MEASUREMENT REPORT
FCC PART 15.407 & RSS-247

FCC ID:	2ABX8SH-000000009
IC:	12219A-00000000009
APPLICANT:	Zhejiang shenghui lighting Co., Ltd. Shanghai Branch

Application Type:	Certification
Product:	Wireless Subwoofer Adapter
Model No.:	C01-BR30NA AMP
Brand Name:	Sengled
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part 15.407
IC Rule(s):	RSS-247 Issue 1
Test Procedure(s):	ANSI C63.10-2013, KDB 789033 D02v01
Test Date:	Jun.06 ~ 25, 2015

Reviewed By : Robin Wu
(Robin Wu)

Approved By : Marlin Chen
(Marlin Chen)

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033 D02v01. Test results reported herein relate only to the item(s) tested.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date
1506RSU01701	Rev. 01	Initial report	07-04-2015

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§2.1033 General Information

Applicant:	Zhejiang shenghui lighting Co., Ltd. Shanghai Branch
Applicant Address:	Rm. 801, 1st Xinye Building,388 Tianlin Rd., Caohejing Development Zone, Shanghai, 200233, China
Manufacturer:	ZHEJIANG SHENGHUI LIGHTING Co., Ltd
Manufacturer Address:	South Jiachuang Rd., Xiuzhou Industrial Park Jiaxing, Zhejiang 314015 P.R. China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT FCC Registration No.:	809388
MRT IC Registration No.:	11384A
FCC Rule Part(s):	Part 15.407
IC Rule(s):	RSS-247
Model No.:	C01-BR30NA AMP
FCC ID:	2ABX8SH-000000009
IC:	12219A-00000000009
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Unlicensed National Information Infrastructure (UNII)

Test Facility / Accreditations

Measurements were performed at MRT Laboratory located in Tian'edang Rd., Suzhou, China.

- **MRT facility is a FCC registered (MRT Reg. No. 809388) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.**
- **MRT facility is an IC registered (MRT Reg. No. 11384A-1) test laboratory with the site description on file at Industry Canada.**
- **MRT facility is a VCCI registered (R-4179, G-814, C-4664, T-2206) test laboratory with the site description on file at VCCI Council.**
- **MRT Lab is accredited to ISO 17025 by the American Association for Laboratory Accreditation (A2LA) under the American Association for Laboratory Accreditation Program (A2LA Cert. No. 3628.01) in EMC, Telecommunications and Radio testing for FCC, Industry Canada, EU and TELEC Rules.**

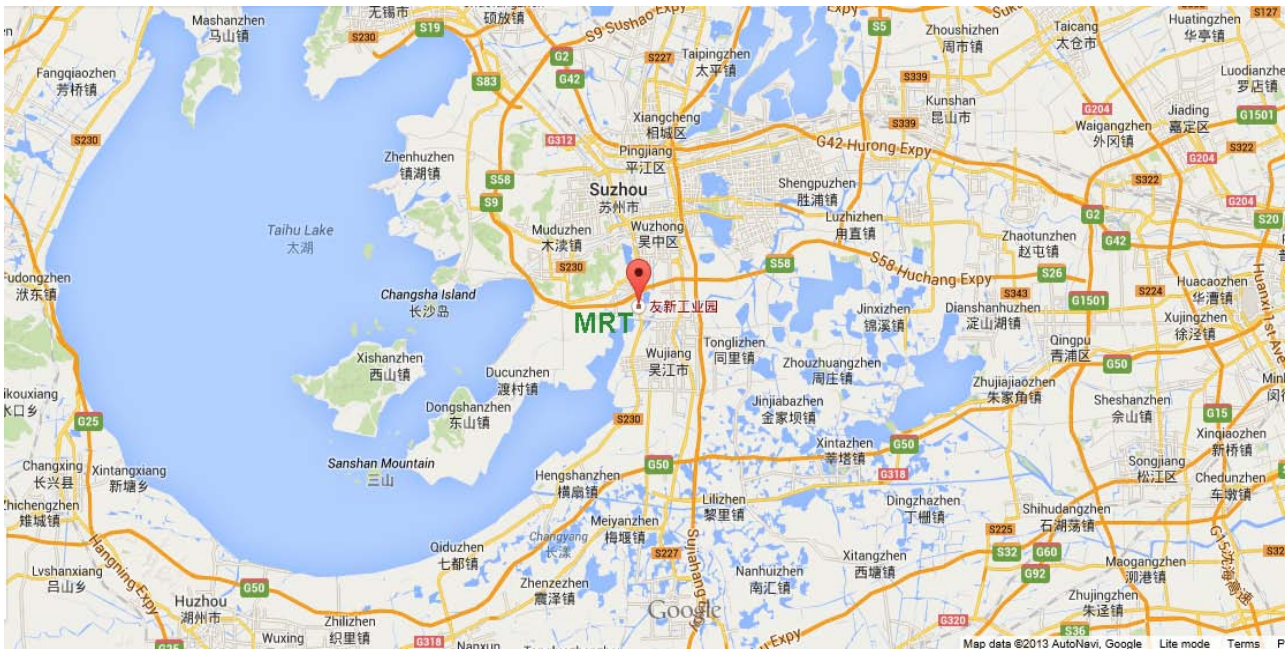
1. INTRODUCTION

1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taihu Lake. These measurement tests were conducted at the MRT Technology (Suzhou) Co., Ltd. Facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2014 on September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Wireless Subwoofer Adapter
Model No.	C01-BR30NA AMP
Frequency Range	5150~5250MHz, 5725~5850MHz
Max Conducted Output Power	13.18dBm
Type of Modulation	QPSK

2.2. Operation Frequency / Channel list

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	5180 MHz	02	5210 MHz	03	5240 MHz
04	5736 MHz	05	5762 MHz	06	5814 MHz

2.3. Description of Available Antennas

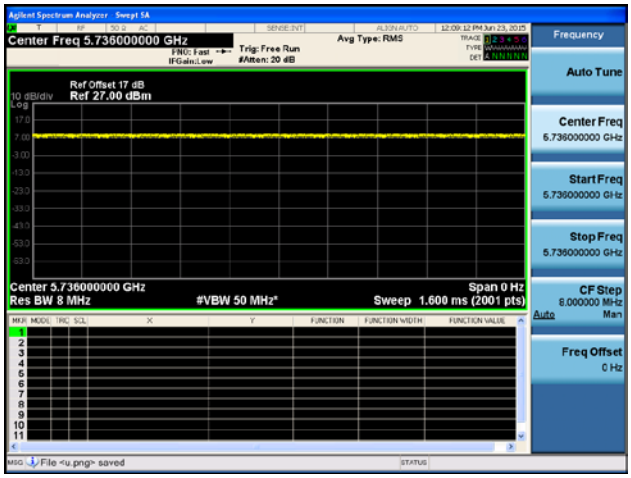
Antenna No.	Antenna Type	Frequency Band (GHz)	Manufacturer	Tx Paths	Max Peak Gain (dBi)
Antenna A	PCB Antenna	UNII-1	SMSC Inc.	1	3.0
		UNII-3		1	3.2
Antenna B	PCB Antenna	UNII-1	SMSC Inc.	1	3.0
		UNII-3		1	3.2

2.4. Device Capabilities

This device contains the following capabilities:

5GHz WLAN (UNII).

Note: 5GHz (NII) operation is possible in 20MHz channel bandwidth. The maximum achievable duty cycle was determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = average per the guidance of Section B)2)b) of KDB 789033 D02v01. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycle is as follow:

Duty Cycle Plot	Duty Cycle Level
	100%

2.5. Test Configuration

The **Wireless Subwoofer Adapter FCC ID: 2ABX8SH-000000009** was tested per the guidance of KDB 789033 D02v01. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.6. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

2.7. Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5). Please see attachment for FCC ID label and label location.

3. DESCRIPTION OF TEST

3.1. Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2013), and the guidance provided in KDB 789033 D02v01 were used in the measurement of the **Wireless Subwoofer Adapter FCC ID: 2ABX8SH-000000009.**
Deviation from measurement procedure…….....None

3.2. AC Line Conducted Emissions

The line-conducted facility is located inside an 8'x4'x4' shielded enclosure. A 1m x 2m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50uH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.
The EUT is powered from one LISN and the support equipment is powered from the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground-plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.
Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the receiver and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The receiver was scanned from 150kHz to 30MHz. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 9kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or data exchange speed, or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions are used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.
An extension cord was used to connect to a single LISN which powered by EUT. The extension cord was calibrated with LISN, the impedance and insertion loss are compliance with the requirements as stated in ANSI C63.10-2013.
Line conducted emissions test results are shown in Section 7.10.

3.3. Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. A MF Model 210SS turntable is used for radiated measurement. It is a continuously rotatable, remote controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm high PVC support structure is placed on top of the turntable.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up for frequencies below 1GHz was placed on top of the 0.8 meter high, 1 x 1.5 meter table; and test set-up for frequencies 1-40GHz was placed on top of the 1.5 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions. According to 3dB Beam-Width of horn antenna, the horn antenna should be always directed to the EUT when rising height.

4. ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section."

- The antenna of the **Wireless Subwoofer Adapter** is **permanently attached.**
- There are no provisions for connection to an external antenna.

Conclusion:

The **Wireless Subwoofer Adapter FCC ID: 2ABX8SH-000000009** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2015/11/07
Temperature/ Meter Humidity	Anymetre	TH101B	MRTSUE06045	1 year	2015/11/14

Radiated Emission

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	MRTSUE06028	1 year	2015/10/09
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2015/11/07
Preamplifier	Schwarzbeck	AP18G40	MRTSUE06121	1 year	2016/04/15
Preamplifier	Agilent	83017A	MRTSUE06019	1 year	2015/12/13
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2015/11/08
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2015/11/08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2015/11/08
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2016/01/05
Temperature/Humidity Meter	Anymetre	TH101B	MRTSUE06048	1 year	2015/11/14

Conducted Test Equipment

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2016/04/23
USB Wideband Power Sensor	Boonton	55006	MRTSUE06109	1 year	2015/10/15
Temperature/Humidity Meter	Anymetre	TH101B	MRTSUE06046	1 year	2015/11/14

Software	Version	Function
e3	V8.3.5	EMI Test Software

6. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

AC Conducted Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 40GHz: 4.76dB

7. TEST RESULT

7.1. Summary

Company Name: **Zhejiang shenghui lighting Co., Ltd. Shanghai Branch**

FCC ID: **2ABX8SH-000000009**

IC **12219A-000000009**

Data Rate(s) Tested: **22Mbps**

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407(a)	26dB Bandwidth	N/A	Conducted	Pass	Section 7.2
15.407(e)	6dB Bandwidth	≥ 500kHz		Pass	Section 7.3
15.407(a)(1)(ii), (3)	Maximum Conducted Output Power	≤ 17 dBm U-NII-1 ≤ 30 dBm U-NII-3		Pass	Section 7.5
15.407(a)(1)(ii), (3), (5)	Peak Power Spectral Density	≤ 11 dBm/MHz U-NII-1 ≤ 30 dBm/500kHz U-NII-3		Pass	Section 7.6
15.407(g)	Frequency Stability	N/A		Pass	Section 7.7
15.407(b)(1), (4)	Undesirable Emissions	≤ -27dBm/MHz EIRP ≤ -17dBm/MHz EIRP	Radiated	Pass	Section 7.8 & 7.9
15.205, 15.209 15.407(b)(5), (6), (7)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209		Pass	
15.207	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 7.10

RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
RSS-247 §6.2	99% Bandwidth	N/A	Conducted	Pass	Section 7.2
RSS-247 §6.2.4	6dB Bandwidth	>500kHz		Pass	Section 7.3
RSS-247 §6.2.1	Operation Frequency Range of 26dB BW	26dBc frequency range above 5250MHz		Pass	Section 7.4
RSS-247 §6.2.1, §6.2.4	Max Conducted Output Power	5725~5850MHz, ≤ 30 dBm		Pass	Section 7.5
	Maximum E.I.R.P	5150~5250MHz ≤ 23 dBm or 10 + 10 log10(99% B)			
RSS-247 §6.2.1, §6.2.4	Peak Power Spectral Density	5150~5250MHz ≤ 10 dBm/MHz 5725~5850MHz, ≤ 30 dBm/500kHz		Pass	Section 7.6
RSS-Gen [8.11]	Frequency Stability	N/A		Pass	Section 7.7
RSS-247 §6.2.1,§6.2.4	Out-of-Band Emissions	≤ -27dBm/MHz EIRP ≤ -17dBm/MHz EIRP	Radiated	Pass	Section 7.8 & 7.9
RSS-247 §6.2.1, §6.2.4	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in RSS-Gen [8.9]		Pass	
RSS-Gen [8.8]	AC Conducted Emissions 150kHz - 30MHz	< RSS-Gen [8.8] limits	Line Conducted	Pass	Section 7.10

Notes:

1) All channels, modes, and modulations/data rates were investigated among all UNII bands. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

7.2. 26dB Bandwidth Measurement

7.2.1. Test Limit

N/A

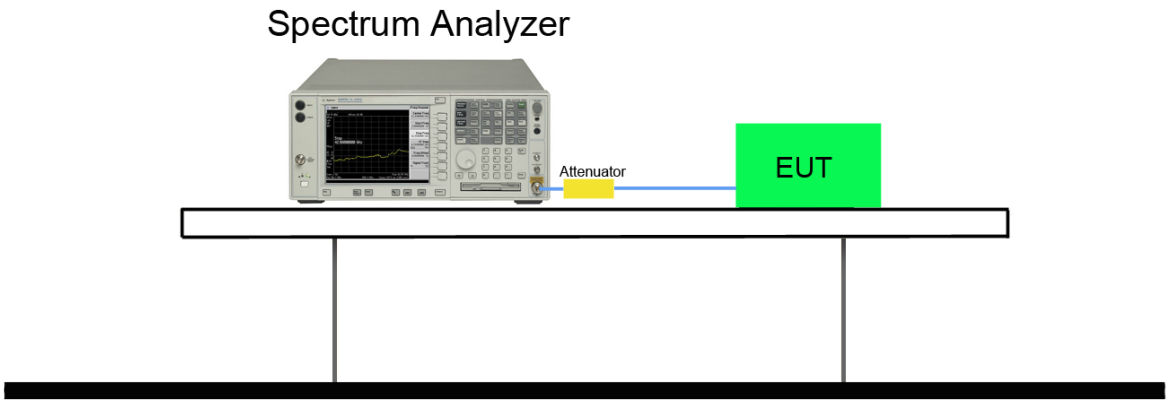
7.2.2. Test Procedure used

KDB 789033 D02v01 – Section C.1

7.2.3. Test Setting

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediated power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth.
3. VBW ≥ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.

7.2.4. Test Setup

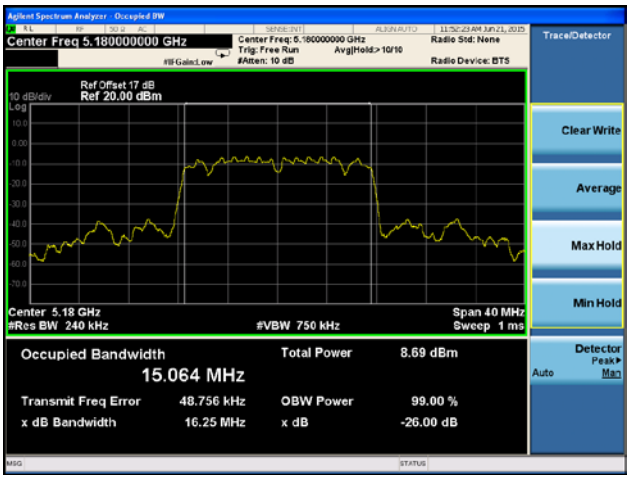


7.2.5. Test Result

Type of Modulation	Data Rate (Mbps)	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)	Result
Ant A						
QPSK	22	01	5180	16.25	15.06	Pass
	22	02	5210	16.25	15.06	Pass
	22	03	5240	16.25	15.06	Pass
QPSK	22	04	5736	16.64	13.85	Pass
	22	05	5762	16.67	13.85	Pass
	22	06	5814	16.66	13.83	Pass
Ant B						
QPSK	22	01	5180	16.25	15.06	Pass
	22	02	5210	16.25	15.06	Pass
	22	03	5240	16.25	15.05	Pass
QPSK	22	04	5736	16.66	13.84	Pass
	22	05	5762	16.68	13.85	Pass
	22	06	5814	16.66	13.84	Pass

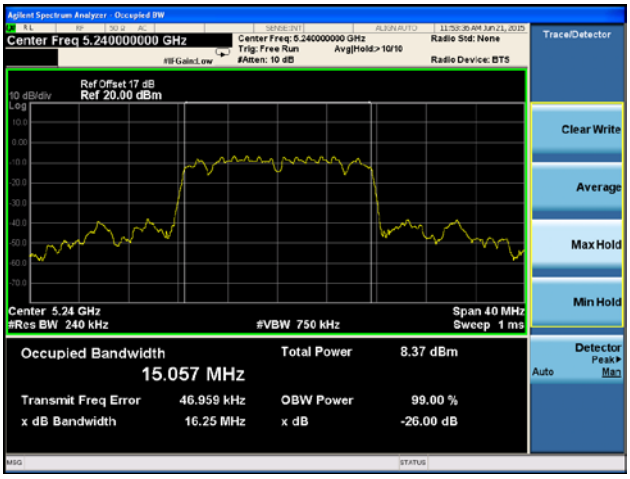
26dB Bandwidth & 99% Bandwidth - Ant A

Channel 01 (5180MHz)



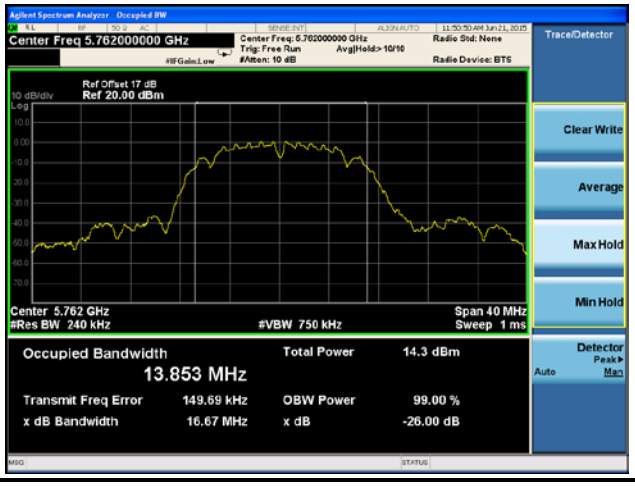
Channel 02 (5210MHz)

Channel 03 (5240MHz)

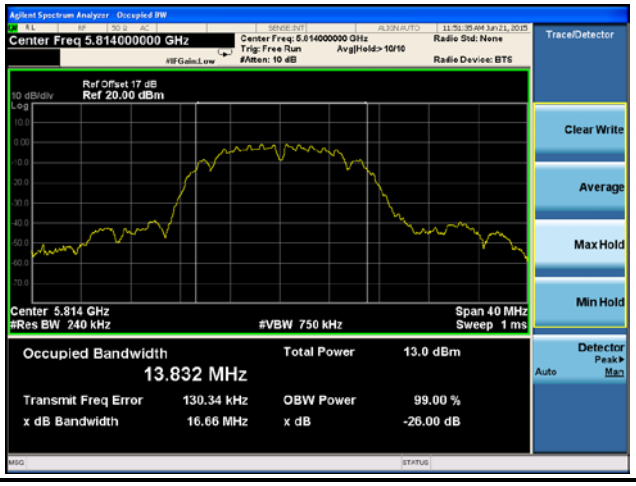


Channel 04 (5736MHz)

Channel 05 (5762MHz)

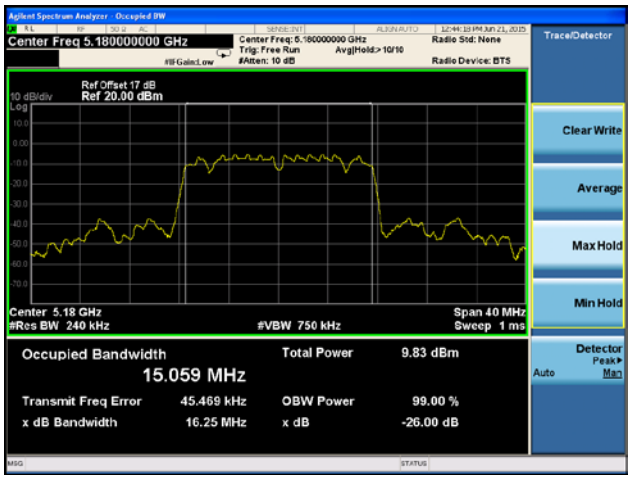


Channel 06 (5814MHz)



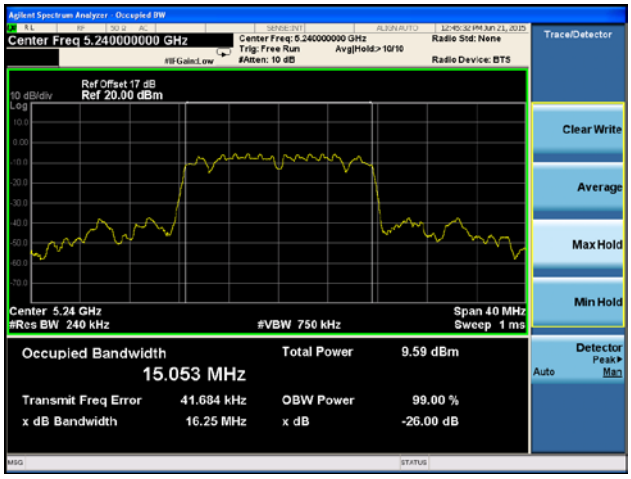
26dB Bandwidth & 99% Bandwidth - Ant B

Channel 01 (5180MHz)



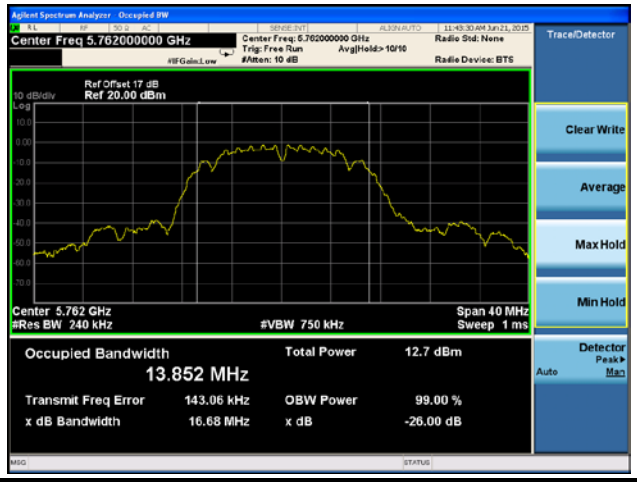
Channel 02 (5210MHz)

Channel 03 (5240MHz)

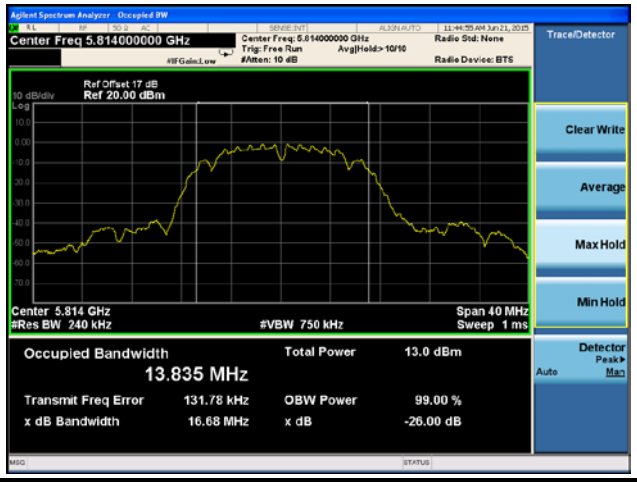


Channel 04 (5736MHz)

Channel 05 (5762MHz)



Channel 06 (5814MHz)



7.3. 6dB Bandwidth Measurement

7.3.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

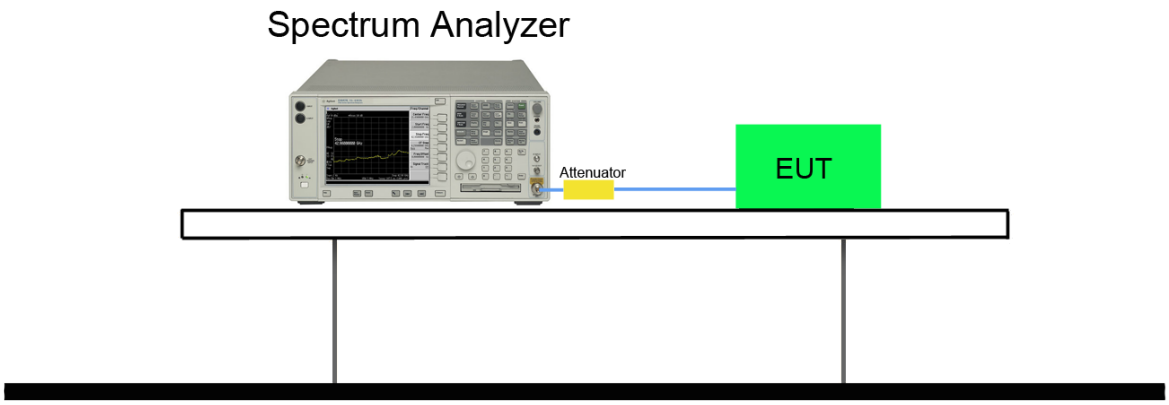
7.3.2. Test Procedure used

KDB 789033 D02v01 – Section C.2

7.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 100 kHz.
3. VBW ≧ 3 × RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.3.4. Test Setup



7.3.5. Test Result

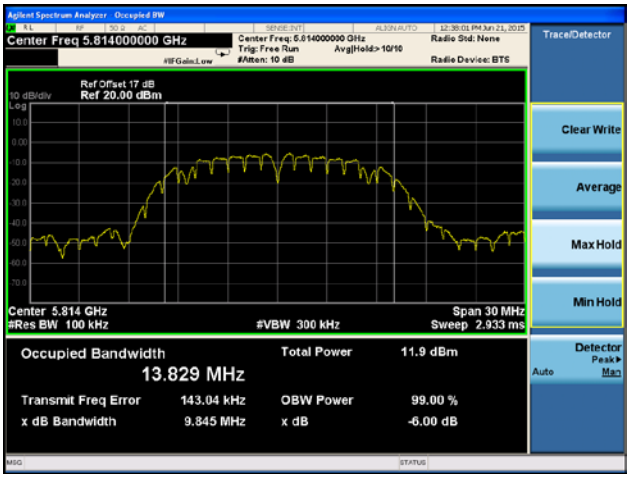
Type of Modulation	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
Ant A						
QPSK	22	04	5736	9.84	≥ 0.5	Pass
	22	05	5762	9.84	≥ 0.5	Pass
	22	06	5814	9.85	≥ 0.5	Pass
Ant B						
QPSK	22	04	5736	9.84	≥ 0.5	Pass
	22	05	5762	9.85	≥ 0.5	Pass
	22	06	5814	9.84	≥ 0.5	Pass

6dB Bandwidth - Ant A

Channel 04 (5736MHz)

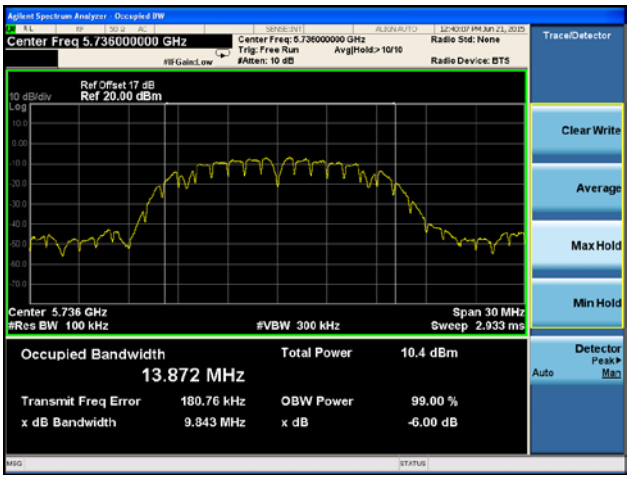
Channel 05 (5762MHz)

Channel 06 (5814MHz)

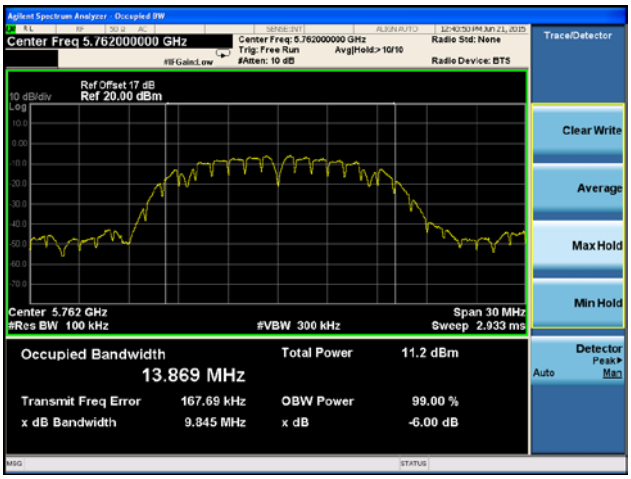


6dB Bandwidth - Ant B

Channel 04 (5736MHz)



Channel 05 (5762MHz)



Channel 06 (5814MHz)

7.4. Operation Frequency Range of 26dBc Bandwidth Measurement

7.4.1. Test Limit

For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27dBm/MHz e.i.r.p. However, any unwanted emissions that fall into the band 5250-5350 MHz must be 26 dBc, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth, above 5.25 GHz.

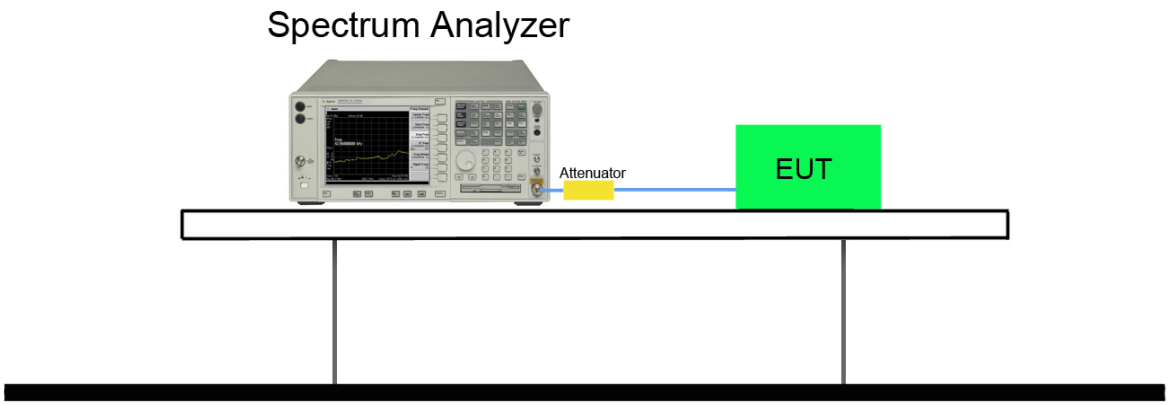
7.4.2. Test Procedure used

N/A

7.4.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. Span = 1.5 times to 5.0 times the OBW.
3. RBW = 1 % to 5 % of the OBW.
4. VBW ≥ 3 × RBW.
5. Detector = Peak.
6. Trace mode = max hold.
7. Allow the trace to stabilize and set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).
8. Determine the "−26 dB down amplitude" using [(reference value) − 26].
9. Using the marker function of the instrument to show 5250MHz frequency level.

7.4.4. Test Setup



7.4.5. Test Result

Type of Modulation	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Result
Ant A				
QPSK	22	03	5240	Pass
Ant B				
QPSK	22	03	5240	Pass

Operation Frequency Range of 26dBc Bandwidth - Ant A	
Channel 03 (5240MHz)	
Operation Frequency Range of 26dBc Bandwidth - Ant B	
Channel 03 (5240MHz)	

7.5. Output Power Measurement

7.5.1. Test Limit

For FCC

For mobile and portable client devices operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

For IC

For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW (23.01dBm) or 10 + 10 $\log_{10}$ B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

For the 5.725-5.85 GHz band, the maximum conducted output power shall not exceed 1 W.

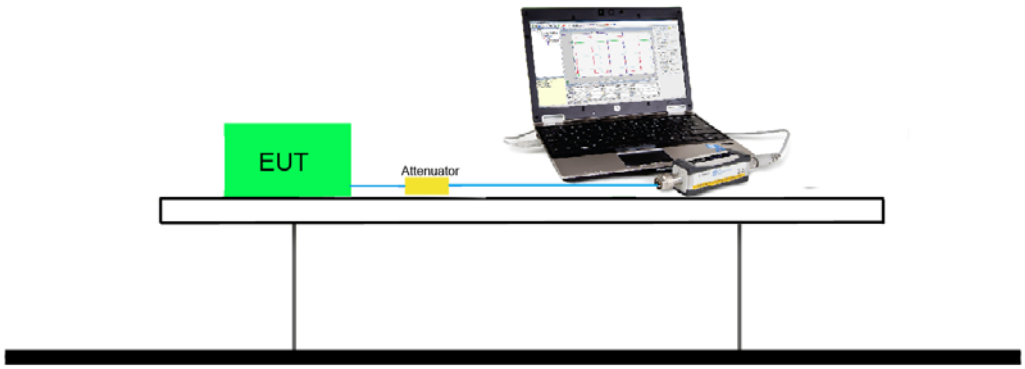
7.5.2. Test Procedure Used

KDB 789033 D02v01 - Section E) 3) b) Method PM-G

7.5.3. Test Setting

Average power measurements were perform only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

7.5.4. Test Setup



7.5.5. Test Result

Type of Modulation	Data Rate (Mbps)	Channel No.	Freq. (MHz)	RMS Power (dBm)	Power Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
Ant A								
QPSK	22	01	5180	8.20	≤ 30	11.20	≤ 21.78	Pass
	22	02	5210	8.05	≤ 30	11.05	≤ 21.78	Pass
	22	03	5240	7.92	≤ 30	10.92	≤ 21.78	Pass
QPSK	22	04	5736	10.52	≤ 30	---	---	Pass
	22	05	5762	10.45	≤ 30	---	---	Pass
	22	06	5814	12.34	≤ 30	---	---	Pass
Ant B								
QPSK	22	01	5180	9.46	≤ 30	12.46	≤ 21.78	Pass
	22	02	5210	9.29	≤ 30	12.29	≤ 21.78	Pass
	22	03	5240	8.86	≤ 30	11.86	≤ 21.78	Pass
QPSK	22	04	5736	11.35	≤ 30	---	---	Pass
	22	05	5762	11.07	≤ 30	---	---	Pass
	22	06	5814	13.18	≤ 30	---	---	Pass

Note: Max EIRP (dBm) = RMS Power (dBm) + Antenna Gain.

For 5150-5250MHz, EIRP Limit: 10 + 10 $\log_{10}$ (15.06MHz) = 21.78dBm < 23.01dBm.

7.6. Power Spectral Density Measurement

7.6.1. Test Limit

For FCC

For mobile and portable client devices operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

For IC

For the band 5.15-5.25 GHz, the e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the 5.725-5.85 GHz band, the power spectral density shall not exceed 30 dBm in any 500 kHz band.

7.6.2. Test Procedure Used

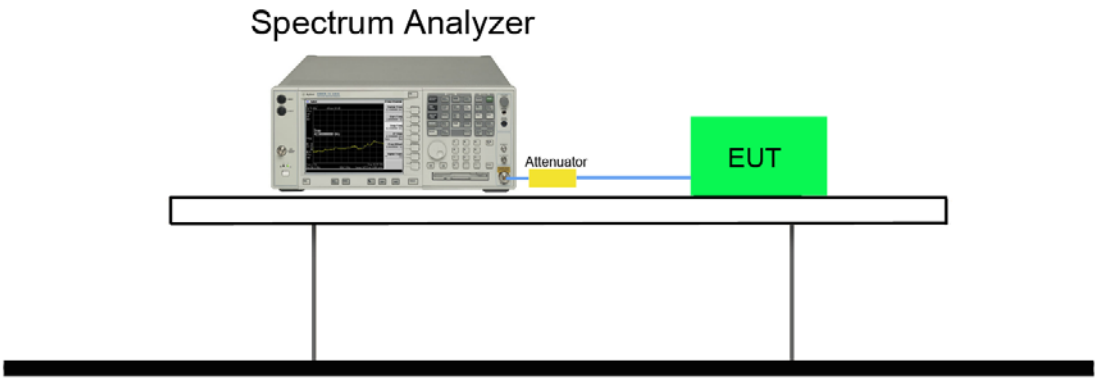
KDB 789033 D02v01 - Section F

7.6.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz, RBW = 100 kHz
4. VBW = 3MHz
5. Number of sweep points ≥ 2 × (span / RBW)
6. Detector = power averaging (RMS)
7. Sweep time = auto
8. Trigger = free run
9. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
10. Add 10*log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10*log(1/0.25) = 6 dB if the duty cycle is 25 percent.

11. When the measurement bandwidth of Maximum PSD is specified in 500 kHz, add a constant factor 10*log(500kHz/100kHz) = 7 dB to the measured result

7.6.4. Test Setup



7.6.5. Test Result

Type of Modulation	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Reading PSD (dBm/ MHz)	Duty Cycle (%)	Limit (dBm/ MHz)	EIRP PSD (dBm/ MHz)	EIRP PSD Limit (dBm/ MHz)	Result
Ant A									
QPSK	22	01	5180	-5.26	100	≤ 17	-2.26	≤ 10	Pass
	22	02	5210	-5.44	100	≤ 17	-2.44	≤ 10	Pass
	22	03	5240	-5.55	100	≤ 17	-2.55	≤ 10	Pass
Ant B									
QPSK	22	01	5180	-5.03	100	≤ 17	-2.03	≤ 10	Pass
	22	02	5210	-4.94	100	≤ 17	-1.94	≤ 10	Pass
	22	03	5240	-5.34	100	≤ 17	-2.34	≤ 10	Pass

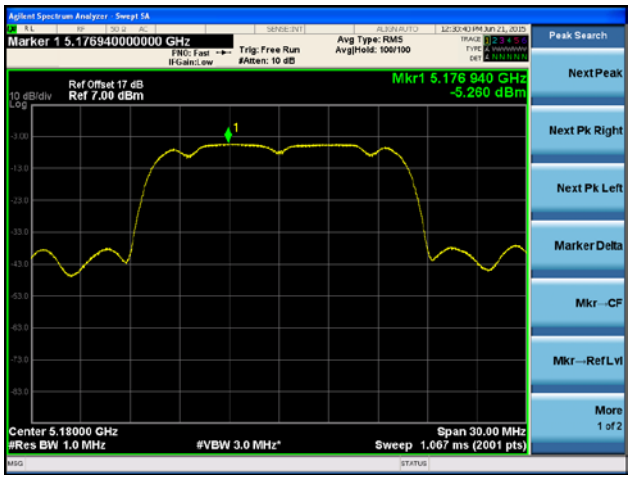
Note: EIRP PSD Level (dBm/MHz) = Reading PSD Level (dBm/MHz) + Antenna Gain.

Type of Modulation	Data Rate (Mbps)	Channel No.	Freq. (MHz)	Reading PSD (dBm/ 100kHz)	Duty Cycle (%)	Constant Factor	Max PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Result
Ant A									
QPSK	22	04	5736	-5.20	100	7	1.80	≤ 30	Pass
	22	05	5762	-7.23	100	7	-0.23	≤ 30	Pass
	22	06	5814	-7.08	100	7	-0.08	≤ 30	Pass
Ant B									
QPSK	22	04	5736	-6.94	100	7	0.06	≤ 30	Pass
	22	05	5762	-6.70	100	7	0.30	≤ 30	Pass
	22	06	5814	-6.43	100	7	0.57	≤ 30	Pass

Note: The Max PSD Level = Reading PSD Level + Constant Factor.

Power Spectral Density - Ant A

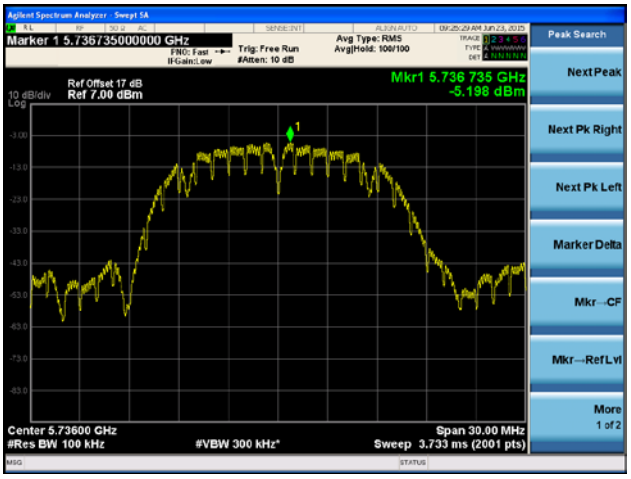
Channel 01 (5180MHz)



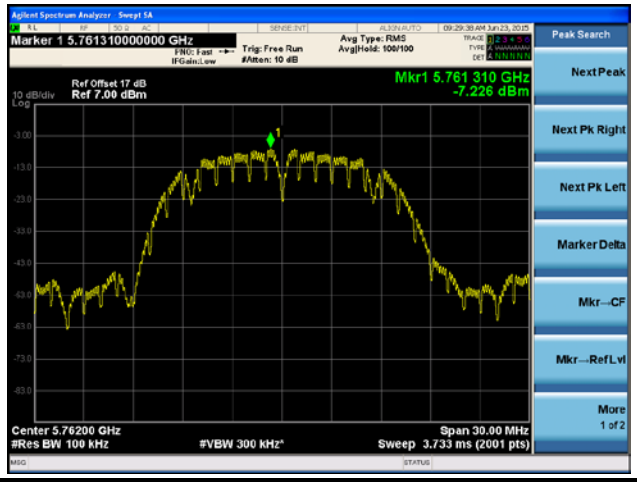
Channel 02 (5210MHz)

Channel 03 (5240MHz)

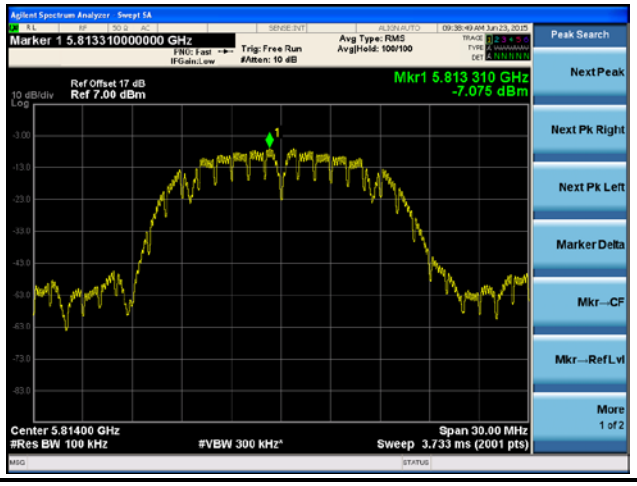
Channel 04 (5736MHz)



Channel 05 (5762MHz)

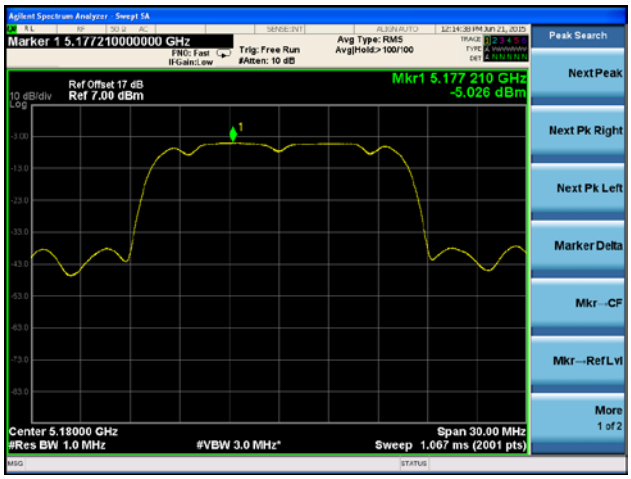


Channel 06 (5814MHz)



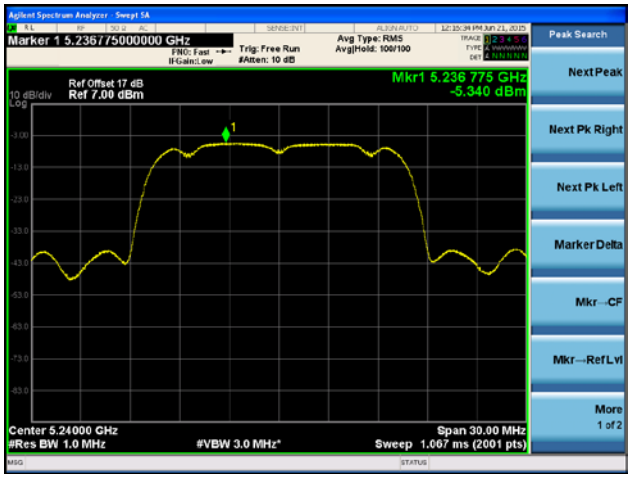
Power Spectral Density - Ant B

Channel 01 (5180MHz)



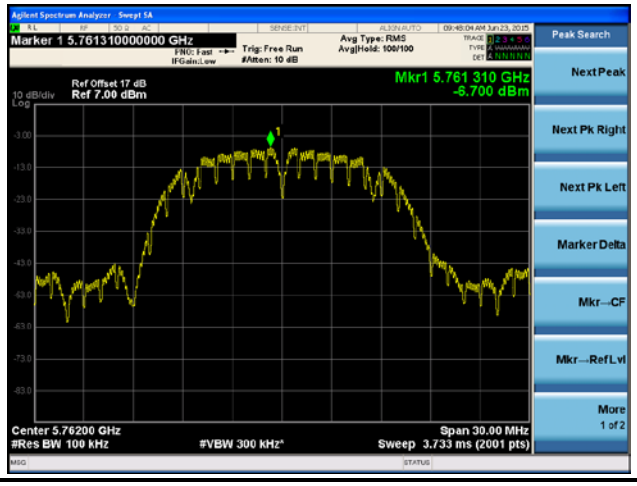
Channel 02 (5210MHz)

Channel 03 (5240MHz)

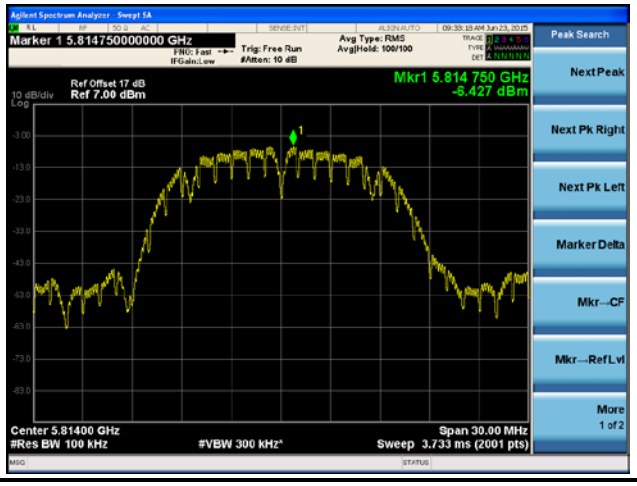


Channel 04 (5736MHz)

Channel 05 (5762MHz)



Channel 06 (5814MHz)



7.7. Frequency Stability Measurement

7.7.1. Test Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

7.7.2. Test Procedure Used

Frequency Stability Under Temperature Variations:

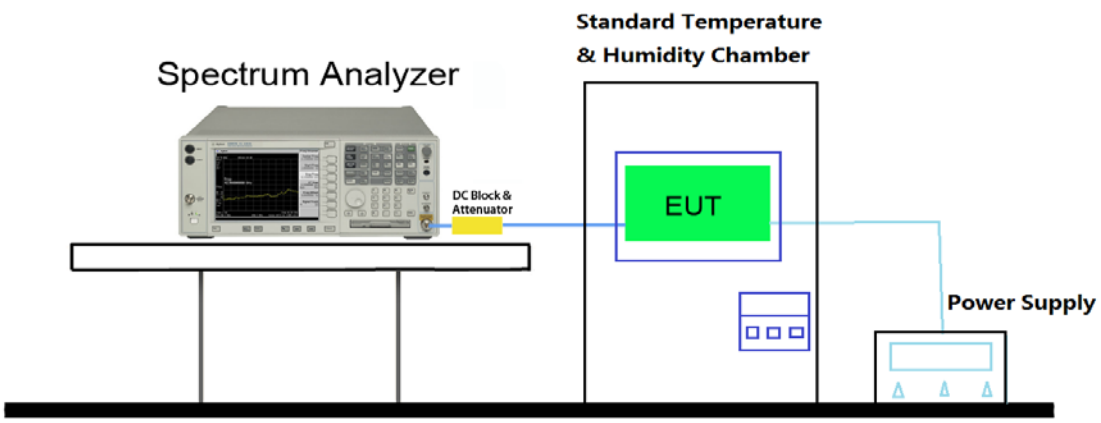
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change.

7.7.3. Test Setup



7.7.4. Test Result

Test Engineer	Milo Li	Temperature	-20 ~ 50°C
Test Time	06-20-2015	Relative Humidity	52%RH

Voltage (%)	Power (VAC)	Temp (°C)	Frequency Tolerance (ppm)			
			0 minutes	2 minutes	5 minutes	10 minutes
100%	120	- 20	4.09	4.12	4.20	4.19
		- 10	4.13	4.11	4.15	4.20
		0	4.11	4.07	4.05	4.10
		+ 10	4.21	4.11	4.15	4.13
		+ 20 (Ref)	4.31	4.31	4.35	4.30
		+ 30	4.32	4.35	4.29	4.31
		+ 40	4.33	4.31	4.34	4.25
		+ 50	4.28	4.31	4.35	4.29
115%	138	+ 20	4.30	4.31	4.33	4.30
85%	102	+ 20	4.35	4.37	4.23	4.31

Note: Frequency Tolerance (ppm) = {[Measured Frequency (Hz) – Declared Frequency (Hz)] / Declared Frequency (Hz)} $*10^6$.

7.8. Radiated Spurious Emission Measurement

7.8.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.8.2. Test Procedure Used

KDB 789033 D02v01 – Section G

7.8.3. Test Setting

Peak Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Quasi-Peak Measurements below 1GHz

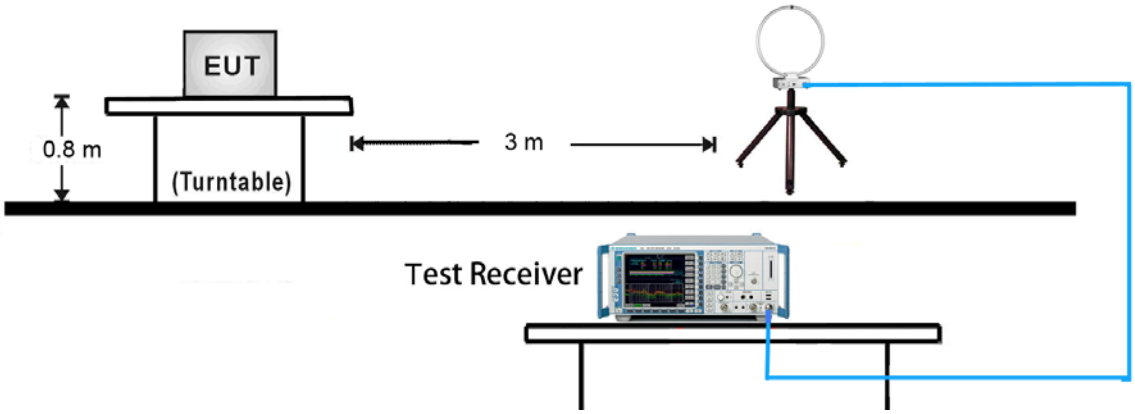
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120 kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Average Measurements above 1GHz (Method AD)

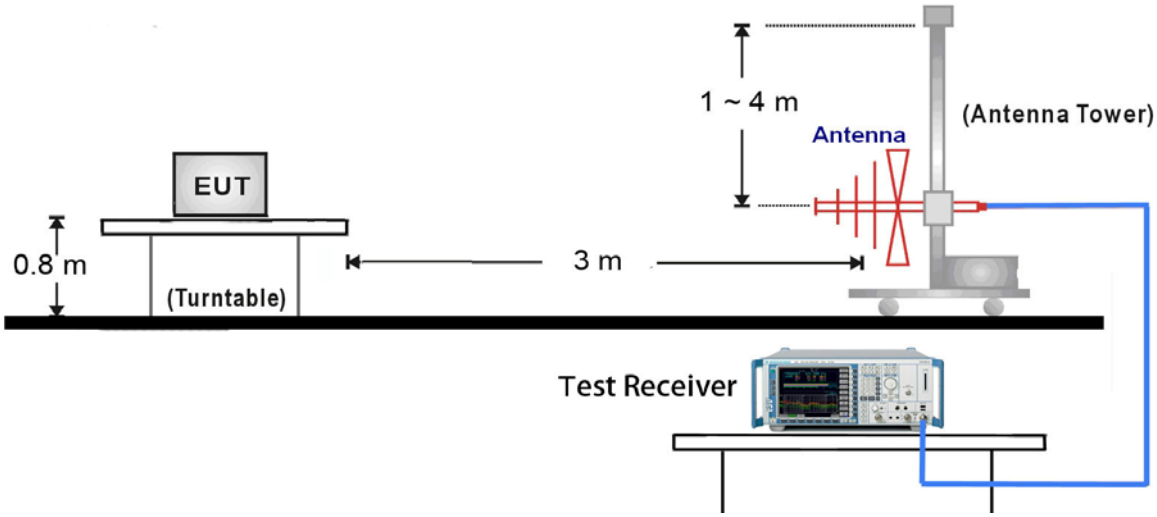
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be > 2 x span/RBW)
6. Sweep time = auto
7. Trace was averaged over at 100 sweeps

7.8.4. Test Setup

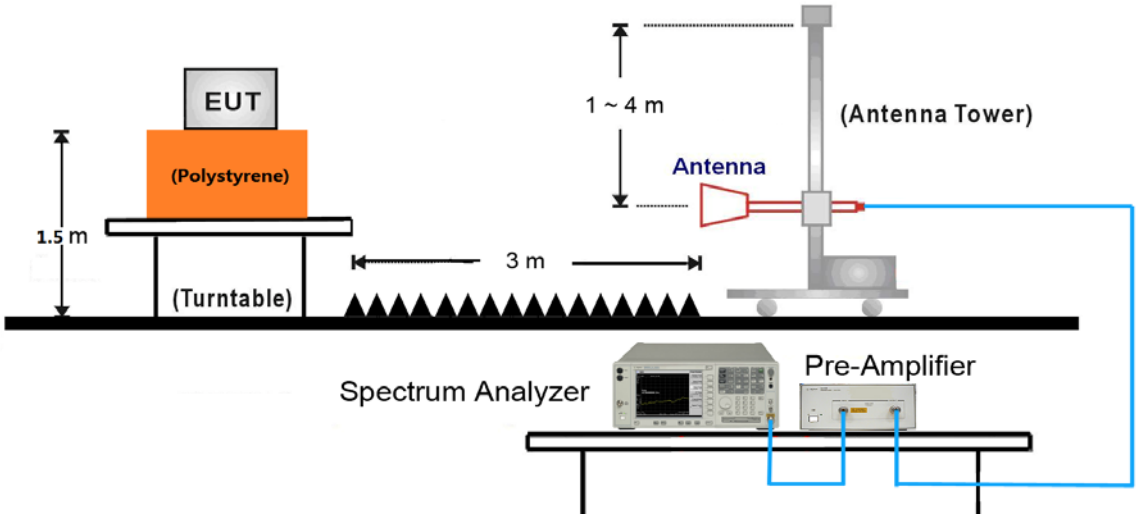
9kHz ~ 30MHz Test Setup:



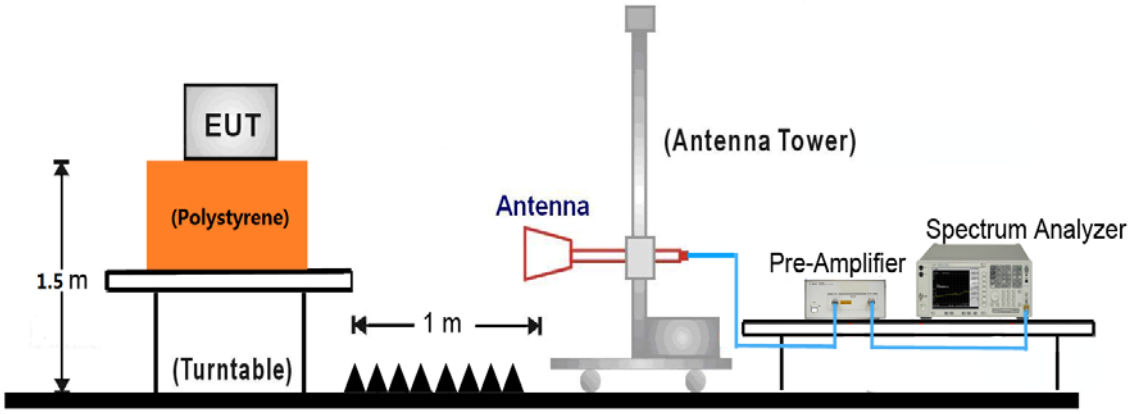
30MHz ~ 1GHz Test Setup:



1GHz ~18GHz Test Setup:



18GHz ~40GHz Test Setup:



7.8.5. Test Result

Test Mode:	Ant A	Test Site:	AC1
Test Channel:	01	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7893.5	37.5	8.3	45.8	68.2	-22.4	Peak	Horizontal
*	8769.0	36.9	8.9	45.8	68.2	-22.4	Peak	Horizontal
	9491.5	36.9	10.6	47.5	74.0	-26.5	Peak	Horizontal
	11472.0	38.6	12.7	51.3	74.0	-22.7	Peak	Horizontal
*	7825.5	38.1	8.4	46.5	68.2	-21.7	Peak	Vertical
*	8718.0	36.2	9.0	45.1	68.2	-23.1	Peak	Vertical
	9423.5	36.5	10.6	47.0	74.0	-27.0	Peak	Vertical
	11472.0	37.7	12.7	50.4	74.0	-23.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant B	Test Site:	AC1
Test Channel:	01	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7834.0	37.1	8.4	45.5	68.2	-22.7	Peak	Horizontal
*	8624.5	36.8	8.8	45.6	68.2	-22.6	Peak	Horizontal
	9126.0	36.8	9.7	46.4	74.0	-27.6	Peak	Horizontal
	11472.0	36.6	12.7	49.3	74.0	-24.7	Peak	Horizontal
*	7987.0	36.2	8.7	45.0	68.2	-23.2	Peak	Vertical
*	8616.0	37.0	8.8	45.8	68.2	-22.4	Peak	Vertical
	9415.0	36.0	10.6	46.6	74.0	-27.4	Peak	Vertical
	11472.0	36.6	12.7	49.3	74.0	-24.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant A	Test Site:	AC1
Test Channel:	02	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7910.5	36.3	8.4	44.7	68.2	-23.5	Peak	Horizontal
*	8735.0	35.7	8.9	44.6	68.2	-23.6	Peak	Horizontal
	9415.0	36.0	10.6	46.6	74.0	-27.4	Peak	Horizontal
	11523.0	37.5	12.7	50.2	74.0	-23.8	Peak	Horizontal
*	7970.0	37.0	8.6	45.7	68.2	-22.5	Peak	Vertical
*	8786.0	37.1	8.9	46.0	68.2	-22.2	Peak	Vertical
	9406.5	35.6	10.6	46.2	74.0	-27.8	Peak	Vertical
	11514.5	37.0	12.8	49.7	74.0	-24.3	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant B	Test Site:	AC1
Test Channel:	02	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7885.0	37.2	8.3	45.5	68.2	-22.7	Peak	Horizontal
*	8760.5	37.7	9.0	46.7	68.2	-21.5	Peak	Horizontal
	9440.5	36.1	10.5	46.6	74.0	-27.4	Peak	Horizontal
	11523.0	36.8	12.7	49.5	74.0	-24.5	Peak	Horizontal
*	7953.0	37.4	8.6	46.0	68.2	-22.2	Peak	Vertical
*	8522.5	37.5	8.4	45.9	68.2	-22.3	Peak	Vertical
	9474.5	35.4	10.6	45.9	74.0	-28.1	Peak	Vertical
	11523.0	36.5	12.7	49.2	74.0	-24.8	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant A	Test Site:	AC1
Test Channel:	03	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7885.0	36.4	8.3	44.7	68.2	-23.5	Peak	Horizontal
*	8675.5	36.7	8.9	45.7	68.2	-22.5	Peak	Horizontal
	9457.5	36.2	10.5	46.8	74.0	-27.2	Peak	Horizontal
	11004.5	36.2	13.0	49.2	74.0	-24.8	Peak	Horizontal
*	7961.5	36.5	8.6	45.2	68.2	-23.0	Peak	Vertical
*	8718.0	36.6	9.0	45.6	68.2	-22.6	Peak	Vertical
	9134.5	36.5	9.7	46.2	74.0	-27.8	Peak	Vertical
	11472.0	36.6	12.7	49.3	74.0	-24.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant B	Test Site:	AC1
Test Channel:	03	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	7961.5	36.9	8.6	45.5	68.2	-22.7	Peak	Horizontal
*	8811.5	35.7	9.0	44.7	68.2	-23.5	Peak	Horizontal
	9338.5	35.4	10.4	45.9	74.0	-28.1	Peak	Horizontal
	11055.5	35.8	12.9	48.7	74.0	-25.4	Peak	Horizontal
*	7927.5	37.0	8.5	45.4	68.2	-22.8	Peak	Vertical
*	8956.0	35.9	9.0	44.9	68.2	-23.3	Peak	Vertical
	9449.0	36.3	10.5	46.8	74.0	-27.2	Peak	Vertical
	11642.0	36.6	12.4	49.0	74.0	-25.0	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant A	Test Site:	AC1
Test Channel:	04	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	6907.5	40.9	6.6	47.4	68.2	-20.8	Peak	Horizontal
*	7961.5	35.6	8.6	44.2	68.2	-24.0	Peak	Horizontal
	9168.5	35.9	9.9	45.8	74.0	-28.2	Peak	Horizontal
	15535.0	41.2	12.2	53.4	74.0	-20.6	Peak	Horizontal
*	6907.5	42.5	6.6	49.1	68.2	-19.1	Peak	Vertical
*	7987.0	35.2	8.7	44.0	68.2	-24.2	Peak	Vertical
	9415.0	34.6	10.6	45.2	74.0	-28.8	Peak	Vertical
	15535.0	41.3	12.2	53.5	74.0	-20.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant B	Test Site:	AC1
Test Channel:	04	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	6907.5	40.2	6.6	46.7	68.2	-21.5	Peak	Horizontal
*	7859.5	37.1	8.4	45.5	68.2	-22.7	Peak	Horizontal
	9423.5	35.9	10.6	46.5	74.0	-27.5	Peak	Horizontal
	15543.5	40.7	12.2	52.9	74.0	-21.1	Peak	Horizontal
*	6907.5	40.2	6.6	46.8	68.2	-21.4	Peak	Vertical
*	7978.5	37.3	8.7	46.0	68.2	-22.2	Peak	Vertical
	9372.5	35.6	10.5	46.1	74.0	-27.9	Peak	Vertical
	15543.5	40.2	12.2	52.3	74.0	-21.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant A	Test Site:	AC1
Test Channel:	05	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	6950.0	39.6	6.7	46.3	68.2	-21.9	Peak	Horizontal
*	7902.0	36.9	8.3	45.3	68.2	-22.9	Peak	Horizontal
	9321.5	35.7	10.4	46.1	74.0	-27.9	Peak	Horizontal
	15620.0	39.9	12.1	52.0	74.0	-22.0	Peak	Horizontal
*	6950.0	41.3	6.7	47.9	68.2	-20.3	Peak	Vertical
*	7910.5	35.9	8.4	44.3	68.2	-23.9	Peak	Vertical
	9364.0	35.4	10.5	45.8	74.0	-28.2	Peak	Vertical
	15637.0	41.2	12.0	53.3	74.0	-20.7	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant B	Test Site:	AC1
Test Channel:	05	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	6950.0	40.4	6.7	47.1	68.2	-21.1	Peak	Horizontal
*	7987.0	35.7	8.7	44.4	68.2	-23.8	Peak	Horizontal
	9347.0	35.1	10.5	45.6	74.0	-28.4	Peak	Horizontal
	15628.5	40.2	12.1	52.3	74.0	-21.7	Peak	Horizontal
*	6950.0	40.9	6.7	47.6	68.2	-20.6	Peak	Vertical
*	7978.5	36.7	8.7	45.4	68.2	-22.8	Peak	Vertical
	9364.0	36.1	10.5	46.5	74.0	-27.5	Peak	Vertical
	15628.5	40.9	12.1	52.9	74.0	-21.1	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant A	Test Site:	AC1
Test Channel:	06	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	6984.0	38.6	6.8	45.3	68.2	-22.9	Peak	Horizontal
*	7842.5	35.5	8.4	43.9	68.2	-24.3	Peak	Horizontal
	9423.5	36.0	10.6	46.6	74.0	-27.4	Peak	Horizontal
	15713.5	39.9	11.8	51.7	74.0	-22.3	Peak	Horizontal
*	6984.0	40.9	6.8	47.7	68.2	-20.5	Peak	Vertical
*	7834.0	36.9	8.4	45.3	68.2	-22.9	Peak	Vertical
	9338.5	34.8	10.4	45.2	74.0	-28.8	Peak	Vertical
	15713.5	40.7	11.8	52.5	74.0	-21.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Test Mode:	Ant B	Test Site:	AC1
Test Channel:	06	Test Engineer:	Roy Cheng
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
*	6984.0	38.9	6.8	45.6	68.2	-22.6	Peak	Horizontal
*	7876.5	36.1	8.4	44.5	68.2	-23.7	Peak	Horizontal
	9330.0	35.7	10.4	46.2	74.0	-27.8	Peak	Horizontal
	15713.5	40.5	11.8	52.3	74.0	-21.7	Peak	Horizontal
*	6984.0	41.2	6.8	48.0	68.2	-20.2	Peak	Vertical
*	7978.5	37.1	8.7	45.7	68.2	-22.5	Peak	Vertical
	9338.5	34.5	10.4	44.9	74.0	-29.1	Peak	Vertical
	15713.5	40.0	11.8	51.8	74.0	-22.2	Peak	Vertical

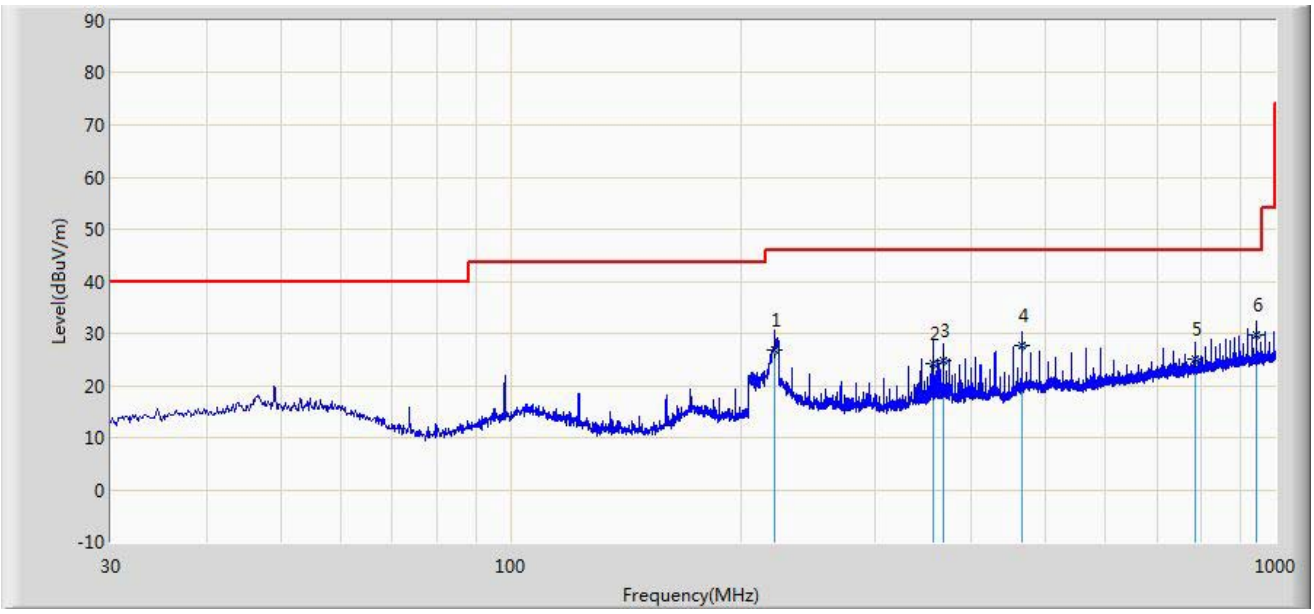
Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

The worst case of Radiated Emission below 1GHz:

Site: AC1	Time: 2015/06/20 - 12:14
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Worst Mode: Transmit at channel 5180MHz	

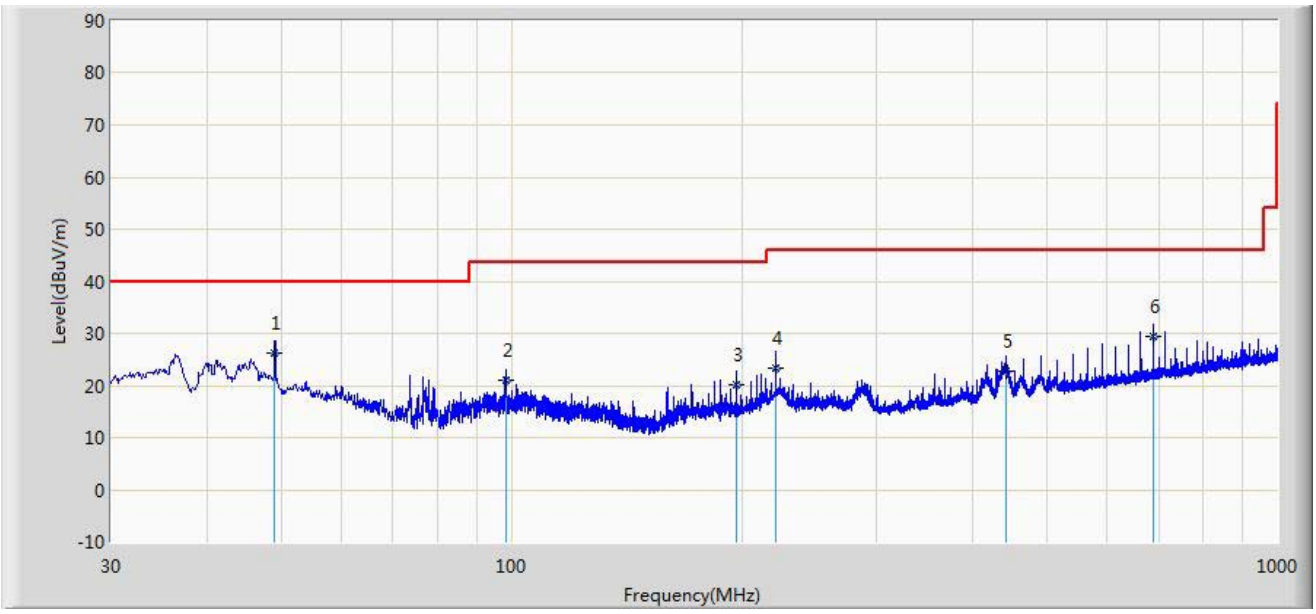


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			221.090	26.832	14.200	-19.168	46.000	12.632	QP
2			356.485	24.275	8.400	-21.725	46.000	15.875	QP
3			368.650	24.761	8.700	-21.239	46.000	16.061	QP
4			466.985	27.744	10.100	-18.256	46.000	17.644	QP
5			786.479	25.048	2.500	-20.952	46.000	22.548	QP
6		*	946.286	29.616	5.300	-16.384	46.000	24.315	QP

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/20 - 12:24
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Worst Mode: Transmit at channel 5180MHz	

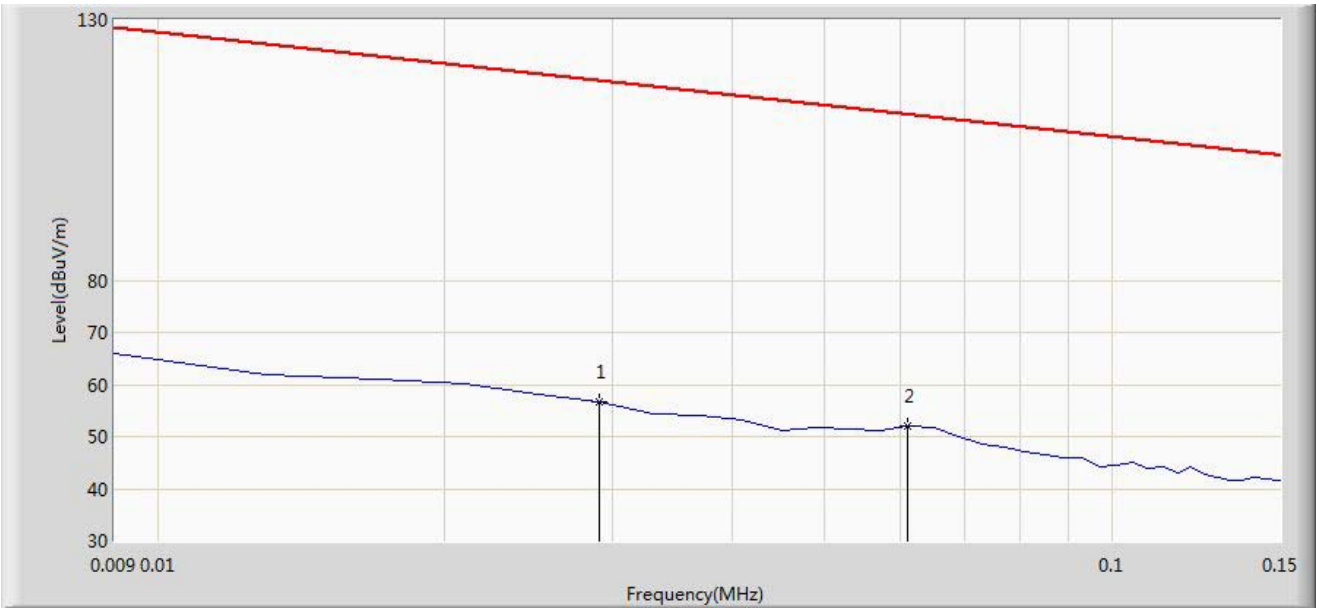


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	49.036	26.121	11.200	-13.879	40.000	14.922	QP
2			98.264	21.020	8.300	-22.480	43.500	12.721	QP
3			196.589	20.237	8.100	-23.263	43.500	12.136	QP
4			221.089	23.232	10.600	-22.768	46.000	12.632	QP
5			442.371	22.619	5.400	-23.381	46.000	17.219	QP
6			688.145	29.356	8.100	-16.644	46.000	21.256	QP

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/10 - 19:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: FMZB1519_0.009-30MHz	Polarity: Face on
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 9kHz~30MHz.	

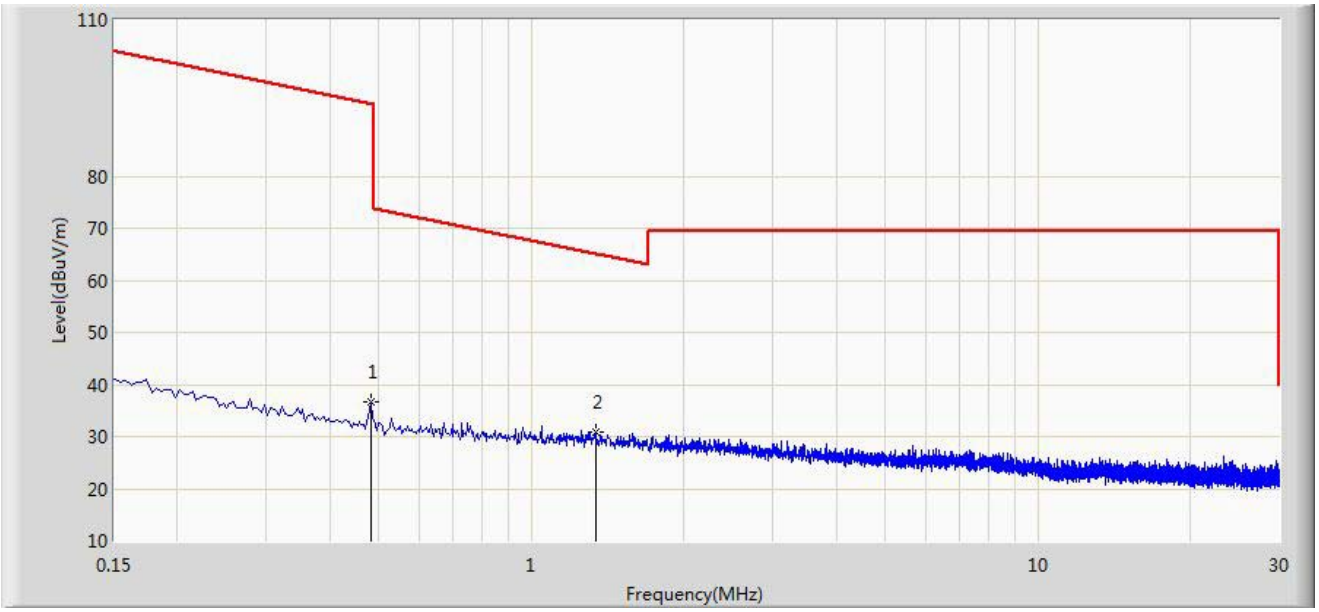


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			0.029	56.610	35.660	-61.732	118.342	21.049	QP
2		*	0.061	51.899	31.588	-59.988	111.887	20.311	QP

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/10 - 19:19
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: FMZB1519_0.009-30MHz	Polarity: Face on
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 9kHz~30MHz.	

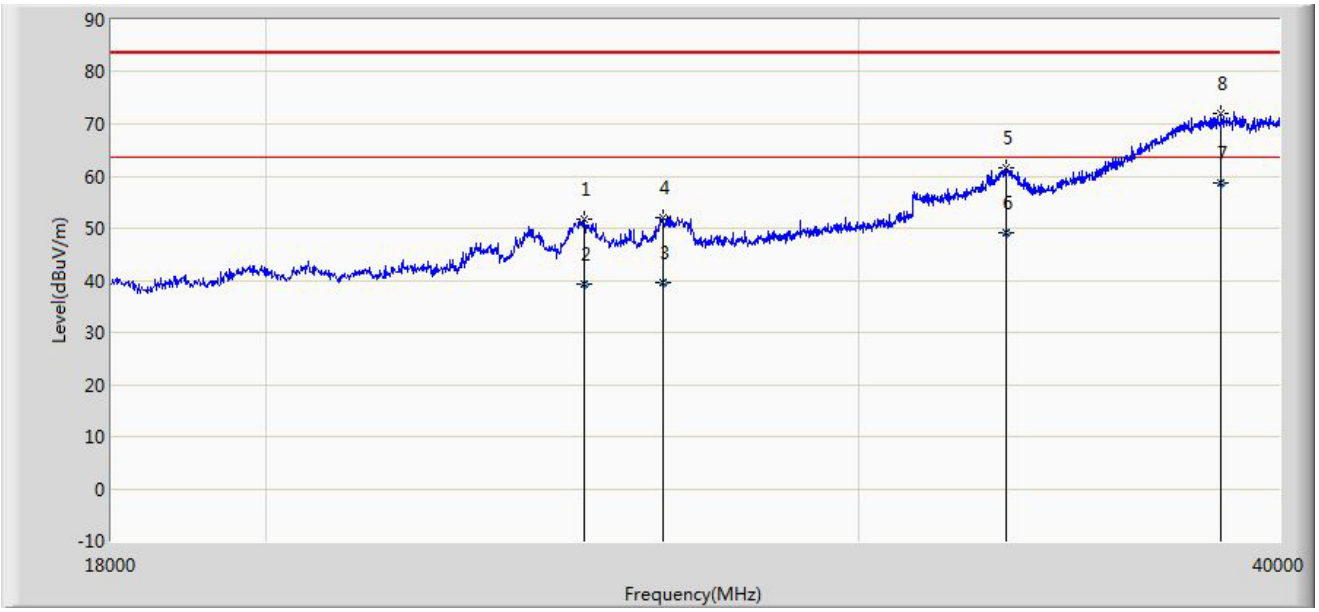


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			0.482	36.584	16.183	-57.359	93.943	20.401	QP
2		*	1.338	31.001	10.512	-34.098	65.099	20.489	QP

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/10 - 21:25
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9170_18-40GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 18GHz~40GHz.	

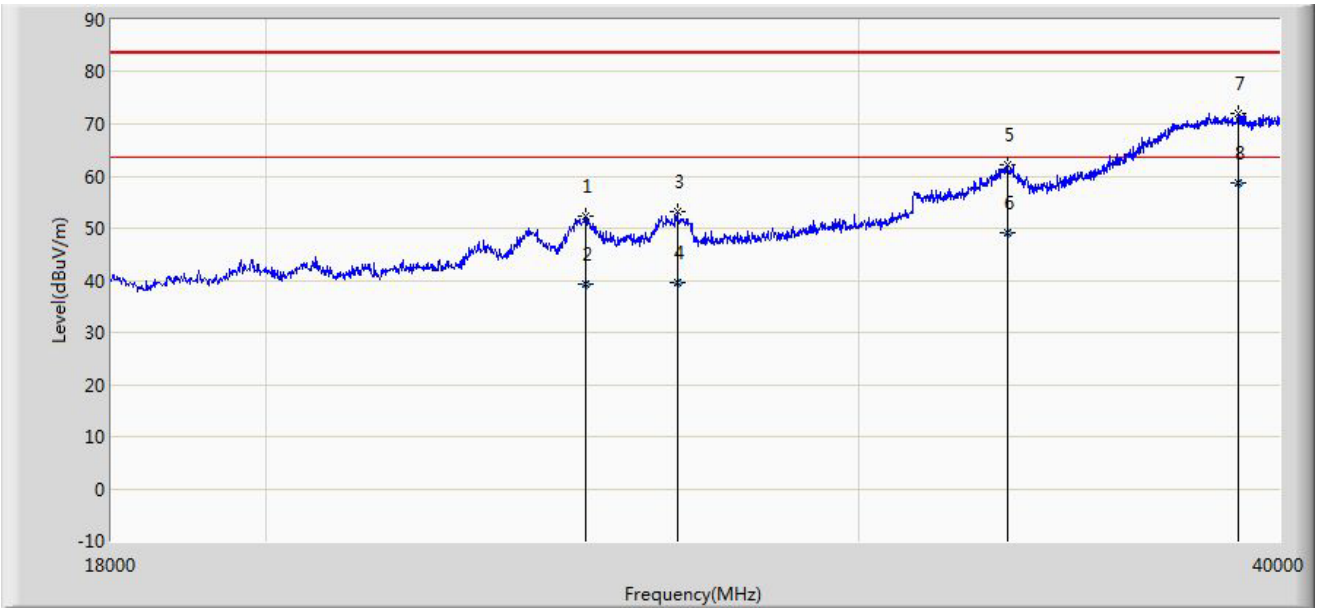


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			24864.000	51.836	37.061	-31.664	83.500	14.775	PK
2			24864.088	39.225	24.450	-24.275	63.500	14.775	AV
3			26260.988	39.469	24.050	-24.031	63.500	15.419	AV
4			26261.000	51.956	36.537	-31.544	83.500	15.419	PK
5			33180.000	61.461	39.940	-22.039	83.500	21.521	PK
6			33180.361	49.061	27.540	-14.439	63.500	21.521	AV
7		*	38437.980	58.523	31.190	-4.977	63.500	27.333	AV
8			38438.000	72.021	44.688	-11.479	83.500	27.333	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Site: AC1	Time: 2015/06/10 - 21:28
Limit: FCC_Part15.209_RE(3m)	Engineer: Roy Cheng
Probe: BBHA9170_18-40GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: There is the ambient noise within frequency range 18GHz~40GHz.	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			24886.000	52.313	37.528	-31.187	83.500	14.785	PK
2			24886.970	39.234	24.449	-24.266	63.500	14.785	AV
3			26503.000	53.227	37.207	-30.273	83.500	16.020	PK
4			26503.872	39.572	23.550	-23.928	63.500	16.022	AV
5			33213.000	62.110	40.572	-21.390	83.500	21.538	PK
6			33213.984	49.098	27.560	-14.402	63.500	21.538	AV
7			38900.000	72.096	44.211	-11.404	83.500	27.885	PK
8		*	38900.755	58.705	30.820	-4.795	63.500	27.885	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

7.9. Radiated Restricted Band Edge Measurement

7.9.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

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])

For RSS-Gen Section 8.10 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 8.10 of RSS-Gen, must also comply with the radiated emission limits specified in Section 8.9.

MHz
0.090-0.110
2.1735-2.1905
3.020-3.026
4.125-4.128
4.17725-4.17775
4.20725-4.20775
5.677-5.683
6.215-6.218
6.26775-6.26825
6.31175-6.31225
8.291-8.294
8.362-8.366
8.37625-8.38675
8.41425-8.41475
12.29-12.293
12.51975-12.52025
12.57675-12.57725
13.36-13.41
16.42-16.423
16.69475-16.69525
16.80425-16.80475
25.5-25.67
37.5-38.25
73-74.6
74.8-75.2
108-138
156.52475-156.52525

MHz
240-285
322-335.4
399.9-410
608-614
960-1427
1435-1626.5
1645.5-1646.5
1660-1710
1718.8-1722.2
2200-2300
2310-2390
2655-2900
3260-3267
3332-3339
3345.8-3358
3500-4400
4500-5150
5350-5460
7250-7750
8025-8500

GHz
9.0-9.2
9.3-9.5
10.6-12.7
13.25-13.4
14.47-14.5
15.35-16.2
17.7-21.4
22.01-23.12
23.6-24.0
31.2-31.8
36.43-36.5
Above 38.6

* Certain frequency bands listed in Table 6 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300-series of RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.

For 15.407(b) requirement:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

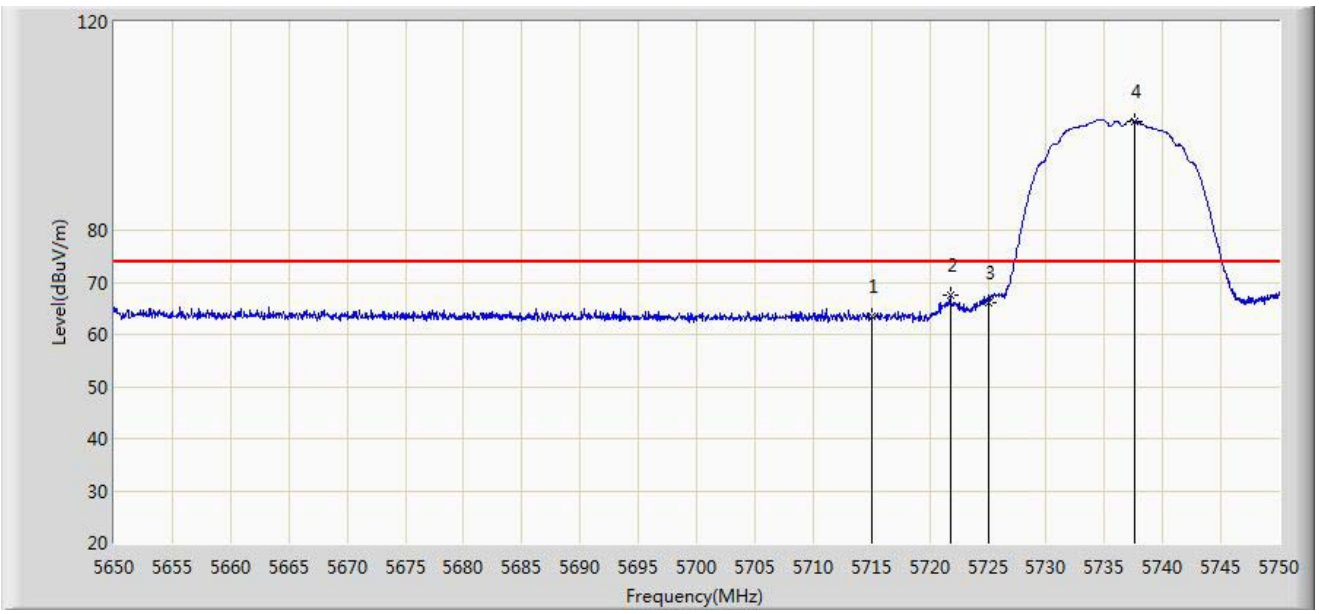
Note: Refer to KDB 789033 D02v01 G)2)c), as specified in § 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a maximum emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in § 15.407(b)(4)). However, an out-of-band emission that complies with both the peak and average limits of § 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz maximum emission limit.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [V/m]	Measured Distance [Meters]
0.009 – 0.490	2400/F (kHz)	300
0.490 – 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

7.9.2. Test Result of Radiated Restricted Band Edge

Site: AC1	Time: 2015/06/23 - 09:36
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5736MHz Ant A	

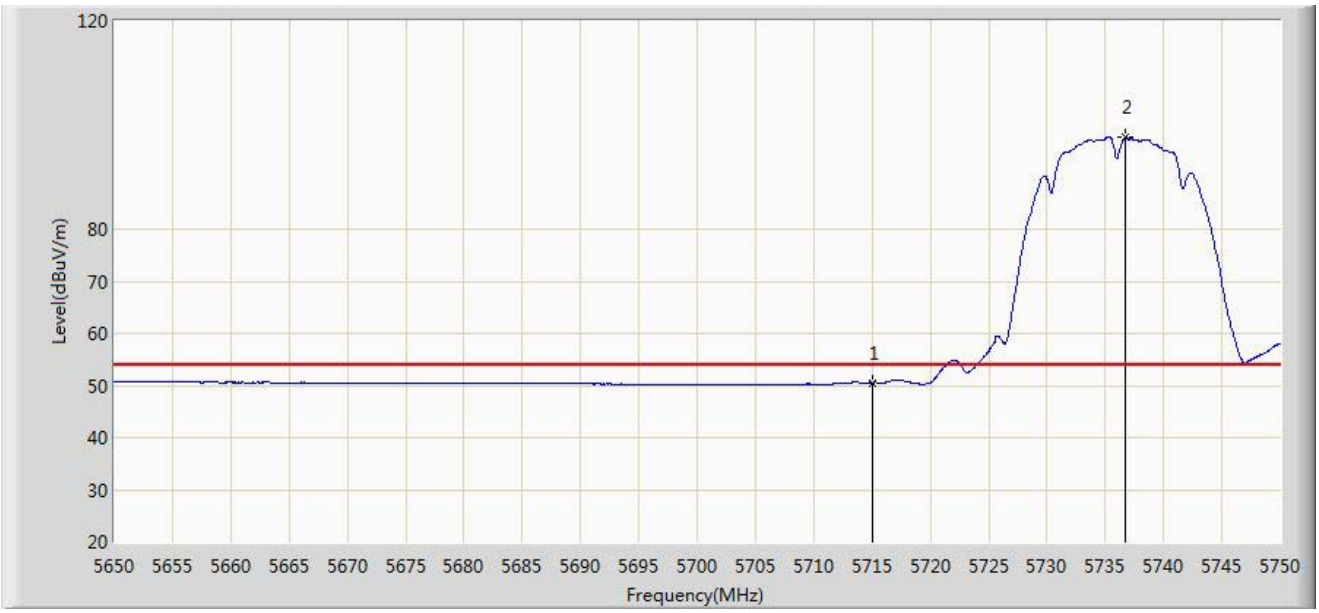


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5715.000	63.565	25.616	-10.435	74.000	37.949	PK
2			5721.750	67.523	29.547	-6.477	74.000	37.976	PK
3			5725.000	66.183	28.193	-7.817	74.000	37.990	PK
4		*	5737.650	100.919	62.877	N/A	N/A	38.042	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 09:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5736MHz Ant A	

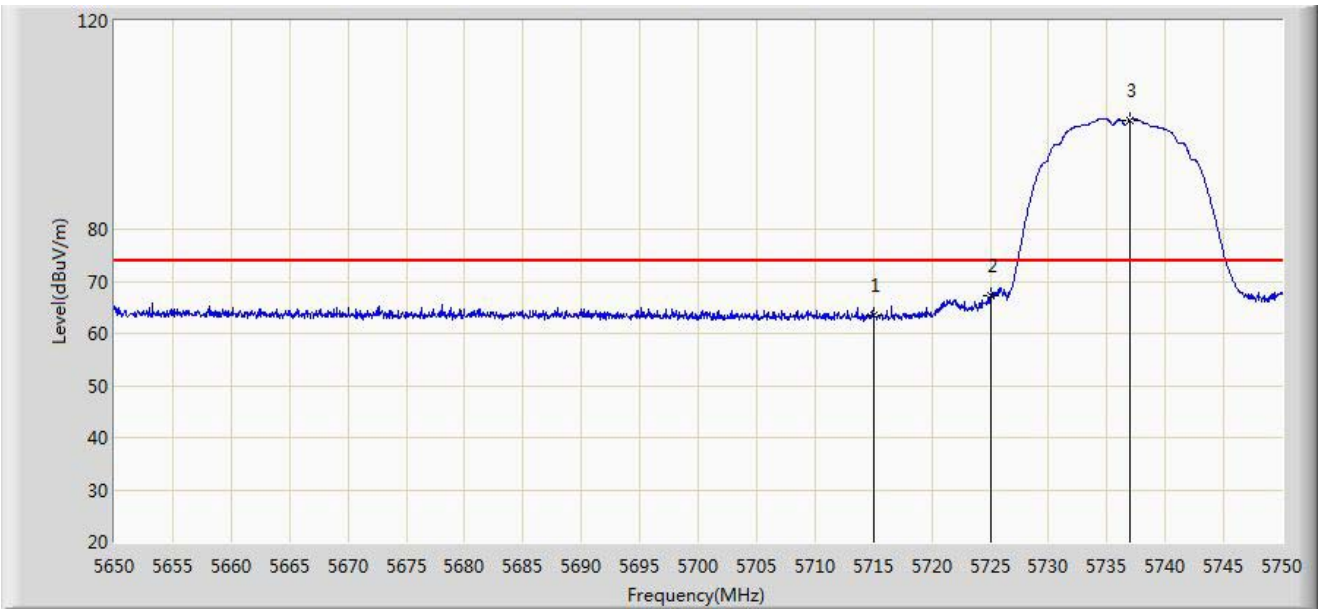


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5715.000	50.561	12.612	-3.439	54.000	37.949	AV
2		*	5736.700	97.556	59.518	N/A	N/A	38.038	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 09:49
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5736MHz Ant A	

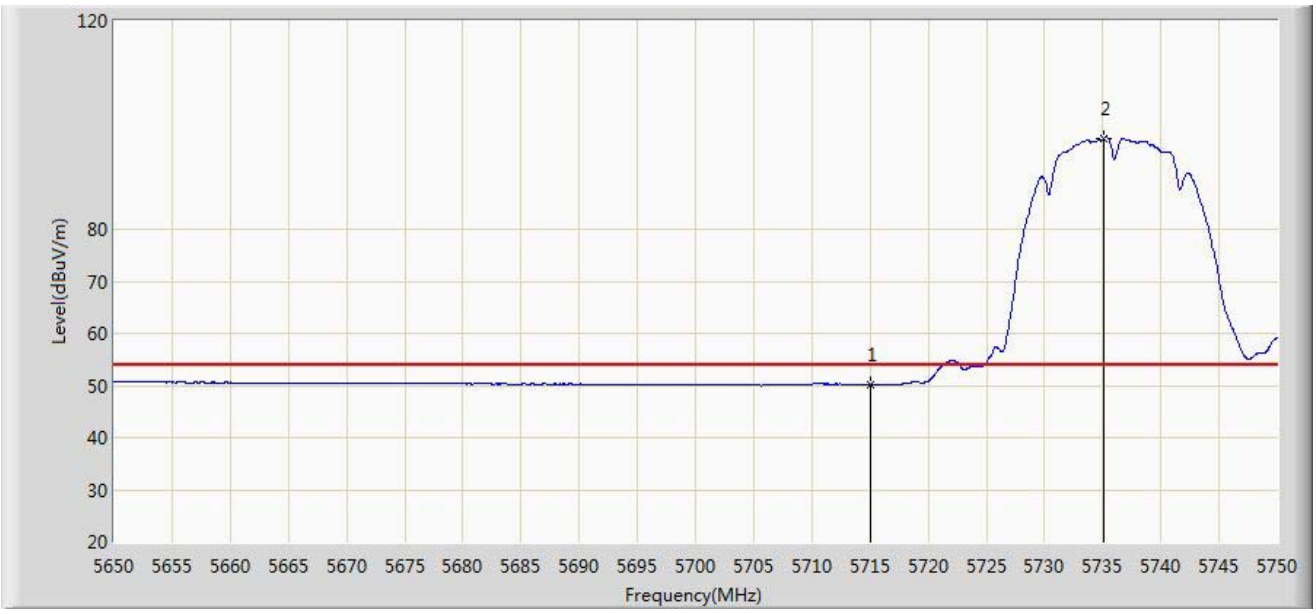


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5715.000	63.448	25.499	-10.552	74.000	37.949	PK
2			5725.000	67.256	29.266	-6.744	74.000	37.990	PK
3		*	5737.000	100.954	62.915	N/A	N/A	38.039	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 09:55
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5736MHz Ant A	

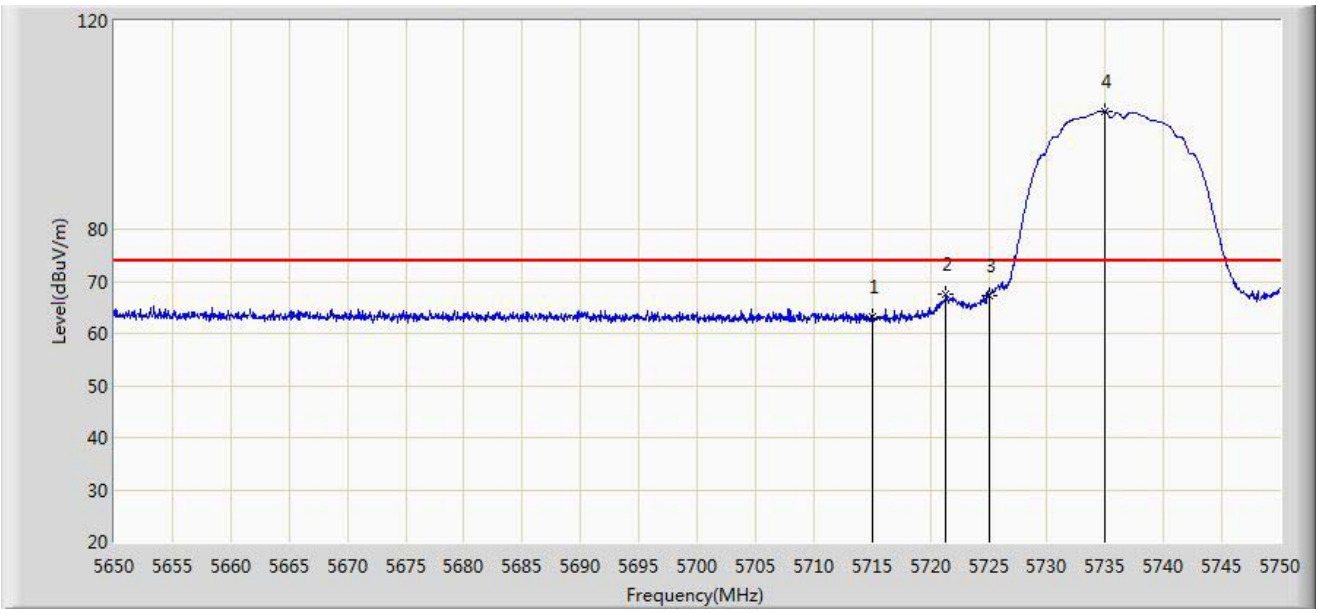


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5715.000	50.096	12.147	-3.904	54.000	37.949	AV
2		*	5735.150	97.496	59.464	N/A	N/A	38.032	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:03
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5736MHz Ant B	

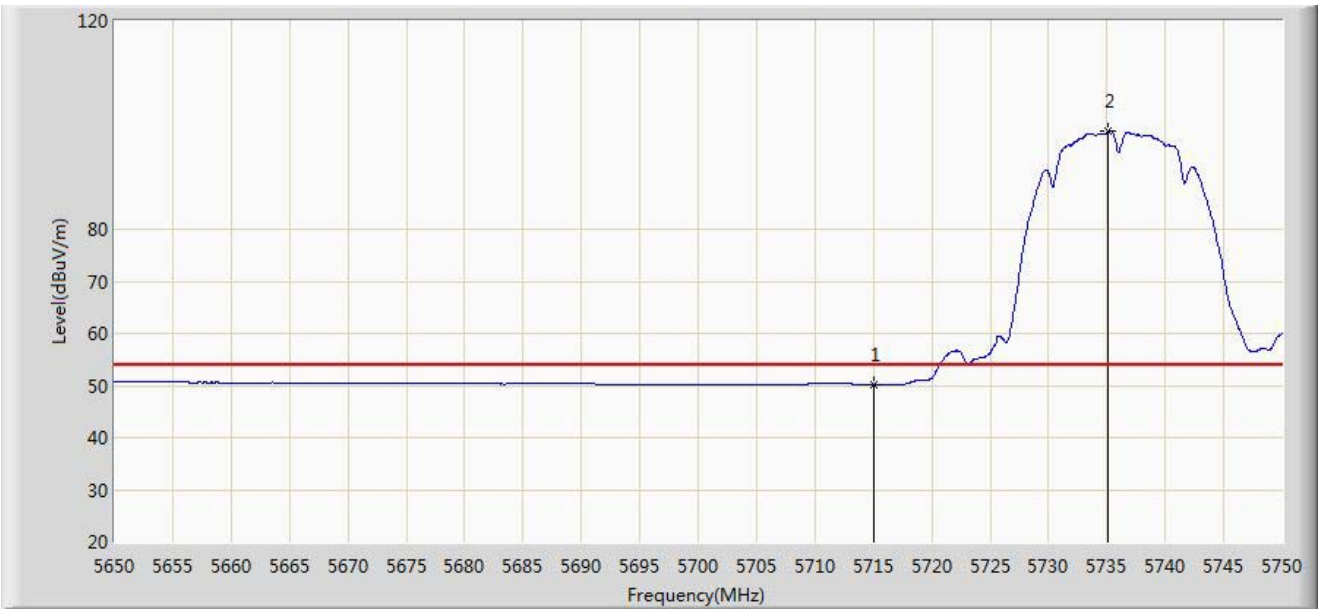


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5715.000	63.139	25.190	-10.861	74.000	37.949	PK
2			5721.350	67.461	29.486	-6.539	74.000	37.975	PK
3			5725.000	67.286	29.296	-6.714	74.000	37.990	PK
4		*	5735.000	102.546	64.515	N/A	N/A	38.031	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:14
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5736MHz Ant B	

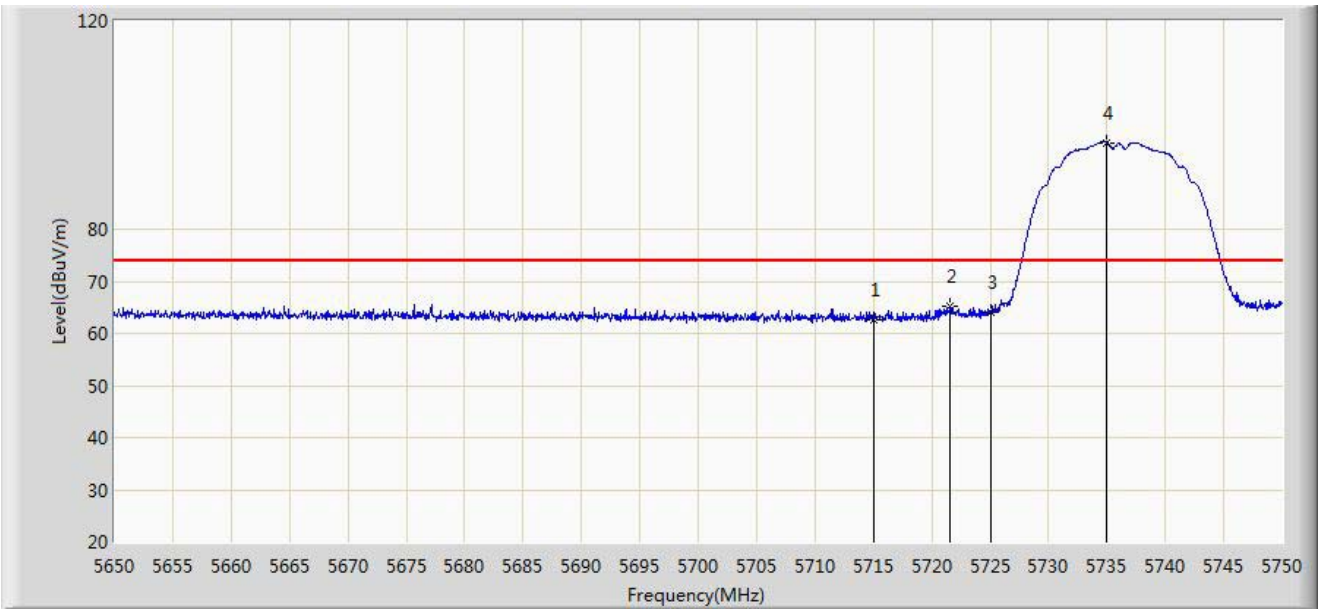


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5715.000	50.131	12.182	-3.869	54.000	37.949	AV
2		*	5735.150	98.746	60.714	N/A	N/A	38.032	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:19
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5736MHz Ant B	

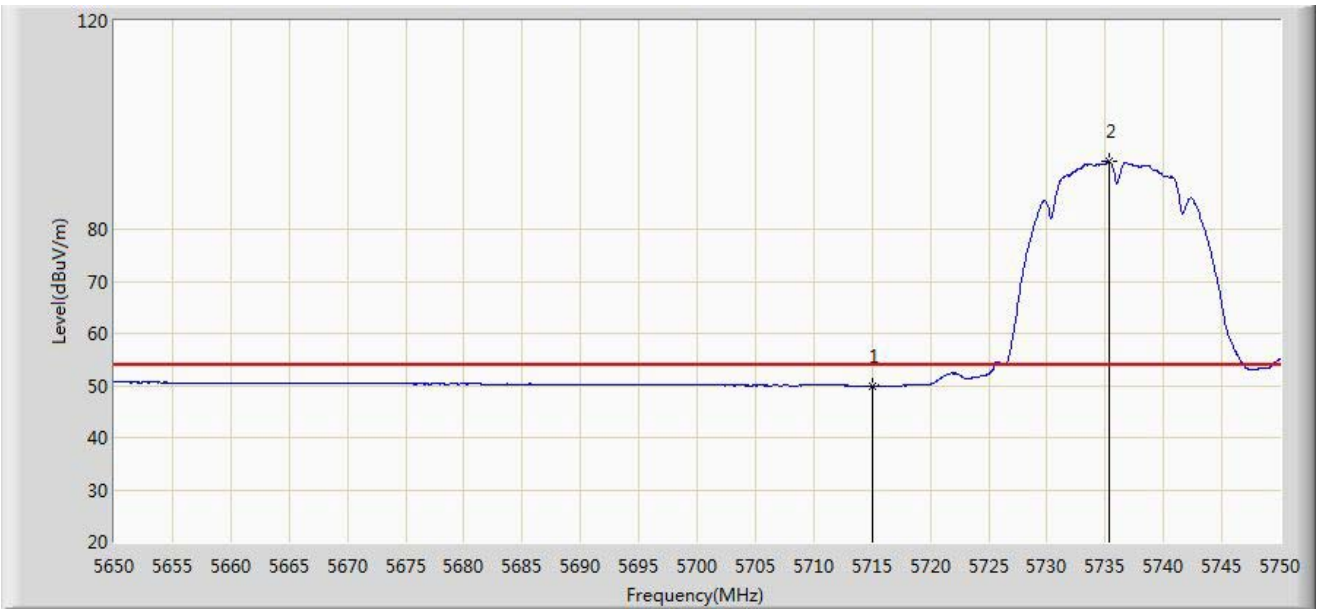


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5715.000	62.653	24.704	-11.347	74.000	37.949	PK
2			5721.600	65.218	27.242	-8.782	74.000	37.976	PK
3			5725.000	64.035	26.045	-9.965	74.000	37.990	PK
4		*	5735.000	96.626	58.595	N/A	N/A	38.031	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:26
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5736MHz Ant B	

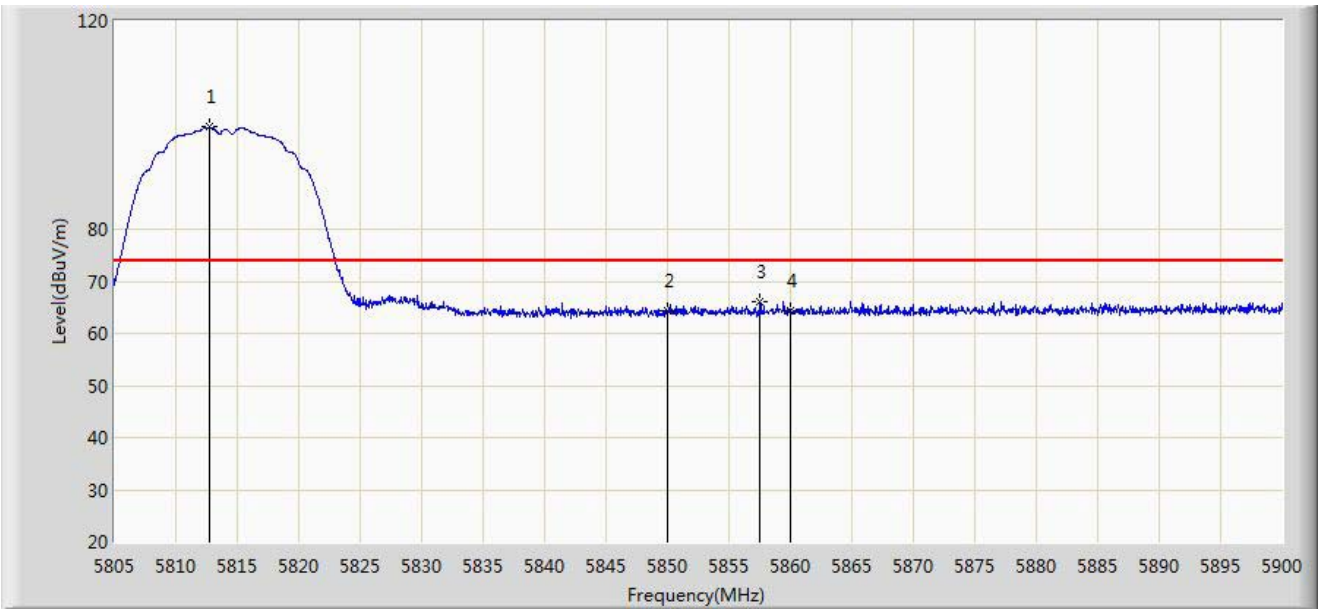


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5715.000	49.954	12.005	-4.046	54.000	37.949	AV
2		*	5735.350	93.031	54.999	N/A	N/A	38.033	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:32
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5814MHz Ant A	

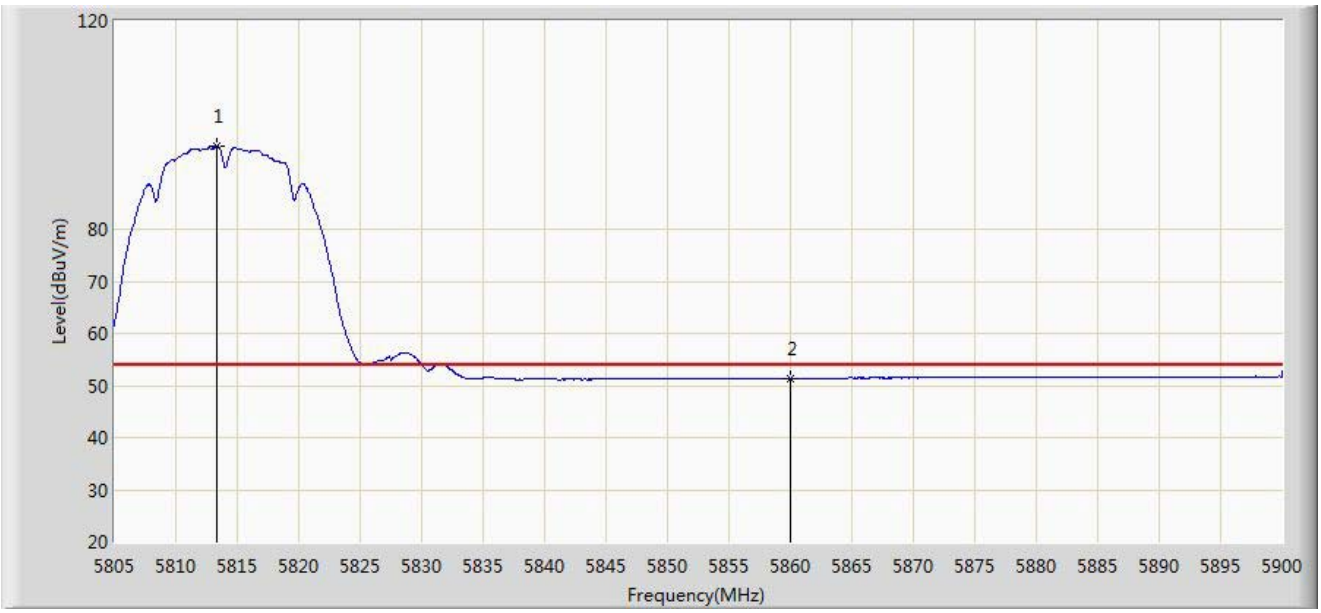


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5812.790	99.591	61.286	N/A	N/A	38.305	PK
2			5850.000	64.203	25.750	-9.797	74.000	38.454	PK
3			5857.535	66.008	27.536	-7.992	74.000	38.472	PK
4			5860.000	64.486	26.008	-9.514	74.000	38.478	PK

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5814MHz Ant A	

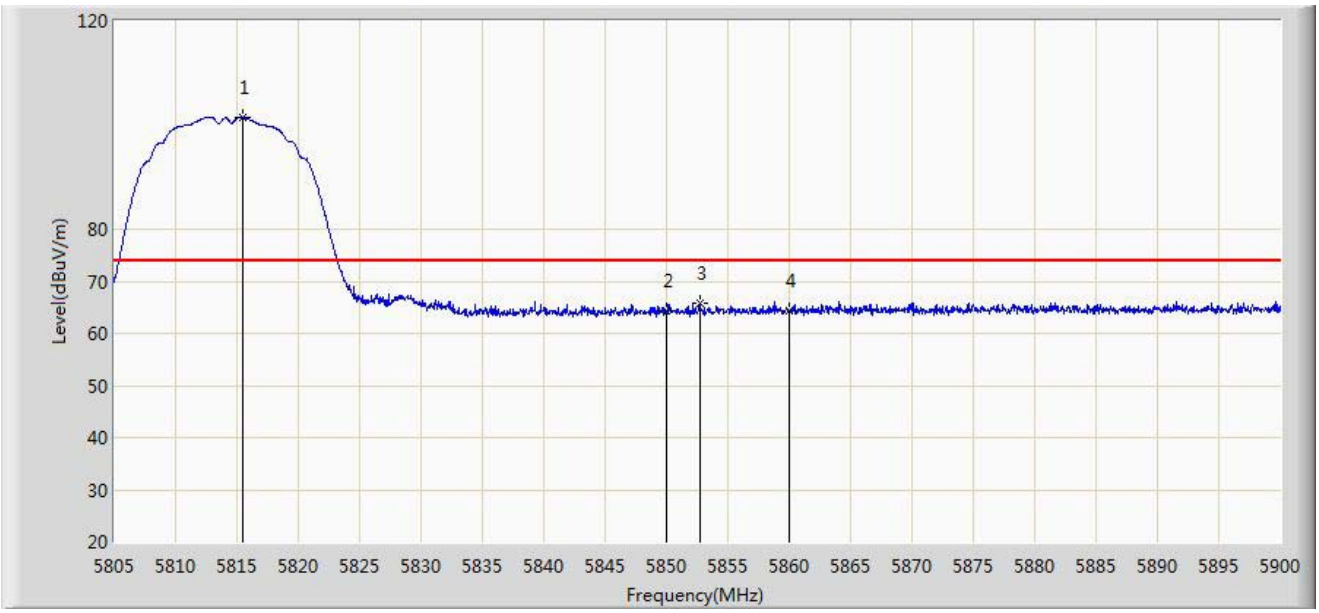


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5813.360	95.984	57.677	N/A	N/A	38.307	AV
2			5860.000	51.401	12.923	-2.599	54.000	38.478	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:46
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5814MHz Ant A	

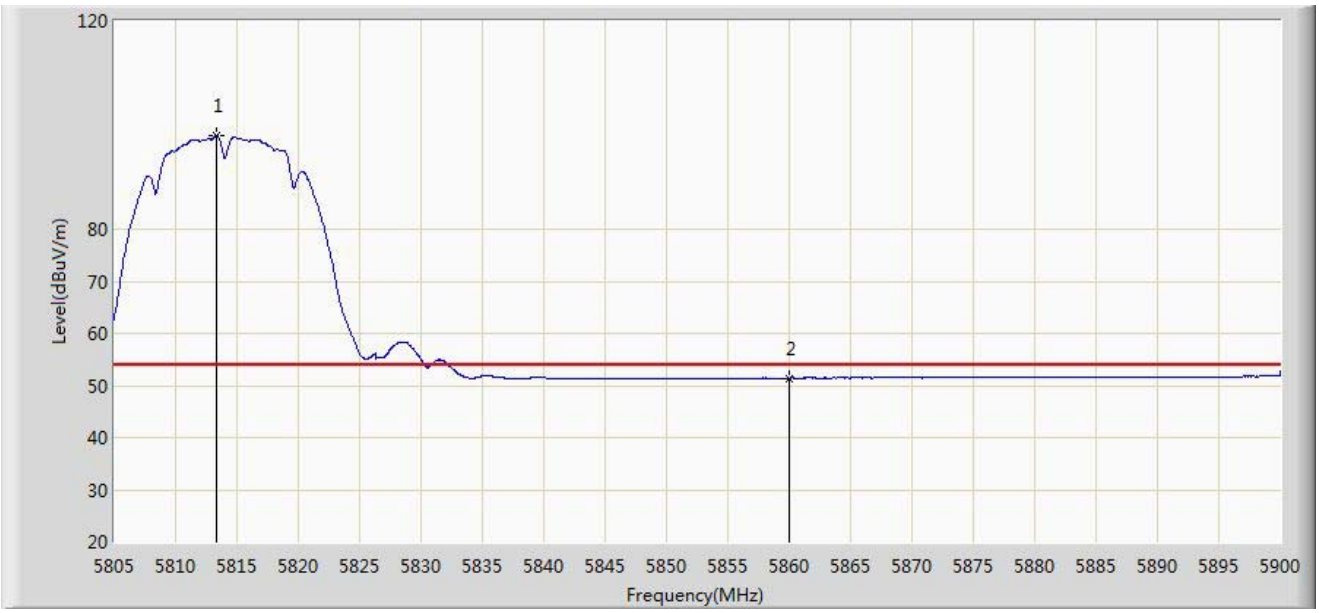


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5815.450	101.404	63.088	N/A	N/A	38.316	PK
2			5850.000	64.302	25.849	-9.698	74.000	38.454	PK
3			5852.690	65.704	27.244	-8.296	74.000	38.459	PK
4			5860.000	64.315	25.837	-9.685	74.000	38.478	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:53
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5814MHz Ant A	

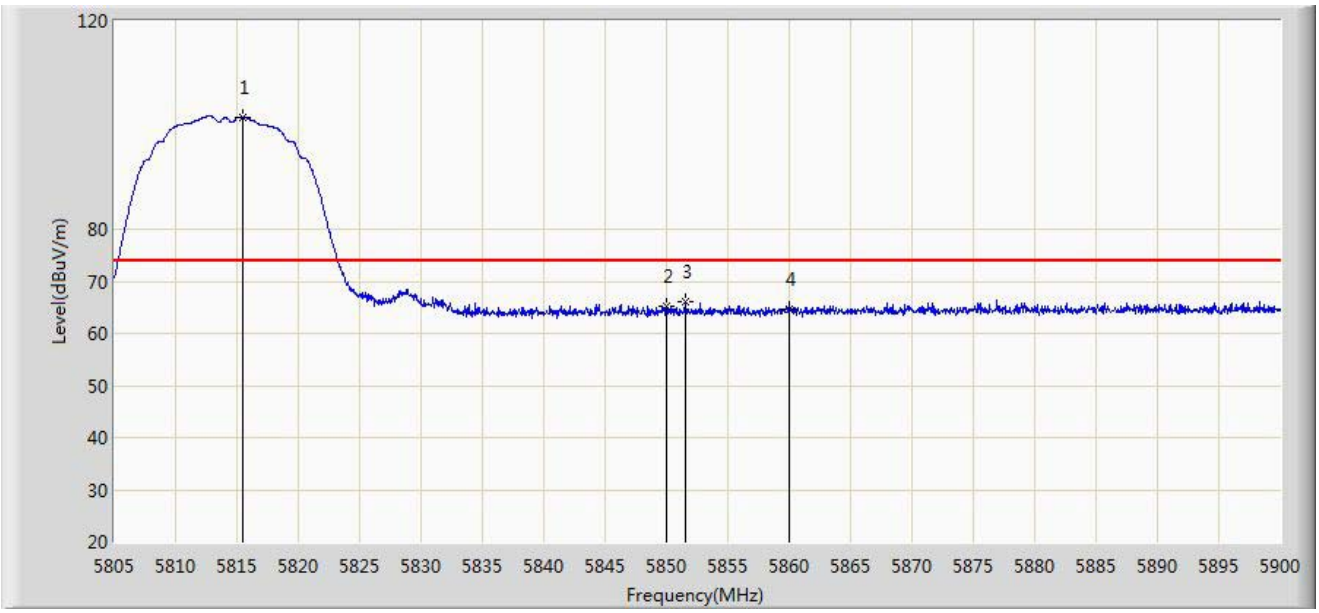


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5813.360	97.877	59.570	N/A	N/A	38.307	AV
2			5860.000	51.416	12.938	-2.584	54.000	38.478	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 10:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5814MHz Ant B	

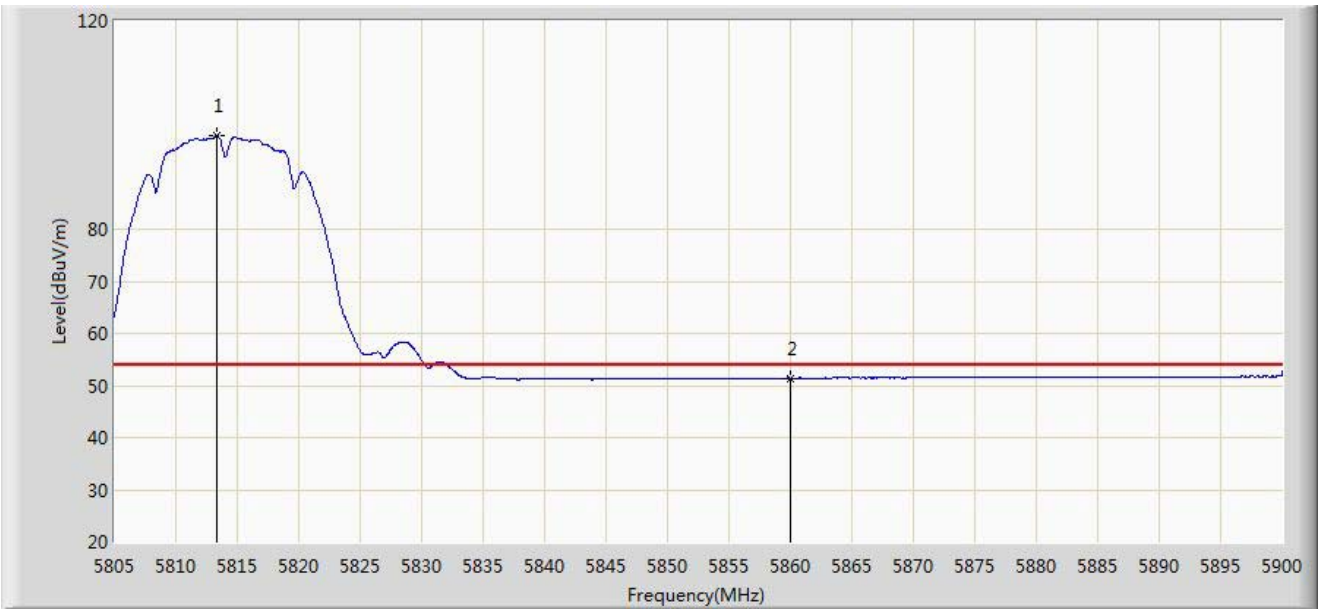


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5815.450	101.544	63.228	N/A	N/A	38.316	PK
2			5850.000	65.081	26.628	-8.919	74.000	38.454	PK
3			5851.598	66.152	27.695	-7.848	74.000	38.457	PK
4			5860.000	64.735	26.257	-9.265	74.000	38.478	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 11:06
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5814MHz Ant B	

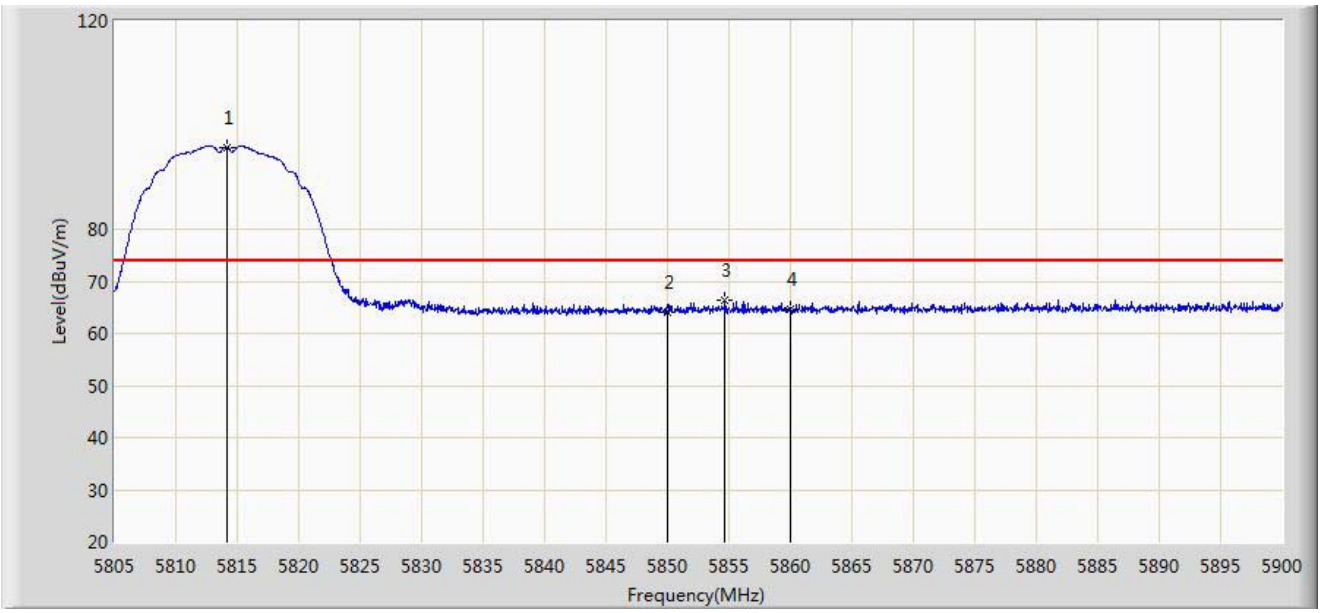


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5813.360	97.949	59.642	N/A	N/A	38.307	AV
2			5860.000	51.389	12.911	-2.611	54.000	38.478	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 11:12
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5814MHz Ant B	

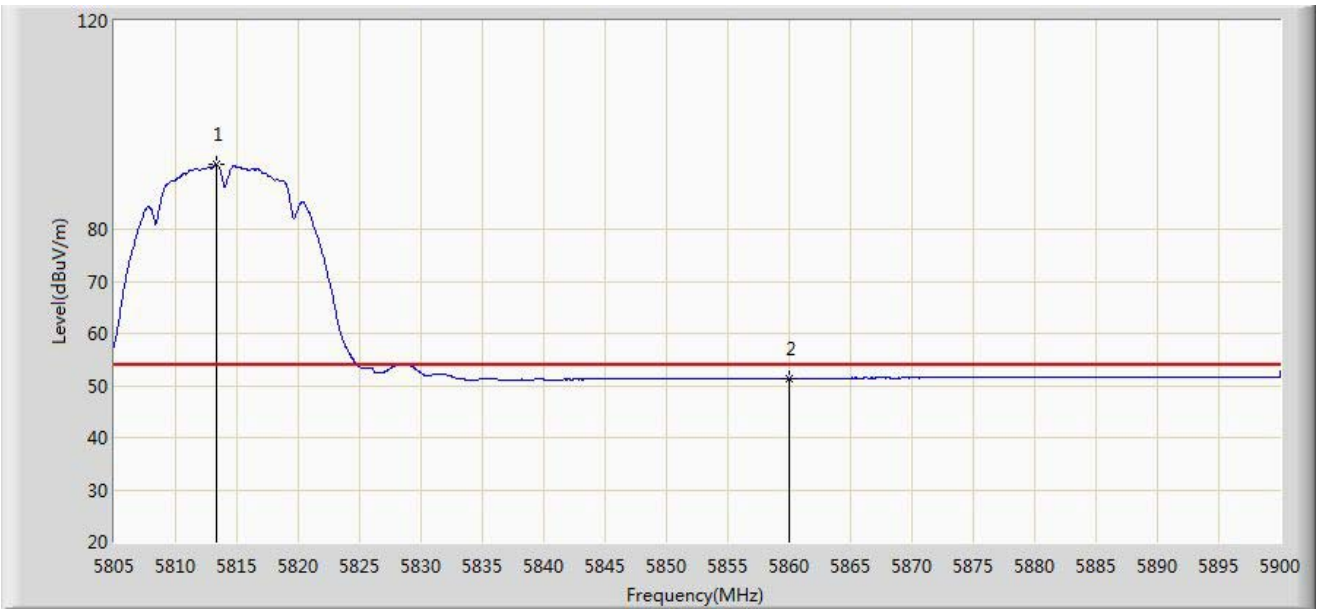


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5814.120	95.760	57.450	N/A	N/A	38.310	PK
2			5850.000	64.101	25.648	-9.899	74.000	38.454	PK
3			5854.638	66.348	27.883	-7.652	74.000	38.465	PK
4			5860.000	64.686	26.208	-9.314	74.000	38.478	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 11:19
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5814MHz Ant B	

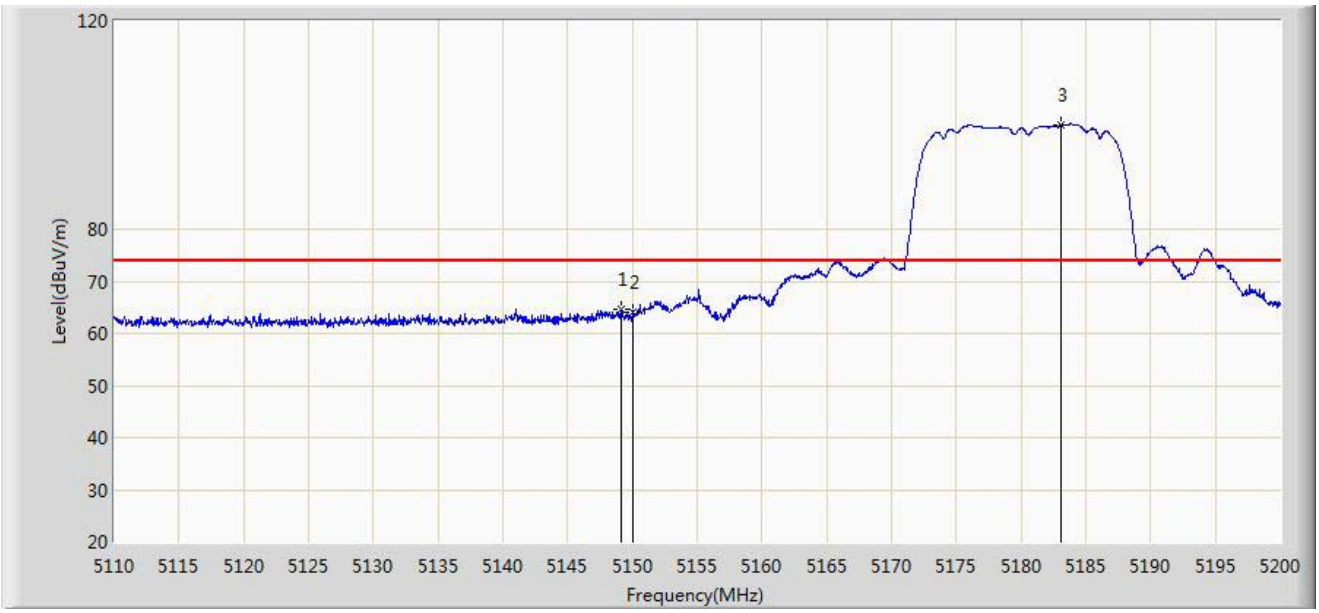


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	5813.360	92.339	54.032	N/A	N/A	38.307	AV
2			5860.000	51.395	12.917	-2.605	54.000	38.478	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 11:25
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5180MHz Ant A	

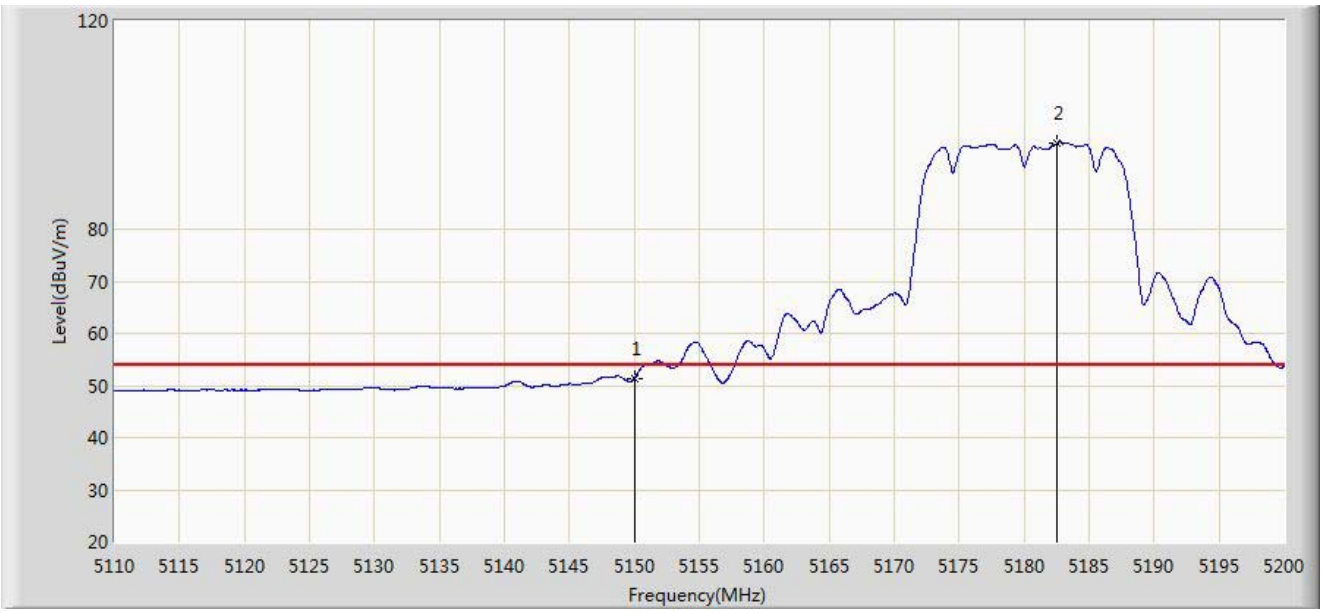


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5149.150	64.714	27.261	-9.286	74.000	37.453	PK
2			5150.000	64.197	26.745	-9.803	74.000	37.452	PK
3		*	5183.125	99.986	62.620	N/A	N/A	37.366	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 11:34
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5180MHz Ant A	

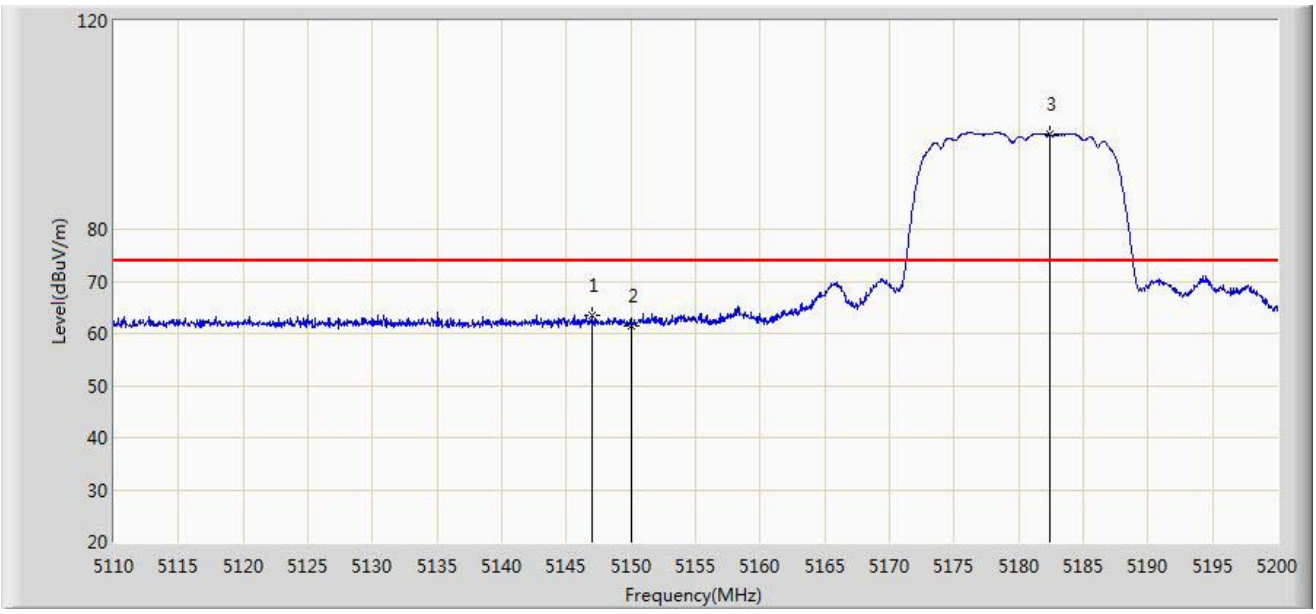


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5150.000	51.348	13.896	-2.652	54.000	37.452	AV
2		*	5182.540	96.557	59.189	N/A	N/A	37.367	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 11:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5180MHz Ant A	

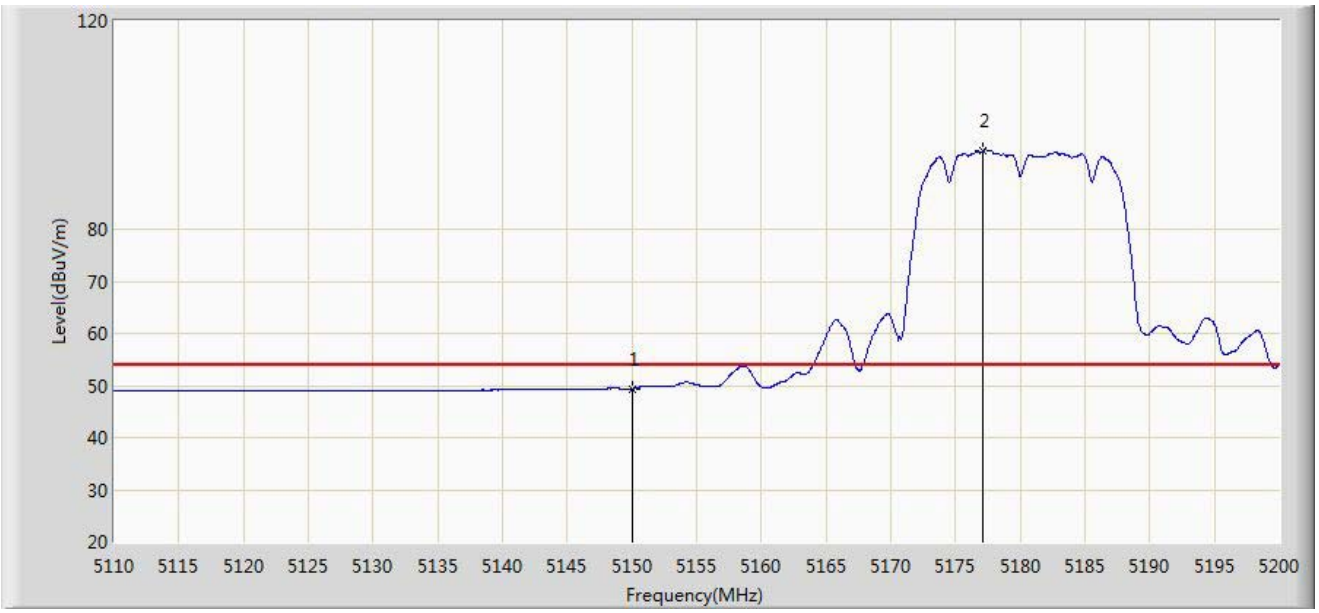


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5146.990	63.542	26.086	-10.458	74.000	37.456	PK
2			5150.000	61.547	24.095	-12.453	74.000	37.452	PK
3		*	5182.450	98.130	60.762	N/A	N/A	37.368	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 11:49
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5180MHz Ant A	

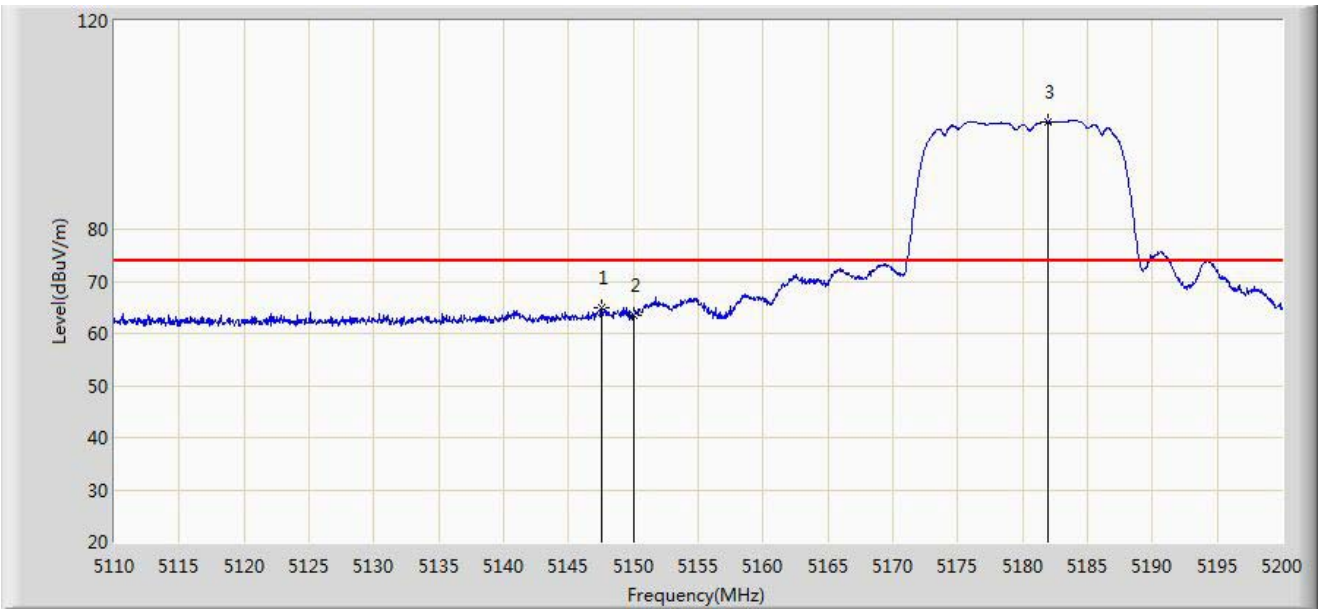


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5150.000	49.327	11.875	-4.673	54.000	37.452	AV
2		*	5177.095	95.012	57.632	N/A	N/A	37.380	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 12:03
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5180MHz Ant B	

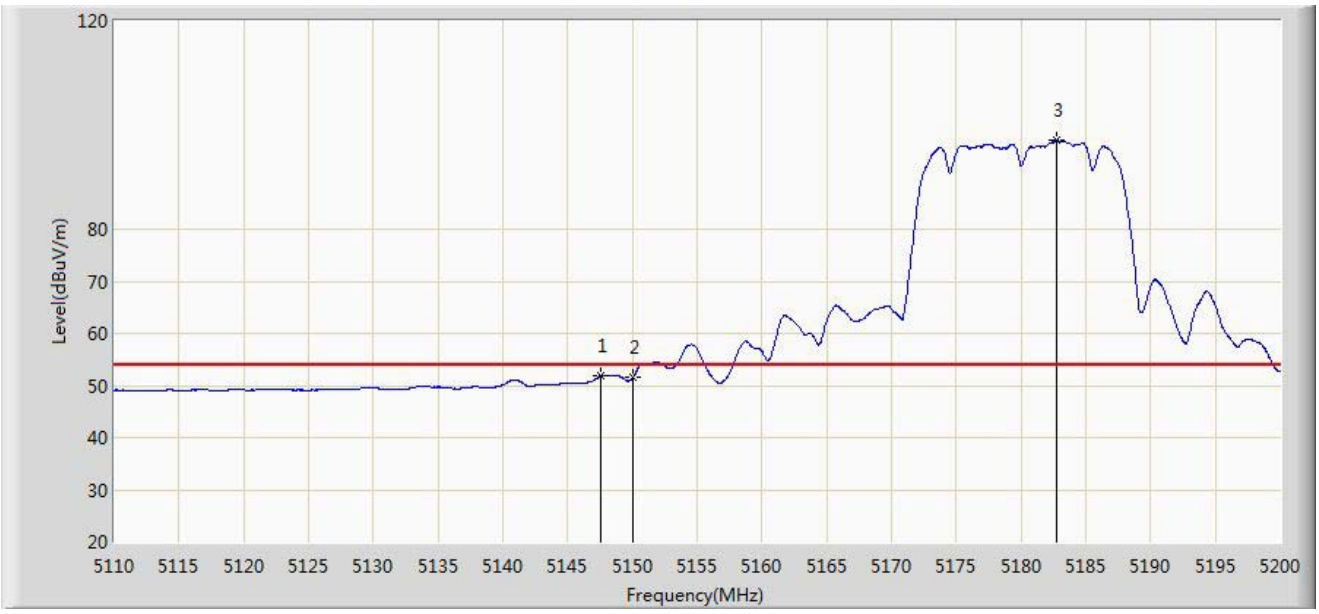


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5147.575	64.922	27.467	-9.078	74.000	37.455	PK
2			5150.000	63.345	25.893	-10.655	74.000	37.452	PK
3		*	5181.910	100.609	63.240	N/A	N/A	37.370	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 12:07
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5180MHz Ant B	

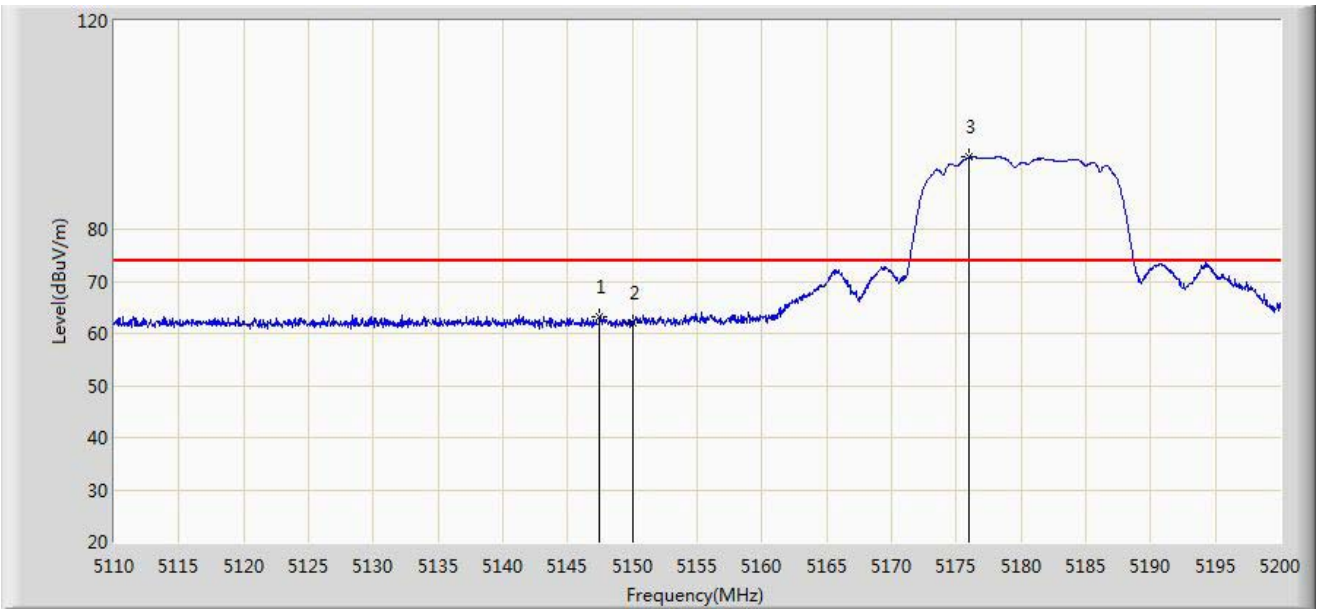


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5147.575	51.866	14.411	-2.134	54.000	37.455	AV
2			5150.000	51.479	14.027	-2.521	54.000	37.452	AV
3		*	5182.720	97.175	59.808	N/A	N/A	37.368	AV

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 12:16
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5180MHz Ant B	

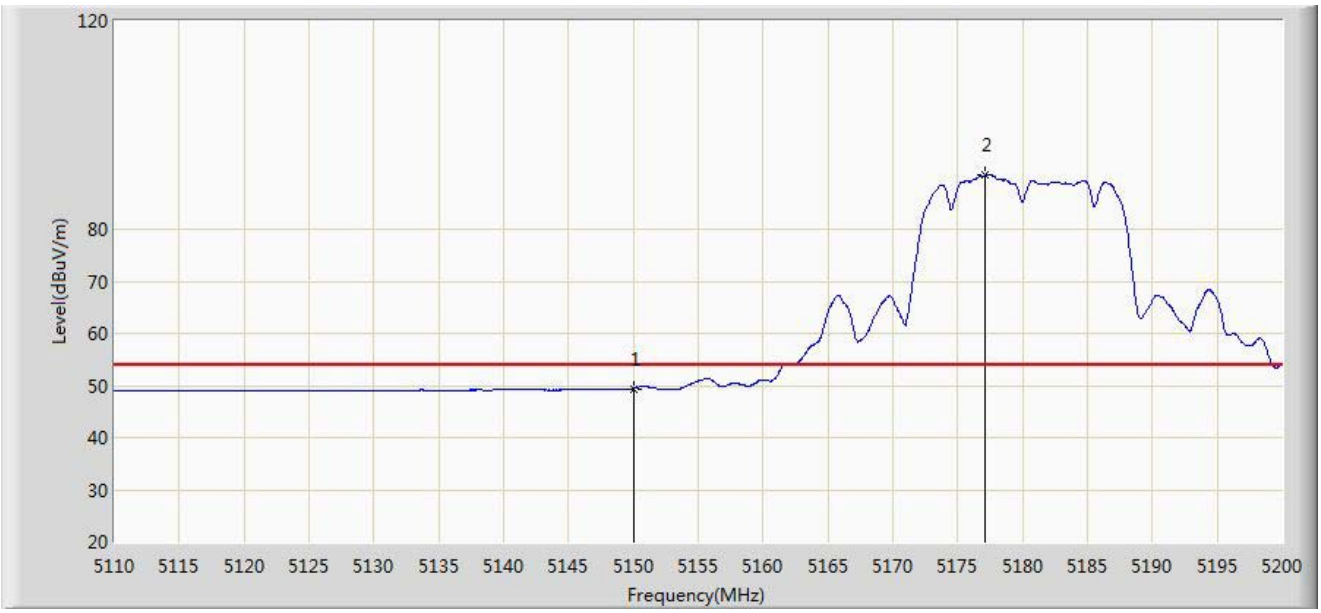


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5147.440	63.059	25.603	-10.941	74.000	37.456	PK
2			5150.000	62.149	24.697	-11.851	74.000	37.452	PK
3		*	5176.015	93.773	56.390	N/A	N/A	37.383	PK

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

Site: AC1	Time: 2015/06/23 - 12:25
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Test Mode: Transmit at channel 5180MHz Ant B	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			5150.000	49.391	11.939	-4.609	54.000	37.452	AV
2		*	5177.140	90.386	53.006	N/A	N/A	37.380	AV

Note: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

7.10. AC Conducted Emissions Measurement

7.10.1. Test Limit

FCC Part 15 Subpart E Paragraph 15.207		
Frequency (MHz)	QP (dBμV)	AV (dBμV)
0.15 - 0.50	66 - 56	56 – 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

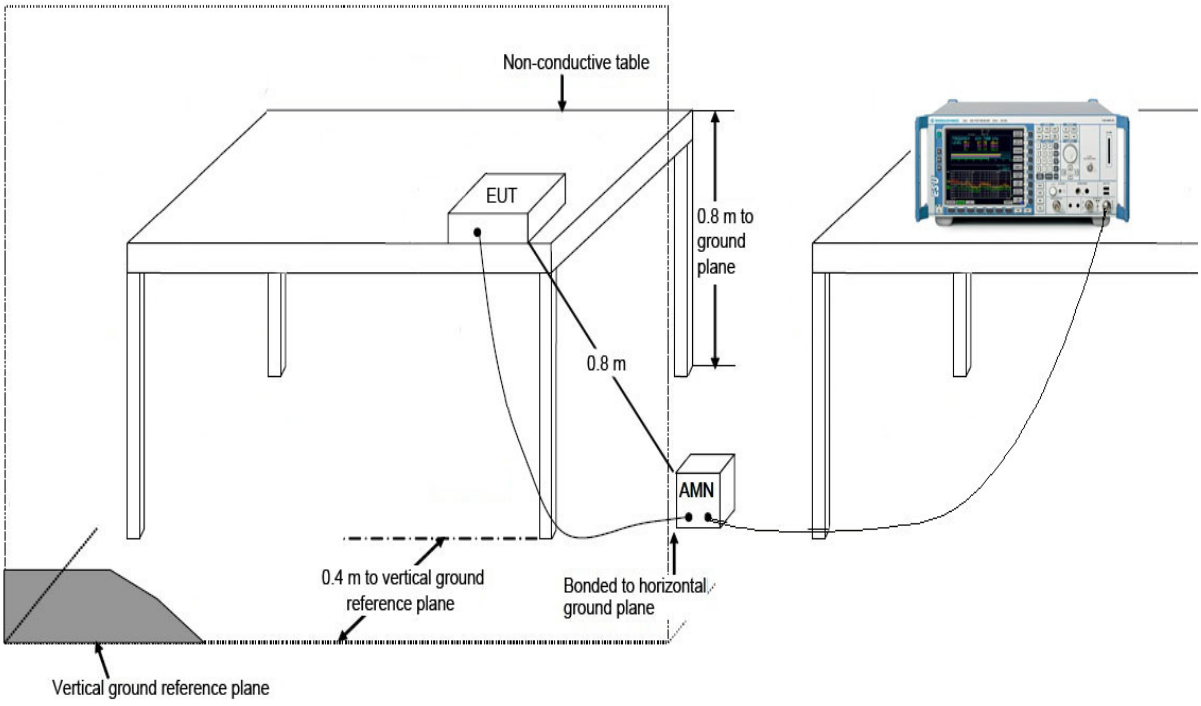
7.10.2. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to KDB 789033 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

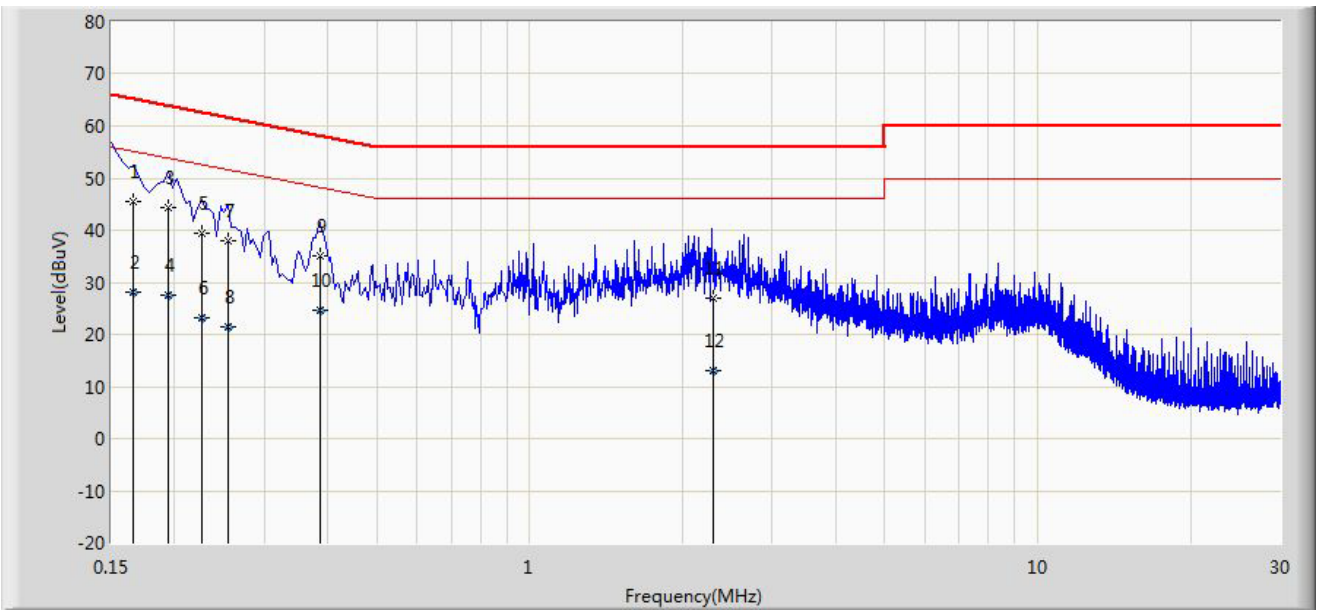
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

7.10.3. Test Setup



7.10.4. Test Result

Site: SR2	Time: 2015/06/22 - 15:02
Limit: FCC_Part15.207_CE_AC Power	Engineer: Lewis Huang
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Mode1	

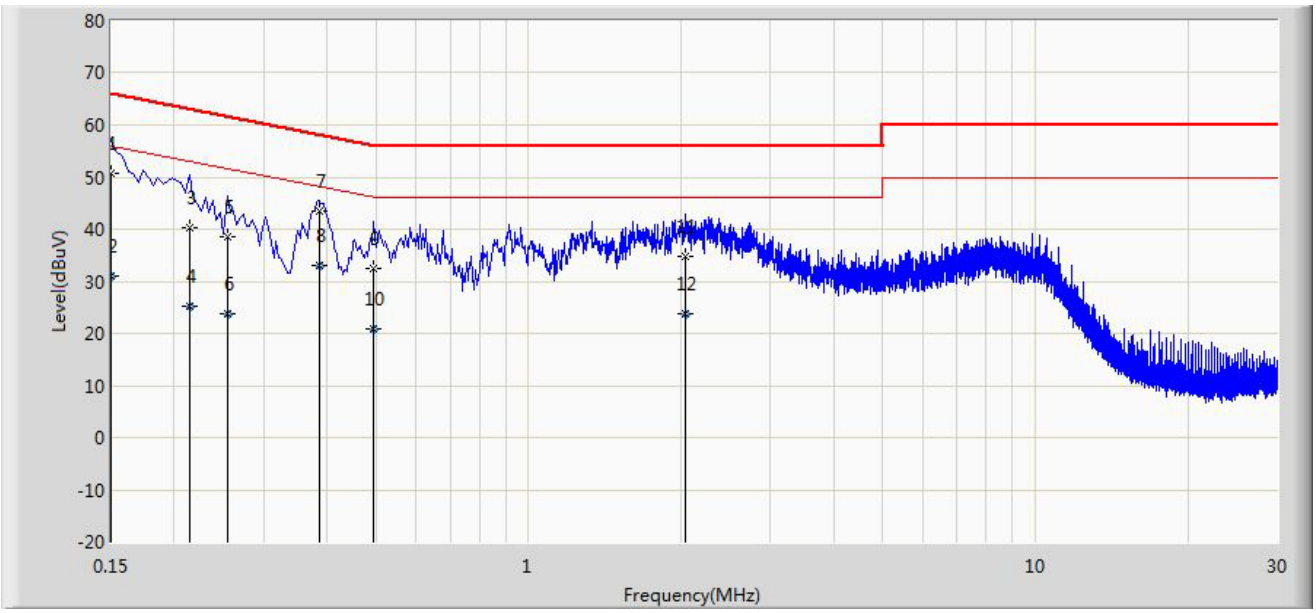


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.166	45.387	35.300	-19.771	65.158	10.087	QP
2			0.166	28.187	18.099	-26.971	55.158	10.087	AV
3		*	0.194	44.205	34.188	-19.659	63.864	10.017	QP
4			0.194	27.441	17.425	-26.422	53.864	10.017	AV
5			0.226	39.409	29.465	-23.187	62.595	9.944	QP
6			0.226	23.239	13.295	-29.357	52.595	9.944	AV
7			0.254	37.829	27.861	-23.797	61.625	9.967	QP
8			0.254	21.451	11.484	-30.174	51.625	9.967	AV
9			0.386	35.147	25.073	-23.002	58.149	10.074	QP
10			0.386	24.637	14.563	-23.512	48.149	10.074	AV
11			2.293	26.865	17.002	-29.135	56.000	9.863	QP
12			2.293	12.978	3.115	-33.022	46.000	9.863	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

Site: SR2	Time: 2015/06/22 - 15:43
Limit: FCC_Part15.207_CE_AC Power	Engineer: Lewis Huang
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Wireless Subwoofer Adapter	Power: AC 120V/60Hz
Note: Mode1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.150	50.751	39.609	-15.249	66.000	11.142	QP
2			0.150	31.008	19.866	-24.992	56.000	11.142	AV
3			0.214	40.299	30.311	-22.750	63.049	9.988	QP
4			0.214	25.159	15.171	-27.889	53.049	9.988	AV
5			0.254	38.621	28.617	-23.005	61.625	10.004	QP
6			0.254	23.807	13.803	-27.818	51.625	10.004	AV
7		*	0.386	43.493	33.391	-14.656	58.149	10.102	QP
8			0.386	33.168	23.066	-14.981	48.149	10.102	AV
9			0.494	32.486	22.308	-23.614	56.100	10.178	QP
10			0.494	20.778	10.599	-25.322	46.100	10.178	AV
11			2.038	34.859	24.987	-21.141	56.000	9.872	QP
12			2.038	23.758	13.886	-22.242	46.000	9.872	AV

Note: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB)

Factor (dB) = Cable Loss (dB) + LISN Factor (dB)

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **Wireless Subwoofer Adapter**

FCC ID: 2ABX8SH-000000009 is in compliance with Part 15E of the FCC Rules.

The End