FCC RF Test Report

APPLICANT	:	**Xiaomi Communications Co., Ltd.**
EQUIPMENT	:	**Mobile Phone**
BRAND NAME	:	**MI**
MODEL NAME	:	**MEG7**
FCC ID	:	**2AFZZ-RMMEG7**
STANDARD	:	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	:	**(NII) Unlicensed National Information Infrastructure**

The product was received on Sep. 18, 2017 and testing was completed on Oct. 16, 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

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR791813E	Rev. 01	Initial issue of report	Oct. 20, 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 11510.000 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 12.20 dB at 0.534 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

Xiaomi Communications Co., Ltd.
The Rainbow City of China Resources,NO.68,Qinghe Middle Street,Haidian District,Beijing,China

1.2 Manufacturer

Xiaomi Communications Co., Ltd.
The Rainbow City of China Resources,NO.68,Qinghe Middle Street,Haidian District,Beijing,China

1.3 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Antenna Type	WWAN: PIFA Antenna WLAN: PIFA Antenna Bluetooth: PIFA Antenna GPS / Glonass / BDS / SBAS: PIFA Antenna FM: Integral Antenna (Earphone acting as FM antenna deemed as an integral antenna)

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. TW0007 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

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	TH05-HY

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

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: +886-3-3273456 FAX: +886-3-3284978
Test Site No.	**Sporton Site No.**
	03CH11-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). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z 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
	-	-	165	5825

Note:

1. The above Frequency and Channel in "*" were 802.11n HT40 and 802.

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 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + USB Cable 1 (Charging from Adapter) Mode 2 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + USB Cable 2 (Charging from Adapter)

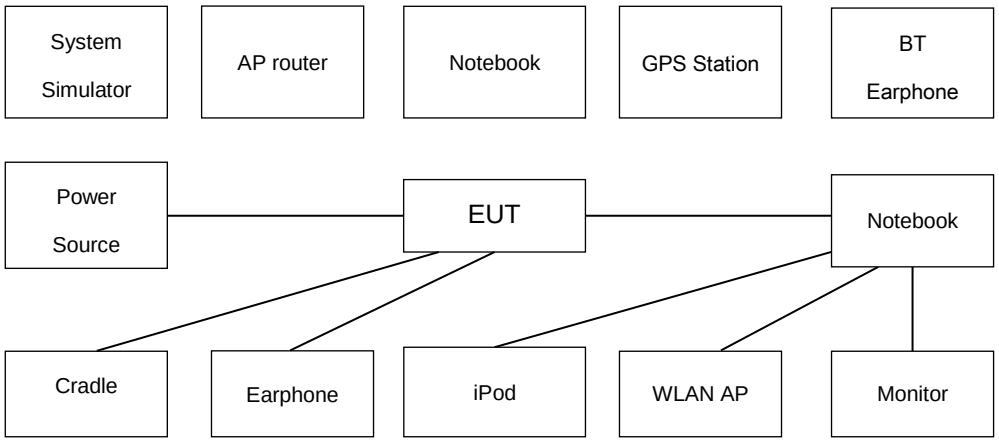
Remark:

1. The worst case of conducted emission is mode 2; only the test data of it was reported.

2. For Radiated Test Cases, The tests were performance with Adapter, Earphone and USB Cable 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	165	165	159

2.3 Connection Diagram of Test System



This example is connection diagram of EUT test configurations.

. For detail, please refer to test mode configuration and setup photographs for each test item.

2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
3.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded,1.8m
4.	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
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.5 EUT Operation Test Setup

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

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example :

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

Offset = RF cable loss + attenuator factor.

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

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

= 4.2 + 10 = 14.2 (dB)

3 Test Result

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

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

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

26dB and 99% Occupied bandwidth are reporting only.

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

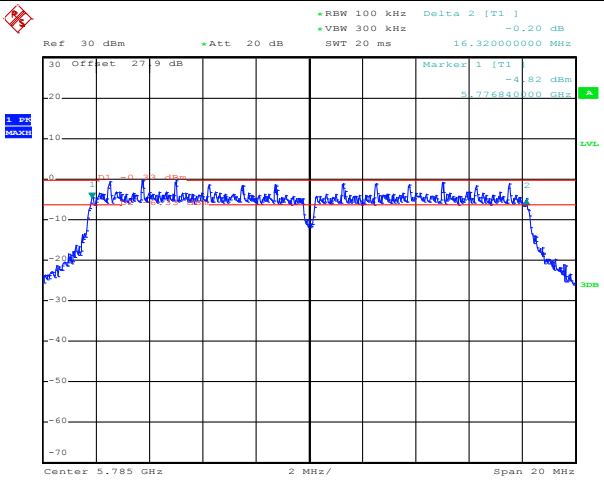
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

3.1.4 Test Setup

3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

Minimum 6dB Bandwidth



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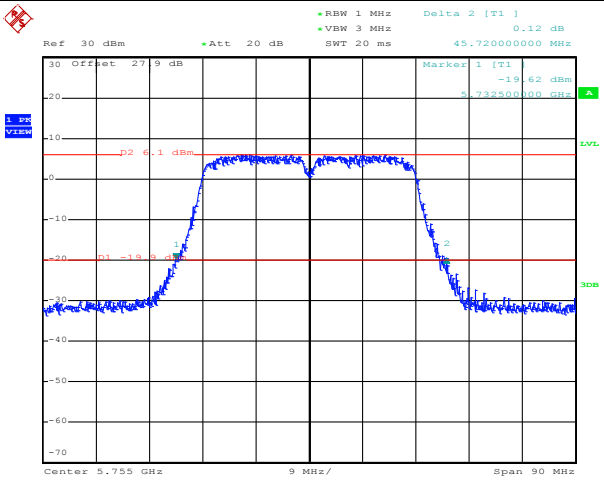
Maximum 26dB Bandwidth



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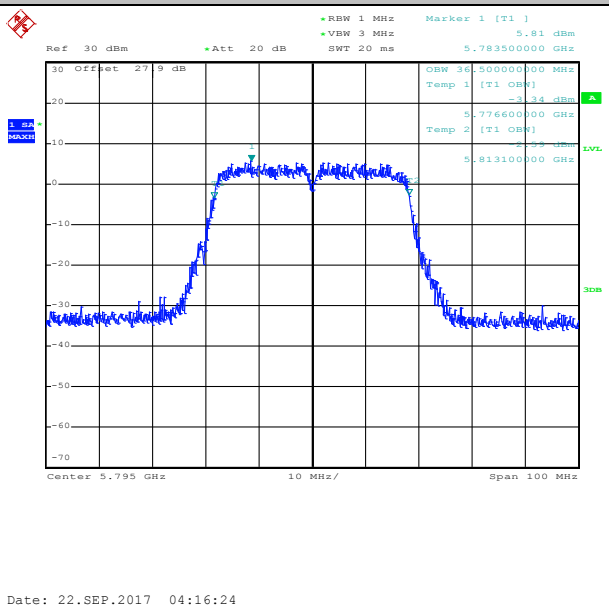
Maximum 99% Occupied Bandwidth



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

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

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

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

3.2.2 Measuring Instruments

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

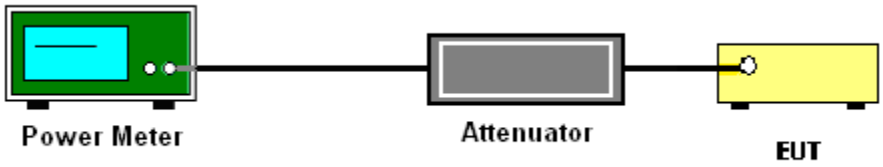
3.2.3 Test Procedures

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

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

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

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

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

3.3.2 Measuring Instruments

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

3.3.3 Test Procedures

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

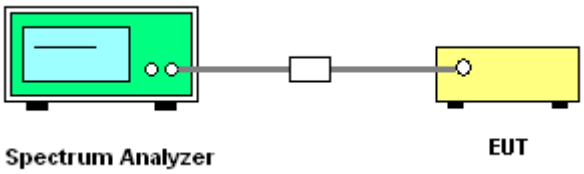
 # Method SA-2 #

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

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

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

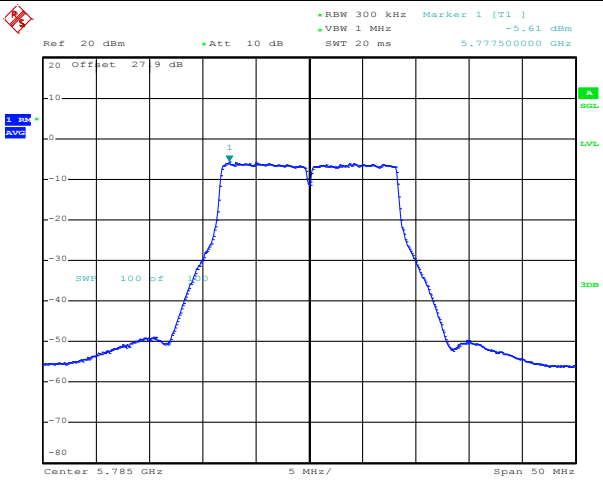
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/300kHz)



3.4 Unwanted Emissions Measurement

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

3.4.1 Limit of Unwanted Emissions

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

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

(2) Unwanted spurious emissions fallen in restricted bands 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.

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

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

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

(i) Section 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and 2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz. However, an out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz dBm/MHz peak emission limit.

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

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

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

3.4.2 Measuring Instruments

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

3.4.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

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

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

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

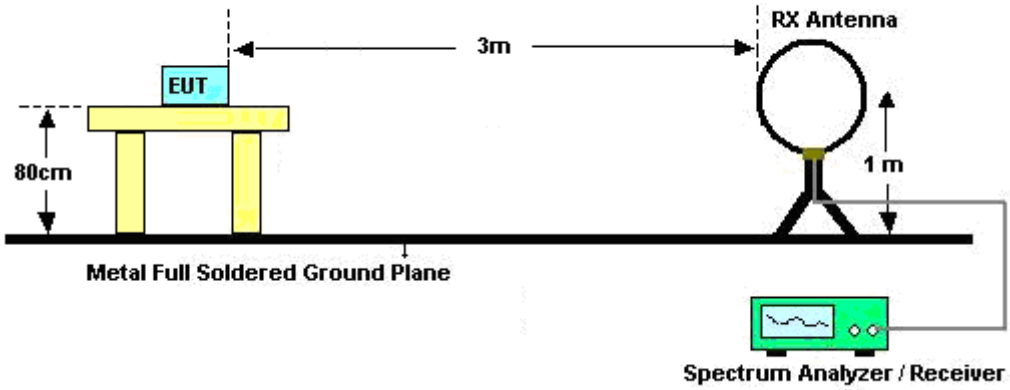
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

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

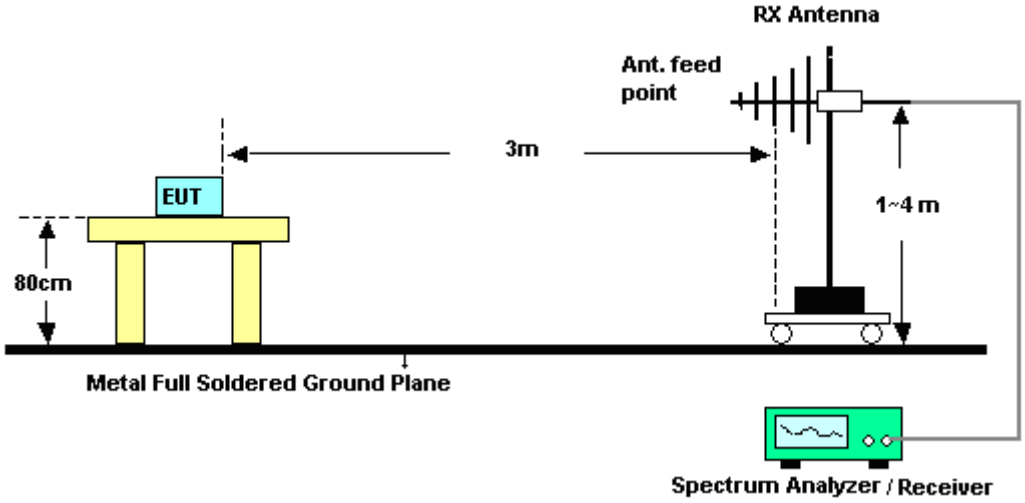
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

3.4.4 Test Setup

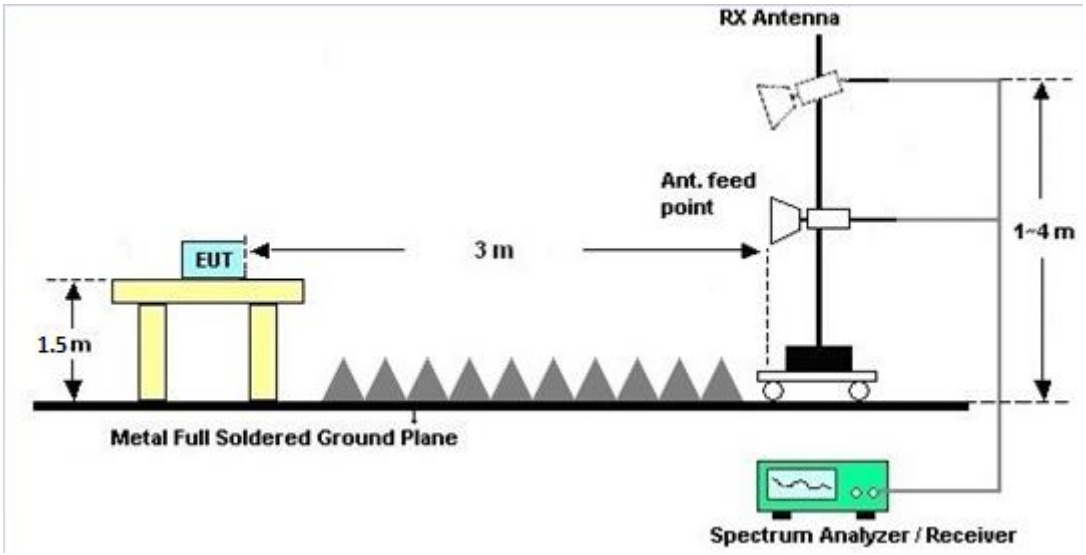
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.4.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

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.

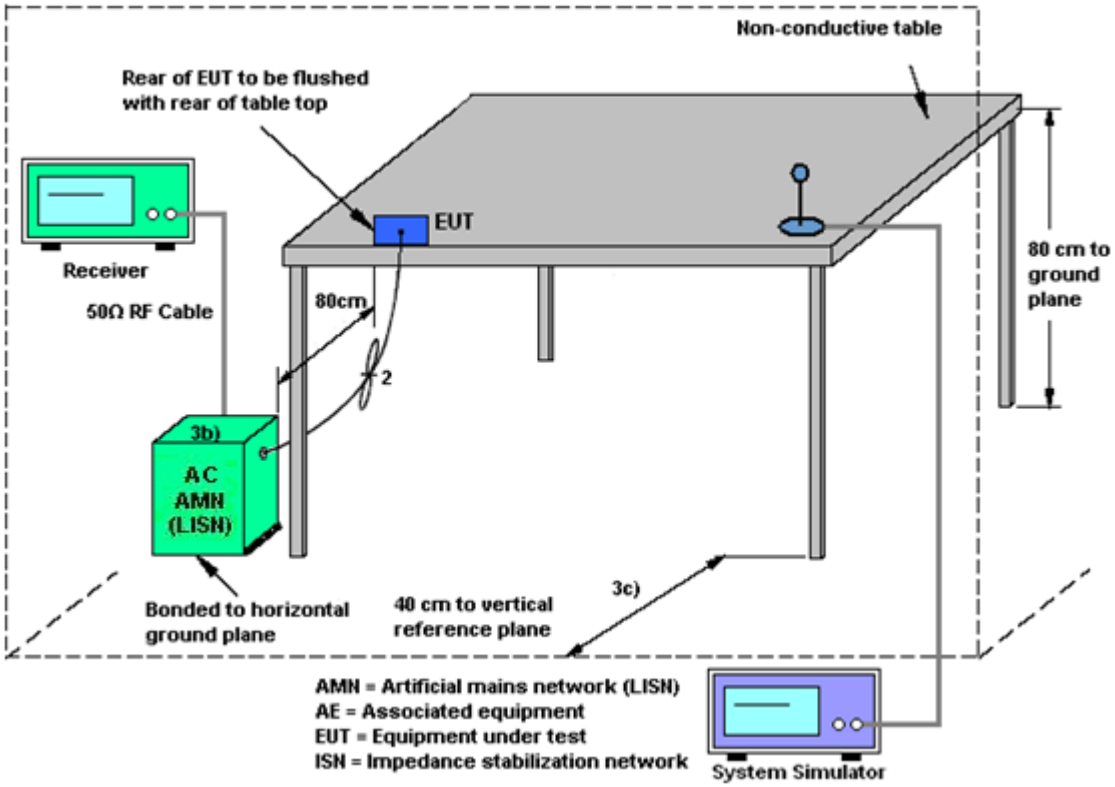
3.5.2 Measuring Instruments

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.

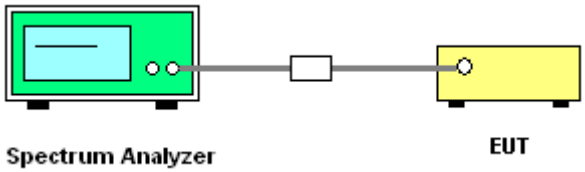
3.6.2 Measuring Instruments

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.

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	1132003	N/A	Aug. 09, 2017	Sep.19, 2017 ~ Oct. 02, 2017	Aug. 08, 2018	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1126017	300MHz~40GHz	Aug. 09, 2017	Sep.19, 2017 ~ Oct. 02, 2017	Aug. 08, 2018	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz ~ 30GHz	Nov. 17, 2016	Sep.19, 2017 ~ Oct. 02, 2017	Nov. 16, 2017	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃ ~90℃	Aug. 28, 2017	Sep.19, 2017 ~ Oct. 02, 2017	Aug. 27, 2018	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	GEO821763	N/A	Nov. 14, 2016	Sep.19, 2017 ~ Oct. 02, 2017	Nov. 13, 2017	Conducted (TH05-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Sep. 26, 2017	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 20, 2017	Sep. 26, 2017	Sep. 19, 2018	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Sep. 26, 2017	Nov. 28, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 06, 2016	Sep. 26, 2017	Dec. 05, 2017	Conduction (CO05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Oct. 20, 2016	Sep. 21, 2017 ~ Oct. 16, 2017	Oct. 19, 2018	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D&N-6-06	40103&04	30MHz~1GHz	Jan. 07, 2017	Sep. 21, 2017 ~ Oct. 16, 2017	Jan. 06, 2018	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1212	1GHz ~ 18GHz	Mar. 17, 2017	Sep. 21, 2017 ~ Oct. 16, 2017	Mar. 16, 2018	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 08, 2016	Sep. 21, 2017 ~ Oct. 16, 2017	Nov. 07, 2017	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 10, 2016	Sep. 21, 2017 ~ Oct. 16, 2017	Nov. 09, 2017	Radiation (03CH11-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1902247	1GHz~18GHz	Jun. 23, 2017	Sep. 21, 2017 ~ Oct. 16, 2017	Jun. 22, 2018	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 10, 2016	Sep. 21, 2017 ~ Oct. 16, 2017	Nov. 09, 2017	Radiation (03CH11-HY)
Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz, VSWR : 2.5:1 max	Jul. 18, 2017	Sep. 21, 2017 ~ Oct. 16, 2017	Jul. 17, 2018	Radiation (03CH11-HY)
EMI Test Receiver	Agilent	N9038A (MXE)	MY53290053	20Hz to 26.5GHz	Jan. 12, 2017	Sep. 21, 2017 ~ Oct. 16, 2017	Jan. 11, 2018	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY53470118	10Hz ~ 44GHz	Apr. 17, 2017	Sep. 21, 2017 ~ Oct. 16, 2017	Apr. 16, 2018	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	Sep. 21, 2017 ~ Oct. 16, 2017	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	Sep. 21, 2017 ~ Oct. 16, 2017	N/A	Radiation (03CH11-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))	**5.20**

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:	AC Chang	Temperature:	21~25	°C
Test Date:	2017/9/19~2017/10/02	Relative Humidity:	51~54	%

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

Band IV									
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)	6 dB Bandwidth (MHz)	6dB Bandwidth min. Limit (MHz)	Pass/Fail
11a	6M bps	1	149	5745	18.70	23.70	16.36	0.5	Pass
11a	6Mbps	1	157	5785	18.20	23.95	16.32	0.5	Pass
11a	6Mbps	1	165	5825	18.10	23.35	16.32	0.5	Pass
HT20	MCS 0	1	149	5745	19.05	23.95	17.56	0.5	Pass
HT20	MCS 0	1	157	5785	19.15	24.00	17.56	0.5	Pass
HT20	MCS 0	1	165	5825	19.00	24.00	17.56	0.5	Pass
HT40	MCS 0	1	151	5755	36.40	45.72	35.12	0.5	Pass
HT40	MCS 0	1	159	5795	36.50	44.46	35.52	0.5	Pass

TEST RESULTS DATA
Average Power Table

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6M bps	1	149	5745	0.59	10.64	30.00	2.33		Pass
11a	6Mbps	1	157	5785	0.59	10.69	30.00	2.33		Pass
11a	6Mbps	1	165	5825	0.59	10.70	30.00	2.33		Pass
HT20	MCS 0	1	149	5745	0.63	10.58	30.00	2.33		Pass
HT20	MCS 0	1	157	5785	0.63	10.60	30.00	2.33		Pass
HT20	MCS 0	1	165	5825	0.63	10.59	30.00	2.33		Pass
HT40	MCS 0	1	151	5755	0.67	10.65	30.00	2.33		Pass
HT40	MCS 0	1	159	5795	0.67	10.64	30.00	2.33		Pass

Report Number : FR791813E

TEST RESULTS DATA
Power Spectral Density

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	10log (500kHz /RBW) Factor (dB)	Average Power Density (dBm/500kHz)	Average PSD Limit (dBm/500kHz)	DG (dBi)	Pass/Fail
11a	6M bps	1	149	5745	0.59	2.22	-2.95	30.00	2.33	Pass
11a	6Mbps	1	157	5785	0.59	2.22	-2.80	30.00	2.33	Pass
11a	6Mbps	1	165	5825	0.59	2.22	-2.80	30.00	2.33	Pass
HT20	MCS 0	1	149	5745	0.63	2.22	-3.21	30.00	2.33	Pass
HT20	MCS 0	1	157	5785	0.63	2.22	-3.20	30.00	2.33	Pass
HT20	MCS 0	1	165	5825	0.63	2.22	-3.07	30.00	2.33	Pass
HT40	MCS 0	1	151	5755	0.67	2.22	-5.79	30.00	2.33	Pass
HT40	MCS 0	1	159	5795	0.67	2.22	-5.72	30.00	2.33	Pass

Report Number : FR791813E

TEST RESULTS DATA
Frequency Stability

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6M bps	1	149	5745	5744.975	-0.025	-4.35	50	3.85	
11a	6M bps	1	149	5745	5745.025	0.025	4.35	-30	3.85	
11a	6M bps	1	149	5745	5745.025	0.025	4.35	20	4.4	
11a	6M bps	1	149	5745	5745.000	0.000	0.00	20	3.4	
11a	6M bps	1	149	5745	5745.000	0.000	0.00	20	3.85	

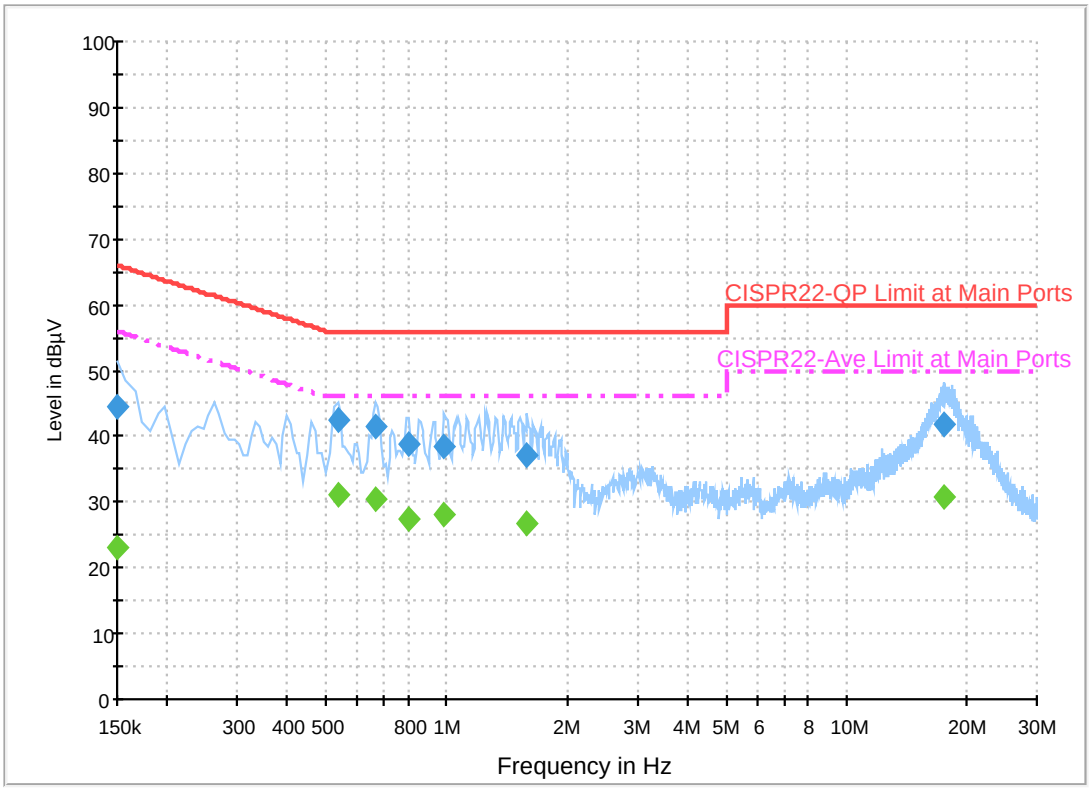
Appendix B. AC Conducted Emission Test Results

Test Engineer :	Shareef Yu	**Temperature :**	26~27℃
		Relative Humidity :	38~39%

EUT Information

Report NO :	791813
Test Mode :	Mode 2
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)
0.150000	44.4	Off	L1	19.6	21.6	66.0
0.534000	42.6	Off	L1	19.6	13.4	56.0
0.662000	41.4	Off	L1	19.6	14.6	56.0
0.806000	38.7	Off	L1	19.6	17.3	56.0
0.990000	38.5	Off	L1	19.6	17.5	56.0
1.590000	37.3	Off	L1	19.6	18.7	56.0
17.574000	41.8	Off	L1	20.5	18.2	60.0

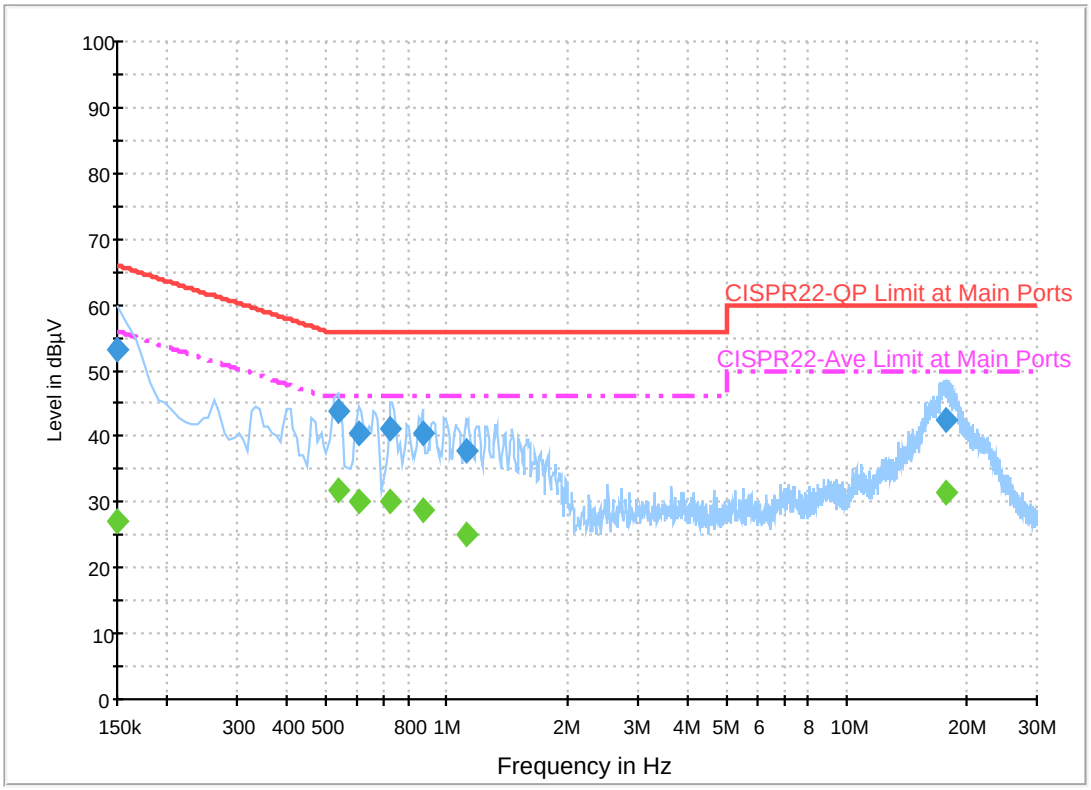
Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	23.0	Off	L1	19.6	33.0	56.0
0.534000	31.0	Off	L1	19.6	15.0	46.0
0.662000	30.3	Off	L1	19.6	15.7	46.0
0.806000	27.4	Off	L1	19.6	18.6	46.0
0.990000	28.1	Off	L1	19.6	17.9	46.0
1.590000	26.9	Off	L1	19.6	19.1	46.0
17.574000	30.9	Off	L1	20.5	19.1	50.0

EUT Information

Report NO :	791813
Test Mode :	Mode 2
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)
0.150000	53.2	Off	N	19.5	12.8	66.0
0.534000	43.8	Off	N	19.5	12.2	56.0
0.606000	40.5	Off	N	19.5	15.5	56.0
0.726000	41.2	Off	N	19.5	14.8	56.0
0.870000	40.5	Off	N	19.6	15.5	56.0
1.118000	38.0	Off	N	19.6	18.0	56.0
17.846000	42.6	Off	N	20.6	17.4	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	27.1	Off	N	19.5	28.9	56.0
0.534000	31.7	Off	N	19.5	14.3	46.0
0.606000	30.2	Off	N	19.5	15.8	46.0
0.726000	30.1	Off	N	19.5	15.9	46.0
0.870000	28.6	Off	N	19.6	17.4	46.0
1.118000	25.2	Off	N	19.6	20.8	46.0
17.846000	31.4	Off	N	20.6	18.6	50.0

Appendix C. Radiated Spurious Emission

Test Engineer :	J.C. Liang / Jacky Hung / Ken Wu	Temperature :	24~26℃
		Relative Humidity :	50~55%

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		5601.6	49.51	-18.69	68.2	40.38	32.65	9.55	33.07	100	116	P	H
		5692	51.98	-47.32	99.3	42.49	32.86	9.75	33.12	100	116	P	H
		5713.8	50.02	-59.05	109.07	40.44	32.9	9.81	33.13	100	116	P	H
		5724.8	55.65	-66.09	121.74	46.03	32.94	9.81	33.13	100	116	P	H
	*	5745	103.35	-	-	93.64	32.98	9.88	33.15	100	116	P	H
	*	5745	95.95	-	-	86.24	32.98	9.88	33.15	100	116	A	H
													H
													H
		5619	49.19	-19.01	68.2	40.03	32.69	9.55	33.08	100	284	P	V
		5692.8	52.34	-47.55	99.89	42.85	32.86	9.75	33.12	100	284	P	V
		5719.8	51.09	-59.65	110.74	41.47	32.94	9.81	33.13	100	284	P	V
		5724.6	54.15	-67.14	121.29	44.53	32.94	9.81	33.13	100	284	P	V
	*	5745	106.4	-	-	96.69	32.98	9.88	33.15	100	284	P	V
	*	5745	99.5	-	-	89.79	32.98	9.88	33.15	100	284	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)
		5610.8	49.27	-18.93	68.2	40.15	32.65	9.55	33.08	100	121	P	H
		5698.8	50.26	-54.06	104.32	40.77	32.86	9.75	33.12	100	121	P	H
		5715.4	49.01	-60.5	109.51	39.43	32.9	9.81	33.13	100	121	P	H
		5723.2	48.15	-69.95	118.1	38.53	32.94	9.81	33.13	100	121	P	H
	*	5785	104.34	-	-	94.44	33.06	10.01	33.17	100	121	P	H
	*	5785	96.04	-	-	86.14	33.06	10.01	33.17	100	121	A	H
		5850.8	47.86	-72.52	120.38	37.8	33.23	10.02	33.19	100	121	P	H
		5872.2	49.7	-56.28	105.98	39.58	33.31	10.02	33.21	100	121	P	H
		5890	50.95	-43.12	94.07	40.8	33.35	10.02	33.22	100	121	P	H
		5925.8	50.71	-17.49	68.2	40.49	33.43	10.02	33.23	100	121	P	H
													H
802.11a CH 157 5785MHz													H
		5632.2	49.65	-18.55	68.2	40.09	33.05	9.61	33.1	100	286	P	V
		5650	50.83	-17.37	68.2	41.55	32.77	9.61	33.1	100	286	P	V
		5712.8	48.95	-59.84	108.79	39.37	32.9	9.81	33.13	100	286	P	V
		5720.8	49.27	-63.35	112.62	39.65	32.94	9.81	33.13	100	286	P	V
	*	5785	107.12	-	-	97.22	33.06	10.01	33.17	100	286	P	V
	*	5785	99.49	-	-	89.59	33.06	10.01	33.17	100	286	A	V
		5851.4	50.55	-68.46	119.01	40.49	33.23	10.02	33.19	100	286	P	V
		5872.4	49.88	-56.05	105.93	39.76	33.31	10.02	33.21	100	286	P	V
		5890.2	50.13	-43.79	93.92	39.98	33.35	10.02	33.22	100	286	P	V
		5934.6	50.17	-18.03	68.2	39.96	33.43	10.02	33.24	100	286	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)
	*	5825	104.05	-	-	94.02	33.19	10.02	33.18	100	121	P	H
	*	5825	96.62	-	-	86.59	33.19	10.02	33.18	100	121	A	H
		5852.8	49.05	-66.77	115.82	38.99	33.23	10.02	33.19	100	121	P	H
		5874.6	50.86	-54.45	105.31	40.74	33.31	10.02	33.21	100	121	P	H
		5878.2	50.22	-52.6	102.82	40.1	33.31	10.02	33.21	100	121	P	H
		5945.4	49.77	-18.43	68.2	39.51	33.48	10.02	33.24	100	121	P	H
													H
802.11a													H
CH 165	*	5825	107.23	-	-	97.2	33.19	10.02	33.18	100	277	P	V
5825MHz	*	5825	99.74	-	-	89.71	33.19	10.02	33.18	100	277	A	V
		5851.2	51.51	-67.95	119.46	41.45	33.23	10.02	33.19	100	277	P	V
		5856.4	49.79	-60.62	110.41	39.69	33.27	10.02	33.19	100	277	P	V
		5877	51.97	-51.74	103.71	41.85	33.31	10.02	33.21	100	277	P	V
		5950	50.35	-17.85	68.2	40.09	33.48	10.02	33.24	100	277	P	V
													V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	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	55.17	-18.83	74	62.5	39.98	15.44	63.03	100	300	P	H
		11490	49.55	-4.45	54	56.88	39.98	15.44	63.03	100	300	A	H
		17235	47.7	-20.5	68.2	48.03	41.14	19.24	61.07	100	0	P	H
													H
		11490	48.23	-25.77	74	55.56	39.98	15.44	63.03	100	0	P	V
		17235	48.6	-19.6	68.2	48.93	41.14	19.24	61.07	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	55.39	-18.61	74	62.72	39.82	15.49	62.92	100	300	P	H
		11570	49.65	-4.35	54	56.98	39.82	15.49	62.92	100	300	A	H
		17355	49.47	-18.73	68.2	48.83	41.21	19.31	60.25	100	0	P	H
													H
		11570	48.72	-25.28	74	56.05	39.82	15.49	62.92	100	0	P	V
		17355	49.69	-18.51	68.2	49.05	41.21	19.31	60.25	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11650	55.32	-18.68	74	62.67	39.64	15.56	62.83	100	300	P	H
		11650	50.15	-3.85	54	57.5	39.64	15.56	62.83	100	300	A	H
		17475	49.33	-18.87	68.2	47.73	41.28	19.37	59.43	100	0	P	H
													H
		11650	47.68	-26.32	74	55.03	39.64	15.56	62.83	100	0	P	V
		17475	49.78	-18.42	68.2	48.18	41.28	19.37	59.43	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)
		5612.6	48.95	-19.25	68.2	39.83	32.65	9.55	33.08	100	123	P	H
		5693.6	49.74	-50.74	100.48	40.25	32.86	9.75	33.12	100	123	P	H
		5717.4	49.82	-60.25	110.07	40.24	32.9	9.81	33.13	100	123	P	H
		5721.4	50.22	-63.77	113.99	40.6	32.94	9.81	33.13	100	123	P	H
	*	5745	102.61	-	-	92.9	32.98	9.88	33.15	100	123	P	H
	*	5745	94.88	-	-	85.17	32.98	9.88	33.15	100	123	A	H
802.11n													H
HT20													H
CH 149		5616.2	49.25	-18.95	68.2	40.09	32.69	9.55	33.08	100	281	P	V
5745MHz		5693	52.21	-47.83	100.04	42.72	32.86	9.75	33.12	100	281	P	V
		5717.4	50.78	-59.29	110.07	41.2	32.9	9.81	33.13	100	281	P	V
		5724.8	55.95	-65.79	121.74	46.33	32.94	9.81	33.13	100	281	P	V
	*	5745	105.46	-	-	95.75	32.98	9.88	33.15	100	281	P	V
	*	5745	98.2	-	-	88.49	32.98	9.88	33.15	100	281	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)
		5648.6	50.42	-17.78	68.2	41.18	32.73	9.61	33.1	100	121	P	H
		5654.6	49.63	-21.99	71.62	40.29	32.77	9.68	33.11	100	121	P	H
		5716.2	50.41	-59.33	109.74	40.83	32.9	9.81	33.13	100	121	P	H
		5721.8	48.57	-66.33	114.9	38.95	32.94	9.81	33.13	100	121	P	H
	*	5785	102.56	-	-	92.66	33.06	10.01	33.17	100	121	P	H
	*	5785	95.03	-	-	85.13	33.06	10.01	33.17	100	121	A	H
		5851.4	48.94	-70.07	119.01	38.88	33.23	10.02	33.19	100	121	P	H
		5871.6	49.09	-57.06	106.15	38.97	33.31	10.02	33.21	100	121	P	H
		5880.2	50.82	-50.52	101.34	40.7	33.31	10.02	33.21	100	121	P	H
		5950	49.72	-18.48	68.2	39.46	33.48	10.02	33.24	100	121	P	H
802.11n													H
HT20													H
CH 157		5611	48.99	-19.21	68.2	39.87	32.65	9.55	33.08	100	281	P	V
5785MHz		5691.4	49.25	-49.61	98.86	39.76	32.86	9.75	33.12	100	281	P	V
		5717.6	49.32	-60.81	110.13	39.7	32.94	9.81	33.13	100	281	P	V
		5720.4	48.84	-62.87	111.71	39.22	32.94	9.81	33.13	100	281	P	V
	*	5785	105.82	-	-	95.92	33.06	10.01	33.17	100	281	P	V
	*	5785	98.55	-	-	88.65	33.06	10.01	33.17	100	281	A	V
		5850.4	50.19	-71.1	121.29	40.13	33.23	10.02	33.19	100	281	P	V
		5855	50.07	-60.73	110.8	39.97	33.27	10.02	33.19	100	281	P	V
		5908.6	49.91	-30.39	80.3	39.72	33.39	10.02	33.22	100	281	P	V
		5932.8	49.36	-18.84	68.2	39.14	33.43	10.02	33.23	100	281	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)
	*	5825	103.24	-	-	93.21	33.19	10.02	33.18	100	121	P	H
	*	5825	95.61	-	-	85.58	33.19	10.02	33.18	100	121	A	H
		5850.6	49.87	-70.96	120.83	39.81	33.23	10.02	33.19	100	121	P	H
		5873.4	49.78	-55.87	105.65	39.66	33.31	10.02	33.21	100	121	P	H
		5876.4	50.93	-53.23	104.16	40.81	33.31	10.02	33.21	100	121	P	H
		5943.6	51.27	-16.93	68.2	41.01	33.48	10.02	33.24	100	121	P	H
802.11n													H
HT20													H
CH 165	*	5825	106.83	-	-	96.8	33.19	10.02	33.18	100	282	P	V
5825MHz	*	5825	98.78	-	-	88.75	33.19	10.02	33.18	100	282	A	V
		5853.6	49.02	-64.97	113.99	38.92	33.27	10.02	33.19	100	282	P	V
		5868.6	50.75	-56.24	106.99	40.67	33.27	10.02	33.21	100	282	P	V
		5876.8	51.78	-52.08	103.86	41.66	33.31	10.02	33.21	100	282	P	V
		5926.8	49.19	-19.01	68.2	38.97	33.43	10.02	33.23	100	282	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)
		11490	53.05	-20.95	74	60.38	39.98	15.44	63.03	100	300	P	H
		11490	49.68	-4.32	54	57.01	39.98	15.44	63.03	100	300	A	H
802.11n		17235	49.49	-18.71	68.2	49.82	41.14	19.24	61.07	100	0	P	H
HT20													H
CH 149		11490	47.87	-26.13	74	55.2	39.98	15.44	63.03	100	0	P	V
5745MHz		17235	49.23	-18.97	68.2	49.56	41.14	19.24	61.07	100	0	P	V
													V
													V
		11570	53.1	-20.9	74	60.43	39.82	15.49	62.92	100	279	P	H
		11570	50.17	-3.83	54	57.5	39.82	15.49	62.92	100	279	A	H
802.11n		17355	49.18	-19.02	68.2	48.54	41.21	19.31	60.25	100	0	P	H
HT20													H
CH 157		11570	47.41	-26.59	74	54.74	39.82	15.49	62.92	100	0	P	V
5785MHz		17355	50.14	-18.06	68.2	49.5	41.21	19.31	60.25	100	0	P	V
													V
													V
		11650	53.1	-20.9	74	60.45	39.64	15.56	62.83	100	299	P	H
		11650	50.08	-3.92	54	57.43	39.64	15.56	62.83	100	299	A	H
802.11n		17475	52.08	-16.12	68.2	50.48	41.28	19.37	59.43	100	0	P	H
HT20													H
CH 165		11650	47.35	-26.65	74	54.7	39.64	15.56	62.83	100	0	P	V
5825MHz		17475	52.87	-15.33	68.2	51.27	41.28	19.37	59.43	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)
		5610.6	49.49	-18.71	68.2	40.37	32.65	9.55	33.08	100	122	P	H
		5692	49.33	-49.97	99.3	39.84	32.86	9.75	33.12	100	122	P	H
		5714.8	52.1	-57.25	109.35	42.52	32.9	9.81	33.13	100	122	P	H
		5723.8	54.8	-64.66	119.46	45.18	32.94	9.81	33.13	100	122	P	H
	*	5755	99.66	-	-	89.91	33.02	9.88	33.15	100	122	P	H
	*	5755	91.94	-	-	82.19	33.02	9.88	33.15	100	122	A	H
		5853	49.39	-65.97	115.36	39.33	33.23	10.02	33.19	100	122	P	H
		5863.4	49.94	-58.51	108.45	39.86	33.27	10.02	33.21	100	122	P	H
		5914.2	51.03	-25.14	76.17	40.85	33.39	10.02	33.23	100	122	P	H
		5943.6	49.51	-18.69	68.2	39.25	33.48	10.02	33.24	100	122	P	H
802.11n													H
HT40													H
CH 151		5642.4	50.09	-18.11	68.2	40.85	32.73	9.61	33.1	100	301	P	V
5755MHz		5693.4	50.25	-50.08	100.33	40.76	32.86	9.75	33.12	100	301	P	V
		5711	52.51	-55.77	108.28	42.93	32.9	9.81	33.13	100	301	P	V
		5721.6	56.17	-58.28	114.45	46.55	32.94	9.81	33.13	100	301	P	V
	*	5755	102.77	-	-	93.02	33.02	9.88	33.15	100	301	P	V
	*	5755	94.91	-	-	85.16	33.02	9.88	33.15	100	301	A	V
		5852.2	47.88	-69.3	117.18	37.82	33.23	10.02	33.19	100	301	P	V
		5861.6	51.23	-57.72	108.95	41.15	33.27	10.02	33.21	100	301	P	V
		5915.6	49.98	-25.15	75.13	39.8	33.39	10.02	33.23	100	301	P	V
		5937.6	49.06	-19.14	68.2	38.85	33.43	10.02	33.24	100	301	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)
		5628	49.45	-18.75	68.2	40.23	32.69	9.61	33.08	100	116	P	H
		5692.4	49.91	-49.69	99.6	40.42	32.86	9.75	33.12	100	116	P	H
		5715.4	50.21	-59.3	109.51	40.63	32.9	9.81	33.13	100	116	P	H
		5724	48.98	-70.94	119.92	39.36	32.94	9.81	33.13	100	116	P	H
	*	5795	98.89	-	-	88.95	33.1	10.01	33.17	100	116	P	H
	*	5795	92.18	-	-	82.24	33.1	10.01	33.17	100	116	A	H
		5854.8	49.74	-61.52	111.26	39.64	33.27	10.02	33.19	100	116	P	H
		5873.4	49.37	-56.28	105.65	39.25	33.31	10.02	33.21	100	116	P	H
		5879	50.23	-52	102.23	40.11	33.31	10.02	33.21	100	116	P	H
		5925.4	50.57	-17.63	68.2	40.35	33.43	10.02	33.23	100	116	P	H
802.11n													H
HT40													H
CH 159		5635.2	50.24	-17.96	68.2	41	32.73	9.61	33.1	100	282	P	V
5795MHz		5680.8	50.47	-40.56	91.03	41.03	32.81	9.75	33.12	100	282	P	V
		5719	49.53	-60.99	110.52	39.91	32.94	9.81	33.13	100	282	P	V
		5722.8	50.27	-66.91	117.18	40.65	32.94	9.81	33.13	100	282	P	V
	*	5795	102.5	-	-	92.56	33.1	10.01	33.17	100	282	P	V
	*	5795	95.54	-	-	85.6	33.1	10.01	33.17	100	282	A	V
		5850	48.67	-73.53	122.2	38.61	33.23	10.02	33.19	100	282	P	V
		5863	52.01	-56.55	108.56	41.93	33.27	10.02	33.21	100	282	P	V
		5898	50.54	-37.6	88.14	40.39	33.35	10.02	33.22	100	282	P	V
		5934	50.45	-17.75	68.2	40.23	33.43	10.02	33.23	100	282	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)
		11510	53.8	-20.2	74	61.07	40	15.45	63	100	280	P	H
		11510	50.5	-3.5	54	57.77	40	15.45	63	100	280	A	H
802.11n		17265	50.61	-17.59	68.2	50.66	41.16	19.26	60.83	100	0	P	H
HT40													H
CH 151		11510	48.49	-25.51	74	55.76	40	15.45	63	100	0	P	V
5755MHz		17265	50.03	-18.17	68.2	50.08	41.16	19.26	60.83	100	0	P	V
													V
													V
		11590	52.55	-21.45	74	59.88	39.78	15.51	62.9	100	281	P	H
		11590	50.04	-3.96	54	57.37	39.78	15.51	62.9	100	281	A	H
802.11n		17385	51.13	-17.07	68.2	50.23	41.23	19.32	60.02	100	0	P	H
HT40													H
CH 159		11590	48.14	-25.86	74	55.47	39.78	15.51	62.9	100	0	P	V
5795MHz		17385	51.77	-16.43	68.2	50.87	41.23	19.32	60.02	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

Emission below 1GHz

5GHz 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.
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT40 LF		30.54	21.89	-18.11	40	29.71	23.84	0.82	32.5	-	-	P	H
		233.04	27.26	-18.74	46	41.13	16.49	1.95	32.38	-	-	P	H
		295.14	28.66	-17.34	46	39.62	19.09	2.22	32.37	-	-	P	H
		311.2	29.74	-16.26	46	40.35	19.36	2.31	32.37	-	-	P	H
		725.6	30.29	-15.71	46	31.72	27.43	3.4	32.39	-	-	P	H
		951.7	33.88	-12.12	46	30.21	30.86	3.82	31.18	100	0	P	H
													H
													H
													H
													H
													H
													H
		44.85	33.76	-6.24	40	48.58	16.65	1.02	32.49	100	175	P	V
		63.48	29.58	-10.42	40	49.23	11.81	1.02	32.49	-	-	P	V
		83.19	21.01	-18.99	40	38.6	13.65	1.22	32.48	-	-	P	V
		309.1	23.62	-22.38	46	34.26	19.33	2.31	32.37	-	-	P	V
		641.6	28.16	-17.84	46	30.75	26.56	3.2	32.46	-	-	P	V
		936.3	33.74	-12.26	46	30.87	30.21	3.82	31.33	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

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

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

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

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

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

Appendix D. Radiated Spurious Emission Plots

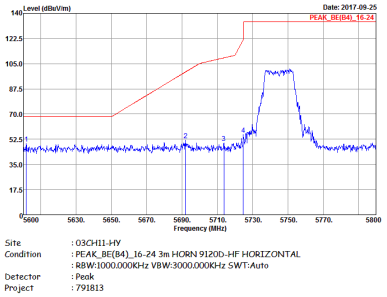
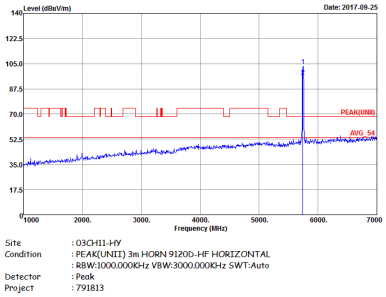
Test Engineer :	J.C. Liang / Jacky Hung / Ken Wu	**Temperature :**	24~26℃
		Relative Humidity :	50~55%

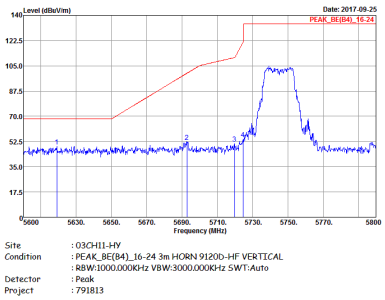
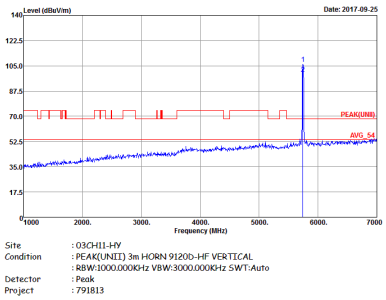
Note symbol

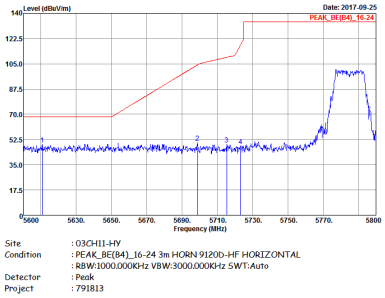
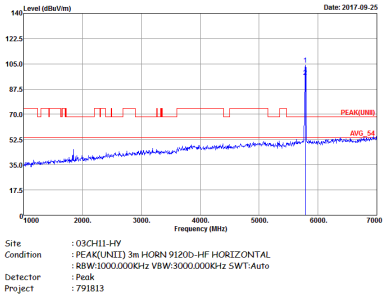
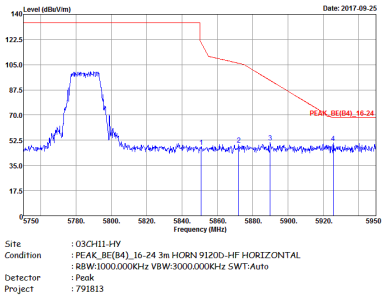
-L	**Low channel location**
-R	**High channel location**

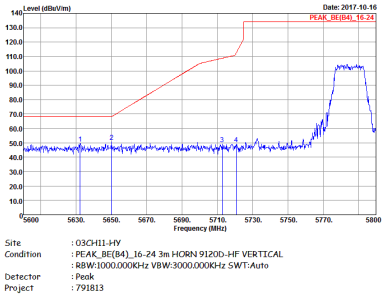
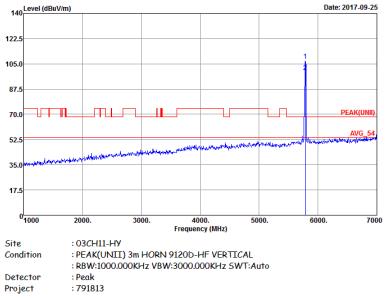
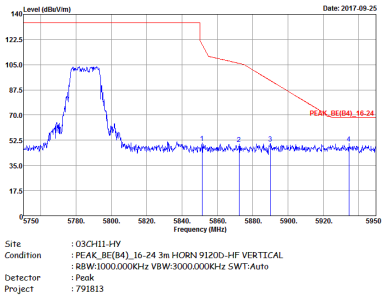
Band 4 - 5725~5850MHz

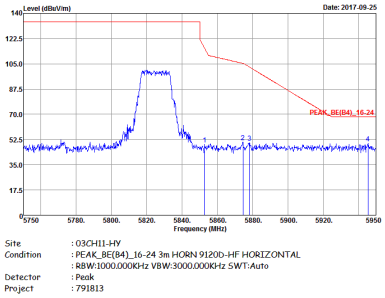
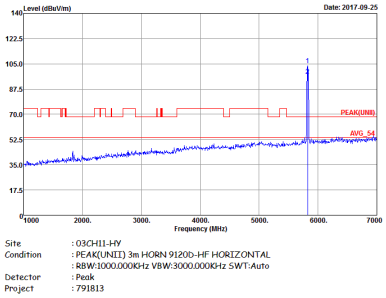
WIFI 802.11a (Band Edge @ 3m)

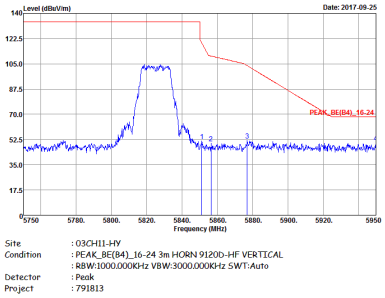
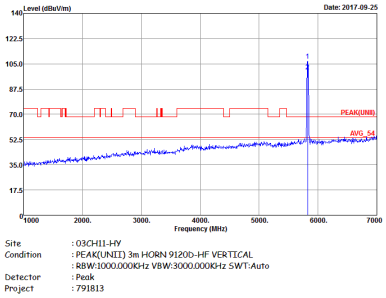
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

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

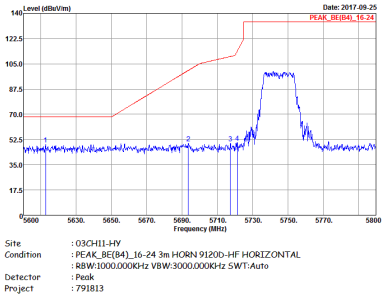
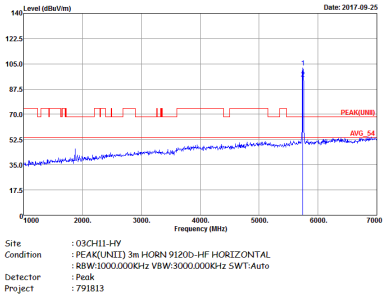
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH11-HV Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813	 Site : 03CH11-HV Condition : PEAK(UNII) 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813
Peak	 Site : 03CH11-HV Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813	Left blank

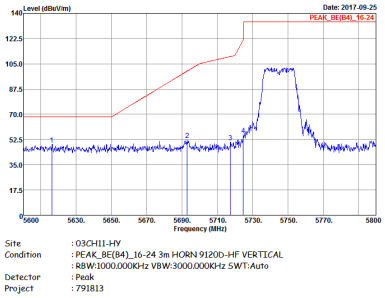
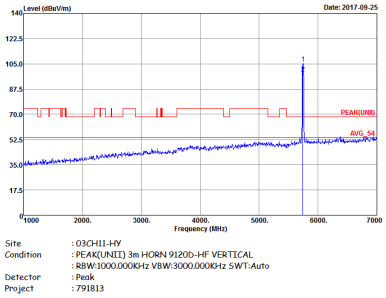
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

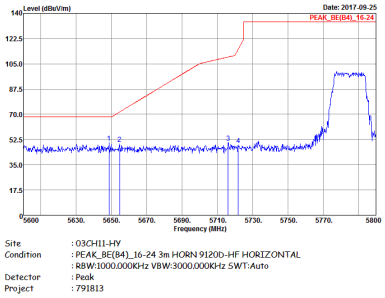
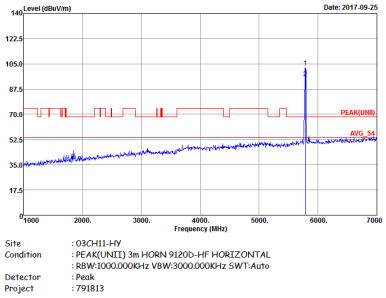
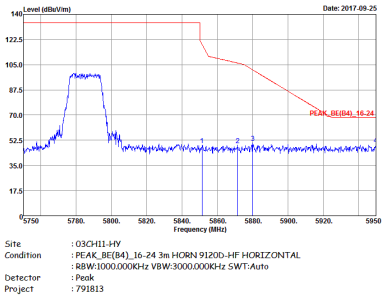
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Fundamental
Peak		

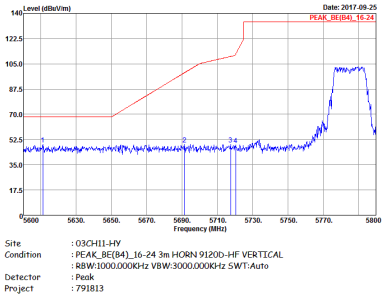
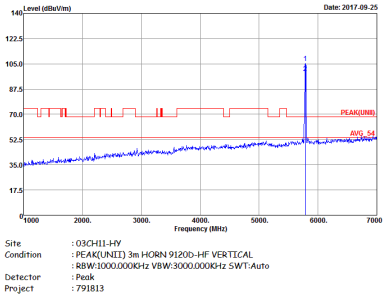
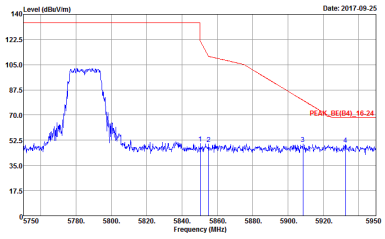
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Vertical	Fundamental
Peak		

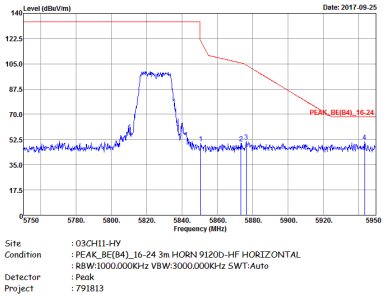
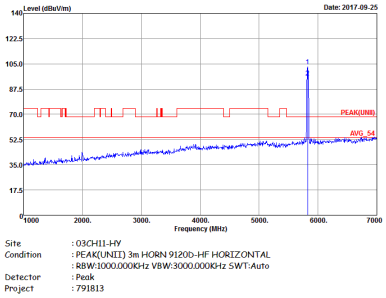
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

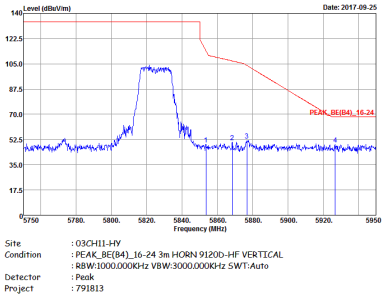
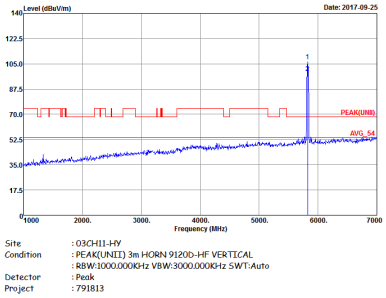
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

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

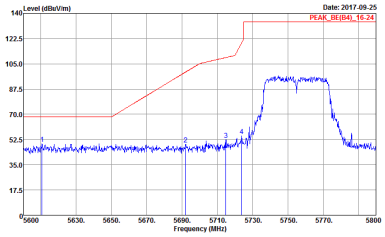
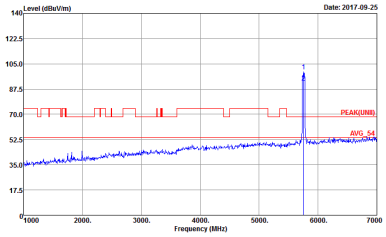
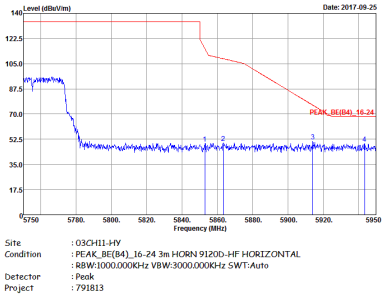
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

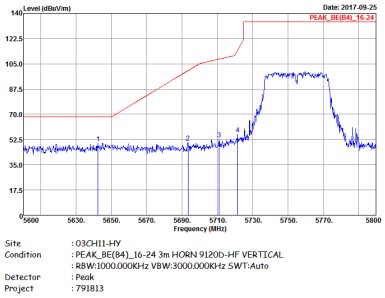
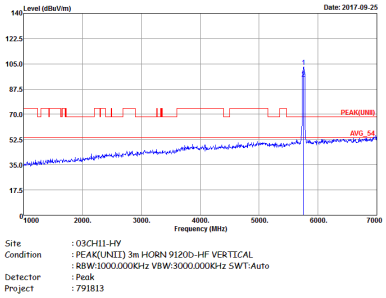
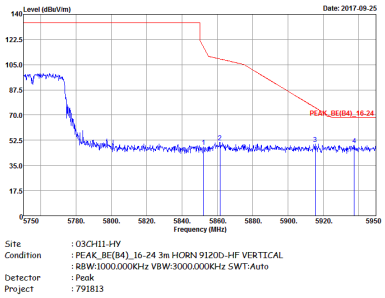
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak	 Site : 03CH11-HV Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813	 Site : 03CH11-HV Condition : PEAK(UNII) 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813
Peak	 Site : 03CH11-HV Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813	Left blank

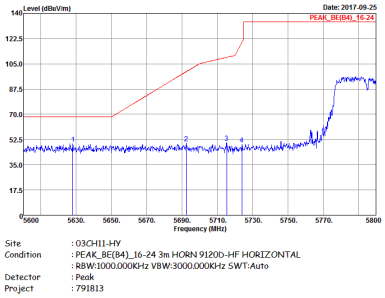
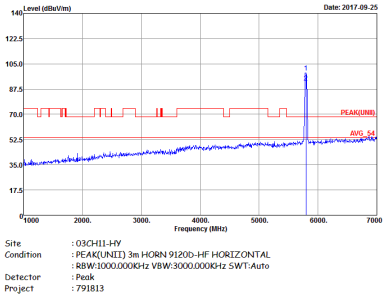
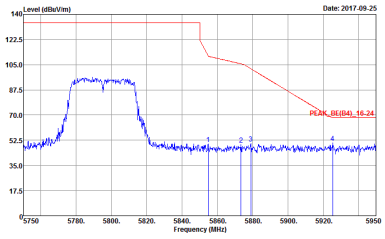
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Fundamental
Peak		

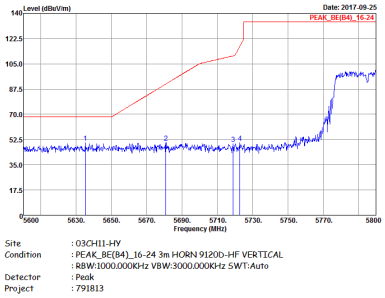
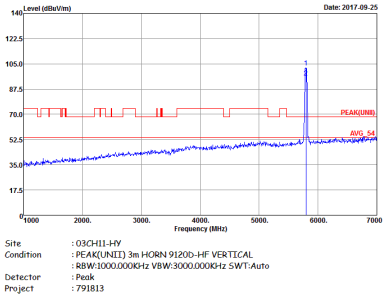
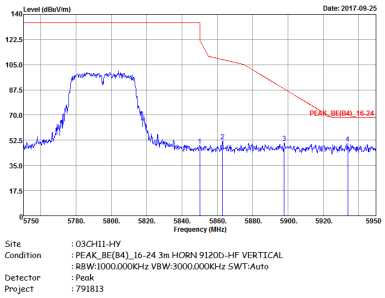
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Vertical	Fundamental
Peak		

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

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

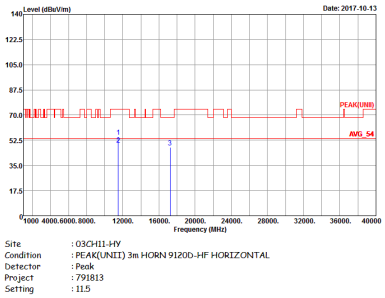
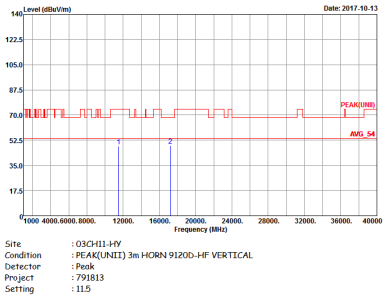
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

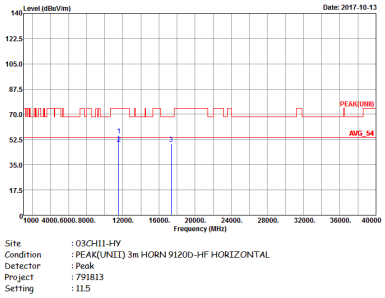
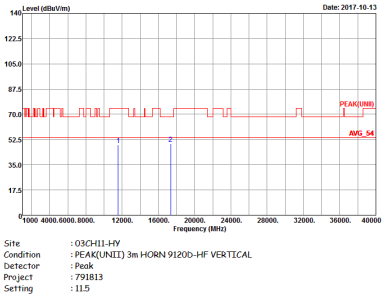
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak	 Site : 03CH11-HV Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813	 Site : 03CH11-HV Condition : PEAK(UNII) 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813
Peak	 Site : 03CH11-HV Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 791813	Left blank

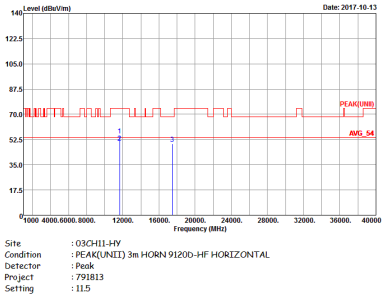
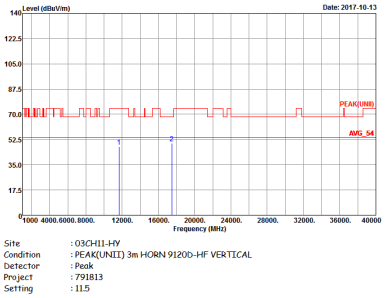
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

Band 4 - 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

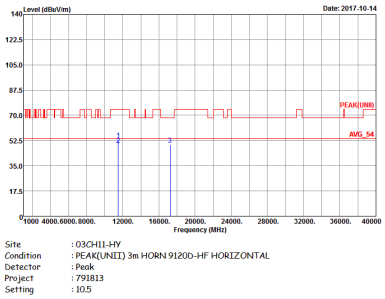
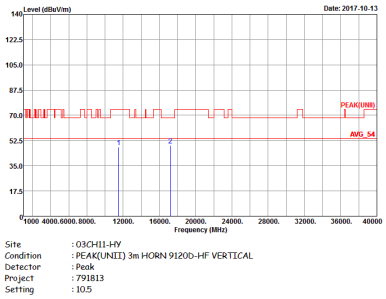
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

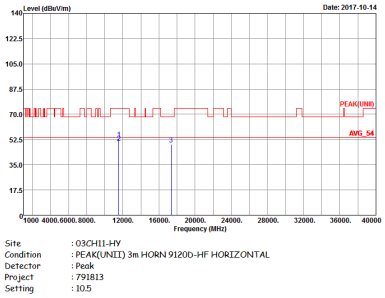
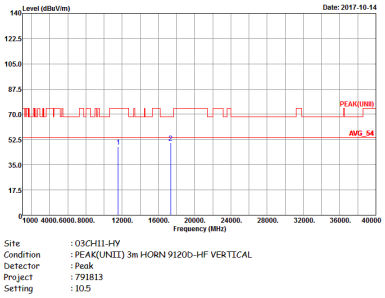
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.		

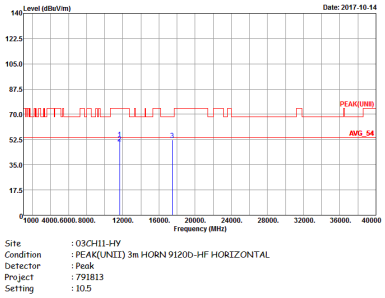
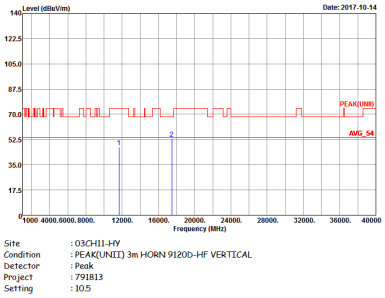
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

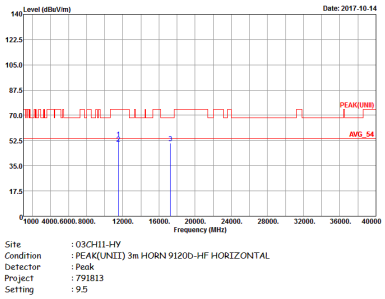
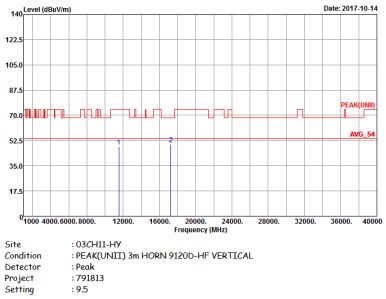
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

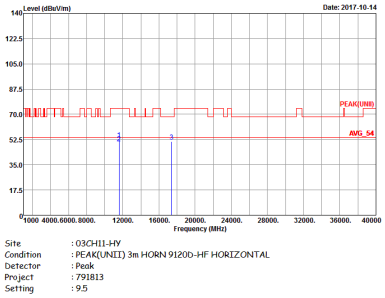
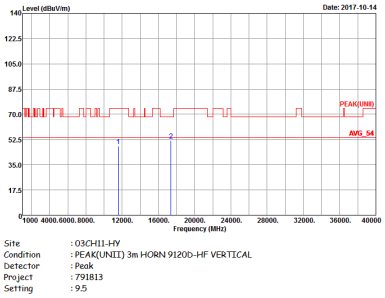
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.		

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

Band 4 5725~5850MHz

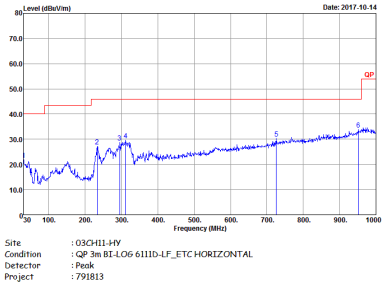
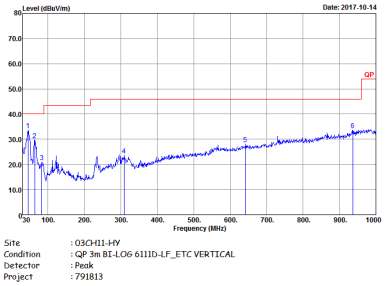
WIFI 802.11n HT40 (Harmonic @ 3m)

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

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

Emission below 1GHz

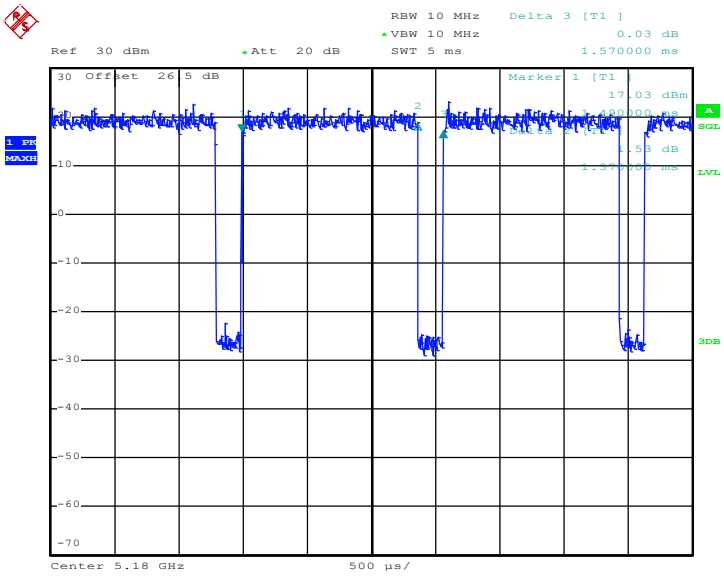
5GHz WIFI 802.11n HT40 (LF)

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

Appendix E. Duty Cycle Plots

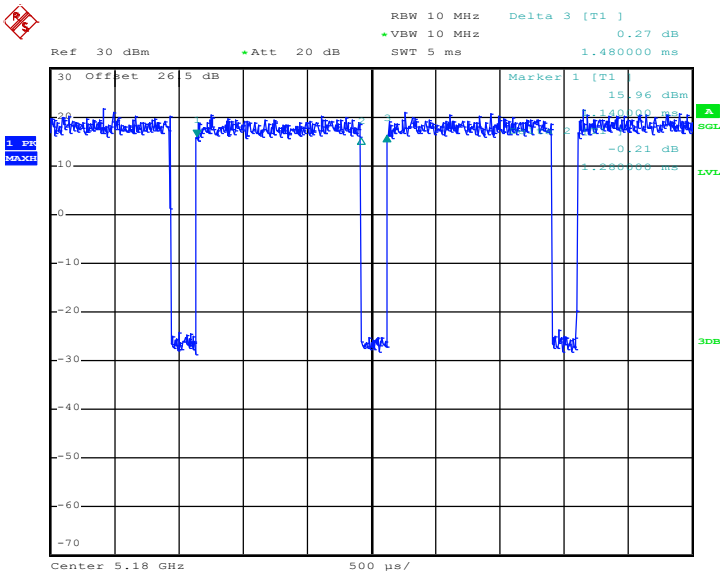
Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
802.11a	87.261	1370	0.73	1kHz
5GHz 802.11n HT20	86.486	1280	0.78	1kHz
5GHz 802.11n HT40	85.714	1230	0.81	1kHz

802.11a



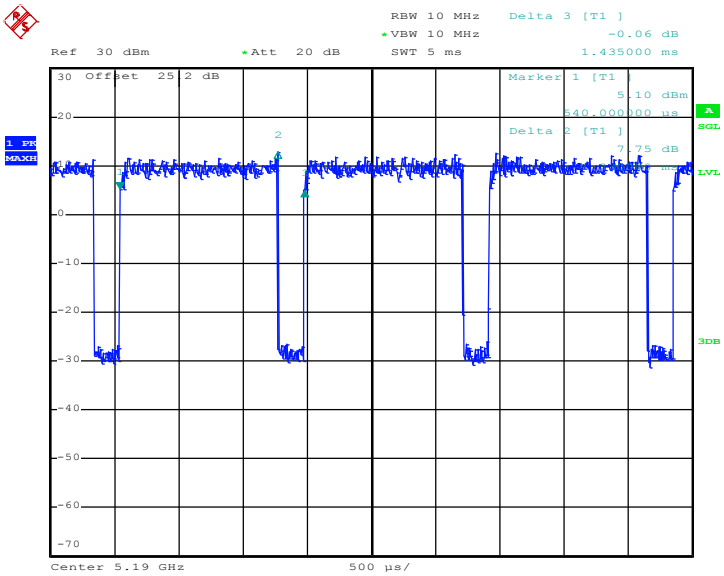
Date: 19.SEP.2017 11:12:11

802.11n HT20



Date: 19.SEP.2017 11:20:45

802.11n HT40



Date: 20.SEP.2017 06:20:35