MEASUREMENT REPORT

FCC PART 15.247 / ISED RSS-247 Bluetooth-LE

FCC ID:	N73-AP60-BLE
IC:	7449B-AP60BLE
Applicant:	Mine Site Technologies Pty Ltd
Application Type:	Certification
Product:	AXON BLE
Model No.:	A-AP60-200
Brand Name:	MINE SITE TECHNOLOGIES
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
ISED Rule(s):	RSS-247 Issue 2, RSS-Gen Issue 5
Test Procedure(s):	ANSI C63.10-2013
Test Date:	June 11 ~ July 30, 2020

Reviewed By: Kevin Guo
(Kevin Guo)

Approved By: Robin Wu
(Robin Wu)

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 ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

Revision History

Report No.	Version	Description	Issue Date	Note
2006RSU024-U1	Rev. 01	Initial Report	07-30-2020	Valid

CONTENTS

Description Page

General Information

Applicant:	Mine Site Technologies Pty Ltd
Applicant Address:	113 Wicks Road, North Ryde, New South Wales, 2113, Australia
Manufacturer:	Mine Site Technologies China Co. Ltd.
Manufacturer Address:	4th Floor, Building 1, No. 1413 Moganshan Road, Hangzhou, Zhejiang Province, 310011, China
Test Site:	MRT Technology (Suzhou) Co., Ltd
Test Site Address:	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

Test Facility / Accreditations

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

- **MRT facility is a FCC registered (MRT Designation No. CN1166) test facility with the site description report on file and has met all the requirements specified in ANSI C63.4-2014.**
- **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-20025, G-20034, C-20020, T-20020) 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, Radio and SAR testing.**

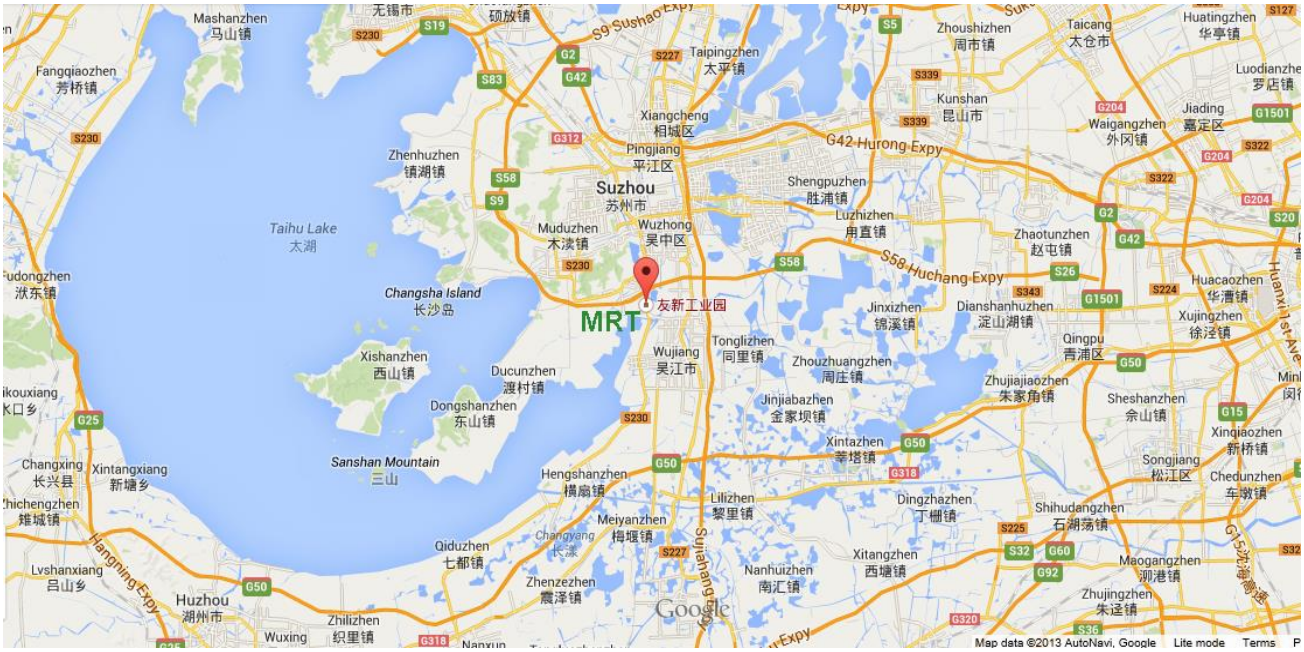
1. INTRODUCTION

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 Innovation, Science and Economic Development Canada and 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, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China. The measurement facility compliant with the test site requirements specified in ANSI C63.4-2014.



2. PRODUCT INFORMATION

2.1. Feature of Equipment under Test

Product Name:	AXON BLE
Model No.:	A-AP60-200
PMN:	AXON BLE
HVIN:	A-AP60-200
Brand Name:	MINE SITE TECHNOLOGIES
Bluetooth Version:	V5.0 (BLE only)
Working Voltage:	DC 3.3V
EUT Identification No.:	20200611Sample#02

2.2. Product Specification Subjective to this Report

Bluetooth Frequency:	2402 ~ 2480MHz
Channel Bandwidth:	2MHz
Type of modulation:	GFSK
Data Rate:	1Mbps

2.3. Working Frequencies for this report

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	--	--	--	--

2.4. Description of Available Antennas

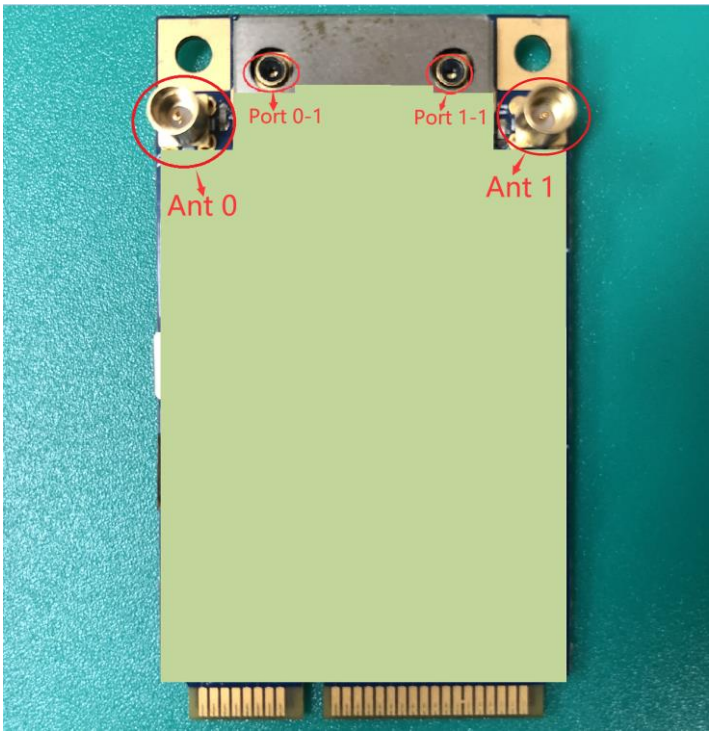
Antenna Type	Model No.	Manufacturer	Frequency Band (MHz)	T_X Paths	Ant 0 Gain (dBi)	Ant 1 Gain (dBi)
Omni Antenna	ANT795-4MX	SIEMENS	2402 ~ 2480	2	2.5	2.5

Note 1: Module supports SISO only, and ant 0.

Note 2: All messages as above are declared by manufacturer.

2.5. Description of Antenna RF Port

Antenna RF Port		
Software Control Port	Bluetooth-LE RF Port	
	Ant 0 (port 0-1)	Ant 1 (port 1-1)



Note: port 0-1 and Ant 1 are in the same transmit path, but port 0-1 is only used for calibration and test, and will never be as an antenna connector. Port 1-1 and Ant 1 have the same principle.

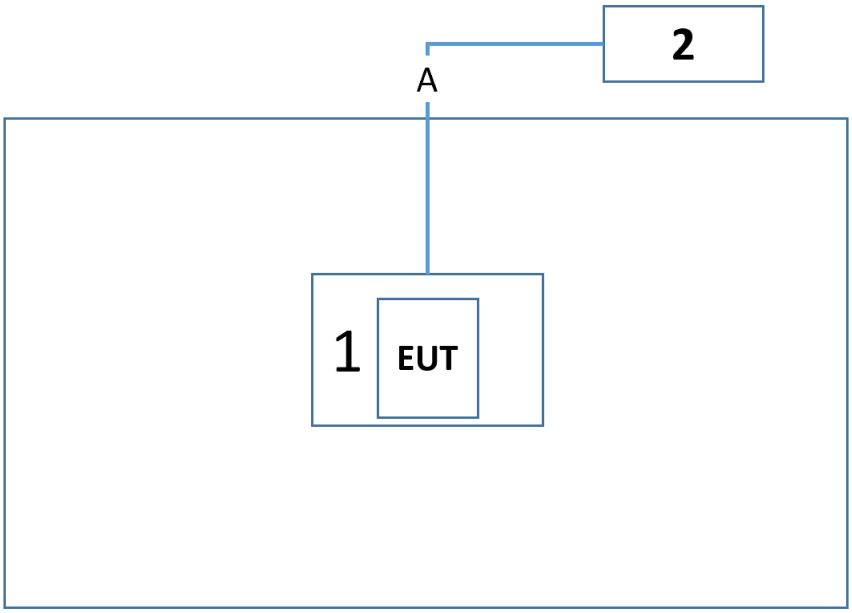
2.6. Test Mode

Test Mode	Mode 1: Transmit by BLE at Ant 0 Mode 2: Transmit by BLE at Ant 1

Note: EUT is as a stand-alone device when the test is processing, but a test fixture will be used as a tool.

2.7. Configuration of Test System

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.

Connection Diagram


Signal Cable Type		Signal Cable Description
A	USB extension cable	Shielded, 1.5m

2.8. Test System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Description
1	Test Fixture	MST	N/A	N/A	Powerd and as a COMDEBUG tool for module
2	Notebook	DELL	Vostro 3300	DN62SP1	Non-Shielded, 1.8m

2.9. Test Software

The test utility software used during testing was “nRF Connect”, and the version was “3.3.1”.

2.10. EMI Suppression Device(s)/Modifications

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

2.11. 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.

RSS-Gen Issue 5 Section 4

In addition to complying with the applicable RSSs and RSP-100, each unit of a product model (i.e. of a radio apparatus) shall meet the labelling requirements set out in this section prior to being marketed in Canada or imported into Canada.

For information regarding the labelling option, see Section 4.1, 4.2, 4.3 4.4. The label for the certified product represents the manufacturer's or importer's compliance with Innovation, Science and Economic Development Canada's (ISED) regulatory requirements.

Please see attachment for IC 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) was used in the measurement of the device.

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 were 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.

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.

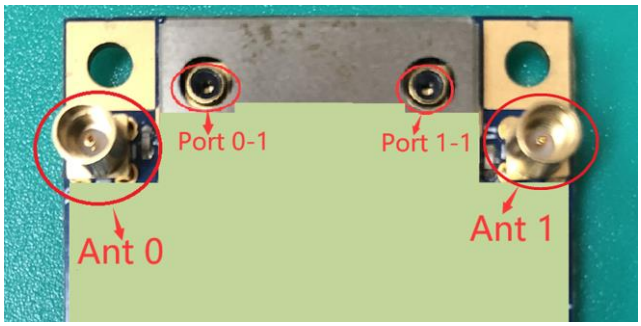
Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn Antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the 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 device uses a unique connector.



Port 0-1 and Port 1-1 will be not as antenna connector

Conclusion:

The device 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	ESR3	MRTSUE06185	1 year	2021/01/18
Two-Line V-Network	R&S	ENV 216	MRTSUE06002	1 year	2021/06/11
Two-Line V-Network	R&S	ENV 216	MRTSUE06003	1 year	2021/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06404	1 year	2020/08/08
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Radiated Emissions - AC1

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2021/01/18
PXA Signal Analyzer	Keysight	9030B	MRTSUE06395	1 year	2020/09/03
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/04/03
Broad Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2020/10/13
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2020/12/17
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Thermohygrometer	Testo	608-H1	MRTSUE06403	1 year	2020/08/08
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2021/04/30

Radiated Emission - AC2

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Keysight	N9038A	MRTSUE06125	1 year	2020/08/01
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2020/11/13
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2020/10/13
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06171	1 year	2020/10/27
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2020/12/17
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2020/11/15
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2021/06/11
Temperature/Humidity Meter	Minggao	ETH529	MRTSUE06170	1 year	2020/12/15
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2021/04/30

Conducted Test Equipment - TR3

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2021/04/14
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06452	1 year	2021/01/08
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2021/04/14
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2020/11/18
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2021/06/11
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2021/06/11
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2021/06/11
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2021/06/11
Modulation Analyzer	HP	8901A	MRTSUE06098	1 year	2020/10/10
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2020/11/07
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Attenuator	MVE	6dB	MRTSUE06534	1 year	2020/12/12
Attenuator	MVE	10dB	MRTSUE06543	1 year	2020/12/12
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2020/11/07
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2020/08/08

Software	Version	Function
EMI Software	V3	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.

Conducted Emission Measurement
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
Radiated Disturbance
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~6GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.78dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.13dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.15dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 0.28%

7. TEST RESULT

7.1. Summary

FCC Section(s)	ISED 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
N/A	RSS-Gen [6.7]	99% Bandwidth	N/A		Pass	
15.247(b)(3)	RSS-247 [5.4(d)]	Output Power	≤ 1Watt & EIRP ≤ 4Watt		Pass	Section 7.3
15.247(e)	RSS-247 [5.2]	Power Spectral Density	≤ 8dBm/3kHz		Pass	Section 7.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	20dBc		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	Pass	Section 7.8

Notes:

1) 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) Test Items “6dB Bandwidth & 99% Bandwidth” showed the worst test data in this report.

7.2. Occupied Bandwidth Measurement

7.2.1.Test Limit

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

7.2.2.Test Procedure used

ANSI C63.10-2013 - Section 11.8 (6dB bandwidth)

ANSI C63.10-2013 - Section 6.9.3 (99% bandwidth)

7.2.3.Test Setting

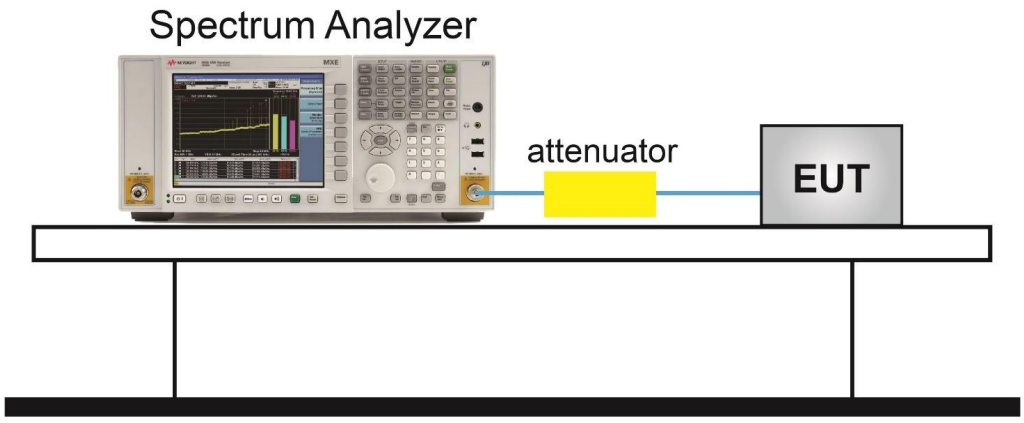
For 6dB bandwidth

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

For 99% bandwidth

1. Span = 1.5 times to 5 times the OBW
2. Set RBW = 1% to 5% the OBW
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

Product	AXON BLE	Temperature	25°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2020/06/26~2020/07/16

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (MHz)	99% Bandwidth (kHz)	Result
Ant 0							
BLE	1	00	2402	727.4	≥ 0.5	1053.8	Pass
BLE	1	19	2440	720.3	≥ 0.5	1055.9	Pass
BLE	1	39	2480	727.7	≥ 0.5	1060.3	Pass

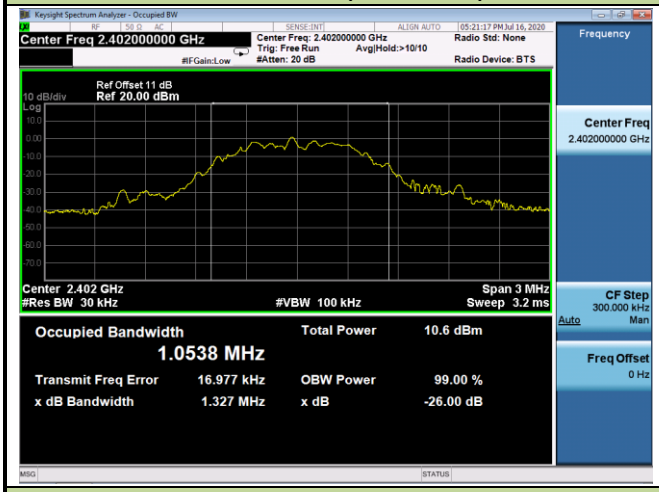
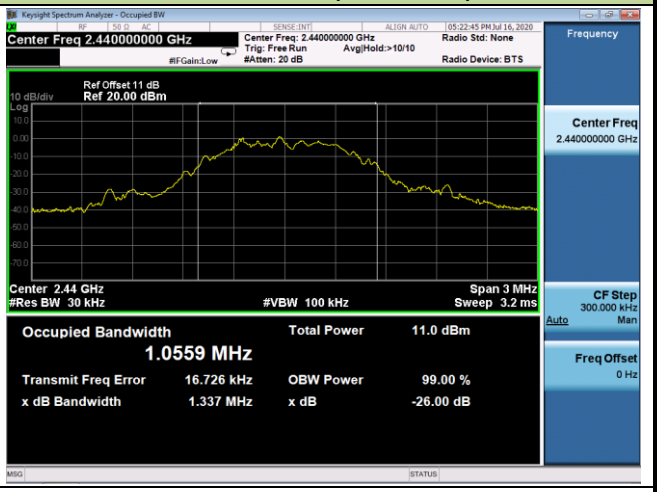
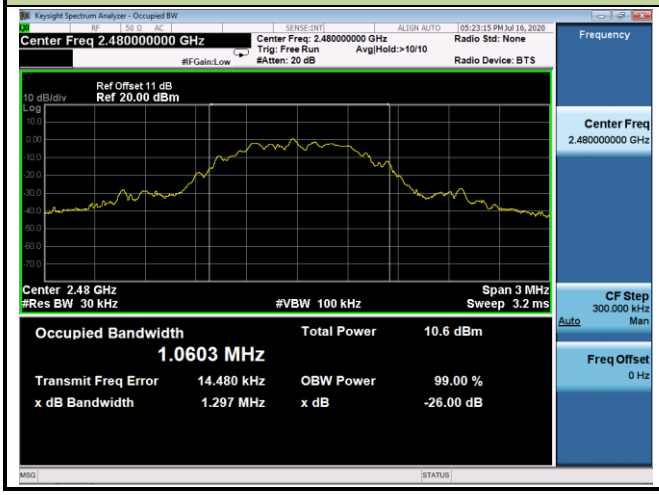
Note: Only the higher power antenna port is selected for 6dB Bandwidth and 99% Bandwidth testing.

6dB Bandwidth – Ant 0

Channel 00 (2402MHz)

Channel 19 (2440MHz)

Channel 39 (2480MHz)

99% Bandwidth – Ant 0	
Channel 00 (2402MHz)	Channel 19 (2440MHz)
	
Channel 39 (2480MHz)	
	

7.3. Output Power Measurement

7.3.1.Test Limit

The maximum out power shall be less 1 Watt (30dBm) and the E.I.R.P shall not exceed 4 Watt (36.02dBm).

The conducted output power limit specified in paragraph FCC Part 15.247(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs FCC Part 15.247(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.3.2.Test Procedure Used

ANSI C63.10 – 2013 Section 11.9.1.3

ANSI C63.10 - 2013 Section 11.9.2.3

7.3.3.Test Setting

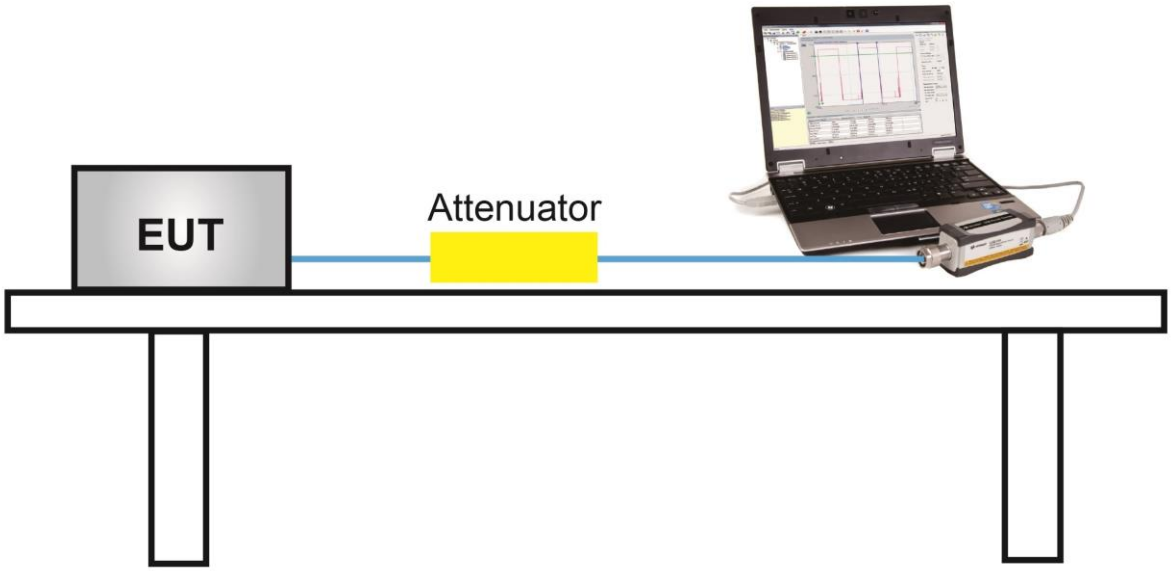
Method PKPM1 (Peak Power Measurement)

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.

Method AVGPM-G (Measurement using a gated RF average-reading power meter)

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

7.3.4.Test Setup



7.3.5.Test Result

Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	51%
Test Site	TR3	Test Date	2020/06/26

Test Result of Peak Output Power

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 0								
BLE	1	00	2402	6.06	≤ 30.00	8.56	≤ 36.02	Pass
BLE	1	19	2440	6.11	≤ 30.00	8.61	≤ 36.02	Pass
BLE	1	39	2480	6.05	≤ 30.00	8.55	≤ 36.02	Pass
Ant 1								
BLE	1	00	2402	5.97	≤ 30.00	8.47	≤ 36.02	Pass
BLE	1	19	2440	5.92	≤ 30.00	8.42	≤ 36.02	Pass
BLE	1	39	2480	4.48	≤ 30.00	6.98	≤ 36.02	Pass

Note: Max EIRP (dBm) = Peak Power (dBm) + Antenna Gain (dBi), Antenna Gain = 2.5dBi.

Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
Ant 0								
BLE	1	00	2402	5.88	≤ 30.00	8.38	≤ 36.02	Pass
BLE	1	19	2440	6.09	≤ 30.00	8.59	≤ 36.02	Pass
BLE	1	39	2480	5.88	≤ 30.00	8.38	≤ 36.02	Pass
Ant 1								
BLE	1	00	2402	5.87	≤ 30.00	8.37	≤ 36.02	Pass
BLE	1	19	2440	5.84	≤ 30.00	8.34	≤ 36.02	Pass
BLE	1	39	2480	4.37	≤ 30.00	6.87	≤ 36.02	Pass

Note: Max EIRP (dBm) = Average Power (dBm) + Antenna Gain (dBi), Antenna Gain = 2.5dBi.

7.4. Power Spectral Density Measurement

7.4.1.Test Limit

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

The same method of determining the conducted output power shall be used to determine the power spectral density.

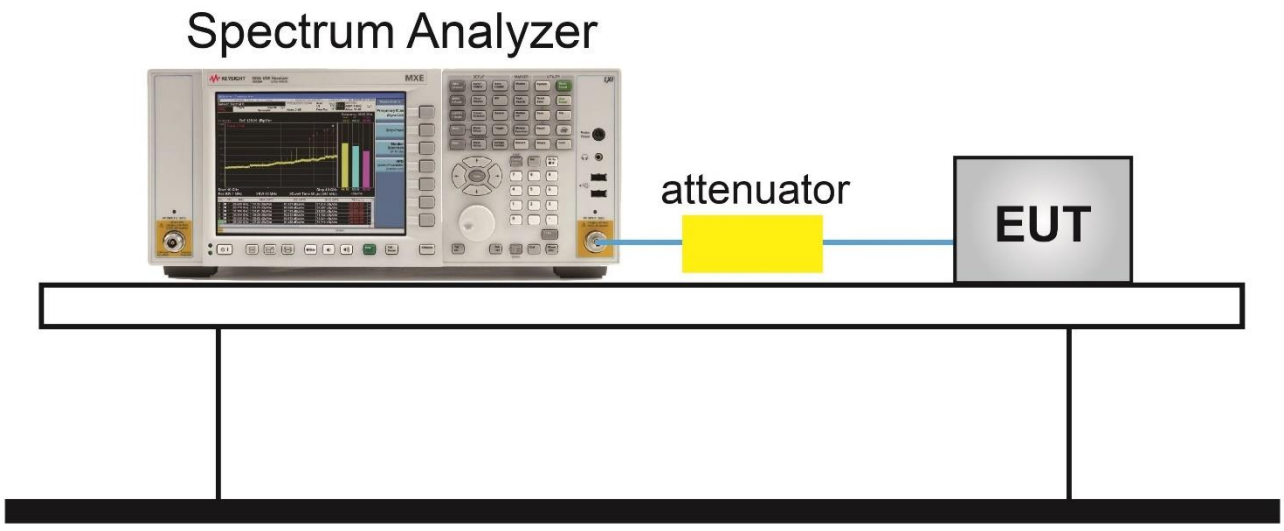
7.4.2.Test Procedure Used

ANSI C63.10-2013 Section 11.10.2.

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



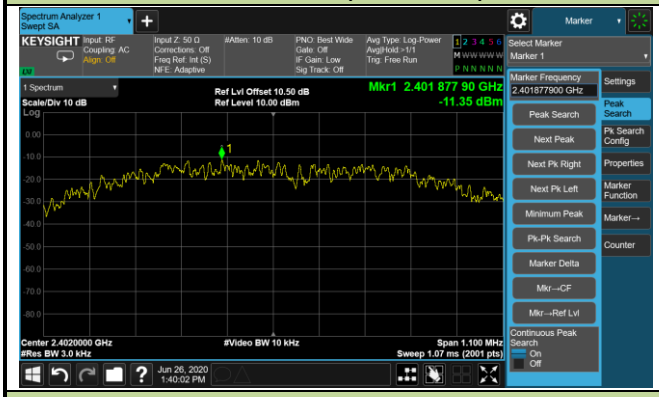
7.4.5.Test Result

Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2020/06/26

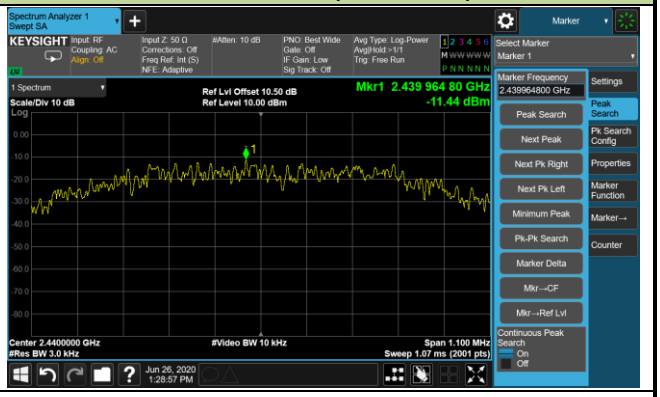
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
Ant 0						
BLE	1	00	2402	-11.35	≤ 8.00	Pass
BLE	1	19	2440	-11.44	≤ 8.00	Pass
BLE	1	39	2480	-11.65	≤ 8.00	Pass
Ant 1						
BLE	1	00	2402	-11.93	≤ 8.00	Pass
BLE	1	19	2440	-11.58	≤ 8.00	Pass
BLE	1	39	2480	-13.41	≤ 8.00	Pass

Peak PSD – Ant 0

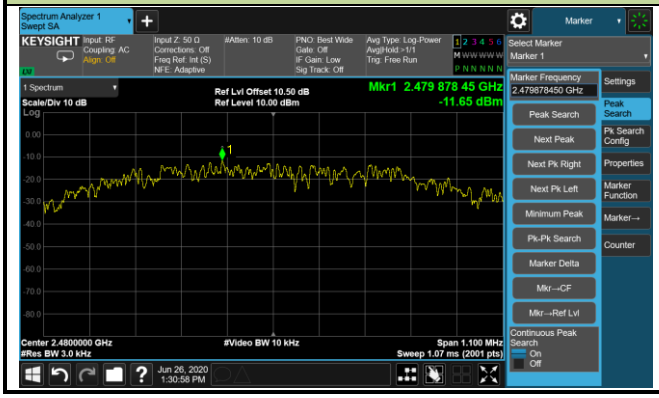
Channel 00 (2402MHz)

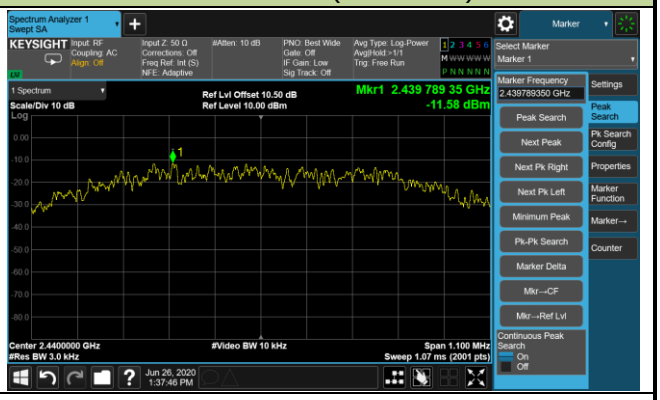


Channel 19 (2440MHz)



Channel 39 (2480MHz)



Peak PSD – Ant 1	
Channel 00 (2402MHz)	Channel 19 (2440MHz)
	
Channel 39 (2480MHz)	
	

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 100kHz bandwidth per the PSD procedure.

7.5.2.Test Procedure Used

ANSI C63.10-2013 Section 11.11

7.5.3.Test Settitng

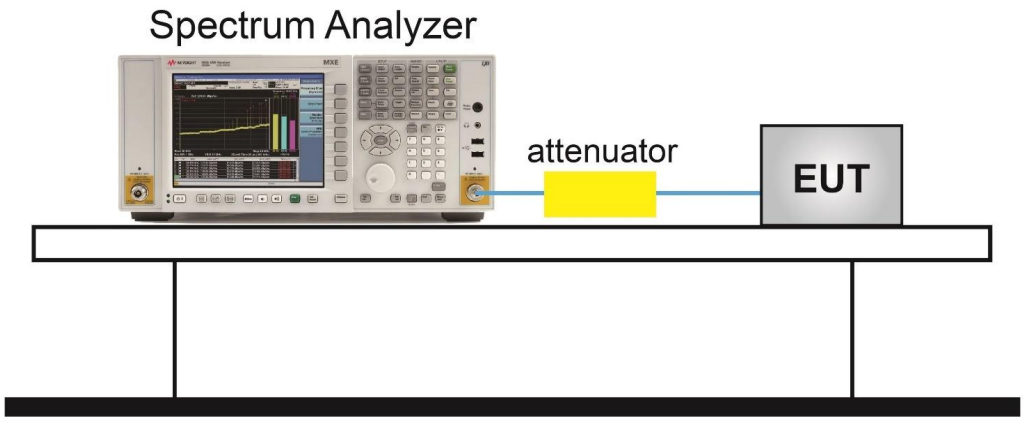
Reference level measurement

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to ≥ 1.5 times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW ≥ 3 x RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

Emission level measurement

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

7.5.4.Test Setup



7.5.5.Test Result

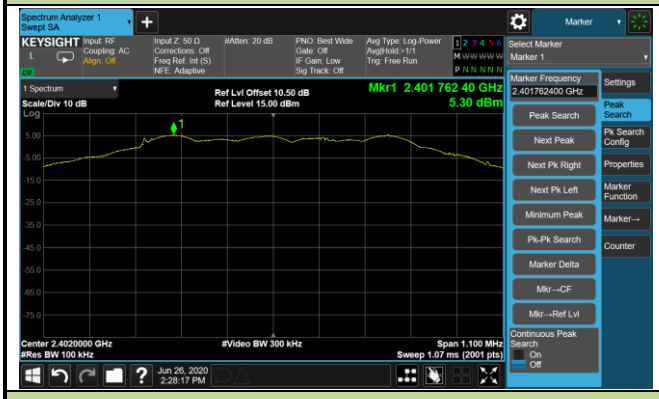
Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	52%
Test Site	TR3	Test Date	2020/06/26~ 2020/07/30

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit	Result
Ant 0					
BLE	1	00	2402	20dBc	Pass
BLE	1	19	2440	20dBc	Pass
BLE	1	39	2480	20dBc	Pass
Ant 1					
BLE	1	00	2402	20dBc	Pass
BLE	1	19	2440	20dBc	Pass
BLE	1	39	2480	20dBc	Pass

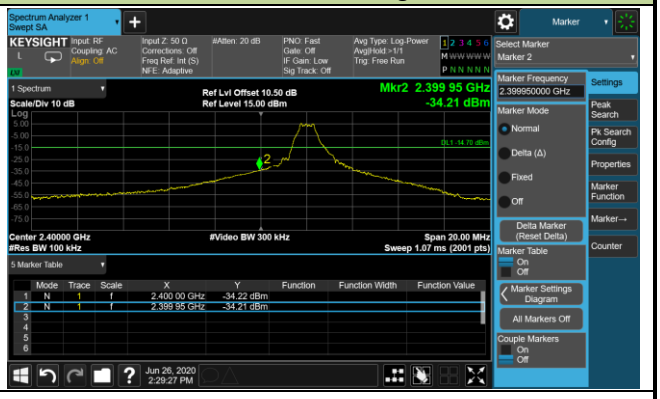
BLE Out-of-Band Emissions – Ant 0

Channel 00 (2402MHz)

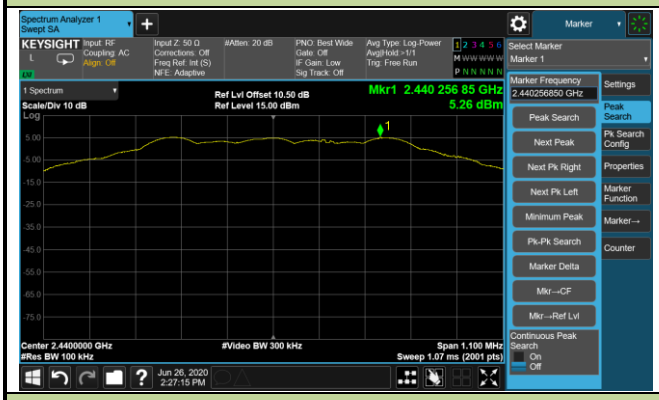
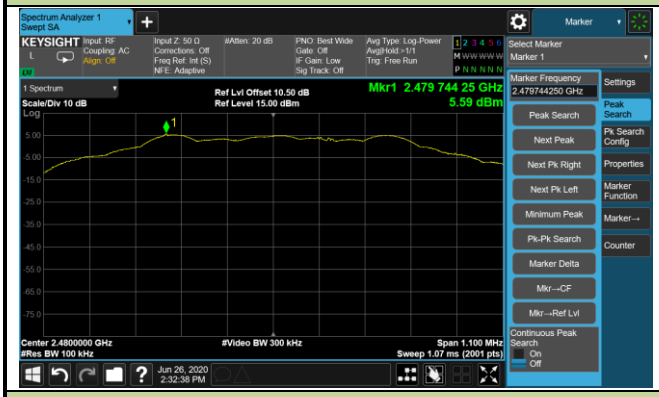
100kHz PSD reference Level

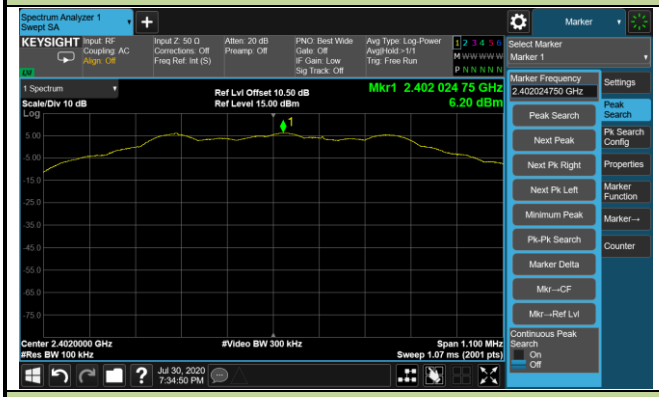
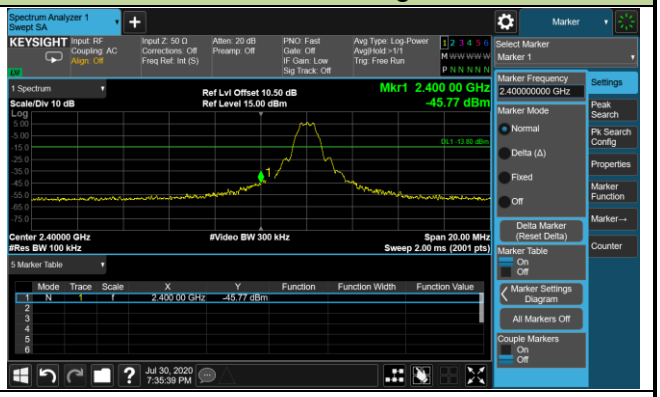
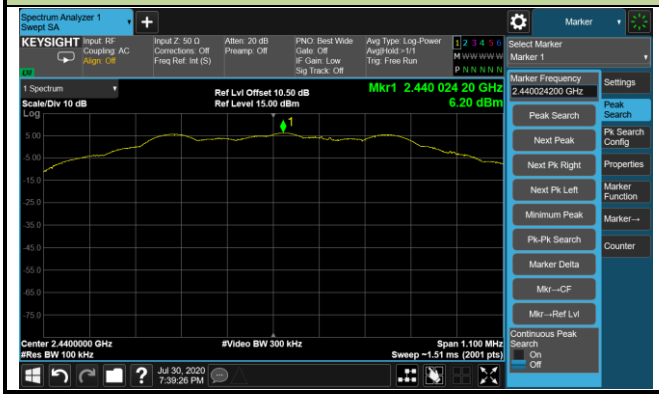


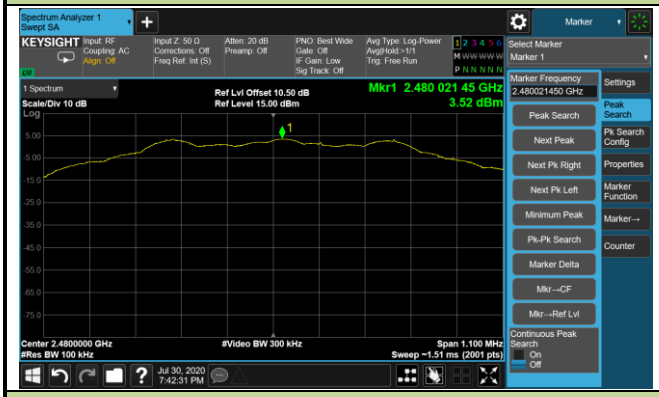
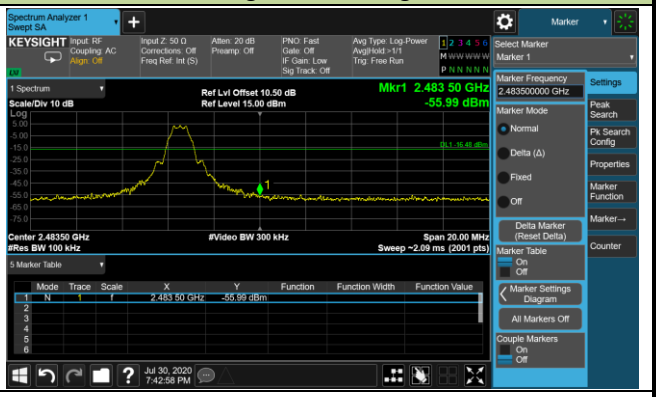
Low Band Edge



Spurious Emission

Channel 19 (2440MHz)	
100kHz PSD reference Level	Spurious Emission
	
Channel 39 (2480MHz)	
100kHz PSD reference Level	High Band Edge
	
Spurious Emission	
	

BLE Out-of-Band Emissions – Ant 1	
Channel 00 (2402MHz)	
100kHz PSD reference Level	Low Band Edge
	
Spurious Emission	
	
Channel 19 (2440MHz)	
100kHz PSD reference Level	Spurious Emission
	

Channel 39 (2480MHz)	
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 below table.

FCC Part 15 Subpart C Paragraph 15.209 & RSS-Gen Section 8.9		
Frequency [MHz]	Field Strength [uV/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

ANSI C63.10-2013 Section 6.3 (General Requirements)

ANSI C63.10-2013 Section 6.4 (Standard test method below 30MHz)

ANSI C63.10-2013 Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10-2013 Section 6.6 (Standard test method above 1GHz)

7.6.3.Test Setting

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

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 = as specified in Table 1

4. Detector = CISPR quasi-peak

5. Sweep time = auto couple

6. Trace was allowed to stabilize

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

Average Measurements above 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest

2. RBW = 1MHz

3. VBW; If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10 Hz.

If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration.

4. Detector = Peak

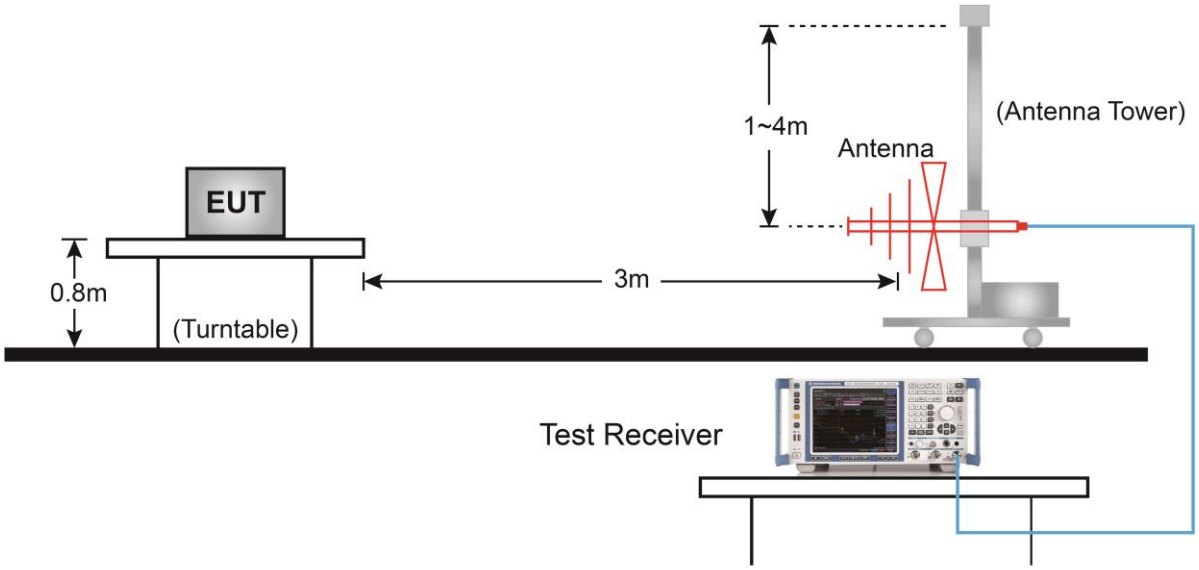
5. Sweep time = auto

6. Trace mode = max hold

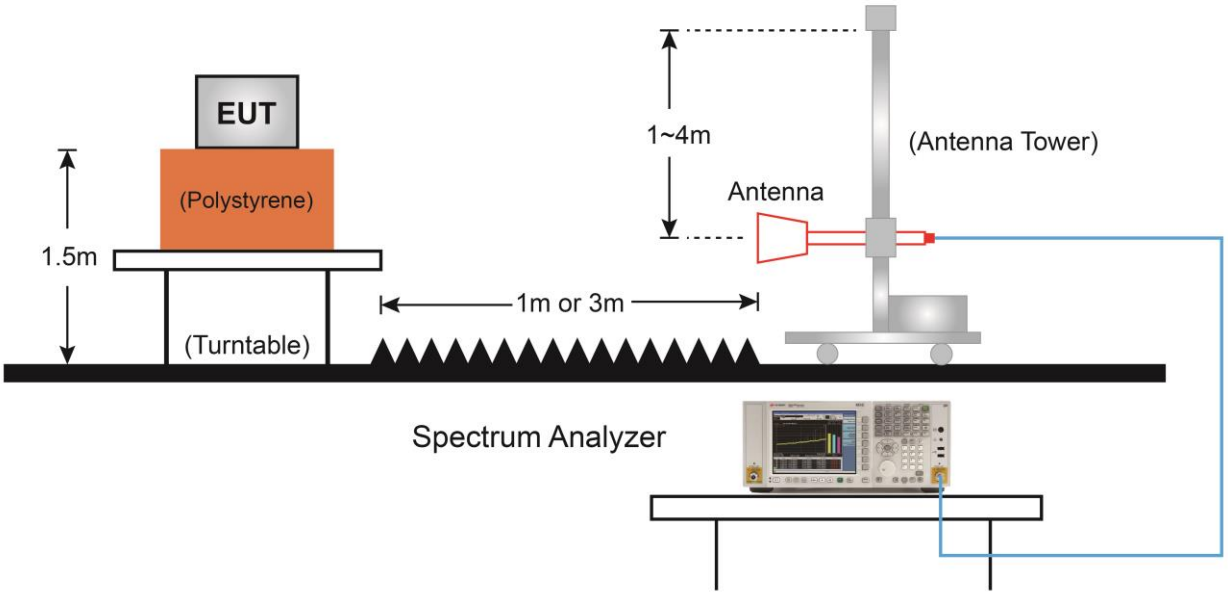
7. Trace was allowed to stabilize

7.6.4.Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



7.6.5.Test Result

Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	53 %
Test Site	AC2	Test Date	2020/06/22
Test Mode:	BLE – Ant 0	Test Channel:	00
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
	4808.0	47.7	4.0	51.7	74.0	-22.3	Peak	Horizontal
	7307.0	38.3	10.4	48.7	74.0	-25.3	Peak	Horizontal
*	9695.5	36.9	12.6	49.5	74.0	-24.5	Peak	Horizontal
*	10384.0	37.2	14.6	51.8	74.0	-22.2	Peak	Horizontal
	4808.0	38.5	4.0	42.5	74.0	-31.5	Peak	Vertical
	7485.5	38.8	10.5	49.3	74.0	-24.7	Peak	Vertical
*	9721.0	34.9	13.2	48.1	74.0	-25.9	Peak	Vertical
*	10401.0	36.8	15.1	51.9	74.0	-22.1	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (99.7dBμV/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)

Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	53 %
Test Site	AC2	Test Date	2020/06/22
Test Mode:	BLE – Ant 0	Test Channel:	19
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	45.1	3.1	48.2	74.0	-25.8	Peak	Horizontal
	7332.5	38.8	10.5	49.3	74.0	-24.7	Peak	Horizontal
*	9874.0	36.7	13.8	50.5	74.0	-23.5	Peak	Horizontal
*	10401.0	37.2	15.1	52.3	74.0	-21.7	Peak	Horizonta
	4884.5	38.5	3.1	41.6	74.0	-32.4	Peak	Vertical
	7468.5	37.7	10.7	48.4	74.0	-25.6	Peak	Vertical
*	9636.0	35.2	12.8	48.0	74.0	-26.0	Peak	Vertical
*	10350.0	35.6	15.0	50.6	74.0	-23.4	Peak	Vertical

Note 1: “*” is not in restricted band, its limit is 20dBc of the fundamental emission level (100.6dBμV/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)

Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	53 %
Test Site	AC2	Test Date	2020/06/22
Test Mode:	BLE – Ant 0	Test Channel:	39
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
	4961.0	42.2	3.2	45.4	74.0	-28.6	Peak	Horizontal
	7443.0	40.1	10.7	50.8	74.0	-23.2	Peak	Horizontal
*	9976.0	36.1	13.5	49.6	74.0	-24.4	Peak	Horizontal
*	10367.0	36.9	14.9	51.8	74.0	-22.2	Peak	Horizontal
	4791.0	37.7	3.8	41.5	74.0	-32.5	Peak	Vertical
	7485.5	39.5	10.5	50.0	74.0	-24.0	Peak	Vertical
*	9678.5	35.5	12.6	48.1	74.0	-25.9	Peak	Vertical
*	10265.0	35.8	14.4	50.2	74.0	-23.8	Peak	Vertical

Note 1: “*” means test frequency did not fall into restricted frequency band.

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

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

Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	53 %
Test Site	AC2	Test Date	2020/06/22
Test Mode:	BLE – Ant 1	Test Channel:	00
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
	4808.0	42.9	4.0	46.9	74.0	-27.1	Peak	Horizontal
	7358.0	38.6	10.5	49.1	74.0	-24.9	Peak	Horizontal
*	10001.5	37.2	13.4	50.6	74.0	-23.4	Peak	Horizontal
*	10358.5	37.9	15.1	53.0	74.0	-21.0	Peak	Horizontal
	4791.0	38.7	3.8	42.5	74.0	-31.5	Peak	Vertical
	7468.5	38.4	10.7	49.1	74.0	-24.9	Peak	Vertical
*	9755.0	36.0	13.3	49.3	74.0	-24.7	Peak	Vertical
*	10146.0	37.6	13.7	51.3	74.0	-22.7	Peak	Vertical

Note 1: “*” means test frequency did not fall into restricted frequency band.

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

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

Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	53 %
Test Site	AC2	Test Date	2020/06/22
Test Mode:	BLE – Ant 1	Test Channel:	19
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	44.2	3.1	47.3	74.0	-26.7	Peak	Horizontal
	7375.0	39.1	10.1	49.2	74.0	-24.8	Peak	Horizontal
*	10137.5	37.2	13.8	51.0	74.0	-23.0	Peak	Horizontal
*	10477.5	37.5	15.1	52.6	74.0	-21.4	Peak	Horizonta
	4111.0	37.5	1.2	38.7	74.0	-35.3	Peak	Vertical
	4816.5	37.8	3.6	41.4	74.0	-32.6	Peak	Vertical
*	5998.0	41.0	5.2	46.2	74.0	-27.8	Peak	Vertical
*	6678.0	37.9	7.4	45.3	74.0	-28.7	Peak	Vertical

Note 1: “*” means test frequency did not fall into restricted frequency band.

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

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

Product	AXON BLE	Temperature	23°C
Test Engineer	Dandy Li	Relative Humidity	53 %
Test Site	AC2	Test Date	2020/06/22
Test Mode:	BLE – Ant 1	Test Channel:	39
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
	4961.0	41.2	3.2	44.4	74.0	-29.6	Peak	Horizontal
	7545.0	36.0	10.7	46.7	74.0	-27.3	Peak	Horizontal
*	9874.0	36.2	13.8	50.0	74.0	-24.0	Peak	Horizontal
*	10545.5	37.6	15.2	52.8	74.0	-21.2	Peak	Horizontal
	4799.5	38.5	3.9	42.4	74.0	-31.6	Peak	Vertical
	7443.0	39.2	10.7	49.9	74.0	-24.1	Peak	Vertical
*	9712.5	37.6	13.2	50.8	74.0	-23.2	Peak	Vertical
*	10435.0	37.0	15.3	52.3	74.0	-21.7	Peak	Vertical

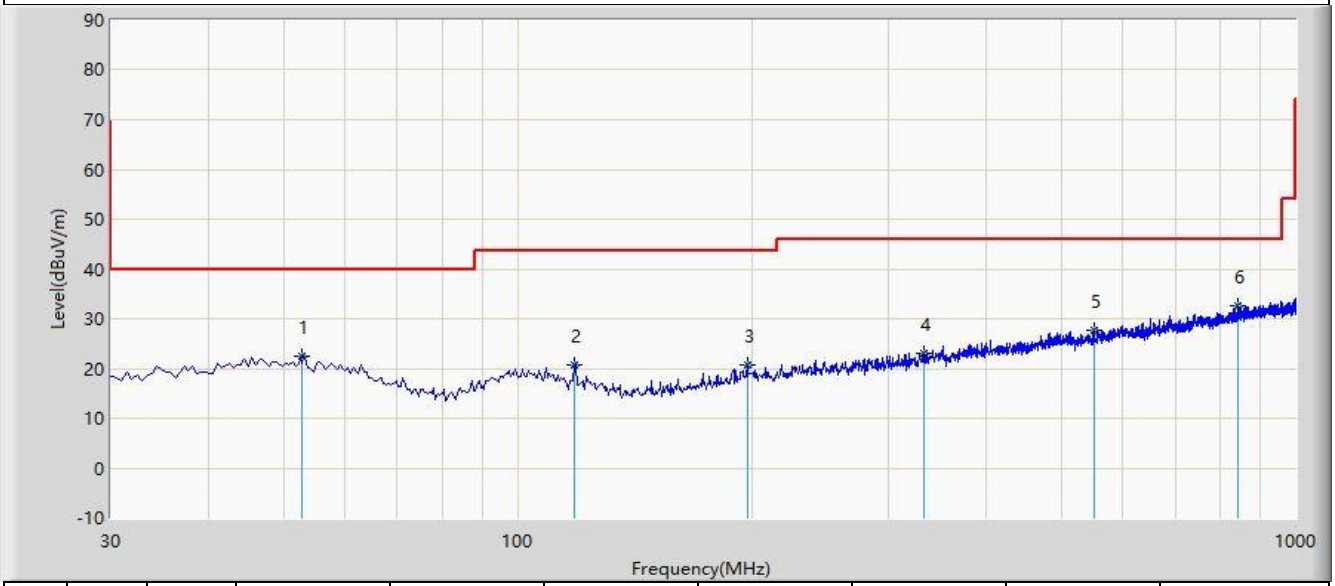
Note 1: “*” means test frequency did not fall into restricted frequency band.

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: 2020/06/23 - 09:30
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: AC2_VULB9162_0.03-7GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Worse Case Mode: Transmit by BLE at channel 2402MHz -Ant 0	



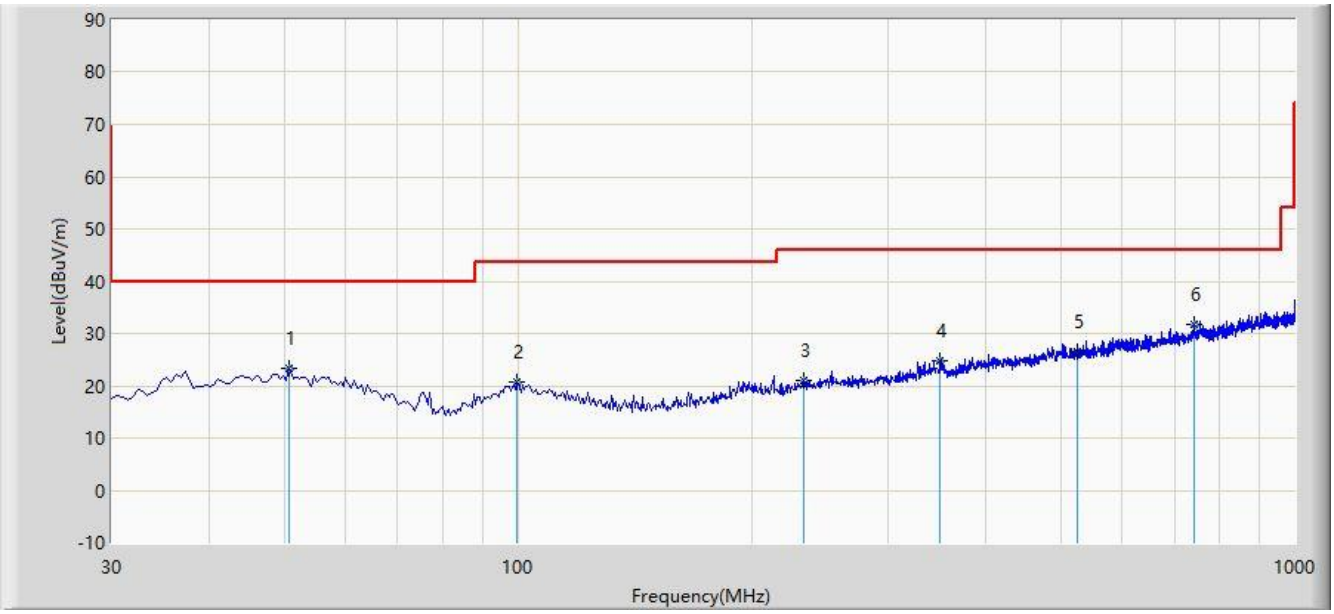
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			52.795	22.528	2.297	-17.472	40.000	20.232	QP
2			118.270	20.629	4.037	-22.871	43.500	16.592	QP
3			197.325	20.610	2.040	-22.890	43.500	18.570	QP
4			332.155	23.028	1.770	-22.972	46.000	21.258	QP
5			550.405	27.794	2.808	-18.206	46.000	24.987	QP
6		*	842.375	32.593	3.377	-13.407	46.000	29.216	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: The amplitude of radiated emissions (frequency range from 9kHz ~ 30MHz, 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

Site: AC2	Time: 2020/06/23 - 09:35
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: AC2_VULB9162_0.03-7GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Worse Case Mode: Transmit by BLE at channel 2402MHz-Ant 0	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			50.855	23.347	2.877	-16.653	40.000	20.470	QP
2			99.840	20.743	2.449	-22.757	43.500	18.294	QP
3			233.215	21.098	2.127	-24.902	46.000	18.972	QP
4			349.615	24.826	2.788	-21.174	46.000	22.038	QP
5			525.670	26.520	2.164	-19.480	46.000	24.356	QP
6		*	741.495	31.673	3.674	-14.327	46.000	27.999	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB)

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

Note 2: The amplitude of radiated emissions (frequency range from 9kHz ~ 30MHz, 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

7.7. Radiated Restricted Band Edge Measurement

7.7.1.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).

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

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.

Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 38.6
8.362 - 8.366	1660 - 1710	--
8.37625 - 8.38675	1718.8 -1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 -2390	
12.51975 - 12.52025	2483.5 -2500	
12.57675 - 12.57725	2655 - 2900	
13.36 -13.41	3260 - 3267	
16.42 - 16.423	3332 -3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
108 - 138	--	

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

FCC Part 15 Subpart C Paragraph 15.209 & RSS-Gen Section 8.9		
Frequency [MHz]	Field Strength [uV/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

7.7.2.Test Procedure Used

ANSI C63.10-2013 Section 6.10.5.2

7.7.3.Test Setting

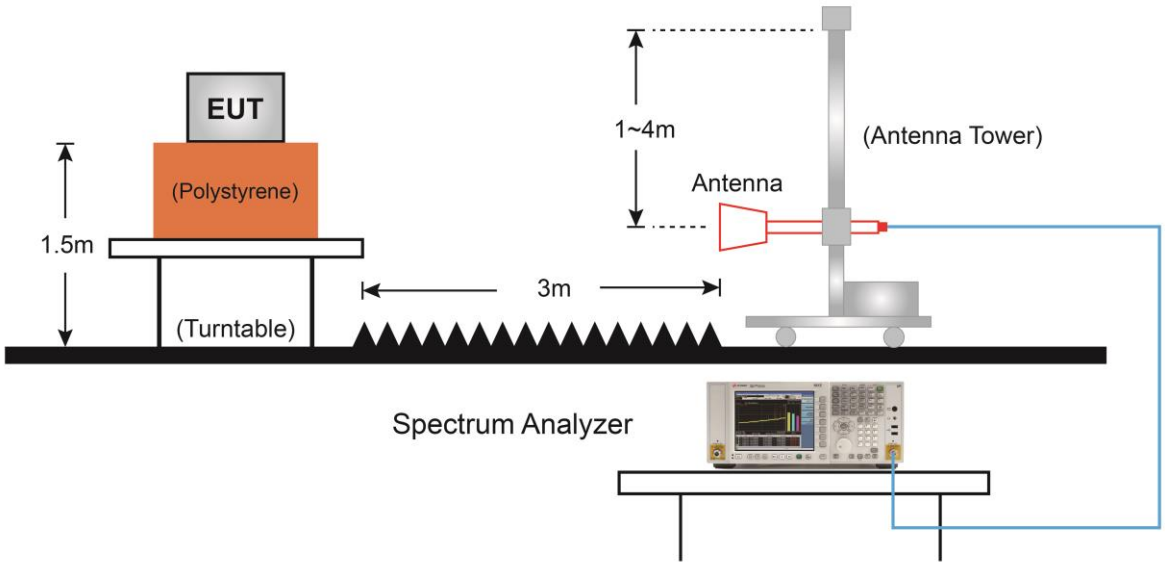
Peak Field Strength Measurements

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

Average Field Strength Measurements

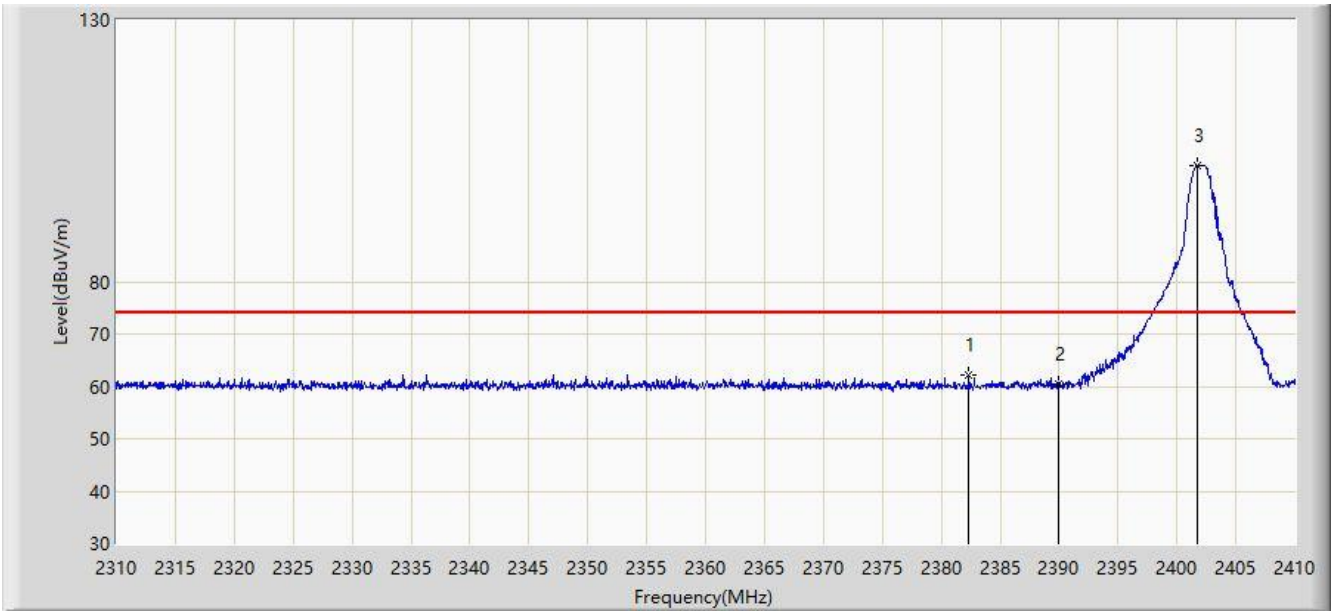
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). 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

7.7.4.Test Setup



7.7.5.Test Result

Site: AC2	Time: 2020/06/22 - 13:59
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2402MHz – Ant 0	

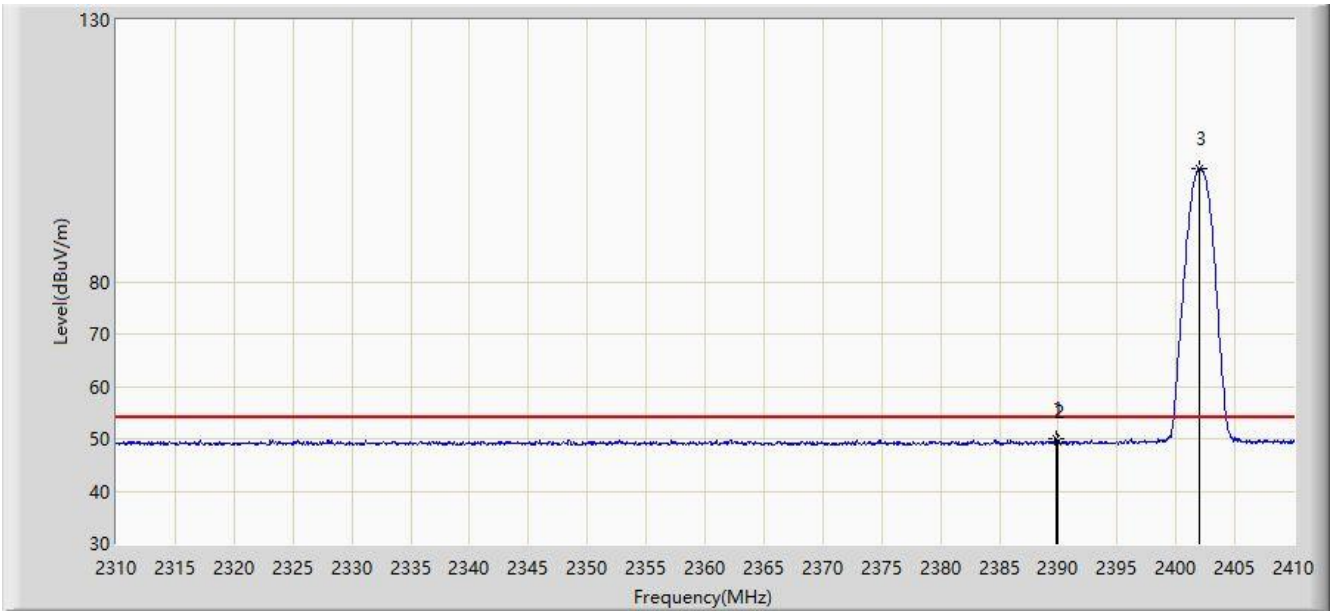


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2382.350	62.206	29.530	-11.794	74.000	32.676	PK
2			2390.000	60.485	27.773	-13.515	74.000	32.712	PK
3		*	2401.700	102.250	69.506	N/A	N/A	32.744	PK

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

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

Site: AC2	Time: 2020/06/22 - 14:18
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2402MHz – Ant 0	

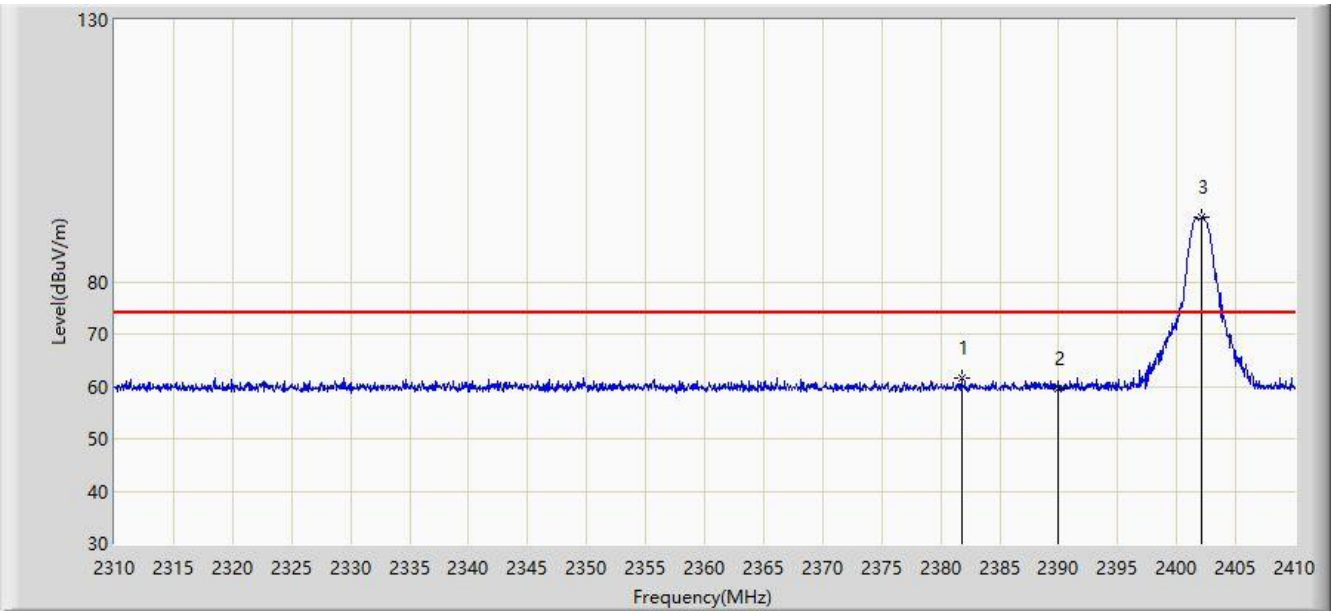


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.800	50.029	17.318	-3.971	54.000	32.711	AV
2			2390.000	49.416	16.704	-4.584	54.000	32.712	AV
3		*	2402.000	101.667	68.923	N/A	N/A	32.744	AV

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

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

Site: AC2	Time: 2020/06/22 - 14:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2402MHz – Ant 0	

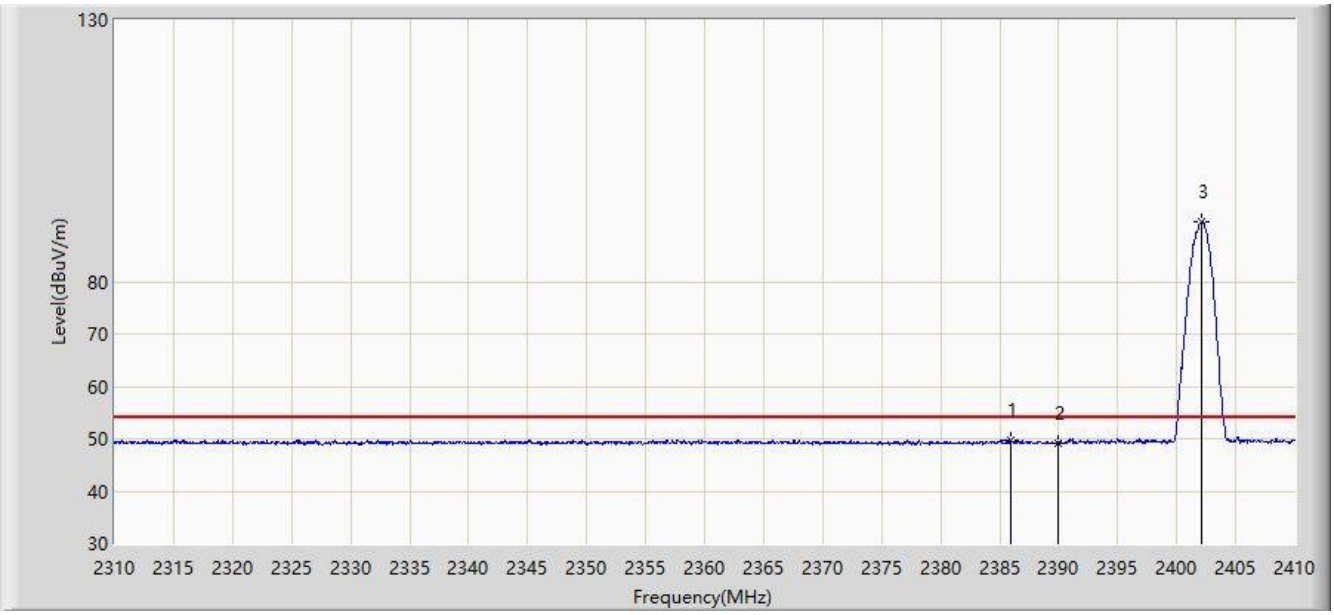


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2381.800	61.508	28.834	-12.492	74.000	32.673	PK
2			2390.000	59.615	26.903	-14.385	74.000	32.712	PK
3		*	2402.150	92.285	59.541	N/A	N/A	32.744	PK

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

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

Site: AC2	Time: 2020/06/22 - 14:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2402MHz – Ant 0	

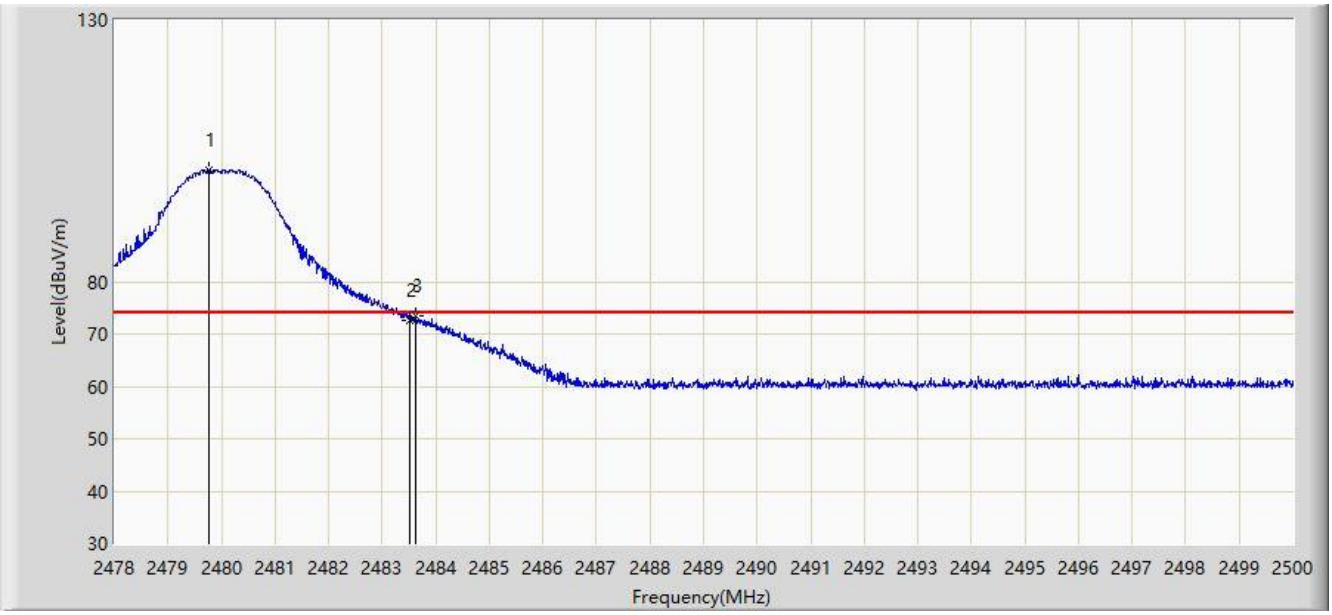


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2386.000	49.668	16.975	-4.332	54.000	32.693	AV
2			2390.000	49.225	16.513	-4.775	54.000	32.712	AV
3		*	2402.100	91.366	58.622	N/A	N/A	32.744	AV

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

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

Site: AC2	Time: 2020/06/22 - 14:39
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2480MHz – Ant 0	

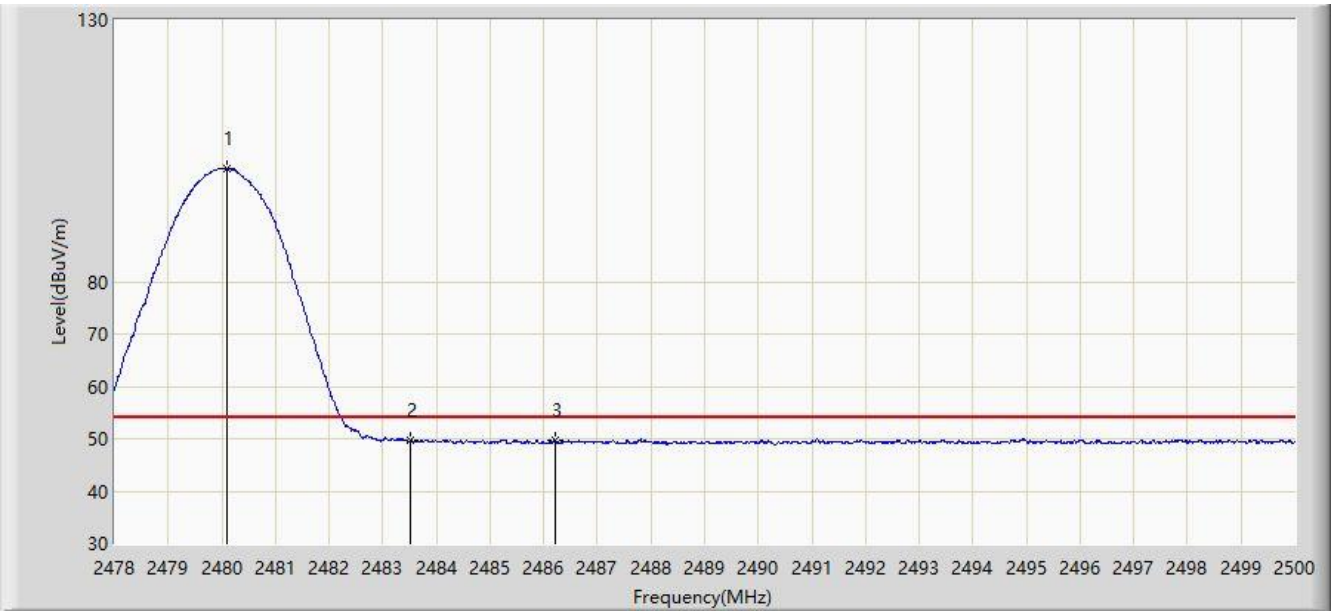


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.771	101.819	69.136	N/A	N/A	32.683	PK
2			2483.500	72.623	39.973	-1.377	74.000	32.651	PK
3			2483.621	73.533	40.884	-0.467	74.000	32.649	PK

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

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

Site: AC2	Time: 2020/06/22 - 14:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2480MHz – Ant 0	

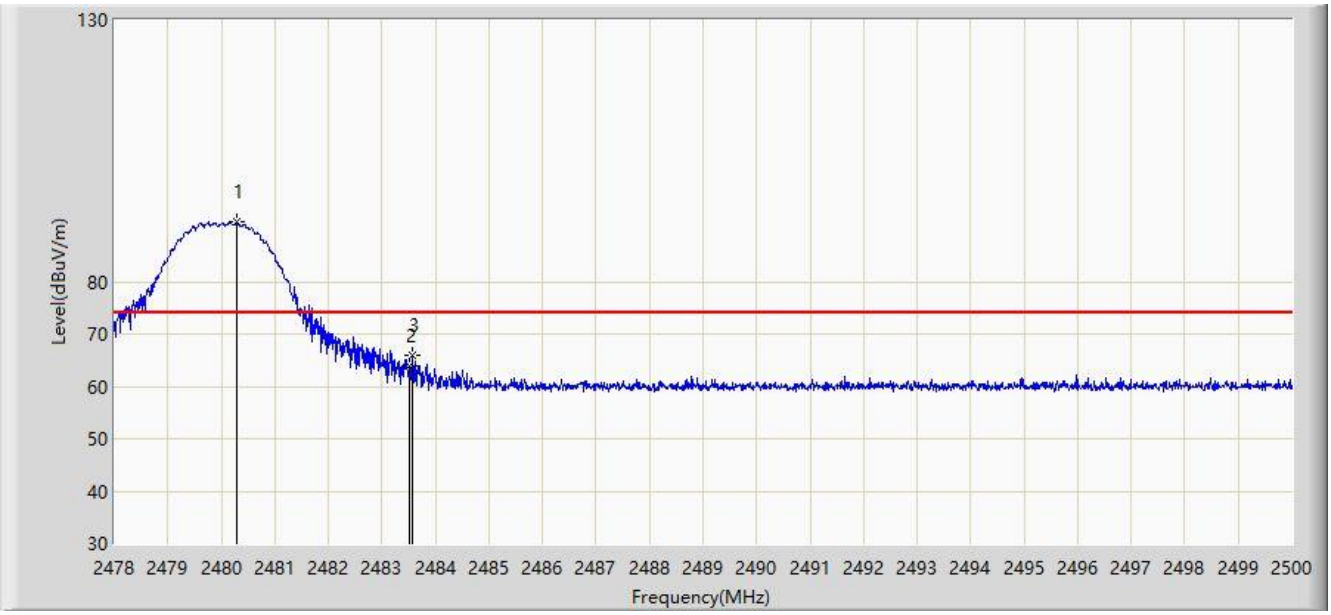


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.090	101.631	68.951	N/A	N/A	32.680	AV
2			2483.500	49.729	17.079	-4.271	54.000	32.651	AV
3			2486.217	49.813	17.186	-4.187	54.000	32.627	AV

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

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

Site: AC2	Time: 2020/06/22 - 14:46
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2480MHz – Ant 0	

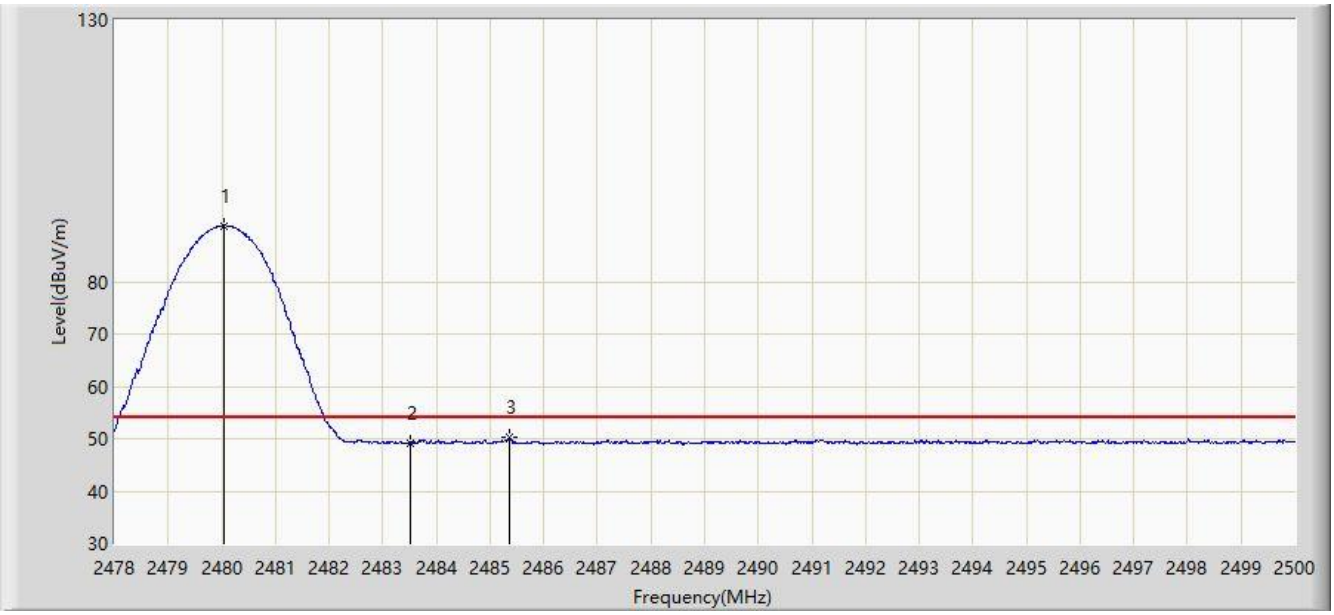


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.288	91.351	58.673	N/A	N/A	32.678	PK
2			2483.500	64.023	31.373	-9.977	74.000	32.651	PK
3			2483.577	65.948	33.298	-8.052	74.000	32.650	PK

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

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

Site: AC2	Time: 2020/04/20 - 11:14
Limit: FCC_Part15.209_RE(3m)	Engineer: Dandy Li
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2480MHz – Ant 0	

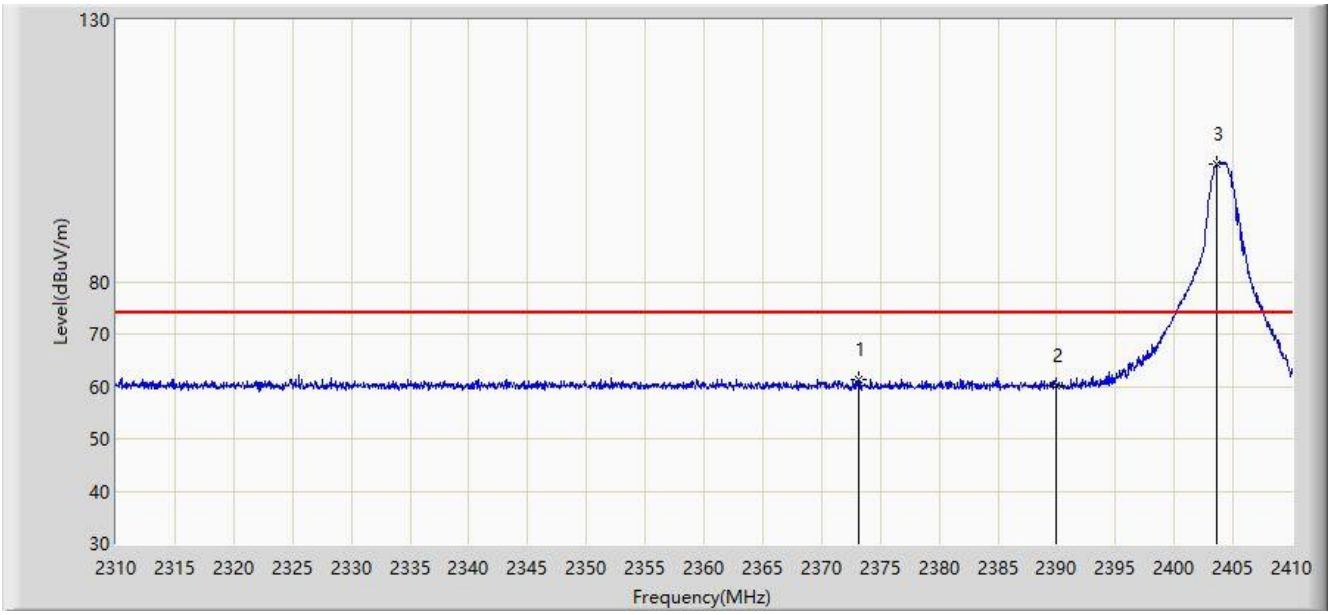


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2480.035	90.715	58.035	N/A	N/A	32.681	AV
2			2483.500	49.256	16.606	-4.744	54.000	32.651	AV
3			2485.359	50.220	17.586	-3.780	54.000	32.634	AV

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

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

Site: AC2	Time: 2020/06/22 - 14:48
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2402MHz – Ant 1	

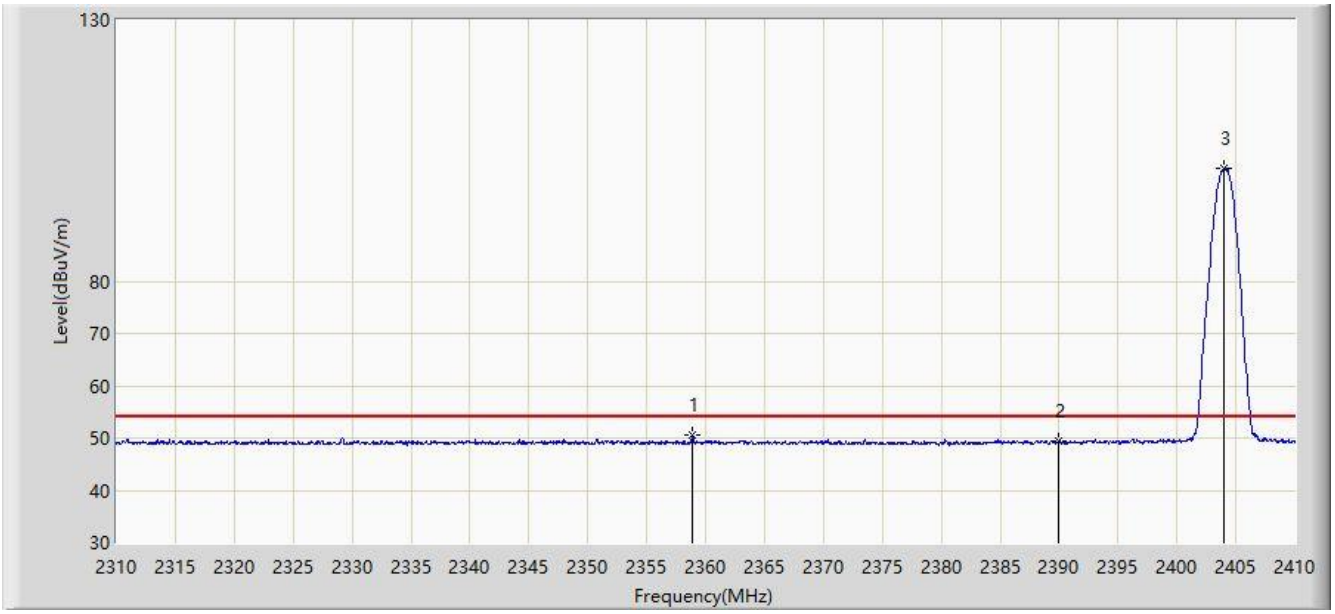


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2373.100	61.422	28.724	-12.578	74.000	32.699	PK
2			2390.000	60.096	27.384	-13.904	74.000	32.712	PK
3		*	2403.650	102.597	69.856	N/A	N/A	32.741	PK

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

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

Site: AC2	Time: 2020/06/22 - 14:54
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2402MHz – Ant 1	

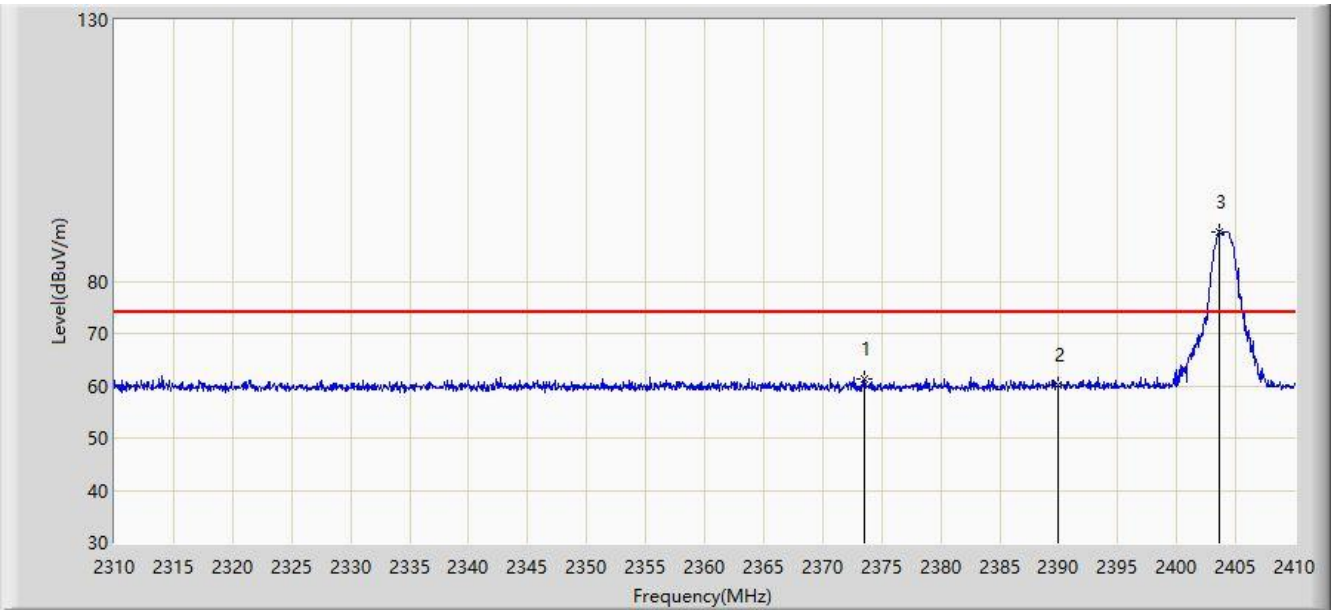


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2358.900	50.470	17.704	-3.530	54.000	32.766	AV
2			2390.000	49.281	16.569	-4.719	54.000	32.712	AV
3		*	2404.000	101.642	68.901	N/A	N/A	32.741	AV

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

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

Site: AC2	Time: 2020/06/22 - 14:57
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2402MHz – Ant 1	

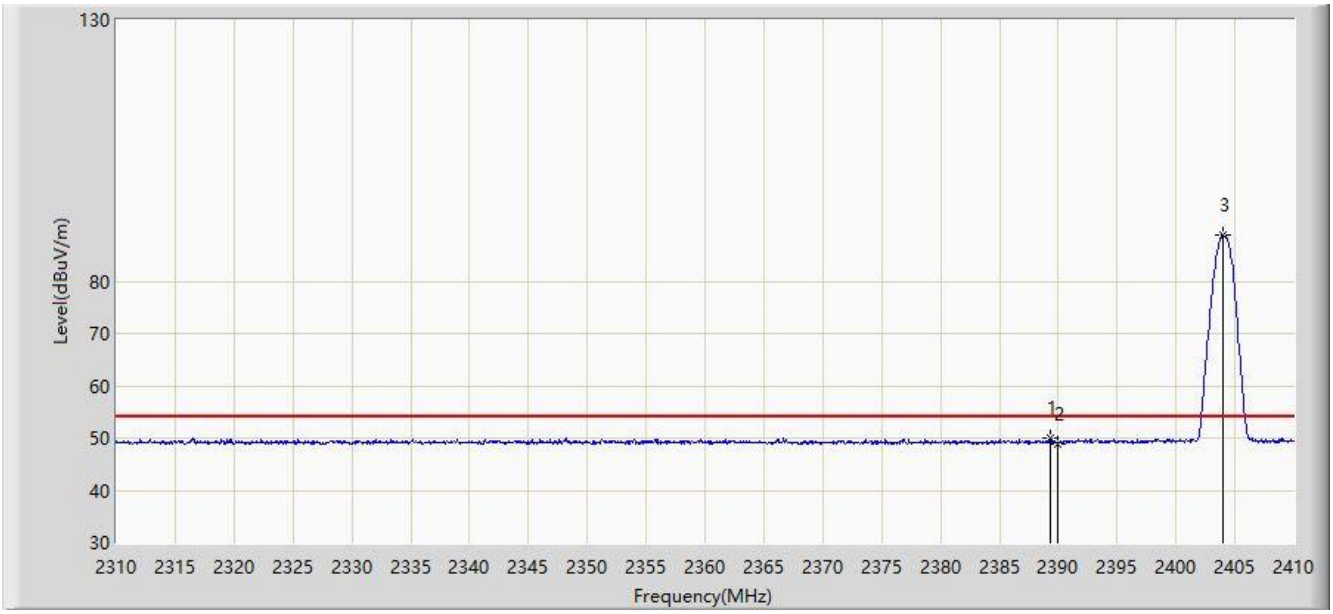


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2373.500	61.442	28.746	-12.558	74.000	32.696	PK
2			2390.000	60.250	27.538	-13.750	74.000	32.712	PK
3		*	2403.650	89.565	56.824	N/A	N/A	32.741	PK

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

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

Site: AC2	Time: 2020/06/22 - 14:55
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2402MHz – Ant 1	

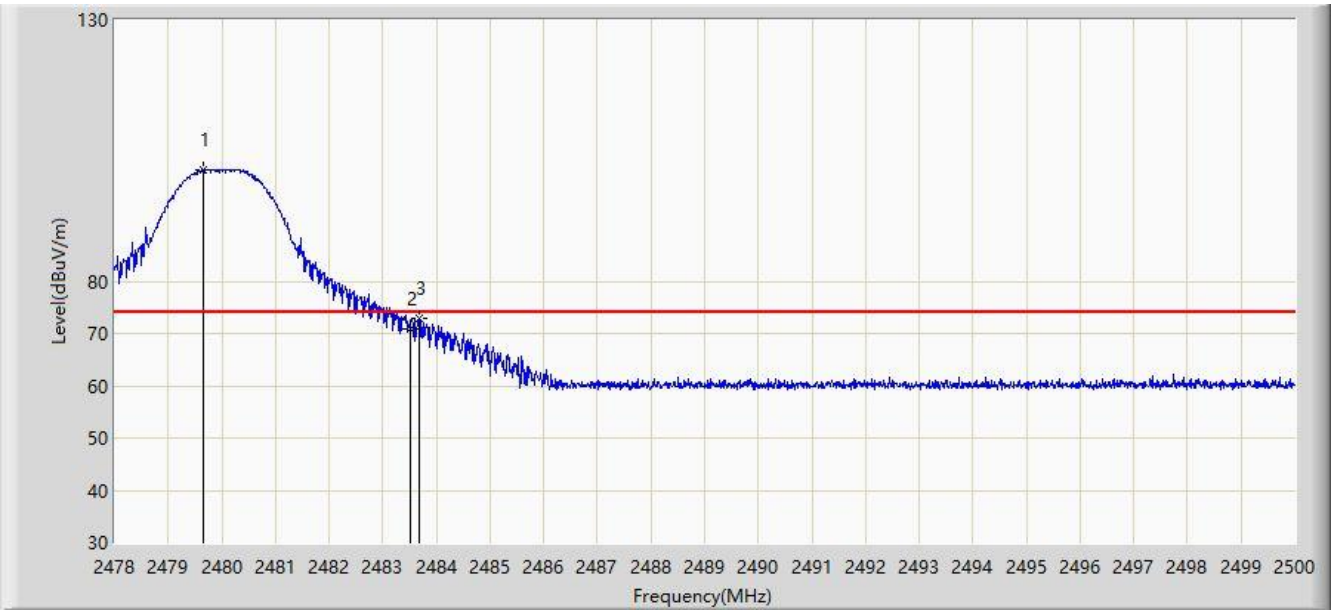


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			2389.300	49.868	17.159	-4.132	54.000	32.709	AV
2			2390.000	48.936	16.224	-5.064	54.000	32.712	AV
3		*	2403.950	88.890	56.149	N/A	N/A	32.741	AV

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

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

Site: AC2	Time: 2020/06/22 - 15:05
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2480MHz – Ant 1	

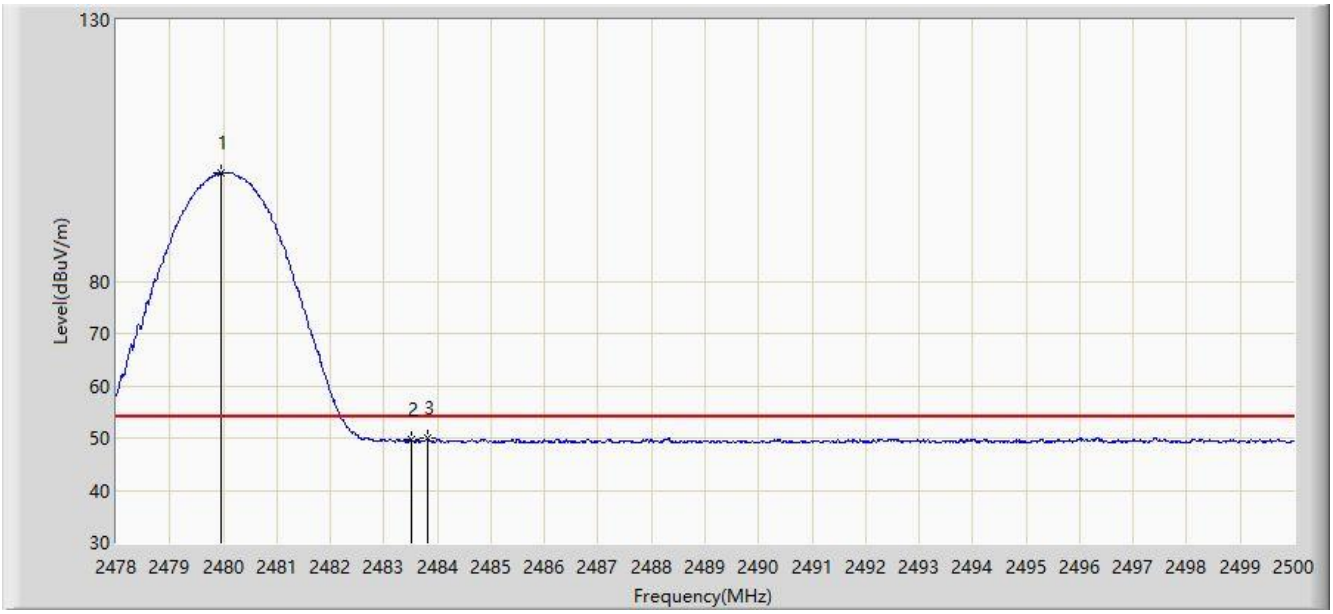


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.661	101.278	68.594	N/A	N/A	32.684	PK
2			2483.500	70.934	38.284	-3.066	74.000	32.651	PK
3			2483.676	72.952	40.303	-1.048	74.000	32.648	PK

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

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

Site: AC2	Time: 2020/06/22 - 15:07
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2480MHz – Ant 1	

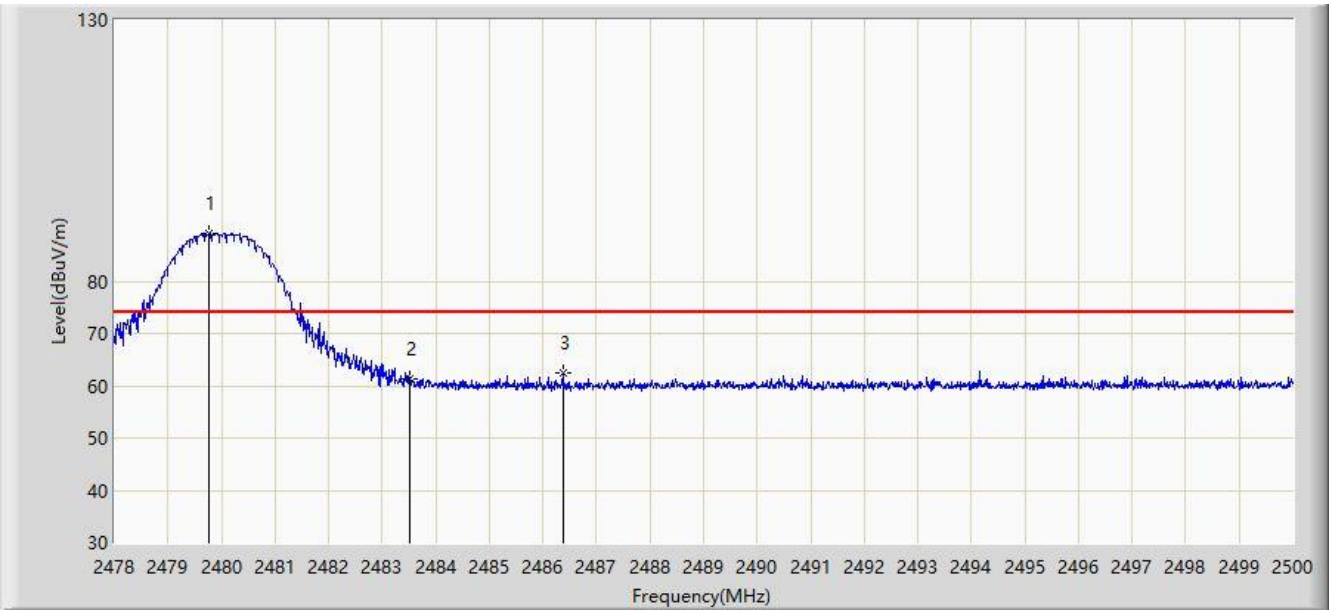


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.958	100.656	67.975	N/A	N/A	32.682	AV
2			2483.500	49.851	17.201	-4.149	54.000	32.651	AV
3			2483.819	49.911	17.263	-4.089	54.000	32.647	AV

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

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

Site: AC2	Time: 2020/06/22 - 15:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2480MHz – Ant 1	

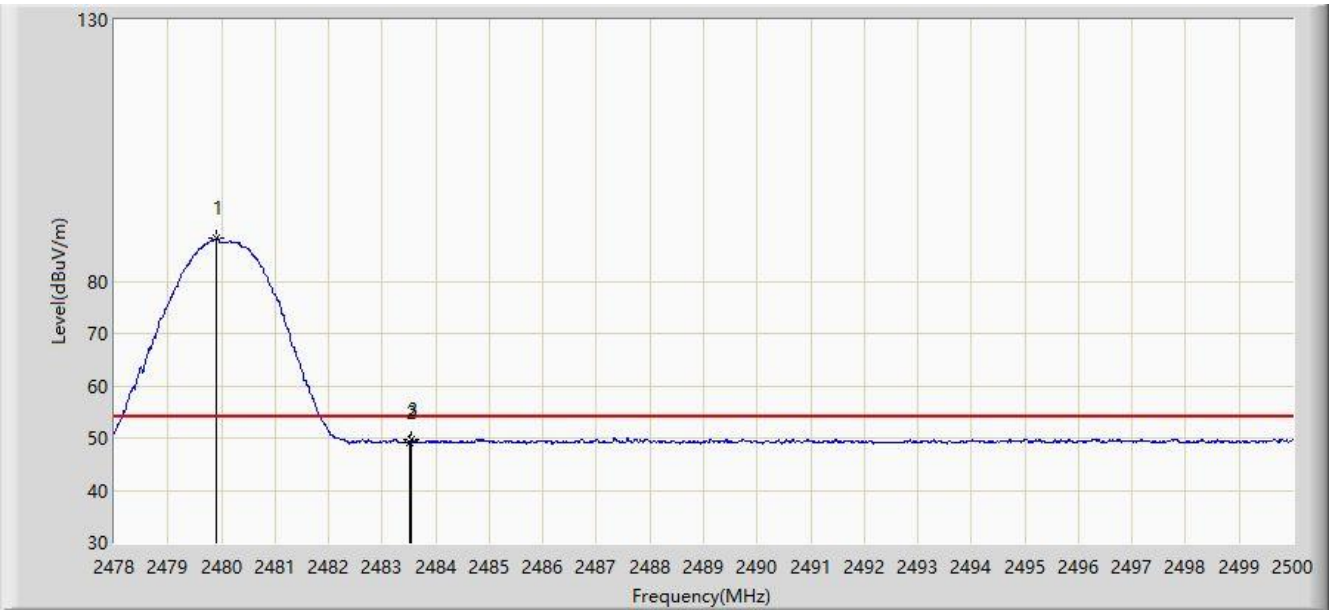


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.771	89.249	56.566	N/A	N/A	32.683	PK
2			2483.500	61.227	28.577	-12.773	74.000	32.651	PK
3			2486.371	62.413	29.788	-11.587	74.000	32.626	PK

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

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

Site: AC2	Time: 2020/06/22 - 15:09
Limit: FCC_Part15.209_RE(3m)	Engineer: Antony Yang
Probe: AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: AXON BLE	Power: By USB
Test Mode: Transmit by BLE at channel 2480MHz – Ant 1	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		*	2479.914	88.275	55.593	N/A	N/A	32.682	AV
2			2483.500	49.069	16.419	-4.931	54.000	32.651	AV
3			2483.533	49.627	16.977	-4.373	54.000	32.650	AV

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

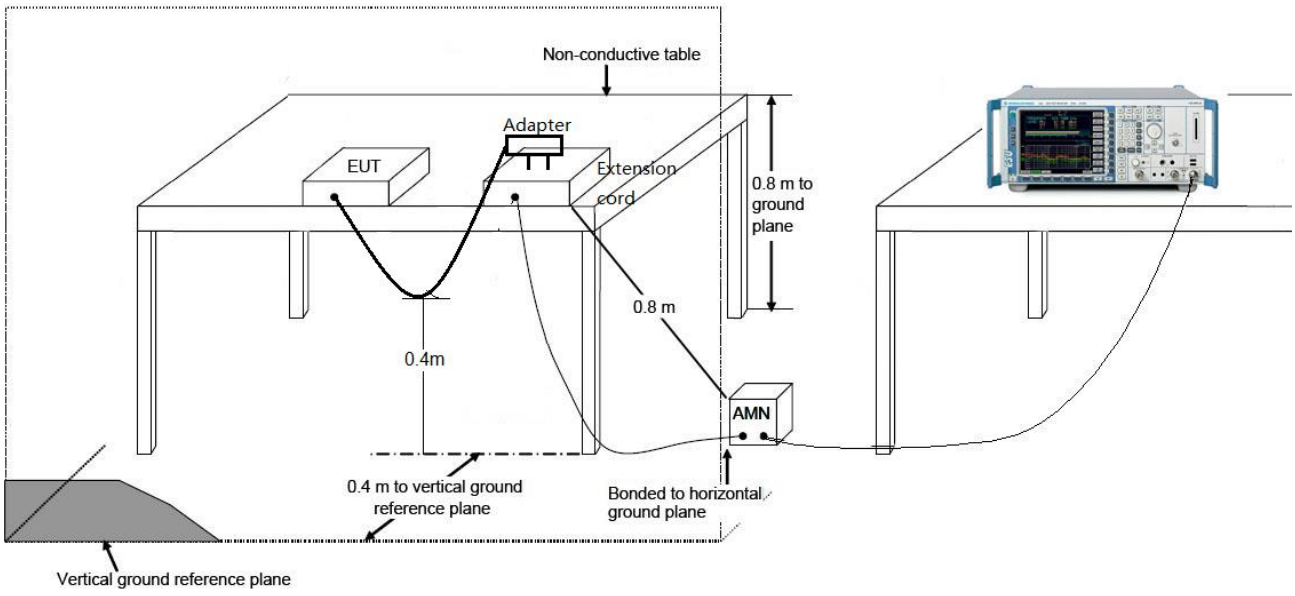
Factor (dB) = Cable Loss (dB) + Antenna Factor (dB/m)

7.8. AC Conducted Emissions Measurement

7.8.1.Test Limit

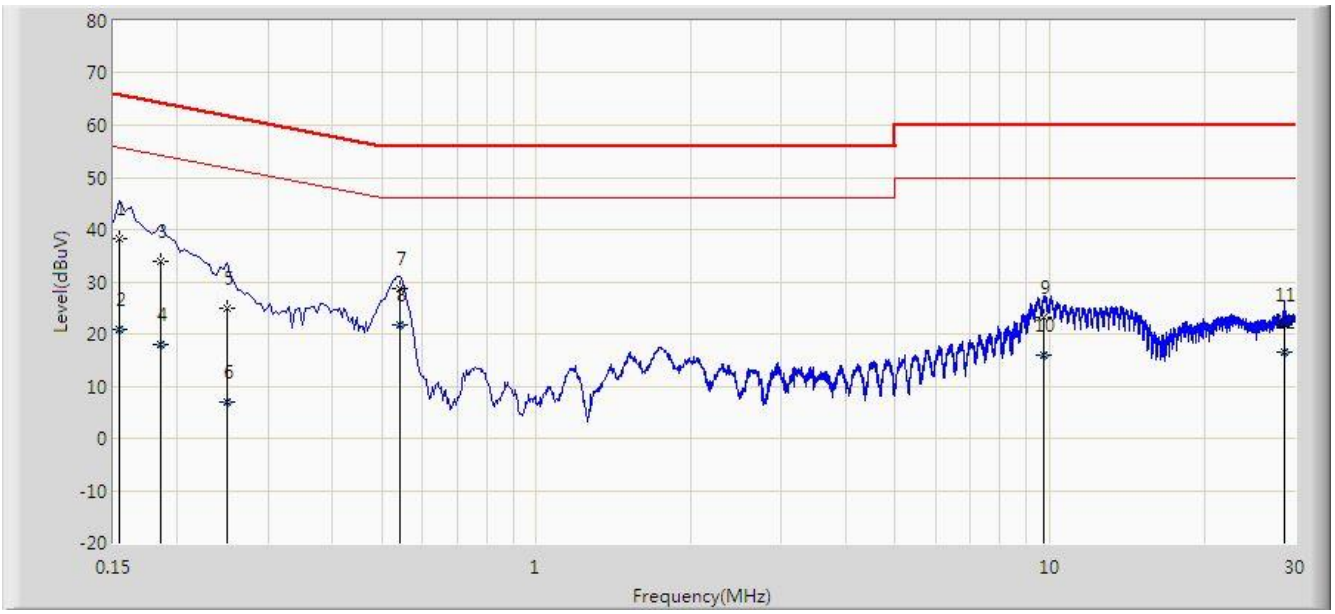
FCC Part 15 Subpart C Paragraph 15.207 / RSS-Gen Issue 5 Section 8.8 Limits		
Frequency (MHz)	QP (dBμV)	Average (dBμV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50
Note 1: The lower limit shall apply at the transition frequencies. Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.		

7.8.2.Test Setup



7.8.3.Test Result

Site: SR2	Time: 2020/06/23 - 14:49
Limit: FCC_Part15.207_CE_AC Power	Engineer: Hyde Yu
Probe: ENV216_101683_Filter On	Polarity: Line
EUT: AXON BLE	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at Channel 2402MHz – Ant 0	

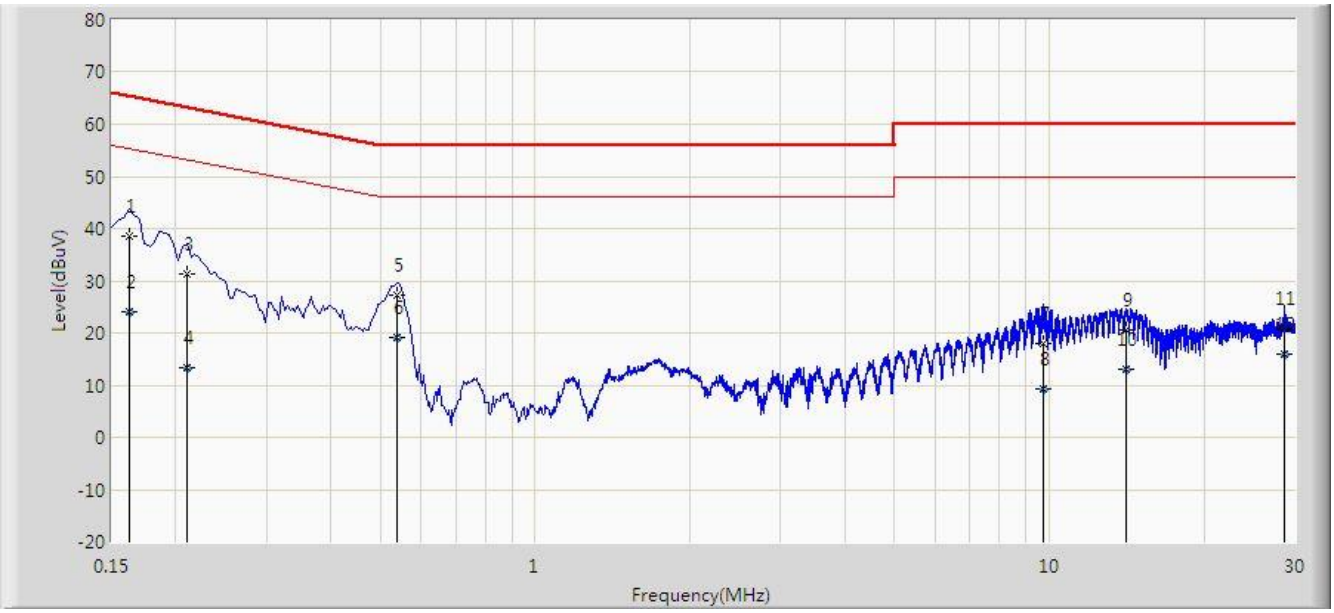


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.154	38.144	28.499	-27.637	65.781	9.645	QP
2			0.154	20.754	11.109	-35.027	55.781	9.645	AV
3			0.186	33.977	24.319	-30.237	64.213	9.657	QP
4			0.186	18.045	8.387	-36.168	54.213	9.657	AV
5			0.250	24.993	15.329	-36.764	61.757	9.664	QP
6			0.250	6.887	-2.777	-44.870	51.757	9.664	AV
7			0.542	28.569	18.824	-27.431	56.000	9.746	QP
8		*	0.542	21.619	11.874	-24.381	46.000	9.746	AV
9			9.742	23.102	12.715	-36.898	60.000	10.387	QP
10			9.742	15.959	5.572	-34.041	50.000	10.387	AV
11			28.682	21.664	11.123	-38.336	60.000	10.541	QP
12			28.682	16.655	6.114	-33.345	50.000	10.541	AV

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

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

Site: SR2	Time: 2020/06/23 - 15:02
Limit: FCC_Part15.207_CE_AC Power	Engineer: Hyde Yu
Probe: ENV216_101683_Filter On	Polarity: Neutral
EUT: AXON BLE	Power: AC 120V/60Hz
Test Mode: Transmit by BLE at Channel 2402MHz – Ant 0	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.162	38.562	28.954	-26.799	65.361	9.608	QP
2			0.162	23.974	14.366	-31.387	55.361	9.608	AV
3			0.210	31.234	21.609	-31.971	63.205	9.625	QP
4			0.210	13.326	3.701	-39.879	53.205	9.625	AV
5			0.538	27.148	17.483	-28.852	56.000	9.665	QP
6		*	0.538	19.239	9.575	-26.761	46.000	9.665	AV
7			9.710	17.834	7.570	-42.166	60.000	10.264	QP
8			9.710	9.338	-0.926	-40.662	50.000	10.264	AV
9			14.130	20.682	10.499	-39.318	60.000	10.183	QP
10			14.130	13.096	2.913	-36.904	50.000	10.183	AV
11			28.682	20.733	10.200	-39.267	60.000	10.533	QP
12			28.682	15.823	5.290	-34.177	50.000	10.533	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 unit is compliance with Part 15C of the FCC Rules and ISED Rules.

The End

Appendix A - Test Setup Photograph

Refer to “2006RSU024-UT” file.

Appendix B - EUT Photograph

Refer to “2006RSU024-UE” file.