



RF MEASUREMENT REPORT

FCC ID: XCO-CONNECT1
Applicant: Hansong(Nanjing) Technology Ltd.
Application Type: Certification
Product: Wireless Transmitter
Model No.: Easy Connect Pro
Brand Name: Platin
FCC Classification: Digital Transmission System (DTS)
FCC Rule Part(s): Part 15 Subpart C (Section 15.247)
Test Date: July 02 ~ December 14, 2021

Reviewed By:

Kevin Guo

Approved By:

Robin Wu



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
2105RSU034-U1	Rev. 01	Initial Report	12-14-2021	Valid

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1. General Information

1.1. Applicant

Hansong (Nanjing) Technology Ltd.

8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211100, China

1.2. Manufacturer

Hansong (Nanjing) Technology Ltd.

8th Kangping Road, Jiangning Economy and Technology Development Zone, Nanjing, 211100, 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 ☐ G-20034 ☐ C-20020 ☐ T-20020 ☐ R-20141 ☐ G-20134 ☐ C-20103 ☐ 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	Wireless Transmitter
Model No.	Easy Connect Pro
Brand Name	Platin
Bluetooth Version	Bluetooth v4.1 (Single Mode, BLE)
Wi-Fi Specification	802.11a
Antenna Information	Refer to section 1.5
EUT Identification No.	20210514Sample#08
Power Type	AC/DC Adapter
Accessory	
AC/DC Adapter	Model No.: GPE006E-050100-Z Input: 100-240V~50/60Hz, 0.2A Output: 5.0V  1.0A, 5.0W Max
Remark: 1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer. 2. EUT installs an authorized module (FCC ID: UA9800), it can transmit simultaneously with BLE, so we perform co-location RSE test in this report.	

1.5. Radio Specification

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

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

1.6. Working Frequencies

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. Test Configuration

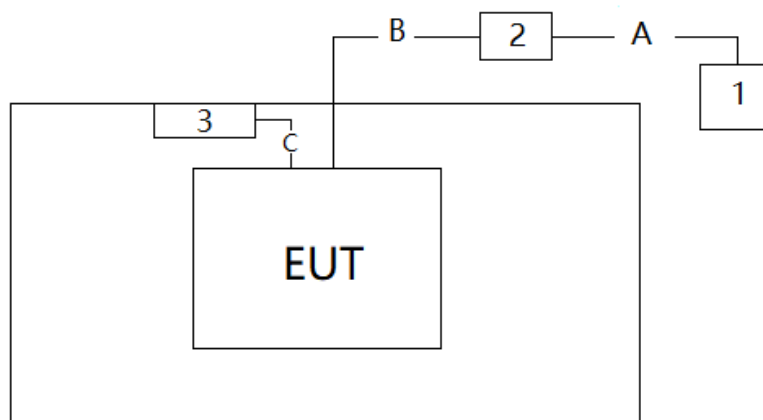
2.1. Test Mode

Mode 1: Transmit by Bluetooth-LE

2.2. Test System Connection Diagram

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



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

2.3. Test System Details

Product		Manufacturer	Model No.
1	Notebook	Lenovo	E495
2	CSR Tool	CSR	USB-SPI
3	AC/DC Adapter	Hansong	GPE006E-050100-Z

2.4. Test Software

The test utility software used during testing was “uEnergy Tools”, and the version was “2.6.2”.

2.5. Applied Standards

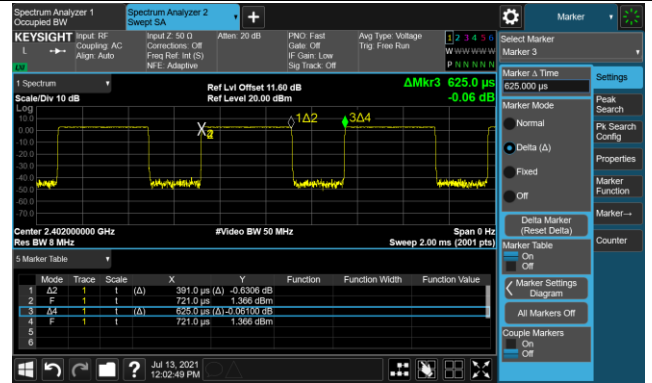
According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.247
- KDB 558074 D01v05r02
- ANSI C63.10-2013

2.6. Duty Cycle

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
BLE	62.56%
Duty Cycle (T = Transmission Duration)	
BLE (T = 391.0us)	



2.7. Test Environment Condition

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

3. 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 is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. Measuring Instrument

No.	Instrument	Manufacturer	Model No.	Asset No.	Last Cali. Date	Cali. Due Date	Test Site
1	Signal Generator	Agilent	E4438C	MRTSUE06081	1 year	2022/6/8	WZ-SR5
2	Signal Analyzer	Agilent	N9020A	MRTSUE06106	1 year	2022/4/13	WZ-SR5
3	Thermohygrometer	testo	608-H1	MRTSUE06402	1 year	2022/6/28	WZ-SR5
4	Shielding Room	HUAMING	WZ-SR5	MRTSUE06442	/	/	WZ-SR5
5	Signal Analyzer	Keysight	N9010B	MRTSUE06457	1 year	2022/6/24	WZ-SR5
6	USB Power Sensor	Agilent	U2021XA	MRTSUE06030	1 year	2021/10/9	WZ-SR3/WZ-SR5
					1 year	2022/10/10	
7	Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2022/6/8	WZ-SR2
8	Shielding Room	MIX-BEP	WZ-SR2	MRTSUE06215	/	/	WZ-SR2
9	Thermohygrometer	testo	608-H1	MRTSUE06404	1 year	2022/6/28	WZ-SR2
10	EMI Test Receiver	R&S	ESR3	MRTSUE06909	1 year	2021/10/30	WZ-SR2
					1 year	2022/11/1	
11	TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2022/5/24	WZ-AC2
12	EMI Test Receiver	Agilent	N9038A	MRTSUE06125	1 year	2022/6/24	WZ-AC2
13	Thermohygrometer	Mingle	ETH529	MRTSUE06170	1 year	2021/11/30	WZ-AC2
					1 year	2022/12/1	
14	Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2021/10/20	WZ-AC2
					1 year	2022/10/21	
15	Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2021/11/11	WZ-AC2
					1 year	2022/11/12	
16	Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2022/4/29	WZ-AC2
17	Thermohygrometer	testo	Testo 608-H1	MRTSUE11038	1 year	2021/11/10	WZ-AC2
					1 year	2022/11/11	
18	Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2021/10/27	WZ-AC1/WZ-AC2
					1 year	2022/10/28	
19	Horn Antenna	ETS	3117	MRTSUE06257	1 year	2021/9/24	WZ-AC1/WZ-AC2
					1 year	2022/9/25	
20	Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2021/12/14	WZ-AC1/WZ-AC2
21	Preamplifier	EMCI	EMC184045SE	MRTSUE06640	1 year	2022/1/14	WZ-AC1/WZ-AC2
22	Preamplifier	EMCI	EMC051845SE	MRTSUE06987	1 year	2021/9/8	WZ-AC1/WZ-AC2
					1 year	2022/9/9	
23	EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2022/1/4	WZ-AC1

No.	Instrument	Manufacturer	Model No.	Asset No.	Last Cali. Date	Cali. Due Date	Test Site
24	Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2021/9/15	WZ-AC1
					1 year	2022/9/16	
25	Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2021/11/11	WZ-AC1
					1 year	2022/11/12	
26	TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2021/8/4	WZ-AC1
					1 year	2022/8/5	
27	Anechoic Chamber	TDK	WZ-AC1	MRTSUE06212	1 year	2022/4/29	WZ-AC1
28	Thermohygrometer	testo	608-H1	MRTSUE06403	1 year	2022/6/28	WZ-AC1
29	Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2022/1/6	WZ-AC1
30	Thermohygrometer	testo	Testo 608-H1	MRTSUE11039	1 year	2021/11/10	WZ-AC1
					1 year	2022/11/11	

Software	Version	Function
EMI Software	V3	EMI Test Software

5. Measurement Uncertainty

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

AC Conducted Emission Measurement
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~40GHz: 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%

6. Test Result

6.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.247(a)(2)	6dB Bandwidth	Conducted	Pass
15.247(b)(3)	Output Power		Pass
15.247(e)	Power Spectral Density		Pass
15.247(d)	Band Edge / Out-of-Band Emissions		Pass
15.205 15.209	General Field Strength (Restricted Bands and Radiated Emission)	Radiated	Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	Pass

Remark:

1. 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.
2. For radiated emission tests, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

6.2. 6dB Bandwidth

6.2.1. Test Limit

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

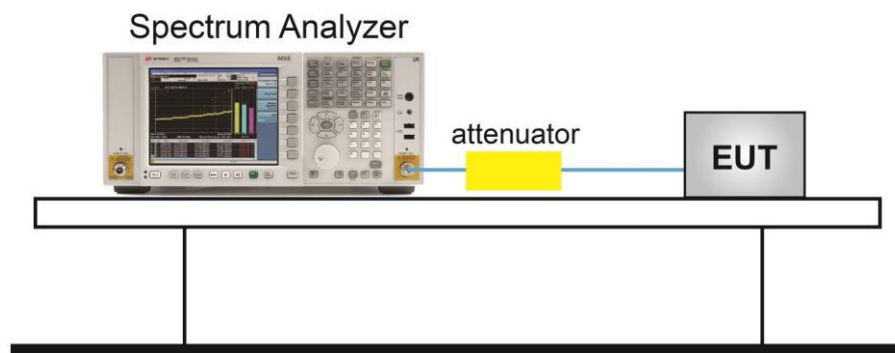
6.2.2. Test Procedure used

ANSI C63.10 - 2013 - Section 11.8

6.2.3. Test Setting

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

6.2.4. Test Setup



6.2.5. Test Result

Refer to Appendix A.1.

6.3. Output Power

6.3.1. Test Limit

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

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.

6.3.2. Test Procedure Used

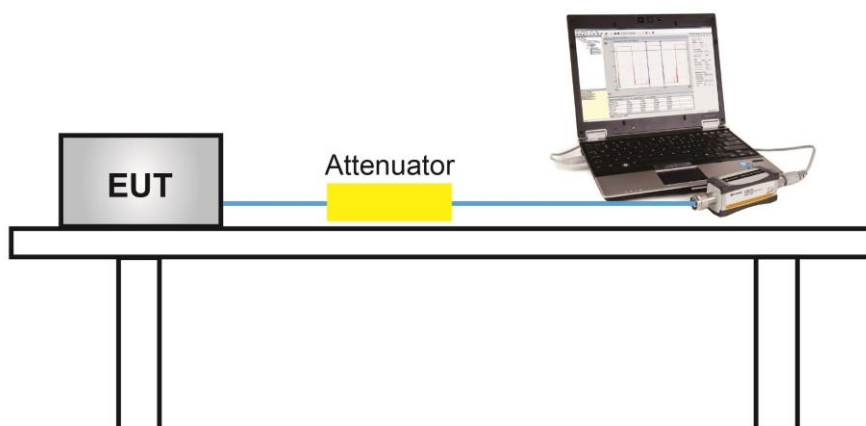
ANSI C63.10 - 2013 - Section 11.9.2.3.2

6.3.3. Test Setting

Average Power Measurement

Average 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 power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

6.3.4. Test Setup



6.3.5. Test Result

Refer to Appendix A.2.

6.4. Power Spectral Density

6.4.1. 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.

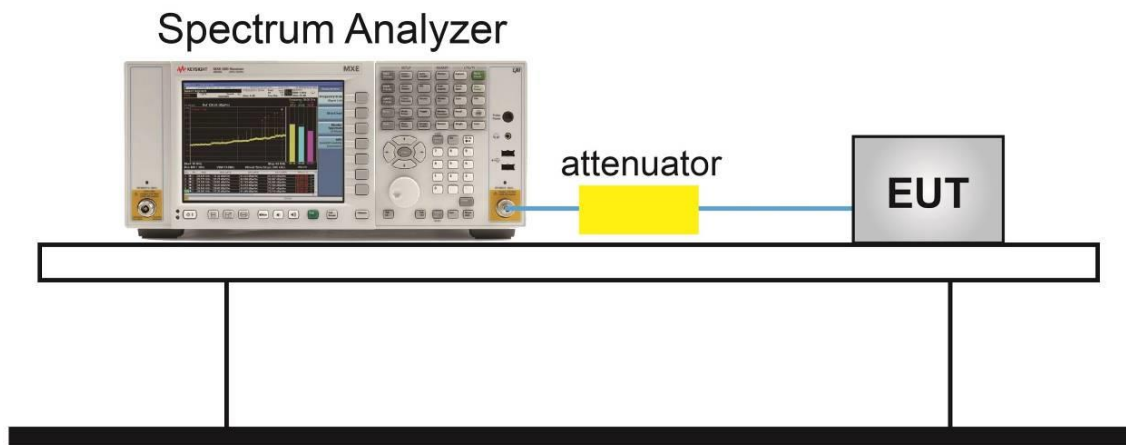
6.4.2. Test Procedure Used

ANSI C63.10 - 2013 - Section 11.10.5

6.4.3. Test Setting

1. Measure the duty cycle (x) of the transmitter output signal.
2. Set instrument center frequency to DTS channel center frequency.
3. Set span to at least 1.5 times the OBW.
4. RBW = 10 kHz.
5. VBW = 30 kHz.
6. Detector = RMS.
7. Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
8. Sweep time = auto couple.
9. Don't use sweep triggering. Allow sweep to "free run".
10. Employ trace averaging (RMS) mode over a minimum of 100 traces.
11. Use the peak marker function to determine the maximum amplitude level.
12. Add $10 \log (1/x)$, where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time. If measured value exceeds requirement specified by regulatory agency, then reduce RBW (but no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span to meet the minimum measurement point requirement as the RBW is reduced).

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.3.

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

6.5.1. 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.

6.5.2. Test Procedure Used

ANSI C63.10-2013 - Section 11.11

6.5.3. Test Setting

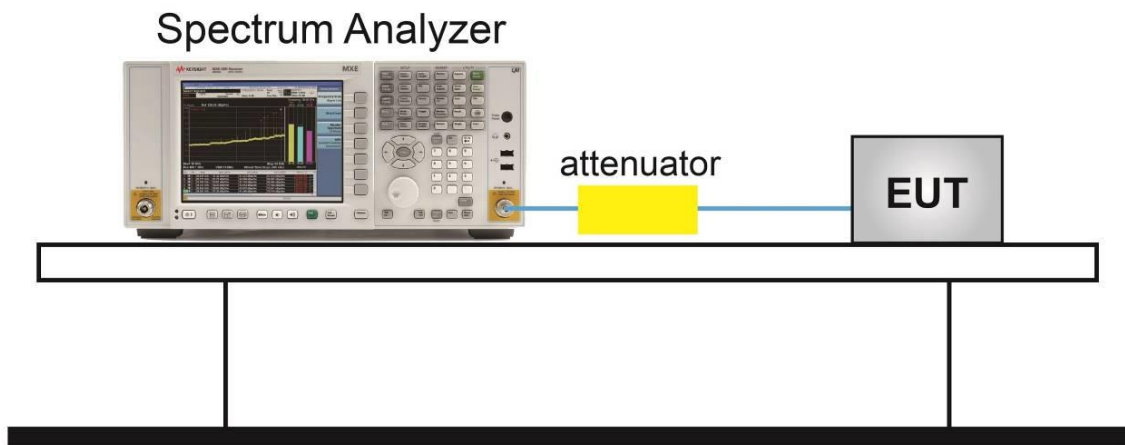
Reference level measurement

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 $\geq 3 \times$ 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

6.5.4. Test Setup



6.5.5. Test Result

Refer to Appendix A.4.

6.6. Radiated Spurious Emission

6.6.1. Test Limit

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

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

6.6.2. Test Procedure Used

ANSI C63.10 - 2013 - Section 11.11 & 11.12

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)

6.6.3. 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
> 1000MHz	1MHz

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

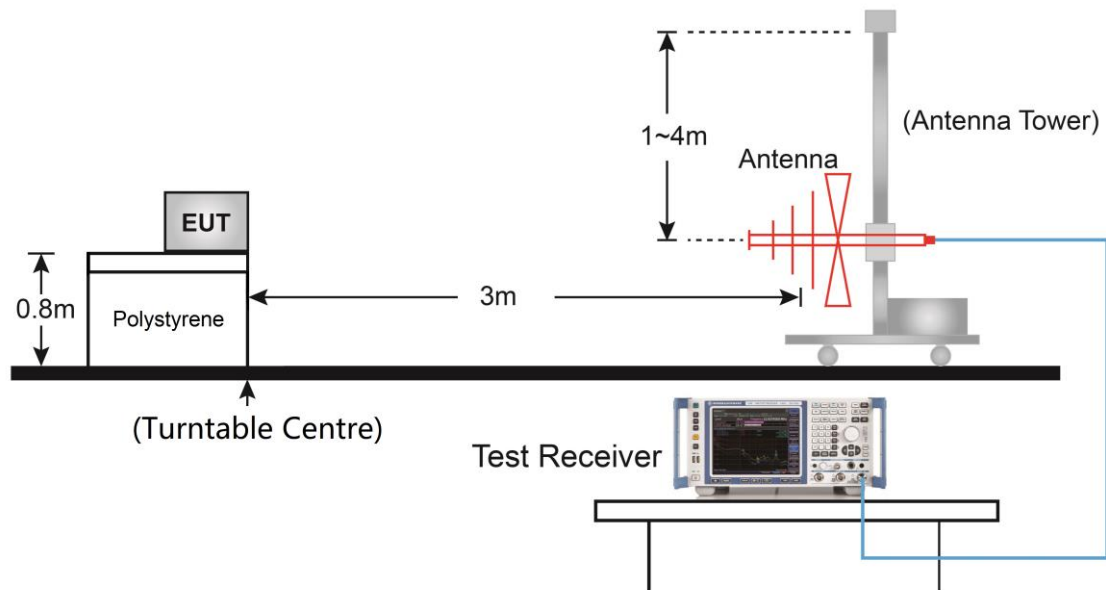
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

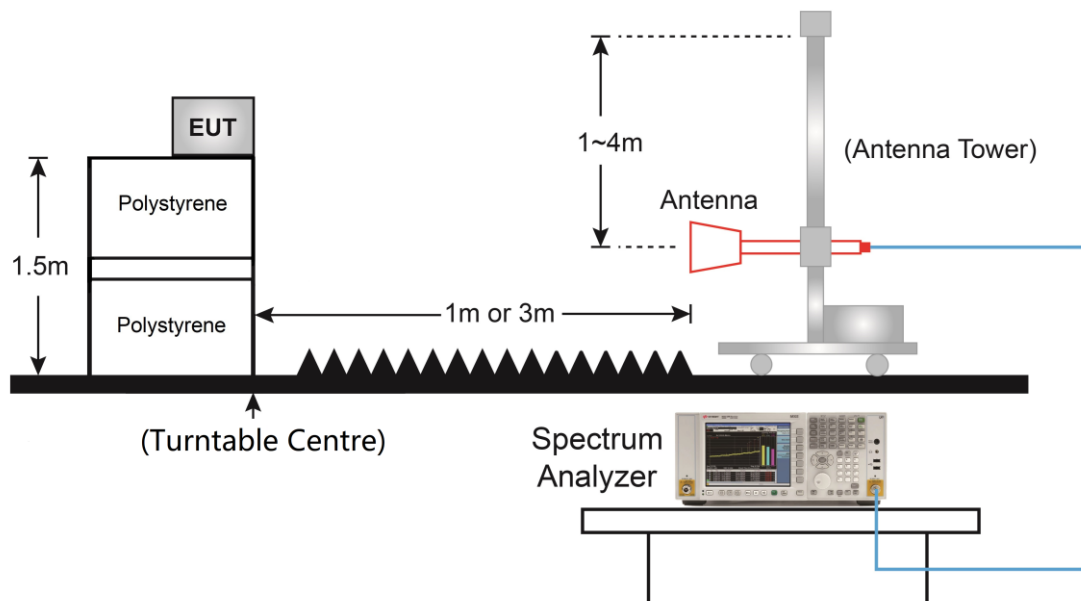
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10 Hz.
If the EUT duty cycle is $< 98\%$, set VBW $\geq 1/T$. T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.6.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.6.5. Test Result

Refer to Appendix A.5.

6.7. Radiated Restricted Band Edge

6.7.1. 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		
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

6.7.2. Test Procedure Used

ANSI C63.10-2013 Section 6.3

ANSI C63.10-2013 Section 6.6

ANSI C63.10-2013 Section 11.13

6.7.3. Test Setting

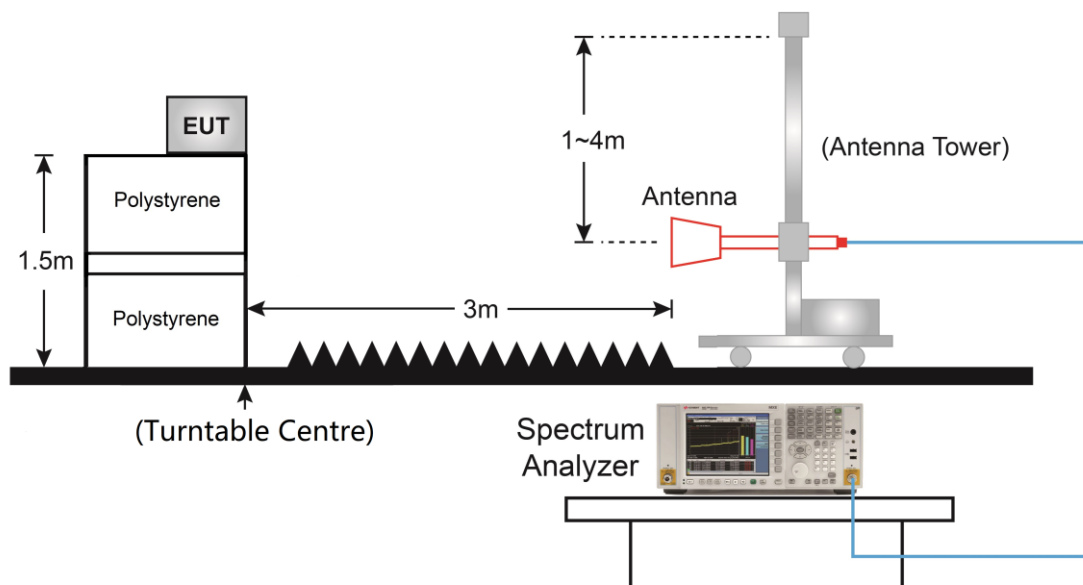
Peak Field Strength Measurements

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 $\geq 1/T$
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

6.7.4. Test Setup



6.7.5. Test Result

Refer to Appendix A.6.

6.8. AC Conducted Emissions

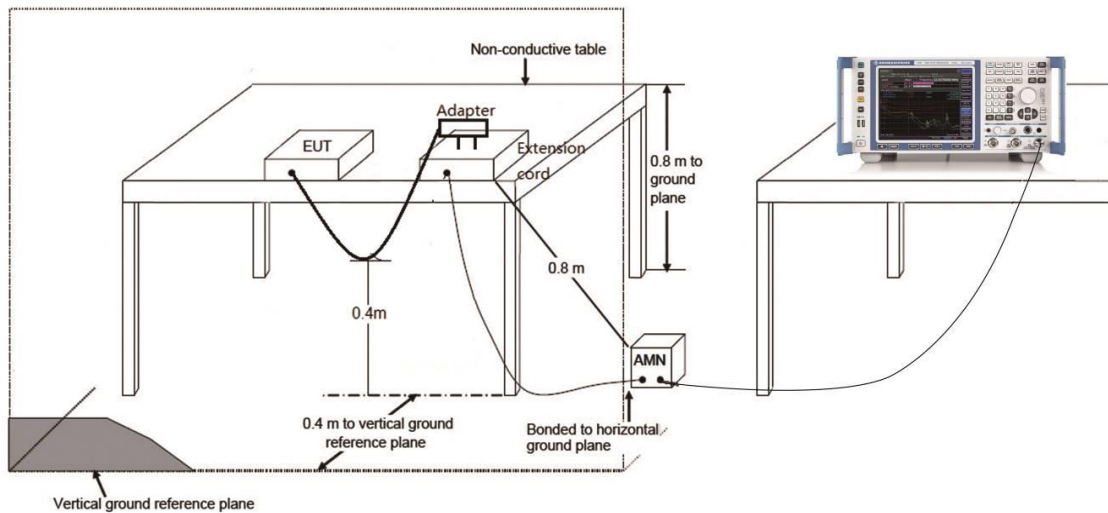
6.8.1. Test Limit

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

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

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

6.8.2. Test Setup



6.8.3. Test Result

Refer to Appendix A.7.

7. Conclusion

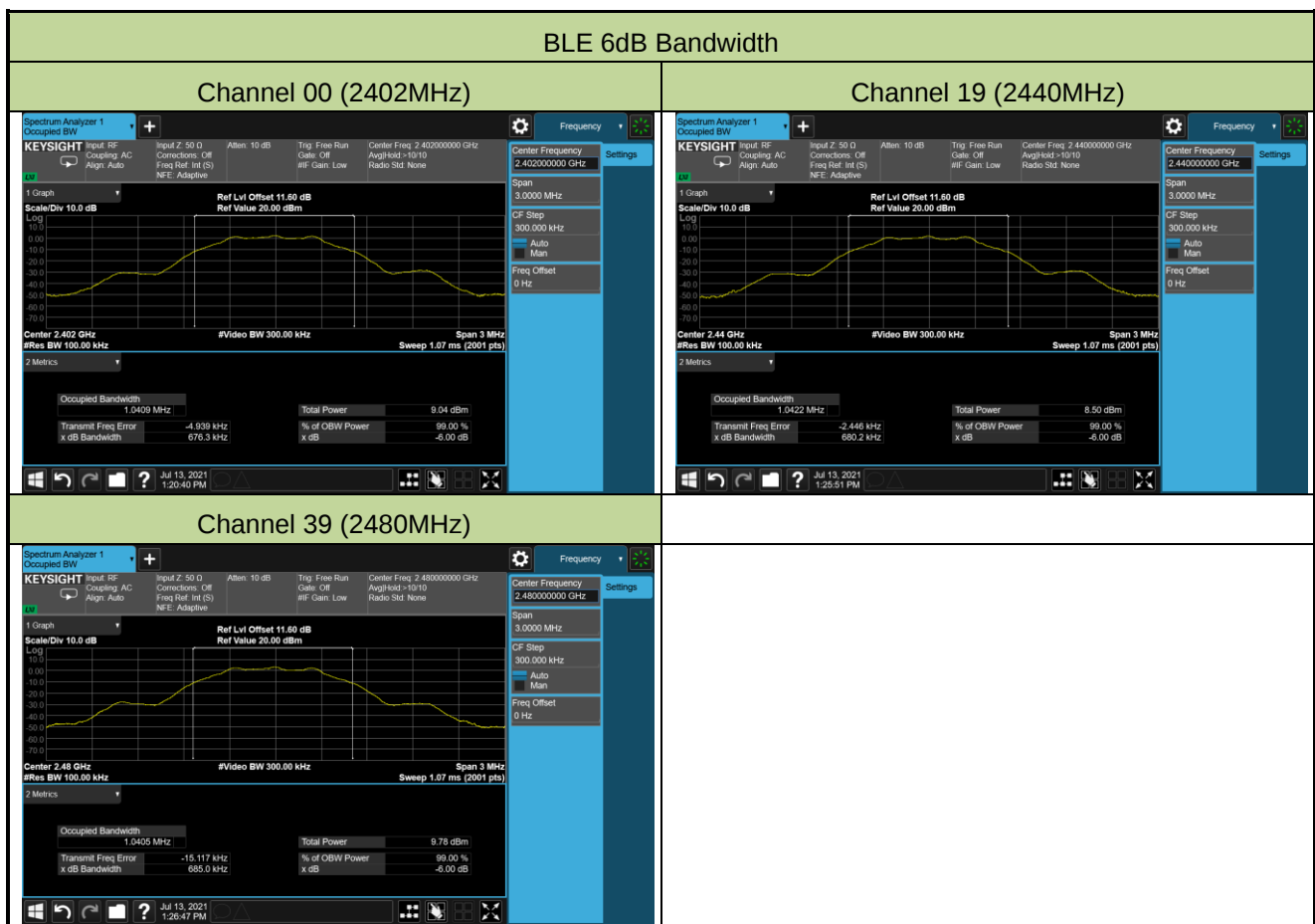
The data collected relate only the item(s) tested and show that the device is in compliance with Part 15C of the FCC rules.

Appendix A – Test Result

A.1 6dB Bandwidth Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2021/07/13		

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
BLE	1Mbps	00	2402	0.676	≥ 0.5
BLE	1Mbps	19	2440	0.680	≥ 0.5
BLE	1Mbps	39	2480	0.685	≥ 0.5



A.2 Output Power Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2021/07/13		

Test Result of Peak Output Power

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)
BLE	1	00	2402	3.56	≤ 30.00
BLE	1	19	2440	2.43	≤ 30.00
BLE	1	39	2480	4.62	≤ 30.00

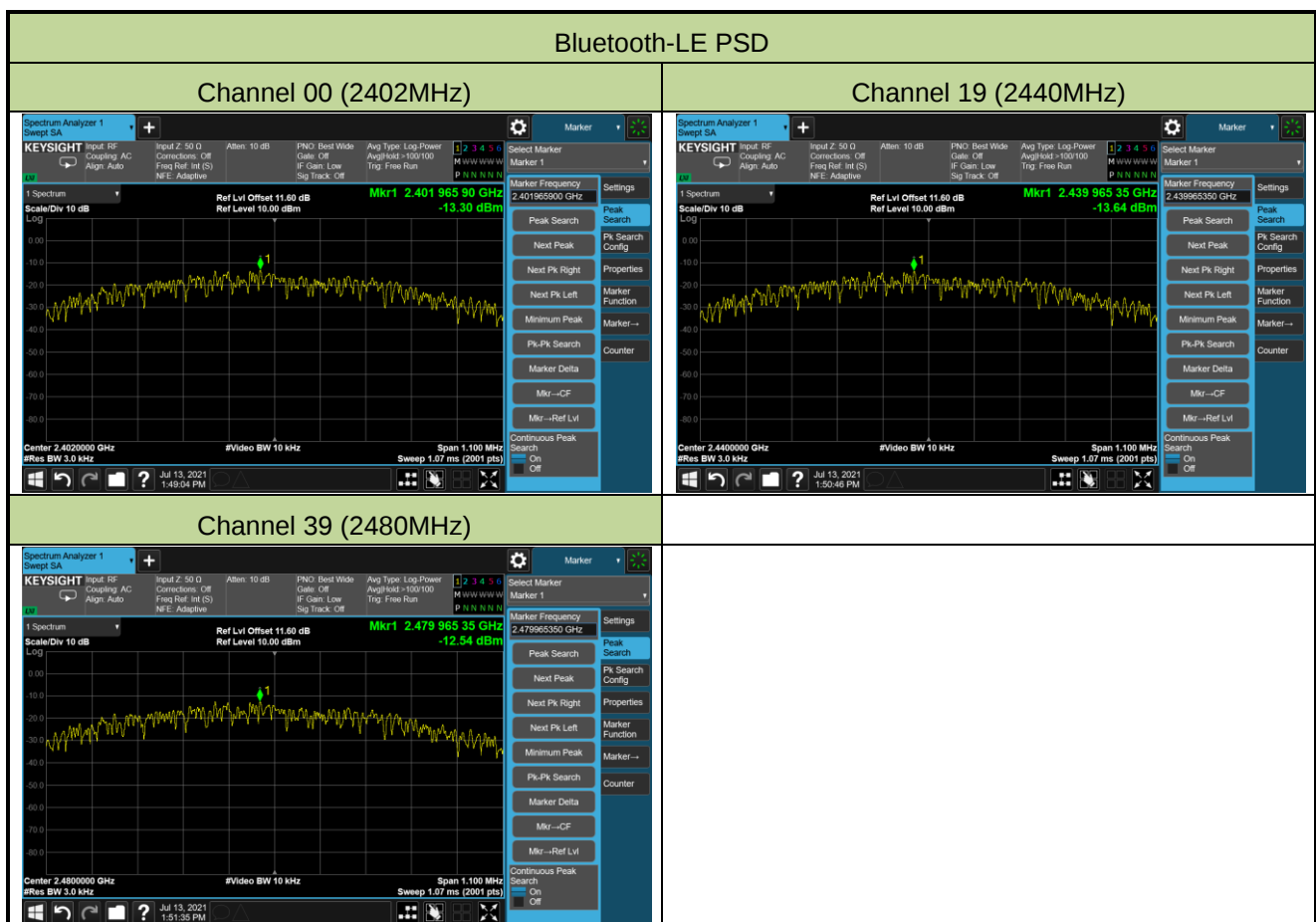
Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)
BLE	1	00	2402	3.18	≤ 30.00
BLE	1	19	2440	2.22	≤ 30.00
BLE	1	39	2480	4.34	≤ 30.00

A.3 Power Spectral Density Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2021/07/13		

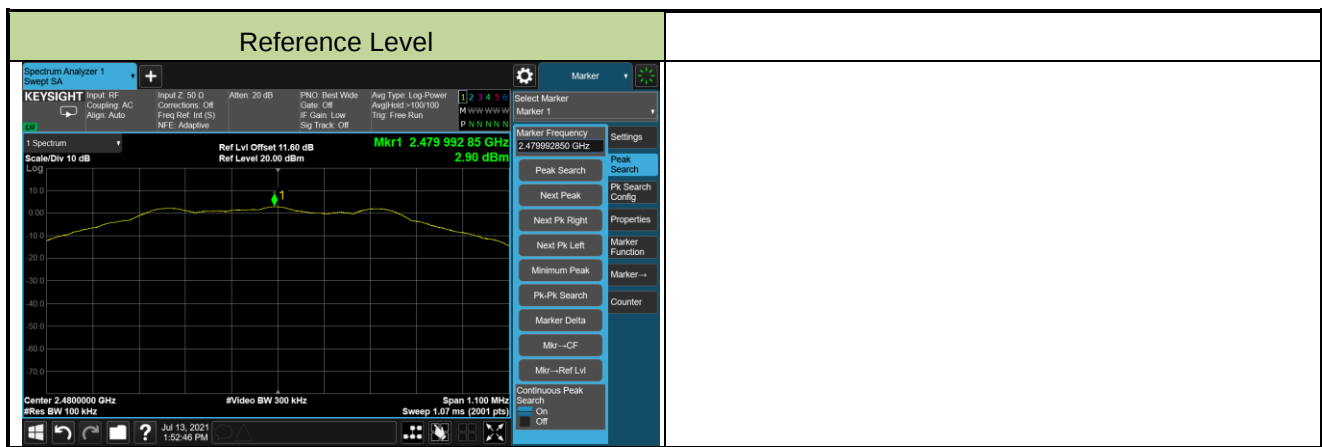
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)
BLE	1	00	2402	-13.30	≤ 8.00
BLE	1	19	2440	-13.64	≤ 8.00
BLE	1	39	2480	-12.54	≤ 8.00



A.4 Conducted Band Edge and Out-of-Band Emissions Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2021/07/13		

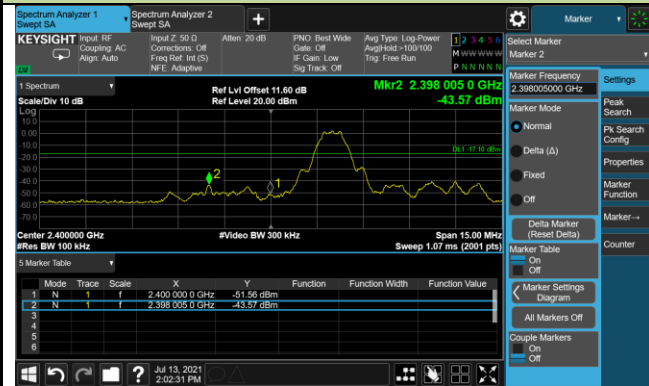
Test Mode	Data Rate (Mbps)	Channel No.	Frequency (MHz)	Limit
BLE	1	00	2402	20dBc
BLE	1	19	2440	20dBc
BLE	1	39	2480	20dBc



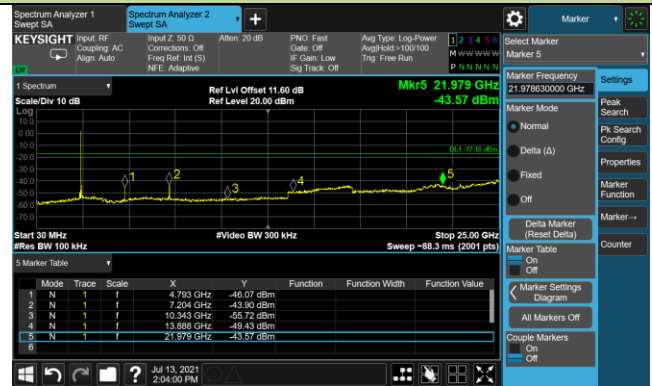
BLE Out-of-Band Emissions

Channel 00 (2402MHz)

Low Band Edge

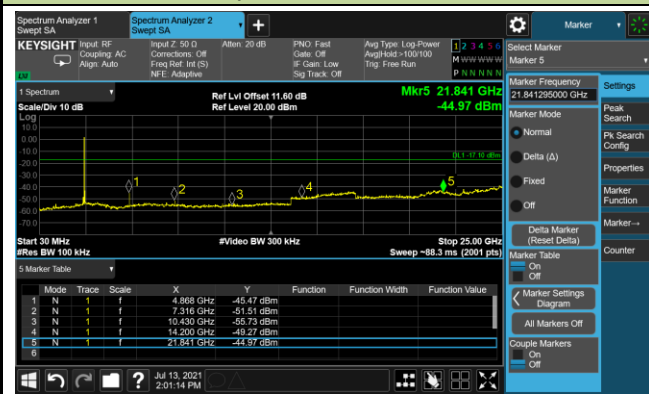


Spurious Emission



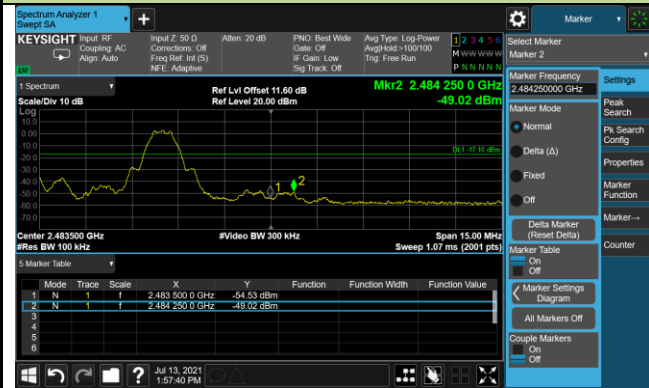
Channel 19 (2440MHz)

Spurious Emission

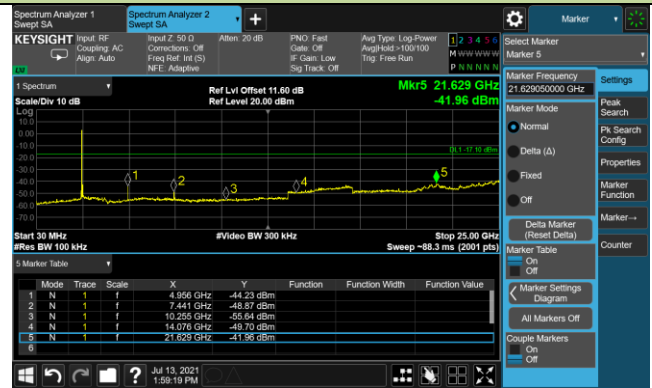


Channel 39 (2480MHz)

High Band Edge



Spurious Emission



A.5 Radiated Spurious Emission Test Result

Test Site	WZ-AC2	Test Engineer	Messiah Li
Test Date	2021/07/02	Test Mode:	BLE
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.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
00	4808.0	42.2	4.5	46.7	74.0	-27.3	Peak	Horizontal
	5437.0	34.3	5.1	39.4	74.0	-34.6	Peak	Horizontal
	10953.5	33.7	17.9	51.6	74.0	-22.4	Peak	Horizontal
	4808.0	42.6	4.5	47.1	74.0	-26.9	Peak	Vertical
	5386.0	35.3	4.9	40.2	74.0	-33.8	Peak	Vertical
	11642.0	31.9	19.7	51.6	74.0	-22.4	Peak	Vertical
19	4884.5	44.3	4.4	48.7	74.0	-25.3	Peak	Horizontal
	7324.0	40.9	12.1	53.0	74.0	-21.0	Peak	Horizontal
	7320.3	37.4	12.1	49.5	54.0	-4.5	Average	Horizontal
	11115.0	32.9	18.3	51.2	74.0	-22.8	Peak	Horizontal
	4884.5	45.9	4.4	50.3	74.0	-23.7	Peak	Vertical
	7324.0	42.2	12.1	54.3	74.0	-19.7	Peak	Vertical
	7320.1	39.8	12.1	51.9	54.0	-2.1	Average	Vertical
	10877.0	33.7	17.7	51.4	74.0	-22.6	Peak	Vertical
39	4961.0	45.3	4.5	49.8	74.0	-24.2	Peak	Horizontal
	7439.4	38.2	12.3	50.5	54.0	-3.5	Average	Horizontal
	7443.0	41.4	12.2	53.6	74.0	-20.4	Peak	Horizontal
	11659.0	33.1	19.5	52.6	74.0	-21.4	Peak	Horizontal
	4961.0	44.2	4.5	48.7	74.0	-25.3	Peak	Vertical
	7439.4	41.4	12.3	53.7	54.0	-0.3	Average	Vertical
	7443.0	43.7	12.2	55.9	74.0	-18.1	Peak	Vertical
	10970.5	32.8	17.9	50.7	74.0	-23.3	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-AC1	Test Engineer	Charles Zhang
Test Date	2021/12/13	Test Mode:	802.11a + BLE
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.		

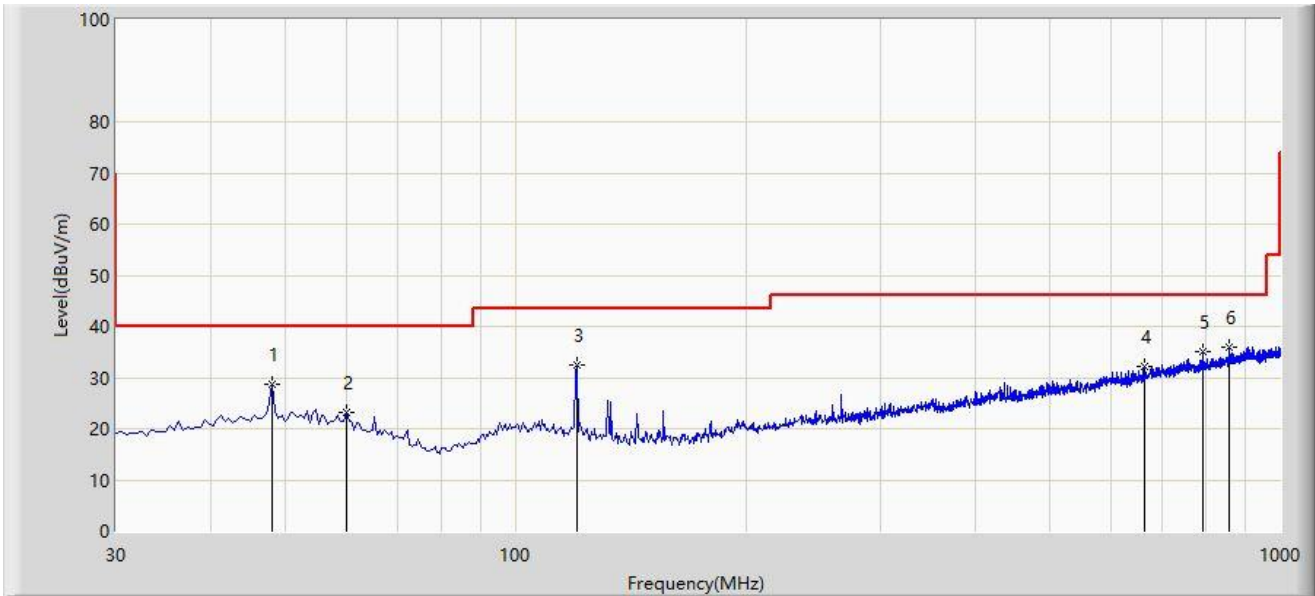
Test Frequency	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
5500MHz + 2480MHz	10970.5	36.4	13.7	50.1	74	-23.9	Peak	Horizontal
	12730.0	38.3	13.3	51.6	74	-22.4	Peak	Horizontal
	10996.0	36.3	13.8	50.1	74	-23.9	Peak	Vertical
	12874.5	36.7	13.8	50.5	74	-23.5	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 Result of Radiated Emission below 1GHz:

Site: WZ-AC2	Time: 2021/07/02 - 22:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_VULB9162_0.03-7GHz	Polarity: Horizontal
EUT: Wireless Transmitter	Power: AC120V / 60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB)	Type
1			47.945	28.635	8.120	-11.365	40.000	20.515	PK
2			60.070	23.220	3.986	-16.780	40.000	19.235	PK
3			120.210	32.526	15.922	-10.974	43.500	16.604	PK
4			663.895	32.165	4.047	-13.835	46.000	28.117	PK
5			790.965	34.947	5.081	-11.053	46.000	29.866	PK
6		*	857.410	36.065	4.897	-9.935	46.000	31.168	PK

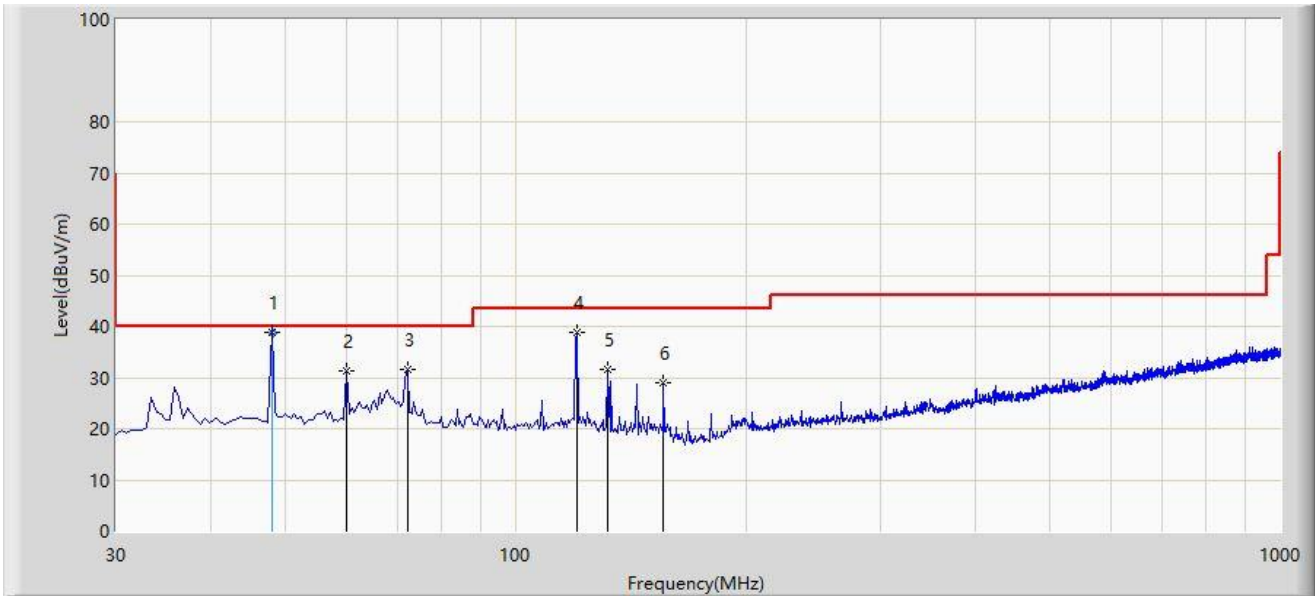
Note 1: Measure Level (dBuV/m) = Reading Level (dBuV) + Factor (dB)

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

Note 2: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 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: WZ-AC2	Time: 2021/07/02 - 22:21
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_VULB9162_0.03-7GHz	Polarity: Vertical
EUT: Wireless Transmitter	Power: AC120V / 60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1		*	48.017	38.818	18.300	-1.182	40.000	20.518	QP
2			60.070	31.237	12.003	-8.763	40.000	19.235	PK
3			72.195	31.609	15.907	-8.391	40.000	15.702	PK
4			120.210	38.963	22.359	-4.537	43.500	16.604	PK
5			131.850	31.529	16.033	-11.971	43.500	15.497	PK
6			156.100	29.063	13.615	-14.437	43.500	15.448	PK

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

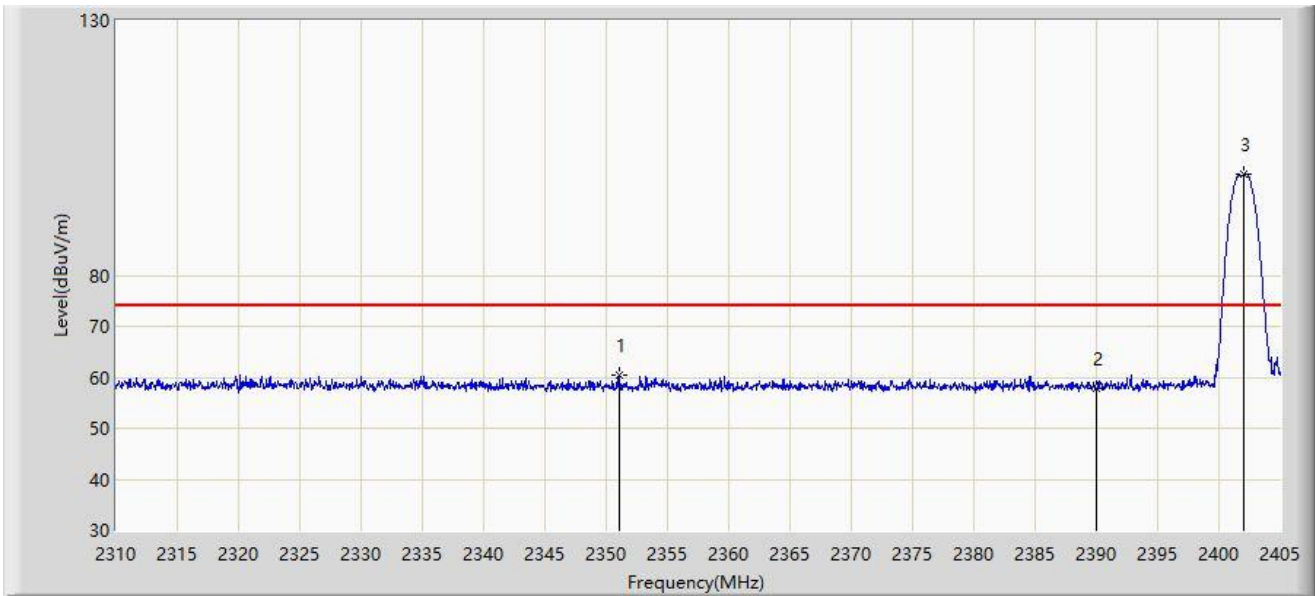
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

Note 2: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 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.

A.6 Radiated Restricted Band Edge Test Result

Site: WZ-AC2	Time: 2021/07/02
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2402MHz	

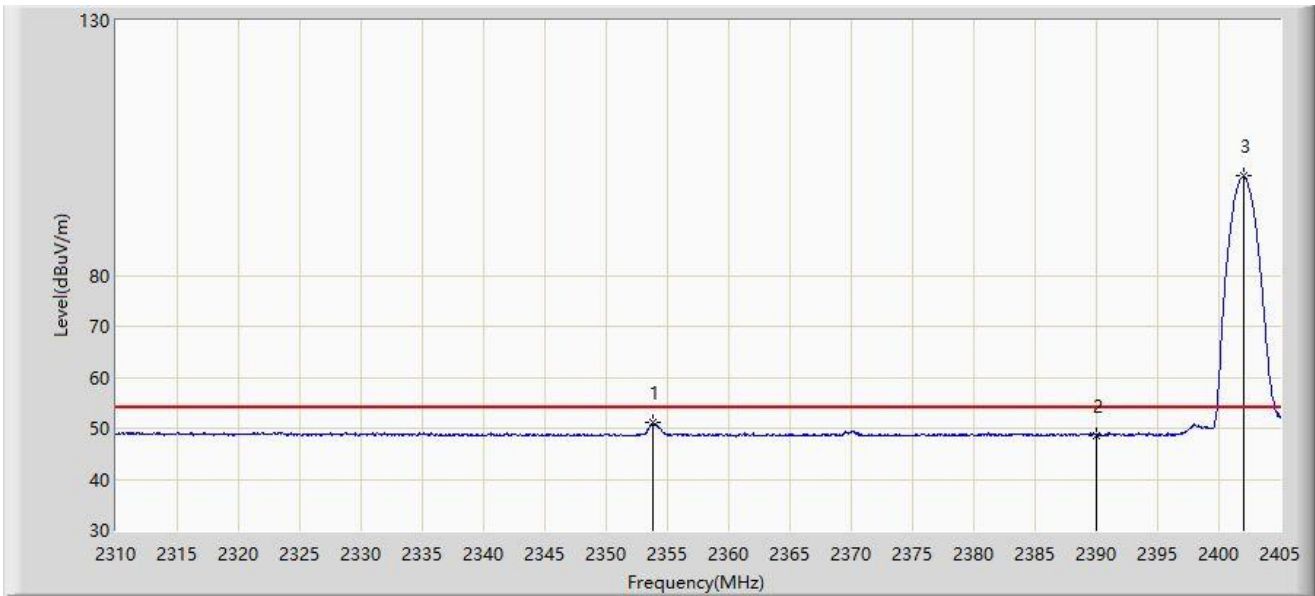


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1			2351.040	60.358	28.327	-13.642	74.000	32.032	PK
2			2390.000	57.926	25.923	-16.074	74.000	32.003	PK
3		*	2402.008	99.727	67.741	N/A	N/A	31.986	PK

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

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

Site: WZ-AC2	Time: 2021/07/02
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2402MHz	

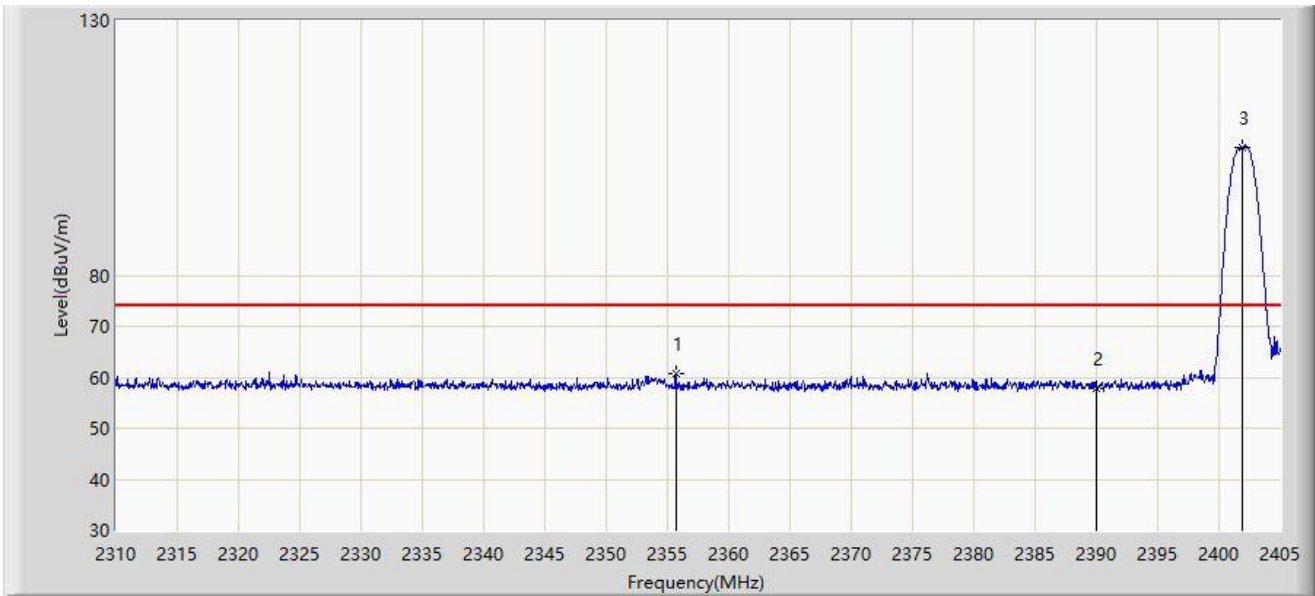


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1			2353.843	51.015	18.987	-2.985	54.000	32.028	AV
2			2390.000	48.616	16.613	-5.384	54.000	32.003	AV
3		*	2402.008	99.438	67.452	N/A	N/A	31.986	AV

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

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

Site: WZ-AC2	Time: 2021/07/02
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2402MHz	

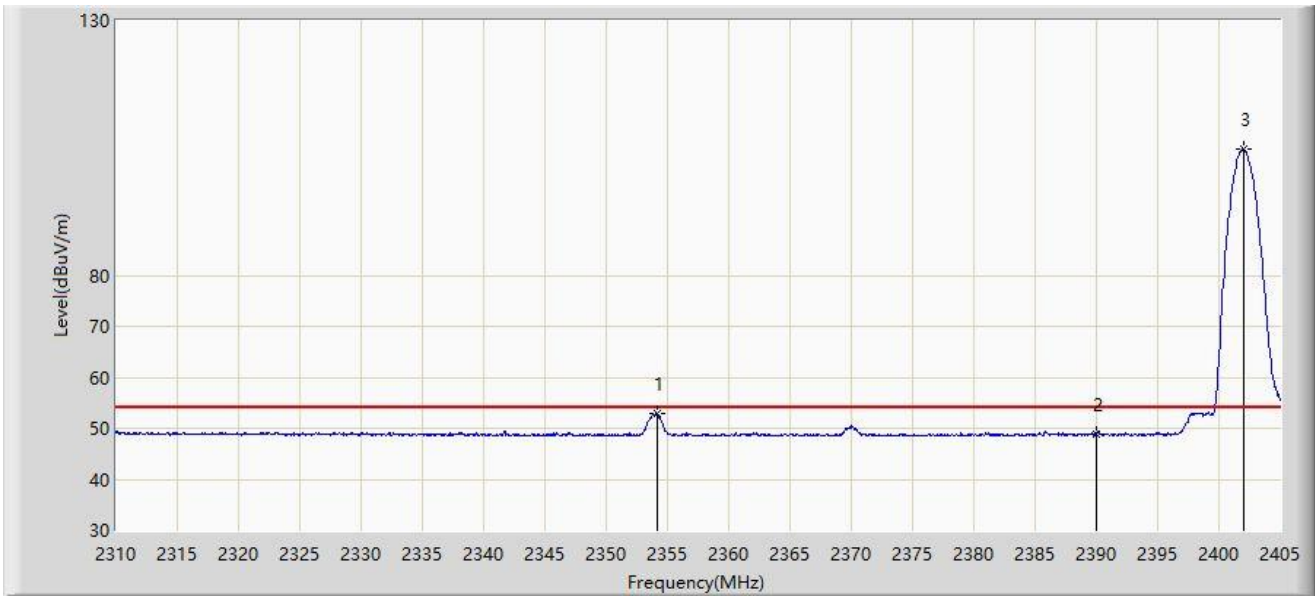


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1			2355.695	60.748	28.722	-13.252	74.000	32.027	PK
2			2390.000	57.714	25.711	-16.286	74.000	32.003	PK
3		*	2401.913	105.023	73.037	N/A	N/A	31.986	PK

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

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

Site: WZ-AC2	Time: 2021/07/02
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2402MHz	

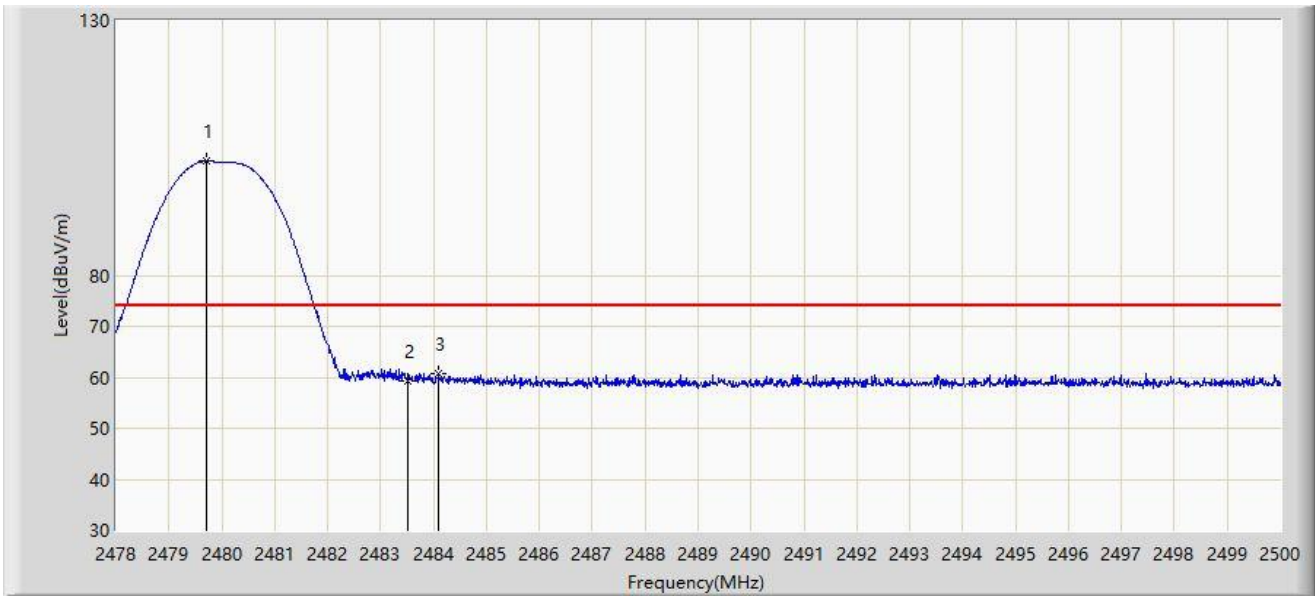


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1			2354.175	52.854	20.826	-1.146	54.000	32.028	AV
2			2390.000	48.757	16.754	-5.243	54.000	32.003	AV
3		*	2402.008	104.746	72.760	N/A	N/A	31.986	AV

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

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

Site: WZ-AC2	Time: 2021/07/02
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2480MHz	

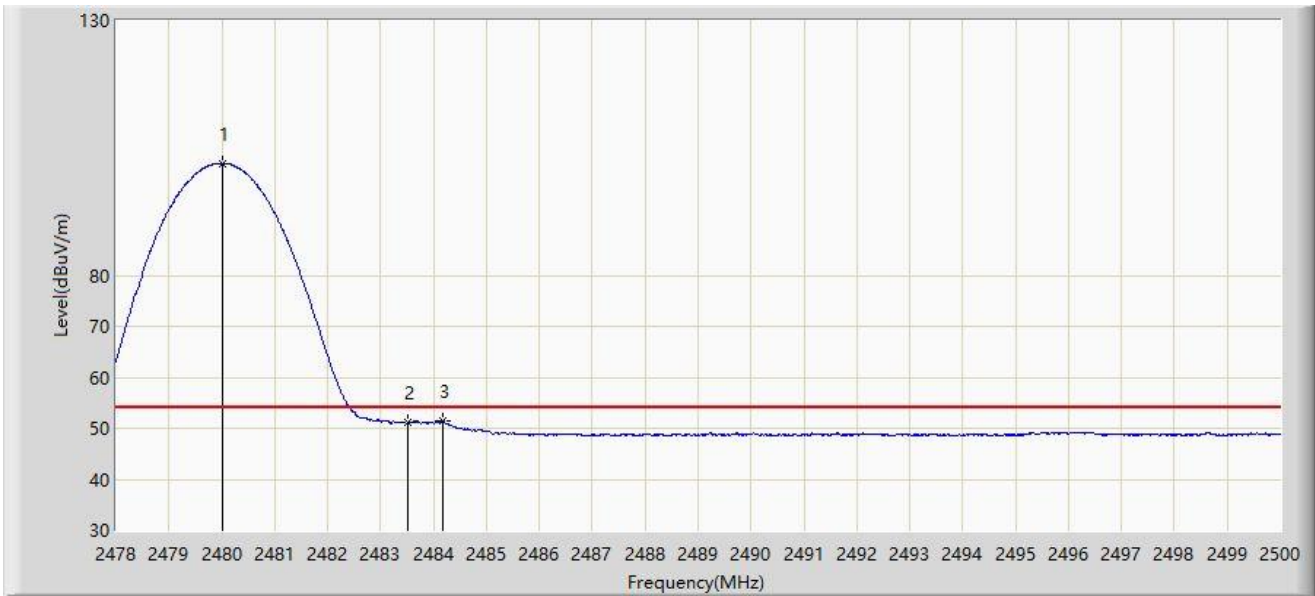


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1		*	2479.705	102.400	70.480	N/A	N/A	31.919	PK
2			2483.500	59.399	27.487	-14.601	74.000	31.912	PK
3			2484.094	60.797	28.886	-13.203	74.000	31.911	PK

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

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

Site: WZ-AC2	Time: 2021/07/02
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2480MHz	

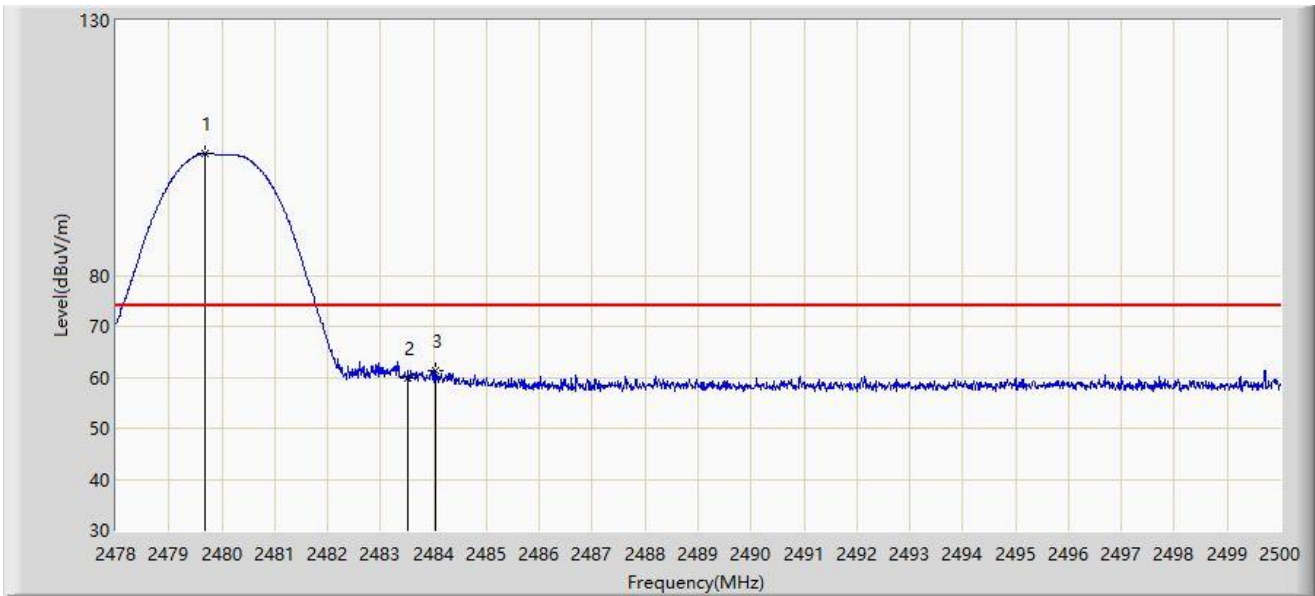


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1		*	2480.024	101.983	70.064	N/A	N/A	31.919	AV
2			2483.500	51.033	19.121	-2.967	54.000	31.912	AV
3			2484.182	51.403	19.493	-2.597	54.000	31.911	AV

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

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

Site: WZ-AC2	Time: 2021/07/02
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2480MHz	

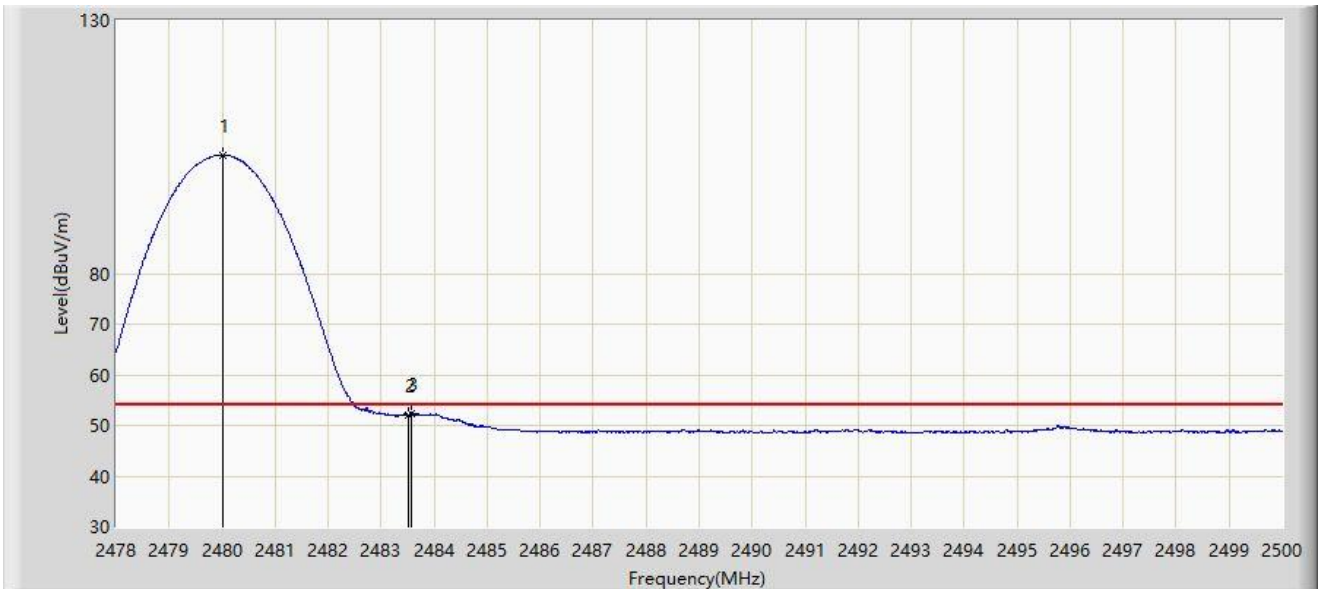


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1		*	2479.694	103.862	71.942	N/A	N/A	31.919	PK
2			2483.500	59.817	27.905	-14.183	74.000	31.912	PK
3			2484.028	61.433	29.522	-12.567	74.000	31.911	PK

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

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

Site: WZ-AC2	Time: 2021/07/02
Limit: FCC_Part15.209_RE(3m)	Engineer: Messiah Li
Probe: WZ-AC2_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2480MHz	



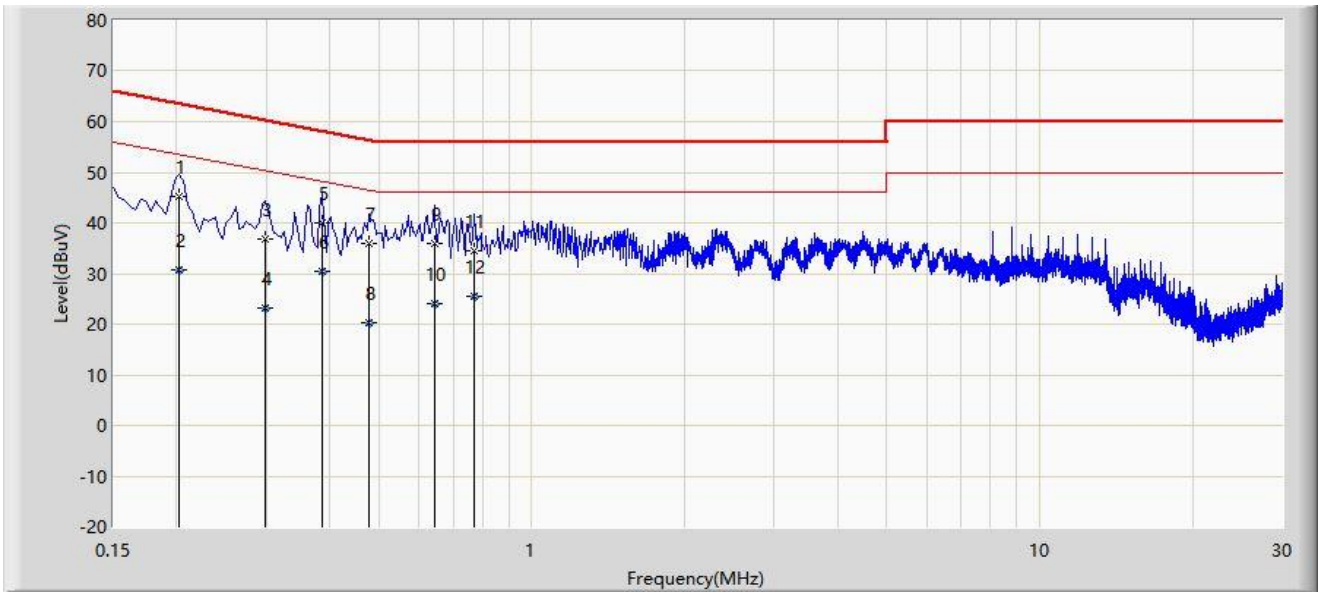
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV/m)	Factor (dB/m)	Type
1		*	2480.002	103.469	71.550	N/A	N/A	31.919	AV
2			2483.500	51.999	20.087	-2.001	54.000	31.912	AV
3			2483.577	52.428	20.516	-1.572	54.000	31.911	AV

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

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

A.7 AC Conducted Emissions Test Result

Site: WZ-SR2	Time: 2021/07/25
Limit: FCC_Part15.207_CE_AC Power	Engineer: Hyde Yu
Probe: ENV216_101683_Filter Off	Polarity: Line
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2402MHz	

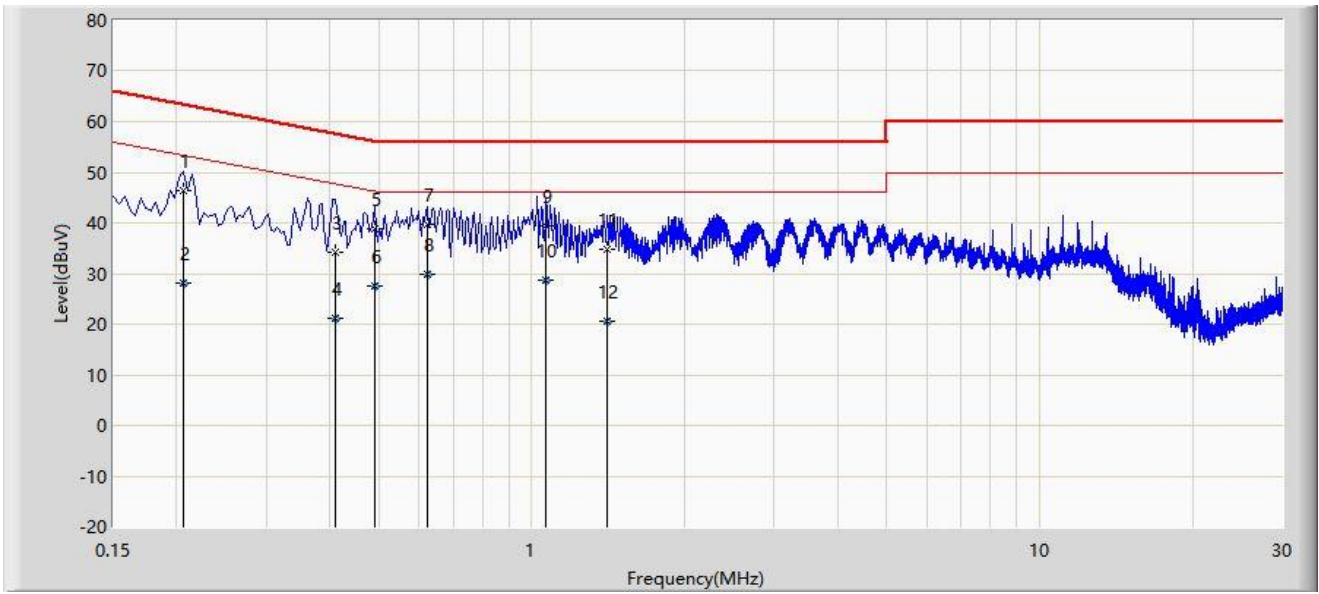


No	Flag	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1			0.202	45.090	35.103	-18.438	63.528	9.987	QP
2			0.202	30.849	20.861	-22.679	53.528	9.987	AV
3			0.298	36.922	26.927	-23.377	60.298	9.995	QP
4			0.298	23.181	13.186	-27.118	50.298	9.995	AV
5			0.386	39.859	29.856	-18.290	58.149	10.004	QP
6		*	0.386	30.531	20.527	-17.619	48.149	10.004	AV
7			0.478	35.939	25.926	-20.435	56.374	10.013	QP
8			0.478	20.158	10.145	-26.216	46.374	10.013	AV
9			0.642	36.059	26.028	-19.941	56.000	10.031	QP
10			0.642	24.024	13.993	-21.976	46.000	10.031	AV
11			0.770	34.593	24.546	-21.407	56.000	10.048	QP
12			0.770	25.397	15.350	-20.603	46.000	10.048	AV

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

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

Site: WZ-SR2	Time: 2021/07/25
Limit: FCC_Part15.207_CE_AC Power	Engineer: Hyde Yu
Probe: ENV216_101683_Filter Off	Polarity: Neutral
EUT: Wireless Transmitter	Power: AC 120V/60Hz
Test Mode: Transmit by Bluetooth-LE at Channel 2402MHz	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Margin (dB)	Limit (dBuV)	Factor (dB)	Type
1			0.206	46.450	36.419	-16.915	63.365	10.031	QP
2			0.206	28.049	18.018	-25.316	53.365	10.031	AV
3			0.410	34.287	24.243	-23.361	57.648	10.044	QP
4			0.410	21.049	11.005	-26.599	47.648	10.044	AV
5			0.490	38.757	28.708	-17.410	56.168	10.049	QP
6			0.490	27.638	17.589	-18.530	46.168	10.049	AV
7		*	0.622	39.847	29.786	-16.153	56.000	10.061	QP
8			0.622	29.820	19.759	-16.180	46.000	10.061	AV
9			1.066	39.349	29.242	-16.651	56.000	10.107	QP
10			1.066	28.608	18.501	-17.392	46.000	10.107	AV
11			1.410	34.790	24.649	-21.210	56.000	10.141	QP
12			1.410	20.625	10.484	-25.375	46.000	10.141	AV

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

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

Appendix B – Test Setup Photograph

Refer to “2105RSU034-UT” file.

Appendix C - EUT Photograph

Refer to “2105RSU034-UE” file.

The End
