



FCC RF Test Report

APPLICANT : Getac Technology Corporation.
EQUIPMENT : WLAN Module
BRAND NAME : AMPAK
MODEL NAME : AP6234
FCC ID : QYLAP6234E
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Jan. 18, 2017 and testing was completed on Apr. 18, 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



SPORTON INTERNATIONAL INC.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR710507-03E	Rev. 01	Initial issue of report	May 05, 2017



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) & 15.209(a)	Pass	Under limit 3.50 dB at 34.590 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 11.10 dB at 23.886 MHz
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

Getac Technology Corporation.

5F., Building A, No. 209, Sec.1, Nangang Rd.,Nangang Dist., Taipei City 11568, Taiwan, R.O.C.

1.2 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Sample 1	WWAN SKU
Sample 2	WLAN SKU
Antenna Type	WWAN: PIFA Antenna WLAN: Chip Antenna Bluetooth: Chip Antenna GPS : PATCH Antenna NFC: Loop Antenna

SKU	WWAN	Wifi+BT	GPS	RFID
SKU1	Brand name: Sierra Model name: EM7455	Brand name: AMPAK Model name: AP6234	Brand name: Ublox Model name: MAX-M8Q	support
SKU 2	not support	Brand name: AMPAK Model name: AP6234	Brand name:Ublox Model name: MAX-M8Q	support

1.3 Modification of EUT

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

1.4 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW0007 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 1 st 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

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

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH13-HY	

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

1.5 Applicable Standards

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

- ♦ FCC Part 15 Subpart E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Y plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155 [#]	5775	-	-

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

AC Conducted Emission	Mode 1 : LTE Band 2 Idle + Bluetooth Link + WLAN (2.4GHz) Link + RFID On + TF + TC for Sample1
	Mode 2 : LTE Band 2 Idle + Bluetooth Link + WLAN (5GHz) Link + RFID On + TF + TC for Sample1
	Mode 3 : Bluetooth Link + WLAN (2.4GHz) Link + RFID On + TF + TC for Sample 2
	Mode 4 : Bluetooth Link + WLAN (5GHz) Link + RFID On + TF + TC for Sample 2
Remark: 1. TC stands for Test Configuration, and consists of EX80 Cradle, USB flash drive (Front), USB Keyboard (side), USB Mouse (side), RJ-45 Link, and Adapter (WA-24Q12R). 2. TF stands for Test Function, and consists of H-Patten, MPEG4, GPS Rx, and Video Record (Rear Camera). 3. The worst case of conducted emission is mode 4; only the test data of it was reported.	

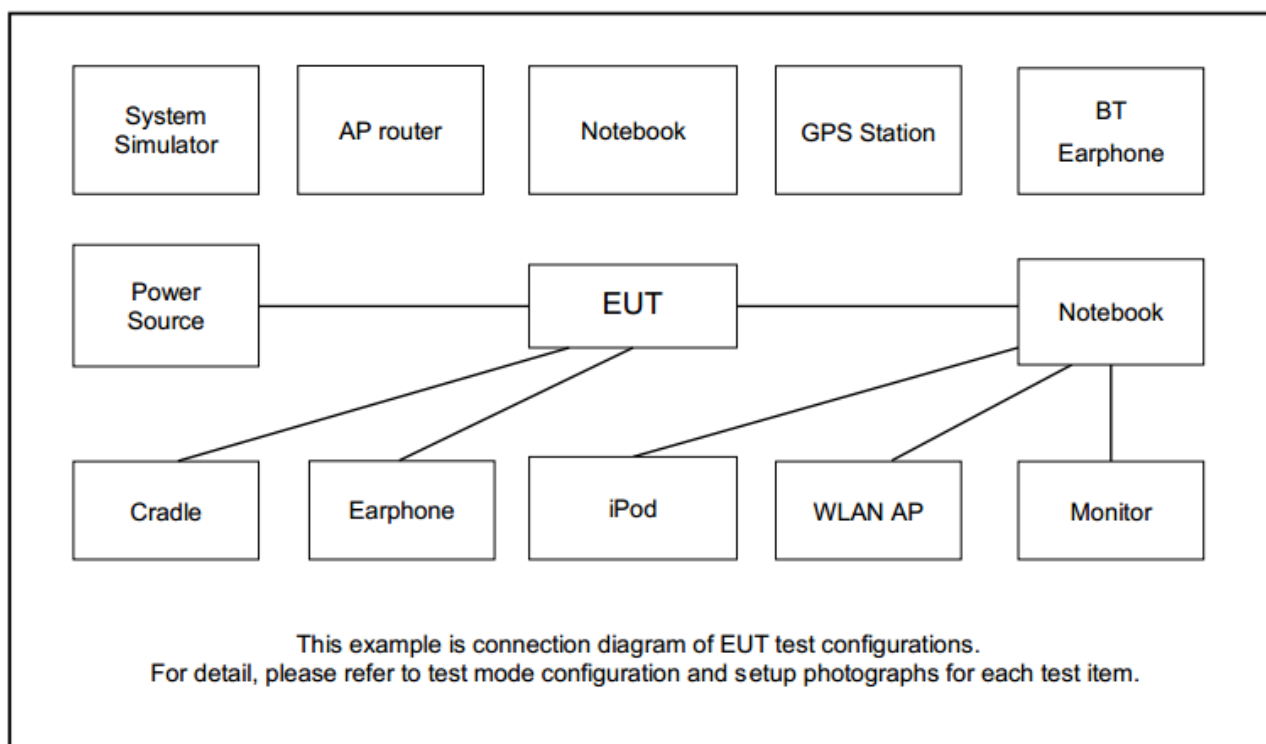
<For Sample 1>

Ch. #		Band IV : 5725-5850 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	-	161	159

<For Sample 2>

Ch. #		Band IV : 5725-5850 MHz	
		802.11n HT40	
L	Low	151	
M	Middle	-	
H	High	-	

2.3 Connection Diagram of Test System





2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	Pendulum	GSG-54	N/A	N/A	Unshielded, 1.8 m
3.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
4.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
5.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
6.	USB Mouse	LOGITECH	M90	FCC DoC	shielded, 1.8m	N/A
7.	Keyboard	KRONE	SK900	FCC DoC	Shielded, 1.8m	N/A
8.	USB Flash Disk	Apacer	N/A	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

The RF test items, programmed RF utility “CMD”, is installed in EUT to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testing. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.



2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

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

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

3 Test Result

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

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

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

26dB and 99% Occupied bandwidth are reporting only.

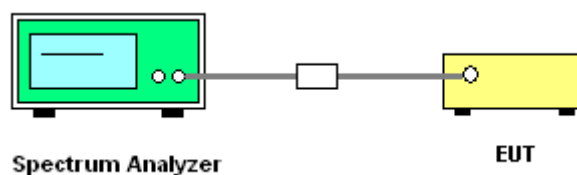
3.1.2 Measuring Instruments

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 v01r03.
Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

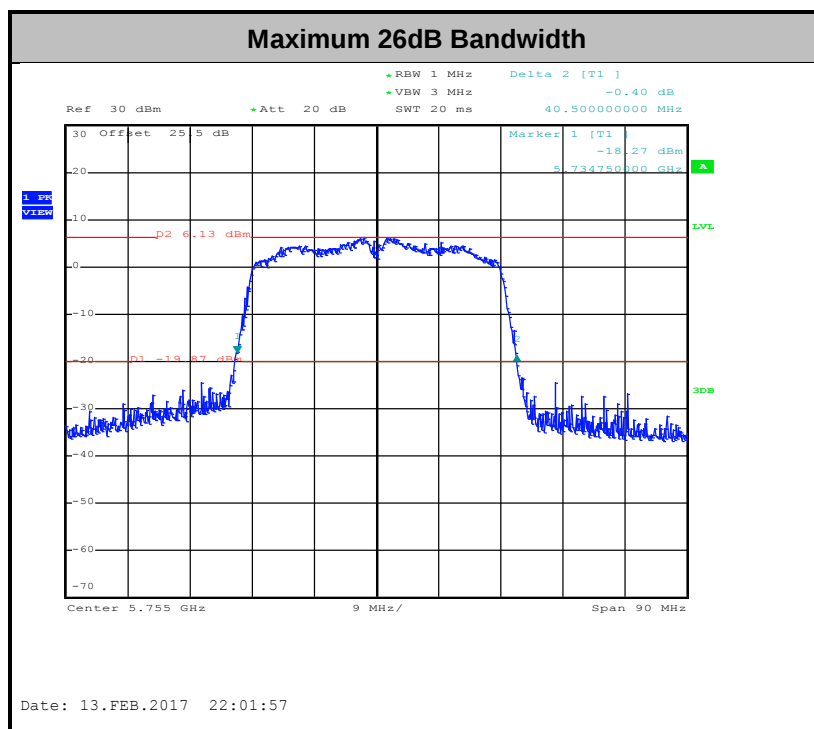
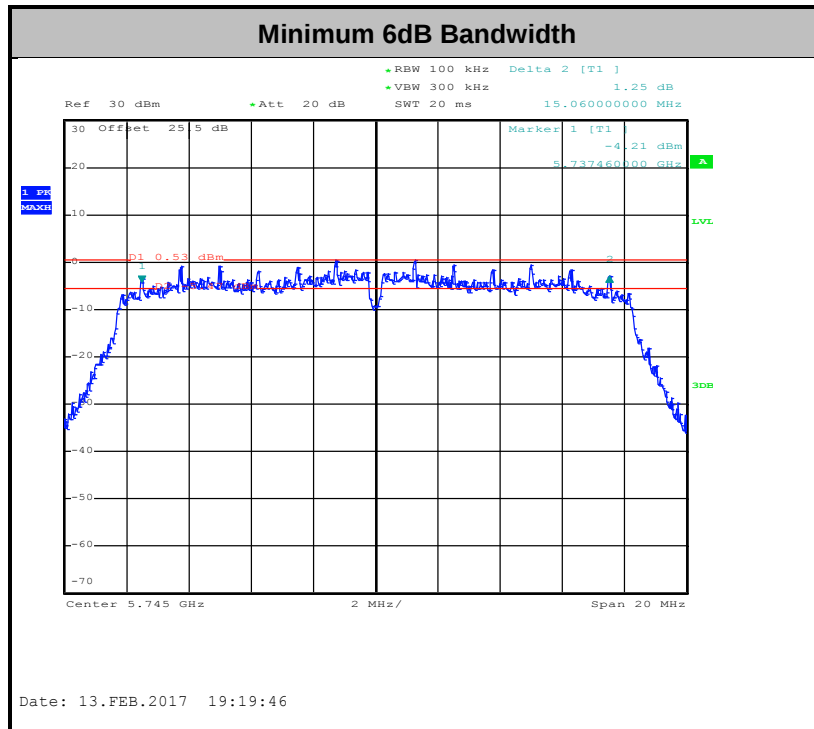
3.1.4 Test Setup

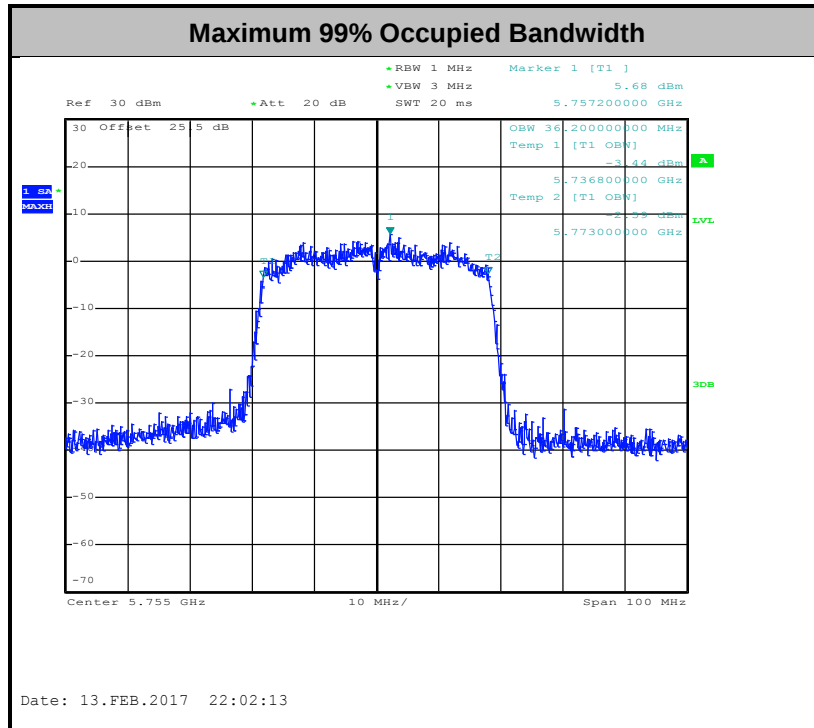




3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.





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

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

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

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

3.2.2 Measuring Instruments

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

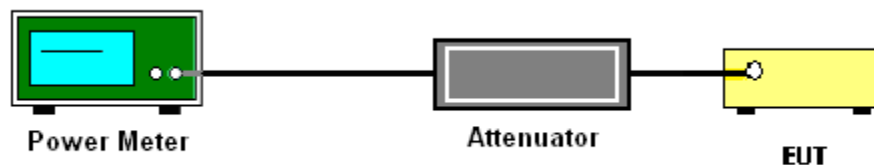
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.

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

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

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

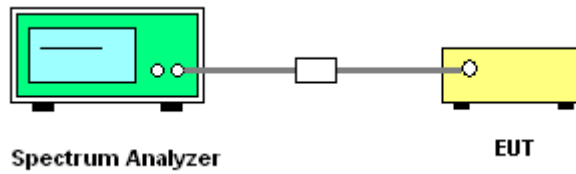
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.
Section F) Maximum power spectral density.

Method SA-2

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

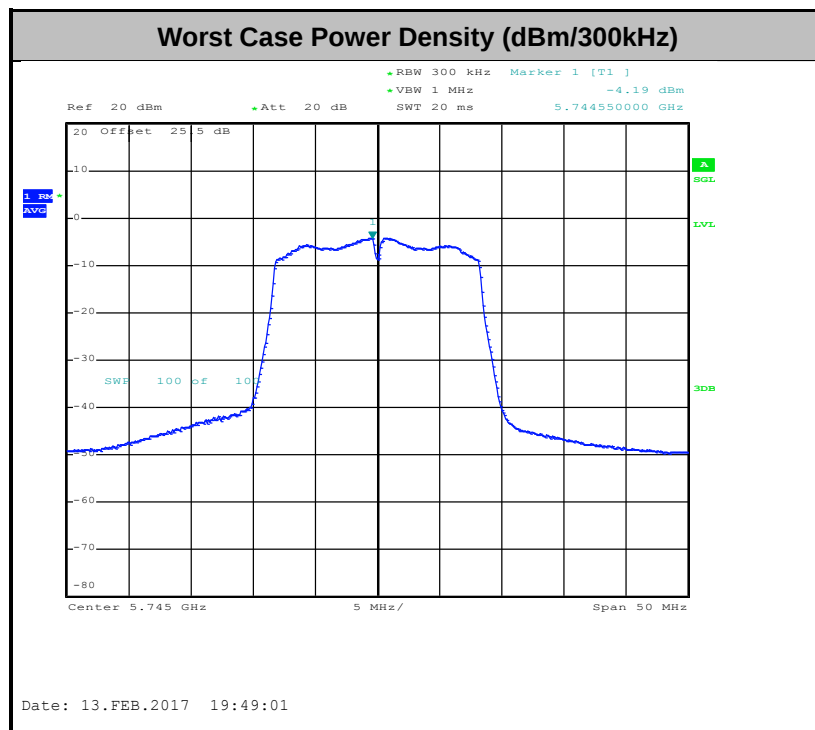
- Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 300 kHz.
 - Set VBW $\geq$ 1 MHz.
 - Number of points in sweep $\geq$ 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - Add $10 \log(500\text{kHz}/\text{RBW})$ to the test result.
 - Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.
1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
 2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



3.4 Unwanted Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

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

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

- (2) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 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.

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



EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

(3) KDB789033 D02 v01r03 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.

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 v01r03.

Section G) Unwanted emissions measurement.

(1) Procedure for Unwanted Emissions Measurements Below 1000MHz

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

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

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

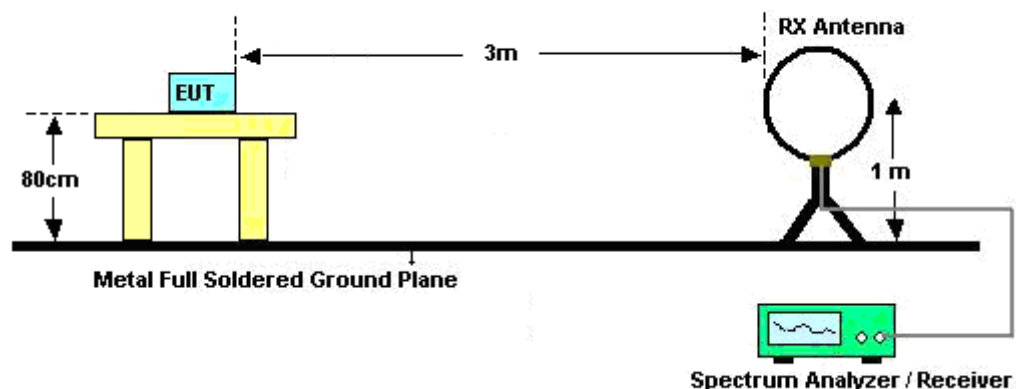
(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

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

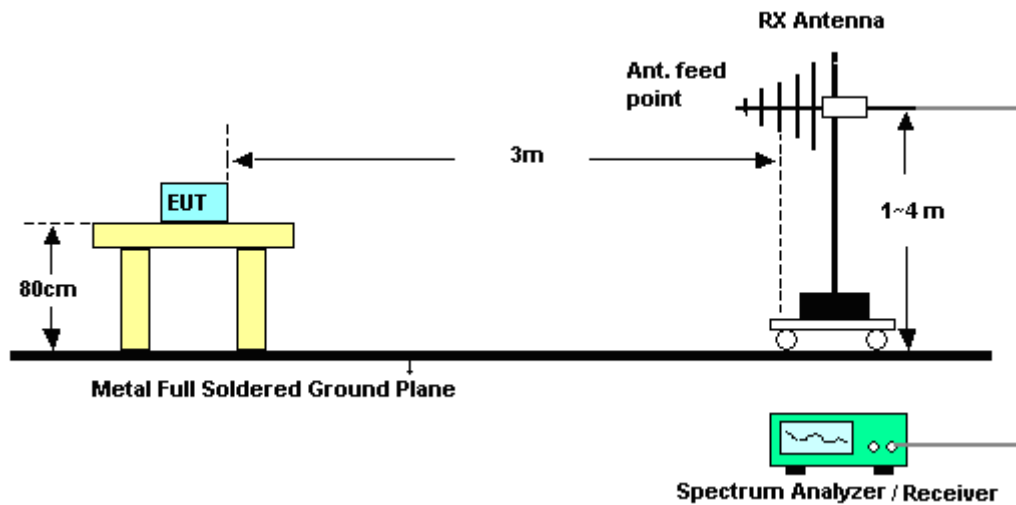
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

3.4.4 Test Setup

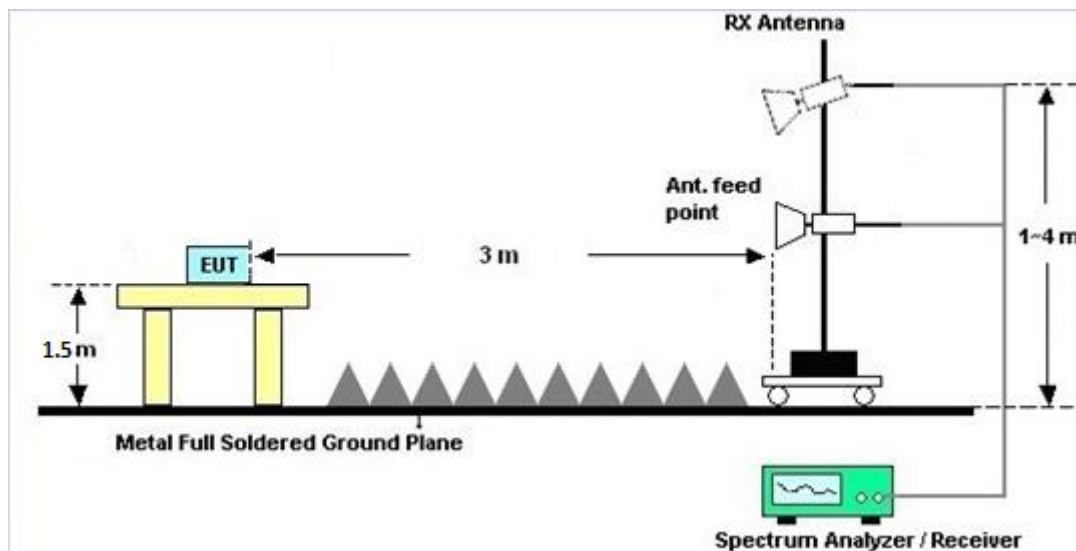
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





3.4.5 Test Results of Radiated 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.

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

*Decreases with the logarithm of the frequency.

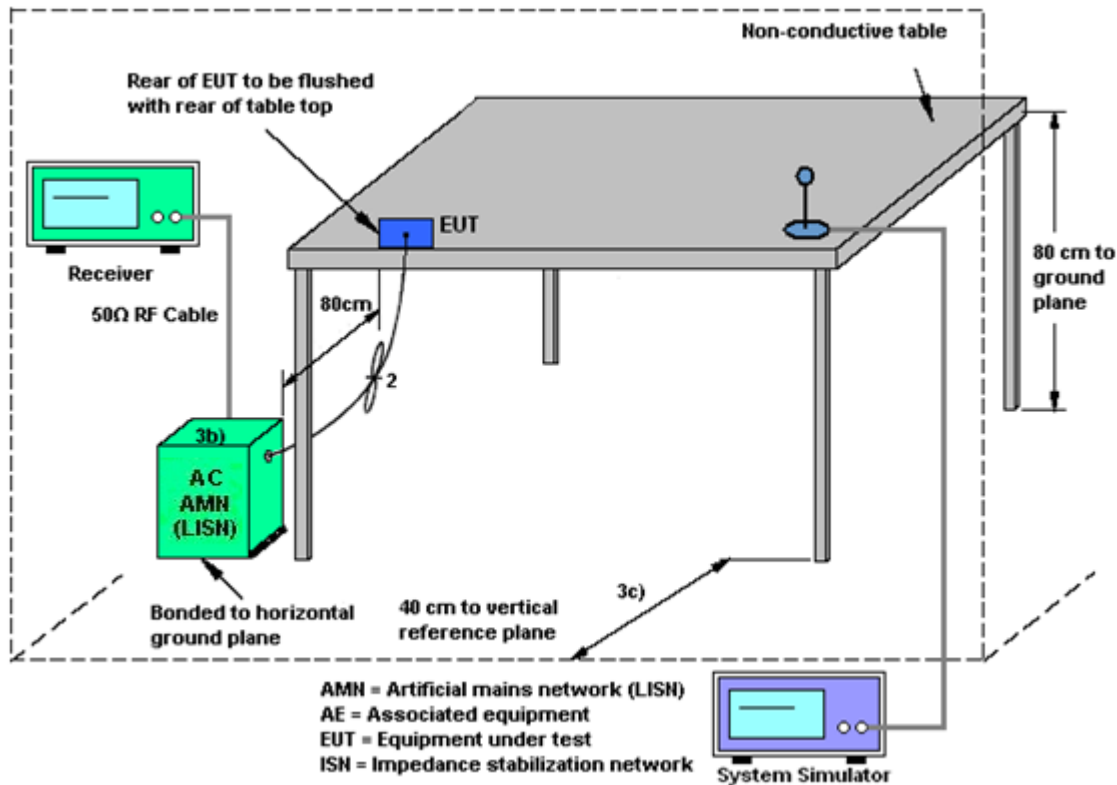
3.5.2 Measuring Instruments

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.

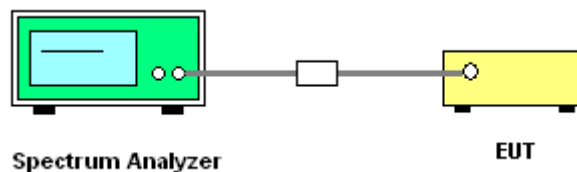
3.6.2 Measuring Instruments

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.



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

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



3.8 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 gain 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	Feb. 07, 2017 ~ Apr. 18, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	0846202	300MHz~40GHz	Sep. 29, 2016	Feb. 07, 2017 ~ Apr. 18, 2017	Sep. 28, 2017	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Jul. 17, 2016	Feb. 07, 2017 ~ Apr. 18, 2017	Jul. 16, 2017	Conducted (TH05-HY)
AC Power Source	AC POWER	AFC-500W	F104070011	50Hz~60Hz	Dec. 01, 2016	Feb. 07, 2017 ~ Apr. 18, 2017	Nov. 30, 2017	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃ ~90℃	Sep. 01, 2016	Feb. 07, 2017 ~ Apr. 18, 2017	Aug. 31, 2017	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Mar. 15, 2017	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 30, 2016	Mar. 15, 2017	Aug. 29, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Mar. 15, 2017	Nov. 28, 2017	Conduction (CO05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Oct. 20, 2016	Mar. 08, 2017 ~ Apr. 18, 2017	Oct. 19, 2018	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	40103&04	30MHz to 1GHz	Jan. 07, 2017	Mar. 08, 2017 ~ Apr. 18, 2017	Jan. 06, 2018	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1241	1GHz ~ 18GHz	Apr. 25, 2016	Mar. 08, 2017 ~ Apr. 18, 2017	Apr. 24, 2017	Radiation (03CH13-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Nov. 08, 2016	Mar. 08, 2017 ~ Apr. 18, 2017	Nov. 07, 2017	Radiation (03CH13-HY)
Amplifier	Sonoma-Instrument	310 N	187282	9KHz~1GHz	Dec. 21, 2016	Mar. 08, 2017 ~ Apr. 18, 2017	Dec. 20, 2017	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800	2025787	1GHZ~18GHZ	Feb. 13, 2017	Mar. 08, 2017 ~ Apr. 18, 2017	Feb. 12, 2018	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY53270147	1GHz~26.5GHz	Jan. 09, 2017	Mar. 08, 2017 ~ Apr. 18, 2017	Jan. 08, 2018	Radiation (03CH13-HY)
Preamplifier	MITEQ	JS44-1800400 0-33-8P	1840917	18GHz ~40GHz	Jun. 14, 2016	Mar. 08, 2017 ~ Apr. 18, 2017	Jun. 13, 2017	Radiation (03CH13-HY)
EMI Test Receiver	Agilent	N9038A (MXE)	MY53290053	20Hz to 26.5GHz	Jan. 12, 2017	Mar. 08, 2017 ~ Apr. 18, 2017	Jan. 11, 2018	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHz	Oct. 12, 2016	Mar. 08, 2017 ~ Apr. 18, 2017	Oct. 11, 2017	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1m~4m	N/A	Mar. 08, 2017 ~ Apr. 18, 2017	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Mar. 08, 2017 ~ Apr. 18, 2017	N/A	Radiation (03CH13-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
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.90
--	------

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.40
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Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.30
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Appendix A. Test Result of Conducted Test Items

Test Engineer:	Shiming Liu	Temperature:	21~25	°C
Test Date:	2017/2/7~2017/4/18	Relative Humidity:	51~54	%

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

Band IV									
Mod.	Data Rate	N _{Tx}	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	6 dB Bandwidth (MHz)	6dB Bandwidth min. Limit (MHz)	Pass/Fail
11a	6M bps	1	149	5745	17.05	20.5	15.06	0.5	Pass
11a	6Mbps	1	157	5785	17.05	20.5	15.1	0.5	Pass
11a	6Mbps	1	161	5805	17.05	20.3	15.1	0.5	Pass
HT20	MCS 0	1	149	5745	18.05	20.9	15.06	0.5	Pass
HT20	MCS 0	1	157	5785	17.95	21.1	16.06	0.5	Pass
HT20	MCS 0	1	161	5805	18.05	20.8	15.1	0.5	Pass
HT40	MCS 0	1	151	5755	36.2	40.5	35	0.5	Pass
HT40	MCS 0	1	159	5795	36.2	40.32	35.08	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV										
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	149	5745	0.33	11.13	30.00	3.26		Pass
11a	6Mbps	1	157	5785	0.33	11.01	30.00	3.26		Pass
11a	6Mbps	1	161	5805	0.33	10.93	30.00	3.26		Pass
HT20	MCS 0	1	149	5745	0.36	10.76	30.00	3.26		Pass
HT20	MCS 0	1	157	5785	0.36	10.69	30.00	3.26		Pass
HT20	MCS 0	1	161	5805	0.36	10.54	30.00	3.26		Pass
HT40	MCS 0	1	151	5755	0.65	11.13	30.00	3.26		Pass
HT40	MCS 0	1	159	5795	0.65	11.05	30.00	3.26		Pass

TEST RESULTS DATA
Power Spectral Density

Band IV										
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Duty Factor (dB)	10log (500kHz /RBW) Factor (dB)	Average Power Density (dBm/500kHz)	Average PSD Limit (dBm/500kHz)	DG (dBi)	Pass/Fail
11a	6M bps	1	149	5745	0.33	2.22	-1.64	30.00	3.26	Pass
11a	6Mbps	1	157	5785	0.33	2.22	-1.64	30.00	3.26	Pass
11a	6Mbps	1	161	5805	0.33	2.22	-1.74	30.00	3.26	Pass
HT20	MCS 0	1	149	5745	0.36	2.22	-2.51	30.00	3.26	Pass
HT20	MCS 0	1	157	5785	0.36	2.22	-2.50	30.00	3.26	Pass
HT20	MCS 0	1	161	5805	0.36	2.22	-2.57	30.00	3.26	Pass
HT40	MCS 0	1	151	5755	0.65	2.22	-4.89	30.00	3.26	Pass
HT40	MCS 0	1	159	5795	0.65	2.22	-4.92	30.00	3.26	Pass

TEST RESULTS DATA
Frequency Stability

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6M bps	1	149	5745	5745.000	0.000	0.00	50	7.4	
11a	6M bps	1	149	5745	5745.000	0.000	0.00	-30	7.4	
11a	6M bps	1	149	5745	5745.025	0.025	4.35	20	8.4	
11a	6M bps	1	149	5745	5744.975	-0.025	-4.35	20	6	
11a	6M bps	1	149	5745	5745.000	0.000	0.00	20	7.4	



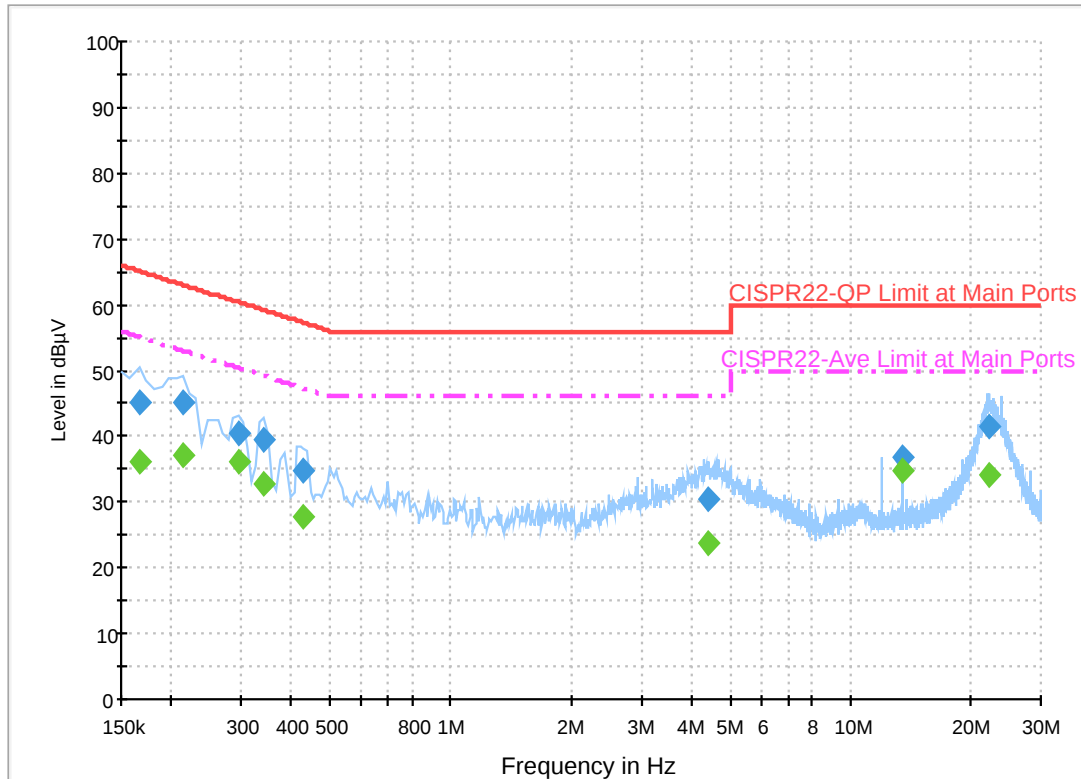
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Kai-Chun Chu	Temperature :	22~23℃
		Relative Humidity :	50~51%

EUT Information

Report NO : 710507-03
Test Mode : Mode 4
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)
0.166000	45.0	Off	L1	19.6	20.2	65.2
0.214000	45.2	Off	L1	19.6	17.8	63.0
0.294000	40.6	Off	L1	19.6	19.8	60.4
0.342000	39.3	Off	L1	19.6	19.9	59.2
0.430000	34.7	Off	L1	19.6	22.6	57.3
4.438000	30.3	Off	L1	19.7	25.7	56.0
13.558000	36.7	Off	L1	20.2	23.3	60.0
22.390000	41.3	Off	L1	20.7	18.7	60.0

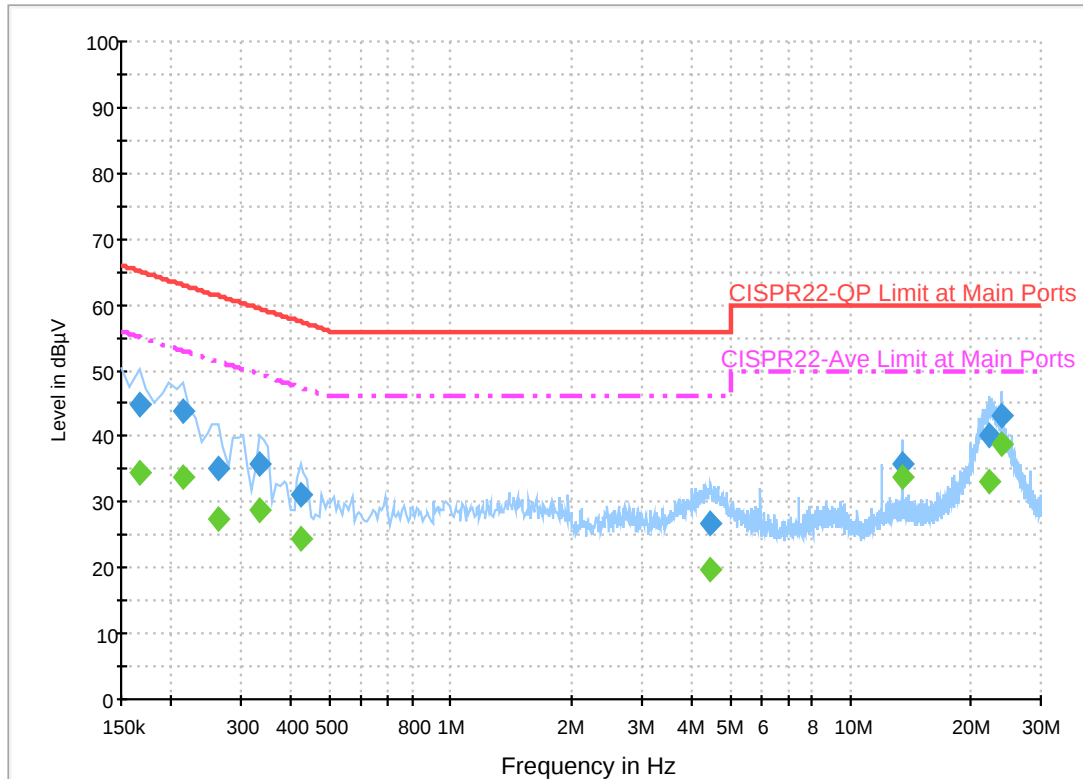
Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	36.1	Off	L1	19.6	19.1	55.2
0.214000	37.3	Off	L1	19.6	15.7	53.0
0.294000	36.2	Off	L1	19.6	14.2	50.4
0.342000	32.9	Off	L1	19.6	16.3	49.2
0.430000	27.6	Off	L1	19.6	19.7	47.3
4.438000	23.7	Off	L1	19.7	22.3	46.0
13.558000	34.7	Off	L1	20.2	15.3	50.0
22.390000	34.0	Off	L1	20.7	16.0	50.0

EUT Information

Report NO : 710507-03
Test Mode : Mode 4
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	44.7	Off	N	19.5	20.5	65.2
0.214000	43.8	Off	N	19.5	19.2	63.0
0.262000	35.1	Off	N	19.5	26.3	61.4
0.334000	35.9	Off	N	19.5	23.5	59.4
0.422000	31.0	Off	N	19.5	26.4	57.4
4.470000	26.6	Off	N	19.7	29.4	56.0
13.558000	35.9	Off	N	20.3	24.1	60.0
22.390000	40.3	Off	N	20.8	19.7	60.0
23.886000	43.0	Off	N	20.9	17.0	60.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.166000	34.6	Off	N	19.5	20.6	55.2
0.214000	33.9	Off	N	19.5	19.1	53.0
0.262000	27.5	Off	N	19.5	23.9	51.4
0.334000	28.7	Off	N	19.5	20.7	49.4
0.422000	24.6	Off	N	19.5	22.8	47.4
4.470000	19.7	Off	N	19.7	26.3	46.0
13.558000	33.8	Off	N	20.3	16.2	50.0
22.390000	33.2	Off	N	20.8	16.8	50.0
23.886000	38.9	Off	N	20.9	11.1	50.0



Appendix C. Radiated Spurious Emission

Test Engineer :	Alex Jheng, Bill Chang , and Wilson Wu	Temperature :	24~25°C
		Relative Humidity :	47~49%

<For Sample 1>

Band 4 - 5725~5850MHz

WIFI 802.11a (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)
802.11a CH 149 5745MHz		5626.6	50.78	-17.42	68.2	38.46	32.07	10.92	30.67	119	351	P	H
		5695.6	56.02	-45.94	101.96	43.53	32.17	11.02	30.7	119	351	P	H
		5718.4	59.01	-51.34	110.35	46.44	32.21	11.07	30.71	119	351	P	H
		5724.4	58.19	-62.64	120.83	45.62	32.21	11.07	30.71	119	351	P	H
	*	5745	101.94	-	-	89.33	32.24	11.1	30.73	119	351	P	H
	*	5745	94.87	-	-	82.26	32.24	11.1	30.73	119	351	A	H
													H
													H
		5637.2	51.08	-17.12	68.2	38.72	32.09	10.94	30.67	100	291	P	V
		5693.8	58.43	-42.2	100.63	45.94	32.17	11.02	30.7	100	291	P	V
		5716.8	59.98	-49.93	109.91	47.45	32.19	11.05	30.71	100	291	P	V
		5725	66.05	-56.15	122.2	53.48	32.21	11.07	30.71	100	291	P	V
	*	5745	105.7	-	-	93.09	32.24	11.1	30.73	100	291	P	V
	*	5745	98.87	-	-	86.26	32.24	11.1	30.73	100	291	A	V
													V
													V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 157 5785MHz		5641.8	50.38	-17.82	68.2	38.03	32.09	10.94	30.68	118	351	P	H
		5685.4	51.74	-42.69	94.43	39.24	32.17	11.02	30.69	118	351	P	H
		5701.6	53.14	-52.51	105.65	40.6	32.19	11.05	30.7	118	351	P	H
		5723.4	51.99	-66.56	118.55	39.42	32.21	11.07	30.71	118	351	P	H
	*	5785	102.48	-	-	89.78	32.29	11.15	30.74	118	351	P	H
	*	5785	95.1	-	-	82.4	32.29	11.15	30.74	118	351	A	H
		5852.6	50.58	-65.69	116.27	37.7	32.38	11.27	30.77	118	351	P	H
		5862.4	51.76	-56.97	108.73	38.82	32.41	11.3	30.77	118	351	P	H
		5882	51.72	-48.28	100	38.74	32.43	11.33	30.78	118	351	P	H
		5931	51.41	-16.79	68.2	38.31	32.5	11.41	30.81	118	351	P	H
													H
													H
		5603	51.55	-16.65	68.2	39.28	32.04	10.89	30.66	100	291	P	V
		5672	51.41	-33.11	84.52	38.96	32.14	11	30.69	100	291	P	V
		5712.6	51.66	-57.07	108.73	39.13	32.19	11.05	30.71	100	291	P	V
		5723.4	52.54	-66.01	118.55	39.97	32.21	11.07	30.71	100	291	P	V
	*	5785	105.6	-	-	92.9	32.29	11.15	30.74	100	291	P	V
	*	5785	98.72	-	-	86.02	32.29	11.15	30.74	100	291	A	V
		5852.6	52.59	-63.68	116.27	39.71	32.38	11.27	30.77	100	291	P	V
		5861.2	53.07	-55.99	109.06	40.13	32.41	11.3	30.77	100	291	P	V
		5891.2	52.72	-40.46	93.18	39.7	32.46	11.35	30.79	100	291	P	V
		5927.2	51.82	-16.38	68.2	38.72	32.5	11.41	30.81	100	291	P	V
													V
													V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 161 5805MHz	*	5805	102.57	-	-	93.11	32.33	7.88	30.75	100	332	P	H
	*	5805	95.22	-	-	85.76	32.33	7.88	30.75	100	332	A	H
		5852.8	51	-64.82	115.82	41.51	32.38	7.88	30.77	100	332	P	H
		5867.8	51.4	-55.81	107.21	41.89	32.41	7.88	30.78	100	332	P	H
		5882.2	51.01	-48.84	99.85	41.48	32.43	7.88	30.78	100	332	P	H
		5946.4	51.06	-17.14	68.2	41.46	32.53	7.89	30.82	100	332	P	H
													H
													H
	*	5805	106.6	-	-	97.14	32.33	7.88	30.75	257	281	P	V
	*	5805	99.02	-	-	89.56	32.33	7.88	30.75	257	281	A	V
		5852	55.12	-62.52	117.64	45.63	32.38	7.88	30.77	257	281	P	V
		5857.2	54.43	-55.75	110.18	44.91	32.41	7.88	30.77	257	281	P	V
		5886.4	52.7	-44.04	96.74	43.17	32.43	7.88	30.78	257	281	P	V
		5939.6	49.71	-18.49	68.2	40.11	32.53	7.89	30.82	257	281	P	V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	46.38	-27.62	74	56.27	40.3	15.2	65.39	100	0	P	H
		17235	47.39	-20.81	68.2	51.05	41.09	19.52	64.27	100	0	P	H
													H
													H
		11490	44.89	-29.11	74	54.78	40.3	15.2	65.39	100	0	P	V
		17235	46.21	-21.99	68.2	49.87	41.09	19.52	64.27	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	43.71	-30.29	74	53.74	40.12	15.22	65.37	100	0	P	H
		17355	47	-21.2	68.2	49.96	41.53	19.62	64.11	100	0	P	H
													H
													H
		11570	43.95	-30.05	74	53.98	40.12	15.22	65.37	100	0	P	V
		17355	46.94	-21.26	68.2	49.9	41.53	19.62	64.11	100	0	P	V
													V
													V
802.11a CH 161 5805MHz		11610	46	-28	74	58.76	40.03	12.06	65.36	100	0	P	H
		17415	50.98	-17.22	68.2	58.08	41.78	14.51	64.02	100	0	P	H
													H
													H
		11610	46.74	-27.26	74	59.5	40.03	12.06	65.36	100	0	P	V
		17415	50.09	-18.11	68.2	57.19	41.78	14.51	64.02	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		5603.2	50.89	-17.31	68.2	38.62	32.04	10.89	30.66	119	350	P	H
		5693.8	54.25	-46.38	100.63	41.76	32.17	11.02	30.7	119	350	P	H
		5717.6	56.78	-53.35	110.13	44.21	32.21	11.07	30.71	119	350	P	H
		5720.2	60.48	-50.78	111.26	47.91	32.21	11.07	30.71	119	350	P	H
	*	5745	101.17	-	-	88.56	32.24	11.1	30.73	119	350	P	H
	*	5745	94.2	-	-	81.59	32.24	11.1	30.73	119	350	A	H
													H
													H
		5610.2	51.68	-16.52	68.2	39.41	32.04	10.89	30.66	100	291	P	V
		5697	54.89	-48.1	102.99	42.4	32.17	11.02	30.7	100	291	P	V
		5719.6	60.44	-50.25	110.69	47.87	32.21	11.07	30.71	100	291	P	V
		5725	64.01	-58.19	122.2	51.44	32.21	11.07	30.71	100	291	P	V
	*	5745	105.14	-	-	92.53	32.24	11.1	30.73	100	291	P	V
	*	5745	98.24	-	-	85.63	32.24	11.1	30.73	100	291	A	V
													V
													V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 157 5785MHz		5638.4	50.65	-17.55	68.2	38.3	32.09	10.94	30.68	125	350	P	H
		5697.6	51.56	-51.87	103.43	39.07	32.17	11.02	30.7	125	350	P	H
		5707.8	51.1	-56.29	107.39	38.56	32.19	11.05	30.7	125	350	P	H
		5723.4	50.9	-67.65	118.55	38.33	32.21	11.07	30.71	125	350	P	H
	*	5785	101.07	-	-	88.37	32.29	11.15	30.74	125	350	P	H
	*	5785	94.18	-	-	81.48	32.29	11.15	30.74	125	350	A	H
		5853.2	52.12	-62.78	114.9	39.24	32.38	11.27	30.77	125	350	P	H
		5869.2	52.87	-53.95	106.82	39.94	32.41	11.3	30.78	125	350	P	H
		5913	51.9	-25.15	77.05	38.85	32.48	11.38	30.81	125	350	P	H
		5944	51.95	-16.25	68.2	38.8	32.53	11.44	30.82	125	350	P	H
													H
													H
		5605.2	50.7	-17.5	68.2	38.43	32.04	10.89	30.66	100	292	P	V
		5679.4	52.32	-37.68	90	39.87	32.14	11	30.69	100	292	P	V
		5710	52.77	-55.23	108	40.23	32.19	11.05	30.7	100	292	P	V
		5720.8	51.73	-60.89	112.62	39.16	32.21	11.07	30.71	100	292	P	V
	*	5785	104.4	-	-	91.7	32.29	11.15	30.74	100	292	P	V
	*	5785	97.75	-	-	85.05	32.29	11.15	30.74	100	292	A	V
		5851.8	50.33	-67.77	118.1	37.45	32.38	11.27	30.77	100	292	P	V
		5859.4	52.79	-56.78	109.57	39.85	32.41	11.3	30.77	100	292	P	V
		5906	52.58	-29.64	82.22	39.51	32.48	11.38	30.79	100	292	P	V
		5938.2	52.86	-15.34	68.2	39.77	32.5	11.41	30.82	100	292	P	V
													V
													V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 161 5805MHz	*	5805	100.83	-	-	88.04	32.33	11.21	30.75	113	348	P	H
	*	5805	93.93	-	-	81.14	32.33	11.21	30.75	113	348	A	H
		5853.2	50.99	-63.91	114.9	38.11	32.38	11.27	30.77	113	348	P	H
		5864.4	52.29	-55.88	108.17	39.36	32.41	11.3	30.78	113	348	P	H
		5922	52.71	-17.7	70.41	39.61	32.5	11.41	30.81	113	348	P	H
		5930.8	51.54	-16.66	68.2	38.44	32.5	11.41	30.81	113	348	P	H
													H
													H
	*	5805	104.59	-	-	91.8	32.33	11.21	30.75	100	293	P	V
	*	5805	97.61	-	-	84.82	32.33	11.21	30.75	100	293	A	V
		5855	53.45	-57.35	110.8	40.51	32.41	11.3	30.77	100	293	P	V
		5855	53.45	-57.35	110.8	40.51	32.41	11.3	30.77	100	293	P	V
		5893.4	53.03	-38.52	91.55	40.01	32.46	11.35	30.79	100	293	P	V
		5932.6	52.01	-16.19	68.2	38.91	32.5	11.41	30.81	100	293	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT20 CH 149 5745MHz		11490	44.97	-29.03	74	54.86	40.3	15.2	65.39	100	0	P	H
		17235	46.56	-21.64	68.2	50.22	41.09	19.52	64.27	100	0	P	H
													H
													H
		11490	44.01	-29.99	74	53.9	40.3	15.2	65.39	100	0	P	V
		17235	46.64	-21.56	68.2	50.3	41.09	19.52	64.27	100	0	P	V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	44.02	-29.98	74	54.05	40.12	15.22	65.37	100	0	P	H
		17355	46.5	-21.7	68.2	49.46	41.53	19.62	64.11	100	0	P	H
													H
													H
		11570	46.26	-27.74	74	56.29	40.12	15.22	65.37	100	0	P	V
		17355	46.85	-21.35	68.2	49.81	41.53	19.62	64.11	100	0	P	V
													V
													V
802.11n HT20 CH 161 5805MHz		11610	43.52	-30.48	74	53.63	40.03	15.22	65.36	100	0	P	H
		17415	49.1	-19.1	68.2	51.67	41.78	19.67	64.02	100	0	P	H
													H
													H
		11610	44.16	-29.84	74	54.27	40.03	15.22	65.36	100	0	P	V
		17415	48.83	-19.37	68.2	51.4	41.78	19.67	64.02	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		5649	51.63	-16.57	68.2	39.28	32.09	10.94	30.68	130	349	P	H
		5680.6	51.63	-39.25	90.88	39.18	32.14	11	30.69	130	349	P	H
		5714.6	55.83	-53.46	109.29	43.3	32.19	11.05	30.71	130	349	P	H
		5724.6	56.97	-64.32	121.29	44.4	32.21	11.07	30.71	130	349	P	H
	*	5755	99.3	-	-	86.64	32.26	11.13	30.73	130	349	P	H
	*	5755	92.68	-	-	80.02	32.26	11.13	30.73	130	349	A	H
		5854	51.67	-61.41	113.08	38.73	32.41	11.3	30.77	130	349	P	H
		5855.2	51.58	-59.16	110.74	38.64	32.41	11.3	30.77	130	349	P	H
		5915.6	51.87	-23.26	75.13	38.82	32.48	11.38	30.81	130	349	P	H
		5930	53.24	-14.96	68.2	40.14	32.5	11.41	30.81	130	349	P	H
													H
													H
		5623.6	50.93	-17.27	68.2	38.61	32.07	10.92	30.67	100	298	P	V
		5698.6	55.85	-48.32	104.17	43.36	32.17	11.02	30.7	100	298	P	V
		5719.8	61.89	-48.85	110.74	49.32	32.21	11.07	30.71	100	298	P	V
		5724.8	63.25	-58.49	121.74	50.68	32.21	11.07	30.71	100	298	P	V
	*	5755	102.88	-	-	90.22	32.26	11.13	30.73	100	298	P	V
	*	5755	95.92	-	-	83.26	32.26	11.13	30.73	100	298	A	V
		5852.6	52.32	-63.95	116.27	39.44	32.38	11.27	30.77	100	298	P	V
		5863.4	53.38	-55.07	108.45	40.45	32.41	11.3	30.78	100	298	P	V
		5904.6	52.36	-30.9	83.26	39.29	32.48	11.38	30.79	100	298	P	V
		5942.4	50.36	-17.84	68.2	37.21	32.53	11.44	30.82	100	298	P	V
													V
													V



WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 159 5795MHz		5603	51.09	-17.11	68.2	38.82	32.04	10.89	30.66	128	349	P	H
		5676.8	51.18	-36.89	88.07	38.73	32.14	11	30.69	128	349	P	H
		5717.2	50.98	-59.04	110.02	38.45	32.19	11.05	30.71	128	349	P	H
		5720.2	50.55	-60.71	111.26	37.98	32.21	11.07	30.71	128	349	P	H
	*	5795	99.05	-	-	86.31	32.31	11.18	30.75	128	349	P	H
	*	5795	92.61	-	-	79.87	32.31	11.18	30.75	128	349	A	H
		5851.8	50.74	-67.36	118.1	37.86	32.38	11.27	30.77	128	349	P	H
		5867	52.54	-54.9	107.44	39.61	32.41	11.3	30.78	128	349	P	H
		5879.4	52.36	-49.57	101.93	39.38	32.43	11.33	30.78	128	349	P	H
		5928.8	51.31	-16.89	68.2	38.21	32.5	11.41	30.81	128	349	P	H
													H
													H
		5638	52.05	-16.15	68.2	39.7	32.09	10.94	30.68	100	292	P	V
		5691.6	53.48	-45.53	99.01	40.99	32.17	11.02	30.7	100	292	P	V
		5715.6	53.77	-55.8	109.57	41.24	32.19	11.05	30.71	100	292	P	V
		5723.8	52.41	-67.05	119.46	39.84	32.21	11.07	30.71	100	292	P	V
	*	5795	102.52	-	-	89.78	32.31	11.18	30.75	100	292	P	V
	*	5795	95.99	-	-	83.25	32.31	11.18	30.75	100	292	A	V
		5851.4	53.11	-65.9	119.01	40.23	32.38	11.27	30.77	100	292	P	V
		5868.2	53.37	-53.73	107.1	40.44	32.41	11.3	30.78	100	292	P	V
		5887.8	54.86	-40.84	95.7	41.84	32.46	11.35	30.79	100	292	P	V
		5927	51.31	-16.89	68.2	38.21	32.5	11.41	30.81	100	292	P	V
													V
													V
Remark	1. No other spurious found.												
	2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		11510	44.8	-29.2	74	54.69	40.3	15.21	65.4	100	0	P	H
		17265	46.66	-21.54	68.2	50.13	41.21	19.55	64.23	100	0	P	H
													H
													H
		11510	45.18	-28.82	74	55.07	40.3	15.21	65.4	100	0	P	V
		17265	46.25	-21.95	68.2	49.72	41.21	19.55	64.23	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	43.62	-30.38	74	53.69	40.08	15.22	65.37	100	0	P	H
		17385	47.69	-20.51	68.2	50.45	41.66	19.64	64.06	100	0	P	H
													H
													H
		11590	43.98	-30.02	74	54.05	40.08	15.22	65.37	100	0	P	V
		17385	47.88	-20.32	68.2	50.64	41.66	19.64	64.06	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT40 LF		32.97	26.88	-13.12	40	34.34	24.22	0.66	32.34	-	-	P	H
		104.25	31.57	-11.93	43.5	46.21	16.6	1.05	32.29	-	-	P	H
		201.18	31.89	-11.61	43.5	47.19	15.46	1.51	32.27	-	-	P	H
		479.9	31.36	-14.64	46	37.55	23.56	2.44	32.19	-	-	P	H
		622.7	33.48	-12.52	46	37.36	25.48	2.84	32.2	-	-	P	H
		960.1	42.74	-11.26	54	40.09	30.14	3.47	30.96	100	0	P	H
													H
													H
													H
													H
													H
													H
		34.59	36.5	-3.5	40	45.1	23.1	0.64	32.34	-	-	P	V
		54.84	35.93	-4.07	40	54.14	13.3	0.81	32.32	-	-	P	V
		65.51	31.39	-8.61	40	50.66	12.16	0.88	32.31	168	1	QP	V
		479.9	31.32	-14.68	46	37.51	23.56	2.44	32.19	-	-	P	V
		740.3	27.47	-18.53	46	29.33	27.15	3.09	32.1	-	-	P	V
		960.1	42.03	-11.97	54	39.38	30.14	3.47	30.96	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

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



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. 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”.



<For Sample 2>

Band 4 - 5725~5850MHz

WIFI 802.11n HT40 (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)
802.11n HT40 CH 151 5755MHz		5648.2	52	-16.2	68.2	39.65	32.09	10.94	30.68	145	336	P	H
		5697	52.96	-50.03	102.99	40.47	32.17	11.02	30.7	145	336	P	H
		5714	61.11	-48.01	109.12	48.58	32.19	11.05	30.71	145	336	P	H
		5720.8	59.18	-53.44	112.62	46.61	32.21	11.07	30.71	145	336	P	H
	*	5755	99.57	-	-	86.91	32.26	11.13	30.73	145	336	P	H
	*	5755	93.64	-	-	80.98	32.26	11.13	30.73	145	336	A	H
		5852	51.03	-66.61	117.64	38.15	32.38	11.27	30.77	145	336	P	H
		5862.4	50.19	-58.54	108.73	37.25	32.41	11.3	30.77	145	336	P	H
		5919.2	50.97	-21.51	72.48	37.92	32.48	11.38	30.81	145	336	P	H
		5938.6	50.03	-18.17	68.2	36.88	32.53	11.44	30.82	145	336	P	H
													H
													H
		5649.4	53.75	-14.45	68.2	41.4	32.09	10.94	30.68	100	290	P	V
		5696.2	56.81	-45.59	102.4	44.32	32.17	11.02	30.7	100	290	P	V
		5717.8	60.86	-49.32	110.18	48.29	32.21	11.07	30.71	100	290	P	V
		5720.4	64.44	-47.27	111.71	51.87	32.21	11.07	30.71	100	290	P	V
	*	5755	102.32	-	-	89.66	32.26	11.13	30.73	100	290	P	V
	*	5755	96.07	-	-	83.41	32.26	11.13	30.73	100	290	A	V
		5853.4	50.9	-63.55	114.45	38.02	32.38	11.27	30.77	100	290	P	V
		5858.6	50.74	-59.05	109.79	37.8	32.41	11.3	30.77	100	290	P	V
		5909.2	50.92	-28.94	79.86	37.85	32.48	11.38	30.79	100	290	P	V
		5943.2	50.38	-17.82	68.2	37.23	32.53	11.44	30.82	100	290	P	V
													V
													V

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

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11n HT40 CH 151 5755MHz		11510	45.34	-28.66	74	55.23	40.3	15.21	65.4	100	0	P	H
		17265	46.67	-21.53	68.2	50.14	41.21	19.55	64.23	100	0	P	H
													H
													H
		11510	45.16	-28.84	74	55.05	40.3	15.21	65.4	100	0	P	V
		17265	46.76	-21.44	68.2	50.23	41.21	19.55	64.23	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT40 LF		66.99	31.64	-8.36	40	50.85	12.22	0.88	32.31	-	-	P	H
		94.8	35.44	-8.06	43.5	51.26	15.45	1.02	32.29	100	0	P	H
		119.91	32.32	-11.18	43.5	45.95	17.5	1.16	32.29	-	-	P	H
		479.9	29.89	-16.11	46	36.08	23.56	2.44	32.19	-	-	P	H
		622.7	31.96	-14.04	46	35.84	25.48	2.84	32.2	-	-	P	H
		960.1	41.52	-12.48	54	38.87	30.14	3.47	30.96	-	-	P	H
													H
													H
													H
													H
													H
													H
		36.21	36.02	-3.98	40	45.2	22.52	0.63	32.33	-	-	P	V
		65.92	35.41	-4.59	40	54.68	12.16	0.88	32.31	100	360	QP	V
		86.97	32.53	-7.47	40	49.36	14.47	1	32.3	-	-	P	V
		479.9	31.37	-14.63	46	37.56	23.56	2.44	32.19	-	-	P	V
		622.7	28.95	-17.05	46	32.83	25.48	2.84	32.2	-	-	P	V
		960.1	42.03	-11.97	54	39.38	30.14	3.47	30.96	-	-	P	V
													V
													V
												V	
												V	
												V	
												V	
												V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.												



Note symbol

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



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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



Appendix D. Radiated Spurious Emission Plots

Test Engineer :	Alex Jheng, Bill Chang , and Wilson Wu	Temperature :	24~25°C
		Relative Humidity :	47~49%

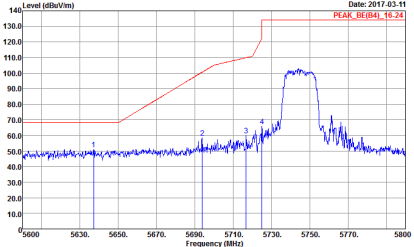
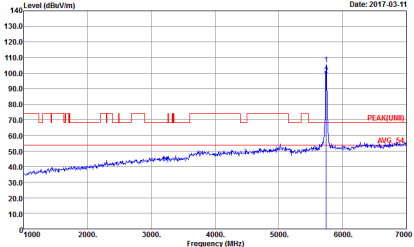
<For Sample 1>

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : 710507-03 Mode : Z9	Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL Detector : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Project : 710507-03 Mode : Z9

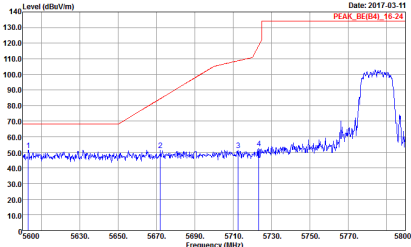
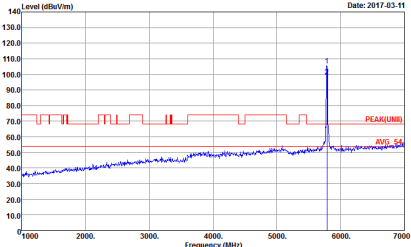
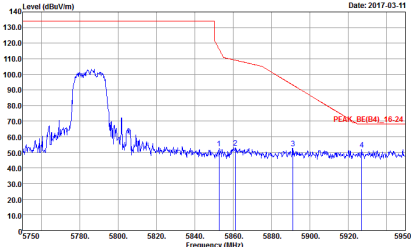


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 29	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 29

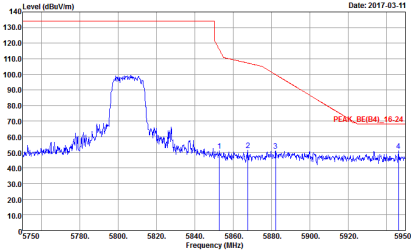
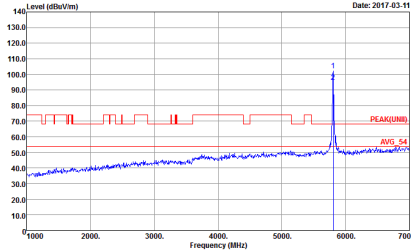


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 30	Site : 03CH13-HY Condition : PEAK(UMB) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 30
Peak	Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 30	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 30	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 30
	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 30	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH161 5805MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HV Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 31	 Site : 03CH13-HV Condition : PEAK(UMB) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 31

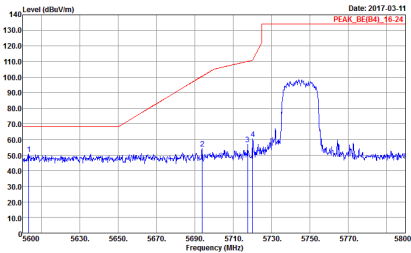
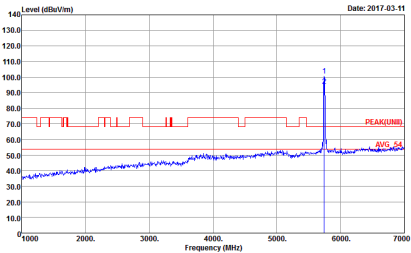


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH161 5805MHz	
1	Vertical	Fundamental
Peak	Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 31	Site : 03CH13-HY Condition : PEAK(UMB) 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 31

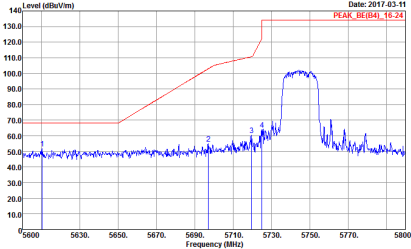
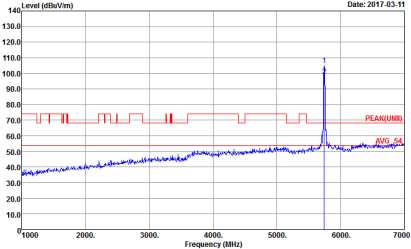


Band 4 5725~5850MHz

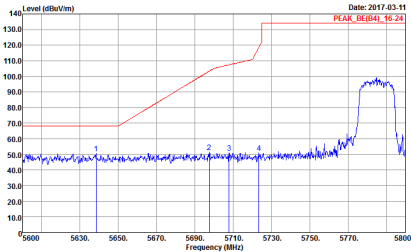
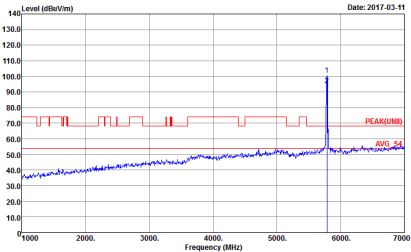
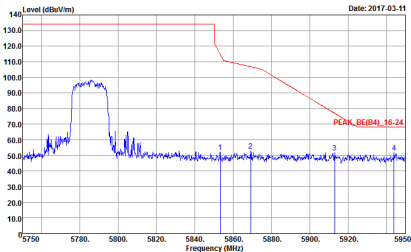
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 32	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 32

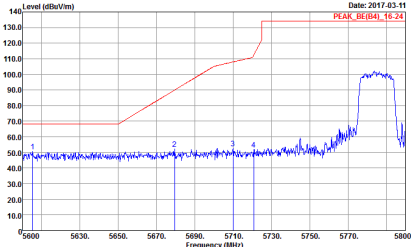
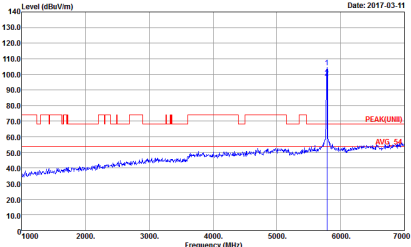
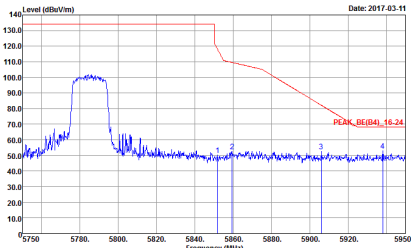


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_9E(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 32	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 32

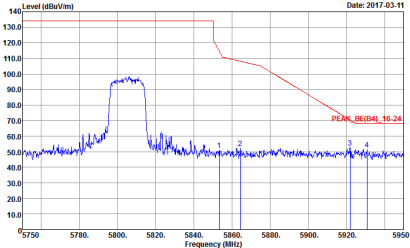
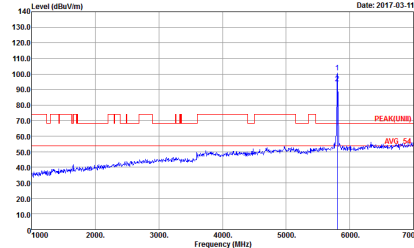


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 33	 Site : 03CH13-HY Condition : PEAK(UMB) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 33
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 33	Left blank

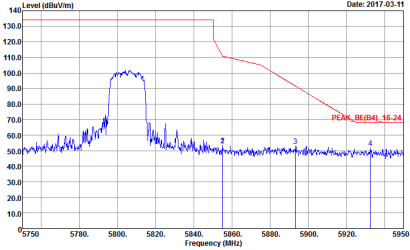
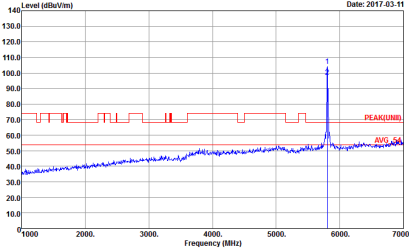


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 33	 Site : 03CH13-HY Condition : PEAK(UMB) 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 33
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 33	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH161 5805MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_9E(B4)_16-24 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 34	 Site : 03CH13-HY Condition : PEAK(UNB) 3m HORN_9120D_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 34

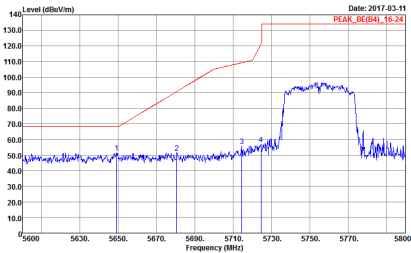
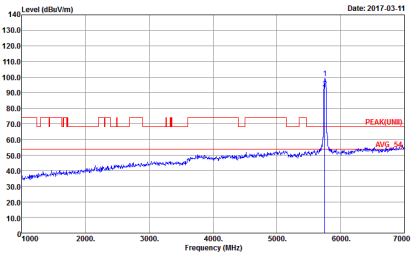
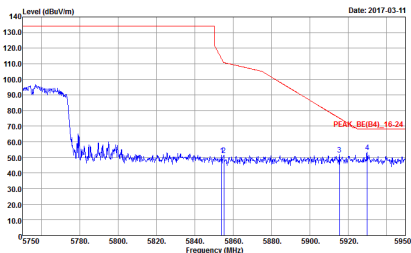


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH161 5805MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_96(B4)_16-24 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 34	 Site : 03CH13-HY Condition : PEAK(UNB) 3m HORN_9120D_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 34

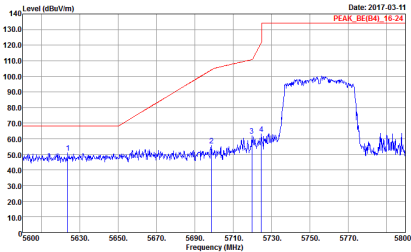
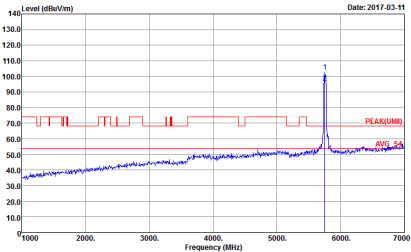
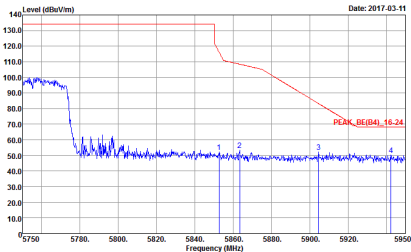


Band 4 5725~5850MHz

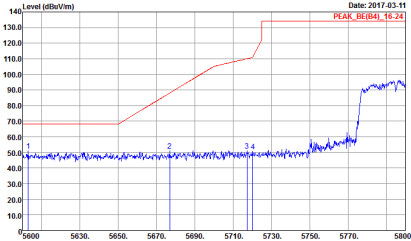
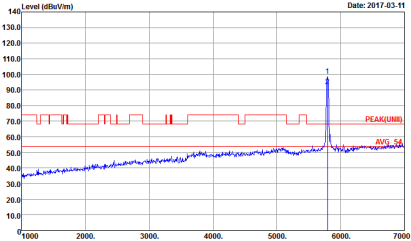
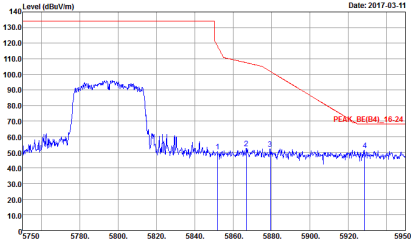
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 35	 Site : 03CH13-HY Condition : PEAK(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 35
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 35	Left blank

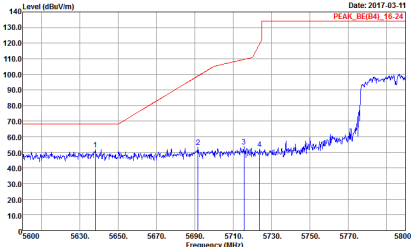
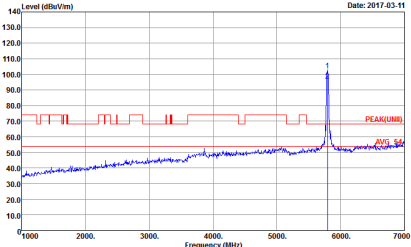
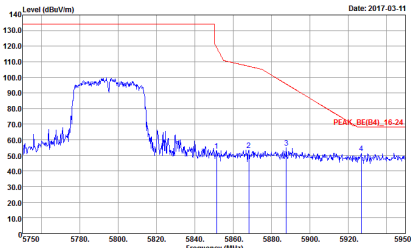


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 35	 Site : 03CH13-HY Condition : PEAK(UMB) 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 35
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 35	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 36	 Site : 03CH13-HY Condition : PEAK(UMB) 3m HORN_91200_1241 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 36
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 36	Left blank

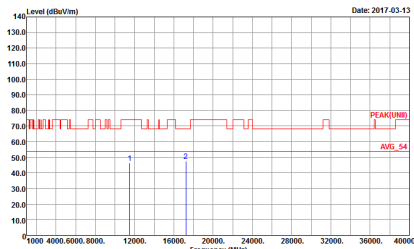
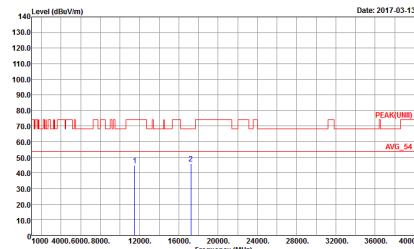


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 36	 Site : 03CH13-HY Condition : PEAK(UMB) 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 36
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 36	Left blank

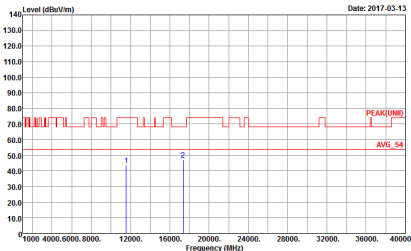
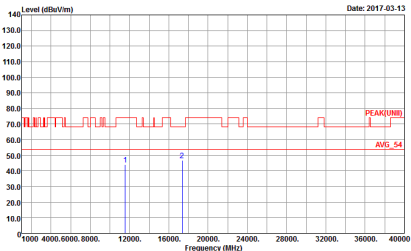


Band 4 - 5725~5850MHz

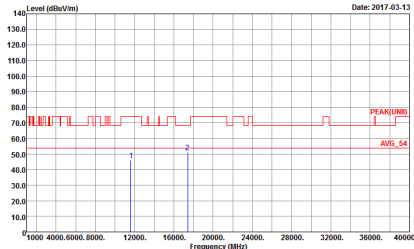
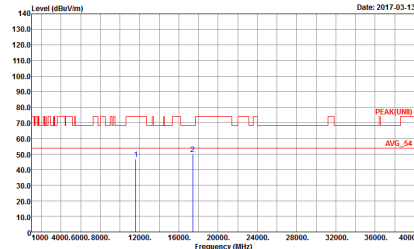
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HV Condition : PEAK(UNII) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 29	 Site : 03CH13-HV Condition : PEAK(UNII) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 29



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 30	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 30



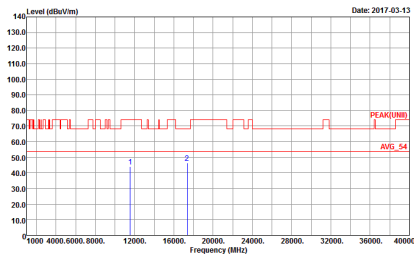
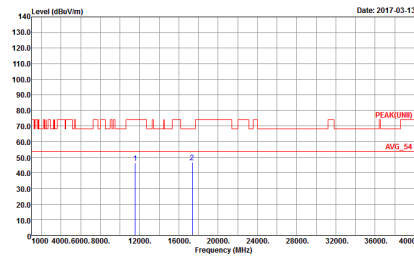
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH161 5805MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNB) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 31	 Site : 03CH13-HY Condition : PEAK(UNB) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 31



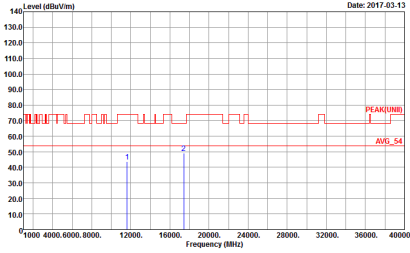
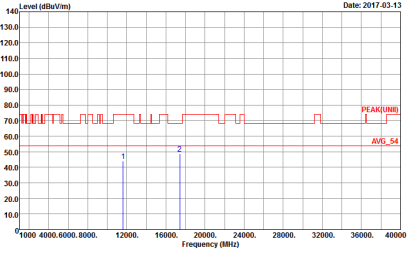
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.	Site : 03CH13-HY Condition : PEAK(UNII) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 32	Site : 03CH13-HY Condition : PEAK(UNII) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 32



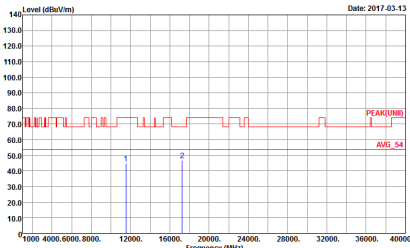
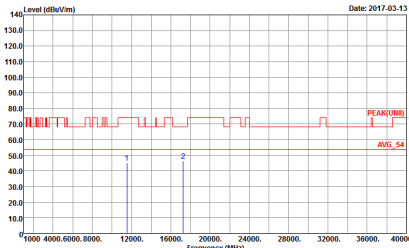
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HV Condition : PEAK(UNIT) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 33	 Site : 03CH13-HV Condition : PEAK(UNIT) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 33



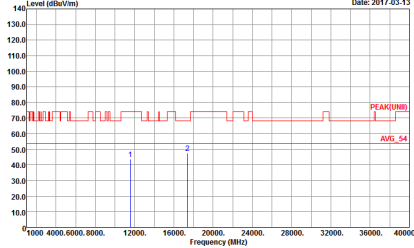
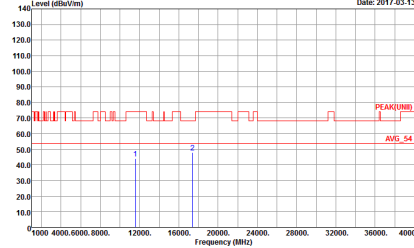
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH161 5805MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 34	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 34



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

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 35	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 35

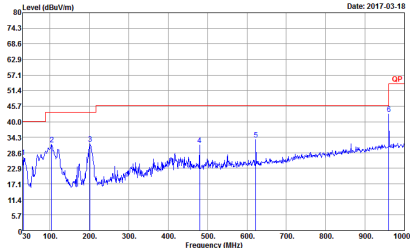
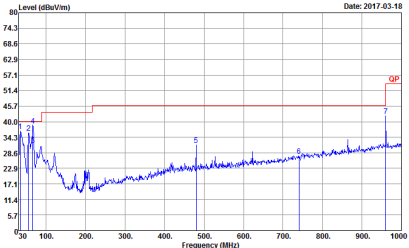


WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HV Condition : PEAK(UNII) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 36	 Site : 03CH13-HV Condition : PEAK(UNII) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 36



Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF)

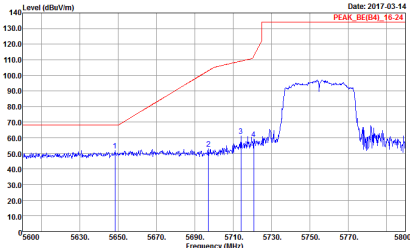
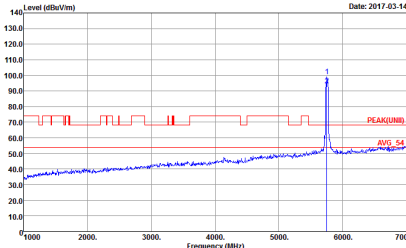
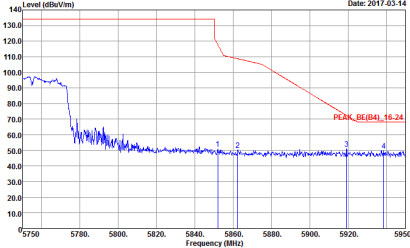
WIFI	5GHz 5725~5850MHz	
ANT	802.11n HT40 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH13-HY Condition : QP 3m BTLOG_40103 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 37	 Site : 03CH13-HY Condition : QP 3m BTLOG_40103 VERTICAL Detector : Peak Project : 710507-03 Mode : 37



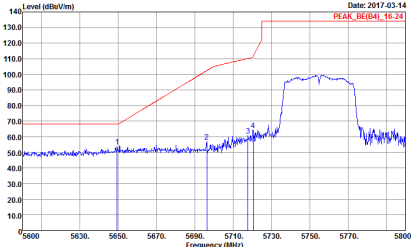
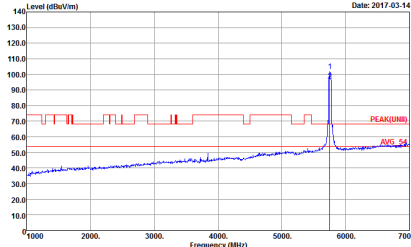
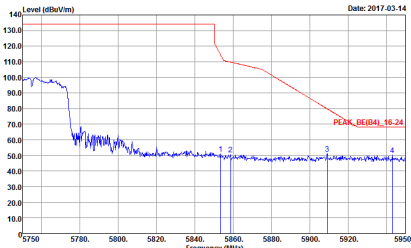
<For Sample 2>

Band 4 - 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 38	 Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 38
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 710507-03 Mode : 38	Left blank

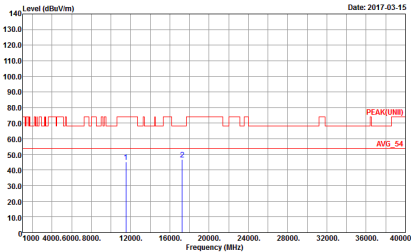
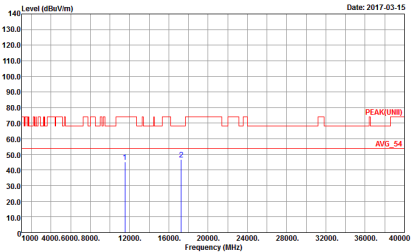


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 38	 Site : 03CH13-HY Condition : PEAK(UMB) 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 38
Peak	 Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak Project : 710507-03 Mode : 38	Left blank



Band 4 - 5725~5850MHz

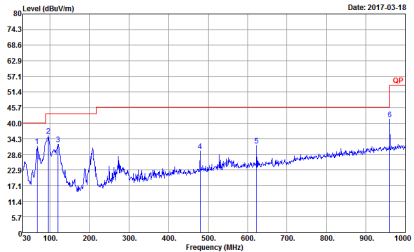
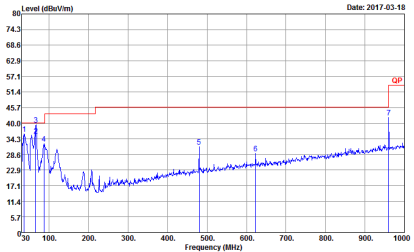
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH13-HY Condition : PEAK(UMI) 3m SHF_HORN_584 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 38	 Site : 03CH13-HY Condition : PEAK(UMI) 3m SHF_HORN_584 VERTICAL Detector : Peak Project : 710507-03 Mode : 38



Emission below 1GHz

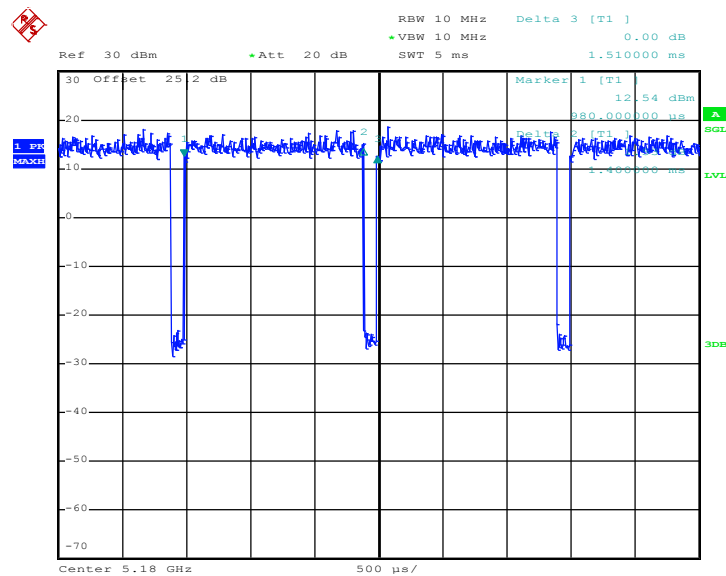
5GHz WIFI 802.11n HT40 (LF)

WIFI	5GHz 5725~5850MHz	
ANT	802.11n HT40 LF	
1	Horizontal	Vertical
QP / Peak	 Site : 03CH13-HY Condition : QP 3m 81LO6_40103 HORIZONTAL Detector : Peak Project : 710507-03 Mode : 39	 Site : 03CH13-HY Condition : QP 3m 81LO6_40103 VERTICAL Detector : Peak Project : 710507-03 Mode : 39

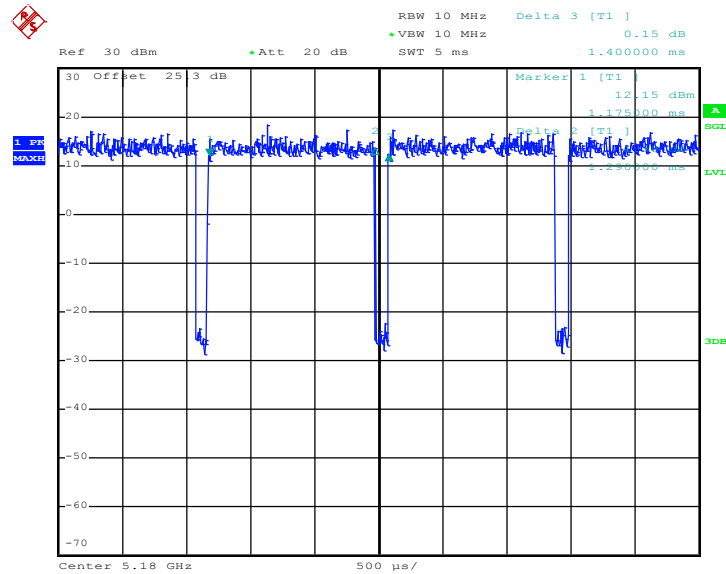
Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11a	92.715	1400	0.71	1kHz
5GHz 802.11n HT20	92.143	1290	0.78	1kHz
5GHz 802.11n HT40	86.179	636	1.57	3kHz

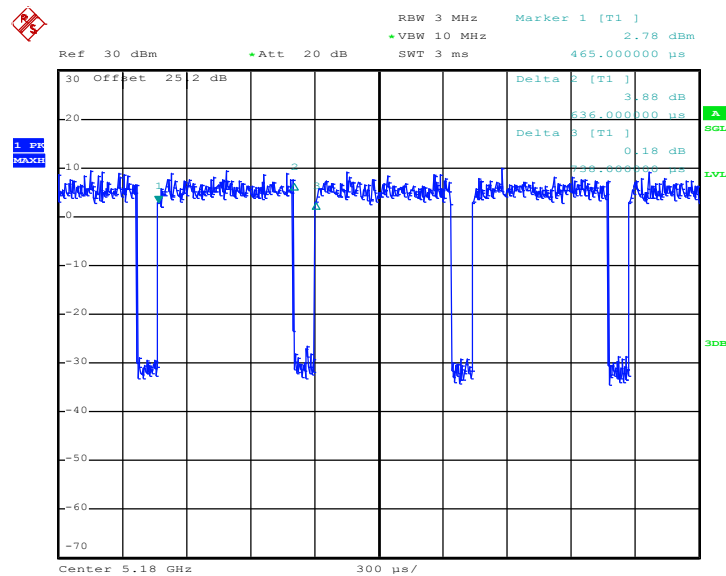
802.11a



Date: 7.FEB.2017 00:46:30

802.11n HT20


Date: 7.FEB.2017 00:56:59

802.11n HT40


Date: 7.FEB.2017 01:25:06