MRT Technology2Suzhou) Co., Ltd
Phone: +86-512-66308358
Fax: +86-512-66308368
Web: www.mrt-cert.com

Report No.: 1601RSU02002
Report Version: V01
Issue Date: 02-18-2016

MEASUREMENT REPORT
FCC PART 15.247 / RSS-247 ZigBee 802.15.4

FCC ID:	2ACS5-ST16
IC:	11554B-ST16
APPLICANT:	Yuneec Technology Co., Limited
Application Type:	Certification
Product:	Radio Controller
FCC Model No.:	ST16***** (The "*" can be 0 to 9, a to z, A to Z, blank or plus, for marketing purpose.)
IC Model No.:	ST16
Brand Name:	YUNEEC
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15.247
IC Rule(s):	RSS-247 Issue 1, RSS-GEN Issue 4
Test Procedure(s):	ANSI C63.10-2013, KDB 558074 D01v03r04
Test Date:	January 22 ~ February 17, 2016

Reviewed By : Robin Wu
(Robin Wu)

Approved By : Marlin Chen
(Marlin Chen)

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 558074 D01v03r04. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date
1601RSU02002	Rev. 01	Initial report	02-18-2016

CONTENTS

Description Page

§2.1033 General Information

Applicant:	Yuneec Technology Co., Limited
Applicant Address:	2/F Man Shung Industrial Building, 7 Lai Yip Street, Kwun Tong, Hong Kong
Manufacturer:	Yuneec International (China) Co., Ltd.
Manufacturer Address:	No.388 East Zhengwei Road, Jinxi Town, Kunshan, Jiangsu 215324, China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China
MRT Registration No.:	809388
IC Registration No.:	11384A
FCC Rule Part(s):	Part 15.247
IC Rule:	RSS-247 Issue 1, RSS-GEN Issue 4
FCC ID:	2ACS5-ST16
IC:	11554B-ST16
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
FCC Classification:	Digital Transmission System (DTS)

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.**

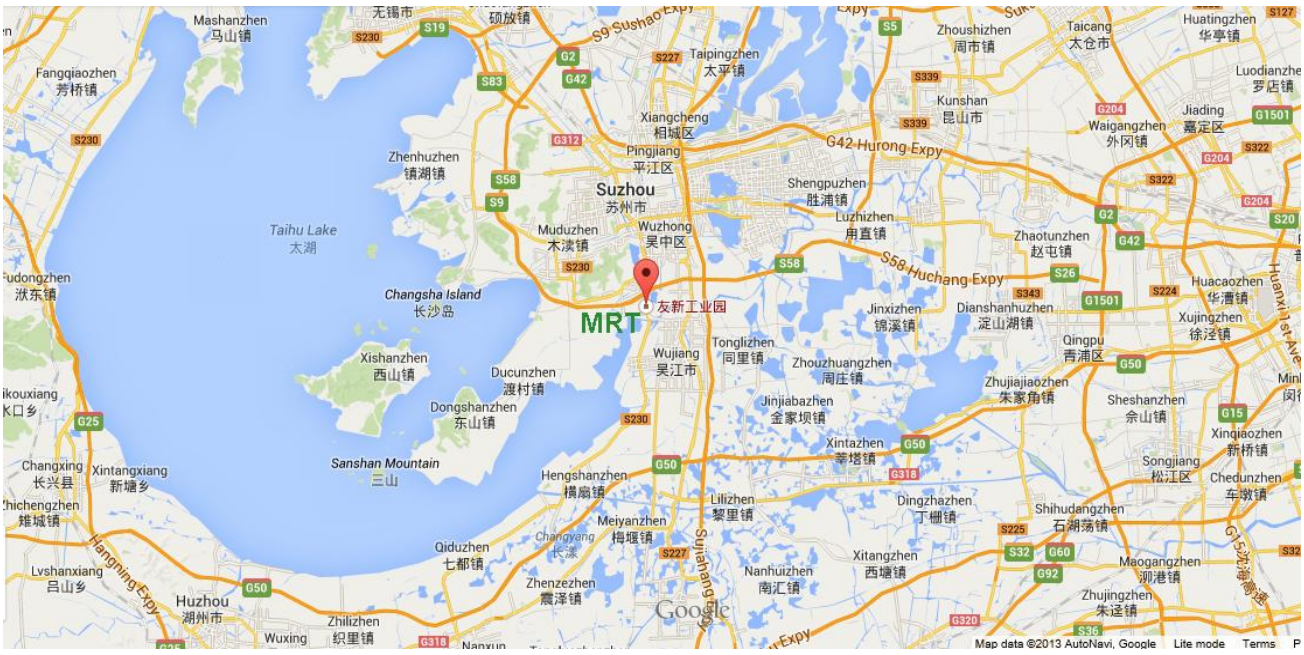
1. INTRODUCTION

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 C63.4-2009 on September 30, 2013.



2. PRODUCT INFORMATION

2.1. Equipment Description

Product Name	Radio Controller
FCC Model No.	ST16***** (The "*" can be 0 to 9, a to z, A to Z, blank or plus, for marketing purpose.)
IC Model No.	ST16
Brand Name	YUNEEC
WLAN Specification	802.11a/b/g/n
ZigBee Specification	802.15.4

2.2. Product Specification Subjective to this Report

Frequency Range	802.15.4: 2405 ~ 2475 MHz
Maximum Peak Output Power	16.83dBm
Type of Modulation	O-QPSK

Note: For other features of this EUT, test report will be issued separately.

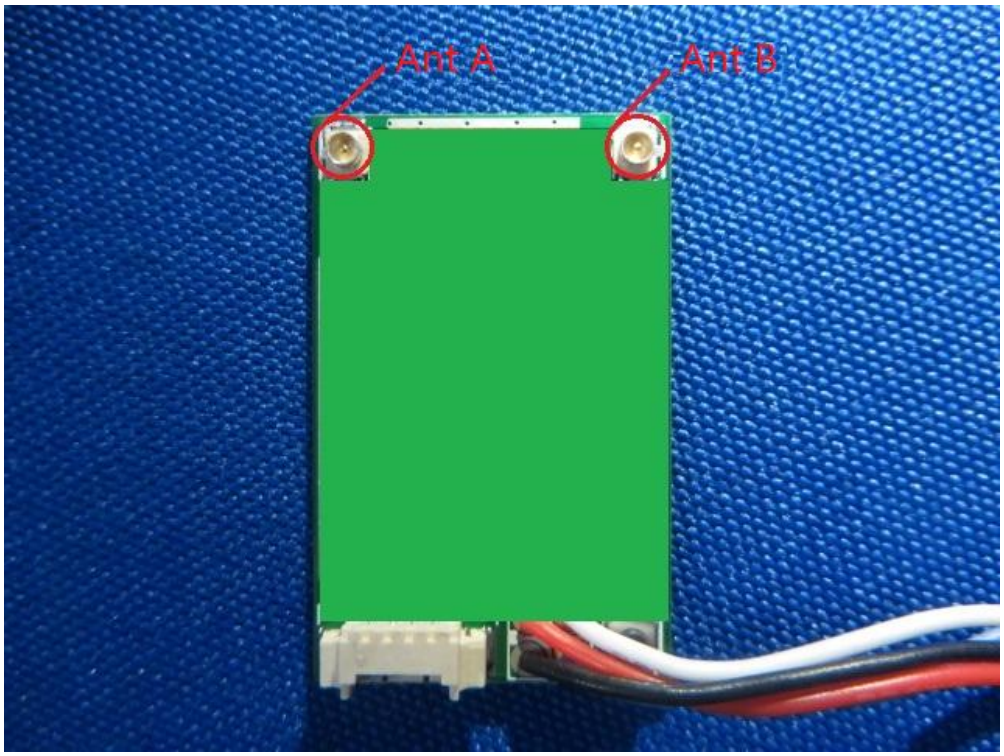
2.3. Operation Frequency / Channel List

Channel	Frequency	Channel	Frequency	Channel	Frequency
11	2405 MHz	12	2410 MHz	13	2415 MHz
14	2420 MHz	15	2425 MHz	16	2430 MHz
17	2435 MHz	18	2440 MHz	19	2445 MHz
20	2450 MHz	21	2455 MHz	22	2460 MHz
23	2465 MHz	24	2470 MHz	25	2475 MHz

2.4. Description of Available Antennas

Antenna Type	Manufacturer	Frequency Band (GHz)	Max Peak Gain (dBi)
Dipole Antenna A	Yuneec Technology Co., Limited	2.4	1.28
Dipole Antenna B		2.4	-0.11

2.5. Description of Antenna RF Port

Antenna RF Port


2.6. Test Mode

Test Mode	Mode 1: Transmit by 802.15.4

2.7. Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Adapter	Supply by MRT	CYSK05-050100

2.8. Test Software

The test utility software used during testing was engineering directive ordered by applicant.

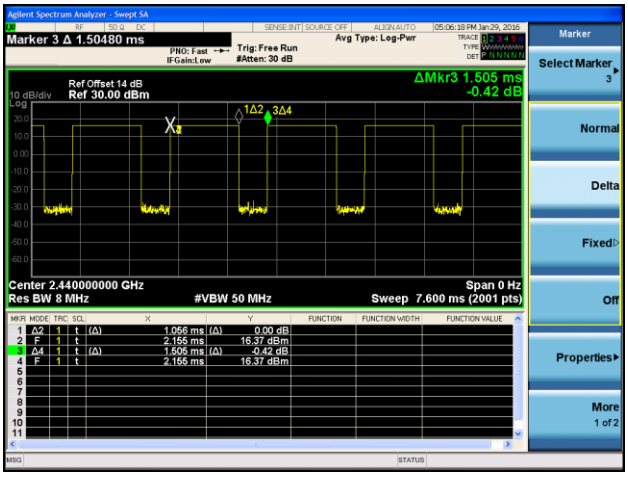
2.9. Device Capabilities

This device contains the following capabilities:

2.4GHz WLAN (DTS) & 2.4GHz ZigBee (DTS) & 5.8GHz WLAN (UNII)

Note: 2.4GHz ZigBee (DTS) 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. 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 cycles are as follows:

Test Mode	Duty Cycle
802.15.4	70.17%



2.10. Test Configuration

The **Radio Controller FCC ID: 2ACS5-ST16** was tested per the guidance of KDB 558074 D01v03r04. ANSI C63.10-2013 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing.

2.11. EMI Suppression Device(s)/Modifications

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

2.12. 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 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 558074 D01v03r04 were used in the measurement of the **Radio Controller FCC ID: 2ACS5-ST16.**

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 7.8.

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 1-25GHz 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 **Radio Controller** uses a unique connector**.**
- There are no provisions for connection to an external antenna.

Conclusion:

The **Radio Controller FCC ID: 2ACS5-ST16** unit complies with the requirement of §15.203.

5. TEST EQUIPMENT CALIBRATION DATE

Conducted Emissions - SR2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2016/11/03
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2016/11/03
Temperature/Humidity Meter	Yuhuaze	N/A	MRTSUE06182	1 year	2016/12/20

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	MRTSUE06028	1 year	2016/12/08
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2016/11/03
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2016/04/16
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2016/03/29
Loop Antenna	Schwarzbeck	FMZB1519	MRTSUE06025	1 year	2016/12/14
TRILOG Antenna	Schwarzbeck	VULB9162	MRTSUE06022	1 year	2016/11/07
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06023	1 year	2016/11/07
Broadband Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06024	1 year	2017/01/04
Digital Thermometer & Hygrometer	Minggao	N/A	MRTSUE06170	1 year	2016/11/30

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2016/05/08
USB Wideband Power Sensor	Boonton	55006	MRTSUE06109	1 year	2016/05/08
Temperature/Humidity Meter	Yuhuaze	N/A	MRTSUE06180	1 year	2016/12/20

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 - SR2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 150kHz~30MHz: 3.46dB
Radiated Emission Measurement - AC2
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz ~ 1GHz: 4.18dB 1GHz ~ 25GHz: 4.76dB

7. TEST RESULT

7.1. Summary

Company Name: **Yuneec Technology Co., Limited**
FCC ID: **2ACS5-ST16**
IC: **11554B-ST16**
FCC Classification: **Digital Transmission System (DTS)**
Data Rate(s) Tested: **250kbps**

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.247(a)(2)	RSS-247 [5.2]	6dB Bandwidth	≥ 500kHz	Conducted	Pass	Section 7.2
15.247(b)(3)	RSS-247 [5.4(4)]	Output Power	≤ 1Watt & EIRP ≤ 4Watt		Pass	Section 7.3
15.247(e)	RSS-247 [5.2]	Power Spectral Density	≤ 8dBm / 3kHz Band		Pass	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	≥ 20dBc(Peak)		Pass	Section 7.5
15.205 15.209	RSS-247 [5.5]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209	Radiated	Pass	Section 7.6&7.7
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	N/A	Section 7.8

Notes:

1) All modes of operation and data rates were investigated. 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.
4) For the test item 6dB Bandwidth & Power Spectral Density & Band Edge / Out-of-Band Emissions, we selected the worst-case antenna port A to perform testing.

7.2. 6dB Bandwidth Measurement

7.2.1. Test Limit

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

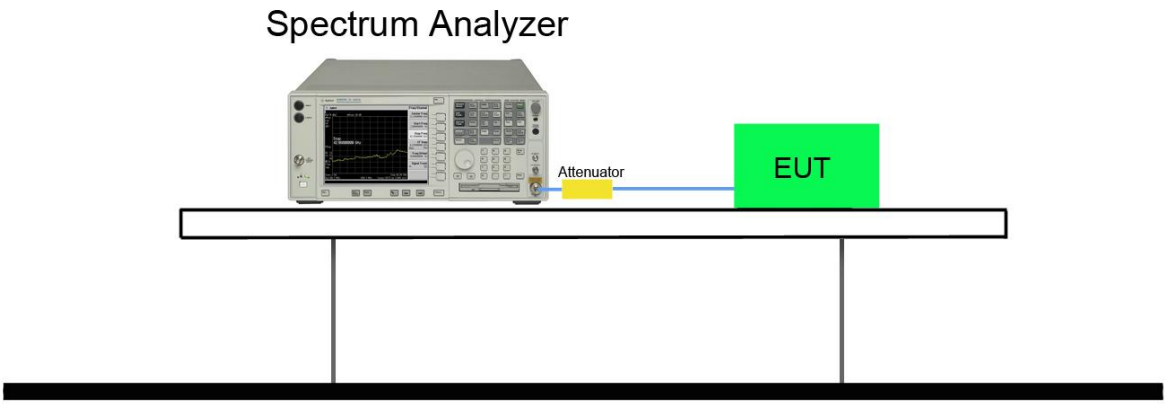
7.2.2. Test Procedure used

KDB 558074 D01v03r04 – Section 8.2 Option 2

7.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. VBW ≥ 3 × RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace was allowed to stabilize

7.2.4. Test Setup

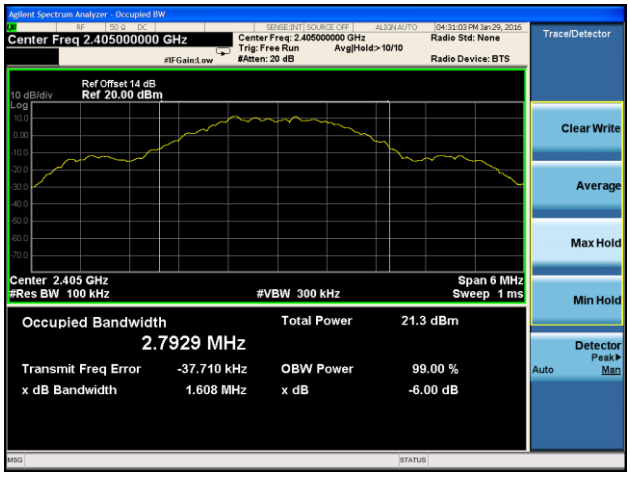


7.2.5. Test Result

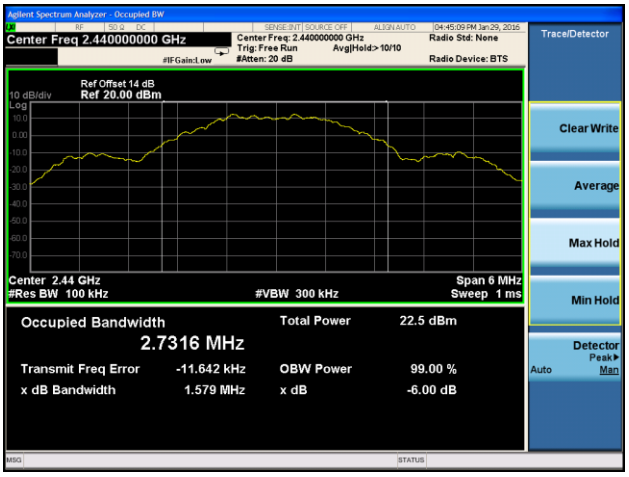
Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.15.4	O-QPSK	11	2405	1.61	≥ 0.5	Pass
802.15.4	O-QPSK	18	2440	1.58	≥ 0.5	Pass
802.15.4	O-QPSK	25	2475	1.62	≥ 0.5	Pass

802.15.4 6dB Bandwidth - Ant A

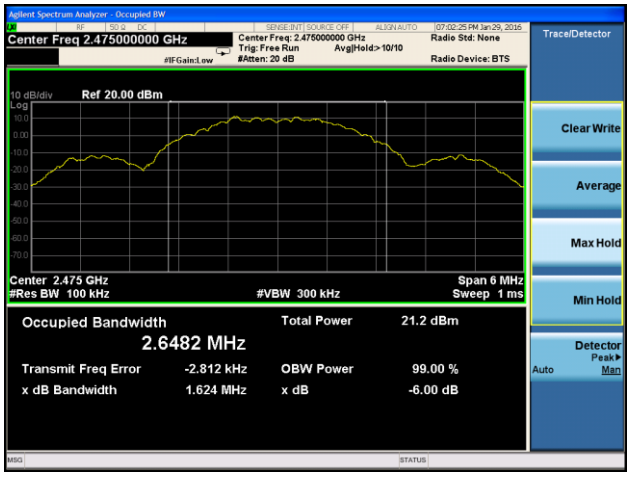
Channel 11 (2405MHz)



Channel 18 (2440MHz)



Channel 25 (2475MHz)



7.3. Output Power Measurement

7.3.1. Test Limit

The maximum output power shall be less 1 Watt (30dBm).

7.3.2. Test Procedure Used

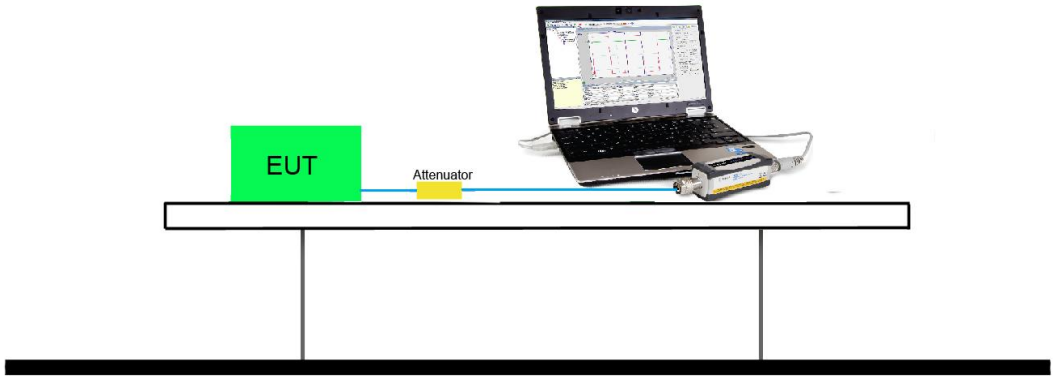
KDB 558074 D01v03r04 - Section 9.1.2 PKPM1 Peak Power Method (for signals with BW ≤ 50MHz)

7.3.3. Test Setting

Method PKPM1 (Peak Power Measurement of Signals with DTS BW ≤ 50MHz)

Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

7.3.4. Test Setup



7.3.5. Test Result of Output Power

Test Result of Peak Output Power

Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	Peak Output Power (dBm)		Limit (dBm)	E.I.R.P (dBm)		Limit (dBm)	Result
				Ant A	Ant B		Ant A	Ant B		
802.15.4	O-QPSK	11	2405	15.57	15.52	≤ 30	16.85	15.41	≤ 36	Pass
802.15.4	O-QPSK	18	2440	16.81	16.83	≤ 30	18.09	16.72	≤ 36	Pass
802.15.4	O-QPSK	25	2475	16.16	16.04	≤ 30	17.44	15.93	≤ 36	Pass

Note: E.I.R.P (dBm) = Peak Output Power (dBm) + Antenna Gain (dBi).

Test Result of Average Output Power for Report Only

Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	Average Output Power (dBm)		Limit (dBm)	E.I.R.P (dBm)		Limit (dBm)	Result
				Ant A	Ant B		Ant A	Ant B		
802.15.4	O-QPSK	11	2405	15.24	15.15	≤ 30	16.52	15.04	≤ 36	Pass
802.15.4	O-QPSK	18	2440	16.49	16.47	≤ 30	17.77	16.36	≤ 36	Pass
802.15.4	O-QPSK	25	2475	15.75	15.68	≤ 30	17.03	15.57	≤ 36	Pass

Note: E.I.R.P (dBm) = Average Output Power (dBm) + Antenna Gain (dBi).

7.4. Power Spectral Density Measurement

7.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

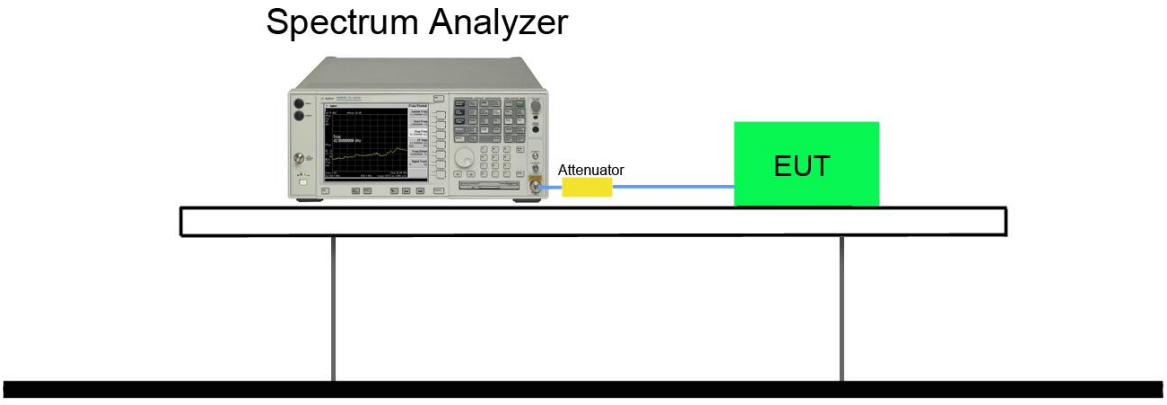
7.4.2. Test Procedure Used

KDB 558074 D01v03r04 - Section 10.2 Method PKPSD

7.4.3. Test Setting

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 3kHz
4. VBW = 10kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

7.4.4. Test Setup

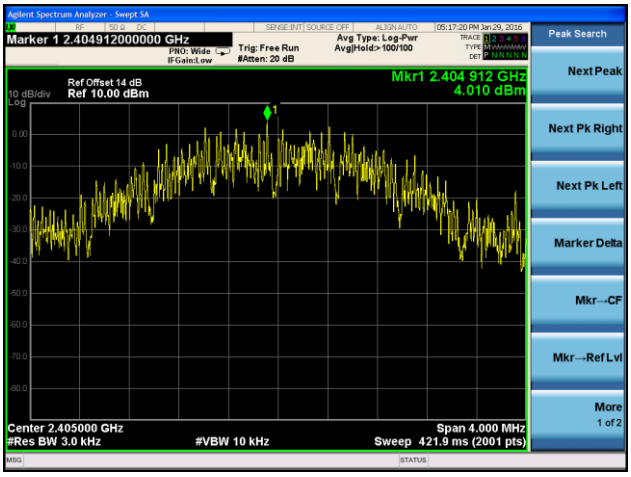


7.4.5. Test Result

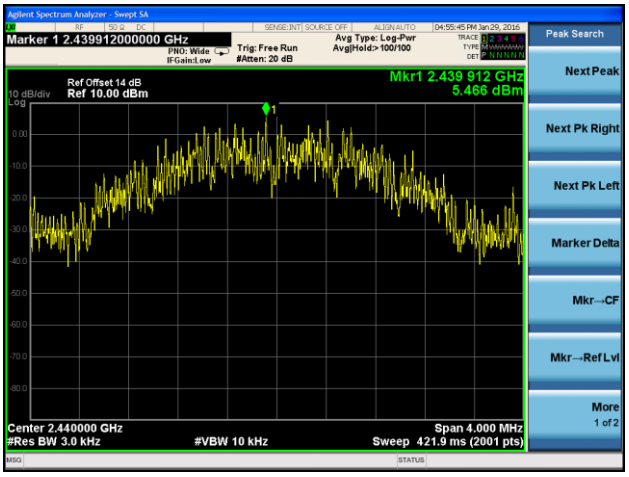
Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	Measured PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
802.15.4	O-QPSK	11	2405	4.010	≤ 8	Pass
802.15.4	O-QPSK	18	2445	5.466	≤ 8	Pass
802.15.4	O-QPSK	25	2480	4.166	≤ 8	Pass

802.15.4 Power Density – Ant A

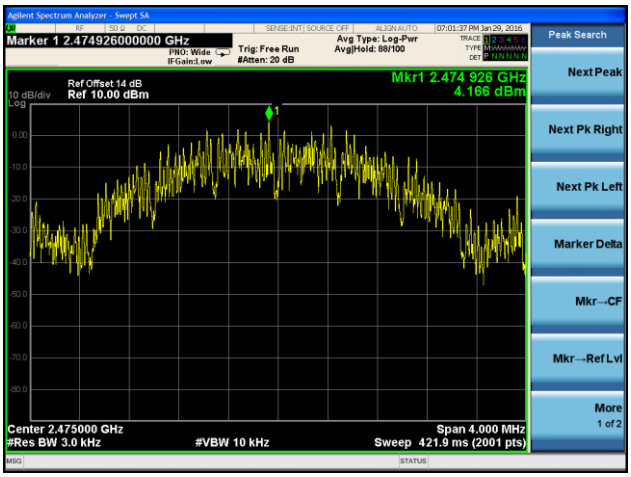
Channel 11 (2405MHz)



Channel 18 (2440MHz)



Channel 25 (2475MHz)



7.5. Conducted Band Edge and Out-of-Band Emissions

7.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

7.5.2. Test Procedure Used

KDB 558074 D01v03r04 - Section 11.2 & Section 11.3

7.5.3. Test Settitng

1. Reference level measurement

(a) Set instrument center frequency to DTS channel center frequency

(b) Set the span to ≥ 1.5 times the DTS bandwidth

(c) Set the RBW = 100 kHz

(d) Set the VBW ≥ 3 x RBW

(e) Detector = peak

(f) Sweep time = auto couple

(g) Trace mode = max hold

(h) Allow trace to fully stabilize

2. Emission level measurement

(a) Set the center frequency and span to encompass frequency range to be measured

(b) RBW = 100kHz

(c) VBW = 300kHz

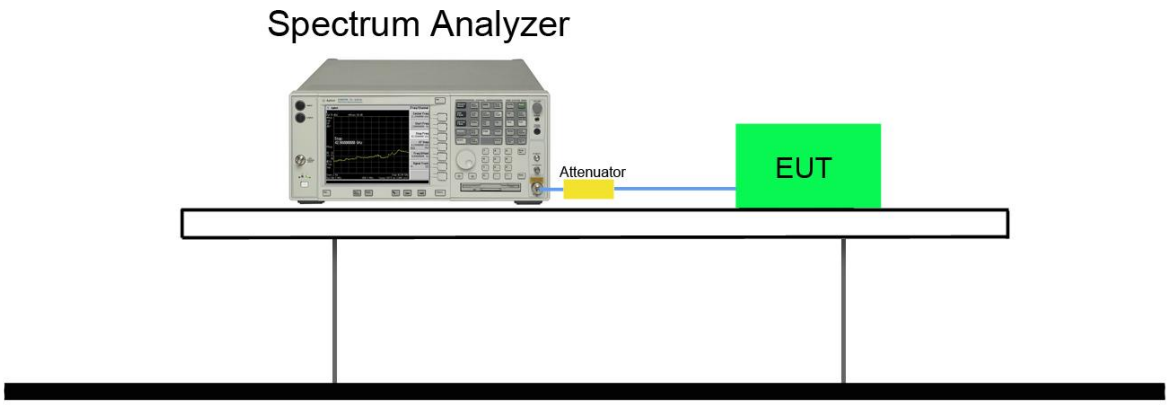
(d) Detector = Peak

(e) Trace mode = max hold

(f) Sweep time = auto couple

(g) The trace was allowed to stabilize

7.5.4. Test Setup



7.5.5. Test Result

Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	Limit	Result
802.15.4	O-QPSK	11	2405	20dBc	Pass
802.15.4	O-QPSK	18	2440	20dBc	Pass
802.15.4	O-QPSK	25	2475	20dBc	Pass

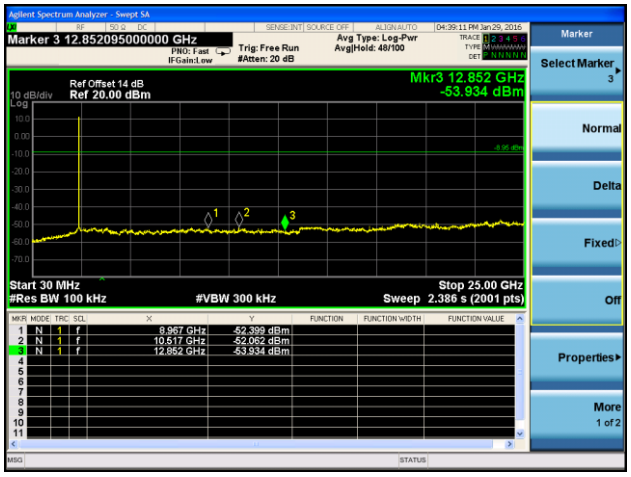
802.15.4 Out-of-Band Emissions – Ant A

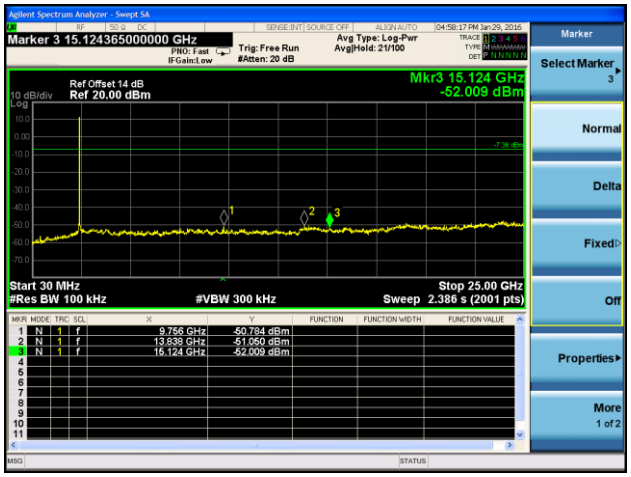
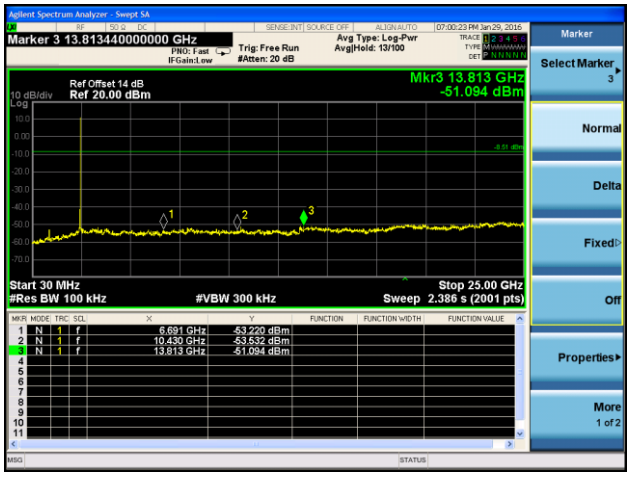
Channel 11 (2405MHz)

100kHz PSD reference Level

Low Band Edge

Spurious Emission



Channel 18 (2440MHz)	
100kHz PSD reference Level	**Spurious Emission**
	
Channel 25 (2475MHz)	
100kHz PSD reference Level	**High Band Edge**
	
Spurious Emission	
	

7.6. Radiated Spurious Emission Measurement

7.6.1. 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

7.6.2. Test Procedure Used

KDB 558074 D01v03r04 – Section 12.2.3 (quasi-peak measurements)

KDB 558074 D01v03r04 – Section 12.2.4 (peak power measurements)

KDB 558074 D01v03r04 – Section 12.2.5 (average power measurements)

7.6.3. Test Setting

Peak Field Strength Measurements per Section 12.2.4 of KDB 558074 D01v03r04

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple

6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 - RBW as a function of frequency

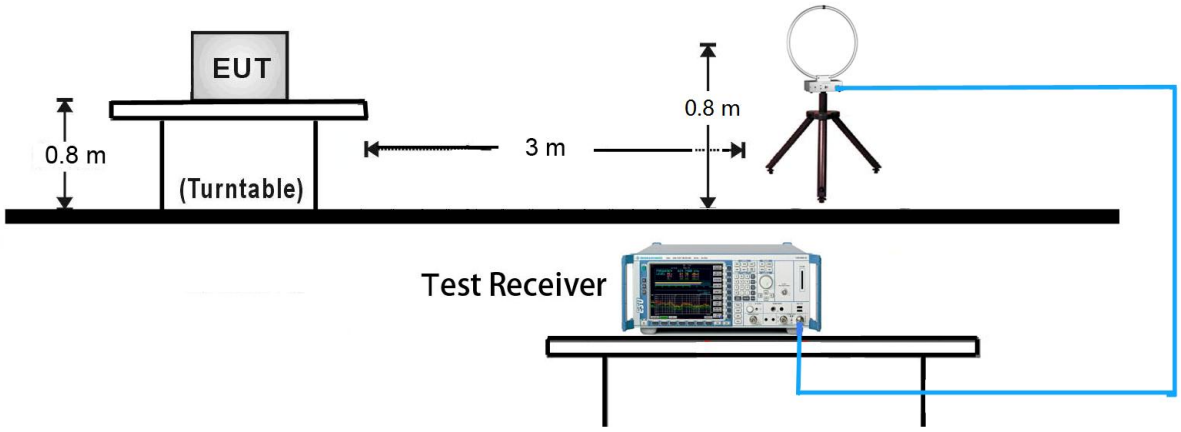
Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements per Section 12.2.5.3 of KDB 558074 D01v03r04

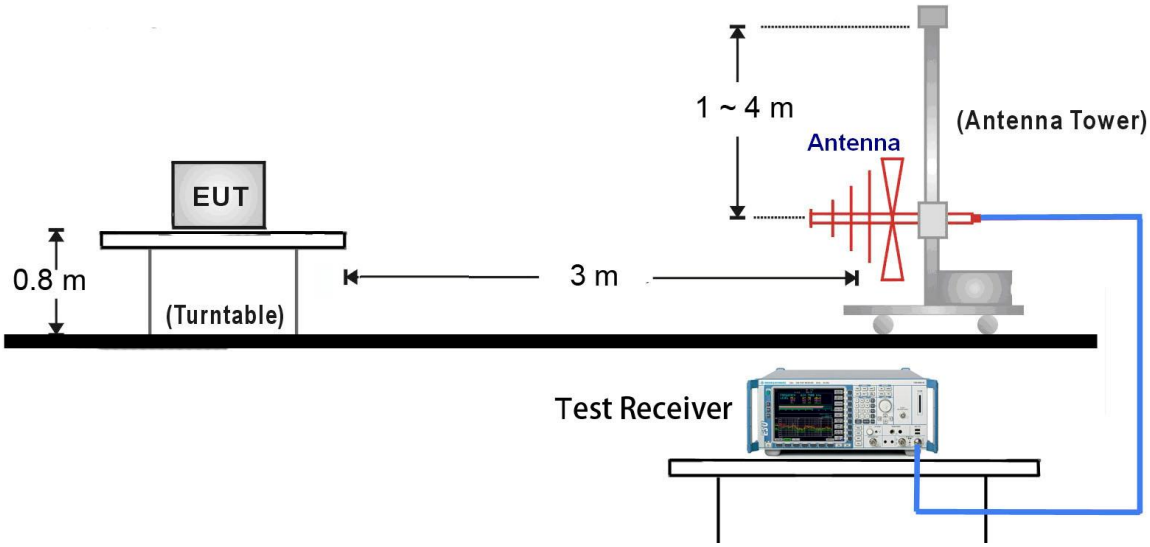
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. De As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to “Voltage” regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

7.6.4. Test Setup

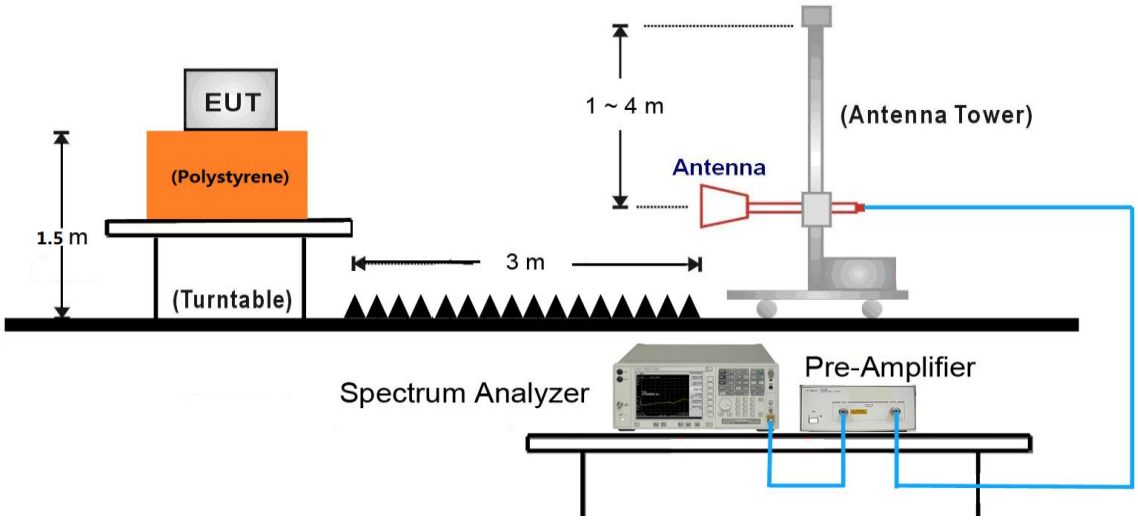
9kHz ~ 30MHz Test Setup:



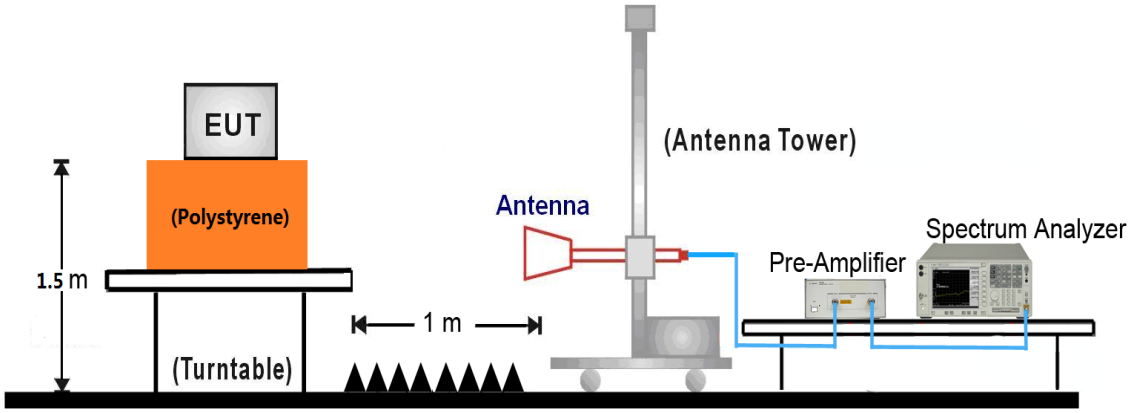
30MHz ~ 1GHz Test Setup:



1GHz ~ 18GHz Test Setup:



18GHz ~25GHz Test Setup:



7.6.5. Test Result

Test Mode:	802.15.4 - Ant A	Test Site:	AC2
Test Channel:	11	Test Engineer:	Lewis Huang
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
	4000.5	40.9	-0.8	40.1	74.0	-33.9	Peak	Horizontal
	4808.0	55.9	2.0	57.9	74.0	-16.1	Peak	Horizontal
	4808.0	46.9	2.0	48.9	54.0	-5.1	Average	Horizontal
*	7213.5	50.6	9.7	60.3	91.9	-31.6	Peak	Horizontal
*	9619.0	44.0	11.1	55.1	91.9	-36.8	Peak	Horizontal
	4000.5	44.9	-0.8	44.1	74.0	-29.9	Peak	Vertical
	4808.0	58.5	2.0	60.5	74.0	-13.5	Peak	Vertical
	4808.0	46.7	2.0	48.7	54.0	-5.3	Average	Vertical
*	7213.5	50.3	9.7	60.0	91.9	-31.9	Peak	Vertical
*	9619.0	49.2	11.1	60.3	91.9	-31.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (111.9dBµV/m) or 15.209 which is higher.

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:	802.15.4 - Ant A	Test Site:	AC2
Test Channel:	18	Test Engineer:	Lewis Huang
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
	4884.5	51.5	2.0	53.5	74.0	-20.5	Peak	Horizontal
	7315.5	52.9	9.7	62.6	74.0	-11.4	Peak	Horizontal
	7315.5	39.0	9.7	48.7	54.0	-5.3	Average	Horizontal
*	8548.0	34.9	9.7	44.6	92.6	-48.0	Peak	Horizontal
*	9755.0	42.4	11.4	53.8	92.6	-38.8	Peak	Horizontal
	4884.5	57.4	2.0	59.4	74.0	-14.6	Peak	Vertical
	4884.5	42.4	2.0	44.4	54.0	-9.6	Average	Vertical
	7315.5	54.2	9.7	63.9	74.0	-10.1	Peak	Vertical
	7315.5	40.0	9.7	49.7	54.0	-4.3	Average	Vertical
*	8811.5	33.5	10.5	44.0	92.6	-48.6	Peak	Vertical
*	9755.0	45.6	11.4	57.0	92.6	-35.6	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (112.6dBμV/m) or 15.209 which is higher.

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:	802.15.4 - Ant A	Test Site:	AC2
Test Channel:	25	Test Engineer:	Lewis Huang
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
	4952.5	54.7	1.9	56.6	74.0	-17.4	Peak	Horizontal
	4952.5	40.1	1.9	42.0	54.0	-12.0	Average	Horizontal
	7426.0	50.7	9.8	60.5	74.0	-13.5	Peak	Horizontal
	7426.0	35.9	9.8	45.7	54.0	-8.3	Average	Horizontal
*	8820.0	33.5	10.4	43.9	91.5	-47.6	Peak	Horizontal
*	9899.5	45.8	11.8	57.6	91.5	-33.9	Peak	Horizontal
	4952.5	56.5	1.9	58.4	74.0	-15.6	Peak	Vertical
	4952.5	42.4	1.9	44.3	54.0	-9.7	Average	Vertical
	7426.0	50.0	9.8	59.8	74.0	-14.2	Peak	Vertical
	7426.0	36.0	9.8	45.8	54.0	-8.2	Average	Vertical
*	8556.5	34.8	9.7	44.5	91.5	-47.0	Peak	Vertical
*	9899.5	46.7	11.8	58.5	91.5	-33.0	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (111.5dBμV/m) or 15.209 which is higher.

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:	802.15.4 - Ant B	Test Site:	AC2
Test Channel:	11	Test Engineer:	Lewis Huang
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
	3983.5	38.5	-0.9	37.6	74.0	-36.4	Peak	Horizontal
	4808.0	58.1	2.0	60.1	74.0	-13.9	Peak	Horizontal
	4808.0	44.0	2.0	46.0	54.0	-8.0	Average	Horizontal
*	7213.5	51.1	9.7	60.8	86.1	-25.3	Peak	Horizontal
*	9619.0	45.1	11.1	56.2	86.1	-29.9	Peak	Horizontal
	3975.0	39.1	-0.9	38.2	74.0	-35.8	Peak	Vertical
	4808.0	59.3	2.0	61.3	74.0	-12.7	Peak	Vertical
	4808.0	46.3	2.0	48.3	54.0	-5.7	Average	Vertical
*	7213.5	51.7	9.7	61.4	86.1	-24.7	Peak	Vertical
*	9619.0	48.5	11.1	59.6	86.1	-26.5	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (106.1dBμV/m) or 15.209 which is higher.

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:	802.15.4 - Ant B	Test Site:	AC2
Test Channel:	18	Test Engineer:	Lewis Huang
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
	4884.5	52.2	2.0	54.2	74.0	-19.8	Peak	Horizontal
	7315.5	54.3	9.7	64.0	74.0	-10.0	Peak	Horizontal
	7315.5	39.7	9.7	49.4	54.0	-4.6	Average	Horizontal
*	8675.5	34.7	10.2	44.9	88.3	-43.4	Peak	Horizontal
*	9755.0	44.6	11.4	56.0	88.3	-32.3	Peak	Horizontal
	4876.0	58.1	1.9	60.0	74.0	-14.0	Peak	Vertical
	4876.0	45.0	1.9	46.9	54.0	-7.1	Average	Vertical
	7324.0	52.5	9.6	62.1	74.0	-11.9	Peak	Vertical
	7324.0	38.5	9.6	48.1	54.0	-5.9	Average	Vertical
*	8607.5	34.8	9.9	44.7	88.3	-43.6	Peak	Vertical
*	9755.0	48.4	11.4	59.8	88.3	-28.5	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is 20dBc of the fundamental emission level (108.3dBμV/m) or 15.209 which is higher.

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:	802.15.4 - Ant B	Test Site:	AC2
Test Channel:	25	Test Engineer:	Lewis Huang
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
	4952.5	51.7	1.9	53.6	74.0	-20.4	Peak	Horizontal
	7426.0	50.1	9.8	59.9	74.0	-14.1	Peak	Horizontal
	7426.0	35.3	9.8	45.1	54.0	-8.9	Average	Horizontal
*	8820.0	34.1	10.4	44.5	87.8	-43.3	Peak	Horizontal
*	9899.5	47.6	11.8	59.4	87.8	-28.4	Peak	Horizontal
	4952.5	54.5	1.9	56.4	74.0	-17.6	Peak	Vertical
	4952.5	39.7	1.9	41.6	54.0	-12.4	Average	Vertical
	7426.0	50.8	9.8	60.6	74.0	-13.4	Peak	Vertical
	7426.0	36.0	9.8	45.8	54.0	-8.2	Average	Vertical
*	8582.0	35.2	9.9	45.1	87.8	-42.7	Peak	Vertical
*	9899.5	47.5	11.8	59.3	87.8	-28.5	Peak	Vertical

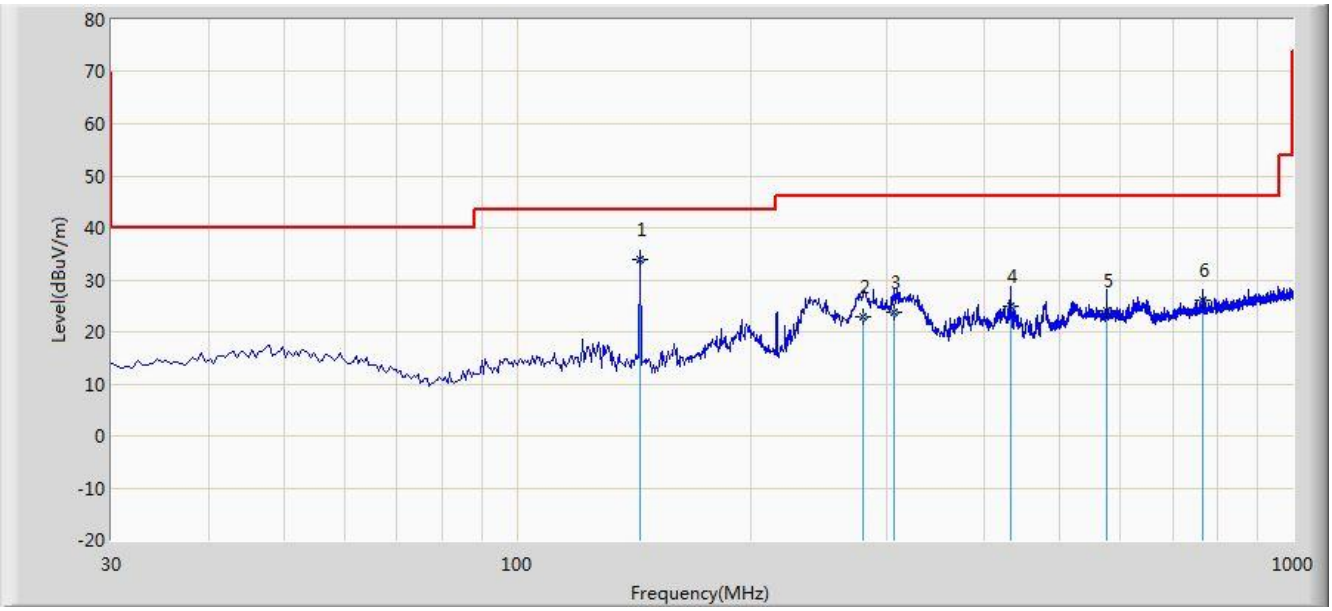
Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (107.8dBμV/m) or 15.209 which is higher.

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: AC2	Time: 2016/01/27 - 14:33
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: VULB9162_0.03-8GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Worse Case Mode: Transmit at Channel 2405MHz by 802.15.4 Ant A	

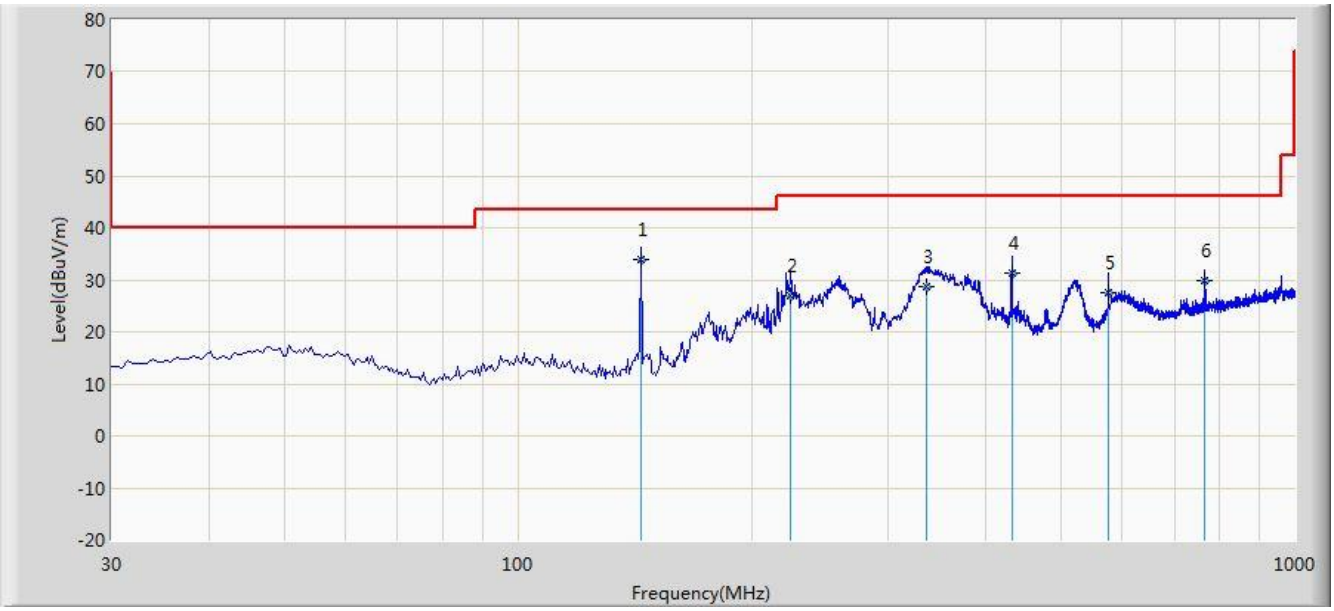


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	143.975	33.967	24.520	-9.533	43.500	9.446	QP
2			279.290	22.864	8.670	-23.136	46.000	14.194	QP
3			305.965	23.684	8.960	-22.316	46.000	14.724	QP
4			432.065	25.026	7.840	-20.974	46.000	17.187	QP
5			576.110	24.060	4.360	-21.940	46.000	19.700	QP
6			766.715	26.103	3.640	-19.897	46.000	22.463	QP

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

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

Site: AC2	Time: 2016/01/27 - 14:34
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: VULB9162_0.03-8GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Worse Case Mode: Transmit at Channel 2405MHz by 802.15.4 Ant A	

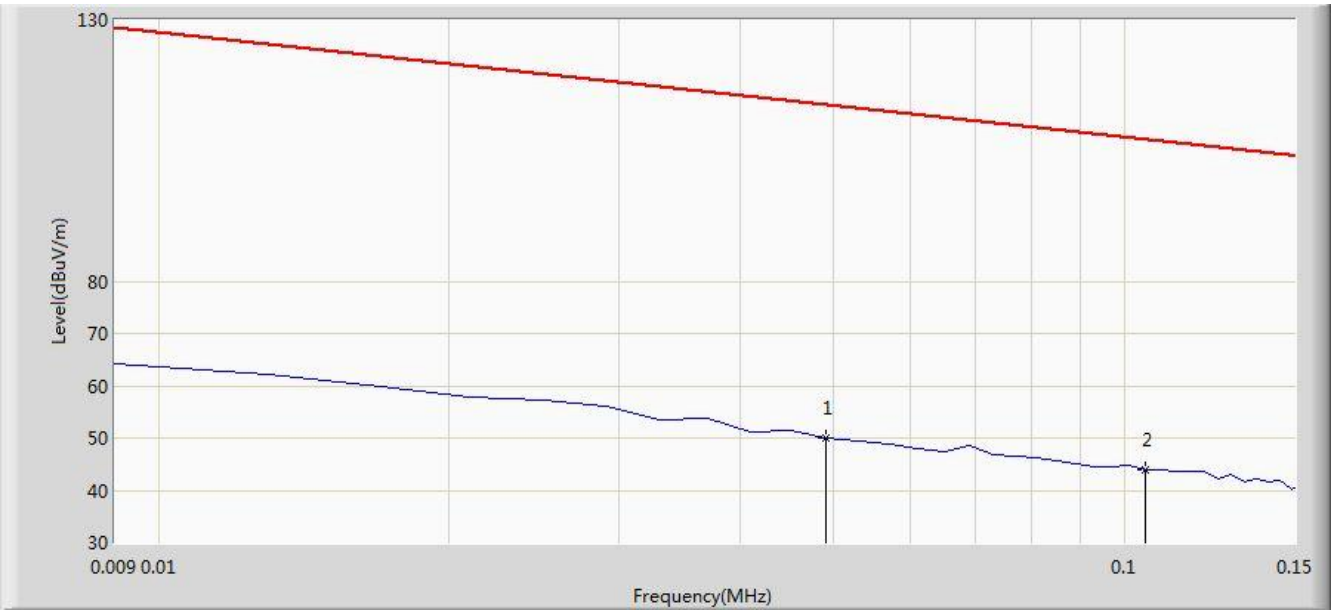


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	143.975	33.797	24.350	-9.703	43.500	9.446	QP
2			224.485	26.863	14.020	-19.137	46.000	12.843	QP
3			335.065	28.561	13.020	-17.439	46.000	15.540	QP
4			432.065	31.326	14.140	-14.674	46.000	17.187	QP
5			576.110	27.540	7.840	-18.460	46.000	19.700	QP
6			766.715	29.913	7.450	-16.087	46.000	22.463	QP

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

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

Site: AC2	Time: 2016/1/27 - 16:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: FMZB1519_0.009-30MHz	Polarity: Face on
EUT: Radio Controller	Power: By Battery
Note: There is the ambient noise within frequency range 9kHz~30MHz.	



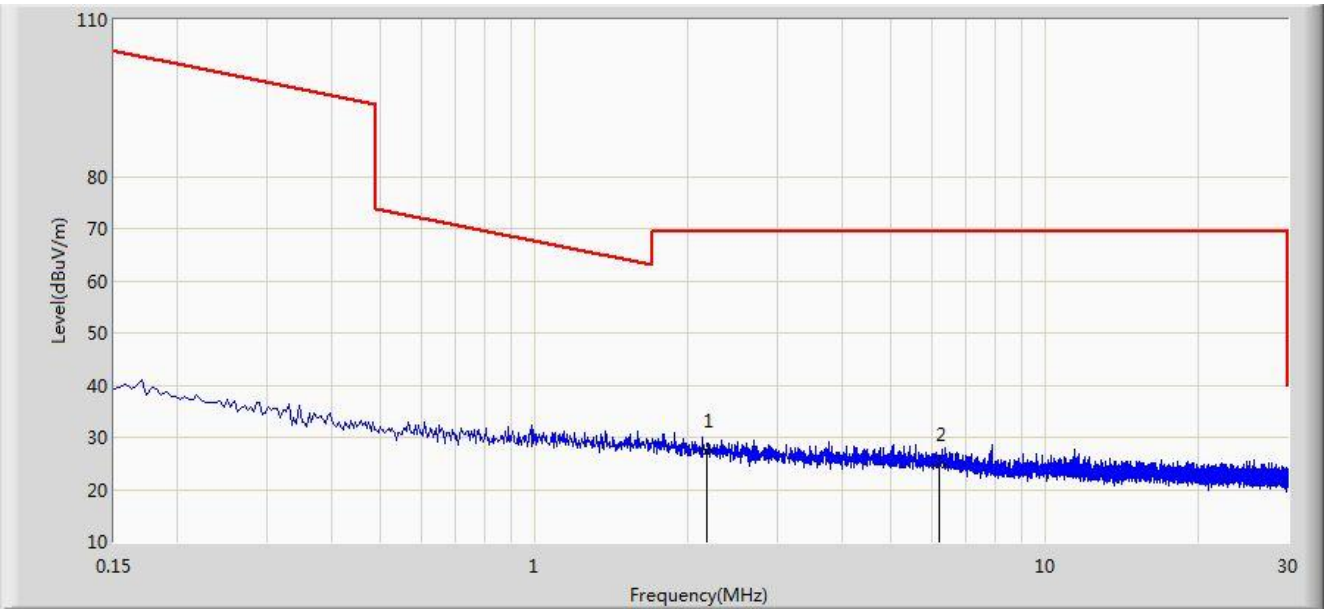
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			0.049	50.112	29.552	-63.688	113.800	20.560	AV
2		*	0.105	44.043	23.845	-63.137	107.180	20.198	QP

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

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

Limit@3m = 20*Log((2400/49)uV/m) + 40*Log(300m/3m) = 113.800dBμv/m (Average detector)

Site: AC2	Time: 2016/1/27 - 16:22
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: FMZB1519_0.009-30MHz	Polarity: Face on
EUT: Radio Controller	Power: By Battery
Note: There is the ambient noise within frequency range 9kHz~30MHz.	



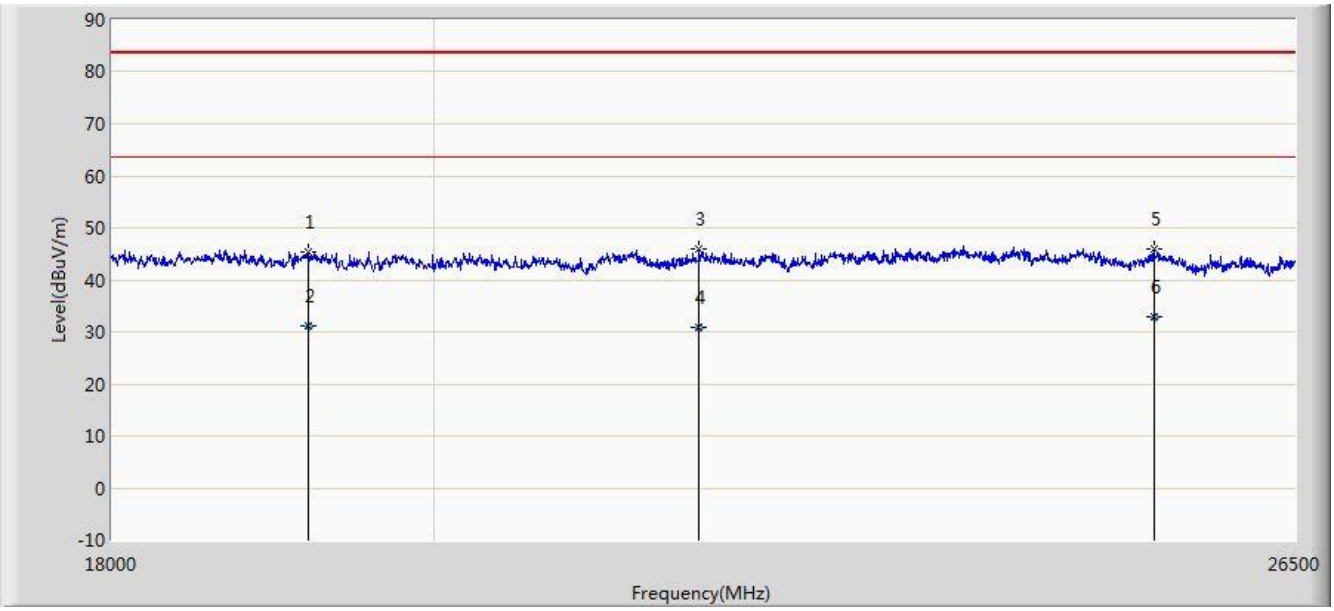
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2.175	27.371	6.960	-42.129	69.500	20.412	QP
2			6.216	24.786	4.701	-44.714	69.500	20.085	QP

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

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

Limit@3m = 20*Log(30uV/m) + 20*Log(30m/3m) = 49.5dBμv/m (Average detector), and 69.5dBμv/m (Quasi-Peak detector).

Site: AC2	Time: 2016/1/27 - 16:27
Limit: FCC_Part15.209_RE(1m)	Engineer: Lewis Huang
Probe: BBHA9170_18-40GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Note: There is the ambient noise within frequency range 18GHz~25GHz.	



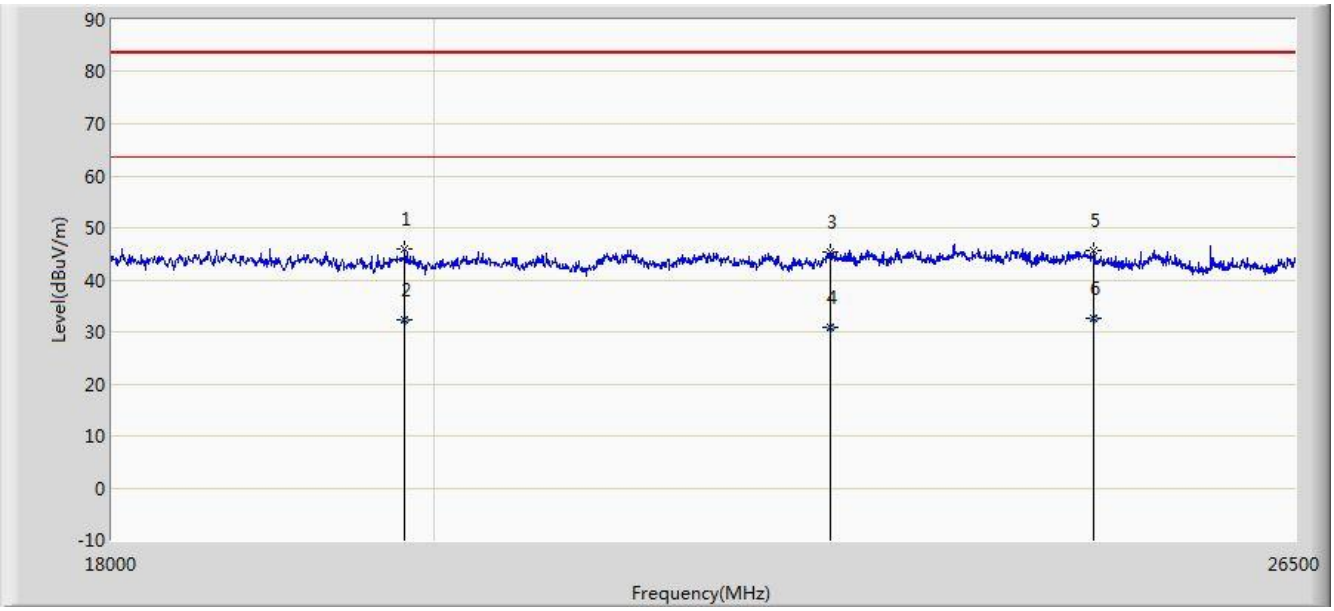
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			19194.250	45.350	44.174	-38.150	83.500	1.176	PK
2			19194.250	31.296	30.120	-32.204	63.500	1.176	AV
3			21812.250	45.806	45.995	-37.694	83.500	-0.189	PK
4			21812.250	31.001	31.190	-32.499	63.500	-0.189	AV
5			25310.000	45.892	43.365	-37.608	83.500	2.527	PK
6		*	25310.000	32.957	30.430	-30.543	63.500	2.527	AV

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

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

Limit@1m = 20*Log(500uV/m) + 20*Log(3m/1m) = 63.5dBμv/m (Average detector), and 83.5dBμv/m (Peak detector).

Site: AC2	Time: 2016/1/27 - 16:33
Limit: FCC_Part15.209_RE(1m)	Engineer: Lewis Huang
Probe: BBHA9170_18-40GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Note: There is the ambient noise within frequency range 18GHz~25GHz.	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			19810.500	46.028	45.623	-37.472	83.500	0.405	PK
2			19810.500	32.225	31.820	-31.275	63.500	0.405	AV
3			22764.250	45.366	44.798	-38.134	83.500	0.568	PK
4			22764.250	30.798	30.230	-32.702	63.500	0.568	AV
5			24812.750	45.794	43.064	-37.706	83.500	2.730	PK
6		*	24812.750	32.620	29.890	-30.880	63.500	2.730	AV

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

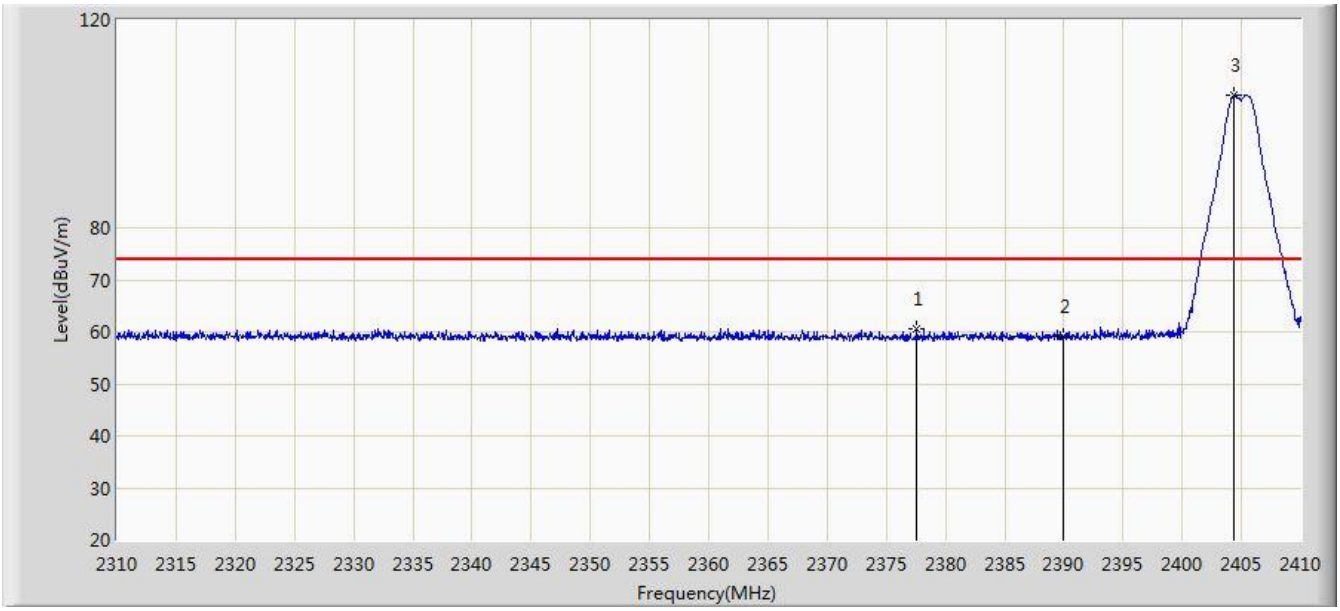
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m) – Pre_Amplifier Gain (dB)

Limit@1m = 20*Log(500uV/m) + 20*Log(3m/1m) = 63.5dBμv/m (Average detector), and 83.5dBμv/m (Peak detector).

7.7. Radiated Restricted Band Edge Measurement

7.7.1. Test Result

Site: AC2	Time: 2016/01/30 - 10:10
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2405MHz by 802.15.4 Ant A	

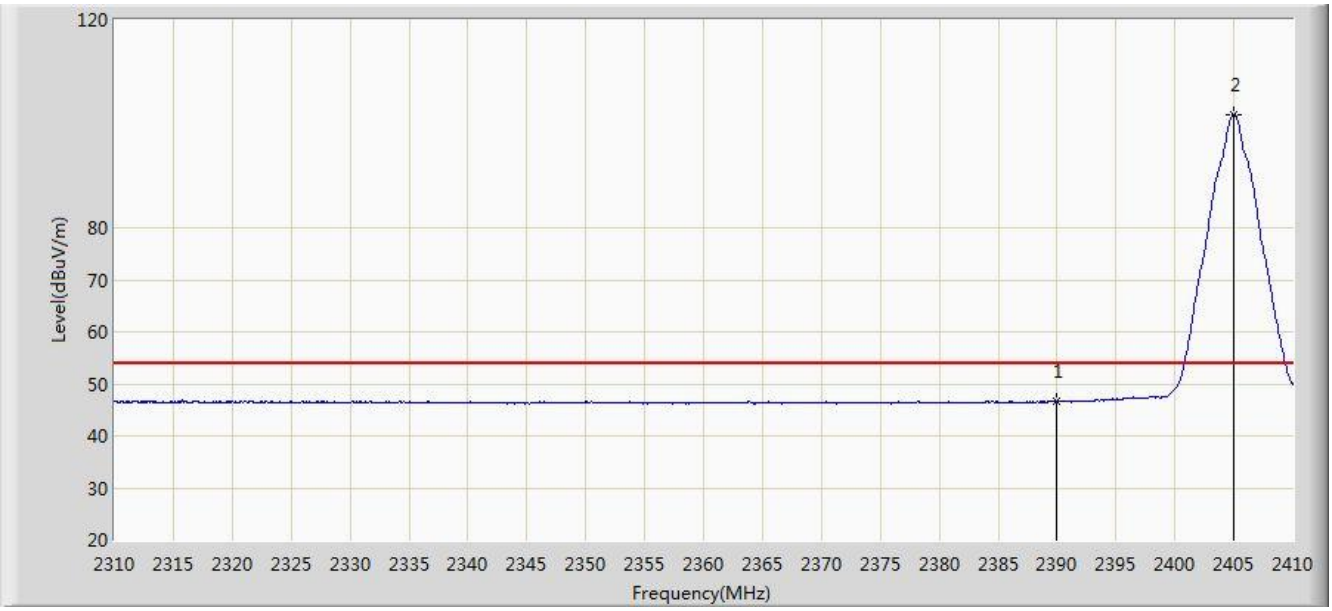


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2377.600	60.708	28.355	-13.292	74.000	32.356	PK
2			2390.000	59.146	26.779	-14.854	74.000	32.368	PK
3		*	2404.350	105.429	73.090	N/A	N/A	32.340	PK

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

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

Site: AC2	Time: 2016/01/30 - 10:10
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2405MHz by 802.15.4 Ant A	

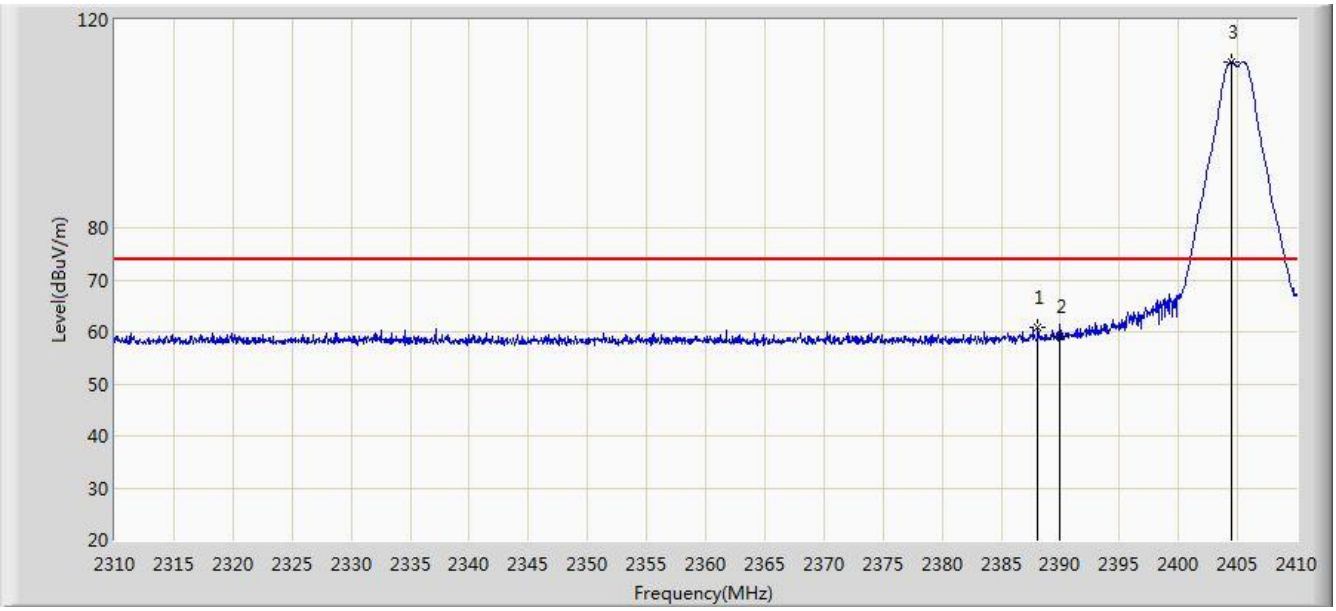


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.541	14.173	-7.459	54.000	32.368	AV
2		*	2404.950	101.809	69.471	N/A	N/A	32.338	AV

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

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

Site: AC2	Time: 2016/01/30 - 10:10
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2405MHz by 802.15.4 Ant A	

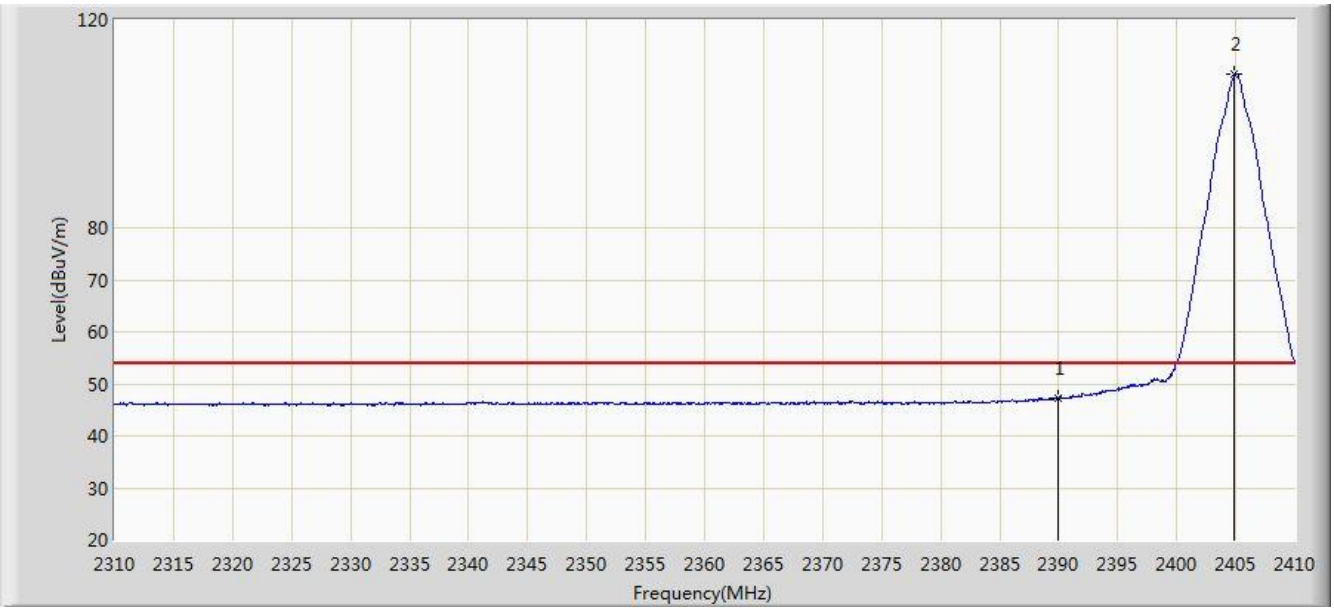


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2388.100	60.952	28.592	-13.048	74.000	32.366	PK
2			2390.000	59.017	26.650	-14.983	74.000	32.368	PK
3		*	2404.500	111.858	79.519	N/A	N/A	32.339	PK

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

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

Site: AC2	Time: 2016/01/30 - 10:10
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2405MHz by 802.15.4 Ant A	

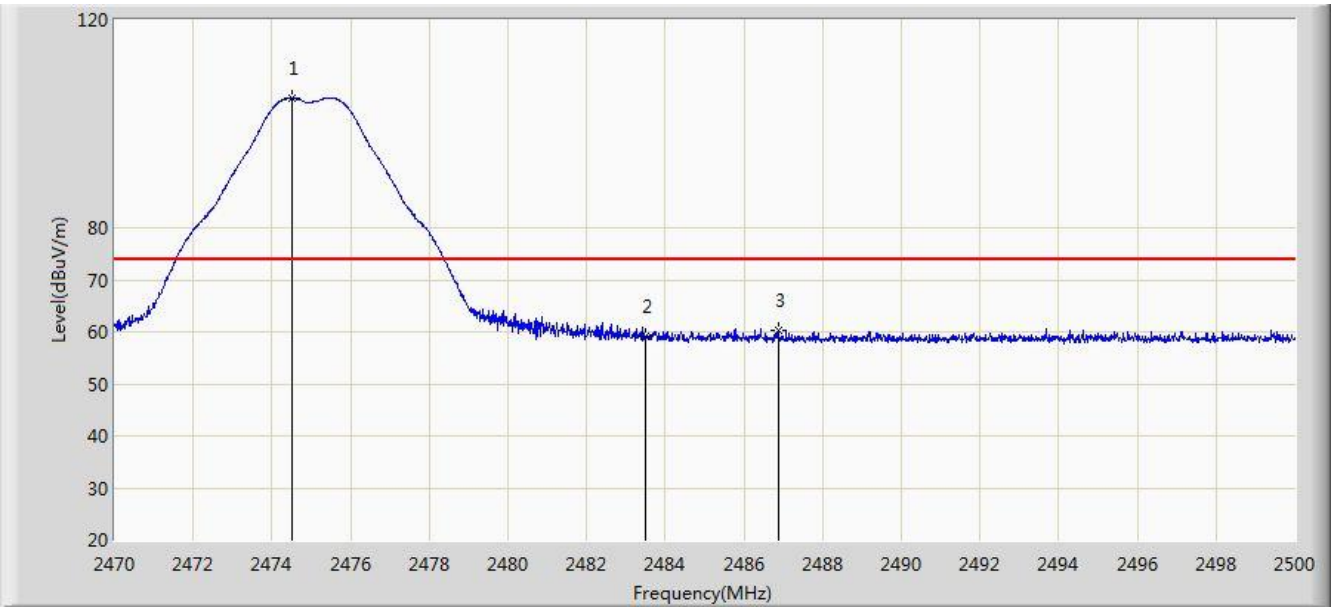


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	47.199	14.832	-6.801	54.000	32.368	AV
2		*	2404.900	109.445	77.107	N/A	N/A	32.338	AV

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

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

Site: AC2	Time: 2016/01/30 - 10:36
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2475MHz by 802.15.4 Ant A	

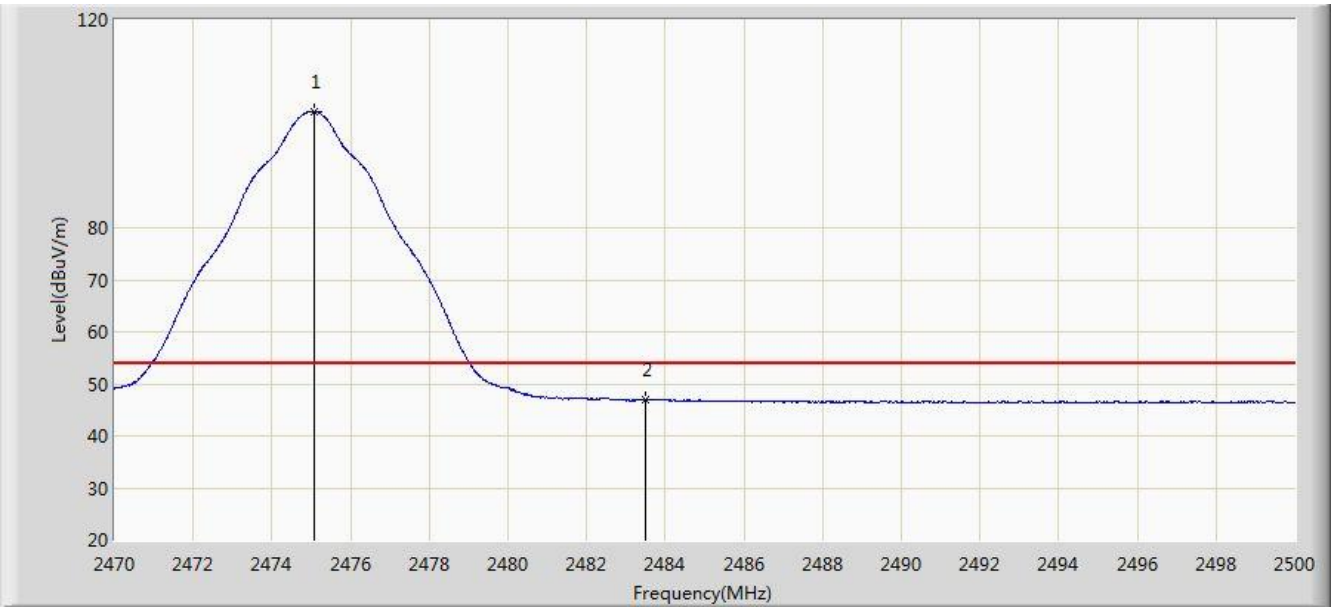


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2474.515	104.875	72.552	N/A	N/A	32.322	PK
2			2483.500	59.131	26.782	-14.869	74.000	32.349	PK
3			2486.875	60.399	28.045	-13.601	74.000	32.355	PK

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

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

Site: AC2	Time: 2016/01/30 - 10:38
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2475MHz by 802.15.4 Ant A	

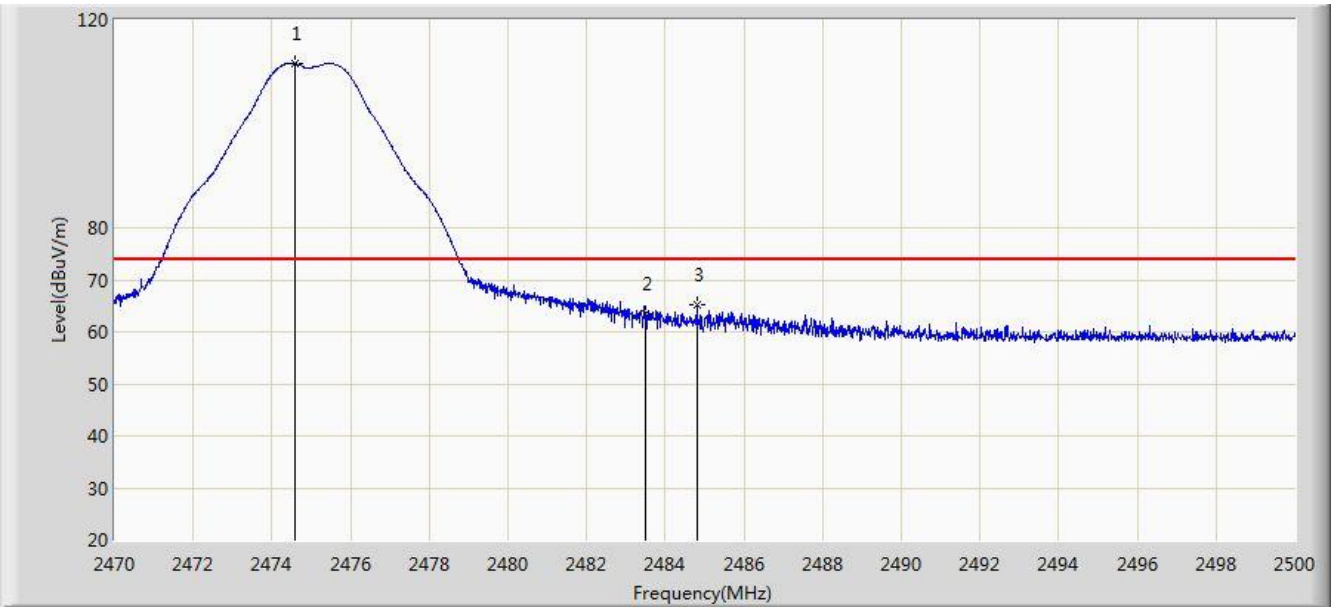


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2475.070	102.410	70.085	N/A	N/A	32.325	AV
2			2483.500	47.071	14.722	-6.929	54.000	32.349	AV

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

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

Site: AC2	Time: 2016/01/30 - 10:38
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2475MHz by 802.15.4 Ant A	

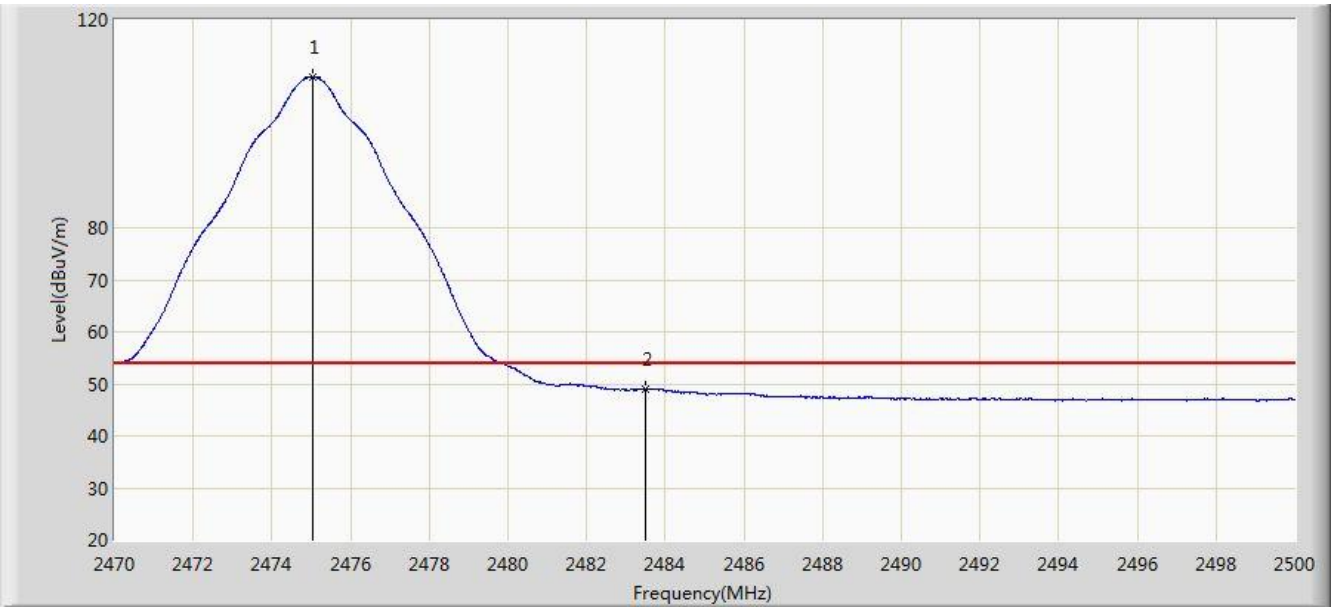


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2474.605	111.539	79.216	N/A	N/A	32.324	PK
2			2483.500	63.358	31.009	-10.642	74.000	32.349	PK
3			2484.805	65.158	32.807	-8.842	74.000	32.351	PK

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

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

Site: AC2	Time: 2016/01/30 - 10:40
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2475MHz by 802.15.4 Ant A	

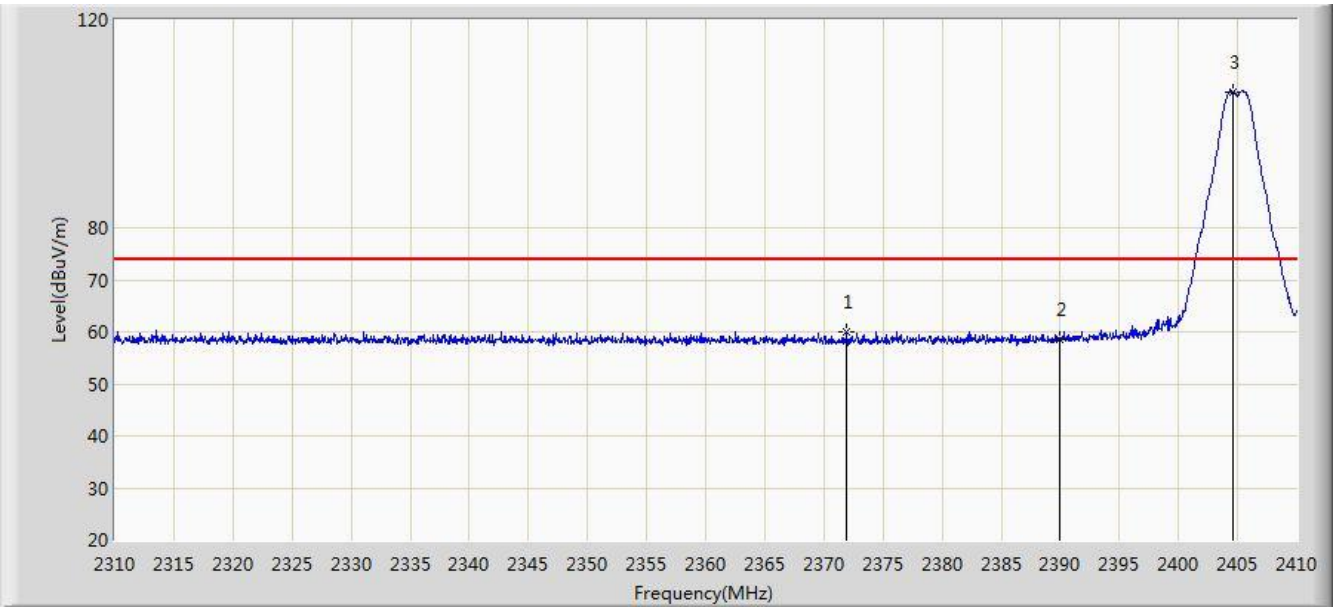


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2475.025	109.026	76.701	N/A	N/A	32.325	AV
2			2483.500	48.905	16.556	-5.095	54.000	32.349	AV

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

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

Site: AC2	Time: 2016/01/30 - 10:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2405MHz by 802.15.4 Ant B	

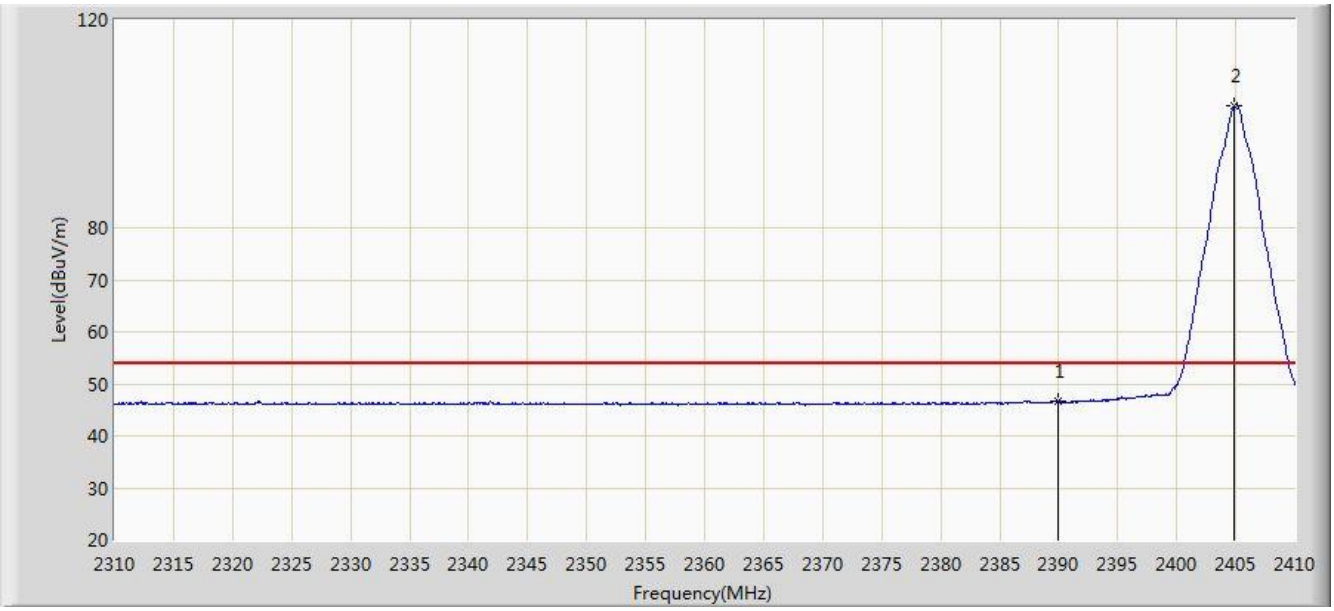


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2371.950	60.050	27.679	-13.950	74.000	32.374	PK
2			2390.000	58.488	26.120	-15.512	74.000	32.368	PK
3		*	2404.650	106.088	73.750	N/A	N/A	32.339	PK

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

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

Site: AC2	Time: 2016/01/30 - 10:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2405MHz by 802.15.4 Ant B	

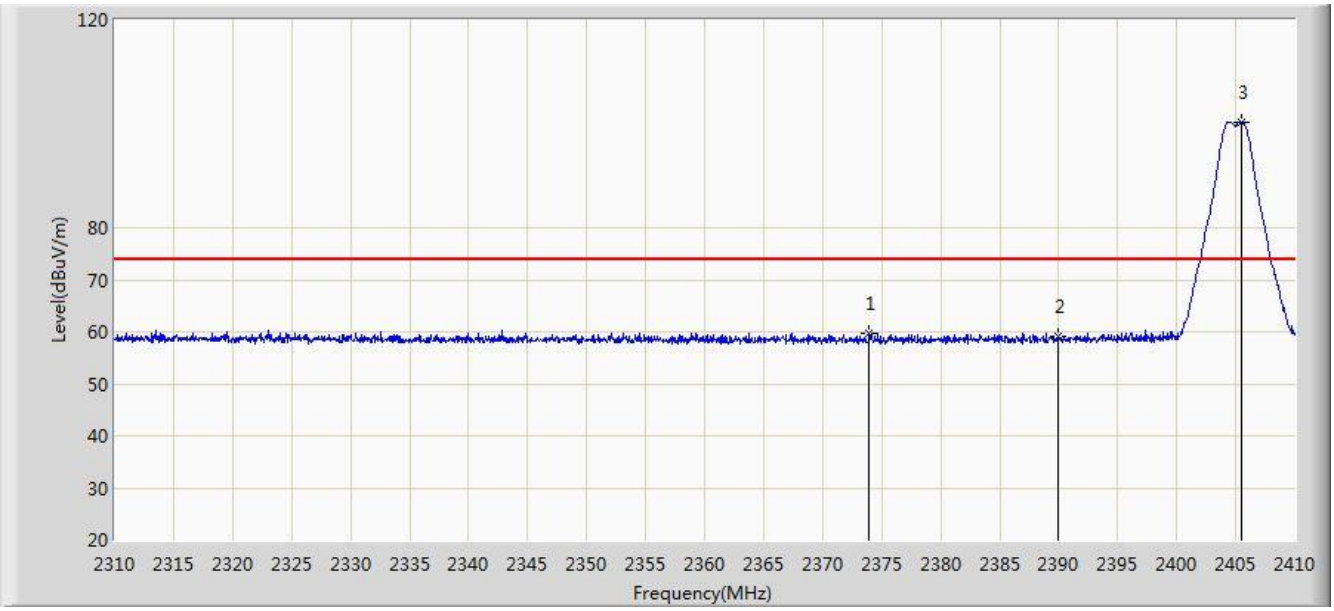


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.576	14.208	-7.424	54.000	32.368	AV
2		*	2404.900	103.563	71.225	N/A	N/A	32.338	AV

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

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

Site: AC2	Time: 2016/01/30 - 10:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2405MHz by 802.15.4 Ant B	

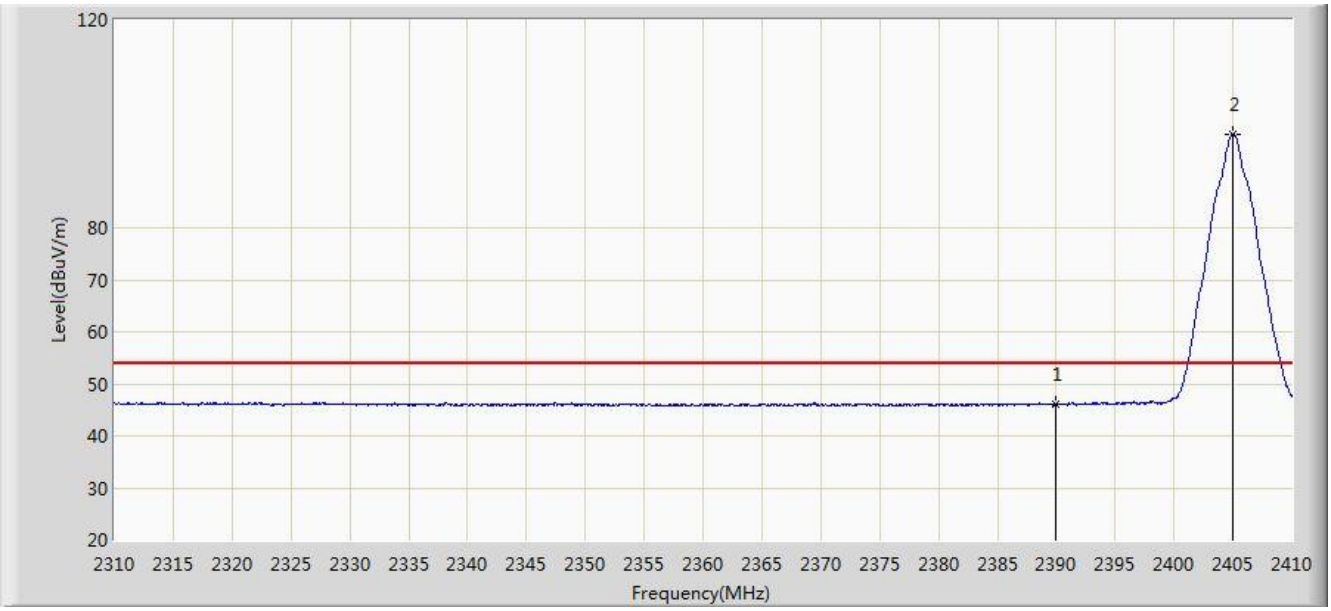


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2373.950	59.736	27.370	-14.264	74.000	32.367	PK
2			2390.000	59.066	26.698	-14.934	74.000	32.368	PK
3		*	2405.450	100.425	68.089	N/A	N/A	32.336	PK

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

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

Site: AC2	Time: 2016/01/30 - 10:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2405MHz by 802.15.4 Ant B	

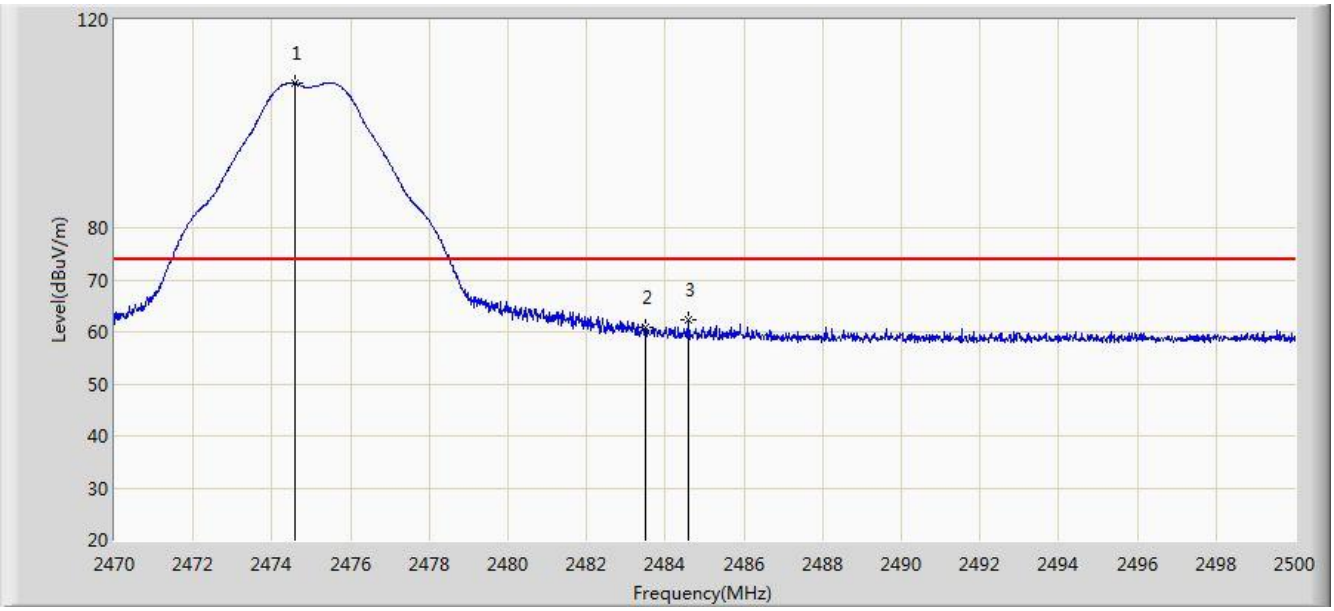


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2390.000	46.185	13.817	-7.815	54.000	32.368	AV
2		*	2404.950	98.026	65.688	N/A	N/A	32.338	AV

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

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

Site: AC2	Time: 2016/01/30 - 10:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2475MHz by 802.15.4 Ant B	

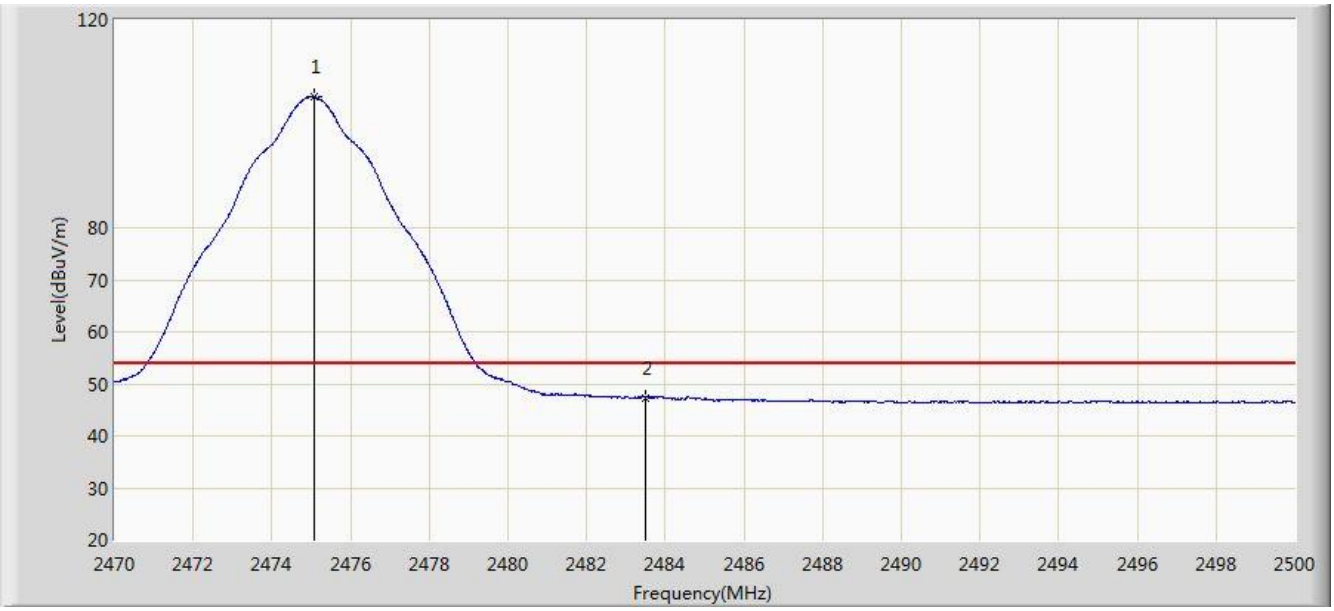


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2474.605	107.750	75.427	N/A	N/A	32.324	PK
2			2483.500	60.982	28.633	-13.018	74.000	32.349	PK
3			2484.580	62.193	29.842	-11.807	74.000	32.351	PK

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

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

Site: AC2	Time: 2016/01/30 - 10:13
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2475MHz by 802.15.4 Ant B	

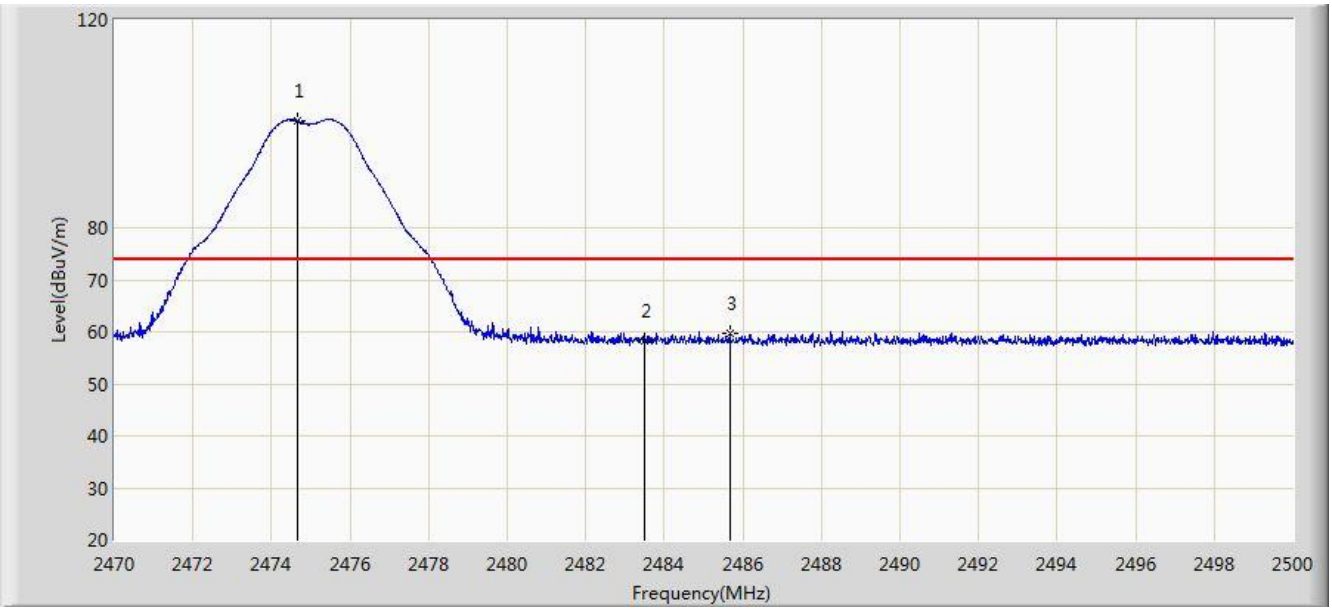


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2475.070	105.174	72.849	N/A	N/A	32.325	AV
2			2483.500	47.356	15.007	-6.644	54.000	32.349	AV

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

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

Site: AC2	Time: 2016/01/30 - 10:13
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2475MHz by 802.15.4 Ant B	

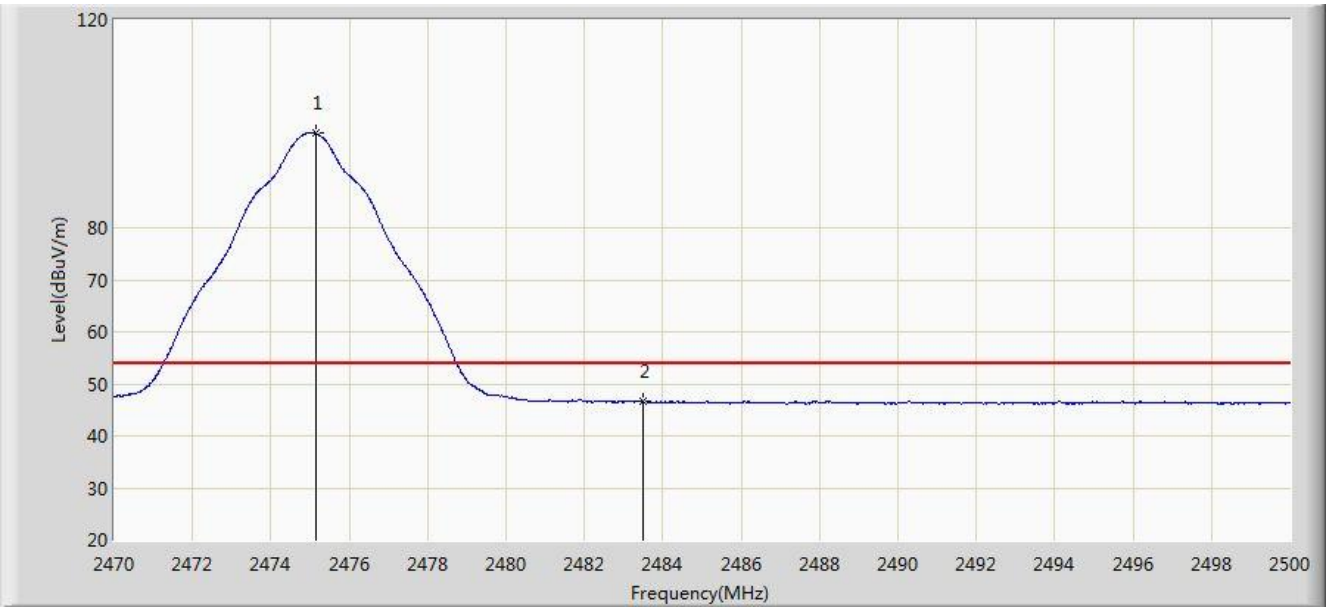


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2474.650	100.620	68.297	N/A	N/A	32.324	PK
2			2483.500	58.147	25.798	-15.853	74.000	32.349	PK
3			2485.660	59.672	27.320	-14.328	74.000	32.353	PK

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

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

Site: AC2	Time: 2016/01/30 - 10:14
Limit: FCC_Part15.209_RE(3m)	Engineer: Lewis Huang
Probe: BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Radio Controller	Power: By Battery
Test Mode: Transmit at Channel 2475MHz by 802.15.4 Ant B	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2475.160	98.129	65.803	N/A	N/A	32.326	AV
2			2483.500	46.639	14.290	-7.361	54.000	32.349	AV

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

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

7.1. AC Conducted Emissions Measurement

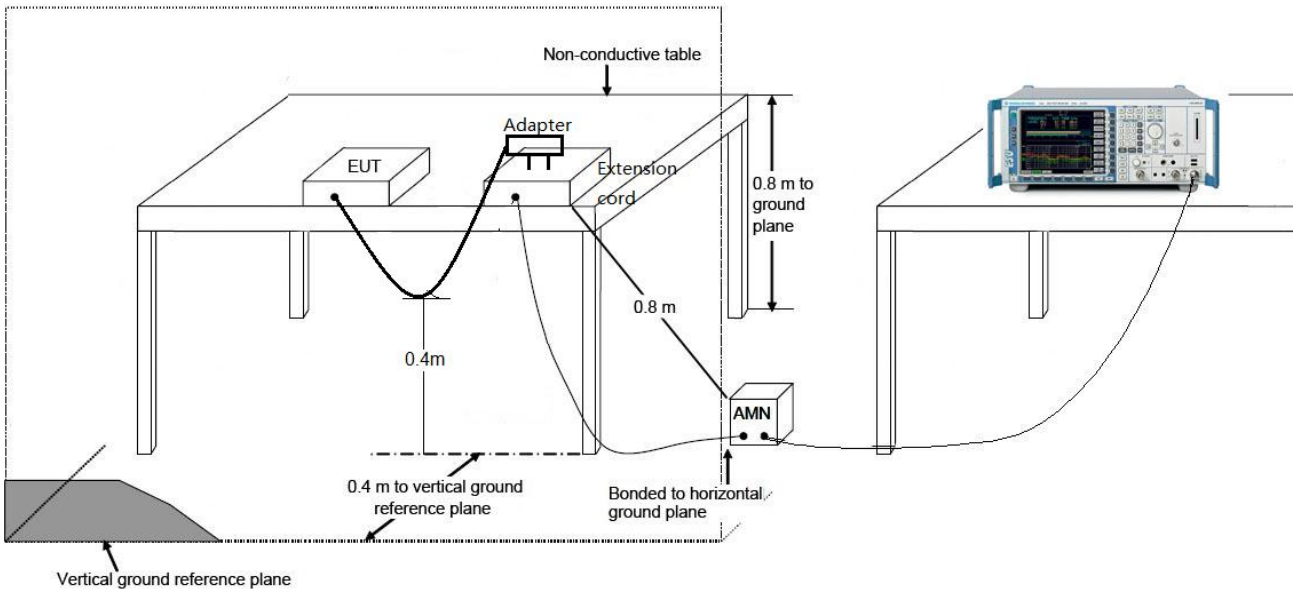
7.1.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
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.

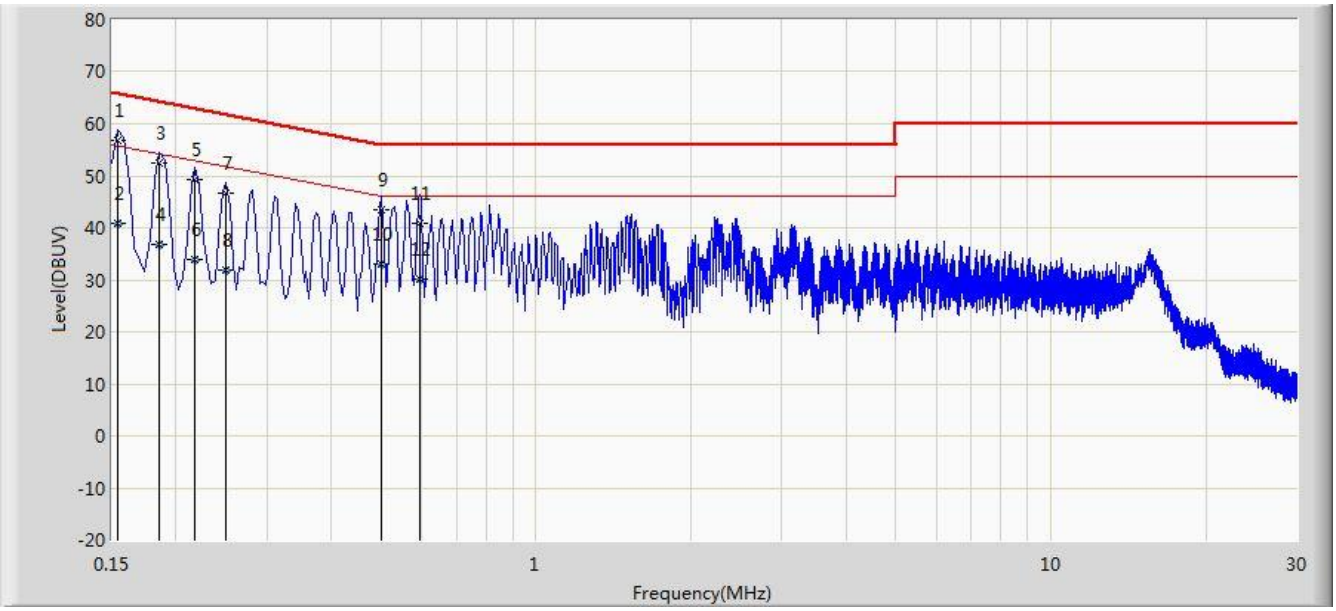
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

7.1.2. Test Setup



7.1.3. Test Result

Site: SR2	Time: 2016/02/17 - 14:59
Limit: FCC_Part15.207_CE_AC Power_ClassB	Engineer: Zero Cao
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: Radio Controller	Power: AC 120V/60Hz
Note: Mode 1	

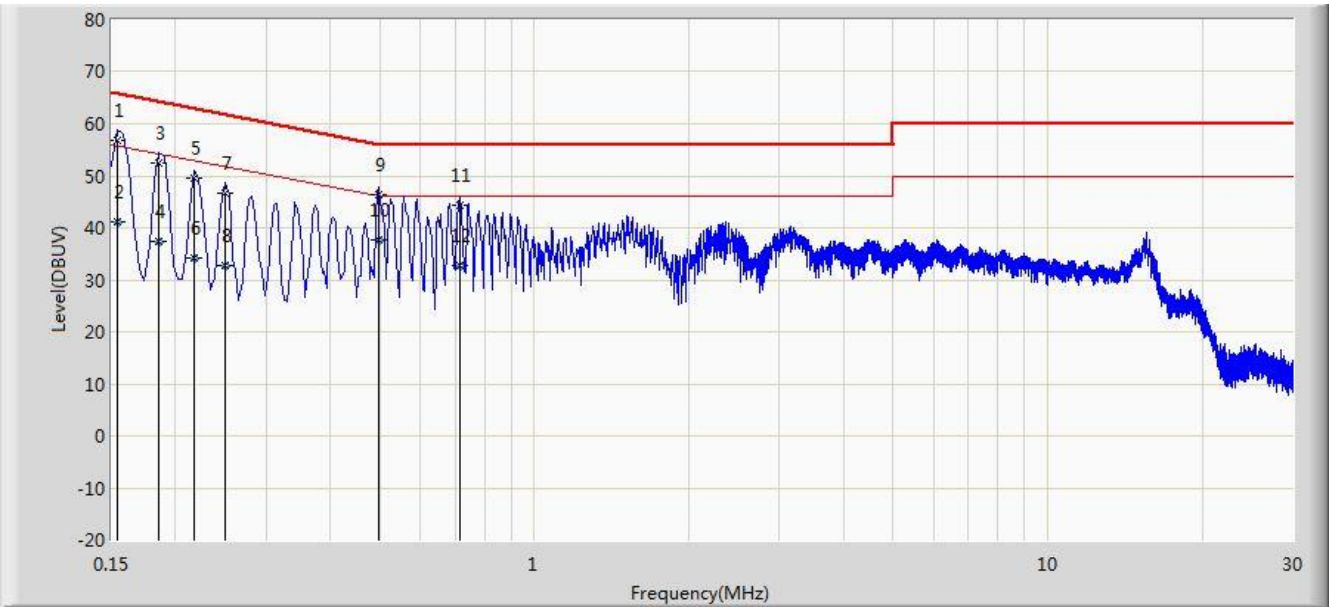


No	Flag	Mark	Frequency (MHz)	Measure Level (DBUV)	Reading Level (DBUV)	Over Limit (dB)	Limit (DBUV)	Factor (dB)	Type
1		*	0.154	56.848	46.108	-8.934	65.781	10.740	QP
2			0.154	40.794	30.055	-14.987	55.781	10.740	AV
3			0.186	52.558	42.520	-11.655	64.213	10.039	QP
4			0.186	36.844	26.805	-17.369	54.213	10.039	AV
5			0.218	49.356	39.412	-13.538	62.895	9.945	QP
6			0.218	34.011	24.066	-18.884	52.895	9.945	AV
7			0.250	46.784	36.819	-14.974	61.757	9.964	QP
8			0.250	31.869	21.905	-19.888	51.757	9.964	AV
9			0.502	43.394	33.237	-12.606	56.000	10.157	QP
10			0.502	33.005	22.847	-12.995	46.000	10.157	AV
11			0.594	40.869	30.751	-15.131	56.000	10.118	QP
12			0.594	30.206	20.088	-15.794	46.000	10.118	AV

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

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

Site: SR2	Time: 2016/02/17 - 15:04
Limit: FCC_Part15.207_CE_AC Power_ClassB	Engineer: Zero Cao
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: Radio Controller	Power: AC 120V/60Hz
Note: Mode 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (DBUV)	Reading Level (DBUV)	Over Limit (dB)	Limit (DBUV)	Factor (dB)	Type
1			0.154	56.762	46.046	-9.019	65.781	10.716	QP
2			0.154	41.223	30.507	-14.558	55.781	10.716	AV
3			0.186	52.548	42.513	-11.666	64.213	10.035	QP
4			0.186	37.404	27.369	-16.809	54.213	10.035	AV
5			0.218	49.440	39.458	-13.455	62.895	9.981	QP
6			0.218	34.296	24.315	-18.599	52.895	9.981	AV
7			0.250	46.781	36.779	-14.977	61.757	10.001	QP
8			0.250	32.894	22.893	-18.863	51.757	10.001	AV
9			0.498	46.421	36.244	-9.612	56.033	10.178	QP
10		*	0.498	37.753	27.575	-8.280	46.033	10.178	AV
11			0.714	44.489	34.422	-11.511	56.000	10.067	QP
12			0.714	32.873	22.806	-13.127	46.000	10.067	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 **Radio Controller FCC ID:**

2ACS5-ST16 Mode Number: ST16 is in compliance with Part 15C of the FCC Rules.

The End