

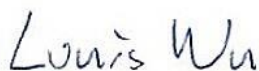


FCC RADIO TEST REPORT

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 performed from Nov. 16, 2021 to Jan. 11, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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



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
FR161608-05F	01	Initial issue of report	Jan. 14, 2022
FR161608-05F	02	1. Revise appendix A and C 2. Revise Product Specification of Equipment Under Test 3. Revise Carrier Frequency and Channel 4. Revise Test Mode 5. Revise 6dB and 26dB and 99% Occupied Bandwidth Measurement 6. Revise Power Spectral Density Measurement 7. Revise description for Antenna Requirements	Feb. 17, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403(i)	6dB & 26dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407(a)	Maximum Conducted Output Power	Pass	-
3.3	15.407(a)	Power Spectral Density	Pass	-
3.4	15.407(b)	Unwanted Emissions	Pass	8.78 dB under the limit at 11570.000 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: Lucy Wu

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	RF 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 Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	MIMO <Ant. 4 + 3> 802.11a: 22.56 dBm / 0.1803 W 802.11n HT20: 22.56 dBm / 0.1803 W 802.11n HT40: 21.34 dBm / 0.1361 W 802.11ac VHT20: 22.46 dBm / 0.1762 W 802.11ac VHT40: 21.24 dBm / 0.1330 W 802.11ac VHT80: 21.67 dBm / 0.1469 W 802.11ac VHT160: 21.06 dBm / 0.1276 W 802.11ax HE20: 22.36 dBm / 0.1722 W 802.11ax HE40: 21.14 dBm / 0.1300 W 802.11ax HE80: 21.57 dBm / 0.1435 W 802.11ax HE160: 21.16 dBm / 0.1306 W

Product Specification is subject to this standard			
99% Occupied Bandwidth	MIMO <Ant. 4> 802.11a: 17.93 MHz 802.11n HT20: 19.13 MHz 802.11n HT40: 37.26 MHz 802.11ac VHT80: 76.00 MHz 802.11ax HE160: 157.04 MHz MIMO <Ant. 3> 802.11a: 17.43 MHz 802.11n HT20: 18.43 MHz 802.11n HT40: 36.76 MHz 802.11ac VHT80: 75.76 MHz 802.11ax HE160: 156.32 MHz		
	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 Type / Gain	<Ant. 4> : IFA Antenna with gain -1.1 dBi <Ant. 3> : IFA Antenna with gain -1.3 dBi		
Antenna Function Description		Ant. 4	Ant. 3
	802.11a/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.
Power of MIMO Ant.4 + Ant.3 is a calculated result from sum of the power MIMO Ant.4 and MIMO Ant.3.
2. 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 made to the EUT during the testing.

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.

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

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

Remark:

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

2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in 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 with Adapter as worst plane.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	159*	5795
	151*	5755	161	5805
	153	5765	163@	5815
	155#	5775	165	5825
	157	5785		

Note:

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

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.

Modulation	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

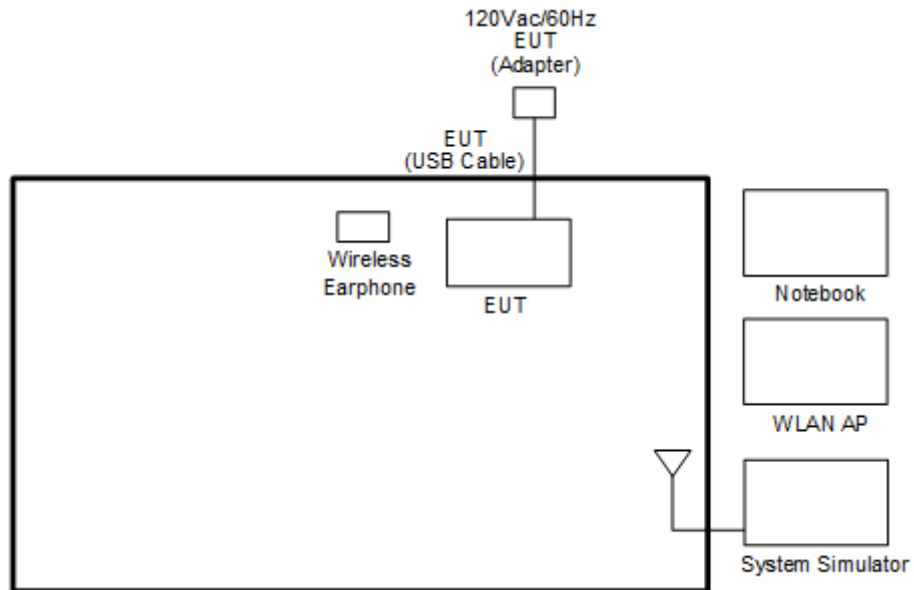
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + WLAN (5GHz) Link + Bluetooth Link + USB Cable 2 (Charging from AC Adapter 2)
Remark: For Radiated Test Cases, the tests were performed with Adapter 1 and USB Cable 2.	

Ch. #		Band IV : 5725-5850 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

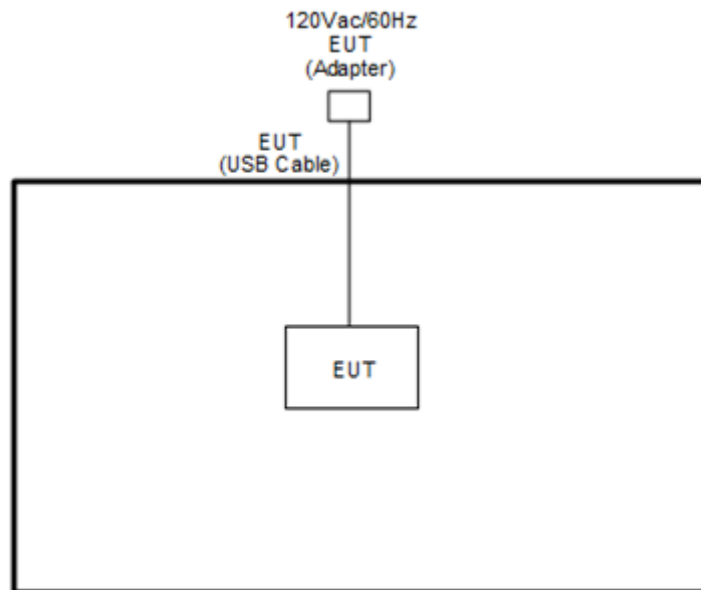
Remark: For radiation spurious emission, the modulation and the data rate picked for testing are determined by the Max. RF conducted power.

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,1.8m
4.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m

2.5 EUT Operation Test Setup

The RF test items, utility “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.

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

3 Test Result

3.1 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.

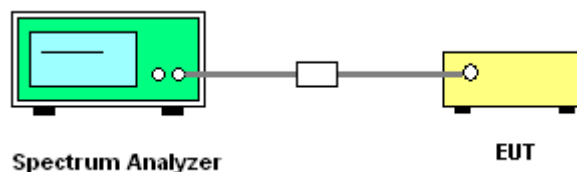
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section C) Emission bandwidth for the band 5.725-5.85 GHz
2. Set RBW = 100 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

3.1.4 Test Setup



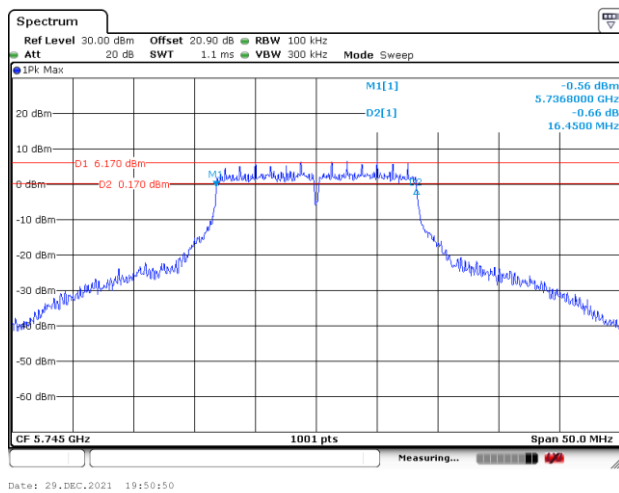
3.1.5 Test Result of 6dB and 26dB and 99% Occupied Bandwidth

Please refer to Appendix A.

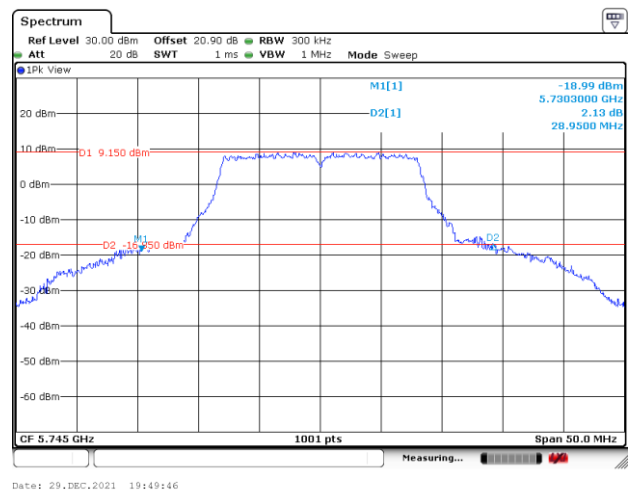


<802.11a CH149>

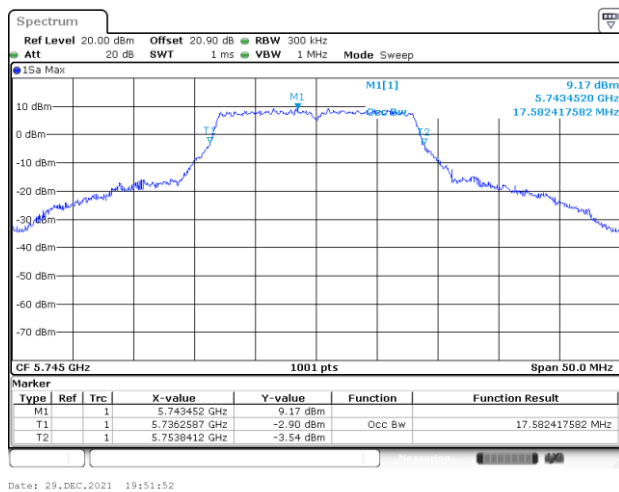
6dB Bandwidth



26dB Bandwidth



99% Occupied Bandwidth



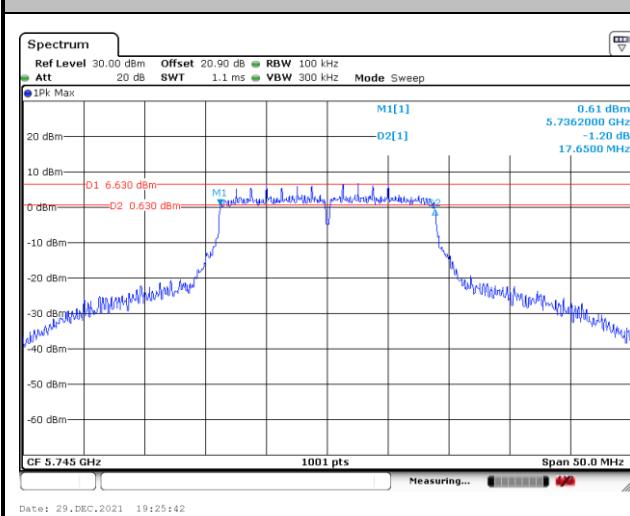
NA

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

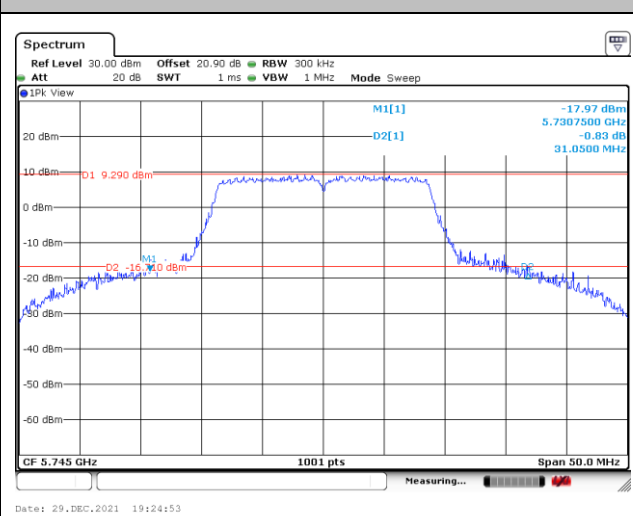


<802.11n HT20 CH149>

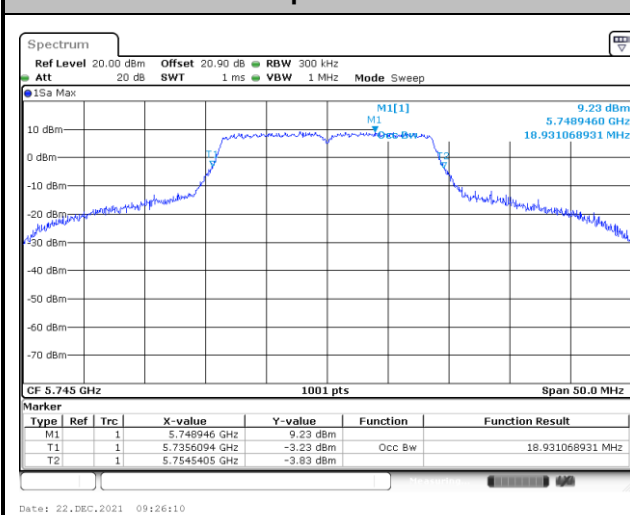
6dB Bandwidth



26dB Bandwidth



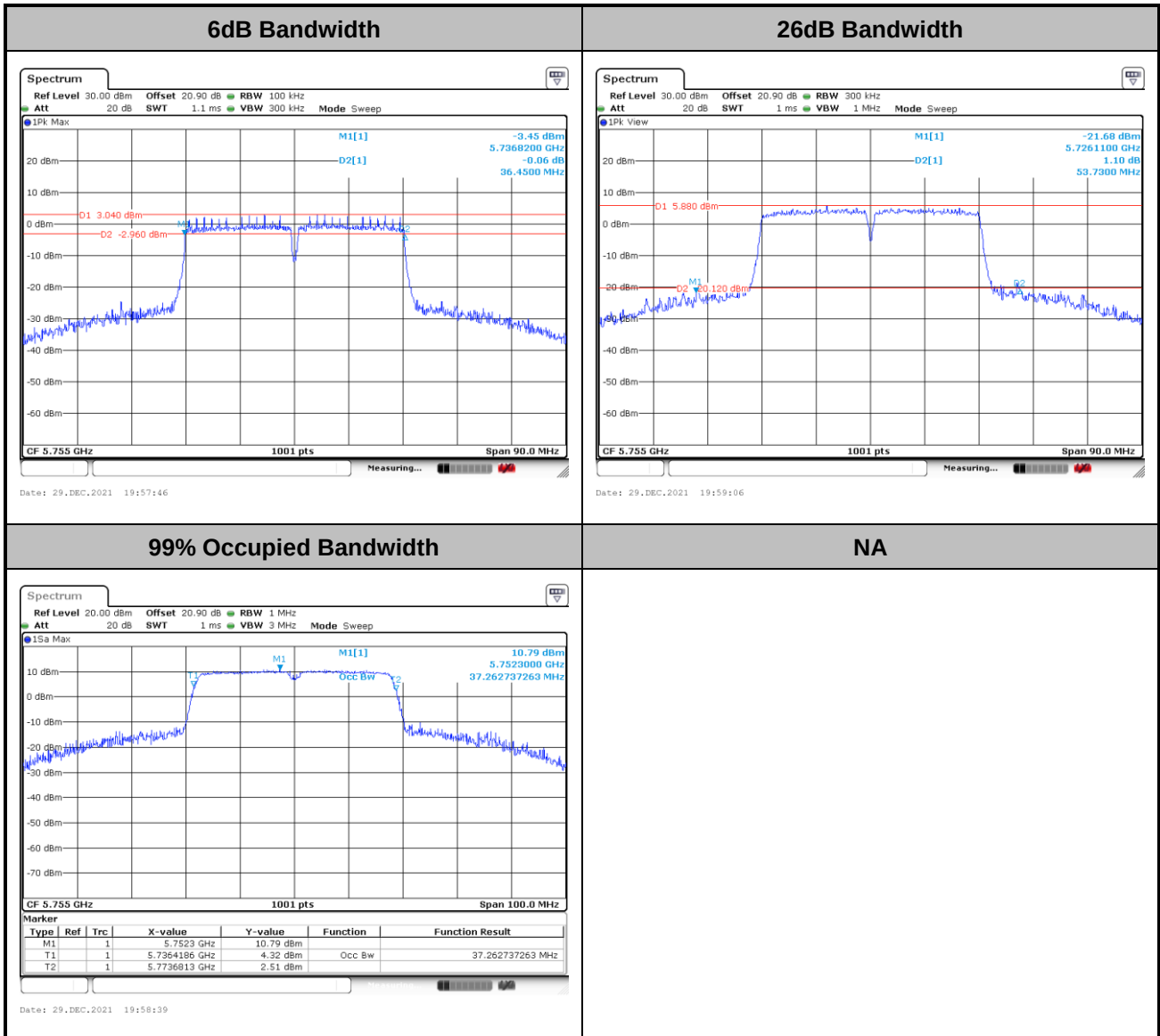
99% Occupied Bandwidth



NA

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

<802.11n HT40 CH151>

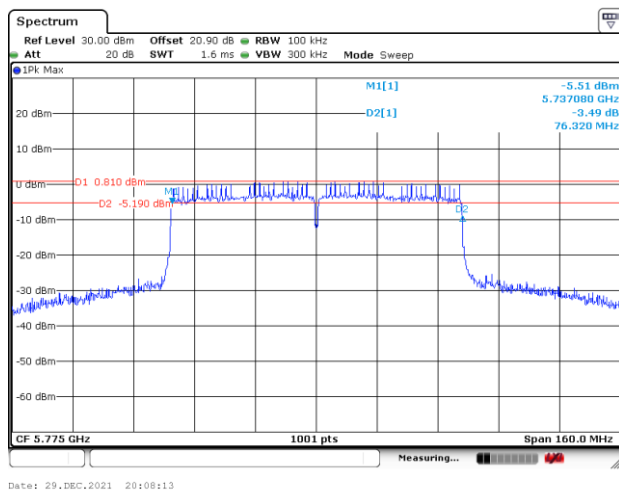


Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

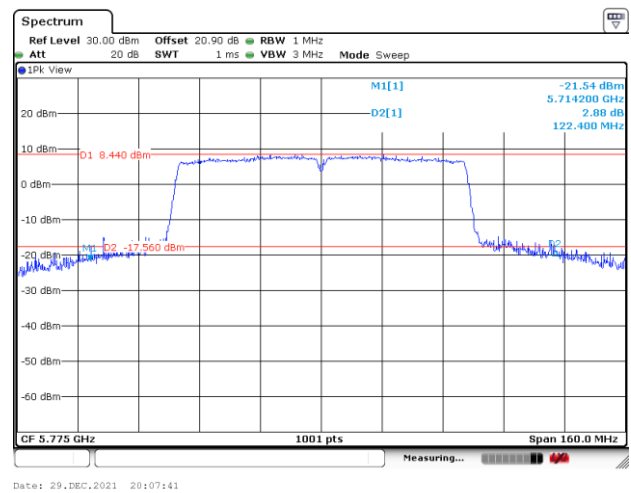


<802.11ac VHT80 CH155>

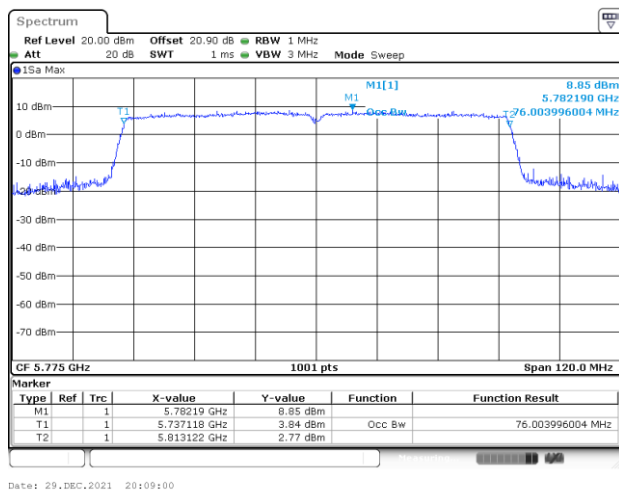
6dB Bandwidth



26dB Bandwidth



99% Occupied Bandwidth

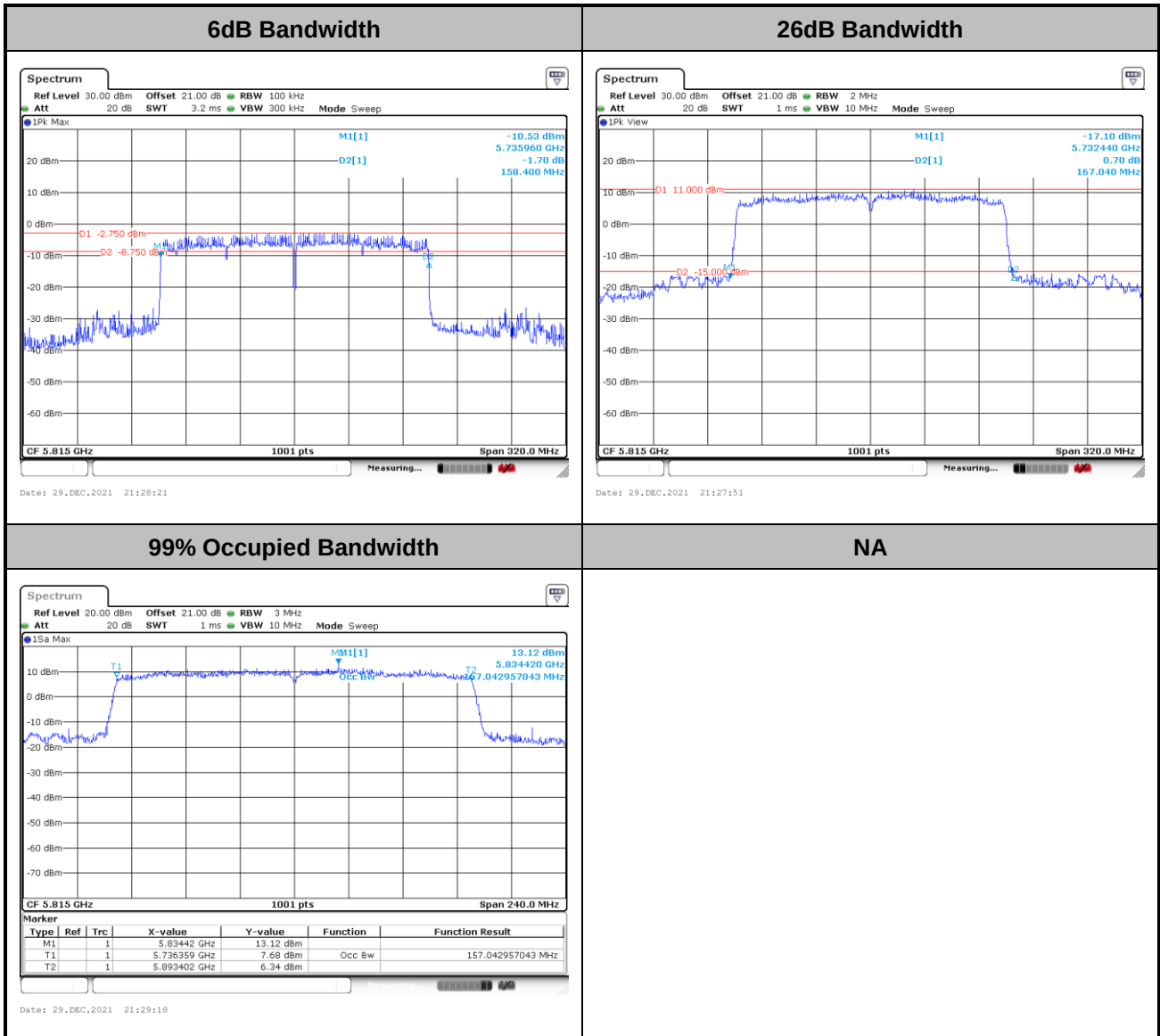


NA

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



<802.11ax HE160 CH163>



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

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.2.2 Measuring Instruments

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

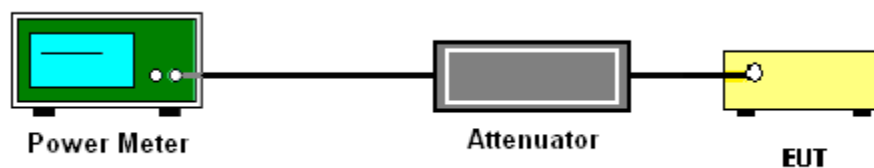
3.2.3 Test Procedures

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter.
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

Section F) Maximum power spectral density.

Method SA-2

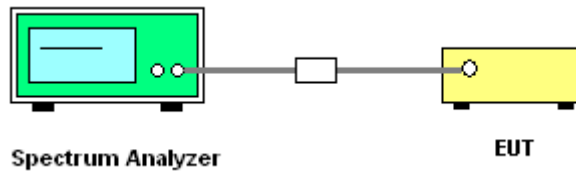
(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 300kHz.
 - Set VBW $\geq$ 1 MHz.
 - Add $10 \log(500 \text{ kHz/RBW})$ to the measured result, whereas RBW ($<500 \text{ kHz}$) is the reduced resolution bandwidth of the spectrum analyzer set during measurement
 - Number of points in sweep $\geq 2 \text{ Span / RBW}$.
 - 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 $10 \log(1/0.25) = 6 \text{ dB}$ if the duty cycle is 25 percent.
1. The RF output of EUT is connected to the spectrum analyzer by a low loss cable.
 2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
 3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (c): Measure and add $10 \log(N_{\text{ANT}})$ 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 $10 \log(N_{\text{ANT}})$ dB is added to each spectrum value before comparing to the emission limit. The addition of $10 \log(N_{\text{ANT}})$ dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{\text{ANT}}^{\text{th}}$ of the PSD limit.

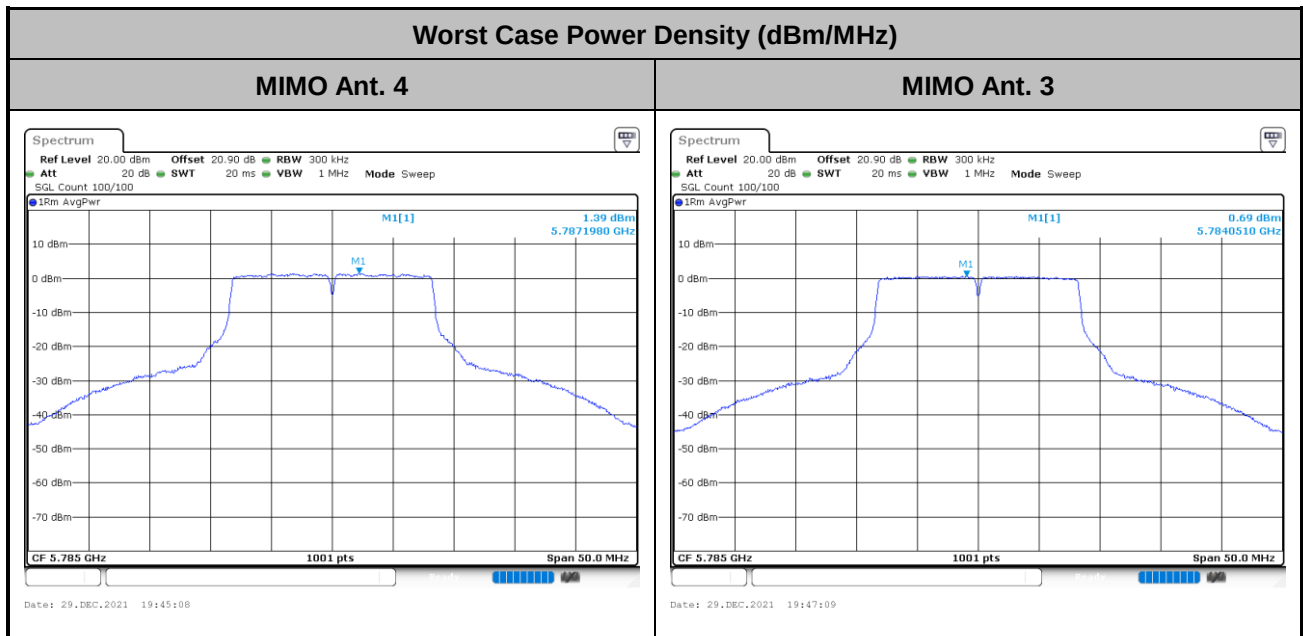
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

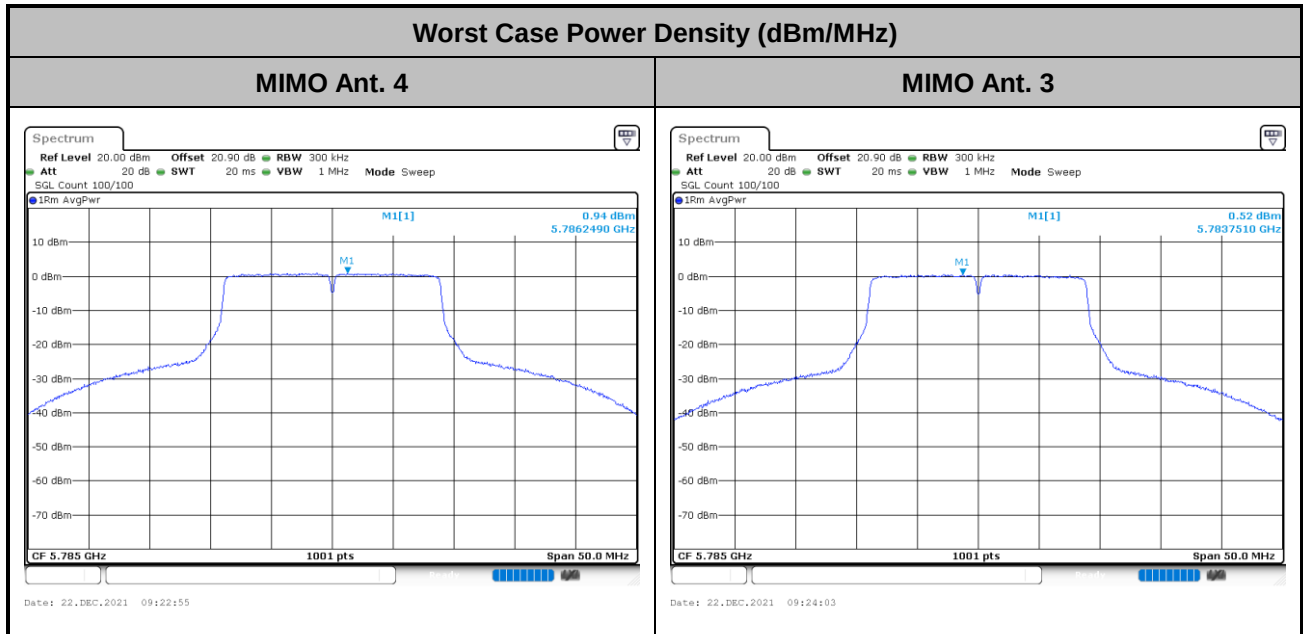
Please refer to Appendix A.

<802.11a Mode>

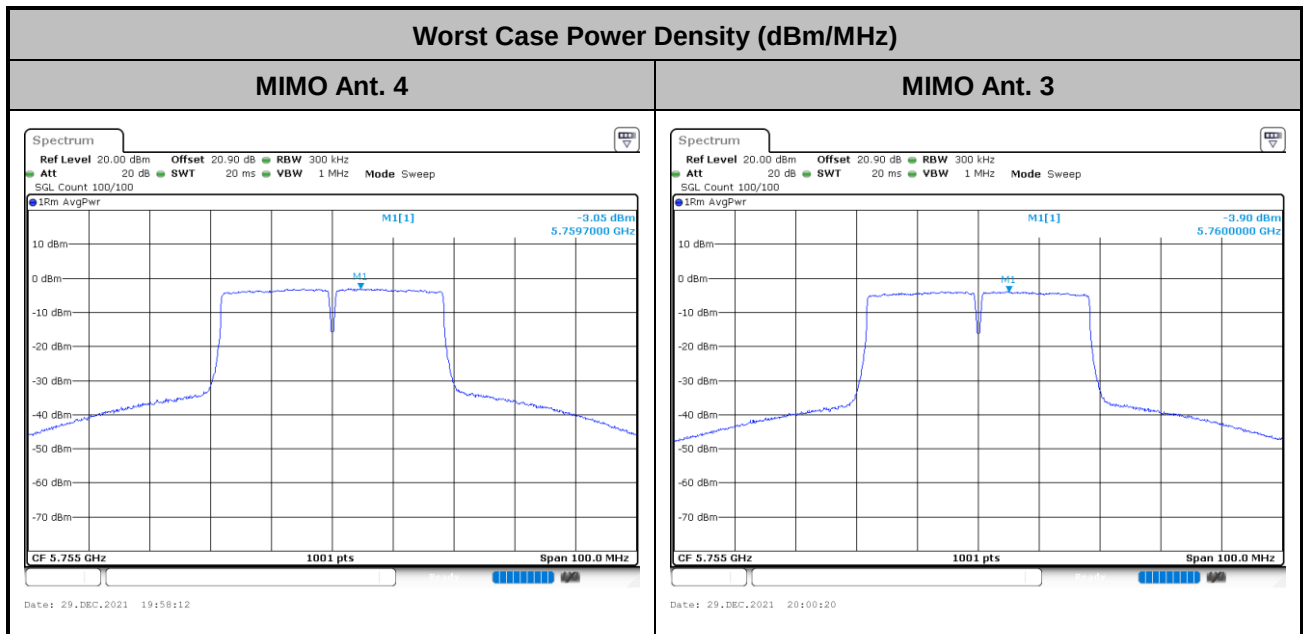




<802.11n HT20 Mode>

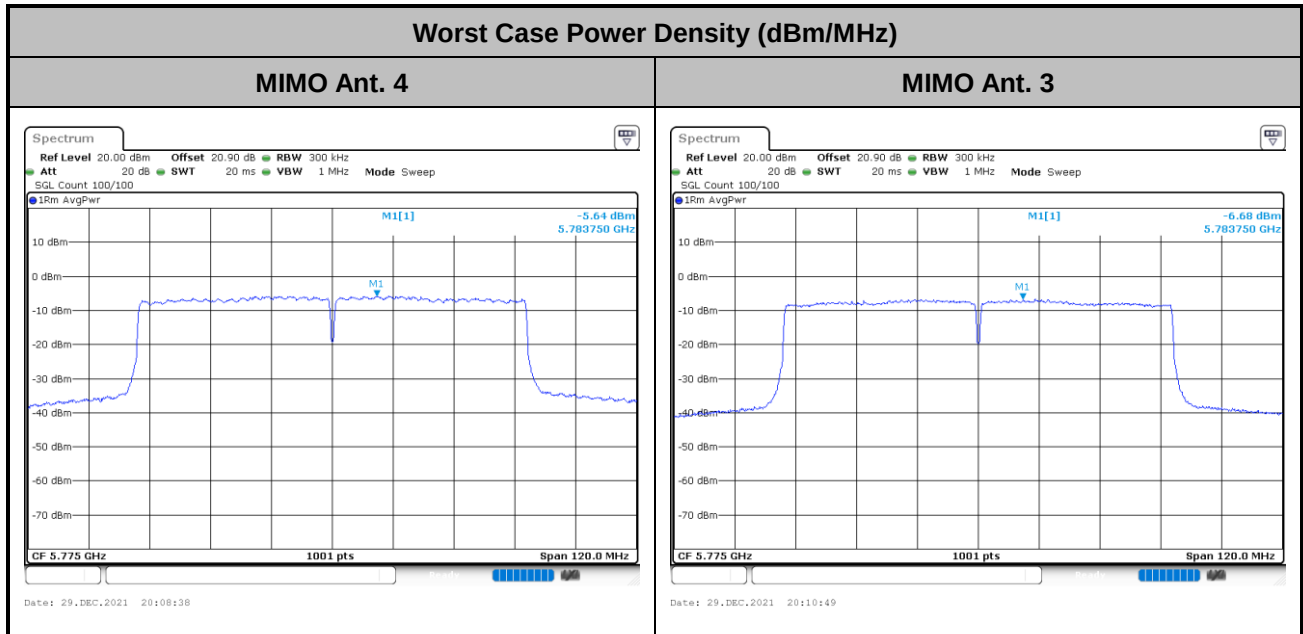


<802.11n HT40 Mode>

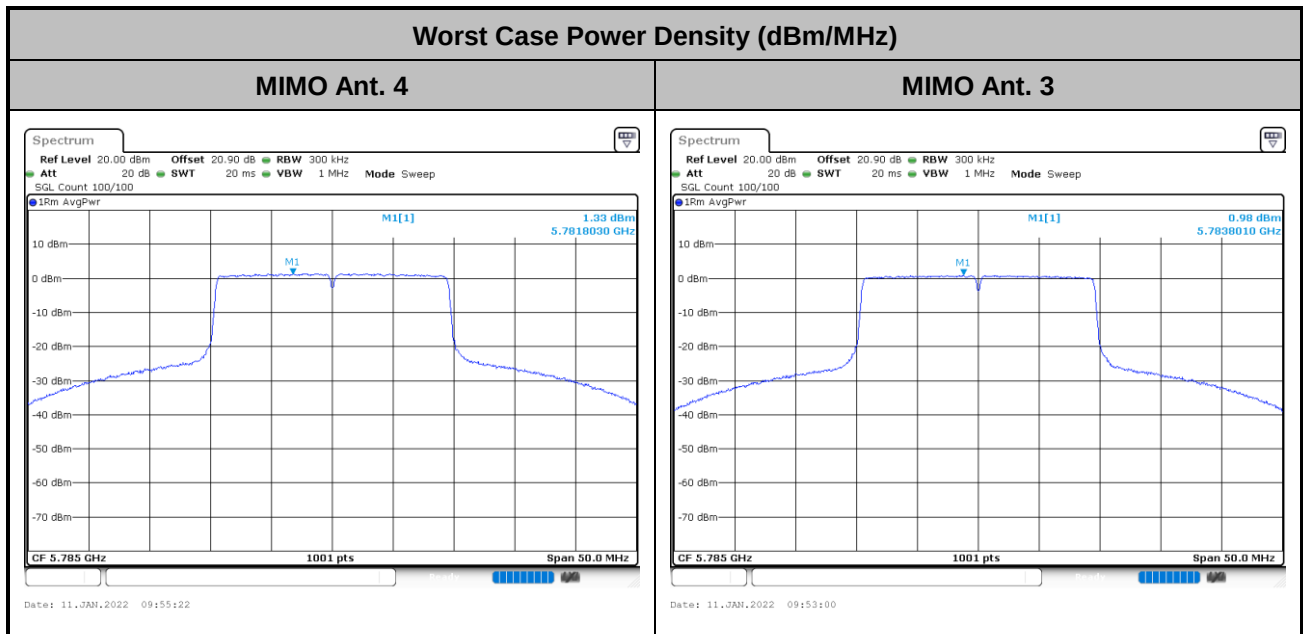




<802.11ac VHT80 Mode>

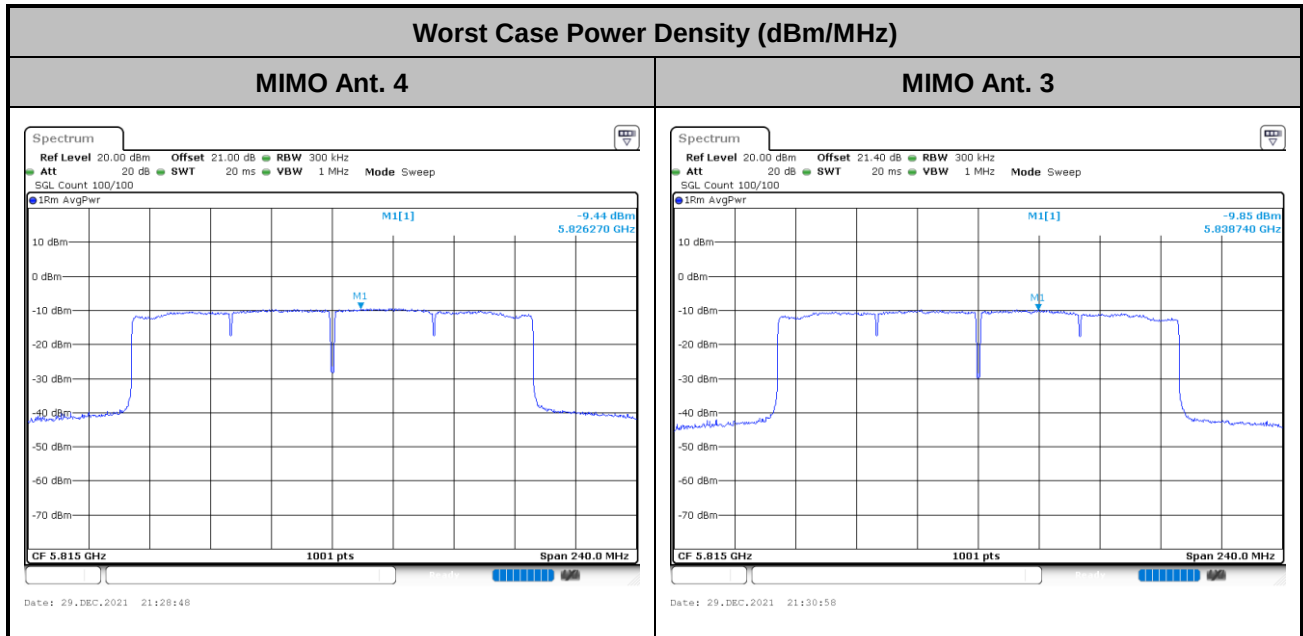


<802.11ax HE20 Mode>





<802.11ax HE160 Mode>



3.4 Unwanted Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

- (1) For transmitters operating in the 5.725-5.85 GHz band:

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

- (2) Unwanted spurious emissions falls in restricted bands shall comply with the general field strength limits as below table,

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

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

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

EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

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

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

3.4.2 Measuring Instruments

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

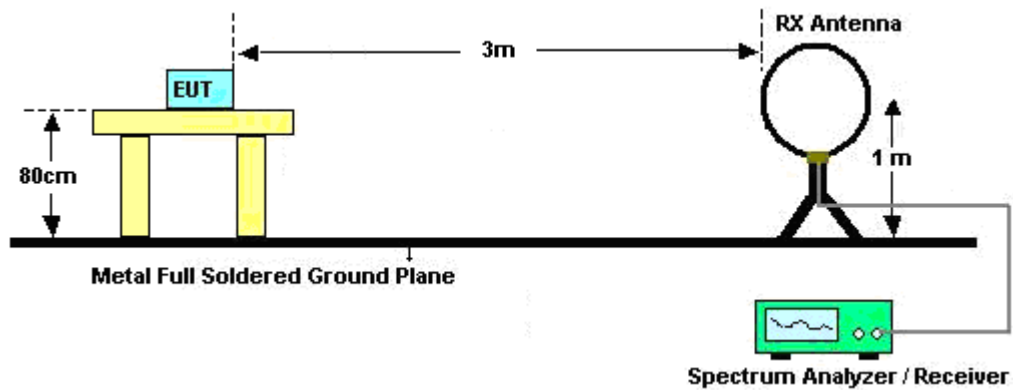
3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000 MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 3 MHz
 - Detector = Peak
 - Sweep time = auto
 - Trace mode = max hold
 - (3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW = 10 Hz, when duty cycle is no less than 98 percent.
 - VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
2. The EUT is placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT is set 3 meters away from the receiving antenna which is mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT is arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.

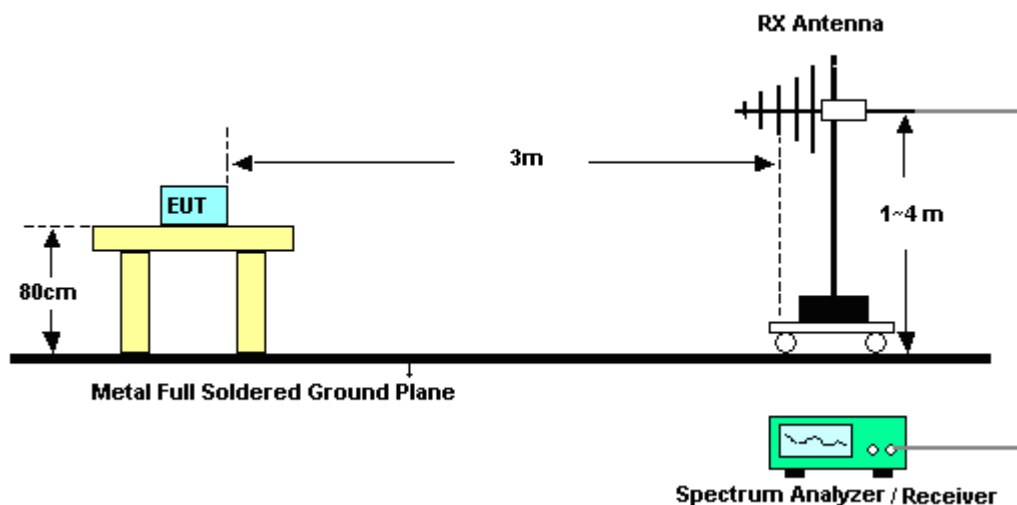
6. Radiated testing below 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading. When there is no suspected emission found and the emission level is with at least 6 dB margin against QP limit line, the position is marked as “-“.
7. Radiated testing above 1 GHz is performed by adjusting the antenna tower from 1 m to 4 m and by rotating the turn table from 0 degree to 360 degrees to find the peak maximum hold reading for scanning all frequencies. When there is no suspected emission found and the harmonic emission level is with at least 6 dB margin against average limit line, the position is marked as “-“.

3.4.4 Test Setup

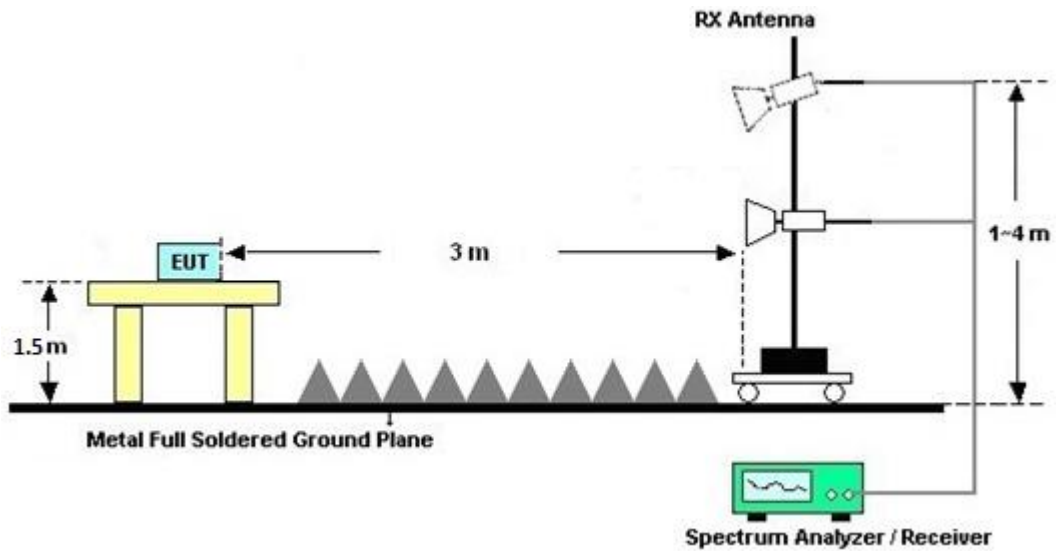
For radiated emissions below 30MHz



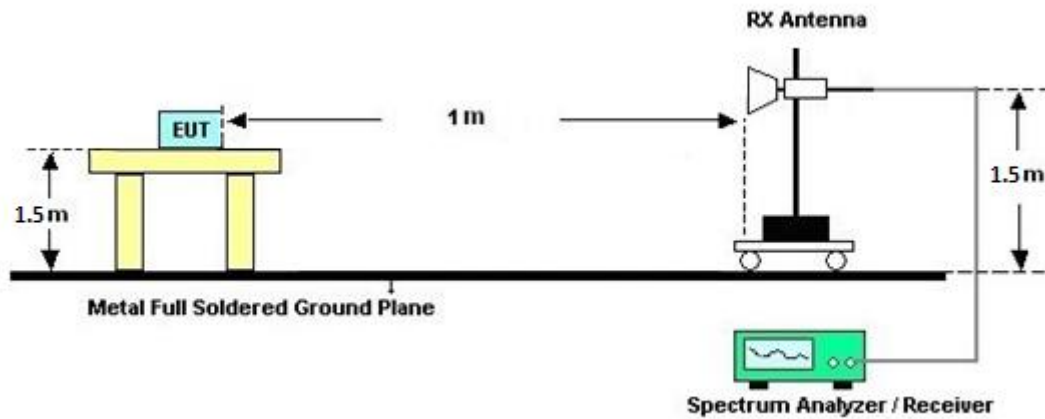
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz





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

The low frequency, which starts from 9 kHz to 30 MHz, is pre-scanned and the result which is 20 dB lower than the limit line is not reported.

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

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

*Decreases with the logarithm of the frequency.

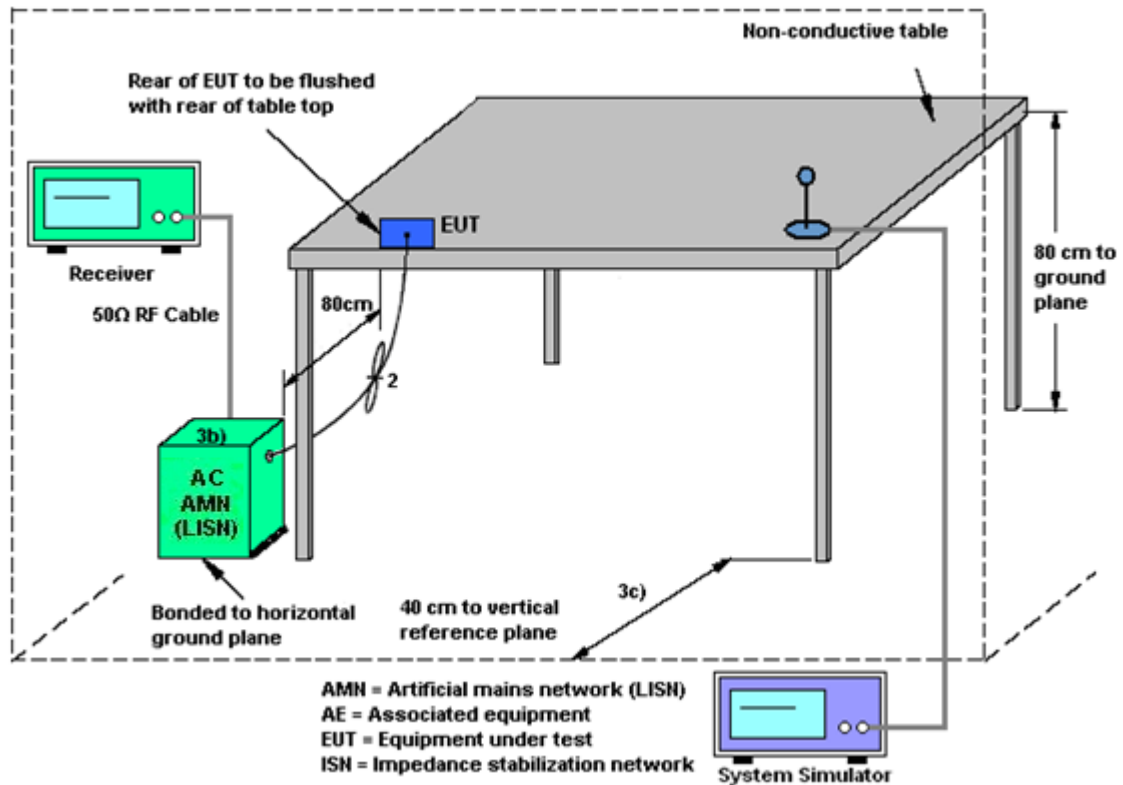
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Antenna Requirements

3.6.1 Standard Applicable

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

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

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 k th antenna is being fed by spatial stream j , or zero if it is not;

G_k is the gain in dBi of the k th antenna.

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

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

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

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

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

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



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

<CDD Modes>						
			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant. 4	Ant. 3	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	-1.10	-1.30	-1.10	1.81	0.00	0.00

Power Limit Reduction = DG(Power) – 6dBi, (min = 0)

PSD Limit Reduction = DG(PSD) – 6dBi, (min = 0)

Calculation example:

The DG for PSD is derived from formula is

$$10 \times \log \left\{ \left[10^{(-1.10 \text{ dBi} / 20)} + 10^{(-1.30 \text{ dBi} / 20)} \right]^2 / 2 \right\} \\ = 1.81 \text{ dBi}$$



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	TECEP	DTM-303A	TP201996	N/A	Nov. 16, 2021	Nov. 22, 2021~ Jan. 11, 2022	Nov. 15, 2022	Conducted (TH05-HY)
Power Meter	Raditeq	RPR3008W	RPR8W-2101 001	10MHz~8GHz	Aug. 17, 2021	Nov. 22, 2021~ Jan. 11, 2022	Aug. 16, 2022	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz~40GHz	Aug. 30, 2021	Nov. 22, 2021~ Jan. 11, 2022	Aug. 29, 2022	Conducted (TH05-HY)
Switch Control Manframe	E-IUSTRUMENT	ETF-1405-0	EC1900067 (BOX7)	N/A	Aug. 12, 2021	Nov. 22, 2021~ Jan. 11, 2022	Aug. 11, 2022	Conducted (TH05-HY)
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	JPA0118-55-30 3	17100018000 55006	1GHz~18GHz	May 06, 2021	Dec. 09, 2021~ Dec. 18, 2021	May 05, 2022	Radiation (03CH15-HY)
Preamplifier	E-INSTRUMENT TECH LTD.	ERA-10M-700 0-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	WLJ4-1000-15 30-6000-40ST	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
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	SCHWARZBECK	VTSD 9561-FN	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:	2021/11/22-2022/01/11	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	149	5745	17.58	17.23	28.95	22.20	16.45	16.45	0.5	Pass
11a	6Mbps	2	157	5785	17.93	17.43	31.95	27.60	16.40	16.40	0.5	Pass
11a	6Mbps	2	165	5825	17.78	17.18	32.15	27.35	16.45	16.45	0.5	Pass
HT20	MCS0	2	149	5745	18.93	18.18	31.05	26.50	17.65	17.70	0.5	Pass
HT20	MCS0	2	157	5785	19.13	18.43	36.25	30.60	17.65	17.70	0.5	Pass
HT20	MCS0	2	165	5825	18.93	18.33	35.75	30.15	17.65	17.70	0.5	Pass
HT40	MCS0	2	151	5755	37.26	36.76	53.73	40.14	36.45	36.54	0.5	Pass
HT40	MCS0	2	159	5795	37.26	36.76	60.48	48.96	36.54	36.54	0.5	Pass
VHT80	MCS0	2	155	5775	76.00	75.76	122.40	107.68	76.32	76.64	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	149	5745	19.50	18.80	22.17	30.00		-1.10		Pass
11a	6Mbps	2	157	5785	19.70	19.00	22.37	30.00		-1.10		Pass
11a	6Mbps	2	165	5825	19.70	19.40	22.56	30.00		-1.10		Pass
HT20	MCS0	2	149	5745	19.50	18.90	22.22	30.00		-1.10		Pass
HT20	MCS0	2	157	5785	19.70	19.10	22.42	30.00		-1.10		Pass
HT20	MCS0	2	165	5825	19.70	19.40	22.56	30.00		-1.10		Pass
HT40	MCS0	2	151	5755	18.80	17.80	21.34	30.00		-1.10		Pass
HT40	MCS0	2	159	5795	18.60	17.80	21.23	30.00		-1.10		Pass
VHT20	MCS0	2	149	5745	19.40	18.80	22.12	30.00		-1.10		Pass
VHT20	MCS0	2	157	5785	19.60	19.00	22.32	30.00		-1.10		Pass
VHT20	MCS0	2	165	5825	19.60	19.30	22.46	30.00		-1.10		Pass
VHT40	MCS0	2	151	5755	18.70	17.70	21.24	30.00		-1.10		Pass
VHT40	MCS0	2	159	5795	18.50	17.70	21.13	30.00		-1.10		Pass
VHT80	MCS0	2	155	5775	19.00	18.30	21.67	30.00		-1.10		Pass
VHT160	MCS0	2	163	5815	18.10	18.00	21.06	30.00		-1.10		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV MIMO														
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	10log (500kHz /RBW) Factor (dB)		Average Power Density with Duty Factor (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 4	Ant 3	Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
11a	6Mbps	2	149	5745	2.22		3.49	2.57	6.50	30.00		1.81		Pass
11a	6Mbps	2	157	5785	2.22		3.90	3.20	6.91	30.00		1.81		Pass
11a	6Mbps	2	165	5825	2.22		3.73	3.33	6.74	30.00		1.81		Pass
HT20	MCS0	2	149	5745	2.22		3.08	2.84	6.09	30.00		1.81		Pass
HT20	MCS0	2	157	5785	2.22		3.47	3.06	6.48	30.00		1.81		Pass
HT20	MCS0	2	165	5825	2.22		3.27	2.98	6.28	30.00		1.81		Pass
HT40	MCS0	2	151	5755	2.22		-0.69	-1.54	2.32	30.00		1.81		Pass
HT40	MCS0	2	159	5795	2.22		-1.04	-1.93	1.97	30.00		1.81		Pass
VHT80	MCS0	2	155	5775	2.22		-2.75	-3.79	0.26	30.00		1.81		Pass

Note: PSD Sum = Max PSD(Ant. 4, Ant. 3) + 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	149	5745	Full	19.30	18.70	22.02	30.00		-1.10		Pass
HE20	MCS0	2	149	5745	26/0	9.80	9.40	12.61	30.00		-1.10		Pass
HE20	MCS0	2	149	5745	52/37	13.40	12.70	16.07	30.00		-1.10		Pass
HE20	MCS0	2	149	5745	106/53	16.20	15.80	19.01	30.00		-1.10		Pass
HE20	MCS0	2	157	5785	Full	19.50	18.90	22.22	30.00		-1.10		Pass
HE20	MCS0	2	157	5785	26/4	10.30	9.70	13.02	30.00		-1.10		Pass
HE20	MCS0	2	157	5785	52/38	13.40	12.40	15.94	30.00		-1.10		Pass
HE20	MCS0	2	157	5785	106/53	16.40	16.20	19.31	30.00		-1.10		Pass
HE20	MCS0	2	165	5825	Full	19.50	19.20	22.36	30.00		-1.10		Pass
HE20	MCS0	2	165	5825	26/8	10.30	9.80	13.07	30.00		-1.10		Pass
HE20	MCS0	2	165	5825	52/40	13.40	12.70	16.07	30.00		-1.10		Pass
HE20	MCS0	2	165	5825	106/54	16.20	15.80	19.01	30.00		-1.10		Pass
HE40	MCS0	2	151	5755	Full	18.60	17.60	21.14	30.00		-1.10		Pass
HE40	MCS0	2	159	5795	Full	18.40	17.60	21.03	30.00		-1.10		Pass
HE80	MCS0	2	155	5775	Full	18.90	18.20	21.57	30.00		-1.10		Pass
HE160	MCS0	2	163	5815	Full	18.20	18.10	21.16	30.00		-1.10		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV MIMO															
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	RU Config.	10log (500kHz /RBW) Factor (dB)		Average Power Density with Duty Factor (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
						Ant 4	Ant 3	Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
HE20	MCS0	2	149	5745	Full	2.22		3.10	2.61	6.11	30.00		1.81		Pass
HE20	MCS0	2	149	5745	26/0	2.22		2.45	1.95	5.46	30.00		1.81		Pass
HE20	MCS0	2	149	5745	52/37	2.22		2.87	2.25	5.88	30.00		1.81		Pass
HE20	MCS0	2	149	5745	106/53	2.22		2.83	2.59	5.84	30.00		1.81		Pass
HE20	MCS0	2	157	5785	Full	2.22		3.72	3.38	6.73	30.00		1.81		Pass
HE20	MCS0	2	157	5785	26/4	2.22		2.95	2.15	5.96	30.00		1.81		Pass
HE20	MCS0	2	157	5785	52/38	2.22		2.99	2.27	6.00	30.00		1.81		Pass
HE20	MCS0	2	157	5785	106/53	2.22		3.29	3.20	6.30	30.00		1.81		Pass
HE20	MCS0	2	165	5825	Full	2.22		3.45	3.05	6.46	30.00		1.81		Pass
HE20	MCS0	2	165	5825	26/8	2.22		3.07	2.31	6.08	30.00		1.81		Pass
HE20	MCS0	2	165	5825	52/40	2.22		2.96	2.49	5.97	30.00		1.81		Pass
HE20	MCS0	2	165	5825	106/54	2.22		2.67	2.60	5.68	30.00		1.81		Pass
HE160	MCS0	2	163	5815	Full	2.22		-6.57	-6.98	-3.56	30.00		1.81		Pass

Note: PSD Sum = Max PSD(Ant. 4, Ant. 3) + 10 log (n)



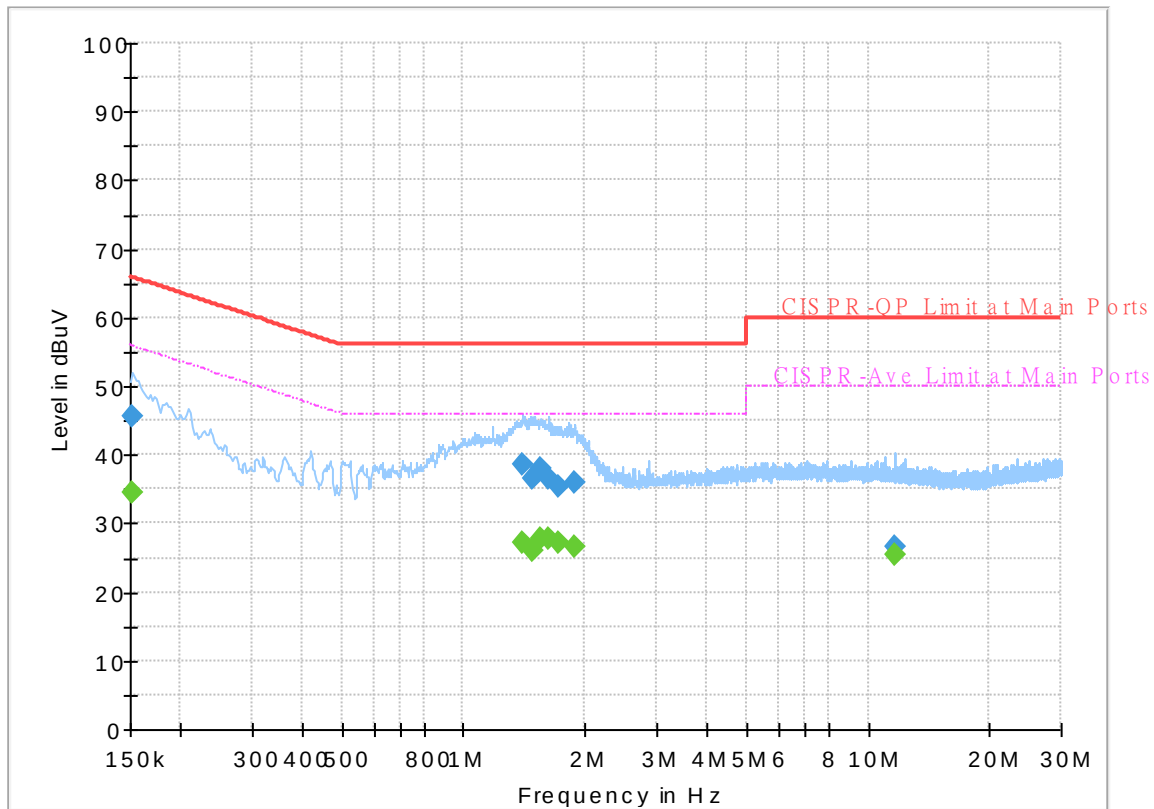
Appendix B. AC Conducted Emission Test Results

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

EUT Information

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

Full Spectrum



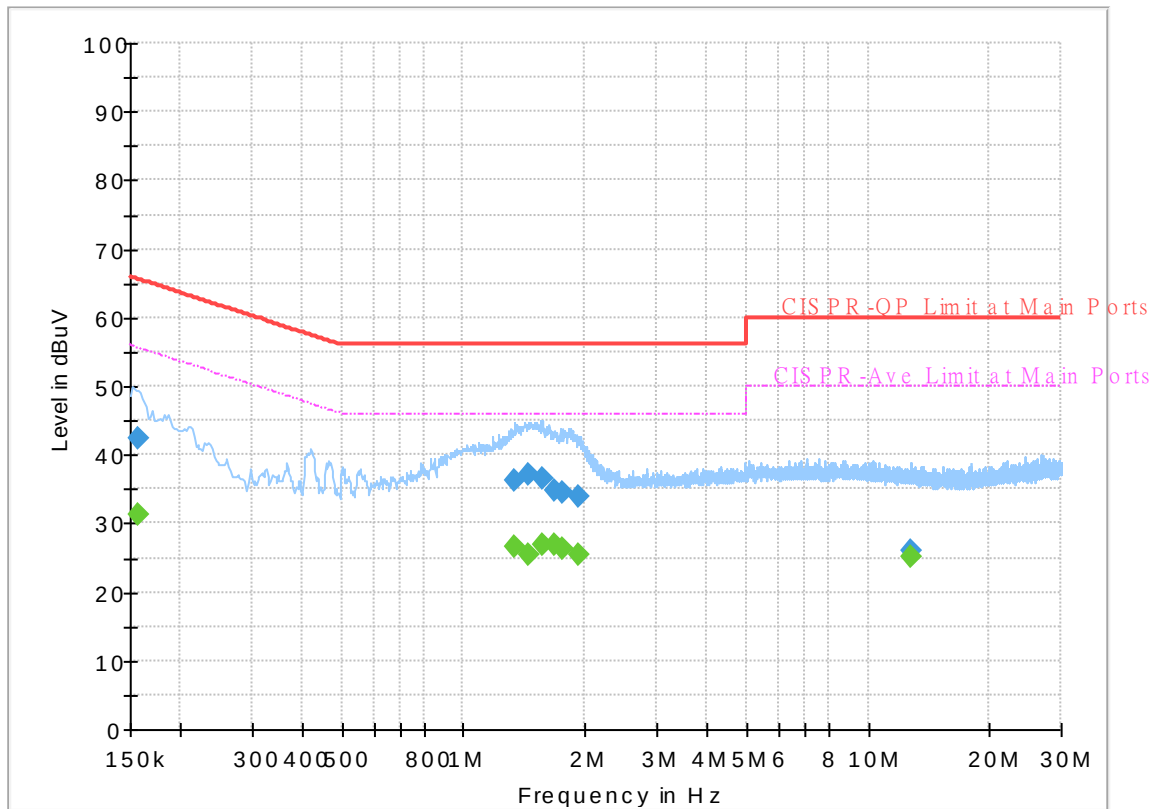
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	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

Full Spectrum



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 :	55~60%

Band 4 - 5725~5850MHz

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 149 5745MHz		5634.2	47.29	-20.91	68.2	40.11	31.93	10.42	35.17	385	288	P	H
		5692.8	49.56	-50.33	99.89	42.24	31.9	10.48	35.06	385	288	P	H
		5718.4	59.31	-51.04	110.35	51.84	31.97	10.51	35.01	385	288	P	H
		5724	69.35	-50.57	119.92	61.83	32	10.52	35	385	288	P	H
	*	5745	106.27	-	-	98.6	32.08	10.54	34.95	385	288	P	H
	*	5745	98.58	-	-	90.91	32.08	10.54	34.95	385	288	A	H
													H
													H
		5641.6	49.5	-18.7	68.2	42.31	31.92	10.43	35.16	319	349	P	V
		5693	54.79	-45.25	100.04	47.47	31.9	10.48	35.06	319	349	P	V
		5718.6	62.33	-48.08	110.41	54.86	31.97	10.51	35.01	319	349	P	V
		5723.6	68.63	-50.38	119.01	61.12	31.99	10.52	35	319	349	P	V
	*	5745	111.27	-	-	103.6	32.08	10.54	34.95	319	349	P	V
	*	5745	103.2	-	-	95.53	32.08	10.54	34.95	319	349	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 157 5785MHz		5622.2	49.41	-18.79	68.2	42.25	31.96	10.4	35.2	400	289	P	H
		5700	48.72	-56.48	105.2	41.37	31.9	10.49	35.04	400	289	P	H
		5700	48.72	-56.48	105.2	41.37	31.9	10.49	35.04	400	289	P	H
		5725	49.86	-72.34	122.2	42.33	32	10.52	34.99	400	289	P	H
	*	5785	107.08	-	-	99.28	32.1	10.58	34.88	400	289	P	H
	*	5785	99.44	-	-	91.64	32.1	10.58	34.88	400	289	A	H
		5852.625	50.42	-65.79	116.21	42.31	32.21	10.64	34.74	400	289	P	H
		5856.315	50	-60.43	110.43	41.88	32.21	10.64	34.73	400	289	P	H
		5924.375	50.53	-18.13	68.66	42.09	32.35	10.69	34.6	400	289	P	H
		5942.415	49.83	-18.37	68.2	41.31	32.38	10.7	34.56	400	289	P	H
													H
													H
		5615	50.18	-18.02	68.2	43.02	31.97	10.4	35.21	100	225	P	V
		5673.6	50.58	-35.12	85.7	43.32	31.9	10.46	35.1	100	225	P	V
		5719	52.33	-58.19	110.52	44.85	31.98	10.51	35.01	100	225	P	V
		5721.2	51.16	-62.38	113.54	43.67	31.98	10.51	35	100	225	P	V
	*	5785	112.26	-	-	104.46	32.1	10.58	34.88	100	225	P	V
	*	5785	104.73	-	-	96.93	32.1	10.58	34.88	100	225	A	V
		5851.6	51.73	-66.82	118.55	43.63	32.2	10.64	34.74	100	225	P	V
		5856.315	52.84	-57.59	110.43	44.72	32.21	10.64	34.73	100	225	P	V
		5880.095	52.1	-49.32	101.42	43.87	32.26	10.66	34.69	100	225	P	V
		5925.4	51.21	-16.99	68.2	42.77	32.35	10.69	34.6	100	225	P	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 165 5825MHz	*	5825	106.79	-	-	98.82	32.15	10.62	34.8	391	289	P	H
	*	5825	99.08	-	-	91.11	32.15	10.62	34.8	391	289	A	H
		5853.2	59.92	-54.98	114.9	51.81	32.21	10.64	34.74	391	289	P	H
		5857.8	58.66	-51.35	110.01	50.53	32.22	10.64	34.73	391	289	P	H
		5880.2	53.23	-48.11	101.34	45	32.26	10.66	34.69	391	289	P	H
		5934.2	50.32	-17.88	68.2	41.84	32.37	10.69	34.58	391	289	P	H
													H
													H
	*	5825	111.92	-	-	103.95	32.15	10.62	34.8	100	226	P	V
	*	5825	104.7	-	-	96.73	32.15	10.62	34.8	100	226	A	V
		5850.8	69.53	-50.85	120.38	61.44	32.2	10.64	34.75	100	226	P	V
		5855.8	65.5	-45.08	110.58	57.39	32.21	10.64	34.74	100	226	P	V
		5875.2	55.1	-49.95	105.05	46.9	32.25	10.65	34.7	100	226	P	V
		5942.4	51.56	-16.64	68.2	43.04	32.38	10.7	34.56	100	226	P	V
													V
													V
													V
Remark 1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



Band 4 5725~5850MHz

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 149 5745MHz		10894	51.15	-22.85	74	56.81	40.39	14.82	60.87	-	-	P	H
		10894	41.13	-12.87	54	46.79	40.39	14.82	60.87	-	-	A	H
		11490	51.62	-22.38	74	57.08	40.29	15.12	60.87	100	10	P	H
		11490	40.67	-13.33	54	46.13	40.29	15.12	60.87	100	10	A	H
		14480	50.11	-23.89	74	55.48	41.34	16.47	63.18	-	-	P	H
		14480	40.06	-13.94	54	45.43	41.34	16.47	63.18	-	-	A	H
		17235	49.43	-18.77	68.2	48.84	40.84	18.3	58.55	-	-	P	H
		17989	58.71	-15.29	74	48.87	48.18	18.93	57.27	-	-	P	H
		17989	48.66	-5.34	54	38.82	48.18	18.93	57.27	-	-	A	H
													H
													H
													H
		10872	50.41	-23.59	74	56.14	40.34	14.81	60.88	-	-	P	V
		10872	40.43	-13.57	54	46.16	40.34	14.81	60.88	-	-	A	V
		11490	54.56	-19.44	74	60.02	40.29	15.12	60.87	100	213	P	V
		11490	44.42	-9.58	54	49.88	40.29	15.12	60.87	100	213	A	V
		14470	50.51	-23.49	74	55.91	41.31	16.47	63.18	-	-	P	V
		14470	40.52	-13.48	54	45.92	41.31	16.47	63.18	-	-	A	V
		17235	49.88	-18.32	68.2	49.29	40.84	18.3	58.55	-	-	P	V
		18000	58.95	-15.05	74	48.85	48.4	18.94	57.24	-	-	P	V
		18000	48.91	-5.09	54	38.81	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)
802.11a CH 157 5785MHz		10850	49.99	-24.01	74	55.77	40.3	14.8	60.88	-	-	P	H
		10850	39.88	-14.12	54	45.66	40.3	14.8	60.88	-	-	A	H
		11570	52.73	-21.27	74	58.35	40.16	15.16	60.94	100	15	P	H
		11570	36.86	-17.14	54	42.48	40.16	15.16	60.94	100	15	A	H
		14491	49.43	-24.57	74	54.75	41.37	16.48	63.17	-	-	P	H
		14491	39.37	-14.63	54	44.69	41.37	16.48	63.17	-	-	A	H
		17355	50.18	-18.02	68.2	48.66	41.6	18.4	58.48	-	-	P	H
		18000	58.01	-15.99	74	47.91	48.4	18.94	57.24	-	-	P	H
		18000	48.26	-5.74	54	38.16	48.4	18.94	57.24	-	-	A	H
													H
													H
													H
		10916	49.95	-24.05	74	55.56	40.43	14.83	60.87	-	-	P	V
		10916	39.91	-14.09	54	45.52	40.43	14.83	60.87	-	-	A	V
		11570	55.2	-18.8	74	60.82	40.16	15.16	60.94	100	214	P	V
		11570	45.22	-8.78	54	50.84	40.16	15.16	60.94	100	214	A	V
		14500	49.63	-24.37	74	54.92	41.4	16.48	63.17	-	-	P	V
		14500	39.64	-14.36	54	44.93	41.4	16.48	63.17	-	-	A	V
		17355	52.46	-15.74	68.2	50.94	41.6	18.4	58.48	-	-	P	V
		18000	59.09	-14.91	74	48.99	48.4	18.94	57.24	-	-	P	V
		18000	49.01	-4.99	54	38.91	48.4	18.94	57.24	-	-	A	V
													V
													V
													V

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.		(MHz)	(dBμV/m)	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4+3				(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 165 5825MHz		10993	50.42	-23.58	74	55.82	40.59	14.87	60.86	-	-	P	H
		10993	40.41	-13.59	54	45.81	40.59	14.87	60.86	-	-	A	H
		11650	51.42	-22.58	74	57.5	39.75	15.2	61.03	100	14	P	H
		11650	41.06	-12.94	54	47.14	39.75	15.2	61.03	100	14	A	H
		14471	50.18	-23.82	74	55.58	41.31	16.47	63.18	-	-	P	H
		14471	40.13	-13.87	54	45.53	41.31	16.47	63.18	-	-	A	H
		17475	51.79	-16.41	68.2	49.17	42.53	18.5	58.41	-	-	P	H
		17989	58.74	-15.26	74	48.9	48.18	18.93	57.27	-	-	P	H
		17989	48.91	-5.09	54	39.07	48.18	18.93	57.27	-	-	A	H
													H
													H
													H
		10872	50.1	-23.9	74	55.83	40.34	14.81	60.88	-	-	P	V
		10872	40.09	-13.91	54	45.82	40.34	14.81	60.88	-	-	A	V
		11650	55.44	-18.56	74	61.52	39.75	15.2	61.03	100	232	P	V
		11650	45	-9	54	51.08	39.75	15.2	61.03	100	232	A	V
		14500	50.39	-23.61	74	55.68	41.4	16.48	63.17	-	-	P	V
		14500	40.34	-13.66	54	45.63	41.4	16.48	63.17	-	-	A	V
		17475	58.34	-9.86	68.2	55.72	42.53	18.5	58.41	100	120	P	V
		17989	58.21	-15.79	74	48.37	48.18	18.93	57.27	-	-	P	V
		17989	48.17	-5.83	54	38.33	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.												

**Band 4 5725~5850MHz****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 149 5745MHz		5644.2	48.59	-19.61	68.2	41.4	31.91	10.43	35.15	383	289	P	H
		5694.8	51.61	-49.76	101.37	44.28	31.9	10.48	35.05	383	289	P	H
		5720	59.21	-51.59	110.8	51.72	31.98	10.51	35	383	289	P	H
		5724	70.63	-49.29	119.92	63.11	32	10.52	35	383	289	P	H
	*	5745	103.83	-	-	96.16	32.08	10.54	34.95	383	289	P	H
	*	5745	97.2	-	-	89.53	32.08	10.54	34.95	383	289	A	H
													H
													H
		5638.8	50.29	-17.91	68.2	43.12	31.92	10.42	35.17	100	225	P	V
		5689	56.15	-40.94	97.09	48.84	31.9	10.48	35.07	100	225	P	V
		5718.6	66.64	-43.77	110.41	59.17	31.97	10.51	35.01	100	225	P	V
		5723.2	77.23	-40.87	118.1	69.72	31.99	10.52	35	100	225	P	V
	*	5745	111.28	-	-	103.61	32.08	10.54	34.95	100	225	P	V
	*	5745	103.14	-	-	95.47	32.08	10.54	34.95	100	225	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 157 5785MHz		5618.4	48.99	-19.21	68.2	41.84	31.96	10.4	35.21	379	288	P	H
		5686	48.82	-46.05	94.87	41.52	31.9	10.47	35.07	379	288	P	H
		5718.8	49.26	-61.2	110.46	41.78	31.98	10.51	35.01	379	288	P	H
		5723	49.11	-68.53	117.64	41.6	31.99	10.52	35	379	288	P	H
	*	5785	105.35	-	-	97.55	32.1	10.58	34.88	379	288	P	H
	*	5785	97.69	-	-	89.89	32.1	10.58	34.88	379	288	A	H
		5850.575	50	-70.89	120.89	41.91	32.2	10.64	34.75	379	288	P	H
		5855.085	49.2	-61.58	110.78	41.09	32.21	10.64	34.74	379	288	P	H
		5883.99	50.05	-48.47	98.52	41.8	32.27	10.66	34.68	379	288	P	H
		5929.09	50.2	-18	68.2	41.74	32.36	10.69	34.59	379	288	P	H
													H
													H
		5634.2	50.1	-18.1	68.2	42.92	31.93	10.42	35.17	100	225	P	V
		5692.2	50.71	-48.74	99.45	43.39	31.9	10.48	35.06	100	225	P	V
		5715.6	51.37	-58.2	109.57	43.91	31.96	10.51	35.01	100	225	P	V
		5722.6	50.98	-65.75	116.73	43.48	31.99	10.51	35	100	225	P	V
	*	5785	111.24	-	-	103.44	32.1	10.58	34.88	100	225	P	V
	*	5785	103.63	-	-	95.83	32.1	10.58	34.88	100	225	A	V
		5852.83	52.07	-63.68	115.75	43.96	32.21	10.64	34.74	100	225	P	V
		5857.955	52.26	-57.71	109.97	44.13	32.22	10.64	34.73	100	225	P	V
		5912.075	51.43	-26.3	77.73	43.05	32.32	10.68	34.62	100	225	P	V
		5940.775	51.32	-16.88	68.2	42.81	32.38	10.7	34.57	100	225	P	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 165 5825MHz	*	5825	105.41	-	-	97.44	32.15	10.62	34.8	392	289	P	H
	*	5825	98.07	-	-	90.1	32.15	10.62	34.8	392	289	A	H
		5850.6	60.84	-59.99	120.83	52.75	32.2	10.64	34.75	392	289	P	H
		5856.2	58.71	-51.75	110.46	50.59	32.21	10.64	34.73	392	289	P	H
		5878.4	53.37	-49.3	102.67	45.15	32.26	10.65	34.69	392	289	P	H
		5935.8	50.89	-17.31	68.2	42.4	32.37	10.7	34.58	392	289	P	H
													H
													H
	*	5825	111.34	-	-	103.37	32.15	10.62	34.8	100	225	P	V
	*	5825	103.93	-	-	95.96	32.15	10.62	34.8	100	225	A	V
		5851	68.27	-51.65	119.92	60.18	32.2	10.64	34.75	100	225	P	V
		5855.4	66.14	-44.55	110.69	58.03	32.21	10.64	34.74	100	225	P	V
		5876.2	55.21	-49.1	104.31	47.01	32.25	10.65	34.7	100	225	P	V
		5936.6	51.65	-16.55	68.2	43.16	32.37	10.7	34.58	100	225	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz
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)
802.11n HT20 CH 149 5745MHz		10949	50.96	-23.04	74	56.48	40.5	14.85	60.87	-	-	P	H
		10949	40.9	-13.1	54	46.42	40.5	14.85	60.87	-	-	A	H
		11490	47.79	-26.21	74	53.25	40.29	15.12	60.87	-	-	P	H
		14480	49.49	-24.51	74	54.86	41.34	16.47	63.18	-	-	P	H
		14480	39.46	-14.54	54	44.83	41.34	16.47	63.18	-	-	A	H
		17235	48.46	-19.74	68.2	47.87	40.84	18.3	58.55	-	-	P	H
		17989	58.98	-15.02	74	49.14	48.18	18.93	57.27	-	-	P	H
		17989	48.97	-5.03	54	39.13	48.18	18.93	57.27	-	-	A	H
													H
													H
													H
													H
		10905	50.58	-23.42	74	56.21	40.41	14.83	60.87	-	-	P	V
		10905	40.64	-13.36	54	46.27	40.41	14.83	60.87	-	-	A	V
		11490	53.58	-20.42	74	59.04	40.29	15.12	60.87	100	210	P	V
		11490	44.39	-9.61	54	49.85	40.29	15.12	60.87	100	210	A	V
		14500	50.15	-23.85	74	55.44	41.4	16.48	63.17	-	-	P	V
		14500	38.93	-15.07	54	44.22	41.4	16.48	63.17	-	-	A	V
		17235	50.04	-18.16	68.2	49.45	40.84	18.3	58.55	-	-	P	V
		18000	58.21	-15.79	74	48.11	48.4	18.94	57.24	-	-	P	V
		18000	48.37	-5.63	54	38.27	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)
802.11n HT20 CH 157 5785MHz		10938	50.73	-23.27	74	56.28	40.48	14.84	60.87	-	-	P	H
		10938	40.71	-13.29	54	46.26	40.48	14.84	60.87	-	-	A	H
		11570	51.6	-22.4	74	57.22	40.16	15.16	60.94	100	13	P	H
		11570	41.61	-12.39	54	47.23	40.16	15.16	60.94	100	13	A	H
		14491	50.19	-23.81	74	55.51	41.37	16.48	63.17	-	-	P	H
		14491	40.18	-13.82	54	45.5	41.37	16.48	63.17	-	-	A	H
		17355	50.61	-17.59	68.2	49.09	41.6	18.4	58.48	-	-	P	H
		17989	59.12	-14.88	74	49.28	48.18	18.93	57.27	-	-	P	H
		17989	49.03	-4.97	54	39.19	48.18	18.93	57.27	-	-	A	H
													H
													H
													H
		10927	50.1	-23.9	74	55.68	40.45	14.84	60.87	-	-	P	V
		10927	40.07	-13.93	54	45.65	40.45	14.84	60.87	-	-	A	V
		11570	56.5	-17.5	74	62.12	40.16	15.16	60.94	100	219	P	V
		11570	44.81	-9.19	54	50.43	40.16	15.16	60.94	100	219	A	V
		14491	50.03	-23.97	74	55.35	41.37	16.48	63.17	-	-	P	V
		14491	39.99	-14.01	54	45.31	41.37	16.48	63.17	-	-	A	V
		17355	58.74	-9.46	68.2	57.22	41.6	18.4	58.48	100	119	P	V
		17989	58.34	-15.66	74	48.5	48.18	18.93	57.27	-	-	P	V
		17989	48.41	-5.59	54	38.57	48.18	18.93	57.27	-	-	A	V
													V
													V
													V

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.		(MHz)	(dBμV/m)	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4+3				(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT20 CH 165 5825MHz		10927	51	-23	74	56.58	40.45	14.84	60.87	-	-	P	H
		10927	40.94	-13.06	54	46.52	40.45	14.84	60.87	-	-	A	H
		11650	53.58	-20.42	74	59.66	39.75	15.2	61.03	100	11	P	H
		11650	44.18	-9.82	54	50.26	39.75	15.2	61.03	100	11	A	H
		14471	50.22	-23.78	74	55.62	41.31	16.47	63.18	-	-	P	H
		14471	40.2	-13.8	54	45.6	41.31	16.47	63.18	-	-	A	H
		17475	50.65	-17.55	68.2	48.03	42.53	18.5	58.41	-	-	P	H
		17978	58.51	-15.49	74	48.91	47.96	18.93	57.29	-	-	P	H
		17978	48.41	-5.59	54	38.81	47.96	18.93	57.29	-	-	A	H
													H
													H
													H
		10938	50.62	-23.38	74	56.17	40.48	14.84	60.87	-	-	P	V
		10938	40.58	-13.42	54	46.13	40.48	14.84	60.87	-	-	A	V
		11650	54.64	-19.36	74	60.72	39.75	15.2	61.03	100	213	P	V
		11650	45.16	-8.84	54	51.24	39.75	15.2	61.03	100	213	A	V
		14471	50.37	-23.63	74	55.77	41.31	16.47	63.18	-	-	P	V
		14471	40.29	-13.71	54	45.69	41.31	16.47	63.18	-	-	A	V
		17475	52.57	-15.63	68.2	49.95	42.53	18.5	58.41	-	-	P	V
		18000	58.46	-15.54	74	48.36	48.4	18.94	57.24	-	-	P	V
		18000	48.26	-5.74	54	38.16	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.												



Band 4 5725~5850MHz

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)
802.11n HT40 CH 151 5755MHz		5621	49.33	-18.87	68.2	42.17	31.96	10.4	35.2	400	287	P	H
		5695.4	50.04	-51.77	101.81	42.71	31.9	10.48	35.05	400	287	P	H
		5718.4	66.42	-43.93	110.35	58.95	31.97	10.51	35.01	400	287	P	H
		5724	67.56	-52.36	119.92	60.04	32	10.52	35	400	287	P	H
	*	5755	100.28	-	-	92.57	32.1	10.55	34.94	400	287	P	H
	*	5755	93.57	-	-	85.86	32.1	10.55	34.94	400	287	A	H
		5850.575	49.01	-71.88	120.89	40.92	32.2	10.64	34.75	400	287	P	H
		5868.615	49.54	-57.45	106.99	41.36	32.24	10.65	34.71	400	287	P	H
		5880.71	49.88	-51.08	100.96	41.65	32.26	10.66	34.69	400	287	P	H
		5935.65	49.84	-18.36	68.2	41.36	32.37	10.69	34.58	400	287	P	H
													H
													H
		5618	51.41	-16.79	68.2	44.26	31.96	10.4	35.21	398	350	P	V
		5698	57.36	-46.37	103.73	50.02	31.9	10.49	35.05	398	350	P	V
		5718.4	76.74	-33.61	110.35	69.27	31.97	10.51	35.01	398	350	P	V
		5723.6	77.37	-41.64	119.01	69.86	31.99	10.52	35	398	350	P	V
	*	5755	107.32	-	-	99.61	32.1	10.55	34.94	398	350	P	V
	*	5755	99.84	-	-	92.13	32.1	10.55	34.94	398	350	A	V
		5851.6	51.12	-67.43	118.55	43.02	32.2	10.64	34.74	398	350	P	V
		5859.39	51.01	-58.56	109.57	42.88	32.22	10.64	34.73	398	350	P	V
		5918.635	51.78	-21.11	72.89	43.37	32.34	10.68	34.61	398	350	P	V
		5926.015	50.98	-17.22	68.2	42.54	32.35	10.69	34.6	398	350	P	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 HT40 CH 159 5795MHz		5641.8	49.02	-19.18	68.2	41.83	31.92	10.43	35.16	379	292	P	H
		5661.2	49.01	-27.51	76.52	41.78	31.9	10.45	35.12	379	292	P	H
		5715.6	48.69	-60.88	109.57	41.23	31.96	10.51	35.01	379	292	P	H
		5720.8	48.77	-63.85	112.62	41.28	31.98	10.51	35	379	292	P	H
	*	5795	101.08	-	-	93.25	32.1	10.59	34.86	379	292	P	H
	*	5795	93.21	-	-	85.38	32.1	10.59	34.86	379	292	A	H
		5850.985	53.06	-66.89	119.95	44.97	32.2	10.64	34.75	379	292	P	H
		5855.085	49.87	-60.91	110.78	41.76	32.21	10.64	34.74	379	292	P	H
		5892.805	50.04	-41.95	91.99	41.75	32.29	10.66	34.66	379	292	P	H
		5943.03	49.73	-18.47	68.2	41.2	32.39	10.7	34.56	379	292	P	H
													H
													H
		5601.2	49.99	-18.21	68.2	42.85	32	10.38	35.24	371	349	P	V
		5691.6	50.09	-48.92	99.01	42.77	31.9	10.48	35.06	371	349	P	V
		5713.4	50.3	-58.65	108.95	42.87	31.95	10.5	35.02	371	349	P	V
		5723.6	51.42	-67.59	119.01	43.91	31.99	10.52	35	371	349	P	V
	*	5795	106.71	-	-	98.88	32.1	10.59	34.86	371	349	P	V
	*	5795	99.01	-	-	91.18	32.1	10.59	34.86	371	349	A	V
		5851.6	60.77	-57.78	118.55	52.67	32.2	10.64	34.74	371	349	P	V
		5855.29	53.48	-57.24	110.72	45.37	32.21	10.64	34.74	371	349	P	V
		5882.76	51.44	-48	99.44	43.19	32.27	10.66	34.68	371	349	P	V
		5948.36	50.64	-17.56	68.2	42.09	32.4	10.7	34.55	371	349	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz
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)
802.11n HT40 CH 151 5755MHz		10905	50.79	-23.21	74	56.42	40.41	14.83	60.87	-	-	P	H
		10905	40.77	-13.23	54	46.4	40.41	14.83	60.87	-	-	A	H
		11510	50.11	-23.89	74	55.58	40.28	15.13	60.88	100	12	P	H
		11510	41.15	-12.85	54	46.62	40.28	15.13	60.88	100	12	A	H
		14500	50.29	-23.71	74	55.58	41.4	16.48	63.17	-	-	P	H
		14500	40.27	-13.73	54	45.56	41.4	16.48	63.17	-	-	A	H
		17265	49.87	-18.33	68.2	49.13	40.96	18.32	58.54	-	-	P	H
		18000	58.46	-15.54	74	48.36	48.4	18.94	57.24	-	-	P	H
		18000	48.49	-5.51	54	38.39	48.4	18.94	57.24	-	-	A	H
													H
													H
													H
		10828	50.38	-23.62	74	56.21	40.26	14.79	60.88	-	-	P	V
		10828	40.4	-13.6	54	46.23	40.26	14.79	60.88	-	-	A	V
		11510	51.66	-22.34	74	57.13	40.28	15.13	60.88	100	210	P	V
		11510	42.75	-11.25	54	48.22	40.28	15.13	60.88	100	210	A	V
		14470	49.9	-24.1	74	55.3	41.31	16.47	63.18	-	-	P	V
		14470	39.91	-14.09	54	45.31	41.31	16.47	63.18	-	-	A	V
		17265	50.04	-18.16	68.2	49.3	40.96	18.32	58.54	-	-	P	V
		18000	58.64	-15.36	74	48.54	48.4	18.94	57.24	-	-	P	V
		18000	48.66	-5.34	54	38.56	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)
802.11n HT40 CH 159 5795MHz		10927	51.15	-22.85	74	56.73	40.45	14.84	60.87	-	-	P	H
		10927	41.14	-12.86	54	46.72	40.45	14.84	60.87	-	-	A	H
		11590	50.51	-23.49	74	56.19	40.12	15.17	60.97	100	14	P	H
		11590	41.59	-12.41	54	47.27	40.12	15.17	60.97	100	14	A	H
		14480	50.8	-23.2	74	56.17	41.34	16.47	63.18	-	-	P	H
		14480	40.79	-13.21	54	46.16	41.34	16.47	63.18	-	-	A	H
		17385	51.58	-16.62	68.2	49.76	41.86	18.42	58.46	-	-	P	H
		18000	57.85	-16.15	74	47.75	48.4	18.94	57.24	-	-	P	H
		18000	47.82	-6.18	54	37.72	48.4	18.94	57.24	-	-	A	H
													H
													H
													H
		10883	50.48	-23.52	74	56.17	40.37	14.82	60.88	-	-	P	V
		10883	40.47	-13.53	54	46.16	40.37	14.82	60.88	-	-	A	V
		11590	50.81	-23.19	74	56.49	40.12	15.17	60.97	100	211	P	V
		11590	41.82	-12.18	54	47.5	40.12	15.17	60.97	100	211	A	V
		14500	50.84	-23.16	74	56.13	41.4	16.48	63.17	-	-	P	V
		14500	40.83	-13.17	54	46.12	41.4	16.48	63.17	-	-	A	V
		17385	51.44	-16.76	68.2	49.62	41.86	18.42	58.46	-	-	P	V
		17989	58.34	-15.66	74	48.5	48.18	18.93	57.27	-	-	P	V
		17989	48.33	-5.67	54	38.49	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.												



Band 4 5725~5850MHz

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)
802.11ac VHT80 CH 155 5775MHz		5604.4	48.9	-19.3	68.2	41.76	31.99	10.38	35.23	400	286	P	H
		5698.8	54.36	-49.96	104.32	47.02	31.9	10.49	35.05	400	286	P	H
		5719.8	59.4	-51.34	110.74	51.91	31.98	10.51	35	400	286	P	H
		5723	61.31	-56.33	117.64	53.8	31.99	10.52	35	400	286	P	H
	*	5775	98.31	-	-	90.54	32.1	10.57	34.9	400	286	P	H
	*	5775	91.56	-	-	83.79	32.1	10.57	34.9	400	286	A	H
		5852.83	57.08	-58.67	115.75	48.97	32.21	10.64	34.74	400	286	P	H
		5857.135	56.92	-53.28	110.2	48.8	32.21	10.64	34.73	400	286	P	H
		5875.175	52.44	-52.63	105.07	44.24	32.25	10.65	34.7	400	286	P	H
		5925.605	49.93	-18.27	68.2	41.49	32.35	10.69	34.6	400	286	P	H
													H
													H
		5629.6	51.45	-16.75	68.2	44.28	31.94	10.41	35.18	399	349	P	V
		5699.6	64.9	-40.01	104.91	57.55	31.9	10.49	35.04	399	349	P	V
		5717.2	69.34	-40.68	110.02	61.87	31.97	10.51	35.01	399	349	P	V
		5720.4	69.77	-41.94	111.71	62.28	31.98	10.51	35	399	349	P	V
	*	5775	104.59	-	-	96.82	32.1	10.57	34.9	399	349	P	V
	*	5775	97.35	-	-	89.58	32.1	10.57	34.9	399	349	A	V
		5853.24	63.77	-51.04	114.81	55.66	32.21	10.64	34.74	399	349	P	V
		5858.775	64.68	-45.06	109.74	56.55	32.22	10.64	34.73	399	349	P	V
		5877.43	57.46	-45.93	103.39	49.25	32.25	10.65	34.69	399	349	P	V
		5940.57	51.21	-16.99	68.2	42.7	32.38	10.7	34.57	399	349	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

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)
i802.11ac VHT80 CH 155 5775MHz		10883	50.44	-23.56	74	56.13	40.37	14.82	60.88	-	-	P	H
		10883	40.42	-13.58	54	46.11	40.37	14.82	60.88	-	-	A	H
		11550	47.89	-26.11	74	53.46	40.2	15.15	60.92	-	-	P	H
		14491	51.25	-22.75	74	56.57	41.37	16.48	63.17	-	-	P	H
		14491	41.21	-12.79	54	46.53	41.37	16.48	63.17	-	-	A	H
		17325	51.11	-17.09	68.2	49.92	41.32	18.37	58.5	-	-	P	H
		18000	59.02	-14.98	74	48.92	48.4	18.94	57.24	-	-	P	H
		18000	49.03	-4.97	54	38.93	48.4	18.94	57.24	-	-	A	H
													H
													H
													H
													H
		10817	51.61	-22.39	74	57.49	40.23	14.78	60.89	-	-	P	V
		10817	41.6	-12.4	54	47.48	40.23	14.78	60.89	-	-	A	V
		11550	51.05	-22.95	74	56.62	40.2	15.15	60.92	100	215	P	V
		11550	42.06	-11.94	54	47.63	40.2	15.15	60.92	100	215	A	V
		14470	50.21	-23.79	74	55.61	41.31	16.47	63.18	-	-	P	V
		14470	40.22	-13.78	54	45.62	41.31	16.47	63.18	-	-	A	V
		17325	49.99	-18.21	68.2	48.8	41.32	18.37	58.5	-	-	P	V
		17978	58.46	-15.54	74	48.86	47.96	18.93	57.29	-	-	P	V
		17978	48.47	-5.53	54	38.87	47.96	18.93	57.29	-	-	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 802.11a (SHF @ 1m)

[illegible]



Emission below 1GHz

5GHz WIFI 802.11a (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4+3		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a LF		30	22.15	-17.85	40	29.44	24.59	0.61	32.49	-	-	P	H
		99.84	27.99	-15.51	43.5	43.26	15.91	1.32	32.5	-	-	P	H
		134.76	24.22	-19.28	43.5	37.59	17.48	1.66	32.51	-	-	P	H
		164.83	28.12	-15.38	43.5	42.78	16.02	1.82	32.5	-	-	P	H
		187.14	24.78	-18.72	43.5	40.67	14.72	1.86	32.47	-	-	P	H
		838.98	30.93	-15.07	46	30.23	28.69	3.95	31.94	-	-	P	H
													H
													H
													H
													H
													H
													H
		35.82	29.6	-10.4	40	39.85	21.61	0.68	32.54	-	-	P	V
		66.86	24.58	-15.42	40	44.07	11.96	1.09	32.54	-	-	P	V
		94.99	28.51	-14.99	43.5	44.43	15.28	1.28	32.48	-	-	P	V
		174.53	24.84	-18.66	43.5	40.27	15.24	1.82	32.49	-	-	P	V
		209.45	20.72	-22.78	43.5	36.02	15.13	2	32.43	-	-	P	V
		750.71	30.09	-15.91	46	30.94	27.91	3.69	32.45	-	-	P	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 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.	
4+3		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 149		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H
5745MHz													

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)

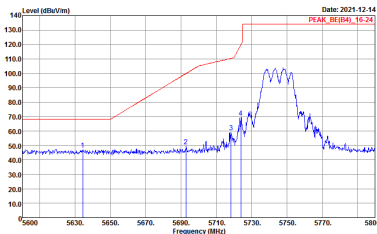
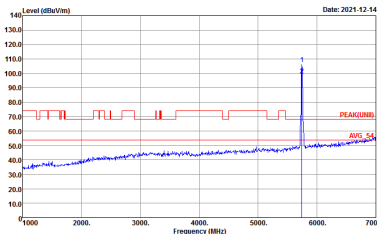
Both peak and average measured complies with the limit line, so test result is “PASS”.



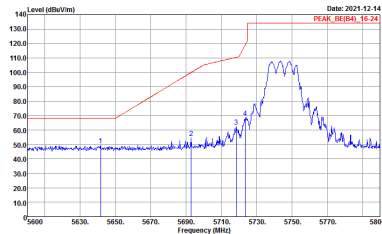
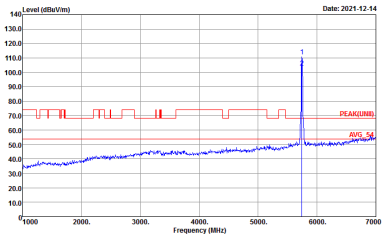
Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.1~23.1°C
		Relative Humidity :	55~60%

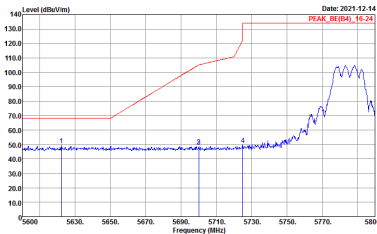
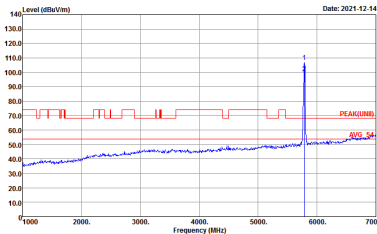
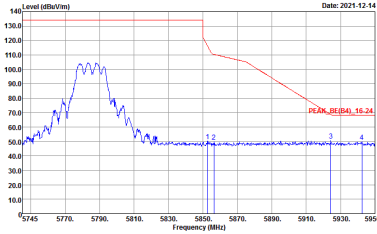
Band 4 - 5725~5850MHz
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNII) 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

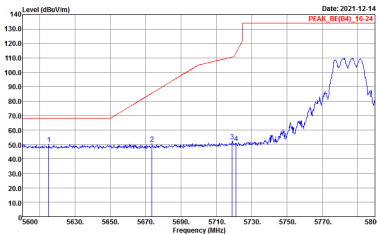
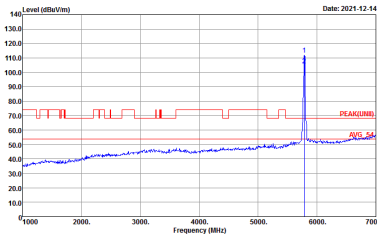
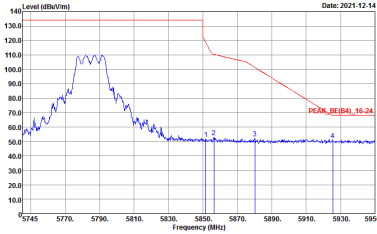


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(LINE) 3m 91200_1620_20211025 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto

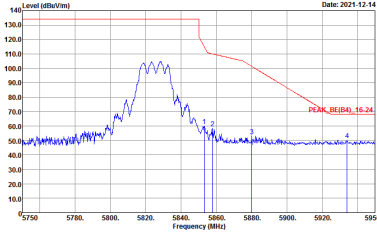
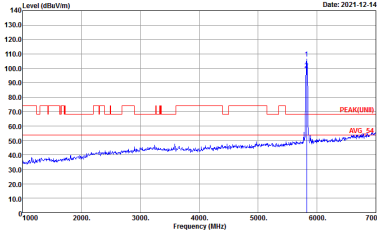


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK_FUND 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

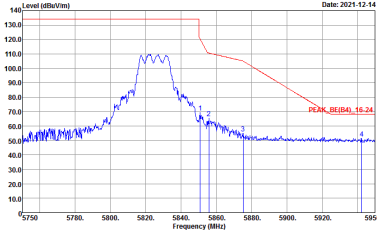
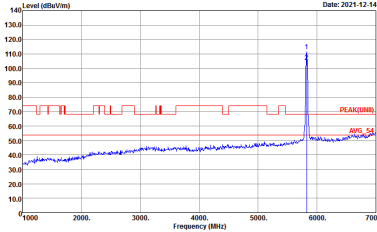


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



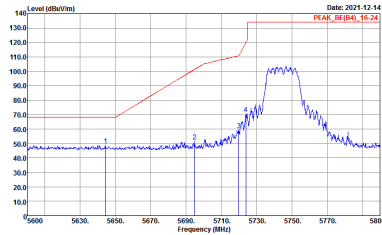
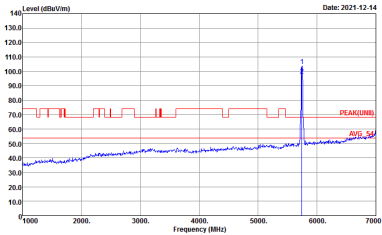
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(LINE) 3m 91200_1620_20211025 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto



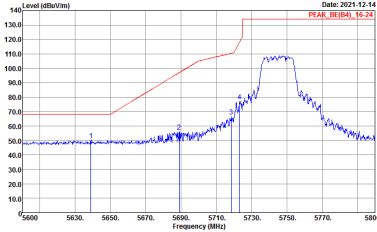
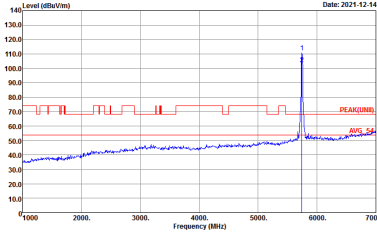
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE[84]_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUNDI) 3m 91200_1620_20211025 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto



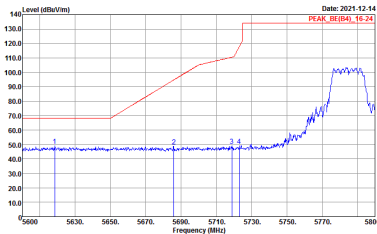
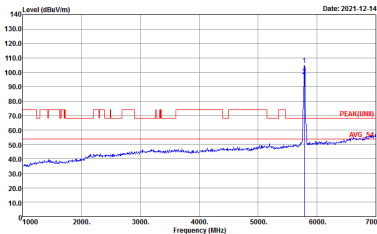
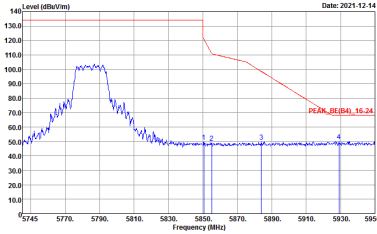
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

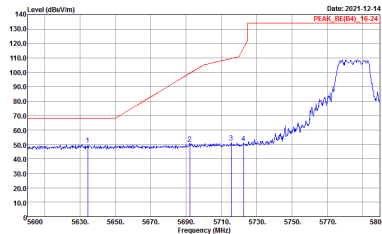
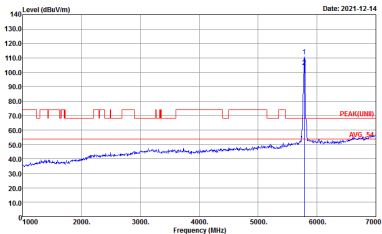
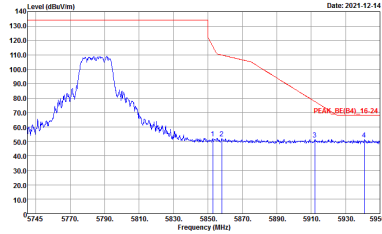


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(LINE) 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

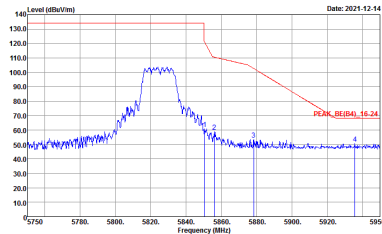
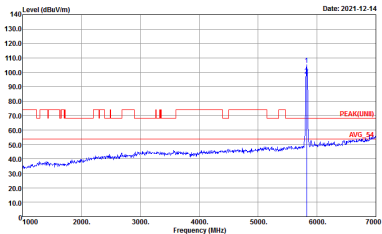


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(LINE) 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

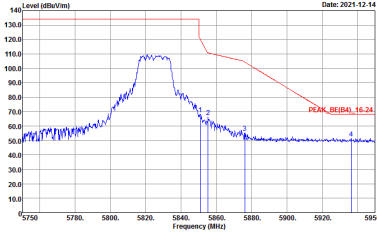
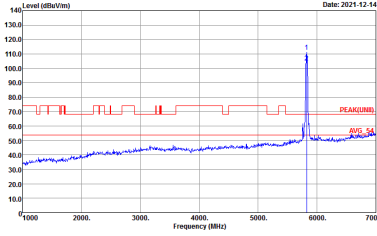


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(LINE1) 3m 91200_1620_20211025 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



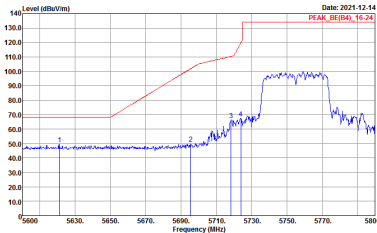
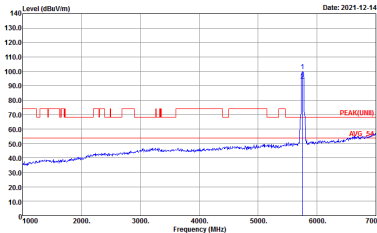
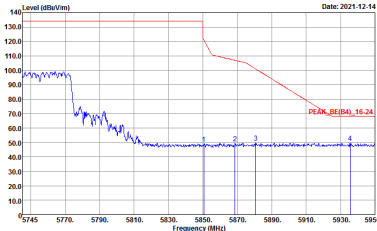
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_B4_16-24 3m 91200_1620_20211025 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK_UWB 3m 91200_1620_20211025 HORIZONTAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto



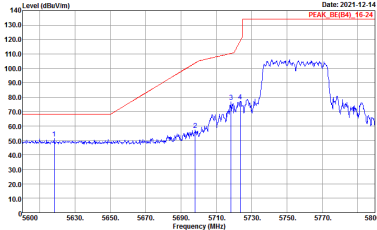
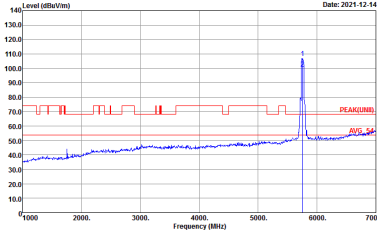
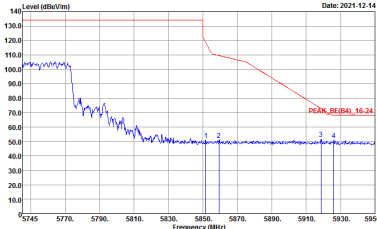
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(04)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto



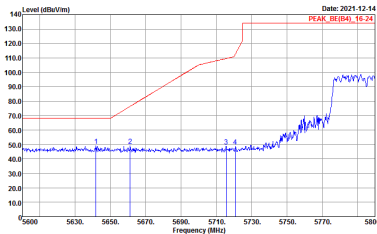
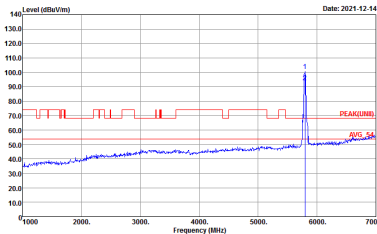
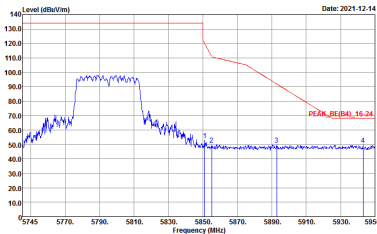
Band 4 5725~5850MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND)_16-24 3m 91200_1620_20211025 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



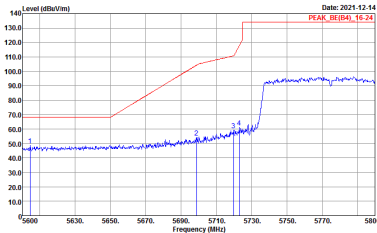
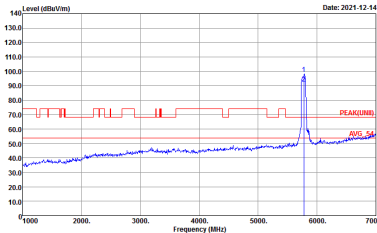
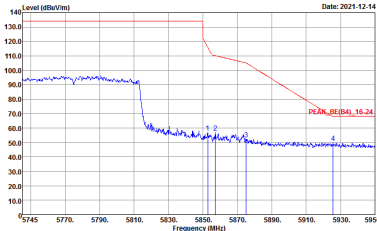
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



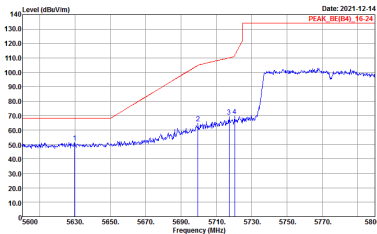
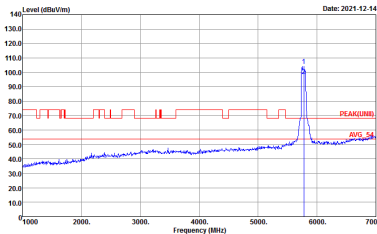
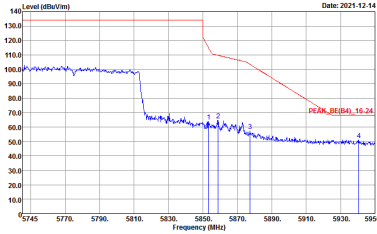
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
4+3	Vertical	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

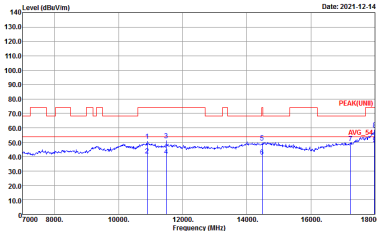
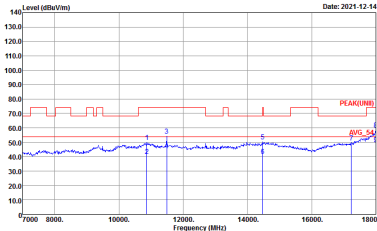
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_1620_20211025 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



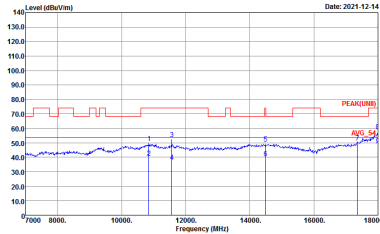
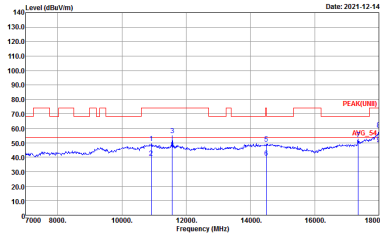
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH15-HY Condition : PEAK(FUND)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_1620_20211025 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



Band 4 - 5725~5850MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
4+3	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL



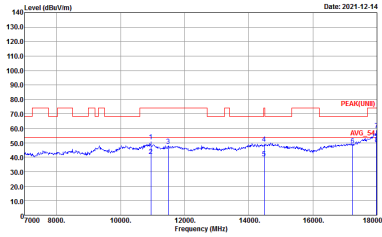
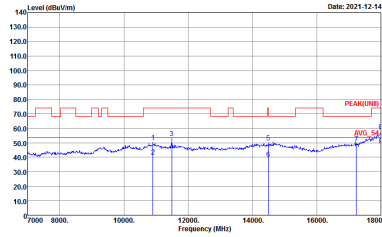
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
4+3	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
4+3	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2021-12-14 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	Level (dBuV/m) Date: 2021-12-14 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL



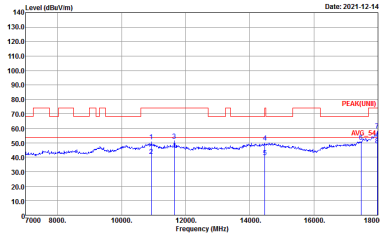
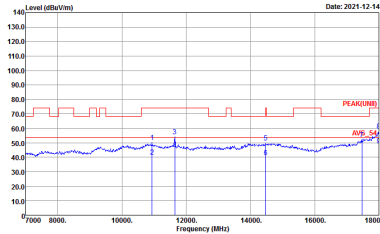
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
4+3	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-14Y Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	 Site : 03CH15-14Y Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL



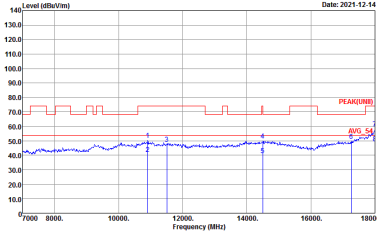
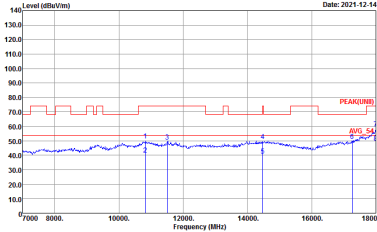
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
4+3	Horizontal	Vertical
Peak Avg.	Level (dBm/100MHz) Date: 2021-12-14 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	Level (dBm/100MHz) Date: 2021-12-14 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL



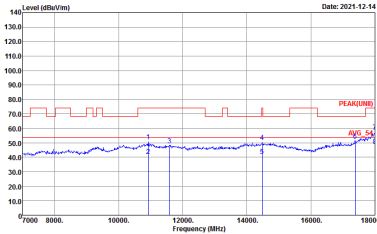
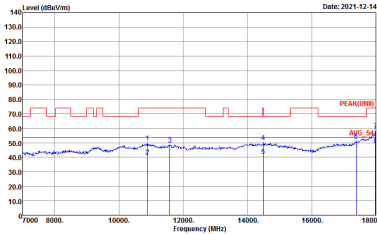
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
4+3	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL



Band 4 5725~5850MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

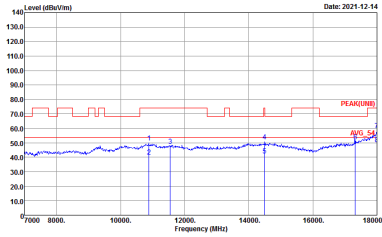
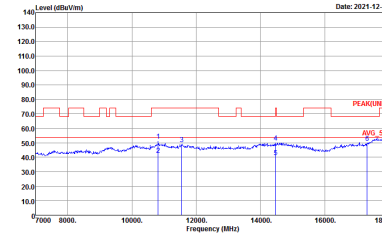
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
4+3	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-14Y Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	 Site : 03CH15-14Y Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
4+3	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL



Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-14Y Condition : PEAK(UNIT) 3m 91200_1620_20211025 HORIZONTAL	 Site : 03CH15-14Y Condition : PEAK(UNIT) 3m 91200_1620_20211025 VERTICAL

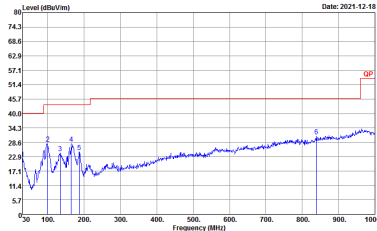
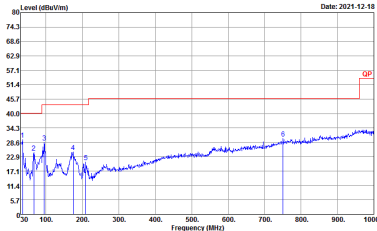


Emission above 18GHz
5GHz WIFI 802.11a (SHF @ 1m)

WIFI	5GHz WIFI	
ANT	802.11a SHF	
4+3	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2021-12-18 Frequency (MHz) Site : 03CH16-HY Condition : PEAK(UNIT) 1m SHF HORN_00991_21051 HORIZONTAL	Level (dBuV/m) Date: 2021-12-18 Frequency (MHz) Site : 03CH16-HY Condition : PEAK(UNIT) 1m SHF HORN_00991_21051 VERTICAL



Emission below 1GHz
5GHz WIFI 802.11ac VHT80 (LF @ 3m)

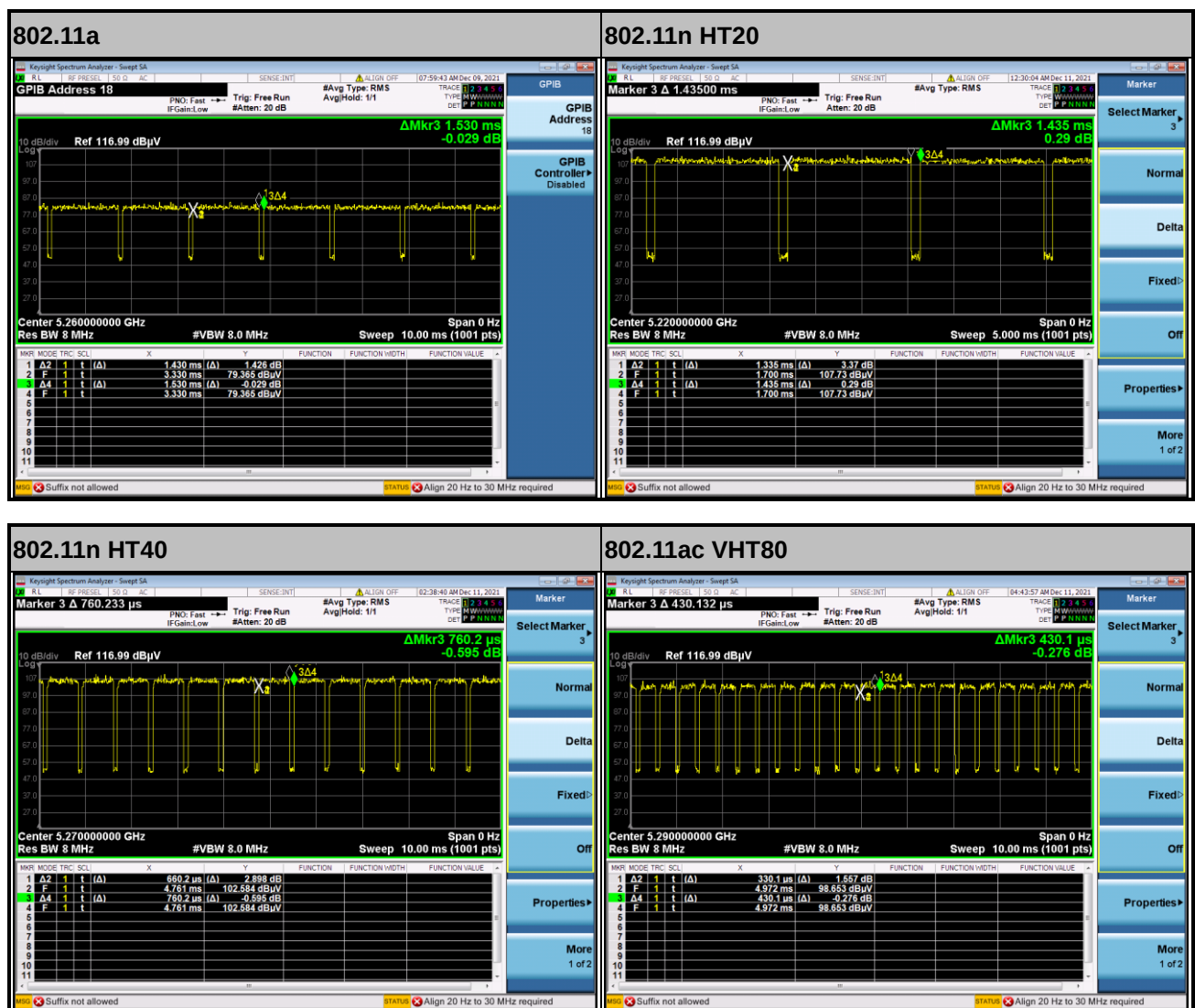
WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
4+3	Horizontal	Vertical
QP / Peak	 Site : 03CH15-HY Condition : QP 3m B1LOG_41912_20210208 HORIZONTAL	 Site : 03CH15-HY Condition : QP 3m B1LOG_41912_20210208 VERTICAL



Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
4+3	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	86.84	660	1.52	3kHz
4+3	5GHz 802.11ac VHT80	76.74	330	3.03	10kHz

MIMO <Ant. 4+3>



—THE END—