FCC RADIO TEST REPORT

FCC ID	:	**2AP4W-AWEAR**
Equipment	:	**mPERS**
Brand Name	:	**Belle W**
Model Name	:	**Belle W**
Marketing Name	:	**Belle W**
Applicant	:	**Freeus, LLC** **1069 Stewart Dr, Suites 3-6 Ogden, Utah 84404, United States**
Manufacturer	:	**WiBASE Industrial Solutions Inc.** **Bldg. G, 17F, No. 3-1, Yuan Qu St., Nan Gang Dist., Taipei City, 115, Taiwan.**
Standard	:	**FCC Part 15 Subpart C §15.247**

The product was received on Jan. 05, 2022 and testing was performed from Jan. 12, 2022 to Apr. 13, 2022. 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
FR1D1704	01	Initial issue of report	Mar. 18, 2022
FR1D1704	02	Revise Connection Diagram of Test System, Test Data and List of Measuring Equipment	Apr. 13, 2022

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	9.13 dB under the limit at 30.000 MHz
3.6	15.207	AC Conducted Emission	Pass	4.03 dB under the limit at 0.476 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	Pass	-

Declaration of Conformity:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
   It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to this report "Uncertainty of Evaluation".

Comments and Explanations:

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

Reviewed by: Keven Cheng

Report Producer: Amy Chen

1 General Description

1.1 Product Feature of Equipment Under Test

LTE and Wi-Fi 2.4GHz 802.11b/g/n

Product Feature	
Antenna Type	WWAN: PIFA (LDS) Antenna WLAN: LDS Antenna

Antenna information		
2400 MHz ~ 2483.5 MHz	Peak Gain (dBi)	0

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

1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	**Sporton Site No.**
	CO05-HY (TAF Code: 1190)
Remark	The AC Conducted Emission test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory

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

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, 03CH15-HY

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

FCC designation No.: TW1190 and TW3786

1.4 Applicable Standards

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

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS 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.

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 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 consider the modulation and the worst data rates as shown in the table below.

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

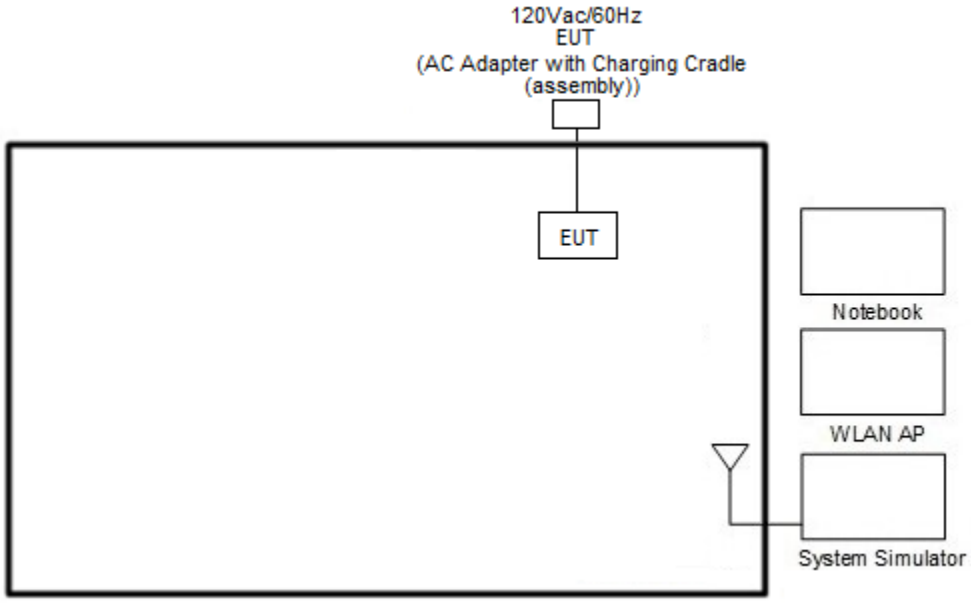
Test Cases	
AC Conducted Emission	Mode 1 :LTE Band 12 Link + WLAN(2.4GHz) Link + AC Adapter with Charging Cradle (assembly)

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

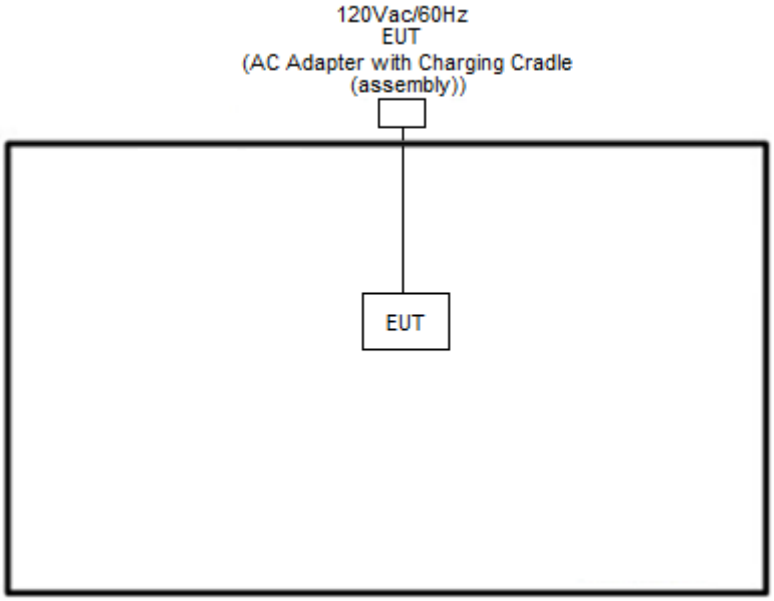
Remark: For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT Version 4.0.00175.0” 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.

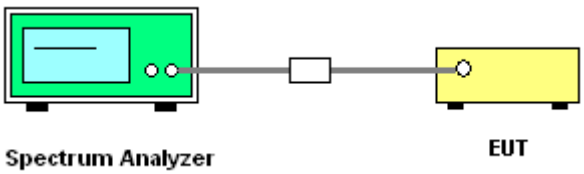
3.1.2 Measuring Instruments

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.

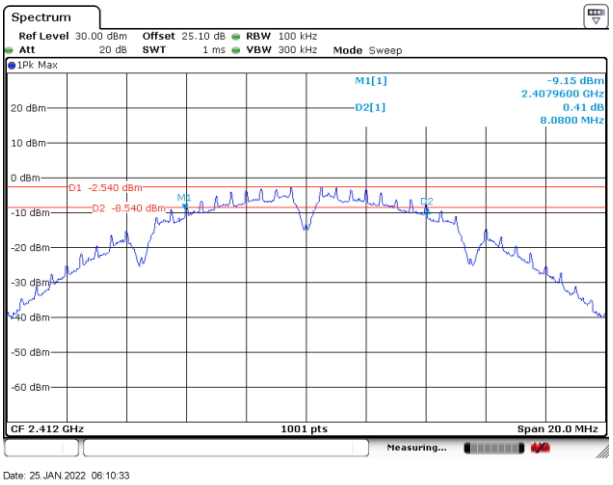
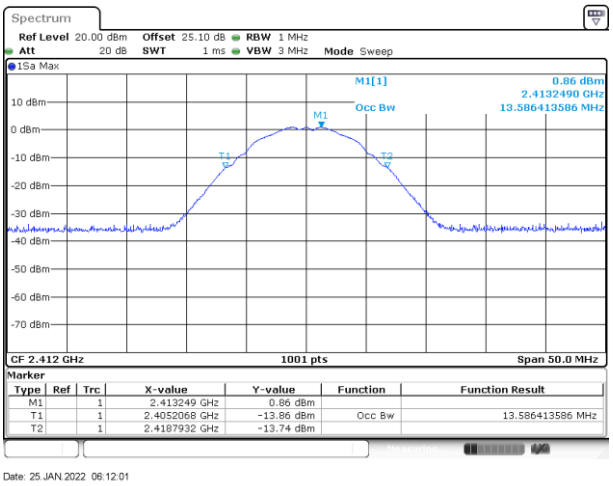
3.1.4 Test Setup



3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

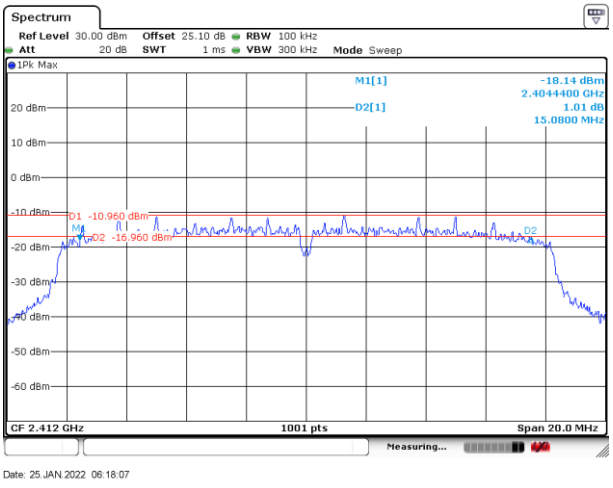
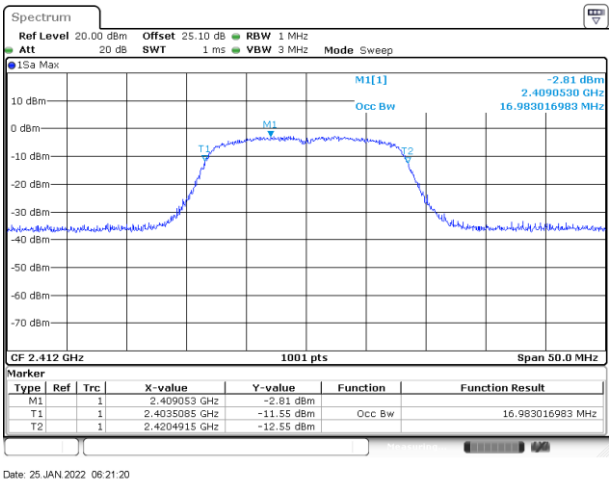
Please refer to Appendix A.

<802.11b>

6dB Bandwidth	99% Occupied Bandwidth
	

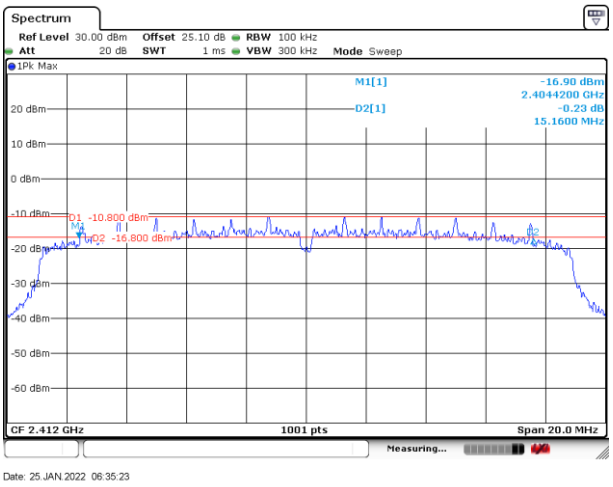
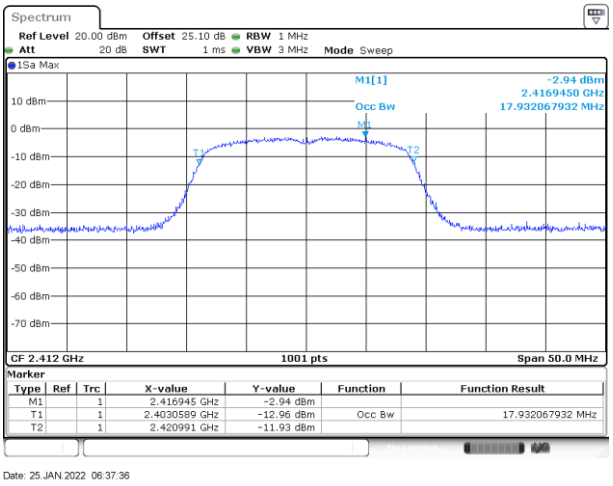
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

<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.

3.2 Output Power Measurement

3.2.1 Limit of Output Power

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

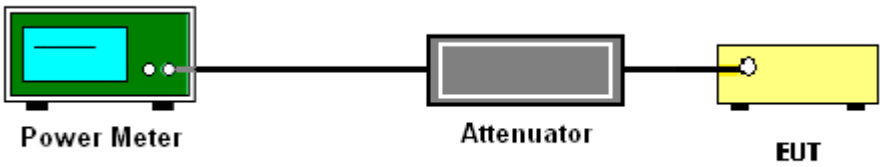
3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Average Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

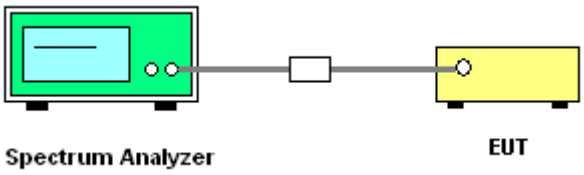
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

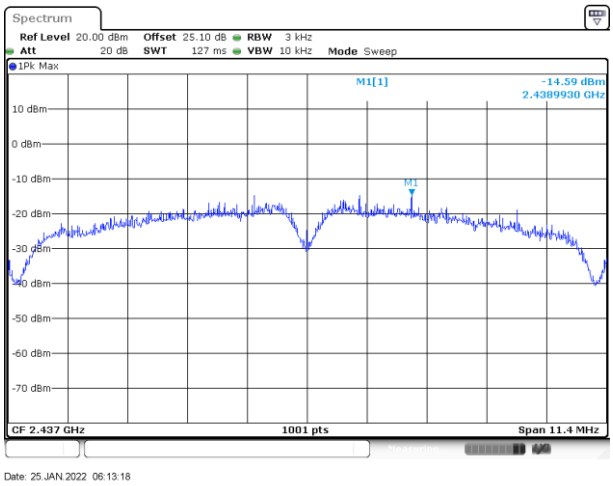
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Maximum Power Density Plot (dBm/3kHz)



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.

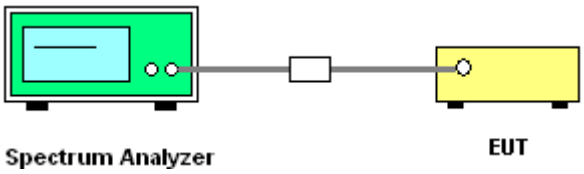
3.4.2 Measuring Instruments

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.

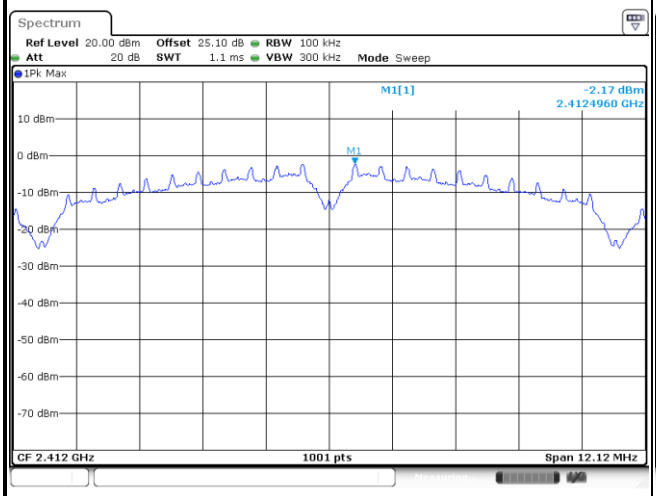
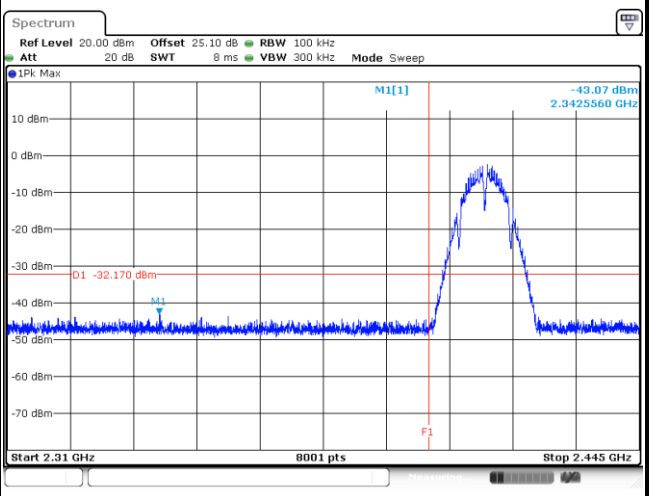
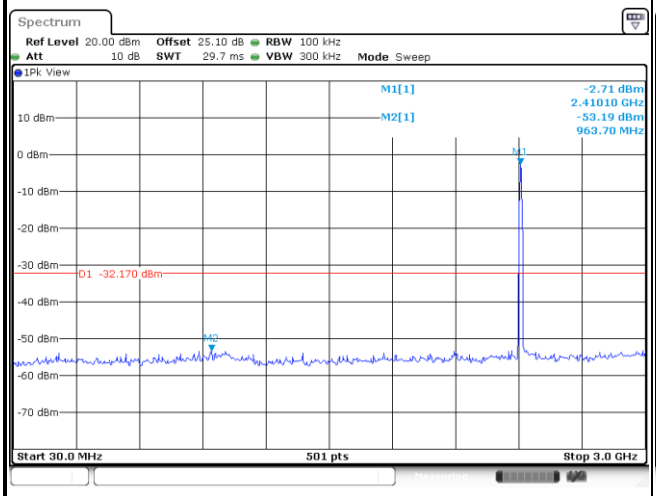
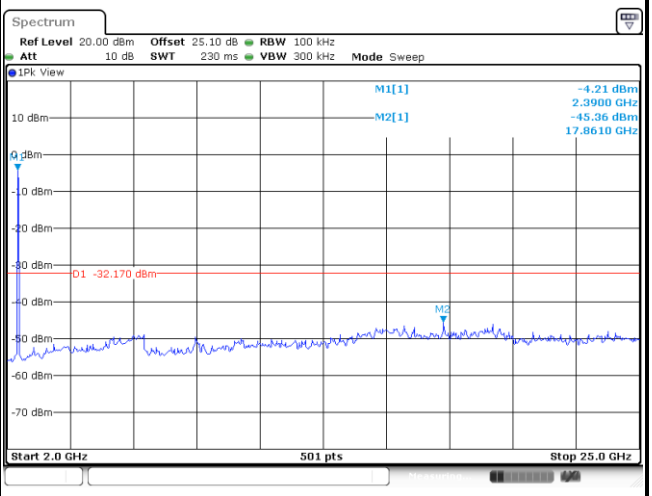
3.4.4 Test Setup



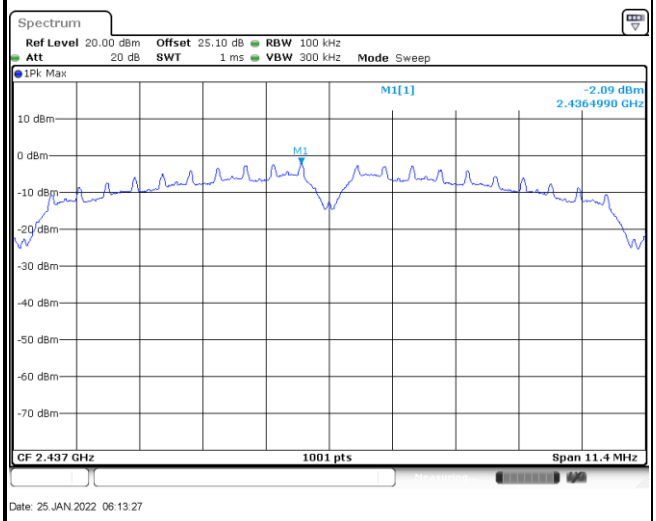
3.4.5 Test Result of Conducted Band Edges and Spurious Emission

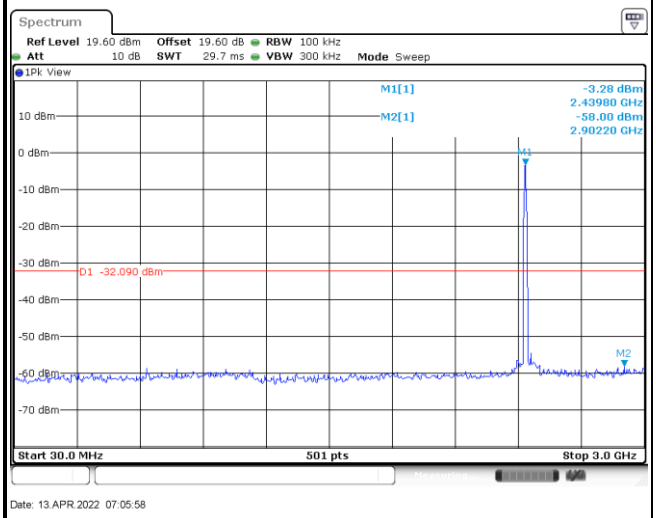
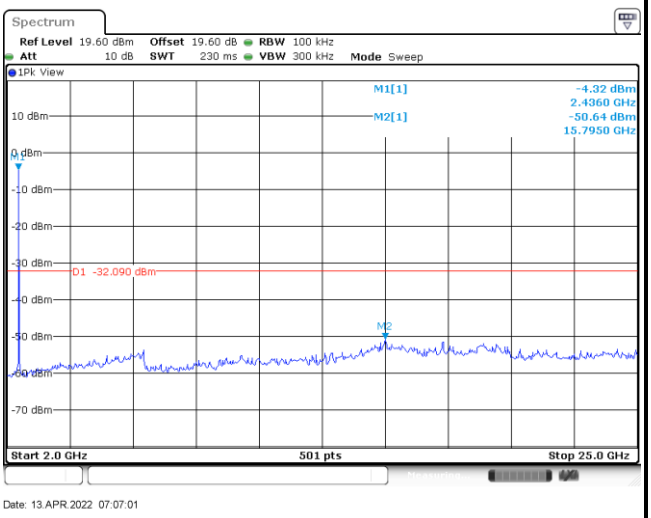
Number of TX = 1, Ant. 1 (Measured)

Test Mode :	802.11b	Test Channel :	01

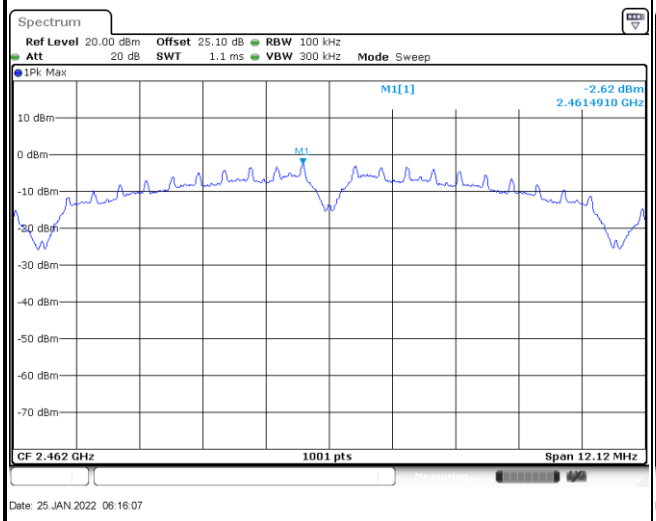
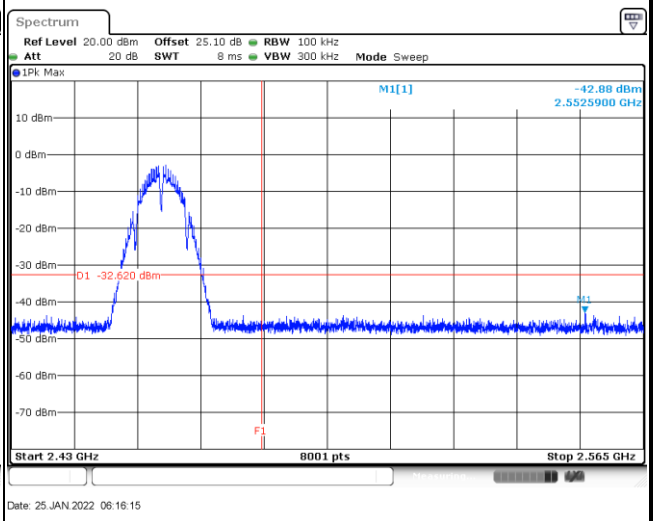
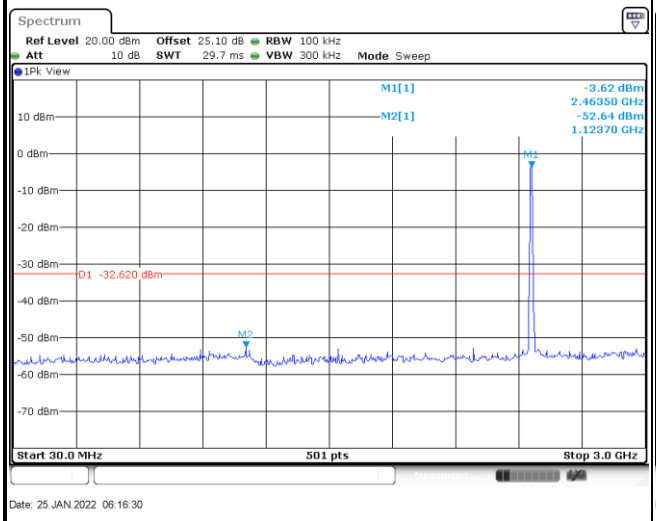
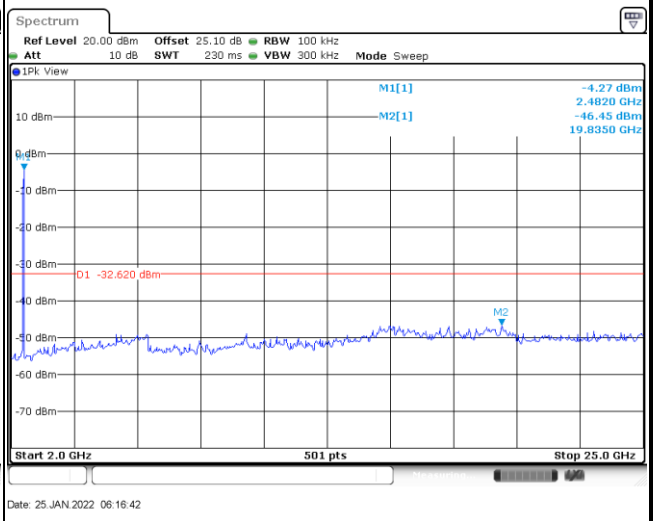
100kHz PSD reference Level	Low Channel Plot
	
Date: 25.JAN.2022 06:11:03	Date: 25.JAN.2022 06:11:13
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JAN.2022 06:11:31	Date: 25.JAN.2022 06:11:44

Test Mode :	802.11b	Test Channel :	06

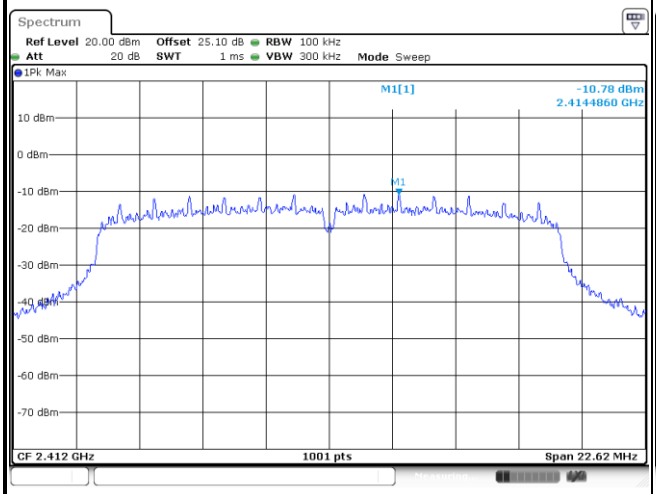
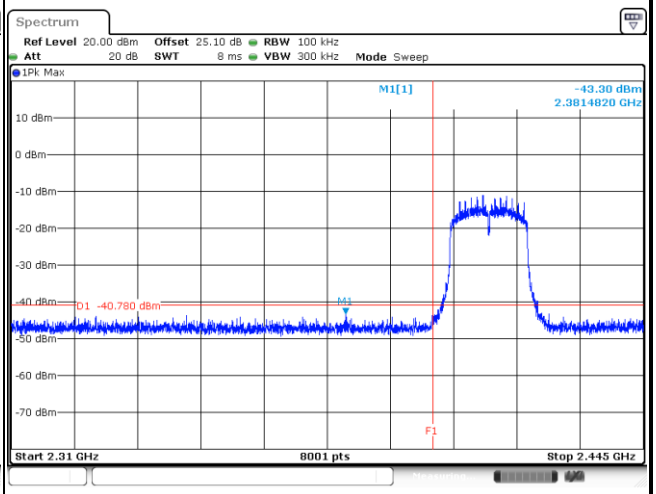
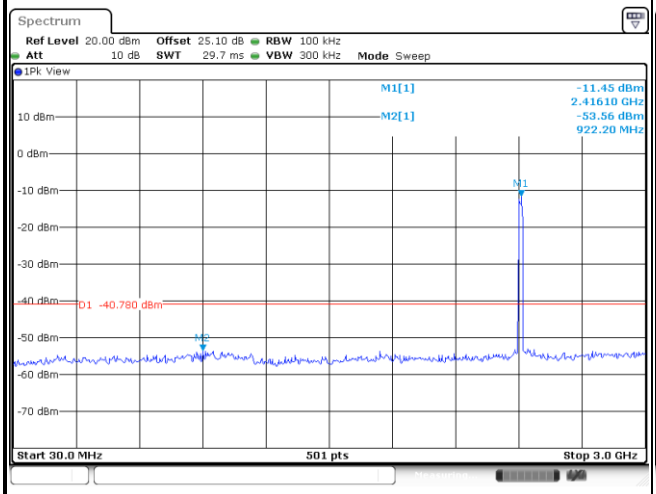
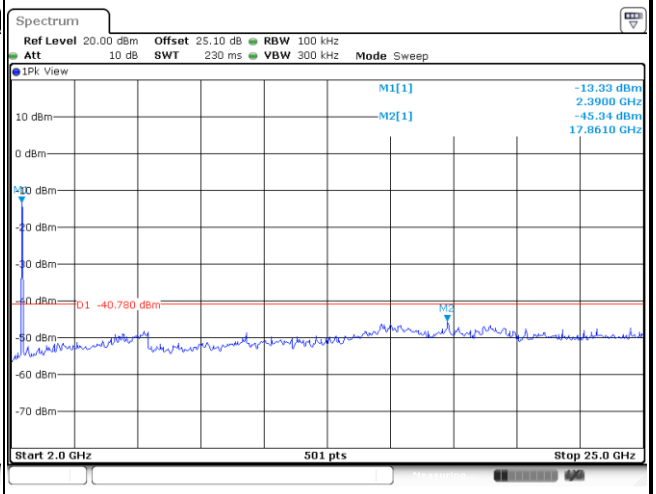
100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

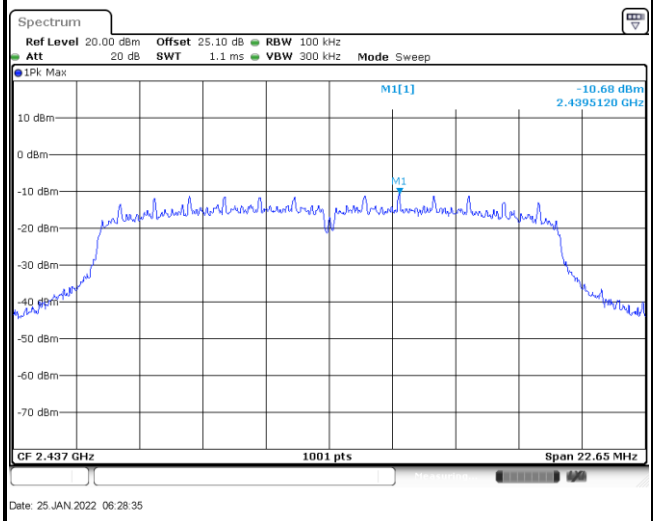
Test Mode :	802.11b	Test Channel :	11

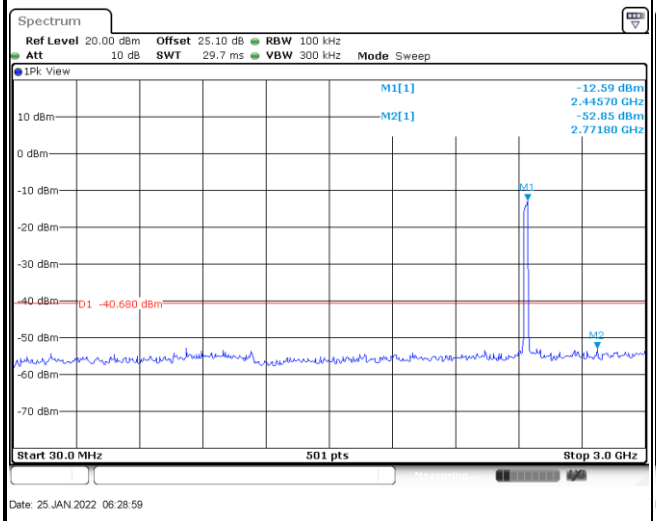
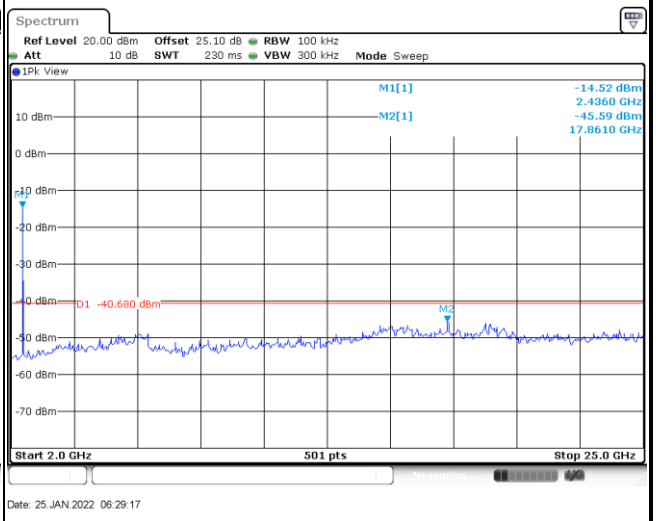
100kHz PSD reference Level	High Channel Plot
	
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	

Test Mode :	802.11g	Test Channel :	01

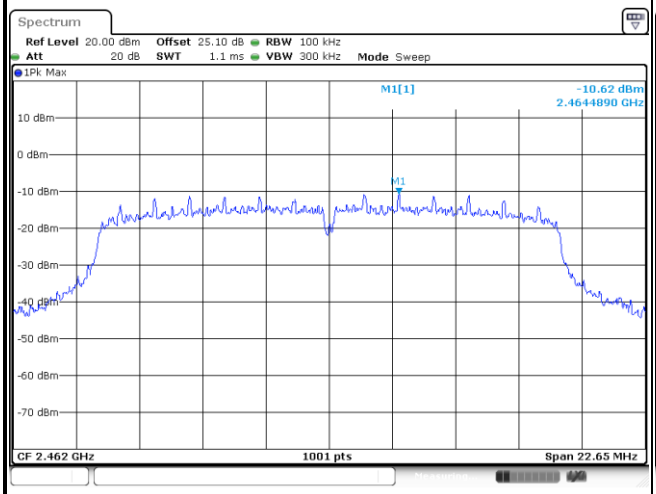
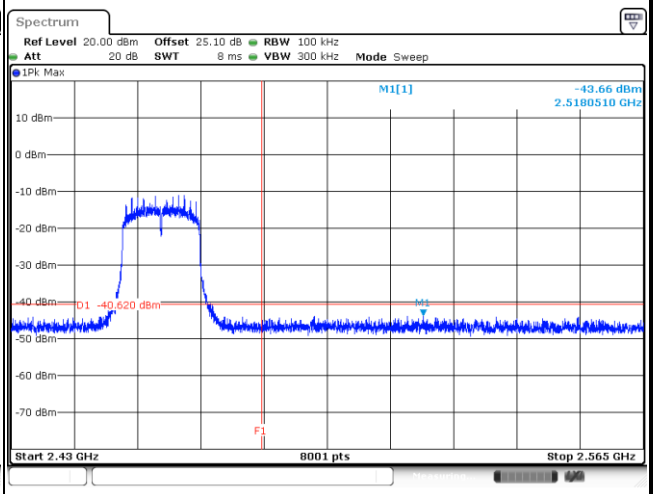
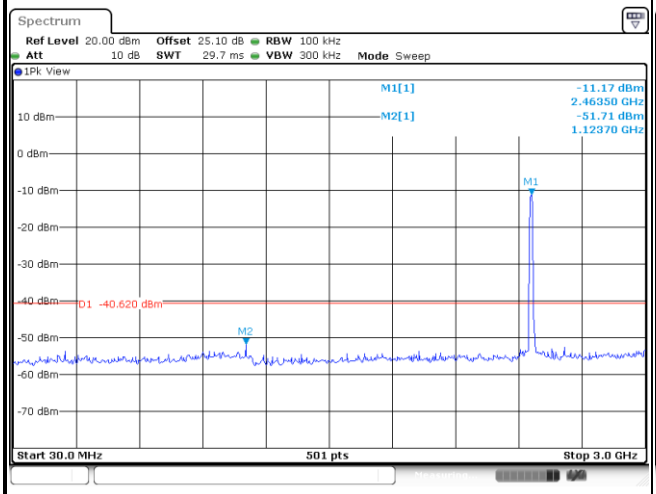
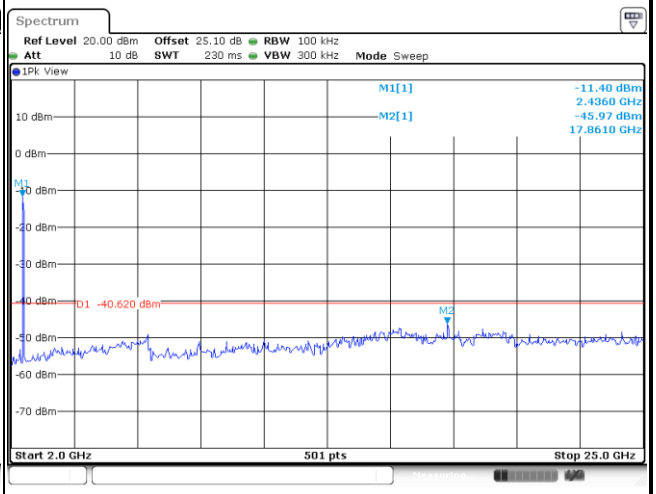
100kHz PSD reference Level	Low Channel Plot
	
Date: 25.JAN.2022 06:18:37	Date: 25.JAN.2022 06:19:57
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JAN.2022 06:20:17	Date: 25.JAN.2022 06:21:06

Test Mode :	802.11g	Test Channel :	06

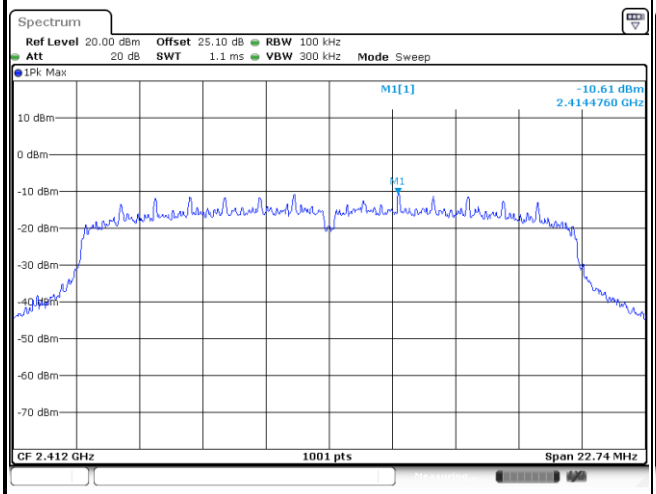
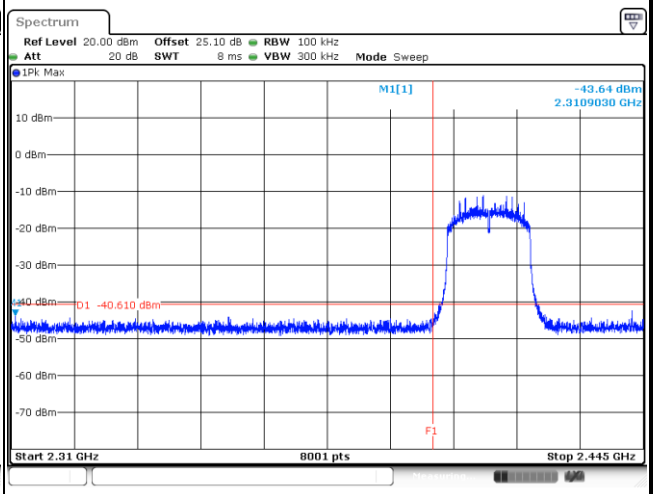
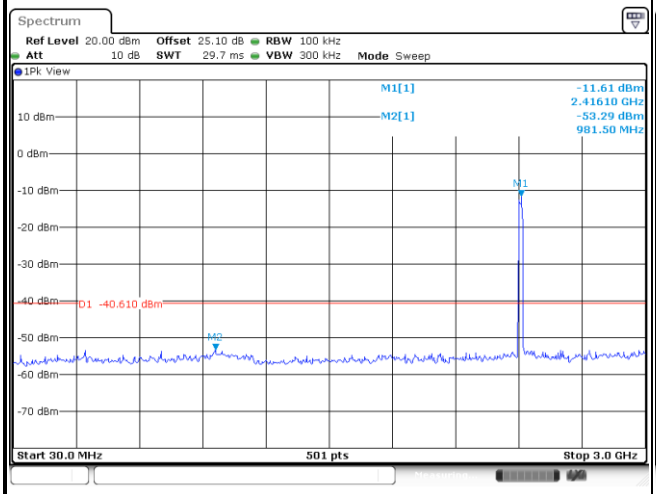
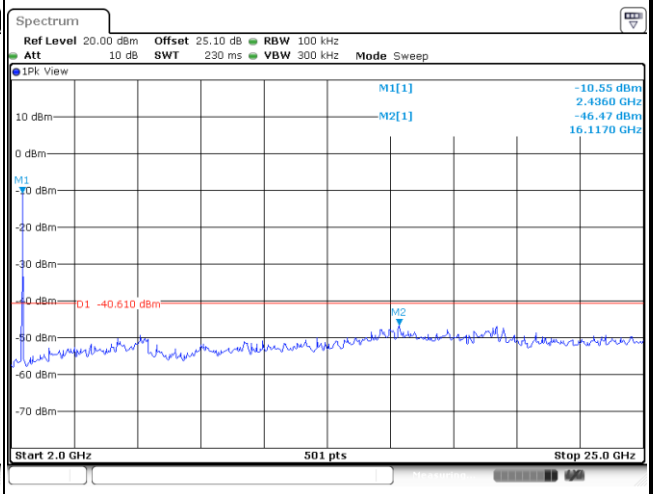
100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

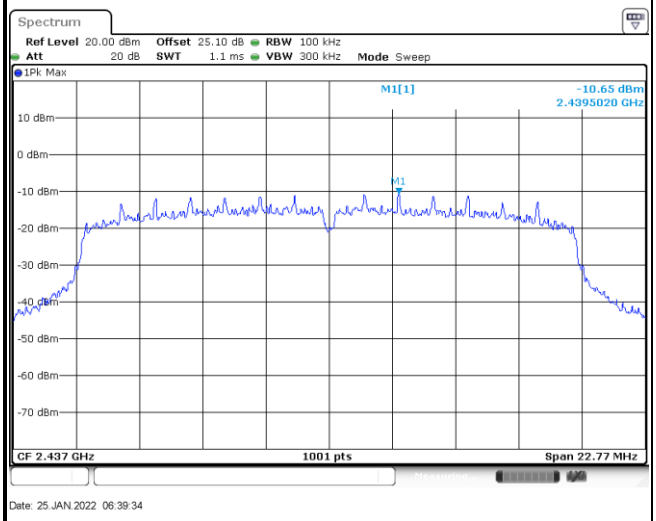
Test Mode :	802.11g	Test Channel :	11

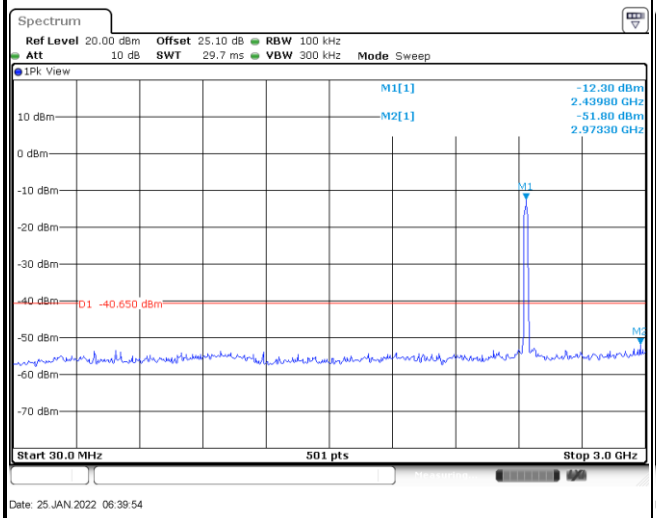
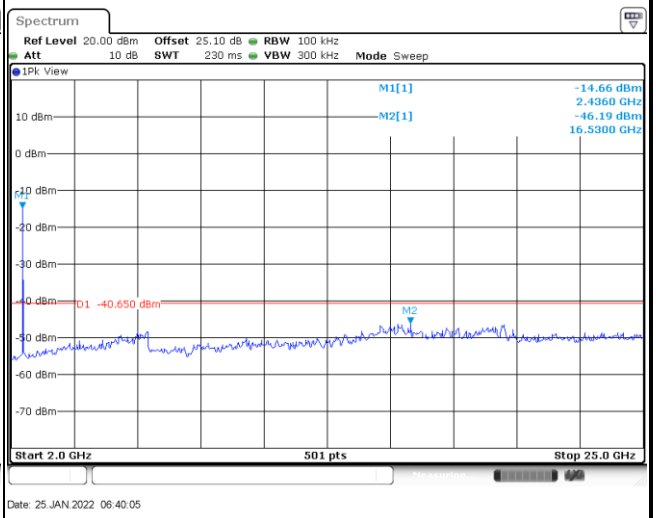
100kHz PSD reference Level	High Channel Plot
	
Date: 25.JAN.2022 06:30:55	Date: 25.JAN.2022 06:31:40
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JAN.2022 06:31:55	Date: 25.JAN.2022 06:33:38

Test Mode :	802.11n HT20	Test Channel :	01

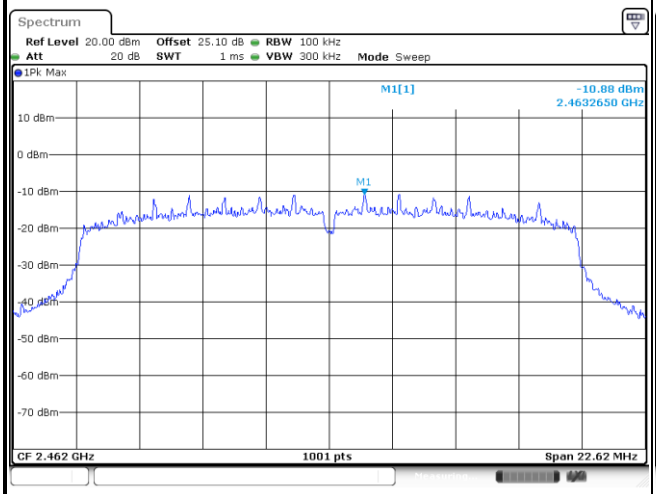
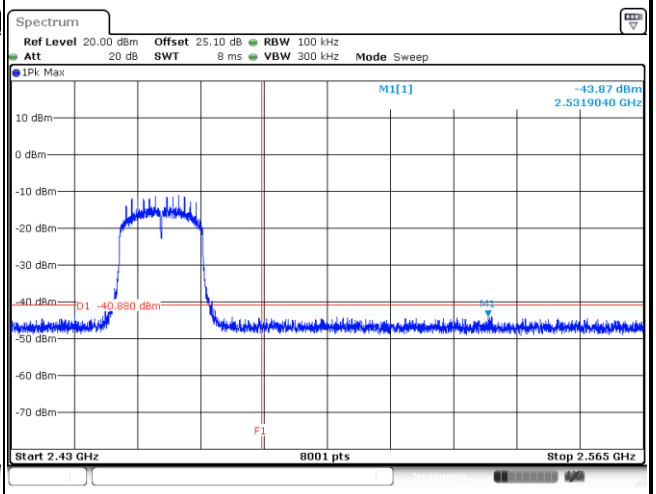
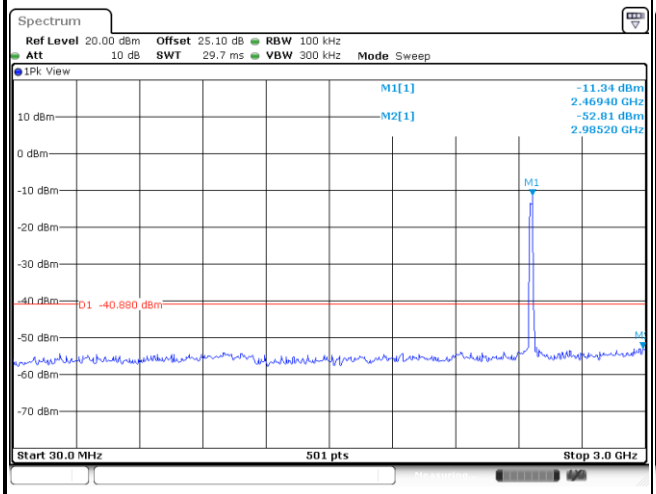
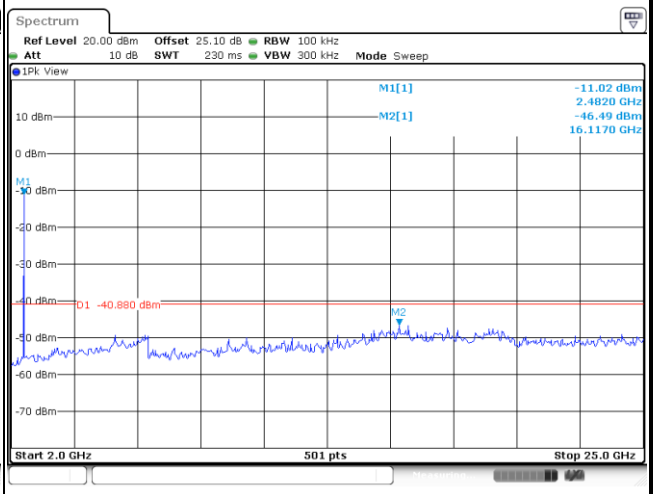
100kHz PSD reference Level	Low Channel Plot
	
Date: 25.JAN.2022 06:35:55	Date: 25.JAN.2022 06:36:07
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JAN.2022 06:36:25	Date: 25.JAN.2022 06:37:22

Test Mode :	802.11n HT20	Test Channel :	06

100kHz PSD reference Level	Mid Channel Plot
	

Spurious Emission 30MHz~3GHz	Spurious Emission 2GHz~25GHz
	

Test Mode :	802.11n HT20	Test Channel :	11

100kHz PSD reference Level	High Channel Plot
	
Date: 25.JAN.2022 06:41:42	Date: 25.JAN.2022 06:41:52
Spurious Emission 30MHz~3GHz	**Spurious Emission 2GHz~25GHz**
	
Date: 25.JAN.2022 06:42:31	Date: 25.JAN.2022 06:44:14

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

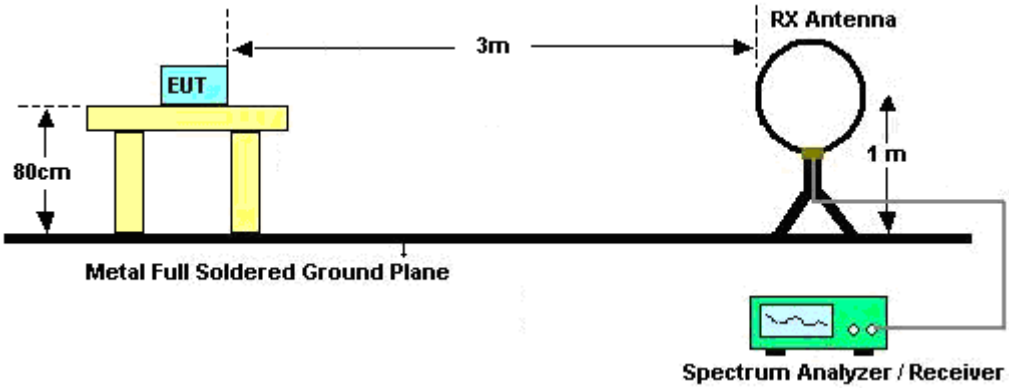
Please refer to the measuring equipment list in this test report.

3.5.3 Test Procedures

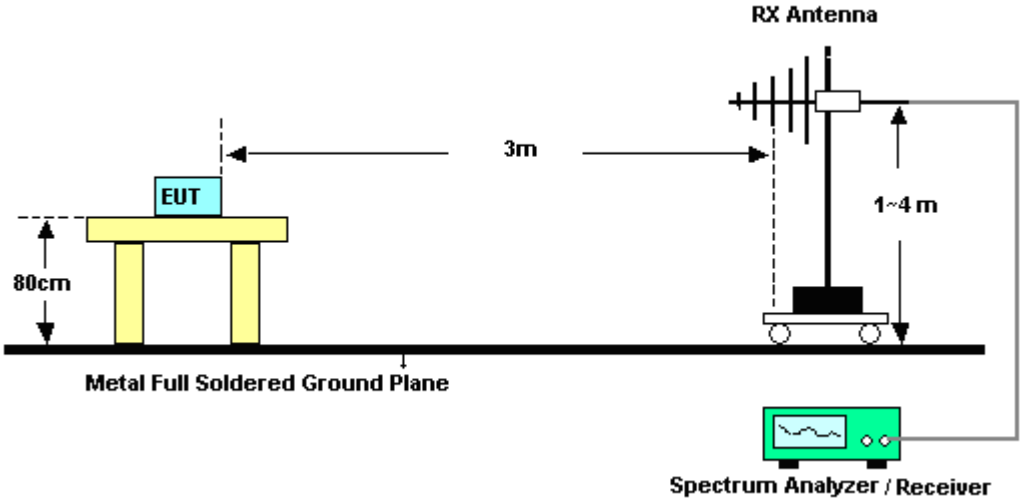
1. The testing follows the ANSI C63.10 Section 11.12.1 Radiated emission measurements.
2. The EUT is arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the 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

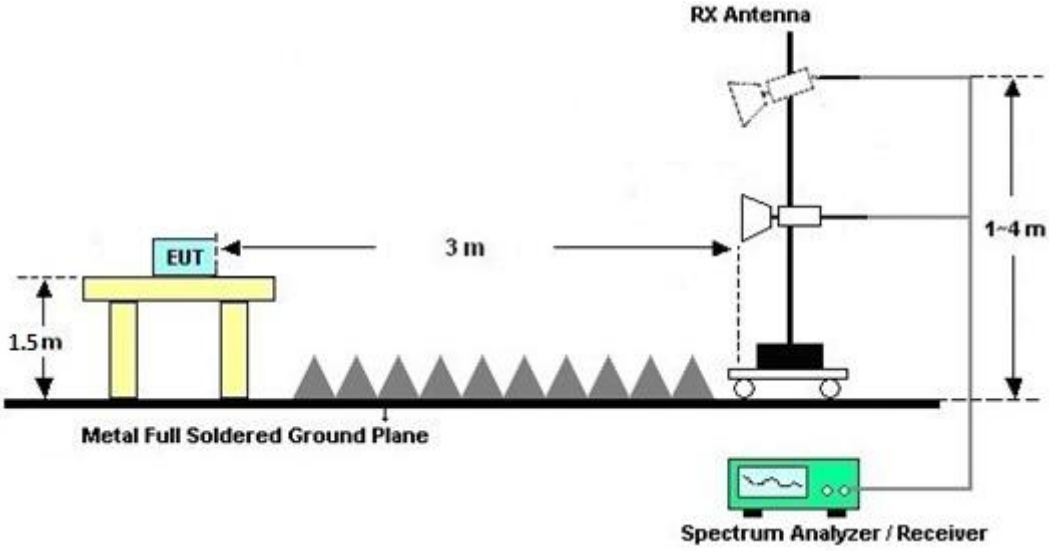
For radiated emissions below 30MHz



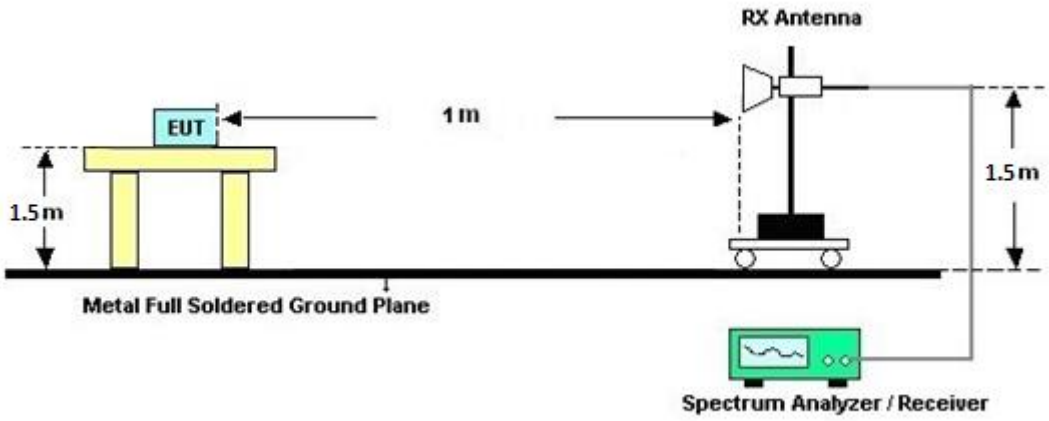
For radiated emissions from 30MHz to 1GHz



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.

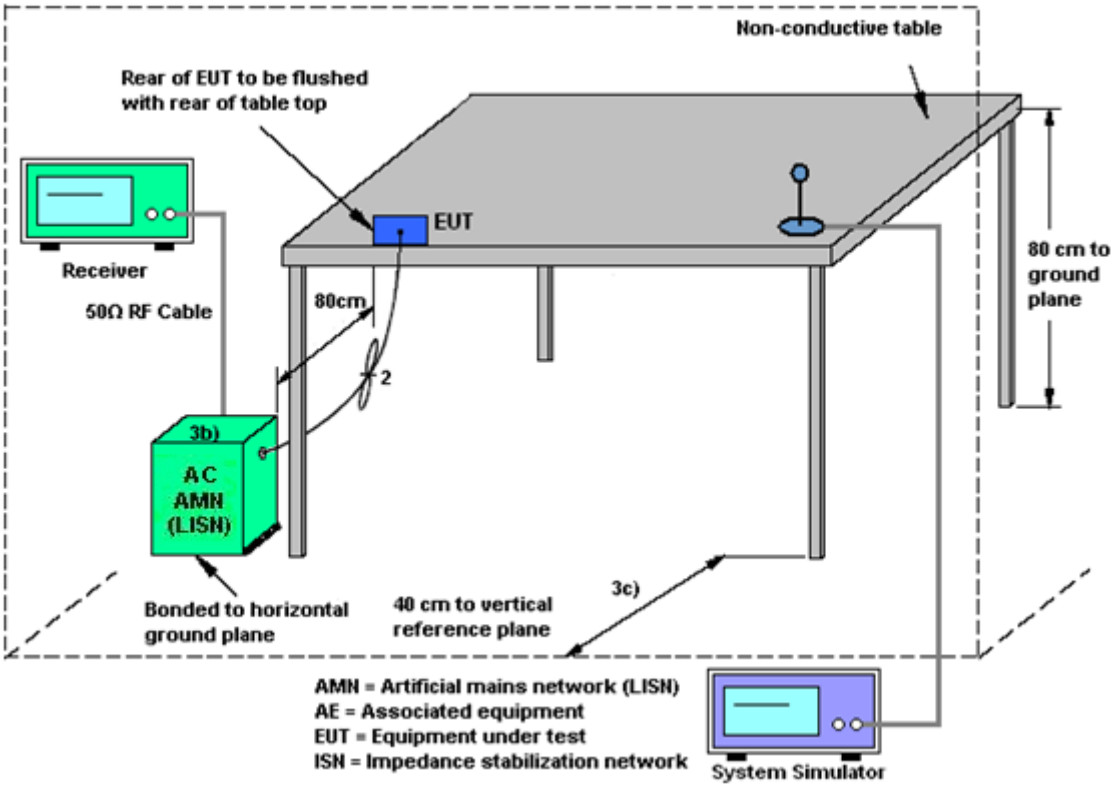
3.6.2 Measuring Instruments

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

If directional gain of transmitting Antennas is greater than 6 dBi, the power shall be reduced by the same level in dB comparing to gain minus 6 dBi. 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.

3.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 07, 2021	Jan. 25, 2022~ Jan. 26, 2022	Sep. 06, 2022	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	41912 & 05	30MHz~1GHz	Feb. 08, 2021	Jan. 25, 2022~ Jan. 26, 2022	Feb. 07, 2022	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 27, 2021	Jan. 25, 2022~ Jan. 26, 2022	Dec. 26, 2022	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Oct. 25, 2021	Jan. 25, 2022~ Jan. 26, 2022	Oct. 24, 2022	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 30, 2021	Jan. 25, 2022~ Jan. 26, 2022	Nov. 29, 2022	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-303	171000180005 5006	1GHz~18GHz	May 06, 2021	Jan. 25, 2022~ Jan. 26, 2022	May 05, 2022	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY53270195	1GHz~26.5GHz	Aug. 19, 2021	Jan. 25, 2022~ Jan. 26, 2022	Aug. 18, 2022	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060801	18-40GHz	Jun. 22, 2021	Jan. 25, 2022~ Jan. 26, 2022	Jun. 21, 2022	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20MHz~8.4GHz	Oct. 21, 2021	Jan. 25, 2022~ Jan. 26, 2022	Oct. 20, 2022	Radiation (03CH15-HY
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	May 07, 2021	Jan. 25, 2022~ Jan. 26, 2022	May 06, 2022	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Jan. 25, 2022~ Jan. 26, 2022	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Jan. 25, 2022~ Jan. 26, 2022	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k5)	RK-000451	N/A	N/A	Jan. 25, 2022~ Jan. 26, 2022	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/4, MY9838/4PE,5 08405/2E	30MHz~18G	Nov. 15, 2021	Jan. 25, 2022~ Jan. 26, 2022	Nov. 14, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 22, 2021	Jan. 25, 2022~ Jan. 26, 2022	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 22, 2021	Jan. 25, 2022~ Jan. 26, 2022	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 11, 2021	Jan. 25, 2022~ Jan. 26, 2022	Mar. 10, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-1530-6000-40ST	SN4	1.53GHz Low Pass Filter	Jul. 02, 2021	Jan. 25, 2022~ Jan. 26, 2022	Jul. 01, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700-30 00-18000-60ST	SN4	3GHz High Pass Filter	Sep. 15, 2021	Jan. 25, 2022~ Jan. 26, 2022	Sep. 14, 2022	Radiation (03CH15-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jan. 12, 2022	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 01, 2021	Jan. 12, 2022	Nov. 30, 2022	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 17, 2021	Jan. 12, 2022	Nov. 16, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 03, 2021	Jan. 12, 2022	Dec. 02, 2022	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Jan. 12, 2022	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Jul. 28, 2021	Jan. 12, 2022	Jul. 27, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 30, 2021	Jan. 12, 2022	Dec. 29, 2022	Conduction (CO05-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Jan. 14, 2022~ Apr. 13, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO12 (NO:113)	10MHz~6GHz	Dec. 16, 2021	Jan. 14, 2022~ Apr. 13, 2022	Dec. 15, 2022	Conducted (TH05-HY)
Power Meter	Anritsu	ML2495A	932001	N/A	Sep. 30, 2021	Jan. 14, 2022~ Apr. 13, 2022	Sep. 29, 2022	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	846202	300MHz~40GHz	Sep. 30, 2021	Jan. 14, 2022~ Apr. 13, 2022	Sep. 29, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Jan. 14, 2022~ Apr. 13, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Switch Control Manframe	E-IUSTRUMENT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Jan. 14, 2022~ Apr. 13, 2022	Aug. 11, 2022	Conducted (TH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.1 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.8 dB

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.6 dB

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Hank Hsu	Temperature:	21~25	°C
Test Date:	2022/1/14~2022/4/13	Relative Humidity:	51~54	%

Report Number : FR1D1704

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	Ant2	Ant1	Ant2		
11b	1Mbps	1	1	2412	13.59	-	8.08	-	0.50	Pass
11b	1Mbps	1	6	2437	13.64	-	7.60	-	0.50	Pass
11b	1Mbps	1	11	2462	13.64	-	8.08	-	0.50	Pass
11g	6Mbps	1	1	2412	16.98	-	15.08	-	0.50	Pass
11g	6Mbps	1	6	2437	16.98	-	15.10	-	0.50	Pass
11g	6Mbps	1	11	2462	17.08	-	15.10	-	0.50	Pass
HT20	MCS0	1	1	2412	17.93	-	15.16	-	0.50	Pass
HT20	MCS0	1	6	2437	17.98	-	15.18	-	0.50	Pass
HT20	MCS0	1	11	2462	17.98	-	15.08	-	0.50	Pass

Report Number : FR1D1704

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	Ant2	SUM	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	5.80	-		30.00	-	0.00	-	5.80	-	36.00	-	Pass
11b	1Mbps	1	6	2437	5.90	-		30.00	-	0.00	-	5.90	-	36.00	-	Pass
11b	1Mbps	1	11	2462	5.60	-		30.00	-	0.00	-	5.60	-	36.00	-	Pass
11g	6Mbps	1	1	2412	-0.20	-		30.00	-	0.00	-	-0.20	-	36.00	-	Pass
11g	6Mbps	1	6	2437	-0.10	-		30.00	-	0.00	-	-0.10	-	36.00	-	Pass
11g	6Mbps	1	11	2462	-0.10	-		30.00	-	0.00	-	-0.10	-	36.00	-	Pass
HT20	MCS0	1	1	2412	-0.40	-		30.00	-	0.00	-	-0.40	-	36.00	-	Pass
HT20	MCS0	1	6	2437	-0.30	-		30.00	-	0.00	-	-0.30	-	36.00	-	Pass
HT20	MCS0	1	11	2462	-0.30	-		30.00	-	0.00	-	-0.30	-	36.00	-	Pass

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

Report Number : FR1D1704

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	Ant2	Worse + 3.01	Ant1	Ant2	Ant1	Ant2	
11b	1Mbps	1	1	2412	-14.90	-		0.00	-	8.00	-	Pass
11b	1Mbps	1	6	2437	-14.59	-		0.00	-	8.00	-	Pass
11b	1Mbps	1	11	2462	-15.35	-		0.00	-	8.00	-	Pass
11g	6Mbps	1	1	2412	-25.62	-		0.00	-	8.00	-	Pass
11g	6Mbps	1	6	2437	-25.20	-		0.00	-	8.00	-	Pass
11g	6Mbps	1	11	2462	-25.67	-		0.00	-	8.00	-	Pass
HT20	MCS0	1	1	2412	-26.15	-		0.00	-	8.00	-	Pass
HT20	MCS0	1	6	2437	-25.45	-		0.00	-	8.00	-	Pass
HT20	MCS0	1	11	2462	-25.38	-		0.00	-	8.00	-	Pass

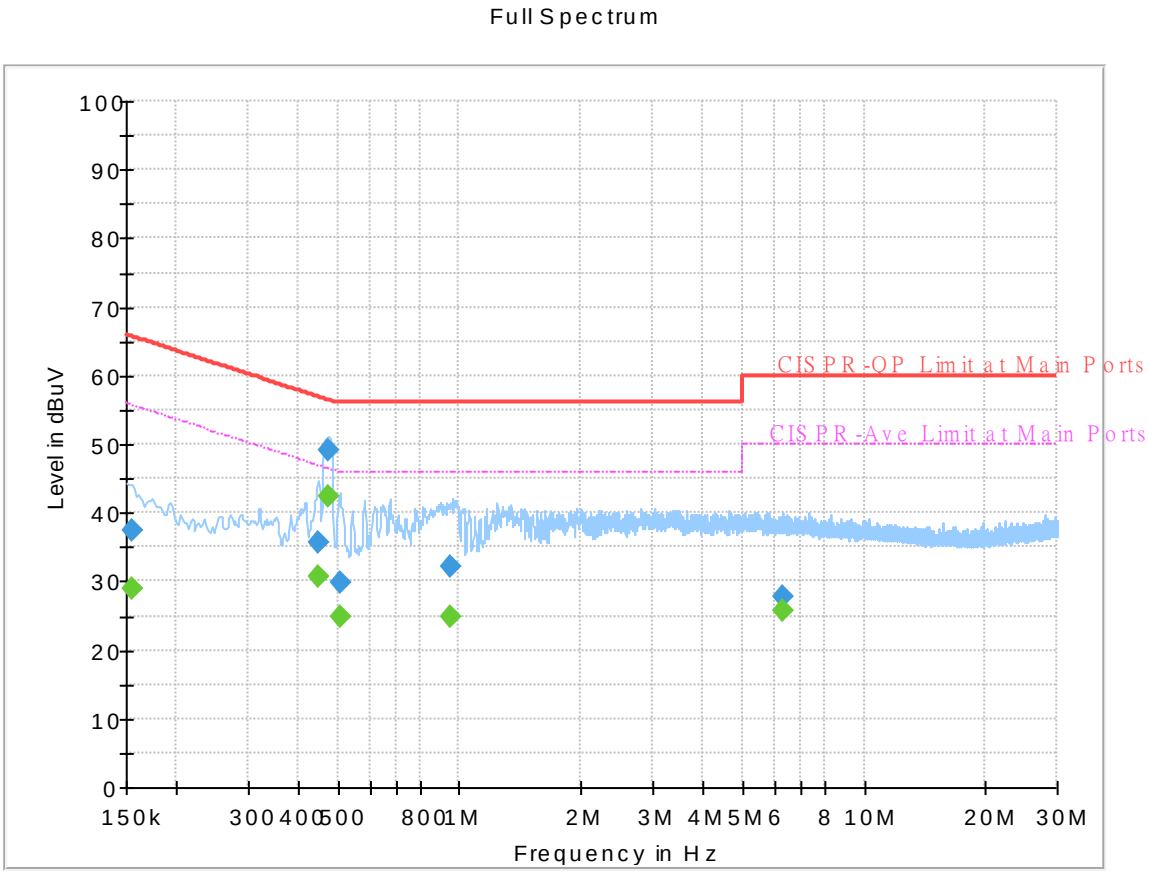
Measured power density (dBm) has offset with cable loss.

Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calvin Wang	**Temperature :**	23~26℃
		Relative Humidity :	45~55%

EUT Information

Report NO :	1D1704
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

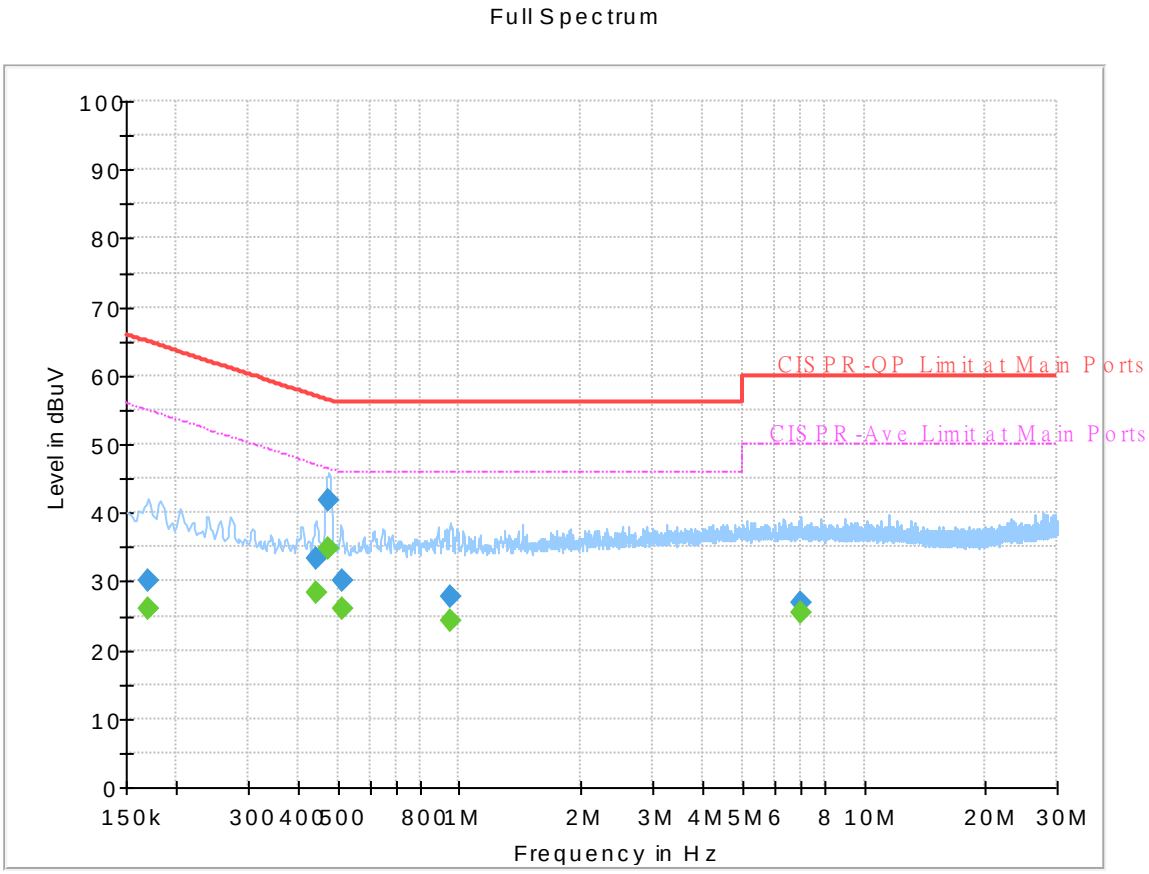


Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154500	---	29.05	55.75	26.70	L1	OFF	19.6
0.154500	37.35	---	65.75	28.40	L1	OFF	19.6
0.447000	---	30.73	46.93	16.20	L1	OFF	19.6
0.447000	35.55	---	56.93	21.38	L1	OFF	19.6
0.476250	---	42.37	46.40	4.03	L1	OFF	19.6
0.476250	49.25	---	56.40	7.15	L1	OFF	19.6
0.505500	---	25.00	46.00	21.00	L1	OFF	19.6
0.505500	29.95	---	56.00	26.05	L1	OFF	19.6
0.946500	---	24.87	46.00	21.13	L1	OFF	19.6
0.946500	32.04	---	56.00	23.96	L1	OFF	19.6
6.310500	---	25.79	50.00	24.21	L1	OFF	19.9
6.310500	27.89	---	60.00	32.11	L1	OFF	19.9

EUT Information

Report NO :	1D1704
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.170250	---	26.01	54.95	28.94	N	OFF	19.6
0.170250	30.20	---	64.95	34.75	N	OFF	19.6
0.442500	---	28.32	47.02	18.70	N	OFF	19.6
0.442500	33.46	---	57.02	23.56	N	OFF	19.6
0.474000	---	34.71	46.44	11.73	N	OFF	19.6
0.474000	41.76	---	56.44	14.68	N	OFF	19.6
0.512250	---	26.10	46.00	19.90	N	OFF	19.6
0.512250	29.98	---	56.00	26.02	N	OFF	19.6
0.946500	---	24.29	46.00	21.71	N	OFF	19.6
0.946500	27.69	---	56.00	28.31	N	OFF	19.6
6.981000	---	25.50	50.00	24.50	N	OFF	19.9
6.981000	26.85	---	60.00	33.15	N	OFF	19.9

Appendix C. Radiated Spurious Emission

Test Engineer :	Leo Li, Mancy Chou, and Bigshow Wang	Temperature :	22.1~23.1°C
		Relative Humidity :	55~60%

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2350.32	51.11	-22.89	74	44.26	27.2	16.5	36.85	134	46	P	H
		2385.705	40.75	-13.25	54	33.68	27.34	16.56	36.83	134	46	A	H
	*	2412	96.1	-	-	88.9	27.42	16.6	36.82	134	46	P	H
	*	2412	92.82	-	-	85.62	27.42	16.6	36.82	134	46	A	H
													H
													H
		2385.18	51.63	-22.37	74	44.56	27.34	16.56	36.83	372	156	P	V
		2389.275	40.57	-13.43	54	33.48	27.36	16.56	36.83	372	156	A	V
	*	2412	93.64	-	-	86.44	27.42	16.6	36.82	372	156	P	V
	*	2412	90.35	-	-	83.15	27.42	16.6	36.82	372	156	A	V
													V
													V
802.11b CH 06 2437MHz		2376.81	51.08	-22.92	74	44.07	27.31	16.54	36.84	134	43	P	H
		2388.71	40.47	-13.53	54	33.39	27.35	16.56	36.83	134	43	A	H
	*	2437	95.77	-	-	88.47	27.47	16.64	36.81	134	43	P	H
	*	2437	92.62	-	-	85.32	27.47	16.64	36.81	134	43	A	H
		2492.08	51.75	-22.25	74	44.14	27.67	16.72	36.78	134	43	P	H
		2483.53	41.2	-12.8	54	33.65	27.63	16.71	36.79	134	43	A	H
		2388.88	51.25	-22.75	74	44.16	27.36	16.56	36.83	400	153	P	V
		2389.39	40.2	-13.8	54	33.11	27.36	16.56	36.83	400	153	A	V
	*	2437	93.29	-	-	85.99	27.47	16.64	36.81	400	153	P	V
	*	2437	90.01	-	-	82.71	27.47	16.64	36.81	400	153	A	V
		2497.3	52.31	-21.69	74	44.67	27.69	16.73	36.78	400	153	P	V
		2485.06	40.76	-13.24	54	33.2	27.64	16.71	36.79	400	153	A	V

802.11b CH 11 2462MHz	*	2462	92.45	-	-	85.02	27.55	16.68	36.8	163	45	P	H
	*	2462	89.09	-	-	81.66	27.55	16.68	36.8	163	45	A	H
		2499.44	51.63	-22.37	74	43.98	27.7	16.73	36.78	163	45	P	H
		2485.24	40.76	-13.24	54	33.2	27.64	16.71	36.79	163	45	A	H
													H
													H
	*	2462	90.6	-	-	83.17	27.55	16.68	36.8	400	153	P	V
	*	2462	87.25	-	-	79.82	27.55	16.68	36.8	400	153	A	V
		2490.92	52.39	-21.61	74	44.79	27.66	16.72	36.78	400	153	P	V
		2486.76	40.68	-13.32	54	33.11	27.65	16.71	36.79	400	153	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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	38.57	-35.43	74	54.93	32.35	10.15	58.86	-	-	P	H
		11205	48.63	-25.37	74	55.82	38.81	14.86	60.86	-	-	P	H
		11205	39.75	-14.25	54	46.94	38.81	14.86	60.86	-	-	A	H
		14475	49.35	-24.65	74	55.15	40.53	16.85	63.18	-	-	P	H
		14475	41.48	-12.52	54	47.28	40.53	16.85	63.18	-	-	A	H
		17985	53.19	-20.81	74	48.55	42.97	18.94	57.27	-	-	P	H
		17985	43.18	-10.82	54	38.54	42.97	18.94	57.27	-	-	A	H
													H
													H
													H
													H
													H
		4824	39.24	-34.76	74	55.6	32.35	10.15	58.86	-	-	P	V
		10665	48.58	-25.42	74	56.1	38.8	14.59	60.91	-	-	P	V
		10665	39.27	-14.73	54	46.79	38.8	14.59	60.91	-	-	A	V
		14475	49.33	-24.67	74	55.13	40.53	16.85	63.18	-	-	P	V
		14475	41.78	-12.22	54	47.58	40.53	16.85	63.18	-	-	A	V
		17985	52.27	-21.73	74	47.63	42.97	18.94	57.27	-	-	P	V
		17985	43.31	-10.69	54	38.67	42.97	18.94	57.27	-	-	A	V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 06 2437MHz		4874	39.24	-34.76	74	55.44	32.5	10.2	58.9	-	-	P	H
		7311	43.59	-30.41	74	53.04	36.56	12.42	58.43	-	-	P	H
		11955	49.16	-24.84	74	56.68	38.6	15.23	61.35	-	-	P	H
		11955	39.26	-14.74	54	46.78	38.6	15.23	61.35	-	-	A	H
		14475	49.34	-24.66	74	55.14	40.53	16.85	63.18	-	-	P	H
		14475	41.39	-12.61	54	47.19	40.53	16.85	63.18	-	-	A	H
		18000	51.94	-22.06	74	47.13	43.1	18.95	57.24	-	-	P	H
		18000	43.38	-10.62	54	38.57	43.1	18.95	57.24	-	-	A	H
													H
													H
													H
													H
		4874	38.58	-35.42	74	54.78	32.5	10.2	58.9	-	-	P	V
		7311	43.73	-30.27	74	53.18	36.56	12.42	58.43	-	-	P	V
		11895	48.13	-25.87	74	55.63	38.59	15.2	61.29	-	-	P	V
		11895	39.28	-14.72	54	46.78	38.59	15.2	61.29	-	-	A	V
		14490	48.31	-25.69	74	54.11	40.51	16.86	63.17	-	-	P	V
		14490	41.33	-12.67	54	47.13	40.51	16.86	63.17	-	-	A	V
		17910	51.49	-22.51	74	47.76	42.29	18.89	57.45	-	-	P	V
		17910	42.39	-11.61	54	38.66	42.29	18.89	57.45	-	-	A	V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11b CH 11 2462MHz		4924	40.06	-33.94	74	56.06	32.7	10.25	58.95	-	-	P	H
		7386	42.68	-31.32	74	52.35	36.18	12.44	58.29	-	-	P	H
		11325	48.47	-25.53	74	55.47	38.95	14.92	60.87	-	-	P	H
		11325	39.58	-14.42	54	46.58	38.95	14.92	60.87	-	-	A	H
		14490	49.15	-24.85	74	54.95	40.51	16.86	63.17	-	-	P	H
		14490	41.58	-12.42	54	47.38	40.51	16.86	63.17	-	-	A	H
		18000	52.92	-21.08	74	48.11	43.1	18.95	57.24	-	-	P	H
		18000	43.1	-10.9	54	38.29	43.1	18.95	57.24	-	-	A	H
													H
													H
													H
													H
		4924	39.08	-34.92	74	55.08	32.7	10.25	58.95	-	-	P	V
		7386	44.04	-29.96	74	53.71	36.18	12.44	58.29	-	-	P	V
		10650	48.27	-25.73	74	55.8	38.8	14.58	60.91	-	-	P	V
		10650	39.42	-14.58	54	46.95	38.8	14.58	60.91	-	-	A	V
		14490	48.01	-25.99	74	53.81	40.51	16.86	63.17	-	-	P	V
		14490	41.48	-12.52	54	47.28	40.51	16.86	63.17	-	-	A	V
		18000	51.92	-22.08	74	47.11	43.1	18.95	57.24	-	-	P	V
		18000	43.09	-10.91	54	38.28	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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		2375.415	51.57	-22.43	74	44.57	27.3	16.54	36.84	136	46	P	H
		2381.19	41.45	-12.55	54	34.41	27.32	16.55	36.83	136	46	A	H
	*	2412	89.62	-	-	82.42	27.42	16.6	36.82	136	46	P	H
	*	2412	81.16	-	-	73.96	27.42	16.6	36.82	136	46	A	H
													H
													H
		2350.845	51.76	-22.24	74	44.91	27.2	16.5	36.85	370	155	P	V
		2389.905	41.3	-12.7	54	34.21	27.36	16.56	36.83	370	155	A	V
	*	2412	87.23	-	-	80.03	27.42	16.6	36.82	370	155	P	V
	*	2412	79.1	-	-	71.9	27.42	16.6	36.82	370	155	A	V
													V
													V
802.11g CH 06 2437MHz		2386.32	50.84	-23.16	74	43.76	27.35	16.56	36.83	135	44	P	H
		2385.36	41.26	-12.74	54	34.19	27.34	16.56	36.83	135	44	A	H
	*	2437	88.91	-	-	81.61	27.47	16.64	36.81	135	44	P	H
	*	2437	80.85	-	-	73.55	27.47	16.64	36.81	135	44	A	H
		2492.53	51.71	-22.29	74	44.1	27.67	16.72	36.78	135	44	P	H
		2484.79	41.83	-12.17	54	34.27	27.64	16.71	36.79	135	44	A	H
		2364.56	51.79	-22.21	74	44.85	27.26	16.52	36.84	400	153	P	V
		2381.36	41.04	-12.96	54	33.99	27.33	16.55	36.83	400	153	A	V
	*	2437	85.96	-	-	78.66	27.47	16.64	36.81	400	153	P	V
	*	2437	77.93	-	-	70.63	27.47	16.64	36.81	400	153	A	V
		2493.97	51.22	-22.78	74	43.59	27.68	16.73	36.78	400	153	P	V
		2485.69	41.59	-12.41	54	34.03	27.64	16.71	36.79	400	153	A	V

802.11g CH 11 2462MHz	*	2462	92.37	-	-	84.94	27.55	16.68	36.8	110	45	P	H
	*	2462	80.49	-	-	73.06	27.55	16.68	36.8	110	45	A	H
		2489.48	51.85	-22.15	74	44.25	27.66	16.72	36.78	110	45	P	H
		2495.84	41.97	-12.03	54	34.34	27.68	16.73	36.78	110	45	A	H
													H
													H
	*	2462	85.69	-	-	78.26	27.55	16.68	36.8	400	154	P	V
	*	2462	77.72	-	-	70.29	27.55	16.68	36.8	400	154	A	V
		2484.16	51.78	-22.22	74	44.22	27.64	16.71	36.79	400	154	P	V
		2490.72	41.8	-12.2	54	34.2	27.66	16.72	36.78	400	154	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)	Over Limit (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	38.22	-35.78	74	54.58	32.35	10.15	58.86	-	-	P	H
		10665	48.75	-25.25	74	56.27	38.8	14.59	60.91	-	-	P	H
		10665	39.35	-14.65	54	46.87	38.8	14.59	60.91	-	-	A	H
		14490	48.3	-25.7	74	54.1	40.51	16.86	63.17	-	-	P	H
		14490	41.35	-12.65	54	47.15	40.51	16.86	63.17	-	-	A	H
		18000	51.77	-22.23	74	46.96	43.1	18.95	57.24	-	-	P	H
		18000	43.38	-10.62	54	38.57	43.1	18.95	57.24	-	-	A	H
													H
													H
													H
													H
													H
		4824	38	-36	74	54.36	32.35	10.15	58.86	-	-	P	V
		11280	48.48	-25.52	74	55.57	38.88	14.9	60.87	-	-	P	V
		11280	39.7	-14.3	54	46.79	38.88	14.9	60.87	-	-	A	V
		14475	48.56	-25.44	74	54.36	40.53	16.85	63.18	-	-	P	V
		14475	41.45	-12.55	54	47.25	40.53	16.85	63.18	-	-	A	V
		18000	52.7	-21.3	74	47.89	43.1	18.95	57.24	-	-	P	V
		18000	43.38	-10.62	54	38.57	43.1	18.95	57.24	-	-	A	V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 06 2437MHz		4874	38.43	-35.57	74	54.63	32.5	10.2	58.9	-	-	P	H
		7311	43.28	-30.72	74	52.73	36.56	12.42	58.43	-	-	P	H
		11430	48.52	-25.48	74	55.41	39.01	14.97	60.87	-	-	P	H
		11430	39.87	-14.13	54	46.76	39.01	14.97	60.87	-	-	A	H
		14475	48.58	-25.42	74	54.38	40.53	16.85	63.18	-	-	P	H
		14475	41.48	-12.52	54	47.28	40.53	16.85	63.18	-	-	A	H
		18000	51.68	-22.32	74	46.87	43.1	18.95	57.24	-	-	P	H
		18000	43.28	-10.72	54	38.47	43.1	18.95	57.24	-	-	A	H
													H
													H
													H
													H
		4874	38.85	-35.15	74	55.05	32.5	10.2	58.9	-	-	P	V
		7311	43.42	-30.58	74	52.87	36.56	12.42	58.43	-	-	P	V
		11355	48	-26	74	54.93	39.01	14.93	60.87	-	-	P	V
		11355	39.76	-14.24	54	46.69	39.01	14.93	60.87	-	-	A	V
		14475	48.66	-25.34	74	54.46	40.53	16.85	63.18	-	-	P	V
		14475	41.36	-12.64	54	47.16	40.53	16.85	63.18	-	-	A	V
		17985	51.75	-22.25	74	47.11	42.97	18.94	57.27	-	-	P	V
		17985	43.21	-10.79	54	38.57	42.97	18.94	57.27	-	-	A	V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11g CH 11 2462MHz		4924	39.22	-34.78	74	55.22	32.7	10.25	58.95	-	-	P	H
		7386	42.74	-31.26	74	52.41	36.18	12.44	58.29	-	-	P	H
		11205	47.77	-26.23	74	54.96	38.81	14.86	60.86	-	-	P	H
		11205	39.75	-14.25	54	46.94	38.81	14.86	60.86	-	-	A	H
		14475	48.38	-25.62	74	54.18	40.53	16.85	63.18	-	-	P	H
		14475	41.49	-12.51	54	47.29	40.53	16.85	63.18	-	-	A	H
		18000	51.27	-22.73	74	46.46	43.1	18.95	57.24	-	-	P	H
		18000	43.05	-10.95	54	38.24	43.1	18.95	57.24	-	-	A	H
													H
													H
													H
													H
		4924	39.62	-34.38	74	55.62	32.7	10.25	58.95	-	-	P	V
		7386	42.95	-31.05	74	52.62	36.18	12.44	58.29	-	-	P	V
		11265	48.49	-25.51	74	55.6	38.87	14.89	60.87	-	-	P	V
		11265	39.6	-14.4	54	46.71	38.87	14.89	60.87	-	-	A	V
		14490	48.37	-25.63	74	54.17	40.51	16.86	63.17	-	-	P	V
		14490	41.39	-12.61	54	47.19	40.51	16.86	63.17	-	-	A	V
		18000	51.88	-22.12	74	47.07	43.1	18.95	57.24	-	-	P	V
		18000	43.09	-10.91	54	38.28	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		2320.185	51.63	-22.37	74	44.96	27.08	16.45	36.86	138	45	P	H
		2382.975	41.49	-12.51	54	34.44	27.33	16.55	36.83	138	45	A	H
	*	2412	89.2	-	-	82	27.42	16.6	36.82	138	45	P	H
	*	2412	81.09	-	-	73.89	27.42	16.6	36.82	138	45	A	H
802.11n													H
HT20													H
CH 01		2340.765	51.14	-22.86	74	44.35	27.16	16.48	36.85	370	154	P	V
2412MHz		2389.59	41.23	-12.77	54	34.14	27.36	16.56	36.83	370	154	A	V
	*	2412	87.58	-	-	80.38	27.42	16.6	36.82	370	154	P	V
	*	2412	78.23	-	-	71.03	27.42	16.6	36.82	370	154	A	V
													V
													V
		2379.44	51.18	-22.82	74	44.15	27.32	16.55	36.84	137	45	P	H
		2388.56	41.34	-12.66	54	34.26	27.35	16.56	36.83	137	45	A	H
	*	2437	89.49	-	-	82.19	27.47	16.64	36.81	137	45	P	H
	*	2437	81.15	-	-	73.85	27.47	16.64	36.81	137	45	A	H
802.11n		2499.37	52.35	-21.65	74	44.7	27.7	16.73	36.78	137	45	P	H
HT20		2490.73	41.8	-12.2	54	34.2	27.66	16.72	36.78	137	45	A	H
CH 06		2348.24	51.34	-22.66	74	44.51	27.19	16.49	36.85	400	152	P	V
2437MHz		2389.84	41.05	-12.95	54	33.96	27.36	16.56	36.83	400	152	A	V
	*	2437	86.68	-	-	79.38	27.47	16.64	36.81	400	152	P	V
	*	2437	78.53	-	-	71.23	27.47	16.64	36.81	400	152	A	V
		2493.16	53.27	-20.73	74	45.66	27.67	16.72	36.78	400	152	P	V
		2488.12	41.61	-12.39	54	34.03	27.65	16.72	36.79	400	152	A	V

	*	2462	88.99	-	-	81.56	27.55	16.68	36.8	106	46	P	H
	*	2462	80.87	-	-	73.44	27.55	16.68	36.8	106	46	A	H
		2489.56	51.94	-22.06	74	44.34	27.66	16.72	36.78	106	46	P	H
		2484.08	41.99	-12.01	54	34.43	27.64	16.71	36.79	106	46	A	H
802.11n													H
HT20													H
CH 11	*	2462	87.19	-	-	79.76	27.55	16.68	36.8	400	154	P	V
2462MHz	*	2462	78.96	-	-	71.53	27.55	16.68	36.8	400	154	A	V
		2485.92	52.15	-21.85	74	44.59	27.64	16.71	36.79	400	154	P	V
		2491.88	41.81	-12.19	54	34.2	27.67	16.72	36.78	400	154	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)	Over Limit (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	38.44	-35.56	74	54.8	32.35	10.15	58.86	-	-	P	H
		11820	48.26	-25.74	74	55.87	38.44	15.16	61.21	-	-	P	H
		11820	39.24	-14.76	54	46.85	38.44	15.16	61.21	-	-	A	H
		14475	48.28	-25.72	74	54.08	40.53	16.85	63.18	-	-	P	H
		14475	41.46	-12.54	54	47.26	40.53	16.85	63.18	-	-	A	H
		18000	51.48	-22.52	74	46.67	43.1	18.95	57.24	-	-	P	H
		18000	43.17	-10.83	54	38.36	43.1	18.95	57.24	-	-	A	H
													H
													H
													H
802.11n													H
HT20													H
CH 01		4824	38.73	-35.27	74	55.09	32.35	10.15	58.86	-	-	P	V
2412MHz		12015	48.3	-25.7	74	55.82	38.65	15.26	61.43	-	-	P	V
		12015	39.39	-14.61	54	46.91	38.65	15.26	61.43	-	-	A	V
		14490	48.78	-25.22	74	54.58	40.51	16.86	63.17	-	-	P	V
		14490	41.46	-12.54	54	47.26	40.51	16.86	63.17	-	-	A	V
		18000	51.45	-22.55	74	46.64	43.1	18.95	57.24	-	-	P	V
		18000	43.12	-10.88	54	38.31	43.1	18.95	57.24	-	-	A	V
													V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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	40.61	-33.39	74	56.81	32.5	10.2	58.9	-	-	P	H
		7311	42.87	-31.13	74	52.32	36.56	12.42	58.43	-	-	P	H
		11880	48.15	-25.85	74	55.67	38.56	15.19	61.27	-	-	P	H
		11880	39.3	-14.7	54	46.82	38.56	15.19	61.27	-	-	A	H
		14490	48.67	-25.33	74	54.47	40.51	16.86	63.17	-	-	P	H
		14490	41.53	-12.47	54	47.33	40.51	16.86	63.17	-	-	A	H
		18000	52.19	-21.81	74	47.38	43.1	18.95	57.24	-	-	P	H
		18000	43.07	-10.93	54	38.26	43.1	18.95	57.24	-	-	A	H
													H
													H
802.11n													H
HT20													H
CH 06		4874	38.93	-35.07	74	55.13	32.5	10.2	58.9	-	-	P	V
2437MHz		7311	43.06	-30.94	74	52.51	36.56	12.42	58.43	-	-	P	V
		11295	47.98	-26.02	74	55.05	38.9	14.9	60.87	-	-	P	V
		11295	39.65	-14.35	54	46.72	38.9	14.9	60.87	-	-	A	V
		14475	48.29	-25.71	74	54.09	40.53	16.85	63.18	-	-	P	V
		14475	41.41	-12.59	54	47.21	40.53	16.85	63.18	-	-	A	V
		18000	51.52	-22.48	74	46.71	43.1	18.95	57.24	-	-	P	V
		18000	43.23	-10.77	54	38.42	43.1	18.95	57.24	-	-	A	V
													V
													V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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	39.42	-34.58	74	55.42	32.7	10.25	58.95	-	-	P	H
		7386	43.09	-30.91	74	52.76	36.18	12.44	58.29	-	-	P	H
		11415	48.42	-25.58	74	55.27	39.06	14.96	60.87	-	-	P	H
		11415	39.87	-14.13	54	46.72	39.06	14.96	60.87	-	-	A	H
		14475	48.08	-25.92	74	53.88	40.53	16.85	63.18	-	-	P	H
		14475	41.46	-12.54	54	47.26	40.53	16.85	63.18	-	-	A	H
		18000	51.8	-22.2	74	46.99	43.1	18.95	57.24	-	-	P	H
		18000	42.94	-11.06	54	38.13	43.1	18.95	57.24	-	-	A	H
													H
													H
802.11n													H
HT20													H
CH 11		4924	39.1	-34.9	74	55.1	32.7	10.25	58.95	-	-	P	V
2462MHz		7386	42.5	-31.5	74	52.17	36.18	12.44	58.29	-	-	P	V
		11445	48.61	-25.39	74	55.53	38.97	14.98	60.87	-	-	P	V
		11445	40.03	-13.97	54	46.95	38.97	14.98	60.87	-	-	A	V
		14490	48.53	-25.47	74	54.33	40.51	16.86	63.17	-	-	P	V
		14490	41.44	-12.56	54	47.24	40.51	16.86	63.17	-	-	A	V
		18000	51.41	-22.59	74	46.6	43.1	18.95	57.24	-	-	P	V
		18000	43.15	-10.85	54	38.34	43.1	18.95	57.24	-	-	A	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.
4. The emission level close to 18GHz is checked that the average emission level is noise floor only.

Emission above 18GHz

2.4GHz WIFI 802.11n HT20 (SHF)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz 802.11n HT20 SHF		21345	40.44	-33.56	74	60.62	37.79	-3.27	54.7	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		21345	39.01	-34.99	74	59.19	37.79	-3.27	54.7	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

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

Emission below 1GHz

2.4GHz WIFI 802.11n HT20 (LF)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
2.4GHz 802.11n HT20 LF		30.97	23.53	-16.47	40	31.18	24.21	0.62	32.48	-	-	P	H
		103.72	22.84	-20.66	43.5	37.69	16.28	1.35	32.48	-	-	P	H
		172.59	22.35	-21.15	43.5	37.61	15.39	1.82	32.47	-	-	P	H
		230.79	24.83	-21.17	46	39.08	16.09	2.13	32.47	-	-	P	H
		563.5	26.85	-19.15	46	29.98	26.13	3.24	32.5	-	-	P	H
		938.89	32.18	-13.82	46	29.2	30.02	4.24	31.28	-	-	P	H
													H
													H
													H
													H
													H
													H
		30	30.87	-9.13	40	38.14	24.59	0.61	32.47	-	-	P	V
		52.31	27.21	-12.79	40	45.52	13.33	0.93	32.57	-	-	P	V
		98.87	19.3	-24.2	43.5	34.75	15.71	1.31	32.47	-	-	P	V
		171.62	19.24	-24.26	43.5	34.42	15.48	1.81	32.47	-	-	P	V
		262.8	19.17	-26.83	46	29.4	19.94	2.27	32.44	-	-	P	V
		945.68	33.06	-12.94	46	29.59	30.47	4.25	31.25	-	-	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	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	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. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 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. Over Limit(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

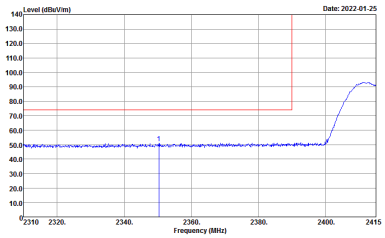
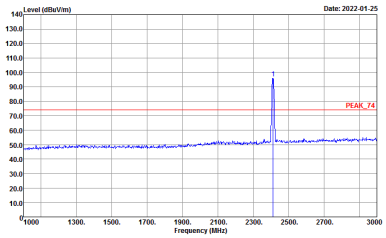
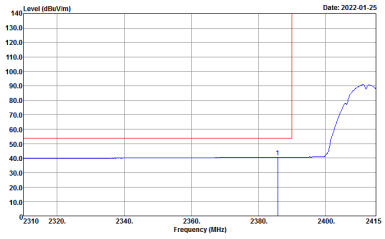
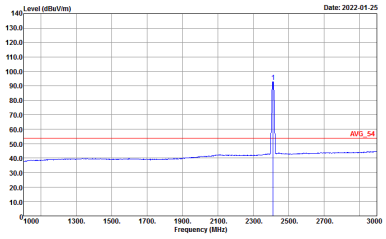
Test Engineer :	Leo Li, Mancy Chou, and Bigshow Wang	**Temperature :**	22.1~23.1°C
		Relative Humidity :	55~60%

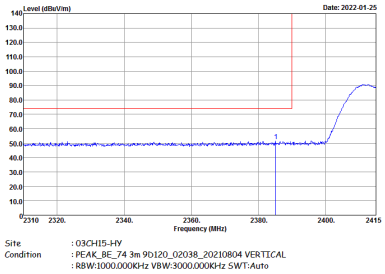
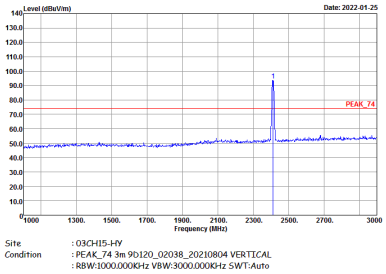
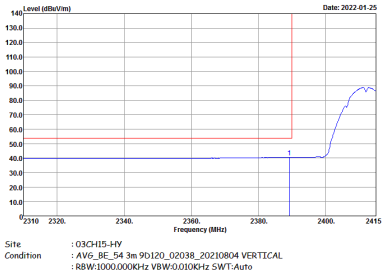
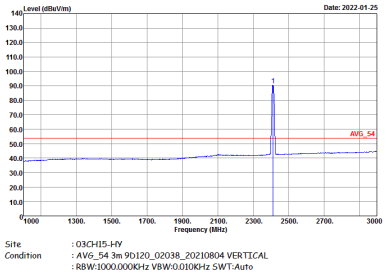
Note symbol

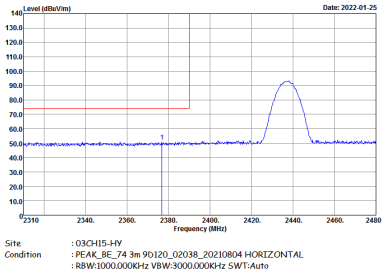
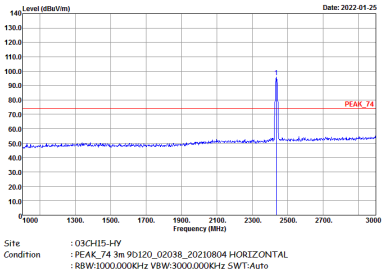
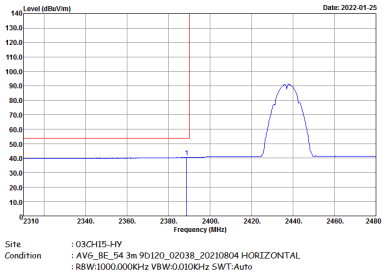
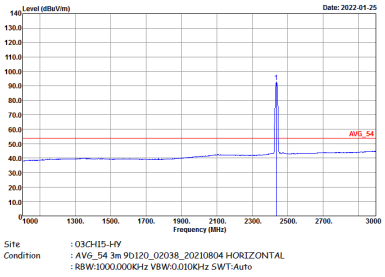
-L	**Low channel location**
-R	**High channel location**

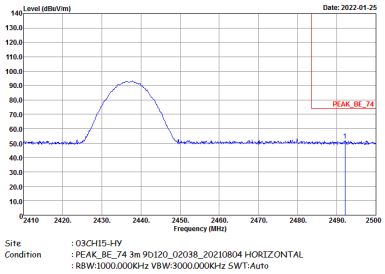
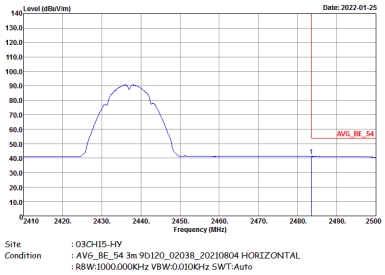
2.4GHz 2400~2483.5MHz

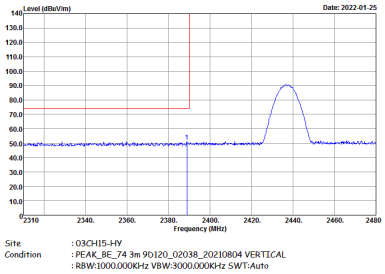
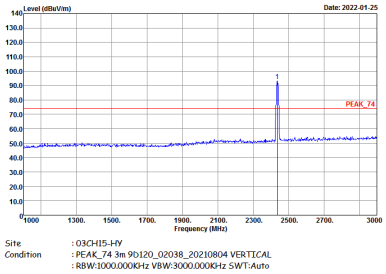
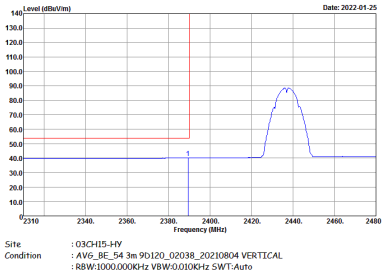
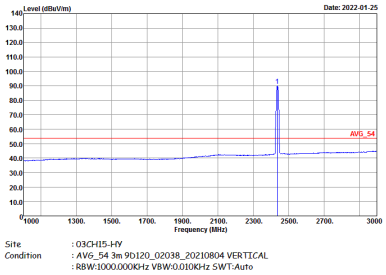
WIFI 802.11b (Band Edge @ 3m)

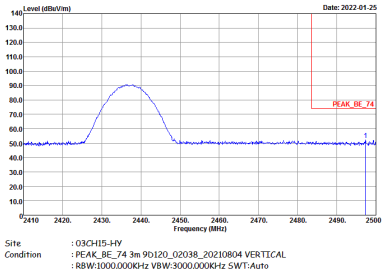
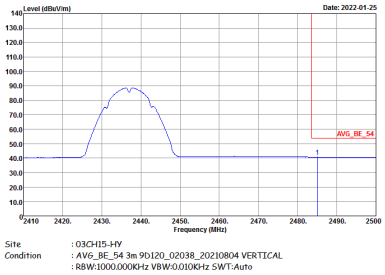
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

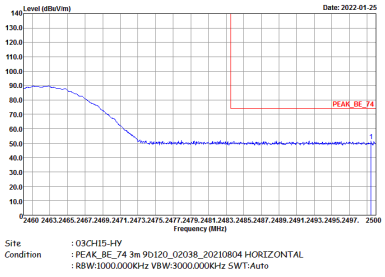
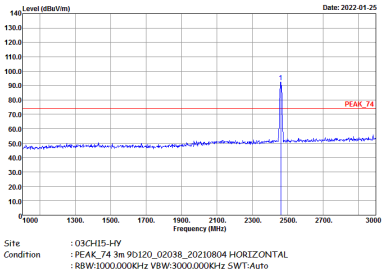
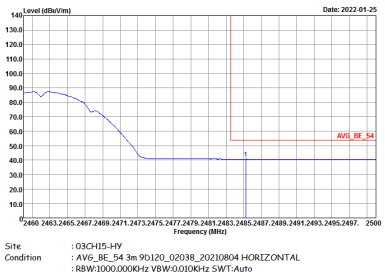
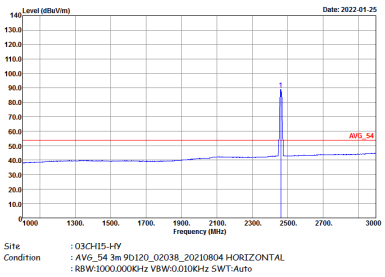
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

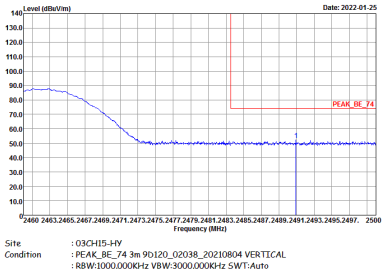
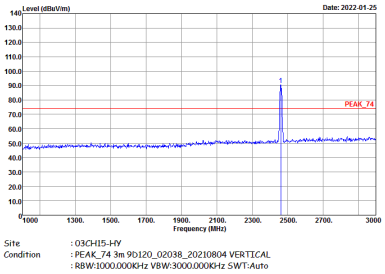
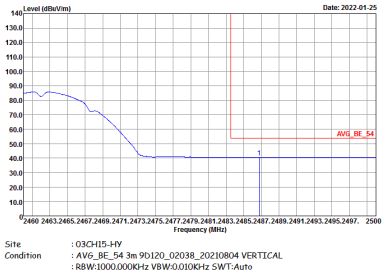
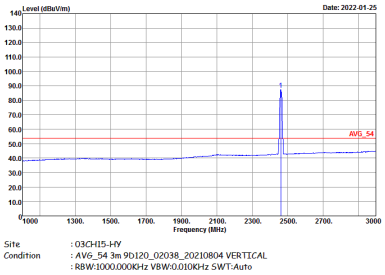
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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.		

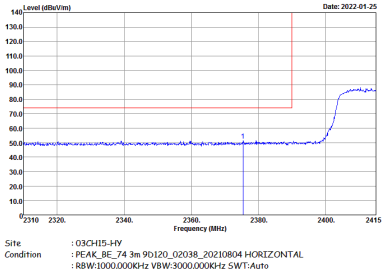
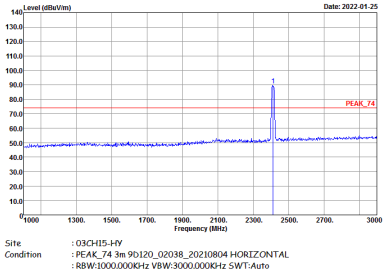
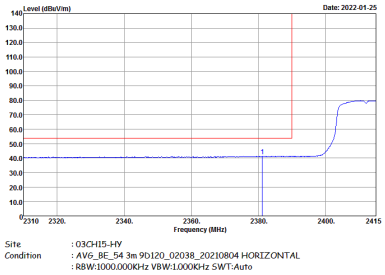
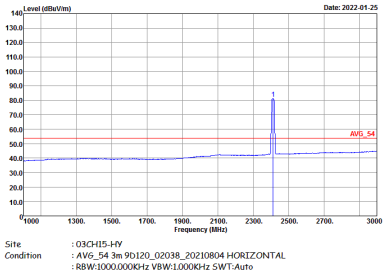
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

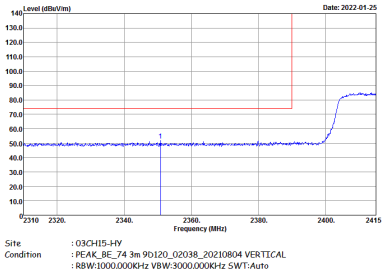
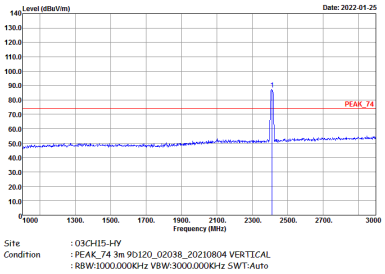
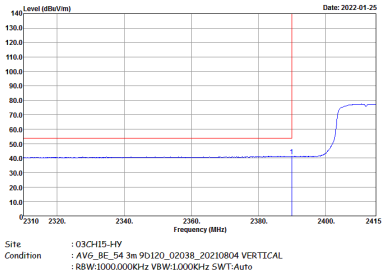
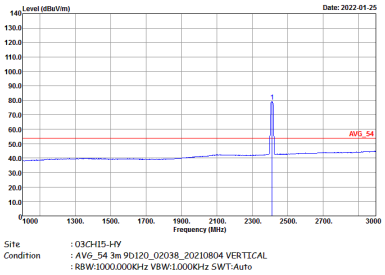
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

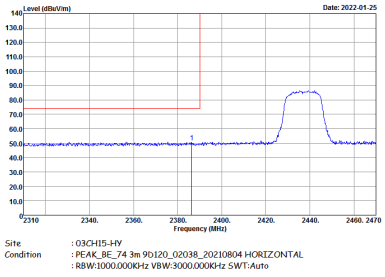
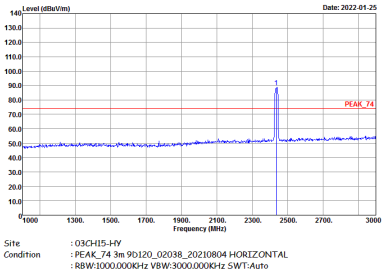
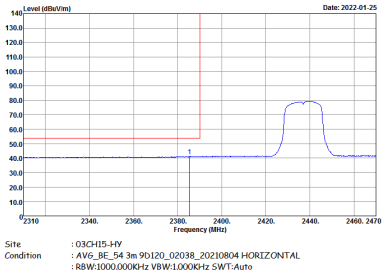
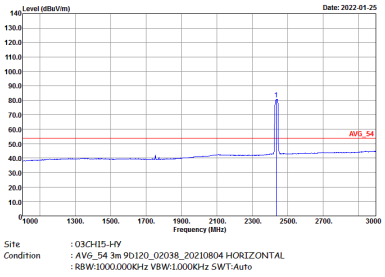
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11b CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

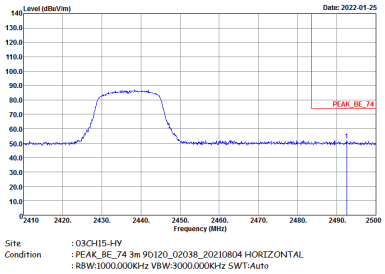
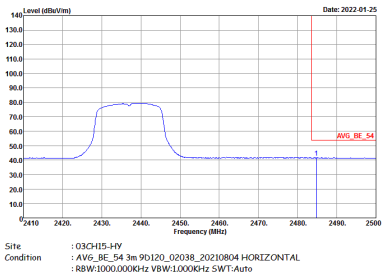
2.4GHz 2400~2483.5MHz

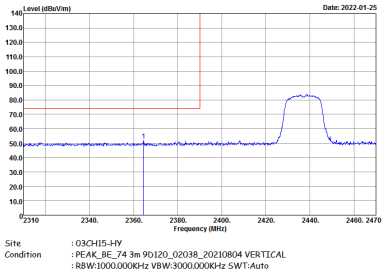
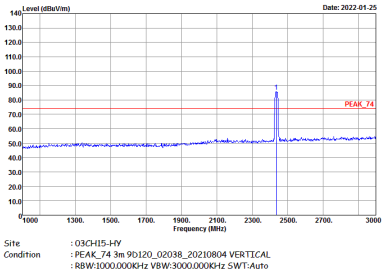
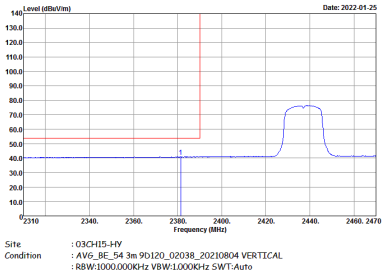
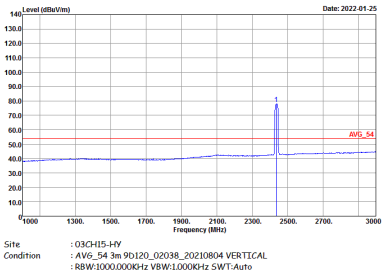
WIFI 802.11g (Band Edge @ 3m)

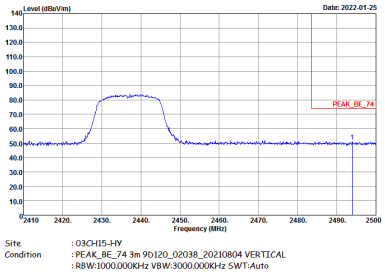
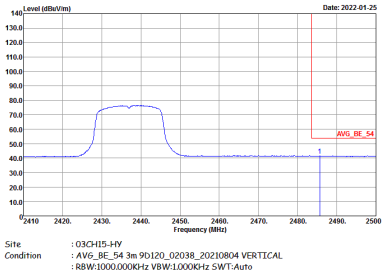
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

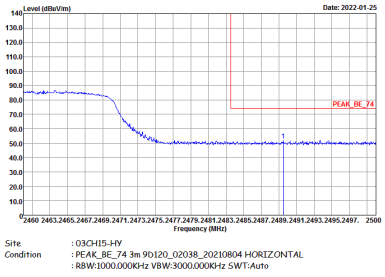
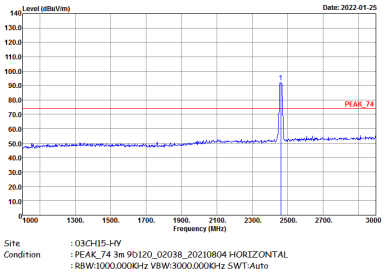
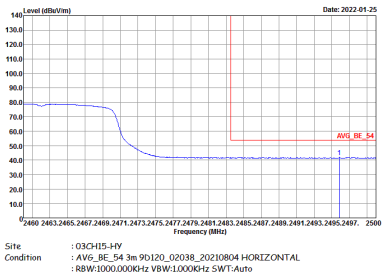
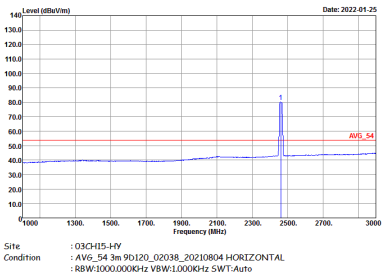
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

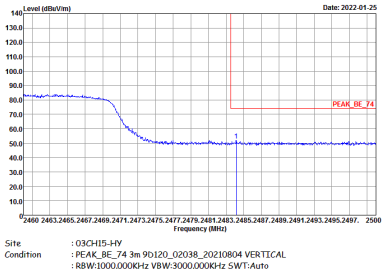
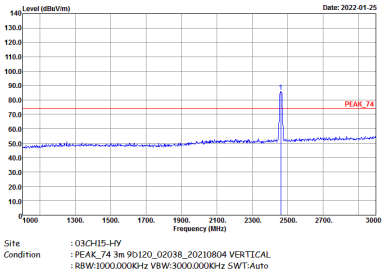
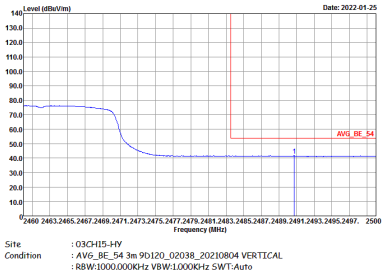
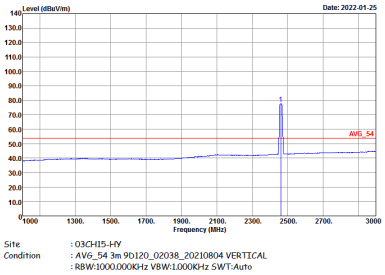
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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.		

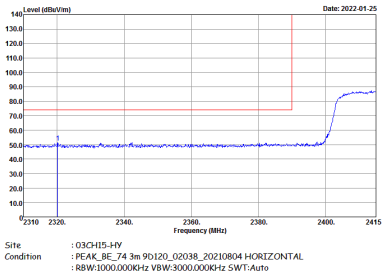
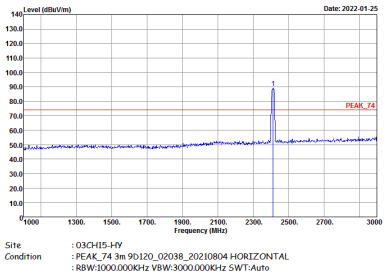
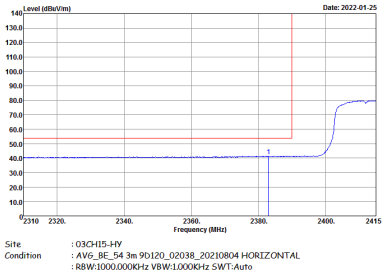
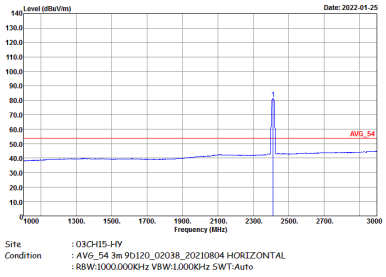
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

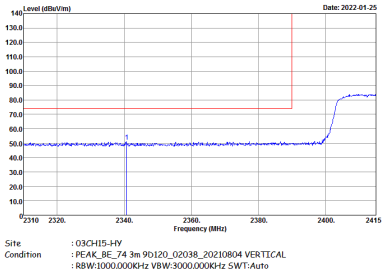
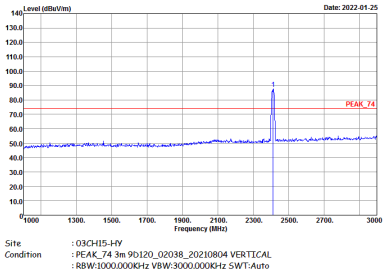
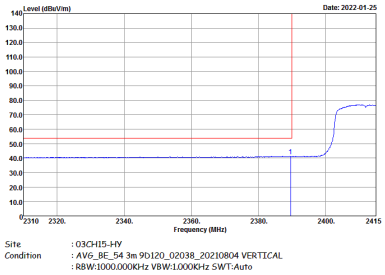
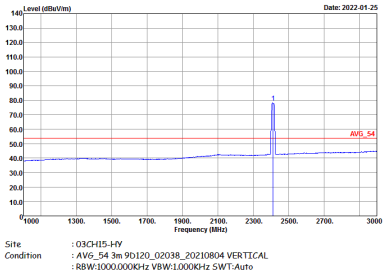
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

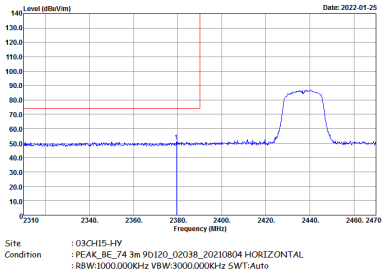
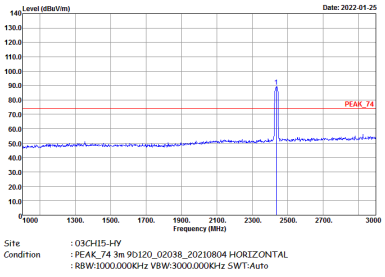
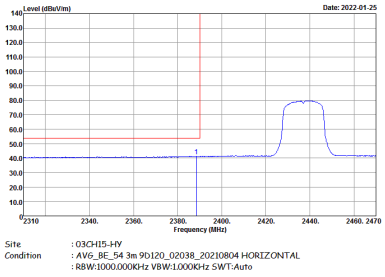
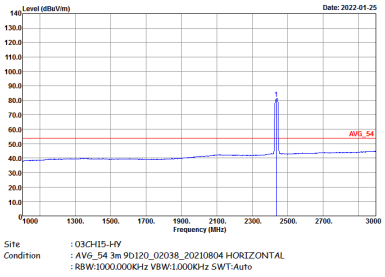
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11g CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

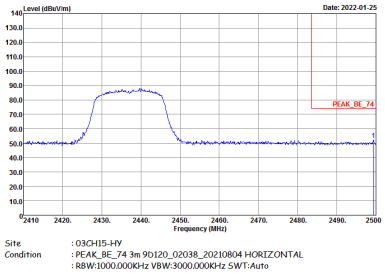
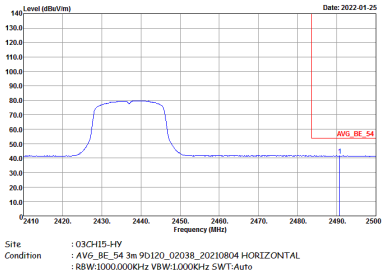
2.4GHz 2400~2483.5MHz

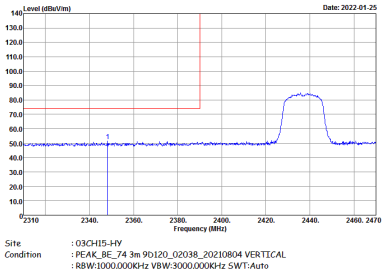
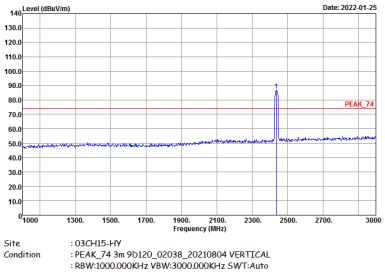
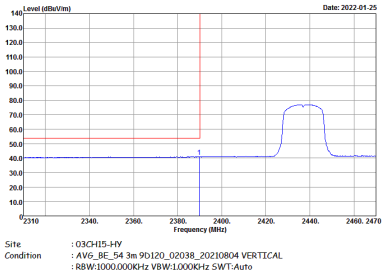
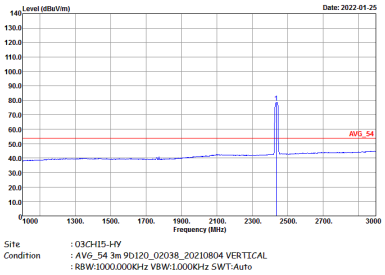
WIFI 802.11n HT20 (Band Edge @ 3m)

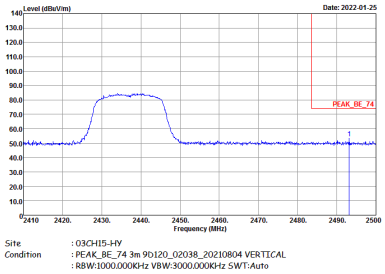
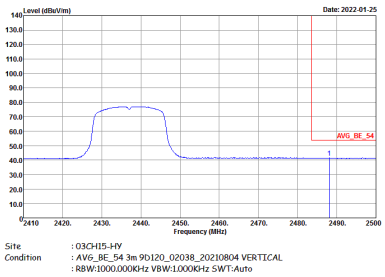
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

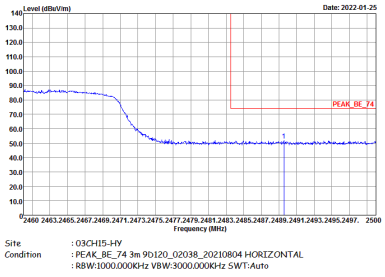
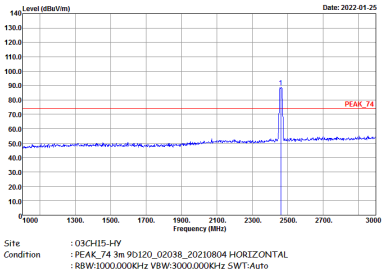
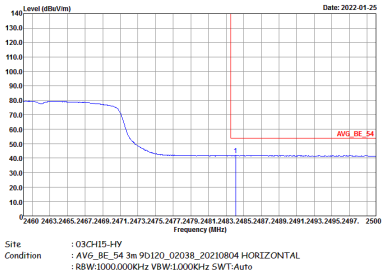
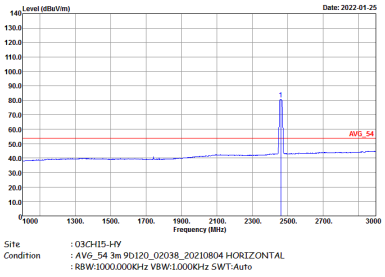
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Vertical	Fundamental
Peak		
Avg.		

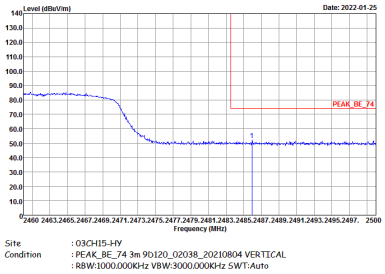
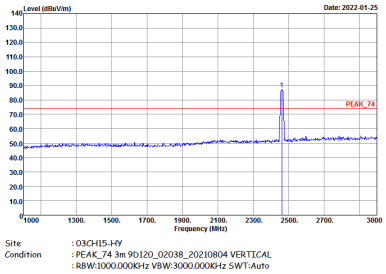
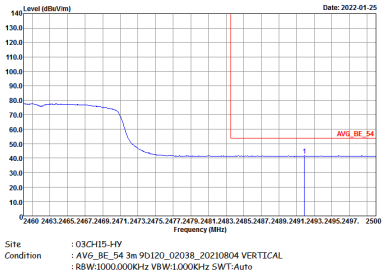
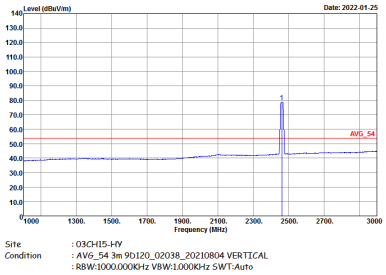
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		

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.		

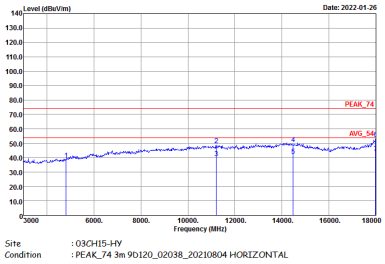
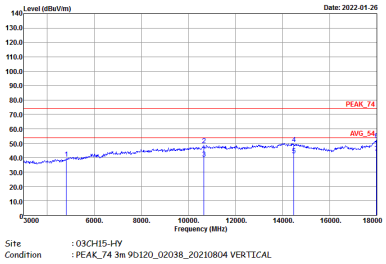
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH06 2437MHz - R	
1	Vertical	Fundamental
Peak		Left Blank
Avg.		Left Blank

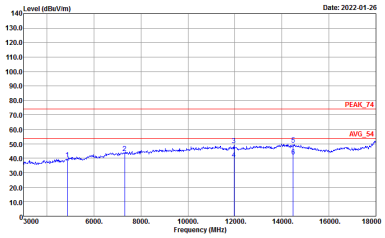
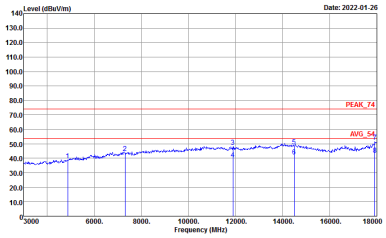
WIFI	2.4GHz 2400~2483.5MHz Band Edge @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Horizontal	Fundamental
Peak		
Avg.		

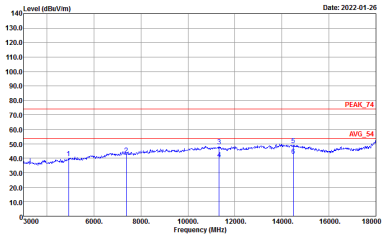
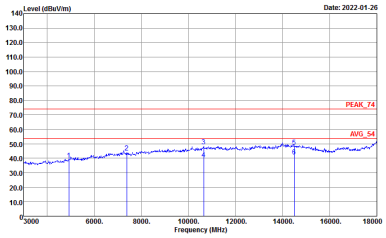
WIFI	2.4GHz 2400~2483.5MHz Fundamental @ 3m	
ANT	802.11n HT20 CH11 2462MHz	
1	Vertical	Fundamental
Peak		
Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11b (Harmonic @ 3m)

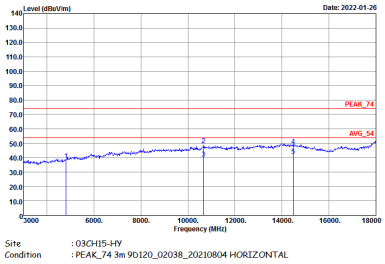
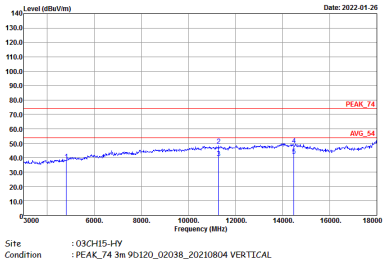
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

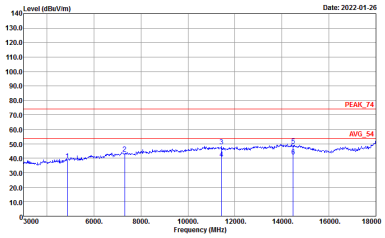
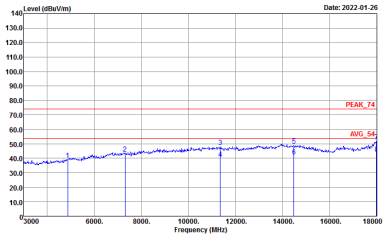
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

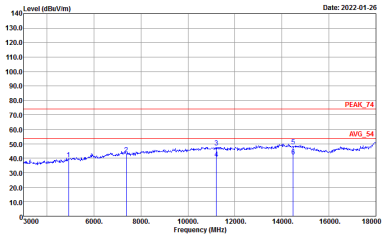
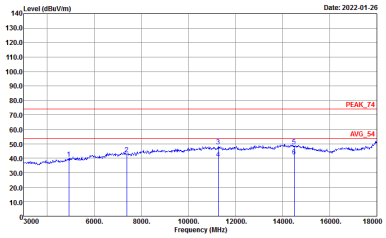
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11b CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11g (Harmonic @ 3m)

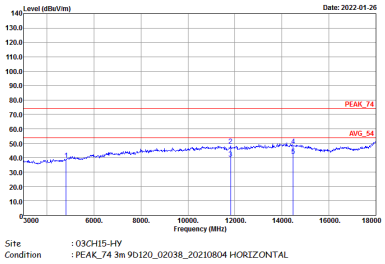
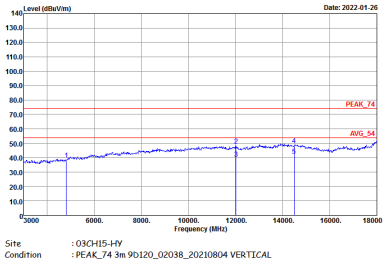
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

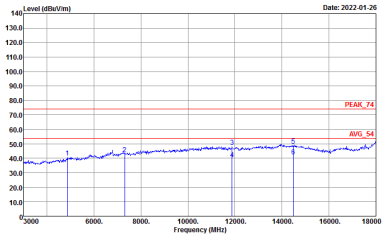
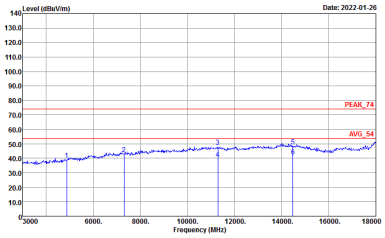
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH06 2437MHz	
1	Horizontal	Vertical
Peak Avg.		

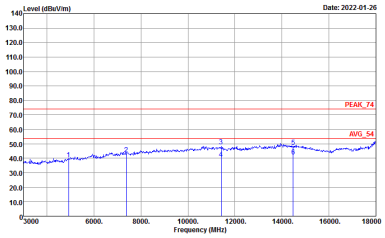
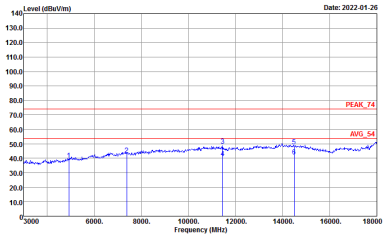
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11g CH11 2462MHz	
1	Horizontal	Vertical
Peak Avg.		

2.4GHz 2400~2483.5MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

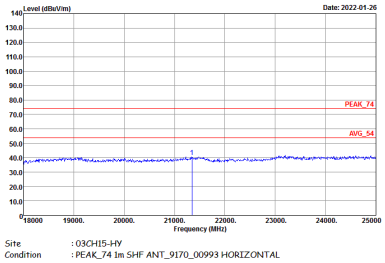
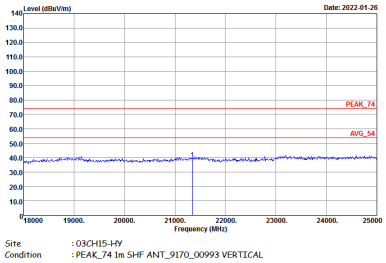
WIFI	2.4GHz 2400~2483.5MHz Harmonic @ 3m	
ANT	802.11n HT20 CH01 2412MHz	
1	Horizontal	Vertical
Peak Avg.		

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

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

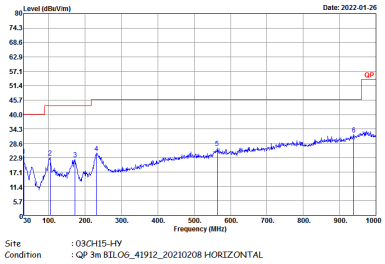
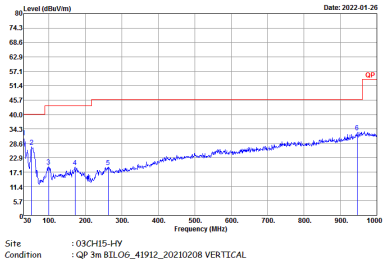
Emission above 18GHz

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

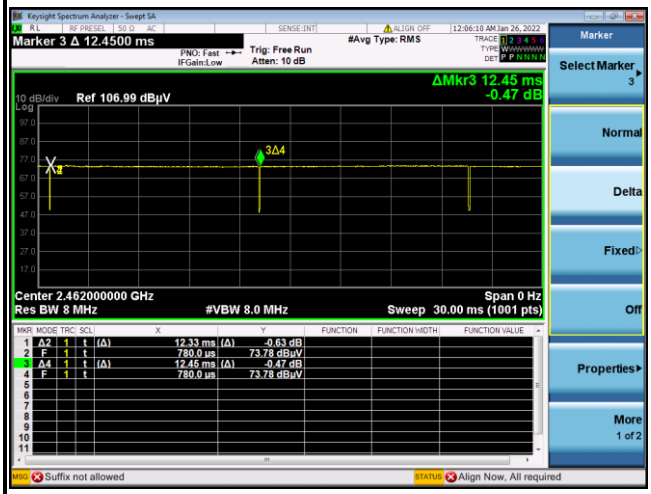
2.4GHz WIFI 802.11n HT20 (LF)

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

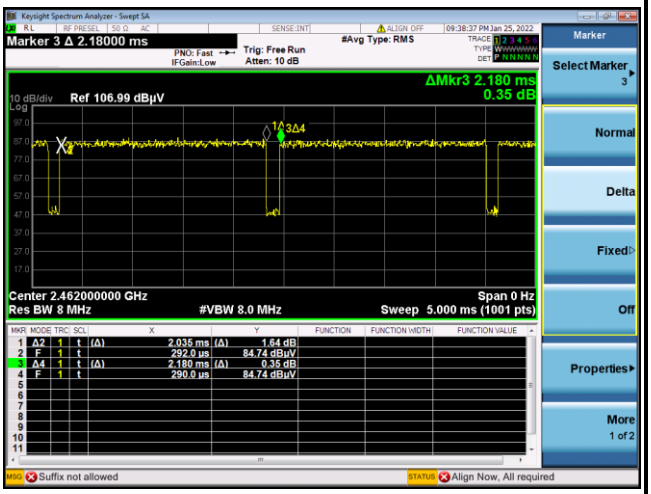
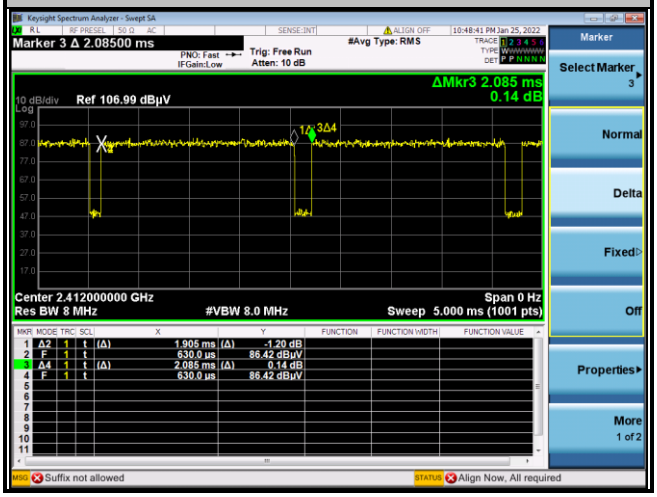
Appendix E. Duty Cycle Plots

Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting
802.11b	99.04	-	-	10Hz
802.11g	93.35	2035	0.49	1kHz
2.4GHz 802.11n HT20	91.37	1905	0.52	1kHz

802.11b



802.11g



802.11n HT20