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
FR740606-01D	Rev. 01	Initial issue of report	Aug. 22, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result
3.1	2.1049 15.403(i)	26dB & 99% Bandwidth	-	Pass
3.2	15.407(a)	Maximum Conducted Output Power	≤ 24 dBm (depend on band)	Pass
3.3	15.407(a)	Power Spectral Density	≤ 11 dBm (depend on band)	Pass
3.4	15.407(b)	Unwanted Emissions	≤ -17, -27 dBm (depend on band)&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	5180 MHz ~ 5240 MHz
Maximum Output Power to Antenna	**<5180 MHz ~ 5240 MHz>** **<Ant. 1>** 802.11a : 20.95 dBm / 0.1245 W 802.11n HT20 : 20.96 dBm / 0.1247 W 802.11n HT40 : 18.70 dBm / 0.0741 W **<Ant. 2>** 802.11a : 19.84 dBm / 0.0964 W 802.11n HT20 : 19.69 dBm / 0.0931 W 802.11n HT40 : 17.71 dBm / 0.0590 W
99% Occupied Bandwidth	**<Ant. 1>** 802.11a : 22.50 MHz 802.11n HT20 : 22.96 MHz 802.11n HT40 : 37.80 MHz **<Ant. 2>** 802.11a : 22.55 MHz 802.11n HT20 : 23.10 MHz 802.11n HT40 : 37.60 MHz
Antenna Type / Gain	**<5180 MHz ~ 5240 MHz>** **Ant. 1 :** Fixed internal Antenna with gain 4.30 dBi **Ant. 2 :** Fixed internal Antenna with gain 5.10 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.**		
	TH05-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)
5150-5250 MHz Band 1 (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	-	-		

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.

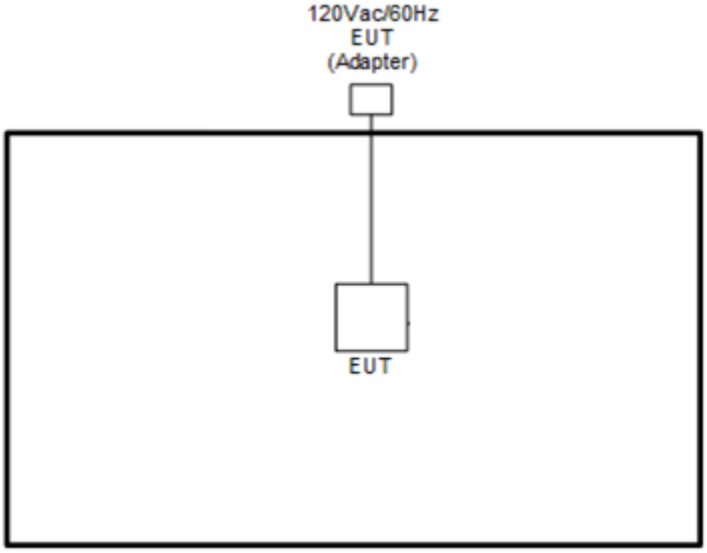
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

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

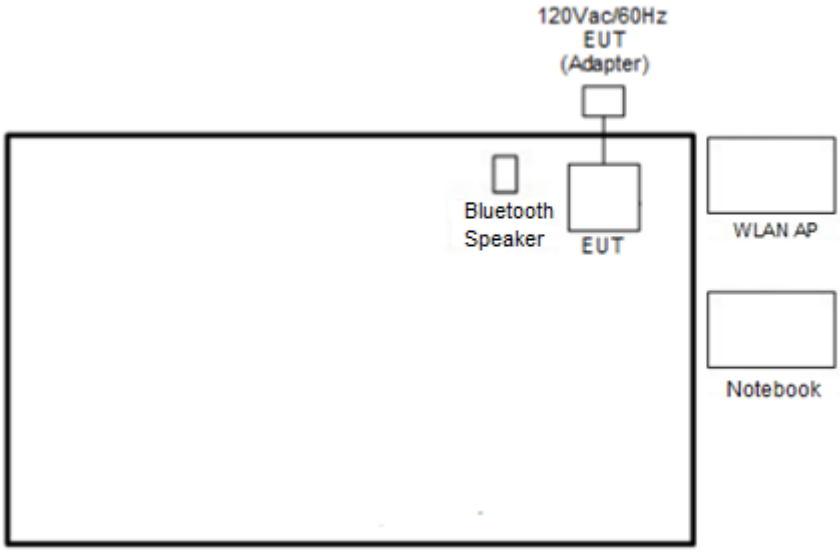
Ch. #		Band I：5150-5250 MHz	Band I：5150-5250 MHz	Band I：5150-5250 MHz
		802.11a	802.11n HT20	802.11n HT40
L	Low	36	36	38
M	Middle	44	44	-
H	High	48	48	46

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 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

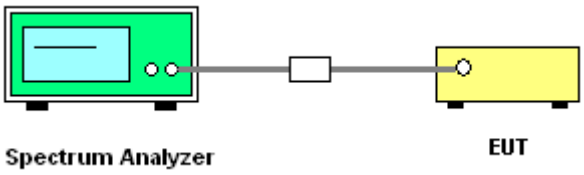
3.1.2 Measuring Instruments

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
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) ≥ 3 * RBW.
8. Measure and record the results in the test report.

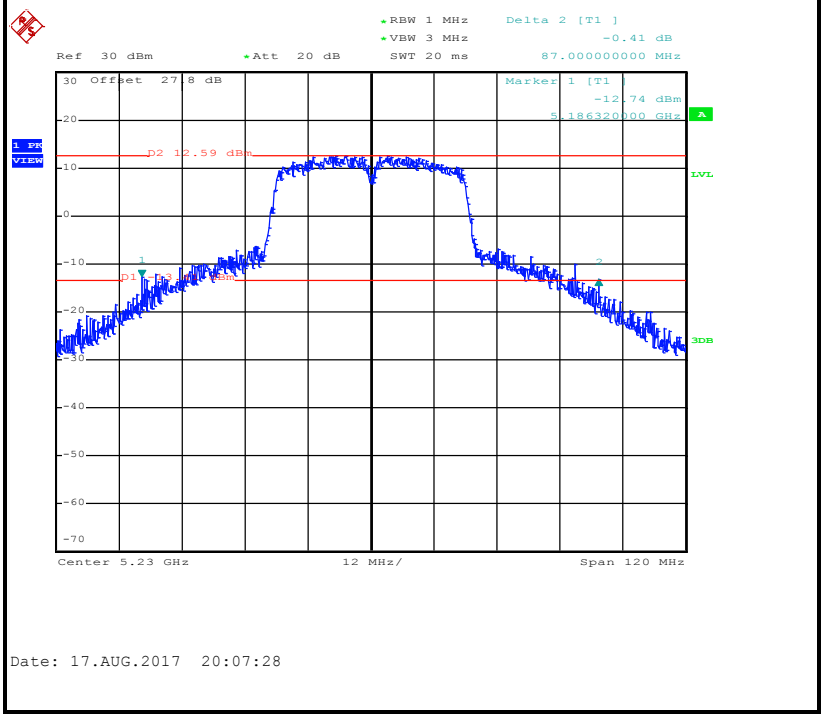
3.1.4 Test Setup



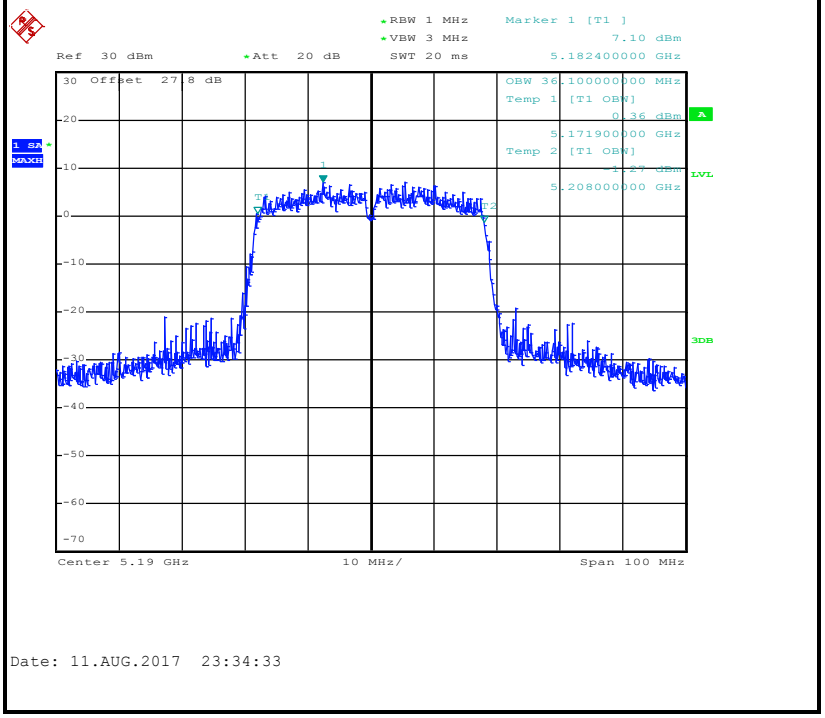
3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.

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

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW.

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.

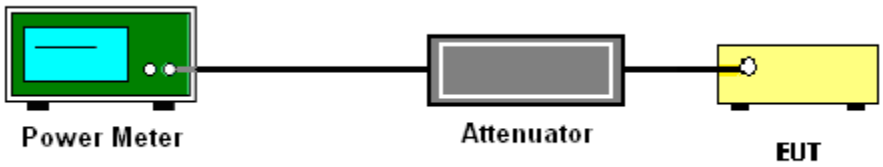
3.2.3 Test Procedures

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

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz 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.

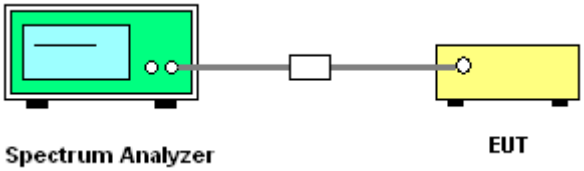
 # Method SA-2 #

(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 = 1 MHz.
- Set VBW ≥ 3 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(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.

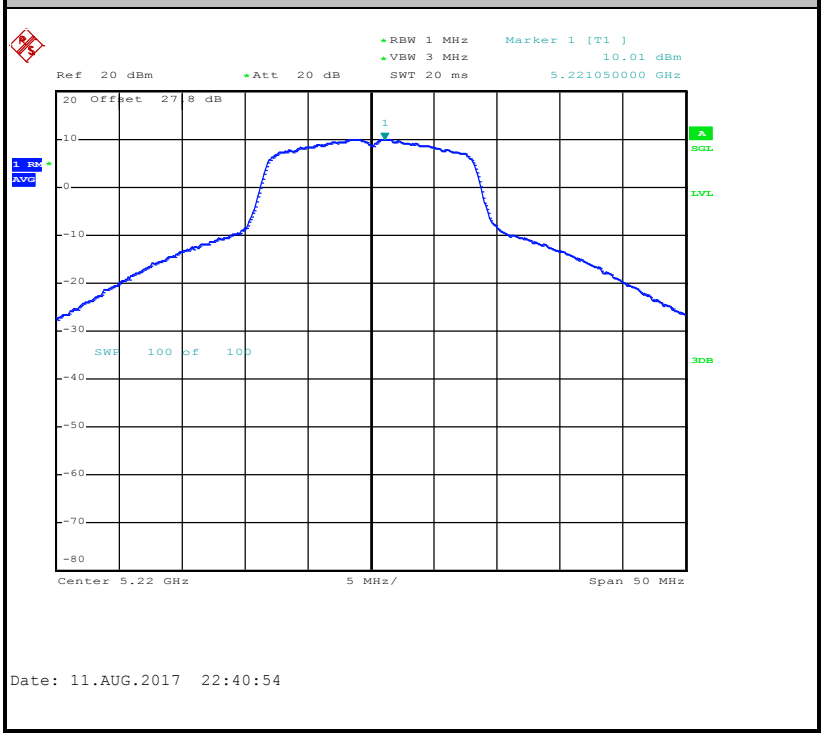
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/MHz)



Note: Average Power Density (dB) = Measured value+ Duty Factor

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 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

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

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

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

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

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

(3) KDB789033 D02 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

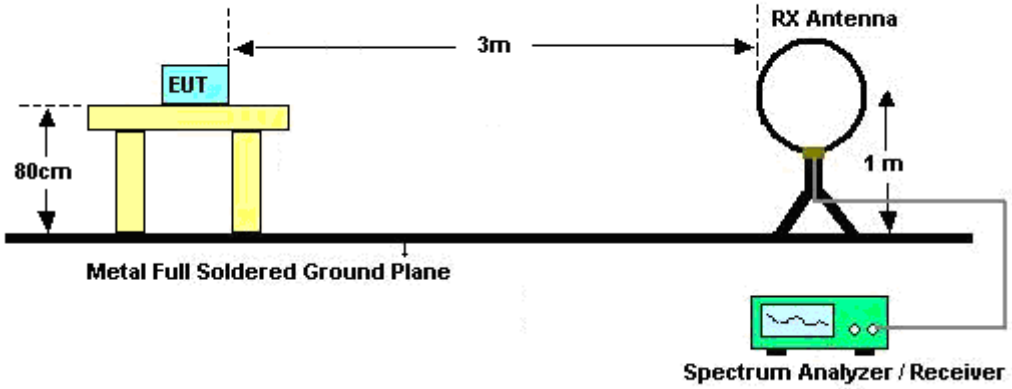
(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

- 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.

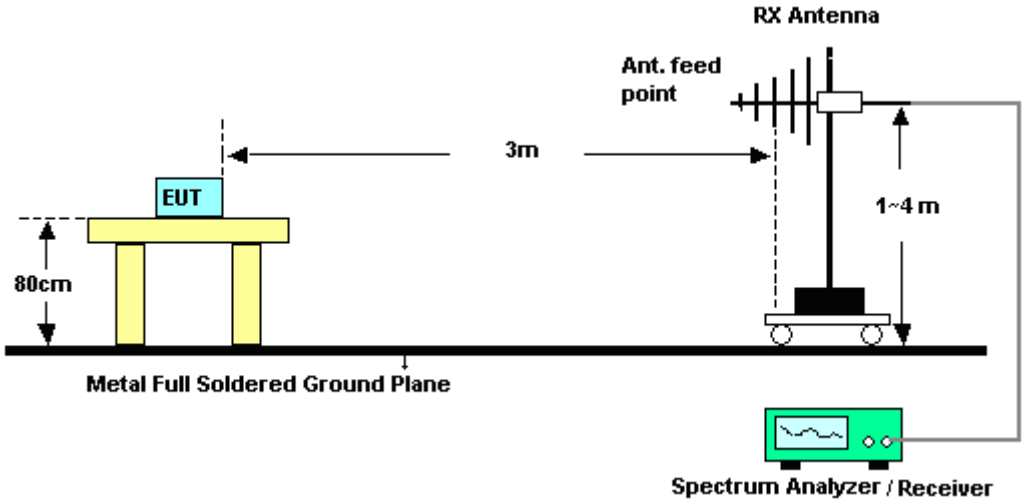
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

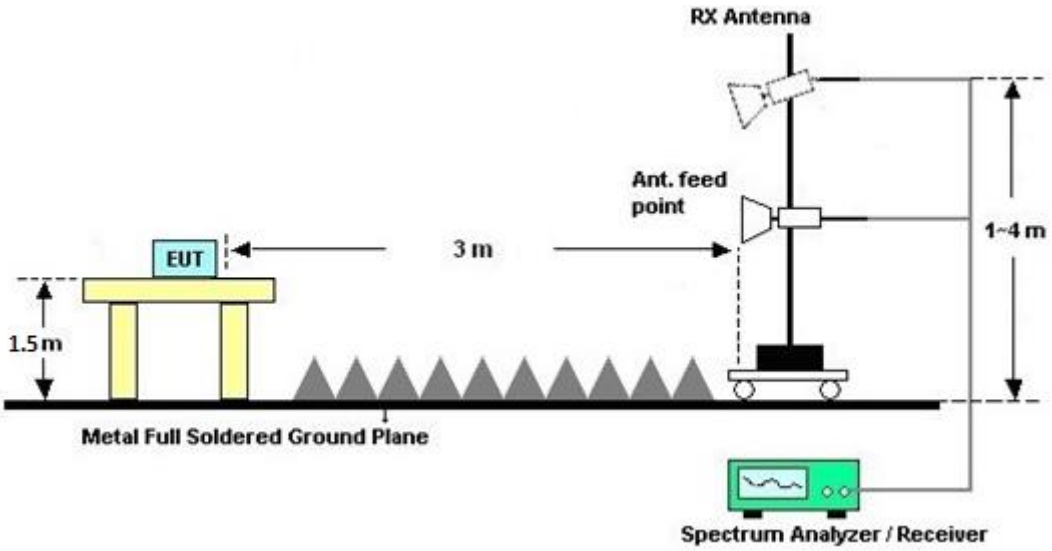
For radiated emissions below 30MHz



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.

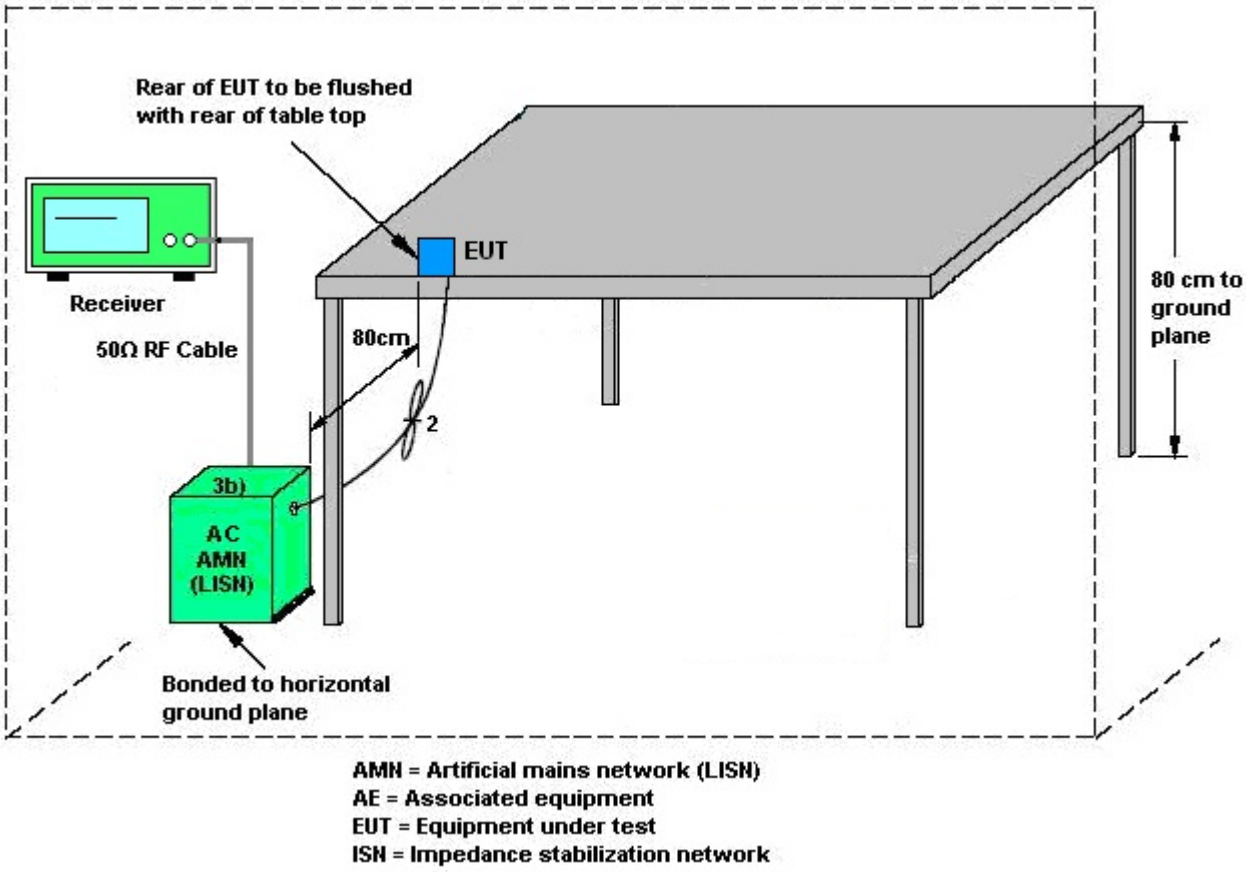
3.5.2 Measuring Instruments

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



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.

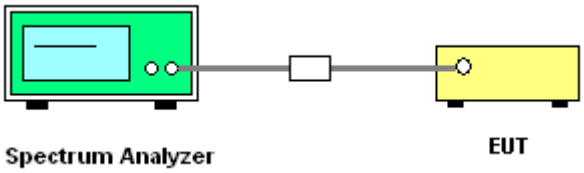
3.6.2 Measuring Instruments

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.

The frequency band 5180-5240MHz which was verified by testing against other standard is less than 20 ppm which is sufficient to maintain the signal within the 5150-5250MHz band.

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.

5180MHz

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:	2017/7/26~2017/8/17	Relative Humidity:	51~54	%

TEST RESULTS DATA
26dB and 99% OBW

Band I														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		IC 99% Bandwidth Power Limit (dBm)		IC 99% Bandwidth EIRP Limit (dBm)			Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	1	36	5180	18.25	18.25	39.60	37.25	-		22.61	22.61		
11a	6Mbps	1	44	5220	22.50	22.55	42.00	44.30	-		23.01	23.01		
11a	6Mbps	1	48	5240	18.60	18.55	38.05	37.70	-		22.70	22.68		
HT20	MCS0	1	36	5180	18.95	18.75	40.26	36.96	-		22.78	22.73		
HT20	MCS0	1	44	5220	22.95	23.10	42.30	45.50	-		23.01	23.01		
HT20	MCS0	1	48	5240	19.45	19.30	40.56	40.56	-		22.89	22.86		
HT40	MCS0	1	38	5190	36.10	36.20	45.72	40.80	-		23.01	23.01		
HT40	MCS0	1	46	5230	37.80	37.60	87.00	78.84	-		23.01	23.01		

Report Number : FR740606-01D

TEST RESULTS DATA
Average Power Table

FCC Band I															
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	36	5180	0.51	0.51	18.30	17.26		21.00	21.00	4.30	5.10		Pass
11a	6Mbps	1	44	5220	0.51	0.51	20.95	19.84		21.00	21.00	4.30	5.10		Pass
11a	6Mbps	1	48	5240	0.51	0.51	18.39	17.22		21.00	21.00	4.30	5.10		Pass
HT20	MCS0	1	36	5180	0.55	0.55	18.37	17.25		21.00	21.00	4.30	5.10		Pass
HT20	MCS0	1	44	5220	0.55	0.55	20.96	19.69		21.00	21.00	4.30	5.10		Pass
HT20	MCS0	1	48	5240	0.55	0.55	18.55	17.27		21.00	21.00	4.30	5.10		Pass
HT40	MCS0	1	38	5190	1.00	1.02	12.65	11.71		21.00	21.00	4.30	5.10		Pass
HT40	MCS0	1	46	5230	1.00	1.02	18.70	17.71		21.00	21.00	4.30	5.10		Pass

Report Number : FR740606-01D

TEST RESULTS DATA
Power Spectral Density

FCC Band I															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)			Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	1	36	5180	0.51	0.51	8.48	7.42		11.00	11.00	4.30	5.10		Pass
11a	6Mbps	1	44	5220	0.51	0.51	10.52	9.59		11.00	11.00	4.30	5.10		Pass
11a	6Mbps	1	48	5240	0.51	0.51	7.75	6.28		11.00	11.00	4.30	5.10		Pass
HT20	MCS0	1	36	5180	0.55	0.55	8.13	7.01		11.00	11.00	4.30	5.10		Pass
HT20	MCS0	1	44	5220	0.55	0.55	10.38	9.55		11.00	11.00	4.30	5.10		Pass
HT20	MCS0	1	48	5240	0.55	0.55	7.66	6.14		11.00	11.00	4.30	5.10		Pass
HT40	MCS0	1	38	5190	1.00	1.02	-0.81	-2.08		11.00	11.00	4.30	5.10		Pass
HT40	MCS0	1	46	5230	1.00	1.02	4.15	3.28		11.00	11.00	4.30	5.10		Pass

Report Number : FR740606-01D

TEST RESULTS DATA
Frequency Stability

Band I										
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	36	5180	5180.050	0.050	9.65	35	120	
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	0	120	
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	20	138	
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	20	102	
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	20	120	

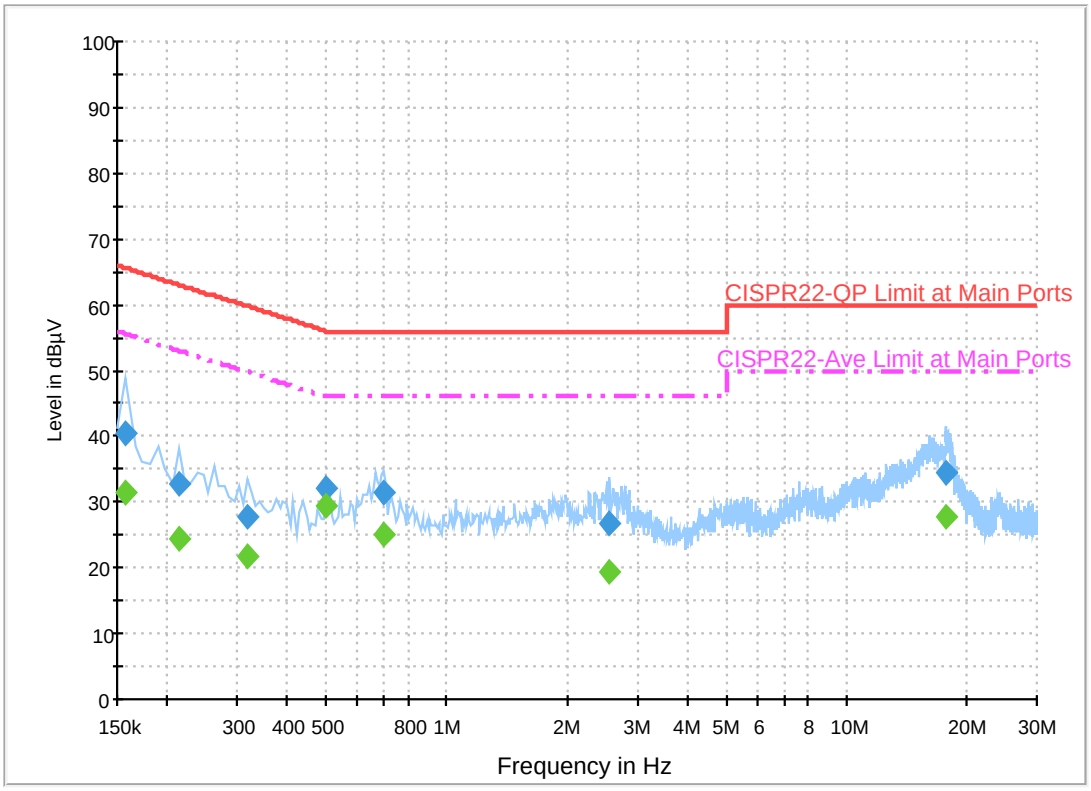
Appendix B. AC Conducted Emission Test Results

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

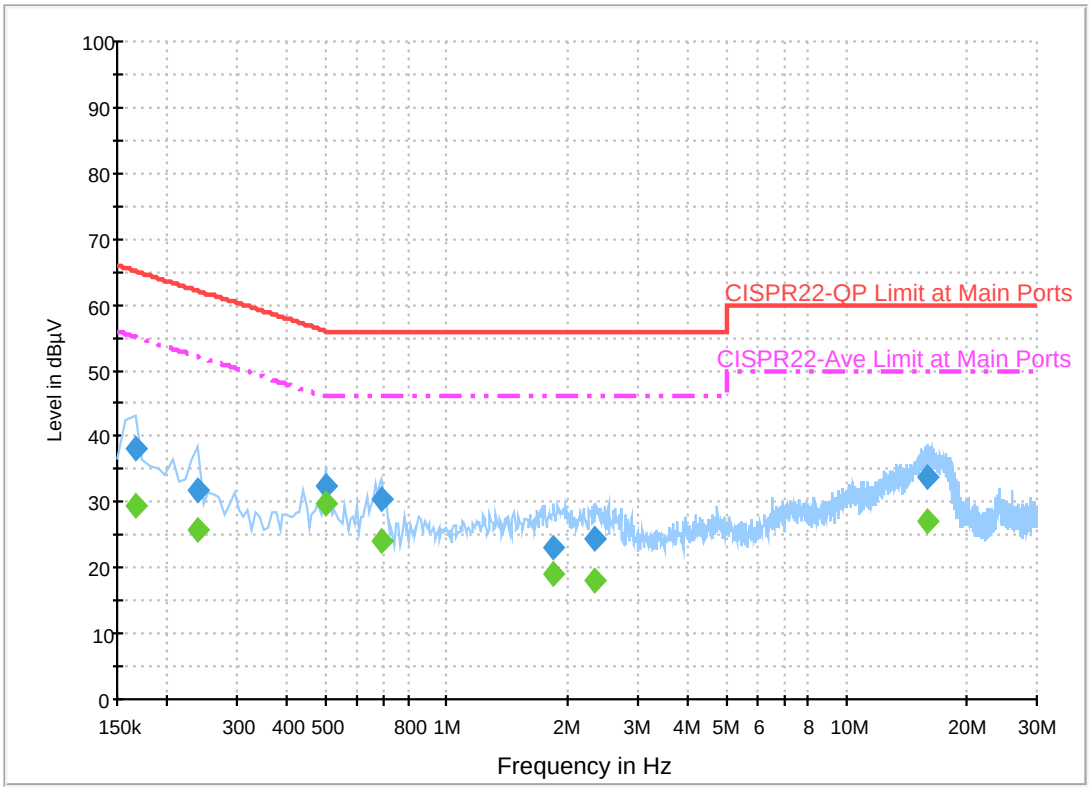
Final Result 2

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 1 - 5150~5250MHz

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 36 5180MHz		5149.5	64.92	-9.08	74	54.32	33.69	11.99	35.08	300	167	P	H
		5149.76	49.23	-4.77	54	38.63	33.69	11.99	35.08	300	167	A	H
	*	5180	110.07	-	-	99.38	33.78	11.99	35.08	300	167	P	H
	*	5180	101.63	-	-	90.94	33.78	11.99	35.08	300	167	A	H
		5148.46	63.02	-10.98	74	52.42	33.69	11.99	35.08	165	190	P	V
		5150	51.2	-2.8	54	40.6	33.69	11.99	35.08	165	190	A	V
	*	5180	111.81	-	-	101.12	33.78	11.99	35.08	165	190	P	V
	*	5180	103.23	-	-	92.54	33.78	11.99	35.08	165	190	A	V
802.11a CH 44 5220MHz		5083.72	50.15	-23.85	74	39.8	33.52	11.9	35.07	343	272	P	H
		5139.88	41	-13	54	30.44	33.69	11.95	35.08	343	272	A	H
	*	5220	112.75	-	-	101.93	33.86	12.04	35.08	343	272	P	H
	*	5220	104.31	-	-	93.49	33.86	12.04	35.08	343	272	A	H
		5372.08	53.86	-20.14	74	42.16	34.25	12.53	35.08	343	272	P	H
		5372.36	45.95	-8.05	54	34.25	34.25	12.53	35.08	343	272	A	H
		5144.3	51.41	-22.59	74	40.81	33.69	11.99	35.08	165	185	P	V
		5139.88	45.5	-8.5	54	34.94	33.69	11.95	35.08	165	185	A	V
	*	5220	111.98	-	-	101.16	33.86	12.04	35.08	165	185	P	V
	*	5220	103.65	-	-	92.83	33.86	12.04	35.08	165	185	A	V
		5371.52	51.44	-22.56	74	39.74	34.25	12.53	35.08	165	185	P	V
		5372.92	42.55	-11.45	54	30.85	34.25	12.53	35.08	165	185	A	V

802.11a CH 48 5240MHz		5105.56	50.24	-23.76	74	39.76	33.6	11.95	35.07	380	270	P	H
		5146.38	41.19	-12.81	54	30.59	33.69	11.99	35.08	380	270	A	H
	*	5240	113.79	-	-	102.8	33.91	12.16	35.08	380	270	P	H
	*	5240	105.51	-	-	94.52	33.91	12.16	35.08	380	270	A	H
		5392.24	52.37	-21.63	74	40.51	34.3	12.65	35.09	380	270	P	H
		5392.24	45.25	-8.75	54	33.39	34.3	12.65	35.09	380	270	A	H
		5149.24	50.46	-23.54	74	39.86	33.69	11.99	35.08	100	185	P	V
		5087.36	41.99	-12.01	54	31.64	33.52	11.9	35.07	100	185	A	V
	*	5240	111.64	-	-	100.65	33.91	12.16	35.08	100	185	P	V
	*	5240	103.34	-	-	92.35	33.91	12.16	35.08	100	185	A	V
		5395.88	51.13	-22.87	74	39.23	34.34	12.65	35.09	100	185	P	V
		5392.24	42.71	-11.29	54	30.85	34.3	12.65	35.09	100	185	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 36 5180MHz		10360	49.85	-24.15	74	52.24	39.09	17.83	59.31	100	0	P	H
		15540	57.29	-16.71	74	50.93	41.07	22.16	56.87	100	225	P	H
		15540	46.37	-7.63	54	40.01	41.07	22.16	56.87	100	225	A	H
		10360	47.47	-26.53	74	49.86	39.09	17.83	59.31	100	0	P	V
		15540	49.2	-24.8	74	42.84	41.07	22.16	56.87			P	V
802.11a CH 44 5220MHz		10440	49.9	-24.1	74	52.09	39.15	17.91	59.25	100	0	P	H
		15660	62.41	-11.59	74	55.59	41.31	22.29	56.78	100	100	P	H
		15660	50.97	-3.03	54	44.15	41.31	22.29	56.78	100	100	A	H
		10440	49.62	-24.38	74	51.81	39.15	17.91	59.25	100	0	P	V
		15660	58.66	-15.34	74	51.84	41.31	22.29	56.78	100	218	P	V
		15660	46.74	-7.26	54	39.92	41.31	22.29	56.78	100	218	A	V
802.11a CH 48 5240MHz		10480	49.91	-24.09	74	51.99	39.19	17.94	59.21	100	0	P	H
		15720	63	-11	74	55.9	41.45	22.37	56.72	100	43	P	H
		15720	50.55	-3.45	54	43.45	41.45	22.37	56.72	100	43	A	H
		10480	49.93	-24.07	74	52.01	39.19	17.94	59.21	100	0	P	V
		15720	58.94	-15.06	74	51.84	41.45	22.37	56.72	100	353	P	V
		15720	48.4	-5.6	54	41.3	41.45	22.37	56.72	100	353	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 36 5180MHz		5149.76	64.66	-9.34	74	54.06	33.69	11.99	35.08	300	200	P	H
		5148.72	53.08	-0.92	54	42.48	33.69	11.99	35.08	300	200	A	H
	*	5180	110.04	-	-	99.35	33.78	11.99	35.08	300	200	P	H
	*	5180	101.3	-	-	90.61	33.78	11.99	35.08	300	200	A	H
		5149.5	65.73	-8.27	74	55.13	33.69	11.99	35.08	206	190	P	V
		5149.76	53.38	-0.62	54	42.78	33.69	11.99	35.08	206	190	A	V
	*	5180	110.97	-	-	100.28	33.78	11.99	35.08	206	190	P	V
	*	5180	102.43	-	-	91.74	33.78	11.99	35.08	206	190	A	V
802.11n HT20 CH 44 5220MHz		5132.34	50.44	-23.56	74	39.92	33.65	11.95	35.08	380	270	P	H
		5140.14	43.22	-10.78	54	32.62	33.69	11.99	35.08	380	270	A	H
	*	5220	111.49	-	-	100.67	33.86	12.04	35.08	380	270	P	H
	*	5220	103.07	-	-	92.25	33.86	12.04	35.08	380	270	A	H
		5372.92	55.45	-18.55	74	43.75	34.25	12.53	35.08	380	270	P	H
		5371.8	46.1	-7.9	54	34.4	34.25	12.53	35.08	380	270	A	H
		5148.98	52.73	-21.27	74	42.13	33.69	11.99	35.08	100	191	P	V
		5140.14	45.45	-8.55	54	34.85	33.69	11.99	35.08	100	191	A	V
	*	5220	112.16	-	-	101.34	33.86	12.04	35.08	100	191	P	V
	*	5220	103.74	-	-	92.92	33.86	12.04	35.08	100	191	A	V
		5372.64	51.07	-22.93	74	39.37	34.25	12.53	35.08	100	191	P	V
		5372.08	43.3	-10.7	54	31.6	34.25	12.53	35.08	100	191	A	V

802.11n HT20 CH 48 5240MHz		5146.38	50.41	-23.59	74	39.81	33.69	11.99	35.08	380	264	P	H
		5150	41.62	-12.38	54	31.02	33.69	11.99	35.08	380	264	A	H
	*	5240	112.93	-	-	101.94	33.91	12.16	35.08	380	264	P	H
	*	5240	105.08	-	-	94.09	33.91	12.16	35.08	380	264	A	H
		5365.64	53.43	-20.57	74	41.73	34.25	12.53	35.08	380	264	P	H
		5391.68	45.51	-8.49	54	33.65	34.3	12.65	35.09	380	264	A	H
		5139.88	50.13	-23.87	74	39.57	33.69	11.95	35.08	100	187	P	V
		5088.14	41.9	-12.1	54	31.55	33.52	11.9	35.07	100	187	A	V
	*	5240	111.44	-	-	100.45	33.91	12.16	35.08	100	187	P	V
	*	5240	103.64	-	-	92.65	33.91	12.16	35.08	100	187	A	V
		5455.52	50.94	-23.06	74	38.93	34.47	12.63	35.09	100	187	P	V
		5391.4	42.65	-11.35	54	30.79	34.3	12.65	35.09	100	187	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 36 5180MHz		10360	48.42	-25.58	74	50.81	39.09	17.83	59.31	100	0	P	H
		15540	57.95	-16.05	74	51.59	41.07	22.16	56.87	100	240	P	H
		15540	45.68	-8.32	54	39.32	41.07	22.16	56.87	100	240	A	H
		10360	47.94	-26.06	74	50.33	39.09	17.83	59.31	100	0	P	V
		15540	49.74	-24.26	74	43.38	41.07	22.16	56.87	100	0	P	V
802.11n HT20 CH 44 5220MHz		10440	49.43	-24.57	74	51.62	39.15	17.91	59.25	100	0	P	H
		15660	62.41	-11.59	74	55.59	41.31	22.29	56.78	100	168	P	H
		15660	51.7	-2.3	54	44.88	41.31	22.29	56.78	100	168	A	H
		10440	49.76	-24.24	74	51.95	39.15	17.91	59.25	100	0	P	V
		15660	57.37	-16.63	74	50.55	41.31	22.29	56.78	100	92	P	V
		15660	47.91	-6.09	54	41.09	41.31	22.29	56.78	100	92	A	V
802.11n HT20 CH 48 5240MHz		10480	49.36	-24.64	74	51.44	39.19	17.94	59.21	100	0	P	H
		15720	61.31	-12.69	74	54.21	41.45	22.37	56.72	100	177	P	H
		15720	50.89	-3.11	54	43.79	41.45	22.37	56.72	100	177	A	H
		10480	49.12	-24.88	74	51.2	39.19	17.94	59.21	100	0	P	V
		15720	57.57	-16.43	74	50.47	41.45	22.37	56.72	100	55	P	V
		15720	47.31	-6.69	54	40.21	41.45	22.37	56.72	100	55	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 38 5190MHz		5149.24	59.92	-14.08	74	49.32	33.69	11.99	35.08	260	193	P	H
		5149.5	52.21	-1.79	54	41.61	33.69	11.99	35.08	260	193	A	H
	*	5190	101.22	-	-	90.48	33.78	12.04	35.08	260	193	P	H
	*	5190	94.51	-	-	83.77	33.78	12.04	35.08	260	193	A	H
		5357.24	51.67	-22.33	74	40.01	34.21	12.53	35.08	260	193	P	H
		5363.4	42.64	-11.36	54	30.94	34.25	12.53	35.08	260	193	A	H
		5149.24	59.67	-14.33	74	49.07	33.69	11.99	35.08	133	194	P	V
		5149.76	51.09	-2.91	54	40.49	33.69	11.99	35.08	133	194	A	V
	*	5190	101.25	-	-	90.51	33.78	12.04	35.08	133	194	P	V
	*	5190	94.1	-	-	83.36	33.78	12.04	35.08	133	194	A	V
		5419.4	50.56	-23.44	74	38.62	34.38	12.65	35.09	133	194	P	V
		5430.32	42.17	-11.83	54	30.2	34.43	12.63	35.09	133	194	A	V
802.11n HT40 CH 46 5230MHz		5134.68	52.41	-21.59	74	41.89	33.65	11.95	35.08	300	275	P	H
		5148.98	43.78	-10.22	54	33.18	33.69	11.99	35.08	300	275	A	H
	*	5230	110.22	-	-	99.23	33.91	12.16	35.08	300	275	P	H
	*	5230	102.42	-	-	91.43	33.91	12.16	35.08	300	275	A	H
		5351.08	58.37	-15.63	74	46.71	34.21	12.53	35.08	300	275	P	H
		5357.24	47.72	-6.28	54	36.06	34.21	12.53	35.08	300	275	A	H
		5148.46	60.81	-13.19	74	50.21	33.69	11.99	35.08	100	190	P	V
		5147.68	49.48	-4.52	54	38.88	33.69	11.99	35.08	100	190	A	V
	*	5230	109.26	-	-	98.27	33.91	12.16	35.08	100	190	P	V
	*	5230	101.46	-	-	90.47	33.91	12.16	35.08	100	190	A	V
		5357.8	56.75	-17.25	74	45.09	34.21	12.53	35.08	100	190	P	V
		5380.48	44.19	-9.81	54	32.33	34.3	12.65	35.09	100	190	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 HT40 CH 38 5190MHz		10380	46.68	-27.32	74	49.03	39.11	17.83	59.29	100	0	P	H
		15570	49.96	-24.04	74	43.46	41.14	22.2	56.84	100	0	P	H
		10380	45.89	-28.11	74	48.24	39.11	17.83	59.29	100	0	P	V
		15570	49.58	-24.42	74	43.08	41.14	22.2	56.84	100	0	P	V
802.11n HT40 CH 46 5230MHz		10460	49.69	-24.31	74	51.86	39.16	17.91	59.24	100	0	P	H
		15690	58.9	-15.1	74	51.94	41.38	22.33	56.75	200	335	P	H
		15690	50.07	-3.93	54	43.11	41.38	22.33	56.75	200	335	A	H
		10460	48.1	-25.9	74	50.27	39.16	17.91	59.24	100	0	P	V
		15690	53.87	-20.13	74	46.91	41.38	22.33	56.75	100	69	P	V
		15690	48.55	-5.45	54	41.59	41.38	22.33	56.75	100	69	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

WIFI 802.11n HT20 (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)
802.11n HT20 LF		30.27	28.93	-11.07	40	32.57	26	1.71	31.35	100	51	P	H
		118.29	24.85	-18.65	43.5	36.26	17.79	2.34	31.54	-	-	P	H
		214.41	23.79	-19.71	43.5	36.16	16.34	2.72	31.43	-	-	P	H
		926.5	34.03	-11.97	46	29.58	29.64	5.33	30.52	-	-	P	H
		965	35.24	-18.76	54	30.12	30.23	5.4	30.51	-	-	P	H
		997.2	35.25	-18.75	54	29.93	30.29	5.54	30.51	-	-	P	H
		39.99	28.99	-11.01	40	38.36	20.4	1.71	31.48	100	22	P	V
		57	24.73	-15.27	40	41.69	12.93	1.71	31.6	-	-	P	V
		115.32	22.8	-20.7	43.5	34.37	17.63	2.34	31.54	-	-	P	V
		852.3	33.55	-12.45	46	30.18	28.72	5.2	30.55	-	-	P	V
		920.2	34.48	-11.52	46	30.18	29.49	5.33	30.52	-	-	P	V
		970.6	34.91	-19.09	54	29.78	30.24	5.4	30.51	-	-	P	V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Band 1 - 5150~5250MHz

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 36 5180MHz		5150	57.98	-16.02	74	47.38	33.69	11.99	35.08	360	85	P	H
		5150	49.92	-4.08	54	39.32	33.69	11.99	35.08	360	85	A	H
	*	5180	110.84	-	-	100.15	33.78	11.99	35.08	360	85	P	H
	*	5180	103.22	-	-	92.53	33.78	11.99	35.08	360	85	A	H
		5149.76	60.85	-13.15	74	50.25	33.69	11.99	35.08	100	174	P	V
		5149.76	50.95	-3.05	54	40.35	33.69	11.99	35.08	100	174	A	V
	*	5180	109.58	-	-	98.89	33.78	11.99	35.08	100	174	P	V
	*	5180	102.31	-	-	91.62	33.78	11.99	35.08	100	174	A	V
802.11a CH 44 5220MHz		5149.76	50.61	-23.39	74	40.01	33.69	11.99	35.08	303	86	P	H
		5140.14	43.07	-10.93	54	32.47	33.69	11.99	35.08	303	86	A	H
	*	5220	113.33	-	-	102.51	33.86	12.04	35.08	303	86	P	H
	*	5220	105.83	-	-	95.01	33.86	12.04	35.08	303	86	A	H
		5372.92	53.24	-20.76	74	41.54	34.25	12.53	35.08	303	86	P	H
		5372.64	45.43	-8.57	54	33.73	34.25	12.53	35.08	303	86	A	H
		5140.14	52.38	-21.62	74	41.78	33.69	11.99	35.08	100	189	P	V
		5140.14	44.7	-9.3	54	34.1	33.69	11.99	35.08	100	189	A	V
	*	5220	111.53	-	-	100.71	33.86	12.04	35.08	100	189	P	V
	*	5220	104.33	-	-	93.51	33.86	12.04	35.08	100	189	A	V
		5446.56	50.83	-23.17	74	38.82	34.47	12.63	35.09	100	189	P	V
		5372.36	42.44	-11.56	54	30.74	34.25	12.53	35.08	100	189	A	V

802.11a CH 48 5240MHz		5127.14	50.66	-23.34	74	40.14	33.65	11.95	35.08	300	86	P	H
		5148.2	41.29	-12.71	54	30.69	33.69	11.99	35.08	300	86	A	H
	*	5240	113.91	-	-	102.92	33.91	12.16	35.08	300	86	P	H
	*	5240	106.02	-	-	95.03	33.91	12.16	35.08	300	86	A	H
		5365.64	53.23	-20.77	74	41.53	34.25	12.53	35.08	300	86	P	H
		5392.24	45.79	-8.21	54	33.93	34.3	12.65	35.09	300	86	A	H
		5075.4	50.56	-23.44	74	40.21	33.52	11.9	35.07	100	189	P	V
		5147.94	41.66	-12.34	54	31.06	33.69	11.99	35.08	100	189	A	V
	*	5240	112.16	-	-	101.17	33.91	12.16	35.08	100	189	P	V
	*	5240	104.34	-	-	93.35	33.91	12.16	35.08	100	189	A	V
		5365.64	50.36	-23.64	74	38.66	34.25	12.53	35.08	100	189	P	V
		5391.96	42.57	-11.43	54	30.71	34.3	12.65	35.09	100	189	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 36 5180MHz		10360	47.37	-26.63	74	49.76	39.09	17.83	59.31	100	0	P	H
		15540	49.64	-24.36	74	43.28	41.07	22.16	56.87	100	0	P	H
		10360	46.55	-27.45	74	48.94	39.09	17.83	59.31	100	0	P	V
		15540	49.63	-24.37	74	43.27	41.07	22.16	56.87	100	0	P	V
802.11a CH 44 5220MHz		10440	49.39	-24.61	74	51.58	39.15	17.91	59.25	100	0	P	H
		15660	49.75	-24.25	74	42.93	41.31	22.29	56.78	100	0	P	H
		10440	49.01	-24.99	74	51.2	39.15	17.91	59.25	100	0	P	V
		15660	54.03	-19.97	74	47.21	41.31	22.29	56.78	100	159	P	V
		15660	46.44	-7.56	54	39.62	41.31	22.29	56.78	100	159	A	V
802.11a CH 48 5240MHz		10480	48.89	-25.11	74	50.97	39.19	17.94	59.21	100	0	P	H
		15720	49.46	-24.54	74	42.36	41.45	22.37	56.72	100	0	P	H
		10480	48.75	-25.25	74	50.83	39.19	17.94	59.21	100	0	P	V
		15720	49.66	-24.34	74	42.56	41.45	22.37	56.72	100	0	P	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 36 5180MHz		5150	61.99	-12.01	74	51.39	33.69	11.99	35.08	360	85	P	H
		5149.76	50.4	-3.6	54	39.8	33.69	11.99	35.08	360	85	A	H
	*	5180	110.93	-	-	100.24	33.78	11.99	35.08	360	85	P	H
	*	5180	103.16	-	-	92.47	33.78	11.99	35.08	360	85	A	H
		5150	64.08	-9.92	74	53.48	33.69	11.99	35.08	100	172	P	V
		5149.5	52.12	-1.88	54	41.52	33.69	11.99	35.08	100	172	A	V
	*	5180	109.54	-	-	98.85	33.78	11.99	35.08	100	172	P	V
	*	5180	102.06	-	-	91.37	33.78	11.99	35.08	100	172	A	V
802.11n HT20 CH 44 5220MHz		5144.82	50.95	-23.05	74	40.35	33.69	11.99	35.08	304	86	P	H
		5139.88	42.79	-11.21	54	32.23	33.69	11.95	35.08	304	86	A	H
	*	5220	112.97	-	-	102.15	33.86	12.04	35.08	304	86	P	H
	*	5220	105.46	-	-	94.64	33.86	12.04	35.08	304	86	A	H
		5372.36	52.96	-21.04	74	41.26	34.25	12.53	35.08	304	86	P	H
		5372.08	45.5	-8.5	54	33.8	34.25	12.53	35.08	304	86	A	H
		5145.34	52.56	-21.44	74	41.96	33.69	11.99	35.08	100	171	P	V
		5139.88	44.89	-9.11	54	34.33	33.69	11.95	35.08	100	171	A	V
	*	5220	111.13	-	-	100.31	33.86	12.04	35.08	100	171	P	V
	*	5220	103.77	-	-	92.95	33.86	12.04	35.08	100	171	A	V
		5396.16	50.48	-23.52	74	38.58	34.34	12.65	35.09	100	171	P	V
		5371.8	42.11	-11.89	54	30.41	34.25	12.53	35.08	100	171	A	V

802.11n HT20 CH 48 5240MHz		5150	50.2	-23.8	74	39.6	33.69	11.99	35.08	300	86	P	H
		5148.2	41.51	-12.49	54	30.91	33.69	11.99	35.08	300	86	A	H
	*	5240	112.96	-	-	101.97	33.91	12.16	35.08	300	86	P	H
	*	5240	105.63	-	-	94.64	33.91	12.16	35.08	300	86	A	H
		5391.68	54.88	-19.12	74	43.02	34.3	12.65	35.09	300	86	P	H
		5391.96	46.12	-7.88	54	34.26	34.3	12.65	35.09	300	86	A	H
		5145.34	50.83	-23.17	74	40.23	33.69	11.99	35.08	100	187	P	V
		5147.16	41.52	-12.48	54	30.92	33.69	11.99	35.08	100	187	A	V
	*	5240	112	-	-	101.01	33.91	12.16	35.08	100	187	P	V
	*	5240	104.06	-	-	93.07	33.91	12.16	35.08	100	187	A	V
		5426.96	50.45	-23.55	74	38.53	34.38	12.63	35.09	100	187	P	V
		5391.4	42.47	-11.53	54	30.61	34.3	12.65	35.09	100	187	A	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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		10360	47.43	-26.57	74	49.82	39.09	17.83	59.31	100	0	P	H
HT20		15540	49.13	-24.87	74	42.77	41.07	22.16	56.87			P	H
CH 36		10360	46.5	-27.5	74	48.89	39.09	17.83	59.31	100	0	P	V
5180MHz		15540	49.23	-24.77	74	42.87	41.07	22.16	56.87	100	0	P	V
802.11n		10440	49.7	-24.3	74	51.89	39.15	17.91	59.25			P	H
HT20		15660	49.24	-24.76	74	42.42	41.31	22.29	56.78	100	0	P	H
CH 44		10440	48.63	-25.37	74	50.82	39.15	17.91	59.25	100	0	P	V
5220MHz		15660	49.85	-24.15	74	43.03	41.31	22.29	56.78	100	0	P	V
802.11n		10480	49.62	-24.38	74	51.7	39.19	17.94	59.21	100	0	P	H
HT20		15720	49.96	-24.04	74	42.86	41.45	22.37	56.72	100	0	P	H
CH 48		10480	46.55	-27.45	74	48.63	39.19	17.94	59.21	100	0	P	V
5240MHz		15720	49.5	-24.5	74	42.4	41.45	22.37	56.72	100	0	P	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

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 38 5190MHz		5148.98	59.4	-14.6	74	48.8	33.69	11.99	35.08	351	96	P	H
		5150	49.53	-4.47	54	38.93	33.69	11.99	35.08	351	96	A	H
	*	5190	103.97	-	-	93.23	33.78	12.04	35.08	351	96	P	H
	*	5190	96.6	-	-	85.86	33.78	12.04	35.08	351	96	A	H
		5410.44	50.76	-23.24	74	38.86	34.34	12.65	35.09	351	96	P	H
		5458.88	42.9	-11.1	54	30.89	34.47	12.63	35.09	351	96	A	H
		5147.68	61.68	-12.32	74	51.08	33.69	11.99	35.08	103	174	P	V
		5150	51.4	-2.6	54	40.8	33.69	11.99	35.08	103	174	A	V
	*	5190	102.92	-	-	92.18	33.78	12.04	35.08	103	174	P	V
	*	5190	95.59	-	-	84.85	33.78	12.04	35.08	103	174	A	V
		5448.52	50.46	-23.54	74	38.45	34.47	12.63	35.09	103	174	P	V
		5425.56	42.14	-11.86	54	30.22	34.38	12.63	35.09	103	174	A	V
802.11n HT40 CH 46 5230MHz		5130.78	56.8	-17.2	74	46.28	33.65	11.95	35.08	364	86	P	H
		5147.68	45	-9	54	34.4	33.69	11.99	35.08	364	86	A	H
	*	5230	112.02	-	-	101.03	33.91	12.16	35.08	364	86	P	H
	*	5230	103.99	-	-	93	33.91	12.16	35.08	364	86	A	H
		5359.76	61.17	-12.83	74	49.51	34.21	12.53	35.08	364	86	P	H
		5357.52	50.38	-3.62	54	38.72	34.21	12.53	35.08	364	86	A	H
		5150	63.75	-10.25	74	53.15	33.69	11.99	35.08	182	185	P	V
		5149.24	52.44	-1.56	54	41.84	33.69	11.99	35.08	182	185	A	V
	*	5230	110.46	-	-	99.47	33.91	12.16	35.08	182	185	P	V
	*	5230	102.95	-	-	91.96	33.91	12.16	35.08	182	185	A	V
		5358.08	55.97	-18.03	74	44.31	34.21	12.53	35.08	182	185	P	V
		5355.84	47.65	-6.35	54	35.99	34.21	12.53	35.08	182	185	A	V

Remark

3. No other spurious found.
4. All results are PASS against Peak and Average limit line.

Band 1 5150~5250MHz

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		10380	46.91	-27.09	74	49.26	39.11	17.83	59.29	100	0	P	H
HT40		15570	49.09	-24.91	74	42.59	41.14	22.2	56.84	100	0	P	H
CH 38		10380	46.02	-27.98	74	48.37	39.11	17.83	59.29	100	0	P	V
5190MHz		15570	48.1	-25.9	74	41.6	41.14	22.2	56.84	100	0	P	V
802.11n		10460	48.88	-25.12	74	51.05	39.16	17.91	59.24	100	0	P	H
HT40		15690	48.97	-25.03	74	42.01	41.38	22.33	56.75	100	0	P	H
CH 46		10460	46.08	-27.92	74	48.25	39.16	17.91	59.24	100	0	P	V
5230MHz		15690	49.18	-24.82	74	42.22	41.38	22.33	56.75	100	0	P	V
Remark	3. No other spurious found. 4. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

Emission below 1GHz

WIFI 802.11n HT40 (LF @ 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.
2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11n HT40 LF		30	28.43	-11.57	40	32.07	26	1.71	31.35	-	-	P	H
		117.48	24.1	-19.4	43.5	35.56	17.74	2.34	31.54	-	-	P	H
		227.64	24.49	-21.51	46	35.83	17.04	3.03	31.41	-	-	P	H
		764.1	31.9	-14.1	46	30.3	27.34	4.88	30.62	-	-	P	H
		861.4	33.78	-12.22	46	30.29	28.77	5.27	30.55	-	-	P	H
		946.1	35.26	-10.74	46	30.27	30.11	5.4	30.52	100	81	P	H
		38.1	29.67	-10.33	40	37.85	21.56	1.71	31.45	100	115	P	V
		53.49	25.24	-14.76	40	40.97	14.17	1.71	31.61	-	-	P	V
		144.75	25.64	-17.86	43.5	36.67	17.86	2.62	31.51	-	-	P	V
		844.6	33.23	-12.77	46	29.99	28.6	5.2	30.56	-	-	P	V
		891.5	34.41	-11.59	46	30.72	28.95	5.27	30.53	-	-	P	V
		967.1	35.14	-18.86	54	30.02	30.23	5.4	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

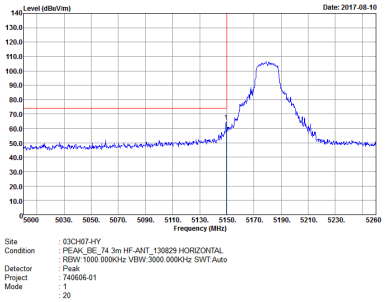
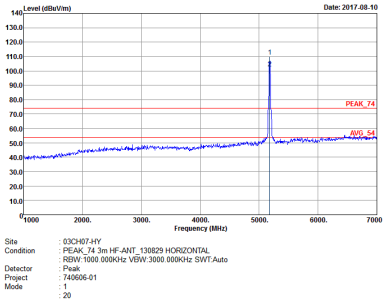
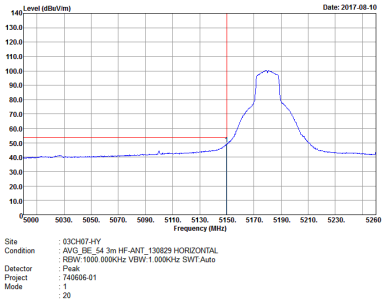
Test Engineer :	Jesse Wang, James Chiu and Potter Liu	**Temperature :**	22~27°C
		Relative Humidity :	50~58%

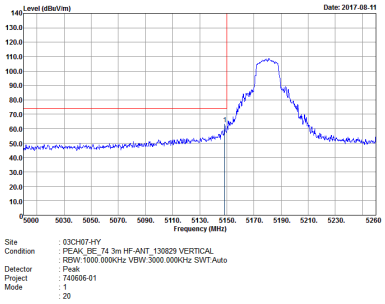
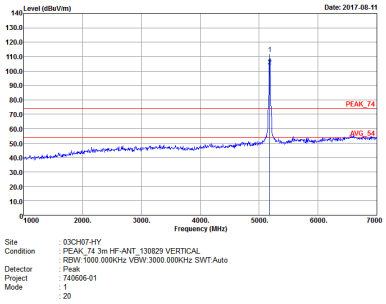
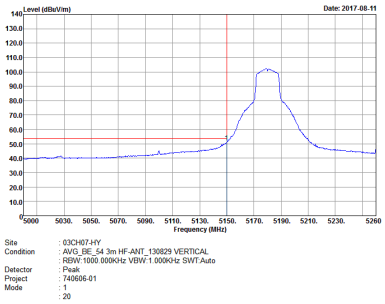
Note symbol

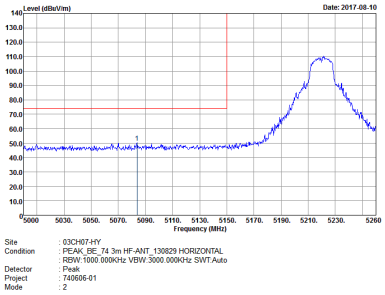
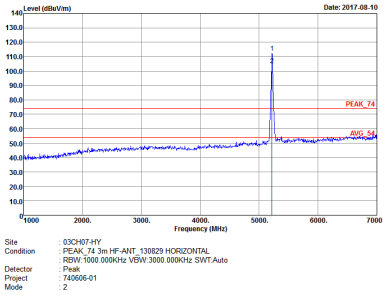
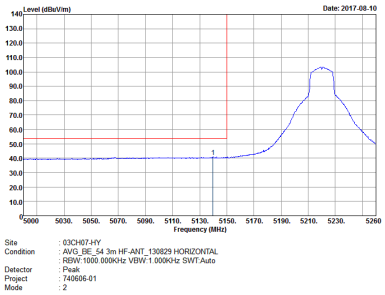
-L	**Low channel location**
-R	**High channel location**

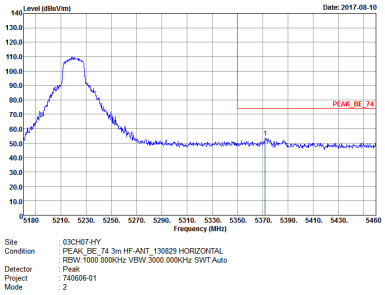
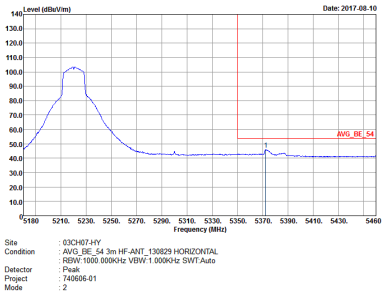
Band 1 - 5150~5250MHz

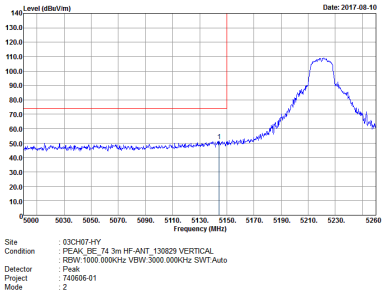
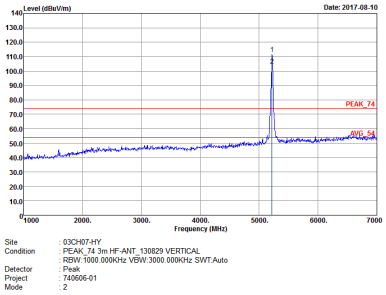
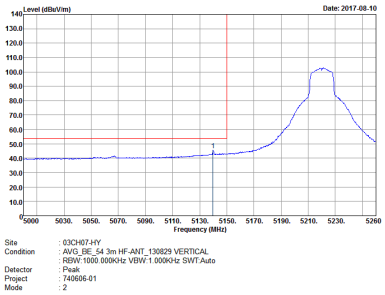
WIFI 802.11a (Band Edge @ 3m)

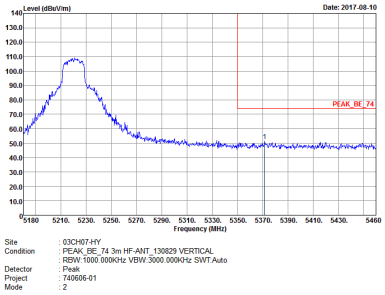
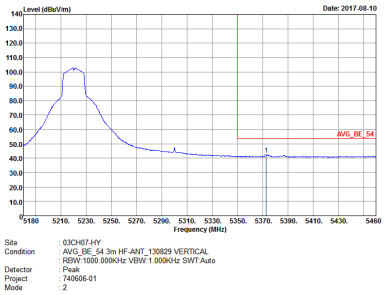
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

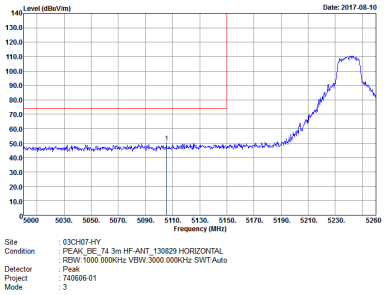
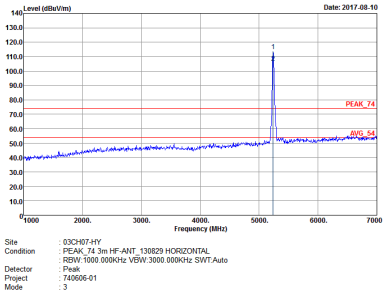
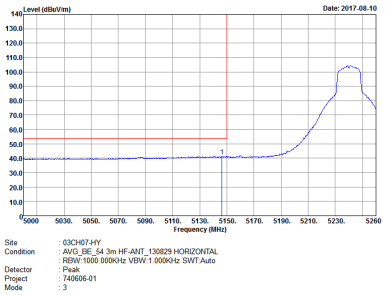
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

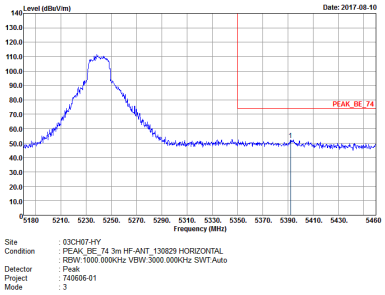
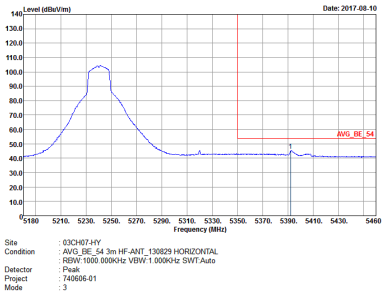
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

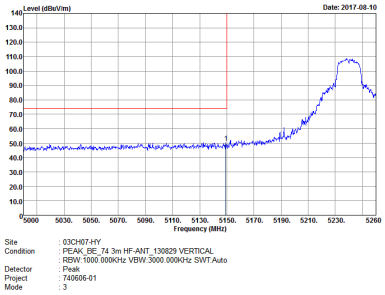
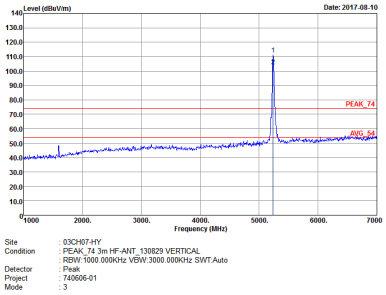
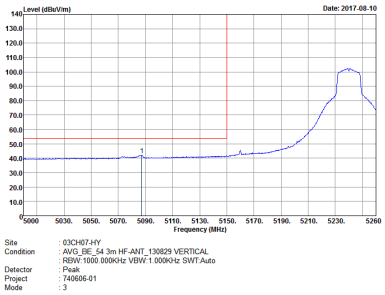
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

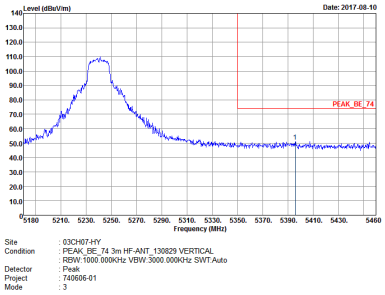
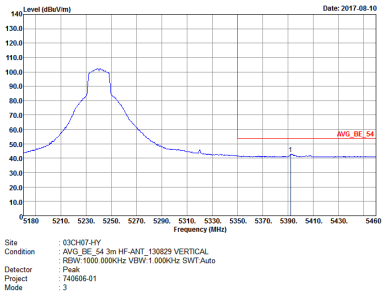
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

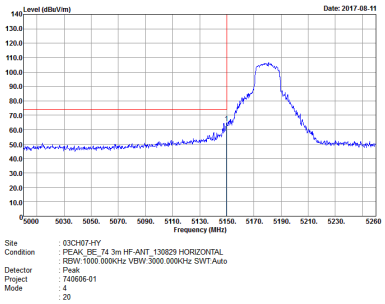
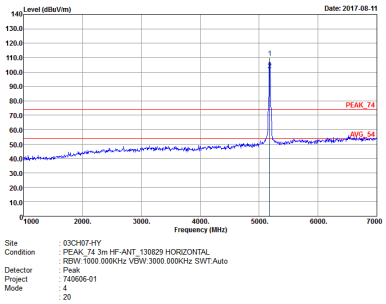
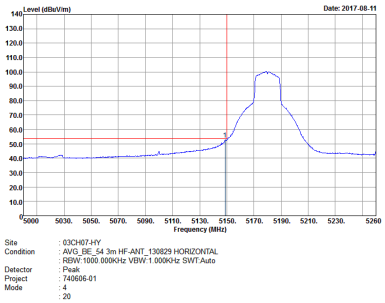
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

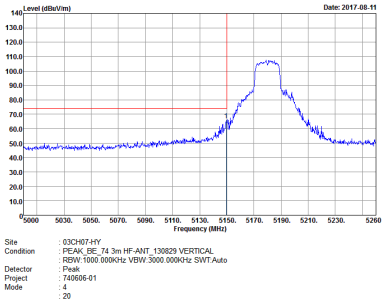
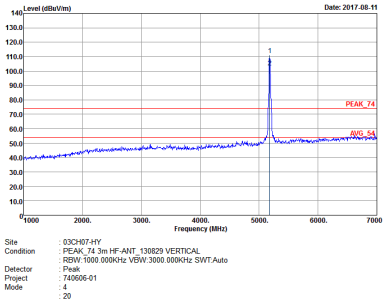
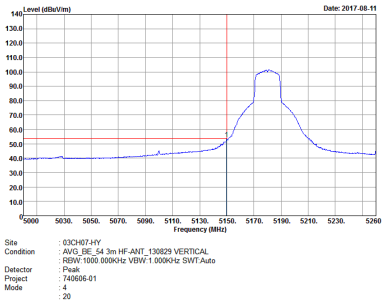
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

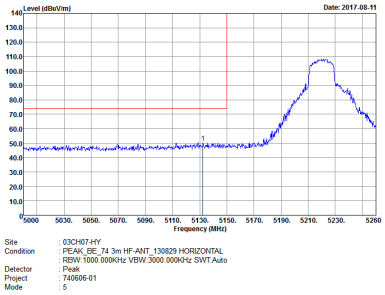
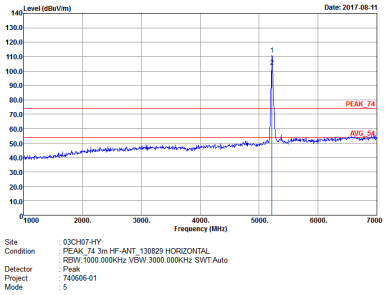
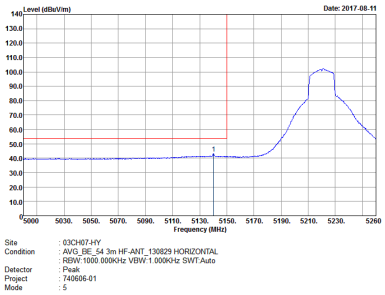
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

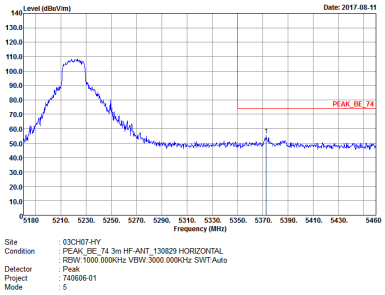
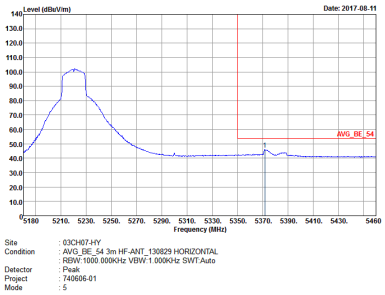
Band 1 5150~5250MHz

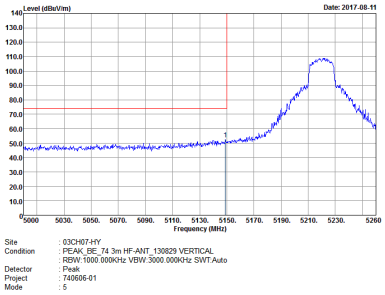
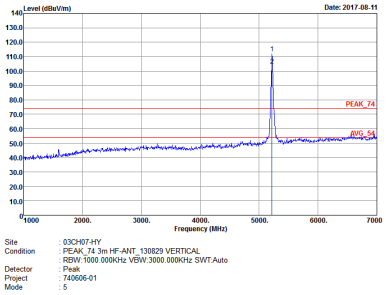
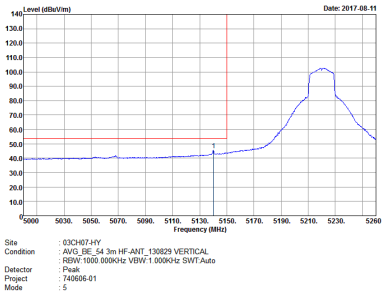
WIFI 802.11n HT20 (Band Edge @ 3m)

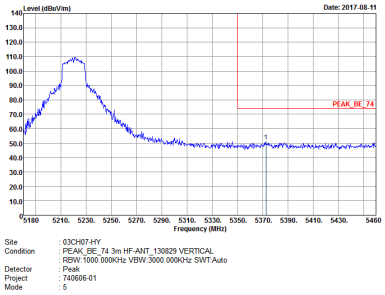
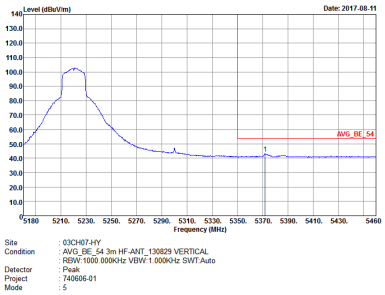
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

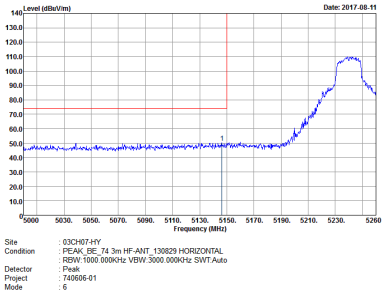
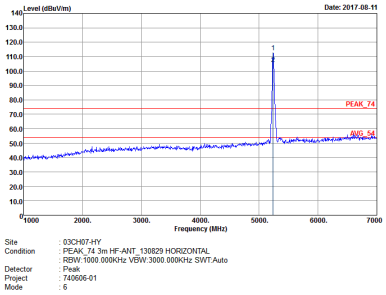
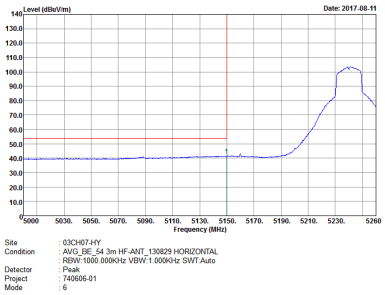
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

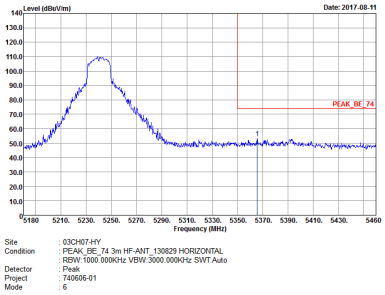
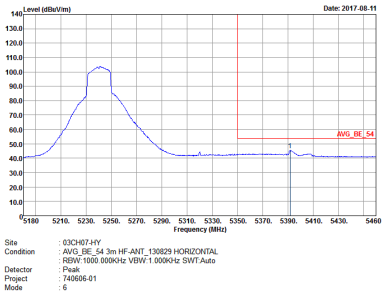
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

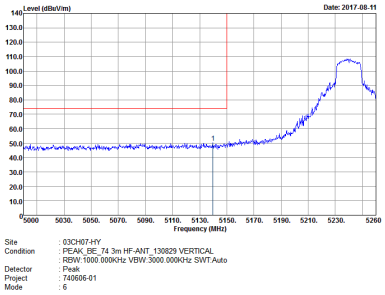
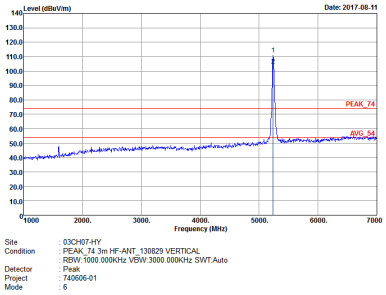
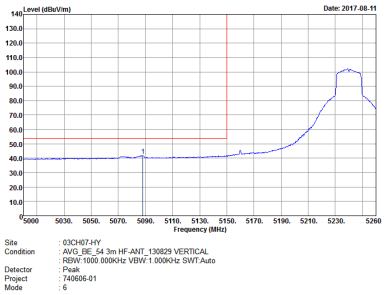
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

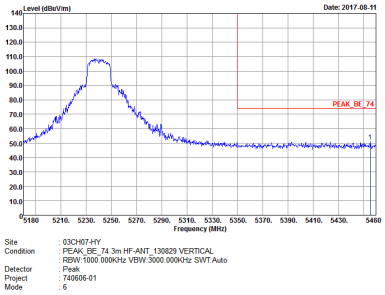
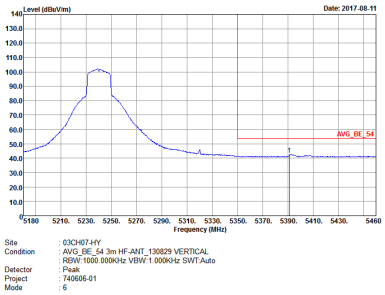
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

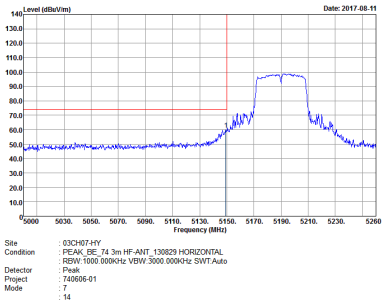
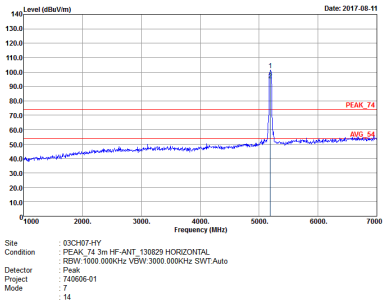
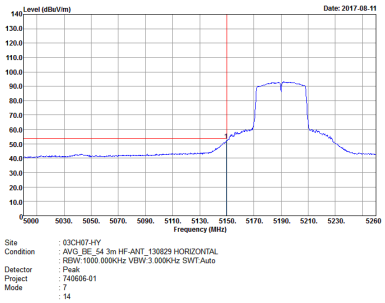
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

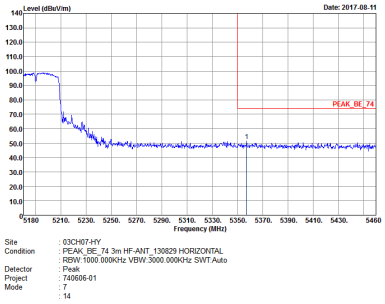
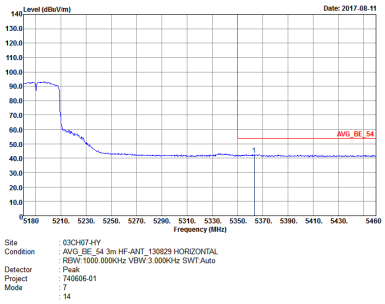
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

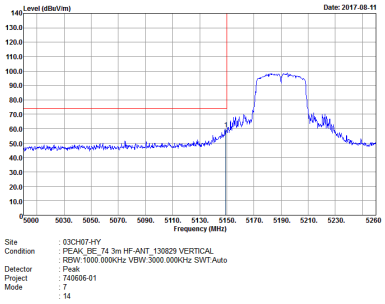
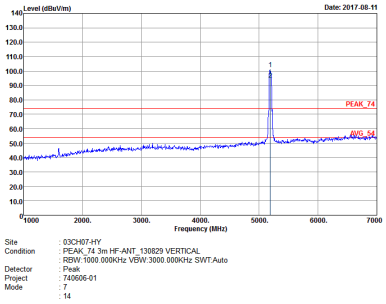
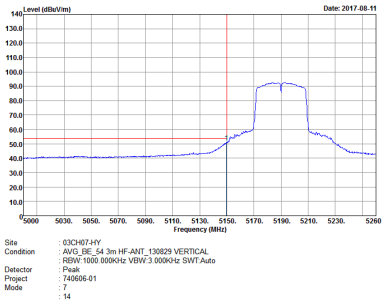
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

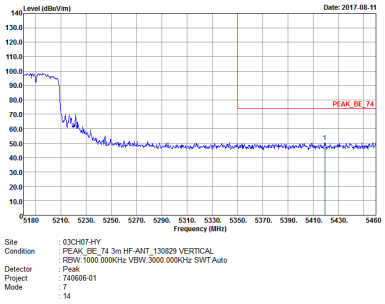
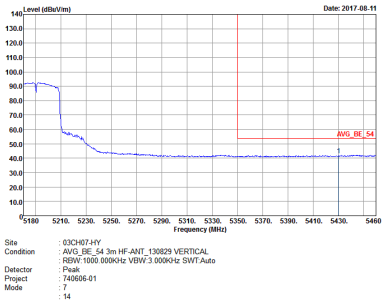
Band 1 5150~5250MHz

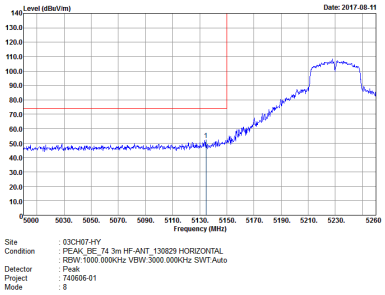
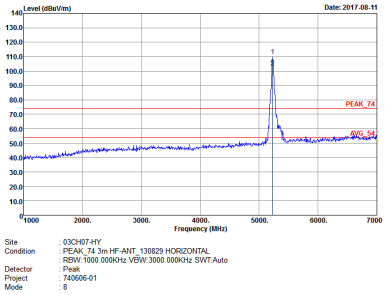
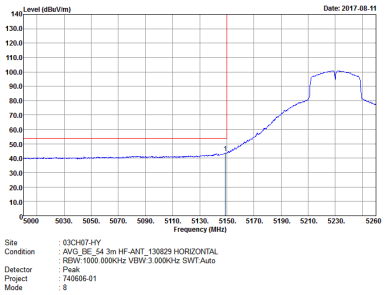
WIFI 802.11n HT40 (Band Edge @ 3m)

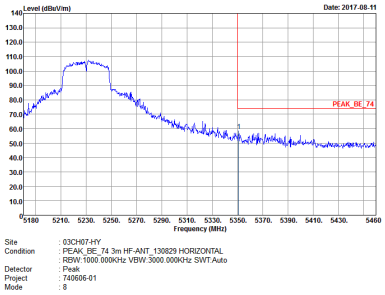
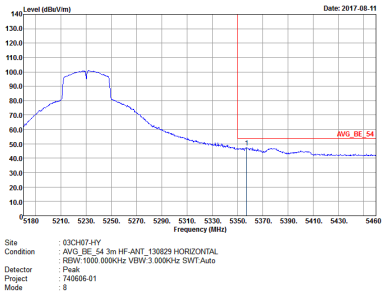
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

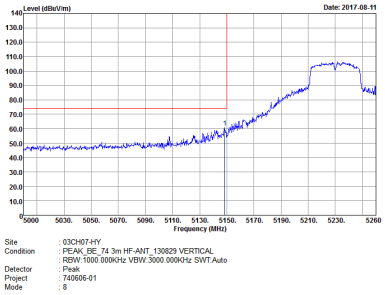
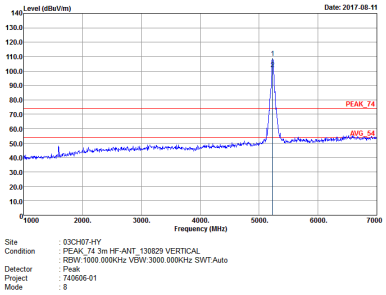
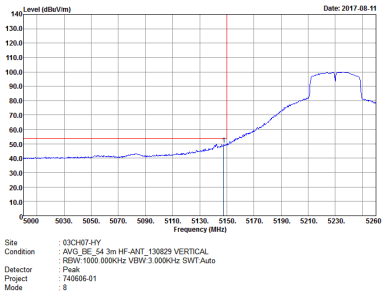
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

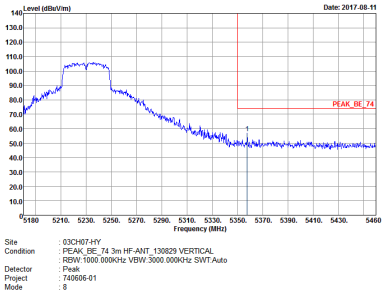
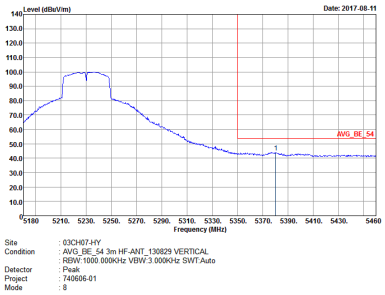
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - L	
1	Horizontal	Fundamental
Peak		
Avg.		Left blank

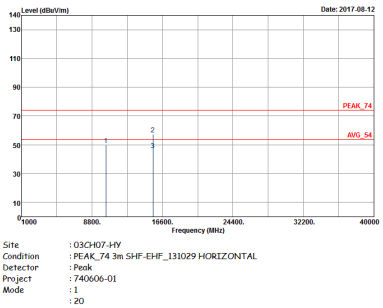
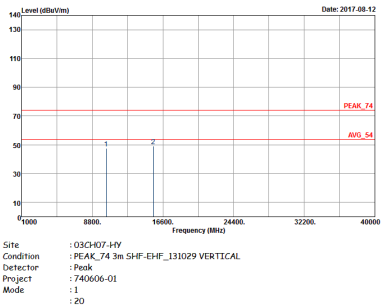
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - R	
1	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

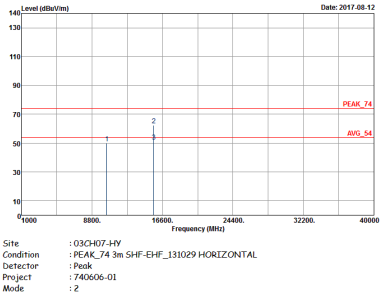
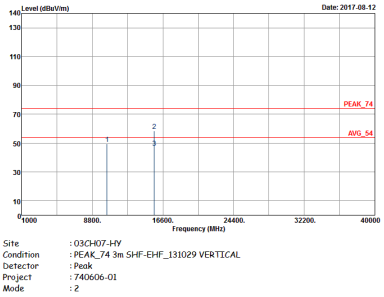
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - L	
1	Vertical	Fundamental
Peak		
Avg.		Left blank

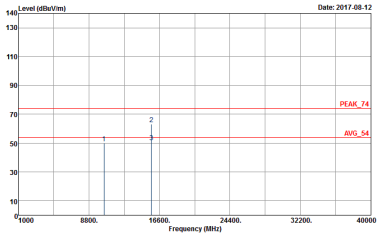
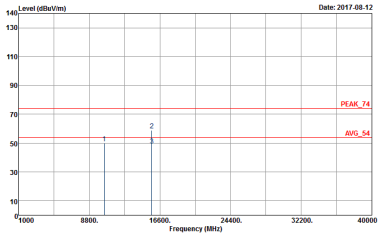
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - R	
1	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

Band 1 - 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

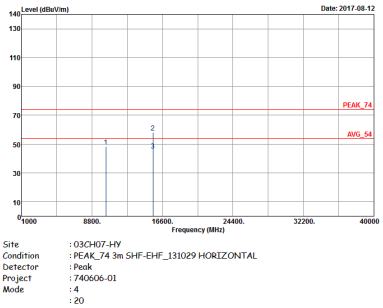
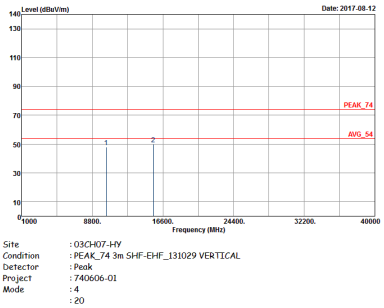
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH36 5180MHz	
1	Horizontal	Vertical
Peak Avg.		

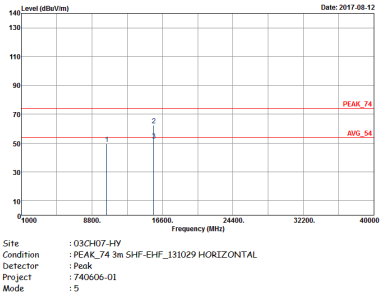
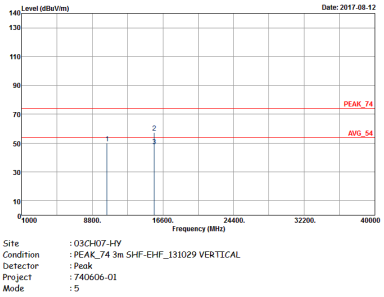
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH44 5220MHz	
1	Horizontal	Vertical
Peak Avg.		

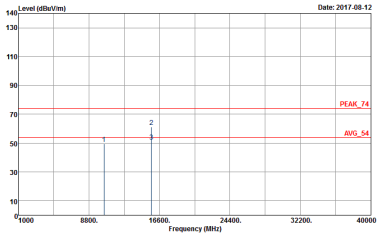
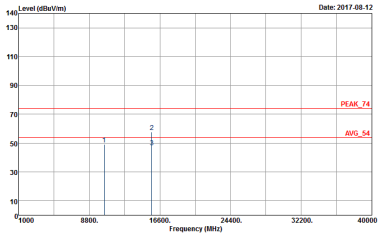
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH48 5240MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 740606-01 Mode : 3	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 740606-01 Mode : 3

Band 1 5150~5250MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

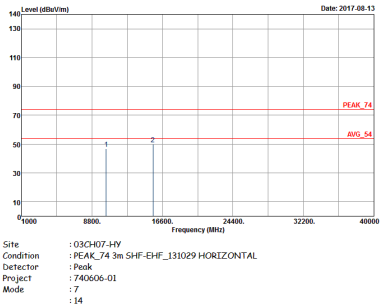
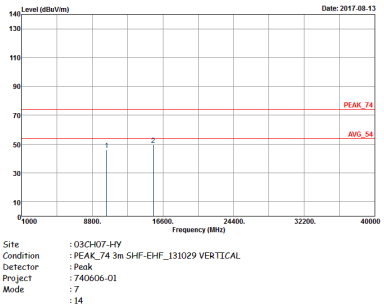
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1	Horizontal	Vertical
Peak Avg.		

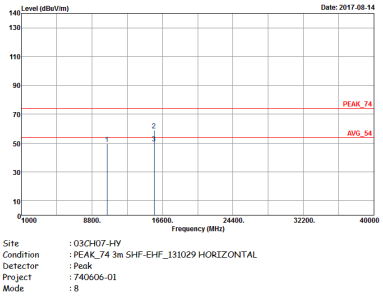
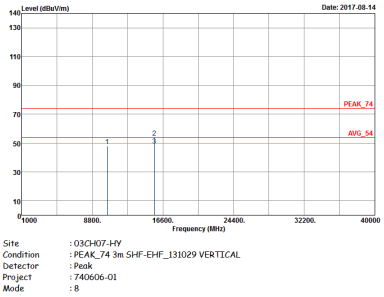
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH44 5220MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH48 5240MHz	
1	Horizontal	Vertical
Peak Avg.		

Band 1 5150~5250MHz

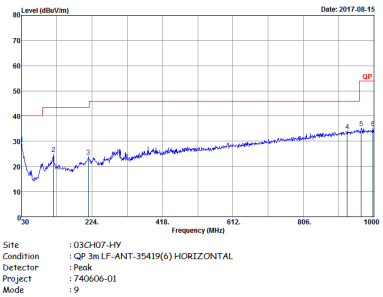
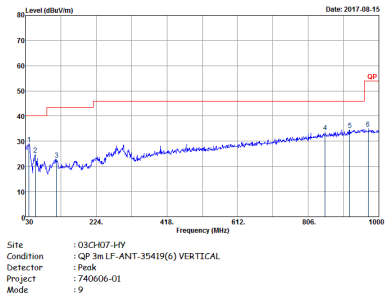
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH38 5190MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH46 5230MHz	
1	Horizontal	Vertical
Peak Avg.		

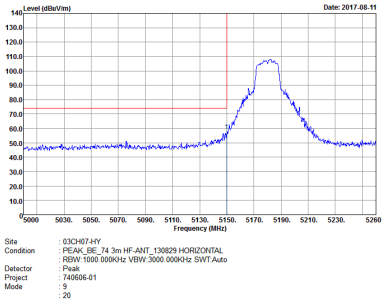
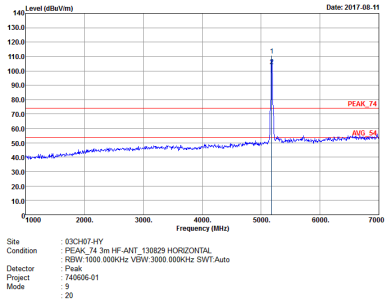
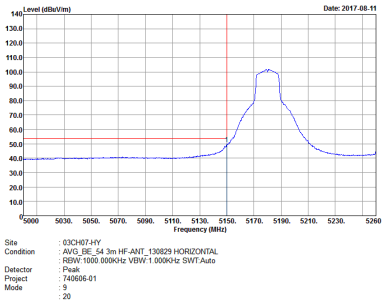
Emission below 1GHz

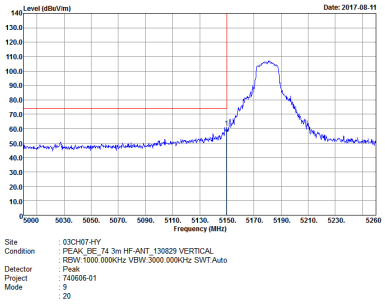
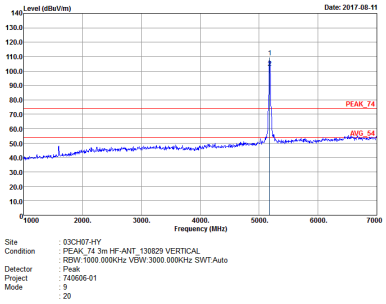
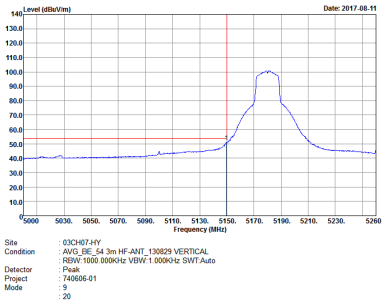
5GHz WIFI 802.11n HT20 (LF)

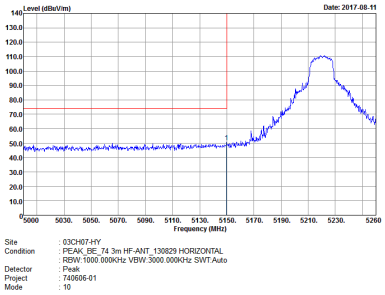
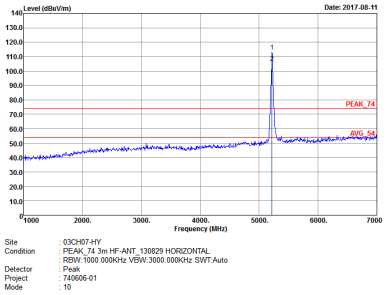
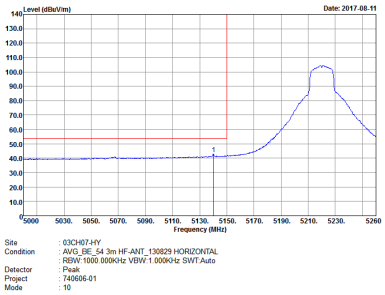
WIFI	5GHz WIFI	
ANT	802.11n HT20 LF	
1	Horizontal	Vertical
QP / Peak		

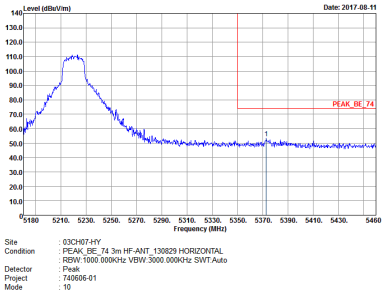
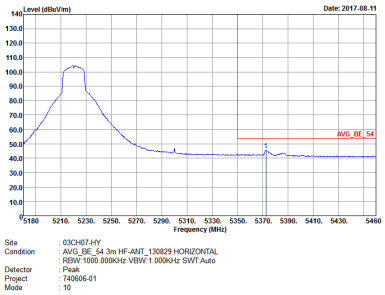
Band 1 - 5150~5250MHz

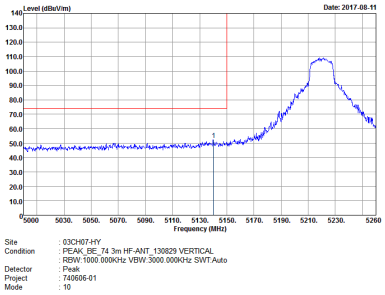
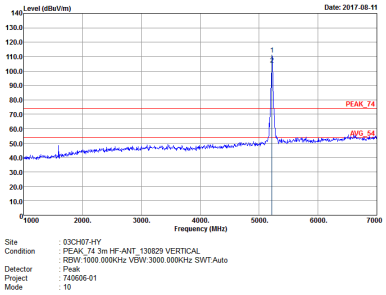
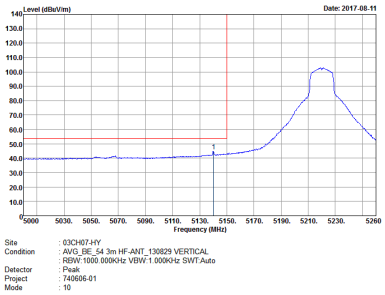
WIFI 802.11a (Band Edge @ 3m)

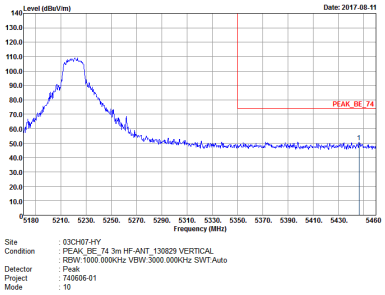
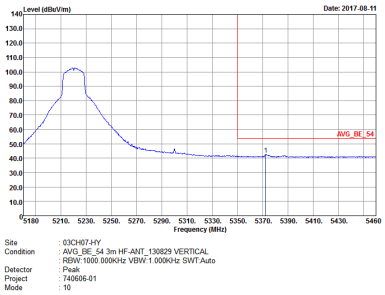
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

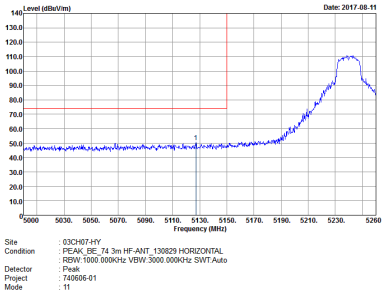
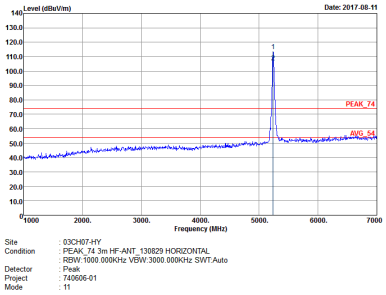
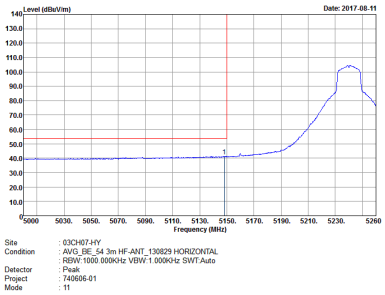
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

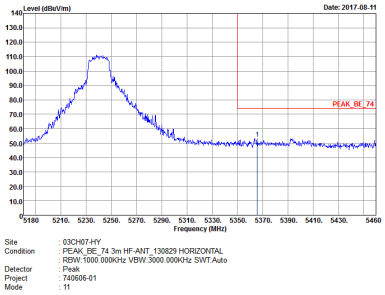
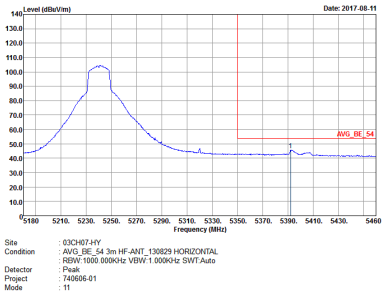
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

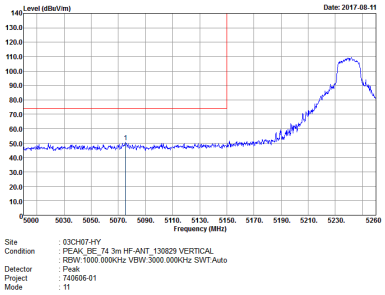
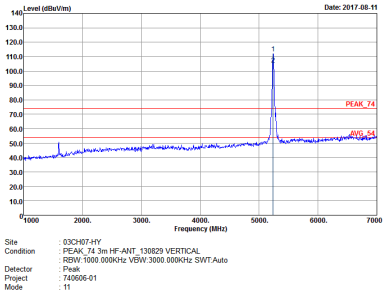
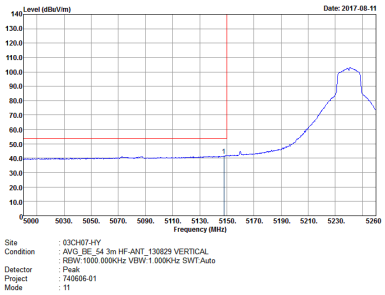
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

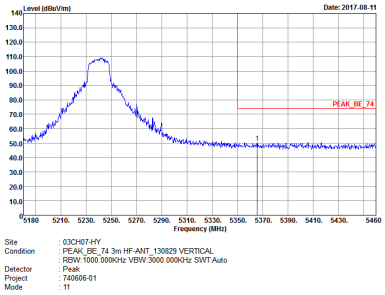
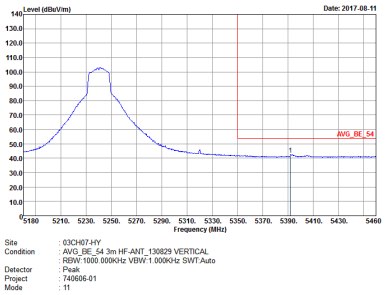
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

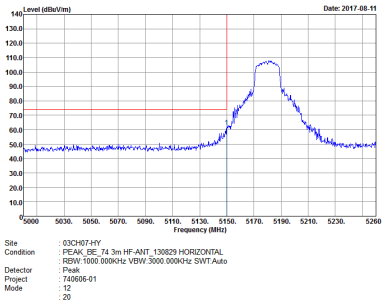
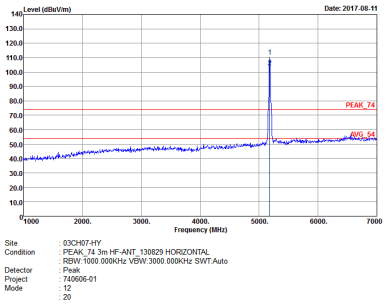
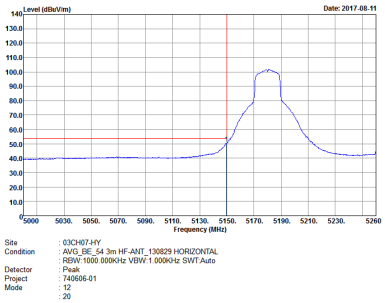
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

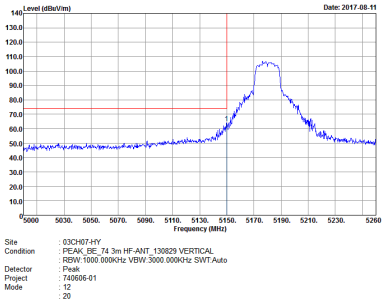
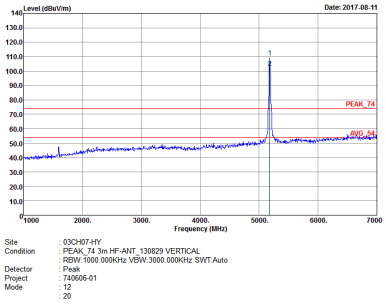
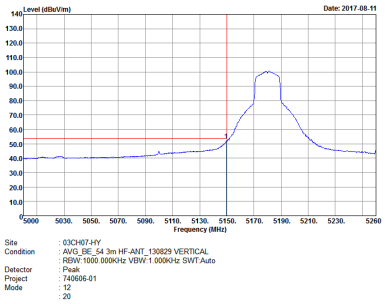
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

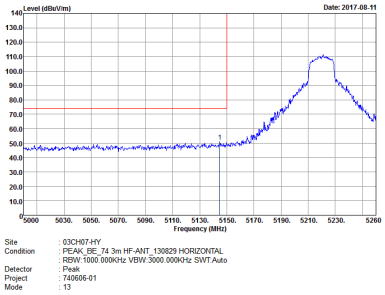
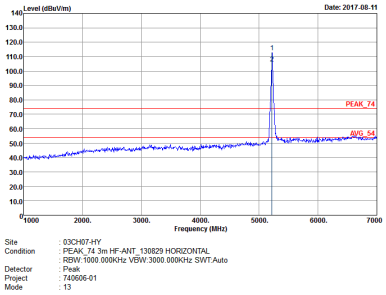
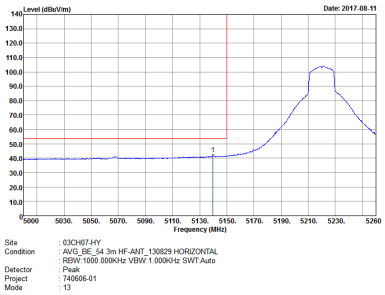
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

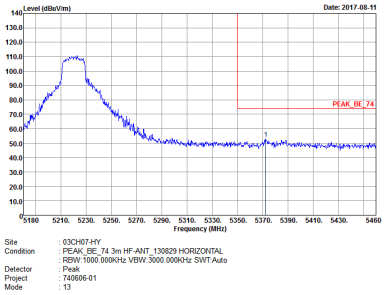
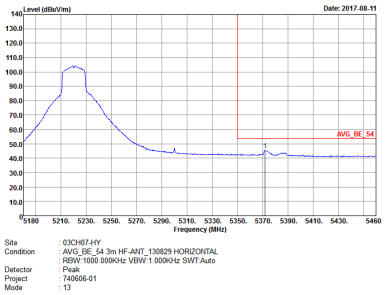
Band 1 5150~5250MHz

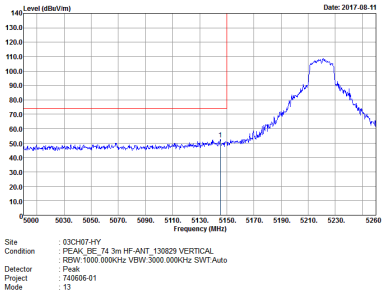
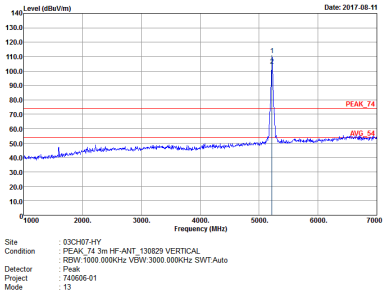
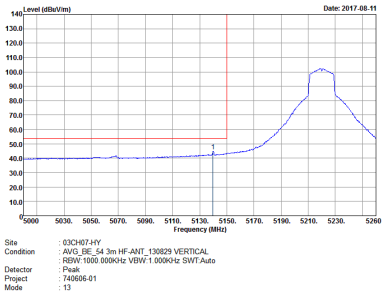
WIFI 802.11n HT20 (Band Edge @ 3m)

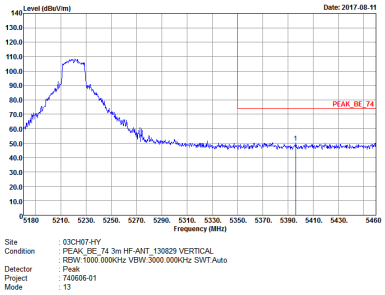
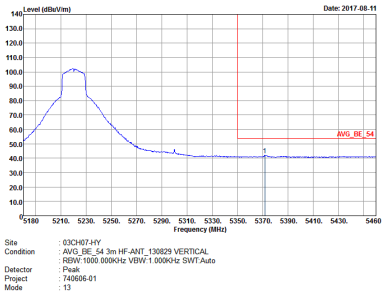
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

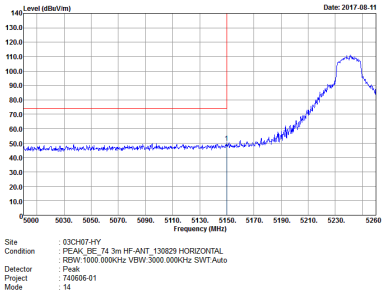
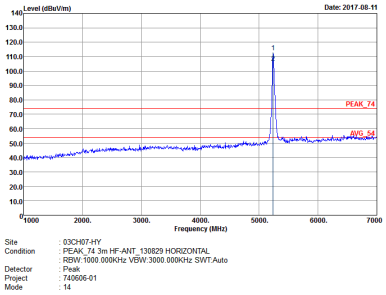
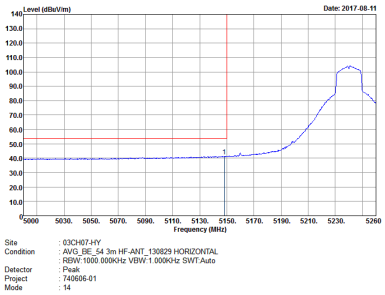
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

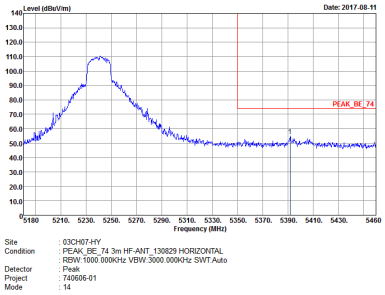
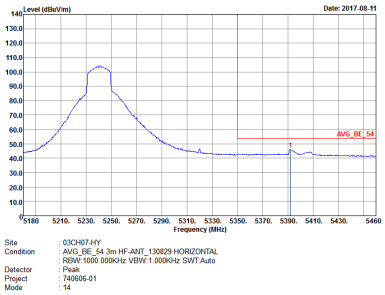
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

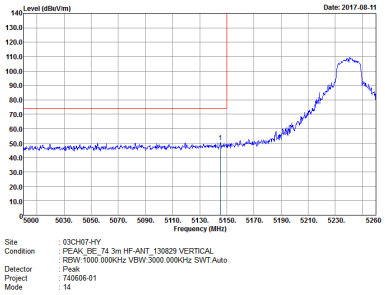
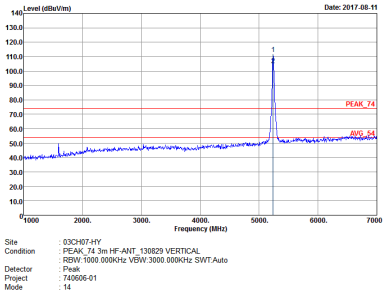
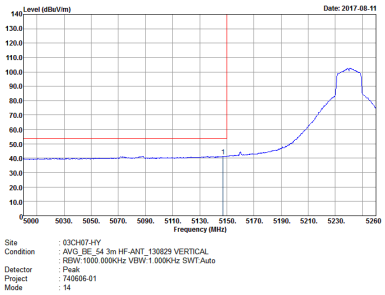
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

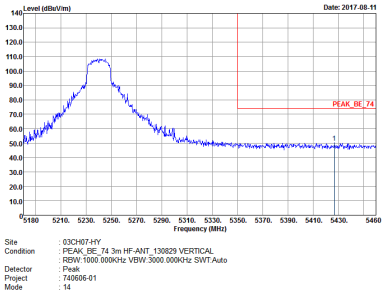
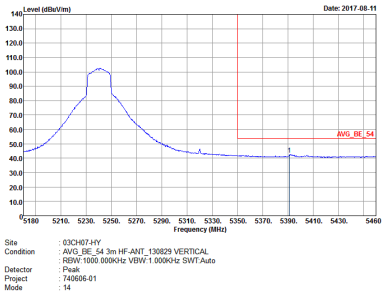
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

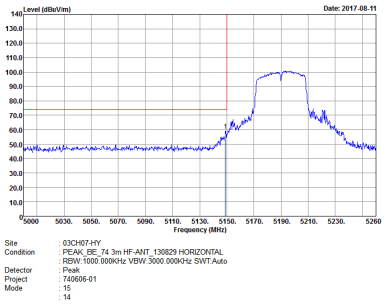
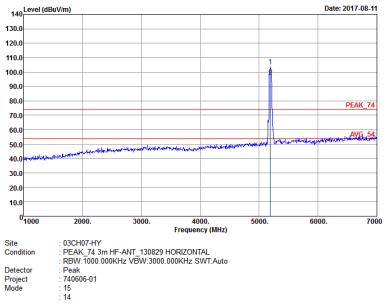
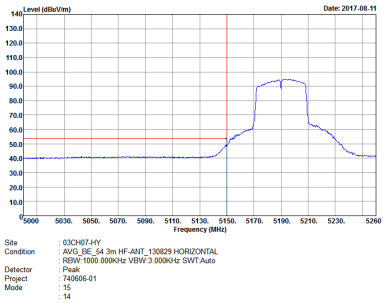
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

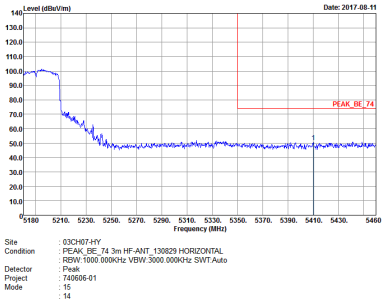
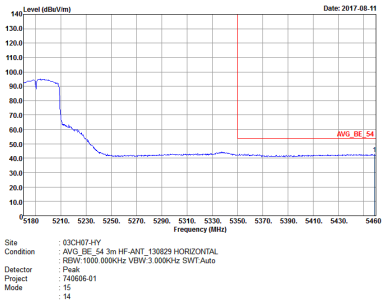
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

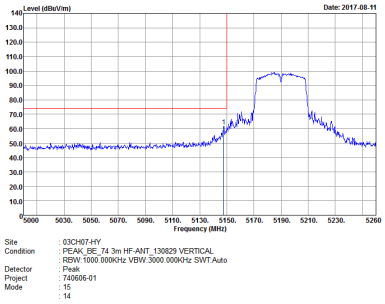
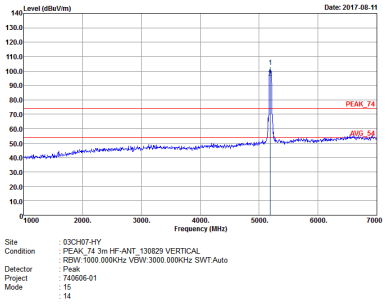
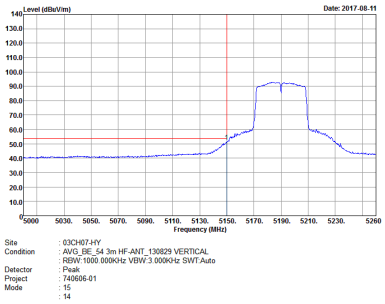
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

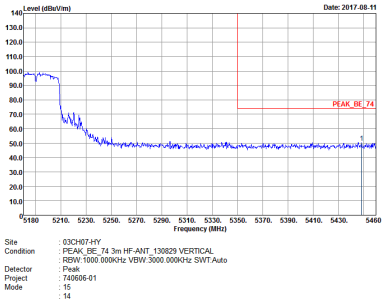
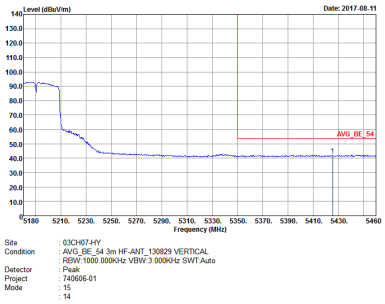
Band 1 5150~5250MHz

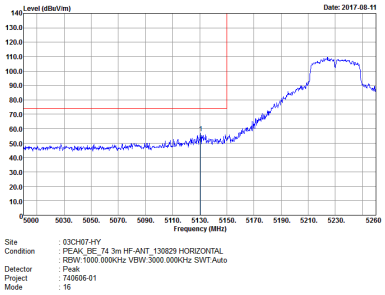
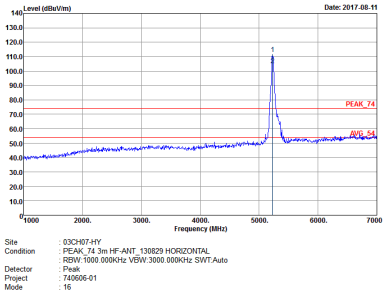
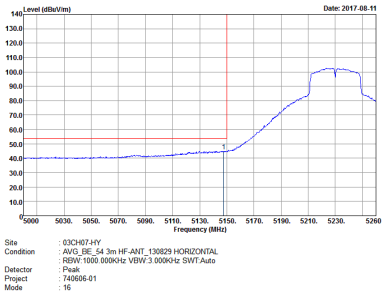
WIFI 802.11n HT40 (Band Edge @ 3m)

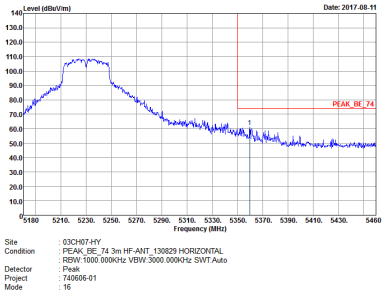
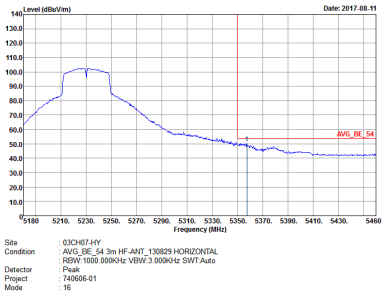
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

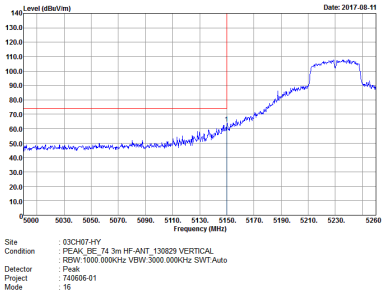
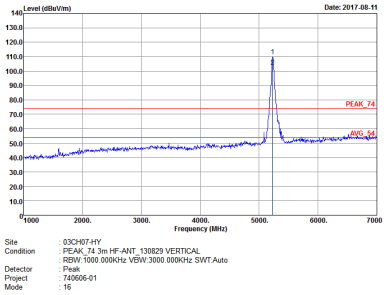
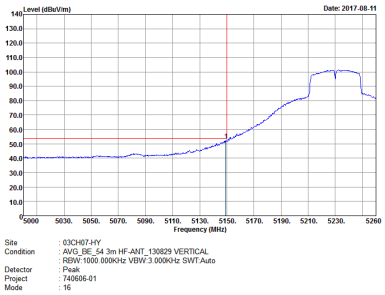
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

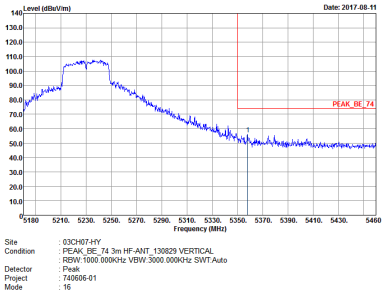
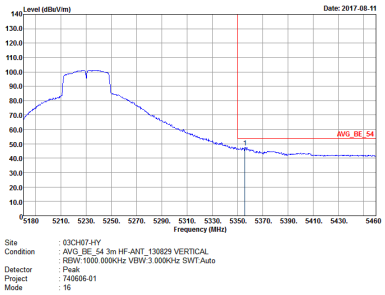
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - L	
2	Horizontal	Fundamental
Peak		
Avg.		Left blank

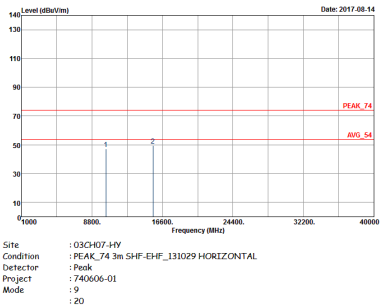
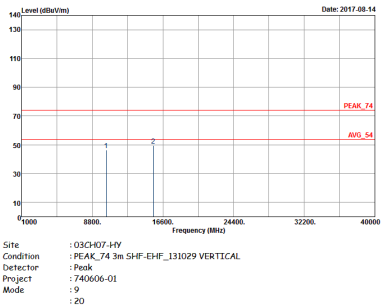
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - R	
2	Horizontal	Fundamental
Peak		Left blank
Avg.		Left blank

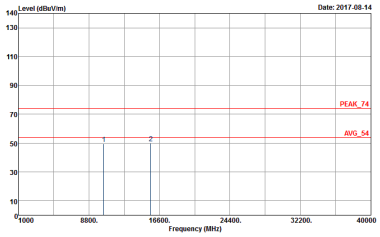
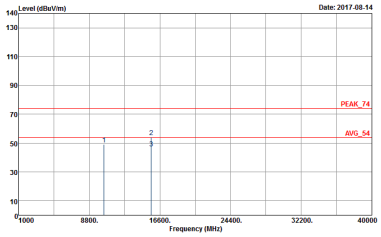
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - L	
2	Vertical	Fundamental
Peak		
Avg.		Left blank

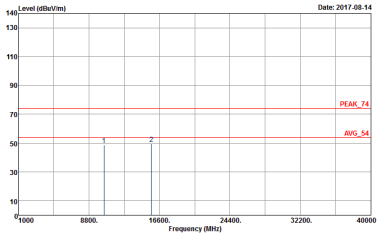
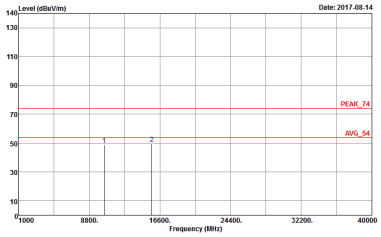
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - R	
2	Vertical	Fundamental
Peak		Left blank
Avg.		Left blank

Band 1 - 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

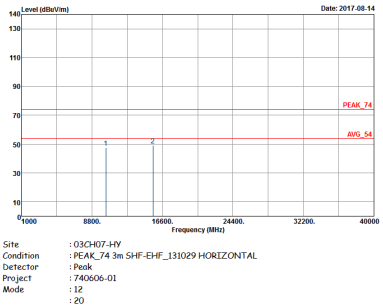
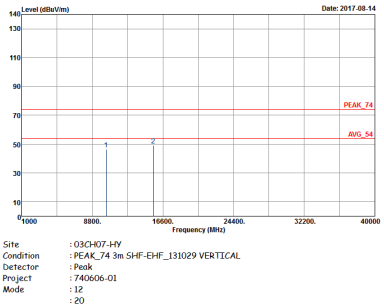
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH36 5180MHz	
2	Horizontal	Vertical
Peak Avg.		

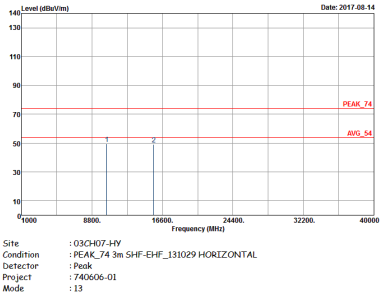
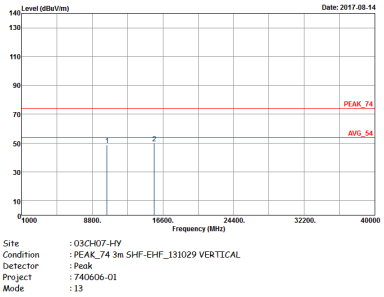
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH44 5220MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 740606-01 Mode : 10	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 740606-01 Mode : 10

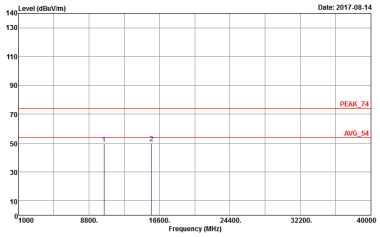
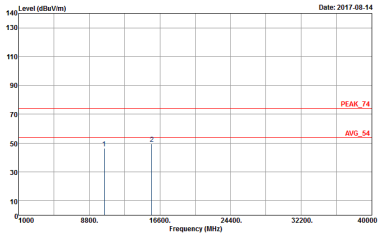
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH48 5240MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 740606-01 Mode : 11	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 740606-01 Mode : 11

Band 1 5150~5250MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

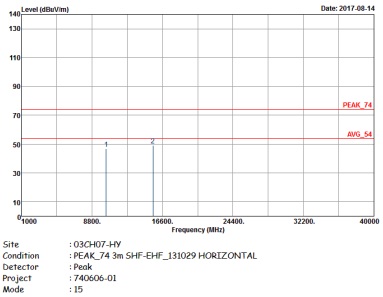
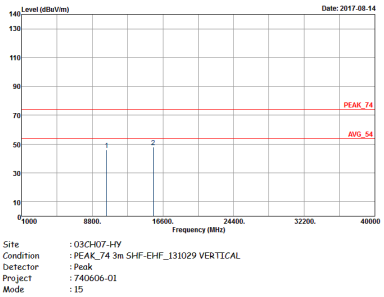
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
2	Horizontal	Vertical
Peak Avg.		

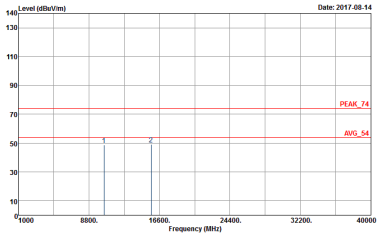
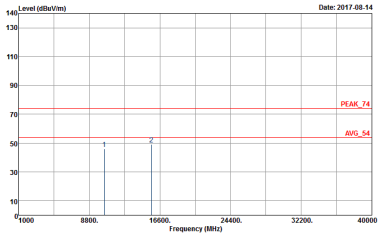
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH44 5220MHz	
2	Horizontal	Vertical
Peak Avg.		

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH48 5240MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 740606-01 Mode : 14	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 740606-01 Mode : 14

Band 1 5150~5250MHz

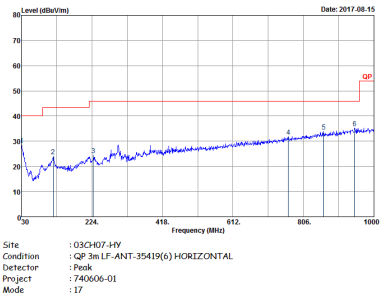
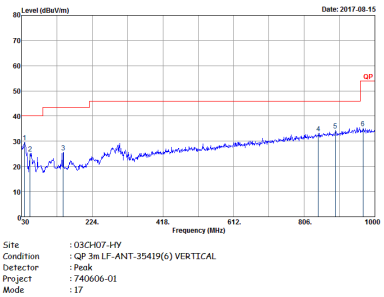
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH38 5190MHz	
2	Horizontal	Vertical
Peak Avg.		

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH46 5230MHz	
2	Horizontal	Vertical
Peak Avg.	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 HORIZONTAL Detector : Peak Project : 740606-01 Mode : 16	 Site : 03CH07-HY Condition : PEAK_74 3m SHF-EHF_131029 VERTICAL Detector : Peak Project : 740606-01 Mode : 16

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF)

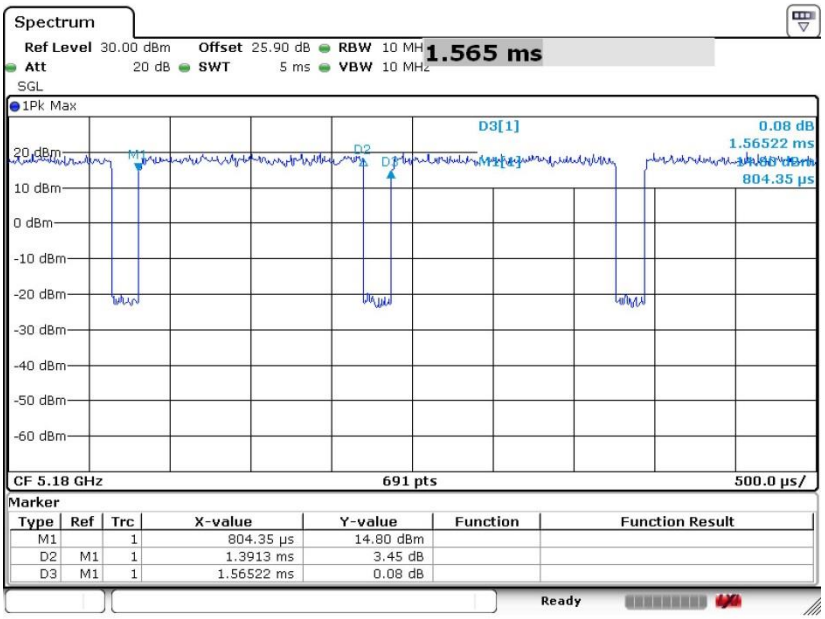
WIFI	5GHz WIFI	
ANT	802.11n HT40 LF	
2	Horizontal	Vertical
QP / Peak		

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	

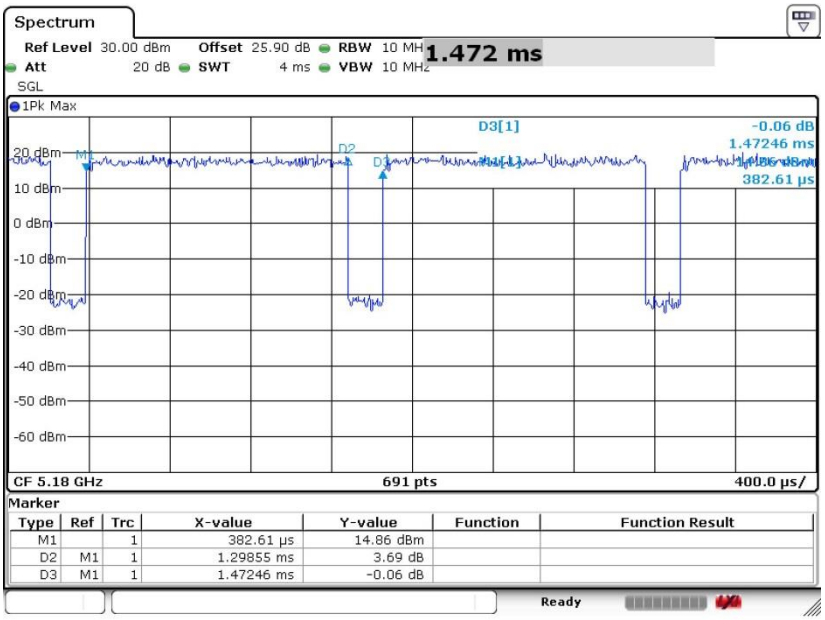
<Ant. 1>

802.11a



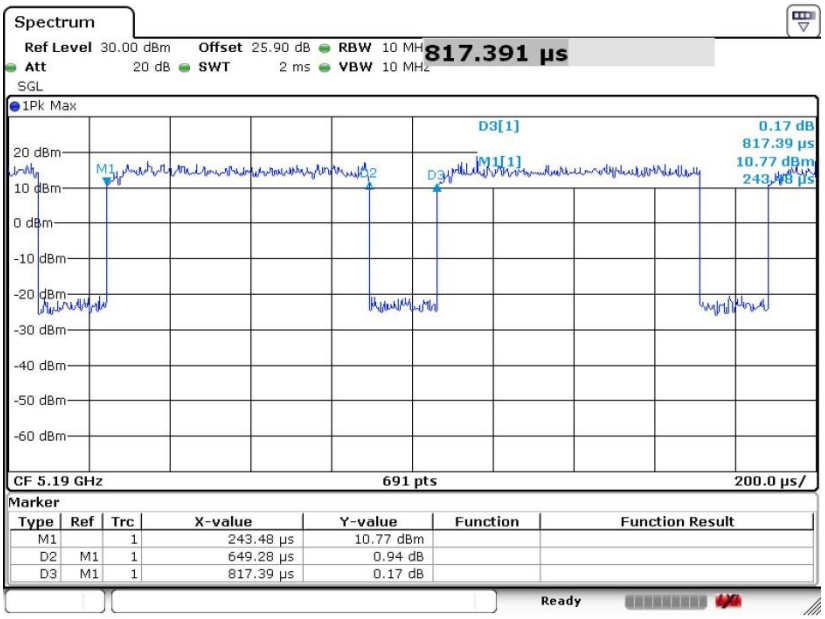
Date: 21.JUL.2017 08:48:31

802.11n HT20



Date: 21.JUL.2017 08:51:04

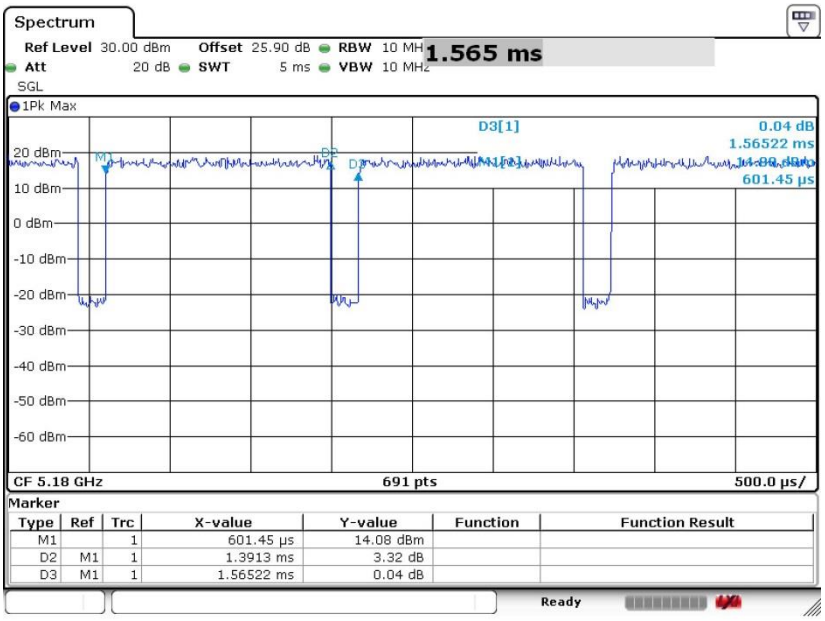
802.11n HT40



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

<Ant. 2>

802.11a



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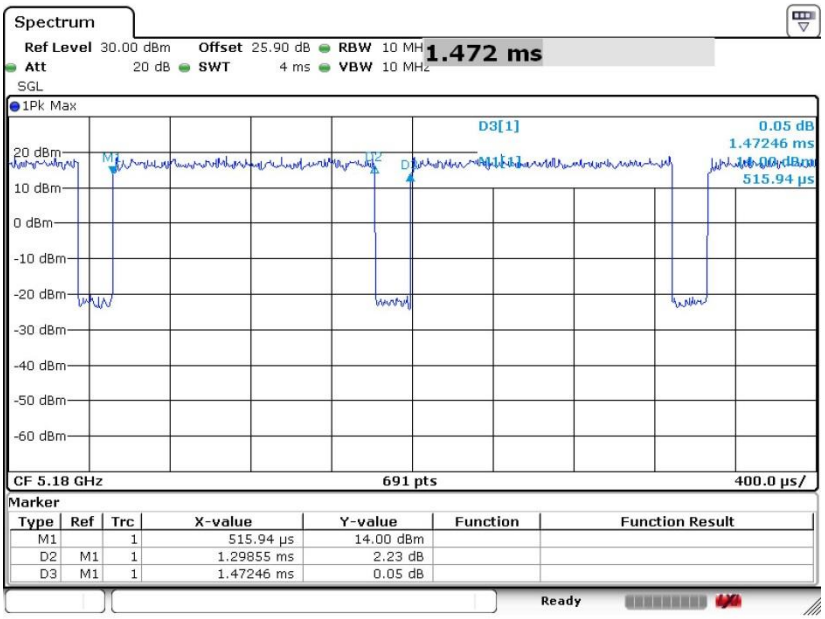
802.11n HT20



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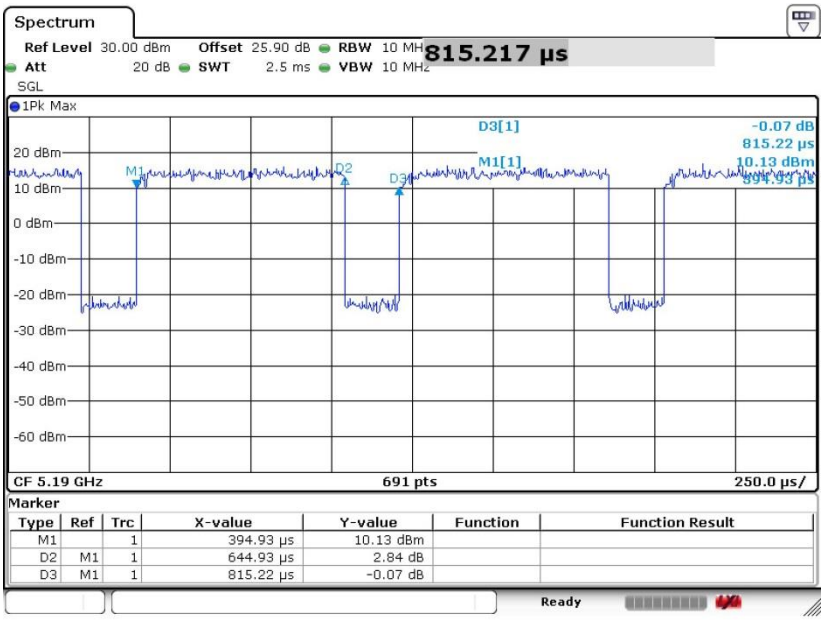
802.11n HT40



Date: 21.JUL.2017 08:45:31