



FCC RADIO TEST REPORT

FCC ID : TX2-RTL8735BDM
Equipment : 11n RTL8735BDM combo module
Brand Name : REALTEK
Model Name : RTL8735BDM
Applicant : Realtek Semiconductor Corp.
No. 2, Innovation Road II, Hsinchu Science Park,
Hsinchu 300, Taiwan
Manufacturer : Realtek Semiconductor Corp.
No. 2, Innovation Road II, Hsinchu Science Park,
Hsinchu 300, Taiwan
Standard : FCC Part 15 Subpart C §15.247

The product was received on Oct. 20, 2023 and testing was performed from Oct. 31, 2023 to Nov. 21, 2023. 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
FR371824B	01	Initial issue of report	Jan. 10, 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	Reporting only	-
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	3.19 dB under the limit at 2390.00 MHz
3.6	15.207	AC Conducted Emission	Pass	18.91 dB under the limit at 3.67 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/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty".

Disclaimer:

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

Reviewed by: Alan Liu

Report Producer: Clio Lo

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
General Specs Bluetooth-LE, Wi-Fi 2.4GHz 802.11b/g/n, Wi-Fi 5GHz 802.11a/n.	

1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth					
1	1	1	1	LYNwave	ALA110-222050-300011	PIFA	IPEX MHF4	Note 1
2	1	1	1	RTANT	K212-10068-A	PIFA	IPEX MHF4	

Note 1

Ant.	Port			WLAN 2.4GHz	WLAN 5GHz	Bluetooth
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth			
1	1	1	1	3.50	5.00	3.50
2	1	1	1	2.77	0.84	2.77

Note 2: The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.

Note 3: There are two antenna models provided by different manufacturers. All tests were conducted using the high-gain antenna.

1.3 Modification of EUT

No modifications made to the EUT during the testing.



1.4 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, 03CH20-HY

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

FCC designation No.: TW3786

1.5 Applicable Standards

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

- ♦ FCC Part 15 Subpart 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	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437		

2.2 Test Mode

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

Single Antenna

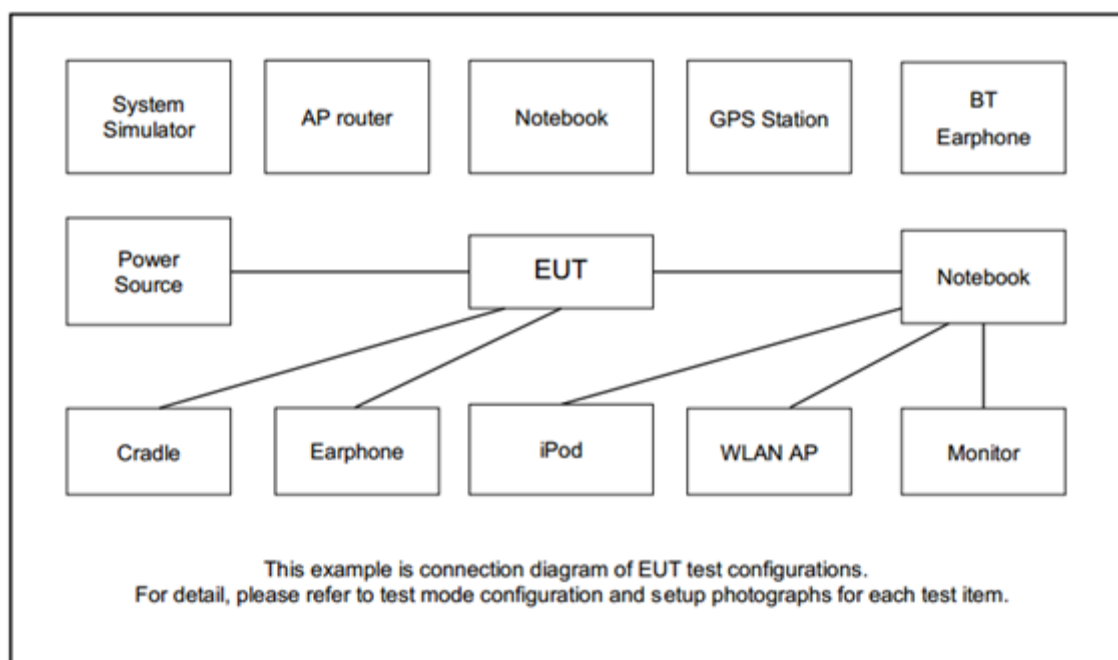
Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11n HT20	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (2.4GHz) Link + Bluetooth-LE Link + USB Cable (Charging from Notebook)

Ch. #	2400-2483.5 MHz		
	802.11b	802.11g	802.11n HT20
Low	01	01	01
Middle	06	06	06
High	11	11	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.	WLAN AP	ASUS	RT-AC52	MSQ-RTAC4A00	N/A	Unshielded,1.8m
2.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	Notebook	Dell	Latitude5310	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	iPod	Apple	A1199	FCC DoC	Shielded, 1.0m	N/A
5.	Mobile Phone	Asus	Zenfone5	MSQX00QSA	N/A	N/A
6.	USB Cable(USB2.0 AM to Micro B flat cable)	PowerSync	USB2-KFMIB 180	N/A	Shielded, 1.8m	N/A
7.	Fixture	REALTEK	AmebaPRO2 adapter	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “AmebaPro2_mptool_1V9.6” 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.

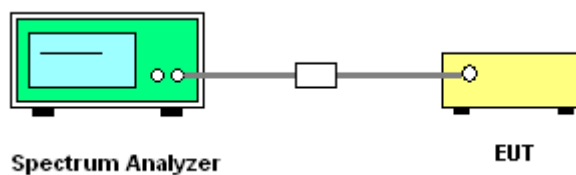
3.1.2 Measuring Instruments

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) $\geq 3 * RBW$.
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.

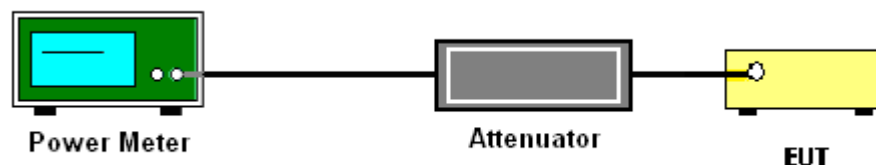
3.2.2 Measuring Instruments

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.

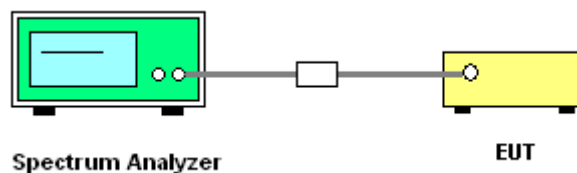
3.3.2 Measuring Instruments

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.

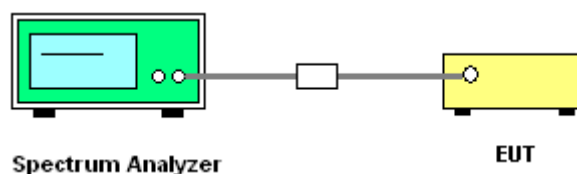
3.4.2 Measuring Instruments

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 “-”.

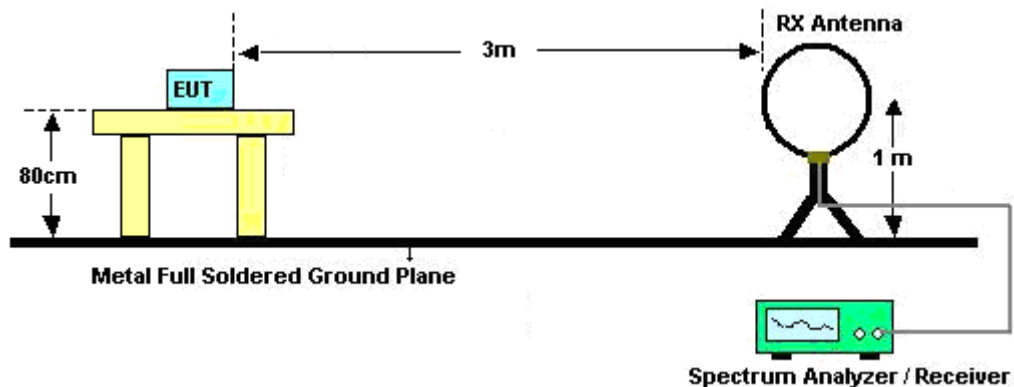
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with 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 $\geq$ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
 - (3) Set RBW = 1 MHz, VBW = 3 MHz for $f \geq 1$ GHz for peak measurement.

For average measurement:

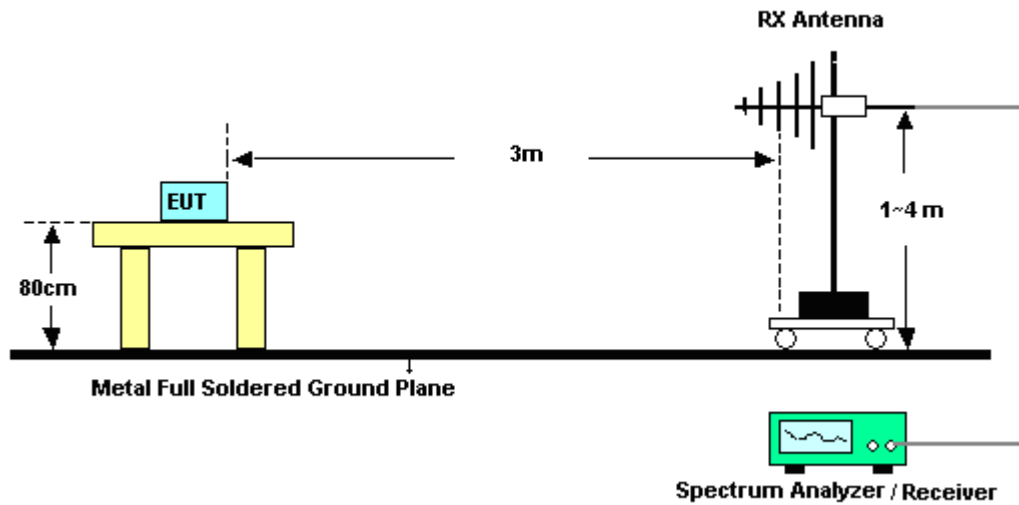
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

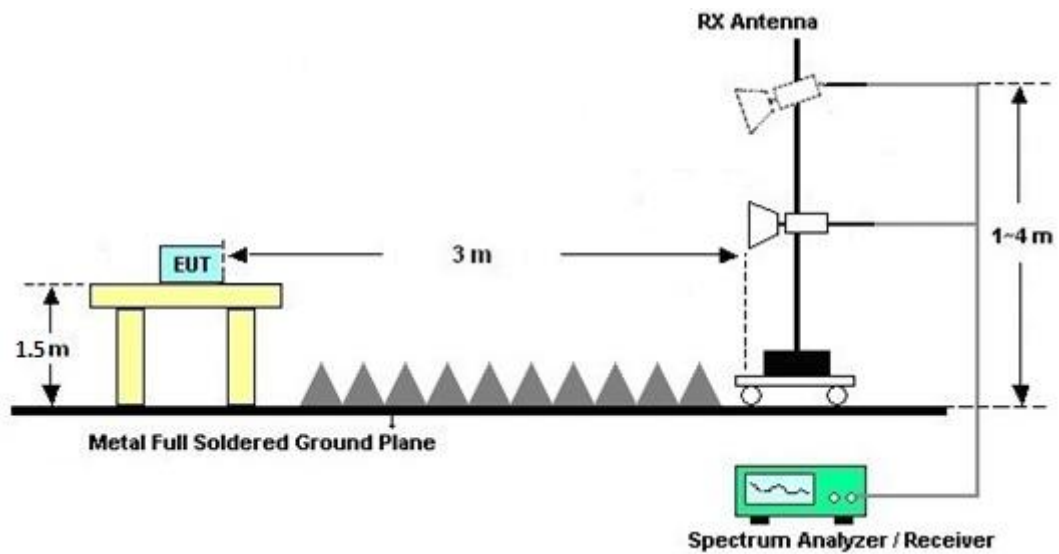
For radiated emissions below 30MHz



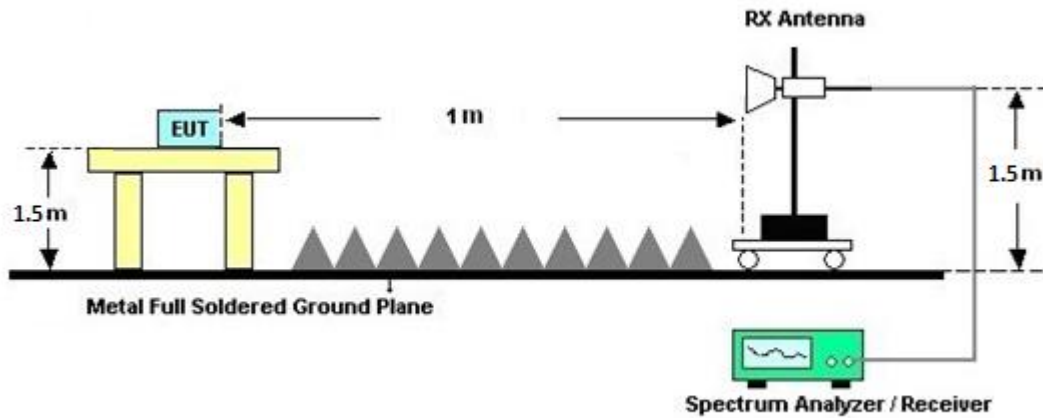
For radiated emissions from 30MHz to 1GHz



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 (dB μ V)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

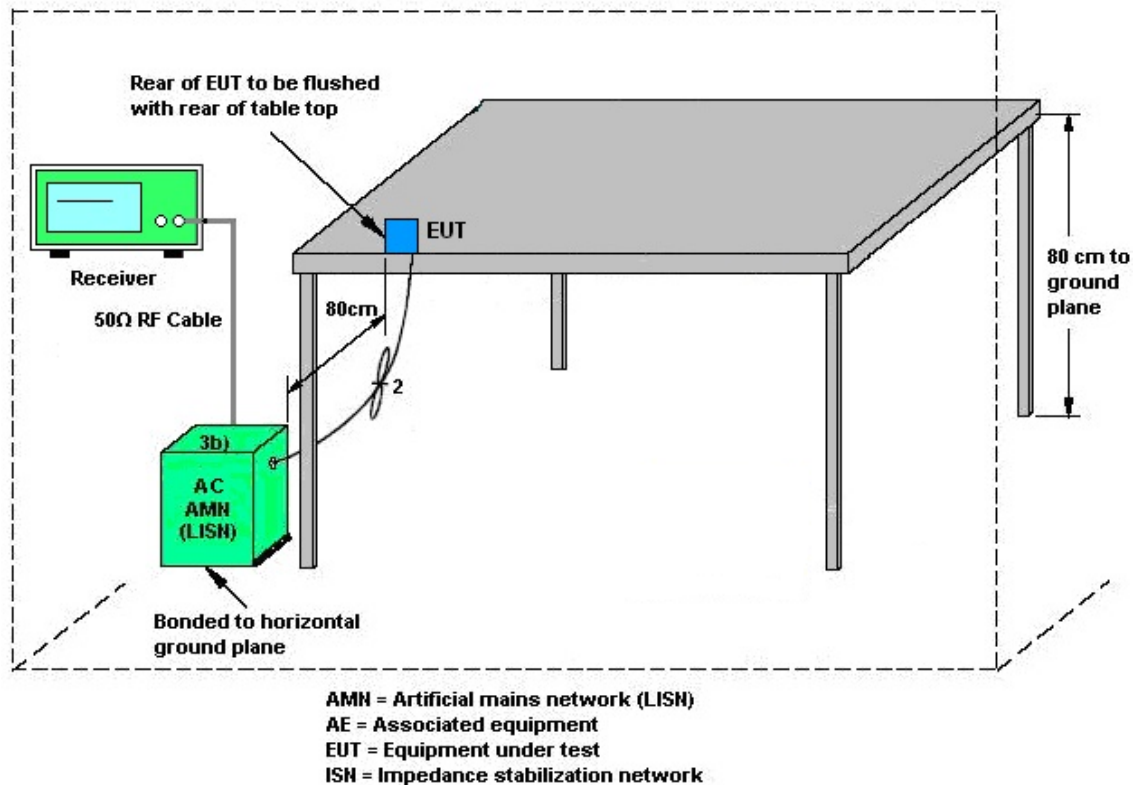
3.6.2 Measuring Instruments

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



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
EMI Test Receiver	Keysight	N9010B	MY60240520	N/A	Dec. 22, 2022	Nov. 03, 2023~ Nov. 21, 2023	Dec. 21, 2023	Radiation (03CH20-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Nov. 03, 2023~ Nov. 21, 2023	Sep. 11, 2024	Radiation (03CH20-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 07, 2022	Nov. 03, 2023~ Nov. 21, 2023	Dec. 06, 2023	Radiation (03CH20-HY)
Controller	ChainTek	3000-1	N/A	Control Turn table & Ant Mast	N/A	Nov. 03, 2023~ Nov. 21, 2023	N/A	Radiation (03CH20-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Nov. 03, 2023~ Nov. 21, 2023	N/A	Radiation (03CH20-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Nov. 03, 2023~ Nov. 21, 2023	N/A	Radiation (03CH20-HY)
Signal Analyzer	Keysight	N9010B	MY60240520	N/A	Dec. 22, 2022	Nov. 03, 2023~ Nov. 21, 2023	Dec. 21, 2023	Radiation (03CH20-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802N 1D01N-06	55606 & 08	30MHz~1GHz	Oct. 20, 2023	Nov. 03, 2023~ Nov. 21, 2023	Oct. 19, 2024	Radiation (03CH20-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1212	1GHz-18GHz	Mar. 23, 2023	Nov. 03, 2023~ Nov. 21, 2023	Mar. 22, 2024	Radiation (03CH20-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	02360	1GHz-18GHz	Oct. 30, 2023	Nov. 03, 2023~ Nov. 21, 2023	Oct. 29, 2024	Radiation (03CH20-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	1223	18GHz-40GHz	Jul. 10, 2023	Nov. 03, 2023~ Nov. 21, 2023	Jul. 09, 2024	Radiation (03CH20-HY)
Preamplifier	COM-POWER	PAM-103	18020201	1MHz-1000MHz	Jan. 02, 2023	Nov. 03, 2023~ Nov. 21, 2023	Jan. 01, 2024	Radiation (03CH20-HY)
Amplifier	EMCI	EMC118A45SE	980792	N/A	Nov. 14, 2022	Nov. 03, 2023~ Nov. 12, 2023	Nov. 13, 2023	Radiation (03CH20-HY)
Amplifier	EMCI	EMC118A45SE	980792	N/A	Nov. 13, 2023	Nov. 13, 2023~ Nov. 21, 2023	Nov. 12, 2024	Radiation (03CH20-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	519229/2,804 015/2,804027 /2	N/A	Jan. 18, 2023	Nov. 03, 2023~ Nov. 21, 2023	Jan. 17, 2024	Radiation (03CH20-HY)
Hygrometer	TECPEL	DTM-303B	TP200728	N/A	Mar. 28, 2023	Nov. 03, 2023~ Nov. 21, 2023	Mar. 27, 2024	Radiation (03CH20-HY)
Software	Audix	N/A	RK-002156	N/A	N/A	Nov. 03, 2023~ Nov. 21, 2023	N/A	Radiation (03CH20-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 17, 2022	Oct. 31, 2023~ Nov. 17, 2023	Nov. 16, 2023	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	15100041SNO 10 (NO:248)	10MHz~6GHz	Jan. 05, 2023	Oct. 31, 2023~ Nov. 17, 2023	Jan. 04, 2024	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 23, 2023	Oct. 31, 2023~ Nov. 17, 2023	Aug. 22, 2024	Conducted (TH05-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Nov. 17, 2023	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Nov. 17, 2023	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Oct. 20, 2023	Nov. 17, 2023	Oct. 19, 2024	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 15, 2023	Nov. 17, 2023	Mar. 14, 2024	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Mar. 05, 2023	Nov. 17, 2023	Mar. 04, 2024	Conduction (CO07-HY)
Four-Line V-Network	TESEQ	NNB 52	36122	N/A	Mar. 13, 2023	Nov. 17, 2023	Mar. 12, 2024	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 20, 2023	Nov. 17, 2023	Sep. 19, 2024	Conduction (CO07-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% ($U = 2Uc(y)$)	6.40 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% ($U = 2Uc(y)$)	4.60 dB
--	---------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.40 dB
--	---------

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Willy Chang and Mina Liu	Temperature:	21~25	°C
Test Date:	2023/10/31~2023/11/17	Relative Humidity:	51~54	%

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	14.04	10.08	0.50	Pass
11b	1Mbps	1	6	2437	14.04	10.06	0.50	Pass
11b	1Mbps	1	11	2462	14.04	10.08	0.50	Pass
11g	6Mbps	1	1	2412	16.33	13.88	0.50	Pass
11g	6Mbps	1	6	2437	16.28	13.86	0.50	Pass
11g	6Mbps	1	11	2462	16.28	12.66	0.50	Pass
HT20	MCS0	1	1	2412	17.38	13.88	0.50	Pass
HT20	MCS0	1	6	2437	17.43	15.10	0.50	Pass
HT20	MCS0	1	11	2462	17.43	13.78	0.50	Pass

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna										
Mod.	Data Rate	N _{TX}	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	1 Mbps	1	1	2412	18.40	30.00	3.50	21.90	36.00	Pass
11b	1 Mbps	1	6	2437	18.20	30.00	3.50	21.70	36.00	Pass
11b	1 Mbps	1	11	2462	18.30	30.00	3.50	21.80	36.00	Pass
11g	6 Mbps	1	1	2412	17.30	30.00	3.50	20.80	36.00	Pass
11g	6 Mbps	1	6	2437	17.40	30.00	3.50	20.90	36.00	Pass
11g	6 Mbps	1	11	2462	17.20	30.00	3.50	20.70	36.00	Pass
HT20	MCS0	1	1	2412	16.60	30.00	3.50	20.10	36.00	Pass
HT20	MCS0	1	6	2437	17.20	30.00	3.50	20.70	36.00	Pass
HT20	MCS0	1	11	2462	15.40	30.00	3.50	18.90	36.00	Pass

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

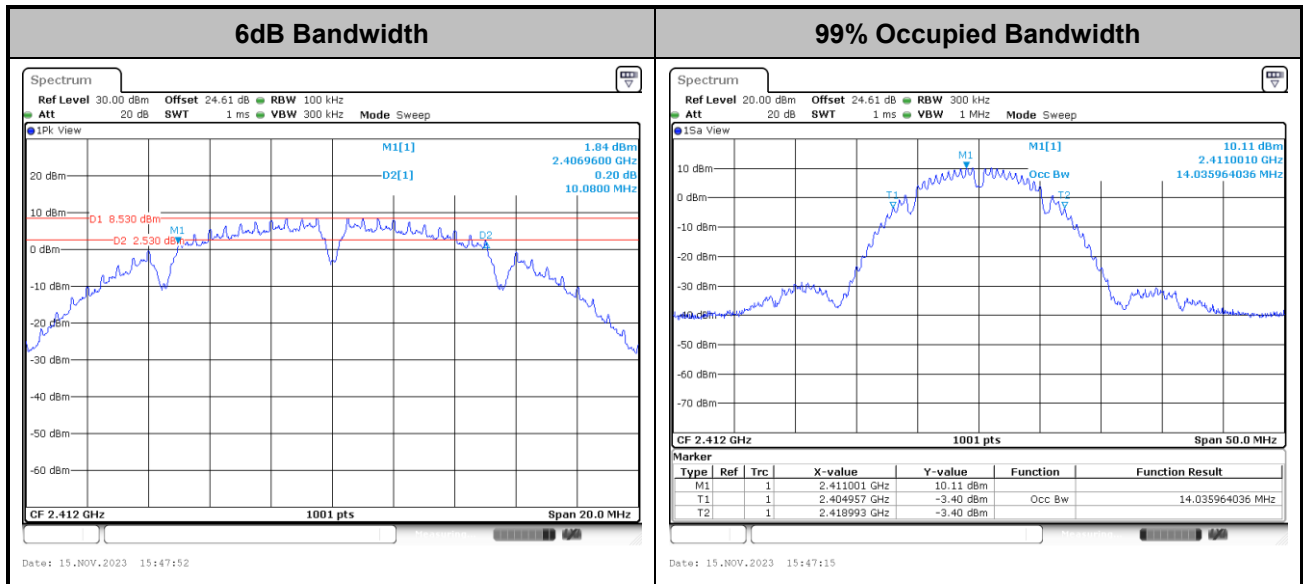
TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band Single Antenna								
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)	DG (dBi)	Peak PSD Limit (dBm/3kHz)	Pass/Fail
					Ant1	Ant1	Ant1	
11b	1 Mbps	1	1	2412	-7.32	3.50	8.00	Pass
11b	1 Mbps	1	6	2437	-7.54	3.50	8.00	Pass
11b	1 Mbps	1	11	2462	-7.27	3.50	8.00	Pass
11g	6 Mbps	1	1	2412	-9.09	3.50	8.00	Pass
11g	6 Mbps	1	6	2437	-9.18	3.50	8.00	Pass
11g	6 Mbps	1	11	2462	-9.10	3.50	8.00	Pass
HT20	MCS0	1	1	2412	-9.22	3.50	8.00	Pass
HT20	MCS0	1	6	2437	-8.72	3.50	8.00	Pass
HT20	MCS0	1	11	2462	-10.07	3.50	8.00	Pass

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

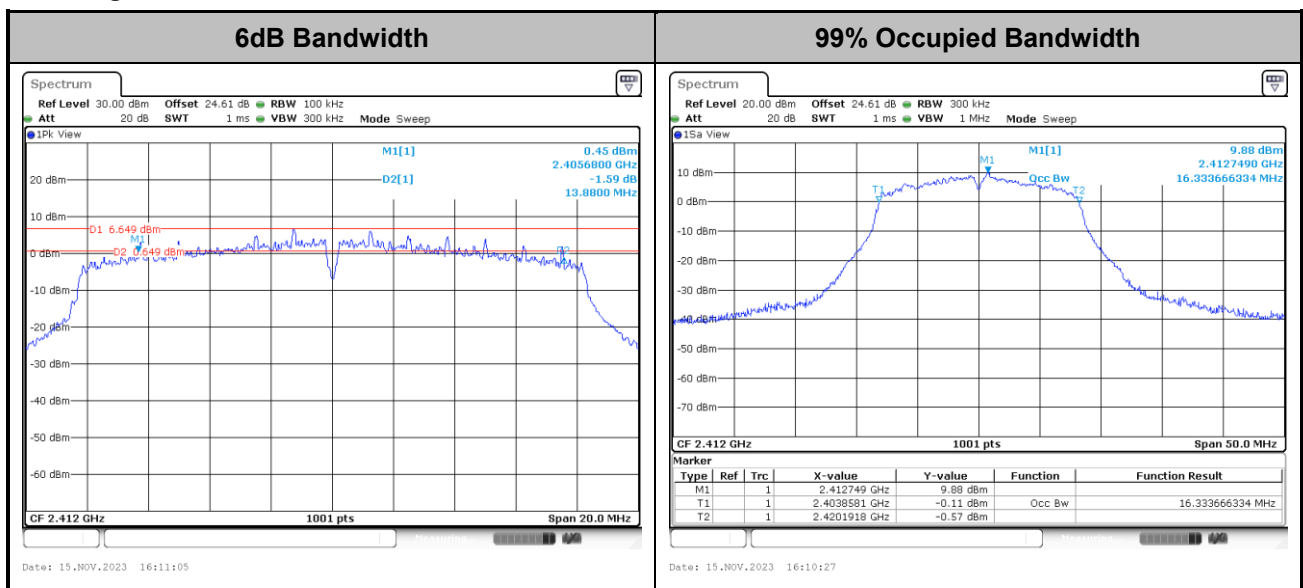
**6dB and 99% Occupied Bandwidth**

<802.11b>



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

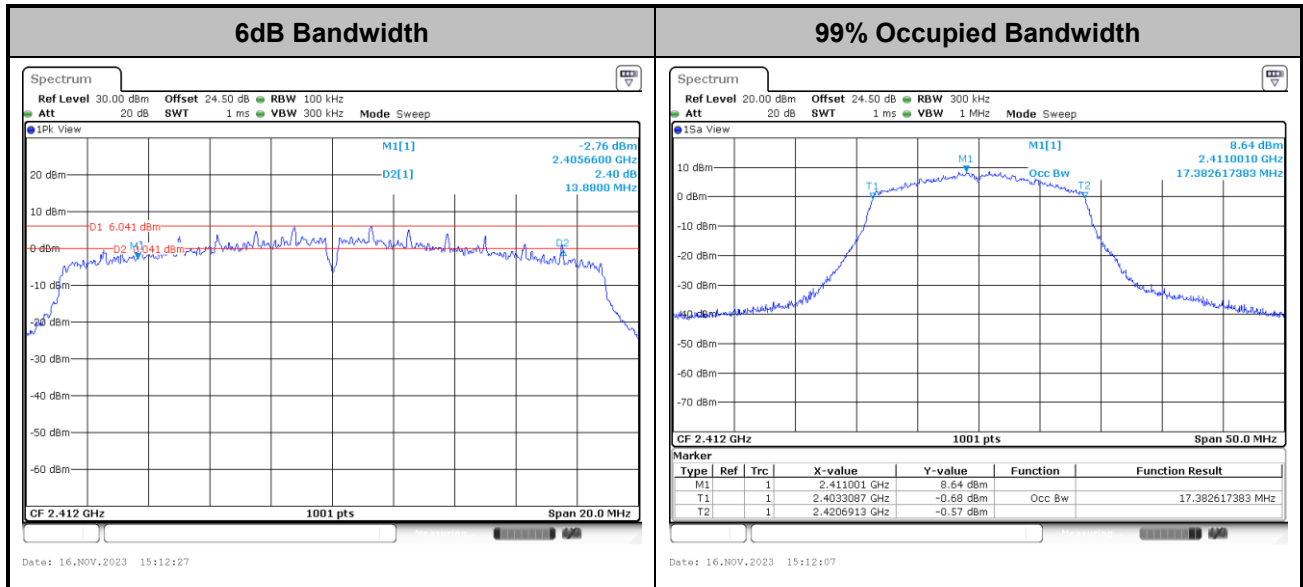
<802.11g>



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



<802.11n HT20>

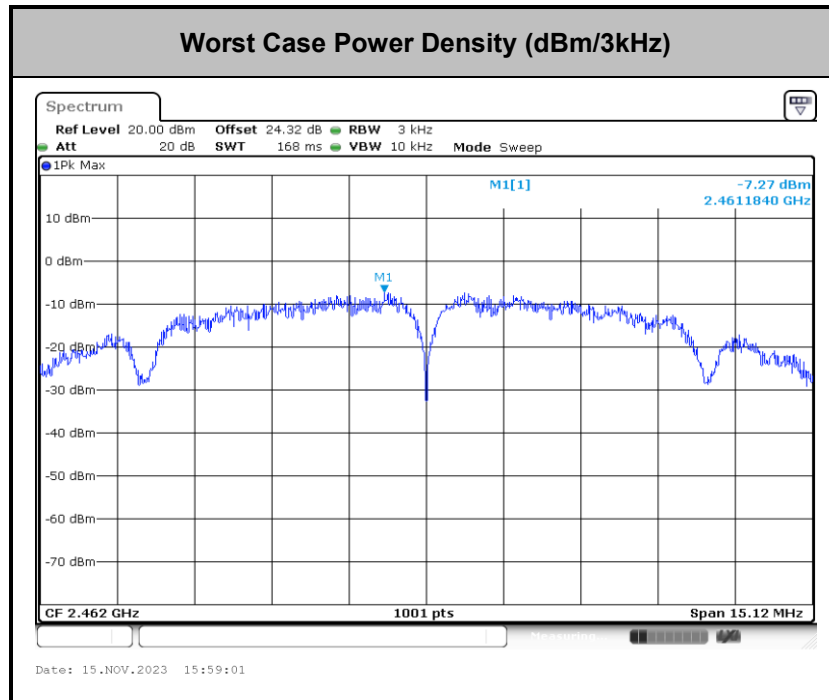


Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



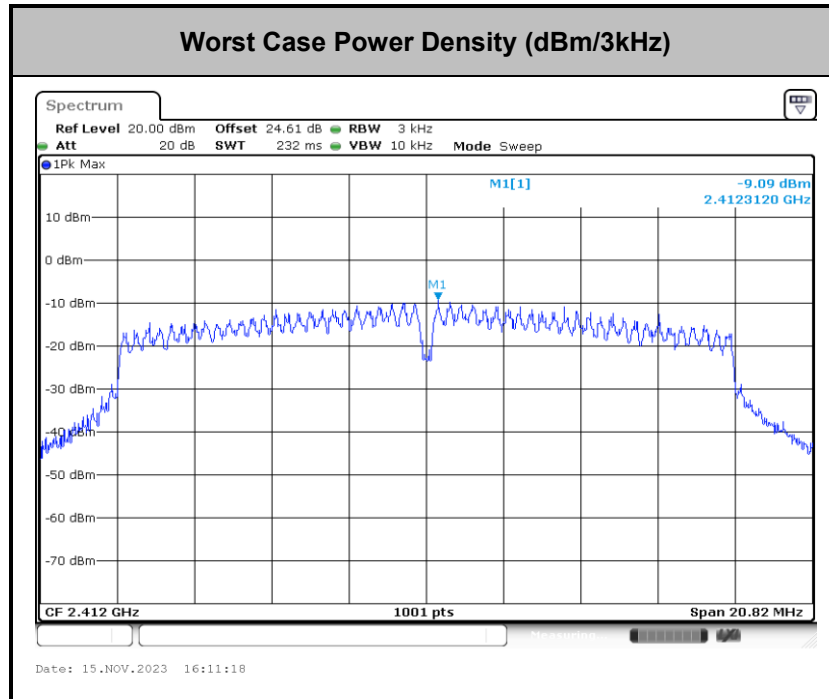
Power Spectral Density(dBm/3kHz)

<802.11b>



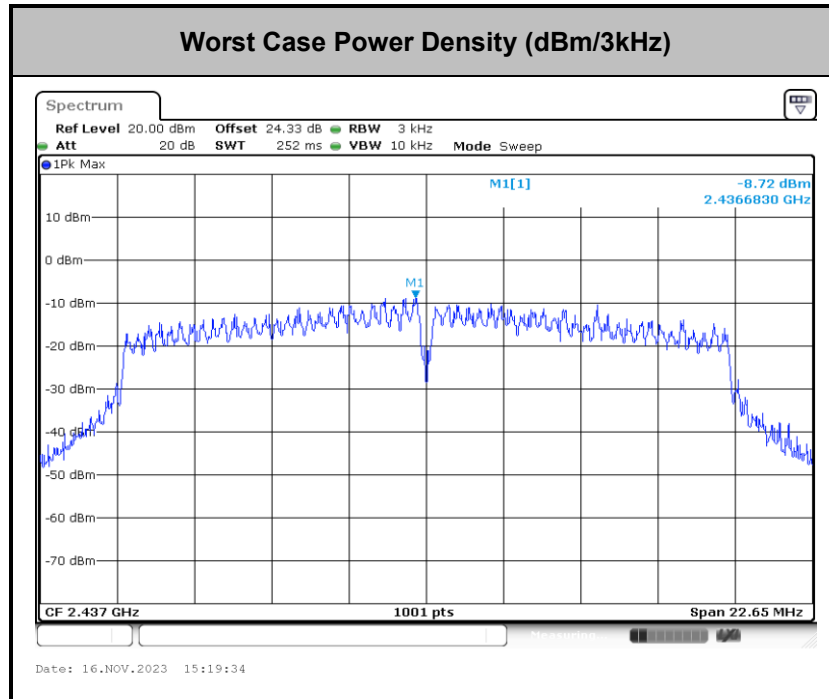


<802.11g>





<802.11n HT20>

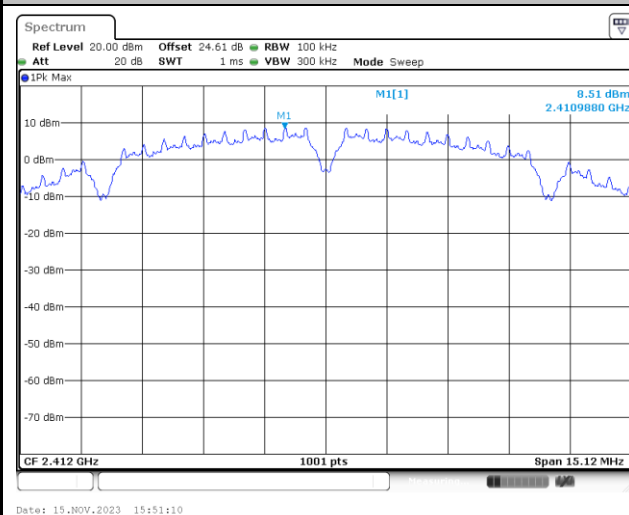
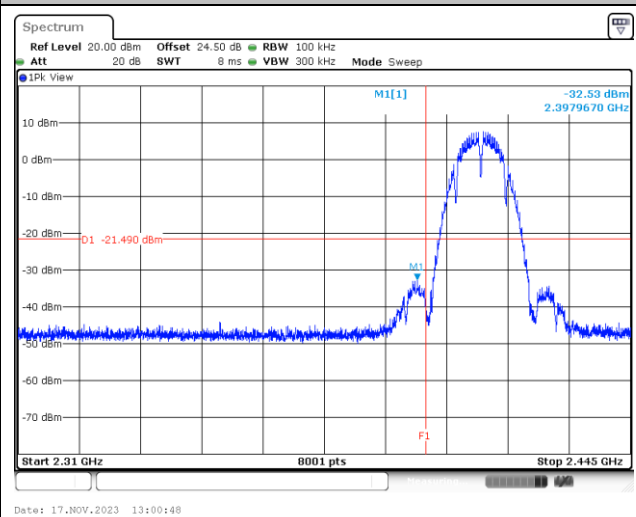
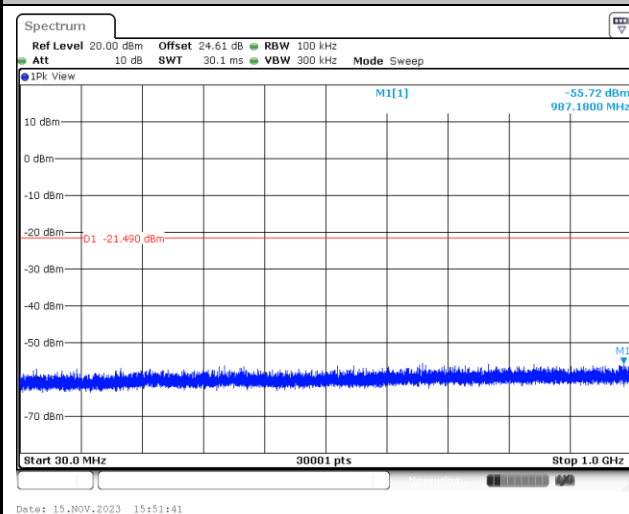
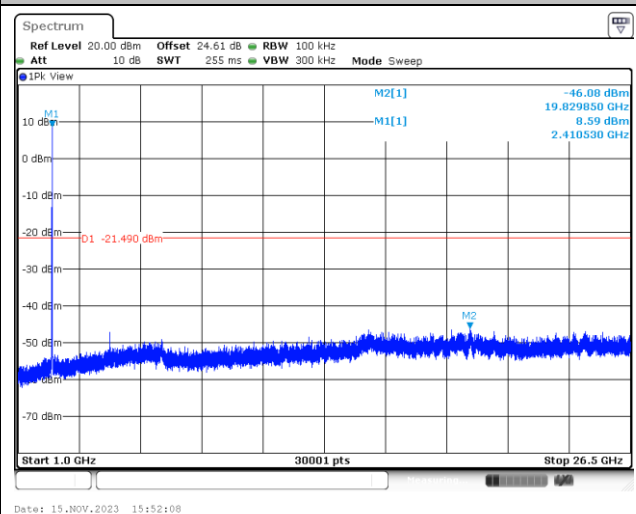


**Band Edges and Spurious Emission**

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

Test Mode : 802.11b

Test Channel : 01

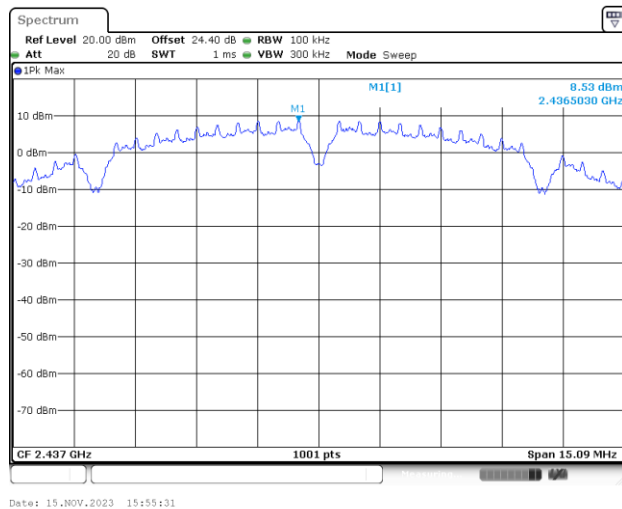
100kHz PSD reference Level**Channel Plot****Spurious Emission 30MHz~1GHz****Spurious Emission 1GHz~26.5GHz**



Test Mode : 802.11b

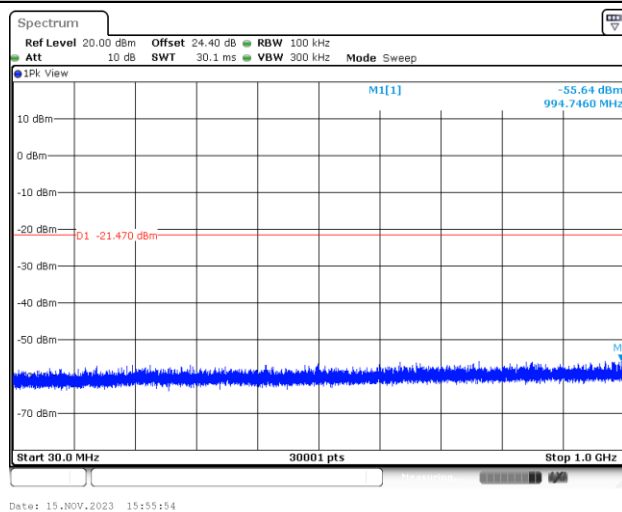
Test Channel : 06

100kHz PSD reference Level

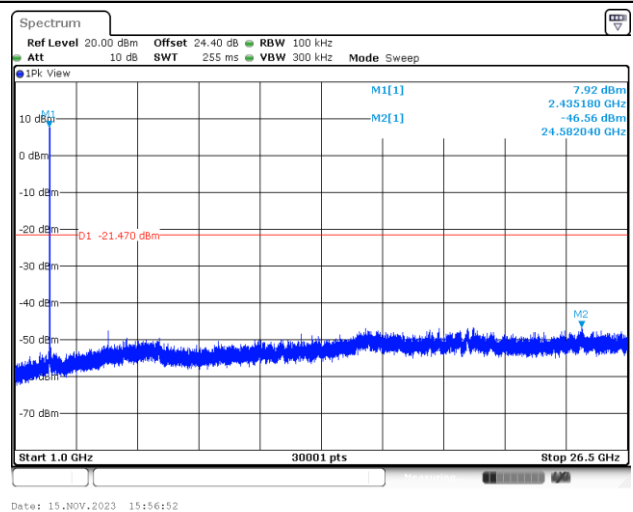


Channel Plot

Spurious Emission 30MHz~1GHz



Spurious Emission 1GHz~26.5GHz

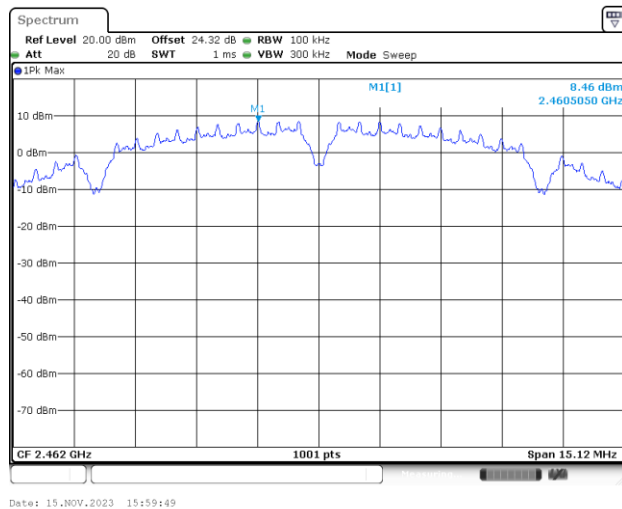




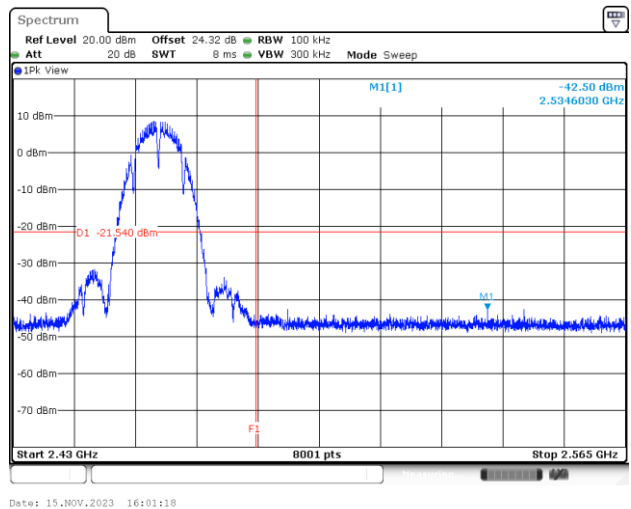
Test Mode : 802.11b

Test Channel : 11

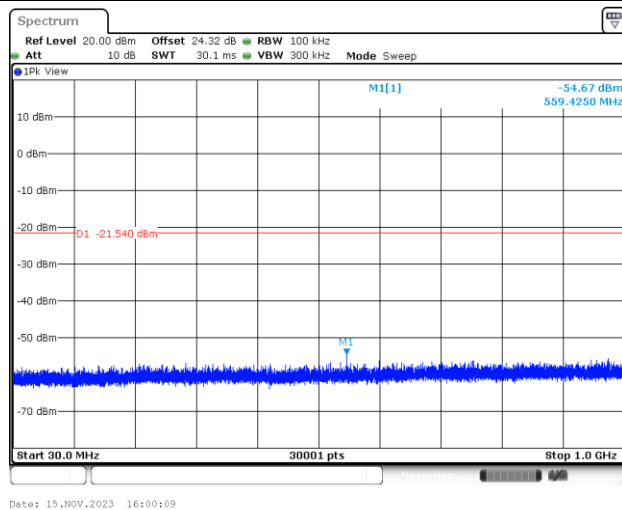
100kHz PSD reference Level



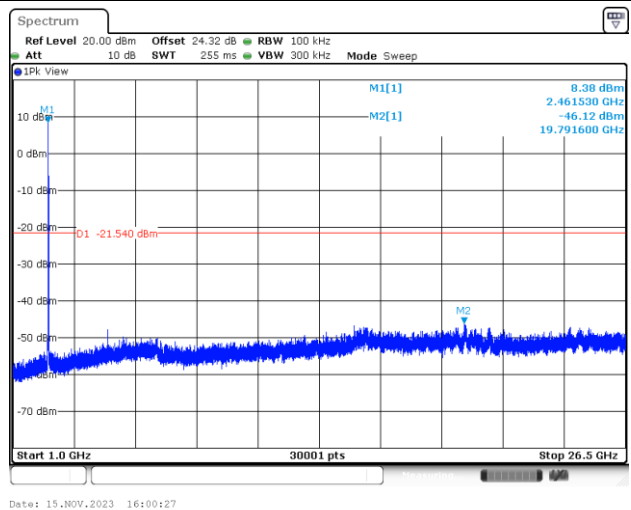
Channel Plot



Spurious Emission 30MHz~1GHz



Spurious Emission 1GHz~26.5GHz

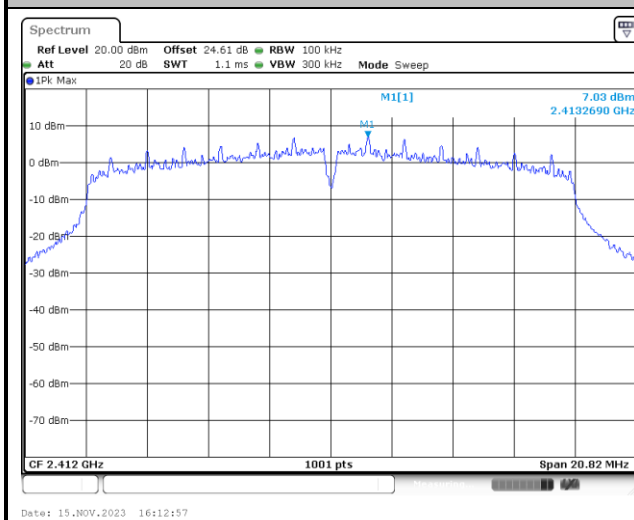




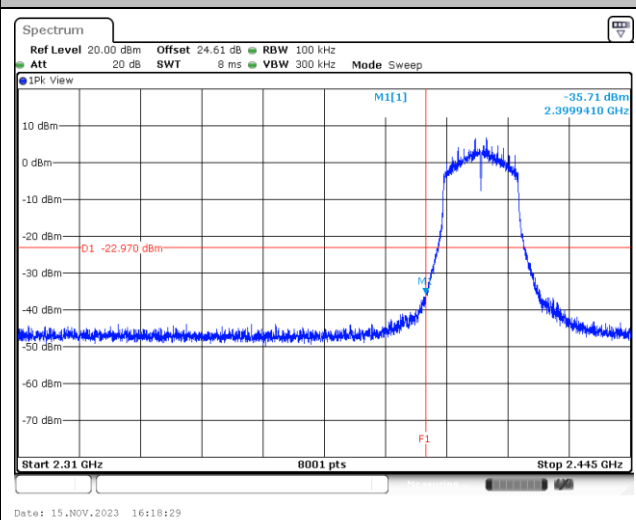
Test Mode : 802.11g

Test Channel : 01

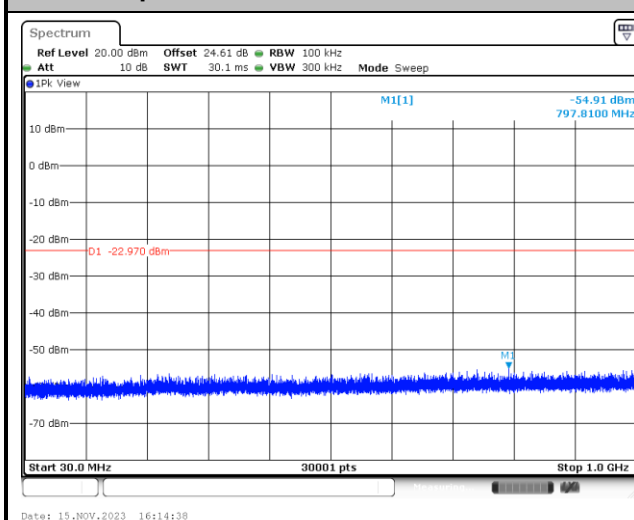
100kHz PSD reference Level



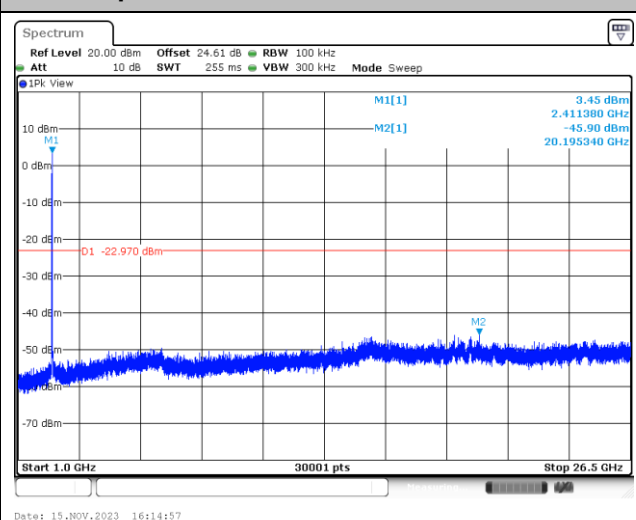
Channel Plot



Spurious Emission 30MHz~1GHz



Spurious Emission 1GHz~26.5GHz

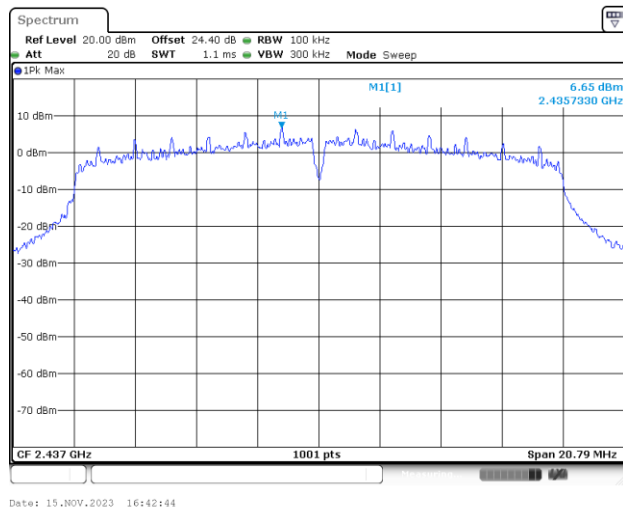




Test Mode : 802.11g

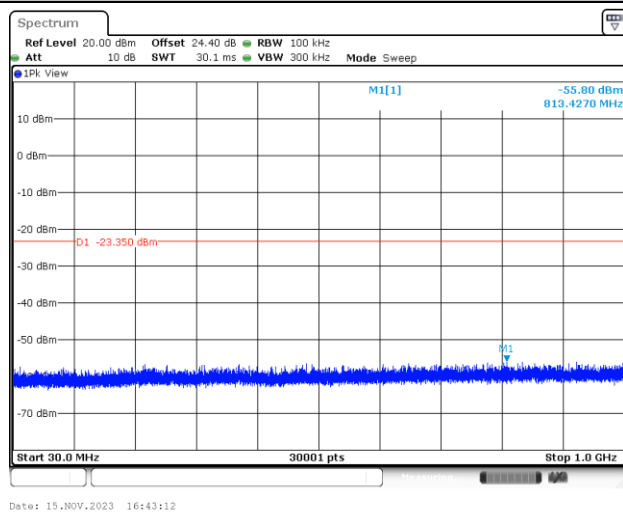
Test Channel : 06

100kHz PSD reference Level

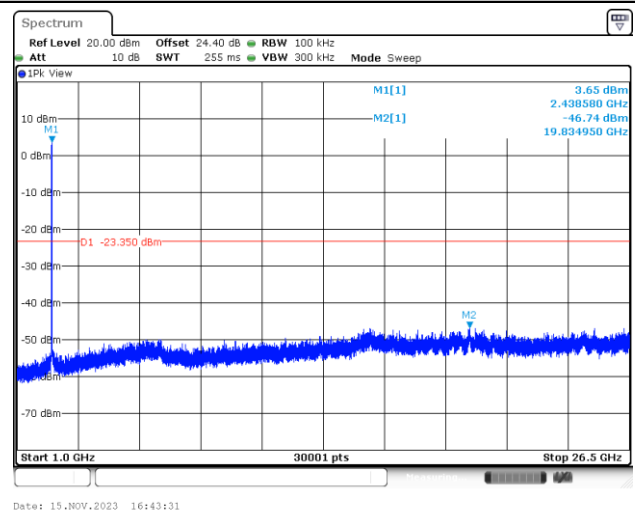


Channel Plot

Spurious Emission 30MHz~1GHz



Spurious Emission 1GHz~26.5GHz

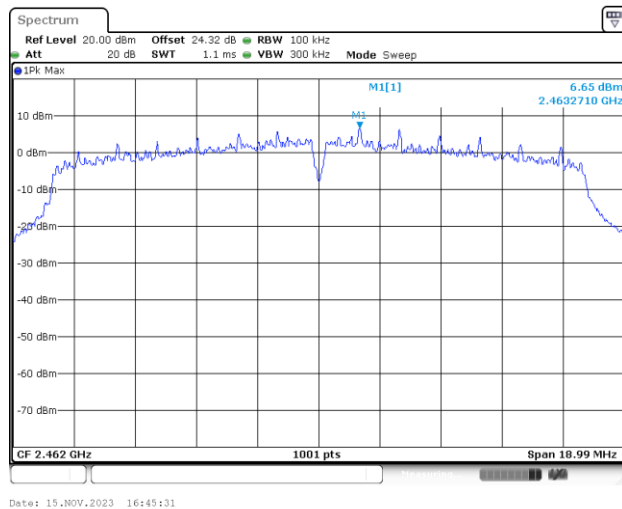




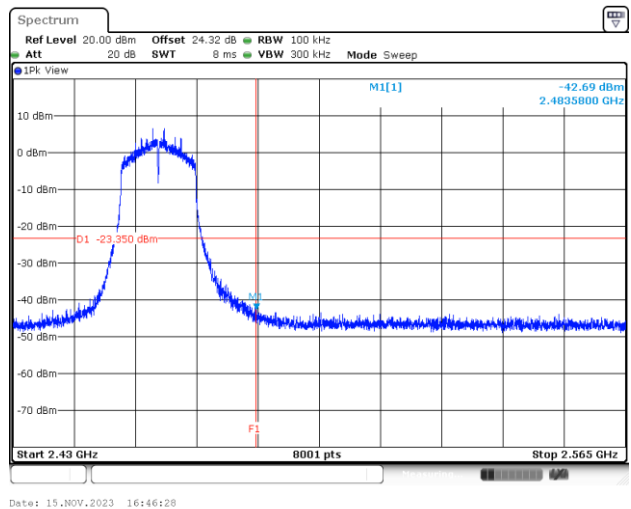
Test Mode : 802.11g

Test Channel : 11

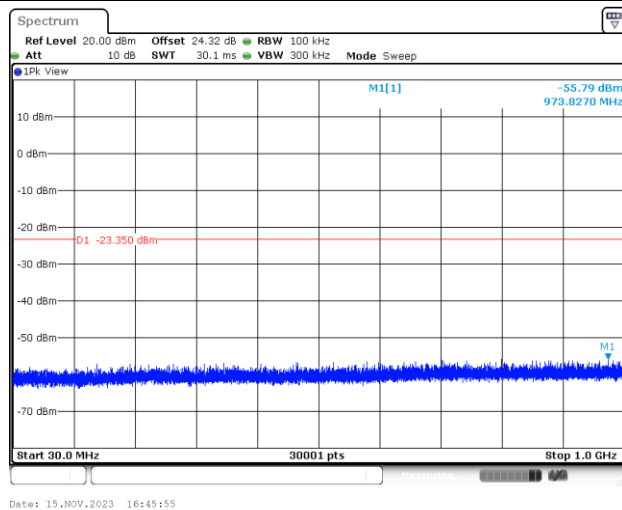
100kHz PSD reference Level



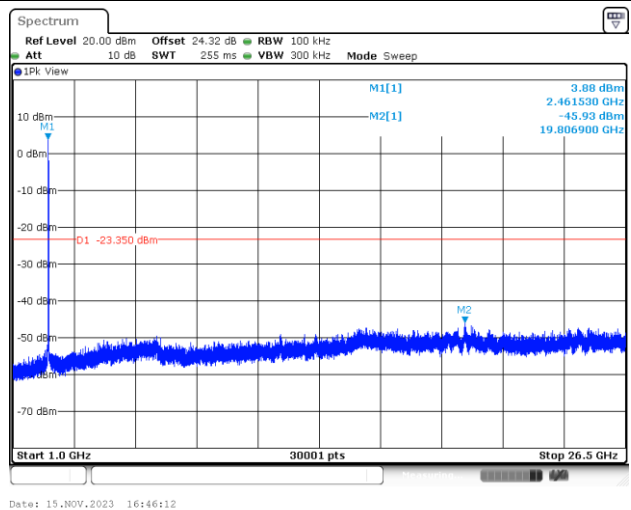
Channel Plot



Spurious Emission 30MHz~1GHz



Spurious Emission 1GHz~26.5GHz

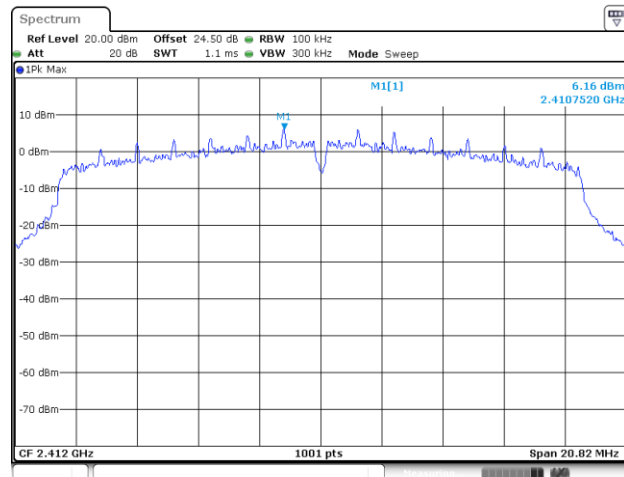




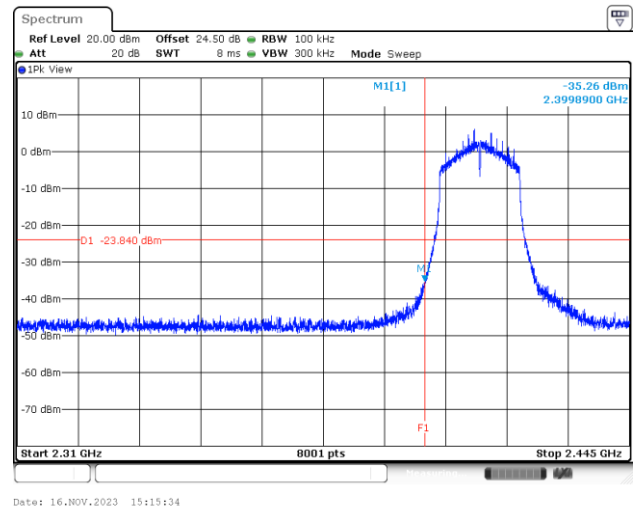
Test Mode : 802.11n HT20

Test Channel : 01

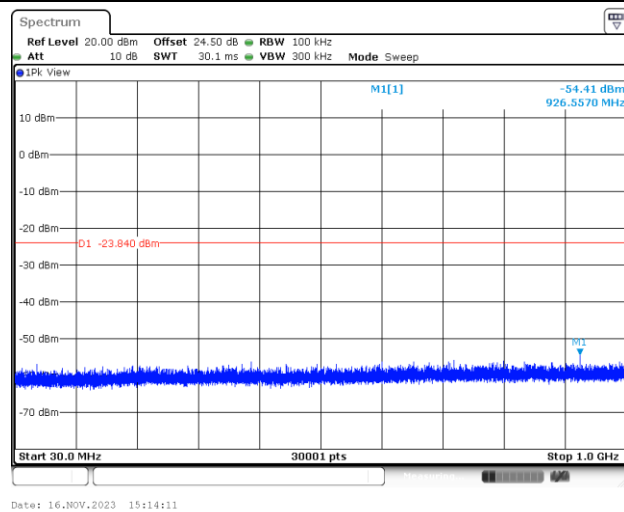
100kHz PSD reference Level



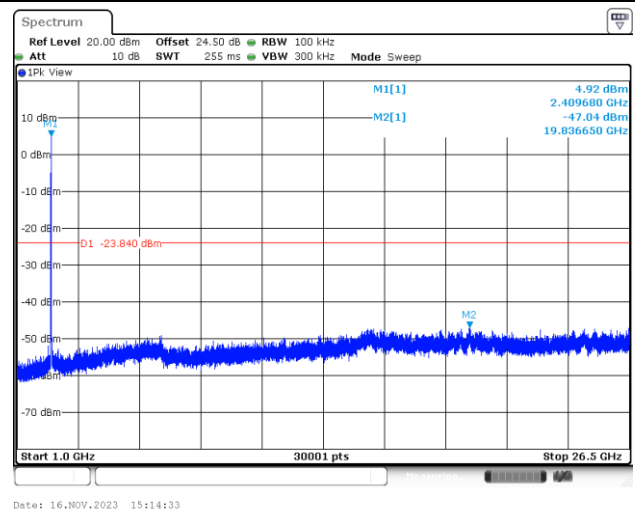
Channel Plot

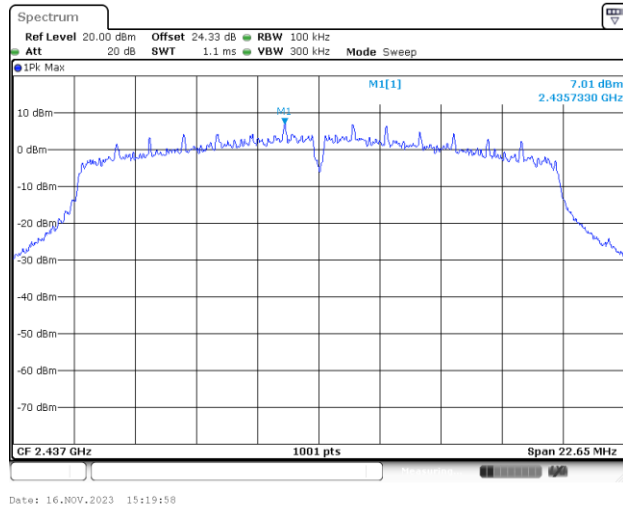
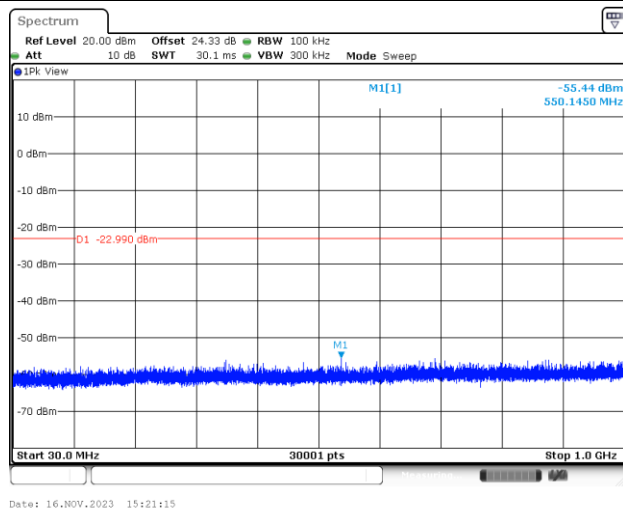
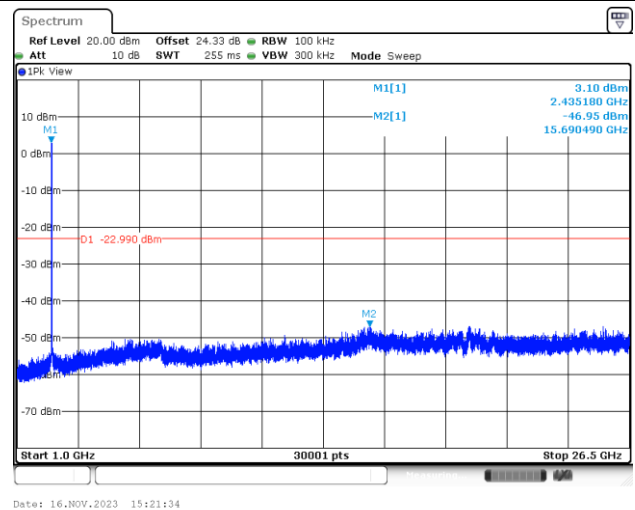


Spurious Emission 30MHz~1GHz



Spurious Emission 1GHz~26.5GHz



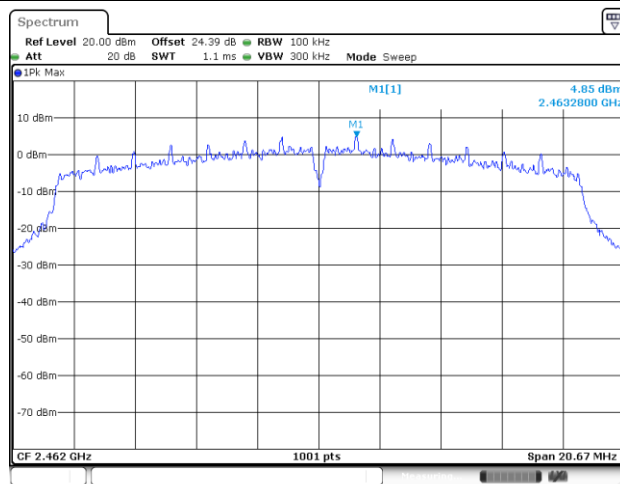
**Test Mode :** 802.11n HT20**Test Channel :** 06**100kHz PSD reference Level****Channel Plot****Spurious Emission 30MHz~1GHz****Spurious Emission 1GHz~26.5GHz**



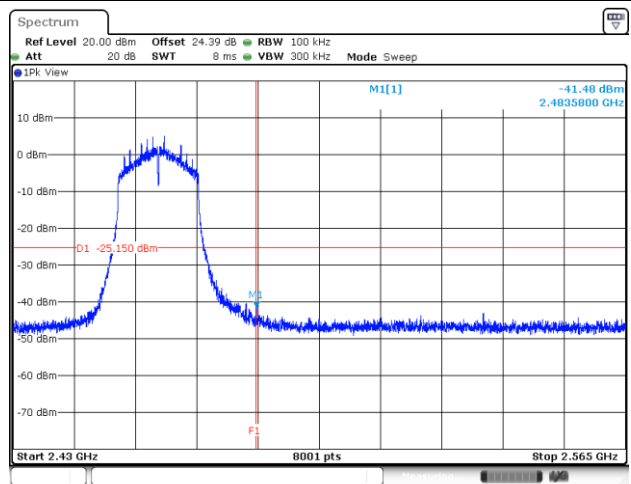
Test Mode : 802.11n HT20

Test Channel : 11

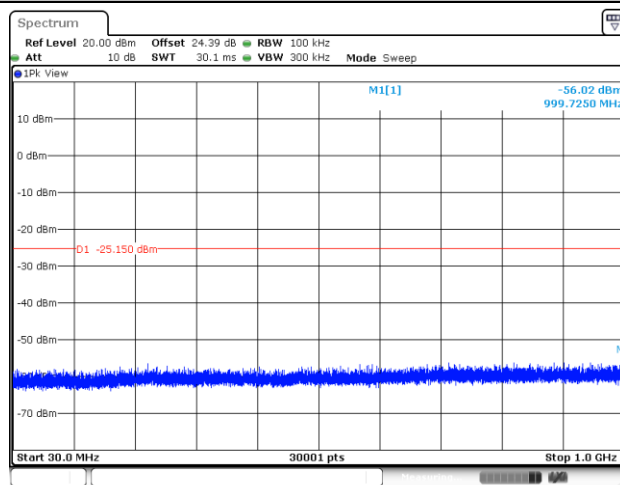
100kHz PSD reference Level



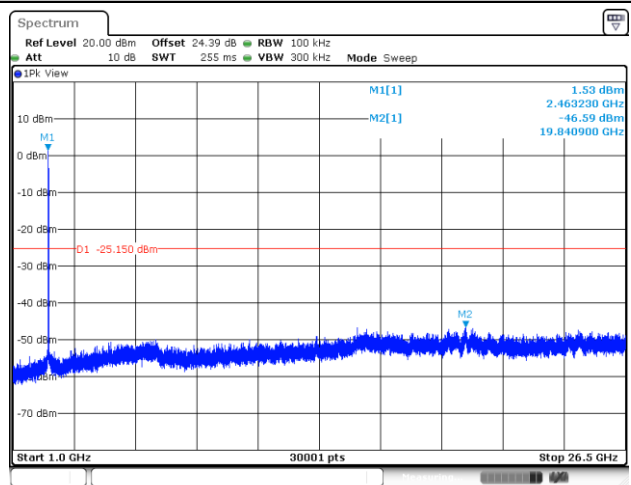
Channel Plot



Spurious Emission 30MHz~1GHz



Spurious Emission 1GHz~26.5GHz





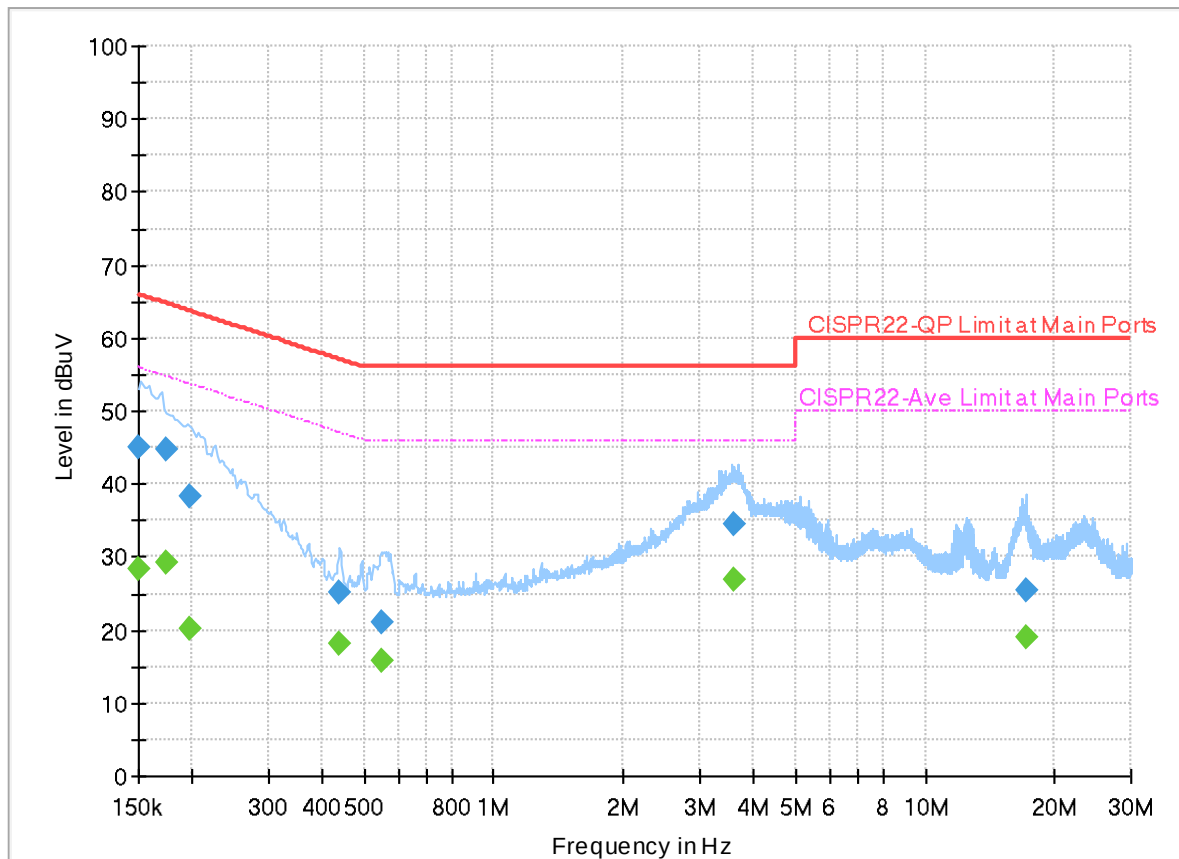
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	Temperature :	22.2~26.3℃
		Relative Humidity :	57.7~62.4%

EUT Information

Report NO : 371824
Test Mode : Mode 1
Test Voltage : Power From System
Phase : Line

Full Spectrum



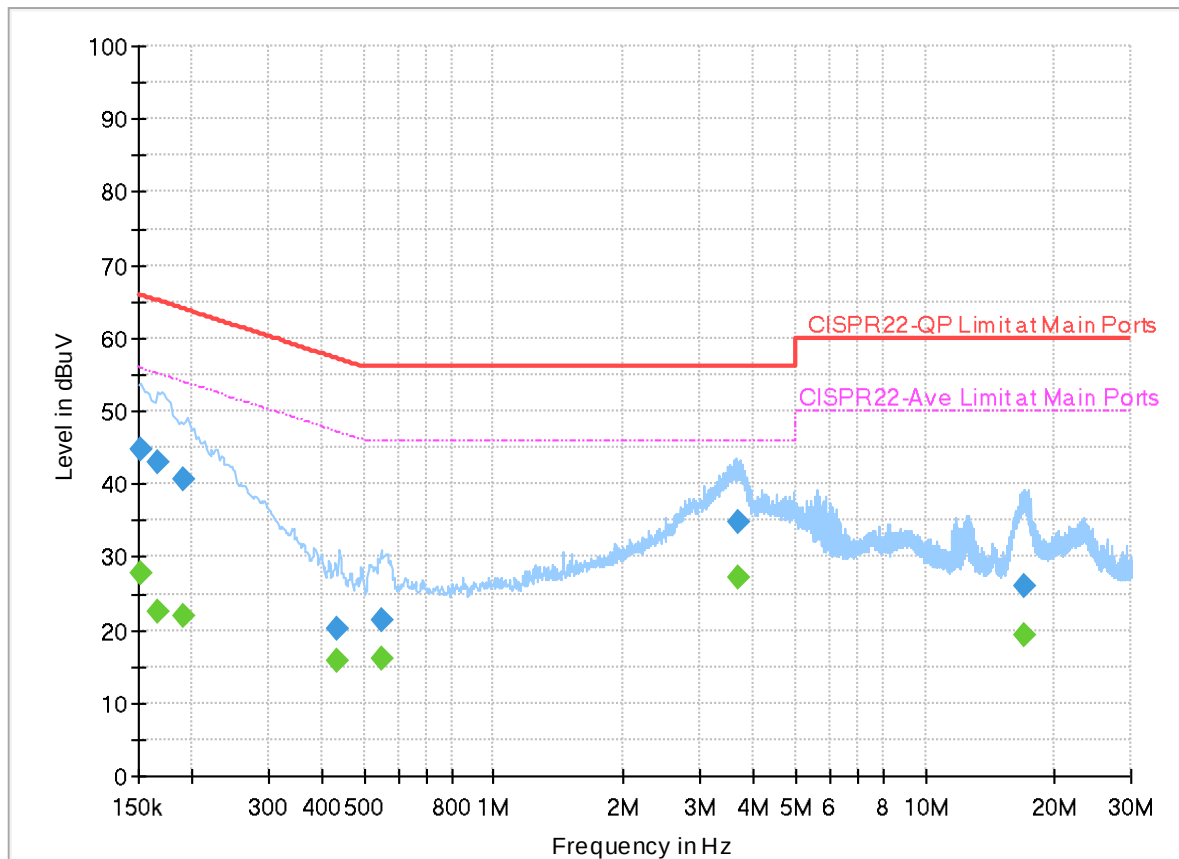
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	28.35	56.00	27.65	L1	OFF	19.9
0.150000	45.02	---	66.00	20.98	L1	OFF	19.9
0.174750	---	29.28	54.73	25.45	L1	OFF	19.9
0.174750	44.74	---	64.73	19.99	L1	OFF	19.9
0.198240	---	20.03	53.68	33.65	L1	OFF	19.9
0.198240	38.27	---	63.68	25.41	L1	OFF	19.9
0.438900	---	18.21	47.08	28.87	L1	OFF	19.9
0.438900	25.18	---	57.08	31.90	L1	OFF	19.9
0.548250	---	15.83	46.00	30.17	L1	OFF	19.9
0.548250	21.00	---	56.00	35.00	L1	OFF	19.9
3.613470	---	26.76	46.00	19.24	L1	OFF	20.0
3.613470	34.53	---	56.00	21.47	L1	OFF	20.0
17.076750	---	19.05	50.00	30.95	L1	OFF	20.1
17.076750	25.44	---	60.00	34.56	L1	OFF	20.1

EUT Information

Report NO : 371824
Test Mode : Mode 1
Test Voltage : Power From System
Phase : Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152363	---	27.90	55.87	27.97	N	OFF	19.9
0.152363	44.75	---	65.87	21.12	N	OFF	19.9
0.166110	---	22.64	55.15	32.51	N	OFF	19.9
0.166110	43.11	---	65.15	22.04	N	OFF	19.9
0.190500	---	21.92	54.02	32.10	N	OFF	19.9
0.190500	40.53	---	64.02	23.49	N	OFF	19.9
0.433500	---	15.74	47.19	31.45	N	OFF	19.9
0.433500	20.18	---	57.19	37.01	N	OFF	19.9
0.548790	---	16.06	46.00	29.94	N	OFF	19.9
0.548790	21.37	---	56.00	34.63	N	OFF	19.9
3.669000	---	27.09	46.00	18.91	N	OFF	20.0
3.669000	34.70	---	56.00	21.30	N	OFF	20.0
16.964250	---	19.36	50.00	30.64	N	OFF	20.2
16.964250	25.92	---	60.00	34.08	N	OFF	20.2



Appendix C. Radiated Spurious Emission

Test Engineer :	John Chuang, David Dai and Howard Huang	Temperature :	18.5~22.4°C
		Relative Humidity :	66.7~69.1%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

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		2389.695	56.35	-17.65	74	46.28	27.5	18.63	36.06	400	22	P	H
		2389.695	47.69	-6.31	54	37.62	27.5	18.63	36.06	400	22	A	H
	*	2412	113.74	-	-	103.61	27.52	18.67	36.06	400	22	P	H
	*	2412	110.26	-	-	100.13	27.52	18.67	36.06	400	22	A	H
													H
													H
		2388.435	52.13	-21.87	74	42.08	27.48	18.63	36.06	307	93	P	V
		2390	43.72	-10.28	54	33.65	27.5	18.63	36.06	307	93	A	V
	*	2412	107.57	-	-	97.44	27.52	18.67	36.06	307	93	P	V
	*	2412	104.06	-	-	93.93	27.52	18.67	36.06	307	93	A	V
													V
													V
802.11b CH 06 2437MHz		2331.76	51.13	-22.87	74	41.35	27.3	18.52	36.04	273	0	P	H
		2390	40.86	-13.14	54	30.79	27.5	18.63	36.06	273	0	A	H
	*	2437	113.91	-	-	103.63	27.63	18.72	36.07	273	0	P	H
	*	2437	110.32	-	-	100.04	27.63	18.72	36.07	273	0	A	H
		2487.04	51.13	-22.87	74	40.6	27.8	18.82	36.09	273	0	P	H
		2483.6	40.01	-13.99	54	29.48	27.8	18.82	36.09	273	0	A	H
		2310.96	50.22	-23.78	74	40.37	27.4	18.48	36.03	298	90	P	V
		2389.36	39.48	-14.52	54	29.42	27.49	18.63	36.06	298	90	A	V
	*	2437	108.59	-	-	98.31	27.63	18.72	36.07	298	90	P	V
	*	2437	105.09	-	-	94.81	27.63	18.72	36.07	298	90	A	V
		2491.6	50.13	-23.87	74	39.59	27.8	18.83	36.09	298	90	P	V
		2485.04	39.42	-14.58	54	28.89	27.8	18.82	36.09	298	90	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	111.25	-	-	100.94	27.62	18.77	36.08	144	16	P	H
	*	2462	107.65	-	-	97.34	27.62	18.77	36.08	144	16	A	H
		2485.84	56.77	-17.23	74	46.24	27.8	18.82	36.09	144	16	P	H
		2484.24	47.26	-6.74	54	36.73	27.8	18.82	36.09	144	16	A	H
													H
													H
	*	2462	104.36	-	-	94.05	27.62	18.77	36.08	316	68	P	V
	*	2462	100.7	-	-	90.39	27.62	18.77	36.08	316	68	A	V
		2484.44	53.38	-20.62	74	42.85	27.8	18.82	36.09	316	68	P	V
		2484.24	42.59	-11.41	54	32.06	27.8	18.82	36.09	316	68	A	V
													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	48.31	-25.69	74	40.04	32.54	12.95	37.22	300	23	P	H
		4824	42.23	-11.77	54	33.96	32.54	12.95	37.22	300	23	A	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	46.11	-27.89	74	37.84	32.54	12.95	37.22	300	10	P	V
		4824	38.75	-15.25	54	30.48	32.54	12.95	37.22	300	10	A	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 06 2437MHz		4874	44.9	-29.1	74	36.32	32.75	13.09	37.26	-	-	P	H
		7311	55.46	-18.54	74	40.69	37.06	15.88	38.17	250	45	P	H
		7311	49.84	-4.16	54	35.07	37.06	15.88	38.17	250	45	A	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4874	45.7	-28.3	74	37.12	32.75	13.09	37.26	-	-	P	V
		7311	54.29	-19.71	74	39.52	37.06	15.88	38.17	400	210	P	V
		7311	47.75	-6.25	54	32.98	37.06	15.88	38.17	400	210	A	V
													V
													V
													V
													V
													V
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													V
													V
													V

[illegible]



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		2389.905	65.87	-8.13	74	55.8	27.5	18.63	36.06	400	23	P	H
		2390	50.81	-3.19	54	40.74	27.5	18.63	36.06	400	23	A	H
	*	2412	114.78	-	-	104.65	27.52	18.67	36.06	400	23	P	H
	*	2412	107.24	-	-	97.11	27.52	18.67	36.06	400	23	A	H
													H
													H
		2389.8	62.08	-11.92	74	52.01	27.5	18.63	36.06	311	92	P	V
		2390	46.44	-7.56	54	36.37	27.5	18.63	36.06	311	92	A	V
	*	2412	107.57	-	-	97.44	27.52	18.67	36.06	311	92	P	V
	*	2412	100.3	-	-	90.17	27.52	18.67	36.06	311	92	A	V
													V
													V
802.11g CH 06 2437MHz		2386.8	52.2	-21.8	74	42.17	27.47	18.62	36.06	273	0	P	H
		2389.84	42.69	-11.31	54	32.62	27.5	18.63	36.06	273	0	A	H
	*	2437	115.79	-	-	105.51	27.63	18.72	36.07	273	0	P	H
	*	2437	108.27	-	-	97.99	27.63	18.72	36.07	273	0	A	H
		2487.92	51.57	-22.43	74	41.03	27.8	18.83	36.09	273	0	P	H
		2483.92	41.33	-12.67	54	30.8	27.8	18.82	36.09	273	0	A	H
		2386.8	50.44	-23.56	74	40.41	27.47	18.62	36.06	400	291	P	V
		2388.88	40.14	-13.86	54	30.08	27.49	18.63	36.06	400	291	A	V
	*	2437	107.27	-	-	96.99	27.63	18.72	36.07	400	291	P	V
	*	2437	99.7	-	-	89.42	27.63	18.72	36.07	400	291	A	V
		2495.2	49.9	-24.1	74	39.35	27.8	18.84	36.09	400	291	P	V
		2495.68	39.75	-14.25	54	29.2	27.8	18.84	36.09	400	291	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	113.52	-	-	103.21	27.62	18.77	36.08	293	358	P	H
	*	2462	105.72	-	-	95.41	27.62	18.77	36.08	293	358	A	H
		2486.2	63.02	-10.98	74	52.49	27.8	18.82	36.09	293	358	P	H
		2483.75	50.72	-3.28	54	40.19	27.8	18.82	36.09	293	358	A	H
													H
													H
	*	2462	95.52	-	-	85.21	27.62	18.77	36.08	100	91	P	V
	*	2462	88.16	-	-	77.85	27.62	18.77	36.08	100	91	A	V
		2484.4	50.09	-23.91	74	39.56	27.8	18.82	36.09	100	91	P	V
		2483.5	39.96	-14.04	54	29.43	27.8	18.82	36.09	100	91	A	V
													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)

[illegible]



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	51.12	-22.88	74	42.54	32.75	13.09	37.26	350	24	P	H
		4874	39.79	-14.21	54	31.21	32.75	13.09	37.26	350	24	A	H
		7311	56.47	-17.53	74	41.7	37.06	15.88	38.17	250	49	P	H
		7311	45.63	-8.37	54	30.86	37.06	15.88	38.17	250	49	A	H
													H
													H
													H
													H
													H
													H
													H
													H
		4874	49.28	-24.72	74	40.7	32.75	13.09	37.26	400	36	P	V
		4874	37.6	-16.4	54	29.02	32.75	13.09	37.26	400	36	A	V
		7311	54.34	-19.66	74	39.57	37.06	15.88	38.17	400	205	P	V
		7311	43.75	-10.25	54	28.98	37.06	15.88	38.17	400	205	A	V
													V
													V
													V
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													V
													V

[illegible]



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	63.34	-10.66	74	53.27	27.5	18.63	36.06	150	22	P	H
		2390	50.5	-3.5	54	40.43	27.5	18.63	36.06	150	22	A	H
	*	2412	114.33	-	-	104.2	27.52	18.67	36.06	150	22	P	H
	*	2412	105.92	-	-	95.79	27.52	18.67	36.06	150	22	A	H
													H
													H
		2389.8	57.44	-16.56	74	47.37	27.5	18.63	36.06	300	100	P	V
		2389.8	44.83	-9.17	54	34.76	27.5	18.63	36.06	300	100	A	V
	*	2412	106.02	-	-	95.89	27.52	18.67	36.06	300	100	P	V
	*	2412	98.76	-	-	88.63	27.52	18.67	36.06	300	100	A	V
													V
													V
802.11n HT20 CH 06 2437MHz		2388.24	55.09	-18.91	74	45.04	27.48	18.63	36.06	150	28	P	H
		2389.68	43.32	-10.68	54	33.25	27.5	18.63	36.06	150	28	A	H
	*	2437	116.7	-	-	106.42	27.63	18.72	36.07	150	28	P	H
	*	2437	108.68	-	-	98.4	27.63	18.72	36.07	150	28	A	H
		2485.28	53.13	-20.87	74	42.6	27.8	18.82	36.09	150	28	P	H
		2483.92	41.65	-12.35	54	31.12	27.8	18.82	36.09	150	28	A	H
		2388.72	51.45	-22.55	74	41.39	27.49	18.63	36.06	300	100	P	V
		2389.68	40.39	-13.61	54	30.32	27.5	18.63	36.06	300	100	A	V
	*	2437	109.95	-	-	99.67	27.63	18.72	36.07	300	100	P	V
	*	2437	102.5	-	-	92.22	27.63	18.72	36.07	300	100	A	V
		2490.08	51.05	-22.95	74	40.51	27.8	18.83	36.09	300	100	P	V
		2484.48	40.43	-13.57	54	29.9	27.8	18.82	36.09	300	100	A	V



802.11n HT20 CH 11 2462MHz	*	2462	111.97	-	-	101.66	27.62	18.77	36.08	200	21	P	H
	*	2462	103.56	-	-	93.25	27.62	18.77	36.08	200	21	A	H
		2483.68	61.97	-12.03	74	51.44	27.8	18.82	36.09	200	21	P	H
		2483.56	50.2	-3.8	54	39.67	27.8	18.82	36.09	200	21	A	H
													H
													H
	*	2462	105.97	-	-	95.66	27.62	18.77	36.08	300	98	P	V
	*	2462	97.6	-	-	87.29	27.62	18.77	36.08	300	98	A	V
		2484.2	57.66	-16.34	74	47.13	27.8	18.82	36.09	300	98	P	V
		2483.68	45.27	-8.73	54	34.74	27.8	18.82	36.09	300	98	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)
802.11n HT20 CH 01 2412MHz		4824	45.52	-28.48	74	37.25	32.54	12.95	37.22	-	-	P	H
													H
													H
													H
													H
													H
		4824	44.23	-29.77	74	35.96	32.54	12.95	37.22	-	-	P	V
													V
													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)
802.11n HT20 CH 06 2437MHz		4874	51.42	-22.58	74	42.84	32.75	13.09	37.26	313	14	P	H
		4874	39.68	-14.32	54	31.1	32.75	13.09	37.26	313	14	A	H
		7311	56.82	-17.18	74	42.05	37.06	15.88	38.17	335	54	P	H
		7311	44.88	-9.12	54	30.11	37.06	15.88	38.17	335	54	A	H
													H
													H
													H
													H
													H
													H
													H
													H
		4874	48.1	-25.9	74	39.52	32.75	13.09	37.26	395	206	P	V
		4874	37.2	-16.8	54	28.62	32.75	13.09	37.26	395	206	A	V
		7311	56.11	-17.89	74	41.34	37.06	15.88	38.17	400	212	P	V
		7311	43.49	-10.51	54	28.72	37.06	15.88	38.17	400	212	A	V
													V
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[illegible]

Emission above 18GHz

2.4GHz WIFI 802.11g (SHF)

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)
2.4GHz 802.11g SHF		24818	42.54	-31.46	74	36.29	39.54	19.71	53	-	-	P	H
													H
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													H
													H
		24972	42.92	-31.08	74	36.69	39.44	19.79	53	-	-	P	V
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Emission below 1GHz

2.4GHz WIFI 802.11g (LF)

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)
2.4GHz 802.11g LF		68.59	32.61	-7.39	40	54.15	12.56	1.61	35.71	300	1	Q	H
		71.99	29.51	-10.49	40	50.71	12.87	1.64	35.71	-	-	P	H
		137.27	27.81	-15.69	43.5	43.29	17.88	2.25	35.61	-	-	P	H
		153.08	30.37	-13.13	43.5	46.43	17.18	2.35	35.59	-	-	P	H
		724	36.5	-9.5	46	37.99	27.56	4.95	34	-	-	P	H
		960	35.86	-10.14	46	32.21	31.01	5.74	33.1	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
		41.39	31.03	-8.97	40	46.56	18.92	1.3	35.75	-	-	P	V
		68.93	33.02	-6.98	40	54.5	12.62	1.61	35.71	-	-	P	V
		141.01	27.1	-16.4	43.5	42.61	17.82	2.28	35.61	-	-	P	V
		285.6	33.61	-12.39	46	46.69	19.08	3.15	35.31	-	-	P	V
		733.6	38.32	-7.68	46	39.3	28	4.98	33.96	-	-	P	V
		899.2	38.62	-7.38	46	37.4	28.99	5.52	33.29	-	-	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	Peak or Average
H/V	Horizontal or Vertical



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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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 :	John Chuang, David Dai and Howard Huang	Temperature :	18.5~22.4°C
		Relative Humidity :	66.7~69.1%

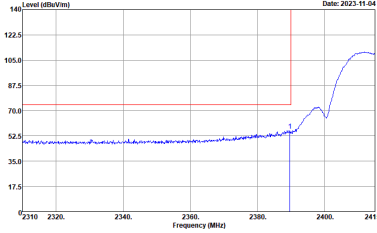
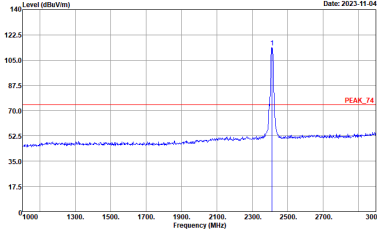
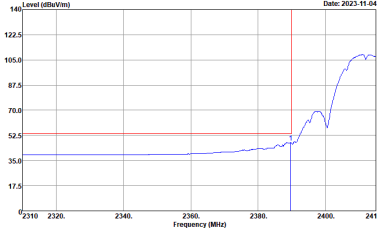
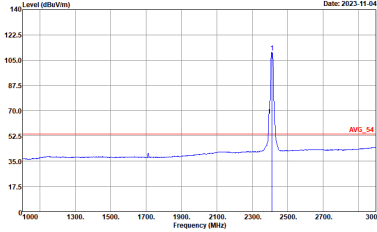
Note symbol

-L	Low channel location
-R	High channel location

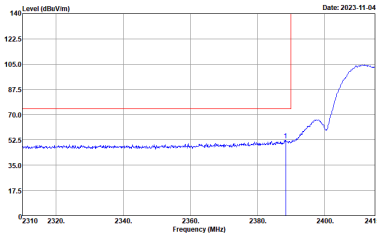
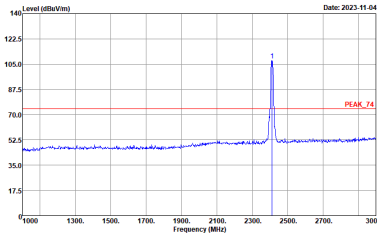
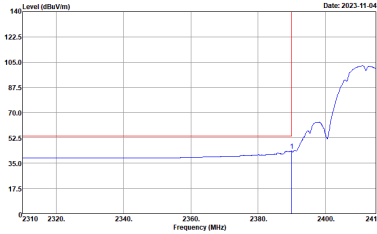
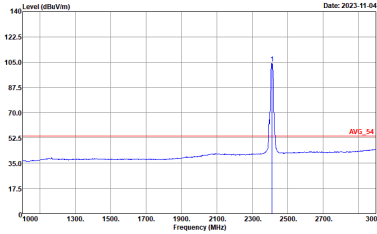


2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto

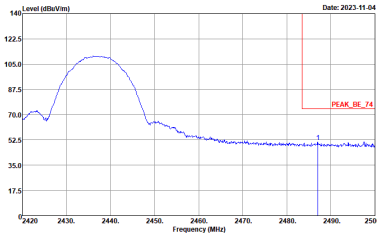
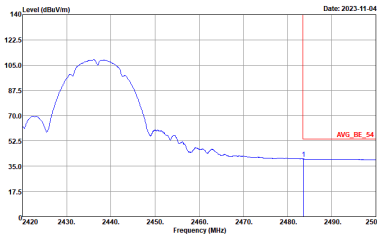


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

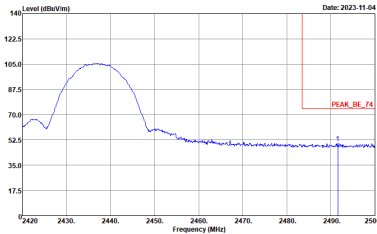
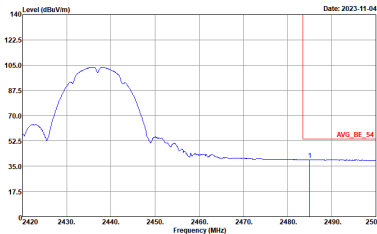


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	Left blank

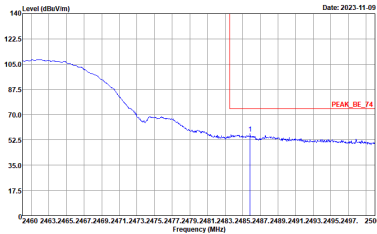
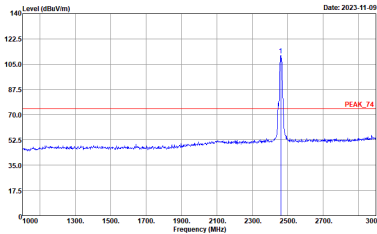
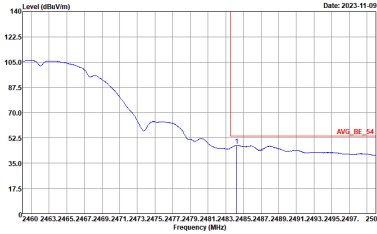
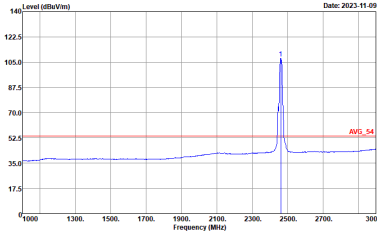


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	Left blank



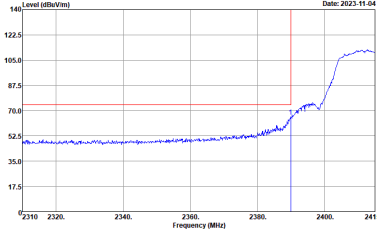
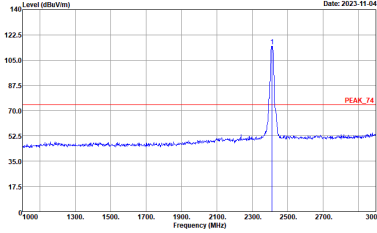
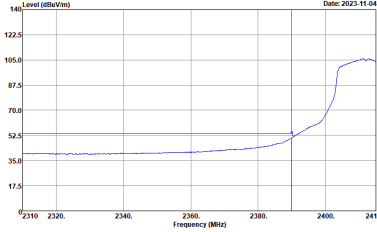
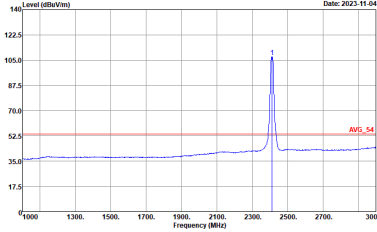
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto
Avg.		



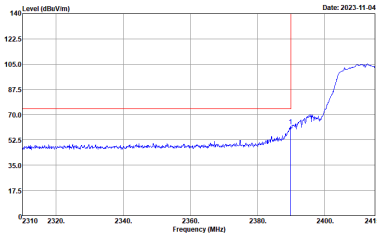
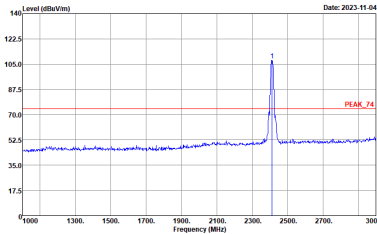
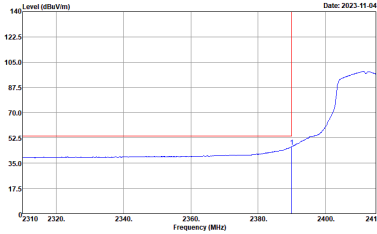
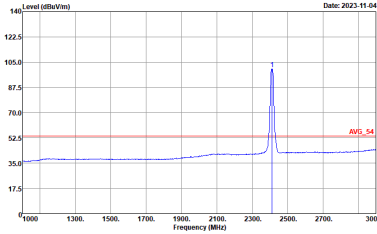
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto



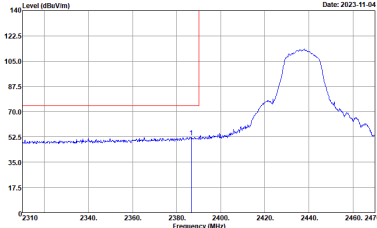
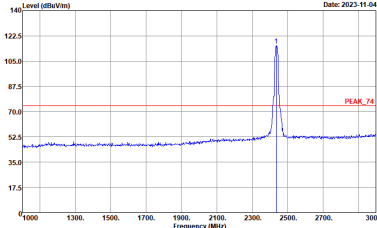
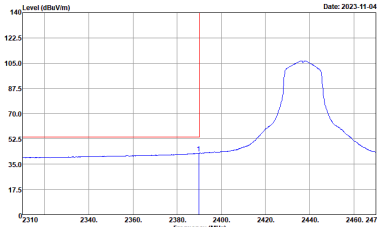
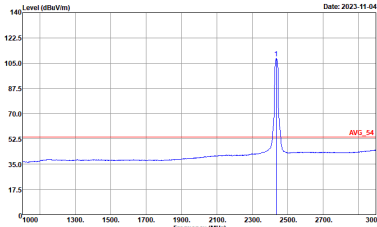
2.4GHz 2400~2483.5MHz
WIFI 802.11g (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL RBW:1000.000kHz VBW:0.270kHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL RBW:1000.000kHz VBW:0.270kHz SWT:Auto

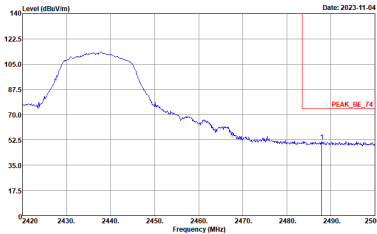
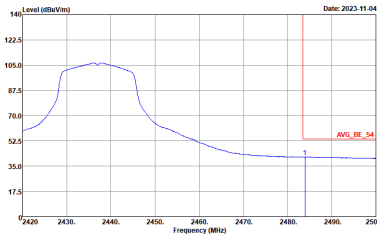


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto
Avg.		

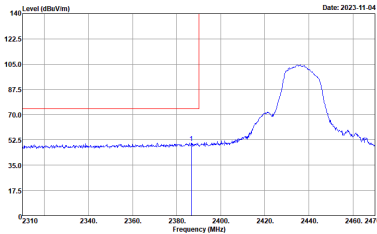
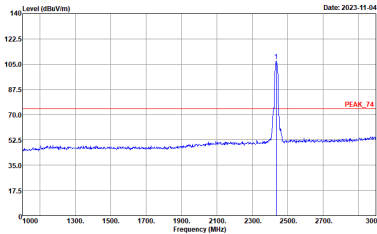
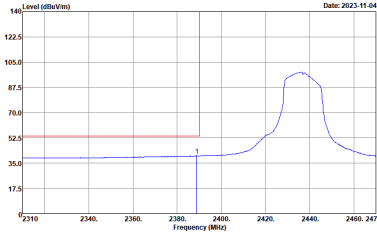
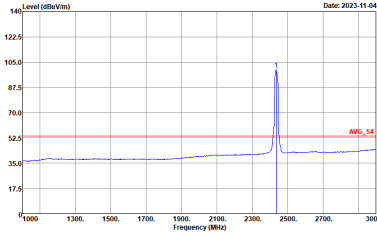


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto
Avg.		

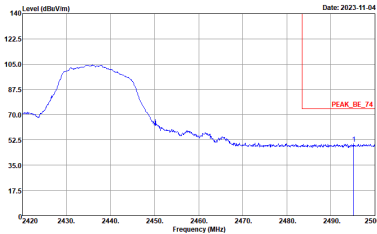
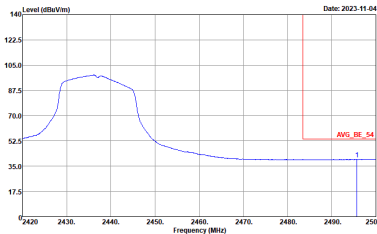


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Date: 2023-11-04	Left blank
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL RBW:1000.000kHz VBW:0.270kHz SWT:Auto Date: 2023-11-04	Left blank

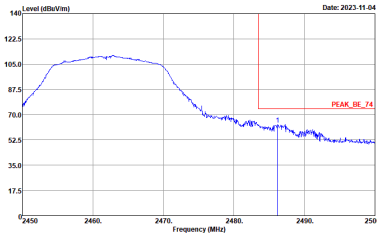
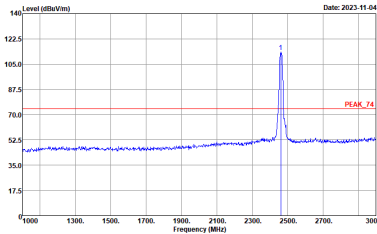
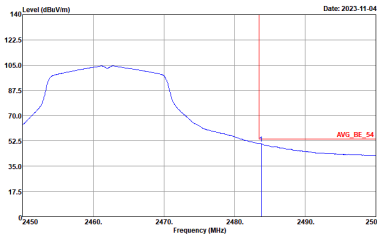
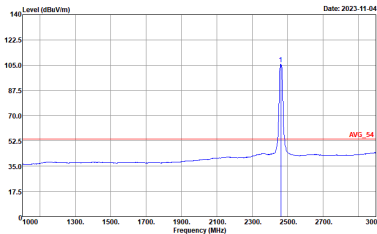


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto
Avg.		

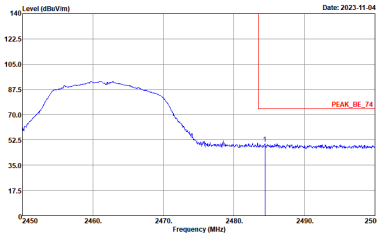
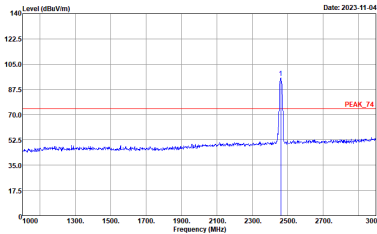
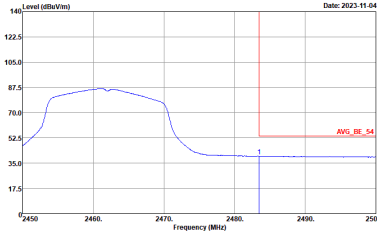
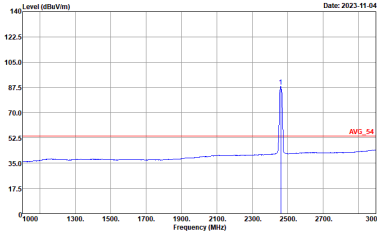


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left Blank
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000kHz VBW:0.270kHz SWT:Auto	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto
Avg.		

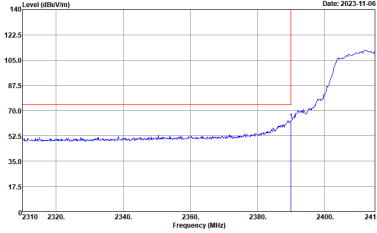
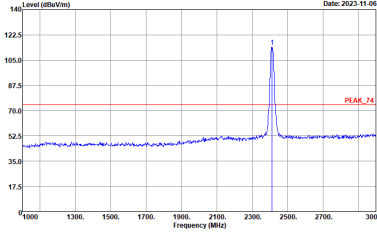
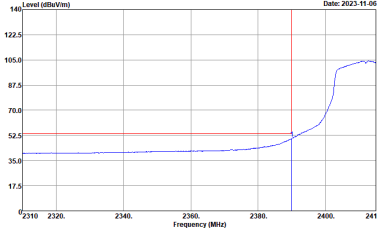
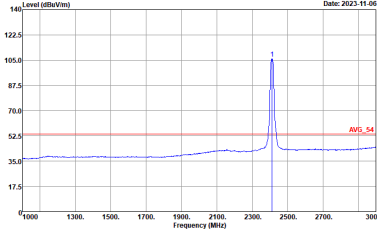


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Level (dBuV/m) vs Frequency (MHz) plot for Vertical polarization. The plot shows a broad peak around 2450 MHz and a sharp peak at 2462 MHz labeled 'PEAK_BE_74'. The y-axis ranges from 17.5 to 140 dBuV/m, and the x-axis ranges from 2450 to 2500 MHz. Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Level (dBuV/m) vs Frequency (MHz) plot for Fundamental polarization. The plot shows a sharp peak at 2462 MHz labeled 'PEAK_74'. The y-axis ranges from 17.5 to 140 dBuV/m, and the x-axis ranges from 1900 to 3000 MHz. Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Level (dBuV/m) vs Frequency (MHz) plot for Vertical polarization. The plot shows a broad peak around 2450 MHz and a sharp peak at 2462 MHz labeled 'AVG_BE_54'. The y-axis ranges from 17.5 to 140 dBuV/m, and the x-axis ranges from 2450 to 2500 MHz. Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto	 Level (dBuV/m) vs Frequency (MHz) plot for Fundamental polarization. The plot shows a sharp peak at 2462 MHz labeled 'AVG_54'. The y-axis ranges from 17.5 to 140 dBuV/m, and the x-axis ranges from 1900 to 3000 MHz. Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.270KHz SWT:Auto
Avg.		

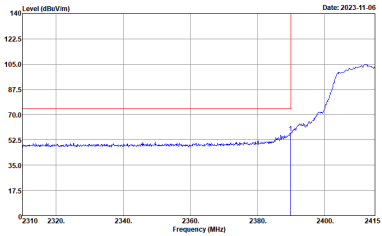
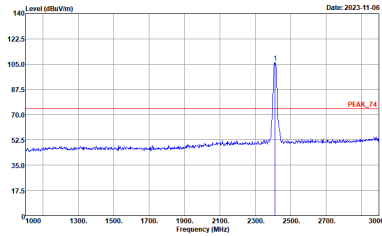
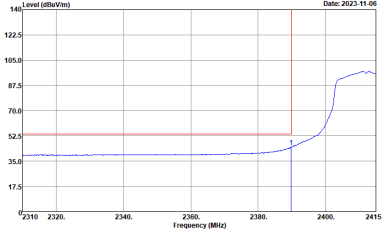
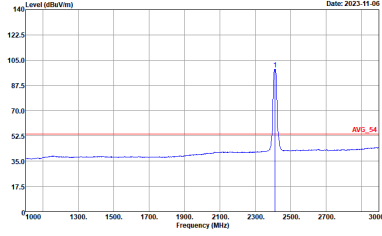


2.4GHz 2400~2483.5MHz

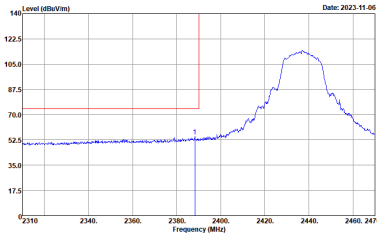
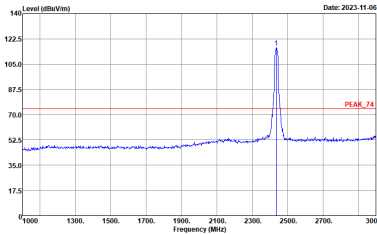
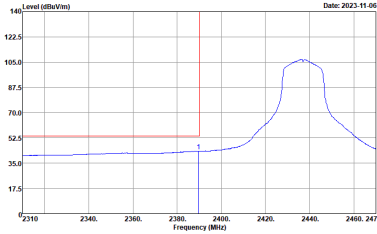
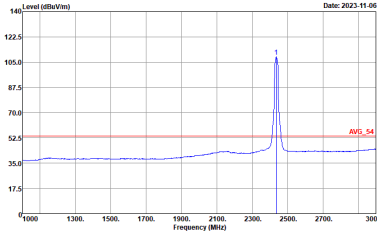
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL RBW:1000.000KHz VBW:0.010KHz SWT:Auto

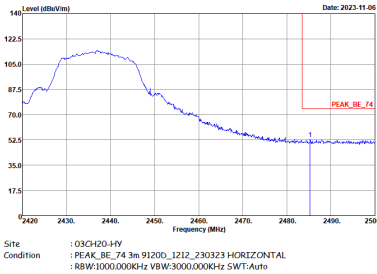
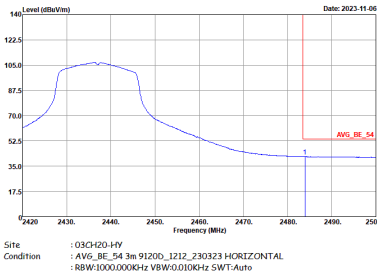


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto
Avg.		

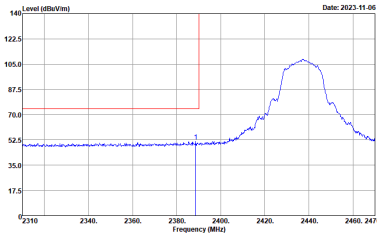
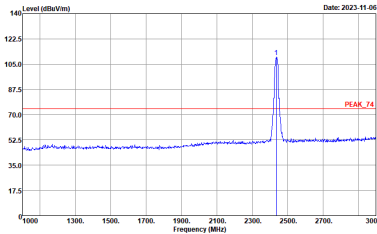
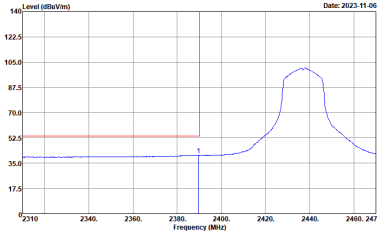
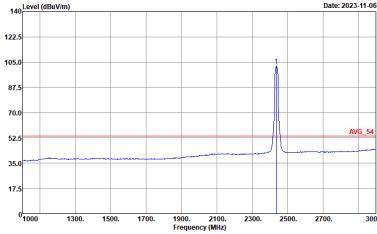


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto
Avg.		

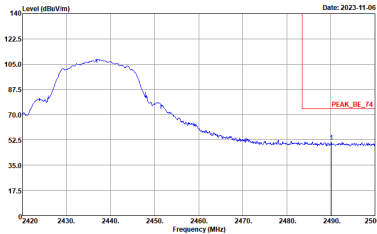
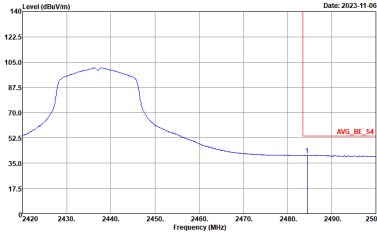


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

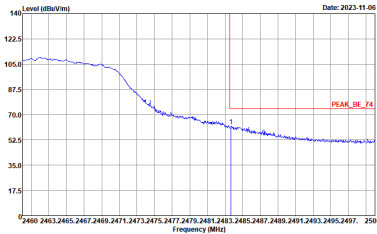
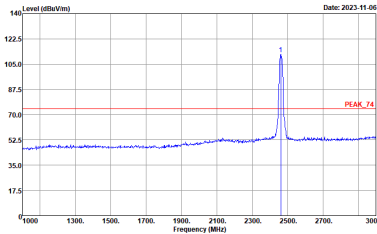
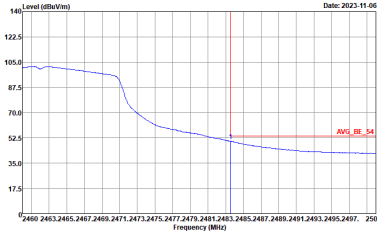
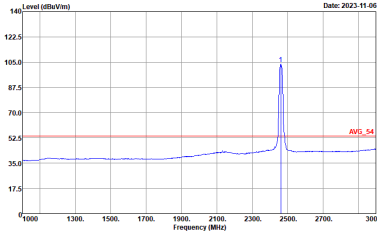


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto
Avg.		

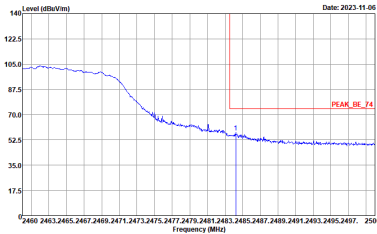
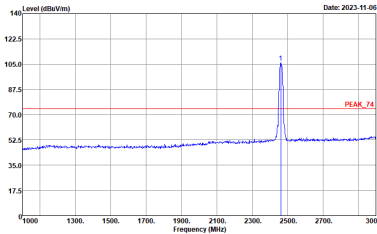
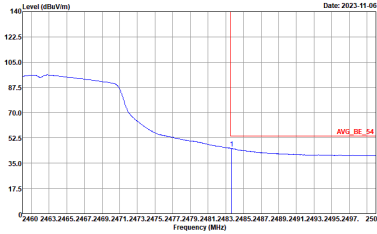
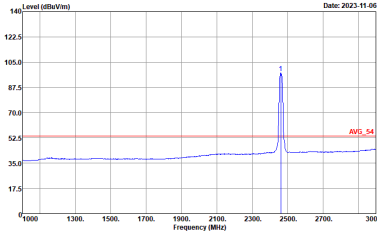


WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left Blank
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto	Left Blank



WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

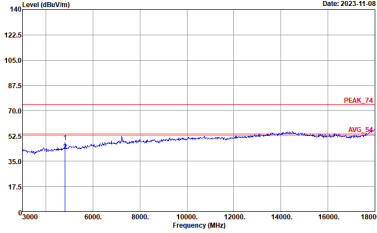
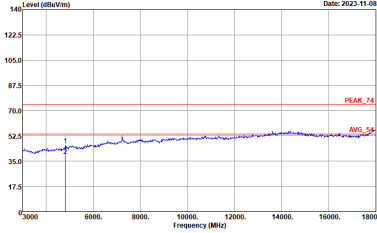


WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH20-HY Condition : AVG_BE_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 91200_1212_230323 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto
Avg.		

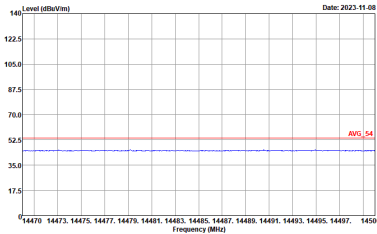
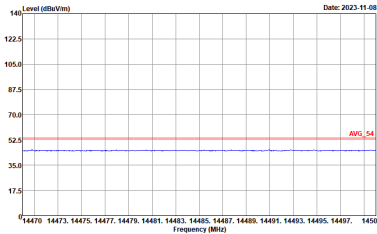
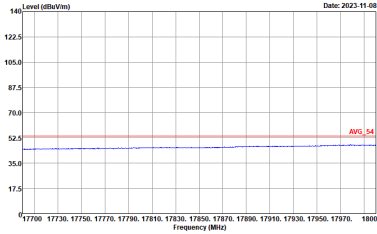
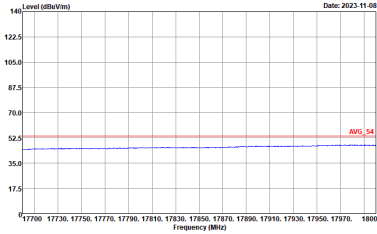


2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-4Y Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL	 Site : 03CH20-4Y Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL
	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL

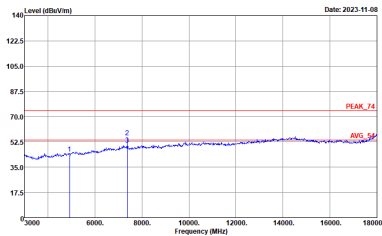
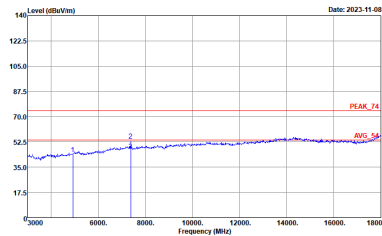


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL :	Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL :



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	Level (dBuV/m) vs Frequency (MHz) plot for Horizontal polarization. The y-axis ranges from 17.5 to 140 dBuV/m, and the x-axis ranges from 14470 to 14500 MHz. A red line indicates the average level (AVG_54) at approximately 52.5 dBuV/m. The plot shows a flat spectrum with a slight peak around 14475 MHz. Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	Level (dBuV/m) vs Frequency (MHz) plot for Vertical polarization. The y-axis ranges from 17.5 to 140 dBuV/m, and the x-axis ranges from 14470 to 14500 MHz. A red line indicates the average level (AVG_54) at approximately 52.5 dBuV/m. The plot shows a flat spectrum with a slight peak around 14475 MHz. Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL
	Level (dBuV/m) vs Frequency (MHz) plot for Horizontal polarization. The y-axis ranges from 17.5 to 140 dBuV/m, and the x-axis ranges from 17700 to 18000 MHz. A red line indicates the average level (AVG_54) at approximately 52.5 dBuV/m. The plot shows a flat spectrum with a slight peak around 17750 MHz. Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	Level (dBuV/m) vs Frequency (MHz) plot for Vertical polarization. The y-axis ranges from 17.5 to 140 dBuV/m, and the x-axis ranges from 17700 to 18000 MHz. A red line indicates the average level (AVG_54) at approximately 52.5 dBuV/m. The plot shows a flat spectrum with a slight peak around 17750 MHz. Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL :	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL :

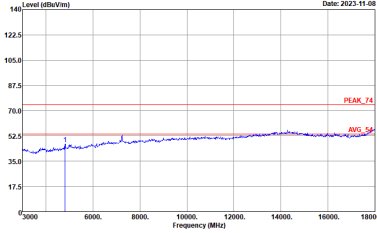
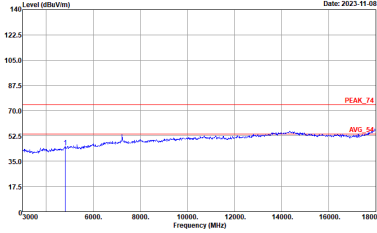


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	Level (dBuV/m) vs Frequency (MHz) graph. The y-axis ranges from 17.5 to 140. The x-axis ranges from 14470 to 14500 MHz. A red line labeled 'AVG_54' is at approximately 52.5 dBuV/m. A blue line is at approximately 45 dBuV/m. The date is 2023-11-08. Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	Level (dBuV/m) vs Frequency (MHz) graph. The y-axis ranges from 17.5 to 140. The x-axis ranges from 14470 to 14500 MHz. A red line labeled 'AVG_54' is at approximately 52.5 dBuV/m. A blue line is at approximately 45 dBuV/m. The date is 2023-11-08. Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL
	Level (dBuV/m) vs Frequency (MHz) graph. The y-axis ranges from 17.5 to 140. The x-axis ranges from 17700 to 18000 MHz. A red line labeled 'AVG_54' is at approximately 52.5 dBuV/m. A blue line is at approximately 45 dBuV/m. The date is 2023-11-08. Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	Level (dBuV/m) vs Frequency (MHz) graph. The y-axis ranges from 17.5 to 140. The x-axis ranges from 17700 to 18000 MHz. A red line labeled 'AVG_54' is at approximately 52.5 dBuV/m. A blue line is at approximately 45 dBuV/m. The date is 2023-11-08. Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL



2.4GHz 2400~2483.5MHz

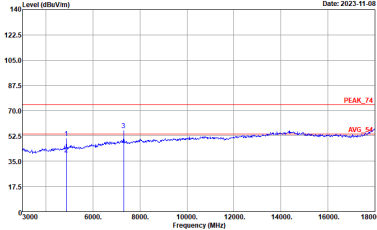
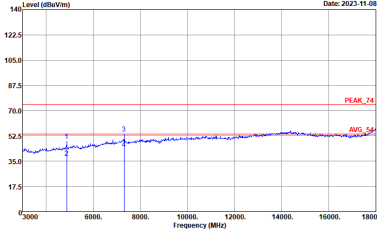
WIFI 802.11g (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-1HY Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL	 Site : 03CH20-1HY Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL

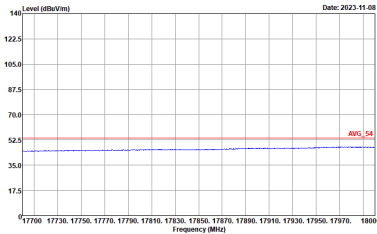
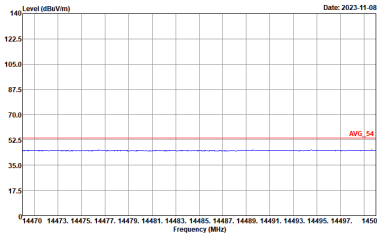
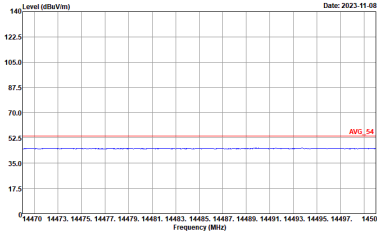
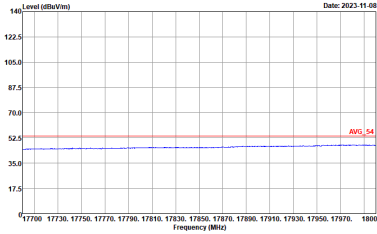


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL
	Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL

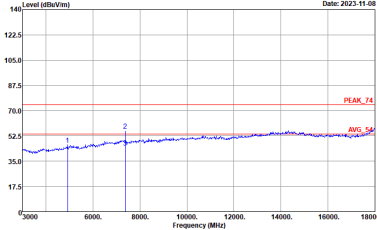
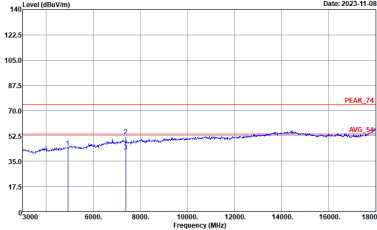


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL :	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL :



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL :	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL :
	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL :	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL :



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL :	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL :



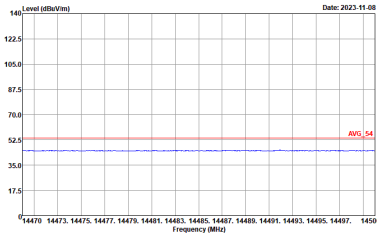
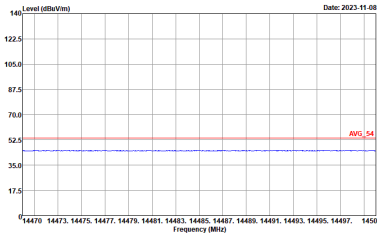
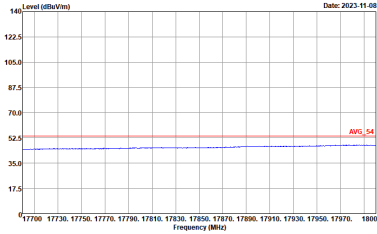
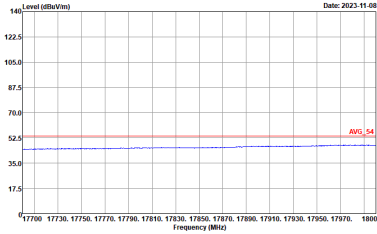
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL Frequency (MHz)	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL Frequency (MHz)
	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL Frequency (MHz)	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL Frequency (MHz)



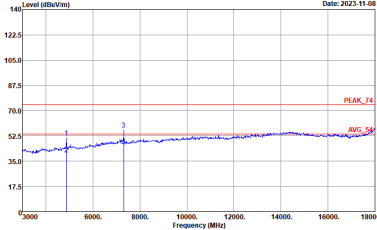
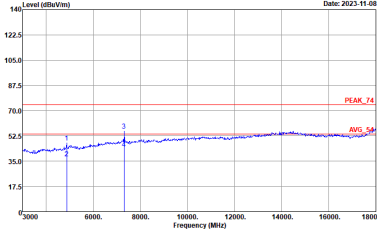
2.4GHz 2400~2483.5MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-1HY Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-1HY Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL
	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL	 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL

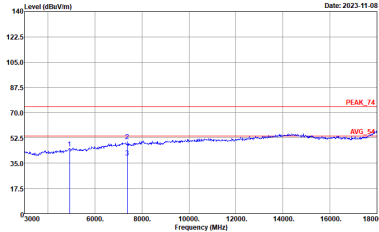
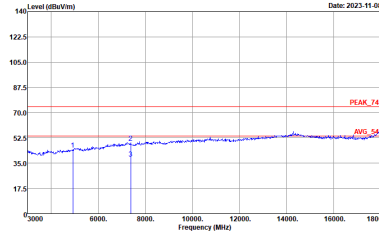


WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL :	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL :



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL Frequency (MHz)	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL Frequency (MHz)
	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL Frequency (MHz)	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL Frequency (MHz)



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 HORIZONTAL :	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_1212_230323 VERTICAL :



WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL Frequency (MHz)	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL Frequency (MHz)
	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 HORIZONTAL Frequency (MHz)	Level (dBuV/m) Date: 2023-11-08 Site : 03CH20-HY Condition : AV6_54 3m 91200_1212_230323 VERTICAL Frequency (MHz)



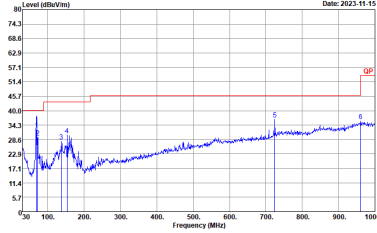
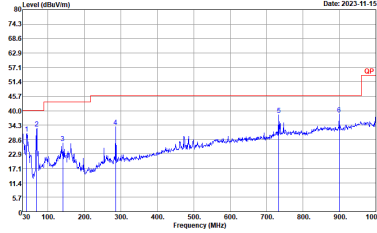
Emission above 18GHz

2.4GHz WIFI 802.11g (SHF @ 1m)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11g SHF	
1	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2023-11-15 Site : 03CH20-1HY Condition : PEAK_74 1m SHF_1223_230710 HORIZONTAL :	Level (dBuV/m) Date: 2023-11-15 Site : 03CH20-1HY Condition : PEAK_74 1m SHF_1223_230710 VERTICAL :



Emission below 1GHz
2.4GHz WIFI 802.11g (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11g LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH20-HY Condition : QP 3m LF_55606_Z31020_200 HORIZONTAL	 Site : 03CH20-HY Condition : QP 3m LF_55606_Z31020_200 VERTICAL



Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11b	99.05	-	-	10Hz
802.11g	97.53	4140	0.24	270Hz
2.4GHz 802.11n HT20	98.09	-	-	10Hz

