

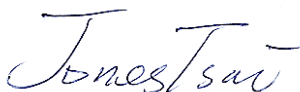
FCC RADIO TEST REPORT

FCC ID : RF41469A
Equipment : Handheld terminal
Brand Name : KEYENCE
Model name : BT-A700GA
Marketing Name : KEYENCE
Applicant : Keyence Corporation
1-3-14, Higashi-Nakajima,
Higashi-Yodogawa-ku, Osaka, 533-8555, JAPAN
Manufacturer : Keyence Corporation
1-3-14, Higashi-Nakajima,
Higashi-Yodogawa-ku, Osaka, 533-8555, JAPAN
Standard : FCC Part 15 Subpart E §15.407

The product was received on Jan. 17, 2019 and testing was started from Jan. 28, 2019 and completed on Apr. 09, 2019. 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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.



Approved by: Jones Tsai

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
FR911730-01E	01	Initial issue of report	Apr. 23, 2019

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 2.75 dB at 11490.000 MHz
-	15.207	AC Conducted Emission	Not Required	-
3.5	15.407 (c)	Automatically Discontinue Transmission	Pass	-
3.6	15.203 & 15.407 (a)	Antenna Requirement	Pass	-
Remark: Not required means after assessing, test items are not necessary to carry out.				

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: Maggie Chiang

1 General Description

1.1 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Antenna Type	WLAN: <Ant. 1> PIFA Antenna <Ant. 2> PIFA Antenna Bluetooth: PIFA Antenna

1.2 Product Specification of Equipment Under Test

Standards-related Product Specification												
Tx/Rx Channel Frequency Range		5745 MHz ~ 5825 MHz										
Maximum Output Power to Antenna		MIMO <Ant. 1 + 2> 802.11a : 20.76 dBm / 0.1191 W 802.11n HT20 : 20.26 dBm / 0.1062 W 802.11n HT40 : 19.46 dBm / 0.0883 W 802.11ac VHT20: 20.46 dBm / 0.1112 W 802.11ac VHT40: 19.71 dBm / 0.0935 W 802.11ac VHT80: 19.96 dBm / 0.0991 W										
99% Occupied Bandwidth		MIMO <Ant. 1> 802.11a : 18.88 MHz 802.11n HT20 : 17.93 MHz 802.11n HT40 : 36.76 MHz 802.11ac VHT80 : 76.48 MHz MIMO <Ant. 2> 802.11a : 17.68 MHz 802.11n HT20 : 17.98 MHz 802.11n HT40 : 36.76 MHz 802.11ac VHT80 : 76.60 MHz										
Antenna Gain / Gain		<Ant. 1> : PIFA Antenna with gain 2.53 dBi <Ant. 2> : PIFA Antenna with gain 2.37 dBi										
Type of Modulation		802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)										
Antenna Function Description		<table><tr><td></td><td>Ant. 1</td><td>Ant. 2</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>			Ant. 1	Ant. 2	802.11 a/n/ac	V	V	802.11 a/n/ac MIMO	V	V
	Ant. 1	Ant. 2										
802.11 a/n/ac	V	V										
802.11 a/n/ac MIMO	V	V										

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

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.
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

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

Test Site	SPORTON INTERNATIONAL INC.
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.
	03CH12-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. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

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: 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 EUT with cradle and three orthogonal panels (X, Y, Z) without cradle. The worst cases (EUT with cradle) were recorded in this report.

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.

Single Mode (Covered by MIMO Mode)

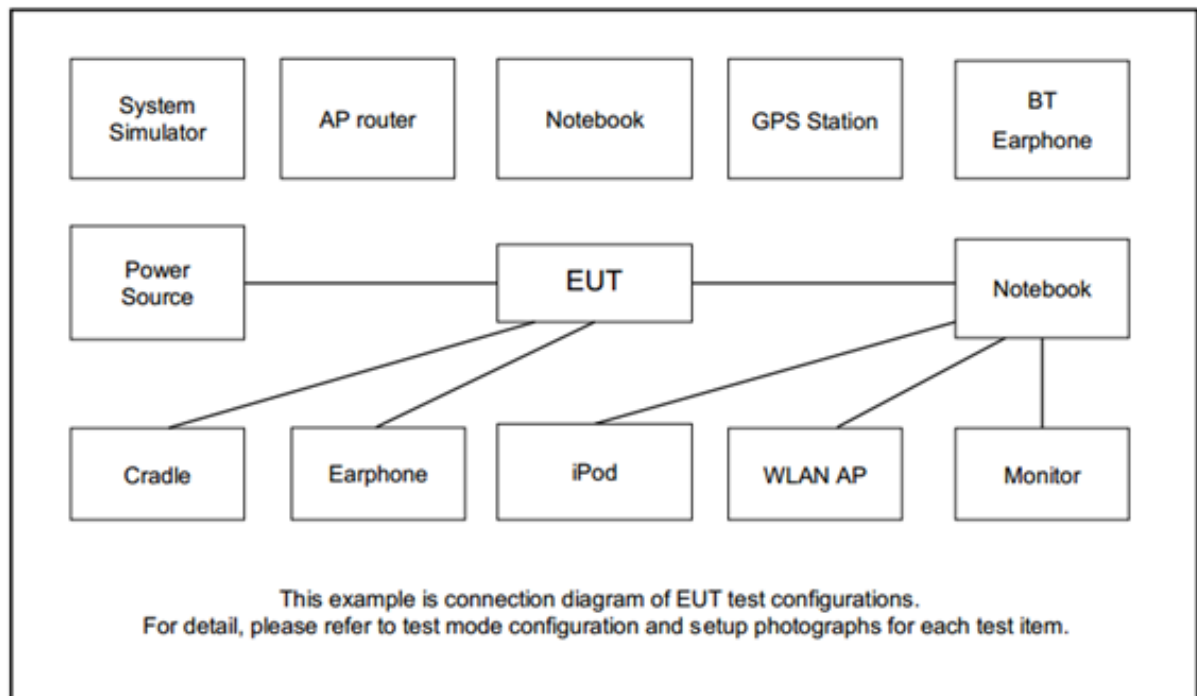
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

MIMO Mode

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

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

2.3 Connection Diagram of Test System



2.4 EUT Operation Test Setup

The RF test items, utility “QRCT” 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.

2.5 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

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

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

3 Test Result

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

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

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

26dB and 99% Occupied bandwidth are reporting only.

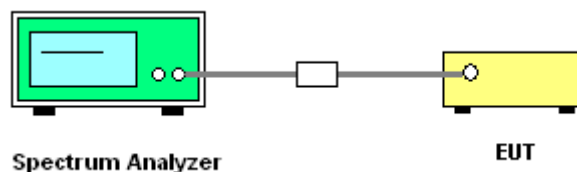
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

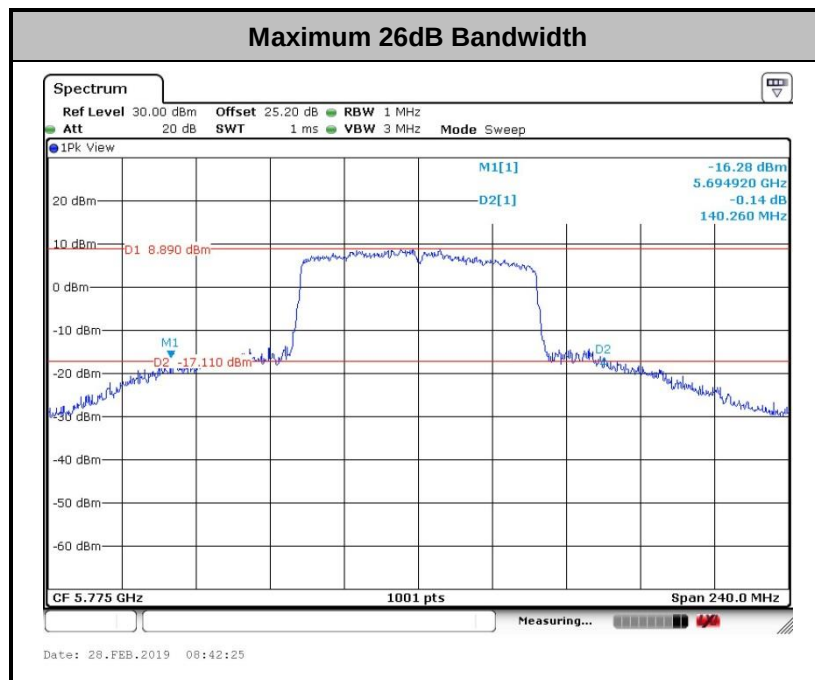
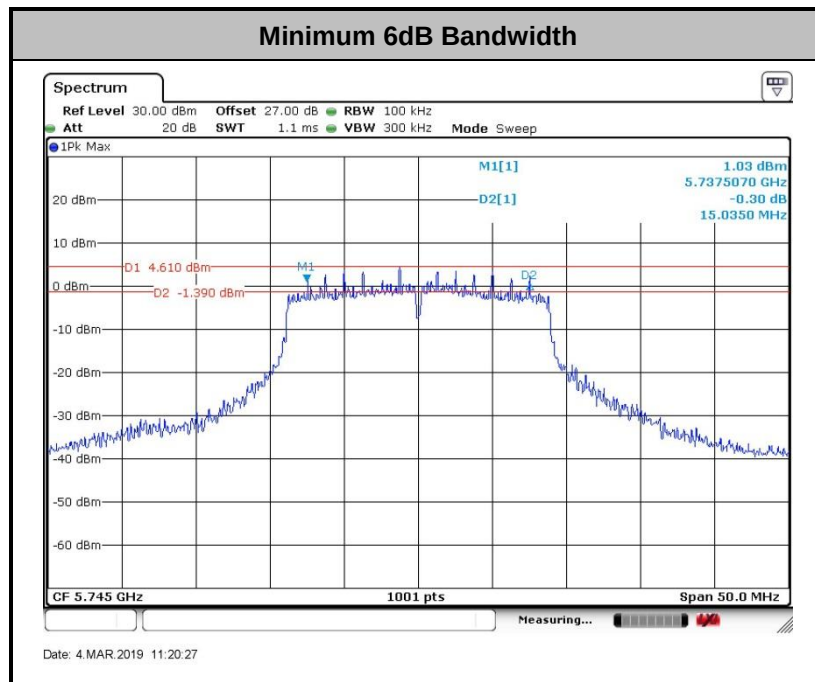
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is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

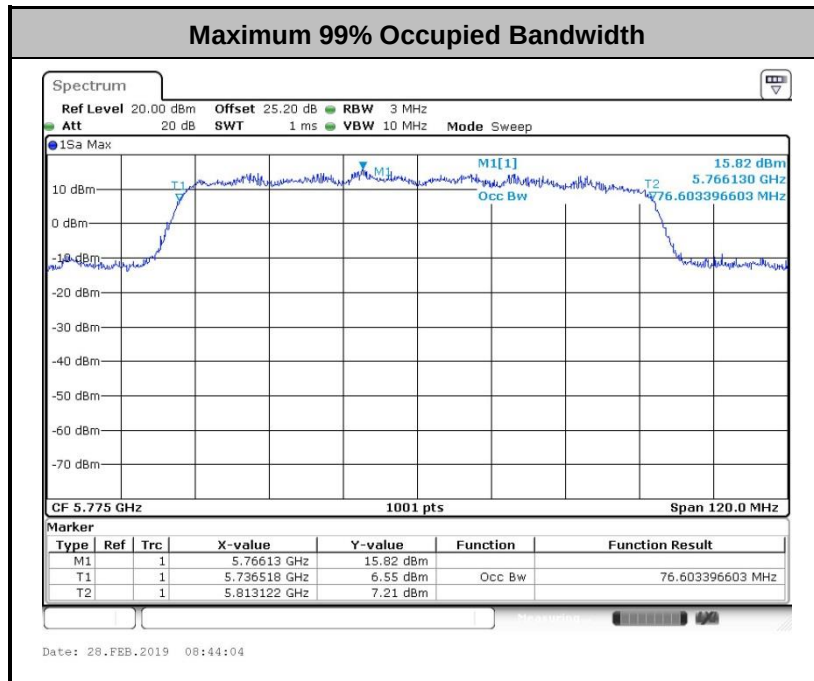
3.1.4 Test Setup



3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.





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

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

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

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

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

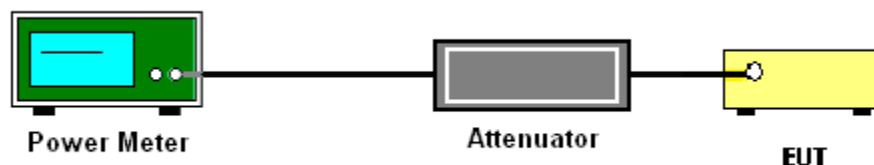
3.2.3 Test Procedures

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

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, $10 \log(1/x)$, where x is the duty cycle.

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-2

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

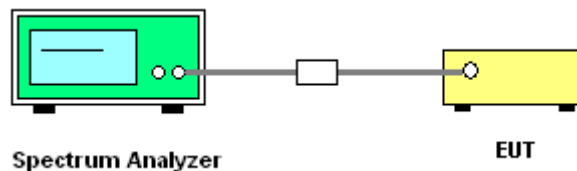
- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz.
- Set VBW $\geq$ 1 MHz.
- Number of points in sweep $\geq$ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add $10 \log(500\text{kHz}/\text{RBW})$ to the test result.
- Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (c): Measure and add $10 \log(N_{\text{ANT}})$ dB.

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

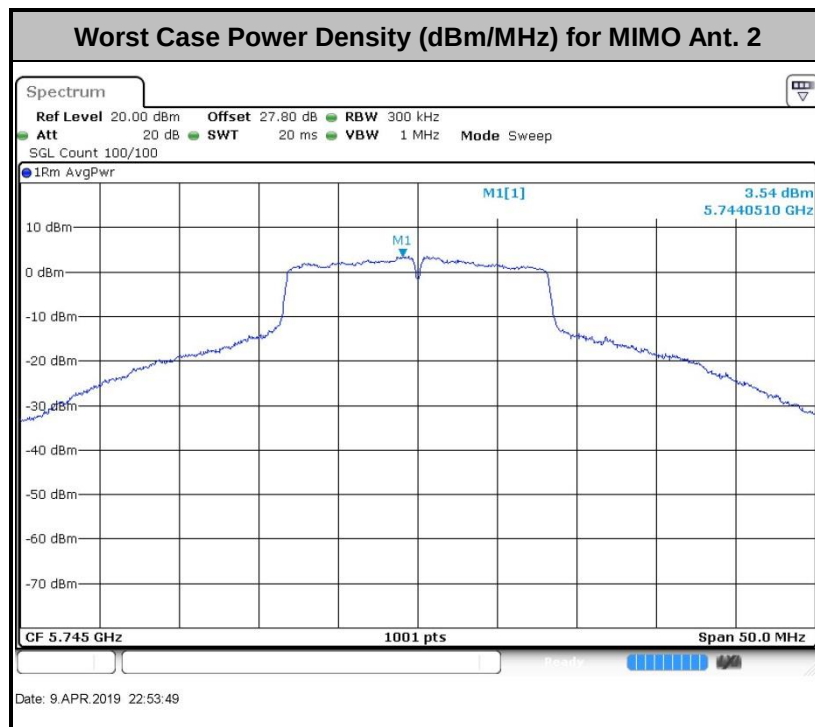
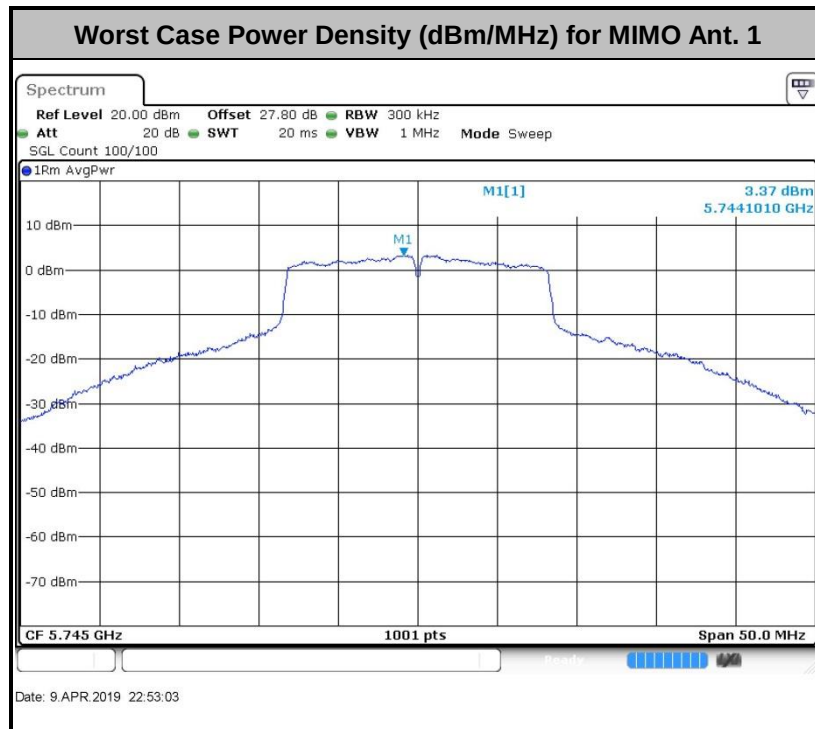
3.3.4 Test Setup





3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



3.4 Unwanted Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

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

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

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

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

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

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

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

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

- (i) Section 15.407(b)(1) to (b)(3) specify the unwanted emission limits 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.³
- (ii) Section 15.407(b)(4) specifies the unwanted emission limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are in terms of a Peak detector. An alternative to the band emissions mask is specified in Section 15.407(b)(4)(ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the devices using the alternative limit.⁴

Note 3: An out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz peak emission limit.

Note 4: Only devices with antenna gains of 10 dBi or less may be approved using the emission limits specified in Section 15.247(d) till March 2, 2018; all other devices operating in this band must use the mask specified in Section 15.407(b)(4)(i).

3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

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

Section G) Unwanted emissions measurement.

(1) Procedure for Unwanted Emissions Measurements Below 1000MHz

- RBW = 120 kHz
- VBW = 300 kHz
- Detector = Peak
- Trace mode = max hold

(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

- RBW = 1 MHz
- VBW $\geq$ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

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

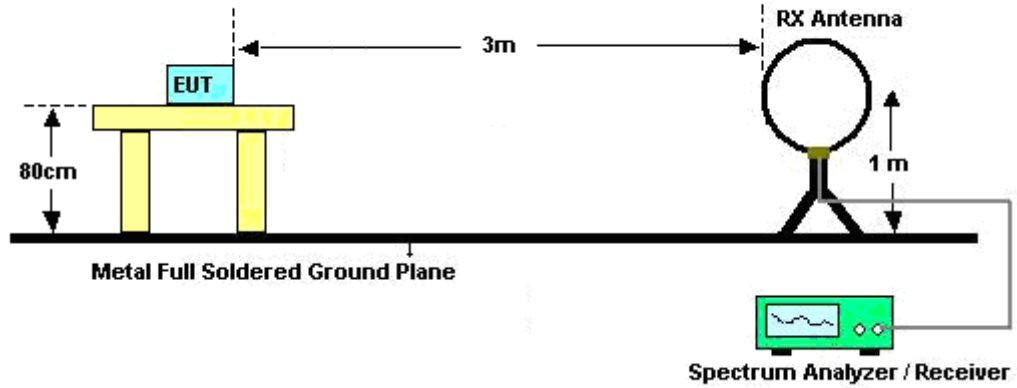
- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.



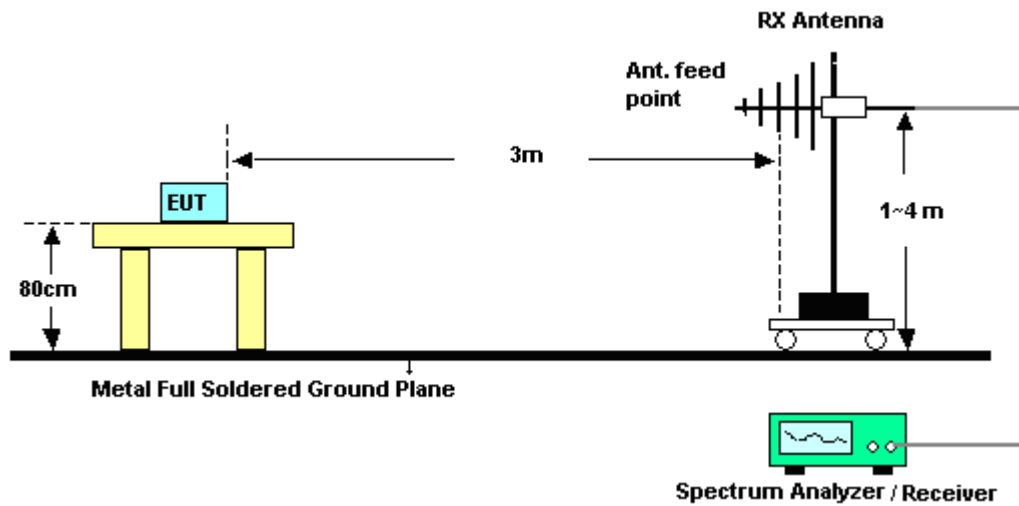
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

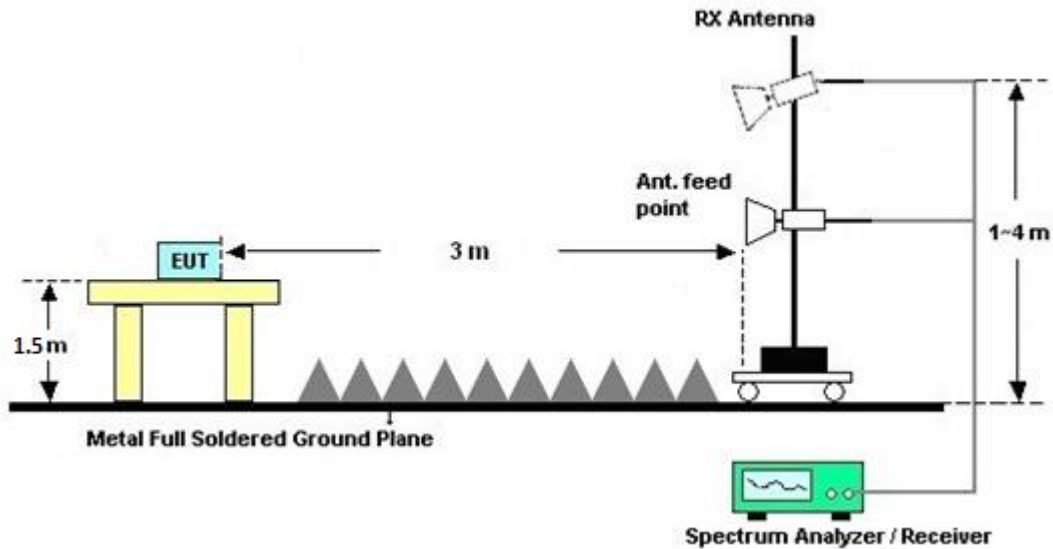
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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 B and C.

3.4.7 Duty Cycle

Please refer to Appendix D.

3.4.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B and C.

3.5 Automatically Discontinue Transmission

3.5.1 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.

3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Result of Automatically Discontinue Transmission

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

3.6 Antenna Requirements

3.6.1 Standard Applicable

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

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

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

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

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

For power measurements on IEEE 802.11 devices,

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

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

The EUT supports CDD mode.

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

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

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

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

<CDD Modes>						
			DG	DG	Power	PSD
			for	for	Limit	Limit
	Ant. 1	Ant. 2	Power	PSD	Reduction	Reduction
	(dBi)	(dBi)	(dBi)	(dBi)	(dB)	(dB)
Band IV	2.53	2.37	2.53	5.46	0.00	0.00

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

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



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Sensor	DARE	RadiPower	15I00041SNO09	10MHz~6GHz	May 07, 2018	Jan. 28, 2019~ Apr. 09, 2019	May 06, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV 30	100895	9kHz~30GHz	Apr. 20, 2018	Jan. 28, 2019~ Apr. 09, 2019	Apr. 19, 2019	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC1300484	N/A	Apr. 17, 2018	Jan. 28, 2019~ Apr. 09, 2019	Apr. 16, 2019	Conducted (TH05-HY)
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz~30 MHz	Jan. 07, 2019	Apr. 01, 2019~ Apr. 04, 2019	Jan. 06, 2020	Radiation (03CH12-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	37059&01	30MHz~1GHz	Oct. 13, 2018	Apr. 01, 2019~ Apr. 04, 2019	Oct. 12, 2019	Radiation (03CH12-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1328	1GHz ~ 18GHz	Oct. 19, 2018	Apr. 01, 2019~ Apr. 04, 2019	Oct. 18, 2019	Radiation (03CH12-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170576	18GHz ~ 40GHz	May 08, 2018	Apr. 01, 2019~ Apr. 04, 2019	May 07, 2019	Radiation (03CH12-HY)
Preamplifier	COM-POWER	PA-103	161075	10MHz~1GHz	Mar. 25, 2019	Apr. 01, 2019~ Apr. 04, 2019	Mar. 24, 2020	Radiation (03CH12-HY)
Preamplifier	Agilent	8449B	3008A02375	1GHz~26.5GHz	May 28, 2018	Apr. 01, 2019~ Apr. 04, 2019	May 27, 2019	Radiation (03CH12-HY)
Preamplifier	Jet-Power	JPA0118-55-30 3K	171000180005 4002	1GHz~18GHz	Apr. 17, 2018	Apr. 01, 2019~ Apr. 04, 2019	Apr. 16, 2019	Radiation (03CH12-HY)
Preamplifier	MITEQ	TTA1840-35-H G	1864481	18GHz ~ 40GHz	Aug. 24, 2018	Apr. 01, 2019~ Apr. 04, 2019	Aug. 23, 2019	Radiation (03CH12-HY)
Spectrum Analyzer	Keysight	N9010A	MY55370118	10Hz~44GHz	Apr. 17, 2018	Apr. 01, 2019~ Apr. 04, 2019	Apr. 16, 2019	Radiation (03CH12-HY)
Filter	Wainwright	WLKS1200-12 SS	SN2	1.2GHz Low Pass	Mar. 20, 2019	Apr. 01, 2019~ Apr. 04, 2019	Mar. 19, 2020	Radiation (03CH12-HY)
Filter	Woken	WHKX8-5272. 5-6750-18000- 40ST	SN2	6.75G Highpass	Mar. 20, 2019	Apr. 01, 2019~ Apr. 04, 2019	Mar. 19, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0058/126E	30M-18G	Mar. 13, 2019	Apr. 01, 2019~ Apr. 04, 2019	Mar. 12, 2020	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30M~40GHz	Oct. 16, 2018	Apr. 01, 2019~ Apr. 04, 2019	Oct. 15, 2019	Radiation (03CH12-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30M~40GHz	Oct. 16, 2018	Apr. 01, 2019~ Apr. 04, 2019	Oct. 15, 2019	Radiation (03CH12-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Apr. 01, 2019~ Apr. 04, 2019	N/A	Radiation (03CH12-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Apr. 01, 2019~ Apr. 04, 2019	N/A	Radiation (03CH12-HY)
Software	Audix	E3 6.2009-8-24	RK-000989	N/A	N/A	Apr. 01, 2019~ Apr. 04, 2019	N/A	Radiation (03CH12-HY)

5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	5.1
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Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.7
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Shiming Liu / Allen Lin/Howard Lin	Temperature:	21~25	°C
Test Date:	2019/1/28~2019/4/9	Relative Humidity:	51~54	%

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

Band IV												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	149	5745	18.88	17.68	32.87	31.42	15.09	15.29	0.5	Pass
11a	6Mbps	2	157	5785	16.88	16.68	25.72	24.98	15.14	15.44	0.5	Pass
11a	6Mbps	2	165	5825	16.83	16.68	25.82	25.08	15.29	15.29	0.5	Pass
VHT20	MCS0	2	149	5745	17.93	17.98	25.38	26.17	15.14	15.04	0.5	Pass
VHT20	MCS0	2	157	5785	17.88	17.83	25.67	23.98	16.93	15.68	0.5	Pass
VHT20	MCS0	2	165	5825	17.88	17.88	25.28	24.48	16.08	15.44	0.5	Pass
VHT40	MCS0	2	151	5755	36.76	36.56	49.87	42.35	35.43	35.07	0.5	Pass
VHT40	MCS0	2	159	5795	36.56	36.76	42.01	42.17	35.25	35.43	0.5	Pass
VHT80	MCS0	2	155	5775	76.48	76.60	136.88	140.26	75.12	75.12	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV												
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	17.70	17.80	20.76	30.00		2.53		Pass
11a	6Mbps	2	157	5785	17.60	17.70	20.66	30.00		2.53		Pass
11a	6Mbps	2	165	5825	17.60	17.80	20.71	30.00		2.53		Pass
HT20	MCS0	2	149	5745	17.20	17.10	20.16	30.00		2.53		Pass
HT20	MCS0	2	157	5785	17.10	17.40	20.26	30.00		2.53		Pass
HT20	MCS0	2	165	5825	17.30	16.90	20.11	30.00		2.53		Pass
HT40	MCS0	2	151	5755	16.50	16.30	19.41	30.00		2.53		Pass
HT40	MCS0	2	159	5795	16.50	16.40	19.46	30.00		2.53		Pass
VHT20	MCS0	2	149	5745	17.40	17.50	20.46	30.00		2.53		Pass
VHT20	MCS0	2	157	5785	17.30	17.30	20.31	30.00		2.53		Pass
VHT20	MCS0	2	165	5825	17.30	17.20	20.26	30.00		2.53		Pass
VHT40	MCS0	2	151	5755	16.70	16.70	19.71	30.00		2.53		Pass
VHT40	MCS0	2	159	5795	16.60	16.70	19.66	30.00		2.53		Pass
VHT80	MCS0	2	155	5775	16.90	17.00	19.96	30.00		2.53		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	0.16	0.18	2.22	5.75	5.94	8.95	30.00		5.46		Pass	
11a	6Mbps	2	157	5785	0.16	0.18	2.22	5.35	5.37	8.38	30.00		5.46		Pass	
11a	6Mbps	2	165	5825	0.16	0.18	2.22	5.17	5.24	8.25	30.00		5.46		Pass	
VHT20	MCS0	2	149	5745	0.18	0.20	2.22	4.40	4.32	7.41	30.00		5.46		Pass	
VHT20	MCS0	2	157	5785	0.18	0.20	2.22	4.97	4.89	7.98	30.00		5.46		Pass	
VHT20	MCS0	2	165	5825	0.18	0.20	2.22	4.82	4.63	7.83	30.00		5.46		Pass	
VHT40	MCS0	2	151	5755	0.35	0.33	2.22	0.85	0.84	3.86	30.00		5.46		Pass	
VHT40	MCS0	2	159	5795	0.35	0.33	2.22	0.98	1.15	4.16	30.00		5.46		Pass	
VHT80	MCS0	2	155	5775	0.67	0.67	2.22	-2.52	-2.80	0.49	30.00		5.46		Pass	

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



Appendix B. Radiated Spurious Emission

Test Engineer :	Jack Cheng, Lance Chiang, and Chuan Chu	Temperature :	22~24°C
		Relative Humidity :	52~60%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5644.6	50.13	-18.07	68.2	41.42	31.71	10.45	33.45	206	11	P	H
		5700	67.01	-38.19	105.2	57.98	32	10.49	33.46	206	11	P	H
		5720	76.81	-33.99	110.8	67.73	32.04	10.5	33.46	206	11	P	H
		5724.4	82.8	-38.03	120.83	73.71	32.05	10.5	33.46	206	11	P	H
	*	5745	114.27	-	-	105.13	32.09	10.51	33.46	206	11	P	H
	*	5745	106.39	-	-	97.25	32.09	10.51	33.46	206	11	A	H
													H
													H
		5643.8	51.1	-17.1	68.2	42.39	31.71	10.45	33.45	395	239	P	V
		5700	67.81	-37.39	105.2	58.78	32	10.49	33.46	395	239	P	V
		5717	76.83	-33.13	109.96	67.77	32.03	10.49	33.46	395	239	P	V
		5724	82.4	-37.52	119.92	73.31	32.05	10.5	33.46	395	239	P	V
	*	5745	115.54	-	-	106.4	32.09	10.51	33.46	395	239	P	V
	*	5745	107.49	-	-	98.35	32.09	10.51	33.46	395	239	A	V
													V
													V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5636.2	51.1	-17.1	68.2	42.37	31.73	10.45	33.45	148	12	P	H
		5690.8	50.74	-47.68	98.42	41.78	31.94	10.48	33.46	148	12	P	H
		5718	52.36	-57.88	110.24	43.29	32.04	10.49	33.46	148	12	P	H
		5723.2	54.83	-63.27	118.1	45.74	32.05	10.5	33.46	148	12	P	H
	*	5785	112	-	-	102.77	32.17	10.53	33.47	148	12	P	H
	*	5785	105.14	-	-	95.91	32.17	10.53	33.47	148	12	A	H
		5853.2	54.5	-60.4	114.9	45.08	32.31	10.59	33.48	148	12	P	H
		5859.2	52.7	-56.92	109.62	43.27	32.32	10.59	33.48	148	12	P	H
		5879	50.84	-51.39	102.23	41.35	32.36	10.61	33.48	148	12	P	H
		5948.6	50.44	-17.76	68.2	40.67	32.59	10.67	33.49	148	12	P	H
													H
													H
		5607.6	49.71	-18.49	68.2	40.95	31.78	10.43	33.45	394	247	P	V
		5688.8	50.32	-46.62	96.94	41.37	31.93	10.48	33.46	394	247	P	V
		5719.6	54.23	-56.46	110.69	45.15	32.04	10.5	33.46	394	247	P	V
		5724.6	54.88	-66.41	121.29	45.79	32.05	10.5	33.46	394	247	P	V
	*	5785	114.35	-	-	105.12	32.17	10.53	33.47	394	247	P	V
	*	5785	107.04	-	-	97.81	32.17	10.53	33.47	394	247	A	V
		5850.8	52.51	-67.87	120.38	43.1	32.3	10.59	33.48	394	247	P	V
		5856	52.73	-57.79	110.52	43.31	32.31	10.59	33.48	394	247	P	V
		5878.8	52	-50.38	102.38	42.51	32.36	10.61	33.48	394	247	P	V
		5949.2	50.94	-17.26	68.2	41.16	32.6	10.67	33.49	394	247	P	V
													V
													V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz	*	5825	112.25	-	-	102.92	32.25	10.56	33.48	160	11	P	H
	*	5825	104.98	-	-	95.65	32.25	10.56	33.48	160	11	A	H
		5851.4	66.61	-52.4	119.01	57.2	32.3	10.59	33.48	160	11	P	H
		5855.8	64.86	-45.72	110.58	55.44	32.31	10.59	33.48	160	11	P	H
		5885	56.25	-41.52	97.77	46.74	32.37	10.62	33.48	160	11	P	H
		5948.6	51.55	-16.65	68.2	41.78	32.59	10.67	33.49	160	11	P	H
													H
													H
	*	5825	114.63	-	-	105.3	32.25	10.56	33.48	388	246	P	V
	*	5825	106.6	-	-	97.27	32.25	10.56	33.48	388	246	A	V
		5850.4	67.52	-53.77	121.29	58.11	32.3	10.59	33.48	388	246	P	V
		5855.4	65.07	-45.62	110.69	55.65	32.31	10.59	33.48	388	246	P	V
		5880.2	56.38	-44.96	101.34	46.89	32.36	10.61	33.48	388	246	P	V
		5938.8	50.19	-18.01	68.2	40.46	32.56	10.66	33.49	388	246	P	V
													V
													V
													V
Remark 1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	62.87	-11.13	74	68.28	39.78	16.21	61.4	214	43	P	H
		11490	51.25	-2.75	54	56.66	39.78	16.21	61.4	214	43	A	H
		17235	53.3	-14.9	68.2	49.19	40.7	20.92	57.51	100	0	P	H
													H
		11490	56.92	-17.08	74	62.33	39.78	16.21	61.4	200	36	P	V
		11490	48.3	-5.7	54	53.71	39.78	16.21	61.4	200	36	A	V
		17235	48.76	-19.44	68.2	44.65	40.7	20.92	57.51	100	0	P	V
													V
802.11a CH 157 5785MHz		11570	60.4	-13.6	74	65.94	39.66	16.3	61.5	234	54	P	H
		11570	47.7	-6.3	54	53.24	39.66	16.3	61.5	234	54	A	H
		17355	50.37	-17.83	68.2	45.08	41.4	21	57.11	100	0	P	H
													H
		11570	59.87	-14.13	74	65.41	39.66	16.3	61.5	191	34	P	V
		11570	46.75	-7.25	54	52.29	39.66	16.3	61.5	191	34	A	V
		17355	48.99	-19.21	68.2	43.7	41.4	21	57.11	100	0	P	V
													V
802.11a CH 165 5825MHz		11650	55.6	-18.4	74	61.46	39.35	16.38	61.59	193	20	P	H
		11650	49.53	-4.47	54	55.39	39.35	16.38	61.59	193	20	A	H
		17475	50.02	-18.18	68.2	43.47	42.17	21.09	56.71	100	0	P	H
													H
		11650	57.46	-16.54	74	63.32	39.35	16.38	61.59	208	32	P	V
		11650	46.89	-7.11	54	52.75	39.35	16.38	61.59	208	32	A	V
		17475	48.32	-19.88	68.2	41.77	42.17	21.09	56.71	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 802.11ac VHT20 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT20 CH 149 5745MHz		5629.4	49.72	-18.48	68.2	40.98	31.74	10.45	33.45	192	350	P	H
		5682.8	55.25	-37.26	92.51	46.33	31.9	10.48	33.46	192	350	P	H
		5719.8	62.12	-48.62	110.74	53.04	32.04	10.5	33.46	192	350	P	H
		5724	71.26	-48.66	119.92	62.17	32.05	10.5	33.46	192	350	P	H
	*	5745	110.64	-	-	101.5	32.09	10.51	33.46	192	350	P	H
	*	5745	102.6	-	-	93.46	32.09	10.51	33.46	192	350	A	H
													H
													H
		5606.8	50.25	-17.95	68.2	41.47	31.79	10.43	33.44	400	248	P	V
		5693.2	58.26	-41.93	100.19	49.28	31.96	10.48	33.46	400	248	P	V
		5720	70.67	-40.13	110.8	61.59	32.04	10.5	33.46	400	248	P	V
		5724.6	74.38	-46.91	121.29	65.29	32.05	10.5	33.46	400	248	P	V
	*	5745	114.36	-	-	105.22	32.09	10.51	33.46	400	248	P	V
	*	5745	106.02	-	-	96.88	32.09	10.51	33.46	400	248	A	V
													V
													V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT20 CH 157 5785MHz		5610.6	49.16	-19.04	68.2	40.39	31.78	10.44	33.45	104	18	P	H
		5653.4	51.1	-19.63	70.73	42.37	31.72	10.46	33.45	104	18	P	H
		5715.4	56.92	-52.59	109.51	47.86	32.03	10.49	33.46	104	18	P	H
		5724.2	50.96	-69.42	120.38	41.87	32.05	10.5	33.46	104	18	P	H
	*	5785	112.76	-	-	103.53	32.17	10.53	33.47	104	18	P	H
	*	5785	104.5	-	-	95.27	32.17	10.53	33.47	104	18	A	H
		5853.8	52.67	-60.87	113.54	43.25	32.31	10.59	33.48	104	18	P	H
		5866.4	54.69	-52.92	107.61	45.24	32.33	10.6	33.48	104	18	P	H
		5891.8	51.18	-41.55	92.73	41.66	32.38	10.62	33.48	104	18	P	H
		5950	49.48	-18.72	68.2	39.69	32.6	10.68	33.49	104	18	P	H
													H
													H
		5605.4	48.24	-19.96	68.2	39.46	31.79	10.43	33.44	395	237	P	V
		5684.8	50.75	-43.24	93.99	41.82	31.91	10.48	33.46	395	237	P	V
		5703.6	55.88	-50.33	106.21	46.84	32.01	10.49	33.46	395	237	P	V
		5723	54.66	-62.98	117.64	45.57	32.05	10.5	33.46	395	237	P	V
	*	5785	113.35	-	-	104.12	32.17	10.53	33.47	395	237	P	V
	*	5785	105.67	-	-	96.44	32.17	10.53	33.47	395	237	A	V
		5853.8	52.34	-61.2	113.54	42.92	32.31	10.59	33.48	395	237	P	V
		5866.4	52.78	-54.83	107.61	43.33	32.33	10.6	33.48	395	237	P	V
		5924.4	51.23	-17.41	68.64	41.57	32.5	10.65	33.49	395	237	P	V
		5944.4	50.18	-18.02	68.2	40.42	32.58	10.67	33.49	395	237	P	V
													V
													V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT20 CH 165 5825MHz	*	5825	111.6	-	-	102.27	32.25	10.56	33.48	150	3	P	H
	*	5825	104.15	-	-	94.82	32.25	10.56	33.48	150	3	A	H
		5850	64.39	-57.81	122.2	54.98	32.3	10.59	33.48	150	3	P	H
		5859	65.41	-44.27	109.68	55.98	32.32	10.59	33.48	150	3	P	H
		5882.2	55.65	-44.2	99.85	46.16	32.36	10.61	33.48	150	3	P	H
		5935.8	50.14	-18.06	68.2	40.43	32.54	10.66	33.49	150	3	P	H
													H
													H
	*	5825	113.66	-	-	104.33	32.25	10.56	33.48	390	249	P	V
	*	5825	105.67	-	-	96.34	32.25	10.56	33.48	390	249	A	V
		5850.2	63.78	-57.96	121.74	54.37	32.3	10.59	33.48	390	249	P	V
		5857.4	65.97	-44.16	110.13	56.55	32.31	10.59	33.48	390	249	P	V
		5881.4	55.89	-44.56	100.45	46.4	32.36	10.61	33.48	390	249	P	V
		5931.4	51.37	-16.83	68.2	41.67	32.53	10.66	33.49	390	249	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT20 CH 149 5745MHz		11490	57.59	-16.41	74	63	39.78	16.21	61.4	209	47	P	H
		11490	50.68	-3.32	54	56.09	39.78	16.21	61.4	209	47	A	H
		17235	49.83	-18.37	68.2	45.72	40.7	20.92	57.51	100	0	P	H
													H
		11490	55.35	-18.65	74	60.76	39.78	16.21	61.4	200	34	P	V
		11490	48.36	-5.64	54	53.77	39.78	16.21	61.4	200	34	A	V
		17235	47.8	-20.4	68.2	43.69	40.7	20.92	57.51	100	0	P	V
													V
802.11ac VHT20 CH 157 5785MHz		11570	56.75	-17.25	74	62.29	39.66	16.3	61.5	196	32	P	H
		11570	49.9	-4.1	54	55.44	39.66	16.3	61.5	196	32	A	H
		17355	49.6	-18.6	68.2	44.31	41.4	21	57.11	100	0	P	H
													H
		11570	57.43	-16.57	74	62.97	39.66	16.3	61.5	196	32	P	V
		11570	47.84	-6.16	54	53.38	39.66	16.3	61.5	196	32	A	V
		17355	48.12	-20.08	68.2	42.83	41.4	21	57.11	100	0	P	V
													V
802.11ac VHT20 CH 165 5825MHz		11650	58.13	-15.87	74	63.99	39.35	16.38	61.59	204	74	P	H
		11650	50.09	-3.91	54	55.95	39.35	16.38	61.59	204	74	A	H
		17475	48.97	-19.23	68.2	42.42	42.17	21.09	56.71	100	0	P	H
													H
		11650	59.05	-14.95	74	64.91	39.35	16.38	61.59	206	35	P	V
		11650	47.22	-6.78	54	53.08	39.35	16.38	61.59	206	35	A	V
		17475	48.31	-19.89	68.2	41.76	42.17	21.09	56.71	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 802.11ac VHT40 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT40 CH 151 5755MHz		5648.8	53.33	-14.87	68.2	44.62	31.7	10.46	33.45	122	6	P	H
		5699.4	67.26	-37.5	104.76	58.24	32	10.48	33.46	122	6	P	H
		5713.4	75.13	-33.82	108.95	66.07	32.03	10.49	33.46	122	6	P	H
		5724.6	76.11	-45.18	121.29	67.02	32.05	10.5	33.46	122	6	P	H
	*	5755	108.75	-	-	99.59	32.11	10.52	33.47	122	6	P	H
	*	5755	100.97	-	-	91.81	32.11	10.52	33.47	122	6	A	H
		5854	57.92	-55.16	113.08	48.5	32.31	10.59	33.48	122	6	P	H
		5857.6	54.48	-55.59	110.07	45.05	32.32	10.59	33.48	122	6	P	H
		5886.2	52.65	-44.23	96.88	43.14	32.37	10.62	33.48	122	6	P	H
		5945	50.39	-17.81	68.2	40.63	32.58	10.67	33.49	122	6	P	H
													H
													H
		5647.8	55.3	-12.9	68.2	46.59	31.7	10.46	33.45	400	248	P	V
		5699	69.3	-35.16	104.46	60.29	31.99	10.48	33.46	400	248	P	V
		5719.8	80.09	-30.65	110.74	71.01	32.04	10.5	33.46	400	248	P	V
		5720	79.9	-30.9	110.8	70.82	32.04	10.5	33.46	400	248	P	V
	*	5755	111.55	-	-	102.39	32.11	10.52	33.47	400	248	P	V
	*	5755	103.73	-	-	94.57	32.11	10.52	33.47	400	248	A	V
		5850	55.2	-67	122.2	45.79	32.3	10.59	33.48	400	248	P	V
		5868.4	54.22	-52.83	107.05	44.76	32.34	10.6	33.48	400	248	P	V
		5880.8	54	-46.89	100.89	44.51	32.36	10.61	33.48	400	248	P	V
		5937.6	52.19	-16.01	68.2	42.47	32.55	10.66	33.49	400	248	P	V
													V
													V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT40 CH 159 5795MHz		5642	49.81	-18.39	68.2	41.09	31.72	10.45	33.45	138	5	P	H
		5700	54.65	-50.55	105.2	45.62	32	10.49	33.46	138	5	P	H
		5710.2	58.82	-49.24	108.06	49.77	32.02	10.49	33.46	138	5	P	H
		5720.6	58.16	-54.01	112.17	49.08	32.04	10.5	33.46	138	5	P	H
	*	5785	108.59	-	-	99.36	32.17	10.53	33.47	138	5	P	H
	*	5785	100.84	-	-	91.61	32.17	10.53	33.47	138	5	A	H
		5851.2	61.63	-57.83	119.46	52.22	32.3	10.59	33.48	138	5	P	H
		5855.4	61.84	-48.85	110.69	52.42	32.31	10.59	33.48	138	5	P	H
		5877.4	59.2	-44.22	103.42	49.72	32.35	10.61	33.48	138	5	P	H
		5927.8	50.84	-17.36	68.2	41.16	32.51	10.66	33.49	138	5	P	H
													H
													H
		5640.8	49.23	-18.97	68.2	40.51	31.72	10.45	33.45	400	114	P	V
		5698.6	59.45	-44.72	104.17	50.44	31.99	10.48	33.46	400	114	P	V
		5717.6	61.68	-48.45	110.13	52.61	32.04	10.49	33.46	400	114	P	V
		5723	63.1	-54.54	117.64	54.01	32.05	10.5	33.46	400	114	P	V
	*	5795	110.23	-	-	100.97	32.19	10.54	33.47	400	114	P	V
	*	5795	102.17	-	-	92.91	32.19	10.54	33.47	400	114	A	V
		5851	61.64	-58.28	119.92	52.23	32.3	10.59	33.48	400	114	P	V
		5857.4	59.46	-50.67	110.13	50.04	32.31	10.59	33.48	400	114	P	V
		5877.6	57.84	-45.43	103.27	48.35	32.36	10.61	33.48	400	114	P	V
		5928.4	52.65	-15.55	68.2	42.97	32.51	10.66	33.49	400	114	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ac VHT40 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT40 CH 151 5755MHz		11510	55.08	-18.92	74	60.46	39.78	16.24	61.4	212	44	P	H
		11510	48.46	-5.54	54	53.84	39.78	16.24	61.4	212	44	A	H
		17265	47.11	-21.09	68.2	42.76	40.8	20.94	57.39	100	0	P	H
													H
		11510	49.58	-24.42	74	54.96	39.78	16.24	61.4	100	0	P	V
		17265	47.47	-20.73	68.2	43.12	40.8	20.94	57.39	100	0	P	V
													V
													V
802.11ac VHT40 CH 159 5795MHz		11590	57.62	-16.38	74	63.2	39.62	16.32	61.52	205	70	P	H
		11590	46.66	-7.34	54	52.24	39.62	16.32	61.52	205	70	A	H
		17385	48.99	-19.21	68.2	43.29	41.67	21.03	57	100	0	P	H
													H
		11590	50.59	-23.41	74	56.17	39.62	16.32	61.52	100	0	P	V
		17385	48.29	-19.91	68.2	42.59	41.67	21.03	57	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		5647.2	61.72	-6.48	68.2	53	31.71	10.46	33.45	135	7	P	H
		5691.4	77.6	-21.26	98.86	68.63	31.95	10.48	33.46	135	7	P	H
		5718.8	80.8	-29.66	110.46	71.72	32.04	10.5	33.46	135	7	P	H
		5723.2	81.49	-36.61	118.1	72.4	32.05	10.5	33.46	135	7	P	H
	*	5775	108.11	-	-	98.9	32.15	10.53	33.47	135	7	P	H
	*	5775	99.38	-	-	90.17	32.15	10.53	33.47	135	7	A	H
		5850	78.54	-43.66	122.2	69.13	32.3	10.59	33.48	135	7	P	H
		5869	74.33	-32.55	106.88	64.87	32.34	10.6	33.48	135	7	P	H
		5875	64.03	-41.17	105.2	54.55	32.35	10.61	33.48	135	7	P	H
		5930	58.29	-9.91	68.2	48.6	32.52	10.66	33.49	135	7	P	H
													H
													H
		5648.6	65.05	-3.15	68.2	56.34	31.7	10.46	33.45	395	238	P	V
		5691	78.26	-20.3	98.56	69.29	31.95	10.48	33.46	395	238	P	V
		5718.8	81.67	-28.79	110.46	72.59	32.04	10.5	33.46	395	238	P	V
		5723.8	79.58	-39.88	119.46	70.49	32.05	10.5	33.46	395	238	P	V
	*	5775	108.4	-	-	99.19	32.15	10.53	33.47	395	238	P	V
	*	5775	100.38	-	-	91.17	32.15	10.53	33.47	395	238	A	V
		5851.8	78.22	-39.88	118.1	68.81	32.3	10.59	33.48	395	238	P	V
		5868.8	73.44	-33.49	106.93	63.98	32.34	10.6	33.48	395	238	P	V
		5875	69.21	-35.99	105.2	59.73	32.35	10.61	33.48	395	238	P	V
		5930.2	57.41	-10.79	68.2	47.72	32.52	10.66	33.49	395	238	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

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

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Path Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 155 5775MHz		11550	52.98	-21.02	74	58.47	39.7	16.28	61.47	161	72	P	H
		11550	43.49	-10.51	54	48.98	39.7	16.28	61.47	161	72	A	H
		17325	47.45	-20.75	68.2	42.57	41.12	20.98	57.22	100	0	P	H
													H
		11550	49.86	-24.14	74	55.35	39.7	16.28	61.47	100	0	P	V
		17325	46.72	-21.48	68.2	41.84	41.12	20.98	57.22	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Path	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11a LF		30.27	25.61	-14.39	40	30.52	24.57	0.7	30.18	-	-	P	H
		148.53	18.57	-24.93	43.5	30.22	16.96	1.77	30.38	-	-	P	H
		240.06	26.62	-19.38	46	37.3	17.3	2.27	30.25	-	-	P	H
		500.9	27.78	-18.22	46	30.62	23.83	3.11	29.78	-	-	P	H
		845.3	33.75	-12.25	46	30.18	28.71	4.08	29.22	100	0	P	H
		995.1	37.08	-16.92	54	31.14	30.3	4.5	28.86	-	-	P	H
													H
													H
													H
													H
													H
													H
		30	31.03	-8.97	40	35.94	24.57	0.7	30.18	100	0	P	V
		136.92	25.76	-17.74	43.5	37.27	17.23	1.65	30.39	-	-	P	V
		296.76	25.66	-20.34	46	34.29	19.07	2.45	30.15	-	-	P	V
		500.9	28.9	-17.1	46	31.74	23.83	3.11	29.78	-	-	P	V
		873.3	35.77	-10.23	46	31.75	29.04	4.16	29.18	-	-	P	V
		972	36.3	-17.7	54	29.97	30.8	4.46	28.93	-	-	P	V
													V
													V
												V	
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

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



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

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

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

For Peak Limit @ 2390MHz:

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

For Average Limit @ 2390MHz:

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

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



Appendix C. Radiated Spurious Emission Plots

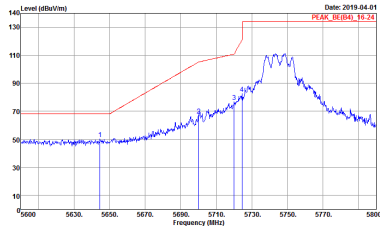
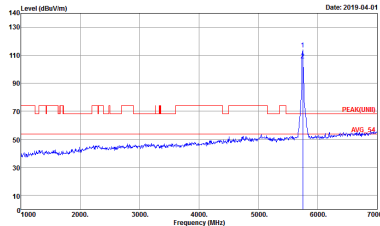
Test Engineer :	Jack Cheng, Lance Chiang, and Chuan Chu	Temperature :	22~24°C
		Relative Humidity :	52~60%

Note symbol

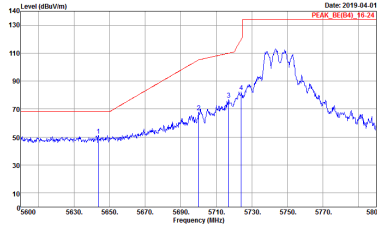
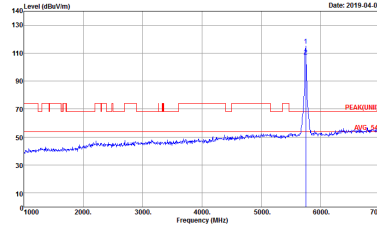
-L	Low channel location
-R	High channel location

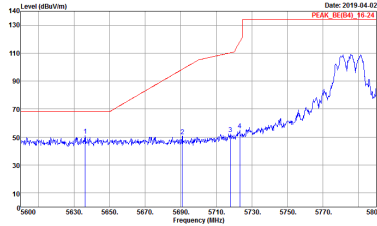
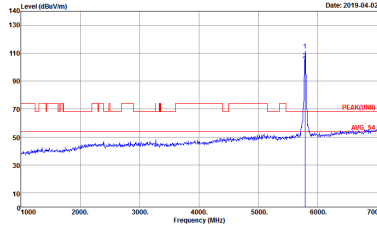
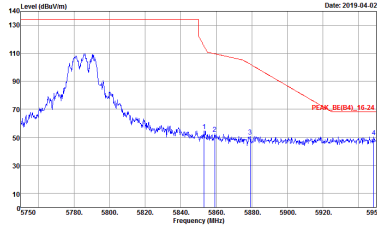


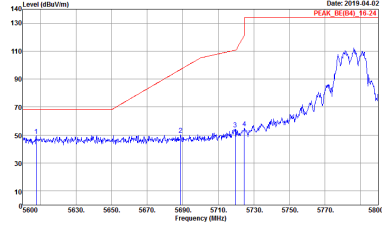
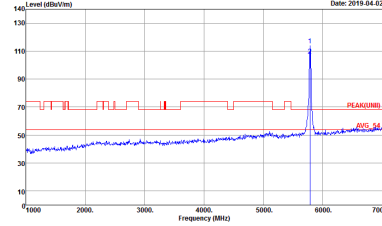
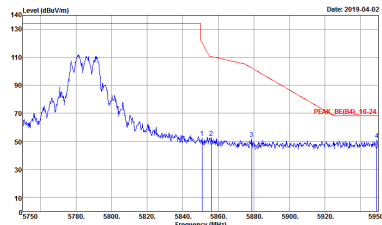
Band 4 - 5725~5850MHz
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HV Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 34 Setting : 19.5	 Site : 03CH12-HV Condition : PEAK(FUND) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 34 Setting : 19.5



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_8E(04)_16-24 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Deflector : Peak Project : 911730-01 Mode : 34 Setting : 19.5	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Deflector : Peak Project : 911730-01 Mode : 34 Setting : 19.5

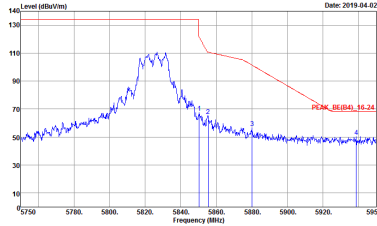
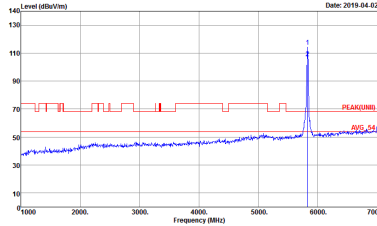
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 35 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 35 Setting : 19
	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 35 Setting : 19	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 35 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 35 Setting : 19
	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 35 Setting : 19	Left blank



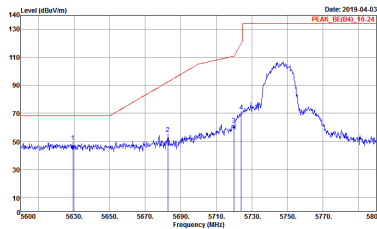
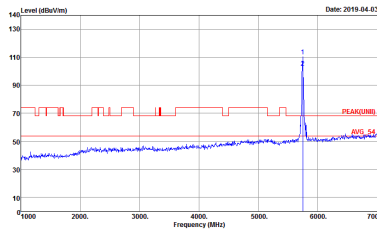
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	Site : 03CH12-HY Condition : PEAK, 8E(B4), 16-24 3m HORN, 9120D, 1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 36 Setting : 19	Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN, 9120D, 1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 36 Setting : 19



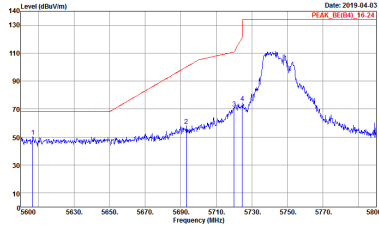
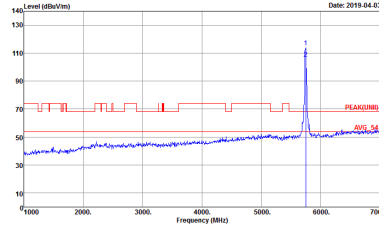
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK, SEC(B4), 16-24 3m HORN, 9120D, 1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 36 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN, 9120D, 1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 36 Setting : 19

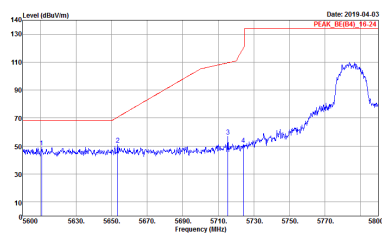
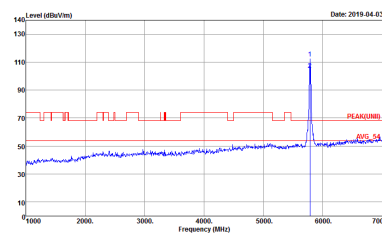
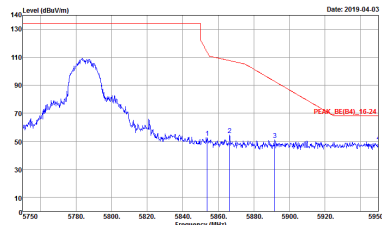


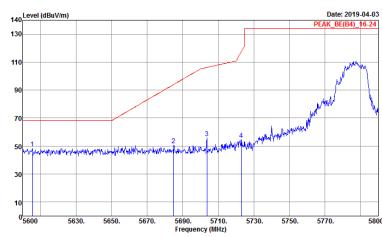
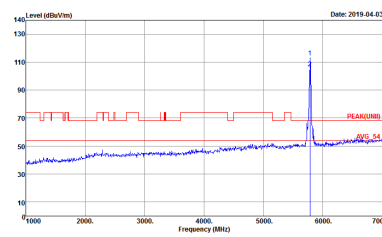
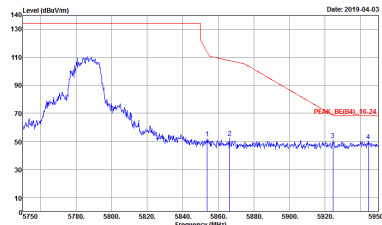
Band 4 5725~5850MHz
WIFI 802.11ac VHT20 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-14Y Condition : PEAK_BE(84)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 37 Setting : 19	 Site : 03CH12-14Y Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 37 Setting : 19

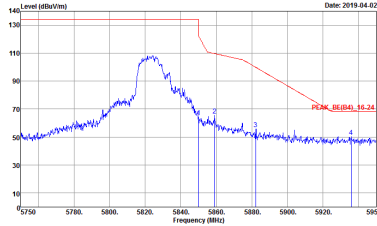
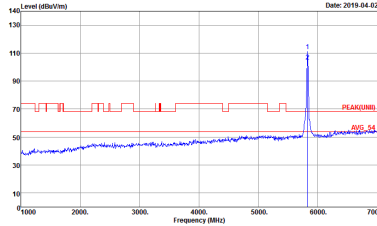


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Vertical	Fundamental
Peak Avg.	 Site : 03CH12-HY Condition : PEAK, SEC(4), 16-24 3m HORN, 91200, 1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 37 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN, 91200, 1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 37 Setting : 19

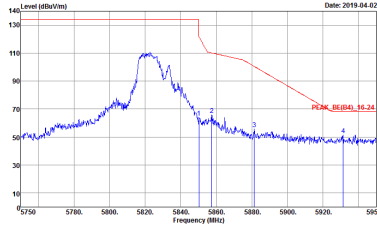
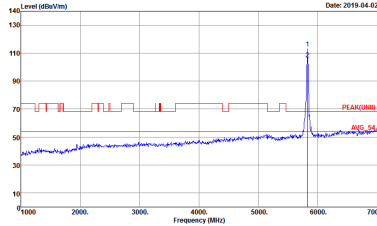
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 38 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 38 Setting : 19
	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 38 Setting : 19	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 38 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 38 Setting : 19
	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 38 Setting : 19	Left blank



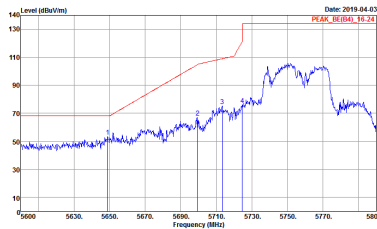
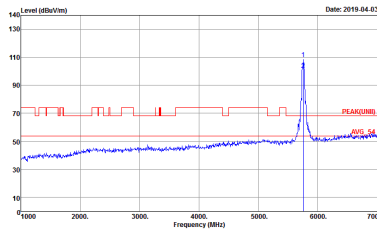
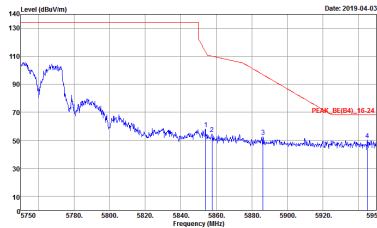
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK, BE(B4)_16-24 3m HORN, 91200, 1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 39 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN, 91200, 1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 39 Setting : 19



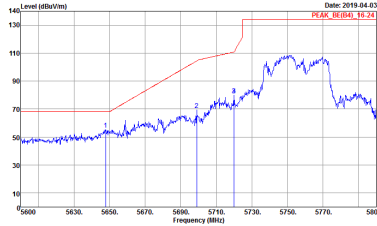
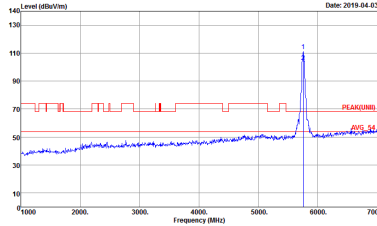
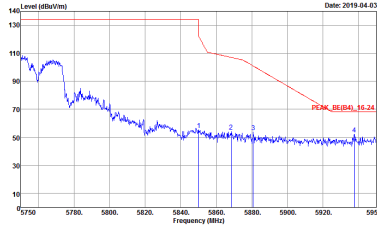
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Vertical	Fundamental
Peak Avg.	 Site : 03CH12-HY Condition : PEAK, SEC(B4)_16-24 3m HORN, 91200_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 39 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN, 91200_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 39 Setting : 19

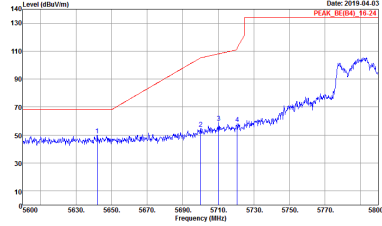
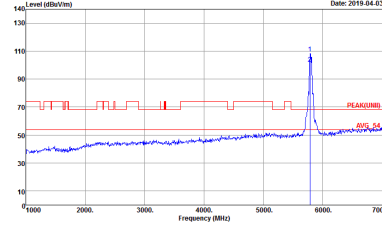
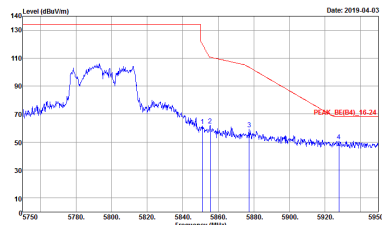


Band 4 5725~5850MHz
WIFI 802.11ac VHT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 40 Setting : 18	 Site : 03CH12-HY Condition : PEAK(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 40 Setting : 18
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 40 Setting : 18	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(04)_16-24 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : Peak Mode : 911730-01 Setting : 40 Setting : 18	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : Peak Mode : 911730-01 Setting : 40 Setting : 18
	 Site : 03CH12-HY Condition : PEAK_BE(04)_16-24 3m HORN_9120D_1328 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : Peak Mode : 911730-01 Setting : 40 Setting : 18	Left blank

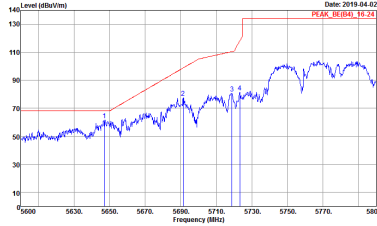
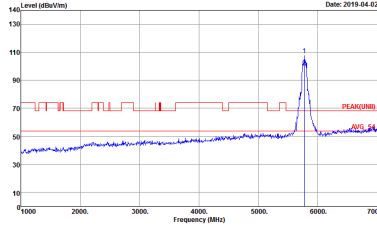
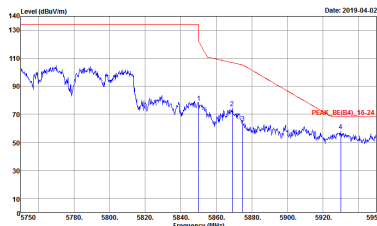
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(04)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 41 Setting : 17.5	 Site : 03CH12-HY Condition : PEAK(04)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 41 Setting : 17.5
	 Site : 03CH12-HY Condition : PEAK_BE(04)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 41 Setting : 17.5	Left blank



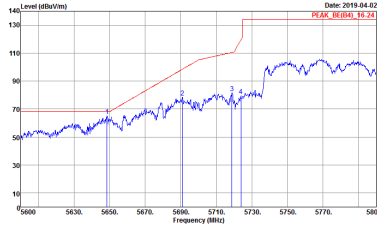
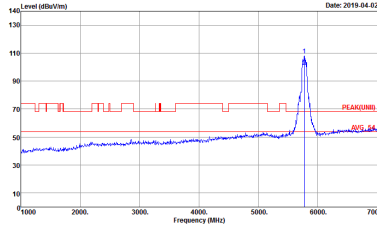
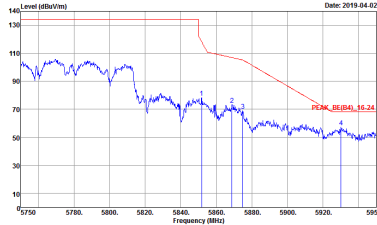
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Vertical	Fundamental
Peak	Site : 03CH12-HY Condition : PEAK_BE(04)_16-24 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 911730-01 Mode : 41 Setting : 17.5	Site : 03CH12-HY Condition : PEAK(04)_16-24 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 911730-01 Mode : 41 Setting : 17.5
	Site : 03CH12-HY Condition : PEAK_BE(04)_16-24 3m HORN_9120D_1328 VERTICAL RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Detector : Peak Project : 911730-01 Mode : 41 Setting : 17.5	Left blank



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

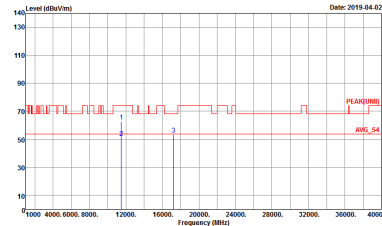
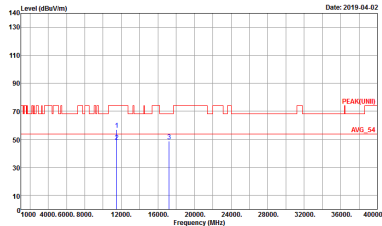
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 911730-01 Setting : 42 Setting : 18	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 911730-01 Setting : 42 Setting : 18
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : Peak Mode : 911730-01 Setting : 42 Setting : 18	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Vertical	Fundamental
Peak	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 42 Setting : 18	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 42 Setting : 18
	 Site : 03CH12-HY Condition : PEAK_BE(B4)_16-24 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 42 Setting : 18	Left blank



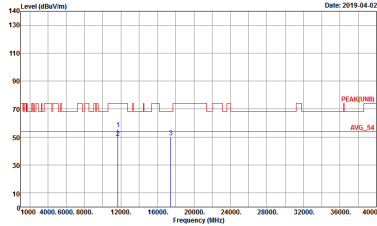
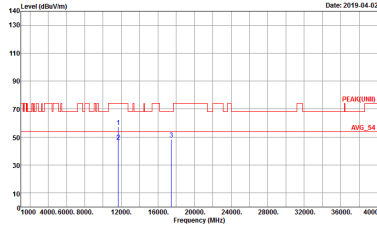
Band 4 - 5725~5850MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 34 Setting : 19.5	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 34 Setting : 19.5



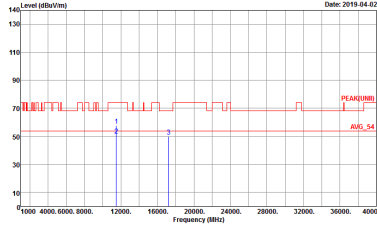
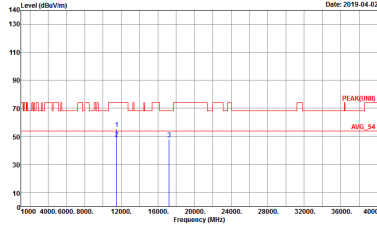
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 35 Setting : 19	Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 35 Setting : 19



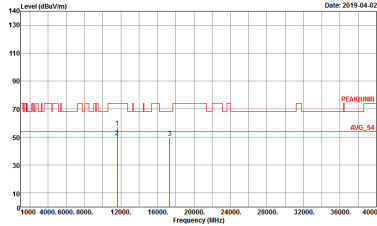
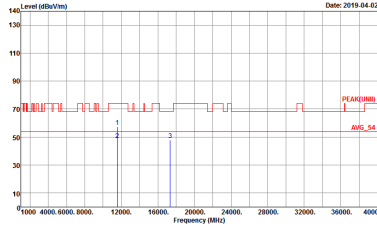
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 36 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 36 Setting : 19



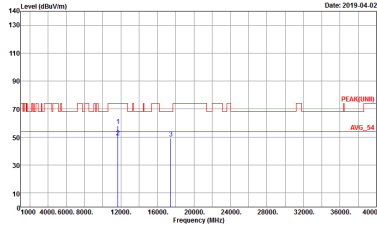
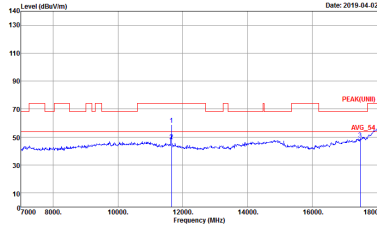
Band 4 5725~5850MHz
WIFI 802.11ac VHT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-4Y Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 37 Setting : 19	 Site : 03CH12-4Y Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 37 Setting : 19



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 38 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 38 Setting : 19



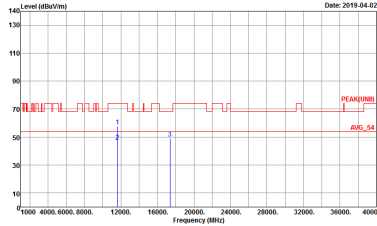
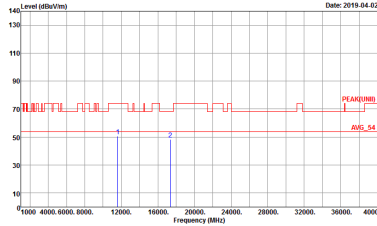
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 39 Setting : 19	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 39 Setting : 19



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

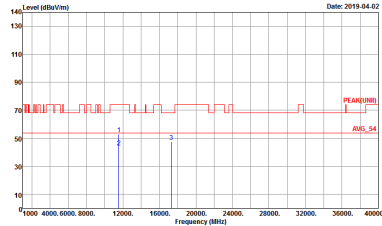
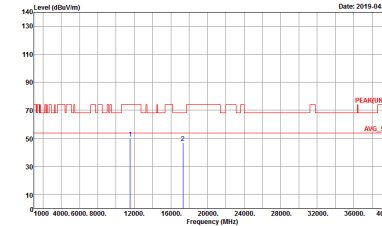
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH151 5755MHz	
1+2	Horizontal	Vertical
Peak Avg.	Site : 03CH12-14Y Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 40 Setting : 18	Site : 03CH12-14Y Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 40 Setting : 18



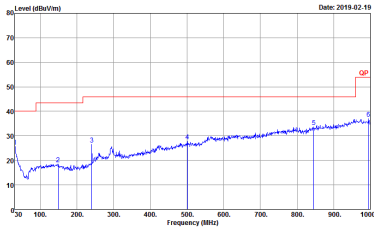
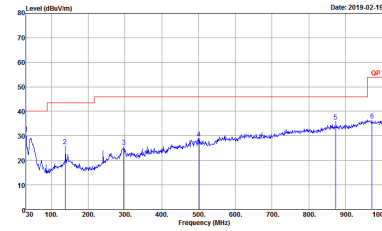
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT40 CH159 5795MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 41 Setting : 17.5	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_9120D_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 41 Setting : 17.5



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

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 42 Setting : 18	 Site : 03CH12-HY Condition : PEAK(UNIT) 3m HORN_91200_1328 VERTICAL Detector : Peak Project : 911730-01 Mode : 42 Setting : 18

Emission below 1GHz
5GHz WIFI 802.11a (LF)

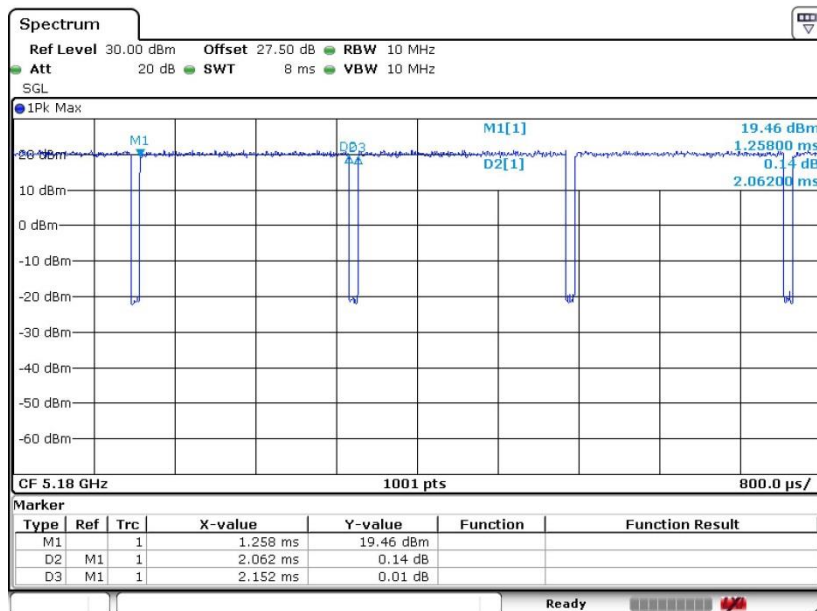
WIFI	5GHz 5725~5850MHz	
ANT	802.11a LF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CH12-HY Condition : QP 3m RIL06_6111D_37059 HORIZONTAL Detector : Peak Project : 911730-01 Mode : 44	 Site : 03CH12-HY Condition : QP 3m RIL06_6111D_37059 VERTICAL Detector : Peak Project : 911730-01 Mode : 44

Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle (%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor (dB)
1	802.11a	95.82	2062.00	0.48	1kHz	0.19
2	802.11a	95.92	2068.00	0.48	1kHz	0.18
1+2	802.11a for Ant. 1	96.28	2072.00	0.48	1kHz	0.16
1+2	802.11a for Ant. 2	95.83	2068.00	0.48	1kHz	0.18
1	5GHz 802.11n HT20	95.93	1932.00	0.52	1kHz	0.18
2	5GHz 802.11n HT20	95.13	1914.00	0.52	1kHz	0.22
1+2	5GHz 802.11n HT20 for Ant. 1	95.54	1928.00	0.52	1kHz	0.20
1+2	5GHz 802.11n HT20 for Ant. 2	95.54	1928.00	0.52	1kHz	0.20
1	5GHz 802.11n HT40	91.12	944.00	1.06	3kHz	0.40
2	5GHz 802.11n HT40	92.19	944.00	1.06	3kHz	0.35
1+2	5GHz 802.11n HT40 for Ant. 1	91.15	948.00	1.05	3kHz	0.40
1+2	5GHz 802.11n HT40 for Ant. 2	91.15	948.00	1.05	3kHz	0.40
1	5GHz 802.11ac VHT20	95.94	1938.00	0.52	1kHz	0.18
2	5GHz 802.11ac VHT20	95.96	1938.00	0.52	1kHz	0.18
1+2	5GHz 802.11ac VHT20 for Ant. 1	95.92	1930.00	0.52	1kHz	0.18
1+2	5GHz 802.11ac VHT20 for Ant. 2	95.54	1930.00	0.52	1kHz	0.20
1	5GHz 802.11ac VHT40	92.25	952.00	1.05	3kHz	0.35
2	5GHz 802.11ac VHT40	92.61	952.00	1.05	3kHz	0.33
1+2	5GHz 802.11ac VHT40 for Ant. 1	92.22	948.00	1.05	3kHz	0.35
1+2	5GHz 802.11ac VHT40 for Ant. 2	92.61	952.00	1.05	3kHz	0.33
1	5GHz 802.11ac VHT80	85.61	464.00	2.16	3kHz	0.67
2	5GHz 802.11ac VHT80	85.93	464.00	2.16	3kHz	0.66
1+2	5GHz 802.11ac VHT80 for Ant. 1	85.61	464.00	2.16	3kHz	0.67
1+2	5GHz 802.11ac VHT80 for Ant. 2	85.61	464.00	2.16	3kHz	0.67

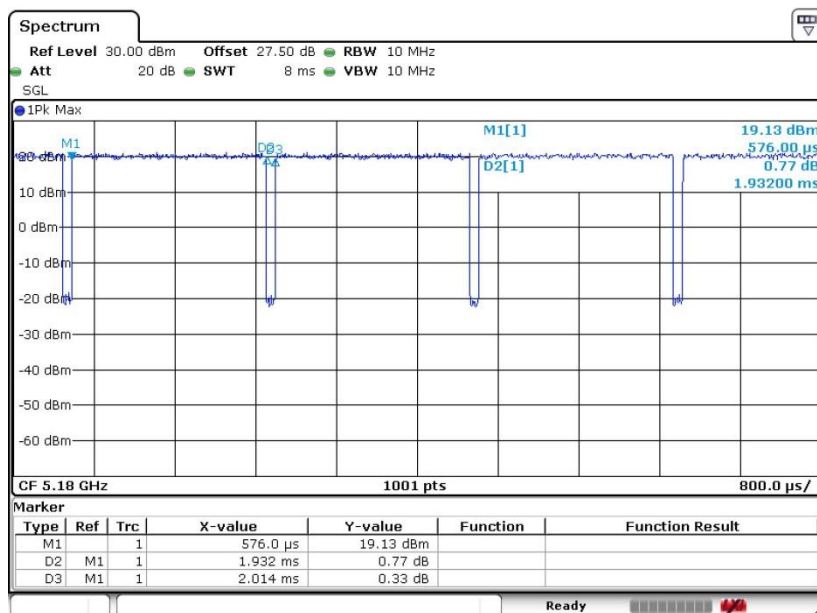
<Ant. 1>

802.11a



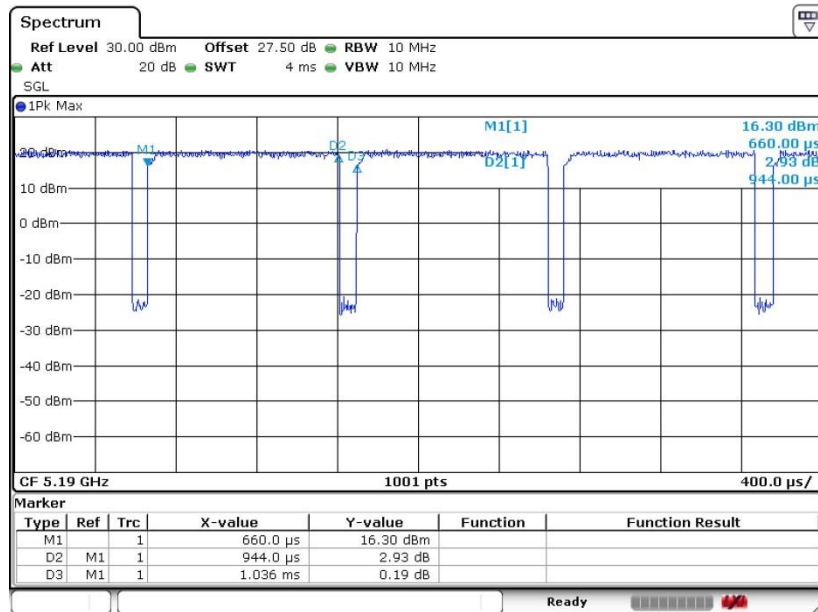
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802.11n HT20



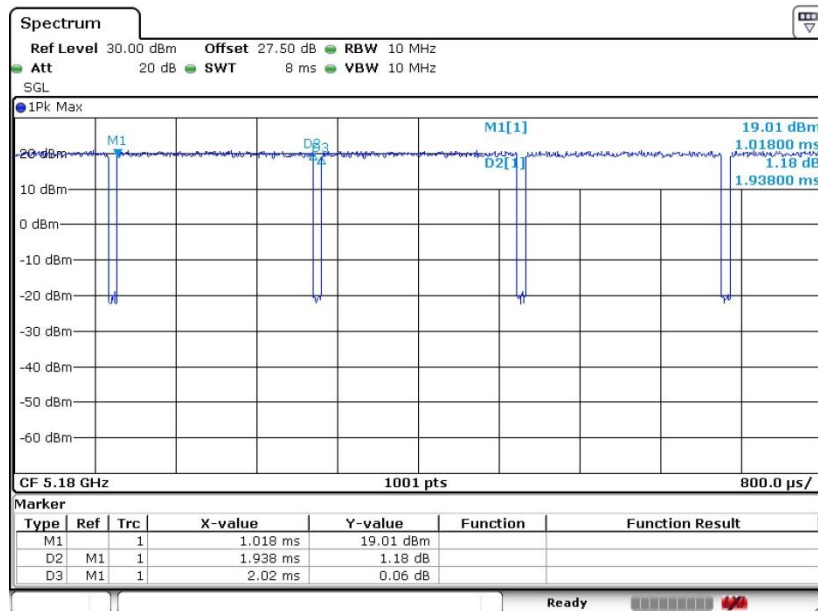
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802.11n HT40



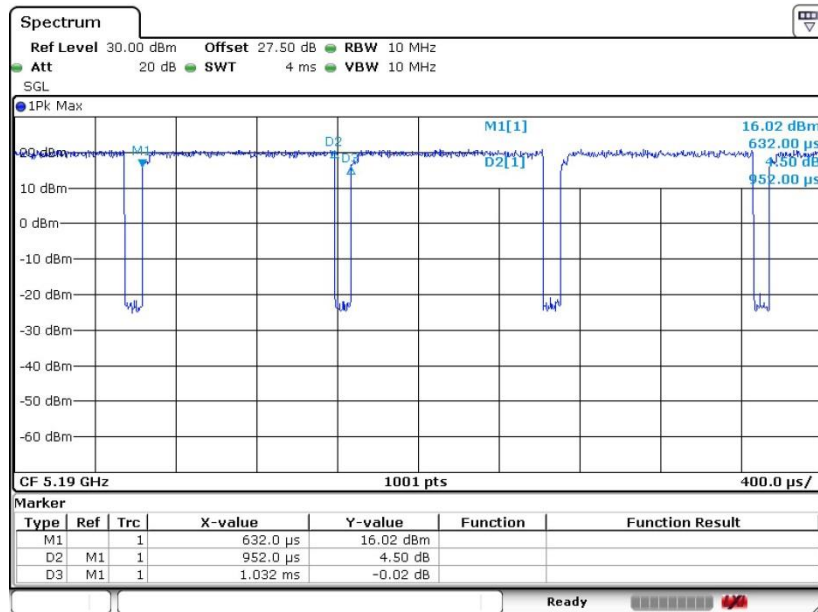
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802.11ac VHT20



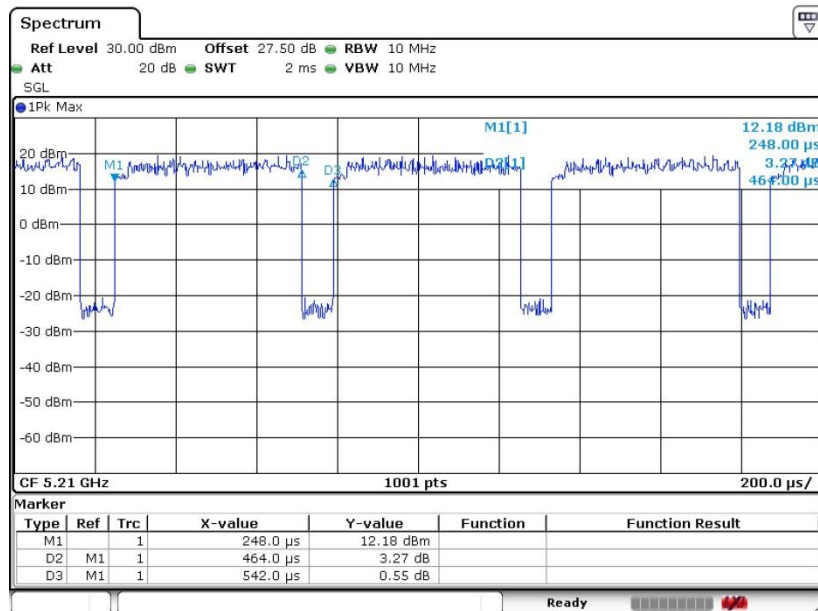
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802.11ac VHT40



Date: 28 JAN 2019 23:45:29

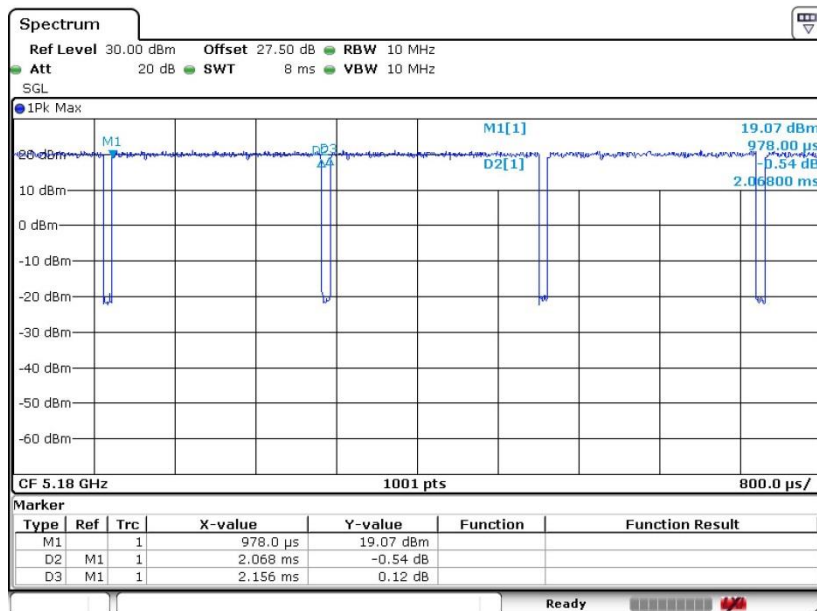
802.11ac VHT80



Date: 29 JAN 2019 00:05:44

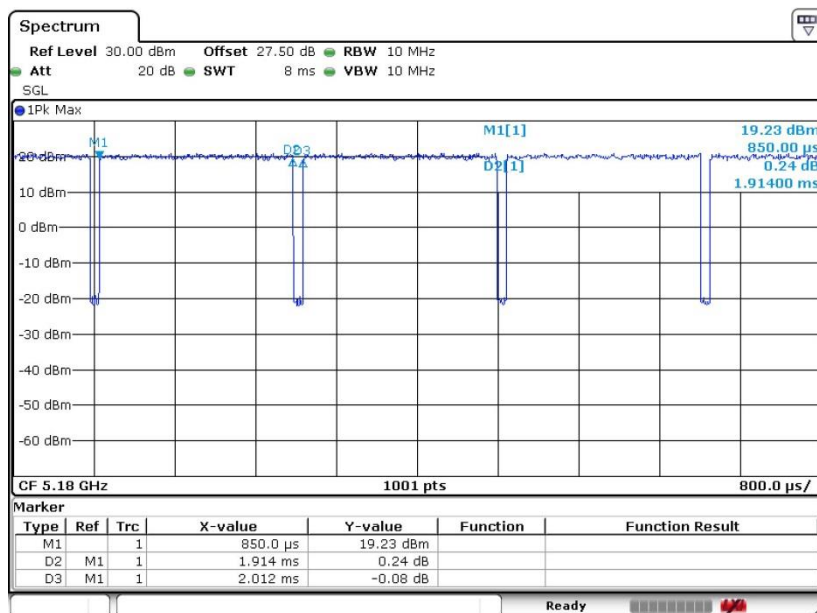
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802.11a



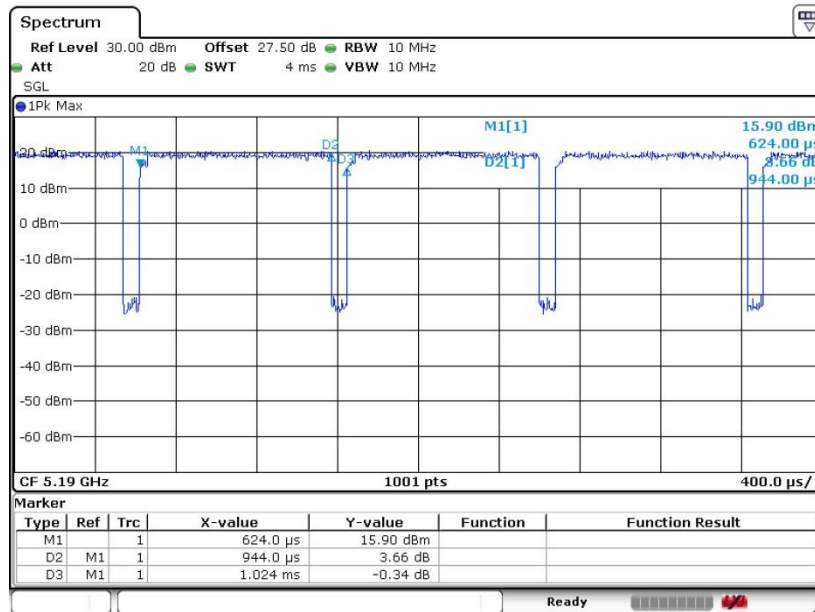
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802.11n HT20



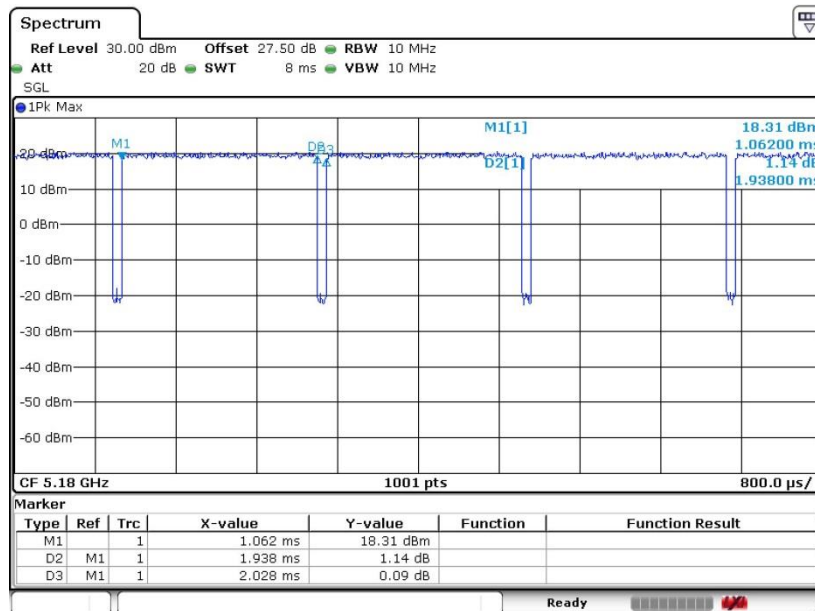
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802.11n HT40



Date: 28 JAN 2019 23:10:41

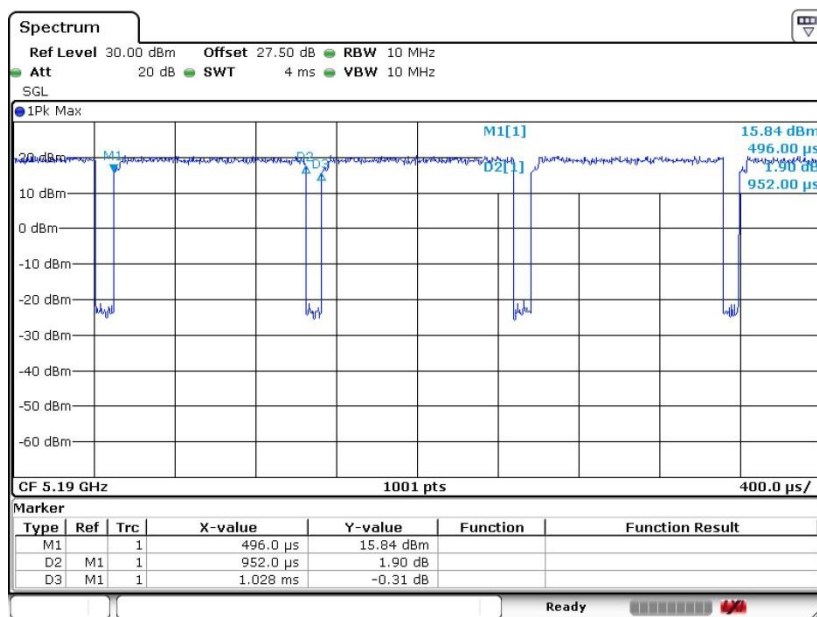
802.11ac VHT20



Date: 28 JAN 2019 23:26:02

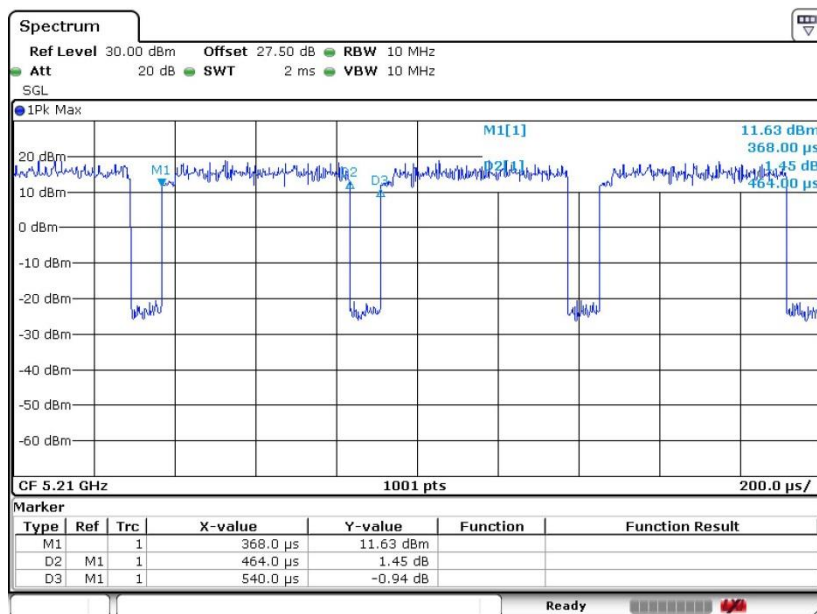


802.11ac VHT40



Date: 28 JAN 2019 23:46:51

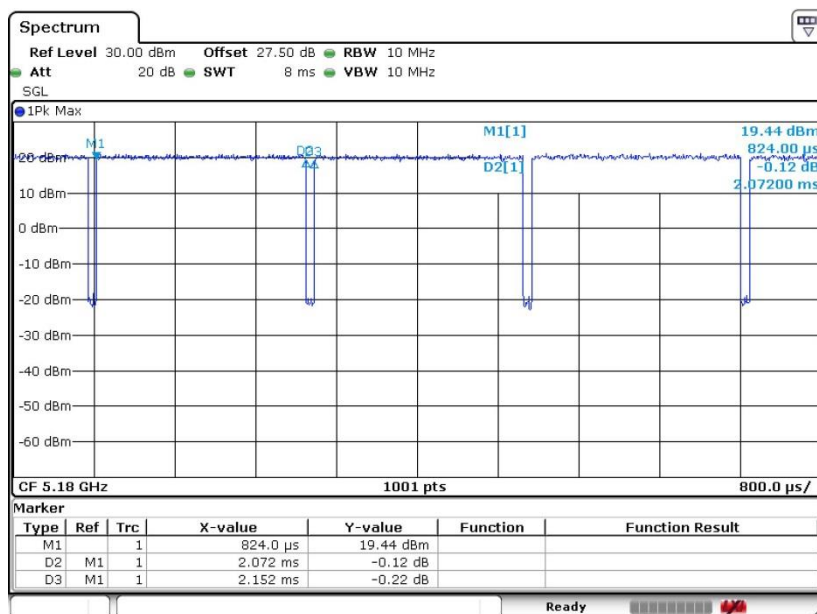
802.11ac VHT80



Date: 29 JAN 2019 00:07:20

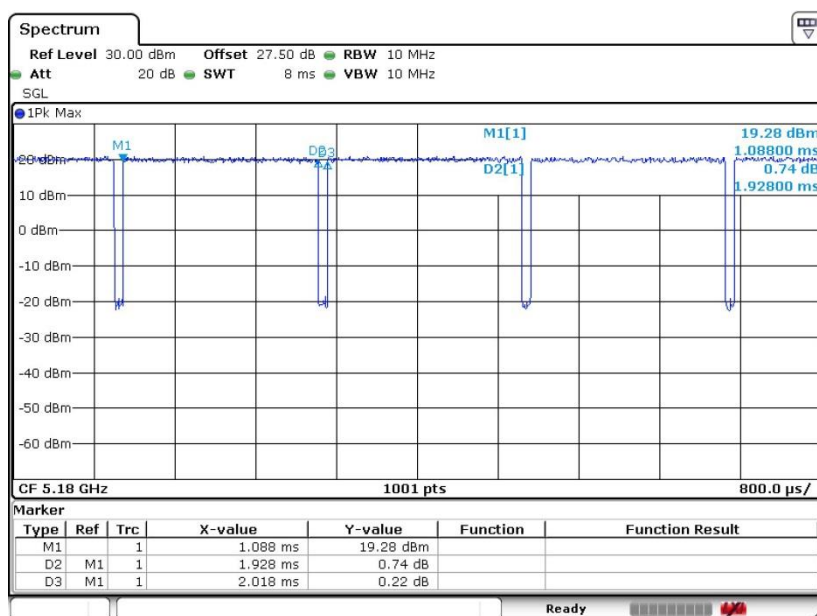
MIMO <Ant. 1>

802.11a



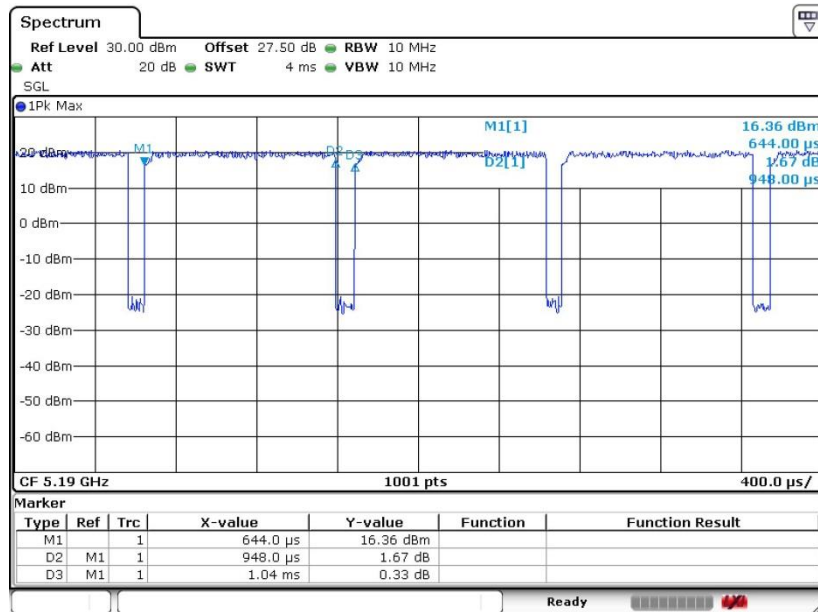
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802.11n HT20



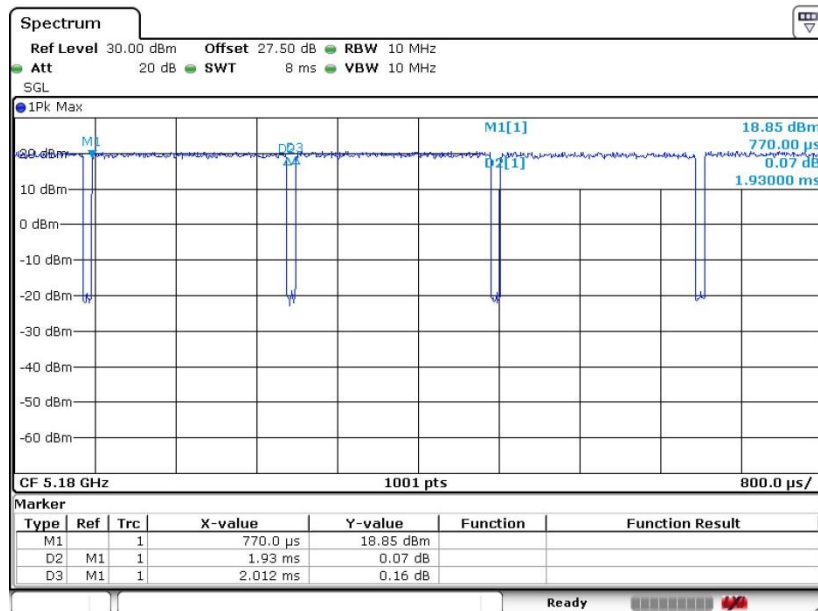
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802.11n HT40



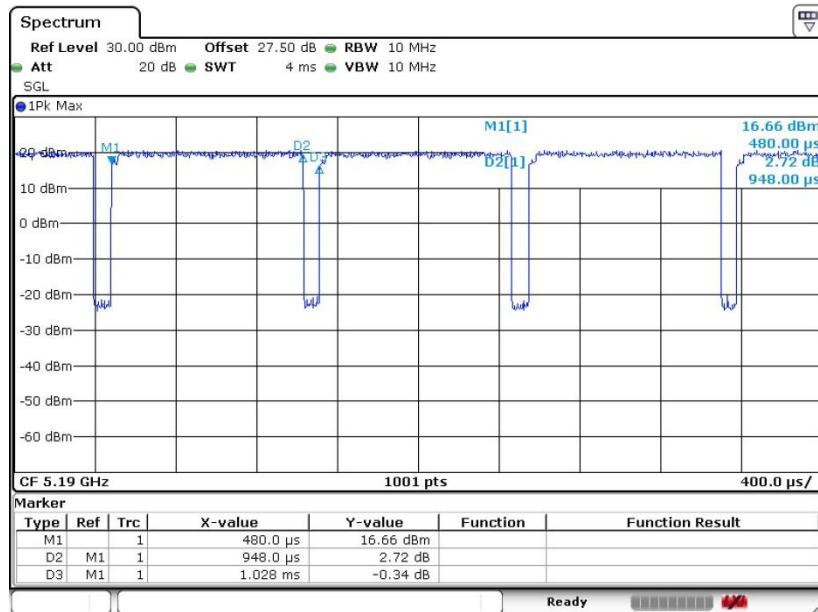
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802.11ac VHT20



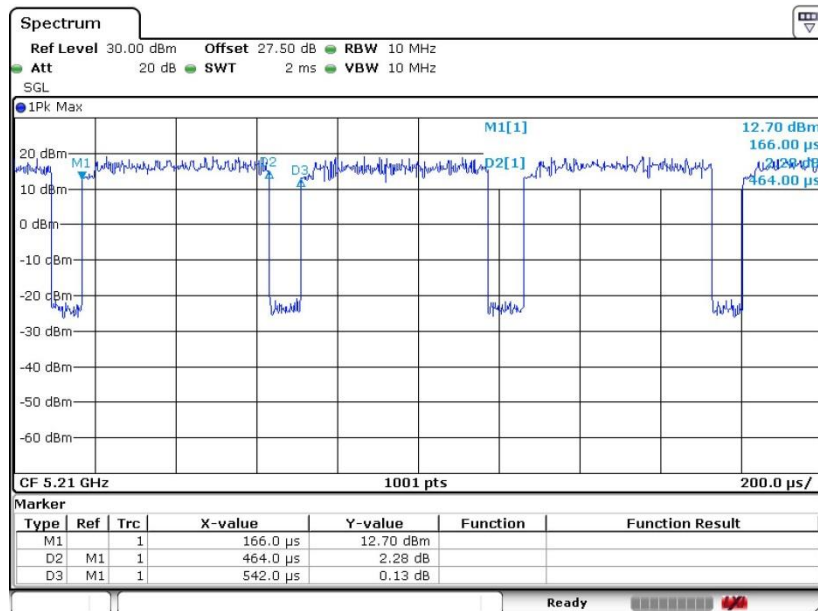
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802.11ac VHT40



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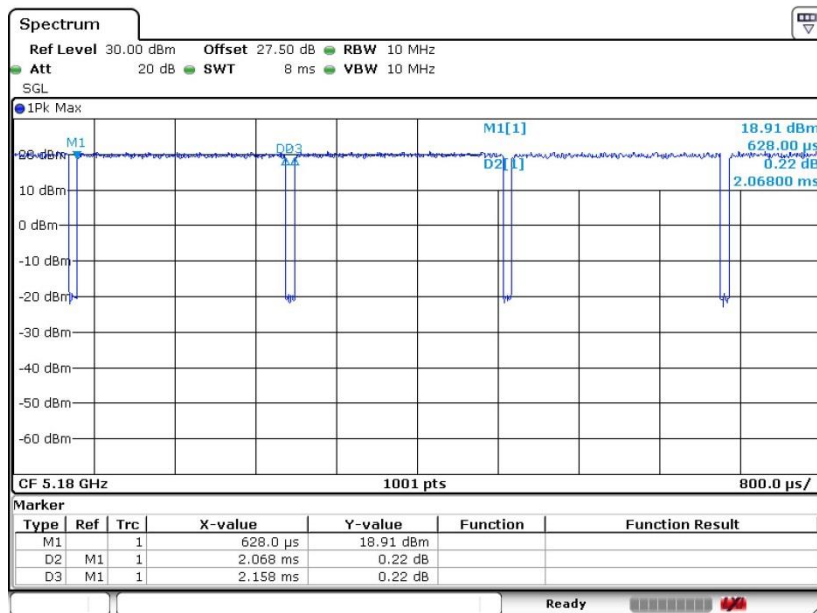
802.11ac VHT80



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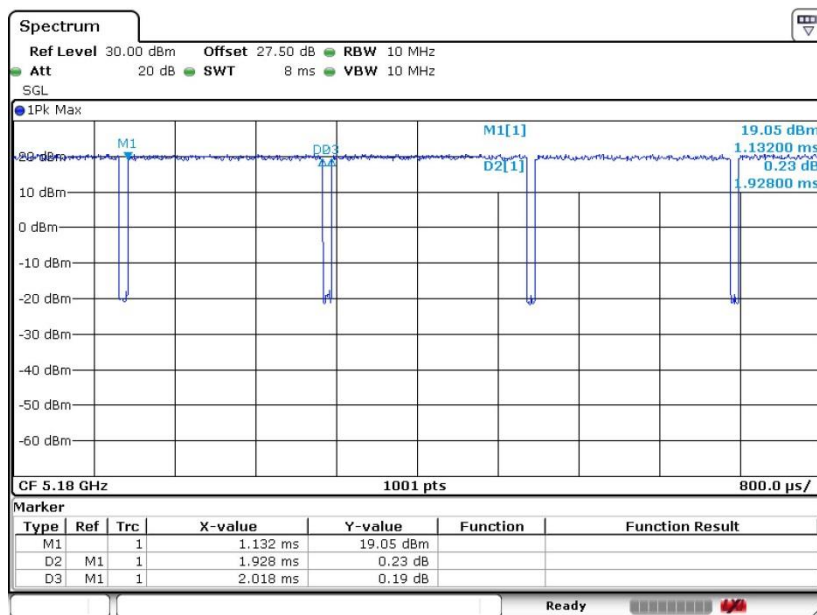
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802.11a

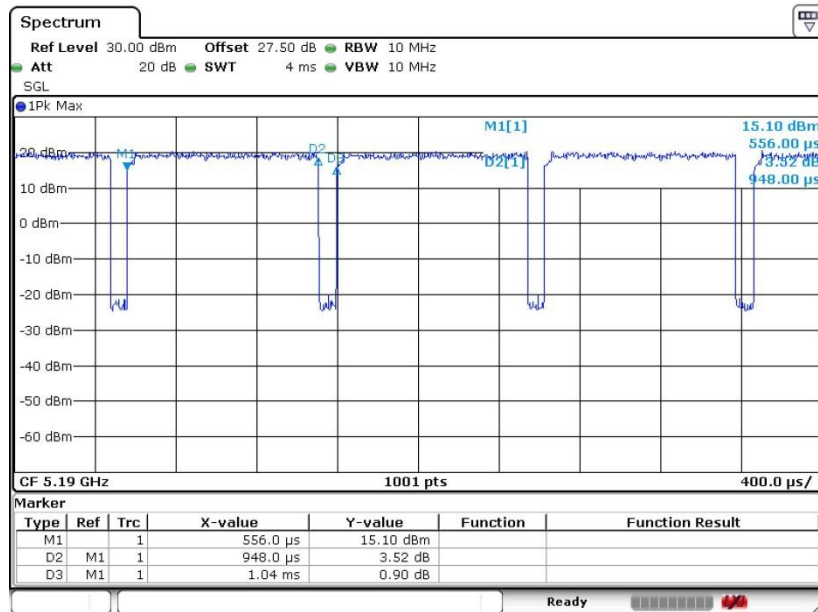


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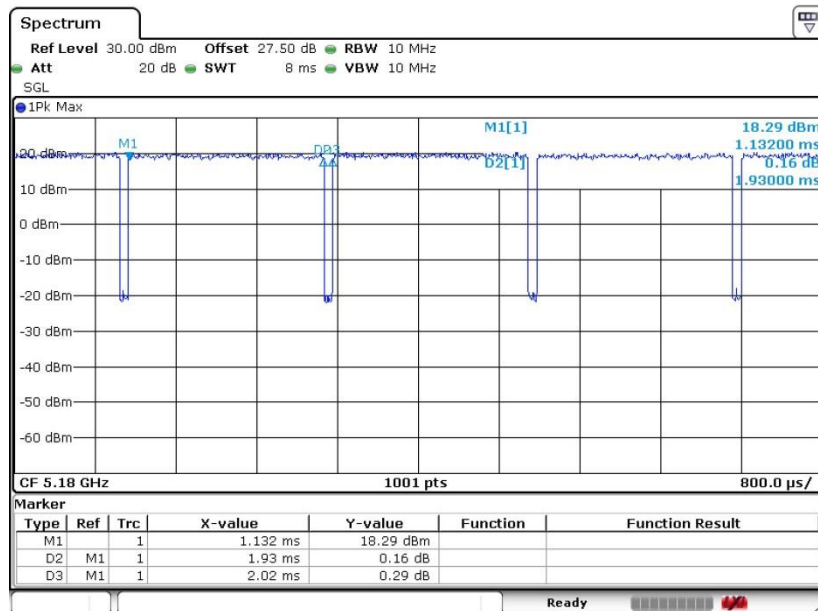
802.11n HT20



Date: 28 JAN 2019 22:59:40

**802.11n HT40**

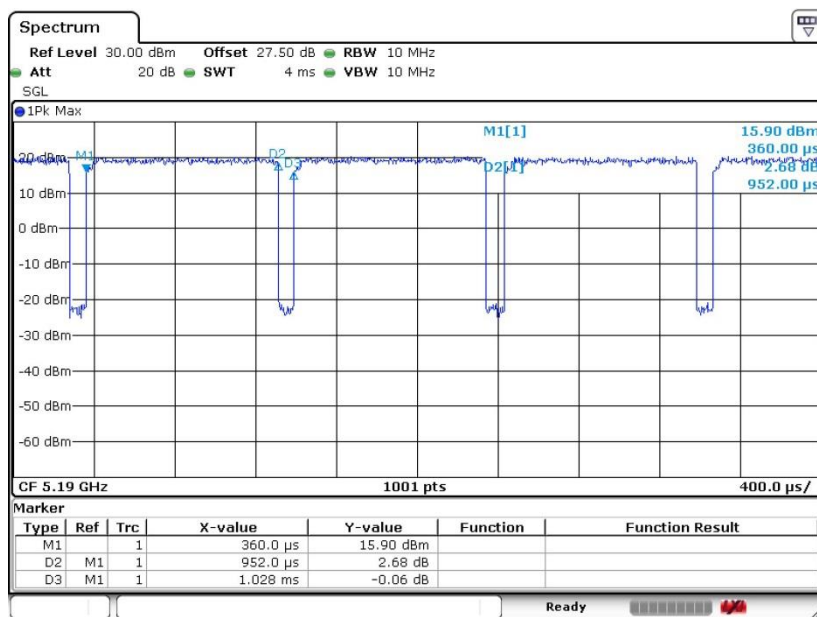
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802.11ac VHT20

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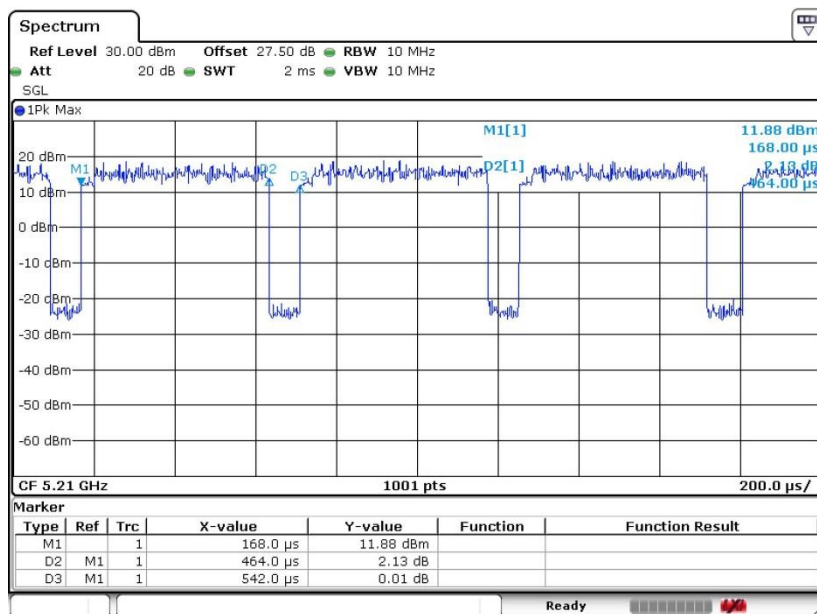


802.11ac VHT40



Date: 28 JAN 2019 23:48:30

802.11ac VHT80



Date: 29 JAN 2019 00:04:25