FCC RADIO TEST REPORT

FCC ID	:	**A4RGD1YQ**
Equipment	:	**Phone**
Model Name	:	**GD1YQ**
Applicant	:	**Google LLC** **1600 Amphitheatre Parkway,** **Mountain View, California, 94043 USA**
Standard	:	**FCC Part 15 Subpart E §15.407**

The product was received on Apr. 16, 2020 and testing was started from May 06, 2020 and completed on Jun. 24, 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.)

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History of this test report

Report No.	Version	Description	Issued Date
FR011718-01F	01	Initial issue of report	Jul. 10, 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 1.39 dB at 40.670 MHz
3.5	15.207	AC Conducted Emission	Pass	Under limit 11.36 dB at 0.205 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: Tina Chuang

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Phone
Model Name	GD1YQ
FCC ID	A4RGD1YQ
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/5G NR/ NFC/GNSS/WPC/WPT WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE

Remark: The above EUT's information was declared by manufacturer.

EUT Information List	
S/N	Performed Test Item
06021FDD40012C	RF Conducted Measurement
03281FDD4000BB	Radiated Spurious Emission
03311FDD40001W	Conducted Emission

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power	**<Ant. 4>** 802.11a : 20.10 dBm / 0.1023 W 802.11n HT20 : 20.40 dBm / 0.1096 W 802.11n HT40 : 20.40 dBm / 0.1096 W 802.11ac VHT20: 20.30 dBm / 0.1072 W 802.11ac VHT40: 20.30 dBm / 0.1072 W 802.11ac VHT80: 20.40 dBm / 0.1096 W. **<Ant. 3>** 802.11a : 19.90 dBm / 0.0977 W 802.11n HT20 : 20.20 dBm / 0.1047 W 802.11n HT40 : 20.00 dBm / 0.1000 W 802.11ac VHT20: 20.10 dBm / 0.1023 W 802.11ac VHT40: 19.90 dBm / 0.0977 W 802.11ac VHT80: 20.10 dBm / 0.1023 W **MIMO <Ant. 4 + 3>** 802.11a : 23.01 dBm / 0.2000 W 802.11n HT20 : 23.31 dBm / 0.2143 W 802.11n HT40 : 23.21 dBm / 0.2094 W 802.11ac VHT20: 23.21 dBm / 0.2094 W 802.11ac VHT40: 23.11 dBm / 0.2046 W 802.11ac VHT80: 23.26 dBm / 0.2118 W
99% Occupied Bandwidth	**MIMO <Ant. 4>** 802.11a : 18.50 MHz 802.11n HT20 : 19.15 MHz 802.11n HT40 : 37.40 MHz 802.11ac VHT80 : 77.28 MHz **MIMO <Ant. 3>** 802.11a : 17.10 MHz 802.11n HT20 : 18.25 MHz 802.11n HT40 : 36.90 MHz 802.11ac VHT80 : 77.16 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Antenna Type / Gain	**<Ant. 4> :** IFA Antenna with gain -0.8 dBi **<Ant. 3> :** Loop Antenna with gain -3.1 dBi
Antenna Function Description	<table><tr><td></td><td>Ant. 4</td><td>Ant. 3</td></tr><tr><td>802.11 a/n/ac</td><td>V</td><td>V</td></tr><tr><td>802.11 a/n/ac MIMO</td><td>V</td><td>V</td></tr></table>

Remark: MIMO Ant. 4+3 is a calculated result from sum of the power MIMO Ant. 4 and MIMO Ant. 3.

1.3 Modification of EUT

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

1.4 Testing Location

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City, 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.**
	03CH16-HY

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

FCC designation No.: TW1190 and TW0007

1.5 Applicable Standards

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

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

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 and Accessory (Adapter or Earphone). The worst cases (Z plane with Adapter and WPC Mode) 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.

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

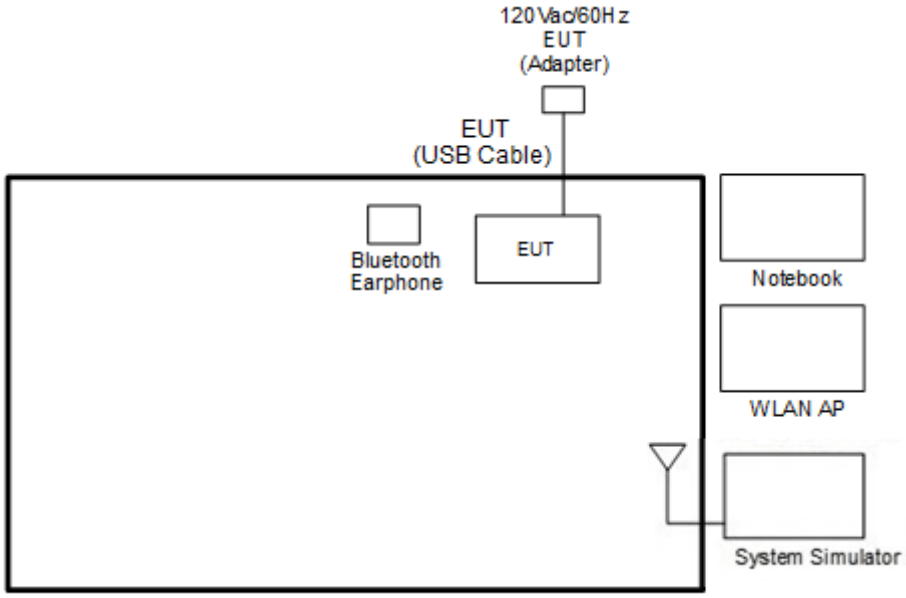
Test Cases	
AC Conducted Emission	Mode 1 : GSM850 Idle + WLAN (5GHz) Link + Bluetooth Link + USB Cable (Charging from Adapter 2)
Remark: For Radiated Test Cases, the tests were performed with Adapter 2.	

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

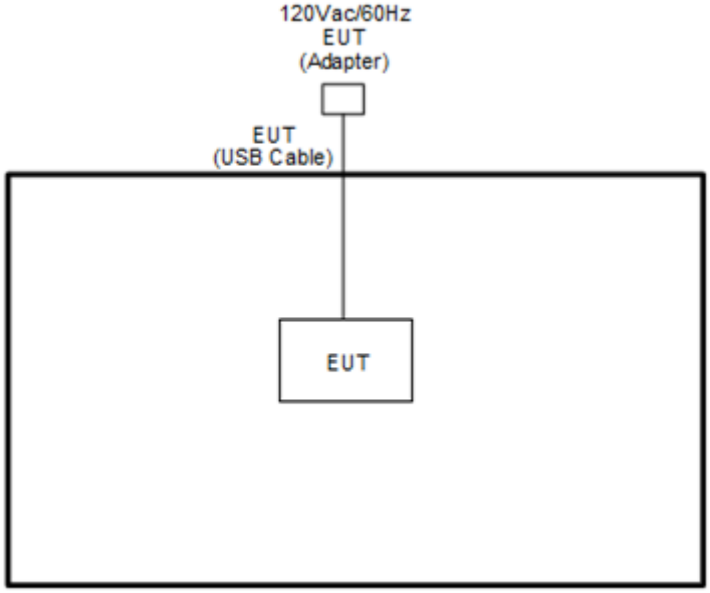
Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System

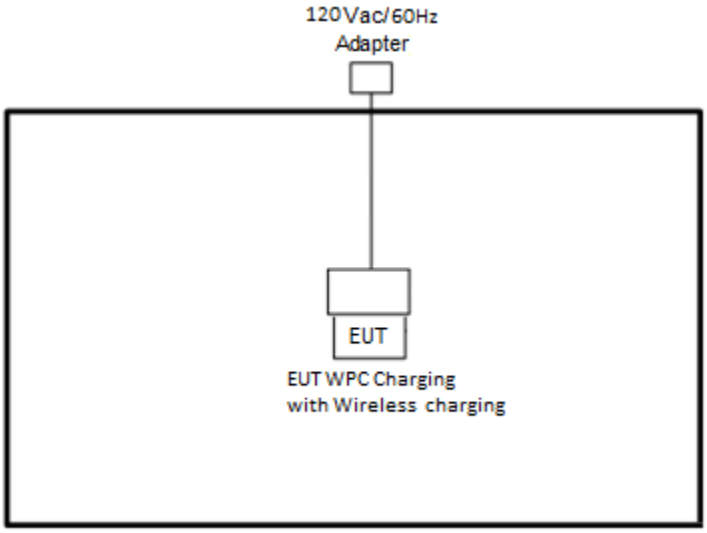
<AC Conducted Emissions Mode>



<WLAN Tx Mode>



<WPC Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade 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	Google	G1007/ G1008	A4RG1007	N/A	N/A
3.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
4.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
5.	Notebook	DELL	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	Wireless charging	YU-live	K8	N/A	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, utility “QRCT V4.0.00153.0 ” 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.

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

= 4.2 + 10 = 14.2 (dB)

3 Test Result

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

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

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

26dB and 99% Occupied bandwidth are reporting only.

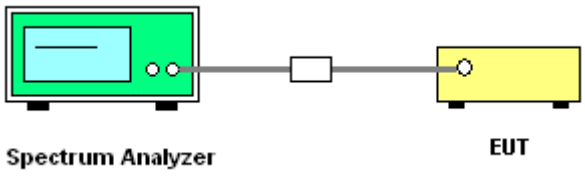
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

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 ≥ 3 x 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.

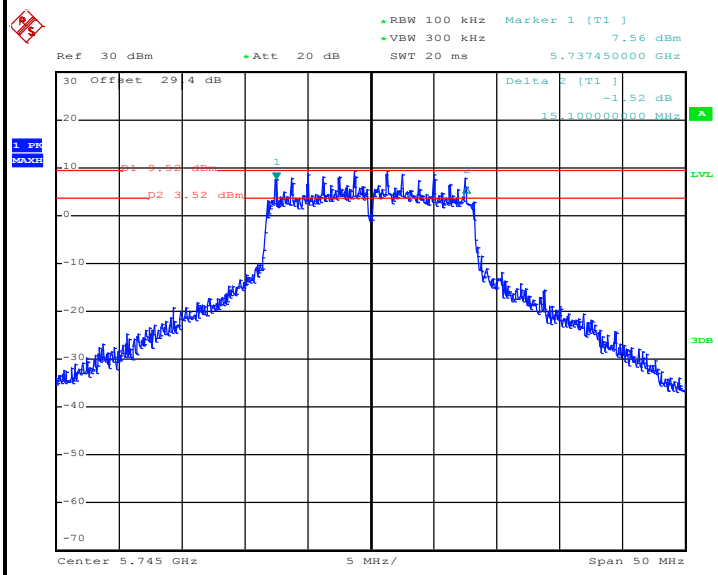
3.1.4 Test Setup



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

Please refer to Appendix A.

Minimum 6dB Bandwidth



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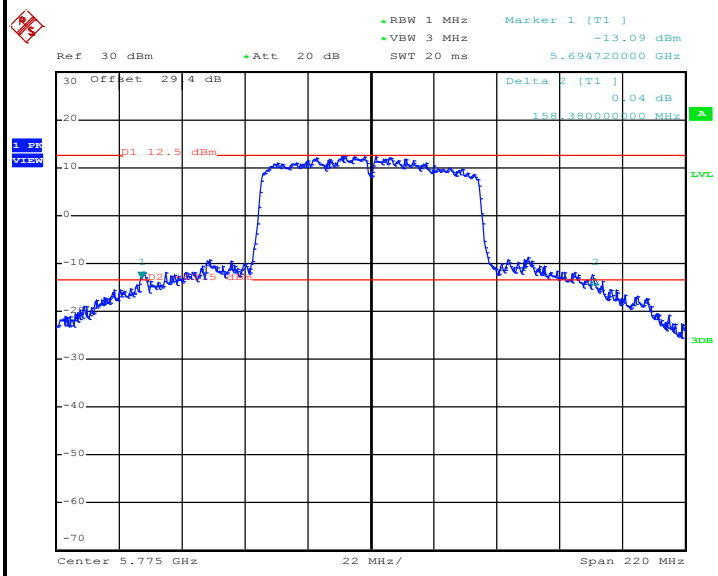
Maximum 26dB Bandwidth



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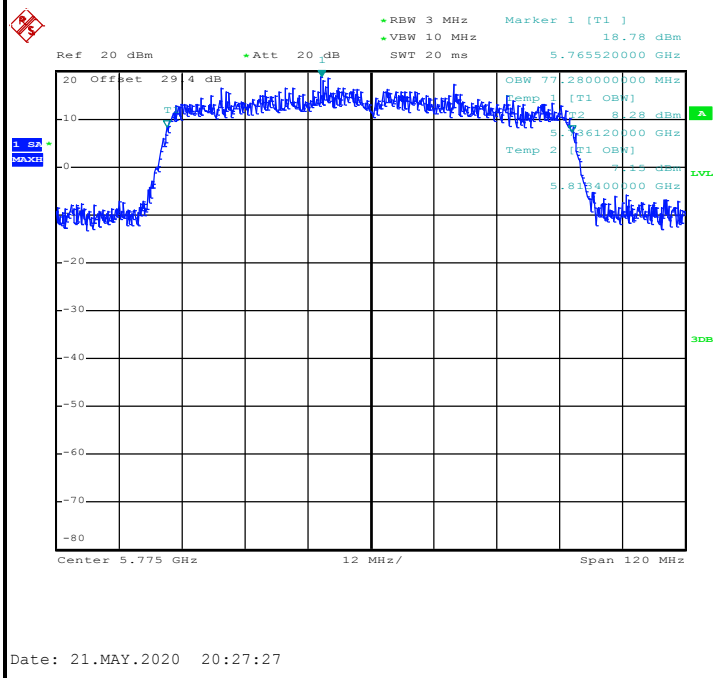
Maximum 99% Occupied Bandwidth



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.

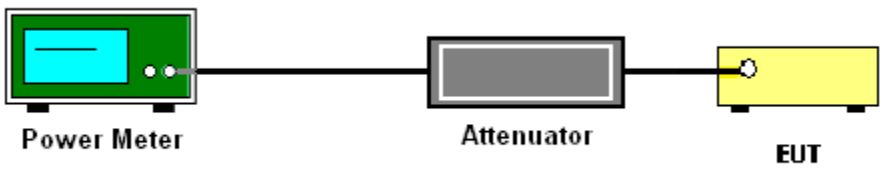
3.2.3 Test Procedures

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):

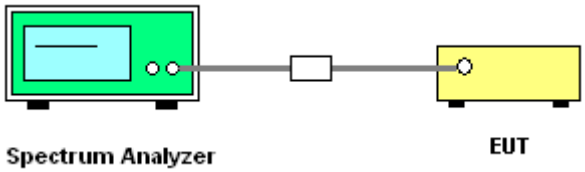
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time ≤ (number of points in sweep) × T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which 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_{ANT}) dB.

   With this technique, spectrum measurements are performed at each output of the device, but rather than summing the spectra or the spectral peaks across the outputs, the quantity 10 log(N_{ANT}) dB is added to each spectrum value before comparing to the emission limit. The addition of 10 log(N_{ANT}) dB serves to apportion the emission limit among the N_{ANT} outputs so that each output is permitted to contribute no more than $1/N_{ANT}$ th of the PSD limit.

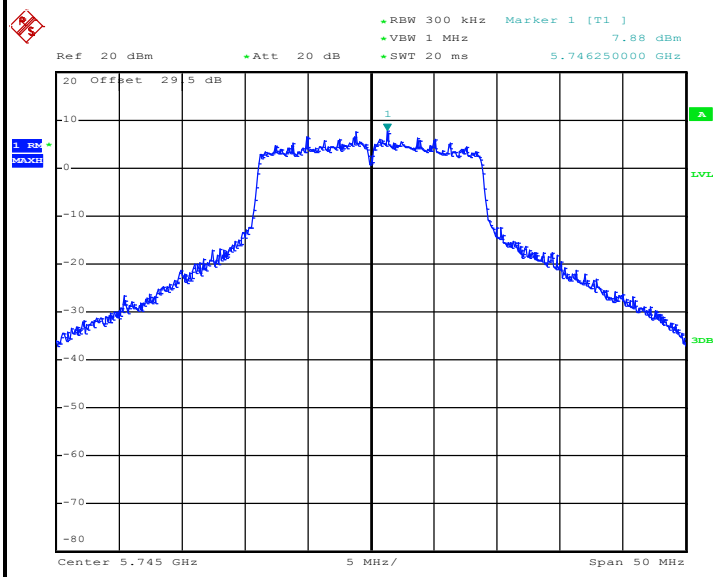
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

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



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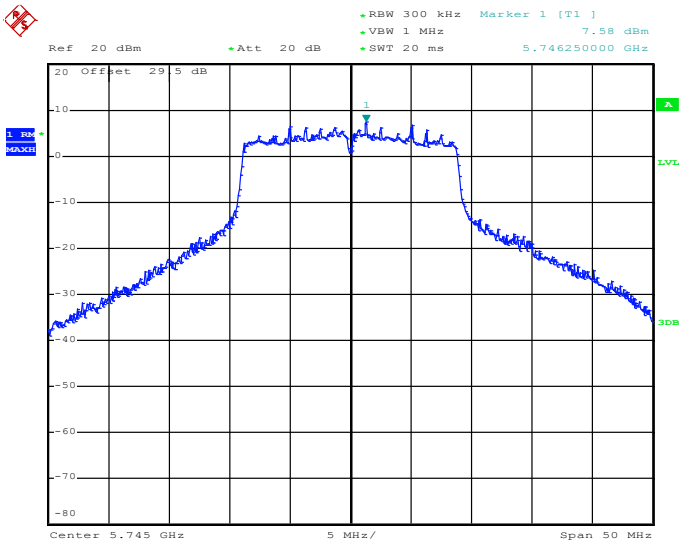
Worst Case Power Density (dBm/MHz) for MIMO Ant. 3



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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.

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/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

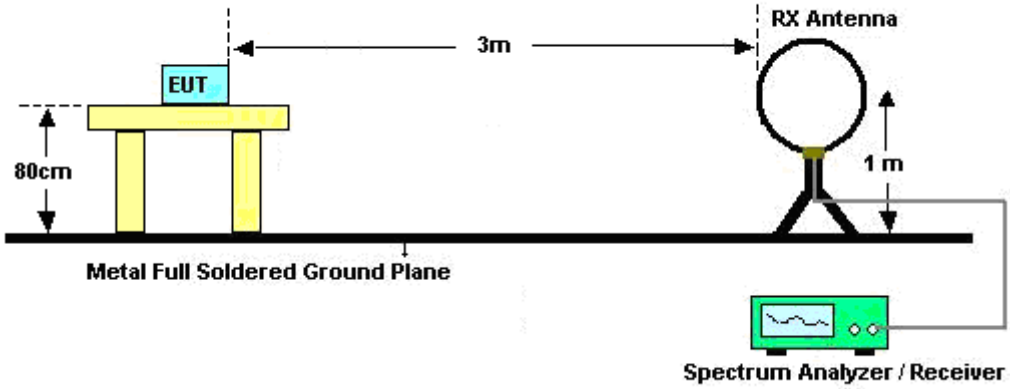
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

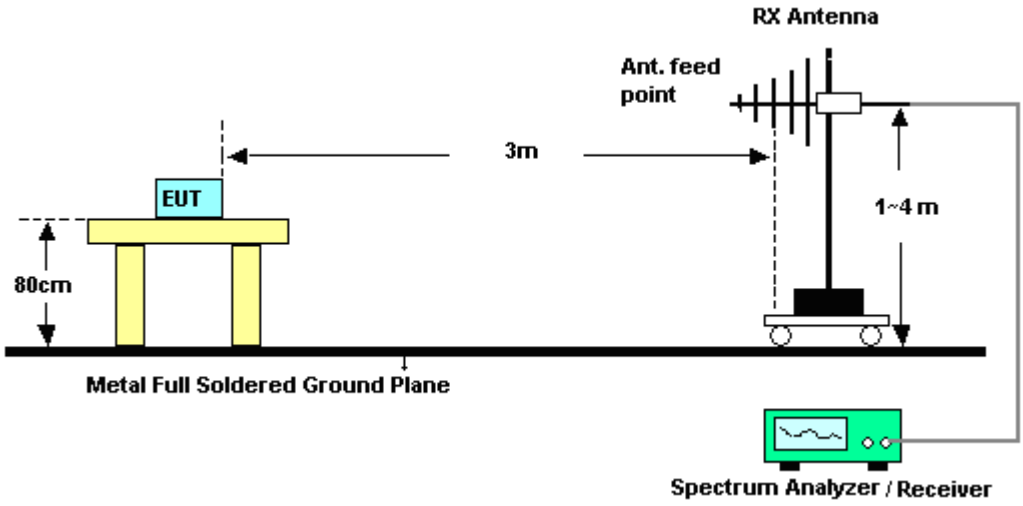
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz
   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting 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

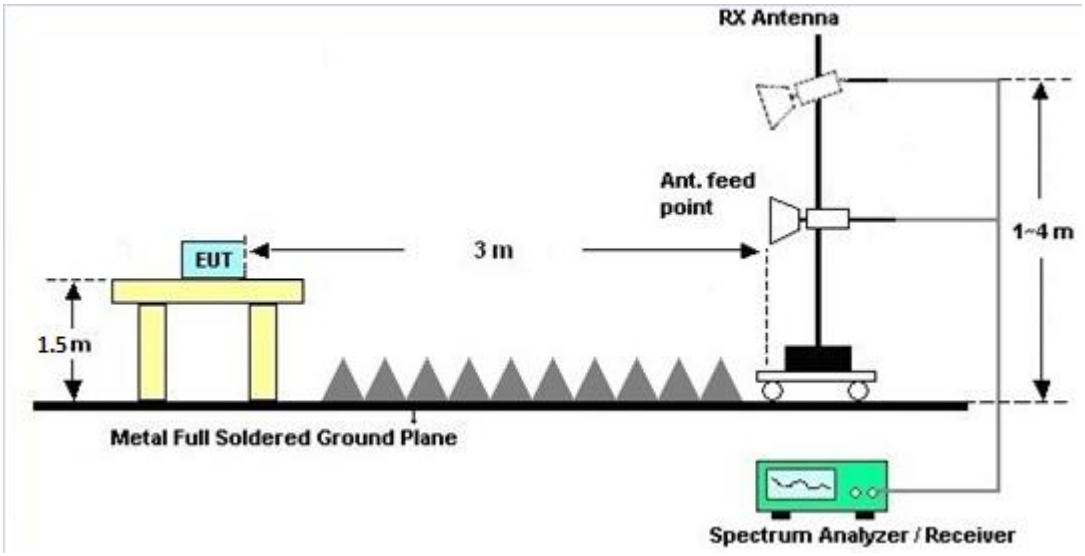
For radiated emissions below 30MHz



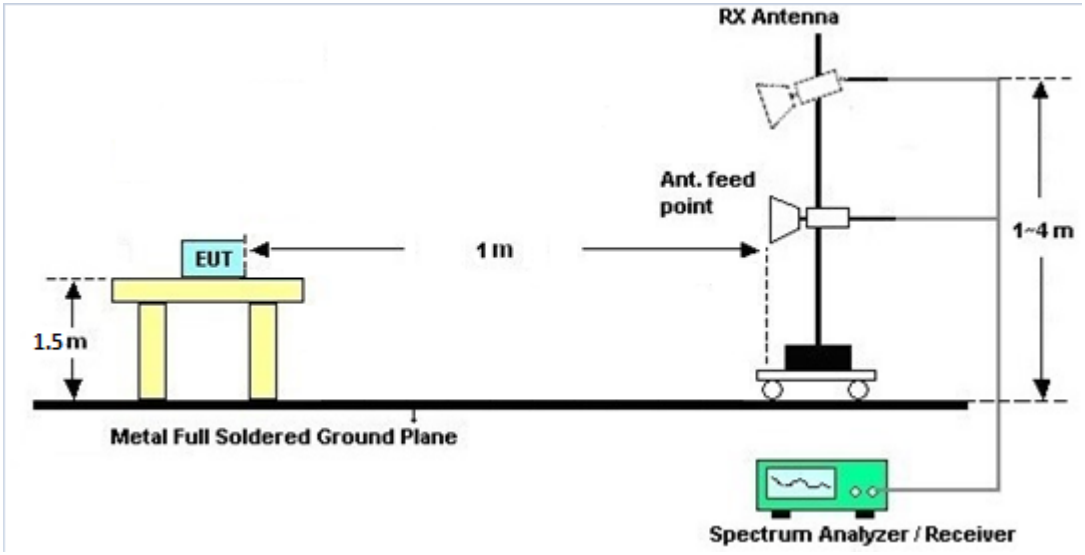
For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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 (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

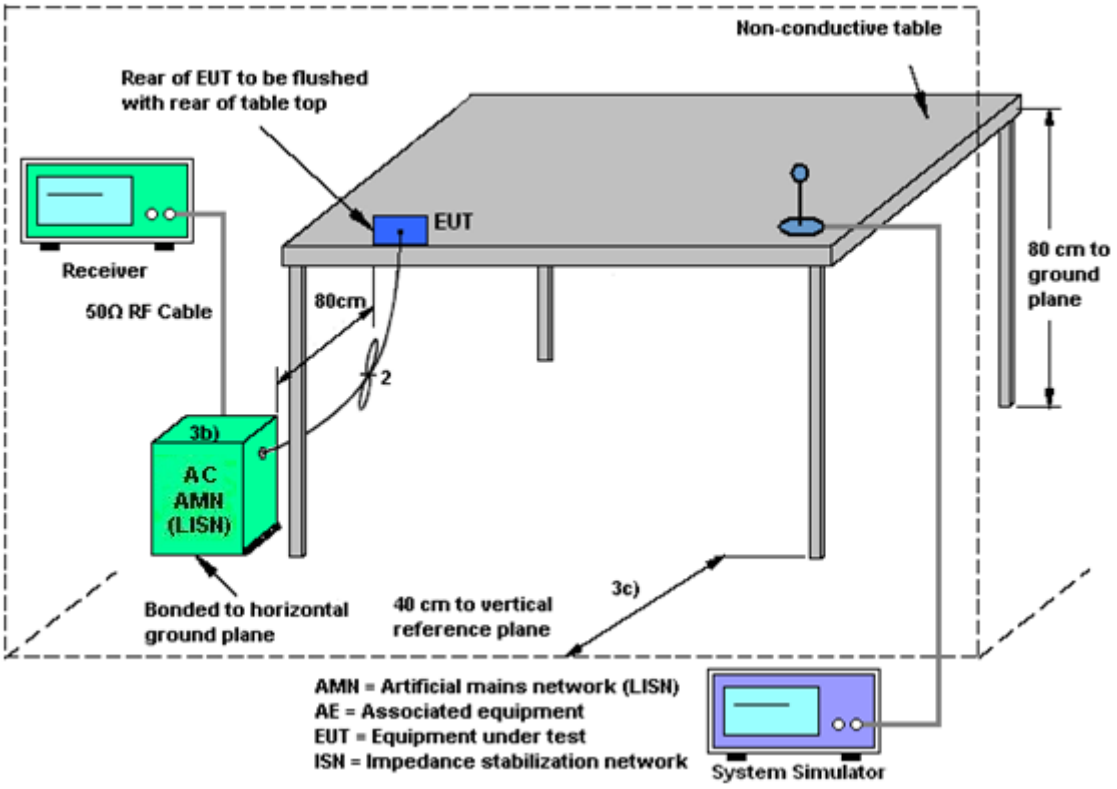
3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN 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

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.

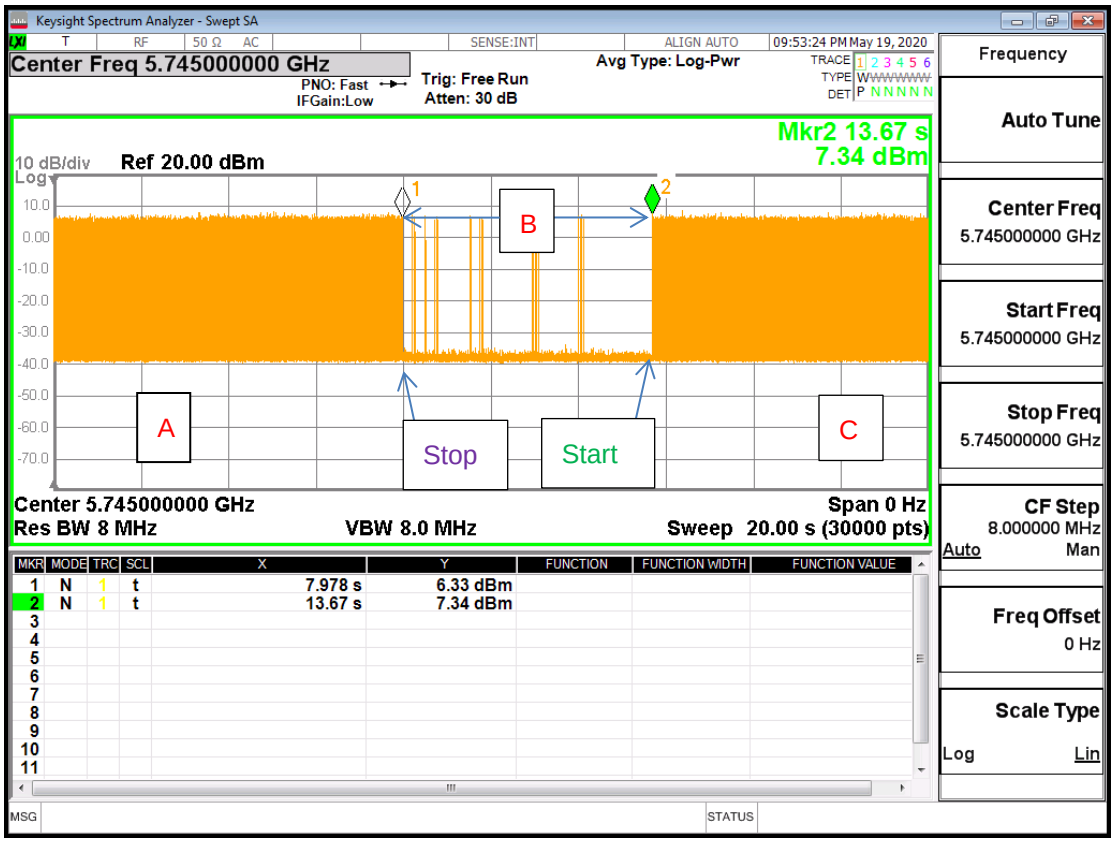
B. Information stop: stop supplying information to the access point.

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.

5745MHz



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 = GANT + Array Gain, where Array Gain is as follows.

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

Array Gain = 10 log(NANT/NSS=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT 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 for Power	DG for PSD	Power Limit Reduction	PSD Limit Reduction
	Ant. 4 (dBi)	Ant. 3 (dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	-0.80	-3.10	-0.80	1.14	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	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Dec. 26, 2019	May 06, 2020~ May 20, 2020	Dec. 25, 2020	Radiation (03CH16-HY)
Bilog Antenna	TESEQ	CBL6111D&00802N1D01N-06	47020&06	30MHz to 1GHz	Oct. 12, 2019	May 06, 2020~ May 20, 2020	Oct. 11, 2020	Radiation (03CH16-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1522	1G~18GHz	Sep. 19, 2019	May 06, 2020~ May 20, 2020	Sep. 18, 2020	Radiation (03CH16-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170980	18GHz~40GHz	Jan. 10, 2020	May 06, 2020~ May 20, 2020	Jan. 09, 2021	Radiation (03CH16-HY)
Amplifier	SONOMA	310N	371607	9kHz~1G	Oct. 01, 2019	May 06, 2020~ May 20, 2020	Sep. 30, 2020	Radiation (03CH16-HY)
Preamplifier	Jet-Power	JPA0118-55-303	1710001800055006	1GHz~18GHz	Mar. 31, 2020	May 06, 2020~ May 20, 2020	Mar. 30, 2021	Radiation (03CH16-HY)
Preamplifier	EMEC	EMC184045B	980192	18GHz ~40GHz	Jul. 10, 2019	May 06, 2020~ May 20, 2020	Jul. 09, 2020	Radiation (03CH16-HY)
Preamplifier	Keysight	83017A	MY53270264	1GHz~26.5GHz	Dec. 11, 2019	May 06, 2020~ May 20, 2020	Dec. 10, 2020	Radiation (03CH16-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY57290111	3Hz~26.5GHz	Dec. 05, 2019	May 06, 2020~ May 20, 2020	Dec. 04, 2020	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY11680/4PE	NA	Aug. 30, 2019	May 06, 2020~ May 20, 2020	Aug. 29, 2020	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY11688/4PE	NA	Aug. 30, 2019	May 06, 2020~ May 20, 2020	Aug. 29, 2020	Radiation (03CH16-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	EC-A5-300-5757	NA	Aug. 30, 2019	May 06, 2020~ May 20, 2020	Aug. 29, 2020	Radiation (03CH16-HY)
Hygrometer	TECPEL	DTM-303B	TP161243	N/A	Jun. 17, 2019	May 06, 2020~ May 20, 2020	Jun. 16, 2020	Radiation (03CH16-HY)
Controller	EMEC	EM 1000	N/A	Control Turn table & Ant Mast	N/A	May 06, 2020~ May 20, 2020	N/A	Radiation (03CH16-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1~4m	N/A	May 06, 2020~ May 20, 2020	N/A	Radiation (03CH16-HY)
Software	Audix	E3 6.2009-8-24	RK-001136	N/A	N/A	May 06, 2020~ May 20, 2020	N/A	Radiation (03CH16-HY)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jun. 24,.2020	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 15, 2019	Jun. 24,.2020	Nov. 14, 2020	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 07, 2019	Jun. 24,.2020	Nov. 06, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 20, 2019	Jun. 24,.2020	Nov. 19, 2020	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 15, 2019	Jun. 24,.2020	Nov. 14, 2020	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Jun. 24,.2020	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Jan. 02, 2020	Jun. 24,.2020	Jan. 01, 2021	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 02, 2020	Jun. 24,.2020	Jan. 01, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H2	41410069	N/A	Jun. 17, 2019	May 07, 2020~ May 20, 2020	Jun. 16, 2020	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SNO10	10MHz~6GHz	Dec. 23, 2019	May 07, 2020~ May 20, 2020	Dec. 22, 2020	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Aug. 14, 2019	May 07, 2020~ May 20, 2020	Aug. 13, 2020	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Aug. 22, 2019	May 07, 2020~ May 20, 2020	Aug. 21, 2020	Conducted (TH05-HY)
Power Supply	GW Instek	SPS-606	GES842931	NA	Aug. 19, 2019	May 07, 2020~ May 20, 2020	Aug. 18, 2020	Conducted (TH05-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))	**4.9**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**6.7**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**3.9**

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Hank Hsu/Kathy Chen	Temperature:	21~25	°C
Test Date:	2020/5/7~5/22	Relative Humidity:	51~54	%

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

Band IV MIMO												
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 4	Ant 3	Ant 4	Ant 3	Ant 4	Ant 3		
11a	6Mbps	2	149	5745	17.45	17.10	31.70	28.25	15.30	15.10	0.5	Pass
11a	6Mbps	2	157	5785	18.50	16.90	33.55	27.00	15.10	15.45	0.5	Pass
11a	6Mbps	2	165	5825	17.60	16.85	32.05	25.60	15.20	15.10	0.5	Pass
HT20	MCS0	2	149	5745	19.05	18.25	33.95	32.30	15.80	15.35	0.5	Pass
HT20	MCS0	2	157	5785	18.95	18.10	35.20	29.10	15.95	15.65	0.5	Pass
HT20	MCS0	2	165	5825	19.15	18.05	33.60	28.65	16.15	15.85	0.5	Pass
HT40	MCS0	2	151	5755	37.10	36.90	60.30	51.39	35.10	35.43	0.5	Pass
HT40	MCS0	2	159	5795	37.40	36.80	69.57	42.30	35.37	35.11	0.5	Pass
VHT80	MCS0	2	155	5775	77.28	77.16	158.38	149.82	75.20	75.20	0.5	Pass

Report Number : FR011718-01F

TEST RESULTS DATA
Average Power Table

Band IV single antenna												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
11a	6Mbps	1	149	5745	20.10	19.90		30.00	30.00	-0.80	-3.10	Pass
11a	6Mbps	1	157	5785	20.00	19.90		30.00	30.00	-0.80	-3.10	Pass
11a	6Mbps	1	165	5825	20.00	19.70		30.00	30.00	-0.80	-3.10	Pass
HT20	MCS0	1	149	5745	20.40	20.20		30.00	30.00	-0.80	-3.10	Pass
HT20	MCS0	1	157	5785	19.80	19.70		30.00	30.00	-0.80	-3.10	Pass
HT20	MCS0	1	165	5825	19.90	19.60		30.00	30.00	-0.80	-3.10	Pass
HT40	MCS0	1	151	5755	20.40	20.00		30.00	30.00	-0.80	-3.10	Pass
HT40	MCS0	1	159	5795	20.20	19.90		30.00	30.00	-0.80	-3.10	Pass
VHT20	MCS0	1	149	5745	20.30	20.10		30.00	30.00	-0.80	-3.10	Pass
VHT20	MCS0	1	157	5785	19.70	19.60		30.00	30.00	-0.80	-3.10	Pass
VHT20	MCS0	1	165	5825	19.80	19.50		30.00	30.00	-0.80	-3.10	Pass
VHT40	MCS0	1	151	5755	20.30	19.90		30.00	30.00	-0.80	-3.10	Pass
VHT40	MCS0	1	159	5795	20.10	19.80		30.00	30.00	-0.80	-3.10	Pass
VHT80	MCS0	1	155	5775	20.40	20.10		30.00	30.00	-0.80	-3.10	Pass

Band IV MIMO												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
11a	6Mbps	2	149	5745	20.10	19.90	23.01	30.00		-0.80		Pass
11a	6Mbps	2	157	5785	20.00	19.90	22.96	30.00		-0.80		Pass
11a	6Mbps	2	165	5825	20.00	19.70	22.86	30.00		-0.80		Pass
HT20	MCS0	2	149	5745	20.40	20.20	23.31	30.00		-0.80		Pass
HT20	MCS0	2	157	5785	19.80	19.70	22.76	30.00		-0.80		Pass
HT20	MCS0	2	165	5825	19.90	19.60	22.76	30.00		-0.80		Pass
HT40	MCS0	2	151	5755	20.40	20.00	23.21	30.00		-0.80		Pass
HT40	MCS0	2	159	5795	20.20	19.90	23.06	30.00		-0.80		Pass
VHT20	MCS0	2	149	5745	20.30	20.10	23.21	30.00		-0.80		Pass
VHT20	MCS0	2	157	5785	19.70	19.60	22.66	30.00		-0.80		Pass
VHT20	MCS0	2	165	5825	19.80	19.50	22.66	30.00		-0.80		Pass
VHT40	MCS0	2	151	5755	20.30	19.90	23.11	30.00		-0.80		Pass
VHT40	MCS0	2	159	5795	20.10	19.80	22.96	30.00		-0.80		Pass
VHT80	MCS0	2	155	5775	20.40	20.10	23.26	30.00		-0.80		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 4	Ant 3	Ant 4	Ant 3	SUM	Ant 4	Ant 3	Ant 4	Ant 3	
11a	6Mbps	2	149	5745	2.22		9.21	8.91	12.22	30.00		1.14		Pass
11a	6Mbps	2	157	5785	2.22		9.54	9.59	12.60	30.00		1.14		Pass
11a	6Mbps	2	165	5825	2.22		9.04	9.26	12.27	30.00		1.14		Pass
HT20	MCS0	2	149	5745	2.22		10.10	9.80	13.11	30.00		1.14		Pass
HT20	MCS0	2	157	5785	2.22		9.67	8.44	12.68	30.00		1.14		Pass
HT20	MCS0	2	165	5825	2.22		8.87	9.23	12.24	30.00		1.14		Pass
HT40	MCS0	2	151	5755	2.22		6.18	6.25	9.26	30.00		1.14		Pass
HT40	MCS0	2	159	5795	2.22		5.73	5.50	8.74	30.00		1.14		Pass
VHT80	MCS0	2	155	5775	2.22		5.25	3.84	8.26	30.00		1.14		Pass

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

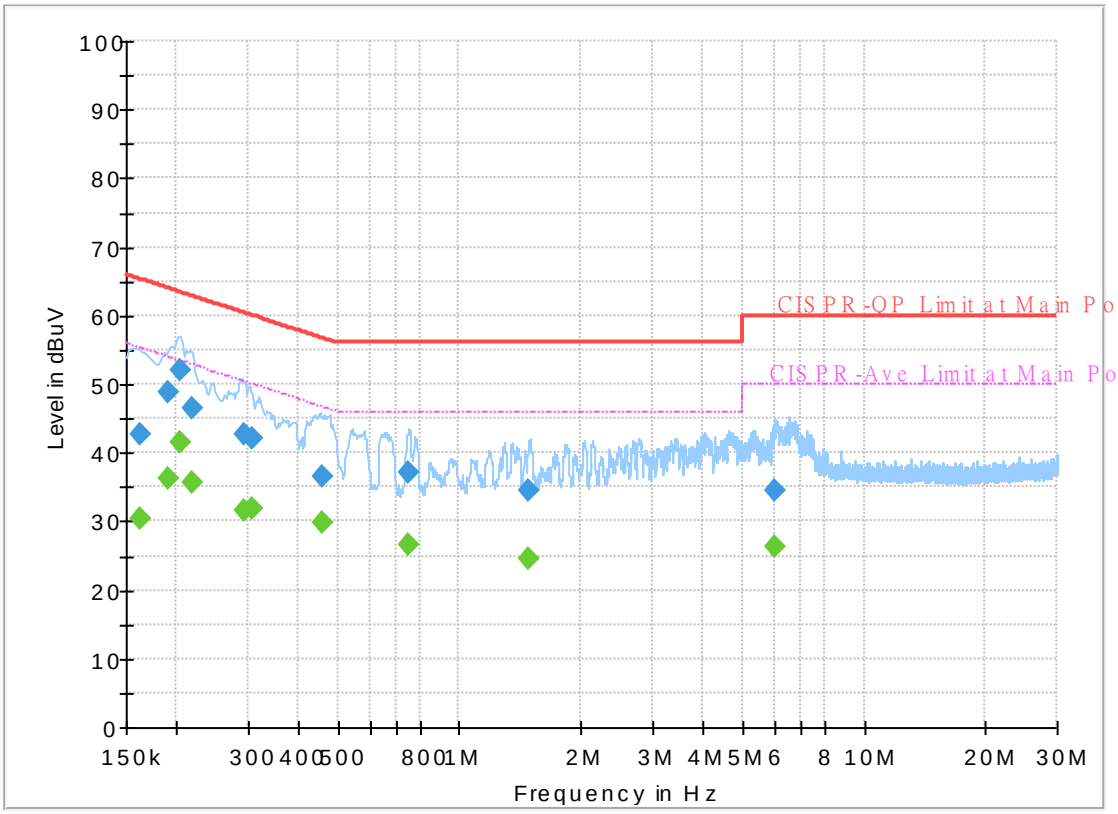
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Tom Lee	**Temperature :**	23~25℃
		Relative Humidity :	42~50%

EUT Information

Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

Full Spectrum



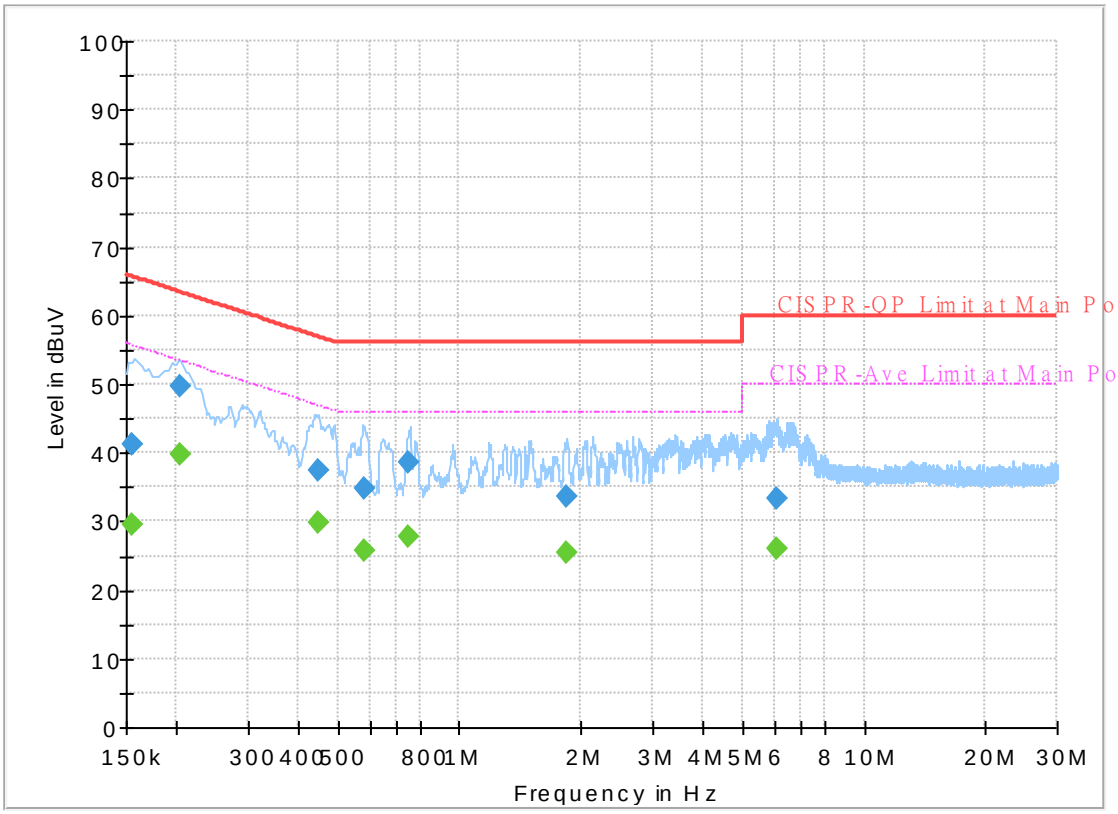
Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.162420	---	30.49	55.34	24.85	L1	OFF	19.6
0.162420	42.80	---	65.34	22.54	L1	OFF	19.6
0.191490	---	36.36	53.97	17.61	L1	OFF	19.6
0.191490	48.84	---	63.97	15.13	L1	OFF	19.6
0.204630	---	41.60	53.42	11.82	L1	OFF	19.6
0.204630	52.06	---	63.42	11.36	L1	OFF	19.6
0.217500	---	35.54	52.91	17.37	L1	OFF	19.6
0.217500	46.60	---	62.91	16.31	L1	OFF	19.6
0.293640	---	31.56	50.42	18.86	L1	OFF	19.6
0.293640	42.57	---	60.42	17.85	L1	OFF	19.6
0.306780	---	31.88	50.06	18.18	L1	OFF	19.6
0.306780	42.02	---	60.06	18.04	L1	OFF	19.6
0.456000	---	29.89	46.77	16.88	L1	OFF	19.6
0.456000	36.69	---	56.77	20.08	L1	OFF	19.6
0.744000	---	26.68	46.00	19.32	L1	OFF	19.6
0.744000	37.11	---	56.00	18.89	L1	OFF	19.6
1.486770	---	24.65	46.00	21.35	L1	OFF	19.6
1.486770	34.59	---	56.00	21.41	L1	OFF	19.6
6.031500	---	26.35	50.00	23.65	L1	OFF	19.9
6.031500	34.51	---	60.00	25.49	L1	OFF	19.9

EUT Information

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)
0.154500	---	29.46	55.75	26.29	N	OFF	19.5
0.154500	41.29	---	65.75	24.46	N	OFF	19.5
0.205080	---	39.91	53.40	13.49	N	OFF	19.5
0.205080	49.80	---	63.40	13.60	N	OFF	19.5
0.449250	---	29.70	46.89	17.19	N	OFF	19.5
0.449250	37.41	---	56.89	19.48	N	OFF	19.5
0.579300	---	25.87	46.00	20.13	N	OFF	19.5
0.579300	34.88	---	56.00	21.12	N	OFF	19.5
0.750750	---	27.90	46.00	18.10	N	OFF	19.5
0.750750	38.57	---	56.00	17.43	N	OFF	19.5
1.837500	---	25.41	46.00	20.59	N	OFF	19.6
1.837500	33.62	---	56.00	22.38	N	OFF	19.6
6.090000	---	26.11	50.00	23.89	N	OFF	19.7
6.090000	33.30	---	60.00	26.70	N	OFF	19.7

Appendix C. Radiated Spurious Emission

Test Engineer :	Karl Hou, CR Liao, and Andy Yang	Temperature :	20~25°C
		Relative Humidity :	50~60%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
4+3		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5640.2	54.53	-13.67	68.2	38.86	31.7	13.02	29.05	101	120	P	H
		5694.8	56.42	-44.95	101.37	40.55	31.79	13.11	29.03	101	120	P	H
		5719.6	71.04	-39.65	110.69	55.04	31.88	13.15	29.03	101	120	P	H
		5723.8	78.95	-40.51	119.46	62.92	31.9	13.16	29.03	101	120	P	H
	*	5745	114.33	-	-	98.18	31.98	13.19	29.02	101	120	P	H
	*	5745	106.7	-	-	90.55	31.98	13.19	29.02	101	120	A	H
													H
													H
		5638.2	55.18	-13.02	68.2	39.51	31.7	13.02	29.05	100	94	P	V
		5692.4	57.35	-42.25	99.6	41.49	31.78	13.11	29.03	100	94	P	V
		5717.2	72.29	-37.73	110.02	56.3	31.87	13.15	29.03	100	94	P	V
		5721.8	76.22	-38.68	114.9	60.21	31.89	13.15	29.03	100	94	P	V
	*	5745	114.49	-	-	98.34	31.98	13.19	29.02	100	94	P	V
	*	5745	106.93	-	-	90.78	31.98	13.19	29.02	100	94	A	V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5650	53.75	-14.45	68.2	38.05	31.7	13.04	29.04	100	119	P	H
		5687.4	54.79	-41.12	95.91	38.96	31.77	13.1	29.04	100	119	P	H
		5718.6	55.49	-54.92	110.41	39.5	31.87	13.15	29.03	100	119	P	H
		5724.2	55.2	-65.18	120.38	39.17	31.9	13.16	29.03	100	119	P	H
	*	5785	114.03	-	-	97.71	32.07	13.26	29.01	100	119	P	H
	*	5785	106.53	-	-	90.21	32.07	13.26	29.01	100	119	A	H
		5842	55.93	-78.27	134.2	39.52	32.1	13.31	29	100	119	P	H
		5855	55.32	-55.48	110.8	38.89	32.11	13.31	28.99	100	119	P	H
		5890	56.18	-37.89	94.07	39.66	32.18	13.33	28.99	100	119	P	H
		5927.8	56.67	-11.53	68.2	39.98	32.31	13.36	28.98	100	119	P	H
													H
802.11a CH 157 5785MHz													H
		5622.6	54.86	-13.34	68.2	39.21	31.7	13	29.05	105	99	P	V
		5666	54.51	-25.57	80.08	38.75	31.73	13.07	29.04	105	99	P	V
		5719.4	55.66	-54.97	110.63	39.66	31.88	13.15	29.03	105	99	P	V
		5725	54.83	-67.37	122.2	38.8	31.9	13.16	29.03	105	99	P	V
	*	5785	114.5	-	-	98.18	32.07	13.26	29.01	105	99	P	V
	*	5785	106.83	-	-	90.51	32.07	13.26	29.01	105	99	A	V
		5852	53.98	-63.66	117.64	37.57	32.1	13.31	29	105	99	P	V
		5870.8	54.83	-51.54	106.37	38.36	32.14	13.32	28.99	105	99	P	V
		5912.2	55.47	-22.17	77.64	38.85	32.25	13.35	28.98	105	99	P	V
		5944	56.58	-11.62	68.2	39.8	32.38	13.37	28.97	105	99	P	V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz	*	5825	113.07	-	-	96.67	32.1	13.3	29	100	121	P	H
	*	5825	105.75	-	-	89.35	32.1	13.3	29	100	121	A	H
		5850	63.33	-58.87	122.2	46.92	32.1	13.31	29	100	121	P	H
		5856	58.92	-51.6	110.52	42.49	32.11	13.31	28.99	100	121	P	H
		5876.2	55.14	-49.17	104.31	38.65	32.15	13.33	28.99	100	121	P	H
		5934.2	54.95	-13.25	68.2	38.23	32.34	13.36	28.98	100	121	P	H
													H
													H
	*	5825	113.12	-	-	96.72	32.1	13.3	29	104	98	P	V
	*	5825	105.53	-	-	89.13	32.1	13.3	29	104	98	A	V
		5850	64.01	-58.19	122.2	47.6	32.1	13.31	29	104	98	P	V
		5859.4	58.3	-51.27	109.57	41.85	32.12	13.32	28.99	104	98	P	V
		5899	56.35	-31.05	87.4	39.79	32.2	13.34	28.98	104	98	P	V
		5935.4	54.87	-13.33	68.2	38.15	32.34	13.36	28.98	104	98	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 802.11a (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	50.9	-23.1	74	51.04	40.1	20.66	60.9	236	228	P	H
		11490	39.99	-14.01	54	40.13	40.1	20.66	60.9	236	228	A	H
		17235	52.55	-15.65	68.2	44.05	40.84	26.48	58.82	100	0	P	H
													H
		11490	50.88	-23.12	74	51.02	40.1	20.66	60.9	187	254	P	V
		11490	40.58	-13.42	54	40.72	40.1	20.66	60.9	187	254	A	V
		17235	51.79	-16.41	68.2	43.29	40.84	26.48	58.82	100	0	P	V
													V
802.11a CH 157 5785MHz		11570	50.61	-23.39	74	50.94	39.89	20.76	60.98	100	0	P	H
		11570	39.79	-14.21	54	40.12	39.89	20.76	60.98	100	0	A	H
		17355	52.4	-15.8	68.2	43	41.38	26.69	58.67	100	0	P	H
													H
		11570	50.78	-23.22	74	51.11	39.89	20.76	60.98	100	0	P	V
		11570	40.08	-13.92	54	40.41	39.89	20.76	60.98	100	0	A	V
		17355	51.46	-16.74	68.2	42.06	41.38	26.69	58.67	100	0	P	V
													V
802.11a CH 165 5825MHz		11650	48.9	-25.1	74	49.53	39.6	20.85	61.08	100	0	P	H
		17475	52.65	-15.55	68.2	42.32	41.97	26.89	58.53	100	0	P	H
													H
		11650	49.17	-24.83	74	49.8	39.6	20.85	61.08	100	0	P	V
		17475	52.48	-15.72	68.2	42.15	41.97	26.89	58.53	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5607.8	54.13	-14.07	68.2	38.51	31.7	12.97	29.05	100	122	P	H
		5695.8	59.77	-42.33	102.1	43.9	31.79	13.11	29.03	100	122	P	H
		5716.6	72.55	-37.3	109.85	56.56	31.87	13.15	29.03	100	122	P	H
		5725	77.67	-44.53	122.2	61.64	31.9	13.16	29.03	100	122	P	H
	*	5745	113	-	-	96.85	31.98	13.19	29.02	100	122	P	H
	*	5745	105.44	-	-	89.29	31.98	13.19	29.02	100	122	A	H
802.11n													H
HT20													H
CH 149		5646	54.37	-13.83	68.2	38.68	31.7	13.03	29.04	100	94	P	V
5745MHz		5700	59.17	-46.03	105.2	43.28	31.8	13.12	29.03	100	94	P	V
		5719.6	73.56	-37.13	110.69	57.56	31.88	13.15	29.03	100	94	P	V
		5725	82.74	-39.46	122.2	66.71	31.9	13.16	29.03	100	94	P	V
	*	5745	114.72	-	-	98.57	31.98	13.19	29.02	100	94	P	V
	*	5745	107.51	-	-	91.36	31.98	13.19	29.02	100	94	A	V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5630.4	54.27	-13.93	68.2	38.61	31.7	13.01	29.05	100	122	P	H
		5694.2	55.3	-45.62	100.92	39.43	31.79	13.11	29.03	100	122	P	H
		5707.6	55.85	-51.48	107.33	39.92	31.83	13.13	29.03	100	122	P	H
		5724.2	54.69	-65.69	120.38	38.66	31.9	13.16	29.03	100	122	P	H
	*	5785	113.6	-	-	97.28	32.07	13.26	29.01	100	122	P	H
	*	5785	105.06	-	-	88.74	32.07	13.26	29.01	100	122	A	H
		5854.6	56	-55.71	111.71	39.57	32.11	13.31	28.99	100	122	P	H
		5856.6	54.74	-55.61	110.35	38.31	32.11	13.31	28.99	100	122	P	H
		5911.6	55.83	-22.26	78.09	39.21	32.25	13.35	28.98	100	122	P	H
		5934.6	54.65	-13.55	68.2	37.93	32.34	13.36	28.98	100	122	P	H
802.11n													H
HT20													H
CH 157		5608.4	53.89	-14.31	68.2	38.27	31.7	12.97	29.05	100	102	P	V
5785MHz		5663.4	54.48	-23.67	78.15	38.73	31.73	13.06	29.04	100	102	P	V
		5719	55.51	-55.01	110.52	39.51	31.88	13.15	29.03	100	102	P	V
		5725	54.74	-67.46	122.2	38.71	31.9	13.16	29.03	100	102	P	V
	*	5785	115.25	-	-	98.93	32.07	13.26	29.01	100	102	P	V
	*	5785	106.63	-	-	90.31	32.07	13.26	29.01	100	102	A	V
		5854.8	54.31	-56.95	111.26	37.88	32.11	13.31	28.99	100	102	P	V
		5862.6	55.91	-52.76	108.67	39.45	32.13	13.32	28.99	100	102	P	V
		5879.2	54.34	-47.74	102.08	37.84	32.16	13.33	28.99	100	102	P	V
		5940.6	54.1	-14.1	68.2	37.35	32.36	13.36	28.97	100	102	P	V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	*	5825	112.68	-	-	96.28	32.1	13.3	29	100	122	P	H
	*	5825	104.46	-	-	88.06	32.1	13.3	29	100	122	A	H
		5850.4	70.43	-50.86	121.29	54.02	32.1	13.31	29	100	122	P	H
		5856.6	60.15	-50.2	110.35	43.72	32.11	13.31	28.99	100	122	P	H
		5876.4	55.96	-48.2	104.16	39.47	32.15	13.33	28.99	100	122	P	H
		5938.4	55	-13.2	68.2	38.26	32.35	13.36	28.97	100	122	P	H
802.11n													H
HT20													H
CH 165	*	5825	113.7	-	-	97.3	32.1	13.3	29	100	92	P	V
5825MHz	*	5825	106.22	-	-	89.82	32.1	13.3	29	100	92	A	V
		5850	64.7	-57.5	122.2	48.29	32.1	13.31	29	100	92	P	V
		5855.4	60.77	-49.92	110.69	44.34	32.11	13.31	28.99	100	92	P	V
		5878	56.46	-46.51	102.97	39.96	32.16	13.33	28.99	100	92	P	V
		5949.6	55.46	-12.74	68.2	38.66	32.4	13.37	28.97	100	92	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11490	49.2	-24.8	74	49.34	40.1	20.66	60.9	100	0	P	H
		17235	51.54	-16.66	68.2	43.04	40.84	26.48	58.82	100	0	P	H
802.11n													H
HT20													H
CH 149		11490	49.77	-24.23	74	49.91	40.1	20.66	60.9	100	0	P	V
5745MHz		17235	51.83	-16.37	68.2	43.33	40.84	26.48	58.82	100	0	P	V
													V
													V
		11570	49.4	-24.6	74	49.73	39.89	20.76	60.98	100	0	P	H
		17355	51.04	-17.16	68.2	41.64	41.38	26.69	58.67	100	0	P	H
802.11n													H
HT20													H
CH 157		11570	49.75	-24.25	74	50.08	39.89	20.76	60.98	100	0	P	V
5785MHz		17355	52.11	-16.09	68.2	42.71	41.38	26.69	58.67	100	0	P	V
													V
													V
		11650	49.29	-24.71	74	49.92	39.6	20.85	61.08	100	0	P	H
		17475	51.93	-16.27	68.2	41.6	41.97	26.89	58.53	100	0	P	H
802.11n													H
HT20													H
CH 165		11650	49.13	-24.87	74	49.76	39.6	20.85	61.08	100	0	P	V
5825MHz		17475	52.02	-16.18	68.2	41.69	41.97	26.89	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 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5646.2	55.42	-12.78	68.2	39.73	31.7	13.03	29.04	100	120	P	H
		5697.2	66.95	-36.19	103.14	51.07	31.79	13.12	29.03	100	120	P	H
		5719.2	82.35	-28.23	110.58	66.35	31.88	13.15	29.03	100	120	P	H
		5721.8	84.48	-30.42	114.9	68.47	31.89	13.15	29.03	100	120	P	H
	*	5755	111.69	-	-	95.49	32.01	13.21	29.02	100	120	P	H
	*	5755	103.85	-	-	87.65	32.01	13.21	29.02	100	120	A	H
		5850	53.56	-68.64	122.2	37.15	32.1	13.31	29	100	120	P	H
		5856.4	54.44	-55.97	110.41	38.01	32.11	13.31	28.99	100	120	P	H
		5877.8	56.36	-46.76	103.12	39.86	32.16	13.33	28.99	100	120	P	H
		5949.6	55.8	-12.4	68.2	39	32.4	13.37	28.97	100	120	P	H
802.11n													H
HT40													H
CH 151		5650	55.67	-12.53	68.2	39.97	31.7	13.04	29.04	101	90	P	V
5755MHz		5698.6	66.42	-37.75	104.17	50.53	31.8	13.12	29.03	101	90	P	V
		5718.8	82.45	-28.01	110.46	66.45	31.88	13.15	29.03	101	90	P	V
		5723.8	82.14	-37.32	119.46	66.11	31.9	13.16	29.03	101	90	P	V
	*	5755	111.77	-	-	95.57	32.01	13.21	29.02	101	90	P	V
	*	5755	104.34	-	-	88.14	32.01	13.21	29.02	101	90	A	V
		5853.6	54.35	-59.64	113.99	37.93	32.11	13.31	29	101	90	P	V
		5867.4	55.75	-51.58	107.33	39.29	32.13	13.32	28.99	101	90	P	V
		5914.6	55.46	-20.41	75.87	38.83	32.26	13.35	28.98	101	90	P	V
		5934.4	55.49	-12.71	68.2	38.77	32.34	13.36	28.98	101	90	P	V
													V
													V

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5601.4	54.23	-13.97	68.2	38.63	31.7	12.96	29.06	100	121	P	H
		5699.4	56.27	-48.49	104.76	40.38	31.8	13.12	29.03	100	121	P	H
		5720	60.52	-50.28	110.8	44.52	31.88	13.15	29.03	100	121	P	H
		5723	62.84	-54.8	117.64	46.82	31.89	13.16	29.03	100	121	P	H
	*	5795	111.31	-	-	94.96	32.09	13.27	29.01	100	121	P	H
	*	5795	103.77	-	-	87.42	32.09	13.27	29.01	100	121	A	H
		5851.2	61.21	-58.25	119.46	44.8	32.1	13.31	29	100	121	P	H
		5858	60.72	-49.24	109.96	44.28	32.12	13.31	28.99	100	121	P	H
		5876	58.35	-46.11	104.46	41.86	32.15	13.33	28.99	100	121	P	H
		5928.8	55.46	-12.74	68.2	38.76	32.32	13.36	28.98	100	121	P	H
802.11n													H
HT40													H
CH 159		5626	54.44	-13.76	68.2	38.79	31.7	13	29.05	107	93	P	V
5795MHz		5690.8	55.12	-43.3	98.42	39.26	31.78	13.11	29.03	107	93	P	V
		5715.6	59.28	-50.29	109.57	43.31	31.86	13.14	29.03	107	93	P	V
		5725	60.89	-61.31	122.2	44.86	31.9	13.16	29.03	107	93	P	V
	*	5795	111.59	-	-	95.24	32.09	13.27	29.01	107	93	P	V
	*	5795	104.13	-	-	87.78	32.09	13.27	29.01	107	93	A	V
		5850.4	61.27	-60.02	121.29	44.86	32.1	13.31	29	107	93	P	V
		5855.8	59.23	-51.35	110.58	42.8	32.11	13.31	28.99	107	93	P	V
		5877.6	57.11	-46.16	103.27	40.61	32.16	13.33	28.99	107	93	P	V
		5929.2	55.06	-13.14	68.2	38.36	32.32	13.36	28.98	107	93	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11510	49.72	-24.28	74	49.86	40.07	20.7	60.91	100	0	P	H
		17265	51.21	-16.99	68.2	42.5	40.96	26.53	58.78	100	0	P	H
802.11n													H
HT40													H
CH 151		11510	49.9	-24.1	74	50.04	40.07	20.7	60.91	100	0	P	V
5755MHz		17265	51.31	-16.89	68.2	42.6	40.96	26.53	58.78	100	0	P	V
													V
													V
		11590	49.42	-24.58	74	49.82	39.83	20.78	61.01	100	0	P	H
		17385	52.68	-15.52	68.2	43.06	41.52	26.74	58.64	100	0	P	H
802.11n													H
HT40													H
CH 159		11590	49.1	-24.9	74	49.5	39.83	20.78	61.01	100	0	P	V
5795MHz		17385	52.73	-15.47	68.2	43.11	41.52	26.74	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. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5644.6	65.71	-2.49	68.2	50.03	31.7	13.03	29.05	100	121	P	H
		5684.4	80.79	-12.9	93.69	64.96	31.77	13.1	29.04	100	121	P	H
		5718.8	86.55	-23.91	110.46	70.55	31.88	13.15	29.03	100	121	P	H
		5720.8	86.2	-26.42	112.62	70.2	31.88	13.15	29.03	100	121	P	H
	*	5775	110.36	-	-	94.08	32.05	13.24	29.01	100	121	P	H
	*	5775	101.82	-	-	85.54	32.05	13.24	29.01	100	121	A	H
		5850	78.04	-44.16	122.2	61.63	32.1	13.31	29	100	121	P	H
		5860.8	78.6	-30.57	109.17	62.15	32.12	13.32	28.99	100	121	P	H
		5881.8	71.24	-28.91	100.15	54.74	32.16	13.33	28.99	100	121	P	H
		5926.4	56.93	-11.27	68.2	40.24	32.31	13.36	28.98	100	121	P	H
802.11ac													H
VHT80													H
CH 155		5649.6	63.78	-4.42	68.2	48.08	31.7	13.04	29.04	101	97	P	V
5775MHz		5692.8	82.23	-17.66	99.89	66.36	31.79	13.11	29.03	101	97	P	V
		5715.8	85.75	-23.88	109.63	69.77	31.86	13.15	29.03	101	97	P	V
		5720	84.78	-26.02	110.8	68.78	31.88	13.15	29.03	101	97	P	V
	*	5775	109.71	-	-	93.43	32.05	13.24	29.01	101	97	P	V
	*	5775	102.06	-	-	85.78	32.05	13.24	29.01	101	97	A	V
		5853.8	82.44	-31.1	113.54	66.02	32.11	13.31	29	101	97	P	V
		5855.4	79.81	-30.88	110.69	63.38	32.11	13.31	28.99	101	97	P	V
		5875	74.54	-30.66	105.2	58.06	32.15	13.32	28.99	101	97	P	V
		5930.2	57.37	-10.83	68.2	40.67	32.32	13.36	28.98	101	97	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11550	49.24	-24.76	74	49.51	39.95	20.74	60.96	100	0	P	H
		17325	51.49	-16.71	68.2	42.34	41.22	26.64	58.71	100	0	P	H
802.11ac													H
VHT80													H
CH 155		11550	49.44	-24.56	74	49.71	39.95	20.74	60.96	100	0	P	V
5775MHz		17325	51.49	-16.71	68.2	42.34	41.22	26.64	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)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT SHF		36106	44.37	-23.83	68.2	39.79	42.64	18.39	56.45	150	0	P	H
		38152	46.77	-21.43	68.2	39.59	43.37	19.78	55.97	150	0	P	H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
													H
		33290	43.88	-24.32	68.2	39.52	40.81	17.77	54.22	150	0	P	V
		37074	46.36	-21.84	68.2	40.84	42.79	19.76	57.03	150	0	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V

Remark

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

Emission below 1GHz

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4+3		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11ac VHT LF		40.67	31.23	-8.77	40	43.57	18.91	1.07	32.32	100	0	P	H
		162.89	31.21	-12.29	43.5	45.1	16.14	2.26	32.29	-	-	P	H
		301.6	28.99	-17.01	46	39.05	19.24	3.06	32.36	-	-	P	H
		484.93	27.01	-18.99	46	31.7	23.71	3.71	32.11	-	-	P	H
		637.22	29.69	-16.31	46	31.01	26.37	4.32	32.01	-	-	P	H
		837.04	32.34	-13.66	46	30.74	28.82	4.98	32.2	-	-	P	H
													H
													H
													H
													H
													H
													H
		40.67	38.61	-1.39	40	50.95	18.91	1.07	32.32	100	183	QP	V
		185.2	29.06	-14.44	43.5	44.23	14.78	2.36	32.31	-	-	P	V
		343.31	23.66	-22.34	46	32.6	20.19	3.16	32.29	-	-	P	V
		442.25	25.46	-20.54	46	31.04	22.99	3.58	32.15	-	-	P	V
		619.76	29.44	-16.56	46	31.42	25.72	4.27	31.97	-	-	P	V
		830.25	31.67	-14.33	46	30.44	28.5	4.96	32.23	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

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

<WPC Mode>

Band 4 - 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
4+3		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		5644	63.7	-4.5	68.2	48.02	31.7	13.03	29.05	100	281	P	H
		5687.6	79.72	-16.33	96.05	63.87	31.78	13.1	29.03	100	281	P	H
		5706.2	83.34	-23.6	106.94	67.42	31.82	13.13	29.03	100	281	P	H
		5724.6	84.77	-36.52	121.29	68.74	31.9	13.16	29.03	100	281	P	H
	*	5775	108.33	-	-	92.05	32.05	13.24	29.01	100	281	P	H
	*	5775	100.65	-	-	84.37	32.05	13.24	29.01	100	281	A	H
		5851	77.39	-42.53	119.92	60.98	32.1	13.31	29	100	281	P	H
		5863.4	76.63	-31.82	108.45	60.17	32.13	13.32	28.99	100	281	P	H
		5885.2	68.78	-28.85	97.63	52.27	32.17	13.33	28.99	100	281	P	H
		5928.4	56.53	-11.67	68.2	39.84	32.31	13.36	28.98	100	281	P	H
802.11ac													H
VHT80													H
CH 155		5645.6	65.74	-2.46	68.2	50.06	31.7	13.03	29.05	302	260	P	V
5775MHz		5687.4	79.66	-16.25	95.91	63.83	31.77	13.1	29.04	302	260	P	V
		5706.8	83.35	-23.76	107.11	67.42	31.83	13.13	29.03	302	260	P	V
		5725	83.94	-38.26	122.2	67.91	31.9	13.16	29.03	302	260	P	V
	*	5775	107.9	-	-	91.62	32.05	13.24	29.01	302	260	P	V
	*	5775	100.17	-	-	83.89	32.05	13.24	29.01	302	260	A	V
		5850.4	76.09	-45.2	121.29	59.68	32.1	13.31	29	302	260	P	V
		5866	76.01	-31.71	107.72	59.55	32.13	13.32	28.99	302	260	P	V
		5885.2	67.1	-30.53	97.63	50.59	32.17	13.33	28.99	302	260	P	V
		5929.6	56.23	-11.97	68.2	39.53	32.32	13.36	28.98	302	260	P	V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11550	49.9	-24.1	74	50.17	39.95	20.74	60.96	400	0	P	H
		17325	53.54	-14.66	68.2	44.39	41.22	26.64	58.71	100	0	P	H
802.11ac													H
VHT80													H
CH 155		11550	49.87	-24.13	74	50.14	39.95	20.74	60.96	100	0	P	V
5775MHz		17325	52.35	-15.85	68.2	43.2	41.22	26.64	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

5GHz WIFI 802.11ac VHT80 (SHF)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
4+3		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		33312	44.02	-24.18	68.2	39.62	40.84	17.78	54.22	150	0	P	H
		37184	46.13	-22.07	68.2	40.5	42.76	19.79	56.92	150	0	P	H
													H
													H
													H
													H
													H
													H
													H
													H
5GHz													H
802.11ac													H
VHT80		29792	42.28	-25.92	68.2	41.14	40.27	15.7	54.83	150	0	P	V
SHF		35798	43.66	-24.54	68.2	39.51	42.48	17.89	56.22	150	0	P	V
													V
													V
													V
													V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (LF)

WIFI Ant. 4+3	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		147.37	38.95	-4.55	43.5	52.07	17.02	2.14	32.28	100	44	QP	H
		260.86	31.78	-14.22	46	41.2	20.09	2.83	32.34	-	-	P	H
		433.52	24.14	-21.86	46	29.87	22.87	3.56	32.16	-	-	P	H
		498.51	25.6	-20.4	46	30.04	23.9	3.75	32.09	-	-	P	H
		644.01	29.45	-16.55	46	30.73	26.39	4.35	32.02	-	-	P	H
		837.04	33.08	-12.92	46	31.48	28.82	4.98	32.2	-	-	P	H
													H
													H
													H
													H
5GHz													H
802.11ac													H
VHT80		151.25	35	-8.5	43.5	48.14	16.98	2.17	32.29	100	0	P	V
LF		258.92	27.18	-18.82	46	36.78	19.92	2.82	32.34	-	-	P	V
		495.6	25.01	-20.99	46	29.49	23.87	3.74	32.09	-	-	P	V
		639.16	28.72	-17.28	46	30.01	26.39	4.33	32.01	-	-	P	V
		746.83	32.46	-13.54	46	31.91	28.1	4.7	32.25	-	-	P	V
		837.04	32.69	-13.31	46	31.09	28.82	4.98	32.2	-	-	P	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 CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix D. Radiated Spurious Emission Plots

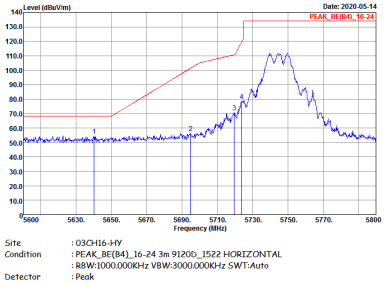
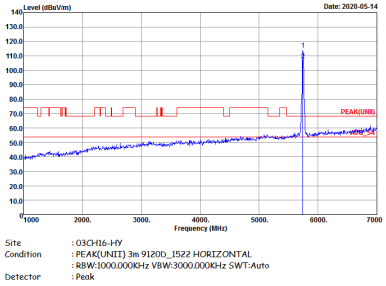
Test Engineer :	Karl Hou, CR Liao, and Andy Yang	**Temperature :**	20~25°C
		Relative Humidity :	50~60%

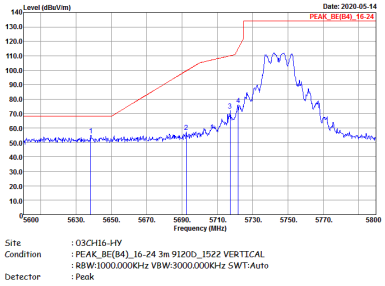
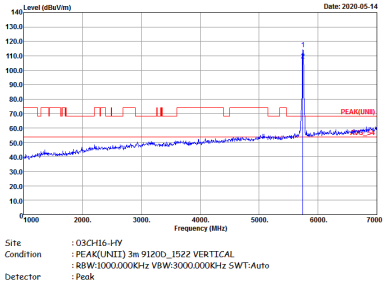
Note symbol

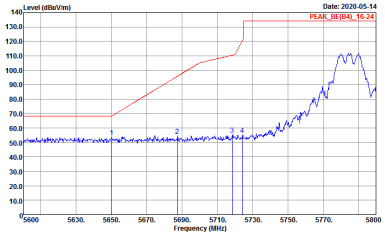
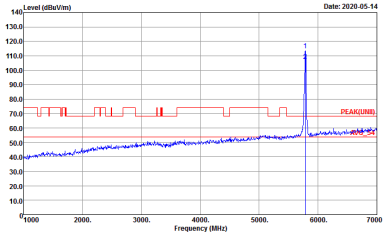
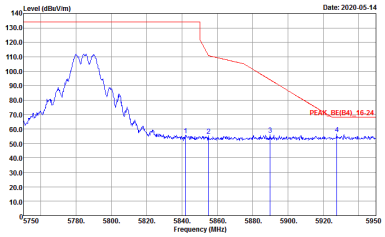
-L	**Low channel location**
-R	**High channel location**

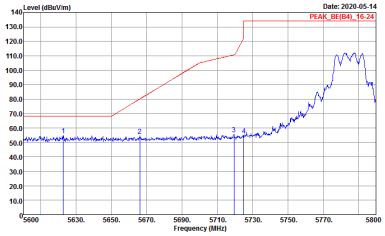
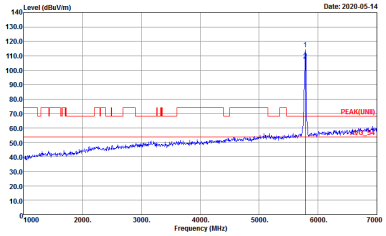
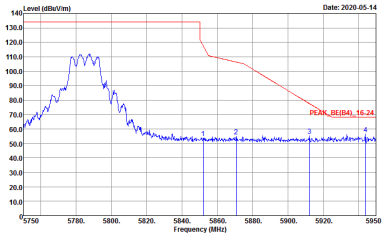
Band 4 - 5725~5850MHz

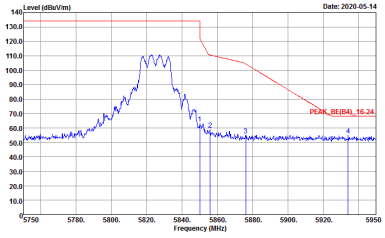
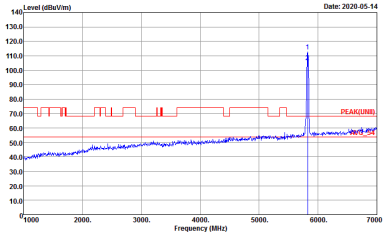
WIFI 802.11a (Band Edge @ 3m)

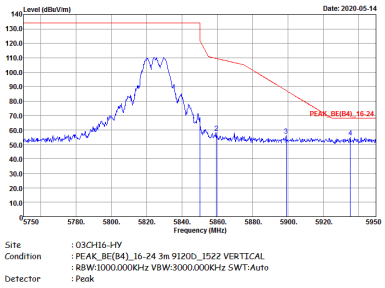
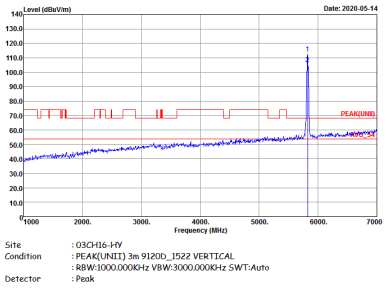
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
4+3	Horizontal	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
4+3	Vertical	Fundamental
Peak		

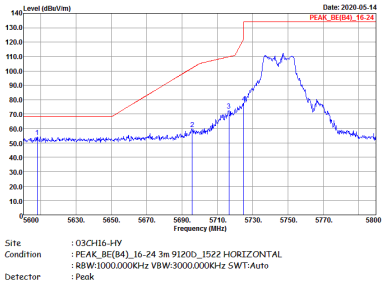
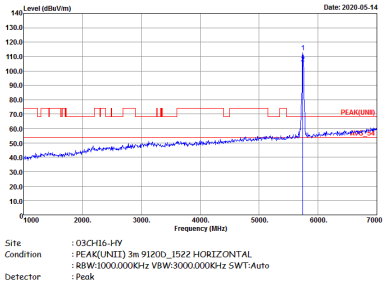
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH16-HV Condition : PEAK(UNII) 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank

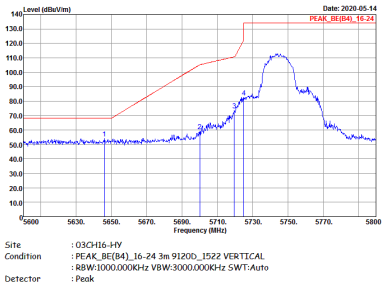
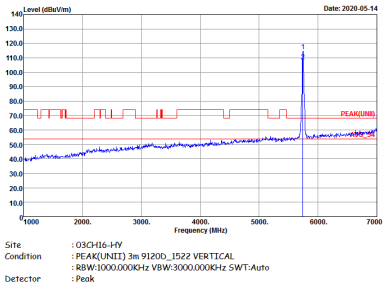
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH16-HV Condition : PEAK(UNII) 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank

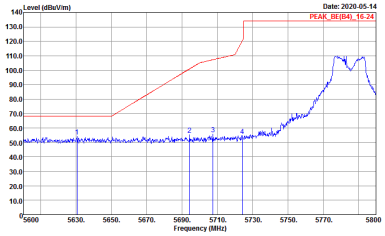
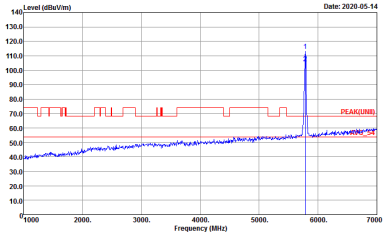
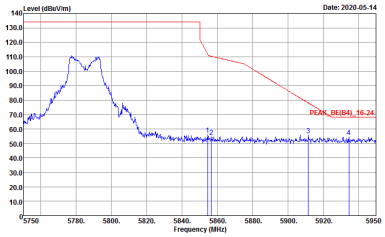
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
4+3	Horizontal	Fundamental
Peak		

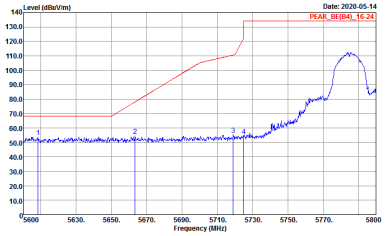
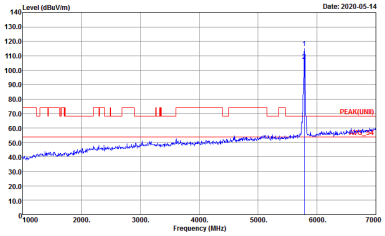
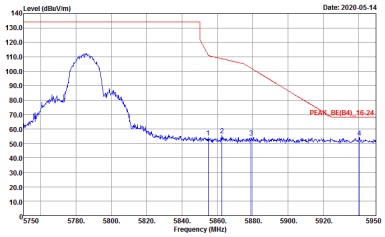
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
4+3	Vertical	Fundamental
Peak		

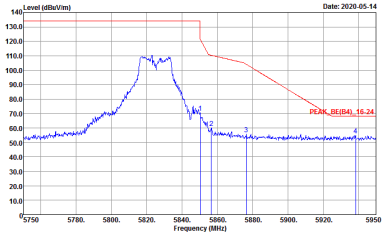
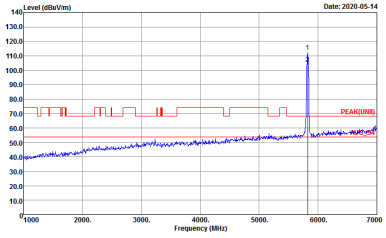
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

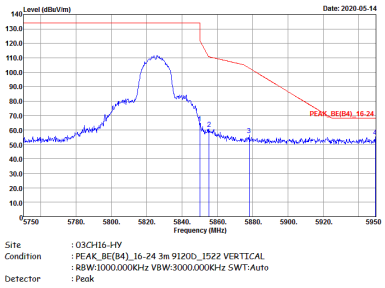
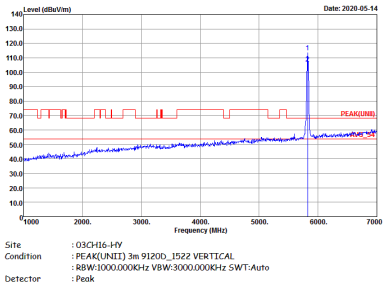
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
4+3	Horizontal	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
4+3	Vertical	Fundamental
Peak		

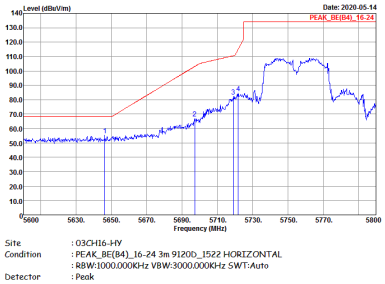
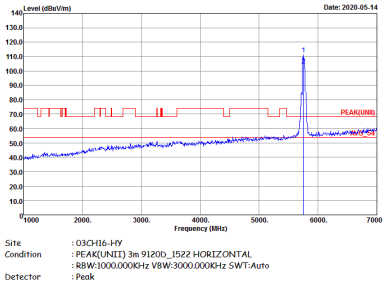
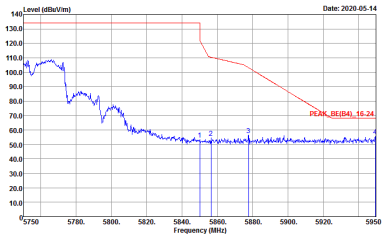
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH16-HV Condition : PEAK(UNII) 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank

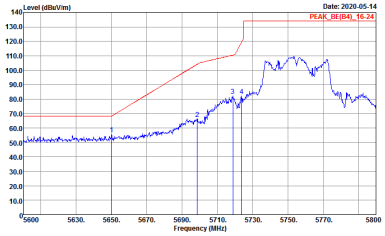
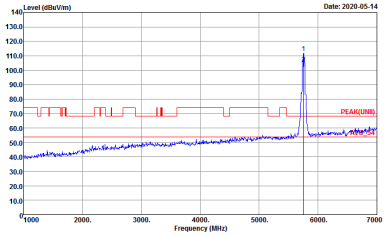
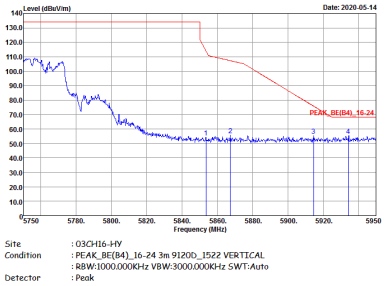
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH16-HV Condition : PEAK(UNII) 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank

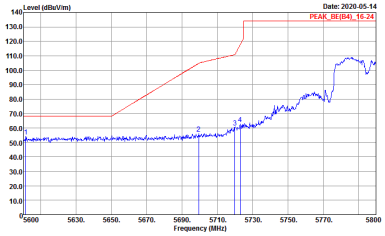
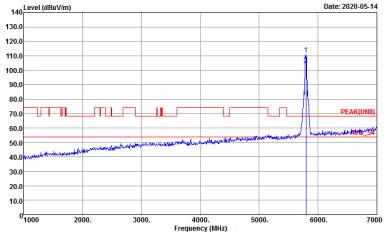
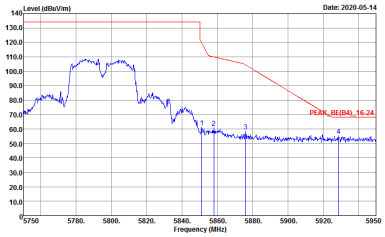
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
4+3	Horizontal	Fundamental
Peak		

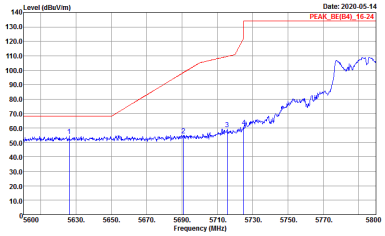
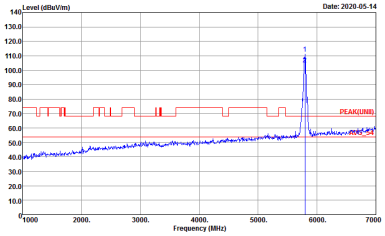
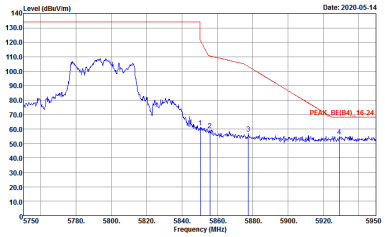
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
4+3	Vertical	Fundamental
Peak		

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

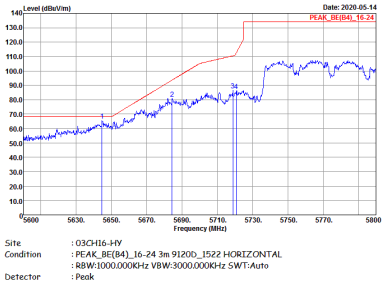
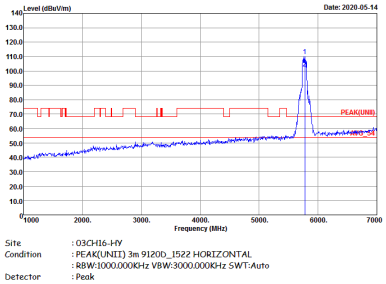
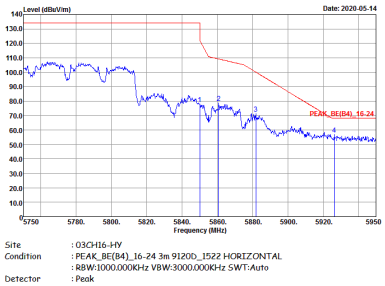
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
4+3	Horizontal	Fundamental
Peak		
Peak		Left blank

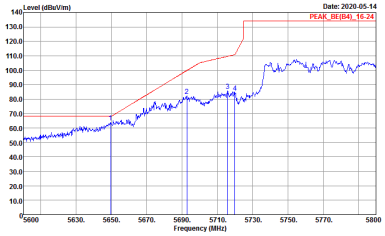
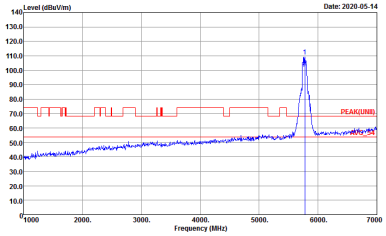
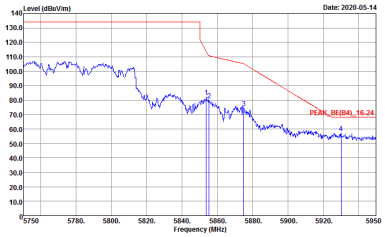
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
4+3	Vertical	Fundamental
Peak		
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
4+3	Horizontal	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH16-HV Condition : PEAK(UNII) 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH16-HV Condition : PEAK(UNII) 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank

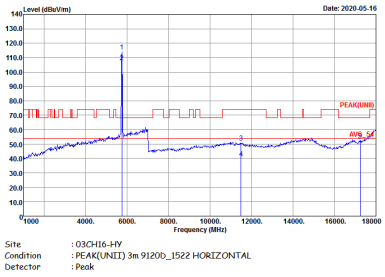
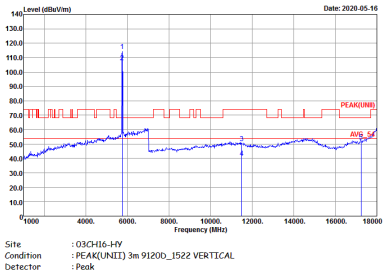
Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

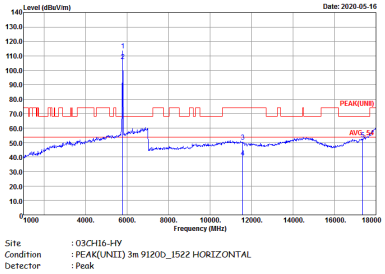
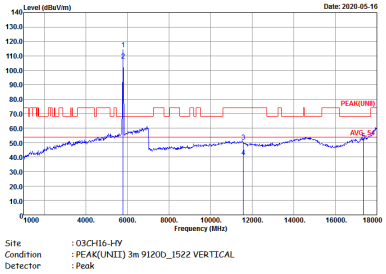
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Horizontal	Fundamental
Peak		
Peak		Left blank

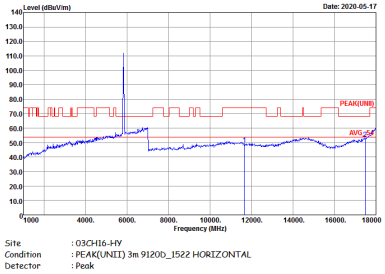
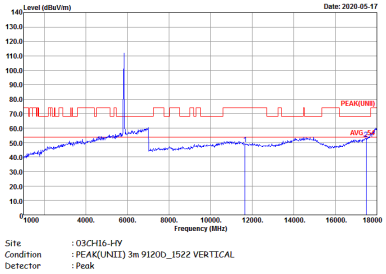
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Vertical	Fundamental
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH16-HV Condition : PEAK(UNII) 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Peak	 Site : 03CH16-HV Condition : PEAK_BE(B4)_16-24 3m 9120D_1522 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Left blank

Band 4 - 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

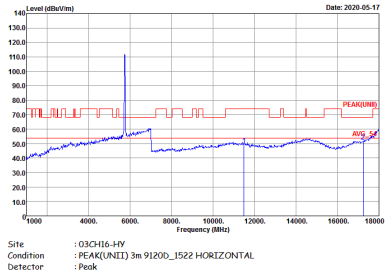
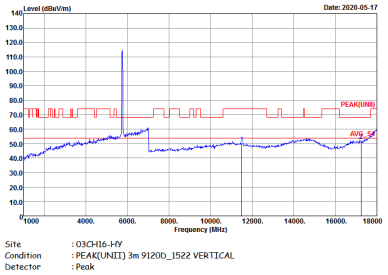
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
4+3	Horizontal	Vertical
Peak Avg.		

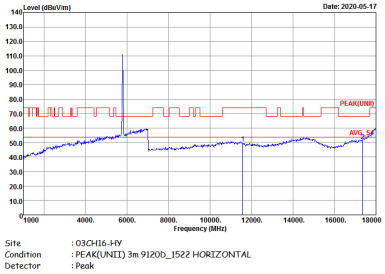
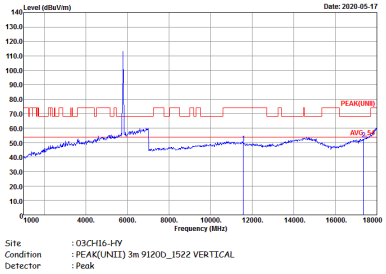
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
4+3	Horizontal	Vertical
Peak Avg.		

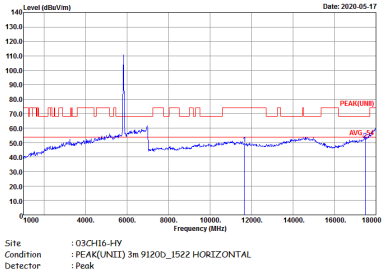
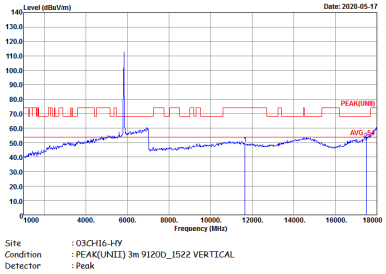
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
4+3	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

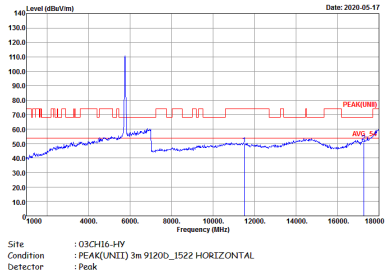
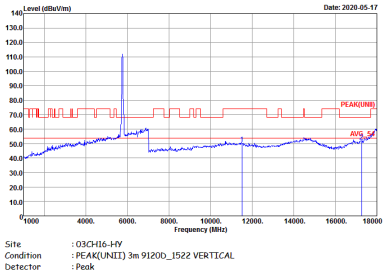
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
4+3	Horizontal	Vertical
Peak Avg.		

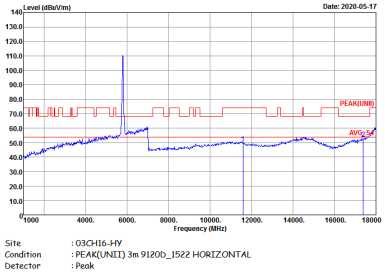
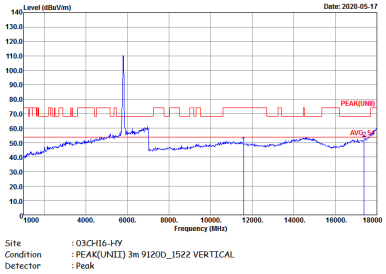
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
4+3	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
4+3	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

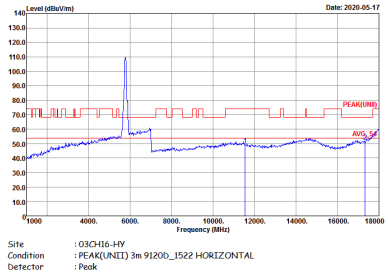
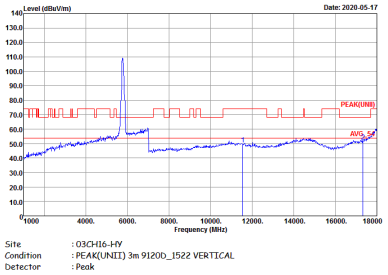
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
4+3	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
4+3	Horizontal	Vertical
Peak Avg.		

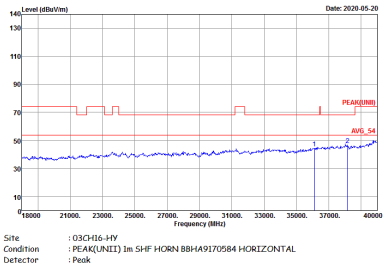
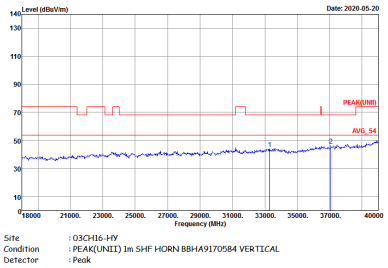
Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Horizontal	Vertical
Peak Avg.		

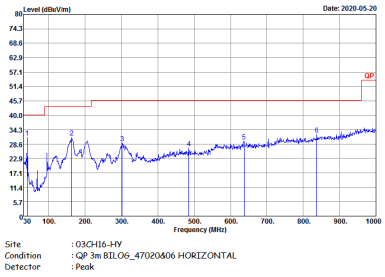
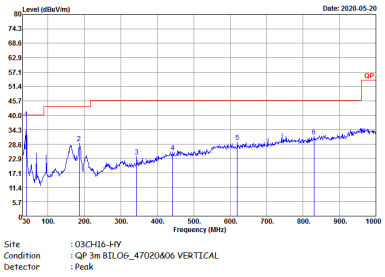
Emission above 18GHz

WIFI 802.11ac VHT80 (SHF)

WIFI	5GHz 5725~5850MHz	
ANT	802.11ac VHT80 LF	
4+3	Horizontal	Vertical
Peak		

Emission below 1GHz

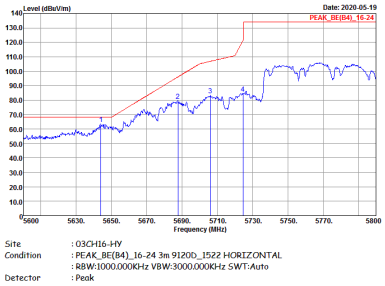
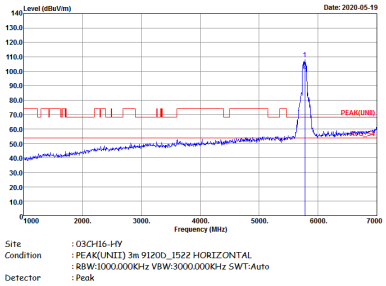
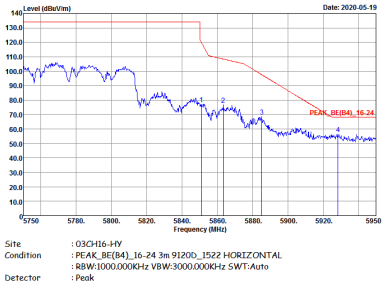
5GHz WIFI 802.11ac VHT80 (LF)

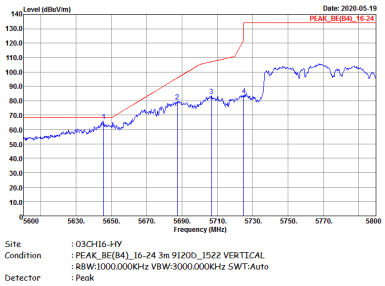
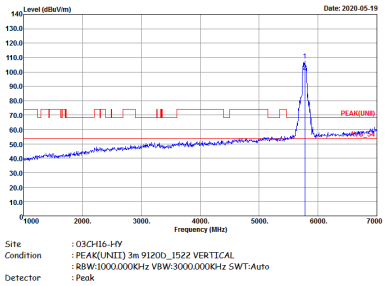
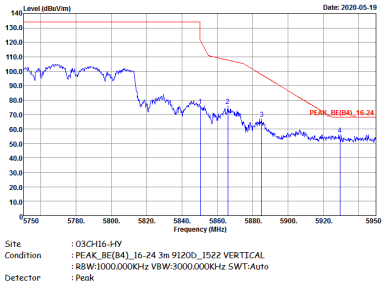
WIFI	5GHz 5725~5850MHz	
ANT	802.11ac VHT80 LF	
4+3	Horizontal	Vertical
QP / Peak		

<WPC Mode>

Band 4 - 5725~5850MHz

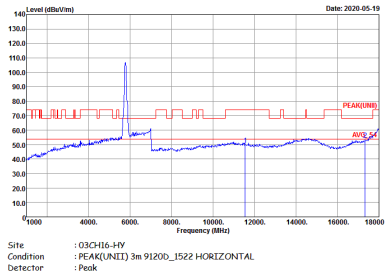
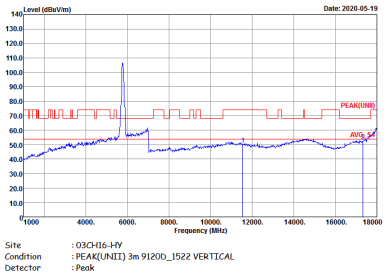
WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Horizontal	Fundamental
Peak		
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Vertical	Fundamental
Peak		
Peak		Left blank

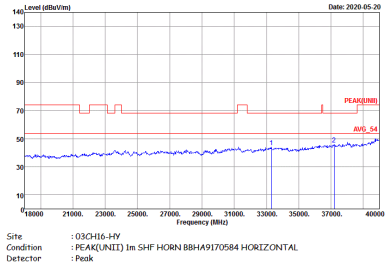
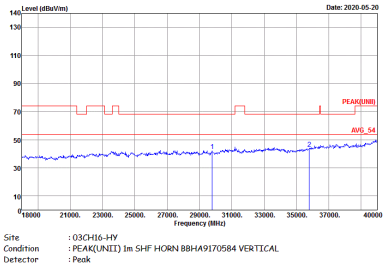
Band 4 - 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
4+3	Horizontal	Vertical
Peak Avg.		

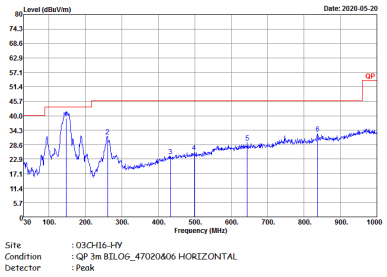
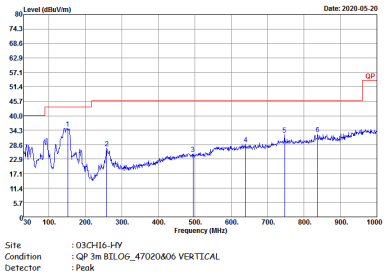
Emission above 18GHz

5GHz WIFI 802.11ac VHT80 (SHF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 SHF	
4+3	Horizontal	Vertical
QP / Peak		

Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (LF)

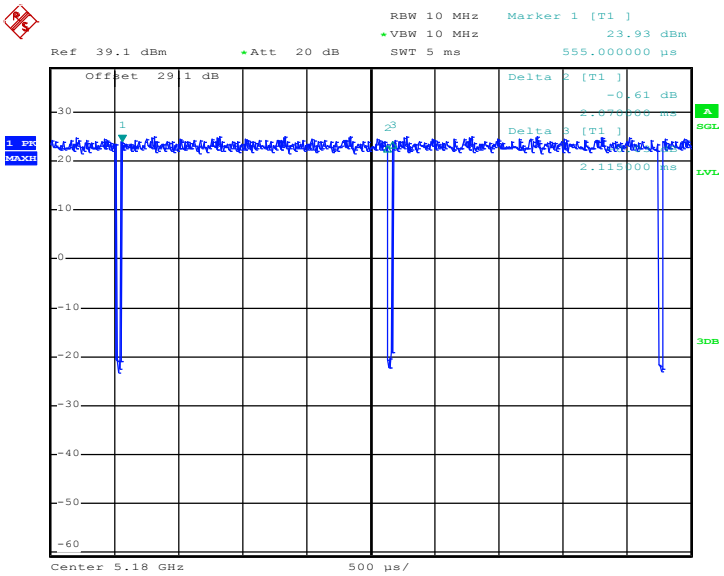
WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
4+3	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

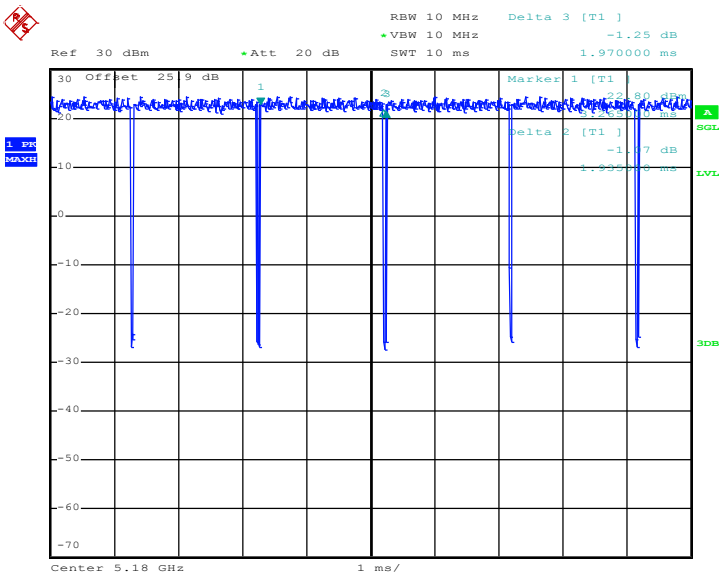
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
4+3	802.11a for Ant 4	97.87	2070	0.48	1kHz	0.09
4+3	802.11a for Ant 3	98.11	-	-	10Hz	0.08
4+3	5GHz 802.11n HT20 for Ant 4	98.22	-	-	10Hz	0.08
4+3	5GHz 802.11n HT20 for Ant 3	96.96	1915	0.52	1kHz	0.13
4+3	5GHz 802.11n HT40 for Ant 4	95.95	950	1.05	3kHz	0.18
4+3	5GHz 802.11n HT40 for Ant 3	95.95	950	1.05	3kHz	0.18
4+3	5GHz 802.11ac VHT80 for Ant 4	90.19	460	2.17	3kHz	0.45
4+3	5GHz 802.11ac VHT80 for Ant 3	92.07	465	2.15	3kHz	0.36

MIMIO<Ant.4>

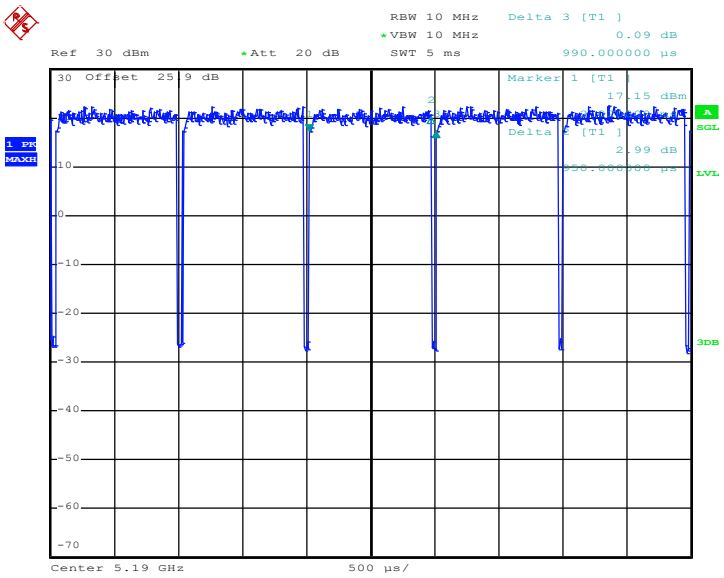
802.11a



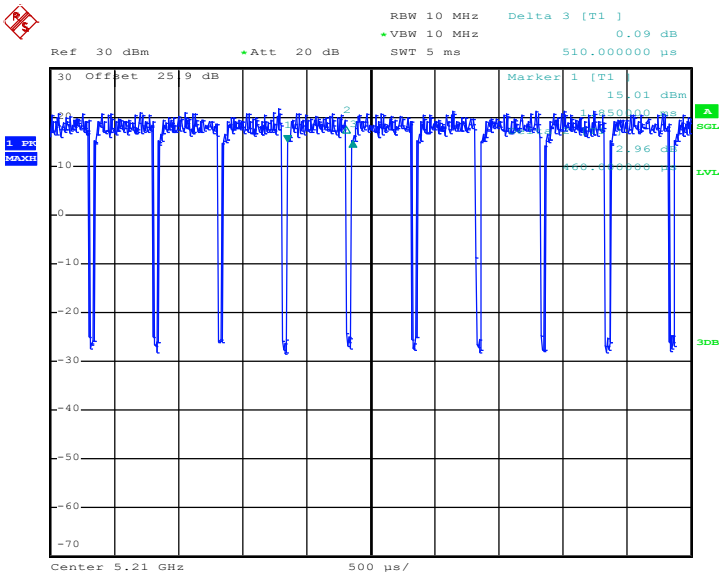
802.11n HT20



802.11n HT40

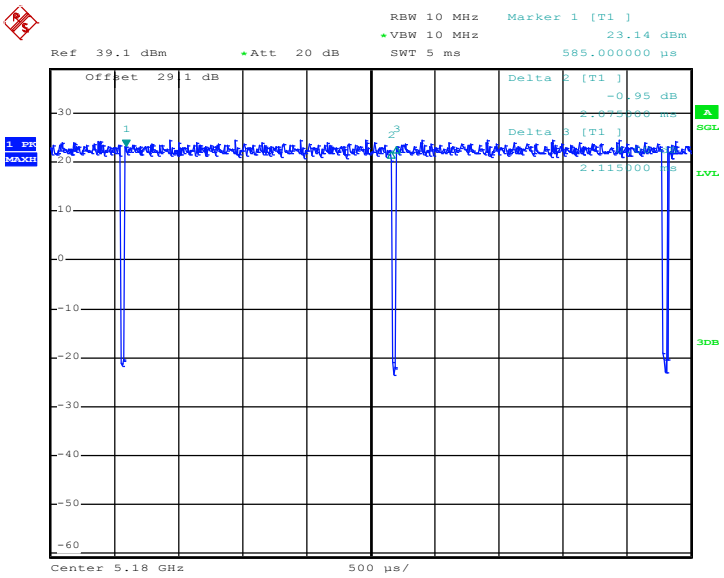


802.11ac VHT80

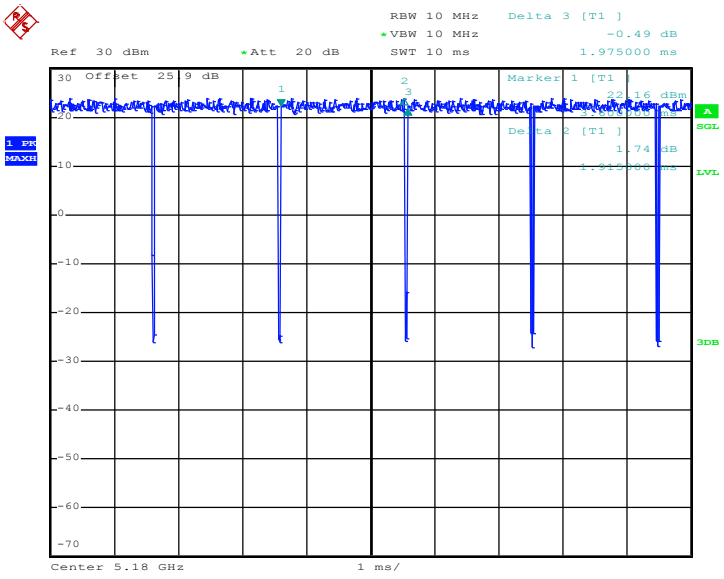


MIMO<Ant. 3>

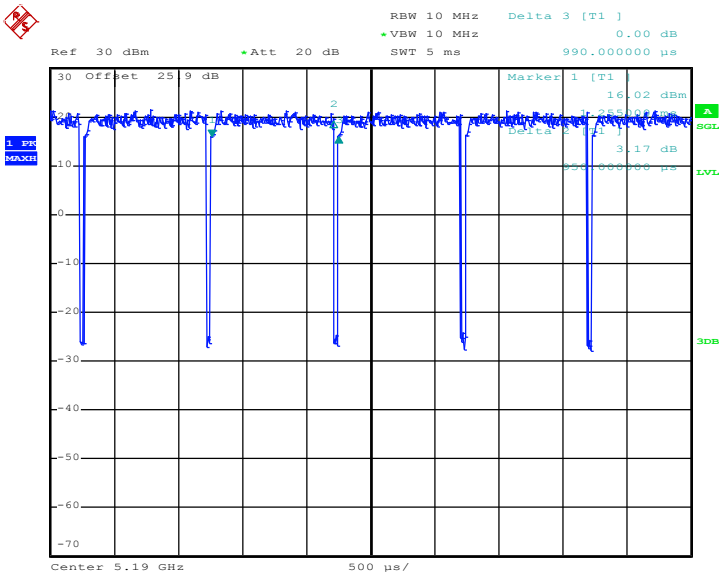
802.11a



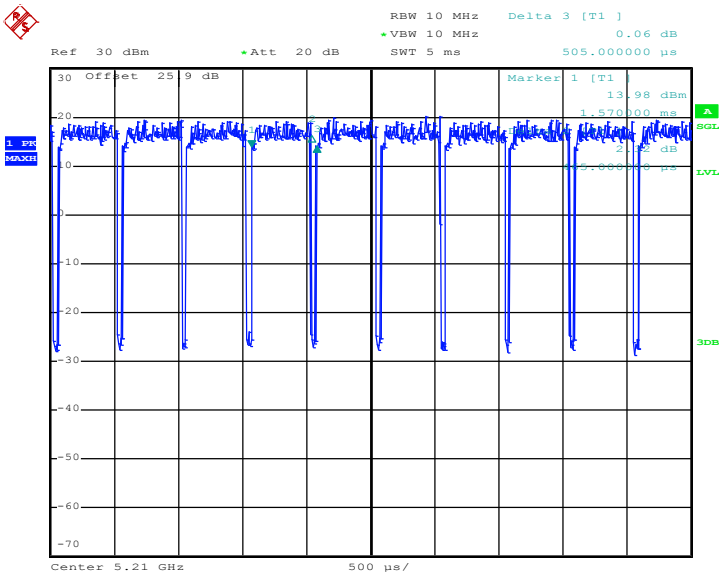
802.11n HT20



802.11n HT40



802.11ac VHT80



———THE END———