FCC RADIO TEST REPORT

FCC ID	:	**2A4DH-3284**
Equipment	:	**Digital Media Receiver**
Model Name	:	**CL32P4**
Applicant	:	**Amazon.com Services LLC** **410 Terry Avenue N, Seattle, WA 98109-5210 United States**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Dec. 18, 2023 and testing was performed from Dec. 22, 2023 to Feb. 19, 2024. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

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History of this test report

Report No.	Version	Description	Issue Date
FR362718-01E	01	Initial issue of report	Mar. 27, 2024
FR362718-01E	02	Revise Test Mode and Support Unit used in test configuration and system. This report is an updated version, replacing the report issued on Mar. 27, 2024.	Apr. 16, 2024
FR362718-01E	03	Revise List of Measuring Equipment. This report is an updated version, replacing the report issued on Apr. 16, 2024.	May 03, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403(i)	6dB & 26dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407(a)	Maximum Conducted Output Power	Pass	-
3.3	15.407(a)	Power Spectral Density	Pass	-
3.4	15.407(b)	Unwanted Emissions	Pass	-
3.5	15.207	AC Conducted Emission	Pass	-
3.6	15.407(c)	Automatically Discontinue Transmission	Pass	-
3.7	15.203	Antenna Requirement	Pass	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”.

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Alan Liu

Report Producer: Wilda Wei

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Digital Media Receiver
Model Name	CL32P4
FCC ID	2A4DH-3284
EUT supports Radios application	WLAN 802.11b/g/n HT20 WLAN 802.11a/n HT20/HT40 WLAN 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE

1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power to antenna	**MIMO <Ant. 0+1>** 802.11a: 18.22 dBm / 0.0664 W 802.11n HT20: 18.10 dBm / 0.0646 W 802.11n HT40: 18.09 dBm / 0.0644 W 802.11ac VHT20: 18.01 dBm / 0.0632 W 802.11ac VHT40: 18.01 dBm / 0.0632 W 802.11ac VHT80: 17.61 dBm / 0.0577 W
99% Occupied Bandwidth	**MIMO <Ant. 0>** 802.11a: 16.78 MHz 802.11n HT20: 17.78MHz 802.11n HT40: 36.56 MHz 802.11ac VHT80: 75.40 MHz **MIMO <Ant. 1>** 802.11a: 16.68 MHz 802.11n HT20: 17.68MHz 802.11n HT40: 36.46 MHz 802.11ac VHT80: 75.40 MHz
Antenna Function Description	

	Ant. 0	Ant. 1
802.11 a/n/ac MIMO	V	V

Product Specification is subject to this standard	
Antenna Type / Gain	**<Ant. 0> :** Printed PCB Loop Antenna with gain 1.5 dBi **<Ant. 1> :** Printed PCB Loop Antenna with gain 3.5 dBi
Type of Modulation	802.11a/n : OFDM (BPSK/QPSK/16QAM/64QAM) 802.11ac : OFDM (BPSK/QPSK/16QAM/64QAM/256QAM)

Remark:

1. MIMO Ant. 0+1 Directional Gain is a calculated result from MIMO Ant. 0 and MIMO Ant. 1. The formula used in calculation is documented in section 1.2.1.
2. Power of MIMO Ant. 0 + Ant. 1 is a calculated result from sum of the power MIMO Ant. 0 and MIMO Ant. 1.

1.2.1 Antenna Directional Gain

<For CDD Mode>

Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)ii)

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows:

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

G_{ANT} is set equal to the gain of the antenna having the highest gain.

For PSD measurements, the directional gain calculation.

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

As minimum N_{SS}=1 is supported by EUT, the formula can be simplified as:

Directional gain = $10*\log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}]$ dBi

Where G1, G2….GN denote single antenna gain.

The directional gain "DG" is calculated as following table.

	Ant 0 (dBi)	Ant 1 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band IV	1.50	3.50	3.50	5.57	0.00	0.00

Calculation example:

If a device has two antenna, G_{ANT0}= 1.5dBi; G_{ANT1}=3.5dBi

Directional gain of power measurement = max(1.5, 3.5) + 0 = 3.5 dBi

Directional gain of PSD derived from formula which is

10 x log { { [10^ (1.5 dBi / 20) + 10^ (3.5 dBi / 20)] ^ 2 } / 2 }

= 5.57 dBi

Power and PSD limit reduction = Composite gain – 6dBi, (min = 0)

1.3 Modification of EUT

No modifications made to the EUT during the testing.

1.4 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	CO05-HY (TAF Code: 1190)
Remark	The AC Conducted Emission test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory

Note: The test site complies with ANSI C63.4 2014 requirement.

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	TH05-HY, 03CH11-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW3786

1.5 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find Z plane with Notebook as worst plane.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155#	5775	165	5825

Note:

1. The above Frequency and Channel with "*" are 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel with "#" are 802.11ac VHT80.

2.2 Test Mode

The SISO mode conducted power is covered by MIMO mode per chain, so only the MIMO mode is tested.

The power for 802.11ac mode is smaller than 802.11n mode, so all other conducted and radiated test is covered by 802.11n mode.

The final test modes include the worst data rates for each modulation shown in the table below.

MIMO Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0
802.11ac VHT80	MCS0

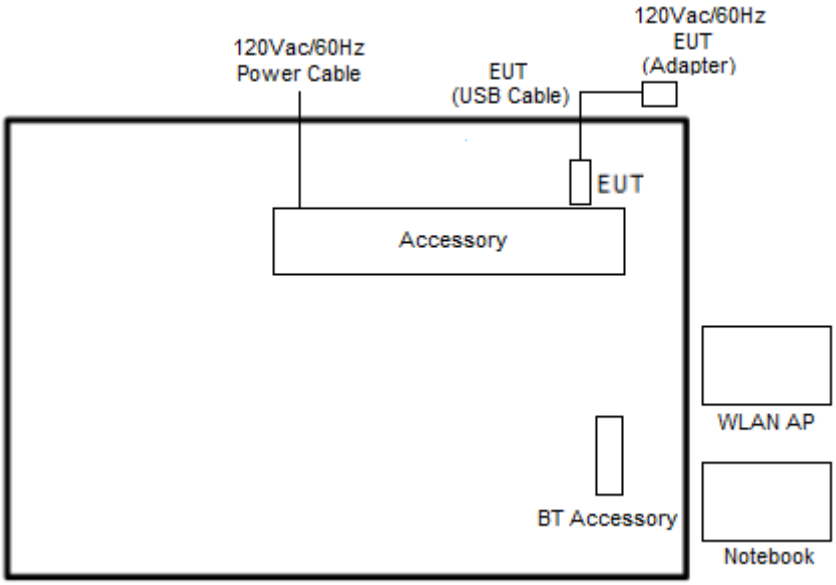
Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + Bluetooth Link + USB Cable1 (Charging from Adapter (FANA7R)) + Without Extender + Video mode
Remark: For Radiated Test Cases, the tests were performed with USB Cable 1.	

Ch. #		Band IV：5725-5850 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

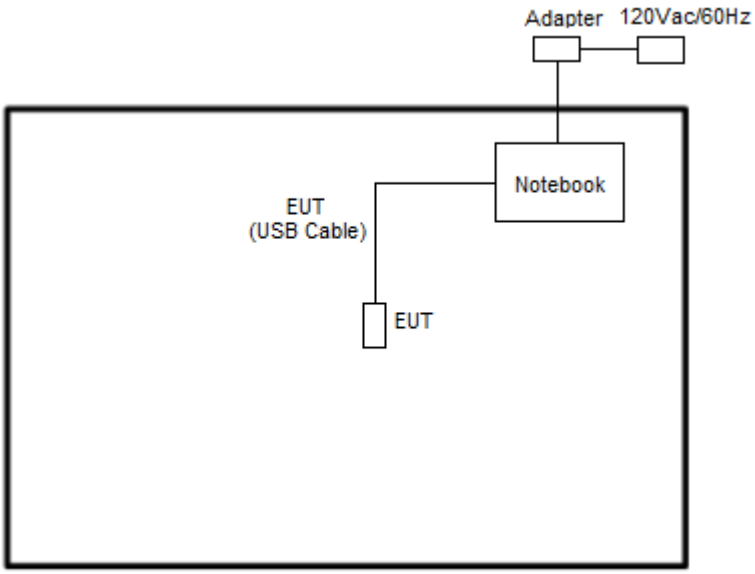
Remark: For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



<WLAN Tx Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,1.8m
2.	Notebook	DELL	Latitude 3420	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Accessory	Sharp	LC-50UA6800T	FCC DoC	N/A	Unshielded,1.8m
5.	BT Accessory	Amazon	PA38CA	2A4DH-3832	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “Compliance 1.0.1.25” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

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

26dB and 99% Occupied bandwidth are reporting only.

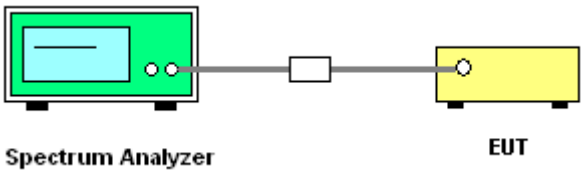
3.1.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth for the band 5.725-5.85 GHz
2. Set RBW = 100 kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 26dB and 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

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

3.2.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.2.3 Test Procedures

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter.
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section F) Maximum power spectral density.

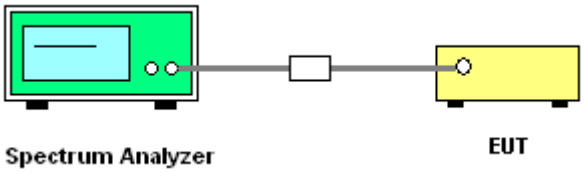
 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300kHz.
- Set VBW ≥ 1 MHz.
- Add 10 log (500 kHz/RBW) to the measured result, whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- 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. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT is connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
   Method (c): Measure and add 10 log(N_{ANT}) dB.
   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit. The addition of 10 log(N_{ANT}) dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}$ th of the PSD limit.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5.725-5.85 GHz band:

15.407(b)(4)(i) 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.

(2) Unwanted spurious emissions falls in restricted bands shall comply with the general field strength limits as below table,

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

(3) KDB789033 D02 v02r01 G)2)c)

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of −27 dBm/MHz.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

3.4.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000 MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

   (3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT is arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin

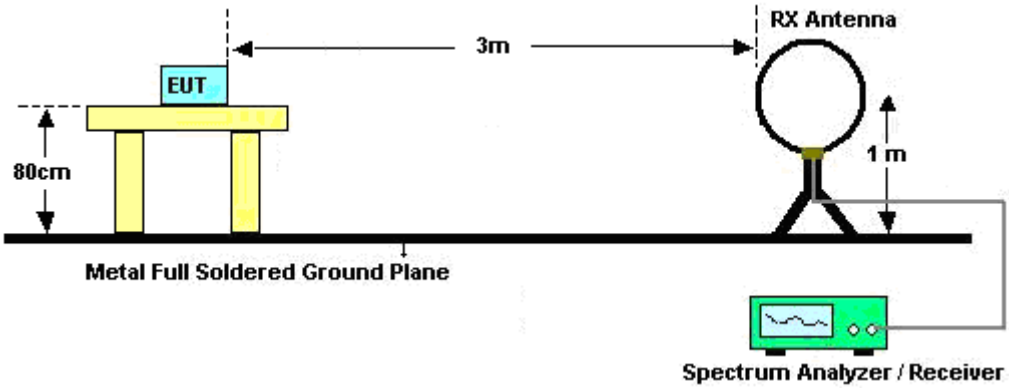
against QP limit line, the position is marked as "-".

7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies.

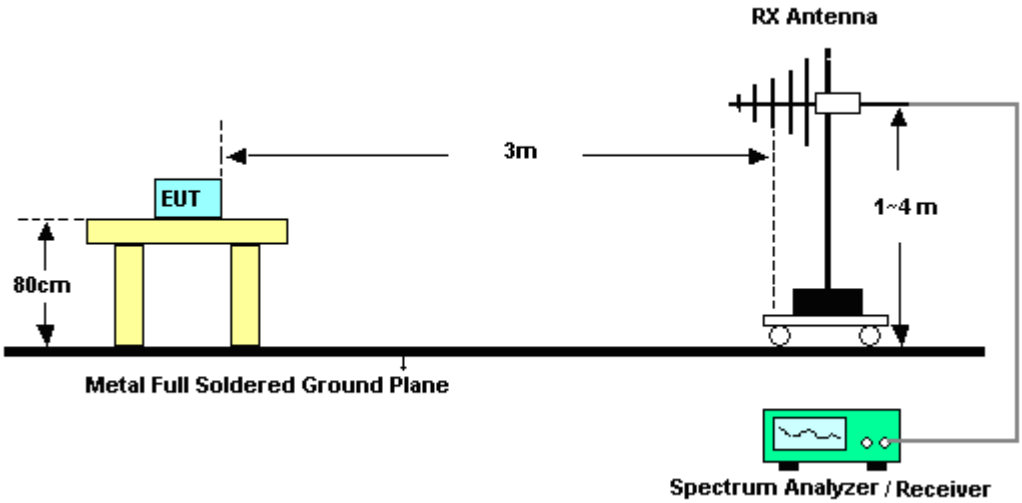
   When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as "-".

3.4.4 Test Setup

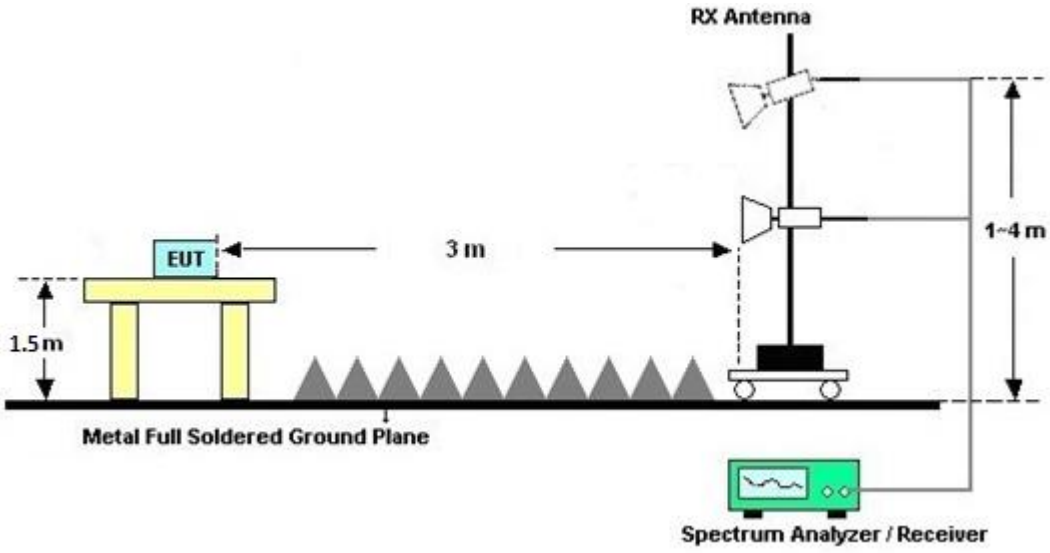
For radiated emissions below 30MHz



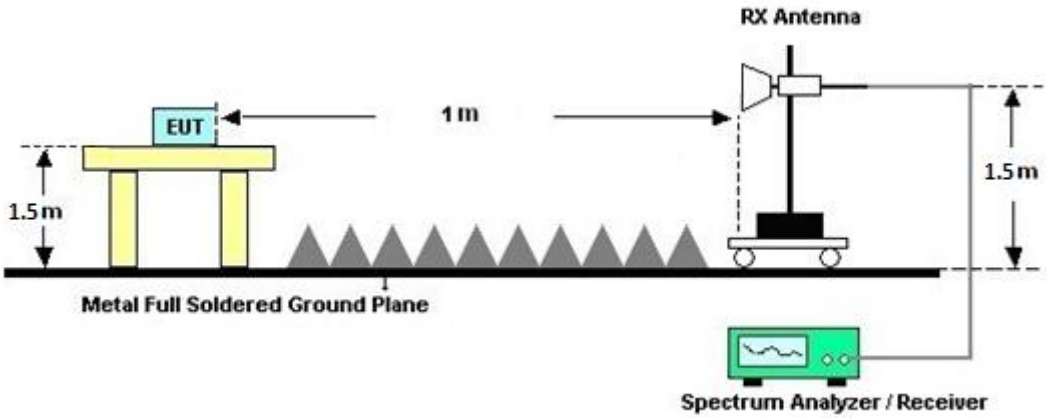
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



3.4.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix C and D.

3.4.7 Duty Cycle

Please refer to Appendix E.

3.4.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

3.5 AC Conducted Emission Measurement

3.5.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

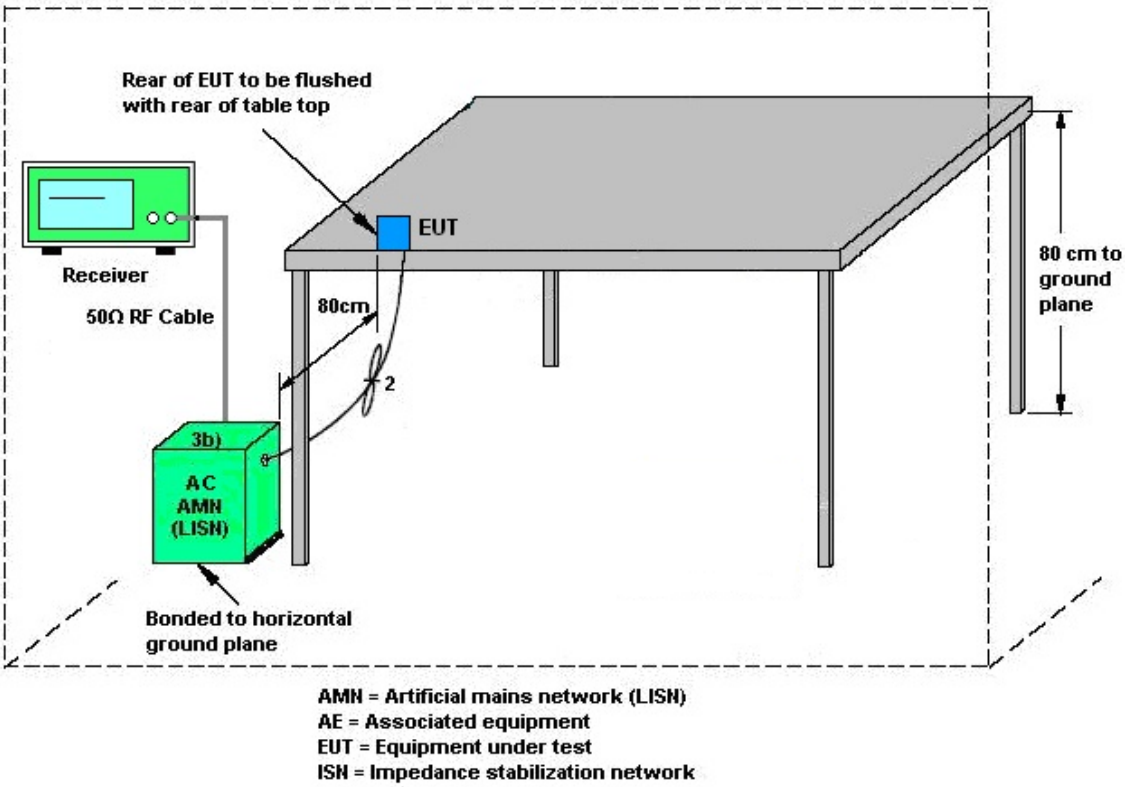
3.5.2 Measuring Instruments

Please refer to the measuring equipment list in this test report.

3.5.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Result of Automatically Discontinue Transmission

EUT is verified this characteristic during the function check of normal sample associated with an access point:

A. Information start: make EUT supply information to the access point.

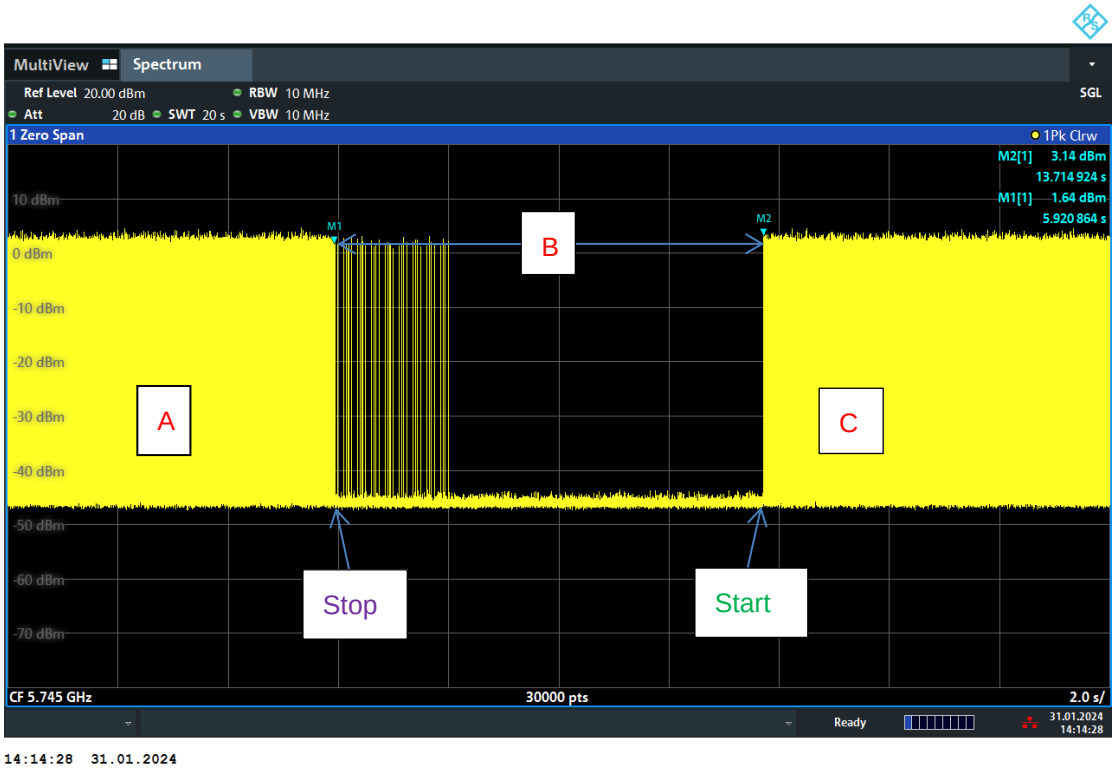
B. Information stop: stop supplying information to the access point.

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving.

C. Information start: make EUT supply information to the access point again.

The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

5745MHz



Note: The control / signalling information during the period B is precluded.

3.7 Antenna Requirements

3.7.1 Standard Applicable

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 rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 07, 2023	Dec. 22, 2023~ Feb. 05, 2024	Oct. 06, 2024	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Dec. 22, 2023~ Feb. 05, 2024	Sep. 11, 2024	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Aug. 17, 2023	Dec. 22, 2023~ Feb. 05, 2024	Aug. 16, 2024	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	1223	18GHz~40GHz	Jul. 10, 2023	Dec. 22, 2023~ Feb. 05, 2024	Jul. 09, 2024	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 08, 2023	Dec. 22, 2023~ Feb. 05, 2024	Dec. 07, 2024	Radiation (03CH11-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-10M-7000-MR	EC1900245	10MHz-7GHz	Jan. 10, 2023	Dec. 22, 2023~ Jan. 08, 2024	Jan. 09, 2024	Radiation (03CH11-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-10M-7000-MR	EC1900245	10MHz-7GHz	Jan. 09, 2024	Jan. 09, 2024~ Feb. 05, 2024	Jan. 08, 2025	Radiation (03CH11-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055007	1GHz~18GHz	Jun. 14, 2023	Dec. 22, 2023~ Feb. 05, 2024	Jun. 13, 2024	Radiation (03CH11-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 27, 2023	Dec. 22, 2023~ Feb. 05, 2024	Jun. 26, 2024	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 05, 2023	Dec. 22, 2023~ Feb. 05, 2024	Oct. 04, 2024	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY55420170	20MHz~8.4GHz	Aug. 02, 2023	Dec. 22, 2023~ Feb. 05, 2024	Aug. 01, 2024	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Dec. 22, 2023~ Feb. 05, 2024	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Dec. 22, 2023~ Feb. 05, 2024	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Dec. 22, 2023~ Feb. 05, 2024	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001053	N/A	N/A	Dec. 22, 2023~ Feb. 05, 2024	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY1595/2	30MHz~40GHz	Mar. 07, 2023	Dec. 22, 2023~ Feb. 05, 2024	Mar. 06, 2024	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz~40GHz	Mar. 07, 2023	Dec. 22, 2023~ Feb. 05, 2024	Mar. 06, 2024	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9K~30M	Mar. 07, 2023	Dec. 22, 2023~ Feb. 05, 2024	Mar. 06, 2024	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	30M~40G	Mar. 07, 2023	Dec. 22, 2023~ Feb. 05, 2024	Mar. 06, 2024	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN11	1.53G Low Pass	Sep. 11, 2023	Dec. 22, 2023~ Feb. 05, 2024	Sep. 10, 2024	Radiation (03CH11-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40SS	SN3	6.75GHz High Pass Filter	Sep. 11, 2023	Dec. 22, 2023~ Feb. 05, 2024	Sep. 10, 2024	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTM-303B	TP140325	N/A	Dec. 08, 2023	Dec. 22, 2023~ Feb. 05, 2024	Dec. 07, 2024	Radiation (03CH11-HY)
Attenuator	HONOVA	5910 SMA-50-005	0028	N/A	Jul. 10, 2023	Dec. 22, 2023~ Feb. 05, 2024	Jul. 09, 2024	Radiation (03CH11-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Feb. 19, 2024	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 06, 2023	Feb. 19, 2024	Dec. 05, 2024	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Oct. 26, 2023	Feb. 19, 2024	Oct. 25, 2024	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 08, 2023	Feb. 19, 2024	Dec. 07, 2024	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 22, 2023	Feb. 19, 2024	Nov. 21, 2024	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Feb. 19, 2024	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Jul. 28, 2023	Feb. 19, 2024	Jul. 27, 2024	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 28, 2023	Feb. 19, 2024	Dec. 27, 2024	Conduction (CO05-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 07. 2023	Jan. 08, 2024~ Feb. 02, 2024	Nov. 06, 2024	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	17I00015SNO37 (NO:167)	10MHz~6GHz	Dec. 01, 2023	Jan. 08, 2024~ Feb. 02, 2024	Nov. 30, 2024	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	17I00015SNO35 (NO:109)	10MHz~6GHz	Jan. 11, 2023	Jan. 08, 2024~ Jan. 09, 2024	Jan. 10, 2024	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	17I00015SNO35 (NO:109)	10MHz~6GHz	Jan. 15, 2024	Feb. 02, 2024	Jan. 14, 2025	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101397	10Hz ~ 40GHz	Aug. 31, 2023	Jan. 08, 2024~ Feb. 02, 2024	Aug. 30, 2024	Conducted (TH05-HY)
Switch Control Mainframe	E-Instument	ETF-1405-0	EC1900067 (BOX7)	N/A	Jul. 10, 2023	Jan. 08, 2024~ Feb. 02, 2024	Jul. 09, 2024	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV3013	101550	10Hz~13.6GHz	Jan. 22, 2024	Jan. 31, 2024	Jan. 21, 2025	DFS (DF02-HY)

5 Measurement Uncertainty

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.50 dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.10 dB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 6000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.30 dB

Uncertainty of Radiated Emission Measurement (6000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.30 dB

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.30 dB

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Ching Chen and Kevin Xiao	Temperature:	21~25	°C
Test Date:	2024/01/08~2024/02/02	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 26dB EBW and 99% OBW

U-NII-3 MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 0	Ant 1	Ant 0	Ant 1	Ant 0	Ant 1		
11a	6Mbps	2	149	5745	16.78	16.63	20.28	20.42	16.34	16.34	0.5	Pass
11a	6Mbps	2	157	5785	16.78	16.68	20.43	20.34	16.34	16.34	0.5	Pass
11a	6Mbps	2	165	5825	16.78	16.53	20.28	20.38	16.33	16.34	0.5	Pass
HT20	MCS0	2	149	5745	17.78	17.63	21.54	20.38	17.59	17.56	0.5	Pass
HT20	MCS0	2	157	5785	17.78	17.68	20.64	20.53	17.57	17.59	0.5	Pass
HT20	MCS0	2	165	5825	17.73	17.63	20.59	20.43	17.58	17.60	0.5	Pass
HT40	MCS0	2	151	5755	36.56	36.36	41.84	41.52	36.33	36.32	0.5	Pass
HT40	MCS0	2	159	5795	36.56	36.46	42.10	41.47	36.33	35.92	0.5	Pass
VHT80	MCS0	2	155	5775	75.40	75.40	81.95	80.90	76.35	76.35	0.5	Pass

TEST RESULTS DATA
Average Power Table

U-NII-3 MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1	
11a	6Mbps	2	149	5745	15.22	14.96	18.10	30.00		3.50		Pass
11a	6Mbps	2	157	5785	15.22	15.19	18.22	30.00		3.50		Pass
11a	6Mbps	2	165	5825	14.67	15.16	17.93	30.00		3.50		Pass
HT20	MCS0	2	149	5745	15.12	15.06	18.10	30.00		3.50		Pass
HT20	MCS0	2	157	5785	15.03	15.04	18.05	30.00		3.50		Pass
HT20	MCS0	2	165	5825	14.66	15.12	17.91	30.00		3.50		Pass
HT40	MCS0	2	151	5755	15.09	15.06	18.09	30.00		3.50		Pass
HT40	MCS0	2	159	5795	15.05	14.93	18.00	30.00		3.50		Pass
VHT20	MCS0	2	149	5745	15.00	14.82	17.92	30.00		3.50		Pass
VHT20	MCS0	2	157	5785	15.00	15.00	18.01	30.00		3.50		Pass
VHT20	MCS0	2	165	5825	14.60	15.10	17.87	30.00		3.50		Pass
VHT40	MCS0	2	151	5755	15.00	15.00	18.01	30.00		3.50		Pass
VHT40	MCS0	2	159	5795	15.00	14.90	17.96	30.00		3.50		Pass
VHT80	MCS0	2	155	5775	14.70	14.50	17.61	30.00		3.50		Pass

TEST RESULTS DATA
Power Spectral Density

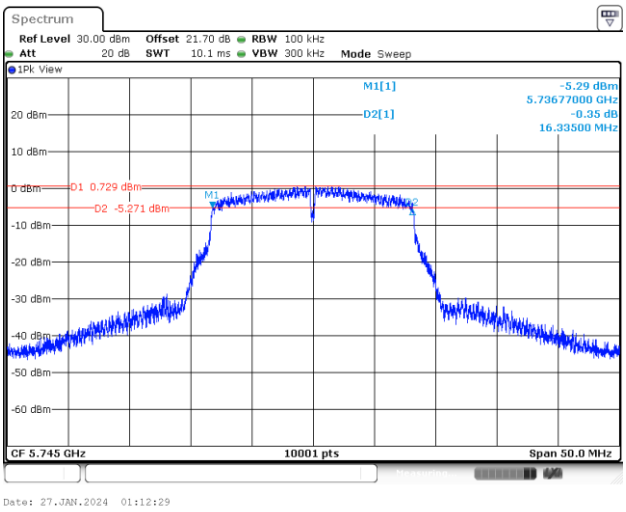
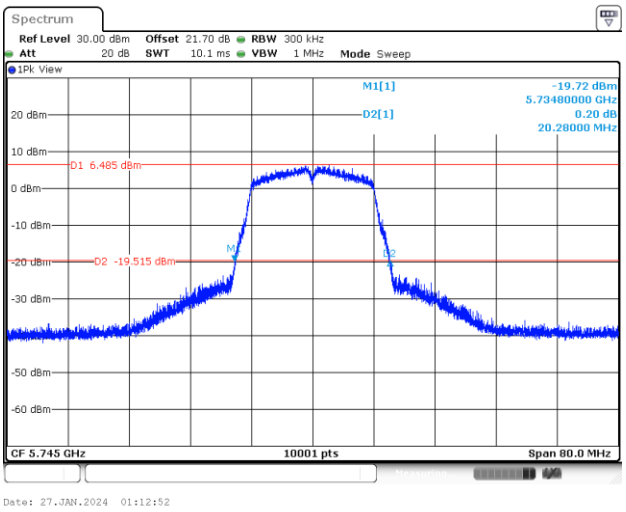
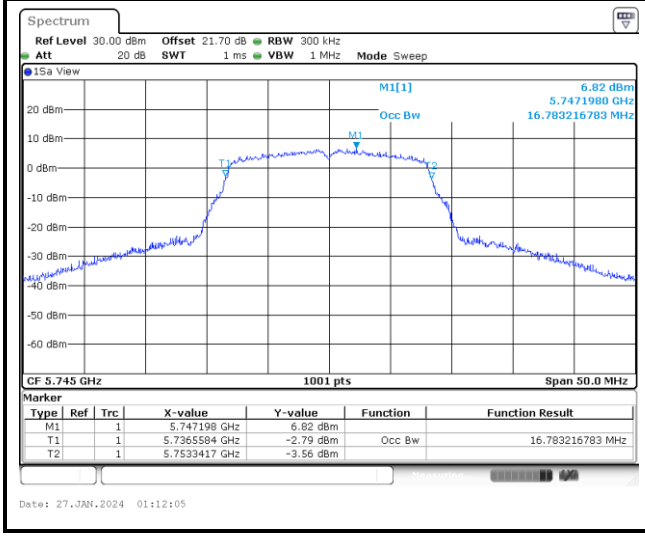
U-NII-3 MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density with Duty Factor (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 0	Ant 1	Ant 0	Ant 1	Ant 0	Ant 1	SUM	Ant 0	Ant 1	Ant 0	Ant 1	
11a	6Mbps	2	149	5745	0.00	0.00	2.22		1.32	1.43	4.44	30.00		5.57		Pass
11a	6Mbps	2	157	5785	0.00	0.00	2.22		1.21	1.70	4.71	30.00		5.57		Pass
11a	6Mbps	2	165	5825	0.00	0.00	2.22		0.77	1.72	4.73	30.00		5.57		Pass
HT20	MCS0	2	149	5745	0.00	0.00	2.22		0.92	1.31	4.32	30.00		5.57		Pass
HT20	MCS0	2	157	5785	0.00	0.00	2.22		0.74	1.50	4.51	30.00		5.57		Pass
HT20	MCS0	2	165	5825	0.00	0.00	2.22		0.54	1.60	4.61	30.00		5.57		Pass
HT40	MCS0	2	151	5755	0.00	0.00	2.22		-1.84	-1.46	1.55	30.00		5.57		Pass
HT40	MCS0	2	159	5795	0.00	0.00	2.22		-2.19	-1.62	1.39	30.00		5.57		Pass
VHT80	MCS0	2	155	5775	0.00	0.00	2.22		-5.33	-4.98	-1.97	30.00		5.57		Pass

Note: PSD Sum = Max PSD(Ant. 0, Ant. 1) + 10 log (n)

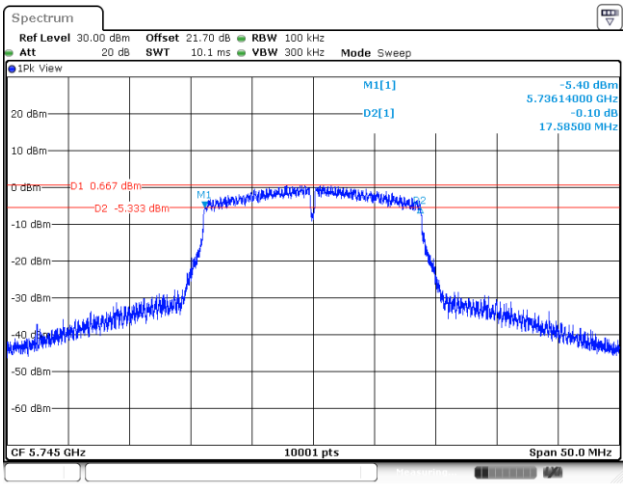
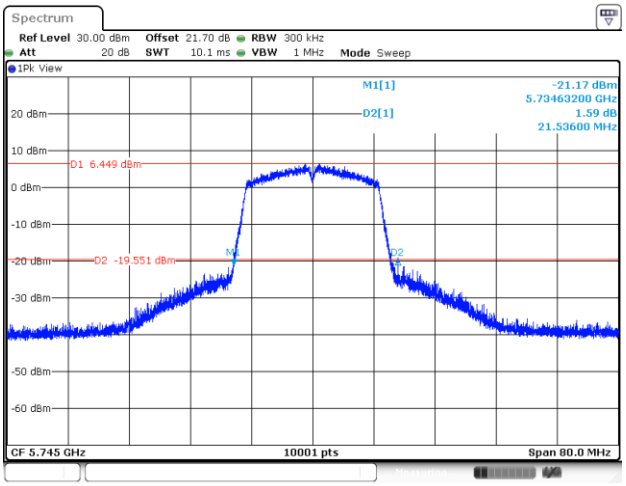
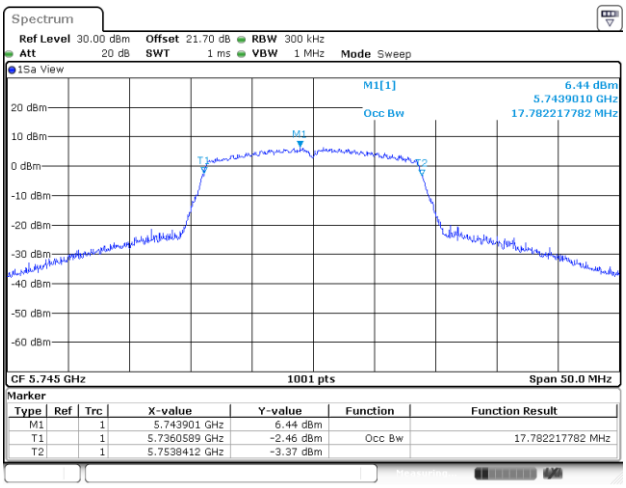
Test Result of 6dB and 26dB and 99% Occupied Bandwidth

MIMO <Ant. 0+1>

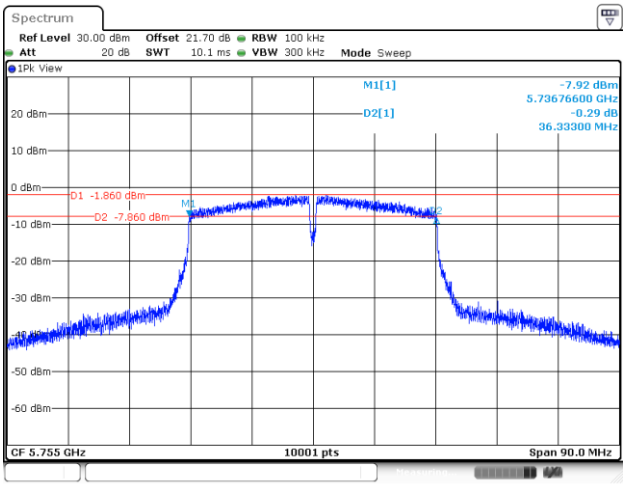
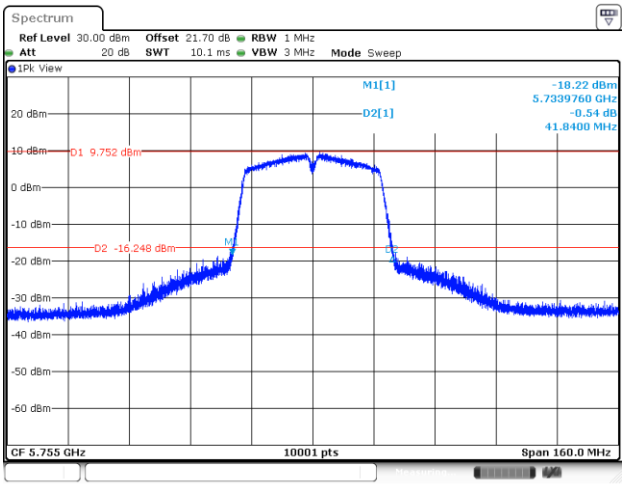
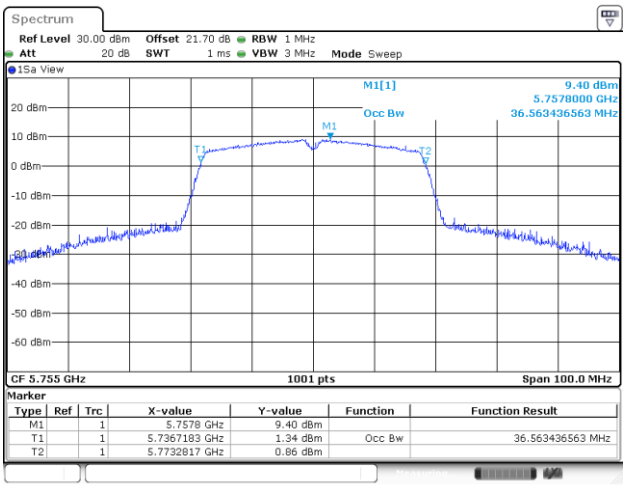
<802.11a>

6dB Bandwidth	26dB Bandwidth
	
99% Occupied Bandwidth	**N/A**
	

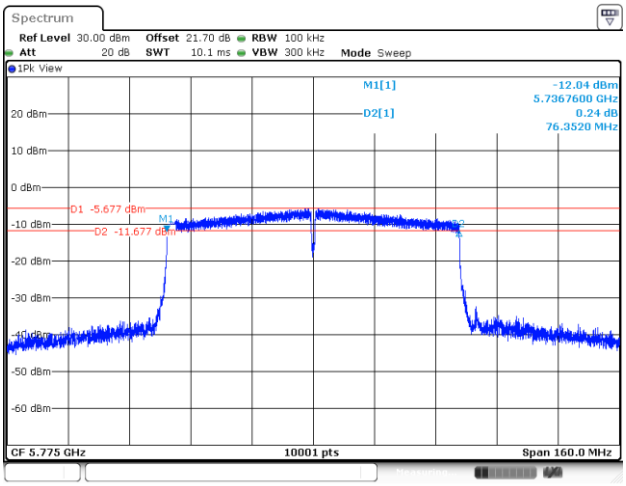
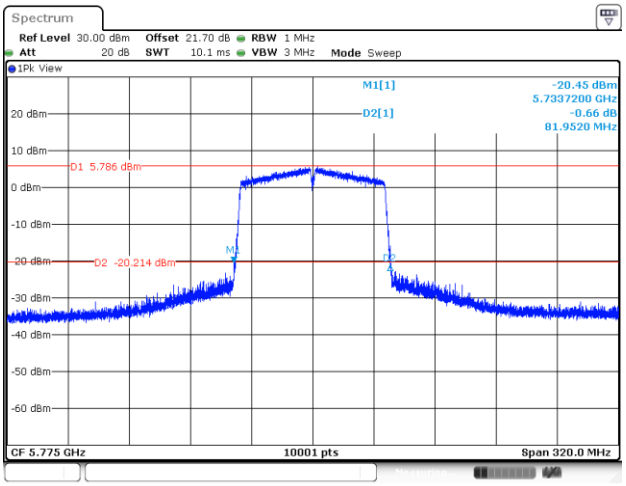
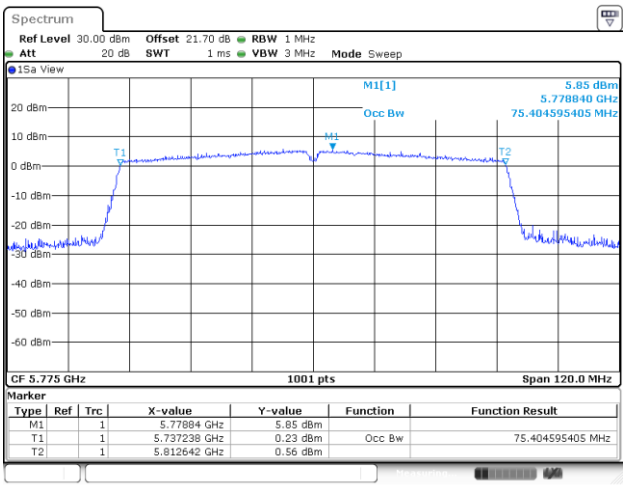
<802.11n HT20>

6dB Bandwidth	26dB Bandwidth
	
99% Occupied Bandwidth	**N/A**
	

<802.11n HT40>

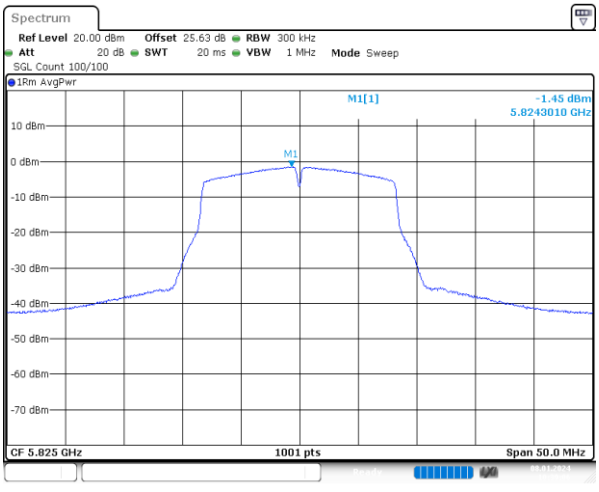
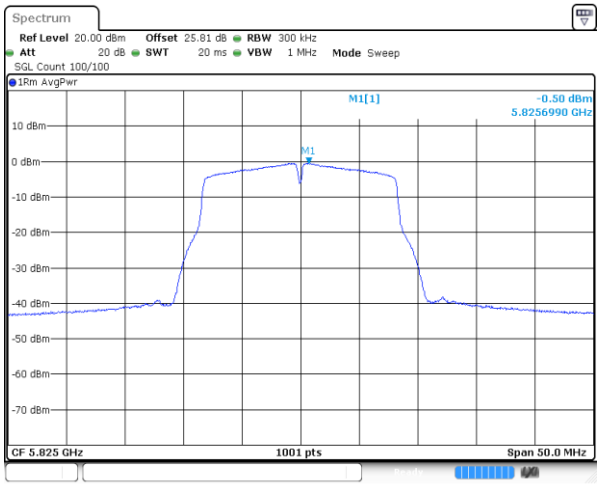
6dB Bandwidth	26dB Bandwidth
	
99% Occupied Bandwidth	**N/A**
	

<802.11ac VHT80>

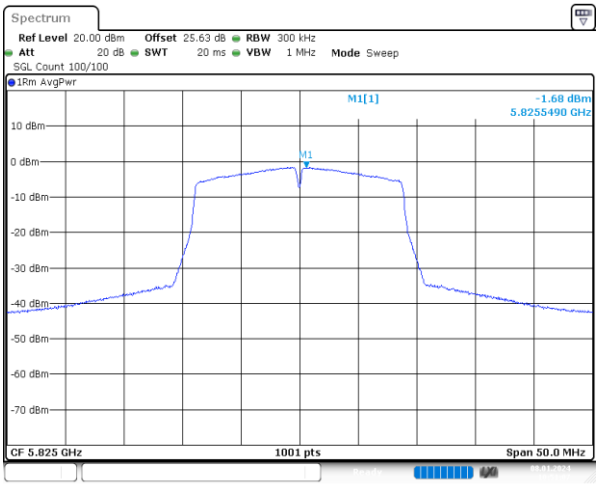
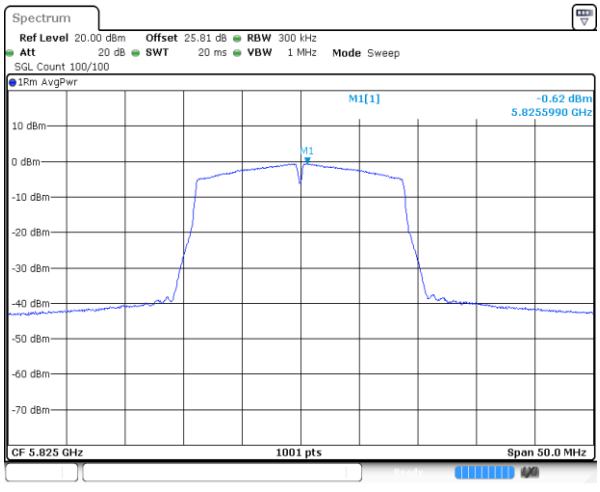
6dB Bandwidth	26dB Bandwidth
	
99% Occupied Bandwidth	**N/A**
	

Test Result of Power Spectral Density

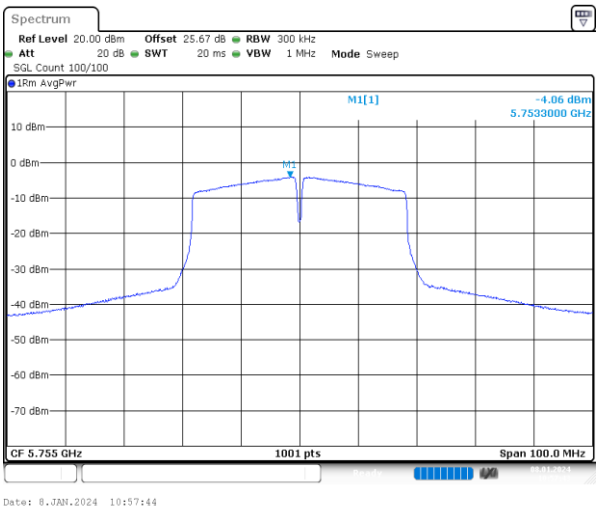
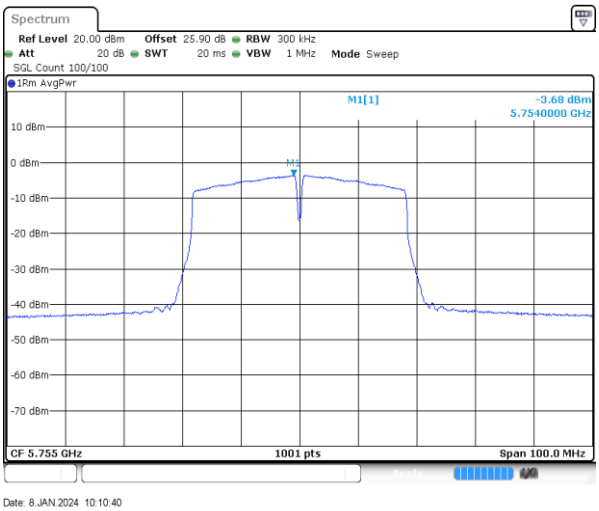
<802.11a>

Maximum Power Density Plot (dBm/300kHz)	
MIMO Ant. 0	**MIMO Ant. 1**
	

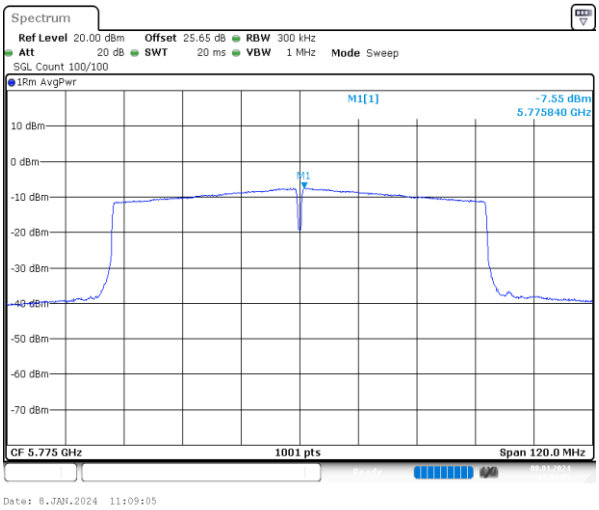
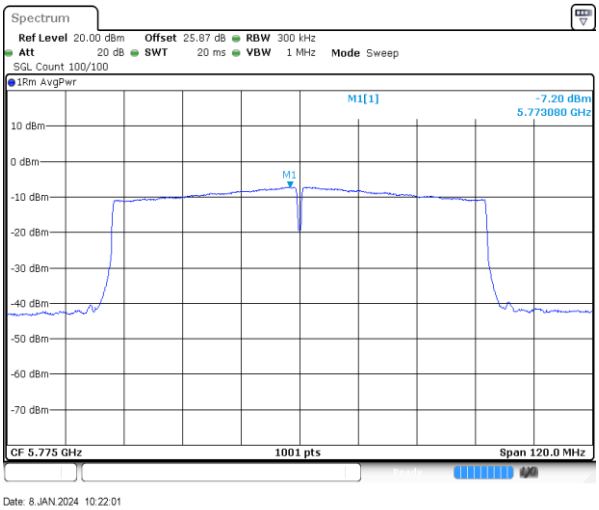
<802.11n HT20>

Maximum Power Density Plot (dBm/300kHz)	
MIMO Ant. 0	**MIMO Ant. 1**
	

<802.11n HT40>

Maximum Power Density Plot (dBm/300kHz)	
MIMO Ant. 0	MIMO Ant. 1
	

<802.11ac VHT80>

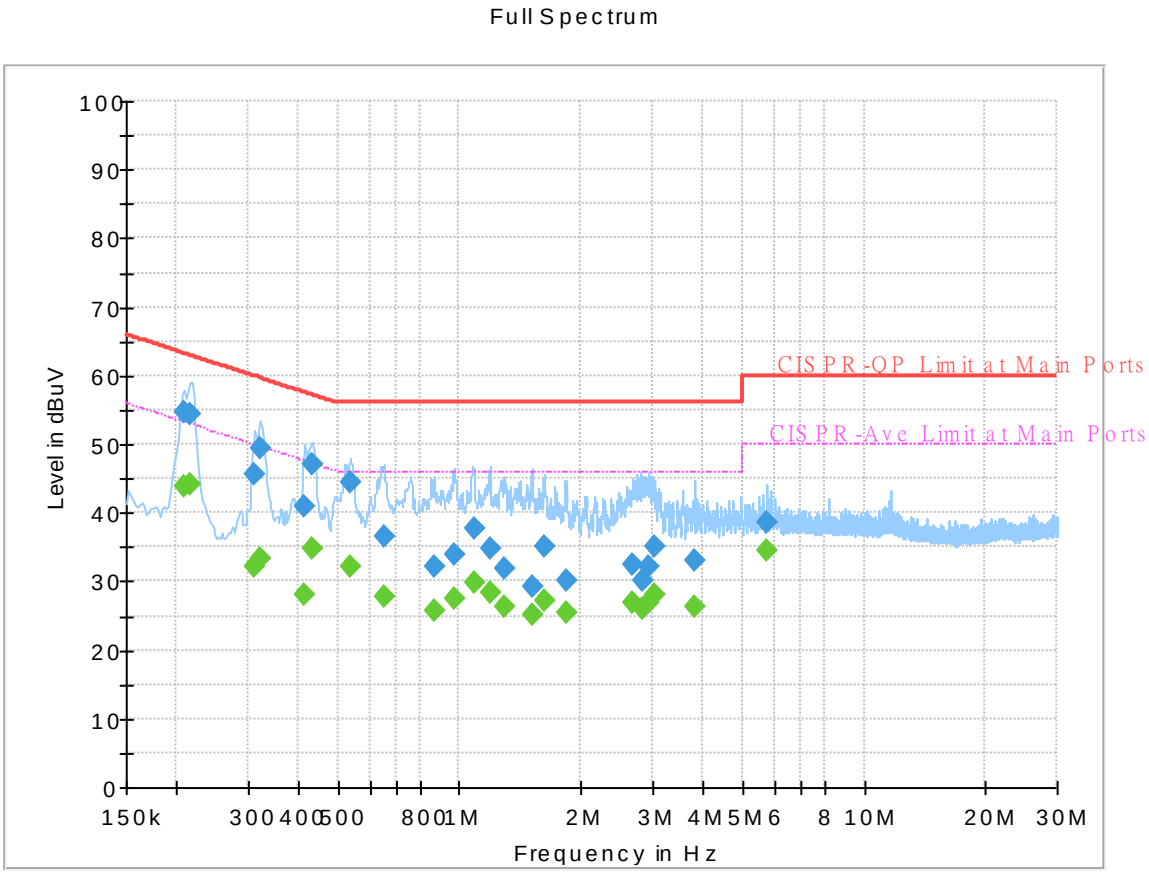
Maximum Power Density Plot (dBm/300kHz)	
MIMO Ant. 0	MIMO Ant. 1
	

Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calvin Wang	**Temperature :**	23~26℃
		Relative Humidity :	45~55%

EUT Information

Report NO :	362718-01
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line



Final_Result

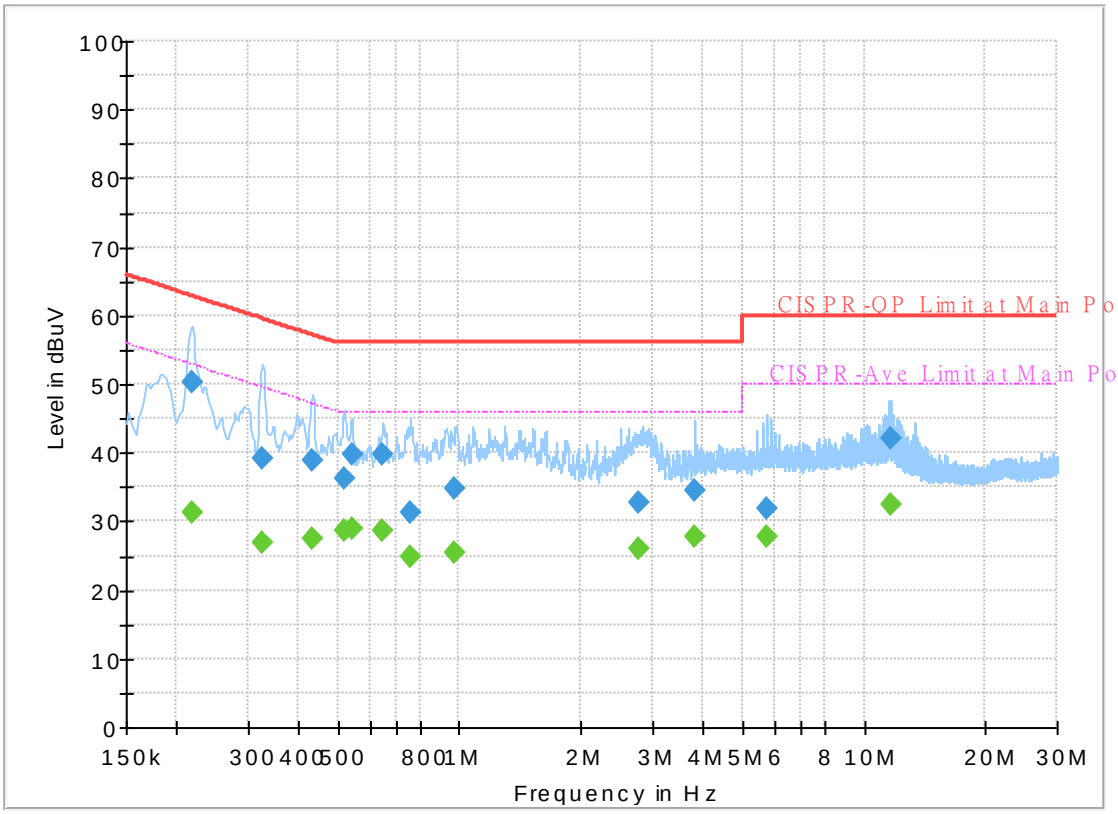
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.208500	---	43.76	53.27	9.51	L1	OFF	19.8
0.208500	54.58	---	63.27	8.69	L1	OFF	19.8
0.215250	---	44.07	53.00	8.93	L1	OFF	19.8
0.215250	54.40	---	63.00	8.60	L1	OFF	19.8
0.312000	---	32.02	49.92	17.90	L1	OFF	19.8
0.312000	45.58	---	59.92	14.34	L1	OFF	19.8
0.321000	---	33.43	49.68	16.25	L1	OFF	19.8
0.321000	49.48	---	59.68	10.20	L1	OFF	19.8
0.415500	---	28.01	47.54	19.53	L1	OFF	19.8
0.415500	40.93	---	57.54	16.61	L1	OFF	19.8
0.433500	---	34.87	47.19	12.32	L1	OFF	19.8
0.433500	46.96	---	57.19	10.23	L1	OFF	19.8
0.537000	---	32.23	46.00	13.77	L1	OFF	19.8
0.537000	44.31	---	56.00	11.69	L1	OFF	19.8
0.649500	---	27.85	46.00	18.15	L1	OFF	19.8
0.649500	36.69	---	56.00	19.31	L1	OFF	19.8
0.863250	---	25.65	46.00	20.35	L1	OFF	19.8
0.863250	32.16	---	56.00	23.84	L1	OFF	19.8
0.966750	---	27.37	46.00	18.63	L1	OFF	19.8
0.966750	33.92	---	56.00	22.08	L1	OFF	19.8
1.083750	---	29.70	46.00	16.30	L1	OFF	19.8

1.083750	37.86	---	56.00	18.14	L1	OFF	19.8
1.191750	---	28.38	46.00	17.62	L1	OFF	19.8
1.191750	34.85	---	56.00	21.15	L1	OFF	19.8
1.286250	---	26.28	46.00	19.72	L1	OFF	19.8
1.286250	31.93	---	56.00	24.07	L1	OFF	19.8
1.509000	---	25.03	46.00	20.97	L1	OFF	19.9
1.509000	29.23	---	56.00	26.77	L1	OFF	19.9
1.621500	---	27.13	46.00	18.87	L1	OFF	19.9
1.621500	35.03	---	56.00	20.97	L1	OFF	19.9
1.830750	---	25.55	46.00	20.45	L1	OFF	19.9
1.830750	30.08	---	56.00	25.92	L1	OFF	19.9
2.688000	---	26.85	46.00	19.15	L1	OFF	19.9
2.688000	32.49	---	56.00	23.51	L1	OFF	19.9
2.841000	---	26.03	46.00	19.97	L1	OFF	19.9
2.841000	30.05	---	56.00	25.95	L1	OFF	19.9
2.944500	---	26.80	46.00	19.20	L1	OFF	19.9
2.944500	32.14	---	56.00	23.86	L1	OFF	19.9
3.023250	---	27.96	46.00	18.04	L1	OFF	19.9
3.023250	34.94	---	56.00	21.06	L1	OFF	19.9
3.819750	---	26.25	46.00	19.75	L1	OFF	19.9
3.819750	33.12	---	56.00	22.88	L1	OFF	19.9
5.741250	---	34.37	50.00	15.63	L1	OFF	20.0
5.741250	38.48	---	60.00	21.52	L1	OFF	20.0

EUT Information

Report NO :	362718-01
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.217500	---	31.34	52.91	21.57	N	OFF	19.8
0.217500	50.35	---	62.91	12.56	N	OFF	19.8
0.325500	---	26.78	49.57	22.79	N	OFF	19.8
0.325500	39.13	---	59.57	20.44	N	OFF	19.8
0.433500	---	27.49	47.19	19.70	N	OFF	19.8
0.433500	38.95	---	57.19	18.24	N	OFF	19.8
0.516750	---	28.63	46.00	17.37	N	OFF	19.8
0.516750	36.31	---	56.00	19.69	N	OFF	19.8
0.541500	---	29.00	46.00	17.00	N	OFF	19.8
0.541500	39.75	---	56.00	16.25	N	OFF	19.8
0.647250	---	28.58	46.00	17.42	N	OFF	19.8
0.647250	39.67	---	56.00	16.33	N	OFF	19.8
0.757500	---	24.78	46.00	21.22	N	OFF	19.8
0.757500	31.34	---	56.00	24.66	N	OFF	19.8
0.975750	---	25.35	46.00	20.65	N	OFF	19.8
0.975750	34.75	---	56.00	21.25	N	OFF	19.8
2.764500	---	26.08	46.00	19.92	N	OFF	19.9
2.764500	32.82	---	56.00	23.18	N	OFF	19.9
3.822000	---	27.70	46.00	18.30	N	OFF	19.9
3.822000	34.47	---	56.00	21.53	N	OFF	19.9
5.736750	---	27.78	50.00	22.22	N	OFF	20.0

5.736750	**31.82**	**---**	**60.00**	**28.18**	**N**	**OFF**	**20.0**
11.602500	**---**	**32.35**	**50.00**	**17.65**	**N**	**OFF**	**20.2**
11.602500	**41.98**	**---**	**60.00**	**18.02**	**N**	**OFF**	**20.2**

Appendix C. Radiated Spurious Emission

Test Engineer :	Fu Chen, Yuan Lee, Sam Chou and Troye Hsieh	Temperature :	18.1~20.7°C
		Relative Humidity :	42.7~65.5%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		5633.8	52.77	-15.43	68.2	43.48	33.07	11.22	35	109	208	P	H
		5693	54.22	-45.82	100.04	44.48	33.44	11.27	34.97	109	208	P	H
		5718.2	56.16	-54.14	110.3	46.24	33.57	11.3	34.95	109	208	P	H
		5725	66.04	-56.16	122.2	56.09	33.6	11.3	34.95	109	208	P	H
	*	5745	111.8	-	-	101.74	33.68	11.32	34.94	109	208	P	H
	*	5745	104.81	-	-	94.75	33.68	11.32	34.94	109	208	A	H
		5624.4	51.31	-16.89	68.2	42.06	33.05	11.21	35.01	307	274	P	V
		5691	53.04	-45.52	98.56	43.31	33.43	11.27	34.97	307	274	P	V
		5717.6	58.6	-51.53	110.13	48.68	33.57	11.3	34.95	307	274	P	V
		5724.8	67.45	-54.29	121.74	57.5	33.6	11.3	34.95	307	274	P	V
	*	5745	112.68	-	-	102.62	33.68	11.32	34.94	307	274	P	V
	*	5745	105.74	-	-	95.68	33.68	11.32	34.94	307	274	A	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5645.75	51.47	-16.73	68.2	42.15	33.09	11.23	35	111	205	P	H
		5697.25	53.34	-49.83	103.17	43.55	33.48	11.28	34.97	111	205	P	H
		5707.75	53.22	-54.15	107.37	43.36	33.53	11.29	34.96	111	205	P	H
		5724.25	53.06	-67.43	120.49	43.11	33.6	11.3	34.95	111	205	P	H
	*	5785	113.38	-	-	103.09	33.84	11.36	34.91	111	205	P	H
	*	5785	105.96	-	-	95.67	33.84	11.36	34.91	111	205	A	H
		5854.75	52.58	-58.79	111.37	42.1	34.02	11.33	34.87	111	205	P	H
		5871.75	54.06	-52.05	106.11	43.51	34.09	11.32	34.86	111	205	P	H
		5894	51.96	-39.14	91.1	41.33	34.18	11.3	34.85	111	205	P	H
		5927.75	51.73	-16.47	68.2	41.03	34.26	11.27	34.83	111	205	P	H
		5631	51.79	-16.41	68.2	42.51	33.06	11.22	35	320	272	P	V
		5654.75	51.8	-19.93	71.73	42.41	33.14	11.24	34.99	320	272	P	V
		5715.25	52.58	-56.89	109.47	42.69	33.56	11.29	34.96	320	272	P	V
		5724.75	52.42	-69.21	121.63	42.47	33.6	11.3	34.95	320	272	P	V
	*	5785	111.62	-	-	101.33	33.84	11.36	34.91	320	272	P	V
	*	5785	105.32	-	-	95.03	33.84	11.36	34.91	320	272	A	V
		5853.25	51.74	-63.05	114.79	41.28	34.01	11.33	34.88	320	272	P	V
		5861.25	51.04	-58.01	109.05	40.54	34.05	11.32	34.87	320	272	P	V
		5902	53.23	-31.95	85.18	42.59	34.2	11.29	34.85	320	272	P	V
		5928.75	51.94	-16.26	68.2	41.24	34.26	11.27	34.83	320	272	P	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz	*	5825	112.5	-	-	102.09	33.95	11.35	34.89	105	201	P	H
	*	5825	105.02	-	-	94.61	33.95	11.35	34.89	105	201	A	H
		5852.6	58.12	-58.15	116.27	47.66	34.01	11.33	34.88	105	201	P	H
		5855.2	56.56	-54.18	110.74	46.08	34.02	11.33	34.87	105	201	P	H
		5887.6	53.7	-42.15	95.85	43.11	34.15	11.3	34.86	105	201	P	H
		5931	53.29	-14.91	68.2	42.59	34.26	11.27	34.83	105	201	P	H
	*	5825	112.39	-	-	101.98	33.95	11.35	34.89	315	271	P	V
	*	5825	105.17	-	-	94.76	33.95	11.35	34.89	315	271	A	V
		5850	57.87	-64.33	122.2	47.42	34	11.33	34.88	315	271	P	V
		5855.6	56.57	-54.06	110.63	46.09	34.02	11.33	34.87	315	271	P	V
		5878.4	54.24	-48.43	102.67	43.68	34.11	11.31	34.86	315	271	P	V
		5925.8	53.66	-14.54	68.2	42.96	34.25	11.28	34.83	315	271	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	56.58	-17.42	74	60.63	39	18.21	61.26	100	88	P	H
		11490	46.27	-7.73	54	50.32	39	18.21	61.26	100	88	A	H
		17235	45.74	-22.46	68.2	42.2	38.44	22.99	57.89	-	-	P	H
		11490	55.06	-18.94	74	59.11	39	18.21	61.26	284	11	P	V
		11490	43.63	-10.37	54	47.68	39	18.21	61.26	284	11	A	V
		17235	46.11	-22.09	68.2	42.57	38.44	22.99	57.89	-	-	P	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		11570	57.92	-16.08	74	62.29	38.82	18.26	61.45	100	267	P	H
		11570	47.88	-6.12	54	52.25	38.82	18.26	61.45	100	267	A	H
		17325	47.05	-21.15	68.2	43.11	38.5	23.04	57.6	-	-	P	H
		11570	55.51	-18.49	74	59.88	38.82	18.26	61.45	309	210	P	V
		11570	45.37	-8.63	54	49.74	38.82	18.26	61.45	309	210	A	V
		17355	45.2	-23	68.2	41.04	38.61	23.06	57.51	-	-	P	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz		11650	60.16	-13.84	74	64.91	38.6	18.31	61.66	100	89	P	H
		11650	49.54	-4.46	54	54.29	38.6	18.31	61.66	100	89	A	H
		17475	47.33	-20.87	68.2	42.69	38.65	23.12	57.13	-	-	P	H
		11650	59.7	-14.3	74	64.45	38.6	18.31	61.66	298	11	P	V
		11650	49.33	-4.67	54	54.08	38.6	18.31	61.66	298	11	A	V
		17475	45.87	-22.33	68.2	41.23	38.65	23.12	57.13	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		5648.8	52.38	-15.82	68.2	43.04	33.1	11.23	34.99	109	205	P	H
		5667.6	54.02	-27.24	81.26	44.51	33.24	11.25	34.98	109	205	P	H
		5717.8	59.28	-50.9	110.18	49.36	33.57	11.3	34.95	109	205	P	H
		5725	70.72	-51.48	122.2	60.77	33.6	11.3	34.95	109	205	P	H
	*	5745	111.62	-	-	101.56	33.68	11.32	34.94	109	205	P	H
	*	5745	105.17	-	-	95.11	33.68	11.32	34.94	109	205	A	H
		5628.2	51.57	-16.63	68.2	42.3	33.06	11.22	35.01	307	273	P	V
		5699	53.32	-51.14	104.46	43.51	33.49	11.28	34.96	307	273	P	V
		5719	61.25	-49.27	110.52	51.32	33.58	11.3	34.95	307	273	P	V
		5725	68.44	-53.76	122.2	58.49	33.6	11.3	34.95	307	273	P	V
	*	5745	111.74	-	-	101.68	33.68	11.32	34.94	307	273	P	V
	*	5745	105.19	-	-	95.13	33.68	11.32	34.94	307	273	A	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		5622.25	52.89	-15.31	68.2	43.65	33.04	11.21	35.01	110	205	P	H
		5688.25	53.11	-43.42	96.53	43.4	33.41	11.27	34.97	110	205	P	H
		5707	53.35	-53.81	107.16	43.49	33.53	11.29	34.96	110	205	P	H
		5724.25	53.13	-67.36	120.49	43.18	33.6	11.3	34.95	110	205	P	H
	*	5785	113.35	-	-	103.06	33.84	11.36	34.91	110	205	P	H
	*	5785	105.62	-	-	95.33	33.84	11.36	34.91	110	205	A	H
		5853	51.38	-63.98	115.36	40.92	34.01	11.33	34.88	110	205	P	H
		5862.5	53.07	-55.63	108.7	42.57	34.05	11.32	34.87	110	205	P	H
		5875.75	53.05	-51.59	104.64	42.5	34.1	11.31	34.86	110	205	P	H
		5939.5	51.5	-16.7	68.2	40.78	34.28	11.27	34.83	110	205	P	H
		5638	52.31	-15.89	68.2	43.01	33.08	11.22	35	318	272	P	V
		5654.5	52.42	-19.12	71.54	43.03	33.14	11.24	34.99	318	272	P	V
		5710	51.4	-56.6	108	41.53	33.54	11.29	34.96	318	272	P	V
		5724.5	51	-70.06	121.06	41.05	33.6	11.3	34.95	318	272	P	V
	*	5785	111.88	-	-	101.59	33.84	11.36	34.91	318	272	P	V
	*	5785	104.93	-	-	94.64	33.84	11.36	34.91	318	272	A	V
		5850.25	51.28	-70.35	121.63	40.83	34	11.33	34.88	318	272	P	V
		5874	51.93	-53.55	105.48	41.38	34.1	11.31	34.86	318	272	P	V
		5888.75	52.55	-42.44	94.99	41.95	34.15	11.3	34.85	318	272	P	V
		5925	51.81	-16.39	68.2	41.11	34.25	11.28	34.83	318	272	P	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 165 5825MHz	*	5825	111.66	-	-	101.25	33.95	11.35	34.89	104	201	P	H
	*	5825	104.69	-	-	94.28	33.95	11.35	34.89	104	201	A	H
		5850.2	60.48	-61.26	121.74	50.03	34	11.33	34.88	104	201	P	H
		5855.4	56.79	-53.9	110.69	46.31	34.02	11.33	34.87	104	201	P	H
		5894.4	54.96	-35.85	90.81	44.33	34.18	11.3	34.85	104	201	P	H
		5946.8	52.68	-15.52	68.2	41.95	34.29	11.26	34.82	104	201	P	H
	*	5825	111.04	-	-	100.63	33.95	11.35	34.89	315	272	P	V
	*	5825	104.67	-	-	94.26	33.95	11.35	34.89	315	272	A	V
		5850.2	59.54	-62.2	121.74	49.09	34	11.33	34.88	315	272	P	V
		5855.4	57.99	-52.7	110.69	47.51	34.02	11.33	34.87	315	272	P	V
		5917	53.49	-20.61	74.1	42.82	34.23	11.28	34.84	315	272	P	V
		5925.4	54.57	-13.63	68.2	43.87	34.25	11.28	34.83	315	272	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		11490	55.73	-18.27	74	59.78	39	18.21	61.26	100	271	P	H
		11490	45.59	-8.41	54	49.64	39	18.21	61.26	100	271	A	H
		17235	47.22	-20.98	68.2	43.68	38.44	22.99	57.89	-	-	P	H
		11490	54.04	-19.96	74	58.09	39	18.21	61.26	299	197	P	V
		11490	44.29	-9.71	54	48.34	39	18.21	61.26	299	197	A	V
		17235	45.44	-22.76	68.2	41.9	38.44	22.99	57.89	-	-	P	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		11570	57.48	-16.52	74	61.85	38.82	18.26	61.45	100	268	P	H
		11570	47.02	-6.98	54	51.39	38.82	18.26	61.45	100	268	A	H
		17355	43.91	-24.29	68.2	39.75	38.61	23.06	57.51	-	-	P	H
		11570	56.07	-17.93	74	60.44	38.82	18.26	61.45	301	201	P	V
		11570	45.48	-8.52	54	49.85	38.82	18.26	61.45	301	201	A	V
		17355	43.8	-24.4	68.2	39.64	38.61	23.06	57.51	-	-	P	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 165 5825MHz		11650	59.66	-14.34	74	64.41	38.6	18.31	61.66	107	269	P	H
		11650	47.96	-6.04	54	52.71	38.6	18.31	61.66	107	269	A	H
		17475	47.12	-21.08	68.2	42.48	38.65	23.12	57.13	-	-	P	H
		11650	57.99	-16.01	74	62.74	38.6	18.31	61.66	343	196	P	V
		11650	47.97	-6.03	54	52.72	38.6	18.31	61.66	343	196	A	V
		17475	45.81	-22.39	68.2	41.17	38.65	23.12	57.13	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		5614.25	52.11	-16.09	68.2	42.89	33.03	11.2	35.01	113	206	P	H
		5698.5	57.39	-46.7	104.09	47.58	33.49	11.28	34.96	113	206	P	H
		5717	72.23	-37.73	109.96	62.31	33.57	11.3	34.95	113	206	P	H
		5722.5	74.1	-42.4	116.5	64.16	33.59	11.3	34.95	113	206	P	H
	*	5755	108.9	-	-	98.78	33.72	11.33	34.93	113	206	P	H
	*	5755	102	-	-	91.88	33.72	11.33	34.93	113	206	A	H
		5852.75	52.25	-63.68	115.93	41.79	34.01	11.33	34.88	113	206	P	H
		5867	52.74	-54.7	107.44	42.22	34.07	11.32	34.87	113	206	P	H
		5879.5	52.2	-49.66	101.86	41.63	34.12	11.31	34.86	113	206	P	H
		5940	51.27	-16.93	68.2	40.54	34.28	11.27	34.82	113	206	P	H
		5629.5	51.81	-16.39	68.2	42.53	33.06	11.22	35	306	273	P	V
		5696.75	55.48	-47.32	102.8	45.7	33.47	11.28	34.97	306	273	P	V
		5718.25	69.35	-40.96	110.31	59.43	33.57	11.3	34.95	306	273	P	V
		5724.5	71.43	-49.63	121.06	61.48	33.6	11.3	34.95	306	273	P	V
	*	5755	109.01	-	-	98.89	33.72	11.33	34.93	306	273	P	V
	*	5755	102.26	-	-	92.14	33.72	11.33	34.93	306	273	A	V
		5854	51.12	-61.96	113.08	40.64	34.02	11.33	34.87	306	273	P	V
		5866.5	51.85	-55.73	107.58	41.33	34.07	11.32	34.87	306	273	P	V
		5881.75	53.08	-47.11	100.19	42.5	34.13	11.31	34.86	306	273	P	V
		5945	51.96	-16.24	68.2	41.23	34.29	11.26	34.82	306	273	P	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 159 5795MHz		5637	52.99	-15.21	68.2	43.7	33.07	11.22	35	114	205	P	H
		5692.75	53.16	-46.7	99.86	43.42	33.44	11.27	34.97	114	205	P	H
		5714	54.24	-54.88	109.12	44.35	33.56	11.29	34.96	114	205	P	H
		5724.75	55.14	-66.49	121.63	45.19	33.6	11.3	34.95	114	205	P	H
	*	5795	109.37	-	-	99.03	33.88	11.37	34.91	114	205	P	H
	*	5795	101.89	-	-	91.55	33.88	11.37	34.91	114	205	A	H
		5851.25	55.38	-63.97	119.35	44.92	34.01	11.33	34.88	114	205	P	H
		5859.25	54.09	-55.52	109.61	43.59	34.04	11.33	34.87	114	205	P	H
		5888.5	53.7	-41.48	95.18	43.1	34.15	11.3	34.85	114	205	P	H
		5933	52.95	-15.25	68.2	42.24	34.27	11.27	34.83	114	205	P	H
		5636	52.27	-15.93	68.2	42.98	33.07	11.22	35	302	273	P	V
		5694.5	52.14	-49.01	101.15	42.37	33.46	11.28	34.97	302	273	P	V
		5717	52.31	-57.65	109.96	42.39	33.57	11.3	34.95	302	273	P	V
		5724.5	53.32	-67.74	121.06	43.37	33.6	11.3	34.95	302	273	P	V
	*	5795	108.69	-	-	98.35	33.88	11.37	34.91	302	273	P	V
	*	5795	102.11	-	-	91.77	33.88	11.37	34.91	302	273	A	V
		5850.75	55.27	-65.22	120.49	44.82	34	11.33	34.88	302	273	P	V
		5855.25	53.1	-57.63	110.73	42.62	34.02	11.33	34.87	302	273	P	V
		5914.5	53.44	-22.5	75.94	42.77	34.23	11.28	34.84	302	273	P	V
		5937.25	53.09	-15.11	68.2	42.38	34.27	11.27	34.83	302	273	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		11510	53.25	-20.75	74	57.33	38.98	18.23	61.29	103	268	P	H
		11510	43.31	-10.69	54	47.39	38.98	18.23	61.29	103	268	A	H
		17265	44.79	-23.41	68.2	41.1	38.47	23.01	57.79	-	-	P	H
		11510	52.76	-21.24	74	56.84	38.98	18.23	61.29	340	192	P	V
		11510	42.27	-11.73	54	46.35	38.98	18.23	61.29	340	192	A	V
		17265	45.56	-22.64	68.2	41.87	38.47	23.01	57.79	-	-	P	V

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 159 5795MHz		11590	54.43	-19.57	74	58.92	38.74	18.27	61.5	101	267	P	H
		11590	44.99	-9.01	54	49.48	38.74	18.27	61.5	101	267	A	H
		17385	44.51	-23.69	68.2	40.18	38.67	23.07	57.41	-	-	P	H
		11590	52.23	-21.77	74	56.72	38.74	18.27	61.5	297	195	P	V
		11590	43.37	-10.63	54	47.86	38.74	18.27	61.5	297	195	A	V
		17385	44.72	-23.48	68.2	40.39	38.67	23.07	57.41	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		5636.75	54.25	-13.95	68.2	44.96	33.07	11.22	35	319	271	P	V
		5692.25	62.81	-36.68	99.49	53.07	33.44	11.27	34.97	319	271	P	V
		5717.5	67.56	-42.54	110.1	57.64	33.57	11.3	34.95	319	271	P	V
		5722.75	67.73	-49.34	117.07	57.79	33.59	11.3	34.95	319	271	P	V
	*	5775	105.39	-	-	95.16	33.8	11.35	34.92	319	271	P	V
	*	5775	98.47	-	-	88.24	33.8	11.35	34.92	319	271	A	V
		5851	57.68	-62.24	119.92	47.23	34	11.33	34.88	319	271	P	V
		5855.75	58.19	-52.4	110.59	47.71	34.02	11.33	34.87	319	271	P	V
		5880.75	53.83	-47.1	100.93	43.26	34.12	11.31	34.86	319	271	P	V
		5932	52.15	-16.05	68.2	41.45	34.26	11.27	34.83	319	271	P	V
		5641.75	53.81	-14.39	68.2	44.5	33.08	11.23	35	110	204	P	H
		5696.75	67.84	-34.96	102.8	58.06	33.47	11.28	34.97	110	204	P	H
		5715.75	71.51	-38.1	109.61	61.61	33.56	11.29	34.95	110	204	P	H
		5722.5	74.63	-41.87	116.5	64.69	33.59	11.3	34.95	110	204	P	H
	*	5775	106.86	-	-	96.63	33.8	11.35	34.92	110	204	P	H
	*	5775	99.12	-	-	88.89	33.8	11.35	34.92	110	204	A	H
		5850.5	66.35	-54.71	121.06	55.9	34	11.33	34.88	110	204	P	H
		5859	62.78	-46.9	109.68	52.28	34.04	11.33	34.87	110	204	P	H
		5876	56.62	-47.84	104.46	46.07	34.1	11.31	34.86	110	204	P	H
		5933.25	51.82	-16.38	68.2	41.11	34.27	11.27	34.83	110	204	P	H
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
i802.11ac VHT80 CH 155 5775MHz		11550	52.38	-21.62	74	56.62	38.9	18.25	61.39	100	270	P	H
		11550	41.38	-12.62	54	45.62	38.9	18.25	61.39	100	270	A	H
		17325	45.87	-22.33	68.2	41.93	38.5	23.04	57.6	-	-	P	H
		11550	50.4	-23.6	74	54.64	38.9	18.25	61.39	310	212	P	V
		11550	40.08	-13.92	54	44.32	38.9	18.25	61.39	310	212	A	V
		17325	45.37	-22.83	68.2	41.43	38.5	23.04	57.6	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Emission above 18GHz

WIFI 802.11a (SHF @ 1m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a SHF		39580	51.43	-22.57	74	39.07	44.8	23.96	56.4	-	-	P	H
		39580	40.77	-13.23	54	28.41	44.8	23.96	56.4	-	-	A	H
		38656	52.19	-21.81	74	40.8	44.13	24.27	57.01	-	-	P	V
		38656	41.2	-12.8	54	29.81	44.13	24.27	57.01	-	-	A	V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 3m)

WIFI Ant. 0+1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a LF		54.03	29.19	-10.81	40	47.42	12.63	1.31	32.17	-	-	P	H
		208.47	34.52	-8.98	43.5	49.51	15.01	2.33	32.33	-	-	P	H
		242.22	28.59	-17.41	46	41.02	17.29	2.47	32.19	-	-	P	H
		337.8	28.82	-17.18	46	37.67	19.89	2.91	31.65	-	-	P	H
		664	36.51	-9.49	46	37.94	26.35	4.06	31.84	-	-	P	H
		981.8	34.87	-19.13	54	29.65	30.85	4.98	30.61	-	-	P	H
		54.03	31.27	-8.73	40	49.5	12.63	1.31	32.17	-	-	P	V
		81.03	27.34	-12.66	40	44.82	13.24	1.61	32.33	-	-	P	V
		190.38	30.16	-13.34	43.5	45.51	14.57	2.25	32.17	-	-	P	V
		444.9	27.04	-18.96	46	32.85	22.88	3.35	32.04	-	-	P	V
		584.2	30.83	-15.17	46	33.66	25.81	3.81	32.45	-	-	P	V
		664	38.97	-7.03	46	40.4	26.35	4.06	31.84	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as “-” means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **Margin** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
0+1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5650	55.45	-12.75	68.2	54.51	32.22	4.58	35.86	103	308	P	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Margin (dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 5650MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Margin(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 68.2(dBμV/m)

= -12.75 (dB)

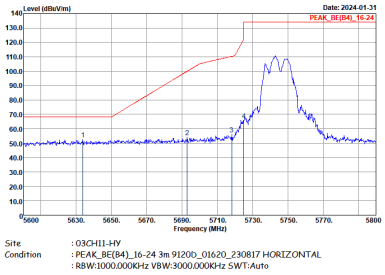
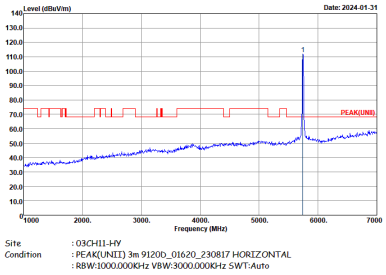
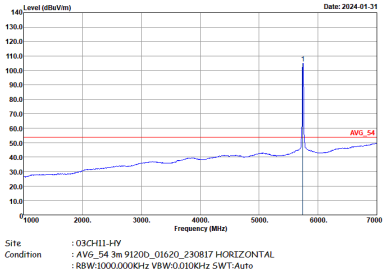
Peak measured complies with the limit line, so test result is “PASS”.

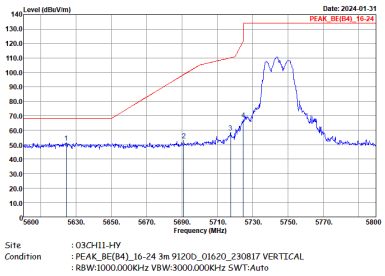
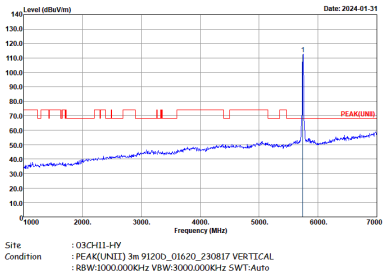
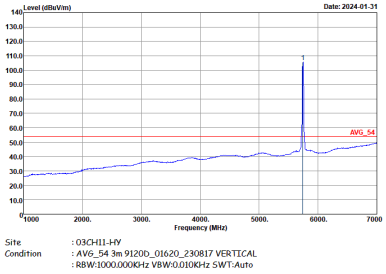
Appendix D. Radiated Spurious Emission Plots

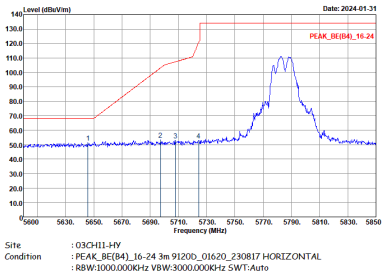
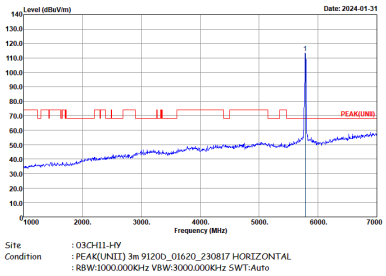
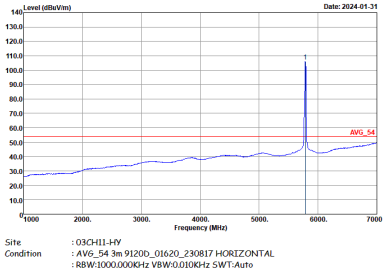
Test Engineer :	Fu Chen, Yuan Lee, Sam Chou and Troye Hsieh	**Temperature :**	18.1~20.7°C
		Relative Humidity :	42.7~65.5%

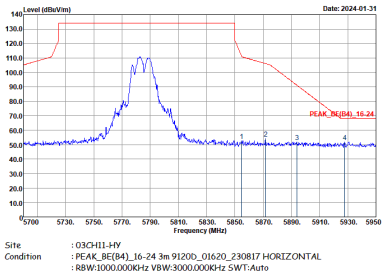
Band 4 - 5725~5850MHz

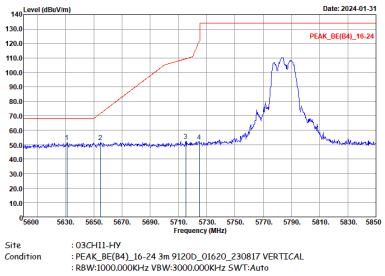
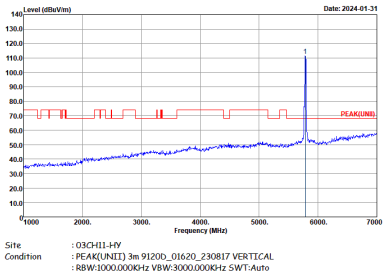
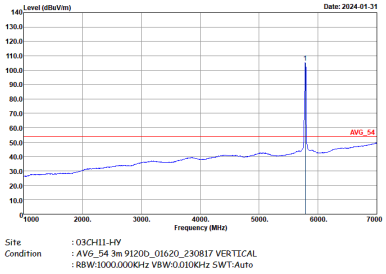
WIFI 802.11a (Band Edge @ 3m)

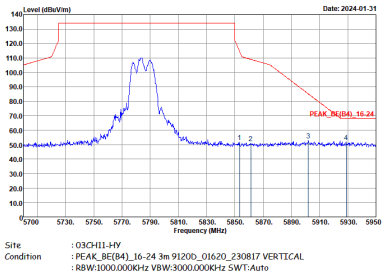
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

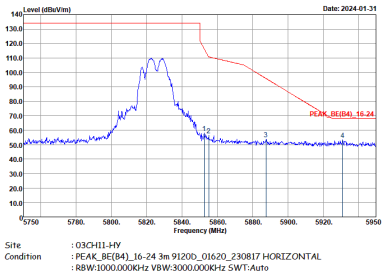
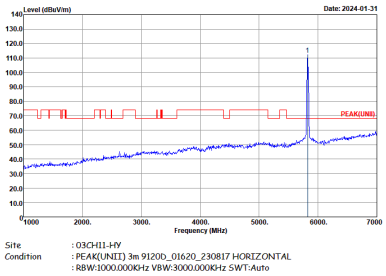
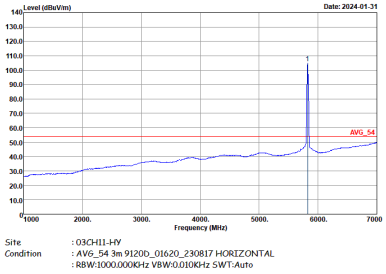
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

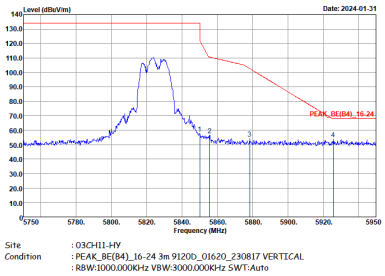
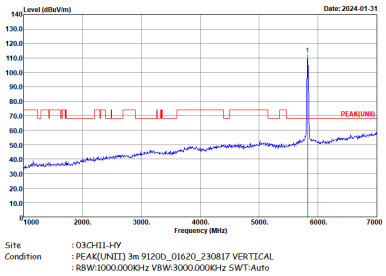
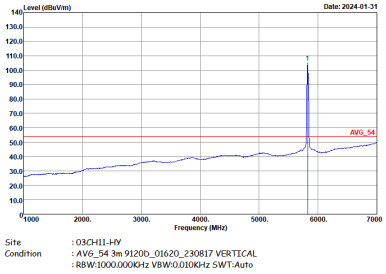
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Horizontal	Fundamental
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

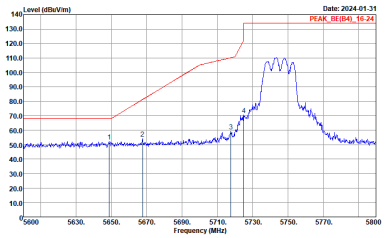
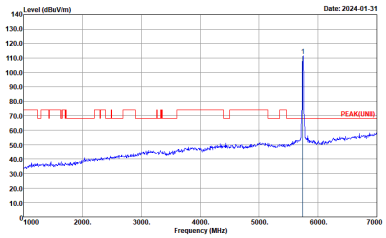
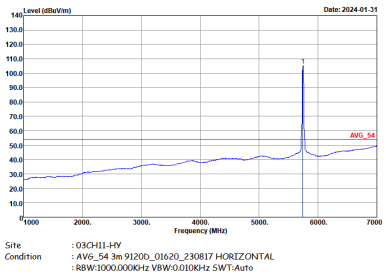
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Vertical	Fundamental
Peak		Left blank

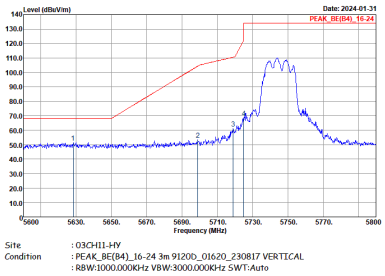
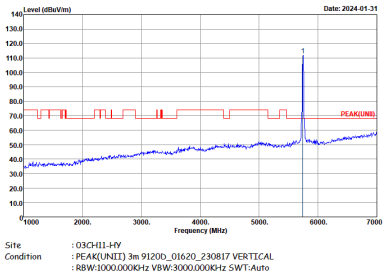
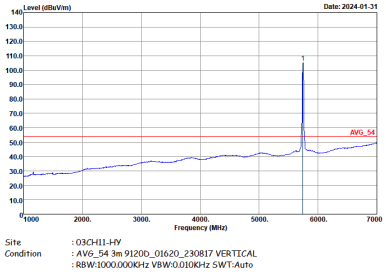
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

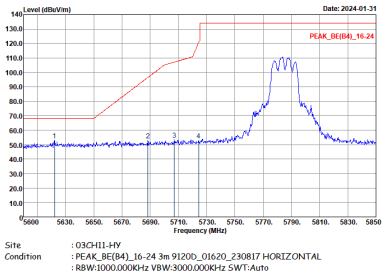
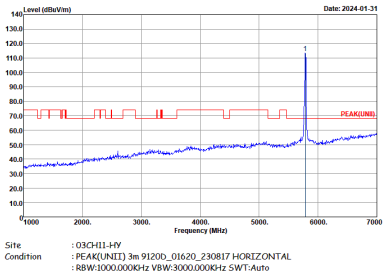
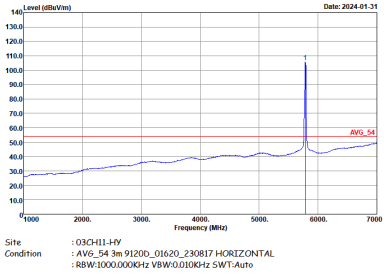
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

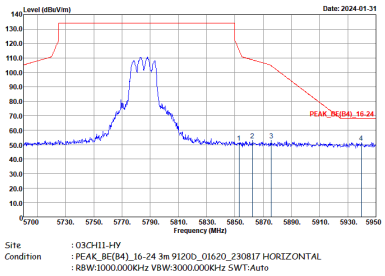
Band 4 5725~5850MHz

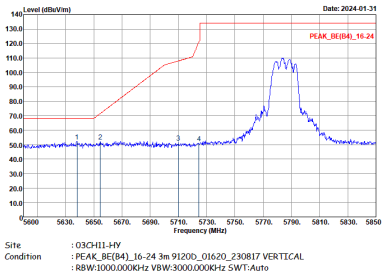
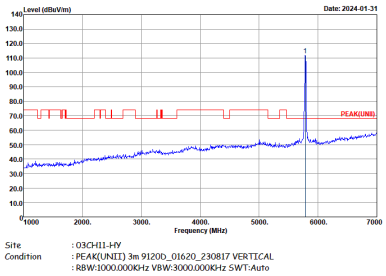
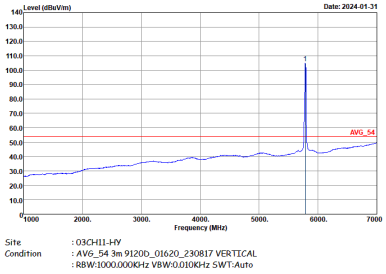
WIFI 802.11n HT20 (Band Edge @ 3m)

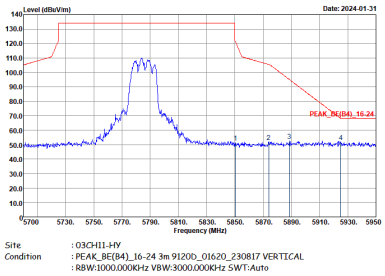
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

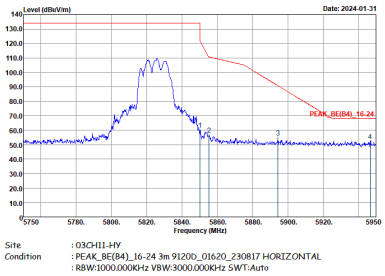
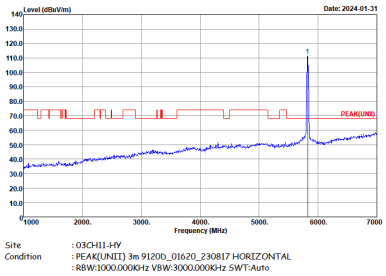
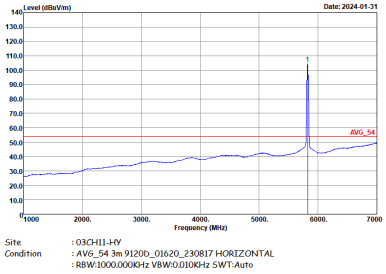
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

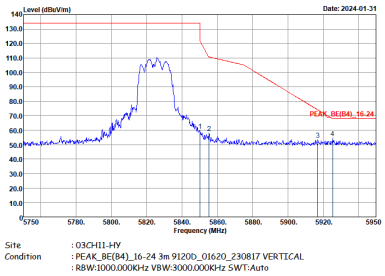
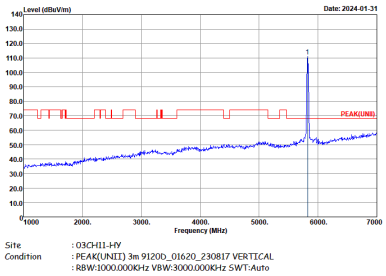
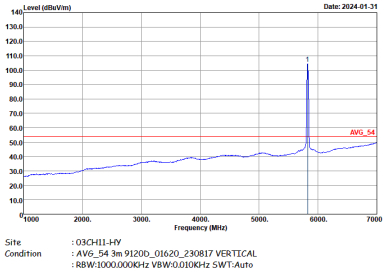
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
0+1	Horizontal	Fundamental
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

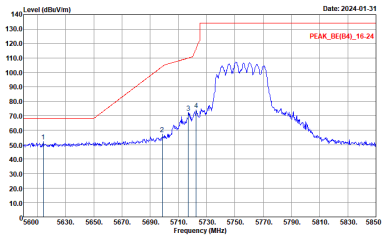
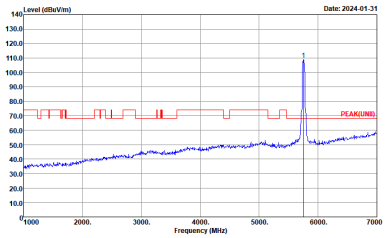
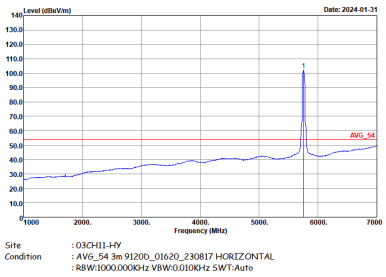
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
0+1	Vertical	Fundamental
Peak		Left blank

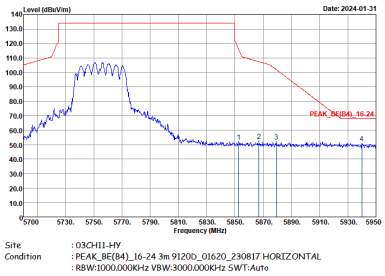
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

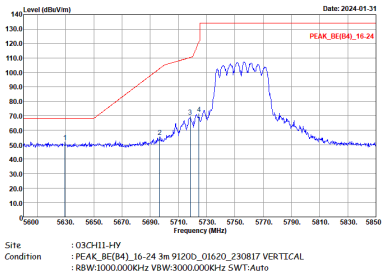
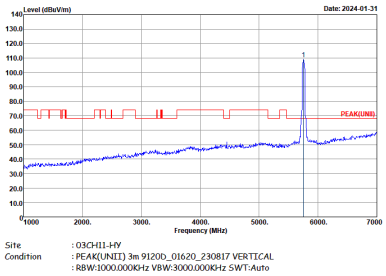
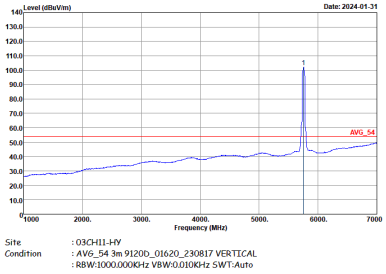
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

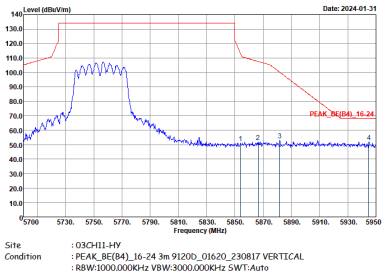
Band 4 5725~5850MHz

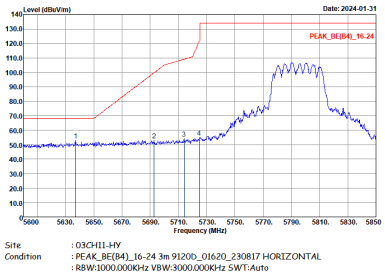
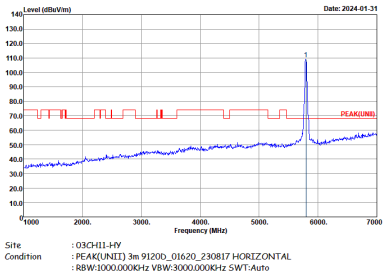
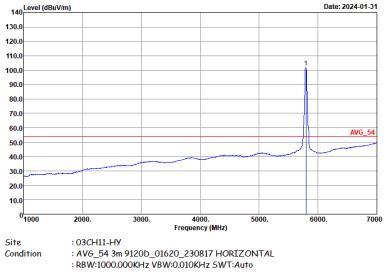
WIFI 802.11n HT40 (Band Edge @ 3m)

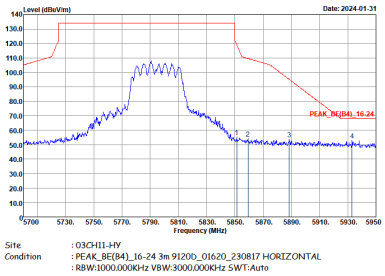
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

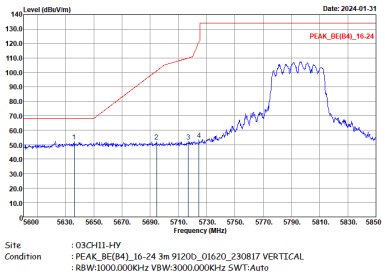
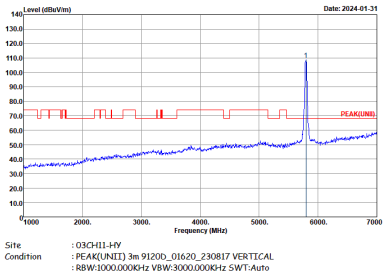
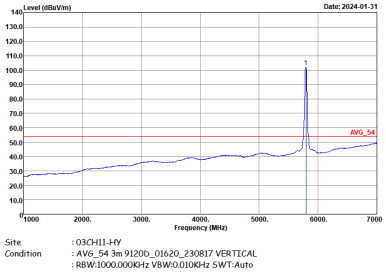
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
0+1	Horizontal	Fundamental
Peak		Left blank

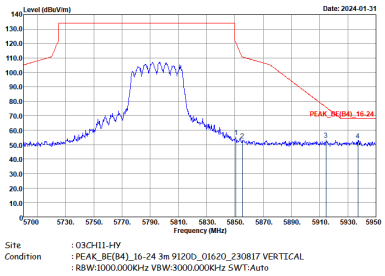
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
0+1	Vertical	Fundamental
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

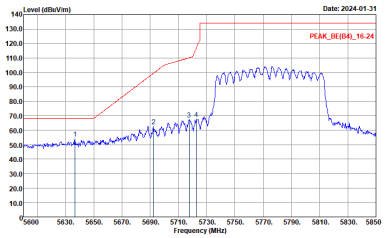
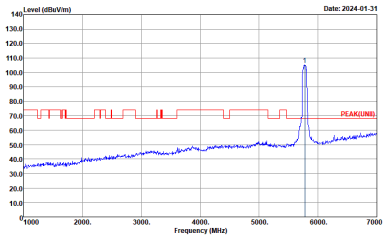
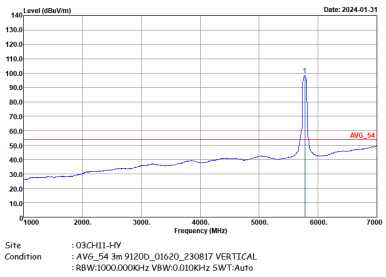
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
0+1	Horizontal	Fundamental
Peak		Left blank

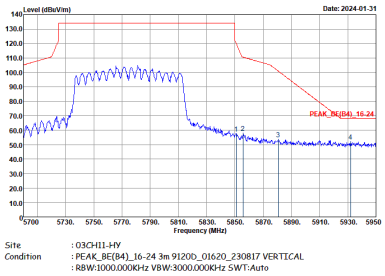
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

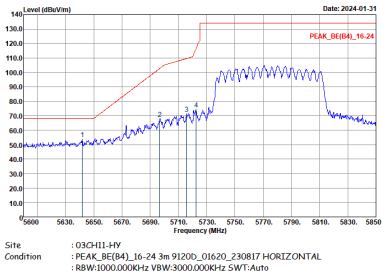
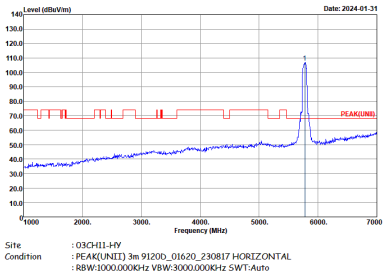
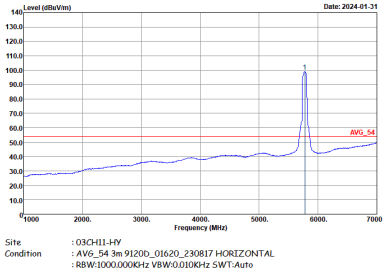
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
0+1	Vertical	Fundamental
Peak		Left blank

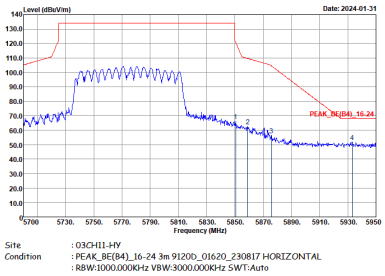
Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
0+1	Horizontal	Fundamental
Peak		
Avg	Left blank	

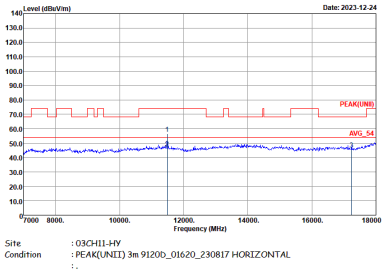
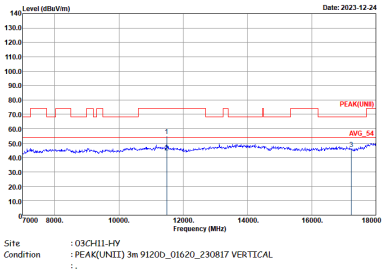
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
0+1	Horizontal	Fundamental
Peak		Left blank

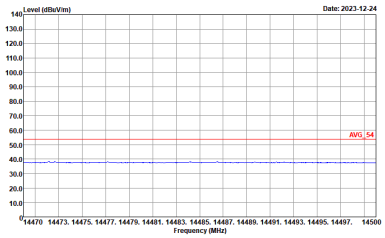
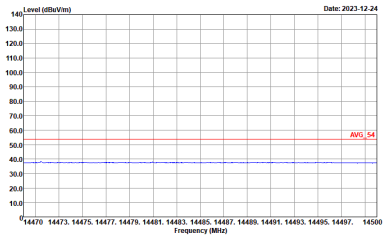
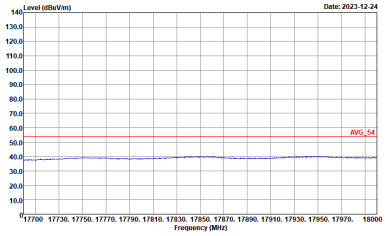
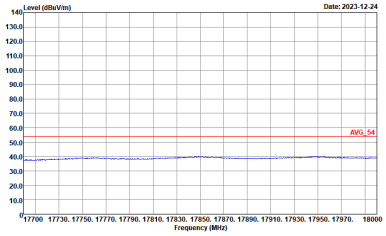
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
0+1	Vertical	Fundamental
Peak		
Avg	Left blank	

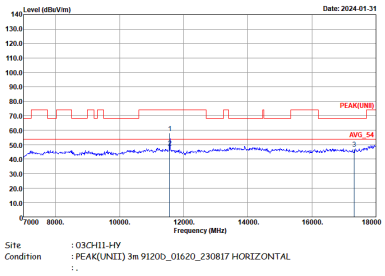
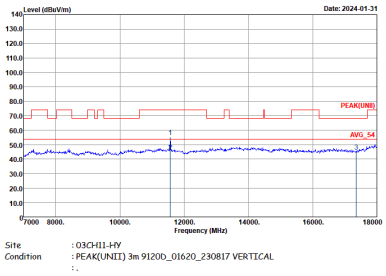
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
0+1	Vertical	Fundamental
Peak		Left blank

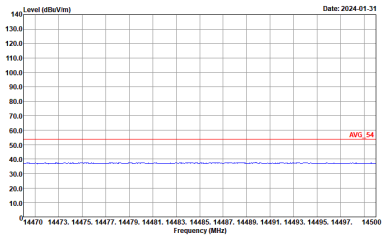
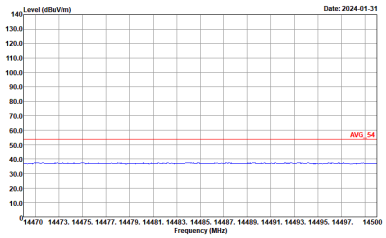
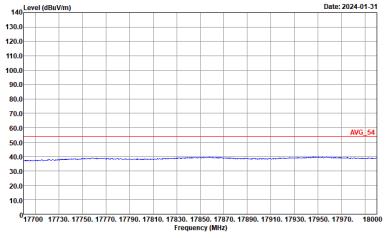
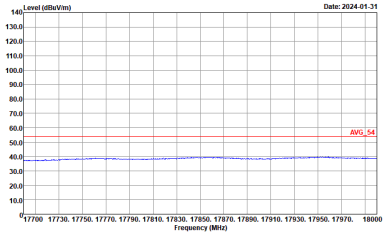
Band 4 - 5725~5850MHz

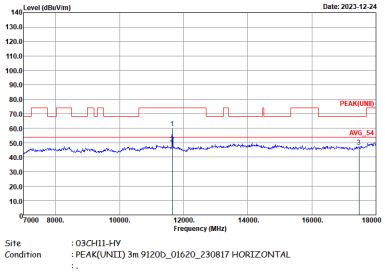
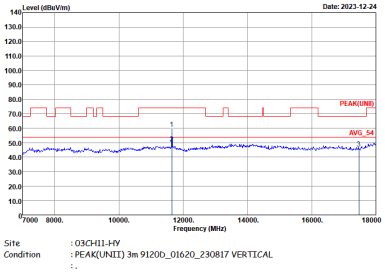
WIFI 802.11a (Harmonic @ 3m)

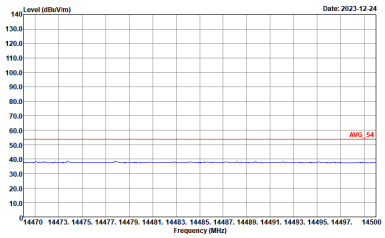
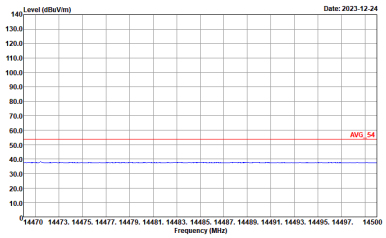
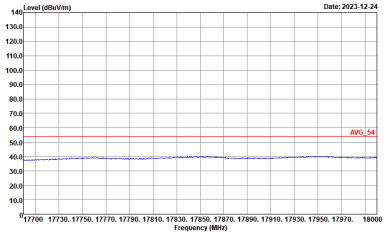
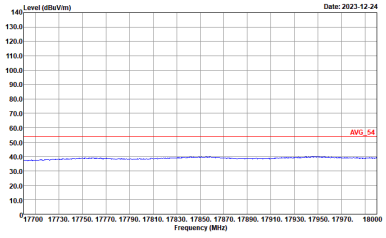
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
0+1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH11-HY Condition : AVG_54 3m 9120D_01620_230817 HORIZONTAL : .	 Site : 03CH11-HY Condition : AVG_54 3m 9120D_01620_230817 VERTICAL : .
17.7G ~18G Avg	 Site : 03CH11-HY Condition : AVG_54 3m 9120D_01620_230817 HORIZONTAL : .	 Site : 03CH11-HY Condition : AVG_54 3m 9120D_01620_230817 VERTICAL : .

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Horizontal	Vertical
Peak Avg.		

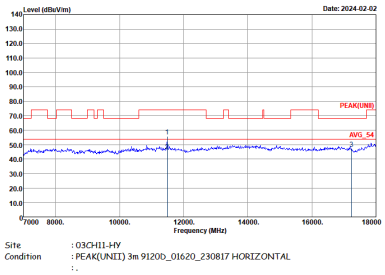
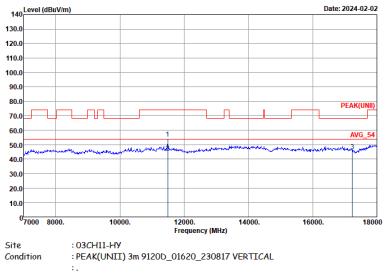
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

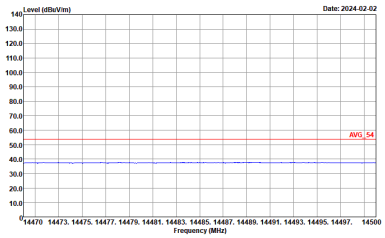
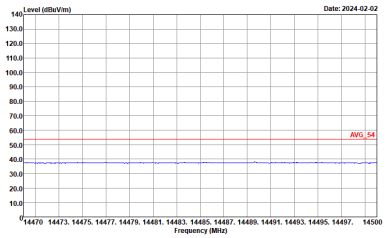
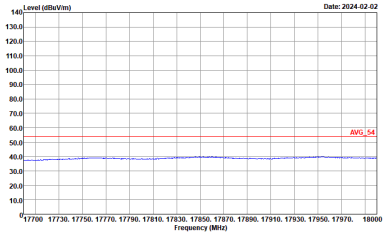
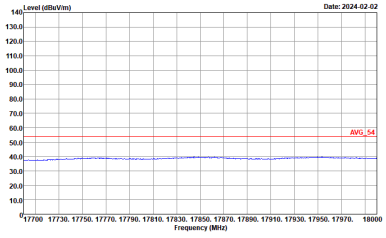
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
0+1	Horizontal	Vertical
Peak Avg.		

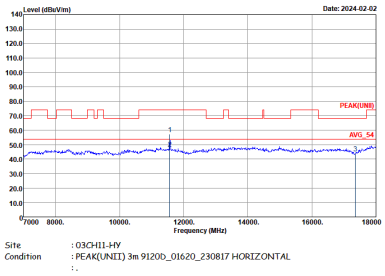
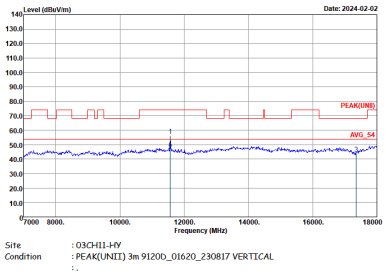
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

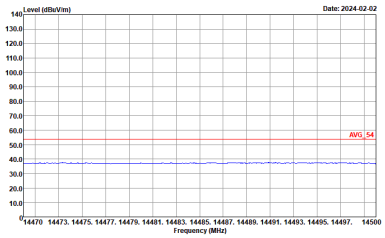
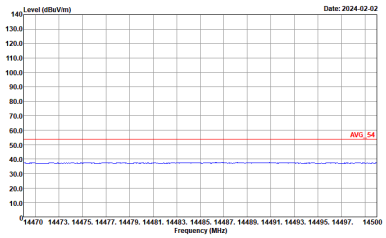
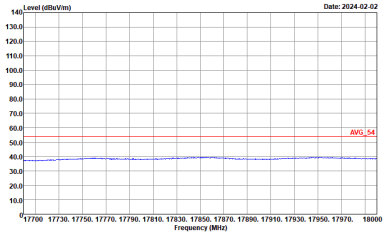
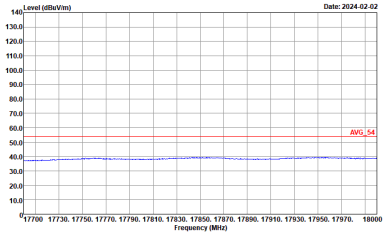
Band 4 5725~5850MHz

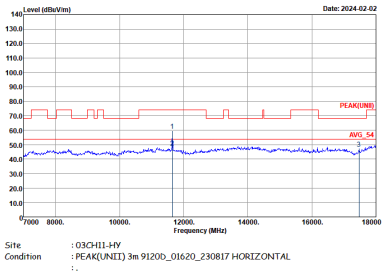
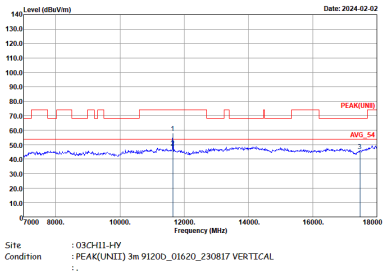
WIFI 802.11n HT20 (Harmonic @ 3m)

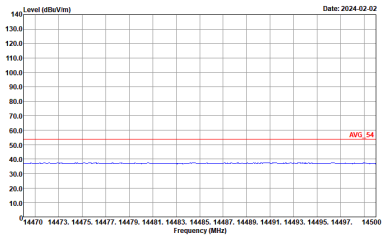
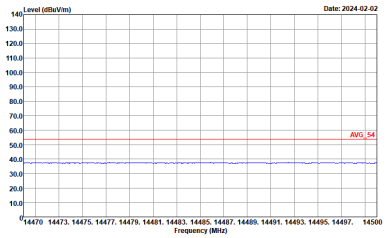
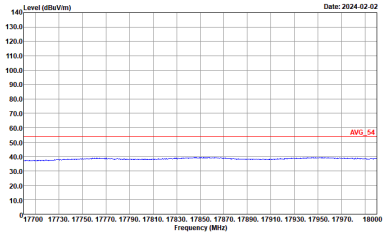
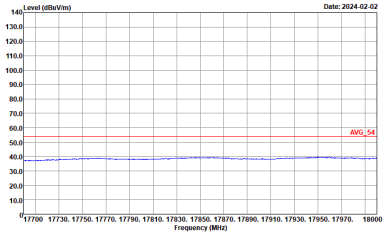
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
0+1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
0+1	Horizontal	Vertical
Peak Avg.		

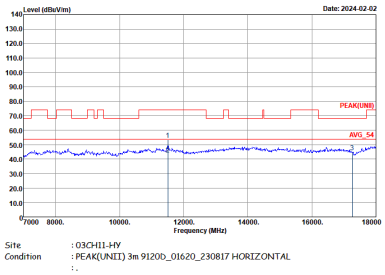
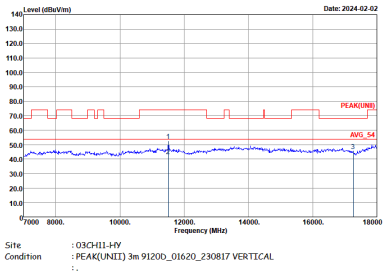
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

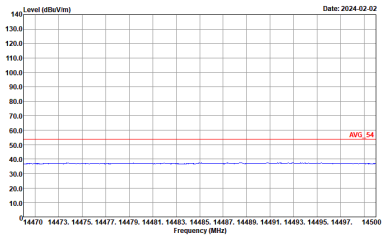
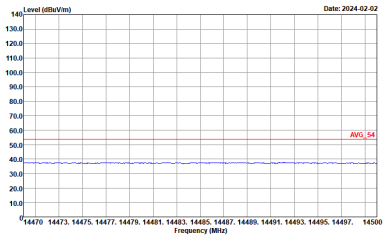
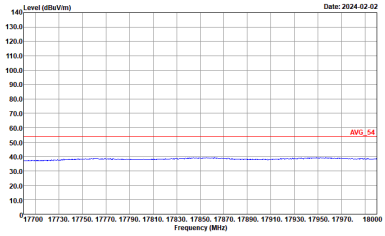
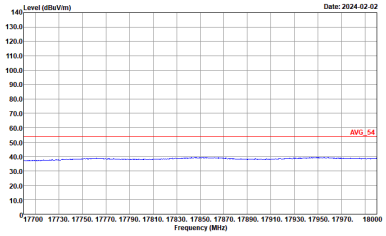
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
0+1	Horizontal	Vertical
Peak Avg.		

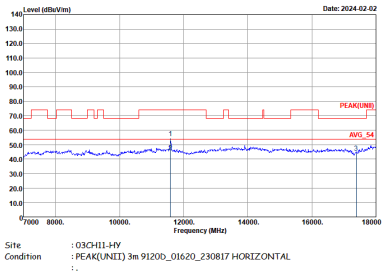
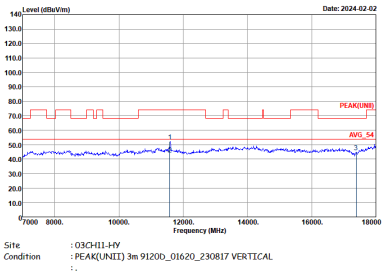
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

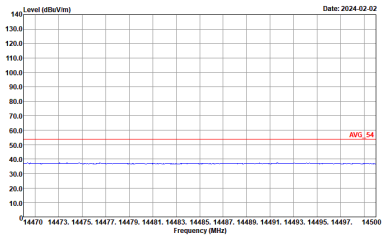
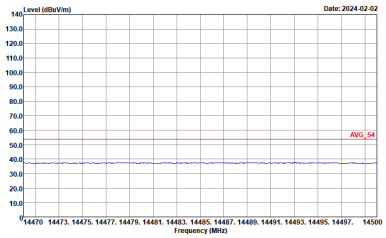
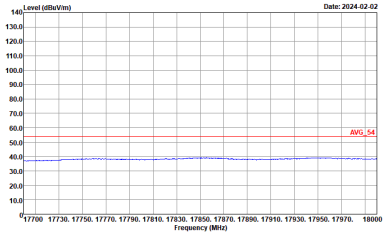
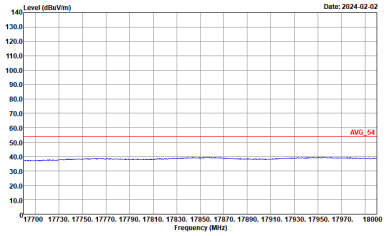
Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
0+1	Horizontal	Vertical
Peak Avg.		

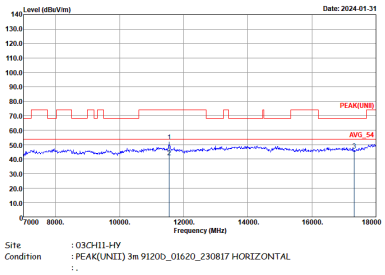
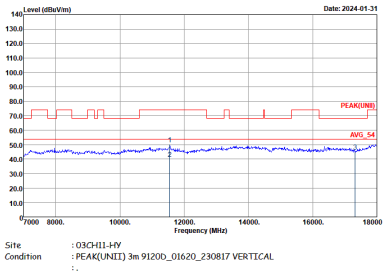
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

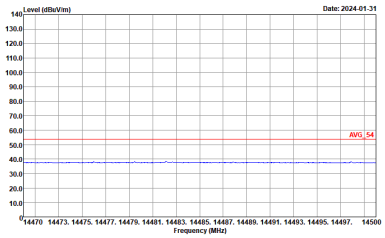
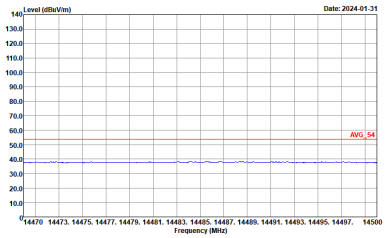
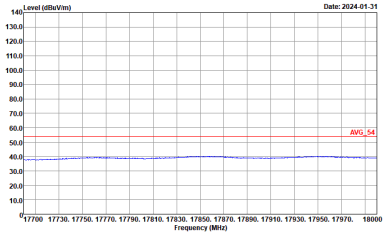
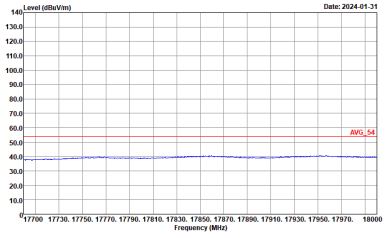
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
0+1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

Band 4 5725~5850MHz

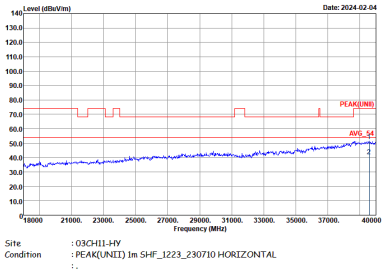
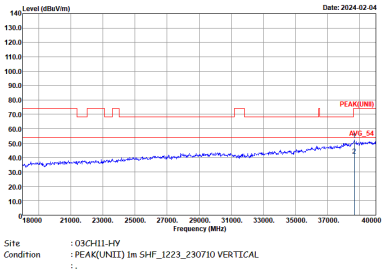
WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
0+1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
0+1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

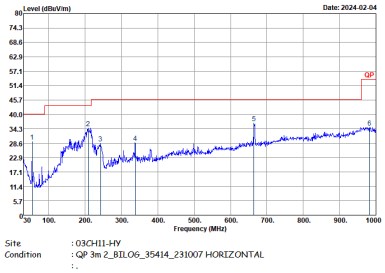
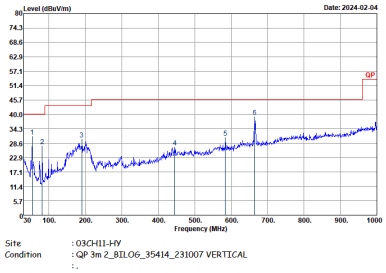
Emission above 18GHz

5GHz WIFI 802.11a (SHF @ 1m)

WIFI	5GHz WIFI	
ANT	802.11a SHF	
0+1	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 3m)

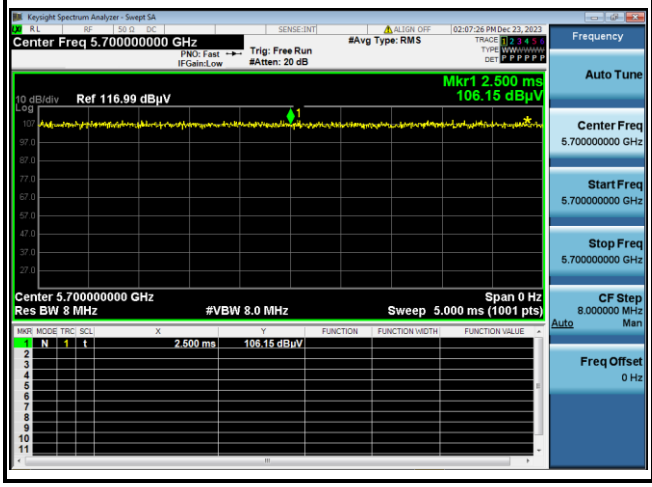
WIFI	5GHz WIFI	
ANT	802.11a LF	
0+1	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

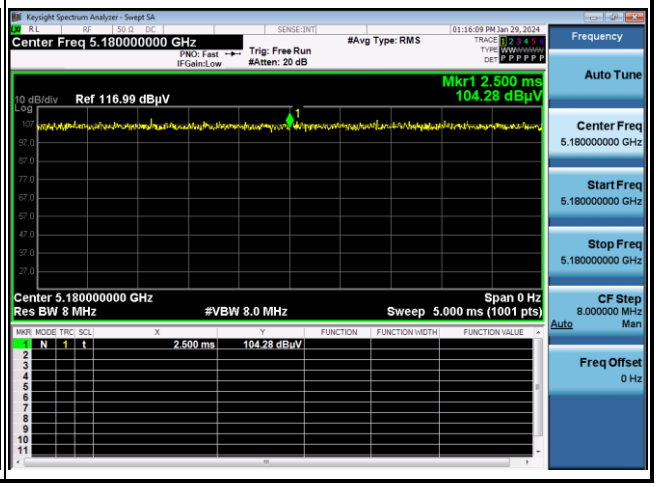
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
0+1	802.11a	100.00	-	-	10Hz
0+1	5GHz 802.11n HT20	100.00	-	-	10Hz
0+1	5GHz 802.11n HT40	100.00	-	-	10Hz
0+1	5GHz 802.11ac VHT80	100.00	-	-	10Hz

MIMO <Ant. 0+1>

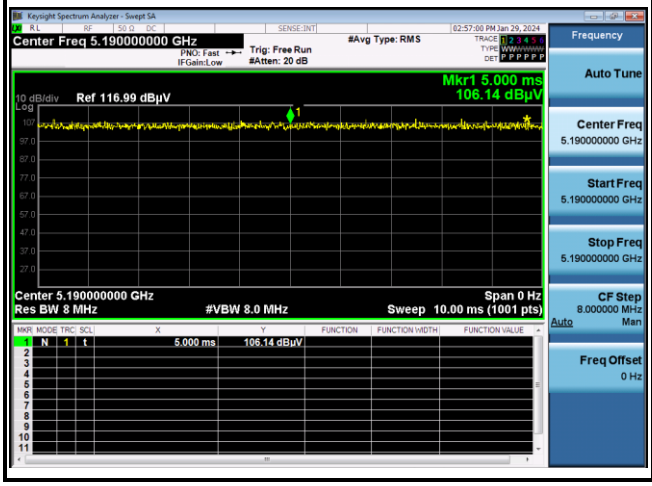
802.11a



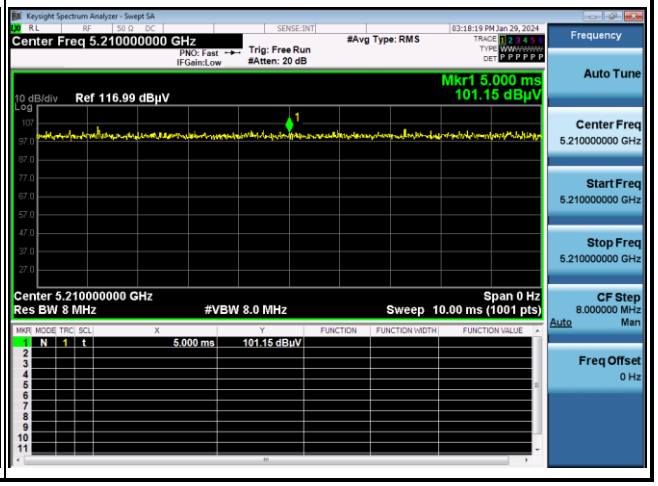
5GHz 802.11n HT20



5GHz 802.11n HT40



5GHz 802.11ac VHT80



———THE END———