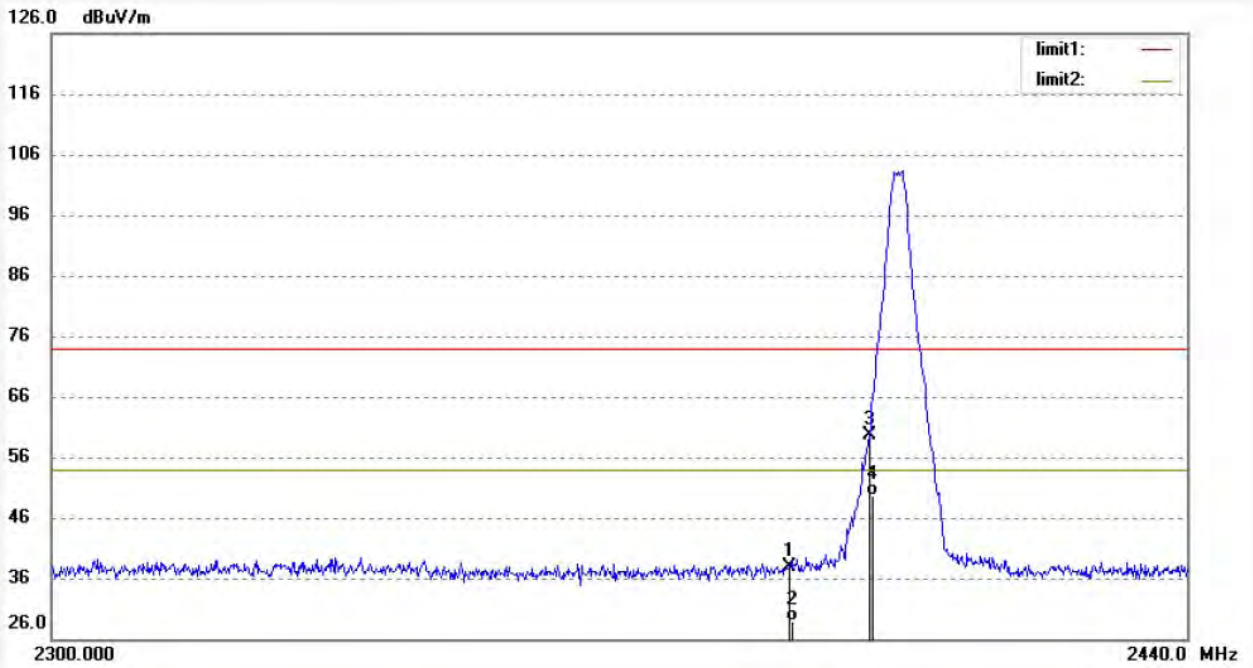
Job No.: FRANK2019 #665	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/47/14
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2403.5MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	44.14	-6.32	37.82	74.00	-36.18	peak	150	116	
2	2390.000	35.12	-6.32	28.80	54.00	-25.20	AVG	150	92	
3	2400.000	65.80	-6.27	59.53	74.00	-14.47	peak	150	221	
4	2400.000	55.97	-6.27	49.70	54.00	-4.30	AVG	150	103	

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

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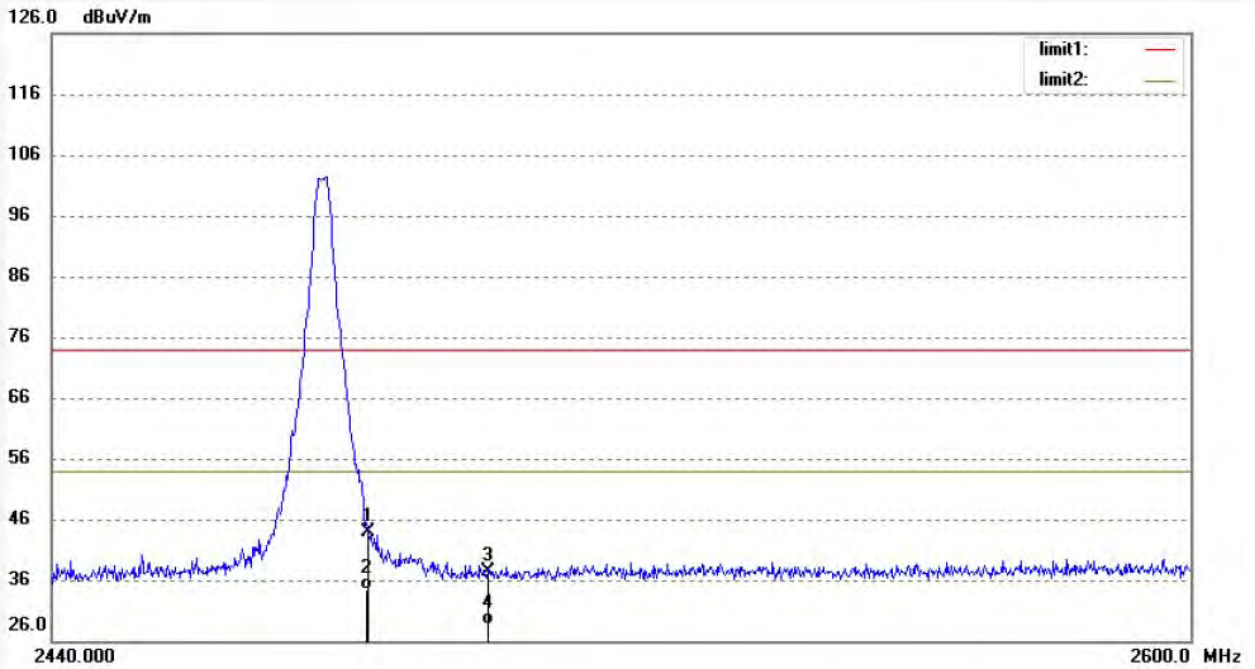
Job No.: FRANK2019 #663	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/44/15
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2477.3MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



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	49.74	-5.89	43.85	74.00	-30.15	peak	200	106	
2	2483.500	40.21	-5.89	34.32	54.00	-19.68	AVG	250	96	
3	2500.000	43.30	-5.81	37.49	74.00	-36.51	peak	200	221	
4	2500.000	34.45	-5.81	28.64	54.00	-25.36	AVG	250	103	

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

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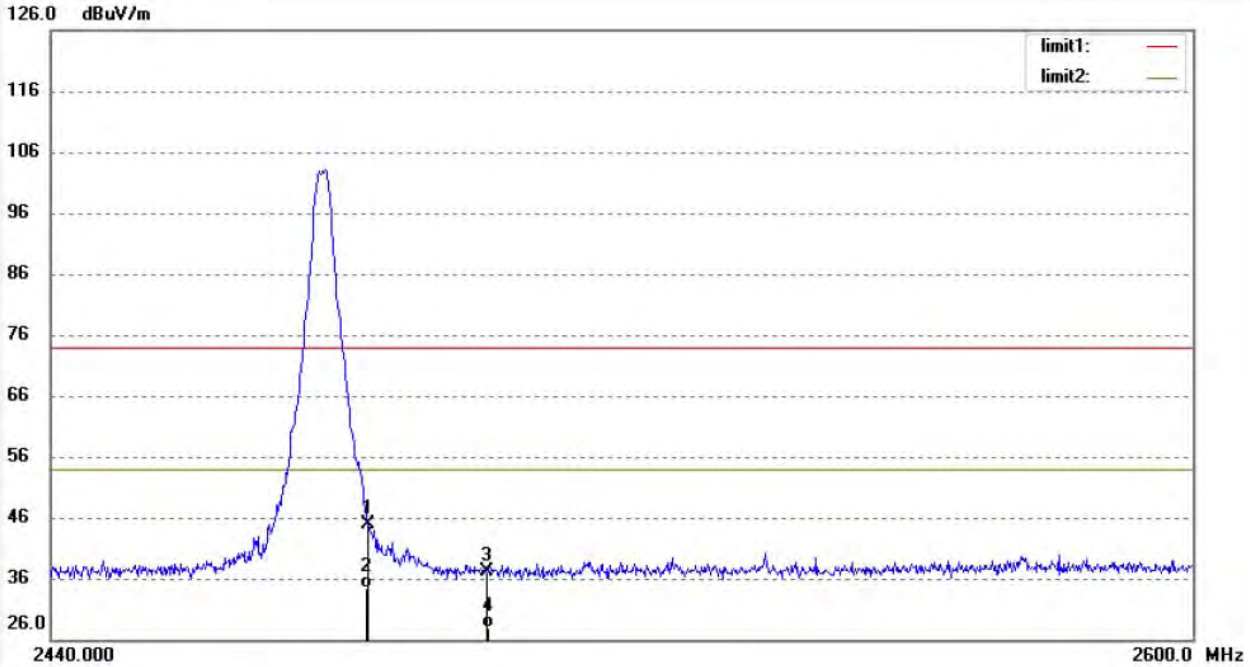
Job No.: FRANK2019 #664	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/03/30/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/45/16
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: TX 2477.3MHz	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



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	50.88	-5.89	44.99	74.00	-29.01	peak	150	310	
2	2483.500	40.31	-5.89	34.42	54.00	-19.58	AVG	150	93	
3	2500.000	43.06	-5.81	37.25	74.00	-36.75	peak	150	229	
4	2500.000	33.65	-5.81	27.84	54.00	-26.16	AVG	150	103	

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

Hopping mode

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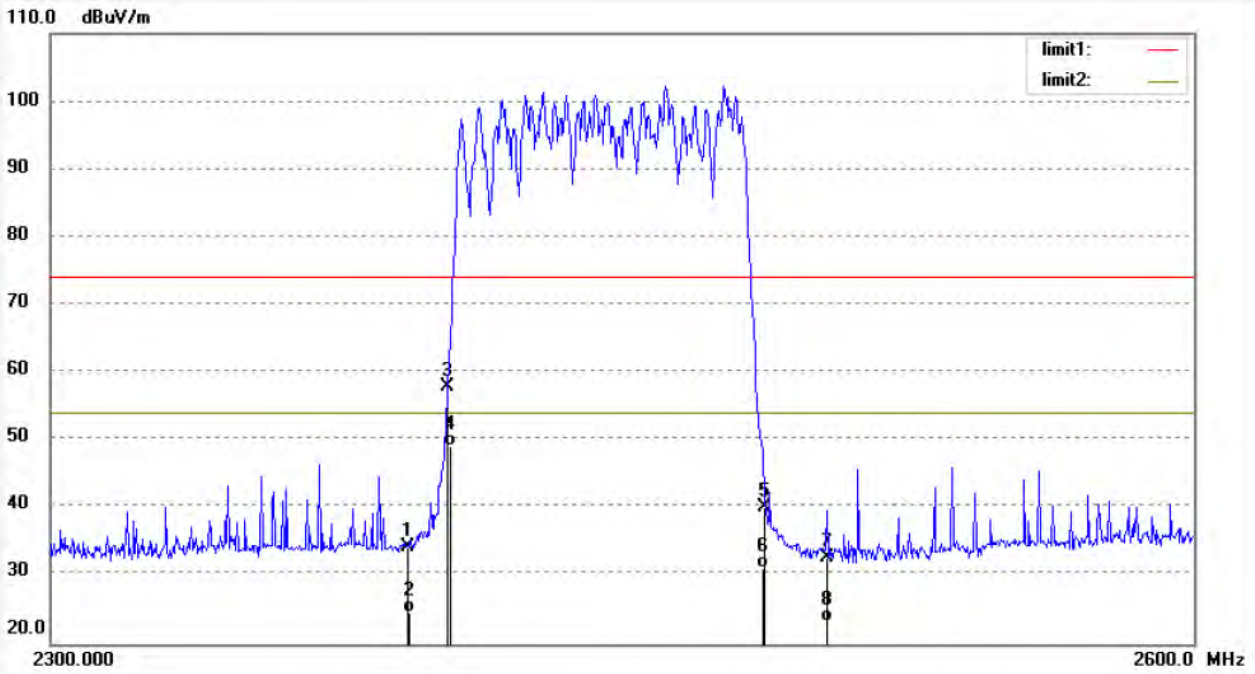
Job No.: FRANK2019 #693	Polarization: Horizontal
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/04/04/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/50/59
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: Hopping	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



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	40.50	-6.32	34.18	74.00	-39.82	peak	250	109	
2	2390.000	31.02	-6.32	24.70	54.00	-29.30	AVG	200	79	
3	2400.000	64.17	-6.27	57.90	74.00	-16.10	peak	200	125	
4	2400.000	55.48	-6.27	49.21	54.00	-4.79	AVG	200	210	
5	2483.500	46.10	-5.89	40.21	74.00	-33.79	peak	200	63	
6	2483.500	37.00	-5.89	31.11	54.00	-22.89	AVG	200	210	
7	2500.000	38.59	-5.81	32.78	74.00	-41.22	peak	250	214	
8	2500.000	29.15	-5.81	23.34	54.00	-30.66	AVG	200	82	

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

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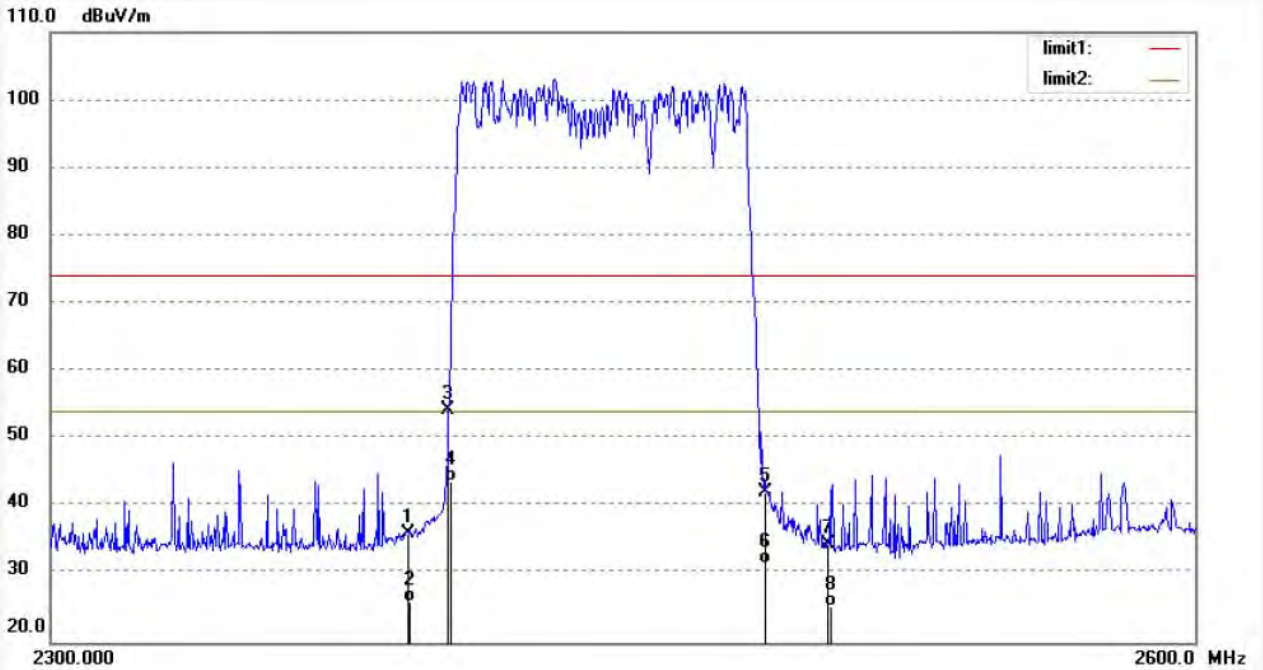
Job No.: FRANK2019 #694	Polarization: Vertical
Standard: FCC PK	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 19/04/04/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 8/54/10
EUT: 5.1 Home Theater Sound Bar	Engineer Signature:
Mode: Hopping	Distance: 3m
Model: STUDIO ADVANCE SUBWOOFER	
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd	

Note: Report NO.:ATE20182049



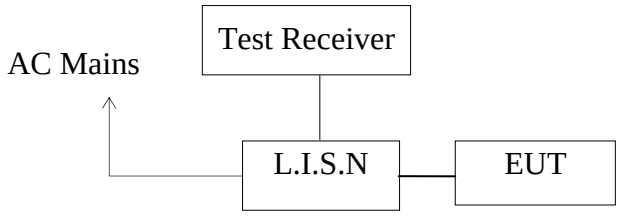
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	42.38	-6.32	36.06	74.00	-37.94	peak	150	103	
2	2390.000	32.25	-6.32	25.93	54.00	-28.07	AVG	150	193	
3	2400.000	60.51	-6.27	54.24	74.00	-19.76	peak	150	221	
4	2400.000	50.00	-6.27	43.73	54.00	-10.27	AVG	150	82	
5	2483.500	48.12	-5.89	42.23	74.00	-31.77	peak	150	301	
6	2483.500	37.45	-5.89	31.56	54.00	-22.44	AVG	150	229	
7	2500.000	40.40	-5.81	34.59	74.00	-39.41	peak	150	31	
8	2500.000	31.05	-5.81	25.24	54.00	-28.76	AVG	150	210	

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

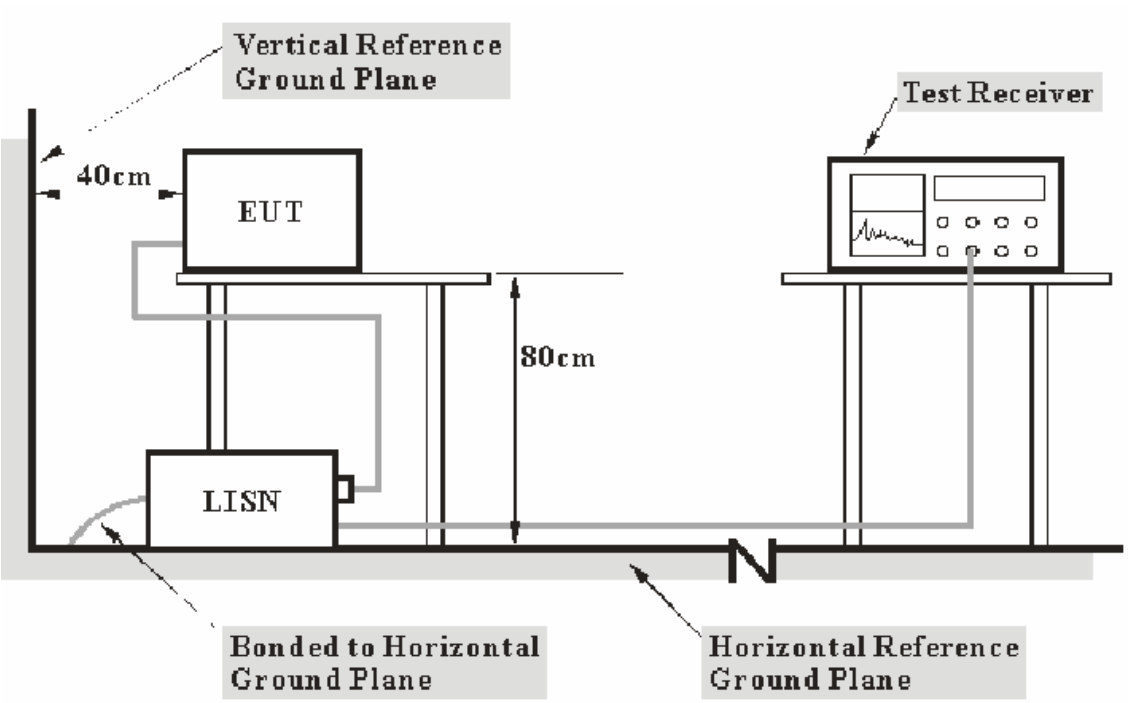
12. AC POWER LINE CONDUCTED EMISSION TEST

12.1. Block Diagram of Test Setup

12.1.1. Block diagram of connection between the EUT and simulators



12.1.2. Test System Setup



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

12.2.The Limits for Section 15.207(a)

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies,
within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.
The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

12.3.EUT Configuration on Test

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

12.4.Operating Condition of EUT

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

12.4.2.Turn on the power of all equipment.

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

12.5.Test Procedure

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

The bandwidth of test receiver is set at 9kHz.

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

12.6.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dBμV)	Average Level (dBμV)	QuasiPeak Limit (dBμV)	Average Limit (dBμV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.5	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

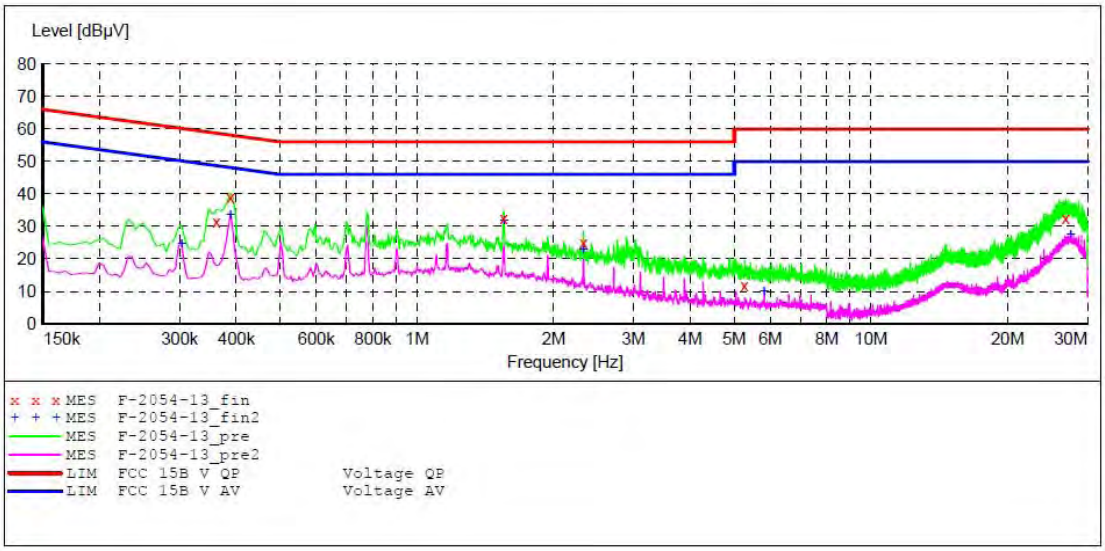
CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: 5.1 Home Theater Sound Bar and Wireless Subwoofer System
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd
Operating Condition: Wireless communication
Test Site: 1#Shielding Room
Operator: Frank
Test Specification: L 240V/60Hz
Comment: Report NO.:ATE20182049 M/N: STUDIO ADVANCE SUBWOOFER
Start of Test: 2019-3-12 / 13:55:53

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

Short Description: _SUB_STD_VTERM2 1.70

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



MEASUREMENT RESULT: "F-2054-13_fin"

2019-3-12 13:58

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.361500	31.50	10.9	59	27.2	QP	L1	GND
0.388500	38.80	11.0	58	19.3	QP	L1	GND
1.554000	32.70	11.2	56	23.3	QP	L1	GND
2.328000	24.90	11.3	56	31.1	QP	L1	GND
5.271000	11.80	11.4	60	48.2	QP	L1	GND
26.835000	32.40	11.8	60	27.6	QP	L1	GND

MEASUREMENT RESULT: "F-2054-13_fin2"

2019-3-12 13:58

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.303000	24.70	10.9	50	25.5	AV	L1	GND
0.388500	33.70	11.0	48	14.4	AV	L1	GND
1.554000	31.90	11.2	46	14.1	AV	L1	GND
2.328000	22.80	11.3	46	23.2	AV	L1	GND
5.820000	9.90	11.5	50	40.1	AV	L1	GND
27.550500	27.50	11.8	50	22.5	AV	L1	GND

ACCURATE TECHNOLOGY CO.,LTD

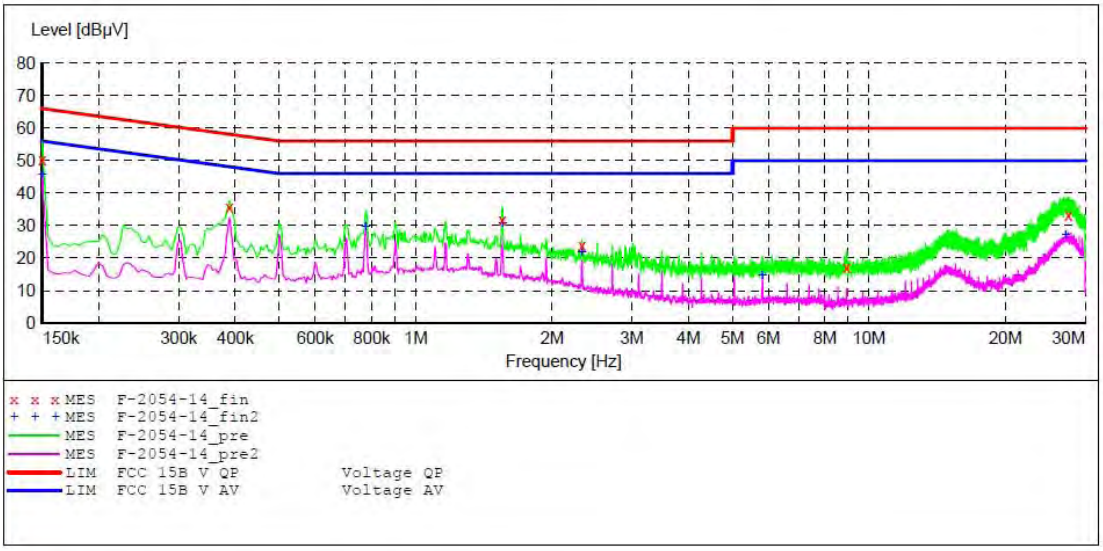
CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: 5.1 Home Theater Sound Bar and Wireless Subwoofer System
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd
Operating Condition: Wireless communication
Test Site: 1#Shielding Room
Operator: Frank
Test Specification: N 240V/60Hz
Comment: Report NO.:ATE20182049 M/N: STUDIO ADVANCE SUBWOOFER
Start of Test: 2019-3-12 / 13:58:34

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

Short Description: _SUB_STD_VTERM2 1.70

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



MEASUREMENT RESULT: "F-2054-14_fin"

2019-3-12 14:00

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	50.40	10.8	66	15.6	QP	N	GND
0.388500	35.70	11.0	58	22.4	QP	N	GND
1.554000	31.70	11.2	56	24.3	QP	N	GND
2.328000	23.90	11.3	56	32.1	QP	N	GND
8.925000	17.00	11.5	60	43.0	QP	N	GND
27.550500	33.30	11.8	60	26.7	QP	N	GND

MEASUREMENT RESULT: "F-2054-14_fin2"

2019-3-12 14:00

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	45.60	10.8	56	10.4	AV	N	GND
0.775500	29.50	11.1	46	16.5	AV	N	GND
1.554000	30.80	11.2	46	15.2	AV	N	GND
2.328000	21.70	11.3	46	24.3	AV	N	GND
5.820000	14.50	11.5	50	35.5	AV	N	GND
27.163500	27.20	11.8	50	22.8	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

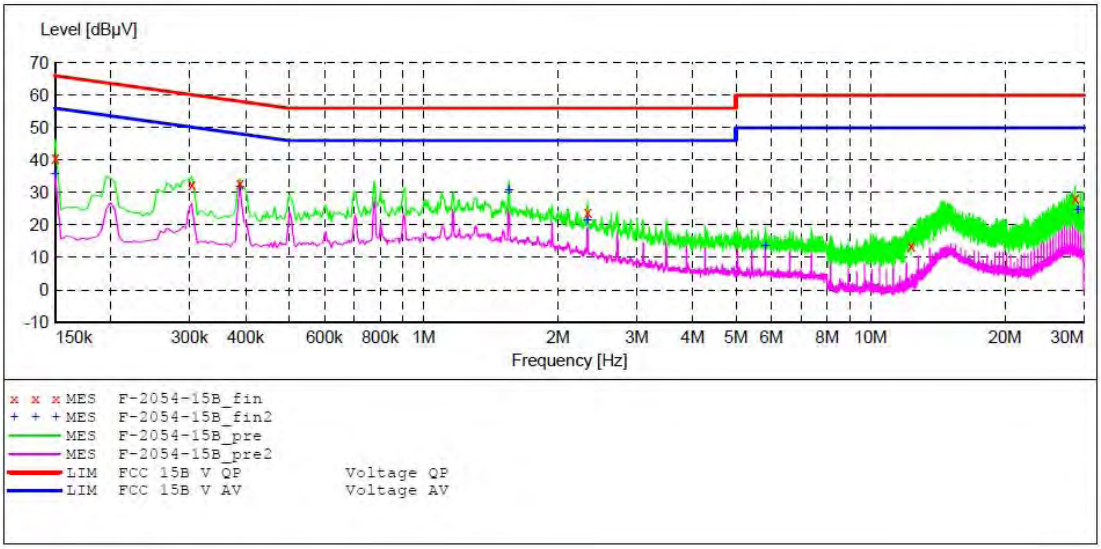
CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: 5.1 Home Theater Sound Bar and Wireless Subwoofer System
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd
Operating Condition: Wireless communication
Test Site: 1#Shielding Room
Operator: Frank
Test Specification: N 120V/60Hz
Comment: Report NO.:ATE20182049 M/N: STUDIO ADVANCE SUBWOOFER
Start of Test: 2019-3-12 / 14:08:02

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

Short Description: _SUB_STD_VTERM2 1.70

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



MEASUREMENT RESULT: "F-2054-15B_fin"

2019-3-12 14:10

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	40.80	10.8	66	25.2	QP	N	GND
0.303000	32.40	10.9	60	27.8	QP	N	GND
0.388500	32.90	11.0	58	25.2	QP	N	GND
2.328000	23.90	11.3	56	32.1	QP	N	GND
12.327000	13.70	11.6	60	46.3	QP	N	GND
28.716000	28.10	11.8	60	31.9	QP	N	GND

MEASUREMENT RESULT: "F-2054-15B_fin2"

2019-3-12 14:10

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.150000	35.70	10.8	56	20.3	AV	N	GND
0.388500	31.70	11.0	48	16.4	AV	N	GND
1.554000	30.80	11.2	46	15.2	AV	N	GND
2.328000	21.60	11.3	46	24.4	AV	N	GND
5.820000	13.70	11.5	50	36.3	AV	N	GND
29.103000	24.60	11.8	50	25.4	AV	N	GND

ACCURATE TECHNOLOGY CO.,LTD

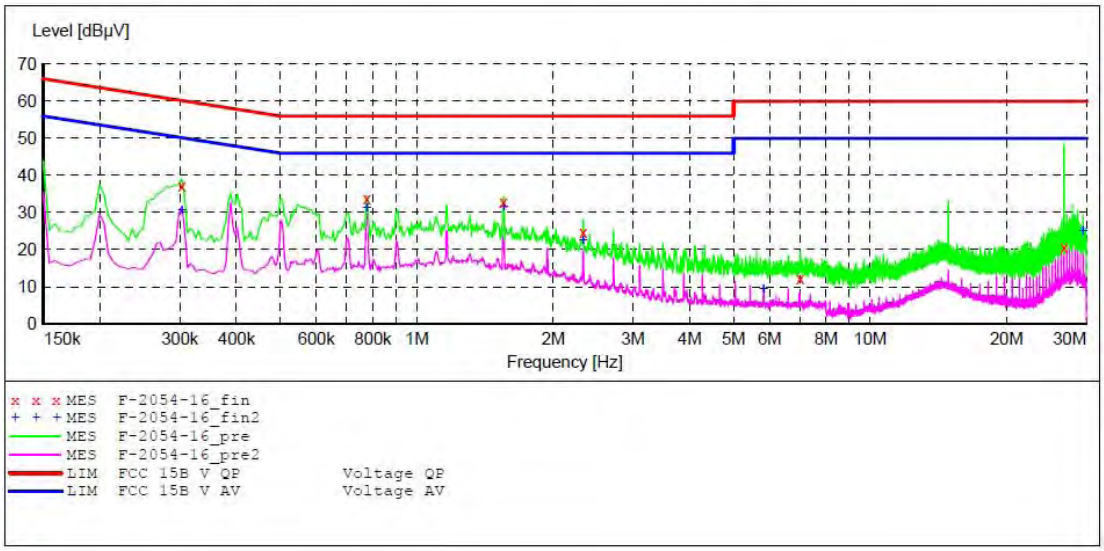
CONDUCTED EMISSION STANDARD FCC PART 15C

EUT: 5.1 Home Theater Sound Bar and Wireless Subwoofer System
Manufacturer: Zhao Yang Electronic (Shenzhen)Co.,Ltd
Operating Condition: Wireless communication
Test Site: 1#Shielding Room
Operator: Frank
Test Specification: L 120V/60Hz
Comment: Report NO.:ATE20182049 M/N: STUDIO ADVANCE SUBWOOFER
Start of Test: 2019-3-12 / 14:11:25

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

Short Description: _SUB_STD_VTERM2 1.70

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



MEASUREMENT RESULT: "F-2054-16_fin"

2019-3-12 14:14

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.303000	37.30	10.9	60	22.9	QP	L1	GND
0.775500	33.70	11.1	56	22.3	QP	L1	GND
1.554000	32.70	11.2	56	23.3	QP	L1	GND
2.328000	24.80	11.3	56	31.2	QP	L1	GND
7.012500	12.20	11.5	60	47.8	QP	L1	GND
26.794500	20.50	11.8	60	39.5	QP	L1	GND

MEASUREMENT RESULT: "F-2054-16_fin2"

2019-3-12 14:14

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.303000	30.60	10.9	50	19.6	AV	L1	GND
0.775500	31.20	11.1	46	14.8	AV	L1	GND
1.554000	31.60	11.2	46	14.4	AV	L1	GND
2.328000	22.60	11.3	46	23.4	AV	L1	GND
5.820000	9.40	11.5	50	40.6	AV	L1	GND
29.490000	25.10	11.8	50	24.9	AV	L1	GND

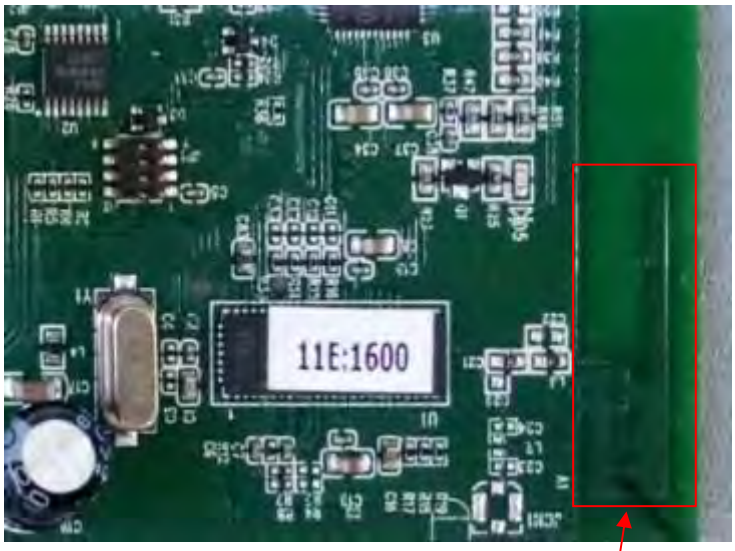
13. ANTENNA REQUIREMENT

13.1. The Requirement

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

13.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Max Antenna gain of EUT is 3.3dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



Antenna

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