RF MEASUREMENT REPORT

FCC ID:	2AI9TOAW-AP152X
Applicant:	ALE USA Inc.
Product:	OmniAccess Stellar
Model No.:	OAW-AP1521
Brand Name:	Alcatel-Lucent Enterprise
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
Result:	Complies
Received Date:	2024-08-12
Test Date:	2024-10-09 ~ 2024-10-24

Reviewed By: Vincent Yu

Approved By: Robin Wu

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

Revision History

Report No.	Version	Description	Issue Date	Note
2408RSU020-U2	V01	Initial Report	2024-12-24	Valid

CONTENTS

1. General Information

1.1. Applicant

ALE USA Inc.

2000 Corporate Center Drive Thousand Oaks, CA 91320

1.2. Manufacturer

ALE USA Inc.

2000 Corporate Center Drive Thousand Oaks, CA 91320

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 Location (Suzhou - Wujiang)** Building 1, No.1 Xingdong Road, Wujiang, Suzhou, Jiangsu, People's Republic of 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: 3261				
	FCC: 291082, TW3261		ISED: TW3261		

1.4. Product Information

Product Name	OmniAccess Stellar
Model No.	OAW-AP1521
EUT Identification No.	20240929Sample#04
Wi-Fi Specification	802.11a/b/g/n/ac/ax/be
Bluetooth Specification	V5.1 single mode, BLE only
Zigbee Specification	802.15.4
Antenna Information	Refer to section 1.5
Power Type	AC/DC Adapter Input or PoE Input
Operating Environment	Indoor Use
Accessories	
Adapter	Model: ADP-50GR B Input: 100-240V ~ 1.3A 50-60Hz Output: 48.0V, 1.042A 50.1W
PoE Injector	Model: POE60U-1BT-X (ALE P/N: POE60U-1BT-X-R) Input: 100-240V ~ 1.5A, 50/60Hz Output: 56.0V, 0.535A, 30W PIN 3, 6+ PIN 1, 2 Return Output: 56.0V, 0.535A, 30W PIN 4, 5+ PIN 7, 8 Return
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. AC/DC Power Adapter and PoE Injector are not sold with Product. For this report, we select AC/DC Adapter for testing.	

1.5. Radio Specification under Test

Zigbee Specification	802.15.4
Frequency Range	2405 ~ 2480MHz
Channel Number	16
Type of Modulation	O-QPSK
Antenna Type	Dipole Antenna
Antenna Gain	5.3dBi

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	--	--	--	--

2. Test Configuration

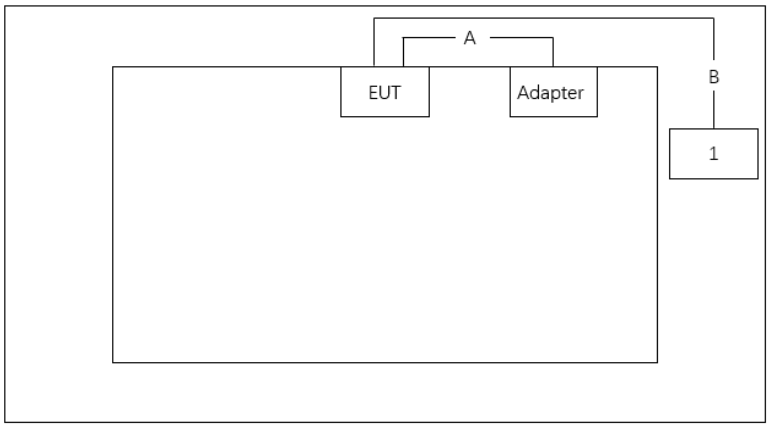
2.1. Test Mode

Mode 1: Transmit by 802.15.4

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	Length
A	Power Cable	Non-Shielded	1.5m
B	LAN Cable	Non-Shielded	> 10m
Product		Manufacturer	Model No.
1	Notebook	ThinkPad	E14 Gen 5

2.3. Test Software

The test utility software used during testing was “IPOP” and commands were 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
Signal Analyzer	Keysight	N9010B	MRTSUE07028	1 year	2025-10-13	SIP-TR1
Thermohygrometer	testo	608-H1	MRTSUE11022	1 year	2024-10-28	SIP-TR1
USB Power Sensor	Keysight	U2021XA	MRTSUE06596	1 year	2025-07-23	SIP-TR1
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2025-05-08	SIP-SR2
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2025-05-08	SIP-SR2
Four-Line V-Network	R&S	ENV432	MRTSUE06614	1 year	2025-10-13	SIP-SR2
Thermohygrometer	testo	608-H1	MRTSUE06621	1 year	2024-11-03	SIP-SR2
Shielding Room	MIX-BEP	SIP-SR2	MRTSUE06949	5 years	2029-10-13	SIP-SR2
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2024-12-17	SIP-AC2
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2025-10-08	SIP-AC2
Signal Analyzer	Keysight	N9010B	MRTSUE07028	1 year	2025-10-13	SIP-AC2
Thermohygrometer	testo	608-H1	MRTSUE06622	1 year	2024-11-03	SIP-AC2
Active Loop Antenna	Schwarzbeck	FMZB 1519-60 D	MRTSUE07075	1 year	2024-12-04	SIP-AC2
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06647	1 year	2025-06-15	SIP-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06648	1 year	2024-10-21	SIP-AC2
Anechoic Chamber	RIKEN	SIP-AC2	MRTSUE06781	1 year	2024-12-21	SIP-AC2

Software	Version	Function
e3	230711	EMI Test Software
Agilent Power Analyzer/Agilent Power Panel	V R03.09.00	Power
Controller_MF 7802BS	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.

AC Conducted Emission Measurement
The maximum measurement uncertainty is evaluated as: 9kHz~150kHz: 3.58dB 150kHz~30MHz: 3.20dB
Radiated Emission Measurement
The maximum measurement uncertainty is evaluated as: Coaxial: 9kHz~30MHz: 2.61dB Coplanar: 9kHz~30MHz: 2.62dB Horizontal: 30MHz~200MHz: 3.79dB 200MHz~1GHz: 3.91dB 1GHz~40GHz: 4.99dB Vertical: 30MHz~200MHz: 4.06dB 200MHz~1GHz: 5.21dB 1GHz~40GHz: 4.90dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.2dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.4dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.2dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 2.7%

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:

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, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

6.2. 6dB Bandwidth Measurement

6.2.1. Test Limit

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

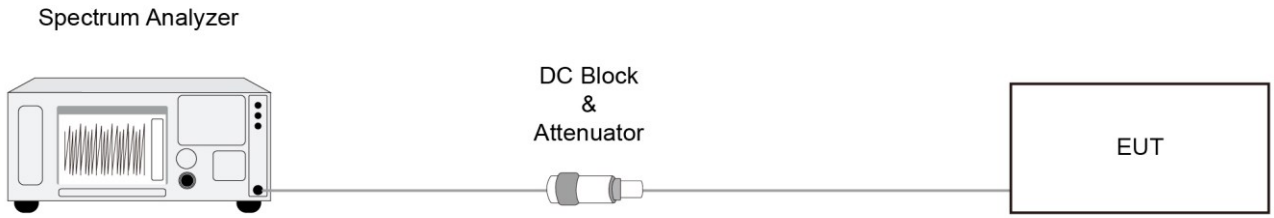
6.2.2. Test Procedure

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 ≥ 3 × 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

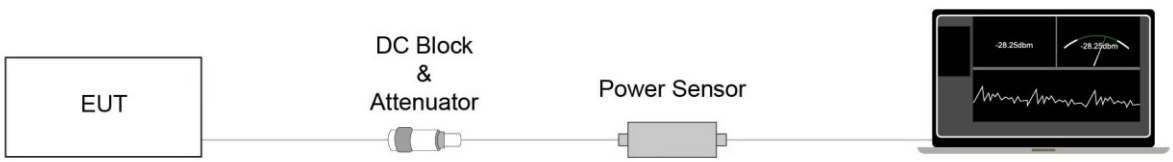
Method PKPM1 (Peak Power Measurement of Signals with DTS BW ≤ 50MHz)

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

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.

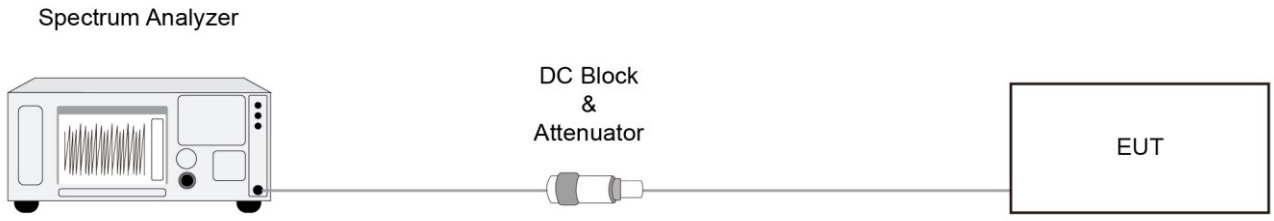
6.4.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.10.2

6.4.3. Test Setting

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

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

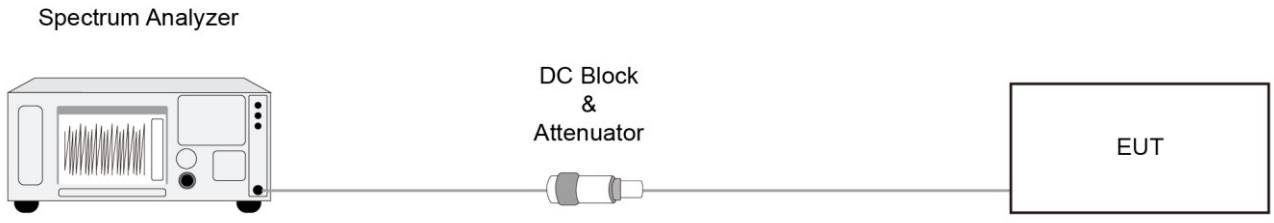
Reference level measurement

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

Emission level measurement

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

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

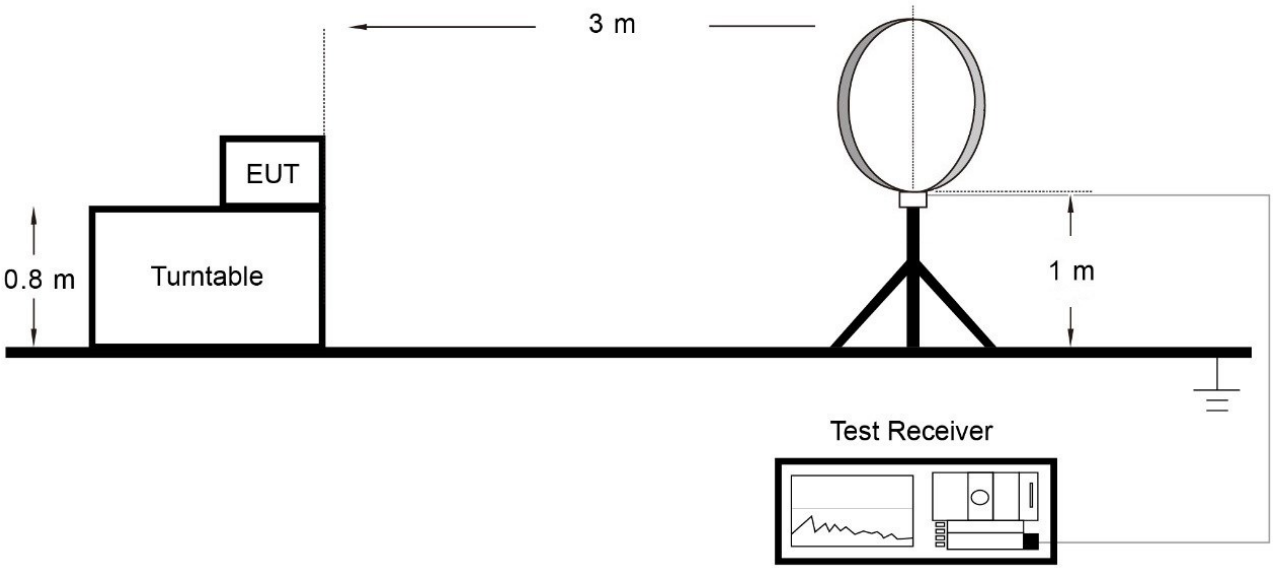
Average Measurements above 1GHz (Method VB)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; if the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10Hz

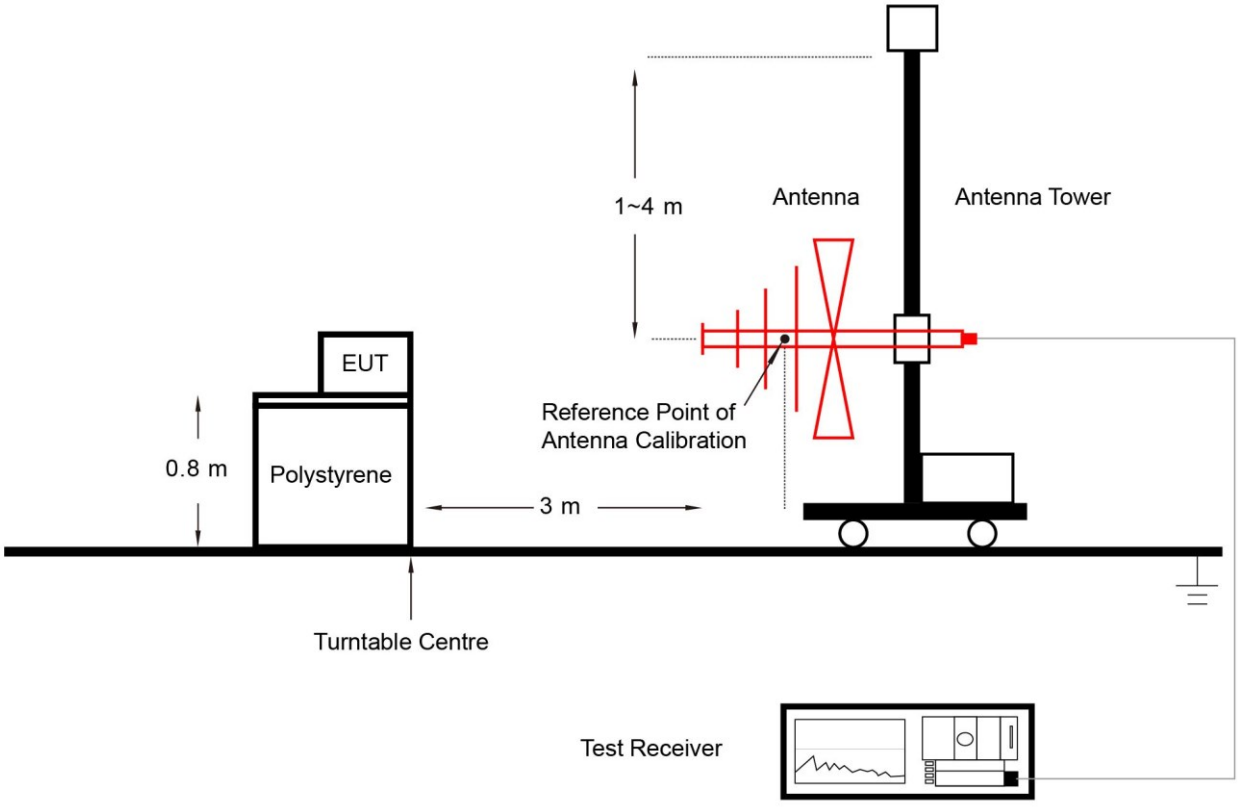
   If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration.
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display 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. Trace was allowed to stabilize

6.6.4. Test Setup

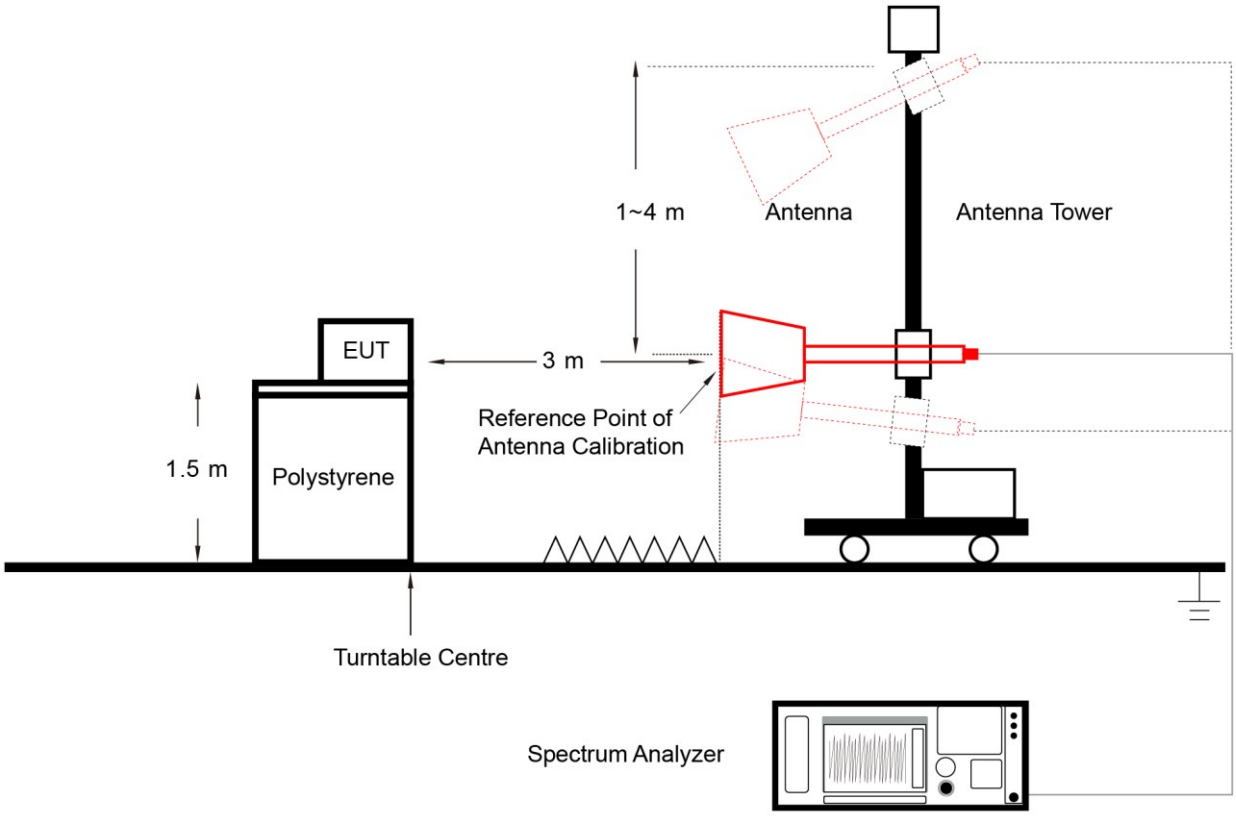
Below 30MHz Test Setup:



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
[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

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

6.7.3. Test Setting

Peak Field Strength Measurements

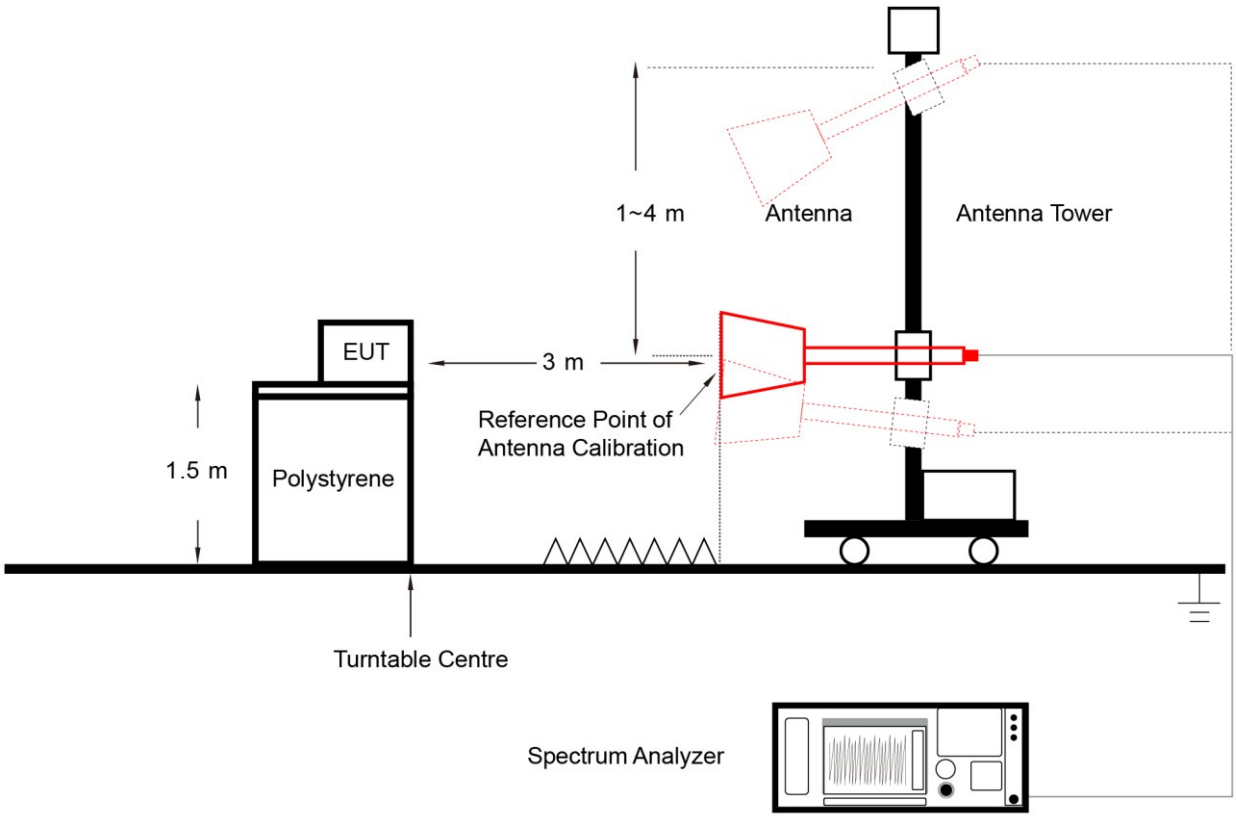
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle ≥ 98%, set VBW = 10 Hz.

   If the EUT duty cycle is < 98%, set VBW ≥ 1/T. T is the minimum transmission duration.
4. 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

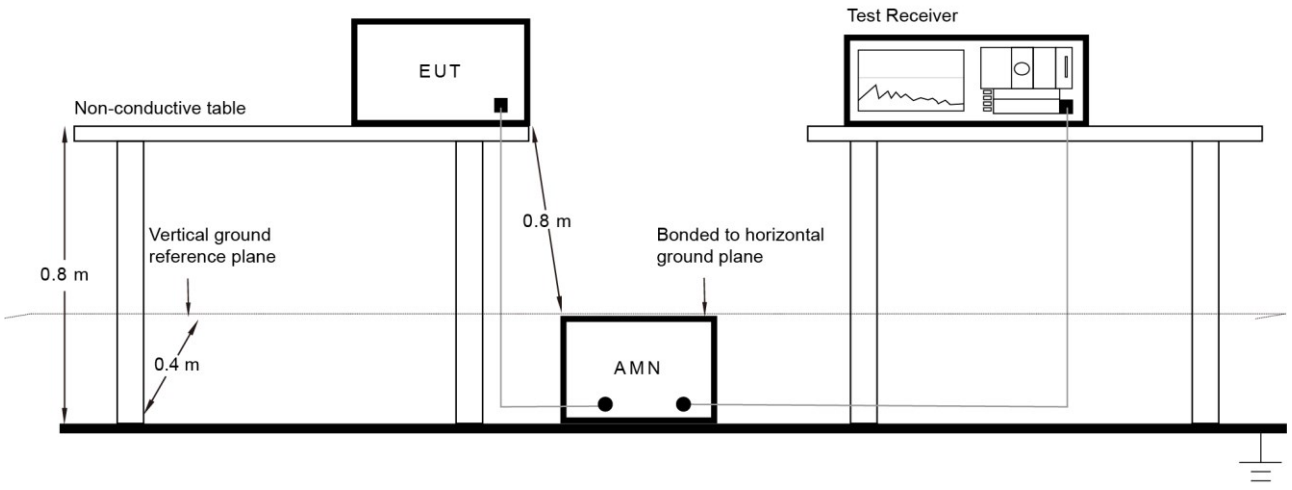
Refer to Appendix A.7.

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

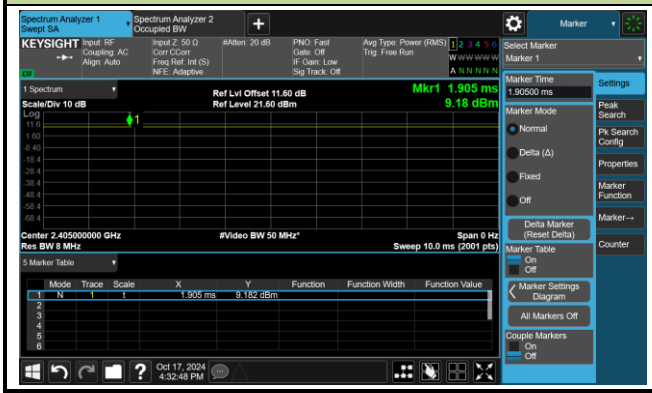
Refer to Appendix A.8.

Appendix A – Test Result

A.1 Duty Cycle Test Result

Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2024-10-17		

Test Mode	Duty Cycle
802.15.4	100%

Duty Cycle (T = Transmission Duration)	
802.15.4	
	

A.2 6dB Bandwidth Test Result

Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2024-10-17		

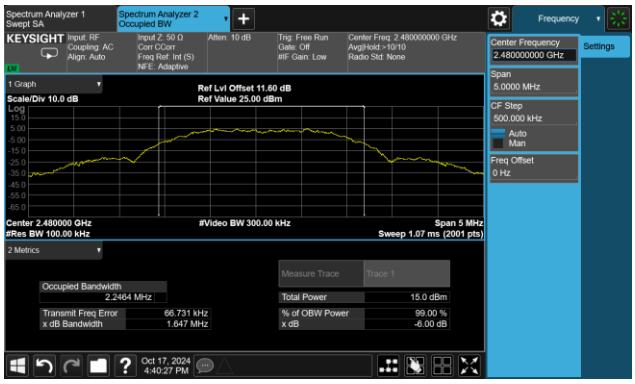
Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.15.4	O-QPSK	11	2405	1.642	≥ 0.5	Pass
802.15.4	O-QPSK	18	2440	1.636	≥ 0.5	Pass
802.15.4	O-QPSK	26	2480	1.647	≥ 0.5	Pass

802.15.4 6dB Bandwidth

Channel 11 (2405MHz)

Channel 18 (2440MHz)

Channel 26 (2480MHz)



A.3 Output Power Test Result

Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2024-10-17		

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	9.49	≤ 30.00	Pass
802.15.4	O-QPSK	18	2440	9.45	≤ 30.00	Pass
802.15.4	O-QPSK	26	2480	9.27	≤ 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	9.46	≤ 30.00	Pass
802.15.4	O-QPSK	18	2440	9.41	≤ 30.00	Pass
802.15.4	O-QPSK	26	2480	9.22	≤ 30.00	Pass

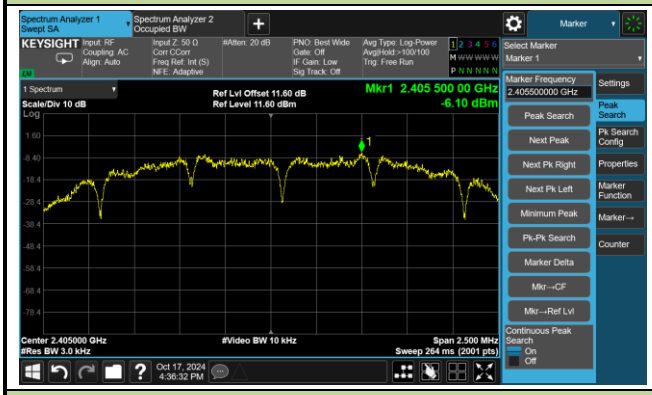
A.4 Power Spectral Density Test Result

Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2024-10-17		

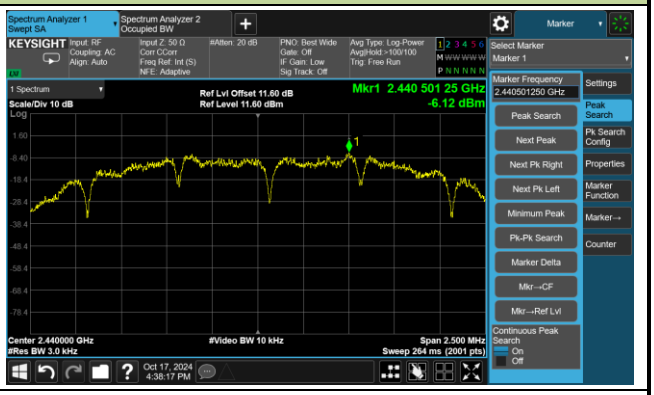
Test Mode	Modulation Mode	Channel No.	Frequency (MHz)	PK PSD (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
802.15.4	O-QPSK	11	2405	-6.10	≤ 8.00	Pass
802.15.4	O-QPSK	18	2440	-6.12	≤ 8.00	Pass
802.15.4	O-QPSK	26	2480	-6.31	≤ 8.00	Pass

802.15.4 Power Density

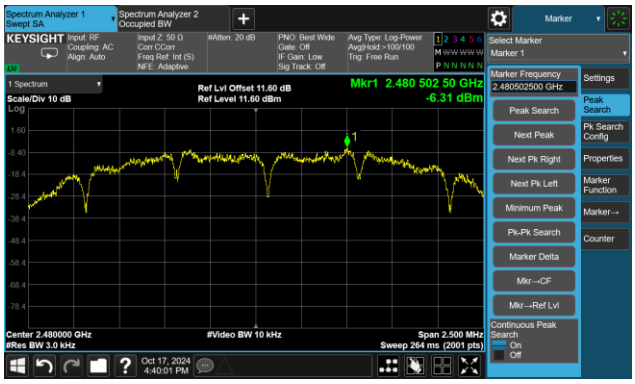
Channel 11 (2405MHz)



Channel 18 (2440MHz)



Channel 26 (2480MHz)



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

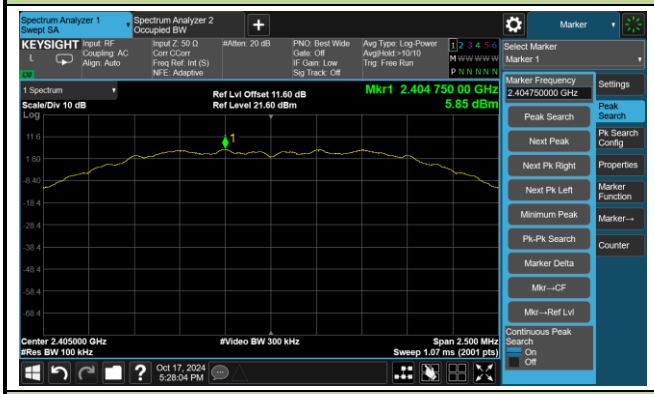
Test Site	SIP-TR1	Test Engineer	Ryan Wang
Test Date	2024-10-17		

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

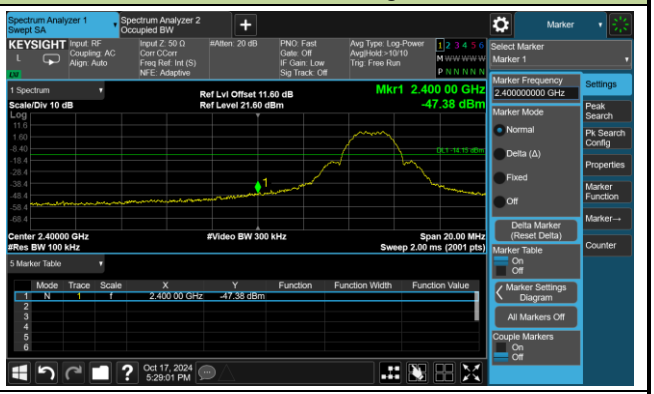
802.15.4 Out-of-Band Emissions

Channel 11 (2405MHz)

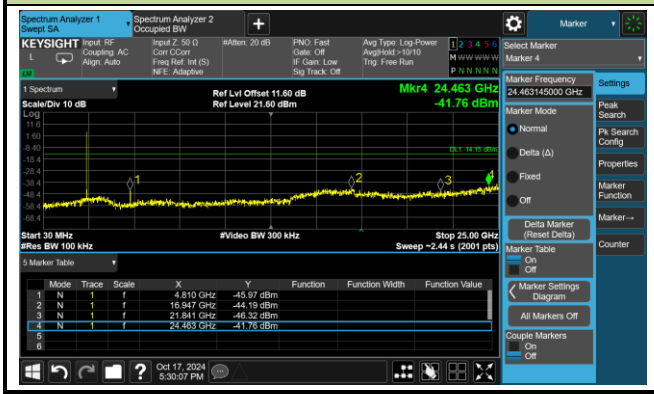
100kHz PSD Reference Level

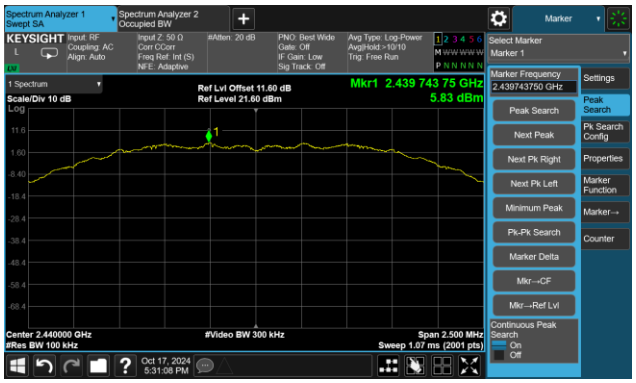
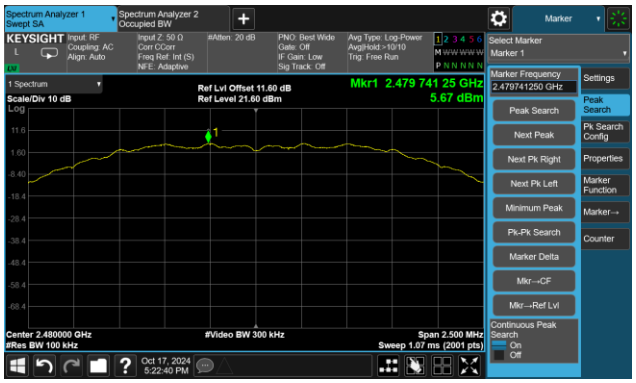
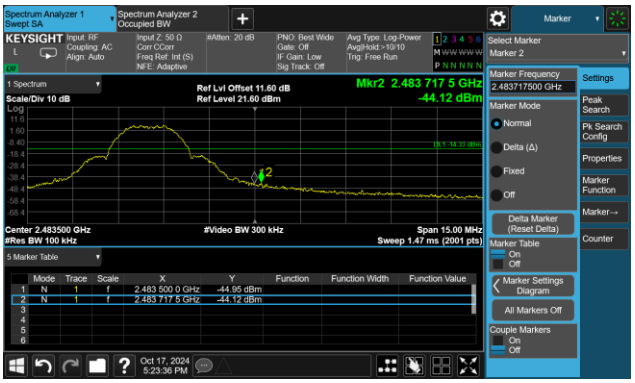
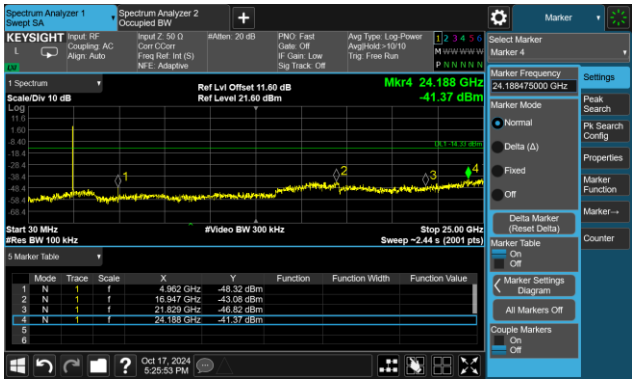


Low Band Edge



Spurious Emission



Channel 18 (2440MHz)	
100kHz PSD Reference Level	Spurious Emission
	
Channel 26 (2480MHz)	
100kHz PSD Reference Level	High Band Edge
	
Spurious Emission	
	

A.6 Radiated Spurious Emission Test Result

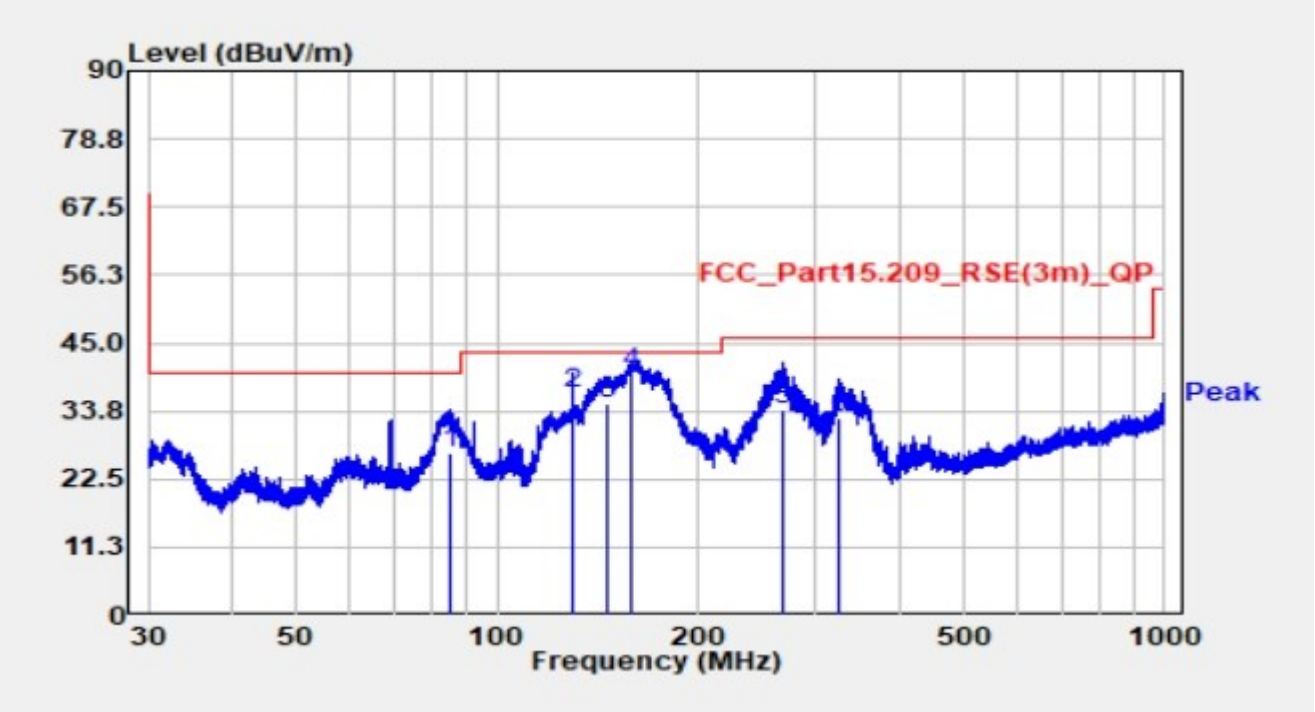
Test Site	SIP-AC2	Test Engineer	Fusco Pan
Test Date	2024-10-18		
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not shown in the report.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
11	4809.7	48.6	-6.2	42.4	54.0	-11.6	Average	Horizontal
	4809.7	60.2	-6.2	54.0	74.0	-20.0	Peak	Horizontal
	14809.1	26.0	10.6	36.6	54.0	-17.4	Average	Horizontal
	14809.1	39.6	10.6	50.2	74.0	-23.8	Peak	Horizontal
	17996.6	24.3	17.7	42.0	54.0	-12.0	Average	Horizontal
	17996.6	36.7	17.7	54.4	74.0	-19.6	Peak	Horizontal
	4809.7	49.3	-6.2	43.1	54.0	-10.9	Average	Vertical
	4809.7	55.7	-6.2	49.5	74.0	-24.5	Peak	Vertical
	9647.9	38.4	3.7	42.1	54.0	-11.9	Average	Vertical
	9647.9	45.7	3.7	49.4	74.0	-24.6	Peak	Vertical
	14239.6	26.4	9.6	36.0	54.0	-18.0	Average	Vertical
	14239.6	40.4	9.6	50.0	74.0	-24.0	Peak	Vertical
	17926.9	24.9	16.9	41.8	54.0	-12.2	Average	Vertical
	17926.9	38.4	16.9	55.3	74.0	-18.7	Peak	Vertical
18	4881.1	41.2	-5.8	35.4	54.0	-18.6	Average	Horizontal
	4881.1	52.5	-5.8	46.7	74.0	-27.3	Peak	Horizontal
	14511.6	26.2	11.0	37.2	54.0	-16.8	Average	Horizontal
	14511.6	38.8	11.0	49.8	74.0	-24.2	Peak	Horizontal
	17923.5	25.0	17.1	42.1	54.0	-11.9	Average	Horizontal
	17923.5	38.4	17.1	55.5	74.0	-18.5	Peak	Vertical
	9647.9	39.5	3.7	43.2	54.0	-10.8	Average	Vertical
	9647.9	45.5	3.7	49.2	74.0	-24.8	Peak	Vertical
	14574.5	26.2	10.3	36.5	54.0	-17.5	Average	Vertical
	14574.5	38.9	10.3	49.2	74.0	-24.8	Peak	Vertical
	17887.8	24.2	16.5	40.7	54.0	-13.3	Average	Vertical
	17887.8	37.3	16.5	53.8	74.0	-20.2	Peak	Vertical
26	9647.9	29.1	3.7	32.8	54.0	-21.2	Average	Horizontal
	9647.9	44.1	3.7	47.8	74.0	-26.2	Peak	Horizontal

	14809.1	25.1	10.6	35.7	54.0	-18.3	Average	Horizontal
	14809.1	39.3	10.6	49.9	74.0	-24.1	Peak	Horizontal
	17926.9	24.3	16.9	41.2	54.0	-12.8	Average	Horizontal
	17926.9	37.6	16.9	54.5	74.0	-19.5	Peak	Horizontal
	9647.9	29.3	3.7	33.0	54.0	-21.0	Average	Vertical
	9647.9	46.1	3.7	49.8	74.0	-24.2	Peak	Vertical
	14812.5	25.2	10.5	35.7	54.0	-18.3	Average	Vertical
	14812.5	40.7	10.5	51.2	74.0	-22.8	Peak	Vertical
	17925.2	24.1	17.0	41.1	54.0	-12.9	Average	Vertical
	17925.2	39.0	17.0	56.0	74.0	-18.0	Peak	Vertical
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m) Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

The Result of Radiated Emission below 1GHz:

Site	SIP-AC2	Test Date	2024-10-18
Test Engineer	Fusco Pan	Temp./Humidity	24.3°C /65.2%
Factor	VULB 9168_00999_25-2000MHz	Polarity	Horizontal
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by Zigbee at 2405MHz		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1		84.821	11.90	14.87	26.77	-13.23	40.00	QP
2		129.968	17.60	18.98	36.58	-6.92	43.50	QP
3		146.733	14.80	20.24	35.04	-8.46	43.50	QP
4	*	158.390	19.60	20.44	40.04	-3.46	43.50	QP
5		266.890	14.20	19.75	33.95	-12.05	46.00	QP
6		326.396	10.90	21.71	32.61	-13.39	46.00	QP

Notes:

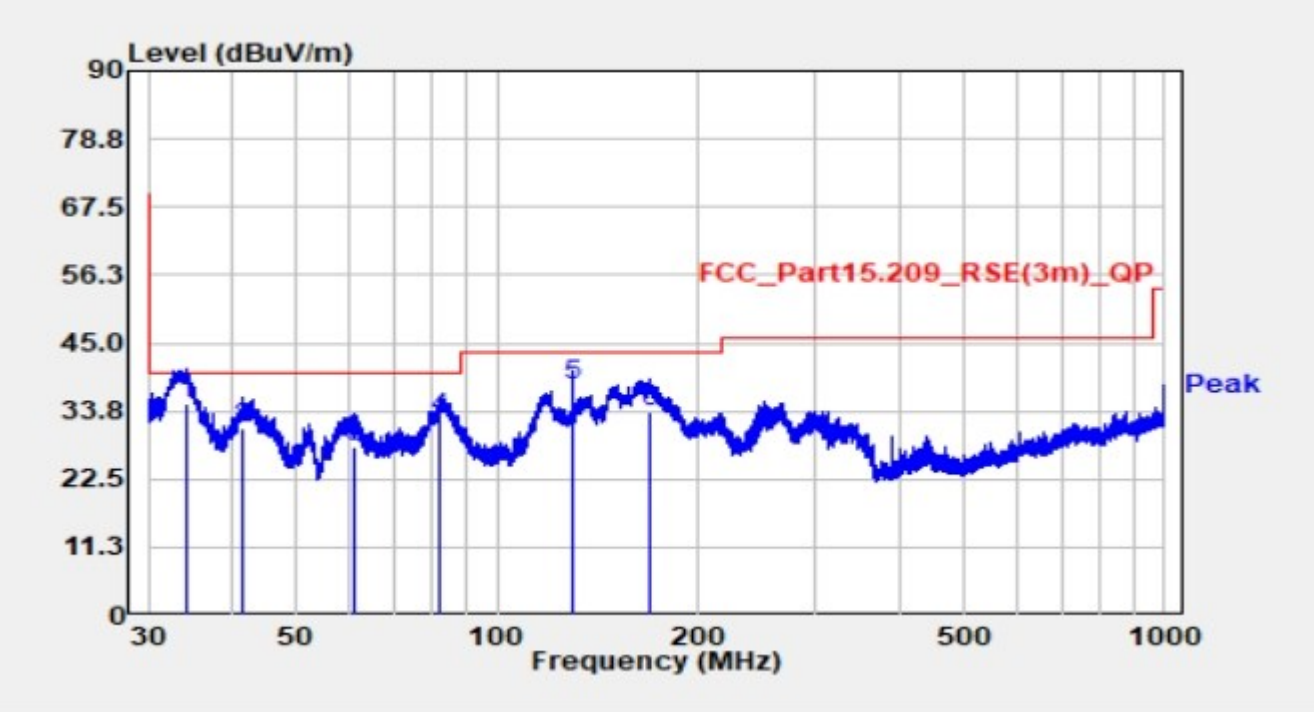
1. " * ", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).

4. 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	SIP-AC2	Test Date	2024-10-18
Test Engineer	Fusco Pan	Temp./Humidity	24.3°C /65.2%
Factor	VULB 9168_00999_25-2000MHz	Polarity	Vertical
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by Zigbee at 2405MHz		



No	Mark	Frequency (MHz)	Reading (dBμV)	C.F (dB/m)	Measurement (dBμV/m)	Margin (dB)	Limit (dBμV/m)	Detector
1	*	34.252	15.80	19.12	34.92	-5.08	40.00	QP
2		41.509	10.80	20.08	30.88	-9.12	40.00	QP
3		60.939	8.40	19.59	27.99	-12.01	40.00	QP
4		82.186	17.10	15.35	32.45	-7.55	40.00	QP
5		129.968	18.90	18.98	37.88	-5.62	43.50	QP
6		169.065	13.70	19.99	33.69	-9.81	43.50	QP

Notes:

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

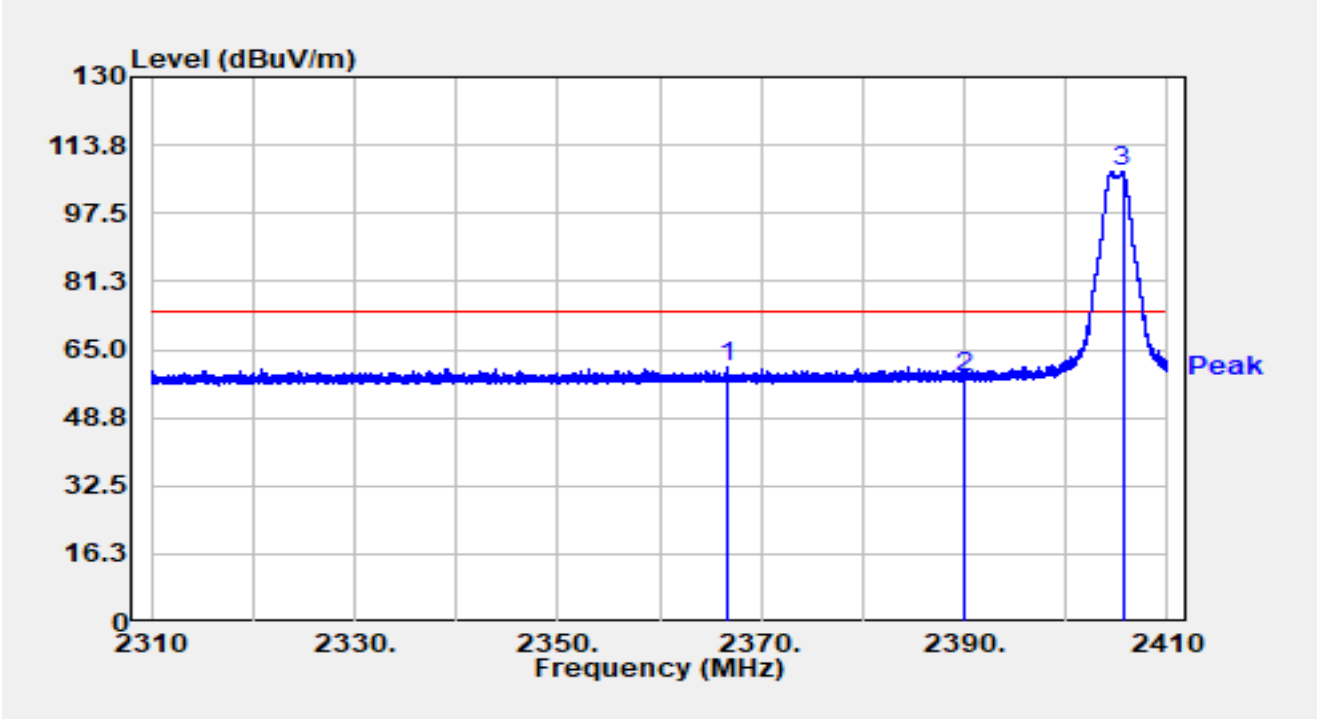
2. C.F (dB/m) = Antenna Factor (dB/m)+ Cable Loss (dB).

3. Measurement (dBμV/m) = Reading (dBμV) + C.F (dB/m).

4. 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.7 Radiated Restricted Band Edge Test Result

Site	SIP-AC3	Test Date	2024-10-24
Test Engineer	Mero Zhou	Temp./Humidity	24.3°C /65.2%
Factor	HF907_102861_1-18GHz	Polarity	Horizontal
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/50Hz
Test Mode	Transmit by Zigbee at 2405MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1		2366.680	27.99	32.62	60.61	-13.39	74.00	Peak
2		2390.000	25.67	32.69	58.36	-15.64	74.00	Peak
3	*	2405.590	74.67	32.75	107.42	N/A	N/A	Peak

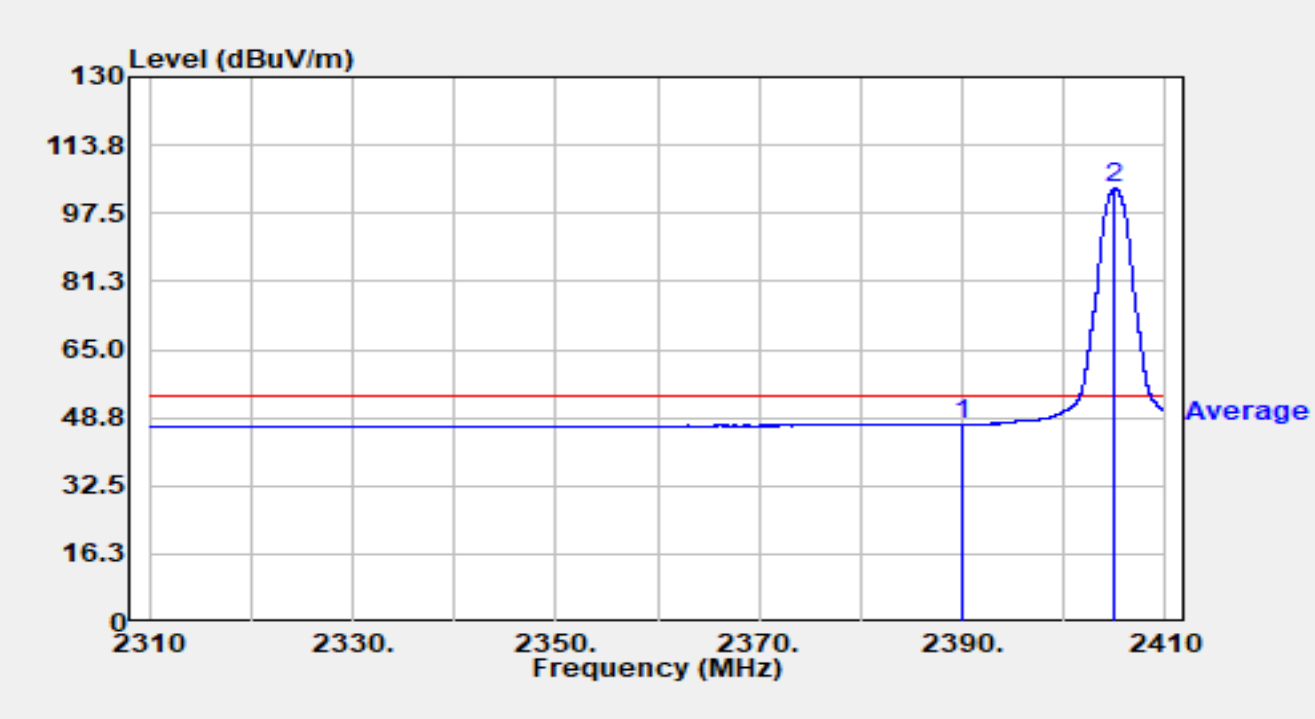
Notes:

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

2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2024-10-24
Test Engineer	Mero Zhou	Temp./Humidity	24.3°C /65.2%
Factor	HF907_102861_1-18GHz	Polarity	Horizontal
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/50Hz
Test Mode	Transmit by Zigbee at 2405MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1		2390.000	14.52	32.69	47.21	-6.79	54.00	Average
2	*	2405.040	70.78	32.75	103.52	N/A	N/A	Average

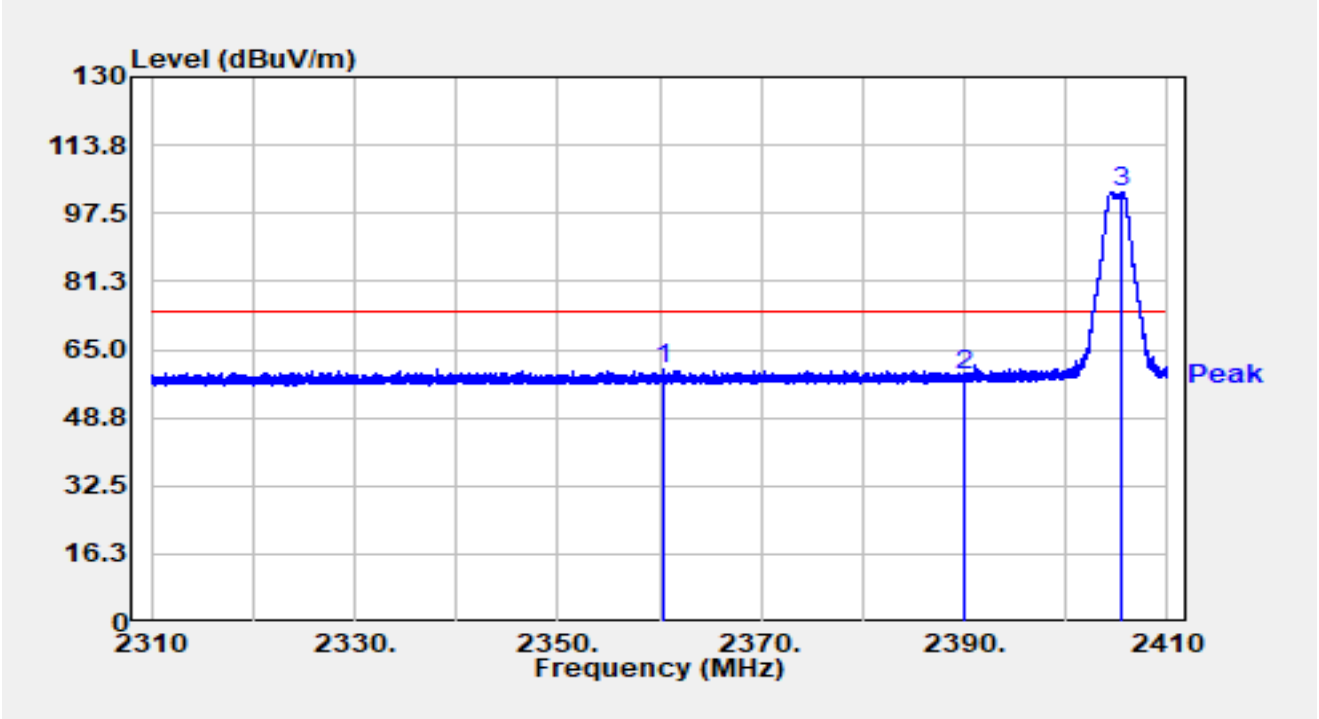
Notes:

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

2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2024-10-24
Test Engineer	Mero Zhou	Temp./Humidity	24.3°C /65.2%
Factor	HF907_102861_1-18GHz	Polarity	Vertical
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/50Hz
Test Mode	Transmit by Zigbee at 2405MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1		2360.350	27.66	32.61	60.27	-13.73	74.00	Peak
2		2390.000	25.99	32.69	58.68	-15.32	74.00	Peak
3	*	2405.560	69.86	32.75	102.61	N/A	N/A	Peak

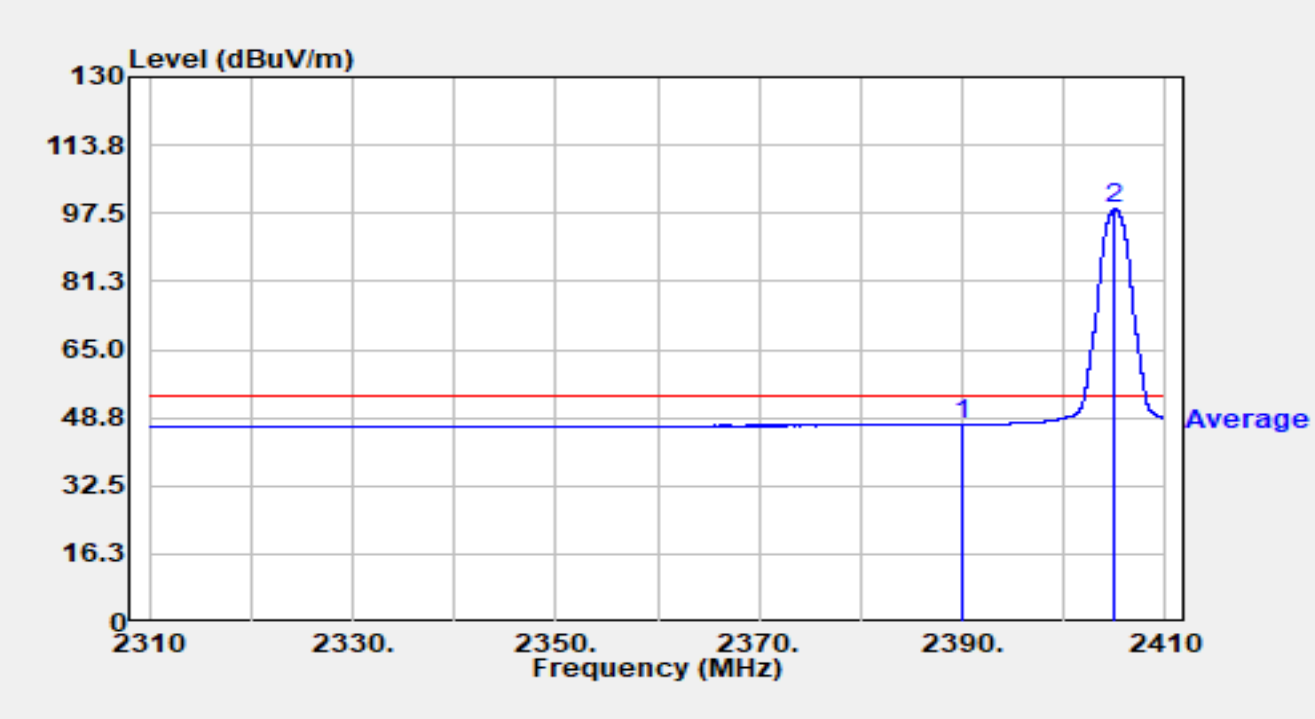
Notes:

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

2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2024-10-24
Test Engineer	Mero Zhou	Temp./Humidity	24.3°C /65.2%
Factor	HF907_102861_1-18GHz	Polarity	Vertical
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/50Hz
Test Mode	Transmit by Zigbee at 2405MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1		2390.000	14.46	32.69	47.15	-6.85	54.00	Average
2	*	2405.030	65.86	32.75	98.61	N/A	N/A	Average

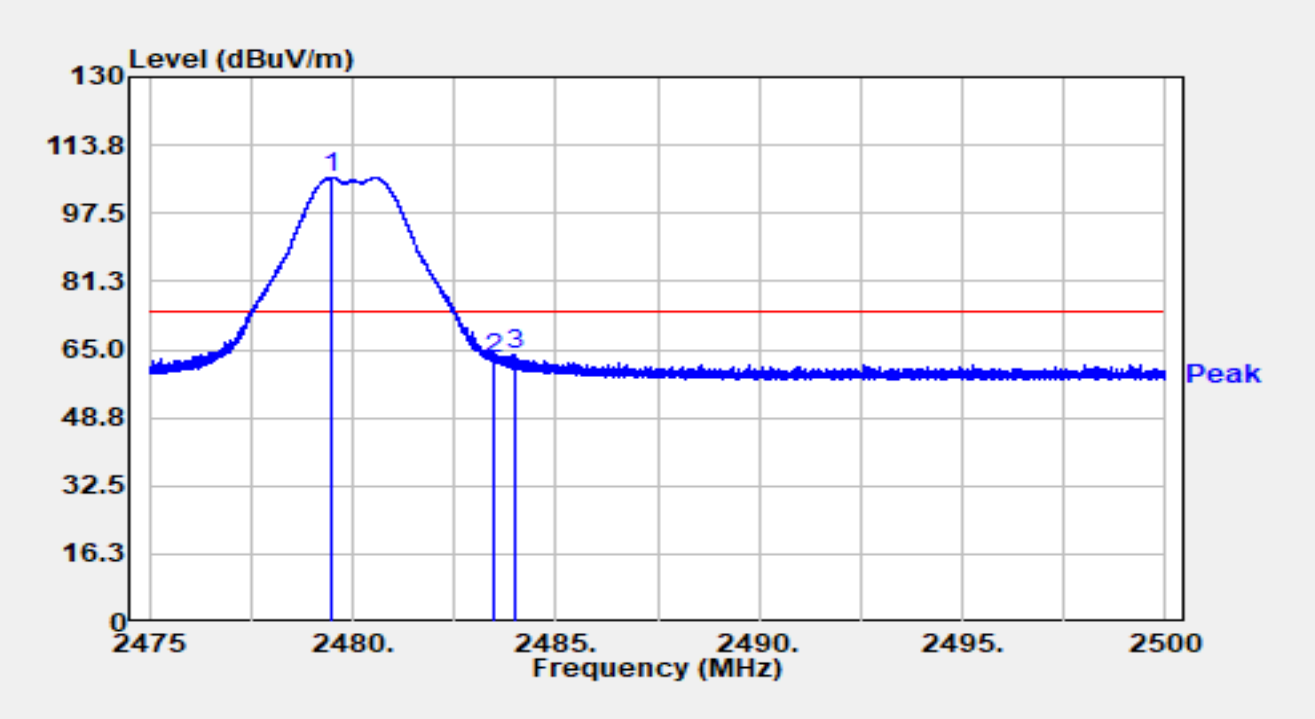
Notes:

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

2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2024-10-24
Test Engineer	Mero Zhou	Temp./Humidity	24.3°C /65.2%
Factor	HF907_102861_1-18GHz	Polarity	Horizontal
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/50Hz
Test Mode	Transmit by Zigbee at 2480MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1	*	2479.492	72.79	33.11	105.90	N/A	N/A	Peak
2		2483.500	29.70	33.13	62.83	-11.17	74.00	Peak
3		2484.005	30.74	33.13	63.87	-10.13	74.00	Peak

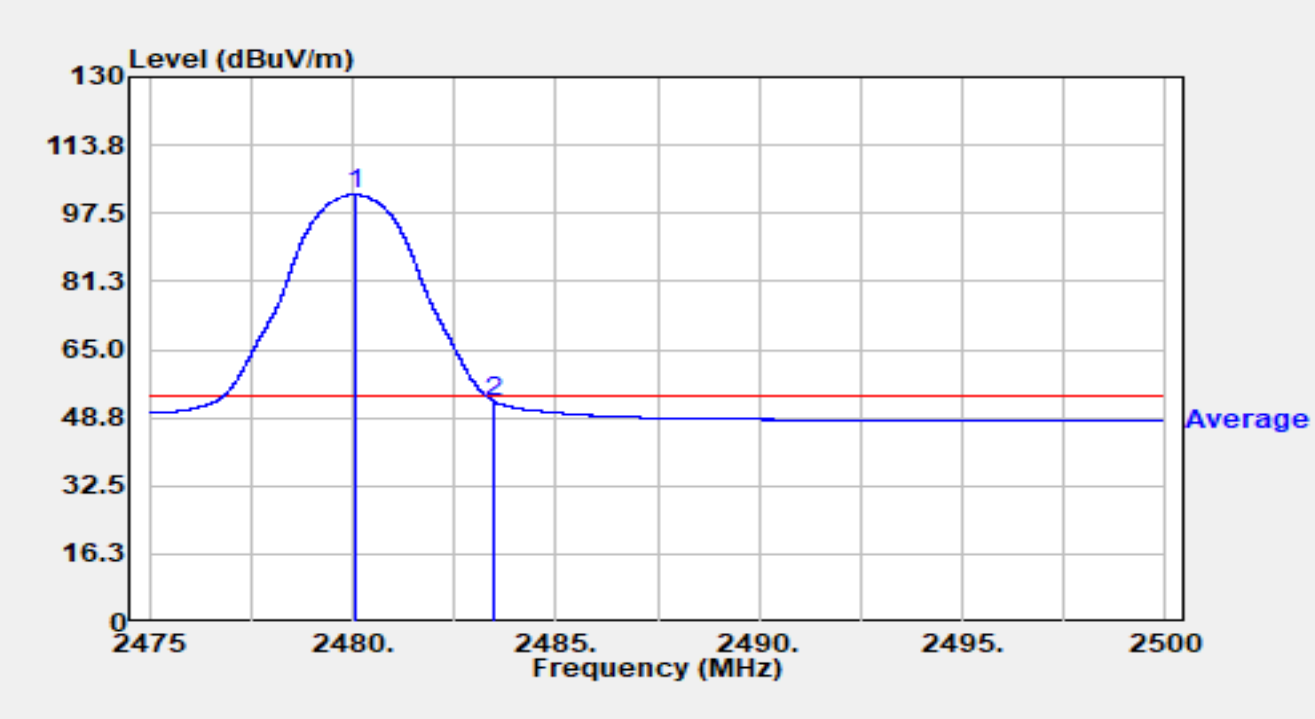
Notes:

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

2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2024-10-24
Test Engineer	Mero Zhou	Temp./Humidity	24.3°C /65.2%
Factor	HF907_102861_1-18GHz	Polarity	Horizontal
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/50Hz
Test Mode	Transmit by Zigbee at 2480MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1	*	2480.038	68.91	33.11	102.02	N/A	N/A	Average
2		2483.500	19.43	33.13	52.56	-1.44	54.00	Average

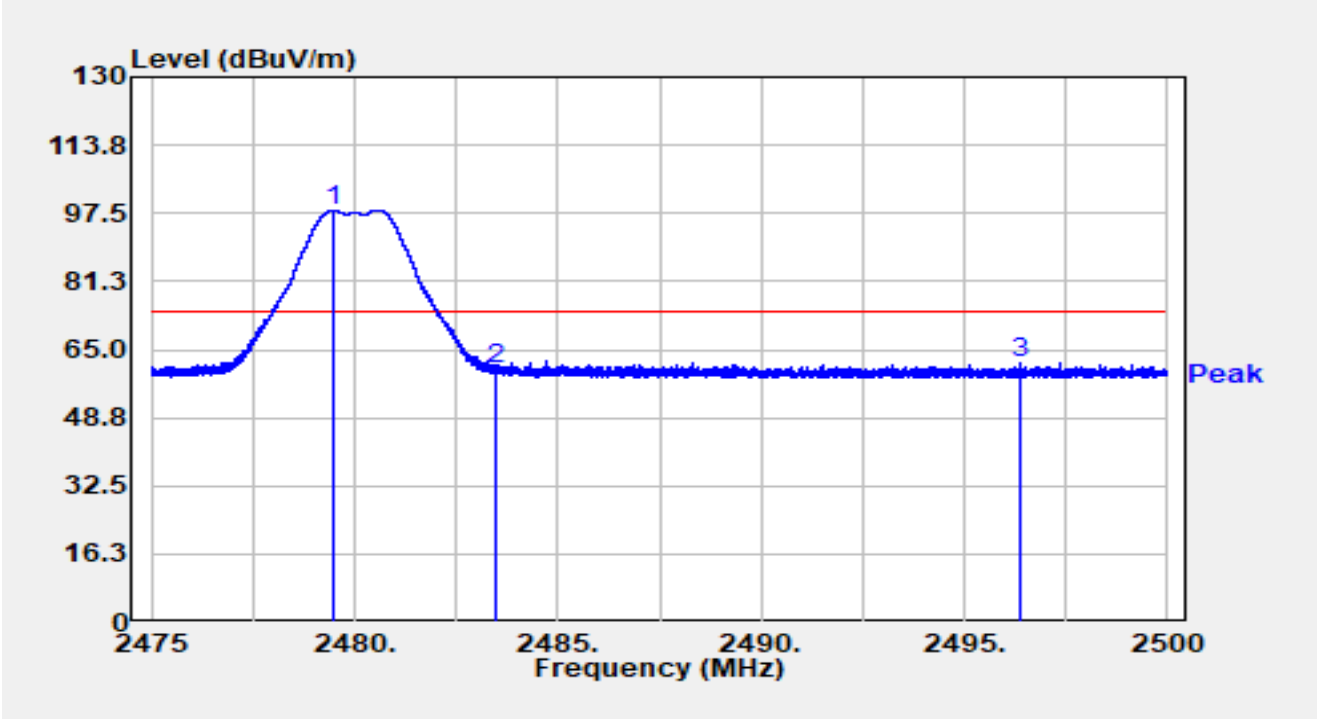
Notes:

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

2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2024-10-24
Test Engineer	Mero Zhou	Temp./Humidity	24.3°C /65.2%
Factor	HF907_102861_1-18GHz	Polarity	Vertical
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/50Hz
Test Mode	Transmit by Zigbee at 2480MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1	*	2479.450	65.21	33.11	98.33	N/A	N/A	Peak
2		2483.500	27.30	33.13	60.43	-13.57	74.00	Peak
3		2496.373	28.65	33.19	61.84	-12.16	74.00	Peak

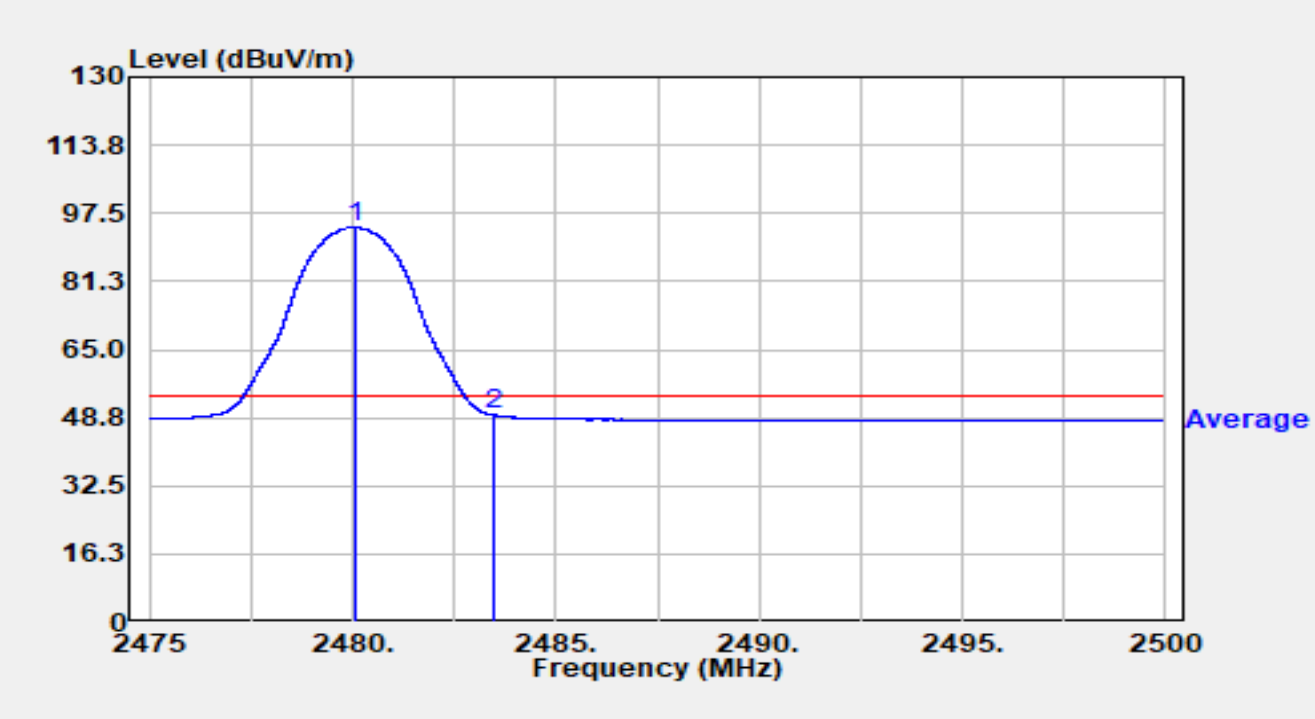
Notes:

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

2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

Site	SIP-AC3	Test Date	2024-10-24
Test Engineer	Mero Zhou	Temp./Humidity	24.3°C /65.2%
Factor	HF907_102861_1-18GHz	Polarity	Vertical
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/50Hz
Test Mode	Transmit by Zigbee at 2480MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB/m)	Measurement (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector
1	*	2480.038	61.07	33.11	94.18	N/A	N/A	Average
2		2483.500	16.18	33.13	49.31	-4.69	54.00	Average

Notes:

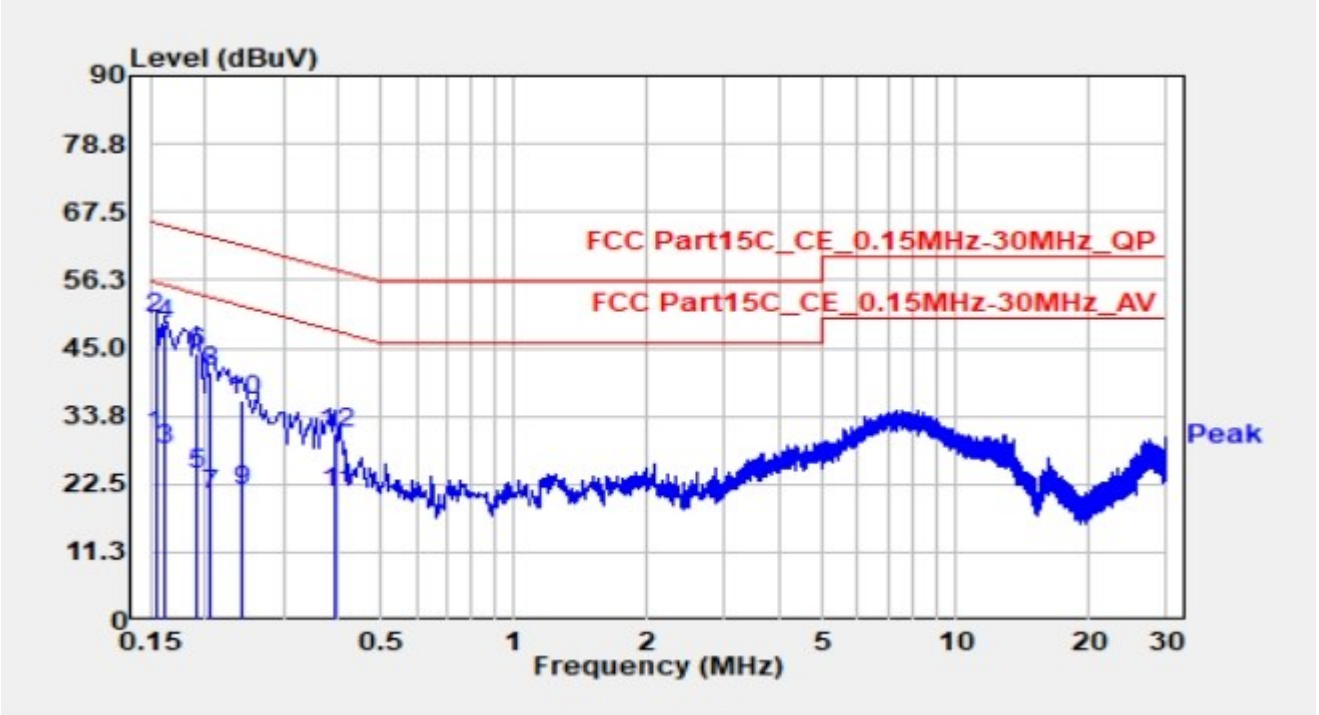
1. " *", means this data is the worst emission level.

2. C.F (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB).

3. Measurement(dBµV/m) = Reading(dBµV) + C.F (dB/m).

A.8 AC Conducted Emissions Test Result

Site	SIP-SR2	Test Date	2024-10-09
Test Engineer	Arvin Ding	Temp./Humidity	24.1°C /52.6%
Factor	SIP-SR2-ENV216_101684_C	Polarity	Line
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by Zigbee at 2405MHz		

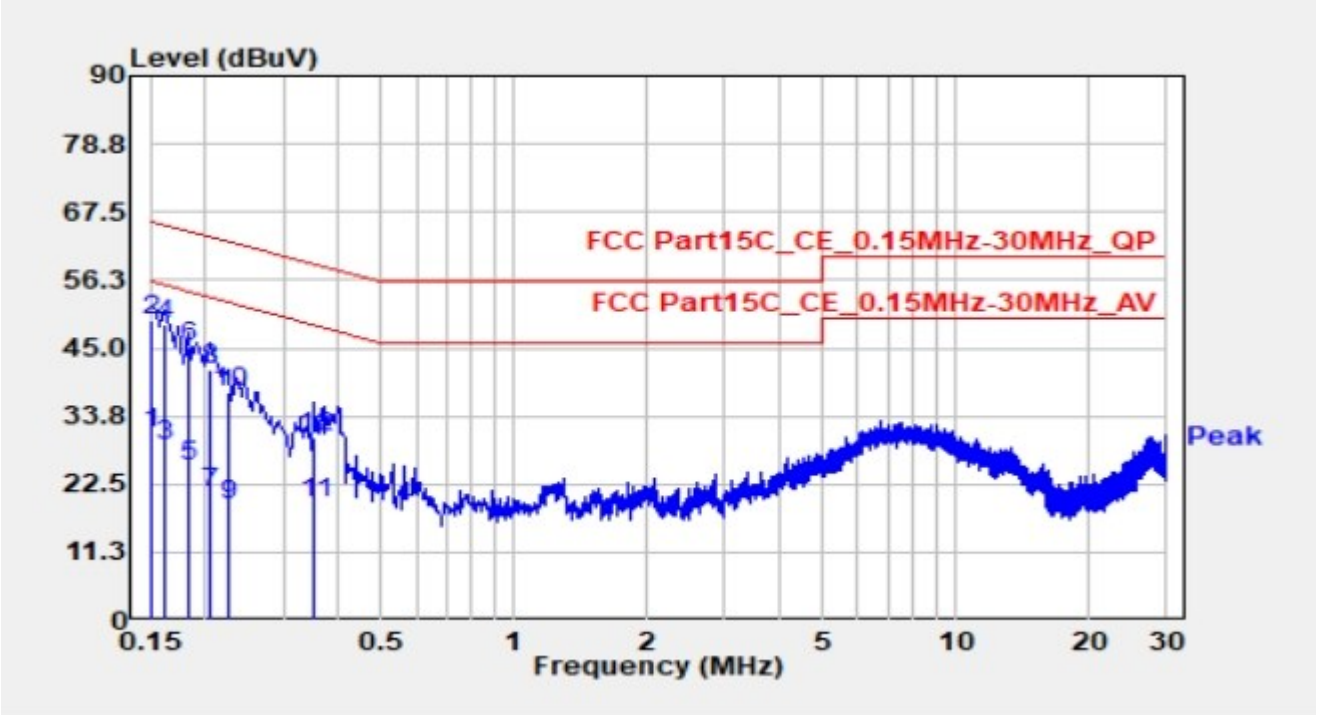


No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB)	Measurement (dBµV)	Margin (dB)	Limit (dBµV)	Detector
1		0.154	21.00	9.65	30.65	-25.13	55.78	Average
2	*	0.154	40.24	9.65	49.90	-15.88	65.78	QP
3		0.162	18.60	9.65	28.26	-27.10	55.36	Average
4		0.162	39.38	9.65	49.03	-16.33	65.36	QP
5		0.190	14.55	9.67	24.22	-29.82	54.04	Average
6		0.190	34.45	9.67	44.12	-19.91	64.04	QP
7		0.206	11.04	9.70	20.73	-32.63	53.37	Average
8		0.206	31.55	9.70	41.25	-22.12	63.37	QP
9		0.242	11.69	9.72	21.41	-30.62	52.03	Average
10		0.242	26.72	9.72	36.44	-25.59	62.03	QP
11		0.394	11.25	9.74	20.99	-26.99	47.98	Average
12		0.394	21.17	9.74	30.91	-27.07	57.98	QP

Notes:

1. " *", means this data is the worst emission level.
2. C.F (dB) = LISN Factor (dB) + Cable Loss (dB).
3. Measurement (dBµV) = Reading (dBµV) + C.F (dB).

Site	SIP-SR2	Test Date	2024-10-09
Test Engineer	Arvin Ding	Temp./Humidity	24.1°C /52.6%
Factor	SIP-SR2-ENV216_101684_C	Polarity	Neutral
EUT	OmniAccess Stellar (OAW-AP1521)	Test Voltage	AC 120V/60Hz
Test Mode	Transmit by Zigbee at 2405MHz		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB)	Measurement (dBµV)	Margin (dB)	Limit (dBµV)	Detector
1		0.150	21.36	9.68	31.04	-24.96	56.00	Average
2		0.150	39.89	9.68	49.57	-16.43	66.00	QP
3		0.162	19.31	9.68	28.99	-26.37	55.36	Average
4	*	0.162	39.33	9.68	49.01	-16.35	65.36	QP
5		0.182	15.84	9.68	25.52	-28.87	54.39	Average
6		0.182	35.61	9.68	45.30	-19.10	64.39	QP
7		0.206	11.35	9.72	21.06	-32.30	53.37	Average
8		0.206	31.56	9.72	41.27	-22.10	63.37	QP
9		0.226	9.33	9.73	19.06	-33.54	52.60	Average
10		0.226	28.08	9.73	37.81	-24.78	62.60	QP
11		0.354	9.73	9.75	19.48	-29.39	48.87	Average
12		0.354	20.41	9.75	30.16	-28.71	58.87	QP

Notes:

1. " *", means this data is the worst emission level.
2. C.F (dB) = LISN Factor (dB) + Cable Loss (dB).
3. Measurement (dBµV) = Reading (dBµV) + C.F (dB).

Appendix B – Test Setup Photograph

Refer to “2408RSU020-UT” file.

Appendix C – EUT Photograph

Refer to “2408RSU020-UE” file.

The End