MEASUREMENT REPORT

FCC PART 15.247 / ISED RSS-247 Bluetooth-LE

FCC ID:	2AQV6RABBIT-S
IC:	24210-RABBITS
Applicant:	Suzhou Pairlink Network Technology Ltd.
Application Type:	Certification
Product:	Rabbit Bluetooth 5 BLE module
Model No.:	Rabbit-S
Brand Name:	Pairlink
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part15 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:	July 19 ~ 24, 2021

Reviewed By: Sunny Sun

Approved By: 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.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2107RSU042-U1	Rev. 01	Initial Report	08-31-2021	Valid

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1. GENERAL INFORMATION

1.1. Applicant

Suzhou Pairlink Network Technology Ltd.

Room 117, No.55, Su hong xi Road,Suzhou Industrial Park, Suzhou City, Jiangsu Province, China

1.2. Manufacturer

Suzhou Pairlink Network Technology Ltd.

Room 117, No.55, Su hong xi Road,Suzhou Industrial Park, Suzhou City, Jiangsu Province, China

1.3. Testing Facility

☒	**Test Site – MRT Suzhou Laboratory**	
	Laboratory Location (Suzhou - Wuzhong)	
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China	
	Laboratory Location (Suzhou - SIP)	
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China	
	Laboratory Accreditations	
	A2LA: 3628.01	CNAS: L10551
	FCC: CN1166	ISED: CN0001
	VCCI: R-20025, R-20141, G-20034, G-20134, C-20020, C-20103, T-20020, T-20104	
☐	**Test Site – MRT Shenzhen Laboratory**	
	Laboratory Location (Shenzhen)	
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China	
	Laboratory Accreditations	
	A2LA: 3628.02	CNAS: L10551
	FCC: CN1284	ISED: CN0105
☐	**Test Site – MRT Taiwan Laboratory**	
	Laboratory Location (Taiwan)	
	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)	
	Laboratory Accreditations	
	TAF: L3261-190725	
	FCC: 291082, TW3261	ISED: TW3261

1.4. Product Information

Product Name	Rabbit Bluetooth 5 BLE module
Model No.	Rabbit-S
Test Device Serial No.	Conducted: 18 Radiated & AC Conducted Emission: 06
Hardware Version	V2
Software Version	V1
Brand Name	Pairlink
Bluetooth Specification	v5.0 single mode, BLE only
Operating Temperature	-40 ~ 85°C
Power Type	DC 1.8V ~ 3.6V
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification under Test

Frequency Range	2402 ~ 2480MHz
Channel Number	40
Type of Modulation	GFSK
Data Rate	1Mbps & 2Mbps
Antenna Type	PCB Antenna
Antenna Gain	-0.41dBi

1.6. Working Frequencies for this report

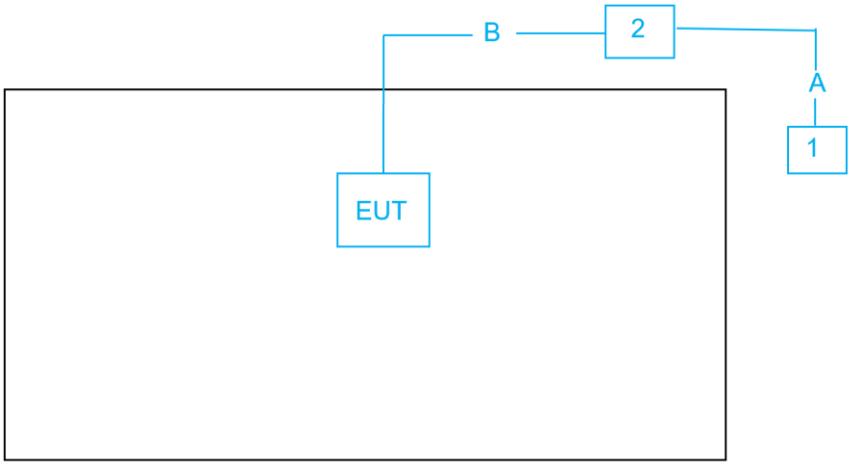
Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 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	--	--	--	--

1.7. Test Mode

Test Modes	Mode 1: Transmit by BLE-1Mbps
	Mode 2: Transmit by BLE-2Mbps

1.8. Configuration of Test System

The measurement procedures and appropriate EUT setup described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) was used in the measurement.

Connection Diagram		
		
Cable Type		Cable Description
A	USB Cable	Shielded, < 2.0m
B	Connect Cable	Non-Shielded, < 1.5m

1.9. Test System Details

The types for all equipment and descriptions of all cables used in the test system (including inserted cards) are:

Product		Manufacturer	Model No.
1	Notebook	Lenovo	E495
2	Serial Interface Board	Suzhou Pairlink Network Technology Ltd	FT232RL

1.10. Test Software

The test utility software used during testing was “RTL8762x_RFTestTool” and version was v1.0.1.7.

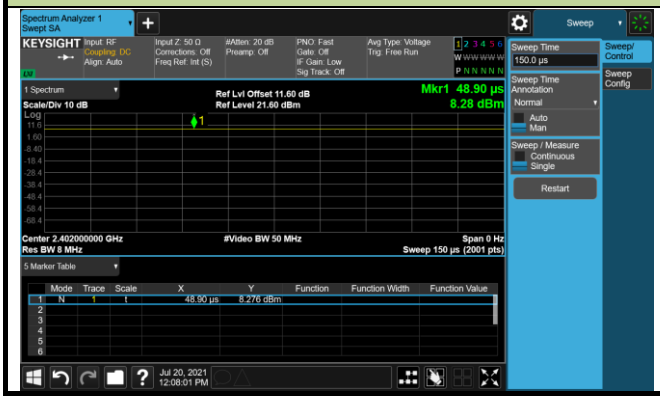
1.11. Test Environment Condition

Ambient Temperature	15°C~35°C
Relative Humidity	20%RH ~75%RH

1.12. Duty Cycle

Bluetooth-LE (DTS) operation is possible in channel bandwidths. The maximum achievable duty cycles for all modes were 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
Mode 1	100%
Mode 2	100%

Duty Cycle (T = Transmission Duration)	
BLE-1Mbps	BLE-2Mbps
	

1.13. EMI Suppression Device(s)/Modifications

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

1.14. 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.

2. 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."

- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

3. TEST EQUIPMENT CALIBRATION DATE

Conducted Emission (WZ-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2022/01/12
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2021/09/09
Thermal Hygrometer	testo	608-H1	MRTSUE06404	1 year	2022/06/28
Shielding Room	MIX-BEP	Chamber-SR2	MRTSUE06215	N/A	N/A

Conducted Emission (SIP-SR2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2022/06/24
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2021/09/09
Thermal Hygrometer	testo	608-H1	MRTSUE06621	1 year	2021/12/03

Radiated Emission (WZ-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2022/01/04
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/08/08
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2021/09/27
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2021/12/14
Microwave System Amplifier	Agilent	83017A	MRTSUE06076	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2022/06/09
Thermal Hygrometer	testo	608-H1	MRTSUE06403	1 year	2022/06/28
Anechoic Chamber	TDK	Chamber-AC1	MRTSUE06212	1 year	2022/04/29

Radiated Emission (WZ-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
MXE EMI Receiver	Keysight	N9038A	MRTSUE06125	1 year	2022/06/24
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2022/05/24
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2021/10/25
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06597	1 year	2021/12/14
Broadband Coaxial Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2021/11/14
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2022/06/09
Thermal Hygrometer	Minggao	ETH529	MRTSUE06170	1 year	2021/12/08
Anechoic Chamber	RIKEN	Chamber-AC2	MRTSUE06213	1 year	2022/04/29

Radiated Emission (SIP-AC1)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2022/06/24
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2022/06/24
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06645	1 year	2021/08/30
Double Ridged Horn Antenna	R&S	HF907	MRTSUE06610	1 year	2021/08/30
Preamplifier	EMCI	EMC051845SE	MRTSUE06600	1 year	2021/11/12
Thermal Hygrometer	testo	608-H1	MRTSUE06620	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC1	MRTSUE06554	1 year	2021/12/24

Radiated Emission (SIP-AC2)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06613	1 year	2022/06/24
MXA Signal Analyzer	Keysight	N9020B	MRTSUE06604	1 year	2021/09/26
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06646	1 year	2021/08/30
Horn Antenna	Schwarzbeck	BBHA9120D	MRTSUE06648	1 year	2021/11/26
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06599	1 year	2021/11/26
Preamplifier	EMCI	EMC051845SE	MRTSUE06644	1 year	2021/11/12
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2021/10/13
Thermal Hygrometer	testo	608-H1	MRTSUE06624	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC2	MRTSUE06781	1 year	2021/12/24

Radiated Emission (SIP-AC3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2022/06/24
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2022/06/24
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/11/08
Bilog Period Antenna	Schwarzbeck	VULB9168	MRTSUE06647	1 year	2021/08/08
Double Ridged Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2021/09/13
Horn Antenna	Schwarzbeck	BBHA9170	MRTSUE06598	1 year	2021/11/26
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2022/01/14
Preamplifier	EMCI	EMC184045SE	MRTSUE06641	1 year	2022/01/14
Thermal Hygrometer	testo	608-H1	MRTSUE06622	1 year	2021/12/03
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2021/12/24

Conducted Test Equipment (WZ-TR3)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
EXA Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2022/04/13
EXA Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2022/01/07
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2022/04/13
Power Meter	Agilent	U2021XA	MRTSUE06030	1 year	2021/10/22
USB wideband power sensor	Keysight	U2021XA	MRTSUE06446	1 year	2021/08/30
USB wideband power sensor	Keysight	U2021XA	MRTSUE06447	1 year	2022/06/08
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2022/06/08
Audio Analyzer	Agilent	U8903B	MRTSUE06143	1 year	2022/05/19
Modulation Analyzer	HP	HP8901A	MRTSUE06098	1 year	2021/09/26
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Attenuator	MVE	3dB	MRTSUE06529	1 year	2021/12/12
Attenuator	MVE	6dB	MRTSUE06534	1 year	2021/12/12
Attenuator	MVE	10dB	MRTSUE06540	1 year	2021/12/12
Attenuator	MVE	20dB	MRTSUE06547	1 year	2021/12/12
DC Power Supply	GWINSTEK	DPS-3303C	MRTSUE06064	N/A	N/A
Temperature & Humidity Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2021/10/22
Thermal Hygrometer	testo	608-H1	MRTSUE06401	1 year	2022/06/28

Conducted Test Equipment (SIP-SR5)

Instrument	Manufacturer	Type No.	Asset No.	Cali. Interval	Cali. Due Date
Signal Analyzer	R&S	FSV40	MRTSUE06218	1 year	2022/04/13
PXA Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2021/08/30
USB wideband power sensor	Agilent	U2021XA	MRTSUE06595	1 year	2021/09/26
USB wideband power sensor	Agilent	U2021XA	MRTSUE06596	1 year	2021/09/26
Wideband Radio Communication Tester	R&S	CMW 500	MRTSUE06243	1 year	2021/10/20
Bluetooth Test Set	Anritsu	MT8852B-042	MRTSUE06389	1 year	2022/06/08
Attenuator	MVE	3dB	MRTSUE06530	1 year	2021/12/12
Attenuator	MVE	6dB	MRTSUE06535	1 year	2021/12/12
Attenuator	MVE	10dB	MRTSUE06541	1 year	2021/12/12
Attenuator	MVE	20dB	MRTSUE06548	1 year	2021/12/12
Temperature Chamber	BAOYT	BYG-408CS	MRTSUE06847	1 year	2022/02/23
Thermal Hygrometer	testo	622	MRTSUE06629	1 year	2021/11/25

Software	Version	Function
EMI Software	V3	EMI Test Software

4. 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: 9KHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~6GHz: 6.40dB Vertical: 9KHz~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%

5. TEST RESULT

5.1. 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 5.2
N/A	RSS-Gen [6.7]	99% Bandwidth	N/A		Pass	
15.247(b)(3)	RSS-247 [5.4(d)]	Output Power	≤ 1Watt (30dBm) & EIRP ≤ 4Watt (36dBm)		Pass	Section 5.3
15.247(e)	RSS-247 [5.2]	Power Spectral Density	≤ 8dBm/3kHz		Pass	Section 5.4
15.247(d)	RSS-247 [5.5]	Band Edge / Out-of-Band Emissions	20dBc		Pass	Section 5.5
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 5.6 & 5.7
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz - 30MHz	< FCC 15.207 limits	Line Conducted	Pass	Section 5.8

Notes:

1) For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represented 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.

5.2. Occupied Bandwidth Measurement

5.2.1.Test Limit

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

5.2.2.Test Procedure used

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

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

5.2.3.Test Setting

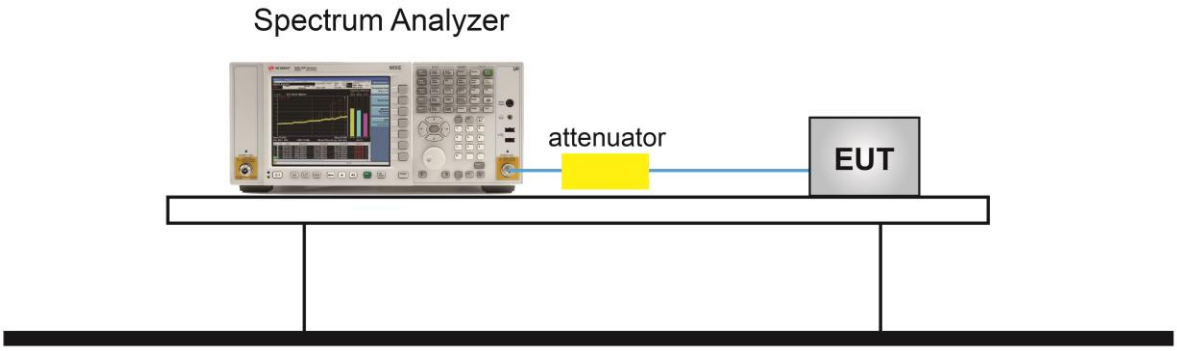
For 6dB bandwidth

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

5.2.4.Test Setup



5.2.5.Test Result

Test Site	WZ-TR3	Test Engineer	Luis Yang
Test Date	2021/07/20 ~ 2021/07/24		

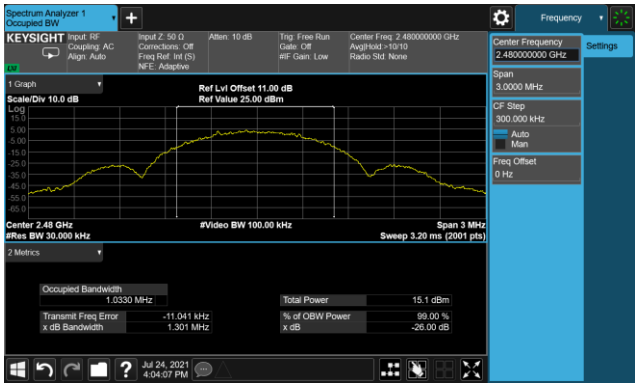
Test Mode	Channel No.	Frequency (MHz)	6dB Bandwidth (kHz)	Limit (kHz)	99% Bandwidth (kHz)	Result
Mode 1	00	2402	669.1	≥ 500	1046.7	Pass
	19	2440	668.6	≥ 500	1040.5	Pass
	39	2480	707.7	≥ 500	1033.0	Pass
Mode 2	00	2402	1376.0	≥ 500	2092.3	Pass
	19	2440	1323.0	≥ 500	2084.6	Pass
	39	2480	1365.0	≥ 500	2063.0	Pass

BLE-1Mbps 6dB Bandwidth

Channel 00 (2402MHz)

Channel 19 (2440MHz)

Channel 39 (2480MHz)

BLE-1Mbps 99% Bandwidth	
Channel 00 (2402MHz)	Channel 19 (2440MHz)
Channel 39 (2480MHz)	
	

BLE-2Mbps 6dB Bandwidth

Channel 00 (2402MHz)

Channel 19 (2440MHz)

Channel 39 (2480MHz)

BLE-2Mbps 99% Bandwidth

Channel 00 (2402MHz)

Channel 19 (2440MHz)

Channel 39 (2480MHz)

5.3. Output Power Measurement

5.3.1.Test Limit

The maximum out power shall be less 1 Watt (30dBm) and the E.I.R.P shall not exceed 4 Watt (36dBm).

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.

5.3.2.Test Procedure Used

ANSI C63.10-2013 - Section 11.9.1.3 PKPM1 Peak-reading power meter method

ANSI C63.10-2013 - Section 11.9.2.3.2 Method AVGPM-G

5.3.3.Test Setting

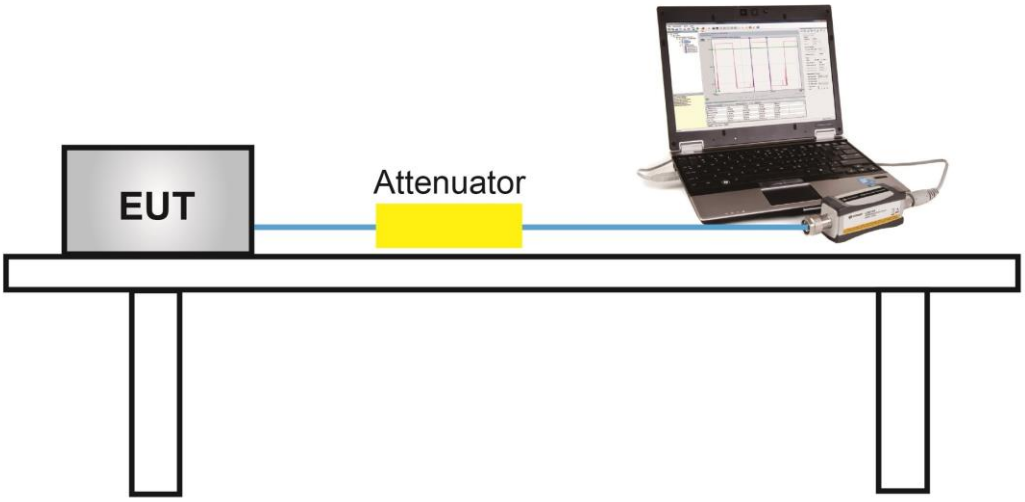
Method PKPM1 (Peak power measurement)

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.

5.3.4.Test Setup



5.3.5.Test Result

Test Site	WZ-TR3	Test Engineer	Luis Yang
Test Date	2021/07/19 ~ 2021/07/20		

Test Result of Peak Output Power

Test Mode	Channel No.	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Max EIRP (dBm)	EIRP Limit (dBm)	Result
Peak Output Power							
Mode 1	00	2402	8.29	≤ 30.00	7.88	≤ 36.00	Pass
	19	2440	8.24	≤ 30.00	7.83	≤ 36.00	Pass
	39	2480	8.13	≤ 30.00	7.72	≤ 36.00	Pass
Mode 2	00	2402	8.29	≤ 30.00	7.88	≤ 36.00	Pass
	19	2440	8.28	≤ 30.00	7.87	≤ 36.00	Pass
	39	2480	8.02	≤ 30.00	7.61	≤ 36.00	Pass
Average Output Power							
Mode 1	00	2402	8.22	≤ 30.00	7.81	≤ 36.00	Pass
	19	2440	8.21	≤ 30.00	7.80	≤ 36.00	Pass
	39	2480	8.01	≤ 30.00	7.60	≤ 36.00	Pass
Mode 2	00	2402	8.21	≤ 30.00	7.80	≤ 36.00	Pass
	19	2440	8.21	≤ 30.00	7.80	≤ 36.00	Pass
	39	2480	7.95	≤ 30.00	7.54	≤ 36.00	Pass

Note: Max EIRP (dBm) = Average Power (dBm) + Antenna Gain (dBi), Antenna Gain = -0.41 dBi.

5.4. Power Spectral Density Measurement

5.4.1.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.

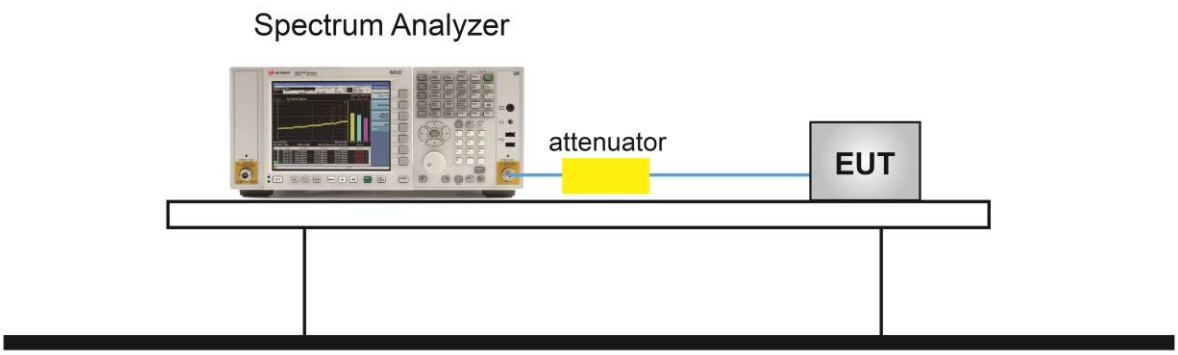
5.4.2.Test Procedure Used

ANSI C63.10-2013 - Section 11.10.2.

5.4.3.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

5.4.4.Test Setup



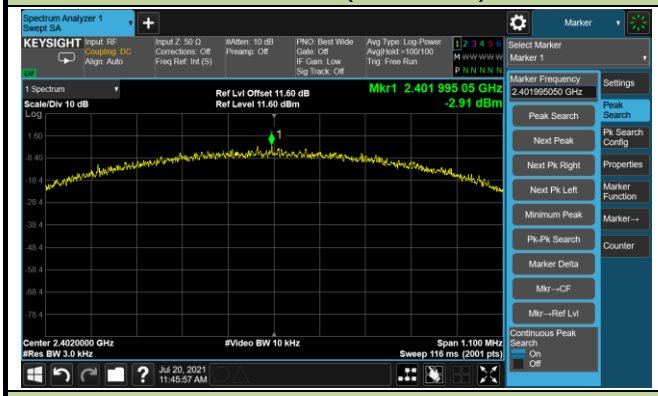
5.4.5.Test Result

Test Site	WZ-TR3	Test Engineer	Luis Yang
Test Date	2021/07/20		

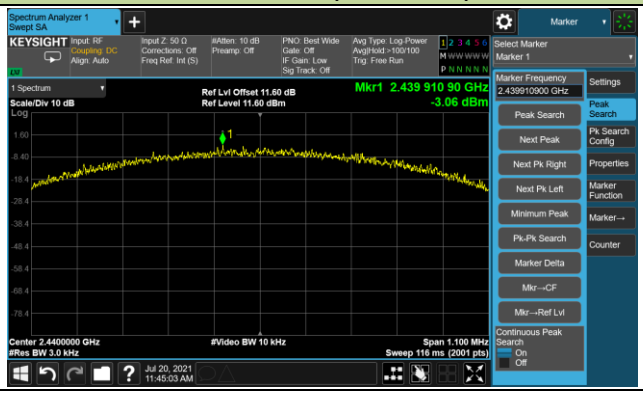
Test Mode	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
Mode 1	00	2402	-2.91	≤ 8.00	Pass
	19	2440	-3.06	≤ 8.00	Pass
	39	2480	-4.42	≤ 8.00	Pass
Mode 2	00	2402	-5.83	≤ 8.00	Pass
	19	2440	-6.72	≤ 8.00	Pass
	39	2480	-6.29	≤ 8.00	Pass

BLE-1Mbps PSD

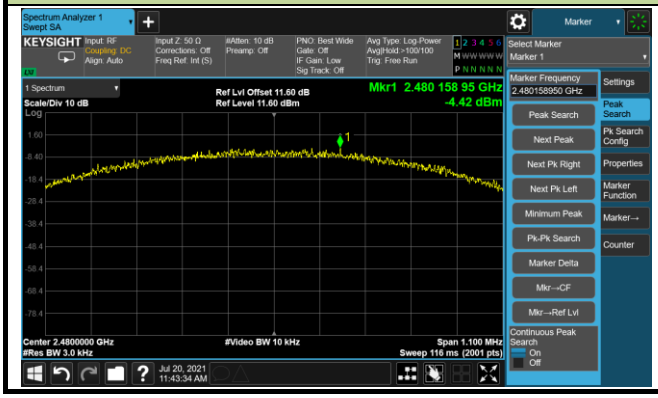
Channel 00 (2402MHz)

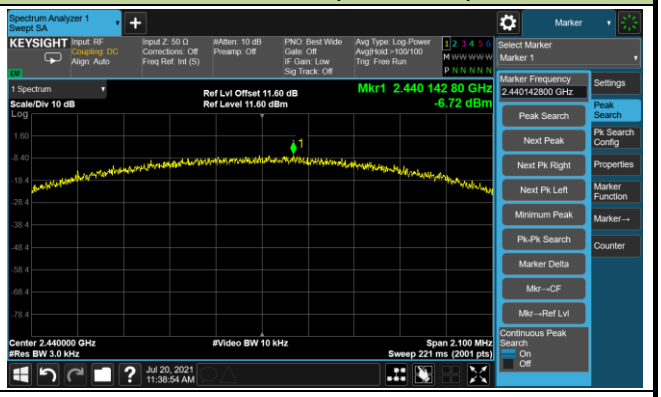
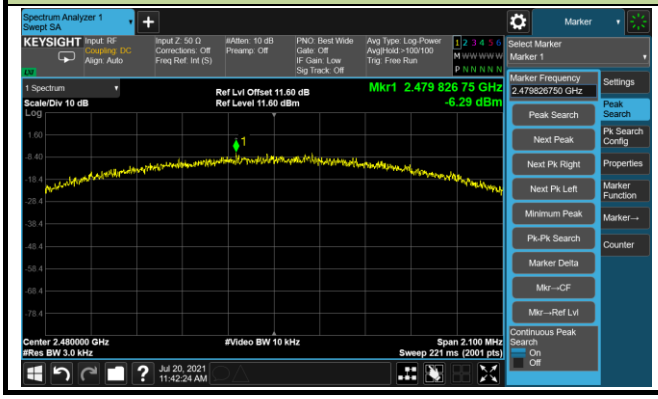


Channel 19 (2440MHz)



Channel 39 (2480MHz)



BLE-2Mbps PSD	
Channel 00 (2402MHz)	Channel 19 (2440MHz)
	
Channel 39 (2480MHz)	
	

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

5.5.1.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.

5.5.2.Test Procedure Used

ANSI C63.10-2013 - Section 11.11.2 & 11.11.3.

5.5.3.Test Setting

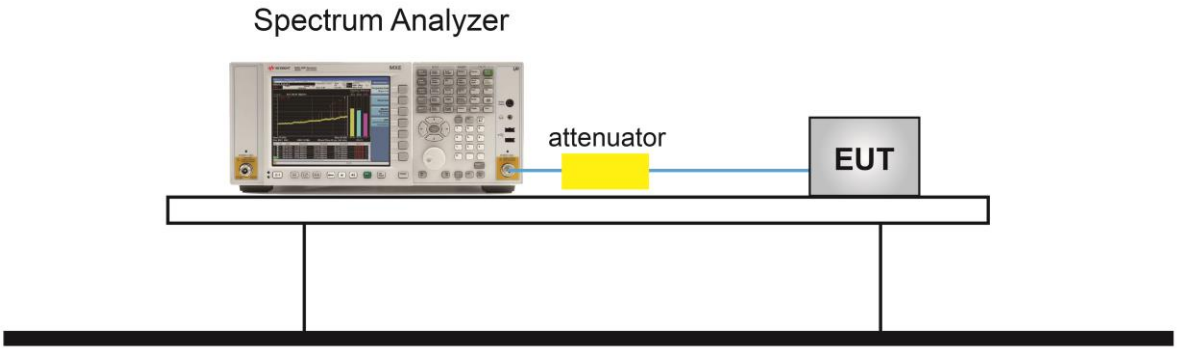
Reference level measurement

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

5.5.4.Test Setup



5.5.5.Test Result

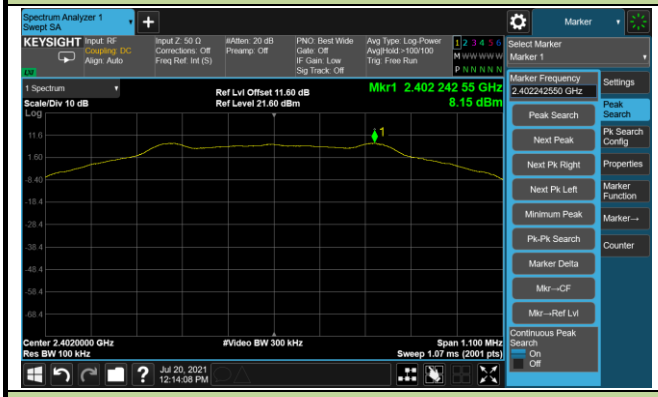
Test Site	WZ-TR3	Test Engineer	Luis Yang
Test Date	2021/07/20		

Test Mode	Channel No.	Frequency (MHz)	Limit (dBc)	Result
Mode 1	00	2402	20	Pass
	19	2440	20	Pass
	39	2480	20	Pass
Mode 2	00	2402	20	Pass
	19	2440	20	Pass
	39	2480	20	Pass

BLE-1Mbps Out-of-Band Emissions

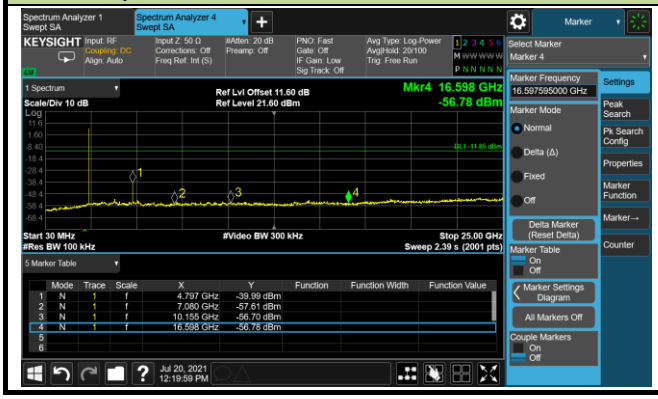
Channel 00 (2402MHz)

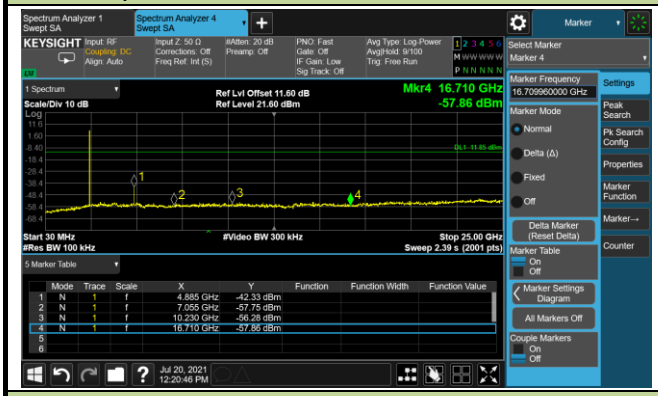
100kHz PSD Reference Level

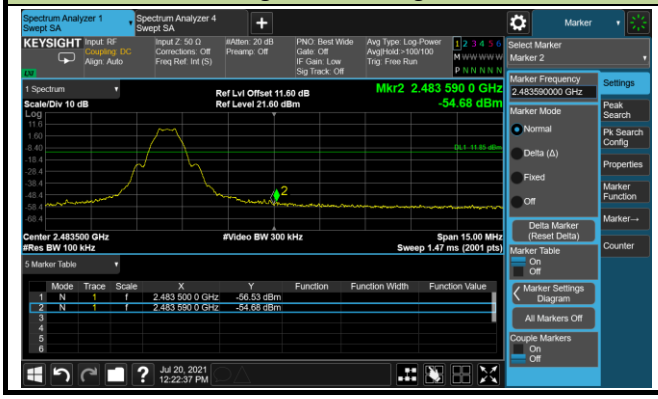
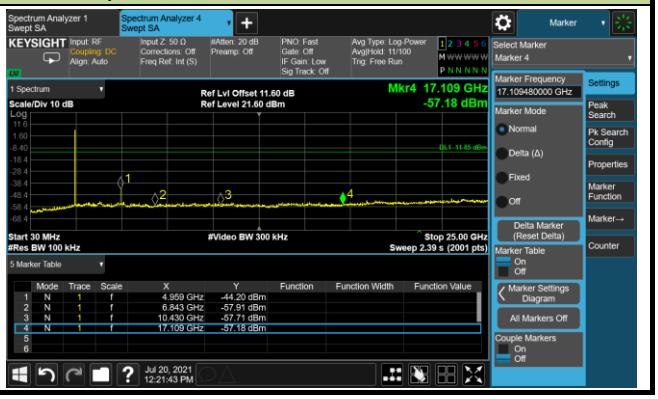


Low Band Edge

Spurious Emission 30MHz ~ 25GHz



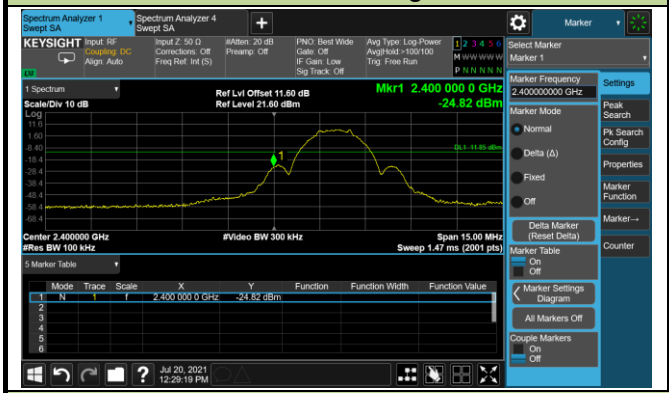
Channel 19 (2440MHz)	
Spurious Emission 30MHz ~ 25GHz	
	

Channel 39 (2480MHz)	
High Band Edge	Spurious Emission 30MHz ~ 25GHz
	

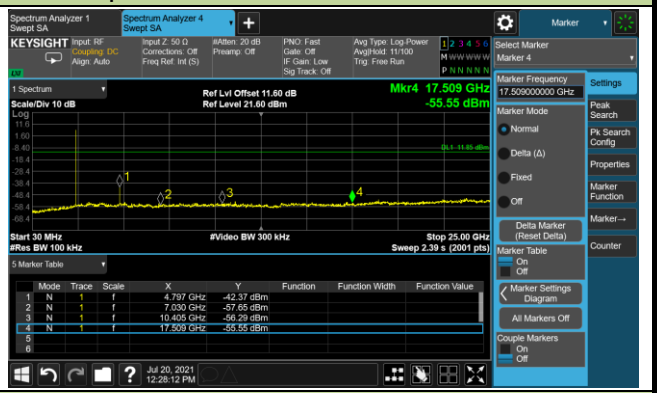
BLE-2Mbps Out-of-Band Emissions

Channel 00 (2402MHz)

Low Band Edge

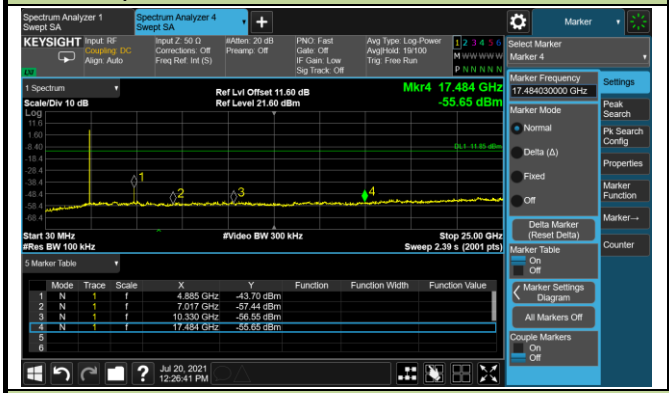


Spurious Emission 30MHz ~ 25GHz



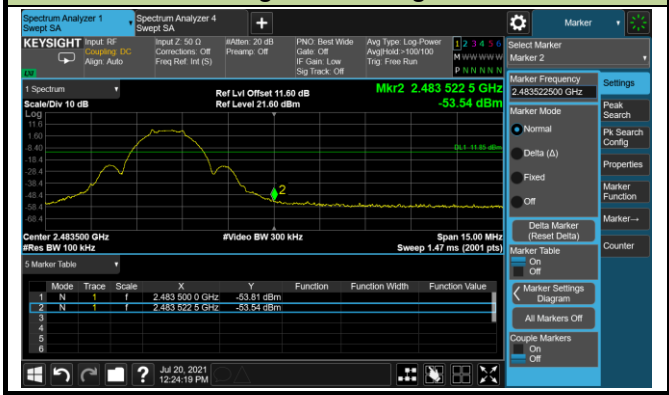
Channel 19 (2440MHz)

Spurious Emission 30MHz ~ 25GHz



Channel 39 (2480MHz)

High Band Edge



Spurious Emission 30MHz ~ 25GHz

5.6. Radiated Spurious Emission Measurement

5.6.1.Test Limit

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 Table per Section 15.209.

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

5.6.2.Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

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

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

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

5.6.3.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 (Method VB)

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

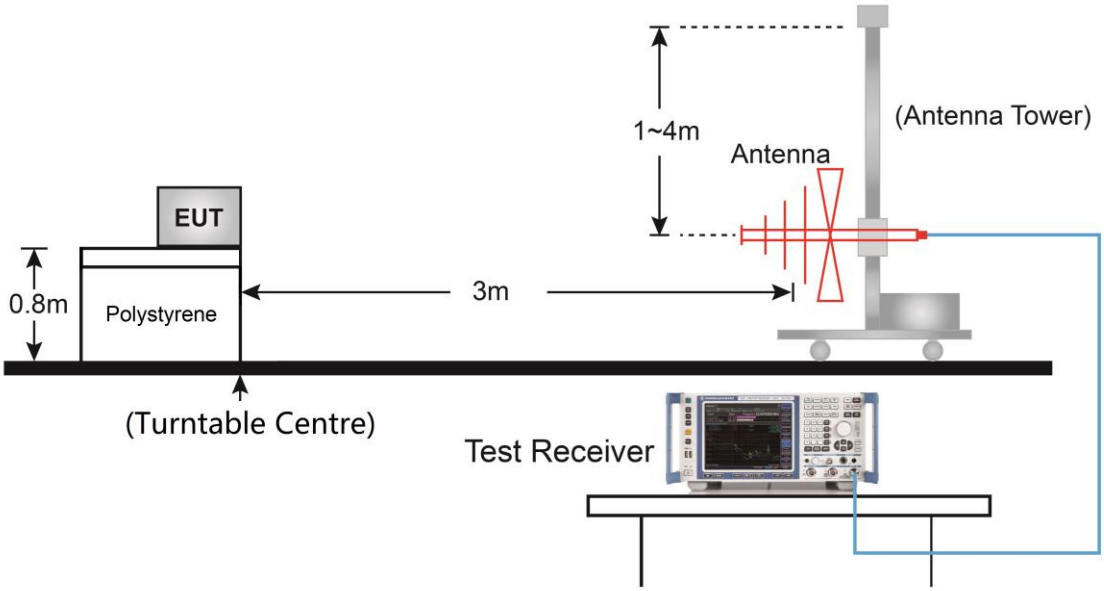
5. Sweep time = auto

6. Trace mode = max hold

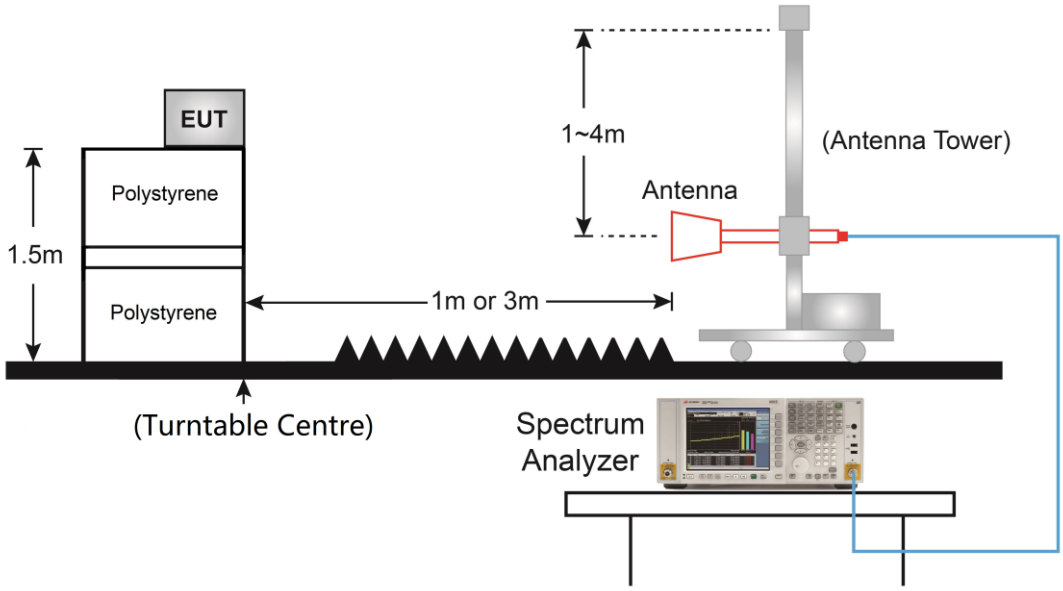
7. Trace was allowed to stabilize

5.6.4.Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



5.6.5.Test Result

Test Site	WZ-AC2	Test Engineer	Messiah Li
Test Date	2021/07/21	Test Channel	00
Test Mode	Mode 1		
Note	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/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4808.0	43.2	4.5	47.7	74.0	-26.3	Peak	Horizontal
	7553.5	35.1	12.1	47.2	74.0	-26.8	Peak	Horizontal
	10970.5	34.1	17.9	52.0	74.0	-22.0	Peak	Horizontal
	4808.0	41.5	4.5	46.0	74.0	-28.0	Peak	Vertical
	7485.5	34.2	12.3	46.5	74.0	-27.5	Peak	Vertical
	10928.0	33.5	17.9	51.4	74.0	-22.6	Peak	Vertical

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

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

Test Site	WZ-AC2	Test Engineer	Messiah Li
Test Date	2021/07/21	Test Channel	19
Test Mode	Mode 1		
Note	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/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4876.0	41.0	4.4	45.4	74.0	-28.6	Peak	Horizontal
	7630.0	34.7	12.0	46.7	74.0	-27.3	Peak	Horizontal
	11642.0	32.2	19.7	51.9	74.0	-22.1	Peak	Horizontal
	4876.0	38.2	4.4	42.6	74.0	-31.4	Peak	Vertical
	7494.0	33.5	12.3	45.8	74.0	-28.2	Peak	Vertical
	10860.0	33.4	17.9	51.3	74.0	-22.7	Peak	Vertical

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

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

Test Site	WZ-AC2	Test Engineer	Messiah Li
Test Date	2021/07/21	Test Channel	39
Test Mode	Mode 1		
Note	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/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4961.0	41.5	4.5	46.0	74.0	-28.0	Peak	Horizontal
	7502.5	33.1	12.3	45.4	74.0	-28.6	Peak	Horizontal
	10894.0	33.4	17.8	51.2	74.0	-22.8	Peak	Horizontal
	4961.0	38.9	4.5	43.4	74.0	-30.6	Peak	Vertical
	7443.0	35.7	12.2	47.9	74.0	-26.1	Peak	Vertical
	11710.0	32.5	19.5	52.0	74.0	-22.0	Peak	Vertical

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

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

Test Site	WZ-AC2	Test Engineer	Messiah Li
Test Date	2021/07/21	Test Channel	00
Test Mode	Mode 2		
Note	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/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4808.0	42.2	4.5	46.7	74.0	-27.3	Peak	Horizontal
	7400.5	34.7	12.3	47.0	74.0	-27.0	Peak	Horizontal
	10979.0	33.8	18.0	51.8	74.0	-22.2	Peak	Horizontal
	4799.5	40.5	4.5	45.0	74.0	-29.0	Peak	Vertical
	7426.0	34.3	12.5	46.8	74.0	-27.2	Peak	Vertical
	10911.0	33.8	17.9	51.7	74.0	-22.3	Peak	Vertical

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

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

Test Site	WZ-AC2	Test Engineer	Messiah Li
Test Date	2021/07/21	Test Channel	19
Test Mode	Model 2		
Note	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/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4884.5	40.8	4.4	45.2	74.0	-28.8	Peak	Horizontal
	7494.0	33.4	12.3	45.7	74.0	-28.3	Peak	Horizontal
	11574.0	32.8	19.1	51.9	74.0	-22.1	Peak	Horizontal
	4884.5	39.0	4.4	43.4	74.0	-30.6	Peak	Vertical
	7426.0	33.6	12.5	46.1	74.0	-27.9	Peak	Vertical
	11259.5	32.5	18.6	51.1	74.0	-22.9	Peak	Vertical

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

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

Test Site	WZ-AC2	Test Engineer	Messiah Li
Test Date	2021/07/21	Test Channel	39
Test Mode	Model 2		
Note	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.		

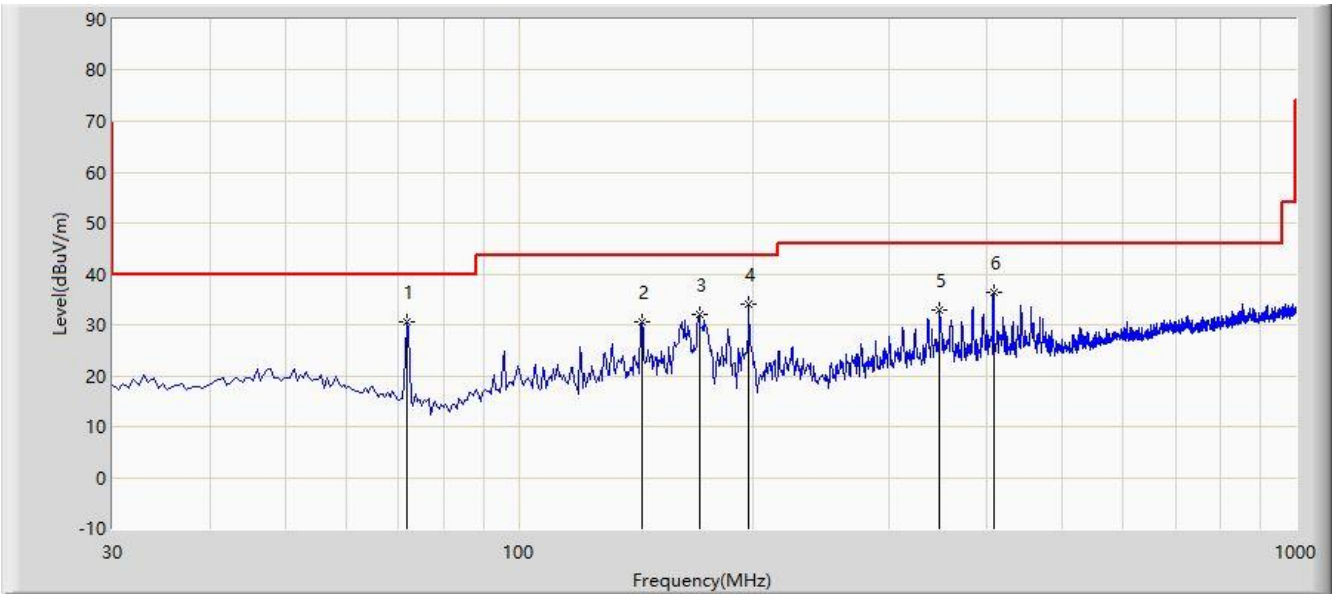
Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	4961.0	40.3	4.5	44.8	74.0	-29.2	Peak	Horizontal
	7443.0	35.5	12.2	47.7	74.0	-26.3	Peak	Horizontal
	11285.0	32.5	19.0	51.5	74.0	-22.5	Peak	Horizontal
	4961.0	38.5	4.5	43.0	74.0	-31.0	Peak	Vertical
	7434.5	34.9	12.4	47.3	74.0	-26.7	Peak	Vertical
	11251.0	32.8	18.4	51.2	74.0	-22.8	Peak	Vertical

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

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

The Worst Case of Radiated Emission below 1GHz:

Site: WZ-AC2	Time: 2021/07/23 - 01:12
Limit: FCC_Part15.209_RSE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_VULB9162_0.03-7GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: By DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2402MHz	



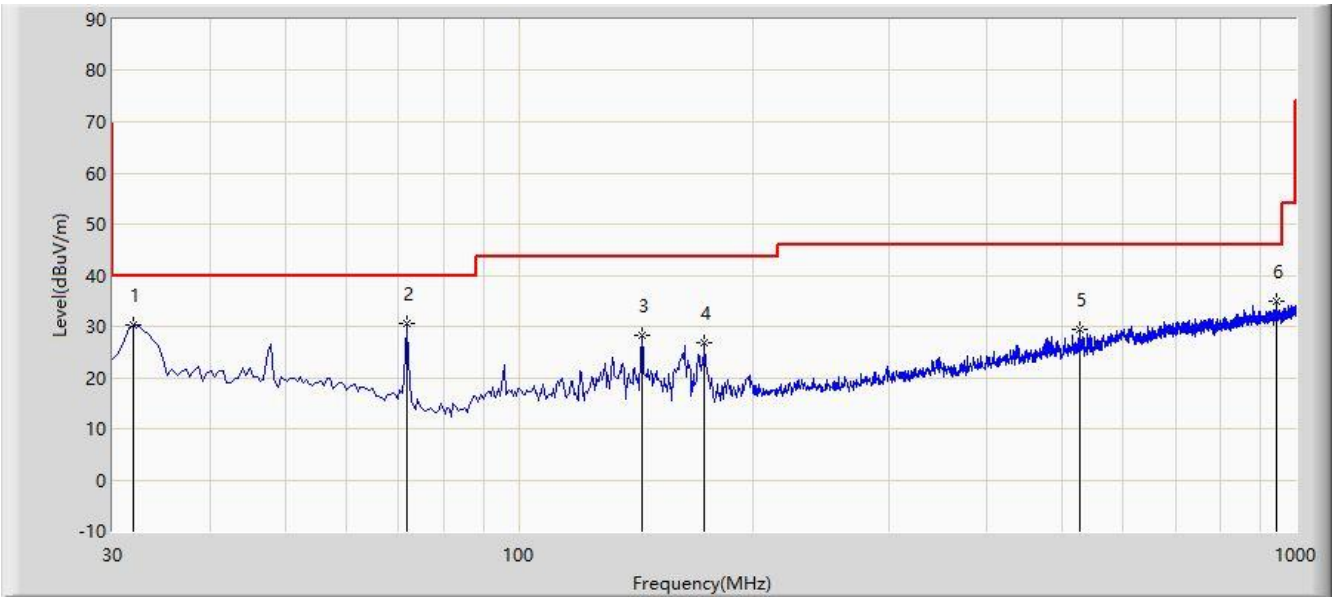
No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			71.710	30.525	14.676	-9.475	40.000	15.849	PK
2			143.975	30.524	15.477	-12.976	43.500	15.047	PK
3			170.650	32.015	15.874	-11.485	43.500	16.141	PK
4		*	197.810	34.095	15.142	-9.405	43.500	18.953	PK
5			348.160	32.839	10.158	-13.161	46.000	22.681	PK
6			408.300	36.261	12.753	-9.739	46.000	23.508	PK

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

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

Note 2: The amplitude of radiated emissions (frequency range from 9kHz ~ 30MHz, 18GHz to 26GHz) 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: WZ-AC2	Time: 2021/07/23 - 01:24
Limit: FCC_Part15.209_RSE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_VULB9162_0.03-7GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: By DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2402MHz	



No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			31.940	30.295	13.082	-9.705	40.000	17.213	PK
2		*	71.710	30.542	14.693	-9.458	40.000	15.849	PK
3			143.975	28.137	13.090	-15.363	43.500	15.047	PK
4			173.560	26.667	10.388	-16.833	43.500	16.279	PK
5			528.095	29.562	4.187	-16.438	46.000	25.374	PK
6			944.710	34.968	3.576	-11.032	46.000	31.392	PK

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

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

Note 2: The amplitude of radiated emissions (frequency range from 9kHz ~ 30MHz, 18GHz to 26GHz) 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.

Note 3: Average measurement was not performed if peak level lower than average limit.

5.7. Radiated Restricted Band Edge Measurement

5.7.1.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	--	--	--

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 Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency [MHz]	Field Strength [μV/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

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 - 156.525225	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 8.10 of the RSS-Gen must not exceed the limits shown in Table per Section 8.9.

RSS-Gen Section 8.9			
Frequency [MHz]	Magnetic field strength (H-Field) [μA/m]	Field Strength [μV/m]	Measured Distance [Meters]
0.009 - 0.490	6.37/F(F in kHz)	--	300
0.490 - 1.705	63.7/F(F in kHz)	--	30
1.705 - 30	0.08	--	30
30 - 88	--	100	3
88 - 216	--	150	3
216 - 960	--	200	3
Above 960	--	500	3

5.7.2.Test Procedure Used

ANSI C63.10 Section 6.3 (General Requirements)

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

5.7.3.Test Setting

Peak Field Strength Measurements

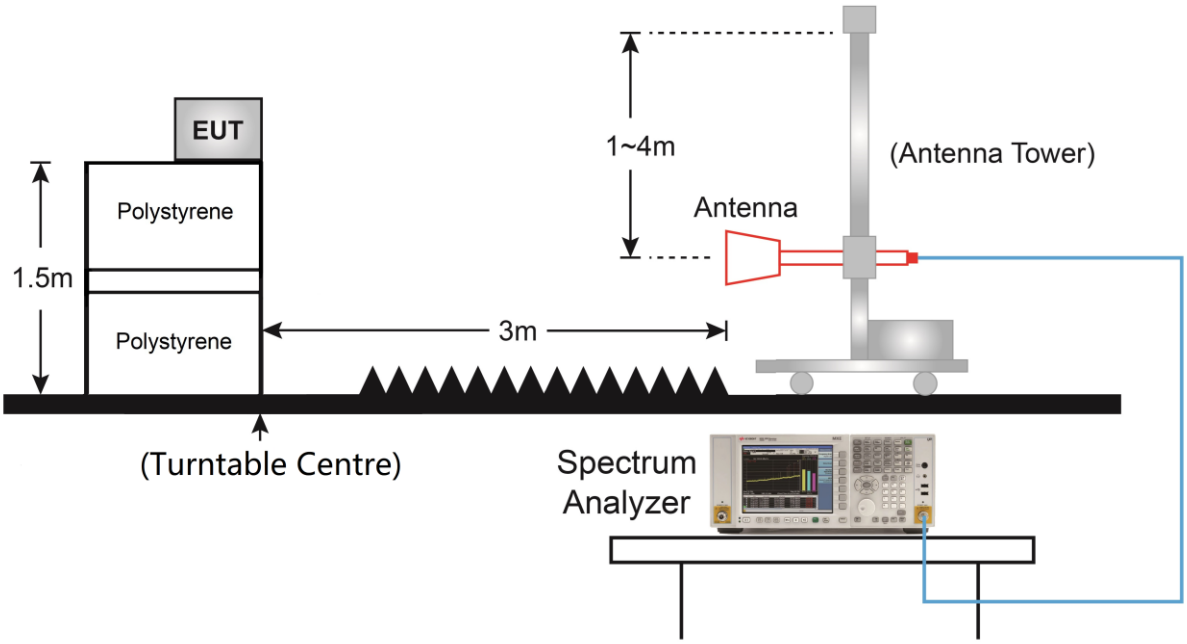
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

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.

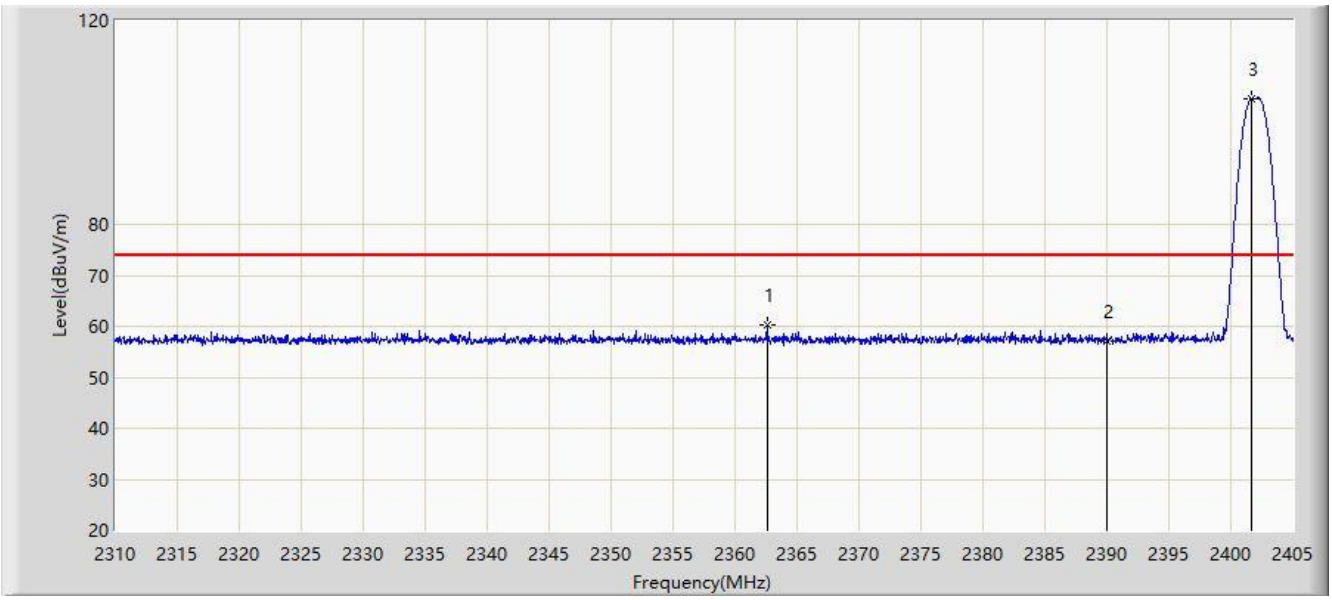
   If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

5.7.4.Test Setup



5.7.5.Test Result

Site: WZ-AC2	Time: 2021/07/23 - 00:22
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2402MHz	

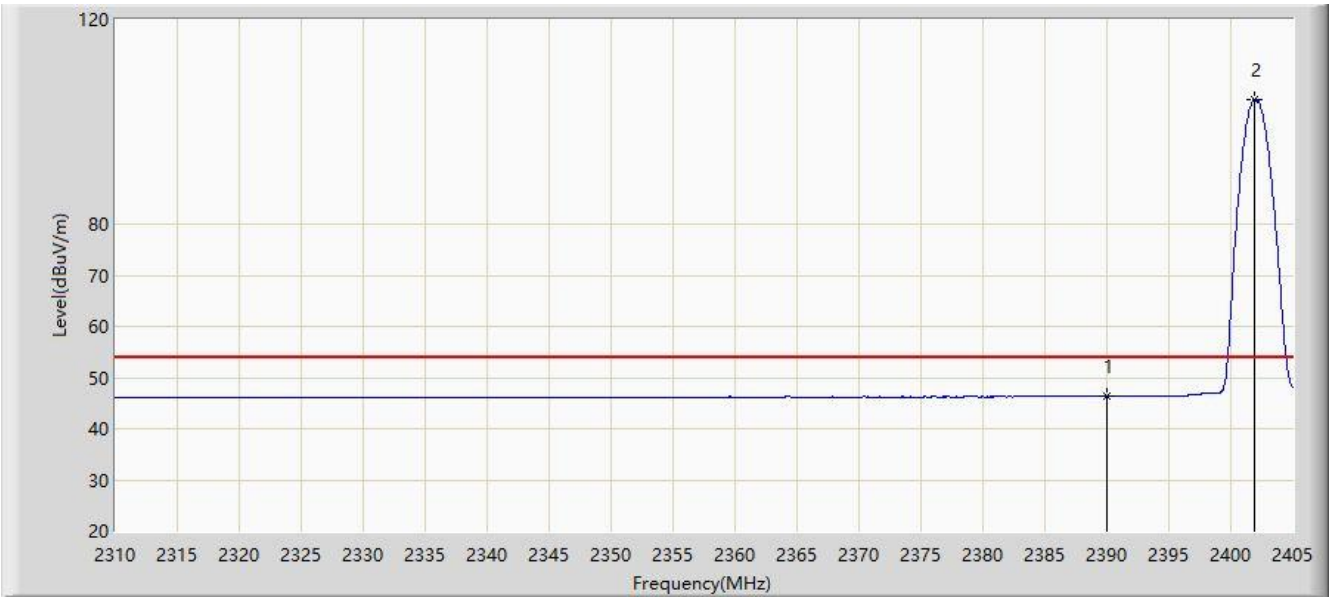


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1			2362.583	60.213	28.195	-7.987	68.200	32.018	PK
2			2390.000	57.044	25.041	-11.156	68.200	32.003	PK
3		*	2401.627	104.686	72.700	36.486	68.200	31.986	PK

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

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

Site: WZ-AC2	Time: 2021/07/23 - 00:27
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2402MHz	

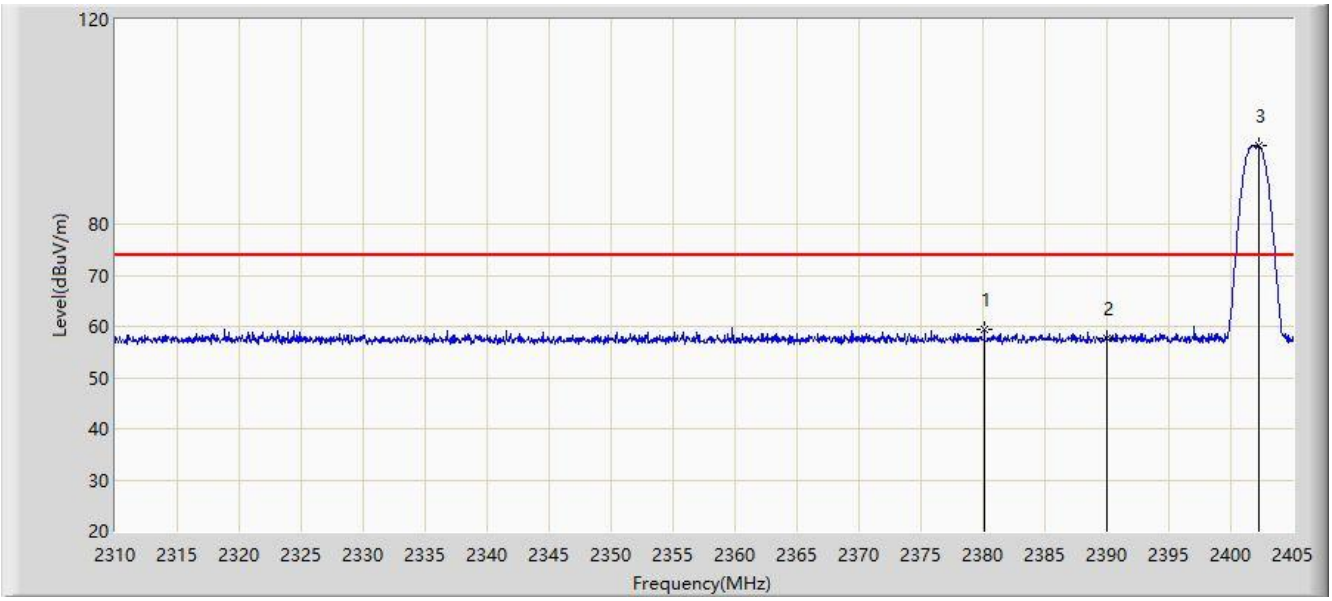


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1			2390.000	46.310	14.307	-7.690	54.000	32.003	AV
2		*	2401.865	104.340	72.354	50.340	54.000	31.986	AV

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

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

Site: WZ-AC2	Time: 2021/07/23 - 00:28
Limit: Limit: FCC_Part15.209_RE(3m))	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2402MHz	

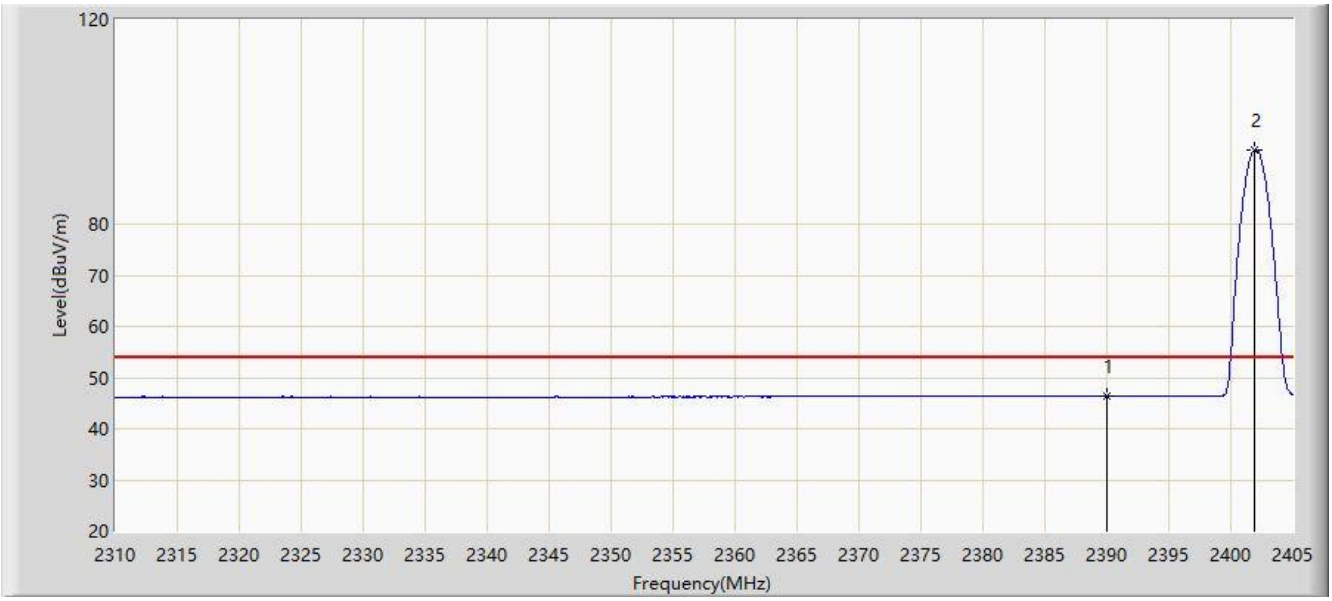


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1			2380.110	59.350	27.335	-14.650	74.000	32.015	PK
2			2390.000	57.595	25.592	-16.405	74.000	32.003	PK
3		*	2402.245	95.318	63.333	21.318	74.000	31.985	PK

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

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

Site: WZ-AC2	Time: 2021/07/23 - 00:31
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2402MHz	

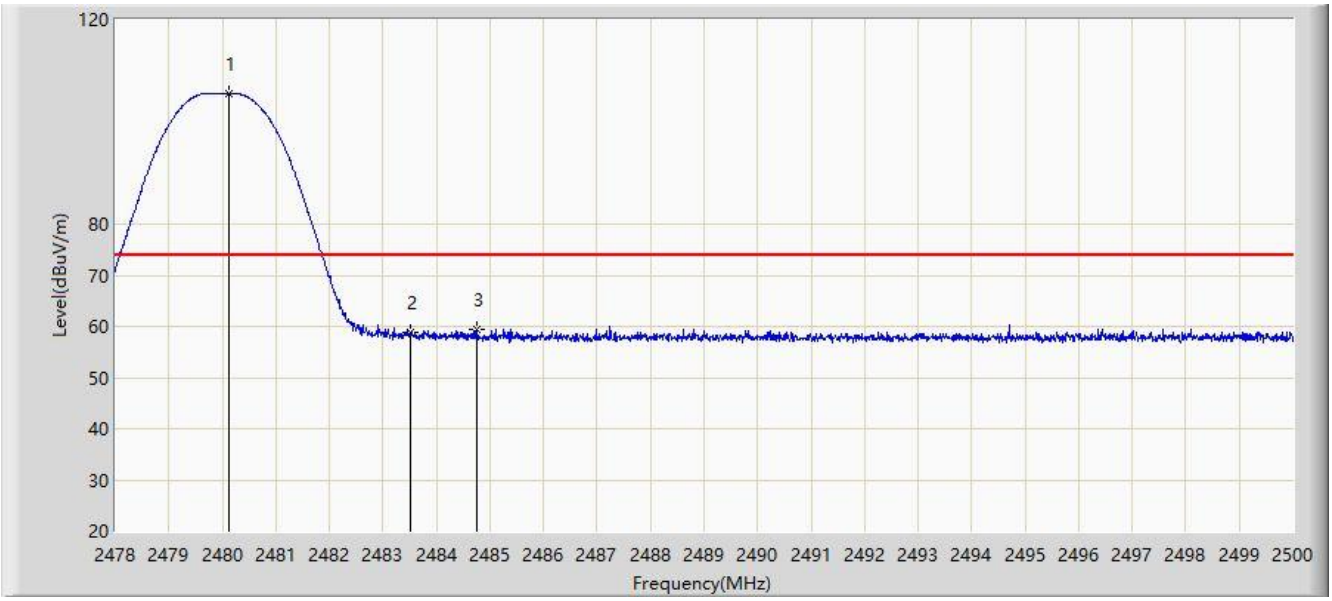


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1			2390.000	46.318	14.315	-7.682	54.000	32.003	AV
2		*	2401.865	94.434	62.448	40.434	54.000	31.986	AV

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

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

Site: WZ-AC2	Time: 2021/07/23 - 00:37
Limit: Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2480MHz	

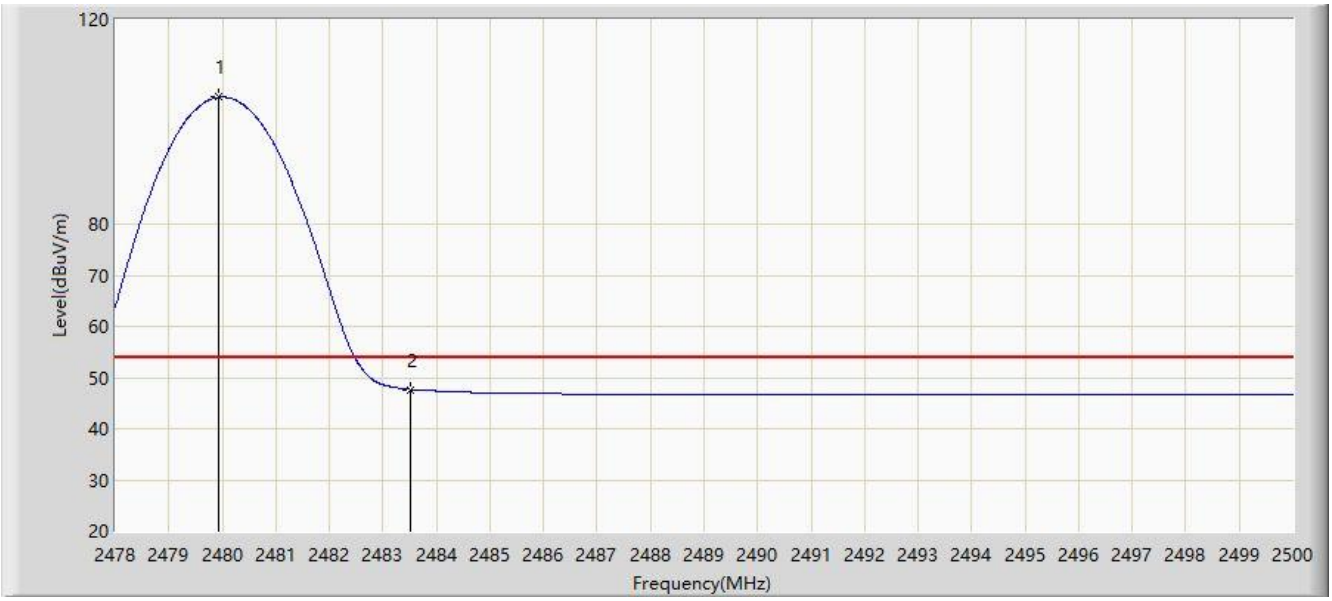


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		*	2480.112	105.494	73.575	31.494	74.000	31.919	PK
2			2483.500	58.745	26.833	-15.255	74.000	31.912	PK
3			2484.743	59.288	27.379	-14.712	74.000	31.909	PK

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

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

Site: WZ-AC2	Time: 2021/07/23 - 00:40
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2480MHz	

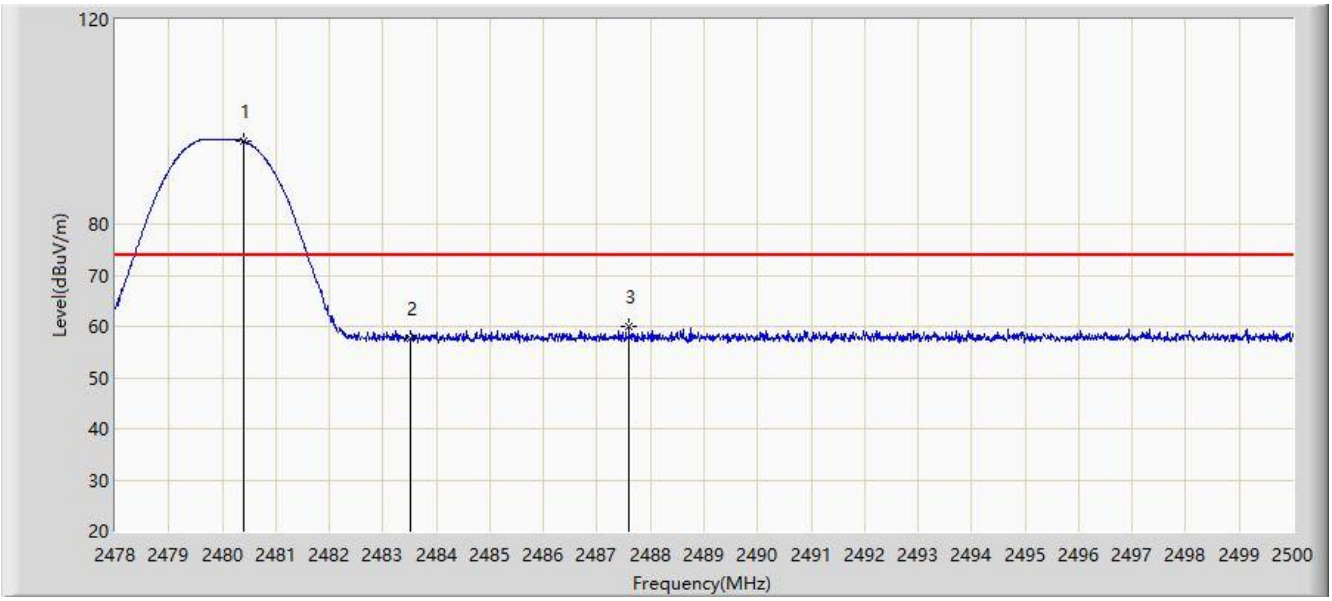


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2479.936	104.803	72.884	50.803	54.000	31.919	AV
2			2483.500	47.677	15.765	-6.323	54.000	31.912	AV

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

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

Site: WZ-AC2	Time: 2021/07/23 - 00:41
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2480MHz	

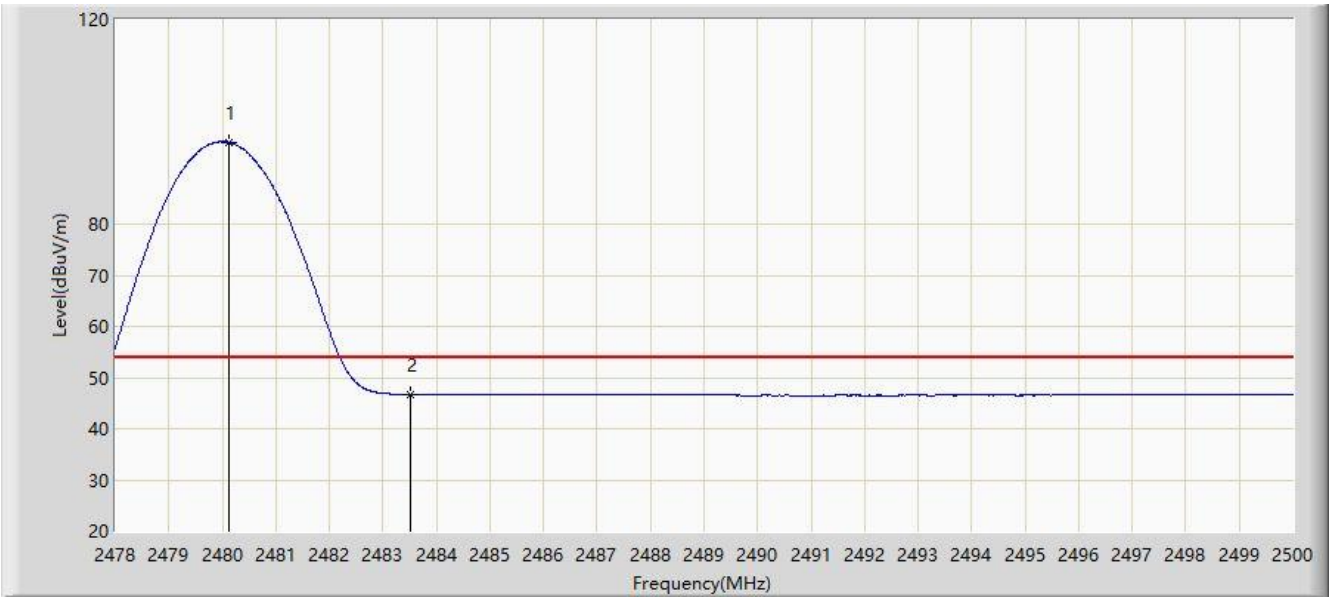


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		*	2480.387	96.317	64.399	22.317	74.000	31.919	PK
2			2483.500	57.570	25.658	-16.430	74.000	31.912	PK
3			2487.592	59.931	28.028	-14.069	74.000	31.903	PK

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

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

Site: WZ-AC2	Time: 2021/07/23 - 00:42
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 1Mbps at Channel 2480MHz	

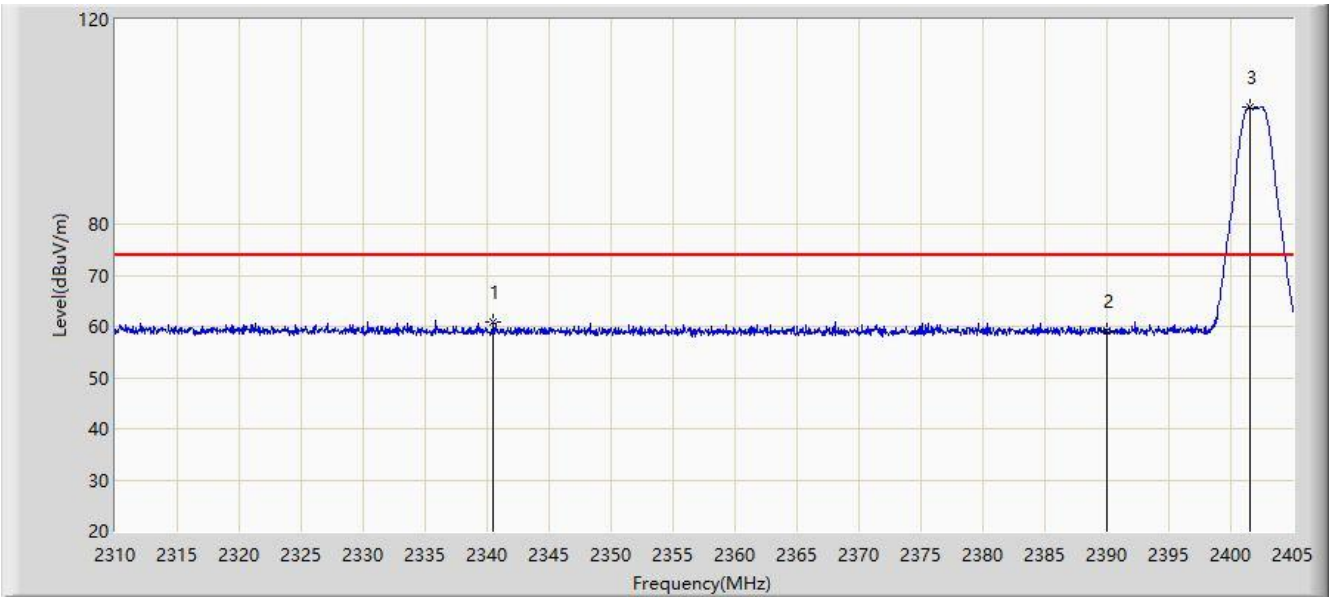


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.112	96.001	64.082	42.001	54.000	31.919	AV
2			2483.500	46.695	14.783	-7.305	54.000	31.912	AV

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

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

Site: WZ-AC2	Time: 2021/07/21 - 23:11
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 2Mbps at Channel 2402MHz	

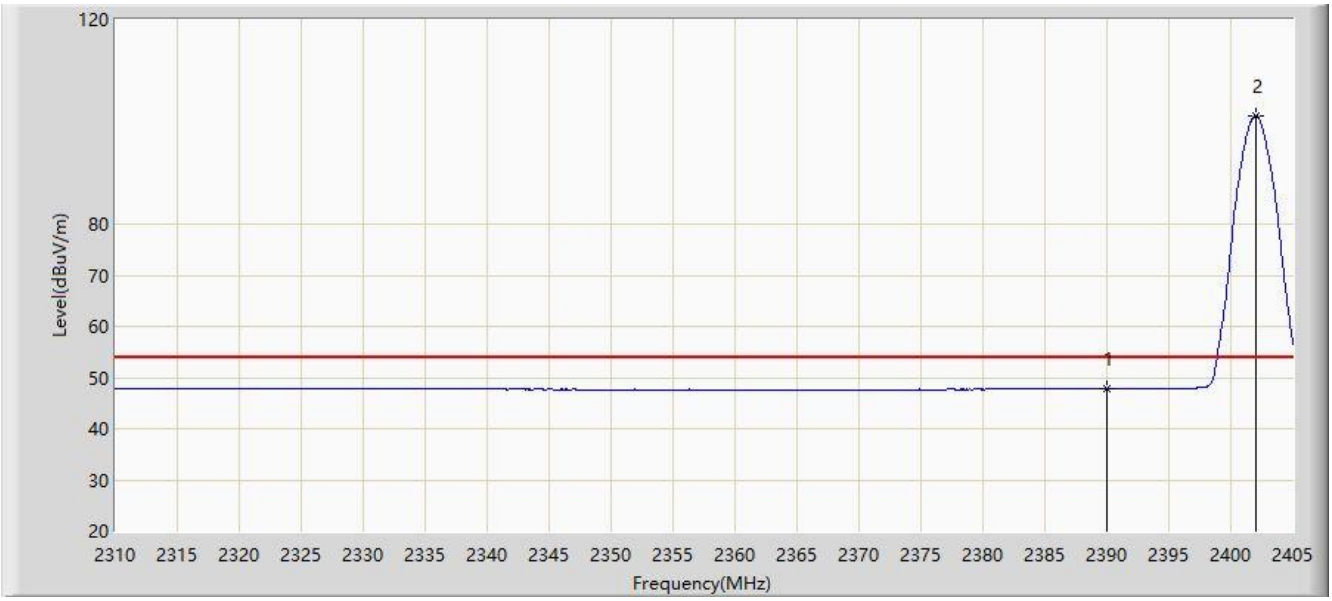


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			2340.495	60.901	28.815	-13.099	74.000	32.087	PK
2			2390.000	59.055	27.052	-14.945	74.000	32.003	PK
3		*	2401.532	102.811	70.825	28.811	74.000	31.987	PK

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

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

Site: WZ-AC2	Time: 2021/07/21 - 23:14
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 2Mbps at Channel 2402MHz	

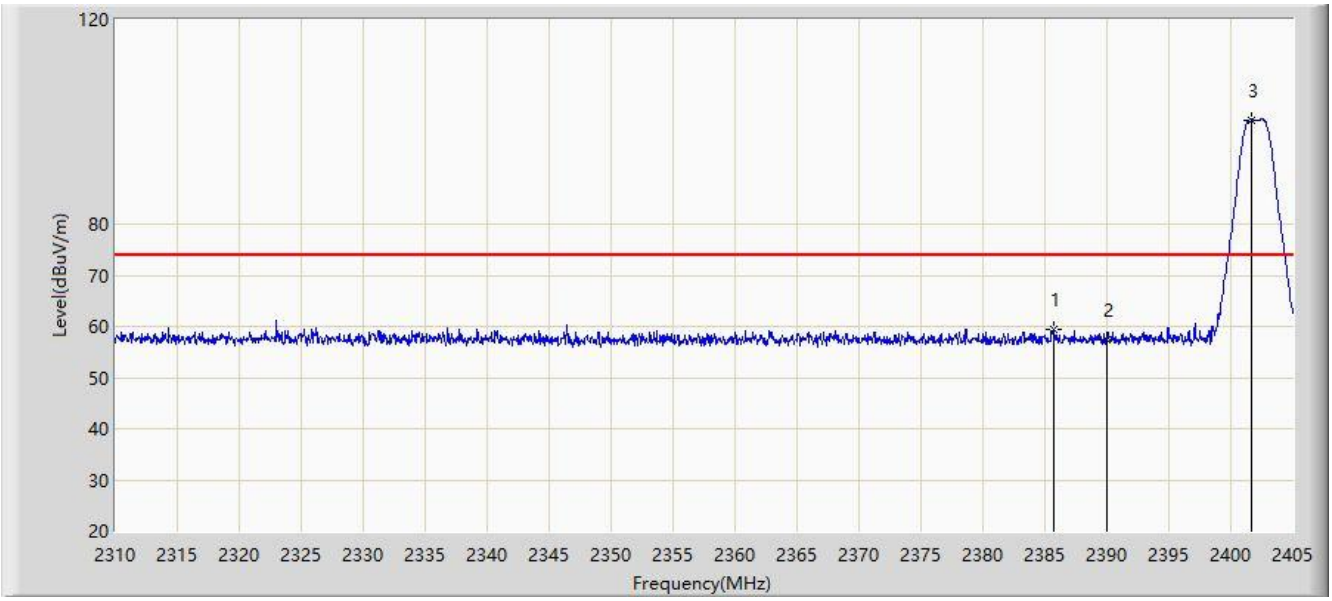


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			2390.000	47.746	15.743	-6.254	54.000	32.003	AV
2		*	2402.008	101.120	69.134	47.120	54.000	31.986	AV

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

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

Site: WZ-AC2	Time: 2021/07/21 - 23:16
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 2Mbps at Channel 2402MHz	

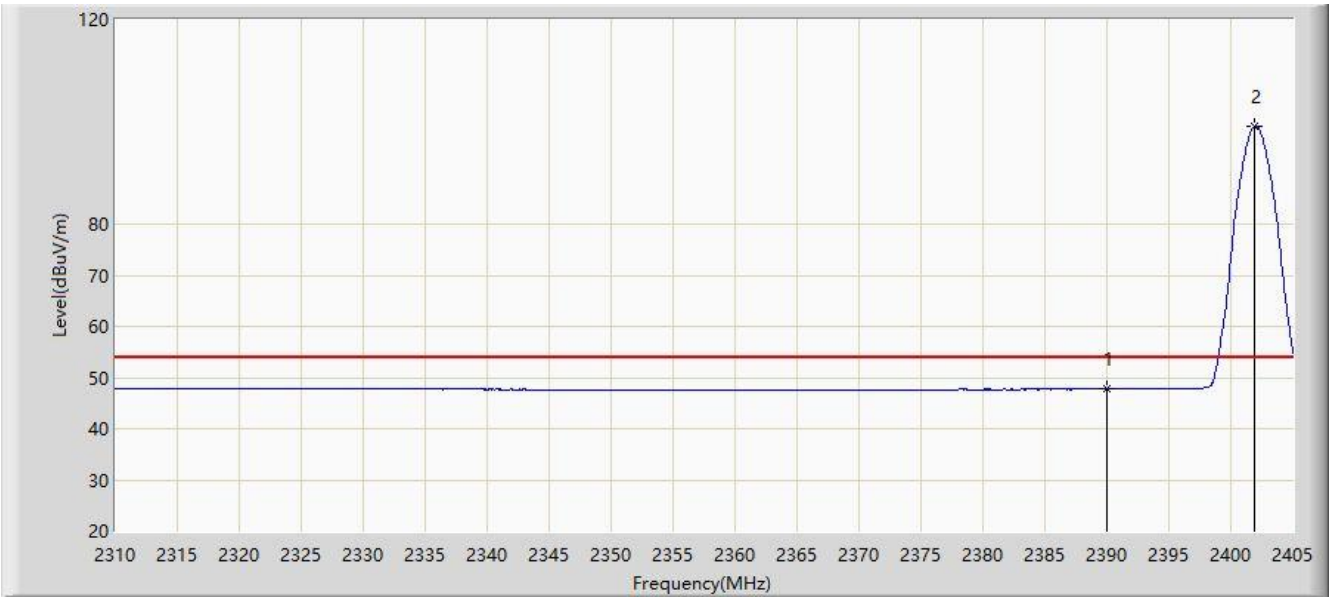


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1			2385.667	59.543	27.529	-14.457	74.000	32.014	PK
2			2390.000	57.325	25.322	-16.675	74.000	32.003	PK
3		*	2401.722	100.369	68.383	26.369	74.000	31.986	PK

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

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

Site: WZ-AC2	Time: 2021/07/21 - 23:17
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 2Mbps at Channel 2402MHz	

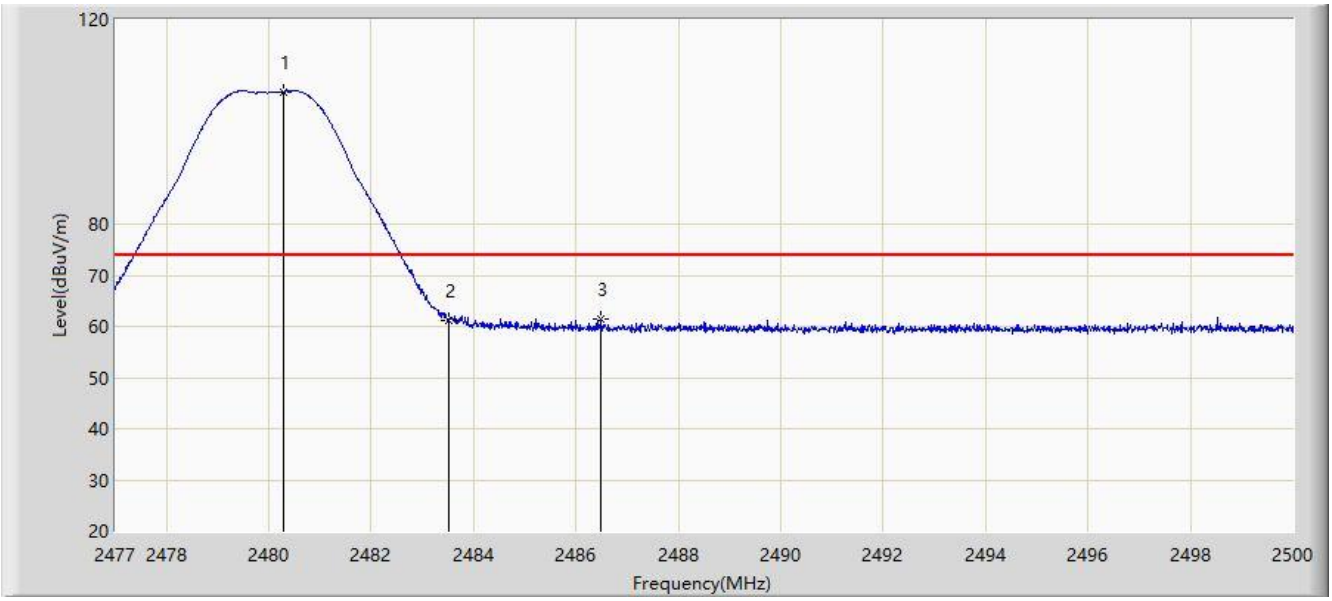


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1			2390.000	47.716	15.713	-6.284	54.000	32.003	AV
2		*	2401.865	99.065	67.079	45.065	54.000	31.986	AV

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

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

Site: WZ-AC2	Time: 2021/07/21 - 23:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 2Mbps at Channel 2480MHz	

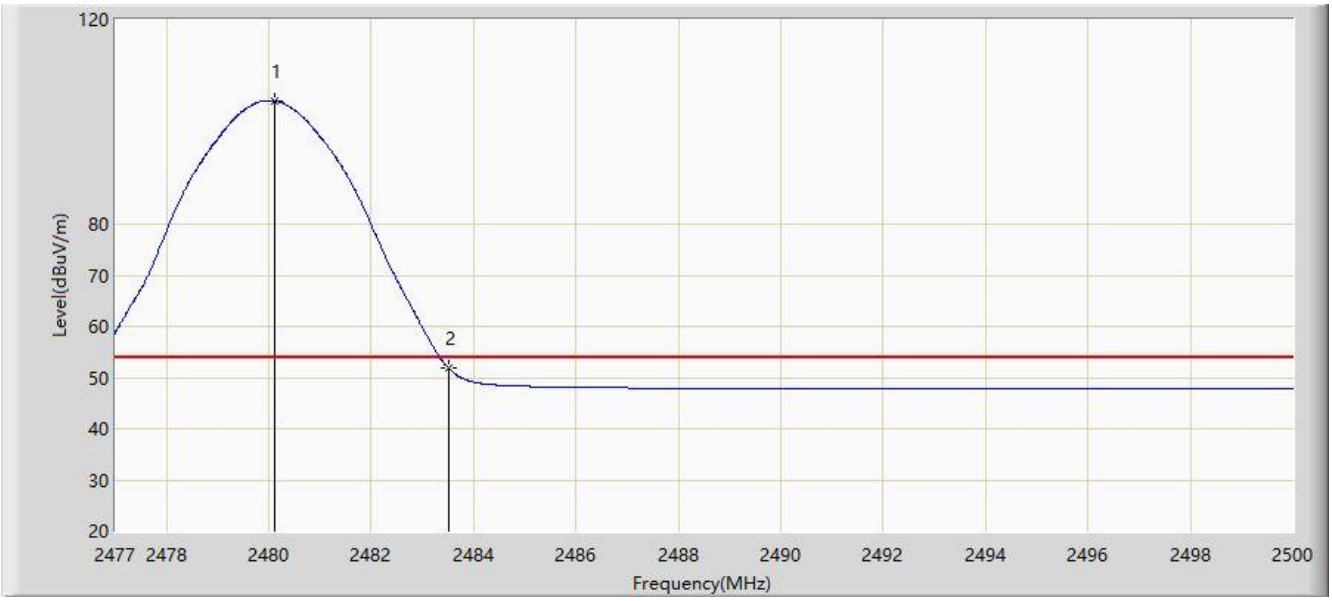


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.300	105.906	73.987	31.906	74.000	31.919	PK
2			2483.500	61.119	29.207	-12.881	74.000	31.912	PK
3			2486.488	61.532	29.626	-12.468	74.000	31.906	PK

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

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

Site: WZ-AC2	Time: 2021/07/21 - 23:23
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 2Mbps at Channel 2480MHz	

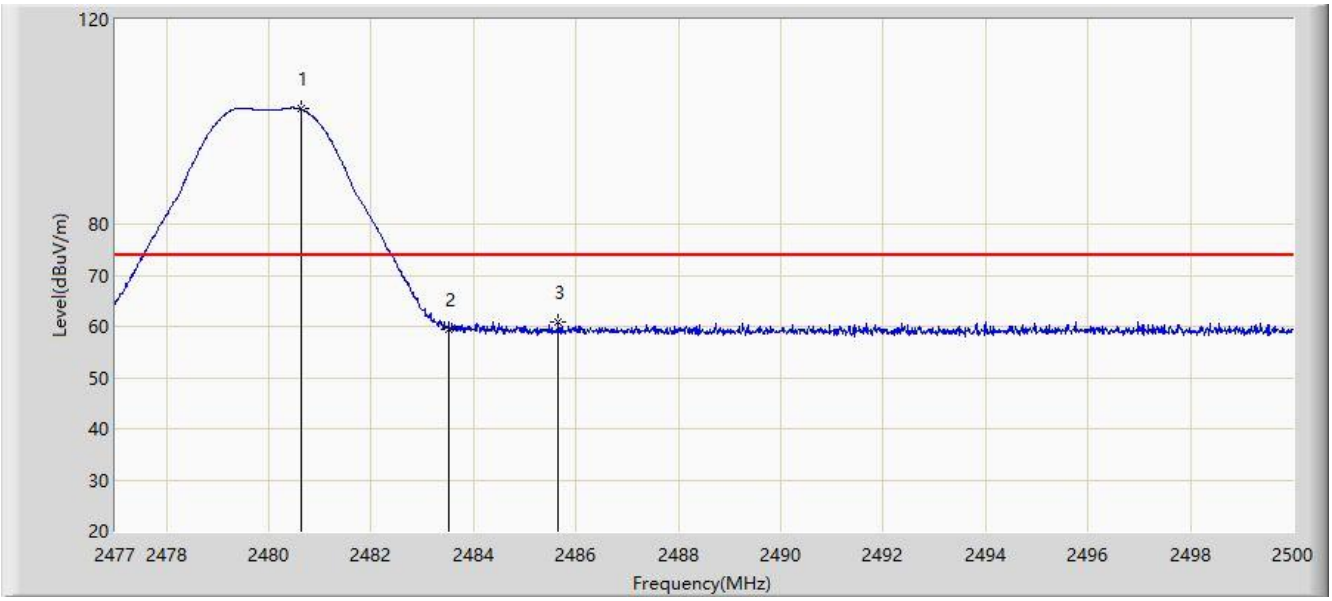


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.125	104.068	72.149	50.068	54.000	31.919	AV
2			2483.500	51.937	20.025	-2.063	54.000	31.912	AV

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

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

Site: WZ-AC2	Time: 2021/07/21 - 23:25
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 2Mbps at Channel 2480MHz	

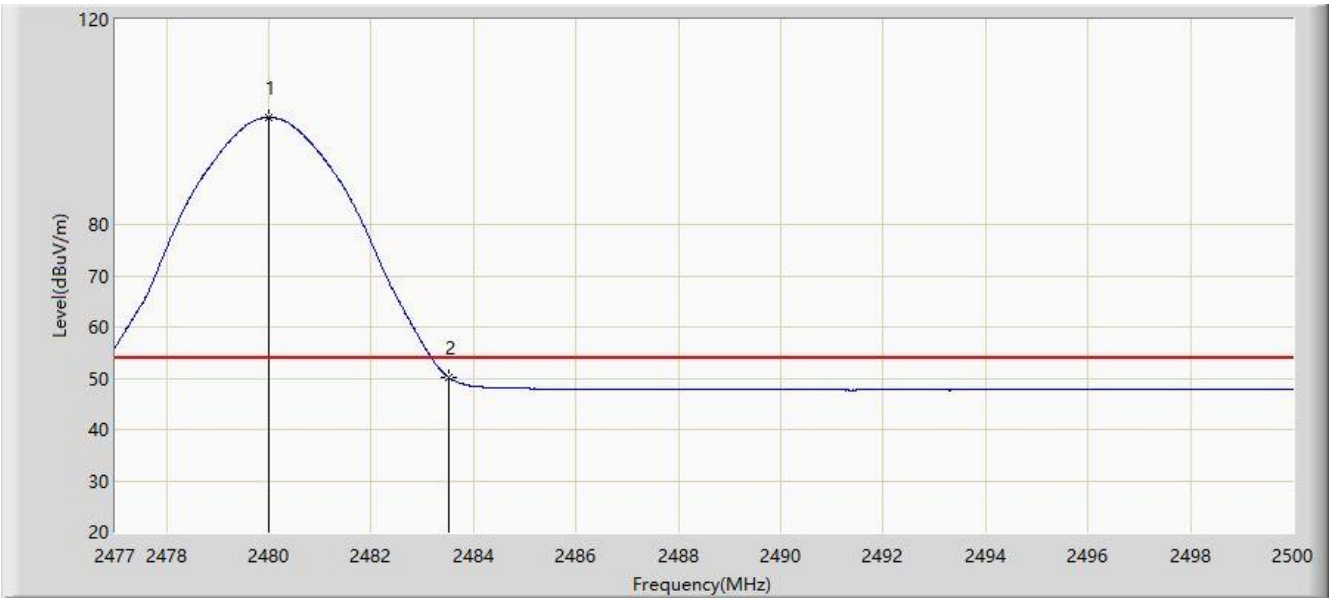


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.625	102.474	70.556	28.474	74.000	31.917	PK
2			2483.500	59.351	27.439	-14.649	74.000	31.912	PK
3			2485.650	60.789	28.882	-13.211	74.000	31.907	PK

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

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

Site: WZ-AC2	Time: 2021/07/21 - 23:27
Limit: FCC_Part15.209_RE(3m)	Engineer: Bob Zhang
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Rabbit Bluetooth 5 BLE module	Power: DC 3.3V
Test Mode: Transmit by BLE 2Mbps at Channel 2480MHz	



No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		*	2480.000	100.872	68.953	46.872	54.000	31.919	AV
2			2483.500	50.228	18.316	-3.772	54.000	31.912	AV

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

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

5.8. AC Conducted Emissions Measurement

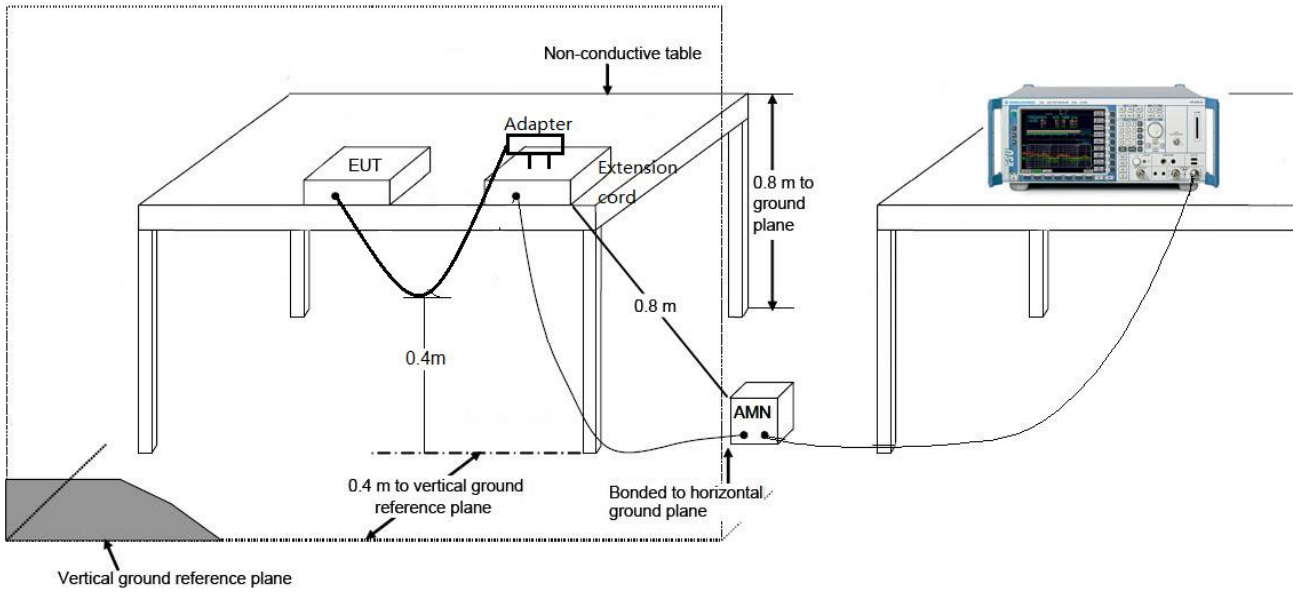
5.8.1.Test Limit

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

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

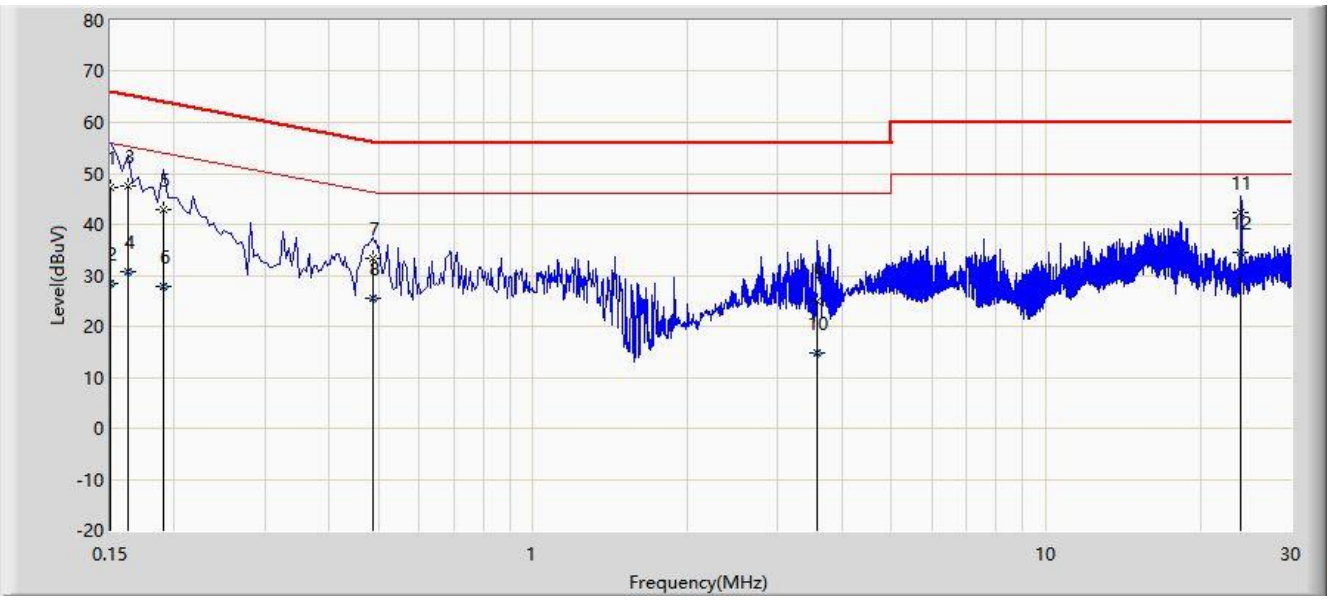
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

5.8.2.Test Setup



5.8.3.Test Result

Site: WZ-SR2	Time: 2021/07/24 - 14:12
Limit: FCC_Part15.207_CE_AC Power	Engineer: Antony Yang
Probe: ENV216_101683_Filter Off	Polarity: Line
EUT: Rabbit Bluetooth 5 BLE module	Power: By PC
Test Mode: Transmit by BLE 1Mbps at Channel 2402MHz	

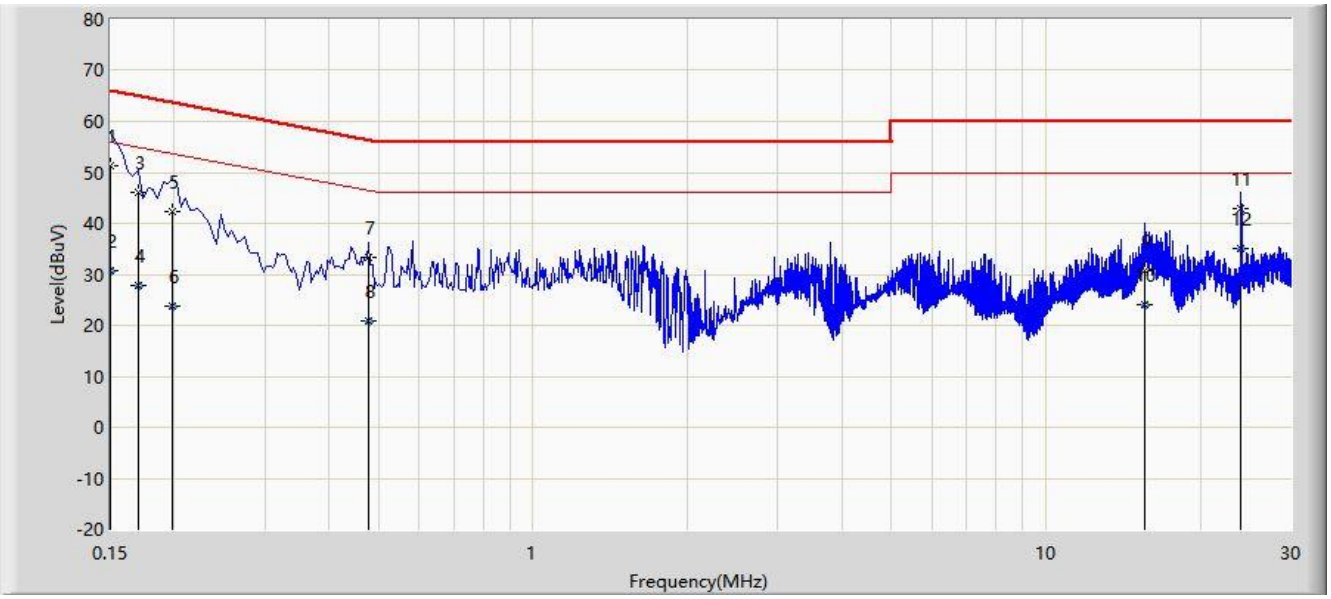


No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1			0.150	47.333	37.703	-18.667	66.000	9.630	QP
2			0.150	28.337	18.707	-27.663	56.000	9.630	AV
3			0.162	47.502	37.869	-17.859	65.361	9.633	QP
4			0.162	30.846	21.214	-24.514	55.361	9.633	AV
5			0.190	42.833	33.195	-21.204	64.037	9.638	QP
6			0.190	27.698	18.060	-26.339	54.037	9.638	AV
7			0.486	33.384	23.716	-22.852	56.236	9.669	QP
8			0.486	25.481	15.812	-20.755	46.236	9.669	AV
9			3.578	24.933	14.944	-31.067	56.000	9.989	QP
10			3.578	14.818	4.829	-31.182	46.000	9.989	AV
11			24.002	42.316	31.476	-17.684	60.000	10.840	QP
12		*	24.002	34.533	23.693	-15.467	50.000	10.840	AV

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

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

Site: WZ-SR2	Time: 2021/07/24 - 14:14
Limit: FCC_Part15.207_CE_AC Power	Engineer: Antony Yang
Probe: ENV216_101683_Filter Off	Polarity: Neutral
EUT: Rabbit Bluetooth 5 BLE module	Power: By PC
Test Mode: Transmit by BLE 1Mbps at Channel 2402MHz	



No.	Flag	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1		*	0.150	51.178	41.547	-14.822	66.000	9.630	QP
2			0.150	30.691	21.061	-25.309	56.000	9.630	AV
3			0.170	45.959	36.325	-19.001	64.960	9.634	QP
4			0.170	27.749	18.115	-27.211	54.960	9.634	AV
5			0.198	42.395	32.756	-21.299	63.694	9.639	QP
6			0.198	23.826	14.187	-29.868	53.694	9.639	AV
7			0.478	33.461	23.784	-22.913	56.374	9.676	QP
8			0.478	20.834	11.158	-25.540	46.374	9.676	AV
9			15.598	30.697	20.172	-29.303	60.000	10.526	QP
10			15.598	23.971	13.445	-26.029	50.000	10.526	AV
11			24.002	43.005	32.111	-16.995	60.000	10.894	QP
12			24.002	34.990	24.096	-15.010	50.000	10.894	AV

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

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

6. CONCLUSION

The data collected relate only the item(s) tested and show that the device is in compliance with Part 15C of the FCC rules and ISED rules.

The End

Appendix A - Test Setup Photograph

Refer to “2107RSU042-UT” file.

Appendix B - EUT Photograph

Refer to “ 2107RSU042-UE” file.