



FCC RADIO TEST REPORT

FCC ID : 2AG0Z-H38W
Equipment : Portal Go
Brand Name : FACEBOOK
Model Name : TN49KC
Applicant : Facebook Technologies, LLC
1 Hacker Way, Menlo Park, CA 94025, USA
Standard : FCC Part 15 Subpart E §15.407

The product was received on May 04, 2021 and testing was started from May 05, 2021 and completed on May 20, 2021. We, Sporton International Inc. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

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

Louis Wu

Approved by: Louis Wu

Sporton International Inc. EMC & Wireless Communications Laboratory

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



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History of this test report

Report No.	Version	Description	Issued Date
FR131119-01E	01	Initial issue of report	Jun. 08, 2021

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	Under limit 4.53 dB at 18000.000 MHz
3.5	15.207	AC Conducted Emission	Pass	Under limit 14.41 dB at 0.501 MHz
3.6	15.407(c)	Automatically Discontinue Transmission	Pass	-
3.7	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 declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Danny Lee

Report Producer: Amy Chen

1 General Description

1.1 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard		
Antenna Type	WLAN:	
	<Main>: Monopole Antenna	
	<Aux.>: PIFA Antenna	
	Bluetooth: PIFA Antenna	
Antenna information		
5725 MHz ~ 5850 MHz	Peak Gain (dBi)	<Main>: 3.44
		<Aux.>: 2.47

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

1.2 Modification of EUT

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

1.3 Testing Location

Test Site	Sporton International Inc. EMC & Wireless Communications Laboratory
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
Test Site No.	Sporton Site No. TH02-HY, CO05-HY, DFS02-HY

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

Test Site	Sporton International Inc. Wensan Laboratory
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	Sporton Site No. 03CH11-HY (TAF Code: 3786)
Remark	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory.

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

FCC designation No.: TW1190 and TW3786



1.4 Applicable Standards

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

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

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
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, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane without accessory) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

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

Note:

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

2.2 Test Mode

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

MIMO Mode

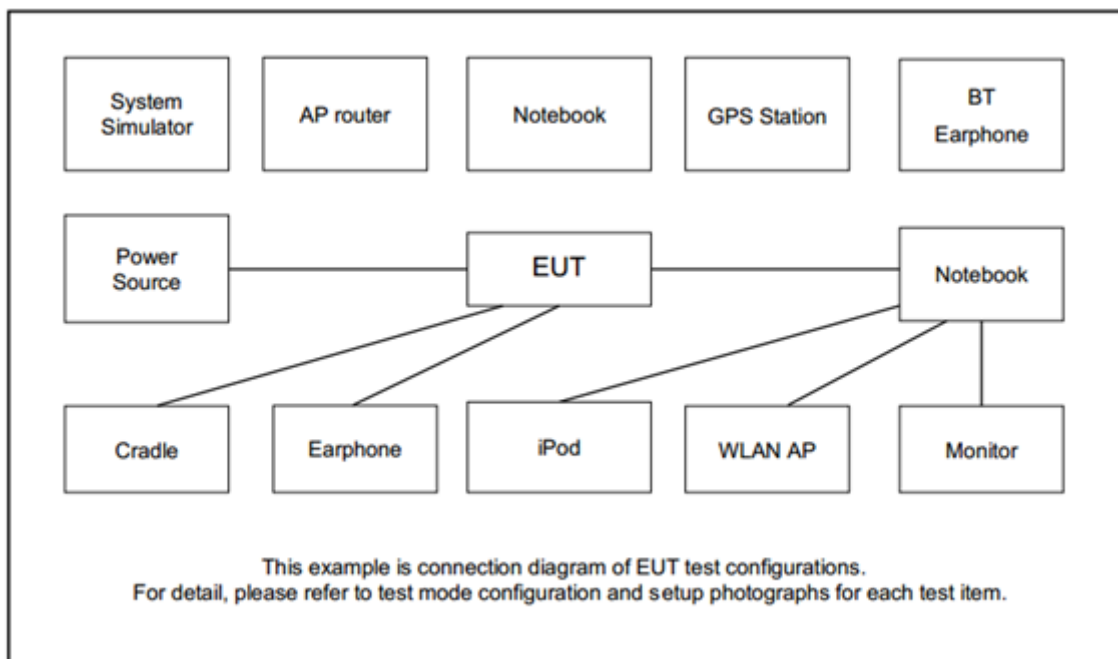
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20 (Covered by VHT20)	MCS0
802.11n HT40 (Covered by VHT40)	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + Bluetooth Link + H-Pattern + Docking (Charging from AC Adapter)

Ch. #		Band IV : 5725-5850 MHz			
		802.11a	802.11ac VHT20	802.11ac VHT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m



2.5 EUT Operation Test Setup

The RF test items, utility "QRCT V4.0.00113" 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.

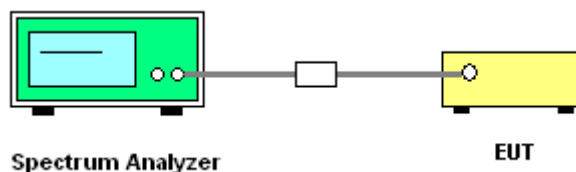
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

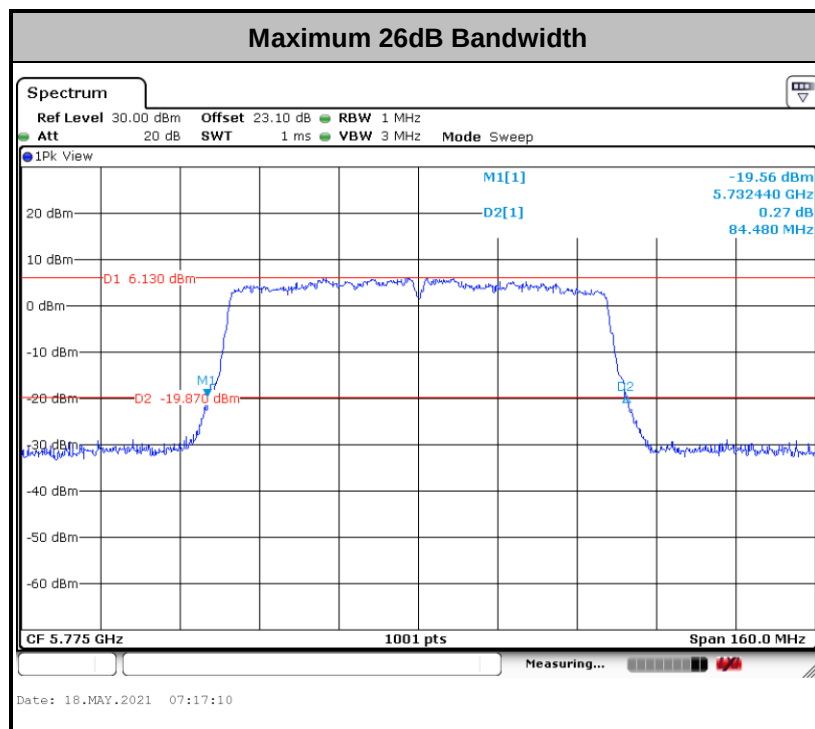
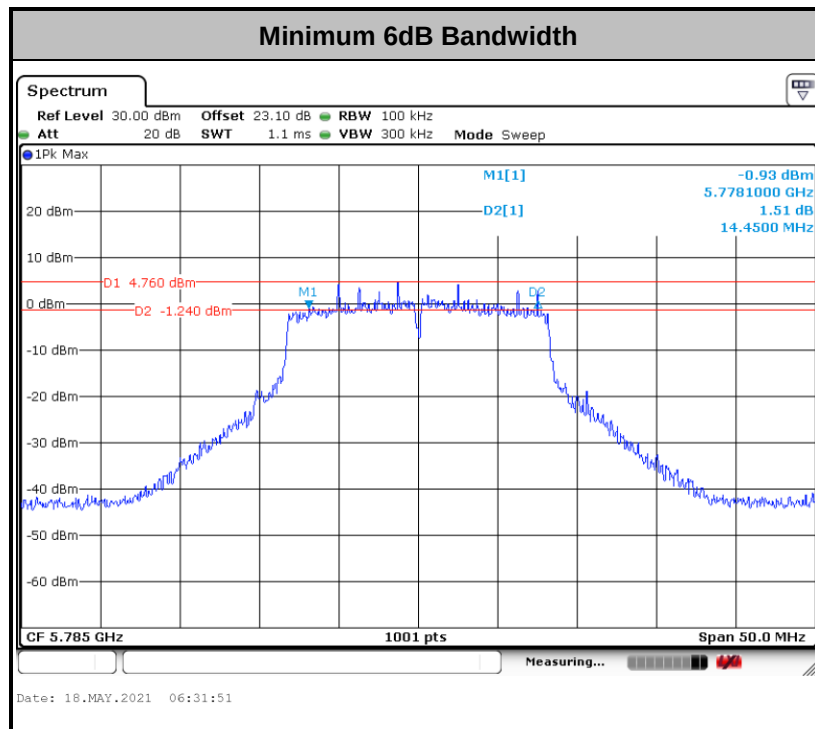
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section C) Emission bandwidth for the band 5.725-5.85 GHz
2. Set RBW = 100 kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is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

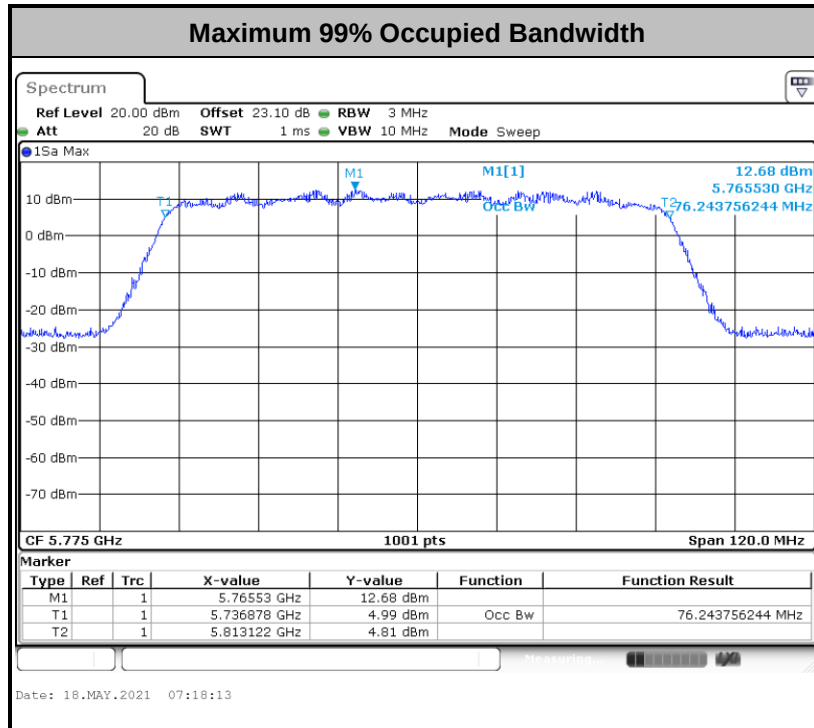
3.1.4 Test Setup



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

Please refer to Appendix A.





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

See list of measuring equipment of this test report.

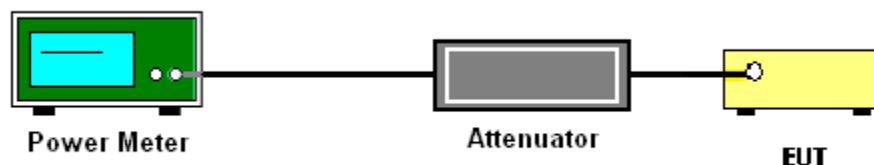
3.2.3 Test Procedures

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

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

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter.
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

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

See list of measuring equipment of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section F) Maximum power spectral density.

Method SA-3

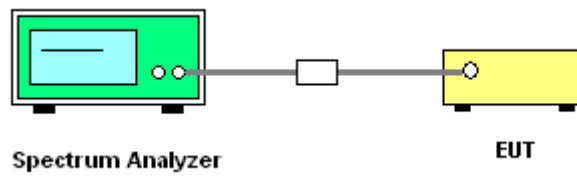
(power averaging (rms) detection with max hold):

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 1 MHz.
 - Set VBW $\geq$ 3 MHz.
 - Number of points in sweep $\geq$ 2 Span / RBW.
 - Sweep time $\leq$ (number of points in sweep) $\times$ T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Detector = power averaging (rms).
 - Trace mode = max hold.
 - Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
1. The RF output of EUT was 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.

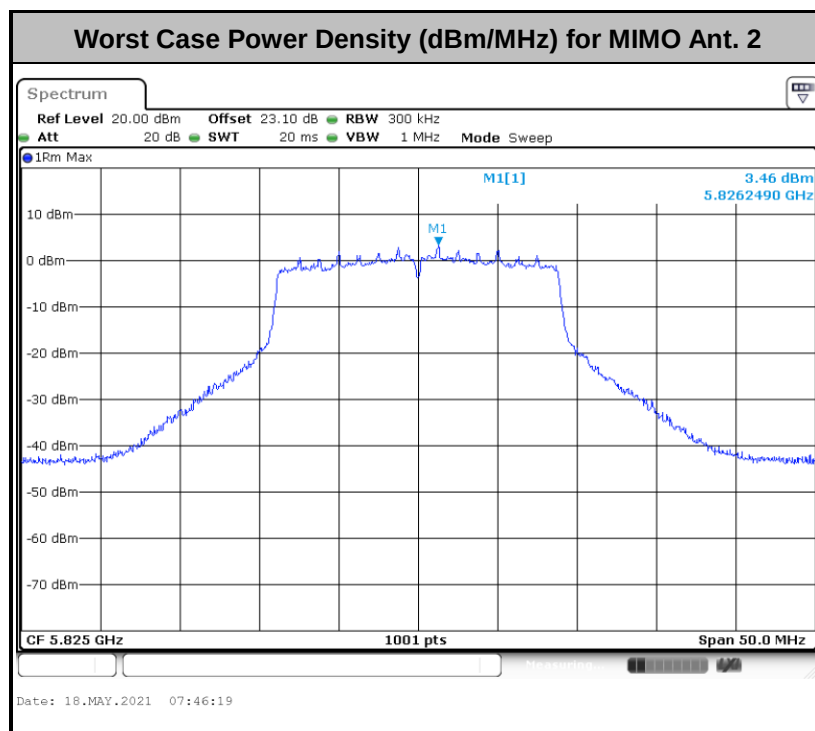
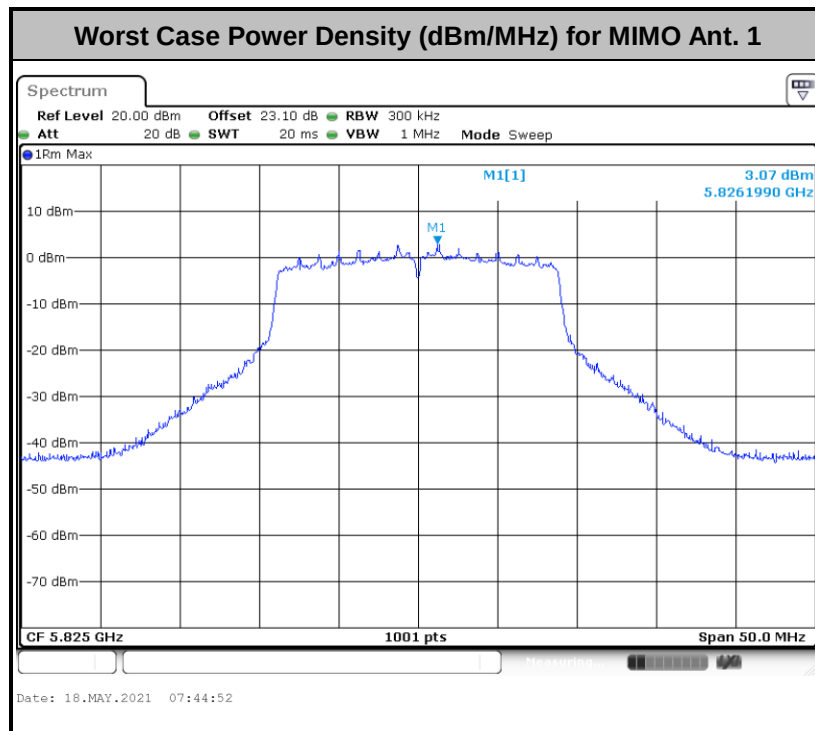
With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity $10 \log(N_{\text{ANT}})$ dB is added to each spectrum value before comparing to the emission limit. The addition of $10 \log(N_{\text{ANT}})$ 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.



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 fallen in restricted bands shall comply with the general field strength limits as below table,

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

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

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

EIRP (dBm)	Field Strength at 3m (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

See list of measuring equipment of this test report.

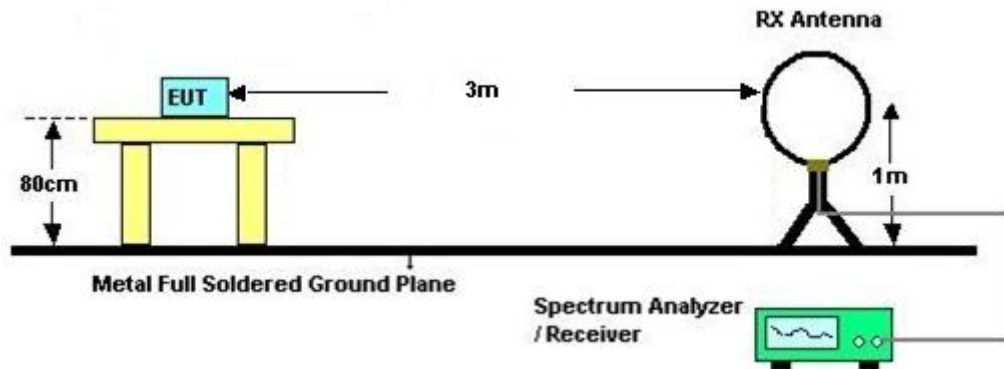
3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
 - (1) Procedure for Unwanted Emissions Measurements Below 1000 MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
 - (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 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 was placed on a turntable with 0.8 meter for frequency below 1 GHz and 1.5 meter for frequency above 1 GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was 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 was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1 GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.

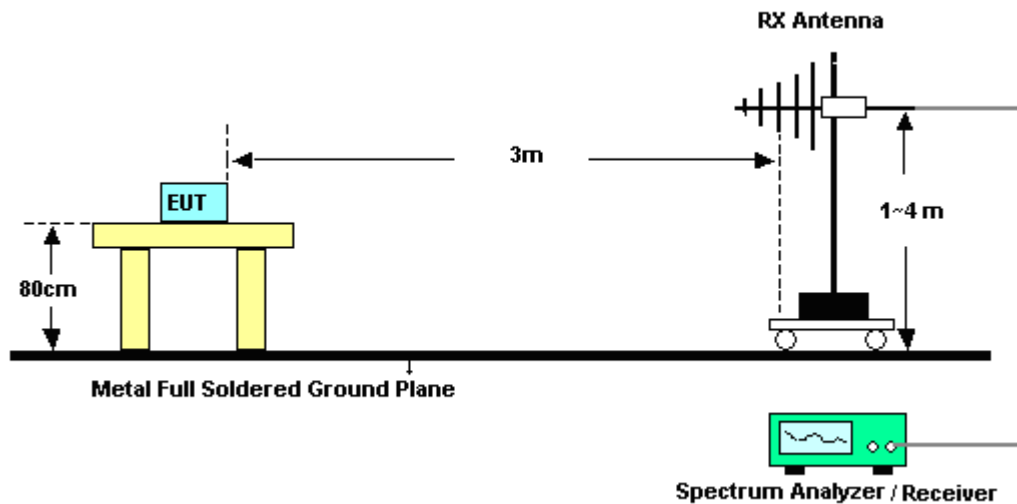
7. For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

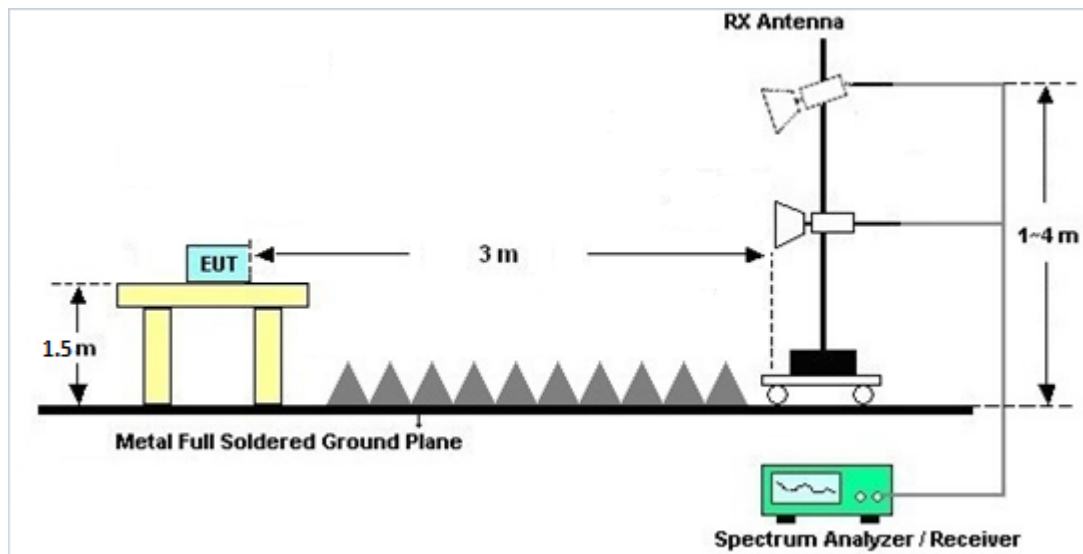
For radiated emissions below 30MHz



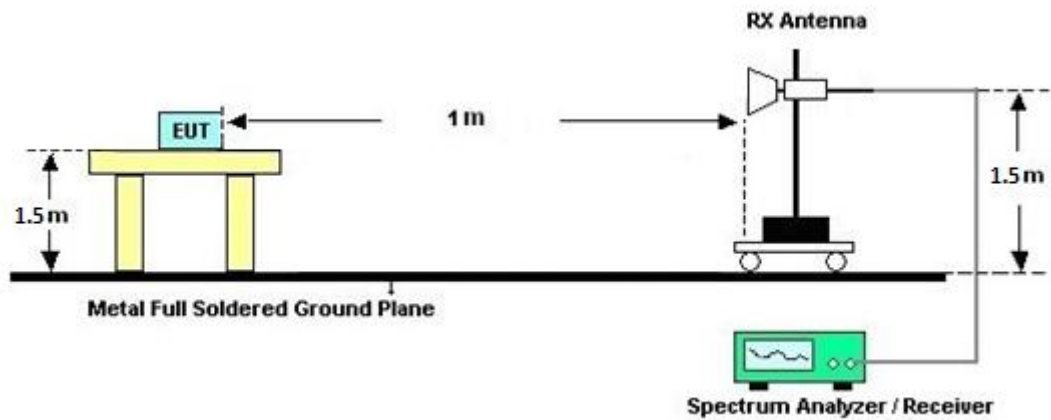
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz





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

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

There is a comparison data 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.

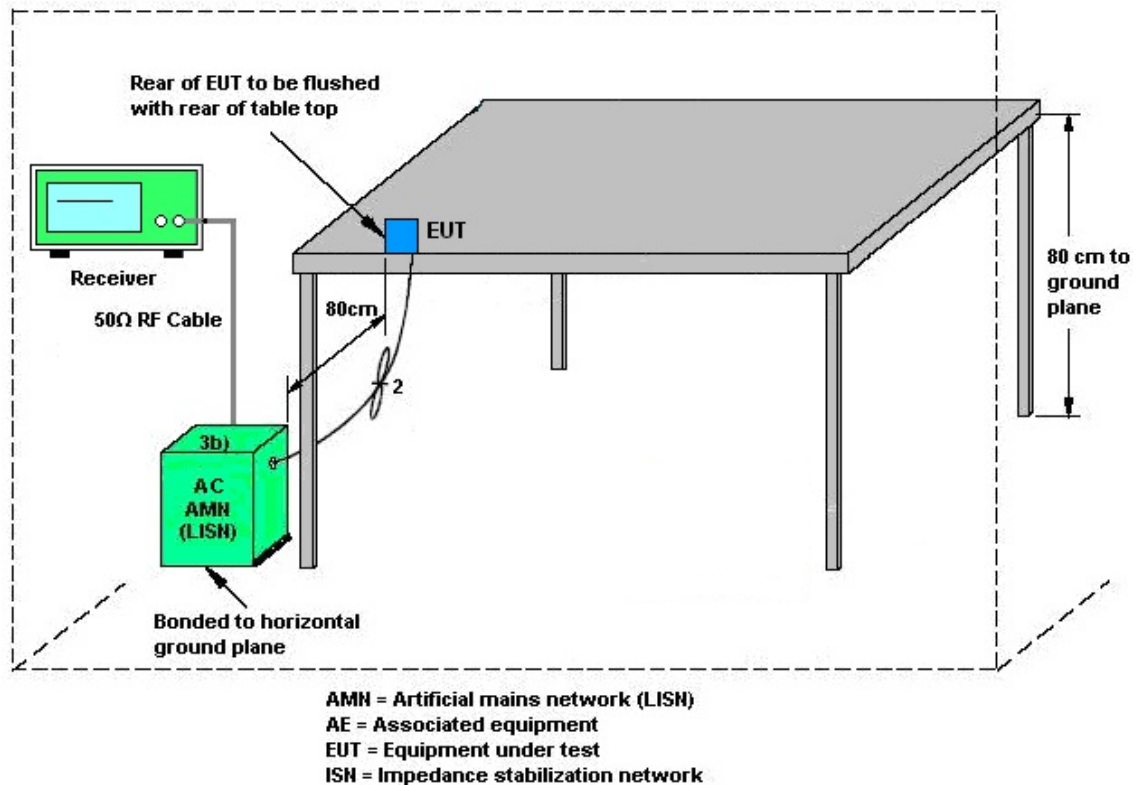
3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Automatically Discontinue Transmission

3.6.1 Limit of Automatically Discontinue Transmission

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Result of Automatically Discontinue Transmission

EUT is verified this characteristic during the function check of normal sample associated with an access point:

- A. Information start: make EUT supply information to the access point.
- B. Information stop: stop supplying information to the access point.

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving.

- C. Information start: make EUT supply information to the access point again.

The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.



Note: The control / signalling information during the period B is precluded.

3.7 Antenna Requirements

3.7.1 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.

3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

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

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT}/N_{SS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

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

Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain G_{ANT} is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

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

<CDD Modes>						
			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant. 1	Ant. 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	2.47	3.44	3.44	5.98	0.00	0.00

$Power\ Limit\ Reduction = DG(Power) - 6dBi, (min = 0)$

$PSD\ Limit\ Reduction = DG(PSD) - 6dBi, (min = 0)$



4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Jul. 14, 2020	May 07, 2021~ May 19, 2021	Jul. 13, 2021	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D & N-6-06	35414 & AT-N0602	30MHz~1GHz	Oct. 11, 2020	May 07, 2021~ May 19, 2021	Oct. 10, 2021	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Nov. 03, 2020	May 07, 2021~ May 19, 2021	Nov. 02, 2021	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00994	18GHz~40GHz	Nov. 19, 2020	May 07, 2021~ May 19, 2021	Nov. 18, 2021	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Dec. 02, 2020	May 07, 2021~ May 19, 2021	Dec. 01, 2021	Radiation (03CH11-HY)
Preamplifier	EMEC	EM1G18G	060812	1GHz~18GHz	Oct. 27, 2020	May 07, 2021~ May 19, 2021	Oct. 26, 2021	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 12, 2020	May 07, 2021~ May 19, 2021	Nov. 11, 2021	Radiation (03CH11-HY)
Preamplifier	EMEC	EM18G40G	060801	18GHz~40GHz	Jun. 15, 2020	May 07, 2021~ May 19, 2021	Jun. 14, 2021	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz~44GHz	Oct. 23, 2020	May 07, 2021~ May 19, 2021	Oct. 22, 2021	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	May 07, 2021~ May 19, 2021	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	May 07, 2021~ May 19, 2021	N/A	Radiation (03CH11-HY)
Software	Audix	E3 6.2009-8-24	RK-001053	N/A	N/A	May 07, 2021~ May 19, 2021	N/A	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz-30MHz	Mar. 11, 2021	May 07, 2021~ May 19, 2021	Mar. 10, 2022	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY2859/2	30MHz-40GHz	Mar. 11, 2021	May 07, 2021~ May 19, 2021	Mar. 10, 2022	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	30M-18G	Mar. 11, 2021	May 07, 2021~ May 19, 2021	Mar. 10, 2022	Radiation (03CH11-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	MY4274/2	30MHz-40GHz	Mar. 11, 2021	May 07, 2021~ May 19, 2021	Mar. 10, 2022	Radiation (03CH11-HY)
Filter	Wainwright	WLK4-1000-15 30-8000-40SS	SN11	1.53G Low Pass	Sep. 14, 2020	May 07, 2021~ May 19, 2021	Sep. 13, 2021	Radiation (03CH11-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40SS	SN3	6.75GHz High Pass Filter	Sep. 15, 2020	May 07, 2021~ May 19, 2021	Sep. 14, 2021	Radiation (03CH11-HY)
Power Sensor	DARE	RPR3006W	16I00054SN O10	10MHz~6GHz	Dec. 16, 2020	May 05, 2021~ May 20, 2021	Dec. 15, 2021	Conducted (TH02-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz ~ 40GHz	Jul. 22, 2020	May 05, 2021~ May 20, 2021	Jul. 21, 2021	Conducted (TH02-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2021	May 05, 2021~ May 20, 2021	Mar. 16, 2022	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV3044	101048	10Hz~44GHz	Apr. 20, 2021	May 12, 2021~ May 13, 2021	Apr. 19, 2022	DFS (DFS02-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	May 05, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 30, 2020	May 05, 2021	Nov. 29, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	May 05, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	May 05, 2021	N/A	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Feb. 25, 2021	May 05, 2021	Feb. 24, 2022	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	May 05, 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% ($U = 2Uc(y)$)	2.3
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.4
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.2
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.1
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Luffy Lin and Junyu Jhou	Temperature:	20.4~24	°C
Test Date:	2021/05/05~2021/05/20	Relative Humidity:	51~54	%

Remark: For Conducted Test Items, Ant. 1 means Aux. Antenna and Ant. 2 means Main Antenna.

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 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	149	5745	16.68	16.58	24.20	23.50	14.50	15.45	0.5	Pass
11a	6Mbps	2	157	5785	16.68	16.63	24.25	23.65	14.45	16.35	0.5	Pass
11a	6Mbps	2	165	5825	16.68	16.63	24.30	23.35	15.50	15.35	0.5	Pass
VHT20	MCS0	2	149	5745	17.83	17.83	26.25	25.15	16.75	16.80	0.5	Pass
VHT20	MCS0	2	157	5785	17.93	17.78	26.20	25.10	16.80	15.05	0.5	Pass
VHT20	MCS0	2	165	5825	17.78	17.83	25.80	25.05	16.80	15.70	0.5	Pass
VHT40	MCS0	2	151	5755	36.56	36.36	41.85	42.12	35.28	35.10	0.5	Pass
VHT40	MCS0	2	159	5795	36.46	36.46	41.94	42.03	35.10	35.10	0.5	Pass
VHT80	MCS0	2	155	5775	76.24	76.00	84.48	82.56	75.20	75.20	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 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	15.50	15.40	18.46	30.00		3.44		Pass
11a	6Mbps	2	157	5785	15.40	15.50	18.46	30.00		3.44		Pass
11a	6Mbps	2	165	5825	15.00	15.40	18.21	30.00		3.44		Pass
HT20	MCS0	2	149	5745	15.20	15.40	18.31	30.00		3.44		Pass
HT20	MCS0	2	157	5785	15.20	15.40	18.31	30.00		3.44		Pass
HT20	MCS0	2	165	5825	15.40	15.30	18.36	30.00		3.44		Pass
HT40	MCS0	2	151	5755	14.80	15.00	17.91	30.00		3.44		Pass
HT40	MCS0	2	159	5795	15.30	15.30	18.31	30.00		3.44		Pass
VHT20	MCS0	2	149	5745	15.30	15.50	18.41	30.00		3.44		Pass
VHT20	MCS0	2	157	5785	15.30	15.50	18.41	30.00		3.44		Pass
VHT20	MCS0	2	165	5825	15.50	15.40	18.46	30.00		3.44		Pass
VHT40	MCS0	2	151	5755	14.80	15.00	17.91	30.00		3.44		Pass
VHT40	MCS0	2	159	5795	15.40	15.40	18.41	30.00		3.44		Pass
VHT80	MCS0	2	155	5775	15.40	15.50	18.46	30.00		3.44		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 (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	2.22		5.58	5.38	8.59	30.00		5.98		Pass
11a	6Mbps	2	157	5785	2.22		4.98	5.19	8.20	30.00		5.98		Pass
11a	6Mbps	2	165	5825	2.22		4.56	4.71	7.72	30.00		5.98		Pass
VHT20	MCS0	2	149	5745	2.22		5.29	5.46	8.47	30.00		5.98		Pass
VHT20	MCS0	2	157	5785	2.22		5.15	5.52	8.53	30.00		5.98		Pass
VHT20	MCS0	2	165	5825	2.22		5.29	5.68	8.69	30.00		5.98		Pass
VHT40	MCS0	2	151	5755	2.22		1.25	1.42	4.43	30.00		5.98		Pass
VHT40	MCS0	2	159	5795	2.22		1.52	1.50	4.53	30.00		5.98		Pass
VHT80	MCS0	2	155	5775	2.22		-0.22	-0.32	2.79	30.00		5.98		Pass

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



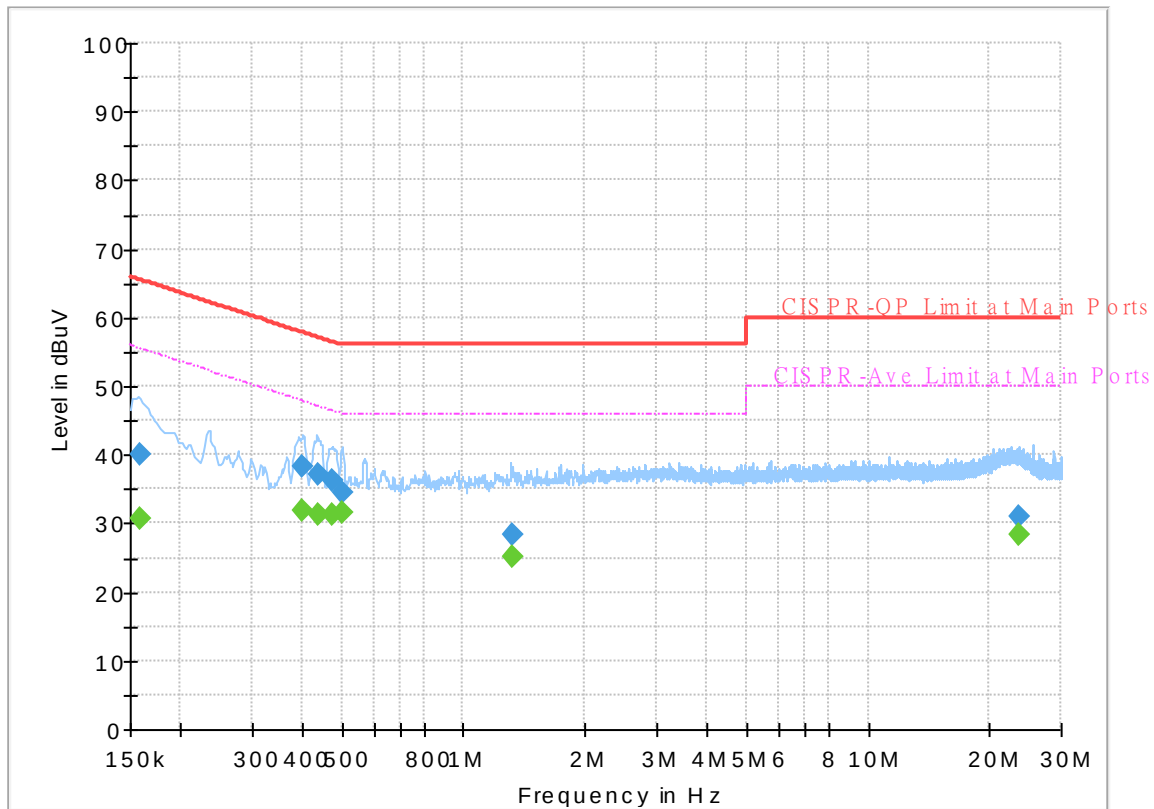
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee and Howard Huang	Temperature :	23~26°C
		Relative Humidity :	40~50%

EUT Information

Report NO : 131119-01
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



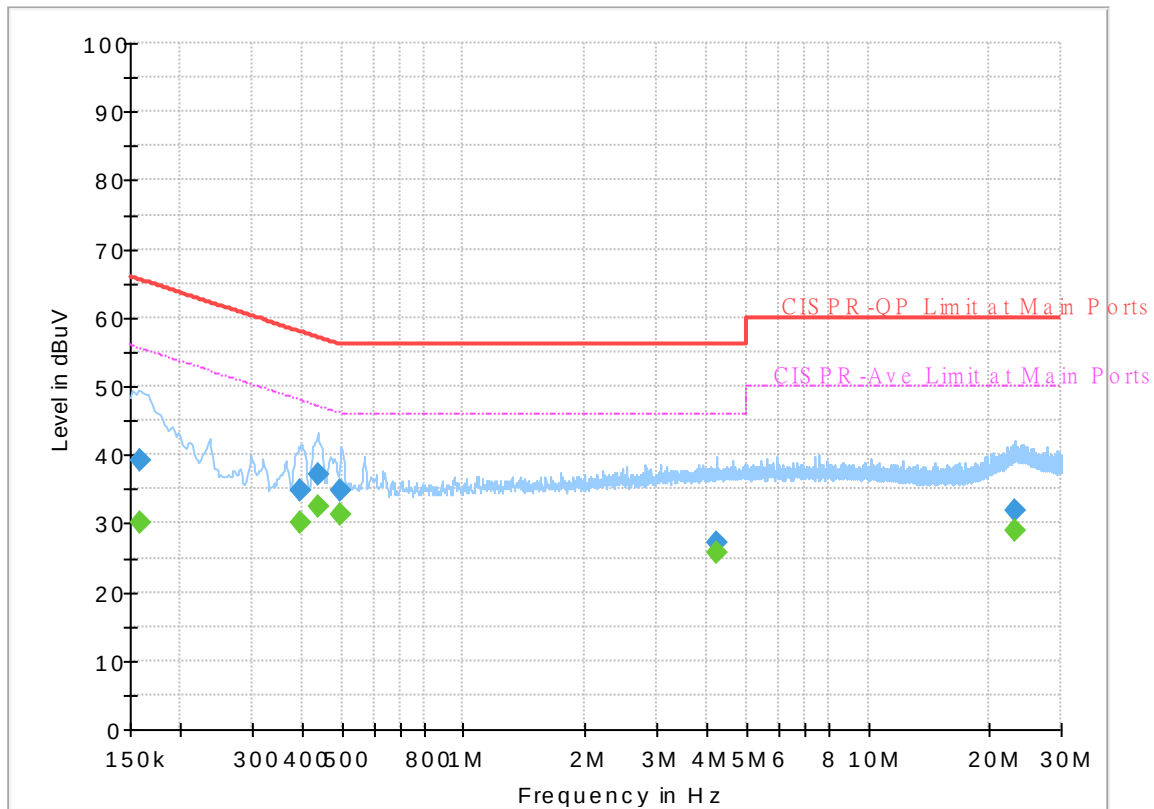
Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.159000	---	30.74	55.52	24.78	L1	OFF	19.5
0.159000	39.99	---	65.52	25.53	L1	OFF	19.5
0.399750	---	31.80	47.86	16.06	L1	OFF	19.5
0.399750	38.28	---	57.86	19.58	L1	OFF	19.5
0.438000	---	31.40	47.10	15.70	L1	OFF	19.6
0.438000	37.15	---	57.10	19.95	L1	OFF	19.6
0.471750	---	31.26	46.48	15.22	L1	OFF	19.6
0.471750	36.14	---	56.48	20.34	L1	OFF	19.6
0.501000	---	31.59	46.00	14.41	L1	OFF	19.7
0.501000	34.64	---	56.00	21.36	L1	OFF	19.7
1.322250	---	25.02	46.00	20.98	L1	OFF	20.0
1.322250	28.36	---	56.00	27.64	L1	OFF	20.0
23.547750	---	28.50	50.00	21.50	L1	OFF	20.5
23.547750	31.11	---	60.00	28.89	L1	OFF	20.5

EUT Information

Report NO : 131119-01
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)
0.159000	---	30.18	55.52	25.34	N	OFF	19.5
0.159000	39.15	---	65.52	26.37	N	OFF	19.5
0.395250	---	30.19	47.95	17.76	N	OFF	19.6
0.395250	34.76	---	57.95	23.19	N	OFF	19.6
0.435750	---	32.33	47.14	14.81	N	OFF	19.6
0.435750	37.05	---	57.14	20.09	N	OFF	19.6
0.498750	---	31.15	46.02	14.87	N	OFF	19.7
0.498750	34.67	---	56.02	21.35	N	OFF	19.7
4.218000	---	25.60	46.00	20.40	N	OFF	19.9
4.218000	27.32	---	56.00	28.68	N	OFF	19.9
23.037000	---	29.01	50.00	20.99	N	OFF	20.7
23.037000	31.79	---	60.00	28.21	N	OFF	20.7



Appendix C. Radiated Spurious Emission

Test Engineer :	Harvey Guo, Bill Chang , Fu Chen, and Troye Hsieh	Temperature :	18.3~25.7°C
		Relative Humidity :	58.2~70.8%

Remark: For Radiated Spurious Emission Test Items, Ant. 1 means Aux. Antenna and Ant. 2 means Main Antenna.

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.
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5641	52.45	-15.75	68.2	42.89	31.78	10.73	32.95	100	28	P	H
		5695.6	54.14	-47.82	101.96	44.49	31.8	10.79	32.94	100	28	P	H
		5719.8	59.92	-50.82	110.74	50.16	31.88	10.82	32.94	100	28	P	H
		5725	63.78	-58.42	122.2	54	31.9	10.82	32.94	100	28	P	H
	*	5745	114.81	-	-	104.92	31.98	10.85	32.94	100	28	P	H
	*	5745	107.29	-	-	97.4	31.98	10.85	32.94	100	28	A	H
													H
													H
		5631	50.95	-17.25	68.2	41.43	31.76	10.72	32.96	107	274	P	V
		5691.2	52.17	-46.54	98.71	42.54	31.8	10.78	32.95	107	274	P	V
		5719.4	54.64	-55.99	110.63	44.88	31.88	10.82	32.94	107	274	P	V
		5724.8	57.65	-64.09	121.74	47.87	31.9	10.82	32.94	107	274	P	V
	*	5745	108.76	-	-	98.87	31.98	10.85	32.94	107	274	P	V
	*	5745	101.48	-	-	91.59	31.98	10.85	32.94	107	274	A	V
													V
													V



WIFI Ant. 1+2	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		5644.25	51.25	-16.95	68.2	41.68	31.79	10.73	32.95	104	29	P	H
		5699.25	52.61	-52.04	104.65	42.96	31.8	10.79	32.94	104	29	P	H
		5714.25	54.71	-54.48	109.19	44.98	31.86	10.81	32.94	104	29	P	H
		5723.25	53.9	-64.31	118.21	44.13	31.89	10.82	32.94	104	29	P	H
	*	5785	114.59	-	-	104.56	32.07	10.89	32.93	104	29	P	H
	*	5785	107.54	-	-	97.51	32.07	10.89	32.93	104	29	A	H
		5850	55.58	-66.62	122.2	45.25	32.3	10.95	32.92	104	29	P	H
		5855	54.07	-56.73	110.8	43.72	32.31	10.96	32.92	104	29	P	H
		5901.5	53.02	-32.53	85.55	42.53	32.4	11	32.91	104	29	P	H
		5925	52.27	-15.93	68.2	41.75	32.4	11.02	32.9	104	29	P	H
													H
													H
		5647.5	50.06	-18.14	68.2	40.48	31.8	10.73	32.95	100	274	P	V
		5699.25	50.65	-54	104.65	41	31.8	10.79	32.94	100	274	P	V
		5713.25	50.76	-58.15	108.91	41.04	31.85	10.81	32.94	100	274	P	V
		5720.25	51.07	-60.3	111.37	41.31	31.88	10.82	32.94	100	274	P	V
	*	5785	109.9	-	-	99.87	32.07	10.89	32.93	100	274	P	V
	*	5785	102.7	-	-	92.67	32.07	10.89	32.93	100	274	A	V
		5852.25	53.53	-63.54	117.07	43.19	32.3	10.96	32.92	100	274	P	V
		5856.25	52.81	-57.64	110.45	42.46	32.31	10.96	32.92	100	274	P	V
		5885.25	52.06	-45.53	97.59	41.61	32.37	10.99	32.91	100	274	P	V
		5942	51.51	-16.69	68.2	40.97	32.4	11.04	32.9	100	274	P	V
													V
													V



WIFI Ant. 1+2	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	114.4	-	-	104.19	32.2	10.93	32.92	118	28	P	H
	*	5825	106.66	-	-	96.45	32.2	10.93	32.92	118	28	A	H
		5853.4	57.83	-56.62	114.45	47.48	32.31	10.96	32.92	118	28	P	H
		5856	55.75	-54.77	110.52	45.4	32.31	10.96	32.92	118	28	P	H
		5883.2	53.84	-45.27	99.11	43.4	32.37	10.98	32.91	118	28	P	H
		5929	52.44	-15.76	68.2	41.91	32.4	11.03	32.9	118	28	P	H
													H
													H
	*	5824	110.31	-	-	100.1	32.2	10.93	32.92	100	273	P	V
	*	5824	102.65	-	-	92.44	32.2	10.93	32.92	100	273	A	V
		5850	55.14	-67.06	122.2	44.81	32.3	10.95	32.92	100	273	P	V
		5868.2	53.72	-53.38	107.1	43.32	32.34	10.97	32.91	100	273	P	V
		5883.8	53.34	-45.33	98.67	42.89	32.37	10.99	32.91	100	273	P	V
		5934.6	51.57	-16.63	68.2	41.04	32.4	11.03	32.9	100	273	P	V
													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. 1+2	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		11490	46.39	-27.61	74	55.07	39.79	17.75	66.22	100	0	P	H
		17235	48.71	-19.49	68.2	52.05	40.07	22.75	66.16	100	0	P	H
		18000	58.8	-15.2	74	53.01	47.4	23.49	65.1	100	0	P	H
		18000	48	-6	54	42.21	47.4	23.49	65.1	100	0	A	H
		11490	46.57	-27.43	74	55.25	39.79	17.75	66.22	100	0	P	V
		17235	48.8	-19.4	68.2	52.14	40.07	22.75	66.16	100	0	P	V
		17945	56.87	-17.13	74	52.31	46.3	23.44	65.18	100	0	P	V
		17945	47.02	-6.98	54	42.46	46.3	23.44	65.18	100	0	A	V
802.11a CH 157 5785MHz		11570	46.59	-27.41	74	55.39	39.59	17.83	66.22	100	0	P	H
		17355	48.29	-19.91	68.2	50.81	40.64	22.87	66.03	100	0	P	H
		17989	57.85	-16.15	74	52.31	47.18	23.48	65.12	100	0	P	H
		17989	47.85	-6.15	54	42.31	47.18	23.48	65.12	100	0	A	H
		11570	46.76	-27.24	74	55.56	39.59	17.83	66.22	100	0	P	V
		17355	46.89	-21.31	68.2	49.41	40.64	22.87	66.03	100	0	P	V
		18000	57.05	-16.95	74	51.26	47.4	23.49	65.1	100	0	P	V
		18000	47.58	-6.42	54	41.79	47.4	23.49	65.1	100	0	A	V
802.11a CH 165 5825MHz		11650	46.21	-27.79	74	55.28	39.25	17.9	66.22	100	0	P	H
		17475	50.28	-17.92	68.2	51.82	41.38	22.98	65.9	100	0	P	H
		17945	58.04	-15.96	74	53.48	46.3	23.44	65.18	100	0	P	H
		17945	47.32	-6.68	54	42.76	46.3	23.44	65.18	100	0	A	H
		11650	46.02	-27.98	74	55.09	39.25	17.9	66.22	100	0	P	V
		17475	49.28	-18.92	68.2	50.82	41.38	22.98	65.9	100	0	P	V
		18000	57.74	-16.26	74	51.95	47.4	23.49	65.1	100	0	P	V
		18000	48.62	-5.38	54	42.83	47.4	23.49	65.1	100	0	A	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 VHT20 (Band Edge @ 3m)

WIFI Ant. 1+2	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 VHT20 CH 149 5745MHz		5643.4	52.07	-16.13	68.2	42.5	31.79	10.73	32.95	100	18	P	H
		5695.2	56.77	-44.89	101.66	47.12	31.8	10.79	32.94	100	18	P	H
		5719.8	58.9	-51.84	110.74	49.14	31.88	10.82	32.94	100	18	P	H
		5725	64.63	-57.57	122.2	54.85	31.9	10.82	32.94	100	18	P	H
	*	5745	115.22	-	-	105.33	31.98	10.85	32.94	100	18	P	H
	*	5745	107.3	-	-	97.41	31.98	10.85	32.94	100	18	A	H
													H
													H
		5622.2	51.41	-16.79	68.2	41.92	31.74	10.71	32.96	100	256	P	V
		5695.4	52.52	-49.29	101.81	42.87	31.8	10.79	32.94	100	256	P	V
		5719.2	55.2	-55.38	110.58	45.44	31.88	10.82	32.94	100	256	P	V
		5724.8	60.48	-61.26	121.74	50.7	31.9	10.82	32.94	100	256	P	V
	*	5745	109.71	-	-	99.82	31.98	10.85	32.94	100	256	P	V
	*	5745	102.55	-	-	92.66	31.98	10.85	32.94	100	256	A	V
													V
													V



WIFI Ant. 1+2	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 VHT20 CH 157 5785MHz		5628.75	50.77	-17.43	68.2	41.26	31.76	10.71	32.96	130	18	P	H
		5698.75	51.94	-52.34	104.28	42.29	31.8	10.79	32.94	130	18	P	H
		5718	54.74	-55.5	110.24	44.99	31.87	10.82	32.94	130	18	P	H
		5723	55.93	-61.71	117.64	46.16	31.89	10.82	32.94	130	18	P	H
	*	5785	114.95	-	-	104.92	32.07	10.89	32.93	130	18	P	H
	*	5785	107.32	-	-	97.29	32.07	10.89	32.93	130	18	A	H
		5850.5	55.06	-66	121.06	44.72	32.3	10.96	32.92	130	18	P	H
		5858	54.24	-55.72	109.96	43.88	32.32	10.96	32.92	130	18	P	H
		5886.25	53.27	-43.58	96.85	42.82	32.37	10.99	32.91	130	18	P	H
		5926.75	52.13	-16.07	68.2	41.61	32.4	11.02	32.9	130	18	P	H
													H
													H
		5646.75	51.8	-16.4	68.2	42.23	31.79	10.73	32.95	100	261	P	V
		5693.25	50.82	-49.4	100.22	41.18	31.8	10.79	32.95	100	261	P	V
		5708.25	51.31	-56.2	107.51	41.62	31.83	10.8	32.94	100	261	P	V
		5723.25	52.19	-66.02	118.21	42.42	31.89	10.82	32.94	100	261	P	V
	*	5785	110.88	-	-	100.85	32.07	10.89	32.93	100	261	P	V
	*	5785	103.02	-	-	92.99	32.07	10.89	32.93	100	261	A	V
		5853.25	52.17	-62.62	114.79	41.82	32.31	10.96	32.92	100	261	P	V
		5857	53.38	-56.86	110.24	43.03	32.31	10.96	32.92	100	261	P	V
		5884.25	51.93	-46.4	98.33	41.48	32.37	10.99	32.91	100	261	P	V
		5933.5	51.43	-16.77	68.2	40.9	32.4	11.03	32.9	100	261	P	V
													V
													V



WIFI Ant. 1+2	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 VHT20 CH 165 5825MHz	*	5825	114.76	-	-	104.55	32.2	10.93	32.92	100	296	P	H
	*	5825	106.97	-	-	96.76	32.2	10.93	32.92	100	296	A	H
		5850	61.77	-60.43	122.2	51.44	32.3	10.95	32.92	100	296	P	H
		5857.4	59.64	-50.49	110.13	49.29	32.31	10.96	32.92	100	296	P	H
		5875.6	57.1	-47.65	104.75	46.68	32.35	10.98	32.91	100	296	P	H
		5926.2	52.73	-15.47	68.2	42.21	32.4	11.02	32.9	100	296	P	H
													H
													H
	*	5825	111.65	-	-	101.44	32.2	10.93	32.92	100	315	P	V
	*	5825	103.65	-	-	93.44	32.2	10.93	32.92	100	315	A	V
		5850.2	59.99	-61.75	121.74	49.65	32.3	10.96	32.92	100	315	P	V
		5857	55.35	-54.89	110.24	45	32.31	10.96	32.92	100	315	P	V
		5878.2	54.49	-48.33	102.82	44.06	32.36	10.98	32.91	100	315	P	V
		5934.6	52.55	-15.65	68.2	42.02	32.4	11.03	32.9	100	315	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 VHT20 (Harmonic @ 3m)

WIFI Ant. 1+2	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 VHT20 CH 149 5745MHz		11490	46.16	-27.84	74	54.84	39.79	17.75	66.22	100	0	P	H
		17235	48.84	-19.36	68.2	52.18	40.07	22.75	66.16	100	0	P	H
		18000	58.11	-15.89	74	52.32	47.4	23.49	65.1	100	0	P	H
		18000	47.86	-6.14	54	42.07	47.4	23.49	65.1	100	0	A	H
		11490	46.12	-27.88	74	54.8	39.79	17.75	66.22	100	0	P	V
		17235	47.46	-20.74	68.2	50.8	40.07	22.75	66.16	100	0	P	V
		17934	56.62	-17.38	74	52.31	46.08	23.43	65.2	100	0	P	V
		17934	46.78	-7.22	54	42.47	46.08	23.43	65.2	100	0	A	V
802.11ac VHT20 CH 157 5785MHz		11570	46.52	-27.48	74	55.32	39.59	17.83	66.22	100	0	P	H
		17355	46.76	-21.44	68.2	49.28	40.64	22.87	66.03	100	0	P	H
		17956	57.21	-16.79	74	52.41	46.52	23.45	65.17	100	0	P	H
		17956	47.33	-6.67	54	42.53	46.52	23.45	65.17	100	0	A	H
		11570	46.76	-27.24	74	55.56	39.59	17.83	66.22	100	0	P	V
		17355	47.03	-21.17	68.2	49.55	40.64	22.87	66.03	100	0	P	V
		17934	56.55	-17.45	74	52.24	46.08	23.43	65.2	100	0	P	V
		17934	46.34	-7.66	54	42.03	46.08	23.43	65.2	100	0	A	V
802.11ac VHT20 CH 165 5825MHz		11650	46.78	-27.22	74	55.85	39.25	17.9	66.22	100	0	P	H
		17475	51.42	-16.78	68.2	52.96	41.38	22.98	65.9	100	0	P	H
		18000	57.91	-16.09	74	52.12	47.4	23.49	65.1	100	0	P	H
		18000	47.91	-6.09	54	42.12	47.4	23.49	65.1	100	0	A	H
		11650	47.73	-26.27	74	56.8	39.25	17.9	66.22	100	0	P	V
		17475	50.33	-17.87	68.2	51.87	41.38	22.98	65.9	100	0	P	V
		18000	57.77	-16.23	74	51.98	47.4	23.49	65.1	100	0	P	V
		18000	47.57	-6.43	54	41.78	47.4	23.49	65.1	100	0	A	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 VHT40 (Band Edge @ 3m)

WIFI Ant. 1+2	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 VHT40 CH 151 5755MHz		5645	51.57	-16.63	68.2	42	31.79	10.73	32.95	122	18	P	H
		5699	61.5	-42.96	104.46	51.85	31.8	10.79	32.94	122	18	P	H
		5718	67.94	-42.3	110.24	58.19	31.87	10.82	32.94	122	18	P	H
		5720.25	65.83	-45.54	111.37	56.07	31.88	10.82	32.94	122	18	P	H
	*	5755	112.91	-	-	102.97	32.01	10.86	32.93	122	18	P	H
	*	5755	104.81	-	-	94.87	32.01	10.86	32.93	122	18	A	H
		5852.25	52.26	-64.81	117.07	41.92	32.3	10.96	32.92	122	18	P	H
		5864.25	53.29	-54.92	108.21	42.9	32.33	10.97	32.91	122	18	P	H
		5910.25	52.42	-26.66	79.08	41.92	32.4	11.01	32.91	122	18	P	H
		5926	51.75	-16.45	68.2	41.23	32.4	11.02	32.9	122	18	P	H
													H
													H
		5603.5	51.27	-16.93	68.2	41.84	31.71	10.68	32.96	100	262	P	V
		5699.75	57.32	-47.7	105.02	47.67	31.8	10.79	32.94	100	262	P	V
		5719	62.86	-47.66	110.52	53.1	31.88	10.82	32.94	100	262	P	V
		5722.5	61.56	-54.94	116.5	51.79	31.89	10.82	32.94	100	262	P	V
	*	5755	108.92	-	-	98.98	32.01	10.86	32.93	100	262	P	V
	*	5755	101.16	-	-	91.22	32.01	10.86	32.93	100	262	A	V
		5851.25	52.26	-67.09	119.35	41.92	32.3	10.96	32.92	100	262	P	V
		5866	52.55	-55.17	107.72	42.16	32.33	10.97	32.91	100	262	P	V
		5877.75	51.72	-51.44	103.16	41.29	32.36	10.98	32.91	100	262	P	V
		5940.25	51.26	-16.94	68.2	40.72	32.4	11.04	32.9	100	262	P	V
													V
													V



WIFI Ant. 1+2	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 VHT40 CH 159 5795MHz		5642.75	51.43	-16.77	68.2	41.86	31.79	10.73	32.95	100	297	P	H
		5700	52.98	-52.22	105.2	43.32	31.8	10.8	32.94	100	297	P	H
		5717.75	54.6	-55.57	110.17	44.85	31.87	10.82	32.94	100	297	P	H
		5725	54.18	-68.02	122.2	44.4	31.9	10.82	32.94	100	297	P	H
	*	5795	111.9	-	-	101.84	32.09	10.9	32.93	100	297	P	H
	*	5795	104.38	-	-	94.32	32.09	10.9	32.93	100	297	A	H
		5850.25	59.05	-62.58	121.63	48.71	32.3	10.96	32.92	100	297	P	H
		5865.75	58.52	-49.27	107.79	48.13	32.33	10.97	32.91	100	297	P	H
		5888.25	55.56	-39.8	95.36	45.1	32.38	10.99	32.91	100	297	P	H
		5929	52.55	-15.65	68.2	42.02	32.4	11.03	32.9	100	297	P	H
													H
													H
		5602.25	49.97	-18.23	68.2	40.55	31.7	10.68	32.96	100	261	P	V
		5679.75	51.95	-38.3	90.25	42.33	31.8	10.77	32.95	100	261	P	V
		5718	52.81	-57.43	110.24	43.06	31.87	10.82	32.94	100	261	P	V
		5721	52.26	-60.82	113.08	42.5	31.88	10.82	32.94	100	261	P	V
	*	5795	108.97	-	-	98.91	32.09	10.9	32.93	100	261	P	V
	*	5795	101.15	-	-	91.09	32.09	10.9	32.93	100	261	A	V
		5853.25	57.47	-57.32	114.79	47.12	32.31	10.96	32.92	100	261	P	V
		5855	55.66	-55.14	110.8	45.31	32.31	10.96	32.92	100	261	P	V
		5882.5	53.82	-45.81	99.63	43.38	32.37	10.98	32.91	100	261	P	V
		5941.25	52.29	-15.91	68.2	41.75	32.4	11.04	32.9	100	261	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 VHT40 (Harmonic @ 3m)

WIFI Ant. 1+2	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 VHT40 CH 151 5755MHz		11510	47.92	-26.08	74	56.6	39.77	17.77	66.22	100	0	P	H
		17265	46.9	-21.3	68.2	50.12	40.13	22.78	66.13	100	0	P	H
		17989	57.85	-16.15	74	52.31	47.18	23.48	65.12	100	0	P	H
		17989	49.13	-4.87	54	43.59	47.18	23.48	65.12	100	0	A	H
		11510	46.77	-27.23	74	55.45	39.77	17.77	66.22	100	0	P	V
		17265	47.15	-21.05	68.2	50.37	40.13	22.78	66.13	100	0	P	V
		17989	57.85	-16.15	74	52.31	47.18	23.48	65.12	100	0	P	V
		17989	49.03	-4.97	54	43.49	47.18	23.48	65.12	100	0	A	V
802.11ac VHT40 CH 159 5795MHz		11590	47.5	-26.5	74	56.34	39.53	17.85	66.22	100	0	P	H
		17385	49	-19.2	68.2	51.22	40.88	22.9	66	100	0	P	H
		17934	57.61	-16.39	74	53.3	46.08	23.43	65.2	100	0	P	H
		17934	48.16	-5.84	54	43.85	46.08	23.43	65.2	100	0	A	H
		11590	47.84	-26.16	74	56.68	39.53	17.85	66.22	100	0	P	V
		17385	49.3	-18.9	68.2	51.52	40.88	22.9	66	100	0	P	V
		17945	57.98	-16.02	74	53.42	46.3	23.44	65.18	100	0	P	V
		17945	48.44	-5.56	54	43.88	46.3	23.44	65.18	100	0	A	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 (Band Edge @ 3m)

WIFI Ant. 1+2	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		5647.25	56.9	-11.3	68.2	47.33	31.79	10.73	32.95	100	18	P	H
		5696.75	65.48	-37.32	102.8	55.83	31.8	10.79	32.94	100	18	P	H
		5717.5	68.3	-41.8	110.1	58.55	31.87	10.82	32.94	100	18	P	H
		5722.25	68.5	-47.43	115.93	58.73	31.89	10.82	32.94	100	18	P	H
	*	5775	109.18	-	-	99.18	32.05	10.88	32.93	100	18	P	H
	*	5775	101.15	-	-	91.15	32.05	10.88	32.93	100	18	A	H
		5850.25	66.41	-55.22	121.63	56.07	32.3	10.96	32.92	100	18	P	H
		5868	64.36	-42.8	107.16	53.96	32.34	10.97	32.91	100	18	P	H
		5884.5	56.71	-41.44	98.15	46.26	32.37	10.99	32.91	100	18	P	H
		5928.5	51.55	-16.65	68.2	41.02	32.4	11.03	32.9	100	18	P	H
													H
													H
		5643.75	52.16	-16.04	68.2	42.59	31.79	10.73	32.95	100	315	P	V
		5697.5	61.8	-41.56	103.36	52.15	31.8	10.79	32.94	100	315	P	V
		5717.25	64.25	-45.78	110.03	54.51	31.87	10.81	32.94	100	315	P	V
		5724.75	63.61	-58.02	121.63	53.83	31.9	10.82	32.94	100	315	P	V
	*	5775	104.61	-	-	94.61	32.05	10.88	32.93	100	315	P	V
	*	5775	96.81	-	-	86.81	32.05	10.88	32.93	100	315	A	V
		5850.5	64.28	-56.78	121.06	53.94	32.3	10.96	32.92	100	315	P	V
		5861.75	65.97	-42.94	108.91	55.59	32.32	10.97	32.91	100	315	P	V
		5880	58.43	-43.06	101.49	48	32.36	10.98	32.91	100	315	P	V
		5940.25	52.02	-16.18	68.2	41.48	32.4	11.04	32.9	100	315	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. 1+2	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		11550	47.97	-26.03	74	56.73	39.65	17.81	66.22	100	0	P	H
		17325	47.58	-20.62	68.2	50.4	40.4	22.84	66.06	100	0	P	H
		17934	57.61	-16.39	74	53.3	46.08	23.43	65.2	100	0	P	H
		17934	47.89	-6.11	54	43.58	46.08	23.43	65.2	100	0	A	H
		11550	46.57	-27.43	74	55.33	39.65	17.81	66.22	100	0	P	V
		17325	47.88	-20.32	68.2	50.7	40.4	22.84	66.06	100	0	P	V
		18000	58.43	-15.57	74	52.64	47.4	23.49	65.1	100	0	P	V
		18000	49.47	-4.53	54	43.68	47.4	23.49	65.1	100	0	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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

[illegible]



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

WIFI Ant. 1+2	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)
5GHz 802.11ac VHT80 LF		30.97	19.67	-20.33	40	27.52	23.79	0.81	32.45	-	-	P	H
		111.48	16.96	-26.54	43.5	30.99	16.87	1.6	32.5	-	-	P	H
		161.92	19.27	-24.23	43.5	33.58	16.24	1.97	32.52	-	-	P	H
		758.47	28.89	-17.11	46	28.61	28.08	4.13	31.93	-	-	P	H
		801.15	29.77	-16.23	46	28.82	28.3	4.25	31.6	-	-	P	H
		876.81	31.08	-14.92	46	28.67	29.21	4.49	31.29	100	0	P	H
													H
													H
													H
													H
													H
													H
		47.46	21.33	-18.67	40	37.63	15.16	1.08	32.54	-	-	P	V
		97.9	22.45	-21.05	43.5	37.76	15.67	1.52	32.5	-	-	P	V
		161.92	26.19	-17.31	43.5	40.5	16.24	1.97	32.52	-	-	P	V
		703.18	27.02	-18.98	46	28.81	26.6	3.97	32.36	-	-	P	V
		794.36	29.39	-16.61	46	28.52	28.27	4.24	31.64	-	-	P	V
		862.26	31.64	-14.36	46	29.27	29.28	4.44	31.35	100	0	P	V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

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

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)
 = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
 = 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)
 = 55.45 (dBμV/m)
2. Over Limit(dB)
 = Level(dBμV/m) – Limit Line(dBμV/m)
 = 55.45(dBμV/m) – 74(dBμV/m)
 = -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)
 = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
 = 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)
 = 43.54 (dBμV/m)
2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)
 = 43.54(dBμV/m) – 54(dBμV/m)
 = -10.46(dB)

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



Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Harvey Guo, Bill Chang , Fu Chen, and Troye Hsieh	Temperature :	18.3~25.7°C
		Relative Humidity :	58.2~70.8%

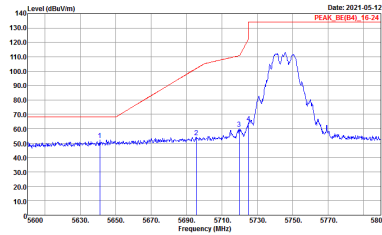
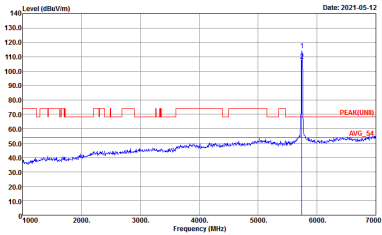
Remark: For Radiated Spurious Emission Test Items, Ant. 1 means Aux. Antenna and Ant. 2 means Main Antenna.

Note symbol

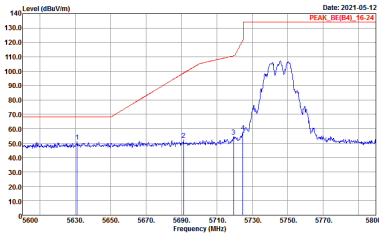
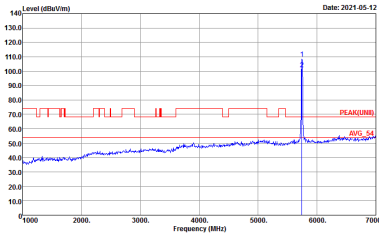
-L	Low channel location
-R	High channel location



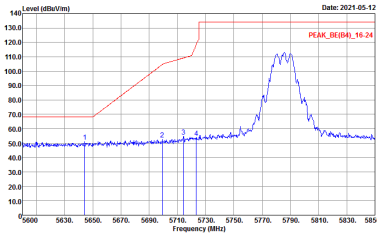
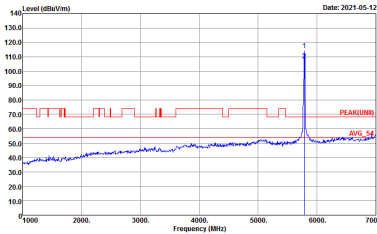
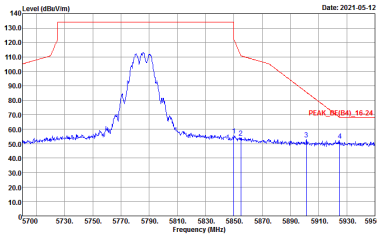
Band 4 - 5725~5850MHz
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_SE(BA)_16-24 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(FUND) 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

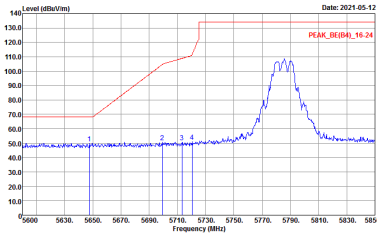
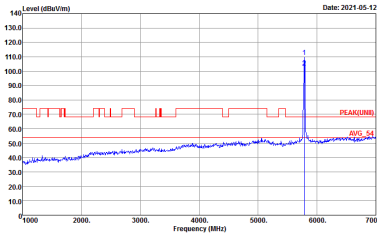
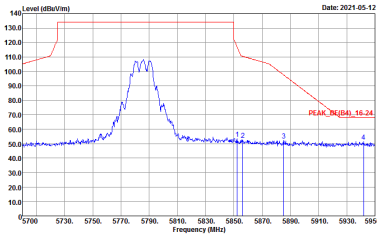


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : : PEAK_SE(B4)_16-24 3m HORN 9120D-HF_132% VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : : PEAK(FUND) 3m HORN 9120D-HF_132% VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

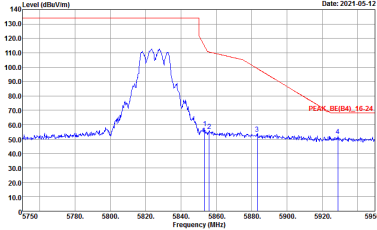
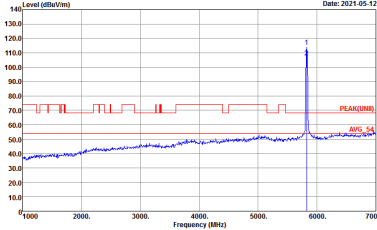


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK_UNB 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

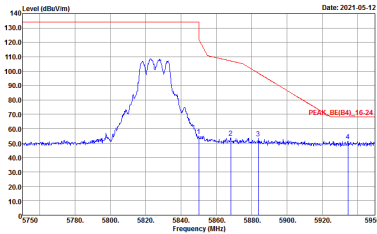
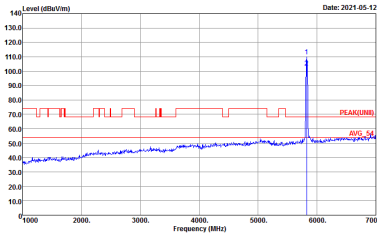


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF_132% VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(FUND) 3m HORN 9120D-HF_132% VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF_132% VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

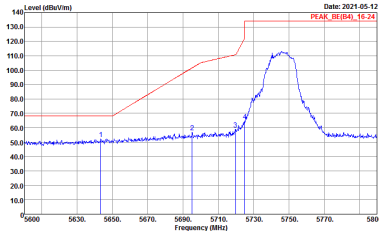
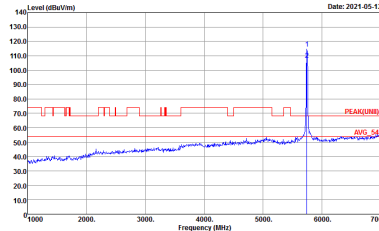


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CHI1-HY Condition : PEAK_802.11a_16-24 3m HORN 9120D-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CHI1-HY Condition : PEAK_802.11a_16-24 3m HORN 9120D-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

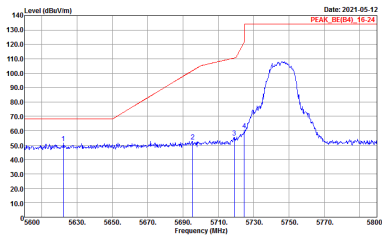
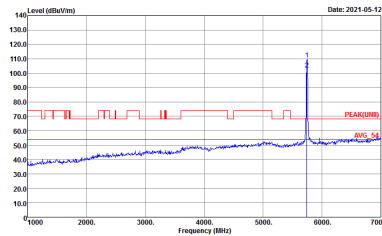


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_802.11a_16-24 3m HORN 91200-HF_132% VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK_802.11a_16-24 3m HORN 91200-HF_132% VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

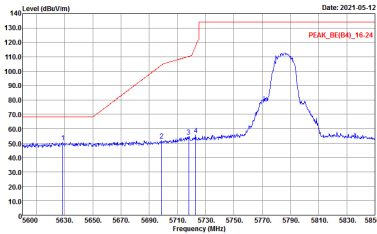
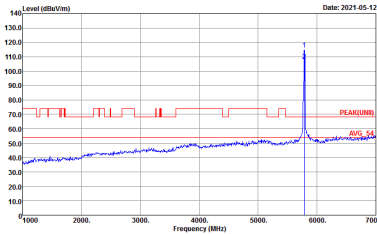
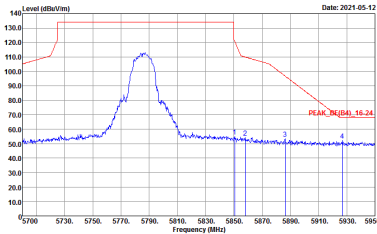
Band 4 5725~5850MHz
WIFI 802.11ac VHT20 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(84)_16-24 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNB) 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

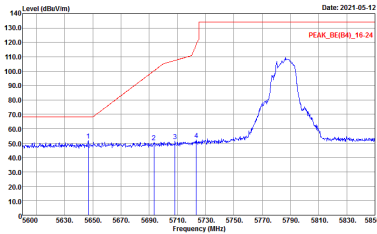
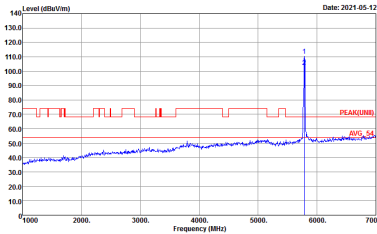
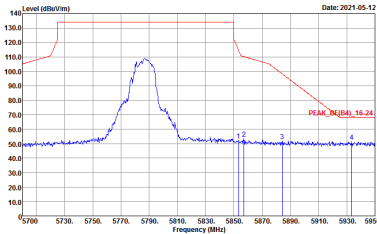


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Vertical	Fundamental
Peak Avg.	 Site : 03CHI1-HY Condition : PEAK_BC(B4)_16-24 3m HORN 91200-HF_132% VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CHI1-HY Condition : PEAK(UNI) 3m HORN 91200-HF_132% VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(LINE) 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(FUND) 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

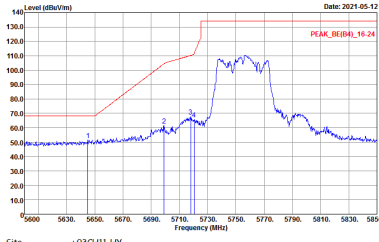
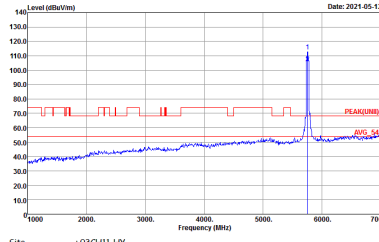
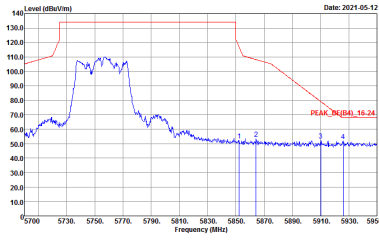


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	Site : 03CHI1-HY Condition : PEAK_80(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CHI1-HY Condition : PEAK_80(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

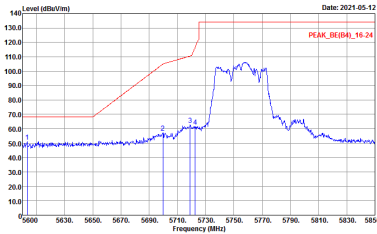
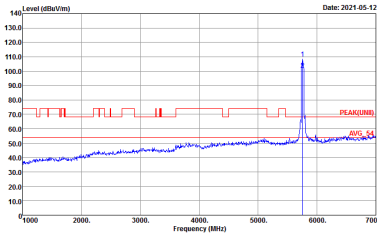
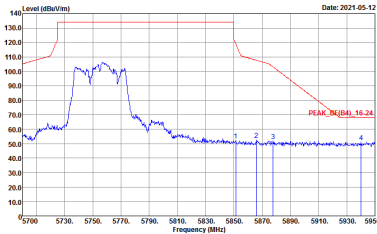


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Vertical	Fundamental
Peak Avg.	Site : 03CHI1-HY Condition : : PEAK_80(B4)_16-24 3m HORN 91200-HF_132% VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Site : 03CHI1-HY Condition : : PEAK_80(B4)_16-24 3m HORN 91200-HF_132% VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto

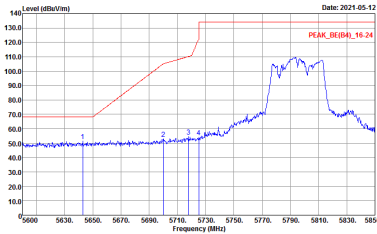
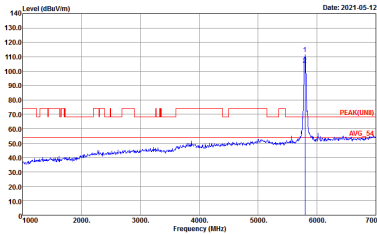
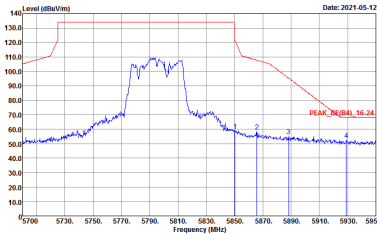
Band 4 5725~5850MHz
WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank

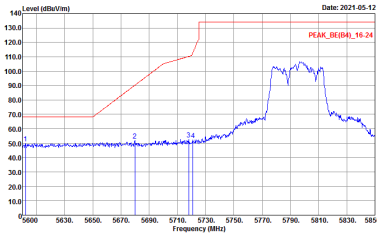
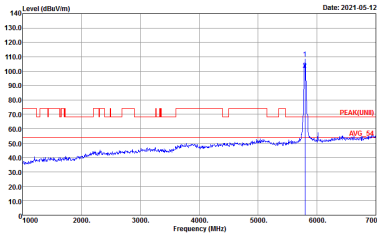
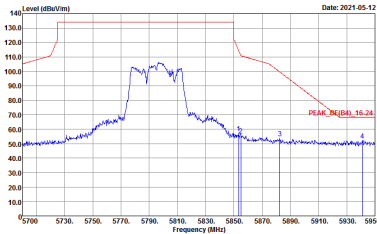


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(FUND) 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



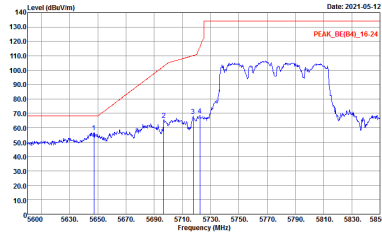
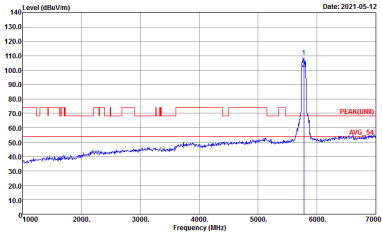
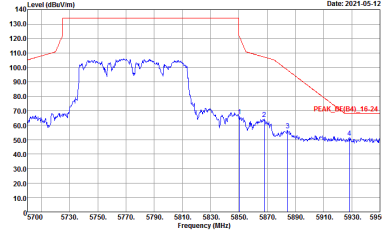
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK_FUND 3m HORN 9120D-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF_1326 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



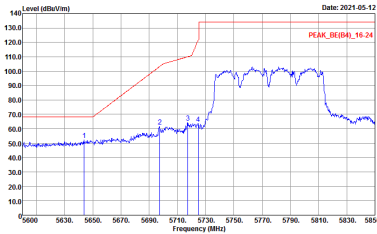
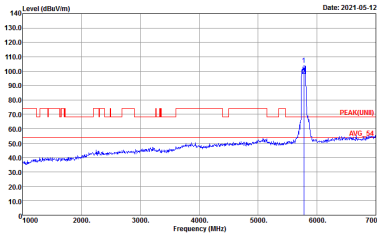
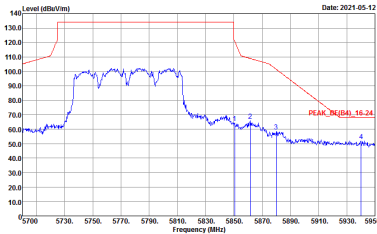
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	Left blank



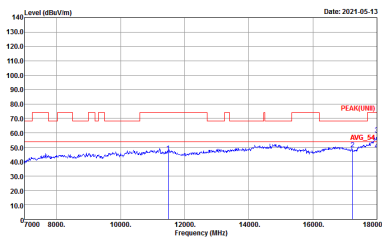
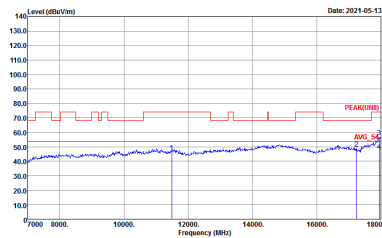
Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNB) 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto
Peak	 Site : 03CH11-HY Condition : PEAK_BE(B4)_16-24 3m HORN 91200-HF_1326 HORIZONTAL : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto	Left blank

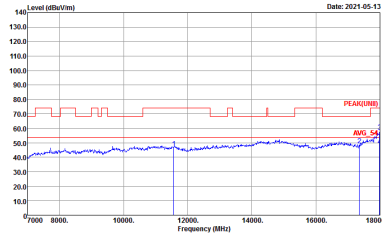
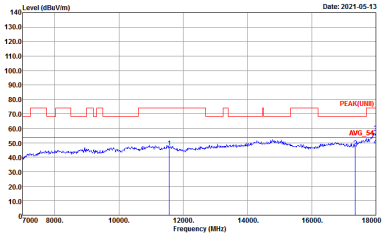


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH11-HY Condition : PEAK_BE(84)_16-24 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH11-HY Condition : PEAK(UNII) 3m HORN 91200-HF_1326 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
	 Site : 03CH11-HY Condition : PEAK_BE(84)_16-24 3m HORN 91200-HF_1326 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	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL



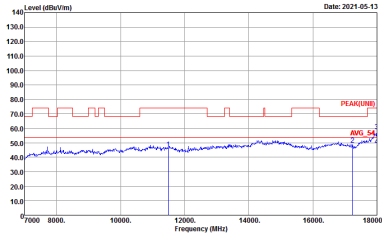
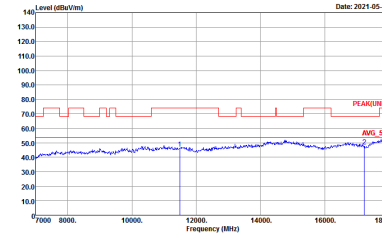
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2021-05-13 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	Level (dBuV/m) Date: 2021-05-13 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL



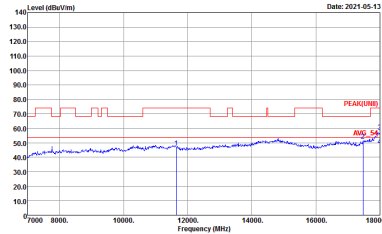
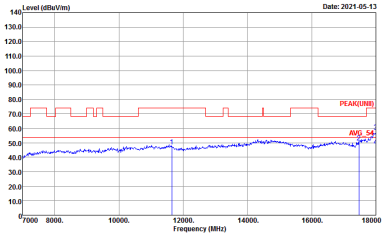
Band 4 5725~5850MHz
WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL

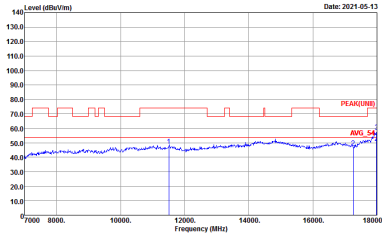
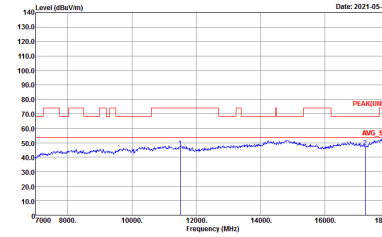


WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2021-05-13 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	Level (dBuV/m) Date: 2021-05-13 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL

Band 4 5725~5850MHz
WIFI 802.11ac VHT40 (Harmonic @ 3m)

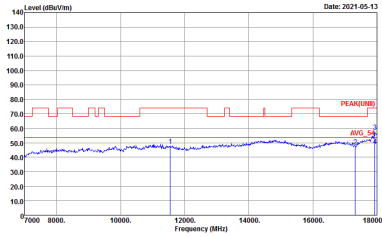
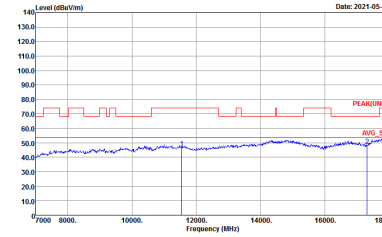
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBm/100MHz) Date: 2021-05-13 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	Level (dBm/100MHz) Date: 2021-05-13 Site : 03CHI1-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL

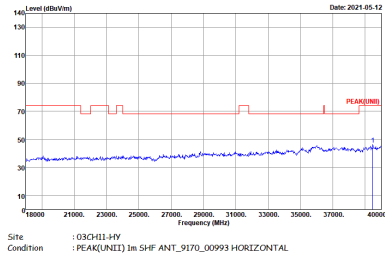
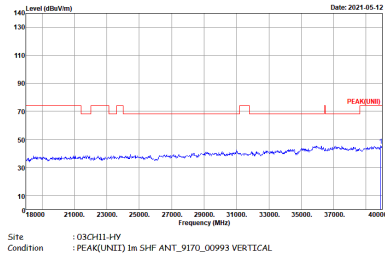


Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)

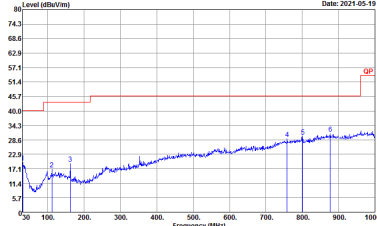
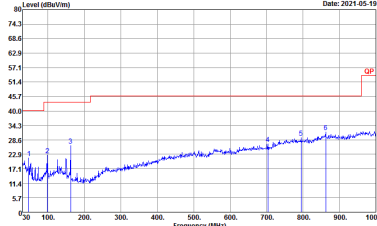
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 HORIZONTAL	 Site : 03CH11-HY Condition : PEAK(UNIT) 3m HORN 9120D-HF_1326 VERTICAL



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

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 SHF	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : : PEAK(UNII) 1m SHF ANT_9170_00993 HORIZONTAL	 Site : 03CH11-HY Condition : : PEAK(UNII) 1m SHF ANT_9170_00993 VERTICAL

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

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CHI1-HY Condition : QP 3m BE-LOG 6111D-LF_ETC HORIZONTAL	 Site : 03CHI1-HY Condition : QP 3m BE-LOG 6111D-LF_ETC VERTICAL



Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
1+2	802.11a	98.33	-	-	10Hz	0.07
1+2	5GHz 802.11ac VHT20	98.17	-	-	10Hz	0.08
1+2	5GHz 802.11ac VHT40	96.36	954	1.05	3kHz	0.16
1+2	5GHz 802.11ac VHT80	92.80	464	2.16	3kHz	0.32

MIMO <Ant. 1+2>

