



FCC RADIO TEST REPORT

FCC ID : U8G-P1MT01
Equipment : Peplink Pepwave Wireless Product
Brand Name :



PEPWAWE

Model Name : MAX BR1 Mini
MAX-BR1-MINI-LTE-US-T-PRM
MAX-BR1-MINI-LTEA-W-T-PRM
MAX-BR1-MINI-LTEA-US-T-PRM
MAX-BR1-MINI-LTE-US-DC-T-PRM
MAX-BR1-MINI-LTEA-W-DC-T-PRM
MAX-BR1-MINI-LTEA-US-DC-T-PRM
AP One Rugged
APO-AC-RUG

Applicant : PISMO LABS TECHNOLOGY LIMITED
A8, 5/F, HK Spinners Industrial Building, Phase 6, 481 Castle Peak Road, Cheung Sha Wan, Hong Kong

Manufacturer : PISMO LABS TECHNOLOGY LIMITED
A8, 5/F, HK Spinners Industrial Building, Phase 6, 481 Castle Peak Road, Cheung Sha Wan, Hong Kong

Standard : FCC Part 15 Subpart E §15.407

The product was received on Feb. 14, 2022 and testing was performed from May 25, 2022 to Oct. 08, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval from Sporton International Inc. Wensan Laboratory, the test report shall not be reproduced except in full.



Louis Wu

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory

No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)



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History of this test report

Report No.	Version	Description	Issue Date
FR250205B	01	Initial issue of report	Oct. 27, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403(i)	26dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407(a)	Maximum Conducted Output Power	Pass	-
3.3	15.407(a)	Power Spectral Density	Pass	-
3.4	15.407(b)	Unwanted Emissions	Pass	0.82 dB under the limit at 5150.000 MHz
3.5	15.207	AC Conducted Emission	Pass	14.90 dB under the limit at 0.152 MHz
3.6	15.203	Antenna Requirement	Pass	-

Declaration of Conformity:

- 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.
- 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.
- The purpose of different model name is for marketing segmentation.

Reviewed by: Lewis Ho

Report Producer: Rachel Hsieh



1 General Description

1.1 Product Feature of Equipment Under Test

WCDMA/LTE, Wi-Fi 2.4GHz 802.11b/g/n, WiFi 5GHz 802.11a/n/ac, and GPS.

Product Feature	
Integrated WWAN Module 1	Brand Name: Sierra Model Name: EM7411 FCC ID: N7NEM74B
Integrated WWAN Module 2	Brand Name: Sierra Model Name: MC7455 FCC ID: N7NMC7455
Integrated WWAN Module 3	Brand Name: Telit Model Name: LE910C4-NF FCC ID: RI7LE910CXNF
Sample 1	EUT with WWAN Module 1 (EM7411) + GPS
Sample 2	EUT with WWAN Module 2 (MC7455) + GPS
Sample 3	EUT with WWAN Module 3 (LE910C4-NF) + GPS
Sample 4	EUT without WWAN Module + GPS
Antenna Type	WWAN <For EM7411>: Omni-directional Antenna <For MC7455>: Omni-directional Antenna <For LE910C4-NF >: Omni-directional Antenna WLAN: <Ant. 1>: Omni-directional Antenna <Ant. 2>: Omni-directional Antenna GPS: Directional Antenna

Antenna information		
5180 MHz ~ 5240 MHz	Peak Gain (dBi)	Ant. 1: 3.29 Ant. 2: 3.29

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

1.1.1 Antenna Gain

<For CDD Mode>

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

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

For power measurements on IEEE 802.11 devices,

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

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

For PSD measurements, the directional gain calculation.

Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

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

where

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

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

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

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

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

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

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

			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant 1	Ant 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
Band I	3.29	3.29	3.29	6.30	0.00	0.30

Calculation example:

If a device has two antenna, $G_{ANT1} = 3.29\text{dBi}$; $G_{ANT2} = 3.29\text{dBi}$

Directional gain of power measurement = $\max(3.29, 3.29) + 0 = 3.29\text{ dBi}$

Directional gain of PSD derived from formula which is

$$10 \times \log \left\{ \left[10^{\frac{3.29\text{ dBi}}{20}} + 10^{\frac{3.29\text{ dBi}}{20}} \right]^2 \right\} / 2$$

$$= 6.30\text{ dBi}$$

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 (TAF Code: 1190)
Remark	The AC Conducted Emission test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory

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

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. TH05-HY, 03CH12-HY

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

FCC designation No.: TW1190 and TW3786

1.4 Applicable Standards

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

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

Remark:

1. All the test items were validated and recorded in accordance with the standards without any modification during the testing.
2. The TAF code is not including all the FCC KDB listed without accreditation.
3. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in two antenna polarization (Horizontal and Vertical), 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		

Note:

1. The above Frequency and Channel with "*" are 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel with "[#]" are 802.11ac VHT80.

2.2 Test Mode

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

The power for 802.11n mode is smaller than 802.11ac mode, so all other conducted and radiated test is covered by 802.11ac 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 (Covered by VHT20)	MCS0
802.11n HT40 (Covered by VHT40)	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 : WLAN (5GHz) Link + LAN Link + WAN Link + Adapter for Sample 1 Mode 2 : WLAN (5GHz) Link + LAN Link + WAN Link + Adapter for Sample 2 Mode 3 : WLAN (5GHz) Link + LAN Link + WAN Link + Adapter for Sample 3 Mode 4 : WLAN (5GHz) Link + LAN Link + WAN Link + Adapter for Sample 4
Remark: The worst case of Conducted Emission is mode 3; only the test data of it was reported.	

<Sample 3>

Ch. #		Band I : 5150-5250 MHz	
		802.11a	802.11ac VHT20
L	Low	36	36
M	Middle	44	44
H	High	48	48

Ch. #		Band I : 5150-5250 MHz	
		802.11ac VHT40	802.11ac VHT80
L	Low	38	-
M	Middle	-	42
H	High	46	-

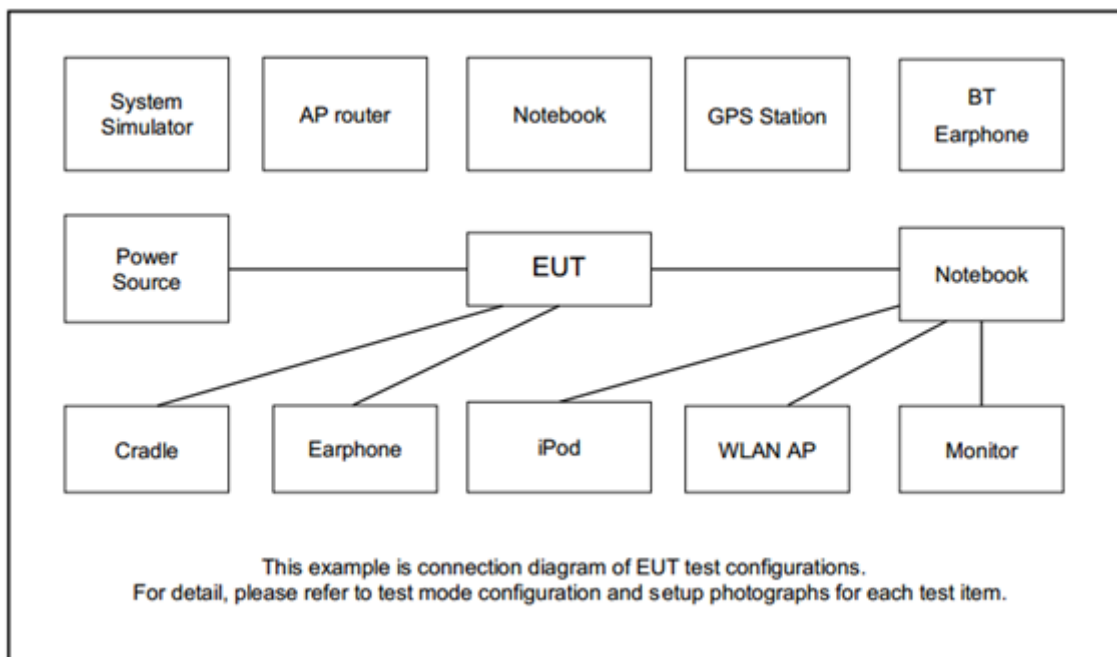
<Sample 4>

Ch. #		Band I : 5150-5250 MHz	
		802.11ac VHT80	
L	Low	-	
M	Middle	42	
H	High	-	

Remark:

1. For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.
2. Since the product supports Client and Indoor AP, the test is evaluated to meet the Client and Indoor AP Limit respectively. Unwanted Emissions uses the Indoor AP Limit test.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

2.5 EUT Operation Test Setup

The RF test items, utility "MT7615 QA 0.0.2.0" was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.



2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10 dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

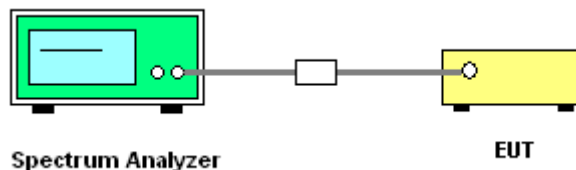
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) $\geq 3 * RBW$.
8. Measure and record the results in the test report.

3.1.4 Test Setup



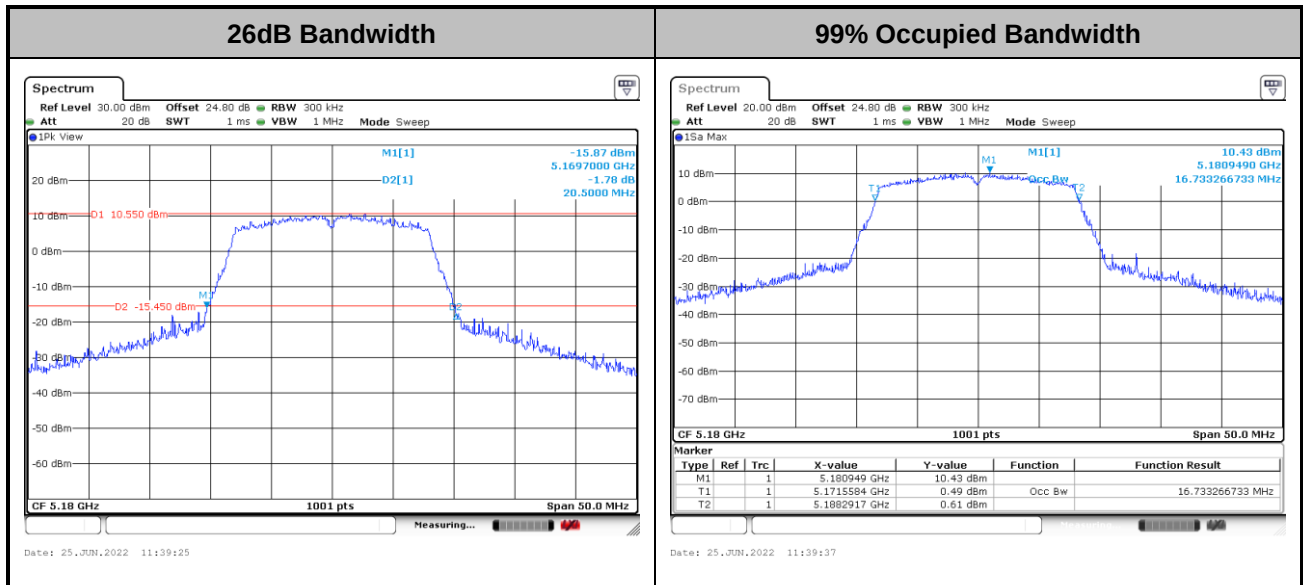
3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.



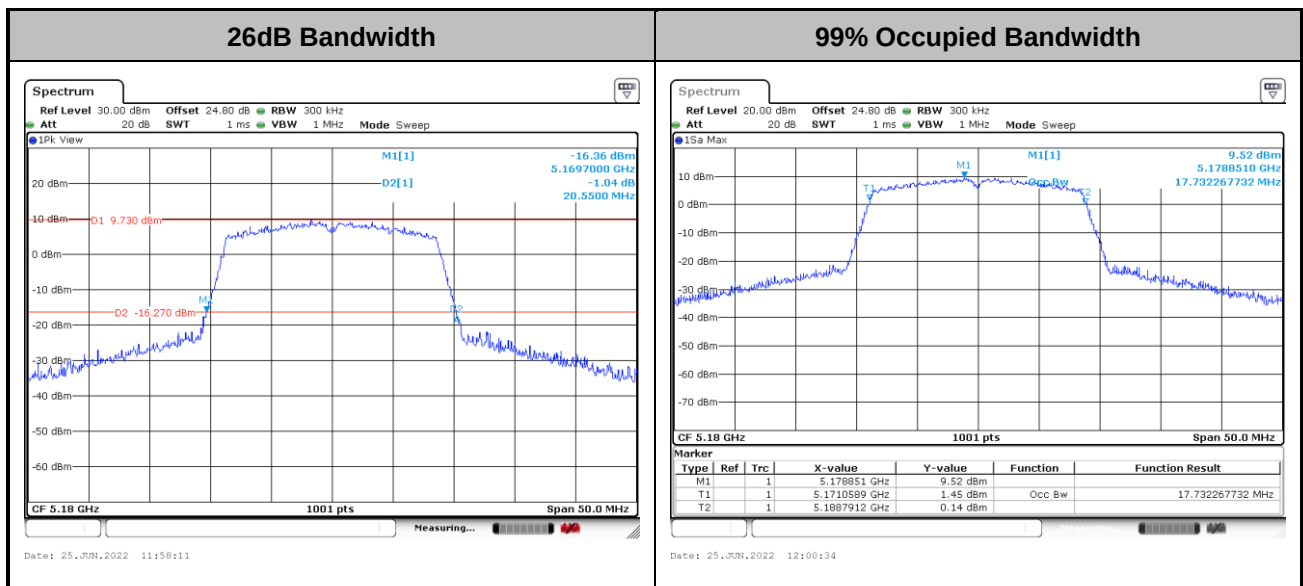
<AP Mode>

<802.11a>



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

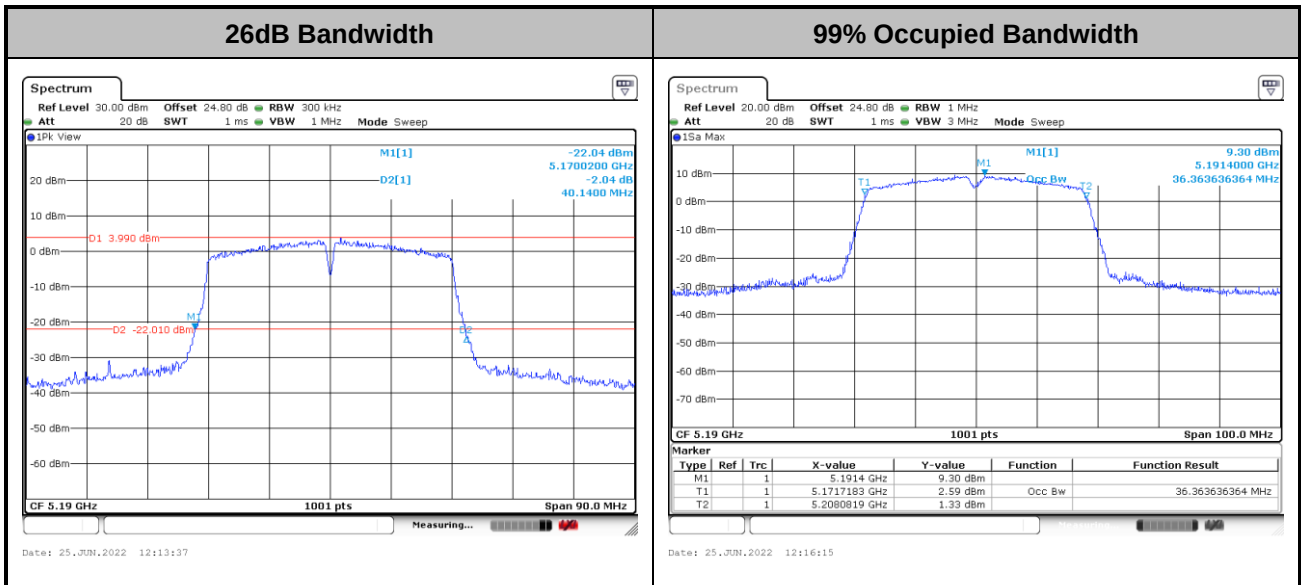
<802.11ac VHT20>



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

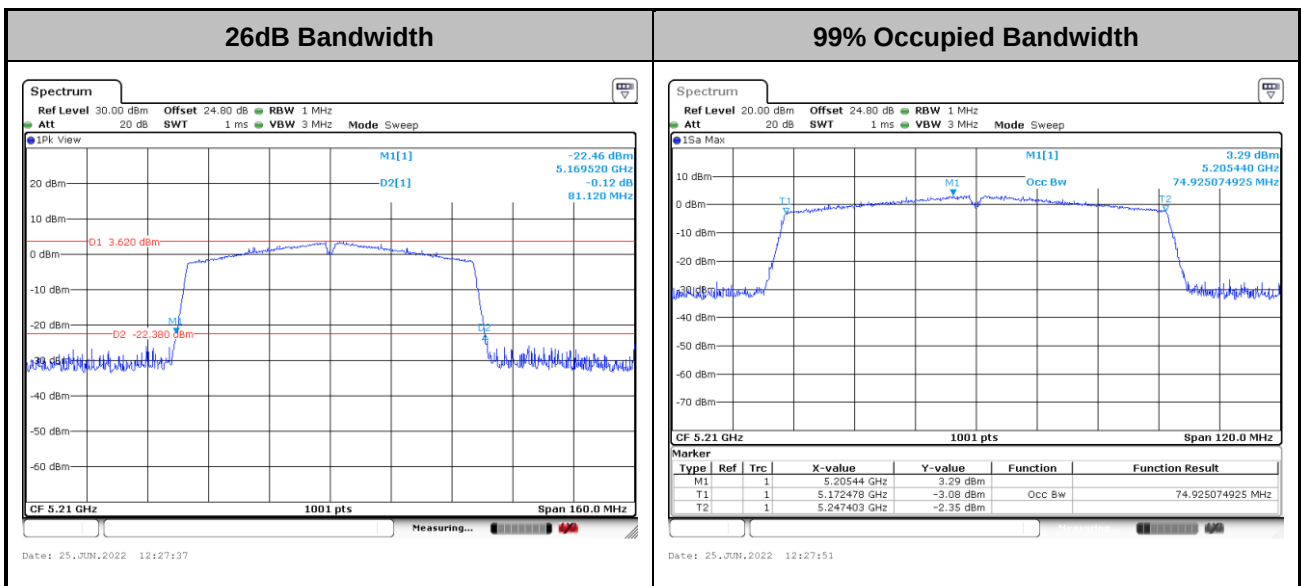


<802.11ac VHT40>



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

<802.11ac VHT80>

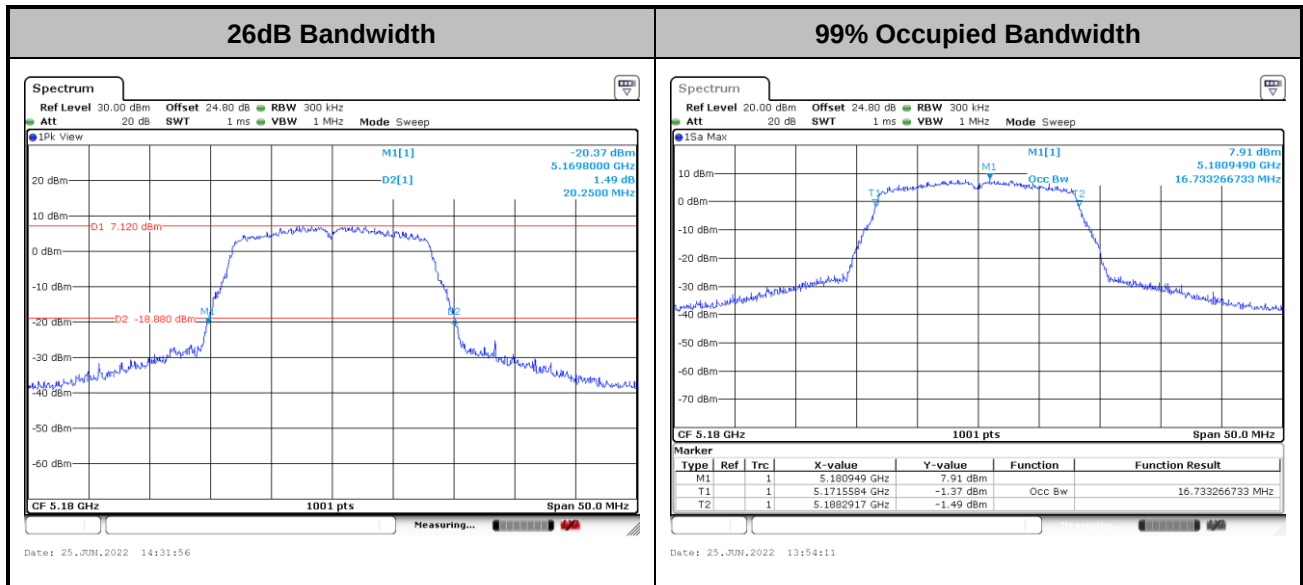


Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



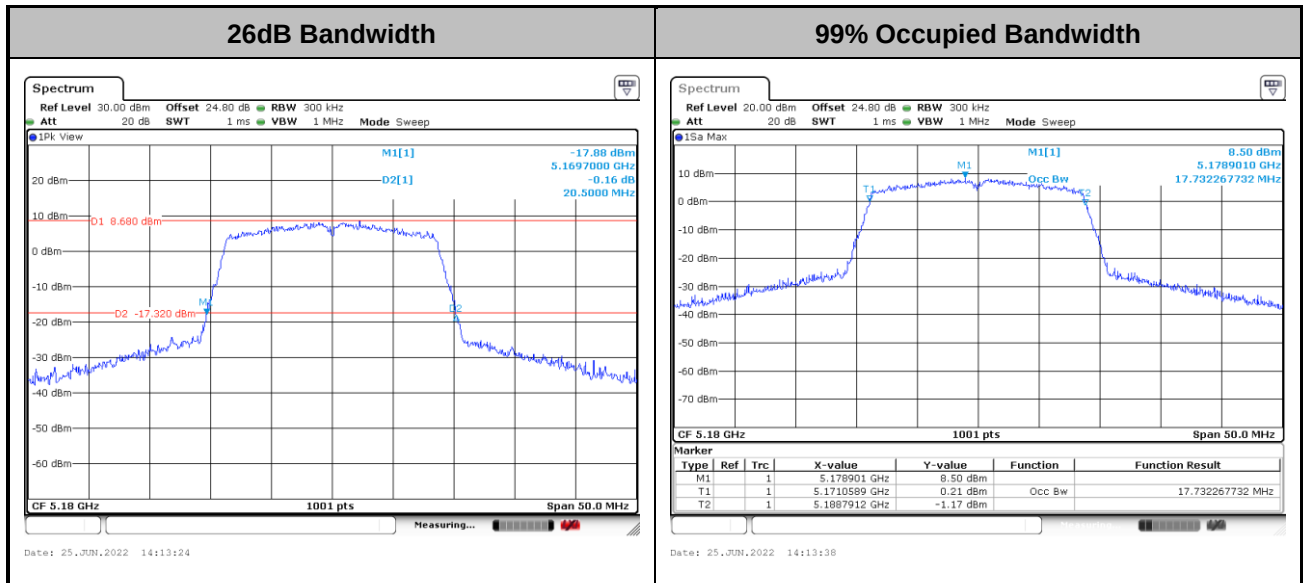
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<802.11a>



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

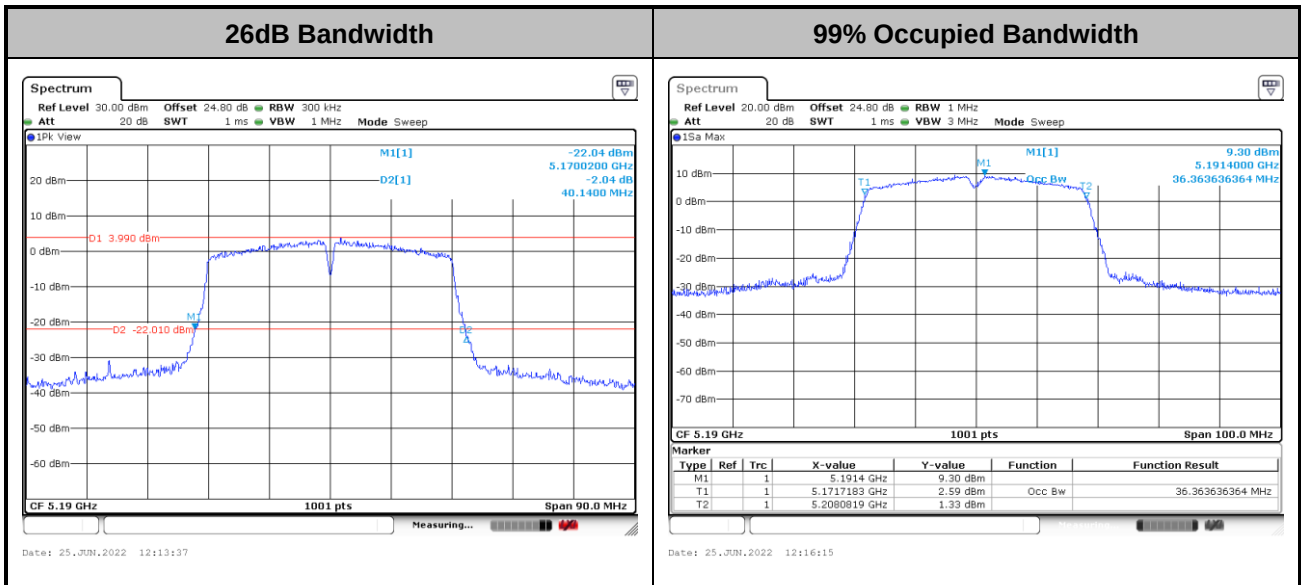
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Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

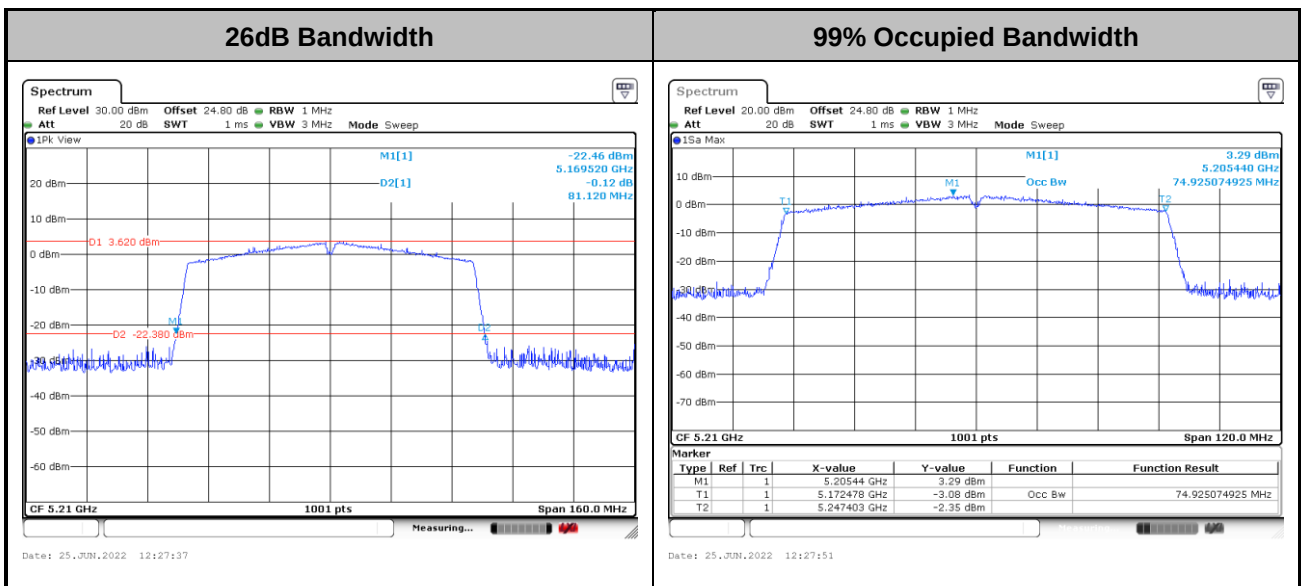


<802.11ac VHT40>



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

<802.11ac VHT80>



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

3.2 Maximum Conducted Output Power Measurement

3.2.1 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.

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.

3.2.2 Measuring Instruments

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

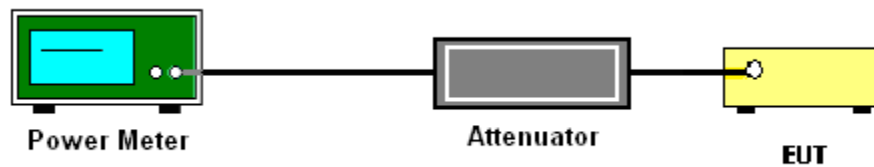
3.2.3 Test Procedures

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

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<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 power spectral density shall not exceed 11 dBm in any 1.0 MHz band. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1.0 MHz band.

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.

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Section F) Maximum power spectral density.

Method SA-3

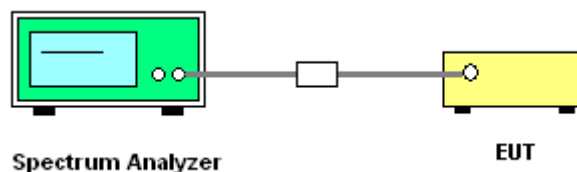
(power averaging (rms) detection with max hold):

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW $\geq$ 3 MHz.
 - Number of points in sweep $\geq$ 2 Span / RBW.
 - Sweep time $\leq$ (number of points in sweep) $\times$ 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.
Detector = power averaging (rms).
 - Trace mode = max hold.
 - Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
1. The RF output of EUT is connected to the spectrum analyzer by a low loss cable.
 2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
 3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (a): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points; the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

3.3.4 Test Setup



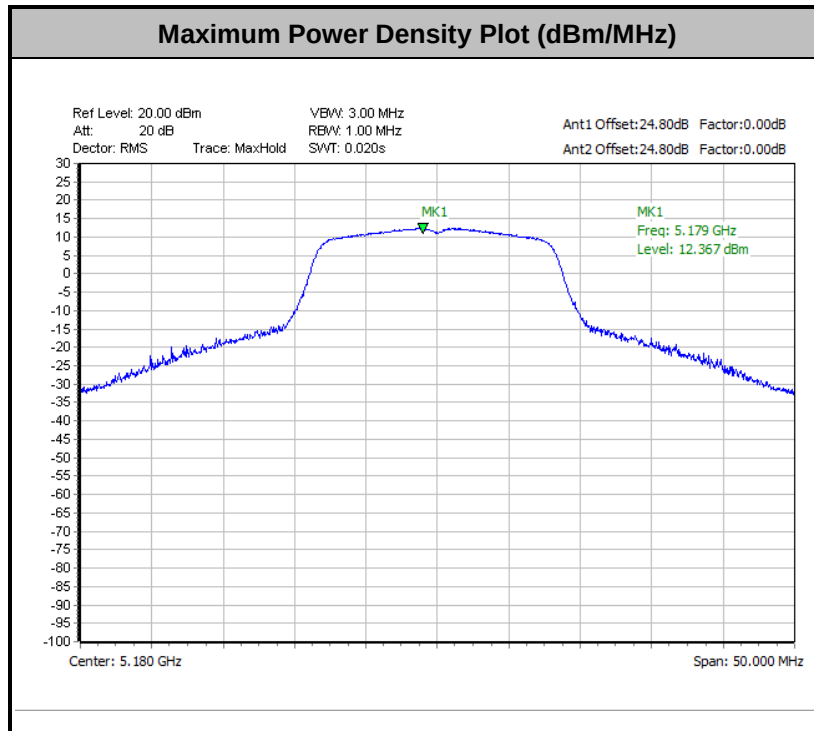
3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

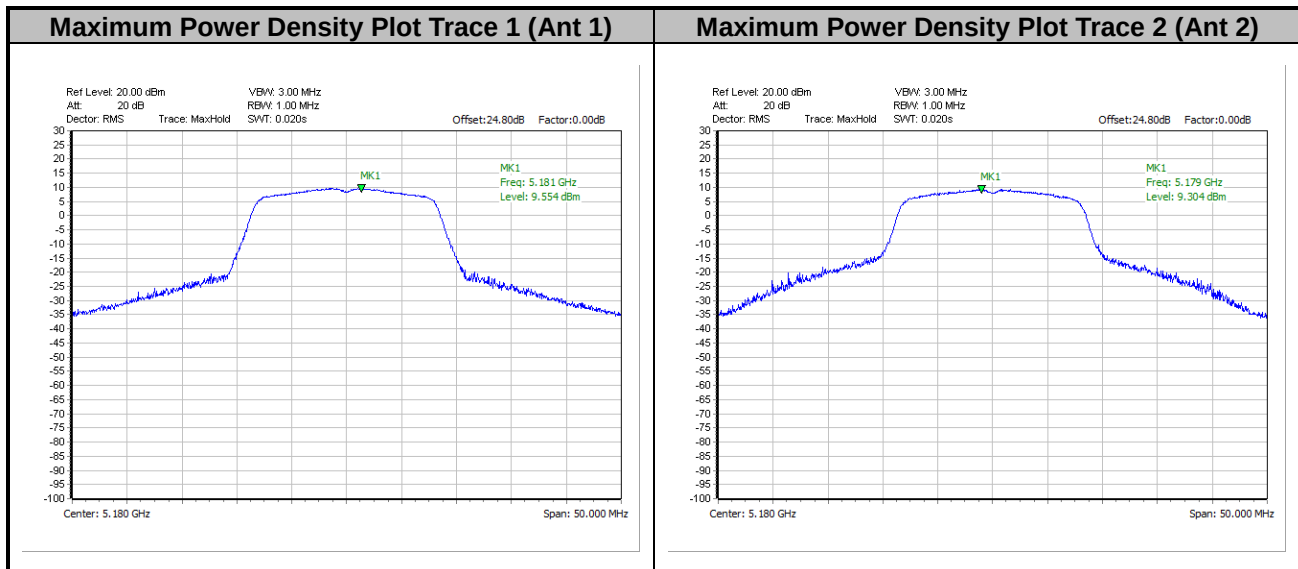


<AP Mode>

<802.11a>

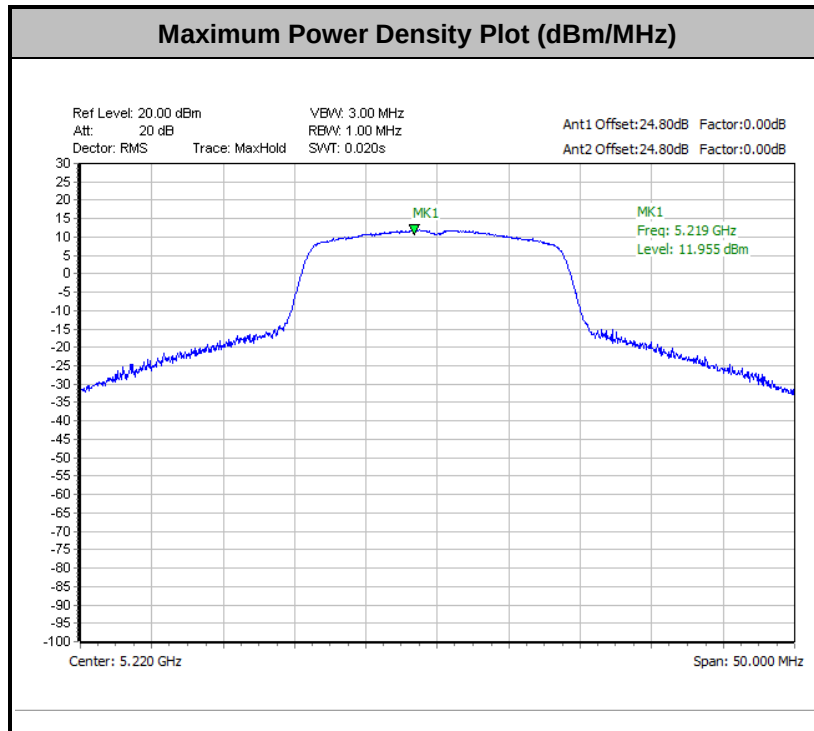


Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.

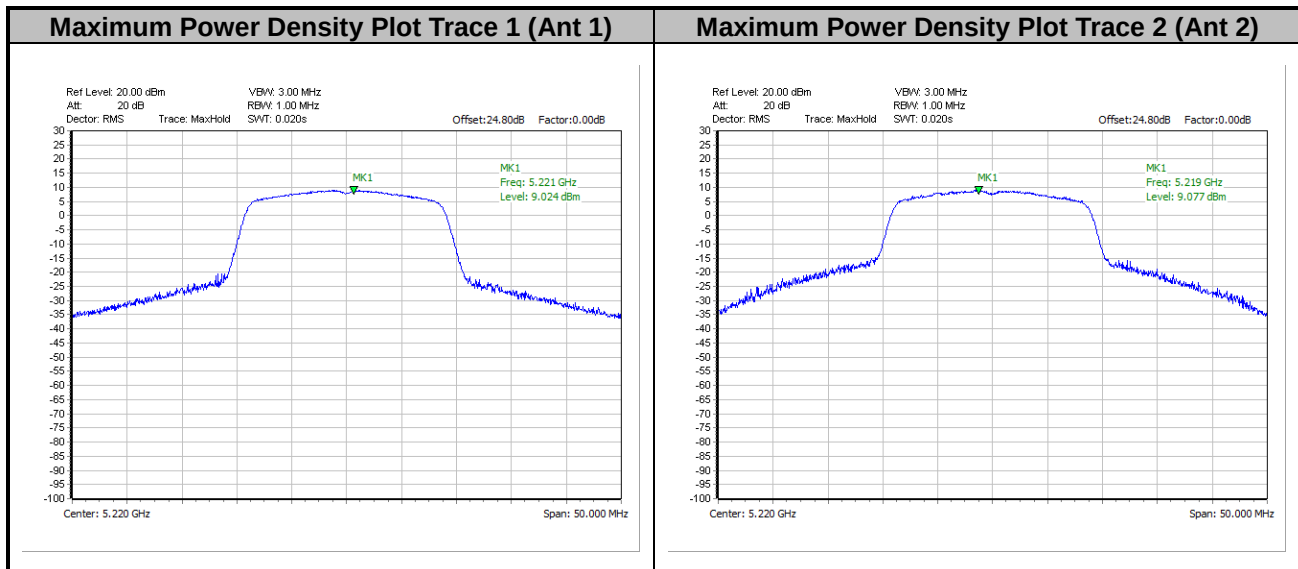




<802.11ac VHT20>

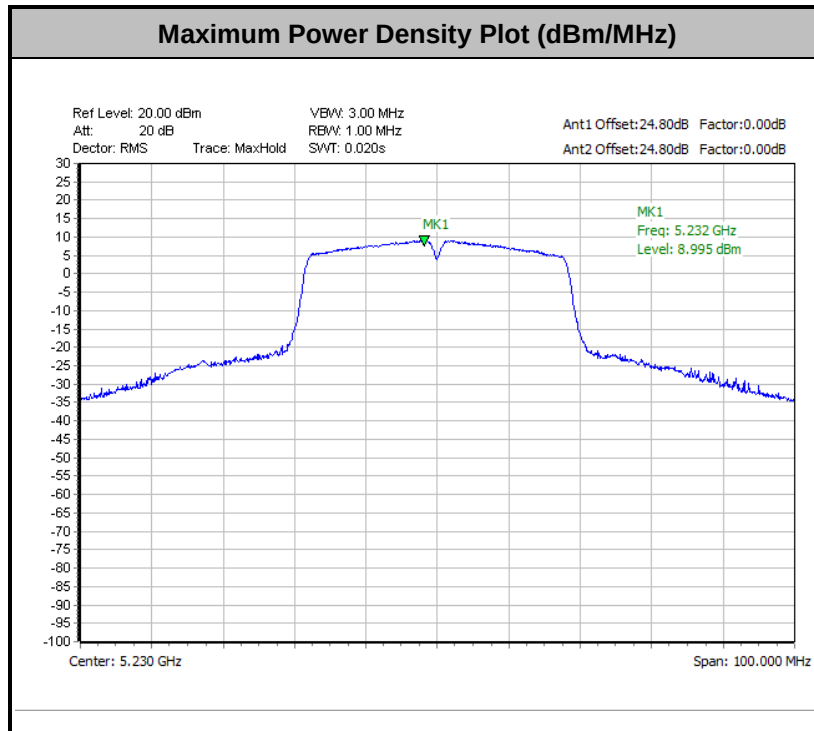


Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.

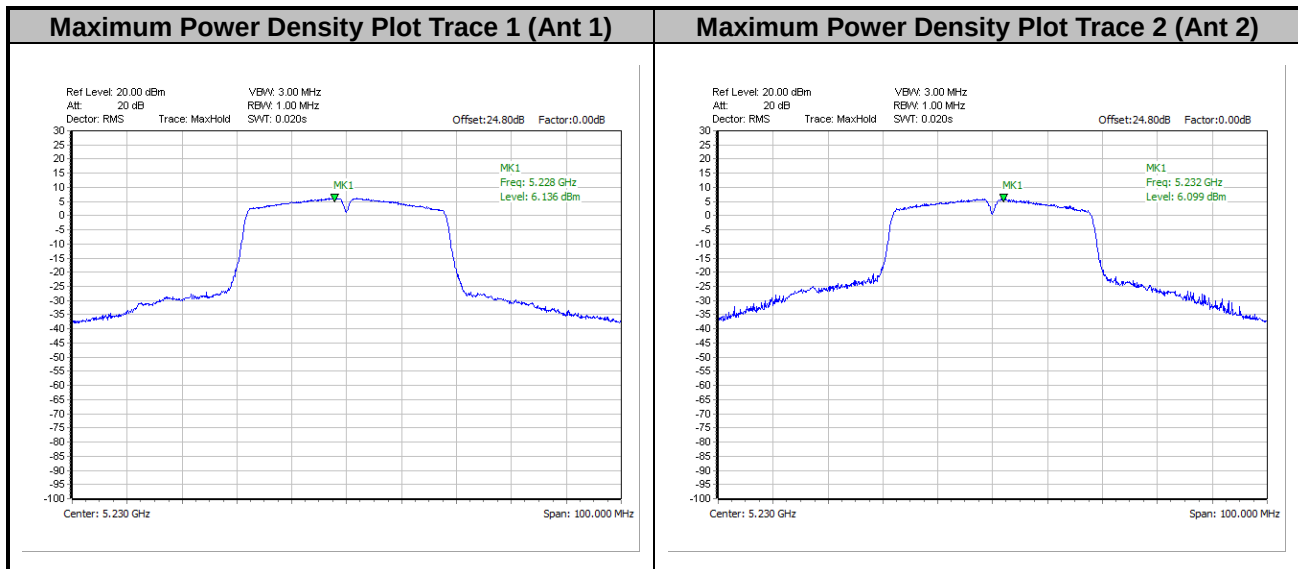




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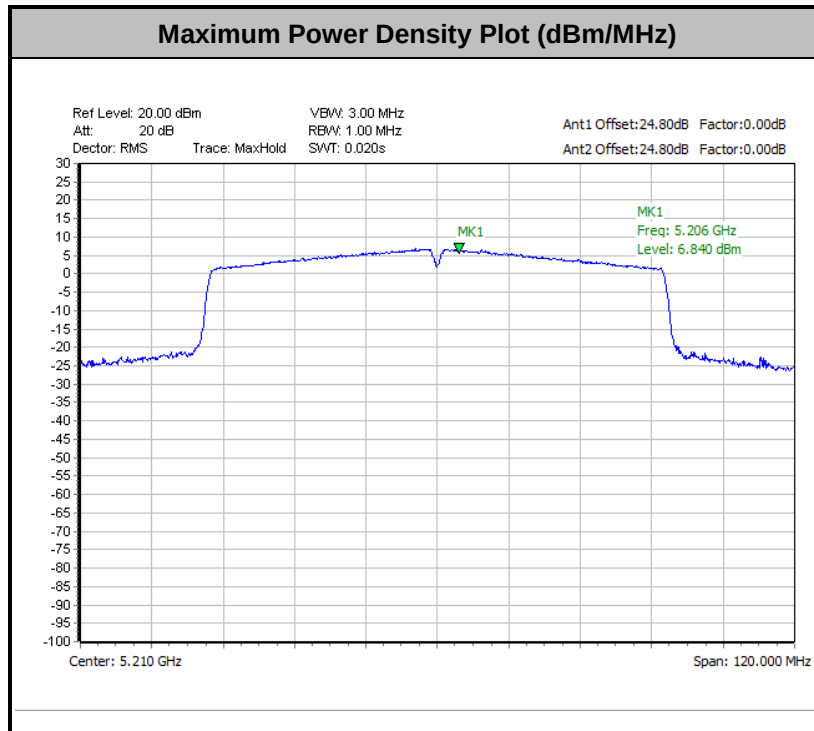


Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.

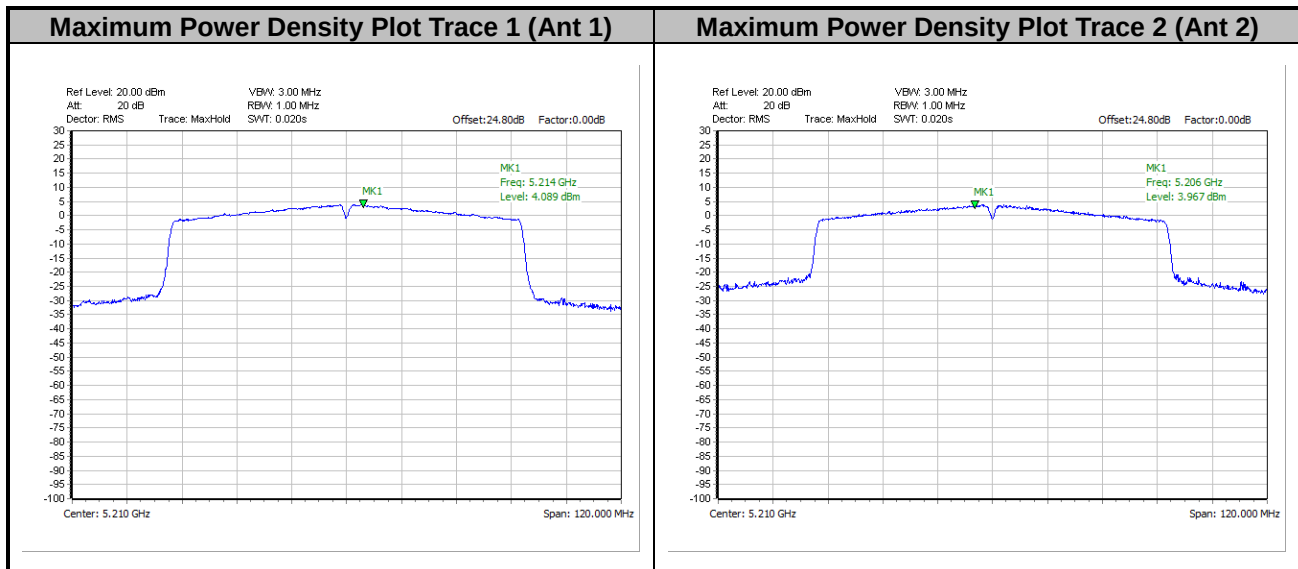




<802.11ac VHT80>



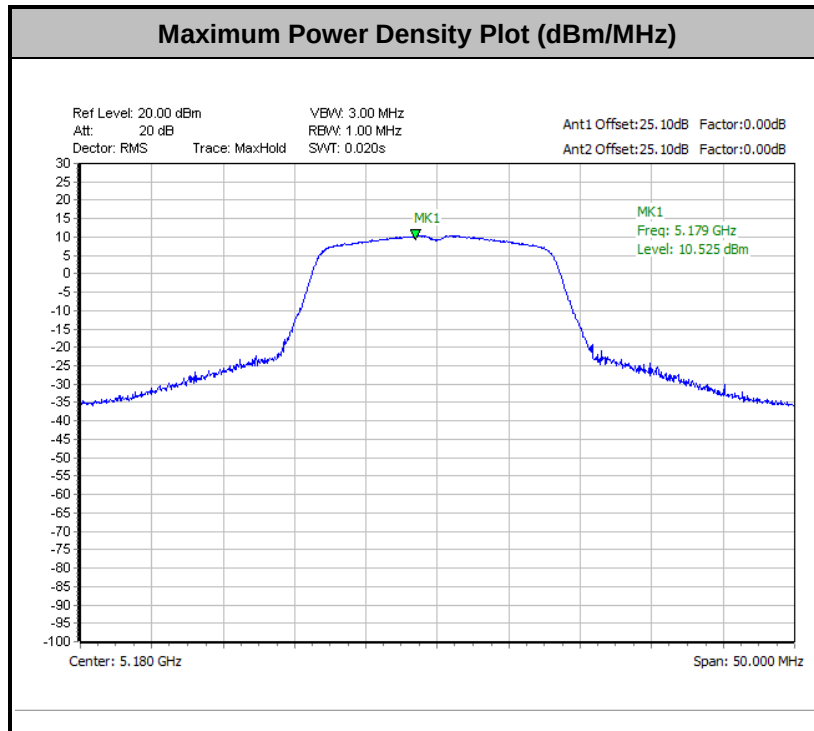
Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.



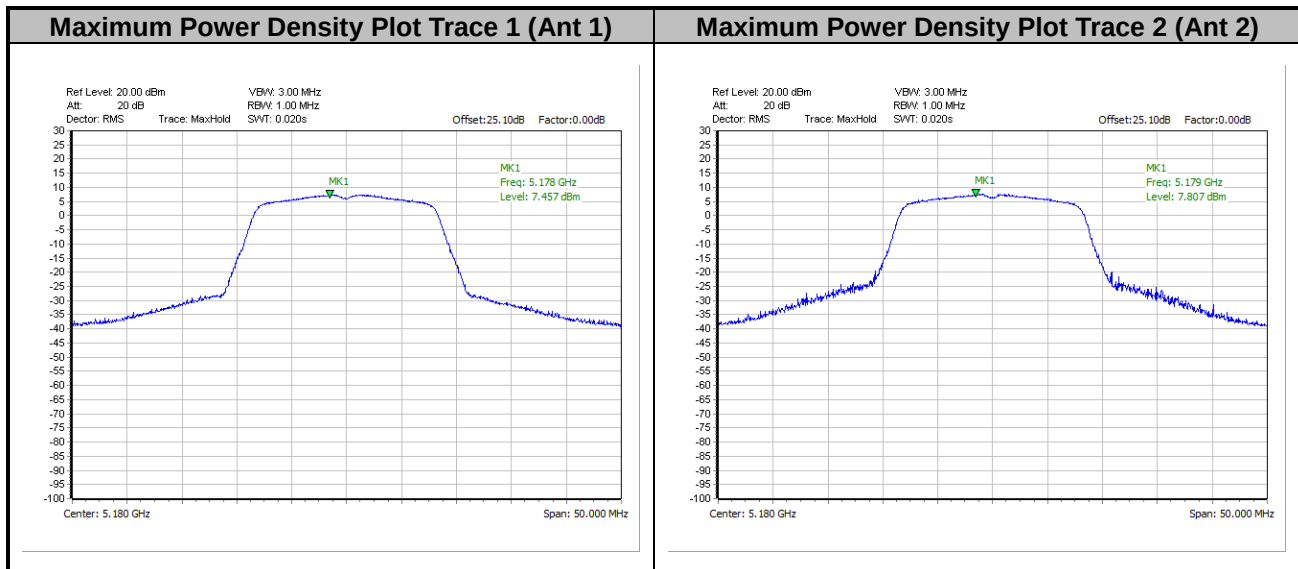


< Client Mode >

<802.11a>

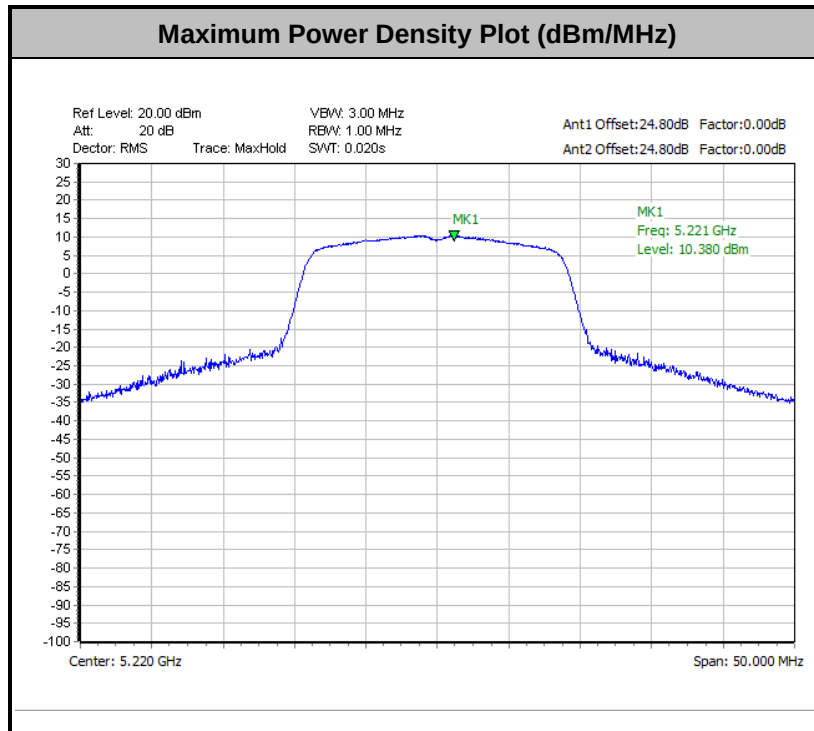


Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.

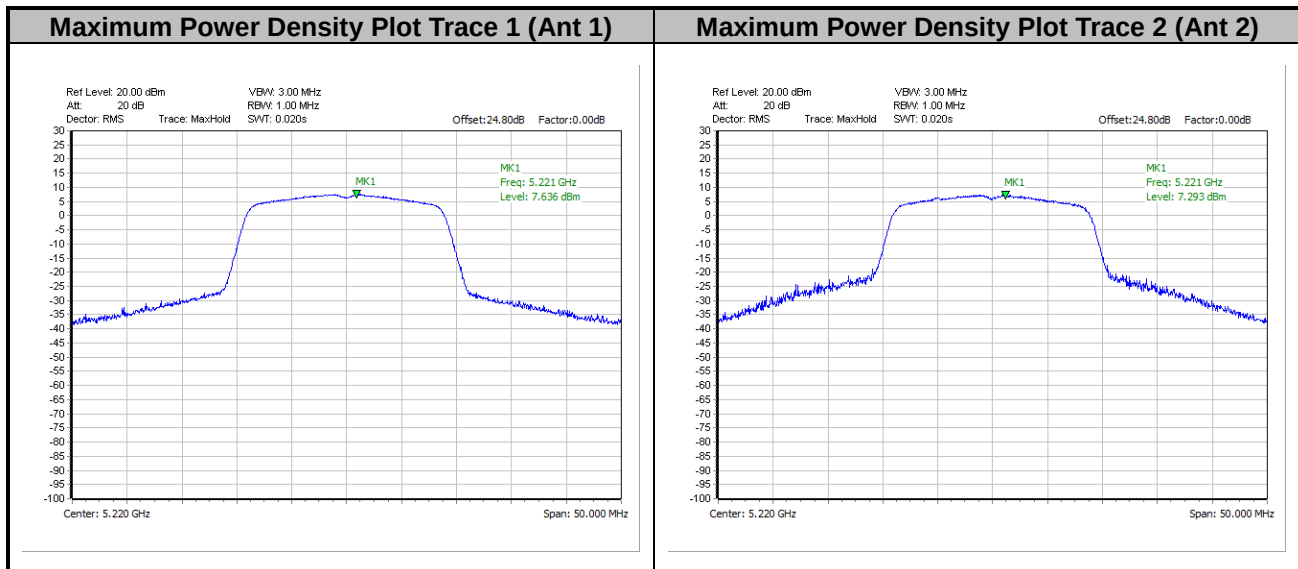




<802.11ac VHT20>

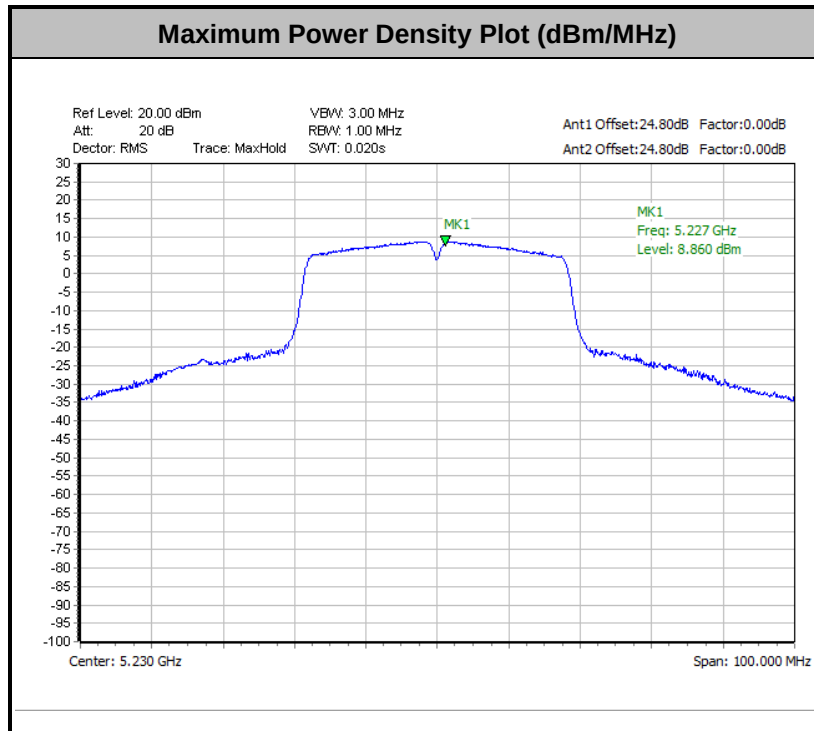


Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.

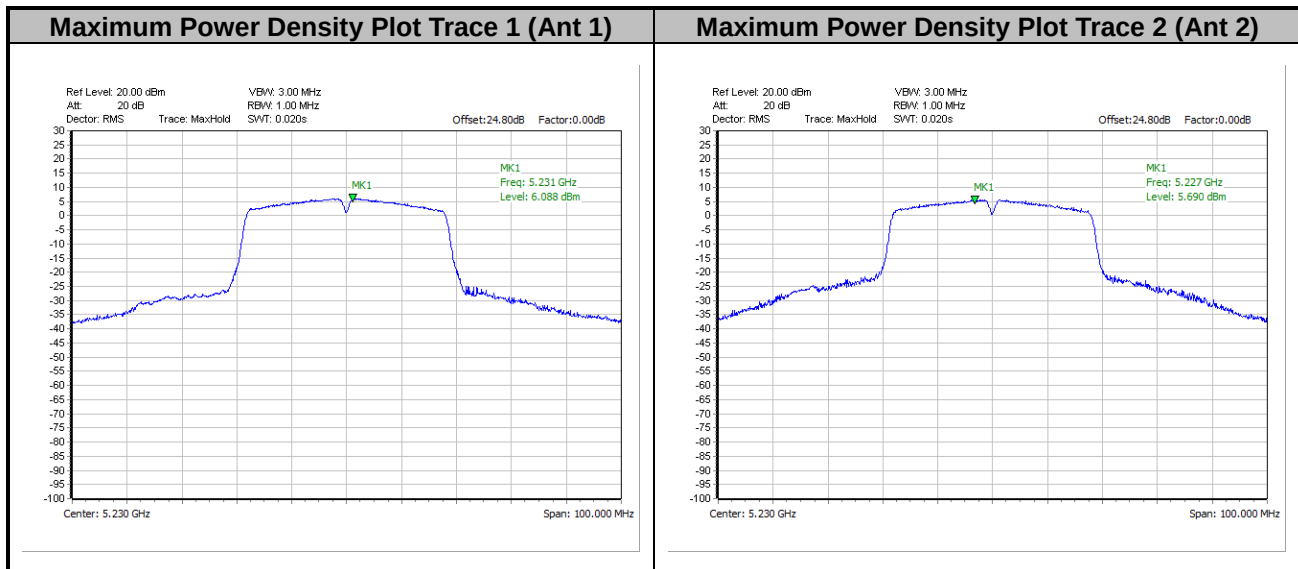




<802.11ac VHT40>

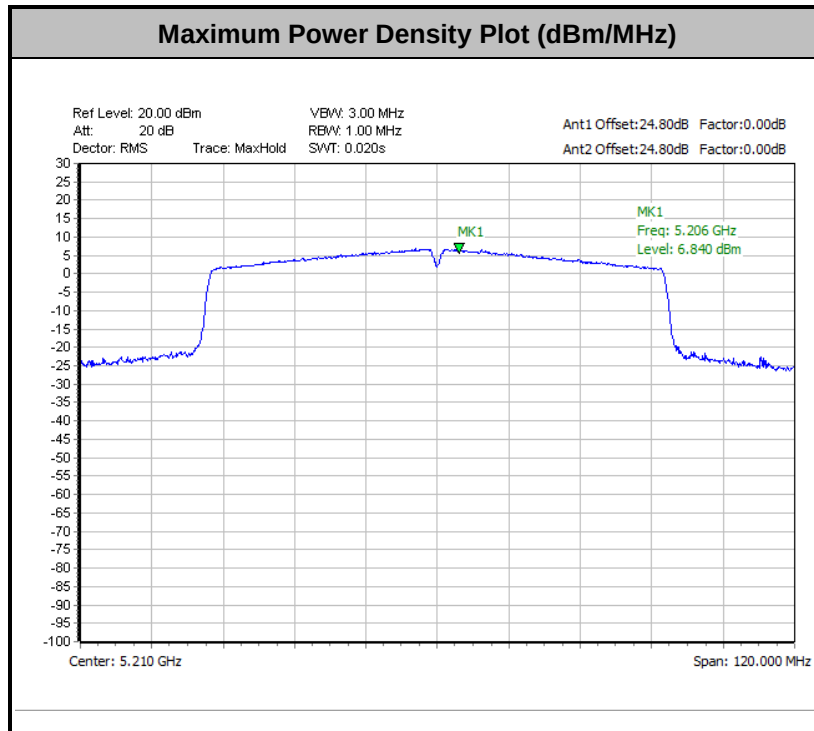


Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.

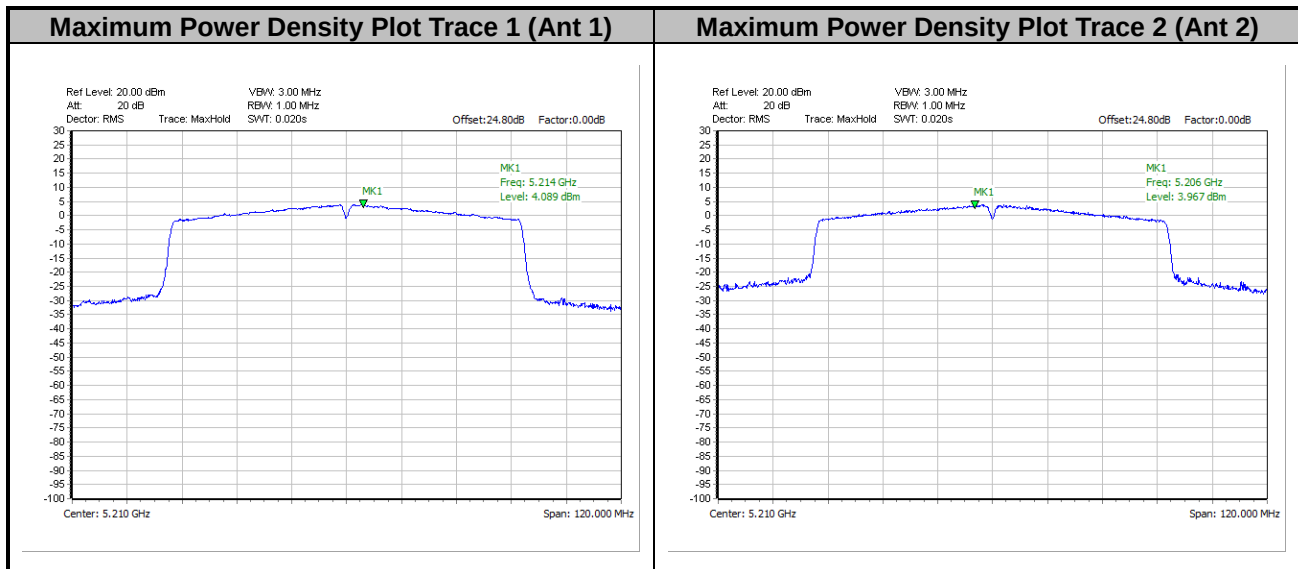




<802.11ac VHT80>



Remark: The test plot is showing a bin by bin combined result mathematically adds two traces.



3.4 Unwanted Emissions Measurement

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

3.4.1 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.
- (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.

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



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.

3.4.2 Measuring Instruments

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

3.4.3 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 $\geq$ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

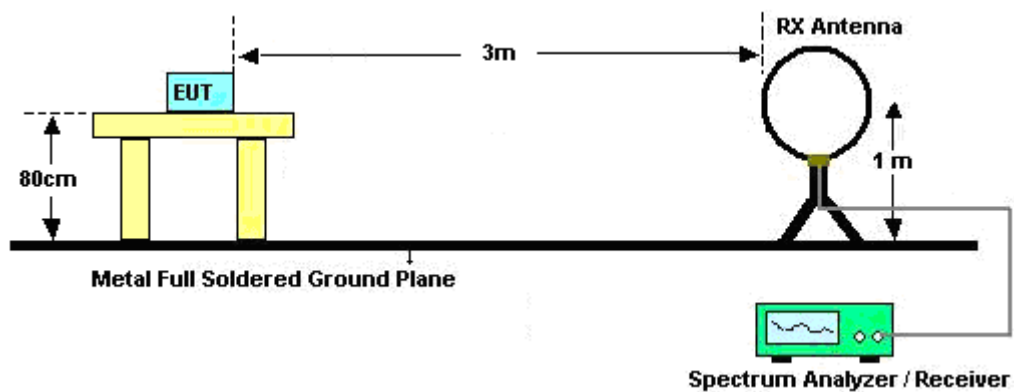
(3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

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

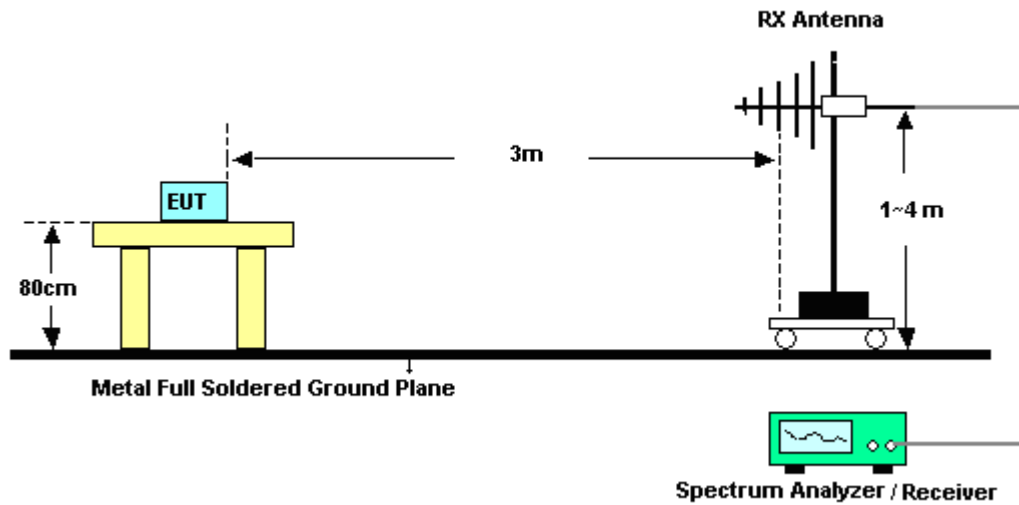
2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT is arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-”.
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-”.

3.4.4 Test Setup

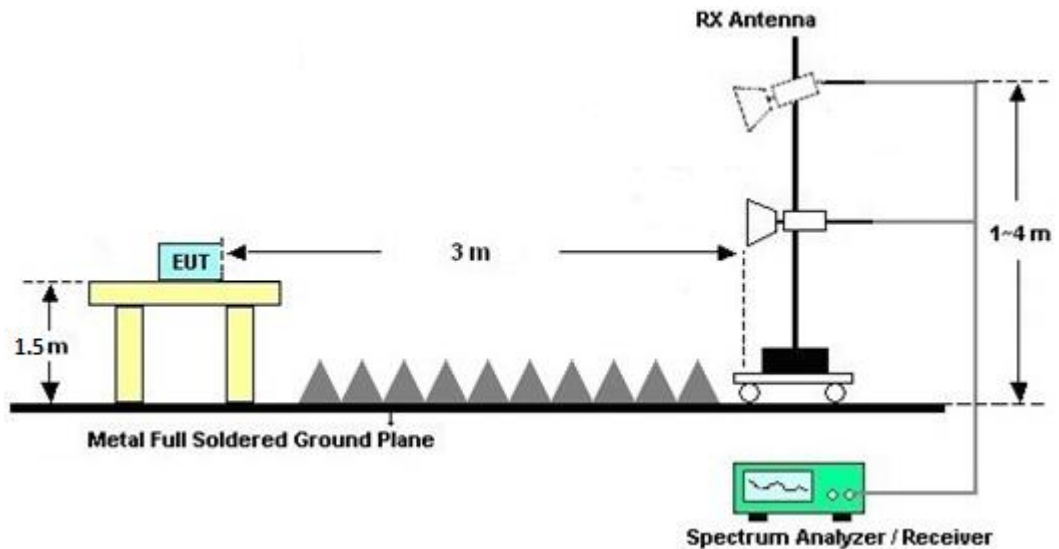
For radiated emissions below 30MHz



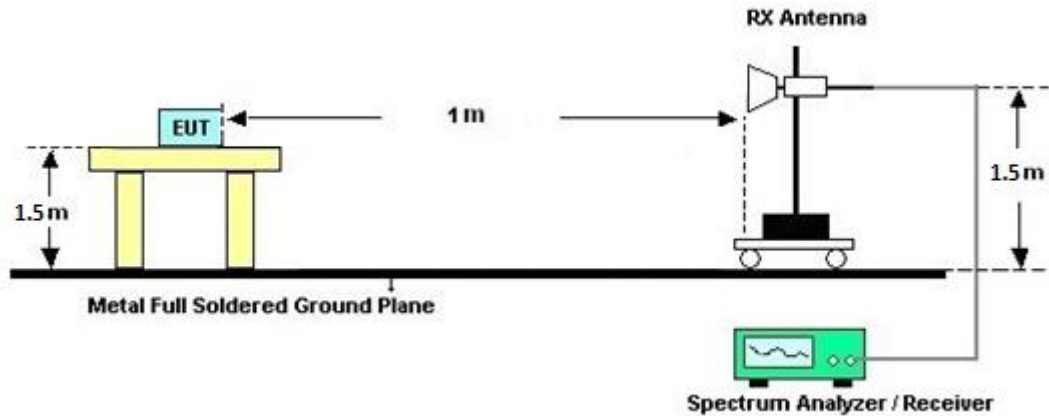
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



3.4.5 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.

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C and D.

3.4.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

3.5 AC Conducted Emission Measurement

3.5.1 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.

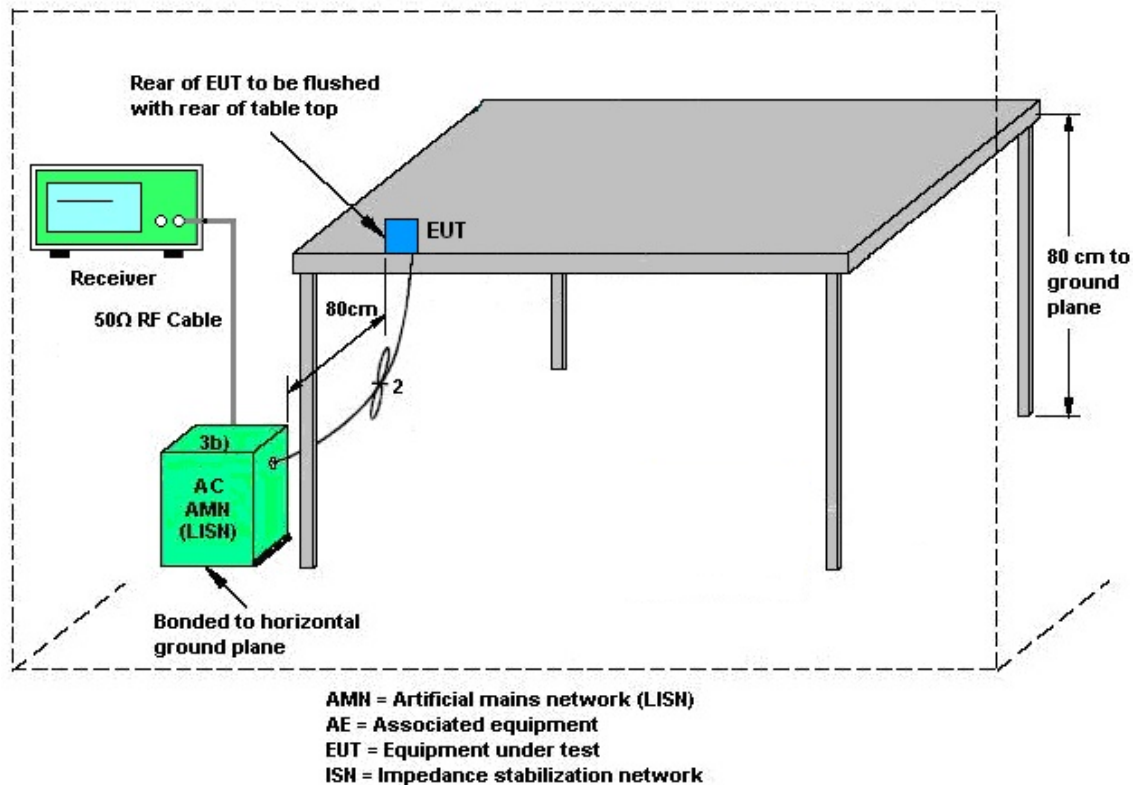
3.5.2 Measuring Instruments

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

3.5.3 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.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



3.6 Antenna Requirements

3.6.1 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.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	May 13, 2022	Jun. 16, 2022~ Oct. 08, 2022	May 12, 2023	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	40103 & 07	30MHz~1GHz	Apr. 24, 2022	Jun. 16, 2022~ Oct. 08, 2022	Apr. 23, 2023	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-1328	1GHz~18GHz	Dec. 03, 2021	Jun. 16, 2022~ Oct. 08, 2022	Dec. 02, 2022	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA9170	00993	18GHz~40GHz	Nov. 30, 2021	Jun. 16, 2022~ Oct. 08, 2022	Nov. 29, 2022	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 23, 2022	Jun. 16, 2022~ Oct. 08, 2022	Mar. 22, 2023	Radiation (03CH12-HY)
Preamplifier	Aglient	8449B	3008A02375	1GHz~26.5GHz	May 24, 2022	Jun. 16, 2022~ Oct. 08, 2022	May 23, 2023	Radiation (03CH12-HY)
Preamplifier	E-INSTRUME NT TECH LTD.	ERA-100M-18 G-56-01-A70	EC1900249	1GHz-18GHz	Dec. 22, 2021	Jun. 16, 2022~ Oct. 08, 2022	Dec. 21, 2022	Radiation (03CH12-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 24, 2021	Jun. 16, 2022~ Oct. 08, 2022	Dec. 23, 2022	Radiation (03CH12-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Jan. 12, 2022	Jun. 16, 2022~ Oct. 08, 2022	Jan. 11, 2023	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12 SS	SN2	1.2GHz Low Pass Filter	Mar. 15, 2022	Jun. 16, 2022~ Oct. 08, 2022	Mar. 14, 2023	Radiation (03CH12-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN2	6.75GHz High Pass Filter	Mar. 15, 2022	Jun. 16, 2022~ Oct. 08, 2022	Mar. 14, 2023	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY9837/4PE	9kHz~30MHz	Mar. 10, 2022	Jun. 16, 2022~ Oct. 08, 2022	Mar. 09, 2023	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30MHz~18GHz	Dec. 10, 2021	Jun. 16, 2022~ Oct. 08, 2022	Dec. 09, 2022	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz~40GHz	Feb. 21, 2022	Jun. 16, 2022~ Oct. 08, 2022	Feb. 20, 2023	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz~40GHz	Feb. 21, 2022	Jun. 16, 2022~ Oct. 08, 2022	Feb. 20, 2023	Radiation (03CH12-HY)
Hygrometer	TECPEL	DTM-303B	TP200728	N/A	Mar. 22, 2022	Jun. 16, 2022~ Oct. 08, 2022	Mar. 21, 2023	Radiation (03CH12-HY)
Controller	EMEC	EM1000	N/A	Control Turn table & Ant Mast	N/A	Jun. 16, 2022~ Oct. 08, 2022	N/A	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Jun. 16, 2022~ Oct. 08, 2022	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Jun. 16, 2022~ Oct. 08, 2022	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Jun. 16, 2022~ Oct. 08, 2022	N/A	Radiation (03CH12-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECPEL	DTM-303A	TP201996	N/A	Nov. 16, 2021	May 28, 2022~ Jun. 25, 2022	Nov. 15, 2022	Conducted (TH05-HY)
USB Power Sensor	DARE	RPR3006W	16I00054SNO 12 (NO:113)	10MHz~6GHz	Dec. 16, 2021	May 28, 2022~ Jun. 25, 2022	Dec. 15, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	May 28, 2022~ Jun. 25, 2022	Aug. 29, 2022	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	May 25, 2022~ Aug. 29, 2022	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Dec. 01, 2021	May 25, 2022~ Aug. 29, 2022	Nov. 30, 2022	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 17, 2021	May 25, 2022~ Aug. 29, 2022	Nov. 16, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 03, 2021	May 25, 2022~ Aug. 29, 2022	Dec. 02, 2022	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32	N/A	N/A	N/A	May 25, 2022~ Aug. 29, 2022	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Jul. 28, 2021	May 25, 2022	Jul. 27, 2022	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	VTSD 9561-F N	00691	N/A	Aug. 01, 2022	Aug. 29, 2022	Jul. 31, 2023	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 30, 2021	May 25, 2022~ Aug. 29, 2022	Dec. 29, 2022	Conduction (CO05-HY)

5 Uncertainty of Evaluation

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.8 dB
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.4 dB
--	--------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.9 dB
--	--------

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Sylvia Li	Temperature:	21~25	°C
Test Date:	2022/05/28~2022/06/25	Relative Humidity:	51~54	%

<AP Mode>

TEST RESULTS DATA
26dB and 99% OBW

Band I MIMO													
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		IC 99% Bandwidth Power Limit (dBm)		IC 99% Bandwidth EIRP Limit (dBm)		Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180	16.73	16.68	20.50	27.75	-		22.22		
11a	6Mbps	2	44	5220	16.78	16.88	20.40	27.40	-		22.25		
11a	6Mbps	2	48	5240	16.78	16.68	20.45	26.80	-		22.22		
VHT20	MCS0	2	36	5180	17.73	17.68	20.55	23.50	-		22.48		
VHT20	MCS0	2	44	5220	17.73	17.78	20.55	25.80	-		22.49		
VHT20	MCS0	2	48	5240	17.78	17.78	20.70	26.80	-		22.50		
VHT40	MCS0	2	38	5190	36.36	36.26	40.14	40.05	-		23.01		
VHT40	MCS0	2	46	5230	36.46	36.96	40.23	47.52	-		23.01		
VHT80	MCS0	2	42	5210	74.93	74.81	81.12	80.64	-		23.01		

TEST RESULTS DATA
Average Power Table

FCC Band I MIMO												
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	19.00	18.60	21.81	30.00		3.29		Pass
11a	6Mbps	2	44	5220	19.00	18.40	21.72	30.00		3.29		Pass
11a	6Mbps	2	48	5240	18.80	18.10	21.47	30.00		3.29		Pass
HT20	MCS0	2	36	5180	17.80	17.50	20.66	30.00		3.29		Pass
HT20	MCS0	2	44	5220	18.70	18.10	21.42	30.00		3.29		Pass
HT20	MCS0	2	48	5240	18.50	17.90	21.22	30.00		3.29		Pass
HT40	MCS0	2	38	5190	14.90	14.50	17.71	30.00		3.29		Pass
HT40	MCS0	2	46	5230	18.70	18.30	21.51	30.00		3.29		Pass
VHT20	MCS0	2	36	5180	17.90	17.60	20.76	30.00		3.29		Pass
VHT20	MCS0	2	44	5220	18.80	18.20	21.52	30.00		3.29		Pass
VHT20	MCS0	2	48	5240	18.60	18.00	21.32	30.00		3.29		Pass
VHT40	MCS0	2	38	5190	15.00	14.60	17.81	30.00		3.29		Pass
VHT40	MCS0	2	46	5230	18.80	18.40	21.61	30.00		3.29		Pass
VHT80	MCS0	2	42	5210	11.70	11.90	14.81	30.00		3.29		Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180			12.37	16.70		6.30		Pass
11a	6Mbps	2	44	5220			12.31	16.70		6.30		Pass
11a	6Mbps	2	48	5240			12.02	16.70		6.30		Pass
VHT20	MCS0	2	36	5180			11.56	16.70		6.30		Pass
VHT20	MCS0	2	44	5220			11.96	16.70		6.30		Pass
VHT20	MCS0	2	48	5240			11.70	16.70		6.30		Pass
VHT40	MCS0	2	38	5190			5.30	16.70		6.30		Pass
VHT40	MCS0	2	46	5230			9.00	16.70		6.30		Pass
VHT80	MCS0	2	42	5210			6.84	16.70		6.30		Pass

<Client Mode>

TEST RESULTS DATA
26dB and 99% OBW

Band I MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		IC 99% Bandwidth Power Limit (dBm)		IC 99% Bandwidth EIRP Limit (dBm)		Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180	16.73	16.53	20.25	19.90	-		22.18		
11a	6Mbps	2	44	5220	16.78	16.58	20.20	20.05	-		22.20		
11a	6Mbps	2	48	5240	16.68	16.58	20.50	20.60	-		22.20		
VHT20	MCS0	2	36	5180	17.73	17.68	20.50	20.50	-		22.48		
VHT20	MCS0	2	44	5220	17.78	17.68	20.65	20.50	-		22.48		
VHT20	MCS0	2	48	5240	17.68	17.68	20.70	20.75	-		22.48		
VHT40	MCS0	2	38	5190	36.36	36.26	40.14	40.05	-		23.01		
VHT40	MCS0	2	46	5230	36.56	36.66	40.14	41.49	-		23.01		
VHT80	MCS0	2	42	5210	74.93	74.81	81.12	80.64	-		23.01		

TEST RESULTS DATA
Average Power Table

FCC Band I MIMO													
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	16.10	16.20	19.16	24.00		3.29		Pass	
11a	6Mbps	2	44	5220	17.10	16.50	19.82	24.00		3.29		Pass	
11a	6Mbps	2	48	5240	16.90	16.30	19.62	24.00		3.29		Pass	
HT20	MCS0	2	36	5180	16.70	16.40	19.56	24.00		3.29		Pass	
HT20	MCS0	2	44	5220	17.10	16.60	19.87	24.00		3.29		Pass	
HT20	MCS0	2	48	5240	17.20	16.40	19.83	24.00		3.29		Pass	
HT40	MCS0	2	38	5190	14.90	14.50	17.71	24.00		3.29		Pass	
HT40	MCS0	2	46	5230	18.60	17.80	21.23	24.00		3.29		Pass	
VHT20	MCS0	2	36	5180	16.80	16.50	19.66	24.00		3.29		Pass	
VHT20	MCS0	2	44	5220	17.20	16.70	19.97	24.00		3.29		Pass	
VHT20	MCS0	2	48	5240	17.30	16.50	19.93	24.00		3.29		Pass	
VHT40	MCS0	2	38	5190	15.00	14.60	17.81	24.00		3.29		Pass	
VHT40	MCS0	2	46	5230	18.70	17.90	21.33	24.00		3.29		Pass	
VHT80	MCS0	2	42	5210	11.70	11.90	14.81	24.00		3.29		Pass	

TEST RESULTS DATA
Power Spectral Density

FCC Band I MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180			10.53	10.70		6.30		Pass
11a	6Mbps	2	44	5220			10.38	10.70		6.30		Pass
11a	6Mbps	2	48	5240			10.24	10.70		6.30		Pass
VHT20	MCS0	2	36	5180			10.33	10.70		6.30		Pass
VHT20	MCS0	2	44	5220			10.38	10.70		6.30		Pass
VHT20	MCS0	2	48	5240			10.25	10.70		6.30		Pass
VHT40	MCS0	2	38	5190			5.30	10.70		6.30		Pass
VHT40	MCS0	2	46	5230			8.86	10.70		6.30		Pass
VHT80	MCS0	2	42	5210			6.84	10.70		6.30		Pass



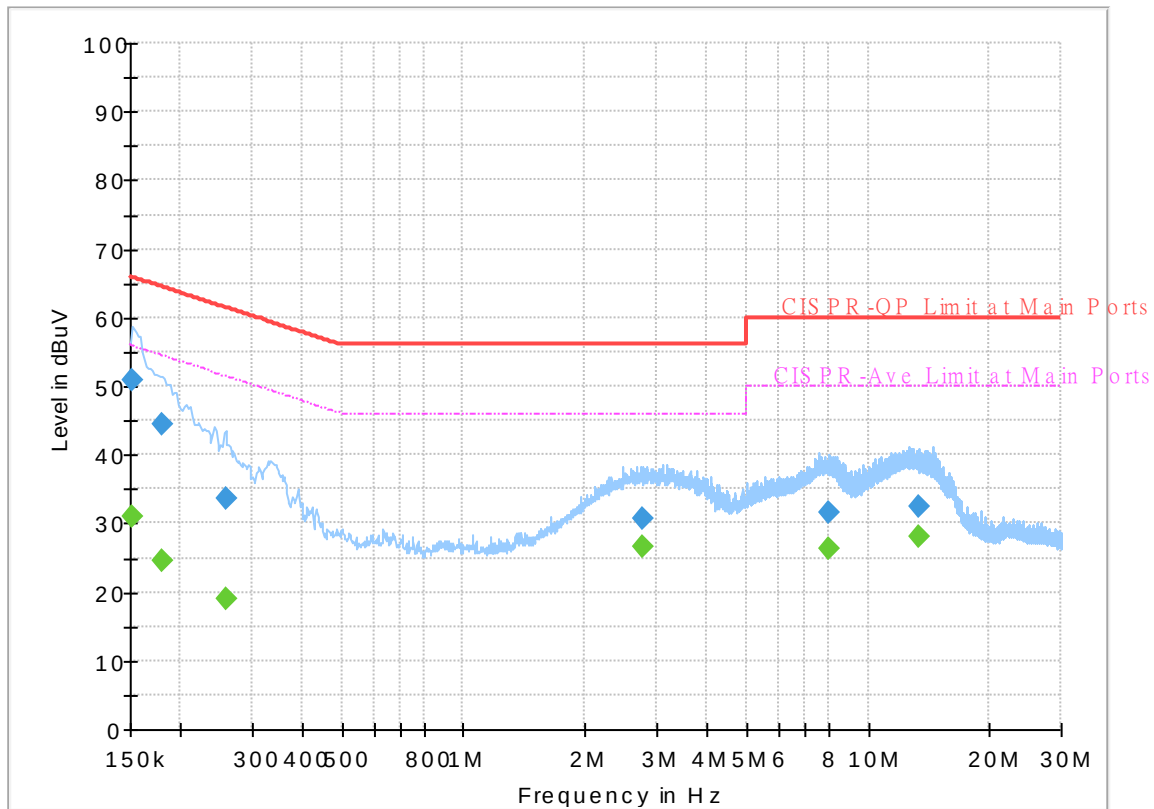
Appendix B. AC Conducted Emission Test Results

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

EUT Information

Report NO : 250205
Test Mode : Mode 3
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



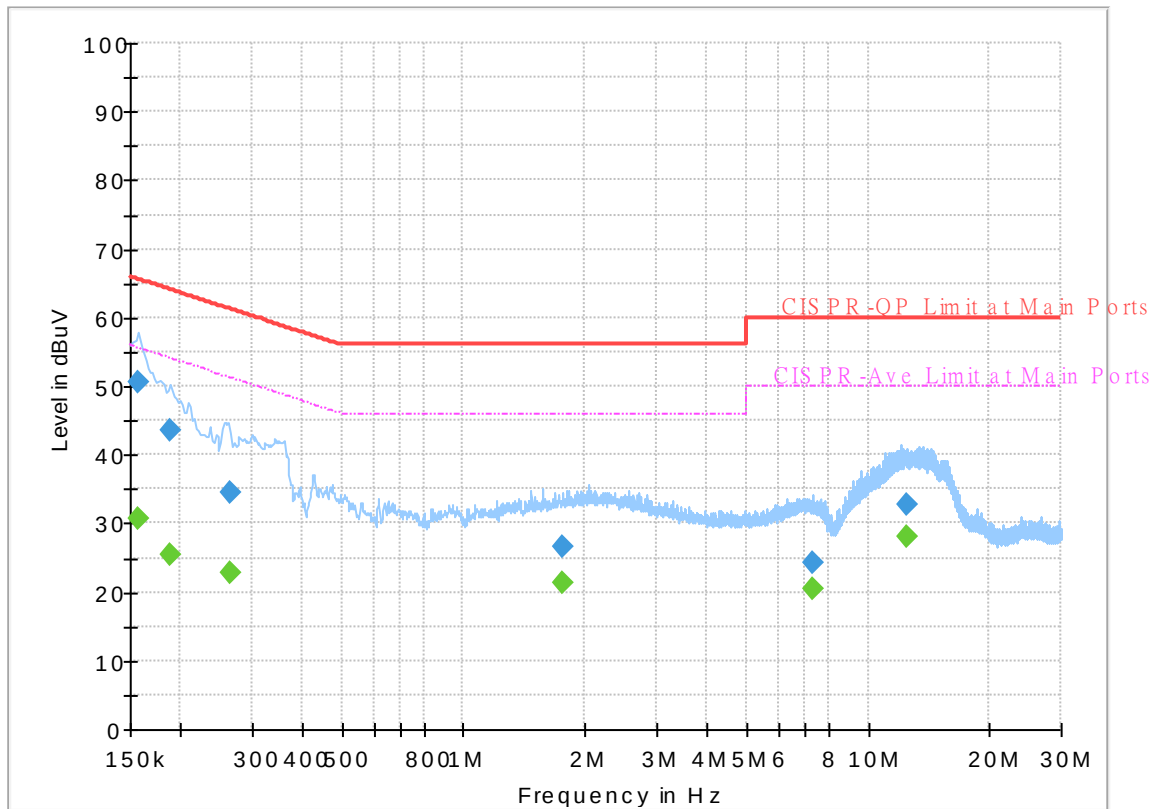
Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	50.98	---	65.88	14.90	L1	OFF	19.6
0.152250	---	31.09	55.88	24.79	L1	OFF	19.6
0.179250	44.30	---	64.52	20.22	L1	OFF	19.6
0.179250	---	24.50	54.52	30.02	L1	OFF	19.6
0.258000	33.76	---	61.50	27.74	L1	OFF	19.6
0.258000	---	19.09	51.50	32.41	L1	OFF	19.6
2.771250	30.79	---	56.00	25.21	L1	OFF	19.6
2.771250	---	26.57	46.00	19.43	L1	OFF	19.6
7.973250	31.62	---	60.00	28.38	L1	OFF	19.7
7.973250	---	26.34	50.00	23.66	L1	OFF	19.7
13.337250	32.60	---	60.00	27.40	L1	OFF	19.8
13.337250	---	28.01	50.00	21.99	L1	OFF	19.8

EUT Information

Report NO : 250205
Test Mode : Mode 3
Test Voltage : 120Vac/60Hz
Phase : Neutral

Full Spectrum



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.156750	50.51	---	65.63	15.12	N	OFF	19.6
0.156750	---	30.70	55.63	24.93	N	OFF	19.6
0.188250	43.54	---	64.11	20.57	N	OFF	19.6
0.188250	---	25.44	54.11	28.67	N	OFF	19.6
0.264750	34.43	---	61.28	26.85	N	OFF	19.6
0.264750	---	22.72	51.28	28.56	N	OFF	19.6
1.763250	26.52	---	56.00	29.48	N	OFF	19.6
1.763250	---	21.21	46.00	24.79	N	OFF	19.6
7.296000	24.34	---	60.00	35.66	N	OFF	19.7
7.296000	---	20.40	50.00	29.60	N	OFF	19.7
12.444000	32.80	---	60.00	27.20	N	OFF	19.8
12.444000	---	28.16	50.00	21.84	N	OFF	19.8



Appendix C. Radiated Spurious Emission

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

<Sample 3>

Band 1 - 5150~5250MHz

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 36 5180MHz		5145.34	62.76	-11.24	74	54.45	32	9.96	33.65	100	195	P	H
		5150	52.52	-1.48	54	44.2	32	9.97	33.65	100	195	A	H
	*	5180	117.52	-	-	109.29	31.88	9.99	33.64	100	195	P	H
	*	5180	110.56	-	-	102.33	31.88	9.99	33.64	100	195	A	H
													H
		5082.94	55.97	-18.03	74	47.83	31.9	9.9	33.66	400	257	P	V
		5098.54	47.69	-6.31	54	39.44	31.99	9.92	33.66	400	257	A	V
	*	5180	113.28	-	-	105.05	31.88	9.99	33.64	400	257	P	V
	*	5180	106.33	-	-	98.1	31.88	9.99	33.64	400	257	A	V
													V
802.11a CH 44 5220MHz		5142.48	61.54	-12.46	74	53.23	32	9.96	33.65	113	194	P	H
		5142.22	51.74	-2.26	54	43.43	32	9.96	33.65	113	194	A	H
	*	5220	117.89	-	-	109.78	31.72	10.03	33.64	113	194	P	H
	*	5220	110.74	-	-	102.63	31.72	10.03	33.64	113	194	A	H
		5356.4	56.78	-17.22	74	48.74	31.44	10.21	33.61	113	194	P	H
		5353.32	48.9	-5.1	54	40.89	31.42	10.2	33.61	113	194	A	H
		5094.12	55.21	-18.79	74	47	31.96	9.91	33.66	395	253	P	V
		5103.22	46.96	-7.04	54	38.7	32	9.92	33.66	395	253	A	V
	*	5220	113.87	-	-	105.76	31.72	10.03	33.64	395	253	P	V
	*	5220	107.06	-	-	98.95	31.72	10.03	33.64	395	253	A	V
		5374.32	54.44	-19.56	74	46.27	31.55	10.23	33.61	395	253	P	V
		5359.76	46.51	-7.49	54	38.45	31.46	10.21	33.61	395	253	A	V



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 48 5240MHz		5137.28	59.35	-14.65	74	51.05	32	9.95	33.65	108	194	P	H
		5137.54	50.77	-3.23	54	42.47	32	9.95	33.65	108	194	A	H
	*	5240	118.25	-	-	110.18	31.64	10.06	33.63	108	194	P	H
	*	5240	110.64	-	-	102.57	31.64	10.06	33.63	108	194	A	H
		5353.32	56.21	-17.79	74	48.2	31.42	10.2	33.61	108	194	P	H
		5354.16	50.01	-3.99	54	42	31.42	10.2	33.61	108	194	A	H
		5122.2	55.75	-18.25	74	47.47	32	9.94	33.66	393	251	P	V
		5128.18	47.09	-6.91	54	38.79	32	9.95	33.65	393	251	A	V
	*	5240	113.55	-	-	105.48	31.64	10.06	33.63	393	251	P	V
	*	5240	106.82	-	-	98.75	31.64	10.06	33.63	393	251	A	V
		5389.44	53.5	-20.5	74	45.21	31.64	10.25	33.6	393	251	P	V
		5375.72	46.32	-7.68	54	38.14	31.55	10.23	33.6	393	251	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 1 5150~5250MHz

WIFI 802.11a (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 36 5180MHz		10360	50.22	-17.98	68.2	61.43	39.62	16.57	67.4	-	-	P	H
		10872	52.11	-21.89	74	61.59	40.46	17	66.94	-	-	P	H
		10872	42.04	-11.96	54	51.52	40.46	17	66.94	-	-	A	H
		14480	53.68	-20.32	74	58.43	41.64	19.79	66.18	-	-	P	H
		14480	43.63	-10.37	54	48.38	41.64	19.79	66.18	-	-	A	H
		15540	56.9	-17.1	74	65.5	38.36	20.28	67.24	100	140	P	H
		15540	45.39	-8.61	54	53.99	38.36	20.28	67.24	100	140	A	H
		17989	61.77	-12.23	74	59.3	49.7	22.02	69.25	-	-	P	H
		17989	51.72	-2.28	54	49.25	49.7	22.02	69.25	-	-	A	H
													H
													H
													H
		10360	49.76	-18.44	68.2	60.97	39.62	16.57	67.4	-	-	P	V
		11455	51.55	-22.45	74	60.52	40	17.45	66.42	-	-	P	V
		11455	41.49	-12.51	54	50.46	40	17.45	66.42	-	-	A	V
		14491	53	-21	74	57.7	41.67	19.8	66.17	-	-	P	V
		14491	42.95	-11.05	54	47.65	41.67	19.8	66.17	-	-	A	V
		15540	62.21	-11.79	74	70.81	38.36	20.28	67.24	224	83	P	V
		15540	48.65	-5.35	54	57.25	38.36	20.28	67.24	224	83	A	V
		18000	62.06	-11.94	74	59.31	50	22.03	69.28	-	-	P	V
		18000	47.03	-6.97	54	44.28	50	22.03	69.28	-	-	A	V
													V
													V
													V



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 44 5220MHz		10440	50.28	-17.92	68.2	61.17	39.82	16.64	67.35	-	-	P	H
		10861	51.49	-22.51	74	61.05	40.4	16.99	66.95	-	-	P	H
		10861	41.54	-12.46	54	51.1	40.4	16.99	66.95	-	-	A	H
		14491	52.77	-21.23	74	57.47	41.67	19.8	66.17	-	-	P	H
		14491	42.71	-11.29	54	47.41	41.67	19.8	66.17	-	-	A	H
		15660	55.17	-18.83	74	64.33	37.88	20.34	67.38	100	139	P	H
		15660	44.46	-9.54	54	53.62	37.88	20.34	67.38	100	139	A	H
		17956	61.73	-12.27	74	60.09	48.81	22	69.17	-	-	P	H
		17956	46.77	-7.23	54	45.13	48.81	22	69.17	-	-	A	H
													H
													H
													H
		10440	50.05	-18.15	68.2	60.94	39.82	16.64	67.35	-	-	P	V
		10883	51.82	-22.18	74	61.23	40.51	17.01	66.93	-	-	P	V
		10883	41.77	-12.23	54	51.18	40.51	17.01	66.93	-	-	A	V
		14491	52.44	-21.56	74	57.14	41.67	19.8	66.17	-	-	P	V
		14491	42.39	-11.61	54	47.09	41.67	19.8	66.17	-	-	A	V
		15660	59.58	-14.42	74	68.74	37.88	20.34	67.38	215	83	P	V
		15660	47.08	-6.92	54	56.24	37.88	20.34	67.38	215	83	A	V
		17978	61.81	-12.19	74	59.61	49.41	22.01	69.22	-	-	P	V
		17978	46.76	-7.24	54	44.56	49.41	22.01	69.22	-	-	A	V
													V
													V
													V



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 48 5240MHz		10480	49.66	-18.54	68.2	60.37	39.94	16.67	67.32	-	-	P	H
		10949	52.56	-21.44	74	61.85	40.5	17.07	66.86	-	-	P	H
		10949	42.59	-11.41	54	51.88	40.5	17.07	66.86	-	-	A	H
		14491	53.07	-20.93	74	57.77	41.67	19.8	66.17	-	-	P	H
		14491	43.01	-10.99	54	47.71	41.67	19.8	66.17	-	-	A	H
		15720	57.12	-16.88	74	66.41	37.78	20.38	67.45	100	138	P	H
		15720	44.39	-9.61	54	53.68	37.78	20.38	67.45	100	138	A	H
		17989	61.55	-12.45	74	59.08	49.7	22.02	69.25	-	-	P	H
		17989	46.59	-7.41	54	44.12	49.7	22.02	69.25	-	-	A	H
													H
													H
													H
		10480	50.09	-18.11	68.2	60.8	39.94	16.67	67.32	-	-	P	V
		12038	51.14	-22.86	74	60.41	38.95	17.89	66.11	-	-	P	V
		12038	41.08	-12.92	54	50.35	38.95	17.89	66.11	-	-	A	V
		14491	52.77	-21.23	74	57.47	41.67	19.8	66.17	-	-	P	V
		14491	42.73	-11.27	54	47.43	41.67	19.8	66.17	-	-	A	V
		15720	61.6	-12.4	74	70.89	37.78	20.38	67.45	211	83	P	V
		15720	47.65	-6.35	54	56.94	37.78	20.38	67.45	211	83	A	V
		17978	61.72	-12.28	74	59.52	49.41	22.01	69.22	-	-	P	V
		17978	46.75	-7.25	54	44.55	49.41	22.01	69.22	-	-	A	V
													V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												
	3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												
	4. The emission level close to 18GHz is checked that the average emission level is noise floor only.												



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)
802.11ac VHT20 CH 36 5180MHz		5149.5	60.69	-13.31	74	52.38	32	9.96	33.65	100	195	P	H
		5150	52.46	-1.54	54	44.14	32	9.97	33.65	100	195	A	H
	*	5180	115.14	-	-	106.91	31.88	9.99	33.64	100	195	P	H
	*	5180	107.44	-	-	99.21	31.88	9.99	33.64	100	195	A	H
													H
													H
		5066.82	56.2	-17.8	74	48.18	31.8	9.89	33.67	400	259	P	V
		5081.38	47.81	-6.19	54	39.68	31.89	9.9	33.66	400	259	A	V
	*	5180	110.85	-	-	102.62	31.88	9.99	33.64	400	259	P	V
	*	5180	103.72	-	-	95.49	31.88	9.99	33.64	400	259	A	V
													V
													V
802.11ac VHT20 CH 44 5220MHz		5149.5	61.23	-12.77	74	52.92	32	9.96	33.65	117	193	P	H
		5138.84	51.7	-2.3	54	43.4	32	9.95	33.65	117	193	A	H
	*	5220	116.38	-	-	108.27	31.72	10.03	33.64	117	193	P	H
	*	5220	109.07	-	-	100.96	31.72	10.03	33.64	117	193	A	H
		5359.76	56.87	-17.13	74	48.81	31.46	10.21	33.61	117	193	P	H
		5356.4	49.87	-4.13	54	41.83	31.44	10.21	33.61	117	193	A	H
		5100.88	55.94	-18.06	74	47.68	32	9.92	33.66	398	263	P	V
		5086.06	47.55	-6.45	54	39.38	31.92	9.91	33.66	398	263	A	V
	*	5220	112.2	-	-	104.09	31.72	10.03	33.64	398	263	P	V
	*	5220	104.66	-	-	96.55	31.72	10.03	33.64	398	263	A	V
		5356.12	53.96	-20.04	74	45.92	31.44	10.21	33.61	398	263	P	V
		5350	47.66	-6.34	54	39.67	31.4	10.2	33.61	398	263	A	V



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 VHT20 CH 48 5240MHz		5142.74	58.75	-15.25	74	50.44	32	9.96	33.65	100	204	P	H
		5139.62	51.39	-2.61	54	43.08	32	9.96	33.65	100	204	A	H
	*	5240	116.46	-	-	108.39	31.64	10.06	33.63	100	204	P	H
	*	5240	108.7	-	-	100.63	31.64	10.06	33.63	100	204	A	H
		5391.4	58	-16	74	49.7	31.65	10.25	33.6	100	204	P	H
		5358.08	51.09	-2.91	54	43.04	31.45	10.21	33.61	100	204	A	H
		5104.52	57.21	-16.79	74	48.95	32	9.92	33.66	395	237	P	V
		5114.66	47.57	-6.43	54	39.3	32	9.93	33.66	395	237	A	V
	*	5240	112.76	-	-	104.69	31.64	10.06	33.63	395	237	P	V
	*	5240	105.14	-	-	97.07	31.64	10.06	33.63	395	237	A	V
		5370.12	55.05	-18.95	74	46.92	31.52	10.22	33.61	395	237	P	V
		5353.04	47.31	-6.69	54	39.3	31.42	10.2	33.61	395	237	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 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)
802.11ac VHT20 CH 36 5180MHz		10360	50.03	-18.17	68.2	61.24	39.62	16.57	67.4	-	-	P	H
		10905	51.67	-22.33	74	60.95	40.59	17.03	66.9	-	-	P	H
		10905	41.57	-12.43	54	50.85	40.59	17.03	66.9	-	-	A	H
		14491	52.28	-21.72	74	56.98	41.67	19.8	66.17	-	-	P	H
		14491	42.17	-11.83	54	46.87	41.67	19.8	66.17	-	-	A	H
		15540	52.48	-21.52	74	61.08	38.36	20.28	67.24	100	140	P	H
		15540	42.79	-11.21	54	51.39	38.36	20.28	67.24	100	140	A	H
		18000	61.53	-12.47	74	58.78	50	22.03	69.28	-	-	P	H
		18000	46.61	-7.39	54	43.86	50	22.03	69.28	-	-	A	H
													H
													H
													H
		10360	50.51	-17.69	68.2	61.72	39.62	16.57	67.4	-	-	P	V
		10949	51.4	-22.6	74	60.69	40.5	17.07	66.86	-	-	P	V
		10949	41.43	-12.57	54	50.72	40.5	17.07	66.86	-	-	A	V
		14491	52.63	-21.37	74	57.33	41.67	19.8	66.17	-	-	P	V
		14491	42.58	-11.42	54	47.28	41.67	19.8	66.17	-	-	A	V
		15540	58.08	-15.92	74	66.68	38.36	20.28	67.24	217	82	P	V
		15540	45.13	-8.87	54	53.73	38.36	20.28	67.24	217	82	A	V
		18000	62.02	-11.98	74	59.27	50	22.03	69.28	-	-	P	V
		18000	46.94	-7.06	54	44.19	50	22.03	69.28	-	-	A	V
													V
													V
													V



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 VHT20 CH 44 5220MHz		10440	50.4	-17.8	68.2	61.29	39.82	16.64	67.35	-	-	P	H
		10916	52.53	-21.47	74	61.81	40.57	17.04	66.89	-	-	P	H
		10916	42.57	-11.43	54	51.85	40.57	17.04	66.89	-	-	A	H
		14491	52.4	-21.6	74	57.1	41.67	19.8	66.17	-	-	P	H
		14491	42.35	-11.65	54	47.05	41.67	19.8	66.17	-	-	A	H
		15660	55.11	-18.89	74	64.27	37.88	20.34	67.38	332	307	P	H
		15660	44.03	-9.97	54	53.19	37.88	20.34	67.38	332	307	A	H
		17989	62.03	-11.97	74	59.56	49.7	22.02	69.25	-	-	P	H
		17989	47.09	-6.91	54	44.62	49.7	22.02	69.25	-	-	A	H
													H
													H
													H
		10440	49.25	-18.95	68.2	60.14	39.82	16.64	67.35	-	-	P	V
		12632	51.27	-22.73	74	60.35	38.93	18.41	66.42	-	-	P	V
		12632	41.2	-12.8	54	50.28	38.93	18.41	66.42	-	-	A	V
		14491	52.27	-21.73	74	56.97	41.67	19.8	66.17	-	-	P	V
		14491	42.29	-11.71	54	46.99	41.67	19.8	66.17	-	-	A	V
		15660	59.67	-14.33	74	68.83	37.88	20.34	67.38	112	82	P	V
		15660	47.65	-6.35	54	56.81	37.88	20.34	67.38	112	82	A	V
		18000	62.15	-11.85	74	59.4	50	22.03	69.28	-	-	P	V
		18000	47.2	-6.8	54	44.45	50	22.03	69.28	-	-	A	V
													V
													V
													V

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 VHT20 CH 48 5240MHz		10480	50.33	-17.87	68.2	61.04	39.94	16.67	67.32	-	-	P	H
		11510	52.69	-21.31	74	61.61	39.96	17.49	66.37	-	-	P	H
		11510	42.66	-11.34	54	51.58	39.96	17.49	66.37	-	-	A	H
		14480	53.36	-20.64	74	58.11	41.64	19.79	66.18	-	-	P	H
		14480	43.41	-10.59	54	48.16	41.64	19.79	66.18	-	-	A	H
		15720	54.51	-19.49	74	63.8	37.78	20.38	67.45	342	303	P	H
		15720	42.59	-11.41	54	51.88	37.78	20.38	67.45	342	303	A	H
		17989	62.38	-11.62	74	59.91	49.7	22.02	69.25	-	-	P	H
		17989	47.43	-6.57	54	44.96	49.7	22.02	69.25	-	-	A	H
													H
													H
													H
		10480	49.96	-18.24	68.2	60.67	39.94	16.67	67.32	-	-	P	V
		10883	51.98	-22.02	74	61.39	40.51	17.01	66.93	-	-	P	V
		10883	41.95	-12.05	54	51.36	40.51	17.01	66.93	-	-	A	V
		14480	53.06	-20.94	74	57.81	41.64	19.79	66.18	-	-	P	V
		14480	43.1	-10.9	54	47.85	41.64	19.79	66.18	-	-	A	V
		15720	58.52	-15.48	74	67.81	37.78	20.38	67.45	100	80	P	V
		15720	44.26	-9.74	54	53.55	37.78	20.38	67.45	100	80	A	V
		17978	62.42	-11.58	74	60.22	49.41	22.01	69.22	-	-	P	V
	17978	47.37	-6.63	54	45.17	49.41	22.01	69.22	-	-	A	V	
												V	
												V	
												V	
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												
	3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												
	4. The emission level close to 18GHz is checked that the average emission level is noise floor only.												



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)
802.11ac VHT40 CH 38 5190MHz		5144.3	59.85	-14.15	74	51.54	32	9.96	33.65	100	197	P	H
		5149.76	52.33	-1.67	54	44.02	32	9.96	33.65	100	197	A	H
	*	5190	110.51	-	-	102.31	31.84	10	33.64	100	197	P	H
	*	5190	101.93	-	-	93.73	31.84	10	33.64	100	197	A	H
		5353.6	54.28	-19.72	74	46.27	31.42	10.2	33.61	100	197	P	H
		5352.2	46.92	-7.08	54	38.92	31.41	10.2	33.61	100	197	A	H
		5081.38	53.1	-20.9	74	44.97	31.89	9.9	33.66	400	285	P	V
		5099.84	45.43	-8.57	54	37.17	32	9.92	33.66	400	285	A	V
	*	5190	106.08	-	-	97.88	31.84	10	33.64	400	285	P	V
	*	5190	98.17	-	-	89.97	31.84	10	33.64	400	285	A	V
		5433.4	51.04	-22.96	74	42.51	31.83	10.29	33.59	400	285	P	V
		5352.48	44.38	-9.62	54	36.38	31.41	10.2	33.61	400	285	A	V
802.11ac VHT40 CH 46 5230MHz		5134.16	60.52	-13.48	74	52.22	32	9.95	33.65	100	195	P	H
		5148.46	52.11	-1.89	54	43.8	32	9.96	33.65	100	195	A	H
	*	5230	115.18	-	-	107.08	31.68	10.05	33.63	100	195	P	H
	*	5230	106.68	-	-	98.58	31.68	10.05	33.63	100	195	A	H
		5377.68	58.35	-15.65	74	50.15	31.57	10.23	33.6	100	195	P	H
		5354.16	51.22	-2.78	54	43.21	31.42	10.2	33.61	100	195	A	H
		5086.06	55.06	-18.94	74	46.89	31.92	9.91	33.66	395	268	P	V
		5094.9	47.69	-6.31	54	39.46	31.97	9.92	33.66	395	268	A	V
	*	5230	111.22	-	-	103.12	31.68	10.05	33.63	395	268	P	V
	*	5230	102.8	-	-	94.7	31.68	10.05	33.63	395	268	A	V
		5361.44	54.74	-19.26	74	46.67	31.47	10.21	33.61	395	268	P	V
		5368.44	47.74	-6.26	54	39.62	31.51	10.22	33.61	395	268	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 VHT40 (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)
802.11ac VHT40 CH 38 5190MHz		10380	49.68	-18.52	68.2	60.82	39.66	16.59	67.39	-	-	P	H
		10927	52.14	-21.86	74	61.42	40.55	17.05	66.88	-	-	P	H
		10927	42.1	-11.9	54	51.38	40.55	17.05	66.88	-	-	A	H
		14480	53.1	-20.9	74	57.85	41.64	19.79	66.18	-	-	P	H
		14480	43.02	-10.98	54	47.77	41.64	19.79	66.18	-	-	A	H
		15570	47.93	-26.07	74	56.73	38.18	20.29	67.27	-	-	P	H
		17989	62.07	-11.93	74	59.6	49.7	22.02	69.25	-	-	P	H
		17989	47.05	-6.95	54	44.58	49.7	22.02	69.25	-	-	A	H
													H
													H
													H
													H
		10380	50.64	-17.56	68.2	61.78	39.66	16.59	67.39	-	-	P	V
		10927	51.49	-22.51	74	60.77	40.55	17.05	66.88	-	-	P	V
		10927	41.43	-12.57	54	50.71	40.55	17.05	66.88	-	-	A	V
		14491	52.84	-21.16	74	57.54	41.67	19.8	66.17	-	-	P	V
		14491	42.75	-11.25	54	47.45	41.67	19.8	66.17	-	-	A	V
		15570	47.97	-26.03	74	56.77	38.18	20.29	67.27	-	-	P	V
		17989	62.35	-11.65	74	59.88	49.7	22.02	69.25	-	-	P	V
		17989	47.4	-6.6	54	44.93	49.7	22.02	69.25	-	-	A	V
													V
													V
													V
													V

WIFI	Note	Frequency	Level	Margin	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant. 1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	Level (dBμV)	Factor (dB/m)	Loss (dB)	Factor (dB)	Pos (cm)	Pos (deg)	Avg. (P/A)	(H/V)
802.11ac VHT40 CH 46 5230MHz		10460	49.99	-18.21	68.2	60.79	39.88	16.66	67.34	-	-	P	H
		11389	51.87	-22.13	74	60.97	39.98	17.4	66.48	-	-	P	H
		11389	41.79	-12.21	54	50.89	39.98	17.4	66.48	-	-	A	H
		14480	52.93	-21.07	74	57.68	41.64	19.79	66.18	-	-	P	H
		14480	42.91	-11.09	54	47.66	41.64	19.79	66.18	-	-	A	H
		15690	52.66	-21.34	74	61.89	37.82	20.36	67.41	326	305	P	H
		15690	42.94	-11.06	54	52.17	37.82	20.36	67.41	326	305	A	H
		17989	61.95	-12.05	74	59.48	49.7	22.02	69.25	-	-	P	H
		17989	47	-7	54	44.53	49.7	22.02	69.25	-	-	A	H
													H
													H
													H
		10460	49.52	-18.68	68.2	60.32	39.88	16.66	67.34	-	-	P	V
		10894	51.37	-22.63	74	60.7	40.57	17.02	66.92	-	-	P	V
		10894	41.33	-12.67	54	50.66	40.57	17.02	66.92	-	-	A	V
		14491	52.69	-21.31	74	57.39	41.67	19.8	66.17	-	-	P	V
		14491	42.65	-11.35	54	47.35	41.67	19.8	66.17	-	-	A	V
		15690	57.2	-16.8	74	66.43	37.82	20.36	67.41	100	81	P	V
		15690	44.56	-9.44	54	53.79	37.82	20.36	67.41	100	81	A	V
		17978	62.45	-11.55	74	60.25	49.41	22.01	69.22	-	-	P	V
		17978	47.3	-6.7	54	45.1	49.41	22.01	69.22	-	-	A	V
													V
												V	
												V	
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												
	3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												
	4. The emission level close to 18GHz is checked that the average emission level is noise floor only.												

**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		5150	57.37	-16.63	74	49.05	32	9.97	33.65	100	198	P	H
		5137.54	52.59	-1.41	54	44.29	32	9.95	33.65	100	198	A	H
	*	5210	105.09	-	-	96.95	31.76	10.02	33.64	100	198	P	H
	*	5210	98.53	-	-	90.39	31.76	10.02	33.64	100	198	A	H
		5366.76	53.65	-20.35	74	45.54	31.5	10.22	33.61	100	198	P	H
		5358.36	47.29	-6.71	54	39.24	31.45	10.21	33.61	100	198	A	H
		5148.98	54.41	-19.59	74	46.1	32	9.96	33.65	400	268	P	V
		5096.72	46.39	-7.61	54	38.15	31.98	9.92	33.66	400	268	A	V
	*	5210	101.26	-	-	93.12	31.76	10.02	33.64	400	268	P	V
	*	5210	95.04	-	-	86.9	31.76	10.02	33.64	400	268	A	V
		5458.6	51.26	-22.74	74	42.64	31.9	10.31	33.59	400	268	P	V
		5456.36	45.49	-8.51	54	36.87	31.9	10.31	33.59	400	268	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 (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)	
802.11ac VHT80 CH 42 5210MHz		10420	50.32	-17.88	68.2	61.3	39.76	16.62	67.36	-	-	P	H	
		10971	51.26	-22.74	74	60.55	40.46	17.09	66.84	-	-	P	H	
		10971	41.3	-12.7	54	50.59	40.46	17.09	66.84	-	-	A	H	
		14480	52.79	-21.21	74	57.54	41.64	19.79	66.18	-	-	P	H	
		14480	42.84	-11.16	54	47.59	41.64	19.79	66.18	-	-	A	H	
		15630	47.92	-26.08	74	56.99	37.94	20.33	67.34	-	-	P	H	
		17967	61.71	-12.29	74	59.79	49.11	22.01	69.2	-	-	P	H	
		17967	46.74	-7.26	54	44.82	49.11	22.01	69.2	-	-	A	H	
														H
														H
														H
														H
		10420	49.76	-18.44	68.2	60.74	39.76	16.62	67.36	-	-	P	V	
		10872	51.61	-22.39	74	61.09	40.46	17	66.94	-	-	P	V	
		10872	41.66	-12.34	54	51.14	40.46	17	66.94	-	-	A	V	
		14480	53.8	-20.2	74	58.55	41.64	19.79	66.18	-	-	P	V	
		14480	43.87	-10.13	54	48.62	41.64	19.79	66.18	-	-	A	V	
		15630	47.87	-26.13	74	56.94	37.94	20.33	67.34	-	-	P	V	
		17989	61.93	-12.07	74	59.46	49.7	22.02	69.25	-	-	P	V	
		17989	46.98	-7.02	54	44.51	49.7	22.02	69.25	-	-	A	V	
													V	
													V	
													V	
													V	
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													
	3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.													
	4. The emission level close to 18GHz is checked that the average emission level is noise floor only.													

Emission above 18GHz

5GHz WIFI 802.11ac VHT80 (SHF@ 1m)

[illegible]

Emission below 1GHz

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

[illegible]



<Sample 4>

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		5148.98	57.72	-16.28	74	49.41	32	9.96	33.65	124	195	P	H
		5150	53.18	-0.82	54	44.86	32	9.97	33.65	124	195	A	H
	*	5210	102.36	-	-	94.22	31.76	10.02	33.64	124	195	P	H
	*	5210	96.39	-	-	88.25	31.76	10.02	33.64	124	195	A	H
		5362.56	52.7	-21.3	74	44.62	31.48	10.21	33.61	124	195	P	H
		5381.04	46.36	-7.64	54	38.13	31.59	10.24	33.6	124	195	A	H
		5065.52	53.14	-20.86	74	45.13	31.79	9.89	33.67	400	257	P	V
		5087.36	46.6	-7.4	54	38.43	31.92	9.91	33.66	400	257	A	V
	*	5210	99.11	-	-	90.97	31.76	10.02	33.64	400	257	P	V
	*	5210	92.76	-	-	84.62	31.76	10.02	33.64	400	257	A	V
		5365.08	50.39	-23.61	74	42.29	31.49	10.22	33.61	400	257	P	V
		5448.24	44.89	-9.11	54	36.29	31.89	10.3	33.59	400	257	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 (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)
802.11ac VHT80 CH 42 5210MHz		10420	49.39	-18.81	68.2	60.37	39.76	16.62	67.36	-	-	P	H
		11004	52.76	-21.24	74	62.07	40.38	17.12	66.81	-	-	P	H
		11004	42.72	-11.28	54	52.03	40.38	17.12	66.81	-	-	A	H
		14491	54.33	-19.67	74	59.03	41.67	19.8	66.17	-	-	P	H
		14491	44.39	-9.61	54	49.09	41.67	19.8	66.17	-	-	A	H
		15630	47.94	-26.06	74	57.01	37.94	20.33	67.34	-	-	P	H
		18000	63.6	-10.4	74	60.85	50	22.03	69.28	-	-	P	H
		18000	48.46	-5.54	54	45.71	50	22.03	69.28	-	-	A	H
													H
													H
													H
													H
		10420	50.35	-17.85	68.2	61.33	39.76	16.62	67.36	-	-	P	V
		11411	51.12	-22.88	74	60.16	40	17.42	66.46	-	-	P	V
		11411	41.14	-12.86	54	50.18	40	17.42	66.46	-	-	A	V
		14491	52.59	-21.41	74	57.29	41.67	19.8	66.17	-	-	P	V
		14491	42.55	-11.45	54	47.25	41.67	19.8	66.17	-	-	A	V
		15630	47.96	-26.04	74	57.03	37.94	20.33	67.34	-	-	P	V
		18000	62.78	-11.22	74	60.03	50	22.03	69.28	-	-	P	V
		18000	47.86	-6.14	54	45.11	50	22.03	69.28	-	-	A	V
													V
													V
													V
													V
													V
Remark	- No other spurious found. - All results are PASS against Peak and Average limit line. - The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only. - The emission level close to 18GHz is checked that the average emission level is noise floor only.												

Emission above 18GHz

5GHz WIFI 802.11ac VHT80 (SHF@ 1m)

[illegible]

Emission below 1GHz

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

[illegible]



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	Peak or Average
H/V	Horizontal or Vertical

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		5150	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 36		5150	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H
5180MHz													

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

For Peak Limit @ 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. Margin(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. Margin(dB) = Level(dBμV/m) – Limit Line(dBμV/m)
 = 43.54(dBμV/m) – 54(dBμV/m)
 = -10.46(dB)

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



Appendix D. Radiated Spurious Emission Plots

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

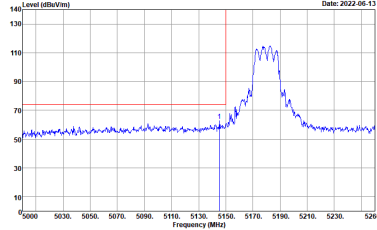
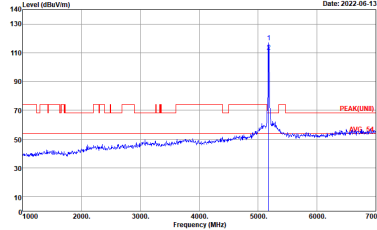
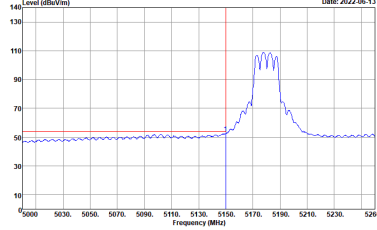
Note symbol

-L	Low channel location
-R	High channel location

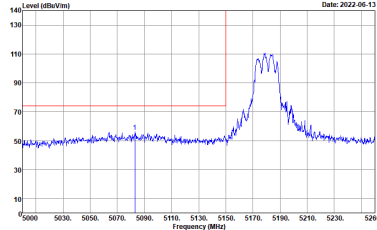
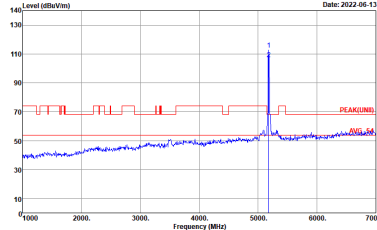
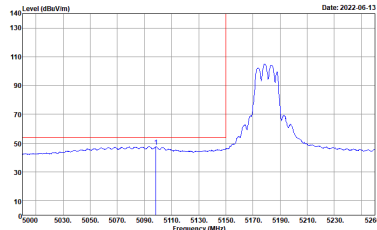


<Sample 3>

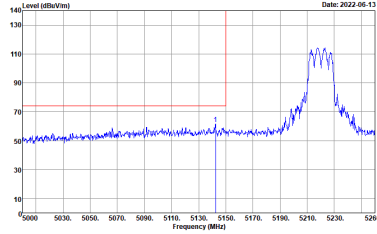
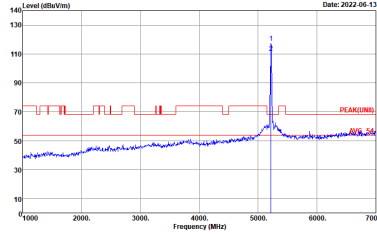
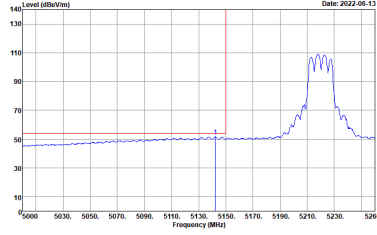
Band 1 - 5150~5250MHz
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_86_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_86_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.000kHz VBW:1000kHz SWT:Auto	Left blank

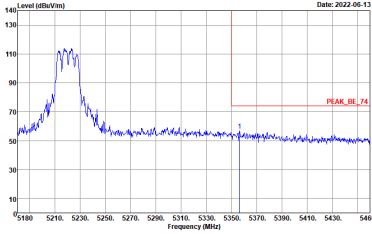
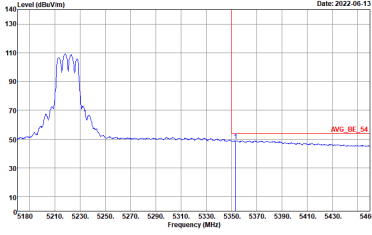


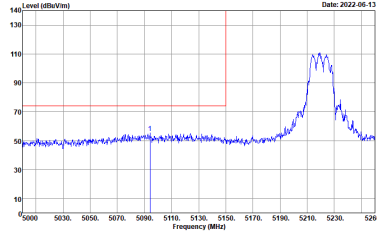
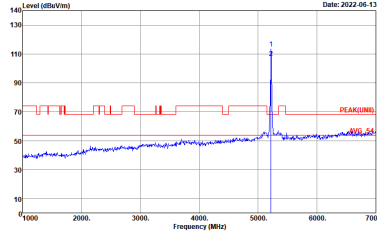
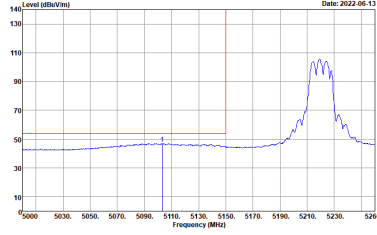
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	Left blank



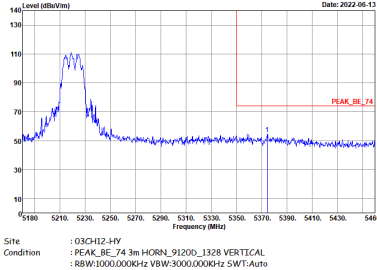
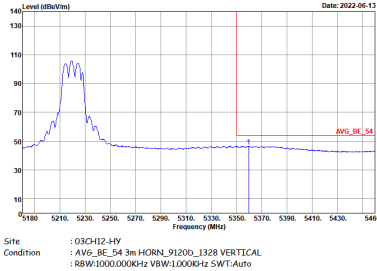
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	Left blank

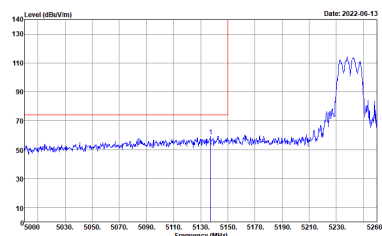
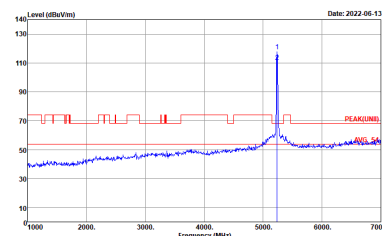
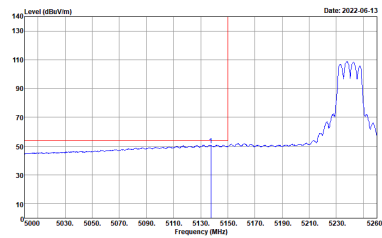


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	Left blank

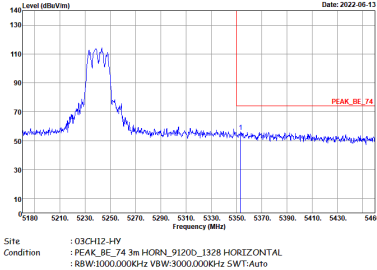
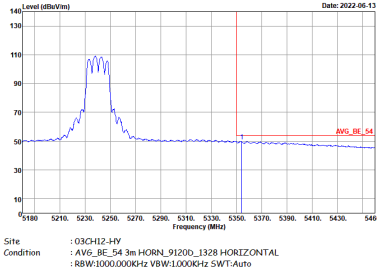
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	Left blank



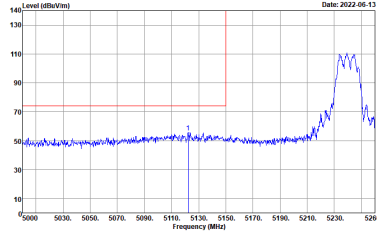
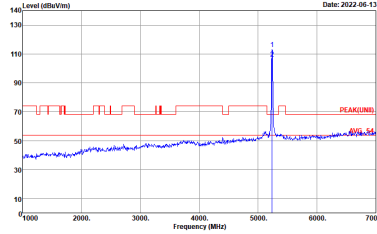
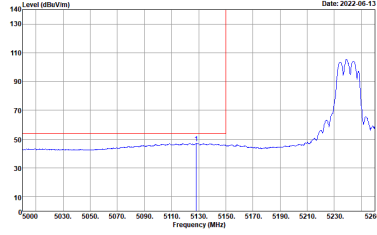
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:1.000kHz SWT:Auto	Left blank

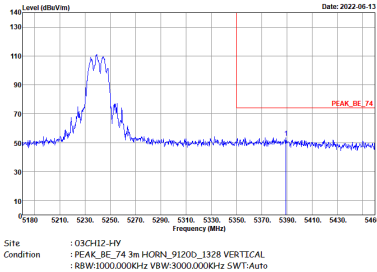
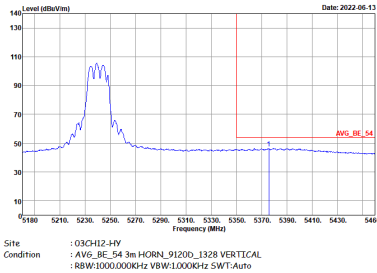


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	Left blank



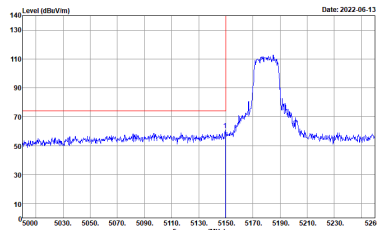
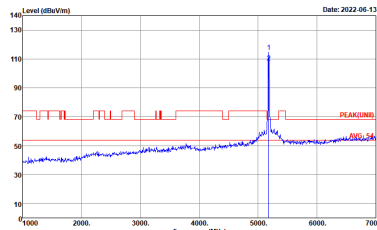
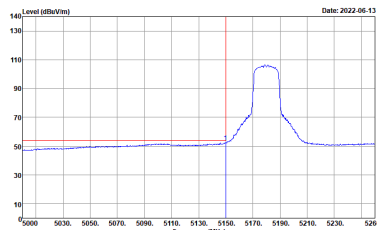
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:1.000KHz SWT:Auto	Left blank



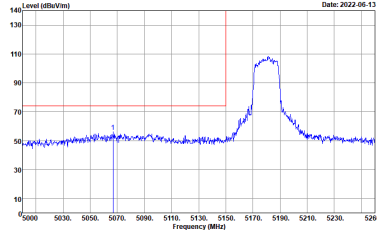
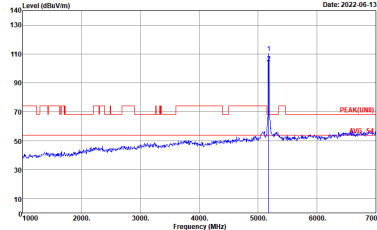
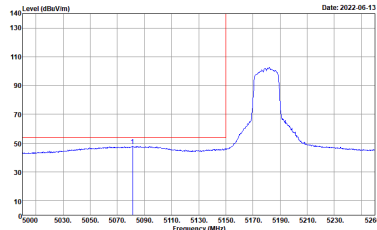
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - R	
1+2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

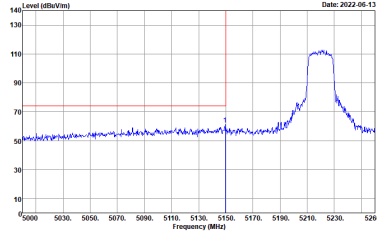
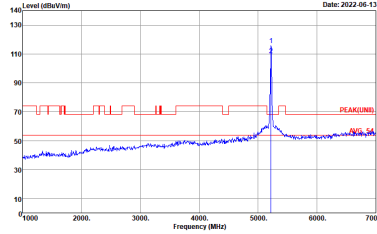
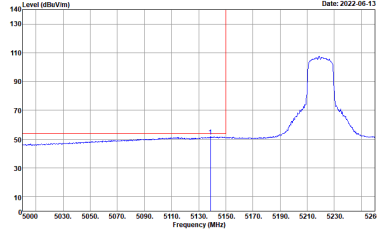


Band 1 5150~5250MHz
WIFI 802.11ac VHT20 (Band Edge @ 3m)

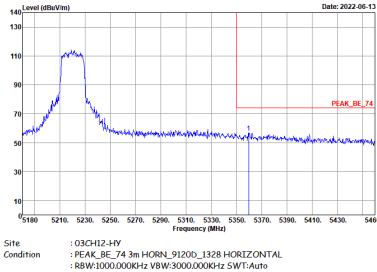
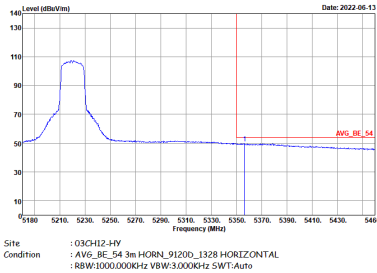
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH36 5180MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank



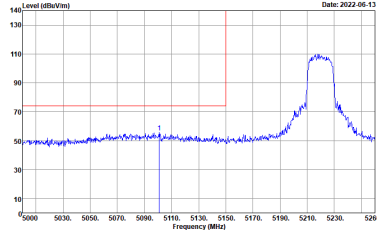
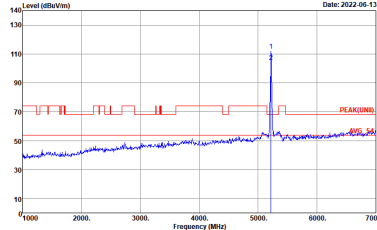
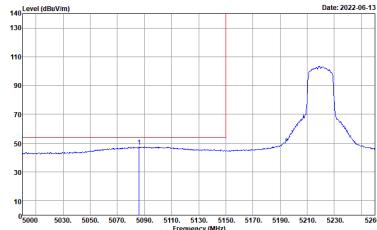
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH36 5180MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH44 5220MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

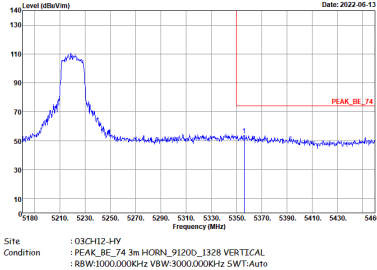
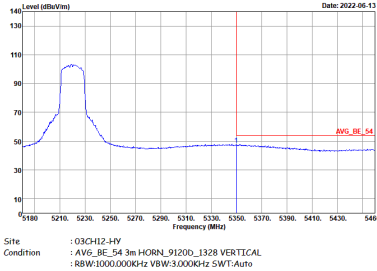


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH44 5220MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH44 5220MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

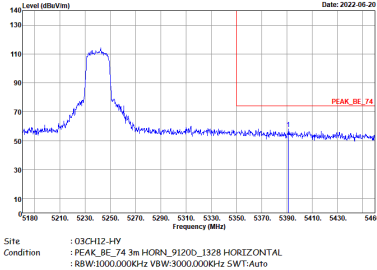
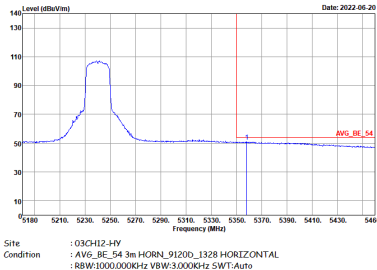


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH44 5220MHz - R	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

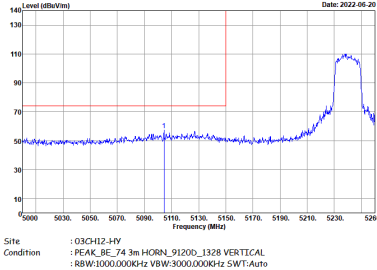
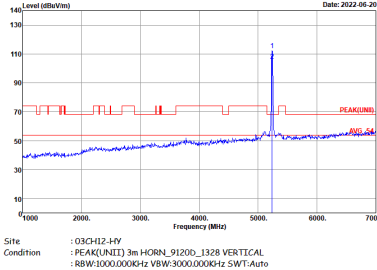
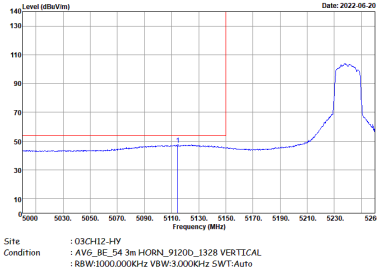


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH48 5240MHz - L	
1+2	Horizontal	Fundamental
Peak	Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank

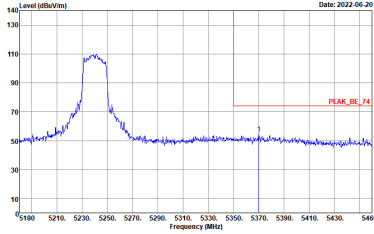
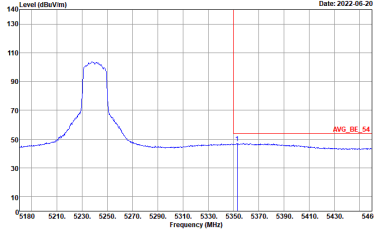


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH48 5240MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



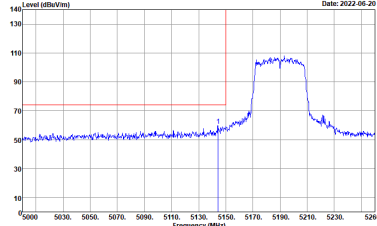
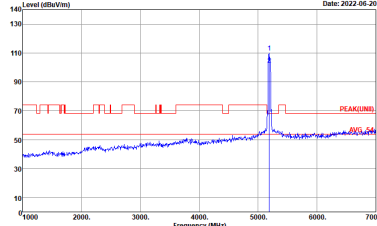
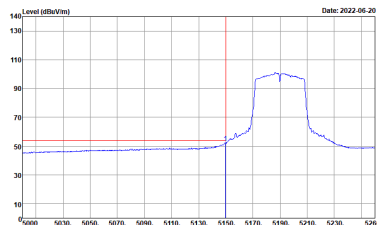
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH48 5240MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Date: 2022-06-20	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Date: 2022-06-20
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Date: 2022-06-20	Left blank



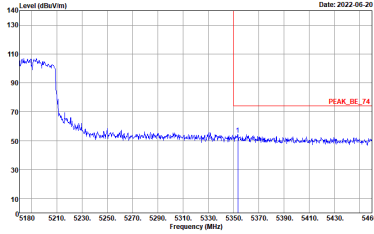
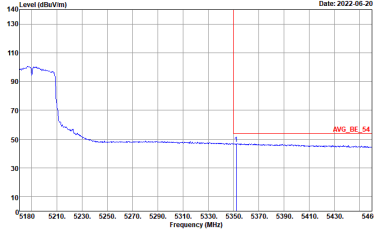
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH48 5240MHz - R	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank



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	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank

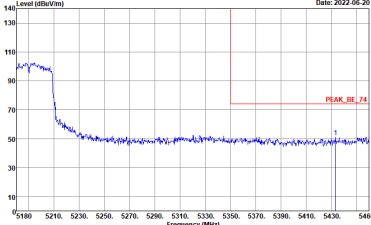
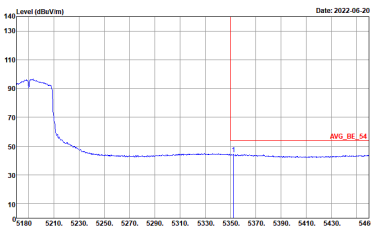


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH38 5190MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3.000KHz SWT:Auto	Left blank

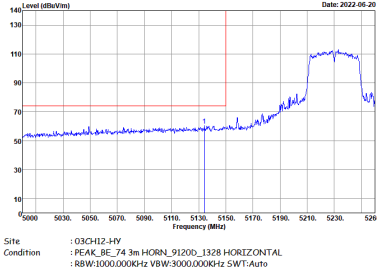
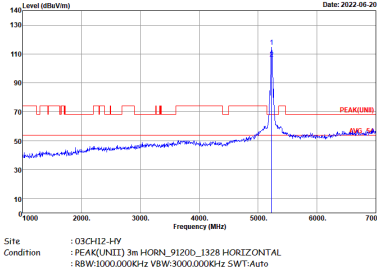
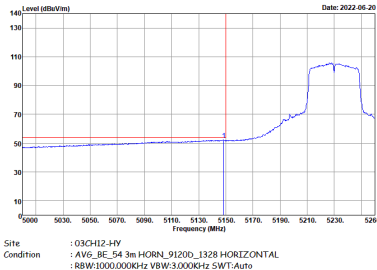


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH38 5190MHz - L	
1+2	Vertical	Fundamental
Peak	Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank

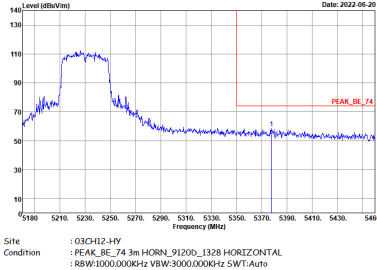
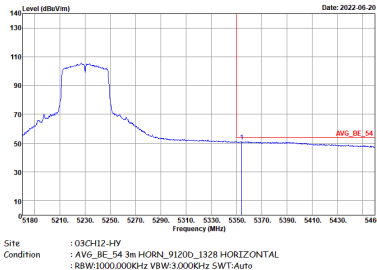


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH38 5190MHz - R	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

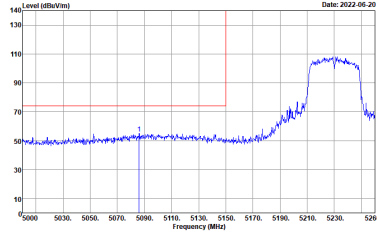
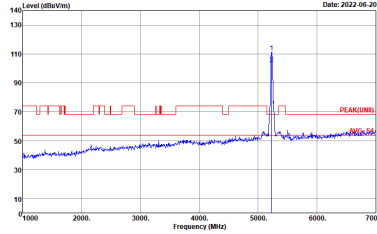
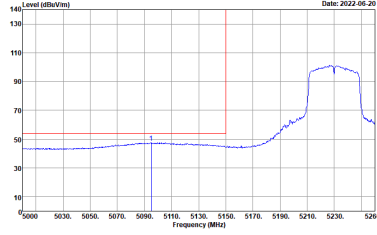


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH46 5230MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(FUND) 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank

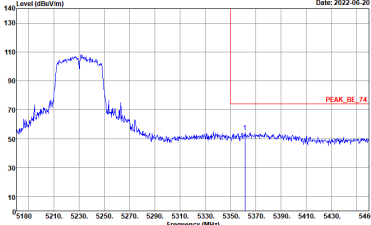
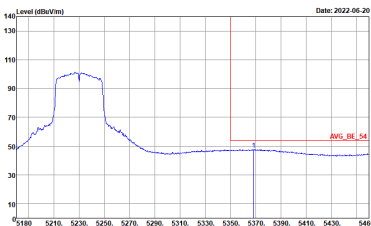


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH46 5230MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH46 5230MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



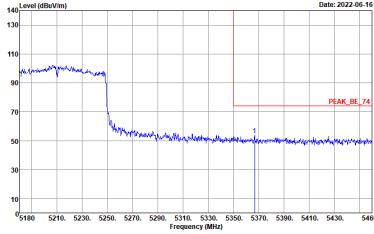
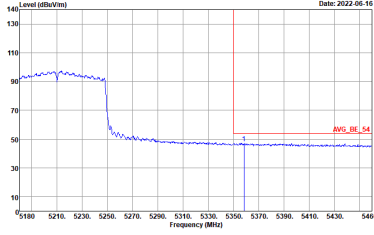
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH46 5230MHz - R	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



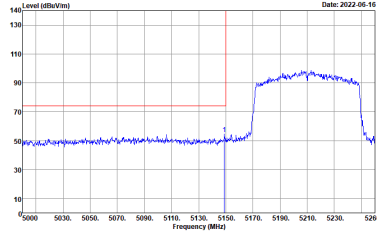
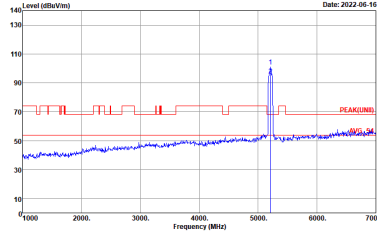
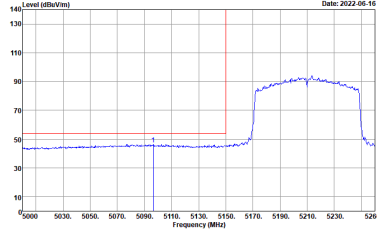
Band 1 5150~5250MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1+2	Horizontal	Fundamental
Peak	Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto	Left blank

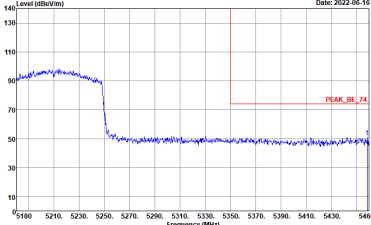
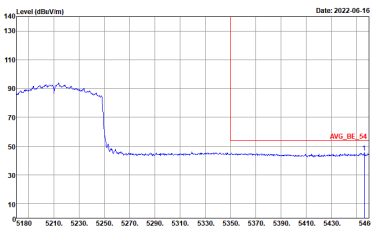


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 HORIZONTAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto	Left blank



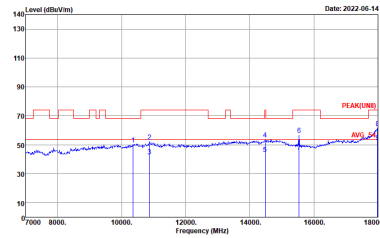
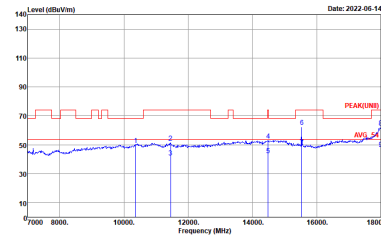
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_91200_1328 VERTICAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto	Left blank



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto	Left blank



Band 1 - 5150~5250MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL



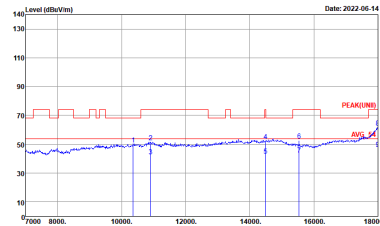
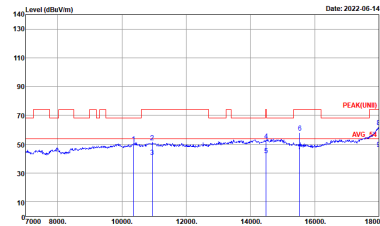
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH44 5220MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBu/Vm) Date: 2022-06-14 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 HORIZONTAL	Level (dBu/Vm) Date: 2022-06-14 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 VERTICAL



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH48 5240MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBu/Vm) Date: 2022-06-14 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 HORIZONTAL	Level (dBu/Vm) Date: 2022-06-14 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 VERTICAL



Band 1 5150~5250MHz
WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH36 5180MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-4Y Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL	 Site : 03CH12-4Y Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL



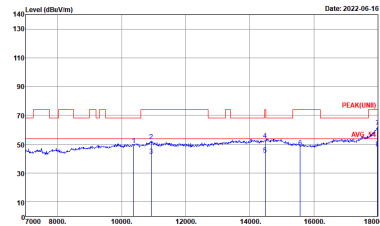
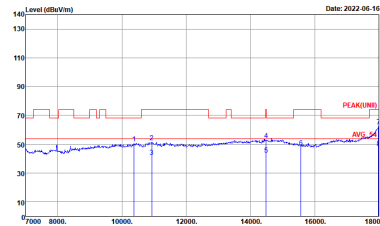
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH44 5220MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBu/Vm) Date: 2022-06-16 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 HORIZONTAL	Level (dBu/Vm) Date: 2022-06-16 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 VERTICAL



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH48 5240MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBu/Vm) Date: 2022-06-16 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 HORIZONTAL	Level (dBu/Vm) Date: 2022-06-16 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 VERTICAL



Band 1 5150~5250MHz
WIFI 802.11ac VHT40 (Harmonic @ 3m)

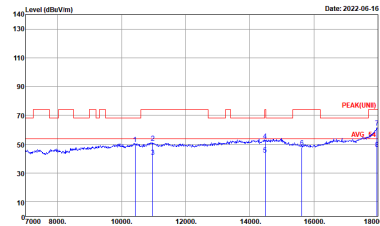
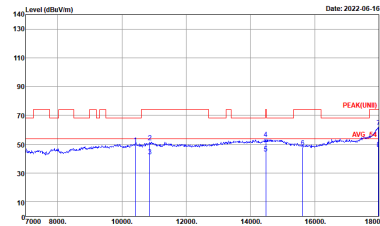
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH38 5190MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-4Y Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL	 Site : 03CH12-4Y Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH46 5230MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBu/Vm) Date: 2022-06-16 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 HORIZONTAL	Level (dBu/Vm) Date: 2022-06-16 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_91200_1328 VERTICAL

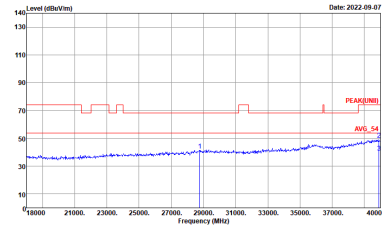
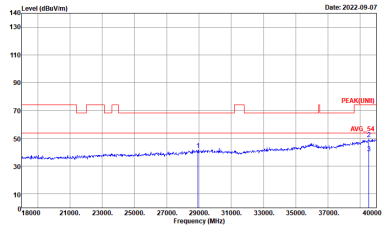


Band 1 5150~5250MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-4Y Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL	 Site : 03CH12-4Y Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL

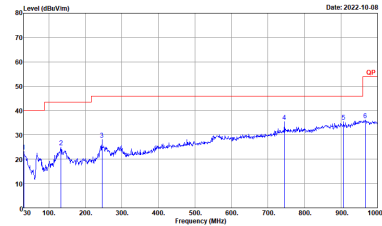
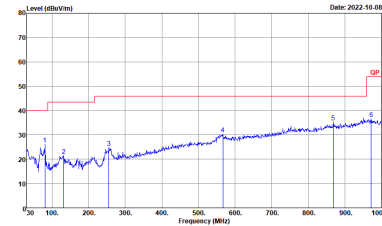


Emission above 18GHz
5GHz WIFI 802.11ac VHT80 (SHF @ 1m)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 SHF	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNIT) 1m SHF HORN BBH49170993 HORIZONTAL	 Site : 03CH12-HY Condition : PEAK(UNIT) 1m SHF HORN BBH49170993 VERTICAL



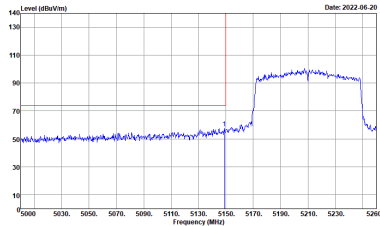
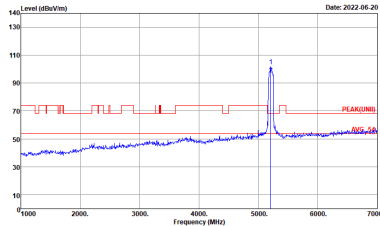
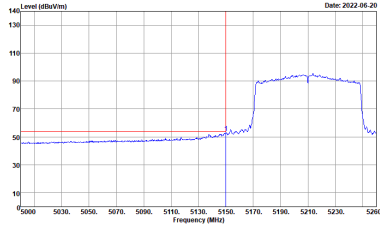
Emission below 1GHz
5GHz WIFI 802.11ac VHT80 (LF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CH12-HY Condition : QP 3m 81LO6_6111D_40103 HORIZONTAL	 Site : 03CH12-HY Condition : QP 3m 81LO6_6111D_40103 VERTICAL

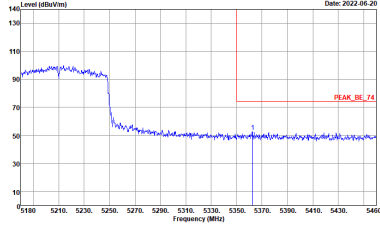
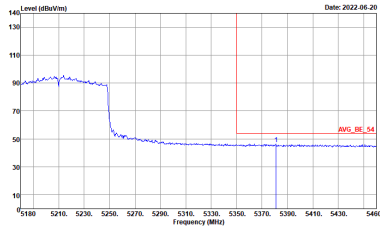


<Sample 4>

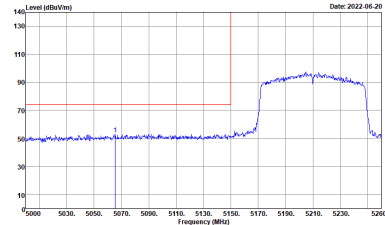
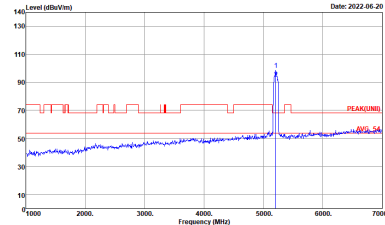
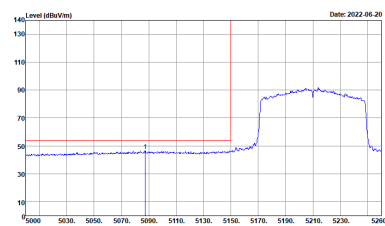
Band 1 - 5150~5250MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1+2	Horizontal	Fundamental
Peak	 Site: 03CH12-4Y Condition: : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site: 03CH12-4Y Condition: : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site: 03CH12-4Y Condition: : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto	Left blank

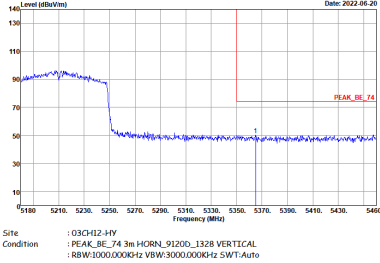
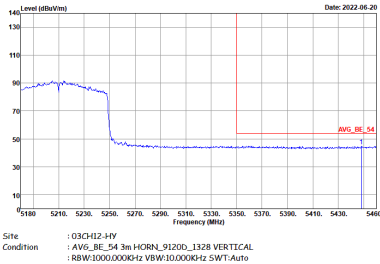


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 HORIZONTAL : RBW:1000.000KHz VBW:10.000KHz SWT:Auto	Left blank



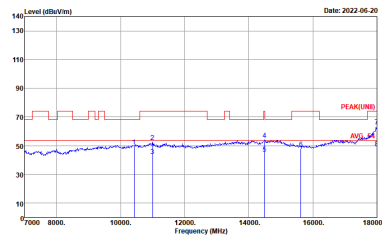
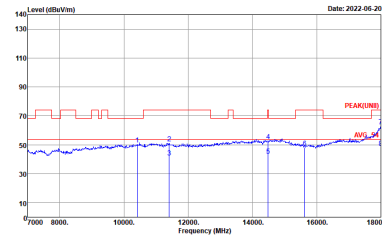
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE_74 3m HORN_9120D_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Avg.	 Site : 03CH12-HY Condition : AVG_BE_54 3m HORN_9120D_1328 VERTICAL : RBW:1000.000kHz VBW:10.000kHz SWT:Auto	Left blank



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 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_9120D_1328 HORIZONTAL	 Site : 03CH12-HY Condition : PEAK(UM) 3m HORN_9120D_1328 VERTICAL

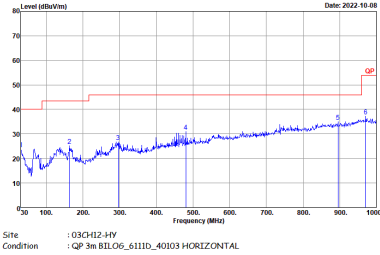
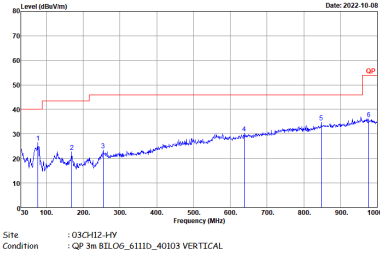


Emission above 18GHz
5GHz WIFI 802.11ac VHT80 (SHF @ 1m)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 SHF	
1+2	Horizontal	Vertical
Peak Avg.	140 Level (dBuV/m) Date: 2022-09-07 Site : 03CH12-HY Condition : PEAK(UNIT) in SHF HORN BBH49170993 HORIZONTAL	140 Level (dBuV/m) Date: 2022-09-07 Site : 03CH12-HY Condition : PEAK(UNIT) in SHF HORN BBH49170993 VERTICAL



Emission below 1GHz
5GHz WIFI 802.11ac VHT80 (LF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CH12-HY Condition : QP 3m 81LO6_6111D_40103 HORIZONTAL	 Site : 03CH12-HY Condition : QP 3m 81LO6_6111D_40103 VERTICAL

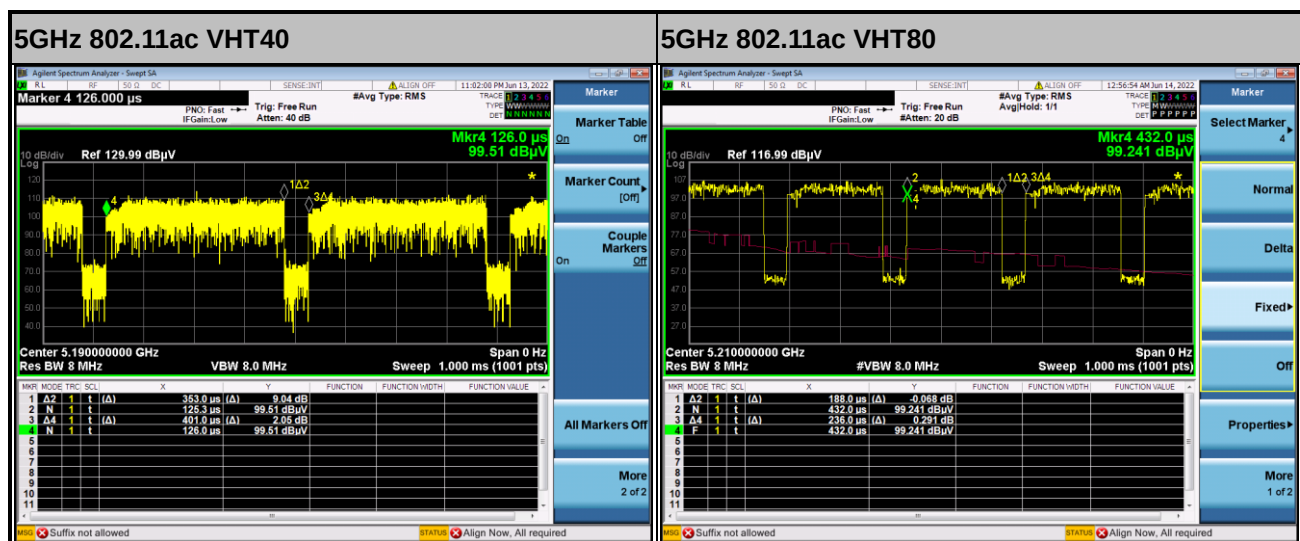
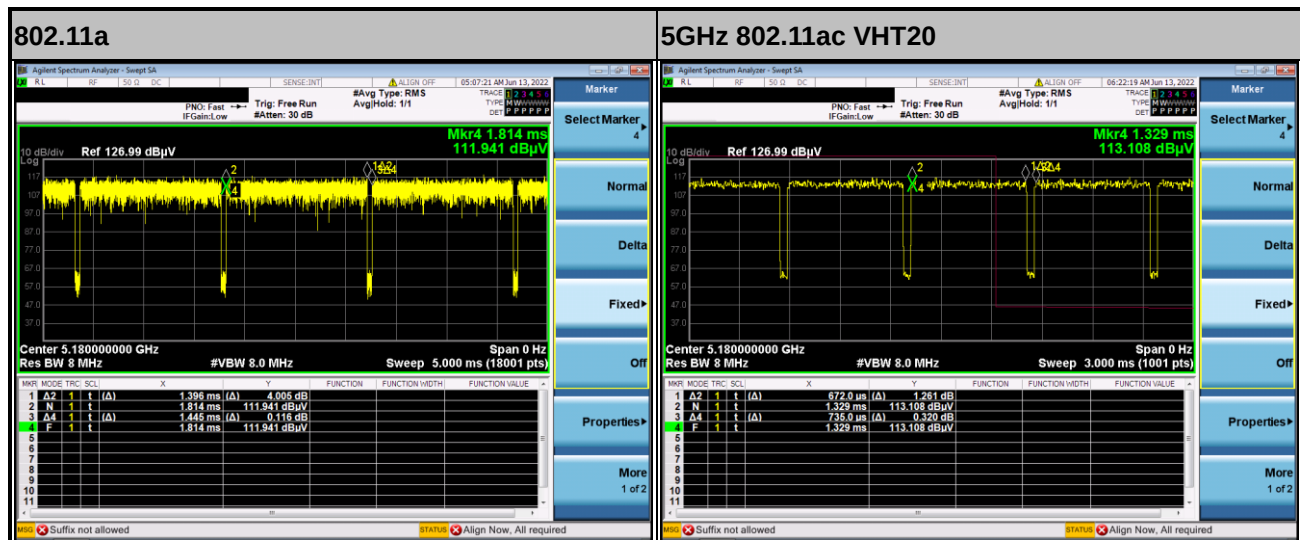


Appendix E. Duty Cycle Plots

<Sample 3>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	802.11a	96.61	1396	0.72	1kHz
1+2	5GHz 802.11ac VHT20	91.43	672	1.49	3kHz
1+2	5GHz 802.11ac VHT40	88.03	353	2.83	3kHz
1+2	5GHz 802.11ac VHT80	79.66	188	5.32	10kHz

MIMO <Ant. 1+2>





<Sample 4>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	5GHz 802.11ac VHT80	87.05	327.4	3.05	10kHz

MIMO <Ant. 1+2>

