FCC RADIO TEST REPORT

FCC ID	:	**QYLAX211NG**
Equipment	:	**Wireless Module**
Brand Name	:	**Getac**
Model Name	:	**AX211NGW**
Applicant	:	**Getac Technology Corporation.** **5F., Building A, No. 209, Sec.1, Nangang Rd.,Nangang Dist., Taipei City 115018, Taiwan, R.O.C.**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Feb. 11, 2025 and testing was performed from Feb. 17, 2025 to Mar. 09, 2025. 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 partial 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
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History of this test report

Report No.	Version	Description	Issue Date
FR521111D	01	Initial issue of report	Mar. 19, 2025

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.403(i)	26dB Bandwidth	Pass	See Note
-	2.1049	99% Occupied Bandwidth	Pass	See Note
3.1	15.407(a)	Maximum Conducted Output Power	Pass	-
-	15.407(a)	Power Spectral Density	Pass	See Note
3.2	15.407(b)	Unwanted Emissions	Pass	-
3.3	15.207	AC Conducted Emission	Pass	-
3.4	15.203	Antenna Requirement	Pass	-

Note:

1. For host device, Unwanted Emissions is verified and comply with the limit in this test report.
2. For host device, the Maximum Conducted Output Power is no difference after compared to module (Model: AX211NGW)

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: Michelle Chen

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
General Specs	WCDMA/LTE, Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ax, Wi-Fi 5GHz 802.11a/n/ac/ax, Wi-Fi 6GHz 802.11ax, and GNSS.
Antenna Type	WLAN: <Main>: PIFA Antenna <Aux.>: PIFA Antenna

Antenna Information for Host			
Antenna	**Manufacturer**	GTK	
	Antenna Type	PIFA Antenna	PIFA Antenna
	Part number	340140100002	340140100003
	Peak gain (dBi)	Main Antenna:	Aux. Antenna:
		WLAN(5G B1): 4.37 WLAN(5G B2): 3.99 WLAN(5G B3): 4.19	WLAN(5G B1): 2.65 WLAN(5G B2): 2.08 WLAN(5G B3): 2.64

The product was installed into Tablet PC (Brand Name: Getac, Model Name: A140, A140G2, A140Y (Y= 10 characters, Y can be 0-9, a-z, A-Z, "-", "_" or blank for marketing purpose and no impact safety related critical components and constructions.)) during test, and the host information was recorded in the following table.

Sample Information for Host	
SKU	**SKU 5**
WWAN	Support (EM7511)
WLAN	Support (AX211NGW)
RFID	Not Support
GPS	Support (MC1010)
Finger printer	Support
Barcode	Support
AC Adapter 1 (65W)	Not Support
AC Adapter 2 (120W)	Not Support
AC Adapter 3 (65W)	Support
AC Adapter 3 (65W)	Support

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

1.1.1 Antenna Directional Gain

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 $N_{ANT} \le 4$.
G_{ANT} is set equal to the gain of the antenna having the highest gain.
For PSD measurements, the directional gain calculation.

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

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.

As minimum N_{SS}=1 is supported by EUT, the formula can be simplified as:
Directional gain = $10*\log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}]$ dBi
Where G1, G2….GN denote single antenna gain.

The directional gain “DG” is calculated as following table.

	Chain A (dBi)	Chain B (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band I	2.65	4.37	4.37	6.56	0.00	0.56
Band II	2.08	3.99	3.99	6.10	0.00	0.10
Band III	2.64	4.19	4.19	6.46	0.00	0.46

Calculation example:
If a device has two antenna, G_{ANT1}= 2.65dBi; G_{ANT2}=4.37dBi
Directional gain of power measurement = max(2.65, 4.37) + 0 = 4.37 dBi
Directional gain of PSD derived from formula which is
10 x log { { [10^ (2.65 dBi / 20) + 10^ (4.37 dBi / 20)] ^ 2 } / 2 }
= 6.56 dBi
Power and PSD limit reduction = Composite 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, 03CH12-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 three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.

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

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
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)
5150-5350 MHz	50@	5250
5470-5725 MHz	114@	5570

Note:

1. The above Frequency and Channel with "*" are 802.11n HT40 and 802.11ac VHT40 and 802.11ax HE40.
2. The above Frequency and Channel with "#" are 802.11ac VHT80 and 802.11ax HE80.
3. The above Frequency and Channel with "@" are 802.11ac VHT160 and 802.11ax HE160.

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.

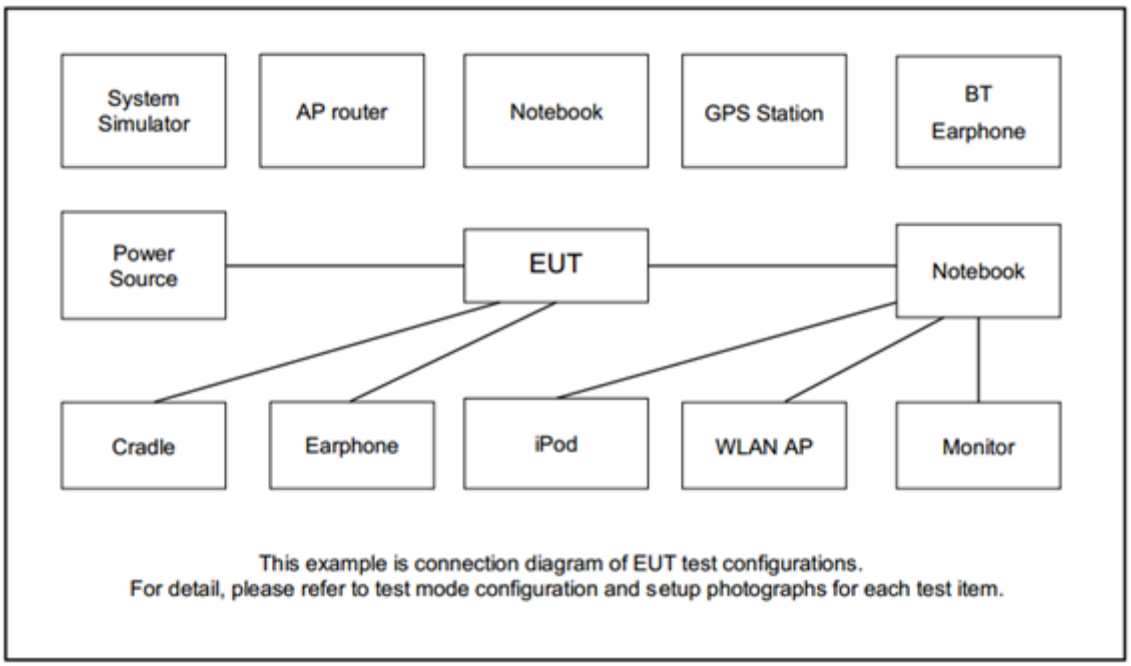
MIMO Mode

Modulation	Data Rate
802.11ax HE20	**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 : Bluetooth link + WLAN (5GHz) Link + H-patterm + Earphone + Battery + AC Adapter 3
Remark: 1. The detailed Radiated test modes are shown in Appendix C. 2. For Radiated Test Cases, the tests were performed with Adapter 3. 3. For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.	

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	Netgear	RAXE500	PY320300508	N/A	Unshielded,1.8m
3.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Earphone + Mic	Samsung	Ecouteur	N/A	Unshielded 1.8m	N/A
5.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QCRT 0.7332.23.90.0” was installed in Host 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.

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.

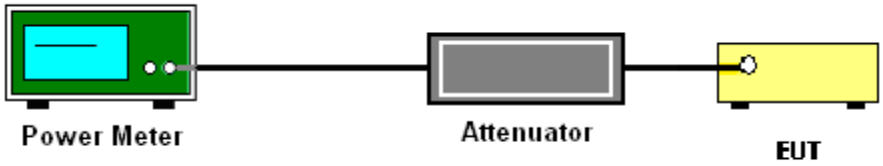
3.1.3 Test Procedures

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

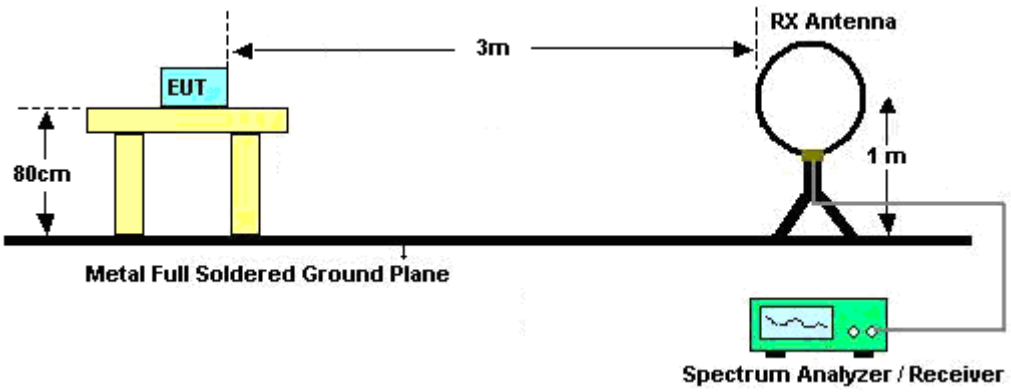
(3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

- 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.

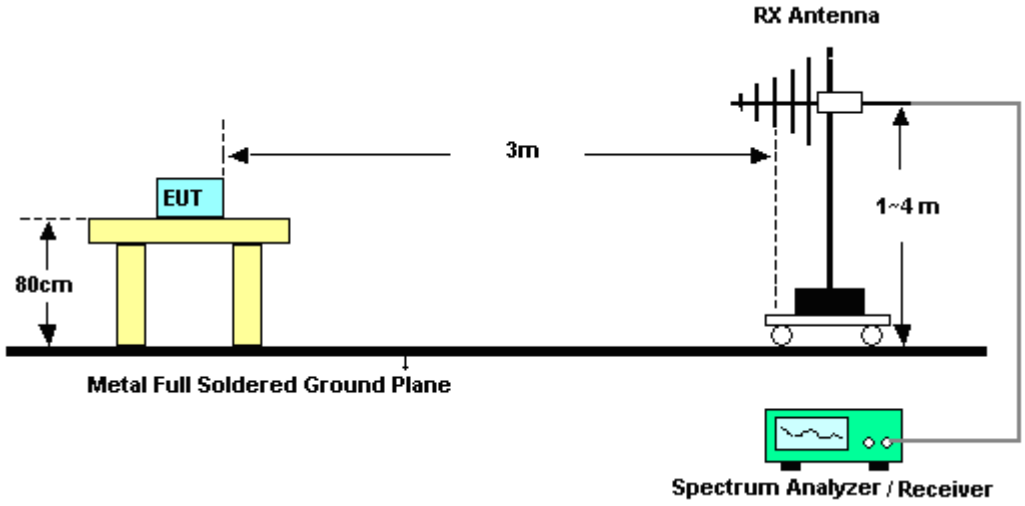
2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna 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

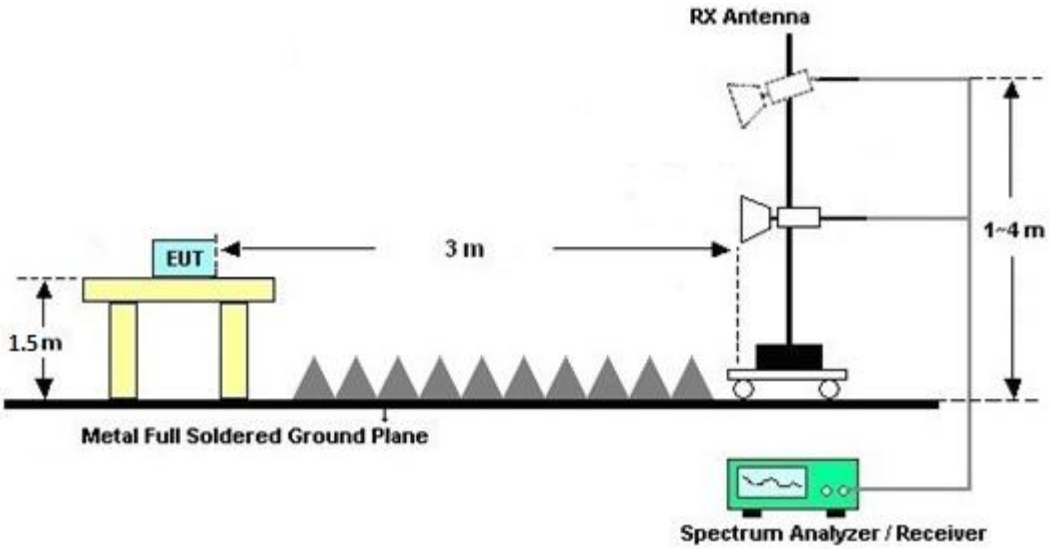
For radiated emissions below 30MHz



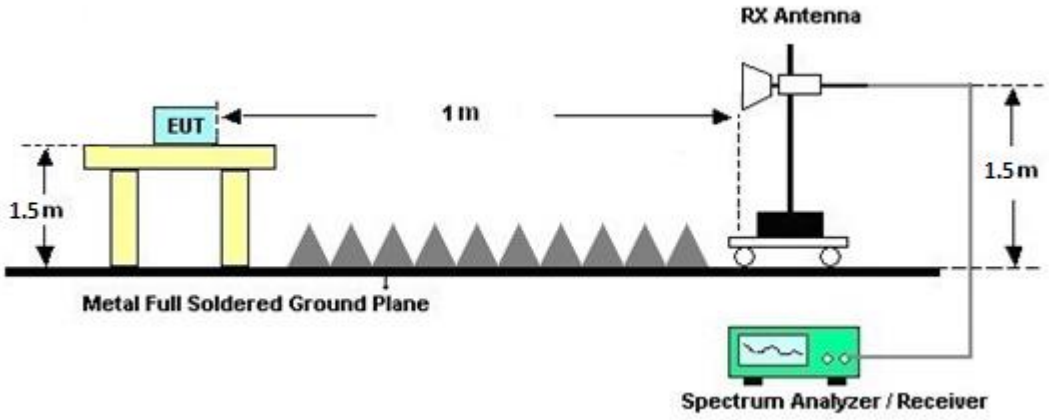
For radiated emissions from 30MHz to 1GHz



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.

3.2.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix C.

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.

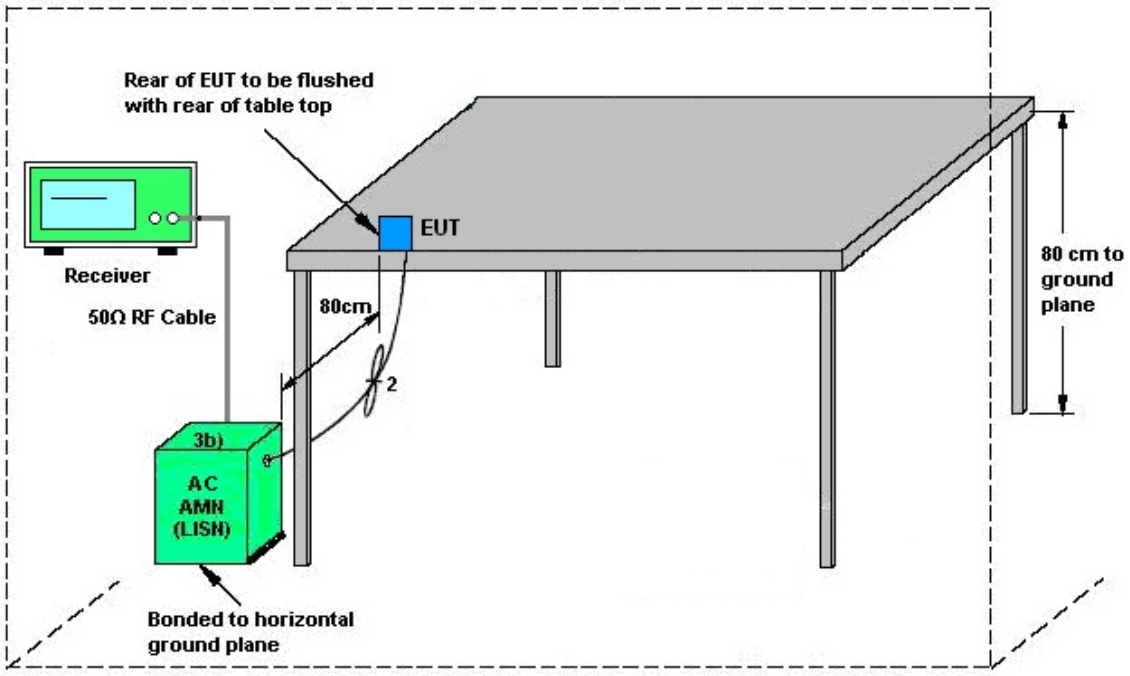
3.3.2 Measuring Instruments

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

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

3.4.2 Antenna Anti-Replacement Construction

Unique (non-standard) antenna connector.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 01, 2024	Feb. 17, 2025~ Feb. 18, 2025	Oct. 30, 2025	Conducted (TH05-HY)
USB Power Sensor	DARE	RPR3008W	RPR8W-23010013 (NO:100)	10MHz~8GHz	Jul. 26, 2024	Feb. 17, 2025~ Feb. 18, 2025	Jul. 25, 2025	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV3044	101466	10HZ~44GHZ	Aug. 14, 2024	Feb. 17, 2025~ Feb. 18, 2025	Aug. 13, 2025	Conducted (TH05-HY)
Switch Control Mainframe	Burgeon	ETF-058	EC1300484 (BOX3)	N/A	May 20, 2024	Feb. 17, 2025~ Feb. 18, 2025	May 19, 2025	Conducted (TH05-HY)
Software	Sporton	BTWIFI_Final_version_250114	N/A	Conducted Other Test Item	N/A	Feb. 17, 2025~ Feb. 18, 2025	N/A	Conducted (TH05-HY)
AC Power Source	ACPOWER	AFC-11003G	F317040033	N/A	N/A	Mar. 05, 2025	N/A	Conduction (CO07-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Mar. 05, 2025	N/A	Conduction (CO07-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	9561-F N00373	9kHz-200MHz	Oct. 23, 2024	Mar. 05, 2025	Oct. 22, 2025	Conduction (CO07-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 03, 2025	Mar. 05, 2025	Mar. 02, 2026	Conduction (CO07-HY)
Two-Line V-Network	TESEQ	NNB 51	45051	N/A	Mar. 10, 2024	Mar. 05, 2025	Mar. 09, 2025	Conduction (CO07-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 23, 2024	Mar. 05, 2025	Sep. 22, 2025	Conduction (CO07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9kHz~30MHz	Aug. 29, 2024	Mar. 07, 2025~ Mar. 09, 2025	Aug. 28, 2025	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	37059 & 01	30MHz~1GHz	Nov. 27, 2024	Mar. 07, 2025~ Mar. 09, 2025	Nov. 26, 2025	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-02114	1GHz~18GHz	Jul. 11, 2024	Mar. 07, 2025~ Mar. 09, 2025	Jul. 10, 2025	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00993	18GHz-40GHz	Nov. 18, 2024	Mar. 07, 2025~ Mar. 09, 2025	Nov. 17, 2025	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 20, 2024	Mar. 07, 2025~ Mar. 09, 2025	Mar. 19, 2025	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	Feb. 07, 2025	Mar. 07, 2025~ Mar. 09, 2025	Feb. 06, 2026	Radiation (03CH12-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-100M-18G-56-01-A70	EC1900269	1GHz-18GHz	Dec. 19, 2024	Mar. 07, 2025~ Mar. 09, 2025	Dec. 18, 2025	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 02, 2024	Mar. 07, 2025~ Mar. 09, 2025	Dec. 01, 2025	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Aug.09, 2024	Mar. 07, 2025~ Mar. 09, 2025	Aug.08, 2025	Radiation (03CH12-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz~26.5GHz	Sep. 09, 2024	Mar. 07, 2025~ Mar. 09, 2025	Sep. 08, 2025	Radiation (03CH12-HY)
Notch Filter	Wainwright	WHKX12-2700-3000-18000-60ST	SN2	3GHz High Pass Filter	Mar. 13, 2024	Mar. 07, 2025~ Mar. 09, 2025	Mar. 12, 2025	Radiation (03CH12-HY)
Notch Filter	Wainwright	WLKS1200-12SS	SN2	1.2GHz Low Pass Filter	Mar. 13, 2024	Mar. 07, 2025~ Mar. 09, 2025	Mar. 12, 2025	Radiation (03CH12-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Notch Filter	Wainwright	WHKX6-7268-9200-26500-40CD	SN1	9GHz High Pass Filter	May. 21, 2024	Mar. 07, 2025 ~ Mar. 09, 2025	May. 20, 2025	Radiation (03CH12-HY)
Notch Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN2	6.75GHz High Pass Filter	Mar. 13, 2024	Mar. 07, 2025 ~ Mar. 09, 2025	Mar. 12, 2025	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9kHz~30MHz	Mar. 05, 2025	Mar. 07, 2025 ~ Mar. 09, 2025	Mar. 04, 2026	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Dec. 19, 2024	Mar. 07, 2025 ~ Mar. 09, 2025	Dec. 18, 2025	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803955/2	30MHz~40GHz	Nov. 01, 2024	Mar. 07, 2025 ~ Mar. 09, 2025	Oct. 31, 2025	Radiation (03CH12-HY)
RF Cable	EMCI	EMC101Y-KM-KM-100	240907	30MHz~40GHz	Nov. 14, 2024	Mar. 07, 2025 ~ Mar. 09, 2025	Dec. 13, 2025	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP210090	N/A	Aug. 29, 2024	Mar. 07, 2025 ~ Mar. 09, 2025	Aug. 28, 2025	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Mar. 07, 2025 ~ Mar. 09, 2025	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Mar. 07, 2025 ~ Mar. 09, 2025	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Mar. 07, 2025 ~ Mar. 09, 2025	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Mar. 07, 2025 ~ Mar. 09, 2025	N/A	Radiation (03CH12-HY)

5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.7 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.3 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.7 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.1 dB**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Beck Chen	Temperature:	21~25	°C
Test Date:	2025/2/17-2025/2/18	Relative Humidity:	51~54	%
Remark: For Conducted Test Items, Ant. 1 means Chain A (Aux.) and Ant. 2 means Chain B (Main).				

Report Number : FR521111D

TEST RESULTS DATA
Average Power Table

FCC U-NII-2C MIMO														
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
						Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
HE20	MCS0	2	140	5700	Full	18.50	18.30	21.41	23.98		4.19		26.99	Pass

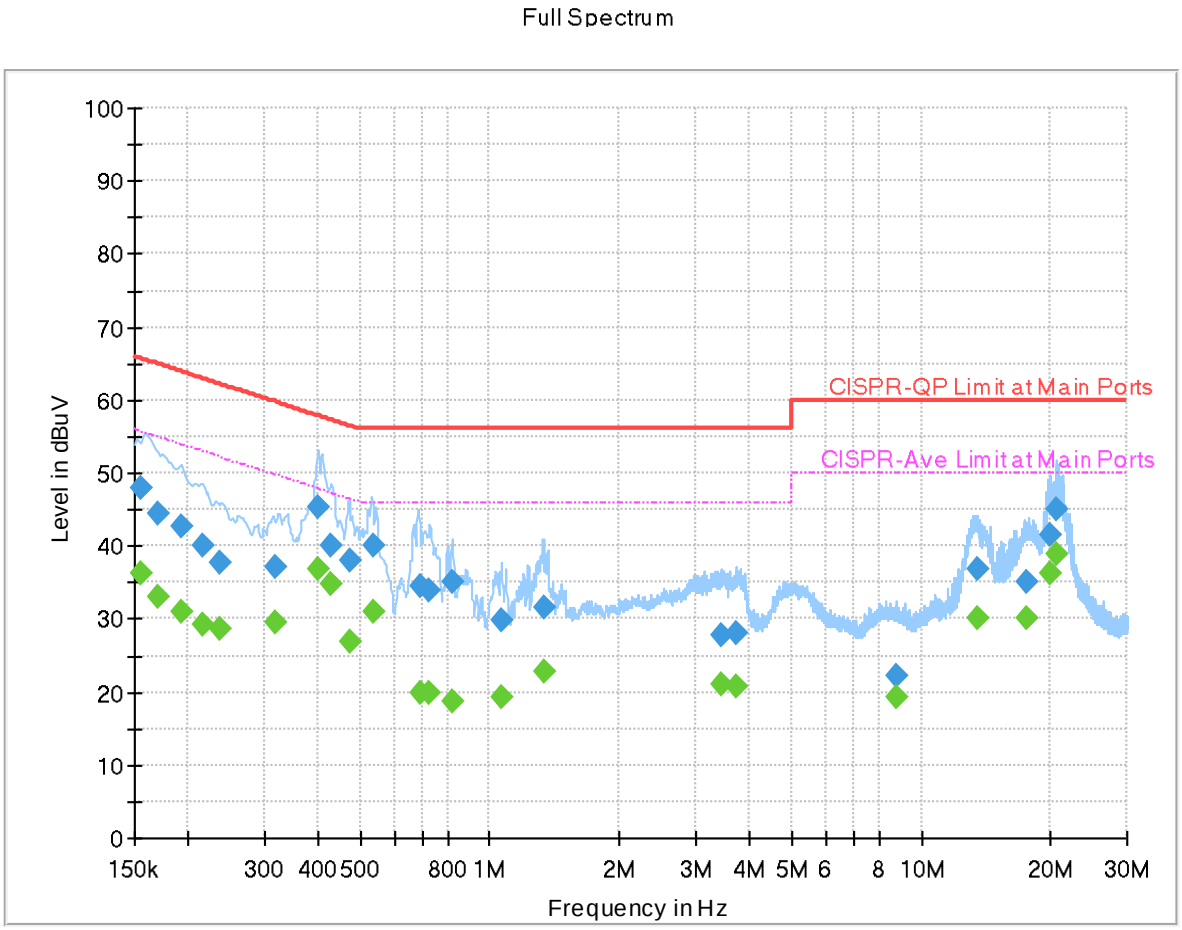
Power Setting	
Ant 1	Ant 2
20	

Appendix B. AC Conducted Emission Test Results

Test Engineer :	Louis Chung	**Temperature :**	20.1~23.3℃
		Relative Humidity :	47.3~61.2%

EUT Information

Report NO :	521111
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line



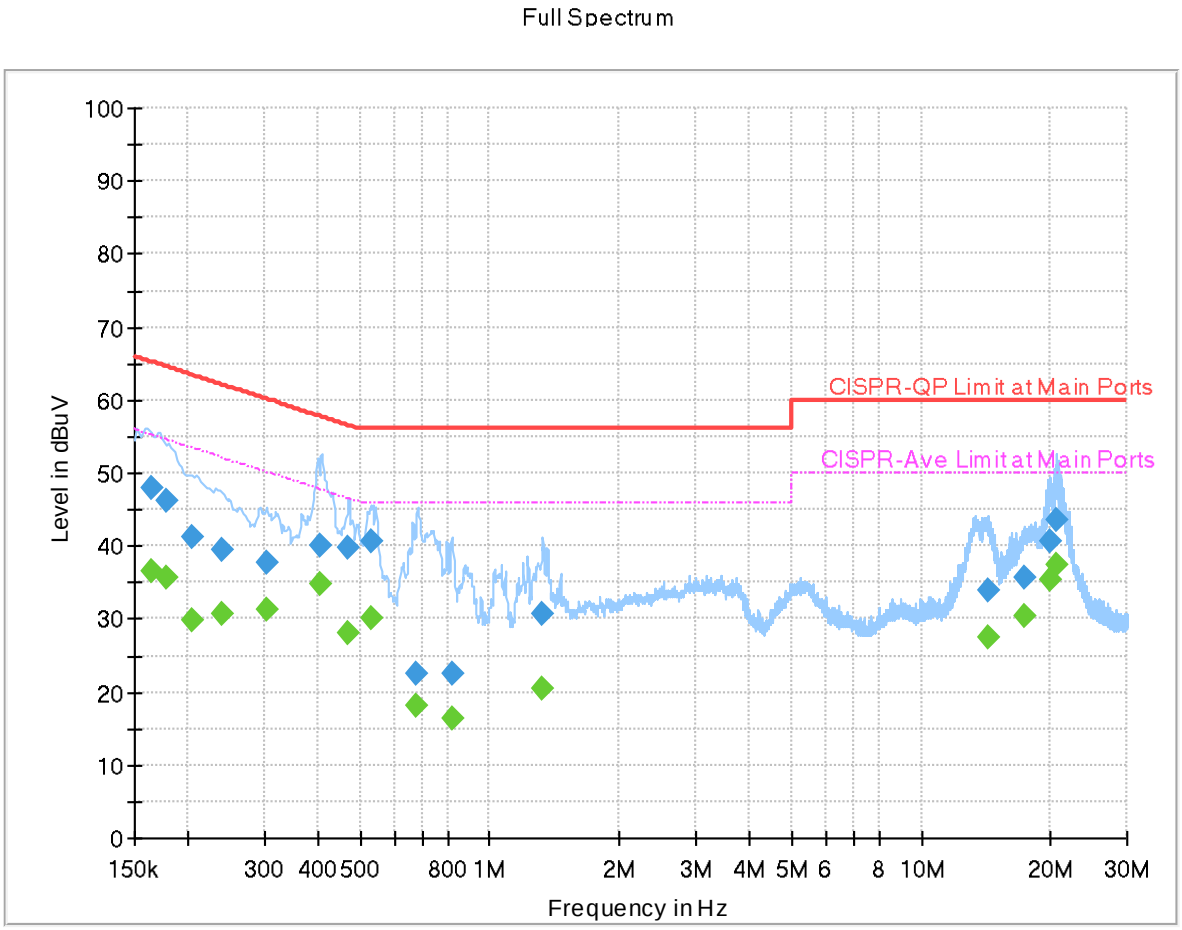
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	PE	Corr. (dB)
0.154500	---	36.26	55.75	19.49	L1	FLO	20.0
0.154500	48.01	---	65.75	17.74	L1	FLO	20.0
0.170610	---	32.95	54.93	21.98	L1	FLO	20.0
0.170610	44.34	---	64.93	20.59	L1	FLO	20.0
0.192210	---	30.89	53.94	23.05	L1	FLO	20.0
0.192210	42.64	---	63.94	21.30	L1	FLO	20.0
0.215070	---	29.11	53.01	23.90	L1	FLO	20.0
0.215070	39.94	---	63.01	23.07	L1	FLO	20.0
0.236940	---	28.78	52.20	23.42	L1	FLO	20.0
0.236940	37.82	---	62.20	24.38	L1	FLO	20.0
0.319920	---	29.56	49.71	20.15	L1	FLO	20.0
0.319920	37.04	---	59.71	22.67	L1	FLO	20.0
0.398850	---	36.77	47.88	11.11	L1	FLO	20.0
0.398850	45.38	---	57.88	12.50	L1	FLO	20.0
0.426750	---	34.80	47.32	12.52	L1	FLO	20.0
0.426750	40.02	---	57.32	17.30	L1	FLO	20.0
0.474000	---	26.79	46.44	19.65	L1	FLO	20.0
0.474000	37.92	---	56.44	18.52	L1	FLO	20.0
0.534840	---	31.05	46.00	14.95	L1	FLO	20.0

0.534840	40.03	---	56.00	15.97	L1	FLO	20.0
0.687750	---	19.75	46.00	26.25	L1	FLO	20.0
0.687750	34.41	---	56.00	21.59	L1	FLO	20.0
0.723300	---	19.77	46.00	26.23	L1	FLO	20.0
0.723300	33.83	---	56.00	22.17	L1	FLO	20.0
0.814740	---	18.76	46.00	27.24	L1	FLO	20.0
0.814740	35.14	---	56.00	20.86	L1	FLO	20.0
1.064400	---	19.36	46.00	26.64	L1	FLO	20.0
1.064400	29.91	---	56.00	26.09	L1	FLO	20.0
1.335750	---	22.84	46.00	23.16	L1	FLO	20.0
1.335750	31.58	---	56.00	24.42	L1	FLO	20.0
3.439500	---	21.19	46.00	24.81	L1	FLO	20.1
3.439500	27.66	---	56.00	28.34	L1	FLO	20.1
3.735060	---	20.72	46.00	25.28	L1	FLO	20.1
3.735060	28.00	---	56.00	28.00	L1	FLO	20.1
8.725920	---	19.18	50.00	30.82	L1	FLO	20.3
8.725920	22.33	---	60.00	37.67	L1	FLO	20.3
13.479000	---	30.22	50.00	19.78	L1	FLO	20.5
13.479000	36.74	---	60.00	23.26	L1	FLO	20.5
17.585610	---	30.07	50.00	19.93	L1	FLO	20.7
17.585610	35.03	---	60.00	24.97	L1	FLO	20.7
19.888800	---	36.29	50.00	13.71	L1	FLO	20.8
19.888800	41.66	---	60.00	18.34	L1	FLO	20.8
20.708250	---	38.97	50.00	11.03	L1	FLO	20.8
20.708250	44.98	---	60.00	15.02	L1	FLO	20.8

EUT Information

Report NO :	521111
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	PE	Corr. (dB)
0.165030	---	36.41	55.21	18.80	N	FLO	20.0
0.165030	47.95	---	65.21	17.26	N	FLO	20.0
0.177000	---	35.57	54.63	19.06	N	FLO	20.0
0.177000	46.30	---	64.63	18.33	N	FLO	20.0
0.205170	---	29.68	53.40	23.72	N	FLO	20.0
0.205170	41.36	---	63.40	22.04	N	FLO	20.0
0.238920	---	30.57	52.13	21.56	N	FLO	20.0
0.238920	39.41	---	62.13	22.72	N	FLO	20.0
0.304530	---	31.35	50.12	18.77	N	FLO	20.0
0.304530	37.82	---	60.12	22.30	N	FLO	20.0
0.404250	---	34.92	47.77	12.85	N	FLO	20.0
0.404250	40.12	---	57.77	17.65	N	FLO	20.0
0.467250	---	28.05	46.56	18.51	N	FLO	20.0
0.467250	39.84	---	56.56	16.72	N	FLO	20.0
0.532770	---	30.24	46.00	15.76	N	FLO	20.0
0.532770	40.64	---	56.00	15.36	N	FLO	20.0
0.677670	---	18.01	46.00	27.99	N	FLO	20.0
0.677670	22.57	---	56.00	33.43	N	FLO	20.0
0.821040	---	16.36	46.00	29.64	N	FLO	20.0

0.821040	22.55	---	56.00	33.45	N	FLO	20.0
1.325310	---	20.57	46.00	25.43	N	FLO	20.0
1.325310	30.73	---	56.00	25.27	N	FLO	20.0
14.379090	---	27.46	50.00	22.54	N	FLO	20.5
14.379090	33.80	---	60.00	26.20	N	FLO	20.5
17.448000	---	30.47	50.00	19.53	N	FLO	20.7
17.448000	35.59	---	60.00	24.41	N	FLO	20.7
19.862250	---	35.34	50.00	14.66	N	FLO	20.8
19.862250	40.57	---	60.00	19.43	N	FLO	20.8
20.623650	---	37.57	50.00	12.43	N	FLO	20.8
20.623650	43.51	---	60.00	16.49	N	FLO	20.8

Appendix C. Radiated Spurious Emission Test Data

Test Engineer :	Jack Cheng, Tim Lee and Wilson Wu	Temperature(℃):	20~25 ℃
		Relative Humidity(%):	50~60 %

Remark: For Radiated Spurious Emission Test Data, Ant. 1 means Chain A (Aux.) and Ant. 2 means Chain B (Main).

Note symbol

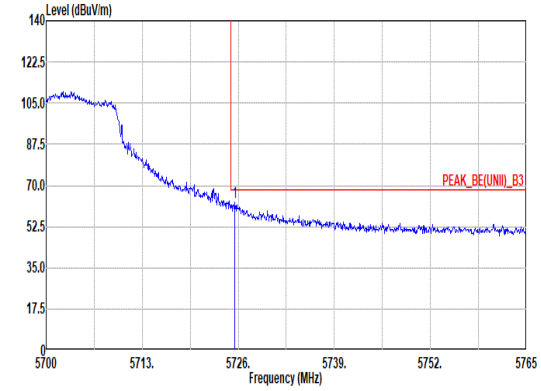
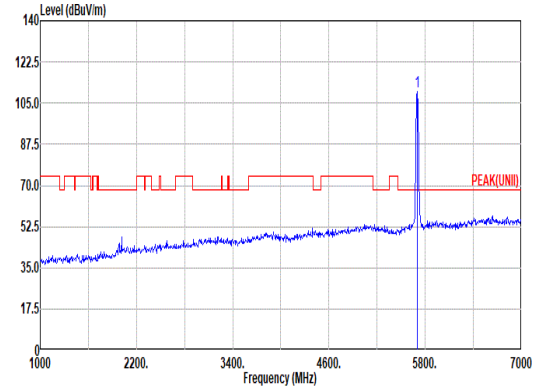
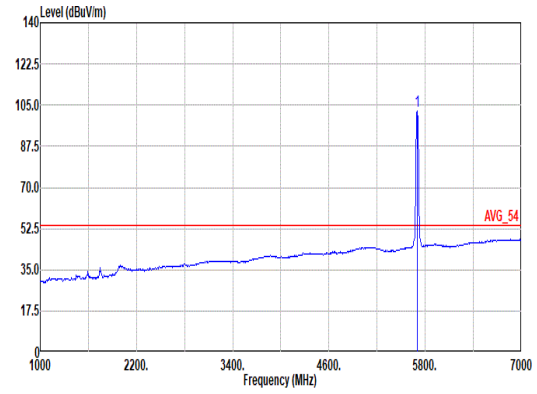
-L	**Low channel location**
-R	**High channel location**

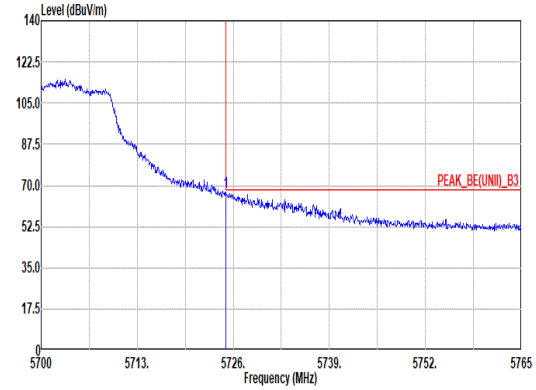
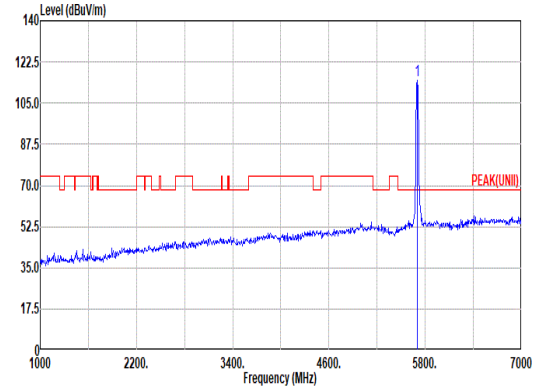
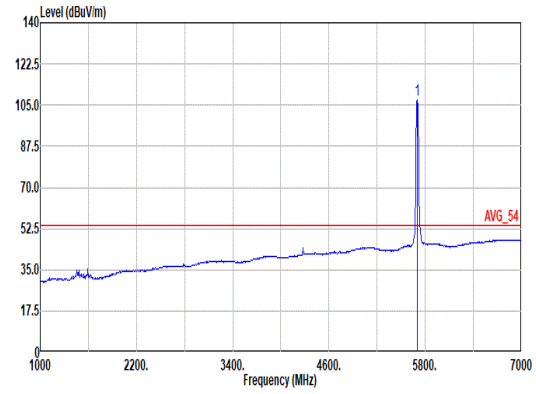
C1. Radiated Spurious Emission Test Modes

Mode	Band	Band (GHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	U-NII-2C	5.47-5.725	1+2	802.11ax HE20	140	5700	MCS0	Full RU	-
Mode 2	U-NII-2C	5.47-5.725	1+2	802.11ax HE20	140	5700	MCS0	Full RU	SHF
Mode 3	U-NII-2C	5.47-5.725	1+2	802.11ax HE20	140	5700	MCS0	Full RU	LF

C2. Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	RU	Remark
1	802.11ax HE20	140	5725.03	66.85	68.20	-1.35	V	Peak	Pass	Full RU	Band Edge
	802.11ax HE20	140	17100.00	49.80	68.20	-18.40	V	Peak	Pass	Full RU	Harmonic
2	802.11ax HE20	140	38471.00	50.91	68.20	-17.29	H	Peak	Pass	Full RU	SHF
3	802.11ax HE20	140	519.85	37.04	46.00	-8.96	V	Peak	Pass	Full RU	LF

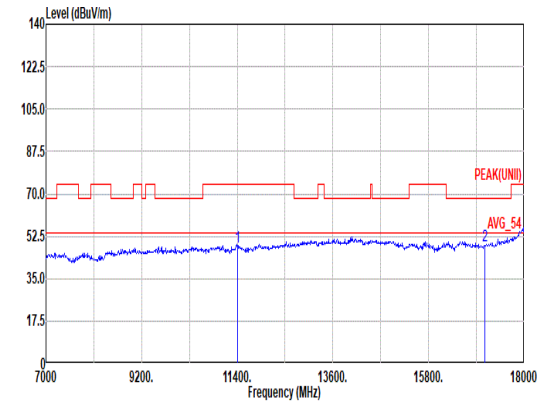
Mode	1	
	Band Edge	
	U-NII-2C_5.47-5.725_802.11ax HE20_CH140_Full RU_5700MHz	
ANT	1+2	
Pol.	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition: PEAK_BE(UNII)_B3 3m 9120D-02114-240711 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5725.55 62.73 68.20 -5.47 52.52 33.70 10.52 34.01 0.00 227 40 PEAK	 Site : 03CH12-HY Condition: PEAK(UNII) 3m 9120D-02114-240711 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5700.00 109.83 ------ ------ 99.77 33.58 10.49 34.01 0.00 227 40 PEAK
Avg	Blank	 Site : 03CH12-HY Condition: AVG_54 3m 9120D-02114-240711 HORIZONTAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5700.00 102.65 ------ ------ 92.59 33.58 10.49 34.01 0.00 227 40 AVERAGE

Mode	1	
	Band Edge	
	U-NII-2C_5.47-5.725_802.11ax HE20_CH140_Full RU_5700MHz	
ANT	1+2	
Pol.	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition: PEAK_BE(UNII)_B3 3m 9120D-02114-240711 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5725.03 66.85 68.20 -1.35 56.64 33.70 10.52 34.01 0.00 228 319 PEAK	 Site : 03CH12-HY Condition: PEAK(UNII) 3m 9120D-02114-240711 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5700.00 114.80 ------ ------ 104.74 33.58 10.49 34.01 0.00 228 319 PEAK
Avg	Blank	 Site : 03CH12-HY Condition: AVG_54 3m 9120D-02114-240711 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 5700.00 107.45 ------ ------ 97.35 33.62 10.49 34.01 0.00 228 319 AVERAGE

Mode	1	
	Harmonic	
	U-NII-2C_5.47-5.725_802.11ax HE20_CH140_Full RU_5700MHz	
ANT	1+2	
Pol.	Horizontal	Vertical

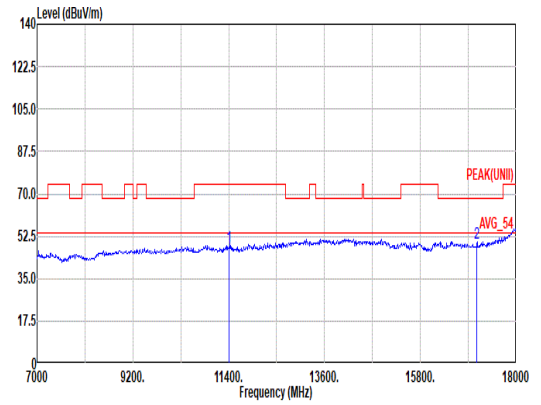
Peak

Avg



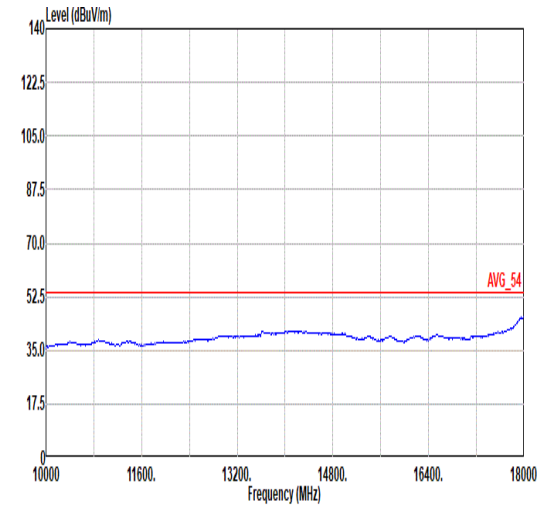
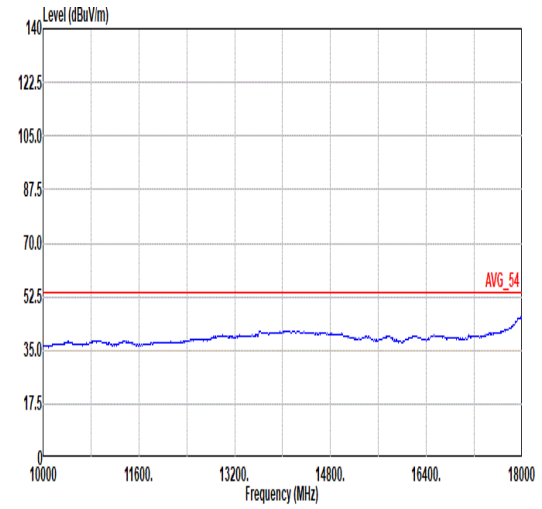
Site : 03CH12-HY
Condition: PEAK(UNII) 3m 9120D-02114-240711 HORIZONTAL

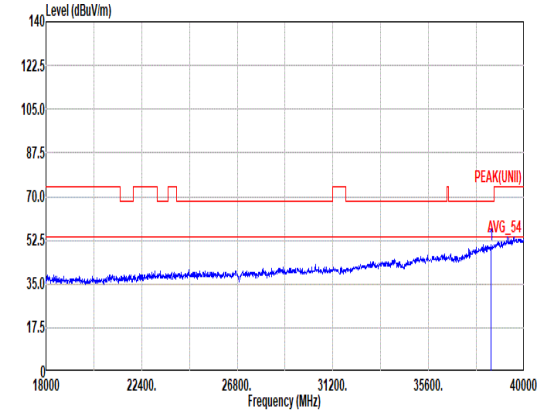
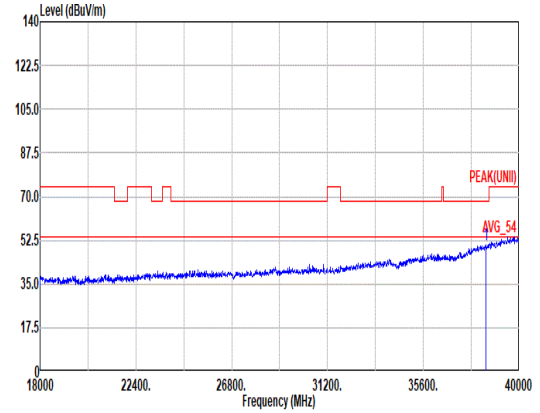
	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	11400.00	47.93	74.00	-26.07	59.33	39.20	16.43	67.32	0.29	--	--	Peak
2	17100.00	48.63	68.20	-19.57	56.62	38.00	20.37	66.87	0.51	--	--	Peak



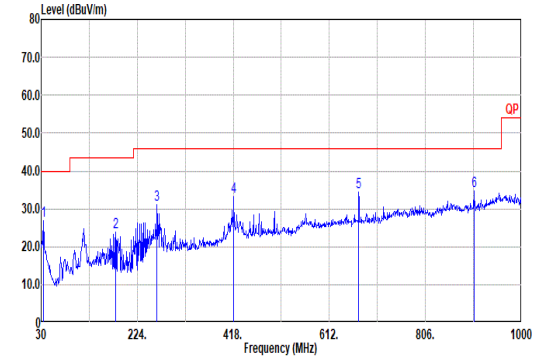
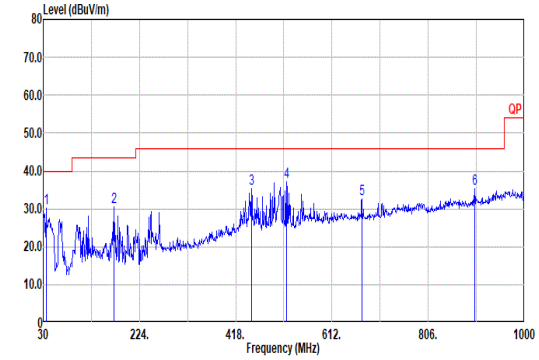
Site : 03CH12-HY
Condition: PEAK(UNII) 3m 9120D-02114-240711 VERTICAL

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	11400.00	47.92	74.00	-26.08	59.32	39.20	16.43	67.32	0.29	--	--	Peak
2	17100.00	49.80	68.20	-18.40	57.78	38.00	20.37	66.86	0.51	--	--	Peak

Mode	1	
	Harmonic	
	U-NII-2C_5.47-5.725_802.11ax HE20_CH140_Full RU_5700MHz	
ANT	1+2	
Pol.	Horizontal	Vertical
10G ~18G Avg		

Mode	2	
	SHF	
	U-NII-2C_5.47-5.725_802.11ax HE20_CH140_Full RU_5700MHz	
ANT	1+2	
Pol.	Horizontal	Vertical
Peak	 Site : 03CH12-HY Condition: PEAK(UNII) 1m BBHA9170_1223_240622 HORIZONTAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 38471.00 50.91 68.20 -17.29 38.67 43.85 29.18 51.25 -9.54 -- -- Peak	 Site : 03CH12-HY Condition: PEAK(UNII) 1m BBHA9170_1223_240622 VERTICAL Freq Level Limit Line Margin Read Level Ant Factor Cable Loss Preamp Factor Aux Factor APos TPos Remark MHz dBuV/m dBuV/m dB dBuV dB/m dB dB dB cm deg 1 38460.00 50.84 68.20 -17.36 38.48 43.98 29.18 51.26 -9.54 -- -- Peak

Mode	3
	LF
	U-NII-2C_5.47-5.725_802.11ax HE20_CH140_Full RU_5700MHz
ANT	1+2

Pol.	Horizontal	Vertical
QP/ Peak		

Site : 03CH12-HY
Condition: QP 3m Bilog_37059_20241127 HORIZONTAL

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	34.85	26.91	40.00	-13.09	33.35	22.44	0.83	29.76	0.05	--	--	Peak
2	180.35	23.80	43.50	-19.70	36.36	15.26	1.88	29.79	0.09	--	--	Peak
3	263.77	31.11	46.00	-14.89	38.23	20.14	2.24	29.64	0.14	--	--	Peak
4	418.97	33.17	46.00	-12.83	36.91	22.67	2.82	29.41	0.18	--	--	Peak
5	671.17	34.43	46.00	-11.57	32.99	26.61	3.61	29.06	0.28	--	--	Peak
6	903.97	34.84	46.00	-11.16	29.48	29.32	4.18	28.49	0.35	--	--	Peak

Site : 03CH12-HY
Condition: QP 3m Bilog_37059_20241127 VERTICAL

	Freq	Level	Limit Line	Margin	Read Level	Ant Factor	Cable Loss	Preamp Factor	Aux Factor	APos	TPos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	cm	deg	
1	35.82	30.11	40.00	-9.89	37.08	21.88	0.84	29.74	0.05	--	--	Peak
2	172.59	30.51	43.50	-12.99	42.64	15.73	1.84	29.80	0.10	--	--	Peak
3	450.01	35.34	46.00	-10.66	38.28	23.29	2.94	29.36	0.19	--	--	Peak
4	519.85	37.04	46.00	-8.96	38.53	24.25	3.19	29.22	0.29	--	--	Peak
5	672.14	32.50	46.00	-13.50	31.03	26.62	3.62	29.05	0.28	--	--	Peak
6	899.12	35.24	46.00	-10.76	30.01	29.23	4.17	28.51	0.34	--	--	Peak

Appendix D. Duty Cycle Plots

Chain	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
A+B	5GHz 802.11ax HE20 Full RU	98.88	-	-	10Hz

MIMO <Chain A+B>

5GHz 802.11ax HE20 Full RU