



FCC RADIO TEST REPORT

FCC ID : TX2-RTL8822CE
Equipment : 802.11a/b/g/n/ac RTL8822CE Combo module
Brand Name : Realtek
Model Name : RTL8822CE
Applicant : Realtek Semiconductor Corp.
No. 2 Innovation Road II, Hsinchu Science Park Hsinchu 300, Taiwan
Standard : FCC Part 15 Subpart E §15.407

The product was received on Sep. 12, 2024 and testing was performed from Sep. 24, 2024 to Oct. 17, 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 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

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
FR0D1216-04B	01	Initial issue of report	Nov. 11, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)
3.1	15.407(a)	Maximum Conducted Output Power	Pass
3.2	15.407(b)	Unwanted Emissions	Pass
3.3	15.207	AC Conducted Emission	Pass
3.4	15.203	Antenna Requirement	Pass

Note: The test configurations are designated by the manufacturer.

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: Mila Chen



1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
General Specs	Wi-Fi 2.4GHz 802.11b/g/n/ac and Wi-Fi 5GHz 802.11a/n/ac.
Sample 1	EUT with Host 1
Sample 2	EUT with Host 2
Sample 3	EUT with Host 3
Sample 4	EUT with Host 4
Sample 5	EUT with Host 5
Sample 6	EUT with Host 6
Sample 7	EUT with Host 7
Antenna Type	WLAN: <Main>: PIFA Antenna <Aux.>: PIFA Antenna

Antenna information		
5150 MHz ~ 5250 MHz	Peak Gain (dBi)	Main: 1.92 Aux.: 4.27
5250 MHz ~ 5350 MHz	Peak Gain (dBi)	Main: 1.94 Aux.: 3.66
5470 MHz ~ 5725 MHz	Peak Gain (dBi)	Main: 3.85 Aux.: 4.30

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

The product was installed into Notebook

(Brand Name: Getac, Model Name: S410, S410G4, S410-4012C, S410-4212D, S410-4212E, S410G5 S410Y (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.

Host Information	
Host 1	Host with SKU A
Host 2	Host with SKU B
Host 3	Host with SKU C
Host 4	Host with SKU D
Host 5	Host with SKU E
Host 6	Host with SKU F
Host 7	Host with SKU G



SKU List				
DVT SKUs	SKU A	SKU B	SKU C	SKU D
CPU	i5	i5	i5	i5
Display Resolution	FHD	FHD	FHD	FHD
Discrete Graphics	Not Support	Not Support	Not Support	Not Support
Wifi/BT	Support (RTL8822CE) (AX201NGW)	Support (RTL8822CE) (AX201NGW)	Support (RTL8822CE) (AX201NGW)	Support (RTL8822CE) (AX201NGW)
Touch	Not Support	Not Support	Not Support	Not Support
Sunlight Readable	Support	Support	Support	Support
Main Storage	SSD 1TB	SSD 1 TB	SSD 1TB	SSD 1TB
Battery	Main	Main	Main	Main
2nd Storage	2nd Battery	Not Support	2nd Battery	Not Support
Webcam	Support	Support	Support	Support
Smart Card	Support	Support	Support	Support
Option I/O Ports	RS232 + LAN + Fischer	RS232 + LAN + Fischer	RS232 + LAN + Display	S232 + LAN + Fischer
Discrete GPS	Not Support	Not Support	Not Support	Not Support
Finger Print	Not Support	Not Support	Not Support	Not Support
Contactless Smart Card(NFC)	Not Support	Not Support	Not Support	Not Support
LTE	Not Support	Support	Not Support	Not Support

SKU List			
DVT SKUs	SKU E	SKU F	SKU G
CPU	i5	i5	i5
Display Resolution	FHD	FHD	FHD
Discrete Graphics	Not Support	Not Support	Not Support
Wifi/BT	Support (RTL8822CE) (AX201NGW)	Support (RTL8822CE) (AX211NGW)	Support (RTL8822CE) (AX211NGW)
Touch	Not Support	Not Support	Not Support
Sunlight Readable	Support	Support	Support
Main Storage	SSD 1TB	SSD 1TB	SSD 1TB
Battery	Main	Main	Main
2nd Storage	2nd Battery	2nd Battery	2nd Battery
Webcam	Support	Support	Support
Smart Card	Support	Support	Support
Option I/O Ports	RS232 + LAN + Display	RS232 + LAN + Fischer	RS232 + LAN + Fischer
Discrete GPS	Not Support	Support	Not Support
Finger Print	Not Support	Not Support	Not Support
Contactless Smart Card(NFC)	Not Support	Not Support	Not Support
LTE	Not Support	Support	Not Support

1.1.1 Antenna Directional Gain

Follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01 F2)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.

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

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 k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

As minimum $N_{SS}=1$ is supported by EUT, the formula can be simplified as:

Directional gain = $10 \cdot \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]$ dBi

Where $G_1, G_2, \dots, G_N$ denote single antenna gain.

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

			DG	DG	Power	PSD
			for	for	Limit	Limit
	Chain 1	Chain 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
Band I	4.27	1.92	4.27	6.18	0.00	0.18
Band II	3.66	1.94	3.66	5.85	0.00	0.00
Band III	4.30	3.85	4.30	7.09	0.00	1.09

Calculation example:

If a device has two antenna, $C_{chain 1} = 4.30$ dBi; $C_{chain 2} = 3.85$ dBi

Directional gain of power measurement = $\max(4.30, 3.85) + 0 = 4.30$ dBi

Directional gain of PSD derived from formula which is

$10 \times \log \{ \{ [10^{(4.30 \text{ dBi} / 20)} + 10^{(3.85 \text{ dBi} / 20)}]^2 \} / 2 \}$

= 7.09 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. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. CO05-HY (TAF Code: 1190)
Remark	The AC Conducted Emission test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory.

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, 03CH11-HY

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

FCC designation No.: TW1190 and TW3786

1.4 Applicable Standards

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

- ♦ FCC Part 15 Subpart 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).
- 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



2.2 Test Mode

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

Single Mode

Modulation	Data Rate
802.11ac VHT40	MCS0

MIMO Mode

Modulation	Data Rate
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + AC Adapter for Sample 6
Remark: For Radiated Test Cases, the tests were performed with Sample 6	

Single Mode

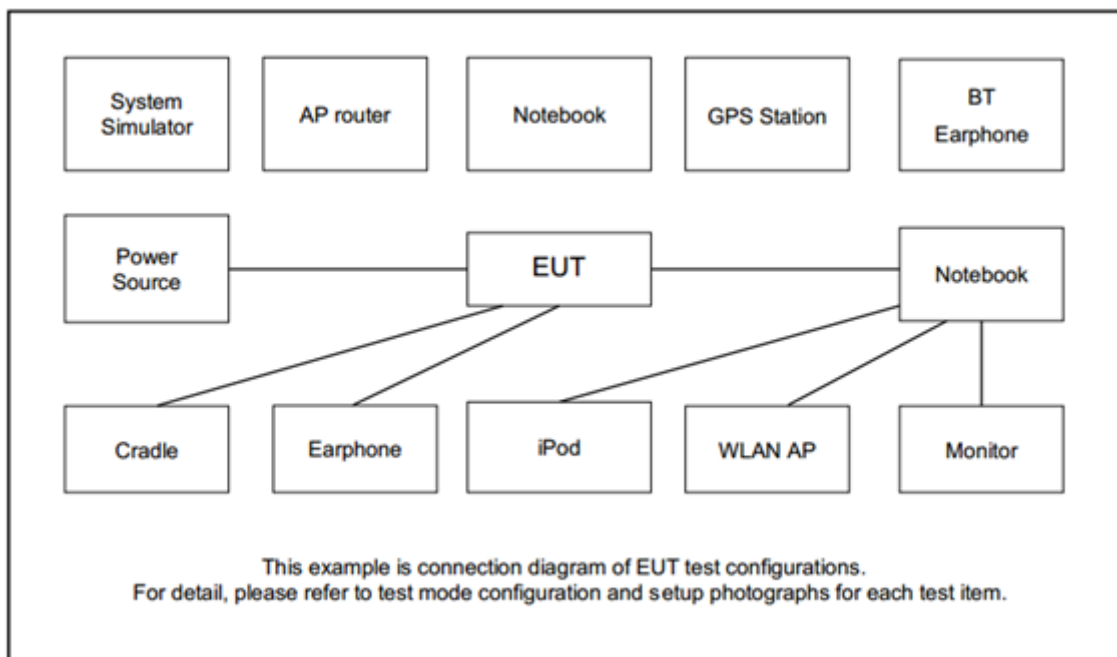
Ch. #		Band I : 5150-5250 MHz
		802.11ac VHT40
L	Low	38
M	Middle	-
H	High	-

MIMO Mode

Ch. #		Band I : 5150-5250 MHz
		802.11ac VHT80
L	Low	-
M	Middle	58
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.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
2.	Notebook	DELL	Latitude 3420	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	USB HD	ADATA	HV620S-1T	FCC DoC	Shielded, 1.0m	N/A
5.	Router	ASUS	GT-AX6000	MSQ-RTAX5600	N/A	N/A
6.	Earphone	Sony	MH410C	N/A	Unshielded, 1.5m	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “MP Version 0.0001.1020.2018” 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 $11 \text{ dBm} + 10 \log B$, 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.

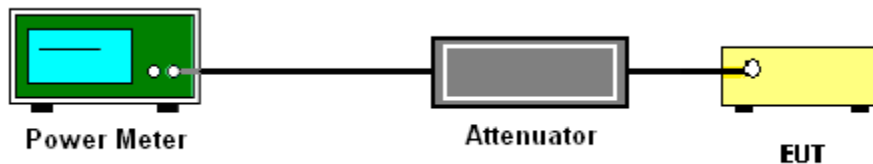
3.1.3 Test Procedures

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.

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

EIRP (dBm)	Field Strength at 3m (dB μ V/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

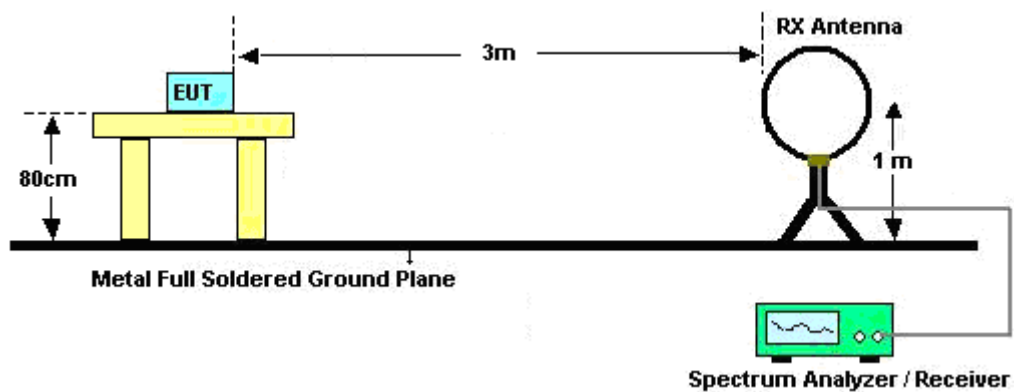
(2) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

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

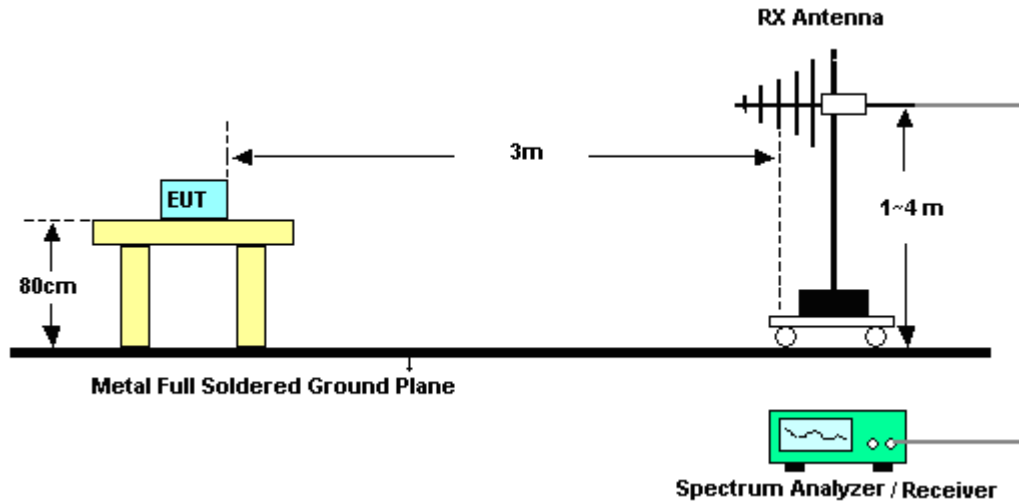
2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna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

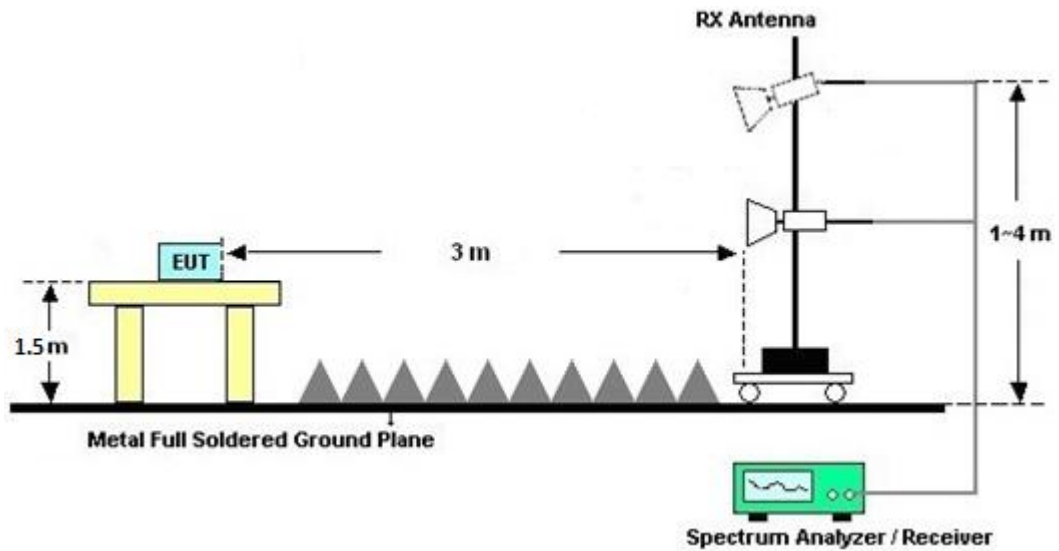
For radiated emissions below 30MHz



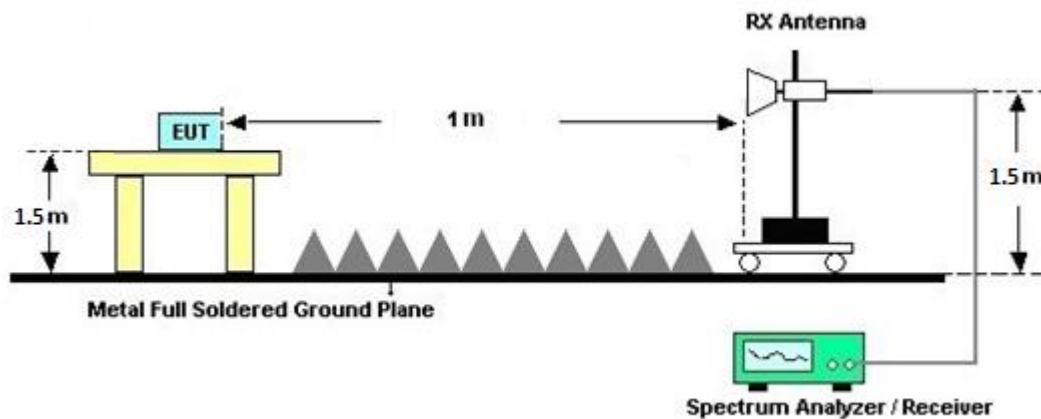
For radiated emissions from 30MHz to 1GHz



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

*Decreases with the logarithm of the frequency.

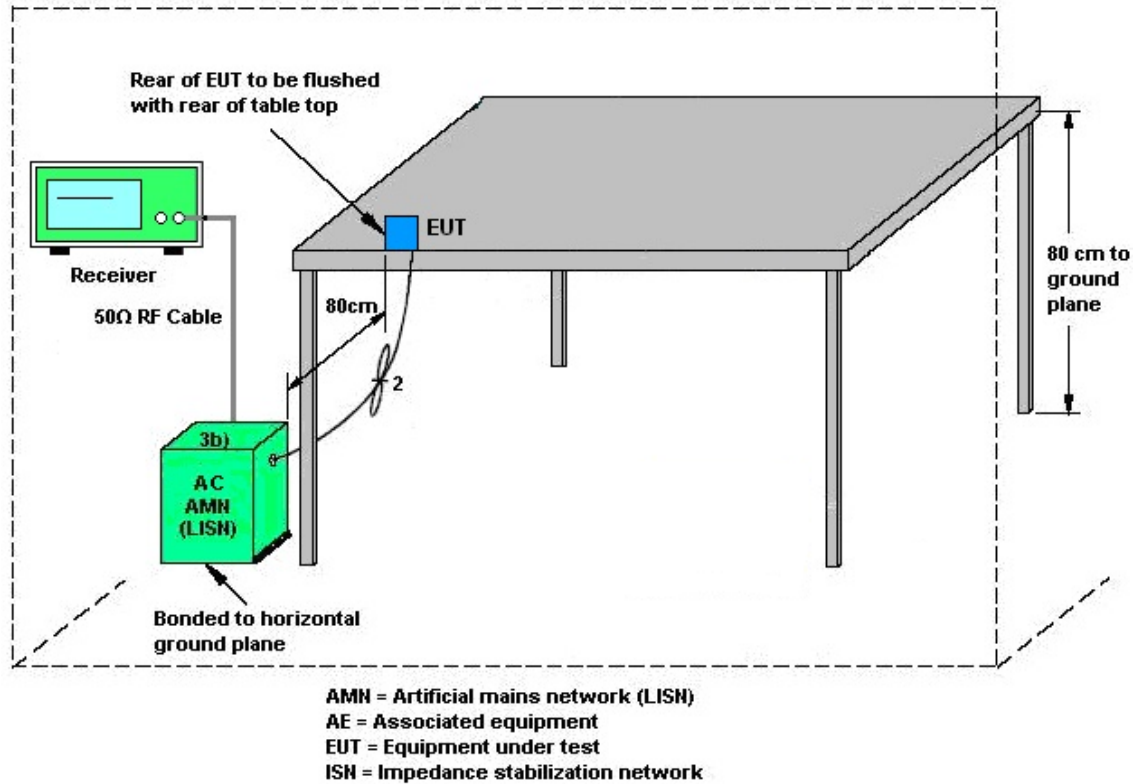
3.3.2 Measuring Instruments

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



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

Antenna permanently attached.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Sep. 24, 2024	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 06, 2023	Sep. 24, 2024	Dec. 05, 2024	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Oct. 26, 2023	Sep. 24, 2024	Oct. 25, 2024	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 08, 2023	Sep. 24, 2024	Dec. 07, 2024	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 22, 2023	Sep. 24, 2024	Nov. 21, 2024	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Sep. 24, 2024	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-FN	00691	N/A	Jul. 30, 2024	Sep. 24, 2024	Jul. 29, 2025	Conduction (CO05-HY)
RF Cable	HUBER + SUHNER	RG 214/U	1358175	9kHz~30MHz	Mar. 14, 2024	Sep. 24, 2024	Mar. 13, 2025	Conduction (CO05-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 05, 2024	Oct. 14, 2024~ Oct. 17, 2024	Oct. 04, 2025	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Aug. 28, 2024	Oct. 14, 2024~ Oct. 17, 2024	Aug. 27, 2025	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00993	18GHz~40GHz	Nov. 24, 2023	Oct. 14, 2024~ Oct. 17, 2024	Nov. 23, 2024	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 08, 2023	Oct. 14, 2024~ Oct. 17, 2024	Dec. 07, 2024	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Mar. 25, 2024	Oct. 14, 2024~ Oct. 17, 2024	Mar. 24, 2025	Radiation (03CH11-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055007	1GHz~18GHz	Jun. 13, 2024	Oct. 14, 2024~ Oct. 17, 2024	Jun. 12, 2025	Radiation (03CH11-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 07, 2023	Oct. 14, 2024~ Oct. 17, 2024	Dec. 06, 2024	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 14, 2024	Oct. 17, 2024	Oct. 13, 2025	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz~44GHz	May 13, 2024	Oct. 14, 2024~ Oct. 16, 2024	May 12, 2025	Radiation (03CH11-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY55420170	20MHz~8.4GHz	Jul. 19, 2024	Oct. 14, 2024~ Oct. 17, 2024	Jul. 18, 2025	Radiation (03CH11-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	Oct. 14, 2024~ Oct. 17, 2024	N/A	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Oct. 14, 2024~ Oct. 17, 2024	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Oct. 14, 2024~ Oct. 17, 2024	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001053	N/A	N/A	Oct. 14, 2024~ Oct. 17, 2024	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	804013/2	30M~40G	May 23, 2024	Oct. 14, 2024~ Oct. 17, 2024	May 22, 2025	Radiation (03CH11-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz~40GHz	Mar. 06, 2024	Oct. 14, 2024~ Oct. 17, 2024	Mar. 05, 2025	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	9K~30M	Mar. 06, 2024	Oct. 14, 2024~ Oct. 17, 2024	Mar. 05, 2025	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	803951/2	30M~40G	Mar. 06, 2024	Oct. 14, 2024~ Oct. 17, 2024	Mar. 05, 2025	Radiation (03CH11-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40SS	SN3	6.75GHz High Pass Filter	Sep. 10, 2024	Oct. 14, 2024~ Oct. 17, 2024	Sep. 09, 2025	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-15 30-8000-40SS	SN11	1.53GHz Low Pass Filter	Sep. 10, 2024	Oct. 14, 2024~ Oct. 17, 2024	Sep. 09, 2025	Radiation (03CH11-HY)
Hygrometer	TECEPIL	DTM-303B	TP140325	N/A	Dec. 08, 2023	Oct. 14, 2024~ Oct. 17, 2024	Dec. 07, 2024	Radiation (03CH11-HY)
Hygrometer	TECEPIL	DTM-303A	TP201996	N/A	Nov. 07, 2023	Sep. 24, 2024	Nov. 06, 2024	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	15I00041SNO 10 (NO:248)	10MHz~6GHz	Jan. 10, 2024	Sep. 24, 2024	Jan. 09, 2025	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 23, 2024	Sep. 24, 2024	Aug. 22, 2025	Conducted (TH05-HY)
Switch Control Mainframe	Burgeon	ETF-058	EC1300484 (BOX3)	N/A	May 20, 2024	Sep. 24, 2024	May 19, 2025	Conducted (TH05-HY)
Software	Sporton	BTWIFI_Final_ version_24051 3	N/A	Conducted Other Test Item	N/A	Sep. 24, 2024	N/A	Conducted (TH05-HY)

5 Measurement Uncertainty

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	3.5 dB
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	6.4 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 6000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1 dB
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Uncertainty of Radiated Emission Measurement (6000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.3 dB
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.3 dB
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Eason Huang	Temperature:	21~25	°C
Test Date:	2024/9/24	Relative Humidity:	51~54	%
Remark: For Conducted Test Items, Ant. A means Chain 1 (Aux.) and Ant. B means Chain 2 (Main).				

TEST RESULTS DATA
Average Power Table

FCC U-NII-1 single antenna													
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
					Ant. A	Ant. B	SUM	Ant. A	Ant. B	Ant. A	Ant. B		
VHT40	MCS0	1	38	5190	17.70	-	-	24.00	24.00	4.27	1.92	-	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. A	Ant. B	SUM	Ant. A	Ant. B	Ant. A	Ant. B		
VHT80	MCS0	2	58	5290	13.90	13.90	16.91	23.98		3.66		30	Pass



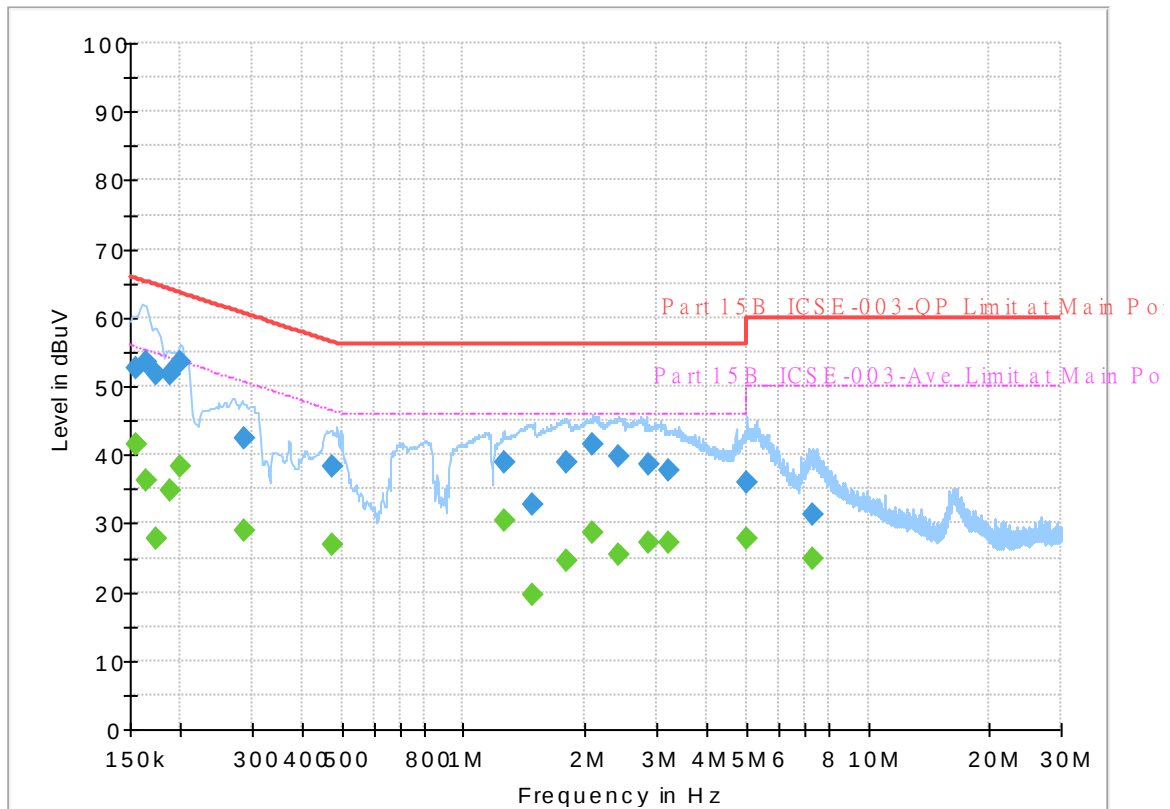
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Calvin Wang	Temperature :	23~26°C
		Relative Humidity :	45~55%

EUT Information

Report NO : 0D1216-04
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Line

Full Spectrum



Final_Result

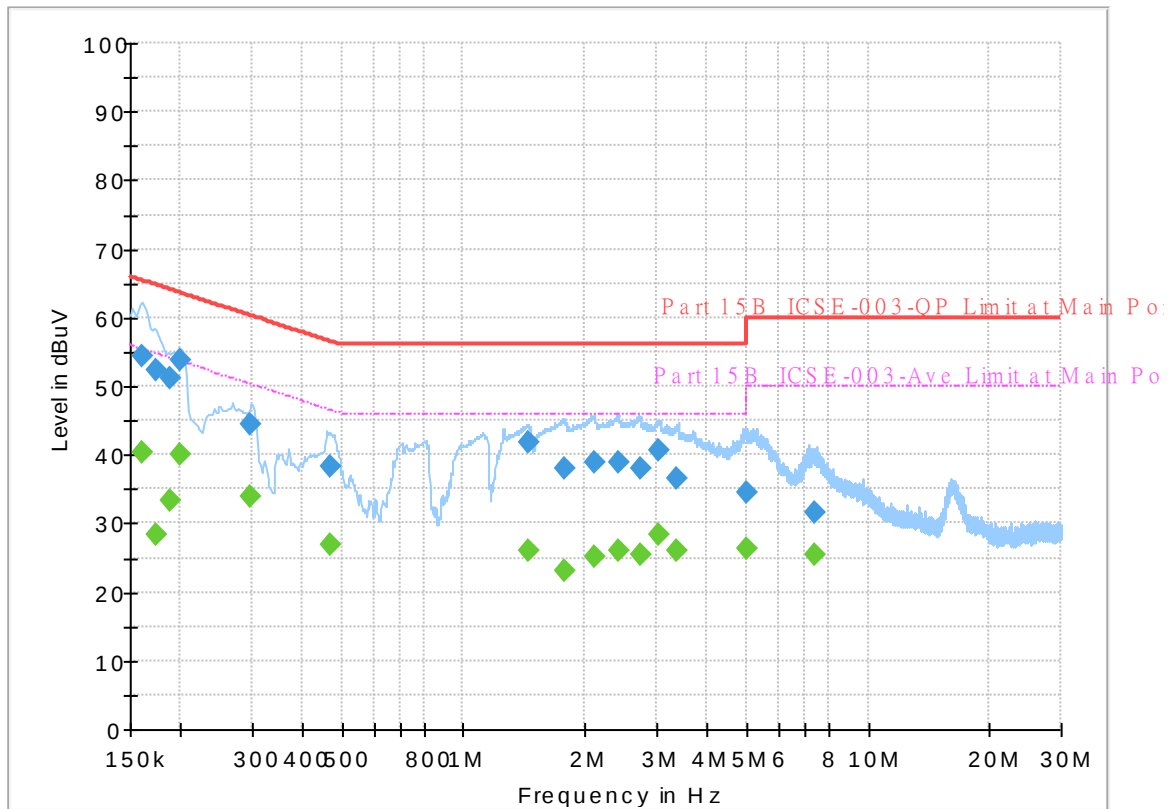
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154500	---	41.54	55.75	14.21	L1	OFF	19.8
0.154500	52.57	---	65.75	13.18	L1	OFF	19.8
0.163500	---	36.39	55.28	18.89	L1	OFF	19.8
0.163500	53.48	---	65.28	11.80	L1	OFF	19.8
0.174750	---	27.76	54.73	26.97	L1	OFF	19.8
0.174750	51.82	---	64.73	12.91	L1	OFF	19.8
0.188250	---	34.90	54.11	19.21	L1	OFF	19.8
0.188250	51.75	---	64.11	12.36	L1	OFF	19.8
0.199500	---	38.24	53.63	15.39	L1	OFF	19.8
0.199500	53.60	---	63.63	10.03	L1	OFF	19.8
0.287250	---	29.07	50.60	21.53	L1	OFF	19.8
0.287250	42.35	---	60.60	18.25	L1	OFF	19.8
0.471750	---	26.81	46.48	19.67	L1	OFF	19.8
0.471750	38.17	---	56.48	18.31	L1	OFF	19.8
1.257000	---	30.52	46.00	15.48	L1	OFF	19.8
1.257000	38.92	---	56.00	17.08	L1	OFF	19.8
1.479750	---	19.71	46.00	26.29	L1	OFF	19.8
1.479750	32.72	---	56.00	23.28	L1	OFF	19.8
1.799250	---	24.42	46.00	21.58	L1	OFF	19.8
1.799250	38.98	---	56.00	17.02	L1	OFF	19.8
2.078250	---	28.62	46.00	17.38	L1	OFF	19.8

2.078250	41.39	---	56.00	14.61	L1	OFF	19.8
2.420250	---	25.54	46.00	20.46	L1	OFF	19.8
2.420250	39.73	---	56.00	16.27	L1	OFF	19.8
2.870250	---	27.24	46.00	18.76	L1	OFF	19.8
2.870250	38.47	---	56.00	17.53	L1	OFF	19.8
3.216750	---	27.34	46.00	18.66	L1	OFF	19.8
3.216750	37.70	---	56.00	18.30	L1	OFF	19.8
5.007750	---	27.67	50.00	22.33	L1	OFF	19.8
5.007750	35.93	---	60.00	24.07	L1	OFF	19.8
7.316250	---	24.74	50.00	25.26	L1	OFF	19.9
7.316250	31.14	---	60.00	28.86	L1	OFF	19.9

EUT Information

Report NO : 0D1216-04
 Test Mode : Mode 1
 Test Voltage : 120Vac/60Hz
 Phase : Neutral

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.161250	---	40.36	55.40	15.04	N	OFF	19.8
0.161250	54.49	---	65.40	10.91	N	OFF	19.8
0.174750	---	28.25	54.73	26.48	N	OFF	19.8
0.174750	52.45	---	64.73	12.28	N	OFF	19.8
0.188250	---	33.21	54.11	20.90	N	OFF	19.8
0.188250	51.18	---	64.11	12.93	N	OFF	19.8
0.199500	---	39.97	53.63	13.66	N	OFF	19.8
0.199500	53.81	---	63.63	9.82	N	OFF	19.8
0.298500	---	33.93	50.28	16.35	N	OFF	19.8
0.298500	44.47	---	60.28	15.81	N	OFF	19.8
0.469500	---	26.92	46.52	19.60	N	OFF	19.8
0.469500	38.41	---	56.52	18.11	N	OFF	19.8
1.446000	---	25.93	46.00	20.07	N	OFF	19.8
1.446000	41.70	---	56.00	14.30	N	OFF	19.8
1.772250	---	23.17	46.00	22.83	N	OFF	19.8
1.772250	37.95	---	56.00	18.05	N	OFF	19.8
2.109750	---	25.15	46.00	20.85	N	OFF	19.8
2.109750	39.01	---	56.00	16.99	N	OFF	19.8
2.418000	---	25.90	46.00	20.10	N	OFF	19.8
2.418000	38.88	---	56.00	17.12	N	OFF	19.8
2.742000	---	25.48	46.00	20.52	N	OFF	19.8

2.742000	37.90	---	56.00	18.10	N	OFF	19.8
3.045750	---	28.46	46.00	17.54	N	OFF	19.8
3.045750	40.58	---	56.00	15.42	N	OFF	19.8
3.383250	---	26.11	46.00	19.89	N	OFF	19.8
3.383250	36.48	---	56.00	19.52	N	OFF	19.8
5.032500	---	26.31	50.00	23.69	N	OFF	19.9
5.032500	34.51	---	60.00	25.49	N	OFF	19.9
7.363500	---	25.38	50.00	24.62	N	OFF	19.9
7.363500	31.53	---	60.00	28.47	N	OFF	19.9



Appendix C. Radiated Spurious Emission Test Data

Test Engineer :	Kevin Hsu, Fu Chen, and Troye Hsieh	Temperature :	20.1~24.0°C
		Relative Humidity :	43.7~51.3%

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

Note symbol

-L	Low channel location
-R	High channel location

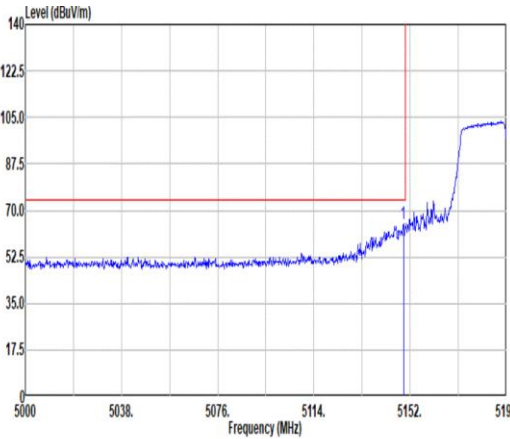
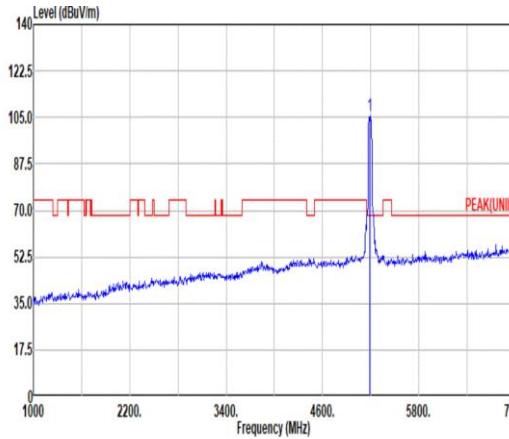
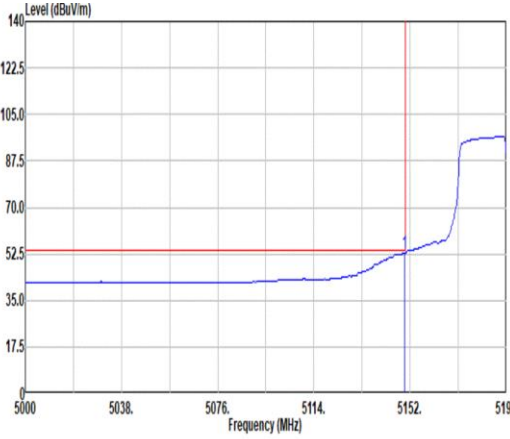
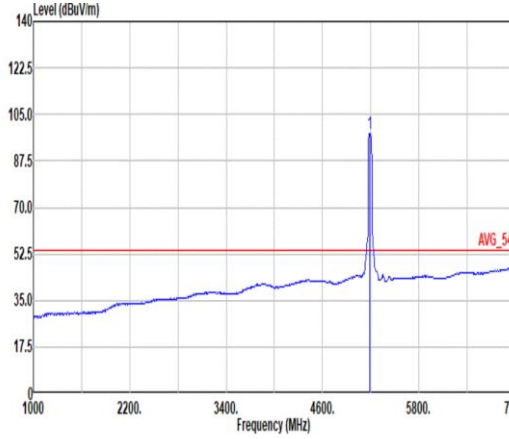
C1. Radiated Spurious Emission Test Modes

Mode	Band	Band (GHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 1	U-NII-1	5.15-5.25	A	802.11ac VHT40	38	5190	MCS0	-	-
Mode 2	U-NII-2A	5.15-5.25	A+B	802.11ac VHT80	58	5290	MCS0	-	-
Mode 3	U-NII-1	5.15-5.25	A	802.11ac VHT40	38	5190	MCS0	-	SHF
Mode 4	U-NII-1	5.15-5.25	A	802.11ac VHT40	38	5190	MCS0	-	LF

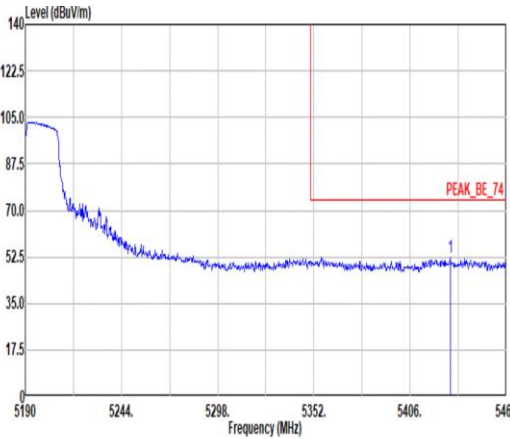
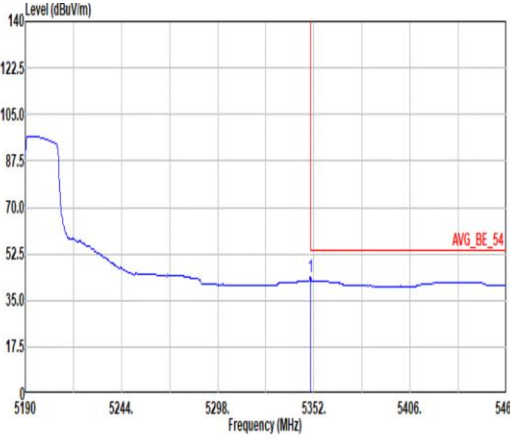
C2. Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	RU	Remark
1	802.11ac VHT40	38	5149.91	52.94	54.00	-1.06	V	Avg.	Pass	-	Band Edge
	802.11ac VHT40	38	10380.00	45.77	68.20	-22.43	V	Peak	Pass	-	Harmonic
2	802.11ac VHT80	58	5350.01	52.68	54.00	-1.32	H	Avg.	Pass	-	Band Edge
	802.11ac VHT80	58	10580.00	45.18	68.20	-23.02	H	Peak	Pass	-	Harmonic
3	SHF	38	39599.28	49.86	54.00	-4.14	H	Avg.	Pass	-	SHF
4	LF	38	30.00	32.29	40.00	-7.71	H	Peak	Pass	-	LF

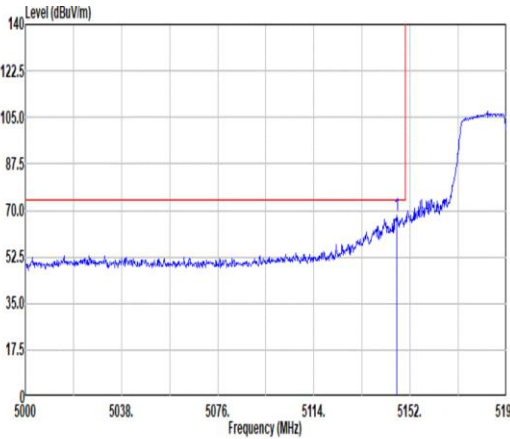
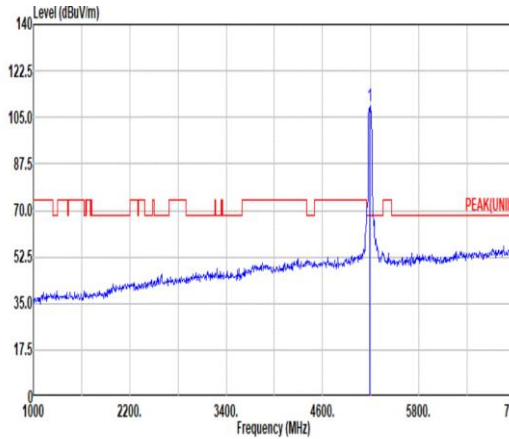
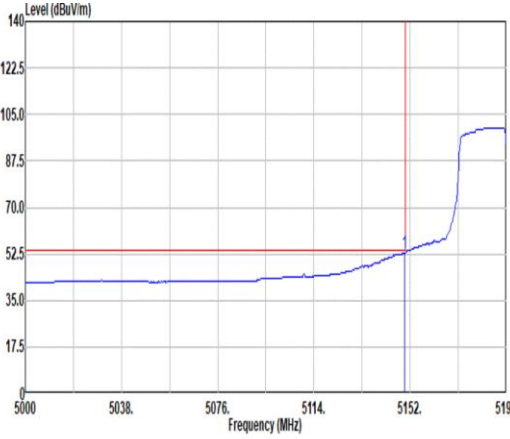
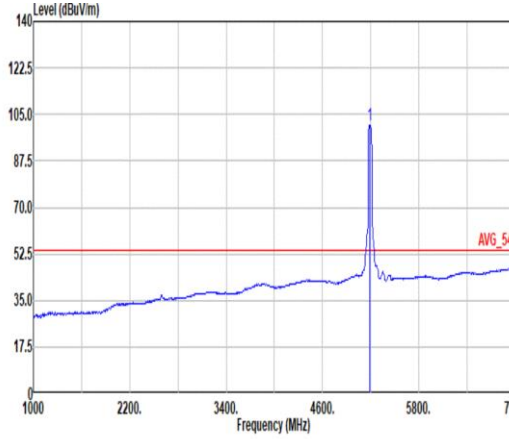


Mode	1																																																																																									
	Band Edge - L																																																																																									
	U-NII-1_5.15-5.25_802.11ac VHT40_CH38_5190MHz																																																																																									
ANT	A																																																																																									
Pol.	Horizontal	Fundamental																																																																																								
Peak	 Site : 03CH11-HY Condition: PEAK_BE_74 3m 91200_01620_240828 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SMT:Auto <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line Margin</th><th>Level Factor</th><th>Loss Factor</th><th>Loss Factor</th><th>Factor</th><th></th><th></th><th></th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>5149.34</td><td>65.21</td><td>74.00</td><td>-8.79</td><td>54.51</td><td>33.20</td><td>10.37</td><td>32.87</td><td>0.00</td><td>100</td><td>158</td><td>PEAK</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line Margin	Level Factor	Loss Factor	Loss Factor	Factor					MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	5149.34	65.21	74.00	-8.79	54.51	33.20	10.37	32.87	0.00	100	158	PEAK	 Site : 03CH11-HY Condition: PEAK(UNII) 3m 91200_01620_240828 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SMT:Auto <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line Margin</th><th>Level Factor</th><th>Loss Factor</th><th>Loss Factor</th><th>Factor</th><th></th><th></th><th></th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>5190.00</td><td>105.73</td><td>-----</td><td>-----</td><td>95.17</td><td>33.02</td><td>10.40</td><td>32.86</td><td>0.00</td><td>100</td><td>158</td><td>PEAK</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line Margin	Level Factor	Loss Factor	Loss Factor	Factor					MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	5190.00	105.73	-----	-----	95.17	33.02	10.40	32.86	0.00	100	158	PEAK
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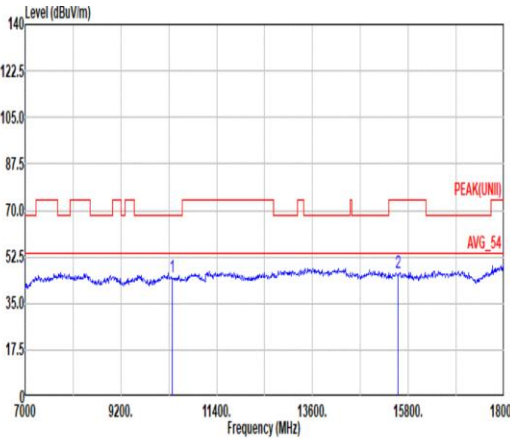
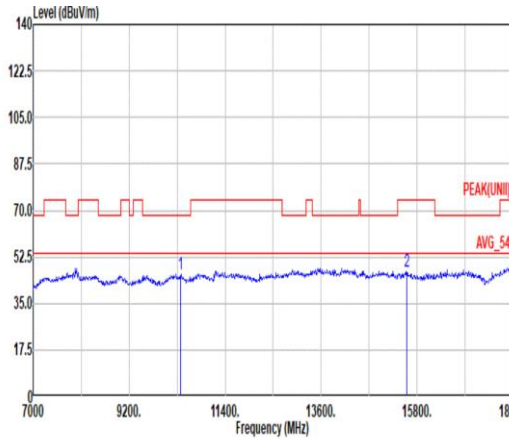


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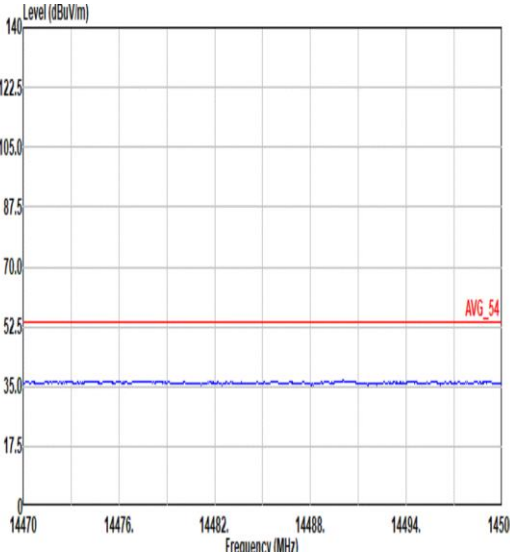
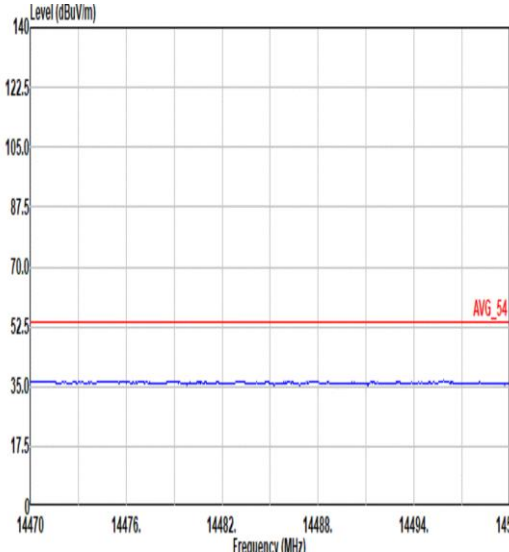
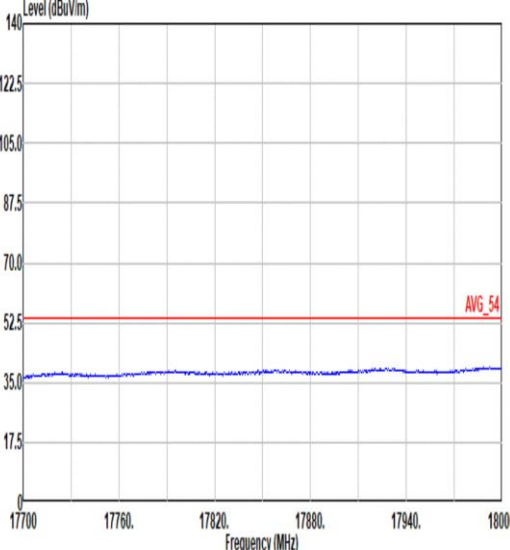
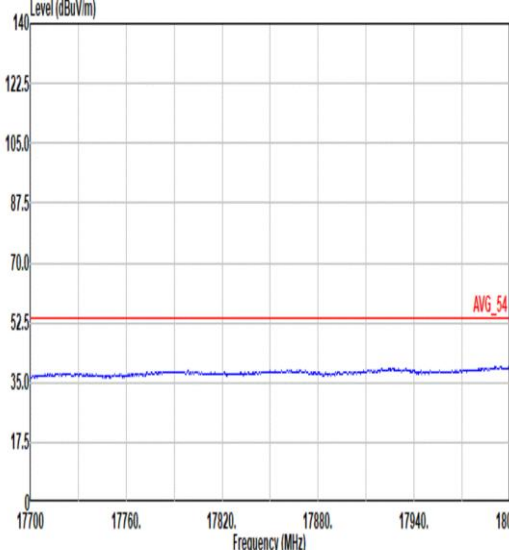


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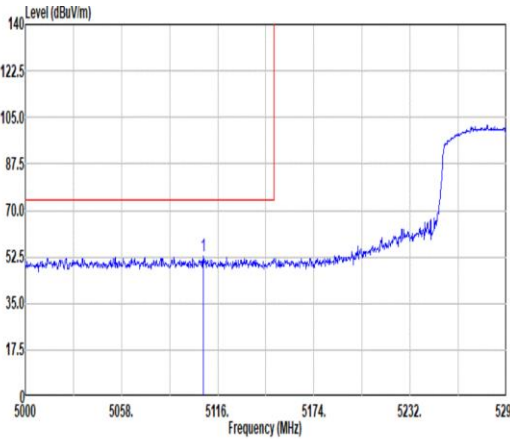
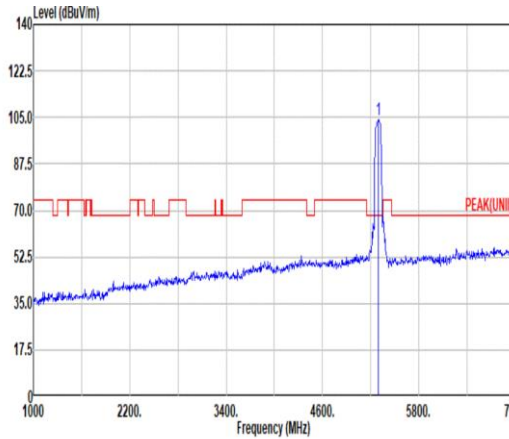
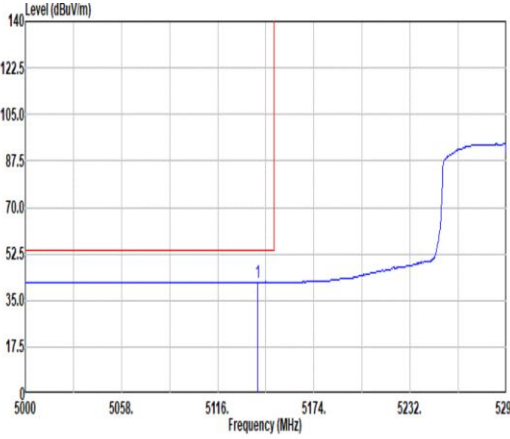
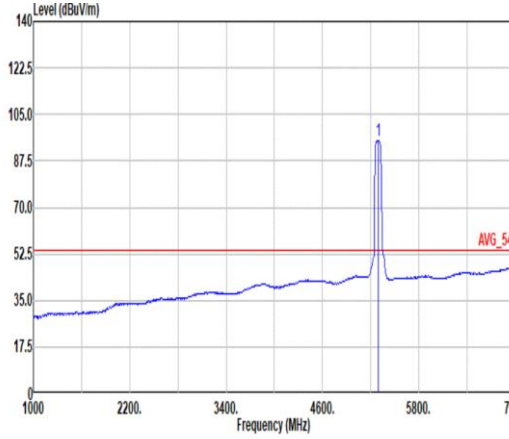


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Peak Avg.	 Site : 03CH11-HY Condition: PEAK(UNII) 3m 91200_01620_240828 HORIZONTAL <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th></th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>10380.00</td><td>44.93</td><td>68.20</td><td>-23.27</td><td>49.03</td><td>38.60</td><td>17.54</td><td>60.56</td><td>0.32</td><td>--</td><td>PEAK</td></tr><tr><td>2</td><td>15570.00</td><td>46.43</td><td>74.00</td><td>-27.57</td><td>48.73</td><td>38.06</td><td>21.59</td><td>62.28</td><td>0.33</td><td>--</td><td>PEAK</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos		Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor	Remark		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	10380.00	44.93	68.20	-23.27	49.03	38.60	17.54	60.56	0.32	--	PEAK	2	15570.00	46.43	74.00	-27.57	48.73	38.06	21.59	62.28	0.33	--	PEAK	 Site : 03CH11-HY Condition: PEAK(UNII) 3m 91200_01620_240828 VERTICAL <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th></th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>10380.00</td><td>45.77</td><td>68.20</td><td>-22.43</td><td>49.07</td><td>38.60</td><td>17.54</td><td>60.56</td><td>0.32</td><td>--</td><td>PEAK</td></tr><tr><td>2</td><td>15570.00</td><td>46.92</td><td>74.00</td><td>-27.08</td><td>49.22</td><td>38.06</td><td>21.59</td><td>62.28</td><td>0.33</td><td>--</td><td>PEAK</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos		Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor	Remark		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	10380.00	45.77	68.20	-22.43	49.07	38.60	17.54	60.56	0.32	--	PEAK	2	15570.00	46.92	74.00	-27.08	49.22	38.06	21.59	62.28	0.33	--	PEAK
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Mode	1	
	Harmonic	
	U-NII-1_5.15-5.25_802.11ac VHT40_CH38_5190MHz	
ANT	A	
Pol.	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH11-HY Condition: AVG_54 3m 91200_01620_240828 HORIZONTAL	 Site : 03CH11-HY Condition: AVG_54 3m 91200_01620_240828 VERTICAL
17.7G ~18G Avg.	 Site : 03CH11-HY Condition: AVG_54 3m 91200_01620_240828 HORIZONTAL	 Site : 03CH11-HY Condition: AVG_54 3m 91200_01620_240828 VERTICAL



Mode	2																																																																																	
	Band Edge - L																																																																																	
	U-NII-2A_5.15-5.25_802.11ac VHT80_CH58_5290MHz																																																																																	
ANT	A+B																																																																																	
Pol.	Horizontal	Fundamental																																																																																
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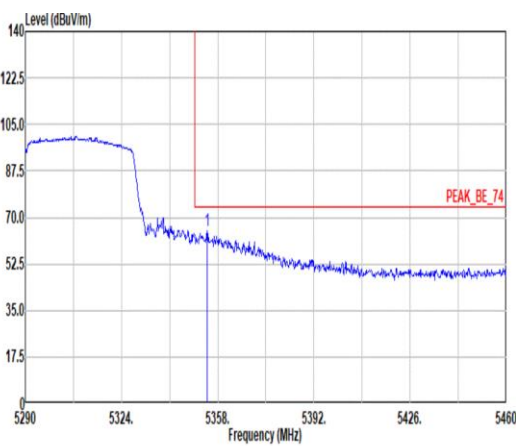
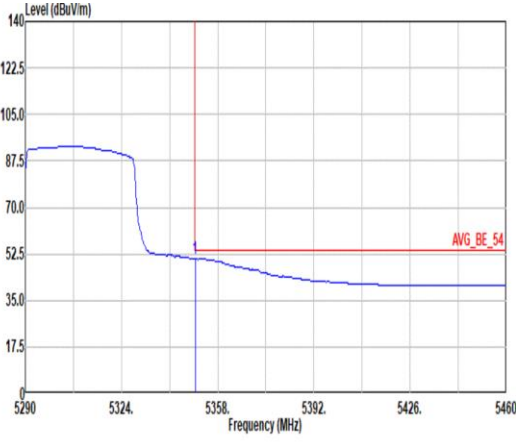


Mode	2																																													
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	U-NII-2A_5.15-5.25_802.11ac VHT80_CH58_5290MHz																																													
ANT	A+B																																													
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Avg.	Site : 03CH11-HY Condition: AVG_BE_54 3m 91200_01620_240828 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto <table><thead><tr><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th></tr></thead><tbody><tr><td>1 5290.00</td><td>93.94</td><td>74.00</td><td>-19.06</td><td>41.88</td><td>32.95</td><td>10.31</td><td>32.87</td><td>0.00</td></tr></tbody></table>	Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	1 5290.00	93.94	74.00	-19.06	41.88	32.95	10.31	32.87	0.00	Site : 03CH11-HY Condition: AVG_54 3m 91200_01620_240828 VERTICAL : RBW:1000.000kHz VBW:0.010kHz SWT:Auto <table><thead><tr><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th></tr></thead><tbody><tr><td>1 5290.00</td><td>93.94</td><td>70.00</td><td>-23.94</td><td>83.38</td><td>32.96</td><td>10.46</td><td>32.86</td><td>0.00</td></tr></tbody></table>	Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	dB	1 5290.00	93.94	70.00	-23.94	83.38	32.96	10.46	32.86	0.00
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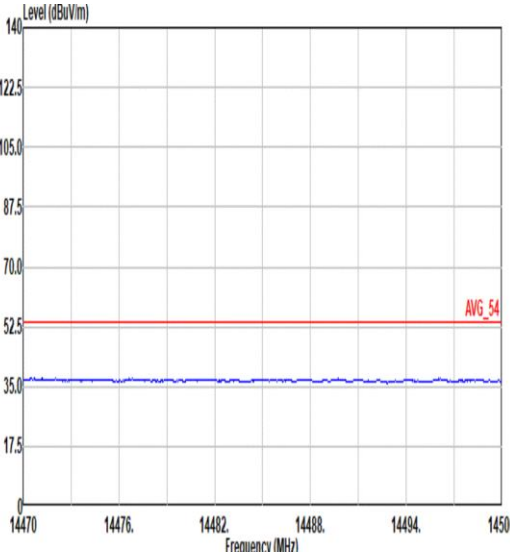
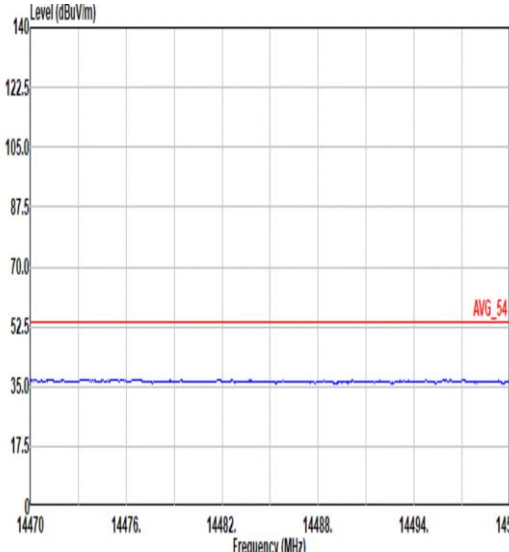
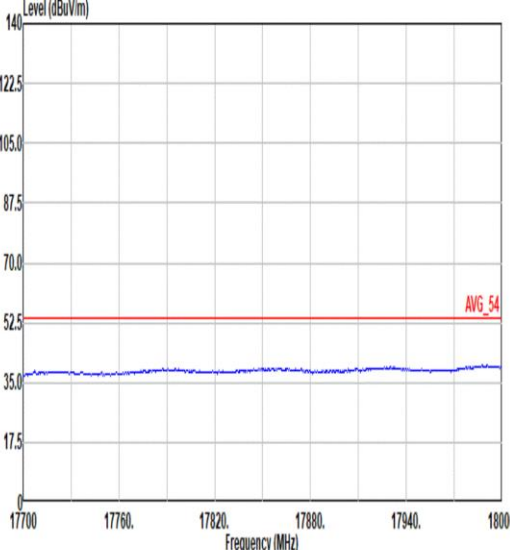
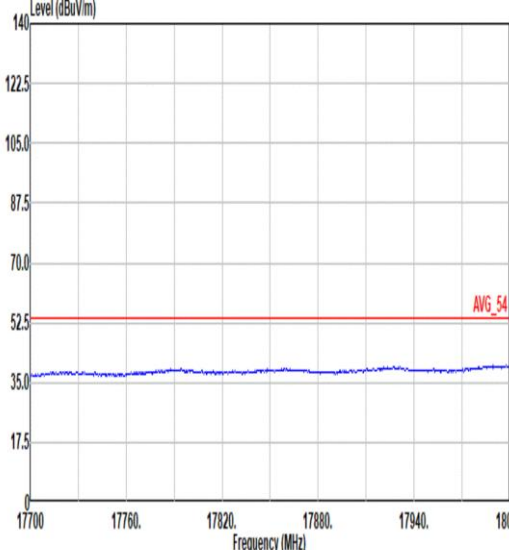


Mode	2																																													
	Band Edge - R																																													
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ANT	A+B																																													
Pol.	Vertical	Fundamental																																												
Peak	 Site : 03CH11-HY Condition: PEAK_BE_74 3m 91200_01620_240028 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SMT:Auto <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th></th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>5354.26</td><td>64.73</td><td>74.00</td><td>-9.27</td><td>54.18</td><td>32.89</td><td>10.51</td><td>32.85</td><td>0.00</td><td>300</td><td>221</td><td>PEAK</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos		Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor	Remark		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	5354.26	64.73	74.00	-9.27	54.18	32.89	10.51	32.85	0.00	300	221	PEAK	Blank
	Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos																																						
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Peak Avg.	Site : 03CH11-HY Condition: PEAK(UNII) 3m 91200_01620_240828 HORIZONTAL <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th></th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>10580.00</td><td>45.18</td><td>68.20</td><td>-23.02</td><td>49.26</td><td>38.88</td><td>17.60</td><td>60.89</td><td>0.33</td><td>--</td><td>PEAK</td></tr><tr><td>2</td><td>15870.00</td><td>45.94</td><td>74.00</td><td>-28.06</td><td>47.71</td><td>37.68</td><td>21.74</td><td>61.51</td><td>0.32</td><td>--</td><td>PEAK</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos		Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor	Remark		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	10580.00	45.18	68.20	-23.02	49.26	38.88	17.60	60.89	0.33	--	PEAK	2	15870.00	45.94	74.00	-28.06	47.71	37.68	21.74	61.51	0.32	--	PEAK	Site : 03CH11-HY Condition: PEAK(UNII) 3m 91200_01620_240828 VERTICAL <table><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th></th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th>Remark</th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>10580.00</td><td>44.72</td><td>68.20</td><td>-23.48</td><td>48.80</td><td>38.88</td><td>17.60</td><td>60.89</td><td>0.33</td><td>--</td><td>PEAK</td></tr><tr><td>2</td><td>15870.00</td><td>45.36</td><td>74.00</td><td>-28.64</td><td>47.13</td><td>37.68</td><td>21.74</td><td>61.51</td><td>0.32</td><td>--</td><td>PEAK</td></tr></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos		Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Factor	Remark		MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	10580.00	44.72	68.20	-23.48	48.80	38.88	17.60	60.89	0.33	--	PEAK	2	15870.00	45.36	74.00	-28.64	47.13	37.68	21.74	61.51	0.32	--	PEAK
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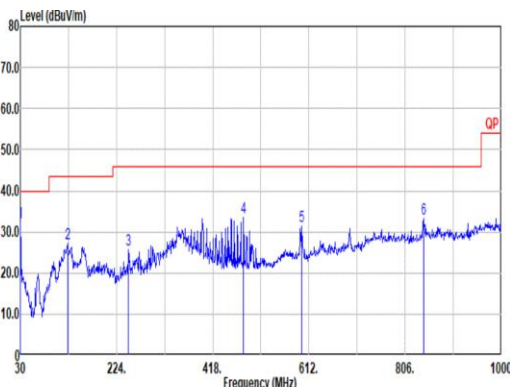
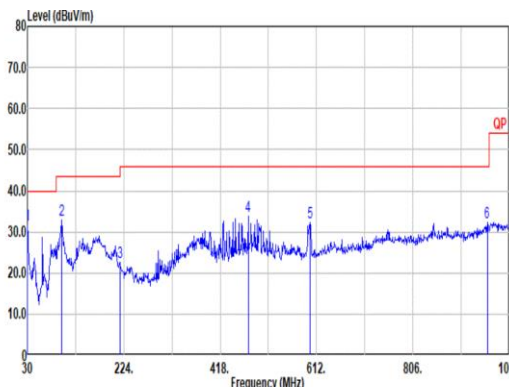


Mode	2	
	Harmonic	
	U-NII-2A_5.15-5.25_802.11ac VHT80_CH58_5290MHz	
ANT	A+B	
Pol.	Horizontal	Vertical
14.47G ~14.5G Avg.	 Site : 03CH11-HY Condition: AVG_54 3m 91280_01620_240828 HORIZONTAL	 Site : 03CH11-HY Condition: AVG_54 3m 91280_01620_240828 VERTICAL
17.7G ~18G Avg.	 Site : 03CH11-HY Condition: AVG_54 3m 91280_01620_240828 HORIZONTAL	 Site : 03CH11-HY Condition: AVG_54 3m 91280_01620_240828 VERTICAL



Mode	3																																																																																																																																							
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Peak Avg.	Site : 03CH11-HY Condition: PEAK(UNII) 1m SHF_00993_231124 HORIZONTAL <table><thead><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line Margin</th><th>Level</th><th>Factor</th><th>Loss Factor</th><th>Factor</th><th></th><th></th><th></th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr></thead><tbody><tr><td>1</td><td>25546.38</td><td>40.54</td><td>68.20</td><td>-27.66</td><td>35.76</td><td>39.00</td><td>28.40</td><td>53.08</td><td>-9.54</td><td>--</td><td>PEAK</td></tr><tr><td>2</td><td>39599.28</td><td>59.27</td><td>74.00</td><td>-14.73</td><td>38.30</td><td>44.99</td><td>35.88</td><td>50.36</td><td>-9.54</td><td>100</td><td>121 PEAK</td></tr><tr><td>3</td><td>39599.28</td><td>49.86</td><td>54.00</td><td>-4.14</td><td>28.92</td><td>44.95</td><td>35.88</td><td>50.35</td><td>-9.54</td><td>100</td><td>121 AVERAGE</td></tr></tbody></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line Margin	Level	Factor	Loss Factor	Factor					MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	25546.38	40.54	68.20	-27.66	35.76	39.00	28.40	53.08	-9.54	--	PEAK	2	39599.28	59.27	74.00	-14.73	38.30	44.99	35.88	50.36	-9.54	100	121 PEAK	3	39599.28	49.86	54.00	-4.14	28.92	44.95	35.88	50.35	-9.54	100	121 AVERAGE	Site : 03CH11-HY Condition: PEAK(UNII) 1m SHF_00993_231124 VERTICAL <table><thead><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th>Remark</th></tr><tr><th>Freq</th><th>Level</th><th>Line Margin</th><th>Level</th><th>Factor</th><th>Loss Factor</th><th>Factor</th><th></th><th></th><th></th></tr><tr><th></th><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr></thead><tbody><tr><td>1</td><td>25990.34</td><td>39.97</td><td>68.20</td><td>-28.23</td><td>35.13</td><td>38.90</td><td>28.38</td><td>52.90</td><td>-9.54</td><td>--</td><td>PEAK</td></tr><tr><td>2</td><td>39552.67</td><td>58.29</td><td>74.00</td><td>-15.71</td><td>38.02</td><td>44.34</td><td>35.94</td><td>50.47</td><td>-9.54</td><td>100</td><td>293 PEAK</td></tr><tr><td>3</td><td>39552.67</td><td>49.05</td><td>54.00</td><td>-4.95</td><td>28.75</td><td>44.38</td><td>35.93</td><td>50.47</td><td>-9.54</td><td>100</td><td>293 AVERAGE</td></tr></tbody></table>		Limit	Read	Ant	Cable	Preamp	Aux	APos	TPos	Remark	Freq	Level	Line Margin	Level	Factor	Loss Factor	Factor					MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg	1	25990.34	39.97	68.20	-28.23	35.13	38.90	28.38	52.90	-9.54	--	PEAK	2	39552.67	58.29	74.00	-15.71	38.02	44.34	35.94	50.47	-9.54	100	293 PEAK	3	39552.67	49.05	54.00	-4.95	28.75	44.38	35.93	50.47	-9.54	100	293 AVERAGE
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38.6G ~40G Avg.	Site : 03CH11-HY Condition: AVG_54 1m SHF_00993_231124 HORIZONTAL	Site : 03CH11-HY Condition: AVG_54 1m SHF_00993_231124 VERTICAL																																																																																																																																						



Mode	4																																																																																																																																																																																																																																												
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QP/ Peak																																																																																																																																																																																																																																													
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	<table><tr><th></th><th colspan="2">Limit</th><th colspan="2">Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th rowspan="2">Remark</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th></th><th></th></tr><tr><th></th><th>MHz</th><th>dBm</th><th>dBm</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>30.00</td><td>32.29</td><td>40.00</td><td>-7.71</td><td>39.83</td><td>24.34</td><td>0.50</td><td>32.46</td><td>0.08</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>2</td><td>125.06</td><td>27.10</td><td>43.50</td><td>-16.40</td><td>40.43</td><td>17.51</td><td>1.22</td><td>32.11</td><td>0.05</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>3</td><td>248.25</td><td>25.52</td><td>46.00</td><td>-20.48</td><td>37.56</td><td>18.03</td><td>1.93</td><td>32.17</td><td>0.17</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>4</td><td>480.00</td><td>33.44</td><td>46.00</td><td>-12.56</td><td>39.40</td><td>23.35</td><td>2.00</td><td>32.23</td><td>0.12</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>5</td><td>597.45</td><td>31.51</td><td>46.00</td><td>-14.49</td><td>34.91</td><td>25.69</td><td>3.17</td><td>32.38</td><td>0.12</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>6</td><td>842.86</td><td>33.09</td><td>46.00</td><td>-12.91</td><td>31.58</td><td>29.30</td><td>3.73</td><td>31.62</td><td>0.10</td><td>--</td><td>--</td><td>Peak</td></tr></table>							Limit		Read		Ant	Cable	Preamp	Aux	APos	TPos	Remark		Freq	Level	Margin	Level	Factor	Loss	Factor	Factor				MHz	dBm	dBm	dB	dBuV	dB/m	dB	dB	dB	cm	deg	1	30.00	32.29	40.00	-7.71	39.83	24.34	0.50	32.46	0.08	--	--	Peak	2	125.06	27.10	43.50	-16.40	40.43	17.51	1.22	32.11	0.05	--	--	Peak	3	248.25	25.52	46.00	-20.48	37.56	18.03	1.93	32.17	0.17	--	--	Peak	4	480.00	33.44	46.00	-12.56	39.40	23.35	2.00	32.23	0.12	--	--	Peak	5	597.45	31.51	46.00	-14.49	34.91	25.69	3.17	32.38	0.12	--	--	Peak	6	842.86	33.09	46.00	-12.91	31.58	29.30	3.73	31.62	0.10	--	--	Peak	<table><tr><th></th><th colspan="2">Limit</th><th colspan="2">Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>Aux</th><th>APos</th><th>TPos</th><th rowspan="2">Remark</th></tr><tr><th></th><th>Freq</th><th>Level</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Factor</th><th></th><th></th></tr><tr><th></th><th>MHz</th><th>dBm</th><th>dBm</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>dB</th><th>cm</th><th>deg</th></tr><tr><td>1</td><td>30.00</td><td>31.58</td><td>40.00</td><td>-8.42</td><td>39.12</td><td>24.34</td><td>0.50</td><td>32.46</td><td>0.08</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>2</td><td>98.87</td><td>32.99</td><td>43.50</td><td>-10.51</td><td>40.34</td><td>15.90</td><td>1.00</td><td>32.37</td><td>0.04</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>3</td><td>216.24</td><td>22.59</td><td>46.00</td><td>-23.41</td><td>38.21</td><td>14.78</td><td>1.76</td><td>32.30</td><td>0.14</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>4</td><td>474.26</td><td>33.71</td><td>46.00</td><td>-12.29</td><td>39.67</td><td>23.31</td><td>2.78</td><td>32.16</td><td>0.11</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>5</td><td>599.39</td><td>32.33</td><td>46.00</td><td>-13.67</td><td>35.72</td><td>25.68</td><td>3.18</td><td>32.37</td><td>0.12</td><td>--</td><td>--</td><td>Peak</td></tr><tr><td>6</td><td>955.38</td><td>32.23</td><td>46.00</td><td>-13.77</td><td>27.59</td><td>31.26</td><td>4.09</td><td>30.93</td><td>0.22</td><td>--</td><td>--</td><td>Peak</td></tr></table>							Limit		Read		Ant	Cable	Preamp	Aux	APos	TPos	Remark		Freq	Level	Margin	Level	Factor	Loss	Factor	Factor				MHz	dBm	dBm	dB	dBuV	dB/m	dB	dB	dB	cm	deg	1	30.00	31.58	40.00	-8.42	39.12	24.34	0.50	32.46	0.08	--	--	Peak	2	98.87	32.99	43.50	-10.51	40.34	15.90	1.00	32.37	0.04	--	--	Peak	3	216.24	22.59	46.00	-23.41	38.21	14.78	1.76	32.30	0.14	--	--	Peak	4	474.26	33.71	46.00	-12.29	39.67	23.31	2.78	32.16	0.11	--	--	Peak	5	599.39	32.33	46.00	-13.67	35.72	25.68	3.18	32.37	0.12	--	--	Peak	6	955.38	32.23	46.00	-13.77	27.59	31.26	4.09	30.93	0.22	--	--
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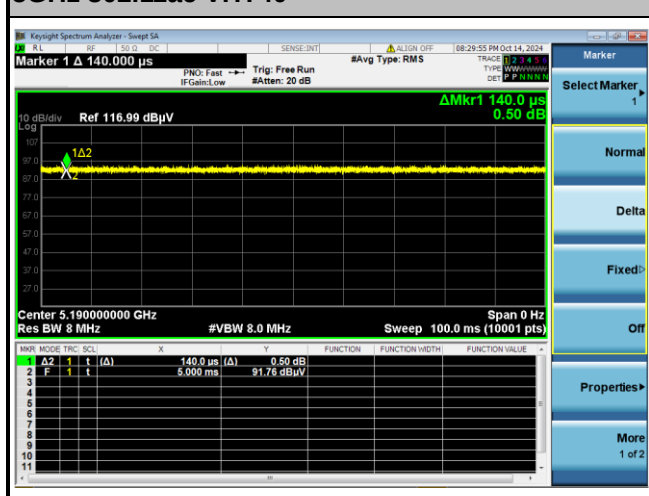


Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	5GHz 802.11ac VHT40	100.00	-	-	10Hz
1+2	5GHz 802.11ac VHT40	100.00	-	-	10Hz
1+2	5GHz 802.11ac VHT80	100.00	-	-	10Hz

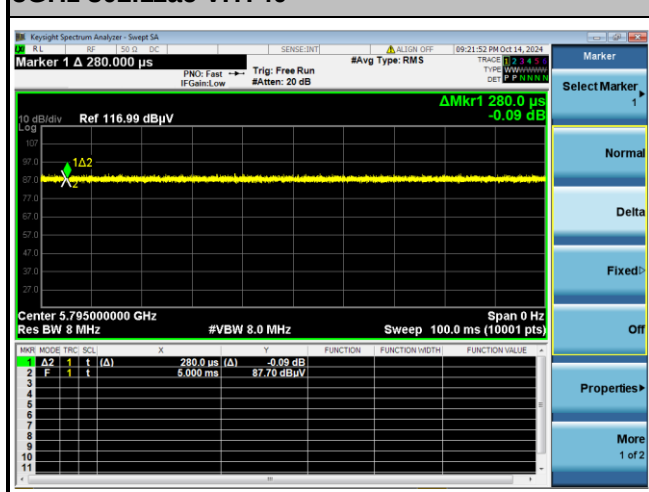
<Chain 1>

5GHz 802.11ac VHT40



MIMO <Chain 1+2>

5GHz 802.11ac VHT40



5GHz 802.11ac VHT80

