RF MEASUREMENT REPORT

FCC ID:	TV7L11AX5
Applicant:	Mikrotikls SIA
Product:	L11UG-5HaxD-US NetBox 5 ax
Model No.:	L11UG-5HaxD-US L11UG-5HaxD-NB-US
Brand Name:	MikroTik
FCC Classification:	Unlicensed National Information Infrastructure (NII)
FCC Rule Part(s):	Part 15 Subpart E (Section 15.407)
Result:	Complies
Received Date:	2023-09-01
Test Date:	2024-01-05 ~ 2024-02-26

Reviewed By: Vincent Yu

Approved By: Robin Wu

Revision History

Report No.	Version	Description	Issue Date	Note
2308RSU087-U1	V01	Initial Report	2024-03-01	Valid

CONTENTS

1. General Information

1.1. Applicant

Mikrotikls SIA

Ūnijas iela 2, Riga, LV-1039 LATVIA

1.2. Manufacturer

Mikrotikls SIA

Ūnijas iela 2, Riga, LV-1039 LATVIA

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: 3261				
	FCC: 291082, TW3261		ISED: TW3261		

1.4. Product Information

Product Name	L11UG-5HaxD-US NetBox 5 ax
Model No.	L11UG-5HaxD-US L11UG-5HaxD-NB-US
EUT Serial No.	L11UG-5HaxD-US: HEM08NA93Q1/320 L11UG-5HaxD-NB-US: HEQ096MM7FF/339
Wi-Fi Specification	802.11a/n/ac/ax
Antenna Information	Refer to section 1.7
Power Type	AC/DC Adapter Input or PoE Input
Operating Environment	Outdoor Use
Accessories	
AC/DC Adapter	Model No.: SAW30-240-1200G Input Power: 100 - 240V ~ 50/60Hz, 0.8A Output Power: 24.0V ⎓ 1.2A 28.8W
Gigabit PoE	Input: 18-57V PIN 4, 5: 18-57V 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. PoE needs to be used with an AC adapter. L11UG-5HaxD-NB-US only can powered by PoE. 3. For model differences, please refer to the Operation Description document.	

1.5. Radio Specification under Test

Frequency Range	For 802.11a/n-HT20/ac-VHT20/ax-HE20: 5180~5240MHz, 5260~5320MHz, 5500~5720MHz, 5745~5825MHz For 802.11n-HT40/ac-VHT40/ax-HE40: 5190~5230MHz, 5270~5310MHz, 5510~5710MHz, 5755~5795MHz For 802.11ac-VHT80/ax-HE80: 5210MHz, 5290MHz, 5530MHz, 5610 MHz, 5690MHz, 5775MHz For 802.11ac-VHT160/ax-HE160: 5250MHz, 5570MHz	
Type of Modulation	802.11a/n/ac: OFDM 802.11ax: OFDMA	
Data Rate	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 1732Mbps 802.11ax: up to 2402Mbps	
Channel Puncturing Function	☐ Supported	☒ Unsupported
Support RU	☒ Full RU	☐ Partial RU

1.6. Working Frequencies

802.11a/n-HT20/ac-VHT20/ax-HE20

Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz
128	5640 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	144	5720 MHz	149	5745 MHz
153	5765 MHz	157	5785 MHz	161	5805 MHz
165	5825 MHz	--	--	--	--

802.11n-HT40/ac-VHT40/ax-HE40

Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550MHz
118	5590 MHz	126	5630 MHz	134	5670 MHz
142	5710 MHz	151	5755 MHz	159	5795 MHz

802.11ac-VHT80/ax-HE80

Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	106	5530 MHz
122	5610 MHz	138	5690 MHz	155	5775 MHz

802.11ac-VHT160/ax-HE160

Channel	Frequency	Channel	Frequency	Channel	Frequency
50	5250 MHz	114	5570 MHz	--	--

1.7. Antenna Details

Antenna Type	Antenna Model	Frequency Range (MHz)	Max. PK Gain (dBi)	CDD DG (dBi)	
				For Power	For PSD
Omni Antenna	HGO-antenna-OUT	5150 ~ 5850	7.1	7.1	10.11
Sector Antenna	MTAS-5G-19D120	5150 ~ 5850	19.0	19.0	22.01

Notes:

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

2, The Maximum antenna gain of any elevation angle above 30 degrees is the same as the gain in the above table.

3, The antenna specification is provided by the applicant.

2. Test Configuration

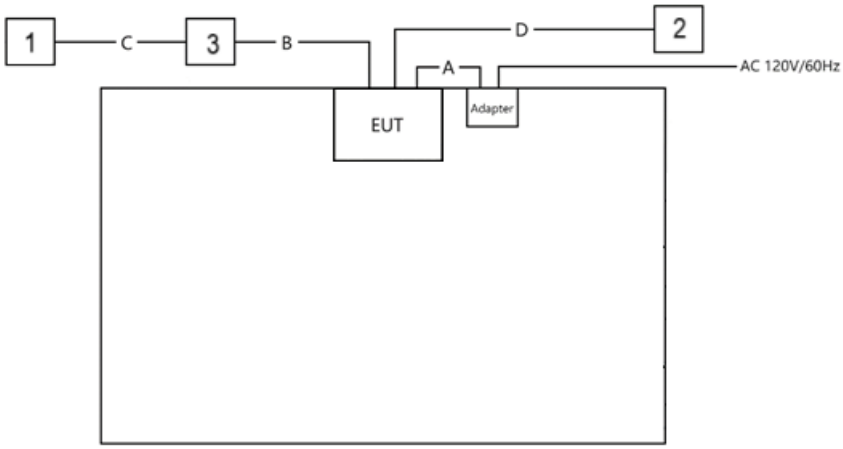
2.1. Test Mode

CDD Mode
Mode 1: Transmit by 802.11a_N_{SS}=1 (6Mbps)
Mode 2: Transmit by 802.11ac-VHT40_N_{SS}=1 (MCS0)
Mode 3: Transmit by 802.11ac-VHT80_N_{SS}=1 (MCS0)
Mode 4: Transmit by 802.11ac-VHT160_N_{SS}=1 (MCS0)
Mode 5: Transmit by 802.11ax-HE20_N_{SS}=1 (MCS0)
Mode 6: Transmit by 802.11ax-HE40_N_{SS}=1 (MCS0)
Mode 7: Transmit by 802.11ax-HE80_N_{SS}=1 (MCS0)
Mode 8: Transmit by 802.11ax-HE160_N_{SS}=1 (MCS0)
Notes: 1. The modulation and bandwidth are same for 802.11n mode for 20MHz/40MHz and 802.11ac mode for 20MHz/40MHz. Therefore, 802.11ac mode was selected as representative test mode in this report, and the power level of 802.11n mode will be controlled to be the same as or lower than that of 802.11ac mode. 2. All modes of operation and data rates were investigated, so all RF test requirements shall be executed at the worst data rate.

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-Shielding	1.5m
B	Optical Cable	Non-Shielding	>10m
C	LAN Cable	Non-Shielding Cat5e	0.5m
D	LAN Cable	Non-Shielding Cat5e	>10m
Product		Manufacturer	Model No.
1	PC	AVITA	NS13A3
2	PC	ASUS	K5504V
3	Switch	TP-Link	TL-SG2226

2.3. Test Software

The test utility software used during testing was “winbox.exe”, the version was “3.39” and commands are 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 15.407
- KDB 789033 D02v02r01
- KDB 662911 D01v02r01
- 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 model L11UG-5HaxD-US and L11UG-5HaxD-NB-US use unique antenna connectors.

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
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2024-06-07	SIP-AC3
Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2024-07-14	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06619	1 year	2024-10-28	SIP-AC3
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2024-01-12 2025-01-11	SIP-AC3
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2024-09-17	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06597	1 year	2024-11-04	WZ-AC2
Preamplifier	EMCI	EMC184045SE	MRTSUE06640	1 year	2024-01-12 2025-01-11	WZ-AC2
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06022	1 year	2024-05-15	WZ-AC2
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06171	1 year	2024-10-11	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	2024-10-25	WZ-AC2
Thermohygrometer	testo	608-H1	MRTSUE11263	1 year	2024-11-07	WZ-AC2
Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2024-10-24	WZ-AC2
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2024-05-23	WZ-SR2
Shielding Room	MIX-BEP	WZ-SR2	MRTSUE06215	5 years	2026-12-20	WZ-SR2
Thermohygrometer	testo	608-H1	MRTSUE06404	1 year	2024-05-31	WZ-SR2
Four-Line V-Network	R&S	ENV432	MRTSUE06615	1 year	2024-09-27	WZ-SR2
EMI Test Receiver	R&S	ESR3	MRTSUE06909	1 year	2024-09-27	WZ-SR2
USB Power Sensor	Keysight	U2021XA	MRTSUE06447	1 year	2024-05-23	WZ-SR5
USB Power Sensor	Agilent	U2021XA	MRTSUE06030	1 year	2024-09-27	WZ-SR5
Thermohygrometer	testo	608-H1	MRTSUE06402	1 year	2024-05-31	WZ-SR5
Shielding Room	HUAMING	WZ-SR5	MRTSUE06442	N/A	N/A	WZ-SR5
Signal Analyzer	Keysight	N9010B	MRTSUE06457	1 year	2024-05-23	WZ-SR5
Signal Analyzer	Keysight	N9010B	MRTSUE06558	1 year	2024-05-23	WZ-SR5
Temperature Chamber	BAOYT	BYH-150CL	MRTSUE06051	1 year	2024-09-27	WZ-TR3
Thermohygrometer	testo	608-H1	MRTSUE06401	1 year	2024-05-31	WZ-TR3
Signal Analyzer	Keysight	N9020B	MRTSUE07037	1 year	2024-02-29	WZ-TR3/WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11086	1 year	2024-06-08	WZ-TR3/WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11087	1 year	2024-06-08	WZ-TR3/WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11088	1 year	2024-06-08	WZ-TR3/WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11089	1 year	2024-06-08	WZ-TR3/WZ-SR5
Attenuator	MVE	MVE2213	MRTSUE11090	1 year	2024-06-08	WZ-TR3/WZ-SR5

Software	Version	Function
EMI V3	V 3.0.0	EMI Test Software
Controller_MF 7802	1.02	RE Antenna & Turntable
Controller_MF 7802BS	1.02	RE Antenna & Turntable
BenchVue Power Meter	2018.1	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
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
15.407(a)	26dB Bandwidth	Conducted	Pass
15.407(e)	6dB Bandwidth		Pass
15.407(a)(1)(i), (2), (3)(i)	Maximum Conducted Output Power		Pass
15.407(h)(1)	Transmit Power Control		Pass
15.407(g)	Frequency Stability		Pass
15.407(a)(1)(ii), (2), (3)(i), (12)	Peak Power Spectral Density		Pass
15.407(b)(1), (2), (3), (4)(i)	Undesirable Emissions	Radiated	Pass
15.205, 15.209 15.407(b)(8), (9), (10)	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)		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.
3. L11UG-5HaxD-US and L11UG-5HaxD-NB-US (FCC ID: TV7L11AX5) are based on L23UGSR-5HaxD2HaxD-US (FCC ID: TV7L23AX52) with the 2.4GHz Radio removed. For other detailed information, please refer to the Operation Description document.

6.2. 26dB & 99% Bandwidth Measurement

6.2.1. Test Limit

N/A

6.2.2. Test Procedure

KDB 789033 D02v02r01- Section Ⅱ)C)1) (26dB Bandwidth)

KDB 789033 D02v02r01- Section Ⅱ)D) (99% Bandwidth)

6.2.3. Test Setting

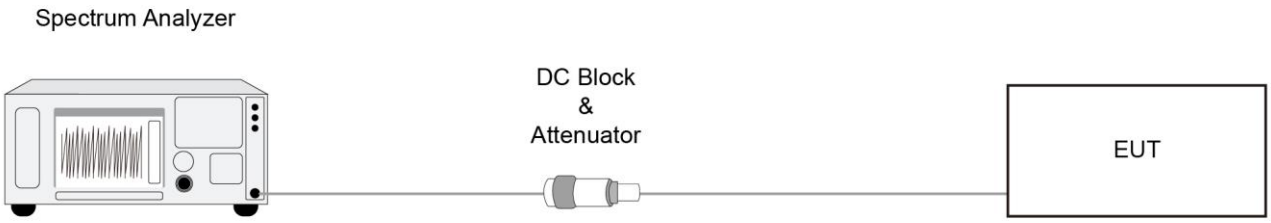
26dB Bandwidth

1. The analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth
2. RBW = approximately 1% of the emission bandwidth.
3. VBW > RBW
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

99% Bandwidth

1. Set center frequency to the nominal EUT channel center frequency.
2. RBW = 1% to 5% of the OBW
3. VBW ≥ 3 × RBW
4. Span = 1.5 times to 5 times the OBW
5. Detector = peak
6. Trace mode = max hold
7. Allow the trace to stabilize
8. Use the 99% power bandwidth function of the instrument.

6.2.4. Test Setup



6.2.5. Test Result

Refer to Appendix A.1.

6.3. 6dB Bandwidth Measurement

6.3.1. Test Limit

The minimum 6dBbandwidth shall be at least 500 kHz.

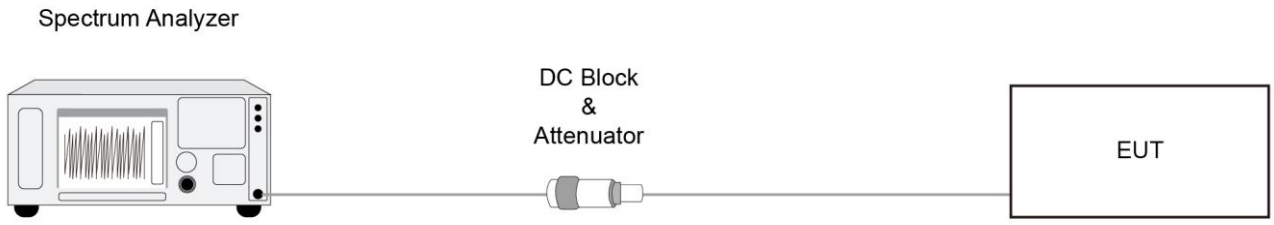
6.3.2. Test Procedure

KDB 789033 D02v02r01- Section II)C)2)

6.3.3. Test Setting

1. Set center frequency to the nominal EUT channel center frequency.
2. 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.
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.3.4. Test Setup



6.3.5. Test Result

Refer to Appendix A.2.

6.4. Output Power Measurement

6.4.1. Test Limit

For an outdoor access point operating in the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm).

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

6.4.2. Test Procedure

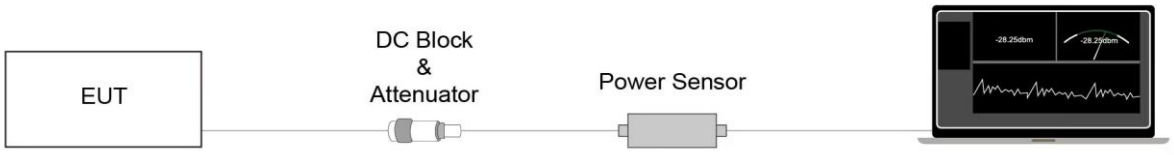
KDB 789033D02v02r01- Section Ⅱ)E)3)b) Method PM-G

6.4.3. 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.

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.3.

6.5. Transmit Power Control Measurement

6.5.1. Test Limit

The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.

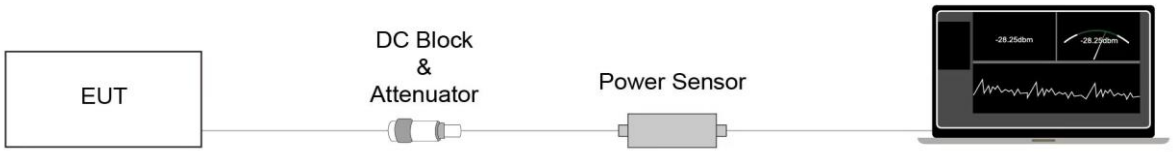
6.5.2. Test Procedure

KDB 789033 D02v01- Section II)E)3)b) Method PM-G

6.5.3. Test Setting

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. The trace was averaged over 100 traces to obtain the final measured average power.

6.5.4. Test Setup



6.5.5. Test Result

Device supports TPC mechanism, details refer to the operational description.

6.6. Power Spectral Density Measurement

6.6.1. Test Limit

For an outdoor access point operating in the band 5.15–5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

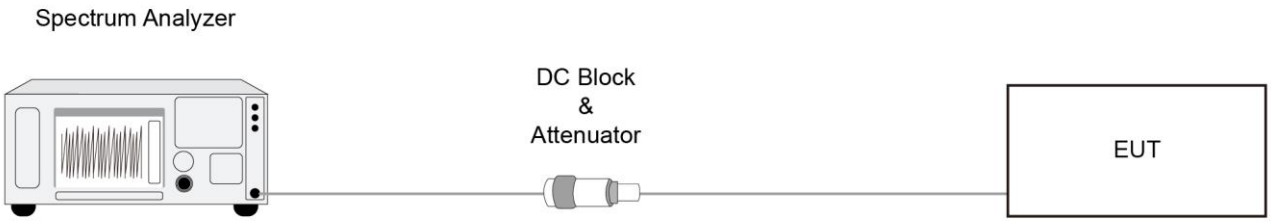
6.6.2. Test Procedure

KDB 789033 D02v02r01-Section Ⅱ)F)

6.6.3. Test Setting

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire 26dB EBW of the signal.
3. RBW = 1MHz (510kHz, if measurement bandwidth of Maximum PSD is specified in 500 kHz)
4. VBW = 3 × RBW
5. Number of sweep points ≥ 2 × (span / RBW)
6. Detector = power averaging (Average)
7. Sweep time = auto
8. Trigger = free run
9. Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
10. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
11. Add 10*log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10*log(1/0.25) = 6 dB if the duty cycle is 25 percent.

6.6.4. Test Setup



6.6.5. Test Result

Refer to Appendix A.4.

6.7. Frequency Stability Measurement

6.7.1. Test Limit

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

6.7.2. Test Procedure

Frequency Stability Under Temperature Variations:

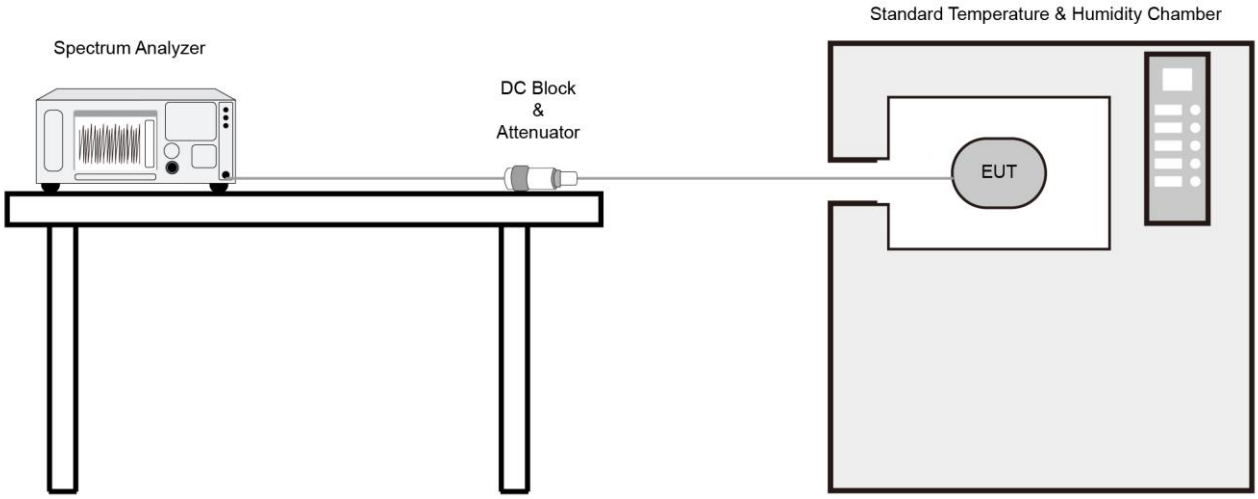
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, recordthe maximum frequency change.

6.7.3. Test Setup



6.7.4. Test Result

Refer to Appendix A.5.

6.8. Radiated Spurious Emission Measurement

6.8.1. 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

6.8.2. Test Procedure

KDB 789033 D02v02r01- Section II)G)

6.8.3. 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

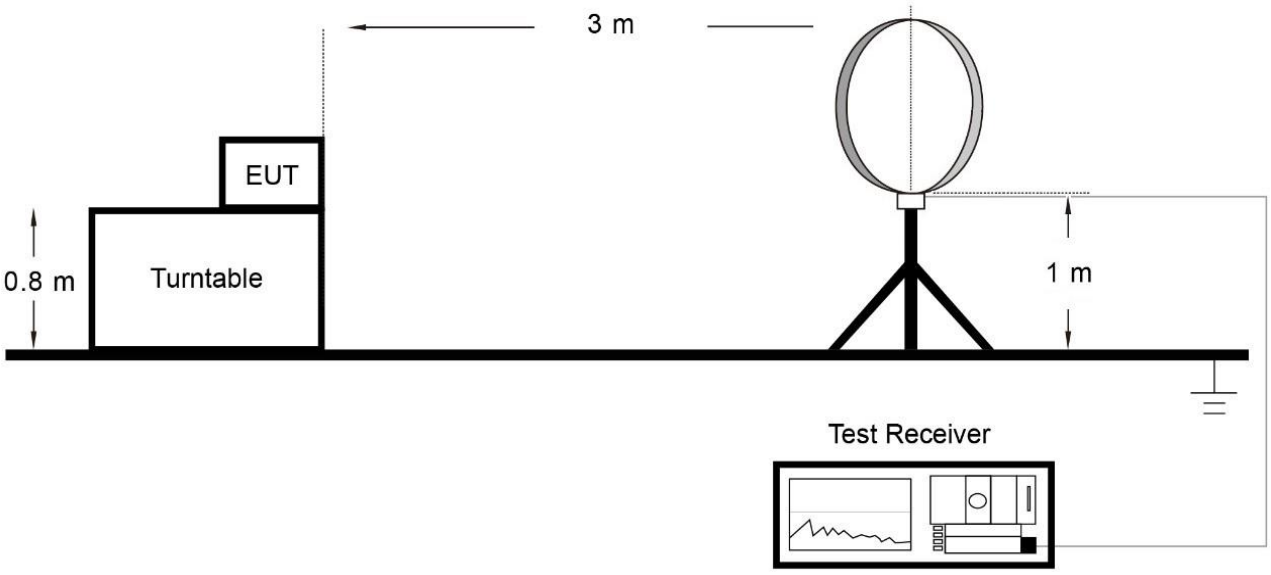
5. Sweep time = auto

6. Trace mode = max hold

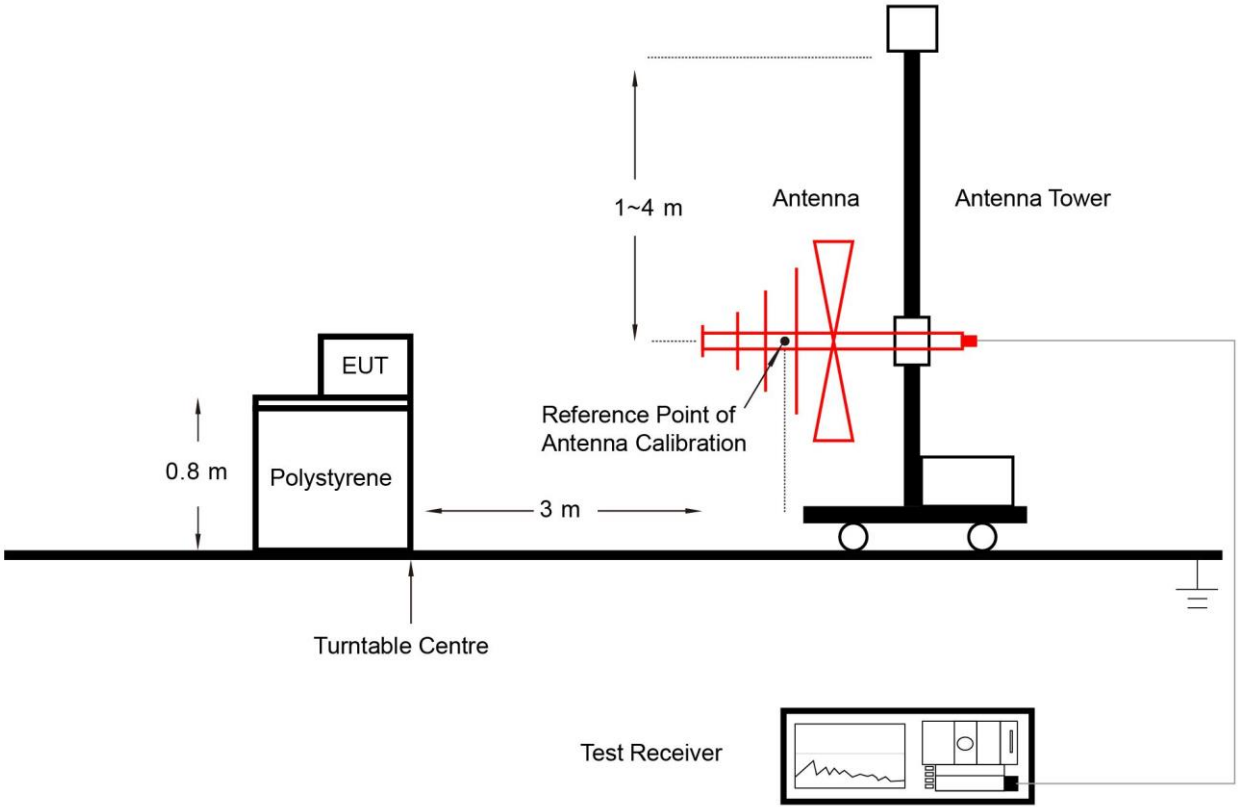
7. Trace was allowed to stabilize

6.8.4. Test Setup

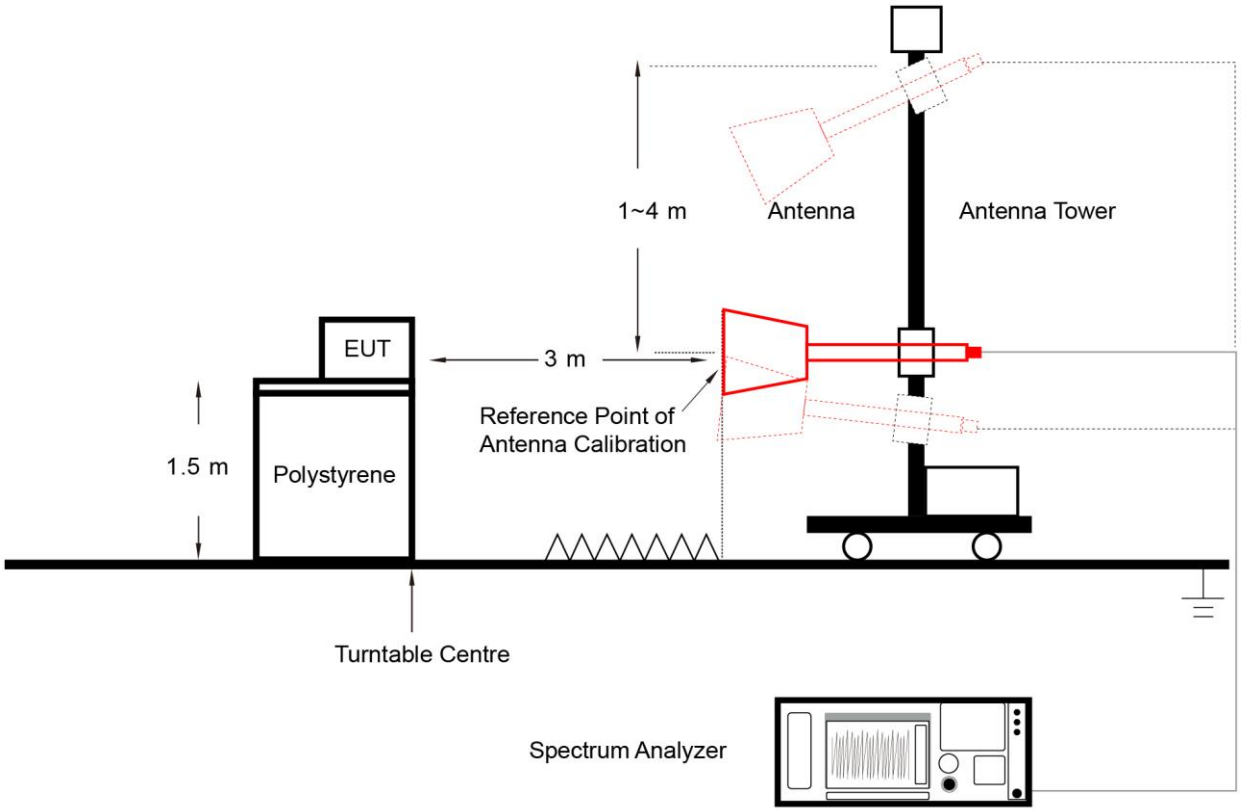
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.8.5. Test Result

Refer to Appendix A.6.

6.9. Radiated Restricted Band Edge Measurement

6.9.1. 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	--	--	--

For 15.407(b) requirement:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Refer to KDB 789033 D02v02r01 G)2)c), as specified in § 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a maximum emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in § 15.407(b)(4)). However, an out-of-band emission that complies with both the peak and average limits of § 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz maximum emission limit.

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

FCC Part 15 Subpart C Paragraph 15.209		
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

6.9.2. Test Procedure

KDB 789033 D02v02r01- Section Ⅱ)G)

6.9.3. Test Setting

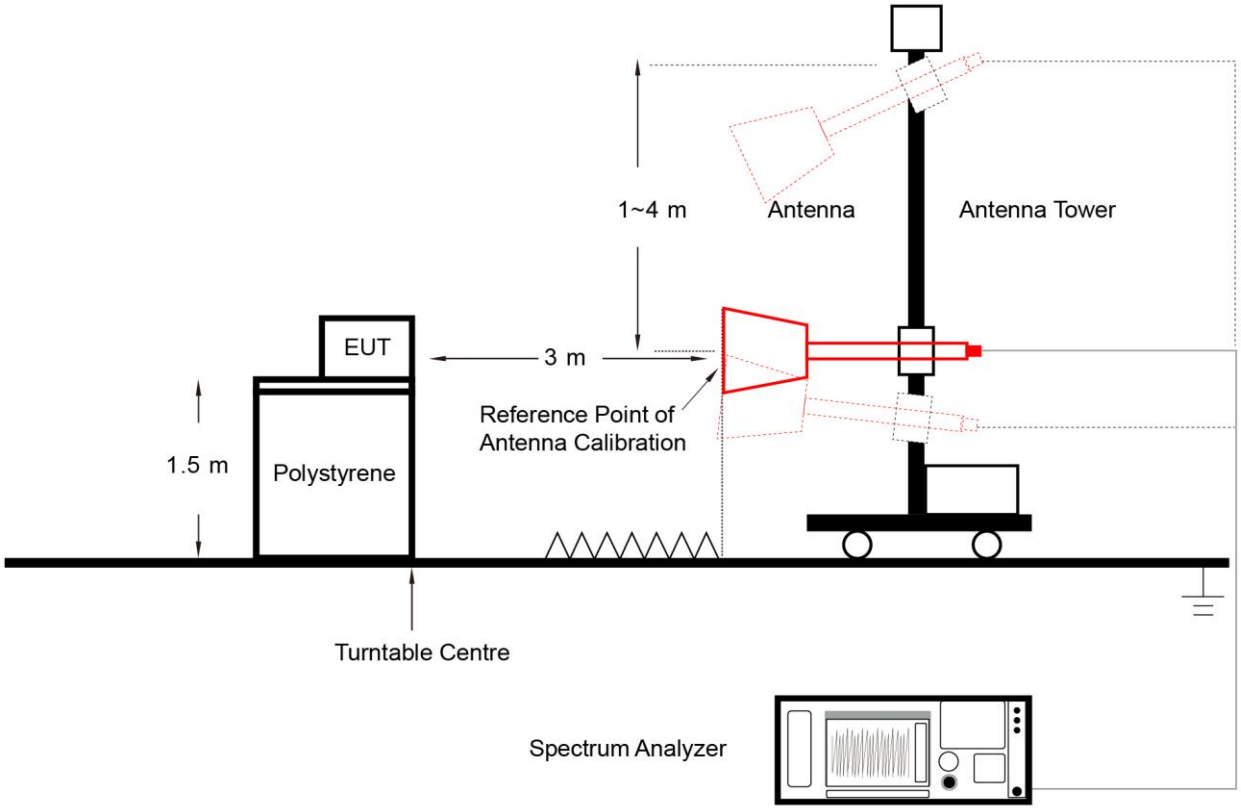
Peak Measurements above 1GHz

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

6.9.4. Test Setup



6.9.5. Test Result

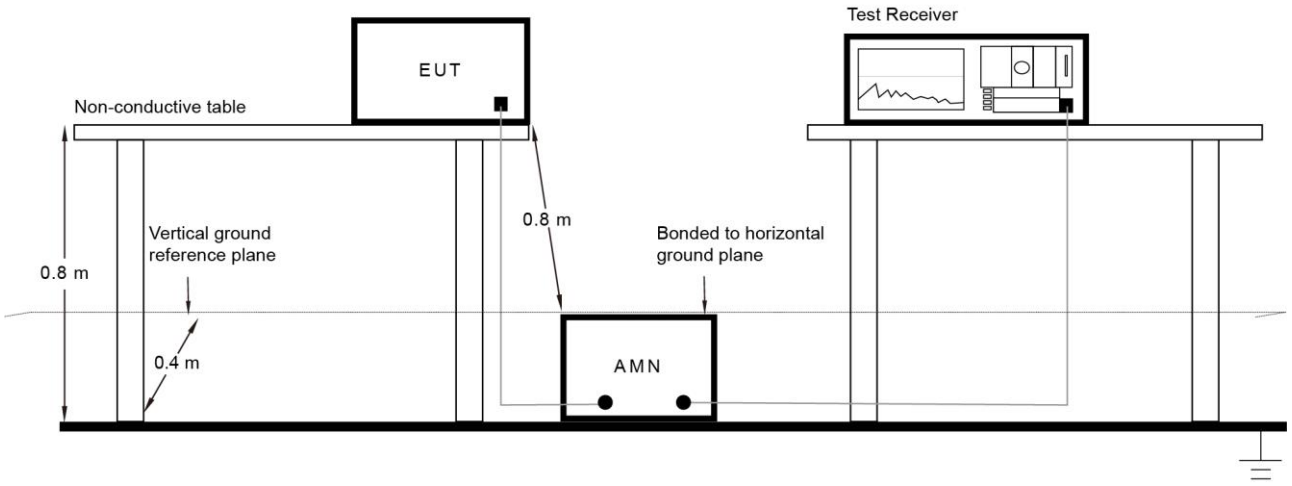
Refer to Appendix A.7.

6.10. AC Conducted Emissions Measurement

6.10.1. Test Limit

FCC Part 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.		

6.10.2. Test Setup



6.10.3. Test Result

Refer to Appendix A.8.

Appendix A – Test Result

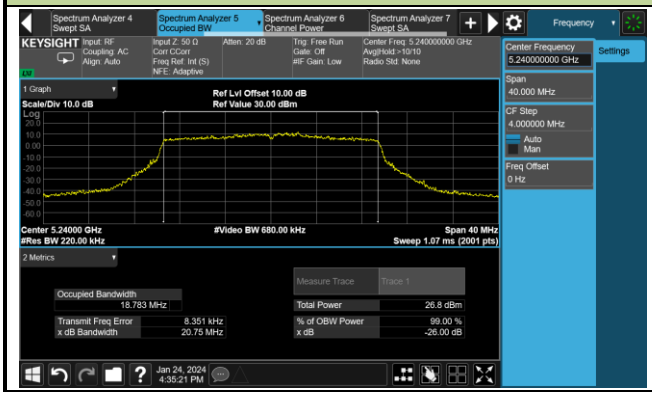
A.1 26dB Bandwidth Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-1-24		
Test Model	L11UG-5HaxD-US		

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
11ax-HE20	MCS0	48	5240	20.75	18.783

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	F_H (MHz)	Limit (MHz)
802.11ax-HE20	MCS0	48	5240	5249.3915	< 5250

Note: F_H = Centre frequency + 99% OBW / 2.

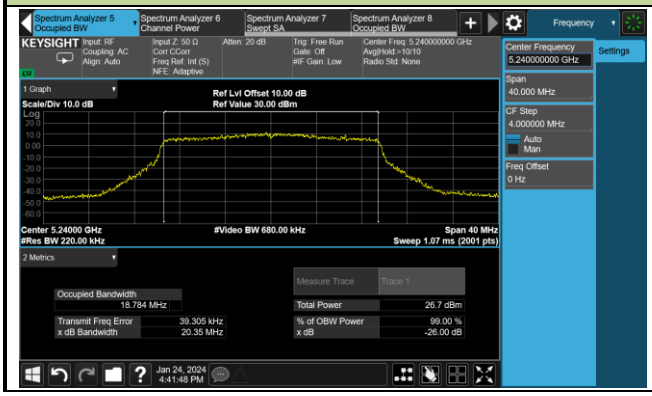
802.11ax-HE20 26dB Bandwidth & 99% Bandwidth	
Channel 48 (5240MHz)	
	

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-24		
Test Model	L11UG-5HaxD-NB-US		

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
11ax-HE20	MCS0	48	5240	20.35	18.784

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	F_H (MHz)	Limit (MHz)
802.11ax-HE20	MCS0	48	5240	5249.392	< 5250

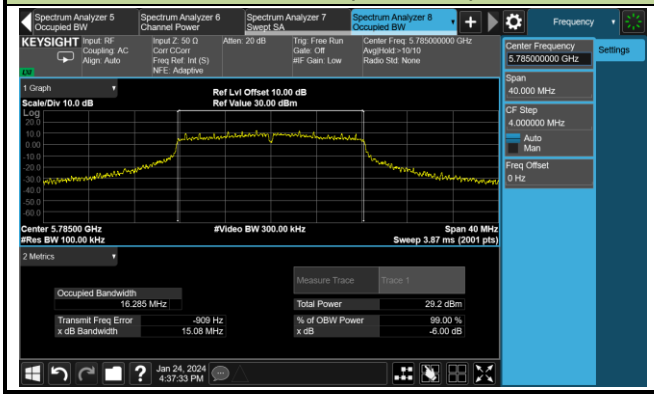
Note: F_H = Centre frequency + 99% OBW / 2.

802.11ax-HE20 26dB Bandwidth & 99% Bandwidth	
Channel 48 (5240MHz)	
	

A.2 6dB Bandwidth Test Result

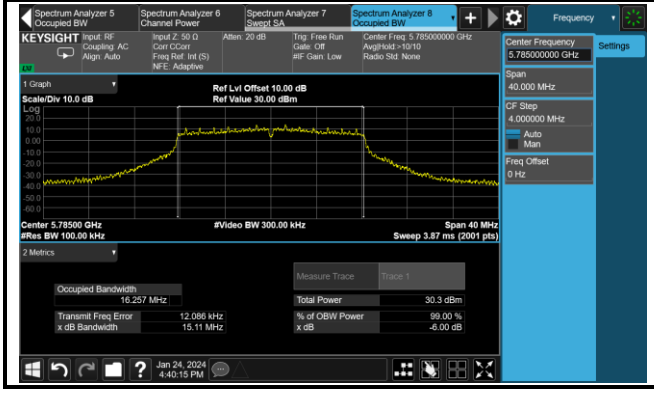
Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-24		
Test Model	L11UG-5HaxD-US		

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
11a	6Mbps	157	5785	15.08	≥0.5

802.11a 6dB Bandwidth	
Channel 157 (5785MHz)	
	

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-24		
Test Model	L11UG-5HaxD-NB-US		

Test Mode	Data Rate/ MCS	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
11a	6Mbps	157	5785	15.11	≥0.5

802.11a 6dB Bandwidth	
Channel 157 (5785MHz)	
	

A.3 Output Power Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-24		
Test Configuration	L11UG-5HaxD-US + Sector antenna		

Test Mode	Data Rate MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Total Average Power (dBm)	Power Limit (dBm)
				Ant 0	Ant 1		
11ax-HE40	MCS0	38	5190	-1.25	-1.39	1.69	≤ 17.00
11ax-HE160	MCS0	114	5570	7.44	7.17	10.32	≤ 10.98
11ac-VHT40	MCS0	159	5795	13.21	13.52	16.38	≤ 17.00

Note 1: Total Average Power (dBm) = 10*log {$10^{(\text{Ant 0 Average Power /10})}$ + $10^{(\text{Ant 1 Average Power /10})}$}.

Note 2: For 5250-5350MHz & 5470-5725MHz, the conducted power limit is as below.

802.11ax-HE160: 11 + 10 $\log_{10}$ B – (Ant Gain – 6) > 10.98dBm.

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-02-26		
Test Configuration	L11UG-5HaxD-US + Omni antenna		

Test Mode	Data Rate MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Total Average Power (dBm)	Power Limit (dBm)
				Ant 0	Ant 1		
11ax-HE80	MCS0	58	5290	19.87	19.8	22.85	≤ 22.88

Note 1: Total Average Power (dBm) = 10*log {$10^{(\text{Ant 0 Average Power /10})}$ + $10^{(\text{Ant 1 Average Power /10})}$}.

Note 2: For 5250-5350MHz & 5470-5725MHz, the conducted power limit is as below.

802.11ax-HE80: 11 + 10 $\log_{10}$ B – (Ant Gain – 6) > 22.88dBm.

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-24		
Test Configuration	L11UG-5HaxD-NB-US + Sector antenna		

Test Mode	Data Rate MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Total Average Power (dBm)	Power Limit (dBm)
				Ant 0	Ant 1		
11ax-HE40	MCS0	38	5190	-1.31	-1.89	1.42	≤ 17.00
11ax-HE160	MCS0	114	5570	6.71	7.36	10.06	≤ 10.98
11ac-VHT40	MCS0	159	5795	13.62	13.43	16.54	≤ 17.00

Note 1: Total Average Power (dBm) = 10*log {$10^{(\text{Ant 0 Average Power /10})}$ + $10^{(\text{Ant 1 Average Power /10})}$}.

Note 2: For 5250-5350MHz & 5470-5725MHz, the conducted power limit is as below.

802.11ax-HE160: 11 + 10 $\log_{10}$ B – (Ant Gain – 6) > 10.98dBm.

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-02-26		
Test Configuration	L11UG-5HaxD-US-NB + Omni antenna		

Test Mode	Data Rate MCS	Channel No.	Freq. (MHz)	Average Power (dBm)		Total Average Power (dBm)	Power Limit (dBm)
				Ant 0	Ant 1		
11ax-HE80	MCS0	58	5290	16.58	16.49	19.55	≤ 22.88

Note 1: Total Average Power (dBm) = 10*log {$10^{(\text{Ant 0 Average Power /10})}$ + $10^{(\text{Ant 1 Average Power /10})}$}.

Note 2: For 5250-5350MHz & 5470-5725MHz, the conducted power limit is as below.

802.11ax-HE80: 11 + 10 $\log_{10}$ B – (Ant Gain – 6) > 22.88dBm.

A.4 Power Spectral Density Test Result

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-24~2024-02-06		
Test Configuration	L11UG-5HaxD-US + Omni antenna		
Test Item	Power Spectral Density (UNII-Band 1 & UNII-2a)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AV PSD (dBm/ MHz)		Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)
				Ant 0	Ant 1			
11a	6Mbps	48	5240	-0.48	-0.19	99.25	2.68	≤ 12.89
11ax-HE80	MCS0	58	5290	3.28	3.10	99.63	6.20	≤ 6.89

Note 1: When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) =10*log {$10^{(\text{Ant 0 AVGPSD}/10)}$ + $10^{(\text{Ant 1 AVGPSD}/10)}$}.

Note 2:

For 5150 - 5250MHz Band: PSD Limit (dBm/MHz) = 17 - (10.11 - 6) = 12.89dBm/MHz

For 5250 - 5350MHz Band: Average Power Limit (dBm) = 11 - (10.11 - 6) = 6.89dBm/MHz.

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-24		
Test Configuration	L11UG-5HaxD-US + Sector antenna		
Test Item	Power Spectral Density (UNII-2c)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AV PSD (dBm/ MHz)		Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)
				Ant 0	Ant 1			
11a	6Mbps	116	5580	-9.19	-8.70	99.25	-5.93	≤ -5.01

Note 1: When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) =10*log {$10^{(\text{Ant 0 AVGPSD}/10)}$ + $10^{(\text{Ant 1 AVGPSD}/10)}$}.

Note 2:

For 5470 - 5725MHz Band: Average Power Limit (dBm) = 11 - (22.01 - 6) = -5.01dBm/MHz.

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-02-02		
Test Configuration	L11UG-5HaxD-US + Sector antenna		
Test Item	Power Spectral Density (UNII-Band 3)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AV PSD (dBm/ 510KHz)		Duty Cycle (%)	Total PSD (dBm/ 510KHz)	PSD Limit (dBm/ 500KHz)
				Ant 0	Ant 1			
11a	6Mbps	157	5785	2.43	2.66	99.25	5.56	≤ 13.99

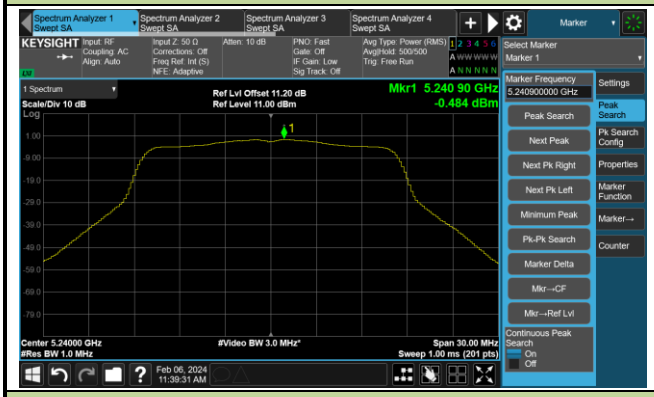
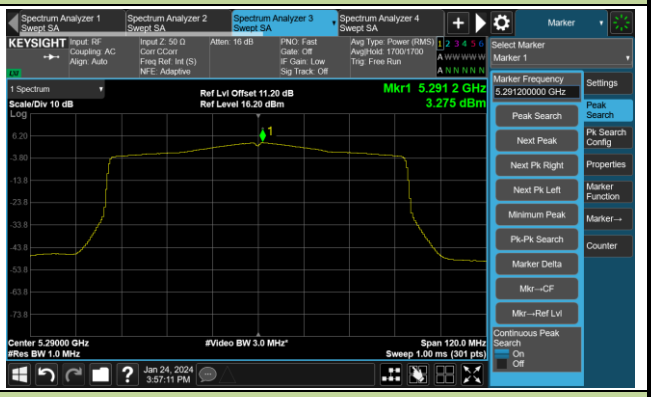
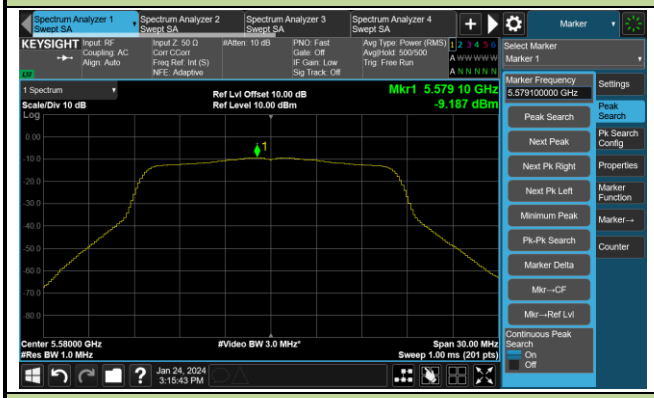
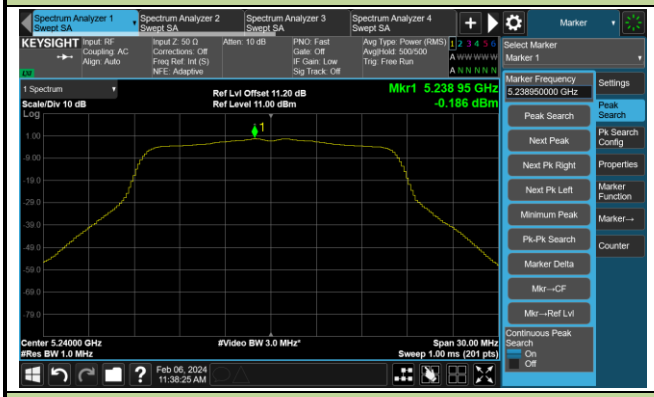
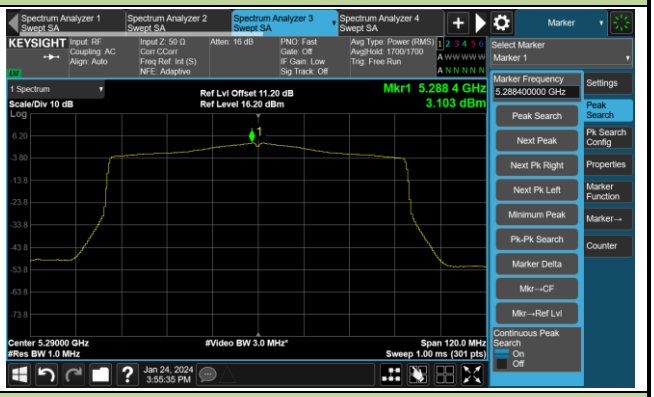
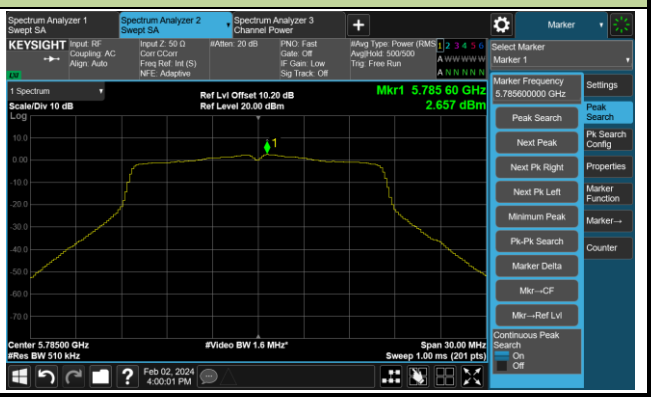
Note 1:

When EUT duty cycle < 98%, the total PSD (dBm/510kHz) =10*log {$10^{(\text{Ant 0 AVGPSD}/10)} + 10^{(\text{Ant 1 AVGPSD}/10)}$}

+10*log (1/Duty cycle).

When EUT duty cycle ≥ 98%, the total PSD (dBm/510kHz) =10*log {$10^{(\text{Ant 0 AVGPSD}/10)} + 10^{(\text{Ant 1 AVGPSD}/10)}$}.

Note 2: PSD Limit (dBm/500KHz) = 30 - (22.01 - 6) = 13.99 dBm/500KHz.

Power Spectral Density- Ant 0	
802.11a Channel 48 (5240MHz)	802.11ax-HE80 Channel 58 (5290MHz)
	
802.11a Channel 116 (5580MHz)	802.11a Channel 157 (5785MHz)
	
Power Spectral Density- Ant 1	
802.11a Channel 48 (5240MHz)	802.11ax-HE80 Channel 58 (5290MHz)
	
802.11a Channel 116 (5580MHz)	802.11a Channel 157 (5785MHz)
	

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-23~2024-02-06		
Test Configuration	L11UG-5HaxD-NB-US + Omni antenna		
Test Item	Power Spectral Density (UNII-Band 1 & UNII-2a)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AV PSD (dBm/ MHz)		Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)
				Ant 0	Ant 1			
11a	6Mbps	48	5240	0.62	0.48	99.25	3.56	≤ 12.89
11ax-HE80	MCS0	58	5290	1.20	1.49	99.63	4.36	≤ 6.89

Note 1: When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) =10*log {$10^{(\text{Ant 0 AVGPSD}/10)}$ + $10^{(\text{Ant 1 AVGPSD}/10)}$}.

Note 2:

For 5150 - 5250MHz Band: PSD Limit (dBm/MHz) = 17 - (10.11 - 6) = 12.89dBm/MHz

For 5250 - 5350MHz Band: Average Power Limit (dBm) = 11 - (10.11 - 6) = 6.89dBm/MHz.

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-01-23		
Test Configuration	L11UG-5HaxD-NB-US + Sector antenna		
Test Item	Power Spectral Density (UNII-2c)		

Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AV PSD (dBm/ MHz)		Duty Cycle (%)	Total PSD (dBm/ MHz)	PSD Limit (dBm/MHz)
				Ant 0	Ant 1			
11a	6Mbps	116	5580	-8.17	-8.03	99.25	-5.09	≤ -5.01

Note 1: When EUT duty cycle ≥ 98%, the total PSD (dBm/MHz) =10*log {$10^{(\text{Ant 0 AVGPSD}/10)}$ + $10^{(\text{Ant 1 AVGPSD}/10)}$}.

Note 2:

For 5470 - 5725MHz Band: Average Power Limit (dBm) = 11 - (22.01 - 6) = -5.01dBm/MHz.

Test Site	WZ-SR5	Test Engineer	Luis Yang
Test Date	2024-02-02		
Test Configuration	L11UG-5HaxD-NB-US + Sector antenna		
Test Item	Power Spectral Density (UNII-Band 3)		

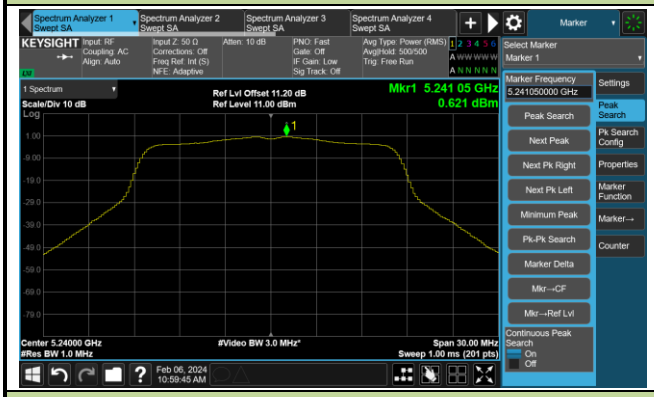
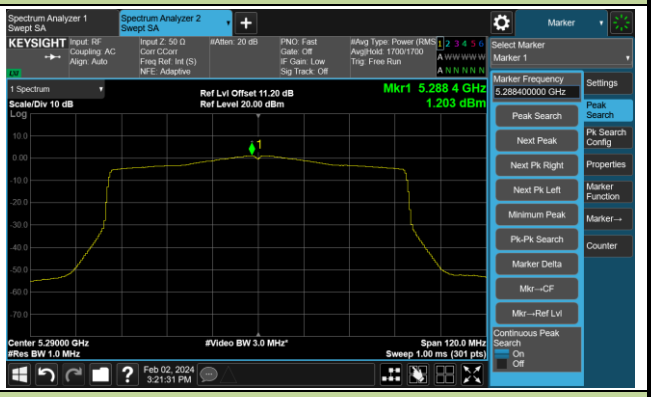
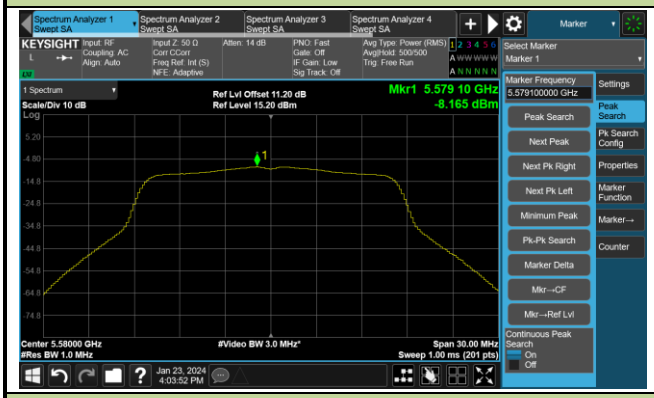
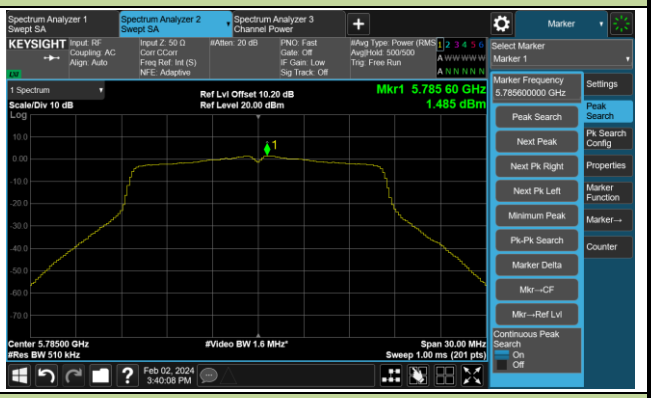
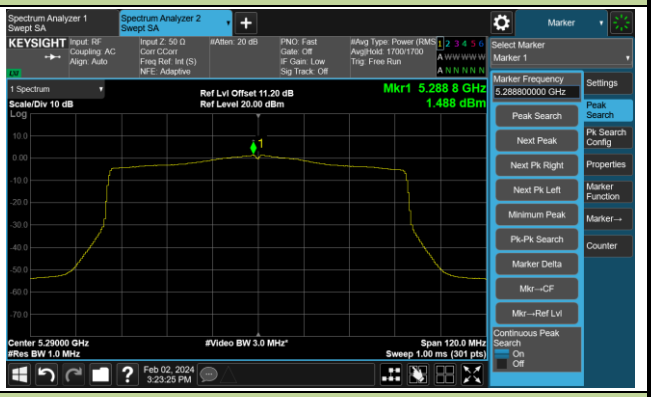
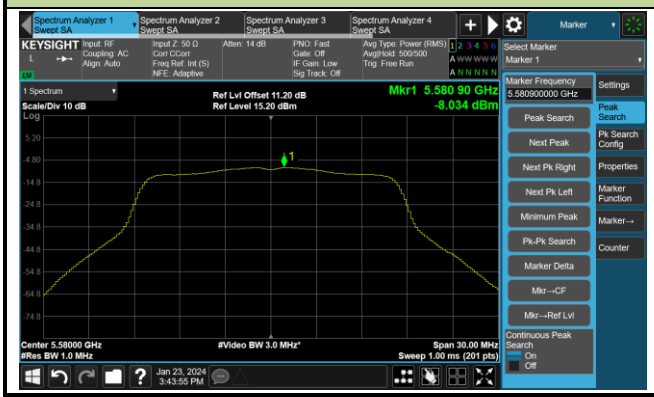
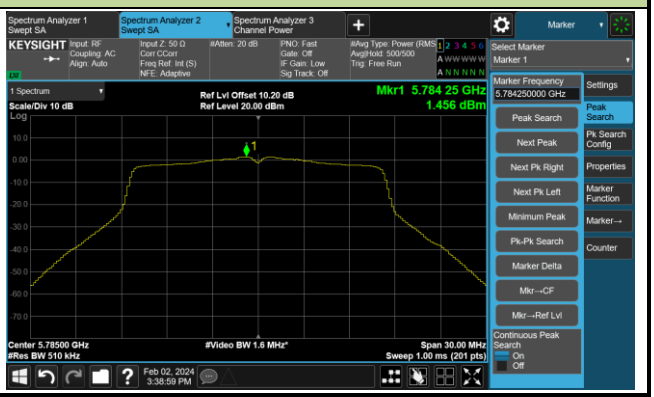
Test Mode	Data Rate/ MCS	Channel No.	Freq. (MHz)	AV PSD (dBm/ 510KHz)		Duty Cycle (%)	Total PSD (dBm/ 510KHz)	PSD Limit (dBm/ 500KHz)
				Ant 0	Ant 1			
11a	6Mbps	157	5785	1.49	1.46	99.25	4.48	≤ 13.99

Note 1:

When EUT duty cycle < 98%, the total PSD (dBm/510kHz) =10*log $\{10^{(\text{Ant 0 AVGPSD}/10)} + 10^{(\text{Ant 1 AVGPSD}/10)}\}$ +10*log (1/Duty cycle).

When EUT duty cycle ≥ 98%, the total PSD (dBm/510kHz) =10*log $\{10^{(\text{Ant 0 AVGPSD}/10)} + 10^{(\text{Ant 1 AVGPSD}/10)}\}$.

Note 2: PSD Limit (dBm/500KHz) = 30 - (22.01 - 6) = 13.99 dBm/500KHz.

Power Spectral Density- Ant 0	
802.11a Channel 48 (5240MHz)	802.11ax-HE80 Channel 58 (5290MHz)
	
802.11a Channel 116 (5580MHz)	802.11a Channel 157 (5785MHz)
	
Power Spectral Density- Ant 1	
802.11a Channel 48 (5240MHz)	802.11ax-HE80 Channel 58 (5290MHz)
	
802.11a Channel 116 (5580MHz)	802.11a Channel 157 (5785MHz)
	

A.5 Frequency Stability Test Result

Test Site	WZ-TR3	Test Engineer	Luis Yang
Test Date	2024-01-24	Test Mode	5180MHz
Test Model	L11UG-5HaxD-US		

Voltage (%)	Power (VAC)	Temp (°C)	Frequency Tolerance (ppm)
			10 minutes
100%	120	- 30	6.01

Note: Frequency Tolerance (ppm) = {[Measured Frequency (Hz) - Declared Frequency (Hz)] / Declared Frequency (Hz)} *10^6.

Test Site	WZ-TR3	Test Engineer	Luis Yang
Test Date	2024-01-24	Test Mode	5180MHz
Test Model	L11UG-5HaxD-NB-US		

Voltage (%)	Power (VAC)	Temp (°C)	Frequency Tolerance (ppm)
			10 minutes
100%	120	- 30	8.91

Note: Frequency Tolerance (ppm) = {[Measured Frequency (Hz) - Declared Frequency (Hz)] / Declared Frequency (Hz)} *10^6.

A.6 Radiated Spurious Emission Test Result

L11UG-5HaxD-US + Sector antenna:

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-05	Test Mode	802.11ac-VHT20 – Channel 44
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7485.5	32.1	12.0	44.1	74.0	-29.9	Peak	Horizontal
*	8284.5	40.3	11.1	51.4	74.0	-22.6	Peak	Horizontal
	10358.5	32.8	15.1	47.9	68.2	-20.3	Peak	Horizontal
*	13945.5	31.8	19.6	51.4	68.2	**-16.8**	Peak	Horizontal

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

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

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-05	Test Mode	802.11ax-HE20 – Channel 52
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB/m)	Detector	Polarization
	8412.0	39.0	11.4	50.4	74.0	-23.6	Peak	Horizontal
*	10486.0	33.8	15.4	49.2	68.2	-19.0	Peak	Horizontal
	11540.0	31.7	17.6	49.3	74.0	-24.7	Peak	Horizontal
*	14413.0	33.2	19.7	52.9	68.2	**-15.3**	Peak	Horizontal

Note 1: “*” is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

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

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-05	Test Mode	802.11a – Channel 100
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB/m)	Detector	Polarization
	7468.5	32.1	12.1	44.2	74.0	-29.8	Peak	Vertical
*	9857.0	33.6	13.5	47.1	68.2	-21.1	Peak	Vertical
	11548.5	31.1	17.7	48.8	74.0	-25.2	Peak	Vertical
*	14464.0	31.8	20.2	52.0	68.2	**-16.2**	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

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

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

L11UG-5HaxD-NB-US + Sector antenna:

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-05	Test Mode	802.11ac-VHT20 – Channel 44
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
	7298.5	32.5	11.4	43.9	74.0	-30.1	Peak	Horizontal
*	9738.0	33.2	13.5	46.7	68.2	-21.5	Peak	Horizontal
	10843.0	33.8	16.5	50.3	74.0	-23.7	Peak	Horizontal
*	14821.0	32.7	19.6	52.3	68.2	**-15.9**	Peak	Horizontal

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

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

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-02-01	Test Mode	802.11ax-HE20 – Channel 52
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB/m)	Detector	Polarization
*	9772.0	31.5	13.5	45.0	68.2	-23.2	Peak	Horizontal
	10987.5	30.9	16.4	47.3	74.0	-26.7	Peak	Horizontal
	11565.5	30.7	17.8	48.5	74.0	-25.5	Peak	Horizontal
*	16402.0	33.7	18.5	52.2	68.2	**-16.0**	Peak	Horizontal

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

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

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

Test Site	WZ-AC2	Test Engineer	Dick Shen
Test Date	2024-01-05	Test Mode	802.11a – Channel 100
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.		

Mark	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB/m)	Detector	Polarization
	8089.0	32.9	11.8	44.7	74.0	-29.3	Peak	Vertical
*	10129.0	33.5	14.2	47.7	68.2	-20.5	Peak	Vertical
	11557.0	30.8	17.9	48.7	74.0	-25.3	Peak	Vertical
*	14336.5	32.4	20.3	52.7	68.2	**-15.5**	Peak	Vertical

Note 1: "*" is not in restricted band, its limit is -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions.

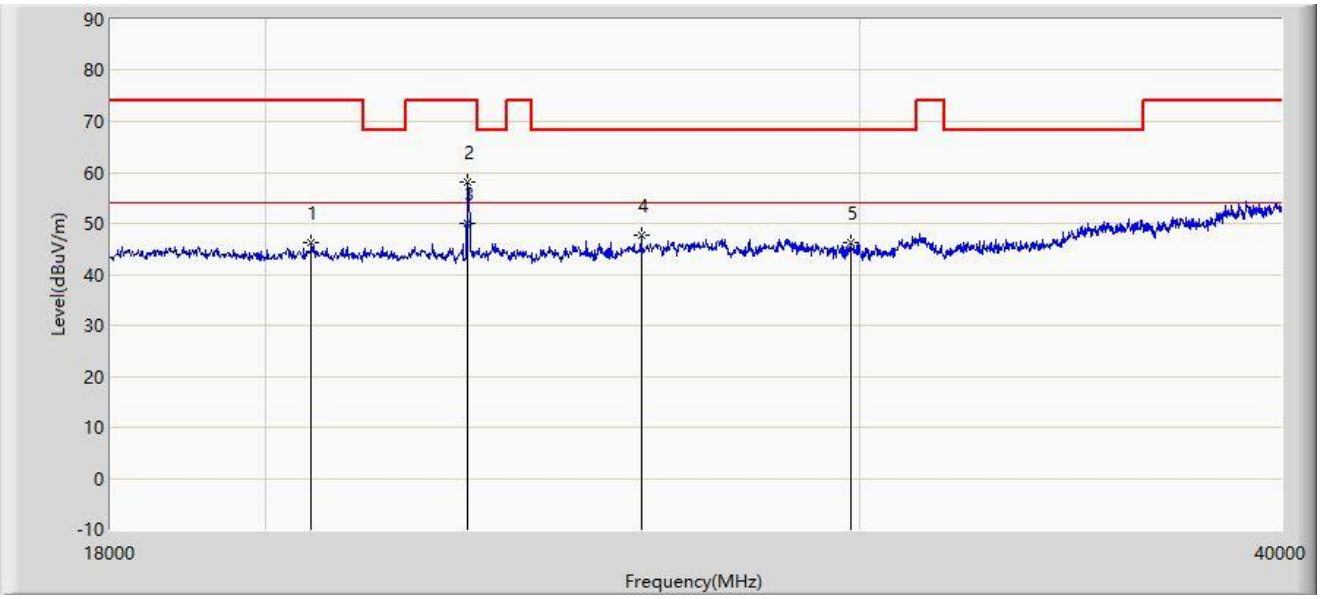
Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

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

The Result of Radiated Emission above 18GHz:

L11UG-5HaxD-US + Omni antenna:

Site: WZ-AC2	Test Date: 2024-02-19 - 19:25
Limit: FCC_Part15.209_RSE(3m)	Engineer: Dick Shen
Probe: BBHA9170_549_18-40GHz	Polarity: Worst Polarity
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Note: Transmit by 802.11a at 5745MHz	



No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		20640.000	46.096	55.335	-27.904	74.000	-9.239	PK
2		22972.000	58.044	65.341	-15.956	74.000	-7.297	PK
3	*	22972.000	49.913	57.210	**-4.087**	54.000	-7.297	AV
4		25854.000	47.794	54.651	-20.406	68.200	-6.857	PK
5		29814.000	46.130	54.232	-22.070	68.200	-8.102	PK

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

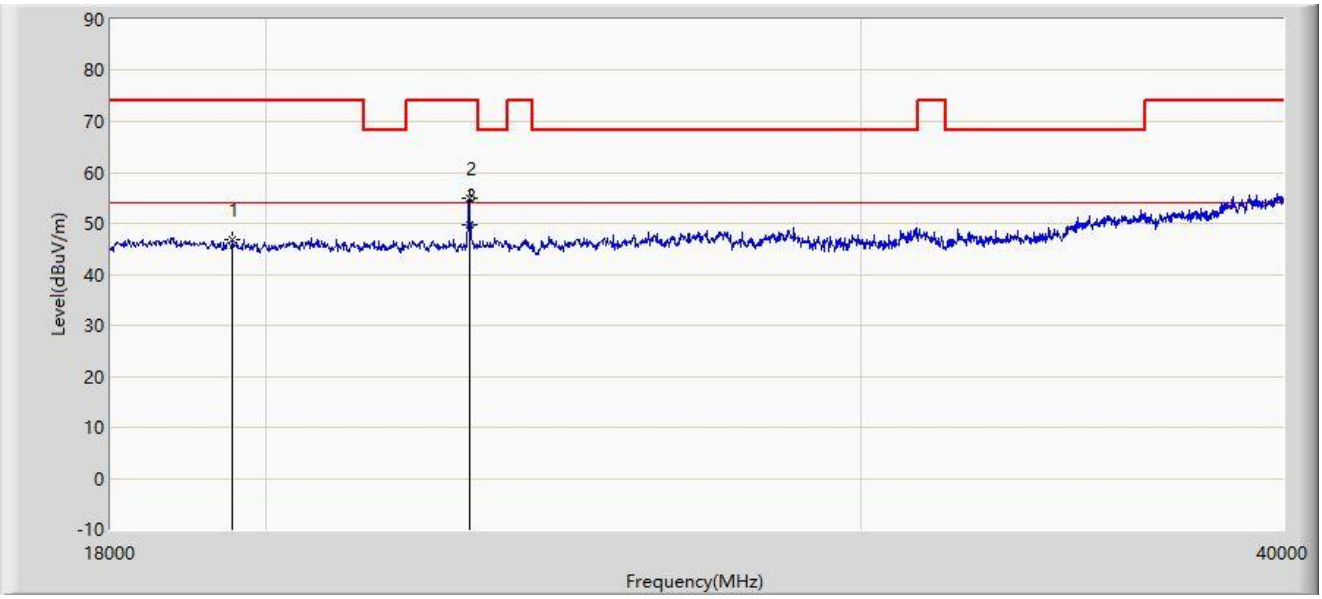
Note 2: Measure Level (dBµV/m) = Reading Level (dBµV) + Factor (dB/m).

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

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

L11UG-5HaxD-NB-US + Omni antenna:

Site: WZ-AC2	Test Date: 2024-02-20 - 14:06
Limit: FCC_Part15.209_RSE(3m)	Engineer: Dick Shen
Probe: BBHA9170_549_18-40GHz	Polarity: Worst Polarity
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Note: Transmit by 802.11a at 5745MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		19562.000	46.733	56.944	-27.267	74.000	-10.211	PK
2		22983.000	55.004	62.176	-18.996	74.000	-7.172	PK
3	*	22983.000	49.628	56.800	**-4.372**	54.000	-7.172	AV

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

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

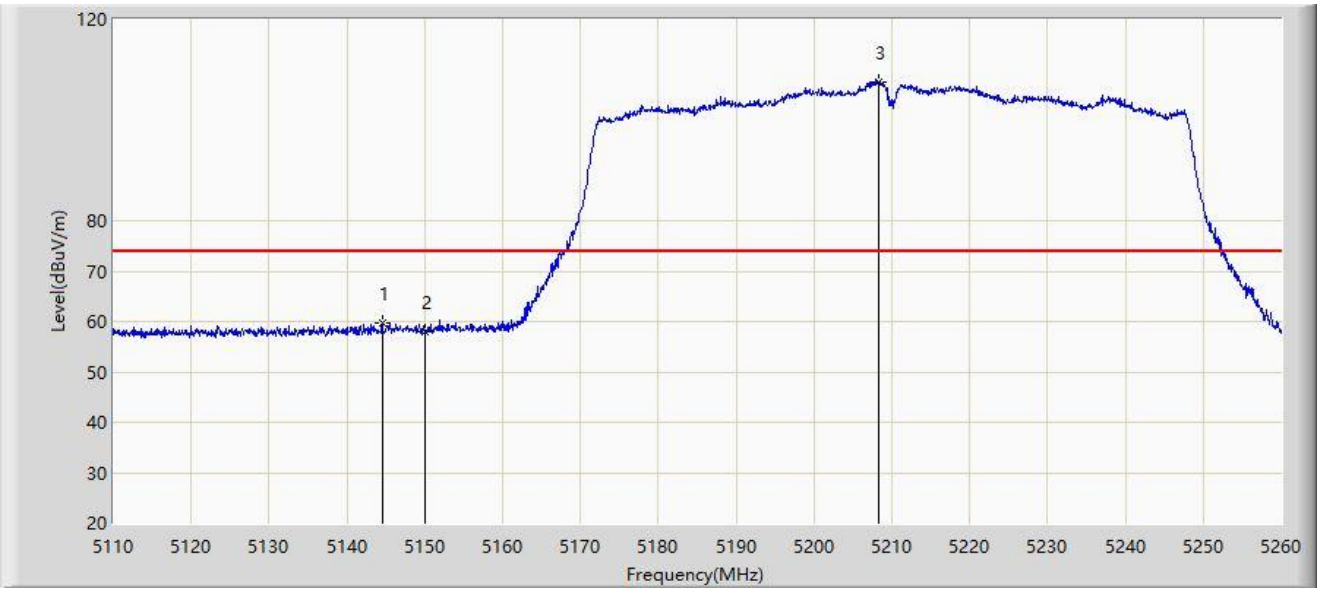
Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB).

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

L11UG-5HaxD-US + Omni antenna:

Site: WZ-AC2	Test Date: 2024-02-05 - 16:26
Limit: FCC_5G_RE(3m)	Engineer: Dick Shen
Probe: BBHA9120D_1457_1-18GHz	Polarity: Vertical
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT80 at 5210MHz	



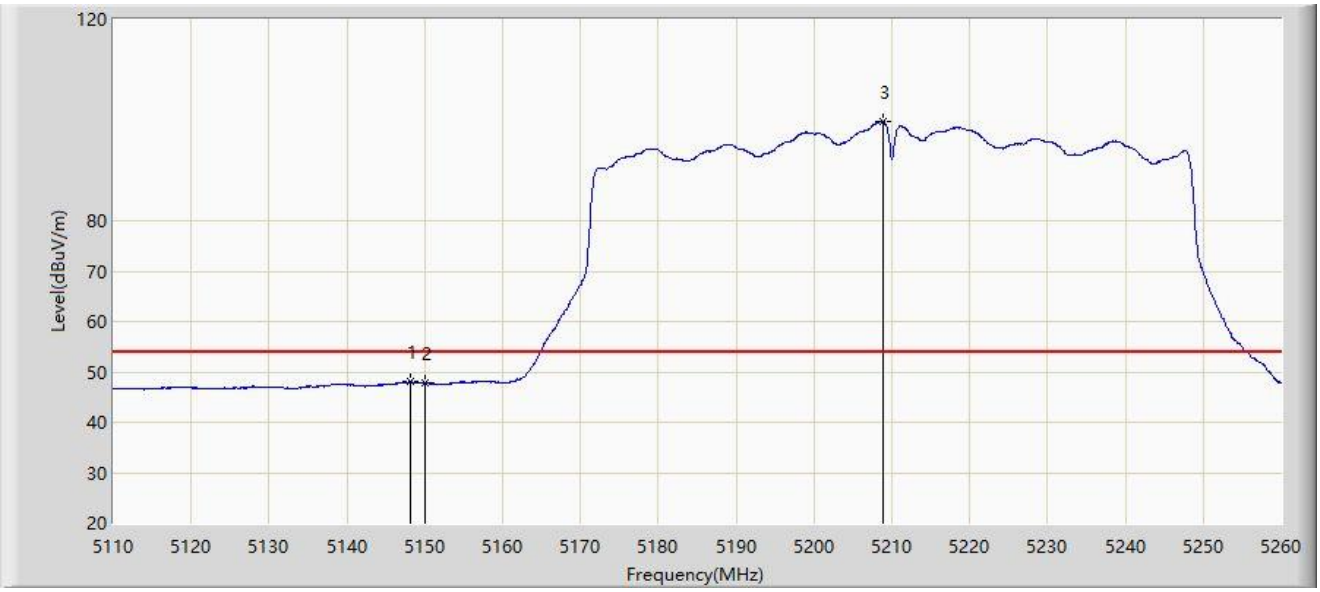
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	5144.500	59.650	56.219	-14.350	74.000	3.432	PK
2		5150.000	57.908	54.426	-16.092	74.000	3.482	PK
3		5208.325	107.530	104.640	N/A	N/A	2.890	PK

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) - Pre_Amplifier Gain (dB).

Site: WZ-AC2	Test Date: 2024-02-05 - 16:28
Limit: FCC_5G_RE(3m)	Engineer: Dick Shen
Probe: BBHA9120D_1457_1-18GHz	Polarity: Vertical
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT80 at 5210MHz	



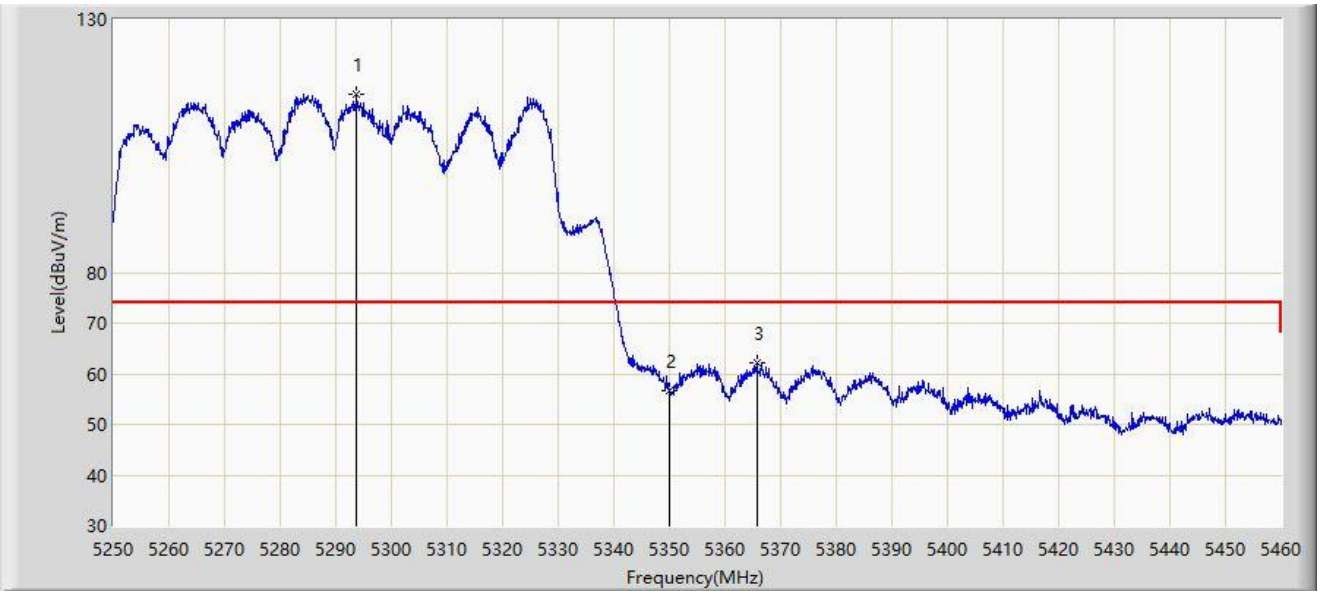
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	5148.250	47.992	44.516	**-6.008**	54.000	3.476	AV
2		5150.000	47.700	44.218	-6.300	54.000	3.482	AV
3		5208.850	99.689	96.797	N/A	N/A	2.892	AV

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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-05 - 15:51
Limit: FCC_5G_RE(3m)	Engineer: Justin Guo
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ax-HE80 at 5290MHz	



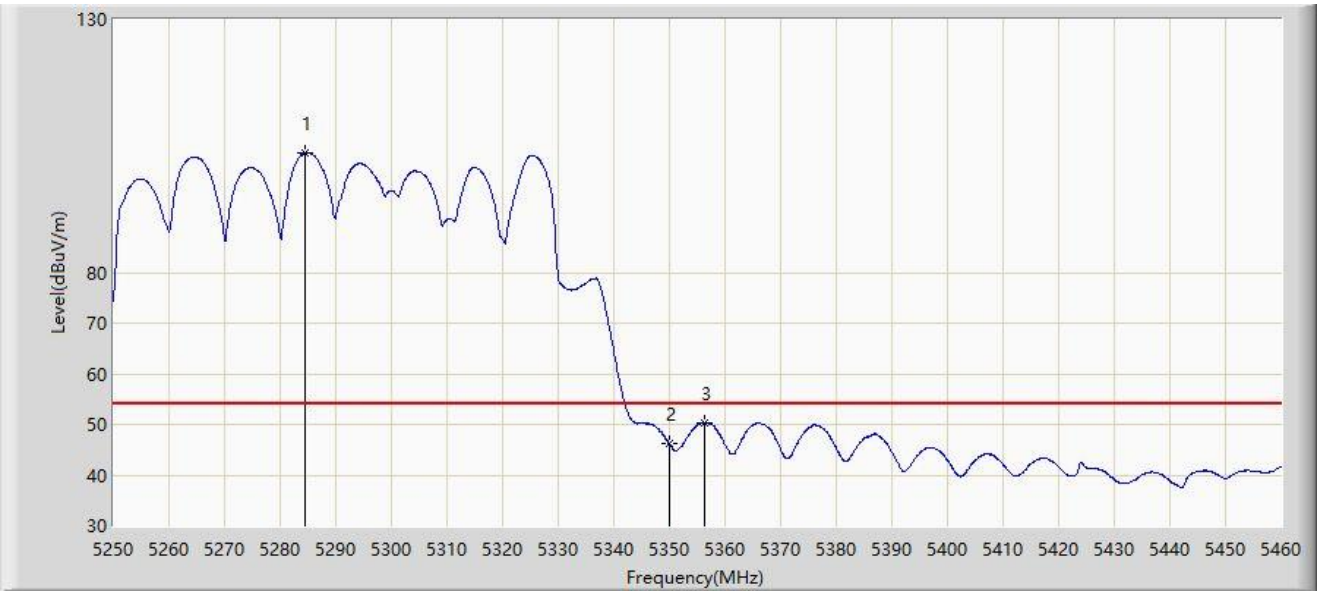
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		5293.785	115.320	76.450	N/A	N/A	38.871	PK
2		5350.000	56.578	57.982	-17.422	74.000	-1.404	PK
3	*	5365.710	62.131	66.770	-11.869	74.000	-4.639	PK

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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-05 - 16:02
Limit: FCC_5G_RE(3m)	Engineer: Justin Guo
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ax-HE80 at 5290MHz	



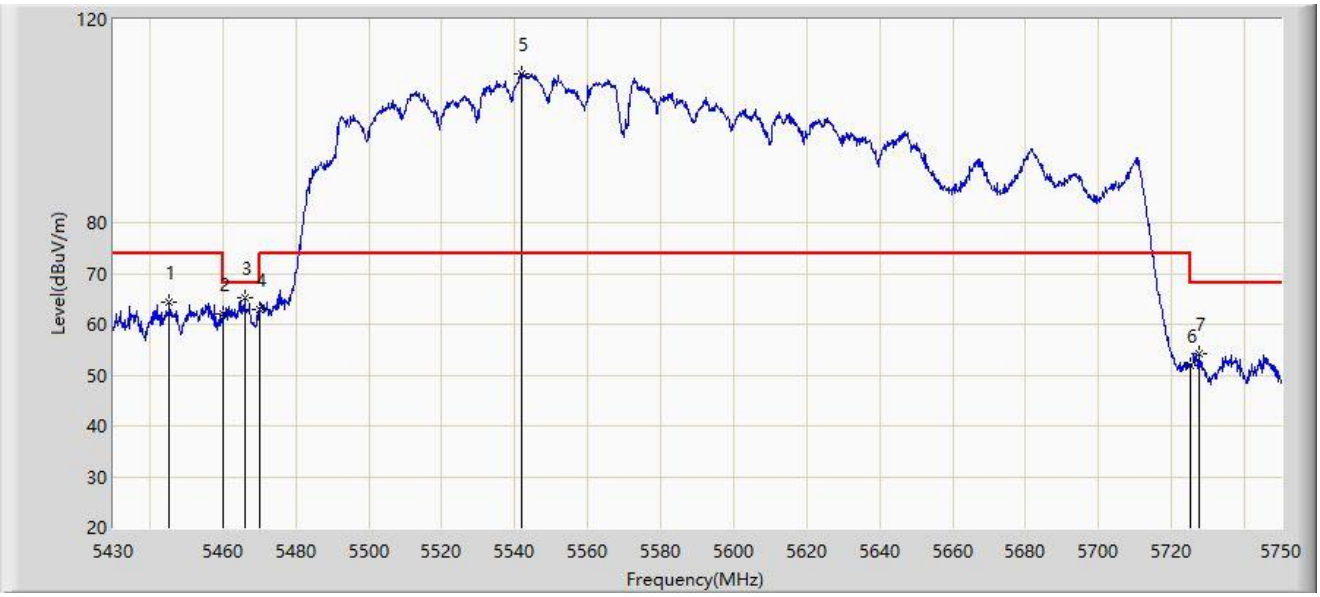
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		5284.545	103.686	60.458	N/A	N/A	43.228	AV
2		5350.000	46.168	47.572	-7.832	54.000	-1.404	AV
3	*	5356.365	50.381	53.874	**-3.619**	54.000	-3.493	AV

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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-02 - 14:03
Limit: FCC_5G_RE(3m)	Engineer: Arvin Ding
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT160 at 5570MHz	



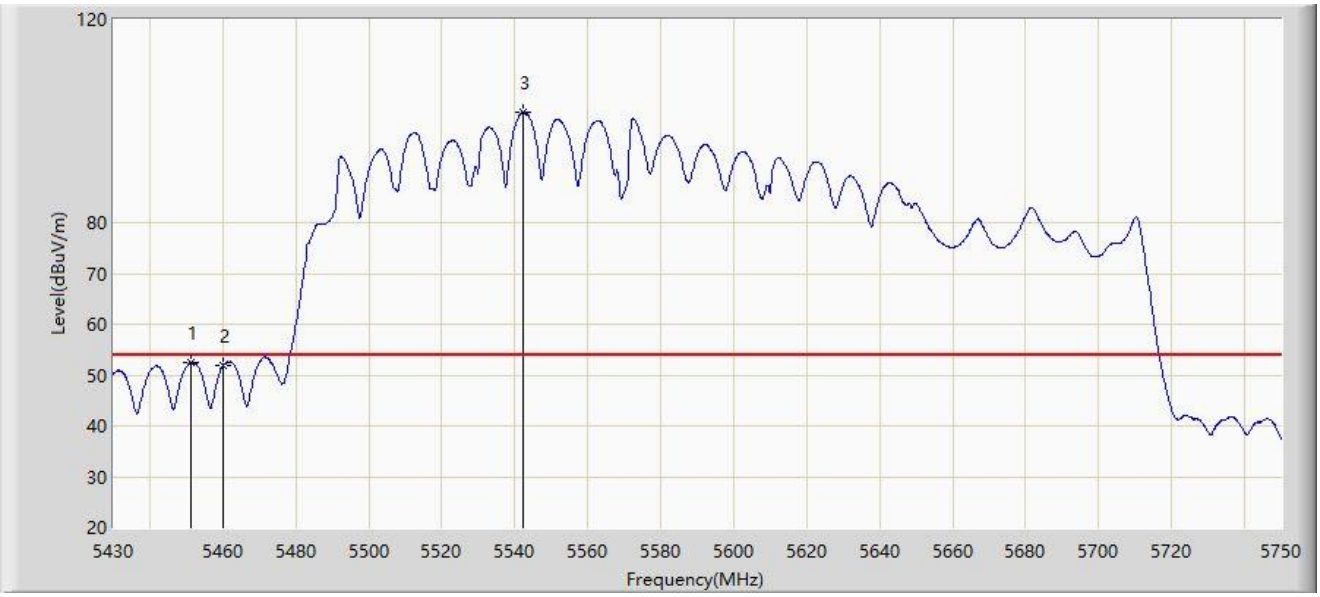
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		5445.360	64.261	68.429	-9.739	74.000	-4.168	PK
2		5460.000	62.167	65.510	-6.033	68.200	-3.343	PK
3	*	5466.000	65.244	67.946	-2.956	68.200	-2.702	PK
4		5470.000	62.781	64.391	-5.419	68.200	-1.610	PK
5		5542.000	109.346	70.551	N/A	N/A	38.794	PK
6		5725.000	51.799	53.634	-16.401	68.200	-1.836	PK
7		5727.600	54.271	57.243	-13.929	68.200	-2.971	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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-02 - 13:57
Limit: FCC_5G_RE(3m)	Engineer: Arvin Ding
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT160 at 5570MHz	



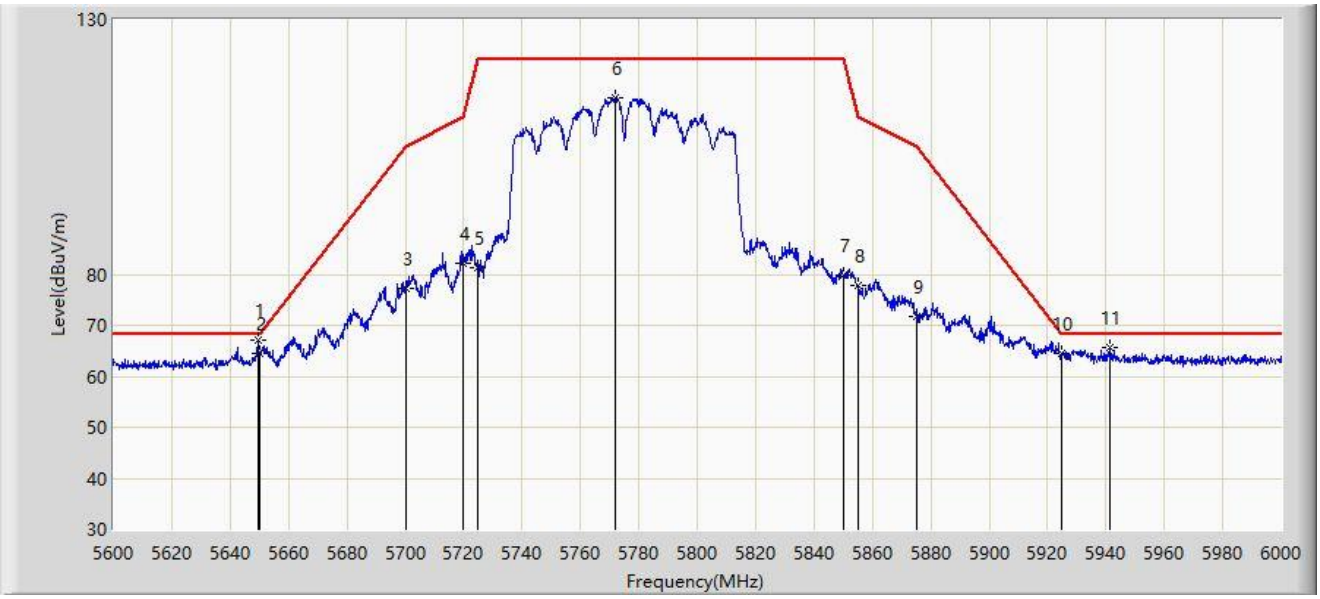
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	5451.440	52.454	56.326	**-1.546**	54.000	-3.872	AV
2		5460.000	51.845	55.188	-2.155	54.000	-3.343	AV
3		5542.320	101.705	62.905	N/A	N/A	38.800	AV

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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-02 - 13:40
Limit: FCC_5.8G_RE(3m)	Engineer: Arvin Ding
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT80 at 5775MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	5649.400	67.099	74.419	**-1.101**	68.200	-7.320	PK
2		5650.000	64.609	71.929	-3.591	68.200	-7.319	PK
3		5700.000	77.254	84.428	-27.946	105.200	-7.174	PK
4		5720.000	82.300	89.772	-28.500	110.800	-7.472	PK
5		5725.000	81.212	88.673	-40.988	122.200	-7.461	PK
6		5771.800	114.700	122.081	N/A	N/A	-7.381	PK
7		5850.000	79.859	87.096	-42.341	122.200	-7.237	PK
8		5855.000	77.809	85.027	-32.991	110.800	-7.217	PK
9		5875.000	71.778	79.130	-33.422	105.200	-7.352	PK
10		5925.000	64.434	71.560	-3.766	68.200	-7.126	PK
11		5941.600	65.629	72.641	-2.571	68.200	-7.012	PK

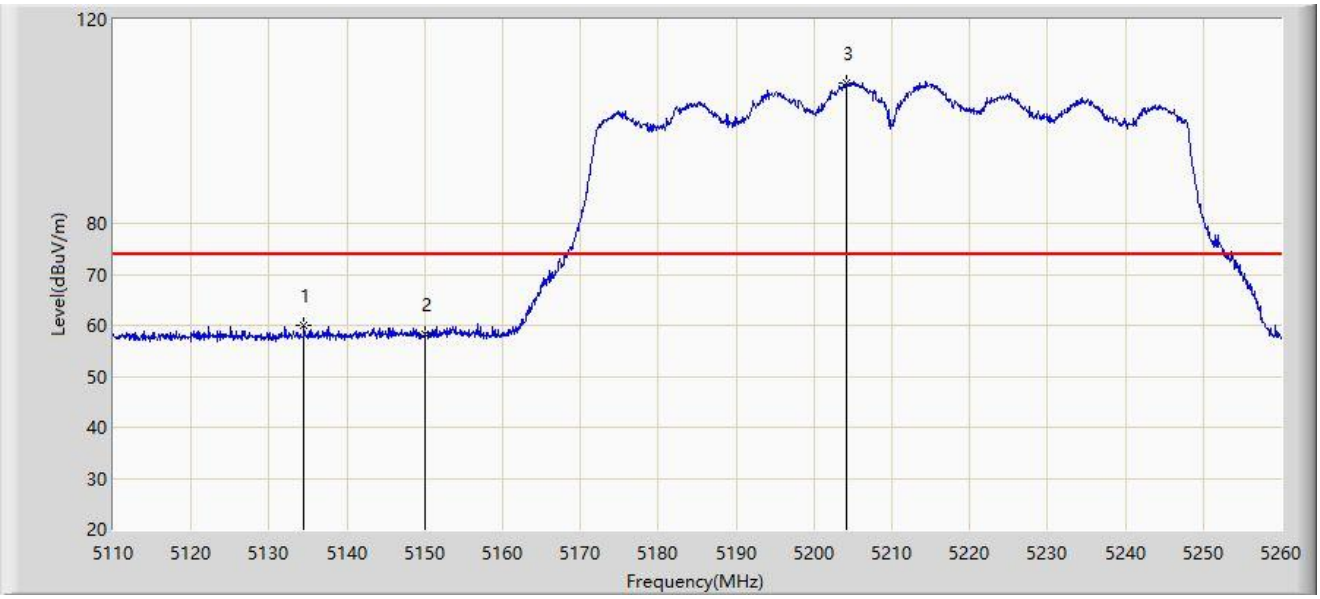
Note 1: " * ", means this data is the worst emission level.

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

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

L11UG-5HaxD-NB-US + Omni antenna:

Site: WZ-AC2	Test Date: 2024-02-05 - 16:38
Limit: FCC_5G_RE(3m)	Engineer: Dick Shen
Probe: BBHA9120D_1457_1-18GHz	Polarity: Vertical
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT80 at 5210MHz	



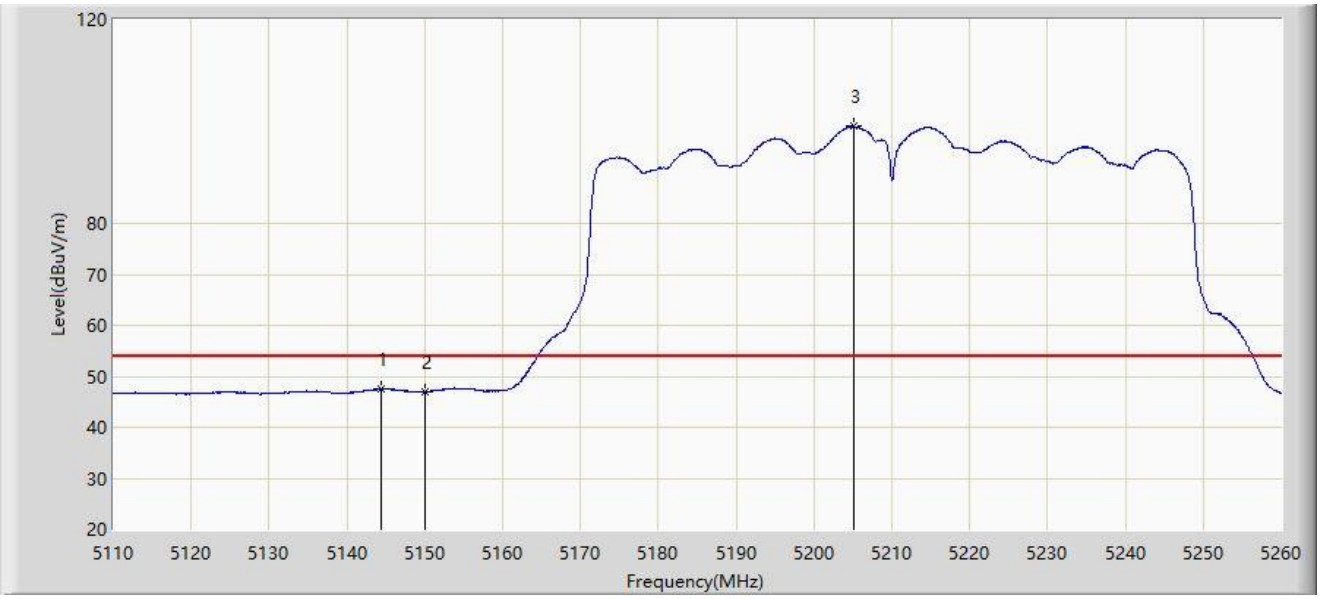
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	5134.525	60.089	56.784	-13.911	74.000	3.306	PK
2		5150.000	58.348	54.866	-15.652	74.000	3.482	PK
3		5204.200	107.680	104.806	N/A	N/A	2.874	PK

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) - Pre_Amplifier Gain (dB).

Site: WZ-AC2	Test Date: 2024-02-05 - 16:40
Limit: FCC_5G_RE(3m)	Engineer: Dick Shen
Probe: BBHA9120D_1457_1-18GHz	Polarity: Vertical
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT80 at 5210MHz	



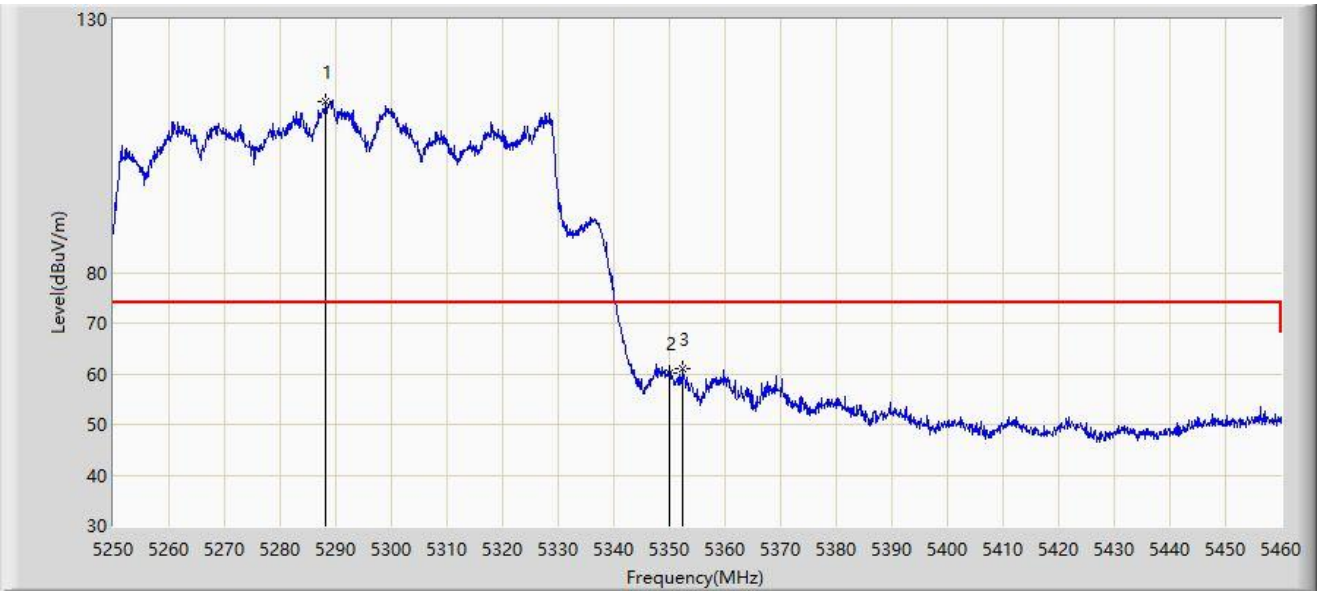
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1	*	5144.350	47.492	44.063	**-6.508**	54.000	3.429	AV
2		5150.000	46.979	43.497	-7.021	54.000	3.482	AV
3		5205.100	99.042	96.164	N/A	N/A	2.878	AV

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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-05 - 16:13
Limit: FCC_5G_RE(3m)	Engineer: Justin Guo
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ax-HE80 at 5290MHz	



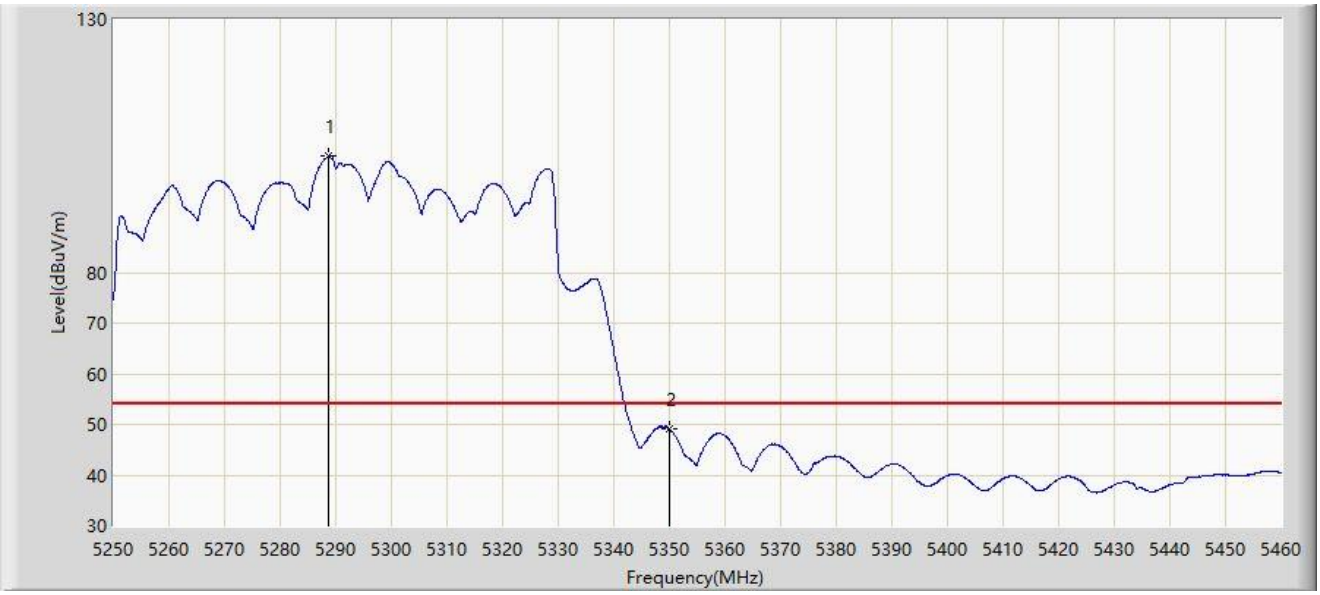
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		5288.220	113.898	74.413	N/A	N/A	39.485	PK
2		5350.000	60.055	61.459	-13.945	74.000	-1.404	PK
3	*	5352.480	60.988	63.437	-13.012	74.000	-2.449	PK

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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-05 - 16:26
Limit: FCC_5G_RE(3m)	Engineer: Justin Guo
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ax-HE80 at 5290MHz	



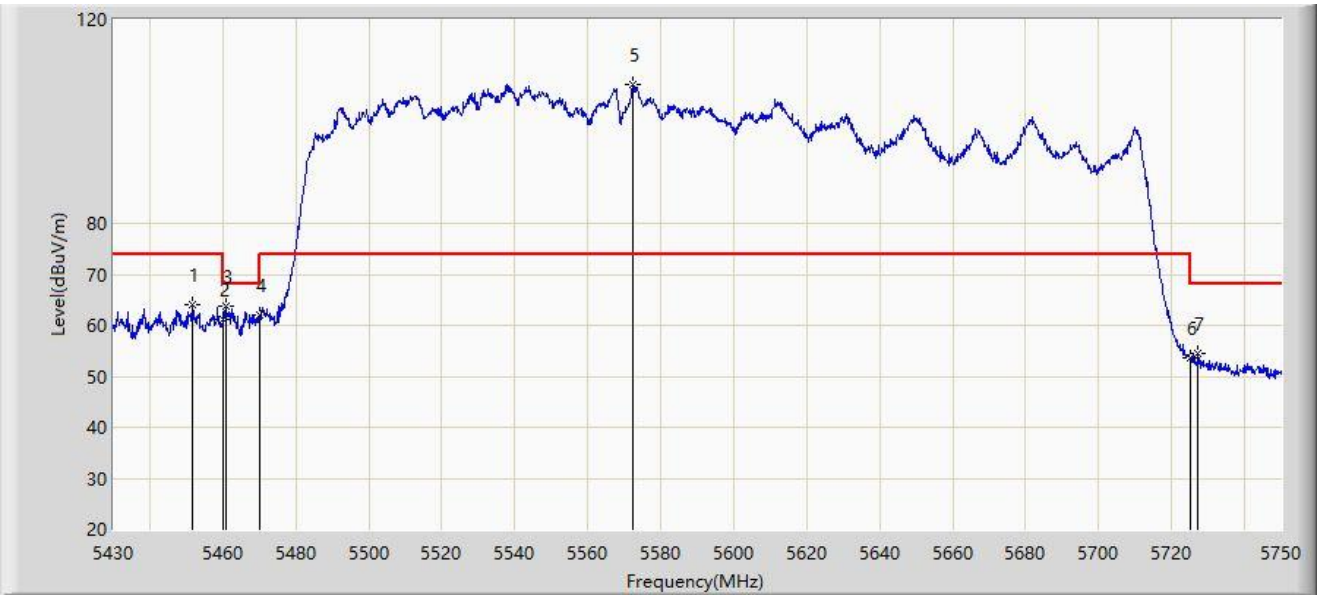
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		5288.745	102.959	63.768	N/A	N/A	39.190	AV
2	*	5350.000	49.066	50.470	**-4.934**	54.000	-1.404	AV

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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-02 - 11:46
Limit: FCC_5G_RE(3m)	Engineer: Arvin Ding
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT160 at 5570MHz	



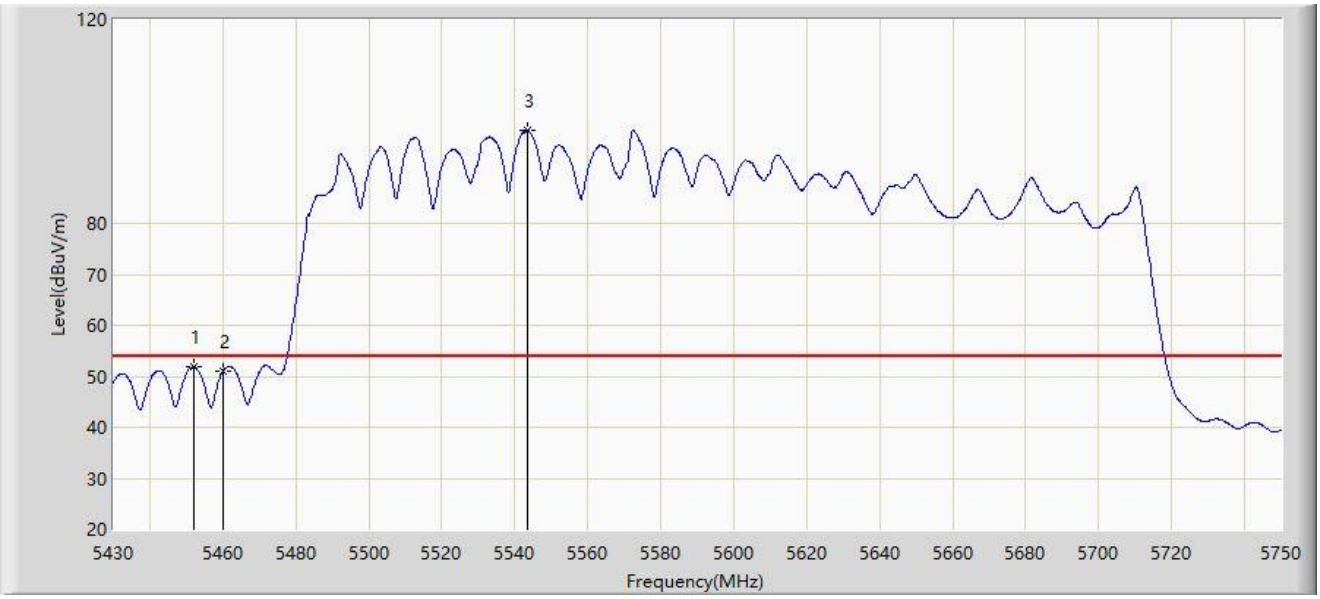
No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		5451.600	64.003	67.864	-9.997	74.000	-3.861	PK
2		5460.000	61.195	64.538	-7.005	68.200	-3.343	PK
3	*	5460.720	63.802	67.151	-4.398	68.200	-3.348	PK
4		5470.000	62.061	63.671	-6.139	68.200	-1.610	PK
5		5572.400	107.117	60.482	N/A	N/A	46.635	PK
6		5725.000	53.678	55.513	-14.522	68.200	-1.836	PK
7		5727.280	54.609	57.516	-13.591	68.200	-2.906	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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-02 - 11:25
Limit: FCC_5G_RE(3m)	Engineer: Arvin Ding
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT160 at 5570MHz	



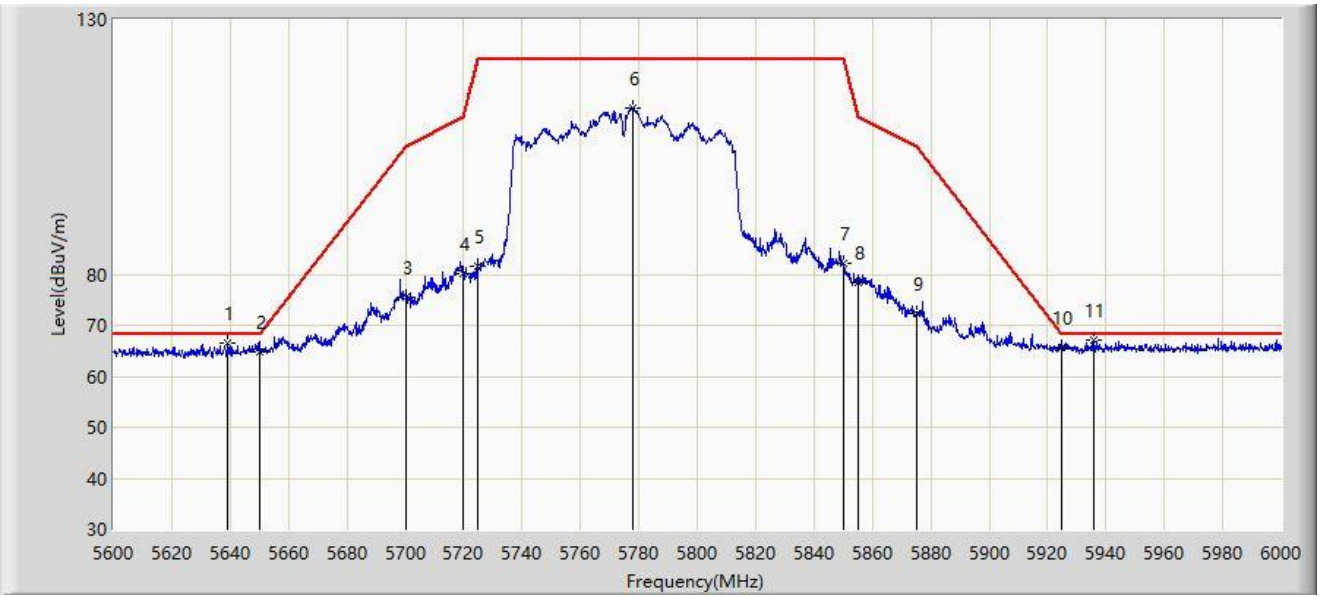
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	5452.240	51.846	55.676	**-2.154**	54.000	-3.830	AV
2		5460.000	51.012	54.355	-2.988	54.000	-3.343	AV
3		5543.440	98.182	59.100	N/A	N/A	39.083	AV

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) - Pre_Amplifier Gain (dB).

Site: SIP-AC3	Test Date: 2024-02-02 - 11:55
Limit: FCC_5.8G_RE(3m)	Engineer: Arvin Ding
Probe: HF907_102861_1-18GHz	Polarity: Horizontal
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11ac-VHT80 at 5775MHz	



No	Mark	Frequency (MHz)	Measure Level (dBµV/m)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV/m)	Factor (dB/m)	Type
1		5639.200	66.449	73.771	-1.751	68.200	-7.322	PK
2		5650.000	64.797	72.117	-3.403	68.200	-7.319	PK
3		5700.000	75.603	82.777	-29.597	105.200	-7.174	PK
4		5720.000	80.157	87.629	-30.643	110.800	-7.472	PK
5		5725.000	81.553	89.014	-40.647	122.200	-7.461	PK
6		5778.000	112.742	120.126	N/A	N/A	-7.384	PK
7		5850.000	82.262	89.499	-39.938	122.200	-7.237	PK
8		5855.000	78.440	85.658	-32.360	110.800	-7.217	PK
9		5875.000	72.266	79.618	-32.934	105.200	-7.352	PK
10		5925.000	65.763	72.889	-2.437	68.200	-7.126	PK
11	*	5935.600	67.146	74.204	**-1.054**	68.200	-7.058	PK

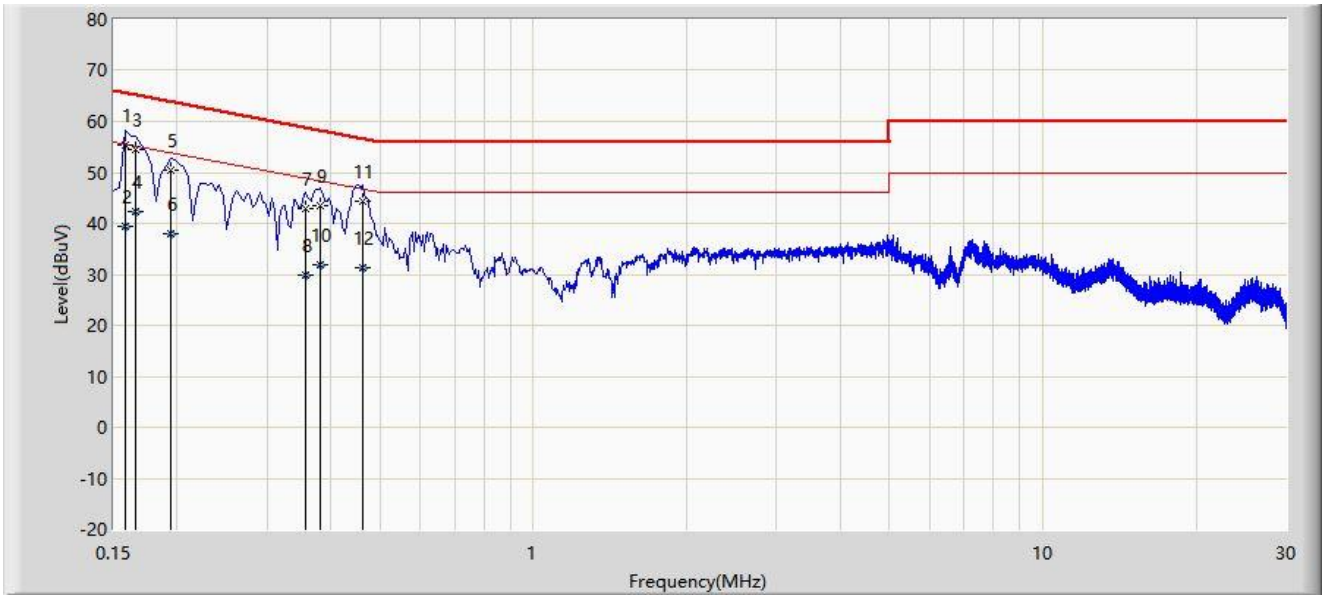
Note 1: " * ", means this data is the worst emission level.

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

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

A.8 AC Conducted Emissions Test Result

Site: WZ-SR2	Test Date: 2024-01-22
Temperature: 16.1°C	Humidity: 36%
Limit: FCC_Part15.207_CE_AC Power	Engineer: Linda Wei
Probe: ENV216_101683_Filter Off_E	Polarity: Line
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11a at channel 5825MHz	



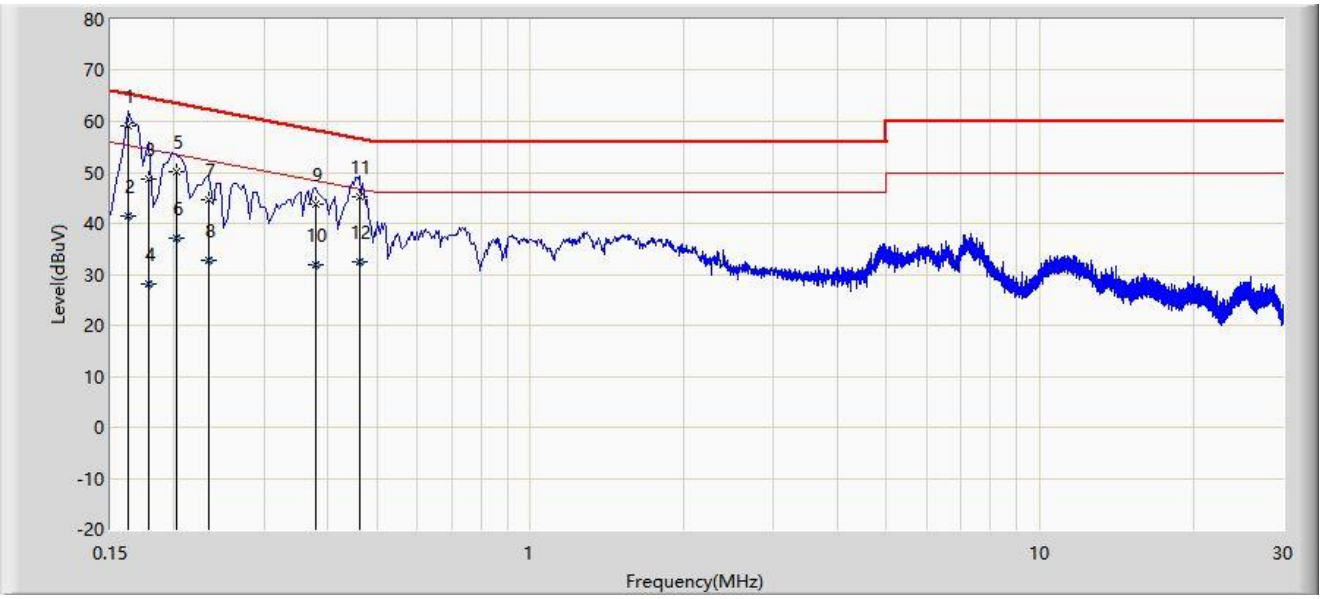
No	Mark	Frequency (MHz)	Measure Level (dBµV)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV)	Factor (dB)	Type
1	*	0.158	55.382	45.613	-10.186	65.568	9.770	QP
2		0.158	39.443	29.673	-16.126	55.568	9.770	AV
3		0.166	54.439	44.666	-10.719	65.158	9.773	QP
4		0.166	42.263	32.490	-12.895	55.158	9.773	AV
5		0.194	50.545	40.760	-13.319	63.864	9.785	QP
6		0.194	38.014	28.229	-15.850	53.864	9.785	AV
7		0.358	42.936	33.081	-15.838	58.775	9.855	QP
8		0.358	29.903	20.048	-18.871	48.775	9.855	AV
9		0.382	43.464	33.597	-14.772	58.236	9.867	QP
10		0.382	31.906	22.038	-16.330	48.236	9.867	AV
11		0.462	44.358	34.447	-12.299	56.657	9.910	QP
12		0.462	31.250	21.339	-15.406	46.657	9.910	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: 2024-01-22
Temperature: 16.1°C	Humidity: 36%
Limit: FCC_Part15.207_CE_AC Power	Engineer: Linda Wei
Probe: ENV216_101683_Filter Off_E	Polarity: Neutral
EUT: L11UG-5HaxD-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11a at channel 5825MHz	



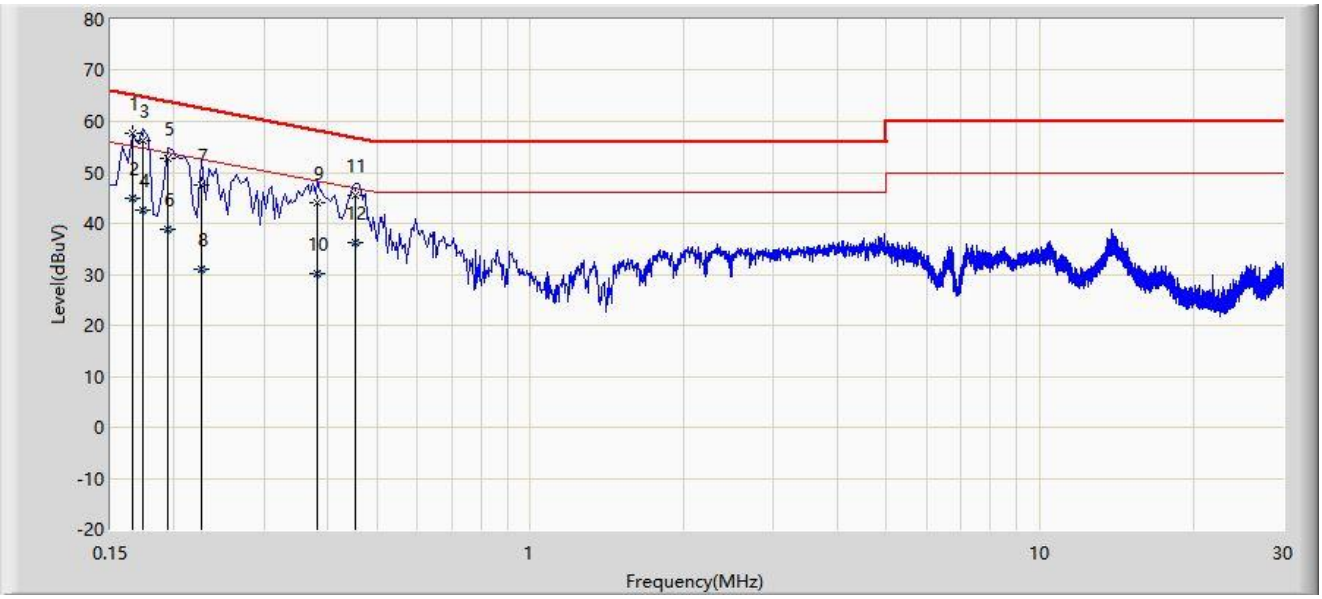
No	Mark	Frequency (MHz)	Measure Level (dBµV)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV)	Factor (dB)	Type
1	*	0.162	58.989	49.213	-6.372	65.361	9.777	QP
2		0.162	41.556	31.779	-13.805	55.361	9.777	AV
3		0.178	48.637	38.857	-15.941	64.578	9.780	QP
4		0.178	28.188	18.408	-26.391	54.578	9.780	AV
5		0.202	50.256	40.468	-13.272	63.528	9.788	QP
6		0.202	37.092	27.303	-16.436	53.528	9.788	AV
7		0.234	44.750	34.948	-17.557	62.307	9.802	QP
8		0.234	32.613	22.812	-19.693	52.307	9.802	AV
9		0.378	43.810	33.939	-14.513	58.323	9.871	QP
10		0.378	31.867	21.995	-16.457	48.323	9.871	AV
11		0.462	45.289	35.368	-11.368	56.657	9.920	QP
12		0.462	32.516	22.595	-14.141	46.657	9.920	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: 2024-01-22
Temperature: 16.1°C	Humidity: 36%
Limit: FCC_Part15.207_CE_AC Power	Engineer: Linda Wei
Probe: ENV216_101683_Filter Off_E	Polarity: Line
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11a at channel 5825MHz	



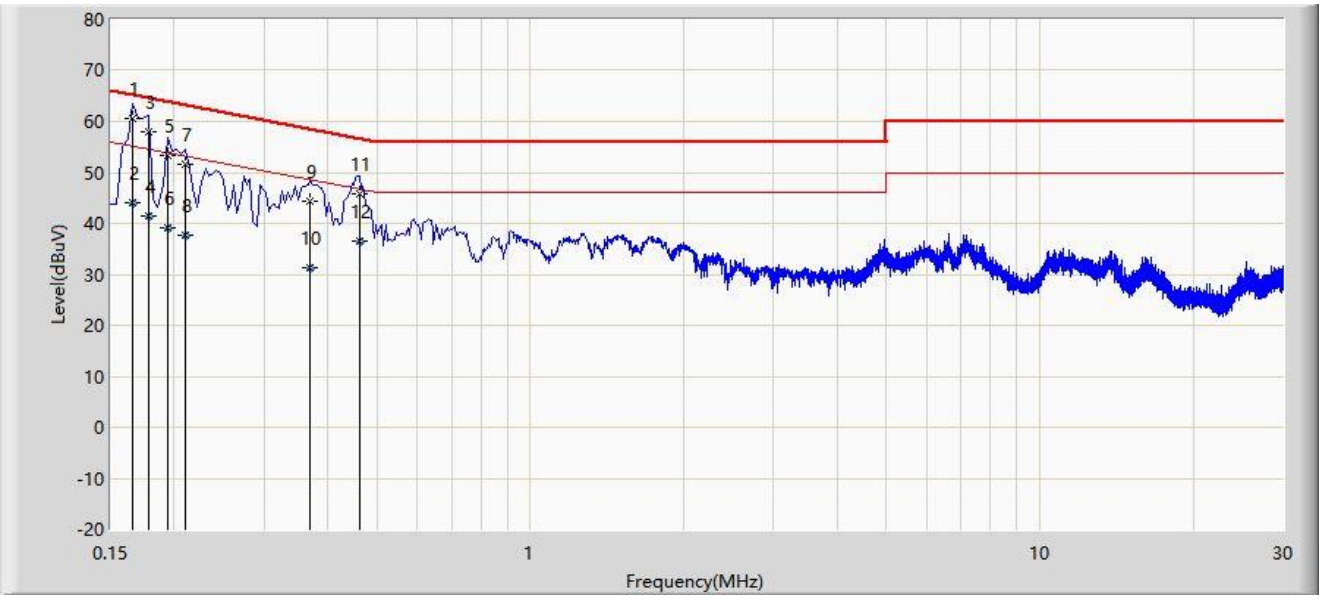
No	Mark	Frequency (MHz)	Measure Level (dBµV)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV)	Factor (dB)	Type
1	*	0.166	57.616	47.843	-7.542	65.158	9.773	QP
2		0.166	44.850	35.077	-10.308	55.158	9.773	AV
3		0.174	56.310	46.534	-8.457	64.767	9.777	QP
4		0.174	42.474	32.698	-12.293	54.767	9.777	AV
5		0.194	52.816	43.031	-11.047	63.864	9.785	QP
6		0.194	38.789	29.004	-15.075	53.864	9.785	AV
7		0.226	47.531	37.733	-15.064	62.595	9.798	QP
8		0.226	31.149	21.351	-21.446	52.595	9.798	AV
9		0.382	44.110	34.242	-14.126	58.236	9.867	QP
10		0.382	30.230	20.363	-18.006	48.236	9.867	AV
11		0.454	45.545	35.638	-11.257	56.802	9.907	QP
12		0.454	36.227	26.321	-10.575	46.802	9.907	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: 2024-01-22
Temperature: 16.1°C	Humidity: 36%
Limit: FCC_Part15.207_CE_AC Power	Engineer: Linda Wei
Probe: ENV216_101683_Filter Off_E	Polarity: Neutral
EUT: L11UG-5HaxD-NB-US	Power: AC 120V/60Hz
Test Mode: Transmit by 802.11a at channel 5825MHz	



No	Mark	Frequency (MHz)	Measure Level (dBµV)	Reading Level (dBµV)	Margin (dB)	Limit (dBµV)	Factor (dB)	Type
1	*	0.166	60.469	50.691	-4.689	65.158	9.778	QP
2		0.166	43.942	34.164	-11.217	55.158	9.778	AV
3		0.178	57.885	48.105	-6.693	64.578	9.780	QP
4		0.178	41.315	31.534	-13.264	54.578	9.780	AV
5		0.194	53.221	43.436	-10.643	63.864	9.785	QP
6		0.194	39.228	29.443	-14.636	53.864	9.785	AV
7		0.210	51.454	41.663	-11.751	63.205	9.792	QP
8		0.210	37.557	27.765	-15.649	53.205	9.792	AV
9		0.370	44.203	34.337	-14.298	58.501	9.866	QP
10		0.370	31.444	21.579	-17.057	48.501	9.866	AV
11		0.462	45.821	35.901	-10.835	56.657	9.920	QP
12		0.462	36.393	26.472	-10.263	46.657	9.920	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 “2308RSU087-UT” file.

Appendix C – EUT Photograph

Refer to “2308RSU087-UE” file.

The End