FCC RF Test Report

APPLICANT	:	S&R Land LLC
EQUIPMENT	:	Digital Media Receiver
MODEL NAME	:	XC56PY
FCC ID	:	2ALWB-7232
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure

The product was completed on Aug. 17, 2017. We, SPORTON INTERNATIONAL INC., 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., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory
1190

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR740606-01E	Rev. 01	Initial issue of report	Aug. 22, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result
3.1	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass
3.4	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) &15.209(a)	Pass
3.5	15.207	AC Conducted Emission	15.207(a)	Pass
3.6	15.407(g)	Frequency Stability	Within Operation Band	Pass
3.7	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass
3.8	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass

1 General Description

1.1 Applicant

S&R Land LLC
4000 S. Faber Place Drive, Suite 300 Charleston, South Carolina 29405

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	Digital Media Receiver
Model Name	XC56PY
FCC ID	2ALWB-7232
EUT supports Radios application	WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 Bluetooth BR/EDR/LE

1.3 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5745 MHz ~ 5825 MHz
Maximum Output Power to Antenna	**<5745 MHz ~ 5825 MHz>** **<Ant. 1>** 802.11a : 19.50 dBm / 0.0891 W 802.11n HT20 : 19.47 dBm / 0.0885 W 802.11n HT40 : 19.70 dBm / 0.0933 W **<Ant. 2>** 802.11a : 18.48 dBm / 0.0705 W 802.11n HT20 : 18.50 dBm / 0.0708 W 802.11n HT40 : 18.53 dBm / 0.0713 W
99% Occupied Bandwidth	**<Ant. 1>** 802.11a : 26.15 MHz 802.11n HT20 : 23.60 MHz 802.11n HT40 : 48.90 MHz **<Ant. 2>** 802.11a : 22.00 MHz 802.11n HT20 : 23.35 MHz 802.11n HT40 : 48.90 MHz
Antenna Type / Gain	**<5745 MHz ~ 5825 MHz>** **Ant. 1 :** Fixed internal Antenna with gain 5.60 dBi **Ant. 2 :** Fixed internal Antenna with gain 5.00 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)

1.4 Modification of EUT

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

1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	**Sporton Site No.**		
	TH02-HY	CO05-HY	03CH07-HY

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

1.6 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 v01r04.
- ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

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).

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
	-	-	165	5825

Note: The above Frequency and Channel in "*" were 802.11n HT40

2.2 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

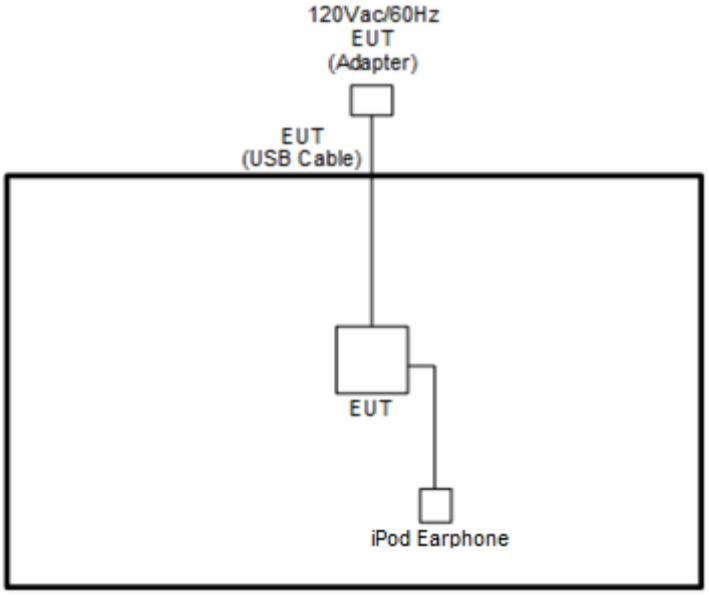
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + Bluetooth Link + MP3 + Adapter

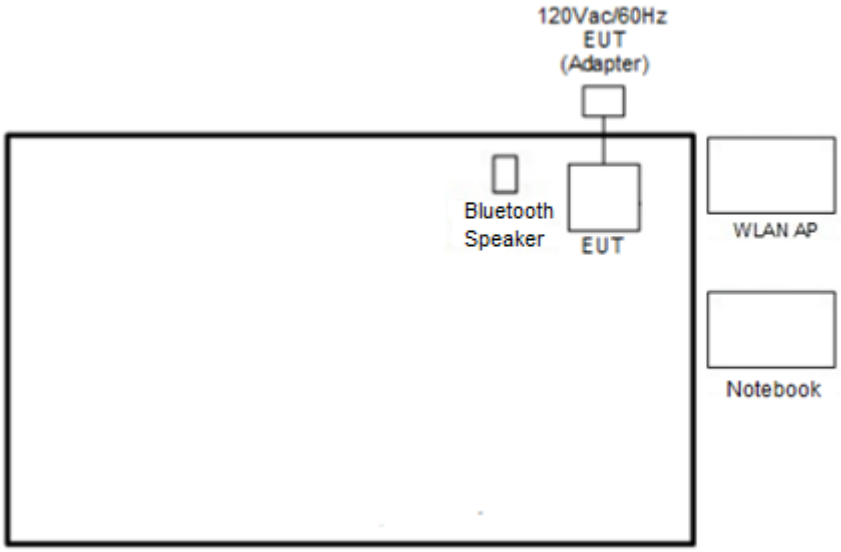
Ch. #		Band IV：5725-5850 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<EUT with Adapter in Link Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,1.8m
2.	Speaker	JAWBONE	JAMBOX	V3J-JBE	N/A	N/A
3.	iPhone Earphone	Apple	A1387	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, programmed RF utility, “CMD” installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving 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.

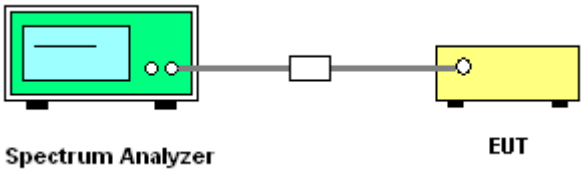
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. 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.

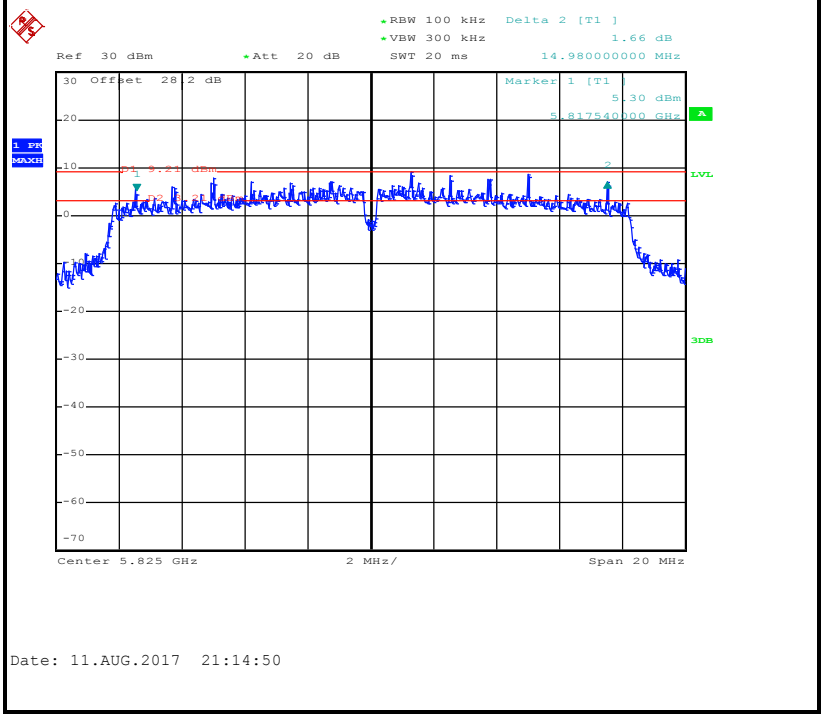
3.1.4 Test Setup



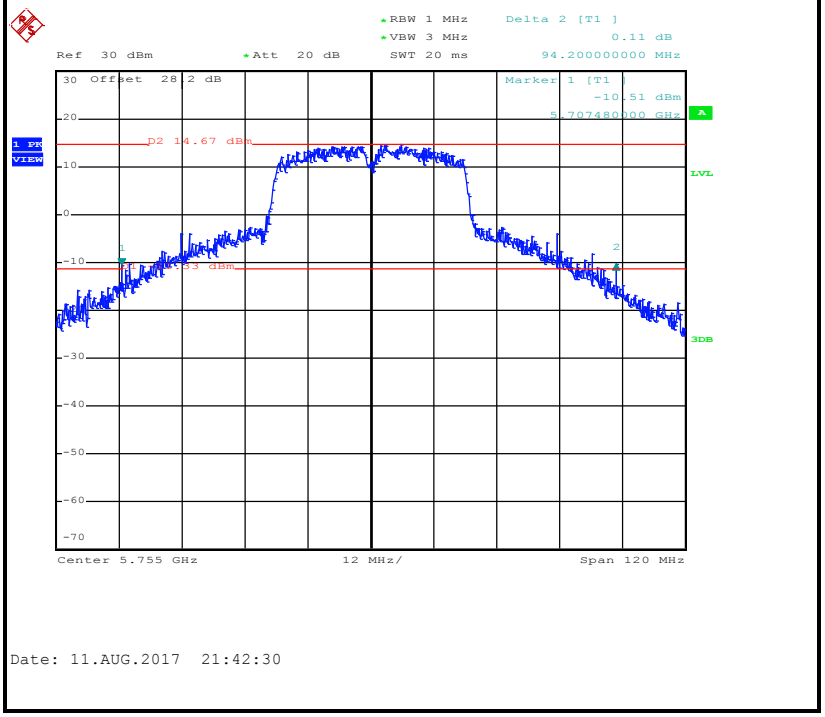
3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

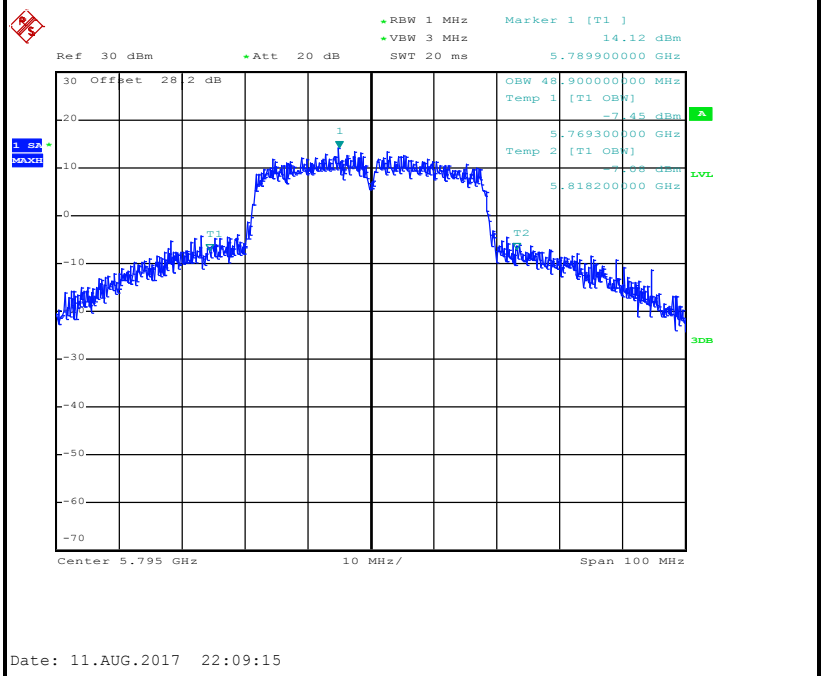
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth



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

The measuring equipment is listed in the section 4 of this test report.

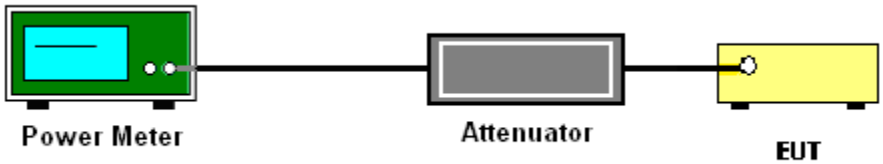
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04.

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

The measuring equipment is listed in the section 4 of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section F) Maximum power spectral density.

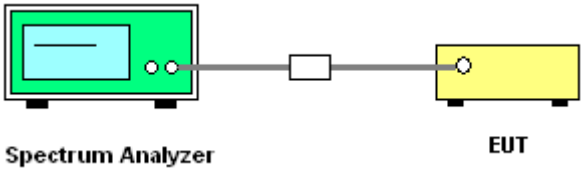
 # Method SA-2 #

(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 ≥ 1 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(500kHz/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.

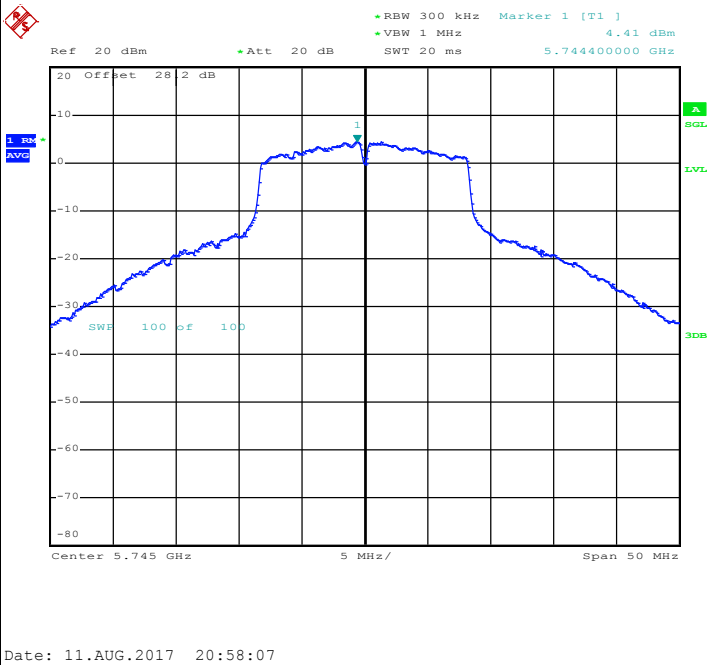
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/300kHz)



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)
-17	78.3
- 27	68.3

(3) KDB789033 D02 v01r04 G)2)c)

(i) Section 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and 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. However, 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 dBm/MHz peak emission limit.

(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). 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 alternative limit.

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

The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. 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

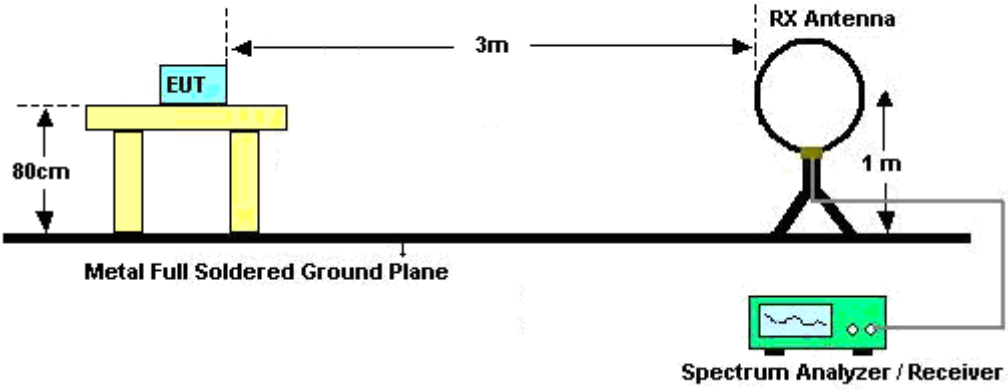
(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

- 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.

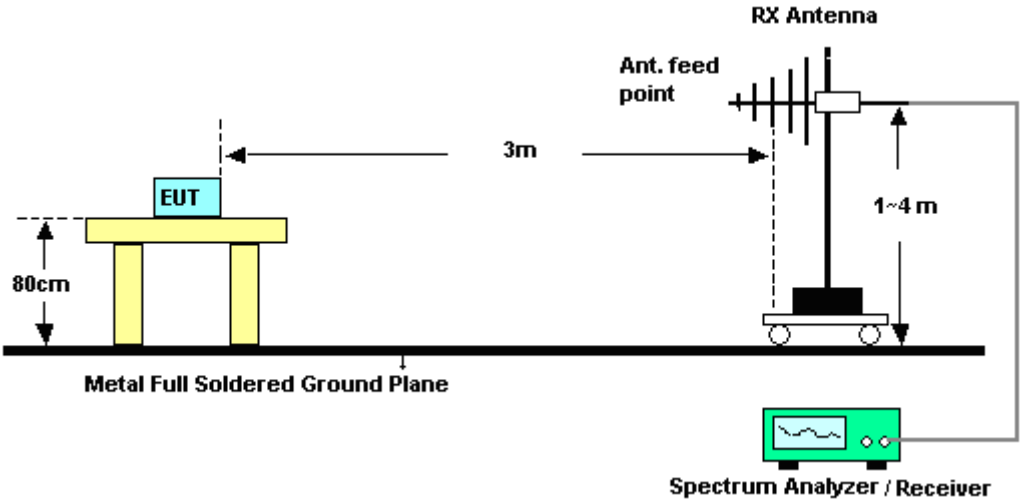
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband 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

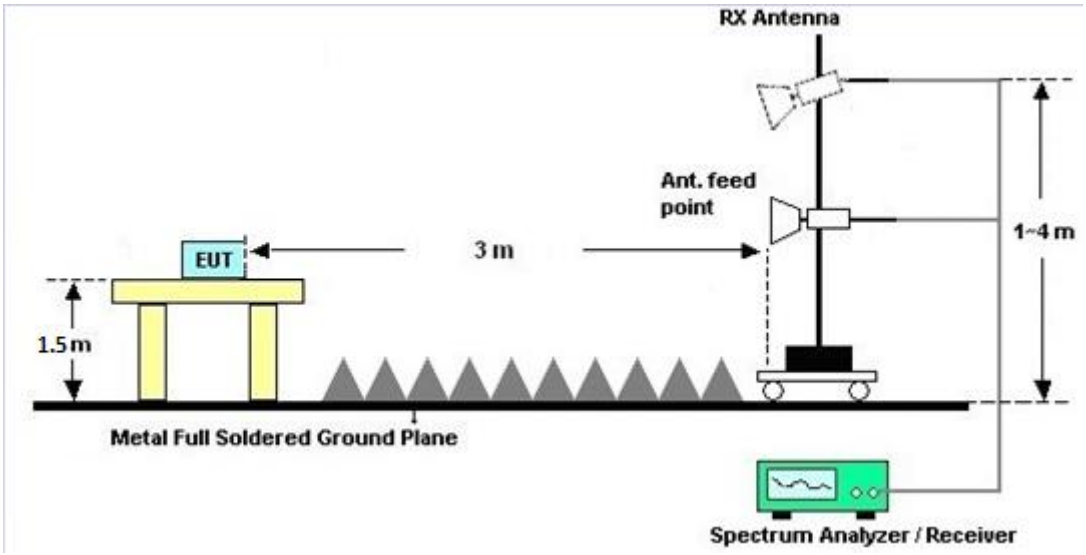
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Spurious 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 semi-Anechoic chamber, and the result came out very similar.

3.4.6 Test Result of Radiated Spurious at 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 Radiated Spurious Emissions (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.

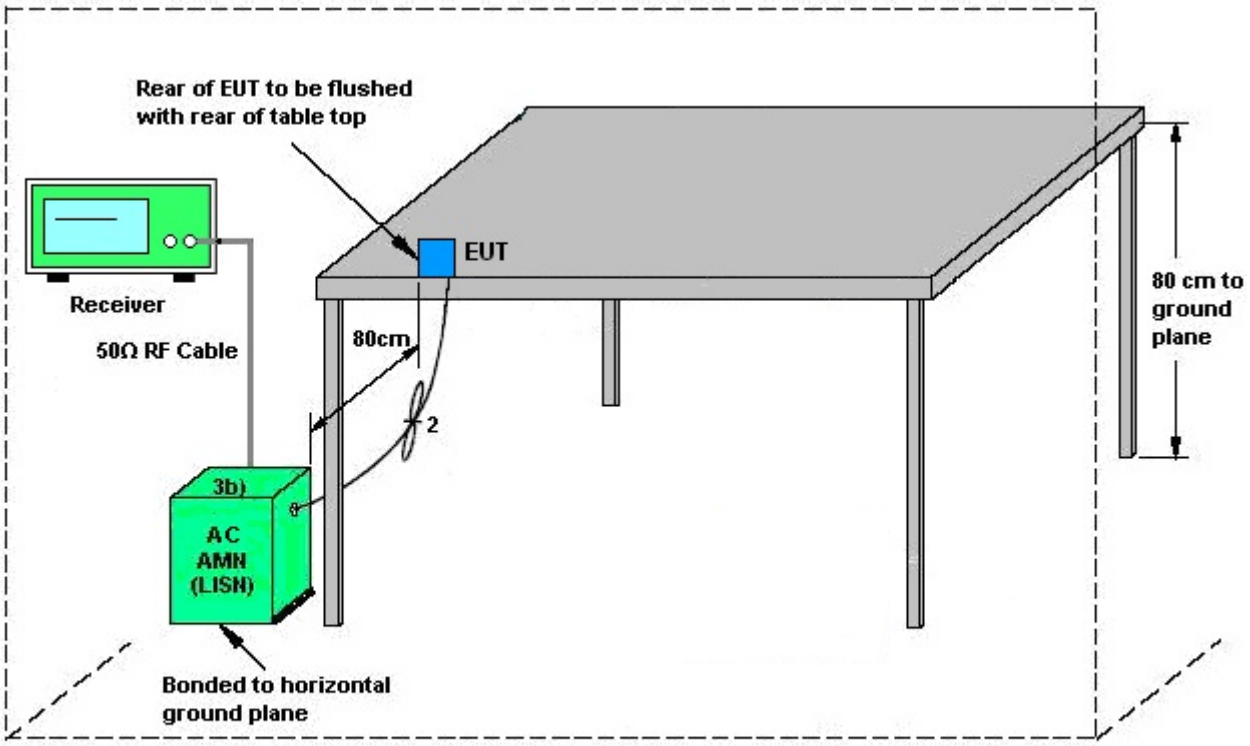
3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 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



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Frequency Stability Measurement

3.6.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

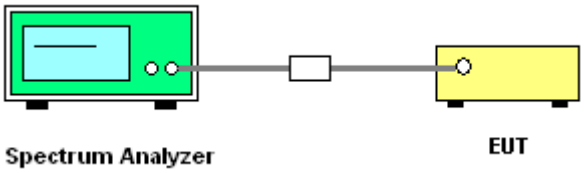
3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.6.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.6.4 Test Setup



3.6.5 Test Result of Frequency Stability

Please refer to Appendix A.

3.7 Automatically Discontinue Transmission

3.7.1 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.

3.7.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.7.3 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.

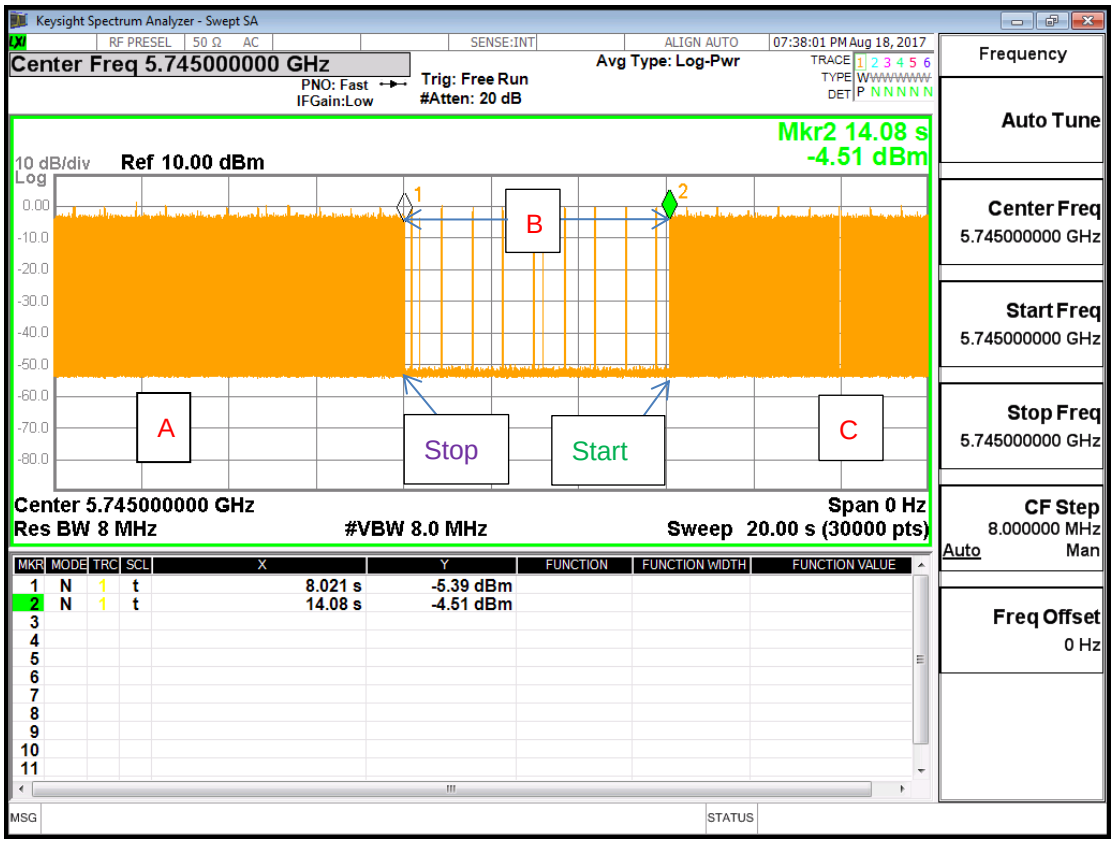
B. Information stop: stop supplying information to the access point.

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.

3.8 Antenna Requirements

3.8.1 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.

3.8.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.8.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	0932001	300MHz~40GHz	Sep. 29, 2016	Jul. 26. 2017~ Aug. 17. 2017	Sep. 28, 2017	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz	Sep. 29, 2016	Jul. 26. 2017~ Aug. 17. 2017	Sep. 28, 2017	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 25, 2016	Jul. 26. 2017~ Aug. 17. 2017	Nov. 24, 2017	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃ ~90℃	Sep. 01, 2016	Jul. 26. 2017~ Aug. 17. 2017	Aug. 31, 2017	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	EL890094	1V~20V 0.5A~5A	Oct. 11, 2016	Jul. 26. 2017~ Aug. 17. 2017	Oct. 10, 2017	Conducted (TH05-HY)
AC Power Source	AC POWER	AFC-500W	F104070011	50Hz~60Hz	Dec. 01.2016	Jul. 26. 2017~ Aug. 17. 2017	Nov. 30 2017	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Jul. 11, 2017	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 30, 2016	Jul. 11, 2017	Aug. 29, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Jul. 11, 2017	Nov. 28, 2017	Conduction (CO05-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35419&03	30MHz to 1GHz	Jan. 07, 2017	Aug. 10, 2017~ Aug. 15, 2017	Jan. 06, 2018	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2016	Aug. 10, 2017~ Aug. 15, 2017	Aug. 18, 2017	Radiation (03CH07-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20Hz ~ 8.4GHz	Oct. 26, 2016	Aug. 10, 2017~ Aug. 15, 2017	Oct. 25, 2017	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	May 15, 2017	Aug. 10, 2017~ Aug. 15, 2017	May 14, 2019	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz ~ 18GHz	Apr. 25, 2017	Aug. 10, 2017~ Aug. 15, 2017	Apr. 24, 2018	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	Mar. 14, 2017	Aug. 10, 2017~ Aug. 15, 2017	Mar. 13, 2018	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Oct. 12, 2016	Aug. 10, 2017~ Aug. 15, 2017	Oct. 11, 2017	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Aug. 10, 2017~ Aug. 15, 2017	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Aug. 10, 2017~ Aug. 15, 2017	N/A	Radiation (03CH07-HY)
Amplifier	MITEQ	TTA1840-35-H G	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Aug. 10, 2017~ Aug. 15, 2017	Jul. 17, 2018	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917058 4	18GHz- 40GHz	Nov. 08, 2016	Aug. 10, 2017~ Aug. 15, 2017	Nov. 07, 2017	Radiation (03CH07-HY)
EMI Test Receiver	Agilent	N9038A(MXE)	MY53290053	20Hz to 26.5GHz	Jan. 12, 2017	Aug. 10, 2017~ Aug. 15, 2017	Jan. 11, 2018	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.70

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.70

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.50

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.20

Appendix A. Test Result of Conducted Test Items

Test Engineer:	Aking chang	Temperature:	21~25	°C
Test Date:	2017/7/21~2017/8/11	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	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	23.55	21.55	42.60	41.94	15.02	15.00	0.5	0.5	Pass
11a	6Mbps	1	157	5785	26.15	21.65	42.96	40.14	15.44	15.42	0.5	0.5	Pass
11a	6Mbps	1	165	5825	20.60	22.00	40.06	39.90	14.98	15.08	0.5	0.5	Pass
HT20	MCS0	1	149	5745	23.15	22.40	43.80	46.26	15.68	15.10	0.5	0.5	Pass
HT20	MCS0	1	157	5785	23.60	22.70	44.10	44.52	14.98	15.08	0.5	0.5	Pass
HT20	MCS0	1	165	5825	21.85	23.35	43.14	43.62	15.34	15.12	0.5	0.5	Pass
HT40	MCS0	1	151	5755	47.30	48.90	94.20	90.84	35.08	35.08	0.5	0.5	Pass
HT40	MCS0	1	159	5795	48.90	48.80	93.00	85.32	35.12	35.08	0.5	0.5	Pass

Report Number : FR740606-01E

TEST RESULTS DATA
Average Power Table

Band IV															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	1	149	5745	0.51	0.51	19.50	18.44		30.00	30.00	5.60	5.00		Pass
11a	6Mbps	1	157	5785	0.51	0.51	19.19	18.27		30.00	30.00	5.60	5.00		Pass
11a	6Mbps	1	165	5825	0.51	0.51	19.23	18.48		30.00	30.00	5.60	5.00		Pass
HT20	MCS0	1	149	5745	0.55	0.55	19.47	18.45		30.00	30.00	5.60	5.00		Pass
HT20	MCS0	1	157	5785	0.55	0.55	19.25	18.25		30.00	30.00	5.60	5.00		Pass
HT20	MCS0	1	165	5825	0.55	0.55	19.28	18.50		30.00	30.00	5.60	5.00		Pass
HT40	MCS0	1	151	5755	1.00	1.02	19.70	18.52		30.00	30.00	5.60	5.00		Pass
HT40	MCS0	1	159	5795	1.00	1.02	19.14	18.53		30.00	30.00	5.60	5.00		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	1	149	5745	0.51	0.51	2.22	2.22	7.14	5.95		30.00	30.00	5.60	5.00	Pass
11a	6Mbps	1	157	5785	0.51	0.51	2.22	2.22	6.40	5.73		30.00	30.00	5.60	5.00	Pass
11a	6Mbps	1	165	5825	0.51	0.51	2.22	2.22	6.24	5.71		30.00	30.00	5.60	5.00	Pass
HT20	MCS0	1	149	5745	0.55	0.55	2.22	2.22	6.92	5.95		30.00	30.00	5.60	5.00	Pass
HT20	MCS0	1	157	5785	0.55	0.55	2.22	2.22	6.32	5.47		30.00	30.00	5.60	5.00	Pass
HT20	MCS0	1	165	5825	0.55	0.55	2.22	2.22	6.32	5.51		30.00	30.00	5.60	5.00	Pass
HT40	MCS0	1	151	5755	1.00	1.02	2.22	2.22	3.67	2.66		30.00	30.00	5.60	5.00	Pass
HT40	MCS0	1	159	5795	1.00	1.02	2.22	2.22	3.14	2.29		30.00	30.00	5.60	5.00	Pass

Report Number : FR740606-01E

TEST RESULTS DATA
Frequency Stability

Band IV										
Mod.	Data Rate	N_{TX}	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (˚C)	Voltage (V)	Note
11a	6Mbps	1	149	5745	5745.050	0.050	8.70	35	120	
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	0	120	
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	20	138	
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	20	102	
11a	6Mbps	1	149	5745	5745.050	0.050	8.70	20	120	

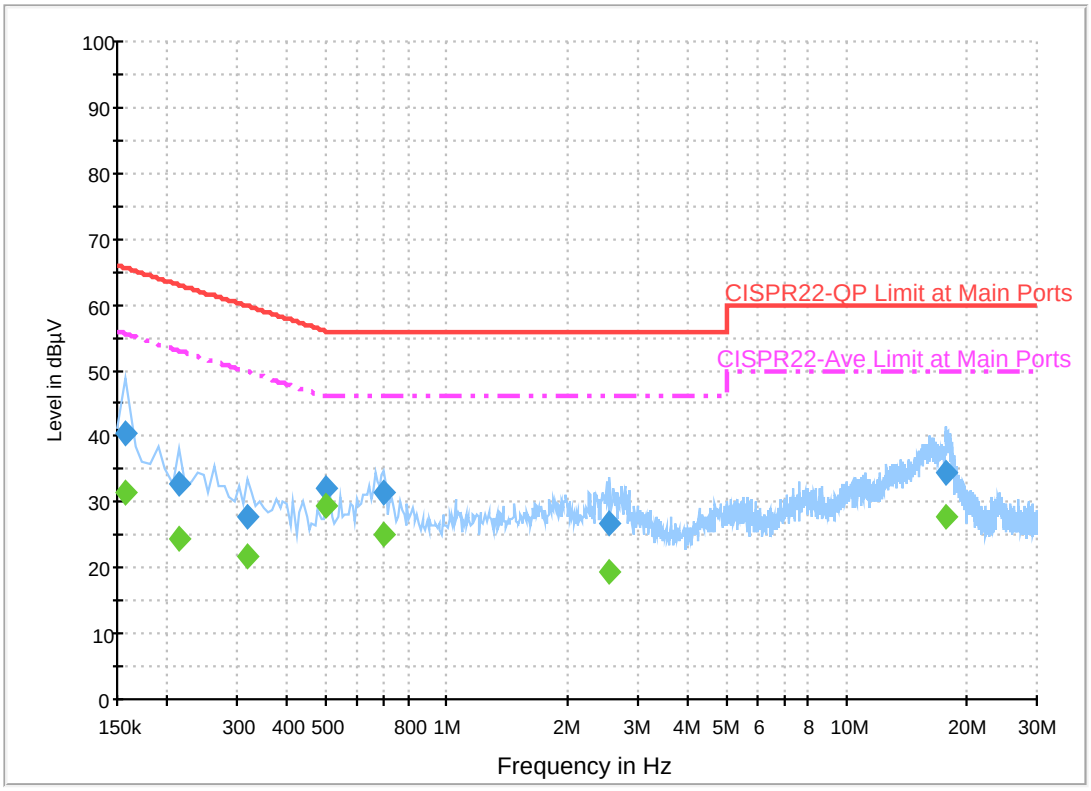
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Kai-Chun Chu	**Temperature :**	24~25℃
		Relative Humidity :	44~45%

EUT Information

Report NO :	740606-01
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Line

ENV216 Auto Test FCC Power Bar - L



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	40.4	Off	L1	19.6	25.2	65.6
0.214000	32.8	Off	L1	19.6	30.2	63.0
0.318000	27.6	Off	L1	19.6	32.2	59.8
0.502000	32.0	Off	L1	19.6	24.0	56.0
0.694000	31.5	Off	L1	19.6	24.5	56.0
2.566000	26.6	Off	L1	19.3	29.4	56.0
17.726000	34.6	Off	L1	20.5	25.4	60.0

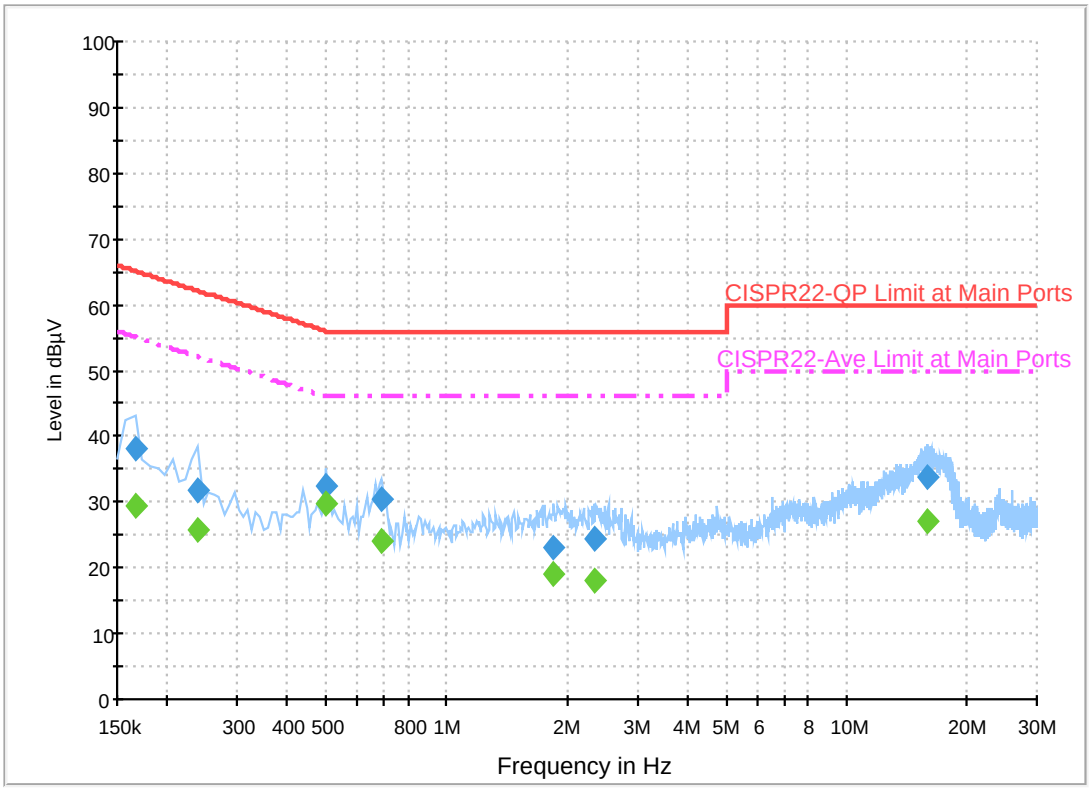
Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	31.5	Off	L1	19.6	24.1	55.6
0.214000	24.4	Off	L1	19.6	28.6	53.0
0.318000	21.9	Off	L1	19.6	27.9	49.8
0.502000	29.5	Off	L1	19.6	16.5	46.0
0.694000	25.0	Off	L1	19.6	21.0	46.0
2.566000	19.3	Off	L1	19.3	26.7	46.0
17.726000	27.7	Off	L1	20.5	22.3	50.0

EUT Information

Report NO :	740606-01
Test Mode :	Mode 1
Test Voltage :	120Vac/60Hz
Phase :	Neutral

ENV216 Auto Test FCC Power Bar - N



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	38.3	Off	N	19.5	26.9	65.2
0.238000	31.9	Off	N	19.5	30.3	62.2
0.502000	32.4	Off	N	19.5	23.6	56.0
0.686000	30.6	Off	N	19.5	25.4	56.0
1.854000	23.2	Off	N	19.6	32.8	56.0
2.342000	24.5	Off	N	18.9	31.5	56.0
16.022000	33.9	Off	N	20.5	26.1	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	29.6	Off	N	19.5	25.6	55.2
0.238000	25.8	Off	N	19.5	26.4	52.2
0.502000	29.7	Off	N	19.5	16.3	46.0
0.686000	23.9	Off	N	19.5	22.1	46.0
1.854000	18.9	Off	N	19.6	27.1	46.0
2.342000	18.1	Off	N	18.9	27.9	46.0
16.022000	27.1	Off	N	20.5	22.9	50.0

Appendix C. Radiated Spurious Emission

Test Engineer :	Jesse Wang, James Chiu and Potter Liu	Temperature :	22~27°C
		Relative Humidity :	50~58%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5606	52.85	-15.35	68.2	40.81	34.6	12.56	35.12	363	298	P	H
		5699.8	57.35	-47.7	105.05	45.22	34.6	12.67	35.14	363	298	P	H
		5717.6	75.9	-34.23	110.13	63.71	34.6	12.73	35.14	363	298	P	H
		5724	83.5	-36.42	119.92	71.31	34.6	12.73	35.14	363	298	P	H
	*	5745	115.45	-	-	103.21	34.6	12.79	35.15	363	298	P	H
	*	5745	107.57	-	-	95.33	34.6	12.79	35.15	363	298	A	H
		5618.2	52.07	-16.13	68.2	40.03	34.6	12.56	35.12	172	219	P	V
		5698	55.42	-48.31	103.73	43.29	34.6	12.67	35.14	172	219	P	V
		5719.4	73.04	-37.59	110.63	60.85	34.6	12.73	35.14	172	219	P	V
		5724.6	78.53	-42.76	121.29	66.34	34.6	12.73	35.14	172	219	P	V
	*	5745	111.27	-	-	99.03	34.6	12.79	35.15	172	219	P	V
	*	5745	103.86	-	-	91.62	34.6	12.79	35.15	172	219	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5632.2	54.29	-13.91	68.2	42.21	34.6	12.61	35.13	281	279	P	H
		5671.8	54.26	-30.11	84.37	42.12	34.6	12.67	35.13	281	279	P	H
		5718.6	54.38	-56.03	110.41	42.19	34.6	12.73	35.14	281	279	P	H
		5725	54.47	-67.73	122.2	42.28	34.6	12.73	35.14	281	279	P	H
	*	5785	115.81	-	-	103.52	34.6	12.85	35.16	281	279	P	H
	*	5785	108.16	-	-	95.87	34.6	12.85	35.16	281	279	A	H
		5851.6	53.94	-64.61	118.55	41.57	34.6	12.94	35.17	281	279	P	H
		5865.6	52.25	-55.58	107.83	39.81	34.6	13.02	35.18	281	279	P	H
		5886	50.63	-46.4	97.03	38.2	34.6	13.02	35.19	281	279	P	H
		5938	50.65	-17.55	68.2	38.14	34.6	13.11	35.2	281	279	P	H
		5648.4	51.89	-16.31	68.2	39.81	34.6	12.61	35.13	170	213	P	V
		5694.4	52.91	-48.16	101.07	40.78	34.6	12.67	35.14	170	213	P	V
		5716.6	53.36	-56.49	109.85	41.17	34.6	12.73	35.14	170	213	P	V
		5722.6	52.87	-63.86	116.73	40.68	34.6	12.73	35.14	170	213	P	V
	*	5785	113.08	-	-	100.79	34.6	12.85	35.16	170	213	P	V
	*	5785	105.52	-	-	93.23	34.6	12.85	35.16	170	213	A	V
		5853.6	53.18	-60.81	113.99	40.81	34.6	12.94	35.17	170	213	P	V
		5865.2	53.9	-54.04	107.94	41.46	34.6	13.02	35.18	170	213	P	V
		5877.6	51.99	-51.28	103.27	39.55	34.6	13.02	35.18	170	213	P	V
		5938.2	51.91	-16.29	68.2	39.4	34.6	13.11	35.2	170	213	P	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz	*	5825	115.8	-	-	103.43	34.6	12.94	35.17	268	276	P	H
	*	5825	107.59	-	-	95.22	34.6	12.94	35.17	268	276	A	H
		5853.4	75.86	-38.59	114.45	63.49	34.6	12.94	35.17	268	276	P	H
		5856	71.41	-39.11	110.52	59.04	34.6	12.94	35.17	268	276	P	H
		5875.2	58.39	-46.66	105.05	45.95	34.6	13.02	35.18	268	276	P	H
		5944	50.55	-17.65	68.2	37.95	34.6	13.2	35.2	268	276	P	H
	*	5825	113.97	-	-	101.6	34.6	12.94	35.17	176	214	P	V
	*	5825	106.18	-	-	93.81	34.6	12.94	35.17	176	214	A	V
		5850.4	74.3	-46.99	121.29	61.93	34.6	12.94	35.17	176	214	P	V
		5857.2	73.18	-37	110.18	60.81	34.6	12.94	35.17	176	214	P	V
		5875.8	55.81	-48.8	104.61	43.37	34.6	13.02	35.18	176	214	P	V
		5926.4	51.55	-16.65	68.2	39.03	34.6	13.11	35.19	176	214	P	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	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	48.73	-25.27	74	47.92	39.27	18.88	57.34	100	0	P	H
		17235	54.38	-13.82	68.2	44.37	42.43	23.38	55.8	100	0	P	H
		11490	49.01	-24.99	74	48.2	39.27	18.88	57.34	100	0	P	V
		17235	54.54	-13.66	68.2	44.53	42.43	23.38	55.8	100	0	P	V
802.11a CH 157 5785MHz		11570	47.15	-26.85	74	46.19	39.2	18.95	57.19	100	0	P	H
		17355	53.09	-15.11	68.2	43.2	42.24	23.45	55.8	100	0	P	H
		11570	47.97	-26.03	74	47.01	39.2	18.95	57.19	100	0	P	V
		17355	52.2	-16	68.2	42.31	42.24	23.45	55.8	100	0	P	V
802.11a CH 165 5825MHz		11650	53.36	-20.64	74	52.3	39.11	19.03	57.08	200	94	P	H
		11650	43.46	-10.54	54	42.4	39.11	19.03	57.08	200	94	A	H
		17475	52.05	-16.15	68.2	42.28	42.05	23.52	55.8	100	0	P	H
		11650	49.78	-24.22	74	48.72	39.11	19.03	57.08	100	0	P	V
		17475	52.27	-15.93	68.2	42.5	42.05	23.52	55.8	100	0	P	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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		5609	53.23	-14.97	68.2	41.19	34.6	12.56	35.12	363	293	P	H
		5697.2	58.09	-45.05	103.14	45.96	34.6	12.67	35.14	363	293	P	H
		5719.4	79.49	-31.14	110.63	67.3	34.6	12.73	35.14	363	293	P	H
		5723.8	87.08	-32.38	119.46	74.89	34.6	12.73	35.14	363	293	P	H
	*	5745	115.28	-	-	103.04	34.6	12.79	35.15	363	293	P	H
	*	5745	107.48	-	-	95.24	34.6	12.79	35.15	363	293	A	H
		5646.6	52.02	-16.18	68.2	39.94	34.6	12.61	35.13	171	219	P	V
		5699	58.89	-45.57	104.46	46.76	34.6	12.67	35.14	171	219	P	V
		5719.2	75.75	-34.83	110.58	63.56	34.6	12.73	35.14	171	219	P	V
		5724	81.78	-38.14	119.92	69.59	34.6	12.73	35.14	171	219	P	V
	*	5745	112.11	-	-	99.87	34.6	12.79	35.15	171	219	P	V
	*	5745	104.17	-	-	91.93	34.6	12.79	35.15	171	219	A	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		5630.2	53.2	-15	68.2	41.12	34.6	12.61	35.13	284	279	P	H
		5676.4	53.4	-34.38	87.78	41.26	34.6	12.67	35.13	284	279	P	H
		5710.2	54.54	-53.52	108.06	42.35	34.6	12.73	35.14	284	279	P	H
		5724	56.6	-63.32	119.92	44.41	34.6	12.73	35.14	284	279	P	H
	*	5785	115.71	-	-	103.42	34.6	12.85	35.16	284	279	P	H
	*	5785	107.73	-	-	95.44	34.6	12.85	35.16	284	279	A	H
		5852.4	52.73	-64	116.73	40.36	34.6	12.94	35.17	284	279	P	H
		5865	53.22	-54.78	108	40.78	34.6	13.02	35.18	284	279	P	H
		5894.6	51.6	-39.06	90.66	39.17	34.6	13.02	35.19	284	279	P	H
		5940.8	50.88	-17.32	68.2	38.28	34.6	13.2	35.2	284	279	P	H
		5634.4	52.43	-15.77	68.2	40.35	34.6	12.61	35.13	169	213	P	V
		5689.8	52.15	-45.53	97.68	40.02	34.6	12.67	35.14	169	213	P	V
		5705.4	53.04	-53.67	106.71	40.85	34.6	12.73	35.14	169	213	P	V
		5724.8	54.75	-66.99	121.74	42.56	34.6	12.73	35.14	169	213	P	V
	*	5785	113.62	-	-	101.33	34.6	12.85	35.16	169	213	P	V
	*	5785	105.5	-	-	93.21	34.6	12.85	35.16	169	213	A	V
		5852.6	53.34	-62.93	116.27	40.97	34.6	12.94	35.17	169	213	P	V
		5864.8	53.16	-54.89	108.05	40.72	34.6	13.02	35.18	169	213	P	V
		5900.4	52.03	-34.33	86.36	39.51	34.6	13.11	35.19	169	213	P	V
		5928.6	51.12	-17.08	68.2	38.6	34.6	13.11	35.19	169	213	P	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 165 5825MHz	*	5825	115.49	-	-	103.12	34.6	12.94	35.17	268	276	P	H
	*	5825	107.35	-	-	94.98	34.6	12.94	35.17	268	276	A	H
		5850.4	77.27	-44.02	121.29	64.9	34.6	12.94	35.17	268	276	P	H
		5855.4	72.07	-38.62	110.69	59.7	34.6	12.94	35.17	268	276	P	H
		5875.4	58.19	-46.71	104.9	45.75	34.6	13.02	35.18	268	276	P	H
		5930	50.49	-17.71	68.2	37.97	34.6	13.11	35.19	268	276	P	H
	*	5825	113.17	-	-	100.8	34.6	12.94	35.17	176	213	P	V
	*	5825	105.44	-	-	93.07	34.6	12.94	35.17	176	213	A	V
		5851.8	75.38	-42.72	118.1	63.01	34.6	12.94	35.17	176	213	P	V
		5855.6	72.29	-38.34	110.63	59.92	34.6	12.94	35.17	176	213	P	V
		5875.2	56.92	-48.13	105.05	44.48	34.6	13.02	35.18	176	213	P	V
		5926.8	50.69	-17.51	68.2	38.17	34.6	13.11	35.19	176	213	P	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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		11490	54.59	-19.41	74	53.78	39.27	18.88	57.34	200	91	P	H
		11490	45	-9	54	44.19	39.27	18.88	57.34	200	91	A	H
		17235	54.8	-13.4	68.2	44.79	42.43	23.38	55.8	100	0	P	H
		11490	54.33	-19.67	74	53.52	39.27	18.88	57.34	100	0	P	V
		11490	43.96	-10.04	54	43.15	39.27	18.88	57.34	100	0	A	V
		17235	54.7	-13.5	68.2	44.69	42.43	23.38	55.8	100	0	P	V
802.11n HT20 CH 157 5785MHz		11570	49.08	-24.92	74	48.12	39.2	18.95	57.19	100	0	P	H
		17355	53.49	-14.71	68.2	43.6	42.24	23.45	55.8	100	0	P	H
		11570	49.17	-24.83	74	48.21	39.2	18.95	57.19	100	0	P	V
		17355	53.69	-14.51	68.2	43.8	42.24	23.45	55.8	100	0	P	V
802.11n HT20 CH 165 5825MHz		11650	48.33	-25.67	74	47.27	39.11	19.03	57.08	100	0	P	H
		17475	51.79	-16.41	68.2	42.02	42.05	23.52	55.8	100	0	P	H
		11650	53.34	-20.66	74	52.28	39.11	19.03	57.08	200	114	P	V
		11650	43.58	-10.42	54	42.52	39.11	19.03	57.08	200	114	A	V
		17475	52.22	-15.98	68.2	42.45	42.05	23.52	55.8	100	0	P	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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		5646	61.7	-6.5	68.2	49.62	34.6	12.61	35.13	273	274	P	H
		5698.6	76.37	-27.8	104.17	64.24	34.6	12.67	35.14	273	274	P	H
		5717.6	87.02	-23.11	110.13	74.83	34.6	12.73	35.14	273	274	P	H
		5725	89.72	-32.48	122.2	77.53	34.6	12.73	35.14	273	274	P	H
	*	5755	112.62	-	-	100.38	34.6	12.79	35.15	273	274	P	H
	*	5755	104.7	-	-	92.46	34.6	12.79	35.15	273	274	A	H
		5854.6	57.82	-53.89	111.71	45.45	34.6	12.94	35.17	273	274	P	H
		5867.4	58.95	-48.38	107.33	46.51	34.6	13.02	35.18	273	274	P	H
		5883	57.57	-41.69	99.26	45.13	34.6	13.02	35.18	273	274	P	H
		5926.2	50.96	-17.24	68.2	38.44	34.6	13.11	35.19	273	274	P	H
		5646.2	56.25	-11.95	68.2	44.17	34.6	12.61	35.13	180	219	P	V
		5688	71.25	-25.1	96.35	59.12	34.6	12.67	35.14	180	219	P	V
		5718.4	85.82	-24.53	110.35	73.63	34.6	12.73	35.14	180	219	P	V
		5723.8	86.9	-32.56	119.46	74.71	34.6	12.73	35.14	180	219	P	V
	*	5755	109.98	-	-	97.74	34.6	12.79	35.15	180	219	P	V
	*	5755	102.43	-	-	90.19	34.6	12.79	35.15	180	219	A	V
		5852.8	58.36	-57.46	115.82	45.99	34.6	12.94	35.17	180	219	P	V
		5867	58.09	-49.35	107.44	45.65	34.6	13.02	35.18	180	219	P	V
		5910.2	53.94	-25.18	79.12	41.42	34.6	13.11	35.19	180	219	P	V
		5930.6	51.18	-17.02	68.2	38.66	34.6	13.11	35.19	180	219	P	V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 159 5795MHz		5641.6	56.09	-12.11	68.2	44.01	34.6	12.61	35.13	271	269	P	H
		5695.6	61.25	-40.71	101.96	49.12	34.6	12.67	35.14	271	269	P	H
		5717.4	64.88	-45.19	110.07	52.69	34.6	12.73	35.14	271	269	P	H
		5723.6	66.91	-52.1	119.01	54.72	34.6	12.73	35.14	271	269	P	H
	*	5795	113.34	-	-	101.05	34.6	12.85	35.16	271	269	P	H
	*	5795	105.35	-	-	93.06	34.6	12.85	35.16	271	269	A	H
		5850.6	72.1	-48.73	120.83	59.73	34.6	12.94	35.17	271	269	P	H
		5857.2	71.03	-39.15	110.18	58.66	34.6	12.94	35.17	271	269	P	H
		5881.2	62.54	-38.05	100.59	50.1	34.6	13.02	35.18	271	269	P	H
		5925.6	53.08	-15.12	68.2	40.56	34.6	13.11	35.19	271	269	P	H
		5648.6	53.4	-14.8	68.2	41.32	34.6	12.61	35.13	171	212	P	V
		5693.2	59.01	-41.18	100.19	46.88	34.6	12.67	35.14	171	212	P	V
		5719.6	64	-46.69	110.69	51.81	34.6	12.73	35.14	171	212	P	V
		5724.8	67.56	-54.18	121.74	55.37	34.6	12.73	35.14	171	212	P	V
	*	5795	110.85	-	-	98.56	34.6	12.85	35.16	171	212	P	V
	*	5795	102.9	-	-	90.61	34.6	12.85	35.16	171	212	A	V
		5852.4	70.65	-46.08	116.73	58.28	34.6	12.94	35.17	171	212	P	V
		5860.8	69.95	-39.22	109.17	57.51	34.6	13.02	35.18	171	212	P	V
		5879.4	63.4	-38.53	101.93	50.96	34.6	13.02	35.18	171	212	P	V
		5929.6	55.56	-12.64	68.2	43.04	34.6	13.11	35.19	171	212	P	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. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		11510	49.02	-24.98	74	48.1	39.3	18.92	57.3	100	0	P	H
HT40		17265	54.66	-13.54	68.2	44.69	42.37	23.4	55.8	100	0	P	H
CH 151		11510	49.86	-24.14	74	48.94	39.3	18.92	57.3	100	0	P	V
5755MHz		17265	53.67	-14.53	68.2	43.7	42.37	23.4	55.8	100	0	P	V
802.11n		11590	47.89	-26.11	74	46.88	39.18	18.99	57.16	100	0	P	H
HT40		17385	51.13	-17.07	68.2	41.27	42.19	23.47	55.8	100	0	P	H
CH 159		11590	46.69	-27.31	74	45.68	39.18	18.99	57.16	100	0	P	V
5795MHz		17385	52.23	-15.97	68.2	42.37	42.19	23.47	55.8	100	0	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
5GHz 802.11n HT40 LF		30	28.33	-11.67	40	31.97	26	1.71	31.35	100	78	P	H
		117.48	24.61	-18.89	43.5	36.07	17.74	2.34	31.54	-	-	P	H
		229.53	23.84	-22.16	46	35.02	17.2	3.03	31.41	-	-	P	H
		855.8	33.5	-12.5	46	30.12	28.73	5.2	30.55	-	-	P	H
		923.7	34.28	-11.72	46	29.91	29.56	5.33	30.52	-	-	P	H
		977.6	35.1	-18.9	54	29.95	30.26	5.4	30.51	-	-	P	H
		38.1	29.39	-10.61	40	37.57	21.56	1.71	31.45	100	178	P	V
		83.73	23.58	-16.42	40	38.79	14.26	2.11	31.58	-	-	P	V
		166.35	22.26	-21.24	43.5	34.83	16.3	2.62	31.49	-	-	P	V
		782.3	31.79	-14.21	46	29.89	27.53	4.98	30.61	-	-	P	V
		893.6	33.25	-12.75	46	29.54	28.96	5.27	30.52	-	-	P	V
		981.8	34.95	-19.05	54	29.66	30.26	5.54	30.51	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		5626	54.33	-13.87	68.2	42.24	34.6	12.61	35.12	254	81	P	H
		5695.8	64.48	-37.62	102.1	52.35	34.6	12.67	35.14	254	81	P	H
		5720	84.48	-26.32	110.8	72.29	34.6	12.73	35.14	254	81	P	H
		5723.8	88.52	-30.94	119.46	76.33	34.6	12.73	35.14	254	81	P	H
	*	5745	116.73	-	-	104.49	34.6	12.79	35.15	254	81	P	H
	*	5745	109.1	-	-	96.86	34.6	12.79	35.15	254	81	A	H
		5643.2	52.97	-15.23	68.2	40.89	34.6	12.61	35.13	202	59	P	V
		5700	60.98	-44.22	105.2	48.85	34.6	12.67	35.14	202	59	P	V
		5718.4	78.46	-31.89	110.35	66.27	34.6	12.73	35.14	202	59	P	V
		5723.8	81.16	-38.3	119.46	68.97	34.6	12.73	35.14	202	59	P	V
	*	5745	112.14	-	-	99.9	34.6	12.79	35.15	202	59	P	V
	*	5745	104.37	-	-	92.13	34.6	12.79	35.15	202	59	A	V

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5631.4	54.13	-14.07	68.2	42.05	34.6	12.61	35.13	260	78	P	H
		5677.4	54.71	-33.81	88.52	42.57	34.6	12.67	35.13	260	78	P	H
		5719.4	63.25	-47.38	110.63	51.06	34.6	12.73	35.14	260	78	P	H
		5722.2	62.35	-53.47	115.82	50.16	34.6	12.73	35.14	260	78	P	H
	*	5785	116.69	-	-	104.4	34.6	12.85	35.16	260	78	P	H
	*	5785	108.84	-	-	96.55	34.6	12.85	35.16	260	78	A	H
		5850.8	59	-61.38	120.38	46.63	34.6	12.94	35.17	260	78	P	H
		5855.6	53.56	-57.07	110.63	41.19	34.6	12.94	35.17	260	78	P	H
		5877.4	53.01	-50.41	103.42	40.57	34.6	13.02	35.18	260	78	P	H
		5930.6	50.31	-17.89	68.2	37.79	34.6	13.11	35.19	260	78	P	H
		5613.8	52.46	-15.74	68.2	40.42	34.6	12.56	35.12	206	56	P	V
		5698.8	52.73	-51.59	104.32	40.6	34.6	12.67	35.14	206	56	P	V
		5711.4	57.25	-51.14	108.39	45.06	34.6	12.73	35.14	206	56	P	V
		5722.2	57.18	-58.64	115.82	44.99	34.6	12.73	35.14	206	56	P	V
	*	5785	114.25	-	-	101.96	34.6	12.85	35.16	206	56	P	V
	*	5785	106.47	-	-	94.18	34.6	12.85	35.16	206	56	A	V
		5852	55.04	-62.6	117.64	42.67	34.6	12.94	35.17	206	56	P	V
		5856.2	53.34	-57.12	110.46	40.97	34.6	12.94	35.17	206	56	P	V
		5881.6	51.07	-49.23	100.3	38.63	34.6	13.02	35.18	206	56	P	V
		5937	51.4	-16.8	68.2	38.89	34.6	13.11	35.2	206	56	P	V

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 165 5825MHz	*	5825	116.02	-	-	103.65	34.6	12.94	35.17	260	74	P	H
	*	5825	108.2	-	-	95.83	34.6	12.94	35.17	260	74	A	H
		5850.4	82.17	-39.12	121.29	69.8	34.6	12.94	35.17	260	74	P	H
		5856	76.55	-33.97	110.52	64.18	34.6	12.94	35.17	260	74	P	H
		5881.6	61.11	-39.19	100.3	48.67	34.6	13.02	35.18	260	74	P	H
		5927.6	50.34	-17.86	68.2	37.82	34.6	13.11	35.19	260	74	P	H
	*	5825	114.41	-	-	102.04	34.6	12.94	35.17	206	56	P	V
	*	5825	106.53	-	-	94.16	34.6	12.94	35.17	206	56	A	V
		5851	81.92	-38	119.92	69.55	34.6	12.94	35.17	206	56	P	V
		5855.4	76.01	-34.68	110.69	63.64	34.6	12.94	35.17	206	56	P	V
		5876	61.25	-43.21	104.46	48.81	34.6	13.02	35.18	206	56	P	V
		5949.6	50.17	-18.03	68.2	37.57	34.6	13.2	35.2	206	56	P	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. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	56.84	-17.16	74	572.36	-500	18.88	34.4	200	135	P	H
		11490	44.92	-9.08	54	560.44	-500	18.88	34.4	200	135	A	H
		17235	52.28	-15.92	68.2	42.27	42.43	23.38	55.8	100	0	P	H
		11490	58.93	-15.07	74	574.45	-500	18.88	34.4	100	355	P	V
		11490	45.65	-8.35	54	561.17	-500	18.88	34.4	100	355	A	V
		17235	54.02	-14.18	68.2	44.01	42.43	23.38	55.8	100	0	P	V
802.11a CH 157 5785MHz		11570	48.12	-25.88	74	47.16	39.2	18.95	57.19	100	0	P	H
		17355	51.74	-16.46	68.2	562.04	-500	23.45	33.75	100	0	P	H
		11570	48.07	-25.93	74	47.11	39.2	18.95	57.19	100	0	P	V
		17355	53.29	-14.91	68.2	43.4	42.24	23.45	55.8	100	0	P	V
802.11a CH 165 5825MHz		11650	49.09	-24.91	74	48.03	39.11	19.03	57.08	100	0	P	H
		17475	51.75	-16.45	68.2	561.81	-500	23.52	33.58	100	0	P	H
		11650	47.95	-26.05	74	46.89	39.11	19.03	57.08	100	0	P	V
		17475	54.03	-14.17	68.2	564.09	-500	23.52	33.58	100	0	P	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. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		5643.8	53.65	-14.55	68.2	41.57	34.6	12.61	35.13	200	85	P	H
		5687.6	65.99	-30.06	96.05	53.86	34.6	12.67	35.14	200	85	P	H
		5719.2	82.29	-28.29	110.58	70.1	34.6	12.73	35.14	200	85	P	H
		5723	86.99	-30.65	117.64	74.8	34.6	12.73	35.14	200	85	P	H
	*	5745	115.7	-	-	103.46	34.6	12.79	35.15	200	85	P	H
	*	5745	107.13	-	-	94.89	34.6	12.79	35.15	200	85	A	H
		5612.4	52.67	-15.53	68.2	40.63	34.6	12.56	35.12	200	58	P	V
		5699.8	64.08	-40.97	105.05	51.95	34.6	12.67	35.14	200	58	P	V
		5718.8	78.71	-31.75	110.46	66.52	34.6	12.73	35.14	200	58	P	V
		5725	85.33	-36.87	122.2	73.14	34.6	12.73	35.14	200	58	P	V
	*	5745	111.9	-	-	99.66	34.6	12.79	35.15	200	58	P	V
	*	5745	103.42	-	-	91.18	34.6	12.79	35.15	200	58	A	V

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		5636.4	53.1	-15.1	68.2	41.02	34.6	12.61	35.13	379	60	P	H
		5695.8	53.2	-48.9	102.1	41.07	34.6	12.67	35.14	379	60	P	H
		5715.8	58.1	-51.53	109.63	45.91	34.6	12.73	35.14	379	60	P	H
		5722.4	57.23	-59.04	116.27	45.04	34.6	12.73	35.14	379	60	P	H
	*	5785	114.93	-	-	102.64	34.6	12.85	35.16	379	60	P	H
	*	5785	106.42	-	-	94.13	34.6	12.85	35.16	379	60	A	H
		5853.6	52.53	-61.46	113.99	40.16	34.6	12.94	35.17	379	60	P	H
		5855	51.6	-59.2	110.8	39.23	34.6	12.94	35.17	379	60	P	H
		5898.2	50.27	-37.72	87.99	37.84	34.6	13.02	35.19	379	60	P	H
		5936.8	50.39	-17.81	68.2	37.88	34.6	13.11	35.2	379	60	P	H
		5636.4	52.04	-16.16	68.2	39.96	34.6	12.61	35.13	200	58	P	V
		5692.4	52.36	-47.24	99.6	40.23	34.6	12.67	35.14	200	58	P	V
		5718.8	54.88	-55.58	110.46	42.69	34.6	12.73	35.14	200	58	P	V
		5723.8	56.48	-62.98	119.46	44.29	34.6	12.73	35.14	200	58	P	V
	*	5785	113.54	-	-	101.25	34.6	12.85	35.16	200	58	P	V
	*	5785	104.89	-	-	92.6	34.6	12.85	35.16	200	58	A	V
		5854.6	56.15	-55.56	111.71	43.78	34.6	12.94	35.17	200	58	P	V
		5866.6	53.2	-54.35	107.55	40.76	34.6	13.02	35.18	200	58	P	V
		5883.6	51.45	-47.36	98.81	39.02	34.6	13.02	35.19	200	58	P	V
		5948.4	50.81	-17.39	68.2	38.21	34.6	13.2	35.2	200	58	P	V

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 165 5825MHz	*	5825	113.67	-	-	101.3	34.6	12.94	35.17	200	65	P	H
	*	5825	105.5	-	-	93.13	34.6	12.94	35.17	200	65	A	H
		5852	79.71	-37.93	117.64	67.34	34.6	12.94	35.17	200	65	P	H
		5855	75.01	-35.79	110.8	62.64	34.6	12.94	35.17	200	65	P	H
		5878.8	59.7	-42.68	102.38	47.26	34.6	13.02	35.18	200	65	P	H
		5929.8	51.13	-17.07	68.2	38.61	34.6	13.11	35.19	200	65	P	H
	*	5825	113.06	-	-	100.69	34.6	12.94	35.17	200	58	P	V
	*	5825	104.43	-	-	92.06	34.6	12.94	35.17	200	58	A	V
		5850	78.42	-43.78	122.2	66.05	34.6	12.94	35.17	200	58	P	V
		5859.2	73.05	-36.57	109.62	60.69	34.6	12.94	35.18	200	58	P	V
		5878	58.76	-44.21	102.97	46.32	34.6	13.02	35.18	200	58	P	V
		5925.4	50.55	-17.65	68.2	38.03	34.6	13.11	35.19	200	58	P	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. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		11490	55.59	-18.41	74	54.78	39.27	18.88	57.34	200	138	P	H
		11490	44.12	-9.88	54	43.31	39.27	18.88	57.34	200	138	A	H
		17235	52.78	-15.42	68.2	42.77	42.43	23.38	55.8	100	0	P	H
		11490	55.61	-18.39	74	54.8	39.27	18.88	57.34	100	350	P	V
		11490	43.92	-10.08	54	43.11	39.27	18.88	57.34	100	350	A	V
		17235	53.52	-14.68	68.2	43.51	42.43	23.38	55.8	100	0	P	V
802.11n HT20 CH 157 5785MHz		11570	47.6	-26.4	74	46.64	39.2	18.95	57.19	100	0	P	H
		17355	52.31	-15.89	68.2	42.42	42.24	23.45	55.8	100	0	P	H
		11570	47.24	-26.76	74	46.28	39.2	18.95	57.19	100	0	P	V
		17355	52.25	-15.95	68.2	42.36	42.24	23.45	55.8	100	0	P	V
802.11n HT20 CH 165 5825MHz		11650	48.03	-25.97	74	46.97	39.11	19.03	57.08	100	0	P	H
		17475	51.72	-16.48	68.2	41.95	42.05	23.52	55.8	100	0	P	H
		11650	49.24	-24.76	74	48.18	39.11	19.03	57.08	100	0	P	V
		17475	52.54	-15.66	68.2	42.77	42.05	23.52	55.8	100	0	P	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. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		5649	62.32	-5.88	68.2	50.24	34.6	12.61	35.13	263	78	P	H
		5699.4	78.54	-26.22	104.76	66.41	34.6	12.67	35.14	263	78	P	H
		5715.2	91.17	-18.29	109.46	78.98	34.6	12.73	35.14	263	78	P	H
		5720.6	91.45	-20.72	112.17	79.26	34.6	12.73	35.14	263	78	P	H
	*	5755	114.82	-	-	102.58	34.6	12.79	35.15	263	78	P	H
	*	5755	105.92	-	-	93.68	34.6	12.79	35.15	263	78	A	H
		5851.2	62.36	-57.1	119.46	49.99	34.6	12.94	35.17	263	78	P	H
		5855.2	63.43	-47.31	110.74	51.06	34.6	12.94	35.17	263	78	P	H
		5879.4	59.26	-42.67	101.93	46.82	34.6	13.02	35.18	263	78	P	H
		5935	51.81	-16.39	68.2	39.3	34.6	13.11	35.2	263	78	P	H
		5648.4	59	-9.2	68.2	46.92	34.6	12.61	35.13	200	58	P	V
		5699.8	75.12	-29.93	105.05	62.99	34.6	12.67	35.14	200	58	P	V
		5720	84.02	-26.78	110.8	71.83	34.6	12.73	35.14	200	58	P	V
		5723.4	85.9	-32.65	118.55	73.71	34.6	12.73	35.14	200	58	P	V
	*	5755	110.63	-	-	98.39	34.6	12.79	35.15	200	58	P	V
	*	5755	101.3	-	-	89.06	34.6	12.79	35.15	200	58	A	V
		5850.8	62.34	-58.04	120.38	49.97	34.6	12.94	35.17	200	58	P	V
		5859.8	62.16	-47.29	109.45	49.8	34.6	12.94	35.18	200	58	P	V
		5877	58.91	-44.8	103.71	46.47	34.6	13.02	35.18	200	58	P	V
		5931	51.66	-16.54	68.2	39.14	34.6	13.11	35.19	200	58	P	V

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 159 5795MHz		5630.8	55.33	-12.87	68.2	43.25	34.6	12.61	35.13	190	74	P	H
		5698.8	65.16	-39.16	104.32	53.03	34.6	12.67	35.14	190	74	P	H
		5716.4	70.18	-39.61	109.79	57.99	34.6	12.73	35.14	190	74	P	H
		5724	74.05	-45.87	119.92	61.86	34.6	12.73	35.14	190	74	P	H
	*	5795	113.69	-	-	101.4	34.6	12.85	35.16	190	74	P	H
	*	5795	104.38	-	-	92.09	34.6	12.85	35.16	190	74	A	H
		5850.2	76.94	-44.8	121.74	64.57	34.6	12.94	35.17	190	74	P	H
		5855.2	77.53	-33.21	110.74	65.16	34.6	12.94	35.17	190	74	P	H
		5878.8	68.75	-33.63	102.38	56.31	34.6	13.02	35.18	190	74	P	H
		5928.2	56.1	-12.1	68.2	43.58	34.6	13.11	35.19	190	74	P	H
		5622.8	52.75	-15.45	68.2	40.66	34.6	12.61	35.12	200	58	P	V
		5700	61.5	-43.7	105.2	49.37	34.6	12.67	35.14	200	58	P	V
		5719	68.47	-42.05	110.52	56.28	34.6	12.73	35.14	200	58	P	V
		5724.8	69.82	-51.92	121.74	57.63	34.6	12.73	35.14	200	58	P	V
	*	5795	110.56	-	-	98.27	34.6	12.85	35.16	200	58	P	V
	*	5795	101.66	-	-	89.37	34.6	12.85	35.16	200	58	A	V
		5850	74.98	-47.22	122.2	62.61	34.6	12.94	35.17	200	58	P	V
		5857.2	74.32	-35.86	110.18	61.95	34.6	12.94	35.17	200	58	P	V
		5876.6	65.59	-38.42	104.01	53.15	34.6	13.02	35.18	200	58	P	V
		5928.8	54.12	-14.08	68.2	41.6	34.6	13.11	35.19	200	58	P	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. 2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n		11510	49.09	-24.91	74	48.17	39.3	18.92	57.3	100	0	P	H
HT40		17265	52.54	-15.66	68.2	42.57	42.37	23.4	55.8	100	0	P	H
CH 151		11510	48.35	-25.65	74	47.43	39.3	18.92	57.3	100	0	P	V
5755MHz		17265	52.66	-15.54	68.2	563.12	-500	23.4	33.86	100	0	P	V
802.11n		11590	46.39	-27.61	74	45.38	39.18	18.99	57.16	100	0	P	H
HT40		17385	51.25	-16.95	68.2	41.39	42.19	23.47	55.8	100	0	P	H
CH 159		11590	47.29	-26.71	74	46.28	39.18	18.99	57.16	100	0	P	V
5795MHz		17385	52.05	-16.15	68.2	42.19	42.19	23.47	55.8	100	0	P	V

Remark

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

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT40 LF		30.27	27.57	-12.43	40	31.21	26	1.71	31.35			P	H
		86.16	19.86	-20.14	40	34.7	14.62	2.11	31.57			P	H
		290.01	24.27	-21.73	46	32.6	19.7	3.28	31.31			P	H
		890.8	33.57	-12.43	46	29.89	28.94	5.27	30.53			P	H
		934.9	34.4	-11.6	46	29.74	29.85	5.33	30.52	100	218	P	H
		964.3	35.16	-18.84	54	30.04	30.23	5.4	30.51			P	H
		39.45	28.61	-11.39	40	37.98	20.4	1.71	31.48			P	V
		56.73	24.56	-15.44	40	41.52	12.93	1.71	31.6			P	V
		66.45	22.74	-17.26	40	39.73	12.49	2.11	31.59			P	V
		864.9	33.72	-12.28	46	30.2	28.79	5.27	30.54			P	V
		920.2	34.64	-11.36	46	30.34	29.49	5.33	30.52	100	77	P	V
		990.2	34.78	-19.22	54	29.47	30.28	5.54	30.51			P	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	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(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. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable 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) + Cable 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

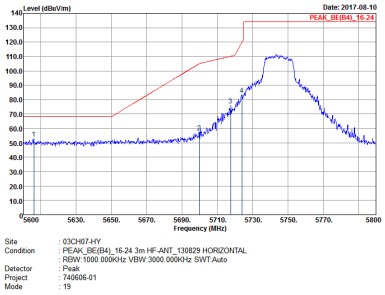
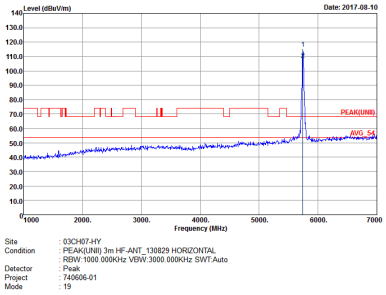
Test Engineer :	Jesse Wang, James Chiu and Potter Liu	**Temperature :**	22~27°C
		Relative Humidity :	50~58%

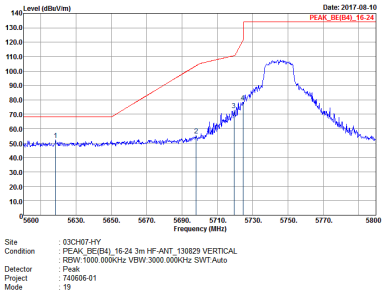
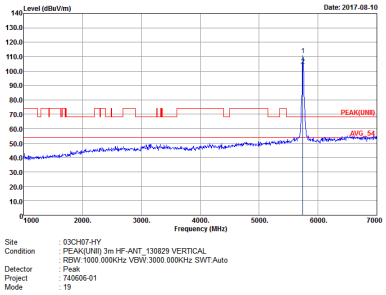
Note symbol

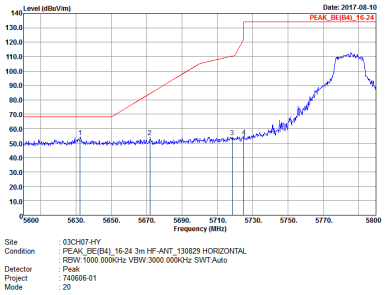
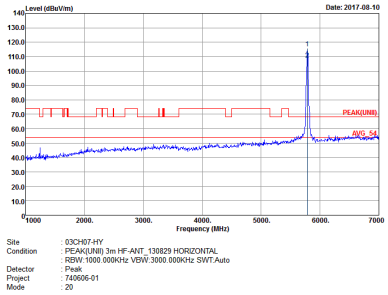
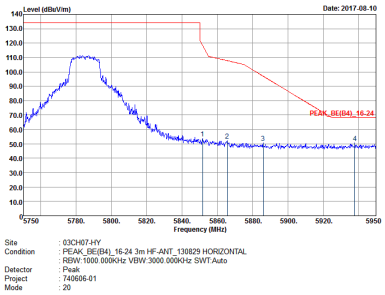
-L	**Low channel location**
-R	**High channel location**

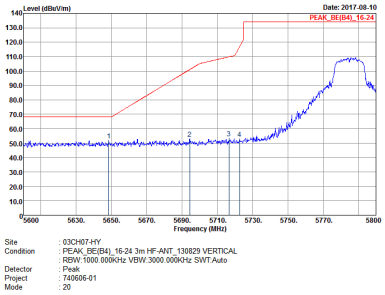
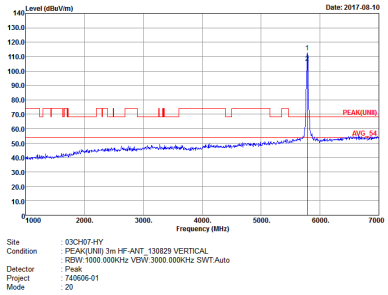
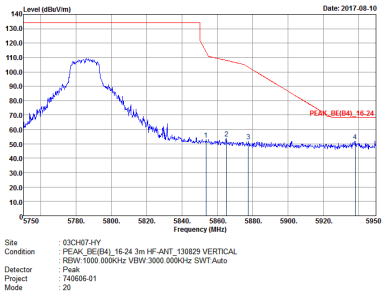
Band 4 - 5725~5850MHz

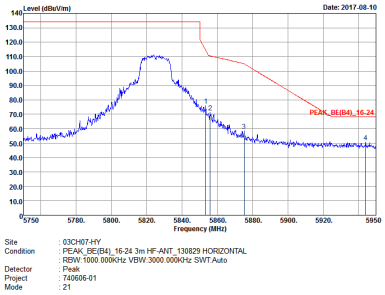
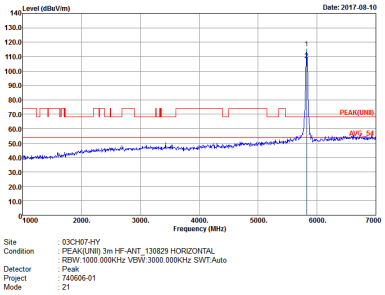
WIFI 802.11a (Band Edge @ 3m)

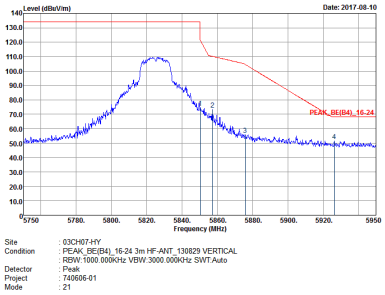
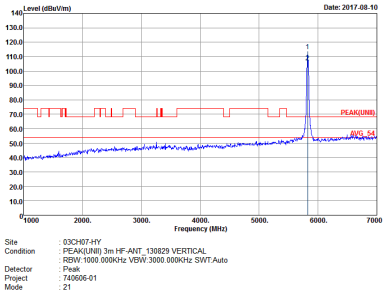
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

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

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

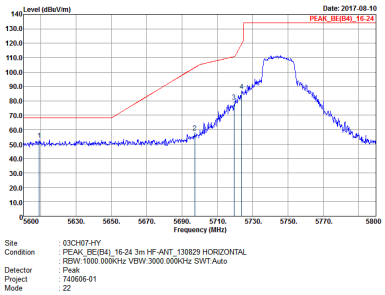
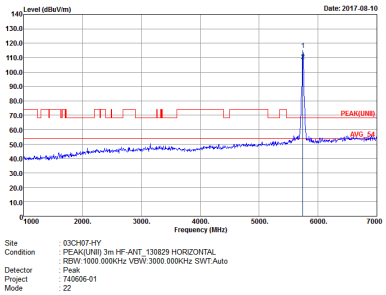
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

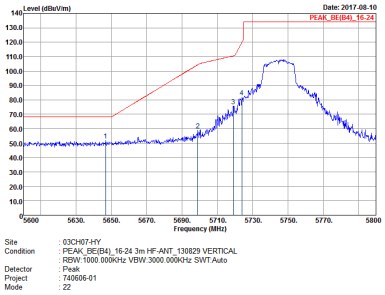
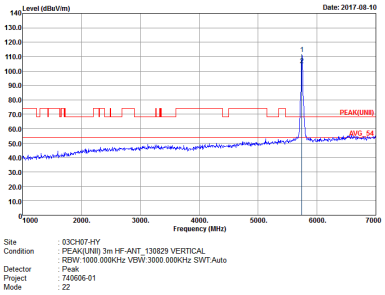
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Fundamental
Peak		

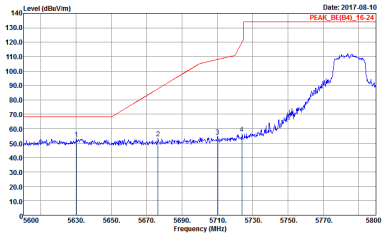
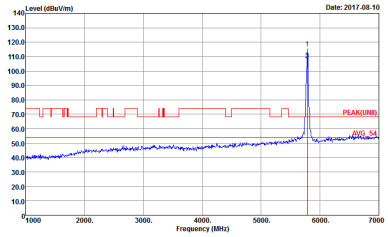
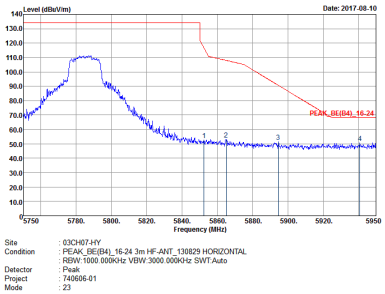
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Vertical	Fundamental
Peak		

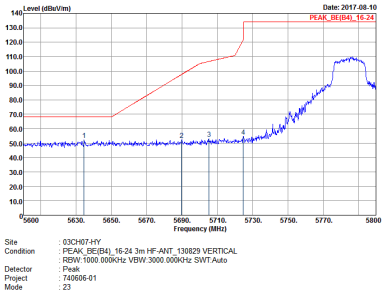
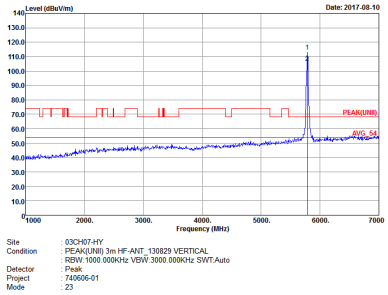
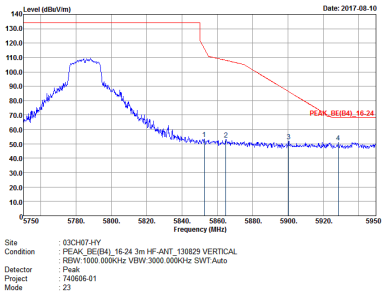
Band 4 5725~5850MHz

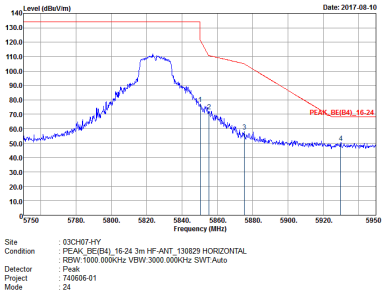
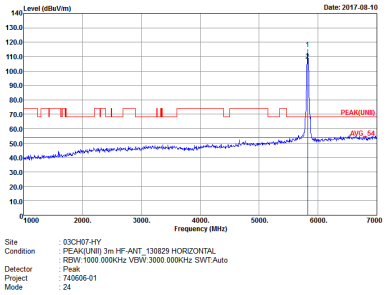
WIFI 802.11n HT20 (Band Edge @ 3m)

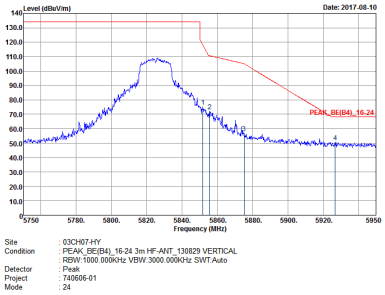
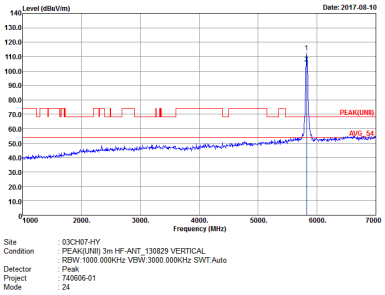
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

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

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

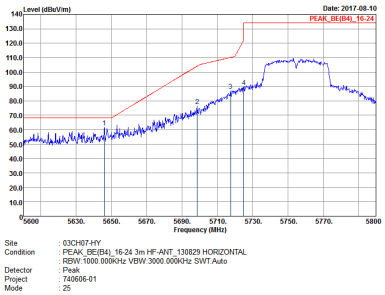
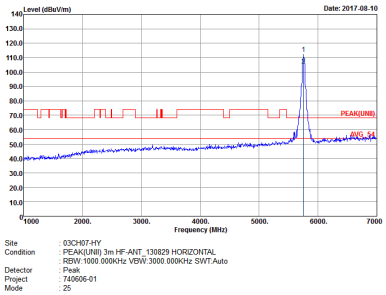
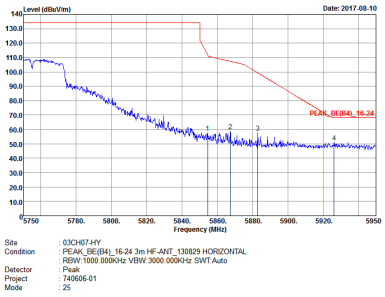
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

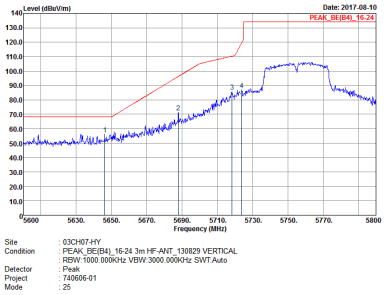
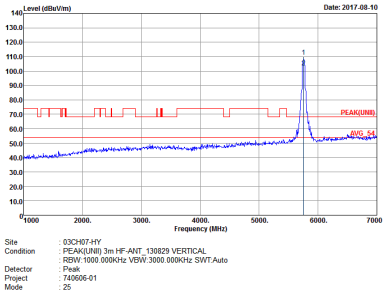
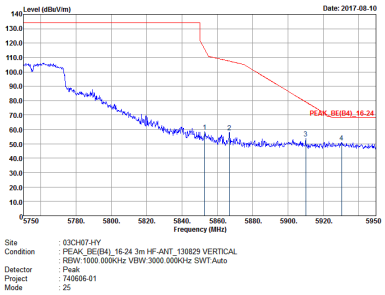
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Fundamental
Peak		

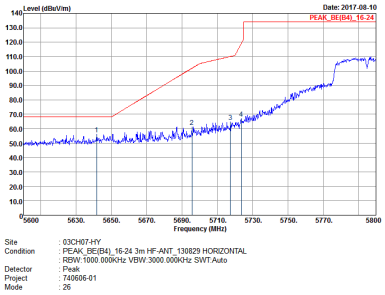
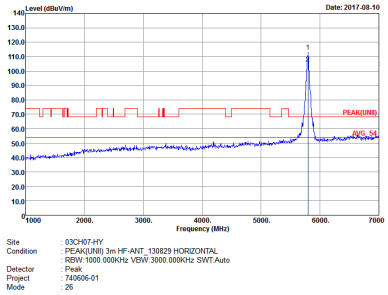
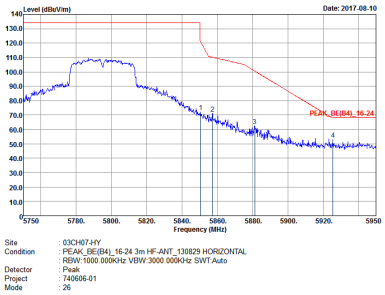
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Vertical	Fundamental
Peak		

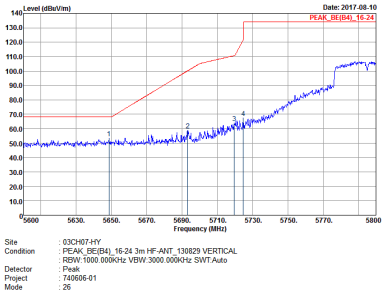
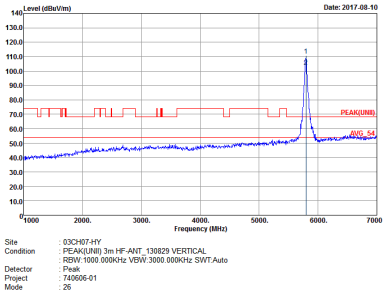
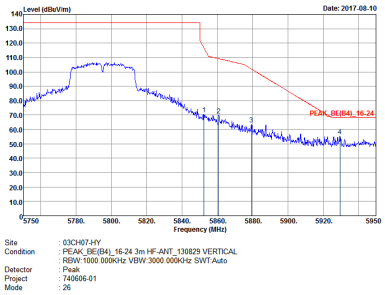
Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

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

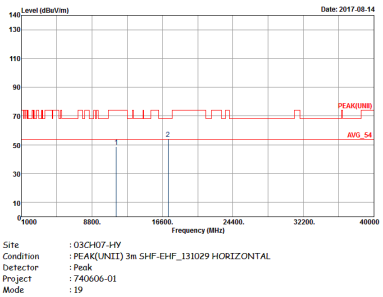
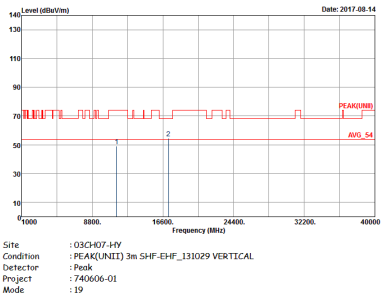
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

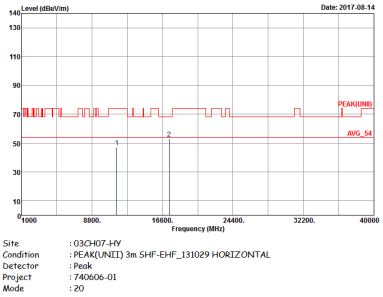
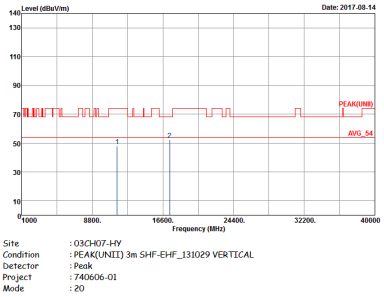
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

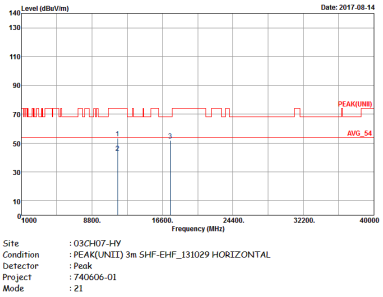
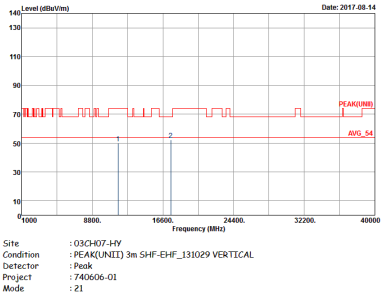
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

Band 4 - 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

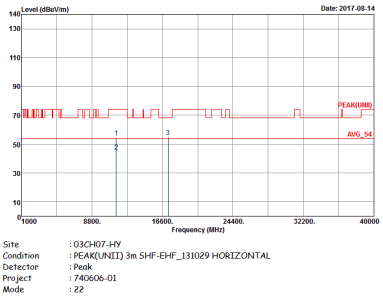
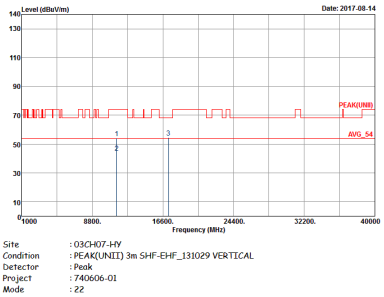
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

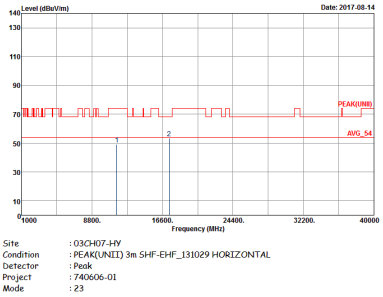
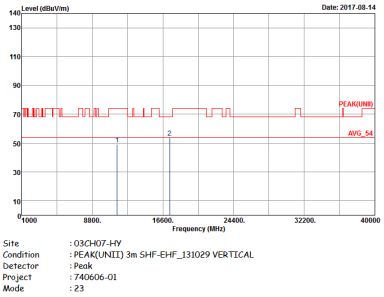
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 	

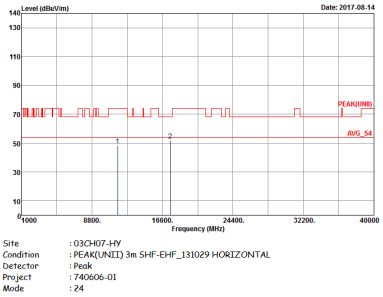
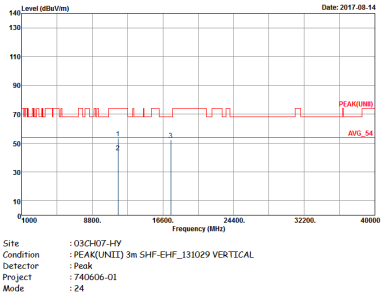
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

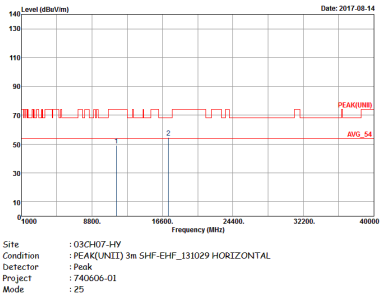
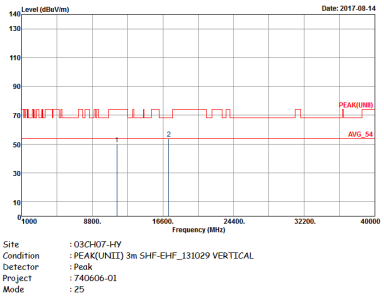
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

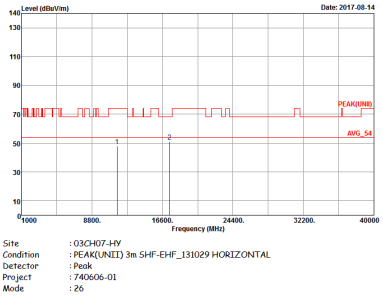
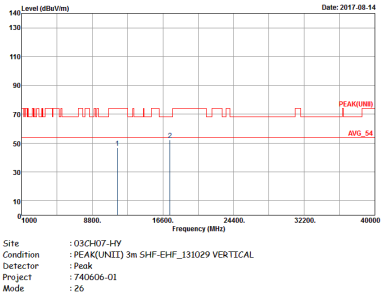
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.		

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

Band 4 5725~5850MHz

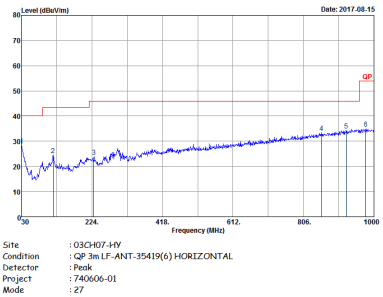
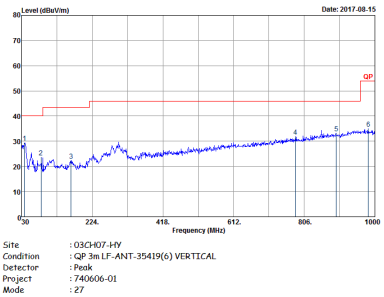
WIFI 802.11n HT40 (Harmonic @ 3m)

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

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

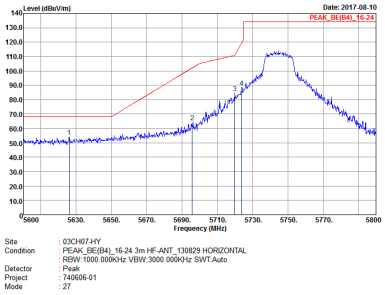
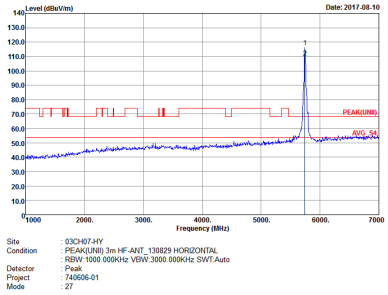
Emission below 1GHz

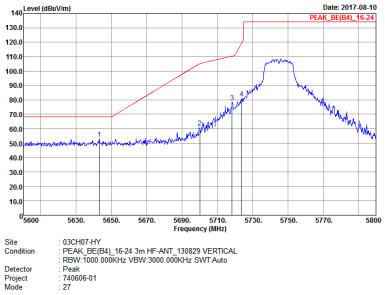
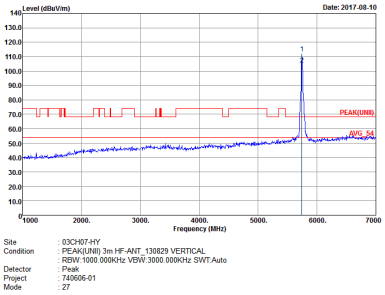
5GHz WIFI 802.11n HT40 (LF)

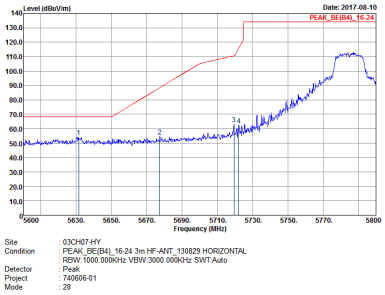
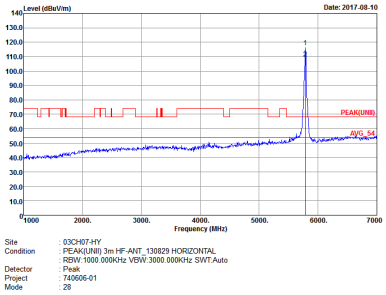
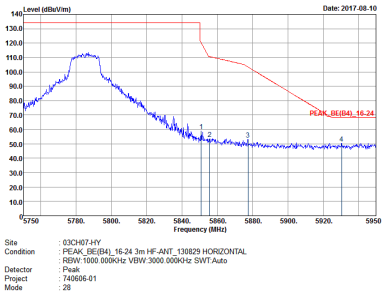
WIFI	5GHz 5725~5850MHz	
ANT	802.11n HT40 LF	
1	Horizontal	Vertical
QP / Peak		

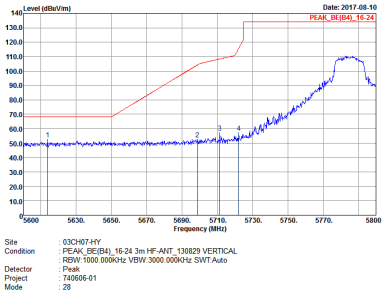
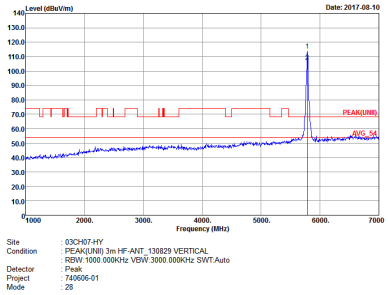
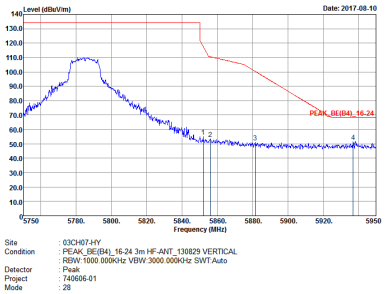
Band 4 - 5725~5850MHz

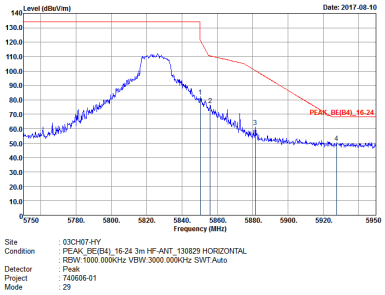
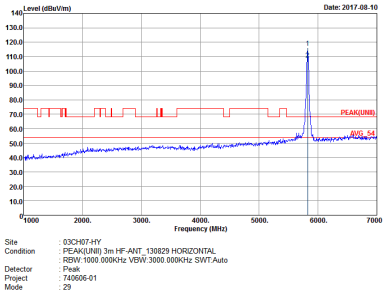
WIFI 802.11a (Band Edge @ 3m)

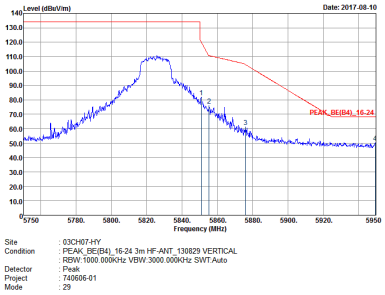
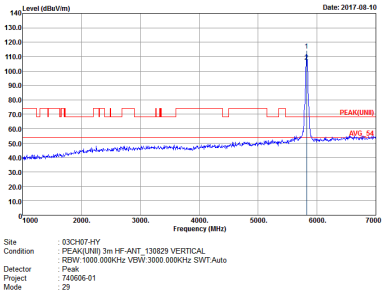
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
2	Horizontal	Fundamental
Peak		

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

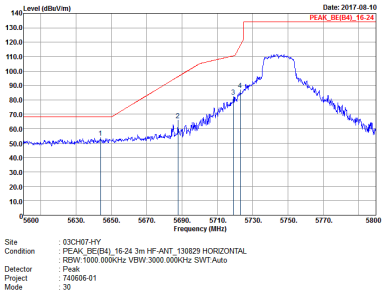
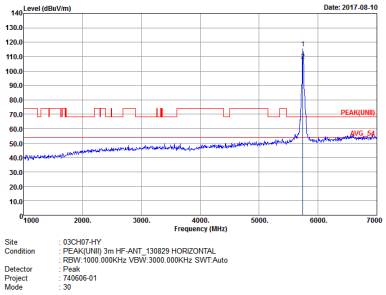
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
2	Horizontal	Fundamental
Peak		
Peak		Left blank

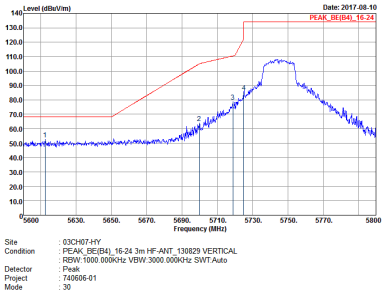
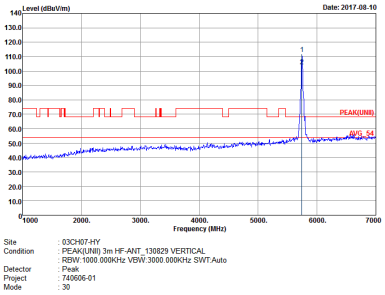
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
2	Vertical	Fundamental
Peak		
Peak		Left blank

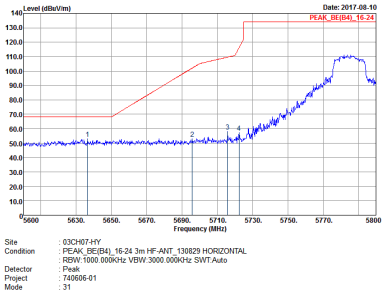
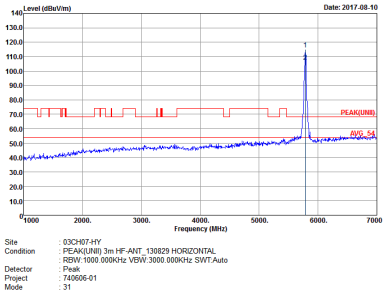
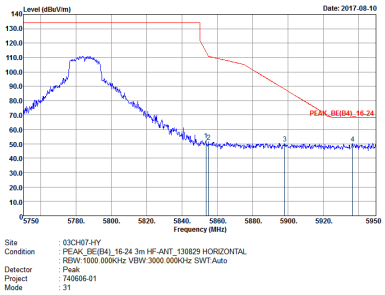
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
2	Horizontal	Fundamental
Peak		

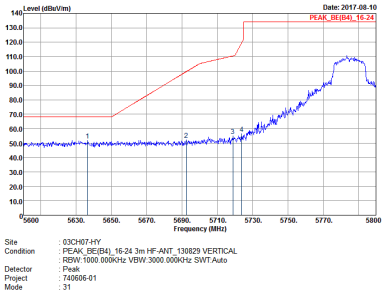
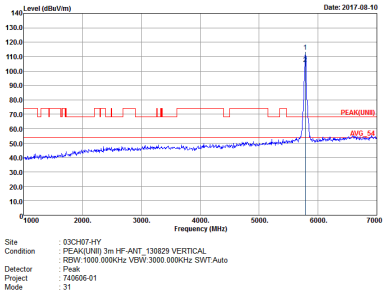
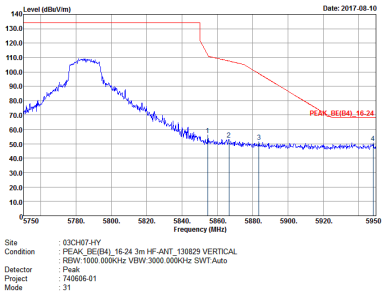
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
2	Vertical	Fundamental
Peak		

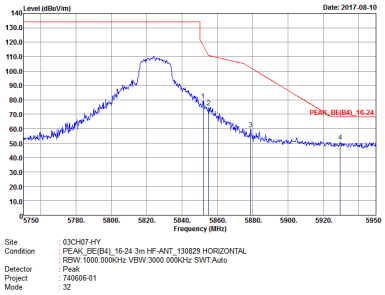
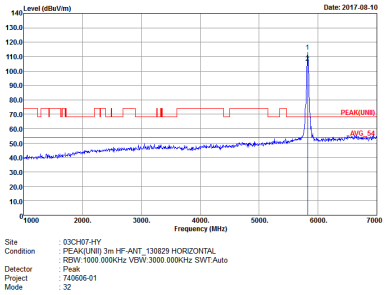
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

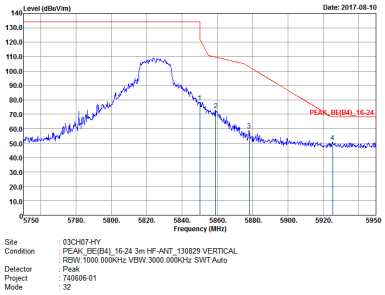
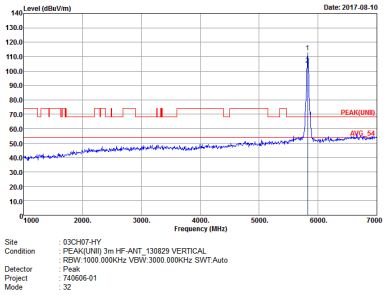
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
2	Horizontal	Fundamental
Peak		

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

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
2	Horizontal	Fundamental
Peak		
Peak		Left blank

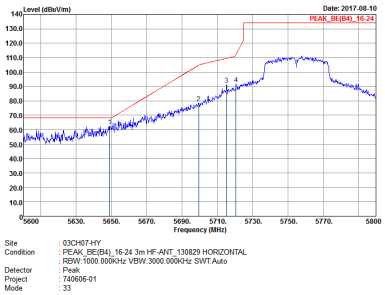
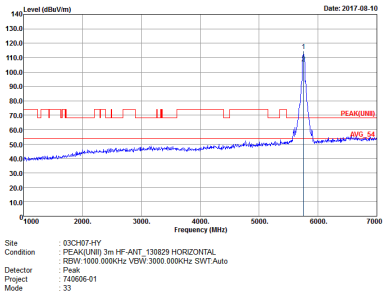
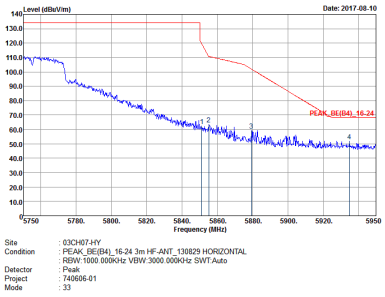
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
2	Vertical	Fundamental
Peak		
Peak		Left blank

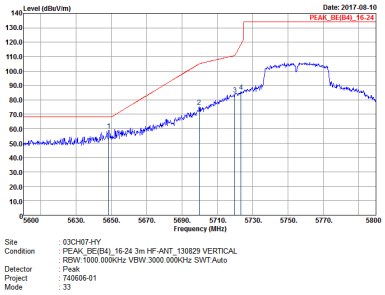
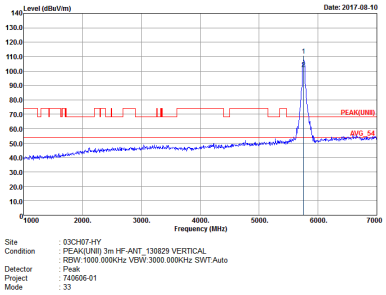
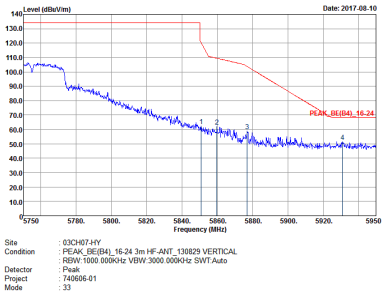
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
2	Horizontal	Fundamental
Peak		

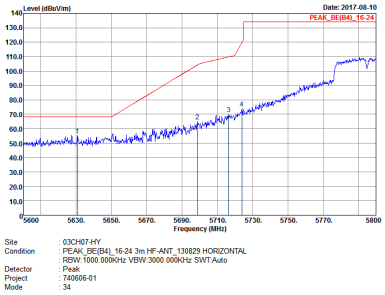
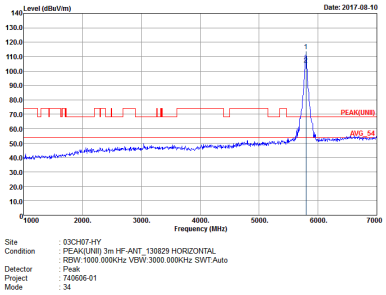
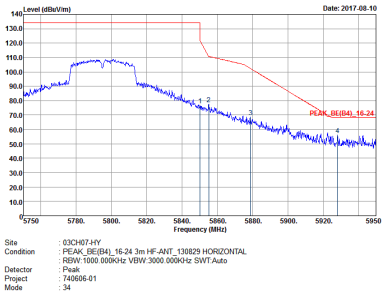
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
2	Vertical	Fundamental
Peak		

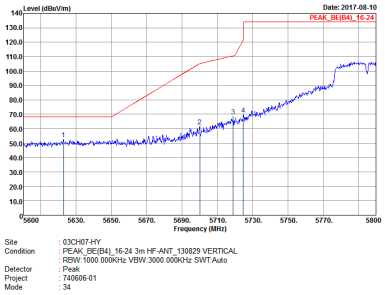
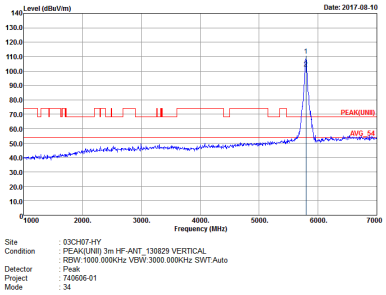
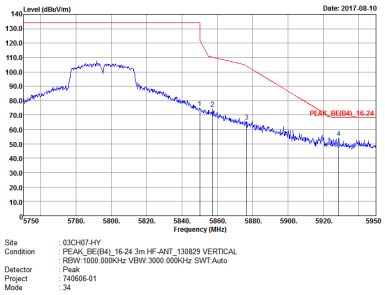
Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

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

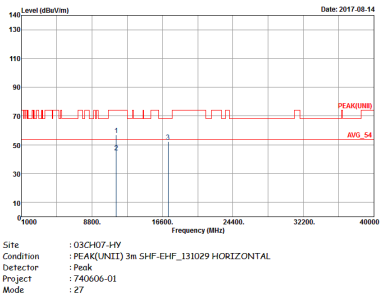
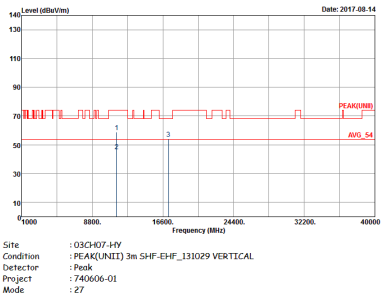
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
2	Vertical	Fundamental
Peak		
Peak		Left blank

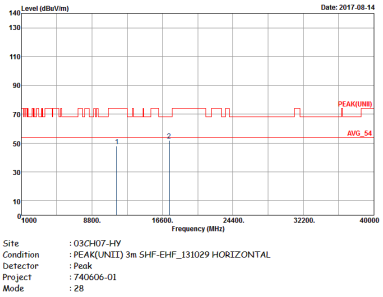
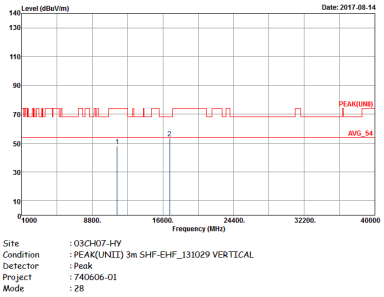
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
2	Horizontal	Fundamental
Peak		
Peak		Left blank

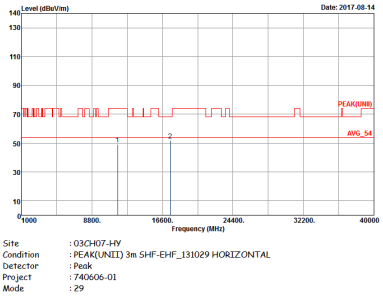
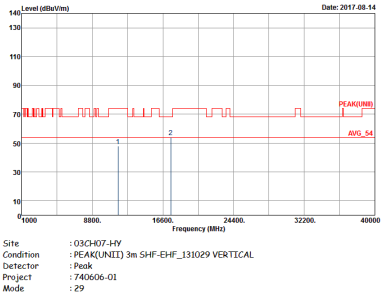
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
2	Vertical	Fundamental
Peak		
Peak		Left blank

Band 4 - 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

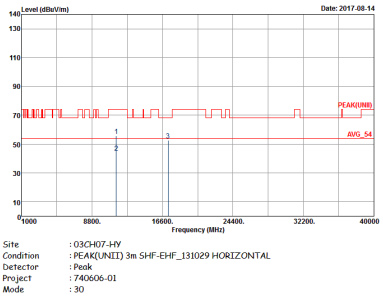
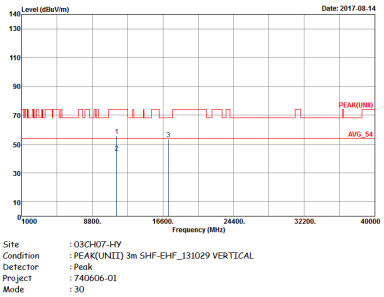
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
2	Horizontal	Vertical
Peak Avg.		

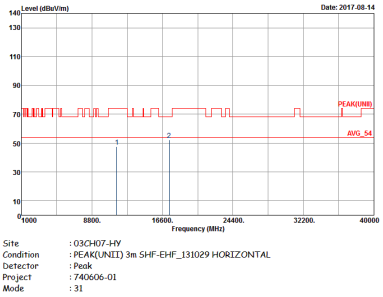
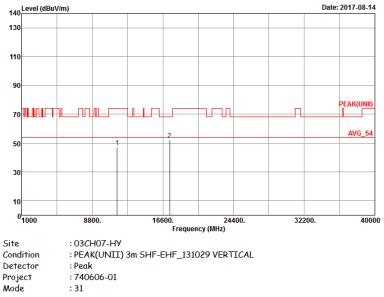
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
2	Horizontal	Vertical
Peak Avg.		

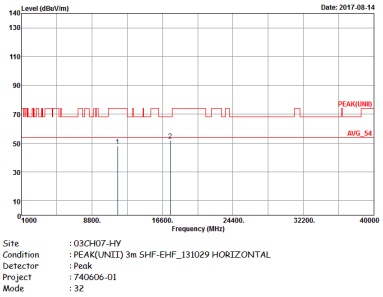
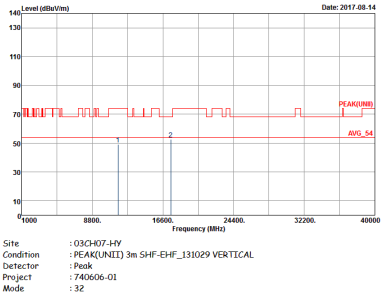
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
2	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

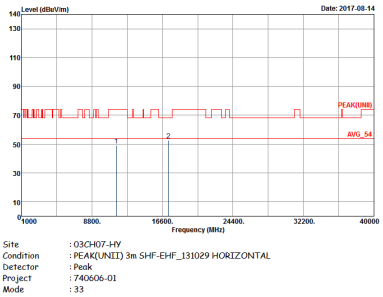
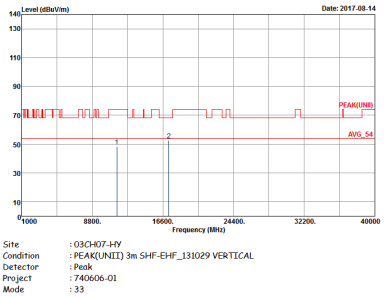
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
2	Horizontal	Vertical
Peak Avg.		

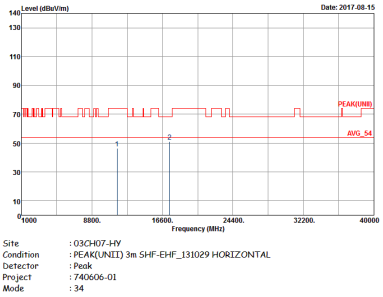
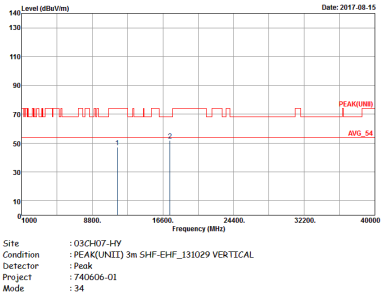
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
2	Horizontal	Vertical
Peak Avg.		

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

Band 4 5725~5850MHz

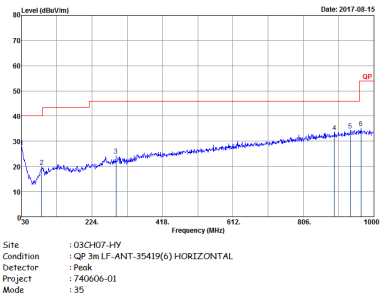
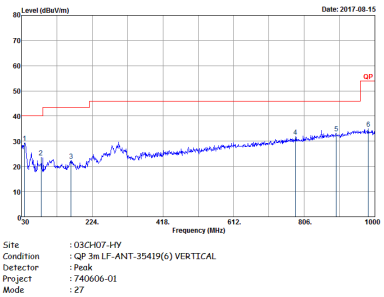
WIFI 802.11n HT40 (Harmonic @ 3m)

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

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

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF)

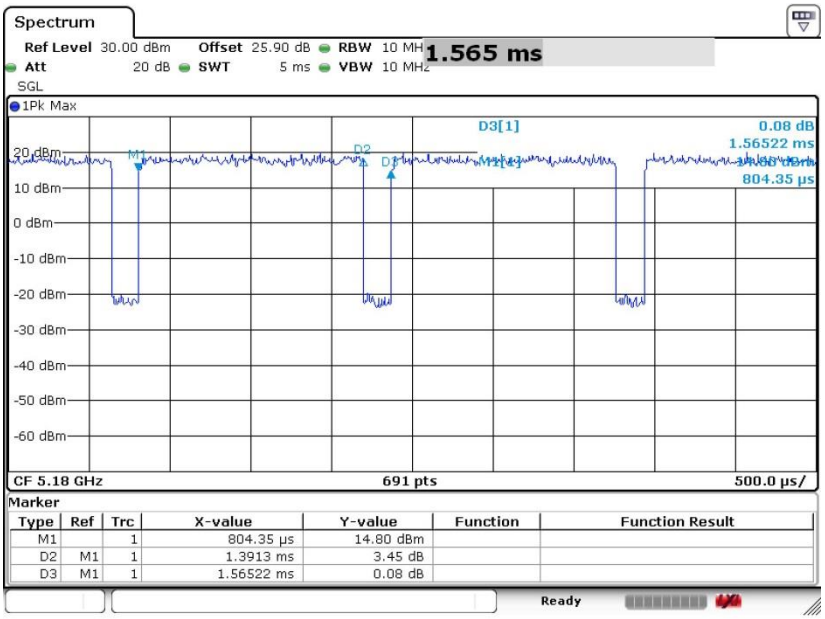
WIFI	5GHz 5725~5850MHz	
ANT	802.11n HT40 LF	
2	Horizontal	Vertical
QP / Peak		

Appendix E. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	802.11a	88.89	1391	0.72	1kHz
2	802.11a	88.89	1391	0.72	
1	5GHz 802.11n HT20	88.19	1298.55	0.77	
2	5GHz 802.11n HT20	88.19	1298.55	0.77	
1	5GHz 802.11n HT40	79.43	649	1.54	3kHz
2	5GHz 802.11n HT40	79.11	645	1.55	

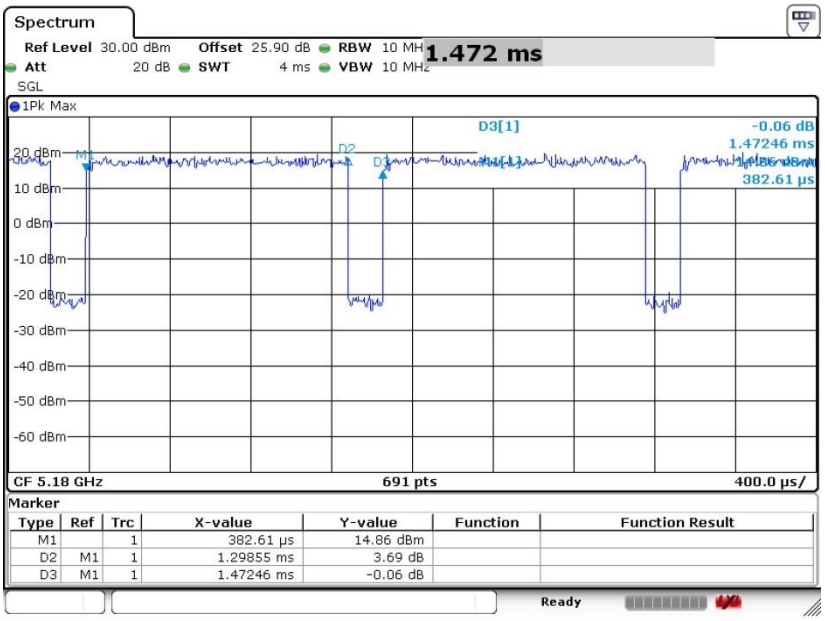
<Ant. 1>

802.11a



Date: 21.JUL.2017 08:48:31

802.11n HT20



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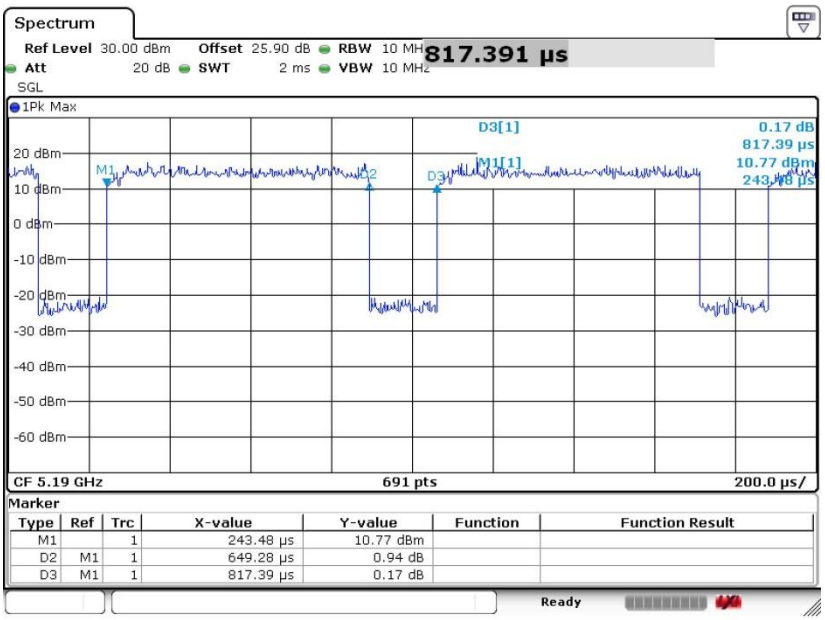
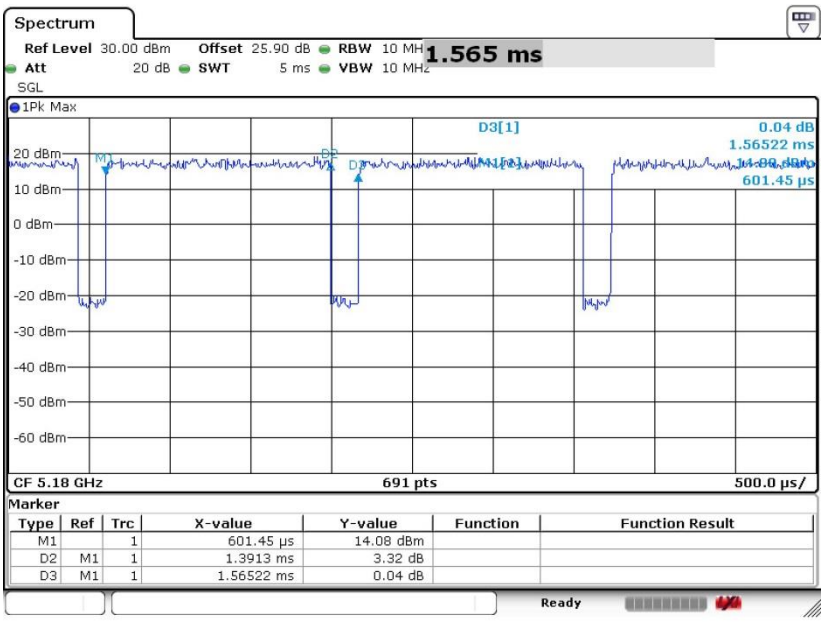
802.11n HT40



Date: 21.JUL.2017 08:54:30

<Ant. 2>

802.11a



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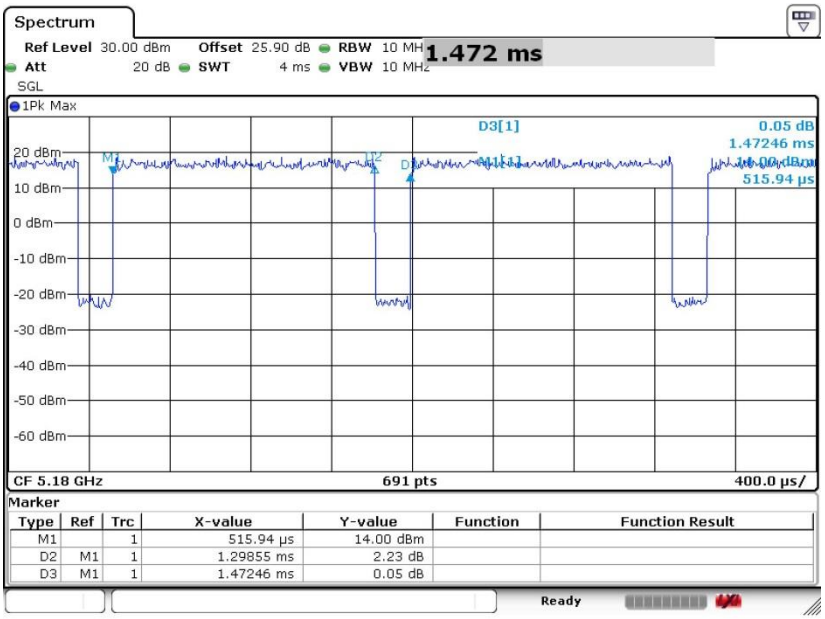
802.11n HT20



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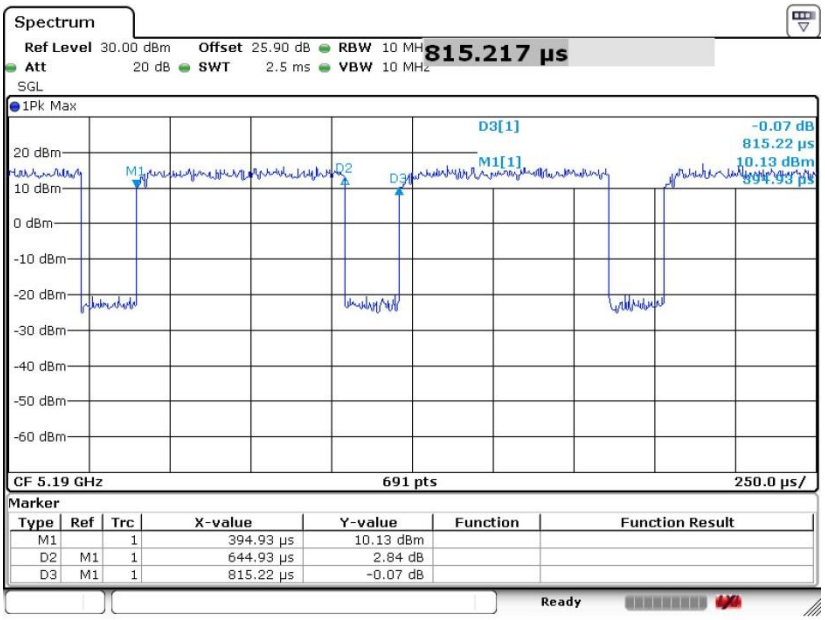
802.11n HT40



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