FCC RADIO TEST REPORT

FCC ID	:	**A4RGX7AS**
Equipment	:	**Phone**
Model Name	:	**GX7AS, GB17L**
Applicant	:	**Google LLC** **1600 Amphitheatre Parkway,** **Mountain View, California, 94043 USA**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Nov. 10, 2021 and testing was started from Nov. 16, 2021 and completed on Jan. 10, 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 of 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
FR161608-05H	01	Initial issue of report	Jan. 24, 2022
FR161608-05H	02	1. Revise Support Unit used in test configuration and system 2. Revise Connection Diagram of Test System, Support Unit used in test configuration and system, Appendix A and Appendix C 3. Revise description typo in Chapter 3 4. Revise description in section 3.4.1 and 3.4.6	Feb. 21, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.407(e)	6dB & 26dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407(a)	Maximum E.I.R.P Output Power	Pass	-
3.3	15.407(a)	Power Spectral Density	Pass	-
3.4	15.407(b)	Unwanted Emissions	Pass	3.05 dB under the limit at 5941.000 MHz
3.5	15.207	AC Conducted Emission	Pass	17.35 dB under the limit at 1.399 MHz
3.6	15.203 15.407(a)	Antenna Requirement	Pass	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: William Chen

Report Producer: Tina Chuang

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Phone
Model Name	GX7AS, GB17L
FCC ID	A4RGX7AS
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA/LTE/5G NR/NFC/GNSS WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80/VHT160 WLAN 11ax HE20/HE40/HE80/HE160 Bluetooth BR/EDR/LE

Remark:

1. The above EUT's information was declared by manufacturer.
2. All the tests were performed with GX7AS.

EUT Information List	
S/N	Performed Test Item
1A261FQGR00062	Conducted Measurement
1A291FQGR00028	Radiated Spurious Emission
1A281FQGR00002	Conducted Emission

1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Tx/Rx Frequency Range	5850 MHz ~ 5895 MHz
Maximum Output Power	**MIMO <Ant. 4+3>** 802.11a: 22.36 dBm / 0.1722 W 802.11n HT20: 22.41 dBm / 0.1742 W 802.11n HT40: 21.66 dBm / 0.1466 W 802.11ac VHT20: 22.31 dBm / 0.1702 W 802.11ac VHT40: 21.56 dBm / 0.1432 W 802.11ac VHT80: 21.81 dBm / 0.1517 W 802.11ac VHT160: 21.06 dBm / 0.1276 W 802.11ax HE20: 22.21 dBm / 0.1663 W 802.11ax HE40: 21.46 dBm / 0.1400 W 802.11ax HE80: 21.51 dBm / 0.1416 W 802.11ax HE160: 21.16 dBm / 0.1306 W
99% Occupied Bandwidth	**MIMO <Ant. 4>** 802.11a: 17.68 MHz 802.11n HT20: 18.88 MHz 802.11n HT40: 37.26 MHz 802.11ac VHT80: 76.00 MHz 802.11ax HE160: 157.04 MHz **MIMO <Ant. 3>** 802.11a: 17.18 MHz 802.11n HT20: 18.28 MHz 802.11n HT40: 36.86 MHz 802.11ac VHT80: 75.76 MHz 802.11ax HE160: 156.32 MHz
Antenna Type / Gain	**<Ant. 4> :** IFA Antenna with gain -1.2 dBi **<Ant. 3> :** IFA Antenna with gain -0.6 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) 802.11ax : OFDMA (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)
Antenna Function Description	

	Ant. 4	Ant. 3
802.11 a/n/ac/ax MIMO	V	V

Remark:

1. MIMO Ant. 4+3 Directional Gain is a calculated result from MIMO Ant. 4 and MIMO Ant. 3. The formula used in calculation is documented in section 3.6.
2. Power of MIMO Ant. 4 + Ant. 3 is a calculated result from sum of the power MIMO Ant. 4 and MIMO Ant. 3.
3. The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.3 Modification of EUT

No modifications are made to the EUT during all test items.

1.4 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 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, 03CH15-HY

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

FCC designation No.: TW1190 and TW3786

1.5 Applicable Standards

According to the specifications of 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.
- FCC KDB 291074 D02 EMC Measurement v01(Draft)
- 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 three orthogonal axis (X: flat, Y: portrait, Z: landscape) and accessory (Adapter or Earphone), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and find X plane as worst plane.

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

2.1 Carrier Frequency and Channel

Frequency Band	Bandwidth	Channel	Frequency (MHz)	Note
5850-5895 MHz (U-NII-4)	20 MHz	169	5845	Straddle
		173	5865	
		177	5885	
	40 MHz	167	5835	Straddle
		175	5875	
	80 MHz	171	5855	Straddle
	160 MHz	163	5815	Straddle

Note: The channel noted with “straddle” spans 5.725-5.850 GHz and 5.850-5.895 GHz.

2.2 Test Mode

This device support 26/52/106/242/484/996-tone RU but does not support 2x996-tone RU on 160MHz channel.

The PSD of partial RU is reduced to be smaller than full RU according to TCB workshop interim guidance.

Final test modes are considering the modulation and worse data rates as below table.

Specification	MCS index /Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0
802.11ac VHT80	MCS0
802.11ac VHT160 (Covered by HE160)	MCS0
802.11ax HE20 (Covered by HT20)	MCS0
802.11ax HE40 (Covered by HT40)	MCS0
802.11ax HE80 (Covered by VHT80)	MCS0
802.11ax HE160	MCS0

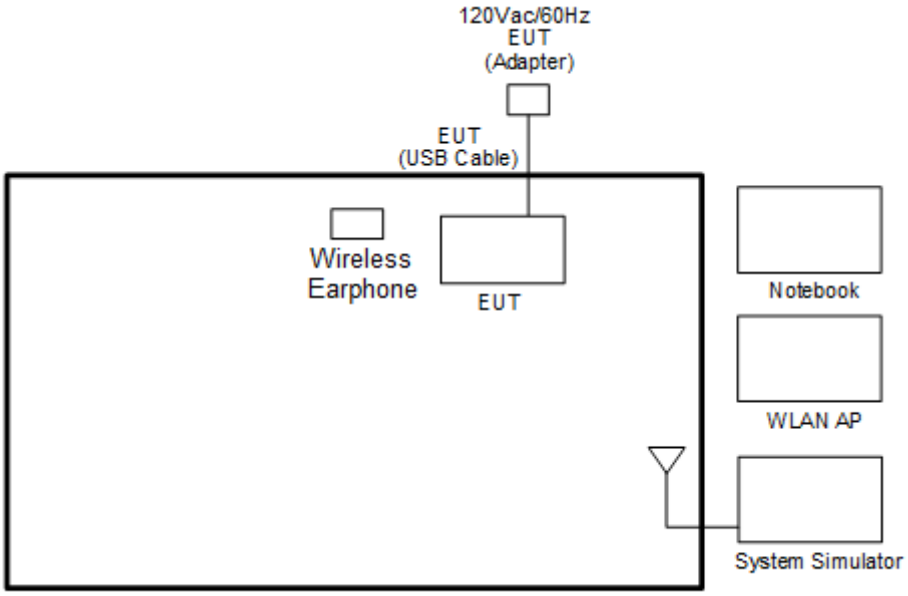
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + WLAN (5GHz) Link + Bluetooth Link + USB Cable 2 (Charging from AC Adapter 2)
Remark: For Radiated Test Cases, the tests were performed with Adapter 1 and USB Cable 2	

Ch. #		RF test channel of UNII-4 and UNII-3 &-4 span channels				
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80	802.11ax HE160
L	Low	169	169	167	-	-
M	Middle	173	173	-	171	163
H	High	177	177	175	-	-

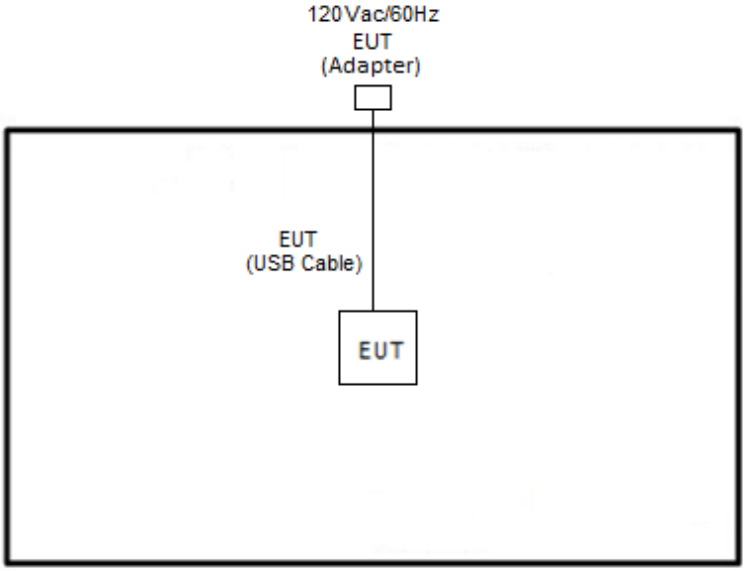
Remark: For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

2.3 Connection Diagram of Test System

<AC Conducted Emission Mode>



<WLAN Tx Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	Wireless Earphone	Google	G1007/G1008	A4RG1007/ A4RG1008	N/A	N/A
3.	WLAN AP	NETGEAR64	RAXE500	N/A	N/A	Unshielded, 1.8 m
4.	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 "Command v10.0.17134.134" 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.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

3 Test Result

3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

26dB and 99% Occupied bandwidth are reporting only.

3.1.2 Measuring Instruments

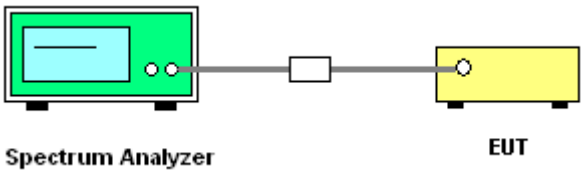
See list of measuring equipment of this test report.

3.1.3 Test Procedures

The testing follows FCC KDB 291074 D02 EMC Measurement v01 (Draft) Section 2.11 Minimum Emission bandwidth

1. Set RBW = 100 kHz.
2. Set the VBW ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
6. Measure and record the results in the test report.

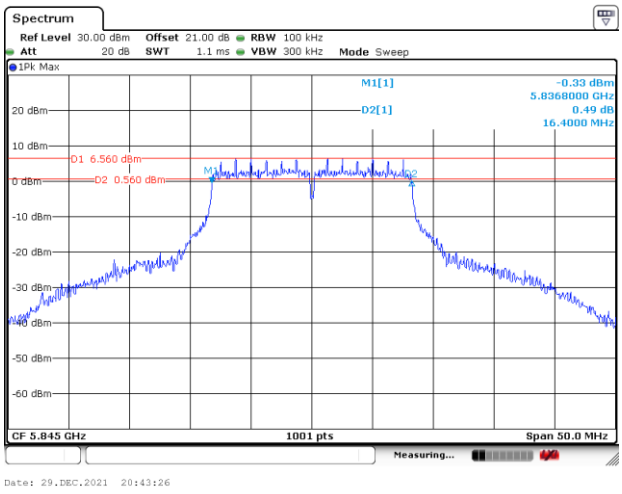
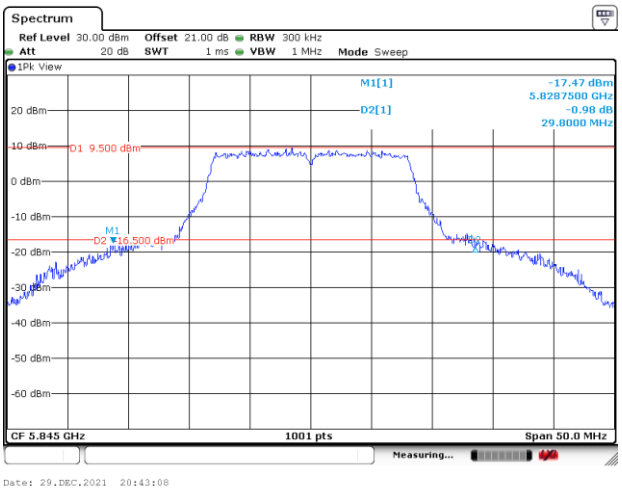
3.1.4 Test Setup



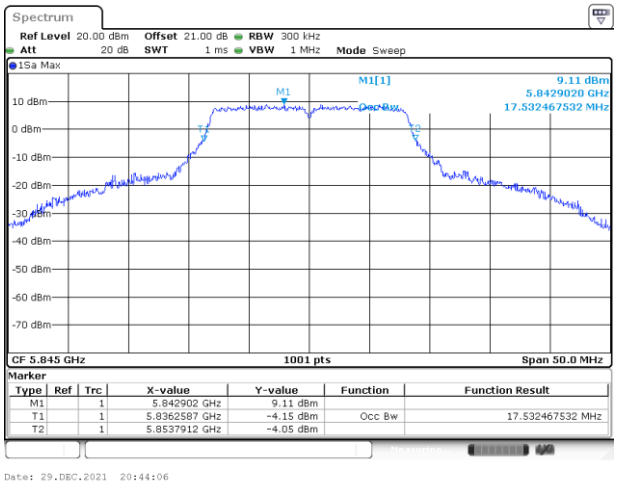
3.1.5 Test Result of 6dB and 26dB and 99% Occupied Bandwidth

Please refer to Appendix A.

<802.11a Mode>

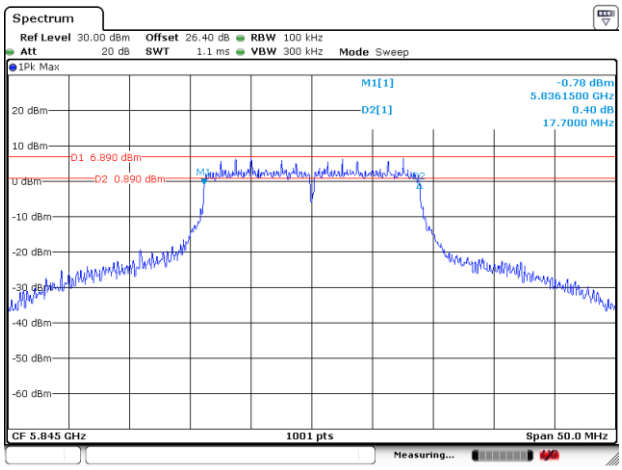
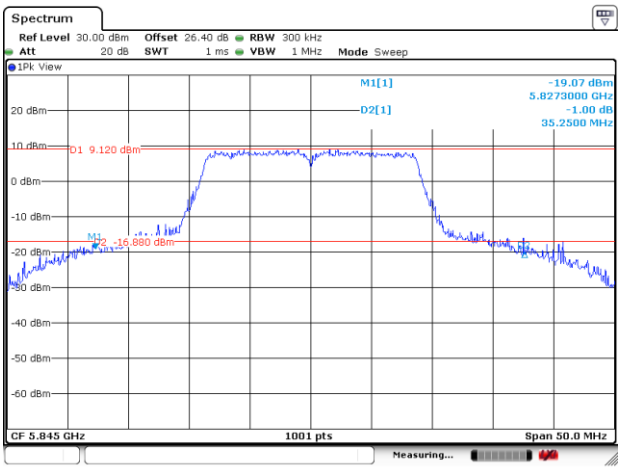
6dB Bandwidth	26dB Bandwidth
	

Occupied Bandwidth

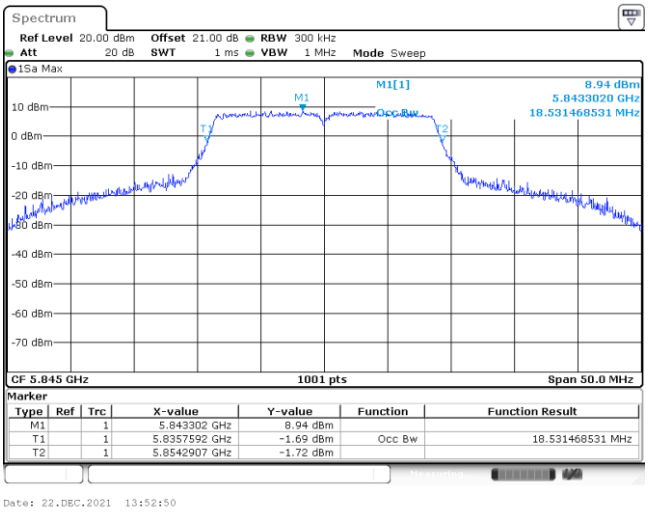


Note: The occupied channel bandwidth is maintained within the band of operation.

<802.11n HT20 Mode>

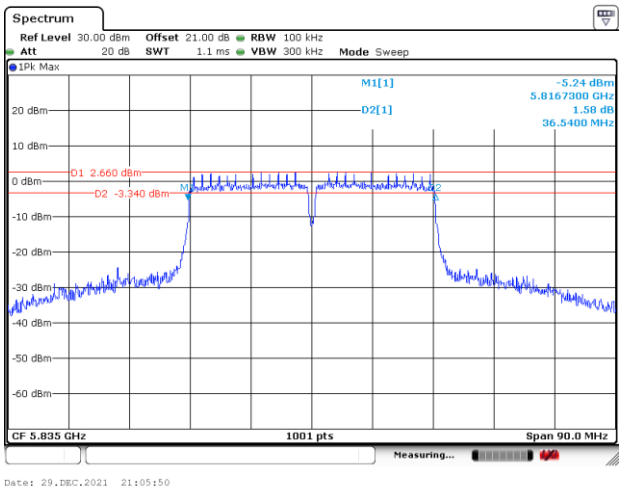
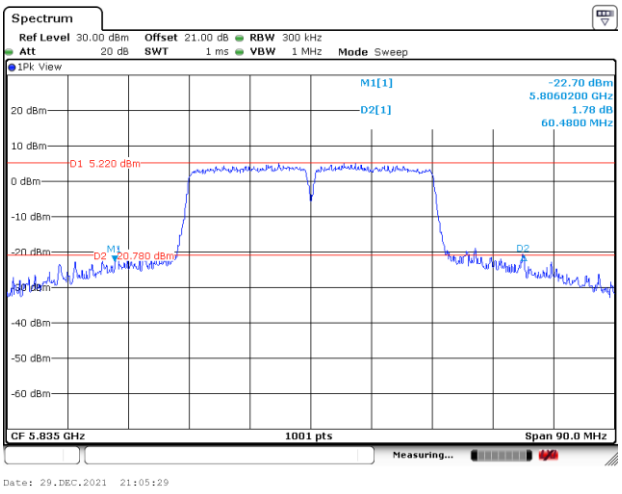
6dB Bandwidth	26dB Bandwidth
	

Occupied Bandwidth

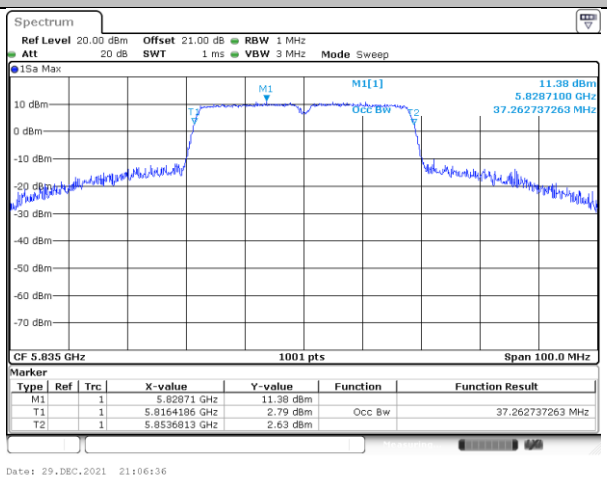


Note: The occupied channel bandwidth is maintained within the band of operation.

<802.11n HT40 Mode>

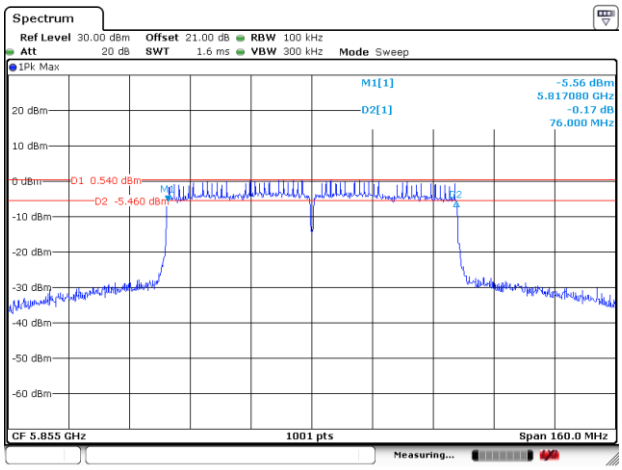
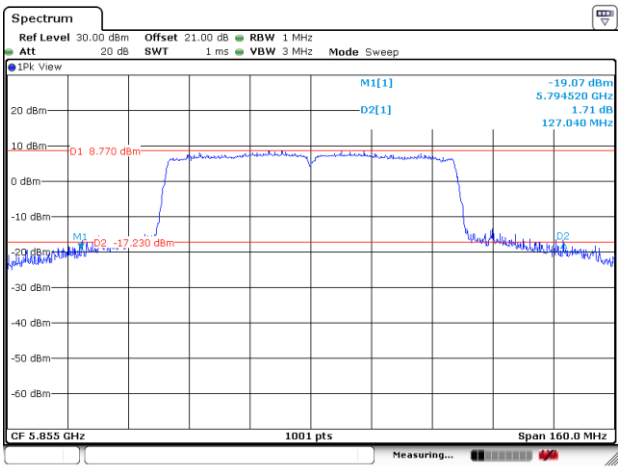
6dB Bandwidth	26dB Bandwidth
	

Occupied Bandwidth

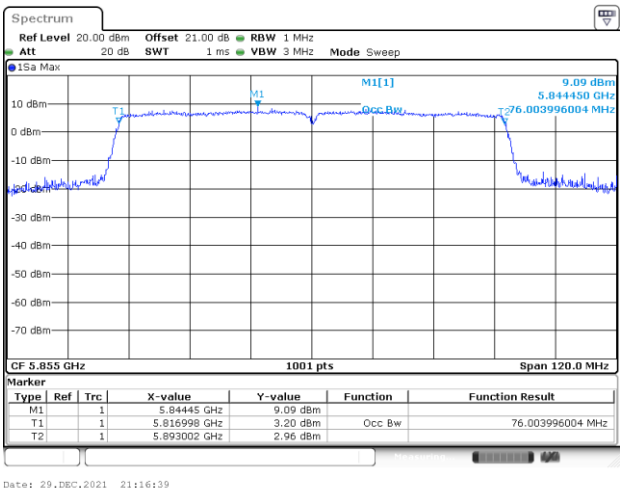


Note: The occupied channel bandwidth is maintained within the band of operation.

<802.11ac VHT80 Mode>

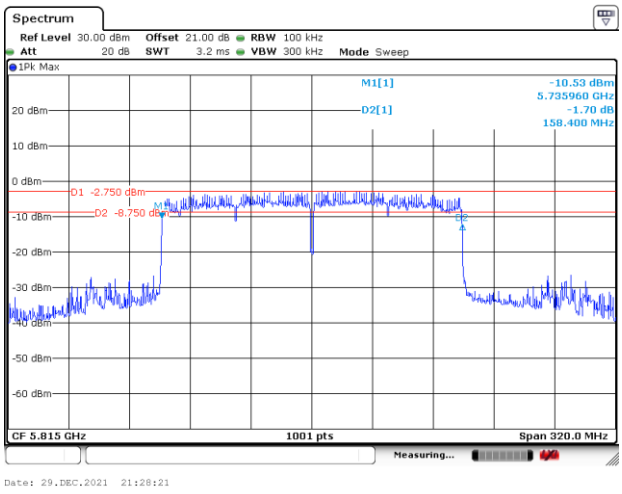
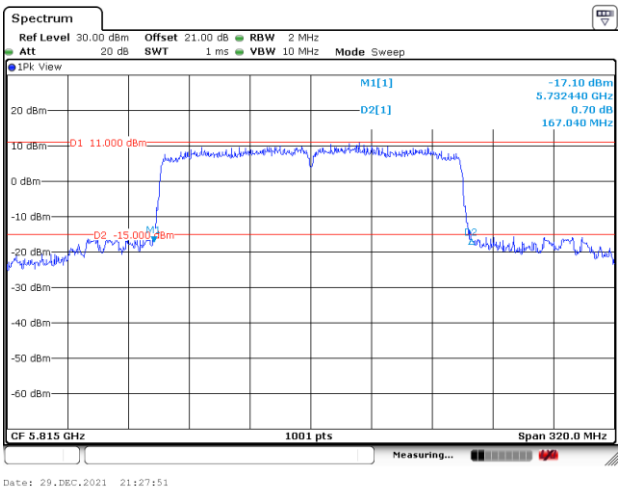
6dB Bandwidth	26dB Bandwidth
	

Occupied Bandwidth

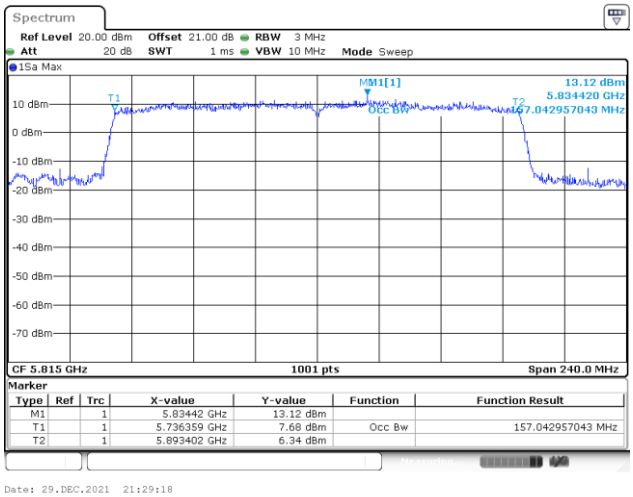


Note: The occupied channel bandwidth is maintained within the band of operation.

<802.11ax HE160 Mode>

6dB Bandwidth	26dB Bandwidth
	

Occupied Bandwidth



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

3.2 Maximum E.I.R.P Output Power Measurement

3.2.1 Limit of Maximum E.I.R.P Output Power

For client devices operating under the control of an indoor access point in the 5.850-5.895 GHz band, the maximum power spectral density must not exceed 14 dBm e.i.r.p. in any 1-megahertz band, and the maximum e.i.r.p. over the frequency band of operation must not exceed 30 dBm. Client devices operating on a channel that spans the 5.725-5.850 GHz and 5.850-5.895 GHz bands must not exceed an e.i.r.p. of 30 dBm.

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

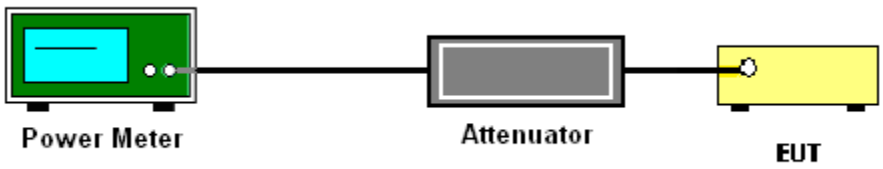
3.2.3 Test Procedures

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

For client devices operating under the control of an indoor access point in the 5.850-5.895 GHz band, the maximum power spectral density must not exceed 14 dBm e.i.r.p. in any 1-megahertz band.

3.3.2 Measuring Instruments

See list of measuring equipment of 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.

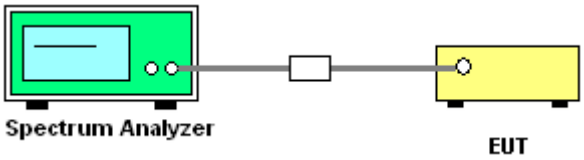
 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. The PSD result should be added with 10*log(1 MHz/RBW) and recorded on the report.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
   Method (c): Measure and add 10 log(N_{ANT}) dB.
   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit.

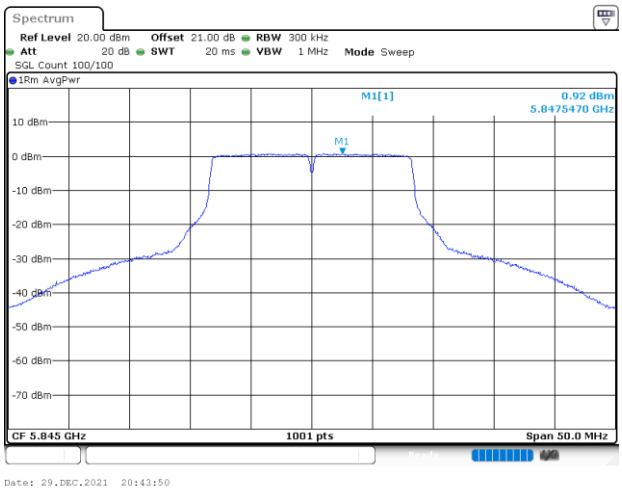
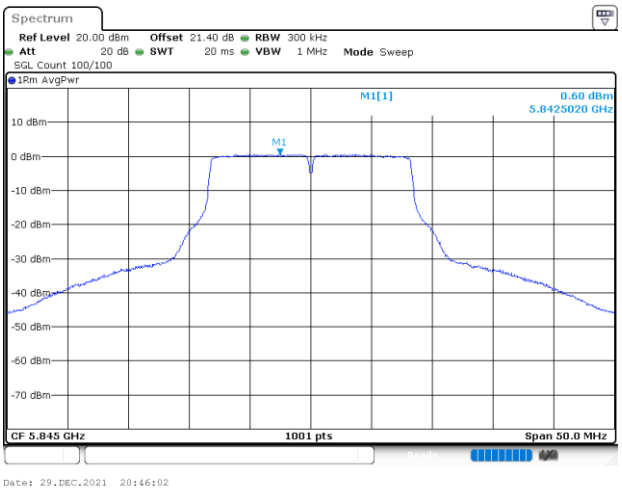
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

<802.11a Mode>

Worst Case Power Density (dBm/MHz)	
MIMO Ant. 4	MIMO Ant. 3
	

<802.11n HT20 Mode>

Worst Case Power Density (dBm/MHz)	
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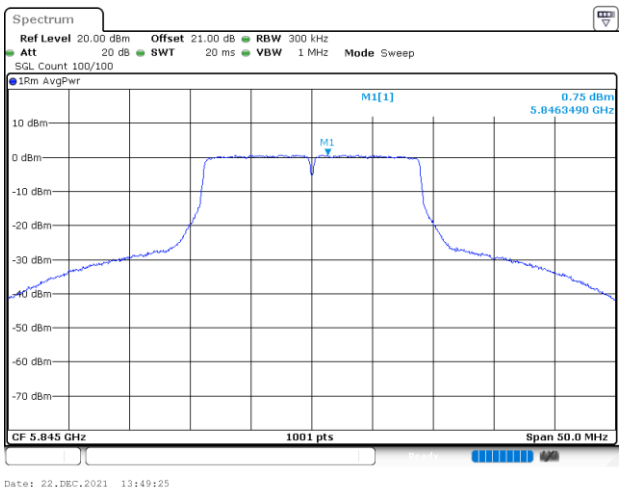	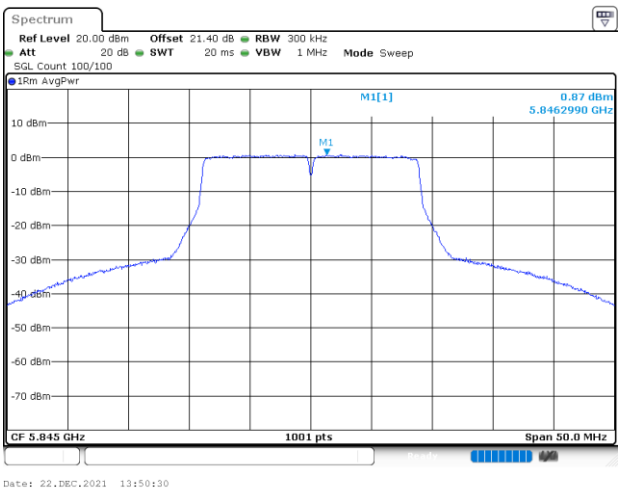

<802.11n HT40 Mode>

Worst Case Power Density (dBm/MHz)	
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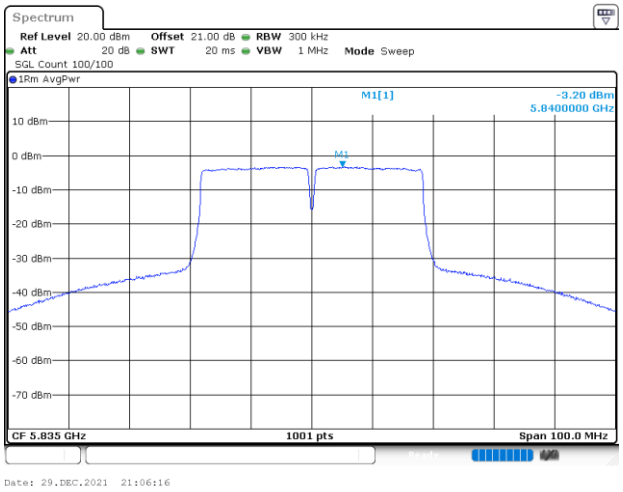	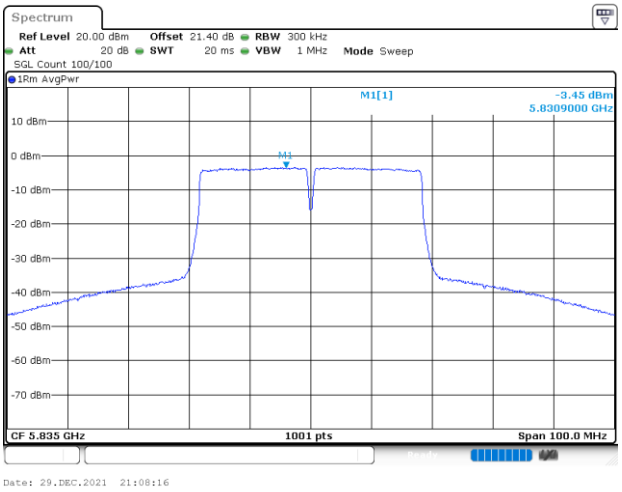

<802.11ac VHT80 Mode>

Worst Case Power Density (dBm/MHz)	
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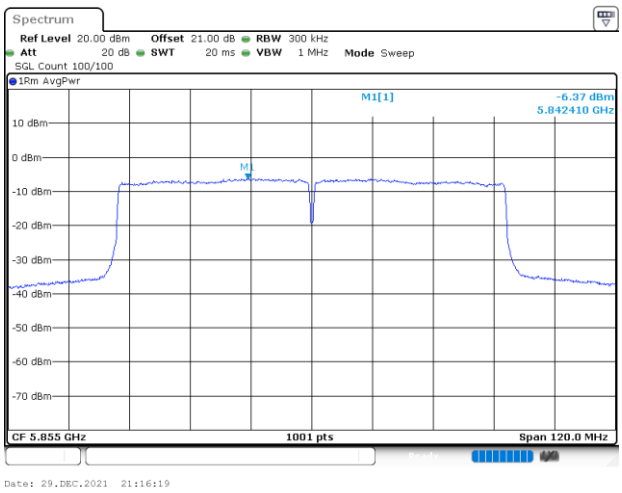	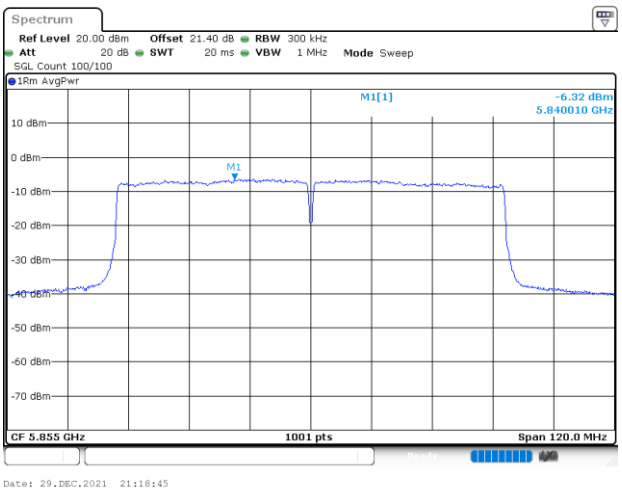

<802.11ax HE20 Mode>

Worst Case Power Density (dBm/MHz)	
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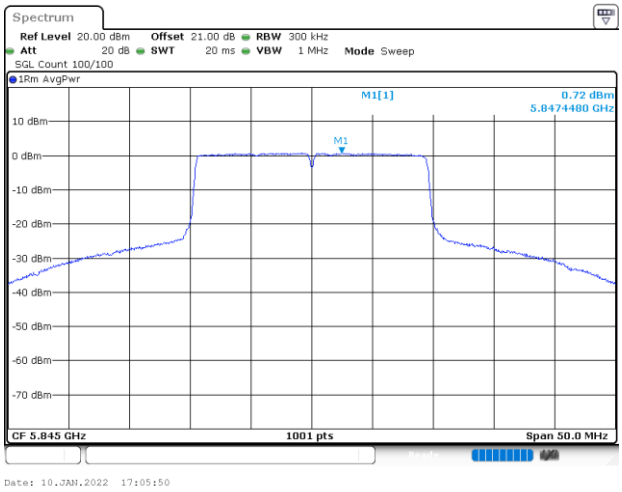
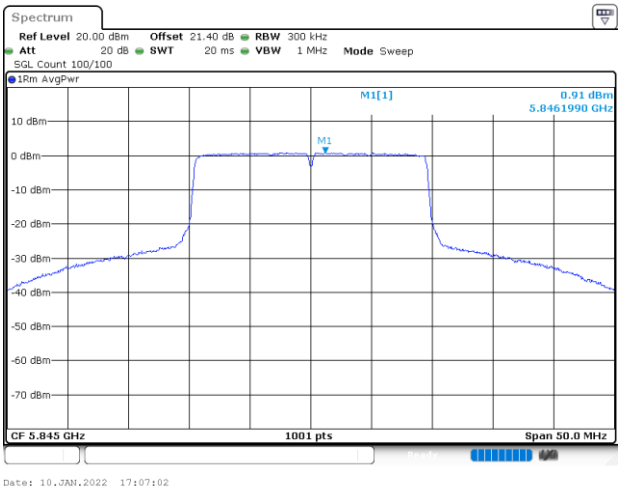
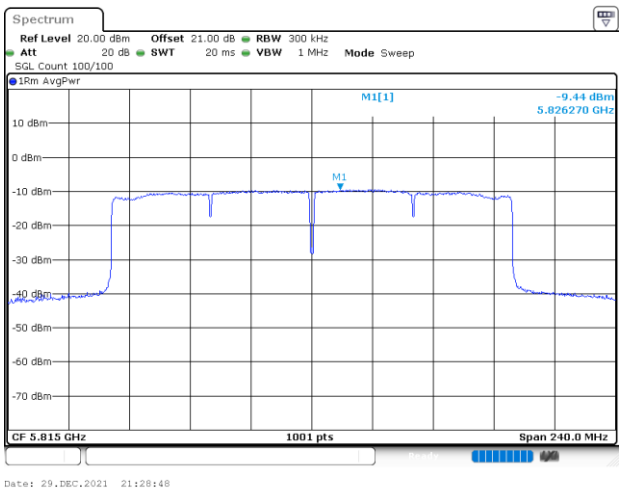
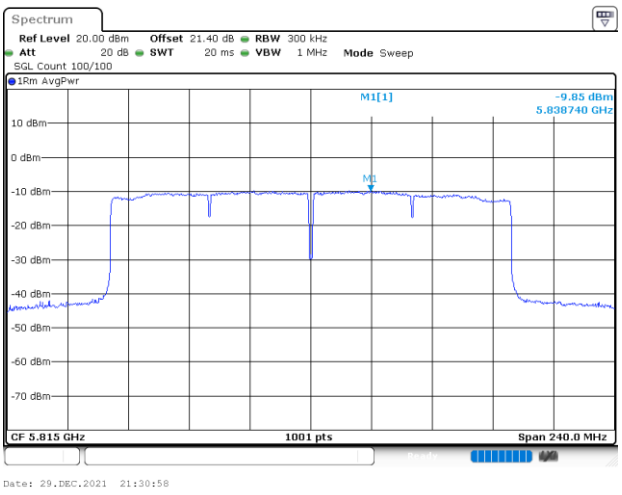
	

<802.11ax HE160 Mode>

Worst Case Power Density (dBm/MHz)	
MIMO Ant. 4	MIMO Ant. 3
	

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) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

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

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

(2) For transmitters operating solely in the 5.850-5.895 GHz band or operating on a channel that spans across 5.725-5.895 GHz:

15.407(b)(5)(ii), all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of −5 dBm/MHz and shall decrease linearly to an e.i.r.p. of −27 dBm/MHz at or above 5.925 GHz.

All emissions below 5.725 GHz shall not exceed an e.i.r.p. of −27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.72 GHz, and from 5.72 GHz increasing linearly to a level of 27 dBm/MHz at 5.725 GHz.

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

Use guidance in KDB Publication 789033 for all measurements. Unwanted emissions outside of restricted bands are measured with an RMS detector. In addition, 15.35(b) applies where the peak emissions must be limited to no more than 20 dB above the average limit.

Unwanted band-edge emissions may be measured using the integration method as described in KDB Publication 789033 3. d) (ii). Emissions below 5725 MHz should be measured using peak-detection while emission above 5895 MHz should be measured using average.

Frequency(GHz)	EIRP (dBm)	Field Strength @3m distance (dBuV/m)	Note
Below 5.65	-27dBm/MHz	68.2	Peak
5.7	10dBm/MHz	105.2	Peak
5.72	15.6dBm/MHz	110.8	Peak
5.725	27dBm/MHz	122.2	Peak
5.895	-5dBm/MHz	90.2	Average
5.895	15dBm/MHz	110.2	Peak
Above 5.925	-27dBm/MHz	68.2	Average
Above 5.925	-7dBm/MHz	88.2	Peak

Note: Field strength at 3 m distance is converted to EIRP as the following equation:

EIRP[dBm] = E[dBμV/m]− 95.2

3.4.2 Measuring Instruments

See list of measuring equipment of 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 ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

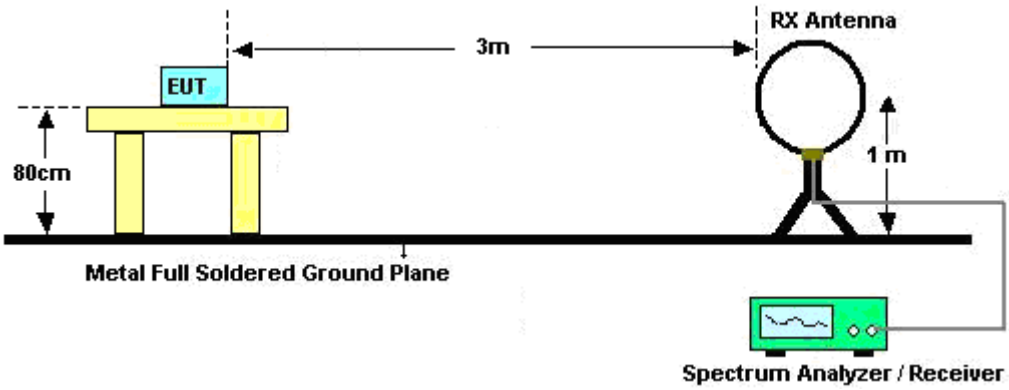
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz

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

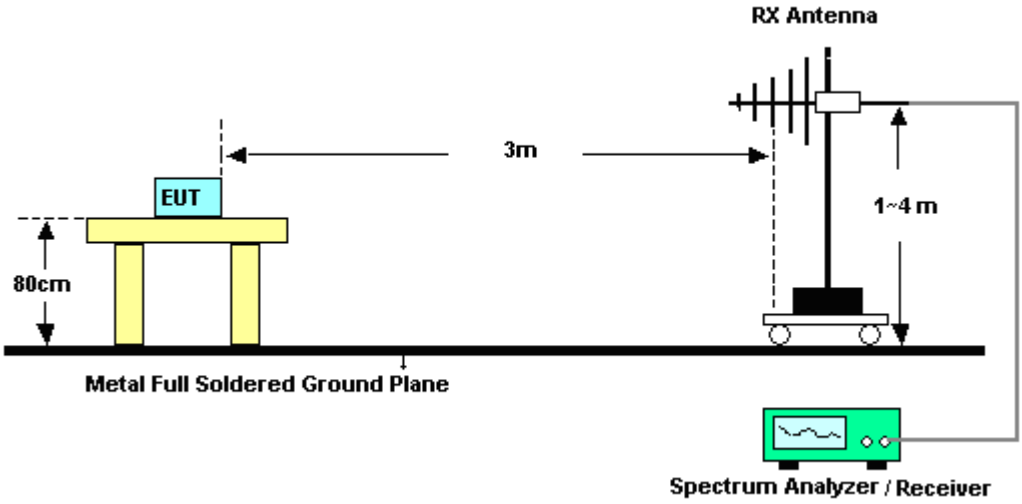
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT was placed at distance 3 meter from measurement antenna which was mounted on the top of a variable height antenna tower.
4. The measurement antenna 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.
5. For each suspected emission, the EUT was 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 1GHz was performed by adjusting the antenna tower from 1m to 4m and by rotating the turn table from 0 degree to 360 degree to find the peak maximum hold reading.
   When there is no suspected emission found and the emission level is with at least 6dB margin against QP limit line, the position is marked as "-".
7. Radiated testing above 1GHz was performed by adjusting the antenna tower from 1m to 4m and by rotating the turn table from 0 degree to 360 degree 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 6dB margin against average limit line, the position is marked as "-".

3.4.4 Test Setup

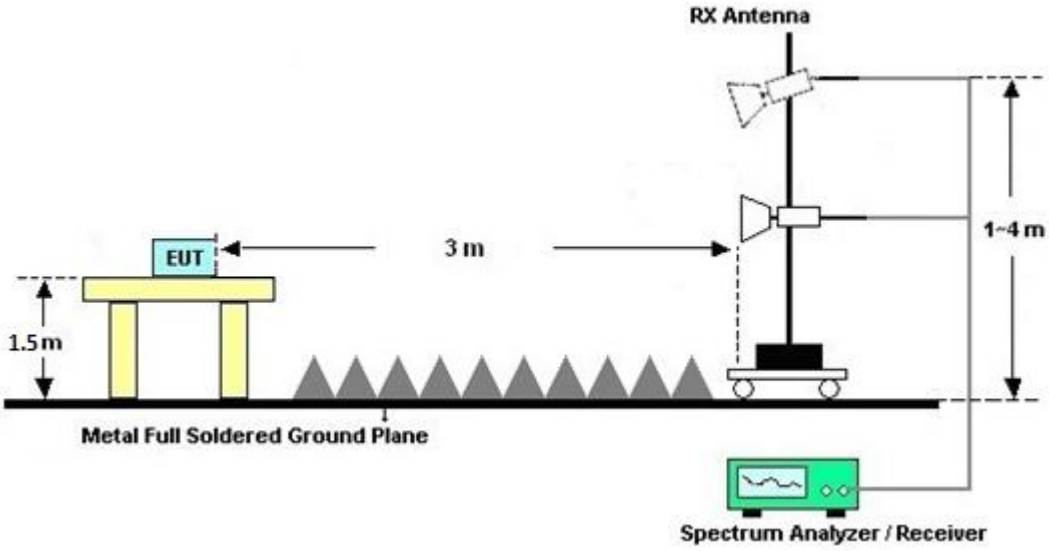
For radiated emissions below 30MHz



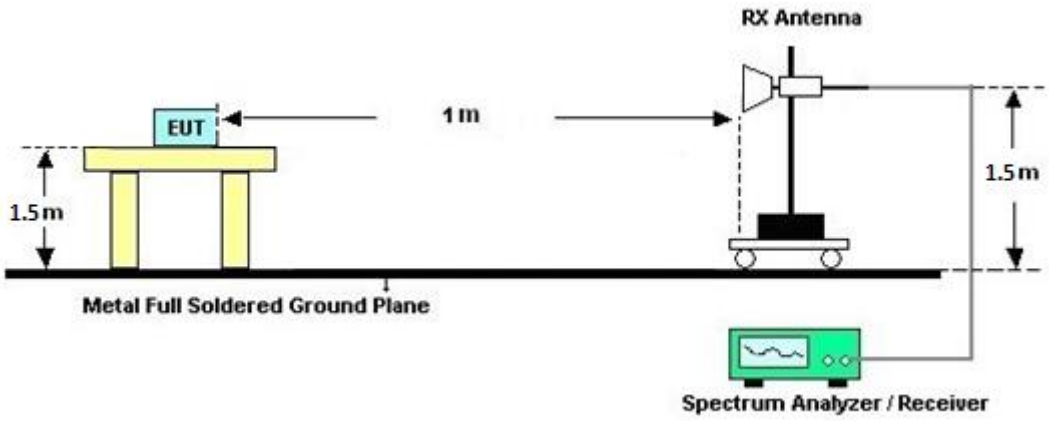
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz



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

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was 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 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 Unwanted Radiated Emission (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.

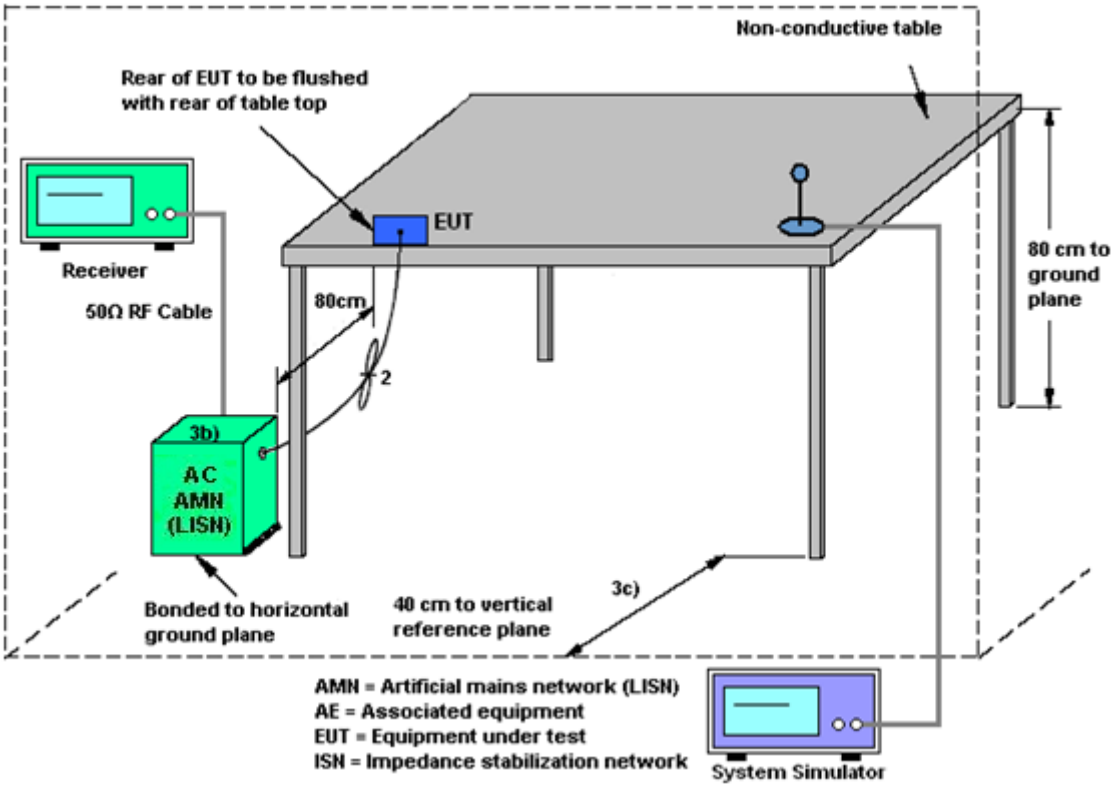
3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was 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 sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
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

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

Refer to FCC KDB 662911 D01 Multiple Transmitter Output v02r01

<CDD Modes>

For power measurements on IEEE 802.11 devices,

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

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 follows F)2)f)ii) of KDB 662911 D01 v02r01.

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

where

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

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

N_{ANT} = the total number of antennas

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

G_k is the gain in dBi of the kth antenna.

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

Directional gain = $10*\log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}]$ dBi

Where G1, G2….GN denote single antenna gain.

For example: If a device has two antenna, G_{ANT1}= 3.6dBi; G_{ANT2}=4.2dBi

Directional gain of power measurement = max(3.6, 4.2) + 0 = 4.2 dBi

Directional gain of PSD measurement = $10 * \log[(10^{3.6/20} + 10^{4.2/20})^2 / 2]$ = 6.92 dBi

The directional gain of EUT is listed in the following table.

UNII-4	Ant 4 (dBi)	Ant 3 (dBi)	DG for Power (dBi)	DG for PSD (dBi)
	-1.20	-0.60	-0.60	2.12

Calculation example:

The DG for PSD is derived from formula is

10 x log { { [10^ (-1.2dBi / 20) + 10^ (-0.6 dBi / 20)] ^ 2 } / 2 }

= 2.12 dBi

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	100315	9 kHz~30 MHz	Jan. 04, 2021	Dec. 09, 2021~ Dec. 18, 2021	Jan. 03, 2022	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N-06	41912 & 05	30MHz~1GHz	Feb. 08, 2021	Dec. 09, 2021~ Dec. 18, 2021	Feb. 07, 2022	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 28, 2020	Dec. 09, 2021~ Dec. 18, 2021	Dec. 27, 2021	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Oct. 25, 2021	Dec. 09, 2021~ Dec. 18, 2021	Oct. 24, 2022	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	00991	18GHz~40GHz	May 12, 2021	Dec. 09, 2021~ Dec. 18, 2021	May 11, 2022	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055006	1GHz~18GHz	May 06, 2021	Dec. 09, 2021~ Dec. 18, 2021	May 05, 2022	Radiation (03CH15-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-10M-7000-MR	EC1900247	10MHz-7GHz	Dec. 03, 2021	Dec. 09, 2021~ Dec. 18, 2021	Dec. 02, 2022	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060801	18-40GHz	Jun. 22, 2021	Dec. 09, 2021~ Dec. 18, 2021	Jun. 21, 2022	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY55420170	20MHz~8.4GHz	Jul. 15, 2021	Dec. 09, 2021~ Dec. 18, 2021	Jul. 14, 2022	Radiation (03CH15-HY
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	May 07, 2021	Dec. 09, 2021~ Dec. 18, 2021	May 06, 2022	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Dec. 09, 2021~ Dec. 18, 2021	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Dec. 09, 2021~ Dec. 18, 2021	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k5)	RK-000451	N/A	N/A	Dec. 09, 2021~ Dec. 18, 2021	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/4, MY9838/4PE ,508405/2E	30MHz~18G	Nov. 15, 2021	Dec. 09, 2021~ Dec. 18, 2021	Nov. 14, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 22, 2021	Dec. 09, 2021~ Dec. 18, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 22, 2021	Dec. 09, 2021~ Dec. 18, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 11, 2021	Dec. 09, 2021~ Dec. 18, 2021	Mar. 10, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-1530-6000-40ST	SN4	1.53GHz Low Pass Filter	Jul. 02, 2021	Dec. 09, 2021~ Dec. 18, 2021	Jul. 01, 2022	Radiation (03CH15-HY)
Filter	Wainwright	WHKX8-5872.5-6750-18000-40ST	SN6	6.75GHz High Pass Filter	Jun. 30, 2021	Dec. 09, 2021~ Dec. 18, 2021	Jun. 29, 2022	Radiation (03CH15-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	Nov. 22, 2021~ Jan. 10, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Meter	Raditeq	RPR3008W	RPR8W-210 1001	10MHz~8GHz	Aug. 17, 2021	Nov. 22, 2021~ Jan. 10, 2022	Aug. 16, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Nov. 22, 2021~ Jan. 10, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Switch Control Manframe	E-IUSTRUME NT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Nov. 22, 2021~ Jan. 10, 2022	Aug. 11, 2022	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Nov. 16, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	Nov. 16, 2021	Nov. 29, 2021	Conduction (CO05-HY)
Hygrometer	TECPEL	DTM-303A	TP201973	N/A	Oct. 22, 2021	Nov. 16, 2021	Oct. 21, 2022	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 01, 2020	Nov. 16, 2021	Nov. 30, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Nov. 16, 2021	N/A	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBE CK	VTSD 9561-F N	00691	N/A	Jul. 28, 2021	Nov. 16, 2021	Jul. 27, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Nov. 16, 2021	Dec. 30, 2021	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

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.3 dB

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.6 dB

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Ching Chen	Temperature:	21~25	°C
Test Date:	2021/11/22-2022/1/10	Relative Humidity:	51~54	%

TEST RESULTS DATA
6dB and 26dB EBW and 99% OBW

Band IV MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 4	Ant 3	Ant 4	Ant 3	Ant 4	Ant 3		
11a	6Mbps	2	169	5845	17.53	17.08	29.80	22.25	16.40	16.40	0.5	Pass
11a	6Mbps	2	173	5865	17.63	17.18	28.80	22.20	16.45	16.50	0.5	Pass
11a	6Mbps	2	177	5885	17.68	17.18	29.30	24.60	16.45	16.50	0.5	Pass
HT20	MCS0	2	169	5845	18.53	18.18	35.25	30.00	17.70	17.70	0.5	Pass
HT20	MCS0	2	173	5865	18.63	18.23	34.10	28.30	17.65	17.70	0.5	Pass
HT20	MCS0	2	177	5885	18.88	18.28	33.95	29.00	17.65	17.65	0.5	Pass
HT40	MCS0	2	167	5835	37.26	36.76	60.48	40.23	36.54	36.54	0.5	Pass
HT40	MCS0	2	175	5875	37.26	36.86	54.45	39.78	36.45	36.54	0.5	Pass
VHT80	MCS0	2	171	5855	76.00	75.76	127.04	92.00	76.00	76.16	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
11a	6Mbps	2	169	5845	19.40	19.30	22.36	30.00		-0.60		Pass
11a	6Mbps	2	173	5865	19.30	19.30	22.31	30.00		-0.60		Pass
11a	6Mbps	2	177	5885	19.30	19.20	22.26	30.00		-0.60		Pass
HT20	MCS0	2	169	5845	19.50	19.30	22.41	30.00		-0.60		Pass
HT20	MCS0	2	173	5865	19.30	19.30	22.31	30.00		-0.60		Pass
HT20	MCS0	2	177	5885	19.30	19.30	22.31	30.00		-0.60		Pass
HT40	MCS0	2	167	5835	18.80	18.50	21.66	30.00		-0.60		Pass
HT40	MCS0	2	175	5875	18.60	18.40	21.51	30.00		-0.60		Pass
VHT20	MCS0	2	169	5845	19.40	19.20	22.31	30.00		-0.60		Pass
VHT20	MCS0	2	173	5865	19.20	19.20	22.21	30.00		-0.60		Pass
VHT20	MCS0	2	177	5885	19.20	19.20	22.21	30.00		-0.60		Pass
VHT40	MCS0	2	167	5835	18.70	18.40	21.56	30.00		-0.60		Pass
VHT40	MCS0	2	175	5875	18.50	18.30	21.41	30.00		-0.60		Pass
VHT80	MCS0	2	171	5855	18.70	18.90	21.81	30.00		-0.60		Pass
VHT160	MCS0	2	163	5815	18.10	18.00	21.06	30.00		-0.60		Pass

Report Number : FR161608-05H

TEST RESULTS DATA
Power Spectral Density

Band IV MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density with Duty Factor (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 4	Ant 3	Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
11a	6Mbps	2	169	5845	0.30	0.30	2.22		3.43	3.11	6.44	30.00		2.12		Pass
11a	6Mbps	2	173	5865	0.30	0.30	2.22		2.99	2.80	6.00	30.00		2.12		Pass
11a	6Mbps	2	177	5885	0.30	0.30	2.22		3.04	2.50	6.05	30.00		2.12		Pass
HT20	MCS0	2	169	5845	0.32	0.32	2.22		3.29	3.41	6.42	30.00		2.12		Pass
HT20	MCS0	2	173	5865	0.32	0.32	2.22		3.02	3.07	6.08	30.00		2.12		Pass
HT20	MCS0	2	177	5885	0.32	0.32	2.22		2.77	3.03	6.04	30.00		2.12		Pass
HT40	MCS0	2	167	5835	0.14	0.17	2.22		-0.84	-1.06	2.17	30.00		2.12		Pass
HT40	MCS0	2	175	5875	0.14	0.17	2.22		-1.06	-1.48	1.95	30.00		2.12		Pass
VHT80	MCS0	2	171	5855	0.67	0.67	2.22		-3.48	-3.43	-0.42	30.00		2.12		Pass

Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)

TEST RESULTS DATA
6dB and 26dB EBW and 99% OBW

Band IV MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
						Ant 4	Ant 3	Ant 4	Ant 3	Ant 4	Ant 3		
HE160	MCS0	2	163	5815	Full	157.04	156.32	167.04	166.72	158.40	158.08	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
						Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
HE20	MCS0	2	169	5845	Full	19.30	19.10	22.21	30.00		-0.60		Pass
HE20	MCS0	2	169	5845	26/0	10.30	9.80	13.07	30.00		-0.60		Pass
HE20	MCS0	2	169	5845	52/37	13.20	12.60	15.92	30.00		-0.60		Pass
HE20	MCS0	2	169	5845	106/53	15.60	15.50	18.56	30.00		-0.60		Pass
HE20	MCS0	2	173	5865	Full	19.10	19.10	22.11	30.00		-0.60		Pass
HE20	MCS0	2	173	5865	26/4	9.50	8.70	12.13	30.00		-0.60		Pass
HE20	MCS0	2	173	5865	52/38	12.80	11.90	15.38	30.00		-0.60		Pass
HE20	MCS0	2	173	5865	106/53	15.60	15.20	18.41	30.00		-0.60		Pass
HE20	MCS0	2	177	5885	Full	19.10	19.10	22.11	30.00		-0.60		Pass
HE20	MCS0	2	177	5885	26/8	10.20	9.20	12.74	30.00		-0.60		Pass
HE20	MCS0	2	177	5885	52/40	12.90	12.30	15.62	30.00		-0.60		Pass
HE20	MCS0	2	177	5885	106/54	15.70	15.30	18.51	30.00		-0.60		Pass
HE40	MCS0	2	167	5835	Full	18.60	18.30	21.46	30.00		-0.60		Pass
HE40	MCS0	2	175	5875	Full	18.40	18.20	21.31	30.00		-0.60		Pass
HE80	MCS0	2	171	5855	Full	18.60	18.40	21.51	30.00		-0.60		Pass
HE160	MCS0	2	163	5815	Full	18.20	18.10	21.16	30.00		-0.60		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV MIMO																	
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density with Duty Factor (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
						Ant 1	Ant 2	Ant 4	Ant 3	Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
HE20	MCS0	2	169	5845	Full	0.18	0.18	2.22		3.11	3.30	6.31	30.00		2.12		Pass
HE20	MCS0	2	169	5845	26/0	0.18	0.18	2.22		2.90	2.99	6.00	30.00		2.12		Pass
HE20	MCS0	2	169	5845	52/37	0.18	0.18	2.22		2.94	2.92	5.95	30.00		2.12		Pass
HE20	MCS0	2	169	5845	106/53	0.18	0.18	2.22		2.70	2.93	5.94	30.00		2.12		Pass
HE20	MCS0	2	173	5865	Full	0.18	0.18	2.22		2.82	2.72	5.83	30.00		2.12		Pass
HE20	MCS0	2	173	5865	26/4	0.18	0.18	2.22		2.43	1.83	5.44	30.00		2.12		Pass
HE20	MCS0	2	173	5865	52/38	0.18	0.18	2.22		2.61	2.14	5.62	30.00		2.12		Pass
HE20	MCS0	2	173	5865	106/53	0.18	0.18	2.22		2.26	2.50	5.51	30.00		2.12		Pass
HE20	MCS0	2	177	5885	Full	0.18	0.18	2.22		2.85	2.82	5.86	30.00		2.12		Pass
HE20	MCS0	2	177	5885	26/8	0.18	0.18	2.22		2.77	2.30	5.78	30.00		2.12		Pass
HE20	MCS0	2	177	5885	52/40	0.18	0.18	2.22		2.74	2.32	5.75	30.00		2.12		Pass
HE20	MCS0	2	177	5885	106/54	0.18	0.18	2.22		2.22	2.38	5.39	30.00		2.12		Pass
HE160	MCS0	2	163	5815	Full	0.65	0.65	2.22		-6.57	-6.98	-3.56	30.00		2.12		Pass

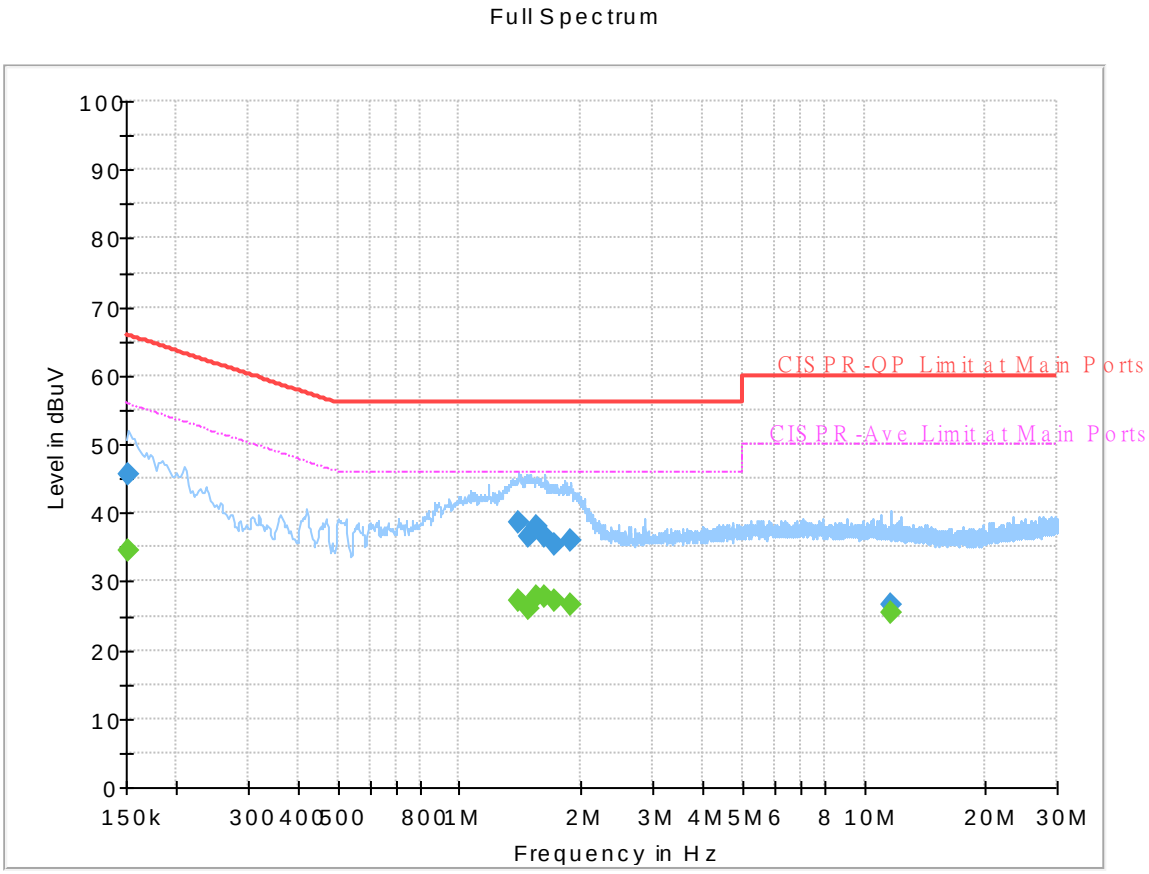
Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)

Appendix B. AC Conducted Emission Test Results

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

EUT Information

Report NO :	161608-05
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

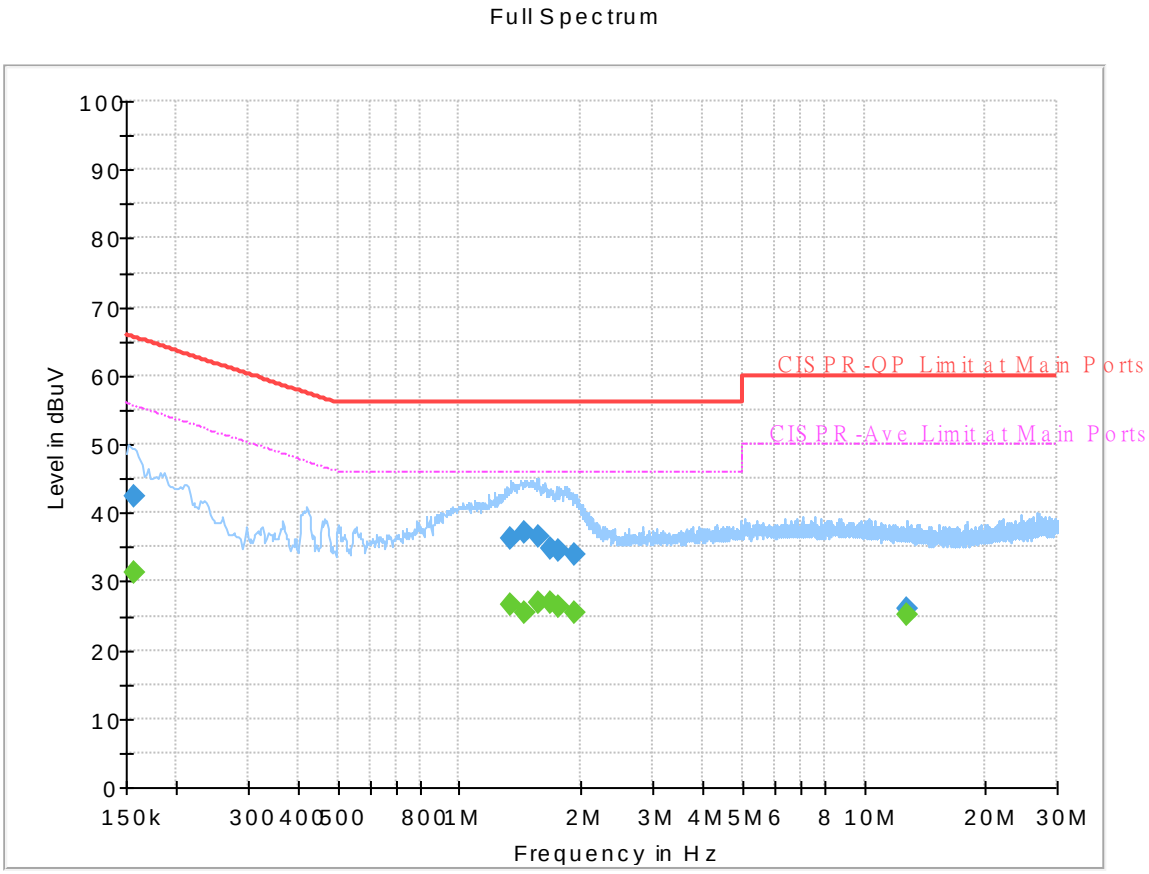


Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	34.62	55.88	21.26	L1	OFF	19.7
0.152250	45.70	---	65.88	20.18	L1	OFF	19.7
1.398750	---	27.14	46.00	18.86	L1	OFF	20.2
1.398750	38.65	---	56.00	17.35	L1	OFF	20.2
1.488750	---	26.13	46.00	19.87	L1	OFF	20.2
1.488750	36.67	---	56.00	19.33	L1	OFF	20.2
1.558500	---	27.77	46.00	18.23	L1	OFF	20.2
1.558500	37.96	---	56.00	18.04	L1	OFF	20.2
1.623750	---	27.73	46.00	18.27	L1	OFF	20.2
1.623750	36.57	---	56.00	19.43	L1	OFF	20.2
1.716000	---	27.23	46.00	18.77	L1	OFF	20.2
1.716000	35.45	---	56.00	20.55	L1	OFF	20.2
1.875750	---	26.56	46.00	19.44	L1	OFF	20.2
1.875750	35.88	---	56.00	20.12	L1	OFF	20.2
11.663250	---	25.57	50.00	24.43	L1	OFF	20.2
11.663250	26.55	---	60.00	33.45	L1	OFF	20.2

EUT Information

Report NO :	161608-05
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.156750	---	31.25	55.63	24.38	N	OFF	19.7
0.156750	42.40	---	65.63	23.23	N	OFF	19.7
1.338000	---	26.46	46.00	19.54	N	OFF	20.2
1.338000	36.23	---	56.00	19.77	N	OFF	20.2
1.448250	---	25.40	46.00	20.60	N	OFF	20.2
1.448250	37.10	---	56.00	18.90	N	OFF	20.2
1.574250	---	26.93	46.00	19.07	N	OFF	20.2
1.574250	36.46	---	56.00	19.54	N	OFF	20.2
1.671000	---	26.83	46.00	19.17	N	OFF	20.2
1.671000	34.94	---	56.00	21.06	N	OFF	20.2
1.749750	---	26.44	46.00	19.56	N	OFF	20.2
1.749750	34.58	---	56.00	21.42	N	OFF	20.2
1.927500	---	25.56	46.00	20.44	N	OFF	20.2
1.927500	33.95	---	56.00	22.05	N	OFF	20.2
12.759000	---	25.22	50.00	24.78	N	OFF	20.3
12.759000	26.13	---	60.00	33.87	N	OFF	20.3

Appendix C. Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.1~23.1°C
		Relative Humidity :	55.0~60.0%

UNII-4 - 5735~5895MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
4+3		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 169 5845MHz		5639.53	47.79	-20.41	68.2	40.61	31.92	10.42	35.16	348	293	P	H
		5656.05	47.23	-25.46	72.69	40.02	31.9	10.44	35.13	348	293	P	H
		5704.135	47	-59.36	106.36	39.63	31.92	10.49	35.04	348	293	P	H
		5723.605	46.79	-72.23	119.02	39.28	31.99	10.52	35	348	293	P	H
	*	5845	106.33	-	-	98.27	32.19	10.63	34.76	348	293	P	H
	*	5845	98.82	-	-	90.76	32.19	10.63	34.76	348	293	A	H
		5896.25	53.6	-55.68	109.28	45.3	32.29	10.67	34.66	348	293	P	H
		5960.5	50.24	-37.96	88.2	41.66	32.4	10.71	34.53	348	293	P	H
		5897.5	40.34	-48.02	88.36	32.03	32.29	10.67	34.65	348	293	A	H
		5998	40.39	-27.81	68.2	31.7	32.4	10.74	34.45	348	293	A	H
		5638.94	48.16	-20.04	68.2	40.98	31.92	10.42	35.16	100	210	P	V
		5662.245	48.26	-29.03	77.29	41.03	31.9	10.45	35.12	100	210	P	V
		5701.48	49.72	-55.9	105.62	42.36	31.91	10.49	35.04	100	210	P	V
		5723.015	48	-69.68	117.68	40.49	31.99	10.52	35	100	210	P	V
	*	5845	111.73	-	-	103.67	32.19	10.63	34.76	100	210	P	V
	*	5845	104.38	-	-	96.32	32.19	10.63	34.76	100	210	A	V
		5897.5	56.09	-52.27	108.36	47.78	32.29	10.67	34.65	100	210	P	V
		5967.75	53.49	-34.71	88.2	44.88	32.4	10.72	34.51	100	210	P	V
		5895.75	42.9	-46.75	89.65	34.6	32.29	10.67	34.66	100	210	A	V
		5934.25	41.64	-26.56	68.2	33.16	32.37	10.69	34.58	100	210	A	V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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 173 5865MHz		5629.5	47.79	-20.41	68.2	40.62	31.94	10.41	35.18	350	291	P	H
		5694.4	47.53	-53.54	101.07	40.21	31.9	10.48	35.06	350	291	P	H
		5701.185	47.03	-58.5	105.53	39.68	31.9	10.49	35.04	350	291	P	H
		5721.245	46.86	-66.78	113.64	39.37	31.98	10.51	35	350	291	P	H
	*	5865	105.78	-	-	97.62	32.23	10.65	34.72	350	291	P	H
	*	5865	98.44	-	-	90.28	32.23	10.65	34.72	350	291	A	H
		5918.25	56	-37.14	93.14	47.59	32.34	10.68	34.61	350	291	P	H
		5926.75	53.8	-34.4	88.2	45.36	32.35	10.69	34.6	350	291	P	H
		5898.75	42.44	-45	87.44	34.12	32.3	10.67	34.65	350	291	A	H
		5968.75	41.09	-27.11	68.2	32.48	32.4	10.72	34.51	350	291	A	H
													H
													H
		5612.39	48.23	-19.97	68.2	41.08	31.98	10.39	35.22	100	230	P	V
		5684.96	48.64	-45.46	94.1	41.34	31.9	10.47	35.07	100	230	P	V
		5702.07	48.17	-57.61	105.78	40.81	31.91	10.49	35.04	100	230	P	V
		5722.425	48.86	-67.47	116.33	41.36	31.99	10.51	35	100	230	P	V
	*	5865	111.99	-	-	103.83	32.23	10.65	34.72	100	230	P	V
	*	5865	104.39	-	-	96.23	32.23	10.65	34.72	100	230	A	V
		5898	61.02	-46.97	107.99	52.7	32.3	10.67	34.65	100	230	P	V
		5936.5	56.9	-31.3	88.2	48.41	32.37	10.7	34.58	100	230	P	V
		5896.5	49.62	-39.48	89.1	41.31	32.29	10.67	34.65	100	230	A	V
		5925.75	43.56	-24.64	68.2	35.12	32.35	10.69	34.6	100	230	A	V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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 177 5885MHz		5614.455	47.24	-20.96	68.2	40.08	31.97	10.4	35.21	345	289	P	H
		5668.735	47.03	-35.07	82.1	39.78	31.9	10.46	35.11	345	289	P	H
		5716.82	46.66	-63.25	109.91	39.19	31.97	10.51	35.01	345	289	P	H
		5723.015	46.03	-71.65	117.68	38.52	31.99	10.52	35	345	289	P	H
	*	5885	106.3	-	-	98.05	32.27	10.66	34.68	345	289	P	H
	*	5885	98.64	-	-	90.39	32.27	10.66	34.68	345	289	A	H
		5895.25	82.83	-27.19	110.02	74.53	32.29	10.67	34.66	345	289	P	H
		5939	54.26	-33.94	88.2	45.75	32.38	10.7	34.57	345	289	P	H
		5895.25	71.75	-18.27	90.02	63.45	32.29	10.67	34.66	345	289	A	H
		5927.25	40.69	-27.51	68.2	32.24	32.35	10.69	34.59	345	289	A	H
		5608.26	48.62	-19.58	68.2	41.48	31.98	10.39	35.23	100	210	P	V
		5674.34	48.2	-38.05	86.25	40.93	31.9	10.46	35.09	100	210	P	V
		5716.23	49.23	-60.52	109.75	41.77	31.96	10.51	35.01	100	210	P	V
		5720.065	47.92	-63.03	110.95	40.43	31.98	10.51	35	100	210	P	V
	*	5885	111.51	-	-	103.26	32.27	10.66	34.68	100	210	P	V
	*	5885	104.1	-	-	95.85	32.27	10.66	34.68	100	210	A	V
		5895.25	87.49	-22.53	110.02	79.19	32.29	10.67	34.66	100	210	P	V
		5926.5	58.85	-29.35	88.2	50.41	32.35	10.69	34.6	100	210	P	V
		5895.25	78.34	-11.68	90.02	70.04	32.29	10.67	34.66	100	210	A	V
		5925.25	44.04	-24.16	68.2	35.6	32.35	10.69	34.6	100	210	A	V

Remark

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

UNII-4 - 5735~5895MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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 169 5845MHz		10828	51.59	-22.41	74	57.42	40.26	14.79	60.88	-	-	P	H
		10828	41.58	-12.42	54	47.41	40.26	14.79	60.88	-	-	A	H
		11690	53.88	-20.12	74	60.26	39.47	15.22	61.07	100	32	P	H
		11690	43.2	-10.8	54	49.58	39.47	15.22	61.07	100	32	A	H
		14491	52.96	-21.04	74	58.28	41.37	16.48	63.17	-	-	P	H
		14491	42.95	-11.05	54	48.27	41.37	16.48	63.17	-	-	A	H
		17535	54.24	-13.96	68.2	51.06	42.94	18.55	58.31	-	-	P	H
		18000	59.65	-14.35	74	49.55	48.4	18.94	57.24	-	-	P	H
		18000	58.7	-5.3	54	48.6	48.4	18.94	57.24	-	-	A	H
													H
													H
													H
		10960	50	-24	74	55.5	40.52	14.85	60.87	-	-	P	V
		10960	50	-4	54	55.5	40.52	14.85	60.87	-	-	A	V
		11690	55.9	-18.1	74	62.28	39.47	15.22	61.07	100	67	P	V
		11690	46.68	-7.32	54	53.06	39.47	15.22	61.07	100	67	A	V
		14469	50.58	-17.62	68.2	55.98	41.31	16.47	63.18	-	-	P	V
		14469	50.58	-3.42	54	55.98	41.31	16.47	63.18	-	-	A	V
		17535	59.86	-8.34	68.2	56.68	42.94	18.55	58.31	100	256	P	V
		17989	59.98	-14.02	74	50.14	48.18	18.93	57.27	-	-	P	V
		17989	49.97	-4.03	54	40.13	48.18	18.93	57.27	-	-	A	V
													V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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 173 5865MHz		10971	51.15	-22.85	74	56.61	40.54	14.86	60.86	-	-	P	H
		10971	41.16	-12.84	54	46.62	40.54	14.86	60.86	-	-	A	H
		11730	53.54	-20.46	74	60.13	39.28	15.24	61.11	100	32	P	H
		11730	43.63	-10.37	54	50.22	39.28	15.24	61.11	100	32	A	H
		14491	50.13	-23.87	74	55.45	41.37	16.48	63.17	-	-	P	H
		14491	40.03	-13.97	54	45.35	41.37	16.48	63.17	-	-	A	H
		17595	52.41	-15.79	68.2	48.61	43.37	18.6	58.17	-	-	P	H
		18000	58.46	-15.54	74	48.36	48.4	18.94	57.24	-	-	P	H
		18000	48.58	-5.42	54	38.48	48.4	18.94	57.24	-	-	A	H
													H
													H
													H
		10960	50.89	-23.11	74	56.39	40.52	14.85	60.87	-	-	P	V
		10960	40.88	-13.12	54	46.38	40.52	14.85	60.87	-	-	A	V
		11730	57.11	-16.89	74	63.7	39.28	15.24	61.11	100	66	P	V
		11730	46.88	-7.12	54	53.47	39.28	15.24	61.11	100	66	A	V
		14480	50.85	-23.15	74	56.22	41.34	16.47	63.18	-	-	P	V
		14480	40.84	-13.16	54	46.21	41.34	16.47	63.18	-	-	A	V
		17595	54.39	-13.81	68.2	50.59	43.37	18.6	58.17	-	-	P	V
		17989	58.21	-15.79	74	48.37	48.18	18.93	57.27	-	-	P	V
		17989	48.16	-5.84	54	38.32	48.18	18.93	57.27	-	-	A	V
													V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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 177 5885MHz		10828	50.62	-23.38	74	56.45	40.26	14.79	60.88	-	-	P	H
		10828	40.52	-13.48	54	46.35	40.26	14.79	60.88	-	-	A	H
		11770	53.21	-20.79	74	59.99	39.12	15.26	61.16	101	33	P	H
		11770	44.24	-9.76	54	51.02	39.12	15.26	61.16	101	33	A	H
		14491	50.41	-23.59	74	55.73	41.37	16.48	63.17	-	-	P	H
		14491	40.41	-13.59	54	45.73	41.37	16.48	63.17	-	-	A	H
		17655	51.78	-16.42	68.2	47.43	43.73	18.65	58.03	-	-	P	H
		17989	58.79	-15.21	74	48.95	48.18	18.93	57.27	-	-	P	H
		17989	48.79	-5.21	54	38.95	48.18	18.93	57.27	-	-	A	H
													H
													H
													H
		10872	51.11	-22.89	74	56.84	40.34	14.81	60.88	-	-	P	V
		10872	40.32	-13.68	54	46.05	40.34	14.81	60.88	-	-	A	V
		11770	57.68	-16.32	74	64.46	39.12	15.26	61.16	100	63	P	V
		11770	46.99	-7.01	54	53.77	39.12	15.26	61.16	100	63	A	V
		14470	50.51	-23.49	74	55.91	41.31	16.47	63.18	-	-	P	V
		14470	40.41	-13.59	54	45.81	41.31	16.47	63.18	-	-	A	V
		17655	52.38	-15.82	68.2	48.03	43.73	18.65	58.03	-	-	P	V
		17989	58.61	-15.39	74	48.77	48.18	18.93	57.27	-	-	P	V
		17989	48.71	-5.29	54	38.87	48.18	18.93	57.27	-	-	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.

UNII-4 - 5735~5895MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 169 5845MHz		5604.72	48.14	-20.06	68.2	40.99	31.99	10.39	35.23	386	291	P	H
		5699.71	46.85	-58.14	104.99	39.5	31.9	10.49	35.04	386	291	P	H
		5702.66	47.44	-58.51	105.95	40.08	31.91	10.49	35.04	386	291	P	H
		5723.015	46.19	-71.49	117.68	38.68	31.99	10.52	35	386	291	P	H
	*	5845	106.6	-	-	98.54	32.19	10.63	34.76	386	291	P	H
	*	5845	98.7	-	-	90.64	32.19	10.63	34.76	386	291	A	H
		5896.25	53.36	-55.92	109.28	45.06	32.29	10.67	34.66	386	291	P	H
		5980.75	50.45	-37.75	88.2	41.81	32.4	10.73	34.49	386	291	P	H
		5901.5	40.16	-45.26	85.42	31.84	32.3	10.67	34.65	386	291	A	H
		5992.5	40.32	-27.88	68.2	31.65	32.4	10.73	34.46	386	291	A	H
		5630.68	50.2	-18	68.2	43.03	31.94	10.41	35.18	100	211	P	V
		5680.83	48.78	-42.27	91.05	41.49	31.9	10.47	35.08	100	211	P	V
		5711.215	48.35	-59.99	108.34	40.93	31.94	10.5	35.02	100	211	P	V
		5723.015	47.94	-69.74	117.68	40.43	31.99	10.52	35	100	211	P	V
	*	5845	110.52	-	-	102.46	32.19	10.63	34.76	100	211	P	V
	*	5845	103.41	-	-	95.35	32.19	10.63	34.76	100	211	A	V
		5897	56.04	-52.69	108.73	47.73	32.29	10.67	34.65	100	211	P	V
		5959.5	52.07	-36.13	88.2	43.49	32.4	10.71	34.53	100	211	P	V
		5897.25	42.86	-45.69	88.55	34.55	32.29	10.67	34.65	100	211	A	V
		5925.25	41.85	-26.35	68.2	33.41	32.35	10.69	34.6	100	211	A	V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		5604.425	46.81	-21.39	68.2	39.67	31.99	10.38	35.23	384	291	P	H
		5695.285	47.62	-54.1	101.72	40.29	31.9	10.48	35.05	384	291	P	H
		5719.18	47.53	-63.04	110.57	40.05	31.98	10.51	35.01	384	291	P	H
		5723.015	46.88	-70.8	117.68	39.37	31.99	10.52	35	384	291	P	H
	*	5865	105.91	-	-	97.75	32.23	10.65	34.72	384	291	P	H
	*	5865	98.89	-	-	90.73	32.23	10.65	34.72	384	291	A	H
		5897	56.18	-52.55	108.73	47.87	32.29	10.67	34.65	384	291	P	H
		5925.75	55.83	-32.37	88.2	47.39	32.35	10.69	34.6	384	291	P	H
		5896.5	44.5	-44.6	89.1	36.19	32.29	10.67	34.65	384	291	A	H
		5993.25	40.42	-27.78	68.2	31.74	32.4	10.74	34.46	384	291	A	H
802.11n													H
HT20													H
CH 173		5616.225	47.9	-20.3	68.2	40.74	31.97	10.4	35.21	100	224	P	V
5865MHz		5695.285	48.78	-52.94	101.72	41.45	31.9	10.48	35.05	100	224	P	V
		5707.675	48.12	-59.23	107.35	40.72	31.93	10.5	35.03	100	224	P	V
		5721.54	48.09	-66.22	114.31	40.59	31.99	10.51	35	100	224	P	V
	*	5865	111.02	-	-	102.86	32.23	10.65	34.72	100	224	P	V
	*	5865	103.5	-	-	95.34	32.23	10.65	34.72	100	224	A	V
		5897.25	62.61	-45.94	108.55	54.3	32.29	10.67	34.65	100	224	P	V
		5951.75	52	-36.2	88.2	43.44	32.4	10.71	34.55	100	224	P	V
		5895.75	49.68	-39.97	89.65	41.38	32.29	10.67	34.66	100	224	A	V
		5926.5	42.84	-25.36	68.2	34.4	32.35	10.69	34.6	100	224	A	V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 177 5885MHz		5618.585	47.74	-20.46	68.2	40.59	31.96	10.4	35.21	399	290	P	H
		5660.18	46.76	-29	75.76	39.53	31.9	10.45	35.12	399	290	P	H
		5709.15	48.09	-59.67	107.76	40.68	31.94	10.5	35.03	399	290	P	H
		5724.195	46.51	-73.85	120.36	38.99	32	10.52	35	399	290	P	H
	*	5885	107.51	-	-	99.26	32.27	10.66	34.68	399	290	P	H
	*	5885	99.12	-	-	90.87	32.27	10.66	34.68	399	290	A	H
		5895.75	83.93	-25.72	109.65	75.63	32.29	10.67	34.66	399	290	P	H
		5939	55.28	-32.92	88.2	46.77	32.38	10.7	34.57	399	290	P	H
		5895.25	74.19	-15.83	90.02	65.89	32.29	10.67	34.66	399	290	A	H
		5925.75	41.3	-26.9	68.2	32.86	32.35	10.69	34.6	399	290	A	H
		5612.685	48.2	-20	68.2	41.06	31.97	10.39	35.22	100	213	P	V
		5694.105	48.31	-52.54	100.85	40.99	31.9	10.48	35.06	100	213	P	V
		5701.185	48.92	-56.61	105.53	41.57	31.9	10.49	35.04	100	213	P	V
		5723.015	48.12	-69.56	117.68	40.61	31.99	10.52	35	100	213	P	V
	*	5885	110.51	-	-	102.26	32.27	10.66	34.68	100	213	P	V
	*	5885	103.27	-	-	95.02	32.27	10.66	34.68	100	213	A	V
		5895.25	92.98	-17.04	110.02	84.68	32.29	10.67	34.66	100	213	P	V
		5929	59.6	-28.6	88.2	51.14	32.36	10.69	34.59	100	213	P	V
		5895.25	80.28	-9.74	90.02	71.98	32.29	10.67	34.66	100	213	A	V
		5925.5	44.5	-23.7	68.2	36.06	32.35	10.69	34.6	100	213	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

UNII-4 - 5735~5895MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		10795	51.01	-22.99	74	56.95	40.18	14.77	60.89	-	-	P	H
		10795	40.12	-13.88	54	46.06	40.18	14.77	60.89	-	-	A	H
		11690	52.74	-21.26	74	59.12	39.47	15.22	61.07	100	37	P	H
		11690	42.64	-11.36	54	49.02	39.47	15.22	61.07	100	37	A	H
		14491	49.89	-24.11	74	55.21	41.37	16.48	63.17	-	-	P	H
		14491	39.89	-14.11	54	45.21	41.37	16.48	63.17	-	-	A	H
		17535	52.56	-15.64	68.2	49.38	42.94	18.55	58.31	-	-	P	H
		17989	58.6	-15.4	74	48.76	48.18	18.93	57.27	-	-	P	H
		17989	48.7	-5.3	54	38.86	48.18	18.93	57.27	-	-	A	H
													H
802.11n													H
HT20													H
CH 169		10949	51.45	-22.55	74	56.97	40.5	14.85	60.87	-	-	P	V
5845MHz		10949	41.27	-12.73	54	46.79	40.5	14.85	60.87	-	-	A	V
		11690	55.48	-18.52	74	61.86	39.47	15.22	61.07	100	67	P	V
		11690	45.1	-8.9	54	51.48	39.47	15.22	61.07	100	67	A	V
		14491	50.11	-23.89	74	55.43	41.37	16.48	63.17	-	-	P	V
		14491	40.01	-13.99	54	45.33	41.37	16.48	63.17	-	-	A	V
		17535	54.25	-13.95	68.2	51.07	42.94	18.55	58.31	-	-	P	V
		18000	58.22	-15.78	74	48.12	48.4	18.94	57.24	-	-	P	V
		18000	48.31	-5.69	54	38.21	48.4	18.94	57.24	-	-	A	V
													V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		10960	50.83	-23.17	74	56.33	40.52	14.85	60.87	-	-	P	H
		10960	41.03	-12.97	54	46.53	40.52	14.85	60.87	-	-	A	H
		11730	53.09	-20.91	74	59.68	39.28	15.24	61.11	100	35	P	H
		11730	42.1	-11.9	54	48.69	39.28	15.24	61.11	100	35	A	H
		14469	50.01	-18.19	68.2	55.41	41.31	16.47	63.18	-	-	P	H
		14469	39.91	-14.09	54	45.31	41.31	16.47	63.18	-	-	A	H
		17595	52.42	-15.78	68.2	48.62	43.37	18.6	58.17	-	-	P	H
		18000	58.88	-15.12	74	48.78	48.4	18.94	57.24	-	-	P	H
		18000	48.97	-5.03	54	38.87	48.4	18.94	57.24	-	-	A	H
													H
802.11n													H
HT20													H
CH 173		10949	49.77	-24.23	74	55.29	40.5	14.85	60.87	-	-	P	V
5865MHz		10949	40.4	-13.6	54	45.92	40.5	14.85	60.87	-	-	A	V
		11730	57.08	-16.92	74	63.67	39.28	15.24	61.11	100	64	P	V
		11730	46.21	-7.79	54	52.8	39.28	15.24	61.11	100	64	A	V
		14491	49.71	-24.29	74	55.03	41.37	16.48	63.17	-	-	P	V
		14491	39.71	-14.29	54	45.03	41.37	16.48	63.17	-	-	A	V
		17595	54.28	-13.92	68.2	50.48	43.37	18.6	58.17	-	-	P	V
		18000	58.44	-15.56	74	48.34	48.4	18.94	57.24	-	-	P	V
		18000	48.44	-5.56	54	38.34	48.4	18.94	57.24	-	-	A	V
													V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		10993	51.54	-22.46	74	56.94	40.59	14.87	60.86	-	-	P	H
		10993	41.09	-12.91	54	46.49	40.59	14.87	60.86	-	-	A	H
		11770	52.18	-21.82	74	58.96	39.12	15.26	61.16	105	32	P	H
		11770	43.58	-10.42	54	50.36	39.12	15.26	61.16	105	32	A	H
		14470	49.92	-18.28	68.2	55.32	41.31	16.47	63.18	-	-	P	H
		14470	39.82	-14.18	54	45.22	41.31	16.47	63.18	-	-	A	H
		17655	52.97	-15.23	68.2	48.62	43.73	18.65	58.03	-	-	P	H
		18000	58.35	-15.65	74	48.25	48.4	18.94	57.24	-	-	P	H
		18000	48.35	-5.65	54	38.25	48.4	18.94	57.24	-	-	A	H
													H
802.11n													H
HT20													H
CH 177		10883	50.92	-23.08	74	56.61	40.37	14.82	60.88	-	-	P	V
5885MHz		10883	40.47	-13.53	54	46.16	40.37	14.82	60.88	-	-	A	V
		11770	55.65	-18.35	74	62.43	39.12	15.26	61.16	111	65	P	V
		11770	46.41	-7.59	54	53.19	39.12	15.26	61.16	111	65	A	V
		14480	50	-24	74	55.37	41.34	16.47	63.18	-	-	P	V
		14480	40.36	-13.64	54	45.73	41.34	16.47	63.18	-	-	A	V
		17655	57.28	-10.92	68.2	52.93	43.73	18.65	58.03	-	-	P	V
		18000	58.64	-15.36	74	48.54	48.4	18.94	57.24	-	-	P	V
		18000	48.54	-5.46	54	38.44	48.4	18.94	57.24	-	-	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.

UNII-4 - 5735~5895MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		5612.39	48.54	-19.66	68.2	41.39	31.98	10.39	35.22	400	292	P	H
		5662.835	46.48	-31.25	77.73	39.25	31.9	10.45	35.12	400	292	P	H
		5710.035	46.67	-61.34	108.01	39.25	31.94	10.5	35.02	400	292	P	H
		5724.195	47.07	-73.29	120.36	39.55	32	10.52	35	400	292	P	H
	*	5835	100.17	-	-	92.16	32.17	10.62	34.78	400	292	P	H
	*	5835	92.76	-	-	84.75	32.17	10.62	34.78	400	292	A	H
		5899.25	53.81	-53.27	107.08	45.49	32.3	10.67	34.65	400	292	P	H
		5929.25	49.41	-38.79	88.2	40.95	32.36	10.69	34.59	400	292	P	H
		5897.25	43.34	-45.21	88.55	35.03	32.29	10.67	34.65	400	292	A	H
		5948.25	41	-27.2	68.2	32.45	32.4	10.7	34.55	400	292	A	H
802.11n													H
HT40													H
CH 167		5631.86	48.5	-19.7	68.2	41.32	31.94	10.42	35.18	100	209	P	V
5835MHz		5699.12	48.29	-56.26	104.55	40.95	31.9	10.49	35.05	100	209	P	V
		5708.855	49.36	-58.32	107.68	41.95	31.94	10.5	35.03	100	209	P	V
		5724.49	48.38	-72.66	121.04	40.86	32	10.52	35	100	209	P	V
	*	5835	106.6	-	-	98.59	32.17	10.62	34.78	100	209	P	V
	*	5835	99.08	-	-	91.07	32.17	10.62	34.78	100	209	A	V
		5901.5	55.14	-50.28	105.42	46.82	32.3	10.67	34.65	100	209	P	V
		5956.75	51.16	-37.04	88.2	42.59	32.4	10.71	34.54	100	209	P	V
		5895.5	46.06	-43.77	89.83	37.76	32.29	10.67	34.66	100	209	A	V
		5933.5	42.22	-25.98	68.2	33.74	32.37	10.69	34.58	100	209	A	V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		5602.95	47.67	-20.53	68.2	40.54	31.99	10.38	35.24	400	292	P	H
		5669.915	47.74	-35.24	82.98	40.48	31.9	10.46	35.1	400	292	P	H
		5712.395	47.34	-61.33	108.67	39.91	31.95	10.5	35.02	400	292	P	H
		5720.065	46.87	-64.08	110.95	39.38	31.98	10.51	35	400	292	P	H
	*	5875	101.92	-	-	93.72	32.25	10.65	34.7	400	292	P	H
	*	5875	95	-	-	86.8	32.25	10.65	34.7	400	292	A	H
		5898.5	77.32	-30.31	107.63	69	32.3	10.67	34.65	400	292	P	H
		5926.75	55.47	-32.73	88.2	47.03	32.35	10.69	34.6	400	292	P	H
		5895.25	62.57	-27.45	90.02	54.27	32.29	10.67	34.66	400	292	A	H
		5925	45.21	-22.99	68.2	36.77	32.35	10.69	34.6	400	292	A	H
802.11n													H
HT40													H
CH 175		5632.155	48.41	-19.79	68.2	41.23	31.94	10.42	35.18	100	234	P	V
5875MHz		5671.39	48.7	-35.37	84.07	41.44	31.9	10.46	35.1	100	234	P	V
		5705.02	48.35	-58.26	106.61	40.96	31.92	10.5	35.03	100	234	P	V
		5721.245	47.56	-66.08	113.64	40.07	31.98	10.51	35	100	234	P	V
	*	5875	107.26	-	-	99.06	32.25	10.65	34.7	100	234	P	V
	*	5875	100.39	-	-	92.19	32.25	10.65	34.7	100	234	A	V
		5911	80.6	-17.85	98.45	72.23	32.32	10.68	34.63	100	234	P	V
		5925	63.62	-24.58	88.2	55.18	32.35	10.69	34.6	100	234	P	V
		5895.25	68.81	-21.21	90.02	60.51	32.29	10.67	34.66	100	234	A	V
		5925.75	52.33	-15.87	68.2	43.89	32.35	10.69	34.6	100	234	A	V
													V
													V

Remark

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

UNII-4 - 5735~5895MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		10817	50.75	-23.25	74	56.63	40.23	14.78	60.89	-	-	P	H
		10817	40.74	-13.26	54	46.62	40.23	14.78	60.89	-	-	A	H
		11670	49.68	-24.32	74	55.91	39.61	15.21	61.05	100	39	P	H
		11670	39.71	-14.29	54	45.94	39.61	15.21	61.05	100	39	A	H
		14480	50.21	-23.79	74	55.58	41.34	16.47	63.18	-	-	P	H
		14480	40.15	-13.85	54	45.52	41.34	16.47	63.18	-	-	A	H
		17505	51.85	-16.35	68.2	48.97	42.74	18.52	58.38	-	-	P	H
		18000	58.86	-15.14	74	48.76	48.4	18.94	57.24	-	-	P	H
		18000	48.82	-5.18	54	38.72	48.4	18.94	57.24	-	-	A	H
													H
802.11n													H
HT40													H
CH 167		10949	50.72	-23.28	74	56.24	40.5	14.85	60.87	-	-	P	V
5835MHz		10949	40.69	-13.31	54	46.21	40.5	14.85	60.87	-	-	A	V
		11670	52.3	-21.7	74	58.53	39.61	15.21	61.05	100	62	P	V
		11670	43.01	-10.99	54	49.24	39.61	15.21	61.05	100	62	A	V
		14470	50.41	-17.79	68.2	55.81	41.31	16.47	63.18	-	-	P	V
		14470	40.41	-13.59	54	45.81	41.31	16.47	63.18	-	-	A	V
		17505	51.52	-16.68	68.2	48.64	42.74	18.52	58.38	-	-	P	V
		17978	58.72	-15.28	74	49.12	47.96	18.93	57.29	-	-	P	V
		17978	48.7	-5.3	54	39.1	47.96	18.93	57.29	-	-	A	V
													V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		10982	51.11	-22.89	74	56.54	40.56	14.87	60.86	-	-	P	H
		10982	41.11	-12.89	54	46.54	40.56	14.87	60.86	-	-	A	H
		11750	51.97	-22.03	74	58.66	39.2	15.25	61.14	100	39	P	H
		11750	41.56	-12.44	54	48.25	39.2	15.25	61.14	100	39	A	H
		14469	50.56	-17.64	68.2	55.96	41.31	16.47	63.18	-	-	P	H
		14469	40.27	-13.73	54	45.67	41.31	16.47	63.18	-	-	A	H
		17625	53	-15.2	68.2	48.93	43.55	18.62	58.1	-	-	P	H
		17989	59.38	-14.62	74	49.54	48.18	18.93	57.27	-	-	P	H
		17989	49.3	-4.7	54	39.46	48.18	18.93	57.27	-	-	A	H
													H
802.11n													H
HT40													H
CH 175		10938	50.41	-23.59	74	55.96	40.48	14.84	60.87	-	-	P	V
5875MHz		10938	40.14	-13.86	54	45.69	40.48	14.84	60.87	-	-	A	V
		11750	53.58	-20.42	74	60.27	39.2	15.25	61.14	100	62	P	V
		11750	43.99	-10.01	54	50.68	39.2	15.25	61.14	100	62	A	V
		14480	50.02	-23.98	74	55.39	41.34	16.47	63.18	-	-	P	V
		14480	40.56	-13.44	54	45.93	41.34	16.47	63.18	-	-	A	V
		17625	52.74	-15.46	68.2	48.67	43.55	18.62	58.1	-	-	P	V
		18000	58.81	-15.19	74	48.71	48.4	18.94	57.24	-	-	P	V
		18000	48.27	-5.73	54	38.17	48.4	18.94	57.24	-	-	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.

UNII-4 - 5735~5895MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		5641.89	48.4	-19.8	68.2	41.21	31.92	10.43	35.16	400	293	P	H
		5690.86	48.5	-49.96	98.46	41.18	31.9	10.48	35.06	400	293	P	H
		5715.05	46.75	-62.67	109.42	39.29	31.96	10.51	35.01	400	293	P	H
		5724.785	46.63	-75.08	121.71	39.1	32	10.52	34.99	400	293	P	H
	*	5855	100.07	-	-	91.96	32.21	10.64	34.74	400	293	P	H
	*	5855	93.15	-	-	85.04	32.21	10.64	34.74	400	293	A	H
		5895.25	73.59	-36.43	110.02	65.29	32.29	10.67	34.66	400	293	P	H
		5929.25	61.25	-26.95	88.2	52.79	32.36	10.69	34.59	400	293	P	H
		5895.5	64.51	-25.32	89.83	56.21	32.29	10.67	34.66	400	293	A	H
		5927	53.49	-14.71	68.2	45.04	32.35	10.69	34.59	400	293	A	H
802.11ac													H
VHT80													H
CH 171		5621.535	49.2	-19	68.2	42.04	31.96	10.4	35.2	100	230	P	V
5855MHz		5668.735	49.52	-32.58	82.1	42.27	31.9	10.46	35.11	100	230	P	V
		5702.365	51.13	-54.73	105.86	43.77	31.91	10.49	35.04	100	230	P	V
		5722.425	51.69	-64.64	116.33	44.19	31.99	10.51	35	100	230	P	V
	*	5855	104.67	-	-	96.56	32.21	10.64	34.74	100	230	P	V
	*	5855	97.21	-	-	89.1	32.21	10.64	34.74	100	230	A	V
		5895.25	76.92	-33.1	110.02	68.62	32.29	10.67	34.66	100	230	P	V
		5925.75	69.14	-19.06	88.2	60.7	32.35	10.69	34.6	100	230	P	V
		5895.25	69.42	-20.6	90.02	61.12	32.29	10.67	34.66	100	230	A	V
		5929.25	61.22	-6.98	68.2	52.76	32.36	10.69	34.59	100	230	A	V
													V
													V

Remark

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

UNII-4 - 5735~5895MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		10861	51.21	-22.79	74	56.97	40.32	14.8	60.88	-	-	P	H
		10861	41.04	-12.96	54	46.8	40.32	14.8	60.88	-	-	A	H
		11710	50.99	-23.01	74	57.49	39.36	15.23	61.09	100	37	P	H
		11710	42.25	-11.75	54	48.75	39.36	15.23	61.09	100	37	A	H
		14480	50.64	-23.36	74	56.01	41.34	16.47	63.18	-	-	P	H
		14480	40.73	-13.27	54	46.1	41.34	16.47	63.18	-	-	A	H
		17565	52.79	-15.41	68.2	49.3	43.16	18.57	58.24	-	-	P	H
		18000	58.56	-15.44	74	48.46	48.4	18.94	57.24	-	-	P	H
		18000	48.75	-5.25	54	38.65	48.4	18.94	57.24	-	-	A	H
													H
802.11ac													H
VHT80													H
CH 171		10806	51.92	-22.08	74	57.82	40.21	14.78	60.89	-	-	P	V
5855MHz		10806	42.02	-11.98	54	47.92	40.21	14.78	60.89	-	-	A	V
		11710	51.82	-22.18	74	58.32	39.36	15.23	61.09	100	63	P	V
		11710	43.96	-10.04	54	50.46	39.36	15.23	61.09	100	63	A	V
		14480	50.66	-23.34	74	56.03	41.34	16.47	63.18	-	-	P	V
		14480	40.68	-13.32	54	46.05	41.34	16.47	63.18	-	-	A	V
		17565	52.75	-15.45	68.2	49.26	43.16	18.57	58.24	-	-	P	V
		17989	58.93	-15.07	74	49.09	48.18	18.93	57.27	-	-	P	V
		17989	49.51	-4.49	54	39.67	48.18	18.93	57.27	-	-	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.

UNII-4 - 5735~5895MHz

WIFI 802.11ax HE160_Full (Band Edge @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
		5648.38	50.01	-18.19	68.2	42.83	31.9	10.43	35.15	100	294	P	H
		5679.945	55.39	-35.01	90.4	48.1	31.9	10.47	35.08	100	294	P	H
		5700.3	54.94	-50.34	105.28	47.59	31.9	10.49	35.04	100	294	P	H
		5725.08	53.71	-80.49	134.2	46.18	32	10.52	34.99	100	294	P	H
	*	5815	93.19	-	-	85.27	32.13	10.61	34.82	100	294	P	H
	*	5815	85.46	-	-	77.54	32.13	10.61	34.82	100	294	A	H
		5895.25	70.8	-39.22	110.02	62.5	32.29	10.67	34.66	100	294	P	H
		5948	64.48	-23.72	88.2	55.93	32.4	10.7	34.55	100	294	P	H
		5895.25	61.73	-28.29	90.02	53.43	32.29	10.67	34.66	100	294	A	H
		5948.5	58.5	-9.7	68.2	49.95	32.4	10.7	34.55	100	294	A	H
802.11ax													H
HE160 Full													H
CH 163		5641.005	61.98	-6.22	68.2	54.79	31.92	10.43	35.16	100	225	P	V
5815MHz		5696.465	69.26	-33.33	102.59	61.92	31.9	10.49	35.05	100	225	P	V
		5707.085	69.11	-38.08	107.19	61.71	31.93	10.5	35.03	100	225	P	V
		5721.835	68.19	-46.79	114.98	60.69	31.99	10.51	35	100	225	P	V
	*	5815	100.73	-	-	92.81	32.13	10.61	34.82	100	225	P	V
	*	5815	92.77	-	-	84.85	32.13	10.61	34.82	100	225	A	V
		5895.25	80.02	-30	110.02	71.72	32.29	10.67	34.66	100	225	P	V
		5940.75	72.09	-16.11	88.2	63.58	32.38	10.7	34.57	100	225	P	V
		5895.25	68.37	-21.65	90.02	60.07	32.29	10.67	34.66	100	225	A	V
		5941	65.15	-3.05	68.2	56.64	32.38	10.7	34.57	100	225	A	V
													V
													V

Remark

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

UNII-4 - 5735~5895MHz

WIFI 802.11ax HE160_Full (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
802.11ax HE160 Full CH 163 5815MHz		10927	51.12	-22.88	74	56.7	40.45	14.84	60.87	-	-	P	H
		10927	40.97	-13.03	54	46.55	40.45	14.84	60.87	-	-	A	H
		11630	48.89	-25.11	74	54.82	39.89	15.19	61.01	101	43	P	H
		11630	40.73	-13.27	54	46.66	39.89	15.19	61.01	101	43	A	H
		14480	50.39	-23.61	74	55.76	41.34	16.47	63.18	-	-	P	H
		14480	40.29	-13.71	54	45.66	41.34	16.47	63.18	-	-	A	H
		17445	51.23	-16.97	68.2	48.87	42.31	18.47	58.42	-	-	P	H
		17989	58.21	-15.79	74	48.37	48.18	18.93	57.27	-	-	P	H
		17989	48.47	-5.53	54	38.63	48.18	18.93	57.27	-	-	A	H
													H
													H
													H
		10784	50.5	-23.5	74	56.48	40.14	14.77	60.89	-	-	P	V
		10784	40.96	-13.04	54	46.94	40.14	14.77	60.89	-	-	A	V
		11630	49.94	-24.06	74	55.87	39.89	15.19	61.01	100	63	P	V
		11630	42.71	-11.29	54	48.64	39.89	15.19	61.01	100	63	A	V
		14502	50.76	-17.44	68.2	56.05	41.4	16.48	63.17	-	-	P	V
		14502	41.31	-12.69	54	46.6	41.4	16.48	63.17	-	-	A	V
		17445	51.09	-17.11	68.2	48.73	42.31	18.47	58.42	-	-	P	V
		18000	59.14	-14.86	74	49.04	48.4	18.94	57.24	-	-	P	V
		18000	49.14	-4.86	54	39.04	48.4	18.94	57.24	-	-	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.

Emission above 18GHz

WIFI 802.11ax HE160 Full (SHF @ 1m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
802.11ax HE160 Full SHF		20904	37.59	-36.41	74	57.65	38.06	-3.38	54.74	-	-	P	H
		31082	41.66	-26.54	68.2	58.59	41	-2.1	55.83	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		20904	36.8	-37.2	74	56.86	38.06	-3.38	54.74	-	-	P	V
		30662	41.53	-26.67	68.2	58.67	40.64	-2.15	55.63	-	-	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as "-" means no suspected emission found with sufficient margin against limit line or noise floor only.												

Emission below 1GHz

WIFI 802.11ax HE160 Full (LF @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (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)
802.11ax HE160 Full LF		30.97	22.32	-17.68	40	29.99	24.21	0.62	32.5	-	-	P	H
		88.2	29.33	-14.17	43.5	46.22	14.36	1.25	32.5	-	-	P	H
		95.96	33.26	-10.24	43.5	49	15.45	1.29	32.48	-	-	P	H
		167.74	28.18	-15.32	43.5	43.06	15.8	1.81	32.49	-	-	P	H
		187.14	25.09	-18.41	43.5	40.98	14.72	1.86	32.47	-	-	P	H
		885.54	33.83	-12.17	46	32.6	28.86	4.07	31.7	-	-	P	H
													H
													H
													H
													H
													H
													H
		33.88	28.66	-11.34	40	37.81	22.72	0.66	32.53	-	-	P	V
		66.86	25.12	-14.88	40	44.61	11.96	1.09	32.54	-	-	P	V
		94.02	26.4	-17.1	43.5	42.5	15.11	1.27	32.48	-	-	P	V
		170.65	25.55	-17.95	43.5	40.65	15.57	1.82	32.49	-	-	P	V
		265.71	20.4	-25.6	46	30.7	19.85	2.28	32.43	-	-	P	V
		948.59	33.3	-12.7	46	29.71	30.63	4.27	31.31	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line. 3. The emission position marked as “-” means no suspected emission found and emission level has at least 6dB margin against limit or emission is noise floor only.												

Note symbol

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

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	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)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(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

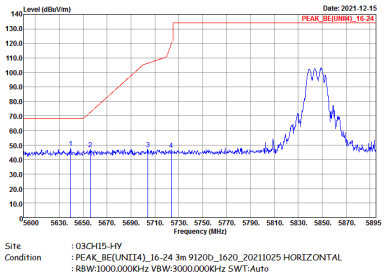
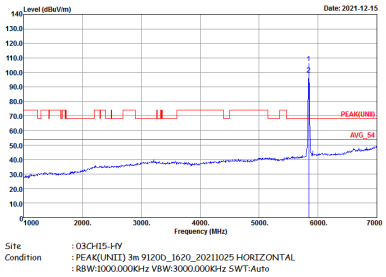
Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	**Temperature :**	22.1~23.1°C
		Relative Humidity :	55.0~60.0%

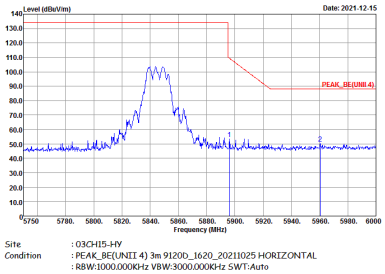
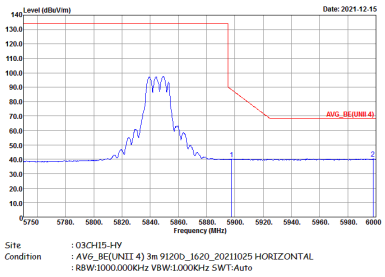
Note symbol

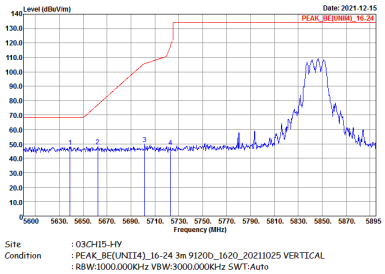
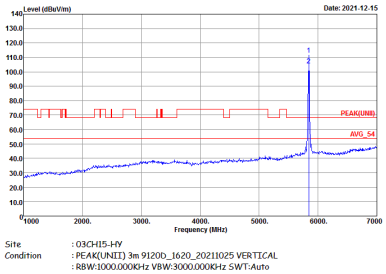
-L	**Low channel location**
-R	**High channel location**

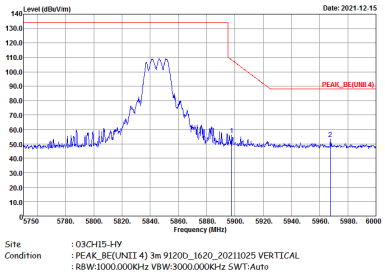
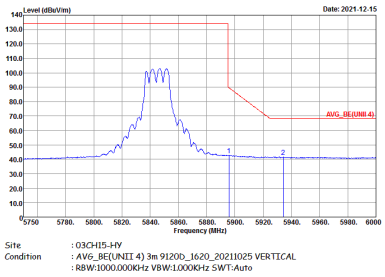
UNII-4 - 5735~5895MHz

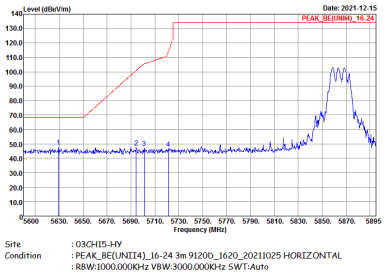
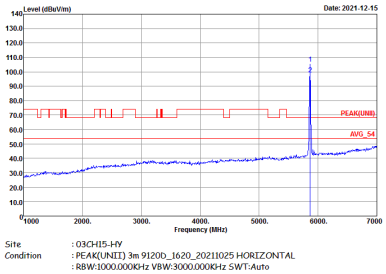
WIFI 802.11a (Band Edge @ 3m)

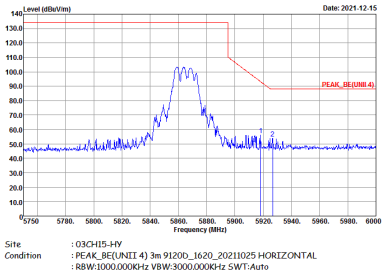
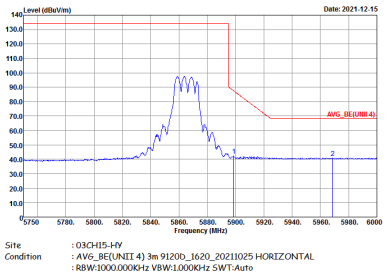
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH169 5845MHz - L	
4+3	Horizontal	Fundamental
Peak		

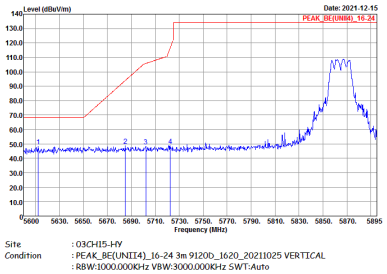
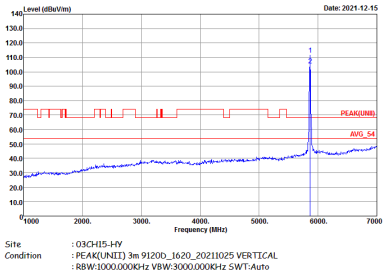
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH169 5845MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

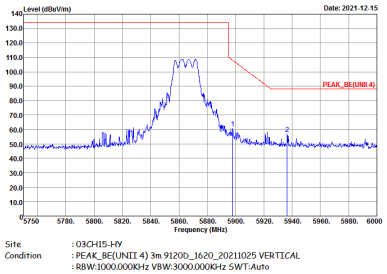
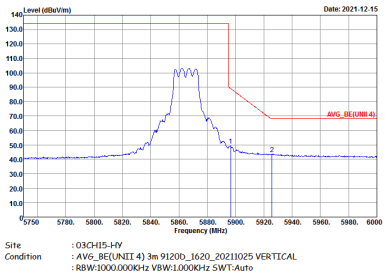
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH169 5845MHz - L	
4+3	Vertical	Fundamental
Peak		

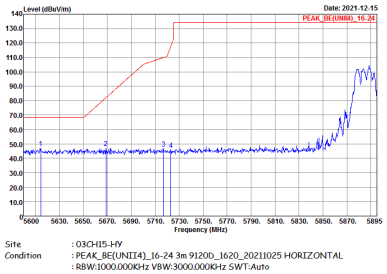
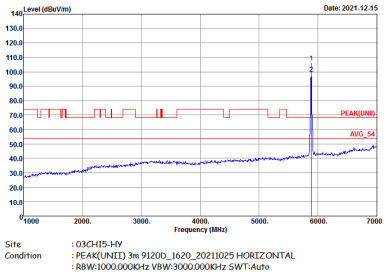
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH169 5845MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

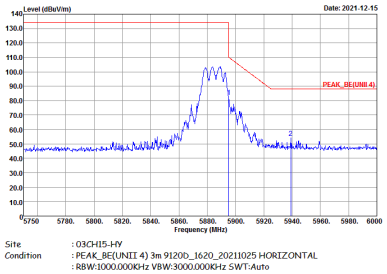
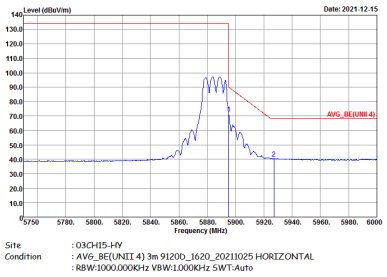
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH173 5865MHz - L	
4+3	Horizontal	Fundamental
Peak		

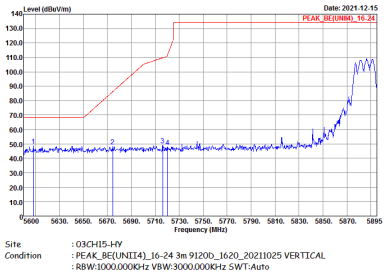
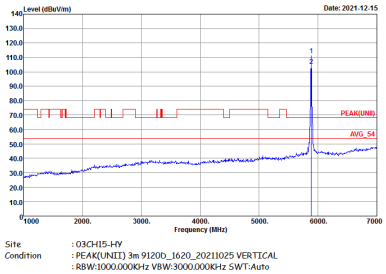
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH173 5865MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

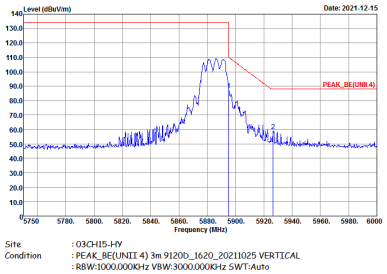
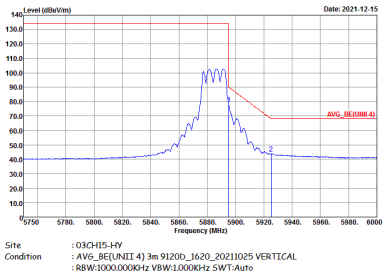
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH173 5865MHz - L	
4+3	Vertical	Fundamental
Peak		

WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH173 5865MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH177 5885MHz - L	
4+3	Horizontal	Fundamental
Peak		

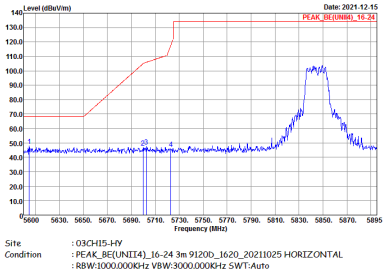
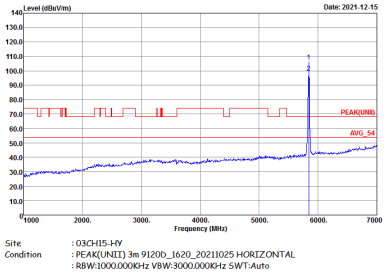
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH177 5885MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

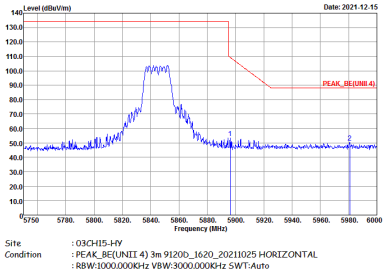
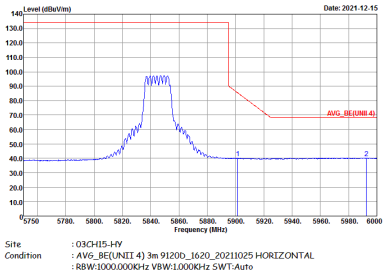
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH177 5885MHz - L	
4+3	Vertical	Fundamental
Peak		

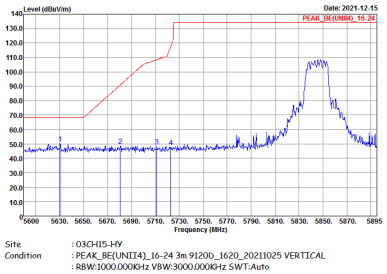
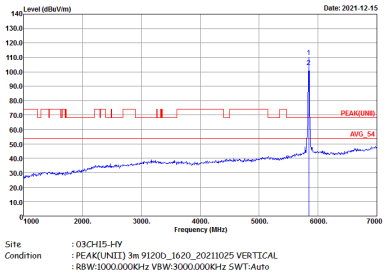
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11a CH177 5885MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

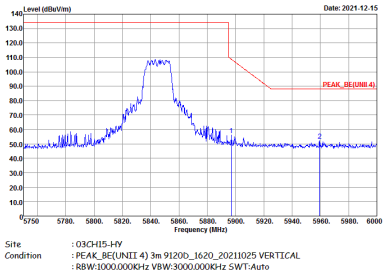
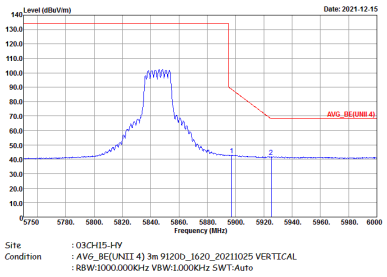
UNII-4 - 5735~5895MHz

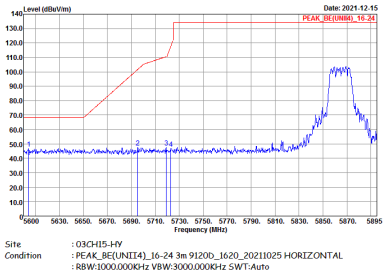
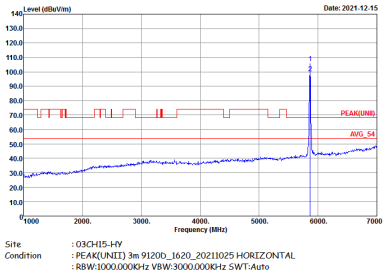
WIFI 802.11n HT20 (Band Edge @ 3m)

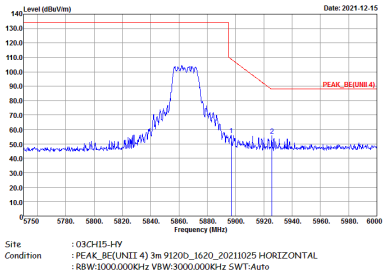
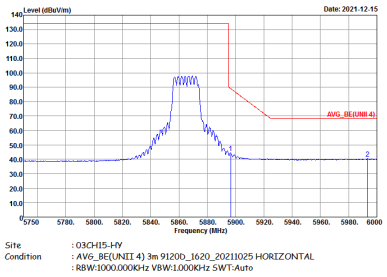
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH169 5845MHz - L	
4+3	Horizontal	Fundamental
Peak		

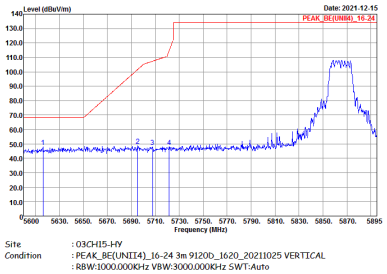
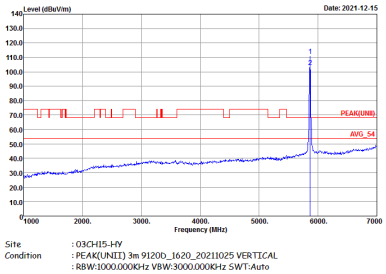
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH169 5845MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

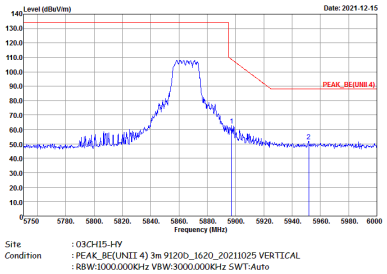
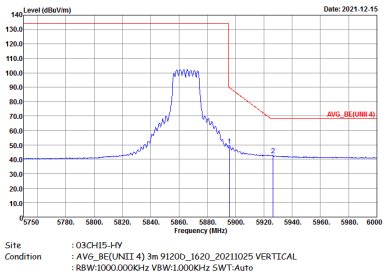
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH169 5845MHz - L	
4+3	Vertical	Fundamental
Peak		

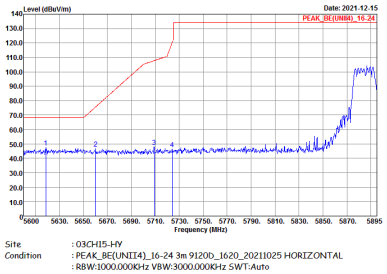
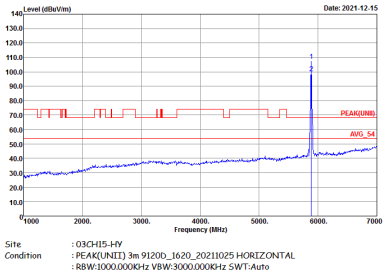
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH169 5845MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

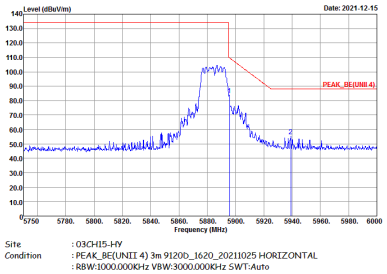
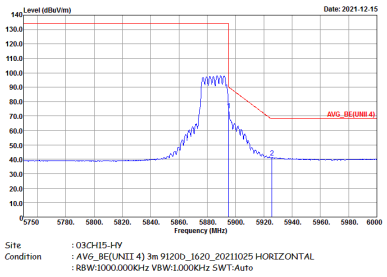
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH173 5865MHz - L	
4+3	Horizontal	Fundamental
Peak		

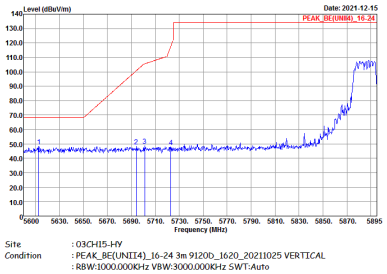
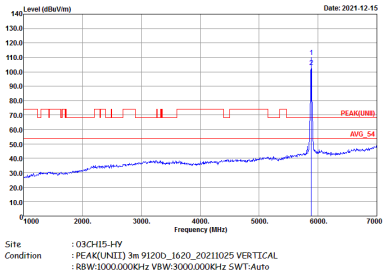
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH173 5865MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

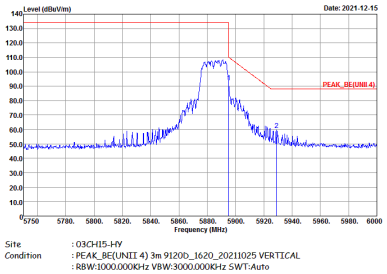
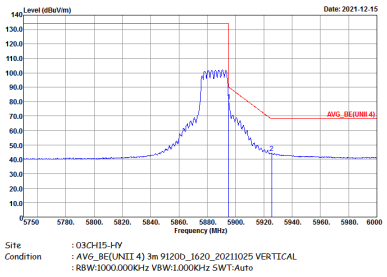
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH173 5865MHz - L	
4+3	Vertical	Fundamental
Peak		

WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH173 5865MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH177 5885MHz - L	
4+3	Horizontal	Fundamental
Peak		

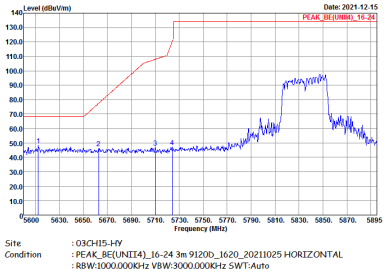
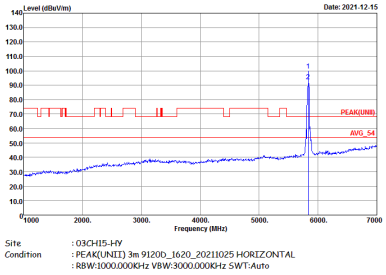
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH177 5885MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

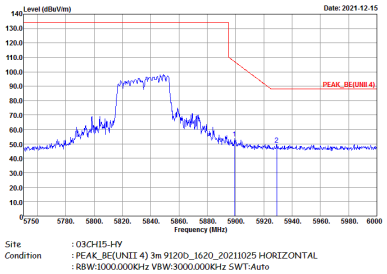
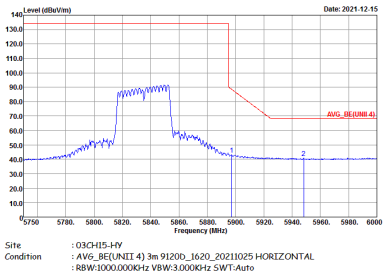
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH177 5885MHz - L	
4+3	Vertical	Fundamental
Peak		

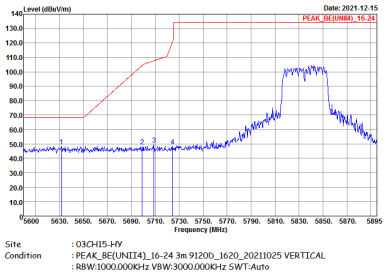
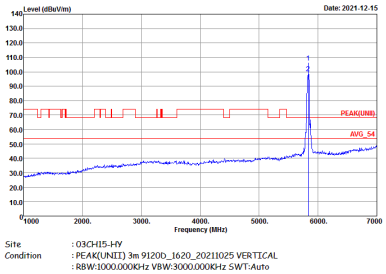
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT20 CH177 5885MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

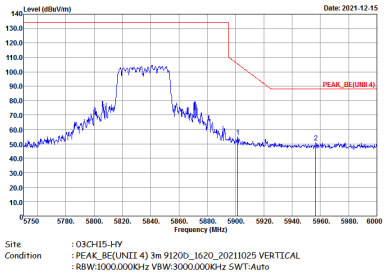
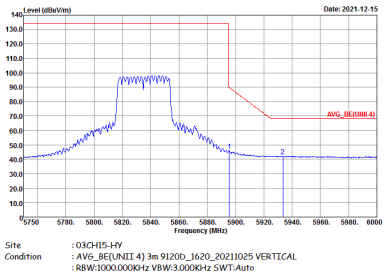
UNII-4 - 5735~5895MHz

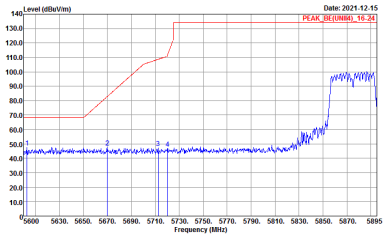
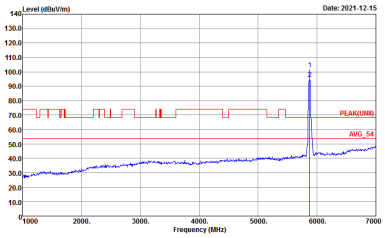
WIFI 802.11n HT40 (Band Edge @ 3m)

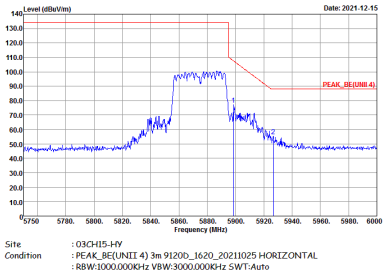
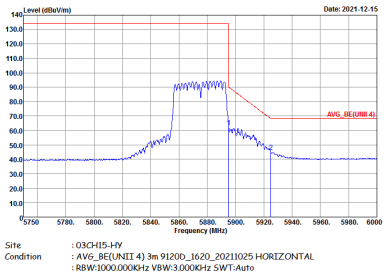
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT40 CH167 5835MHz - L	
4+3	Horizontal	Fundamental
Peak		

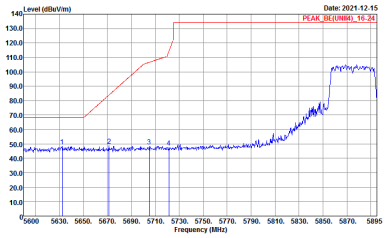
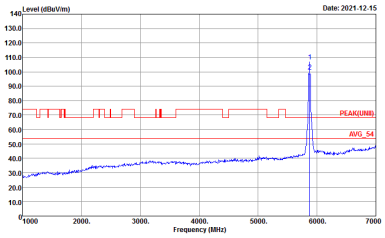
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT40 CH167 5835MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

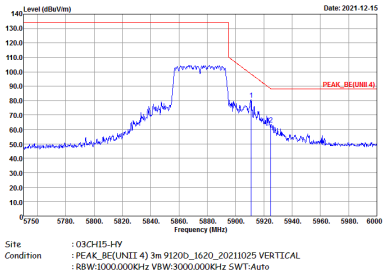
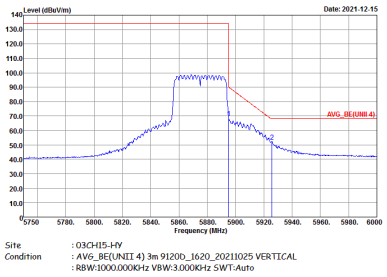
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT40 CH167 5835MHz - L	
4+3	Vertical	Fundamental
Peak		

WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT40 CH167 5835MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT40 CH175 5875MHz - L	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(UNII4)_16-24 3m 9120b_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 9120b_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

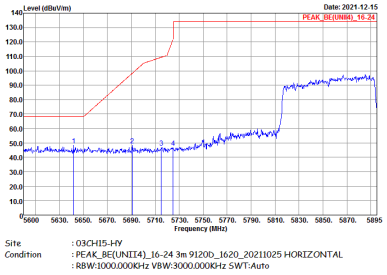
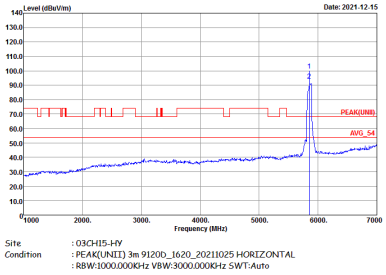
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT40 CH175 5875MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

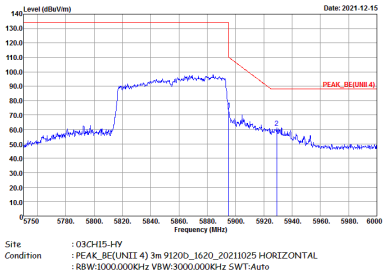
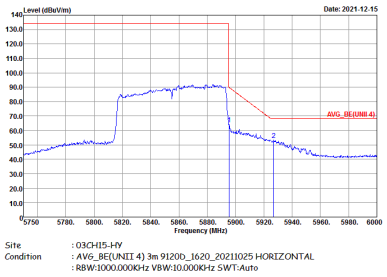
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT40 CH175 5875MHz - L	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(UNII4)_16-24 3m 9120b_1620_20211025 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 9120b_1620_20211025 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

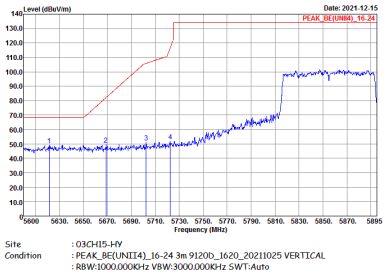
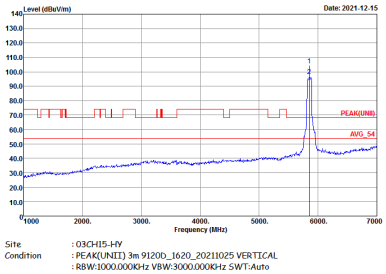
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11n HT40 CH175 5875MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

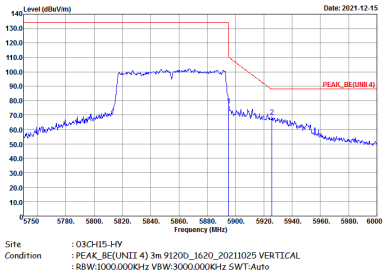
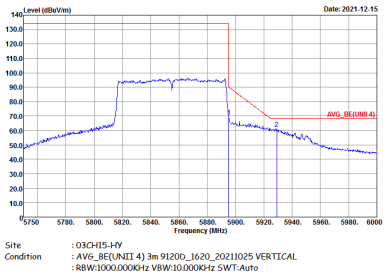
UNII-4 - 5735~5895MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH171 5855MHz - L	
4+3	Horizontal	Fundamental
Peak		

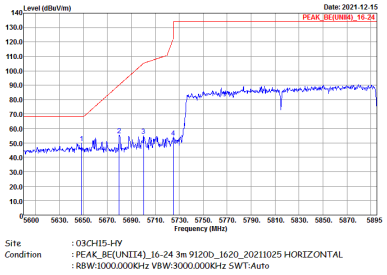
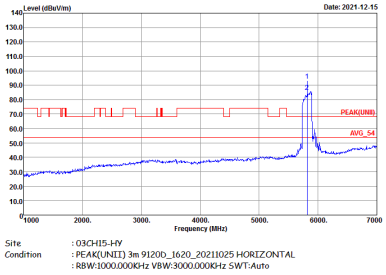
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH171 5855MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

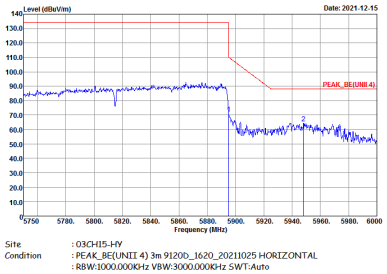
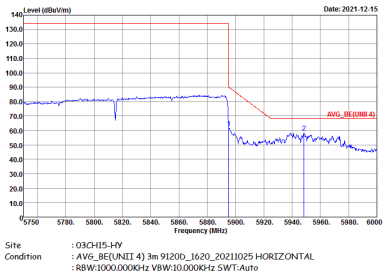
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH171 5855MHz - L	
4+3	Vertical	Fundamental
Peak		

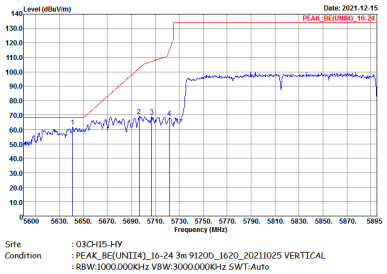
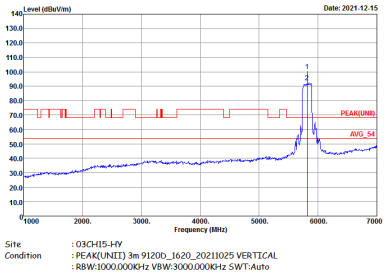
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH171 5855MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

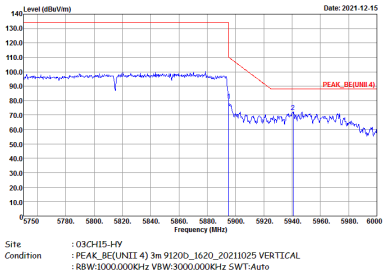
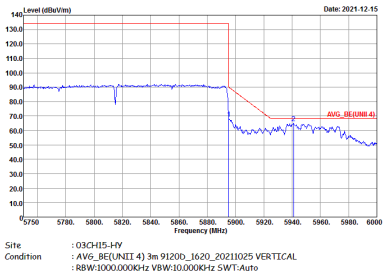
UNII-4 - 5735~5895MHz

WIFI 802.11ax HE160 Full (Band Edge @ 3m)

WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH163 5815MHz - L	
4+3	Horizontal	Fundamental
Peak		

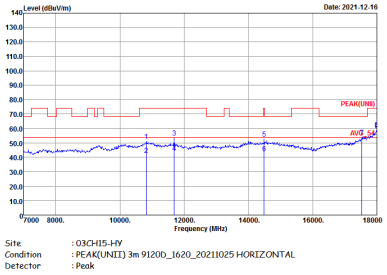
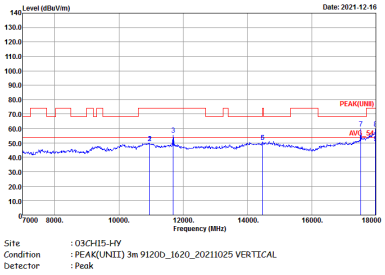
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH163 5815MHz - R	
4+3	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

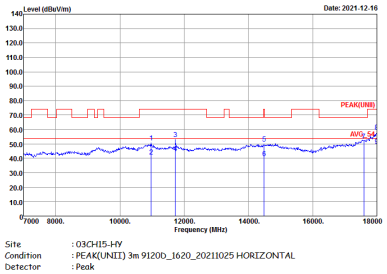
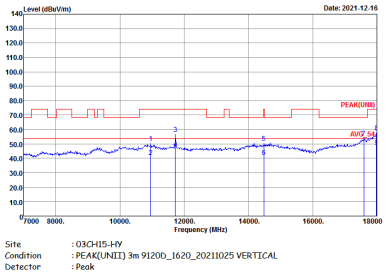
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH163 5815MHz - L	
4+3	Vertical	Fundamental
Peak		

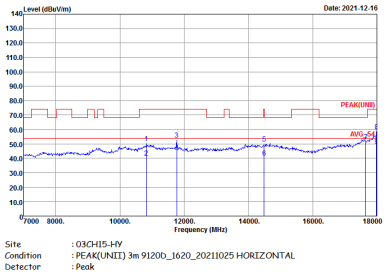
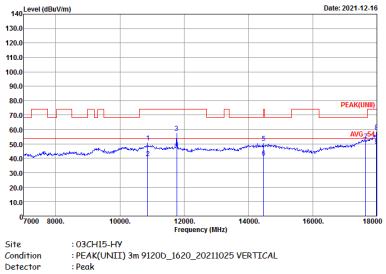
WIFI	UNII-4 5735~5895MHz Band Edge @ 3m	
ANT	802.11ax HE160 Full CH163 5815MHz - R	
4+3	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

UNII-4 - 5735~5895MHz

WIFI 802.11a (Harmonic @ 3m)

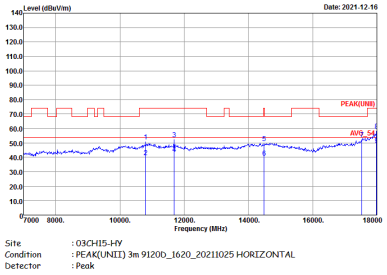
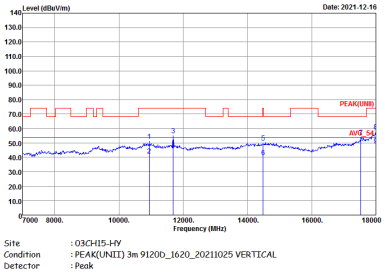
WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11a CH169 5845MHz	
4+3	Horizontal	Vertical
Peak Avg.		

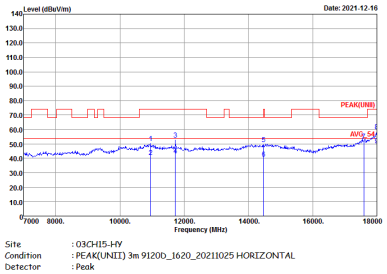
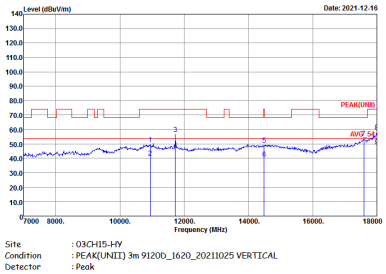
WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11a CH173 5865MHz	
4+3	Horizontal	Vertical
Peak Avg.		

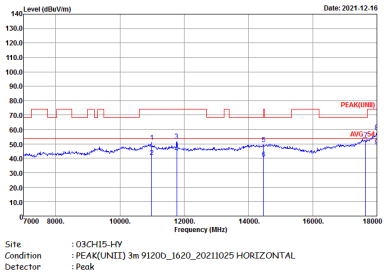
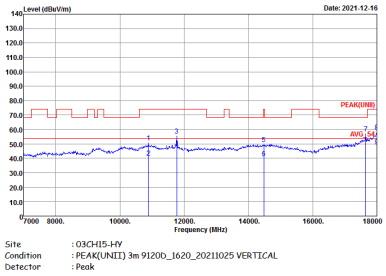
WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11a CH177 5885MHz	
4+3	Horizontal	Vertical
Peak Avg.		

UNII-4 - 5735~5895MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

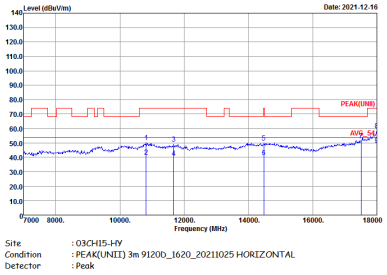
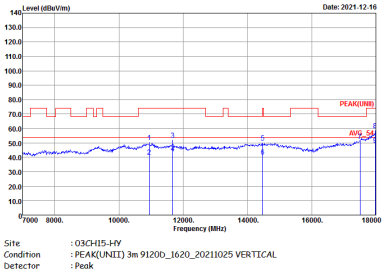
WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11n HT20 CH169 5845MHz	
4+3	Horizontal	Vertical
Peak Avg.		

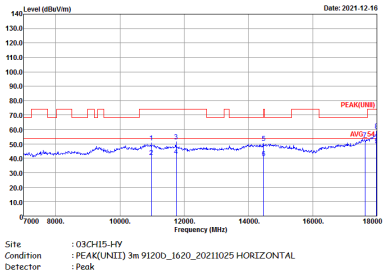
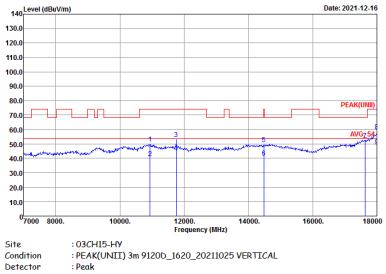
WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11n HT20 CH173 5865MHz	
4+3	Horizontal	Vertical
Peak Avg.		

WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11n HT20 CH177 5885MHz	
4+3	Horizontal	Vertical
Peak Avg.		

UNII-4 - 5735~5895MHz

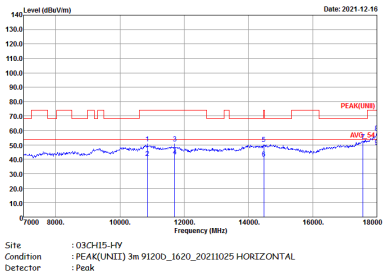
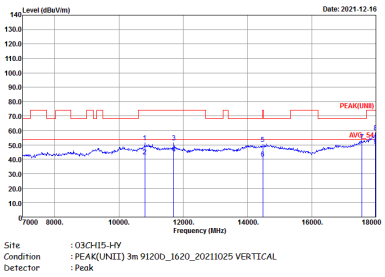
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11n HT40 CH167 5835MHz	
4+3	Horizontal	Vertical
Peak Avg.		

WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11n HT40 CH175 5875MHz	
4+3	Horizontal	Vertical
Peak Avg.		

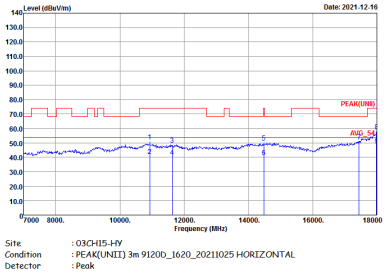
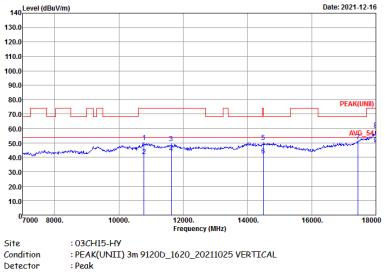
UNII-4 - 5735~5895MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH171 5855MHz	
4+3	Horizontal	Vertical
Peak Avg.		

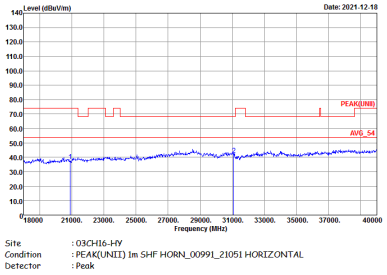
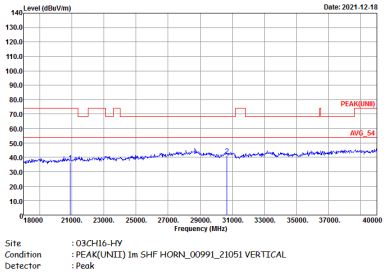
UNII-4 - 5735~5895MHz

WIFI 802.11ax HE160 Full (Harmonic @ 3m)

WIFI	UNII-4 5735~5895MHz Harmonic @ 3m	
ANT	802.11ax HE160 Full CH163 5815MHz	
4+3	Horizontal	Vertical
Peak Avg.		

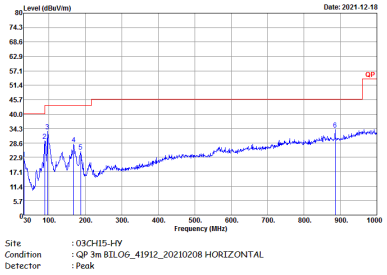
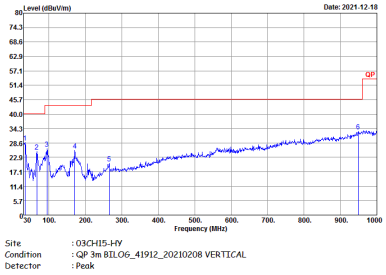
Emission above 18GHz

5GHz WIFI 802.11ax HE160 Full (SHF @ 1m)

WIFI	5GHz WIFI	
ANT	802.11ax HE160 Full SHF	
4+3	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

5GHz WIFI 802.11ax HE160 Full (LF)

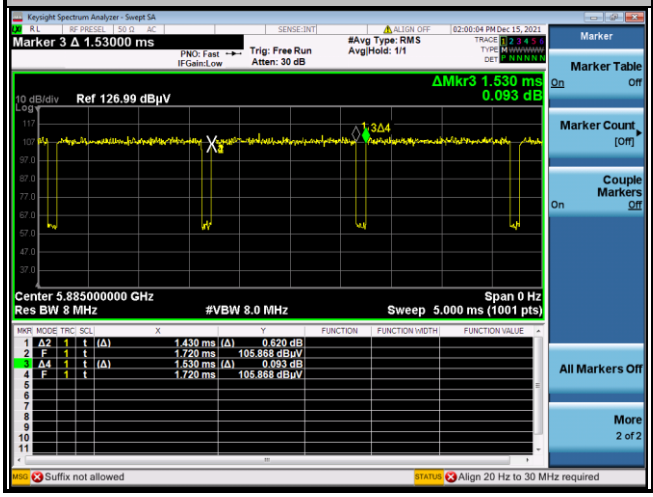
WIFI	5GHz WIFI	
ANT	802.11ax HE160 Full LF	
4+3	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

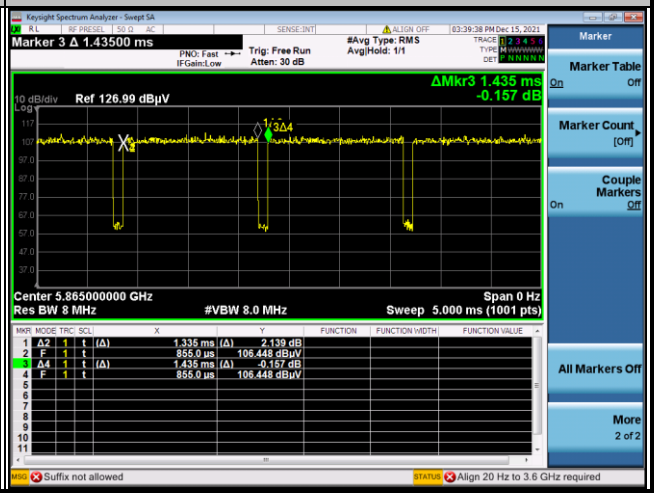
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
4+3	5GHz 802.11a	93.46	1430	0.70	1kHz
4+3	5GHz 802.11n HT20	93.03	1335	0.75	1kHz
4+3	5GHz 802.11n HT40	86.91	664	1.51	3kHz
4+3	5GHz 802.11ac VHT80	65.75	192	5.21	10kHz
4+3	5GHz 802.11ax HE160 Full RU	74.36	290	3.45	10kHz

MIMO <Ant. 4+3>

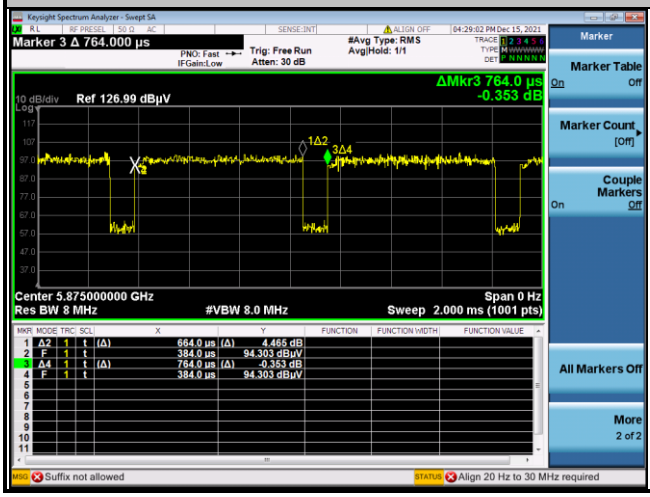
5GHz 802.11a



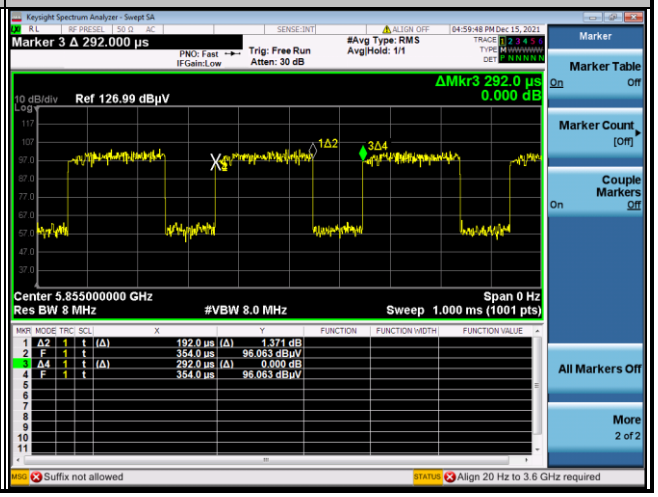
5GHz 802.11n HT20



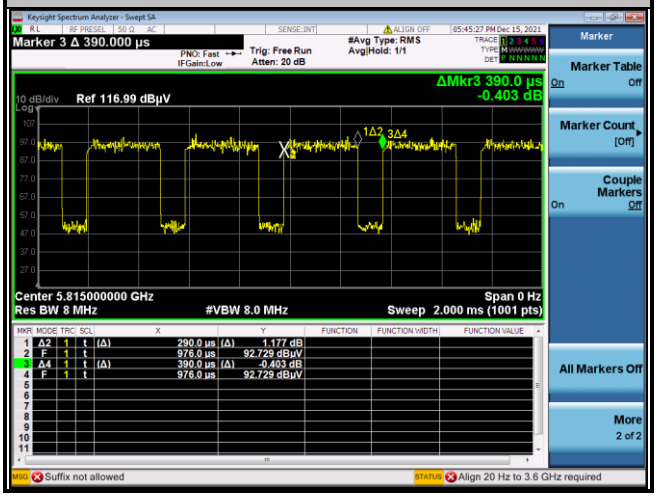
5GHz 802.11n HT40



5GHz 802.11ac VHT80



5GHz 802.11ax HE160 Full RU



———THE END———