FCC RADIO TEST REPORT

FCC ID	:	**A4RGC3G8**
Equipment	:	**Wireless Device**
Model Name	:	**GC3G8**
Applicant	:	**Google LLC** **1600 Amphitheatre Parkway,** **Mountain View, California, 94043 USA**
Standard	:	**FCC Part 15 Subpart C §15.247**

The product was received on Mar. 17, 2023 and testing was performed from Mar. 28, 2023 to May 12, 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
FR330717C	01	Initial issue of report	Jun. 26, 2023
FR330717C	02	1. Revise Appendix A 2. Revise Product Specification is subject to this standard and Test Mode This report is an updated version, replacing the report issued on Jun. 26, 2023.	Jul. 06, 2023

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	3.71 dB under the limit at 2483.560 MHz
3.6	15.207	AC Conducted Emission	Pass	15.7 dB under the limit at 0.161 MHz
3.7	15.203	Antenna Requirement	Pass	-

Conformity Assessment Condition:

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

Disclaimer:

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

Reviewed by: Yun Huang
Report Producer: Ming Chen

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Wireless Device
Model Name	GC3G8
FCC ID	A4RGC3G8
EUT supports Radios application	WCDMA/HSPA/LTE WLAN 11b/g/n HT20 Bluetooth BR/EDR/LE

Remark: The above EUT's information was declared by manufacturer.

EUT Information List	
S/N	**Performed Test Item**
32271RUJWR06QN	RF Conducted Measurement
32271RUJWR06R3	Radiated Spurious Emission
32271RUJWR06QG	Conducted Emission

1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Tx/Rx Channel Frequency Range	2412 MHz ~ 2462 MHz
Maximum (Peak) Output Power to antenna	802.11b: 21.28 dBm (0.1343 W) 802.11g: 22.37 dBm (0.1726 W) 802.11n HT20: 22.34 dBm (0.1714 W)
99% Occupied Bandwidth	802.11b: 14.09 MHz 802.11g: 17.98 MHz 802.11n HT20: 18.98 MHz
Antenna Type / Gain	PIFA Antenna with gain -6.20 dBi
Type of Modulation	802.11b: DSSS (DBPSK / DQPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM)

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

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 find X plane with Adapter as worst plane.

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
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.

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

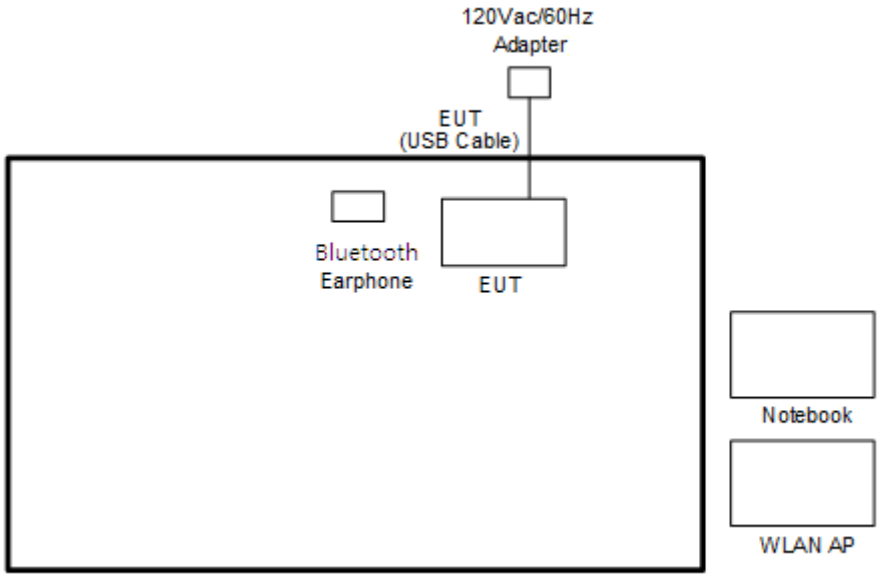
Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (2.4GHz) Link + Battery + USB Cable (Charging from Adapter)

Ch. #	2400-2483.5 MHz		
	802.11b	802.11g	802.11n HT20
Low	01	01	01
Middle	06	06	06
High	11	11	11

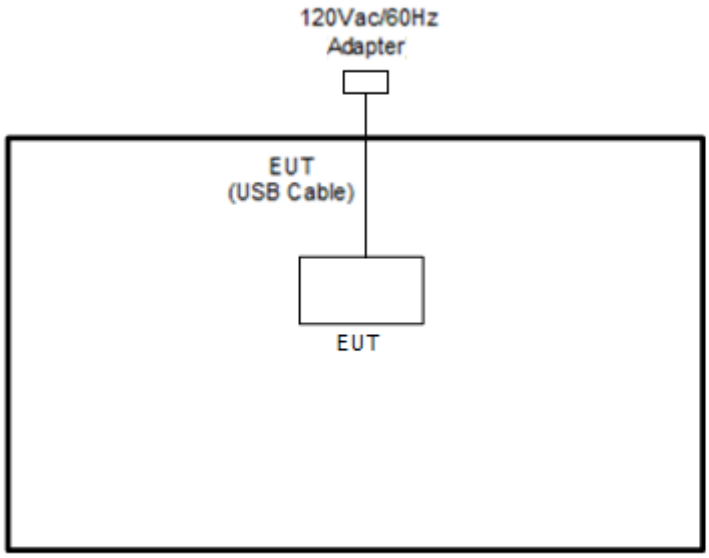
Remark: For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



<WLAN Tx Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Adapter	Google	G1000	N/A	N/A	N/A
2.	Bluetooth Earphone	Kinyo	BTE-3622	N/A	N/A	N/A
3.	WLAN AP	ASUS	RT-AC52	N/A	N/A	Unshielded, 1.8 m
4.	Notebook	Dell	P79G	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT Version 4.0.00158.0” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example:
The spectrum analyzer offset is derived from RF cable loss and attenuator factor.
Offset = RF cable loss + attenuator factor.
Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).
= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 99% Bandwidth Measurement

3.1.1 Limit of 6dB and 99% Bandwidth

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

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

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

3.1.4 Test Setup

3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5 MHz, the limit for output power is 30 dBm. If transmitting antenna with directional gain greater than 6 dBi is used, the 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.

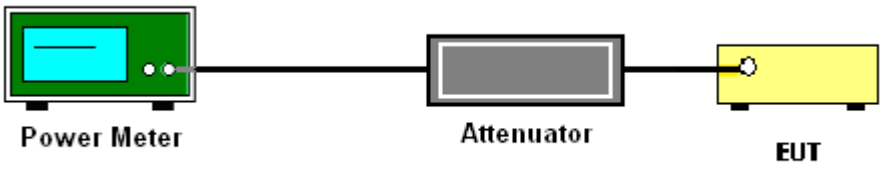
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. For Peak Power, the testing follows ANSI C63.10 Section 11.9.1.3 PKPM1
2. For Average Power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G
3. 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.
4. Set the maximum power setting and enable the EUT to transmit continuously.
5. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup



3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

3.2.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
2. The RF output of EUT is connected to the spectrum analyzer by RF cable and attenuator. The path loss is compensated to the results for each measurement.
3. Set the maximum power setting and enable the EUT to transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

3.3.4 Test Setup

3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

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

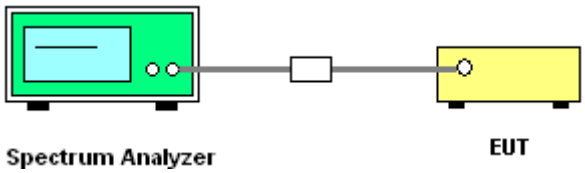
3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

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

3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Please refer to Appendix A.

3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

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

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

3.5.2 Measuring Instruments

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

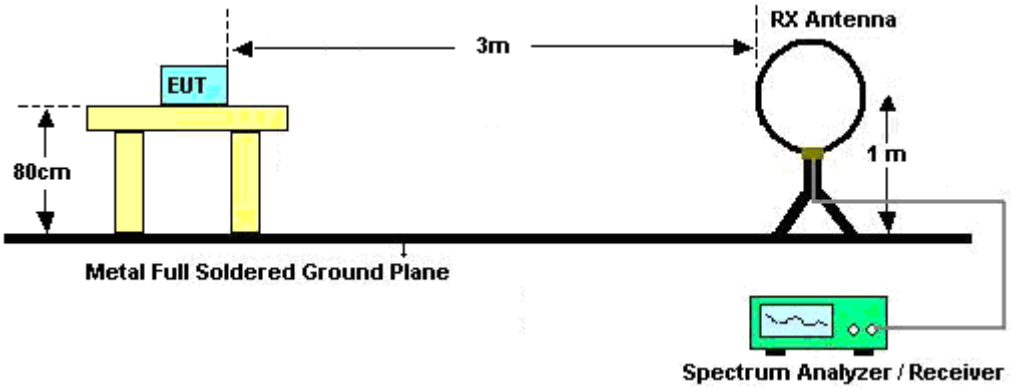
3.5.3 Test Procedures

1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
4. The EUT is set 3 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-“.

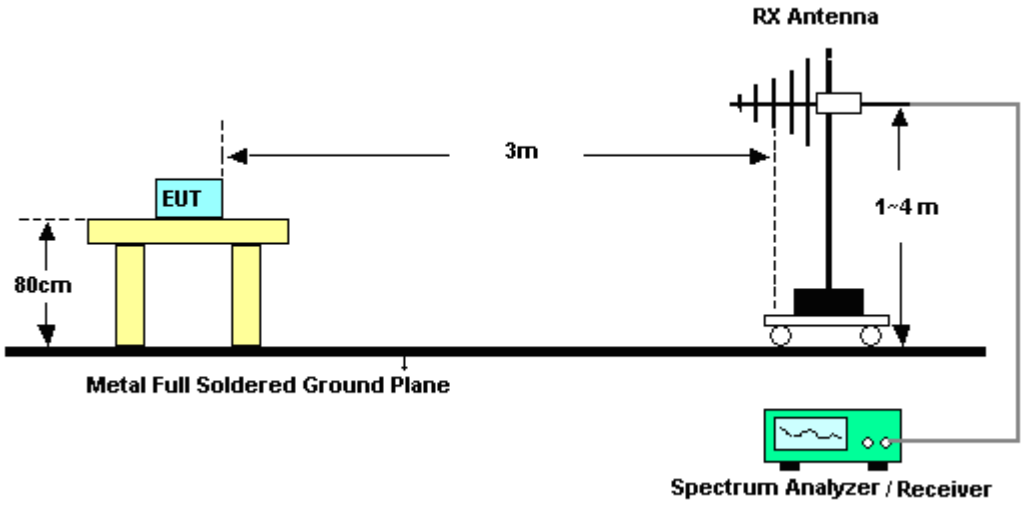
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as "-".
8. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW = 100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3 MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

3.5.4 Test Setup

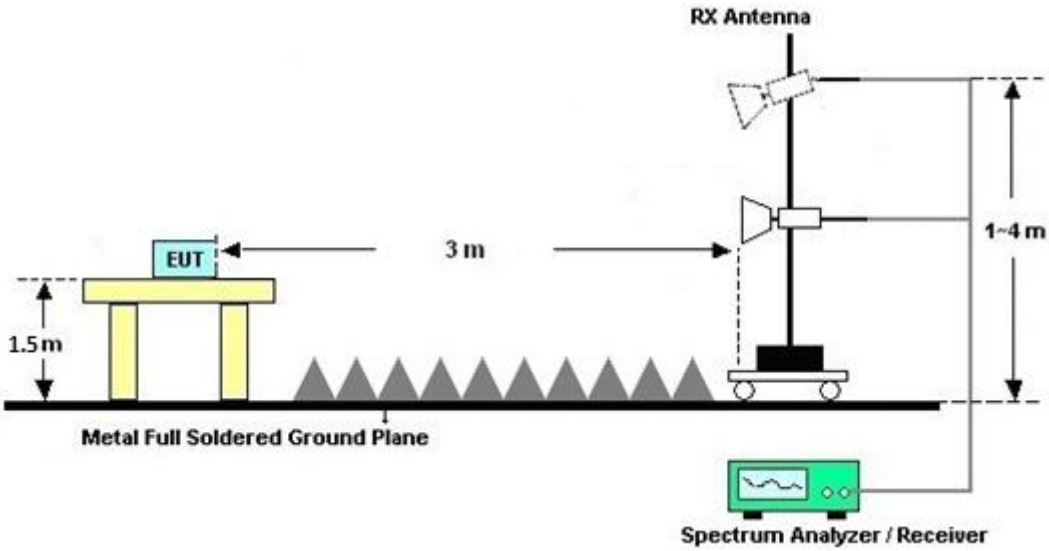
For radiated emissions below 30MHz



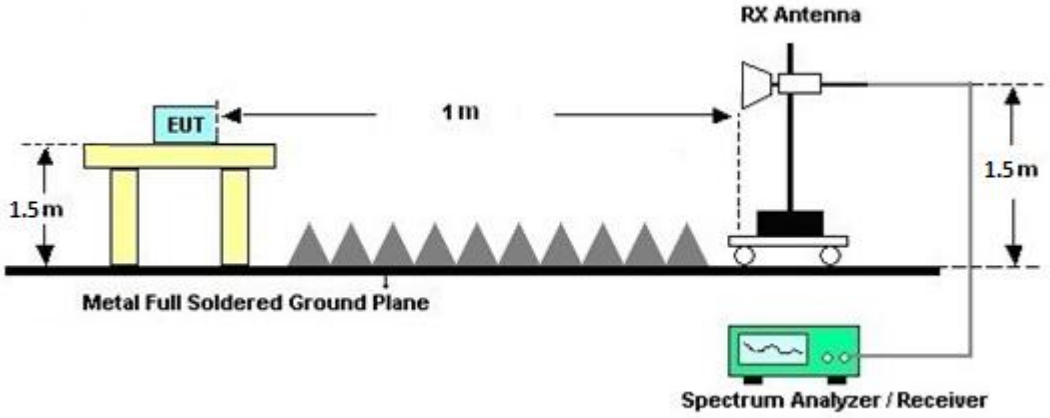
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

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

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

3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.5.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

3.6 AC Conducted Emission Measurement

3.6.1 Limit of AC Conducted Emission

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

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

*Decreases with the logarithm of the frequency.

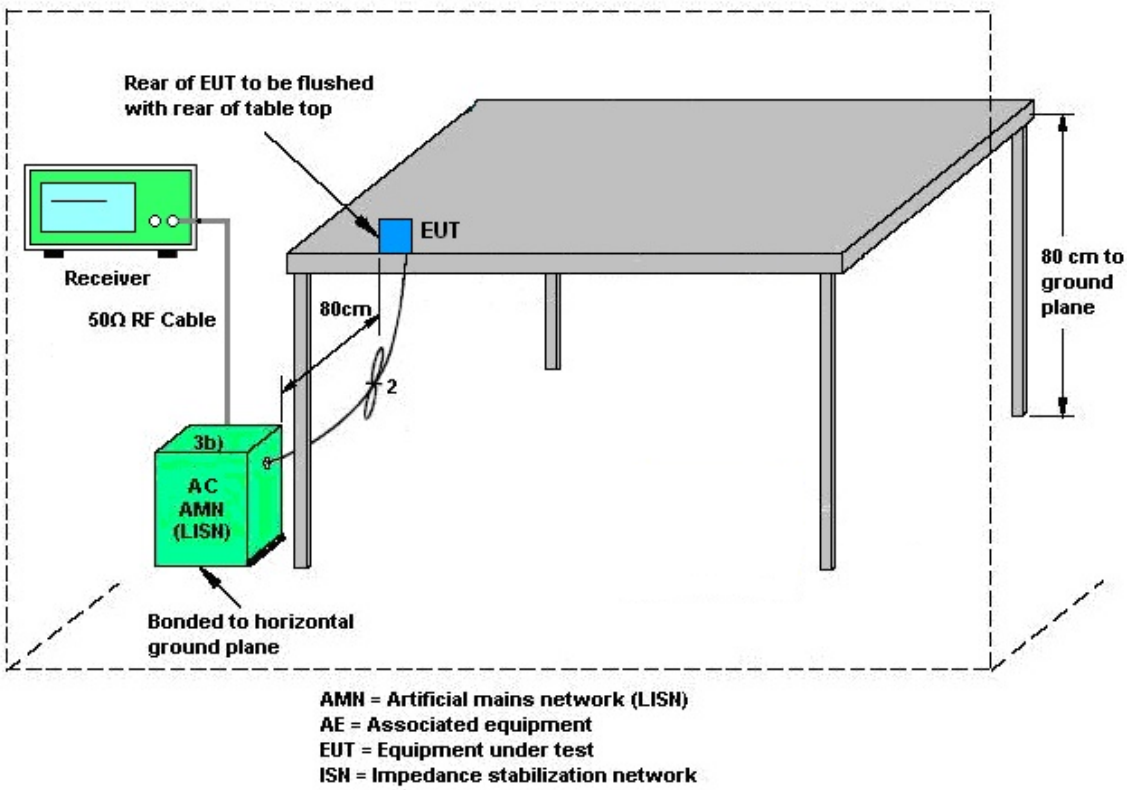
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

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

3.6.4 Test Setup



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
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Mar. 28, 2023	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Mar. 28, 2023	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Nov. 01, 2022	Mar. 28, 2023	Oct. 31, 2023	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 15, 2023	Mar. 28, 2023	Mar. 14, 2024	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Mar. 05, 2023	Mar. 28, 2023	Mar. 04, 2024	Conduction (CO07-HY)
Four-Line V-Network	TESEQ	NNB 52	36122	N/A	Mar. 13, 2023	Mar. 28, 2023	Mar. 12, 2024	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Oct. 06, 2022	Mar. 28, 2023	Oct. 05, 2023	Conduction (CO07-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 17, 2022	Mar. 30, 2023~ May 12, 2023	Nov. 16, 2023	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO 12 (NO:113)	10MHz~6GHz	Dec. 13, 2022	Mar. 30, 2023~ May 12, 2023	Dec. 12, 2023	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	932001	N/A	Sep. 26, 2022	Mar. 30, 2023~ May 12, 2023	Sep. 25, 2023	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	846202	300MHz~40GHz	Sep. 26, 2022	Mar. 30, 2023~ May 12, 2023	Sep. 25, 2023	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101905	10Hz - 40GHz(amp)	Aug. 03, 2022	Mar. 30, 2023~ May 12, 2023	Aug. 02, 2023	Conducted (TH05-HY)
EMI Test Receiver	Keysight	N9038A	MY59053012	N/A	Nov. 18, 2022	Apr. 22, 2023 ~ May 04, 2023	Nov. 17, 2023	Radiation (03CH20-HY)
Signal Analyzer	Keysight	N9010B	MY60241058	N/A	Jul. 07, 2022	Apr. 22, 2023 ~ May 04, 2023	Jul. 06, 2023	Radiation (03CH20-HY)
Preamplifier	COM-POWER	PAM-103	18020201	1MHz-1000MHz	Jan. 02, 2023	Apr. 22, 2023 ~ May 04, 2023	Jan. 01, 2024	Radiation (03CH20-HY)
Amplifier	EMCI	EMC118A45SE	980792	N/A	Nov. 14, 2022	Apr. 22, 2023 ~ May 04, 2023	Nov. 13, 2023	Radiation (03CH20-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 28, 2022	Apr. 22, 2023 ~ May 04, 2023	Jun. 27, 2023	Radiation (03CH20-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 20, 2022	Apr. 22, 2023 ~ May 04, 2023	Sep. 19, 2023	Radiation (03CH20-HY)
Bilog Antenna	TESEQ	CBL 6111D&00802 N1D01N-06	55606 & 08	30MHz~1GHz	Oct. 22, 2022	Apr. 22, 2023 ~ May 04, 2023	Oct. 21, 2023	Radiation (03CH20-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	02360	1GHz~18GHz	Nov. 04, 2022	Apr. 22, 2023 ~ May 04, 2023	Nov. 03, 2023	Radiation (03CH20-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00994	18GHz-40GHz	Nov. 04, 2022	Apr. 22, 2023 ~ May 04, 2023	Nov. 03, 2023	Radiation (03CH20-HY)
Hygrometer	TECPEL	DTM-302	SN3	N/A	Sep. 28, 2022	Apr. 22, 2023 ~ May 04, 2023	Sep. 27, 2023	Radiation (03CH20-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	519229/2,804 015/2,804027 /2	N/A	Jan. 18, 2023	Apr. 22, 2023 ~ May 04, 2023	Jan. 17, 2024	Radiation (03CH20-HY)
Software	Audix	E3 6.2009-8-24	RK-002156	N/A	N/A	Apr. 22, 2023 ~ May 04, 2023	N/A	Radiation (03CH20-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Apr. 22, 2023 ~ May 04, 2023	N/A	Radiation (03CH20-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Apr. 22, 2023 ~ May 04, 2023	N/A	Radiation (03CH20-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Apr. 22, 2023 ~ May 04, 2023	N/A	Radiation (03CH20-HY)

5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.46 dB

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

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

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.80 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	Temperature:	21~25	°C
Test Date:	2023/3/30~2023/4/18	Relative Humidity:	51~54	%

Report Number : FR330717C

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	14.09	9.08	0.50	Pass
11b	1Mbps	1	6	2437	13.99	8.58	0.50	Pass
11b	1Mbps	1	11	2462	13.99	8.60	0.50	Pass
11g	6Mbps	1	1	2412	17.98	16.36	0.50	Pass
11g	6Mbps	1	6	2437	17.88	16.34	0.50	Pass
11g	6Mbps	1	11	2462	17.53	16.08	0.50	Pass
HT20	MCS0	1	1	2412	18.93	17.34	0.50	Pass
HT20	MCS0	1	6	2437	18.98	17.18	0.50	Pass
HT20	MCS0	1	11	2462	18.83	16.84	0.50	Pass

TEST RESULTS DATA
Peak Output Power

2.4GHz Band Single Antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant1	Ant1	Ant1	Ant1	Ant1	
11b	1Mbps	1	1	2412	20.70	30.00	-6.20	14.50	36.00	Pass
11b	1Mbps	1	6	2437	21.03	30.00	-6.20	14.83	36.00	Pass
11b	1Mbps	1	11	2462	21.28	30.00	-6.20	15.08	36.00	Pass
11g	6Mbps	1	1	2412	22.24	30.00	-6.20	16.04	36.00	Pass
11g	6Mbps	1	6	2437	22.37	30.00	-6.20	16.17	36.00	Pass
11g	6Mbps	1	11	2462	20.71	30.00	-6.20	14.51	36.00	Pass
HT20	MCS0	1	1	2412	22.22	30.00	-6.20	16.02	36.00	Pass
HT20	MCS0	1	6	2437	22.34	30.00	-6.20	16.14	36.00	Pass
HT20	MCS0	1	11	2462	20.23	30.00	-6.20	14.03	36.00	Pass

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

TEST RESULTS DATA
Average Output Power

2.4GHz Band Single Antenna										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)	Conducted Power Limit (dBm)	DG (dBi)	EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail
					Ant1	Ant1	Ant1	Ant1	Ant1	
11b	1Mbps	1	1	2412	18.90	30.00	-6.20	12.70	36.00	Pass
11b	1Mbps	1	6	2437	19.30	30.00	-6.20	13.10	36.00	Pass
11b	1Mbps	1	11	2462	19.60	30.00	-6.20	13.40	36.00	Pass
11g	6Mbps	1	1	2412	18.40	30.00	-6.20	12.20	36.00	Pass
11g	6Mbps	1	6	2437	18.60	30.00	-6.20	12.40	36.00	Pass
11g	6Mbps	1	11	2462	16.60	30.00	-6.20	10.40	36.00	Pass
HT20	MCS0	1	1	2412	18.40	30.00	-6.20	12.20	36.00	Pass
HT20	MCS0	1	6	2437	18.60	30.00	-6.20	12.40	36.00	Pass
HT20	MCS0	1	11	2462	16.10	30.00	-6.20	9.90	36.00	Pass

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

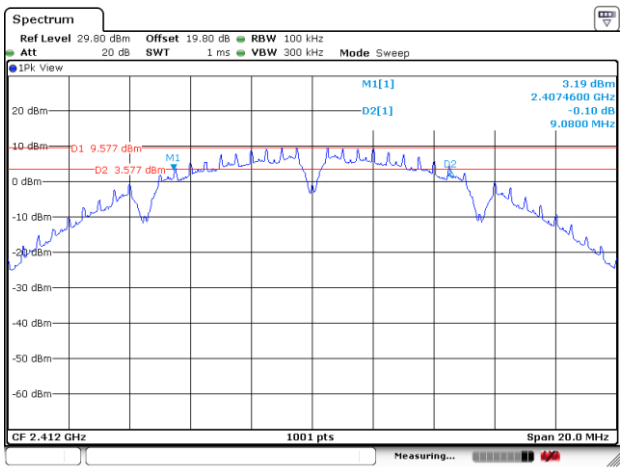
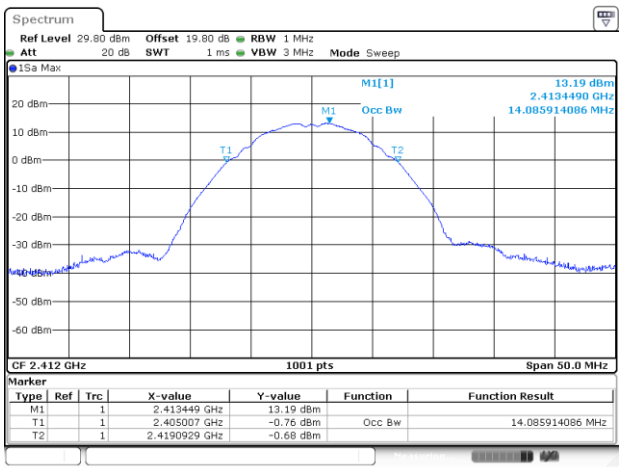
TEST RESULTS DATA
Peak Power Spectral Density

2.4GHz Band Single Antenna								
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Peak PSD (dBm/3kHz)	DG (dBi)	Peak PSD Limit (dBm/3kHz)	Pass/Fail
					Ant1	Ant1	Ant1	
11b	1Mbps	1	1	2412	-3.29	-6.20	8.00	Pass
11b	1Mbps	1	6	2437	-3.64	-6.20	8.00	Pass
11b	1Mbps	1	11	2462	-2.57	-6.20	8.00	Pass
11g	6Mbps	1	1	2412	-5.93	-6.20	8.00	Pass
11g	6Mbps	1	6	2437	-7.81	-6.20	8.00	Pass
11g	6Mbps	1	11	2462	-9.35	-6.20	8.00	Pass
HT20	MCS0	1	1	2412	-6.75	-6.20	8.00	Pass
HT20	MCS0	1	6	2437	-7.66	-6.20	8.00	Pass
HT20	MCS0	1	11	2462	-10.87	-6.20	8.00	Pass

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

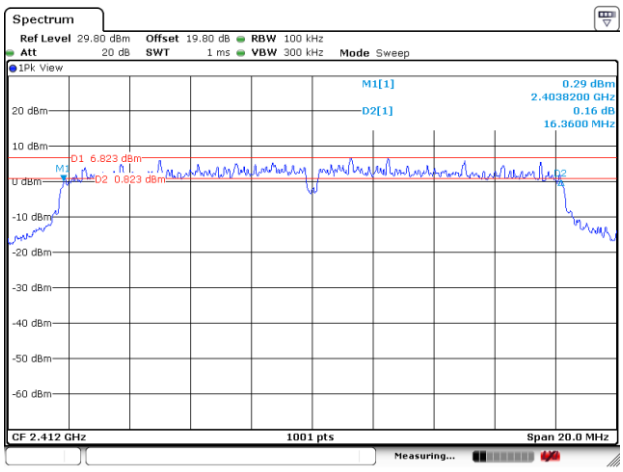
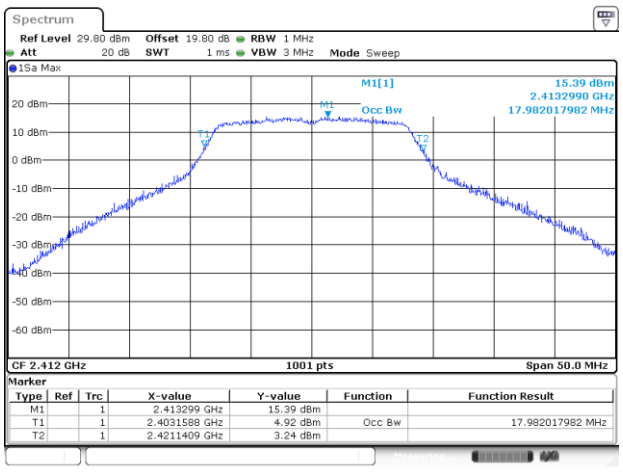
6dB and 99% Occupied Bandwidth

<802.11b>

6dB Bandwidth	99% Occupied Bandwidth
	

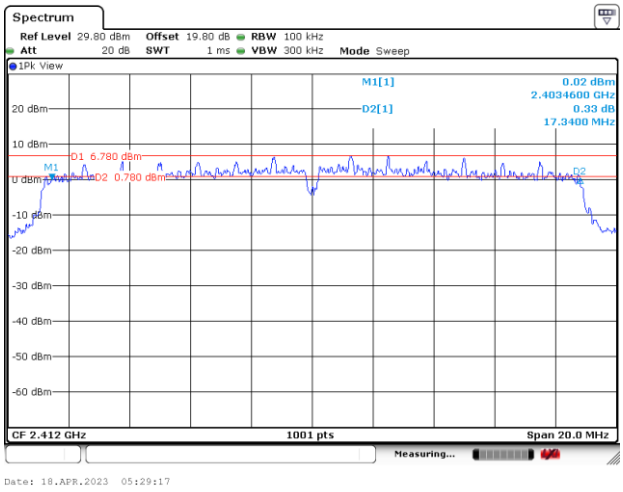
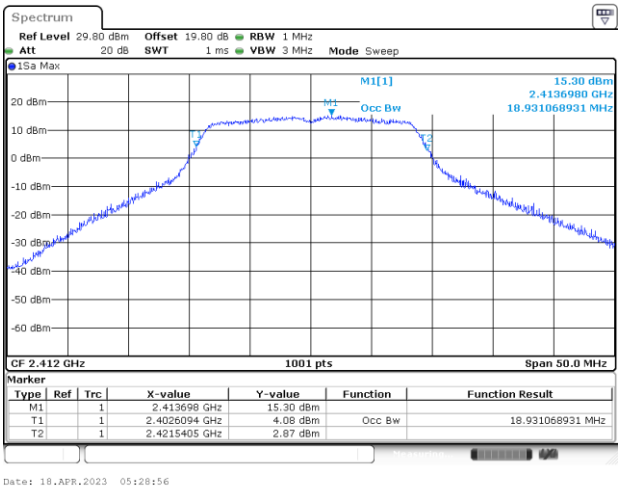
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<802.11g>

6dB Bandwidth	99% Occupied Bandwidth
	

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

<802.11n HT20>

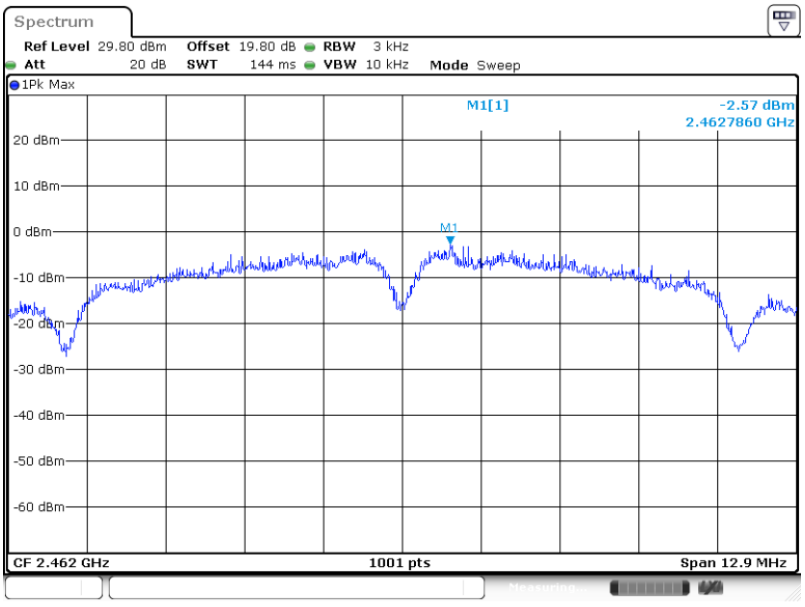
6dB Bandwidth	99% Occupied Bandwidth
	

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

Power Spectral Density(dBm/3kHz)

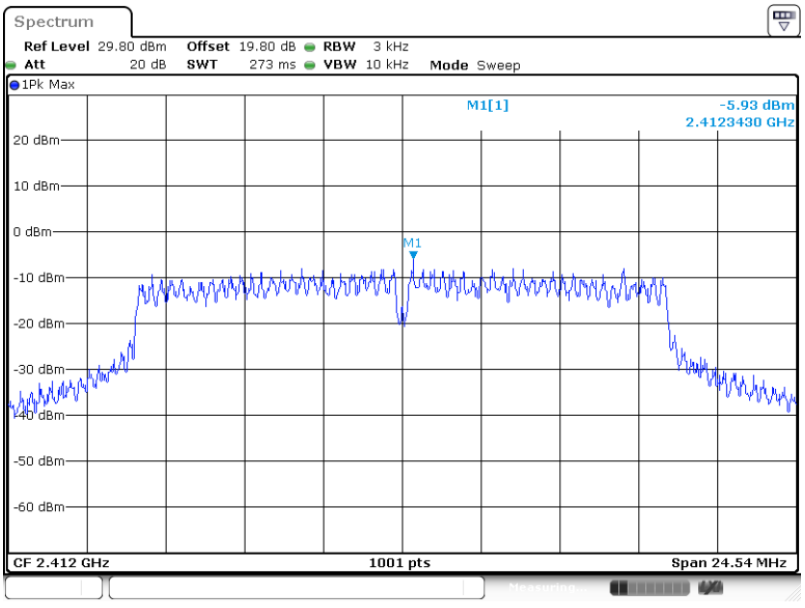
<802.11b>

Worst Case Power Density (dBm/3kHz)



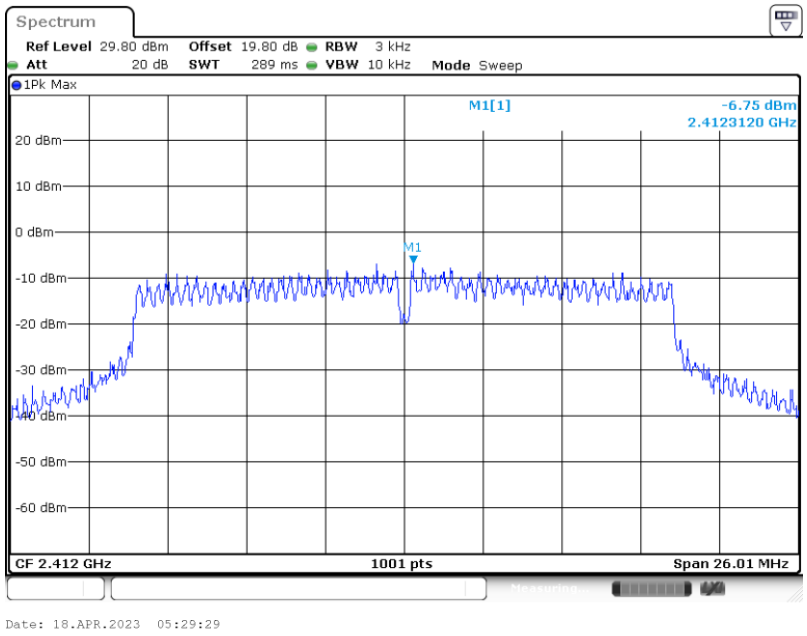
<802.11g>

Worst Case Power Density (dBm/3kHz)



<802.11n HT20>

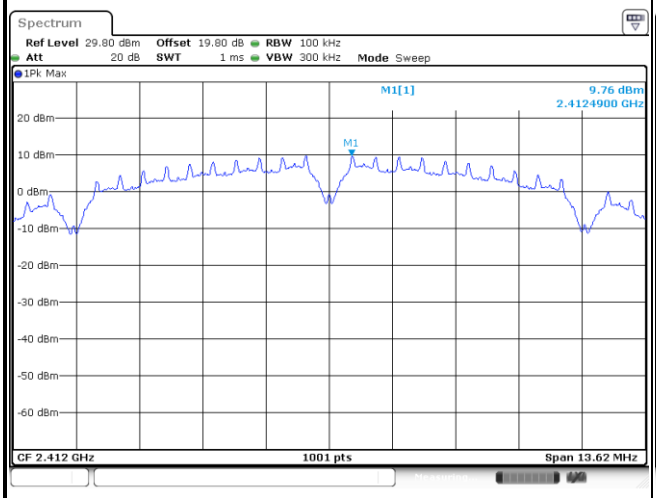
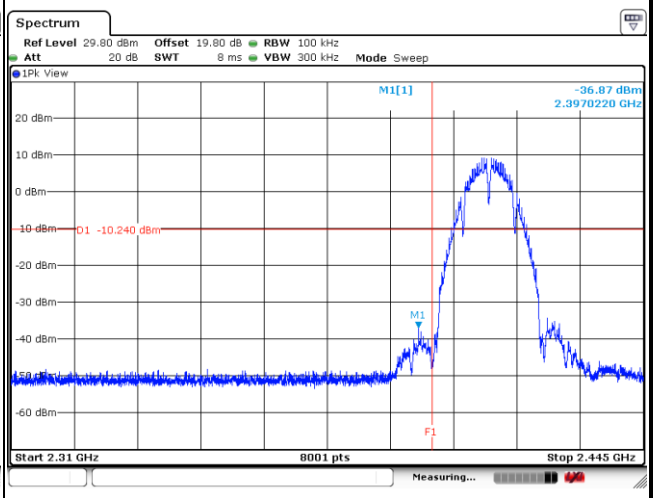
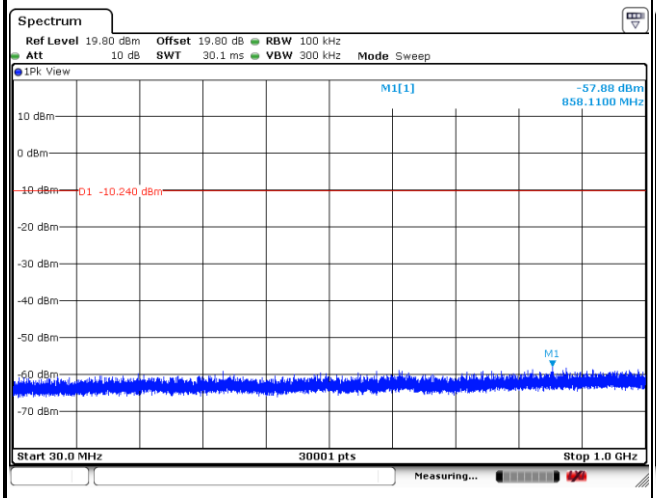
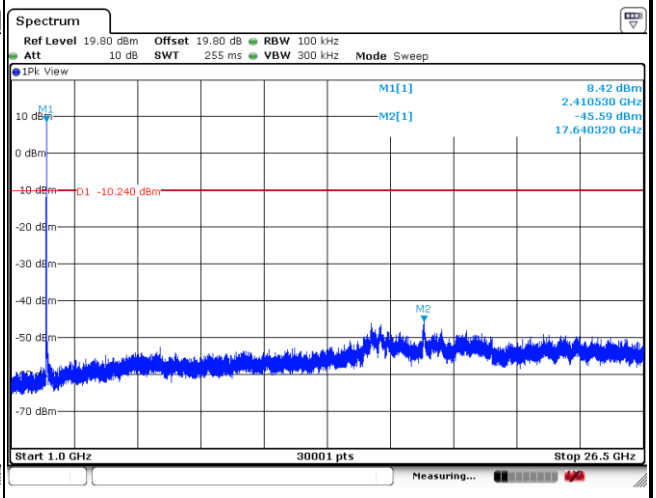
Worst Case Power Density (dBm/3kHz)



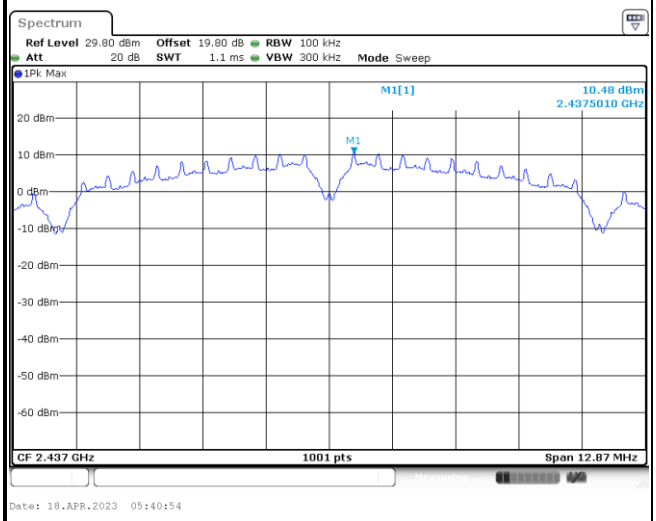
Band Edges and Spurious Emission

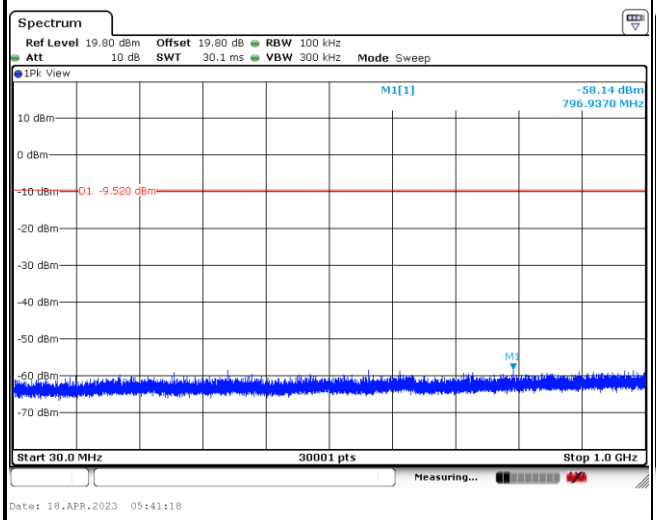
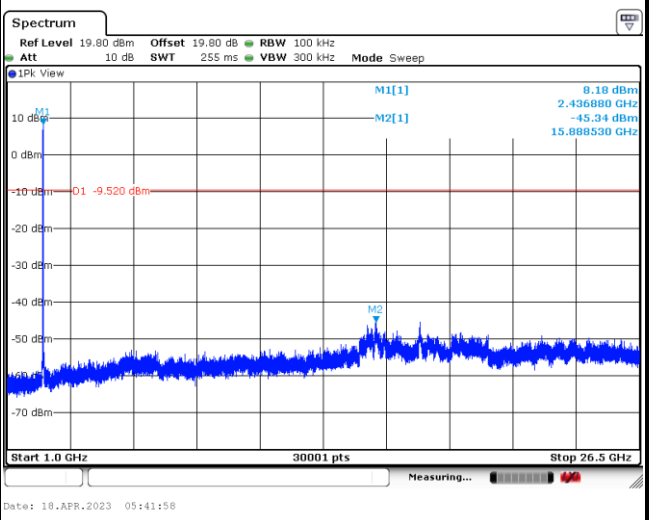
Number of TX = 1, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01

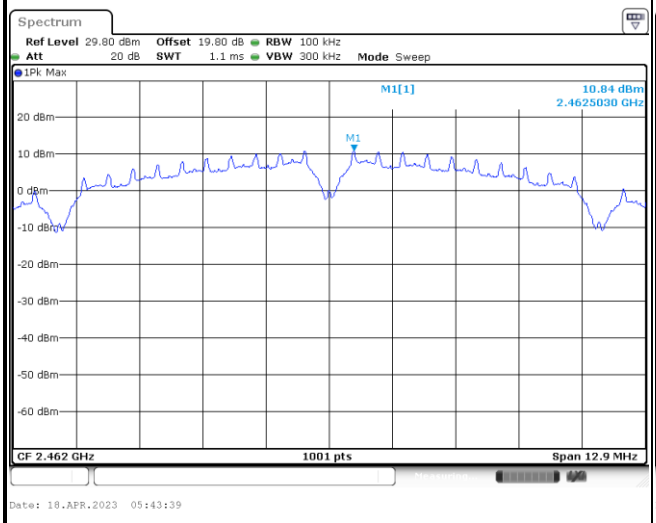
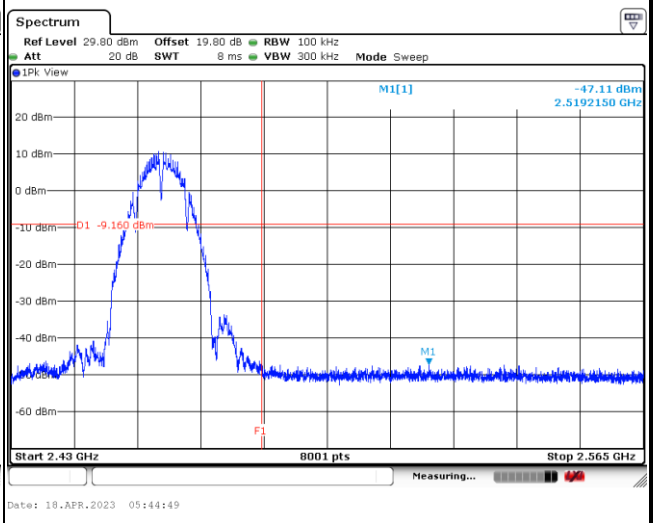
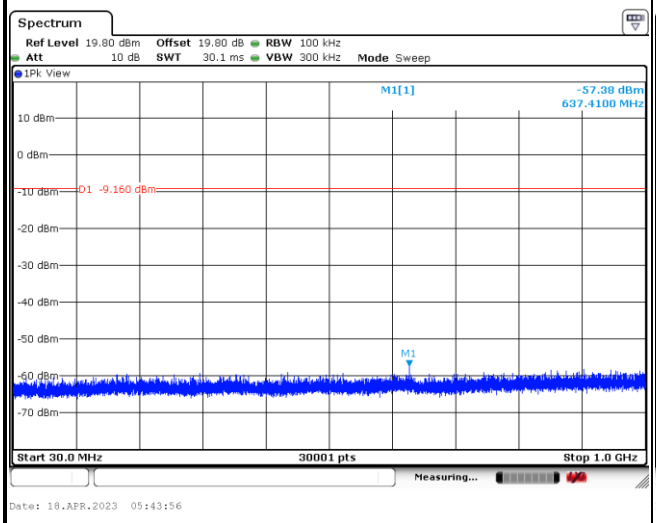
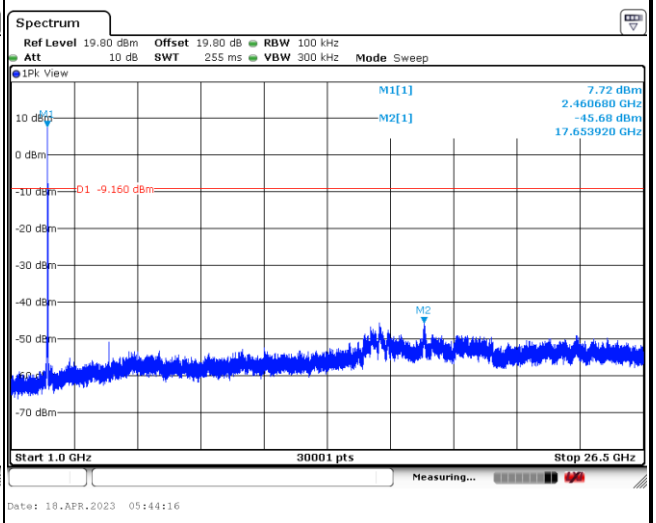
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11b	Test Channel :	06

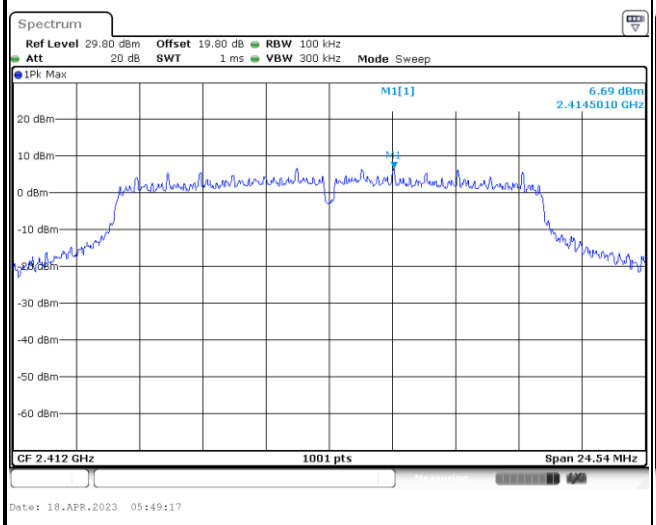
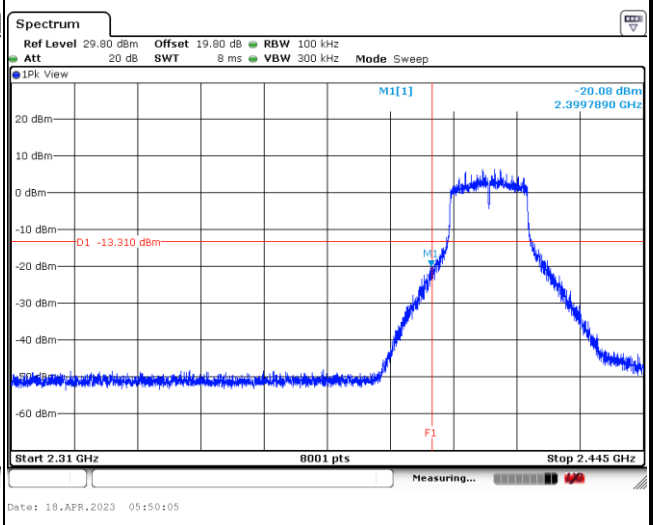
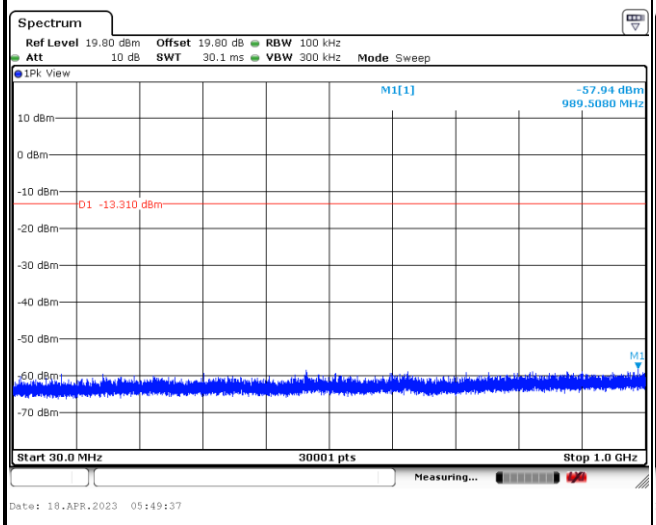
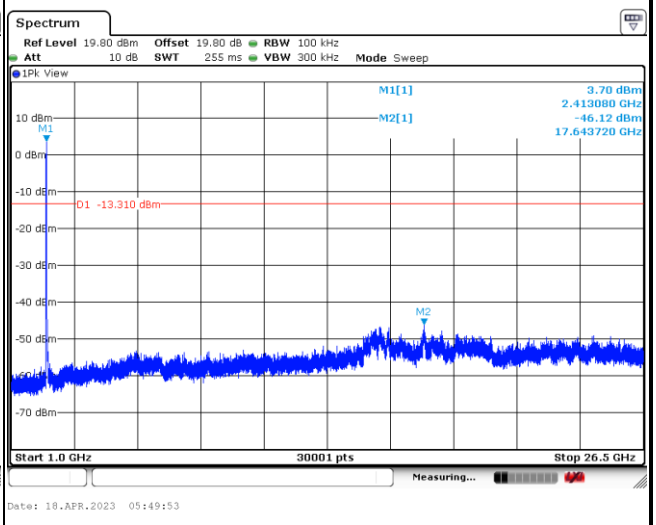
100kHz PSD reference Level	Mid Channel Plot
	

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

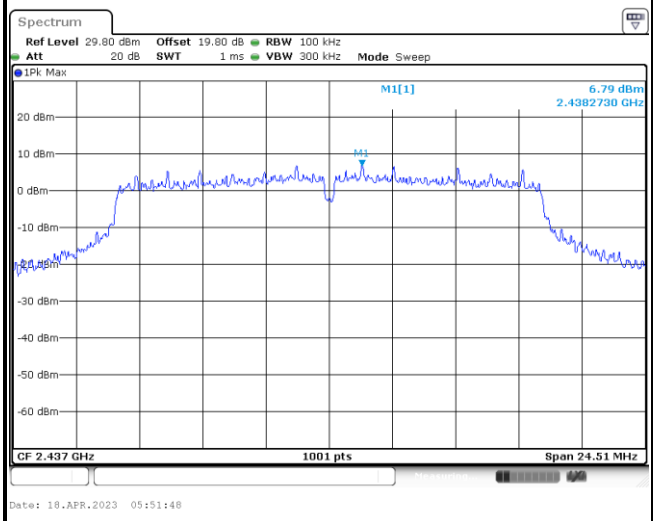
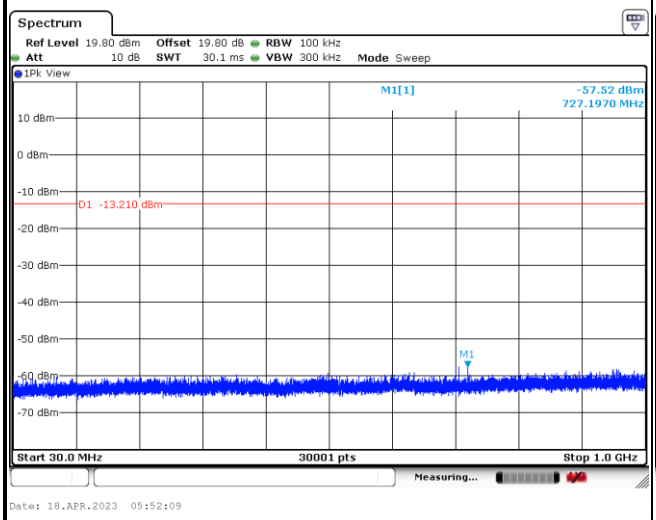
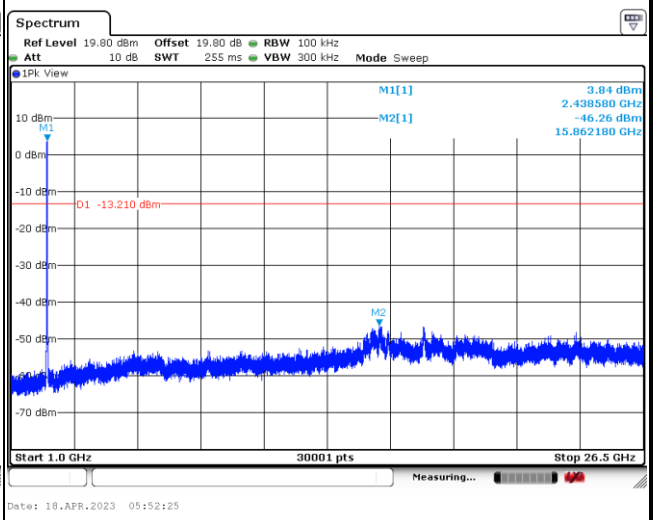
Test Mode :	802.11b	Test Channel :	11

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

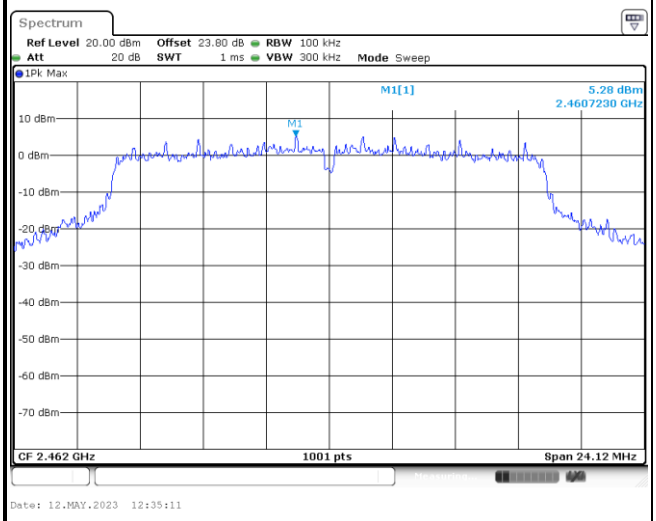
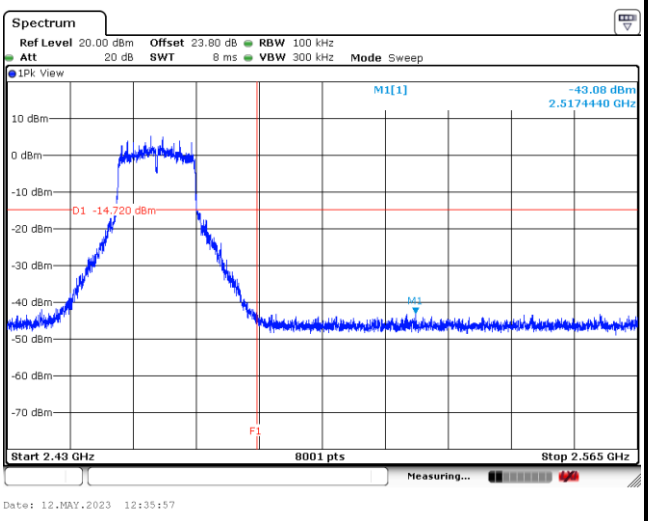
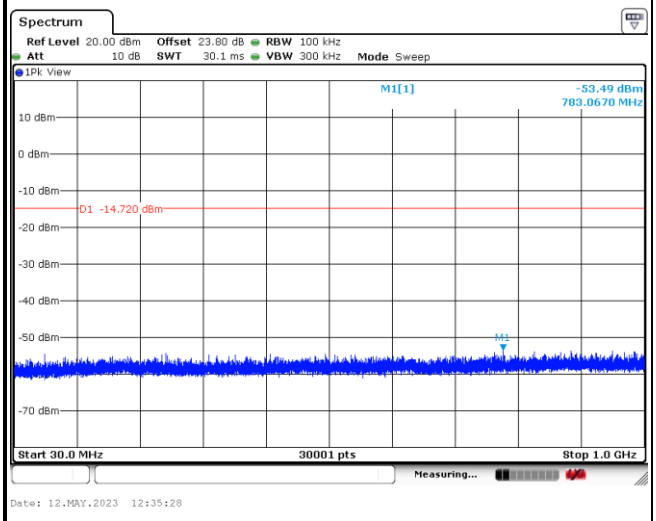
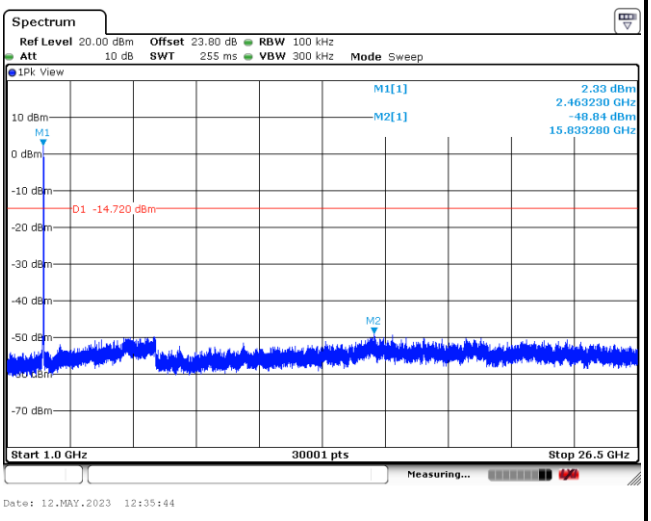
Test Mode :	802.11g	Test Channel :	01

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

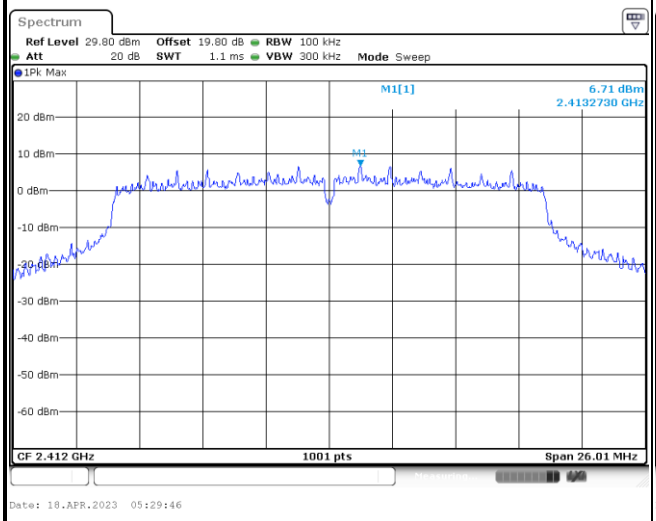
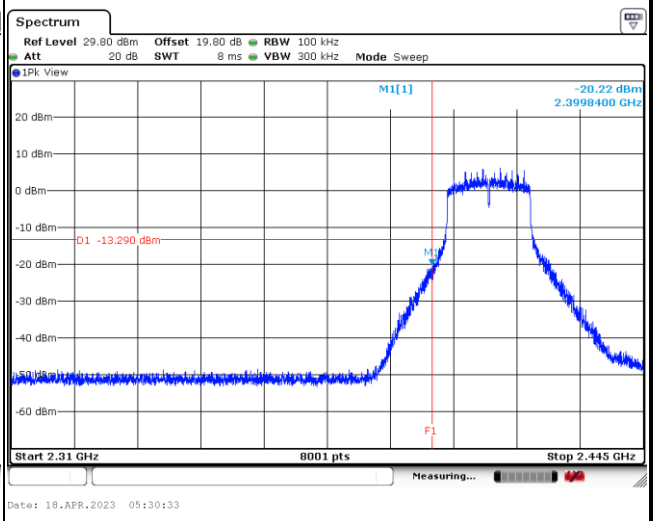
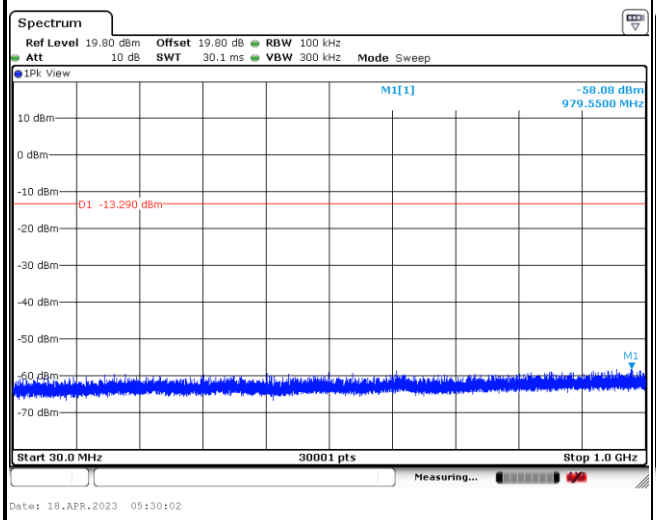
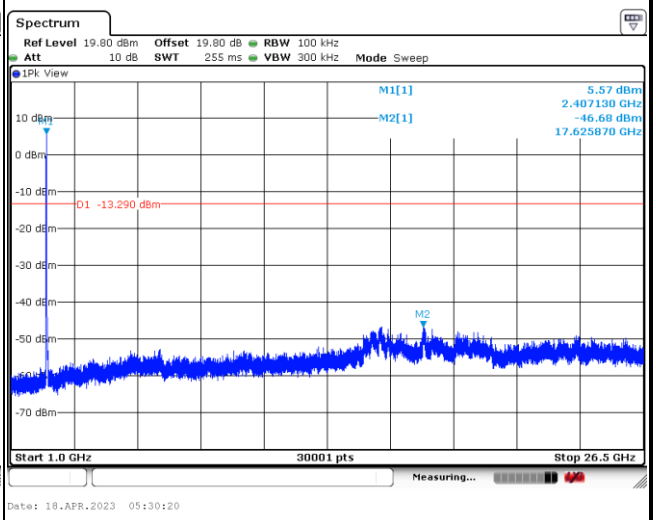
Test Mode :	802.11g	Test Channel :	06

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

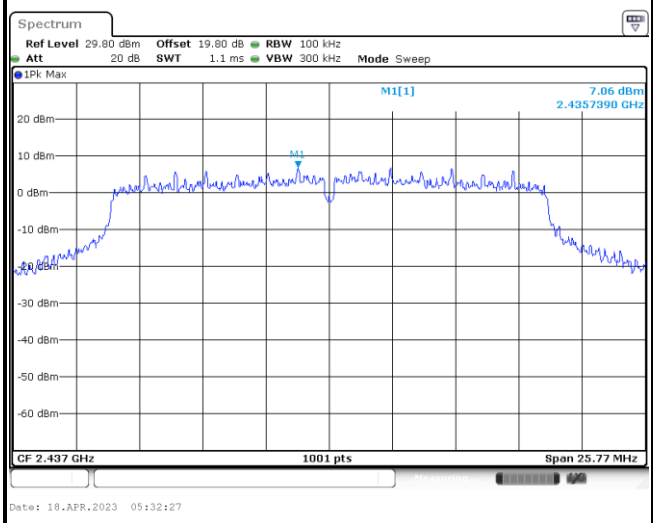
Test Mode :	802.11g	Test Channel :	11

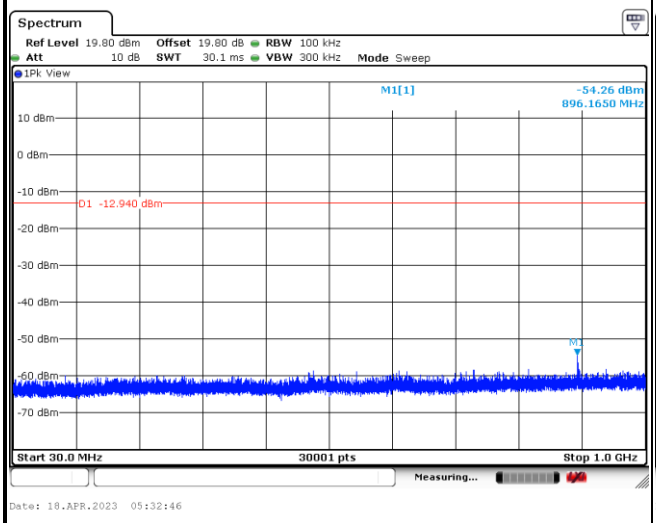
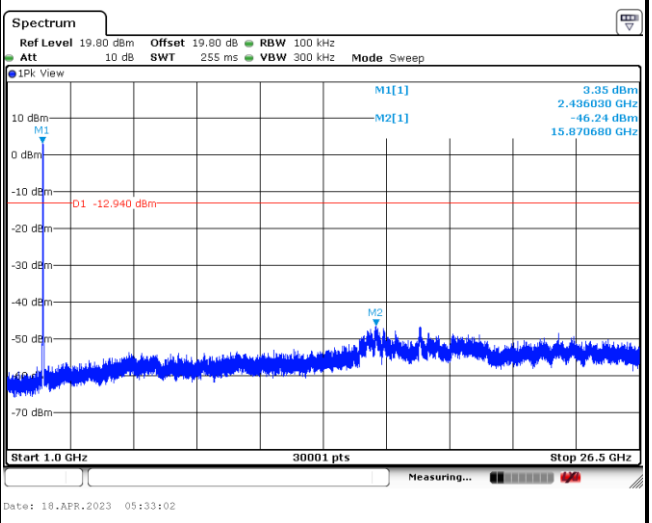
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11n HT20	Test Channel :	01

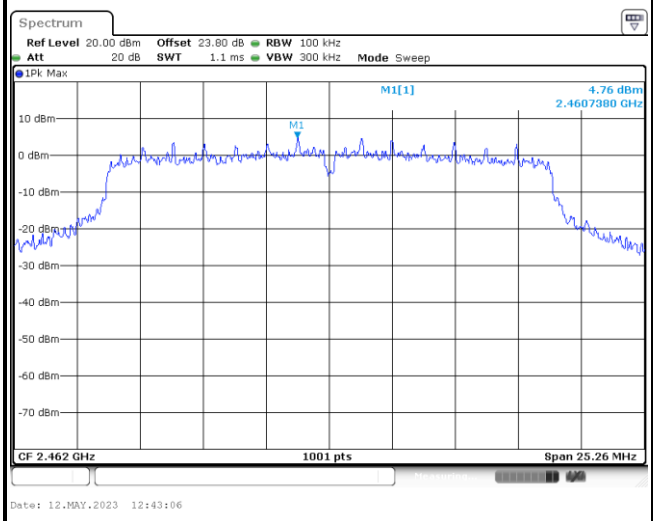
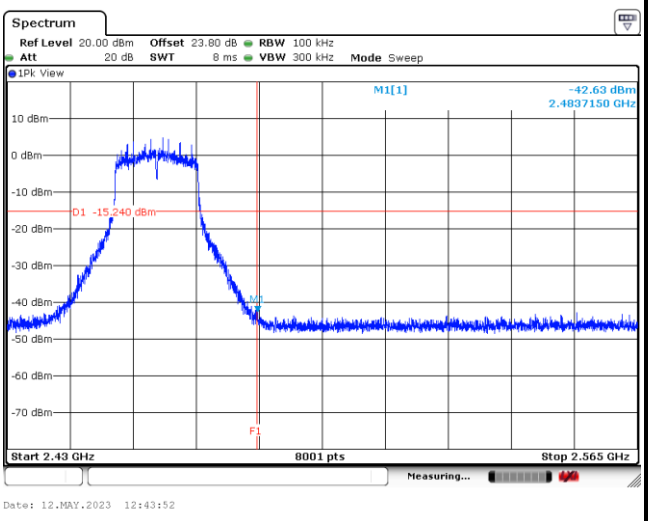
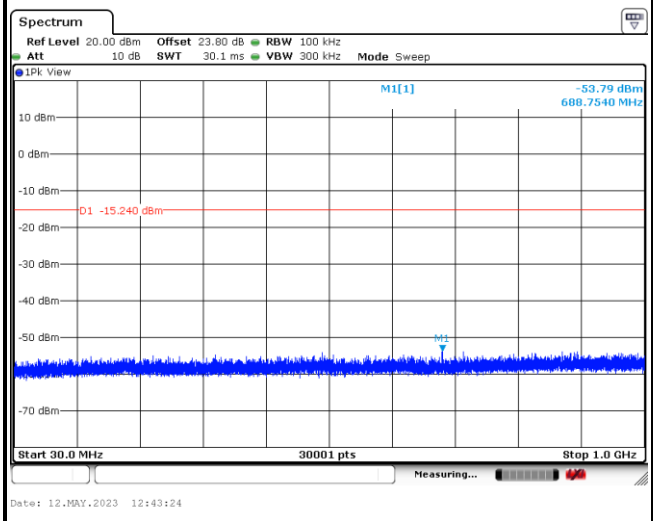
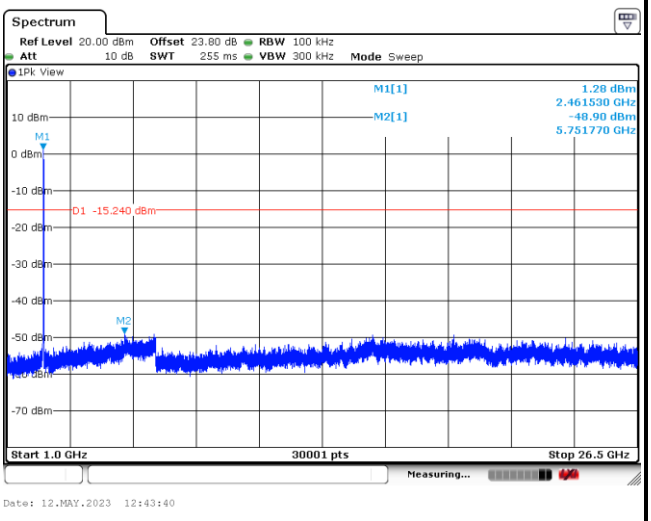
100kHz PSD reference Level	Low Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Test Mode :	802.11n HT20	Test Channel :	06

100kHz PSD reference Level	Mid Channel Plot
	

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

Test Mode :	802.11n HT20	Test Channel :	11

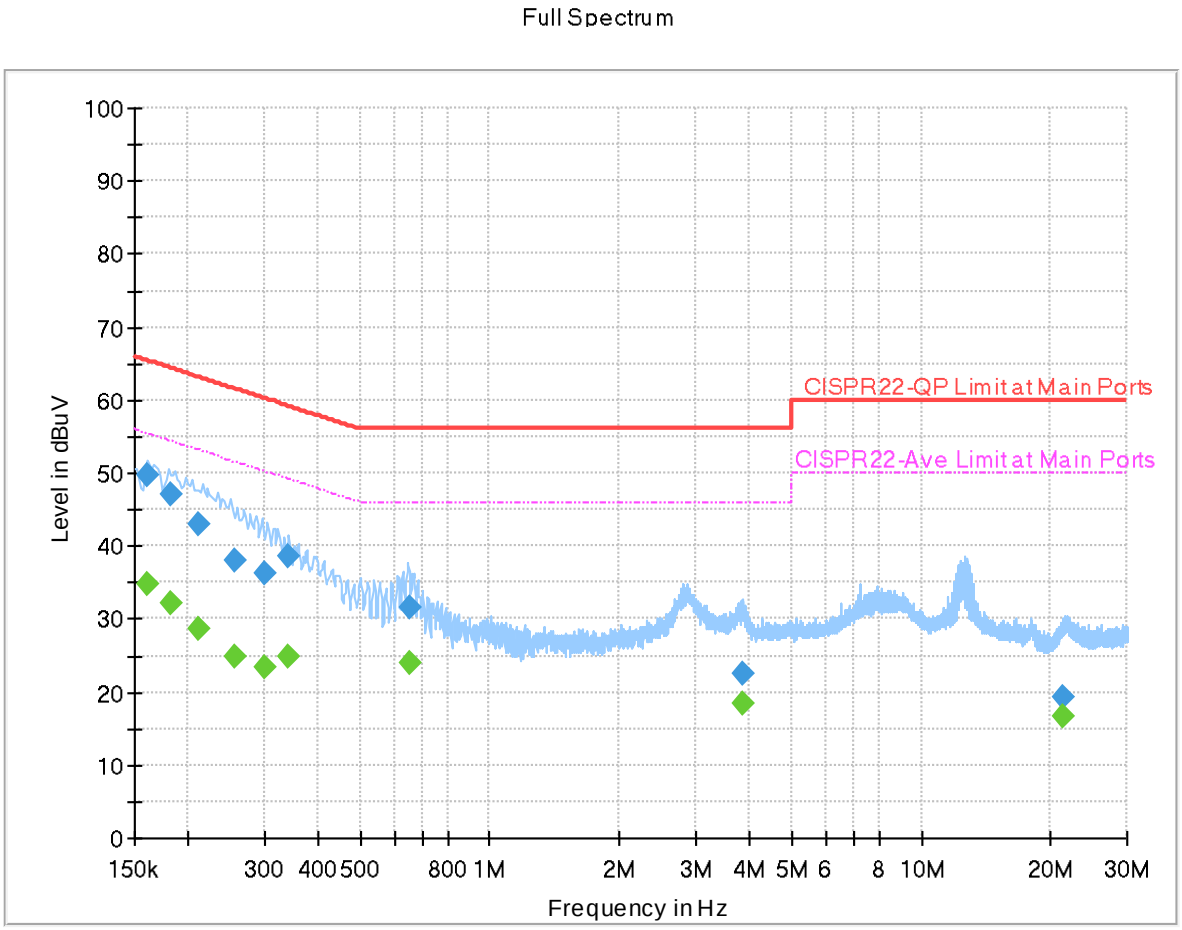
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~1GHz	**Spurious Emission 1GHz~26.5GHz**
	

Appendix B. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	**Temperature :**	21.5~25.5℃
		Relative Humidity :	59.7~63.4%

EUT Information

Report NO :	330717
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line



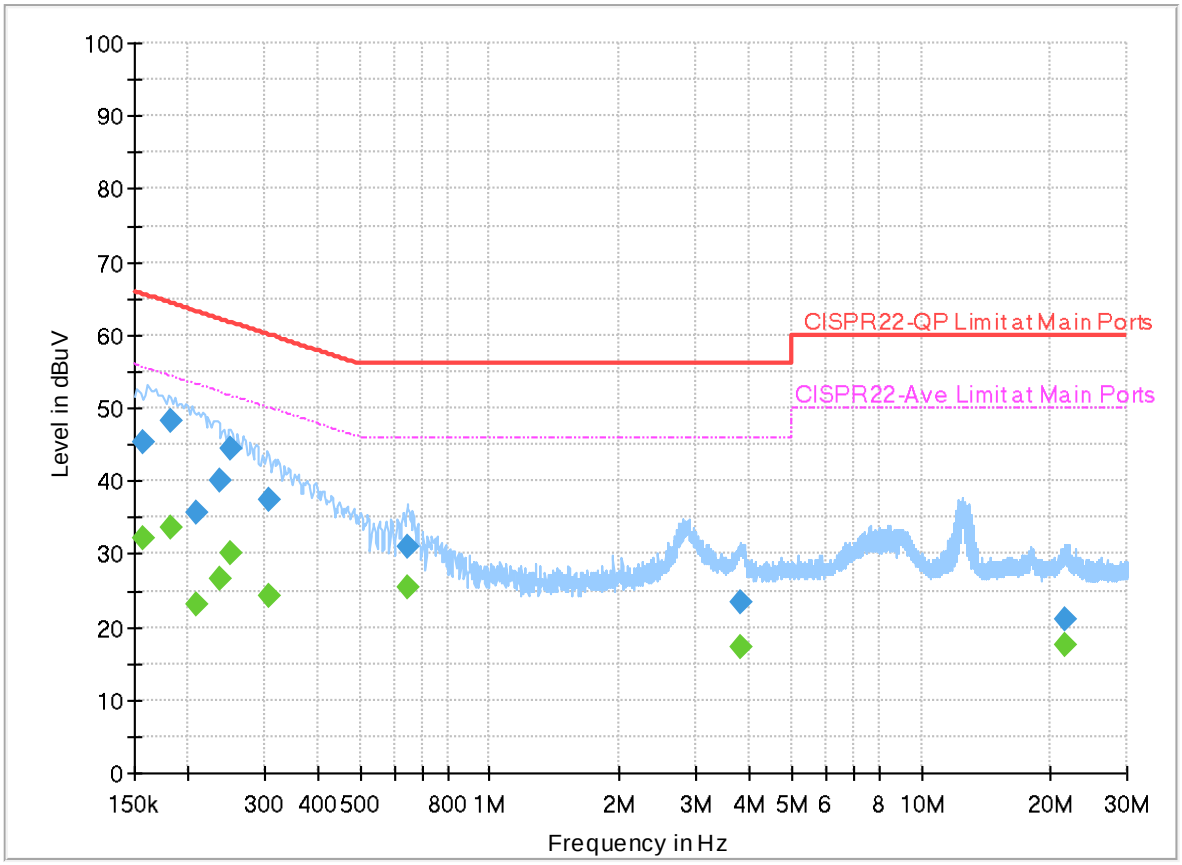
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.161340	---	34.78	55.40	20.62	L1	OFF	19.9
0.161340	49.70	---	65.40	15.70	L1	OFF	19.9
0.181500	---	32.30	54.42	22.12	L1	OFF	19.9
0.181500	47.05	---	64.42	17.37	L1	OFF	19.9
0.211830	---	28.64	53.13	24.49	L1	OFF	20.0
0.211830	42.84	---	63.13	20.29	L1	OFF	20.0
0.255750	---	24.78	51.57	26.79	L1	OFF	20.0
0.255750	38.06	---	61.57	23.51	L1	OFF	20.0
0.300750	---	23.31	50.22	26.91	L1	OFF	20.0
0.300750	36.12	---	60.22	24.10	L1	OFF	20.0
0.342330	---	24.96	49.15	24.19	L1	OFF	20.0
0.342330	38.51	---	59.15	20.64	L1	OFF	20.0
0.648690	---	23.87	46.00	22.13	L1	OFF	20.0
0.648690	31.62	---	56.00	24.38	L1	OFF	20.0
3.837930	---	18.52	46.00	27.48	L1	OFF	20.0
3.837930	22.39	---	56.00	33.61	L1	OFF	20.0
21.318000	---	16.53	50.00	33.47	L1	OFF	20.2
21.318000	19.29	---	60.00	40.71	L1	OFF	20.2

EUT Information

Report NO :	330717
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

Full Spectrum



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.156750	45.36	---	65.63	20.27	N	OFF	20.0
0.156750	---	32.30	55.63	23.33	N	OFF	20.0
0.181500	48.11	---	64.42	16.31	N	OFF	20.0
0.181500	---	33.65	54.42	20.77	N	OFF	20.0
0.208500	35.79	---	63.27	27.48	N	OFF	20.0
0.208500	---	22.98	53.27	30.29	N	OFF	20.0
0.237750	39.99	---	62.17	22.18	N	OFF	20.0
0.237750	---	26.65	52.17	25.52	N	OFF	20.0
0.251250	44.54	---	61.72	17.18	N	OFF	20.0
0.251250	---	30.18	51.72	21.54	N	OFF	20.0
0.308400	37.55	---	60.01	22.46	N	OFF	20.0
0.308400	---	24.40	50.01	25.61	N	OFF	20.0
0.647880	30.85	---	56.00	25.15	N	OFF	20.0
0.647880	---	25.31	46.00	20.69	N	OFF	20.0
3.816870	23.31	---	56.00	32.69	N	OFF	20.0
3.816870	---	17.17	46.00	28.83	N	OFF	20.0
21.486660	20.94	---	60.00	39.06	N	OFF	20.2
21.486660	---	17.54	50.00	32.46	N	OFF	20.2

Appendix C. Radiated Spurious Emission

Test Engineer :	John Chuang, JC Liang and Howard Huang	Temperature :	18.2~22.3°C
		Relative Humidity :	66.5~59.4%

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		2350.74	50.2	-23.8	74	40.4	27.3	18.55	36.05	200	61	P	H
		2383.29	38.61	-15.39	54	28.67	27.37	18.62	36.05	200	61	A	H
	*	2412	91.49	-	-	81.43	27.45	18.67	36.06	200	61	P	H
	*	2412	88.24	-	-	78.18	27.45	18.67	36.06	200	61	A	H
													H
													H
		2348.22	49.48	-24.52	74	39.67	27.3	18.55	36.04	246	322	P	V
		2388.855	38.63	-15.37	54	28.68	27.38	18.63	36.06	246	322	A	V
	*	2412	94.5	-	-	84.44	27.45	18.67	36.06	246	322	P	V
	*	2412	91.26	-	-	81.2	27.45	18.67	36.06	246	322	A	V
													V
													V
802.11b CH 06 2437MHz		2386.8	49.77	-24.23	74	39.84	27.37	18.62	36.06	338	196	P	H
		2370.32	38.62	-15.38	54	28.74	27.34	18.59	36.05	338	196	A	H
	*	2437	93.82	-	-	83.62	27.55	18.72	36.07	338	196	P	H
	*	2437	90.79	-	-	80.59	27.55	18.72	36.07	338	196	A	H
		2496.8	49.82	-24.18	74	39.28	27.79	18.84	36.09	338	196	P	H
		2499.92	39.19	-14.81	54	28.63	27.8	18.85	36.09	338	196	A	H
		2356.08	49.38	-24.62	74	39.56	27.31	18.56	36.05	165	191	P	V
		2369.84	38.64	-15.36	54	28.76	27.34	18.59	36.05	165	191	A	V
	*	2437	101.39	-	-	91.19	27.55	18.72	36.07	165	191	P	V
	*	2437	98.41	-	-	88.21	27.55	18.72	36.07	165	191	A	V
		2484.88	50.43	-23.57	74	39.96	27.74	18.82	36.09	165	191	P	V
		2483.52	39.43	-14.57	54	28.97	27.73	18.82	36.09	165	191	A	V

802.11b CH 11 2462MHz	*	2462	96.15	-	-	85.81	27.65	18.77	36.08	317	237	P	H
	*	2462	93.17	-	-	82.83	27.65	18.77	36.08	317	237	A	H
		2487.32	50.55	-23.45	74	40.07	27.75	18.82	36.09	317	237	P	H
		2483.52	40.12	-13.88	54	29.66	27.73	18.82	36.09	317	237	A	H
													H
													H
	*	2462	103.24	-	-	92.9	27.65	18.77	36.08	300	22	P	V
	*	2462	100.26	-	-	89.92	27.65	18.77	36.08	300	22	A	V
		2486.84	51.01	-22.99	74	40.53	27.75	18.82	36.09	300	22	P	V
		2483.52	42.69	-11.31	54	32.23	27.73	18.82	36.09	300	22	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 01 2412MHz		4824	43.17	-30.83	74	35	32.44	12.95	37.22	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	43.79	-30.21	74	35.62	32.44	12.95	37.22	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	44.32	-29.68	74	35.84	32.65	13.09	37.26	-	-	P	H
		7311	48.96	-25.04	74	34.39	36.86	15.88	38.17	100	223	P	H
		7311	39.24	-14.76	54	24.67	36.86	15.88	38.17	100	223	A	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11b CH 06 2437MHz													H
		4874	43.98	-30.02	74	35.5	32.65	13.09	37.26	-	-	P	V
		7311	48.93	-25.07	74	34.36	36.86	15.88	38.17	217	158	P	V
		7311	39.55	-14.45	54	24.98	36.86	15.88	38.17	217	158	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4924	44.03	-29.97	74	35.3	32.8	13.23	37.3	-	-	P	H
		7386	47.84	-26.16	74	33.52	36.56	15.98	38.22	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11b CH 11 2462MHz													H
		4924	44.22	-29.78	74	35.49	32.8	13.23	37.3	-	-	P	V
		7386	48.13	-25.87	74	33.81	36.56	15.98	38.22	317	284	P	V
		7386	39.79	-14.21	54	25.47	36.56	15.98	38.22	317	284	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		2316.405	49.81	-24.19	74	40.05	27.3	18.49	36.03	100	112	P	H
		2390	40.04	-13.96	54	30.09	27.38	18.63	36.06	100	112	A	H
	*	2412	98.52	-	-	88.46	27.45	18.67	36.06	100	112	P	H
	*	2412	89.78	-	-	79.72	27.45	18.67	36.06	100	112	A	H
													H
													H
		2389.8	53.11	-20.89	74	43.16	27.38	18.63	36.06	316	175	P	V
		2390	42.39	-11.61	54	32.44	27.38	18.63	36.06	316	175	A	V
	*	2412	104.19	-	-	94.13	27.45	18.67	36.06	316	175	P	V
	*	2412	96.18	-	-	86.12	27.45	18.67	36.06	316	175	A	V
													V
													V
802.11g CH 06 2437MHz		2312.88	49.62	-24.38	74	39.87	27.3	18.48	36.03	110	51	P	H
		2390	38.7	-15.3	54	28.75	27.38	18.63	36.06	110	51	A	H
	*	2437	102.05	-	-	91.85	27.55	18.72	36.07	110	51	P	H
	*	2437	94.02	-	-	83.82	27.55	18.72	36.07	110	51	A	H
		2487.28	50.19	-23.81	74	39.71	27.75	18.82	36.09	110	51	P	H
		2483.6	39.74	-14.26	54	29.28	27.73	18.82	36.09	110	51	A	H
		2363.6	50.05	-23.95	74	40.19	27.33	18.58	36.05	302	175	P	V
		2390	38.74	-15.26	54	28.79	27.38	18.63	36.06	302	175	A	V
	*	2437	106.35	-	-	96.15	27.55	18.72	36.07	302	175	P	V
	*	2437	98.34	-	-	88.14	27.55	18.72	36.07	302	175	A	V
		2486.08	51.38	-22.62	74	40.91	27.74	18.82	36.09	302	175	P	V
		2483.52	40.11	-13.89	54	29.65	27.73	18.82	36.09	302	175	A	V

802.11g CH 11 2462MHz	*	2462	99.87	-	-	89.53	27.65	18.77	36.08	113	54	P	H
	*	2462	91.7	-	-	81.36	27.65	18.77	36.08	113	54	A	H
		2483.56	60.84	-13.16	74	50.38	27.73	18.82	36.09	113	54	P	H
		2483.52	48.01	-5.99	54	37.55	27.73	18.82	36.09	113	54	A	H
													H
													H
	*	2462	104.38	-	-	94.04	27.65	18.77	36.08	294	179	P	V
	*	2462	95.51	-	-	85.17	27.65	18.77	36.08	294	179	A	V
		2483.64	61.25	-12.75	74	50.79	27.73	18.82	36.09	294	179	P	V
		2483.52	49.63	-4.37	54	39.17	27.73	18.82	36.09	294	179	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 01 2412MHz		4824	43.48	-30.52	74	35.31	32.44	12.95	37.22	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		4824	43.31	-30.69	74	35.14	32.44	12.95	37.22	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	43.21	-30.79	74	34.73	32.65	13.09	37.26	-	-	P	H
		7311	48.34	-25.66	74	33.77	36.86	15.88	38.17	117	219	P	H
		7311	39.42	-14.58	54	24.85	36.86	15.88	38.17	117	219	A	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11g CH 06 2437MHz													H
		4874	44.79	-29.21	74	36.31	32.65	13.09	37.26	-	-	P	V
		7311	48.54	-25.46	74	33.97	36.86	15.88	38.17	254	217	P	V
		7311	40.45	-13.55	54	25.88	36.86	15.88	38.17	254	217	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4924	44.27	-29.73	74	35.54	32.8	13.23	37.3	-	-	P	H
		7386	47.93	-26.07	74	33.61	36.56	15.98	38.22	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11g CH 11 2462MHz													H
		4924	43.57	-30.43	74	34.84	32.8	13.23	37.3	-	-	P	V
		7386	47.92	-26.08	74	33.6	36.56	15.98	38.22	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		2390	55.26	-18.74	74	45.31	27.38	18.63	36.06	100	56	P	H
		2390	42.76	-11.24	54	32.81	27.38	18.63	36.06	100	56	A	H
	*	2412	99.35	-	-	89.29	27.45	18.67	36.06	100	56	P	H
	*	2412	90.78	-	-	80.72	27.45	18.67	36.06	100	56	A	H
802.11n													H
HT20													H
CH 01		2389.59	54.03	-19.97	74	44.08	27.38	18.63	36.06	400	170	P	V
2412MHz		2390	44.19	-9.81	54	34.24	27.38	18.63	36.06	400	170	A	V
	*	2412	102.53	-	-	92.47	27.45	18.67	36.06	400	170	P	V
	*	2412	94	-	-	83.94	27.45	18.67	36.06	400	170	A	V
													V
													V
		2336.72	49.68	-24.32	74	39.89	27.3	18.53	36.04	100	49	P	H
		2383.92	39.53	-14.47	54	29.6	27.37	18.62	36.06	100	49	A	H
	*	2437	98.78	-	-	88.58	27.55	18.72	36.07	100	49	P	H
	*	2437	90.88	-	-	80.68	27.55	18.72	36.07	100	49	A	H
802.11n		2496.72	50.02	-23.98	74	39.48	27.79	18.84	36.09	100	49	P	H
HT20		2483.68	40.42	-13.58	54	29.96	27.73	18.82	36.09	100	49	A	H
CH 06		2384.56	49.4	-24.6	74	39.47	27.37	18.62	36.06	200	23	P	V
2437MHz		2348.72	39.66	-14.34	54	29.85	27.3	18.55	36.04	200	23	A	V
	*	2437	104.52	-	-	94.32	27.55	18.72	36.07	200	23	P	V
	*	2437	96.78	-	-	86.58	27.55	18.72	36.07	200	23	A	V
		2485.28	52.44	-21.56	74	41.97	27.74	18.82	36.09	200	23	P	V
		2483.76	41.31	-12.69	54	30.84	27.74	18.82	36.09	200	23	A	V

	*	2462	99.02	-	-	88.68	27.65	18.77	36.08	107	54	P	H
	*	2462	90.65	-	-	80.31	27.65	18.77	36.08	107	54	A	H
		2483.52	58.84	-15.16	74	48.38	27.73	18.82	36.09	107	54	P	H
		2483.6	48.99	-5.01	54	38.53	27.73	18.82	36.09	107	54	A	H
802.11n													H
HT20													H
CH 11	*	2462	103.38	-	-	93.04	27.65	18.77	36.08	300	27	P	V
2462MHz	*	2462	94.88	-	-	84.54	27.65	18.77	36.08	300	27	A	V
		2483.64	60.8	-13.2	74	50.34	27.73	18.82	36.09	300	27	P	V
		2483.56	50.29	-3.71	54	39.83	27.73	18.82	36.09	300	27	A	V
													V
													V

Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4824	43.2	-30.8	74	35.03	32.44	12.95	37.22	-	-	P	H
													H
													H
													H
802.11n													H
HT20													H
CH 01		4824	44.57	-29.43	74	36.4	32.44	12.95	37.22	-	-	P	V
2412MHz													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4874	43.95	-30.05	74	35.47	32.65	13.09	37.26	-	-	P	H
		7311	48.79	-25.21	74	34.22	36.86	15.88	38.17	117	316	P	H
		7311	39.4	-14.6	54	24.83	36.86	15.88	38.17	117	316	A	H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 06		4874	44.42	-29.58	74	35.94	32.65	13.09	37.26	-	-	P	V
2437MHz		7311	49.34	-24.66	74	34.77	36.86	15.88	38.17	237	149	P	V
		7311	39.75	-14.25	54	25.18	36.86	15.88	38.17	237	149	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		4924	43.96	-30.04	74	35.23	32.8	13.23	37.3	-	-	P	H
		7386	47.43	-26.57	74	33.11	36.56	15.98	38.22	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11n													H
HT20													H
CH 11		4924	43.47	-30.53	74	34.74	32.8	13.23	37.3	-	-	P	V
2462MHz		7386	47.97	-26.03	74	33.65	36.56	15.98	38.22	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

Emission above 18GHz

2.4GHz WIFI 802.11n HT20 (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)
		24846	42.21	-31.79	74	36.04	39.64	19.72	53.19	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
2.4GHz													H
802.11n													H
HT20		24853	42.55	-31.45	74	36.37	39.64	19.73	53.19	-	-	P	V
SHF													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.
3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (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)
		30.97	23.37	-16.63	40	33.8	24.17	1.16	35.76	-	-	P	H
		164.83	24.99	-18.51	43.5	42.13	15.99	2.44	35.57	-	-	P	H
		212.36	26.34	-17.16	43.5	43.82	15.25	2.73	35.46	-	-	P	H
		672.14	30.5	-15.5	46	33.57	26.38	4.76	34.21	-	-	P	H
		836.07	33.52	-12.48	46	32.9	28.73	5.41	33.52	-	-	P	H
		955.38	35.5	-10.5	46	31.9	31.03	5.68	33.11	-	-	P	H
													H
													H
													H
													H
2.4GHz													H
802.11n													H
HT20		30.97	24.29	-15.71	40	34.72	24.17	1.16	35.76	-	-	P	V
LF		165.8	26.24	-17.26	43.5	43.46	15.9	2.45	35.57	-	-	P	V
		191.02	23.58	-19.92	43.5	41.56	14.93	2.59	35.5	-	-	P	V
		573.2	28.54	-17.46	46	32.59	25.99	4.49	34.53	-	-	P	V
		729.37	33.53	-12.47	46	35.04	27.53	4.94	33.98	-	-	P	V
		944.71	35.59	-10.41	46	32.58	30.52	5.64	33.15	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.
3. The emission position marked as “-” means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only.

Note symbol

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

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

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) =

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

3. Margin(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Margin(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Margin(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix D. Radiated Spurious Emission Plots

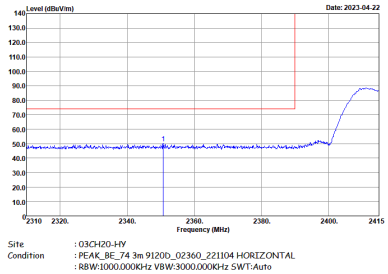
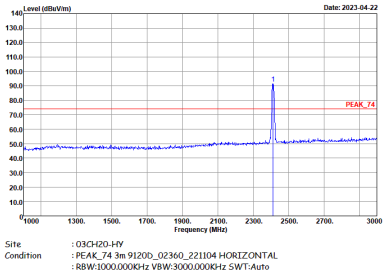
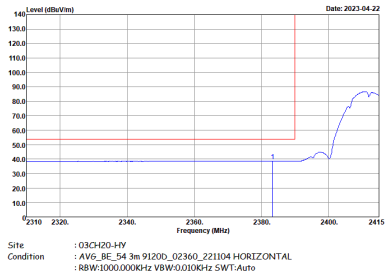
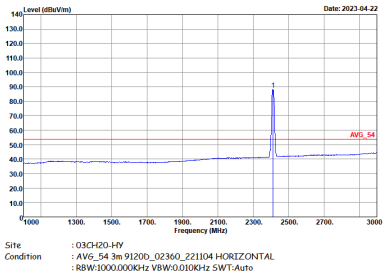
Test Engineer :	John Chuang, JC Liang and Howard Huang	**Temperature :**	18.2~22.3°C
		Relative Humidity :	66.5~59.4%

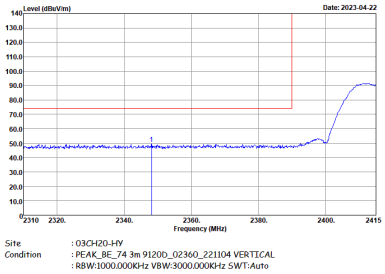
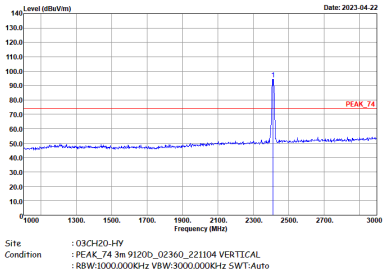
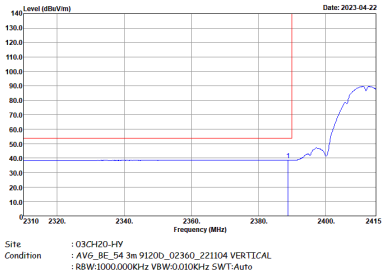
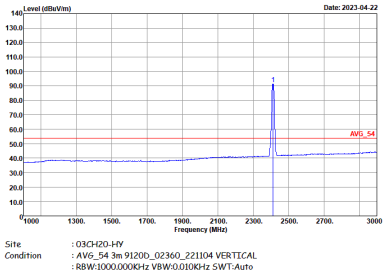
Note symbol

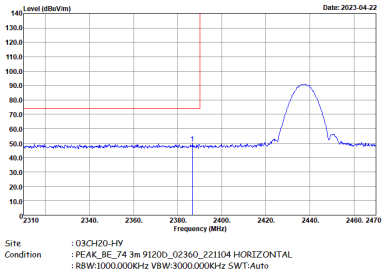
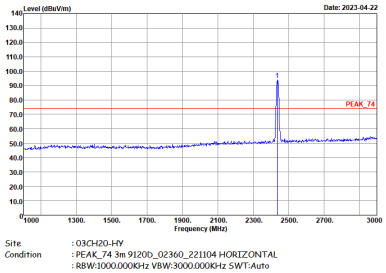
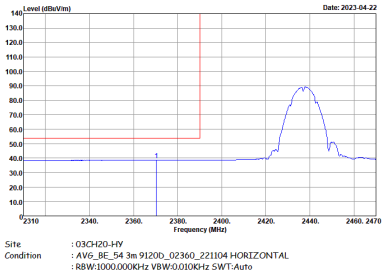
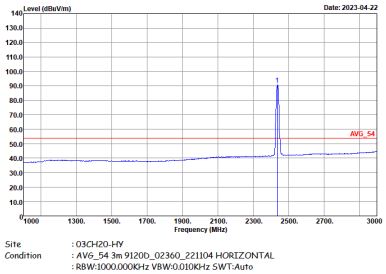
-L	**Low channel location**
-R	**High channel location**

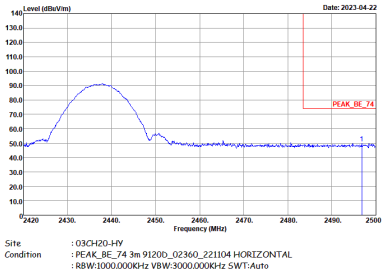
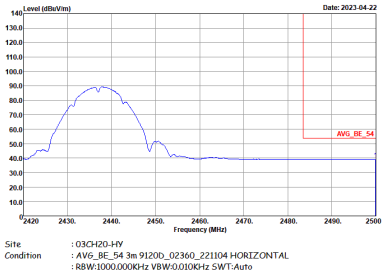
2.4GHz 2400~2483.5MHz

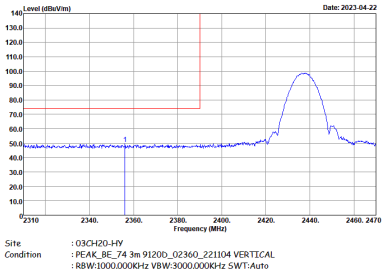
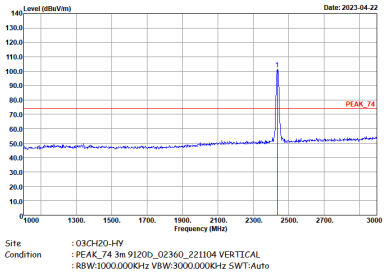
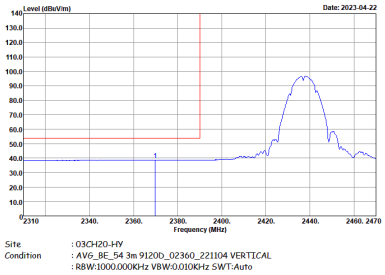
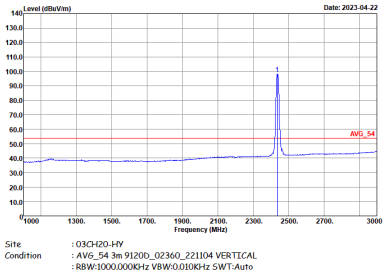
WIFI 802.11b (Band Edge @ 3m)

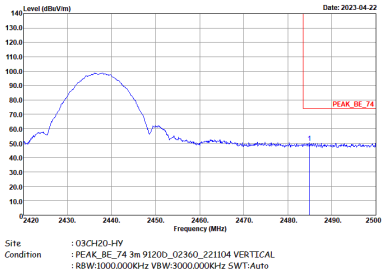
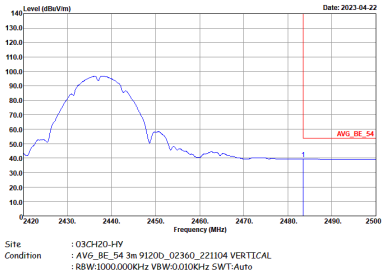
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

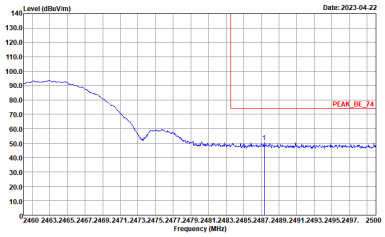
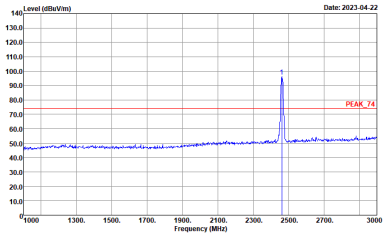
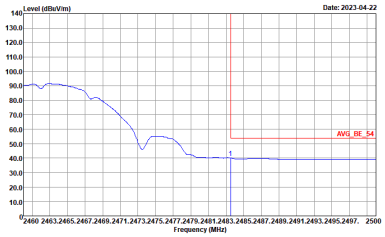
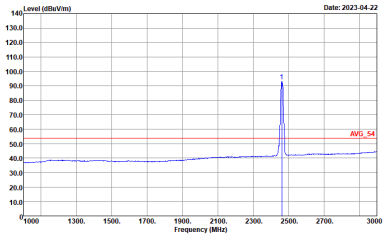
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

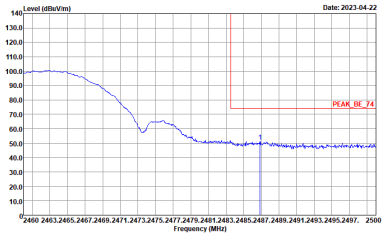
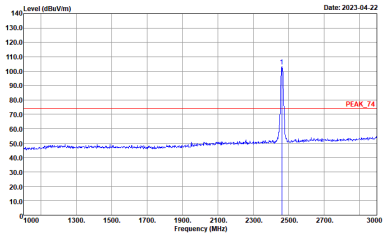
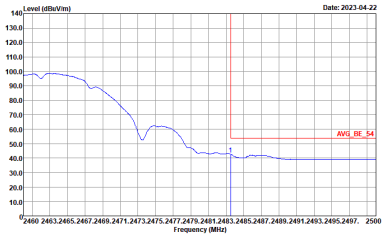
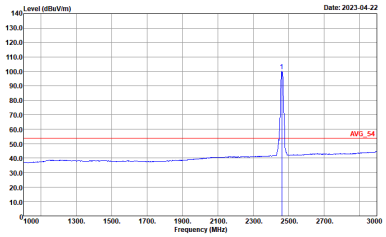
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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

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

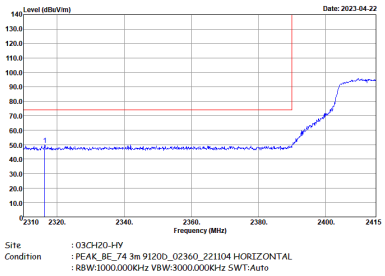
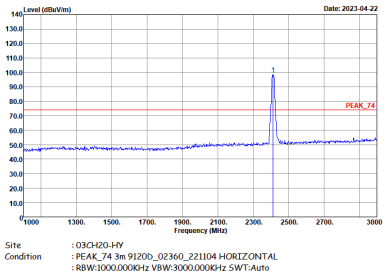
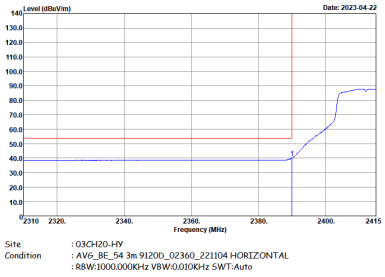
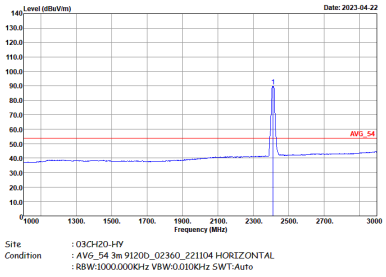
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

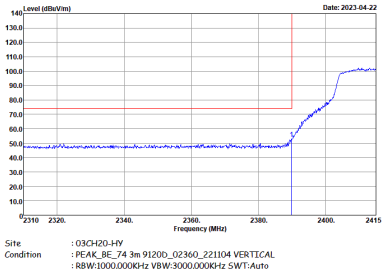
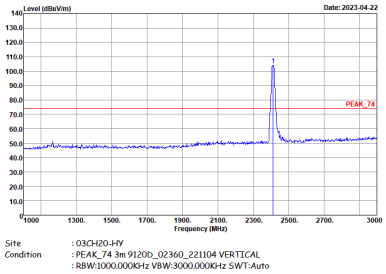
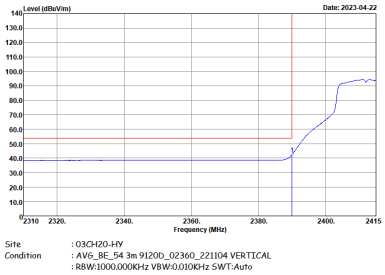
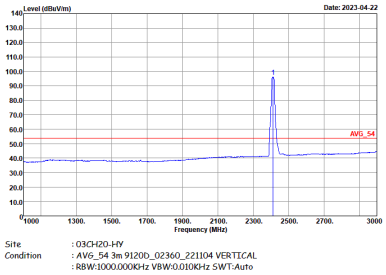
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

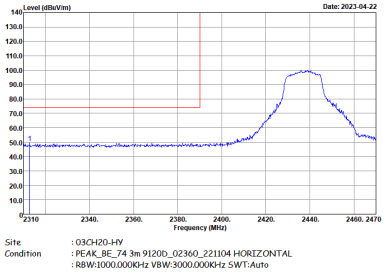
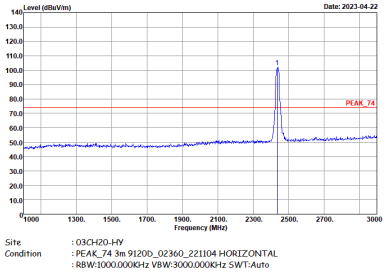
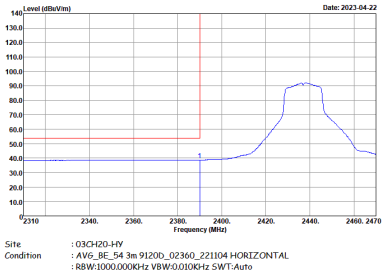
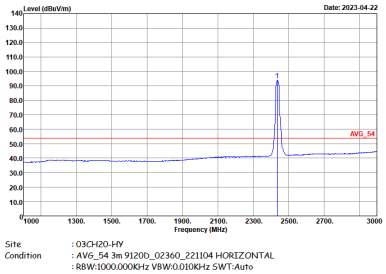
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

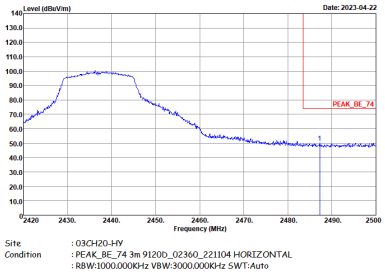
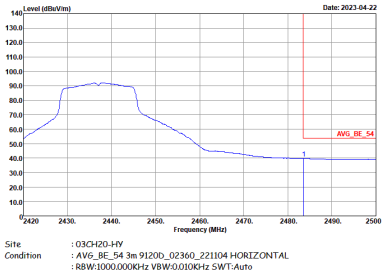
2.4GHz 2400~2483.5MHz

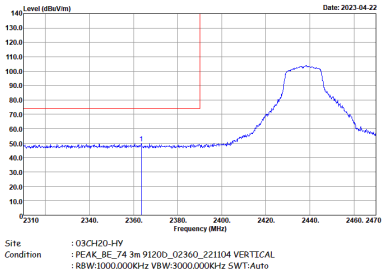
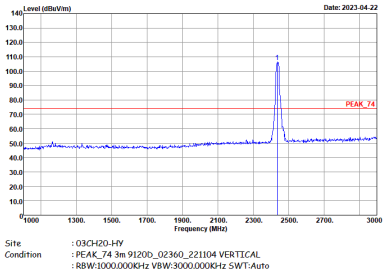
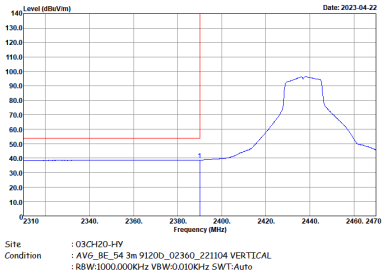
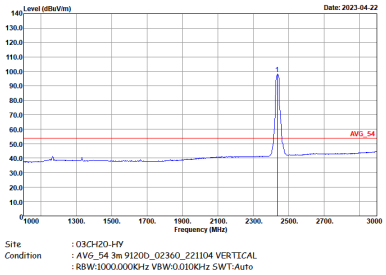
WIFI 802.11g (Band Edge @ 3m)

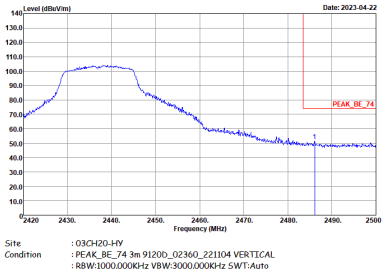
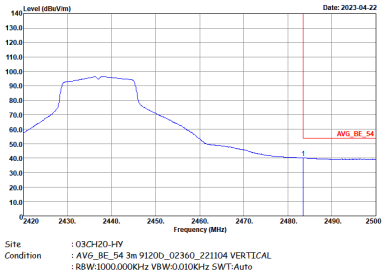
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

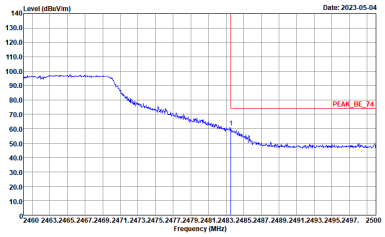
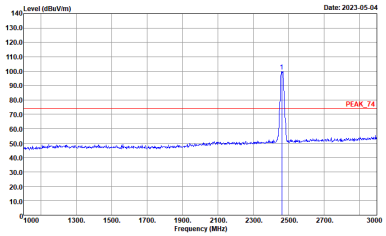
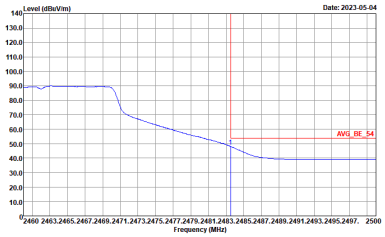
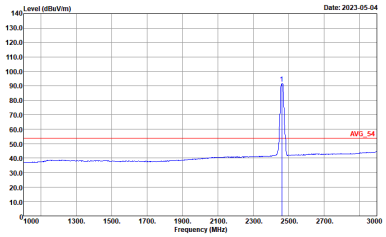
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

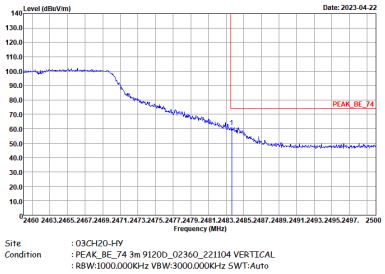
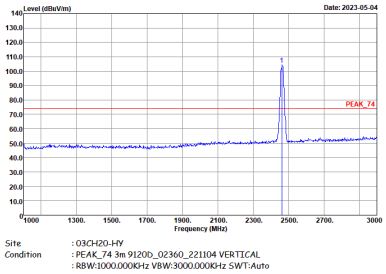
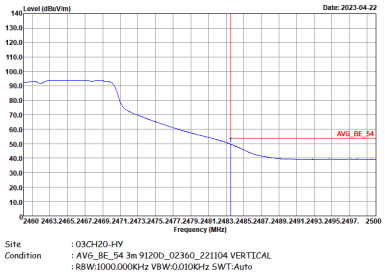
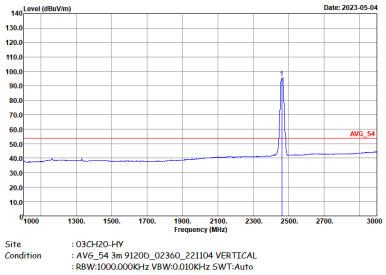
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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

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

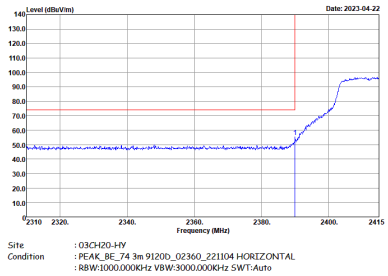
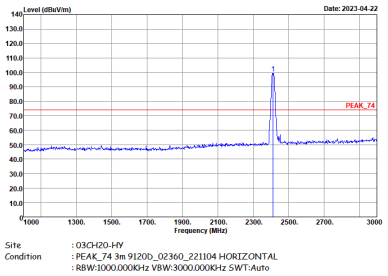
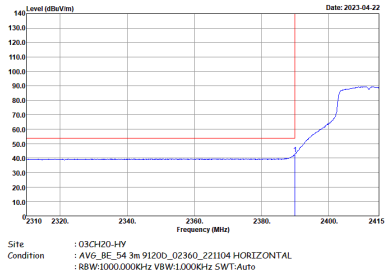
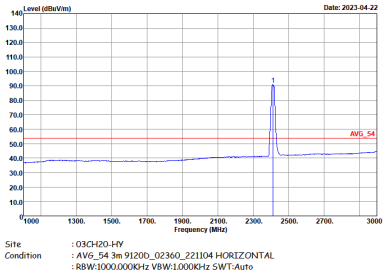
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

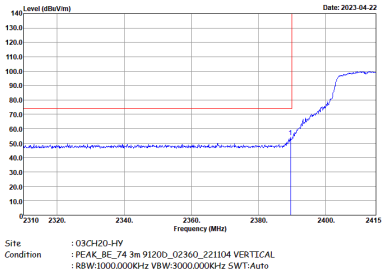
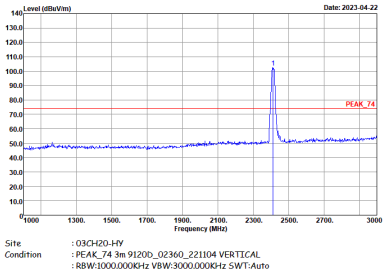
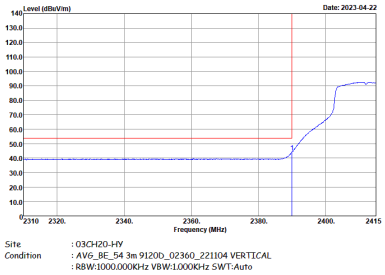
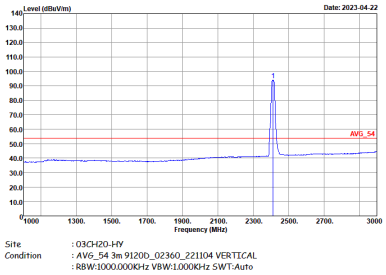
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

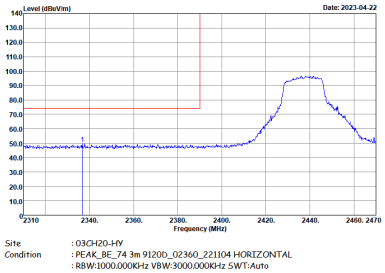
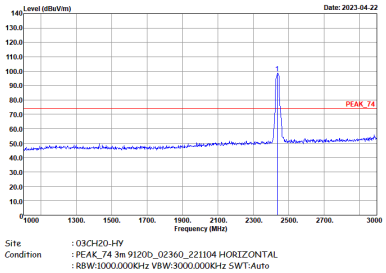
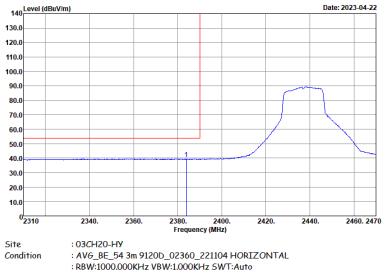
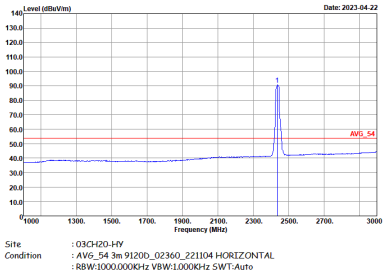
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto

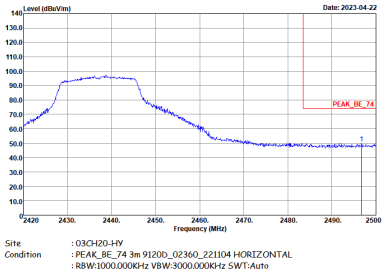
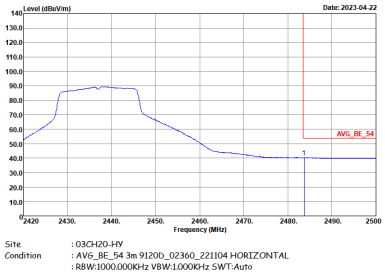
2.4GHz 2400~2483.5MHz

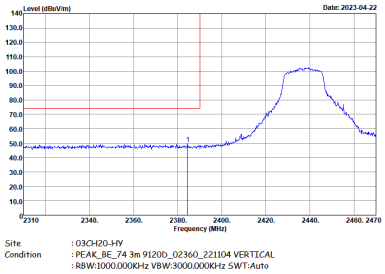
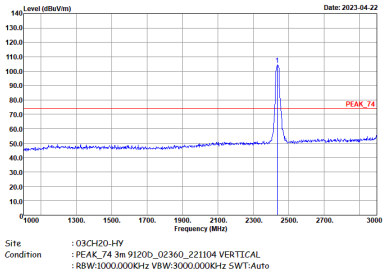
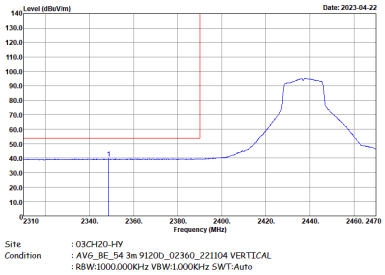
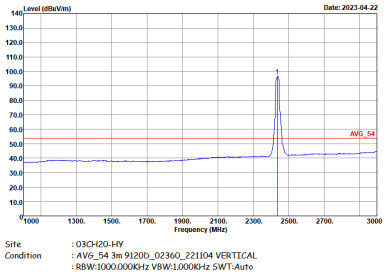
WIFI 802.11n HT20 (Band Edge @ 3m)

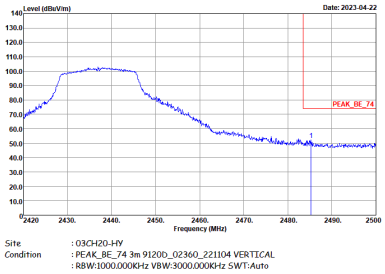
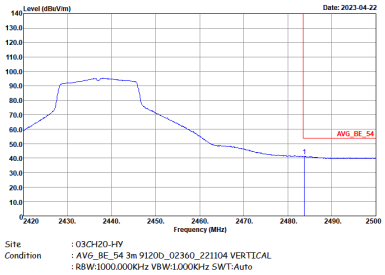
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

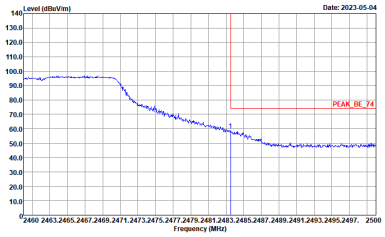
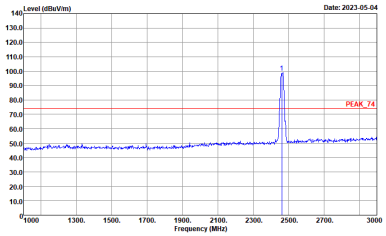
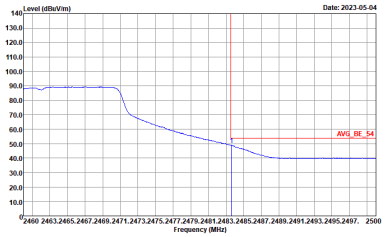
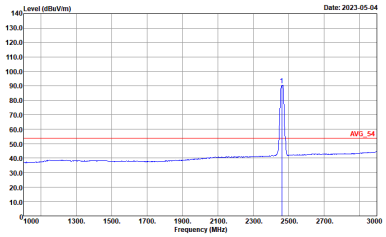
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

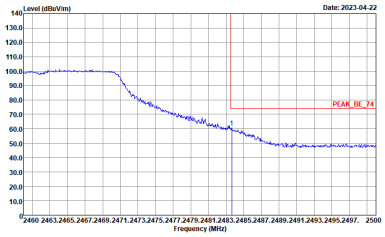
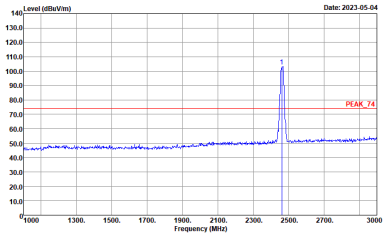
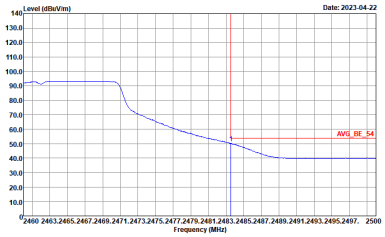
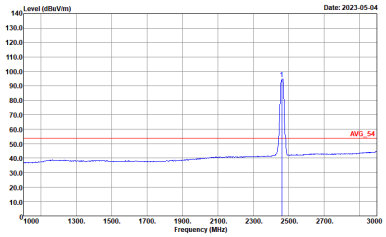
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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		
Avg.		

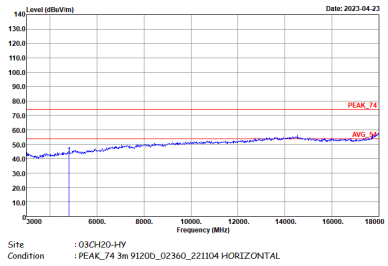
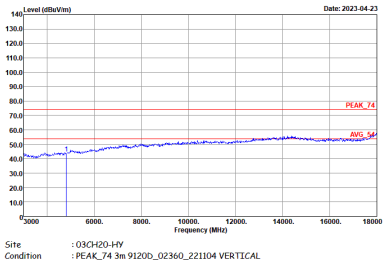
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

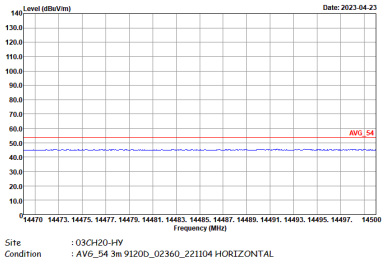
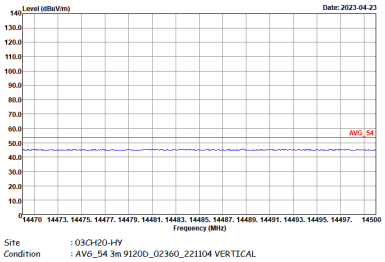
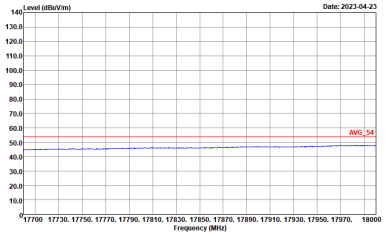
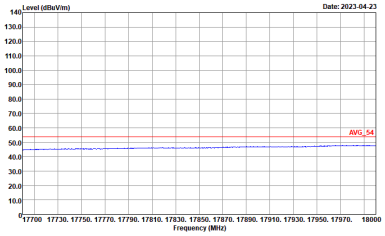
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto

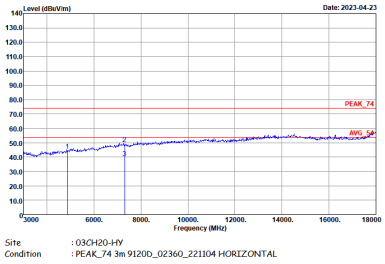
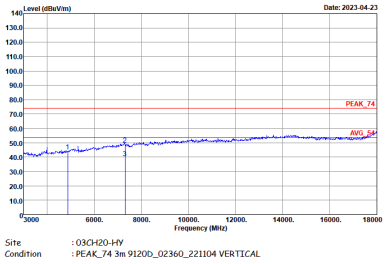
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH20-HY Condition : PEAK_BE_74 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH20-HY Condition : PEAK_74 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH20-HY Condition : AVG_BE_54 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL : RBW:1000.000KHz VBW:1000KHz SWT:Auto

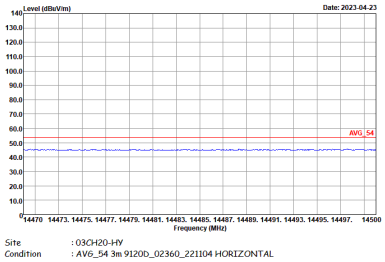
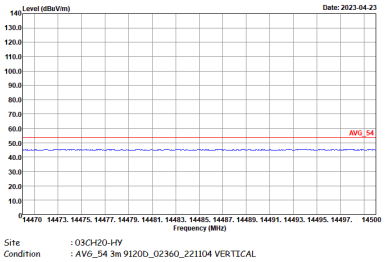
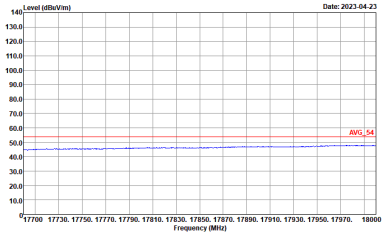
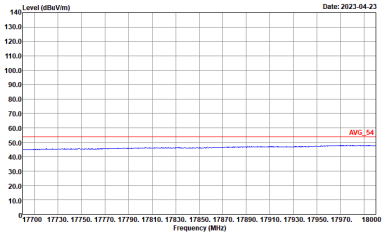
2.4GHz 2400~2483.5MHz

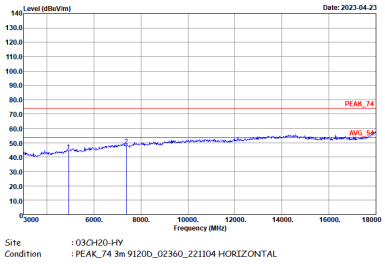
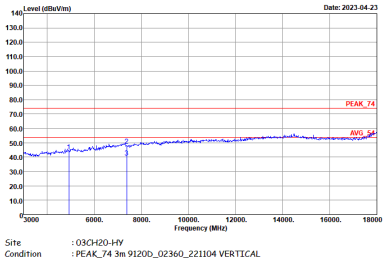
WIFI 802.11b (Harmonic @ 3m)

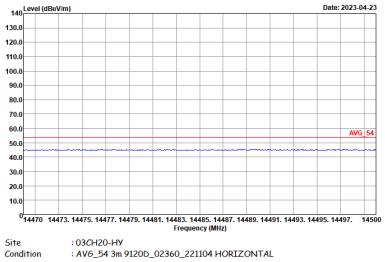
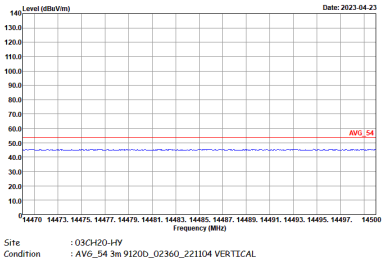
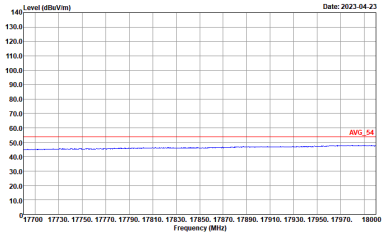
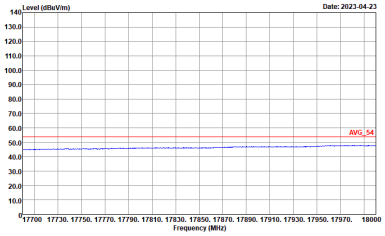
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

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 : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL
17.7G ~18G Avg	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL

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

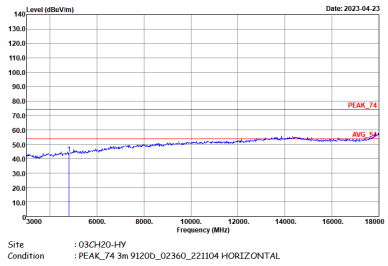
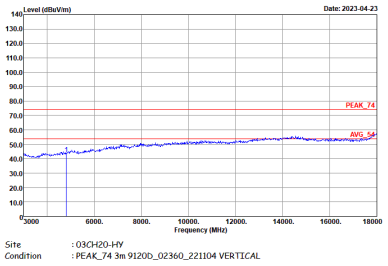
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL
17.7G ~18G Avg	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL

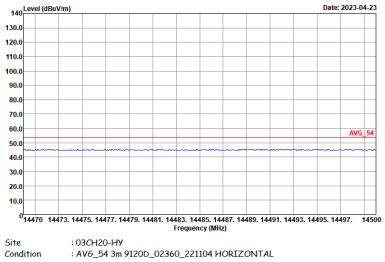
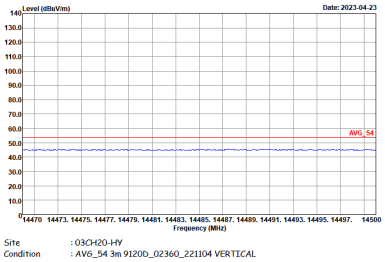
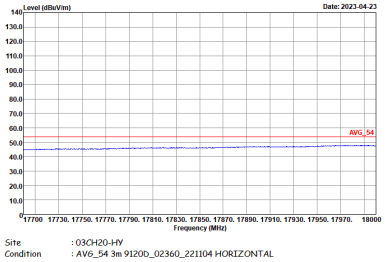
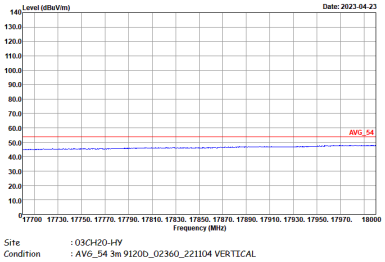
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

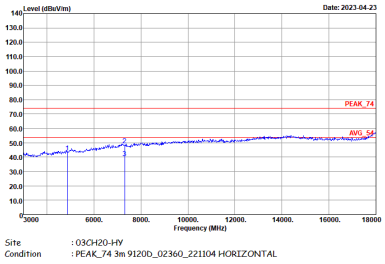
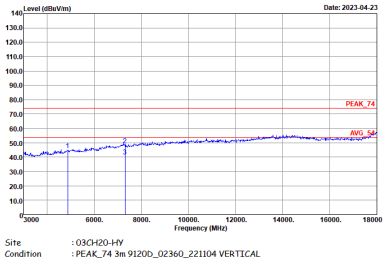
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL
17.7G ~18G Avg	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL

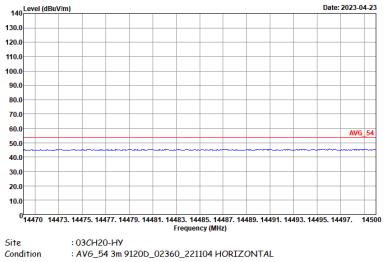
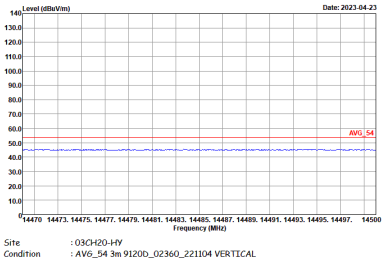
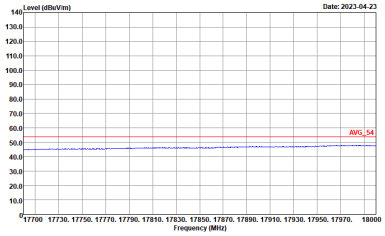
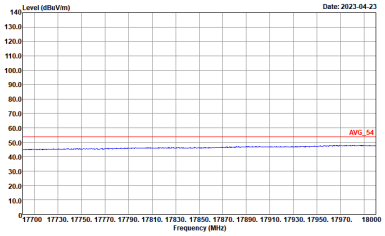
2.4GHz 2400~2483.5MHz

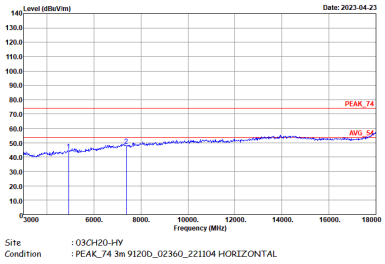
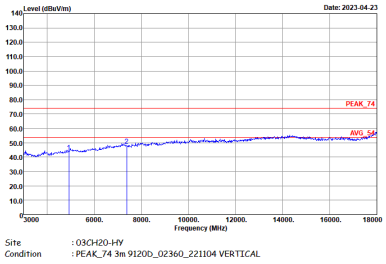
WIFI 802.11g (Harmonic @ 3m)

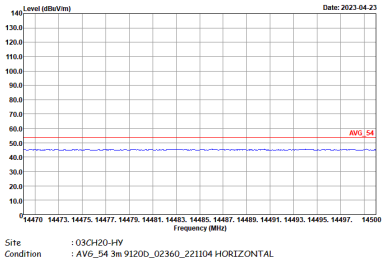
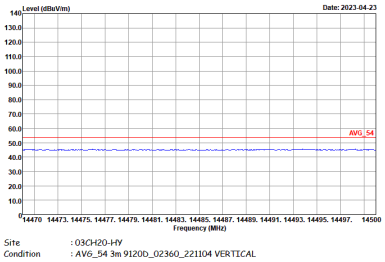
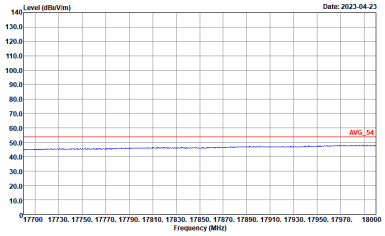
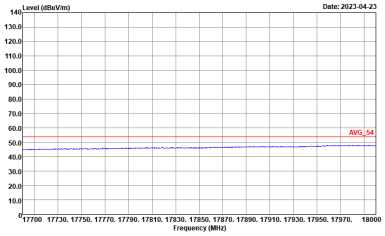
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

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 : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL
17.7G ~18G Avg	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL

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

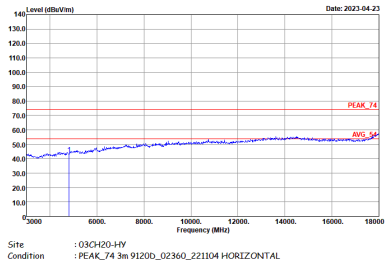
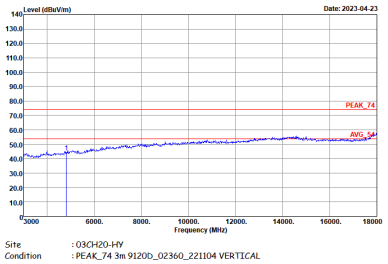
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL
17.7G ~18G Avg	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL

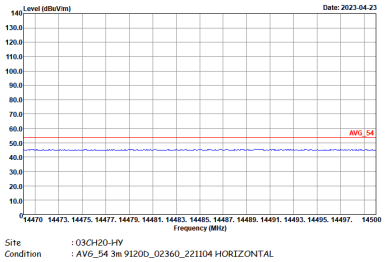
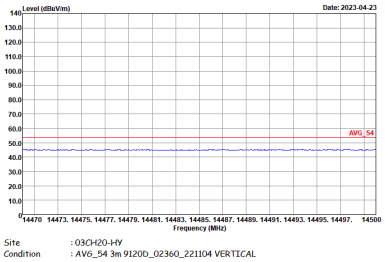
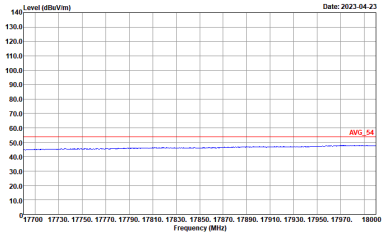
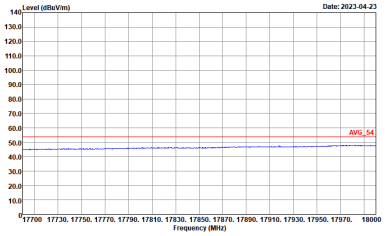
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

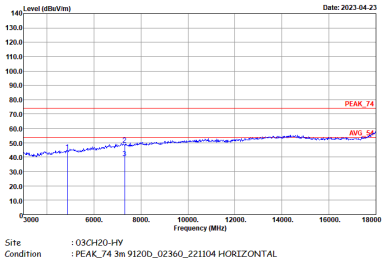
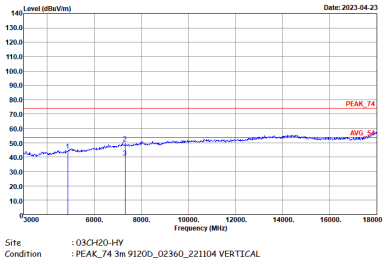
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL
17.7G ~18G Avg	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL

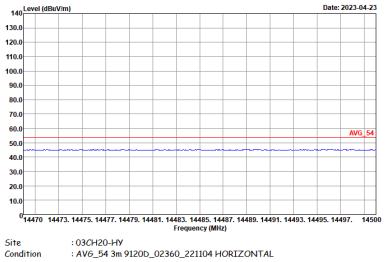
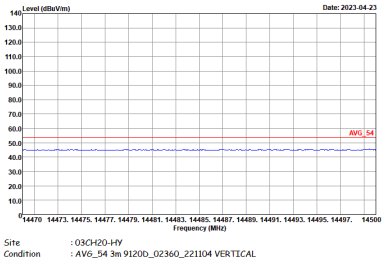
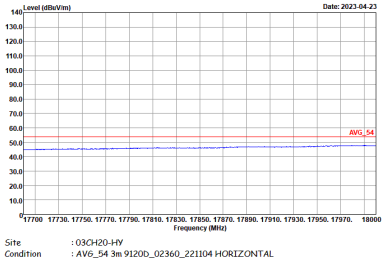
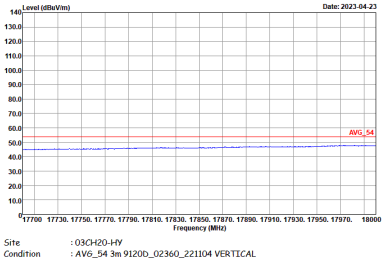
2.4GHz 2400~2483.5MHz

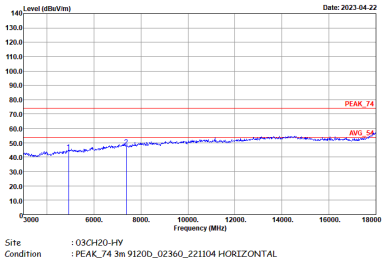
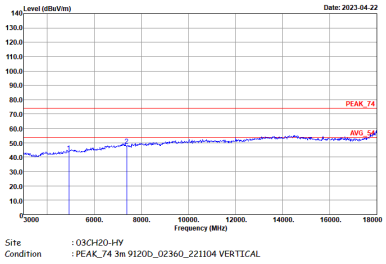
WIFI 802.11n HT20 (Harmonic @ 3m)

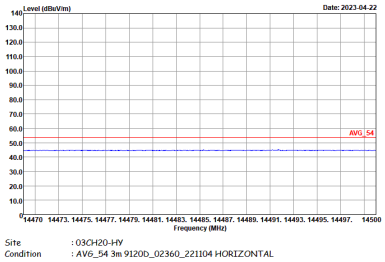
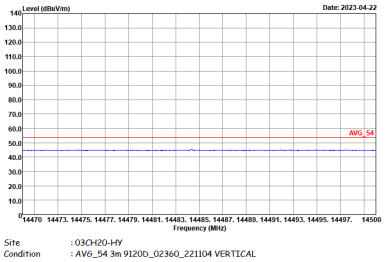
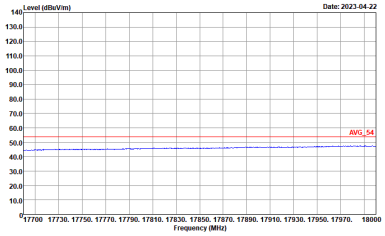
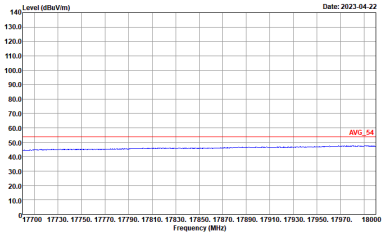
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

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 : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL
17.7G ~18G Avg	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

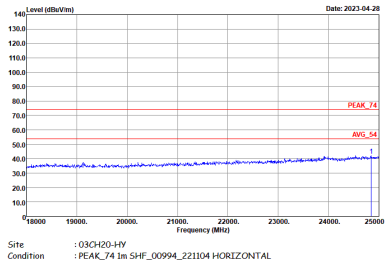
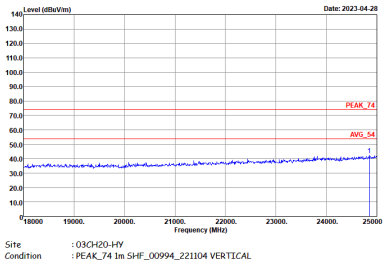
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH06 2437MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL
17.7G ~18G Avg	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 HORIZONTAL	 Site : 03CH20-HY Condition : AVG_54 3m 9120D_02360_221104 VERTICAL

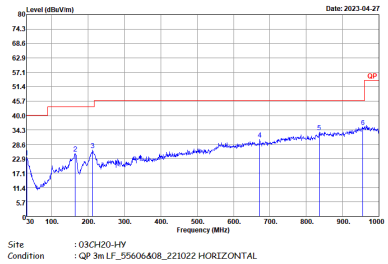
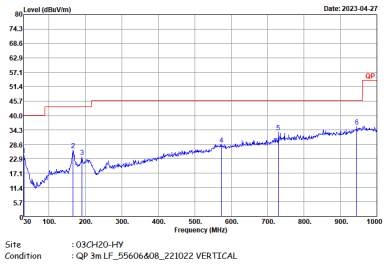
Emission above 18GHz

2.4GHz WIFI 802.11n HT20 (SHF @ 1m)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 SHF	
1	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

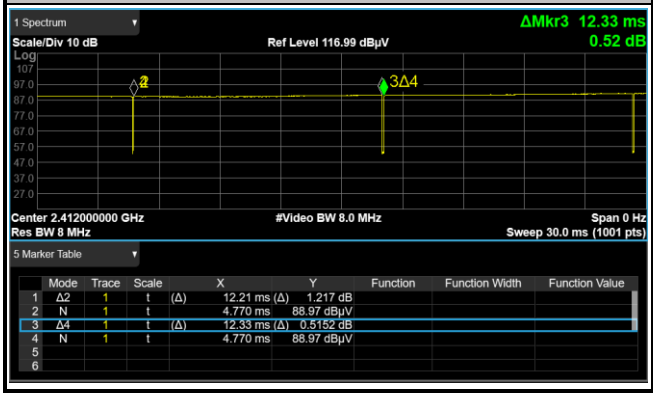
2.4GHz WIFI 802.11n HT20 (LF)

WIFI	2.4GHz 2400~2483.5MHz	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak		

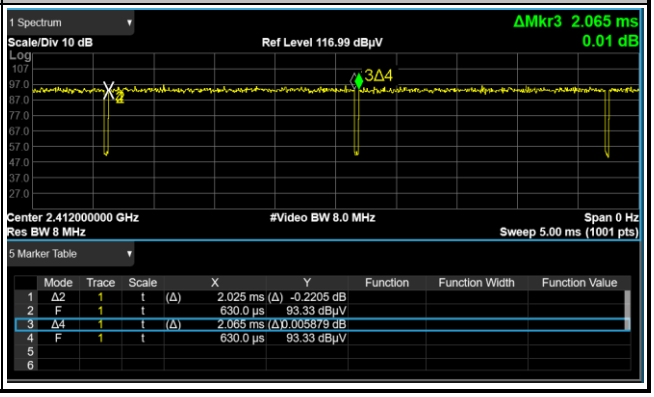
Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	802.11b	99.03	-	-	10Hz
1	802.11g	98.06	-	-	10Hz
1	2.4GHz 802.11n HT20	97.82	1883	0.53	1kHz

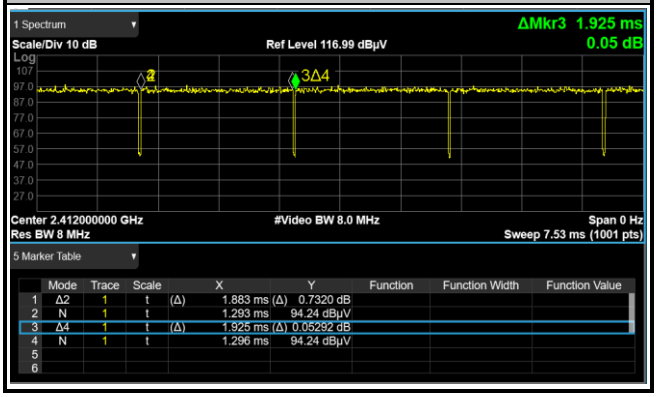
802.11b



802.11g



2.4GHz 802.11n HT20



————THE END————