



FCC RADIO TEST REPORT

FCC ID : HFS-GRS6B
Equipment : Wireless Device
Model Name : GRS6B
Applicant : Quanta Computer Inc.
No.188, Wenhua 2nd Rd., Guishan
Dist., Taoyuan City 33377, Taiwan
Standard : FCC Part 15 Subpart E §15.407

The product was received on Feb. 02, 2024 and testing was performed from Feb. 22, 2024 to Mar. 20, 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

Sporton International Inc. Wensan Laboratory

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Product Feature of Equipment Under Test.....	5
1.2 Modification of EUT	7
1.3 Testing Location	7
1.4 Applicable Standards.....	7
2 Test Configuration of Equipment Under Test	8
2.1 Carrier Frequency and Channel	8
2.2 Test Mode.....	9
2.3 Connection Diagram of Test System.....	10
2.4 Support Unit used in test configuration and system	11
2.5 EUT Operation Test Setup	12
2.6 Measurement Results Explanation Example.....	12
3 Test Result	13
3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement	13
3.2 Maximum Conducted Output Power Measurement	14
3.3 Power Spectral Density Measurement	15
3.4 Unwanted Emissions Measurement.....	17
3.5 AC Conducted Emission Measurement.....	21
3.6 Antenna Requirements.....	23
4 List of Measuring Equipment.....	24
5 Measurement Uncertainty	26
Appendix A. Conducted Test Results	
Appendix B. AC Conducted Emission Test Result	
Appendix C. Radiated Spurious Emission	
Appendix D. Radiated Spurious Emission Plots	
Appendix E. Duty Cycle Plots	
Appendix F. Setup Photographs	



History of this test report

Report No.	Version	Description	Issue Date
FR413008F	01	Initial issue of report	Apr. 02, 2024
FR413008F	02	- Revise Connection Diagram of Test System and Support Unit used in test configuration and system - Revise List of Measuring Equipment This report is an updated version, replacing the report issued on Apr. 02, 2024.	May 08, 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	3.08 dB under the limit at 665.40 MHz
3.5	15.207	AC Conducted Emission	Pass	13.30 dB under the limit at 0.17 MHz
3.6	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/manufacture 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: Avis Chuang

Report Producer: Mila Chen



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature
General Specs Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n/ac and Thread.
Antenna Type WLAN <Ant. 1>: PIFA Antenna <Ant. 2>: PIFA Antenna Bluetooth: PIFA Antenna Thread: PIFA Antenna

EUT Information List	
S/N	Performed Test Item
41301HFBS011W3	RF Conducted Measurement
41301HFBS011XX	Radiated Spurious Emission
41311HFBS012BG 41311HFBS012CP	Conducted Emission

Antenna information		
5725 MHz ~ 5850 MHz	Peak Gain (dBi)	Ant. 1: 2.14 Ant. 2: 4.62

Remark: The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

1.1.1 Antenna Directional Gain

Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F2)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 k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

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

Directional gain = $10 \cdot \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]$ dBi

Where $G_1, G_2, \dots, G_N$ denote single antenna gain.

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

			DG for	DG for	Power Limit	PSD Limit
	Ant 1	Ant 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	2.14	4.62	4.62	6.48	0.00	0.48

Calculation example:

If a device has two antenna, $G_{ANT1} = 2.14$ dBi; $G_{ANT2} = 4.62$ dBi

Directional gain of power measurement = $\max(2.14, 4.62) + 0 = 4.62$ dBi

Directional gain of PSD derived from formula which is

$$10 \times \log \left\{ \left[10^{(2.14 \text{ dBi} / 20)} + 10^{(4.62 \text{ dBi} / 20)} \right]^2 / 2 \right\} \\ = 6.48 \text{ dBi}$$

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



1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

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, CO07-HY, 03CH11-HY

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

FCC designation No.: TW3786

1.4 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). Full connection mode (Ethernet port connected to WLAN AP and HDMI port connected to TV) and stand-alone mode have been verified. Based on the verification results, the worst case (stand-alone mode) were recorded in this report.
- 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 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 SISO mode conducted power is covered by MIMO mode per chain, so only the MIMO mode is tested.

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

Remark: The conducted power level of each chain in MIMO mode is equal or higher than SISO mode.

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) 802.11a Tx + USB Cable 2 (Charging with Adapter 1)
Remark: For Radiated Test Cases, the tests were performed with USB Cable 2.	

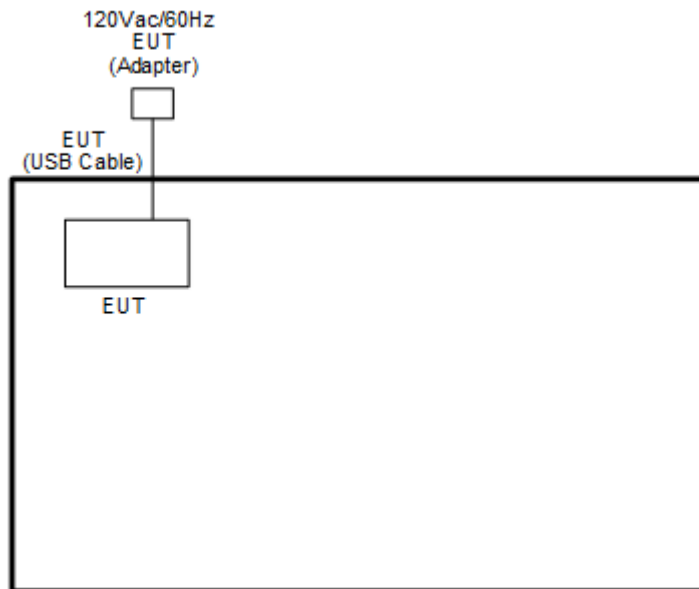
Ch. #		Band IV : 5725-5850 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

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

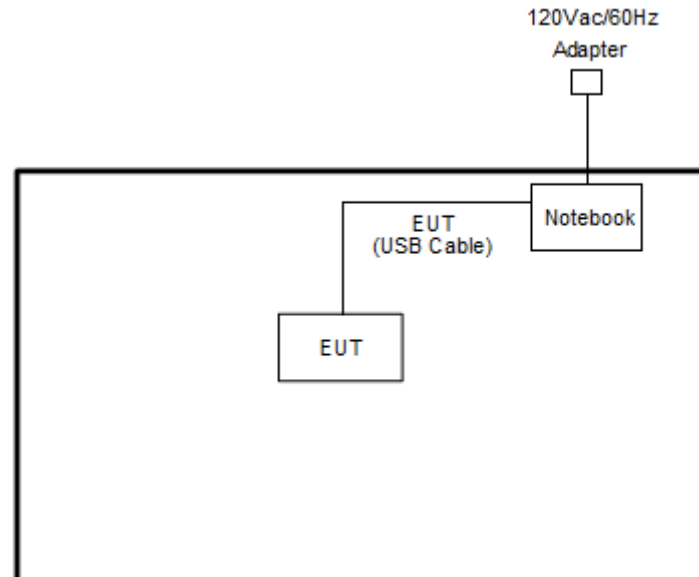
2.3 Connection Diagram of Test System

<Stand-alone Mode >

<AC Conducted Emission Mode>

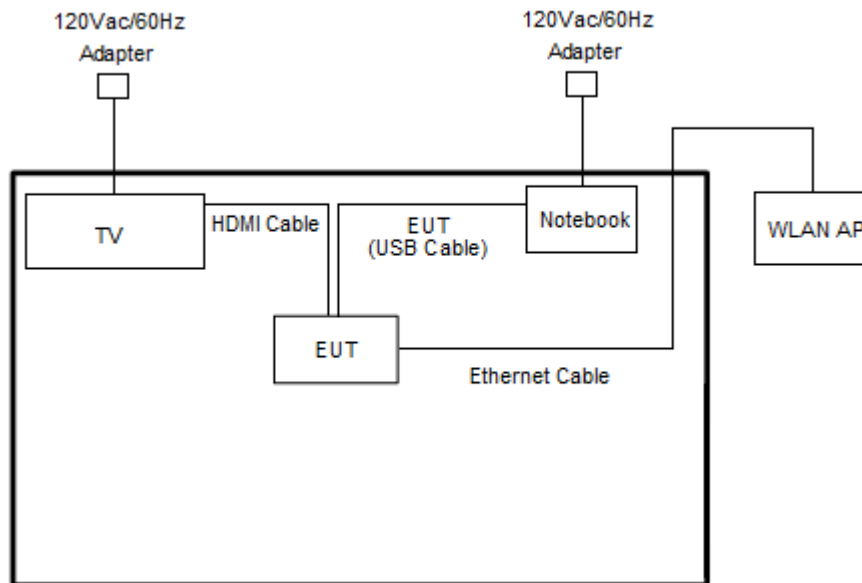


<WLAN Tx Mode>



<Full Connection Mode>

<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.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
2.	TV	LG	LG49SM8111PWA	FCC DoC	N/A	Unshielded, 1.8 m
3.	TV	Sharp	LC-50UA6800T	FCC DoC	N/A	Unshielded, 1.8 m
4.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
5.	WLAN AP	ASUS	RT-AX88U	MSQ-RTAXHP00	N/A	Unshielded, 1.8 m



2.5 EUT Operation Test Setup

The RF test items, utility “Cmd Ver. 10.0.17134.1304” 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.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

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.

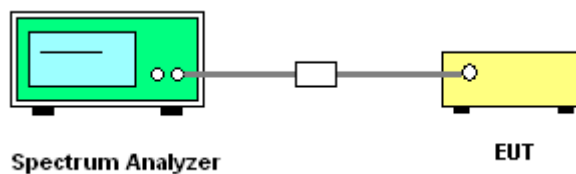
3.1.2 Measuring Instruments

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 $\geq 3 \times$ 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.

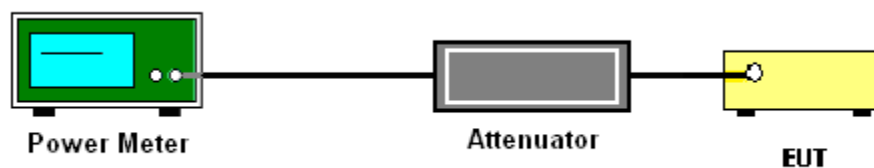
3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



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

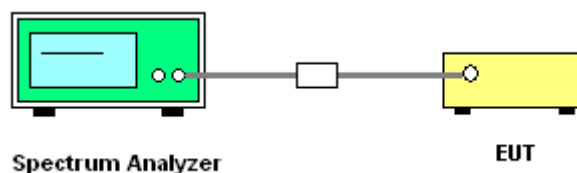
(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 300kHz.
 - Set VBW ≥ 1 MHz.
 - Add $10 \log(500 \text{ kHz/RBW})$ to the measured result, whereas RBW ($< 500 \text{ kHz}$) is the reduced resolution bandwidth of the spectrum analyzer set during measurement
 - Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$.
 - 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 $10 \log(1/0.25) = 6 \text{ dB}$ 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 $10 \log(N_{\text{ANT}})$ 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 $10 \log(N_{\text{ANT}})$ dB is added to each spectrum value before comparing to the emission limit. The addition of $10 \log(N_{\text{ANT}})$ dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{\text{ANT}}^{\text{th}}$ 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.

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

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.

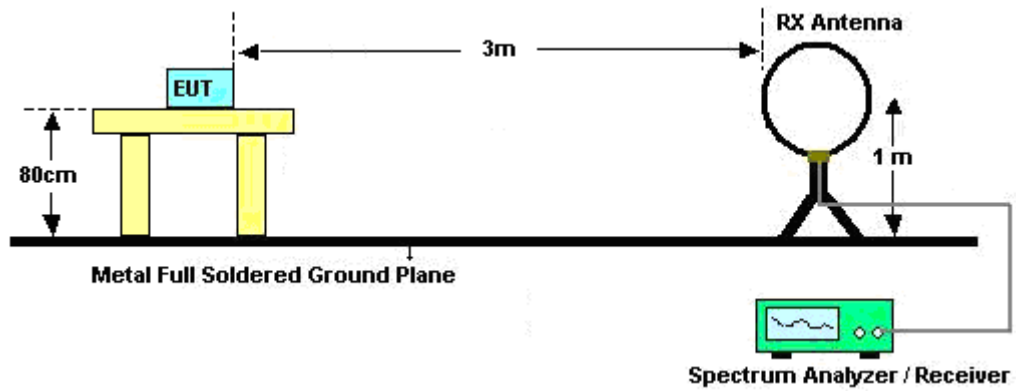
3.4.3 Test Procedures

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) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - $VBW \geq 1/T$, 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.

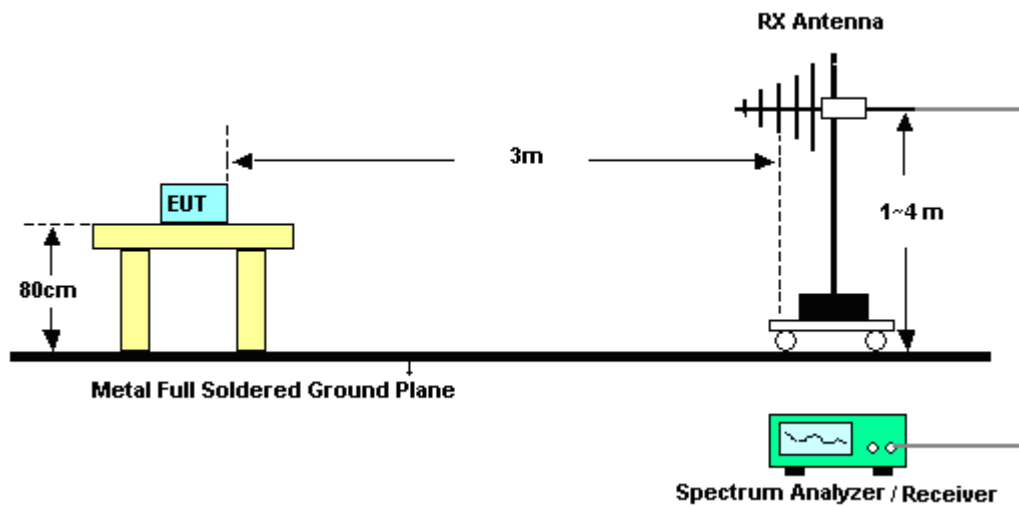
When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-”.

3.4.4 Test Setup

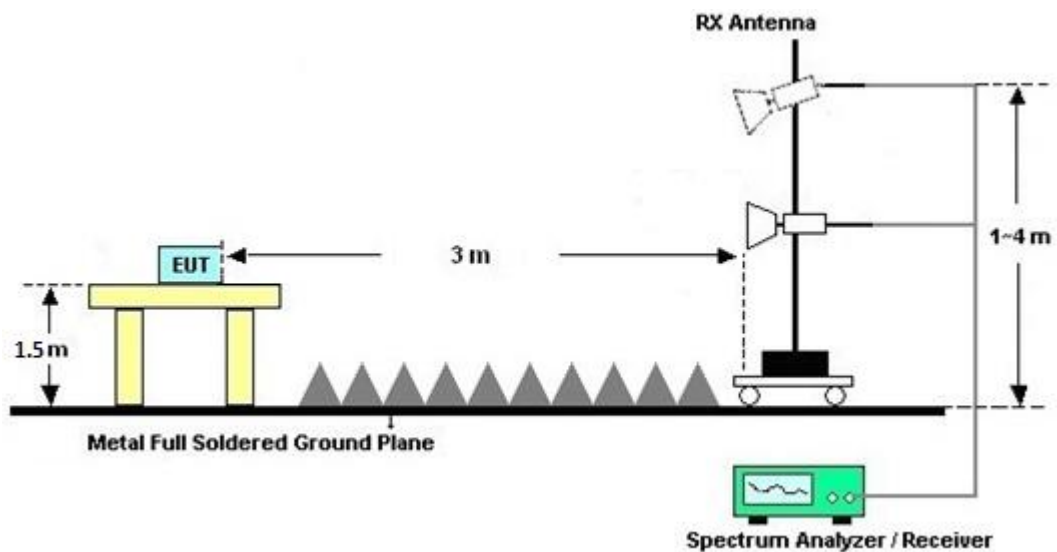
For radiated emissions below 30MHz



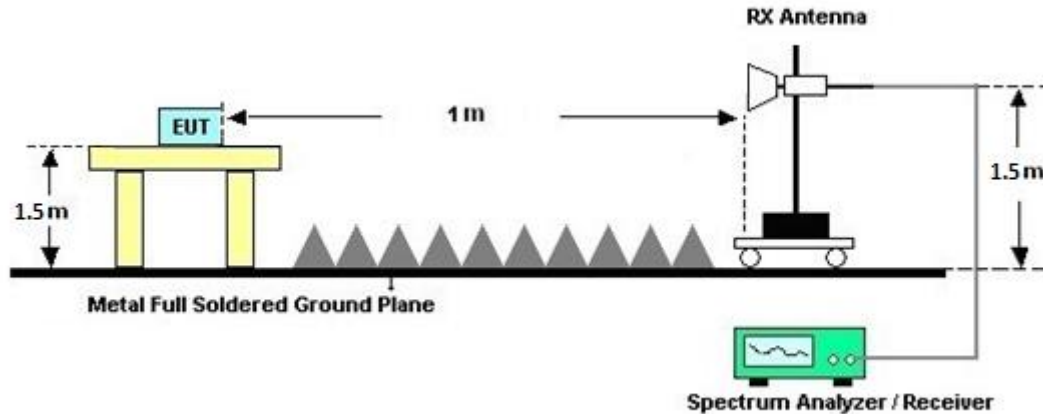
For radiated emissions from 30MHz to 1GHz



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 (dB μ V)	
	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.

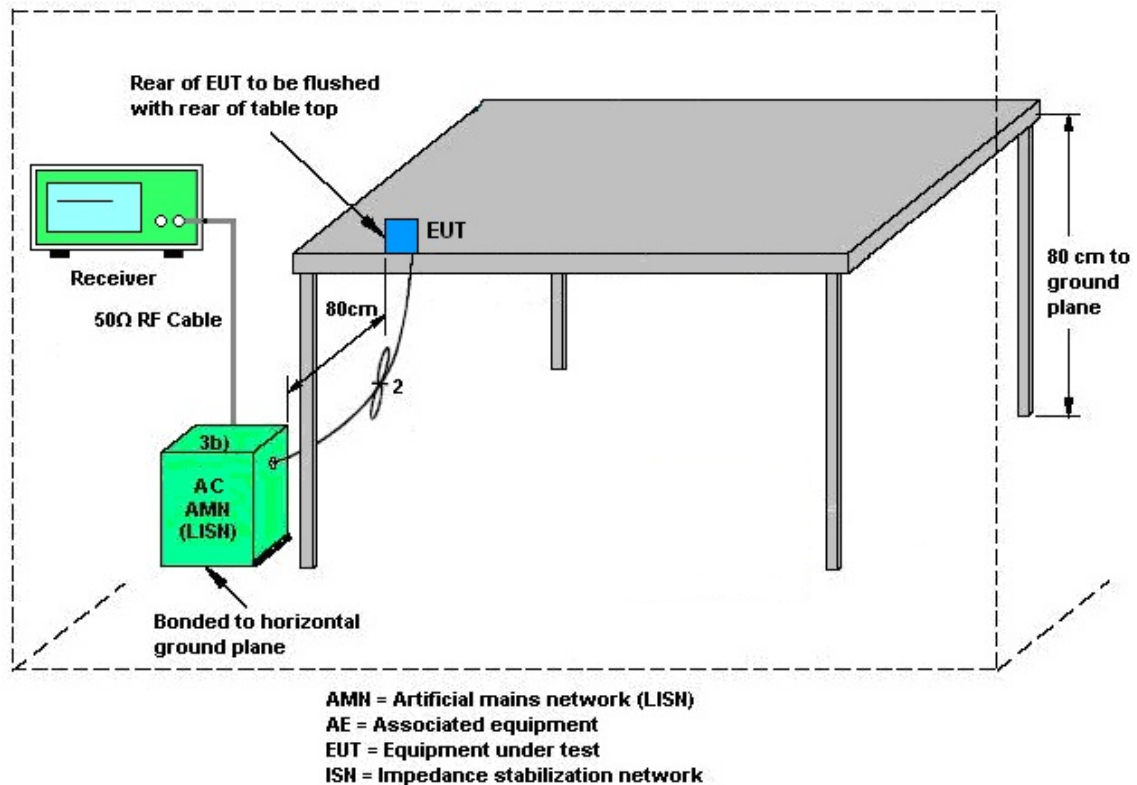
3.5.2 Measuring Instruments

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 Antenna Requirements

3.6.1 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.

3.6.2 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
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Mar. 20, 2024	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Mar. 20, 2024	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz~200MHz	Oct. 20, 2023	Mar. 20, 2024	Oct. 19, 2024	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 14, 2024	Mar. 20, 2024	Mar. 13, 2025	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Mar. 10, 2024	Mar. 20, 2024	Mar. 09, 2025	Conduction (CO07-HY)
Four-Line V-Network	TESEQ	NNB 52	36122	N/A	Mar. 07, 2024	Mar. 20, 2024	Mar. 06, 2025	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 20, 2023	Mar. 20, 2024	Sep. 19, 2024	Conduction (CO07-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 07, 2023	Feb. 22, 2024~ Feb. 23, 2024	Oct. 06, 2024	Radiation (03CH11-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Feb. 22, 2024~ Feb. 23, 2024	Sep. 11, 2024	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Aug. 17, 2023	Feb. 22, 2024~ Feb. 23, 2024	Aug. 16, 2024	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00993	18GHz~40GHz	Nov. 24, 2023	Feb. 22, 2024~ Feb. 23, 2024	Nov. 23, 2024	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 08, 2023	Feb. 22, 2024~ Feb. 23, 2024	Dec. 07, 2024	Radiation (03CH11-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-10M-700 O-MR	EC1900245	10MHz~7GHz	Jan. 09, 2024	Feb. 22, 2024~ Feb. 23, 2024	Jan. 08, 2025	Radiation (03CH11-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055007	1GHz~18GHz	Jun. 14, 2023	Feb. 22, 2024~ Feb. 23, 2024	Jun. 13, 2024	Radiation (03CH11-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 27, 2023	Feb. 22, 2024~ Feb. 23, 2024	Jun. 26, 2024	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 05, 2023	Feb. 22, 2024~ Feb. 23, 2024	Oct. 04, 2024	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY55420170	20MHz~8.4GHz	Aug. 02, 2023	Feb. 22, 2024~ Feb. 23, 2024	Aug. 01, 2024	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Feb. 22, 2024~ Feb. 23, 2024	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Feb. 22, 2024~ Feb. 23, 2024	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Feb. 22, 2024~ Feb. 23, 2024	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001053	N/A	N/A	Feb. 22, 2024~ Feb. 23, 2024	N/A	Radiation (03CH11-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY1595/2	30MHz~40GHz	Mar. 07, 2023	Feb. 22, 2024~ Feb. 23, 2024	Mar. 06, 2024	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz~40GHz	Mar. 07, 2023	Feb. 22, 2024~ Feb. 23, 2024	Mar. 06, 2024	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9K~30M	Mar. 07, 2023	Feb. 22, 2024~ Feb. 23, 2024	Mar. 06, 2024	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	30M~40G	Mar. 07, 2023	Feb. 22, 2024~ Feb. 23, 2024	Mar. 06, 2024	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-15 30-8000-40SS	SN11	1.53G Low Pass	Sep. 11, 2023	Feb. 22, 2024~ Feb. 23, 2024	Sep. 10, 2024	Radiation (03CH11-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40SS	SN3	6.75GHz High Pass Filter	Sep. 11, 2023	Feb. 22, 2024~ Feb. 23, 2024	Sep. 10, 2024	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTM-303B	TP140325	N/A	Dec. 08, 2023	Feb. 22, 2024~ Feb. 23, 2024	Dec. 07, 2024	Radiation (03CH11-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 07, 2023	Mar. 12, 2024	Nov. 06, 2024	Conducted (TH05-HY)
Power Sensor	DARE	RPR3008W	RPR8W-2301 017 (NO:20)	10MHz~8GHz	Jul. 26, 2023	Mar. 12, 2024	Jul. 25, 2024	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101397	10Hz ~ 40GHz	Aug. 31, 2023	Mar. 12, 2024	Aug. 30, 2024	Conducted (TH05-HY)
Switch Control Mainframe	E-Instument	ETF-1405-0	EC1900067 (BOX7)	N/A	Jul. 10, 2023	Mar. 12, 2024	Jul. 09, 2024	Conducted (TH05-HY)



5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.44 dB
--	---------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.1 dB
--	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.3 dB
--	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.3 dB
--	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.3 dB
--	--------

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Kevin Xiao	Temperature:	21~25	°C
Test Date:	2024/3/12	Relative Humidity:	51~54	%

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

U-NII-3 MIMO												
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	149	5745	16.83	17.03	20.42	25.04	16.35	16.04	0.5	Pass
11a	6Mbps	2	157	5785	16.83	17.08	20.50	23.98	16.32	16.33	0.5	Pass
11a	6Mbps	2	165	5825	16.83	16.83	20.17	21.62	16.32	16.32	0.5	Pass
HT20	MCS0	2	149	5745	17.83	17.93	20.64	24.66	17.57	17.59	0.5	Pass
HT20	MCS0	2	157	5785	17.83	17.88	20.56	23.81	17.59	17.57	0.5	Pass
HT20	MCS0	2	165	5825	17.83	17.83	20.56	23.35	17.58	17.59	0.5	Pass
HT40	MCS0	2	151	5755	36.86	36.76	41.94	42.06	36.33	36.30	0.5	Pass
HT40	MCS0	2	159	5795	36.76	36.86	42.18	41.82	36.32	36.32	0.5	Pass
VHT80	MCS0	2	155	5775	75.52	75.52	81.15	81.54	76.35	76.34	0.5	Pass

TEST RESULTS DATA
Average Power Table

U-NII-3 MIMO														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	0.00	0.00	16.10	15.45	18.80	30.00		4.62		Pass
11a	6Mbps	2	157	5785	0.00	0.00	16.40	16.10	19.26	30.00		4.62		Pass
11a	6Mbps	2	165	5825	0.00	0.00	16.00	15.80	18.91	30.00		4.62		Pass
HT20	MCS0	2	149	5745	0.00	0.00	15.90	15.30	18.62	30.00		4.62		Pass
HT20	MCS0	2	157	5785	0.00	0.00	15.80	15.55	18.69	30.00		4.62		Pass
HT20	MCS0	2	165	5825	0.00	0.00	15.90	15.45	18.69	30.00		4.62		Pass
HT40	MCS0	2	151	5755	0.00	0.00	14.90	14.55	17.74	30.00		4.62		Pass
HT40	MCS0	2	159	5795	0.00	0.00	14.90	14.70	17.81	30.00		4.62		Pass
VHT20	MCS0	2	149	5745	0.00	0.00	15.80	15.20	18.52	30.00		4.62		Pass
VHT20	MCS0	2	157	5785	0.00	0.00	15.70	15.45	18.59	30.00		4.62		Pass
VHT20	MCS0	2	165	5825	0.00	0.00	15.80	15.35	18.59	30.00		4.62		Pass
VHT40	MCS0	2	151	5755	0.00	0.00	14.80	14.45	17.64	30.00		4.62		Pass
VHT40	MCS0	2	159	5795	0.00	0.00	14.80	14.60	17.71	30.00		4.62		Pass
VHT80	MCS0	2	155	5775	0.00	0.00	15.40	15.10	18.26	30.00		4.62		Pass

TEST RESULTS DATA
Power Spectral Density

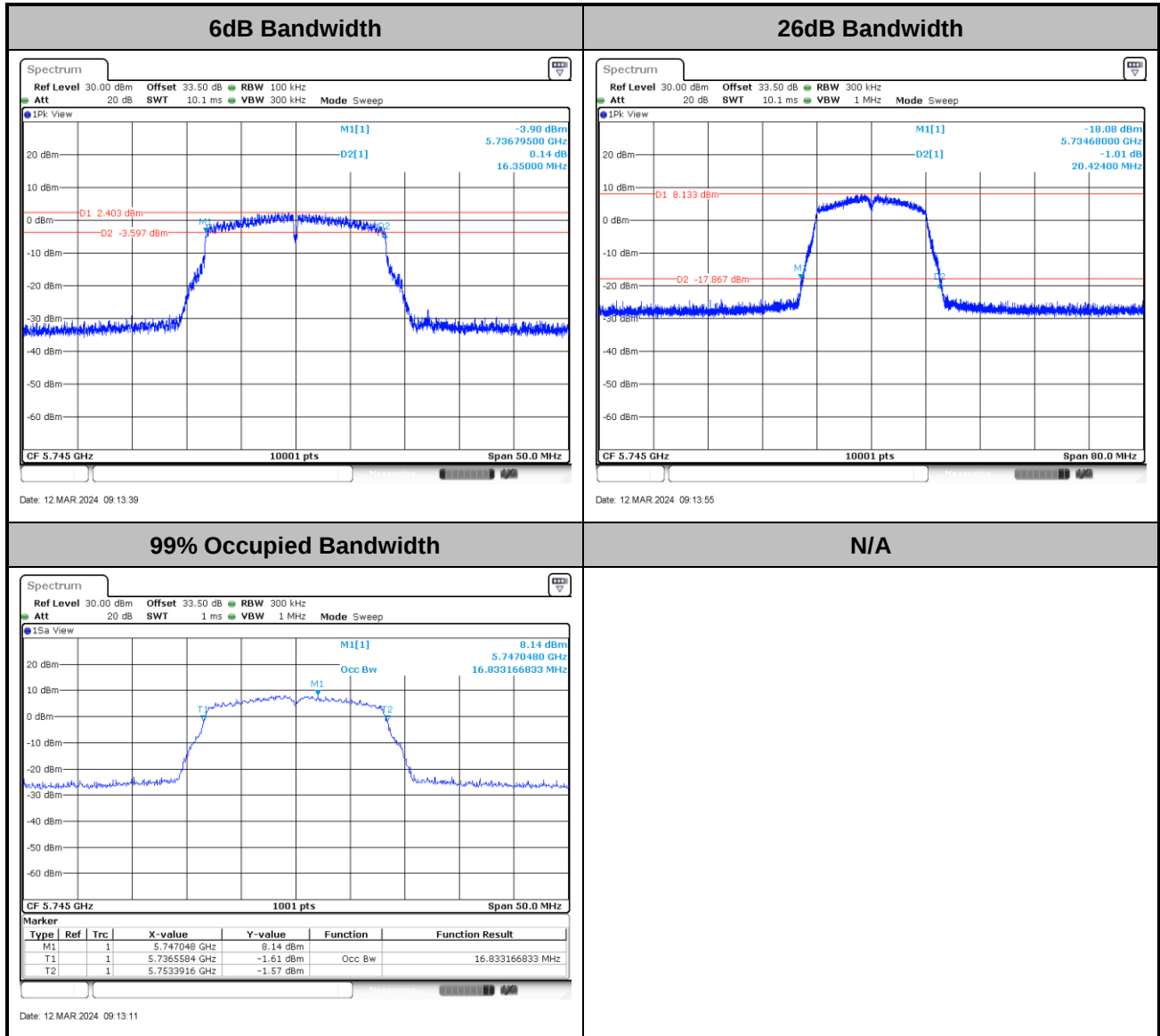
U-NII-3 MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density with Duty Factor (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	0.00	0.00	2.22	2.55	2.25	5.56	29.52	6.48	Pass			
11a	6Mbps	2	157	5785	0.00	0.00	2.22	2.90	2.70	5.91	29.52	6.48	Pass			
11a	6Mbps	2	165	5825	0.00	0.00	2.22	2.59	2.42	5.60	29.52	6.48	Pass			
HT20	MCS0	2	149	5745	0.00	0.00	2.22	2.24	1.70	5.25	29.52	6.48	Pass			
HT20	MCS0	2	157	5785	0.00	0.00	2.22	1.94	1.95	4.96	29.52	6.48	Pass			
HT20	MCS0	2	165	5825	0.00	0.00	2.22	2.23	1.92	5.24	29.52	6.48	Pass			
HT40	MCS0	2	151	5755	0.00	0.00	2.22	-1.83	-1.91	1.18	29.52	6.48	Pass			
HT40	MCS0	2	159	5795	0.00	0.00	2.22	-1.71	-1.87	1.30	29.52	6.48	Pass			
VHT80	MCS0	2	155	5775	0.00	0.00	2.22	-4.20	-4.33	-1.19	29.52	6.48	Pass			

Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)

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

MIMO <Ant. 1+2>

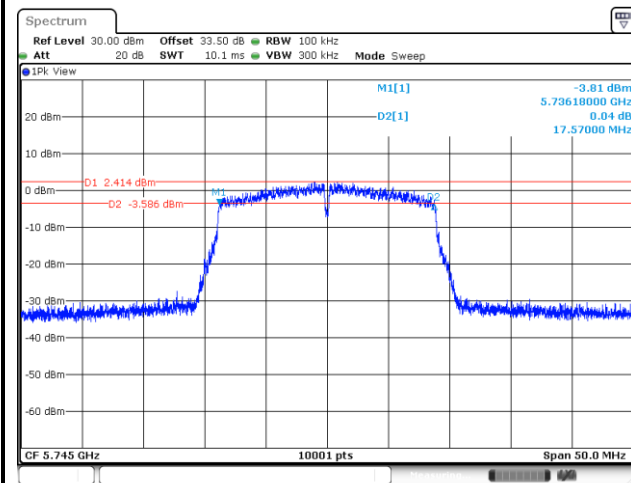
<802.11a>



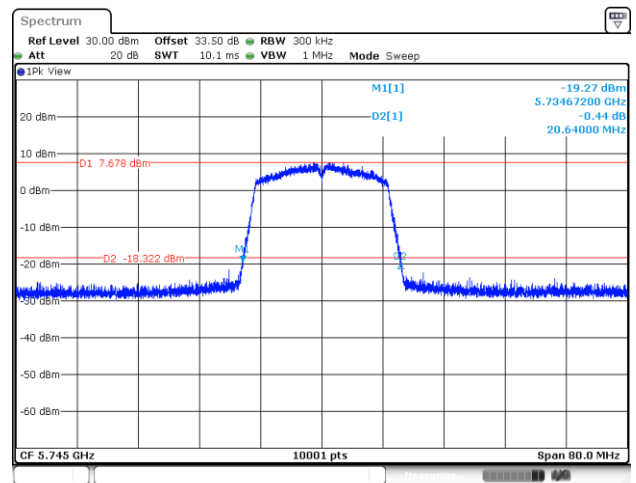


<802.11n HT20>

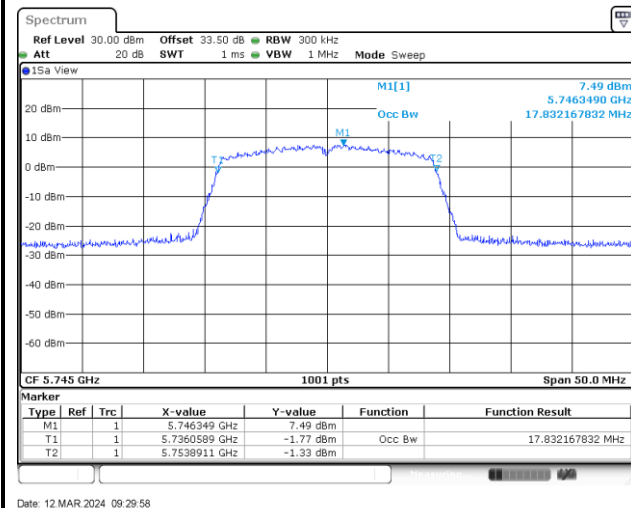
6dB Bandwidth



26dB Bandwidth



99% Occupied Bandwidth

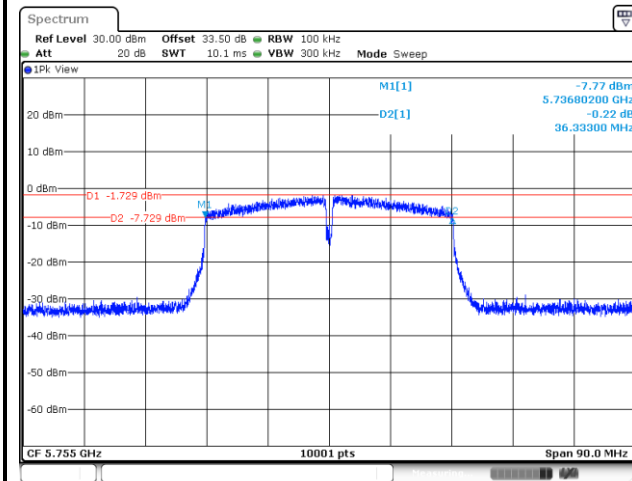


N/A



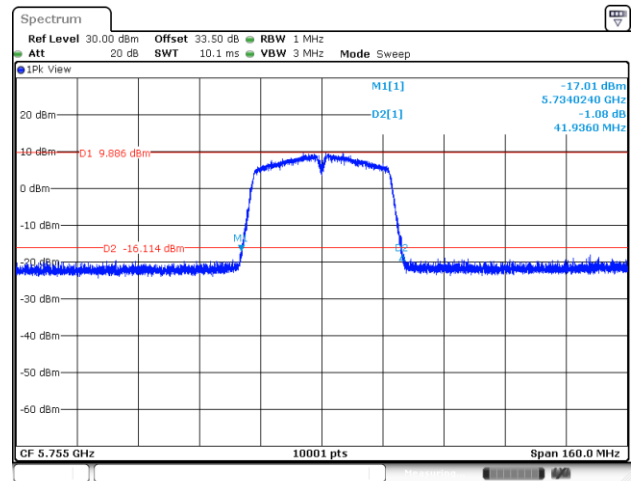
<802.11n HT40>

6dB Bandwidth



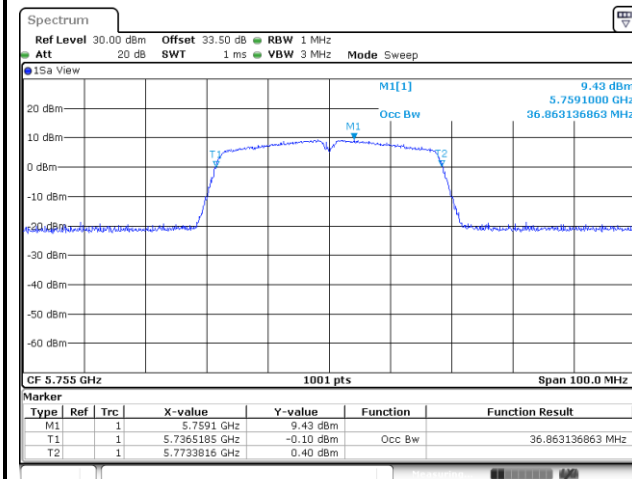
Date: 12.MAR.2024 10:12:32

26dB Bandwidth



Date: 12.MAR.2024 10:12:50

99% Occupied Bandwidth



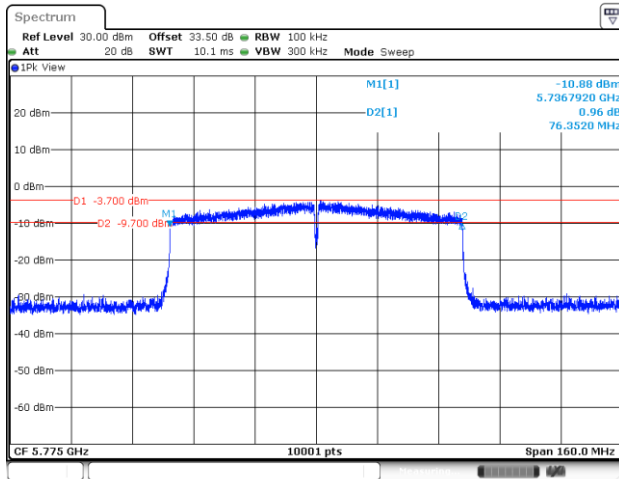
Date: 12.MAR.2024 10:11:56

N/A



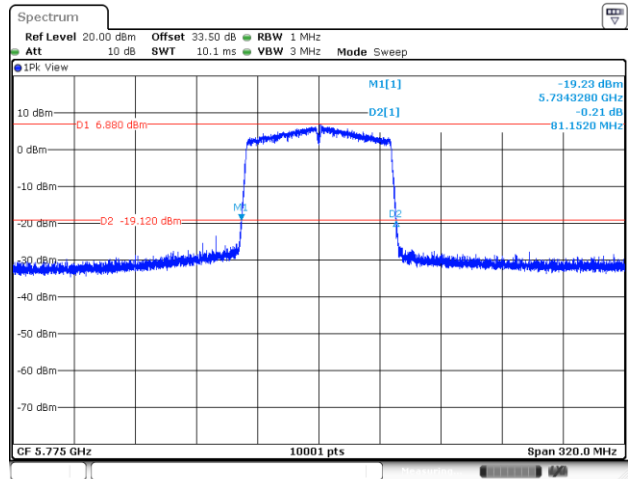
<802.11ac VHT80>

6dB Bandwidth



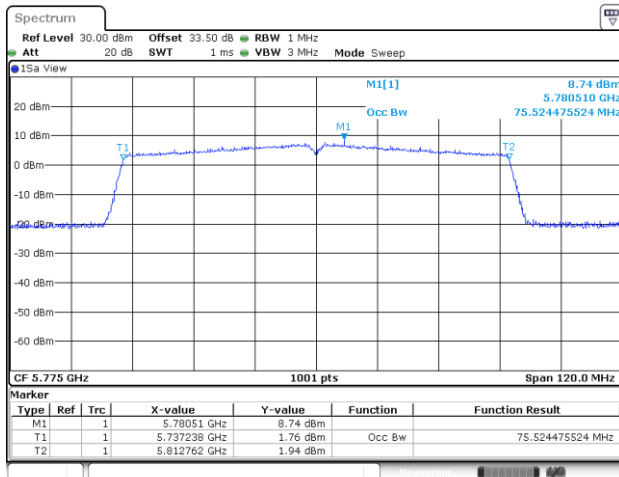
Date: 12.MAR.2024 10:24:35

26dB Bandwidth



Date: 12.MAR.2024 11:07:41

99% Occupied Bandwidth



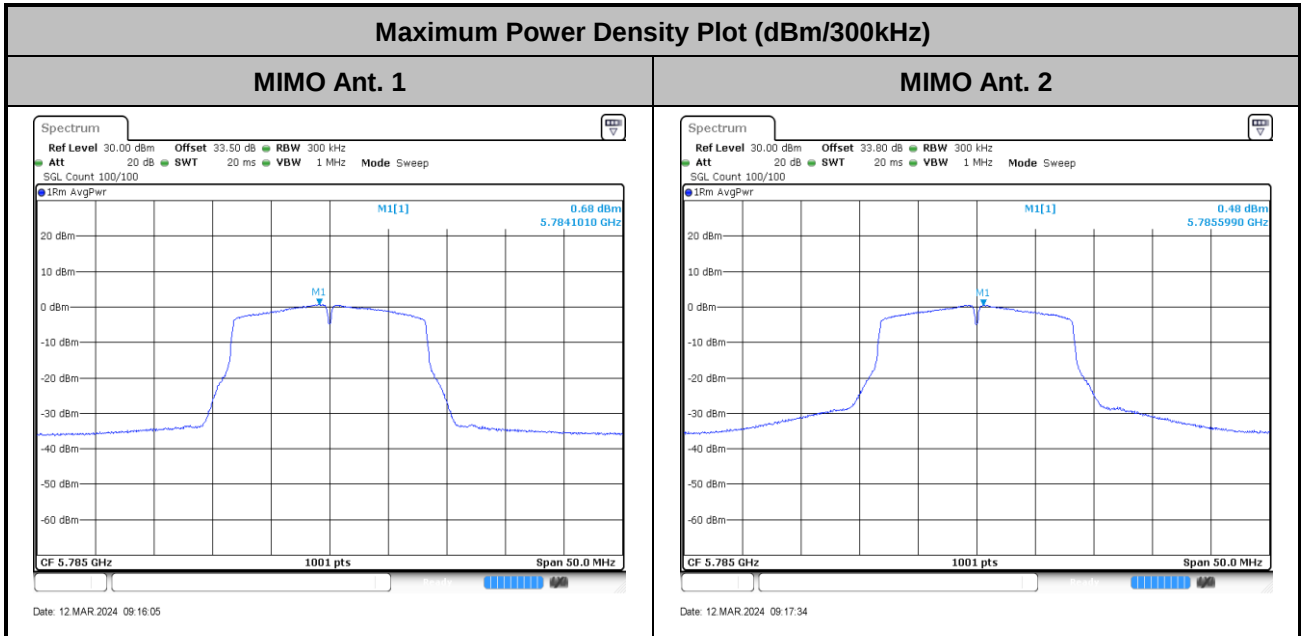
Date: 12.MAR.2024 10:24:03

N/A

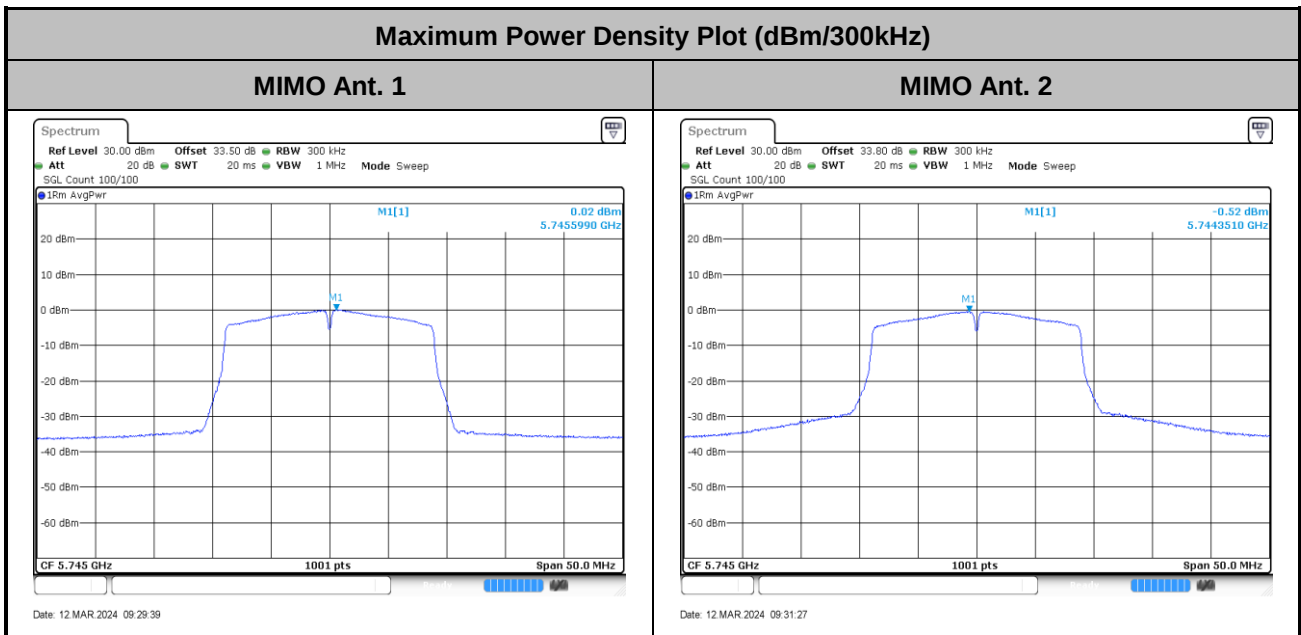


Test Result of Power Spectral Density

<802.11a>



<802.11n HT20>

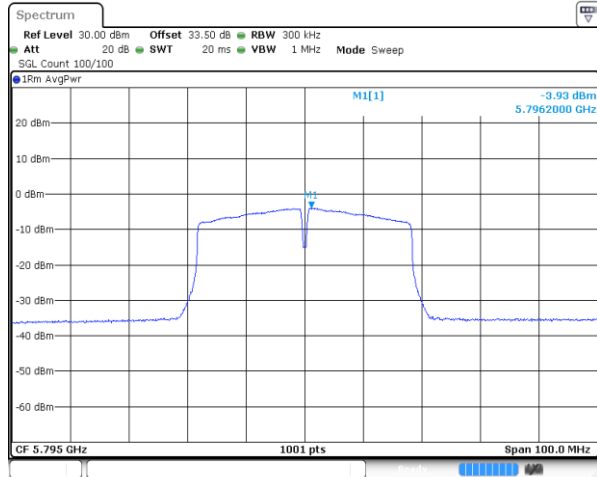




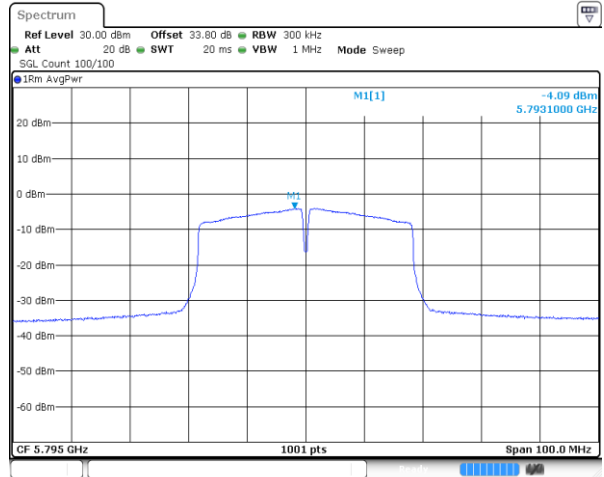
<802.11n HT40>

Maximum Power Density Plot (dBm/300kHz)

MIMO Ant. 1



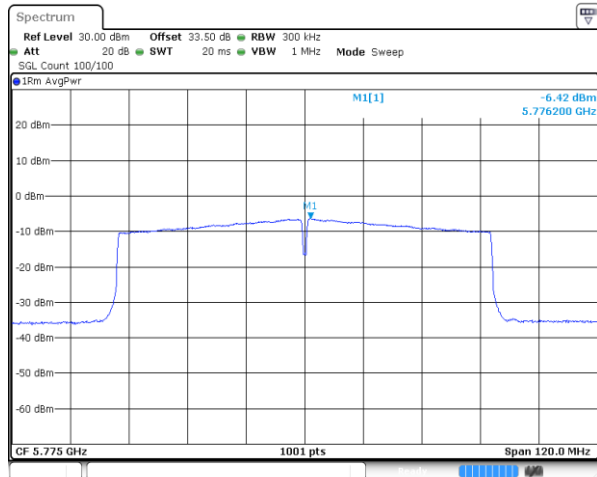
MIMO Ant. 2



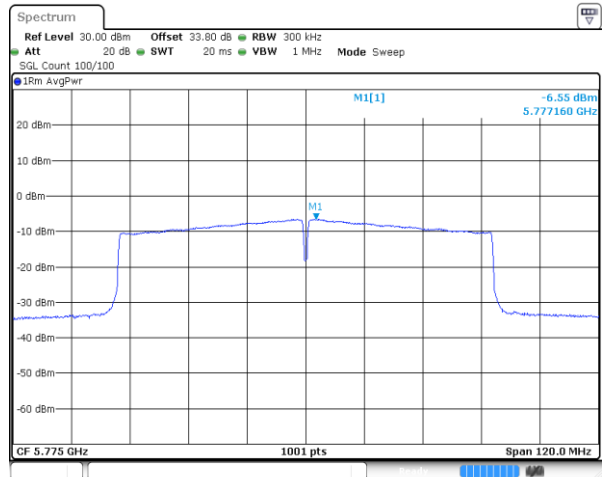
<802.11ac VHT80>

Maximum Power Density Plot (dBm/300kHz)

MIMO Ant. 1



MIMO Ant. 2





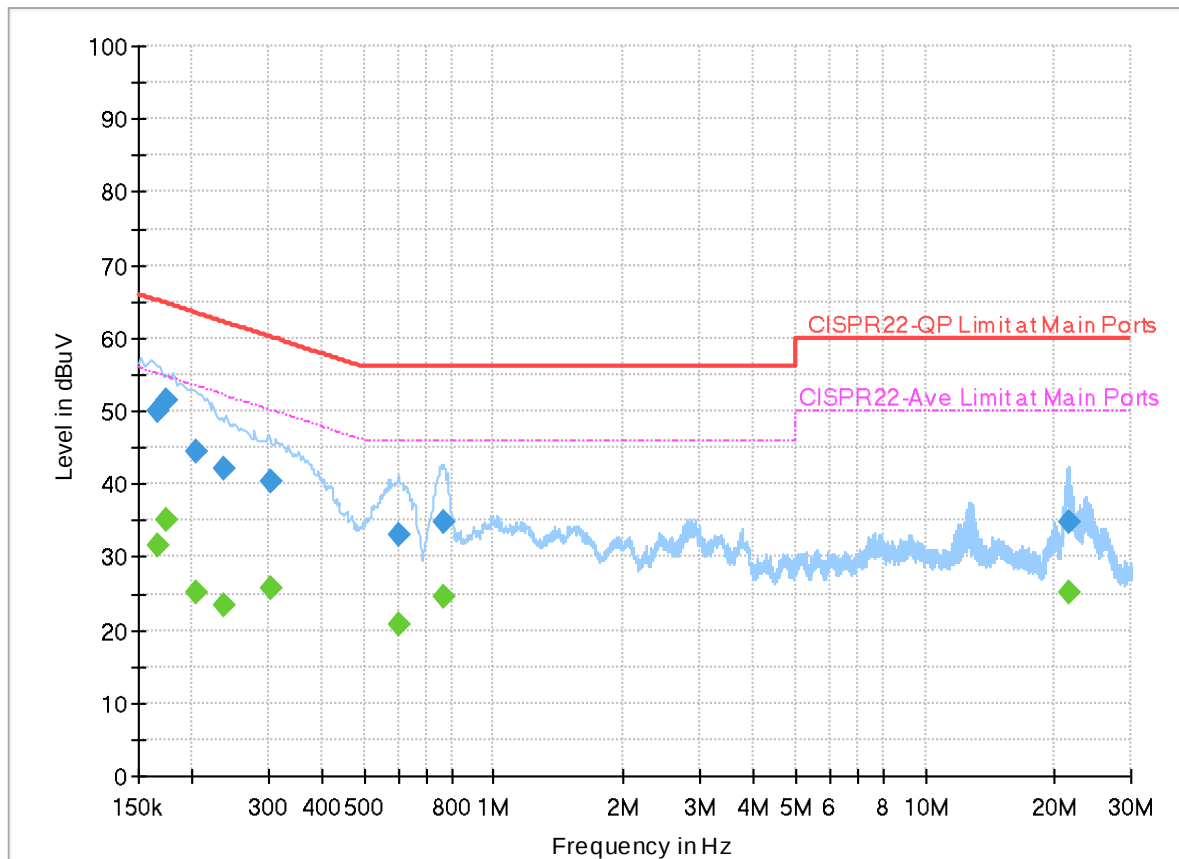
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	Temperature :	18.5~22.7℃
		Relative Humidity :	43.3~48.7%

EUT Information

Report NO : 413008
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



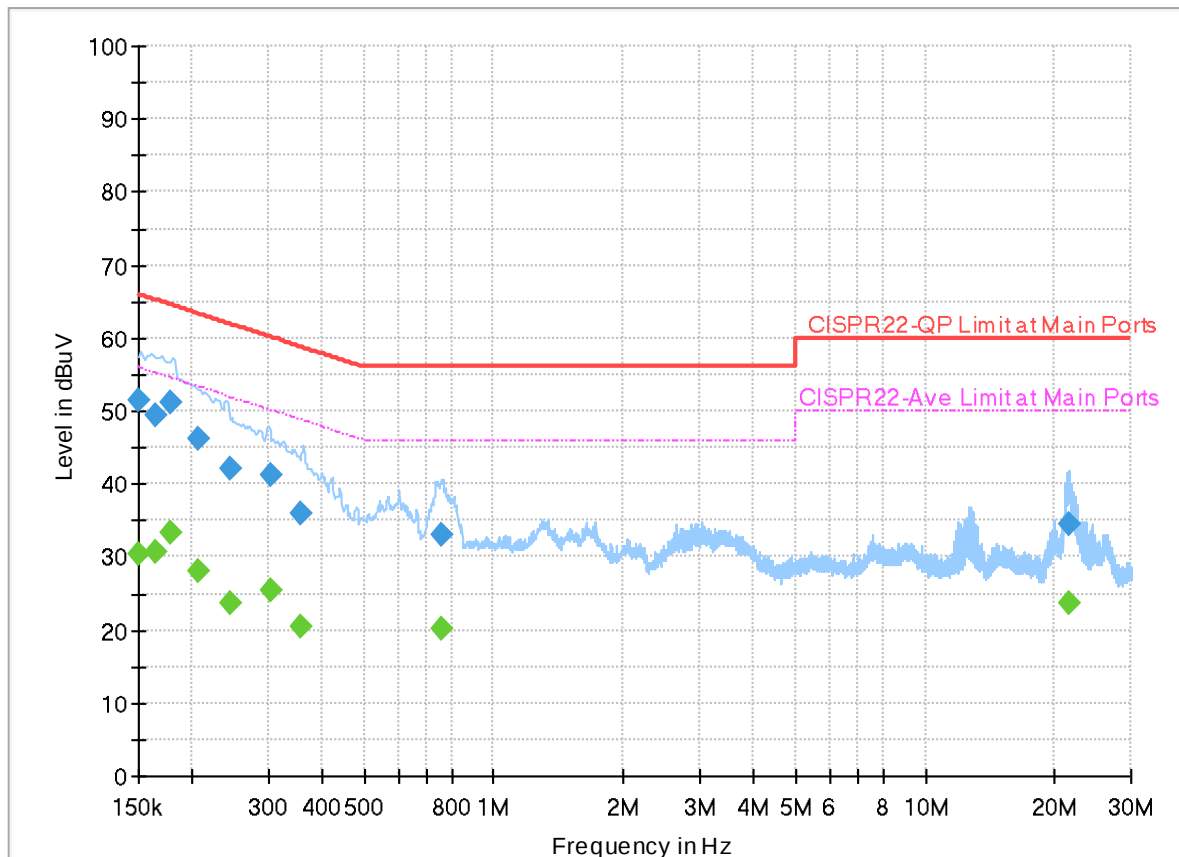
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.165750	---	31.55	55.17	23.62	L1	OFF	19.9
0.165750	49.88	---	65.17	15.29	L1	OFF	19.9
0.174750	---	35.16	54.73	19.57	L1	OFF	19.9
0.174750	51.43	---	64.73	13.30	L1	OFF	19.9
0.204000	---	25.28	53.45	28.17	L1	OFF	19.9
0.204000	44.50	---	63.45	18.95	L1	OFF	19.9
0.235500	---	23.39	52.25	28.86	L1	OFF	19.9
0.235500	42.19	---	62.25	20.06	L1	OFF	19.9
0.304260	---	25.64	50.13	24.49	L1	OFF	19.9
0.304260	40.49	---	60.13	19.64	L1	OFF	19.9
0.601530	---	20.75	46.00	25.25	L1	OFF	19.9
0.601530	33.09	---	56.00	22.91	L1	OFF	19.9
0.765420	---	24.65	46.00	21.35	L1	OFF	19.9
0.765420	34.94	---	56.00	21.06	L1	OFF	19.9
21.441210	---	25.01	50.00	24.99	L1	OFF	20.1
21.441210	34.88	---	60.00	25.12	L1	OFF	20.1

EUT Information

Report NO : 413008
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)
0.150000	---	30.33	56.00	25.67	N	OFF	19.9
0.150000	51.33	---	66.00	14.67	N	OFF	19.9
0.163410	---	30.80	55.29	24.49	N	OFF	19.9
0.163410	49.52	---	65.29	15.77	N	OFF	19.9
0.177720	---	33.42	54.59	21.17	N	OFF	19.9
0.177720	51.10	---	64.59	13.49	N	OFF	19.9
0.207510	---	28.02	53.30	25.28	N	OFF	19.9
0.207510	46.13	---	63.30	17.17	N	OFF	19.9
0.244500	---	23.83	51.94	28.11	N	OFF	19.9
0.244500	42.22	---	61.94	19.72	N	OFF	19.9
0.303000	---	25.56	50.16	24.60	N	OFF	19.9
0.303000	41.17	---	60.16	18.99	N	OFF	19.9
0.357000	---	20.52	48.80	28.28	N	OFF	19.9
0.357000	35.97	---	58.80	22.83	N	OFF	19.9
0.752730	---	20.28	46.00	25.72	N	OFF	19.9
0.752730	32.94	---	56.00	23.06	N	OFF	19.9
21.439500	---	23.54	50.00	26.46	N	OFF	20.2
21.439500	34.57	---	60.00	25.43	N	OFF	20.2



Appendix C. Radiated Spurious Emission

Test Engineer :	Fu Chen and Troye Hsieh	Temperature :	19.6~21.1°C
		Relative Humidity :	46.4~65.3%

MIMO <Ant. 1+2>

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5648.6	53.46	-14.74	68.2	44.12	33.1	11.23	34.99	100	180	P	H
		5695	54.22	-47.29	101.51	44.45	33.46	11.28	34.97	100	180	P	H
		5716.4	59.39	-50.4	109.79	49.48	33.57	11.29	34.95	100	180	P	H
		5724.2	66.83	-53.55	120.38	56.88	33.6	11.3	34.95	100	180	P	H
	*	5745	112.51	-	-	102.45	33.68	11.32	34.94	100	180	P	H
	*	5745	105.83	-	-	95.77	33.68	11.32	34.94	100	180	A	H
													H
													H
		5646.4	51.54	-16.66	68.2	42.22	33.09	11.23	35	100	324	P	V
		5695.6	51.66	-50.3	101.96	41.89	33.46	11.28	34.97	100	324	P	V
		5717	56.48	-53.48	109.96	46.56	33.57	11.3	34.95	100	324	P	V
		5723.4	61.23	-57.32	118.55	51.29	33.59	11.3	34.95	100	324	P	V
	*	5745	107.41	-	-	97.35	33.68	11.32	34.94	100	324	P	V
	*	5745	101.09	-	-	91.03	33.68	11.32	34.94	100	324	A	V
													V
													V



WIFI Ant. 1+2	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	113.12	-	-	102.71	33.95	11.35	34.89	100	243	P	H
	*	5825	105.69	-	-	95.28	33.95	11.35	34.89	100	243	A	H
		5853	57.04	-58.32	115.36	46.58	34.01	11.33	34.88	100	243	P	H
		5855.6	56.31	-54.32	110.63	45.83	34.02	11.33	34.87	100	243	P	H
		5886.4	53.93	-42.81	96.74	43.33	34.15	11.31	34.86	100	243	P	H
		5929.8	53.5	-14.7	68.2	42.8	34.26	11.27	34.83	100	243	P	H
													H
													H
	*	5825	107.75	-	-	97.34	33.95	11.35	34.89	100	313	P	V
	*	5825	101.02	-	-	90.61	33.95	11.35	34.89	100	313	A	V
		5850	59.48	-62.72	122.2	49.03	34	11.33	34.88	100	313	P	V
		5856.8	58.02	-52.28	110.3	47.53	34.03	11.33	34.87	100	313	P	V
		5876.6	52.28	-51.73	104.01	41.72	34.11	11.31	34.86	100	313	P	V
		5926.8	51.31	-16.89	68.2	40.62	34.25	11.27	34.83	100	313	P	V
													V
													V
													V
													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. 1+2	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	47.73	-26.27	74	51.78	39	18.21	61.26	-	-	P	H
		17235	46.12	-22.08	68.2	42.58	38.44	22.99	57.89	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		11490	48.32	-25.68	74	52.37	39	18.21	61.26	-	-	P	V
		17235	46.32	-21.88	68.2	42.78	38.44	22.99	57.89	-	-	P	V
													V
													V
													V
													V
													V
													V
													V



WIFI Ant. 1+2	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	47.12	-26.88	74	51.49	38.82	18.26	61.45	-	-	P	H
		17355	45.63	-22.57	68.2	41.47	38.61	23.06	57.51	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		11570	46.71	-27.29	74	51.08	38.82	18.26	61.45	-	-	P	V
		17355	49.38	-18.82	68.2	45.22	38.61	23.06	57.51	250	183	P	V
		17355	39.87	-14.13	54	35.71	38.61	23.06	57.51	250	183	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V



WIFI Ant. 1+2	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	45.75	-28.25	74	50.5	38.6	18.31	61.66	-	-	P	H
		17475	45.32	-22.88	68.2	40.68	38.65	23.12	57.13	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		11650	45.69	-28.31	74	50.44	38.6	18.31	61.66	-	-	P	V
		17475	45.47	-22.73	68.2	40.83	38.65	23.12	57.13	-	-	P	V
													V
													V
													V
													V
													V
													V
												V	
												V	
												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. 1+2	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		5634.2	52.97	-15.23	68.2	43.68	33.07	11.22	35	100	91	P	H
		5698.8	58.31	-46.01	104.32	48.5	33.49	11.28	34.96	100	91	P	H
		5719.2	67.64	-42.94	110.58	57.71	33.58	11.3	34.95	100	91	P	H
		5725	81.09	-41.11	122.2	71.14	33.6	11.3	34.95	100	91	P	H
	*	5745	114.45	-	-	104.39	33.68	11.32	34.94	100	91	P	H
	*	5745	106.8	-	-	96.74	33.68	11.32	34.94	100	91	A	H
													H
													H
		5605.6	51.24	-16.96	68.2	42.05	33.01	11.2	35.02	100	319	P	V
		5697.8	53.15	-50.43	103.58	43.36	33.48	11.28	34.97	100	319	P	V
		5719.8	62.22	-48.52	110.74	52.29	33.58	11.3	34.95	100	319	P	V
		5724.6	78.05	-43.24	121.29	68.1	33.6	11.3	34.95	100	319	P	V
	*	5745	108.51	-	-	98.45	33.68	11.32	34.94	100	319	P	V
	*	5745	102	-	-	91.94	33.68	11.32	34.94	100	319	A	V
													V
													V



WIFI Ant. 1+2	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		5621.25	54.48	-13.72	68.2	45.24	33.04	11.21	35.01	100	90	P	H
		5696	52.89	-49.36	102.25	43.11	33.47	11.28	34.97	100	90	P	H
		5705	56.99	-49.61	106.6	47.15	33.52	11.28	34.96	100	90	P	H
		5722.75	53.77	-63.3	117.07	43.83	33.59	11.3	34.95	100	90	P	H
	*	5785	113.54	-	-	103.25	33.84	11.36	34.91	100	90	P	H
	*	5785	107.01	-	-	96.72	33.84	11.36	34.91	100	90	A	H
		5851.75	51.35	-66.86	118.21	40.89	34.01	11.33	34.88	100	90	P	H
		5865.25	54.1	-53.83	107.93	43.59	34.06	11.32	34.87	100	90	P	H
		5923.5	53.42	-15.89	69.31	42.72	34.25	11.28	34.83	100	90	P	H
		5935.75	53.43	-14.77	68.2	42.72	34.27	11.27	34.83	100	90	P	H
													H
													H
		5637	50.6	-17.6	68.2	41.31	33.07	11.22	35	100	324	P	V
		5697	52.13	-50.86	102.99	42.34	33.48	11.28	34.97	100	324	P	V
		5709.5	51.46	-56.4	107.86	41.59	33.54	11.29	34.96	100	324	P	V
		5724.5	51.01	-70.05	121.06	41.06	33.6	11.3	34.95	100	324	P	V
	*	5785	108.03	-	-	97.74	33.84	11.36	34.91	100	324	P	V
	*	5785	101.99	-	-	91.7	33.84	11.36	34.91	100	324	A	V
		5851	51.53	-68.39	119.92	41.08	34	11.33	34.88	100	324	P	V
		5855.5	51.39	-59.27	110.66	40.91	34.02	11.33	34.87	100	324	P	V
		5894.5	52.23	-38.5	90.73	41.6	34.18	11.3	34.85	100	324	P	V
		5949	51.64	-16.56	68.2	40.9	34.3	11.26	34.82	100	324	P	V
													V
													V



WIFI Ant. 1+2	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	112.66	-	-	102.25	33.95	11.35	34.89	100	176	P	H
	*	5825	106.87	-	-	96.46	33.95	11.35	34.89	100	176	A	H
		5850	67.52	-54.68	122.2	57.07	34	11.33	34.88	100	176	P	H
		5856.8	61.47	-48.83	110.3	50.98	34.03	11.33	34.87	100	176	P	H
		5875.6	55	-49.75	104.75	44.45	34.1	11.31	34.86	100	176	P	H
		5937.8	52.9	-15.3	68.2	42.18	34.28	11.27	34.83	100	176	P	H
													H
													H
	*	5825	107.68	-	-	97.27	33.95	11.35	34.89	100	317	P	V
	*	5825	101.06	-	-	90.65	33.95	11.35	34.89	100	317	A	V
		5850.2	61.75	-59.99	121.74	51.3	34	11.33	34.88	100	317	P	V
		5857	57.84	-52.4	110.24	47.35	34.03	11.33	34.87	100	317	P	V
		5909.6	52.15	-27.41	79.56	41.48	34.22	11.29	34.84	100	317	P	V
		5929.8	52.01	-16.19	68.2	41.31	34.26	11.27	34.83	100	317	P	V
													V
													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. 1+2	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	46.66	-27.34	74	50.71	39	18.21	61.26	-	-	P	H
		17235	44.74	-23.46	68.2	41.2	38.44	22.99	57.89	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		11490	47.35	-26.65	74	51.4	39	18.21	61.26	-	-	P	V
		17235	46.24	-21.96	68.2	42.7	38.44	22.99	57.89	-	-	P	V
													V
													V
													V
													V
													V
													V



WIFI Ant. 1+2	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	45.83	-28.17	74	50.2	38.82	18.26	61.45	-	-	P	H
		17355	44.03	-24.17	68.2	39.87	38.61	23.06	57.51	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		11570	46.71	-27.29	74	51.08	38.82	18.26	61.45	-	-	P	V
		17355	44.77	-23.43	68.2	40.61	38.61	23.06	57.51	-	-	P	V
													V
													V
													V
													V
													V
													V
													V

[illegible]



Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2	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		5646.75	53.7	-14.5	68.2	44.37	33.09	11.23	34.99	100	92	P	H
		5699.25	63.82	-40.83	104.65	54.01	33.49	11.28	34.96	100	92	P	H
		5717.25	78.51	-31.52	110.03	68.59	33.57	11.3	34.95	100	92	P	H
		5721.25	81.17	-32.48	113.65	71.24	33.58	11.3	34.95	100	92	P	H
	*	5755	110.48	-	-	100.36	33.72	11.33	34.93	100	92	P	H
	*	5755	103.65	-	-	93.53	33.72	11.33	34.93	100	92	A	H
		5851	52.27	-67.65	119.92	41.82	34	11.33	34.88	100	92	P	H
		5861	52.39	-56.73	109.12	41.9	34.04	11.32	34.87	100	92	P	H
		5913.25	52.17	-24.7	76.87	41.49	34.23	11.29	34.84	100	92	P	H
		5939.25	52.37	-15.83	68.2	41.65	34.28	11.27	34.83	100	92	P	H
													H
													H
		5646.25	51.59	-16.61	68.2	42.27	33.09	11.23	35	100	324	P	V
		5700	56.96	-48.24	105.2	47.14	33.5	11.28	34.96	100	324	P	V
		5719.5	73.54	-37.12	110.66	63.61	33.58	11.3	34.95	100	324	P	V
		5724.25	74.34	-46.15	120.49	64.39	33.6	11.3	34.95	100	324	P	V
	*	5755	105.25	-	-	95.13	33.72	11.33	34.93	100	324	P	V
	*	5755	98.48	-	-	88.36	33.72	11.33	34.93	100	324	A	V
		5852.25	51.56	-65.51	117.07	41.1	34.01	11.33	34.88	100	324	P	V
		5864.75	51.7	-56.37	108.07	41.19	34.06	11.32	34.87	100	324	P	V
		5920	51.51	-20.38	71.89	40.83	34.24	11.28	34.84	100	324	P	V
		5948.5	51.9	-16.3	68.2	41.16	34.3	11.26	34.82	100	324	P	V
													V
													V



WIFI Ant. 1+2	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		5608	51.92	-16.28	68.2	42.72	33.02	11.2	35.02	150	177	P	H
		5698.5	53.97	-50.12	104.09	44.16	33.49	11.28	34.96	150	177	P	H
		5709	54.33	-53.39	107.72	44.46	33.54	11.29	34.96	150	177	P	H
		5725	55.16	-67.04	122.2	45.21	33.6	11.3	34.95	150	177	P	H
	*	5795	110.2	-	-	99.86	33.88	11.37	34.91	150	177	P	H
	*	5795	102.5	-	-	92.16	33.88	11.37	34.91	150	177	A	H
		5850.5	57.38	-63.68	121.06	46.93	34	11.33	34.88	150	177	P	H
		5861.75	57.24	-51.67	108.91	46.74	34.05	11.32	34.87	150	177	P	H
		5891.25	53	-40.14	93.14	42.38	34.17	11.3	34.85	150	177	P	H
		5944.5	53.35	-14.85	68.2	42.62	34.29	11.26	34.82	150	177	P	H
													H
													H
		5637.25	50.98	-17.22	68.2	41.69	33.07	11.22	35	100	314	P	V
		5677.75	51.6	-37.18	88.78	42	33.32	11.26	34.98	100	314	P	V
		5719	53.74	-56.78	110.52	43.81	33.58	11.3	34.95	100	314	P	V
		5721.5	54.14	-60.08	114.22	44.2	33.59	11.3	34.95	100	314	P	V
	*	5795	104.68	-	-	94.34	33.88	11.37	34.91	100	314	P	V
	*	5795	97.85	-	-	87.51	33.88	11.37	34.91	100	314	A	V
		5853	55.92	-59.44	115.36	45.46	34.01	11.33	34.88	100	314	P	V
		5861.75	57.28	-51.63	108.91	46.78	34.05	11.32	34.87	100	314	P	V
		5885.25	52.57	-45.02	97.59	41.98	34.14	11.31	34.86	100	314	P	V
		5928.75	52.63	-15.57	68.2	41.93	34.26	11.27	34.83	100	314	P	V
													V
													V
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 (Band Edge @ 3m)

WIFI Ant. 1+2	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		5646.5	60.79	-7.41	68.2	51.47	33.09	11.23	35	250	72	P	H
		5691.75	76.7	-22.42	99.12	66.97	33.43	11.27	34.97	250	72	P	H
		5717.5	81.8	-28.3	110.1	71.88	33.57	11.3	34.95	250	72	P	H
		5724.25	81	-39.49	120.49	71.05	33.6	11.3	34.95	250	72	P	H
	*	5775	109.75	-	-	99.52	33.8	11.35	34.92	250	72	P	H
	*	5775	101.4	-	-	91.17	33.8	11.35	34.92	250	72	A	H
		5851.25	75.48	-43.87	119.35	65.02	34.01	11.33	34.88	250	72	P	H
		5862.25	73.91	-34.86	108.77	63.41	34.05	11.32	34.87	250	72	P	H
		5875.75	66.57	-38.07	104.64	56.02	34.1	11.31	34.86	250	72	P	H
		5929.75	55.16	-13.04	68.2	44.46	34.26	11.27	34.83	250	72	P	H
													H
													H
		5648.5	57.11	-11.09	68.2	47.77	33.1	11.23	34.99	100	322	P	V
		5698.25	71.09	-32.82	103.91	61.29	33.49	11.28	34.97	100	322	P	V
		5717.5	74.41	-35.69	110.1	64.49	33.57	11.3	34.95	100	322	P	V
		5723.5	76.35	-42.43	118.78	66.41	33.59	11.3	34.95	100	322	P	V
	*	5775	103.01	-	-	92.78	33.8	11.35	34.92	100	322	P	V
	*	5775	95.48	-	-	85.25	33.8	11.35	34.92	100	322	A	V
		5853.75	68.92	-44.73	113.65	58.45	34.01	11.33	34.87	100	322	P	V
		5856.25	67.41	-43.04	110.45	56.92	34.03	11.33	34.87	100	322	P	V
		5878	58.87	-44.1	102.97	48.31	34.11	11.31	34.86	100	322	P	V
		5936.5	52.94	-15.26	68.2	42.23	34.27	11.27	34.83	100	322	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission above 18GHz

WIFI 802.11a (SHF @ 1m)

[illegible]

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 3m)

[illegible]



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 over limit 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	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(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. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

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. Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 68.2(dBμV/m)
= -12.75 (dB)

Both peak and average measured complies with the limit line, so test result is “PASS”.



Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Fu Chen and Troye Hsieh	Temperature :	19.6~21.1°C
		Relative Humidity :	46.4~65.3%

Note symbol

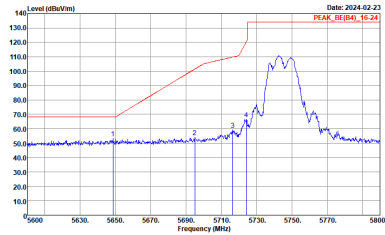
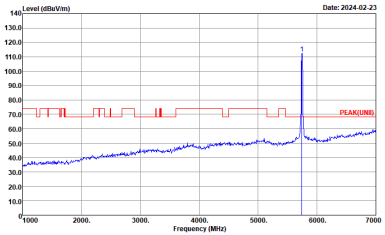
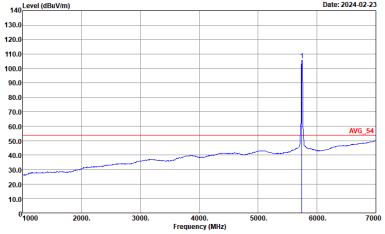
-L	Low channel location
-R	High channel location

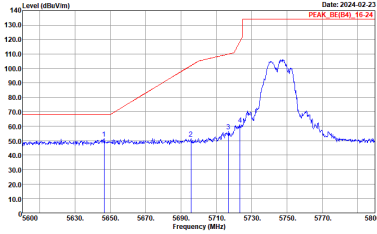
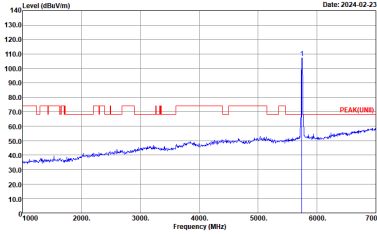
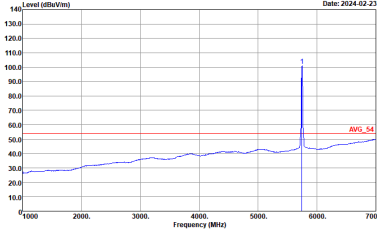


MIMO <Ant. 1+2>

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

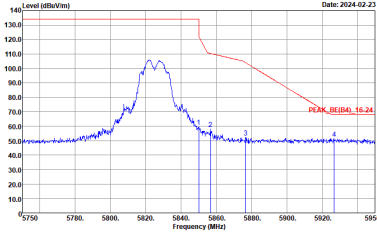
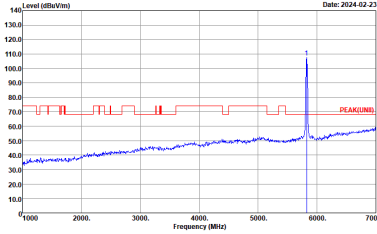
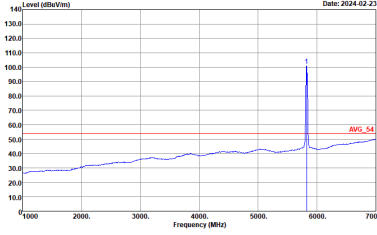
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_R1(64)_16-24 3m 91200_01620_230817 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK_L1(64) 3m 91200_01620_230817 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_85(84)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto



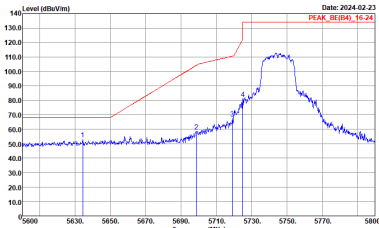
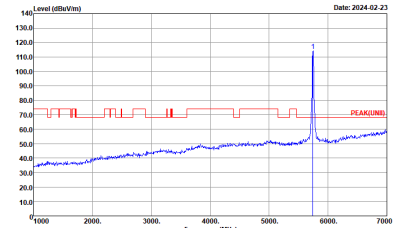
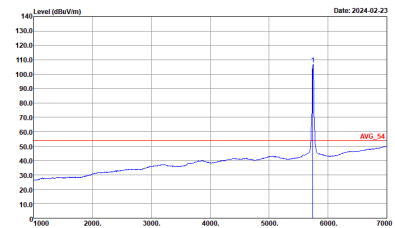
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	Site : 03CH11-HY Condition : PEAK_8E(B4)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto



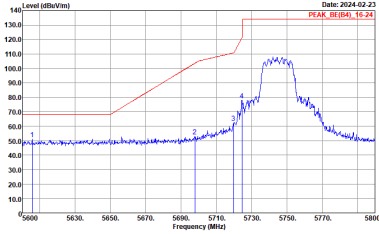
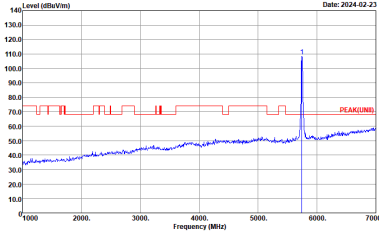
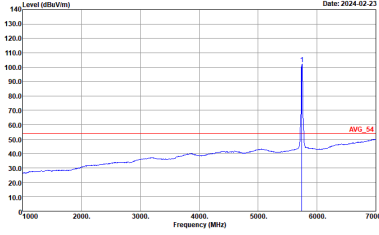
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

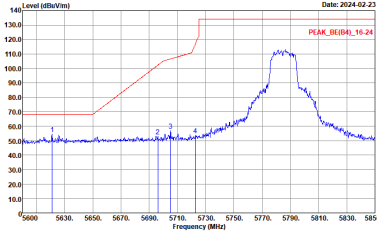
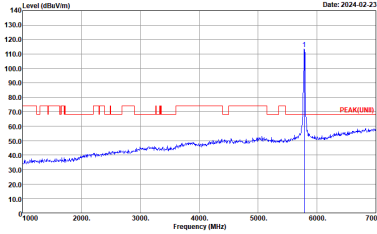
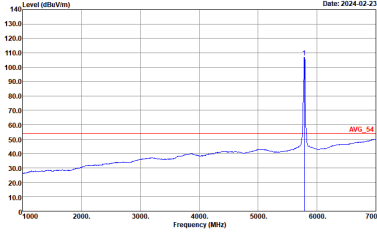


Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

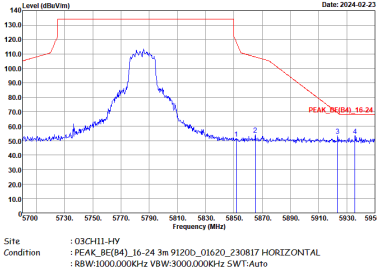
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CHI1-HY Condition : PEAK_BE(84)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CHI1-HY Condition : PEAK(UNB) 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CHI1-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto



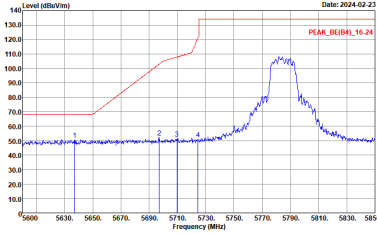
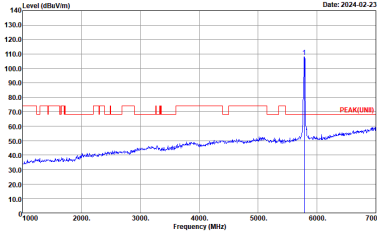
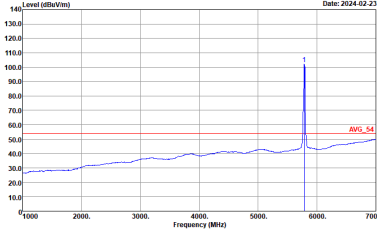
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_85[84]_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK[UNIT] 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

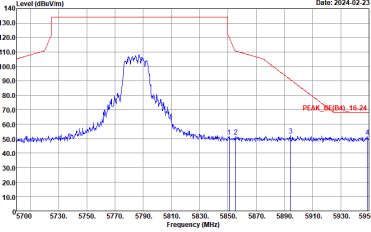


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak		Left blank

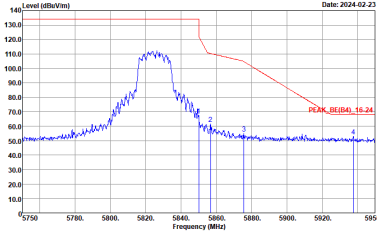
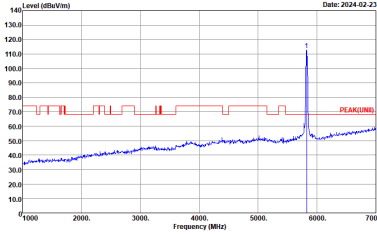
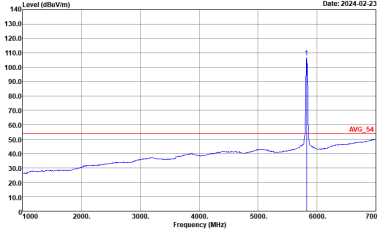


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_DE(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

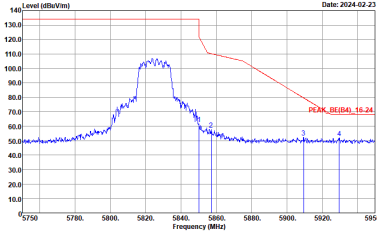
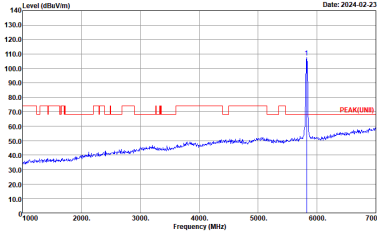
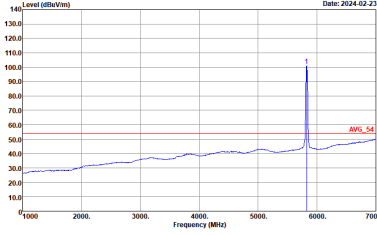


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-AY Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



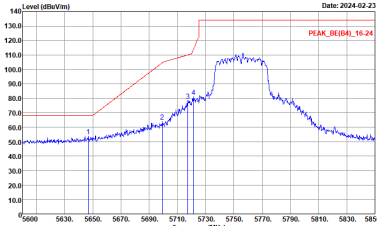
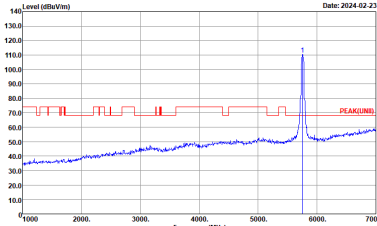
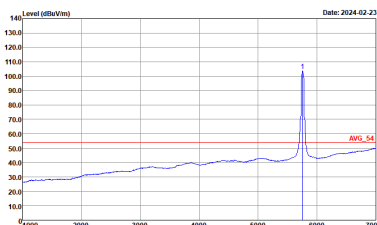
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_8E(B4)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto



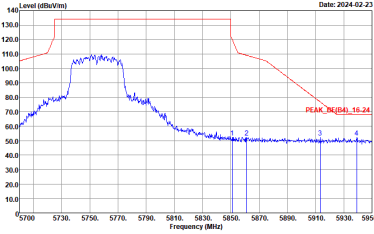
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_8E(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto



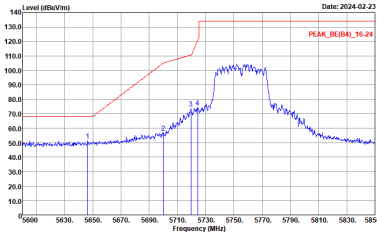
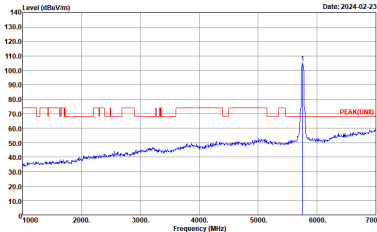
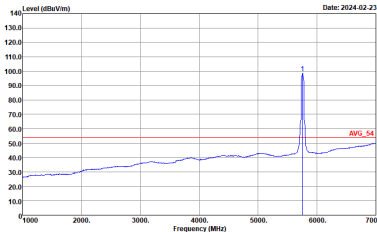
Band 4 5725~5850MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CHI1-HY Condition : PEAK_BE(84)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CHI1-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

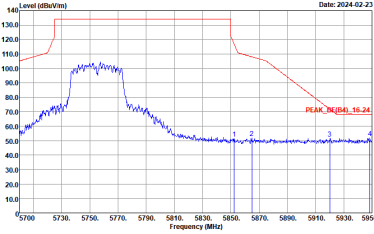


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-19Y Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

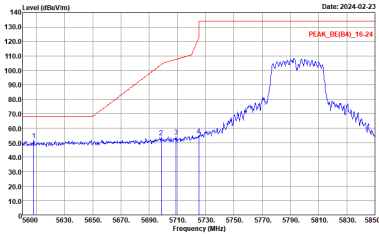
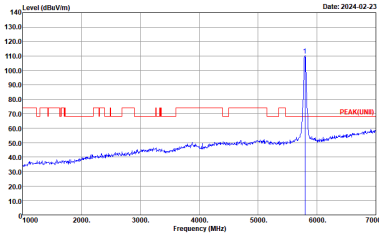
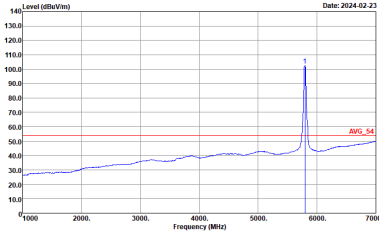


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_85(84)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

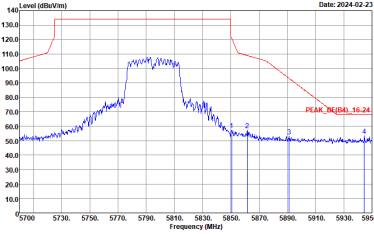


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-19Y Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

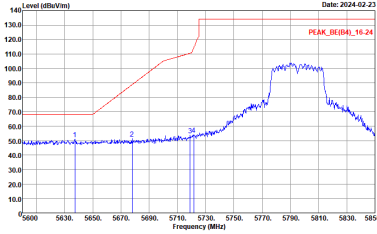
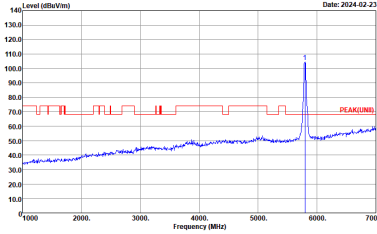
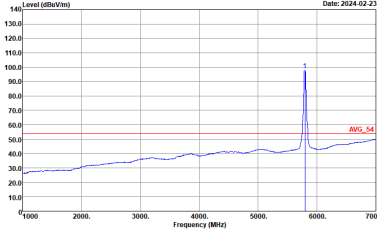


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_RE(B4)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

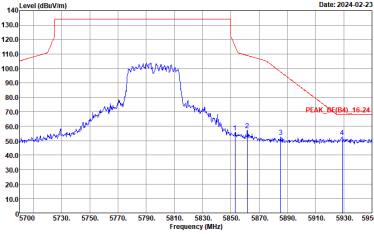


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-19Y Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



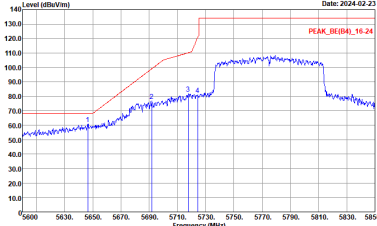
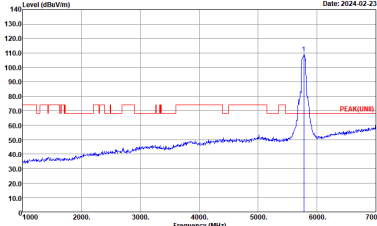
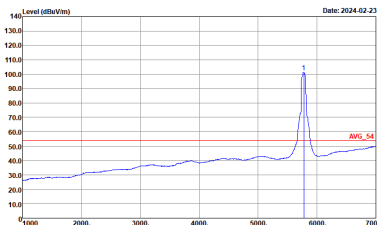
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_DE(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VSW:0.010KHz SWT:Auto



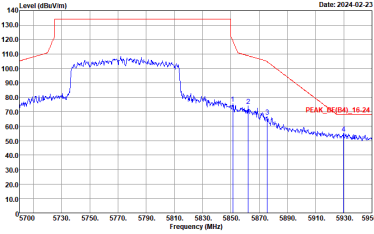
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-19Y Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



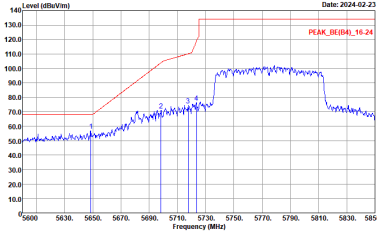
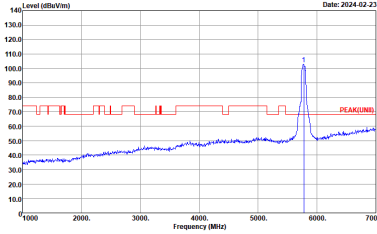
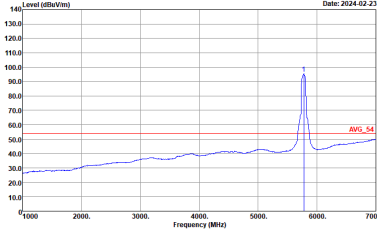
Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CHI1-HY Condition : PEAK_BE(84)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CHI1-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

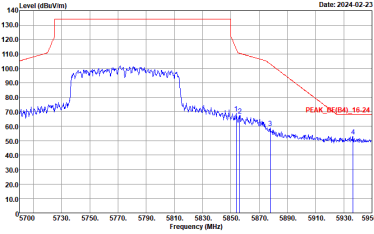


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-19Y Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



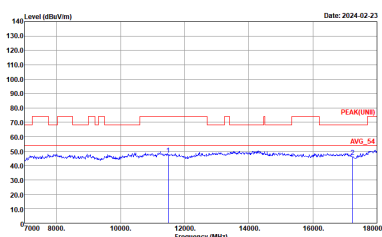
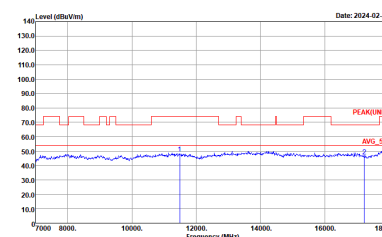
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_DE(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto
Avg.	Left blank	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VSW:3000.000KHz SWT:Auto



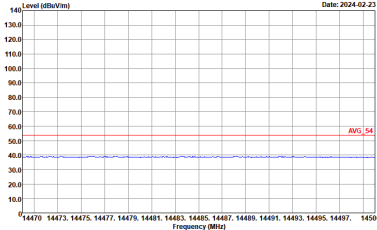
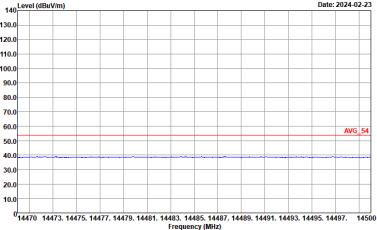
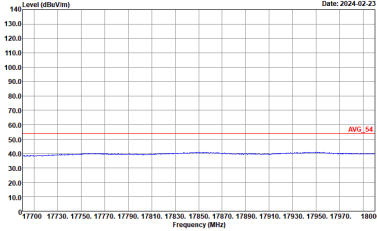
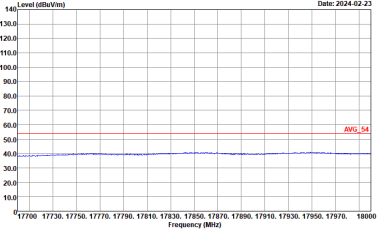
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-19Y Condition : PEAK_85(B4)_16-24 3m 91200_01620_230817 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



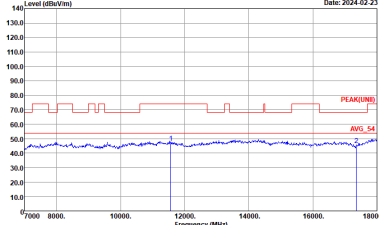
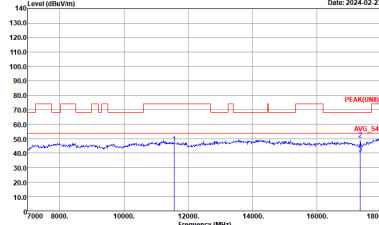
Band 4 - 5725~5850MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL :	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL :



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL .	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL .
	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL .	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL .



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-14Y Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL :	 Site : 03CH11-14Y Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL :

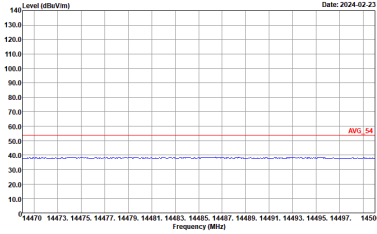
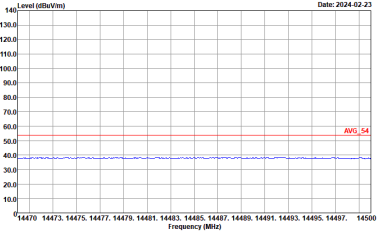
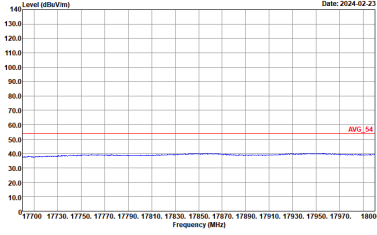
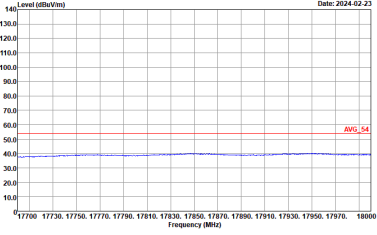


WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
14.47G ~14.5G Avg.	Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL
	Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	140 Level (dBuV/m) Date: 2024-02-23 PEAK (UNIT) AVG_54 Site : 03CH11-14Y Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL	140 Level (dBuV/m) Date: 2024-02-23 PEAK (UNIT) AVG_54 Site : 03CH11-14Y Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL
	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL



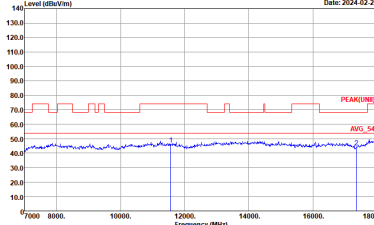
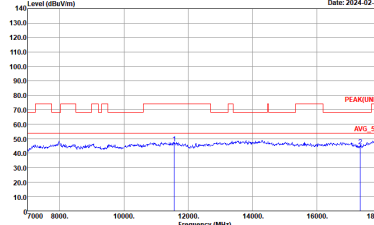
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBu/V/m) Date: 2024-02-23 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL :	Level (dBu/V/m) Date: 2024-02-23 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL :

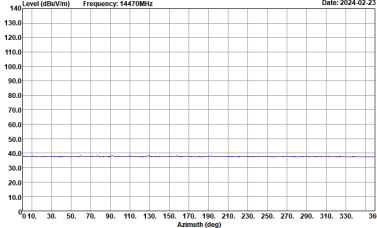
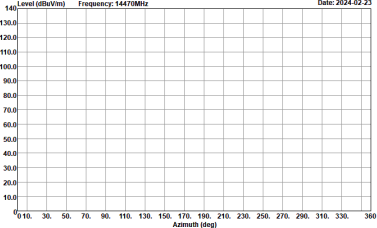
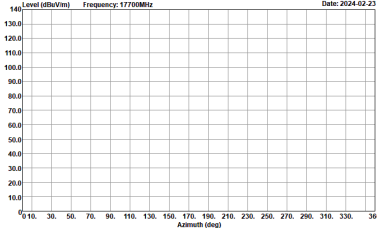
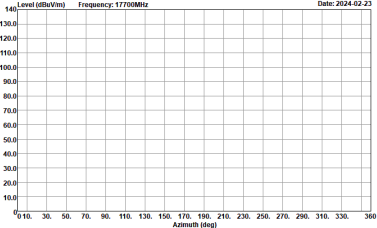


WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Vertical
14.47G ~14.5G Avg.	Level (dBuV/m) Date: 2024-02-23 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	Level (dBuV/m) Date: 2024-02-23 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL
	Level (dBuV/m) Date: 2024-02-23 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	Level (dBuV/m) Date: 2024-02-23 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-14Y Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL :	 Site : 03CH11-14Y Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL :

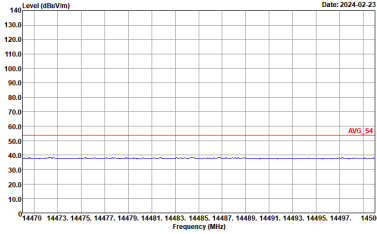
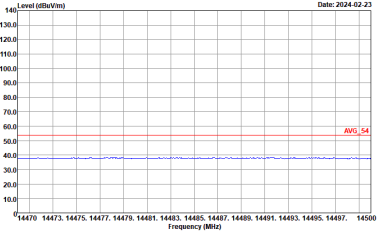
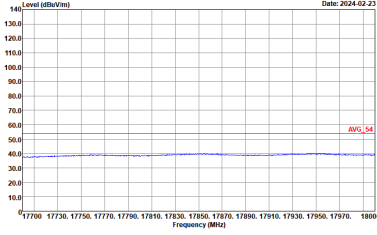
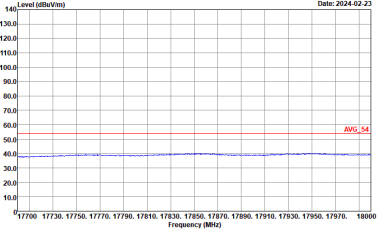


WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Vertical
14.47G ~14.5G Avg.	Level (dBuV/m) Frequency: 14470MHz Date: 2024-02-23  Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	Level (dBuV/m) Frequency: 14470MHz Date: 2024-02-23  Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL
	Level (dBuV/m) Frequency: 17700MHz Date: 2024-02-23  Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	Level (dBuV/m) Frequency: 17700MHz Date: 2024-02-23  Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL



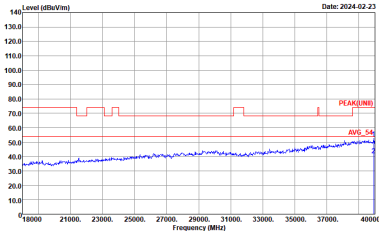
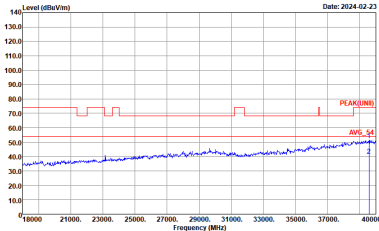
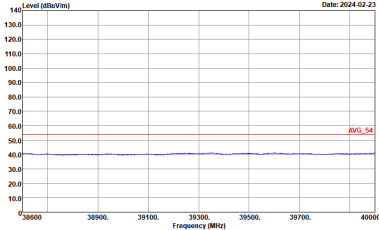
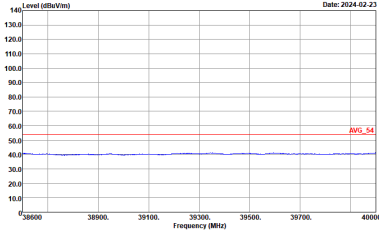
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	140 Level (dBuV/m) Date: 2024-02-23 Site : 03CH11-14Y Condition : PEAK(UNIT) 3m 91200_01620_230817 HORIZONTAL :	140 Level (dBuV/m) Date: 2024-02-23 Site : 03CH11-14Y Condition : PEAK(UNIT) 3m 91200_01620_230817 VERTICAL :



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL
	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 HORIZONTAL	 Site : 03CH11-HY Condition : AVG_54 3m 91200_01620_230817 VERTICAL

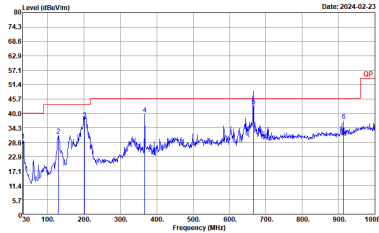
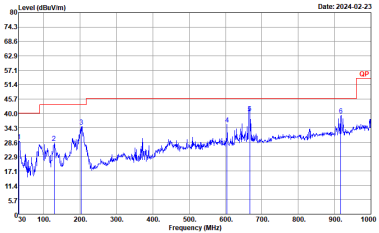


Emission above 18GHz
5GHz WIFI 802.11a (SHF @ 1m)

WIFI	5GHz WIFI	
ANT	802.11a SHF	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CHI1-HY Condition : PEAK(UNIT) 1m SHF_00993_231124 HORIZONTAL :	 Site : 03CHI1-HY Condition : PEAK(UNIT) 1m SHF_00993_231124 VERTICAL :
	 Site : 03CHI1-HY Condition : AVG_54 1m SHF_00993_231124 HORIZONTAL :	 Site : 03CHI1-HY Condition : AVG_54 1m SHF_00993_231124 VERTICAL :



Emission below 1GHz
5GHz WIFI 802.11a (LF)

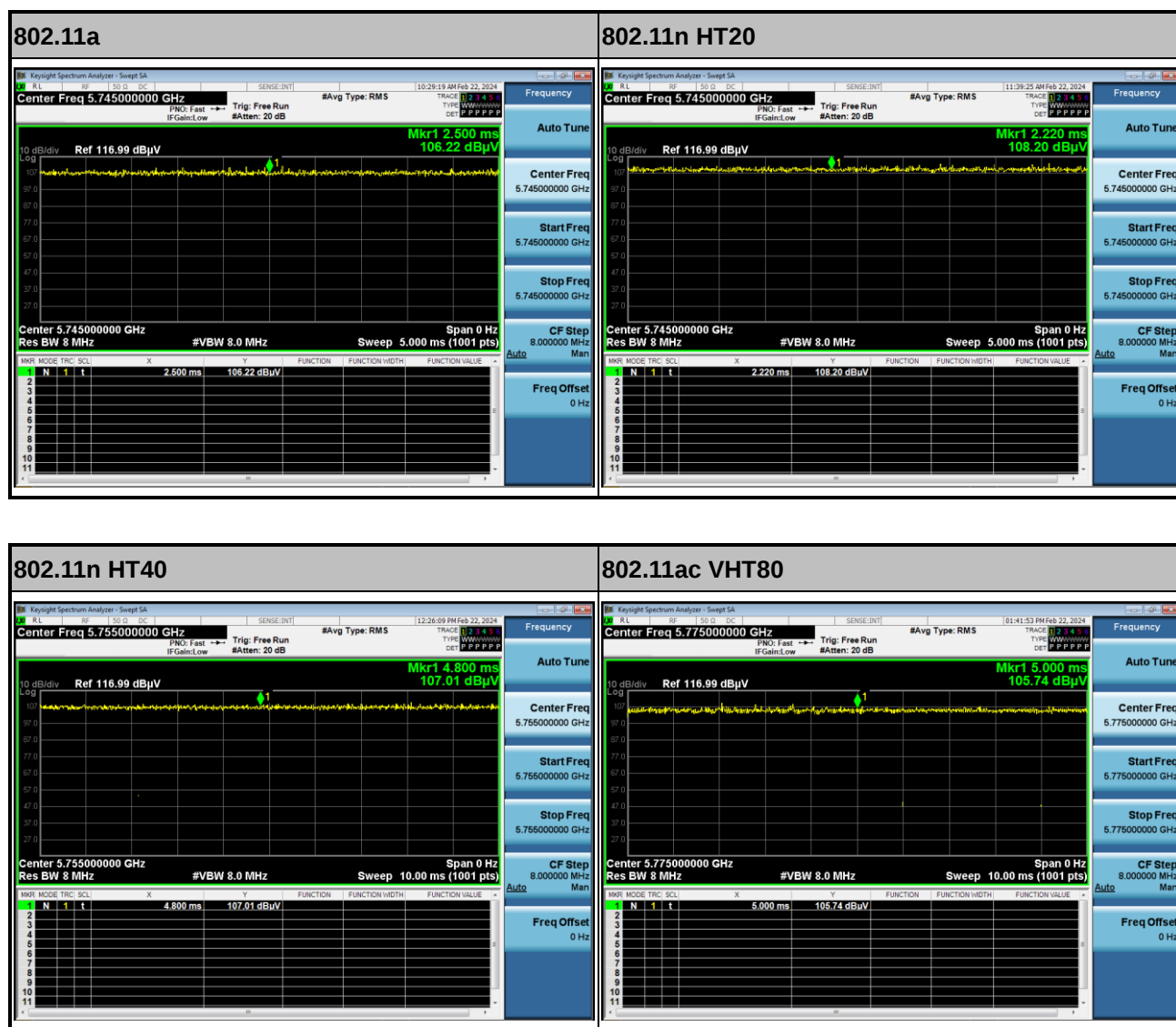
WIFI	5GHz WIFI	
ANT	802.11a LF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CH11-HY Condition : QP 3m 2_BILO6_35414_231007 HORIZONTAL :	 Site : 03CH11-HY Condition : QP 3m 2_BILO6_35414_231007 VERTICAL :



Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	802.11a	100.00	-	-	10Hz
1+2	802.11n HT20	100.00	-	-	10Hz
1+2	802.11n HT40	100.00	-	-	10Hz
1+2	802.11ac VHT80	100.00	-	-	10Hz

MIMO <Ant. 1+2>



—THE END—