FCC RADIO TEST REPORT

FCC ID	:	2AVOB-FH7K2H
Equipment	:	AMC Dash Cart
Brand Name	:	Amazon
Model Name	:	FH7K2H
Applicant	:	Amazon.com Services LLC 410 Terry Avenue N, Seattle, WA 98109-5210 United States
Trademark	:	Nalloy LLC, Amazon Retail LLC
Manufacturer	:	Amazon.com Services LLC 410 Terry Avenue N, Seattle, WA 98109-5210 United States
Standard	:	FCC PART 15 Subpart C §15.247

The product was received on Aug. 16, 2024 and testing was performed from Oct. 11, 2024 to Oct. 28, 2024. We, Sporton International (USA) Inc.,, 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 variant report apply exclusively to the tested model / sample. Without written approval from Sporton International (USA) Inc.,, the test report shall not be reproduced except in full.

Neil Kao

Approved by: Neil Kao

Sporton International (USA) Inc.
1175 Montague Expressway, Milpitas, CA 95035

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History of this test report

Report No.	Version	Description	Issue Date
FR241118001A	01	Initial issue of report	Dec. 06, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
3.1	15.247(a)(2)	6dB Bandwidth	Pass
3.1	2.1049	99% Occupied Bandwidth	Pass
3.2	15.247(b)	Power Output Measurement	Pass
3.3	15.247(e)	Power Spectral Density	Pass
3.4	15.247(d)	Conducted Band Edges	Pass
		Conducted Spurious Emission	Pass
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	Pass
-	15.207	AC Conducted Emission	Not Required
3.6	15.203	Antenna Requirement	Pass

Note:

1. Not required means after assessing, test items are not necessary to carry out.
2. This is a variant report by changing PCBA. All the test cases were performed on original report which can be referred to Sporton Report Number FR240310001-01. Based on the original report, only worst case was verified.

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.

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	AMC Dash Cart
Model Name	FH7K2H
FCC ID	2AVOB-FH7K2H
EUT supports Radios application	LTE/GPS/RFID WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 WLAN 11ax HE20/HE40/HE80

1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Tx/Rx Frequency Range	2412 MHz ~ 2462 MHz
Maximum Output Power to Antenna	**MIMO <Ant. 1+2>** 802.11b : 26.45 dBm / 0.4416 W 802.11g : 25.99 dBm / 0.3972 W 802.11n HT20 : 25.43 dBm / 0.3491 W 802.11n HT40 : 22.34 dBm / 0.1714 W 802.11ac VHT20 : 25.53 dBm / 0.3573 W 802.11ac VHT40 : 22.44 dBm / 0.1754 W 802.11ax HE20 : 25.63 dBm / 0.3656 W 802.11ax HE40 : 22.54 dBm / 0.1795 W
99% Occupied Bandwidth	**MIMO <Ant. 1>** 802.11b: 13.11 MHz 802.11g: 16.40 MHz 802.11ax HE20: 18.89 MHz 802.11ax HE40: 37.79 MHz **MIMO <Ant. 2>** 802.11b: 12.92 MHz 802.11g: 16.36 MHz 802.11ax HE20: 18.84 MHz 802.11ax HE40: 37.72 MHz
Antenna Type / Gain	**<Ant. 1>:** Chip Antenna with gain 1 dBi **<Ant. 2>:** Chip Antenna with gain 2 dBi
Type of Modulation	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) 802.11ax: OFDMA (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)
Antenna Function Description	

	Ant. 1	Ant. 2
802.11b/g/n/ac/ax MIMO	V	V

Remark:

1. MIMO Ant. 1+2 Directional Gain is a calculated result from MIMO Ant. 1 and MIMO Ant. 2. The formula used in calculation is documented in section 1.1.1.
2. Power of MIMO Ant. 1 + Ant. 2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.
3. The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

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.

Array Gain = 10 log(NANT/NSS) dB.

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

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 1 (dBi)	Ant 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
2.4GHz	1.00	2.00	2.00	4.52	0.00	0.00

Calculation example:

If a device has two antenna, G_{ANT1}= 1.0dBi; G_{ANT2}=2.0 dBi

Directional gain of power measurement = max(1.0, 2.0) + 0 = 2.0 dBi

Directional gain of PSD derived from formula which is

10 x log { { [10^ (1.00 dBi / 20) + 10^ (2.00 dBi / 20)] ^ 2 } / 2 }

= 4.52 dBi

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

PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)

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 (USA) Inc.
Test Site Location	1175 Montague Expressway, Milpitas, CA 95035 TEL : 408 9043300
Test Site No.	**Sporton Site No.**
	TH01-CA, 03CH01-CA

FCC Designation No.: US1250

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 C §15.247
- FCC KDB Publication No. 558074 D01 15.247 Meas Guidance v05r02
- 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

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: 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 only the worst case emissions were reported in this report.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

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

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

MIMO Mode

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20 (Covered by HE20)	MCS0
802.11n HT40 (Covered by HE40)	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HE40)	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0

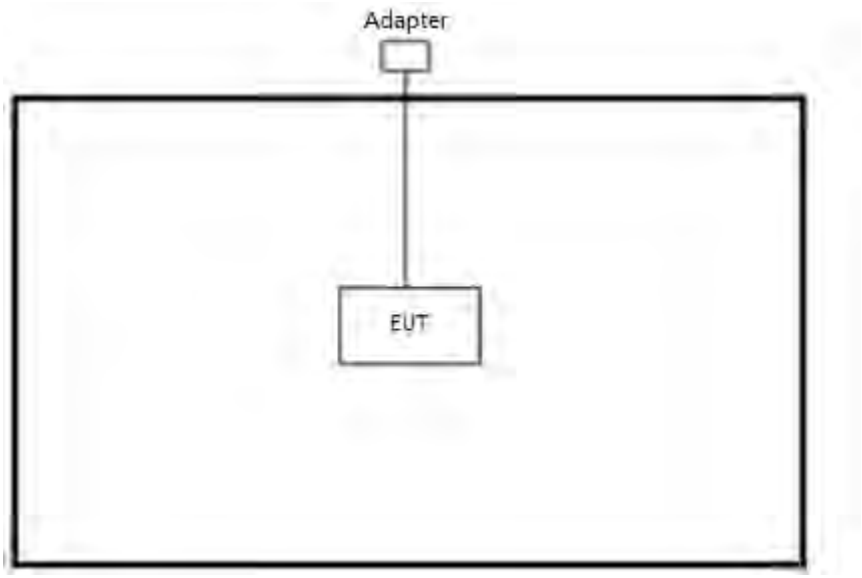
Remark: The conducted power level of each chain in MIMO mode is equal or higher than SISO mode.

<CDD Mode>

Ch. #	2400-2483.5 MHz			
	802.11b	802.11g	802.11ax HE20	802.11ax HE40
Low	01	01	01	03
Middle	06	06	06	06
High	11	11	11	09

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



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Adapter	Delta	ADH-60DRB	NA	N/A	Unshielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility "QRCT Version 4.0.00201.0" 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 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

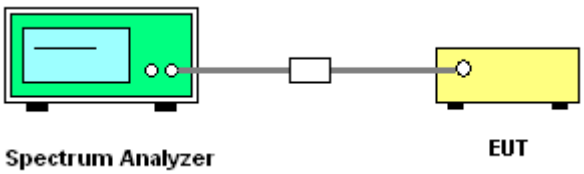
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
6. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5 MHz, the limit for output power is 30 dBm. If transmitting antenna with directional gain greater than 6 dBi is used, the output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

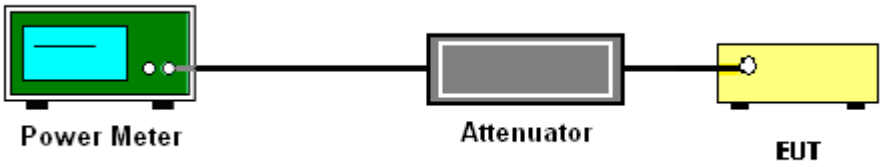
Please refer to the measuring equipment list in this test report.

3.2.3 Test Procedures

<CDD Modes>

1. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
2. The RF output of EUT is connected to the power meter by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Measure the conducted output power and record the results in the test report.
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 Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8 dBm in any 3 kHz band at any time interval of continuous transmission.

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

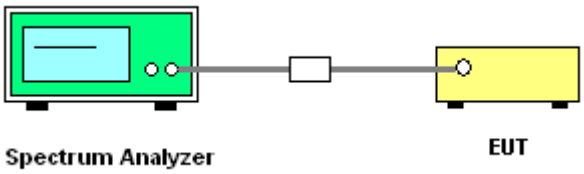
Method AVGPSD-2

1. The testing follows the ANSI C63.10 Section 11.10.5 Method AVGPSD-2.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 10 kHz. Video bandwidth VBW = 30 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW).
5. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins).
6. Detector = RMS, Sweep time = auto couple.
7. Trace average at least 100 traces in power averaging mode.
8. 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.
9. Measure and record the results in the test report.
10. 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 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

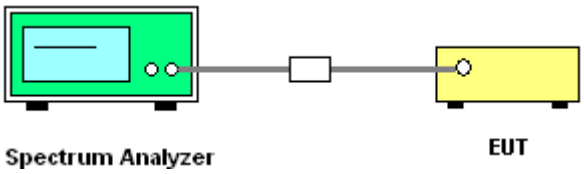
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.11.3 Emission level measurement
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Set RBW = 100 kHz, VBW = 300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Please refer to Appendix A.

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device is measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

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

3.5.2 Measuring Instruments

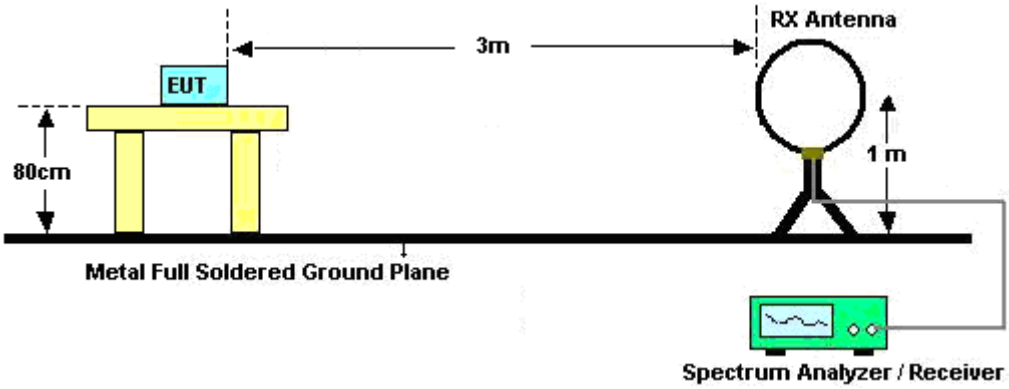
Please refer to the measuring equipment list in this test report.

3.5.3 Test Procedures

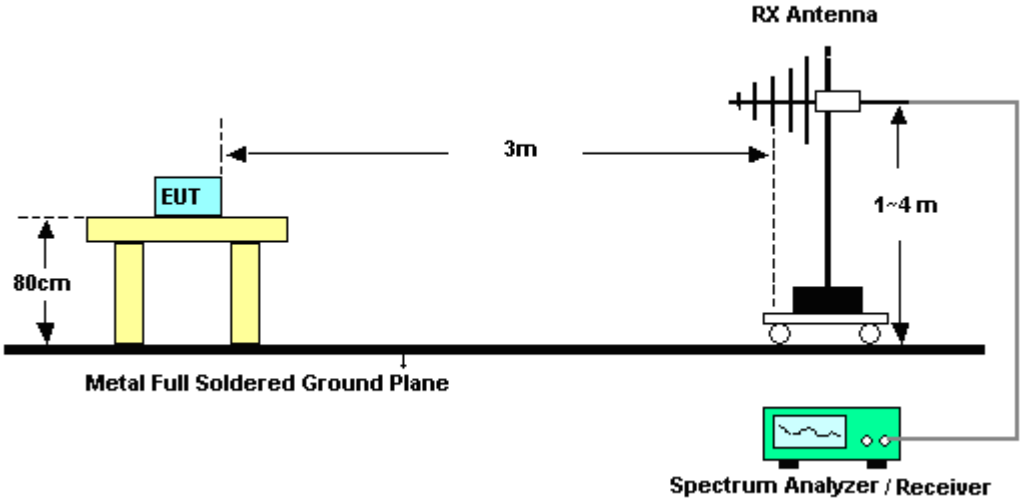
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements
2. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. 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.
4. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
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 "-".
8. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW = 3 MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - 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.

3.5.4 Test Setup

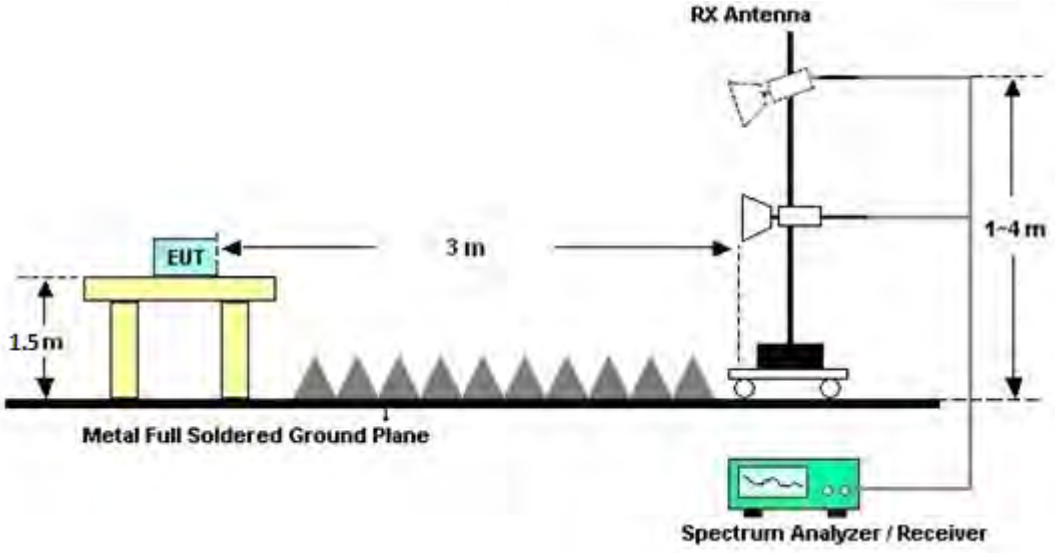
For radiated emissions below 30MHz



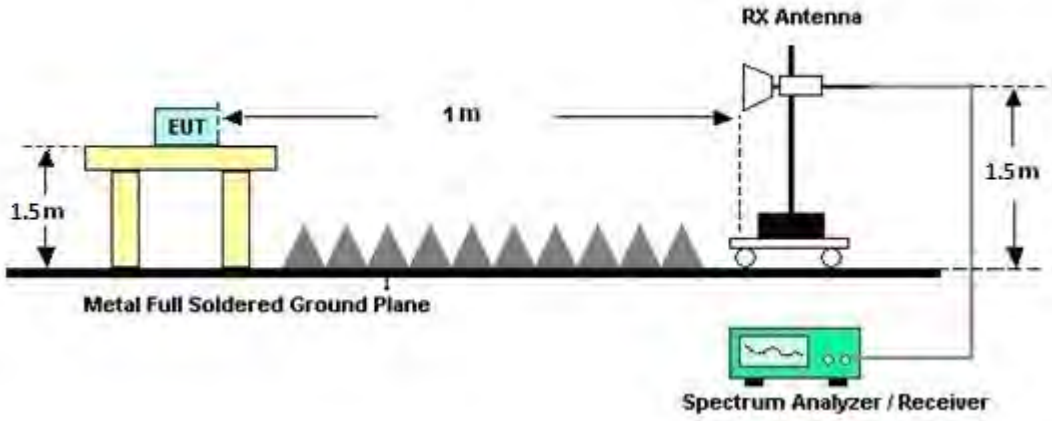
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



3.5.5 Test Results of Radiated Spurious 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 comes out very similar.

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

3.5.7 Duty Cycle

Please refer to Appendix D.

3.5.8 Test Result of Radiated Spurious Emission (30 MHz ~ 10th Harmonic)

Please refer to Appendix B and C.

3.6 Antenna Requirements

3.6.1 Standard Applicable

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

3.6.2 Antenna Anti-Replacement Construction

Antenna permanently attached.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	6111D	54683	30MHz~1GHz	Nov 13, 2023	Oct. 11, 2024 ~ Oct. 25, 2024	Nov 12, 2024	Radiation (03CH01-CA)
Loop Antenna	R&S	HFH2-Z2E	100840	9kHz~30MHz	May 02. 2024	Oct. 11, 2024 ~ Oct. 25, 2024	May 01, 2025	Radiation (03CH01-CA)
Horn Antenna	SCHWARZBECK	BBHA 9120D	02113	1GHz~18GHz	Apr. 26, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Apr. 25, 2025	Radiation (03CH01-CA)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00841	18GHz~40GHz	Aug. 07, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Aug. 06, 2025	Radiation (03CH01-CA)
Amplifier	SONOMA	310N	372241	9kHz~1GHz	Apr. 24, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Apr. 23, 2025	Radiation (03CH01-CA)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN9	3GHz High Pass Filter	Jun. 04, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Jun. 03, 2025	Radiation (03CH01-CA)
Filter	Wainwright	WLK12-1200-1272-11000-40SS	SN1	1.2GHz Low Pass Filter	Jun. 04, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Jun. 03, 2025	Radiation (03CH01-CA)
Preamplifier	Keysight	83017A	MY53270321	1GHz~26.5GHz	Apr. 25, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Apr. 24,2025	Radiation (03CH01-CA)
Preamplifier	E-instrument	ERA-100M-18G-56-01-A70	EC1900252	1GHz~18GHz	Apr. 25, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Apr. 24,2025	Radiation (03CH01-CA)
Preamplifier	EMEC	EMC18G40G	060725	18G-40G	Apr. 24, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Apr. 23,2025	Radiation (03CH01-CA)
RF Cable	HUBER+SUHNER	SUCOFLEX 102	8015932/2, 8015762/2, 804938/2	N/A	Mar. 05, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Mar. 04, 2025	Radiation (03CH01-CA)
Hygrometer	TESEO	608-H1	45142559	N/A	Aug. 14, 2024	Oct. 11, 2024 ~ Oct. 25, 2024	Aug. 13, 2025	Radiation (03CH01-CA)
Controller	Chaintek	EM-1000	060881	Control Turn Table & Antenna Mast	N/A	Oct. 11, 2024 ~ Oct. 25, 2024	N/A	Radiation (03CH01-CA)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Oct. 11, 2024 ~ Oct. 25, 2024	N/A	Radiation (03CH01-CA)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Oct. 11, 2024 ~ Oct. 25, 2024	N/A	Radiation (03CH01-CA)
Test Software	Audix E3	E3 230621 Sporton US,V9	PK-002093	N/A	N/A	Oct. 11, 2024 ~ Oct. 25, 2024	N/A	Radiation (03CH01-CA)
Hygrometer	Testo	608-H1	45142602	N/A	Aug. 14, 2024	Oct.28,2024	Aug. 13, 2025	Conducted (TH01-CA)
Power Sensor	DARE!!	RPR3006W #10	RPR6W-2101003	10MHz-8GHz	Apr. 25, 2024	Oct.28,2024	Apr. 24, 2025	Conducted (TH01-CA)
Switch Box	EM Electronics	EMSW18	1070901	N/A	Jul. 16, 2024	Oct.28,2024	Jul. 15, 2025	Conducted (TH01-CA)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101545	10Hz-40GHz	Apr. 25, 2024	Oct.28,2024	Apr. 24, 2025	Conducted (TH01-CA)

5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.7 dB

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.5 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.5 dB

A1. Conducted Test Results

Test Engineer:	Ju Chang	Temperature:	22.2	°C
Test Date:	2024/10/28	Relative Humidity:	52.1	%
Tool & Version	QRCT Version 4.0.00201.0	Test Site	TH02-CA	
Test Site Locati	1175 Montague Expressway Milpitas, CA 95035 USA			

Report Number : FR241118001A

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band MIMO										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
					Ant1	Ant2	Ant1	Ant2		
11b	1Mbps	2	1	2412	13.11	12.92	7.582	7.260	0.50	Pass
11b	1Mbps	2	6	2437	12.90	12.86	7.538	8.048	0.50	Pass
11b	1Mbps	2	11	2462	12.85	12.78	7.074	7.082	0.50	Pass
11g	6Mbps	2	1	2412	16.40	16.36	16.314	16.322	0.50	Pass
11g	6Mbps	2	6	2437	16.37	16.35	16.026	16.318	0.50	Pass
11g	6Mbps	2	11	2462	16.31	16.32	15.758	16.300	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	2	1	2412	23.11	23.04	26.09	30.00		2.00		28.09		36.00		Pass
11b	1Mbps	2	6	2437	23.51	22.84	26.20	30.00		2.00		28.20		36.00		Pass
11b	1Mbps	2	11	2462	23.81	23.03	26.45	30.00		2.00		28.45		36.00		Pass
11g	6Mbps	2	1	2412	19.81	19.94	22.89	30.00		2.00		24.89		36.00		Pass
11g	6Mbps	2	6	2437	22.81	23.14	25.99	30.00		2.00		27.99		36.00		Pass
11g	6Mbps	2	11	2462	17.01	17.14	20.09	30.00		2.00		22.09		36.00		Pass
HT20	MCS0	2	1	2412	17.51	17.84	20.69	30.00		2.00		22.69		36.00		Pass
HT20	MCS0	2	6	2437	22.19	22.64	25.43	30.00		2.00		27.43		36.00		Pass
HT20	MCS0	2	11	2462	15.91	16.24	19.09	30.00		2.00		21.09		36.00		Pass
HT40	MCS0	2	3	2422	16.86	17.24	20.06	30.00		2.00		22.06		36.00		Pass
HT40	MCS0	2	6	2437	19.31	19.34	22.34	30.00		2.00		24.34		36.00		Pass
HT40	MCS0	2	9	2452	13.01	13.14	16.09	30.00		2.00		18.09		36.00		Pass
VHT20	MCS0	2	1	2412	17.61	17.94	20.79	30.00		2.00		22.79		36.00		Pass
VHT20	MCS0	2	6	2437	22.29	22.74	25.53	30.00		2.00		27.53		36.00		Pass
VHT20	MCS0	2	11	2462	16.01	16.34	19.19	30.00		2.00		21.19		36.00		Pass
VHT40	MCS0	2	3	2422	16.96	17.34	20.16	30.00		2.00		22.16		36.00		Pass
VHT40	MCS0	2	6	2437	19.41	19.44	22.44	30.00		2.00		24.44		36.00		Pass
VHT40	MCS0	2	9	2452	13.11	13.24	16.19	30.00		2.00		18.19		36.00		Pass

TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
					Ant1	Ant2	Worse + 3.01	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	2	1	2412	-2.44	-3.27	0.57	4.52		8.00		Pass
11b	1Mbps	2	6	2437	-1.63	-2.41	1.38	4.52		8.00		Pass
11b	1Mbps	2	11	2462	0.05	-0.89	3.06	4.52		8.00		Pass
11g	6Mbps	2	1	2412	-6.30	-6.02	-3.01	4.52		8.00		Pass
11g	6Mbps	2	6	2437	-3.59	-3.56	-0.55	4.52		8.00		Pass
11g	6Mbps	2	11	2462	-9.54	-9.28	-6.27	4.52		8.00		Pass

Measured power density (dBm) has offset with cable loss.

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band MIMO											
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	99% Occupied BW (MHz)		6dB BW (MHz)		6dB BW Limit (MHz)	Pass/Fail
						Ant1	Ant2	Ant1	Ant2		
HE20	MCS0	2	1	2412	Full	18.89	18.84	18.830	18.500	0.50	Pass
HE20	MCS0	2	6	2437	Full	18.86	18.84	18.530	18.460	0.50	Pass
HE20	MCS0	2	11	2462	Full	18.81	18.81	18.015	18.605	0.50	Pass
HE40	MCS0	2	3	2422	Full	37.76	37.72	36.452	36.504	0.50	Pass
HE40	MCS0	2	6	2437	Full	37.72	37.68	36.460	36.644	0.50	Pass
HE40	MCS0	2	9	2452	Full	37.79	37.72	37.480	36.540	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band MIMO																		
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant1	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
HE20	MCS0	2	1	2412	Full	17.71	18.04	20.89	30.00		2.00		22.89		36.00		Pass
HE20	MCS0	2	6	2437	Full	22.39	22.84	25.63	30.00		2.00		27.63		36.00		Pass
HE20	MCS0	2	11	2462	Full	16.11	16.44	19.29	30.00		2.00		21.29		36.00		Pass
HE40	MCS0	2	3	2422	Full	17.06	17.44	20.26	30.00		2.00		22.26		36.00		Pass
HE40	MCS0	2	6	2437	Full	19.51	19.54	22.54	30.00		2.00		24.54		36.00		Pass
HE40	MCS0	2	9	2452	Full	13.21	13.34	16.29	30.00		2.00		18.29		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

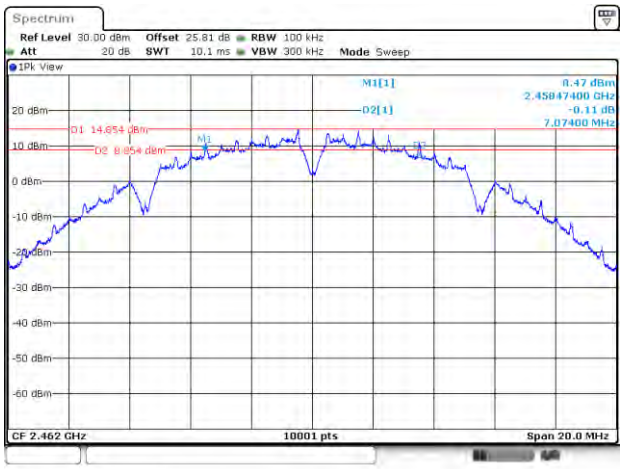
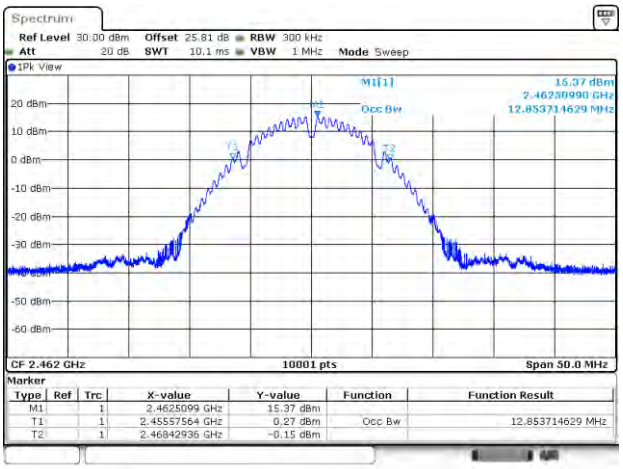
TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Peak PSD (dBm/3kHz)			DG (dBi)		Peak PSD Limit (dBm/3kHz)		Pass/Fail
						Ant1	Ant2	Worse + 3.01	Ant1	Ant2	Ant1	Ant2	
HE20	MCS0	2	1	2412	Full	-8.91	-9.19	-5.90	4.52		8.00		Pass
HE20	MCS0	2	6	2437	Full	-4.34	-4.43	-1.33	4.52		8.00		Pass
HE20	MCS0	2	11	2462	Full	-10.07	-10.67	-7.06	4.52		8.00		Pass
HE40	MCS0	2	3	2422	Full	-11.52	-10.99	-7.98	4.52		8.00		Pass
HE40	MCS0	2	6	2437	Full	-9.88	-9.36	-6.35	4.52		8.00		Pass
HE40	MCS0	2	9	2452	Full	-16.02	-16.25	-13.01	4.52		8.00		Pass

Measured power density (dBm) has offset with cable loss.

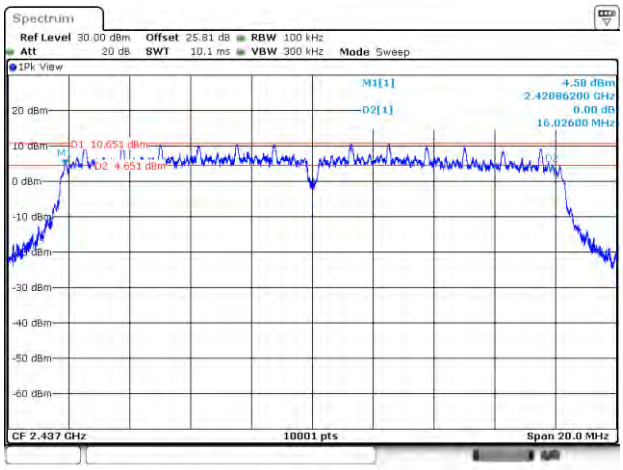
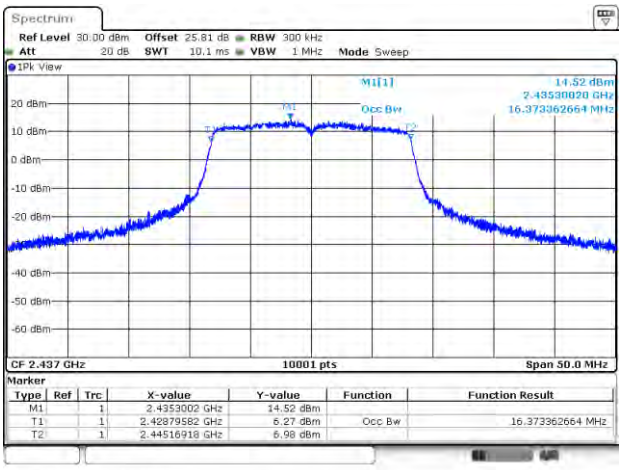
6dB and 99% Occupied Bandwidth

<802.11b>

6dB Bandwidth	99% Occupied Bandwidth
	

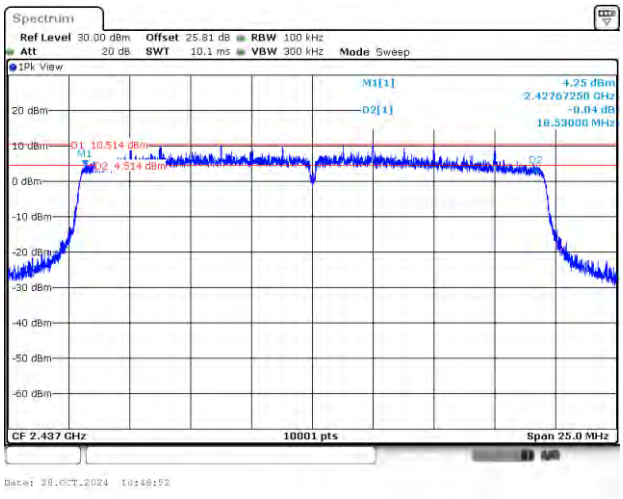
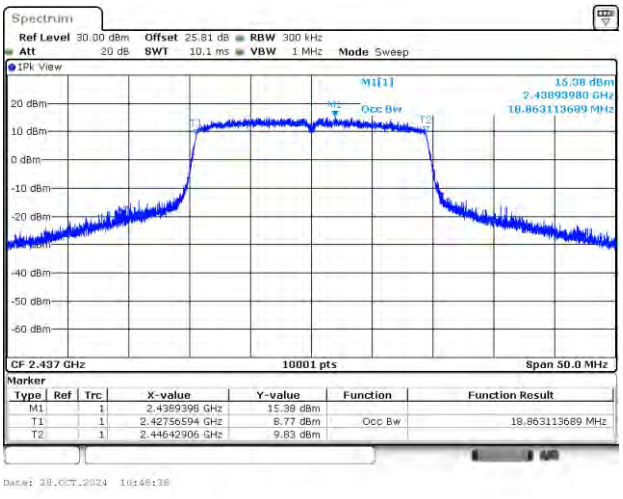
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11g>

6dB Bandwidth	99% Occupied Bandwidth
	

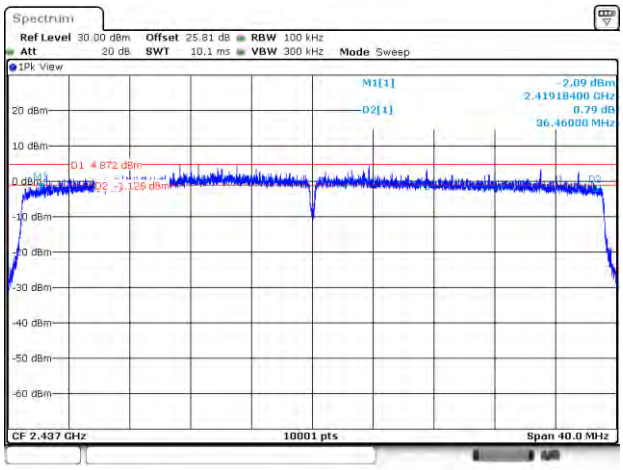
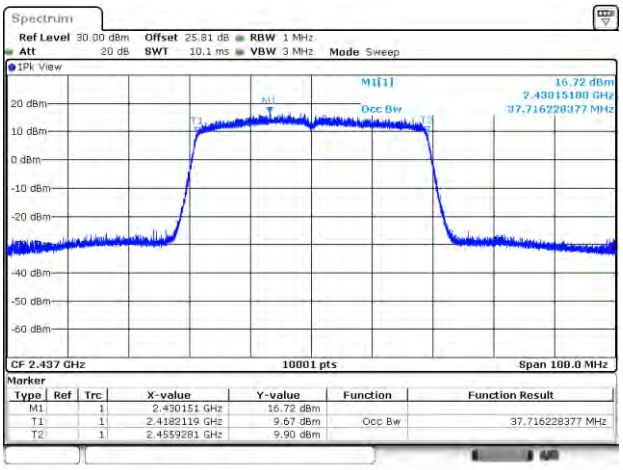
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11ax20>

6dB Bandwidth	99% Occupied Bandwidth
	

Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

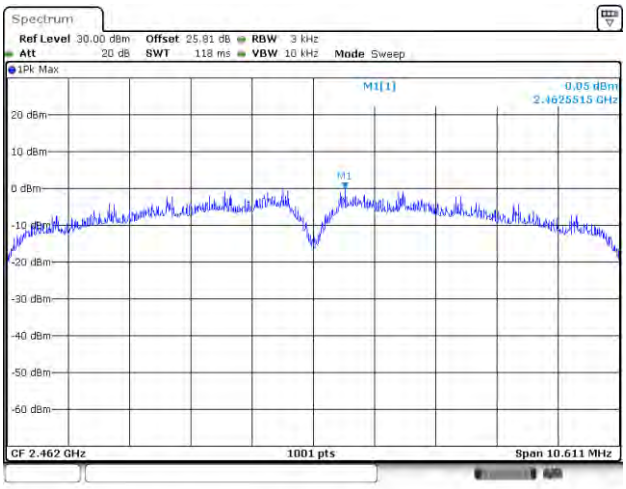
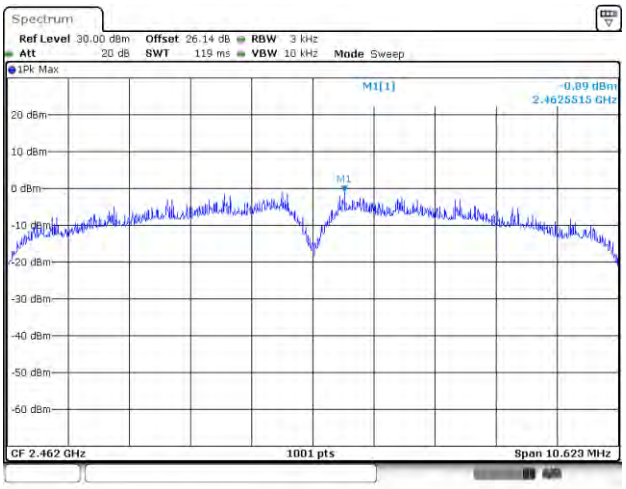
<802.11ax40>

6dB Bandwidth	99% Occupied Bandwidth
	

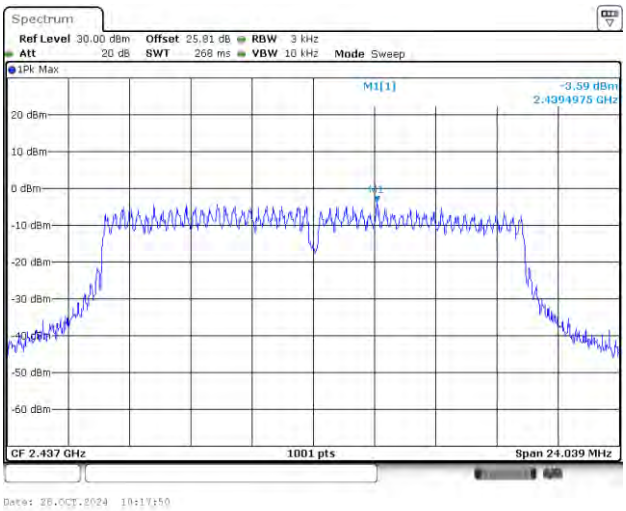
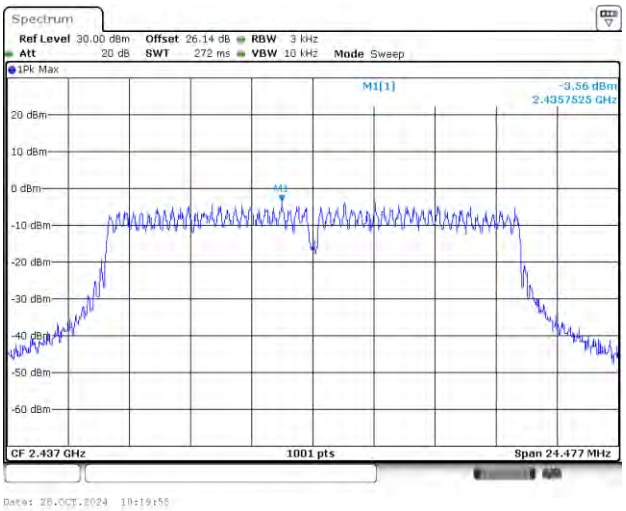
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

Power Spectral Density(dBm/3kHz)

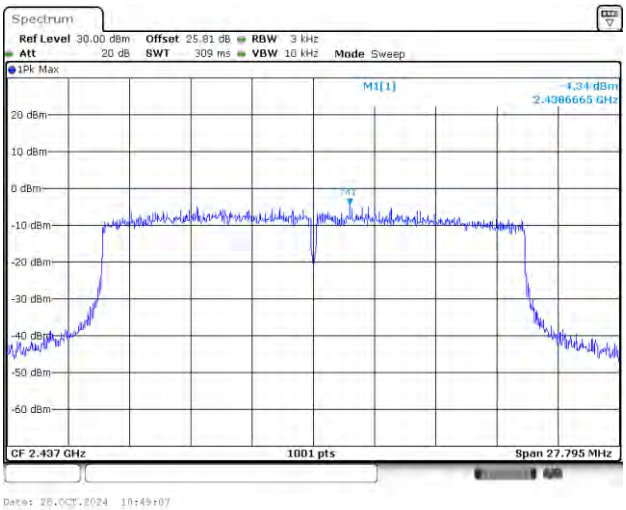
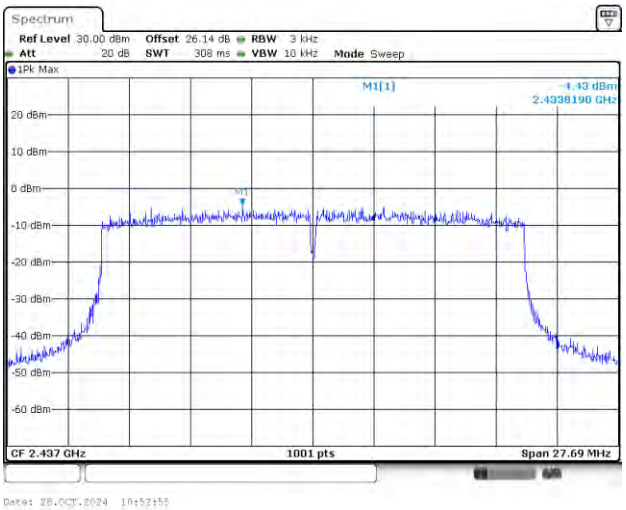
<802.11b>

Maximum Power Density Plot (dBm/3kHz)	
MIMO Ant 1	**MIMO Ant 2**
	

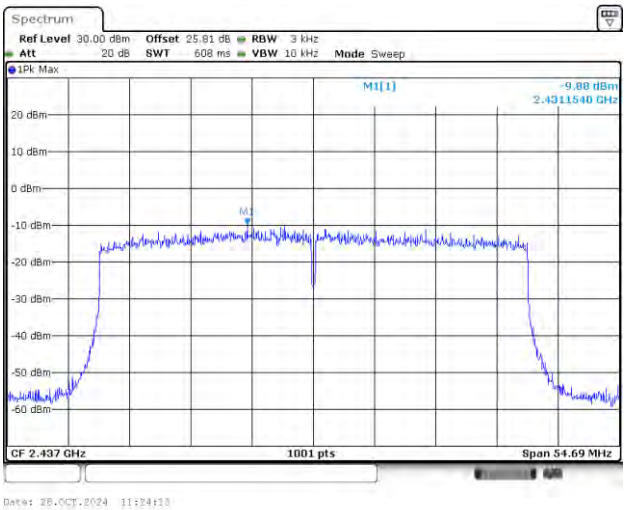
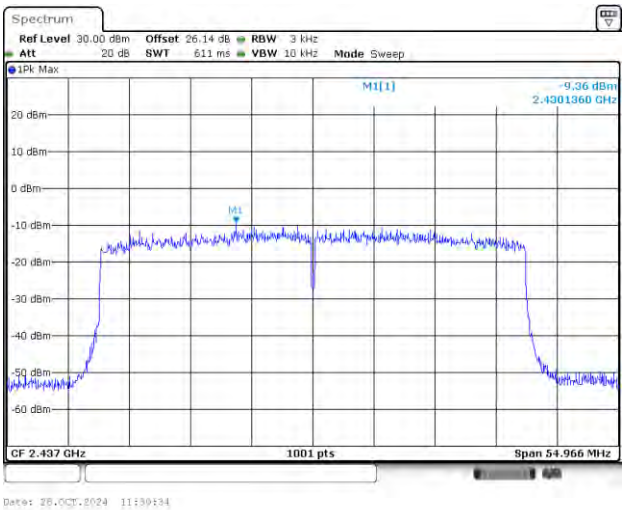
<802.11g>

Maximum Power Density Plot (dBm/3kHz)	
MIMO Ant 1	MIMO Ant 2
	

<802.11ax20>

Maximum Power Density Plot (dBm/3kHz)	
MIMO Ant 1	MIMO Ant 2
	

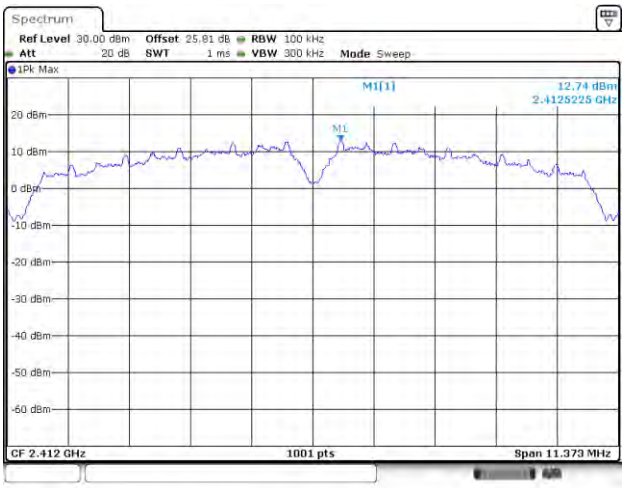
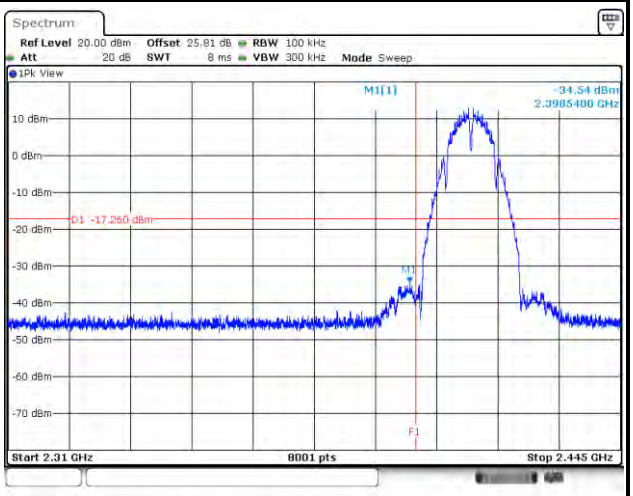
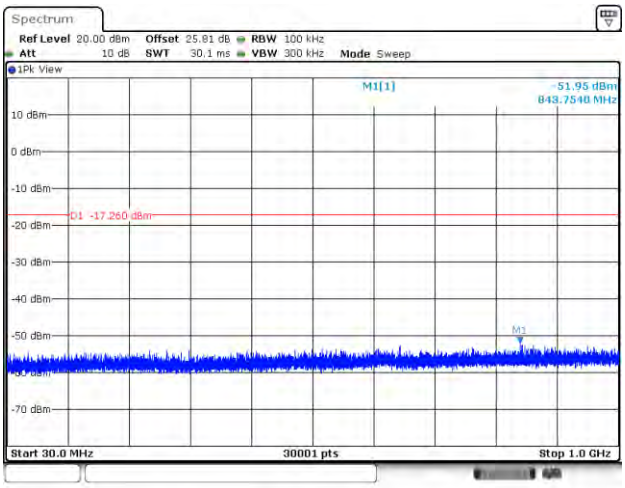
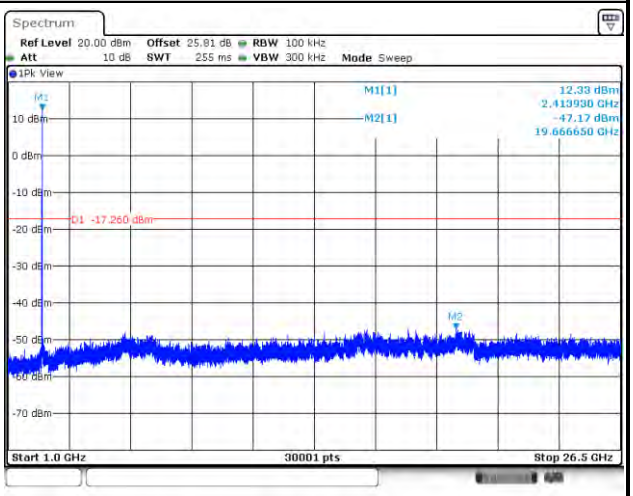
<802.11ax40>

Maximum Power Density Plot (dBm/3kHz)	
MIMO Ant 1	**MIMO Ant 2**
	

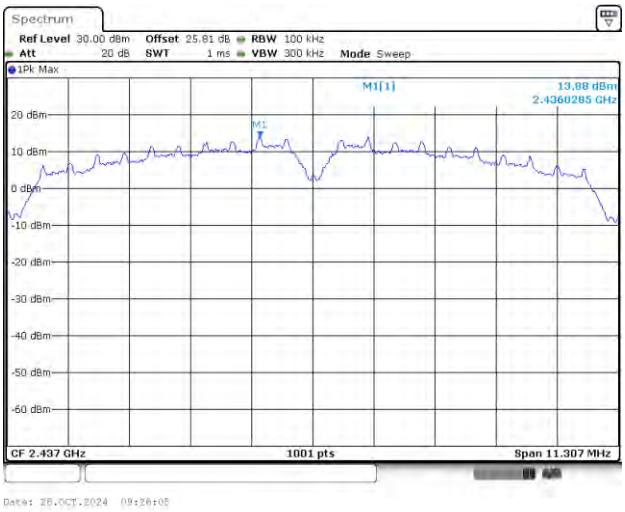
Band Edges and Spurious Emission

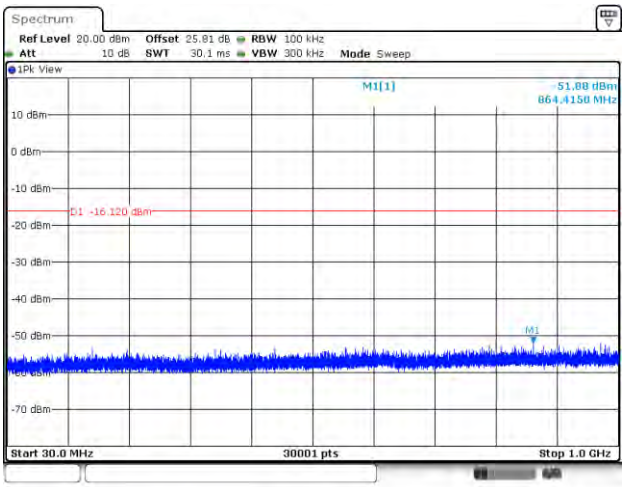
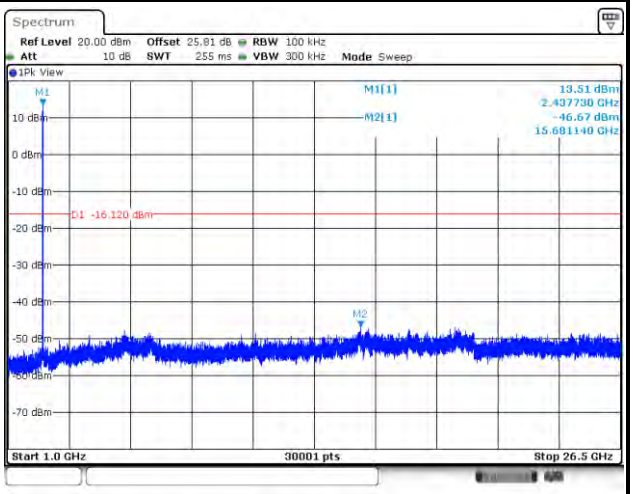
Number of TX = 2, Ant. 0 (Measured)

Test Mode :	802.11b	Test Channel :	01

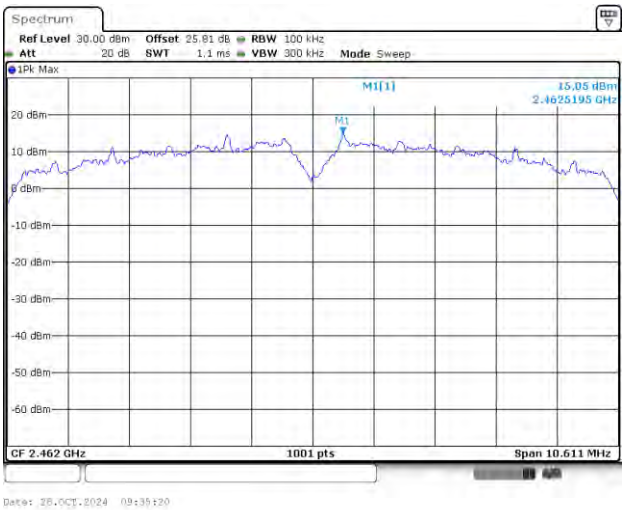
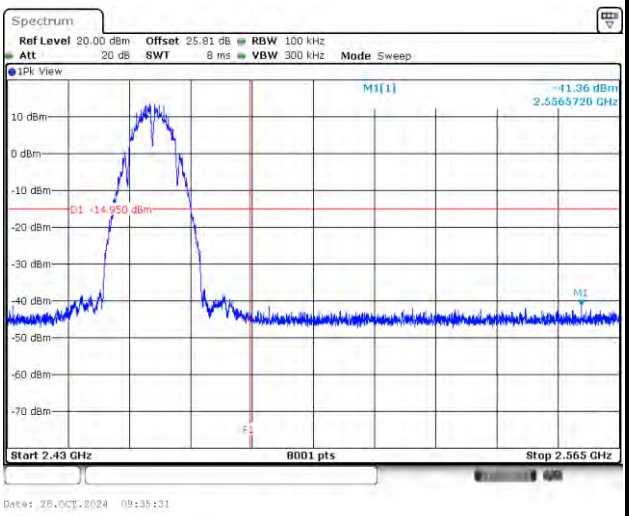
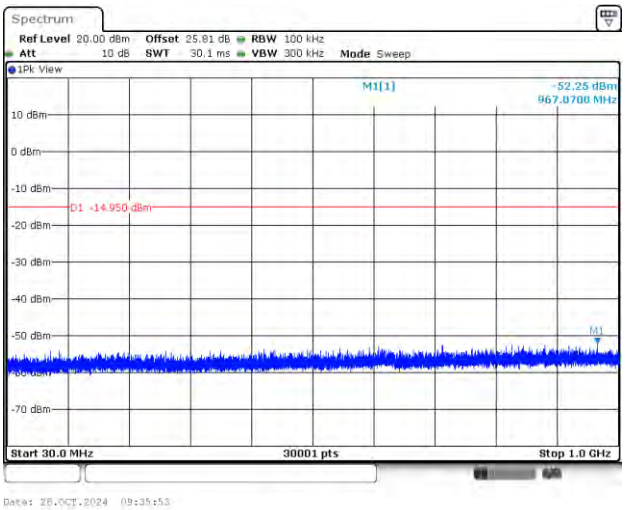
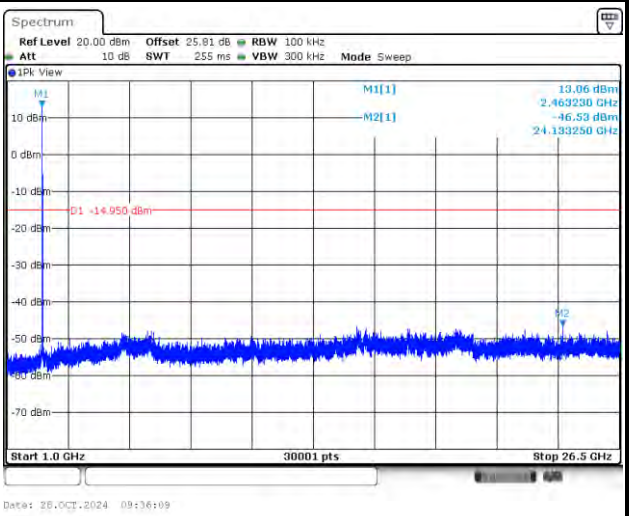
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11b	Test Channel :	06

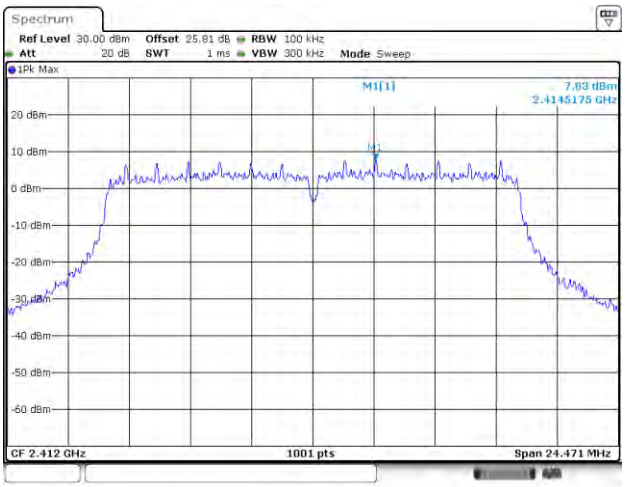
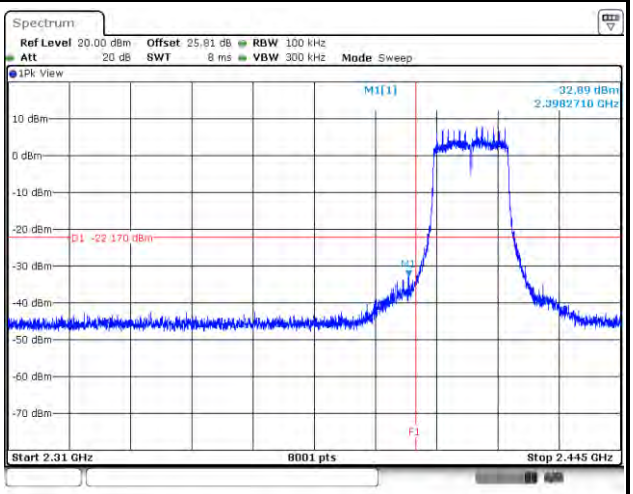
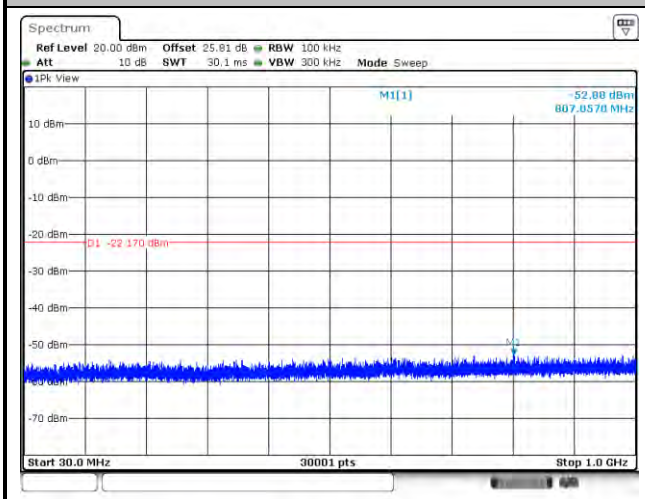
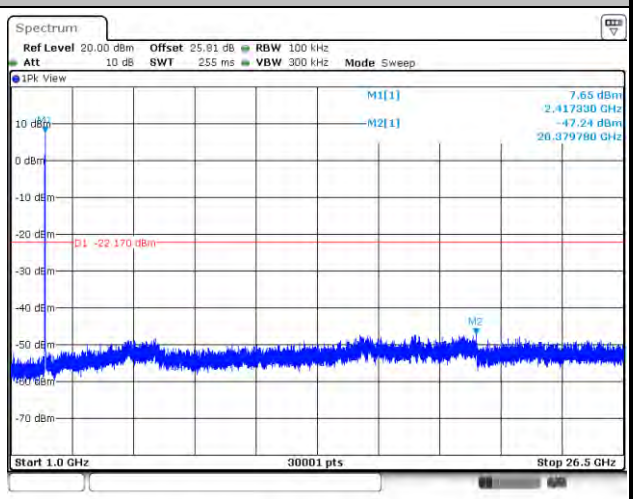
100kHz PSD reference Level	Middle Channel Plot
	

Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

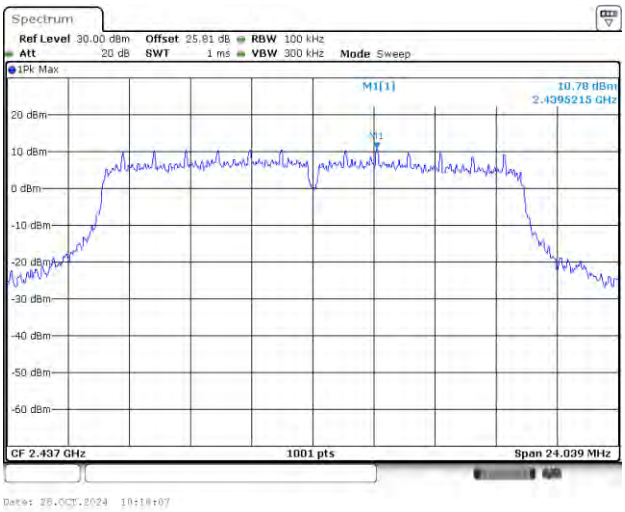
Test Mode :	802.11b	Test Channel :	11

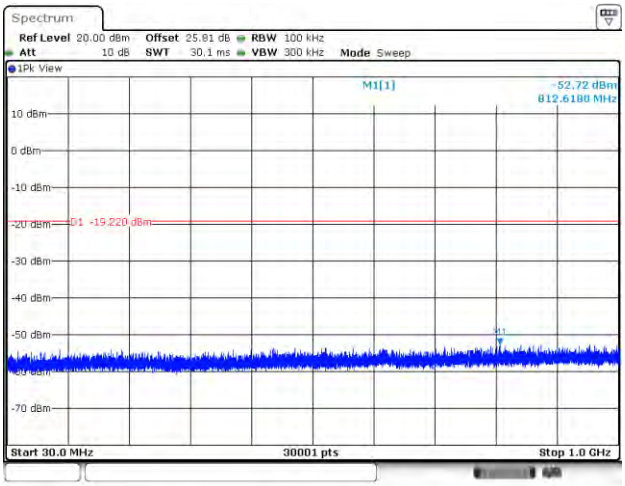
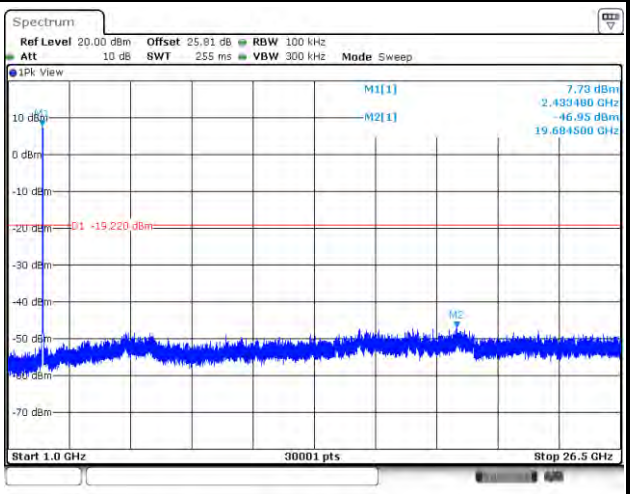
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11g	Test Channel :	01

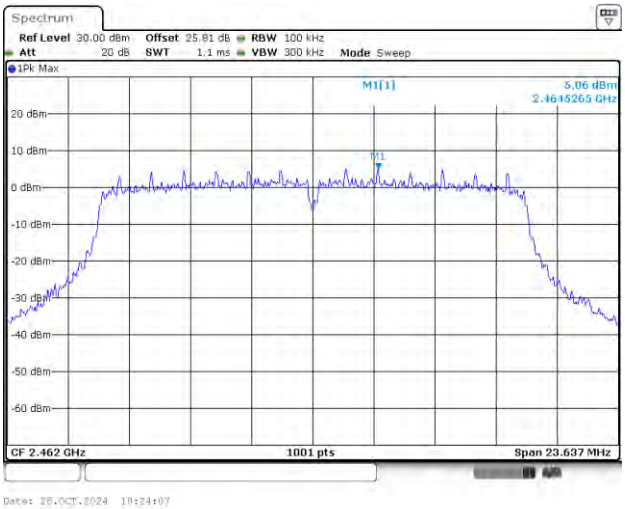
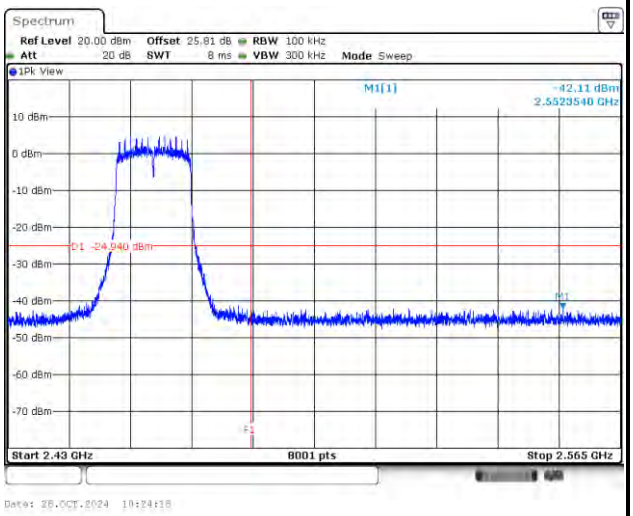
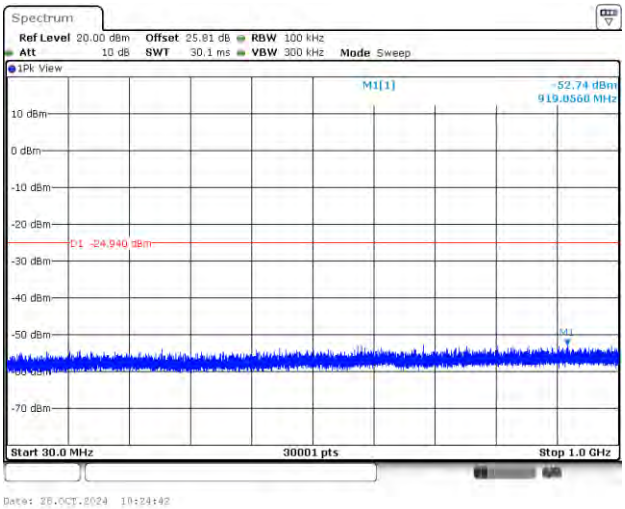
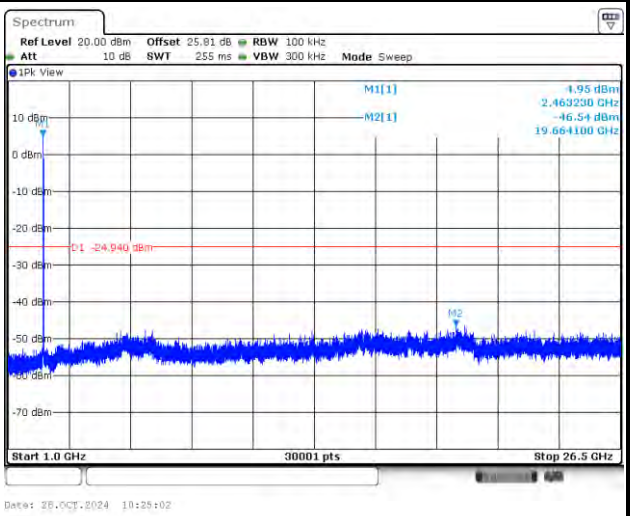
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11g	Test Channel :	06

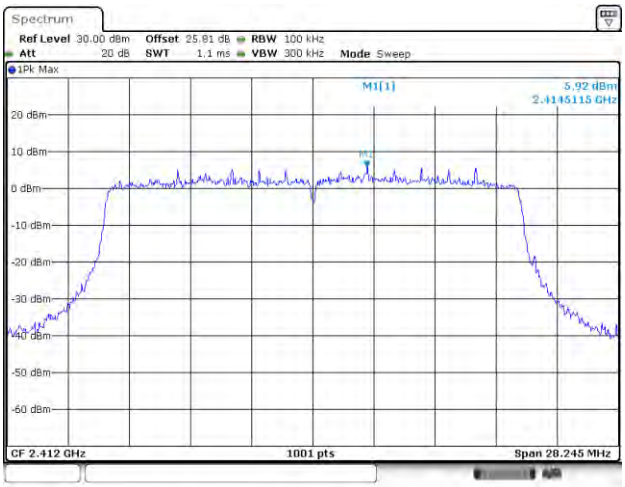
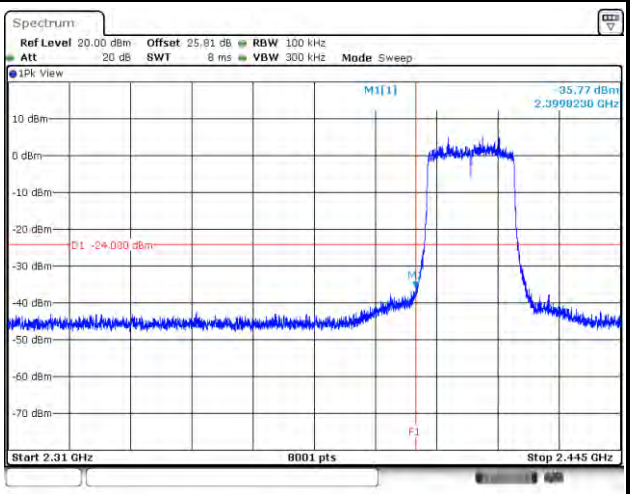
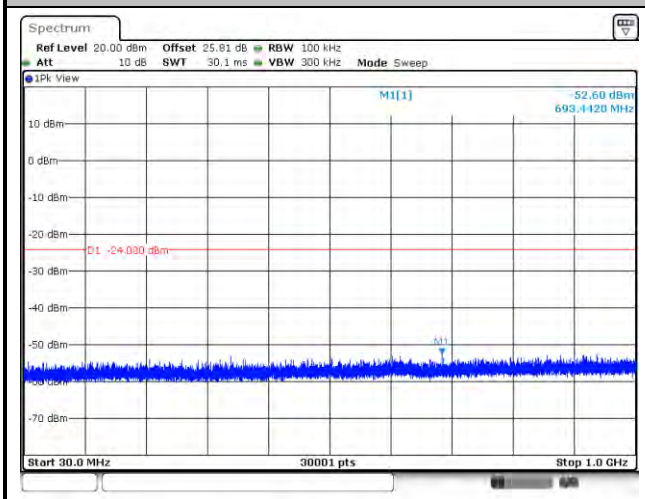
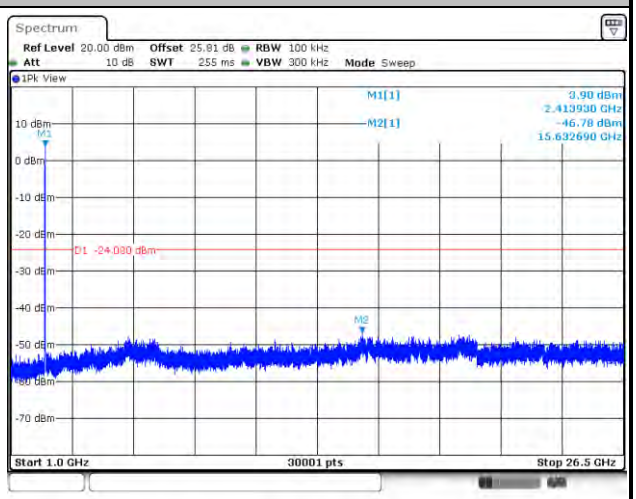
100kHz PSD reference Level	Middle Channel Plot
	

Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

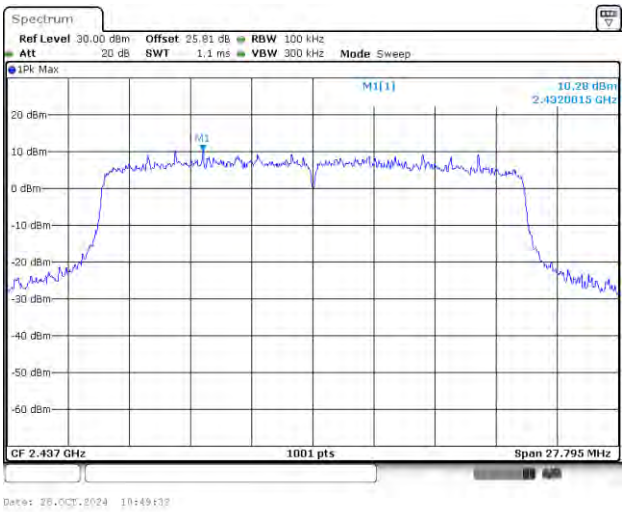
Test Mode :	802.11g	Test Channel :	11

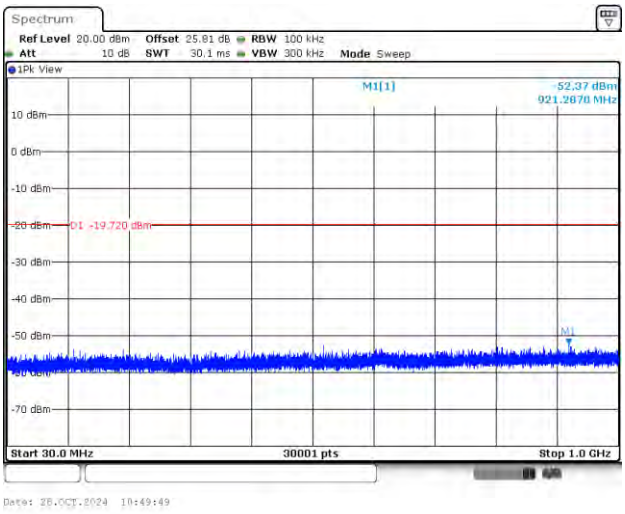
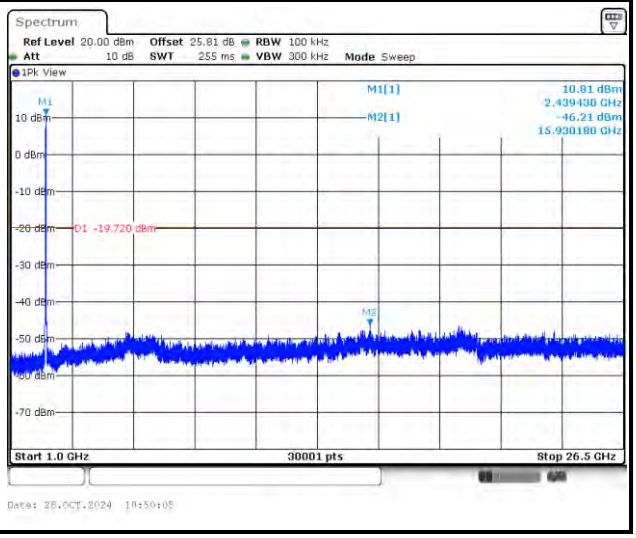
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11ax20_FullRU	Test Channel :	01

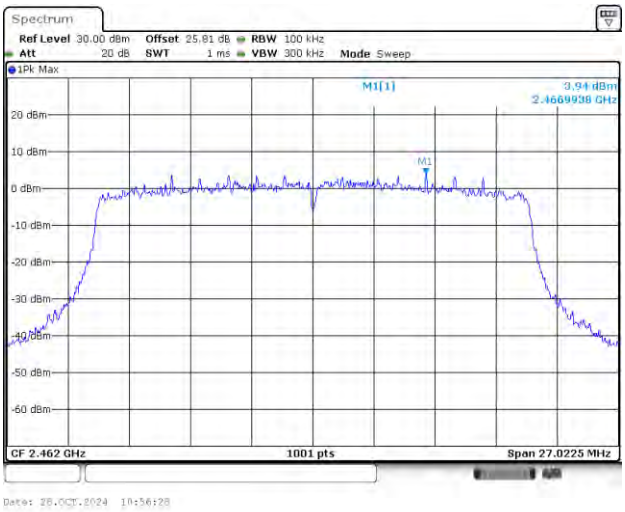
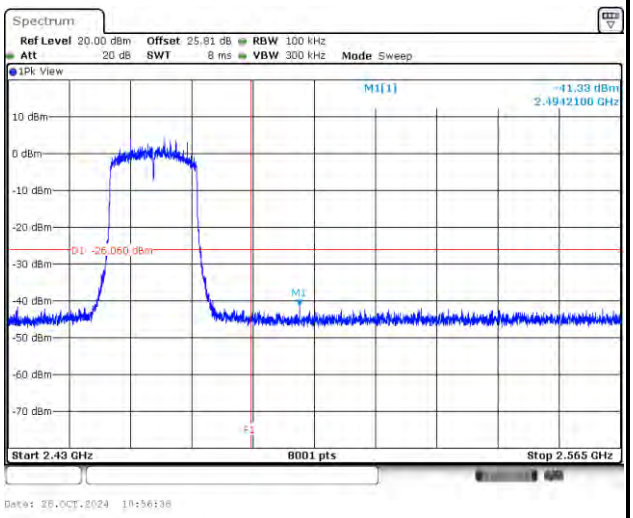
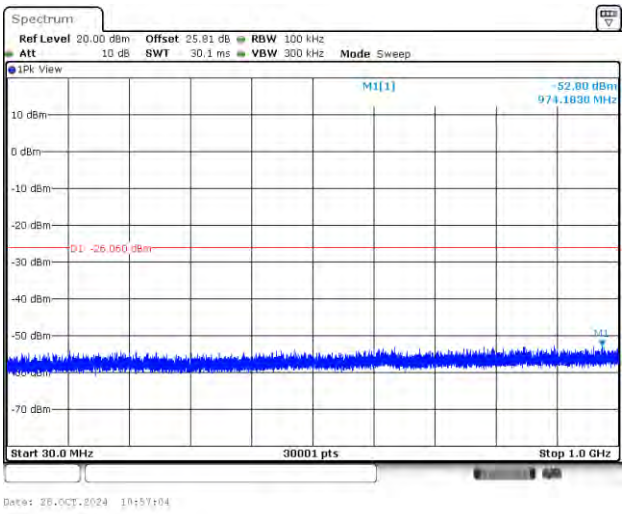
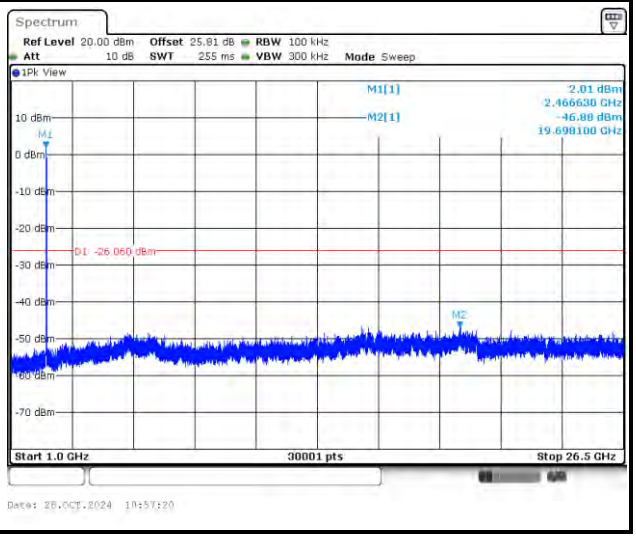
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11ax20_FullRU	Test Channel :	06

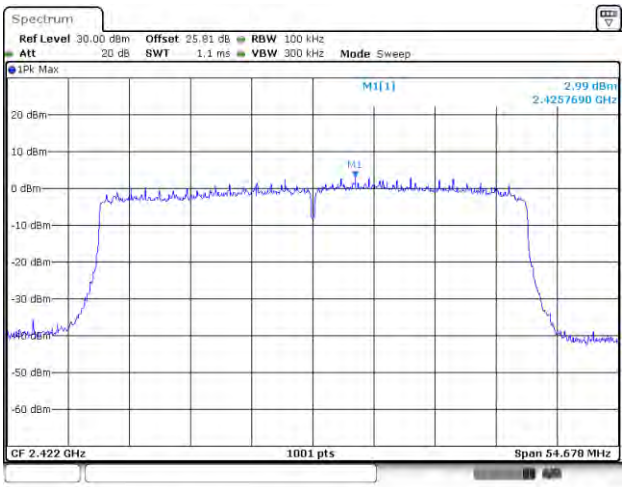
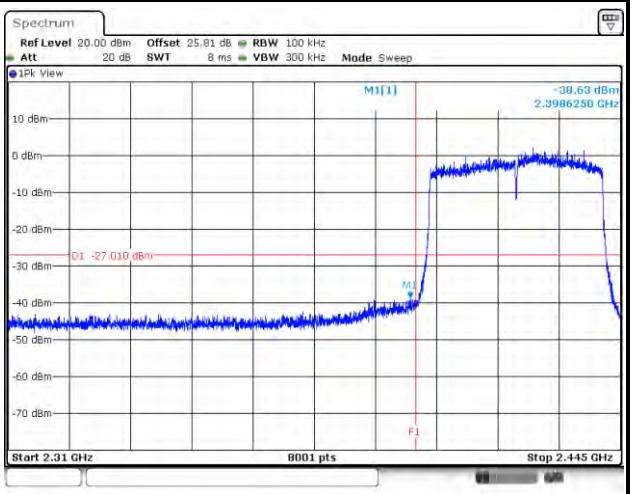
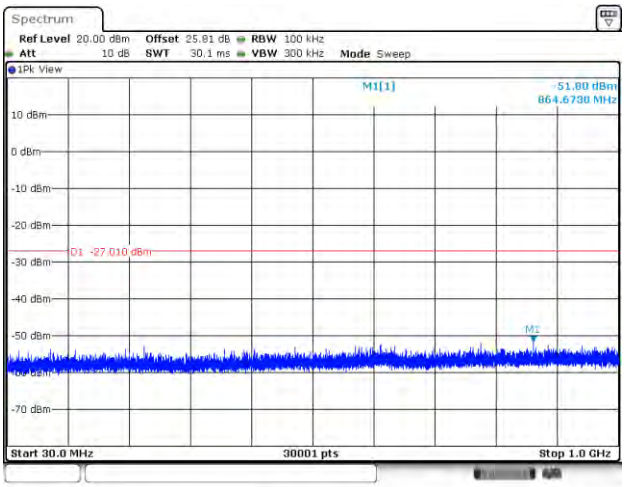
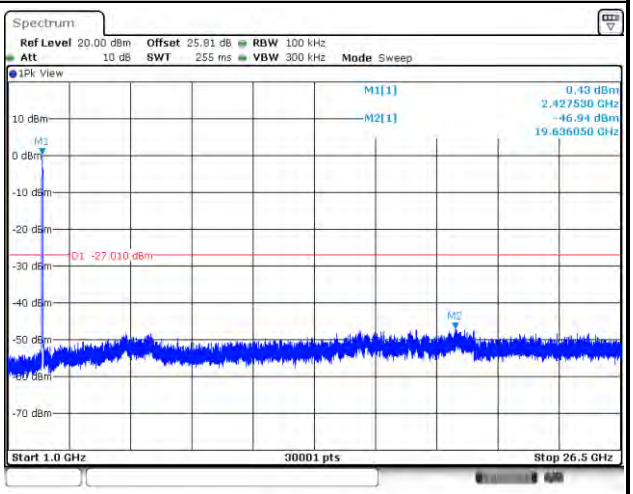
100kHz PSD reference Level	Middle Channel Plot
	

Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

Test Mode :	802.11ax20_FullRU	Test Channel :	11

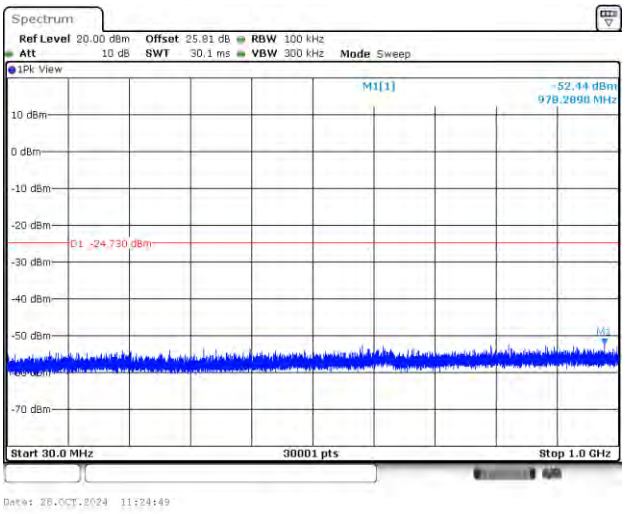
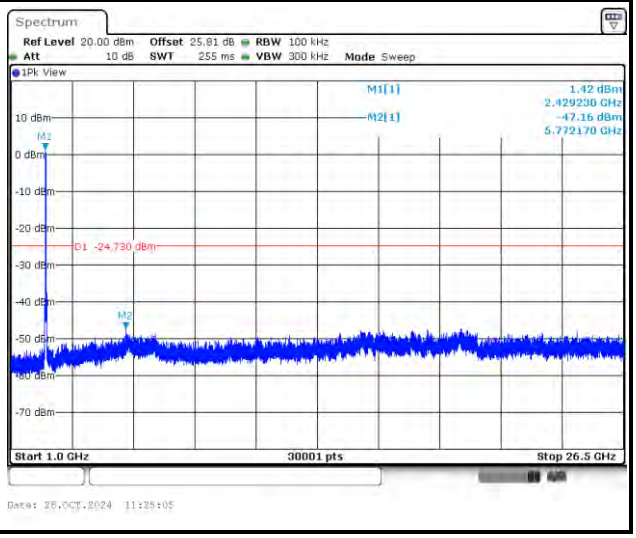
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11ax40_FullRU	Test Channel :	03

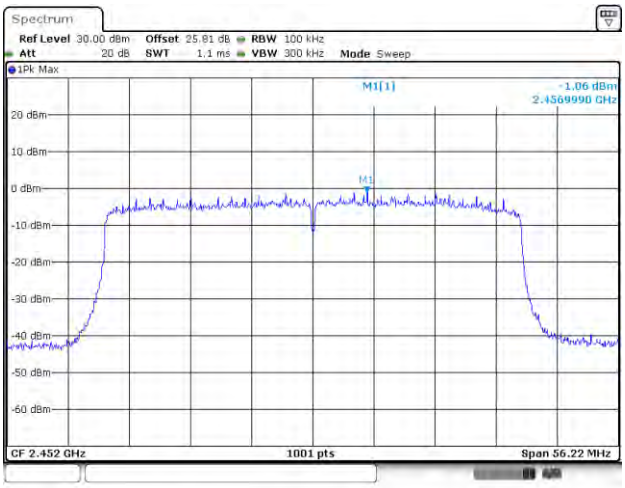
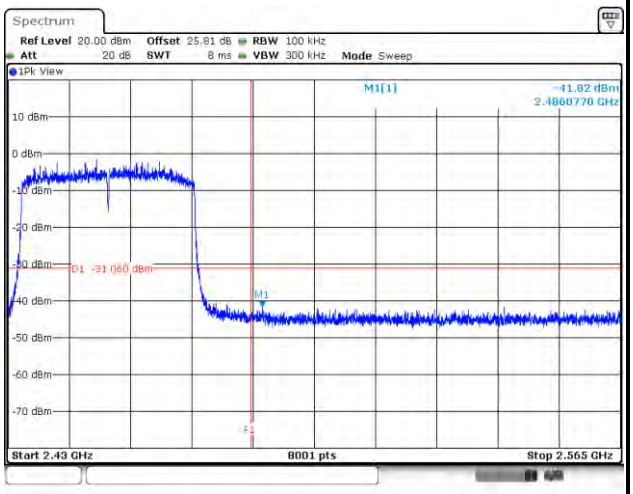
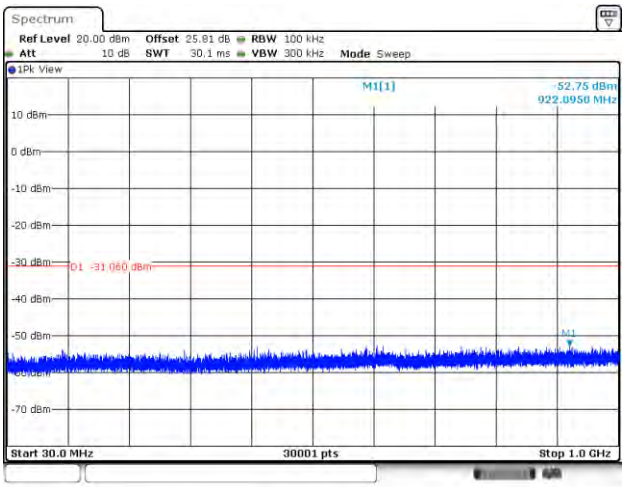
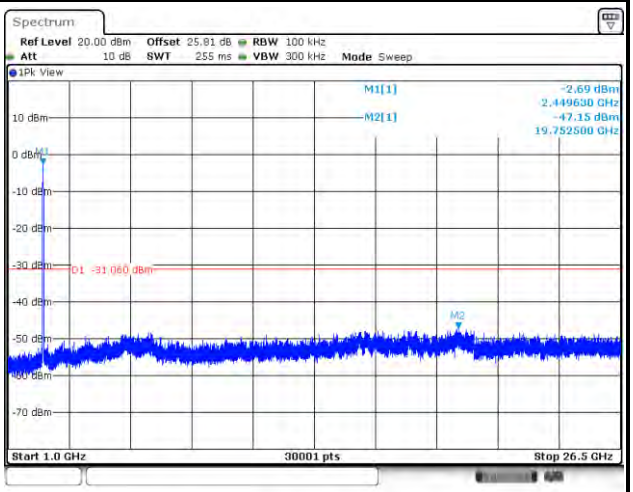
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11ax40_FullRU	Test Channel :	06

100kHz PSD reference Level	Middle Channel Plot

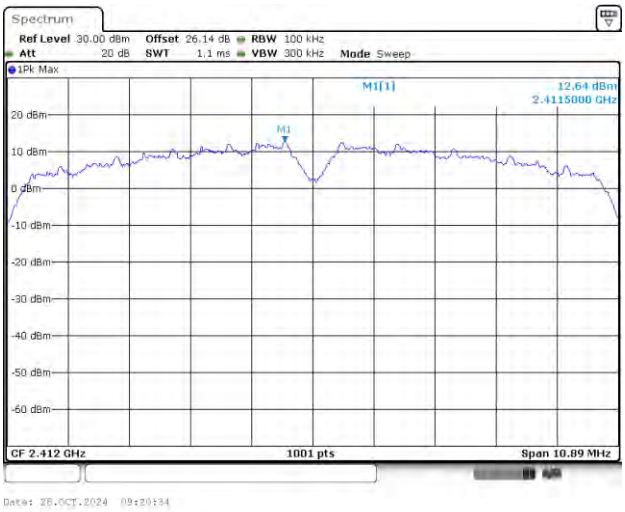
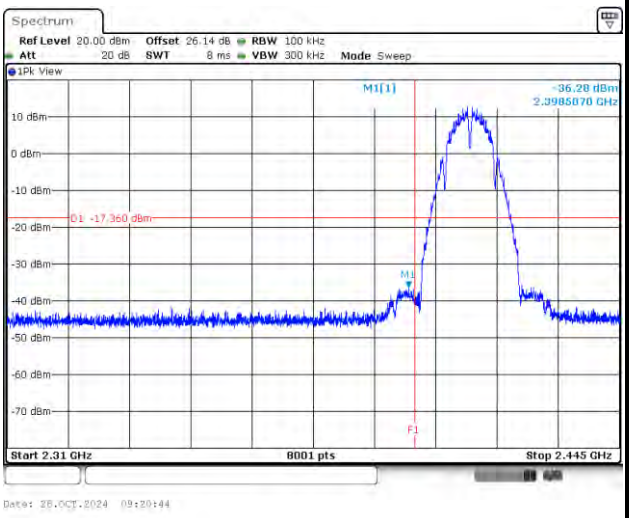
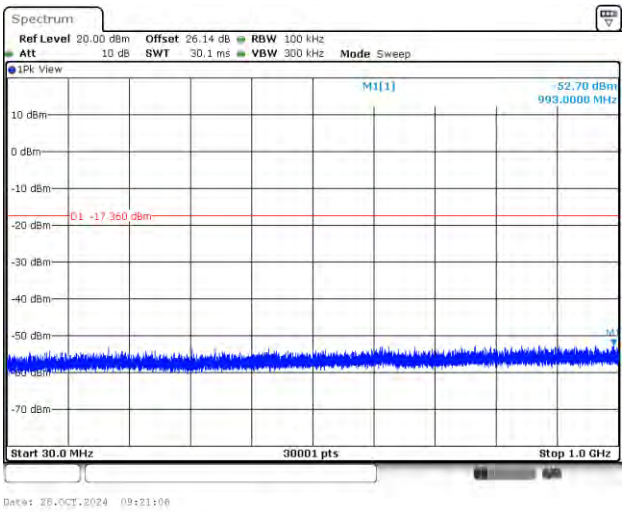
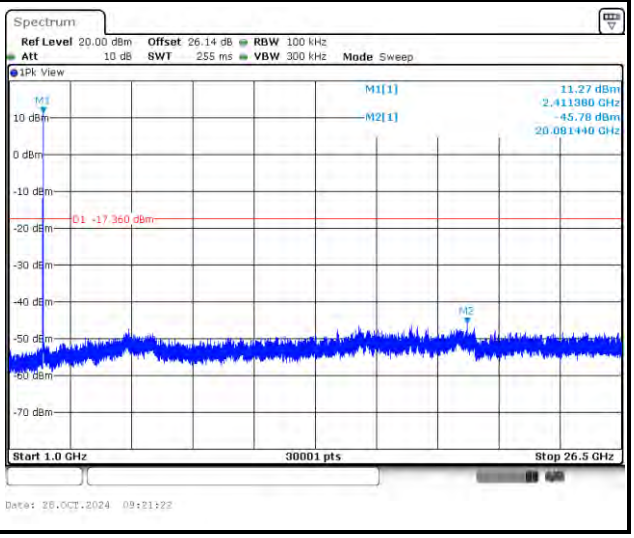
Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

Test Mode :	802.11ax40_FullRU	Test Channel :	09

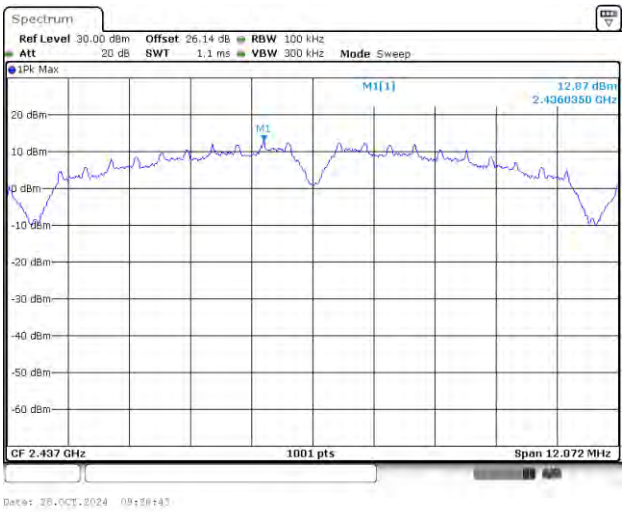
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

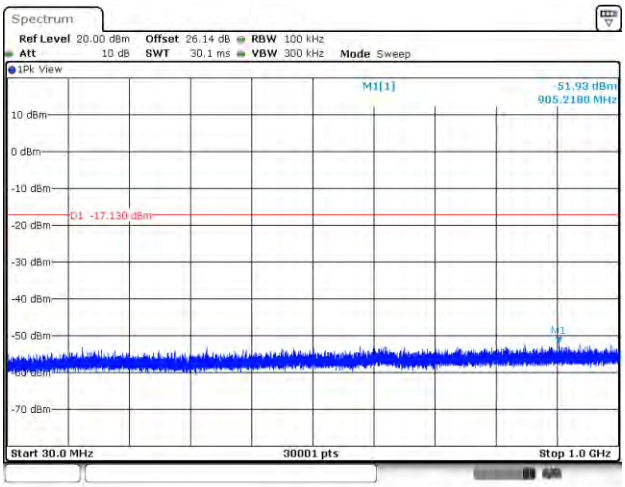
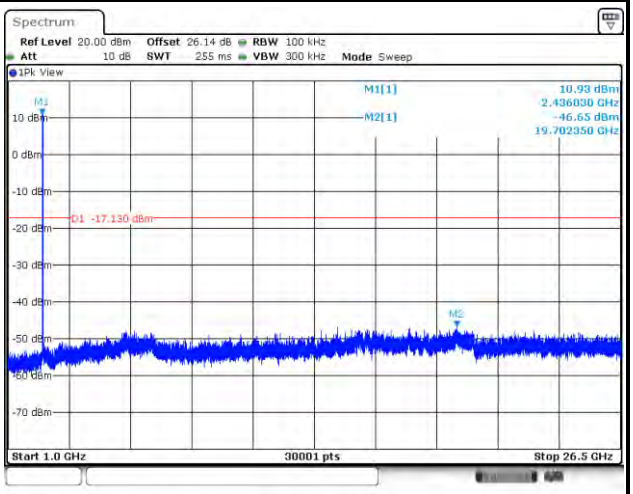
Number of TX = 2, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01

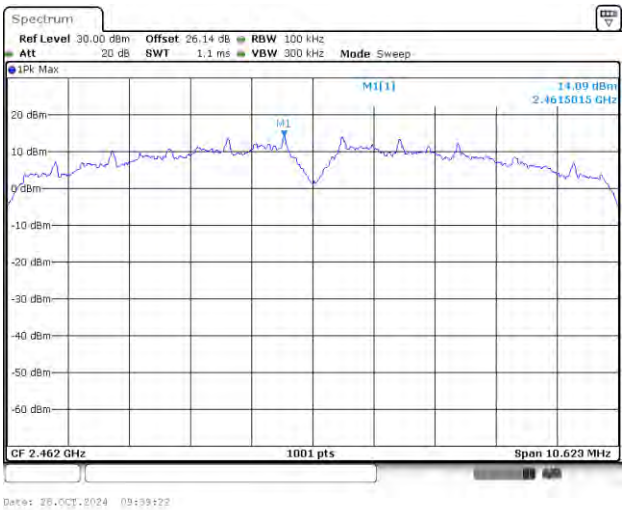
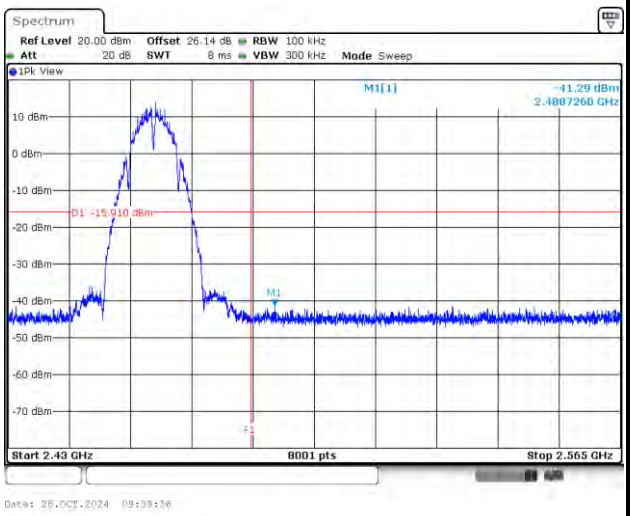
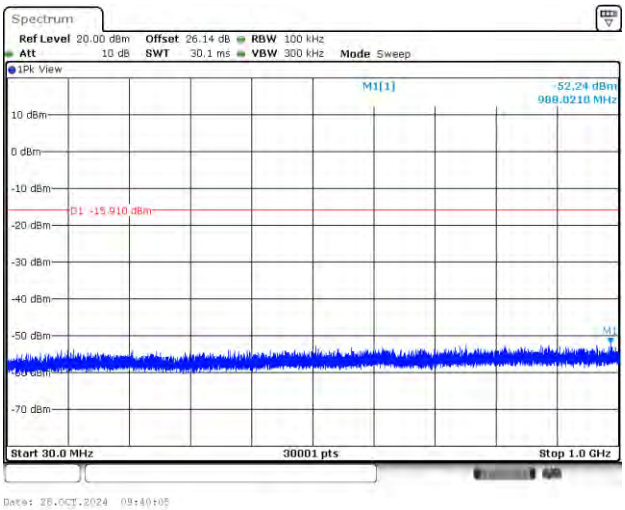
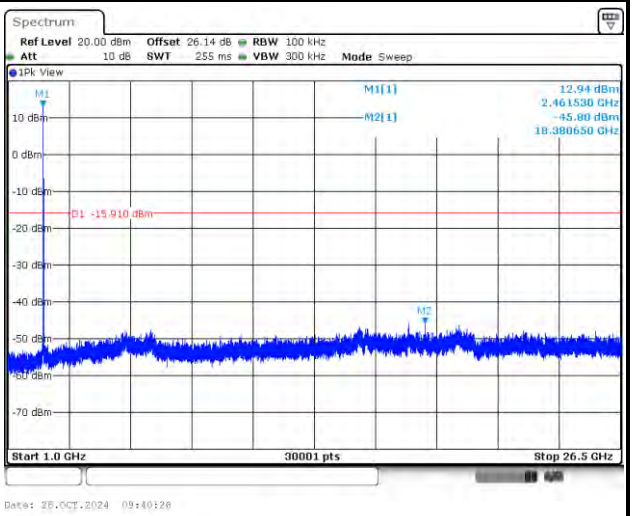
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11b	Test Channel :	06

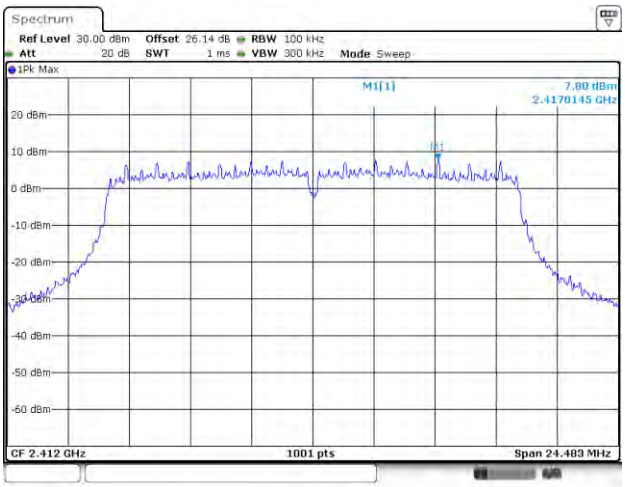
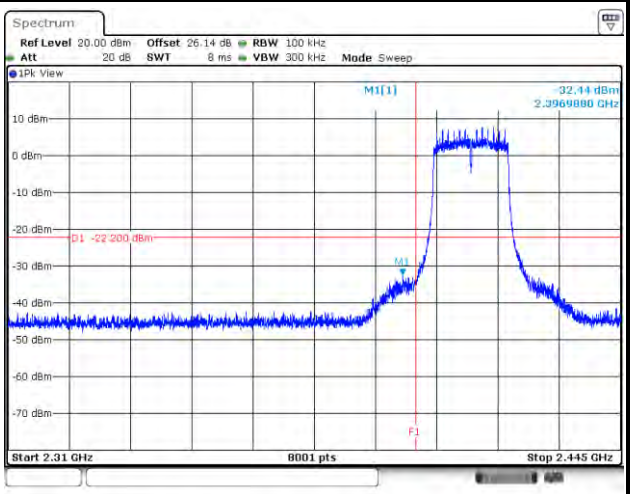
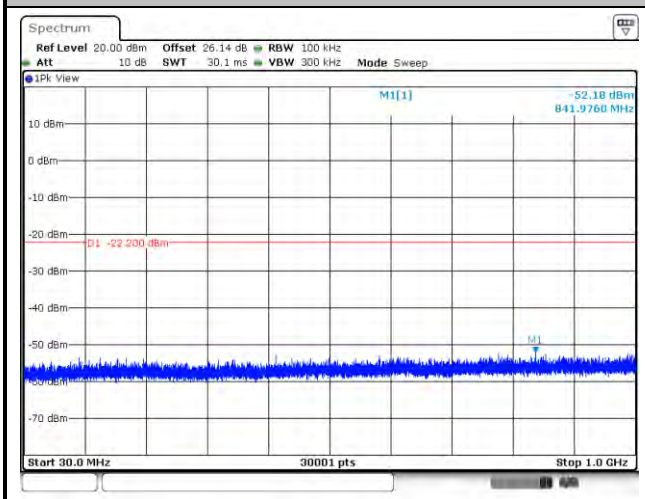
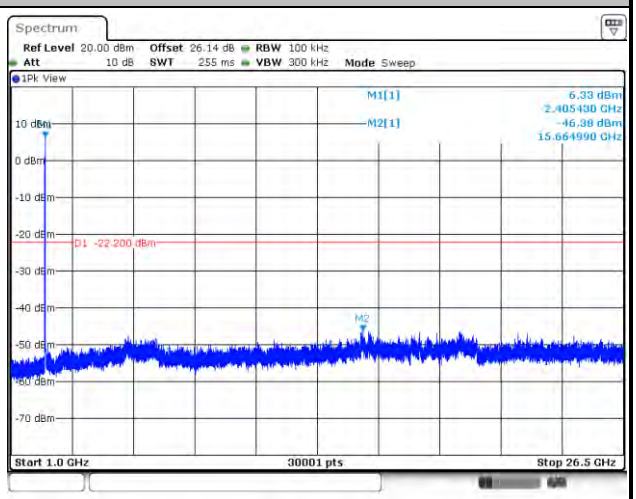
100kHz PSD reference Level	Middle Channel Plot
	

Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

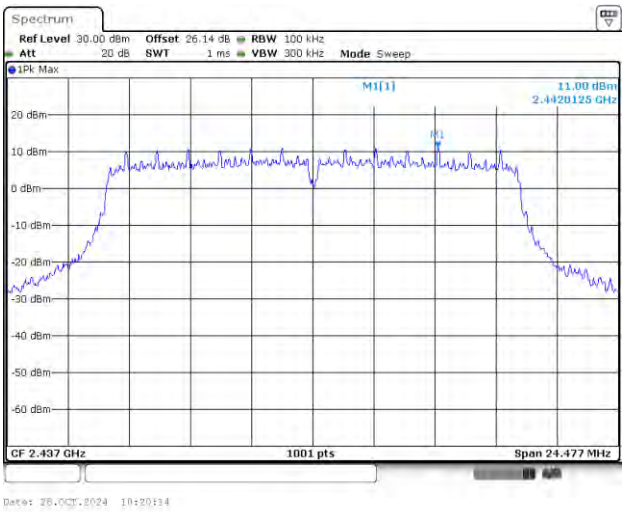
Test Mode :	802.11b	Test Channel :	11

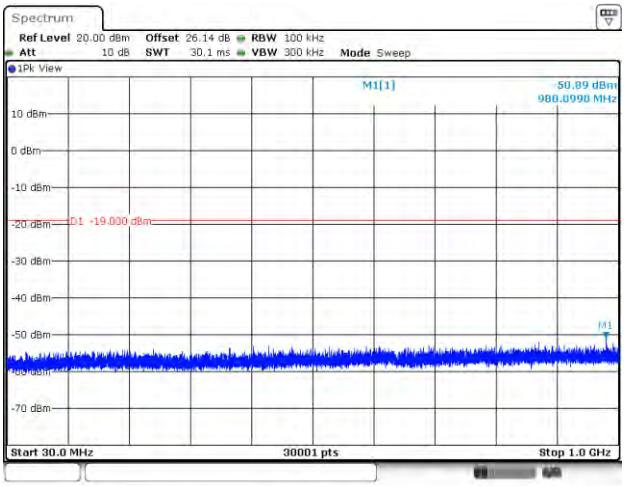
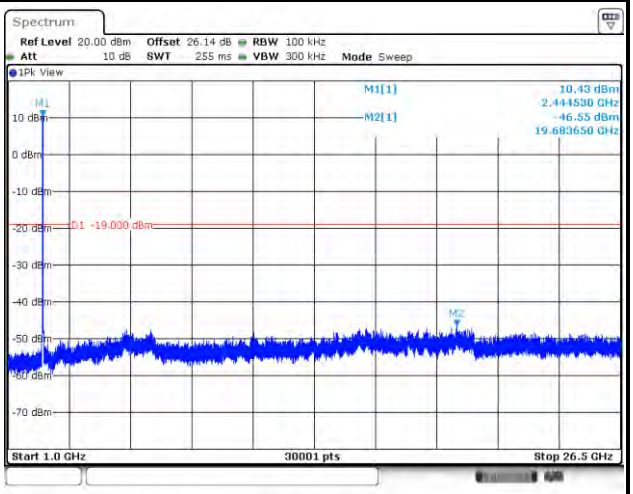
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11g	Test Channel :	01

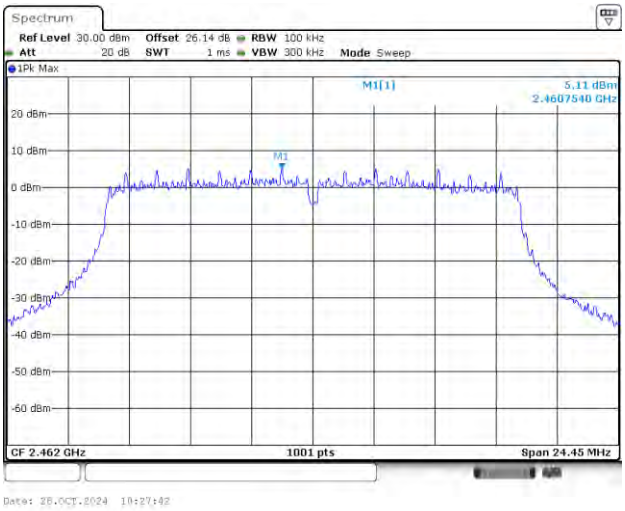
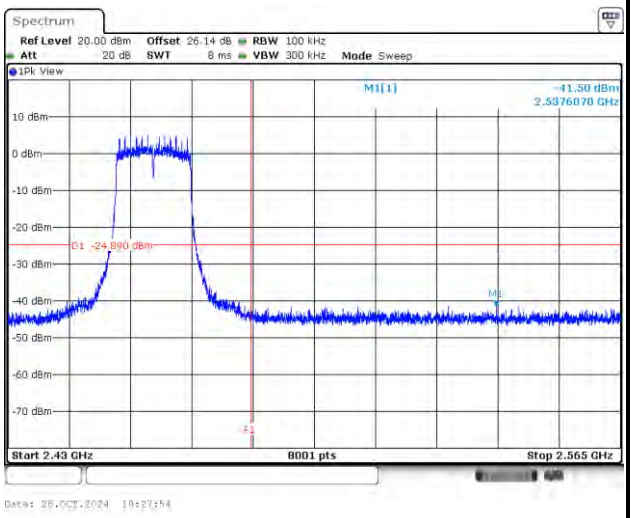
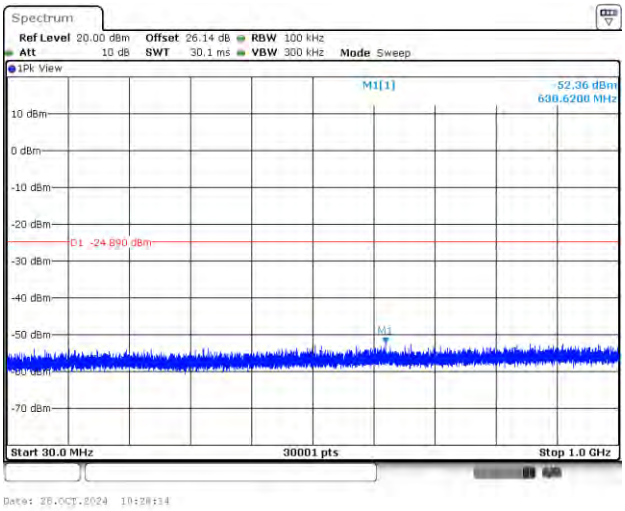
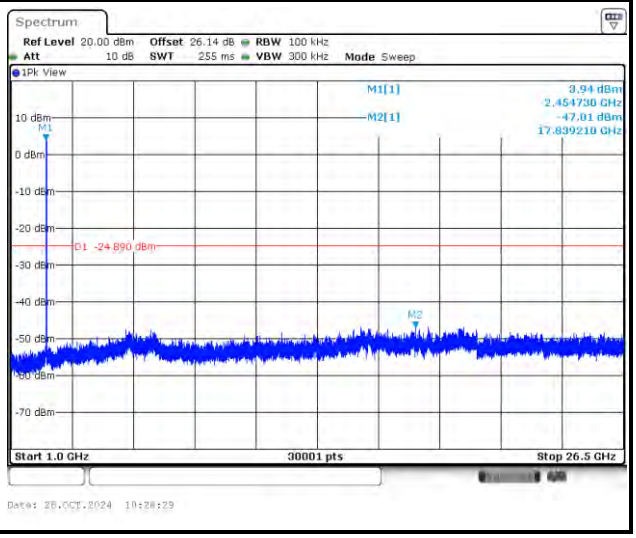
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11g	Test Channel :	06

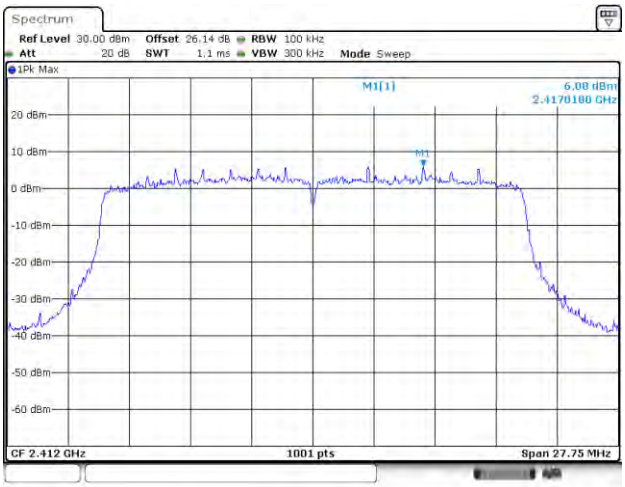
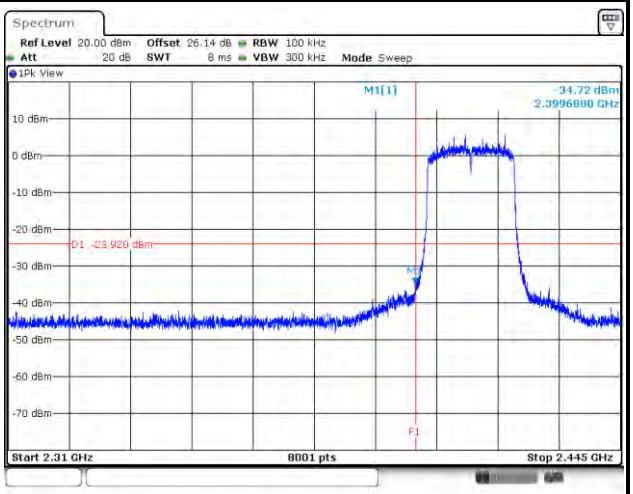
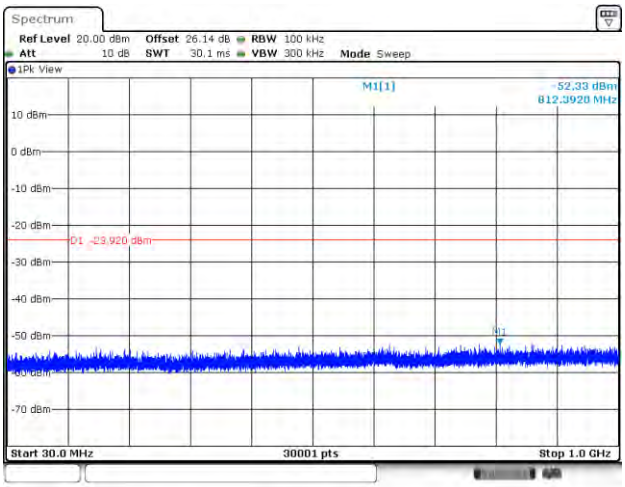
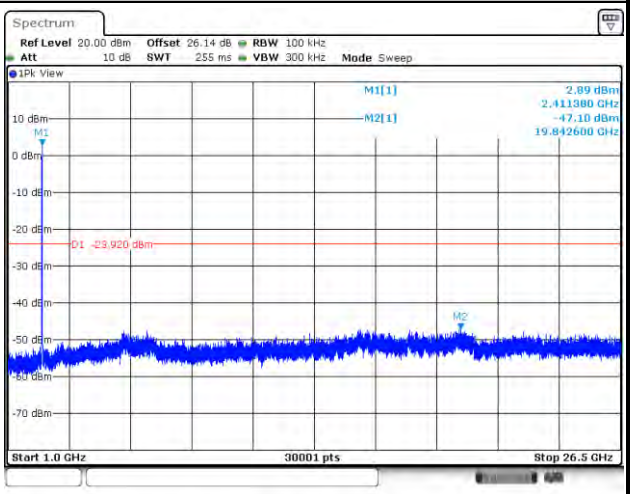
100kHz PSD reference Level	Middle Channel Plot
	

Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

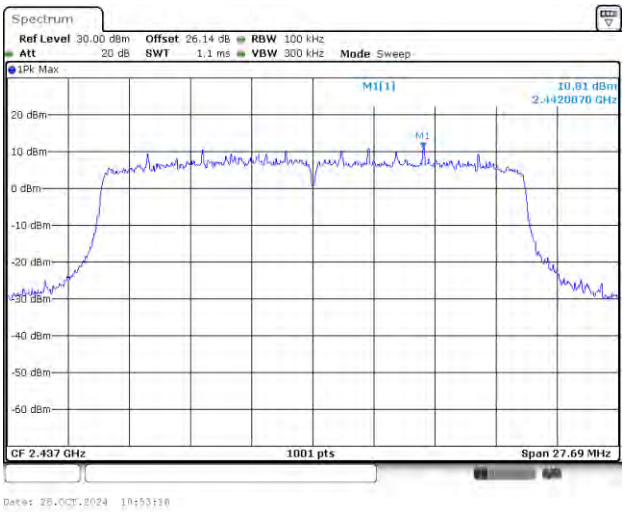
Test Mode :	802.11g	Test Channel :	11

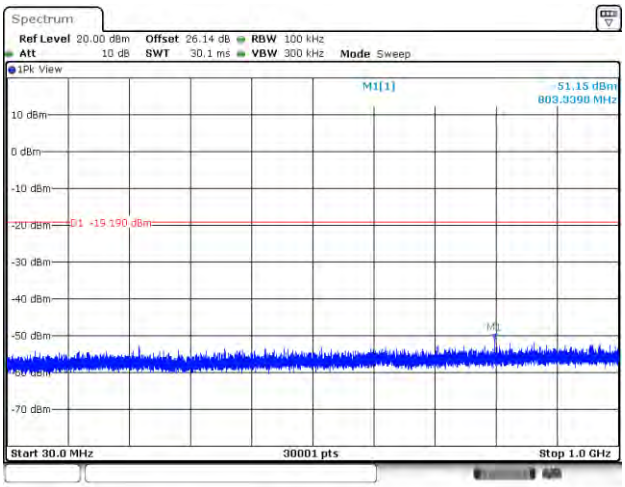
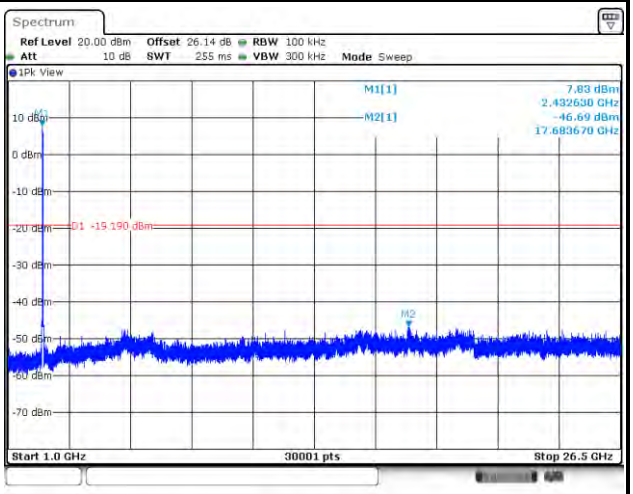
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11ax20_FullRU	Test Channel :	01

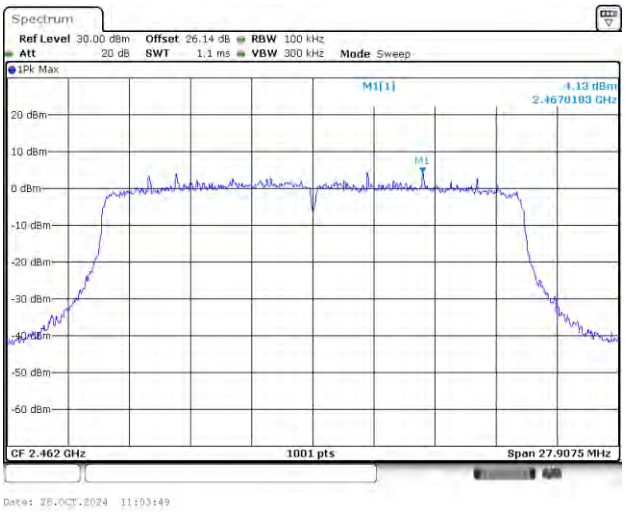
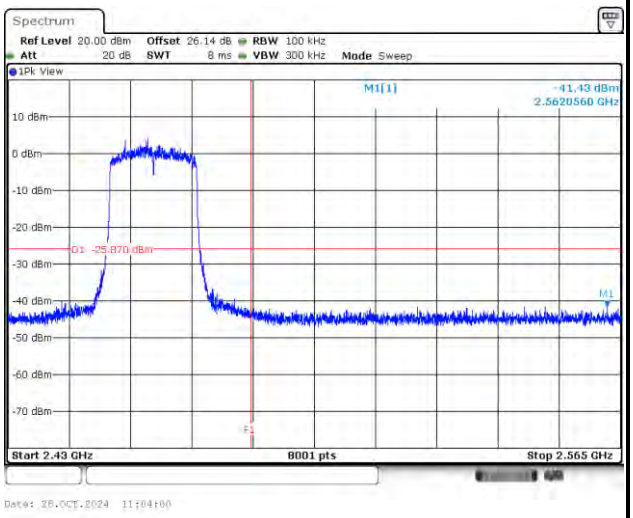
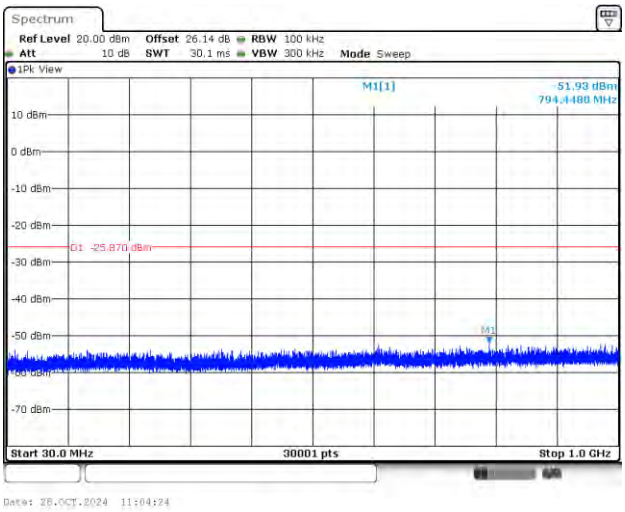
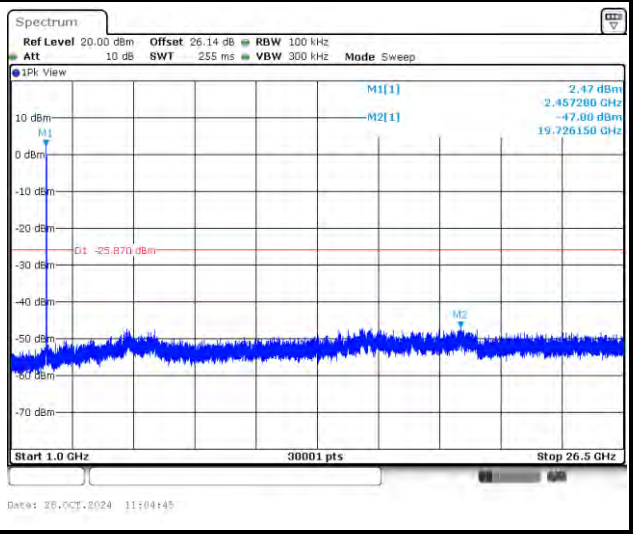
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11ax20_FullRU	Test Channel :	06

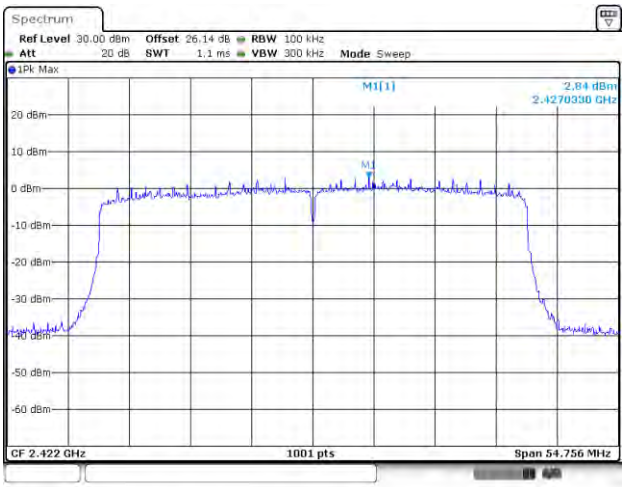
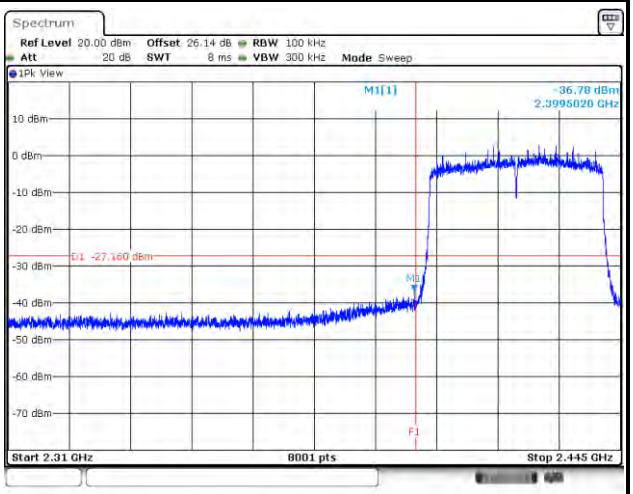
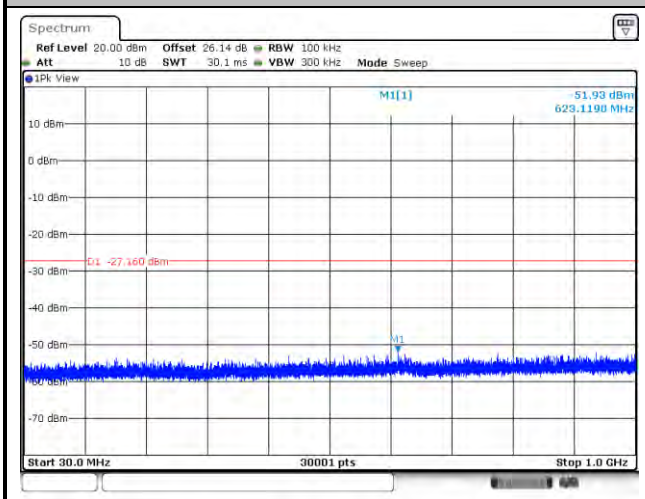
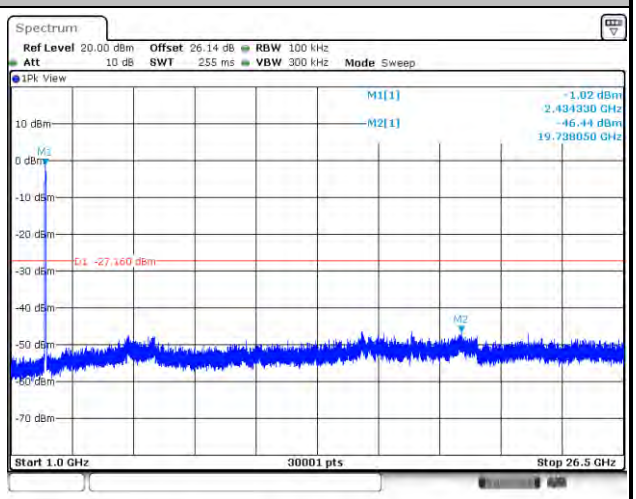
100kHz PSD reference Level	Middle Channel Plot
	

Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

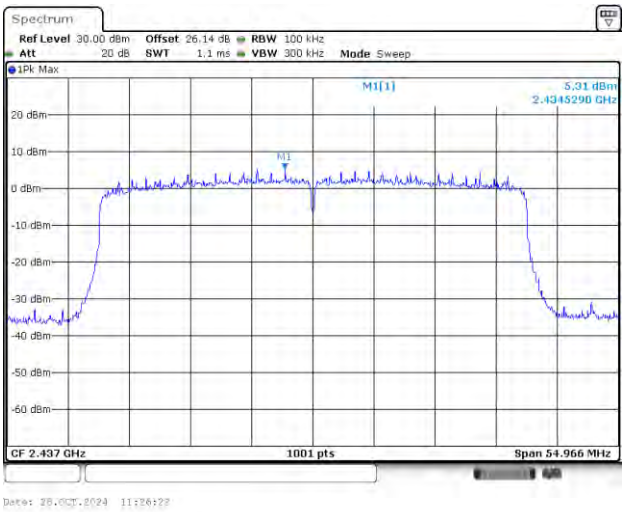
Test Mode :	802.11ax20_FullRU	Test Channel :	11

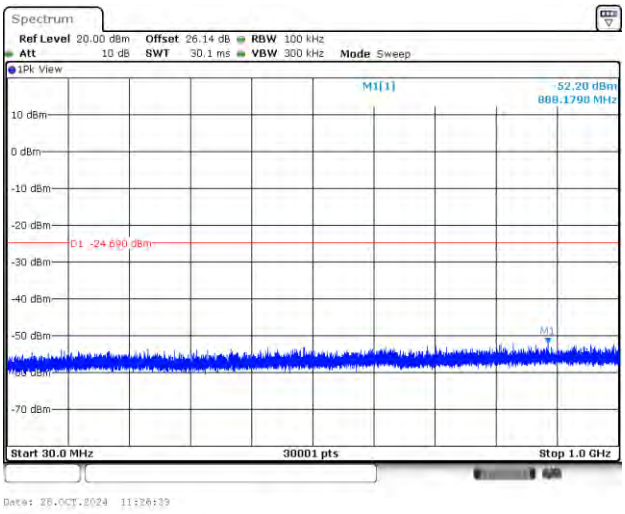
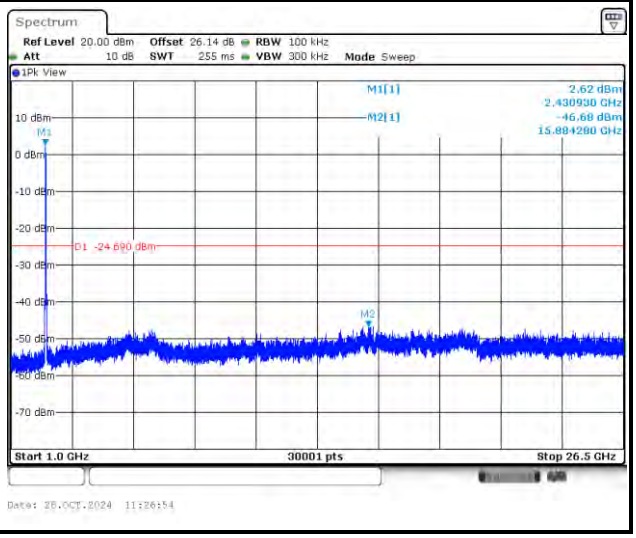
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11ax40_FullRU	Test Channel :	03

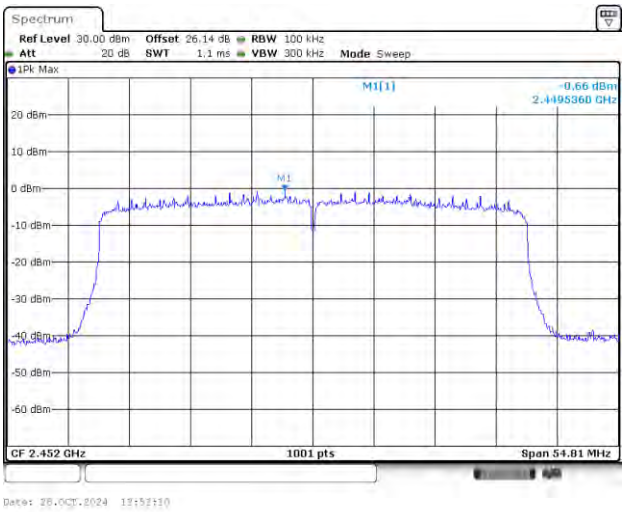
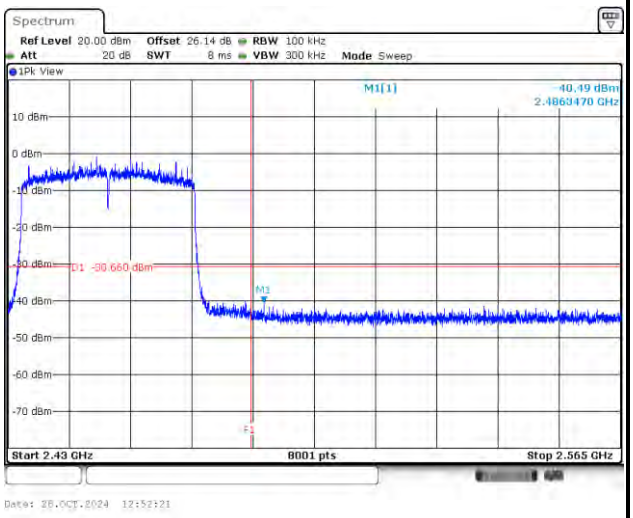
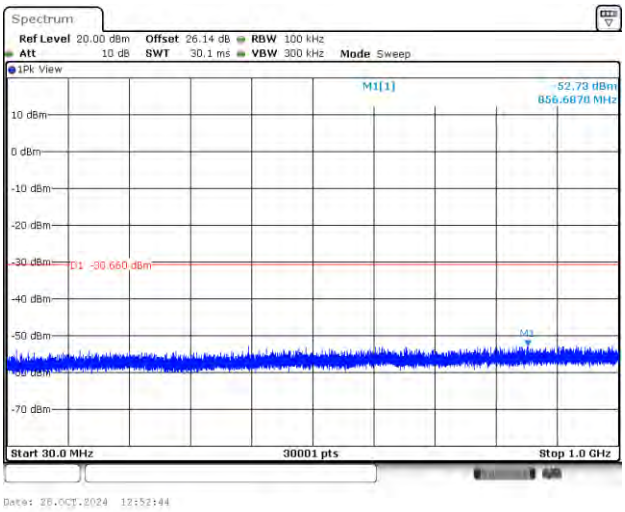
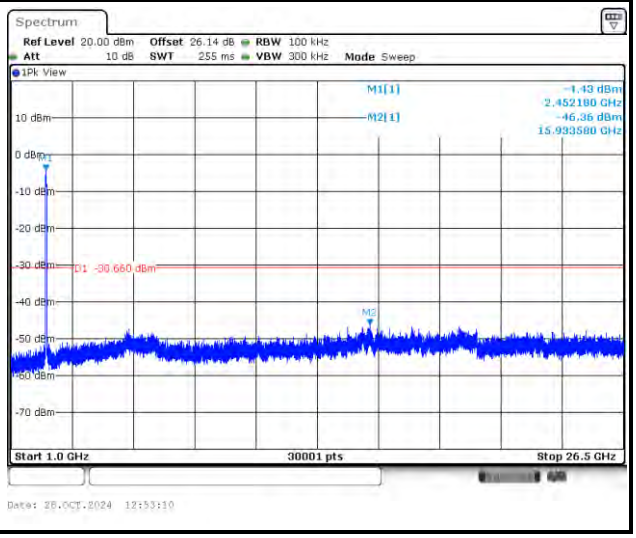
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11ax40_FullRU	Test Channel :	06

100kHz PSD reference Level	Middle Channel Plot
	

Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

Test Mode :	802.11ax40_FullRU	Test Channel :	09

100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Appendix B. Radiated Spurious Emission

Test Engineer :	Jesse Fan, Leo Liu and Bill Chang	**Temperature :**	19.4~23.8°C
		Relative Humidity :	43.1~47.9%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (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)
802.11b CH 01 2412MHz		2383.29	58.5	-15.5	74	44.22	27.4	17.46	30.58	173	154	P	H
		2383.29	50.42	-3.58	54	36.14	27.4	17.46	30.58	173	154	A	H
	*	2412	108.06	-	-	93.62	27.5	17.51	30.57	173	154	P	H
	*	2412	104.76	-	-	90.32	27.5	17.51	30.57	173	154	A	H
													H
													H
		2381.925	57.61	-16.39	74	43.26	27.47	17.46	30.58	384	325	P	V
		2383.29	49.2	-4.8	54	34.84	27.48	17.46	30.58	384	325	A	V
	*	2412	115.38	-	-	100.87	27.57	17.51	30.57	384	325	P	V
	*	2412	111.95	-	-	97.44	27.57	17.51	30.57	384	325	A	V
													V
													V
802.11b CH 06 2437MHz		2375.76	56.22	-17.78	74	41.99	27.37	17.45	30.59	299	298	P	H
		2389.2	44.42	-9.58	54	30.11	27.42	17.47	30.58	299	298	A	H
	*	2437	118.06	-	-	103.5	27.59	17.55	30.58	299	298	P	H
	*	2437	114.86	-	-	100.3	27.59	17.55	30.58	299	298	A	H
		2484	56.17	-17.83	74	41.3	27.79	17.63	30.55	299	298	P	H
		2483.52	45.34	-8.66	54	30.47	27.79	17.63	30.55	299	298	A	H
		2368.72	55.7	-18.3	74	41.43	27.43	17.44	30.6	400	320	P	V
		2389.2	44.44	-9.56	54	30.05	27.5	17.47	30.58	400	320	A	V
	*	2437	117.48	-	-	102.85	27.66	17.55	30.58	400	320	P	V
	*	2437	114.26	-	-	99.63	27.66	17.55	30.58	400	320	A	V
		2484.88	56.89	-17.11	74	41.95	27.86	17.63	30.55	400	320	P	V
		2484	45.27	-8.73	54	30.34	27.85	17.63	30.55	400	320	A	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)
802.11b CH 11 2462MHz	*	2462	119.53	-	-	104.82	27.69	17.59	30.57	293	301	P	H
	*	2462	116.17	-	-	101.46	27.69	17.59	30.57	293	301	A	H
		2483.64	57.96	-16.04	74	43.09	27.79	17.63	30.55	293	301	P	H
		2483.52	48.93	-5.07	54	34.06	27.79	17.63	30.55	293	301	A	H
													H
													H
	*	2462	117.89	-	-	103.11	27.76	17.59	30.57	400	319	P	V
	*	2462	114.57	-	-	99.79	27.76	17.59	30.57	400	319	A	V
		2483.76	57.65	-16.35	74	42.72	27.85	17.63	30.55	400	319	P	V
		2483.52	48.22	-5.78	54	33.29	27.85	17.63	30.55	400	319	A	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 emission level has at least 6dB margin against limit or emission is noise floor only.

2.4GHz 2400~2483.5MHz

WIFI 802.11b (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)
802.11b CH 01 2412MHz		4824	52.49	-21.51	74	76.08	32.67	11.3	67.56	271	148	P	H
		4824	49.12	-4.88	54	72.71	32.67	11.3	67.56	271	148	A	H
		7232	58.08	-15.92	74	73.13	36.97	13.48	65.5	203	224	P	H
		16884	55.69	-18.31	74	65.75	37.25	21.18	68.49	222	139	P	H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	51.37	-22.63	74	74.9	32.73	11.3	67.56	231	335	P	V
		4824	47.85	-6.15	54	71.38	32.73	11.3	67.56	231	335	A	V
		7232	59.14	-14.86	74	74.11	37.05	13.48	65.5	100	148	P	V
		16884	55.98	-18.02	74	65.97	37.32	21.18	68.49	195	246	P	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)
802.11b CH 06 2437MHz		4874	51.93	-22.07	74	75.19	32.9	11.35	67.51	275	144	P	H
		4874	45.92	-8.08	54	69.18	32.9	11.35	67.51	275	144	A	H
		7311	45.4	-28.6	74	61.81	36.9	13.57	66.88	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4874	49.34	-24.66	74	72.54	32.96	11.35	67.51	241	335	P	V
		4874	43.07	-10.93	54	66.27	32.96	11.35	67.51	241	335	A	V
		7311	46.13	-27.87	74	62.45	36.99	13.57	66.88	-	-	P	V
													V
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													V
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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)
802.11b CH 11 2462MHz		4924	47.28	-26.72	74	70.4	33.06	11.4	67.58	100	239	P	H
		4924	42.71	-11.29	54	65.83	33.06	11.4	67.58	100	239	A	H
		7386	45.44	-28.56	74	62.53	36.71	13.65	67.45	-	-	P	H
													H
													H
													H
													H
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													H
													H
													H
													H
		4924	47.04	-26.96	74	70.12	33.1	11.4	67.58	100	182	P	V
		4924	42.54	-11.46	54	65.62	33.1	11.4	67.58	100	182	A	V
		7386	45.07	-28.93	74	62.06	36.81	13.65	67.45	-	-	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.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (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)
802.11g CH 01 2412MHz		2390	64.56	-9.44	74	50.25	27.42	17.47	30.58	276	300	P	H
		2390	51.88	-2.12	54	37.57	27.42	17.47	30.58	276	300	A	H
	*	2412	116.32	-	-	101.88	27.5	17.51	30.57	276	300	P	H
	*	2412	108.36	-	-	93.92	27.5	17.51	30.57	276	300	A	H
													H
													H
		2390	62	-12	74	47.61	27.5	17.47	30.58	400	313	P	V
		2390	50.22	-3.78	54	35.83	27.5	17.47	30.58	400	313	A	V
	*	2412	114.72	-	-	100.21	27.57	17.51	30.57	400	313	P	V
	*	2412	106.7	-	-	92.19	27.57	17.51	30.57	400	313	A	V
													V
													V
802.11g CH 06 2437MHz		2388.56	56.49	-17.51	74	42.18	27.42	17.47	30.58	271	290	P	H
		2390	46.02	-7.98	54	31.71	27.42	17.47	30.58	271	290	A	H
	*	2437	119.09	-	-	104.53	27.59	17.55	30.58	271	290	P	H
	*	2437	111.77	-	-	97.21	27.59	17.55	30.58	271	290	A	H
		2485.44	59.21	-14.79	74	44.33	27.8	17.63	30.55	271	290	P	H
		2483.52	48.15	-5.85	54	33.28	27.79	17.63	30.55	271	290	A	H
		2375.92	55.85	-18.15	74	41.54	27.45	17.45	30.59	301	298	P	V
		2390	45.26	-8.74	54	30.87	27.5	17.47	30.58	301	298	A	V
	*	2437	119.93	-	-	105.3	27.66	17.55	30.58	301	298	P	V
	*	2437	112.15	-	-	97.52	27.66	17.55	30.58	301	298	A	V
		2483.84	59.78	-14.22	74	44.85	27.85	17.63	30.55	301	298	P	V
		2483.52	48.35	-5.65	54	33.42	27.85	17.63	30.55	301	298	A	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)
802.11g CH 11 2462MHz	*	2462	113.54	-	-	98.83	27.69	17.59	30.57	299	301	P	H
	*	2462	106.13	-	-	91.42	27.69	17.59	30.57	299	301	A	H
		2483.88	63.48	-10.52	74	48.61	27.79	17.63	30.55	299	301	P	H
		2483.52	51.86	-2.14	54	36.99	27.79	17.63	30.55	299	301	A	H
													H
													H
	*	2462	114.71	-	-	99.93	27.76	17.59	30.57	294	300	P	V
	*	2462	106.94	-	-	92.16	27.76	17.59	30.57	294	300	A	V
		2483.6	64.45	-9.55	74	49.52	27.85	17.63	30.55	294	300	P	V
		2483.52	53.02	-0.98	54	38.09	27.85	17.63	30.55	294	300	A	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 and emission level has at least 6dB margin against limit or emission is noise floor only.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (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)
802.11g CH 01 2412MHz		4824	45.73	-28.27	74	69.32	32.67	11.3	67.56	390	360	P	H
		4824	30.4	-23.6	54	53.99	32.67	11.3	67.56	390	360	A	H
		7236	45.2	-28.8	74	60.29	36.98	13.48	65.55	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	46.24	-27.76	74	69.77	32.73	11.3	67.56	400	344	P	V
		4824	31.32	-22.68	54	54.85	32.73	11.3	67.56	400	344	A	V
		7236	44.62	-29.38	74	59.63	37.06	13.48	65.55	-	-	P	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)
802.11g CH 06 2437MHz		4874	52.44	-21.56	74	75.7	32.9	11.35	67.51	100	236	P	H
		4874	40.48	-13.52	54	63.74	32.9	11.35	67.51	100	236	A	H
		7311	53.56	-20.44	74	69.97	36.9	13.57	66.88	100	168	P	H
		7311	45.08	-8.92	54	61.49	36.9	13.57	66.88	100	168	A	H
													H
													H
													H
													H
													H
													H
													H
													H
		4874	52.97	-21.03	74	76.17	32.96	11.35	67.51	100	180	P	V
		4874	40.66	-13.34	54	63.86	32.96	11.35	67.51	100	180	A	V
		7311	52.89	-21.11	74	69.21	36.99	13.57	66.88	100	149	P	V
		7311	45.05	-8.95	54	61.37	36.99	13.57	66.88	100	149	A	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)
802.11g CH 11 2462MHz		4924	44	-30	74	67.12	33.06	11.4	67.58	100	238	P	H
		4924	34.01	-19.99	54	57.13	33.06	11.4	67.58	100	238	A	H
		7386	44.37	-29.63	74	61.46	36.71	13.65	67.45	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4924	45.03	-28.97	74	68.11	33.1	11.4	67.58	100	182	P	V
		4924	34.21	-19.79	54	57.29	33.1	11.4	67.58	100	182	A	V
		7386	45.67	-28.33	74	62.66	36.81	13.65	67.45	-	-	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.												

2.4GHz 2400~2483.5MHz

WIFI 802.11ax HE20 Full (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)
802.11ax HE20 Full CH 01 2412MHz		2389.905	64.32	-9.68	74	50.01	27.42	17.47	30.58	269	294	P	H
		2390	52.93	-1.07	54	38.62	27.42	17.47	30.58	269	294	A	H
	*	2412	116.34	-	-	101.9	27.5	17.51	30.57	269	294	P	H
	*	2412	106.07	-	-	91.63	27.5	17.51	30.57	269	294	A	H
													H
													H
		2390	65.14	-8.86	74	50.75	27.5	17.47	30.58	352	319	P	V
		2390	51.58	-2.42	54	37.19	27.5	17.47	30.58	352	319	A	V
	*	2412	115.44	-	-	100.93	27.57	17.51	30.57	352	319	P	V
	*	2412	104.8	-	-	90.29	27.57	17.51	30.57	352	319	A	V
													V
													V
802.11ax HE20 Full CH 06 2437MHz		2386.48	56.89	-17.11	74	42.59	27.41	17.47	30.58	274	294	P	H
		2390	45.89	-8.11	54	31.58	27.42	17.47	30.58	274	294	A	H
	*	2437	123.38	-	-	108.82	27.59	17.55	30.58	274	294	P	H
	*	2437	112.26	-	-	97.7	27.59	17.55	30.58	274	294	A	H
		2487.76	59.89	-14.11	74	45	27.81	17.63	30.55	274	294	P	H
		2483.52	46.98	-7.02	54	32.11	27.79	17.63	30.55	274	294	A	H
		2357.04	56.07	-17.93	74	41.86	27.39	17.42	30.6	276	300	P	V
		2389.84	45.08	-8.92	54	30.69	27.5	17.47	30.58	276	300	A	V
	*	2437	121.77	-	-	107.14	27.66	17.55	30.58	276	300	P	V
	*	2437	111.24	-	-	96.61	27.66	17.55	30.58	276	300	A	V
		2483.6	58.24	-15.76	74	43.31	27.85	17.63	30.55	276	300	P	V
		2483.52	46.8	-7.2	54	31.87	27.85	17.63	30.55	276	300	A	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)
802.11ax HE20 Full CH 11 2462MHz	*	2462	115.09	-	-	100.38	27.69	17.59	30.57	298	304	P	H
	*	2462	104.93	-	-	90.22	27.69	17.59	30.57	298	304	A	H
		2483.84	63.88	-10.12	74	49.01	27.79	17.63	30.55	298	304	P	H
		2483.52	51.94	-2.06	54	37.07	27.79	17.63	30.55	298	304	A	H
													H
													H
	*	2462	114.99	-	-	100.21	27.76	17.59	30.57	296	303	P	V
	*	2462	105.56	-	-	90.78	27.76	17.59	30.57	296	303	A	V
		2484.2	64.1	-9.9	74	49.17	27.85	17.63	30.55	296	303	P	V
		2483.52	52.54	-1.46	54	37.61	27.85	17.63	30.55	296	303	A	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 and emission level has at least 6dB margin against limit or emission is noise floor only.												

2.4GHz 2400~2483.5MHz

WIFI 802.11 ax HE20 Full (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)
		4824	44.56	-29.44	74	68.15	32.67	11.3	67.56	-	-	P	H
		7236	45.18	-28.82	74	60.27	36.98	13.48	65.55	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE20 Full													H
CH 01		4824	41.81	-32.19	74	65.34	32.73	11.3	67.56	-	-	P	V
2412MHz		7236	45.26	-28.74	74	60.27	37.06	13.48	65.55	-	-	P	V
													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)
		4874	53.17	-20.83	74	76.43	32.9	11.35	67.51	100	237	P	H
		4874	39.8	-14.2	54	63.06	32.9	11.35	67.51	100	237	A	H
		7311	59.68	-14.32	74	76.09	36.9	13.57	66.88	221	227	P	H
		7311	43.79	-10.21	54	60.2	36.9	13.57	66.88	221	227	A	H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE20 Full													H
CH 06		4874	53.68	-20.32	74	76.88	32.96	11.35	67.51	128	180	P	V
2437MHz		4874	39.93	-14.07	54	63.13	32.96	11.35	67.51	128	180	A	V
		7311	55.04	-18.96	74	71.36	36.99	13.57	66.88	400	309	P	V
		7311	42.75	-11.25	54	59.07	36.99	13.57	66.88	400	309	A	V
													V
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													V
													V
													V
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													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)
		4924	43.97	-30.03	74	67.09	33.06	11.4	67.58	-	-	P	H
		7386	44.59	-29.41	74	61.68	36.71	13.65	67.45	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE20 Full													H
CH 11		4924	43.2	-30.8	74	66.28	33.1	11.4	67.58	-	-	P	V
2462MHz		7386	43.85	-30.15	74	60.84	36.81	13.65	67.45	-	-	P	V
													V
													V
													V
													V
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													V
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													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.

2.4GHz 2400~2483.5MHz

WIFI 802.11ax HE40 Full (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)
802.11ax HE40 Full CH 03 2422MHz		2386.8	64.55	-9.45	74	50.25	27.41	17.47	30.58	271	290	P	H
		2390	53.45	-0.55	54	39.14	27.42	17.47	30.58	271	290	A	H
	*	2422	113.13	-	-	98.63	27.54	17.53	30.57	271	290	P	H
	*	2422	104	-	-	89.5	27.54	17.53	30.57	271	290	A	H
		2490.88	55.99	-18.01	74	41.08	27.82	17.64	30.55	271	290	P	H
		2483.52	45.35	-8.65	54	30.48	27.79	17.63	30.55	271	290	A	H
		2389.84	63.83	-10.17	74	49.44	27.5	17.47	30.58	321	315	P	V
		2390	52.71	-1.29	54	38.32	27.5	17.47	30.58	321	315	A	V
	*	2422	112.4	-	-	97.83	27.61	17.53	30.57	321	315	P	V
	*	2422	101.29	-	-	86.72	27.61	17.53	30.57	321	315	A	V
		2489.28	56.42	-17.58	74	41.46	27.87	17.64	30.55	321	315	P	V
		2483.6	45.38	-8.62	54	30.45	27.85	17.63	30.55	321	315	A	V
802.11ax HE40 Full CH 06 2437MHz		2389.68	66.09	-7.91	74	51.78	27.42	17.47	30.58	294	300	P	H
		2390	51.34	-2.66	54	37.03	27.42	17.47	30.58	294	300	A	H
	*	2437	114.65	-	-	100.09	27.59	17.55	30.58	294	300	P	H
	*	2437	105.02	-	-	90.46	27.59	17.55	30.58	294	300	A	H
		2486.72	67.93	-6.07	74	53.05	27.8	17.63	30.55	294	300	P	H
		2483.52	52.76	-1.24	54	37.89	27.79	17.63	30.55	294	300	A	H
		2389.84	64.14	-9.86	74	49.75	27.5	17.47	30.58	299	303	P	V
		2390	50.53	-3.47	54	36.14	27.5	17.47	30.58	299	303	A	V
	*	2437	115.53	-	-	100.9	27.66	17.55	30.58	299	303	P	V
	*	2437	105.29	-	-	90.66	27.66	17.55	30.58	299	303	A	V
		2486.88	67.17	-6.83	74	52.23	27.86	17.63	30.55	299	303	P	V
		2483.52	53.05	-0.95	54	38.12	27.85	17.63	30.55	299	303	A	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)
802.11ax HE40 Full CH 09 2452MHz		2317.68	55.84	-18.16	74	41.83	27.27	17.36	30.62	296	299	P	H
		2390	44.4	-9.6	54	30.09	27.42	17.47	30.58	296	299	A	H
	*	2452	109.04	-	-	94.39	27.65	17.58	30.58	296	299	P	H
	*	2452	99.41	-	-	84.76	27.65	17.58	30.58	296	299	A	H
		2485.76	65.75	-8.25	74	50.87	27.8	17.63	30.55	296	299	P	H
		2483.52	52.49	-1.51	54	37.62	27.79	17.63	30.55	296	299	A	H
		2325.04	55.54	-18.46	74	41.43	27.35	17.37	30.61	295	301	P	V
		2389.84	44.67	-9.33	54	30.28	27.5	17.47	30.58	295	301	A	V
	*	2452	109.6	-	-	94.88	27.72	17.58	30.58	295	301	P	V
	*	2452	100.27	-	-	85.55	27.72	17.58	30.58	295	301	A	V
		2486	65.52	-8.48	74	50.58	27.86	17.63	30.55	295	301	P	V
		2483.52	53.37	-0.63	54	38.44	27.85	17.63	30.55	295	301	A	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 and emission level has at least 6dB margin against limit or emission is noise floor only.												

2.4GHz 2400~2483.5MHz

WIFI 802.11 ax HE40 Full (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)
		4844	41.72	-32.28	74	65.14	32.78	11.32	67.52	-	-	P	H
		7266	46.21	-27.79	74	61.75	36.97	13.51	66.02	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE40 Full													H
CH 03		4844	42.45	-31.55	74	65.81	32.84	11.32	67.52	-	-	P	V
2422MHz		7266	45.51	-28.49	74	60.97	37.05	13.51	66.02	-	-	P	V
													V
													V
													V
													V
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													V
													V
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													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)
		4874	43.03	-30.97	74	66.29	32.9	11.35	67.51	-	-	P	H
		7311	45.22	-28.78	74	61.63	36.9	13.57	66.88	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE40 Full													H
CH 06		4874	43.71	-30.29	74	66.91	32.96	11.35	67.51	-	-	P	V
2437MHz		7311	45.02	-28.98	74	61.34	36.99	13.57	66.88	-	-	P	V
													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)
		4904	42.65	-31.35	74	65.78	33.01	11.38	67.52	-	-	P	H
		7356	45.09	-28.91	74	62.29	36.79	13.62	67.61	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ax													H
HE40 Full													H
CH 09		4904	41.91	-32.09	74	64.99	33.06	11.38	67.52	-	-	P	V
2452MHz		7356	44.41	-29.59	74	61.5	36.9	13.62	67.61	-	-	P	V
													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.

2.4GHz 2400~2483.5MHz

Emission above 18GHz

2.4GHz WIFI 802.11ax HE40 (SHF)

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)
2.4GHz 802.11ax HE40 SHF		23663	41.67	-32.33	74	39.34	38.85	15.33	51.85	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		22487	42.41	-31.59	74	41.46	38.58	14.6	52.23	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													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

2.4GHz WIFI 802.11ax HE40 (LF)

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)
2.4GHz 802.11ax HE40 LF		31.94	21.87	-18.13	40	29.2	24.13	0.94	32.4	-	-	P	H
		156.1	28.71	-14.79	43.5	42.46	16.69	1.99	32.43	-	-	P	H
		191.99	30.69	-12.81	43.5	46.09	14.84	2.2	32.44	-	-	P	H
		279.29	35.81	-10.19	46	46.94	18.69	2.68	32.5	-	-	P	H
		662.44	30.22	-15.78	46	32.56	26.4	4.18	32.92	-	-	P	H
		958.29	33.8	-12.2	46	29.1	31.07	5.14	31.51	-	-	P	H
													H
													H
													H
													H
													H
													H
		31.94	25.83	-14.17	40	33.16	24.13	0.94	32.4	-	-	P	V
		122.15	24.66	-18.84	43.5	37.95	17.4	1.73	32.42	-	-	P	V
		168.71	27.53	-15.97	43.5	42.13	15.78	2.05	32.43	-	-	P	V
		427.7	26.84	-19.16	46	33.16	23	3.37	32.69	-	-	P	V
		676.99	27.93	-18.07	46	30.22	26.4	4.22	32.91	-	-	P	V
		949.56	33.82	-12.18	46	29.35	30.98	5.09	31.6	-	-	P	V
													V
													V
													V
													V
													V
													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 **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	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					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)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	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 @ 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. Margin(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average 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) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Margin(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix C. Radiated Spurious Emission Plots

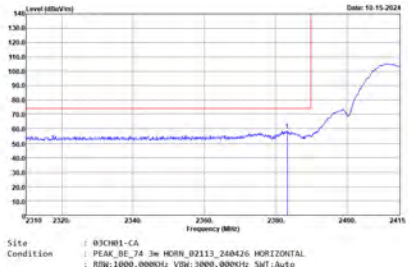
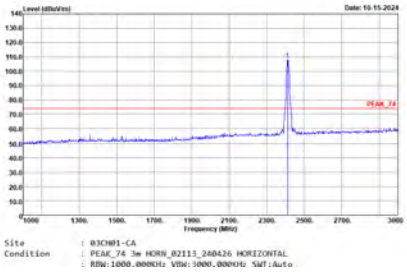
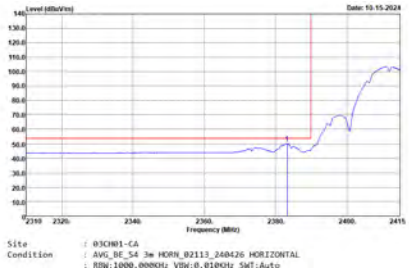
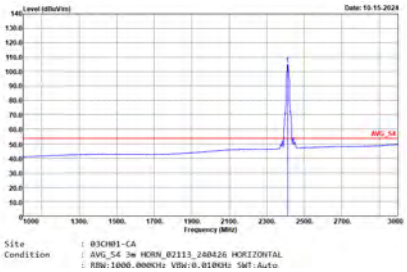
Test Engineer :	Jesse Fan, Leo Liu and Bill Chang	Temperature :	19.4~23.8°C
		Relative Humidity :	43.1~47.9%

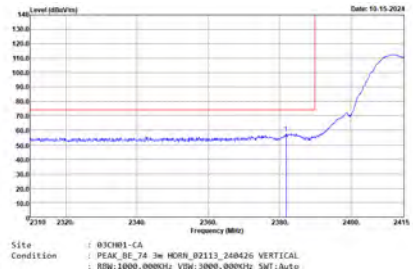
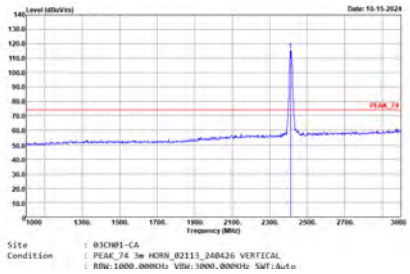
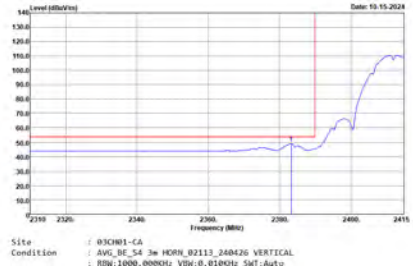
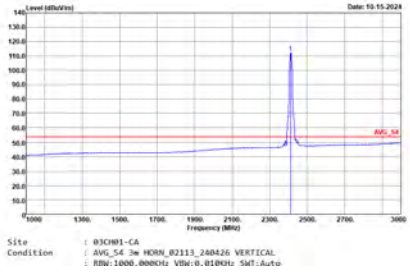
Note symbol

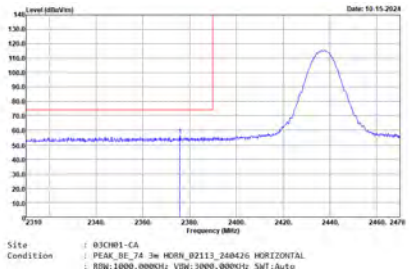
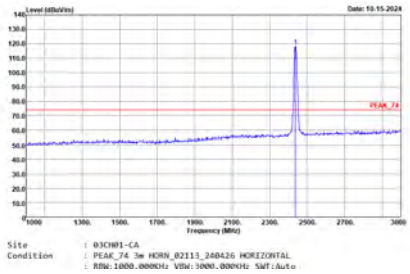
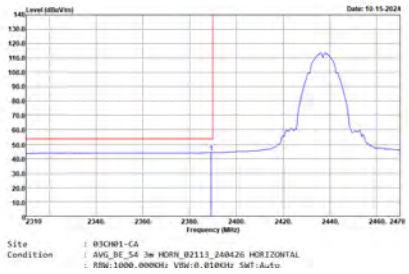
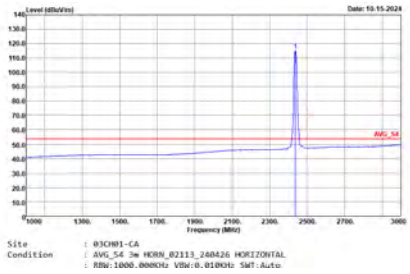
-L	**Low channel location**
-R	**High channel location**

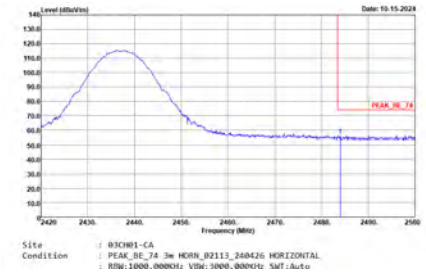
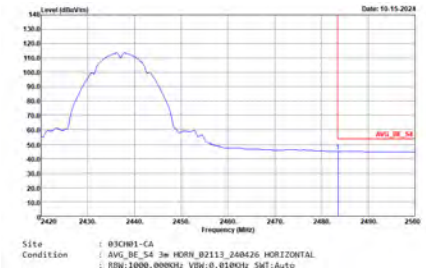
2.4GHz 2400~2483.5MHz

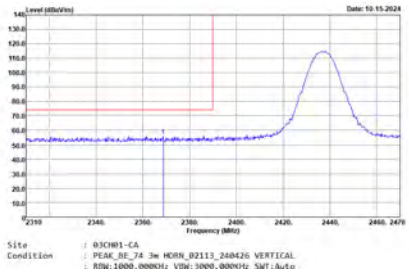
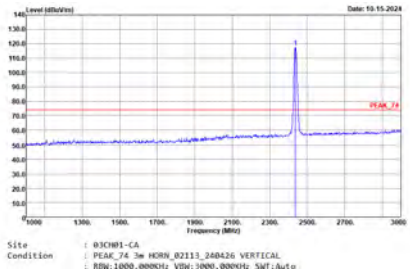
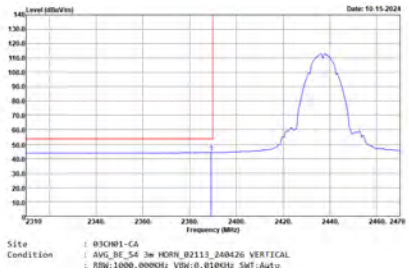
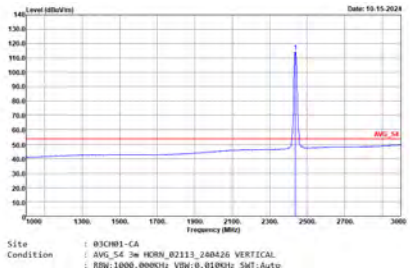
WIFI 802.11b (Band Edge @ 3m)

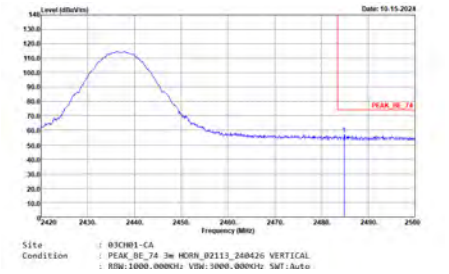
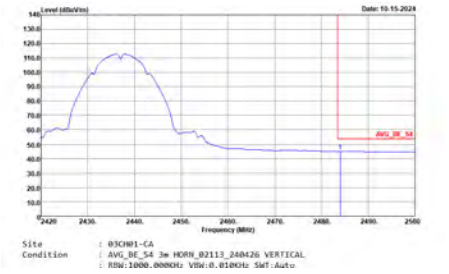
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

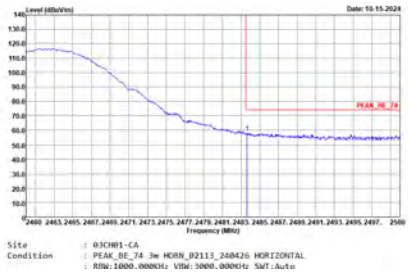
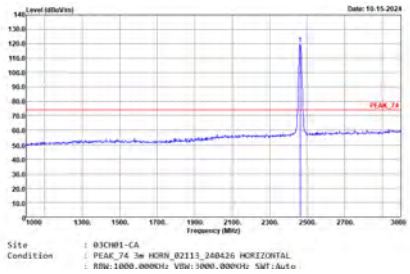
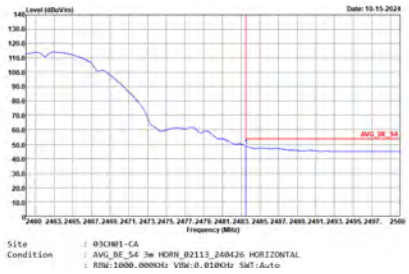
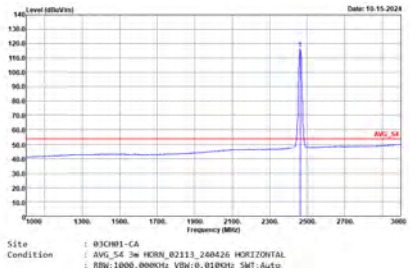
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

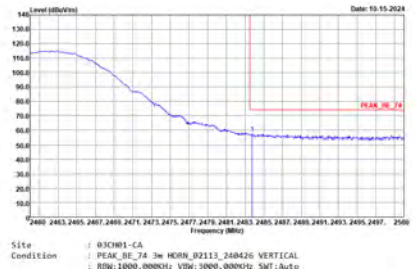
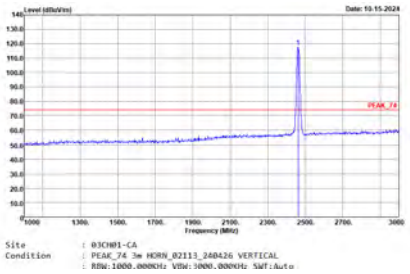
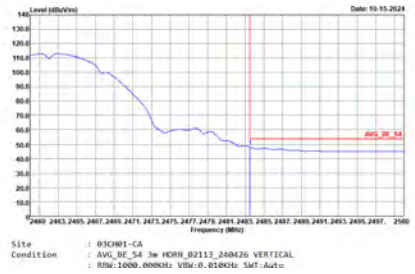
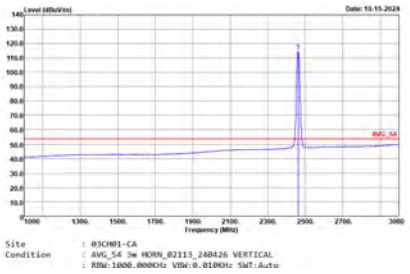
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

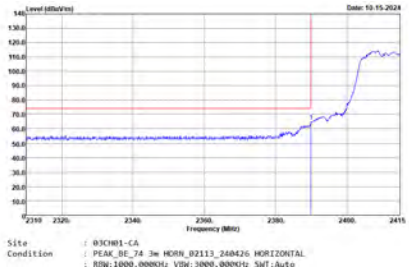
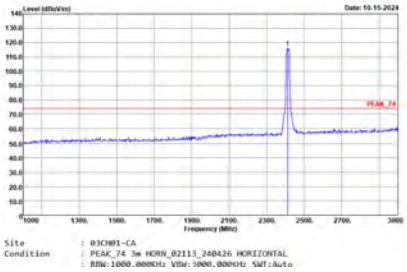
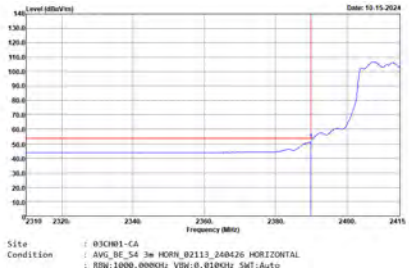
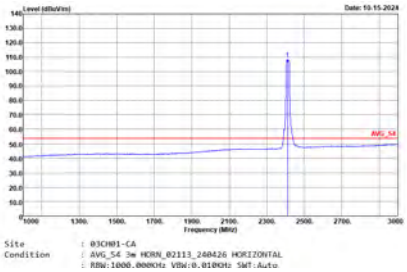
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

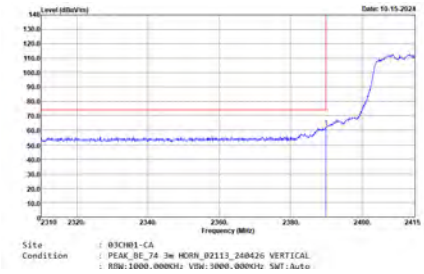
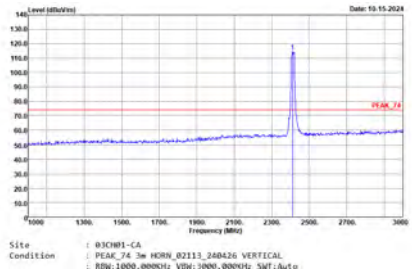
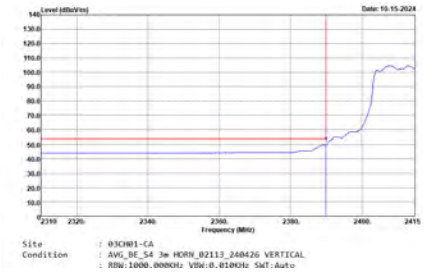
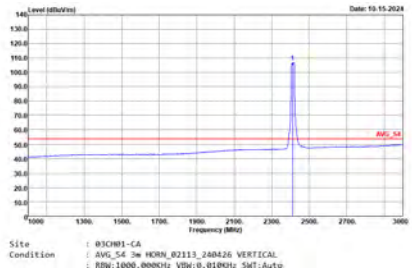
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

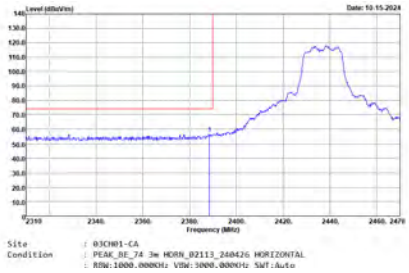
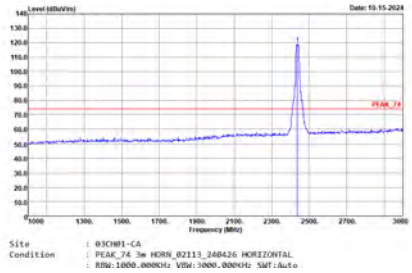
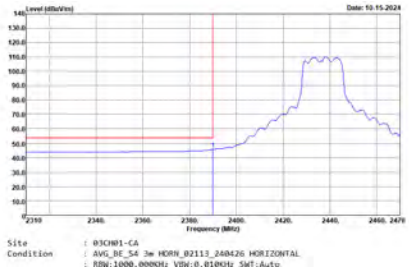
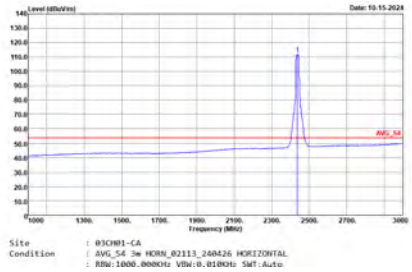
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

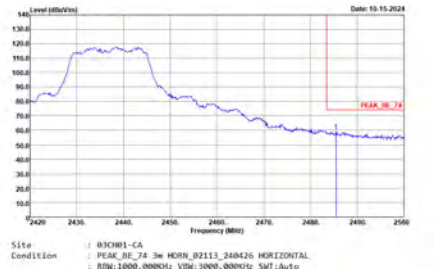
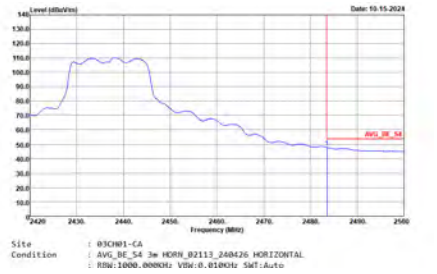
2.4GHz 2400~2483.5MHz

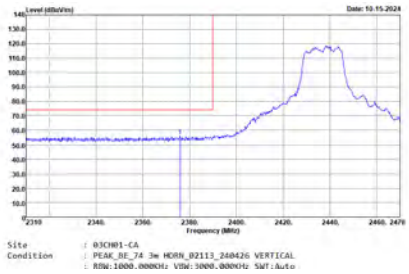
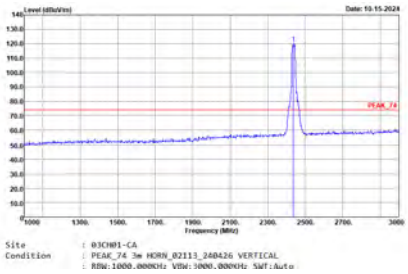
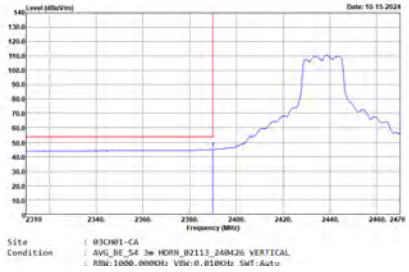
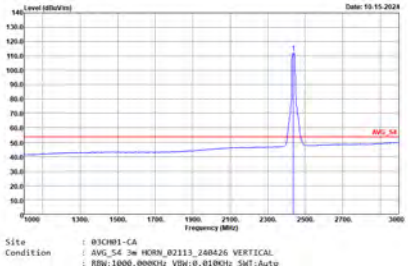
WIFI 802.11g (Band Edge @ 3m)

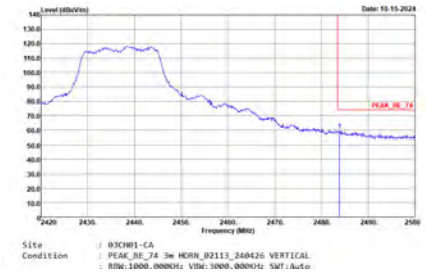
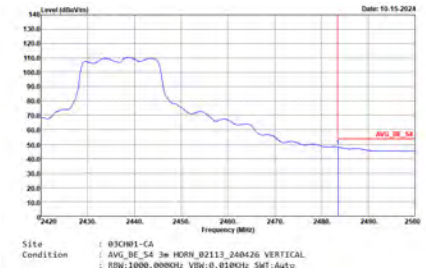
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

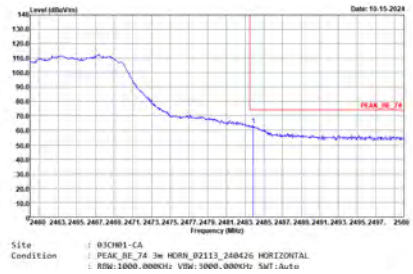
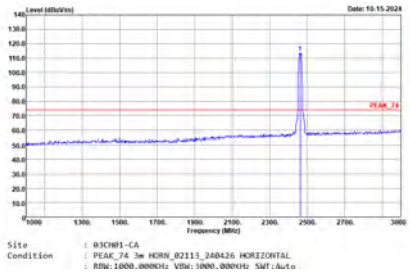
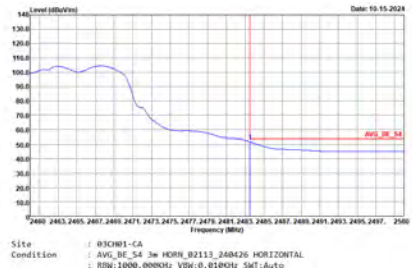
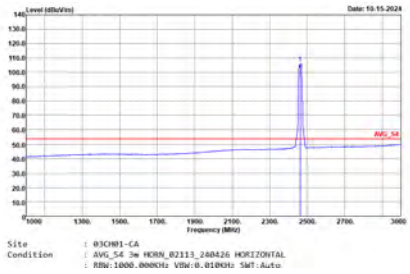
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

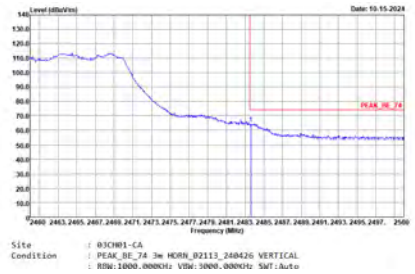
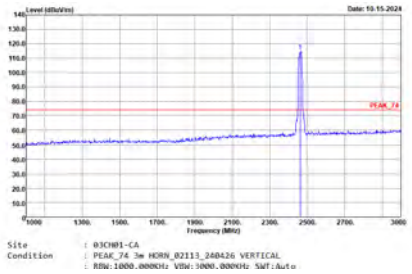
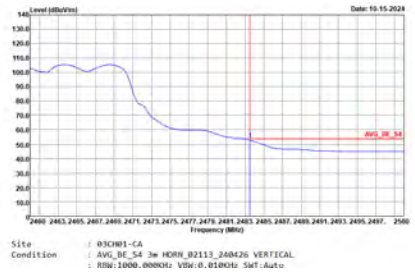
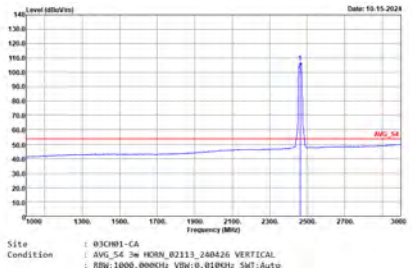
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

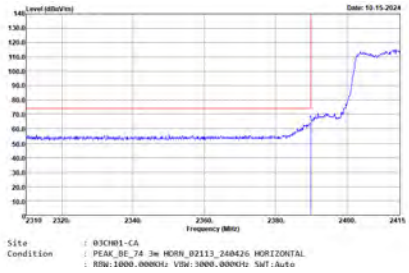
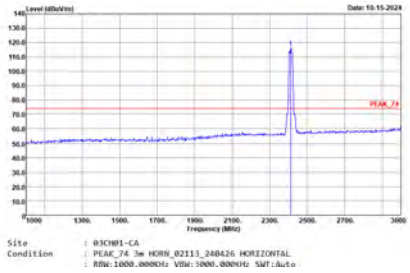
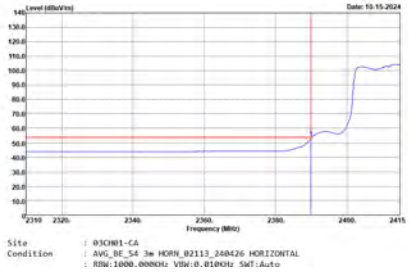
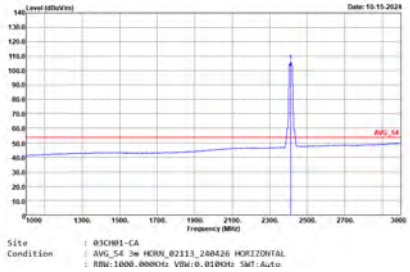
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

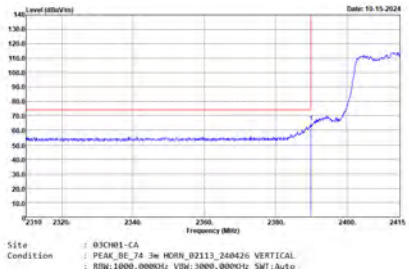
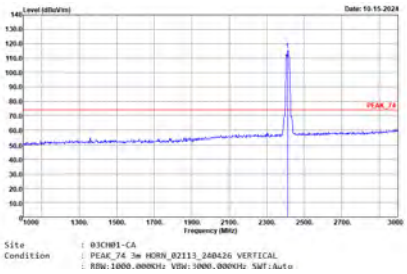
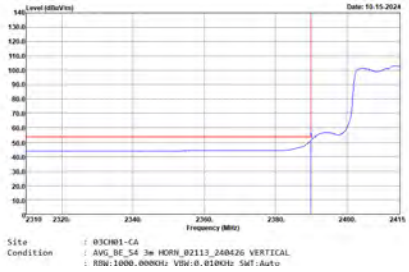
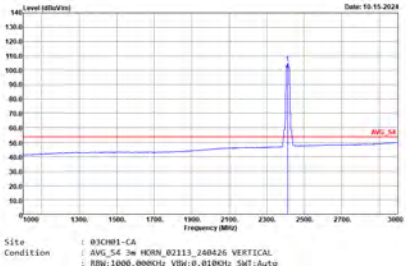
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

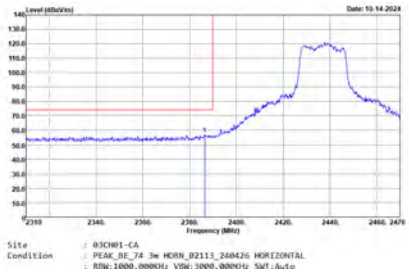
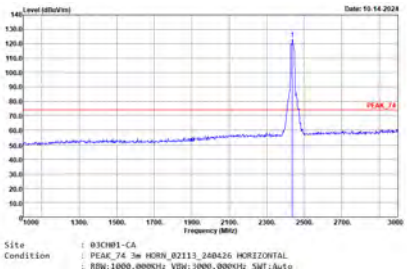
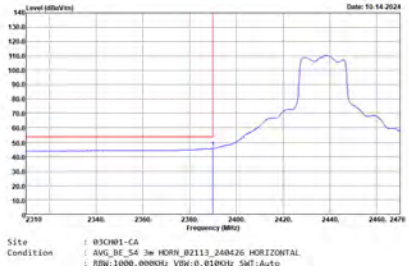
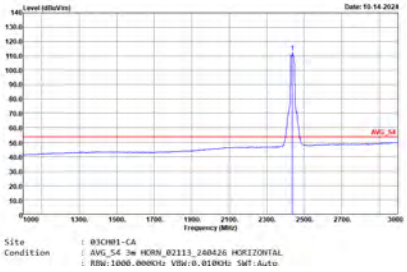
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

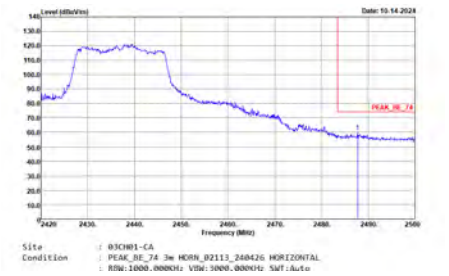
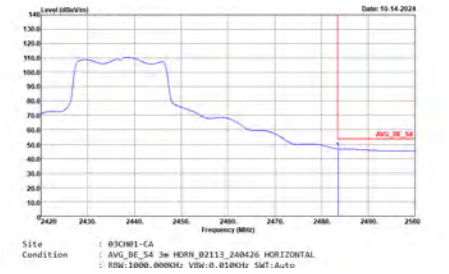
2.4GHz 2400~2483.5MHz

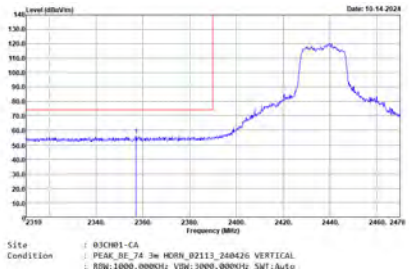
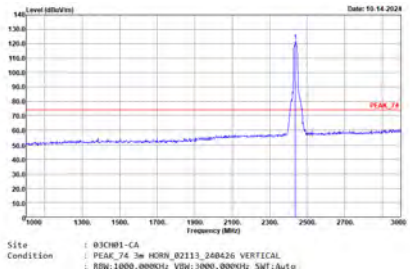
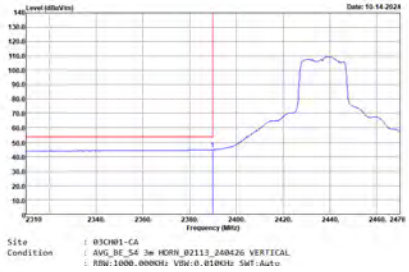
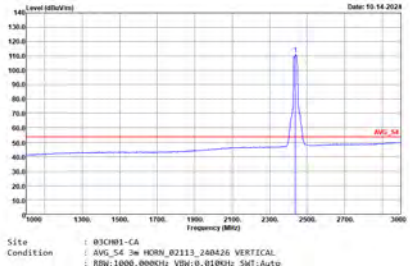
WIFI 802.11ax HE20 Full (Band Edge @ 3m)

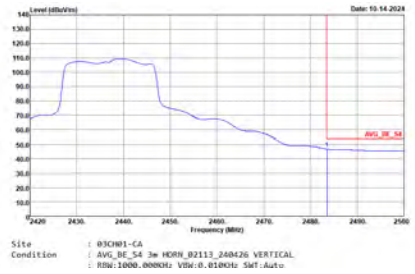
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH01 2412MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

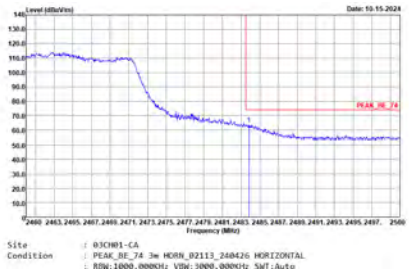
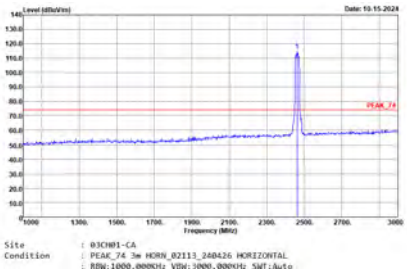
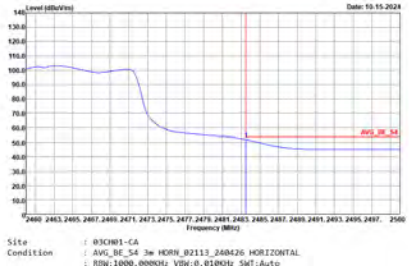
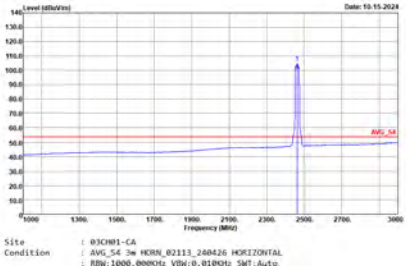
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH01 2412MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

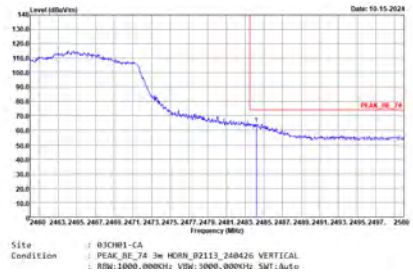
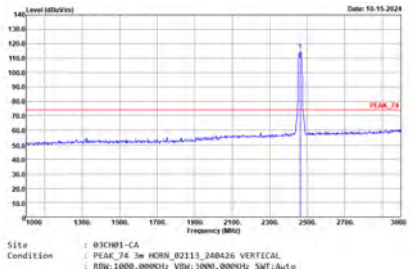
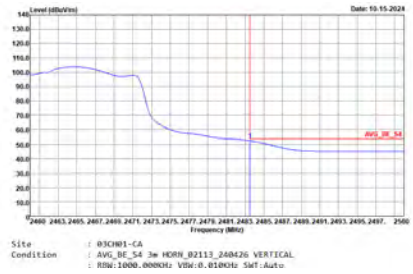
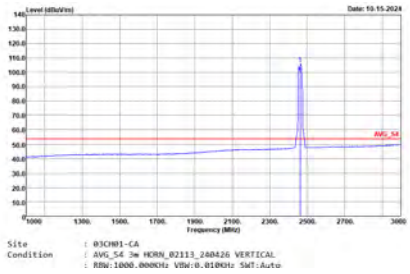
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

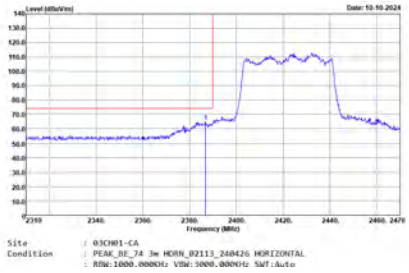
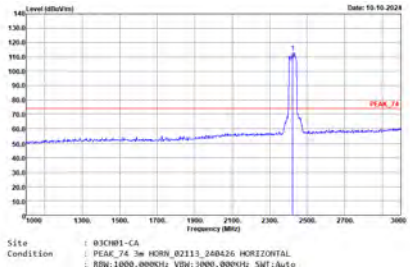
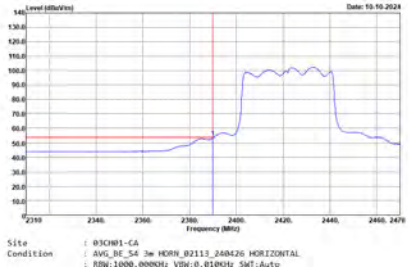
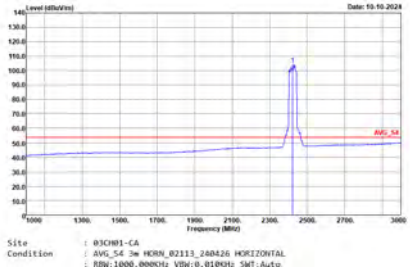
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

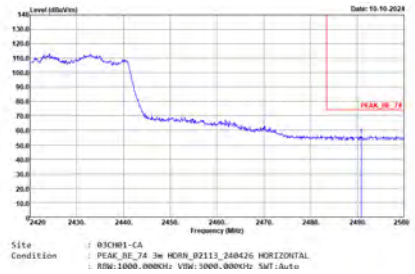
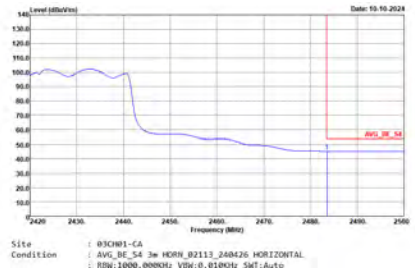
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH11 2462MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

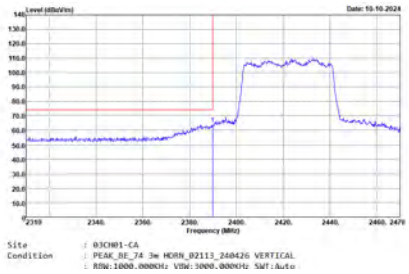
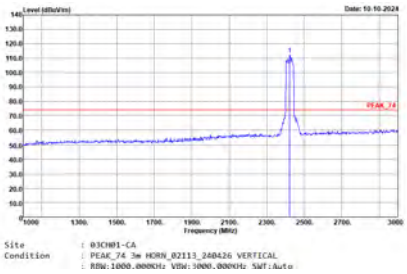
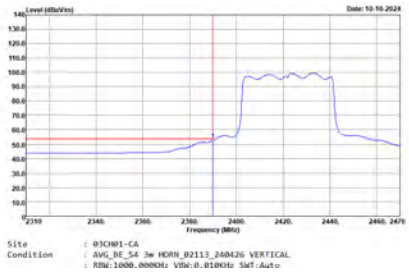
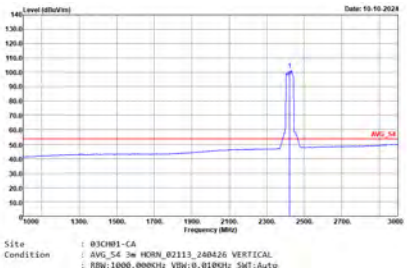
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE20 Full CH11 2462MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

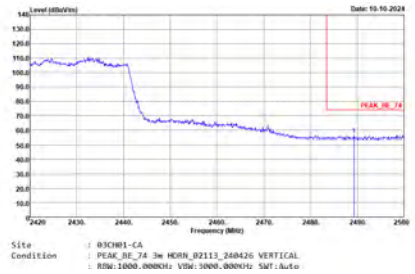
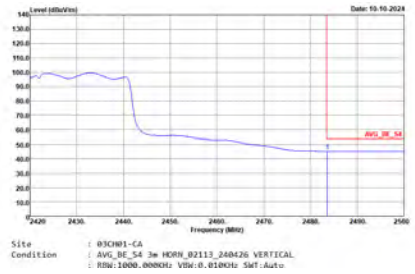
2.4GHz 2400~2483.5MHz

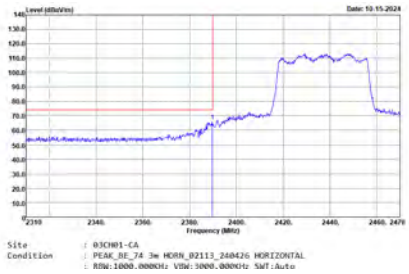
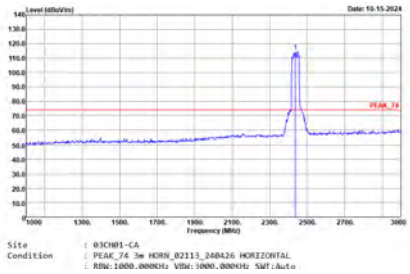
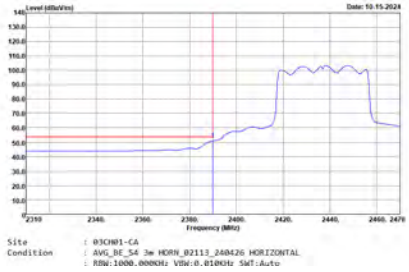
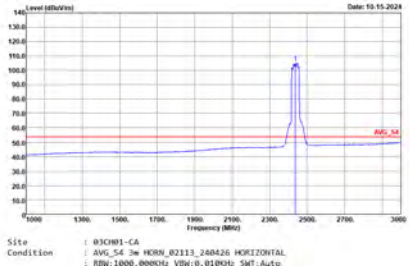
WIFI 802.11ax HE40 Full (Band Edge @ 3m)

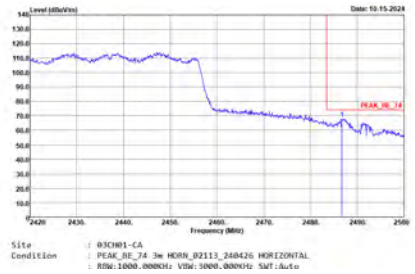
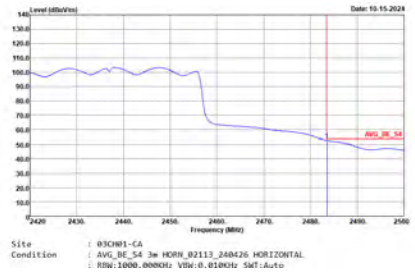
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

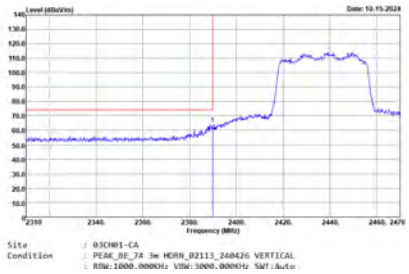
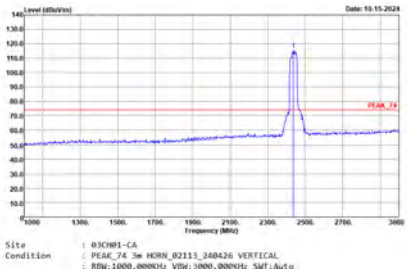
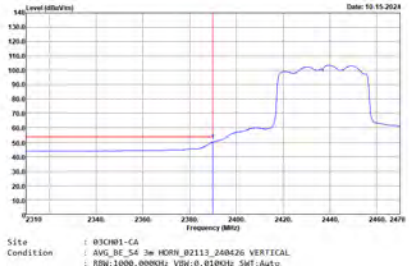
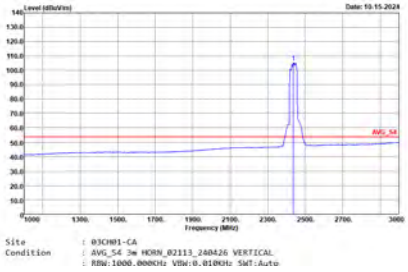
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

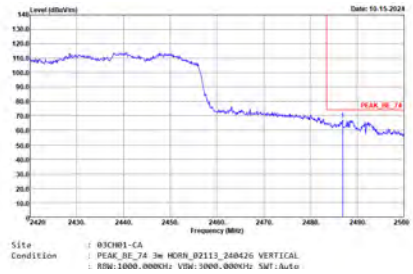
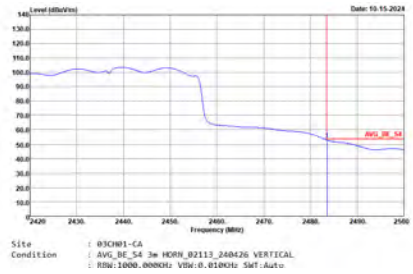
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

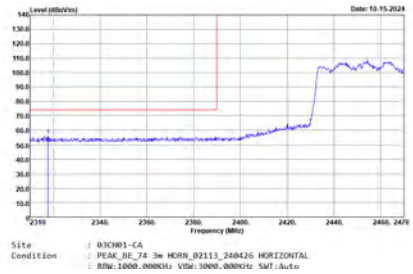
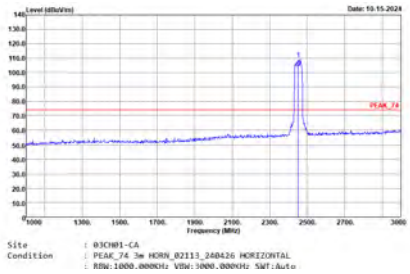
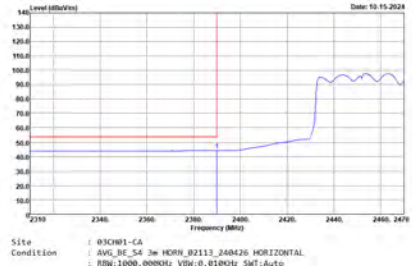
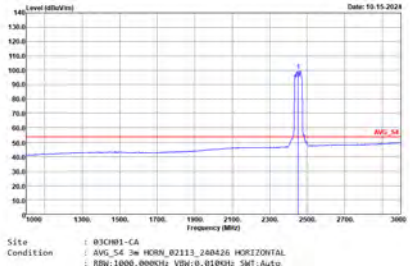
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH03 2422MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

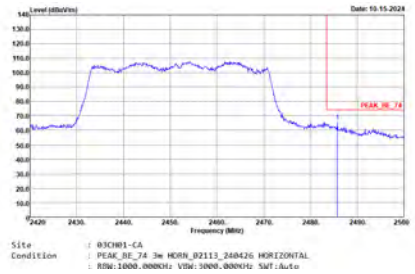
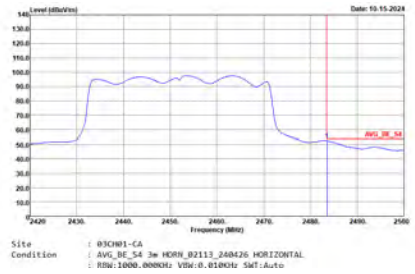
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH06 2437MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

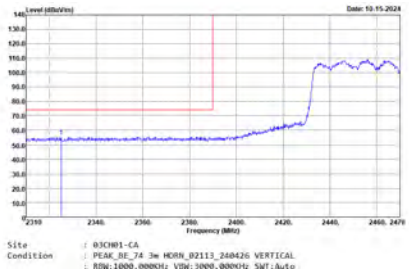
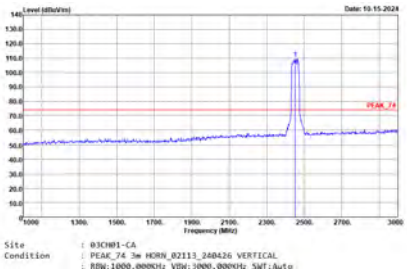
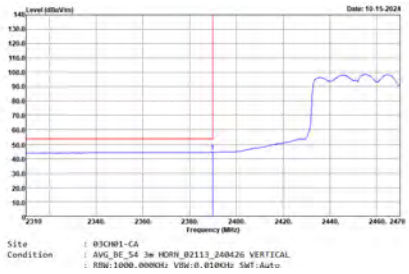
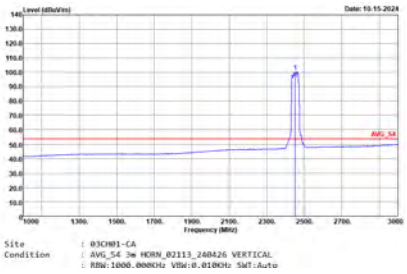
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH06 2437MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

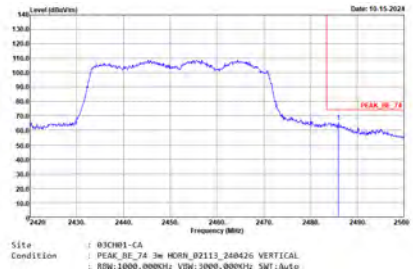
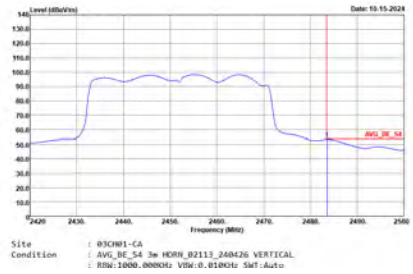
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH06 2437MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH06 2437MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

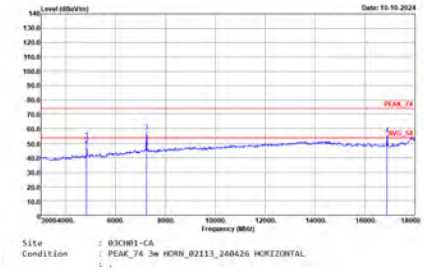
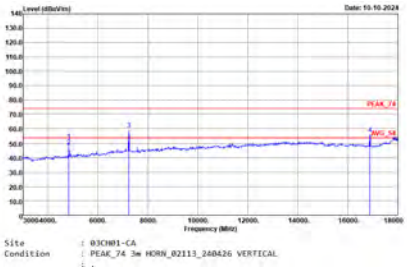
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

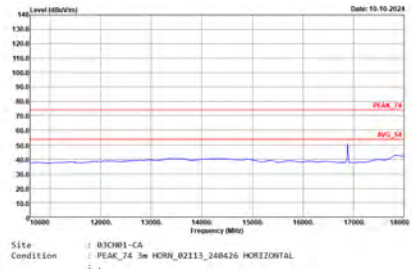
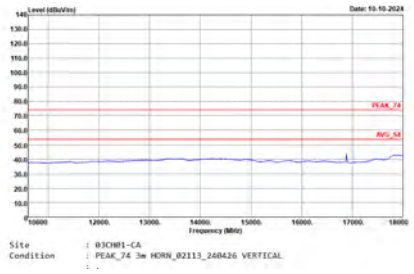
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

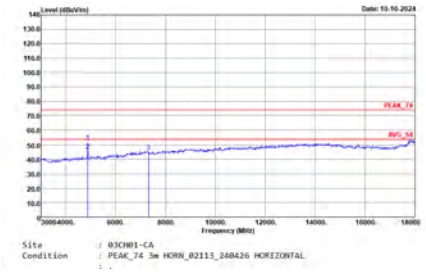
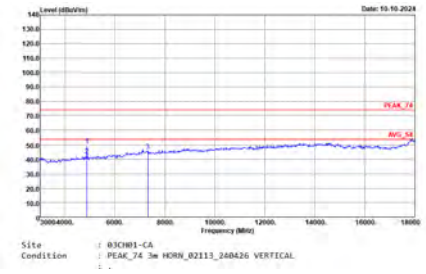
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH09 2452MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

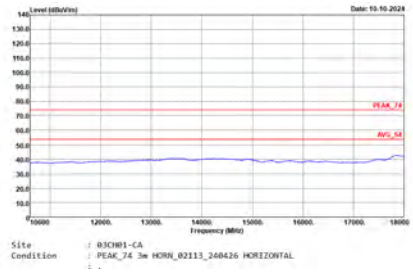
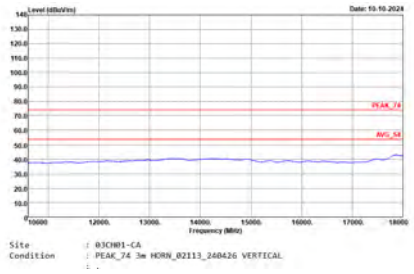
2.4GHz 2400~2483.5MHz

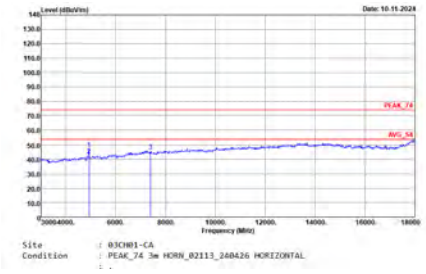
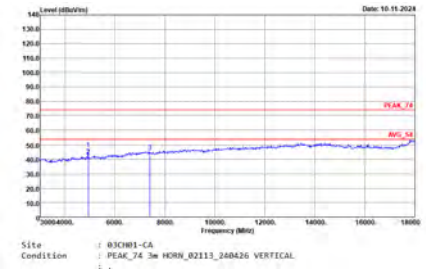
WIFI 802.11b (Harmonic @ 3m)

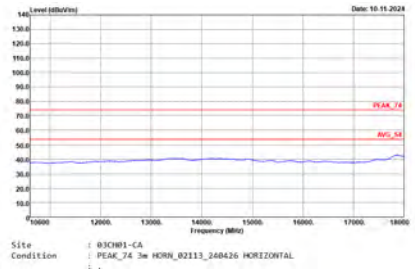
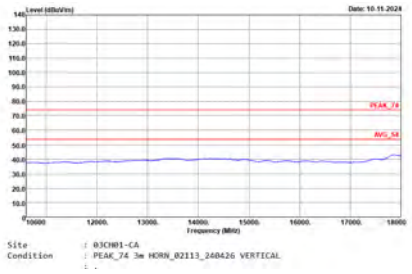
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.		

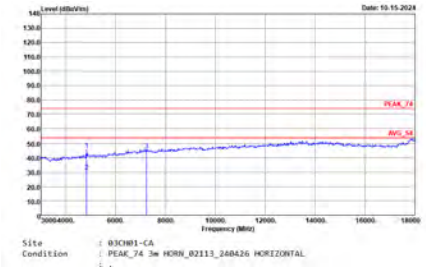
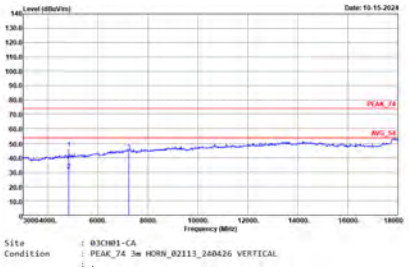
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

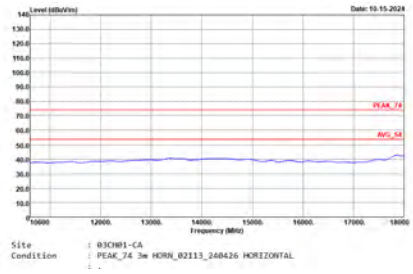
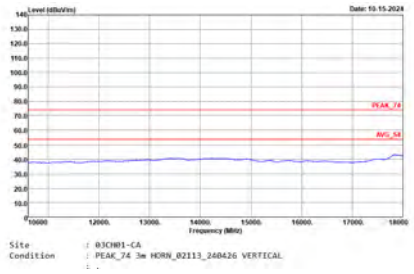
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Horizontal	Vertical
Peak Avg.		

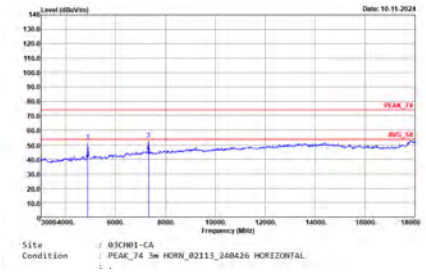
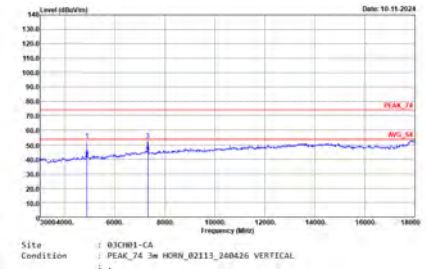
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

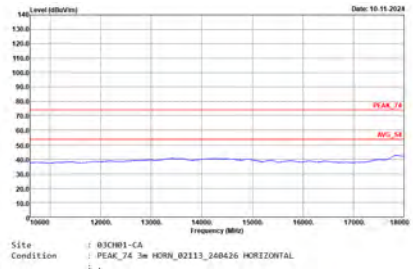
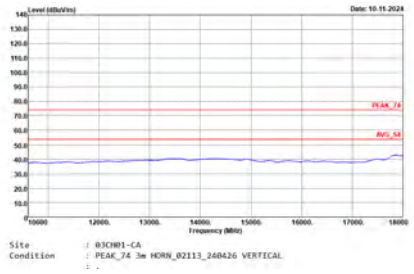
2.4GHz 2400~2483.5MHz

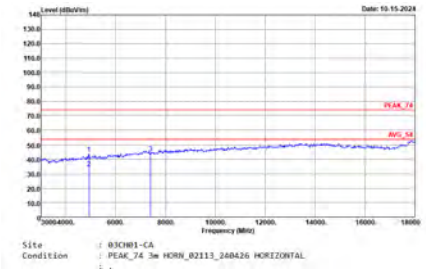
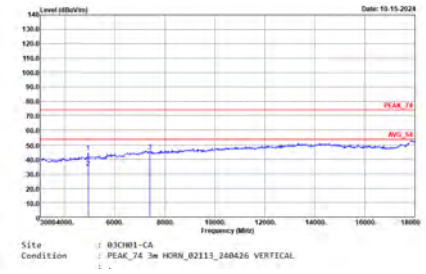
WIFI 802.11g (Harmonic @ 3m)

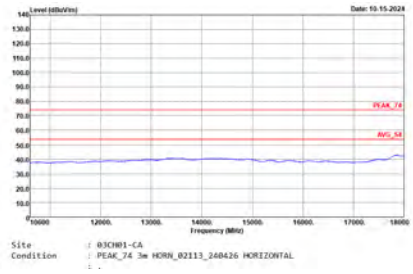
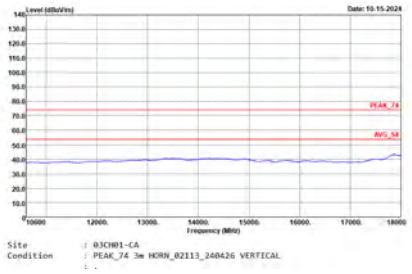
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.		

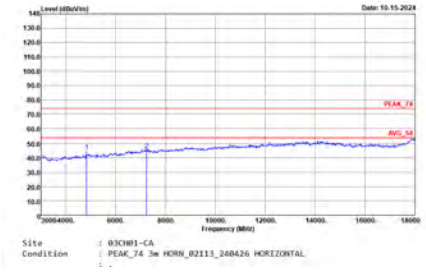
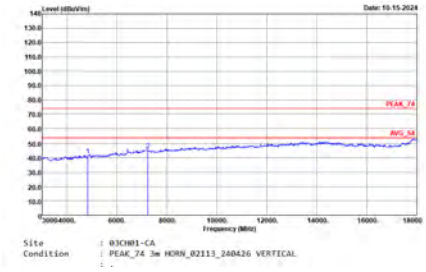
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

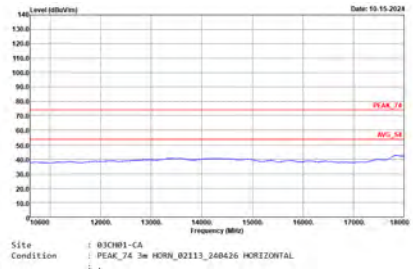
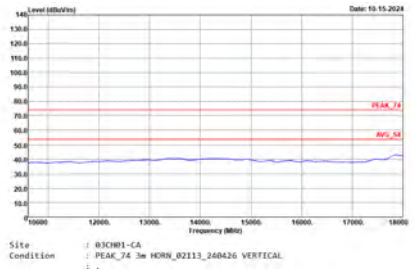
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Horizontal	Vertical
Peak Avg.		

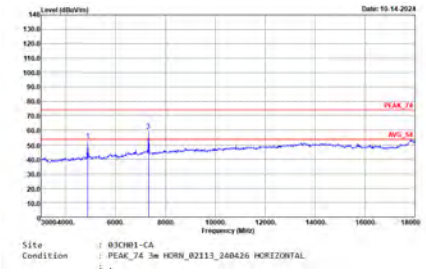
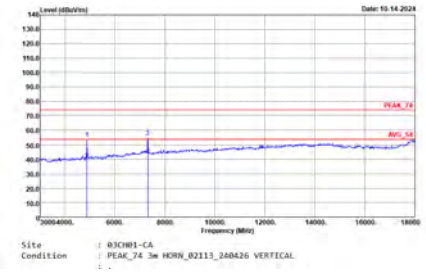
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

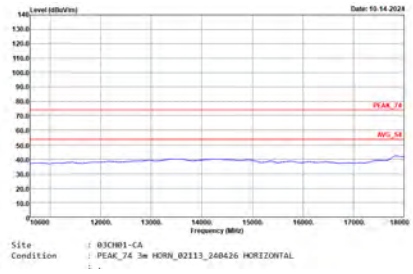
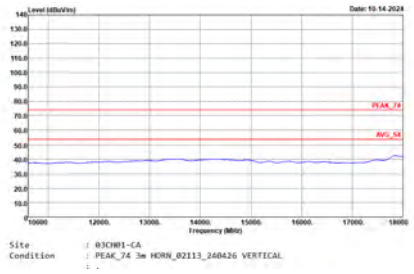
2.4GHz 2400~2483.5MHz

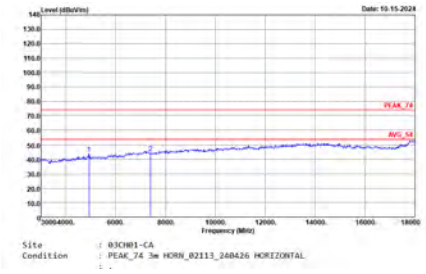
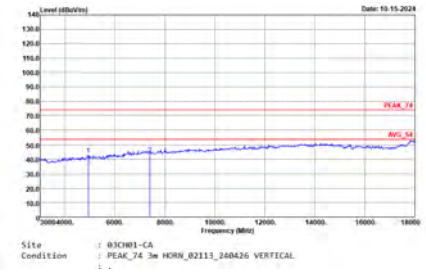
WIFI 802.11 ax HE20 Full (Harmonic @ 3m)

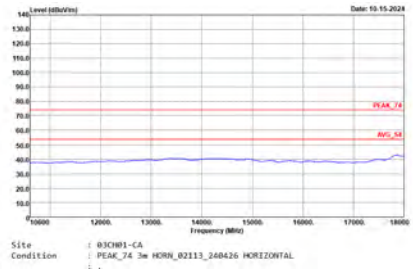
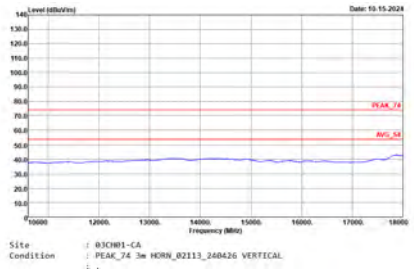
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE20 Full CH01 2412MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE20 Full CH01 2412MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE20 Full CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.		

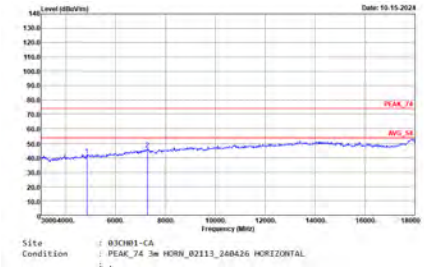
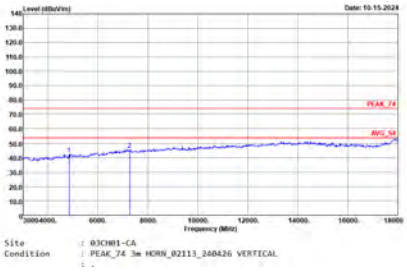
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE20 Full CH06 2437MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

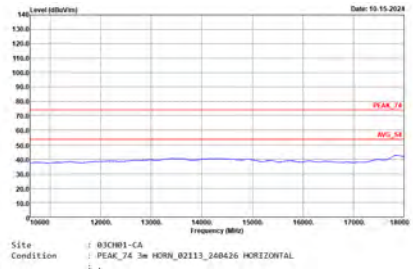
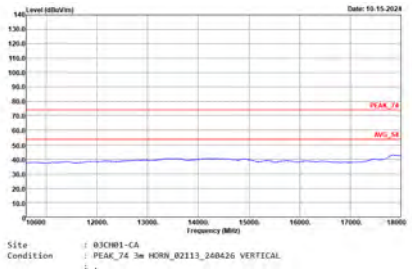
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE20 Full CH11 2462MHz	
1+2	Horizontal	Vertical
Peak Avg.		

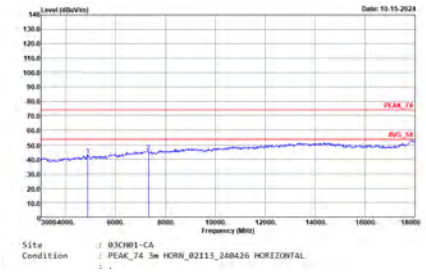
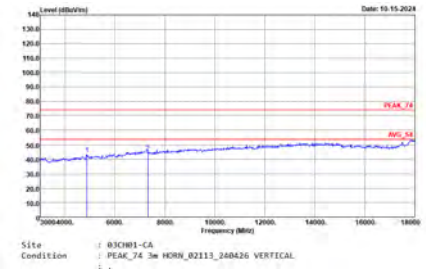
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE20 Full CH11 2462MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

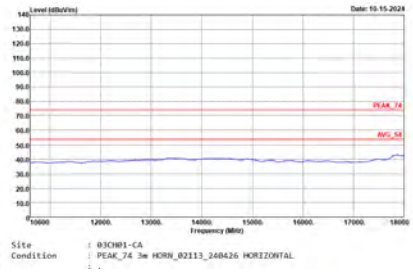
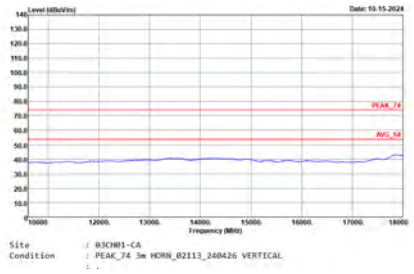
2.4GHz 2400~2483.5MHz

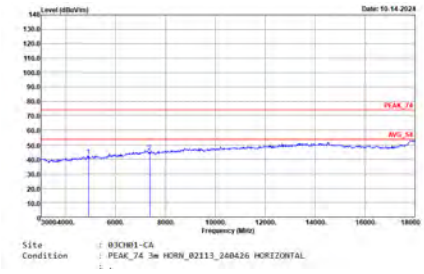
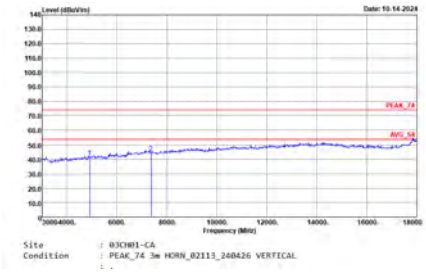
WIFI 802.11 ax HE40 Full (Harmonic @ 3m)

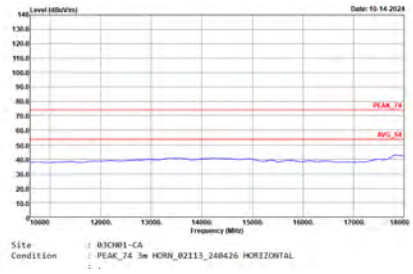
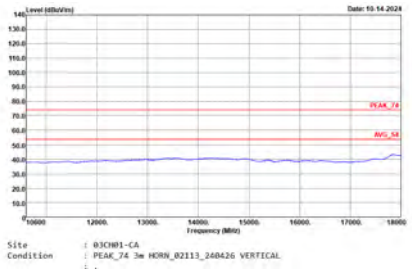
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE40 Full CH03 2422MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE40 Full CH03 2422MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE40 Full CH06 2437MHz	
1+2	Horizontal	Vertical
Peak Avg.		

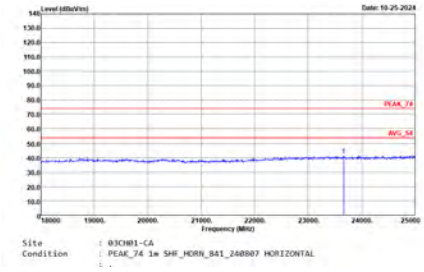
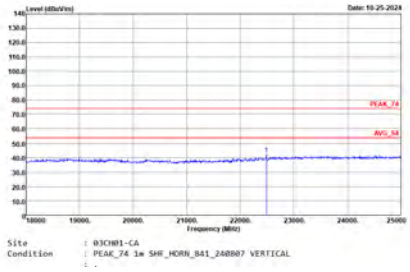
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE40 Full CH06 2437MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE40 Full CH09 2452MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11 ax HE40 Full CH09 2452MHz	
1+2	Horizontal	Vertical
10.6G ~18G Avg.		

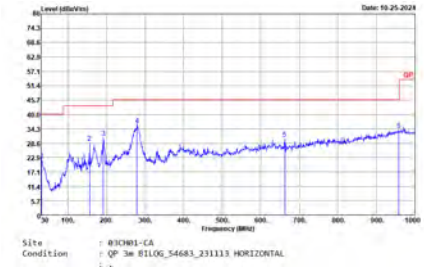
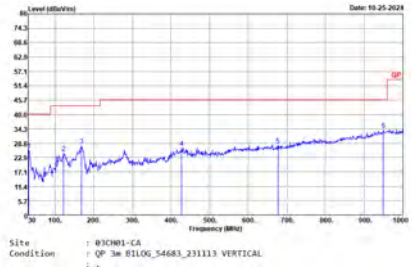
Emission above 18GHz

2.4GHz WIFI 802.11ax HE40 Full (SHF @ 1m)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11ax HE40 Full SHF	
1+2	Horizontal	Vertical
Peak Avg.		

Emission above 18GHz

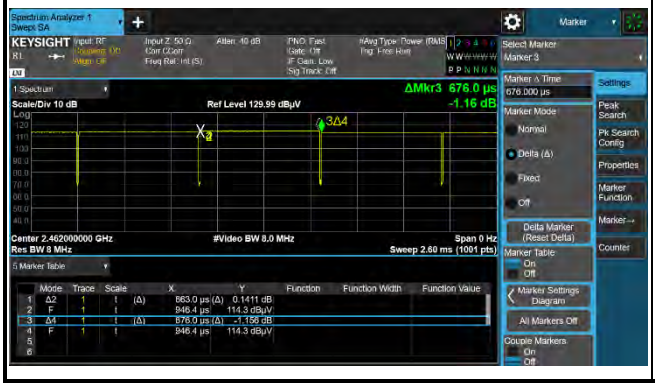
2.4GHz WIFI 802.11ax HE40 Full (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11ax HE40 Full LF	
1+2	Horizontal	Vertical
QP / Peak		

Appendix D. Duty Cycle Plots

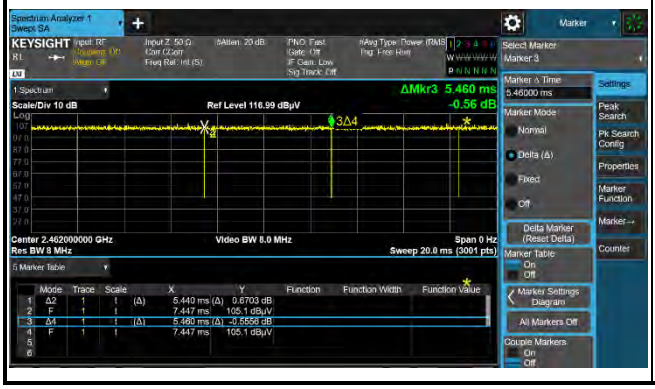
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11b	98.08	663	1.51	10Hz
802.11g	99.15	1975	0.51	10Hz
2.4GHz 802.11ax HE20 Full RU	99.63	5440	0.18	10Hz
2.4GHz 802.11ax HE40 Full RU	99.63	5440	0.18	10Hz

802.11b

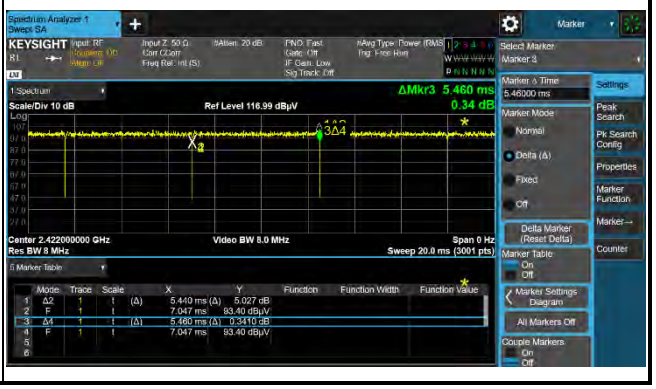


802.11g

802.11ax HE20



802.11ax HE40



——————THE END——————