RF MEASUREMENT REPORT

FCC ID:	2AI9TOAW-AP145X
Applicant:	ALE USA Inc.
Product:	OmniAccess Stellar
Model No.:	OAW-AP1451
Brand Name:	Alcatel-Lucent Enterprise
FCC Classification:	Digital Transmission System (DTS)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.247)
Result:	Complies
Test Date:	2022-04-06 ~ 2022-07-26

Reviewed By: Sunny Sun

Approved By: Robin Wu

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.
This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.
The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2203RSU064-U1	Rev. 01	Initial Report	2022-08-25	Invalid
2203RSU064-U1	Rev. 02	Add description of antenna	2022-09-15	Valid

Note: OAW-AP1451 referenced test data from OAW-AP1351 (FCC ID: 2AI9TOAW-AP135X), only spot check in this report.

This application is based on the differences between the two models as follows:

1. Identical internal printed circuit board layouts, a common design and components.
2. Enable 5150 ~ 5350MHz of High band chip.
3. Enable 5945 ~ 7125MHz and disable 5150 ~ 5350MHz of Low band chip, also disable 160MHz BW of 5GHz Wi-Fi.
4. There’s no change of 2.4GHz Wi-Fi, Bluetooth and Wi-Fi Scan mode.

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1. General Information

1.1. Applicant

ALE USA Inc.

26801 West Agoura Road, Calabasas, CA 91301, United States

1.2. Manufacturer

ALE USA Inc.

26801 West Agoura Road, Calabasas, CA 91301, United States

1.3. Testing Facility

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

1.4. Product Information

Product Name	OmniAccess Stellar
Model No.	OAW-AP1451
EUT Identification No.	20220324Sanmple#09 (Radiated) 20220324Sanmple#10 (Conducted)
Wi-Fi Specification	802.11a/b/g/n/ac/ax
Bluetooth Specification	V5.1 Single Mode
Antenna Information	Refer to Section 1.7
Power Type	AC Adapter Input or PoE Input
Operating Environment	Indoor Use
Accessories	
AC Adapter	Model: ADP-50GR B Input: 100-240V ~ 50/60Hz, 1.3A Output: 48.0V, 1.042A, 50.1W MAX
PoE Injector	Model: POE60U-1BT-X 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 Power Adapter and PoE Injector are not sold with Product.
3. For this report, we select AC Adapter for testing.

1.5. Radio Specification

Bluetooth Frequency	2402 ~ 2480MHz
Channel Number	40
Type of modulation	GFSK
Data Rate	1Mbps & 2Mbps

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

1.6. Working Frequencies

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

1.7. Description of Available Antennas

Antenna Type	Frequency Band (MHz)	T_X Paths	Max Antenna Gain (dBi)	Directional Gain (dBi)		Beamforming Directional Gain (dBi)
				For Power	For PSD	
Wi-Fi Antennas						
PIFA	2400 ~ 2483.5	4	3.9	3.9	9.92	9.92
PIFA & Dipole	5150 ~ 5850	8	3.9	BW⩾40M, 3.9 BW=20M, 6.9	12.93	12.93
Dipole	5925 ~ 7125	4	3.8	3.8	9.82	9.82
Scan Antenna						
Dipole	2400 ~ 2483.5	1	3.5	3.5	3.5	--
Dipole	5150 ~ 5250 & 5725 ~5850	1	3.9	3.9	3.9	--
Bluetooth Antenna						
Dipole	2400 ~ 2483.5	1	3.5	3.5	3.5	--

Remark:

1. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

For CDD transmissions, directional gain is calculated as follows.

Directional gain = $G_{ANT\ Max}$ + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,

  Array Gain = 10 log (N_{ANT}/ N_{SS}) dB;

- For power measurements on IEEE 802.11 devices,

  Array Gain = 0 dB for $N_{ANT} \leq 4$;

  Array Gain = 0 dB for channel widths ≥ 40 MHz for any N_{ANT};

  Array Gain = 5 log(N_{ANT}/ N_{SS}) dB or 3 dB, whichever is less, for 20MHz channel widths with $N_{ANT} \geq 5$.

2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac/ax, not include 802.11a/b/g. Beamforming Directional gain = $G_{ANT\ Max}$ + 10 log (N_{ANT}/ N_{SS}).

2. Test Configuration

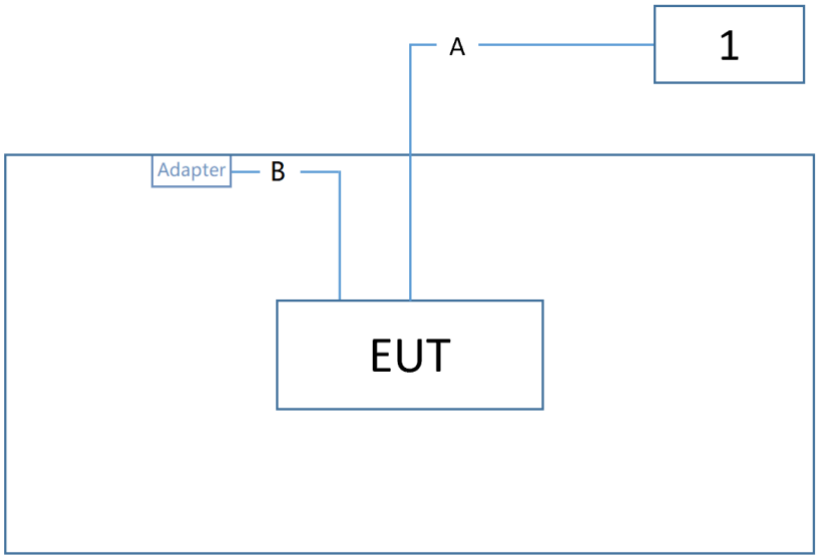
2.1. Test Mode

Mode 1: Transmit by BLE 1Mbps
Mode 2: Transmit by BLE 2Mbps

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 – Radiated Emission testing & AC Conducted Emissions



Cable Type		Cable Description	
A	LAN Cable	Non shielded, > 10m	
B	Power Cable	Non shielded, 1.25m	
Product		**Manufacturer**	**Model No.**
1	Notebook	Dell	Latitude 5491

2.3. Test Software

The test utility software used during testing was “telnet”, and commands was provided by 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
- KDB 484596 D01v01

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
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2022-12-29	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2022-09-16	WZ-AC1
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2022-11-12	WZ-AC1
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2022-08-05	WZ-AC1
Anechoic Chamber	TDK	WZ-AC1	MRTSUE06212	1 year	2022-04-29	WZ-AC1
Anechoic Chamber	TDK	WZ-AC1	MRTSUE06212	1 year	2023-04-21	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE06403	1 year	2022-06-28	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE06403	1 year	2023-06-06	WZ-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2022-12-29	WZ-AC1
Thermohygrometer	testo	Testo 608-H1	MRTSUE11039	1 year	2022-11-11	WZ-AC1
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2022-10-28	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2022-12-01	WZ-AC1
Preamplifier	EMCI	EMC184045SE	MRTSUE06640	1 year	2023-01-13	WZ-AC1
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2022-06-08	WZ-SR2
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2023-06-04	WZ-SR2
Shielding Room	MIX-BEP	WZ-SR2	MRTSUE06215	N/A	N/A	WZ-SR2
Thermohygrometer	testo	608-H1	MRTSUE06404	1 year	2022-06-28	WZ-SR2
Thermohygrometer	testo	608-H1	MRTSUE06404	1 year	2023-06-06	WZ-SR2
Four-Line V-Network	R&S	ENV432	MRTSUE06615	1 year	2022-10-13	WZ-SR2
EMI Test Receiver	R&S	ESR3	MRTSUE06909	1 year	2022-11-01	WZ-SR2
USB Power Sensor	Keysight	U2021XA	MRTSUE06446	1 year	2022-06-08	WZ-SR5
USB Power Sensor	Keysight	U2021XA	MRTSUE06446	1 year	2023-06-04	WZ-SR5
Thermohygrometer	testo	608-H1	MRTSUE06402	1 year	2022-06-28	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
Attenuator	MVE	MVE2213	MRTSUE11072	1 year	2022-06-10	WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11072	1 year	2023-06-09	WZ-SR5

Software	Version	Function
EMI Software	V3.0.0	EMI Test Software
Controller_MF 7802	2.03C	RE Antenna & turntable
BenchVue Power Meter	2021	Power

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
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 9kHz~150kHz: 3.74dB 150kHz~30MHz: 3.44dB
Radiated Disturbance
Measurement Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): Horizontal: 30MHz~300MHz: 5.04dB 300MHz~1GHz: 4.95dB 1GHz~40GHz: 6.40dB Vertical: 30MHz~300MHz: 5.24dB 300MHz~1GHz: 6.03dB 1GHz~40GHz: 6.40dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% (U=2Uc(y)): 1.13dB

6. Test Result

6.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.247(b)(3)	Output Power	Conducted	Pass
15.205 15.209	General Field Strength (Restricted Bands and Radiated Emission)	Radiated	Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	Pass

Remark:

1. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
2. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

Spot check list

Test Items	Test Mode	Test Channel	Test Frequency (MHz)
Output power	BLE 1Mbps	19	2440
	BLE 1Mbps	39	2480
	BLE 2Mbps	00	2402
	BLE 2Mbps	39	2480
Radiated Spurious Emission	BLE 1Mbps	19	2440
Radiated Band Edge	BLE 1Mbps	39	2480
	BLE 2Mbps	00	2402
	BLE 2Mbps	39	2480
AC Conducted Emissions	BLE 1Mbps	19	2440

6.2. Output Power Measurement

6.2.1. 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.

6.2.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.9.1.3

ANSI C63.10 - 2013 - Section 11.9.2.3.2

6.2.3. Test Setting

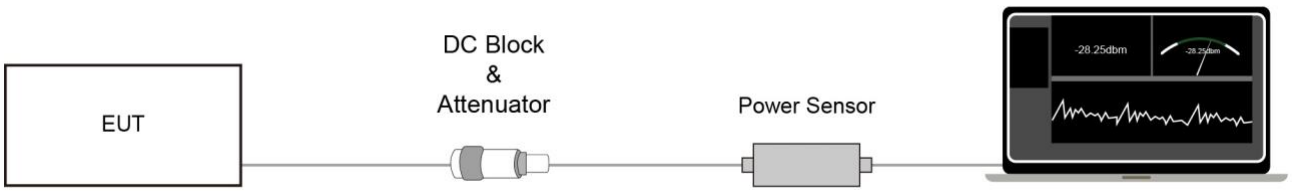
Method PKPM1 (Peak Power Measurement of Signals with DTS BW ≤ 50MHz)

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.

6.2.4. Test Setup



6.2.5. Test Result

Refer to Appendix A.1.

6.3. Radiated Spurious Emission Measurement

6.3.1. 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 [μV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.3.2. 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)

6.3.3. 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 = 10 Hz.

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

4. Detector = Peak

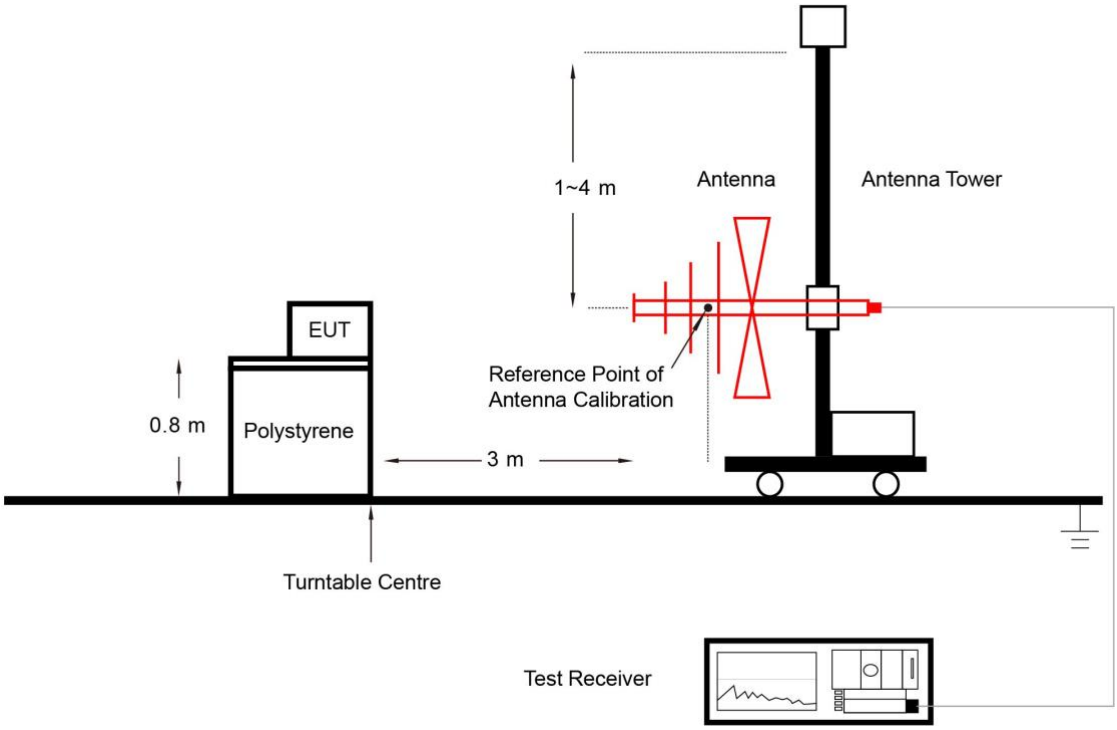
5. Sweep time = auto

6. Trace mode = max hold

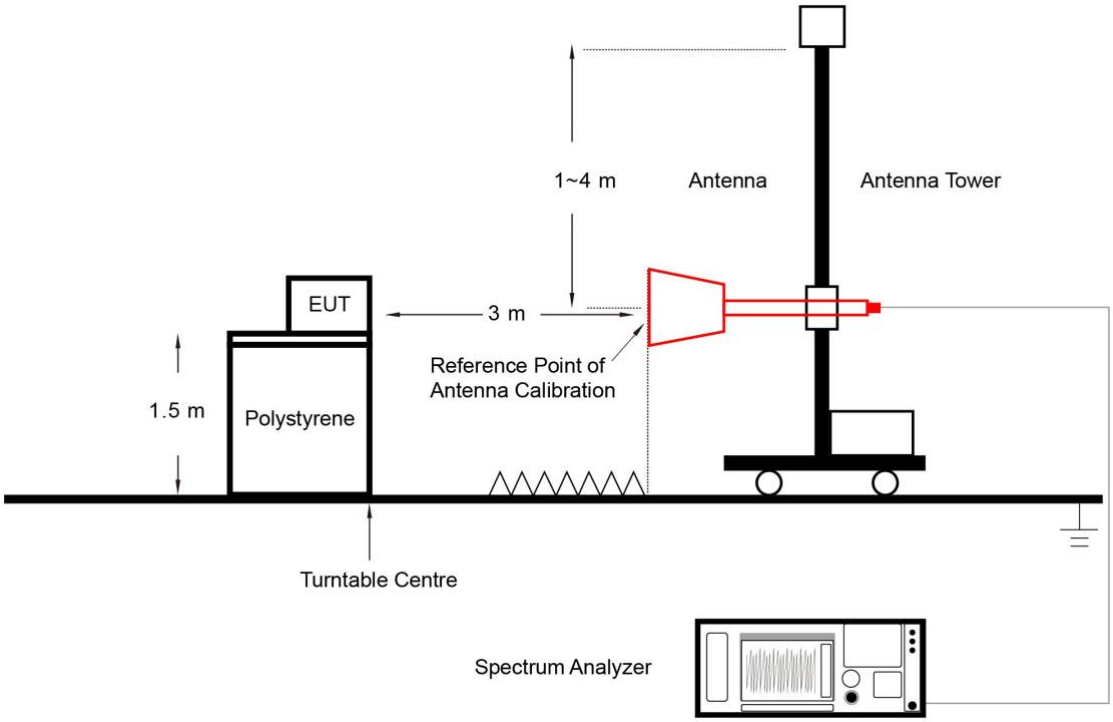
7. Trace was allowed to stabilize

6.3.4. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.3.5. Test Result

Refer to Appendix A.2.

6.4. Radiated Restricted Band Edge Measurement

6.4.1. 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 [μV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.4.2. Test Procedure

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

6.4.3. Test Setting

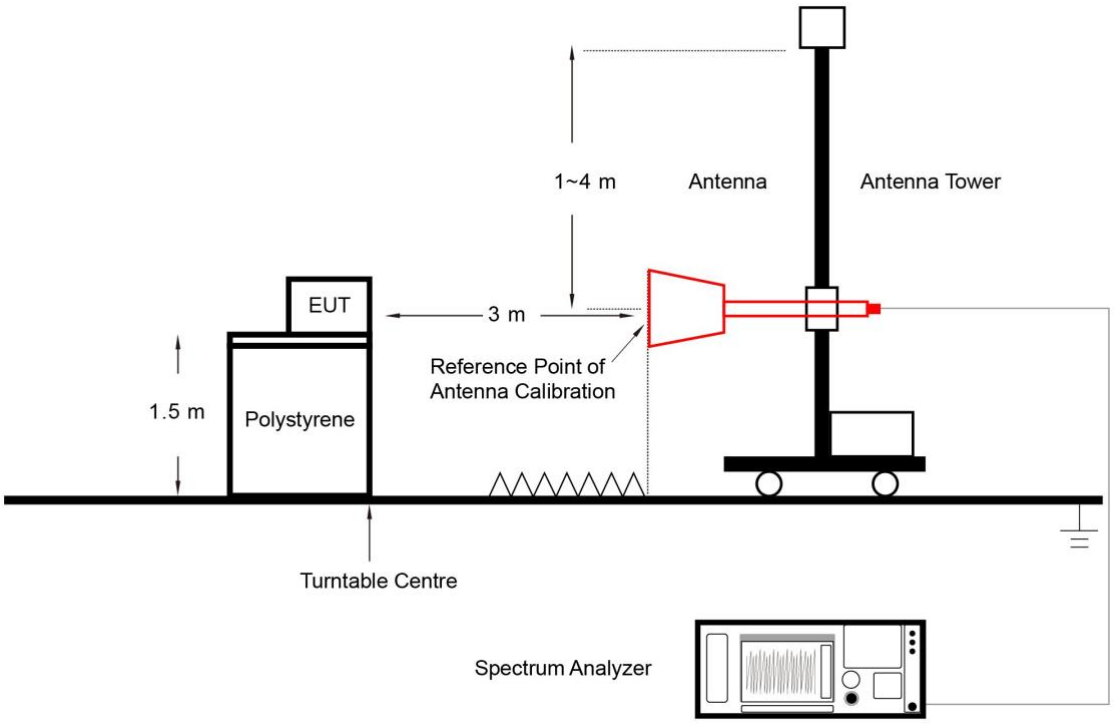
Peak Field Strength Measurements

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

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW ≥ 1/T
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.4.4. Test Setup



6.4.5. Test Result

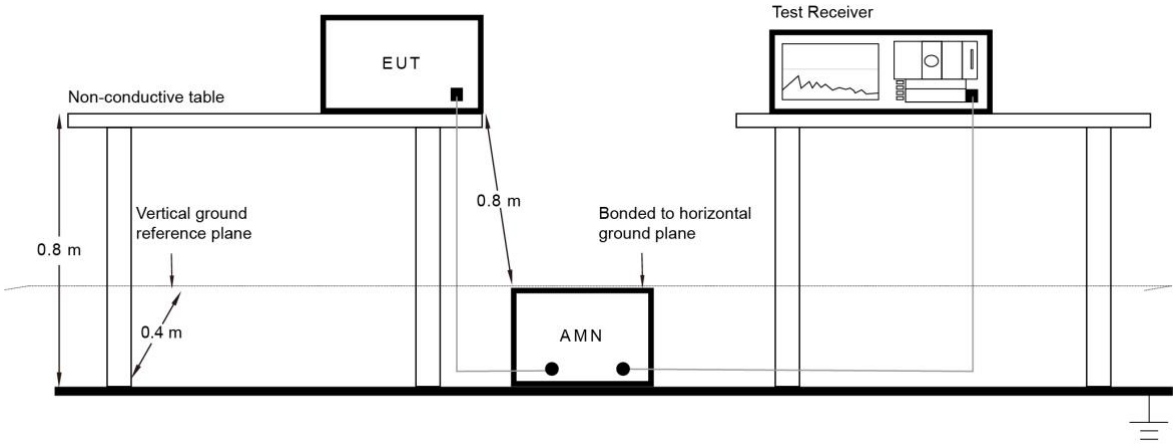
Refer to Appendix A.3.

6.5. AC Conducted Emissions Measurement

6.5.1. Test Limit

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

6.5.2. Test Setup



6.5.3. Test Result

Refer to Appendix A.4.

Appendix A - Test Result

A.1 Output Power Test Result

Test Site	WZ-SR5	Test Engineer	Liz Yuan
Test Date	2022/04/26		

Test Result of Peak Output Power

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	19	2440	17.17	≤ 30.00	Pass
BLE	1Mbps	39	2480	5.21	≤ 30.00	Pass
BLE	2Mbps	00	2402	16.08	≤ 30.00	Pass
BLE	2Mbps	39	2480	1.55	≤ 30.00	Pass

Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	19	2440	16.93	≤ 30.00	Pass
BLE	1Mbps	39	2480	4.59	≤ 30.00	Pass
BLE	2Mbps	00	2402	15.90	≤ 30.00	Pass
BLE	2Mbps	39	2480	-0.95	≤ 30.00	Pass

A.2 Radiated Spurious Emission Test Result

Test Site	WZ-AC1	Test Engineer	Carl Jiang
Test Date	2022/04/06	Test Mode:	BLE-1Mbps
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.		

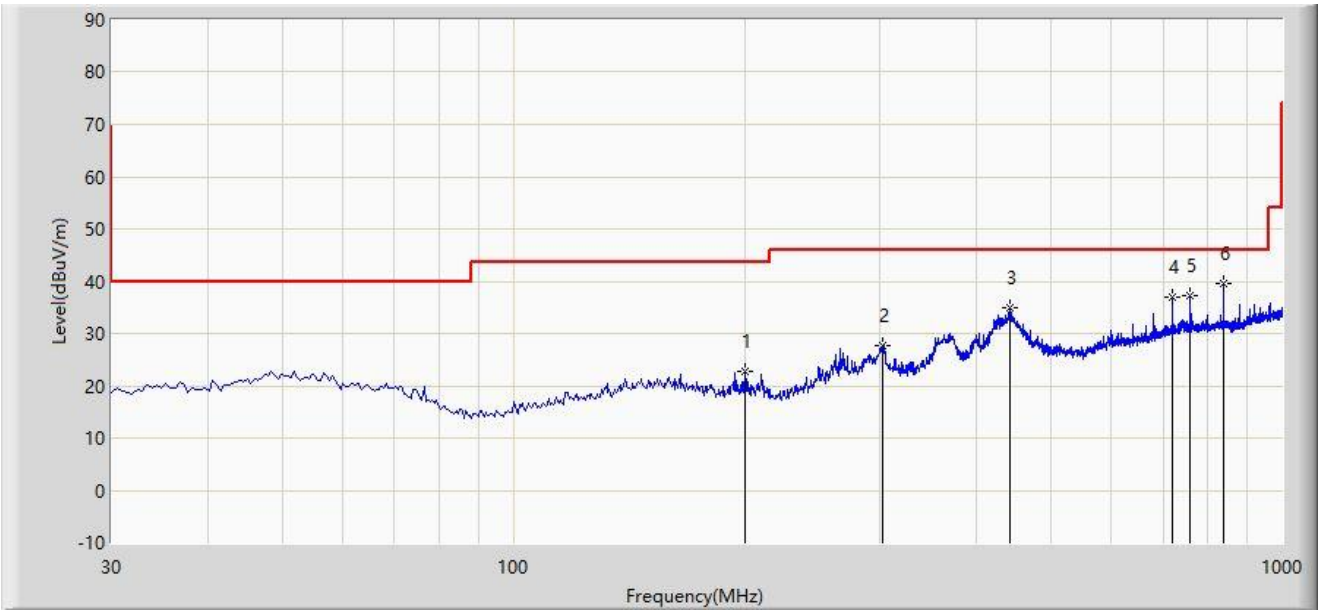
Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
19	4876.0	47.5	3.9	51.4	74.0	-22.6	Peak	Horizontal
	7621.5	37.2	8.7	45.9	74.0	-28.1	Peak	Horizontal
	8310.0	34.7	9.6	44.3	74.0	-29.7	Peak	Horizontal
	3856.0	38.9	1.1	40.0	74.0	-34.0	Peak	Vertical
	4884.5	44.7	3.9	48.6	74.0	-25.4	Peak	Vertical
	7485.5	37.0	8.8	45.8	74.0	-28.2	Peak	Vertical

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

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

The Result of Radiated Emission below 1GHz:

Site: WZ-AC1	Time: 2022/04/06
Limit: FCC_Part15.209_RSE(3m)	Engineer: Carl Jiang
Probe: VULB 9168_25-2000MHz	Polarity: Horizontal
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE-1M at Channel 2440MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		199.750	22.888	8.569	-20.612	43.500	14.319	PK
2		301.600	27.582	9.398	-18.418	46.000	18.184	PK
3		441.765	34.970	12.900	-11.030	46.000	22.070	PK
4		720.155	36.946	10.059	-9.054	46.000	26.887	PK
5		759.925	37.289	9.416	-8.711	46.000	27.873	PK
6	*	839.950	39.656	10.814	-6.344	46.000	28.842	PK

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

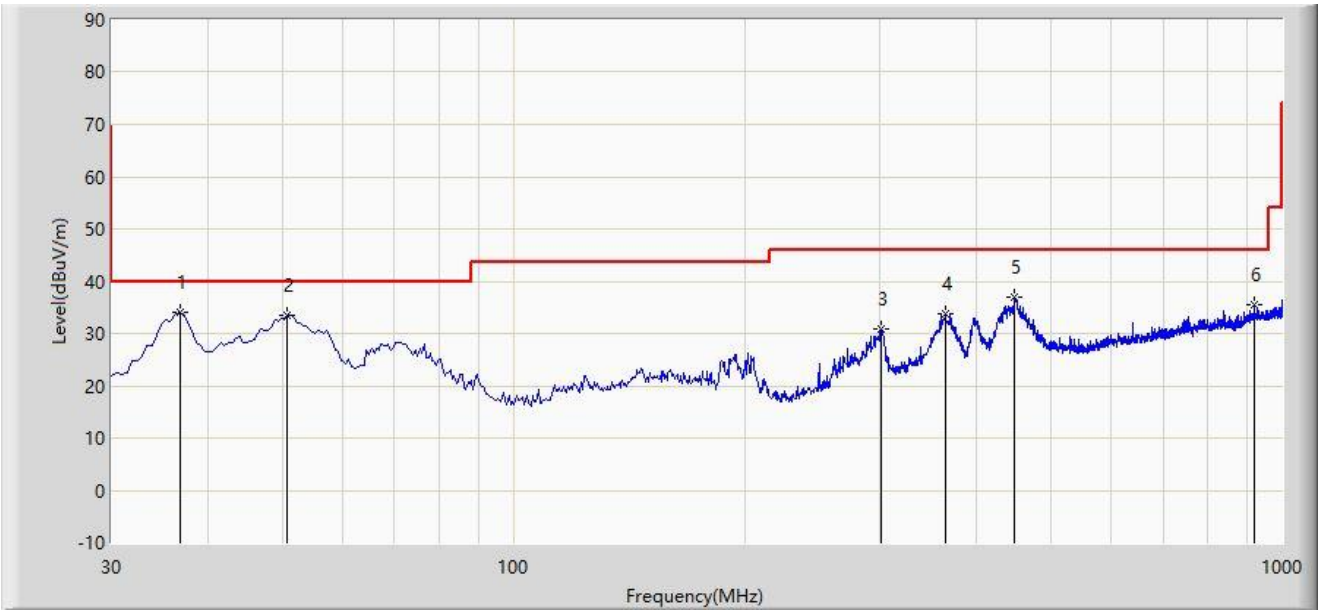
Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

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

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

Note 5: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.

Site: WZ-AC1	Time: 2022/04/06
Limit: FCC_Part15.209_RSE(3m)	Engineer: Carl Jiang
Probe: VULB 9168_25-2000MHz	Polarity: Vertical
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE-1M at Channel 2440MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	36.790	33.976	16.729	-6.024	40.000	17.247	PK
2		50.855	33.464	14.974	-6.536	40.000	18.490	PK
3		300.630	30.853	12.695	-15.147	46.000	18.158	PK
4		364.650	33.847	14.009	-12.153	46.000	19.838	PK
5		448.555	36.994	14.778	-9.006	46.000	22.216	PK
6		919.975	35.575	5.837	-10.425	46.000	29.738	PK

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

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

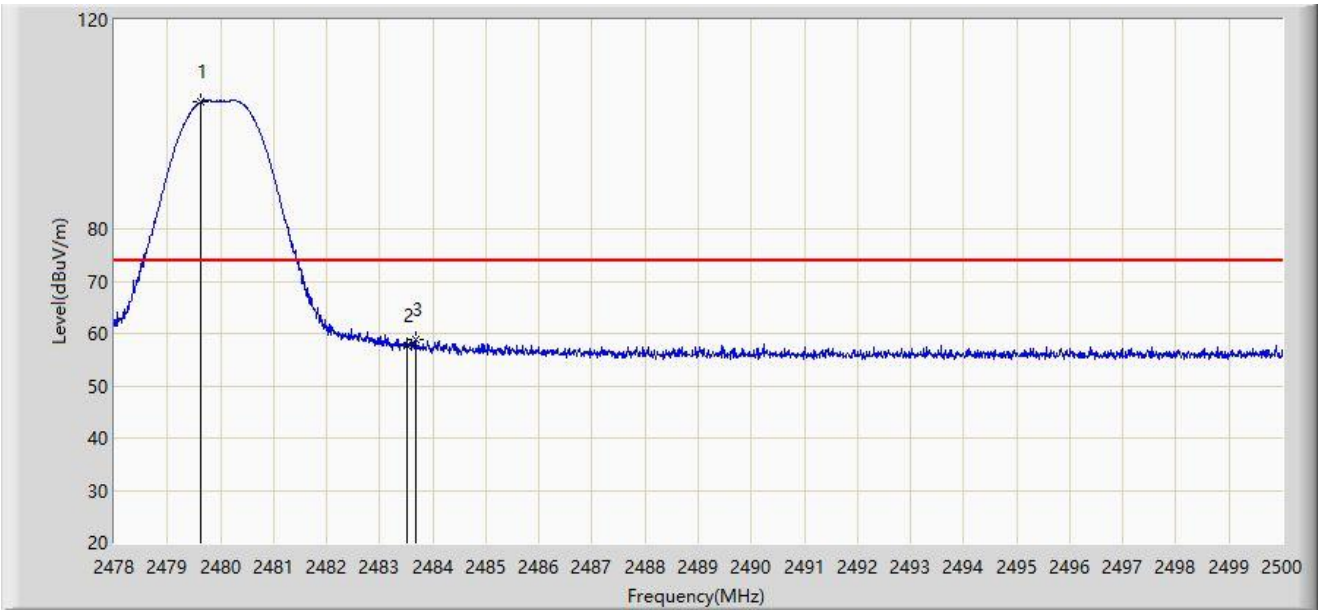
Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

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

Note 5: 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.3 Radiated Restricted Band Edge Test Result

Site: WZ-AC1	Time: 2022/07/26 - 16:39
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 1M at Channel 2480MHz	



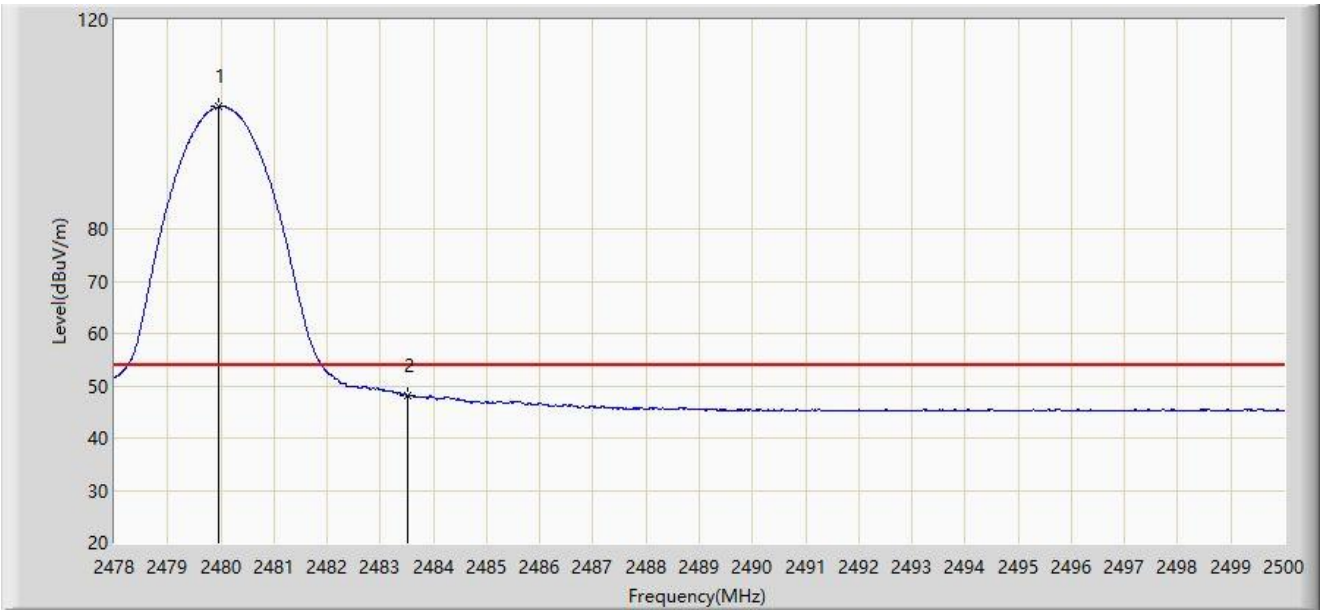
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.639	104.340	73.639	N/A	N/A	30.702	PK
2		2483.500	57.773	27.070	-16.227	74.000	30.704	PK
3	*	2483.687	58.961	28.257	-15.039	74.000	30.704	PK

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).

Site: WZ-AC1	Time: 2022/07/26 - 17:03
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 1M at Channel 2480MHz	



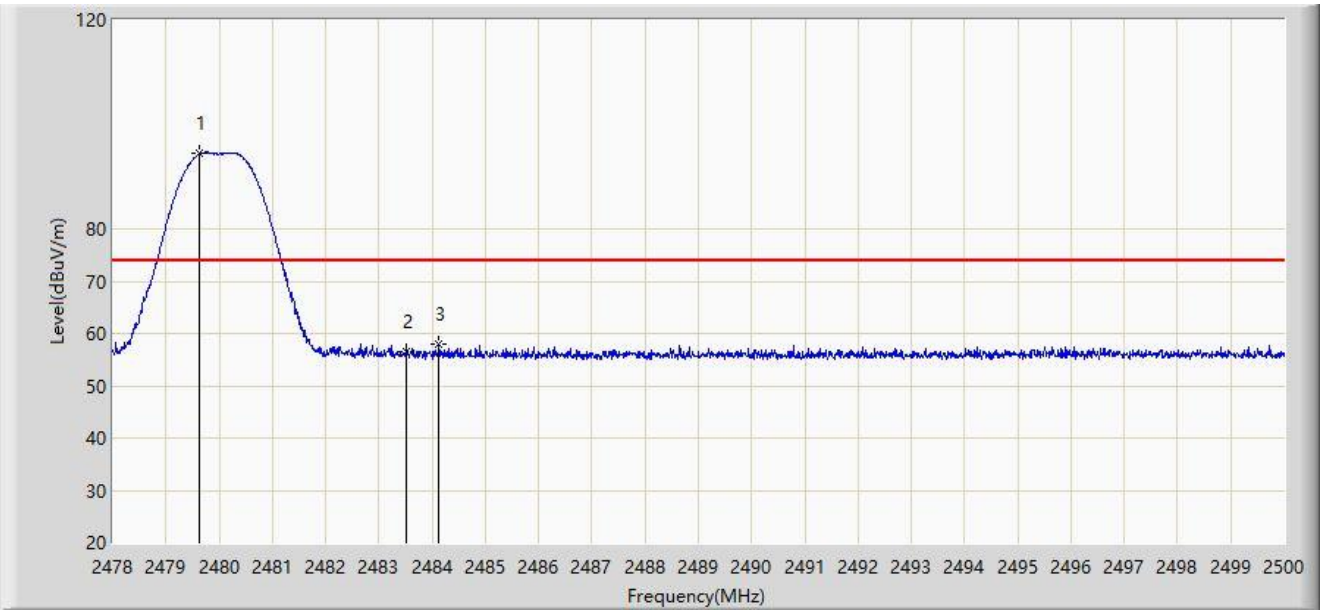
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.958	103.410	72.709	N/A	N/A	30.701	AV
2	*	2483.500	48.218	17.515	-5.782	54.000	30.704	AV

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).

Site: WZ-AC1	Time: 2022/07/26 - 17:04
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 1M at Channel 2480MHz	



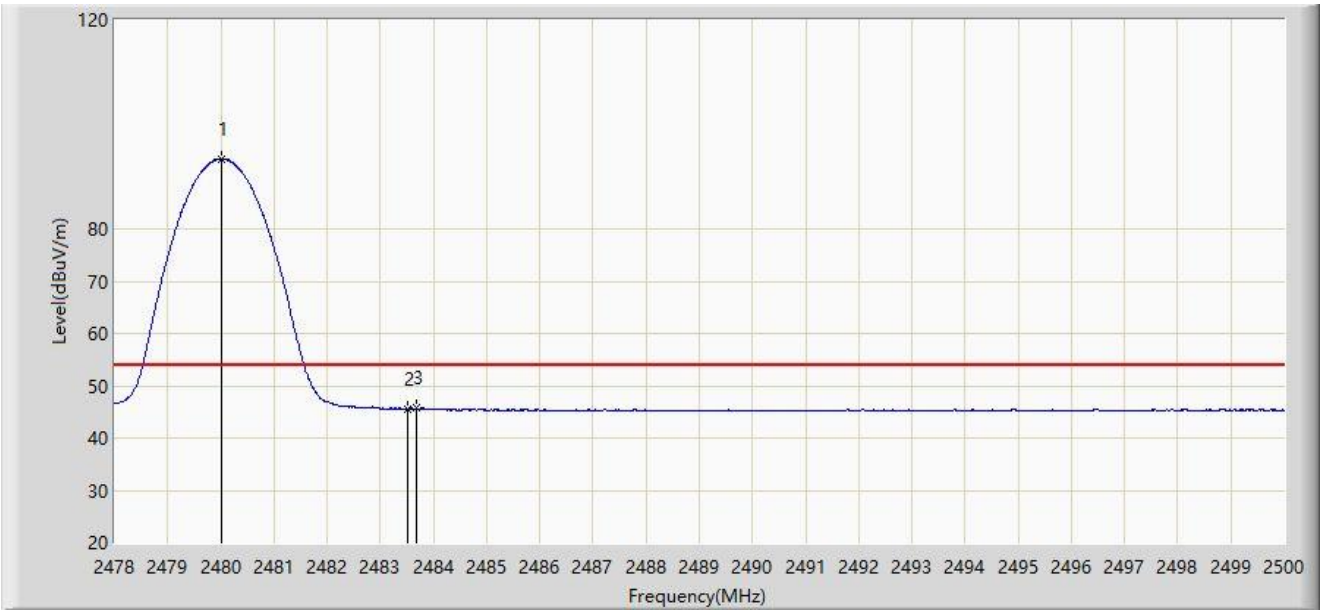
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.639	94.399	63.698	N/A	N/A	30.702	PK
2		2483.500	56.459	25.756	-17.541	74.000	30.704	PK
3	*	2484.127	57.855	27.151	-16.145	74.000	30.704	PK

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).

Site: WZ-AC1	Time: 2022/07/26 - 17:05
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 1M at Channel 2480MHz	



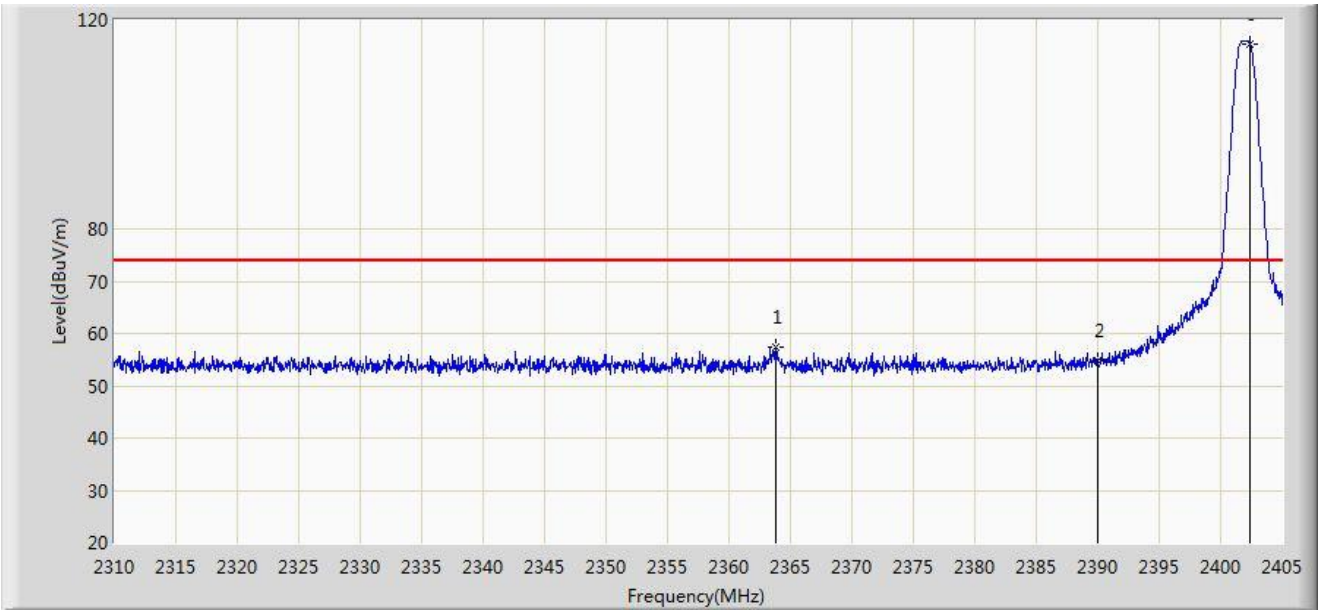
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2480.013	93.432	62.731	N/A	N/A	30.701	AV
2		2483.500	45.466	14.763	-8.534	54.000	30.704	AV
3	*	2483.687	45.686	14.982	-8.314	54.000	30.704	AV

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).

Site: WZ-AC1	Time: 2022/04/06 - 15:26
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: WZ-AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 2M at Channel 2402MHz	



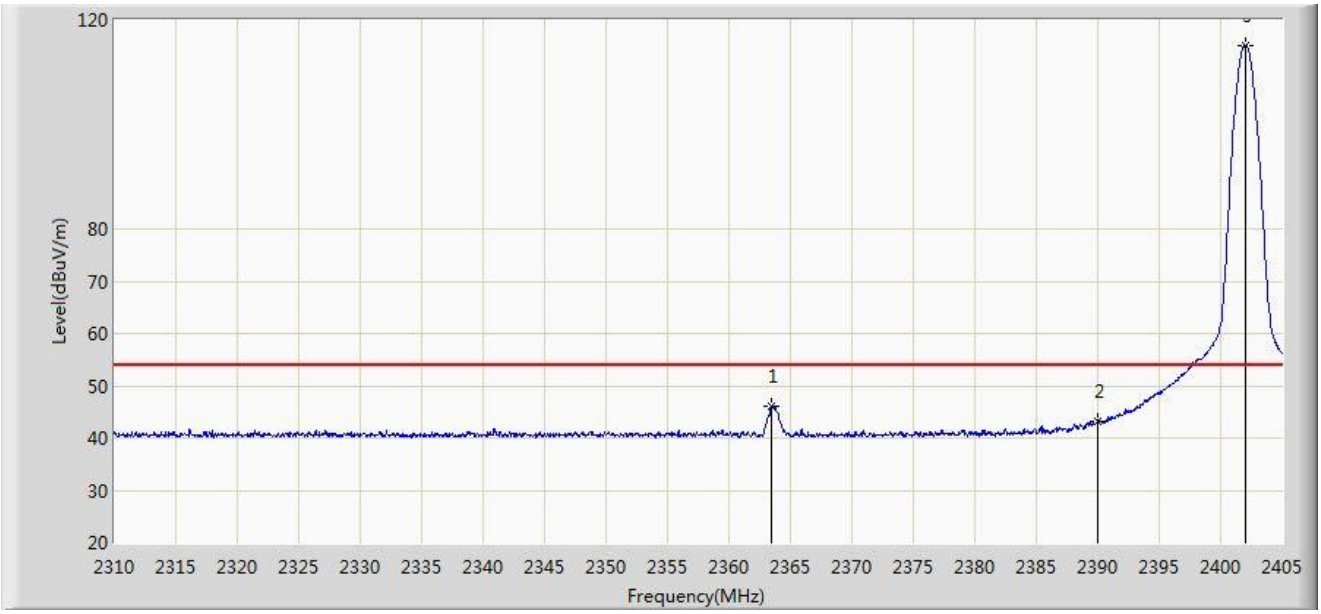
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2363.817	57.316	26.524	-16.684	74.000	30.792	PK
2		2390.000	54.859	24.043	-19.141	74.000	30.816	PK
3		2402.435	115.256	84.417	N/A	N/A	30.839	PK

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).

Site: WZ-AC1	Time: 2022/04/06 - 15:35
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: WZ-AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 2M at Channel 2402MHz	



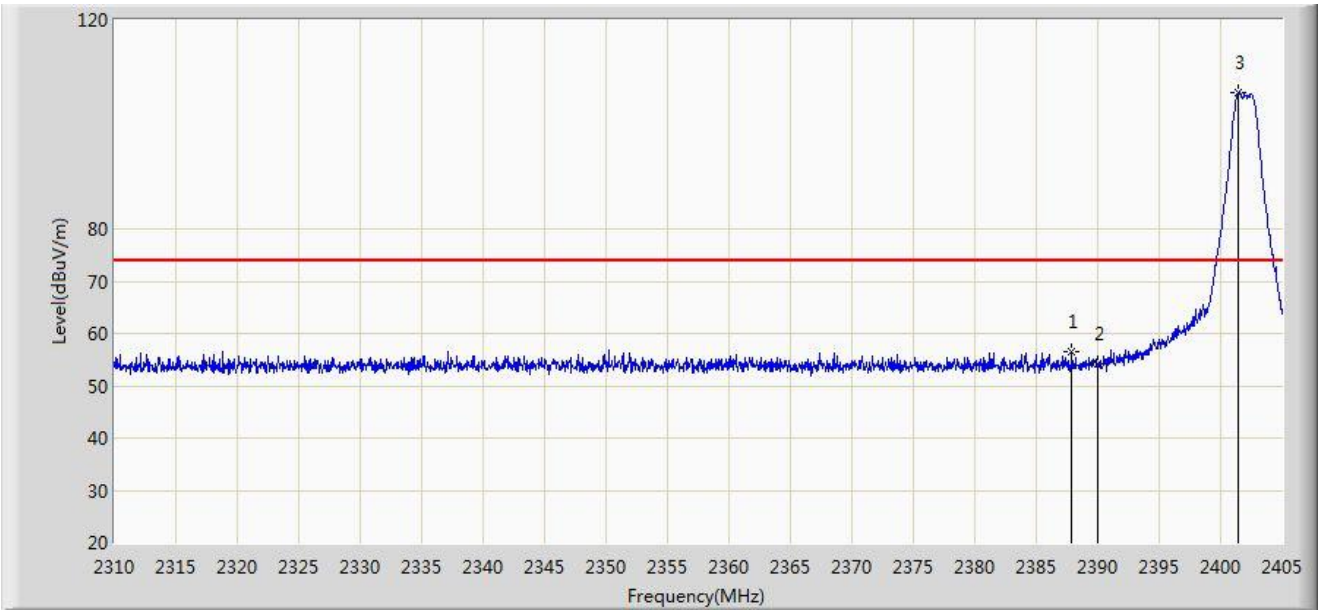
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2363.437	45.971	15.177	-8.029	54.000	30.794	AV
2		2390.000	43.302	12.486	-10.698	54.000	30.816	AV
3		2402.008	115.211	84.372	N/A	N/A	30.839	AV

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).

Site: WZ-AC1	Time: 2022/04/06 - 15:50
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: WZ-AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 2M at Channel 2402MHz	



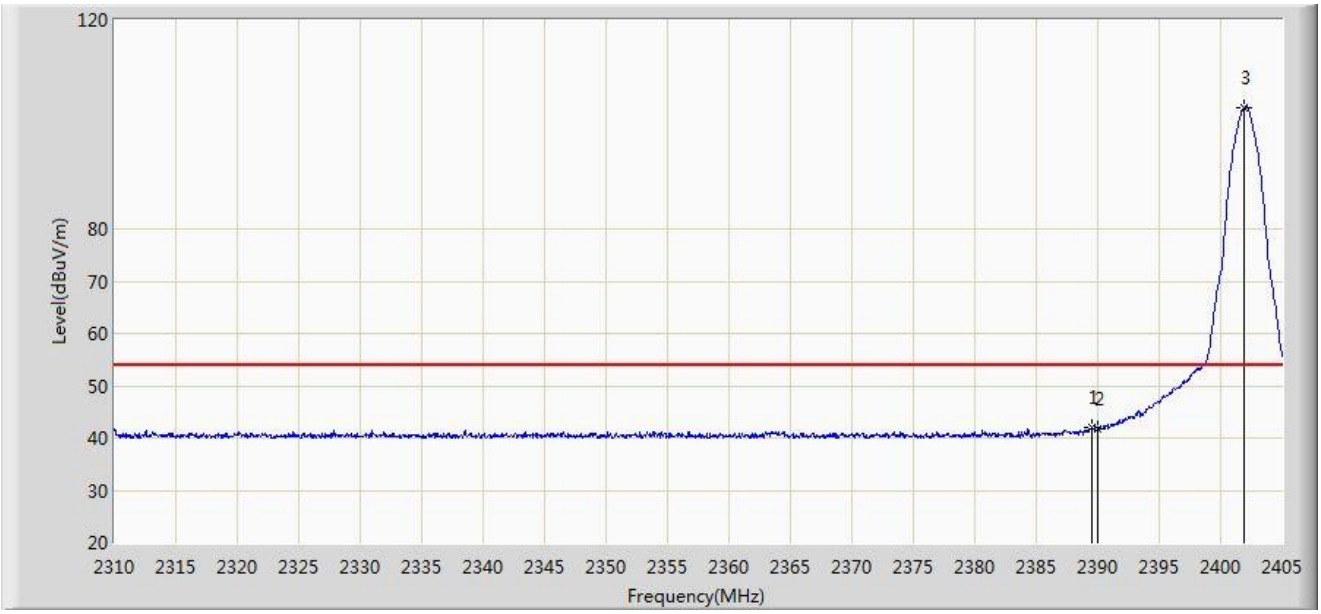
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2387.900	56.610	25.797	-17.390	74.000	30.814	PK
2		2390.000	54.230	23.414	-19.770	74.000	30.816	PK
3		2401.485	105.945	75.107	N/A	N/A	30.838	PK

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).

Site: WZ-AC1	Time: 2022/04/06 - 15:52
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: WZ-AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 2M at Channel 2402MHz	



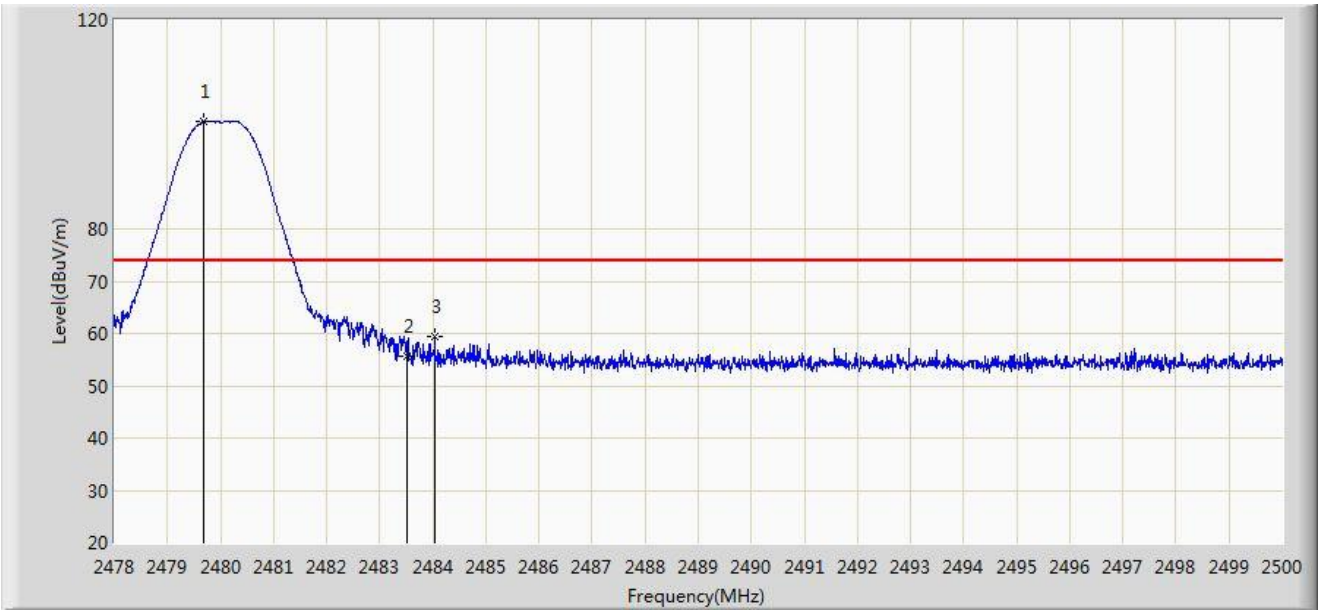
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	2389.515	42.086	11.271	-11.914	54.000	30.815	AV
2		2390.000	41.671	10.855	-12.329	54.000	30.816	AV
3		2401.865	103.181	72.342	N/A	N/A	30.839	AV

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).

Site: WZ-AC1	Time: 2022/04/06 - 15:12
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: WZ-AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 2M at Channel 2480MHz	



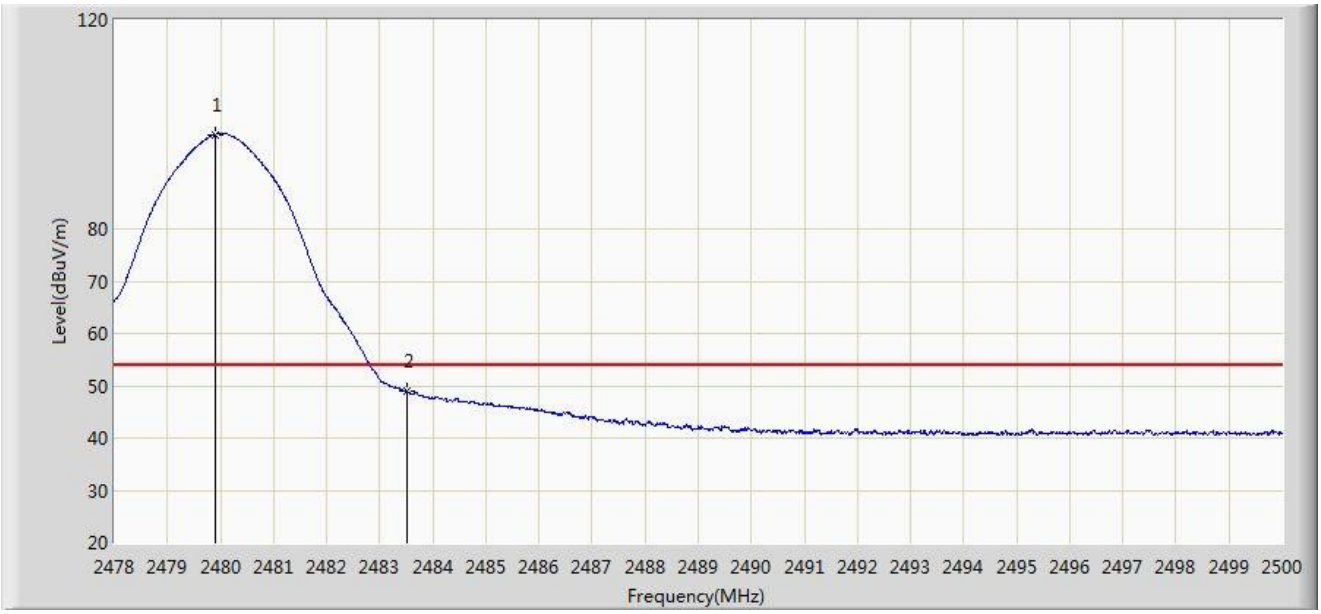
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.694	100.594	69.589	N/A	N/A	31.005	PK
2		2483.500	55.528	24.507	-18.472	74.000	31.021	PK
3	*	2484.039	59.537	28.514	-14.463	74.000	31.023	PK

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).

Site: WZ-AC1	Time: 2022/04/06 - 15:41
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: WZ-AC1_BBHA9120D_1-18GHz	Polarity: Horizontal
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 2M at Channel 2480MHz	



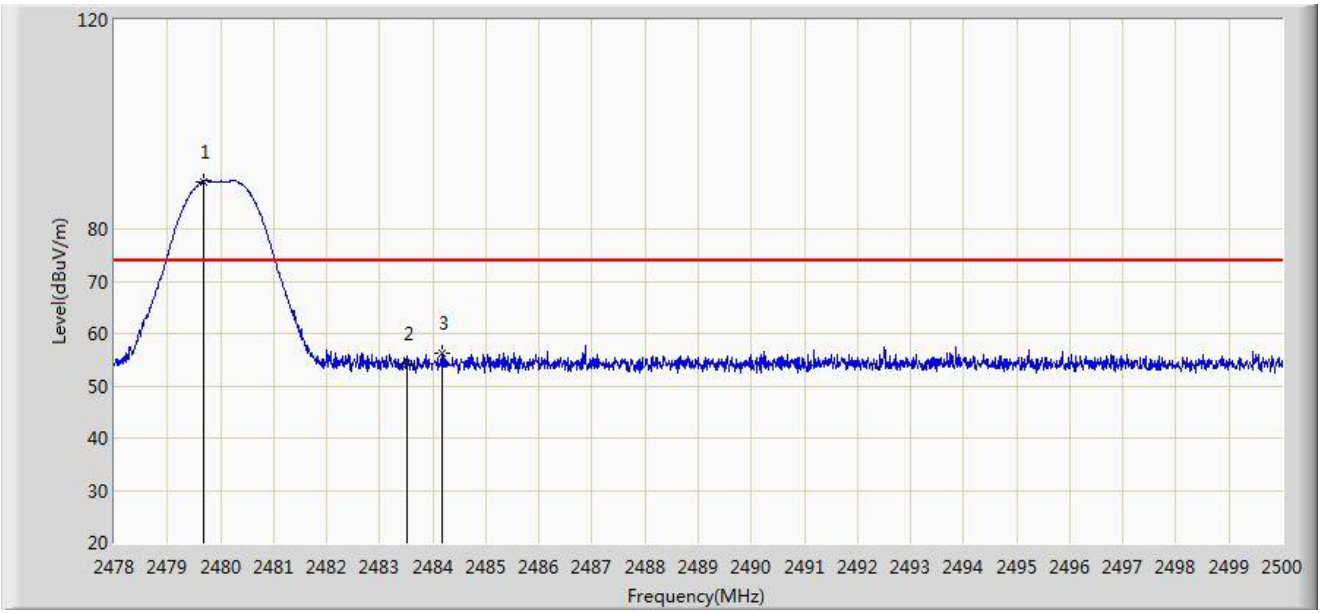
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		2479.914	98.106	67.101	N/A	N/A	31.005	AV
2	*	2483.500	48.898	17.877	-5.102	54.000	31.021	AV

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).

Site: WZ-AC1	Time: 2022/04/06 - 15:20
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: WZ-AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 2M at Channel 2480MHz	



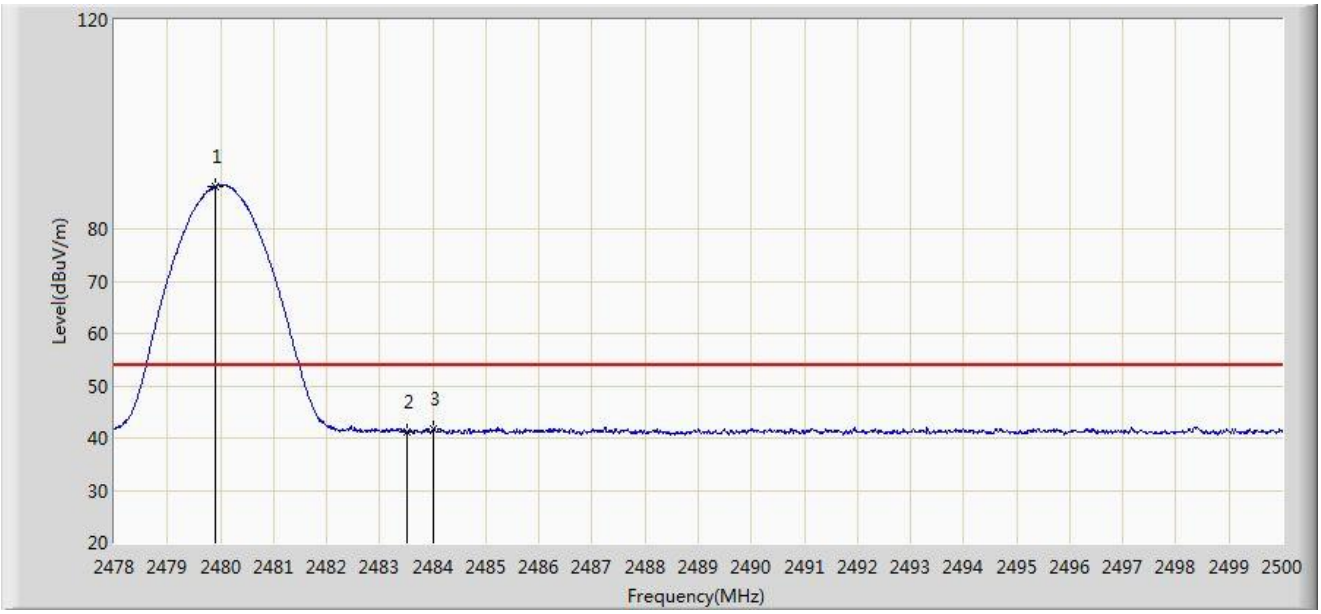
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.683	89.108	58.103	N/A	N/A	31.005	PK
2		2483.500	54.227	23.206	-19.773	74.000	31.021	PK
3	*	2484.182	56.196	25.172	-17.804	74.000	31.023	PK

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).

Site: WZ-AC1	Time: 2022/04/06 - 15:23
Limit: FCC_Part15_Band Edge(3m)	Engineer: Carl Jiang
Probe: WZ-AC1_BBHA9120D_1-18GHz	Polarity: Vertical
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 2M at Channel 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.914	88.212	57.207	N/A	N/A	31.005	AV
2		2483.500	41.132	10.111	-12.868	54.000	31.021	AV
3	*	2484.017	41.855	10.832	-12.145	54.000	31.023	AV

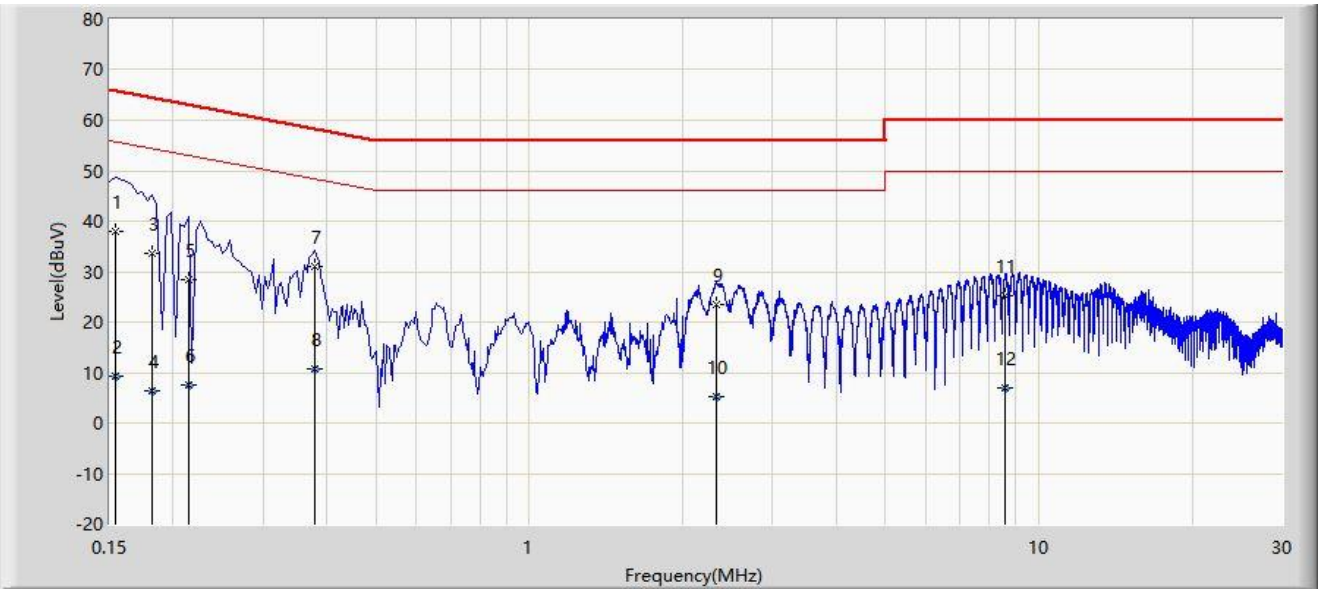
Note 1: " * ", means this data is the worst emission level.

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

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

A.4 AC Conducted Emissions Test Result

Site: WZ-SR2	Time: 2022/05/30
Temperature: 22.9°C	Humidity: 64.8%
Limit: FCC_Part15.207_CE_AC Power	Engineer: Helen Han
Probe: ENV216_101683_Filter Off_C	Polarity: Line
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 1M at channel 2440MHz	



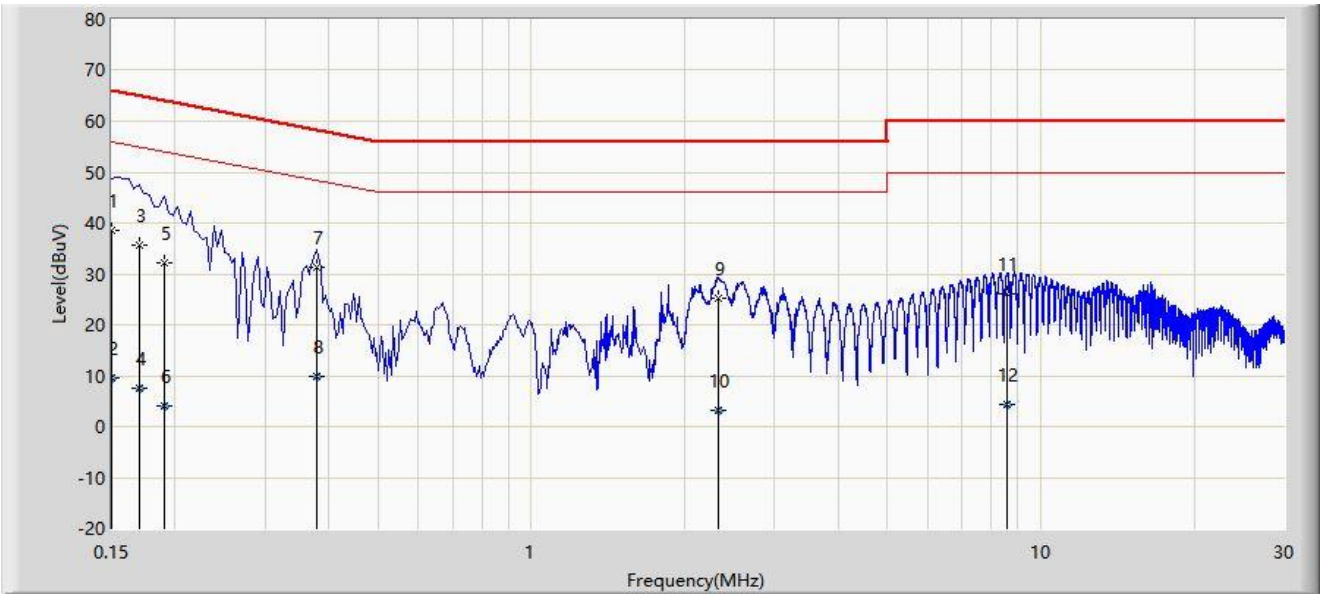
No	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1		0.154	38.079	28.030	-27.703	65.781	10.049	QP
2		0.154	9.284	-0.765	-46.497	55.781	10.049	AV
3		0.182	33.683	23.639	-30.711	64.394	10.043	QP
4		0.182	6.464	-3.579	-47.930	54.394	10.043	AV
5		0.214	28.453	18.408	-34.596	63.049	10.045	QP
6		0.214	7.671	-2.374	-45.378	53.049	10.045	AV
7	*	0.378	30.981	20.894	-27.342	58.323	10.088	QP
8		0.378	10.743	0.655	-37.581	48.323	10.088	AV
9		2.322	23.450	13.124	-32.550	56.000	10.326	QP
10		2.322	5.105	-5.221	-40.895	46.000	10.326	AV
11		8.582	25.265	14.432	-34.735	60.000	10.833	QP
12		8.582	7.020	-3.813	-42.980	50.000	10.833	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	Time: 2022/05/30
Temperature: 22.9°C	Humidity: 64.8%
Limit: FCC_Part15.207_CE_AC Power	Engineer: Helen Han
Probe: ENV216_101683_Filter Off_C	Polarity: Neutral
EUT: OmniAccess Stellar	Power: 120V/60Hz
Test Mode: Transmit by BLE 1M at channel 2440MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1		0.150	38.588	28.211	-27.412	66.000	10.377	QP
2		0.150	9.549	-0.827	-46.451	56.000	10.377	AV
3		0.170	35.685	25.330	-29.276	64.960	10.354	QP
4		0.170	7.557	-2.797	-47.404	54.960	10.354	AV
5		0.190	32.199	21.860	-31.838	64.037	10.339	QP
6		0.190	3.916	-6.423	-50.121	54.037	10.339	AV
7	*	0.378	31.328	20.969	-26.995	58.323	10.360	QP
8		0.378	9.774	-0.586	-38.550	48.323	10.360	AV
9		2.322	25.342	14.774	-30.658	56.000	10.567	QP
10		2.322	3.297	-7.271	-42.703	46.000	10.567	AV
11		8.574	26.121	15.038	-33.879	60.000	11.083	QP
12		8.574	4.310	-6.773	-45.690	50.000	11.083	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 “2203RSU064-UT” file.

Appendix C - EUT Photograph

Refer to “2203RSU064-UE” file.

The End