



FCC RADIO TEST REPORT

FCC ID : S9E-121900
Equipment : Rugged Handheld Computer
Brand Name : Trimble
Model Name : 121900
Marketing Name : TSC5
Applicant : Trimble Inc.
5475 Kellenburger Rd., Dayton, Ohio, United States 45424
Manufacturer : Trimble Inc.
5475 Kellenburger Rd., Dayton, Ohio, United States 45424
Standard : FCC Part 15 Subpart E §15.407

The product was received on Aug. 19, 2020 and testing was started from Sep. 14, 2020 and completed on Oct. 12, 2020. 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, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Product Feature of Equipment Under Test.....	5
1.2 Modification of EUT	5
1.3 Testing Location	5
1.4 Applicable Standards.....	6
2 Test Configuration of Equipment Under Test	7
2.1 Carrier Frequency and Channel	7
2.2 Test Mode.....	7
2.3 Connection Diagram of Test System.....	8
2.4 Support Unit used in test configuration and system	9
2.5 EUT Operation Test Setup	9
2.6 Measurement Results Explanation Example.....	9
3 Test Result	10
3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement	10
3.2 Maximum Conducted Output Power Measurement	13
3.3 Power Spectral Density Measurement	14
3.4 Unwanted Emissions Measurement.....	17
3.5 AC Conducted Emission Measurement.....	21
3.6 Automatically Discontinue Transmission	23
3.7 Antenna Requirements.....	24
4 List of Measuring Equipment.....	25
5 Uncertainty of Evaluation	27
Appendix A. Conducted Test Results	
Appendix B. AC Conducted Emission Test Result	
Appendix C. Radiated Spurious Emission	
Appendix D. Radiated Spurious Emission Plots	
Appendix E. Duty Cycle Plots	
Appendix F. Setup Photographs	



History of this test report

Report No.	Version	Description	Issued Date
FR081931E	01	Initial issue of report	Oct. 28, 2020

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 6.56 dB at 741.980 MHz
3.5	15.207	AC Conducted Emission	Pass	Under limit 10.38 dB at 0.177 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: Wii Chang

Report Producer: Yimin Ho

1 General Description

1.1 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Antenna Type	WWAN: PIFA Antenna WLAN: <Ant. 1> Dipole Antenna <Ant. 2> Dipole Antenna Bluetooth: Dipole Antenna GPS/Glonass/BDS/Galileo: Patch Antenna

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, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	Sporton Site No.	
	TH05-HY	CO05-HY

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

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH15-HY	

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

FCC designation No.: TW1190 and TW0007



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) 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

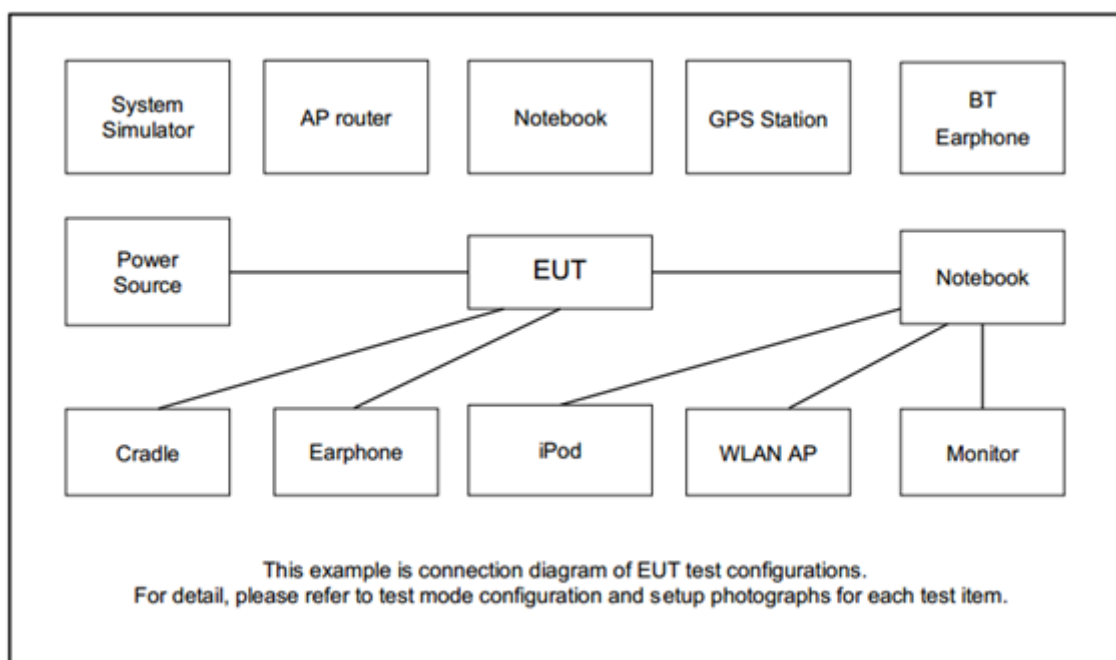
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20 (Covered by VHT20)	MCS0
802.11n HT40 (Covered by VHT40)	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : LTE Band 41 Link + WLAN (5GHz) Link + Bluetooth Link + Color Bar + USB Cable (Charging from Adapter)
	Mode 2 : LTE Band 41 Idle + WLAN (5GHz) Idle + Bluetooth Idle + Color Bar + USB Cable (Charging from Adapter)
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
3.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
4.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
5.	Battery	Trimble	U80596R01	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT v4.0” was installed in Notebook which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

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

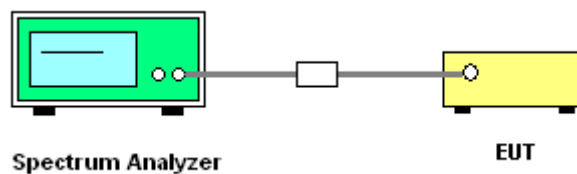
3.1.2 Measuring Instruments

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 5.725-5.85GHz
2. Set RBW = 100kHz.
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.



1 PK
VIEW

Ref 30 dBm Att 20 dB RBW 1 MHz VBW 3 MHz Delta 2 [T1] -0.38 dB
SWT 20 ms 82.88000000 MHz

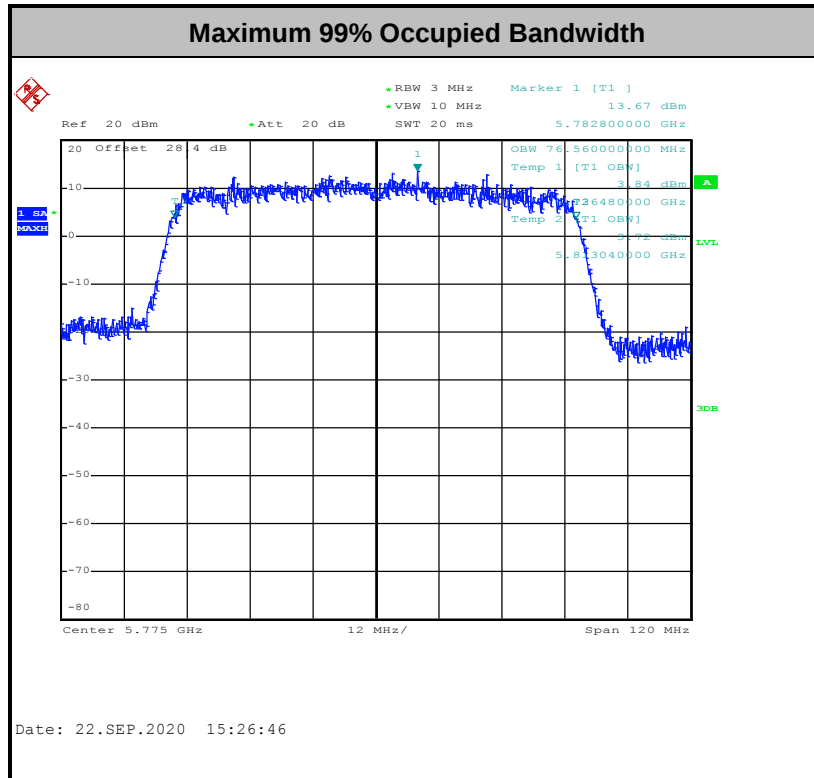
30 Offset 28.4 dB

Marker 1 [T1] -16.65 dBm
5.733400000 GHz

p1 -18.55 dBm
p2 -17.45 dBm

Center 5.775 GHz 16 MHz/ Span 160 MHz

Date: 22.SEP.2020 15:20:07



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.

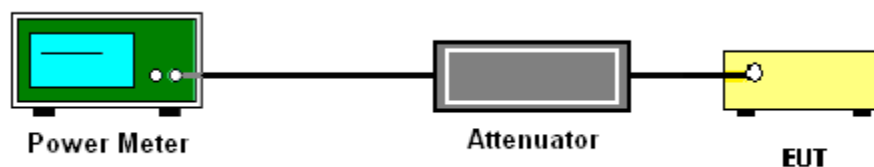
3.2.3 Test Procedures

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):

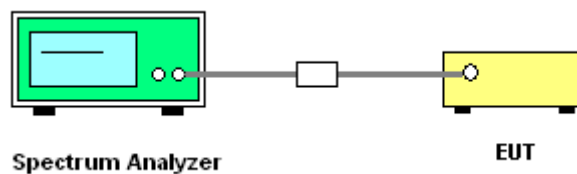
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW $\geq$ 1 MHz.
- Number of points in sweep $\geq$ 2 Span / RBW.
- Sweep time $\leq$ (number of points in sweep) $\times$ T, when duty cycle is less than 98 percent where T is the minimum transmission 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.

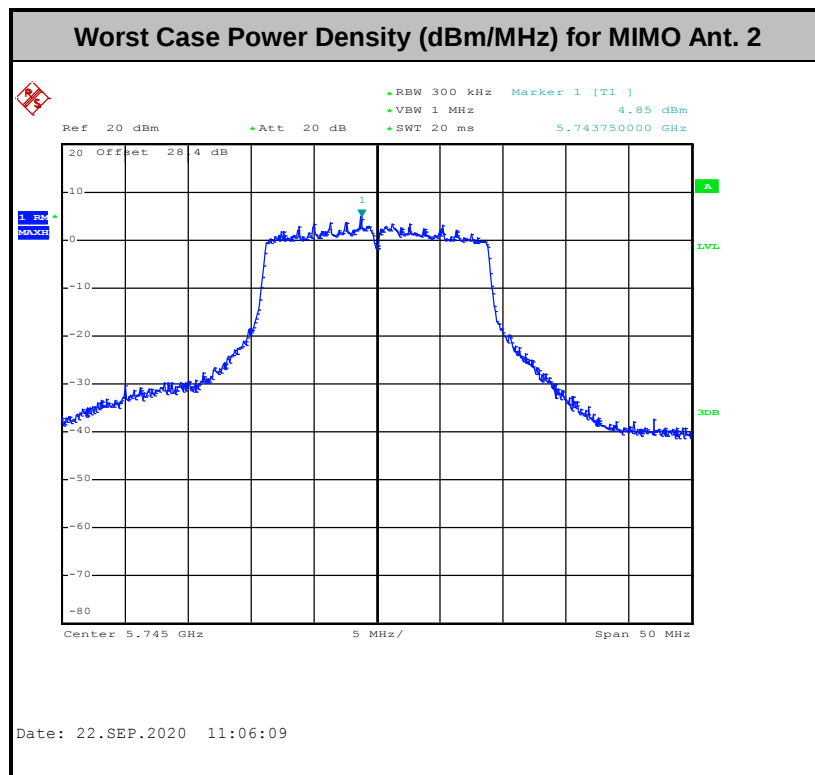
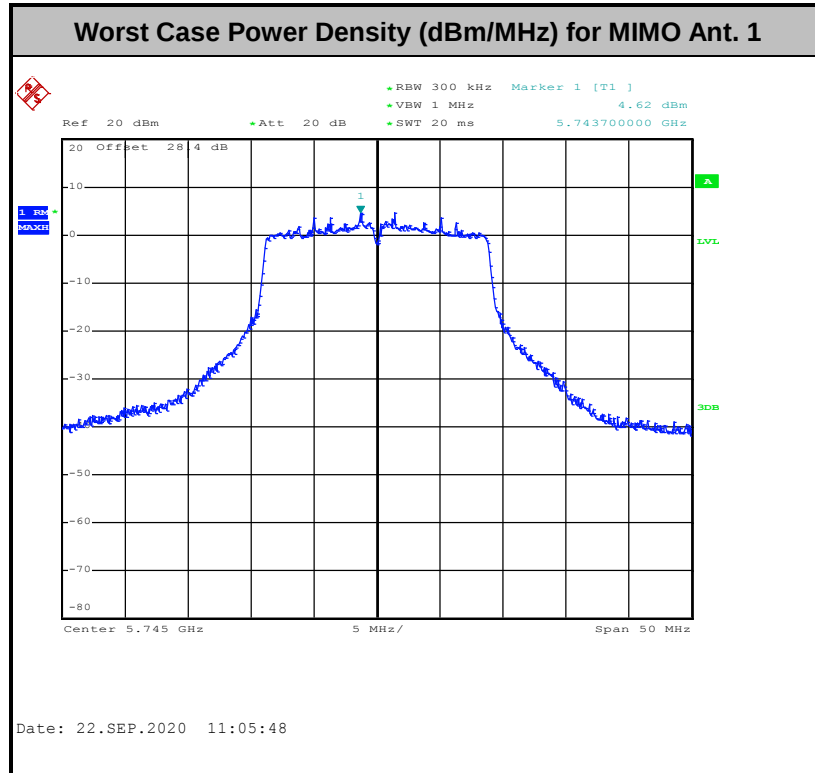
With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity $10 \log(N_{\text{ANT}})$ dB is added to each spectrum value before comparing to the emission limit. The addition of $10 \log(N_{\text{ANT}})$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

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

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

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

- (i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.
- (ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

3.4.2 Measuring Instruments

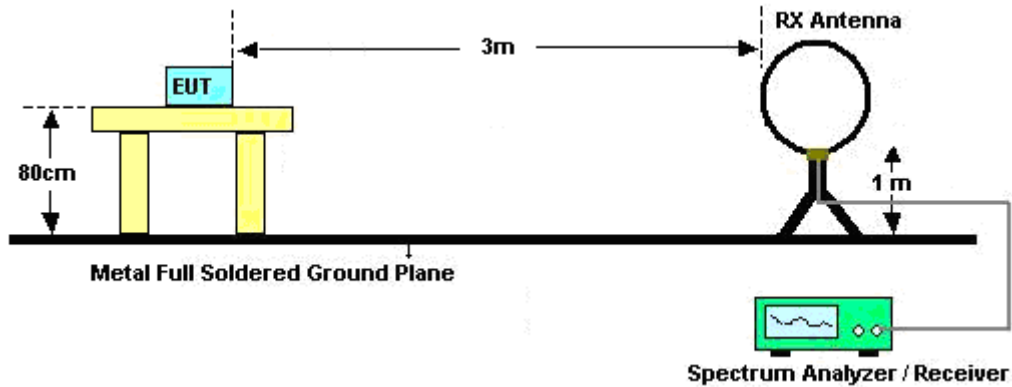
See list of measuring equipment of this test report.

3.4.3 Test Procedures

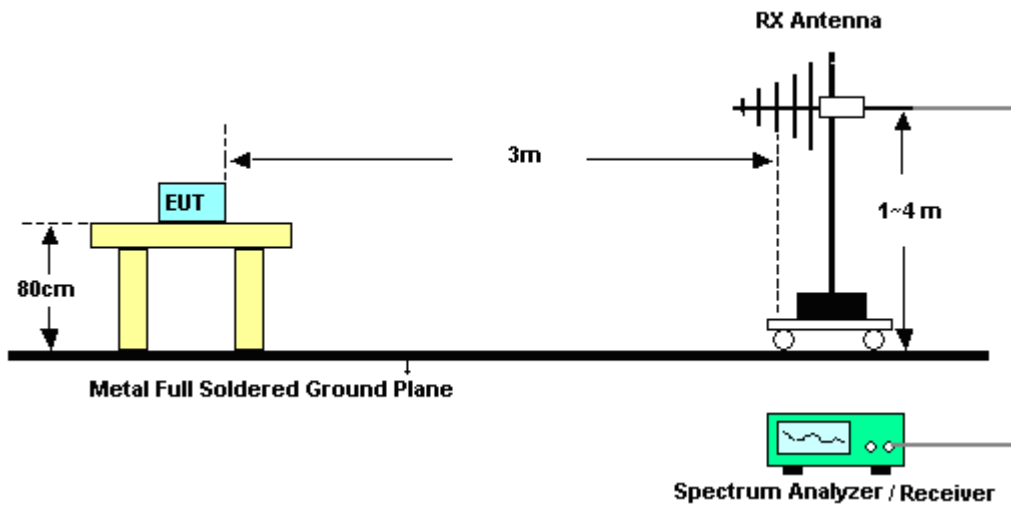
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section G) Unwanted emissions measurement.
(1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold
(2) Procedure for Peak Unwanted 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 1000MHz
 - 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 1GHz and 1.5 meter for frequency above 1GHz 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 1GHz, 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 1GHz, the emission level of the EUT in peak mode was 20dB 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

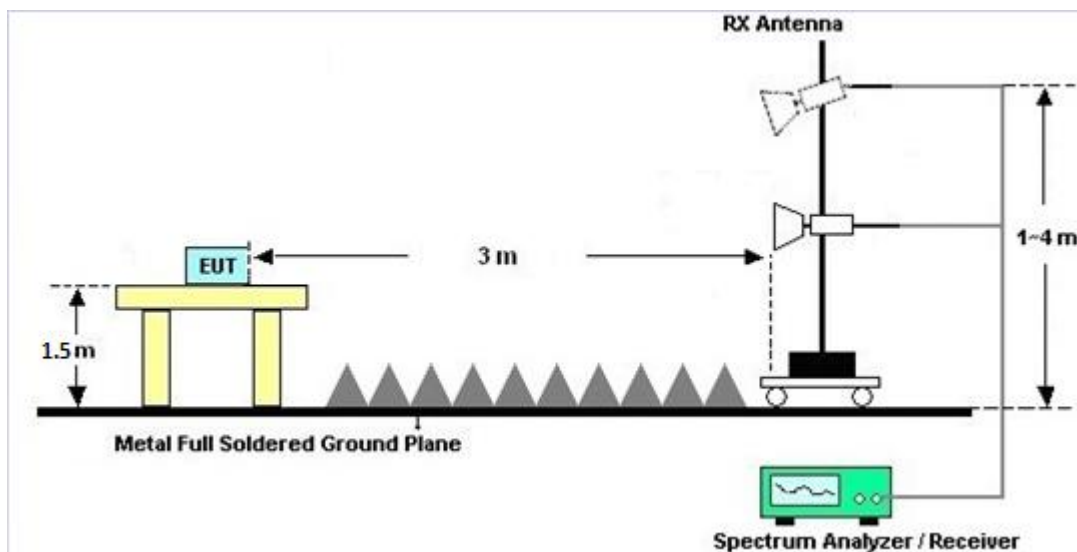
For radiated emissions below 30MHz



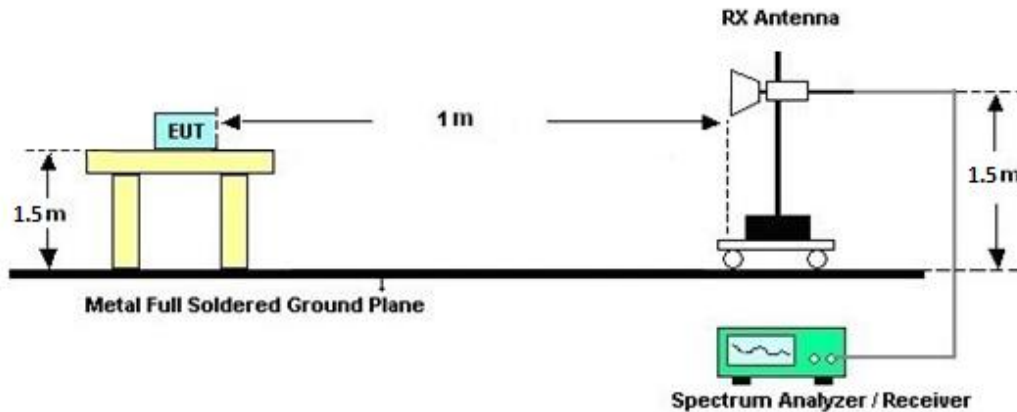
For radiated emissions from 30MHz to 1GHz



For radiated emissions from 1GHz to 18GHz



For radiated emissions 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.

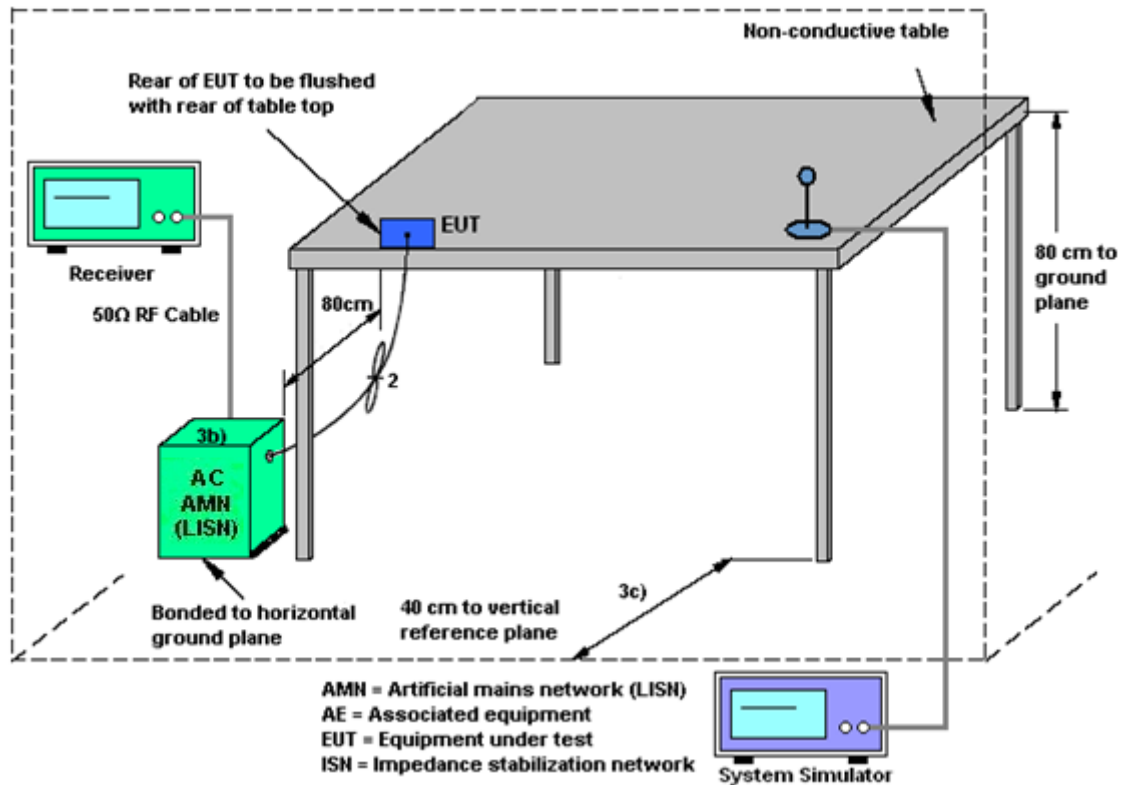
3.5.2 Measuring Instruments

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 should 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

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.

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., F2)f)i).

For PSD, the directional gain calculation is following F2)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.

			DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant. 1 (dBi)	Ant. 2 (dBi)				
Band IV	2.80	0.60	2.80	4.78	0.00	0.00

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

PSD Limit Reduction = $DG(\text{PSD}) - 6\text{dBi}$, (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	100488	9 kHz~30 MHz	Jan. 09, 2020	Sep. 18, 2020~ Oct. 08, 2020	Jan. 08, 2021	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL6111D&0 0800N1D01N- 06	41912&05	30MHz to 1GHz	Feb. 09, 2020	Sep. 18, 2020~ Oct. 08, 2020	Feb. 08, 2021	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 27, 2019	Sep. 18, 2020~ Oct. 08, 2020	Dec. 26, 2020	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-162 0	1-18GHz	Oct. 28, 2019	Sep. 18, 2020~ Oct. 08, 2020	Oct. 27, 2020	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA9170 584	18GHz- 40GHz	Dec. 10, 2019	Sep. 18, 2020~ Oct. 08, 2020	Dec. 09, 2020	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	171000180 0055006	1GHz~18GHz	May 07, 2020	Sep. 18, 2020~ Oct. 08, 2020	May 06, 2021	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY532701 95	1GHz~26.5GHz	Aug. 21, 2020	Sep. 18, 2020~ Oct. 08, 2020	Aug. 20, 2021	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz ~ 40GHz	Dec. 13, 2019	Sep. 18, 2020~ Oct. 08, 2020	Dec. 12, 2020	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY541300 85	20MHz~8.4GHz	Nov. 01, 2019	Sep. 18, 2020~ Oct. 08, 2020	Oct. 31, 2020	Radiation (03CH15-HY)
Spectrum Analyzer	Agilent	E4446A	MY501801 36	3Hz~44GHz	May 04, 2020	Sep. 18, 2020~ Oct. 08, 2020	May 03, 2021	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Sep. 18, 2020~ Oct. 08, 2020	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Sep. 18, 2020~ Oct. 08, 2020	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k 5)	RK-00045 1	N/A	N/A	Sep. 18, 2020~ Oct. 08, 2020	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY36980/ 4	30M-18G	Apr. 14, 2020	Sep. 18, 2020~ Oct. 08, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9838/4 PE	30M-18G	Apr. 14, 2020	Sep. 18, 2020~ Oct. 08, 2020	Apr. 13, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY37710/ 4	30M-18G	Apr. 17, 2020	Sep. 18, 2020~ Oct. 08, 2020	Apr. 16, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 25, 2020	Sep. 18, 2020~ Oct. 08, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 25, 2020	Sep. 18, 2020~ Oct. 08, 2020	Feb. 24, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4 PE	9kHz~30MHz	Mar. 12, 2020	Sep. 18, 2020~ Oct. 08, 2020	Mar. 11, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WLK4-1000-1 530-8000-40S S	SN4	1.53G Low Pass	Jul. 03, 2020	Sep. 18, 2020~ Oct. 08, 2020	Jul. 02, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000 -40ST	SN6	6.75GHz High Pass Filter	Jul. 03, 2020	Sep. 18, 2020~ Oct. 08, 2020	Jul. 02, 2021	Radiation (03CH15-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 02, 2020	Sep. 14, 2020~ Oct. 12, 2020	Mar. 01, 2021	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054S NO10	10MHz~6GHz	Dec. 23, 2019	Sep. 14, 2020~ Oct. 12, 2020	Dec. 22, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Dec. 30, 2019	Sep. 14, 2020~ Oct. 12, 2020	Dec. 29, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2020	Sep. 14, 2020~ Oct. 12, 2020	Mar. 16, 2021	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Sep. 28, 2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	Sep. 28, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 07, 2019	Sep. 28, 2020	Nov. 06, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	Sep. 28, 2020	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Sep. 28, 2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	Sep. 28, 2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	Sep. 28, 2020	Jan. 01, 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
---	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0
---	-----

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.0
---	-----

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Kathy Chen	Temperature:	23.6~24	°C
Test Date:	2020/09/14~2020/10/12	Relative Humidity:	53.7~54.2	%

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	16.60	16.65	23.75	23.30	15.12	15.35	0.5	Pass
11a	6Mbps	2	157	5785	16.70	16.65	23.55	23.70	15.30	15.35	0.5	Pass
11a	6Mbps	2	165	5825	16.65	16.65	24.05	22.95	15.25	15.25	0.5	Pass
VHT20	MCS0	2	149	5745	17.85	17.80	25.05	24.80	15.15	15.45	0.5	Pass
VHT20	MCS0	2	157	5785	17.90	17.80	25.20	24.55	15.90	15.45	0.5	Pass
VHT20	MCS0	2	165	5825	17.85	17.85	24.80	24.60	15.90	15.90	0.5	Pass
VHT40	MCS0	2	151	5755	36.60	36.50	42.06	41.86	35.28	35.10	0.5	Pass
VHT40	MCS0	2	159	5795	36.60	36.60	41.63	41.92	35.70	35.10	0.5	Pass
VHT80	MCS0	2	155	5775	76.44	76.56	82.88	82.88	75.25	75.10	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	16.30	16.40	19.36	30.00		2.80		Pass
11a	6Mbps	2	157	5785	16.40	16.10	19.26	30.00		2.80		Pass
11a	6Mbps	2	165	5825	16.40	16.20	19.31	30.00		2.80		Pass
HT20	MCS0	2	149	5745	15.60	15.70	18.66	30.00		2.80		Pass
HT20	MCS0	2	157	5785	15.80	15.60	18.71	30.00		2.80		Pass
HT20	MCS0	2	165	5825	15.80	15.60	18.71	30.00		2.80		Pass
HT40	MCS0	2	151	5755	15.20	15.20	18.21	30.00		2.80		Pass
HT40	MCS0	2	159	5795	15.30	15.10	18.21	30.00		2.80		Pass
VHT20	MCS0	2	149	5745	16.20	16.30	19.26	30.00		2.80		Pass
VHT20	MCS0	2	157	5785	16.30	16.10	19.21	30.00		2.80		Pass
VHT20	MCS0	2	165	5825	16.30	16.10	19.21	30.00		2.80		Pass
VHT40	MCS0	2	151	5755	15.30	15.30	18.31	30.00		2.80		Pass
VHT40	MCS0	2	159	5795	15.40	15.20	18.31	30.00		2.80		Pass
VHT80	MCS0	2	155	5775	15.40	15.40	18.41	30.00		2.80		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		6.72	7.02	10.03	30.00		4.78		Pass
11a	6Mbps	2	157	5785	2.22		6.68	6.91	9.92	30.00		4.78		Pass
11a	6Mbps	2	165	5825	2.22		6.73	7.05	10.06	30.00		4.78		Pass
VHT20	MCS0	2	149	5745	2.22		6.84	7.07	10.08	30.00		4.78		Pass
VHT20	MCS0	2	157	5785	2.22		7.03	6.81	10.04	30.00		4.78		Pass
VHT20	MCS0	2	165	5825	2.22		6.83	6.99	10.00	30.00		4.78		Pass
VHT40	MCS0	2	151	5755	2.22		2.14	2.26	5.27	30.00		4.78		Pass
VHT40	MCS0	2	159	5795	2.22		2.22	2.27	5.28	30.00		4.78		Pass
VHT80	MCS0	2	155	5775	2.22		1.03	1.26	4.27	30.00		4.78		Pass

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



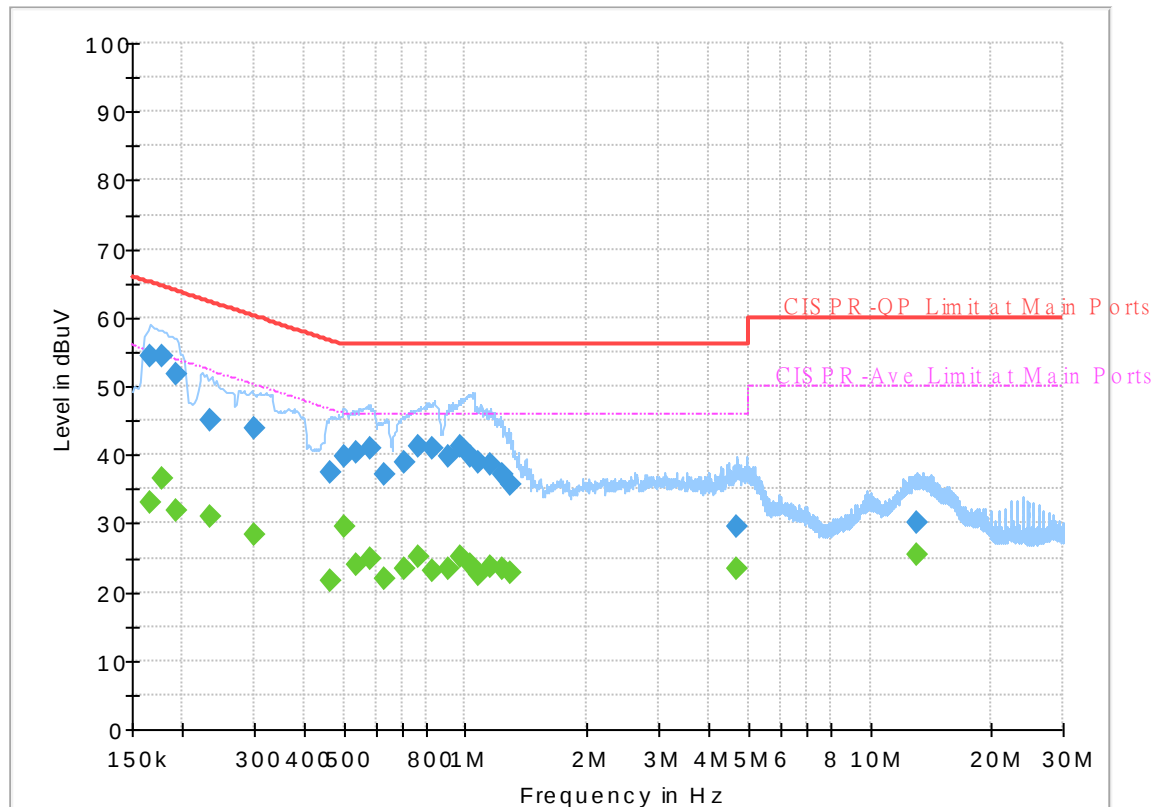
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	Temperature :	24~26℃
		Relative Humidity :	42~50%

EUT Information

Report NO : 081931
Test Mode : Mode 1
Test Voltage : 120Vac/60Hz
Phase : Line

Full Spectrum



Final_Result

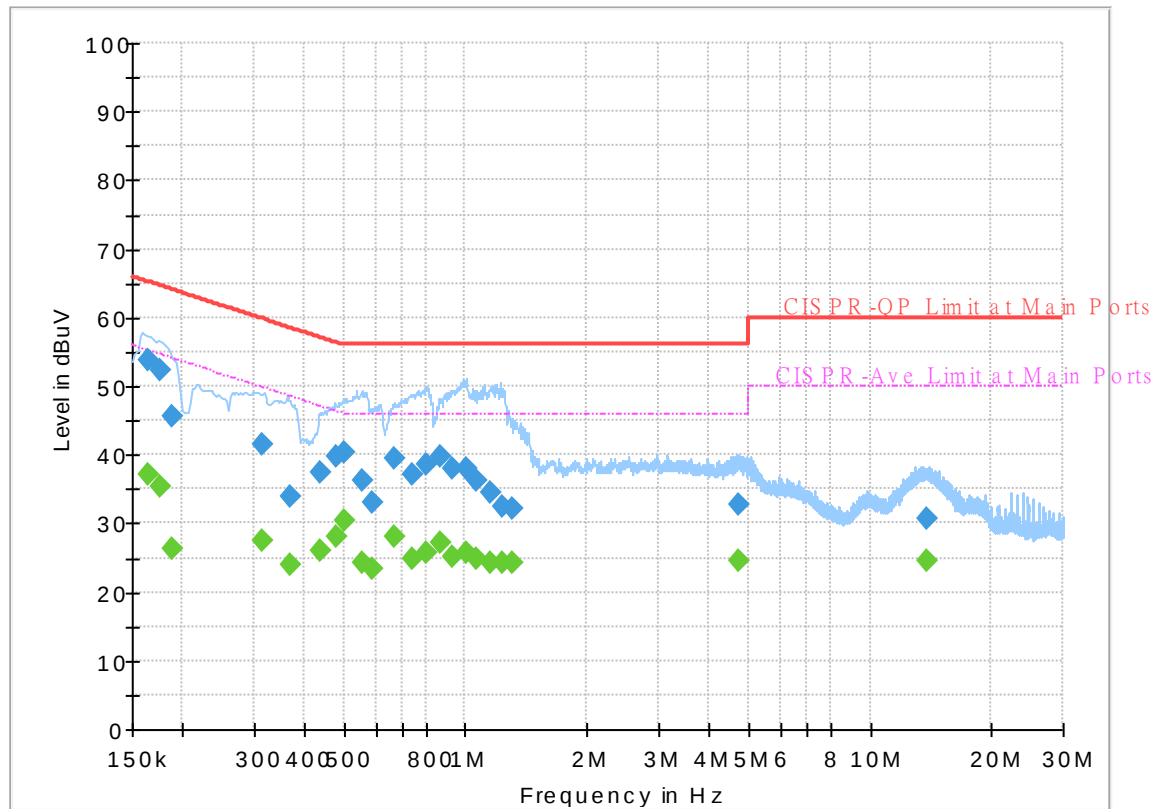
Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.166560	---	32.91	55.13	22.22	L1	OFF	19.6
0.166560	54.39	---	65.13	10.74	L1	OFF	19.6
0.177000	---	36.42	54.63	18.21	L1	OFF	19.6
0.177000	54.25	---	64.63	10.38	L1	OFF	19.6
0.193200	---	32.01	53.90	21.89	L1	OFF	19.6
0.193200	51.76	---	63.90	12.14	L1	OFF	19.6
0.232800	---	30.91	52.35	21.44	L1	OFF	19.6
0.232800	45.00	---	62.35	17.35	L1	OFF	19.6
0.300750	---	28.50	50.22	21.72	L1	OFF	19.6
0.300750	43.83	---	60.22	16.39	L1	OFF	19.6
0.462750	---	21.75	46.64	24.89	L1	OFF	19.6
0.462750	37.53	---	56.64	19.11	L1	OFF	19.6
0.501810	---	29.49	46.00	16.51	L1	OFF	19.6
0.501810	39.74	---	56.00	16.26	L1	OFF	19.6
0.537000	---	24.02	46.00	21.98	L1	OFF	19.6
0.537000	40.30	---	56.00	15.70	L1	OFF	19.6
0.579210	---	24.78	46.00	21.22	L1	OFF	19.6
0.579210	40.80	---	56.00	15.20	L1	OFF	19.6
0.629790	---	21.91	46.00	24.09	L1	OFF	19.6
0.629790	37.11	---	56.00	18.89	L1	OFF	19.6
0.702690	---	23.42	46.00	22.58	L1	OFF	19.6

0.702690	38.78	---	56.00	17.22	L1	OFF	19.6
0.761010	---	25.14	46.00	20.86	L1	OFF	19.6
0.761010	41.34	---	56.00	14.66	L1	OFF	19.6
0.831750	---	23.02	46.00	22.98	L1	OFF	19.6
0.831750	40.84	---	56.00	15.16	L1	OFF	19.6
0.907080	---	23.39	46.00	22.61	L1	OFF	19.6
0.907080	39.87	---	56.00	16.13	L1	OFF	19.6
0.966750	---	25.14	46.00	20.86	L1	OFF	19.6
0.966750	41.12	---	56.00	14.88	L1	OFF	19.6
1.024080	---	23.94	46.00	22.06	L1	OFF	19.6
1.024080	39.66	---	56.00	16.34	L1	OFF	19.6
1.079250	---	22.44	46.00	23.56	L1	OFF	19.6
1.079250	38.98	---	56.00	17.02	L1	OFF	19.6
1.157280	---	23.61	46.00	22.39	L1	OFF	19.6
1.157280	38.53	---	56.00	17.47	L1	OFF	19.6
1.227750	---	23.42	46.00	22.58	L1	OFF	19.6
1.227750	37.27	---	56.00	18.73	L1	OFF	19.6
1.297500	---	22.74	46.00	23.26	L1	OFF	19.6
1.297500	35.60	---	56.00	20.40	L1	OFF	19.6
4.703010	---	23.45	46.00	22.55	L1	OFF	19.7
4.703010	29.66	---	56.00	26.34	L1	OFF	19.7
12.988500	---	25.55	50.00	24.45	L1	OFF	20.0
12.988500	30.08	---	60.00	29.92	L1	OFF	20.0

EUT Information

Report NO : 081931
 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)
0.163500	---	37.19	55.28	18.09	N	OFF	19.6
0.163500	53.83	---	65.28	11.45	N	OFF	19.6
0.175470	---	35.39	54.70	19.31	N	OFF	19.6
0.175470	52.21	---	64.70	12.49	N	OFF	19.6
0.188250	---	26.28	54.11	27.83	N	OFF	19.6
0.188250	45.71	---	64.11	18.40	N	OFF	19.6
0.313800	---	27.51	49.87	22.36	N	OFF	19.6
0.313800	41.49	---	59.87	18.38	N	OFF	19.6
0.368250	---	24.00	48.54	24.54	N	OFF	19.6
0.368250	34.01	---	58.54	24.53	N	OFF	19.6
0.436110	---	26.02	47.14	21.12	N	OFF	19.6
0.436110	37.55	---	57.14	19.59	N	OFF	19.6
0.479040	---	27.99	46.36	18.37	N	OFF	19.6
0.479040	39.72	---	56.36	16.64	N	OFF	19.6
0.503070	---	30.55	46.00	15.45	N	OFF	19.6
0.503070	40.36	---	56.00	15.64	N	OFF	19.6
0.553740	---	24.28	46.00	21.72	N	OFF	19.6
0.553740	36.13	---	56.00	19.87	N	OFF	19.6
0.586500	---	23.27	46.00	22.73	N	OFF	19.6
0.586500	33.00	---	56.00	23.00	N	OFF	19.6
0.668850	---	28.17	46.00	17.83	N	OFF	19.6

0.668850	39.47	---	56.00	16.53	N	OFF	19.6
0.737250	---	24.79	46.00	21.21	N	OFF	19.6
0.737250	37.26	---	56.00	18.74	N	OFF	19.6
0.800250	---	25.72	46.00	20.28	N	OFF	19.6
0.800250	38.53	---	56.00	17.47	N	OFF	19.6
0.870000	---	27.23	46.00	18.77	N	OFF	19.6
0.870000	39.89	---	56.00	16.11	N	OFF	19.6
0.933360	---	25.21	46.00	20.79	N	OFF	19.6
0.933360	38.04	---	56.00	17.96	N	OFF	19.6
1.000500	---	25.73	46.00	20.27	N	OFF	19.6
1.000500	38.06	---	56.00	17.94	N	OFF	19.6
1.068000	---	24.93	46.00	21.07	N	OFF	19.6
1.068000	36.35	---	56.00	19.65	N	OFF	19.6
1.150260	---	24.20	46.00	21.80	N	OFF	19.6
1.150260	34.61	---	56.00	21.39	N	OFF	19.6
1.239810	---	24.27	46.00	21.73	N	OFF	19.6
1.239810	32.46	---	56.00	23.54	N	OFF	19.6
1.305510	---	24.34	46.00	21.66	N	OFF	19.6
1.305510	32.22	---	56.00	23.78	N	OFF	19.6
4.724250	---	24.60	46.00	21.40	N	OFF	19.8
4.724250	32.75	---	56.00	23.25	N	OFF	19.8
13.902000	---	24.46	50.00	25.54	N	OFF	20.1
13.902000	30.59	---	60.00	29.41	N	OFF	20.1



Appendix C. Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.1~23.2°C
		Relative Humidity :	45~59%

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		5622.4	53.36	-14.84	68.2	40.69	31.86	10.89	30.08	273	298	P	H
		5698.2	55.46	-48.41	103.87	42.73	31.99	10.87	30.13	273	298	P	H
		5715.8	66.49	-43.14	109.63	53.77	32	10.87	30.15	273	298	P	H
		5724.8	74.48	-47.26	121.74	61.76	32	10.87	30.15	273	298	P	H
	*	5745	112.42	-	-	99.73	32	10.86	30.17	273	298	P	H
	*	5745	105.01	-	-	92.32	32	10.86	30.17	273	298	A	H
													H
													H
		5644.6	53.53	-14.67	68.2	40.92	31.81	10.89	30.09	200	26	P	V
		5700	56.61	-48.59	105.2	43.87	32	10.87	30.13	200	26	P	V
		5715.8	64.96	-44.67	109.63	52.24	32	10.87	30.15	200	26	P	V
		5725	74.24	-47.96	122.2	61.52	32	10.87	30.15	200	26	P	V
	*	5745	114.17	-	-	101.48	32	10.86	30.17	200	26	P	V
	*	5745	106.5	-	-	93.81	32	10.86	30.17	200	26	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		5611.6	53.01	-15.19	68.2	40.31	31.88	10.89	30.07	268	298	P	H
		5696.8	53.11	-49.73	102.84	40.38	31.99	10.87	30.13	268	298	P	H
		5711.4	53.55	-54.84	108.39	40.82	32	10.87	30.14	268	298	P	H
		5725	53.53	-68.67	122.2	40.81	32	10.87	30.15	268	298	P	H
	*	5785	112.24	-	-	99.45	32.14	10.85	30.2	268	298	P	H
	*	5785	104.72	-	-	91.93	32.14	10.85	30.2	268	298	A	H
		5854.8	53.18	-58.08	111.26	40.22	32.22	10.99	30.25	268	298	P	H
		5864.8	53.43	-54.62	108.05	40.41	32.26	11.01	30.25	268	298	P	H
		5899.6	53.31	-33.65	86.96	40.09	32.4	11.1	30.28	268	298	P	H
		5950	53.49	-14.71	68.2	40.07	32.5	11.23	30.31	268	298	P	H
													H
													H
		5612.8	53.19	-15.01	68.2	40.5	31.87	10.89	30.07	180	25	P	V
		5690.4	53.3	-44.82	98.12	40.59	31.96	10.88	30.13	180	25	P	V
		5718.8	54.4	-56.06	110.46	41.68	32	10.87	30.15	180	25	P	V
		5723.4	55.63	-62.92	118.55	42.91	32	10.87	30.15	180	25	P	V
	*	5785	113.62	-	-	100.83	32.14	10.85	30.2	180	25	P	V
	*	5785	106.06	-	-	93.27	32.14	10.85	30.2	180	25	A	V
		5851.6	53.71	-64.84	118.55	40.76	32.21	10.98	30.24	180	25	P	V
		5868.6	54.19	-52.8	106.99	41.16	32.27	11.02	30.26	180	25	P	V
		5904.4	53.36	-30.05	83.41	40.12	32.41	11.11	30.28	180	25	P	V
		5933	53.55	-14.65	68.2	40.2	32.47	11.18	30.3	180	25	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	113.02	-	-	100.13	32.2	10.91	30.22	264	298	P	H
	*	5825	104.89	-	-	92	32.2	10.91	30.22	264	298	A	H
		5852.4	62.69	-54.04	116.73	49.74	32.21	10.98	30.24	264	298	P	H
		5857.8	59.63	-50.38	110.01	46.65	32.23	11	30.25	264	298	P	H
		5876.4	54.75	-49.41	104.16	41.66	32.31	11.04	30.26	264	298	P	H
		5950	53.14	-15.06	68.2	39.72	32.5	11.23	30.31	264	298	P	H
													H
													H
	*	5825	113.75	-	-	100.86	32.2	10.91	30.22	200	25	P	V
	*	5825	105.74	-	-	92.85	32.2	10.91	30.22	200	25	A	V
		5851.8	61.16	-56.94	118.1	48.21	32.21	10.98	30.24	200	25	P	V
		5857.6	60.82	-49.25	110.07	47.84	32.23	11	30.25	200	25	P	V
		5891	55.33	-38	93.33	42.16	32.36	11.08	30.27	200	25	P	V
		5934	53.53	-14.67	68.2	40.17	32.47	11.19	30.3	200	25	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	48.64	-25.36	74	54.17	40.48	14.89	60.9	100	0	P	H
		17235	50.19	-18.01	68.2	49.1	40.94	18.97	58.82	100	0	P	H
													H
													H
		11490	49.96	-24.04	74	55.49	40.48	14.89	60.9	400	0	P	V
		17235	50.03	-18.17	68.2	48.94	40.94	18.97	58.82	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	48.8	-25.2	74	54.51	40.29	14.98	60.98	100	0	P	H
		17355	52.44	-15.76	68.2	50.25	41.75	19.11	58.67	100	0	P	H
													H
													H
		11570	48.5	-25.5	74	54.21	40.29	14.98	60.98	100	0	P	V
		17355	53.37	-14.83	68.2	51.18	41.75	19.11	58.67	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11590	49.43	-24.57	74	55.21	40.23	15	61.01	100	0	P	H
		17457	52.23	-15.97	68.2	49.13	42.43	19.22	58.55	100	0	P	H
													H
													H
		11590	48.75	-25.25	74	54.53	40.23	15	61.01	100	0	P	V
		17385	52.22	-15.98	68.2	49.67	42.05	19.14	58.64	100	0	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 (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		5634.2	53.95	-14.25	68.2	41.32	31.83	10.89	30.09	267	297	P	H
		5698.4	55.06	-48.96	104.02	42.33	31.99	10.87	30.13	267	297	P	H
		5720	65.02	-45.78	110.8	52.3	32	10.87	30.15	267	297	P	H
		5724.8	74.85	-46.89	121.74	62.13	32	10.87	30.15	267	297	P	H
	*	5745	113.32	-	-	100.63	32	10.86	30.17	267	297	P	H
	*	5745	105.35	-	-	92.66	32	10.86	30.17	267	297	A	H
													H
													H
		5648.8	53.46	-14.74	68.2	40.87	31.8	10.89	30.1	200	6	P	V
		5699.8	56	-49.05	105.05	43.26	32	10.87	30.13	200	6	P	V
		5720	68.09	-42.71	110.8	55.37	32	10.87	30.15	200	6	P	V
		5725	75.76	-46.44	122.2	63.04	32	10.87	30.15	200	6	P	V
	*	5745	114.06	-	-	101.37	32	10.86	30.17	200	6	P	V
	*	5745	106.15	-	-	93.46	32	10.86	30.17	200	6	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		5612.4	52.68	-15.52	68.2	39.98	31.88	10.89	30.07	261	297	P	H
		5699.6	53.59	-51.32	104.91	40.85	32	10.87	30.13	261	297	P	H
		5708.2	53.33	-54.17	107.5	40.6	32	10.87	30.14	261	297	P	H
		5722.8	53.67	-63.51	117.18	40.95	32	10.87	30.15	261	297	P	H
	*	5785	113.26	-	-	100.47	32.14	10.85	30.2	261	297	P	H
	*	5785	105.45	-	-	92.66	32.14	10.85	30.2	261	297	A	H
		5850.8	53.28	-67.1	120.38	40.34	32.2	10.98	30.24	261	297	P	H
		5856	53.72	-56.8	110.52	40.76	32.22	10.99	30.25	261	297	P	H
		5900	53.65	-33.01	86.66	40.43	32.4	11.1	30.28	261	297	P	H
		5932.4	53.11	-15.09	68.2	39.77	32.46	11.18	30.3	261	297	P	H
													H
													H
		5601.8	53.09	-15.11	68.2	40.35	31.9	10.9	30.06	186	6	P	V
		5689	53.04	-44.05	97.09	40.33	31.96	10.88	30.13	186	6	P	V
		5716.6	54.46	-55.39	109.85	41.74	32	10.87	30.15	186	6	P	V
		5720.4	54.62	-57.09	111.71	41.9	32	10.87	30.15	186	6	P	V
	*	5785	113.87	-	-	101.08	32.14	10.85	30.2	186	6	P	V
	*	5785	106.16	-	-	93.37	32.14	10.85	30.2	186	6	A	V
		5850.2	53.64	-68.1	121.74	40.7	32.2	10.98	30.24	186	6	P	V
		5874.2	53.72	-51.7	105.42	40.64	32.3	11.04	30.26	186	6	P	V
		5893.6	52.94	-38.46	91.4	39.75	32.37	11.09	30.27	186	6	P	V
		5927.6	53.82	-14.38	68.2	40.49	32.46	11.17	30.3	186	6	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	111.52	-	-	98.63	32.2	10.91	30.22	278	269	P	H
	*	5825	103.89	-	-	91	32.2	10.91	30.22	278	269	A	H
		5850	59.9	-62.3	122.2	46.96	32.2	10.98	30.24	278	269	P	H
		5860.6	57.53	-51.7	109.23	44.54	32.24	11	30.25	278	269	P	H
		5890.4	54.02	-39.75	93.77	40.85	32.36	11.08	30.27	278	269	P	H
		5939.8	53.15	-15.05	68.2	39.78	32.48	11.2	30.31	278	269	P	H
													H
													H
	*	5825	113	-	-	100.11	32.2	10.91	30.22	204	21	P	V
	*	5825	105.26	-	-	92.37	32.2	10.91	30.22	204	21	A	V
		5852.6	60.99	-55.28	116.27	48.04	32.21	10.98	30.24	204	21	P	V
		5858	61.85	-48.11	109.96	48.87	32.23	11	30.25	204	21	P	V
		5876.8	55.16	-48.7	103.86	42.07	32.31	11.04	30.26	204	21	P	V
		5938.6	53.36	-14.84	68.2	39.99	32.48	11.2	30.31	204	21	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	48.66	-25.34	74	54.19	40.48	14.89	60.9	100	0	P	H
		17235	50.27	-17.93	68.2	49.18	40.94	18.97	58.82	100	0	P	H
													H
													H
		11490	48.89	-25.11	74	54.42	40.48	14.89	60.9	100	0	P	V
		17235	51.03	-17.17	68.2	49.94	40.94	18.97	58.82	100	0	P	V
													V
													V
802.11ac VHT20 CH 157 5785MHz		11570	49.52	-24.48	74	55.23	40.29	14.98	60.98	100	0	P	H
		17355	51.94	-16.26	68.2	49.75	41.75	19.11	58.67	100	0	P	H
													H
													H
		11570	48.55	-25.45	74	54.26	40.29	14.98	60.98	100	0	P	V
		17355	52.96	-15.24	68.2	50.77	41.75	19.11	58.67	100	0	P	V
													V
													V
802.11ac VHT20 CH 165 5825MHz		11650	48.66	-25.34	74	54.83	39.85	15.06	61.08	100	0	P	H
		17475	52.58	-15.62	68.2	49.37	42.5	19.24	58.53	100	0	P	H
													H
													H
		11650	49.01	-24.99	74	55.18	39.85	15.06	61.08	100	0	P	V
		17475	52.99	-15.21	68.2	49.78	42.5	19.24	58.53	100	0	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 (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		5643.8	53.75	-14.45	68.2	41.14	31.81	10.89	30.09	264	296	P	H
		5697.4	61.29	-41.99	103.28	48.56	31.99	10.87	30.13	264	296	P	H
		5719	73.06	-37.46	110.52	60.34	32	10.87	30.15	264	296	P	H
		5724.8	75.53	-46.21	121.74	62.81	32	10.87	30.15	264	296	P	H
	*	5755	108.17	-	-	95.46	32.02	10.86	30.17	264	296	P	H
	*	5755	100.07	-	-	87.36	32.02	10.86	30.17	264	296	A	H
		5850.4	53.4	-67.89	121.29	40.46	32.2	10.98	30.24	264	296	P	H
		5864.4	53.63	-54.54	108.17	40.61	32.26	11.01	30.25	264	296	P	H
		5889	53.58	-41.23	94.81	40.42	32.36	11.07	30.27	264	296	P	H
		5938	53.66	-14.54	68.2	40.29	32.48	11.2	30.31	264	296	P	H
													H
													H
		5632	54.83	-13.37	68.2	42.19	31.84	10.89	30.09	198	21	P	V
		5699	61.08	-43.38	104.46	48.34	32	10.87	30.13	198	21	P	V
		5719	74.02	-36.5	110.52	61.3	32	10.87	30.15	198	21	P	V
		5724.8	75.16	-46.58	121.74	62.44	32	10.87	30.15	198	21	P	V
	*	5755	109.91	-	-	97.2	32.02	10.86	30.17	198	21	P	V
	*	5755	102.4	-	-	89.69	32.02	10.86	30.17	198	21	A	V
		5854.4	53.5	-58.67	112.17	40.54	32.22	10.99	30.25	198	21	P	V
		5862.4	53.77	-54.96	108.73	40.76	32.25	11.01	30.25	198	21	P	V
		5875.4	53.49	-51.41	104.9	40.41	32.3	11.04	30.26	198	21	P	V
		5949.4	53.71	-14.49	68.2	40.29	32.5	11.23	30.31	198	21	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		5644.2	54.05	-14.15	68.2	41.44	31.81	10.89	30.09	278	298	P	H
		5698	53.86	-49.87	103.73	41.13	31.99	10.87	30.13	278	298	P	H
		5719.6	59.09	-51.6	110.69	46.37	32	10.87	30.15	278	298	P	H
		5724.8	58.9	-62.84	121.74	46.18	32	10.87	30.15	278	298	P	H
	*	5795	109.38	-	-	96.55	32.18	10.85	30.2	278	298	P	H
	*	5795	101.38	-	-	88.55	32.18	10.85	30.2	278	298	A	H
		5855	58.56	-52.24	110.8	45.6	32.22	10.99	30.25	278	298	P	H
		5856.8	59.3	-51	110.3	46.33	32.23	10.99	30.25	278	298	P	H
		5881.2	54.17	-46.42	100.59	41.06	32.32	11.05	30.26	278	298	P	H
		5942.8	52.9	-15.3	68.2	39.51	32.49	11.21	30.31	278	298	P	H
													H
													H
		5645.6	53.19	-15.01	68.2	40.58	31.81	10.89	30.09	206	16	P	V
		5694.8	55.07	-46.3	101.37	42.34	31.98	10.88	30.13	206	16	P	V
		5713.8	57.73	-51.34	109.07	45	32	10.87	30.14	206	16	P	V
		5721	57.63	-55.45	113.08	44.91	32	10.87	30.15	206	16	P	V
	*	5795	110	-	-	97.17	32.18	10.85	30.2	206	16	P	V
	*	5795	102.18	-	-	89.35	32.18	10.85	30.2	206	16	A	V
		5851.4	56.76	-62.25	119.01	43.81	32.21	10.98	30.24	206	16	P	V
		5856	56.65	-53.87	110.52	43.69	32.22	10.99	30.25	206	16	P	V
		5902.6	55.35	-29.39	84.74	42.11	32.41	11.11	30.28	206	16	P	V
		5933	53.57	-14.63	68.2	40.22	32.47	11.18	30.3	206	16	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	48.79	-25.21	74	54.32	40.47	14.91	60.91	100	0	P	H
		17265	50.96	-17.24	68.2	49.68	41.06	19	58.78	100	0	P	H
													H
													H
		11510	49.09	-24.91	74	54.62	40.47	14.91	60.91	100	0	P	V
		17265	50.79	-17.41	68.2	49.51	41.06	19	58.78	100	0	P	V
													V
													V
802.11ac VHT40 CH 159 5795MHz		11590	48.76	-25.24	74	54.54	40.23	15	61.01	100	0	P	H
		17385	52.15	-16.05	68.2	49.6	42.05	19.14	58.64	100	0	P	H
													H
													H
		11590	49.63	-24.37	74	55.41	40.23	15	61.01	100	0	P	V
		17385	52.55	-15.65	68.2	50	42.05	19.14	58.64	100	0	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 (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		5649.6	58.14	-10.06	68.2	45.55	31.8	10.89	30.1	265	298	P	H
		5694.8	72.61	-28.76	101.37	59.88	31.98	10.88	30.13	265	298	P	H
		5720	75.5	-35.3	110.8	62.78	32	10.87	30.15	265	298	P	H
		5720	75.5	-35.3	110.8	62.78	32	10.87	30.15	265	298	P	H
	*	5775	105.85	-	-	93.08	32.1	10.86	30.19	265	298	P	H
	*	5775	98.43	-	-	85.66	32.1	10.86	30.19	265	298	A	H
		5853.6	69.92	-44.07	113.99	56.96	32.21	10.99	30.24	265	298	P	H
		5856.4	69.22	-41.19	110.41	56.25	32.23	10.99	30.25	265	298	P	H
		5875.4	63.89	-41.01	104.9	50.81	32.3	11.04	30.26	265	298	P	H
		5943	54.22	-13.98	68.2	40.83	32.49	11.21	30.31	265	298	P	H
													H
													H
		5635.8	58.78	-9.42	68.2	46.15	31.83	10.89	30.09	202	11	P	V
		5695	73.24	-28.27	101.51	60.51	31.98	10.88	30.13	202	11	P	V
		5720	76.32	-34.48	110.8	63.6	32	10.87	30.15	202	11	P	V
		5720.2	76.67	-34.59	111.26	63.95	32	10.87	30.15	202	11	P	V
	*	5775	107.06	-	-	94.29	32.1	10.86	30.19	202	11	P	V
	*	5775	99.23	-	-	86.46	32.1	10.86	30.19	202	11	A	V
		5853.4	66.83	-47.62	114.45	53.88	32.21	10.98	30.24	202	11	P	V
		5856.8	66.66	-43.64	110.3	53.69	32.23	10.99	30.25	202	11	P	V
		5876	61.52	-42.94	104.46	48.44	32.3	11.04	30.26	202	11	P	V
		5937.6	54.25	-13.95	68.2	40.88	32.48	11.2	30.31	202	11	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	49.56	-24.44	74	55.21	40.35	14.96	60.96	100	0	P	H
		17325	52.25	-15.95	68.2	50.43	41.45	19.08	58.71	100	0	P	H
													H
													H
		11550	49.75	-24.25	74	55.4	40.35	14.96	60.96	100	0	P	V
		17325	52.3	-15.9	68.2	50.48	41.45	19.08	58.71	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission above 18GHz

WIFI 802.11ac VHT80 (SHF @ 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.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac VHT80 SHF		23610	41.81	-32.19	74	42.24	39.85	13.02	53.3	150	0	P	H
		39780	49.85	-24.15	74	39.53	45.01	19.96	54.65	150	0	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		23522	41.65	-26.55	68.2	42.19	39.73	13.03	53.3	150	0	P	V
		39890	49.89	-24.11	74	39.14	45.06	20.17	54.48	150	0	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against limit line.												

Emission below 1GHz

WIFI 802.11ac VHT80 (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.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac VHT80 LF		98.87	33.02	-10.48	43.5	47.87	16.07	1.35	32.27	-	-		H
		187.14	30.73	-12.77	43.5	46.17	15	1.94	32.38	-	-		H
		217.21	33.9	-12.1	46	49.22	14.97	2.1	32.39	-	-		H
		478.14	34.45	-11.55	46	40.52	23.41	3.02	32.5	-	-		H
		733.25	35.69	-10.31	46	36.86	27.49	3.78	32.44	-	-		H
		745.86	37.95	-8.05	46	38.94	27.65	3.82	32.46	100	0		H
													H
													H
													H
													H
													H
													H
		64.92	30.01	-9.99	40	48.53	12.24	1.05	31.81	-	-		V
		96.93	32.13	-11.37	43.5	47.27	15.8	1.34	32.28	-	-		V
		191.99	27.47	-16.03	43.5	42.87	15.01	1.97	32.38	-	-		V
		217.21	28.25	-17.75	46	43.57	14.97	2.1	32.39	-	-		V
		497.54	34.01	-11.99	46	39.51	23.81	3.13	32.44	-	-		V
		741.98	39.44	-6.56	46	40.47	27.62	3.81	32.46	100	0		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	Peak or Average
H/V	Horizontal or Vertical



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)

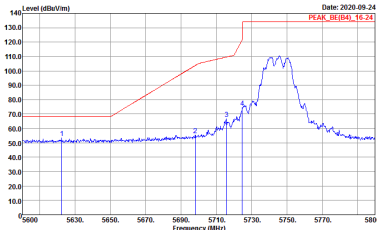
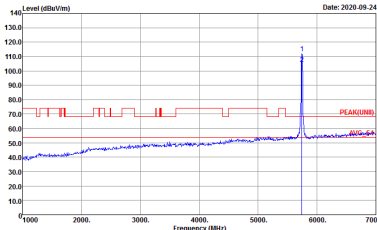
Both peak and average measured complies with the limit line, so test result is “PASS”.



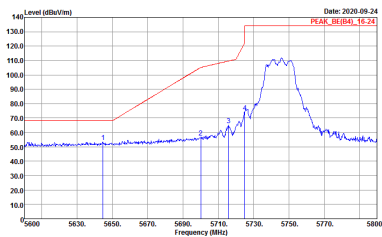
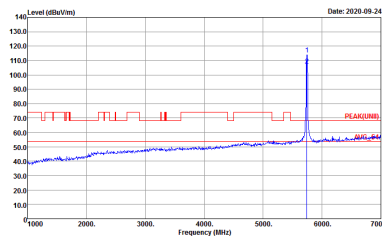
Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.1~23.2°C
		Relative Humidity :	45~59%

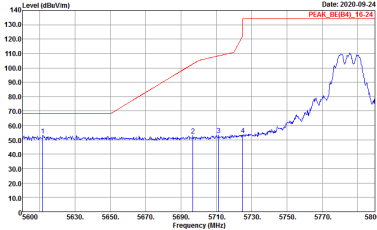
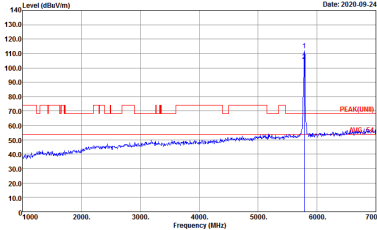
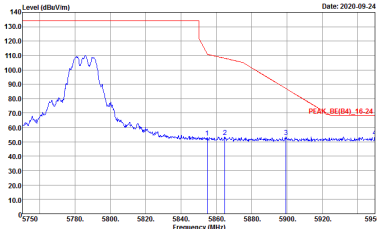
Band 4 - 5725~5850MHz
WIFI 802.11a (Band Edge @ 3m)

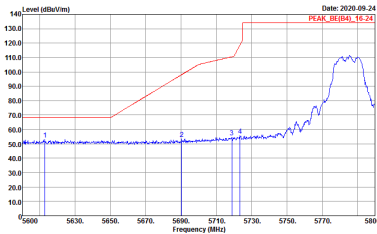
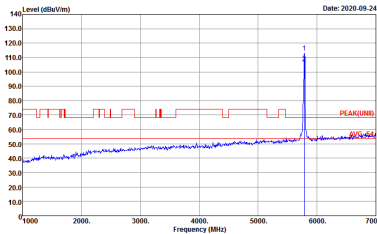
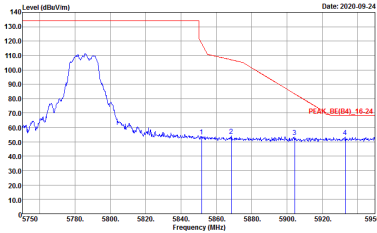
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931



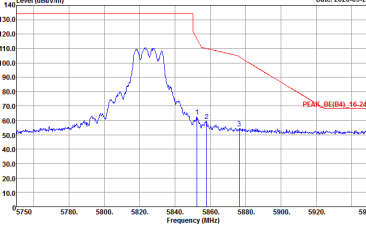
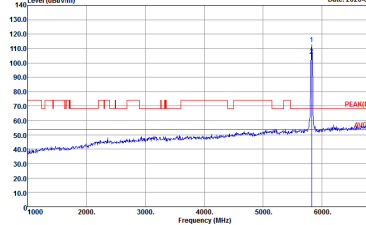
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH15-11Y Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-11Y Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



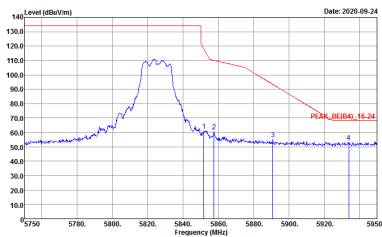
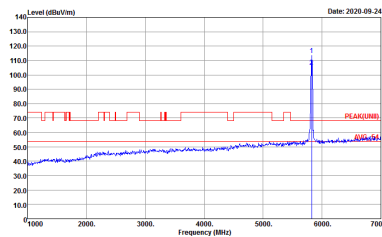
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	Left blank



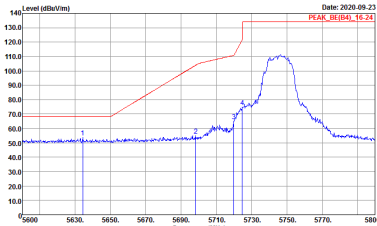
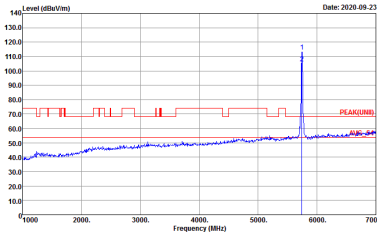
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH15-11Y Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-11Y Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931



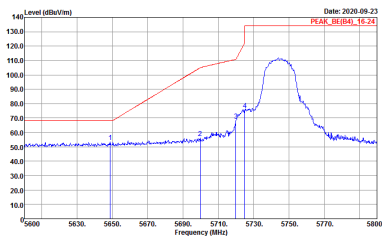
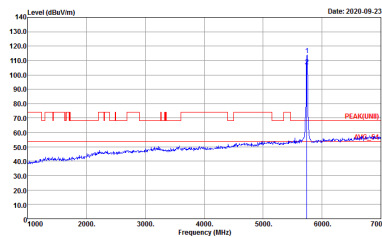
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH15-11Y Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH15-11Y Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931



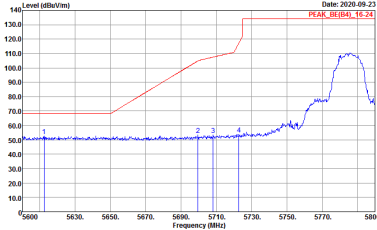
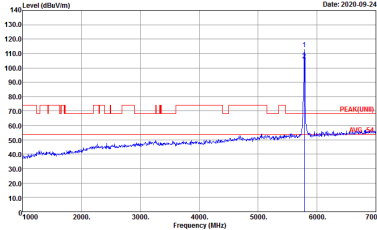
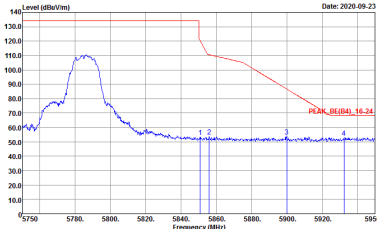
Band 4 5725~5850MHz
WIFI 802.11ac VHT20 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931

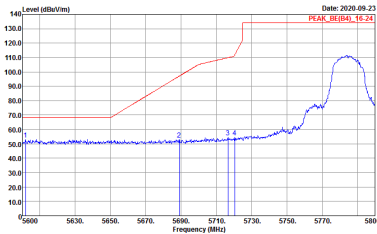
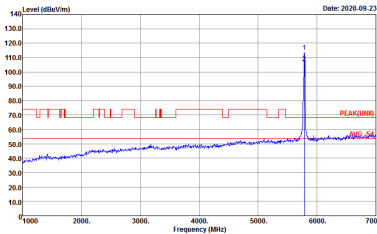
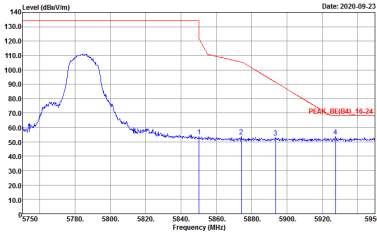


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Vertical	Fundamental
Peak Avg.	 Site : 03CH15-14Y Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH15-14Y Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931

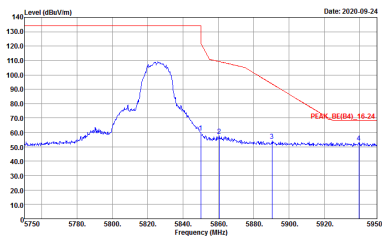
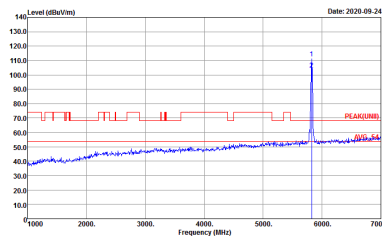


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931
Peak	 Site : 03CH15-HY Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Left blank

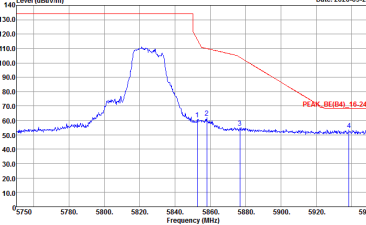
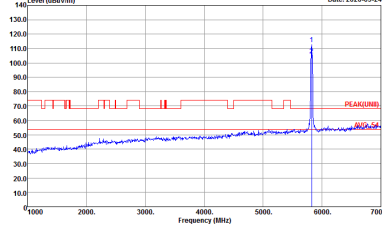


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(B4)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH15-11Y Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-11Y Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931

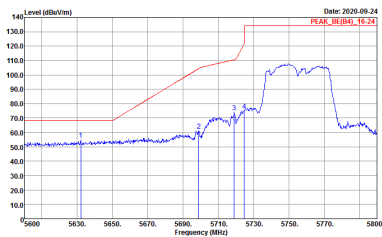
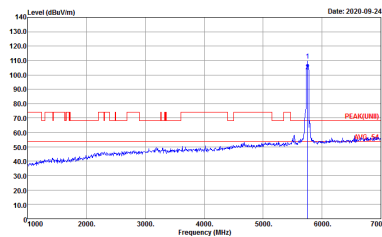
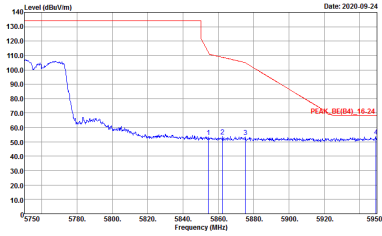


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Vertical	Fundamental
Peak Avg.	 Site : 03CH15-11Y Condition : PEAK_BURST_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931	 Site : 03CH15-11Y Condition : PEAK_BURST_16-24 3m 91200_15_1620 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 081931

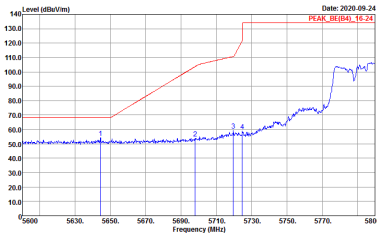
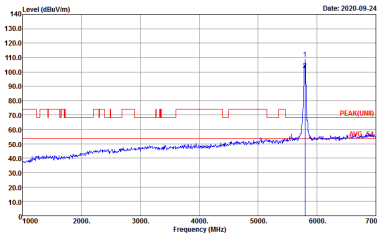
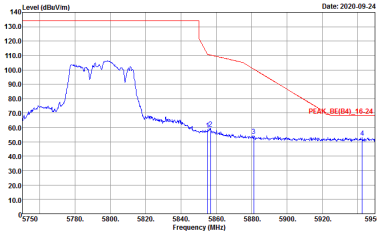


Band 4 5725~5850MHz
WIFI 802.11ac VHT40 (Band Edge @ 3m)

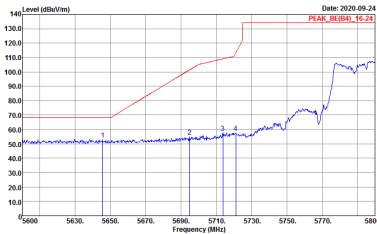
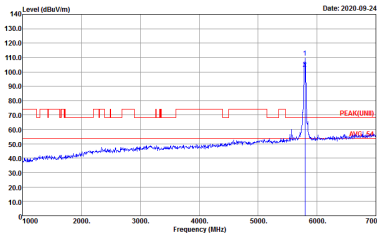
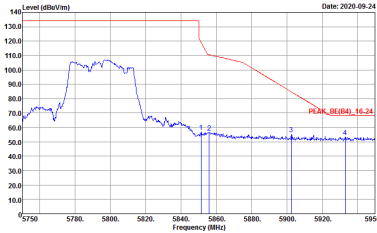
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Horizontal	Fundamental
Peak	Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931
Peak	Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	Left blank



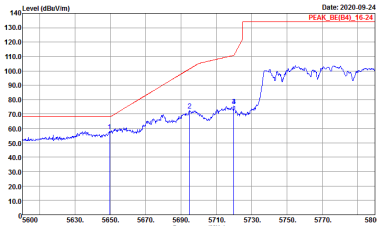
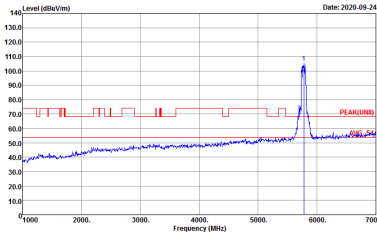
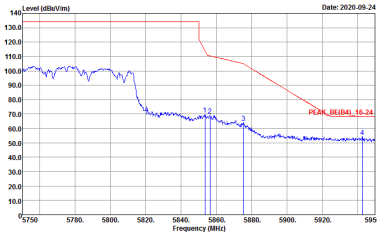
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(FUND)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Left blank



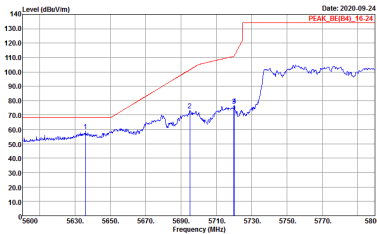
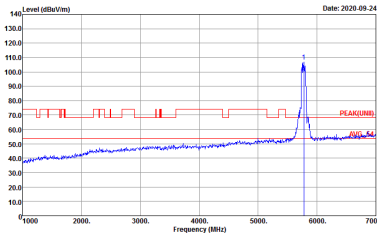
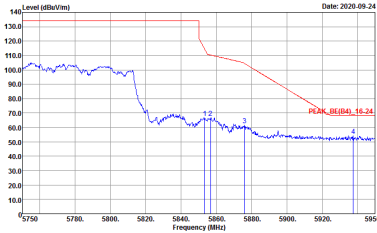
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	Left blank



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

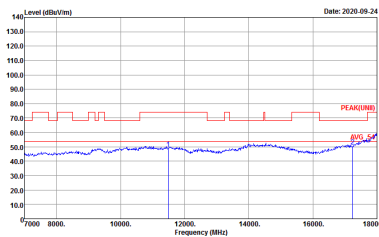
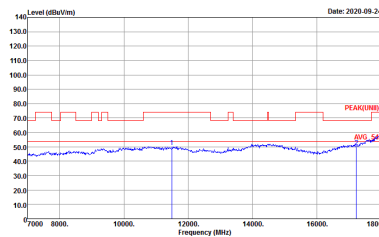
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931
Peak	 Site : 03CH15-HY Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	Left blank



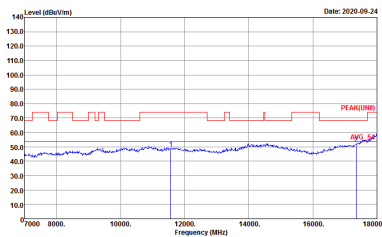
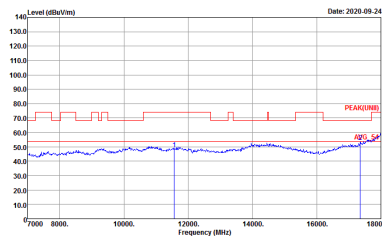
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH15-HY Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931
	 Site : 03CH15-HY Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931	Left blank



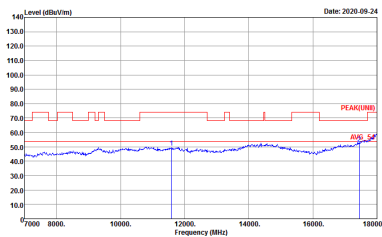
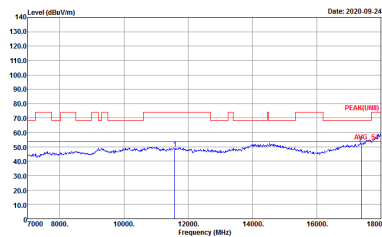
Band 4 - 5725~5850MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



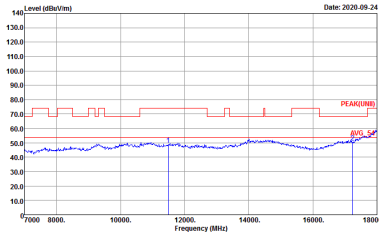
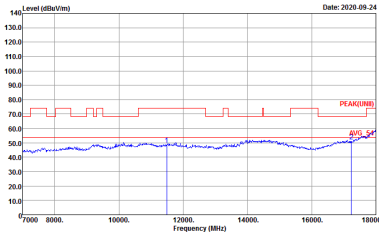
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-149 Condition : PEAK(UNII) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-149 Condition : PEAK(UNII) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



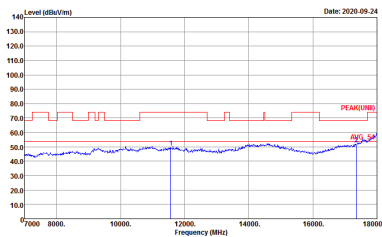
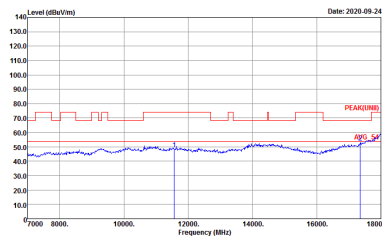
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-11Y Condition : PEAK(UNII) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-11Y Condition : PEAK(UNII) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



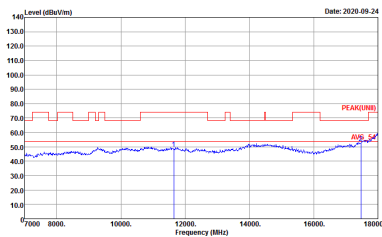
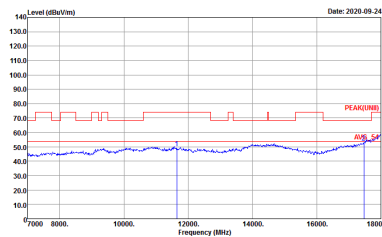
Band 4 5725~5850MHz
WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



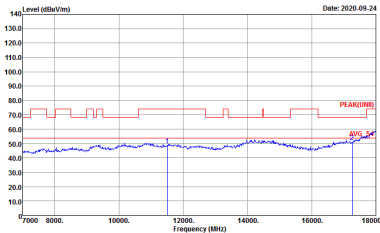
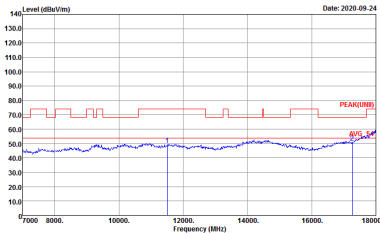
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-149 Condition : PEAK(UWB) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-149 Condition : PEAK(UWB) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



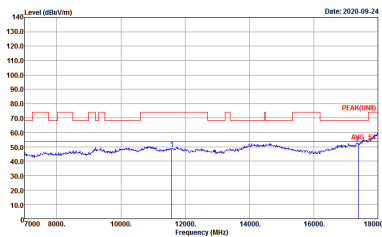
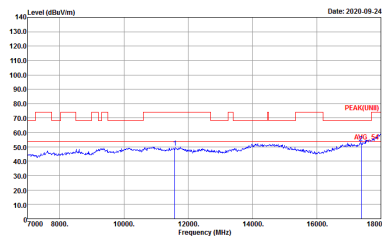
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-14Y Condition : PEAK(UWB) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-14Y Condition : PEAK(UWB) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



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

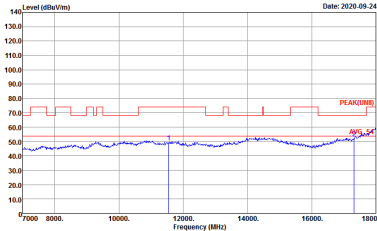
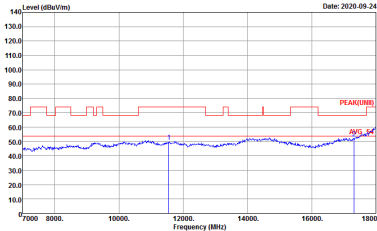
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



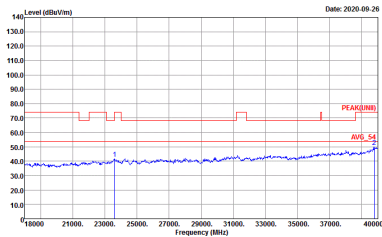
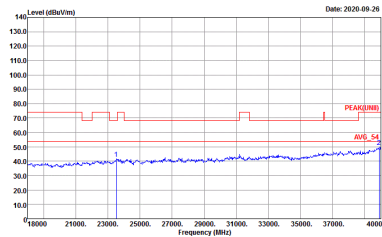
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-14Y Condition : PEAK(UNB) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-14Y Condition : PEAK(UNB) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931



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

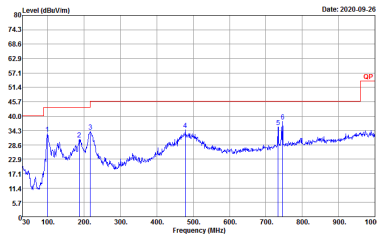
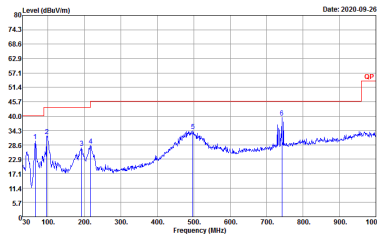
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 081931

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

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 SHF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m SHF HORN BBHA9170584 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : PEAK(UNIT) 3m SHF HORN BBHA9170584 VERTICAL Detector : Peak Project : 081931



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

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CH15-HY Condition : QP 3m B1LOG_15_41912 HORIZONTAL Detector : Peak Project : 081931	 Site : 03CH15-HY Condition : QP 3m B1LOG_15_41912 VERTICAL Detector : Peak Project : 081931

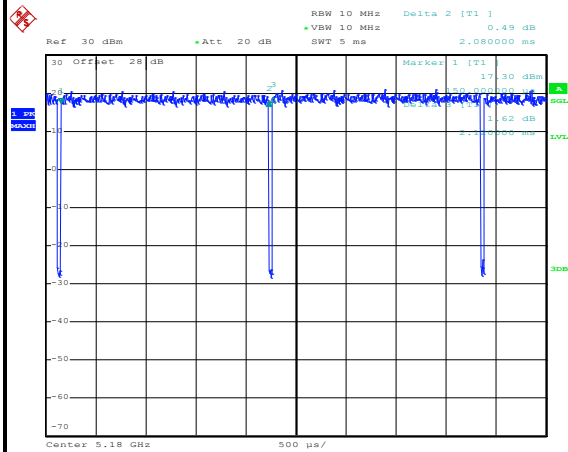
Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
1+2	802.11a	98.11	-	-	10Hz	0.08
1+2	802.11a	98.11	-	-	10Hz	0.08
1+2	5GHz 802.11ac VHT20 for Ant. 1	97.48	1935	0.52	1kHz	0.11
1+2	5GHz 802.11ac VHT20 for Ant. 2	97.73	1935	0.52	1kHz	0.10
1+2	5GHz 802.11ac VHT40 for Ant. 1	95.98	955	1.05	3kHz	0.18
1+2	5GHz 802.11ac VHT40 for Ant. 2	95.48	950	1.05	3kHz	0.20
1+2	5GHz 802.11ac VHT80 for Ant. 1	92.08	465	2.15	3kHz	0.36
1+2	5GHz 802.11ac VHT80 for Ant. 2	92.08	465	2.15	3kHz	0.36



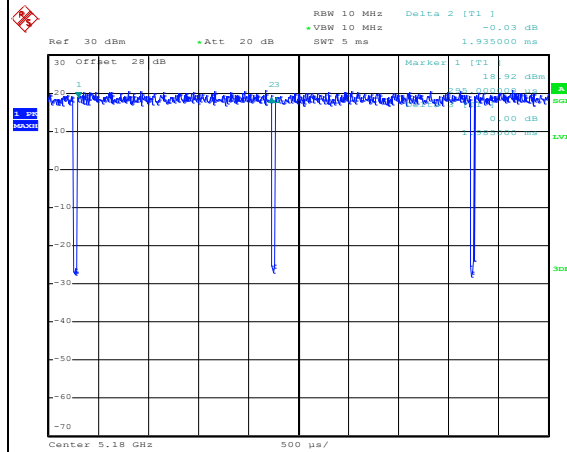
MIMO <Ant. 1>

802.11a



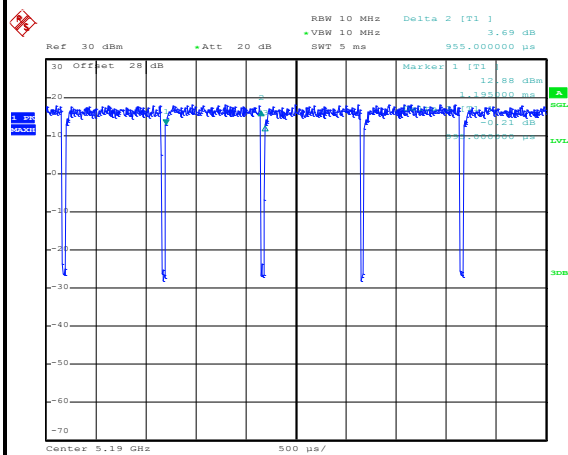
Date: 10.SEP.2020 15:51:46

802.11ac VHT20



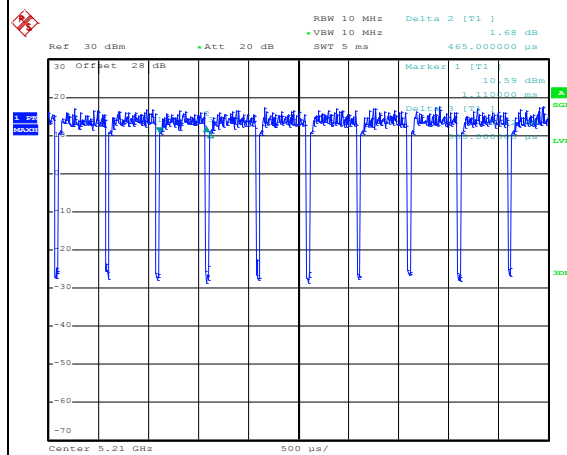
Date: 10.SEP.2020 16:00:40

802.11ac VHT40



Date: 10.SEP.2020 16:02:17

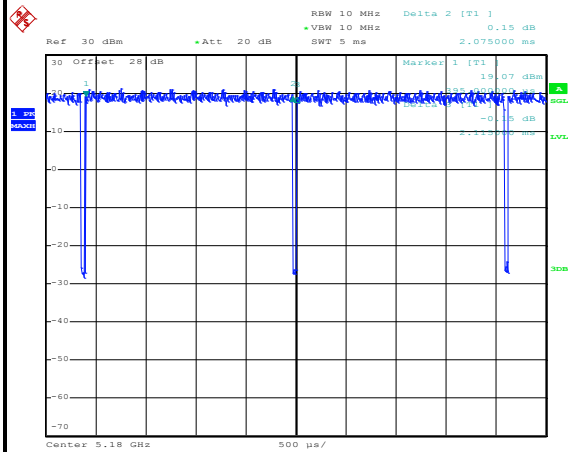
802.11ac VHT80



Date: 10.SEP.2020 16:04:16

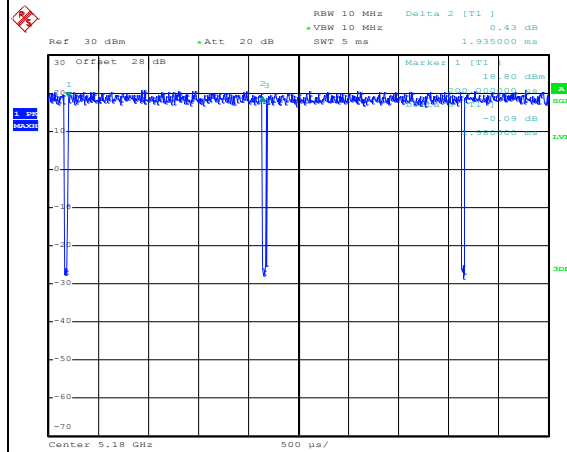
MIMO <Ant. 2>

802.11a



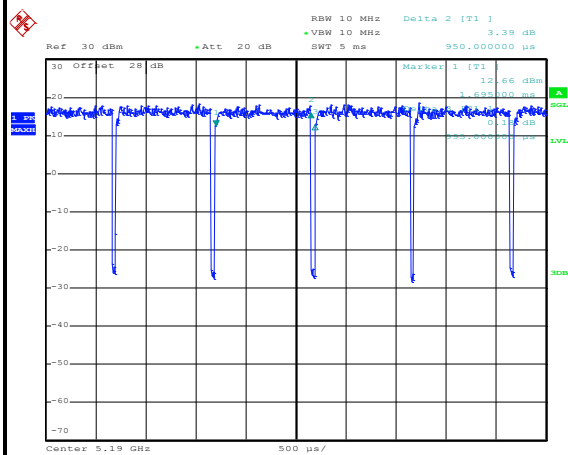
Date: 10.SEP.2020 15:49:50

802.11ac VHT20



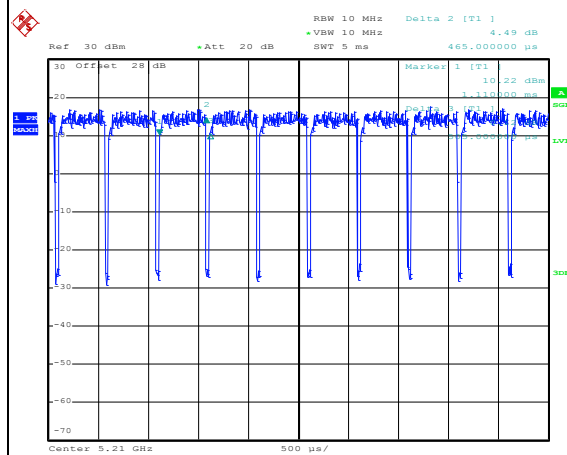
Date: 10.SEP.2020 16:01:25

802.11ac VHT40



Date: 10.SEP.2020 16:02:52

802.11ac VHT80



Date: 10.SEP.2020 16:07:21