


# RF MEASUREMENT REPORT

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**FCC ID:** Q9DAPINR605  
**Applicant:** Hewlett Packard Enterprise Company  
**Product:** ACCESS POINT  
**Model No.:** APINR605  
**Trademark:**    
**FCC Classification:** Digital Transmission System (DTS)  
**FCC Rule Part(s):** Part 15 Subpart C (Section 15.247)  
**Result:** Complies  
**Received Date:** 2022-09-30  
**Test Date:** 2022-12-22 ~ 2023-05-09

**Reviewed By:**

\_\_\_\_\_  
Jame Yuan

**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.

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### Revision History

Report No.	Version	Description	Issue Date	Note
2209RSU069-U2	V01	Initial Report	2023-05-11	Valid

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## 1. General Information

### 1.1. Applicant

Hewlett Packard Enterprise Company  
 6280 America Center Drive, San Jose CA 95002, United States

### 1.2. Manufacturer

Hewlett Packard Enterprise Company  
 6280 America Center Drive, San Jose CA 95002, United States

### 1.3. Testing Facility

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

#### 1.4. Product Information

Product Name	ACCESS POINT
Model No.	APINR605
Serial No.	CNP6L8M03M
Software Version	RAJB-AB05 V1.6.2
Wi-Fi Specification	802.11a/b/g/n/ac/ax
Bluetooth Specification	v5.0 single mode, BLE only
Zigbee Specification	802.15.4
Antenna Information	Refer to section 1.5
Operating Environment	Indoor Use
Power Type	AC/DC Adapter input
Accessories	
AC/DC Adapter	Model: ADP-50GR BD Input: 100 ~ 240V 1.3A 50 – 60Hz Output: 48V 1.042A 50.016W
Optional Integrated Modular	Modular Name: LTE-A Cat 12 M.2 Module Mode No.: APINCM12 Contain FCC ID: XMR201901EM12G Supported UTRA Band: 2, 4, 5 Supported E-UTRA Band: FDD Band: 2, 4, 5, 7, 12, 13, 14, 17, 25, 26, 30, 66, TDD Band: 38, 41
Note: 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	2405 ~ 2480MHz
Channel Number	16
Type of modulation	O-QPSK
Antenna Type	PIFA Antenna
Antenna Gain	5.1dBi

### 1.6. Working Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency
11	2405 MHz	12	2410 MHz	13	2415 MHz
14	2420 MHz	15	2425 MHz	16	2430 MHz
17	2435 MHz	18	2440 MHz	19	2445 MHz
20	2450 MHz	21	2455 MHz	22	2460 MHz
23	2465 MHz	24	2470 MHz	25	2475 MHz
26	2480 MHz	--	--	--	--

**1.7. Description of EUT Filter**

Filter	Specification	Remark
Wi-Fi		
Filter 1#	Band Pass Filter (2412-2472)	Allowing any transmission on all channels
Filter 2#	Band Pass Filter (2402-2447)	Allowing any transmission on 20MHz channels 1 thru 6 and 40MHz channel 3.
Filter 3#	Band Pass Filter (2452-2472)	Allowing any transmission on 20MHz channel 11
Filter 4#	Band Pass Filter (5150-5895)	Allowing any transmission on all channels
Filter 5#	Band Pass Filter (5150-5835)	Allowing any transmission on UNII Band 1/2a/2c/3
Filter 6#	Band Pass Filter (5925-7125)	Allowing any transmission on UNII Band 5/6/7/8
Bluetooth / ZigBee		
Filter 7#	Band Pass Filter (2402-2480)	Allowing any transmission on all channels
Filter 8#	Band Pass Filter (2402-2430)	Allowing transmission on BLE channels 37 (2402MHz) and 38 (2426MHz) and Zigbee channel 11 (2405MHz)
Filter 9#	Band Pass Filter (2478-2482)	Allowing transmission on BLE channel 39 (2480MHz) and Zigbee channel 26(2480MHz)
Note: ZigBee and BLE can't work simultaneously.		

**Working Mode**

	Radio 0	Radio 1	BLE/ZigBee
1	2.4G_Full Band (Filter 1#)	6G_Full Band (Filter 6#)	---
2	---	6G_Full Band (Filter 6#)	2.4G_Full Band (Filter 7#)
3	2.4G_Low Band (Filter 2#)	6G_Full Band (Filter 6#)	2.4G_High Band (Filter 9#)
4	2.4G_High Band (Filter 3#)	6G_Full Band (Filter 6#)	2.4G_Low Band (Filter 8#)
5	5G_Full Band (Filter 4#)	2.4G_Full Band (Filter 1#)	---
6	5G_Full Band (Filter 4#)	---	2.4G_Full Band (Filter 7#)
7	5G_Full Band (Filter 4#)	2.4G_Low Band (Filter 2#)	2.4G_High Band (Filter 9#)
8	5G_Full Band (Filter 4#)	2.4G_High Band (Filter 3#)	2.4G_Low Band (Filter 8#)
9	5G_Full Band (Filter 5#)	6G_Full Band (Filter 6#)	2.4G_Full Band (Filter 1#)
10	5G_Full Band (Filter 5#)	6G_Full Band (Filter 6#)	2.4G_Full Band (Filter 1#)
11	5G_Full Band (Filter 5#)	6G_Full Band (Filter 6#)	2.4G_Full Band (Filter 1#)
12	5G_Full Band (Filter 5#)	6G_Full Band (Filter 6#)	2.4G_Full Band (Filter 1#)

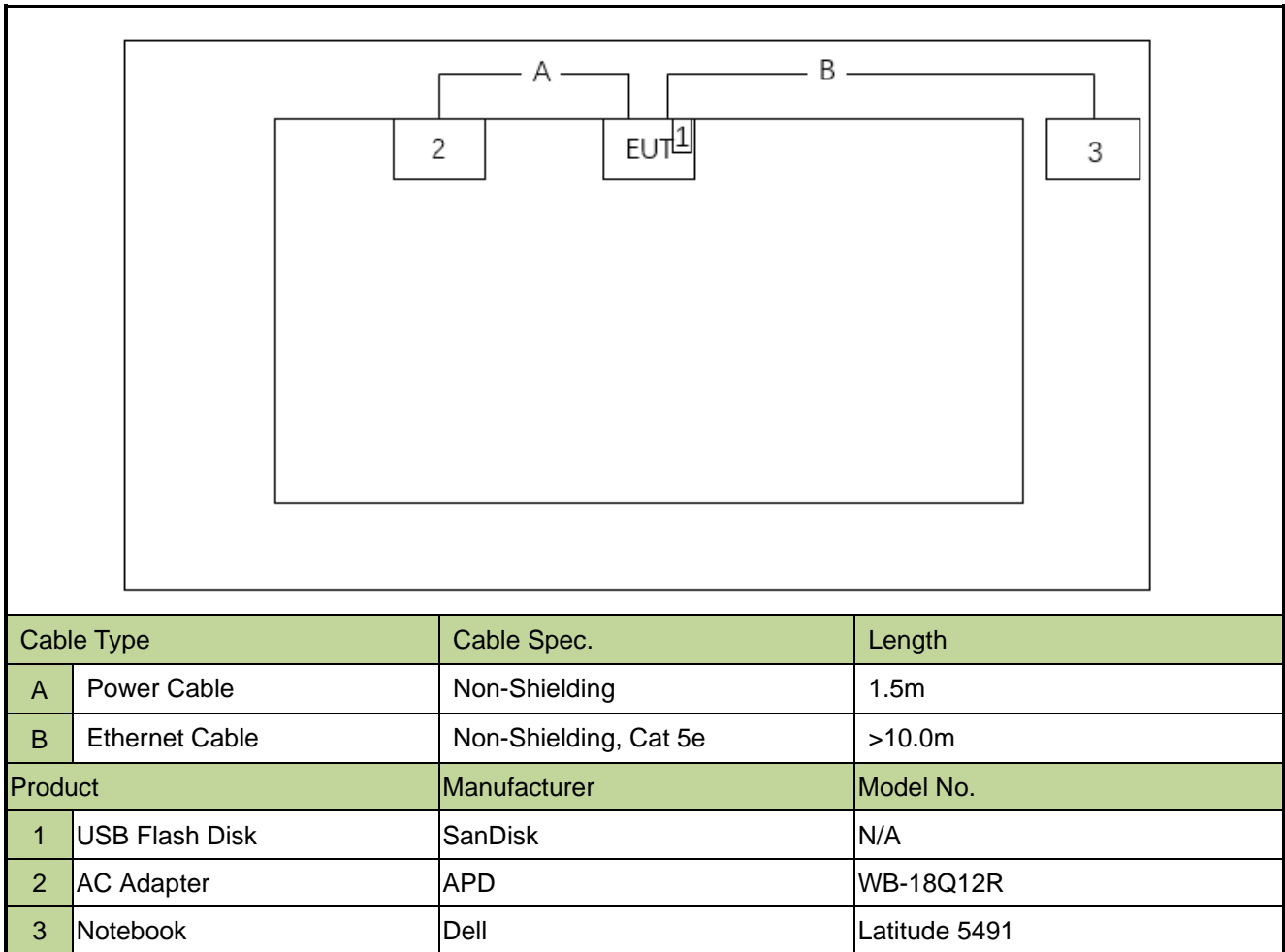


## 2. Test Configuration

### 2.1. Test Mode

Mode 1: Transmit by 802.15.4

### 2.2. Test System Connection Diagram



### 2.3. Test Software

The test utility software used during testing was "telnet.exe" and command was provided by the manufacturer.

#### 2.4. 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

#### 2.5. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~ 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

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2023-05-20	WZ-AC2
EMI Test Receiver	Agilent	N9038A	MRTSUE06125	1 year	2023-06-04	WZ-AC2
Thermohygrometer	Mingle	ETH529	MRTSUE06170	1 year	2023-11-27	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2023-10-13	WZ-AC2
Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06176	1 year	2024-05-07	WZ-AC2
Anechoic Chamber	RIKEN	WZ-AC2	MRTSUE06213	1 year	2024-04-20	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11038	1 year	2023-11-01	WZ-AC2
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2023-09-29	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2023-11-05	WZ-AC2
Preamplifier	EMCI	EMC184045SE	MRTSUE06640	1 year	2024-01-12	WZ-AC2
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2023-12-28	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2023-08-22	WZ-AC1
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2024-05-07	WZ-AC1
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2023-06-21	WZ-AC1
Anechoic Chamber	TDK	WZ-AC1	MRTSUE06212	1 year	2024-04-20	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE06403	1 year	2023-06-06	WZ-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2023-12-28	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11039	1 year	2023-11-01	WZ-AC1
Signal Generator	Agilent	E4438C	MRTSUE06081	1 year	2024-02-29	WZ-SR5
Thermohygrometer	testo	608-H1	MRTSUE06402	1 year	2023-06-06	WZ-SR5
Shielding Room	HUAMING	WZ-SR5	MRTSUE06442	N/A	N/A	WZ-SR5
Signal Analyzer	Keysight	N9010B	MRTSUE06457	1 year	2023-06-04	WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11073	1 year	2023-06-09	WZ
Attenuator	MVE	MVE2213	MRTSUE11074	1 year	2023-06-09	WZ
Attenuator	MVE	MVE2213	MRTSUE11086	1 year	2023-06-09	WZ
Attenuator	MVE	MVE2213	MRTSUE11087	1 year	2023-06-09	WZ

Software	Version	Function
EMI Software	V3.0.0	EMI Test Software
BenchVue Power Meter	2018.1	Power
Controller_MF 7802	2.03C	RE Antenna & Turntable
Controller_MF 7802	1.02	RE Antenna & Turntable

## 5. Decision Rules and Measurement Uncertainty

### 5.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

### 5.2. 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  $k = 2$ .

<b>AC Conducted Emission Measurement</b>
The maximum measurement uncertainty is evaluated as: 9kHz~150kHz: 3.58dB 150kHz~30MHz: 3.20dB
<b>Radiated Emission Measurement</b>
The maximum measurement uncertainty is evaluated as: Coaxial: 9kHz~30MHz: 2.59dB Coplanar: 9kHz~30MHz: 2.60dB Horizontal: 30MHz~200MHz: 3.85dB 200MHz~1GHz: 4.36dB 1GHz~40GHz: 4.98dB Vertical: 30MHz~200MHz: 4.06dB 200MHz~1GHz: 5.28dB 1GHz~40GHz: 4.91dB
<b>Spurious Emissions, Conducted</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 2.3dB
<b>Output Power</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 1.5dB
<b>Power Spectrum Density</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 2.3dB
<b>Occupied Bandwidth</b>
Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): 3.2%

## 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

#### Notes:

- 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.
- 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.

Test Items	Filter 7#	Filter 8#	Filter 9#
6dB Bandwidth	•		
Output Power	•	•	•
Power Spectral Density	•		
Band Edge / Out-of-Band Emissions	•	•	•
Radiated Spurious Emission	•	•	•
Radiated Band Edge	•	•	•
AC Conducted Emissions 150kHz - 30MHz	•		

## 6.2. 6dB Bandwidth Measurement

### 6.2.1. Test Limit

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

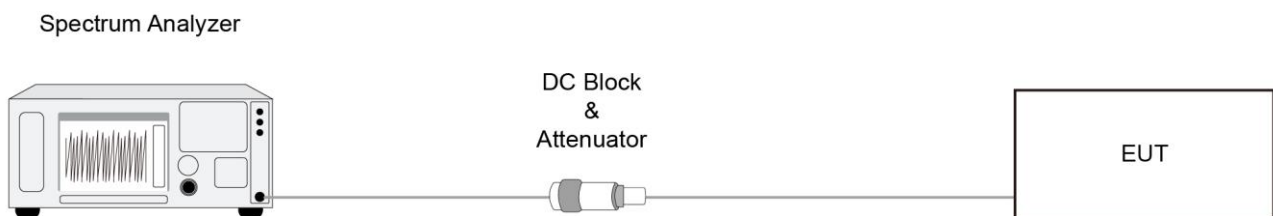
### 6.2.2. Test Procedure

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.2.

### 6.3. Output Power Measurement

#### 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

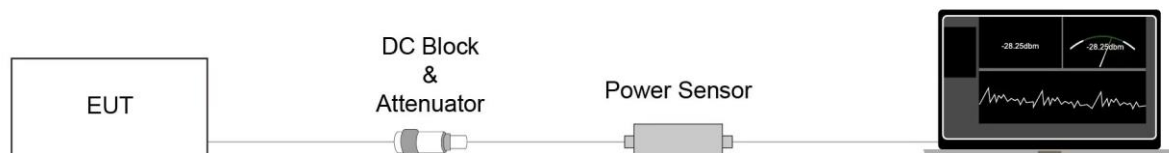
ANSI C63.10 - 2013 - Section 11.9.2.3.2

#### 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.3.



## 6.4. Power Spectral Density Measurement

### 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.

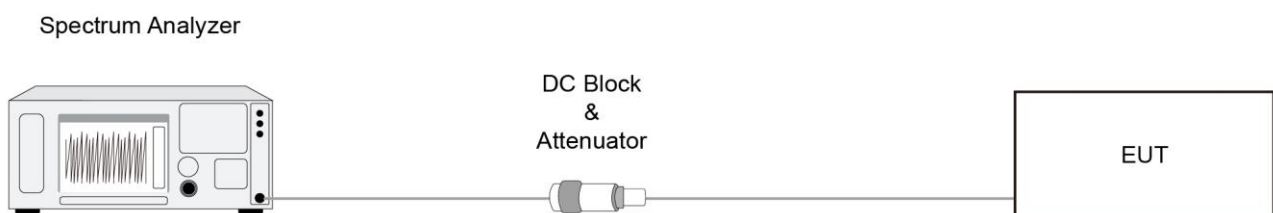
### 6.4.2. Test Procedure

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.4.

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

### 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

ANSI C63.10-2013 - Section 11.11

### 6.5.3. Test Setting

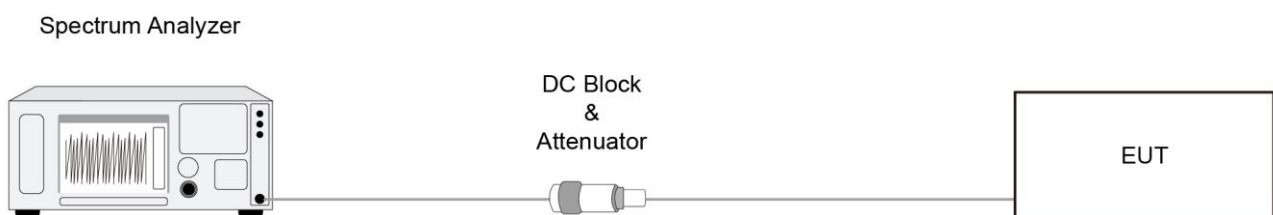
#### Reference level measurement

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to  $\geq 1.5$  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.5.

## 6.6. Radiated Spurious Emission Measurement

### 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

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**

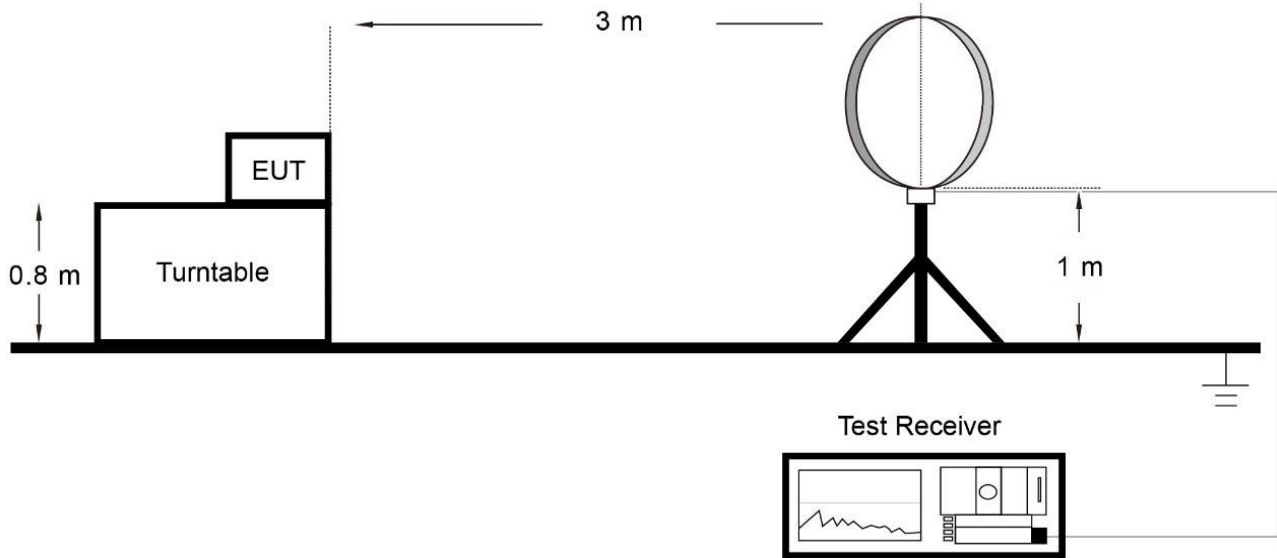
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

**Average Field Strength Measurements**

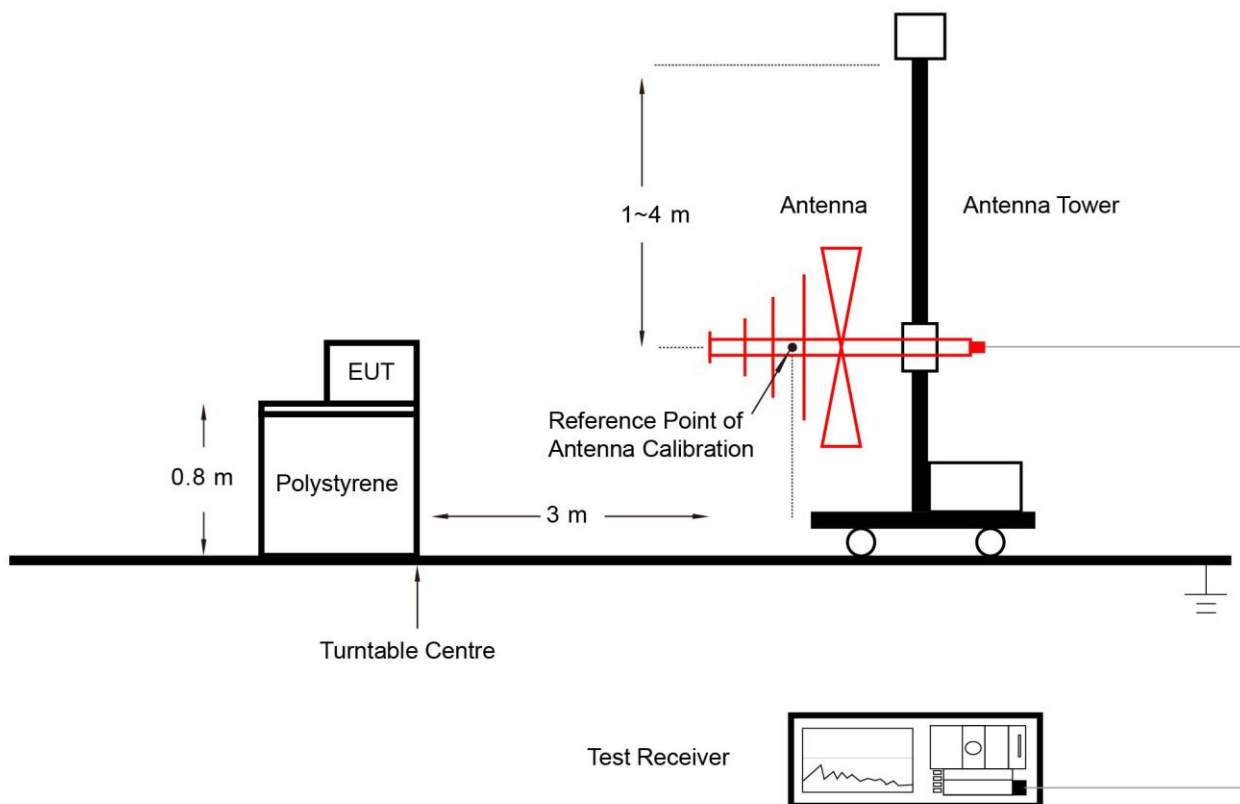
1. Average Measurement Level = Peak Measurement Level -  $20 * \text{Log}(\text{Duty Cycle}) = -20$
2. Duty Cycle = 10% (Refer to cover letter)

### 6.6.4. Test Setup

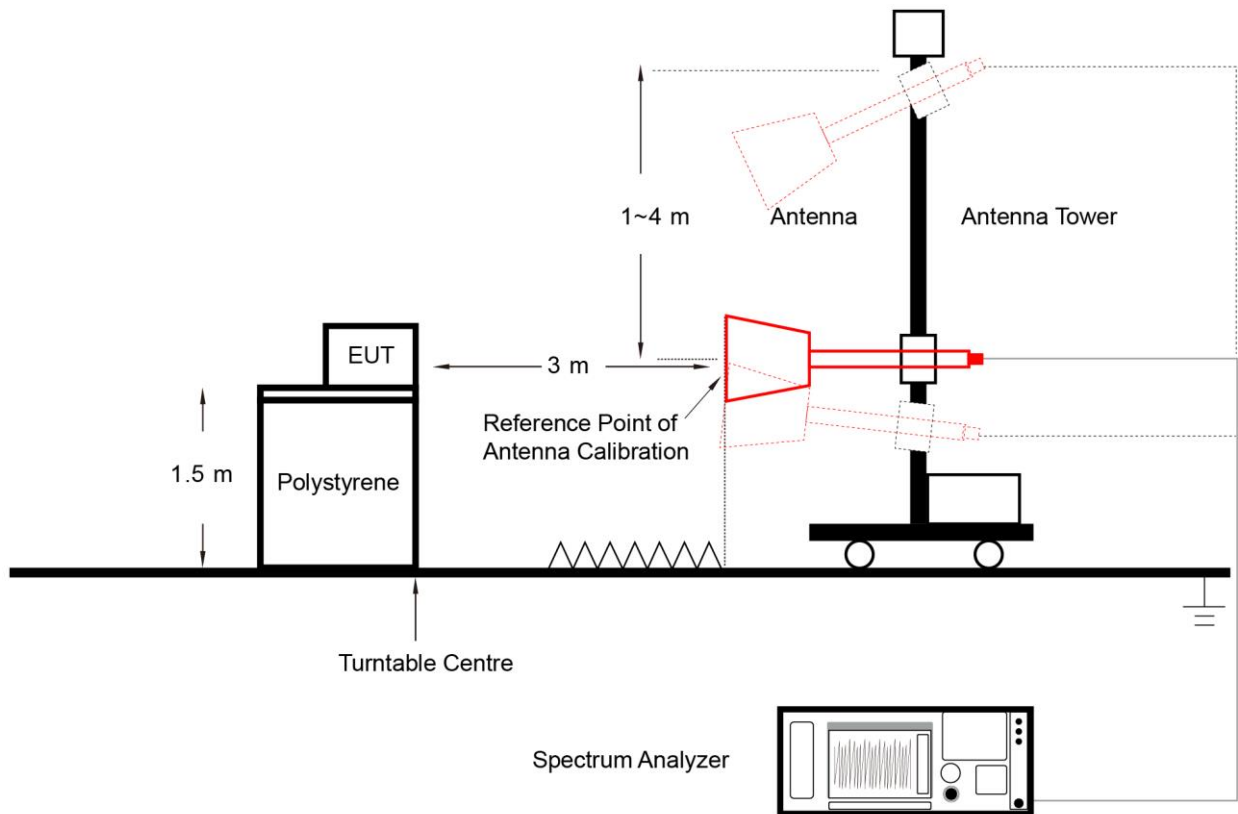
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



**6.6.5. Test Result**

Refer to Appendix A.6.



## 6.7. Radiated Restricted Band Edge Measurement

### 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
<sup>1</sup> 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	( <sup>2</sup> )
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

ANSI C63.10-2013 Section 6.3 & 6.6 & 11.13

### 6.7.3. Test Setting

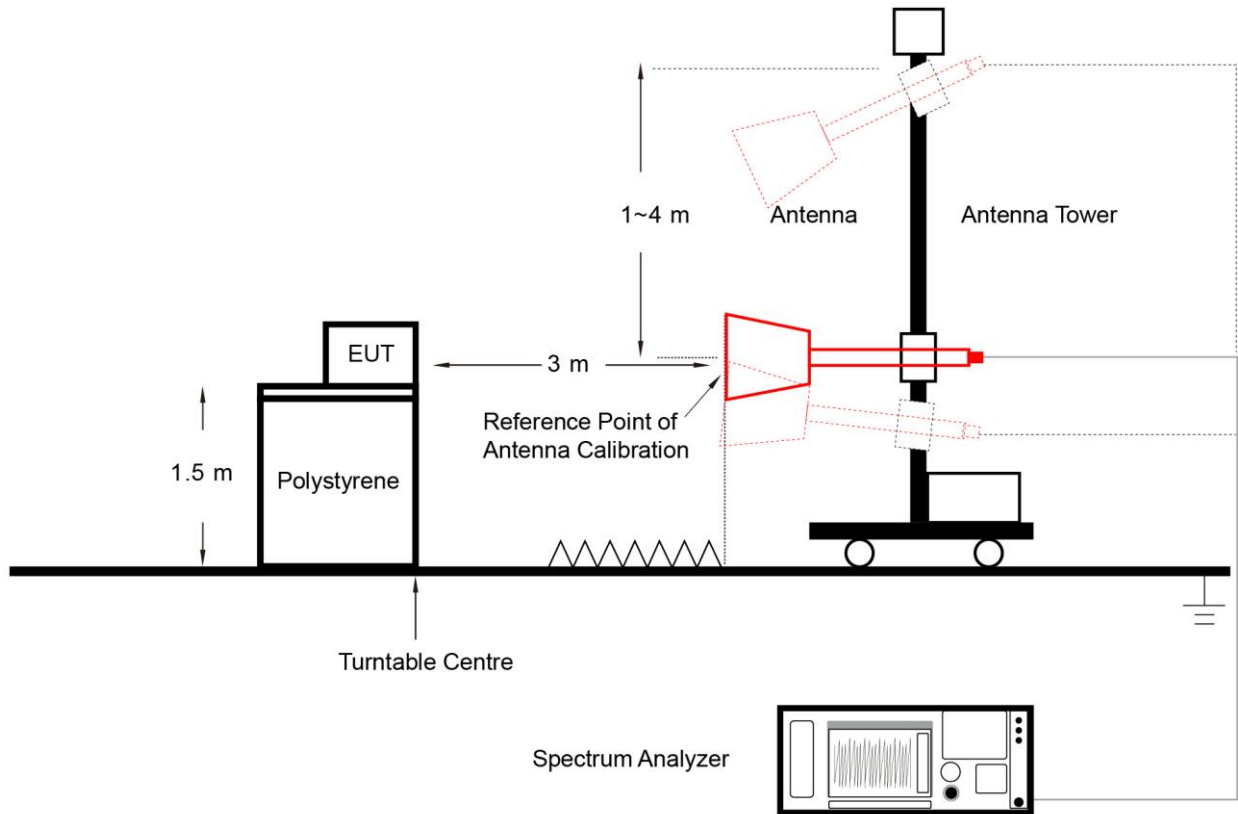
#### Peak Field Strength Measurements

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. Average Measurement Level = Peak Measurement Level - 20 \* Log(Duty Cycle) = -20
2. Duty Cycle = 10% (Refer to cover letter)

### 6.7.4. Test Setup



### 6.7.5. Test Result

Refer to Appendix A.7.

## 6.8. AC Conducted Emissions Measurement

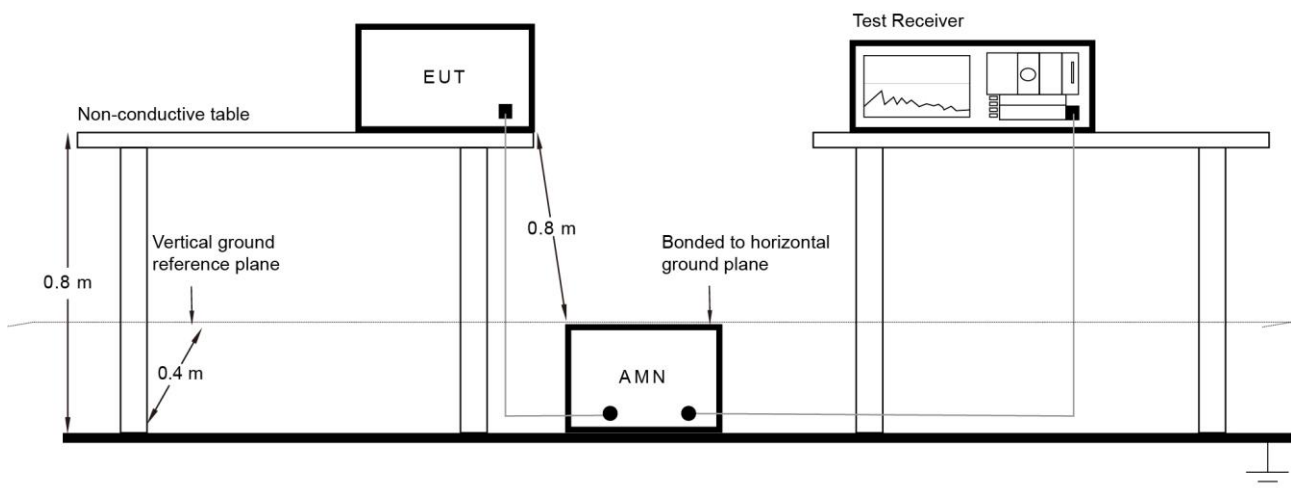
### 6.8.1. Test Limit

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

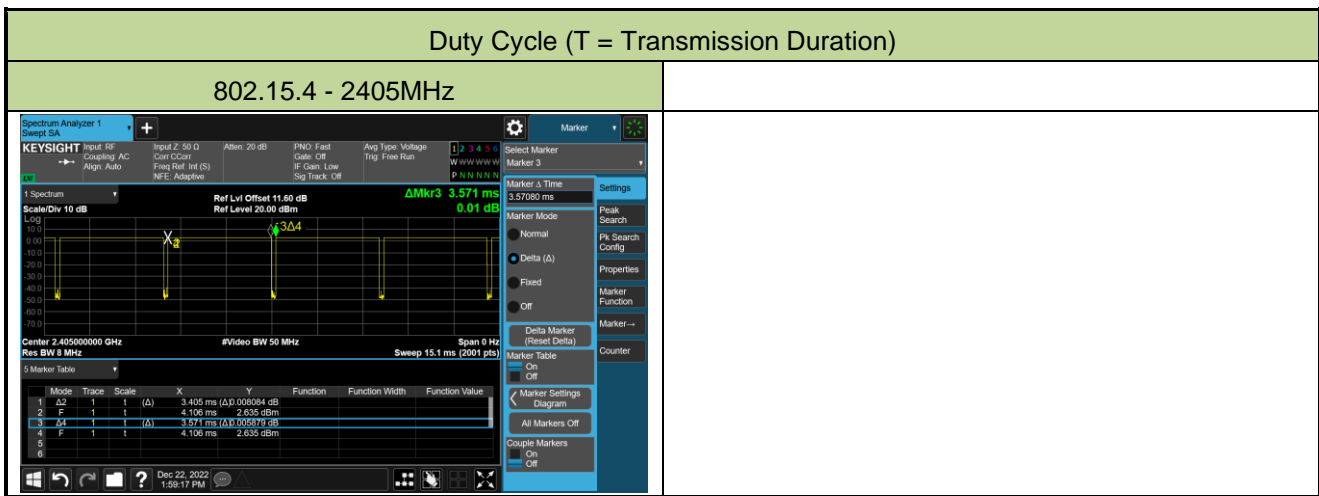
Refer to Appendix A.8.

## Appendix A – Test Result

### A.1 Duty Cycle Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2022-12-22		

Test Mode	Duty Cycle
802.15.4	95.35%



Note 1: This duty cycle was only suitable for continuous transmission of signals via commands.

Note 2: The manufacturer, declared that the ZigBee normal operation, when implemented, will be limited to a max duty cycle of 10% or less in any 100ms period. So -20dB correction factor was used during peak and average band edge testing.

**A.2 6dB Bandwidth Test Result**

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2023-05-06		

Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.15.4	O-QPSK	11	2405	1.117	≥ 0.5	Pass
802.15.4	O-QPSK	18	2440	1.121	≥ 0.5	Pass
802.15.4	O-QPSK	26	2480	1.114	≥ 0.5	Pass



### A.3 Output Power Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2023-05-04	Filter Configuration	Filter 7#

#### Test Result of Peak Output Power

Test Mode	Modulation Mode	Channel No.	Freq. (MHz)	Peak Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	11	2405	4.38	≤ 30.00	Pass
802.15.4	O-QPSK	18	2440	4.82	≤ 30.00	Pass
802.15.4	O-QPSK	26	2480	4.74	≤ 30.00	Pass

#### Test Result of Average Output Power (Reporting Only)

Test Mode	Modulation Mode	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	11	2405	4.22	≤ 30.00	Pass
802.15.4	O-QPSK	18	2440	4.70	≤ 30.00	Pass
802.15.4	O-QPSK	26	2480	4.56	≤ 30.00	Pass

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2023-05-04	Filter Configuration	Filter 8#

**Test Result of Peak Output Power**

Test Mode	Modulation Mode	Channel No.	Freq. (MHz)	Peak Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	11	2405	4.05	≤ 30.00	Pass

**Test Result of Average Output Power (Reporting Only)**

Test Mode	Modulation Mode	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	11	2405	3.91	≤ 30.00	Pass

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2023-05-04	Filter Configuration	Filter 9#

**Test Result of Peak Output Power**

Test Mode	Modulation Mode	Channel No.	Freq. (MHz)	Peak Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	26	2480	3.25	≤ 30.00	Pass

**Test Result of Average Output Power (Reporting Only)**

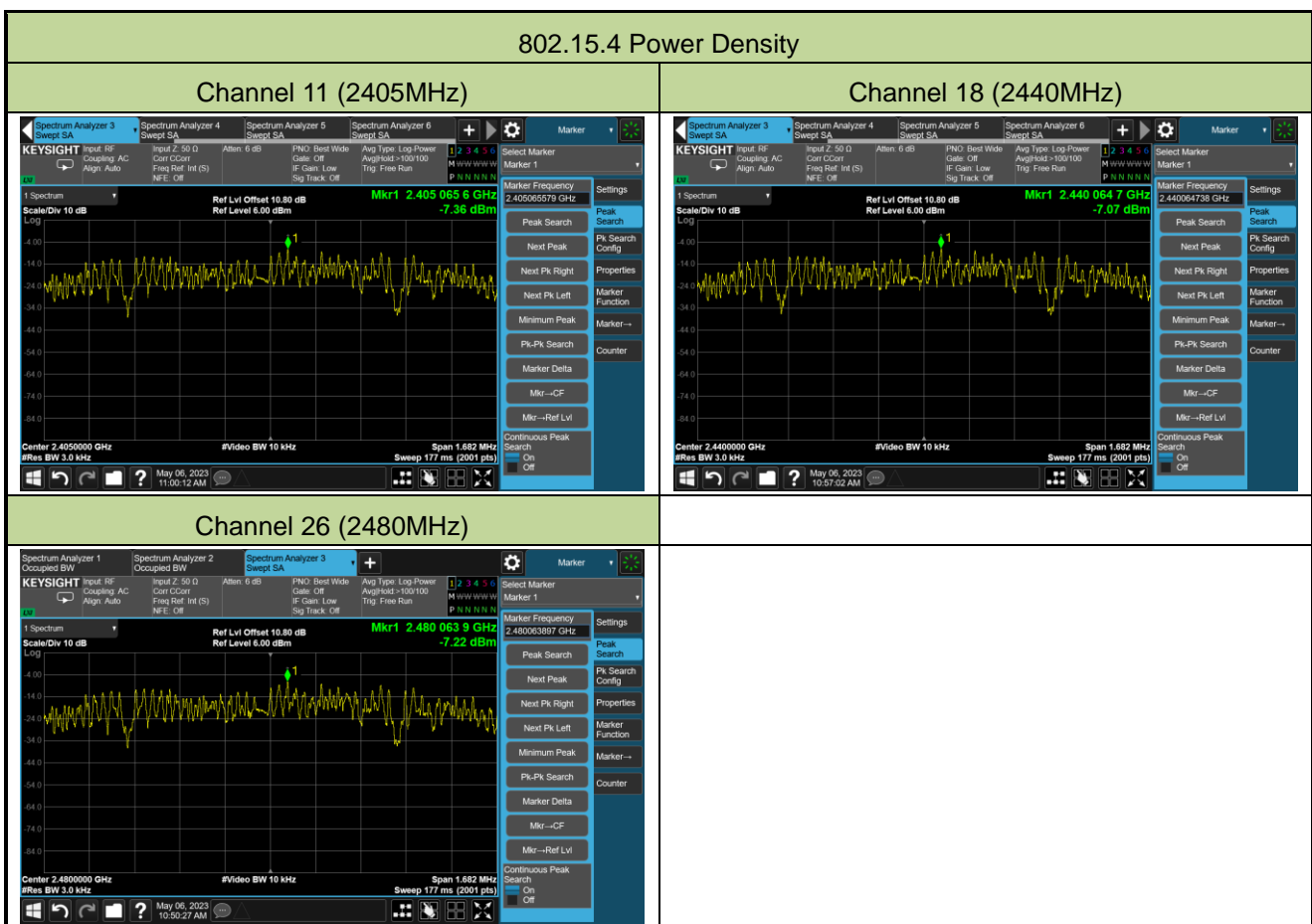
Test Mode	Modulation Mode	Channel No.	Freq. (MHz)	Average Power (dBm)	Limit (dBm)	Result
802.15.4	O-QPSK	26	2480	3.08	≤ 30.00	Pass



### A.4 Power Spectral Density Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2023-05-06		

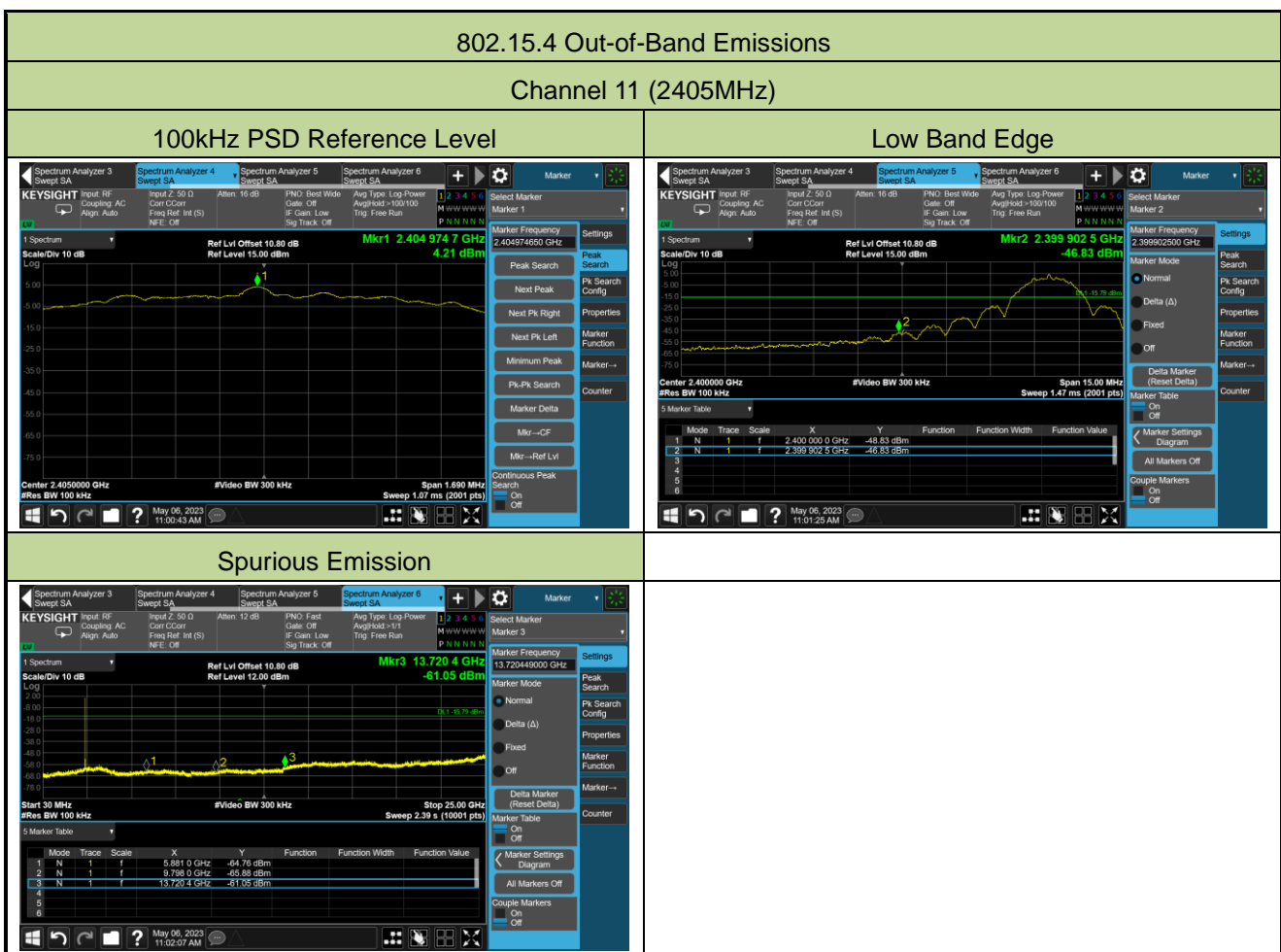
Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	PK PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
802.15.4	O-QPSK	11	2405	-7.36	≤ 8.00	Pass
802.15.4	O-QPSK	18	2440	-7.07	≤ 8.00	Pass
802.15.4	O-QPSK	26	2480	-7.22	≤ 8.00	Pass



**A.5 Conducted Band Edge and Out-of-Band Emissions Test Result**

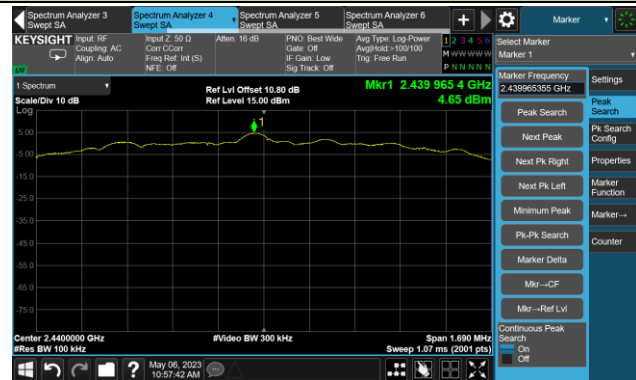
Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2023-05-06	Filter Configuration	Filter 7#

Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit (dBc)	Result
802.15.4	O-QPSK	11	2405	> 20	Pass
802.15.4	O-QPSK	18	2440	> 20	Pass
802.15.4	O-QPSK	26	2480	> 20	Pass



### Channel 18 (2440MHz)

#### 100kHz PSD Reference Level

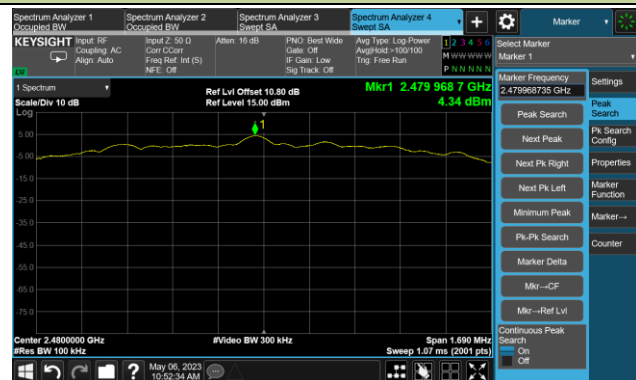


#### Spurious Emission



### Channel 26 (2480MHz)

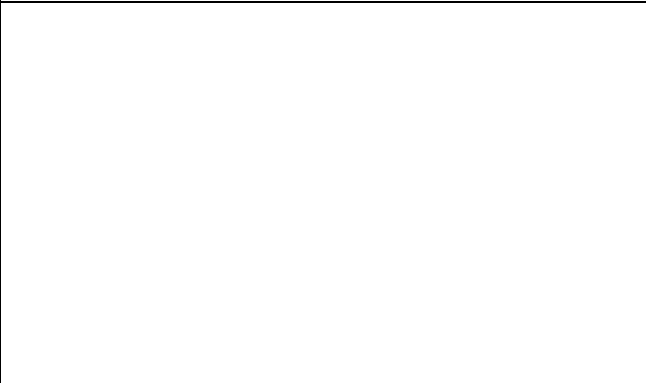
#### 100kHz PSD Reference Level



#### High Band Edge

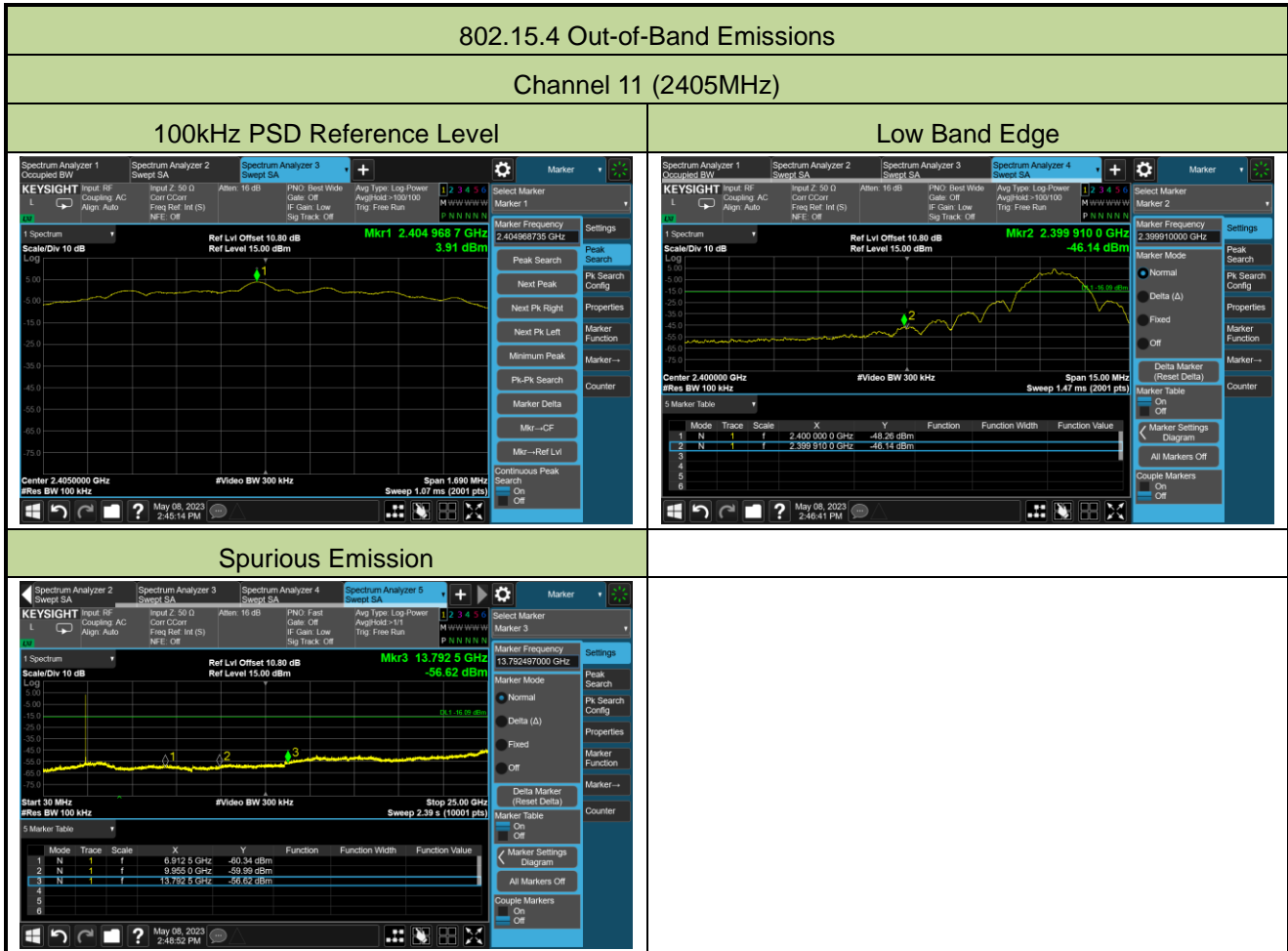


#### Spurious Emission



Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2023-05-08	Filter Configuration	Filter 8#

Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit (dBc)	Result
802.15.4	O-QPSK	11	2405	> 20	Pass



Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2023-05-08	Filter Configuration	Filter 9#

Test Mode	Data Rate / MCS	Channel No.	Frequency (MHz)	Limit (dBc)	Result
802.15.4	O-QPSK	26	2480	> 20	Pass

### 802.15.4 Out-of-Band Emissions

#### Channel 11 (2480MHz)

#### 100kHz PSD Reference Level

#### Low Band Edge

#### Spurious Emission

**A.6 Radiated Spurious Emission Test Result**

Test Site	WZ-AC1	Test Engineer	Charles Zhang
Test Date	2023-05-09	Test Mode	802.15.4
Filter Configuration	Filter 7#		
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
11	4833.5	38.2	2.8	41.0	74.0	-33.0	Peak	Horizontal
	7528.0	38.0	8.1	46.1	74.0	-27.9	Peak	Horizontal
	10843.0	36.6	13.5	50.1	74.0	-23.9	Peak	Horizontal
	4833.5	37.2	2.8	40.0	74.0	-34.0	Peak	Vertical
	7485.5	37.2	8.3	45.5	74.0	-28.5	Peak	Vertical
	10724.0	36.4	13.4	49.8	74.0	-24.2	Peak	Vertical
18	4833.5	36.8	2.8	39.6	74.0	-34.4	Peak	Horizontal
	7281.5	37.0	8.1	45.1	74.0	-28.9	Peak	Horizontal
	10911.0	36.0	13.4	49.4	74.0	-24.6	Peak	Horizontal
	4842.0	37.3	2.8	40.1	74.0	-33.9	Peak	Vertical
	7604.5	37.3	7.9	45.2	74.0	-28.8	Peak	Vertical
	10800.5	36.8	13.4	50.2	74.0	-23.8	Peak	Vertical
26	4833.5	37.7	2.8	40.5	74.0	-33.5	Peak	Horizontal
	7494.0	36.3	8.3	44.6	74.0	-29.4	Peak	Horizontal
	11480.5	36.4	13.0	49.4	74.0	-24.6	Peak	Horizontal
	4825.0	38.1	2.8	40.9	74.0	-33.1	Peak	Vertical
	8106.0	37.0	9.0	46.0	74.0	-28.0	Peak	Vertical
	11064.0	36.8	13.3	50.1	74.0	-23.9	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-AC1	Test Engineer	Charles Zhang
Test Date	2023-05-09	Test Mode	802.15.4
Filter Configuration	Filter 8#		
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
11	4825.0	37.6	2.8	40.4	74.0	-33.6	Peak	Horizontal
	7528.0	37.9	8.1	46.0	74.0	-28.0	Peak	Horizontal
	10996.0	35.9	13.6	49.5	74.0	-24.5	Peak	Horizontal
	4833.5	38.1	2.8	40.9	74.0	-33.1	Peak	Vertical
	7519.5	37.2	8.1	45.3	74.0	-28.7	Peak	Vertical
	11582.5	37.5	12.6	50.1	74.0	-23.9	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-AC1	Test Engineer	Charles Zhang
Test Date	2023-05-09	Test Mode	802.15.4
Filter Configuration	Filter 9#		
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
26	4842.0	38.5	2.8	41.3	74.0	-32.7	Peak	Horizontal
	8097.5	36.4	9.0	45.4	74.0	-28.6	Peak	Horizontal
	11072.5	35.9	13.3	49.2	74.0	-24.8	Peak	Horizontal
	5105.5	36.4	3.5	39.9	74.0	-34.1	Peak	Vertical
	7443.0	36.2	8.2	44.4	74.0	-29.6	Peak	Vertical
	11072.5	36.2	13.3	49.5	74.0	-24.5	Peak	Vertical

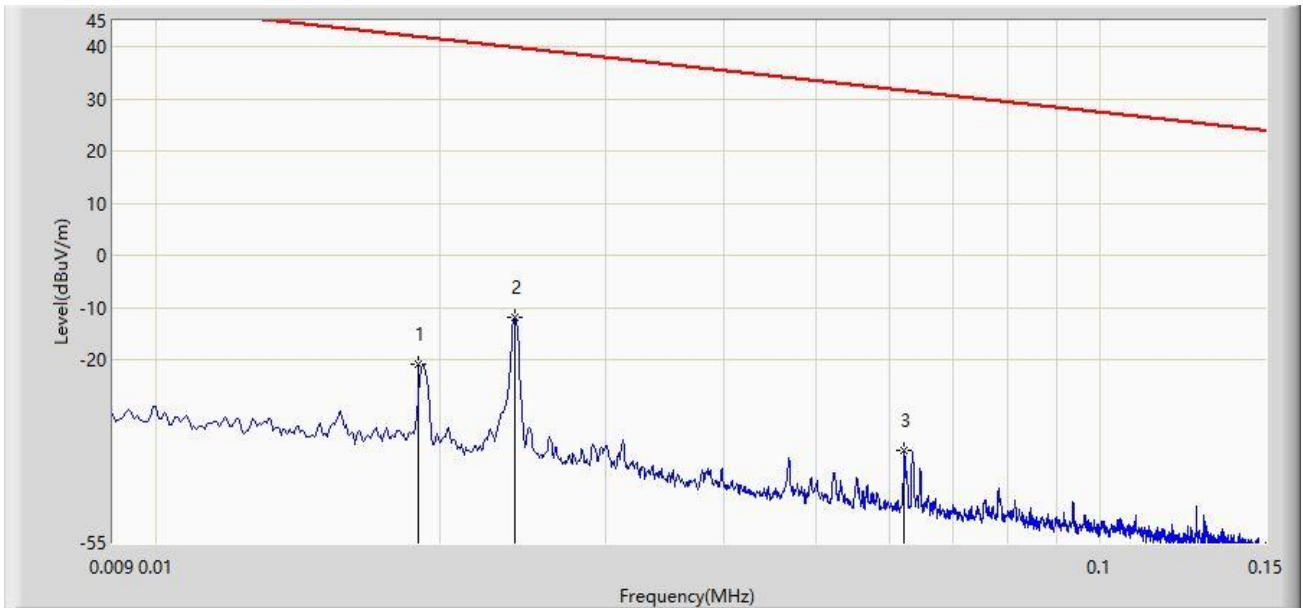
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB)



**The Worst Case of Radiated Emission below 1GHz:**

Site: WZ-AC1	Time: 2023/05/16 - 16:57
Limit: FCC_2.4G_RE(3m)	Engineer: Ajin Fan
Probe: FMZB1519_0.009-30MHz	Polarity: Coaxial
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		0.019	-20.755	39.131	-62.768	42.013	-59.886	PK
2	*	0.024	-11.756	48.720	-51.741	39.985	-60.476	PK
3		0.062	-37.443	25.032	-69.189	31.746	-62.475	PK

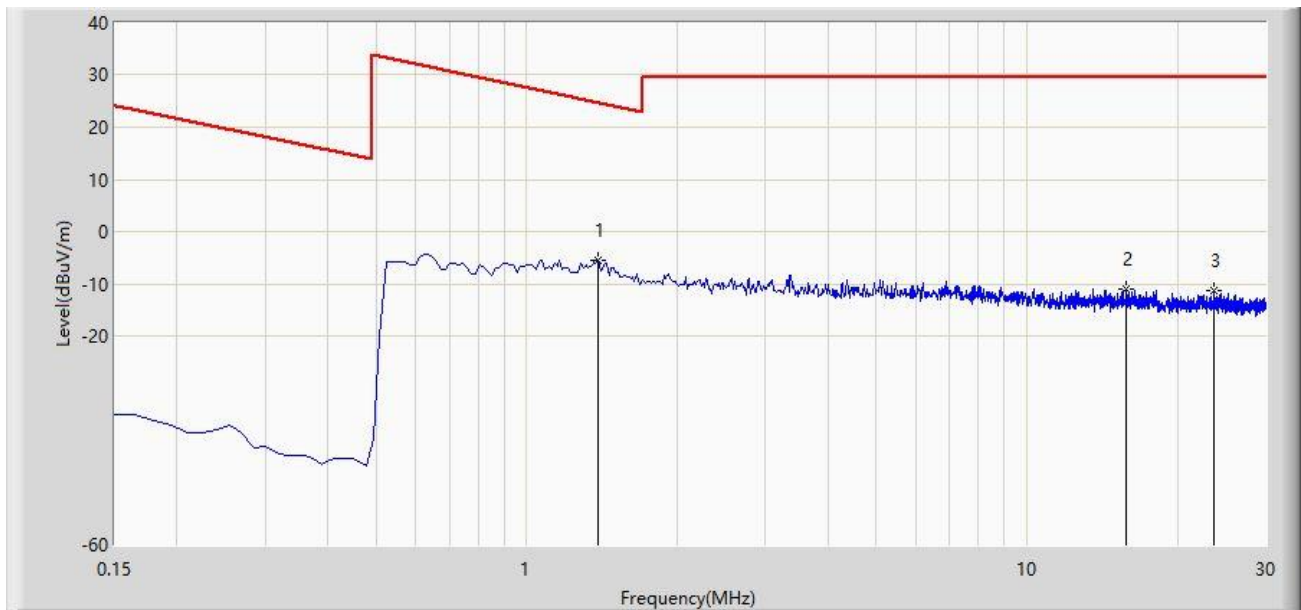
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: Quasi-Peak measurement was not performed when peak measure level was lower than the quasi-peak limit.

Site: WZ-AC1	Time: 2023/05/16 - 16:57
Limit: FCC_2.4G_RE(3m)	Engineer: Ajin Fan
Probe: FMZB1519_0.009-30MHz	Polarity: Coaxial
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1	*	1.389	-5.583	16.782	-30.358	24.775	-22.334	PK
2		15.762	-10.970	11.911	-40.470	29.500	-22.857	PK
3		23.687	-11.342	11.479	-40.842	29.500	-22.780	PK

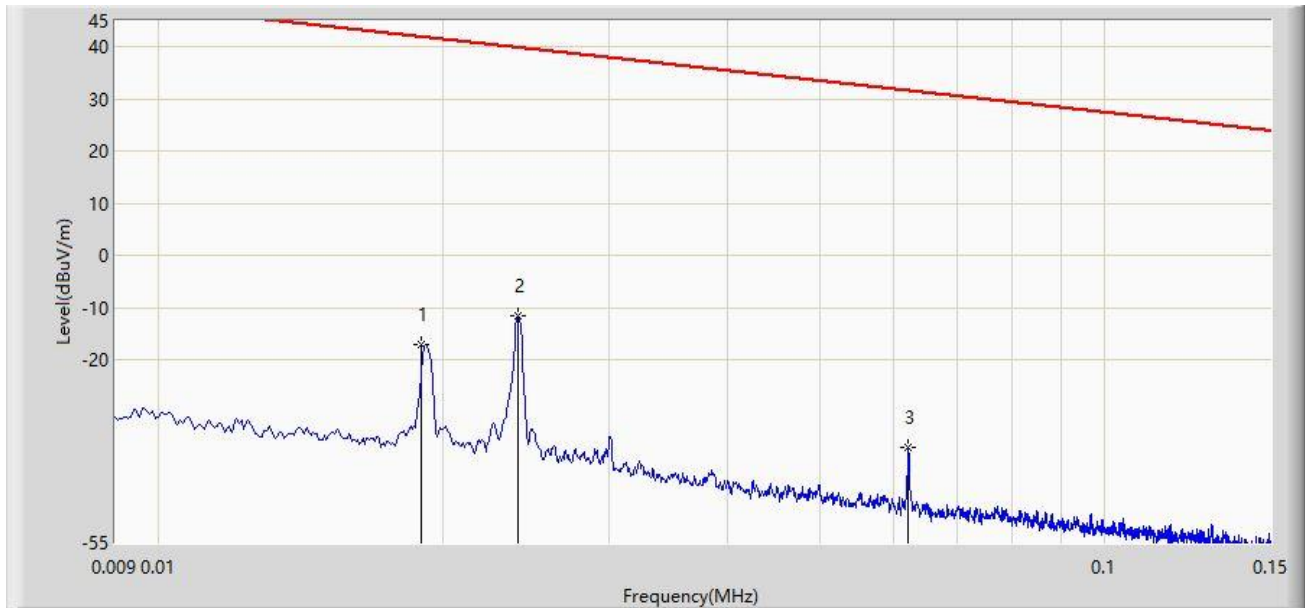
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: Quasi-Peak measurement was not performed when peak measure level was lower than the quasi-peak limit.

Site: WZ-AC1	Time: 2023/05/16 - 16:57
Limit: FCC_2.4G_RE(3m)	Engineer: Ajin Fan
Probe: FMZB1519_0.009-30MHz	Polarity: Coplanar
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		0.019	-17.050	42.836	-59.063	42.013	-59.886	PK
2	*	0.024	-11.398	49.078	-51.383	39.985	-60.476	PK
3		0.062	-36.638	25.837	-68.384	31.746	-62.475	PK

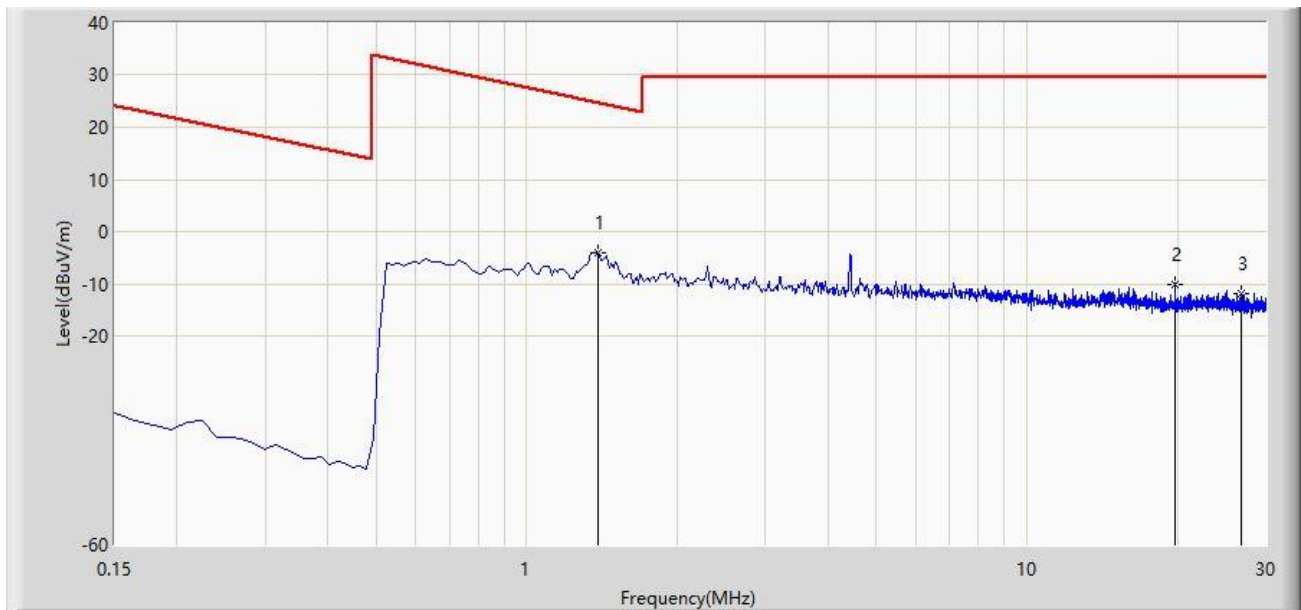
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: Quasi-Peak measurement was not performed when peak measure level was lower than the quasi-peak limit.

Site: WZ-AC1	Time: 2023/05/16 - 16:57
Limit: FCC_2.4G_RE(3m)	Engineer: Ajin Fan
Probe: FMZB1519_0.009-30MHz	Polarity: Coplanar
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1	*	1.389	-3.989	18.367	-28.764	24.775	-22.334	PK
2		19.776	-10.092	12.838	-39.592	29.500	-22.821	PK
3		26.791	-11.913	10.808	-41.413	29.500	-22.719	PK

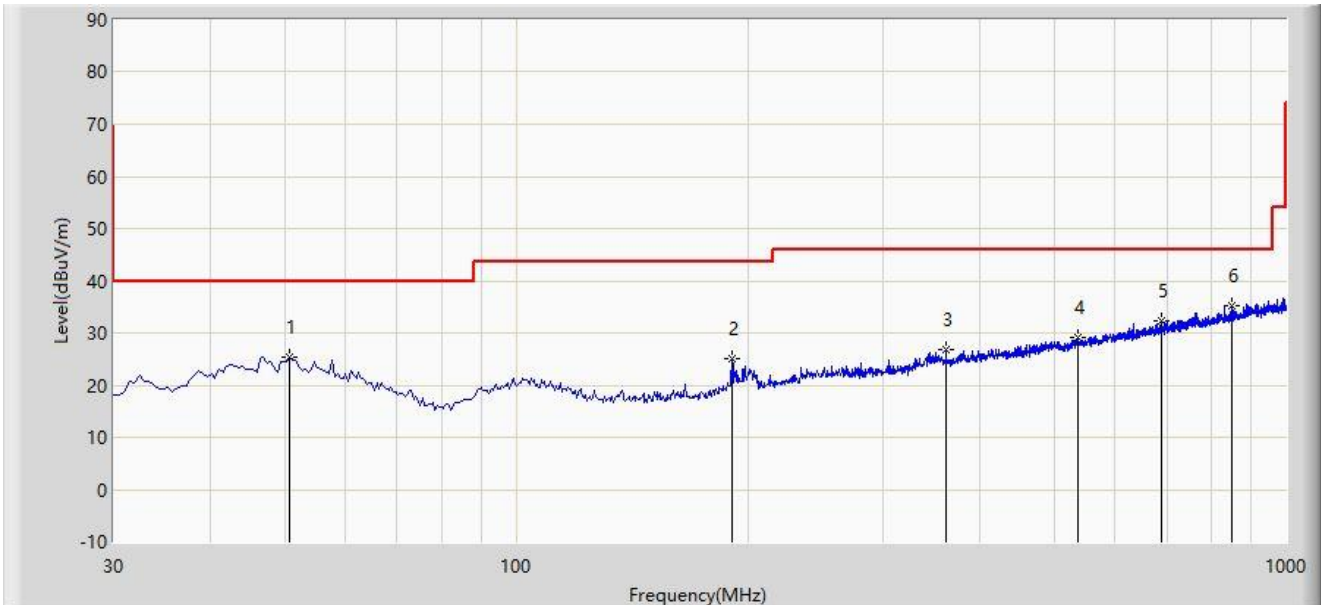
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: Quasi-Peak measurement was not performed when peak measure level was lower than the quasi-peak limit.

Site: WZ-AC2	Test Date: 2023-03-21
Limit: FCC_2.4G_RE(3m)	Engineer: Bob Zhang
Probe: VULB9162_30-7000MHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
<b>Test Mode:</b> Transmit by Zigbee at channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		50.855	25.379	4.951	-14.621	40.000	20.428	PK
2		190.535	24.977	6.932	-18.523	43.500	18.045	PK
3		361.740	26.857	4.766	-19.143	46.000	22.091	PK
4		535.855	29.256	3.744	-16.744	46.000	25.511	PK
5		689.600	32.346	3.975	-13.654	46.000	28.371	PK
6	*	851.590	35.081	4.570	-10.919	46.000	30.511	PK

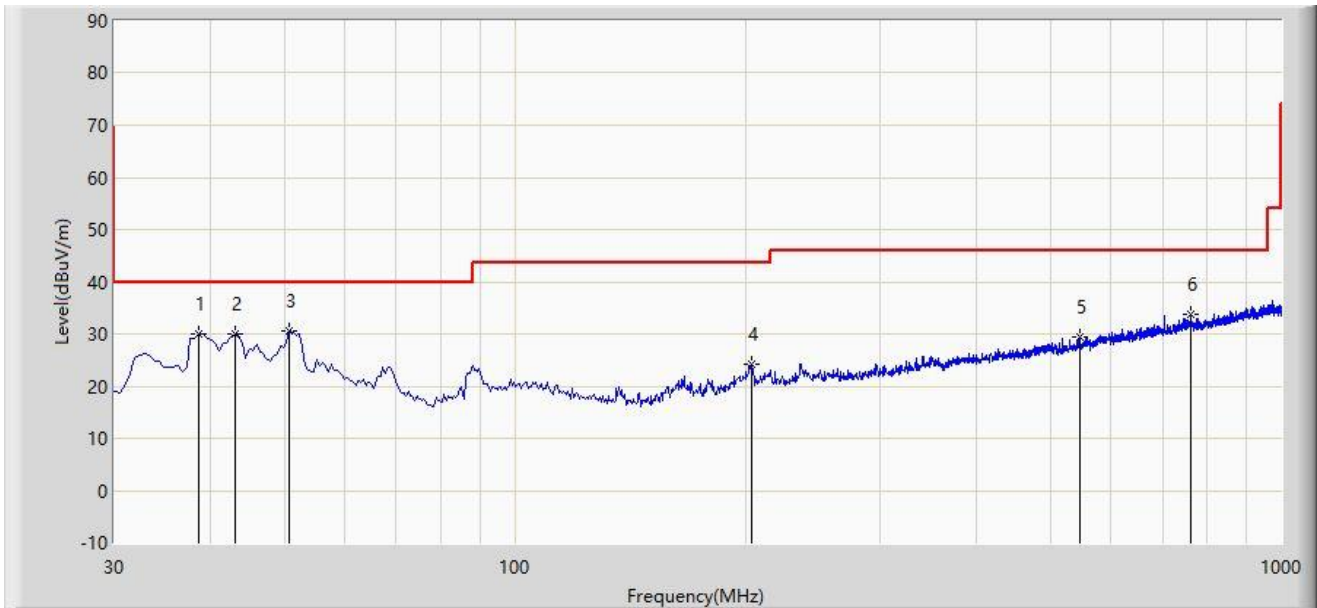
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: Quasi-Peak measurement was not performed when peak measure level was lower than the quasi-peak limit.

Site: WZ-AC2	Test Date: 2023-03-21
Limit: FCC_2.4G_RE(3m)	Engineer: Bob Zhang
Probe: VULB9162_30-7000MHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
<b>Test Mode:</b> Transmit by Zigbee at channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		38.730	30.070	11.760	-9.930	40.000	18.310	PK
2		43.095	30.030	10.441	-9.970	40.000	19.590	PK
3	*	50.855	30.571	10.143	-9.429	40.000	20.428	PK
4		204.115	24.177	5.771	-19.323	43.500	18.406	PK
5		546.040	29.352	3.298	-16.648	46.000	26.054	PK
6		763.320	33.690	4.190	-12.310	46.000	29.500	PK

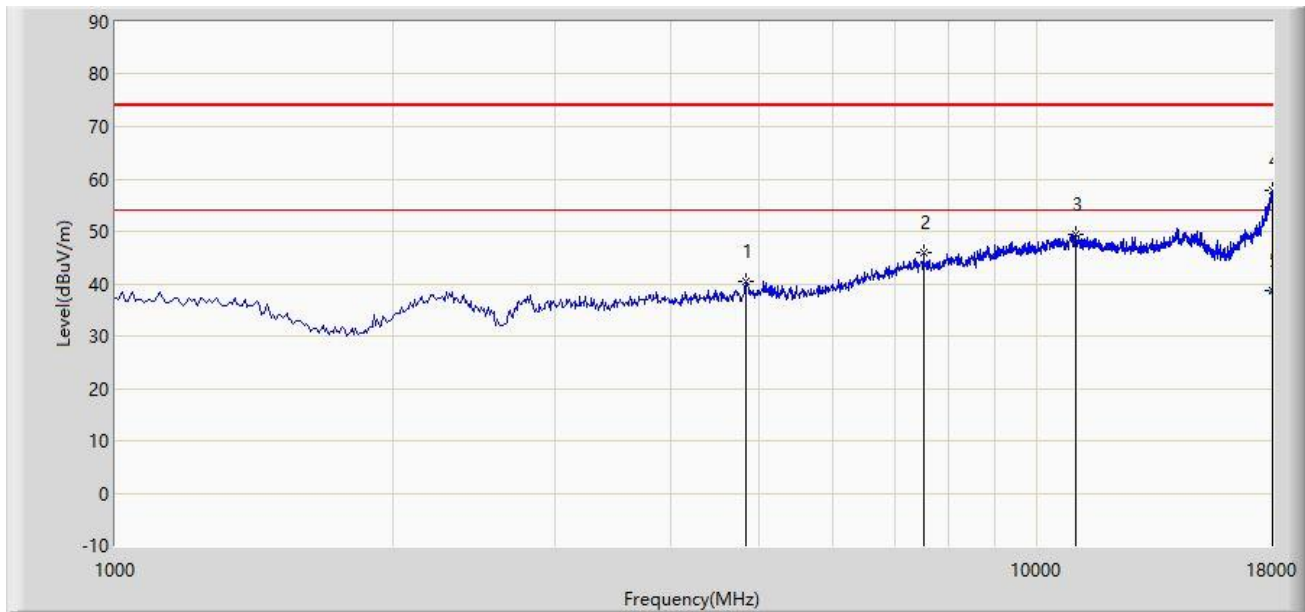
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: Quasi-Peak measurement was not performed when peak measure level was lower than the quasi-peak limit.

Site: WZ-AC1	Time: 2023/05/09 - 18:33
Limit: FCC_2.4G_RE(3m)	Engineer: Charles Zhang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by Zigbee at 2405MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		4825.000	40.343	37.587	-33.657	74.000	2.756	PK
2		7528.000	45.978	37.857	-28.022	74.000	8.122	PK
3		10996.000	49.525	35.906	-24.475	74.000	13.619	PK
4		17974.500	57.768	35.095	-16.232	74.000	22.674	PK
5	*	17974.500	38.813	16.140	-15.187	54.000	22.674	AV

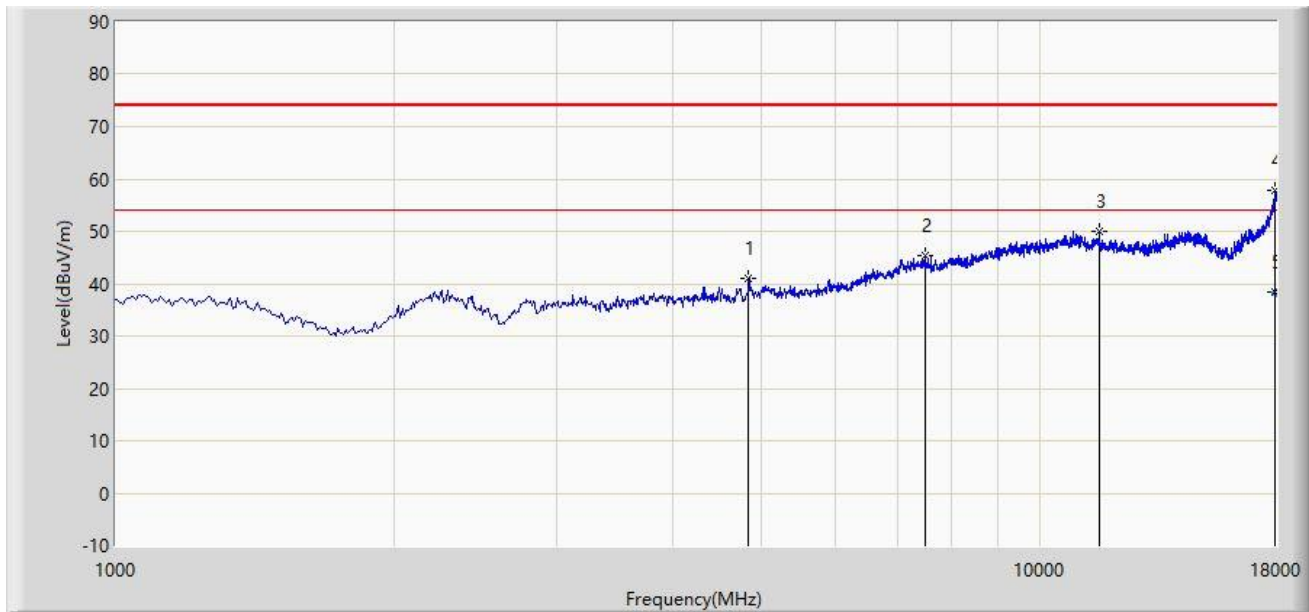
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB).

Note 4: Average measurement was not performed when peak measure level was lower than the average limit.

Site: WZ-AC1	Time: 2023/05/09 - 18:33
Limit: FCC_2.4G_RE(3m)	Engineer: Charles Zhang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Note: Transmit by Zigbee at 2405MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		4833.500	40.886	38.125	-33.114	74.000	2.761	PK
2		7519.500	45.362	37.244	-28.638	74.000	8.118	PK
3		11582.500	50.141	37.503	-23.859	74.000	12.638	PK
4		17923.500	57.814	35.658	-16.186	74.000	22.157	PK
5	*	17932.500	38.314	16.150	-15.686	54.000	22.164	AV

Note 1: " \* ", means this data is the worst emission level.

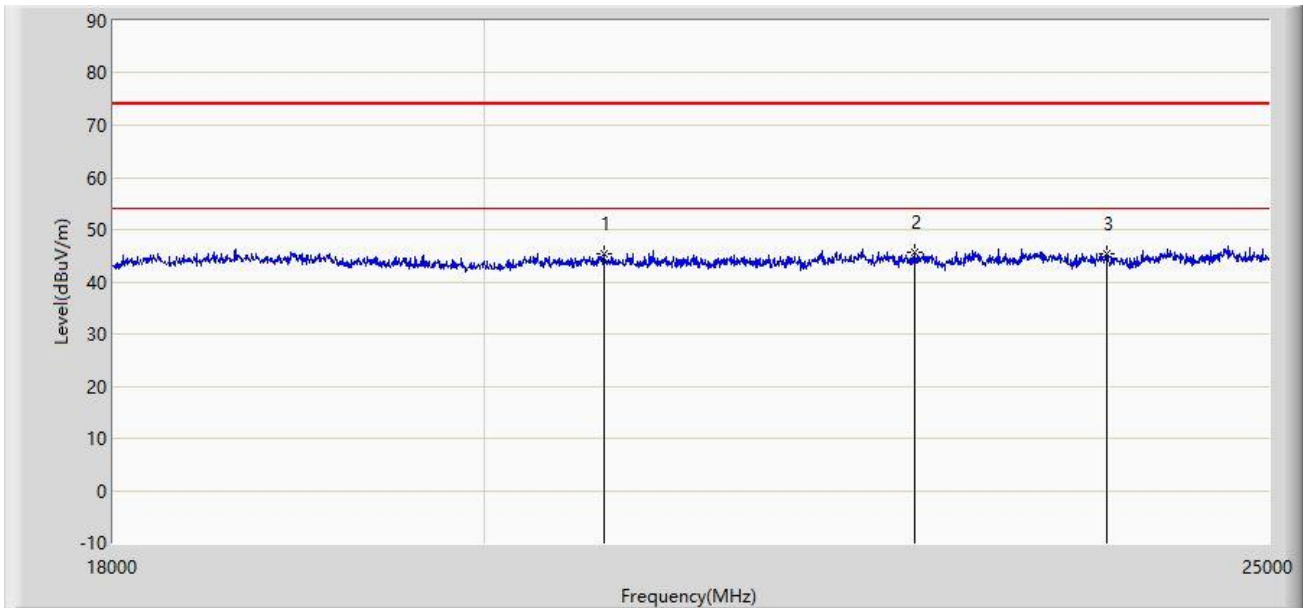
Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB).

Note 4: Average measurement was not performed when peak measure level was lower than the average limit.



Site: WZ-AC1	Time: 2023/04/08 - 00:25
Limit: FCC_2.4G_RE(3m)	Engineer: Ajin Fan
Probe: BBHA9170_933_18-40GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
<b>Test Mode:</b> Transmit by Zigbee at channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		20698.500	45.419	54.601	-28.581	74.000	-9.182	PK
2	*	22606.000	45.613	53.365	-28.387	74.000	-7.752	PK
3		23880.000	45.470	52.172	-28.530	74.000	-6.701	PK

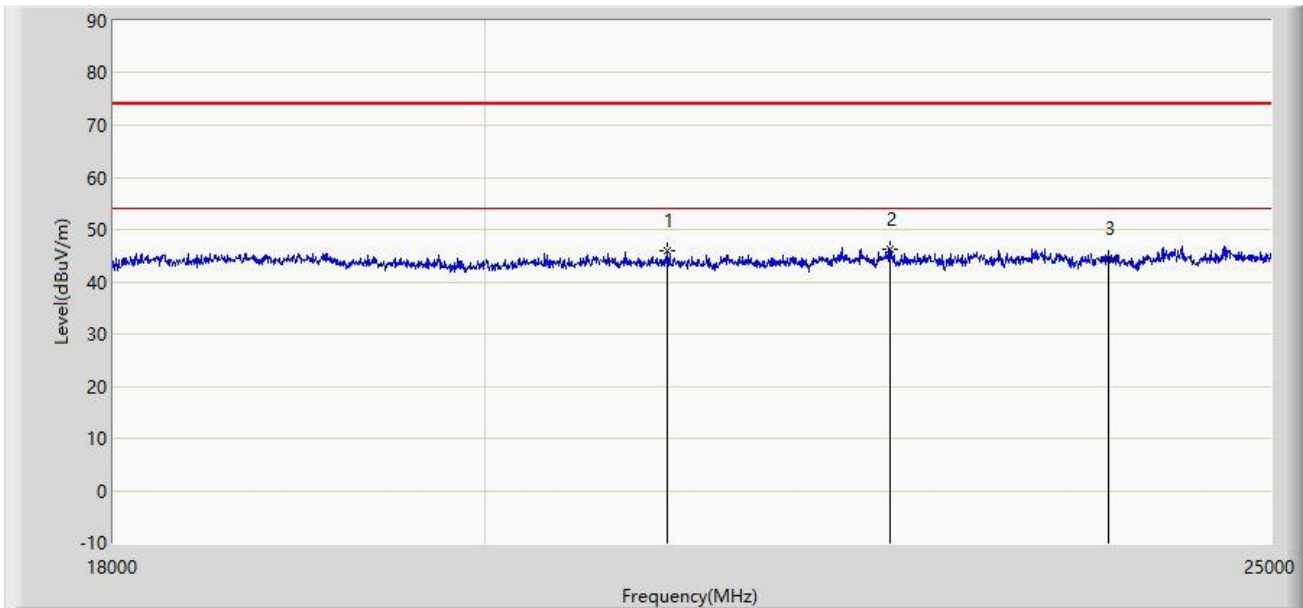
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB).

Note 4: Average measurement was not performed when peak measure level was lower than the average limit.

Site: WZ-AC1	Time: 2023/04/08 - 00:27
Limit: FCC_2.4G_RE(3m)	Engineer: Ajin Fan
Probe: BBHA9170_933_18-40GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
<b>Test Mode:</b> Transmit by Zigbee at channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		21062.500	45.903	55.071	-28.097	74.000	-9.168	PK
2	*	22438.000	46.120	53.547	-27.880	74.000	-7.428	PK
3		23880.000	44.500	51.202	-29.500	74.000	-6.701	PK

Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

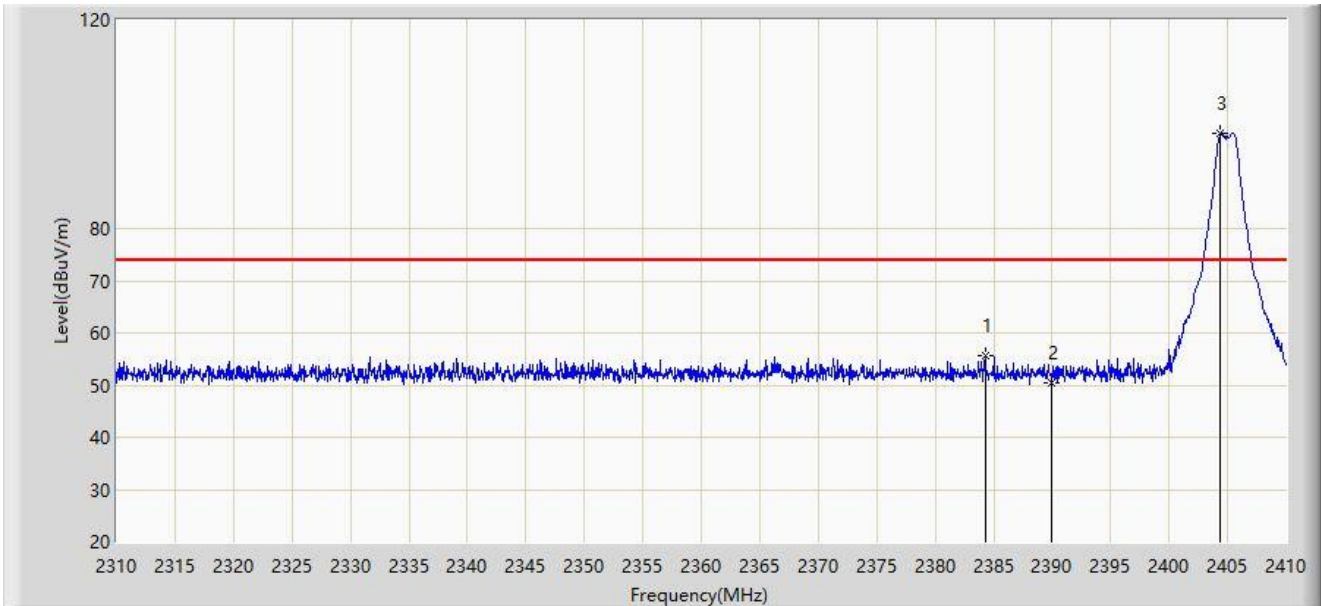
Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre\_Amplifier Gain (dB).

Note 4: Average measurement was not performed when peak measure level was lower than the average limit.

## A.7 Radiated Restricted Band Edge Test Result

### Filter Configuration 7#

Site: WZ-AC1	Test Date: 2023-05-08
Limit: FCC_2.4G_RE(3m)	Engineer: Charles Zhang
Probe: BBHA9120D_1457_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2405MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Duty cycle Factor (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2384.250	55.590	24.596	-18.409	N/A	74.000	30.994	PK
		2384.250	35.590	24.596	-18.409	-20.00	54.000	30.994	AV
2		2390.000	50.483	19.491	-23.517	N/A	74.000	30.992	PK
		2390.000	30.483	19.491	-23.517	-20.00	54.000	30.992	AV
3		2404.400	98.178	67.198	N/A	N/A	N/A	30.980	PK
		2404.400	78.178	67.198	N/A	-20.00	N/A	30.980	AV

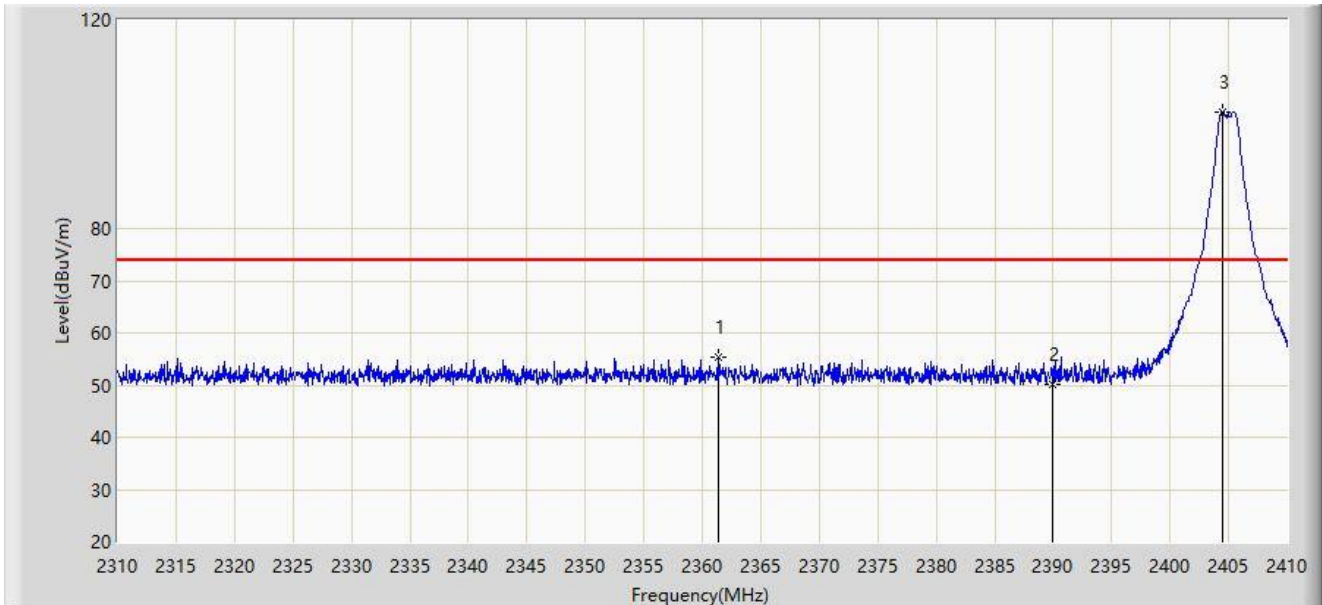
Note 1: " \* ", means this data is the worst emission level.

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

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty cycle factor = -20dB.

Site: WZ-AC1	Test Date: 2023-05-08
Limit: FCC_2.4G_RE(3m)	Engineer: Charles Zhang
Probe: BBHA9120D_1457_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2405MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Duty cycle Factor (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1	*	2361.400	55.402	24.307	-18.598	N/A	74.000	31.095	PK
		2361.400	35.402	24.307	-18.598	-20.00	54.000	31.095	AV
2		2390.000	50.251	19.259	-23.749	N/A	74.000	30.992	PK
		2390.000	30.251	19.259	-23.749	-20.00	54.000	30.992	AV
3		2404.500	102.265	71.285	N/A	N/A	N/A	30.980	PK
		2404.500	82.265	71.285	N/A	-20.00	N/A	30.980	AV

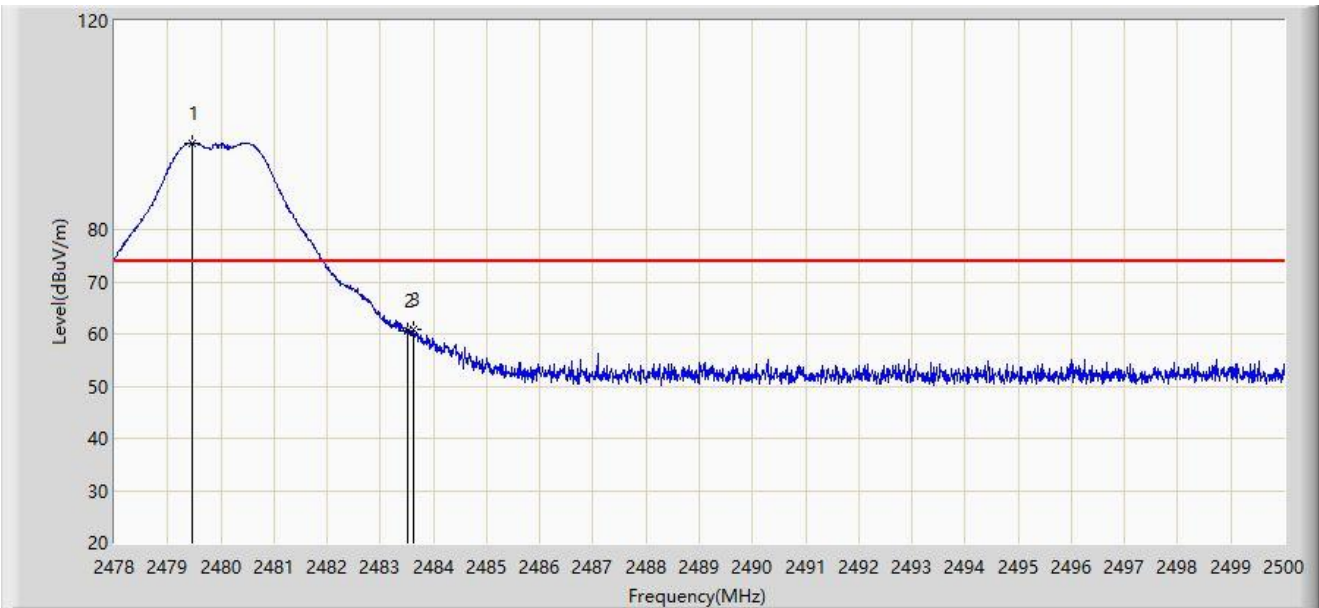
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty cycle factor =  $20 \cdot \log(\text{Duty Cycle})$ .

Site: WZ-AC1	Test Date: 2023-05-08
Limit: FCC_2.4G_RE(3m)	Engineer: Charles Zhang
Probe: BBHA9120D_1457_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Duty cycle Factor (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		2479.452	96.638	65.740	N/A	N/A	N/A	30.898	PK
		2479.452	76.638	65.740	N/A	-20.00	N/A	30.898	AV
2		2483.500	60.484	29.593	-13.516	N/A	74.000	30.892	PK
		2483.500	40.484	29.593	-13.516	-20.00	54.000	30.892	AV
3	*	2483.621	60.760	29.869	-13.240	N/A	74.000	30.892	PK
		2483.621	40.760	29.869	-13.240	-20.00	54.000	30.892	AV

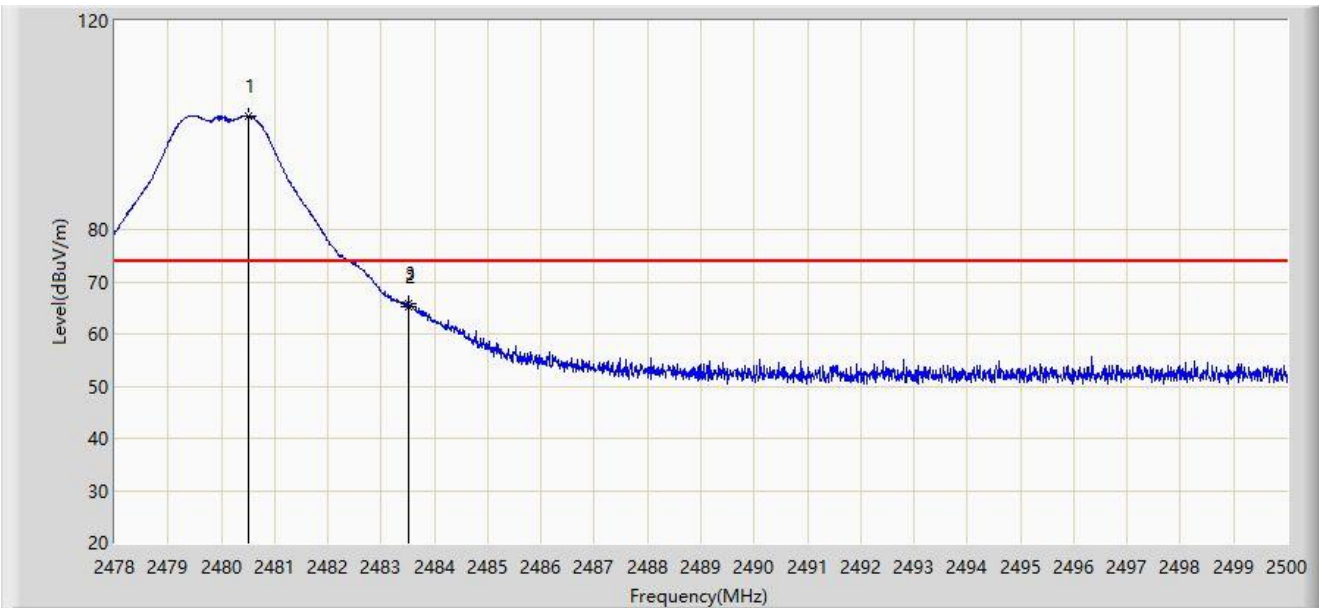
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty cycle factor =  $20 \cdot \log(\text{Duty Cycle})$ .

Site: WZ-AC1	Test Date: 2023-05-08
Limit: FCC_2.4G_RE(3m)	Engineer: Charles Zhang
Probe: BBHA9120D_1457_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Duty cycle Factor (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		2480.497	101.701	70.805	N/A	N/A	N/A	30.896	PK
		2480.497	81.701	70.805	N/A	-20.00	N/A	30.896	AV
2	*	2483.500	65.234	34.343	-8.766	N/A	74.000	30.892	PK
		2483.500	45.234	34.343	-8.766	-20.00	54.000	30.892	AV
		2483.511	65.920	35.029	-8.080	N/A	74.000	30.892	PK
		2483.511	45.920	35.029	-8.080	-20.00	54.000	30.892	AV

Note 1: " \* ", means this data is the worst emission level.

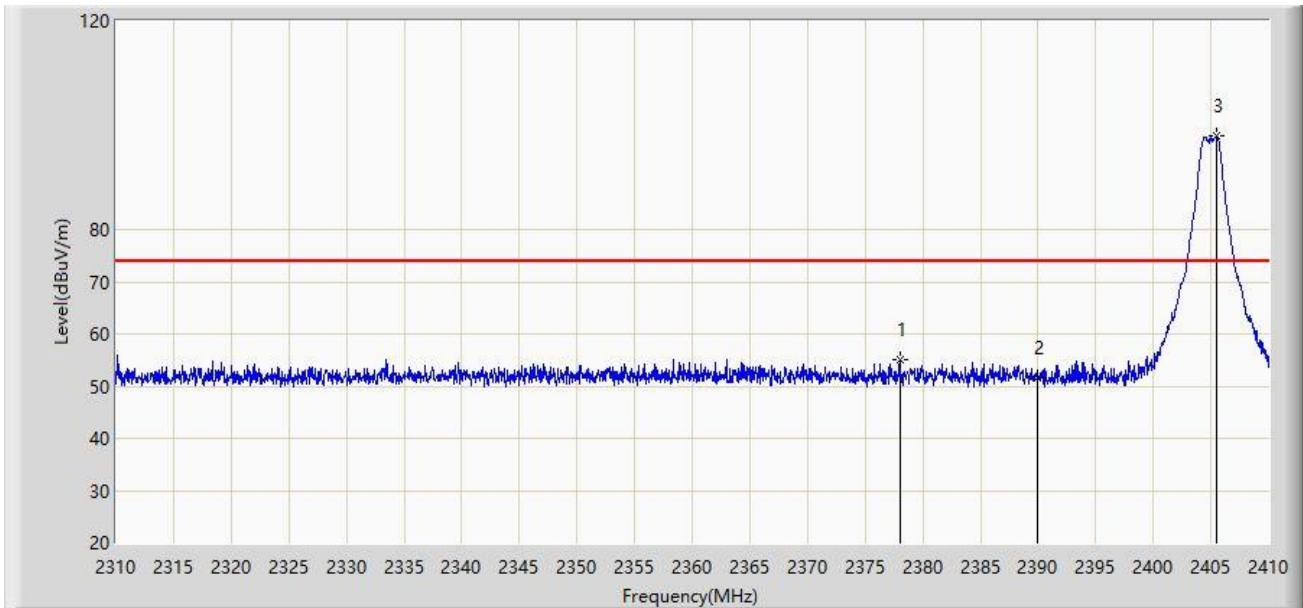
Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty cycle factor =  $20 \cdot \log(\text{Duty Cycle})$ .

**Filter Configuration 8#**

Site: WZ-AC1	Test Date: 2023-05-08
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2405MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Duty cycle Factor (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1	*	2378.050	55.129	24.108	-18.871	N/A	74.000	31.021	PK
		2378.050	35.129	24.108	-18.871	-20.00	54.000	31.021	AV
2		2390.000	51.526	20.534	-22.474	N/A	74.000	30.992	PK
		2390.000	31.526	20.534	-22.474	-20.00	54.000	30.992	AV
3		2405.450	97.837	66.860	N/A	N/A	N/A	30.976	PK
		2405.450	77.837	66.860	N/A	-20.00	N/A	30.976	AV

Note 1: " \* ", means this data is the worst emission level.

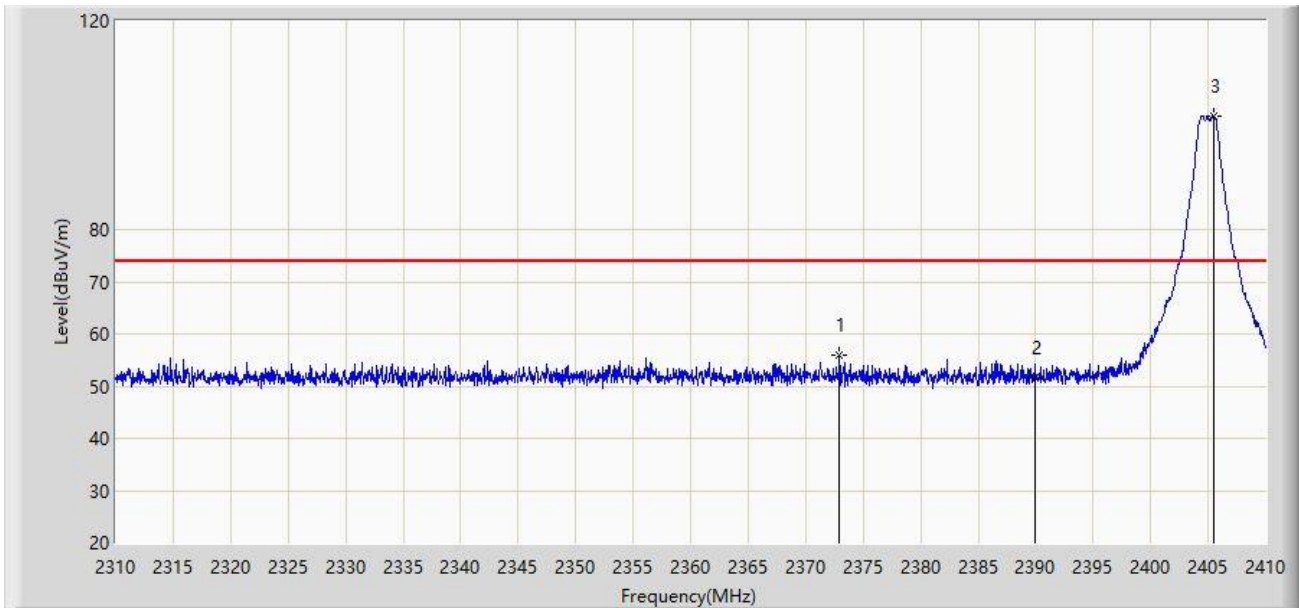
Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty cycle factor =  $20 \cdot \log(\text{Duty Cycle})$ .



Site: WZ-AC1	Test Date: 2023-05-08
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2405MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Duty cycle Factor (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2372.950	56.039	24.993	-17.961	N/A	74.000	31.046	PK
		2372.950	36.039	24.993	-17.961	-20.00	54.000	31.046	AV
2		2390.000	51.483	20.491	-22.517	N/A	74.000	30.992	PK
		2390.000	31.483	20.491	-22.517	-20.00	54.000	30.992	AV
3		2405.450	101.828	70.851	N/A	N/A	N/A	30.976	PK
		2405.450	81.828	70.851	N/A	-20.00	N/A	30.976	AV

Note 1: " \* ", means this data is the worst emission level.

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

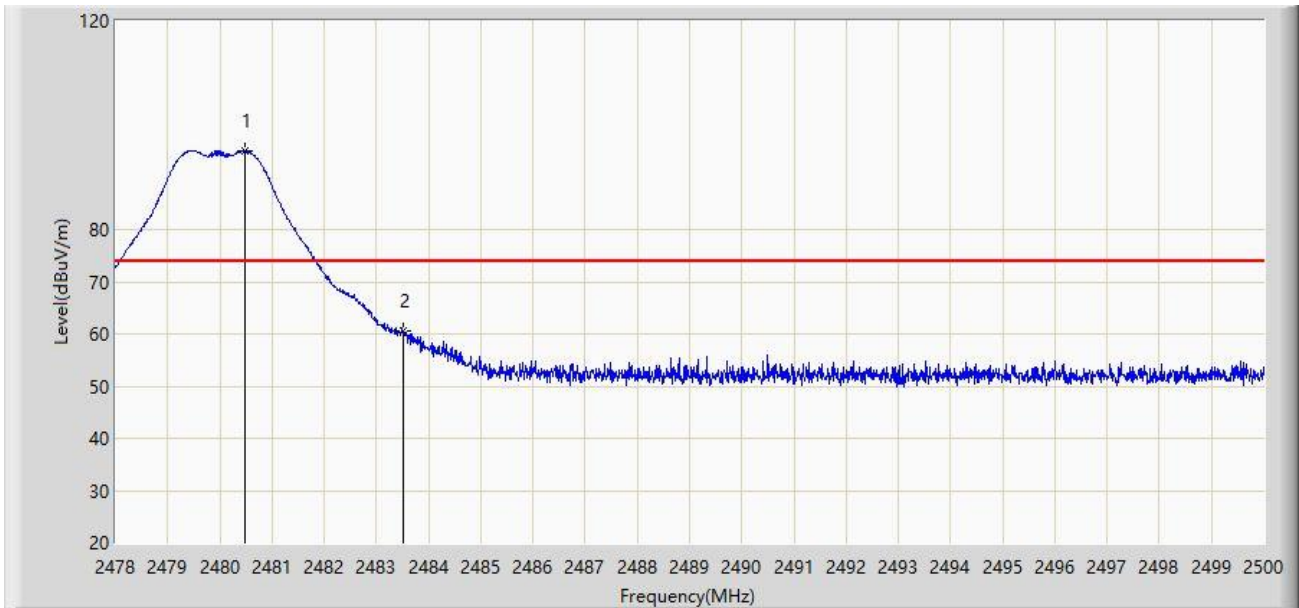
Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty cycle factor =  $20 \cdot \log(\text{Duty Cycle})$ .



**Filter Configuration 9#**

Site: WZ-AC1	Test Date: 2023-05-08
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Duty cycle Factor (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		2480.486	95.017	64.121	N/A	N/A	N/A	30.896	PK
		2480.486	75.017	64.121	N/A	-20.00	N/A	30.896	AV
2	*	2483.500	60.640	29.749	-13.360	N/A	74.000	30.892	PK
		2483.500	40.640	29.749	-13.360	-20.00	54.000	30.892	AV

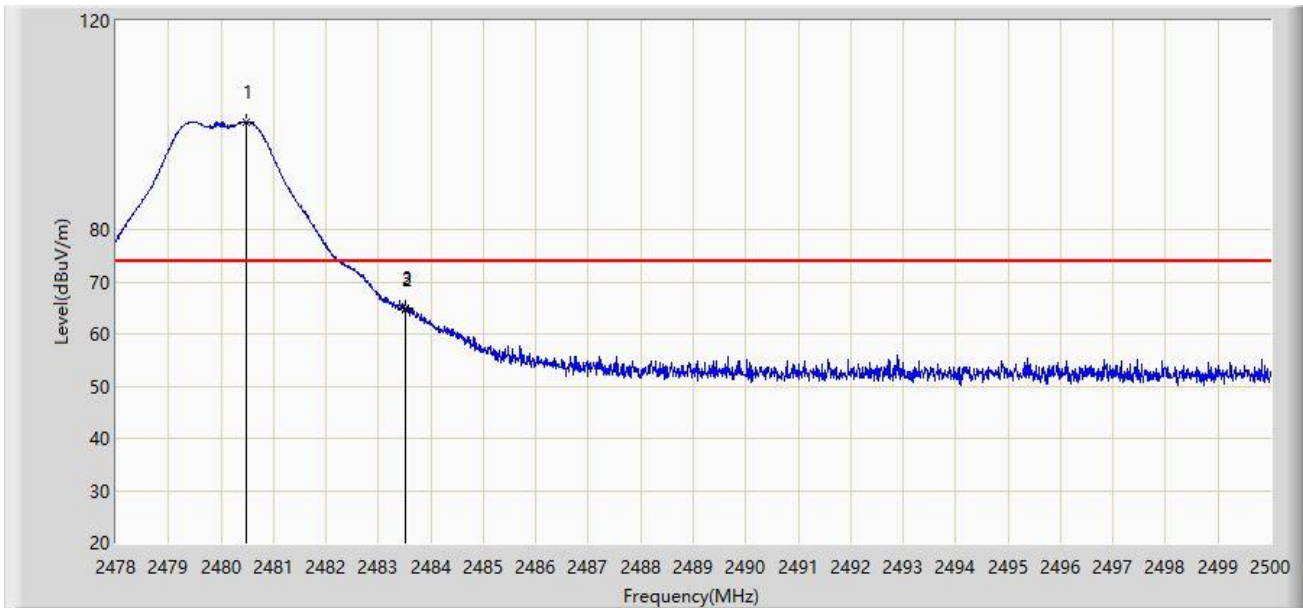
Note 1: " \* ", means this data is the worst emission level.

Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty cycle factor =  $20 \cdot \log(\text{Duty Cycle})$ .

Site: WZ-AC1	Test Date: 2023-05-08
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Margin (dB)	Duty cycle Factor (dB)	Limit (dB $\mu$ V/m)	Factor (dB/m)	Type
1		2480.486	100.609	69.713	N/A	N/A	N/A	30.896	PK
		2480.486	80.609	69.713	N/A	-20.00	N/A	30.896	AV
2		2483.500	64.734	33.843	-9.266	N/A	74.000	30.892	PK
		2483.500	44.734	33.843	-9.266	-20.00	54.000	30.892	AV
3	*	2483.511	65.018	34.127	-8.982	N/A	74.000	30.892	PK
		2483.511	45.018	34.127	-8.982	-20.00	54.000	30.892	AV

Note 1: " \* ", means this data is the worst emission level.

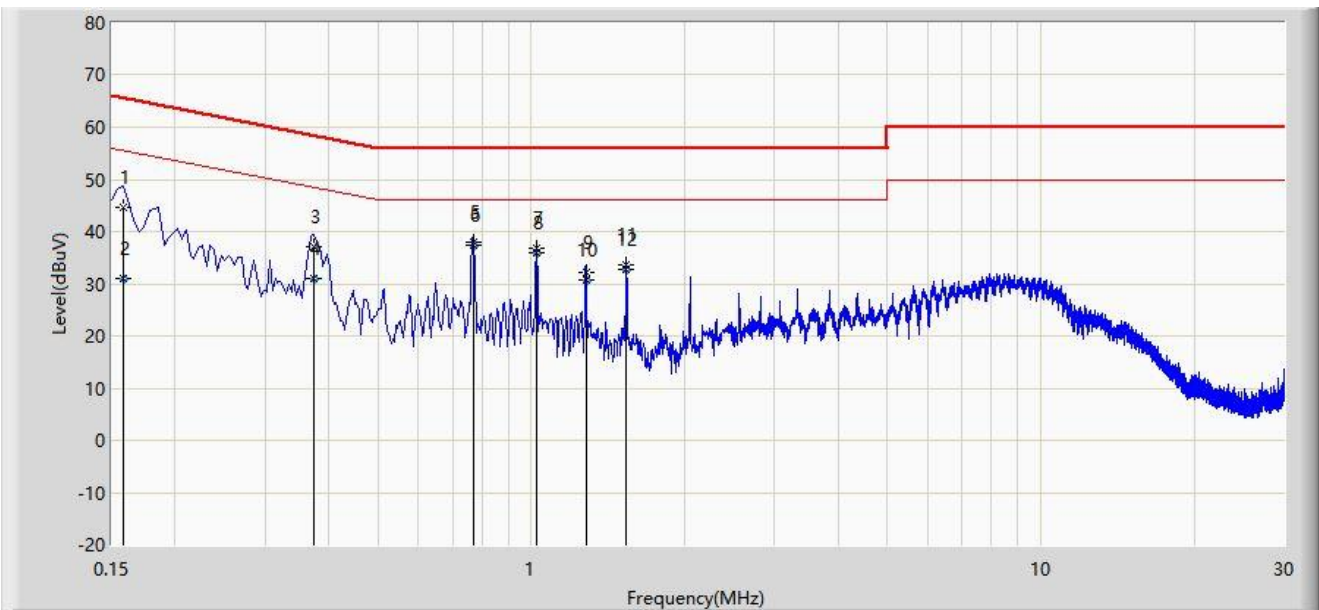
Note 2: Measure Level (dB $\mu$ V/m) = Reading Level (dB $\mu$ V) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4. Average Measure Level = Peak Measure Level + Duty Cycle Factor, Duty cycle factor =  $20 \cdot \log(\text{Duty Cycle})$ .

### A.8 AC Conducted Emissions Test Result

Site: WZ-SR2	Test Date: 2023-03-20
Limit: FCC_Part15.107_CE_AC Power_Class B	Engineer: Alin Zhou
Probe: ENV216_101683_Filter Off	Polarity: Line
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2480MHz	



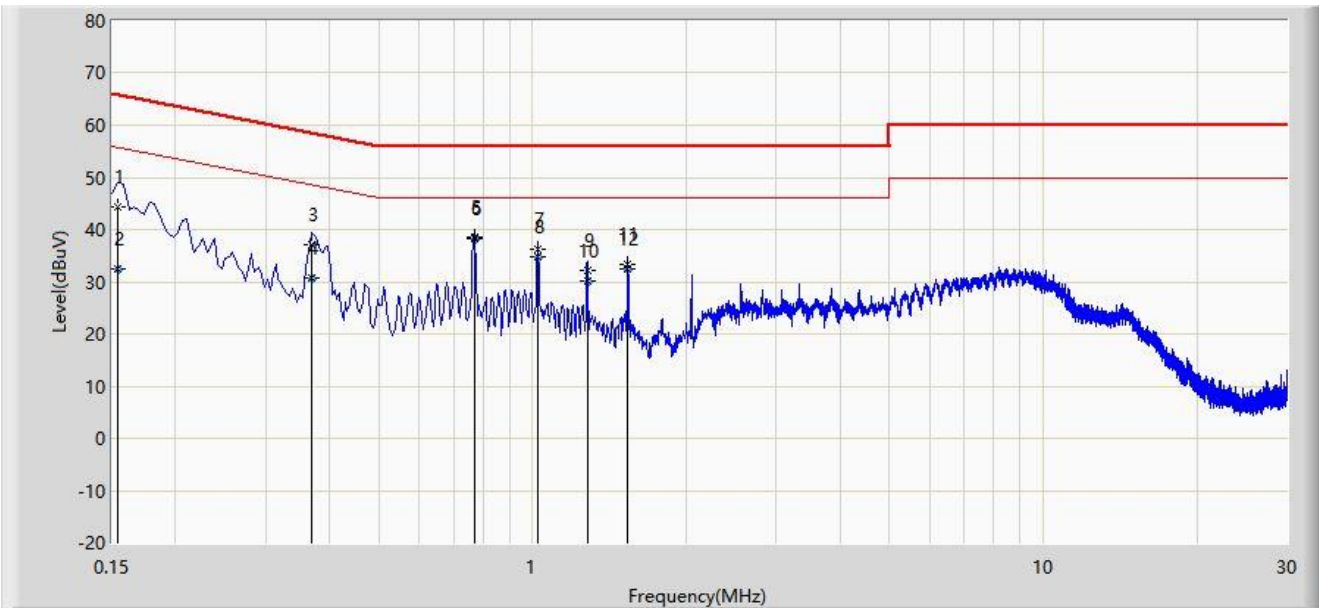
No	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1		0.158	44.592	34.987	-20.976	65.568	9.606	QP
2		0.158	31.094	21.489	-24.474	55.568	9.606	AV
3		0.374	37.061	27.376	-21.351	58.412	9.684	QP
4		0.374	31.079	21.395	-17.332	48.412	9.684	AV
5		0.770	37.871	27.987	-18.129	56.000	9.885	QP
6	*	0.770	37.310	27.425	-8.690	46.000	9.885	AV
7		1.022	36.875	26.886	-19.125	56.000	9.990	QP
8		1.022	35.869	25.879	-10.131	46.000	9.990	AV
9		1.282	32.242	22.249	-23.758	56.000	9.993	QP
10		1.282	30.717	20.724	-15.283	46.000	9.993	AV
11		1.538	33.648	23.651	-22.352	56.000	9.997	QP
12		1.538	32.887	22.890	-13.113	46.000	9.997	AV

Note 1: " \* ", means this data is the worst emission level.

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

Note 3: Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Site: WZ-SR2	Test Date: 2023-03-20
Limit: FCC_Part15.107_CE_AC Power_Class B	Engineer: Alin Zhou
Probe: ENV216_101683_Filter Off	Polarity: Neutral
EUT: ACCESS POINT	Power: AC 120V/60Hz
Test Mode: Transmit by Zigbee at 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1		0.154	44.466	34.897	-21.315	65.781	9.569	QP
2		0.154	32.320	22.751	-23.461	55.781	9.569	AV
3		0.370	37.139	27.460	-21.362	58.501	9.679	QP
4		0.370	30.699	21.021	-17.802	48.501	9.679	AV
5		0.770	38.692	28.813	-17.308	56.000	9.880	QP
6	*	0.770	38.134	28.254	-7.866	46.000	9.880	AV
7		1.022	36.327	26.327	-19.673	56.000	10.000	QP
8		1.022	34.778	24.778	-11.222	46.000	10.000	AV
9		1.282	32.037	22.036	-23.963	56.000	10.000	QP
10		1.282	30.182	20.182	-15.818	46.000	10.000	AV
11		1.538	33.255	23.253	-22.745	56.000	10.002	QP
12		1.538	32.330	22.328	-13.670	46.000	10.002	AV

Note 1: " \* ", means this data is the worst emission level.

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

Note 3: Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

## **Appendix B – Test Setup Photograph**

Refer to “2209RSU069-UT” file.

## Appendix C – EUT Photograph

Refer to “2209RSU069-UE” file.

\_\_\_\_\_ The End \_\_\_\_\_