FCC RADIO TEST REPORT

FCC ID	:	**TX2-RTL8822C**
Equipment	:	**Module**
Brand Name	:	**Realtek**
Model Name	:	**RTL8822C**
Marketing Name	:	**11a/b/g/n/ac RTL8822C Combo module**
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. 01, 2022 and testing was performed from Sep. 16, 2022 to Nov. 04, 2022. We, Sporton International Inc. EMC & Wireless Communications 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. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issue Date
FR290129D	01	Initial issue of report	Nov. 04, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.403(i)	26dB Bandwidth	-	See Note
-	2.1049	99% Occupied Bandwidth	-	See Note
3.1	15.407(a)	Maximum Conducted Output Power	Pass	-
-	15.407(a)	Power Spectral Density	-	See Note
3.2	15.407(b)	Unwanted Emissions	Pass	2.40 dB under the limit at 5149.500 MHz
3.3	15.207	AC Conducted Emission	Pass	11.81 dB under the limit at 0.179 MHz
3.4	15.203	Antenna Requirement	Pass	-

Note: The module (Model: RTL8822C) makes no difference after verifying output power, this report reuses test data from the module report.

Declaration of Conformity:
1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results. 2. The measurement uncertainty please refer to report "Uncertainty of Evaluation".
Comments and Explanations:
The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Keven Cheng

Report Producer: Dewi Huang

1 General Description

1.1 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n/ac and Wi-Fi 5GHz 802.11a/n/ac.

Product Feature	
Installed into the Host	Equipment Name: Steam Deck Brand Name: Valve Model Name: 1010
Sample 1	EUT with INPAQ Antenna
Sample 2	EUT with AWAN Antenna
Sample 3	EUT with High-Tek Antenna
Antenna Type	WLAN **<Main>:** PIFA Antenna **<Aux.>:** PIFA Antenna Bluetooth: PIFA Antenna

Antenna Information			
INPAQ Antenna	**Antenna Type**	PIFA Antenna	
	Part Number	DQ600015300 (WA-P-LE-02-153)	DQ600004300 (WA-P-LE-01-043)
	Peak gain (dBi)	Main Antenna	Aux. Antenna
		WLAN (5GHz B1): 2.56 WLAN (5GHz B2): 2.56 WLAN (5GHz B3): 2.77	WLAN (5GHz B1): 2.23 WLAN (5GHz B2): 2.23 WLAN (5GHz B3): 3.46
AWAN Antenna	**Antenna Type**	PIFA Antenna	
	Part Number	DQ610001400 (AEP6Y-100014)	DQ610001500 (AEP6Y-100015)
	Peak gain (dBi)	Main Antenna	Aux. Antenna
		WLAN (5GHz B1): 0.69 WLAN (5GHz B2): 0.54 WLAN (5GHz B3):1.45	WLAN (5GHz B1): 1.71 WLAN (5GHz B2): 1.53 WLAN (5GHz B3):2.74
HTK Antenna	**Antenna Type**	PIFA Antenna	
	Part Number	DQ60ACQD0E5 (0ACQD022049N)	DQ60ACQD0E4 (0ACQD022050N)
	Peak gain (dBi)	Main Antenna	Aux. Antenna
		WLAN (5GHz B1): 0.86 WLAN (5GHz B2): 1.87 WLAN (5GHz B3): 2.29	WLAN (5GHz B1): 2.35 WLAN (5GHz B2): 2.87 WLAN (5GHz B3): 2.57

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

1.1.1 Antenna Directional Gain

<For CDD Mode>

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

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

For power measurements on IEEE 802.11 devices,

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

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

For PSD measurements, the directional gain calculation.

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

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 1 (dBi)	Chain 0 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band I	2.56	2.23	2.56	5.41	0.00	0.00
Band II	2.56	2.23	2.56	5.41	0.00	0.00
Band III	2.77	3.46	3.46	6.13	0.00	0.13

Calculation example:

If a device has two antenna, G_{ANT1}= 2.56dBi; G_{ANT2}=2.23dBi

Directional gain of power measurement = max(2.56, 2.23) + 0 = 2.56 dBi

Directional gain of PSD derived from formula which is

10 x log { { [10^ (2.56 dBi / 20) + 10^ (2.23 dBi / 20)] ^ 2 } / 2 }

= 5.41 dBi

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

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

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, 03CH07-HY

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

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	TH05-HY (TAF Code: 3786)
Remark	The Conducted test item subcontracted to Sporton International Inc. Wensan Laboratory.

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

Note:

1. The above Frequency and Channel with "*" are 802.11n HT40 and 802 and11ac VHT40.
2. The above Frequency and Channel with "#" is 802.11ac VHT80.

2.2 Test Mode

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

MIMO Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	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 + Adapter for Sample 1
Remark: For Radiated Test Cases, the tests were performed with Sample 1.	

Ch. #		Band I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5725MHz
		802.11a	802.11a	802.11a
L	Low	36	-	100
M	Middle	40	60	116
H	High	-	64	140

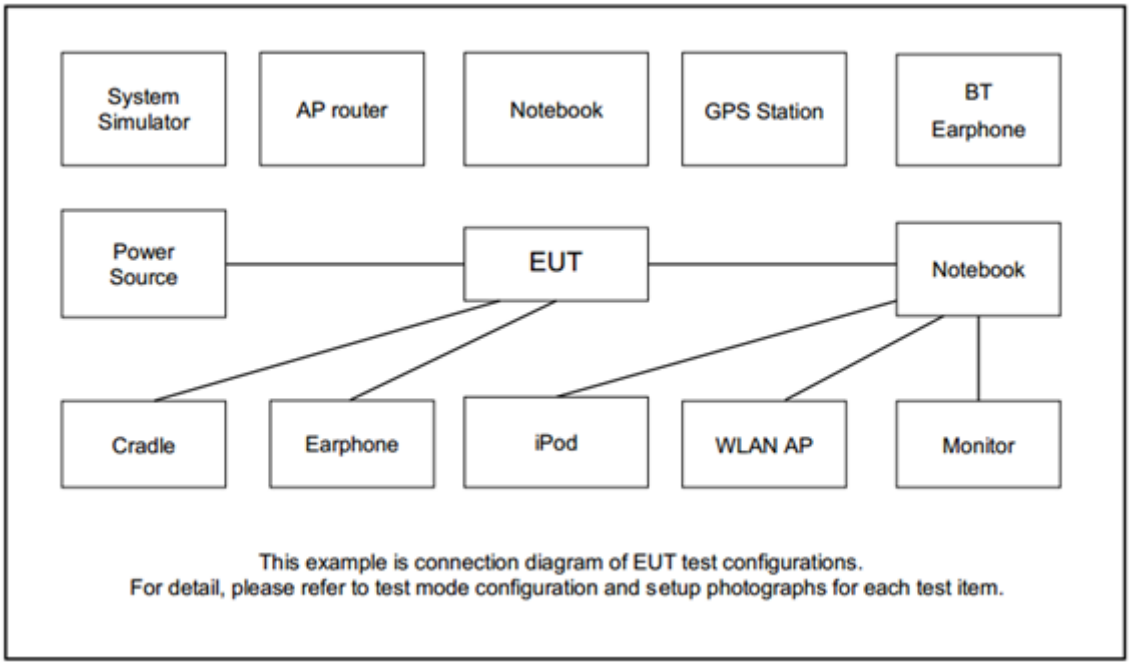
Ch. #		Band I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5725MHz
		802.11ac VHT20	802.11ac VHT20	802.11ac VHT20
L	Low	36	-	100
M	Middle	40	60	116
H	High	-	64	140

Ch. #		Band I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5725MHz
		802.11ac VHT40	802.11ac VHT40	802.11ac VHT40
L	Low	38	-	102
M	Middle	-	-	-
H	High	-	62	134

Ch. #		Band I：5150-5250 MHz	Band II：5250-5350 MHz	Band III：5470-5725MHz
		802.11ac VHT80	802.11ac VHT80	802.11ac VHT80
L	Low	-	-	106
M	Middle	42	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.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P：Unshielded, 1.2m DC O/P：Shielded, 1.8m

2.5 EUT Operation Test Setup

The RF test items, utility “VTE version 0.60.3” 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.

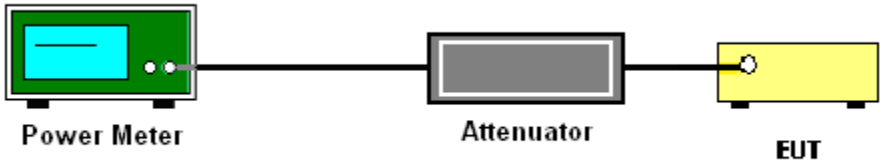
3.1.3 Test Procedures

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

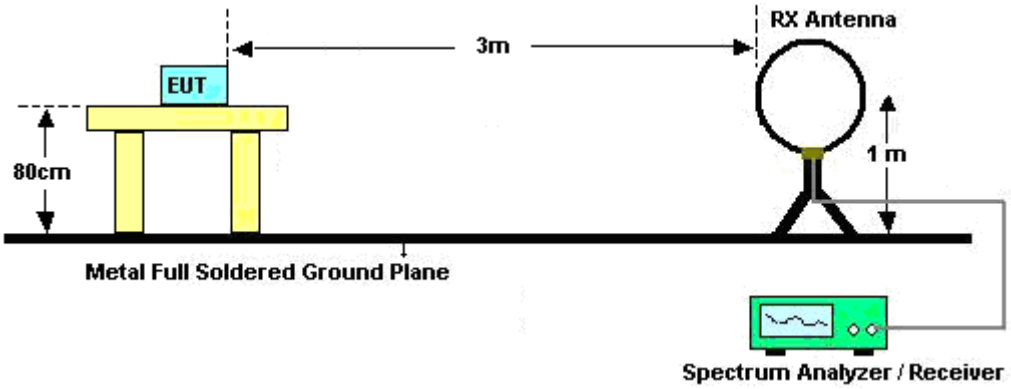
(3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

- 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.

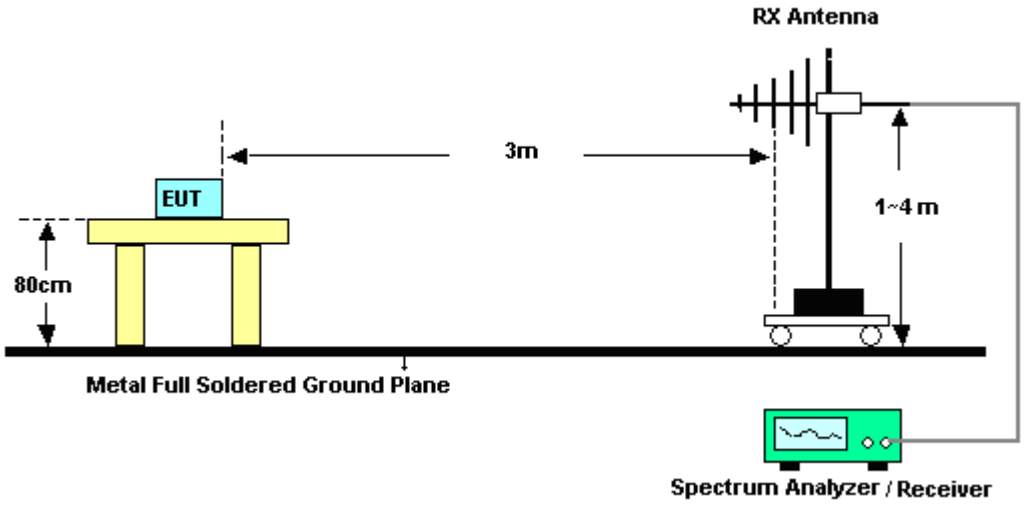
2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna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

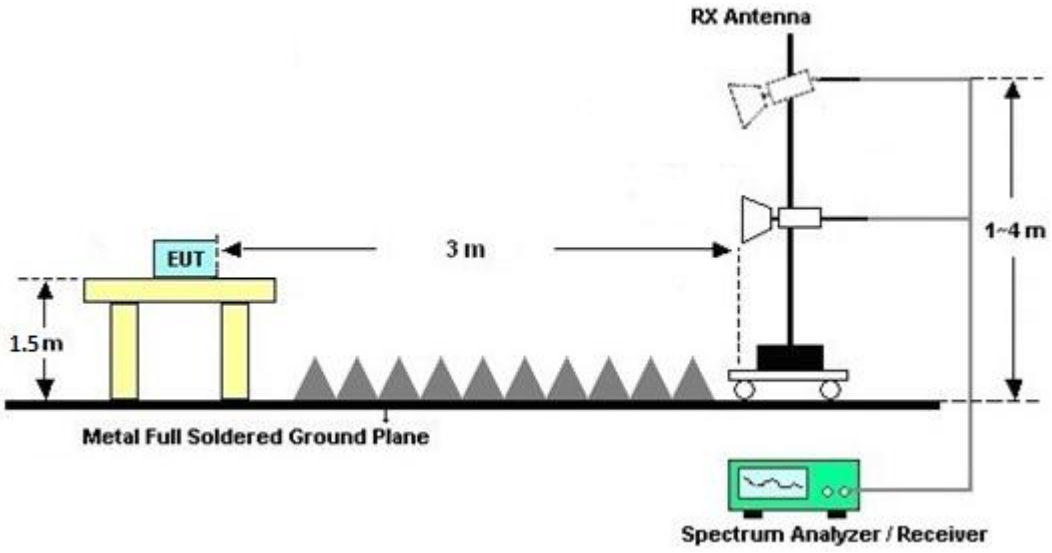
For radiated emissions below 30MHz



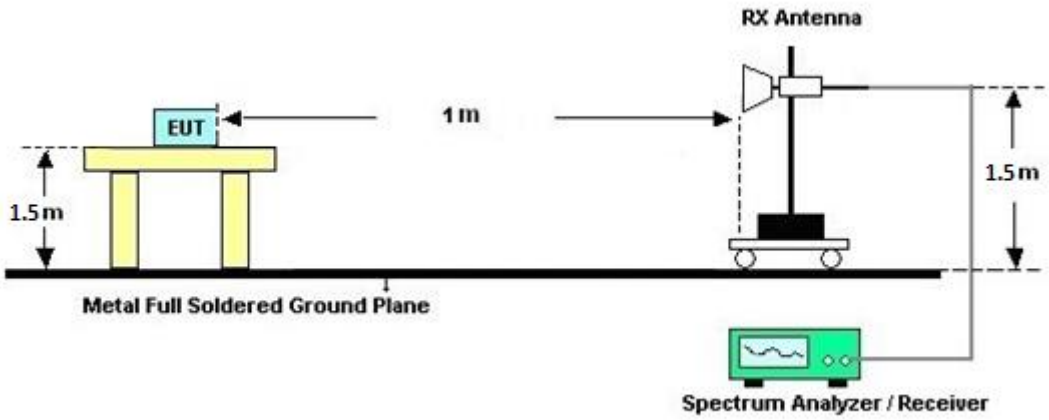
For radiated emissions from 30MHz to 1GHz



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 and D.

3.2.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

3.3 AC Conducted Emission Measurement

3.3.1 Limit of AC Conducted Emission

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

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

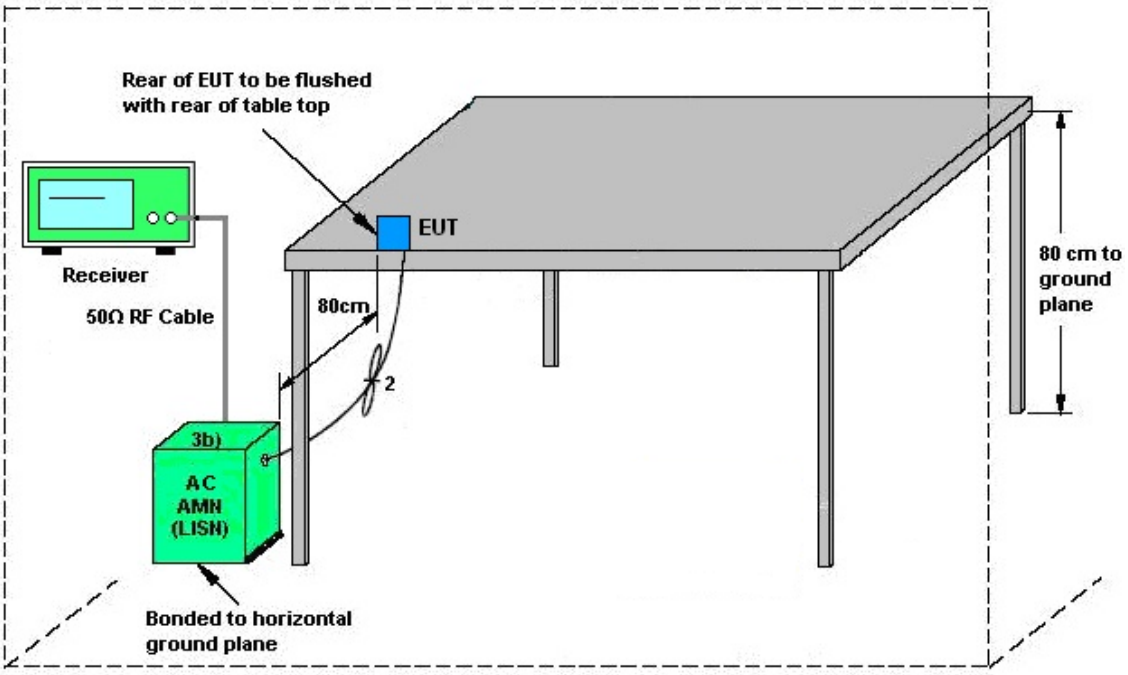
3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

3.3.4 Test Setup



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

3.3.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.4 Antenna Requirements

3.4.1 Standard Applicable

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

3.4.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	35419 & 03	30MHz~1GHz	Apr. 24, 2022	Oct. 21, 2022~ Nov. 04, 2022	Apr. 23, 2023	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Dec. 03, 2021	Oct. 21, 2022~ Nov. 04, 2022	Dec. 02, 2022	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jan. 07, 2022	Oct. 21, 2022~ Nov. 04, 2022	Jan. 06, 2023	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz~18GHz	Apr. 21, 2022	Oct. 21, 2022~ Nov. 04, 2022	Apr. 20, 2023	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz~1GHz	Oct. 03, 2022	Oct. 21, 2022~ Nov. 04, 2022	Oct. 02, 2023	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Oct. 03, 2022	Oct. 21, 2022~ Nov. 04, 2022	Oct. 02, 2023	Radiation (03CH07-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Jul. 21, 2022	Oct. 21, 2022~ Nov. 04, 2022	Jul. 20, 2023	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9030A	MY52350276	3Hz~44GHz	Jul. 22, 2022	Oct. 21, 2022~ Nov. 04, 2022	Jul. 21, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY15682/4	30MHz to 18GHz	Feb. 23, 2022	Oct. 21, 2022~ Nov. 04, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24971/4	9kHz to 18GHz	Feb. 23, 2022	Oct. 21, 2022~ Nov. 04, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY28655/4	9kHz to 18GHz	Feb. 23, 2022	Oct. 21, 2022~ Nov. 04, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126	532078/126E	30MHz~18GHz	Sep. 16, 2022	Oct. 21, 2022~ Nov. 04, 2022	Sep. 15, 2023	Radiation (03CH07-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2858/2	18GHz~40GHz	Feb. 23, 2022	Oct. 21, 2022~ Nov. 04, 2022	Feb. 22, 2023	Radiation (03CH07-HY)
Controller	EMEC	EM1000	N/A	Control Ant Mast	N/A	Oct. 21, 2022~ Nov. 04, 2022	N/A	Radiation (03CH07-HY)
Controller	MF	MF-7802	N/A	Control Turn table	N/A	Oct. 21, 2022~ Nov. 04, 2022	N/A	Radiation (03CH07-HY)
Antenna Mast	EMEC	AM-BS-4500E	N/A	Boresight mast 1M~4M	N/A	Oct. 21, 2022~ Nov. 04, 2022	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Oct. 21, 2022~ Nov. 04, 2022	N/A	Radiation (03CH07-HY)
Software	Audix	E3	N/A	N/A	N/A	Oct. 21, 2022~ Nov. 04, 2022	N/A	Radiation (03CH07-HY)
USB Data Logger	TECPEL	TR-32	HE17XB2495	N/A	Mar. 07, 2022	Oct. 21, 2022~ Nov. 04, 2022	Mar. 06, 2023	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz~26.5GHz	May 27, 2022	Oct. 21, 2022~ Nov. 04, 2022	May 26, 2023	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz~40GHz	Nov. 30, 2021	Oct. 21, 2022~ Nov. 04, 2022	Nov. 29, 2022	Radiation (03CH07-HY)

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Sep. 26, 2022	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 01, 2021	Sep. 26, 2022	Nov. 30, 2022	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 17, 2021	Sep. 26, 2022	Nov. 16, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 03, 2021	Sep. 26, 2022	Dec. 02, 2022	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	Sep. 26, 2022	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Aug. 01, 2022	Sep. 26, 2022	Jul. 31, 2023	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 30, 2021	Sep. 26, 2022	Dec. 29, 2022	Conduction (CO05-HY)
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	Sep. 16, 2022~ Oct. 27, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	15I00041SNO10 (NO:248)	10MHz~6GHz	Dec. 29, 2021	Sep. 16, 2022~ Oct. 27, 2022	Dec. 28, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101905	10Hz - 40GHz	Aug. 03, 2022	Sep. 16, 2022~ Oct. 27, 2022	Aug. 02, 2023	Conducted (TH05-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.10 dB**

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

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

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.20 dB**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.30 dB**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Willy Chang, Paul Lin and Ching Chen	Temperature:	21~25	°C
Test Date:	2022/9/16-2022/10/27	Relative Humidity:	51~54	%

Remark: For Conducted Test Items, Ant. 1 means Chain 1 and Ant. 2 means Chain 0.

Report Number : FR290129D

TEST RESULTS DATA
Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	36	5180	15.70	15.60	18.66	24.00		2.56			Pass
11a	6Mbps	2	40	5200	15.80	16.00	18.91	24.00		2.56			Pass
11a	6Mbps	2	48	5240	16.00	15.90	18.96	24.00		2.56			Pass
HT20	MCS0	2	36	5180	15.50	15.50	18.51	24.00		2.56			Pass
HT20	MCS0	2	40	5200	15.70	15.80	18.76	24.00		2.56			Pass
HT20	MCS0	2	48	5240	15.70	15.80	18.76	24.00		2.56			Pass
HT40	MCS0	2	38	5190	15.00	15.10	18.06	24.00		2.56			Pass
HT40	MCS0	2	46	5230	15.30	15.40	18.36	24.00		2.56			Pass
VHT20	MCS0	2	36	5180	15.70	15.60	18.66	24.00		2.56			Pass
VHT20	MCS0	2	40	5220	15.80	16.00	18.91	24.00		2.56			Pass
VHT20	MCS0	2	48	5240	15.90	16.00	18.96	24.00		2.56			Pass
VHT40	MCS0	2	38	5190	15.10	15.20	18.16	24.00		2.56			Pass
VHT40	MCS0	2	46	5230	15.40	15.50	18.46	24.00		2.56			Pass
VHT80	MCS0	2	42	5210	15.10	15.50	18.31	24.00		2.56			Pass

Report Number : FR290129D

TEST RESULTS DATA
Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	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		
11a	6Mbps	2	52	5260	15.90	15.90	18.91	23.98		2.56		30	Pass
11a	6Mbps	2	60	5300	15.80	15.90	18.86	23.98		2.56		30	Pass
11a	6Mbps	2	64	5320	15.70	16.00	18.86	23.98		2.56		30	Pass
HT20	MCS0	2	52	5260	15.90	15.80	18.86	23.98		2.56		30	Pass
HT20	MCS0	2	60	5300	15.70	15.90	18.81	23.98		2.56		30	Pass
HT20	MCS0	2	64	5320	15.60	16.00	18.81	23.98		2.56		30	Pass
HT40	MCS0	2	54	5270	15.00	15.30	18.16	23.98		2.56		30	Pass
HT40	MCS0	2	62	5310	15.10	15.00	18.06	23.98		2.56		30	Pass
VHT20	MCS0	2	52	5260	16.00	15.90	18.96	23.98		2.56		30	Pass
VHT20	MCS0	2	60	5300	15.80	15.90	18.86	23.98		2.56		30	Pass
VHT20	MCS0	2	64	5320	15.70	16.00	18.86	23.98		2.56		30	Pass
VHT40	MCS0	2	54	5270	15.10	15.40	18.26	23.98		2.56		30	Pass
VHT40	MCS0	2	62	5310	15.20	15.10	18.16	23.98		2.56		30	Pass
VHT80	MCS0	2	58	5290	15.30	15.30	18.31	23.98		2.56		30	Pass

TEST RESULTS DATA
Average Power Table

FCC Band III MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	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		
11a	6Mbps	2	100	5500	15.90	15.80	18.86	23.98		3.46		30	Pass
11a	6Mbps	2	116	5580	15.70	15.70	18.71	23.98		3.46		30	Pass
11a	6Mbps	2	140	5700	15.80	15.70	18.76	23.98		3.46		30	Pass
HT20	MCS0	2	100	5500	15.80	15.70	18.76	23.98		3.46		30	Pass
HT20	MCS0	2	116	5580	15.60	15.50	18.56	23.98		3.46		30	Pass
HT20	MCS0	2	140	5700	15.60	15.70	18.66	23.98		3.46		30	Pass
HT40	MCS0	2	102	5510	14.90	15.20	18.06	23.98		3.46		30	Pass
HT40	MCS0	2	110	5550	15.20	15.30	18.26	23.98		3.46		30	Pass
HT40	MCS0	2	134	5670	15.40	15.20	18.31	23.98		3.46		30	Pass
VHT20	MCS0	2	100	5500	15.90	15.80	18.86	23.98		3.46		30	Pass
VHT20	MCS0	2	116	5580	15.70	15.70	18.71	23.98		3.46		30	Pass
VHT20	MCS0	2	140	5700	15.80	15.80	18.81	23.98		3.46		30	Pass
VHT40	MCS0	2	102	5510	15.10	15.30	18.21	23.98		3.46		30	Pass
VHT40	MCS0	2	110	5550	15.40	15.50	18.46	23.98		3.46		30	Pass
VHT40	MCS0	2	134	5670	15.50	15.30	18.41	23.98		3.46		30	Pass
VHT80	MCS0	2	106	5530	14.40	13.50	16.98	23.98		3.46		30	Pass

TEST RESULTS DATA
Average Power Table

Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	15.80	15.70	18.76	30.00		3.64		Pass
11a	6Mbps	2	157	5785	15.80	15.90	18.86	30.00		3.64		Pass
11a	6Mbps	2	165	5825	15.60	15.60	18.61	30.00		3.64		Pass
HT20	MCS0	2	149	5745	15.70	15.60	18.66	30.00		3.64		Pass
HT20	MCS0	2	157	5785	15.70	15.80	18.76	30.00		3.64		Pass
HT20	MCS0	2	165	5825	15.40	15.50	18.46	30.00		3.64		Pass
HT40	MCS0	2	151	5755	15.20	15.00	18.11	30.00		3.64		Pass
HT40	MCS0	2	159	5795	15.20	15.10	18.16	30.00		3.64		Pass
VHT20	MCS0	2	149	5745	15.80	15.70	18.76	30.00		3.64		Pass
VHT20	MCS0	2	157	5785	15.80	15.90	18.86	30.00		3.64		Pass
VHT20	MCS0	2	165	5825	15.60	15.50	18.56	30.00		3.64		Pass
VHT40	MCS0	2	151	5755	15.30	15.10	18.21	30.00		3.64		Pass
VHT40	MCS0	2	159	5795	15.30	15.30	18.31	30.00		3.64		Pass
VHT80	MCS0	2	155	5775	15.30	15.10	18.21	30.00		3.64		Pass

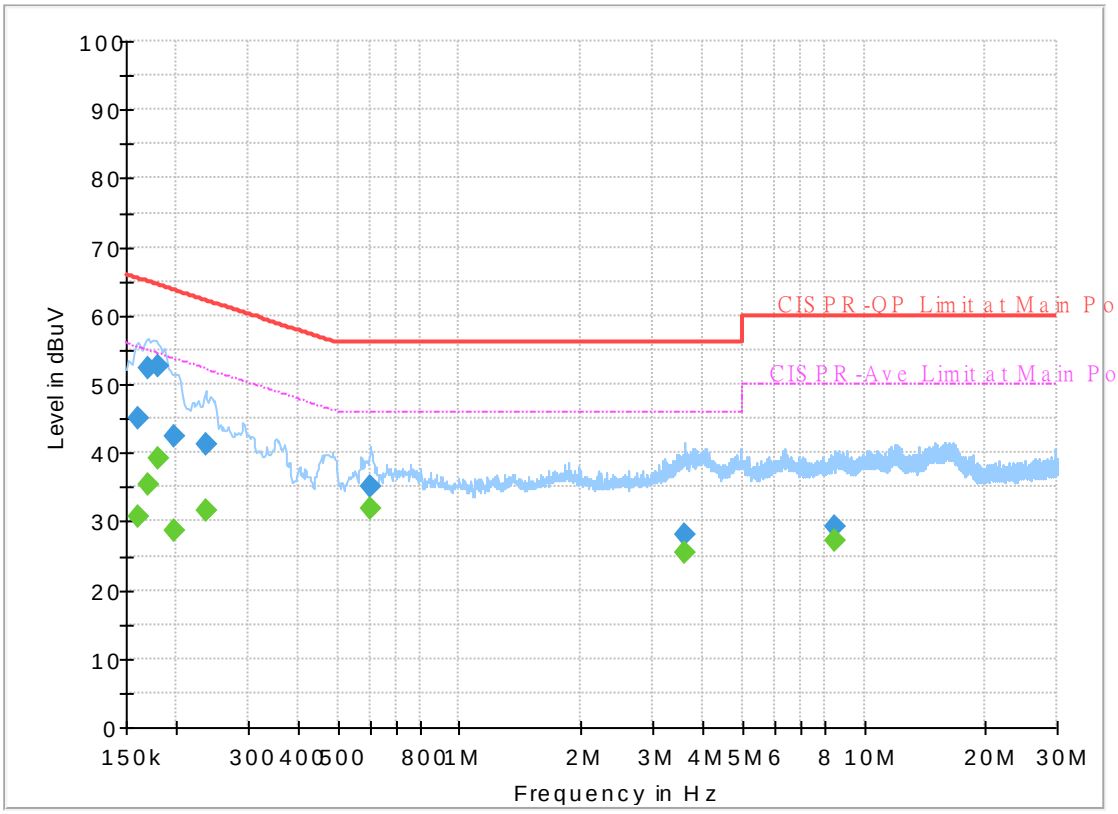
Appendix B. AC Conducted Emission Test Results

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

EUT Information

Report NO :	290129
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



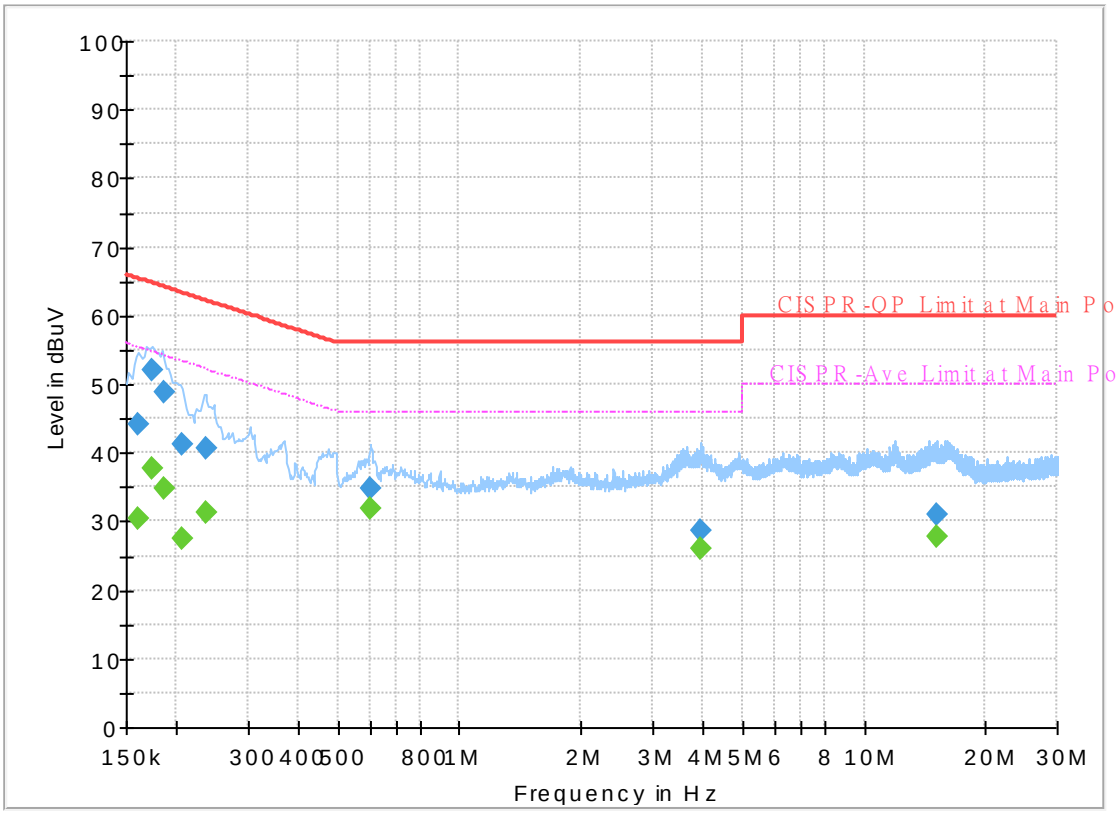
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.161250	---	30.80	55.40	24.60	L1	OFF	19.8
0.161250	45.10	---	65.40	20.30	L1	OFF	19.8
0.170250	---	35.34	54.95	19.61	L1	OFF	19.8
0.170250	52.44	---	64.95	12.51	L1	OFF	19.8
0.179250	---	39.26	54.52	15.26	L1	OFF	19.8
0.179250	52.71	---	64.52	11.81	L1	OFF	19.8
0.197250	---	28.52	53.73	25.21	L1	OFF	19.8
0.197250	42.33	---	63.73	21.40	L1	OFF	19.8
0.235500	---	31.54	52.25	20.71	L1	OFF	19.8
0.235500	41.21	---	62.25	21.04	L1	OFF	19.8
0.602250	---	31.87	46.00	14.13	L1	OFF	19.8
0.602250	35.04	---	56.00	20.96	L1	OFF	19.8
3.588000	---	25.49	46.00	20.51	L1	OFF	19.9
3.588000	28.17	---	56.00	27.83	L1	OFF	19.9
8.479500	---	27.09	50.00	22.91	L1	OFF	20.1
8.479500	29.30	---	60.00	30.70	L1	OFF	20.1

EUT Information

Report NO :	290129
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	---	30.35	55.40	25.05	N	OFF	19.8
0.161250	44.19	---	65.40	21.21	N	OFF	19.8
0.174750	---	37.62	54.73	17.11	N	OFF	19.8
0.174750	51.94	---	64.73	12.79	N	OFF	19.8
0.186000	---	34.78	54.21	19.43	N	OFF	19.8
0.186000	48.97	---	64.21	15.24	N	OFF	19.8
0.206250	---	27.38	53.36	25.98	N	OFF	19.8
0.206250	41.34	---	63.36	22.02	N	OFF	19.8
0.237750	---	31.22	52.17	20.95	N	OFF	19.8
0.237750	40.60	---	62.17	21.57	N	OFF	19.8
0.602250	---	31.79	46.00	14.21	N	OFF	19.8
0.602250	34.87	---	56.00	21.13	N	OFF	19.8
3.936750	---	26.17	46.00	19.83	N	OFF	20.0
3.936750	28.70	---	56.00	27.30	N	OFF	20.0
15.069750	---	27.77	50.00	22.23	N	OFF	20.4
15.069750	31.04	---	60.00	28.96	N	OFF	20.4

Appendix C. Radiated Spurious Emission

Test Engineer :	Jesse Wang, Stan Hsieh, Ken Wu and Howard Huang	**Temperature :**	22.6~24.5°C
		Relative Humidity :	58.6~61.3%

Remark: For Radiated Spurious Emission Test Items, Ant. 1 means Chain 1 and Ant. 2 means Chain 0.

Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5148.2	50.94	-23.06	74	40.29	34.1	11.84	35.29	100	84	P	H
		5150	42.02	-11.98	54	31.37	34.1	11.84	35.29	100	84	A	H
	*	5180	104.46	-	-	93.62	34.22	11.88	35.26	100	84	P	H
	*	5180	97.34	-	-	86.5	34.22	11.88	35.26	100	84	A	H
													H
													H
		5148.98	50.6	-23.4	74	39.95	34.1	11.84	35.29	304	32	P	V
		5150	41.4	-12.6	54	30.75	34.1	11.84	35.29	304	32	A	V
	*	5180	106.53	-	-	95.69	34.22	11.88	35.26	304	32	P	V
	*	5180	98.95	-	-	88.11	34.22	11.88	35.26	304	32	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 40 5200MHz		10400	45.71	-22.49	68.2	48.64	37.4	18.44	58.77	-	-	P	H
		15600	54.71	-19.29	74	48.51	40.2	22.65	56.65	206	124	P	H
		15600	43.07	-10.93	54	36.87	40.2	22.65	56.65	206	124	A	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		10400	45.76	-22.44	68.2	48.69	37.4	18.44	58.77	-	-	P	V
		15600	55.51	-18.49	74	49.31	40.2	22.65	56.65	400	177	P	V
		15600	42.85	-11.15	54	36.65	40.2	22.65	56.65	400	177	A	V
													V
													V
													V
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													V
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													V
													V
													V

Remark

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

Band 1 5150~5250MHz

WIFI 802.11ac VHT20 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5149.76	51.82	-22.18	74	41.17	34.1	11.84	35.29	100	84	P	H
		5150	42.38	-11.62	54	31.73	34.1	11.84	35.29	100	84	A	H
	*	5180	105.14	-	-	94.3	34.22	11.88	35.26	100	84	P	H
	*	5180	97.07	-	-	86.23	34.22	11.88	35.26	100	84	A	H
802.11ac													H
VHT20													H
CH 36		5147.16	49.67	-24.33	74	39.02	34.1	11.84	35.29	304	32	P	V
5180MHz		5150	42	-12	54	31.35	34.1	11.84	35.29	304	32	A	V
	*	5180	106.42	-	-	95.58	34.22	11.88	35.26	304	32	P	V
	*	5180	98.9	-	-	88.06	34.22	11.88	35.26	304	32	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		10400	45.3	-22.9	68.2	48.23	37.4	18.44	58.77	-	-	P	H
		15600	55.68	-18.32	74	49.48	40.2	22.65	56.65	203	124	P	H
		15600	43.47	-10.53	54	37.27	40.2	22.65	56.65	203	124	A	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ac VHT20 CH 40 5200MHz													H
		10400	46.46	-21.74	68.2	49.39	37.4	18.44	58.77	-	-	P	V
		15600	55.64	-18.36	74	49.44	40.2	22.65	56.65	400	177	P	V
		15600	43.13	-10.87	54	36.93	40.2	22.65	56.65	400	177	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

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

Band 1 5150~5250MHz

WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5147.94	58.18	-15.82	74	47.53	34.1	11.84	35.29	100	243	P	H
		5149.76	47.54	-6.46	54	36.89	34.1	11.84	35.29	100	243	A	H
	*	5190	100.99	-	-	90.1	34.26	11.89	35.26	100	243	P	H
	*	5190	93.44	-	-	82.55	34.26	11.89	35.26	100	243	A	H
802.11ac		5373.76	48.27	-25.73	74	36.86	34.65	12	35.24	100	243	P	H
VHT40		5447.12	39.14	-14.86	54	27.62	34.7	12.06	35.24	100	243	A	H
CH 38		5147.94	58.91	-15.09	74	48.26	34.1	11.84	35.29	258	292	P	V
5190MHz		5149.76	49.47	-4.53	54	38.82	34.1	11.84	35.29	258	292	A	V
	*	5190	101.79	-	-	90.9	34.26	11.89	35.26	258	292	P	V
	*	5190	93.06	-	-	82.17	34.26	11.89	35.26	258	292	A	V
		5388.32	48.4	-25.6	74	36.96	34.68	12	35.24	258	292	P	V
		5431.44	39.23	-14.77	54	27.72	34.7	12.05	35.24	258	292	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 42 5210MHz		5147.16	60.26	-13.74	74	49.61	34.1	11.84	35.29	100	246	P	H
		5149.5	48.74	-5.26	54	38.09	34.1	11.84	35.29	100	246	A	H
	*	5210	97.95	-	-	86.95	34.34	11.91	35.25	100	246	P	H
	*	5210	90.81	-	-	79.81	34.34	11.91	35.25	100	246	A	H
		5383	48.18	-25.82	74	36.75	34.67	12	35.24	100	246	P	H
		5448.52	39.2	-14.8	54	27.67	34.7	12.07	35.24	100	246	A	H
		5149.76	62.12	-11.88	74	51.47	34.1	11.84	35.29	243	291	P	V
		5149.5	51.6	-2.4	54	40.95	34.1	11.84	35.29	243	291	A	V
	*	5210	99.6	-	-	88.6	34.34	11.91	35.25	243	291	P	V
	*	5210	91.05	-	-	80.05	34.34	11.91	35.25	243	291	A	V
		5363.12	48.8	-25.2	74	37.42	34.63	11.99	35.24	243	291	P	V
		5458.32	39.28	-14.72	54	27.74	34.7	12.08	35.24	243	291	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 2 - 5250~5350MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 64 5320MHz	*	5320	102.56	-	-	91.23	34.6	11.97	35.24	100	270	P	H
	*	5320	96.29	-	-	84.96	34.6	11.97	35.24	100	270	A	H
		5441.76	48.77	-25.23	74	37.25	34.7	12.06	35.24	100	270	P	H
		5350.24	39.59	-14.41	54	28.25	34.6	11.98	35.24	100	270	A	H
													H
													H
	*	5320	104.28	-	-	92.95	34.6	11.97	35.24	343	5	P	V
	*	5320	98.23	-	-	86.9	34.6	11.97	35.24	343	5	A	V
		5428.16	49.28	-24.72	74	37.78	34.7	12.04	35.24	343	5	P	V
		5350.08	40.02	-13.98	54	28.68	34.6	11.98	35.24	343	5	A	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 2 5250~5350MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
i802.11a CH 60 5300MHz		10600	45.29	-28.71	74	47.77	37.5	18.61	58.59	-	-	P	H
		15900	53.99	-20.01	74	46.41	40.9	22.83	56.15	201	127	P	H
		15900	42.99	-11.01	54	35.41	40.9	22.83	56.15	201	127	A	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		10600	46.12	-27.88	74	48.6	37.5	18.61	58.59	-	-	P	V
		15900	55.12	-18.88	74	47.54	40.9	22.83	56.15	208	187	P	V
		15900	42.67	-11.33	54	35.09	40.9	22.83	56.15	208	187	A	V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

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

Band 2 5250~5350MHz

WIFI 802.11ac VHT20 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	*	5320	100.78	-	-	89.45	34.6	11.97	35.24	100	270	P	H
	*	5320	95.22	-	-	83.89	34.6	11.97	35.24	100	270	A	H
		5352.8	48.47	-25.53	74	37.12	34.61	11.98	35.24	100	270	P	H
		5350.08	39.9	-14.1	54	28.56	34.6	11.98	35.24	100	270	A	H
802.11ac													H
VHT20													H
CH 64	*	5320	104.21	-	-	92.88	34.6	11.97	35.24	381	9	P	V
5320MHz	*	5320	96.91	-	-	85.58	34.6	11.97	35.24	381	9	A	V
		5452	48.87	-25.13	74	37.34	34.7	12.07	35.24	381	9	P	V
		5350.08	40.94	-13.06	54	29.6	34.6	11.98	35.24	381	9	A	V
													V
													V

Remark

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

Band 2 5250~5350MHz

WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		10600	45.12	-28.88	74	47.6	37.5	18.61	58.59	-	-	P	H
		15900	54.8	-19.2	74	47.22	40.9	22.83	56.15	202	129	P	H
		15900	42.08	-11.92	54	34.5	40.9	22.83	56.15	202	129	A	H
													H
													H
													H
													H
													H
													H
													H
802.11ac													H
VHT20													H
CH 60		10600	45.46	-28.54	74	47.94	37.5	18.61	58.59	-	-	P	V
5300MHz		15900	55.12	-18.88	74	47.54	40.9	22.83	56.15	213	209	P	V
		15900	43.15	-10.85	54	35.57	40.9	22.83	56.15	213	209	A	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

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

Band 2 5250~5350MHz

WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT40 CH 62 5310MHz		5137.2	48.98	-25.02	74	38.35	34.1	11.83	35.3	102	272	P	H
		5150	39.4	-14.6	54	28.75	34.1	11.84	35.29	102	272	A	H
	*	5310	100.89	-	-	89.57	34.6	11.96	35.24	102	272	P	H
	*	5310	93.39	-	-	82.07	34.6	11.96	35.24	102	272	A	H
		5350.56	57.26	-16.74	74	45.92	34.6	11.98	35.24	102	272	P	H
		5350.08	41.52	-12.48	54	30.18	34.6	11.98	35.24	102	272	A	H
		5064.05	50.11	-23.89	74	39.69	34.03	11.74	35.35	344	349	P	V
		5150	39.49	-14.51	54	28.84	34.1	11.84	35.29	344	349	A	V
	*	5310	101.95	-	-	90.63	34.6	11.96	35.24	344	349	P	V
	*	5310	94.93	-	-	83.61	34.6	11.96	35.24	344	349	A	V
		5351.28	54.86	-19.14	74	43.52	34.6	11.98	35.24	344	349	P	V
		5350.08	42.89	-11.11	54	31.55	34.6	11.98	35.24	344	349	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 2 5250~5350MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 58 5290MHz		5148.05	49.63	-24.37	74	38.98	34.1	11.84	35.29	100	83	P	H
		5129.85	39.68	-14.32	54	29.06	34.1	11.82	35.3	100	83	A	H
	*	5290	98.55	-	-	87.27	34.58	11.95	35.25	100	83	P	H
	*	5290	91.02	-	-	79.74	34.58	11.95	35.25	100	83	A	H
		5357.04	55.1	-18.9	74	43.74	34.61	11.99	35.24	100	83	P	H
		5350.8	43.63	-10.37	54	32.29	34.6	11.98	35.24	100	83	A	H
		5089.25	50.47	-23.53	74	39.95	34.08	11.77	35.33	330	350	P	V
		5129.85	39.77	-14.23	54	29.15	34.1	11.82	35.3	330	350	A	V
	*	5290	99.61	-	-	88.33	34.58	11.95	35.25	330	350	P	V
	*	5290	92.46	-	-	81.18	34.58	11.95	35.25	330	350	A	V
		5371.2	57.38	-16.62	74	45.99	34.64	11.99	35.24	330	350	P	V
		5350.56	43.23	-10.77	54	31.89	34.6	11.98	35.24	330	350	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 3 - 5470~5725MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 100 5500MHz		5408.4	48.78	-25.22	74	37.3	34.7	12.02	35.24	371	207	P	H
		5470	48.21	-19.99	68.2	36.66	34.7	12.09	35.24	371	207	P	H
		5459.28	39.25	-14.75	54	27.71	34.7	12.08	35.24	371	207	A	H
	*	5500	101.3	-	-	89.72	34.7	12.12	35.24	371	207	P	H
	*	5500	95.08	-	-	83.5	34.7	12.12	35.24	371	207	A	H
													H
		5363.44	49.2	-24.8	74	37.82	34.63	11.99	35.24	305	2	P	V
		5469.36	51.36	-16.84	68.2	39.81	34.7	12.09	35.24	305	2	P	V
		5459.92	39.85	-14.15	54	28.31	34.7	12.08	35.24	305	2	A	V
	*	5500	106.02	-	-	94.44	34.7	12.12	35.24	305	2	P	V
	*	5500	98.21	-	-	86.63	34.7	12.12	35.24	305	2	A	V
													V
802.11a CH 140 5700MHz	*	5700	99.88	-	-	87.88	34.9	12.28	35.18	100	102	P	H
	*	5700	93.05	-	-	81.05	34.9	12.28	35.18	100	102	A	H
		5725.4	51.48	-16.72	68.2	39.3	35.05	12.3	35.17	100	102	P	H
													H
													H
													H
	*	5700	103.1	-	-	91.1	34.9	12.28	35.18	268	0	P	V
	*	5700	95.72	-	-	83.72	34.9	12.28	35.18	268	0	A	V
		5726.2	53.82	-14.38	68.2	41.63	35.06	12.3	35.17	268	0	P	V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 3 - 5470~5725MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11160	45.13	-28.87	74	46.06	37.86	19.04	57.83	-	-	P	H
		16740	49.69	-18.51	68.2	40.25	42.14	23.49	56.19	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
802.11a CH 116 5580MHz		11160	51.88	-22.12	74	52.81	37.86	19.04	57.83	288	205	P	V
		11160	39.68	-14.32	54	40.61	37.86	19.04	57.83	288	205	A	V
		16740	50.21	-17.99	68.2	40.77	42.14	23.49	56.19	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

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

Band 3 - 5470~5725MHz

WIFI 802.11ac VHT20 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5400.88	48.64	-25.36	74	37.17	34.7	12.01	35.24	369	208	P	H
		5468.88	48.66	-19.54	68.2	37.11	34.7	12.09	35.24	369	208	P	H
		5459.76	39.29	-14.71	54	27.75	34.7	12.08	35.24	369	208	A	H
	*	5500	100.41	-	-	88.83	34.7	12.12	35.24	369	208	P	H
802.11ac	*	5500	93.92	-	-	82.34	34.7	12.12	35.24	369	208	A	H
VHT20													H
CH 100		5417.68	48.59	-25.41	74	37.1	34.7	12.03	35.24	302	0	P	V
5500MHz		5469.84	50.46	-17.74	68.2	38.91	34.7	12.09	35.24	302	0	P	V
		5459.76	39.84	-14.16	54	28.3	34.7	12.08	35.24	302	0	A	V
	*	5500	105.91	-	-	94.33	34.7	12.12	35.24	302	0	P	V
	*	5500	98.42	-	-	86.84	34.7	12.12	35.24	302	0	A	V
													V
	*	5700	99.06	-	-	87.06	34.9	12.28	35.18	100	86	P	H
	*	5700	91.73	-	-	79.73	34.9	12.28	35.18	100	86	A	H
		5734.12	50.87	-17.33	68.2	38.64	35.1	12.3	35.17	100	86	P	H
													H
802.11ac													H
VHT20													H
CH 140	*	5700	103.45	-	-	91.45	34.9	12.28	35.18	269	5	P	V
5700MHz	*	5700	95.32	-	-	83.32	34.9	12.28	35.18	269	5	A	V
		5725.08	55.05	-13.15	68.2	42.87	35.05	12.3	35.17	269	5	P	V
													V
													V
													V

Remark

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

Band 3 - 5470~5725MHz

WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11160	46.81	-27.19	74	47.74	37.86	19.04	57.83	-	-	P	H
		16740	49.42	-18.78	68.2	39.98	42.14	23.49	56.19	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
802.11ac													H
VHT20													H
CH 116		11160	51.16	-22.84	74	52.09	37.86	19.04	57.83	-	-	P	V
5580MHz		11160	40.22	-13.78	54	41.15	37.86	19.04	57.83	239	205	A	V
		16740	50.72	-17.48	68.2	41.28	42.14	23.49	56.19	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

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

Band 3 - 5470~5725MHz

WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Margin (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5458.48	48.48	-25.52	74	36.94	34.7	12.08	35.24	369	207	P	H
		5469.76	52.7	-15.5	68.2	41.15	34.7	12.09	35.24	369	207	P	H
		5459.92	39.88	-14.12	54	28.34	34.7	12.08	35.24	369	207	A	H
	*	5510	98.01	-	-	86.4	34.7	12.14	35.23	369	207	P	H
802.11ac	*	5510	91.19	-	-	79.58	34.7	12.14	35.23	369	207	A	H
VHT40		5762.165	49.02	-19.18	68.2	36.67	35.2	12.31	35.16	369	207	P	H
CH 102		5457.76	50.28	-23.72	74	38.74	34.7	12.08	35.24	338	0	P	V
5510MHz		5465.2	56.78	-11.42	68.2	45.24	34.7	12.08	35.24	338	0	P	V
		5459.92	40.95	-13.05	54	29.41	34.7	12.08	35.24	338	0	A	V
	*	5510	102.3	-	-	90.69	34.7	12.14	35.23	338	0	P	V
	*	5510	95.65	-	-	84.04	34.7	12.14	35.23	338	0	A	V
		5725.31	50.31	-17.89	68.2	38.13	35.05	12.3	35.17	338	0	P	V
		5430.15	48.07	-25.93	74	36.57	34.7	12.04	35.24	100	88	P	H
		5462	46.26	-21.94	68.2	34.72	34.7	12.08	35.24	100	88	P	H
		5459.9	39.09	-14.91	54	27.55	34.7	12.08	35.24	100	88	A	H
	*	5670	95.25	-	-	83.4	34.78	12.27	35.2	100	88	P	H
802.11ac	*	5670	89.23	-	-	77.38	34.78	12.27	35.2	100	88	A	H
VHT40		5753.8	49.09	-19.11	68.2	36.74	35.2	12.31	35.16	100	88	P	H
CH 134		5450.8	48.07	-25.93	74	36.54	34.7	12.07	35.24	300	2	P	V
5670MHz		5464.1	47.33	-20.87	68.2	35.79	34.7	12.08	35.24	300	2	P	V
		5458.15	39.27	-14.73	54	27.73	34.7	12.08	35.24	300	2	A	V
	*	5670	100.77	-	-	88.92	34.78	12.27	35.2	300	2	P	V
	*	5670	93.4	-	-	81.55	34.78	12.27	35.2	300	2	A	V
		5727.375	52.13	-16.07	68.2	39.94	35.06	12.3	35.17	300	2	P	V

Remark

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

Band 3 5470~5725MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Margin (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 106 5530MHz		5453.2	49.17	-24.83	74	37.64	34.7	12.07	35.24	368	208	P	H
		5469.28	48.76	-19.44	68.2	37.21	34.7	12.09	35.24	368	208	P	H
		5459.68	40.21	-13.79	54	28.67	34.7	12.08	35.24	368	208	A	H
	*	5530	92.98	-	-	81.35	34.7	12.16	35.23	368	208	P	H
	*	5530	86.43	-	-	74.8	34.7	12.16	35.23	368	208	A	H
		5729.09	49.79	-18.41	68.2	37.59	35.07	12.3	35.17	368	208	P	H
		5445.28	49.52	-24.48	74	38	34.7	12.06	35.24	304	0	P	V
		5468.56	54.81	-13.39	68.2	43.26	34.7	12.09	35.24	304	0	P	V
		5459.92	41.7	-12.3	54	30.16	34.7	12.08	35.24	304	0	A	V
	*	5530	96.9	-	-	85.27	34.7	12.16	35.23	304	0	P	V
	*	5530	90.4	-	-	78.77	34.7	12.16	35.23	304	0	A	V
		5756.81	50.43	-17.77	68.2	38.08	35.2	12.31	35.16	304	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (LF @ 3m)

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		30	21.18	-18.82	40	25.74	24.51	1.01	30.08	-	-	P	H
		138	26.36	-17.14	43.5	37.01	17.29	2.02	29.96	-	-	P	H
		290.28	31.52	-14.48	46	39.46	19.08	2.92	29.94	-	-	P	H
		317.5	34	-12	46	41.42	19.4	3.1	29.92	-	-	P	H
		834.8	37.56	-8.44	46	33.63	28.21	5.1	29.38	-	-	P	H
		944	33.77	-12.23	46	27.18	29.9	5.54	28.85	-	-	P	H
													H
													H
													H
													H
5GHz													H
802.11ac													H
VHT80		30	30.58	-9.42	40	35.14	24.51	1.01	30.08	-	-	P	V
LF		136.92	27.87	-15.63	43.5	38.44	17.38	2.01	29.96	-	-	P	V
		288.12	29.83	-16.17	46	37.84	19.02	2.91	29.94	-	-	P	V
		630.4	32.46	-13.54	46	32.13	25.97	4.31	29.95	-	-	P	V
		806.1	34.35	-11.65	46	31.18	27.67	5.04	29.54	-	-	P	V
		955.2	34.15	-11.85	46	26.78	30.6	5.57	28.8	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

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

Note symbol

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

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

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.					Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5150	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		5150	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

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

For Peak Limit @ 5150MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Marrgin (dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 5150MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

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

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Jesse Wang, Stan Hsieh, Ken Wu and Howard Huang	**Temperature :**	22.6~24.5°C
		Relative Humidity :	58.6~61.3%

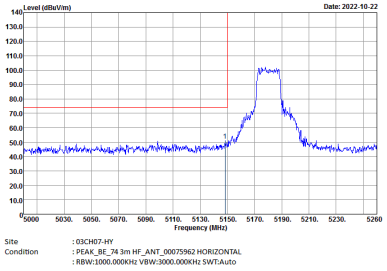
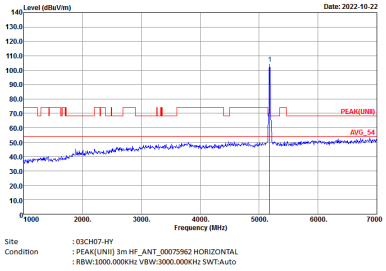
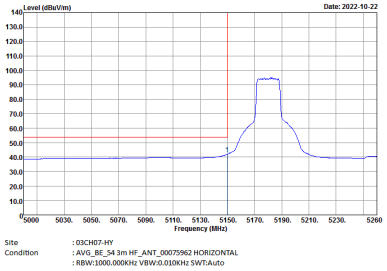
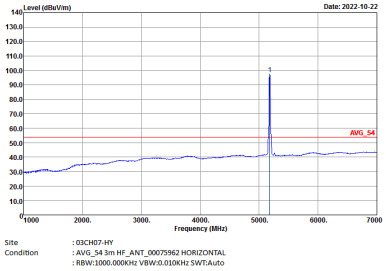
Remark: For Radiated Spurious Emission Plots Test Items, Ant. 1 means Chain 1 and Ant. 2 means Chain 0.

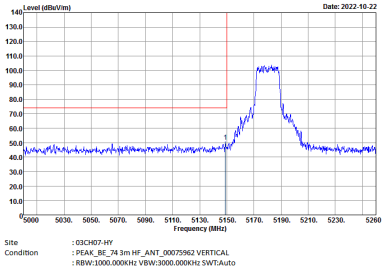
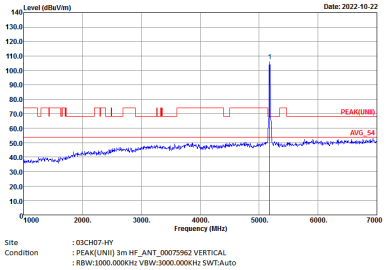
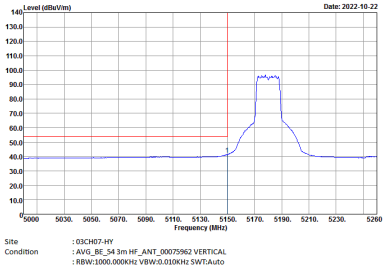
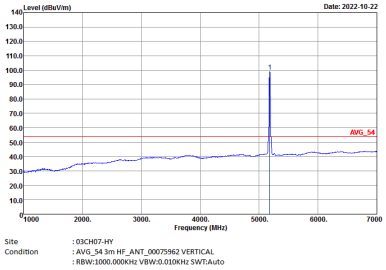
Note symbol

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

Band 1 - 5150~5250MHz

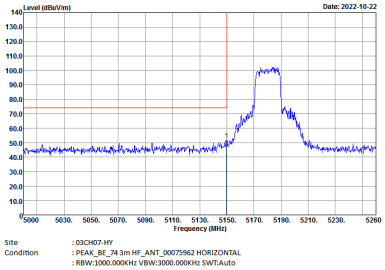
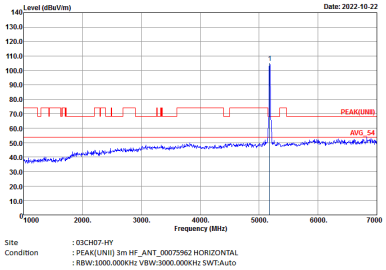
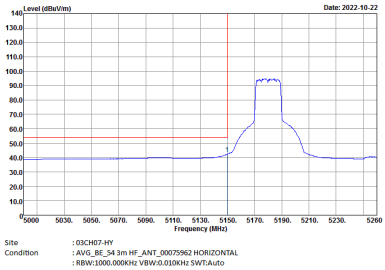
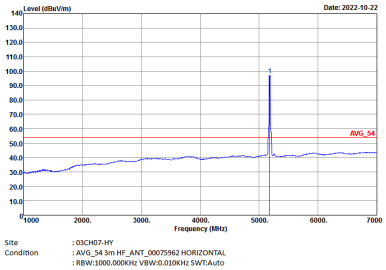
WIFI 802.11a (Band Edge @ 3m)

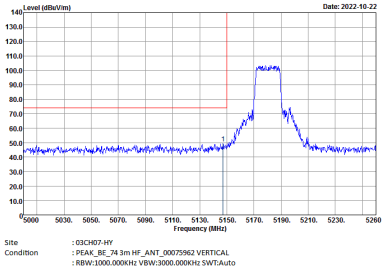
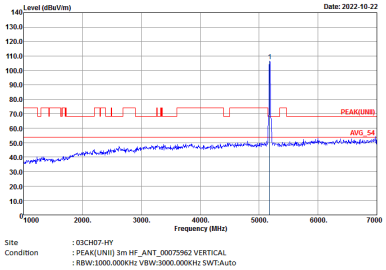
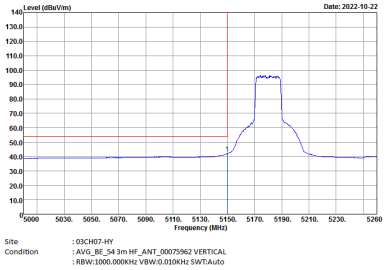
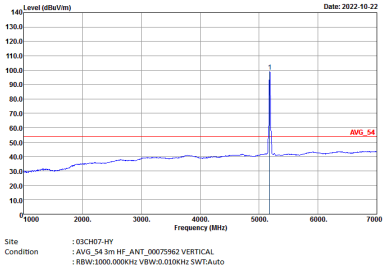
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

Band 1 5150~5250MHz

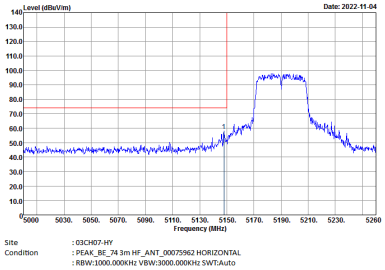
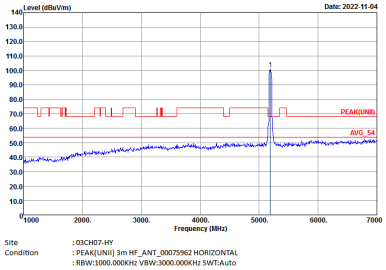
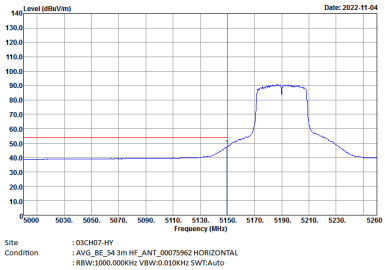
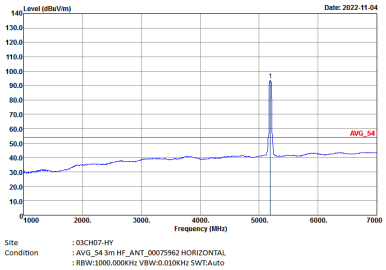
WIFI 802.11ac VHT20 (Band Edge @ 3m)

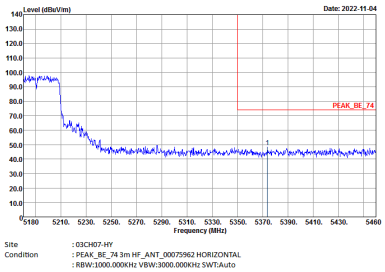
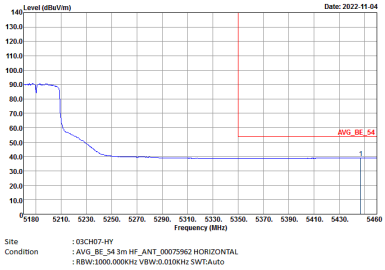
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH36 5180MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

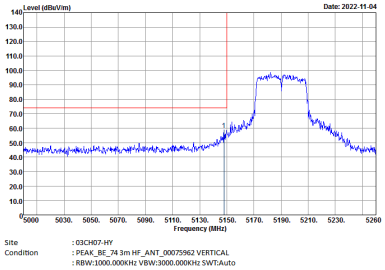
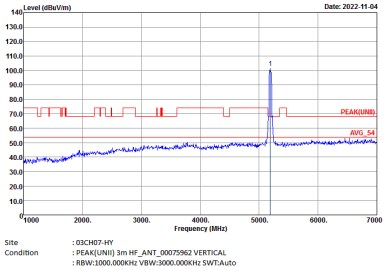
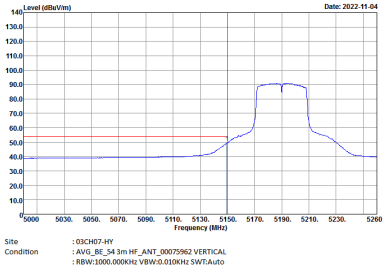
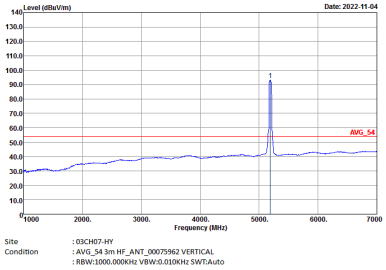
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH36 5180MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

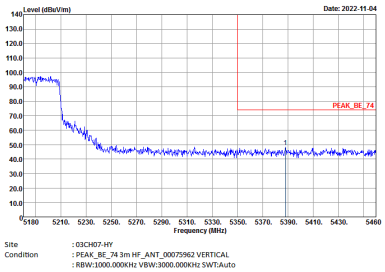
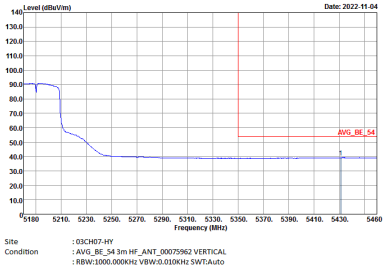
Band 1 5150~5250MHz

WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH38 5190MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

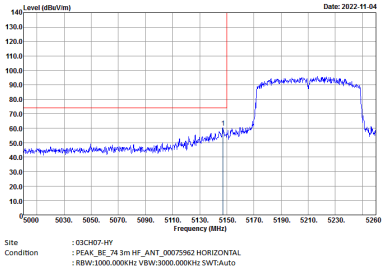
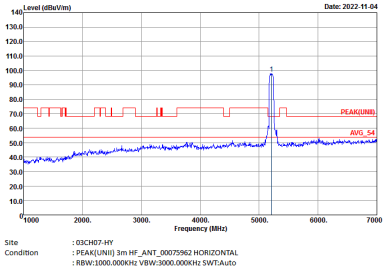
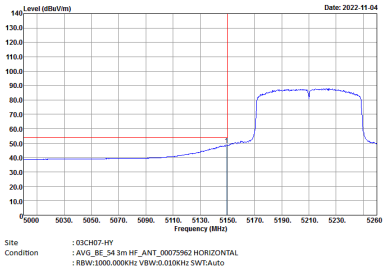
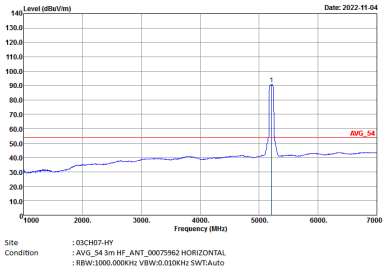
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH38 5190MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

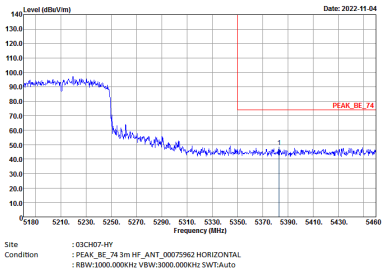
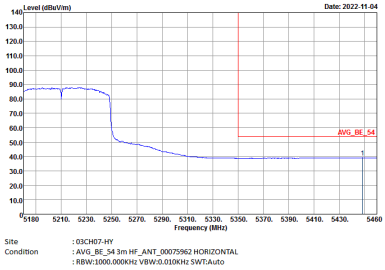
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH38 5190MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

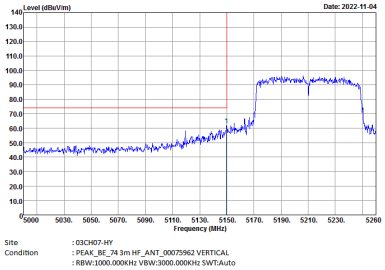
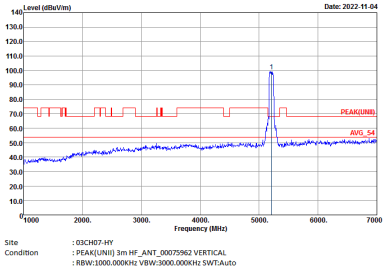
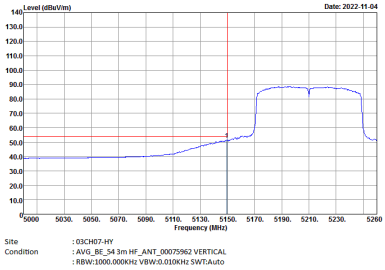
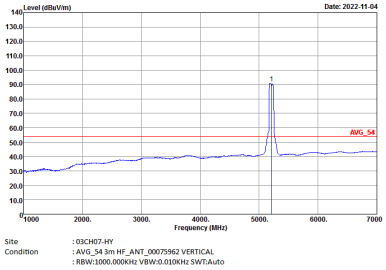
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH38 5190MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

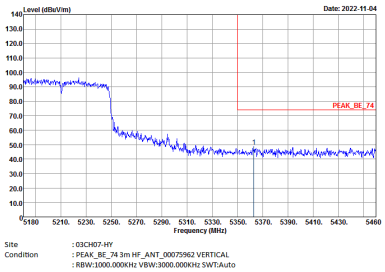
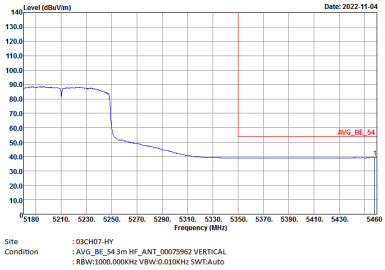
Band 1 5150~5250MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

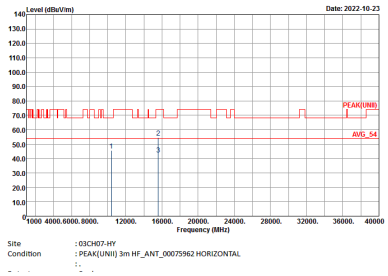
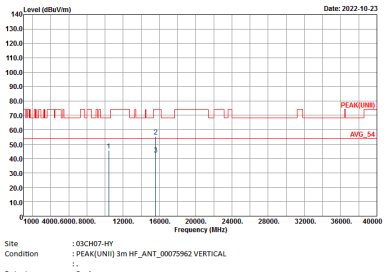
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

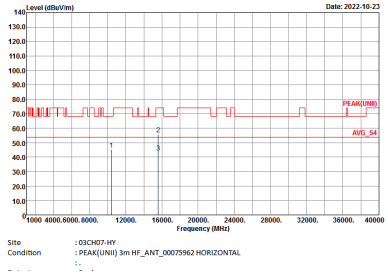
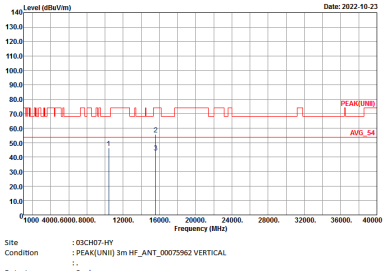
Band 1 - 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH40 5200MHz	
1+2	Horizontal	Vertical
Peak Avg.		

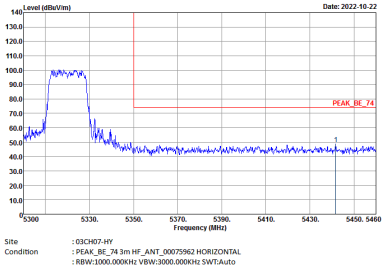
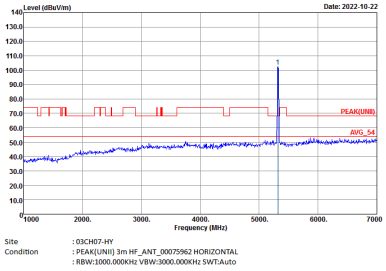
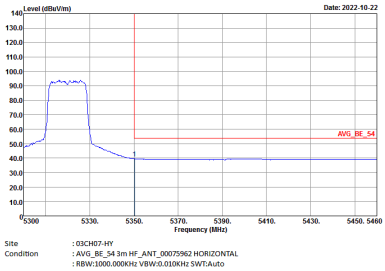
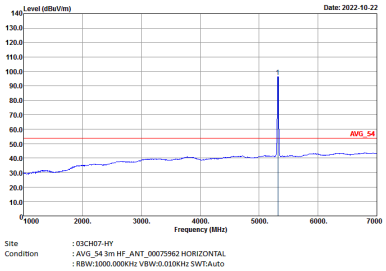
Band 1 5150~5250MHz

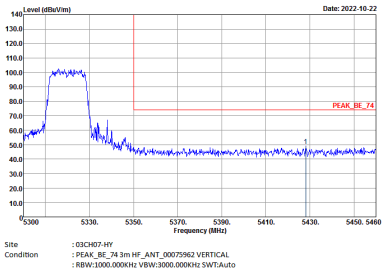
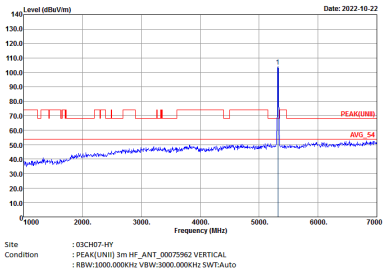
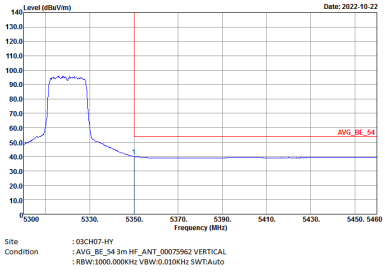
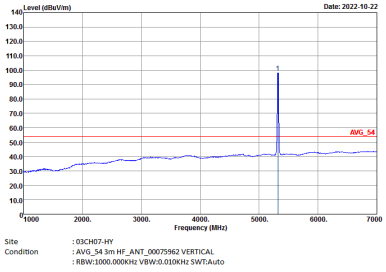
WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH40 5200MHz	
1+2	Horizontal	Vertical
Peak Avg.		

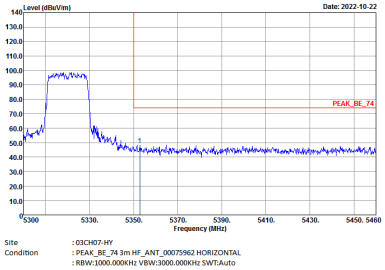
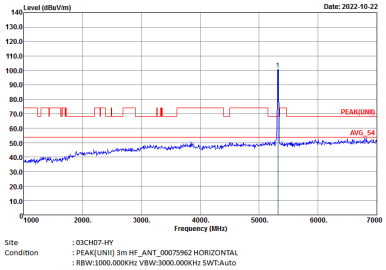
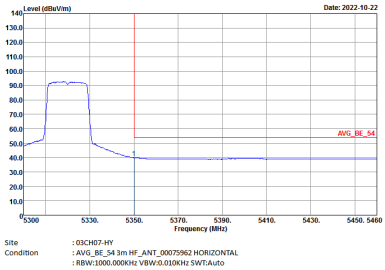
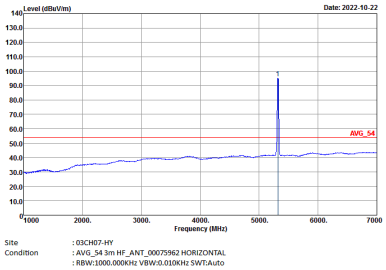
Band 2 - 5250~5350MHz

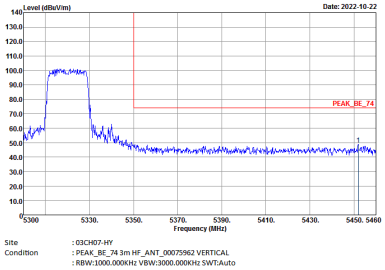
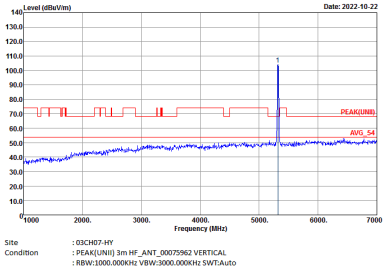
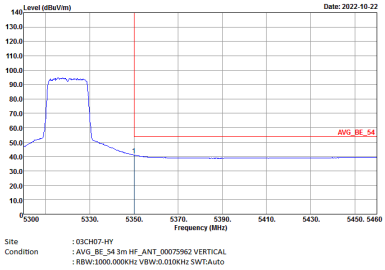
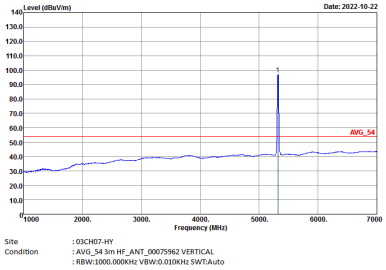
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11a CH64 5320MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11a CH64 5320MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

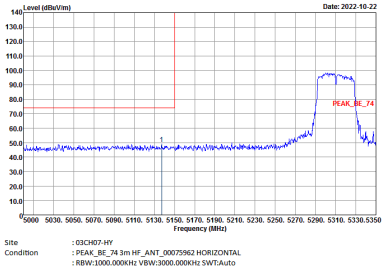
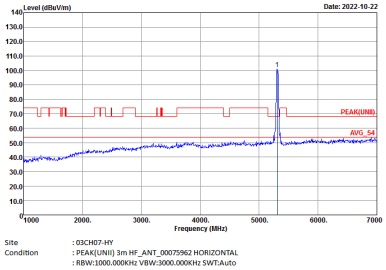
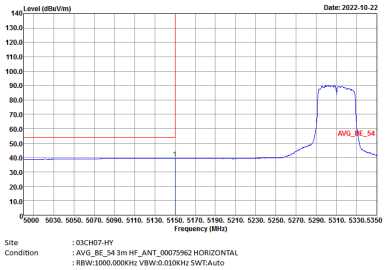
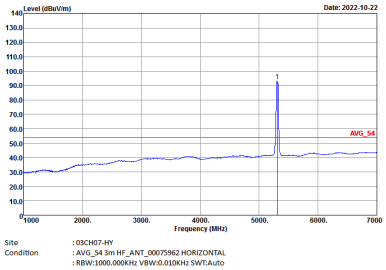
Band 2 5250~5350MHz
WIFI 802.11ac VHT20 (Band Edge @ 3m)

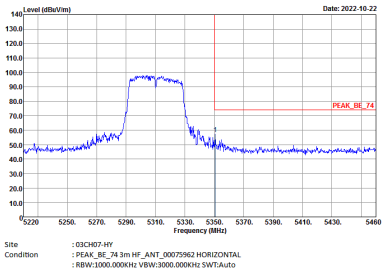
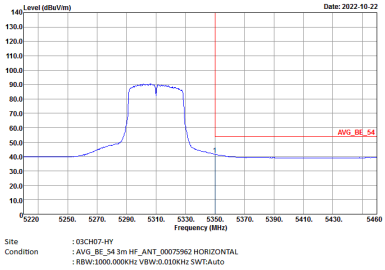
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH64 5320MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

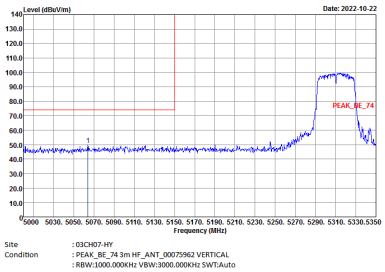
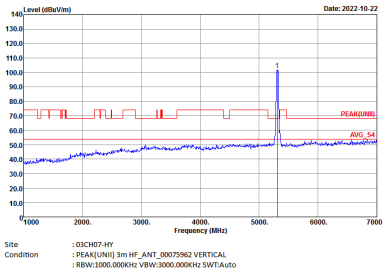
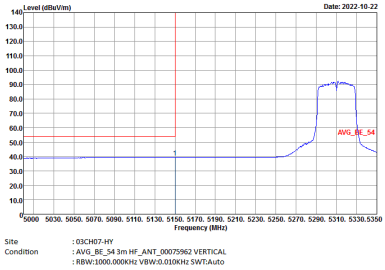
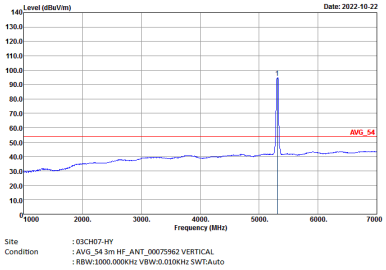
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH64 5320MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

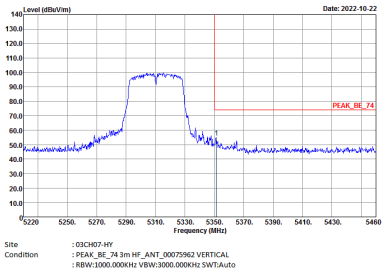
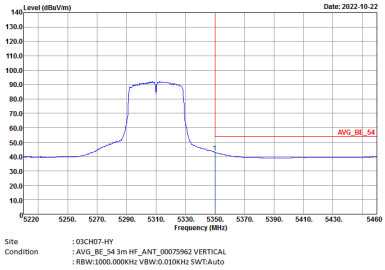
Band 2 5250~5350MHz

WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310 - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

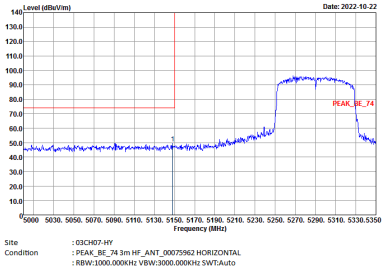
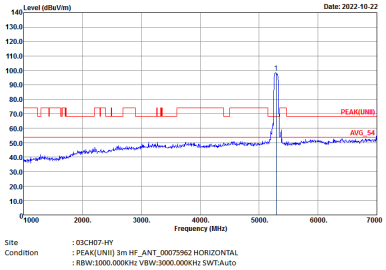
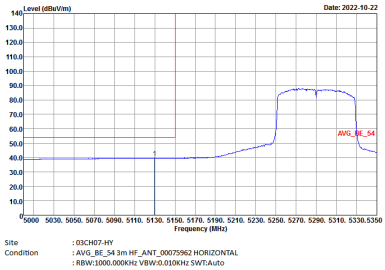
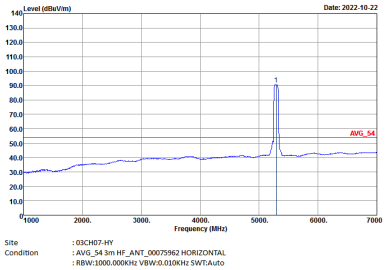
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310 - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

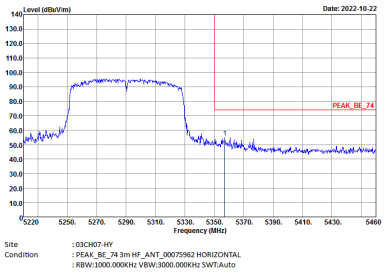
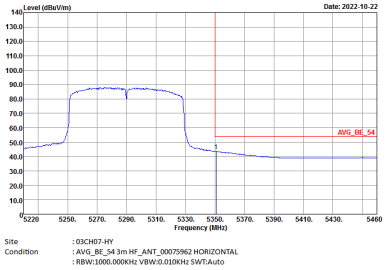
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310 - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

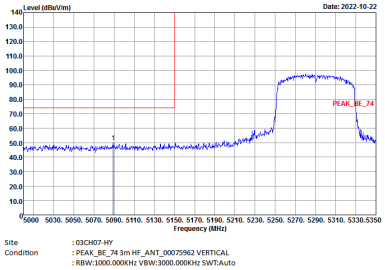
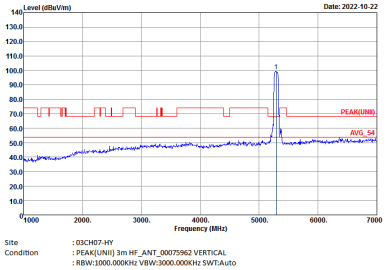
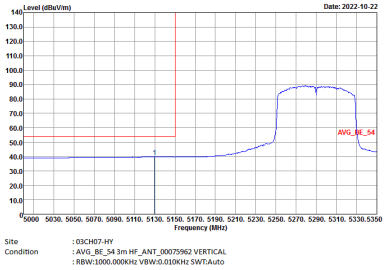
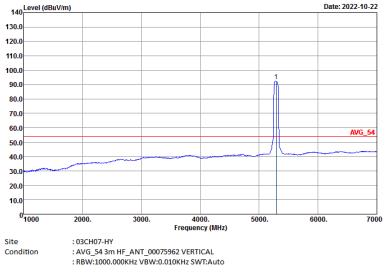
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH62 5310 - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

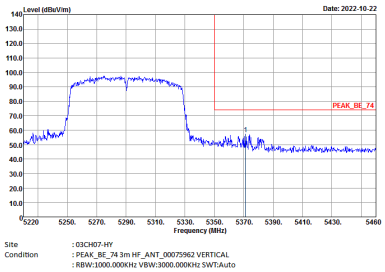
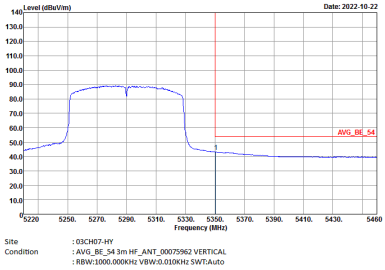
Band 2 5250~5350MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH58 5290MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

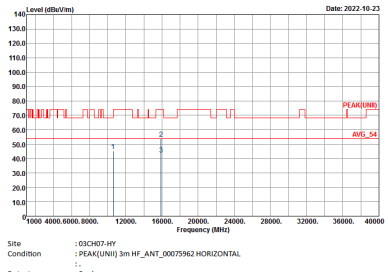
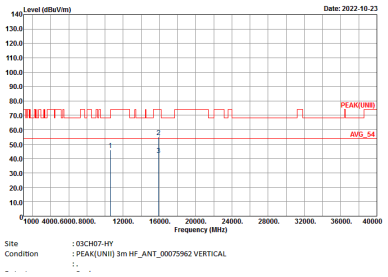
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH58 5290MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

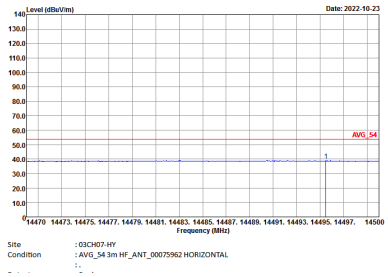
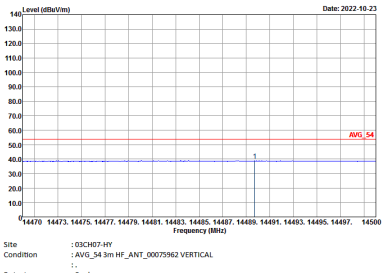
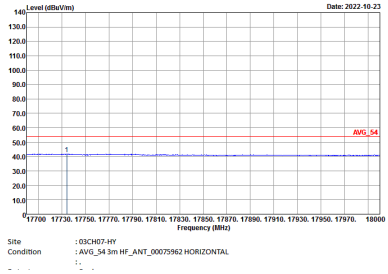
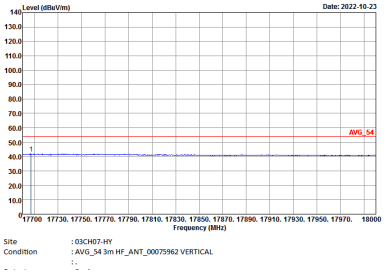
WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH58 5290MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

WIFI	Band 2 5250~5350MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH58 5290MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

Band 2 - 5250~5350MHz

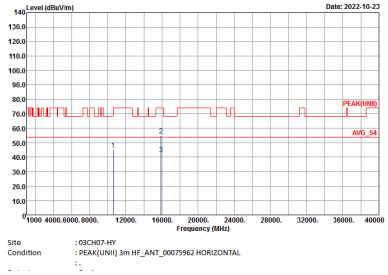
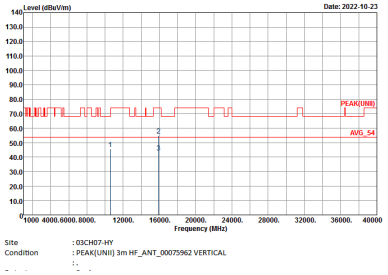
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 2 5250~5350MHz Harmonic @ 3m	
ANT	802.11a CH60 5300MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	Band 2 5250~5350MHz Harmonic @ 3m	
ANT	802.11a CH60 5300MHz	
1+2	Horizontal	Vertical
14.47G ~14.5G Avg.		
17.7G ~18G Avg		

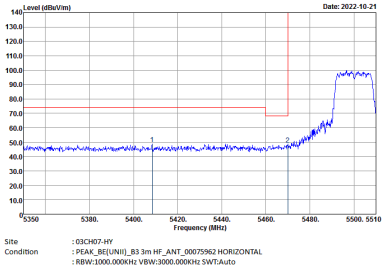
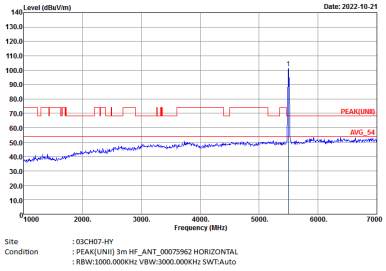
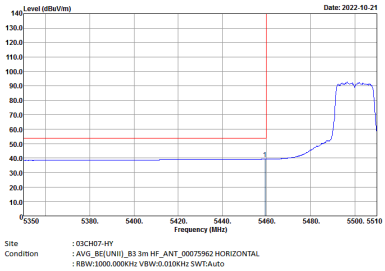
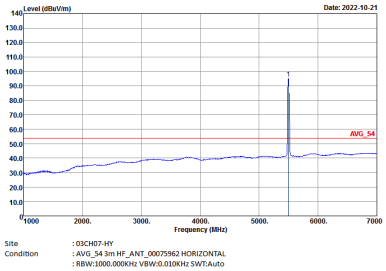
Band 2 5250~5350MHz

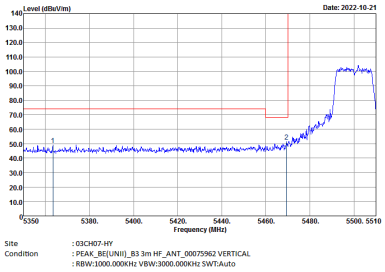
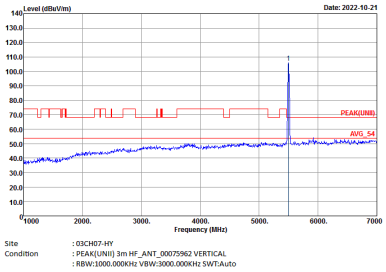
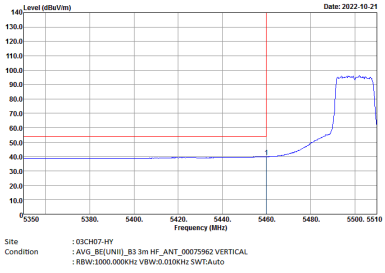
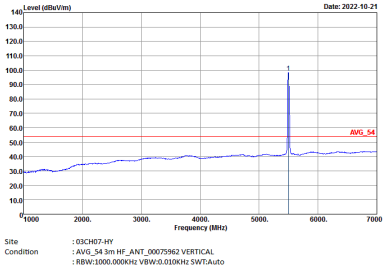
WIFI 802.11ac VHT20 (Harmonic @ 3m)

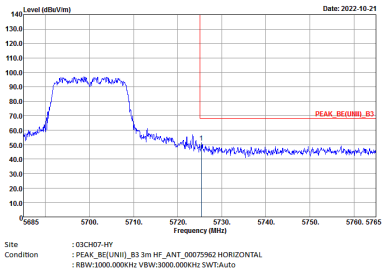
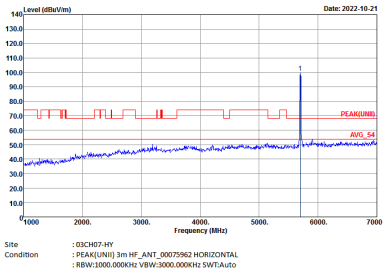
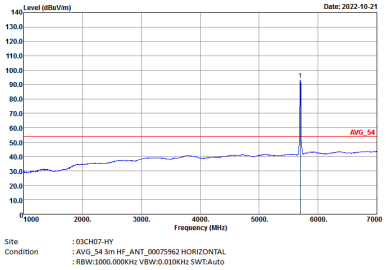
WIFI	Band 2 5250~5350MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH60 5300MHz	
1+2	Horizontal	Vertical
Peak Avg.		

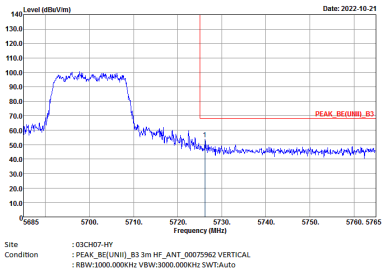
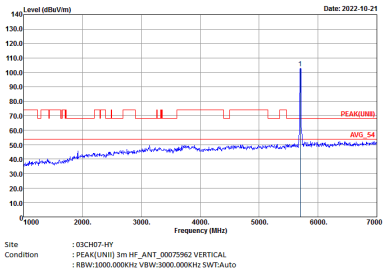
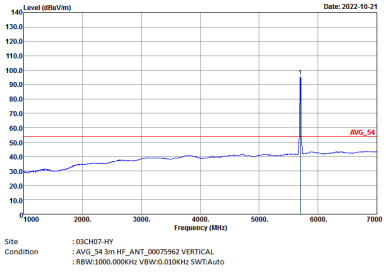
Band 3 - 5470~5725MHz

WIFI 802.11a (Band Edge @ 3m)

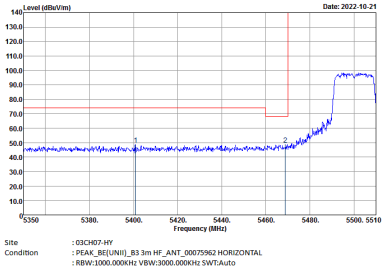
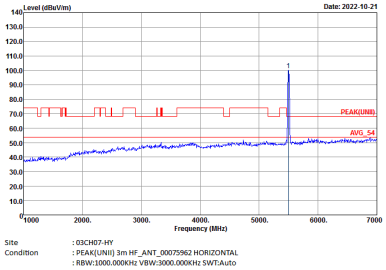
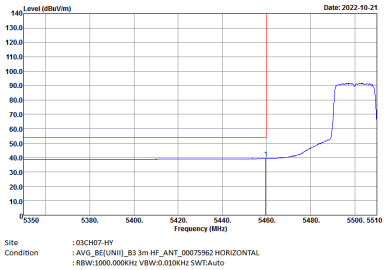
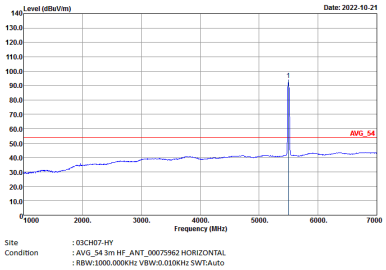
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH100 5500MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

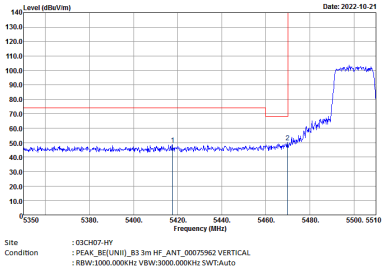
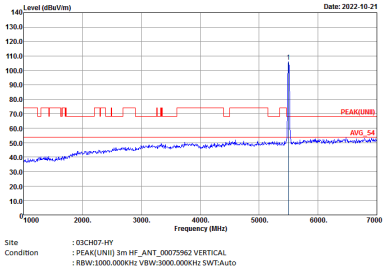
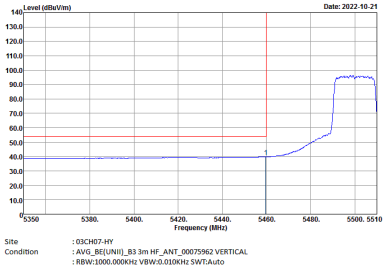
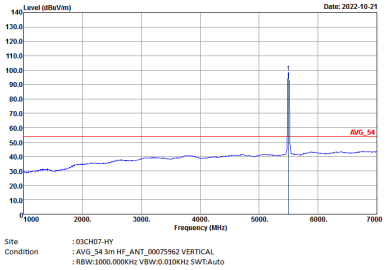
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH100 5500MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

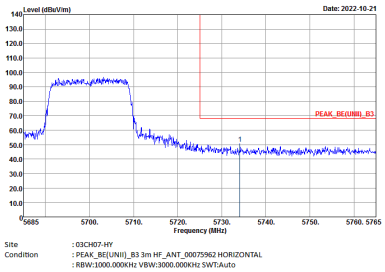
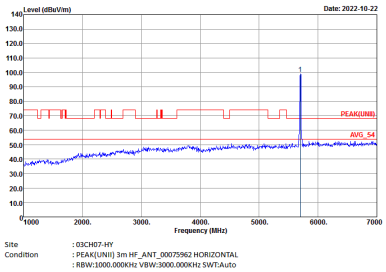
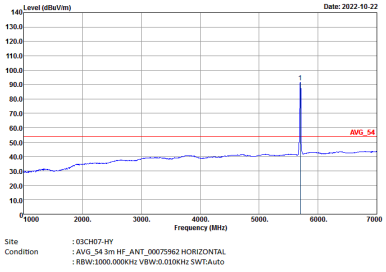
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH140 5700MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.	Left blank	

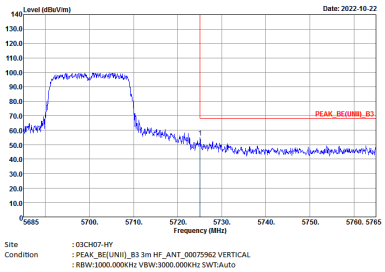
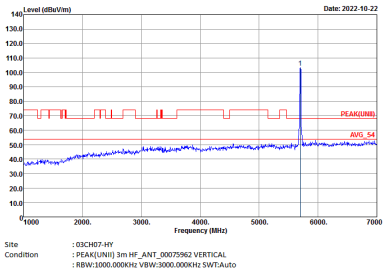
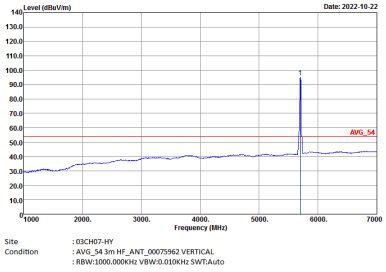
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11a CH140 5700MHz	
1+2	Vertical	Fundamental
Peak		
Avg.	Left blank	

Band 3 5470~5725MHz
WIFI 802.11ac VHT20 (Band Edge @ 3m)

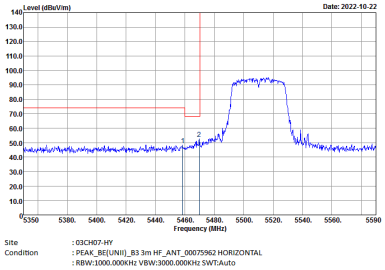
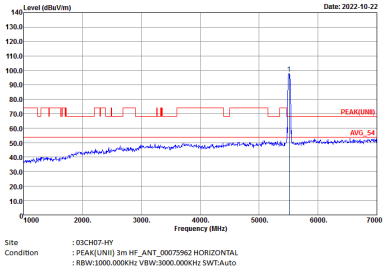
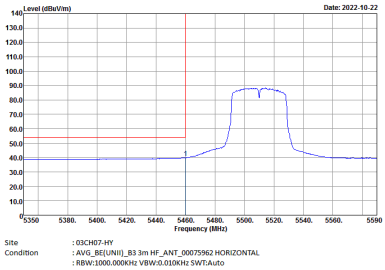
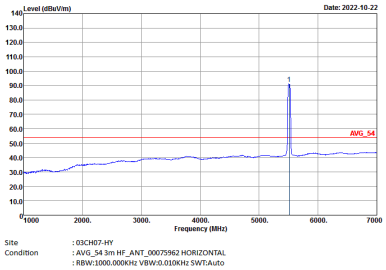
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH100 5500MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.		

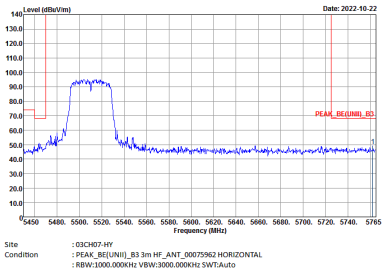
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH100 5500MHz	
1+2	Vertical	Fundamental
Peak		
Avg.		

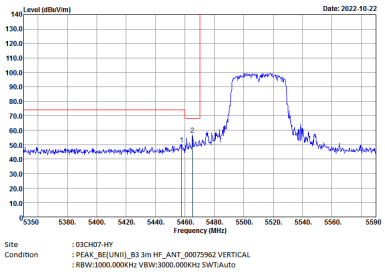
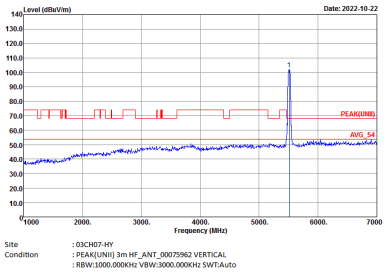
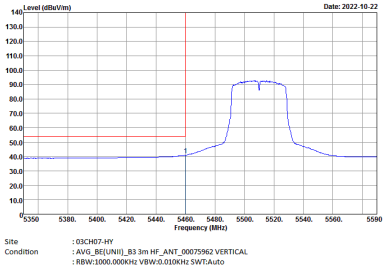
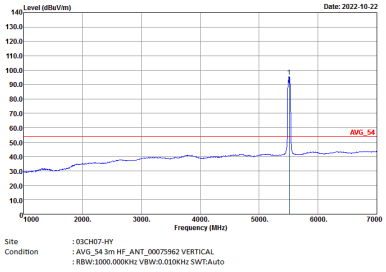
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH140 5700MHz	
1+2	Horizontal	Fundamental
Peak		
Avg.	Left blank	

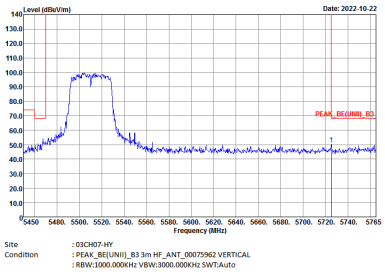
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH140 5700MHz	
1+2	Vertical	Fundamental
Peak		
Avg.	Left blank	

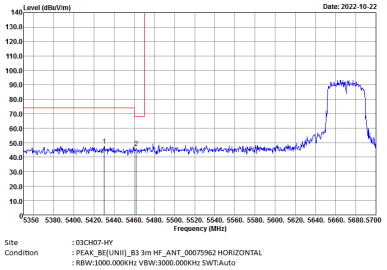
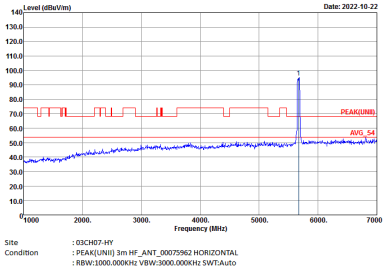
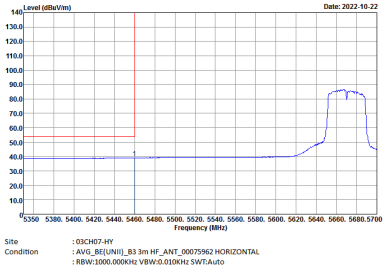
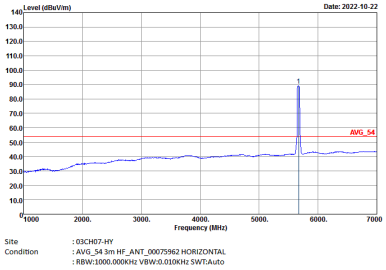
Band 3 5470~5725MHz
WIFI 802.11ac VHT40 (Band Edge @ 3m)

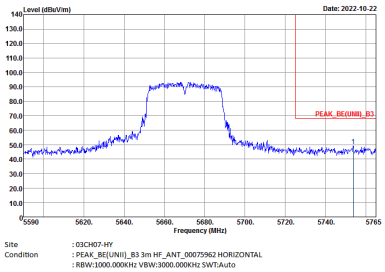
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH102 5510MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

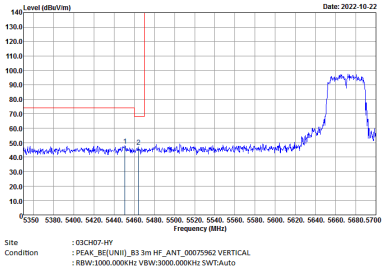
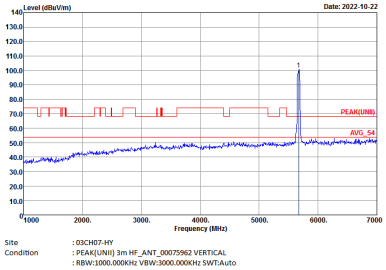
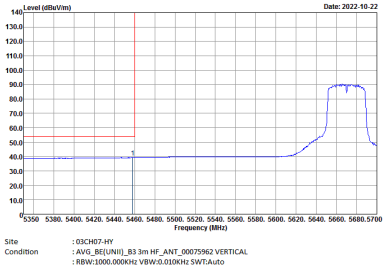
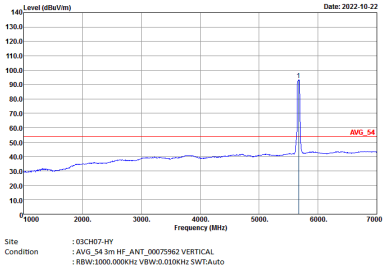
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH102 5510MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank

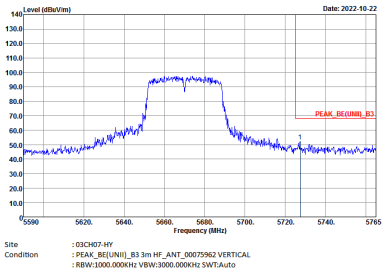
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH102 5510MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH102 5510MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH134 5670MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

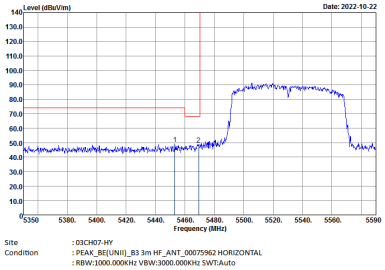
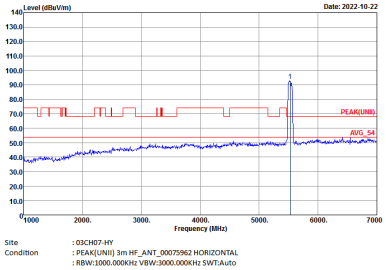
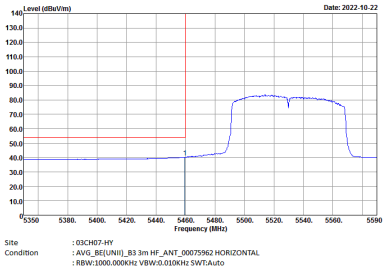
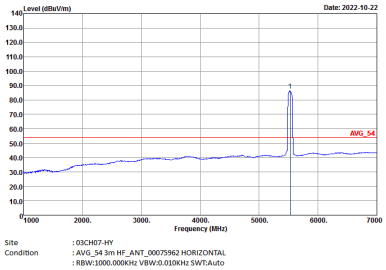
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH134 5670MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank

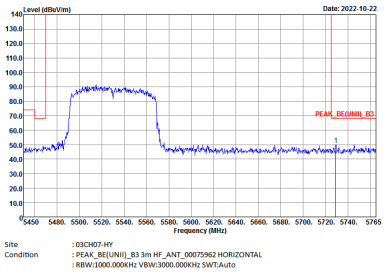
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH134 5670MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

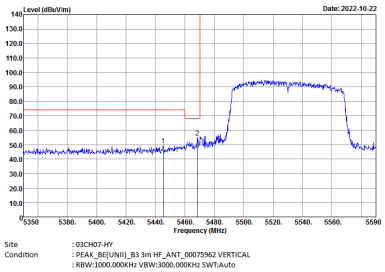
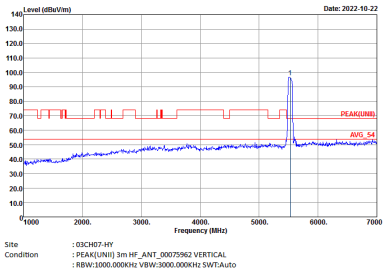
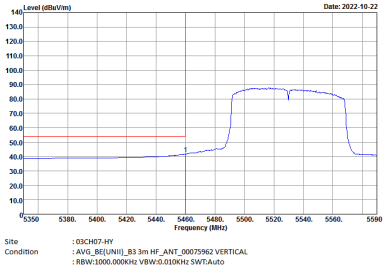
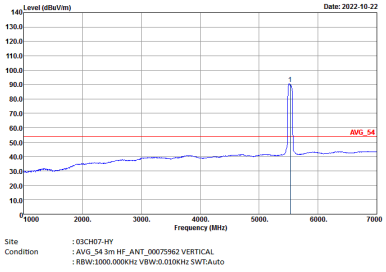
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH134 5670MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank

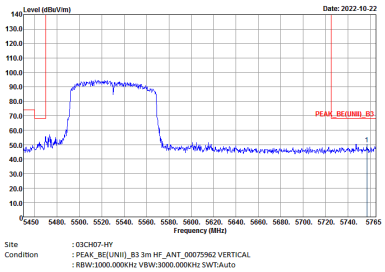
Band 3 5470~5725MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz - L	
1+2	Horizontal	Fundamental
Peak		
Avg.		

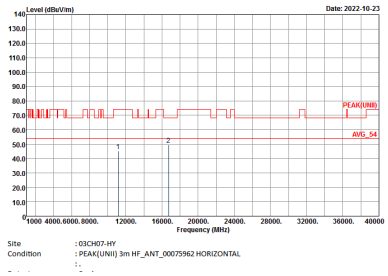
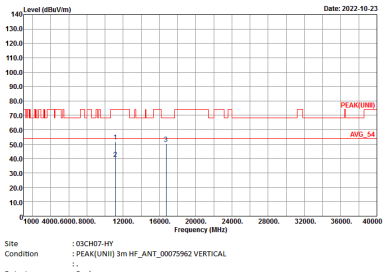
WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz - R	
1+2	Horizontal	Fundamental
Peak		Left blank

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz - L	
1+2	Vertical	Fundamental
Peak		
Avg.		

WIFI	Band 3 5470~5725MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH106 5530MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank

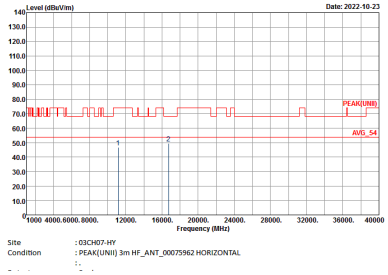
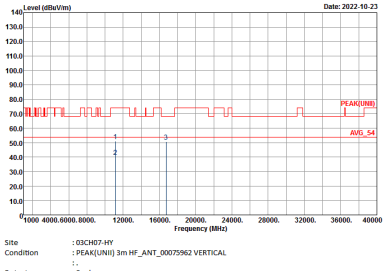
Band 3 - 5470~5725MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 3 5470~5725MHz Harmonic @ 3m	
ANT	802.11a CH116 5580MHz	
1+2	Horizontal	Vertical
Peak Avg.		

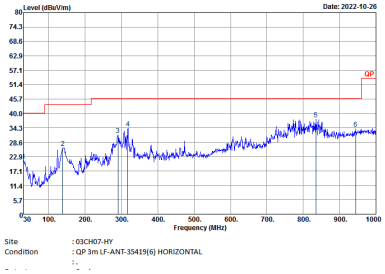
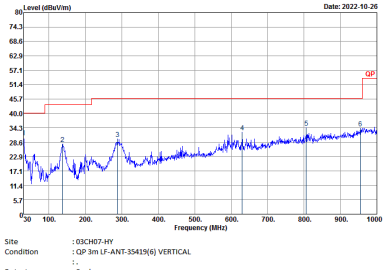
Band 3 5470~5725MHz

WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI	Band 3 5470~5725MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH116 5580MHz	
1+2	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (LF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
1+2	Horizontal	Vertical
QP / Peak		

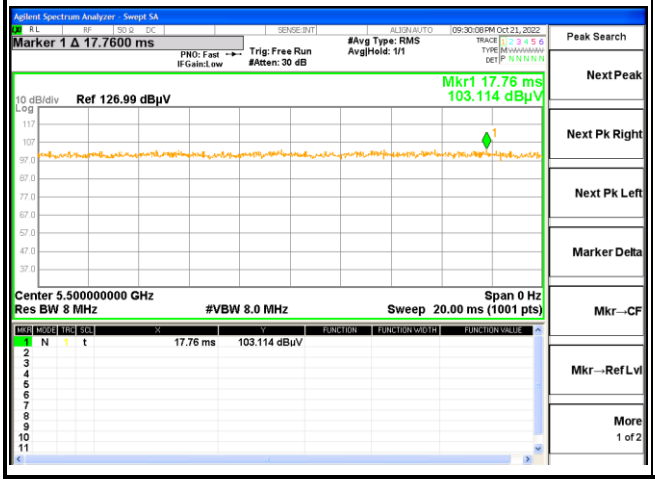
Appendix E. Duty Cycle Plots

Chain	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+0	802.11a	100.00	-	-	10Hz
1+0	5GHz 802.11ac VHT20	100.00	-	-	10Hz
1+0	5GHz 802.11ac VHT40	100.00	-	-	10Hz
1+0	5GHz 802.11ac VHT80	100.00	-	-	10Hz

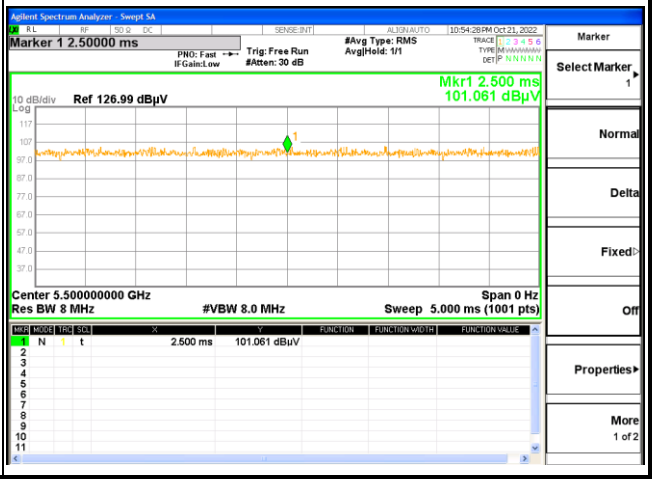
Remark: For Radiated Spurious Emission Test Items, Ant. 1 means Chain 1 and Ant. 2 means Chain 0.

MIMO <Chain 1+0>

802.11a



5GHz 802.11ac VHT20



5GHz 802.11ac VHT40

5GHz 802.11ac VHT80