# FCC RF Test Report

| | | |
|---|---|---|
| APPLICANT | : | Motorola Mobility, LLC |
| EQUIPMENT | : | Mobile Cellular Phone |
| BRAND NAME | : | Motorola |
| MODEL NAME | : | 5892 |
| FCC ID | : | IHDT56VC1 |
| STANDARD | : | FCC Part 15 Subpart E §15.407 |
| CLASSIFICATION | : | (NII) Unlicensed National Information Infrastructure |

**The product was received on Jul. 25, 2016 and testing was completed on Jul. 29, 2016. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.**

**The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.**

**Reviewed by: Joseph Lin / Supervisor**

**Approved by: Jones Tsai / Manager**

Testing Laboratory
1190

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# REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|---|---|---|---|
| FR651612-13E | Rev. 01 | This is a variant report. All the test cases were performed base on the worst case identified in the original report. The test purpose is to verify the influence caused by additional accessory applied, hence only RSE and AC conducted emission need to be considered. Please referred to appendix D for the original report.(Sporton Report Number FR651612E) | Aug. 04, 2016 |
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# SUMMARY OF TEST RESULT

| Report Section | FCC Rule | Description | Limit | Result | Remark |
|---|---|---|---|---|---|
| 3.1 | 15.407(b) | Unwanted Emissions | 15.407(b)(4)(i) &15.209(a) | Pass | Under limit 7.97 dB at 40.800 MHz |
| 3.2 | 15.207 | AC Conducted Emission | 15.207(a) | Pass | Under limit 1.40 dB at 0.270 MHz |

# 1 General Description

## 1.1 Applicant

**Motorola Mobility, LLC**
222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

## 1.2 Manufacturer

**Motorola Mobility, LLC**
222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

## 1.3 Product Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | Mobile Cellular Phone |
| **Brand Name** | Motorola |
| **Model Name** | 5892 |
| **FCC ID** | IHDT56VC1 |
| **IMEI Code** | 354130070011751 (for Radiation)<br>354130070011991 (for Conduction) |
| **EUT supports Radios application** | CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/NFC<br>WLAN 11b/g/n HT20<br>WLAN 11a/n HT20/HT40<br>Bluetooth v3.0 EDR<br>Bluetooth v4.0 LE |
| **HW Version** | DVT2 |
| **EUT Stage** | Identical Prototype |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

| Accessory List | |
|---|---|
| **WPC Cover** | Brand Name : INCIPIO |
| | Model Name : MT-043-CASE |

## 1.4 Product Specification of Equipment Under Test

| Standards-related Product Specification | |
|---|---|
| **Tx/Rx Channel Frequency Range** | 5745 MHz ~ 5825 MHz |
| **Type of Modulation** | 802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) |
| **Antenna Type** | ILA Antenna<br>(The antenna peak gain of EUT is less than 6 dBi) |
| **Antenna Function Description** | |

| | Ant.1 | Ant.2 |
|---|---|---|
| 802.11 a/n MIMO | V | V |

## 1.5 Modification of EUT

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

## 1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

| **Test Site** | SPORTON INTERNATIONAL INC. |
|---|---|
| **Test Site Location** | No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,<br>Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |
| **Test Site No.** | **Sporton Site No.** |
| | 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,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| **Test Site No.** | **Sporton Site No.** |
| | 03CH11-HY |

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

## 1.7 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 v01r02
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- KDB 648474 D03 Handset Wireless Chargers Battery Covers v01r04
- ANSI C63.10-2013

**Remark:**

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

# 2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

## 2.1 Carrier Frequency and Channel

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5725-5850 MHz Band 4 (U-NII-3) | 149 | 5745 | **159** | **5795** |
| | **151** | **5755** | 161 | 5805 |
| | 153 | 5765 | 165 | 5825 |
| | 157 | 5785 | | |

**Note:** The above Frequency and Channel in boldface 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.**

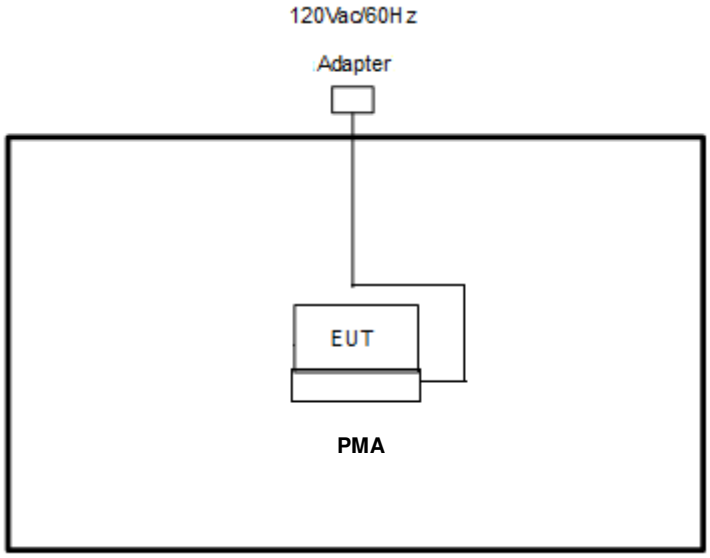
| Modulation | Data Rate |
|---|---|
| **802.11n HT40** | **MCS0** |

| | |
|---|---|
| **AC Conducted Emission** | Mode 1 : GSM1900 Idle + Bluetooth Link + WLAN (5GHz) Link + Camera + WPC Back Cover + WPC Charging Pad + USB Cable (Charging from Adapter)<br>Mode 2 : WCDMA Band V Idle + Bluetooth Link + WLAN (5GHz) Link + MPEG4 + WPC Back Cover + PMA Charging Pad + Adapter |

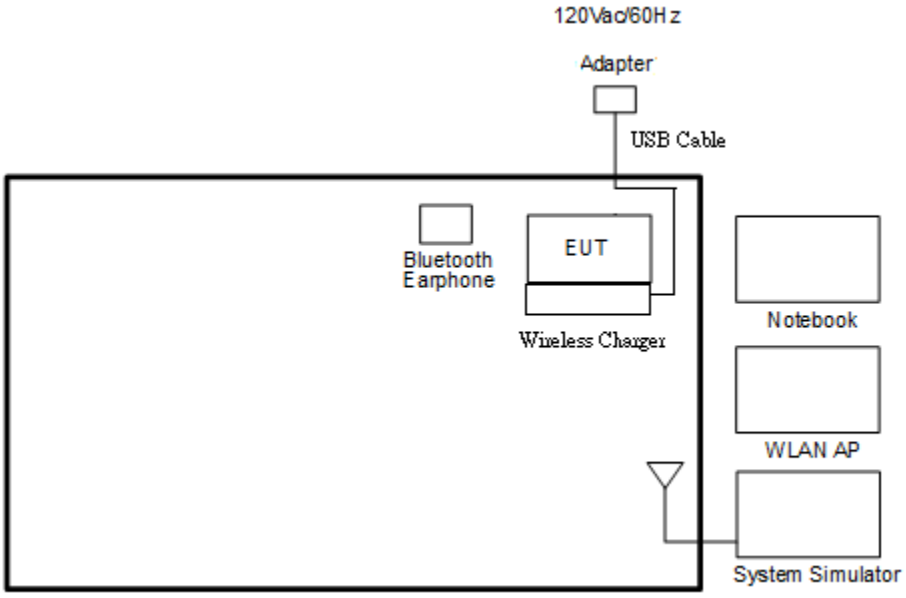
| Ch. # | | Band IV：5725-5850 MHz |
|---|---|---|
| | | 802.11n HT40 |
| L | Low | - |
| M | Middle | - |
| H | High | 159 |

## 2.3 Connection Diagram of Test System

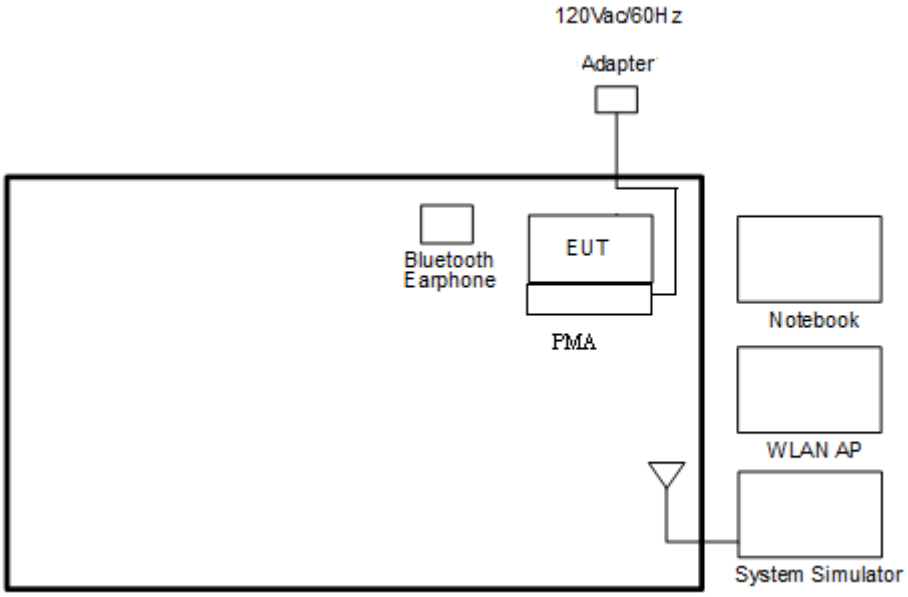
**<WLAN Tx with PMA Charging Mode>**



**<AC Conducted Emission with WPC Charging Mode>**




**<AC Conducted Emission with PMA Charging Mode>**



## 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. | WLAN AP | D-Link | DIR-628 | KA2DIR628A2 | N/A | Unshielded, 1.8 m |
| 3. | Bluetooth Earphone | Sony Ericsson | MW600 | PY7DDA-2029 | N/A | N/A |
| 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 |
| 6. | Wireless Charger | LG | WCD-100 | FCC DoC | N/A | N/A |
| 7. | PMA | DURACELL | M-018B-518A | FCC DoC | N/A | N/A |
| 8. | USB Cable | Motorola | SKN6461A | N/A | Unshielded, 1.0 m | N/A |
| 9. | Adapter | Motorola | SPN5865A | N/A | N/A | N/A |

## 2.5 EUT Operation Test Setup

For WLAN function, 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.

# 3 Test Result

## 3.1 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

### 3.1.1 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) KDB 789033 D02 General UNII Test Procedures New Rules v01r02 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

### 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 v01r02. 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

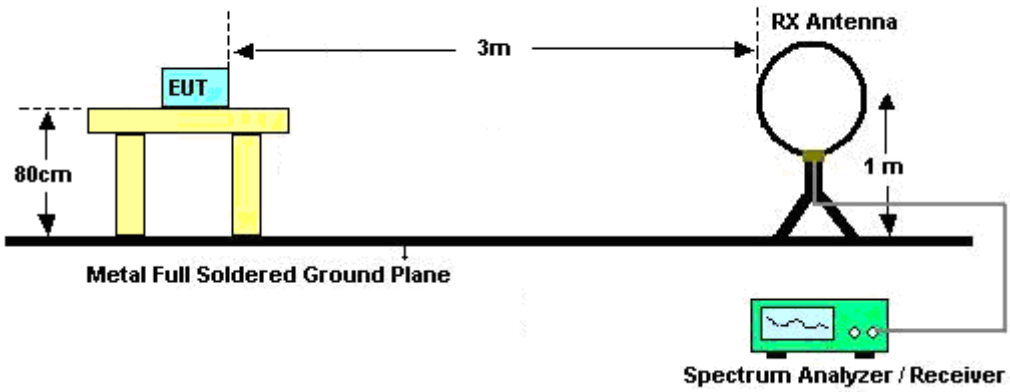
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - 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.

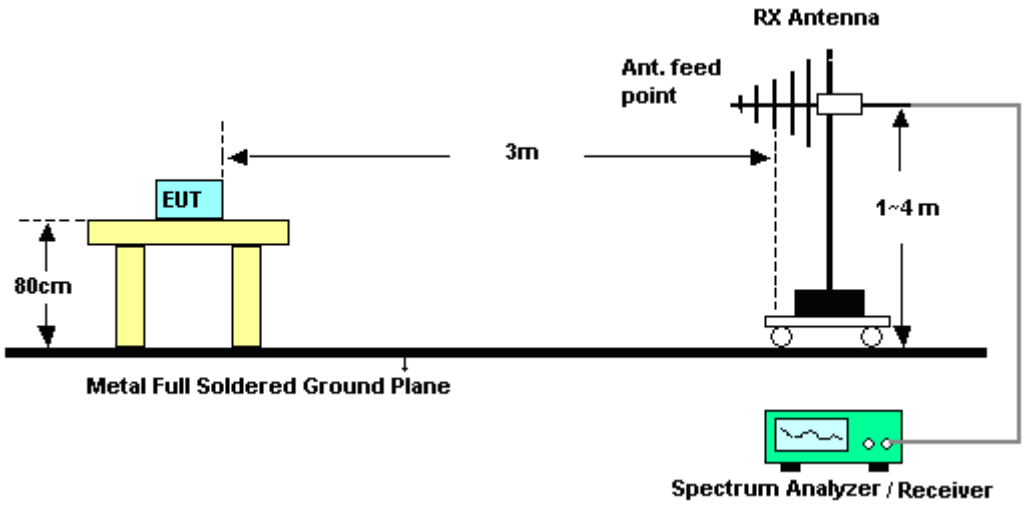
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

### 3.1.4 Test Setup

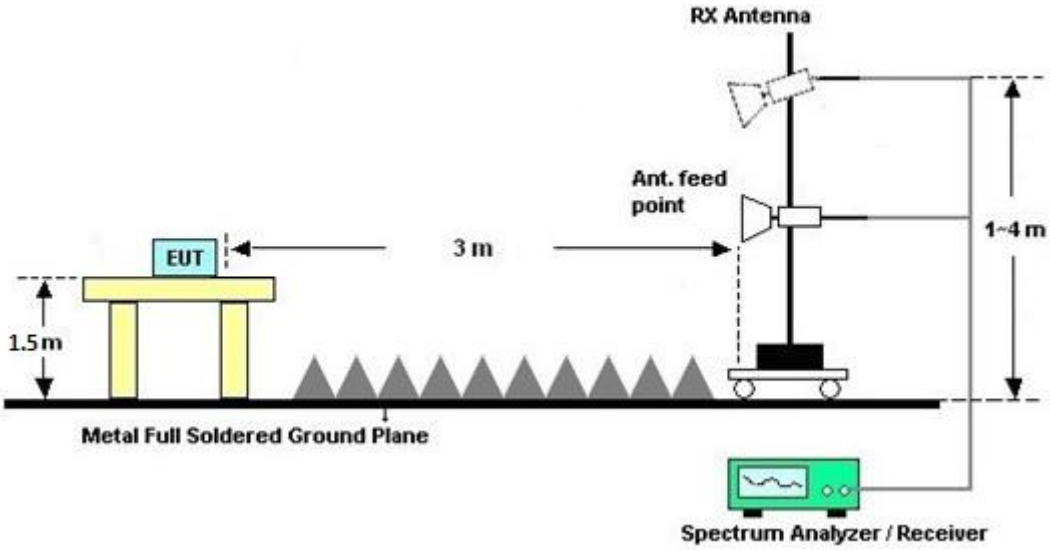
**For radiated emissions below 30MHz**



**For radiated emissions from 30MHz to 1GHz**




**For radiated emissions above 1GHz**



### 3.1.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

### 3.1.6 Test Result of Radiated Band Edges

Please refer to Appendix A and B

### 3.1.7 Duty Cycle

Please refer to Appendix C.

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

Please refer to Appendix A and B

## 3.2 AC Conducted Emission Measurement

### 3.2.1 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.

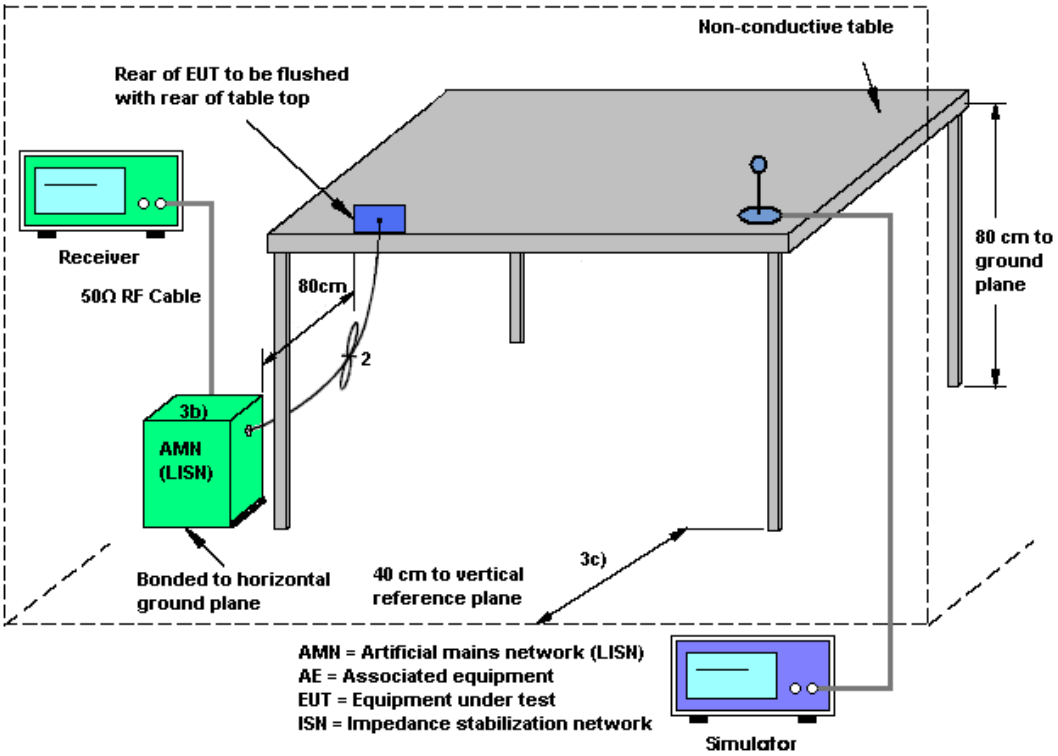
### 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

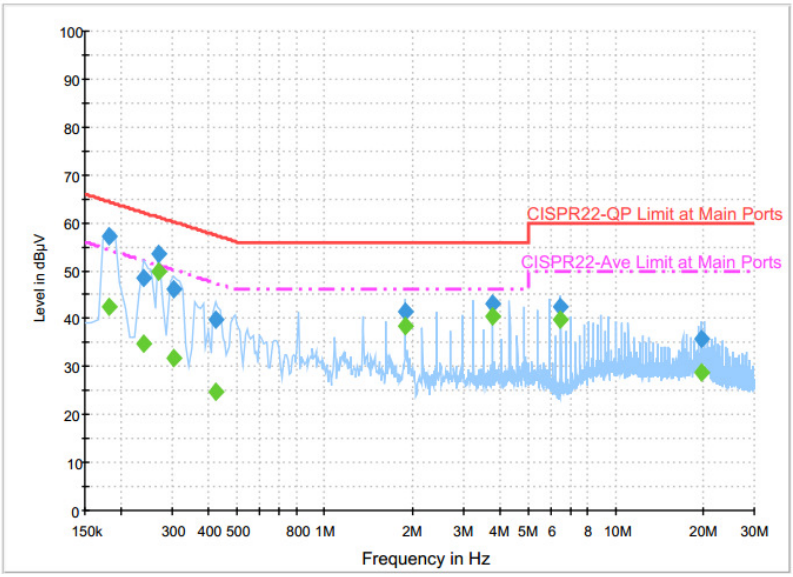
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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.

### 3.2.4 Test Setup



### 3.2.5 Test Result of AC Conducted Emission

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 2 | **Temperature :** | 22~23℃ |
| **Test Engineer :** | Arthur Hsieh and Kai-Chun Chu | **Relative Humidity :** | 51~52% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Line |
| **Function Type :** | WCDMA Band V Idle + Bluetooth Link + WLAN (5GHz) Link + MPEG4 + WPC Back Cover + PMA Charging Pad + Adapter | | |



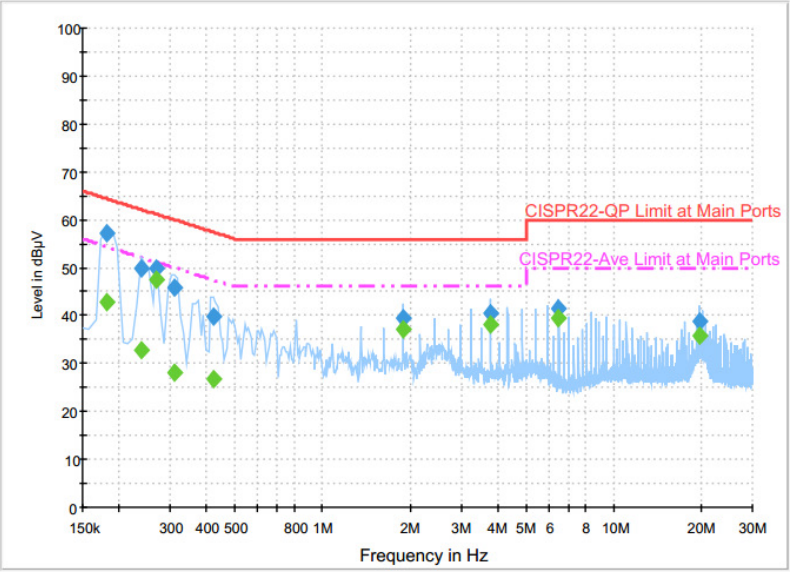

**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.182000 | 57.1 | Off | L1 | 19.6 | 7.3 | 64.4 |
| 0.238000 | 48.4 | Off | L1 | 19.6 | 13.8 | 62.2 |
| 0.270000 | 53.4 | Off | L1 | 19.6 | 7.7 | 61.1 |
| 0.302000 | 46.0 | Off | L1 | 19.6 | 14.2 | 60.2 |
| 0.422000 | 39.8 | Off | L1 | 19.6 | 17.6 | 57.4 |
| 1.894000 | 41.6 | Off | L1 | 19.7 | 14.4 | 56.0 |
| 3.790000 | 43.2 | Off | L1 | 19.8 | 12.8 | 56.0 |
| 6.494000 | 42.6 | Off | L1 | 20.0 | 17.4 | 60.0 |
| 19.750000 | 35.7 | Off | L1 | 20.7 | 24.3 | 60.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.182000 | 42.4 | Off | L1 | 19.6 | 12.0 | 54.4 |
| 0.238000 | 34.9 | Off | L1 | 19.6 | 17.3 | 52.2 |
| 0.270000 | 49.7 | Off | L1 | 19.6 | 1.4 | 51.1 |
| 0.302000 | 31.8 | Off | L1 | 19.6 | 18.4 | 50.2 |
| 0.422000 | 24.6 | Off | L1 | 19.6 | 22.8 | 47.4 |
| 1.894000 | 38.6 | Off | L1 | 19.7 | 7.4 | 46.0 |
| 3.790000 | 40.5 | Off | L1 | 19.8 | 5.5 | 46.0 |
| 6.494000 | 39.9 | Off | L1 | 20.0 | 10.1 | 50.0 |
| 19.750000 | 28.9 | Off | L1 | 20.7 | 21.1 | 50.0 |

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 2 | **Temperature :** | 22~23℃ |
| **Test Engineer :** | Arthur Hsieh and Kai-Chun Chu | **Relative Humidity :** | 51~52% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Neutral |
| **Function Type :** | WCDMA Band V Idle + Bluetooth Link + WLAN (5GHz) Link + MPEG4 + WPC Back Cover + PMA Charging Pad + Adapter | | |




**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.182000 | 57.1 | Off | N | 19.6 | 7.3 | 64.4 |
| 0.238000 | 49.9 | Off | N | 19.6 | 12.3 | 62.2 |
| 0.270000 | 49.9 | Off | N | 19.6 | 11.2 | 61.1 |
| 0.310000 | 45.7 | Off | N | 19.6 | 14.3 | 60.0 |
| 0.422000 | 39.9 | Off | N | 19.6 | 17.5 | 57.4 |
| 1.894000 | 39.4 | Off | N | 19.7 | 16.6 | 56.0 |
| 3.790000 | 40.6 | Off | N | 19.7 | 15.4 | 56.0 |
| 6.494000 | 41.6 | Off | N | 19.9 | 18.4 | 60.0 |
| 19.758000 | 38.7 | Off | N | 20.8 | 21.3 | 60.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.182000 | 42.8 | Off | N | 19.6 | 11.6 | 54.4 |
| 0.238000 | 32.7 | Off | N | 19.6 | 19.5 | 52.2 |
| 0.270000 | 47.5 | Off | N | 19.6 | 3.6 | 51.1 |
| 0.310000 | 28.0 | Off | N | 19.6 | 22.0 | 50.0 |
| 0.422000 | 26.9 | Off | N | 19.6 | 20.5 | 47.4 |
| 1.894000 | 37.1 | Off | N | 19.7 | 8.9 | 46.0 |
| 3.790000 | 38.2 | Off | N | 19.7 | 7.8 | 46.0 |
| 6.494000 | 39.4 | Off | N | 19.9 | 10.6 | 50.0 |
| 19.758000 | 35.7 | Off | N | 20.8 | 14.3 | 50.0 |

# 4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| AC Power Source | ChainTek | APC-1000W | N/A | N/A | N/A | Jul. 29, 2016 | N/A | Conduction (CO05-HY) |
| EMI Test Receiver | Rohde & Schwarz | ESCI 7 | 100724 | 9kHz~7GHz | Aug. 26, 2015 | Jul. 29, 2016 | Aug. 25, 2016 | Conduction (CO05-HY) |
| LISN | Rohde & Schwarz | ENV216 | 100080 | 9kHz~30MHz | Dec. 02, 2015 | Jul. 29, 2016 | Dec. 01, 2016 | Conduction (CO05-HY) |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100315 | 9 kHz~30 MHz | Sep. 02, 2015 | Jul. 28, 2016 ~ Jul. 29, 2016 | Sep. 01, 2016 | Radiation (03CH11-HY) |
| Amplifier | SONOMA | 310N | 187312 | 9kHz~1GHz | Nov. 20, 2015 | Jul. 28, 2016 ~ Jul. 29, 2016 | Nov. 19, 2016 | Radiation (03CH11-HY) |
| Bilog Antenna | TESEQ | CBL 6111D | 35414 | 30MHz~1GHz | Nov. 17, 2015 | Jul. 28, 2016 ~ Jul. 29, 2016 | Nov. 16, 2016 | Radiation (03CH11-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-1326 | 1GHz ~ 18GHz | Oct. 08, 2015 | Jul. 28, 2016 ~ Jul. 29, 2016 | Oct. 07, 2016 | Radiation (03CH11-HY) |
| Preamplifier | Keysight | 83017A | MY53270080 | 1GHz~26.5GHz | Nov. 19, 2015 | Jul. 28, 2016 ~ Jul. 29, 2016 | Nov. 18, 2016 | Radiation (03CH11-HY) |
| Preamplifier | MITEQ | AMF-7D-0010 1800-30-10P | 1902247 | 1GHz~18GHz | Jun. 22, 2016 | Jul. 28, 2016 ~ Jul. 29, 2016 | Jun. 21, 2017 | Radiation (03CH11-HY) |
| Spectrum Analyzer | Keysight | N9010A | MY54200486 | 10Hz ~ 44GHZ | Sep. 24, 2015 | Jul. 28, 2016 ~ Jul. 29, 2016 | Sep. 23, 2016 | Radiation (03CH11-HY) |
| Antenna Mast | EMEC | AM-BS-4500-B | N/A | 1~4m | N/A | Jul. 28, 2016 ~ Jul. 29, 2016 | N/A | Radiation (03CH11-HY) |
| Turn Table | EMEC | TT 2000 | N/A | 0~360 Degree | N/A | Jul. 28, 2016 ~ Jul. 29, 2016 | N/A | Radiation (03CH11-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170584 | 18GHz- 40GHz | Nov. 02, 2015 | Jul. 28, 2016 ~ Jul. 29, 2016 | Nov. 01, 2016 | Radiation (03CH11-HY) |
| Preamplifier | MITEQ | TTA0204 | 1872107 | 2GHz~40GHz | Feb. 15, 2016 | Jul. 28, 2016 ~ Jul. 29, 2016 | Feb. 14, 2017 | 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)) | 2.26 |

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

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 3.37 |

# Appendix A. Radiated Spurious Emission

| Test Engineer : | J.C. Liang, Jacky Hung and Ken Wu | Temperature : | 20~23°C |
|---|---|---|---|
| | | Relative Humidity : | 50~54% |

**Band 4 - 5725~5850MHz**

**WIFI 802.11n HT40 (Band Edge @ 3m)**

**<PMA Charging Mode>**

| 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+2 | | ( MHz ) | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11n HT40 CH 159 5795MHz | | 5638.2 | 48.73 | -19.57 | 68.3 | 39.39 | 32.19 | 10.69 | 33.54 | 391 | 137 | P | H |
| | | 5676.6 | 50.17 | -37.85 | 88.02 | 40.81 | 32.24 | 10.67 | 33.55 | 391 | 137 | P | H |
| | | 5718.2 | 47.4 | -63 | 110.4 | 38.01 | 32.31 | 10.65 | 33.57 | 391 | 137 | P | H |
| | | 5722.2 | 50.05 | -65.87 | 115.92 | 40.66 | 32.31 | 10.65 | 33.57 | 391 | 137 | P | H |
| | | 5795 | 95.9 | -26.4 | 122.3 | 86.47 | 32.41 | 10.61 | 33.59 | 391 | 137 | P | H |
| | | 5795 | 87.31 | - | - | 77.88 | 32.41 | 10.61 | 33.59 | 391 | 137 | A | H |
| | | 5851 | 56.03 | -63.99 | 120.02 | 46.38 | 32.48 | 10.78 | 33.61 | 391 | 137 | P | H |
| | | 5866.2 | 50.38 | -57.38 | 107.76 | 40.55 | 32.51 | 10.94 | 33.62 | 391 | 137 | P | H |
| | | 5876.2 | 49.62 | -54.79 | 104.41 | 39.77 | 32.53 | 10.94 | 33.62 | 391 | 137 | P | H |
| | | 5945.8 | 48.68 | -19.62 | 68.3 | 38.43 | 32.63 | 11.27 | 33.65 | 391 | 137 | P | H |
| | | 5637.6 | 48.55 | -19.75 | 68.3 | 39.21 | 32.19 | 10.69 | 33.54 | 400 | 38 | P | V |
| | | 5687.8 | 49.32 | -46.98 | 96.3 | 39.94 | 32.27 | 10.67 | 33.56 | 400 | 38 | P | V |
| | | 5700.8 | 49.47 | -56.05 | 105.52 | 40.09 | 32.29 | 10.65 | 33.56 | 400 | 38 | P | V |
| | | 5724.6 | 51.12 | -70.27 | 121.39 | 41.73 | 32.31 | 10.65 | 33.57 | 400 | 38 | P | V |
| | | 5795 | 100.1 | -22.2 | 122.3 | 90.67 | 32.41 | 10.61 | 33.59 | 400 | 38 | P | V |
| | | 5795 | 91.42 | - | - | 81.99 | 32.41 | 10.61 | 33.59 | 400 | 38 | A | V |
| | | 5852.8 | 52.68 | -63.24 | 115.92 | 43.03 | 32.48 | 10.78 | 33.61 | 400 | 38 | P | V |
| | | 5867.2 | 51.9 | -55.58 | 107.48 | 42.07 | 32.51 | 10.94 | 33.62 | 400 | 38 | P | V |
| | | 5875.8 | 50.85 | -53.86 | 104.71 | 41 | 32.53 | 10.94 | 33.62 | 400 | 38 | P | V |
| | | 5948.6 | 48.26 | -20.04 | 68.3 | 38.01 | 32.63 | 11.27 | 33.65 | 400 | 38 | P | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

## Band 4 5725~5850MHz

## WIFI 802.11n HT40 (Harmonic @ 3m)

| WIFI Ant. 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | 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 | | 11590 | 42.76 | -31.24 | 74 | 38.63 | 39.73 | 15.66 | 51.26 | 100 | 0 | P | H |
| | | 17385 | 45.27 | -28.73 | 74 | 37.17 | 41.45 | 18.66 | 52.01 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11590 | 42.63 | -31.37 | 74 | 38.5 | 39.73 | 15.66 | 51.26 | 100 | 0 | P | V |
| | | 17385 | 45.1 | -28.9 | 74 | 37 | 41.45 | 18.66 | 52.01 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found.<br>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. 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5GHz 802.11n HT40 LF | | 31.08 | 23.78 | -16.22 | 40 | 29.5 | 25.18 | 0.93 | 31.83 | - | - | P | H |
| | | 90.21 | 20.7 | -22.8 | 43.5 | 36.41 | 14.9 | 1.17 | 31.78 | - | - | P | H |
| | | 158.52 | 34.15 | -9.35 | 43.5 | 47.25 | 17 | 1.68 | 31.78 | 238 | 152 | P | H |
| | | 746.6 | 29.45 | -16.55 | 46 | 30.17 | 27.64 | 3.62 | 31.98 | - | - | P | H |
| | | 869.8 | 31.89 | -14.11 | 46 | 30.61 | 29.02 | 3.84 | 31.58 | - | - | P | H |
| | | 977.6 | 34.21 | -19.79 | 54 | 30.59 | 30.54 | 3.89 | 30.81 | - | - | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 40.8 | 32.03 | -7.97 | 40 | 43.18 | 19.74 | 0.93 | 31.82 | 192 | 271 | P | V |
| | | 54.57 | 25.39 | -14.61 | 40 | 42.56 | 13.7 | 0.93 | 31.8 | - | - | P | V |
| | | 82.38 | 24.22 | -15.78 | 40 | 40.9 | 13.94 | 1.17 | 31.79 | - | - | P | V |
| | | 758.5 | 29.58 | -16.42 | 46 | 30.13 | 27.8 | 3.62 | 31.97 | - | - | P | V |
| | | 879.6 | 32.03 | -13.97 | 46 | 30.64 | 29.08 | 3.84 | 31.53 | - | - | P | V |
| | | 976.2 | 33.46 | -20.54 | 54 | 29.85 | 30.55 | 3.89 | 30.83 | - | - | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| **Remark** | 1. No other spurious found.<br>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+2 | | ( 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”.**

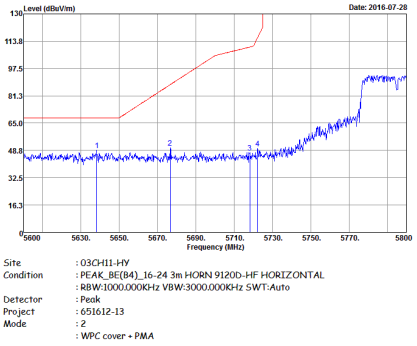
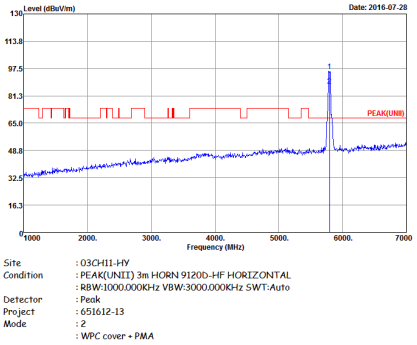
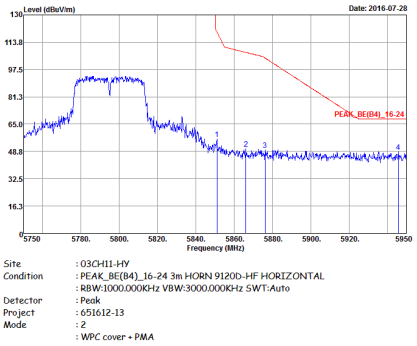
# Appendix B. Radiated Spurious Emission Plots

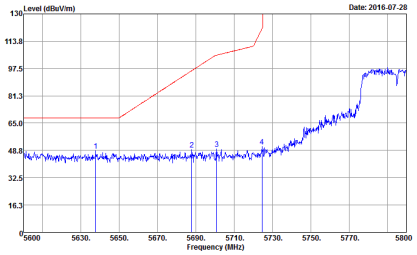
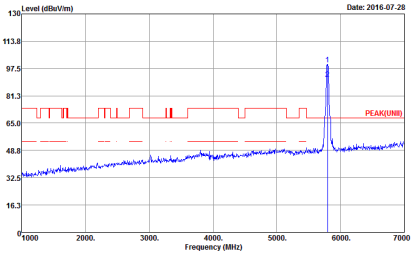
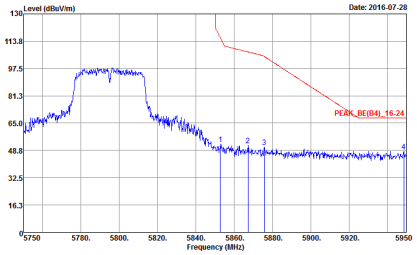
| | | | |
|---|---|---|---|
| **Test Engineer :** | J.C. Liang, Jacky Hung and Ken Wu | **Temperature :** | 20~23°C |
| | | **Relative Humidity :** | 50~54% |

## Band 4 - 5725~5850MHz

## WIFI 802.11n HT40 (Band Edge @ 3m)

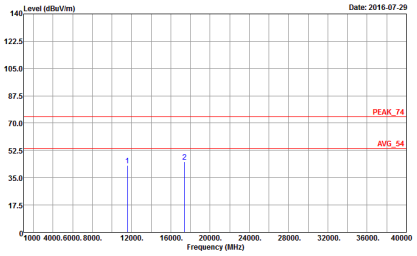
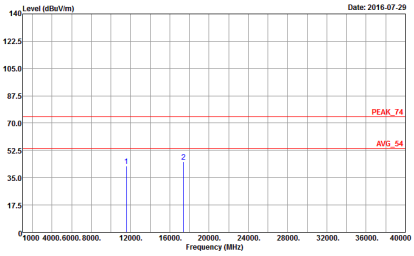
### <PMA Charging Mode>

| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT40 CH159 5795MHz | |
| 1+2 | Horizontal | Fundamental |
| Peak |  |  |
| Peak |  | Left blank |

| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT40 CH159 5795MHz | |
| 1+2 | Vertical | Fundamental |
| Peak |  <br>Site : 03CH11-HY<br>Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612-13<br>Mode : 2<br>: WPC cover + PMA |  <br>Site : 03CH11-HY<br>Condition : PEAK(UNII) 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612-13<br>Mode : 2<br>: WPC cover + PMA |
| Peak |  <br>Site : 03CH11-HY<br>Condition : PEAK_BE(B4)_16-24 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612-13<br>Mode : 2<br>: WPC cover + PMA | Left blank |

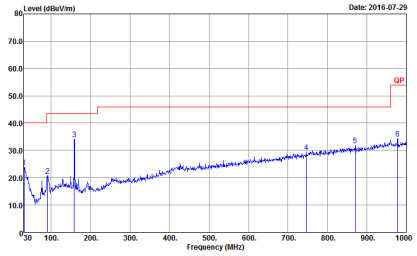
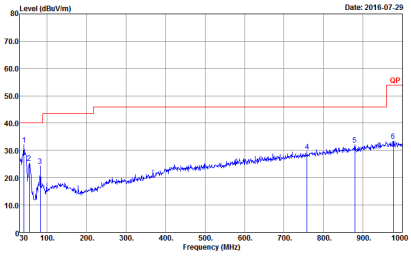
## Band 4 - 5725~5850MHz

## WIFI 802.11n HT40 (Harmonic @ 3m)

| WIFI | Band 4 5725~5850MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11n HT40 CH159 5795MHz | |
| 1+2 | Horizontal | Vertical |
| Peak<br>Avg. |  <br>Site : 03CH11-HY<br>Condition : PEAK_74 3m 9170 SHF HORM_150809 HORIZONTAL<br>Detector : Peak<br>Project : 651612-13<br>Mode : 1<br>: WPC cover + LG |  <br>Site : 03CH11-HY<br>Condition : PEAK_74 3m 9170 SHF HORM_150809 VERTICAL<br>Detector : Peak<br>Project : 651612-13<br>Mode : 1<br>: WPC cover + LG |

## Emission below 1GHz

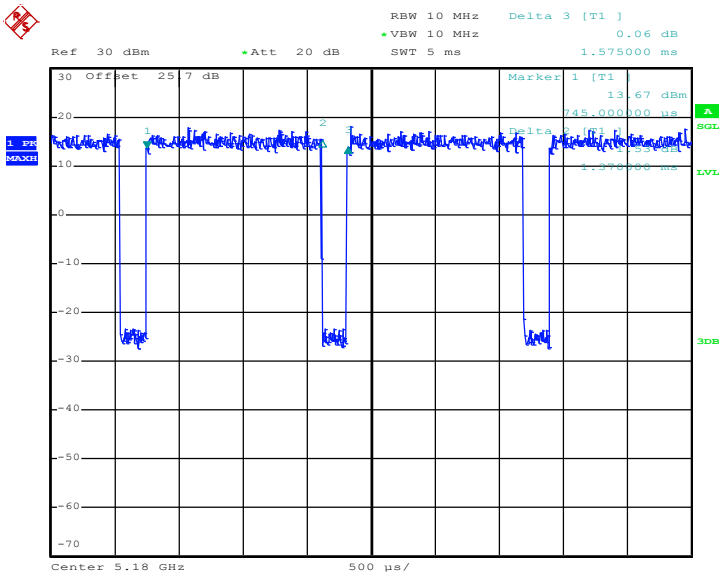
## 5GHz WIFI 802.11n HT40 (LF)

| WIFI | 5GHz 5725~5850MHz | |
|---|---|---|
| ANT | 802.11n HT40 LF | |
| 1+2 | Horizontal | Vertical |
| QP / Peak |  <br>Site : 03CH11-HY<br>Condition : QP 3m BI-LOG 6111D-LF_ETC HORIZONTAL<br>Detector : Peak<br>Project : 651612-13<br>Mode : 2<br>: WPC cover + PMA |  <br>Site : 03CH11-HY<br>Condition : QP 3m BI-LOG 6111D-LF_ETC VERTICAL<br>Detector : Peak<br>Project : 651612-13<br>Mode : 2<br>: WPC cover + PMA |

# Appendix C. Duty Cycle Plots

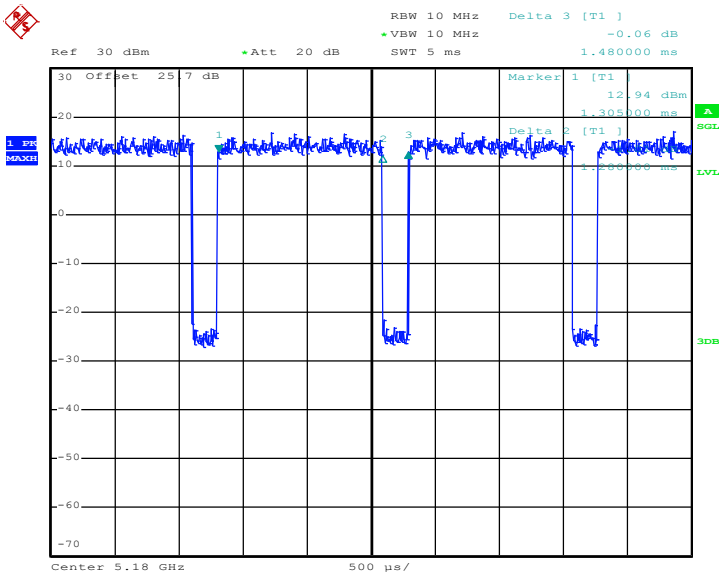
| Antenna | Band | Duty Cycle(%) | T(us) | 1/T(kHz) | VBW Setting |
|---|---|---|---|---|---|
| 1+2 | 802.11a | 86.984 | 1370 | 0.730 | 1kHz |
| 1+2 | 5GHz 802.11n HT20 | 86.486 | 1280 | 0.781 | 1kHz |
| 1+2 | 5GHz 802.11n HT40 | 75.598 | 632 | 1.582 | 3kHz |

## 802.11a



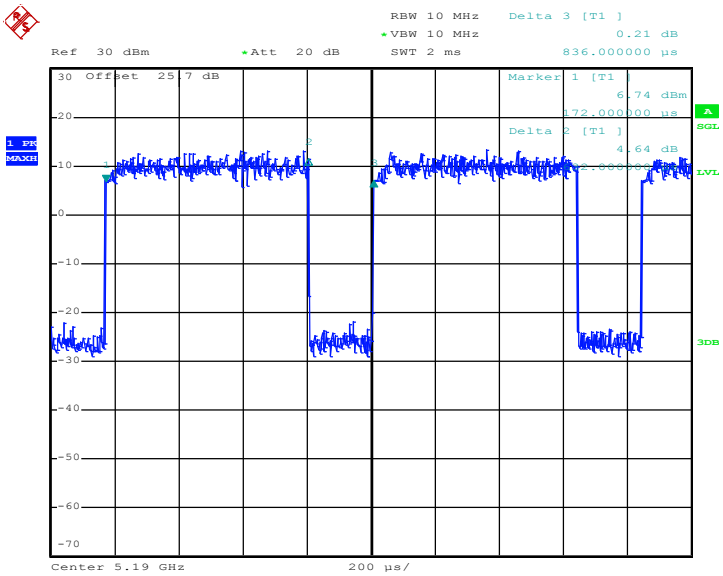

Date: 22.MAY.2016 09:02:32

## 802.11n HT20




Date: 22.MAY.2016 09:08:23

## 802.11n HT40




Date: 22.MAY.2016 09:23:04

# Appendix D. Original Report

Please refer to Sporton report number FR651612E as below.

# FCC RF Test Report

| | | |
|---|---|---|
| APPLICANT | : | Motorola Mobility, LLC |
| EQUIPMENT | : | Mobile Cellular Phone |
| BRAND NAME | : | Motorola |
| MODEL NAME | : | 5892 |
| FCC ID | : | IHDT56VC1 |
| STANDARD | : | FCC Part 15 Subpart E §15.407 |
| CLASSIFICATION | : | (NII) Unlicensed National Information Infrastructure |

**The product was received on May 16, 2016 and testing was completed on Jun. 22, 2016. 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 |
|---|---|---|---|
| FR651612E | Rev. 01 | Initial issue of report | Jun. 28, 2016 |
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# 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) ≤ -17, -27 dBm/MHz &15.209(a) | Pass | Under limit 3.23 dB at 34.590 MHz |
| 3.5 | 15.207 | AC Conducted Emission | 15.207(a) | Pass | Under limit 20.60 dB at 0.158 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

**Motorola Mobility, LLC**
222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

## 1.2 Manufacturer

**Motorola Mobility, LLC**
222 W Merchandise Mart Plaza, Suite 1800, Chicago, IL 60654, United States

## 1.3 Product Feature of Equipment Under Test

| Product Feature | |
|---|---|
| **Equipment** | Mobile Cellular Phone |
| **Brand Name** | Motorola |
| **Model Name** | 5892 |
| **FCC ID** | IHDT56VC1 |
| **IMEI Code** | 354130070011751 (for Radiation)<br>354130070013450 (for Conduction) |
| **EUT supports Radios application** | CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE/NFC<br>WLAN 11b/g/n HT20<br>WLAN 11a/n HT20/HT40<br>Bluetooth v3.0 EDR<br>Bluetooth v4.0 LE |
| **EUT Stage** | Identical Prototype |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

| Accessory List | |
|---|---|
| **AC Adapter** | Brand Name : Motorola |
| | Model Name : SPN5913A |
| **Battery 1** | Brand Name : Motorola |
| | Model Name : SNN5974A |
| **Battery 2** | Brand Name : Motorola |
| | Model Name : SNN5975A |
| **Earphone** | Brand Name : Motorola |
| | Model Name : SJYN1181B |
| **USB Cable** | Brand Name : Motorola |
| | Model Name : SKN6473A |

## 1.4 Product Specification of Equipment Under Test

| Standards-related Product Specification | |
|---|---|
| **Tx/Rx Channel Frequency Range** | 5745 MHz ~ 5825 MHz |
| **Maximum Output Power** | 802.11a : 16.34 dBm / 0.0431 W<br>802.11n HT20 : 15.32 dBm / 0.0340 W<br>802.11n HT40 : 14.93 dBm / 0.0311 W |
| **99% Occupied Bandwidth** | 802.11a : 19.25 MHz<br>802.11n HT20 : 19.50 MHz<br>802.11n HT40 : 37.10 MHz |
| **Type of Modulation** | 802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) |
| **Antenna Type** | ILA Antenna<br>(The antenna peak gain of EUT is less than 6 dBi) |

## 1.5 Modification of EUT

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

## 1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

| | | |
|---|---|---|
| **Test Site** | SPORTON INTERNATIONAL INC. | |
| **Test Site Location** | No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,<br>Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.<br>TEL: +886-3-327-3456<br>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,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| **Test Site No.** | **Sporton Site No.** |
| | 03CH11-HY |

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

## 1.7 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 v01r02
- ANSI C63.10-2013

**Remark:**

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

# 2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated 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 (X plane) were recorded in this report.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

## 2.1 Carrier Frequency and Channel

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5725-5850 MHz Band 4 (U-NII-3) | 149 | 5745 | 157 | 5785 |
| | **151** | **5755** | **159** | **5795** |
| | 153 | 5765 | 161 | 5805 |
| | 155 | 5775 | 165 | 5825 |

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

## 2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables. Final Output Power equals to Measured Output Power adds the duty factor.

| Channel | Frequency | 5GHz 802.11a Average Power (dBm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Data Rate | | | | | | | |
| | | 6 Mbps | 9 Mbps | 12 Mbps | 18 Mbps | 24 Mbps | 36 Mbps | 48 Mbps | 54 Mbps |
| CH 149 | 5745 MHz | 15.80 | 15.42 | 15.44 | 15.48 | 15.48 | 14.77 | 13.72 | 13.12 |
| CH 157 | 5785 MHz | 16.22 | 15.71 | 15.65 | 15.67 | 15.71 | 14.73 | 13.88 | 13.31 |
| CH 165 | 5825 MHz | **16.34** | 15.84 | 15.97 | 15.87 | 15.98 | 15.22 | 14.31 | 13.57 |

| Channel | Frequency | 5GHz 802.11n HT20 Average Power (dBm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Data Rate | | | | | | | |
| | | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 |
| CH 149 | 5745 MHz | 14.78 | 14.77 | 14.68 | 14.71 | 14.75 | 13.93 | 13.27 | 12.37 |
| CH 157 | 5785 MHz | 15.12 | 15.06 | 15.07 | 15.09 | 15.09 | 14.51 | 13.72 | 12.77 |
| CH 165 | 5825 MHz | **15.32** | 15.28 | 15.27 | 15.30 | 15.31 | 14.80 | 13.99 | 12.97 |

| Channel | Frequency | 5GHz 802.11n HT40 Average Power (dBm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Data Rate | | | | | | | |
| | | MCS0 | MCS1 | MCS2 | MCS3 | MCS4 | MCS5 | MCS6 | MCS7 |
| CH 151 | 5755 MHz | 14.58 | 14.41 | 14.53 | 14.57 | 13.82 | 13.81 | 12.91 | 12.25 |
| CH 159 | 5795 MHz | **14.93** | 14.86 | 14.91 | 14.84 | 14.13 | 14.06 | 13.15 | 12.20 |

## 2.3 Test Mode

**Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.**

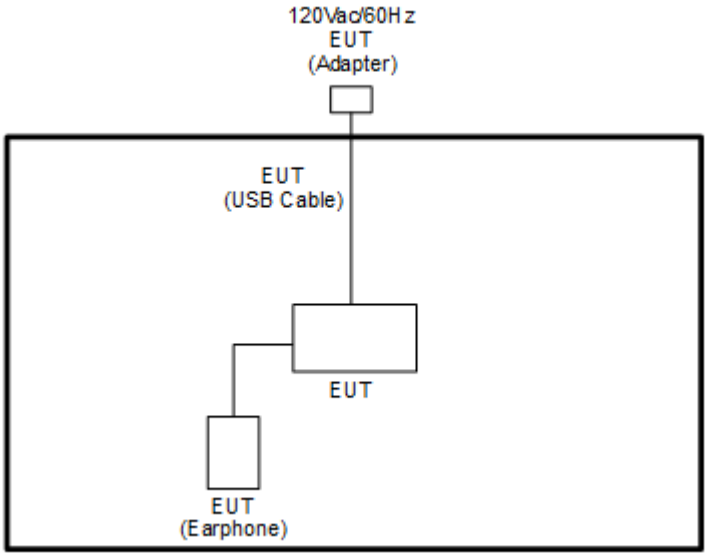
| Modulation | Data Rate |
|---|---|
| 802.11a | 6 Mbps |
| 802.11n HT20 | MCS0 |
| 802.11n HT40 | MCS0 |

| | |
|---|---|
| AC Conducted Emission | Mode 1 : GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + MP3 + Adapter |

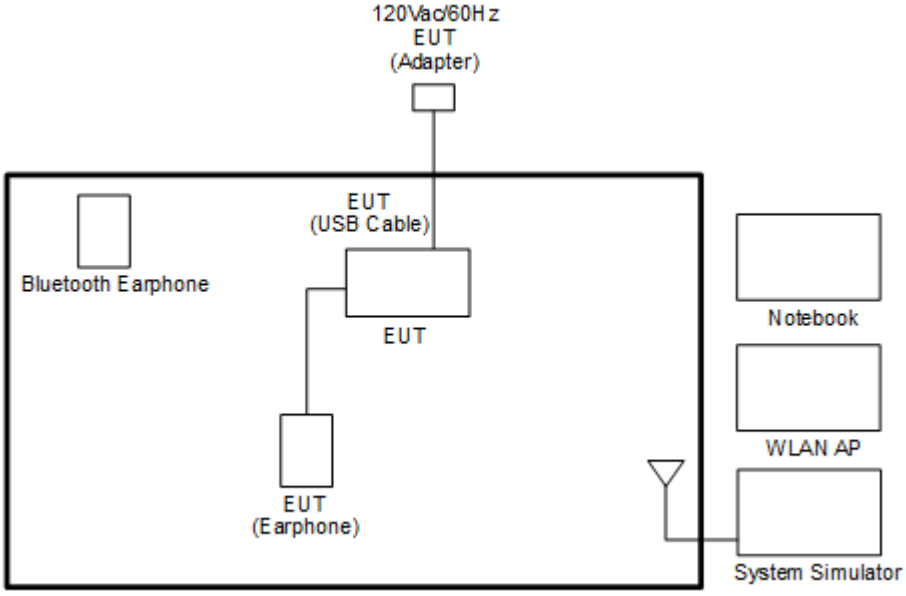
| Ch. # | | Band IV：5725-5850 MHz | | |
|---|---|---|---|---|
| | | 802.11a | 802.11n HT20 | 802.11n HT40 |
| L | Low | 149 | 149 | 151 |
| M | Middle | 157 | 157 | - |
| H | High | 165 | 165 | 159 |

## 2.4 Connection Diagram of Test System

**<WLAN Tx Mode>**




**<AC Conducted Emission Mode>**



## 2.5 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. | WLAN AP | D-Link | DIR-865L | KA2IR865LA1 | N/A | Unshielded, 1.8 m |
| 3. | 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 |
| 4. | Bluetooth Earphone | Sony Ericsson | MW600 | PY7DDA-2029 | N/A | N/A |
| 5. | SD Card | SanDisk | MicroSD HC | FCC DoC | N/A | N/A |

## 2.6 EUT Operation Test Setup

For WLAN function, 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.

## 2.7 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.

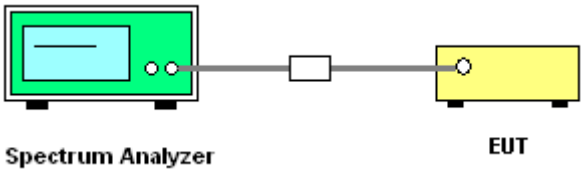
### 3.1.2 Measuring Instruments

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 v01r02. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

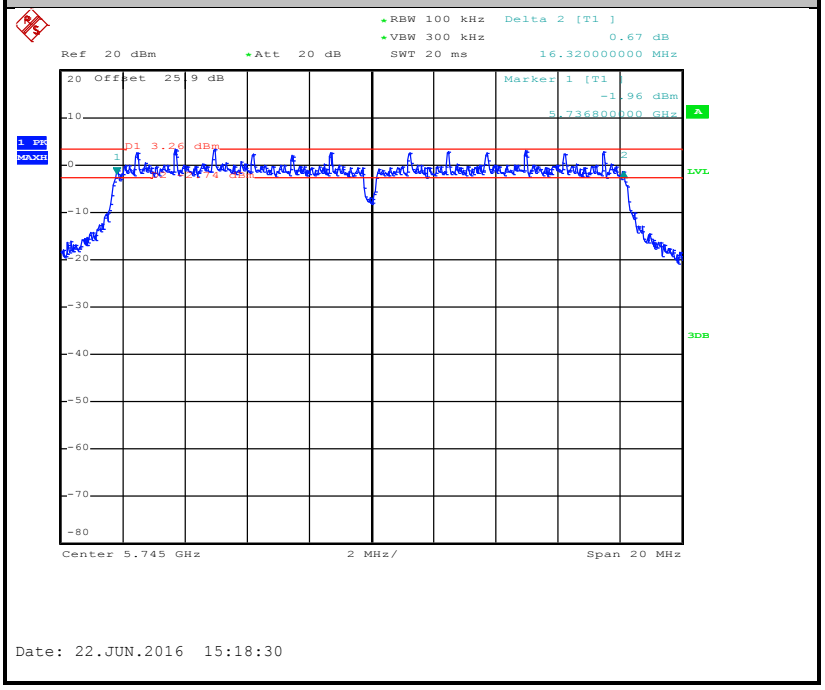
### 3.1.4 Test Setup



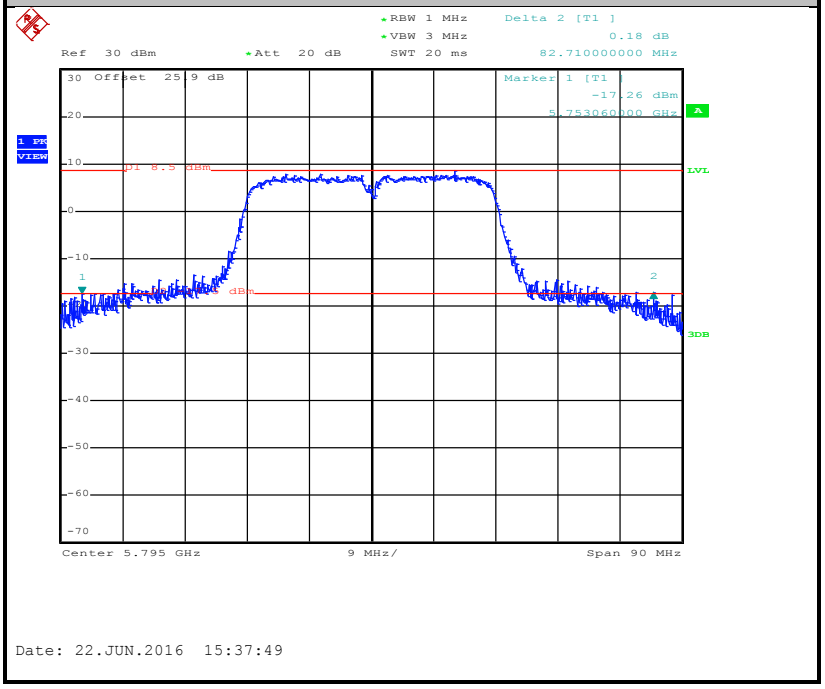
### 3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

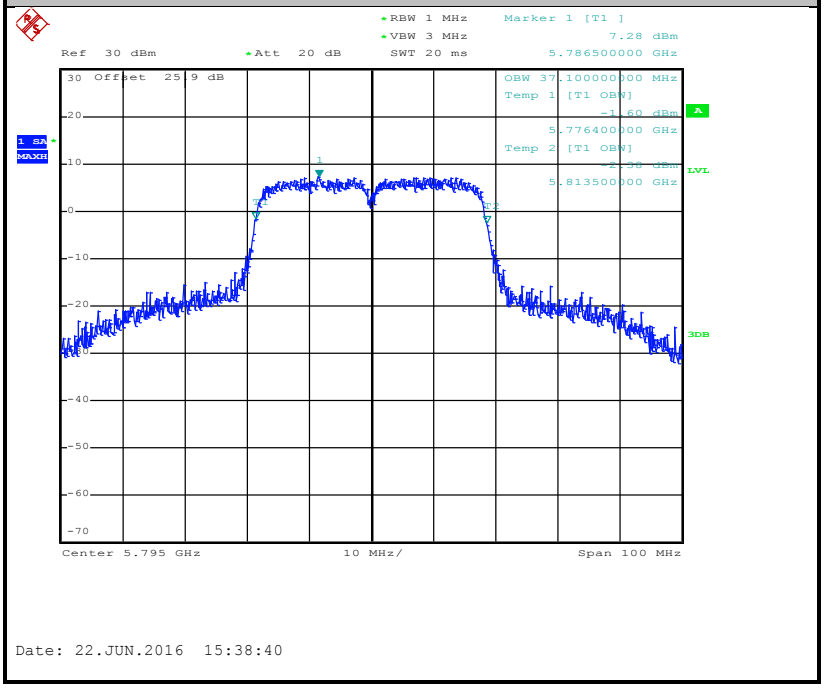
**Minimum 6dB Bandwidth**




**Maximum 26dB Bandwidth**



## Maximum 99% Occupied Bandwidth




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

## 3.2 Maximum Conducted Output Power Measurement

### 3.2.1 Limit of Maximum Conducted Output Power

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

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

### 3.2.2 Measuring Instruments

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

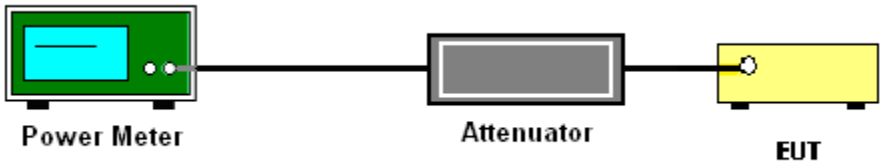
### 3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.

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

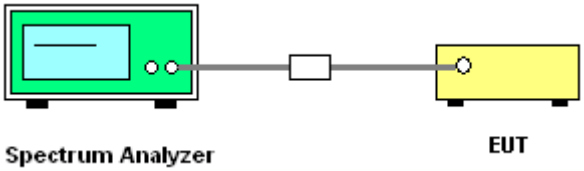
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02. Section F) Maximum power spectral density.

**# Method SA-2 #**

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

1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.
   - 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.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

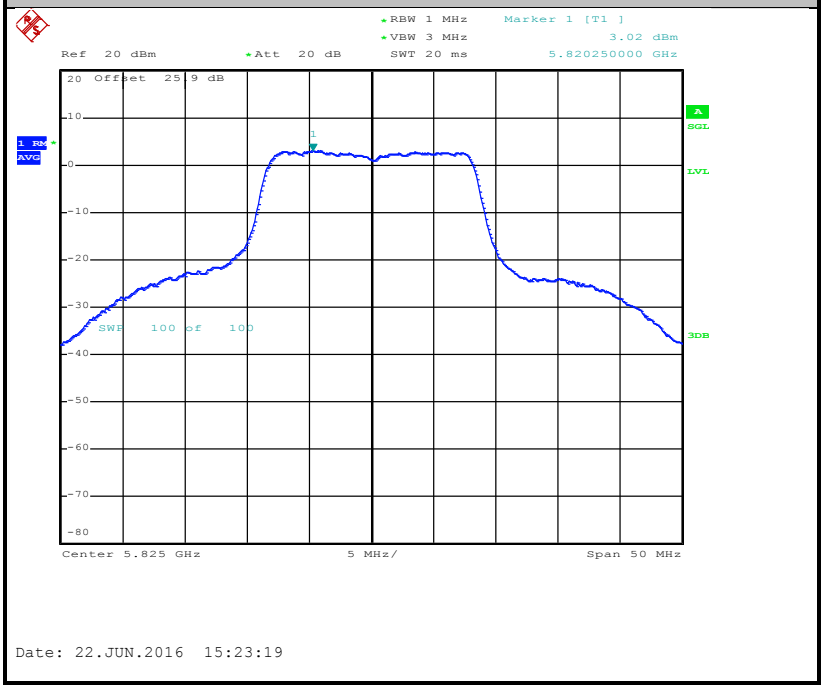
### 3.3.4 Test Setup




### 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 as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

### 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) For transmitters operating in the 5725-5850 MHz band:

all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBμV/m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBμV/m).

(3) 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 |

(4) KDB 789033 D02 General UNII Test Procedures New Rules v01r02 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission 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 v01r02. 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

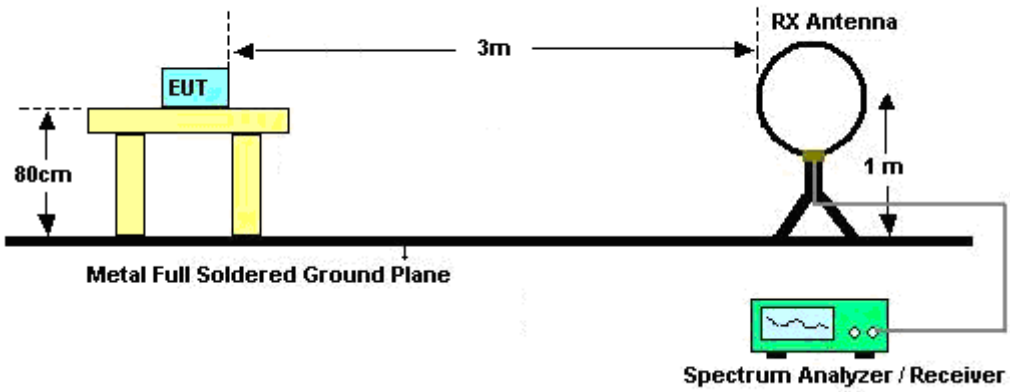
   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

   (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.

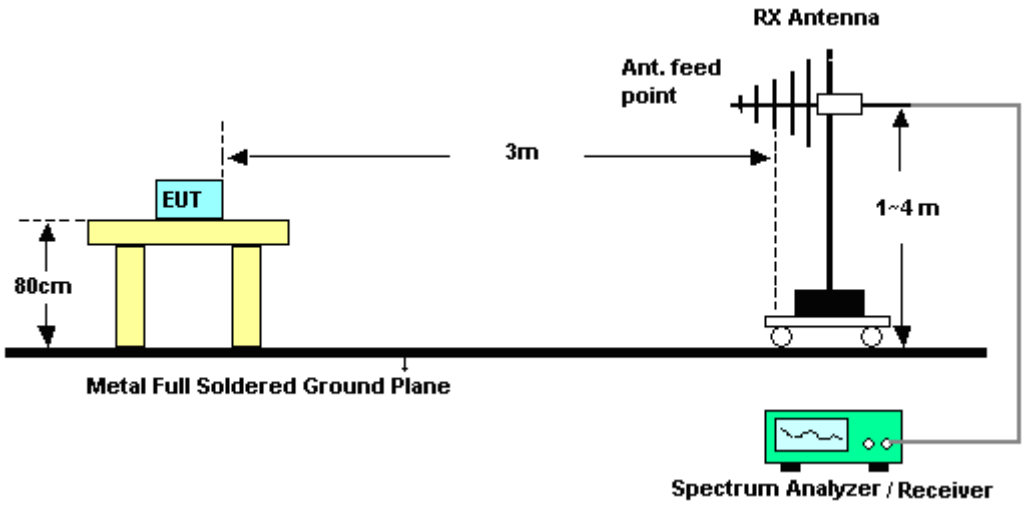
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

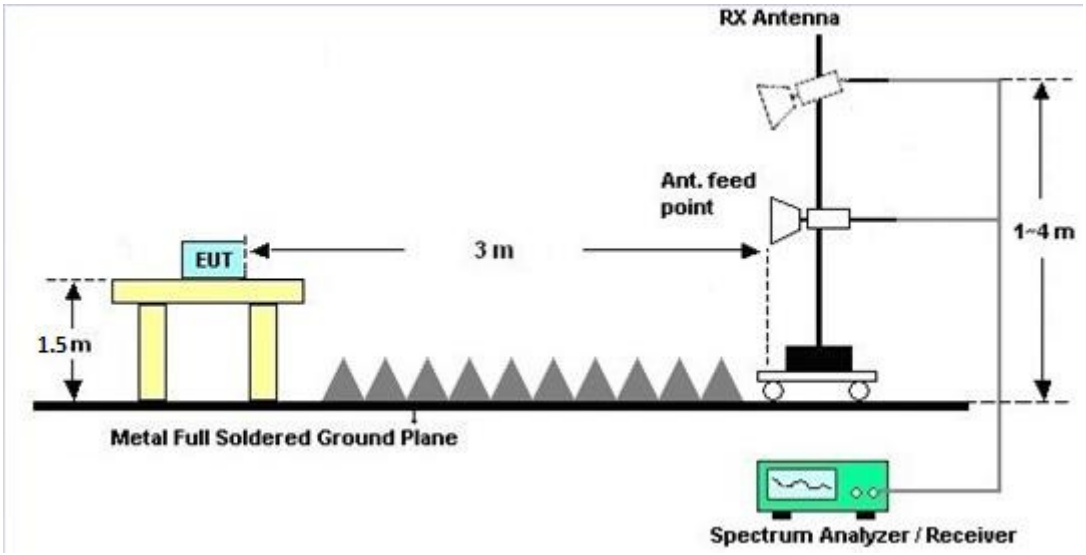
**For radiated emissions below 30MHz**



**For radiated emissions from 30MHz to 1GHz**




**For radiated emissions above 1GHz**



### 3.4.5 Test Results of Radiated 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 per 15.31(o) was not reported.

### 3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix B and C.

### 3.4.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix B and C.

## 3.5 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.

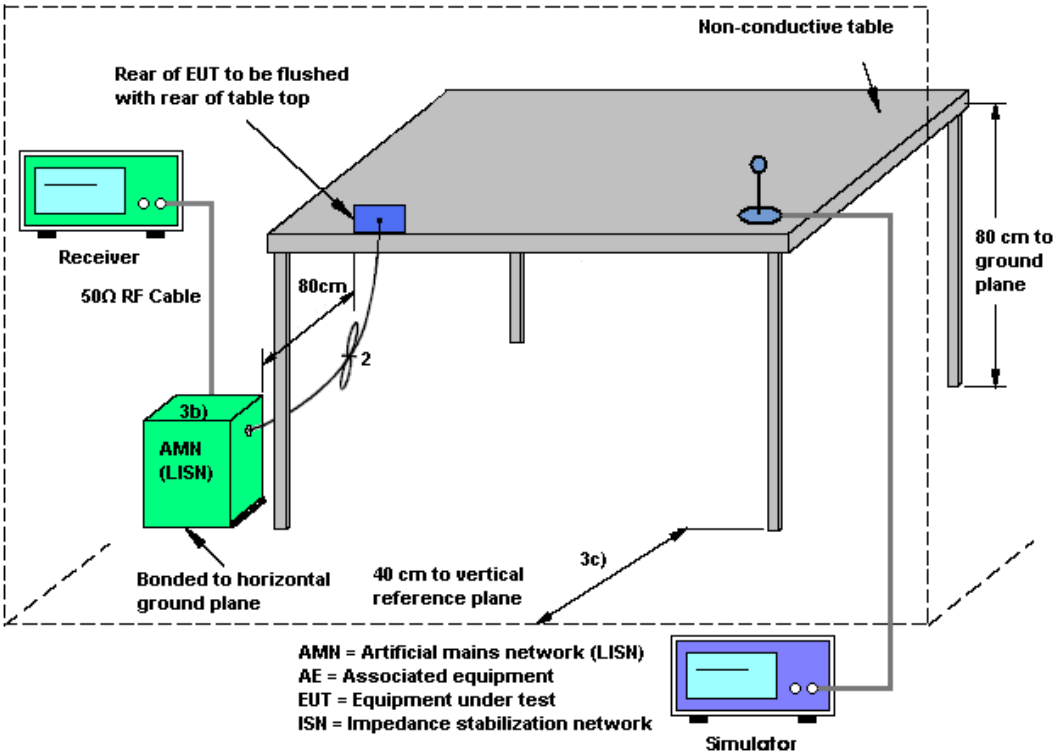
### 3.5.2 Measuring Instruments

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

### 3.5.3 Test Procedures

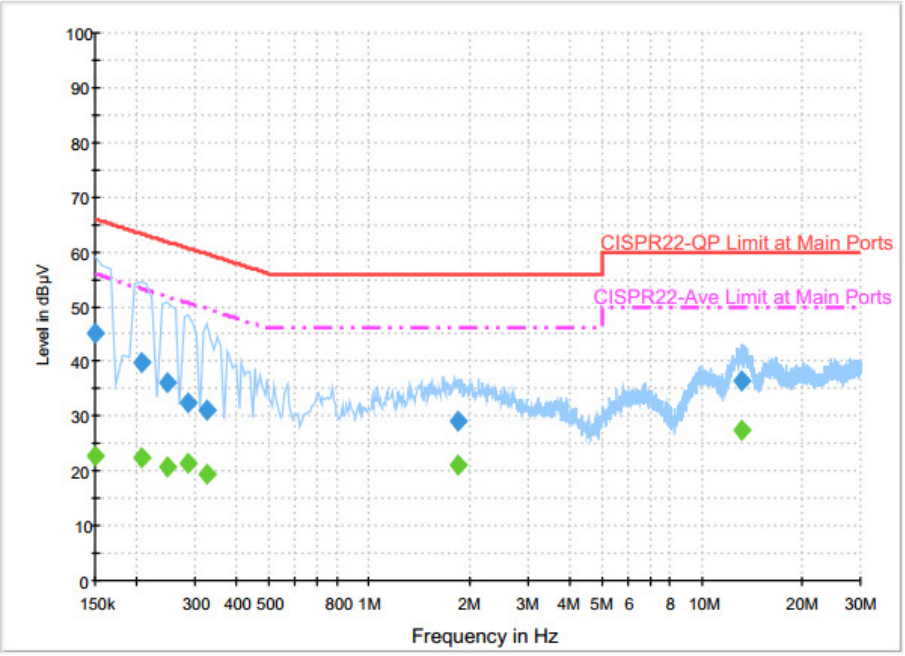
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
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

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 1 | **Temperature :** | 25~26℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 51~52% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Line |
| **Function Type :** | GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + MP3 + Adapter | | |



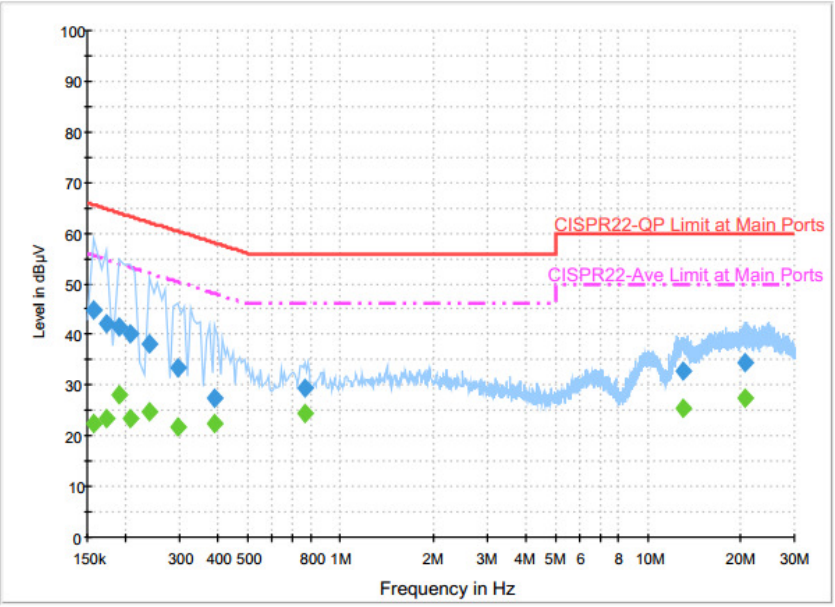

**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 45.3 | Off | L1 | 19.6 | 20.7 | 66.0 |
| 0.206000 | 39.6 | Off | L1 | 19.6 | 23.8 | 63.4 |
| 0.246000 | 36.1 | Off | L1 | 19.6 | 25.8 | 61.9 |
| 0.286000 | 32.4 | Off | L1 | 19.6 | 28.2 | 60.6 |
| 0.326000 | 31.3 | Off | L1 | 19.6 | 28.3 | 59.6 |
| 1.854000 | 29.2 | Off | L1 | 19.7 | 26.8 | 56.0 |
| 13.254000 | 36.6 | Off | L1 | 20.3 | 23.4 | 60.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.150000 | 22.7 | Off | L1 | 19.6 | 33.3 | 56.0 |
| 0.206000 | 22.6 | Off | L1 | 19.6 | 30.8 | 53.4 |
| 0.246000 | 20.9 | Off | L1 | 19.6 | 31.0 | 51.9 |
| 0.286000 | 21.5 | Off | L1 | 19.6 | 29.1 | 50.6 |
| 0.326000 | 19.4 | Off | L1 | 19.6 | 30.2 | 49.6 |
| 1.854000 | 21.1 | Off | L1 | 19.7 | 24.9 | 46.0 |
| 13.254000 | 27.5 | Off | L1 | 20.3 | 22.5 | 50.0 |

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 1 | **Temperature :** | 25~26℃ |
| **Test Engineer :** | Kai-Chun Chu | **Relative Humidity :** | 51~52% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Neutral |
| **Function Type :** | GSM850 Idle + Bluetooth Link + WLAN (5GHz) Link + Earphone + MP3 + Adapter | | |




**Final Result : QuasiPeak**

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.158000 | 45.0 | Off | N | 19.6 | 20.6 | 65.6 |
| 0.174000 | 42.2 | Off | N | 19.6 | 22.6 | 64.8 |
| 0.190000 | 41.6 | Off | N | 19.6 | 22.4 | 64.0 |
| 0.206000 | 40.1 | Off | N | 19.6 | 23.3 | 63.4 |
| 0.238000 | 38.0 | Off | N | 19.6 | 24.2 | 62.2 |
| 0.294000 | 33.5 | Off | N | 19.6 | 26.9 | 60.4 |
| 0.390000 | 27.5 | Off | N | 19.6 | 30.6 | 58.1 |
| 0.766000 | 29.3 | Off | N | 19.6 | 26.7 | 56.0 |
| 13.102000 | 32.8 | Off | N | 20.3 | 27.2 | 60.0 |
| 20.798000 | 34.5 | Off | N | 20.8 | 25.5 | 60.0 |

**Final Result : Average**

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|---|---|---|---|---|---|---|
| 0.158000 | 22.4 | Off | N | 19.6 | 33.2 | 55.6 |
| 0.174000 | 23.5 | Off | N | 19.6 | 31.3 | 54.8 |
| 0.190000 | 28.0 | Off | N | 19.6 | 26.0 | 54.0 |
| 0.206000 | 23.5 | Off | N | 19.6 | 29.9 | 53.4 |
| 0.238000 | 24.9 | Off | N | 19.6 | 27.3 | 52.2 |
| 0.294000 | 21.9 | Off | N | 19.6 | 28.5 | 50.4 |
| 0.390000 | 22.4 | Off | N | 19.6 | 25.7 | 48.1 |
| 0.766000 | 24.4 | Off | N | 19.6 | 21.6 | 46.0 |
| 13.102000 | 25.5 | Off | N | 20.3 | 24.5 | 50.0 |
| 20.798000 | 27.3 | Off | N | 20.8 | 22.7 | 50.0 |

## 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.

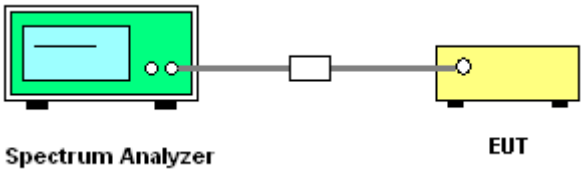
### 3.6.2 Measuring Instruments

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

According to FCC 47 CFR Section 15.407(a)(1)(2) ,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 | 300MHz~40GHz | Aug. 12, 2015 | May 22, 2016 ~ Jun. 22, 2016 | Aug. 11, 2016 | Conducted (TH05-HY) |
| Power Sensor | Anritsu | MA2411B | 1126017 | 300MHz~40GHz | Aug. 12, 2015 | May 22, 2016 ~ Jun. 22, 2016 | Aug. 11, 2016 | Conducted (TH05-HY) |
| Spectrum Analyzer | Rohde & Schwarz | FSP30 | 101067 | 9kHz ~ 30GHz | Nov. 13, 2015 | May 22, 2016 ~ Jun. 22, 2016 | Nov. 12, 2016 | Conducted (TH05-HY) |
| Temperature Chamber | ESPEC | SH-641 | 92013720 | -40℃ ~90℃ | Sep. 08, 2015 | May 22, 2016 ~ Jun. 22, 2016 | Sep. 07, 2016 | Conducted (TH05-HY) |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100315 | 9 kHz~30 MHz | Sep. 02, 2015 | Jun. 16, 2016 ~ Jun. 18, 2016 | Sep. 01, 2016 | Radiation (03CH11-HY) |
| Amplifier | SONOMA | 310N | 187312 | 9kHz~1GHz | Nov. 20, 2015 | Jun. 16, 2016 ~ Jun. 18, 2016 | Nov. 19, 2016 | Radiation (03CH11-HY) |
| Bilog Antenna | TESEQ | CBL 6111D | 35414 | 30MHz~1GHz | Nov. 17, 2015 | Jun. 16, 2016 ~ Jun. 18, 2016 | Nov. 16, 2016 | Radiation (03CH11-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-1326 | 1GHz ~ 18GHz | Oct. 08, 2015 | Jun. 16, 2016 ~ Jun. 18, 2016 | Oct. 07, 2016 | Radiation (03CH11-HY) |
| Preamplifier | Keysight | 83017A | MY53270080 | 1GHz~26.5GHz | Nov. 19, 2015 | Jun. 16, 2016 ~ Jun. 18, 2016 | Nov. 18, 2016 | Radiation (03CH11-HY) |
| Preamplifier | MITEQ | AMF-7D-0010 1800-30-10P | 1902247 | 1GHz~18GHz | Jul. 01, 2015 | Jun. 16, 2016 ~ Jun. 18, 2016 | Jun. 30, 2016 | Radiation (03CH11-HY) |
| Spectrum Analyzer | Keysight | N9010A | MY54200486 | 10Hz ~ 44GHZ | Sep. 24, 2015 | Jun. 16, 2016 ~ Jun. 18, 2016 | Sep. 23, 2016 | Radiation (03CH11-HY) |
| Antenna Mast | EMEC | AM-BS-4500-B | N/A | 1~4m | N/A | Jun. 16, 2016 ~ Jun. 18, 2016 | N/A | Radiation (03CH11-HY) |
| Turn Table | EMEC | TT 2000 | N/A | 0~360 Degree | N/A | Jun. 16, 2016 ~ Jun. 18, 2016 | N/A | Radiation (03CH11-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170584 | 18GHz- 40GHz | Nov. 02, 2015 | Jun. 16, 2016 ~ Jun. 18, 2016 | Nov. 01, 2016 | Radiation (03CH11-HY) |
| Preamplifier | MITEQ | TTA0204 | 1872107 | 2GHz~40GHz | Feb. 15, 2016 | Jun. 16, 2016 ~ Jun. 18, 2016 | Feb. 14, 2017 | Radiation (03CH11-HY) |
| AC Power Source | ChainTek | APC-1000W | N/A | N/A | N/A | May 28, 2016 | N/A | Conduction (CO05-HY) |
| EMI Test Receiver | Rohde & Schwarz | ESCI 7 | 100724 | 9kHz~7GHz | Aug. 26, 2015 | May 28, 2016 | Aug. 25, 2016 | Conduction (CO05-HY) |
| LISN | Rohde & Schwarz | ENV216 | 100080 | 9kHz~30MHz | Dec. 02, 2015 | May 28, 2016 | Dec. 01, 2016 | Conduction (CO05-HY) |

# 5 Uncertainty of Evaluation

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

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 2.26 |

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

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 4.9 |

# Appendix A. Conducted Test Results

Report Number : FR651612E

| | | | | |
|---|---|---|---|---|
| Test Engineer: | Kenny Chen | Temperature: | 21~25 | °C |
| Test Date: | 2016/05/22~2016/06/22 | 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 | 18.85 | 44.2 | 16.32 | 0.5 | Pass |
| 11a | 6Mbps | 1 | 157 | 5785 | 19.25 | 42.85 | 16.32 | 0.5 | Pass |
| 11a | 6Mbps | 1 | 165 | 5825 | 19 | 44.55 | 16.32 | 0.5 | Pass |
| HT20 | MCS 0 | 1 | 149 | 5745 | 19.35 | 43.6 | 17.56 | 0.5 | Pass |
| HT20 | MCS 0 | 1 | 157 | 5785 | 19.4 | 45.8 | 17.56 | 0.5 | Pass |
| HT20 | MCS 0 | 1 | 165 | 5825 | 19.5 | 46.55 | 17.56 | 0.5 | Pass |
| HT40 | MCS 0 | 1 | 151 | 5755 | 36.7 | 77.4 | 35.12 | 0.5 | Pass |
| HT40 | MCS 0 | 1 | 159 | 5795 | 37.1 | 82.71 | 35.12 | 0.5 | Pass |

Report Number : FR651612E

## ***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 | 0.61 | 15.80 | 30.00 | 0.00 | | Pass |
| 11a | 6Mbps | 1 | 157 | 5785 | 0.61 | 16.22 | 30.00 | 0.00 | | Pass |
| 11a | 6Mbps | 1 | 165 | 5825 | 0.61 | 16.34 | 30.00 | 0.00 | | Pass |
| HT20 | MCS 0 | 1 | 149 | 5745 | 0.63 | 14.78 | 30.00 | 0.00 | | Pass |
| HT20 | MCS 0 | 1 | 157 | 5785 | 0.63 | 15.12 | 30.00 | 0.00 | | Pass |
| HT20 | MCS 0 | 1 | 165 | 5825 | 0.63 | 15.32 | 30.00 | 0.00 | | Pass |
| HT40 | MCS 0 | 1 | 151 | 5755 | 1.21 | 14.58 | 30.00 | 0.00 | | Pass |
| HT40 | MCS 0 | 1 | 159 | 5795 | 1.21 | 14.93 | 30.00 | 0.00 | | Pass |

Report Number : FR651612E

## ***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 | 0.61 | 2.22 | 4.89 | 30.00 | 0.00 | Pass |
| 11a | 6Mbps | 1 | 157 | 5785 | 0.61 | 2.22 | 5.18 | 30.00 | 0.00 | Pass |
| 11a | 6Mbps | 1 | 165 | 5825 | 0.61 | 2.22 | 5.84 | 30.00 | 0.00 | Pass |
| HT20 | MCS 0 | 1 | 149 | 5745 | 0.63 | 2.22 | 3.93 | 30.00 | 0.00 | Pass |
| HT20 | MCS 0 | 1 | 157 | 5785 | 0.63 | 2.22 | 4.06 | 30.00 | 0.00 | Pass |
| HT20 | MCS 0 | 1 | 165 | 5825 | 0.63 | 2.22 | 4.83 | 30.00 | 0.00 | Pass |
| HT40 | MCS 0 | 1 | 151 | 5755 | 1.21 | 2.22 | 1.28 | 30.00 | 0.00 | Pass |
| HT40 | MCS 0 | 1 | 159 | 5795 | 1.21 | 2.22 | 1.51 | 30.00 | 0.00 | Pass |

Report Number : FR651612E

## ***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 | 5745.000 | 0.000 | 0.00 | 20 | 3.4 | |
| 11a | 6M bps | 1 | 149 | 5745 | 5744.950 | -0.050 | -8.70 | 20 | 4.35 | |
| 11a | 6M bps | 1 | 149 | 5745 | 5745.000 | 0.000 | 0.00 | 20 | 3.9 | |
| 11a | 6M bps | 1 | 149 | 5745 | 5745.000 | 0.000 | 0.00 | -30 | 3.9 | |
| 11a | 6M bps | 1 | 149 | 5745 | 5745.000 | 0.000 | 0.00 | 50 | 3.9 | |

# Appendix B. Radiated Spurious Emission

| Test Engineer : | J.C. Liang, Jacky Su, Ken Wu, and Bill Chang | Temperature : | 20~23°C |
|---|---|---|---|
| | | Relative Humidity : | 50~54% |

**Band 4 - 5725~5850MHz**

**WIFI 802.11a (Band Edge @ 3m)**

| WIFI Ant. | Note | Frequency | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Ant Pos | Table Pos | Peak Avg. | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | ( MHz ) | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11a CH 149 5745MHz | | 5645 | 48.96 | -19.34 | 68.3 | 39.62 | 32.19 | 10.69 | 33.54 | 311 | 114 | P | H |
| | | 5651.6 | 47.55 | -21.94 | 69.49 | 38.18 | 32.22 | 10.69 | 33.54 | 311 | 114 | P | H |
| | | 5719.8 | 58.74 | -52.1 | 110.84 | 49.35 | 32.31 | 10.65 | 33.57 | 311 | 114 | P | H |
| | | 5723.6 | 70.15 | -48.96 | 119.11 | 60.76 | 32.31 | 10.65 | 33.57 | 311 | 114 | P | H |
| | | 5745 | 98.9 | - | - | 89.5 | 32.34 | 10.63 | 33.57 | 311 | 114 | P | H |
| | | 5745 | 89.93 | - | - | 80.53 | 32.34 | 10.63 | 33.57 | 311 | 114 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 5631.4 | 48.41 | -19.89 | 68.3 | 39.09 | 32.17 | 10.69 | 33.54 | 303 | 46 | P | V |
| | | 5652 | 47.7 | -22.09 | 69.79 | 38.33 | 32.22 | 10.69 | 33.54 | 303 | 46 | P | V |
| | | 5717.6 | 63.24 | -46.99 | 110.23 | 53.85 | 32.31 | 10.65 | 33.57 | 303 | 46 | P | V |
| | | 5724.4 | 70.24 | -50.69 | 120.93 | 60.85 | 32.31 | 10.65 | 33.57 | 303 | 46 | P | V |
| | | 5745 | 105.2 | - | - | 95.8 | 32.34 | 10.63 | 33.57 | 303 | 46 | P | V |
| | | 5745 | 96.62 | - | - | 87.22 | 32.34 | 10.63 | 33.57 | 303 | 46 | 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 | | 5604.2 | 48.49 | -19.81 | 68.3 | 39.17 | 32.14 | 10.71 | 33.53 | 284 | 113 | P | H |
| | | 5652.4 | 49.41 | -20.67 | 70.08 | 40.04 | 32.22 | 10.69 | 33.54 | 284 | 113 | P | H |
| | | 5701 | 48.5 | -57.08 | 105.58 | 39.12 | 32.29 | 10.65 | 33.56 | 284 | 113 | P | H |
| | | 5720.4 | 46.13 | -65.68 | 111.81 | 36.74 | 32.31 | 10.65 | 33.57 | 284 | 113 | P | H |
| | | 5785 | 100.06 | - | - | 90.65 | 32.39 | 10.61 | 33.59 | 284 | 113 | P | H |
| | | 5785 | 91.51 | - | - | 82.1 | 32.39 | 10.61 | 33.59 | 284 | 113 | A | H |
| | | 5854.4 | 48.45 | -63.82 | 112.27 | 38.77 | 32.51 | 10.78 | 33.61 | 284 | 113 | P | H |
| | | 5872.2 | 49.11 | -56.97 | 106.08 | 39.26 | 32.53 | 10.94 | 33.62 | 284 | 113 | P | H |
| | | 5922.8 | 46.62 | -23.3 | 69.92 | 36.55 | 32.6 | 11.11 | 33.64 | 284 | 113 | P | H |
| | | 5946.8 | 48.68 | -19.62 | 68.3 | 38.43 | 32.63 | 11.27 | 33.65 | 284 | 113 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 5641.8 | 48.08 | -20.22 | 68.3 | 38.74 | 32.19 | 10.69 | 33.54 | 289 | 52 | P | V |
| | | 5650.2 | 46.72 | -21.73 | 68.45 | 37.35 | 32.22 | 10.69 | 33.54 | 289 | 52 | P | V |
| | | 5702.2 | 46.84 | -59.08 | 105.92 | 37.46 | 32.29 | 10.65 | 33.56 | 289 | 52 | P | V |
| | | 5723 | 47.37 | -70.37 | 117.74 | 37.98 | 32.31 | 10.65 | 33.57 | 289 | 52 | P | V |
| | | 5785 | 106.81 | - | - | 97.4 | 32.39 | 10.61 | 33.59 | 289 | 52 | P | V |
| | | 5785 | 97.81 | - | - | 88.4 | 32.39 | 10.61 | 33.59 | 289 | 52 | A | V |
| | | 5853.4 | 50.41 | -64.14 | 114.55 | 40.76 | 32.48 | 10.78 | 33.61 | 289 | 52 | P | V |
| | | 5874.6 | 48.77 | -56.64 | 105.41 | 38.92 | 32.53 | 10.94 | 33.62 | 289 | 52 | P | V |
| | | 5923.6 | 49.39 | -19.94 | 69.33 | 39.32 | 32.6 | 11.11 | 33.64 | 289 | 52 | P | V |
| | | 5930.6 | 49.29 | -19.01 | 68.3 | 39.22 | 32.6 | 11.11 | 33.64 | 289 | 52 | 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 165 5825MHz | | 5825 | 101.13 | - | - | 91.49 | 32.46 | 10.78 | 33.6 | 279 | 114 | P | H |
| | | 5825 | 92.73 | - | - | 83.09 | 32.46 | 10.78 | 33.6 | 279 | 114 | A | H |
| | | 5851.6 | 59.39 | -59.26 | 118.65 | 49.74 | 32.48 | 10.78 | 33.61 | 279 | 114 | P | H |
| | | 5855 | 58 | -52.9 | 110.9 | 48.32 | 32.51 | 10.78 | 33.61 | 279 | 114 | P | H |
| | | 5922.4 | 49.48 | -20.74 | 70.22 | 39.41 | 32.6 | 11.11 | 33.64 | 279 | 114 | P | H |
| | | 5939.4 | 48.03 | -20.27 | 68.3 | 37.94 | 32.63 | 11.11 | 33.65 | 279 | 114 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 5825 | 108.33 | - | - | 98.69 | 32.46 | 10.78 | 33.6 | 281 | 55 | P | V |
| | | 5825 | 99.01 | - | - | 89.37 | 32.46 | 10.78 | 33.6 | 281 | 55 | A | V |
| | | 5850.6 | 67.1 | -53.83 | 120.93 | 57.45 | 32.48 | 10.78 | 33.61 | 281 | 55 | P | V |
| | | 5855.6 | 63.17 | -47.56 | 110.73 | 53.49 | 32.51 | 10.78 | 33.61 | 281 | 55 | P | V |
| | | 5923.4 | 48.62 | -20.86 | 69.48 | 38.55 | 32.6 | 11.11 | 33.64 | 281 | 55 | P | V |
| | | 5934.4 | 48.83 | -19.47 | 68.3 | 38.77 | 32.6 | 11.11 | 33.65 | 281 | 55 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| **Remark** | 1. No other spurious found.<br>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 | 42.11 | -31.89 | 74 | 52.35 | 39.91 | 15.59 | 65.74 | 100 | 0 | P | H |
| | | 17235 | 41.88 | -26.42 | 68.3 | 46.36 | 41 | 18.6 | 64.08 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11490 | 43.38 | -30.62 | 74 | 53.62 | 39.91 | 15.59 | 65.74 | 100 | 0 | P | V |
| | | 17235 | 42.31 | -25.99 | 68.3 | 46.79 | 41 | 18.6 | 64.08 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11a CH 157 5785MHz | | 11570 | 41.48 | -32.52 | 74 | 51.74 | 39.76 | 15.64 | 65.66 | 100 | 0 | P | H |
| | | 17355 | 42.66 | -25.64 | 68.3 | 46.88 | 41.35 | 18.65 | 64.22 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11570 | 42.21 | -31.79 | 74 | 52.47 | 39.76 | 15.64 | 65.66 | 100 | 0 | P | V |
| | | 17355 | 40.83 | -27.47 | 68.3 | 45.05 | 41.35 | 18.65 | 64.22 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11a CH 165 5825MHz | | 11650 | 41.85 | -32.15 | 74 | 52.16 | 39.62 | 15.69 | 65.62 | 100 | 0 | P | H |
| | | 17475 | 41 | -27.3 | 68.3 | 44.96 | 41.7 | 18.7 | 64.36 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11650 | 43.54 | -30.46 | 74 | 53.85 | 39.62 | 15.69 | 65.62 | 100 | 0 | P | V |
| | | 17475 | 41.52 | -26.78 | 68.3 | 45.48 | 41.7 | 18.7 | 64.36 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found.<br>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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5648.6 | 48.58 | -19.72 | 68.3 | 39.24 | 32.19 | 10.69 | 33.54 | 369 | 119 | P | H |
| | | 5675.2 | 47.7 | -39.29 | 86.99 | 38.34 | 32.24 | 10.67 | 33.55 | 369 | 119 | P | H |
| | | 5719 | 52.63 | -57.99 | 110.62 | 43.24 | 32.31 | 10.65 | 33.57 | 369 | 119 | P | H |
| | | 5724 | 62.17 | -57.85 | 120.02 | 52.78 | 32.31 | 10.65 | 33.57 | 369 | 119 | P | H |
| | | 5752 | 97.76 | - | - | 88.34 | 32.36 | 10.63 | 33.57 | 369 | 119 | P | H |
| | | 5752 | 89.96 | - | - | 80.54 | 32.36 | 10.63 | 33.57 | 369 | 119 | A | H |
| 802.11n | | | | | | | | | | | | | H |
| HT20 | | | | | | | | | | | | | H |
| CH 149 | | 5628.6 | 48.5 | -19.8 | 68.3 | 39.18 | 32.17 | 10.69 | 33.54 | 303 | 55 | P | V |
| 5745MHz | | 5690.2 | 50.75 | -47.32 | 98.07 | 41.37 | 32.27 | 10.67 | 33.56 | 303 | 55 | P | V |
| | | 5718.6 | 60.28 | -50.23 | 110.51 | 50.89 | 32.31 | 10.65 | 33.57 | 303 | 55 | P | V |
| | | 5724.6 | 66.46 | -54.93 | 121.39 | 57.07 | 32.31 | 10.65 | 33.57 | 303 | 55 | P | V |
| | | 5752 | 104.73 | - | - | 95.31 | 32.36 | 10.63 | 33.57 | 303 | 55 | P | V |
| | | 5752 | 96.29 | - | - | 86.87 | 32.36 | 10.63 | 33.57 | 303 | 55 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5603.2 | 49.3 | -19 | 68.3 | 39.98 | 32.14 | 10.71 | 33.53 | 345 | 117 | P | H |
| | | 5688.6 | 48.63 | -48.26 | 96.89 | 39.25 | 32.27 | 10.67 | 33.56 | 345 | 117 | P | H |
| | | 5712 | 46.63 | -62.03 | 108.66 | 37.26 | 32.29 | 10.65 | 33.57 | 345 | 117 | P | H |
| | | 5721 | 47.3 | -65.88 | 113.18 | 37.91 | 32.31 | 10.65 | 33.57 | 345 | 117 | P | H |
| | | 5785 | 96.44 | - | - | 87.03 | 32.39 | 10.61 | 33.59 | 345 | 117 | P | H |
| | | 5785 | 88.39 | - | - | 78.98 | 32.39 | 10.61 | 33.59 | 345 | 117 | A | H |
| | | 5850.4 | 48.02 | -73.37 | 121.39 | 38.37 | 32.48 | 10.78 | 33.61 | 345 | 117 | P | H |
| | | 5862.4 | 49.05 | -59.78 | 108.83 | 39.22 | 32.51 | 10.94 | 33.62 | 345 | 117 | P | H |
| | | 5881.6 | 48.62 | -51.78 | 100.4 | 38.77 | 32.53 | 10.94 | 33.62 | 345 | 117 | P | H |
| | | 5948.8 | 49.02 | -19.28 | 68.3 | 38.77 | 32.63 | 11.27 | 33.65 | 345 | 117 | P | H |
| 802.11n | | | | | | | | | | | | | H |
| HT20 | | | | | | | | | | | | | H |
| CH 157 | | 5646.8 | 48.26 | -20.04 | 68.3 | 38.92 | 32.19 | 10.69 | 33.54 | 350 | 50 | P | V |
| 5785MHz | | 5682.2 | 48.27 | -43.9 | 92.17 | 38.92 | 32.24 | 10.67 | 33.56 | 350 | 50 | P | V |
| | | 5704.6 | 48.4 | -58.19 | 106.59 | 39.02 | 32.29 | 10.65 | 33.56 | 350 | 50 | P | V |
| | | 5725 | 48.41 | -73.89 | 122.3 | 39.02 | 32.31 | 10.65 | 33.57 | 350 | 50 | P | V |
| | | 5785 | 102.43 | - | - | 93.02 | 32.39 | 10.61 | 33.59 | 350 | 50 | P | V |
| | | 5785 | 94.08 | - | - | 84.67 | 32.39 | 10.61 | 33.59 | 350 | 50 | A | V |
| | | 5854.6 | 48.25 | -63.56 | 111.81 | 38.57 | 32.51 | 10.78 | 33.61 | 350 | 50 | P | V |
| | | 5863.2 | 48.23 | -60.37 | 108.6 | 38.4 | 32.51 | 10.94 | 33.62 | 350 | 50 | P | V |
| | | 5887.4 | 48.87 | -47.22 | 96.09 | 39.03 | 32.53 | 10.94 | 33.63 | 350 | 50 | P | V |
| | | 5944.8 | 49.44 | -18.86 | 68.3 | 39.19 | 32.63 | 11.27 | 33.65 | 350 | 50 | 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 165 5825MHz | | 5825 | 98.02 | - | - | 88.38 | 32.46 | 10.78 | 33.6 | 308 | 118 | P | H |
| | | 5825 | 89.74 | - | - | 80.1 | 32.46 | 10.78 | 33.6 | 308 | 118 | A | H |
| | | 5850.4 | 61.21 | -60.18 | 121.39 | 51.56 | 32.48 | 10.78 | 33.61 | 308 | 118 | P | H |
| | | 5858.6 | 52.86 | -57.03 | 109.89 | 43.19 | 32.51 | 10.78 | 33.62 | 308 | 118 | P | H |
| | | 5902.8 | 50.15 | -34.54 | 84.69 | 40.11 | 32.56 | 11.11 | 33.63 | 308 | 118 | P | H |
| | | 5942.2 | 48.61 | -19.69 | 68.3 | 38.36 | 32.63 | 11.27 | 33.65 | 308 | 118 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 5825 | 104.46 | - | - | 94.82 | 32.46 | 10.78 | 33.6 | 284 | 52 | P | V |
| | | 5825 | 96.13 | - | - | 86.49 | 32.46 | 10.78 | 33.6 | 284 | 52 | A | V |
| | | 5850 | 62.85 | -59.45 | 122.3 | 53.2 | 32.48 | 10.78 | 33.61 | 284 | 52 | P | V |
| | | 5855.6 | 60.29 | -50.44 | 110.73 | 50.61 | 32.51 | 10.78 | 33.61 | 284 | 52 | P | V |
| | | 5879.4 | 52.06 | -49.97 | 102.03 | 42.21 | 32.53 | 10.94 | 33.62 | 284 | 52 | P | V |
| | | 5938.2 | 48.34 | -19.96 | 68.3 | 38.28 | 32.6 | 11.11 | 33.65 | 284 | 52 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| **Remark** | 1. No other spurious found.<br>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 | 42.36 | -31.64 | 74 | 52.6 | 39.91 | 15.59 | 65.74 | 100 | 0 | P | H |
| | | 17235 | 41.84 | -26.46 | 68.3 | 46.32 | 41 | 18.6 | 64.08 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11490 | 43.24 | -30.76 | 74 | 53.48 | 39.91 | 15.59 | 65.74 | 100 | 0 | P | V |
| | | 17235 | 42.79 | -25.51 | 68.3 | 47.27 | 41 | 18.6 | 64.08 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11n HT20 CH 157 5785MHz | | 11570 | 41.51 | -32.49 | 74 | 51.77 | 39.76 | 15.64 | 65.66 | 100 | 0 | P | H |
| | | 17355 | 40.83 | -27.47 | 68.3 | 45.05 | 41.35 | 18.65 | 64.22 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11570 | 43.47 | -30.53 | 74 | 53.73 | 39.76 | 15.64 | 65.66 | 100 | 0 | P | V |
| | | 17355 | 41.95 | -26.35 | 68.3 | 46.17 | 41.35 | 18.65 | 64.22 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11n HT20 CH 165 5825MHz | | 11650 | 41.51 | -32.49 | 74 | 51.82 | 39.62 | 15.69 | 65.62 | 100 | 0 | P | H |
| | | 17475 | 41.43 | -26.87 | 68.3 | 45.39 | 41.7 | 18.7 | 64.36 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11650 | 43.05 | -30.95 | 74 | 53.36 | 39.62 | 15.69 | 65.62 | 100 | 0 | P | V |
| | | 17475 | 42.44 | -25.86 | 68.3 | 46.4 | 41.7 | 18.7 | 64.36 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found.<br>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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5611 | 48.6 | -19.7 | 68.3 | 39.28 | 32.14 | 10.71 | 33.53 | 389 | 114 | P | H |
| | | 5693.2 | 49.6 | -50.69 | 100.29 | 40.22 | 32.27 | 10.67 | 33.56 | 389 | 114 | P | H |
| | | 5719.6 | 59.88 | -50.91 | 110.79 | 50.49 | 32.31 | 10.65 | 33.57 | 389 | 114 | P | H |
| | | 5724.6 | 63.77 | -57.62 | 121.39 | 54.38 | 32.31 | 10.65 | 33.57 | 389 | 114 | P | H |
| | | 5755 | 93.47 | - | - | 84.05 | 32.36 | 10.63 | 33.57 | 389 | 114 | P | H |
| | | 5755 | 85.13 | - | - | 75.71 | 32.36 | 10.63 | 33.57 | 389 | 114 | A | H |
| | | 5852 | 47.09 | -70.65 | 117.74 | 37.44 | 32.48 | 10.78 | 33.61 | 389 | 114 | P | H |
| | | 5865.2 | 48.41 | -59.63 | 108.04 | 38.58 | 32.51 | 10.94 | 33.62 | 389 | 114 | P | H |
| | | 5919.2 | 50.45 | -22.13 | 72.58 | 40.4 | 32.58 | 11.11 | 33.64 | 389 | 114 | P | H |
| | | 5948.4 | 48.99 | -19.31 | 68.3 | 38.74 | 32.63 | 11.27 | 33.65 | 389 | 114 | P | H |
| 802.11n | | | | | | | | | | | | | H |
| HT40 | | | | | | | | | | | | | H |
| CH 151 | | 5628.8 | 48.47 | -19.83 | 68.3 | 39.15 | 32.17 | 10.69 | 33.54 | 292 | 54 | P | V |
| 5755MHz | | 5691.6 | 55.26 | -43.85 | 99.11 | 45.88 | 32.27 | 10.67 | 33.56 | 292 | 54 | P | V |
| | | 5719.4 | 70.66 | -40.07 | 110.73 | 61.27 | 32.31 | 10.65 | 33.57 | 292 | 54 | P | V |
| | | 5720.8 | 74.28 | -38.44 | 112.72 | 64.89 | 32.31 | 10.65 | 33.57 | 292 | 54 | P | V |
| | | 5755 | 99.86 | - | - | 90.44 | 32.36 | 10.63 | 33.57 | 292 | 54 | P | V |
| | | 5755 | 91.4 | - | - | 81.98 | 32.36 | 10.63 | 33.57 | 292 | 54 | A | V |
| | | 5852.4 | 48.33 | -68.5 | 116.83 | 38.68 | 32.48 | 10.78 | 33.61 | 292 | 54 | P | V |
| | | 5861 | 50.27 | -58.95 | 109.22 | 40.44 | 32.51 | 10.94 | 33.62 | 292 | 54 | P | V |
| | | 5907 | 48.8 | -32.78 | 81.58 | 38.74 | 32.58 | 11.11 | 33.63 | 292 | 54 | P | V |
| | | 5926.4 | 48.65 | -19.65 | 68.3 | 38.58 | 32.6 | 11.11 | 33.64 | 292 | 54 | 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5634.2 | 49.12 | -19.18 | 68.3 | 39.78 | 32.19 | 10.69 | 33.54 | 283 | 119 | P | H |
| | | 5651.6 | 48.64 | -20.85 | 69.49 | 39.27 | 32.22 | 10.69 | 33.54 | 283 | 119 | P | H |
| | | 5719.4 | 48.86 | -61.87 | 110.73 | 39.47 | 32.31 | 10.65 | 33.57 | 283 | 119 | P | H |
| | | 5721.2 | 48.04 | -65.6 | 113.64 | 38.65 | 32.31 | 10.65 | 33.57 | 283 | 119 | P | H |
| | | 5795 | 94.16 | - | - | 84.73 | 32.41 | 10.61 | 33.59 | 283 | 119 | P | H |
| | | 5795 | 86.38 | - | - | 76.95 | 32.41 | 10.61 | 33.59 | 283 | 119 | A | H |
| | | 5854.4 | 49.33 | -62.94 | 112.27 | 39.65 | 32.51 | 10.78 | 33.61 | 283 | 119 | P | H |
| | | 5857.6 | 51.64 | -58.53 | 110.17 | 41.96 | 32.51 | 10.78 | 33.61 | 283 | 119 | P | H |
| | | 5890.2 | 49.39 | -44.63 | 94.02 | 39.52 | 32.56 | 10.94 | 33.63 | 283 | 119 | P | H |
| | | 5946.4 | 48.67 | -19.63 | 68.3 | 38.42 | 32.63 | 11.27 | 33.65 | 283 | 119 | P | H |
| **802.11n** | | | | | | | | | | | | | H |
| **HT40** | | | | | | | | | | | | | H |
| **CH 159** | | 5636.6 | 48.57 | -19.73 | 68.3 | 39.23 | 32.19 | 10.69 | 33.54 | 289 | 48 | P | V |
| **5795MHz** | | 5694 | 49.27 | -51.61 | 100.88 | 39.89 | 32.27 | 10.67 | 33.56 | 289 | 48 | P | V |
| | | 5716 | 49.81 | -59.97 | 109.78 | 40.44 | 32.29 | 10.65 | 33.57 | 289 | 48 | P | V |
| | | 5722.8 | 51.53 | -65.75 | 117.28 | 42.14 | 32.31 | 10.65 | 33.57 | 289 | 48 | P | V |
| | | 5795 | 101.45 | - | - | 92.02 | 32.41 | 10.61 | 33.59 | 289 | 48 | P | V |
| | | 5795 | 92.94 | - | - | 83.51 | 32.41 | 10.61 | 33.59 | 289 | 48 | A | V |
| | | 5852 | 55.01 | -62.73 | 117.74 | 45.36 | 32.48 | 10.78 | 33.61 | 289 | 48 | P | V |
| | | 5856.4 | 54.06 | -56.45 | 110.51 | 44.38 | 32.51 | 10.78 | 33.61 | 289 | 48 | P | V |
| | | 5924.8 | 50.66 | -17.79 | 68.45 | 40.59 | 32.6 | 11.11 | 33.64 | 289 | 48 | P | V |
| | | 5928.8 | 49.34 | -18.96 | 68.3 | 39.27 | 32.6 | 11.11 | 33.64 | 289 | 48 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |

| | |
|---|---|
| **Remark** | 1. No other spurious found.<br>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 | 42.62 | -31.38 | 74 | 52.81 | 39.9 | 15.61 | 65.7 | 100 | 0 | P | H |
| | | 17265 | 42.15 | -26.15 | 68.3 | 46.55 | 41.1 | 18.62 | 64.12 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11510 | 42.75 | -31.25 | 74 | 52.94 | 39.9 | 15.61 | 65.7 | 100 | 0 | P | V |
| | | 17265 | 41.25 | -27.05 | 68.3 | 45.65 | 41.1 | 18.62 | 64.12 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11n HT40 CH 159 5795MHz | | 11590 | 42.32 | -31.68 | 74 | 52.58 | 39.73 | 15.66 | 65.65 | 100 | 0 | P | H |
| | | 17385 | 42.35 | -25.95 | 68.3 | 46.5 | 41.45 | 18.66 | 64.26 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11590 | 43.52 | -30.48 | 74 | 53.78 | 39.73 | 15.66 | 65.65 | 100 | 0 | P | V |
| | | 17385 | 41.97 | -26.33 | 68.3 | 46.12 | 41.45 | 18.66 | 64.26 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

## Band 4 5725~5850MHz

## Emission below 1GHz

## 5GHz WIFI 802.11a (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 802.11a LF | | 91.83 | 27.65 | -15.85 | 43.5 | 43.12 | 15.14 | 1.17 | 31.78 | | | P | H |
| | | 132.06 | 39.8 | -3.7 | 43.5 | 52.12 | 17.98 | 1.48 | 31.78 | 155 | 55 | P | H |
| | | 226.56 | 30.36 | -15.64 | 46 | 43.46 | 16.69 | 1.98 | 31.77 | | | P | H |
| | | 485.5 | 25.27 | -20.73 | 46 | 30.42 | 23.87 | 2.86 | 31.88 | | | P | H |
| | | 696.2 | 28.92 | -17.08 | 46 | 30.85 | 26.66 | 3.45 | 32.04 | | | P | H |
| | | 936.3 | 33.74 | -12.26 | 46 | 30.81 | 30.22 | 3.86 | 31.15 | | | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 34.59 | 36.77 | -3.23 | 40 | 44.57 | 23.1 | 0.93 | 31.83 | 125 | 40 | P | V |
| | | 131.25 | 35.4 | -8.1 | 43.5 | 47.71 | 17.99 | 1.48 | 31.78 | | | P | V |
| | | 223.59 | 32.32 | -13.68 | 46 | 45.64 | 16.48 | 1.98 | 31.78 | | | P | V |
| | | 420.4 | 24.49 | -21.51 | 46 | 29.87 | 22.76 | 3.68 | 31.82 | | | P | V |
| | | 593.3 | 27.19 | -18.81 | 46 | 30.48 | 25.58 | 3.16 | 32.03 | | | P | V |
| | | 843.9 | 31.46 | -14.54 | 46 | 30.56 | 28.83 | 3.77 | 31.7 | | | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found.<br>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)

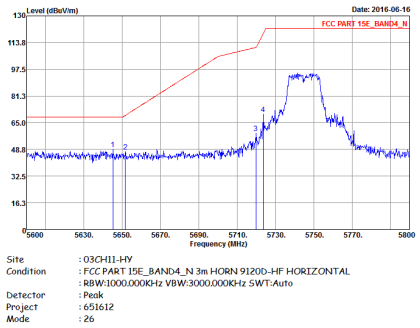
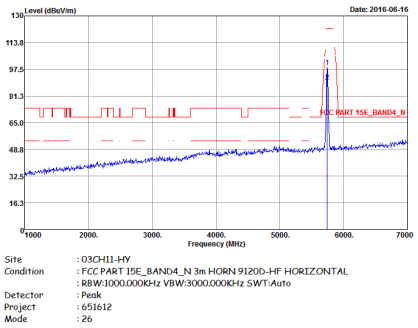
= -10.46(dB)

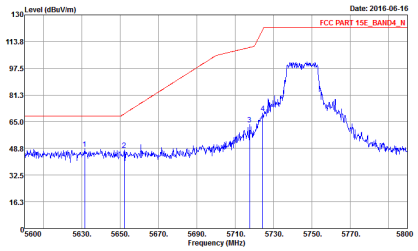
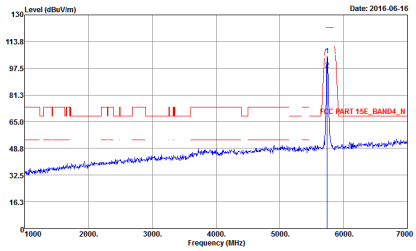
**Both peak and average measured complies with the limit line, so test result is “PASS”.**

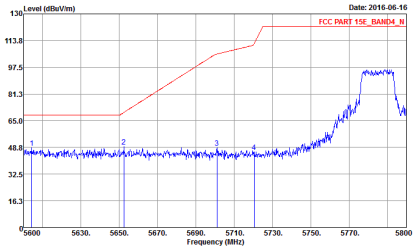
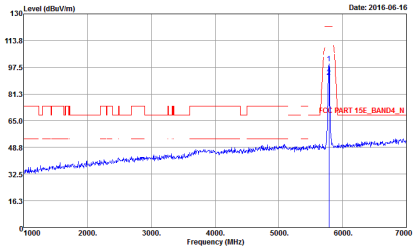
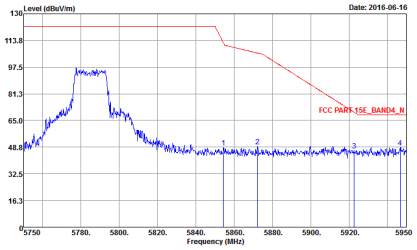
# Appendix C. Radiated Spurious Emission Plots

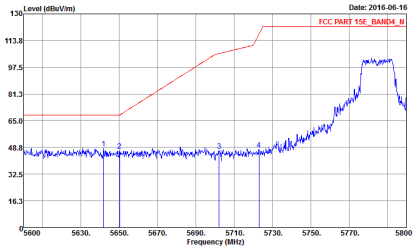
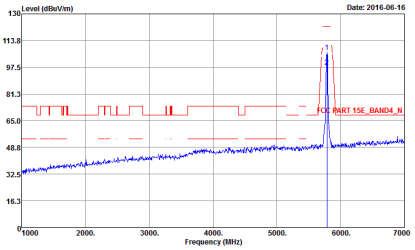
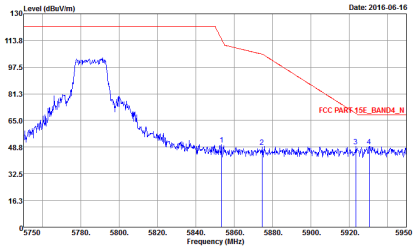
**Band 4 - 5725~5850MHz**

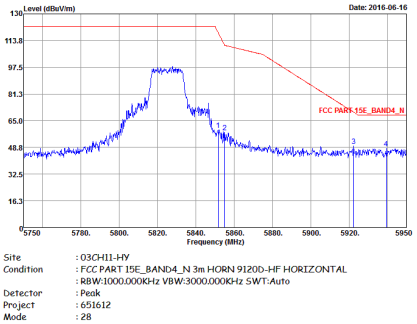
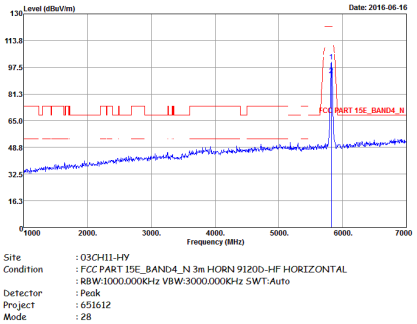
**WIFI 802.11a (Band Edge @ 3m)**

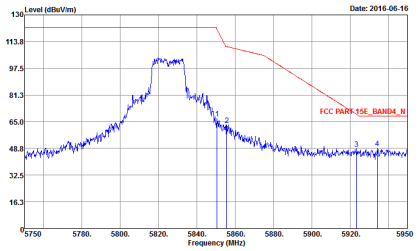
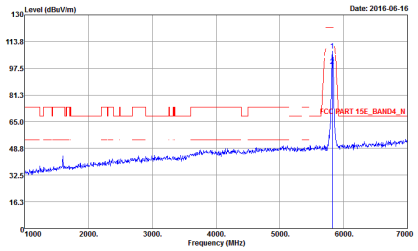
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11a CH149 5745MHz | |
| 1 | Horizontal | Fundamental |
| Peak |  |  |

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

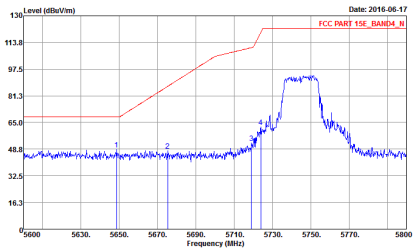
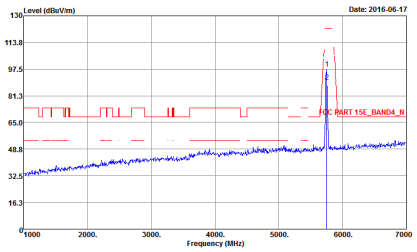
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11a CH157 5785MHz | |
| 1 | Horizontal | Fundamental |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 27 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 27 |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 27 | |

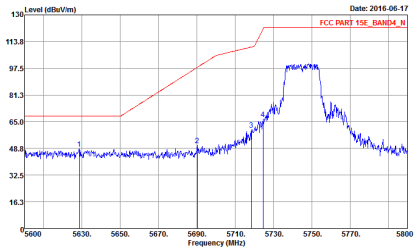
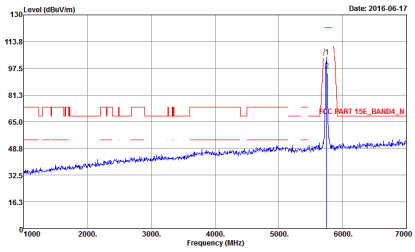
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11a CH157 5785MHz | |
| 1 | Vertical | Fundamental |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 27 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 27 |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 27 | |

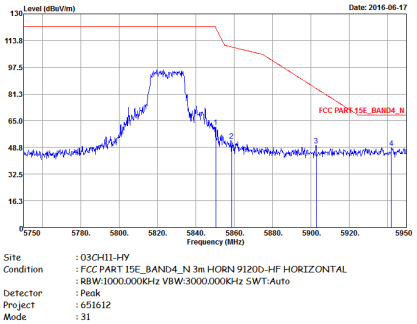
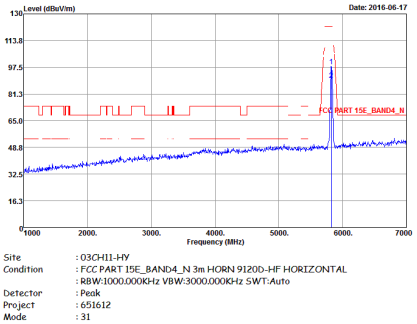
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11a CH165 5825MHz | |
| 1 | Horizontal | Fundamental |
| Peak |  |  |

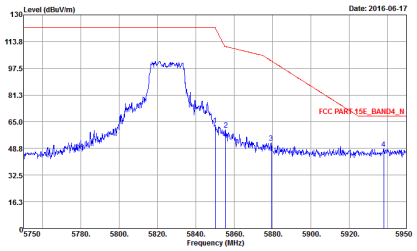
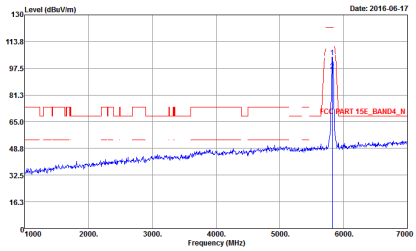
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11a CH165 5825MHz | |
| 1 | Vertical | Fundamental |
| Peak |  |  |

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

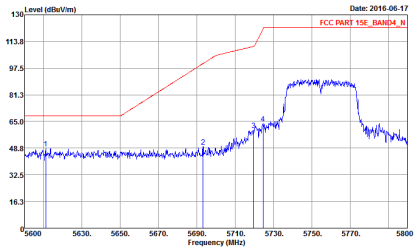
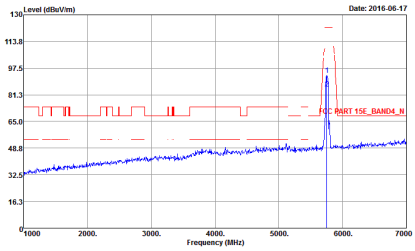
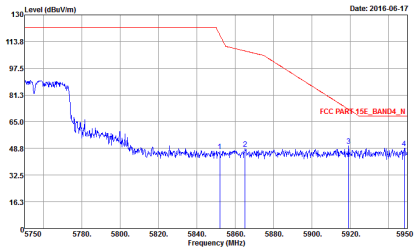
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH149 5745MHz | |
| 1 | Horizontal | Fundamental |
| Peak |  |  |

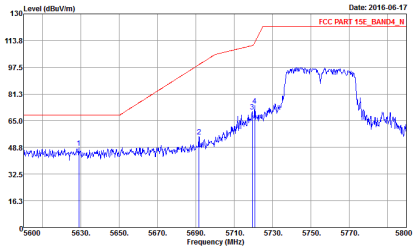
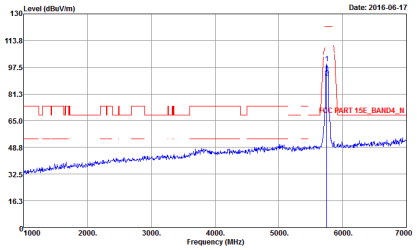
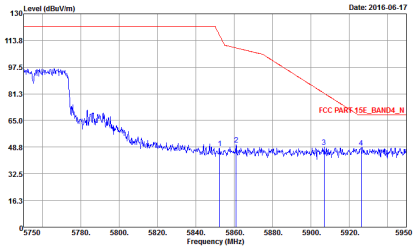
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH149 5745MHz | |
| 1 | Vertical | Fundamental |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 29 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 29 |

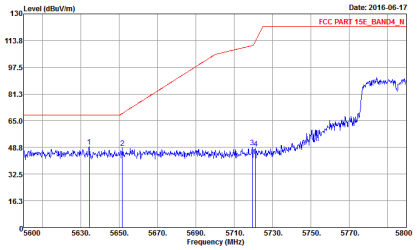
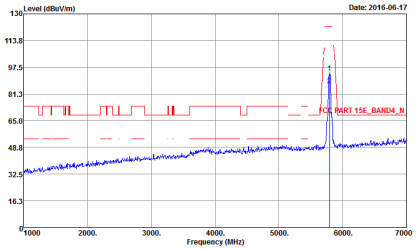
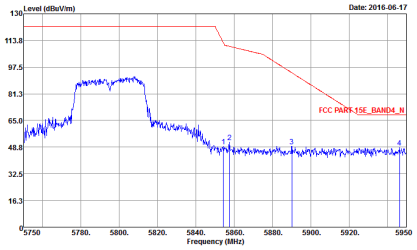
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH165 5825MHz | |
| 1 | Horizontal | Fundamental |
| Peak |  |  |

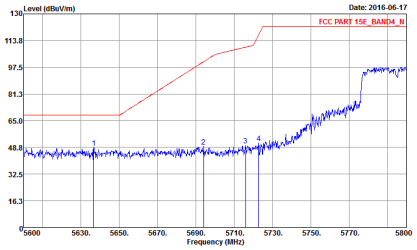
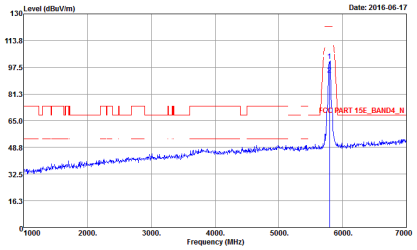
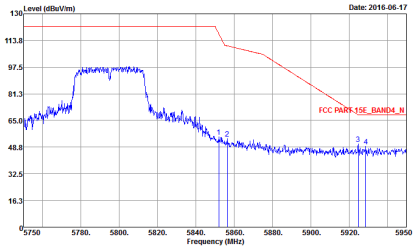
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH165 5825MHz | |
| 1 | Vertical | Fundamental |
| Peak |  |  |

## 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 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 32 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 32 |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 32 | |

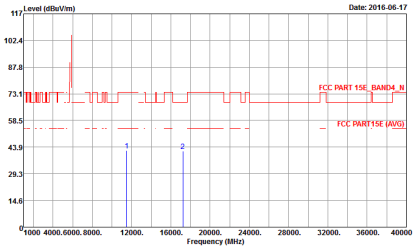
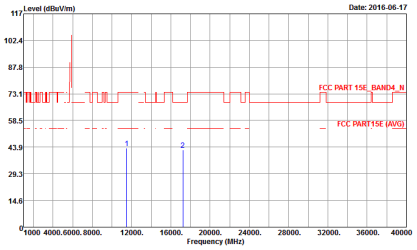
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT40 CH151 5755MHz | |
| 1 | Vertical | Fundamental |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 32 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 32 |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 32 | |

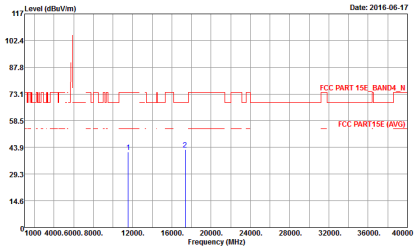
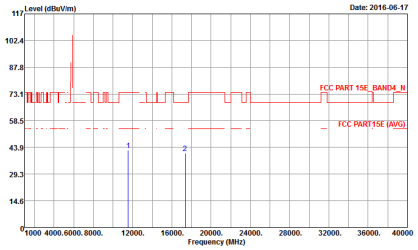
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT40 CH159 5795MHz | |
| 1 | Horizontal | Fundamental |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 33 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 33 |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 33 | |

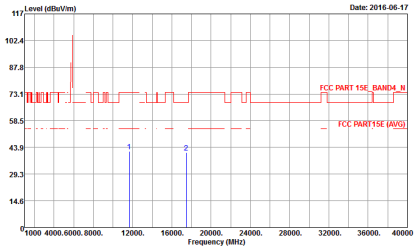
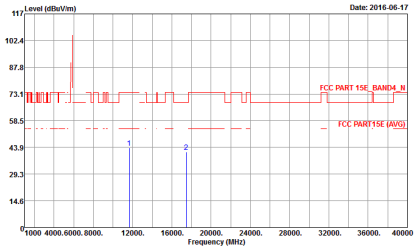
| WIFI | Band 4 5725~5850MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT40 CH159 5795MHz | |
| 1 | Vertical | Fundamental |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 33 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 33 |
| Peak |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 651612<br>Mode : 33 | |

## Band 4 - 5725~5850MHz

## WIFI 802.11a (Harmonic @ 3m)

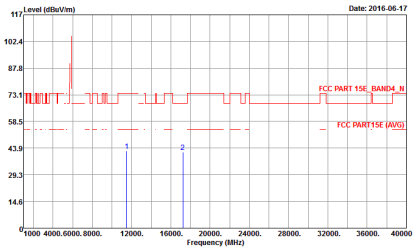
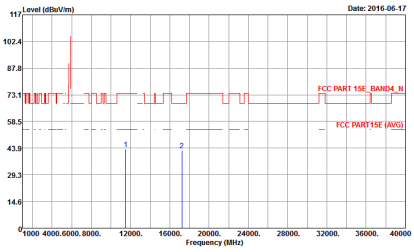
| WIFI | Band 4 5725~5850MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11a CH149 5745MHz | |
| 1 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

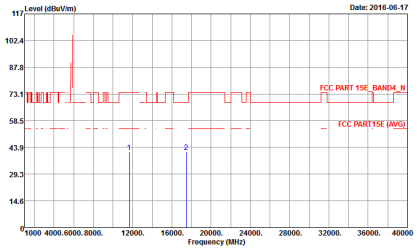
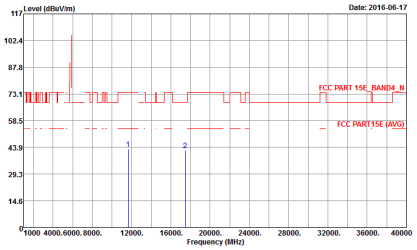
| WIFI | Band 4 5725~5850MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11a CH157 5785MHz | |
| 1 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

| WIFI | Band 4 5725~5850MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11a CH165 5825MHz | |
| 1 | Horizontal | Vertical |
| Peak<br>Avg. |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m 9170 SHF HORM_150809 HORIZONTAL<br>Detector : Peak<br>Project : 651612<br>Mode : 28 |  <br>Site : 03CH11-HY<br>Condition : FCC PART 15E_BAND4_N 3m 9170 SHF HORM_150809 VERTICAL<br>Detector : Peak<br>Project : 651612<br>Mode : 28 |

## Band 4 5725~5850MHz

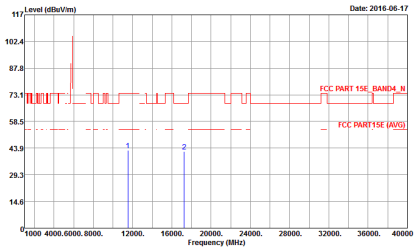
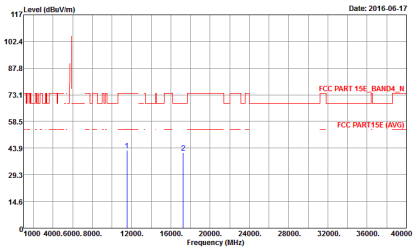
## WIFI 802.11n HT20 (Harmonic @ 3m)

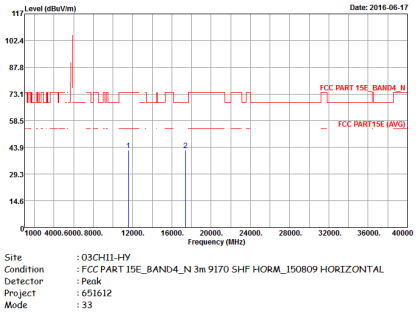
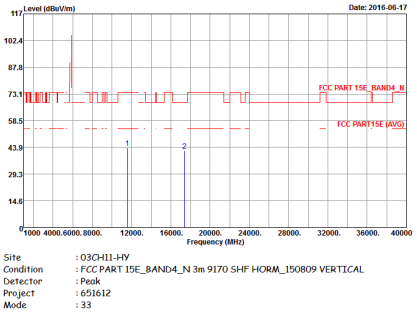
| WIFI | Band 4 5725~5850MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH149 5745MHz | |
| 1 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

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

## Band 4 5725~5850MHz

## WIFI 802.11n HT40 (Harmonic @ 3m)

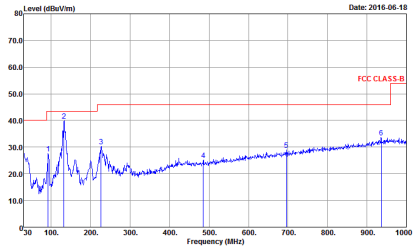
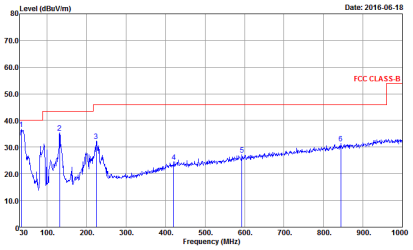
| WIFI | Band 4 5725~5850MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11n HT40 CH151 5755MHz | |
| 1 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

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

## Band 4 5725~5850MHz

## Emission below 1GHz

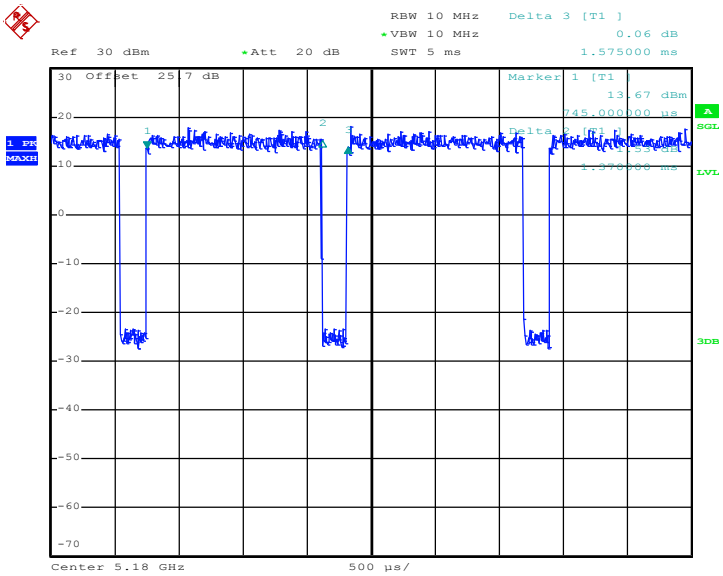
## 5GHz WIFI 802.11a (LF)

| WIFI | 5GHz 5725~5850MHz | |
|---|---|---|
| ANT | 802.11a LF | |
| 1 | Horizontal | Vertical |
| QP / Peak |  |  |

# Appendix D. Duty Cycle Plots

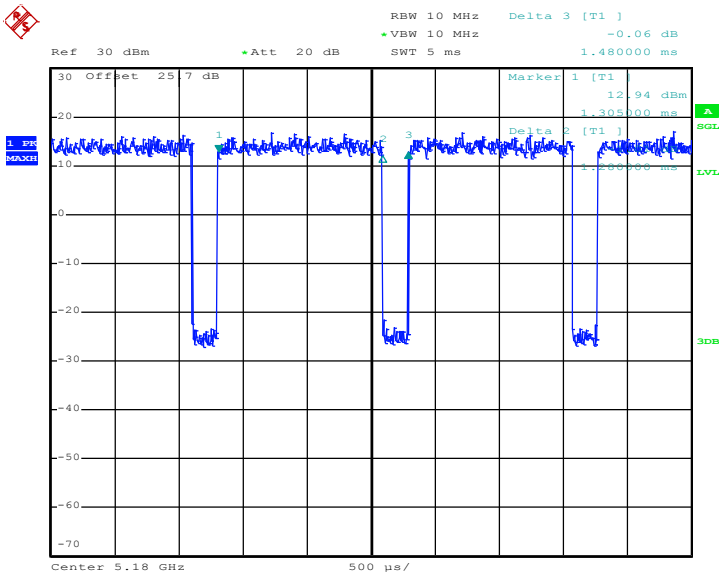
| Antenna | Band | Duty Cycle(%) | T(us) | 1/T(kHz) | VBW Setting |
|---|---|---|---|---|---|
| 1 | 802.11a | 86.984 | 1370 | 0.729927007 | 1kHz |
| 1 | 5GHz 802.11n HT20 | 86.486 | 1280 | 0.78125 | 1kHz |
| 1 | 5GHz 802.11n HT40 | 75.598 | 632 | 1.582278481 | 3kHz |

## 802.11a



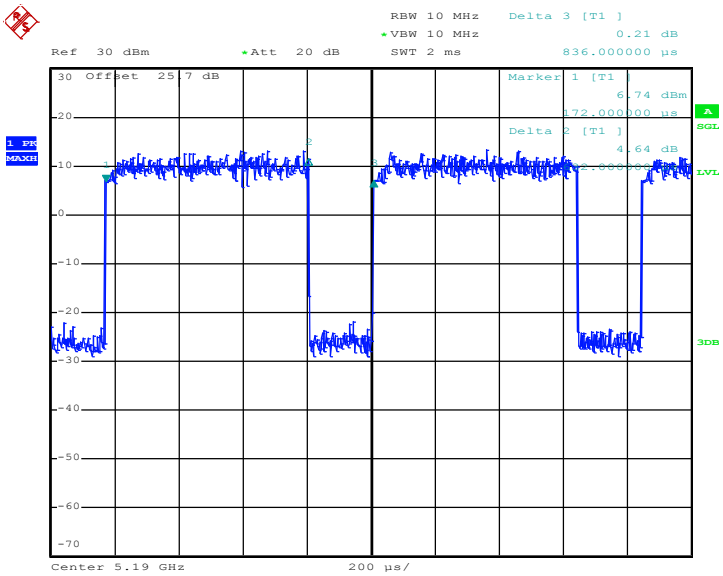

Date: 22.MAY.2016 09:02:32

## 802.11n HT20




Date: 22.MAY.2016 09:08:23

## 802.11n HT40




Date: 22.MAY.2016 09:23:04