FCC RADIO TEST REPORT

FCC ID	:	**2AENP-DWT01**
Equipment	:	**Montblanc Digital Paper**
Brand Name	:	**Montblanc**
Model Name	:	**DWT-01**
Applicant	:	**Montblanc-Simplo GmbH** **Hellgrundweg 100, 22525, Hamburg, Germany**
Manufacturer	:	**Montblanc-Simplo GmbH** **Hellgrundweg 100, 22525, Hamburg, Germany**
Standard	:	**FCC Part 15 Subpart C §15.247**

The product was received on Mar. 15, 2024 and testing was performed from Mar. 25, 2024 to Jun. 08, 2024. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Louis Wu

Approved by: Louis Wu

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

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History of this test report

Report No.	Version	Description	Issue Date
FR431513C	01	Initial issue of report	Aug. 20, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
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	1.01 dB under the limit at 2483.76 MHz
3.6	15.207	AC Conducted Emission	Pass	6.81 dB under the limit at 0.40 MHz
3.7	15.203	Antenna Requirement	Pass	-

Conformity Assessment Condition:

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

Disclaimer:

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

Reviewed by: Keven Cheng

Report Producer: Rebecca Wu

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature
General Specs Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac, Wi-Fi 5GHz 802.11a/n/ac, and NFC. **Antenna Type** WLAN: PIFA Antenna Bluetooth: PIFA Antenna NFC: FPC Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	-3.05

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

1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	TH05-HY, CO07-HY, 03CH16-HY

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

FCC designation No.: TW3786

1.4 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 15.247 Meas Guidance v05r02
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- 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.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	8	2447
	2	2417	9	2452
	3	2422	10	2457
	4	2427	11	2462
	5	2432	12	2467
	6	2437	13	2472
	7	2442		

2.2 Test Mode

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

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

Single Antenna

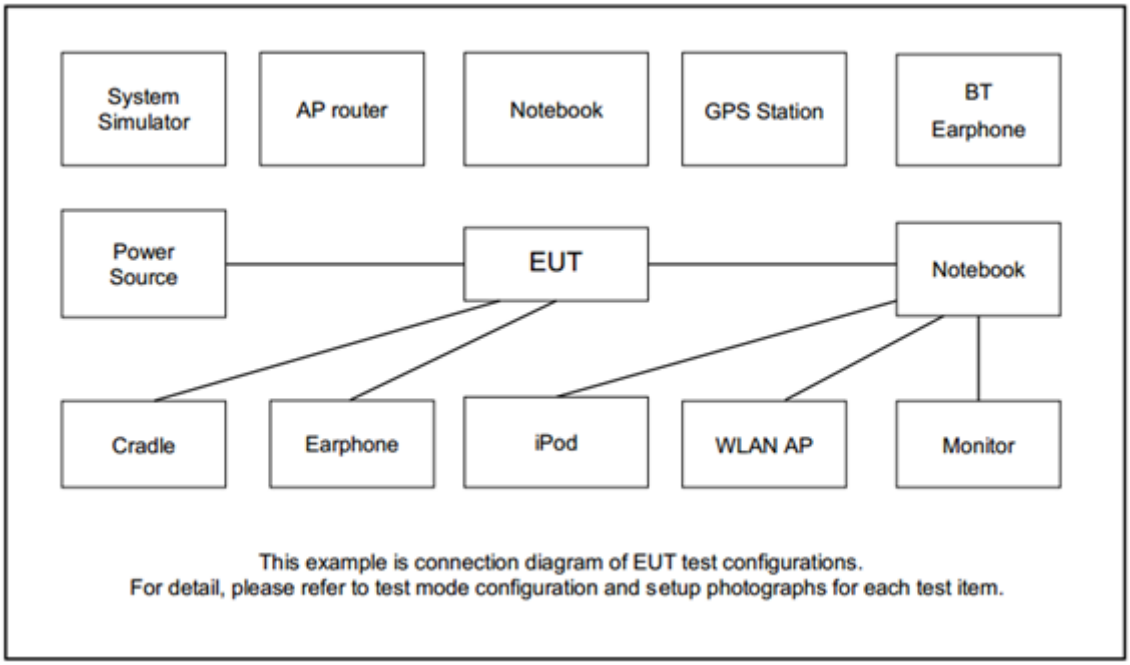
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :Bluetooth Link + WLAN (2.4GHz) Link + Pen Charging + Battery + USB Cable (Charging from Adapter)

Ch. #	2400-2483.5 MHz			
	802.11b	802.11g	802.11n HT20	802.11n HT40
Low	01	01	01	03
Middle	06	06	06	06
High	11	11	11	09
	12	12	12	10
	13	13	13	11

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.	Bluetooth Earphone	Sony	SBH20	PY7-RD0010	N/A	N/A
2.	WLAN AP	ASUS	RT-AC52	MSQ-RTAC4A00	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Notebook	DELL	Latitude 5480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Adapter	louis vuitton	LVMC0029	N/A	N/A	N/A
6.	Adapter	MIBO	MB-21244274	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “cmd version 10.0.19043.2364” 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.

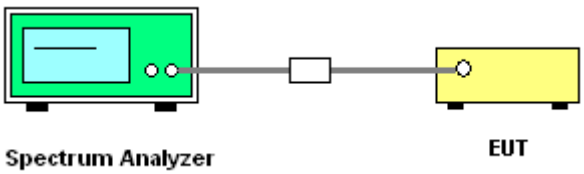
3.1.2 Measuring Instruments

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 peak 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.

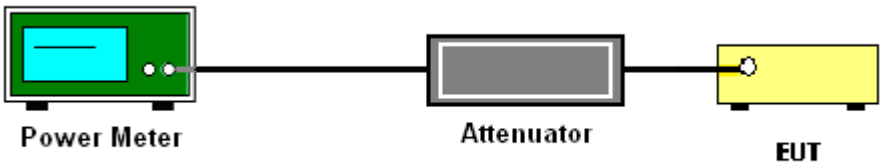
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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.

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.

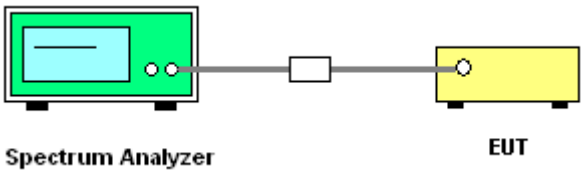
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
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) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

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.

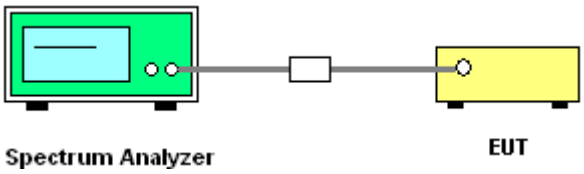
3.4.2 Measuring Instruments

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.

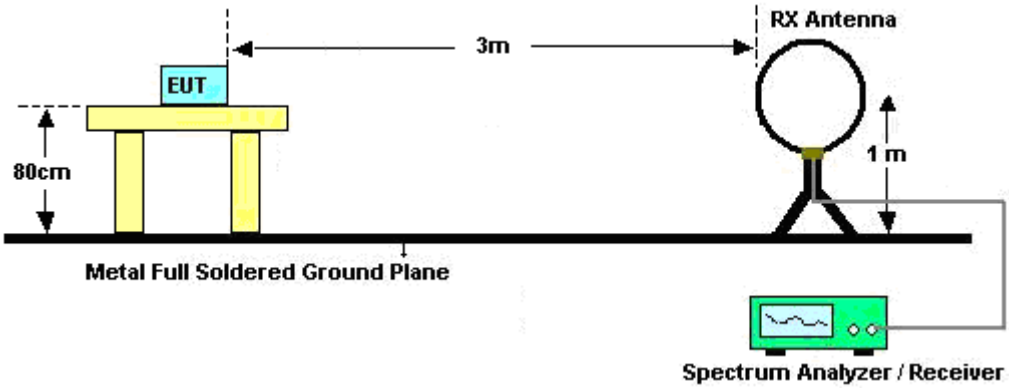
3.5.3 Test Procedures

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 “-“.

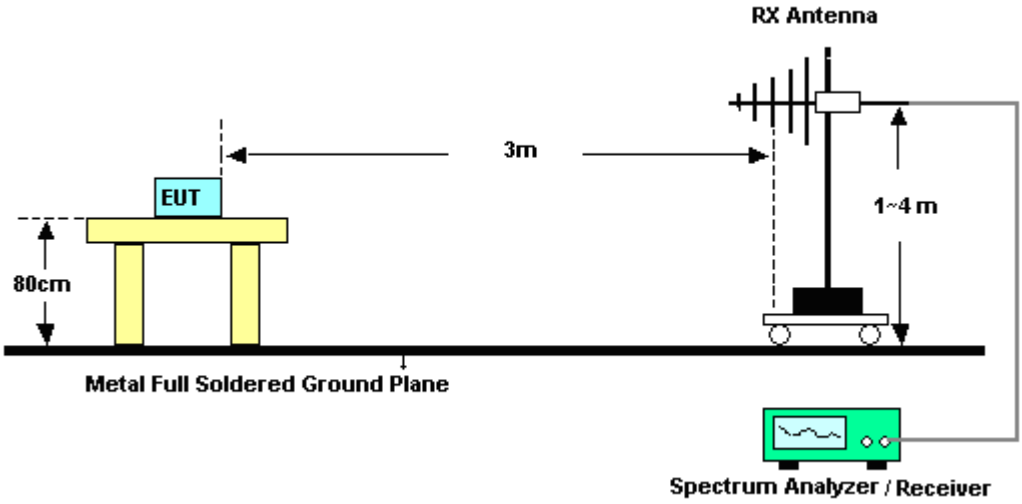
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with 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

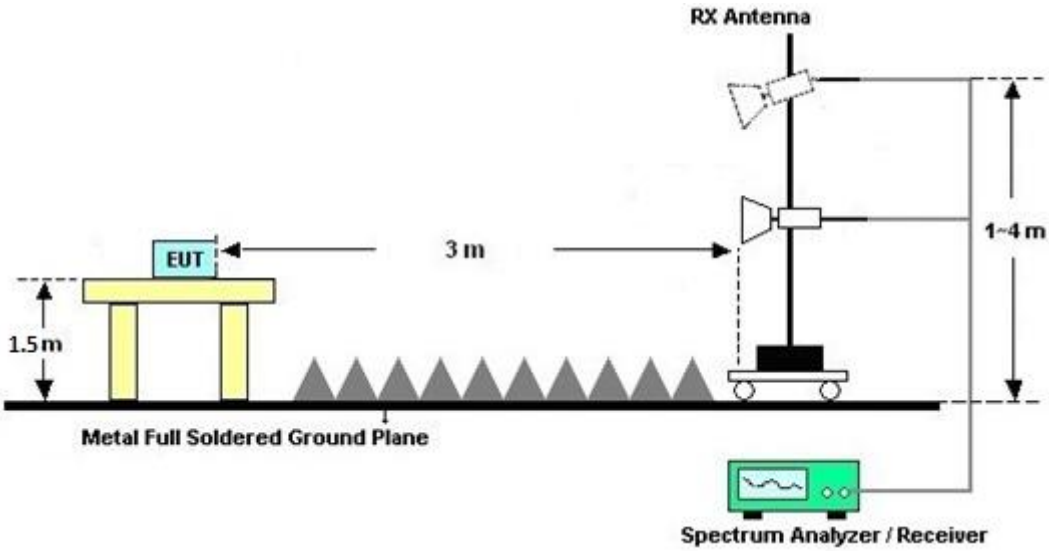
For radiated emissions below 30MHz



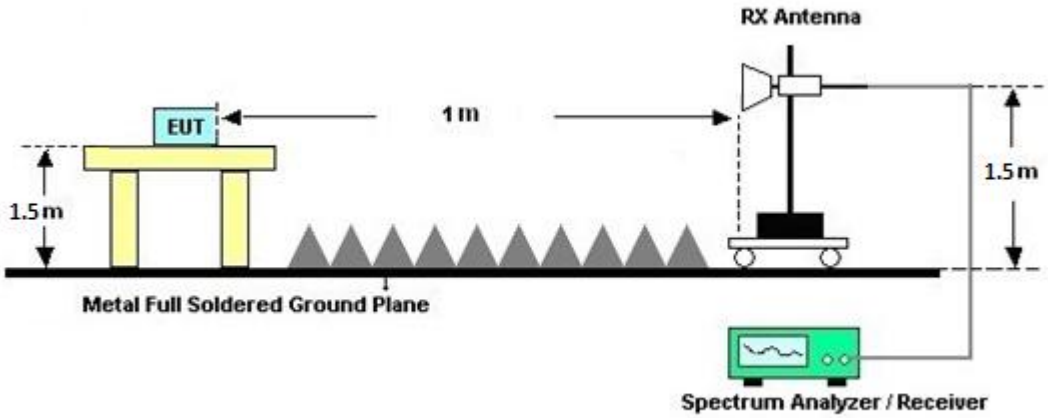
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

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 C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

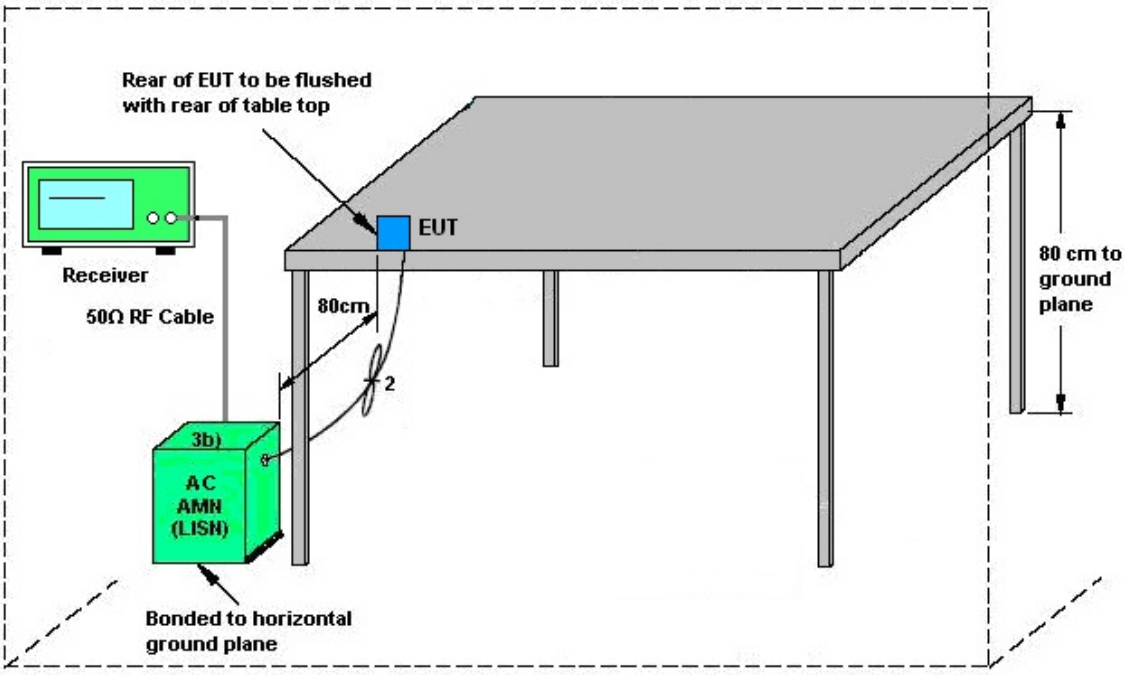
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

1. The EUT is placed 0.4 meter away from the conducting wall of the shielding room, and is kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both Line and Neutral shall be tested in order to find out the maximum conducted emission.
7. The frequency range from 150 kHz to 30 MHz is scanned.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

3.6.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.7 Antenna Requirements

3.7.1 Standard Applicable

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the rule.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Apr. 02, 2024~ Apr. 15, 2024	Sep. 11, 2024	Radiation (03CH16-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00993	18GHz-40GHz	Nov. 24, 2023	Apr. 02, 2024~ Apr. 15, 2024	Nov. 23, 2024	Radiation (03CH16-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00802N1D01N-06	47020 & 06	30MHz to 1GHz	Oct. 07, 2023	Apr. 02, 2024~ Apr. 15, 2024	Oct. 06, 2024	Radiation (03CH16-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02038	1G~18GHz	Jul. 31, 2023	Apr. 02, 2024~ Apr. 15, 2024	Jul. 30, 2024	Radiation (03CH16-HY)
Amplifier	SONOMA	310N	371607	9kHz~1GHz	Jul. 03, 2023	Apr. 02, 2024~ Apr. 15, 2024	Jul. 02, 2024	Radiation (03CH16-HY)
Preamplifier	Keysight	83017A	MY53270264	1GHz~26.5GHz	Dec. 07, 2023	Apr. 02, 2024~ Apr. 15, 2024	Dec. 06, 2024	Radiation (03CH16-HY)
Preamplifier	EMEC	EM1G18G	060812	1GHz~18GHz	Dec. 25, 2023	Apr. 02, 2024~ Apr. 15, 2024	Dec. 24, 2024	Radiation (03CH16-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 27, 2023	Apr. 02, 2024~ Apr. 15, 2024	Jun. 26, 2024	Radiation (03CH16-HY)
Filter	Wainwright	WLK4-1000-1530-8000-40SS	SN17	1.53GHz Low Pass Filter	Jan. 15, 2024	Apr. 02, 2024~ Apr. 15, 2024	Jan. 14, 2025	Radiation (03CH16-HY)
Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN3	3GHz High Pass Filter	Jun. 29, 2023	Apr. 02, 2024~ Apr. 15, 2024	Jun. 28, 2024	Radiation (03CH16-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN27	6.75GHz High Pass Filter	Nov. 13, 2023	Apr. 02, 2024~ Apr. 15, 2024	Nov. 12, 2024	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9K~30M	Mar. 06, 2024	Apr. 02, 2024~ Apr. 15, 2024	Mar. 05, 2025	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102/SUCOFLEX 104	EC-A5-300-5757,805935/4,802434/4	30MHz~18GHz	Aug. 08, 2023	Apr. 02, 2024~ Apr. 15, 2024	Aug. 07, 2024	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804011/2,804012/2	18-40GHz	Jan. 02, 2024	Apr. 02, 2024~ Apr. 15, 2024	Jan. 01, 2025	Radiation (03CH16-HY)
Software	Audix	E3 6.2009-8-24	RK-001136	N/A	N/A	Apr. 02, 2024~ Apr. 15, 2024	N/A	Radiation (03CH16-HY)
Controller	ChainTek	3000-1	N/A	Control Turn table & Ant Mast	N/A	Apr. 02, 2024~ Apr. 15, 2024	N/A	Radiation (03CH16-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Apr. 02, 2024~ Apr. 15, 2024	N/A	Radiation (03CH16-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Apr. 02, 2024~ Apr. 15, 2024	N/A	Radiation (03CH16-HY)
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	May 21, 2024	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	May 21, 2024	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Oct. 20, 2023	May 21, 2024	Oct. 19, 2024	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 14, 2024	May 21, 2024	Mar. 13, 2025	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Mar. 10, 2024	May 21, 2024	Mar. 09, 2025	Conduction (CO07-HY)
Four-Line V-Network	TESEQ	NNB 52	36122	N/A	Mar. 07, 2024	May 21, 2024	Mar. 06, 2025	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 20, 2023	May 21, 2024	Sep. 19, 2024	Conduction (CO07-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 07, 2023	Mar. 25, 2024~ Jun. 08, 2024	Nov. 06, 2024	Conducted (TH05-HY)
Power Sensor	DARE	RPR3008W	RPR8W-2301 017 (NO:20)	10MHz~8GHz	Jul. 26, 2023	Mar. 25, 2024~ Jun. 08, 2024	Jul. 25, 2024	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Aug. 31, 2023	Mar. 25, 2024~ Jun. 08, 2024	Aug. 30, 2024	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL883644	Voltage:0~20V; Current:0~5A	Nov. 20, 2023	Mar. 25, 2024~ Jun. 08, 2024	Nov. 19, 2024	Conducted (TH05-HY)

5 Measurement Uncertainty

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.50 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.50 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.50 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.50 dB

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Kevin Xiao	Temperature:	21~25	°C
Test Date:	2024/03/25 ~ 2024/06/08	Relative Humidity:	51~54	%

Report Number : FR431513C

TEST RESULTS DATA
6dB and 99% Occupied Bandwidth

2.4GHz Band Single Antenna								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Occupied BW (MHz)	6dB BW (MHz)	6dB BW Limit (MHz)	Pass/Fail
					Ant1	Ant1		
11b	1Mbps	1	1	2412	12.99	8.04	0.50	Pass
11b	1Mbps	1	6	2437	12.99	8.06	0.50	Pass
11b	1Mbps	1	11	2462	13.04	8.04	0.50	Pass
11b	1Mbps	1	12	2467	13.04	8.03	0.50	Pass
11b	1Mbps	1	13	2472	12.99	8.05	0.50	Pass
11g	6Mbps	1	1	2412	16.78	15.12	0.50	Pass
11g	6Mbps	1	6	2437	16.78	15.46	0.50	Pass
11g	6Mbps	1	11	2462	16.73	15.13	0.50	Pass
11g	6Mbps	1	12	2467	16.73	15.10	0.50	Pass
11g	6Mbps	1	13	2472	16.68	15.12	0.50	Pass
HT20	MCS 0	1	1	2412	17.78	15.31	0.50	Pass
HT20	MCS 0	1	6	2437	17.83	15.10	0.50	Pass
HT20	MCS 0	1	11	2462	17.78	15.11	0.50	Pass
HT20	MCS 0	1	12	2467	17.78	15.08	0.50	Pass
HT20	MCS 0	1	13	2472	17.73	15.10	0.50	Pass
HT40	MCS 0	1	3	2422	36.66	35.10	0.50	Pass
HT40	MCS 0	1	6	2437	36.66	35.11	0.50	Pass
HT40	MCS 0	1	9	2452	36.46	35.09	0.50	Pass
HT40	MCS 0	1	10	2457	36.46	35.11	0.50	Pass
HT40	MCS 0	1	11	2462	36.56	35.11	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna										
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	Ant1	Ant1	Ant1	Ant1	
11b	1Mbps	1	1	2412	15.50	30.00	-3.05	12.45	36.00	Pass
11b	1Mbps	1	6	2437	15.60	30.00	-3.05	12.55	36.00	Pass
11b	1Mbps	1	11	2462	15.50	30.00	-3.05	12.45	36.00	Pass
11b	1Mbps	1	12	2467	15.50	30.00	-3.05	12.45	36.00	Pass
11b	1Mbps	1	13	2472	15.50	30.00	-3.05	12.45	36.00	Pass
11g	6Mbps	1	1	2412	15.50	30.00	-3.05	12.45	36.00	Pass
11g	6Mbps	1	6	2437	15.50	30.00	-3.05	12.45	36.00	Pass
11g	6Mbps	1	11	2462	15.50	30.00	-3.05	12.45	36.00	Pass
11g	6Mbps	1	12	2467	14.30	30.00	-3.05	11.25	36.00	Pass
11g	6Mbps	1	13	2472	12.50	30.00	-3.05	9.45	36.00	Pass
HT20	MCS 0	1	1	2412	15.60	30.00	-3.05	12.55	36.00	Pass
HT20	MCS 0	1	6	2437	15.70	30.00	-3.05	12.65	36.00	Pass
HT20	MCS 0	1	11	2462	15.60	30.00	-3.05	12.55	36.00	Pass
HT20	MCS 0	1	12	2467	13.30	30.00	-3.05	10.25	36.00	Pass
HT20	MCS 0	1	13	2472	11.40	30.00	-3.05	8.35	36.00	Pass
HT40	MCS 0	1	3	2422	14.50	30.00	-3.05	11.45	36.00	Pass
HT40	MCS 0	1	6	2437	15.70	30.00	-3.05	12.65	36.00	Pass
HT40	MCS 0	1	9	2452	14.40	30.00	-3.05	11.35	36.00	Pass
HT40	MCS 0	1	10	2457	13.40	30.00	-3.05	10.35	36.00	Pass
HT40	MCS 0	1	11	2462	11.50	30.00	-3.05	8.45	36.00	Pass
VHT20	MCS 0	1	1	2412	15.50	30.00	-3.05	12.45	36.00	Pass
VHT20	MCS 0	1	6	2437	15.60	30.00	-3.05	12.55	36.00	Pass
VHT20	MCS 0	1	11	2462	15.50	30.00	-3.05	12.45	36.00	Pass
VHT20	MCS 0	1	12	2467	13.20	30.00	-3.05	10.15	36.00	Pass
VHT20	MCS 0	1	13	2472	11.30	30.00	-3.05	8.25	36.00	Pass
VHT40	MCS 0	1	3	2422	14.40	30.00	-3.05	11.35	36.00	Pass
VHT40	MCS 0	1	6	2437	15.60	30.00	-3.05	12.55	36.00	Pass
VHT40	MCS 0	1	9	2452	14.30	30.00	-3.05	11.25	36.00	Pass
VHT40	MCS 0	1	10	2457	13.30	30.00	-3.05	10.25	36.00	Pass
VHT40	MCS 0	1	11	2462	11.40	30.00	-3.05	8.35	36.00	Pass

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

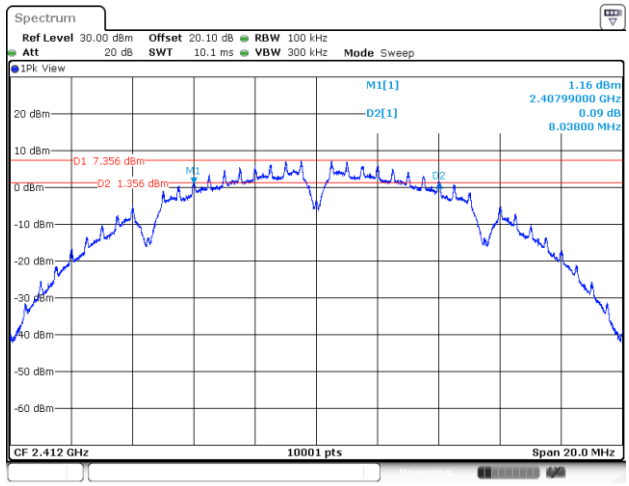
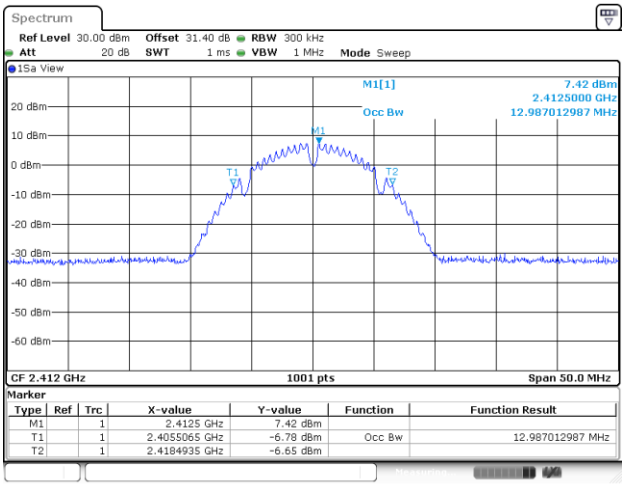
TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band Single Antenna									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)		DG (dBi)	Peak PSD Limit (dBm/3kHz)	Pass/Fail
					Ant1	Worse + 3.01	Ant1	Ant1	
11b	1Mbps	1	1	2412	-6.93	-	-3.05	8.00	Pass
11b	1Mbps	1	6	2437	-7.28		-3.05	8.00	Pass
11b	1Mbps	1	11	2462	-6.09		-3.05	8.00	Pass
11b	1Mbps	1	12	2467	-6.72		-3.05	8.00	Pass
11b	1Mbps	1	13	2472	-7.08		-3.05	8.00	Pass
11g	6Mbps	1	1	2412	-9.53		-3.05	8.00	Pass
11g	6Mbps	1	6	2437	-7.23		-3.05	8.00	Pass
11g	6Mbps	1	11	2462	-8.81		-3.05	8.00	Pass
11g	6Mbps	1	12	2467	-10.63		-3.05	8.00	Pass
11g	6Mbps	1	13	2472	-12.68		-3.05	8.00	Pass
HT20	MCS 0	1	1	2412	-8.78		-3.05	8.00	Pass
HT20	MCS 0	1	6	2437	-9.33		-3.05	8.00	Pass
HT20	MCS 0	1	11	2462	-8.79		-3.05	8.00	Pass
HT20	MCS 0	1	12	2467	-11.05		-3.05	8.00	Pass
HT20	MCS 0	1	13	2472	-12.78		-3.05	8.00	Pass
HT40	MCS 0	1	3	2422	-13.40		-3.05	8.00	Pass
HT40	MCS 0	1	6	2437	-11.90		-3.05	8.00	Pass
HT40	MCS 0	1	9	2452	-13.12		-3.05	8.00	Pass
HT40	MCS 0	1	10	2457	-14.62		-3.05	8.00	Pass
HT40	MCS 0	1	11	2462	-15.76		-3.05	8.00	Pass

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

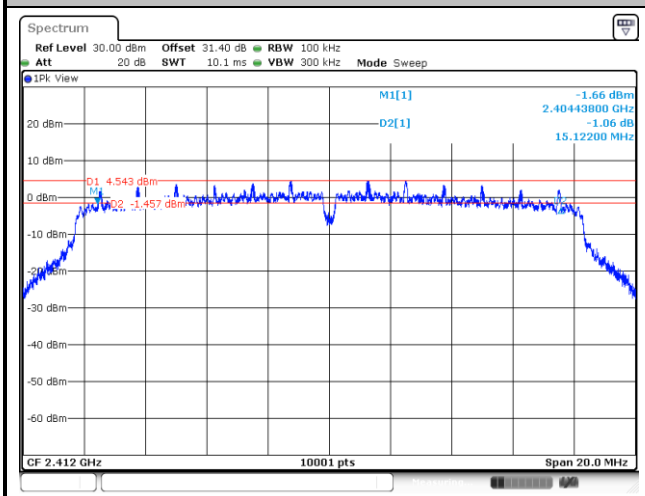
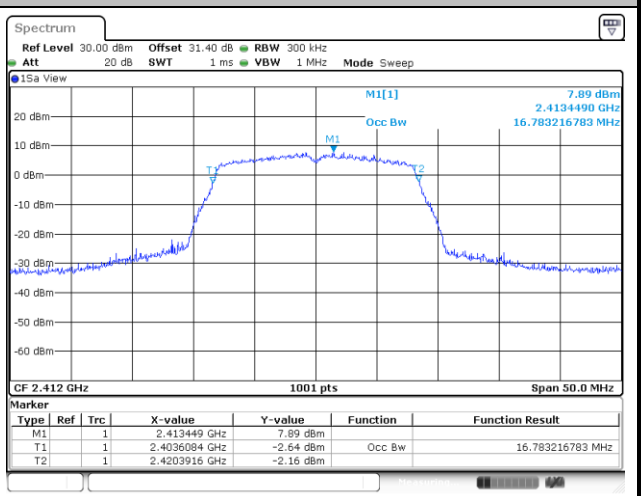
6dB and 99% Occupied Bandwidth

<802.11b>

6dB Bandwidth	99% Occupied Bandwidth
	

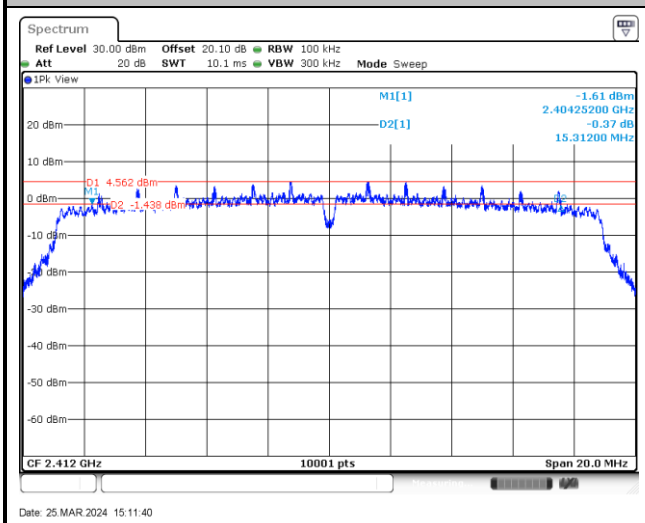
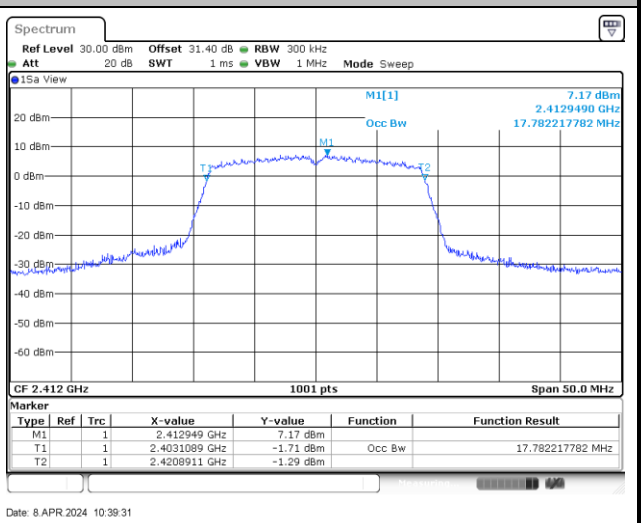
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11g>

6dB Bandwidth	99% Occupied Bandwidth
	

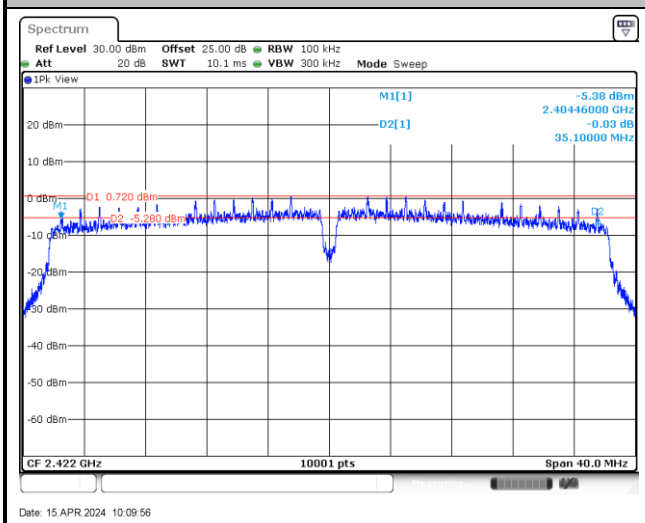
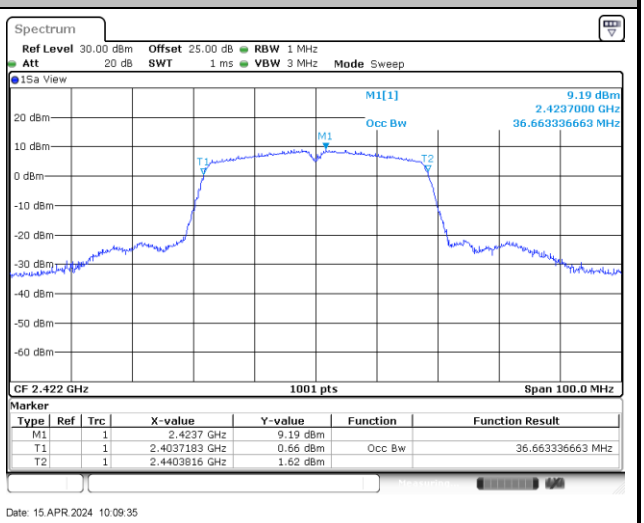
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11n HT20>

6dB Bandwidth	99% Occupied Bandwidth
	

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

<802.11n HT40>

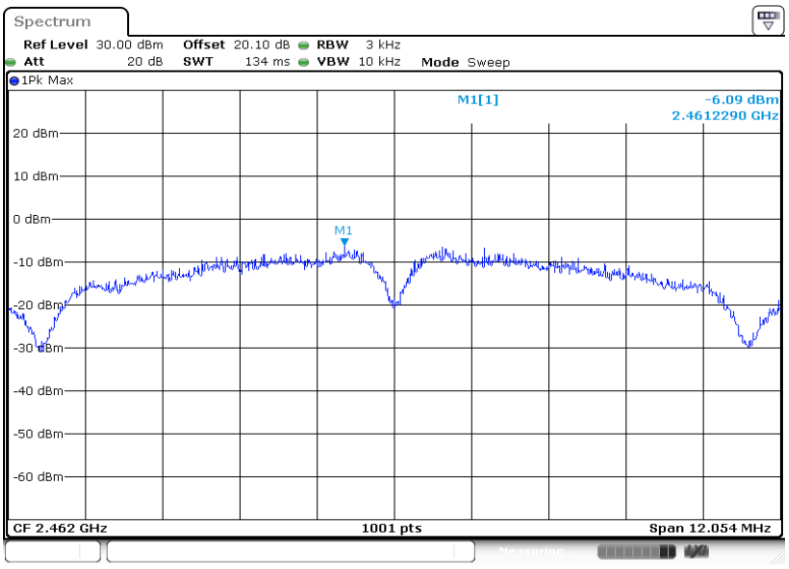
6dB Bandwidth	99% Occupied Bandwidth
	

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

Power Spectral Density(dBm/3kHz)

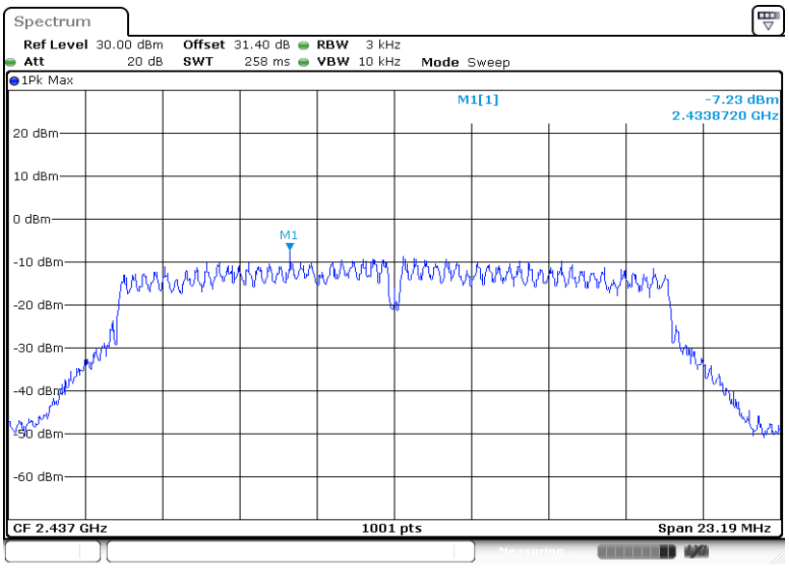
<802.11b>

Worst Case Power Density (dBm/3kHz)



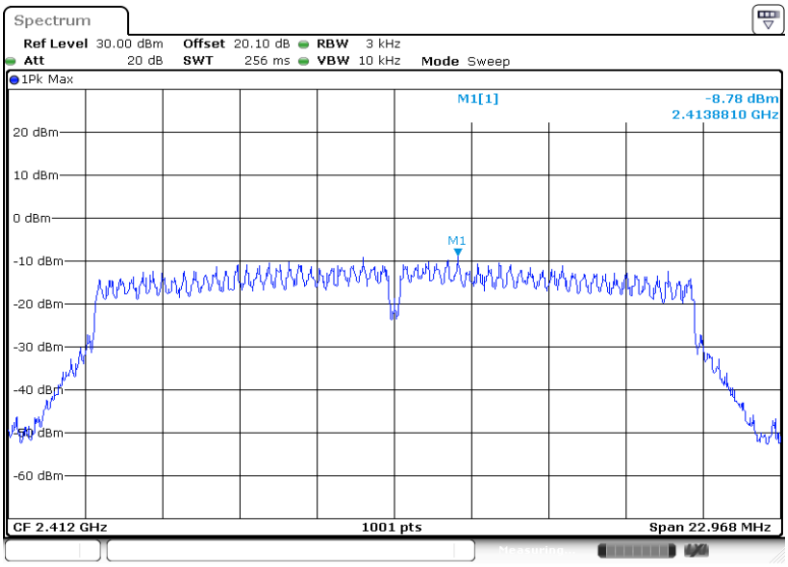
<802.11g>

Worst Case Power Density (dBm/3kHz)



<802.11n HT20>

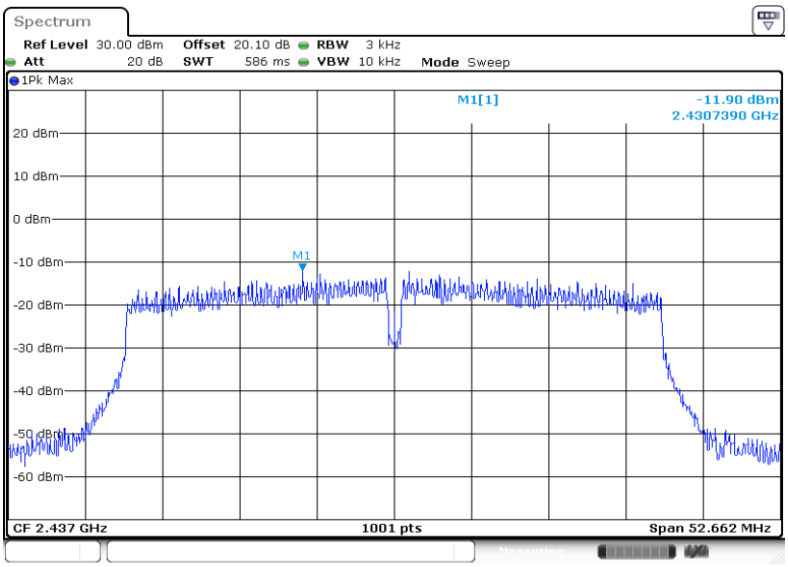
Worst Case Power Density (dBm/3kHz)



Date: 25.MAR.2024 15:11:54

<802.11n HT40>

Worst Case Power Density (dBm/3kHz)

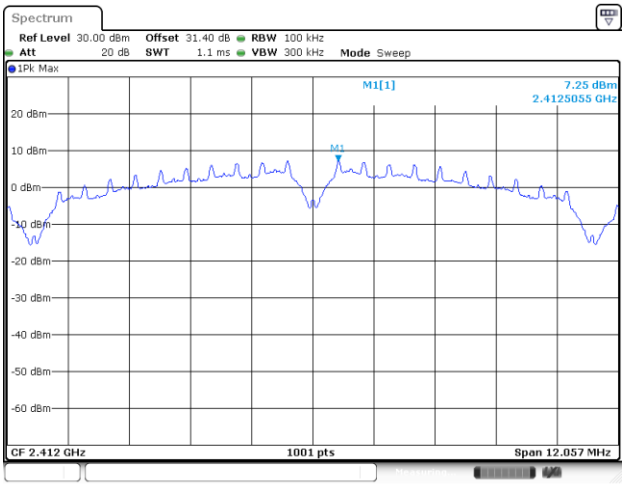
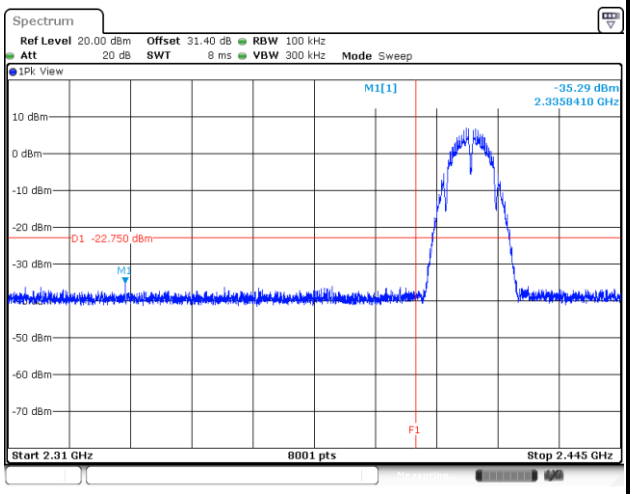
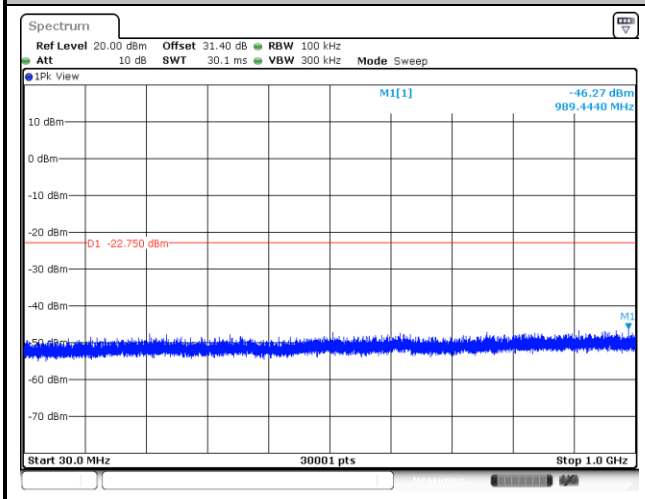
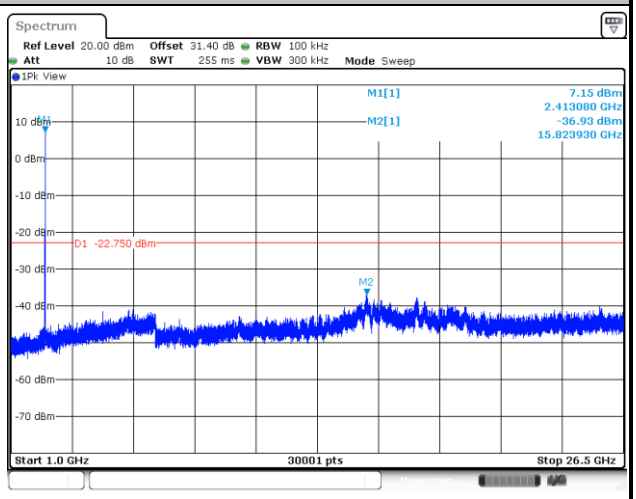


Date: 25.MAR.2024 15:19:24

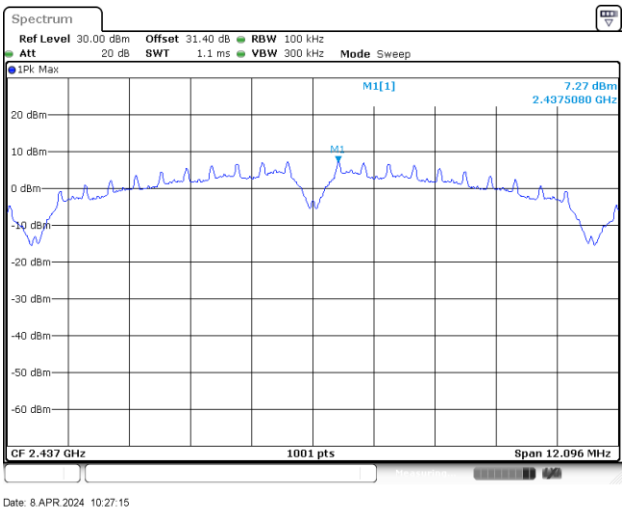
Band Edges and Spurious Emission

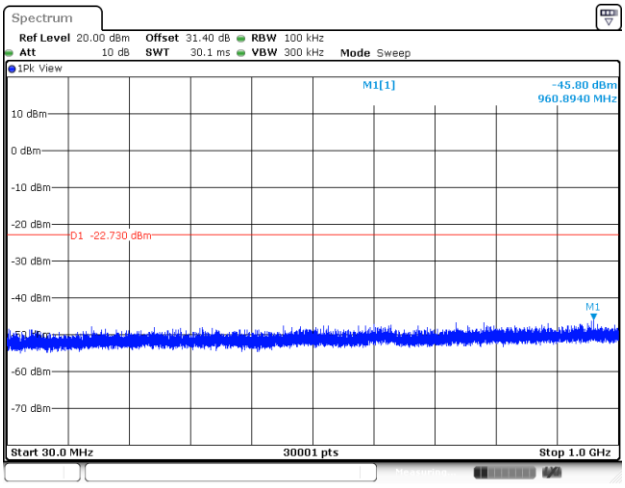
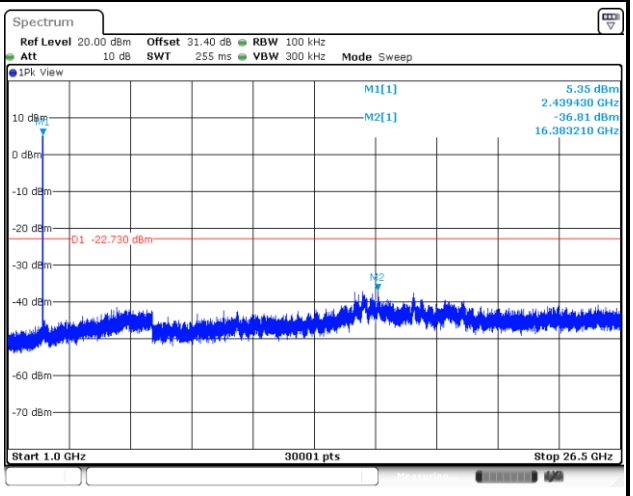
Number of TX = 1, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01

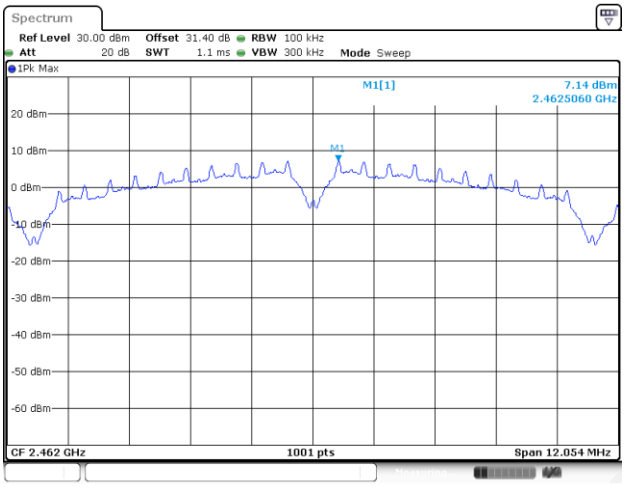
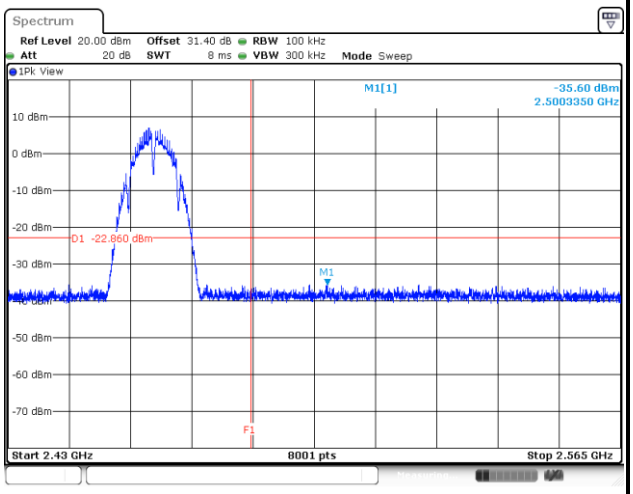
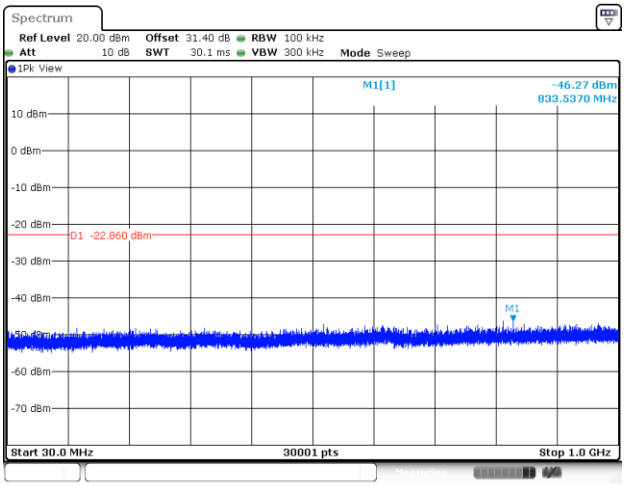
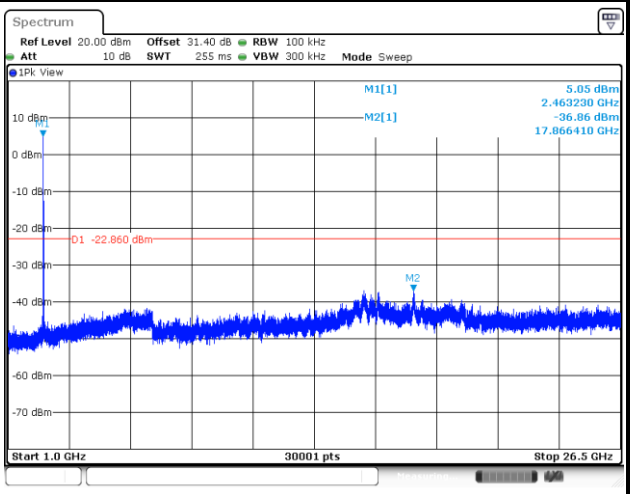
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

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
	
Date: 8.APR.2024 10:29:23	Date: 8.APR.2024 10:30:17
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
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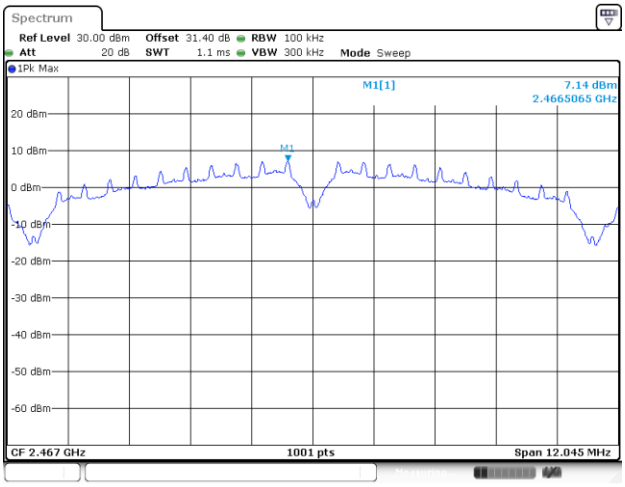
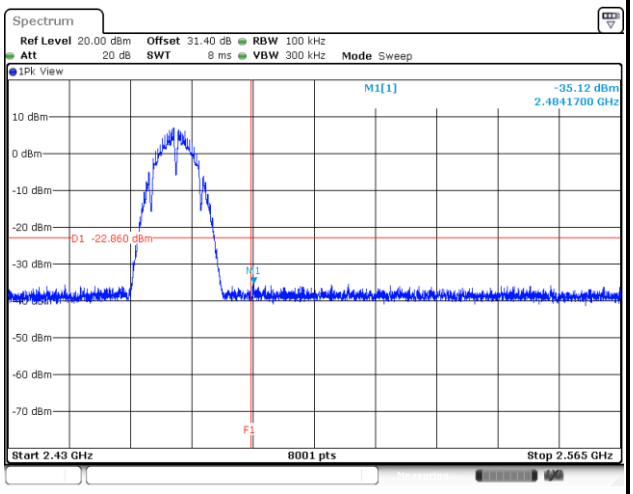
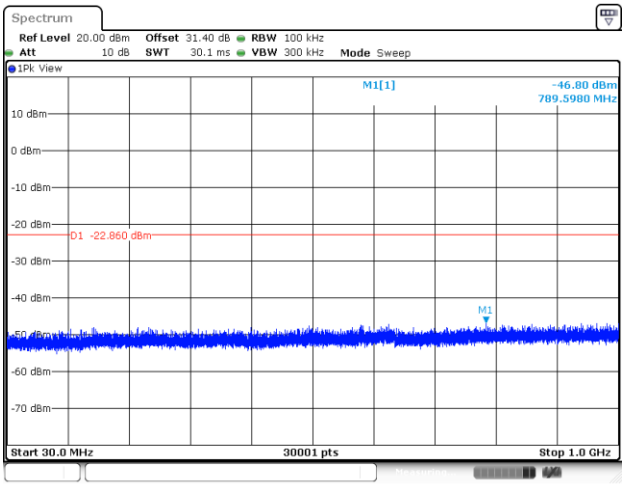
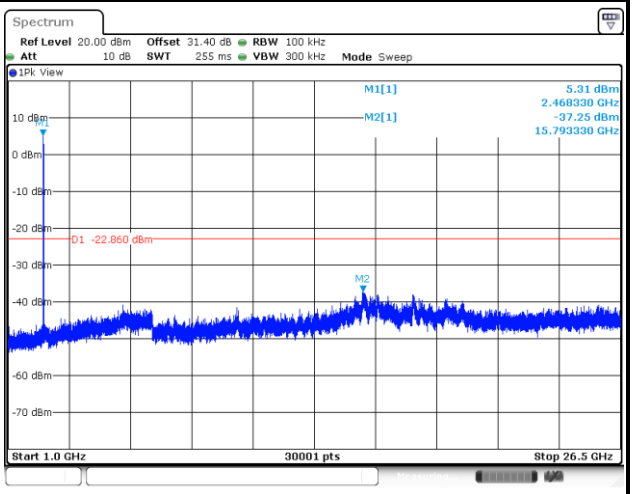
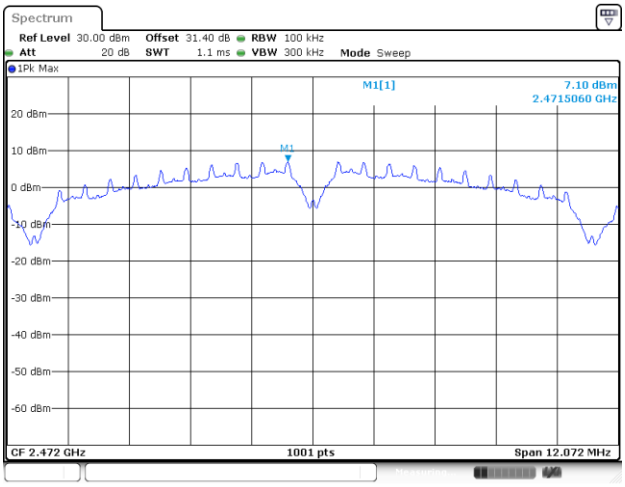
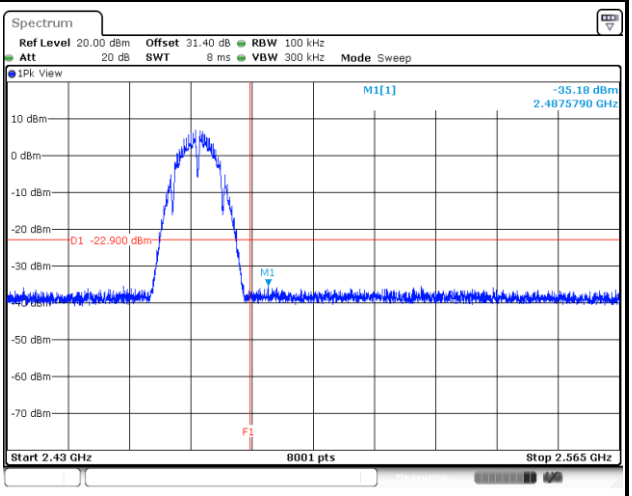
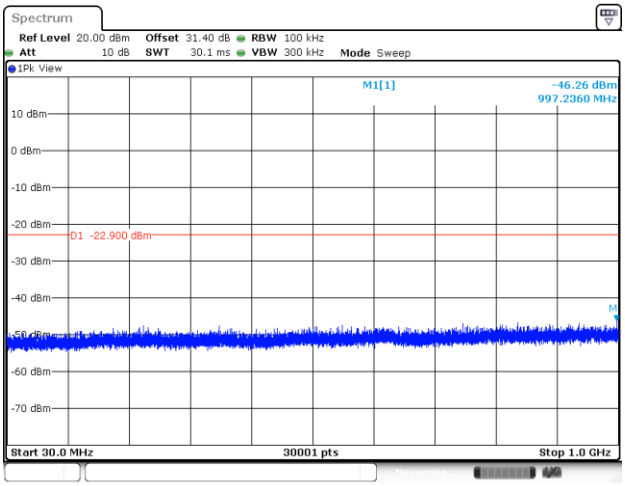
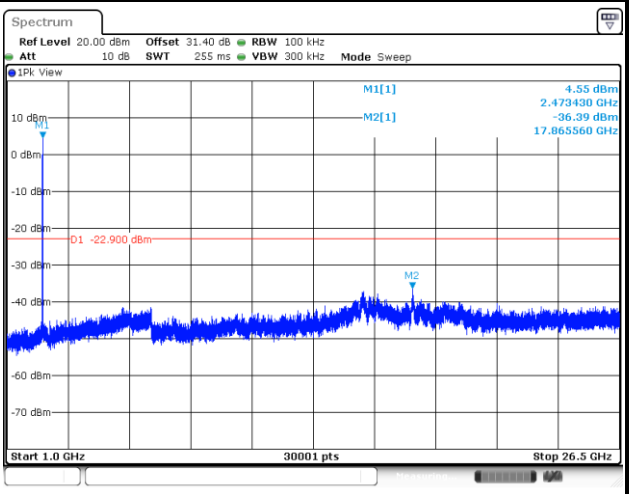
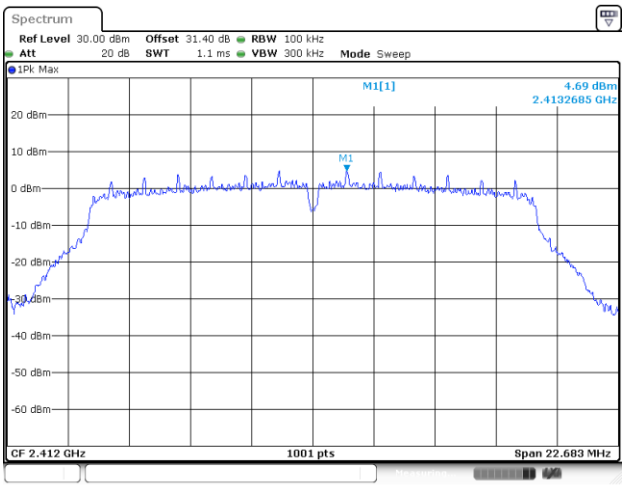
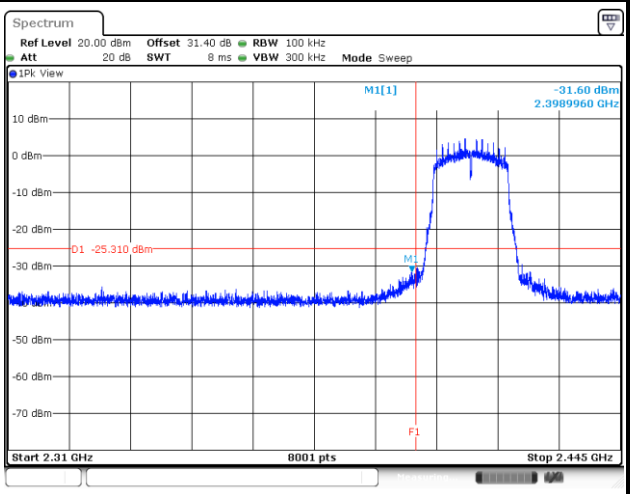
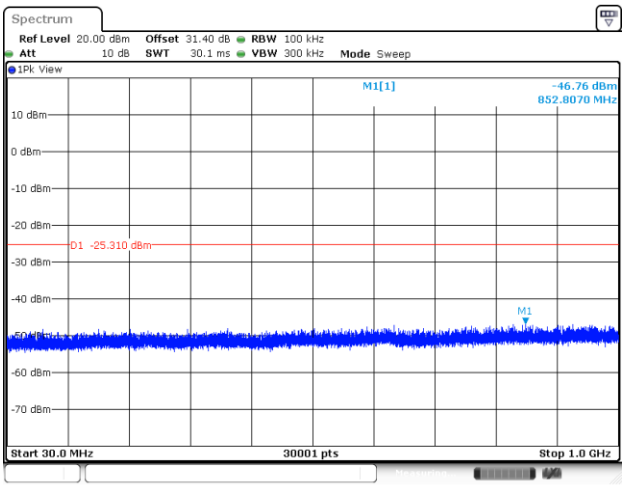
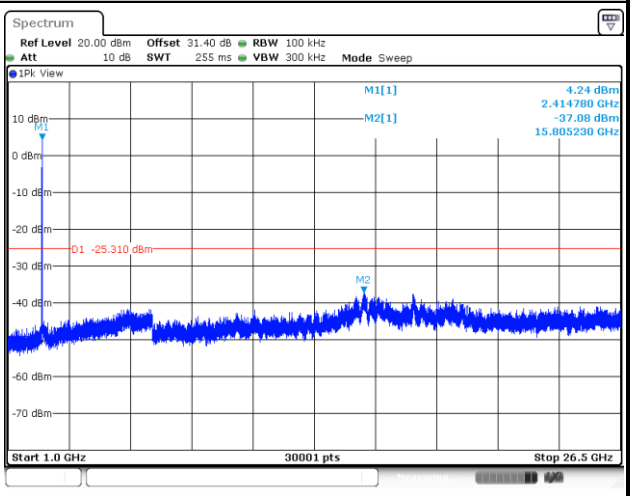
Test Mode :	802.11b	Test Channel :	12

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

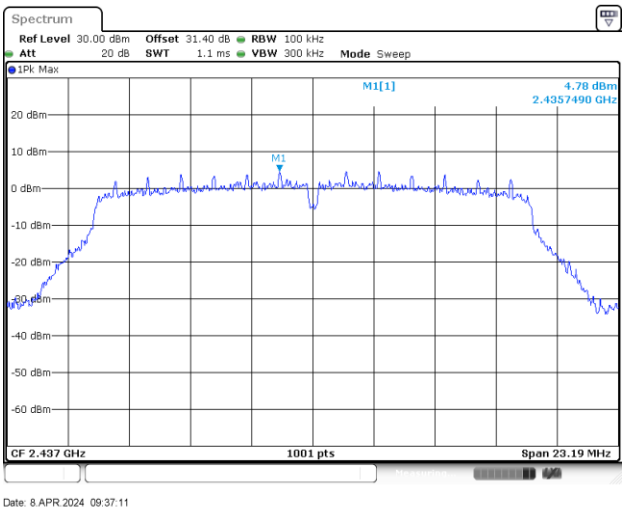
Test Mode :	802.11b	Test Channel :	13

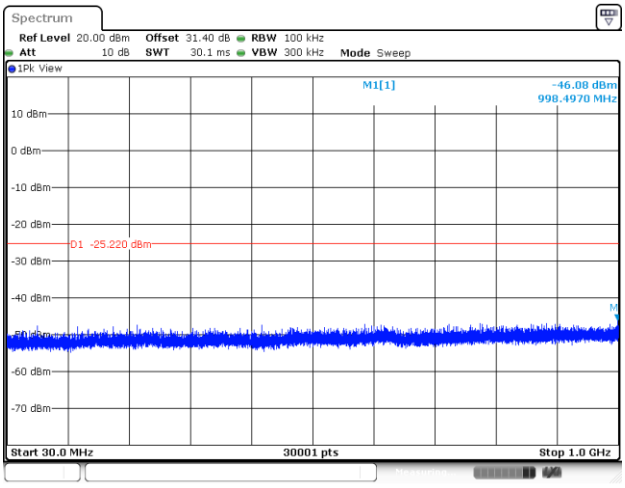
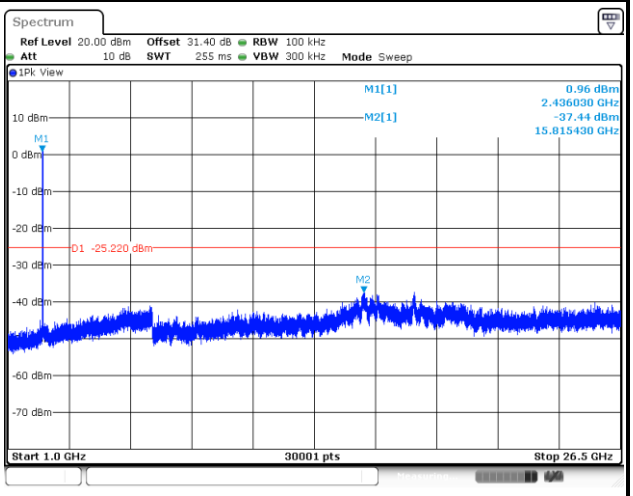
100kHz PSD reference Level	Middle Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11g	Test Channel :	01

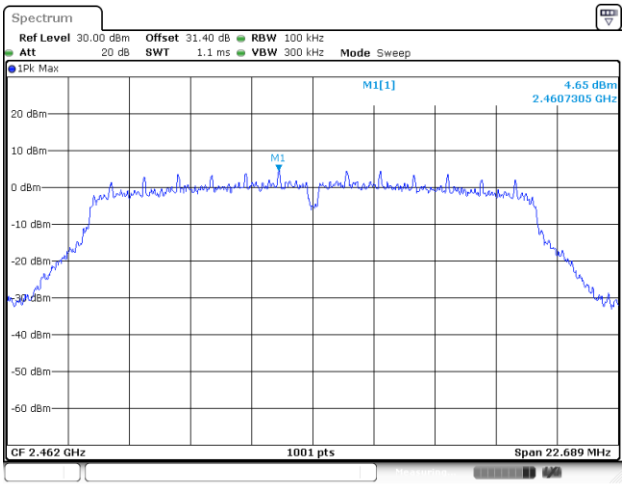
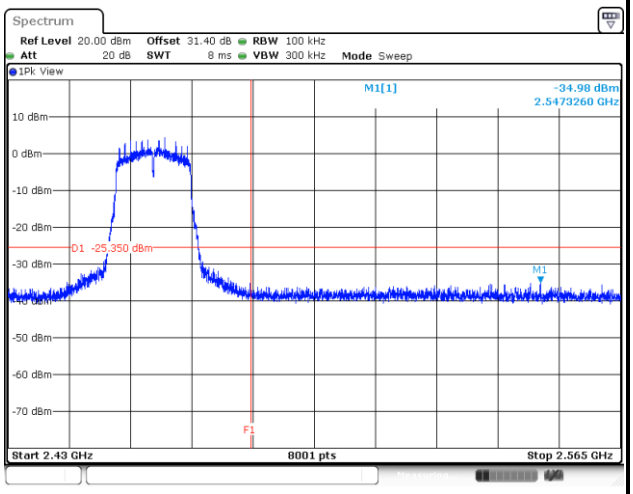
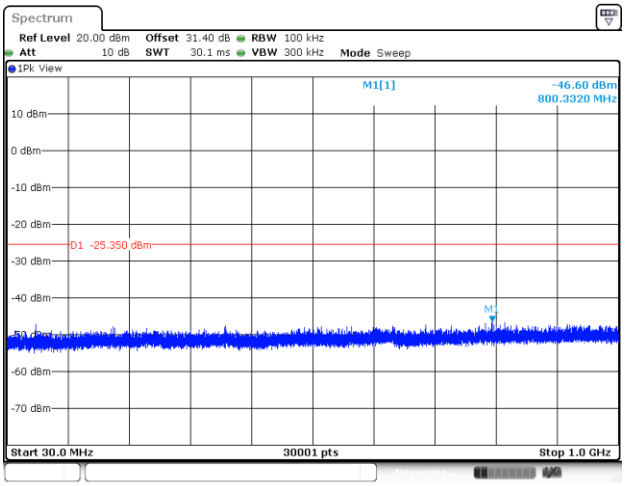
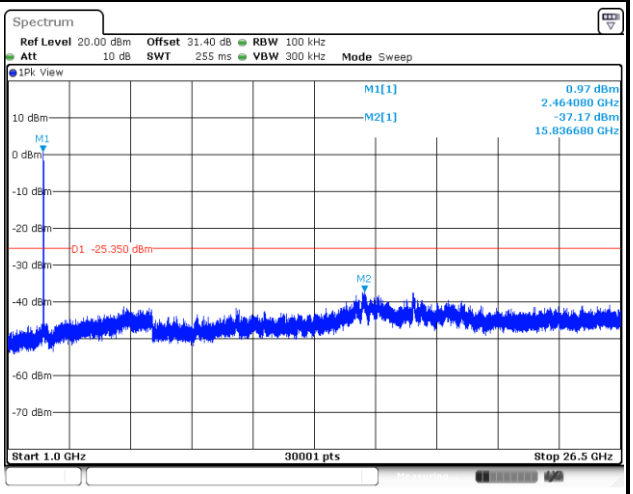
100kHz PSD reference Level	Low Channel Plot
	
Date: 8.APR.2024 09:14:45	Date: 8.APR.2024 09:17:28
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
Date: 8.APR.2024 09:16:30	Date: 8.APR.2024 09:16:51

Test Mode :	802.11g	Test Channel :	06

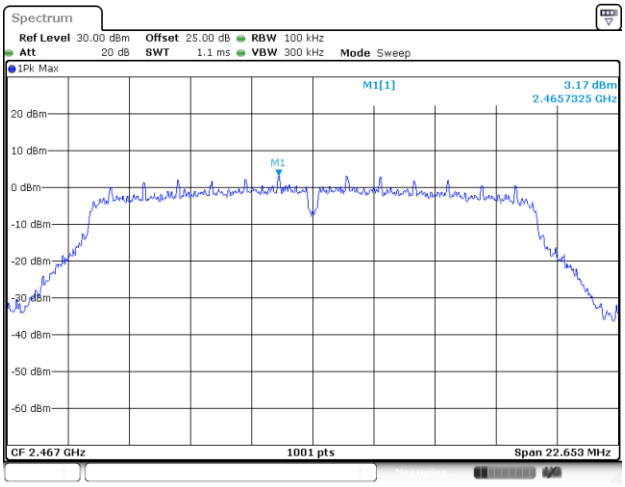
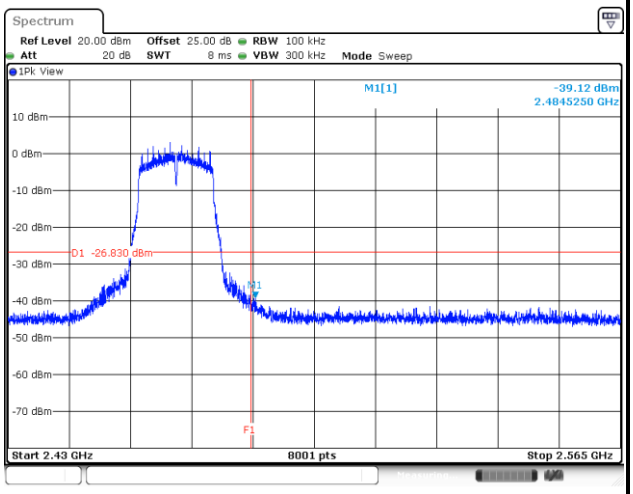
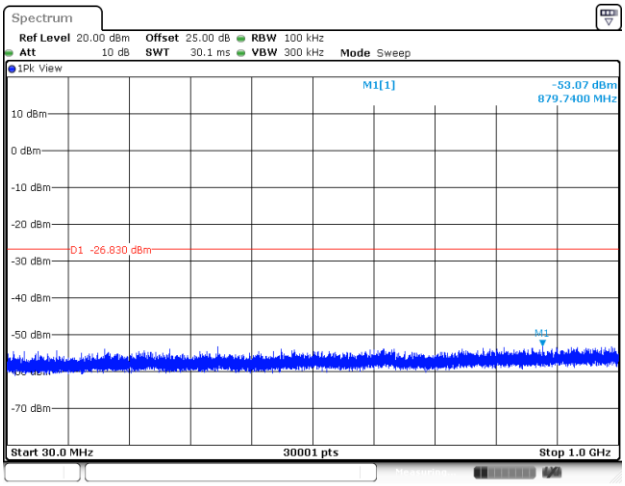
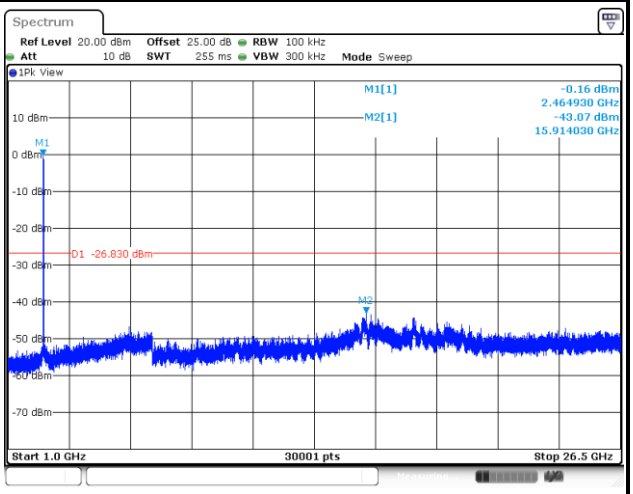
100kHz PSD reference Level	Middle Channel Plot
	

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

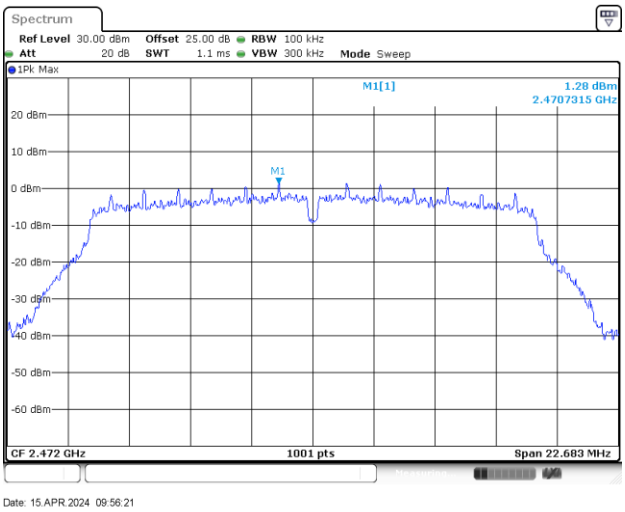
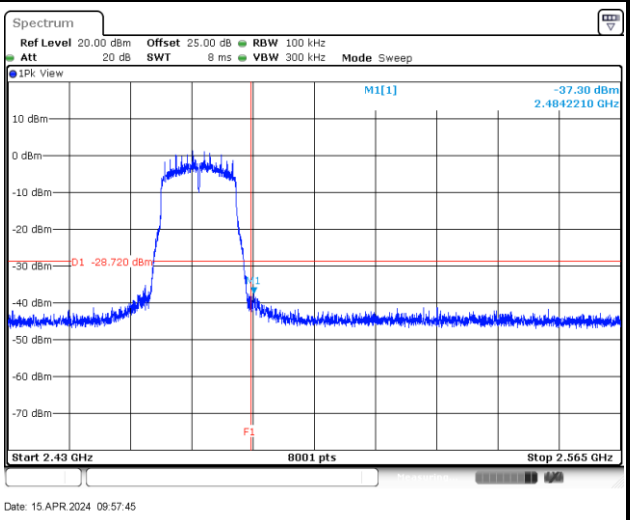
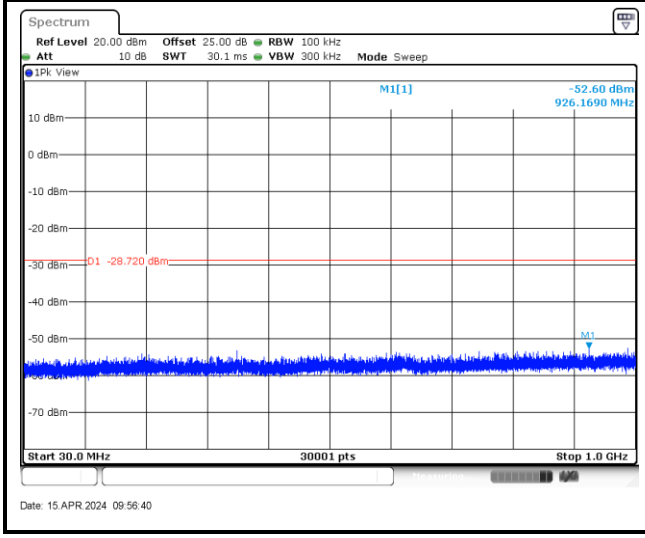
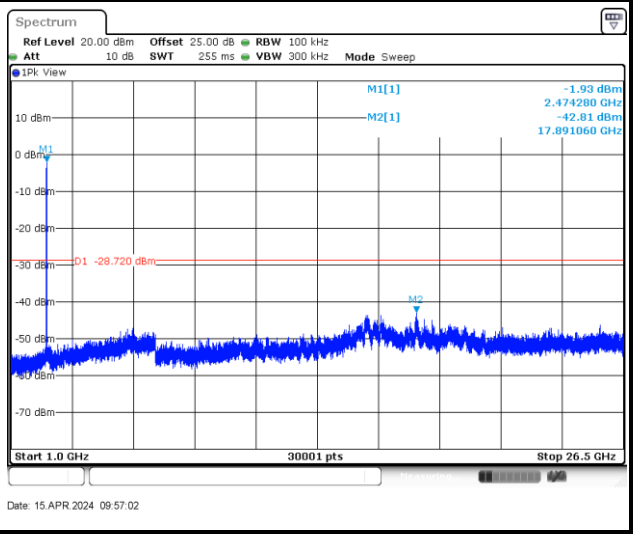
Test Mode :	802.11g	Test Channel :	11

100kHz PSD reference Level	High Channel Plot
	
Date: 8.APR.2024 11:41:23	Date: 8.APR.2024 11:44:11
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
Date: 8.APR.2024 11:41:46	Date: 8.APR.2024 11:43:50

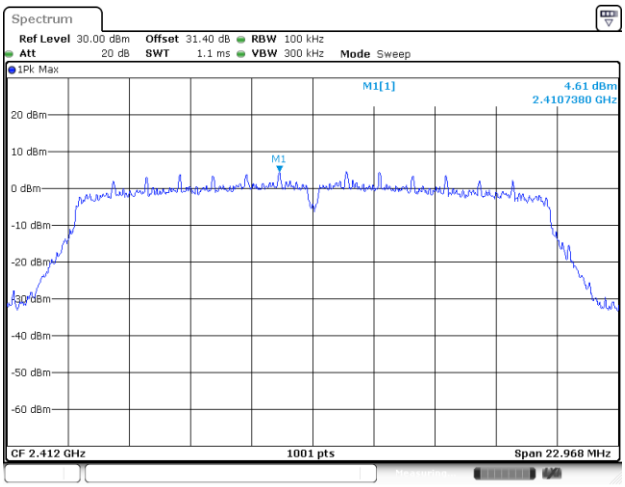
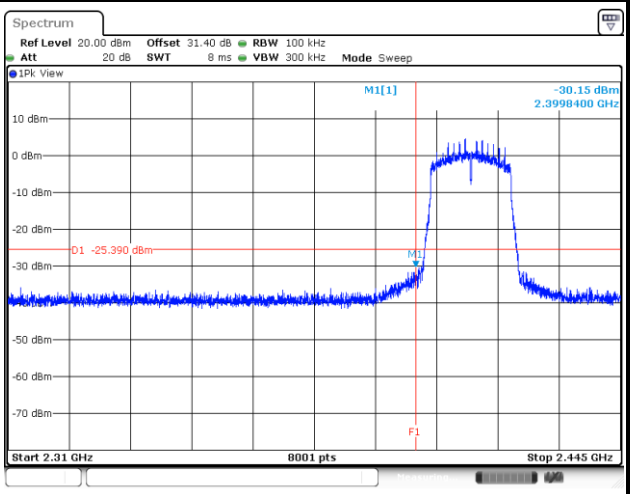
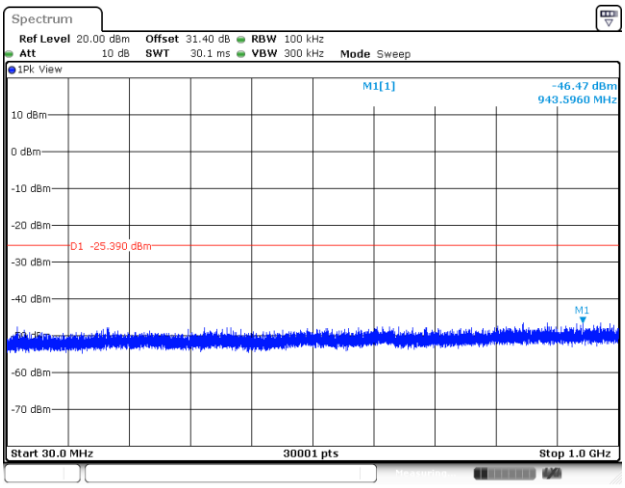
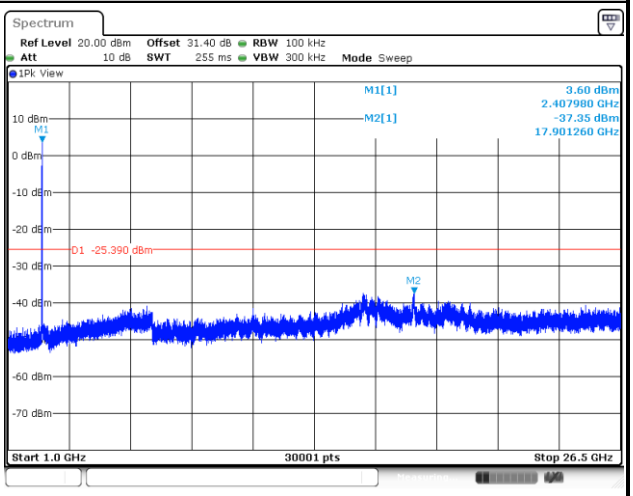
Test Mode :	802.11g	Test Channel :	12

100kHz PSD reference Level	Low Channel Plot
	
Date: 15.APR.2024 09:53:43	Date: 15.APR.2024 09:54:39
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
Date: 15.APR.2024 09:54:01	Date: 15.APR.2024 09:54:21

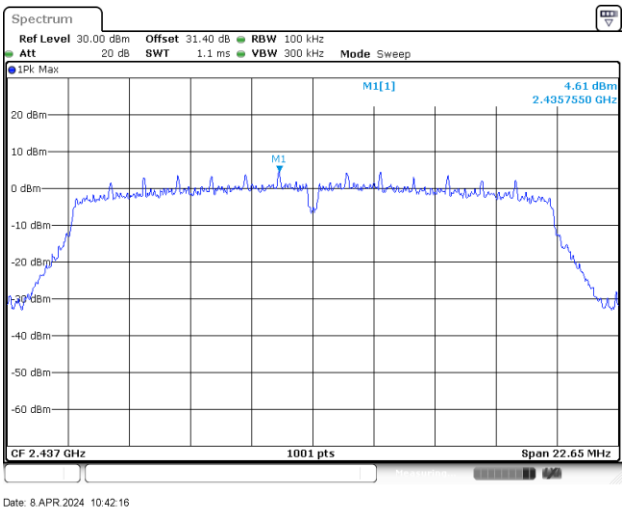
Test Mode :	802.11g	Test Channel :	13

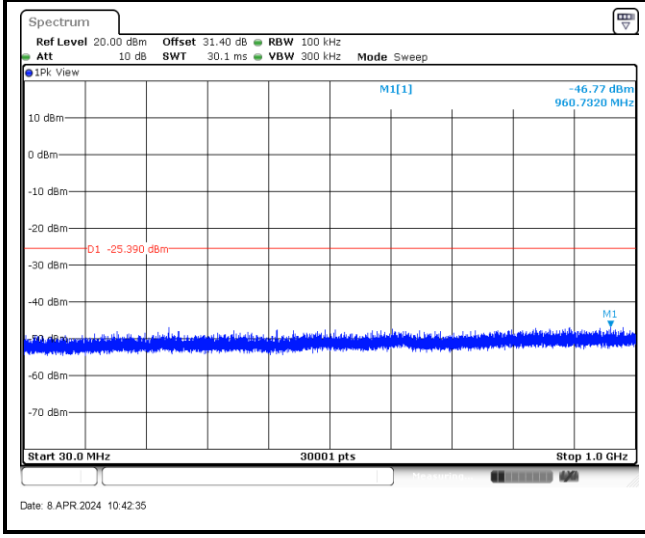
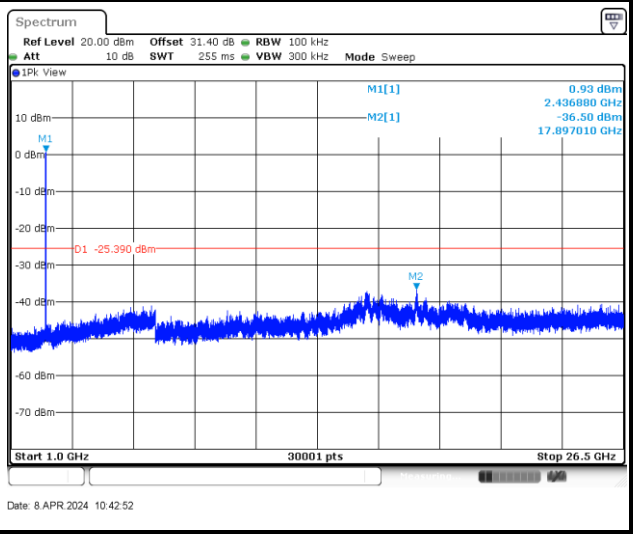
100kHz PSD reference Level	Middle Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11n HT20	Test Channel :	01

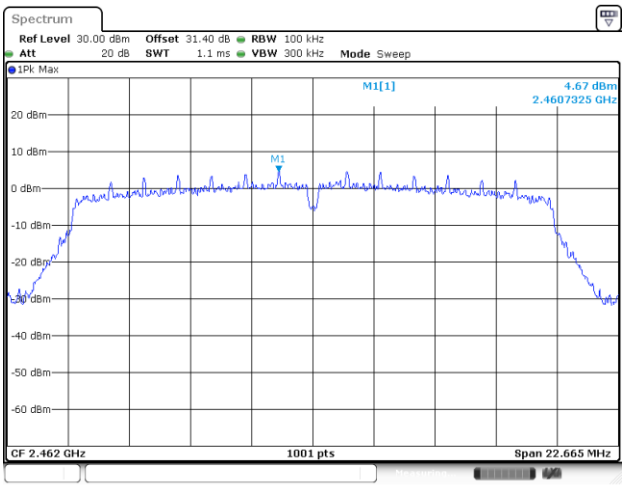
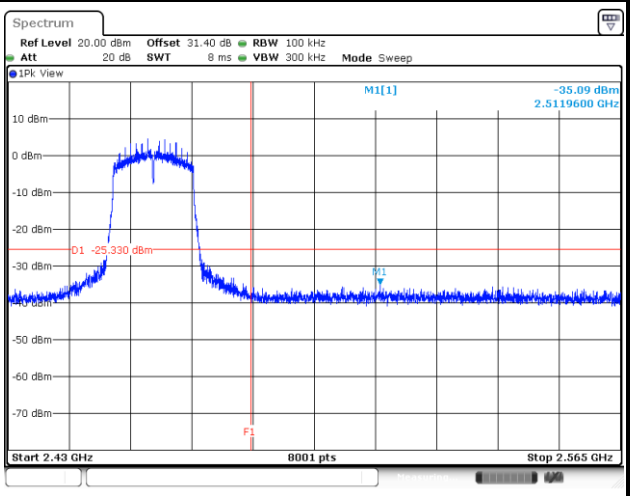
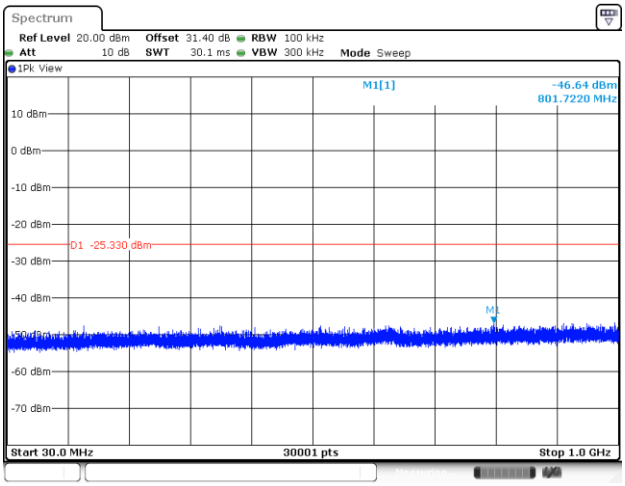
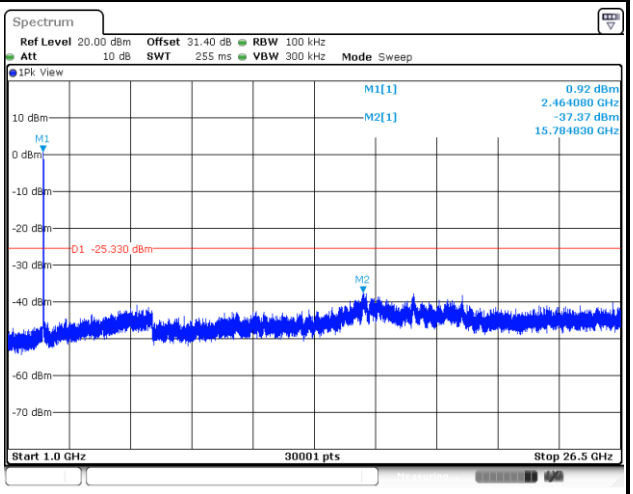
100kHz PSD reference Level	Low Channel Plot
	
Date: 8.APR.2024 10:39:59	Date: 8.APR.2024 10:41:00
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
Date: 8.APR.2024 10:40:20	Date: 8.APR.2024 10:40:41

Test Mode :	802.11n HT20	Test Channel :	06

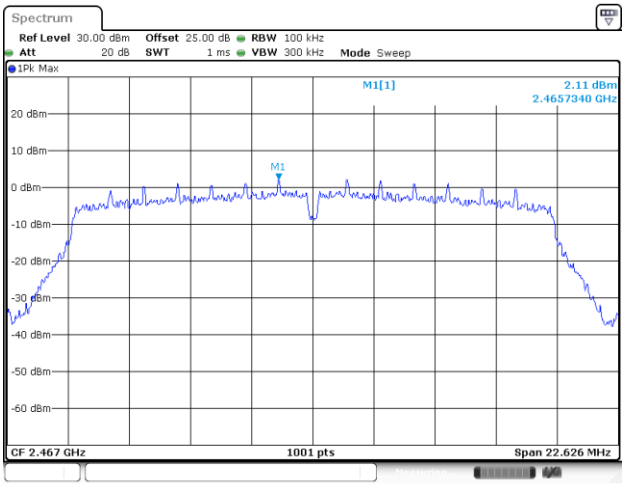
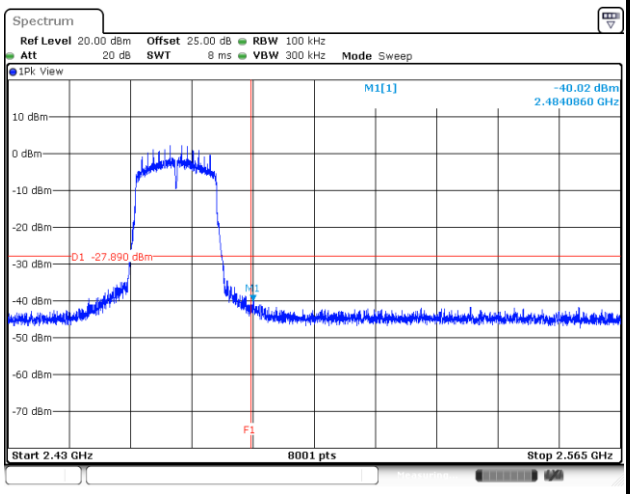
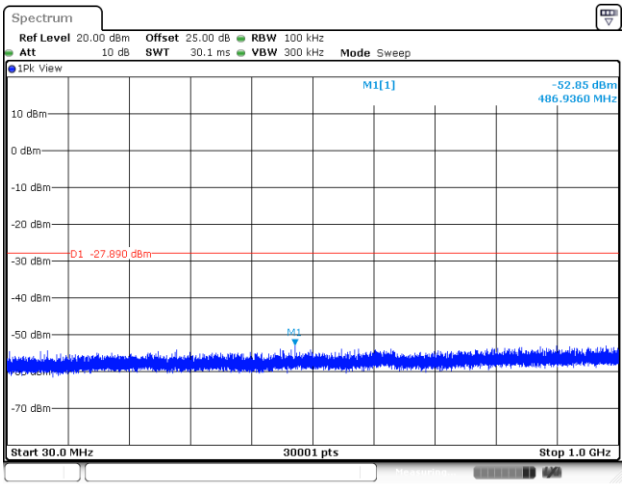
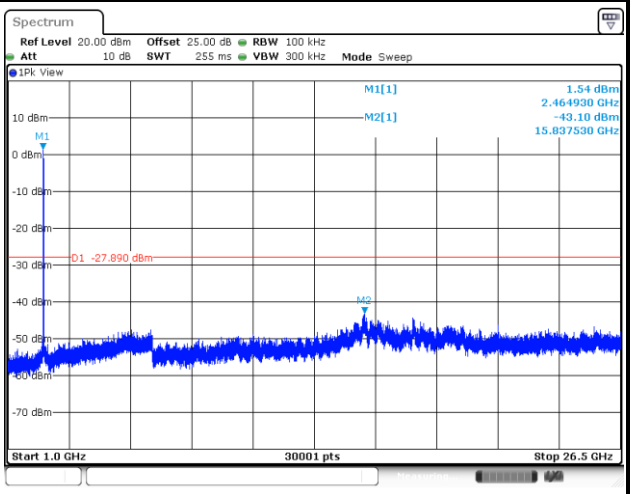
100kHz PSD reference Level	Middle Channel Plot
	

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

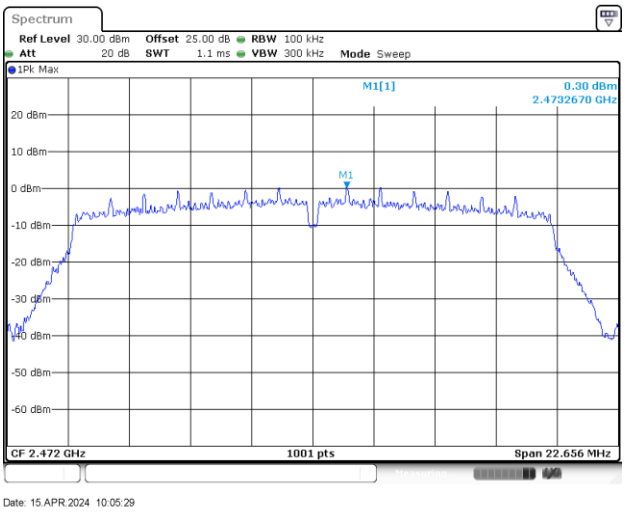
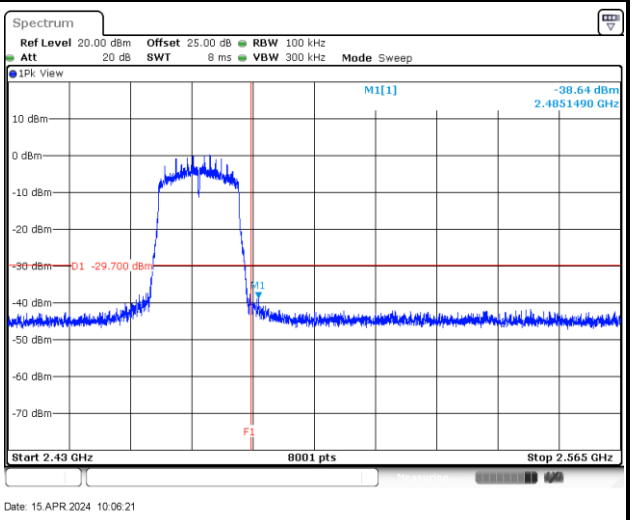
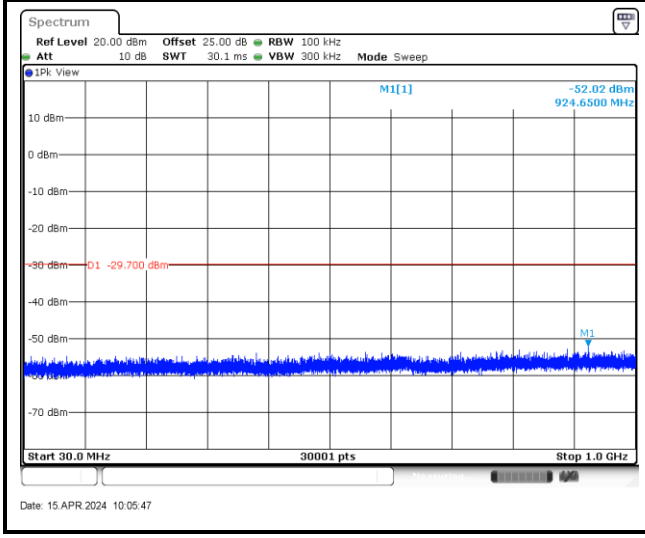
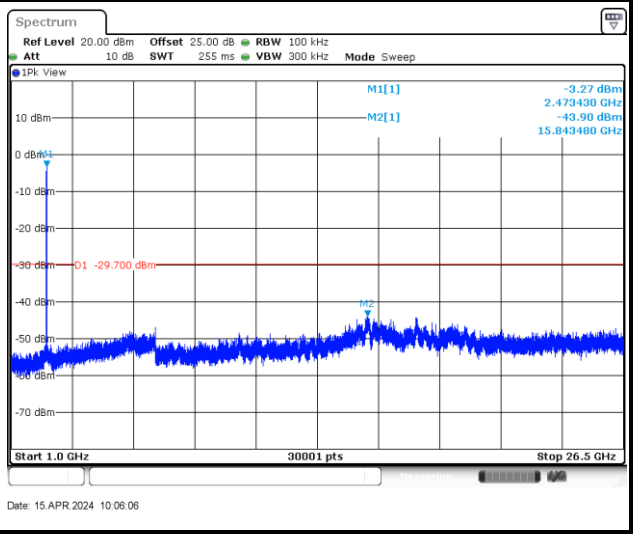
Test Mode :	802.11n HT20	Test Channel :	11

100kHz PSD reference Level	High Channel Plot
	
Date: 8.APR.2024 11:50:49	Date: 8.APR.2024 11:52:43
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
Date: 8.APR.2024 11:52:03	Date: 8.APR.2024 11:52:27

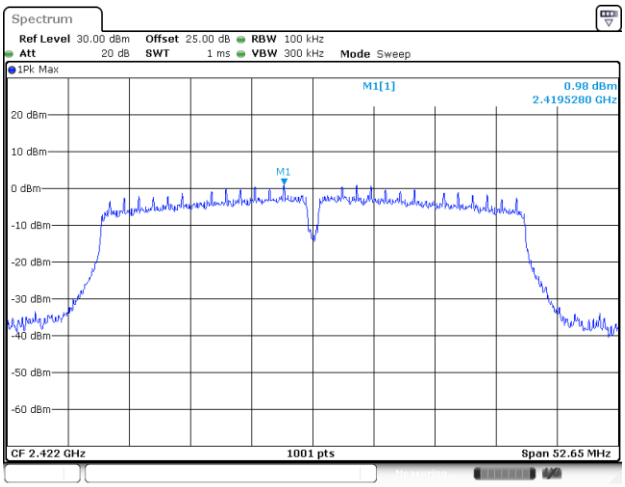
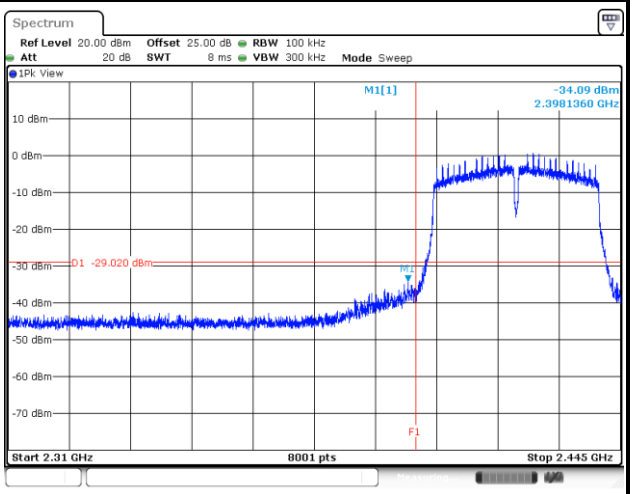
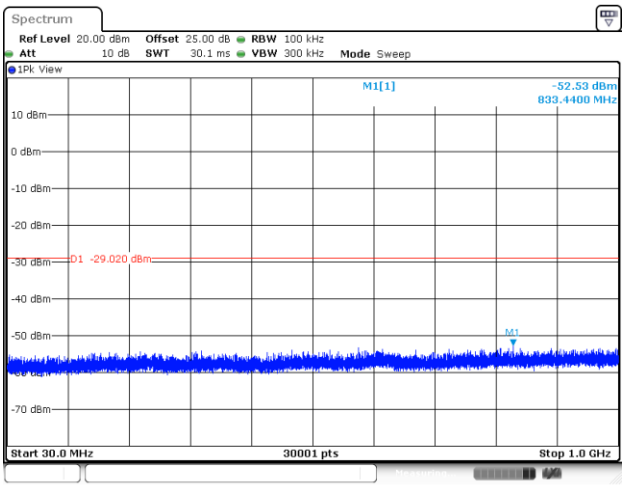
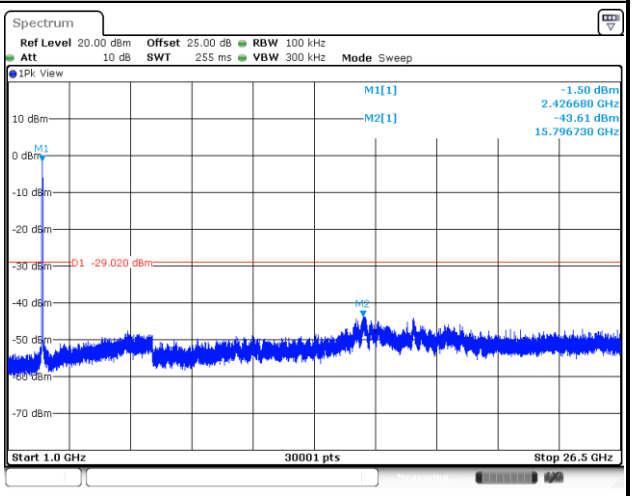
Test Mode :	802.11n HT20	Test Channel :	12

100kHz PSD reference Level	Low Channel Plot
	
Date: 15.APR.2024 10:01:43	Date: 15.APR.2024 10:03:16
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
Date: 15.APR.2024 10:02:00	Date: 15.APR.2024 10:02:26

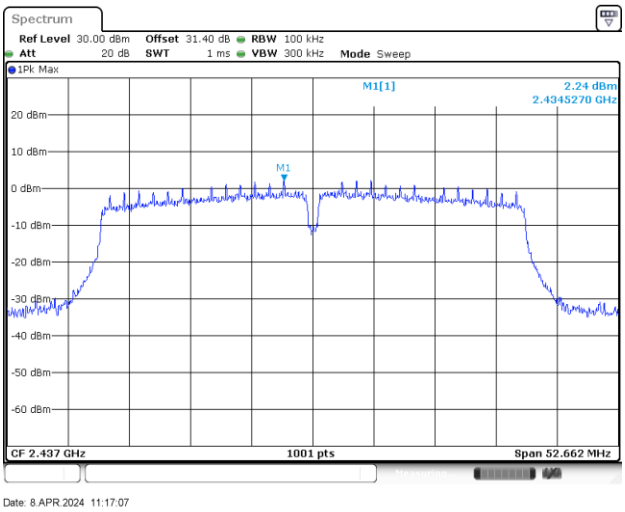
Test Mode :	802.11n HT20	Test Channel :	13

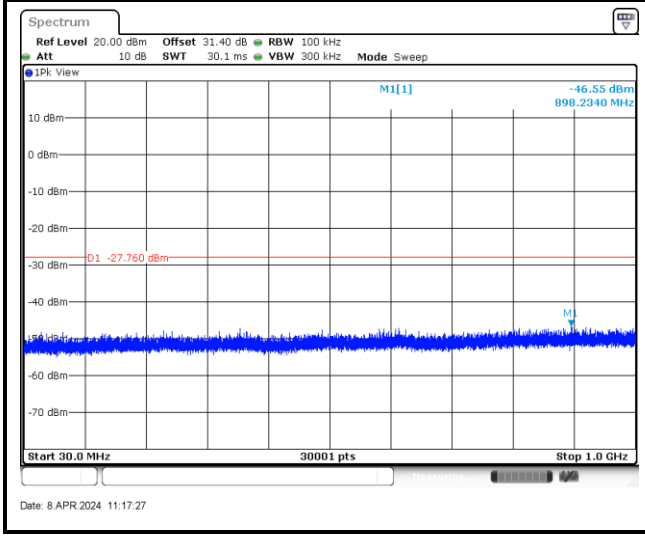
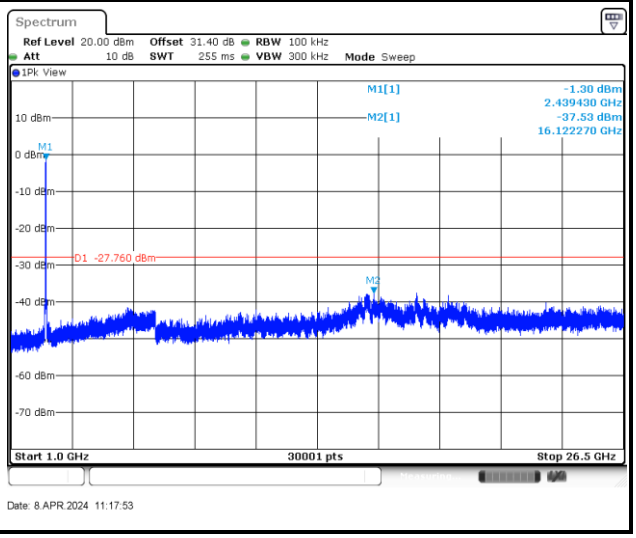
100kHz PSD reference Level	Middle Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11n HT40	Test Channel :	03

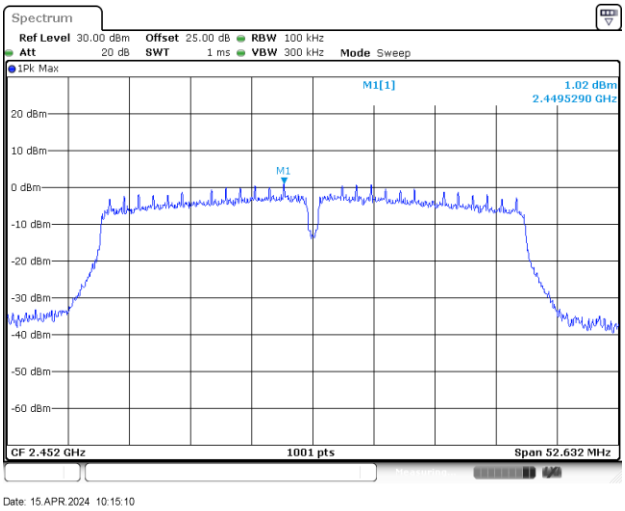
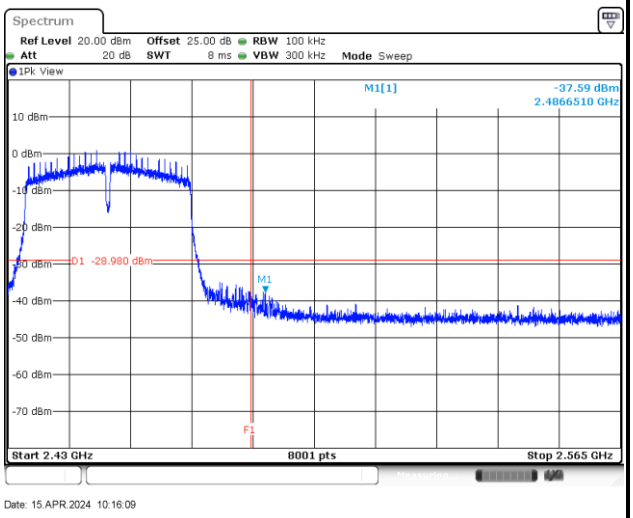
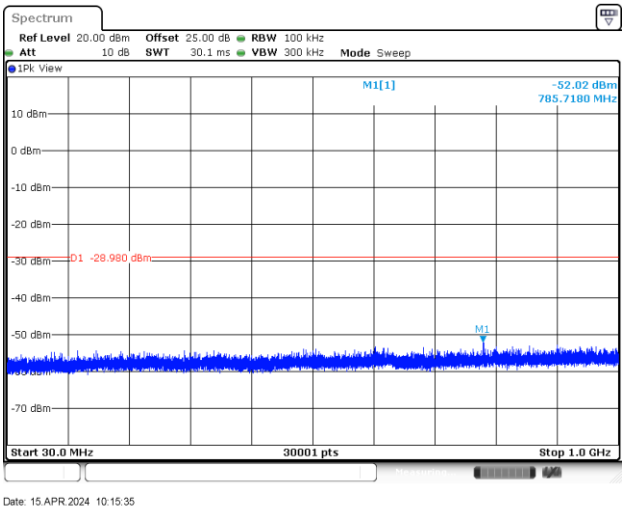
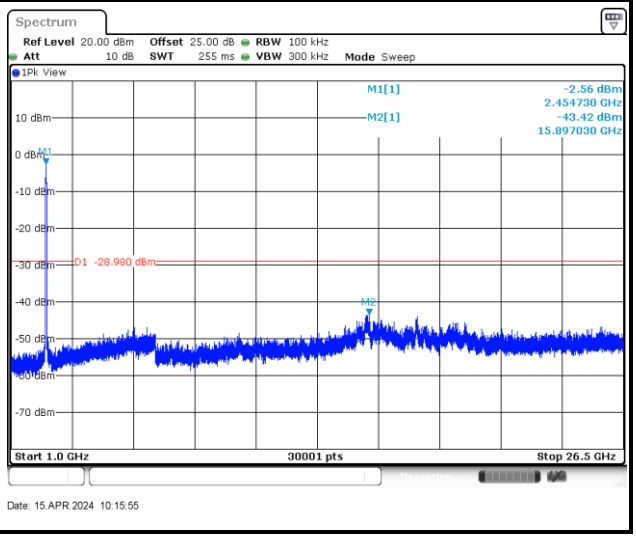
100kHz PSD reference Level	Low Channel Plot
	
Date: 15.APR.2024 10:10:31	Date: 15.APR.2024 10:11:31
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
Date: 15.APR.2024 10:10:51	Date: 15.APR.2024 10:11:11

Test Mode :	802.11n HT40	Test Channel :	06

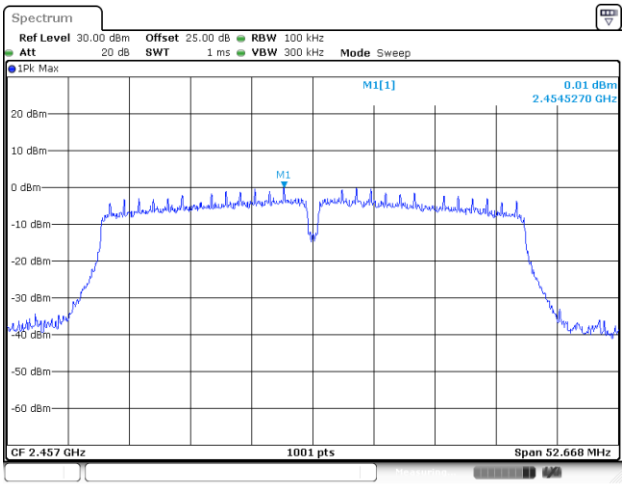
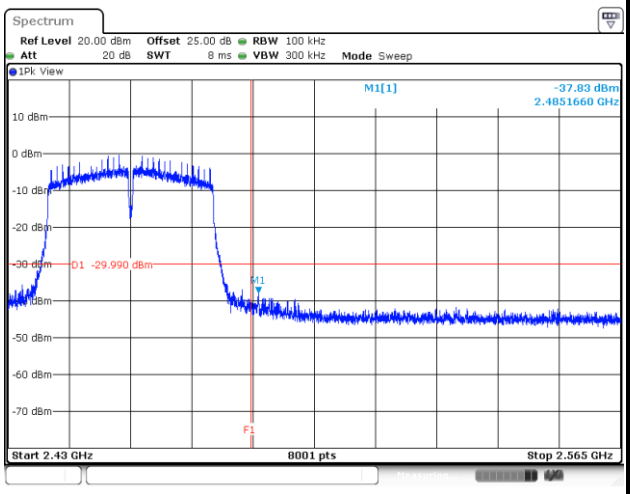
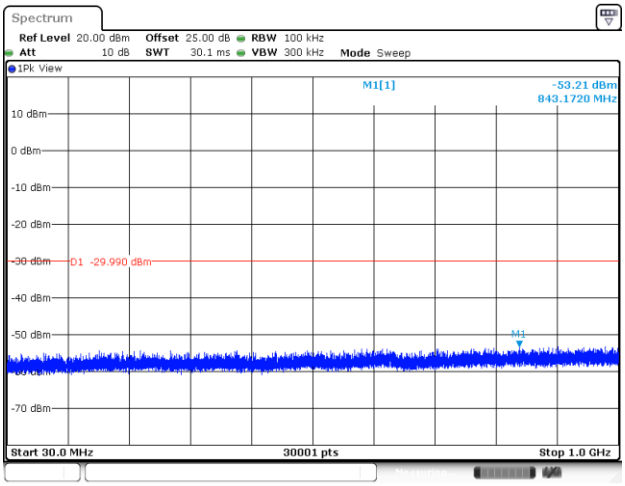
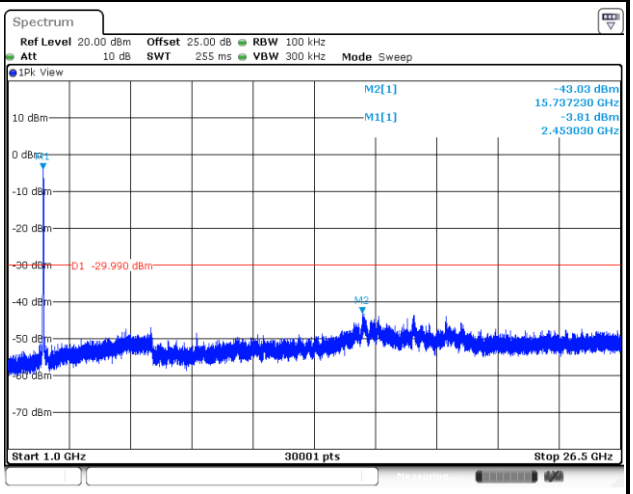
100kHz PSD reference Level	Middle Channel Plot
	

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

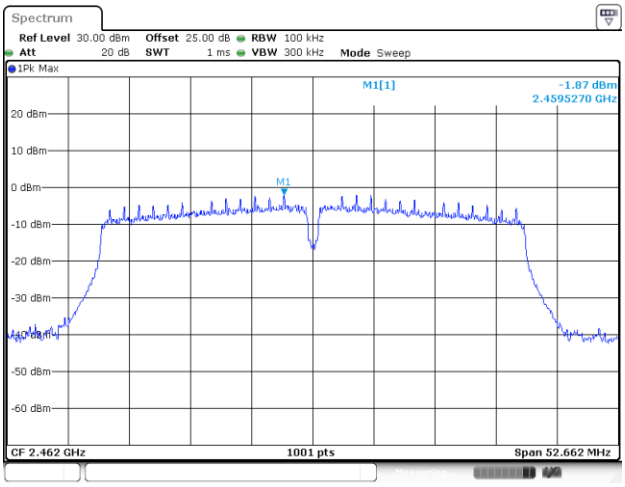
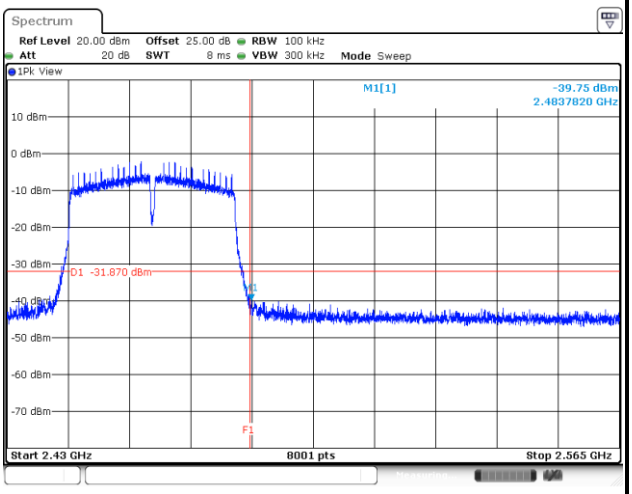
Test Mode :	802.11n HT40	Test Channel :	09

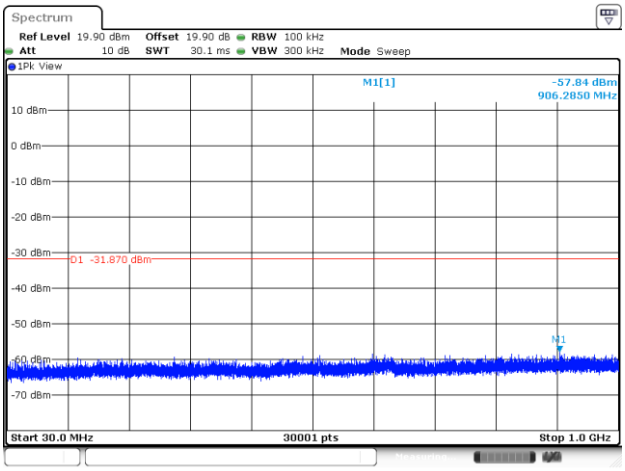
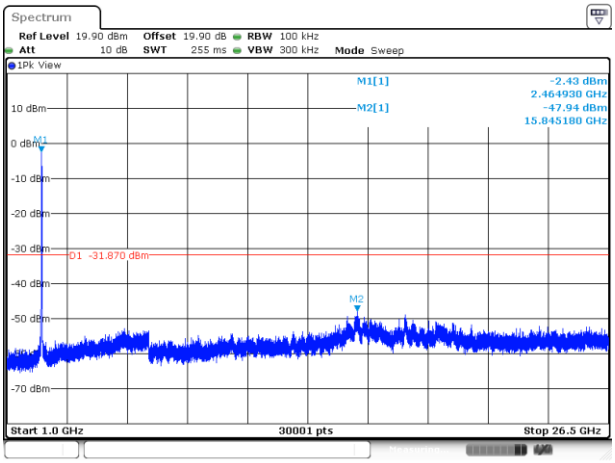
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	

Test Mode :	802.11n HT40	Test Channel :	10

100kHz PSD reference Level	Low Channel Plot
	
Date: 15.APR.2024 10:18:48	Date: 15.APR.2024 10:21:43
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	
Date: 15.APR.2024 10:20:13	Date: 15.APR.2024 10:21:11

Test Mode :	802.11n HT40	Test Channel :	11

100kHz PSD reference Level	Middle Channel Plot
	
Date: 15.APR.2024 10:26:01	Date: 15.APR.2024 10:26:21

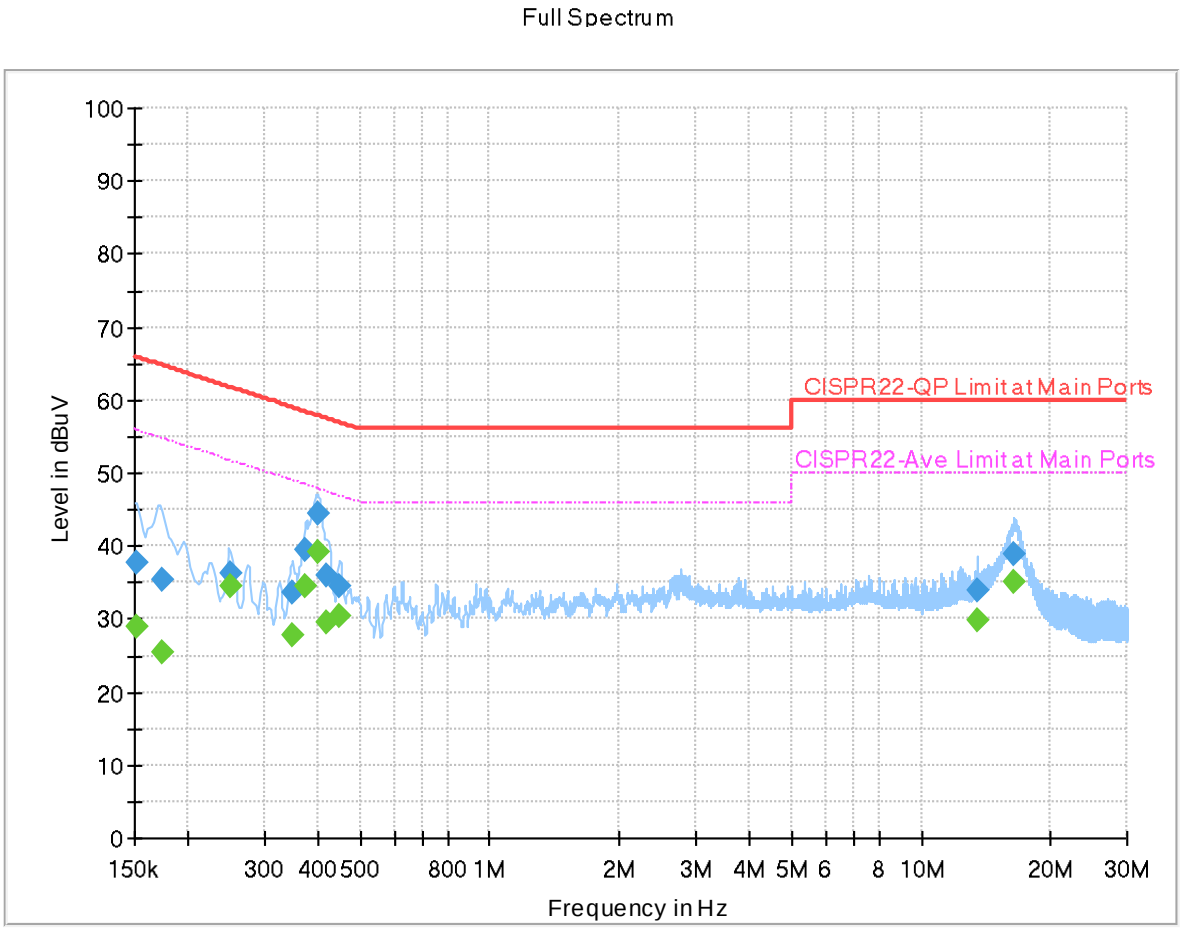
Spurious Emission 30MHz~1GHz	Spurious Emission 1GHz~26.5GHz
	
Date: 8.JUN.2024 03:55:41	Date: 8.JUN.2024 03:56:07

Appendix B. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	**Temperature :**	20.2~23.9℃
		Relative Humidity :	49.8~56.7%

EUT Information

Report NO :	431513
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line



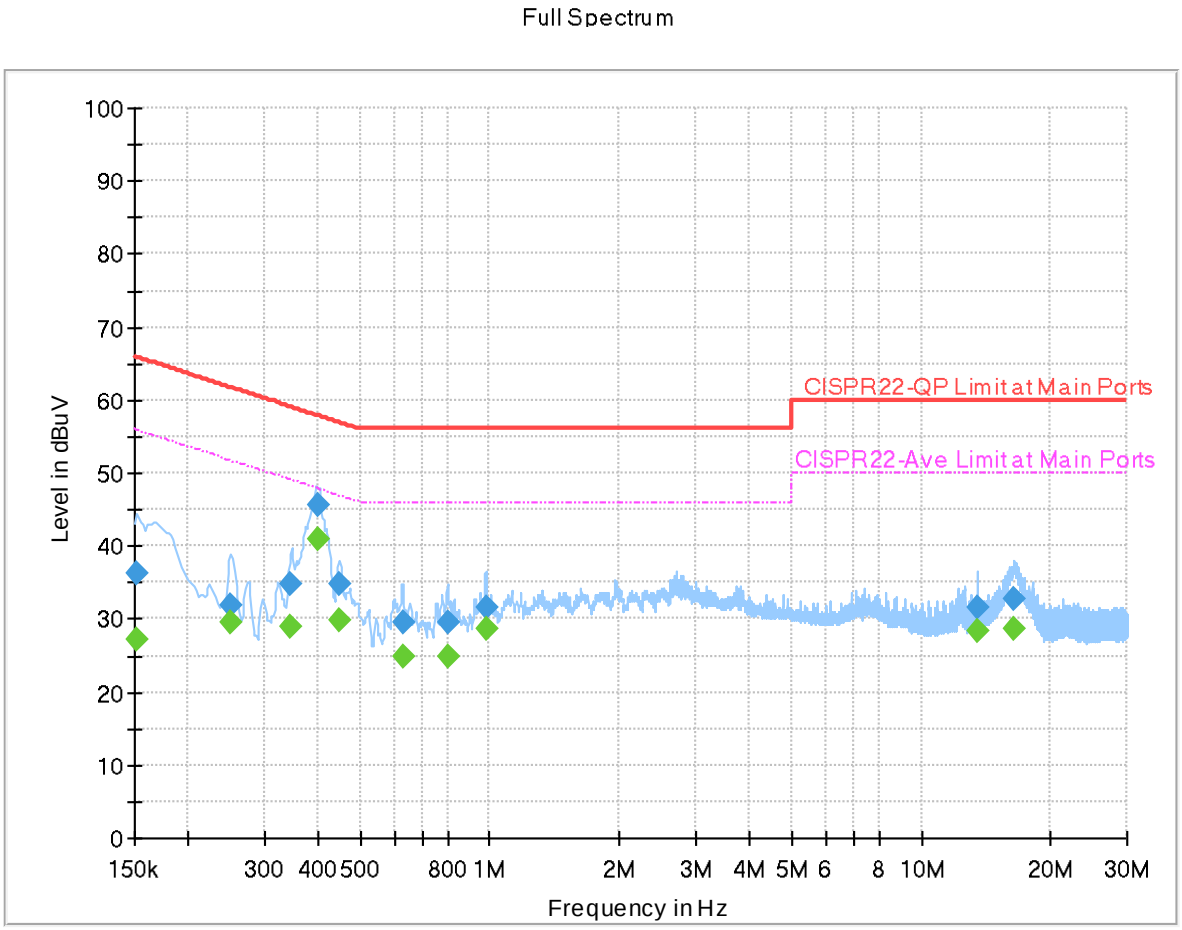
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.151283	---	28.84	55.93	27.09	L1	OFF	19.9
0.151283	37.67	---	65.93	28.26	L1	OFF	19.9
0.174570	---	25.43	54.74	29.31	L1	OFF	19.9
0.174570	35.37	---	64.74	29.37	L1	OFF	19.9
0.250530	---	34.42	51.74	17.32	L1	OFF	19.9
0.250530	36.23	---	61.74	25.51	L1	OFF	19.9
0.347100	---	27.92	49.03	21.11	L1	OFF	19.9
0.347100	33.71	---	59.03	25.32	L1	OFF	19.9
0.374820	---	34.46	48.39	13.93	L1	OFF	19.9
0.374820	39.57	---	58.39	18.82	L1	OFF	19.9
0.397590	---	39.24	47.90	8.66	L1	OFF	19.9
0.397590	44.54	---	57.90	13.36	L1	OFF	19.9
0.420180	---	29.59	47.45	17.86	L1	OFF	19.9
0.420180	35.91	---	57.45	21.54	L1	OFF	19.9
0.447900	---	30.29	46.91	16.62	L1	OFF	19.9
0.447900	34.56	---	56.91	22.35	L1	OFF	19.9
13.559550	---	29.90	50.00	20.10	L1	OFF	20.1
13.559550	34.02	---	60.00	25.98	L1	OFF	20.1
16.446120	---	34.95	50.00	15.05	L1	OFF	20.1

16.446120	**39.00**	**---**	**60.00**	**21.00**	**L1**	**OFF**	**20.1**

EUT Information

Report NO :	431513
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.151170	---	27.29	55.94	28.65	N	OFF	19.9
0.151170	36.36	---	65.94	29.58	N	OFF	19.9
0.251520	---	29.39	51.71	22.32	N	OFF	19.9
0.251520	32.01	---	61.71	29.70	N	OFF	19.9
0.346290	---	29.00	49.05	20.05	N	OFF	19.9
0.346290	34.87	---	59.05	24.18	N	OFF	19.9
0.399660	---	41.05	47.86	6.81	N	OFF	19.9
0.399660	45.73	---	57.86	12.13	N	OFF	19.9
0.447540	---	29.81	46.92	17.11	N	OFF	19.9
0.447540	34.66	---	56.92	22.26	N	OFF	19.9
0.629520	---	24.91	46.00	21.09	N	OFF	19.9
0.629520	29.65	---	56.00	26.35	N	OFF	19.9
0.799440	---	24.85	46.00	21.15	N	OFF	19.9
0.799440	29.56	---	56.00	26.44	N	OFF	19.9
0.979440	---	28.70	46.00	17.30	N	OFF	19.9
0.979440	31.62	---	56.00	24.38	N	OFF	19.9
13.560180	---	28.28	50.00	21.72	N	OFF	20.1
13.560180	31.57	---	60.00	28.43	N	OFF	20.1
16.443060	---	28.53	50.00	21.47	N	OFF	20.2

16.443060	**32.77**	**---**	**60.00**	**27.23**	**N**	**OFF**	**20.2**

Appendix C. Radiated Spurious Emission

Test Engineer :	Bill Chang, Gary Guo, and Steven Wu	Temperature :	18.2~20.2°C
		Relative Humidity :	54.2~56.1%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Margin	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2385.81	55.89	-18.11	74	40.79	27.4	17.61	29.91	262	233	P	H
		2386.23	44.95	-9.05	54	29.85	27.4	17.61	29.91	262	233	A	H
	*	2412	101.45	-	-	86.22	27.5	17.64	29.91	262	233	P	H
	*	2412	98.51	-	-	83.28	27.5	17.64	29.91	262	233	A	H
													H
		2352.735	55.75	-18.25	74	40.72	27.4	17.55	29.92	202	188	P	V
		2386.335	44.81	-9.19	54	29.71	27.4	17.61	29.91	202	188	A	V
	*	2412	98.21	-	-	82.98	27.5	17.64	29.91	202	188	P	V
	*	2412	95.24	-	-	80.01	27.5	17.64	29.91	202	188	A	V
													V
802.11b CH 06 2437MHz		2353.82	55.95	-18.05	74	40.92	27.4	17.55	29.92	257	236	P	H
		2381.96	44.78	-9.22	54	29.7	27.4	17.6	29.92	257	236	A	H
	*	2437	102.62	-	-	87.27	27.6	17.65	29.9	257	236	P	H
	*	2437	99.67	-	-	84.32	27.6	17.65	29.9	257	236	A	H
		2497.76	56.12	-17.88	74	40.34	27.98	17.68	29.88	257	236	P	H
		2486.21	45.54	-8.46	54	29.88	27.86	17.68	29.88	257	236	A	H
		2352.14	55.46	-18.54	74	40.43	27.4	17.55	29.92	171	198	P	V
		2385.6	44.75	-9.25	54	29.66	27.4	17.6	29.91	171	198	A	V
	*	2437	99.01	-	-	83.66	27.6	17.65	29.9	171	198	P	V
	*	2437	95.91	-	-	80.56	27.6	17.65	29.9	171	198	A	V
		2490.13	55.89	-18.11	74	40.19	27.9	17.68	29.88	171	198	P	V
		2497.97	45.45	-8.55	54	29.67	27.98	17.68	29.88	171	198	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 11 2462MHz	*	2462	103.15	-	-	87.66	27.72	17.66	29.89	290	232	P	H
	*	2462	99.88	-	-	84.39	27.72	17.66	29.89	290	232	A	H
		2490.88	55.99	-18.01	74	40.28	27.91	17.68	29.88	290	232	P	H
		2494.84	45.44	-8.56	54	29.69	27.95	17.68	29.88	290	232	A	H
													H
													H
	*	2462	99.71	-	-	84.22	27.72	17.66	29.89	206	187	P	V
	*	2462	96.41	-	-	80.92	27.72	17.66	29.89	206	187	A	V
		2494.96	56.75	-17.25	74	41	27.95	17.68	29.88	206	187	P	V
		2499.36	45.42	-8.58	54	29.63	27.99	17.68	29.88	206	187	A	V
													V
													V
802.11b CH 12 2467MHz	*	2467	102.94	-	-	87.39	27.77	17.67	29.89	173	232	P	H
	*	2467	99.86	-	-	84.31	27.77	17.67	29.89	173	232	A	H
		2491.12	56.53	-17.47	74	40.82	27.91	17.68	29.88	173	232	P	H
		2483.92	47.02	-6.98	54	31.38	27.84	17.68	29.88	173	232	A	H
													H
													H
	*	2467	100	-	-	84.45	27.77	17.67	29.89	226	188	P	V
	*	2467	96.92	-	-	81.37	27.77	17.67	29.89	226	188	A	V
		2499.68	56.42	-17.58	74	40.62	28	17.68	29.88	226	188	P	V
		2483.92	46.25	-7.75	54	30.61	27.84	17.68	29.88	226	188	A	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 13 2472MHz	*	2472	102.67	-	-	87.09	27.8	17.67	29.89	193	235	P	H
	*	2472	99.52	-	-	83.94	27.8	17.67	29.89	193	235	A	H
		2487.52	57.06	-16.94	74	41.38	27.88	17.68	29.88	193	235	P	H
		2484.6	48.51	-5.49	54	32.86	27.85	17.68	29.88	193	235	A	H
													H
													H
	*	2472	99.66	-	-	84.08	27.8	17.67	29.89	139	153	P	V
	*	2472	96.53	-	-	80.95	27.8	17.67	29.89	139	153	A	V
		2484.52	56.94	-17.06	74	41.29	27.85	17.68	29.88	139	153	P	V
		2484.6	46.69	-7.31	54	31.04	27.85	17.68	29.88	139	153	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	53.87	-20.13	74	76.33	32.5	11.17	66.13	368	241	P	H
		4824	51.84	-2.16	54	74.3	32.5	11.17	66.13	368	241	A	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	51.77	-22.23	74	74.23	32.5	11.17	66.13	251	140	P	V
		4824	49.11	-4.89	54	71.57	32.5	11.17	66.13	251	140	A	V
													V
													V
													V
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													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 06 2437MHz		4874	52.24	-21.76	74	74.27	32.7	11.3	66.03	357	214	P	H
		4874	50.31	-3.69	54	72.34	32.7	11.3	66.03	357	214	A	H
		7311	45.21	-28.79	74	59.98	36.88	13.8	65.45	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4874	51.35	-22.65	74	73.38	32.7	11.3	66.03	330	143	P	V
		4874	49.18	-4.82	54	71.21	32.7	11.3	66.03	330	143	A	V
		7311	43.65	-30.35	74	58.42	36.88	13.8	65.45	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 11 2462MHz		4924	49.01	-24.99	74	70.61	32.9	11.44	65.94	400	244	P	H
		4924	46.4	-7.6	54	68	32.9	11.44	65.94	400	244	A	H
		7386	43.97	-30.03	74	59.03	36.58	13.82	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4924	48.57	-25.43	74	70.17	32.9	11.44	65.94	400	191	P	V
		4924	45.49	-8.51	54	67.09	32.9	11.44	65.94	400	191	A	V
		7386	43.51	-30.49	74	58.57	36.58	13.82	65.46	-	-	P	V
													V
													V
													V
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													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 12 2467MHz		4934	48.68	-25.32	74	70.19	32.94	11.47	65.92	306	196	P	H
		4934	45.12	-8.88	54	66.63	32.94	11.47	65.92	306	196	A	H
		7401	43.63	-30.37	74	58.76	36.5	13.83	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4934	47.8	-26.2	74	69.31	32.94	11.47	65.92	283	219	P	V
		4934	43.66	-10.34	54	65.17	32.94	11.47	65.92	283	219	A	V
		7401	43.93	-30.07	74	59.06	36.5	13.83	65.46	-	-	P	V
													V
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													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 13 2472MHz		4944	48.44	-25.56	74	69.87	32.98	11.49	65.9	307	196	P	H
		4944	44.96	-9.04	54	66.39	32.98	11.49	65.9	307	196	A	H
		7416	43.9	-30.1	74	59	36.5	13.86	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4944	47.2	-26.8	74	68.63	32.98	11.49	65.9	284	220	P	V
		4944	43.45	-10.55	54	64.88	32.98	11.49	65.9	284	220	A	V
		7416	43.57	-30.43	74	58.67	36.5	13.86	65.46	-	-	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	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		2389.8	57.52	-16.48	74	42.42	27.4	17.61	29.91	160	242	P	H
		2390	46.8	-7.2	54	31.7	27.4	17.61	29.91	160	242	A	H
	*	2412	103.06	-	-	87.83	27.5	17.64	29.91	160	242	P	H
	*	2412	95.5	-	-	80.27	27.5	17.64	29.91	160	242	A	H
													H
													H
		2380.14	55.31	-18.69	74	40.23	27.4	17.6	29.92	217	190	P	V
		2390	45.52	-8.48	54	30.42	27.4	17.61	29.91	217	190	A	V
	*	2412	99.03	-	-	83.8	27.5	17.64	29.91	217	190	P	V
	*	2412	91.59	-	-	76.36	27.5	17.64	29.91	217	190	A	V
													V
													V
802.11g CH 06 2437MHz		2376.22	55.82	-18.18	74	40.75	27.4	17.59	29.92	151	236	P	H
		2389.94	45.01	-8.99	54	29.91	27.4	17.61	29.91	151	236	A	H
	*	2437	104.95	-	-	89.6	27.6	17.65	29.9	151	236	P	H
	*	2437	97.71	-	-	82.36	27.6	17.65	29.9	151	236	A	H
		2486.98	56.37	-17.63	74	40.7	27.87	17.68	29.88	151	236	P	H
		2486.28	45.82	-8.18	54	30.16	27.86	17.68	29.88	151	236	A	H
		2361.38	55.84	-18.16	74	40.8	27.4	17.56	29.92	273	241	P	V
		2388.82	44.9	-9.1	54	29.8	27.4	17.61	29.91	273	241	A	V
	*	2437	100.04	-	-	84.69	27.6	17.65	29.9	273	241	P	V
	*	2437	92.75	-	-	77.4	27.6	17.65	29.9	273	241	A	V
		2499.79	56.17	-17.83	74	40.37	28	17.68	29.88	273	241	P	V
		2497.69	45.7	-8.3	54	29.92	27.98	17.68	29.88	273	241	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 11 2462MHz	*	2462	104.27	-	-	88.78	27.72	17.66	29.89	193	237	P	H
	*	2462	97.03	-	-	81.54	27.72	17.66	29.89	193	237	A	H
		2483.72	62.14	-11.86	74	46.5	27.84	17.68	29.88	193	237	P	H
		2483.52	48.08	-5.92	54	32.44	27.84	17.68	29.88	193	237	A	H
													H
													H
	*	2462	101.51	-	-	86.02	27.72	17.66	29.89	251	194	P	V
	*	2462	93.95	-	-	78.46	27.72	17.66	29.89	251	194	A	V
		2483.56	58.99	-15.01	74	43.35	27.84	17.68	29.88	251	194	P	V
		2483.52	46.97	-7.03	54	31.33	27.84	17.68	29.88	251	194	A	V
													V
													V
802.11g CH 12 2467MHz	*	2467	105.3	-	-	89.75	27.77	17.67	29.89	252	237	P	H
	*	2467	97.73	-	-	82.18	27.77	17.67	29.89	252	237	A	H
		2484.04	69	-5	74	53.36	27.84	17.68	29.88	252	237	P	H
		2483.52	52.77	-1.23	54	37.13	27.84	17.68	29.88	252	237	A	H
													H
													H
	*	2467	99.41	-	-	83.86	27.77	17.67	29.89	191	158	P	V
	*	2467	91.77	-	-	76.22	27.77	17.67	29.89	191	158	A	V
		2483.88	64.8	-9.2	74	49.16	27.84	17.68	29.88	191	158	P	V
		2483.52	49.87	-4.13	54	34.23	27.84	17.68	29.88	191	158	A	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 13 2472MHz	*	2472	102.97	-	-	87.39	27.8	17.67	29.89	282	239	P	H
	*	2472	95.12	-	-	79.54	27.8	17.67	29.89	282	239	A	H
		2484.68	67.59	-6.41	74	51.94	27.85	17.68	29.88	282	239	P	H
		2484.04	52.97	-1.03	54	37.33	27.84	17.68	29.88	282	239	A	H
													H
													H
	*	2472	98.34	-	-	82.76	27.8	17.67	29.89	195	161	P	V
	*	2472	90.94	-	-	75.36	27.8	17.67	29.89	195	161	A	V
		2483.56	64.8	-9.2	74	49.16	27.84	17.68	29.88	195	161	P	V
		2484.12	50.48	-3.52	54	34.84	27.84	17.68	29.88	195	161	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	49.51	-24.49	74	71.97	32.5	11.17	66.13	392	242	P	H
		4824	37.79	-16.21	54	60.25	32.5	11.17	66.13	392	242	A	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	48.28	-25.72	74	70.74	32.5	11.17	66.13	294	145	P	V
		4824	36.74	-17.26	54	59.2	32.5	11.17	66.13	294	145	A	V
													V
													V
													V
													V
													V
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													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 06 2437MHz		4874	48.63	-25.37	74	70.66	32.7	11.3	66.03	363	243	P	H
		4874	36.98	-17.02	54	59.01	32.7	11.3	66.03	363	243	A	H
		7311	45.25	-28.75	74	60.02	36.88	13.8	65.45	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4874	48.72	-25.28	74	70.75	32.7	11.3	66.03	248	145	P	V
		4874	36.03	-17.97	54	58.06	32.7	11.3	66.03	248	145	A	V
		7311	44.34	-29.66	74	59.11	36.88	13.8	65.45	-	-	P	V
													V
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													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 11 2462MHz		4924	45.23	-28.77	74	66.83	32.9	11.44	65.94	400	243	P	H
		4924	33.66	-20.34	54	55.26	32.9	11.44	65.94	400	243	A	H
		7386	44.59	-29.41	74	59.65	36.58	13.82	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4924	44.31	-29.69	74	65.91	32.9	11.44	65.94	317	221	P	V
		4924	32.78	-21.22	54	54.38	32.9	11.44	65.94	317	221	A	V
		7386	44.24	-29.76	74	59.3	36.58	13.82	65.46	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
i802.11g CH 12 2467MHz		4934	44.08	-29.92	74	65.59	32.94	11.47	65.92	324	198	P	H
		4934	32.58	-21.42	54	54.09	32.94	11.47	65.92	324	198	A	H
		7401	43.44	-30.56	74	58.57	36.5	13.83	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4934	42.78	-31.22	74	64.29	32.94	11.47	65.92	292	199	P	V
		4934	32.4	-21.6	54	53.91	32.94	11.47	65.92	292	199	A	V
		7401	43.91	-30.09	74	59.04	36.5	13.83	65.46	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 13 2472MHz		4944	40.67	-33.33	74	62.1	32.98	11.49	65.9	-	-	P	H
		7416	44.09	-29.91	74	59.19	36.5	13.86	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4944	42.26	-31.74	74	63.69	32.98	11.49	65.9	-	-	P	V
		7416	44.06	-29.94	74	59.16	36.5	13.86	65.46	-	-	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

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 01 2412MHz		2390	60.96	-13.04	74	45.86	27.4	17.61	29.91	100	244	P	H
		2389.8	49.09	-4.91	54	33.99	27.4	17.61	29.91	100	244	A	H
	*	2412	103.84	-	-	88.61	27.5	17.64	29.91	100	244	P	H
	*	2412	95.94	-	-	80.71	27.5	17.64	29.91	100	244	A	H
													H
													H
		2389.17	58.13	-15.87	74	43.03	27.4	17.61	29.91	232	170	P	V
		2390	47.11	-6.89	54	32.01	27.4	17.61	29.91	232	170	A	V
	*	2412	98.62	-	-	83.39	27.5	17.64	29.91	232	170	P	V
	*	2412	91.28	-	-	76.05	27.5	17.64	29.91	232	170	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2346.26	56.01	-17.99	74	41.04	27.36	17.54	29.93	151	240	P	H
		2379.3	45.61	-8.39	54	30.54	27.4	17.59	29.92	151	240	A	H
	*	2437	104.79	-	-	89.44	27.6	17.65	29.9	151	240	P	H
	*	2437	97.22	-	-	81.87	27.6	17.65	29.9	151	240	A	H
		2494.12	56.81	-17.19	74	41.07	27.94	17.68	29.88	151	240	P	H
		2485.51	46.48	-7.52	54	30.82	27.86	17.68	29.88	151	240	A	H
		2362.22	55.83	-18.17	74	40.79	27.4	17.56	29.92	258	187	P	V
		2370.76	45.66	-8.34	54	30.6	27.4	17.58	29.92	258	187	A	V
	*	2437	100.66	-	-	85.31	27.6	17.65	29.9	258	187	P	V
	*	2437	93.23	-	-	77.88	27.6	17.65	29.9	258	187	A	V
		2483.83	56.41	-17.59	74	40.77	27.84	17.68	29.88	258	187	P	V
		2499.37	46.25	-7.75	54	30.46	27.99	17.68	29.88	258	187	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	*	2462	105.31	31.31	74	90.02	27.52	7.74	29.89	166	236	P	H
	*	2462	97.02	43.02	54	81.73	27.52	7.74	29.89	166	236	A	H
		2483.8	69.13	-4.87	74	53.63	27.7	7.76	29.88	166	236	P	H
		2483.76	52.99	-1.01	54	37.49	27.7	7.76	29.88	166	236	A	H
802.11n													H
HT20													H
CH 11	*	2462	103.24	29.24	74	87.95	27.52	7.74	29.89	224	186	P	V
2462MHz	*	2462	95.09	41.09	54	79.8	27.52	7.74	29.89	224	186	A	V
		2483.64	65.75	-8.25	74	50.25	27.7	7.76	29.88	224	186	P	V
		2483.72	49.88	-4.12	54	34.38	27.7	7.76	29.88	224	186	A	V
													V
													V
	*	2467	102.14	-	-	86.59	27.77	17.67	29.89	117	244	P	H
	*	2467	94.47	-	-	78.92	27.77	17.67	29.89	117	244	A	H
		2483.96	66.04	-7.96	74	50.4	27.84	17.68	29.88	117	244	P	H
		2483.52	51.36	-2.64	54	35.72	27.84	17.68	29.88	117	244	A	H
802.11n													H
HT20													H
CH 12	*	2467	99.4	-	-	83.85	27.77	17.67	29.89	230	193	P	V
2467MHz	*	2467	92.11	-	-	76.56	27.77	17.67	29.89	230	193	A	V
		2483.52	64.6	-9.4	74	48.96	27.84	17.68	29.88	230	193	P	V
		2483.52	49.59	-4.41	54	33.95	27.84	17.68	29.88	230	193	A	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 13 2472MHz	*	2472	100.3	-	-	84.72	27.8	17.67	29.89	173	233	P	H
	*	2472	92.86	-	-	77.28	27.8	17.67	29.89	173	233	A	H
		2483.56	67.37	-6.63	74	51.73	27.84	17.68	29.88	173	233	P	H
		2483.52	52.52	-1.48	54	36.88	27.84	17.68	29.88	173	233	A	H
													H
													H
	*	2472	97.27	-	-	81.69	27.8	17.67	29.89	202	177	P	V
	*	2472	89.49	-	-	73.91	27.8	17.67	29.89	202	177	A	V
		2483.6	66.37	-7.63	74	50.73	27.84	17.68	29.88	202	177	P	V
		2483.52	50.85	-3.15	54	35.21	27.84	17.68	29.88	202	177	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4824	50.47	-23.53	74	72.93	32.5	11.17	66.13	373	240	P	H
		4824	38.83	-15.17	54	61.29	32.5	11.17	66.13	373	240	A	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 01		4824	47.24	-26.76	74	69.7	32.5	11.17	66.13	299	137	P	V
2412MHz		4824	37.51	-16.49	54	59.97	32.5	11.17	66.13	299	137	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	47.71	-26.29	74	69.74	32.7	11.3	66.03	366	242	P	H
		4874	38.37	-15.63	54	60.4	32.7	11.3	66.03	366	242	A	H
		7311	45.41	-28.59	74	60.18	36.88	13.8	65.45	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 06		4874	47.11	-26.89	74	69.14	32.7	11.3	66.03	260	148	P	V
2437MHz		4874	37.48	-16.52	54	59.51	32.7	11.3	66.03	260	148	A	V
		7311	44.29	-29.71	74	59.06	36.88	13.8	65.45	-	-	P	V
													V
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													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4924	44.9	-29.1	74	66.5	32.9	11.44	65.94	400	342	P	H
		4924	35.87	-18.13	54	57.47	32.9	11.44	65.94	400	342	A	H
		7386	43.99	-30.01	74	59.05	36.58	13.82	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 11		4924	43.71	-30.29	74	65.31	32.9	11.44	65.94	399	186	P	V
2462MHz		4924	34.73	-19.27	54	56.33	32.9	11.44	65.94	399	186	A	V
		7386	43.43	-30.57	74	58.49	36.58	13.82	65.46	-	-	P	V
													V
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													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4934	41.26	-32.74	74	62.77	32.94	11.47	65.92	-	-	P	H
		7401	43.96	-30.04	74	59.09	36.5	13.83	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 12		4934	41.08	-32.92	74	62.59	32.94	11.47	65.92	-	-	P	V
2467MHz		7401	44.25	-29.75	74	59.38	36.5	13.83	65.46	-	-	P	V
													V
													V
													V
													V
													V
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													V
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													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4944	41.5	-32.5	74	62.93	32.98	11.49	65.9	-	-	P	H
		7416	44.32	-29.68	74	59.42	36.5	13.86	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 13		4944	40.24	-33.76	74	61.67	32.98	11.49	65.9	-	-	P	V
2472MHz		7416	43.5	-30.5	74	58.6	36.5	13.86	65.46	-	-	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

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 03 2422MHz		2389.8	64.06	-9.94	74	48.96	27.4	17.61	29.91	100	242	P	H
		2389.5	51.24	-2.76	54	36.14	27.4	17.61	29.91	100	242	A	H
	*	2422	99.37	-	-	84.11	27.52	17.64	29.9	100	242	P	H
	*	2422	91.88	-	-	76.62	27.52	17.64	29.9	100	242	A	H
		2485.24	56.58	-17.42	74	40.93	27.85	17.68	29.88	100	242	P	H
		2493.07	46.77	-7.23	54	31.04	27.93	17.68	29.88	100	242	A	H
		2389.65	61.54	-12.46	74	46.44	27.4	17.61	29.91	176	163	P	V
		2389.5	48.78	-5.22	54	33.68	27.4	17.61	29.91	176	163	A	V
	*	2422	94.64	-	-	79.38	27.52	17.64	29.9	176	163	P	V
	*	2422	86.62	-	-	71.36	27.52	17.64	29.9	176	163	A	V
		2485.24	56.56	-17.44	74	40.91	27.85	17.68	29.88	176	163	P	V
		2499.91	46.5	-7.5	54	30.7	28	17.68	29.88	176	163	A	V
802.11n HT40 CH 06 2437MHz		2385.75	55.93	-18.07	74	40.83	27.4	17.61	29.91	195	235	P	H
		2389.8	46.01	-7.99	54	30.91	27.4	17.61	29.91	195	235	A	H
	*	2437	102.2	-	-	86.85	27.6	17.65	29.9	195	235	P	H
	*	2437	93.48	-	-	78.13	27.6	17.65	29.9	195	235	A	H
		2483.98	60.06	-13.94	74	44.42	27.84	17.68	29.88	195	235	P	H
		2484.52	47.92	-6.08	54	32.27	27.85	17.68	29.88	195	235	A	H
		2328	55.12	-18.88	74	40.23	27.32	17.5	29.93	176	202	P	V
		2389.05	45.97	-8.03	54	30.87	27.4	17.61	29.91	176	202	A	V
	*	2437	97.28	-	-	81.93	27.6	17.65	29.9	176	202	P	V
	*	2437	89.7	-	-	74.35	27.6	17.65	29.9	176	202	A	V
		2485.06	57.08	-16.92	74	41.43	27.85	17.68	29.88	176	202	P	V
		2484.52	47.14	-6.86	54	31.49	27.85	17.68	29.88	176	202	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 09 2452MHz		2352.9	55.94	-18.06	74	40.91	27.4	17.55	29.92	196	238	P	H
		2385.6	45.66	-8.34	54	30.57	27.4	17.6	29.91	196	238	A	H
	*	2452	101.17	-	-	85.78	27.62	17.66	29.89	196	238	P	H
	*	2452	93.45	-	-	78.06	27.62	17.66	29.89	196	238	A	H
		2485.06	67.67	-6.33	74	52.02	27.85	17.68	29.88	196	238	P	H
		2484.34	52.12	-1.88	54	36.48	27.84	17.68	29.88	196	238	A	H
		2365.8	56.04	-17.96	74	40.99	27.4	17.57	29.92	175	205	P	V
		2360.7	45.81	-8.19	54	30.77	27.4	17.56	29.92	175	205	A	V
	*	2452	95.93	-	-	80.54	27.62	17.66	29.89	175	205	P	V
	*	2452	88.6	-	-	73.21	27.62	17.66	29.89	175	205	A	V
		2484.88	64.82	-9.18	74	49.17	27.85	17.68	29.88	175	205	P	V
		2484.43	49.97	-4.03	54	34.33	27.84	17.68	29.88	175	205	A	V
802.11n HT40 CH 10 2457MHz		2387.1	55.41	-18.59	74	40.31	27.4	17.61	29.91	193	238	P	H
		2389.35	45.76	-8.24	54	30.66	27.4	17.61	29.91	193	238	A	H
	*	2457	100	-	-	84.56	27.67	17.66	29.89	193	238	P	H
	*	2457	92.22	-	-	76.78	27.67	17.66	29.89	193	238	A	H
		2488.21	66.52	-7.48	74	50.84	27.88	17.68	29.88	193	238	P	H
		2483.62	51.9	-2.1	54	36.26	27.84	17.68	29.88	193	238	A	H
		2379.45	55.91	-18.09	74	40.84	27.4	17.59	29.92	173	192	P	V
		2379	45.83	-8.17	54	30.76	27.4	17.59	29.92	173	192	A	V
	*	2457	95.67	-	-	80.23	27.67	17.66	29.89	173	192	P	V
	*	2457	88.14	-	-	72.7	27.67	17.66	29.89	173	192	A	V
		2484.88	64.16	-9.84	74	48.51	27.85	17.68	29.88	173	192	P	V
		2484.52	49.92	-4.08	54	34.27	27.85	17.68	29.88	173	192	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 11 2462MHz		2362.8	55.8	-18.2	74	40.76	27.4	17.56	29.92	194	236	P	H
		2381.55	46.09	-7.91	54	31.01	27.4	17.6	29.92	194	236	A	H
	*	2462	98.41	-	-	82.92	27.72	17.66	29.89	194	236	P	H
	*	2462	90.7	-	-	75.21	27.72	17.66	29.89	194	236	A	H
		2486.59	64.06	-9.94	74	48.39	27.87	17.68	29.88	194	236	P	H
		2483.53	52.41	-1.59	54	36.77	27.84	17.68	29.88	194	236	A	H
		2368.65	55.63	-18.37	74	40.57	27.4	17.58	29.92	176	203	P	V
		2384.4	45.69	-8.31	54	30.6	27.4	17.6	29.91	176	203	A	V
	*	2462	93.74	-	-	78.25	27.72	17.66	29.89	176	203	P	V
	*	2462	86.25	-	-	70.76	27.72	17.66	29.89	176	203	A	V
		2486.59	61.86	-12.14	74	46.19	27.87	17.68	29.88	176	203	P	V
		2483.53	49.94	-4.06	54	34.3	27.84	17.68	29.88	176	203	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4844	43.67	-30.33	74	65.96	32.58	11.22	66.09	317	212	P	H
		4844	34.89	-19.11	54	57.18	32.58	11.22	66.09	317	212	A	H
		7266	44.86	-29.14	74	59.56	36.97	13.78	65.45	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 03		4844	44.03	-29.97	74	66.32	32.58	11.22	66.09	275	144	P	V
2422MHz		4844	34.81	-19.19	54	57.1	32.58	11.22	66.09	275	144	A	V
		7266	44.12	-29.88	74	58.82	36.97	13.78	65.45	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	44.96	-29.04	74	66.99	32.7	11.3	66.03	243	149	P	H
		4874	35.2	-18.8	54	57.23	32.7	11.3	66.03	243	149	A	H
		7311	44.61	-29.39	74	59.38	36.88	13.8	65.45	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 06		4874	45.75	-28.25	74	67.78	32.7	11.3	66.03	256	144	P	V
2437MHz		4874	35.14	-18.86	54	57.17	32.7	11.3	66.03	256	144	A	V
		7311	44.84	-29.16	74	59.61	36.88	13.8	65.45	-	-	P	V
													V
													V
													V
													V
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													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4904	41.93	-32.07	74	63.7	32.82	11.39	65.98	-	-	P	H
		7356	44.28	-29.72	74	59.17	36.76	13.81	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 09		4904	41.34	-32.66	74	63.11	32.82	11.39	65.98	-	-	P	V
2452MHz		7356	44.72	-29.28	74	59.61	36.76	13.81	65.46	-	-	P	V
													V
													V
													V
													V
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													V
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													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4914	40.13	-33.87	74	61.81	32.86	11.42	65.96	-	-	P	H
		7371	44.75	-29.25	74	59.72	36.67	13.82	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 10		4914	40.41	-33.59	74	62.09	32.86	11.42	65.96	-	-	P	V
2457MHz		7371	44.46	-29.54	74	59.43	36.67	13.82	65.46	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4924	40.23	-33.77	74	61.83	32.9	11.44	65.94	-	-	P	H
		7386	44.19	-29.81	74	59.25	36.58	13.82	65.46	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT40													H
CH 11		4924	41.27	-32.73	74	62.87	32.9	11.44	65.94	-	-	P	V
2462MHz		7386	44.73	-29.27	74	59.79	36.58	13.82	65.46	-	-	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.												

Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz 802.11g LF		31.08	21.95	-18.05	40	29.7	23.92	0.77	32.44	-	-	P	H
		140.16	25.54	-17.96	43.5	38.73	17.54	1.69	32.42	-	-	P	H
		259.77	23.79	-22.21	46	33.89	19.97	2.35	32.42	-	-	P	H
		408.5	23.5	-22.5	46	30.71	22.16	3.14	32.51	-	-	P	H
		634.6	28.66	-17.34	46	31.08	26.37	3.87	32.66	-	-	P	H
		918.8	33.1	-12.9	46	30.58	29.59	4.71	31.78	-	-	P	H
													H
													H
													H
													H
													H
													H
		39.18	33.8	-6.2	40	45.49	19.94	0.84	32.47	-	-	P	V
		101.01	22.38	-21.12	43.5	37.25	16.06	1.48	32.41	-	-	P	V
		187.68	25.12	-18.38	43.5	40.61	14.92	1.95	32.36	-	-	P	V
		485.5	25.41	-20.59	46	31.17	23.65	3.24	32.65	-	-	P	V
		757.8	31.08	-14.92	46	31.15	28.14	4.3	32.51	-	-	P	V
		947.5	34.21	-11.79	46	30.19	30.72	4.84	31.54	-	-	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 **Margin** line.
P/A	**P**eak or **A**vg
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		(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 D. Radiated Spurious Emission Plots

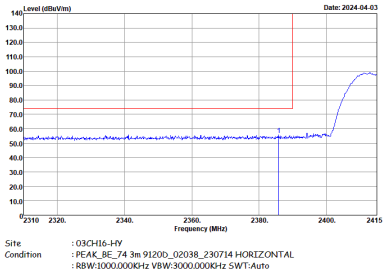
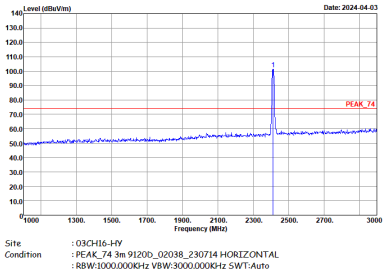
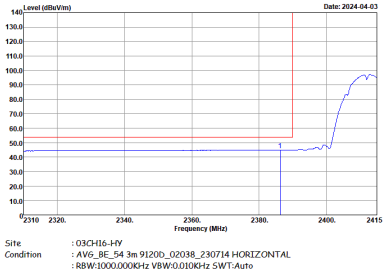
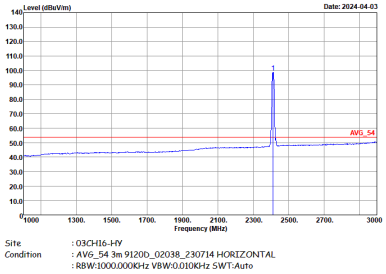
Test Engineer :	Bill Chang, Gary Guo, and Steven Wu	**Temperature :**	18.2~20.2°C
		Relative Humidity :	54.2~56.1%

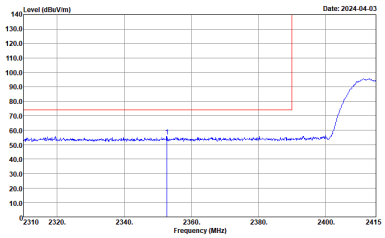
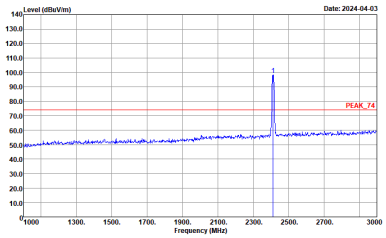
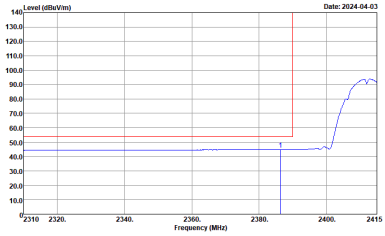
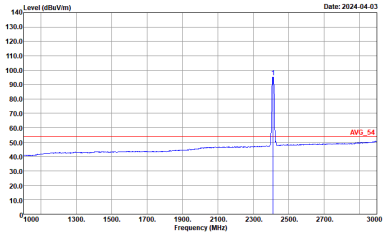
Note symbol

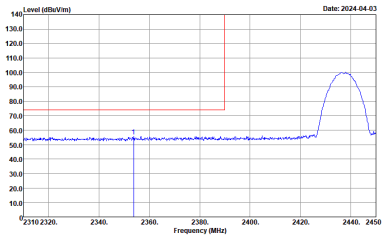
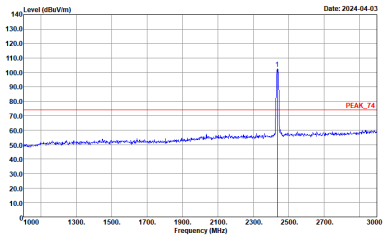
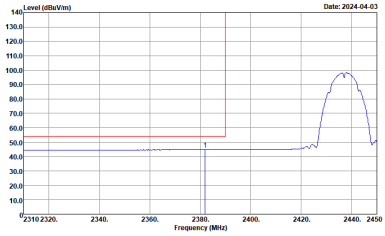
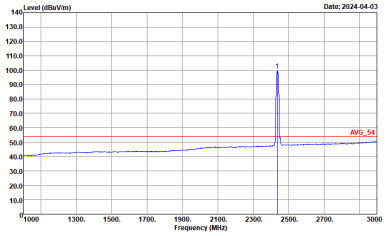
-L	**Low channel location**
-R	**High channel location**

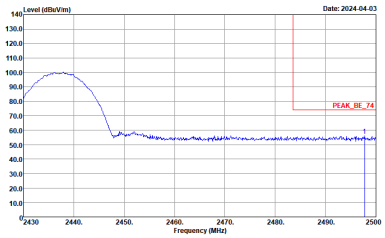
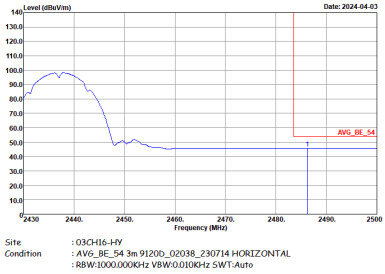
2.4GHz 2400~2483.5MHz

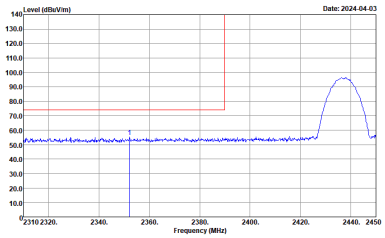
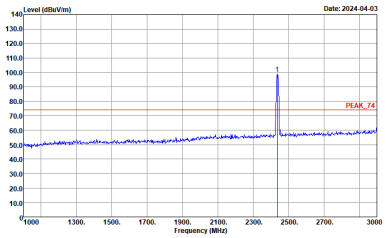
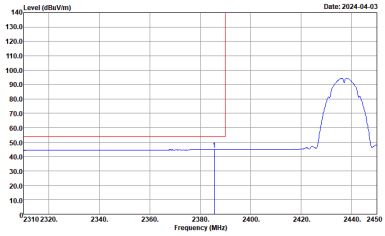
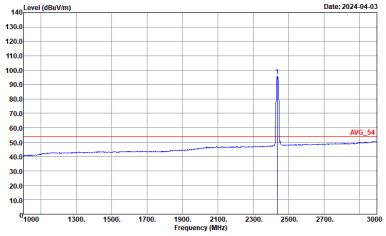
WIFI 802.11b (Band Edge @ 3m)

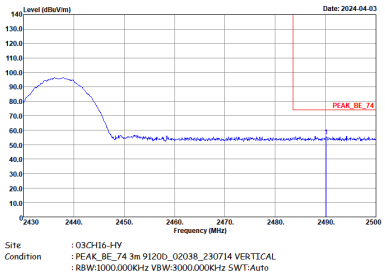
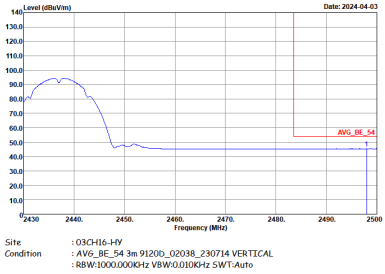
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

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

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

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

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

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