FCC RADIO TEST REPORT

FCC ID	:	**TVE-3901M12**
Equipment	:	**Network Security Gateway**
Brand Name	:	**FORTINET**
Model Name	:	**FortiWiFi 50G-DSLxxxxxxxxxx, FORTIWIFI-50G-DSLxxxxxxxxxx, FWF-50G-DSLxxxxxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software purposes or marketing purposes only)**
Marketing Name	:	**FortiWiFi 50G-DSL**
Applicant	:	**Fortinet Inc. 909 Kifer Rd., Sunnyvale, CA 94086, United States**
Manufacturer	:	**Fortinet Inc. 909 Kifer Rd., Sunnyvale, CA 94086, United States**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Mar. 22, 2024 and testing was performed from Apr. 10, 2024 to Jun. 07, 2024. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this variant 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
FR3D0631-03B	01	Initial issue of report	Jul. 31, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.403(i)	26dB Bandwidth	Not Required	-
-	2.1049	99% Occupied Bandwidth	Not Required	-
3.1	15.407(a)	Maximum Conducted Output Power	Pass	-
-	15.407(a)	Power Spectral Density	Not Required	-
3.2	15.407(b)	Unwanted Emissions	Pass	5.49 dB under the limit at 5352.24 MHz
3.3	15.207	AC Conducted Emission	Pass	13.94 dB under the limit at 0.33 MHz
3.4	15.203	Antenna Requirement	Pass	-

Note:

1. Not required means after assessing, test items are not necessary to carry out.
2. This is a variant report which can be referred Product Equality Declaration. All the test cases were performed on original report which can be referred to Sporton Report Number FR3D0631B(B1) and FR3D0621-01(B2~3). Based on the upgrading, the test cases were verified.

Conformity Assessment Condition:

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

Disclaimer:

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

Reviewed by: Yun Huang

Report Producer: Wilda Wei

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature
General Specs Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ax, Wi-Fi 5GHz 802.11a/n/ac/ax. **Antenna Type** WLAN: Dipole Antenna Bluetooth: Monopole Antenna

Antenna information		
5150 MHz ~ 5250 MHz	Peak Gain (dBi)	Ant. 3: 2.54 Ant. 6: 2.54
5250 MHz ~ 5350 MHz	Peak Gain (dBi)	Ant. 3: 1.88 Ant. 6: 1.88
5470 MHz ~ 5725 MHz	Peak Gain (dBi)	Ant. 3: 2.45 Ant. 6: 2.45

Remark:

1. The EUT's information above is declared by manufacturer. Please refer to Disclaimer in report summary.
2. This device does not support partial RU function.

1.1.1 Antenna Directional Gain

<For CDD Mode>

Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F)2)f)ii)

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows:

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

G_{ANT} is set equal to the gain of the antenna having the highest gain.

For PSD measurements, the directional gain calculation.

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

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

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

G_k is the gain in dBi of the kth antenna.

The directional gain "DG" is calculated as following table.

	Ant 3 (dBi)	Ant 6 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band I	2.54	2.54	2.54	5.55	0.00	0.00
Band II	1.88	1.88	1.88	4.89	0.00	0.00
Band III	2.45	2.45	2.45	5.46	0.00	0.00

Calculation example:

If a device has two antenna, G_{ANT3}= 2.54dBi; G_{ANT6}=2.54dBi

Directional gain of power measurement = max(2.54, 2.54) + 0 = 2.54 dBi

Directional gain of PSD derived from formula which is

10 x log { { [10^ (3.00 dBi / 20) + 10^ (3.20 dBi / 20)] ^ 2 } / 2 }

= 5.55 dBi

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

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

1.2 Modification of EUT

No modifications made to the EUT during the testing.

1.3 Testing Location

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	TH05-HY, CO07-HY, 03CH15-HY

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

FCC designation No.: TW3786

1.4 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.

2 Test Configuration of Equipment Under Test

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 two antenna degrees (Ant. degrees 0 and Ant. Degrees 90), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42#	5210		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5250-5350 MHz Band 2 (U-NII-2A)	52	5260	60	5300
	54*	5270	62*	5310
	56	5280	64	5320
	58#	5290		

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5470-5725 MHz Band 3 (U-NII-2C)	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	106#	5530	134*	5670
	108	5540	136	5680
	110*	5550	140	5700

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
TDWR Channel	118*	5590	124	5620
	120	5600	126*	5630
	122#	5610	128	5640

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	138#	5690	144	5720
	142*	5710		

Note: The above Frequency and Channel with "*" are 802.11n HT40 and 802.11ac VHT40 and 802.11ax HE40.

2.2 Test Mode

The SISO mode conducted power is covered by MIMO mode per chain, so only the MIMO mode is tested.

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

MIMO Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11ac VHT40	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0

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

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + AC/DC Adapter

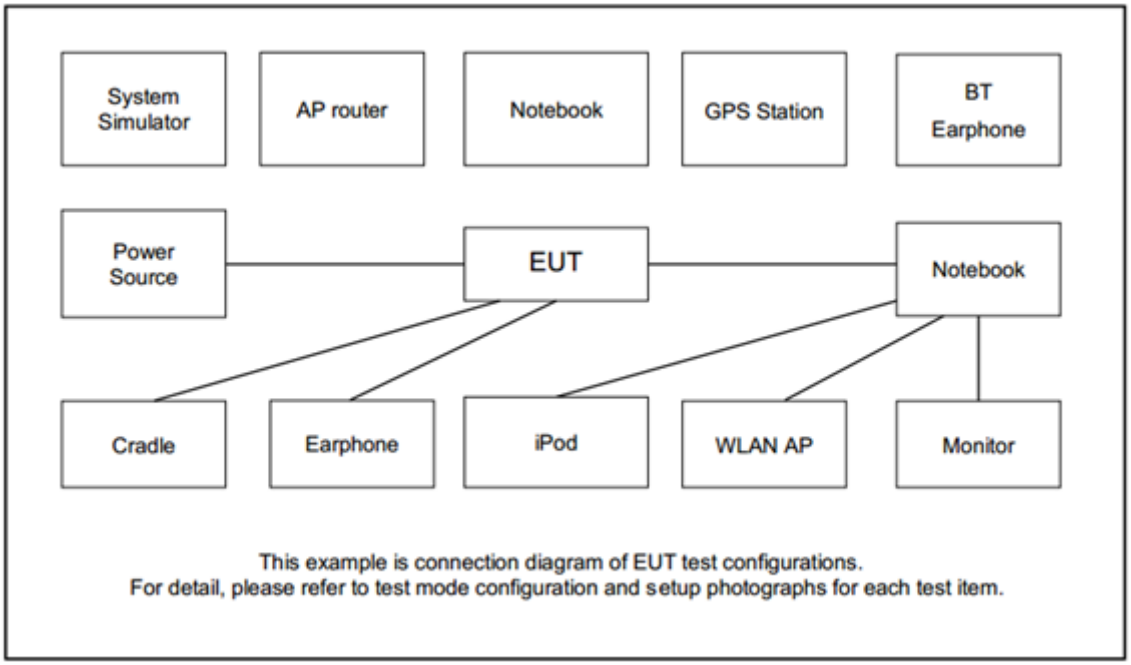
Ch. #		Band I：5150-5250 MHz
		802.11n HT20
L	Low	-
M	Middle	-
H	High	48

h. #		Band II：5250~5350MHz
		802.11a
L	Low	-
M	Middle	-
H	High	52

Ch. #		Band III：5470-5725MHz
		802.11ac VHT40
L	Low	-
M	Middle	110
H	High	-

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

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	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 “MT7906 Version 0.0.2.78” 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.

3 Test Result

3.1 Maximum Conducted Output Power Measurement

3.1.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For the 5.15–5.25 GHz bands:

■ For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

For the 5.25–5.725 GHz bands:

■ The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

3.1.2 Measuring Instruments

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

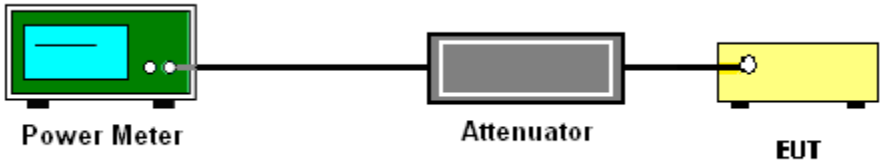
3.1.3 Test Procedures

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter.
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01

3.1.4 Test Setup



3.1.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.2 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

3.2.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) Unwanted spurious emissions falls in restricted bands shall comply with the general field strength limits as below table:

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

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/m, where P is the eirp (Watts)

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

(3) KDB789033 D02 v02r01 G)2)c)

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of −27 dBm/MHz.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

(1) Procedure for Unwanted Emissions Measurements Below 1000 MHz

- RBW = 120 kHz
- VBW = 300 kHz
- Detector = Peak
- Trace mode = max hold

(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

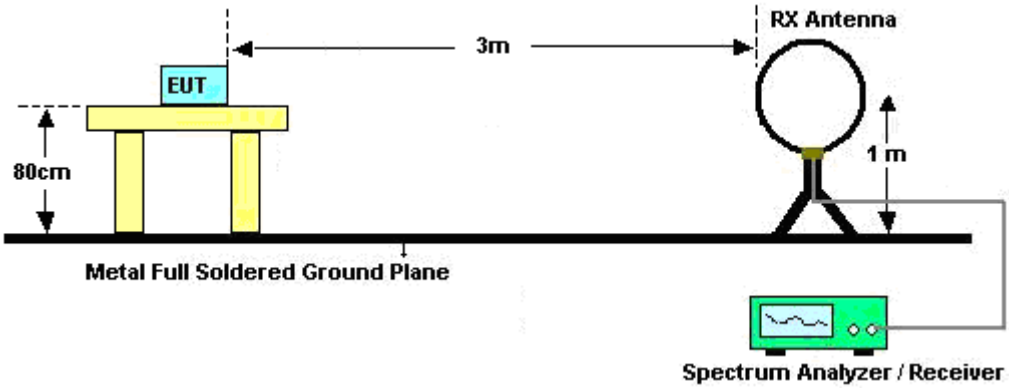
(3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

- RBW = 1 MHz
- 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.

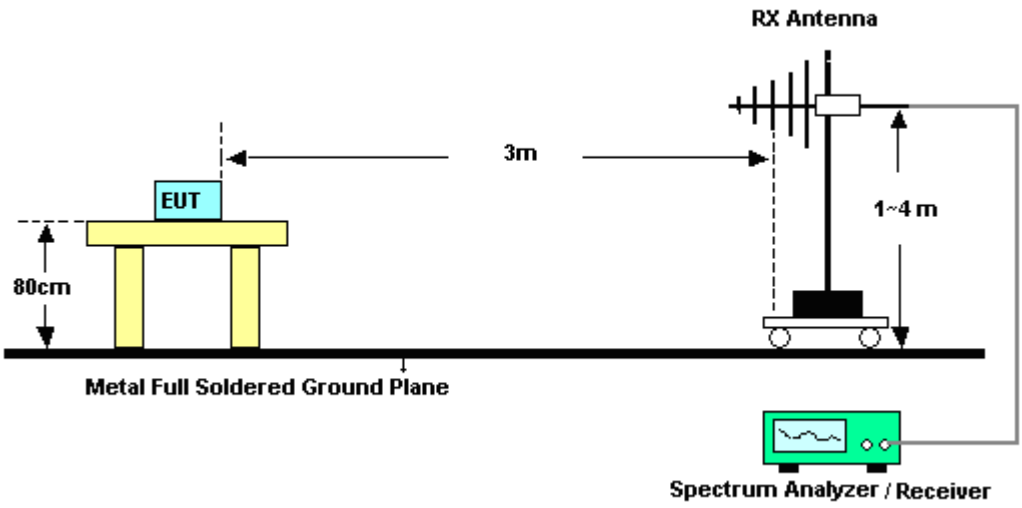
2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT is arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
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 "-".

3.2.4 Test Setup

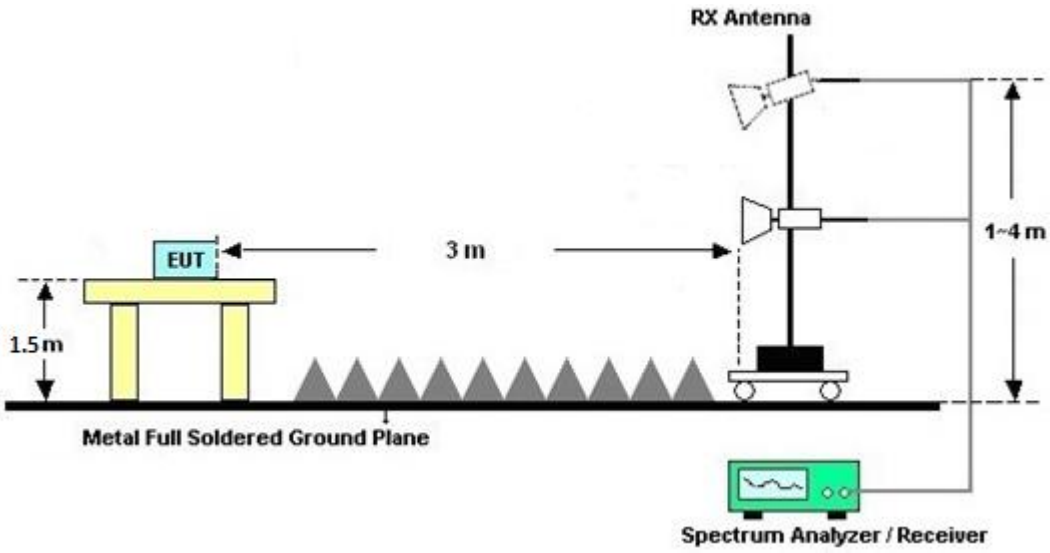
For radiated emissions below 30MHz



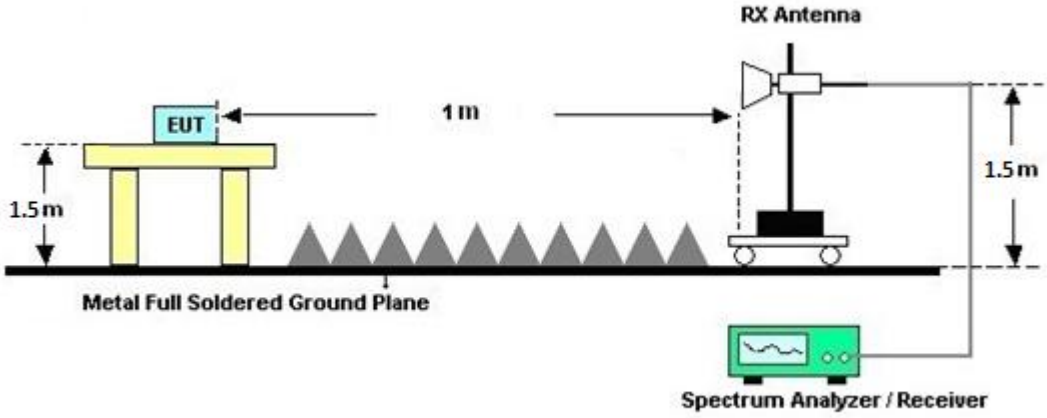
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

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

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

3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.2.7 Duty Cycle

Please refer to Appendix E.

3.2.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix C and D.

3.3 AC Conducted Emission Measurement

3.3.1 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.

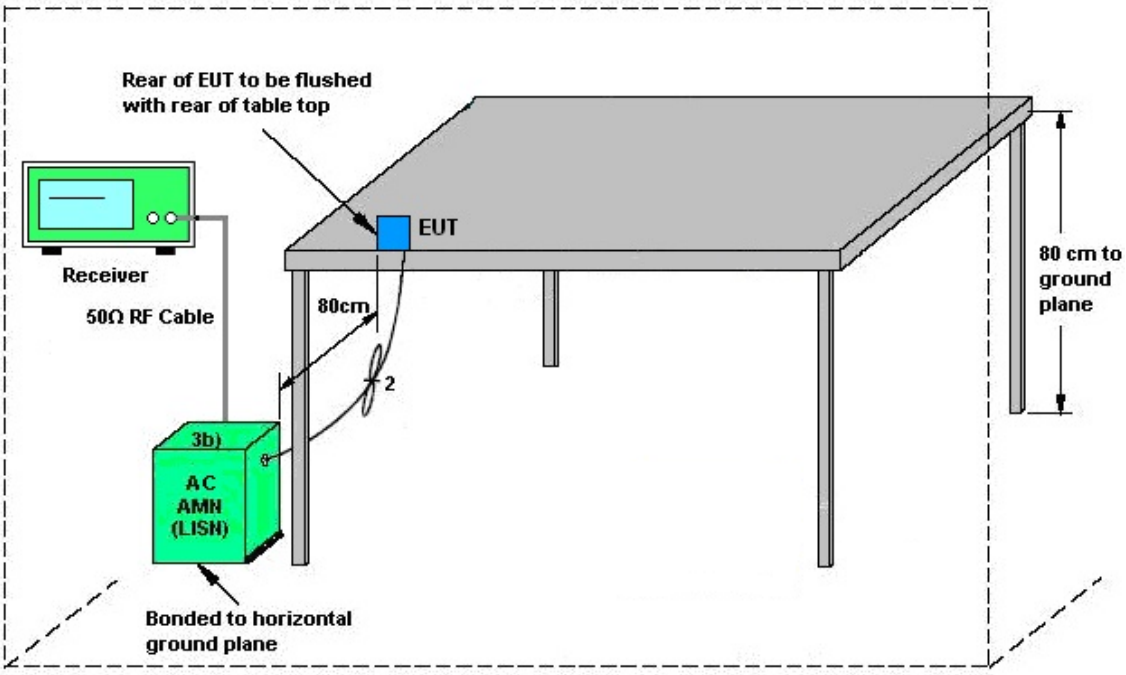
3.3.2 Measuring Instruments

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

3.3.3 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 with Maximum Hold Mode.

3.3.4 Test Setup



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

3.3.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.4 Antenna Requirements

3.4.1 Standard Applicable

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

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Sep. 12, 2023	Apr. 17 , 2024~ Jun. 07 , 2024	Sep. 11, 2024	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	41912 & 05	30MHz~1GHz	Feb. 04, 2024	Apr. 17 , 2024~ Jun. 07 , 2024	Feb. 03, 2025	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-02294	1GHz~18GHz	Jun. 30, 2023	Apr. 17 , 2024~ Jun. 02 , 2024	Jun. 29, 2024	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-02038	1GHz~18GHz	Jul. 31, 2023	Jun. 03, 2024~ Jun. 07, 2024	Jul. 30, 2024	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	1223	18GHz~40GHz	Jul. 10, 2023	Apr. 17, 2024~ Jun. 07, 2024	Jul. 09, 2024	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 25, 2023	Apr. 17, 2024~ Jun. 07, 2024	Dec. 24, 2024	Radiation (03CH15-HY)
Preamplifier	EMEC	EM01G18G	060837	1GHz~18GHz	Feb. 15, 2024	Apr. 17, 2024~ Jun. 07, 2024	Feb. 14, 2025	Radiation (03CH15-HY)
Preamplifier	EM Electronics	EM01G18G	060802	1GHz~18GHz	Feb. 29, 2024	Apr. 17, 2024~ Jun. 07, 2024	Feb. 28, 2025	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 27, 2023	Apr. 17, 2024~ Jun. 07, 2024	Jun. 26, 2024	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY53290045	20MHz~8.4GHz	Oct. 06, 2023	Apr. 17, 2024~ Jun. 07, 2024	Oct. 05, 2024	Radiation (03CH15-HY
Spectrum Analyzer	Keysight	N9010B	MY60241058	10Hz~44GHz	Jul. 06, 2023	Apr. 17, 2024~ Jun. 07, 2024	Jul. 05, 2024	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Apr. 17, 2024~ Jun. 07, 2024	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Apr. 17, 2024~ Jun. 07, 2024	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k5)	RK-000451	N/A	N/A	Apr. 17, 2024~ Jun. 07, 2024	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY582185/4, 519228/2,803 950/2	N/A	Jun. 13, 2023	Apr. 17, 2024~ Jun. 07, 2024	Jun. 12, 2024	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804011/2,804 012/2	18-40G	Jan. 02, 2024	Apr. 17, 2024~ Jun. 07, 2024	Jan. 01, 2025	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-15 30-6000-40ST	SN4	1.53GHz Low Pass Filter	Jun. 14, 2023	Apr. 17, 2024~ Jun. 04, 2024	Jun. 13, 2024	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-15 30-6000-40ST	SN4	1.53GHz Low Pass Filter	Jun. 05, 2023	Jun. 05, 2024~ Jun. 07, 2024	Jun. 04, 2025	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN4	3GHz High Pass Filter	Jun. 14, 2023	Apr. 17, 2024~ Jun. 04, 2024	Jun. 13, 2024	Radiation (03CH15-HY)
Filter	Wainwright	WHKX12-2700 -3000-18000-6 0ST	SN4	3GHz High Pass Filter	Jun. 05, 2023	Jun. 05, 2024~ Jun. 07, 2024	Jun. 04, 2025	Radiation (03CH15-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN6	6.75GHz High Pass Filter	Jun. 07, 2023	Apr. 17, 2024~ Jun. 04, 2024	Jun. 06, 2024	Radiation (03CH15-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN6	6.75GHz High Pass Filter	Jun. 05, 2023	Jun. 05, 2024~ Jun. 07, 2024	Jun. 04, 2025	Radiation (03CH15-HY)
Hygrometer	TECPEL	DTM-302	SN4	N/A	Jul. 26, 2023	Apr. 17, 2024~ Jun. 07, 2024	Jul. 25, 2024	Radiation (03CH15-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Apr. 11, 2024	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Apr. 11, 2024	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Oct. 20, 2023	Apr. 11, 2024	Oct. 19, 2024	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 14, 2024	Apr. 11, 2024	Mar. 13, 2025	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Mar. 10, 2024	Apr. 11, 2024	Mar. 09, 2025	Conduction (CO07-HY)
Four-Line V-Network	TESEQ	NNB 52	36122	N/A	Mar. 07, 2024	Apr. 11, 2024	Mar. 06, 2025	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 20, 2023	Apr. 11, 2024	Sep. 19, 2024	Conduction (CO07-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 07, 2023	Apr. 10, 2024~ Apr. 16, 2024	Nov. 06, 2024	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	17I00015SNO36 (NO:35)	10MHz~6GHz	Aug. 23, 2023	Apr. 10, 2024~ Apr. 16, 2024	Aug. 22, 2024	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101564	10Hz ~ 40GHz	Sep. 12, 2023	Apr. 10, 2024~ Apr. 16, 2024	Sep. 11, 2024	Conducted (TH05-HY)

5 Measurement Uncertainty

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.30 dB

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

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

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

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

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

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

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Junyu Jhou	Temperature:	21~25	°C
Test Date:	2024/04/10~2024/04/16	Relative Humidity:	51~54	%

TEST RESULTS DATA
Average Power Table

FCC U-NII-1 MIMO													
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
					Ant 3	Ant 6	SUM	Ant 3	Ant 6	Ant 3	Ant 6		
HT20	MCS0	2	48	5240	24.60	24.10	27.37	30.00		2.54		-	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2A MIMO														
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 3	Ant 6	SUM	Ant 3	Ant 6	Ant 3	Ant 6		
11a	6Mbps	2	52	5260	18.80	18.90	21.86	23.98		1.88		30	Pass

TEST RESULTS DATA
Average Power Table

FCC U-NII-2C MIMO														
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 3	Ant 6	SUM	Ant 3	Ant 6	Ant 3	Ant 6		
VHT40	MCS0	2	110	5550	20.30	21.00	23.67	23.98		2.45		30	Pass

Report Number : FR3D0631-03B

TEST RESULTS DATA
Average Power Table

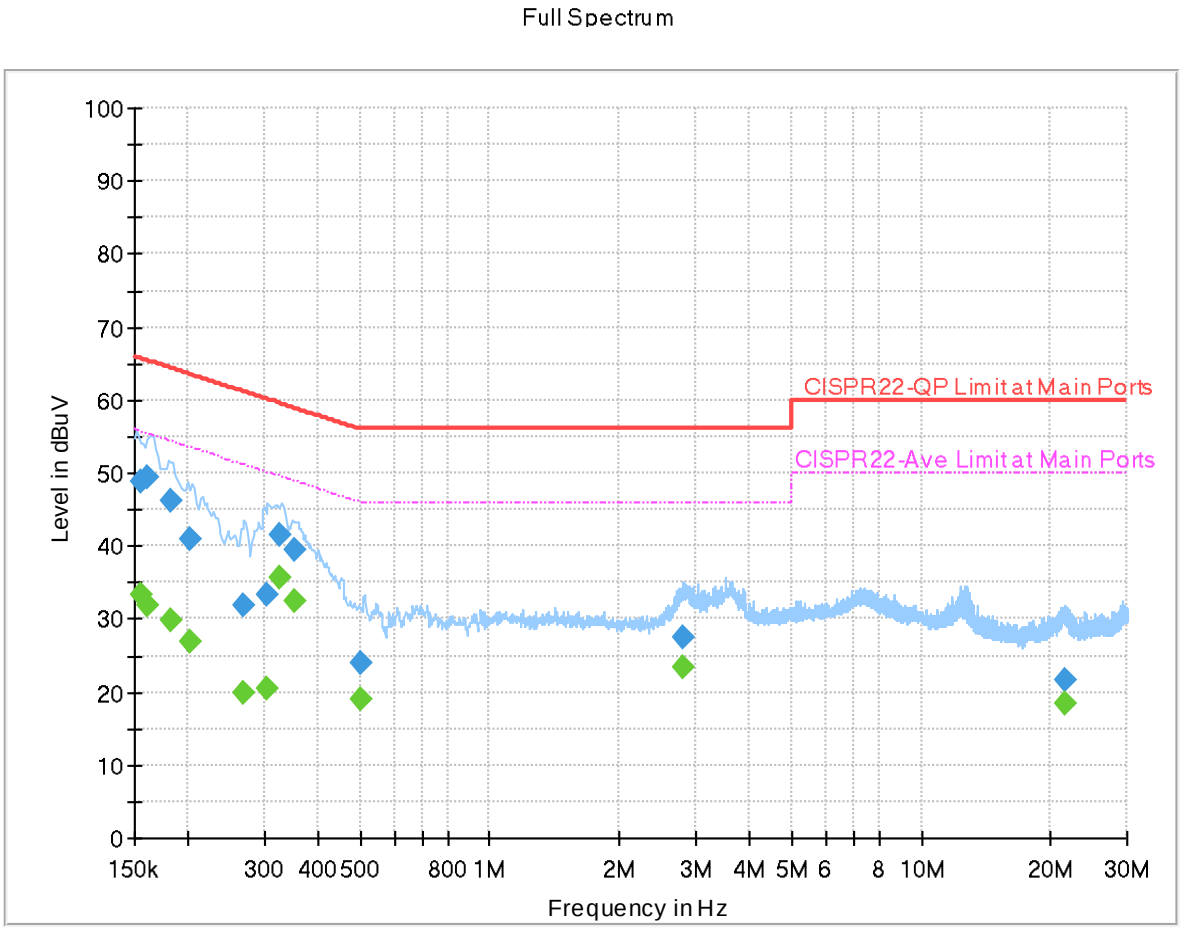
FCC U-NII-1 MIMO														
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
						Ant 3	Ant 6	SUM	Ant 3	Ant 6	Ant 3	Ant 6		
HE20	MCS0	2	48	5240	Full	24.70	24.20	27.47	30.00		2.54		-	Pass
HE40	MCS0	2	46	5230	Full	20.10	21.20	23.70	30.00		2.54			Pass

Appendix B. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	**Temperature :**	23.2~25.9℃
		Relative Humidity :	44.4~50.6%

EUT Information

Report NO :	3D0631-03
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line



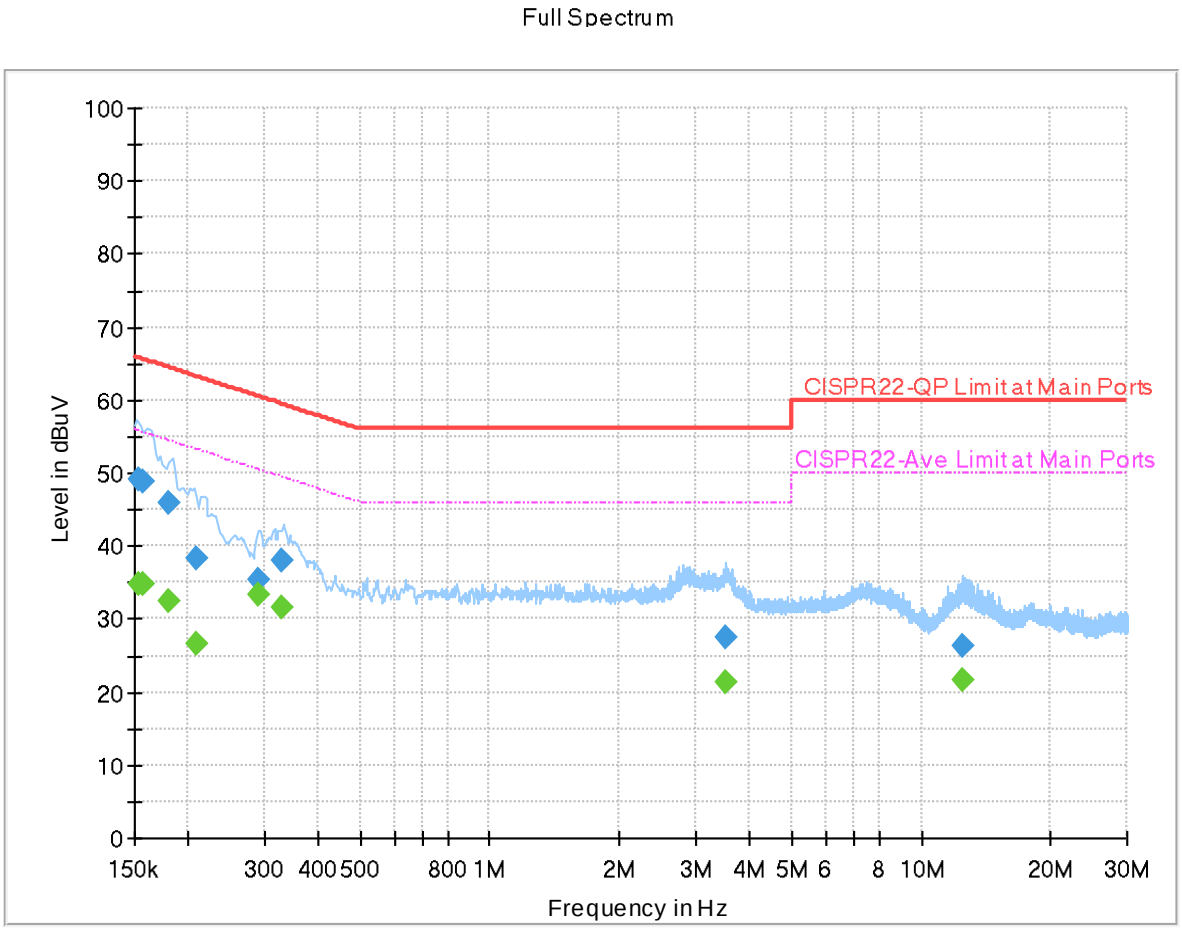
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154658	---	33.29	55.75	22.46	L1	OFF	19.9
0.154658	48.81	---	65.75	16.94	L1	OFF	19.9
0.161520	---	31.99	55.39	23.40	L1	OFF	19.9
0.161520	49.37	---	65.39	16.02	L1	OFF	19.9
0.181860	---	29.75	54.40	24.65	L1	OFF	19.9
0.181860	46.08	---	64.40	18.32	L1	OFF	19.9
0.202200	---	26.93	53.52	26.59	L1	OFF	19.9
0.202200	40.86	---	63.52	22.66	L1	OFF	19.9
0.267270	---	19.92	51.20	31.28	L1	OFF	19.9
0.267270	31.92	---	61.20	29.28	L1	OFF	19.9
0.304710	---	20.34	50.11	29.77	L1	OFF	19.9
0.304710	33.30	---	60.11	26.81	L1	OFF	19.9
0.325590	---	35.62	49.56	13.94	L1	OFF	19.9
0.325590	41.56	---	59.56	18.00	L1	OFF	19.9
0.351240	---	32.48	48.93	16.45	L1	OFF	19.9
0.351240	39.54	---	58.93	19.39	L1	OFF	19.9
0.503520	---	18.93	46.00	27.07	L1	OFF	19.9
0.503520	23.97	---	56.00	32.03	L1	OFF	19.9
2.796720	---	23.39	46.00	22.61	L1	OFF	20.0

2.796720	**27.52**	**---**	**56.00**	**28.48**	**L1**	**OFF**	**20.0**
21.534000	**---**	**18.43**	**50.00**	**31.57**	**L1**	**OFF**	**20.1**
21.534000	**21.67**	**---**	**60.00**	**38.33**	**L1**	**OFF**	**20.1**

EUT Information

Report NO :	3D0631-03
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)
0.153915	---	34.78	55.79	21.01	N	OFF	19.9
0.153915	48.98	---	65.79	16.81	N	OFF	19.9
0.156750	---	34.72	55.63	20.91	N	OFF	19.9
0.156750	48.77	---	65.63	16.86	N	OFF	19.9
0.180600	---	32.39	54.46	22.07	N	OFF	19.9
0.180600	46.01	---	64.46	18.45	N	OFF	19.9
0.207780	---	26.61	53.29	26.68	N	OFF	19.9
0.207780	38.30	---	63.29	24.99	N	OFF	19.9
0.290310	---	33.45	50.52	17.07	N	OFF	19.9
0.290310	35.31	---	60.52	25.21	N	OFF	19.9
0.327750	---	31.59	49.51	17.92	N	OFF	19.9
0.327750	38.13	---	59.51	21.38	N	OFF	19.9
3.539940	---	21.31	46.00	24.69	N	OFF	20.0
3.539940	27.51	---	56.00	28.49	N	OFF	20.0
12.445890	---	21.76	50.00	28.24	N	OFF	20.1
12.445890	26.41	---	60.00	33.59	N	OFF	20.1

Appendix C. Radiated Spurious Emission

Test Engineer :	Daniel Lee, Quentin Liu and Bigshow Wang	Temperature :	21.0~23.4°C
		Relative Humidity :	47~58%

Band 1 - 5150~5250MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 3+6	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 48 5240MHz		5149.25	59.95	-14.05	74	55.03	32.95	8.32	36.35	285	307	P	H
		5149.25	48.29	-5.71	54	43.37	32.95	8.32	36.35	285	307	A	H
	*	5240	115.28	-	-	110.36	32.86	8.39	36.33	285	307	P	H
	*	5240	108.44	-	-	103.52	32.86	8.39	36.33	285	307	A	H
		5351.52	54.14	-19.86	74	49.22	32.8	8.43	36.31	285	307	P	H
		5351.28	45.96	-8.04	54	41.04	32.8	8.43	36.31	285	307	A	H
		5145	59.68	-14.32	74	54.75	32.96	8.32	36.35	100	352	P	V
		5147.25	47.57	-6.43	54	42.65	32.95	8.32	36.35	100	352	A	V
	*	5240	115.19	46.99	68.2	110.27	32.86	8.39	36.33	100	352	P	V
	*	5240	108.71	54.71	54	103.79	32.86	8.39	36.33	100	352	A	V
		5351.76	65.16	-8.84	74	60.24	32.8	8.43	36.31	100	352	P	V
		5352.24	48.51	-5.49	54	43.59	32.8	8.43	36.31	100	352	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 2 - 5250~5350MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 3+6	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 52 5260MHz		10520	45.4	-22.8	68.2	53.12	38.61	12.59	58.92	-	-	P	H
		15780	46.69	-27.31	74	51.48	37.87	16.02	58.68	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		10520	44.75	-23.45	68.2	52.47	38.61	12.59	58.92	-	-	P	V
		15780	46.23	-27.77	74	51.02	37.87	16.02	58.68	-	-	P	V
													V
													V
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													V
													V
													V

Band 3 - 5470~5725MHz

WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI Ant. 3+6	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT40 CH 110 5550MHz		5458.46	54.82	-19.18	74	49.6	33	8.51	36.29	257	36	P	H
		5468.58	55.67	-12.53	68.2	50.43	33	8.53	36.29	257	36	P	H
		5458.24	44.67	-9.33	54	39.45	33	8.51	36.29	257	36	A	H
	*	5550	109.46	-	-	104.04	33.1	8.61	36.29	257	36	P	H
	*	5550	103.93	-	-	98.51	33.1	8.61	36.29	257	36	A	H
		5726.57	51.8	-16.4	68.2	45.78	33.57	8.78	36.33	257	36	P	H
		5452.74	53.99	-20.01	74	48.77	33	8.51	36.29	100	356	P	V
		5469.9	56.53	-11.67	68.2	51.29	33	8.53	36.29	100	356	P	V
		5430.08	46.74	-7.26	54	41.59	32.96	8.48	36.29	100	356	A	V
	*	5550	109.86	-	-	104.44	33.1	8.61	36.29	100	356	P	V
	*	5550	103.83	-	-	98.41	33.1	8.61	36.29	100	356	A	V
		5748.305	47.92	-20.28	68.2	41.68	33.78	8.8	36.34	100	356	P	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.												

Band 3 - 5470~5725MHz

WIFI 802.11ac VHT40 (Harmonic @ 3m)

WIFI Ant. 3+6	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11100	46.7	-27.3	74	53.12	38.9	13.25	58.57	-	-	P	H
		16650	47.3	-20.9	68.2	52.05	38.35	16.17	59.27	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ac													H
VHT40													H
CH 110		11100	45.61	-28.39	74	52.03	38.9	13.25	58.57	-	-	P	V
5550MHz		16650	46.03	-22.17	68.2	50.78	38.35	16.17	59.27	-	-	P	V
													V
													V
													V
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													V

Emission above 18GHz

WIFI 802.11n HT20 (SHF @ 1m)

WIFI Ant. 3+6	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 SHF		40000	46.97	-27.03	74	58.37	44.7	-0.2	55.9	-	-	P	H
													H
													H
													H
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													H
													H
		39956.5	46.65	-27.35	74	58.37	44.44	-0.21	55.95	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Emission below 1GHz

WIFI 802.11n HT20 (LF @ 3m)

WIFI Ant. 3+6	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 LF		31.08	26.53	-13.47	40	33.87	24.25	0.73	32.32	-	-	P	H
		40.98	25.99	-14.01	40	38.17	19.3	0.83	32.31	-	-	P	H
		109.92	31.31	-12.19	43.5	45.5	16.82	1.34	32.35	-	-	P	H
		182.64	23.13	-20.37	43.5	38.77	14.9	1.82	32.36	-	-	P	H
		282.4	23.94	-22.06	46	35.51	18.67	2.11	32.35	-	-	P	H
		896.8	31.61	-14.39	46	31.33	28.16	3.6	31.48	-	-	P	H
													H
													H
													H
													H
													H
													H
		31.26	32.44	-7.56	40	39.94	24.17	0.73	32.4	-	-	P	V
		40.8	33.28	-6.72	40	45.48	19.39	0.83	32.42	-	-	P	V
		97.5	30.16	-13.34	43.5	45.67	15.6	1.31	32.42	-	-	P	V
		182.64	25.19	-18.31	43.5	40.87	14.9	1.82	32.4	-	-	P	V
		207.2	23.07	-20.43	43.5	38.51	15.06	1.88	32.38	-	-	P	V
		932.8	32.29	-13.71	46	30.49	29.25	3.71	31.16	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

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

Note symbol

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

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

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
3+6		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Margin(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Margin (dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

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

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix D. Radiated Spurious Emission Plots

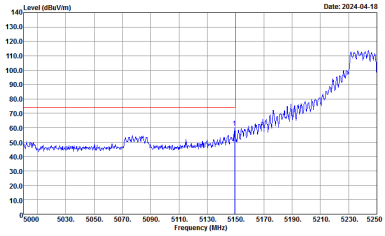
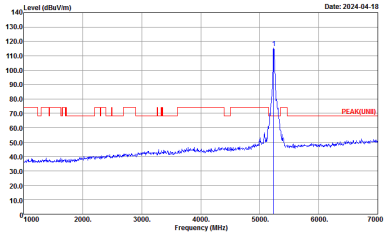
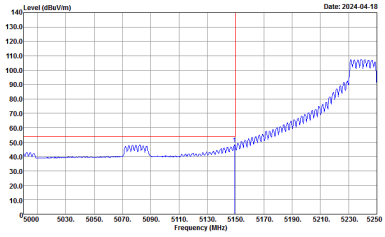
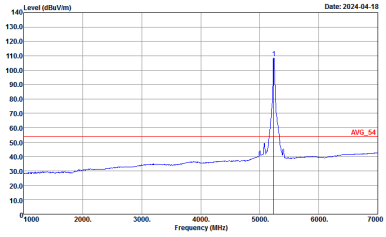
Test Engineer :	Daniel Lee, Quentin Liu and Bigshow Wang	**Temperature :**	21.0~23.4°C
		Relative Humidity :	47~58%

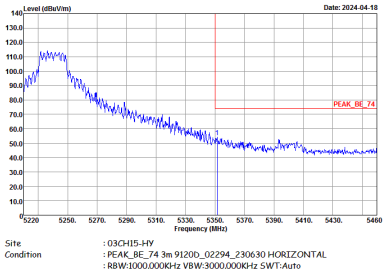
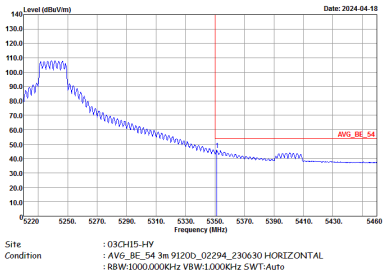
Note symbol

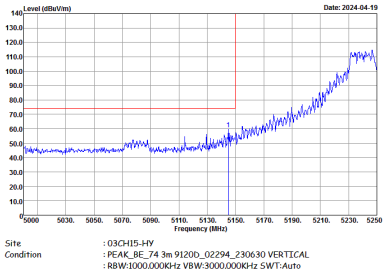
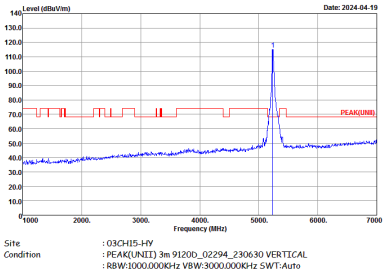
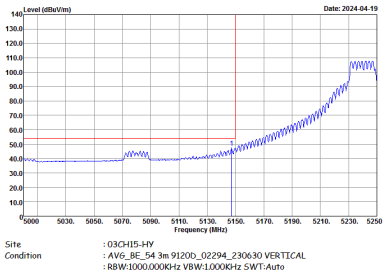
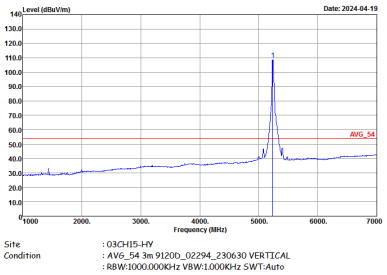
-L	**Low channel location**
-R	**High channel location**

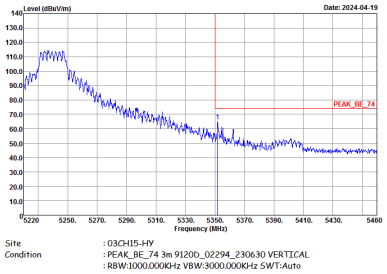
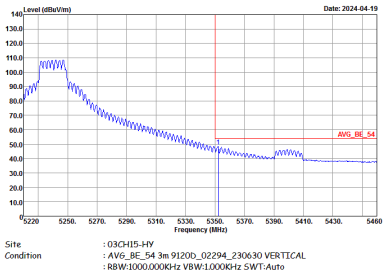
Band 1 - 5150~5250MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
3+6	Horizontal	Fundamental
Peak		
Avg.		

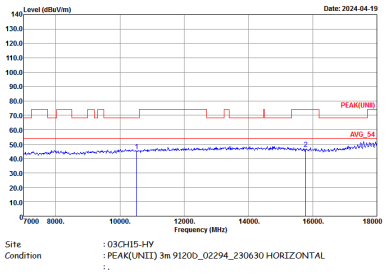
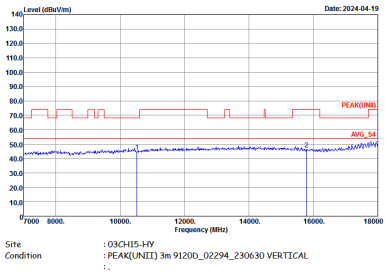
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
3+6	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

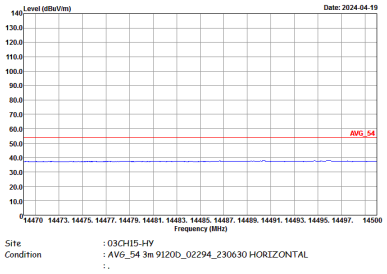
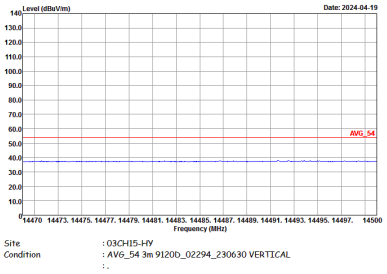
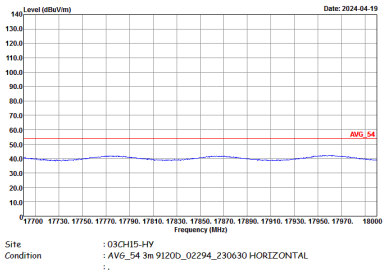
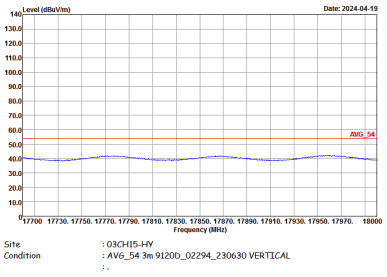
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
3+6	Vertical	Fundamental
Peak		
Avg.		

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
3+6	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

Band 2 - 5250~5350MHz

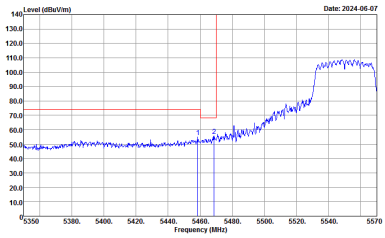
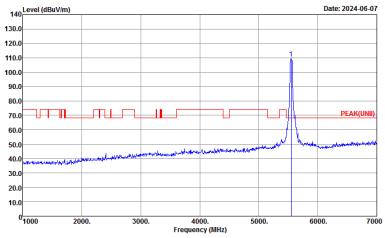
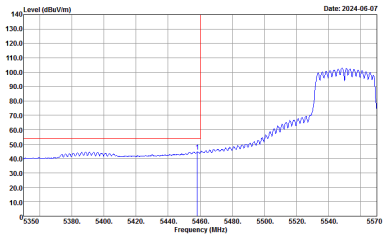
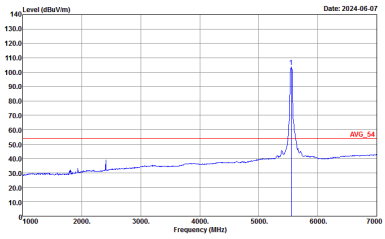
WIFI 802.11a (Harmonic @ 3m)

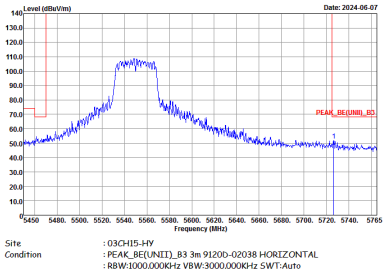
WIFI	Band 2 5250~5350MHz Harmonic @ 3m	
ANT	802.11a CH52 5260MHz	
3+6	Horizontal	Vertical
Peak Avg.		

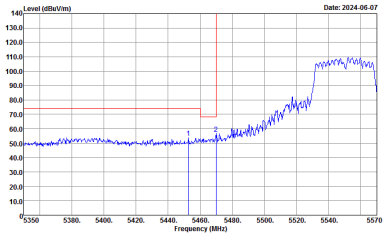
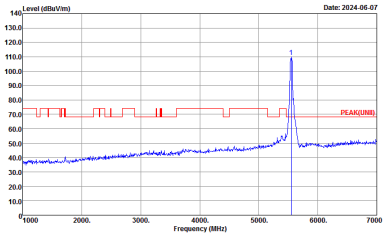
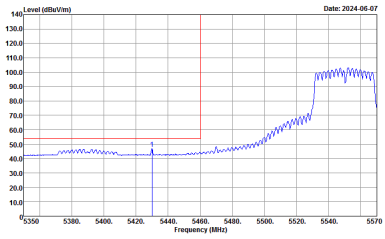
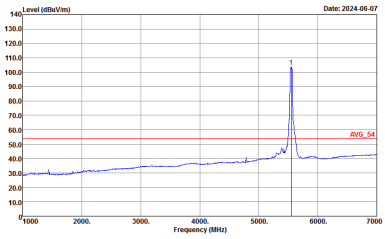
WIFI	Band 2 5250~5350MHz Harmonic @ 3m	
ANT	802.11a CH52 5260MHz	
3+6	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

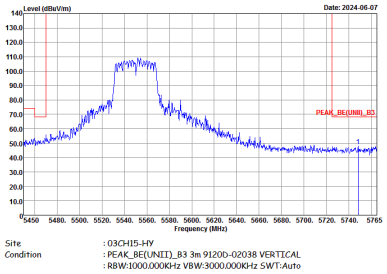
Band 3 - 5470~5725MHz

WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH110 5550MHz - L	
3+6	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(UNII)_B3 3m 9120D-02038 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 9120D-02038 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH15-HY Condition : AVG_BE(UNII)_B3 3m 9120D-02038 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	 Site : 03CH15-HY Condition : AVG_54 3m 9120D-02038 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto

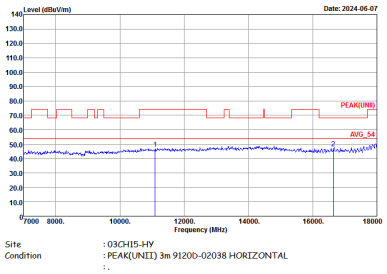
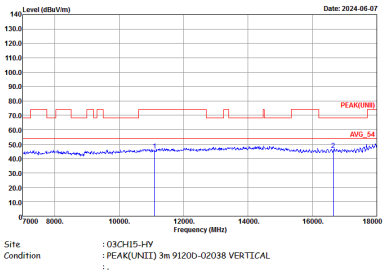
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH110 5550MHz - R	
3+6	Horizontal	Fundamental
Peak		Left blank

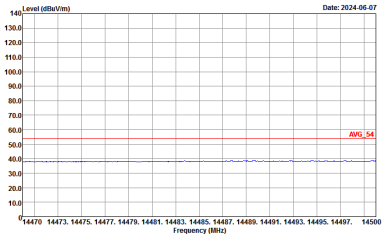
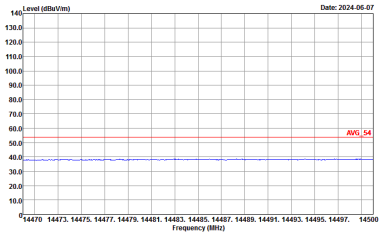
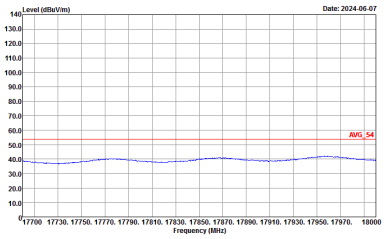
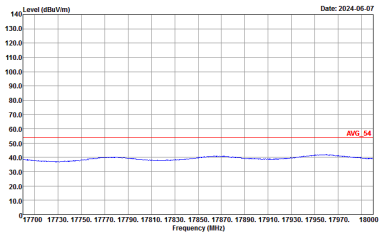
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH110 5550MHz - L	
3+6	Vertical	Fundamental
Peak		
Avg.		

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH110 5550MHz - R	
3+6	Vertical	Fundamental
Peak		Left blank

Band 3 - 5470~5725MHz

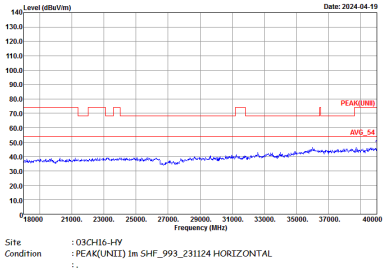
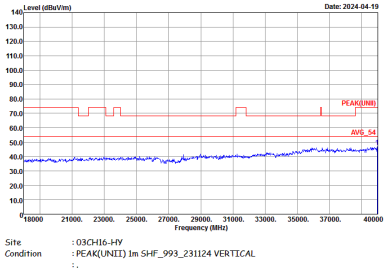
WIFI 802.11ac VHT40 (Harmonic @ 3m)

WIFI	Band 3 5470~5725MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH110 5550MHz	
3+6	Horizontal	Vertical
Peak Avg.		

WIFI	Band 3 5470~5725MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH110 5550MHz	
3+6	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH15-HY Condition : AVG_54 3m 9120D-02038 HORIZONTAL : .	 Site : 03CH15-HY Condition : AVG_54 3m 9120D-02038 VERTICAL : .
17.7G ~18G Avg	 Site : 03CH15-HY Condition : AVG_54 3m 9120D-02038 HORIZONTAL : .	 Site : 03CH15-HY Condition : AVG_54 3m 9120D-02038 VERTICAL : .

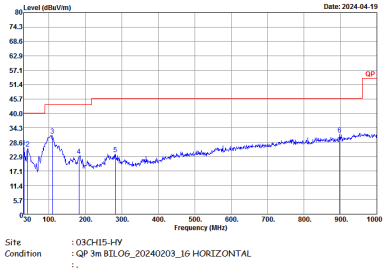
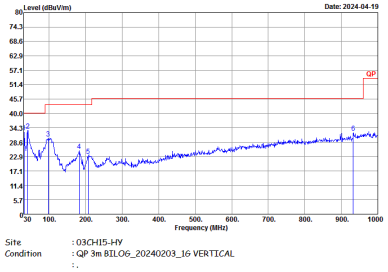
Emission above 18GHz

5GHz WIFI 802.11n HT20 (SHF @ 1m)

WIFI	5GHz WIFI	
ANT	802.11n HT20 SHF	
3+6	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

5GHz WIFI 802.11n HT20 (LF)

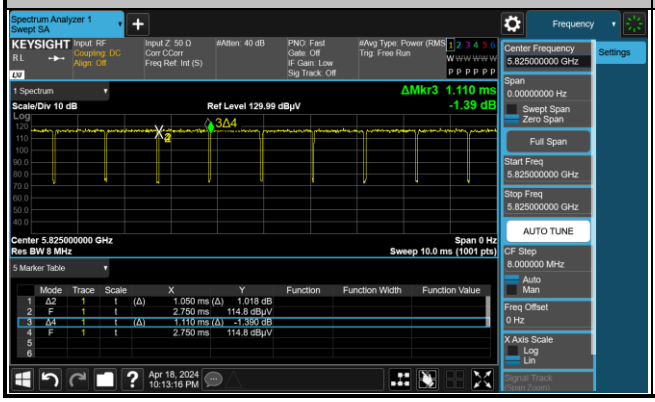
WIFI	5GHz WIFI	
ANT	802.11n HT20 LF	
3+6	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

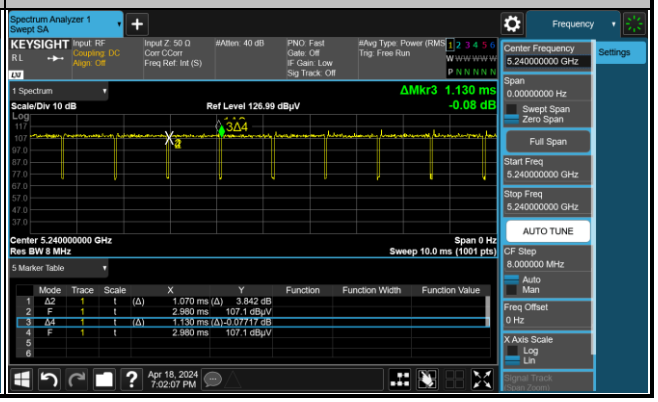
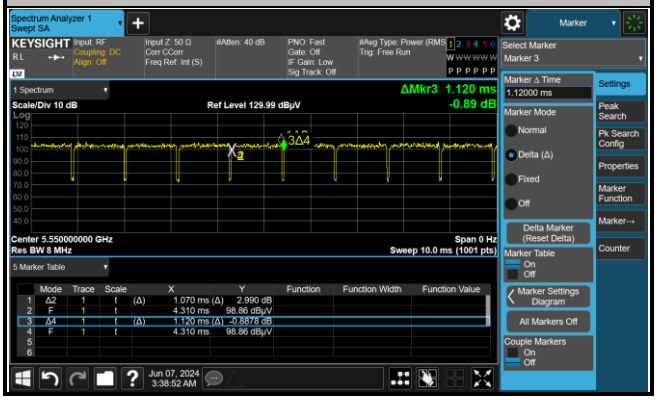
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
3+6	802.11a	94.59	1050	0.95	1kHz
3+6	5GHz 802.11n HT20	94.69	1070	0.93	1kHz
3+6	5GHz 802.11ac VHT40	95.54	1070	0.93	1kHz

MIMO <Ant. 3+6>

802.11a



5GHz 802.11n HT20



5GHz 802.11ac VHT40