

# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

**Test Report No.** : W156R-D015  
**AGR No.** : A155A-050  
**Applicant** : LG Electronics USA  
**Address** : 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States, 7632  
**Manufacturer** : LG Electronics Inc.  
**Address** : 222 LG-ro, Jinwi-Myeon, Pyeongtaek-Si, Gyeonggi-Do, 451-713, Korea  
**Type of Equipment** : WLAN Module  
**FCC ID.** : BEJ9QK-TWFMB008D  
**Model Name** : TWFM-B008D  
**Multiple Model Name** : N/A  
**Serial number** : N/A  
**Total page of Report** : 30 pages (including this page)  
**Date of Incoming** : May 08, 2015  
**Date of issue** : June 15, 2015

## SUMMARY

The equipment complies with the regulation; **FCC PART 15 SUBPART E Section 15.407**

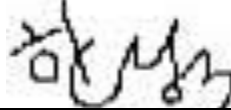
This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

Reviewed by:

  
 Jae-Ho, Lee / Chief Engineer  
 ONETECH Corp.

Approved by:

  
 Sung-Ik, Han/ Managing Director  
 ONETECH Corp.

## CONTENTS

### PAGE

|                                                                         |           |
|-------------------------------------------------------------------------|-----------|
| <b>1. VERIFICATION OF COMPLIANCE .....</b>                              | <b>5</b>  |
| <b>2. TEST SUMMARY .....</b>                                            | <b>6</b>  |
| 2.1 TEST ITEMS AND RESULTS .....                                        | 6         |
| 2.2 ADDITIONS, DEVIATIONS, EXCLUSIONS FROM STANDARDS.....               | 7         |
| 2.3 RELATED SUBMITTAL(S) / GRANT(S) .....                               | 7         |
| 2.4 PURPOSE OF THE TEST .....                                           | 7         |
| 2.5 TEST METHODOLOGY.....                                               | 7         |
| 2.6 TEST FACILITY.....                                                  | 7         |
| <b>3. GENERAL INFORMATION .....</b>                                     | <b>8</b>  |
| 3.1 PRODUCT DESCRIPTION.....                                            | 8         |
| 3.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT..... | 9         |
| <b>4. EUT MODIFICATIONS.....</b>                                        | <b>9</b>  |
| <b>5. SYSTEM TEST CONFIGURATION .....</b>                               | <b>10</b> |
| 5.1 JUSTIFICATION.....                                                  | 10        |
| 5.2 PERIPHERAL EQUIPMENT .....                                          | 10        |
| 5.3 MODE OF OPERATION DURING THE TEST .....                             | 11        |
| 5.4 CONFIGURATION OF TEST SYSTEM.....                                   | 12        |
| 5.5 ANTENNA REQUIREMENT .....                                           | 12        |
| <b>ANTENNAS LIST .....</b>                                              | <b>12</b> |
| <b>6. PRELIMINARY TEST .....</b>                                        | <b>13</b> |
| 6.1 AC POWER LINE CONDUCTED EMISSIONS TESTS.....                        | 13        |
| 6.2 GENERAL RADIATED EMISSIONS TESTS .....                              | 13        |
| <b>7. RADIATED SPURIOUS EMISSIONS.....</b>                              | <b>14</b> |
| 7.1 OPERATING ENVIRONMENT .....                                         | 14        |
| 7.2 TEST SET-UP FOR CONDUCTED MEASUREMENT .....                         | 14        |
| 7.3 TEST EQUIPMENT USED.....                                            | 14        |
| 7.4 TEST DATA FOR 5 150 MHz ~ 5 250 MHz BAND .....                      | 15        |
| 7.4.1 Test data for 802.11a RLAN Mode .....                             | 15        |
| 7.4.2 Test data for 802.11n_HT20 RLAN Mode.....                         | 17        |
| 7.4.3 Test data for 802.11n_HT40 RLAN Mode.....                         | 19        |
| <b>8. RADIATED RESTRICTED BAND EDGE MEASUREMENTS.....</b>               | <b>21</b> |
| 8.1 OPERATING ENVIRONMENT .....                                         | 21        |

|                                                        |           |
|--------------------------------------------------------|-----------|
| <b>8.2 TEST SET-UP FOR CONDUCTED MEASUREMENT .....</b> | <b>21</b> |
| <b>8.3 TEST EQUIPMENT USED .....</b>                   | <b>21</b> |
| <b>8.4 TEST DATA FOR FREQUENCY 5 150 BAND .....</b>    | <b>22</b> |
| <b>8.4.1 Test data for 802.11a RLAN Mode .....</b>     | <b>22</b> |
| <b>8.4.2 Test data for 802.11n_HT20 RLAN Mode.....</b> | <b>25</b> |
| <b>8.4.3 Test data for 802.11n_HT40 RLAN Mode.....</b> | <b>28</b> |

### Revision History

| Issued Report No. | Issued Date   | Revisions     | Effect Section |
|-------------------|---------------|---------------|----------------|
| W156R-D015        | June 15, 2015 | Initial Issue | All            |
|                   |               |               |                |
|                   |               |               |                |
|                   |               |               |                |

## 1. VERIFICATION OF COMPLIANCE

Applicant : LG Electronics USA  
 Address : 1000 Sylvan Avenue, Englewood Cliffs, New Jersey, United States, 7632  
 Contact Person : Yongduk Kwon / Research Engineer  
 Telephone No. : +82-31-610-9606  
 FCC ID : BEJ9QK-TWFMB008D  
 Model Name : TWFM-B008D  
 Serial Number : N/A  
 Date : June 15, 2015

|                                                         |                                                      |
|---------------------------------------------------------|------------------------------------------------------|
| EQUIPMENT CLASS                                         | Unlicensed National Information infrastructure(UNII) |
| E.U.T. DESCRIPTION                                      | Modular Transmitter, WLAN Module                     |
| THIS REPORT CONCERNS                                    | Class II Permissive Change                           |
| MEASUREMENT PROCEDURES                                  | ANSI C63.10: 2013                                    |
| TYPE OF EQUIPMENT TESTED                                | Pre-Production                                       |
| KIND OF EQUIPMENT<br>AUTHORIZATION REQUESTED            | Certification                                        |
| EQUIPMENT WILL BE OPERATED<br>UNDER FCC RULES PART(S)   | FCC PART 15 SUBPART E Section 15.407                 |
| Modifications on the Equipment to Achieve<br>Compliance | None                                                 |
| Final Test was Conducted On                             | 3 m, Semi Anechoic Chamber                           |

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

## 2. TEST SUMMARY

### 2.1 Test items and results

| SECTION           | TEST ITEMS                                                                       | RESULTS              |
|-------------------|----------------------------------------------------------------------------------|----------------------|
| 15.407(a)         | 26 dB Bandwidth                                                                  | N/A (See Note 1)     |
| 15.407(a)         | Maximum Conducted Output Power                                                   | N/A (See Note 1)     |
| 15.407(a)         | Peak Power Spectral Density                                                      | N/A (See Note 1)     |
| 15.407(g)         | Frequency Stability                                                              | N/A (See Note 1)     |
| 15.407(b)         | Undesirable Emissions                                                            | Met the Limit / PASS |
| 15.205, 15.407(b) | General Field Strength Limits<br>(Restricted Bands and Radiated Emission Limits) | Met the Limit / PASS |
| 15.207            | AC Conducted Emissions 150 kHz-30 MHz                                            | N/A (See Note 1)     |
| 15.407(h)         | Dynamic Frequency Selection                                                      | N/A (See Note 2)     |

Note 1: The test is not performed because it was C2PC.

Note 2: The test is not performed because EUT doesn't use the DFS band.

## 2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

## 2.3 Related Submittal(s) / Grant(s)

Antennas are added. (NP8350 V3\_B, NP8350 V3) / C2PC.

## 2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART E Section 15.407

## 2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

## 2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 301-14, Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862 Korea.

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-4617/ G-666/ T-1842 IC (Industry Canada) – Registration No. Site# 3736-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation No. 85

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

### 3. GENERAL INFORMATION

#### 3.1 Product Description

The LG Electronics USA, Model TWFM-B008D (referred to as the EUT in this report) is a WLAN Module. Product specification information described herein was obtained from product data sheet or user's manual.

|                                                    |                                                                   |                                 |                                                                                                   |
|----------------------------------------------------|-------------------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------|
| DEVICE TYPE                                        | WLAN Module                                                       |                                 |                                                                                                   |
| FREQUENCY RANGE                                    | 5 150 MHz ~<br>5 250 MHz Band                                     | 5 180 MHz ~ 5 240 MHz_20 MHz BW |                                                                                                   |
|                                                    |                                                                   | 5 190 MHz ~ 5 230 MHz_40 MHz BW |                                                                                                   |
|                                                    | 5 725 MHz ~<br>5 850 MHz Band                                     | 5 745 MHz ~ 5 825 MHz_20 MHz BW |                                                                                                   |
|                                                    |                                                                   | 5 755 MHz ~ 5 795 MHz_40 MHz BW |                                                                                                   |
| MAX. RF OUTPUT POWER                               | Ant.0                                                             | 5 150 MHz ~<br>5 250 MHz Band   | Wi-Fi 802.11a (10.06 dBm)<br>Wi-Fi 802.11n_20 MHz (10.58 dBm)<br>Wi-Fi 802.11n_40 MHz (12.47 dBm) |
|                                                    |                                                                   | 5 725 MHz ~<br>5 850 MHz Band   | Wi-Fi 802.11a (13.48 dBm)<br>Wi-Fi 802.11n_20 MHz (14.13 dBm)<br>Wi-Fi 802.11n_40 MHz (13.84 dBm) |
|                                                    | Ant.1                                                             | 5 150 MHz ~<br>5 250 MHz Band   | Wi-Fi 802.11a (9.58 dBm)<br>Wi-Fi 802.11n_20 MHz (9.44 dBm)<br>Wi-Fi 802.11n_40 MHz (12.57 dBm)   |
|                                                    |                                                                   | 5 725 MHz ~<br>5 850 MHz Band   | Wi-Fi 802.11a (13.33 dBm)<br>Wi-Fi 802.11n_20 MHz (14.78 dBm)<br>Wi-Fi 802.11n_40 MHz (13.89 dBm) |
| MODULATION TYPE                                    | 802.11a/g/n(HT20)/n(HT40): OFDM Modulation(BPSK/QPSK/16QAM/64QAM) |                                 |                                                                                                   |
| Antenna Gain                                       | 2.4 GHz Band                                                      | NP8350 V3_B : -0.79 dBi         |                                                                                                   |
|                                                    |                                                                   | NP8350 V3 : -1.08 dBi           |                                                                                                   |
|                                                    | 5.15 GHz Band                                                     | NP8350 V3_B : 3.69 dBi          |                                                                                                   |
|                                                    |                                                                   | NP8350 V3 : 1.14 dBi            |                                                                                                   |
|                                                    | 5.8 GHz Band                                                      | NP8350 V3_B : 2.88 dBi          |                                                                                                   |
|                                                    |                                                                   | NP8350 V3 : 2.04 dBi            |                                                                                                   |
| List of each Osc. or crystal Freq.(Freq. >= 1 MHz) | 20 MHz                                                            |                                 |                                                                                                   |

**3.2 Alternative type(s)/model(s); also covered by this test report.**

-. None

**4. EUT MODIFICATIONS**

-. None

## 5. SYSTEM TEST CONFIGURATION

### 5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

| DEVICE TYPE | MANUFACTURER        | MODEL/PART NUMBER | FCC ID           |
|-------------|---------------------|-------------------|------------------|
| Main Board  | LG Electronics Inc. | TWFM-B008D        | BEJ9QK-TWFMB008D |

### 5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

| Model            | Manufacturer                | Description       | Connected to |
|------------------|-----------------------------|-------------------|--------------|
| TWFM-B008D       | LG Electronics Inc.         | WLAN Module (EUT) | Note PC      |
| Pavilion g6      | HP                          | Notebook PC       | EUT          |
| Series PPP009L-E | LITE-ON TECHNOLOGY CO, LTD. | ADAPTER           | Notebook PC  |

### 5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting mode is programmed.

The worse case data rate for each modulation is determined 9 Mbps(Ant.0) / 9 Mbps(Ant.1) for IEEE 802.11a, 26 Mbps(Ant.0) / 26 Mbps(Ant.1) for HT20, 13.5 Mbps(Ant.0) / 13.5 Mbps(Ant.1) for HT40.

- To get a maximum emission levels from the EUT, the EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis.

## 5.4 Configuration of Test System

**Line Conducted Test:** The EUT was connected to USB and the power of USB was connected to Notebook PC. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.

**Radiated Emission Test:** Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter open area test site.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

## 5.5 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### Antenna Construction:

The transmitter antenna of the EUT is a PIFA antenna, so no consideration of replacement by the user.

### Antennas list

| Model       | Type        | Frequency band | Gain (dBi) | Note                                       |
|-------------|-------------|----------------|------------|--------------------------------------------|
| NP8740      | PCB antenna | 2.4 GHz band   | 3.70       | Original antenna                           |
|             |             | 5.15 GHz band  | 4.09       |                                            |
|             |             | 5.8 GHz band   | 5.58       |                                            |
| NP8350 V3_B |             | 2.4 GHz band   | -0.79      | Additional antenna1<br>by C2PC<br>(Tested) |
|             |             | 5.15 GHz band  | 3.69       |                                            |
|             |             | 5.8 GHz band   | 2.88       |                                            |
| NP8350 V3   |             | 2.4 GHz band   | -1.08      | Additional antenna2<br>by C2PC             |
|             |             | 5.15 GHz band  | 1.14       |                                            |
|             |             | 5.8 GHz band   | 2.04       |                                            |

## 6. PRELIMINARY TEST

### 6.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

| Operation Mode    | The Worse operating condition (Please check one only) |
|-------------------|-------------------------------------------------------|
| Transmitting Mode | -                                                     |

### 6.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

| Operation Mode    | The Worse operating condition (Please check one only) |
|-------------------|-------------------------------------------------------|
| Transmitting Mode | X                                                     |

## 7. RADIATED SPURIOUS EMISSIONS

### 7.1 Operating environment

Temperature : 22 ~ 23 °C  
Relative humidity : 54 ~ 55 % R.H.

### 7.2 Test set-up for conducted measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable above the ground plane.

The frequency spectrum from 30 MHz to 40 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.



### 7.3 Test equipment used

| Model Number  | Manufacturer      | Description              | Serial Number | Last Cal.(Interval) |
|---------------|-------------------|--------------------------|---------------|---------------------|
| ■ - FSV40     | Rohde & Schwarz   | Signal Analyzer          | 101009        | Jul. 30, 2014 (1Y)  |
| ■ - ESCI      | Rohde & Schwarz   | Test Receiver            | 101012        | Nov. 03, 2014 (1Y)  |
| ■ - 310N      | Sonoma Instrument | Pre-Amplifier            | 312544        | Apr. 29, 2015 (1Y)  |
| ■ - SCU-18    | Rohde & Schwarz   | Pre-Amplifier            | 10041         | Nov. 25, 2014 (1Y)  |
| ■ - DT3000    | Innco System      | Turn Table               | 930611        | N/A                 |
| ■ - MA4000-EP | Innco System      | Antenna Master           | 3320611       | N/A                 |
| ■ - VULB9163  | Schwarzbeck       | TRILOG Broadband Antenna | 9163-421      | Jul. 10, 2014 (2Y)  |
| ■ - BBHA9120D | Schwarzbeck       | Horn Antenna             | BBHA9120D294  | Sep. 05, 2013 (2Y)  |
| ■ - BBHA9170  | Schwarzbeck       | Horn Antenna             | BBHA9170178   | Sep. 05, 2013 (2Y)  |

All test equipment used is calibrated on a regular basis.

## 7.4 Test data for 5 150 MHz ~ 5 250 MHz Band

### 7.4.1 Test data for 802.11a RLAN Mode

#### 7.4.1.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 54 ~ 55 % R.H.

Temperature: 22 ~ 23 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

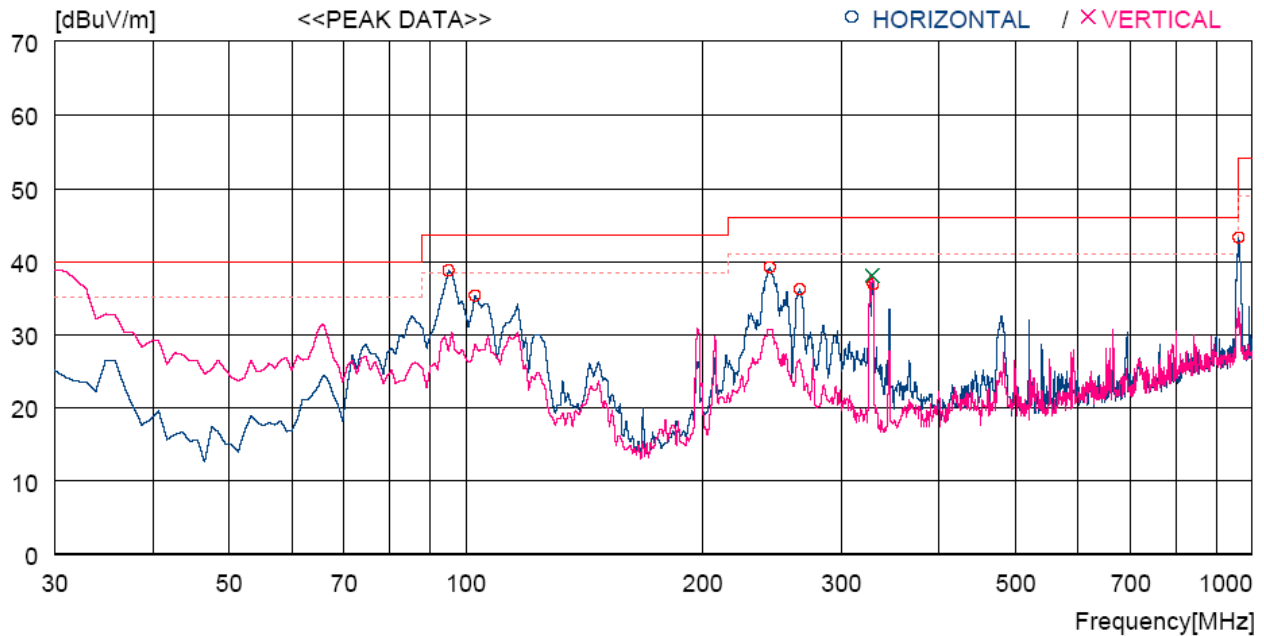
Result : PASSED

EUT : WLAN Module

Date: June 09, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



| No.                    | FREQ<br>[MHz] | READING<br>PEAK<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|---------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                           |                       |              |              |                    |                   |                |                 |                |
| 1                      | 94.990        | 51.4                      | 12.5                  | 7.9          | 33.1         | 38.7               | 43.5              | 4.8            | 200             | 0              |
| 2                      | 102.750       | 47.0                      | 13.4                  | 8.0          | 33.1         | 35.3               | 43.5              | 8.2            | 300             | 359            |
| 3                      | 243.400       | 49.7                      | 13.4                  | 9.1          | 33.0         | 39.2               | 46.0              | 6.8            | 100             | 359            |
| 4                      | 265.710       | 46.0                      | 13.9                  | 9.3          | 33.0         | 36.2               | 46.0              | 9.8            | 100             | 359            |
| 5                      | 329.730       | 44.9                      | 15.4                  | 9.6          | 33.0         | 36.9               | 46.0              | 9.1            | 100             | 138            |
| 6                      | 961.187       | 38.7                      | 23.8                  | 12.6         | 31.9         | 43.2               | 54.0              | 10.8           | 100             | 359            |
| ----- Vertical -----   |               |                           |                       |              |              |                    |                   |                |                 |                |
| 7                      | 328.760       | 46.1                      | 15.4                  | 9.6          | 33.0         | 38.1               | 46.0              | 7.9            | 200             | 359            |

#### 7.4.1.2 Test data for Below 30 MHz

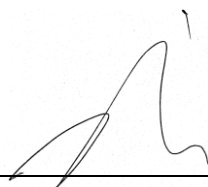
- Test Date : June 09, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

| Frequency (MHz)                                 | Reading (dBμV) | Ant. Pol. (H/V) | Ant. Height (m) | Angle (°) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|-------------------------------------------------|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| It was not observed any emissions from the EUT. |                |                 |                 |           |                    |            |                        |                 |             |

#### 7.4.1.3 Test data for above 1 GHz

- Test Date : June 09, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

| Frequency (MHz)                                 | Reading (dBμV) | Ant. Pol. (H/V) | Ant. Height (m) | Angle (°) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|-------------------------------------------------|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| It was not observed any emissions from the EUT. |                |                 |                 |           |                    |            |                        |                 |             |



Tested by: Jun-Hui, Lee / Senior Engineer

## 7.4.2 Test data for 802.11n\_HT20 RLAN Mode

### 7.4.2.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 54 ~ 55 % R.H.

Temperature: 22 ~ 23 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

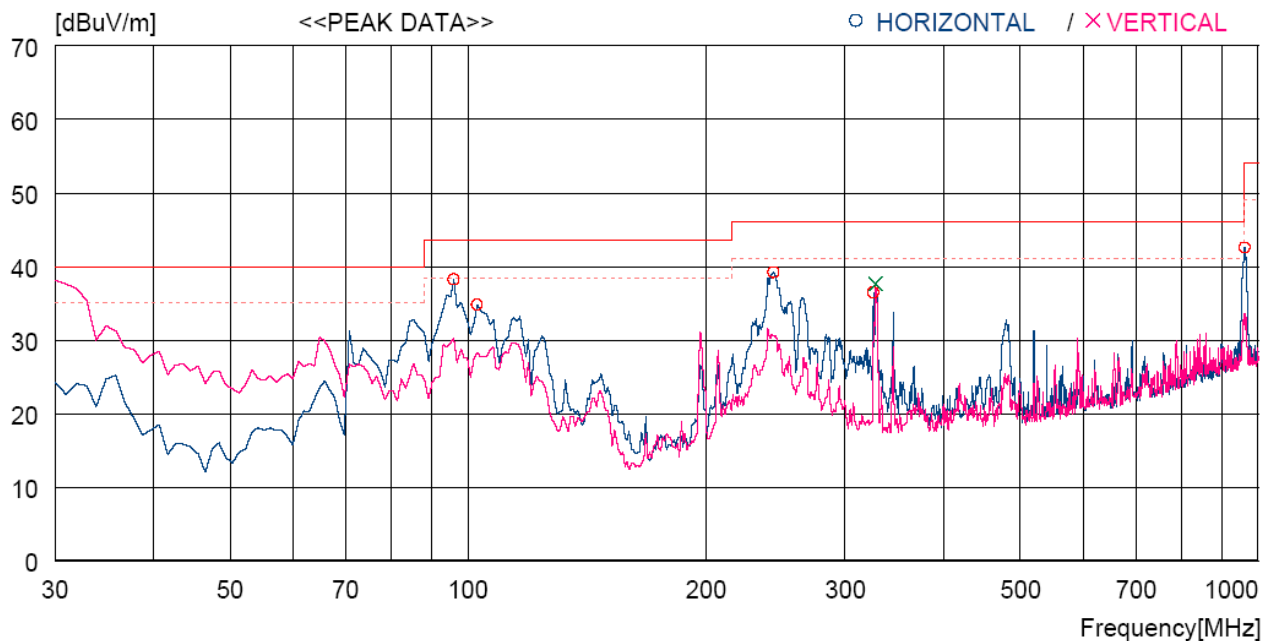
Result : PASSED

EUT : WLAN Module

Date: June 09, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



| No.                    | FREQ<br>[MHz] | READING<br>PEAK<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|---------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                           |                       |              |              |                    |                   |                |                 |                |
| 1                      | 95.960        | 50.7                      | 12.7                  | 7.9          | 33.1         | 38.2               | 43.5              | 5.3            | 200             | 173            |
| 2                      | 102.750       | 46.4                      | 13.4                  | 8.0          | 33.1         | 34.7               | 43.5              | 8.8            | 300             | 167            |
| 3                      | 243.400       | 49.7                      | 13.4                  | 9.1          | 33.0         | 39.2               | 46.0              | 6.8            | 100             | 359            |
| 4                      | 325.850       | 44.5                      | 15.3                  | 9.6          | 33.0         | 36.4               | 46.0              | 9.6            | 100             | 359            |
| 5                      | 960.217       | 38.1                      | 23.8                  | 12.6         | 32.0         | 42.5               | 54.0              | 11.5           | 100             | 359            |
| ----- Vertical -----   |               |                           |                       |              |              |                    |                   |                |                 |                |
| 6                      | 327.790       | 45.6                      | 15.4                  | 9.6          | 33.0         | 37.6               | 46.0              | 8.4            | 200             | 359            |

#### 7.4.2.1 Test data for Below 30 MHz

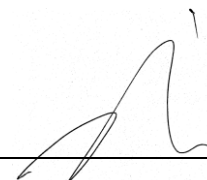
- Test Date : June 09, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

| Frequency (MHz)                                 | Reading (dBμV) | Ant. Pol. (H/V) | Ant. Height (m) | Angle (°) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|-------------------------------------------------|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| It was not observed any emissions from the EUT. |                |                 |                 |           |                    |            |                        |                 |             |

#### 7.4.2.3 Test data for above 1 GHz

- Test Date : June 09, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

| Frequency (MHz)                                 | Reading (dBμV) | Ant. Pol. (H/V) | Ant. Height (m) | Angle (°) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|-------------------------------------------------|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| It was not observed any emissions from the EUT. |                |                 |                 |           |                    |            |                        |                 |             |



Tested by: Jun-Hui, Lee / Senior Engineer

### 7.4.3 Test data for 802.11n\_HT40 RLAN Mode

#### 7.4.3.1 Test data for 30 MHz ~ 1 000 MHz

Humidity Level : 22 ~ 23 % R.H.

Temperature: 54 ~ 55 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

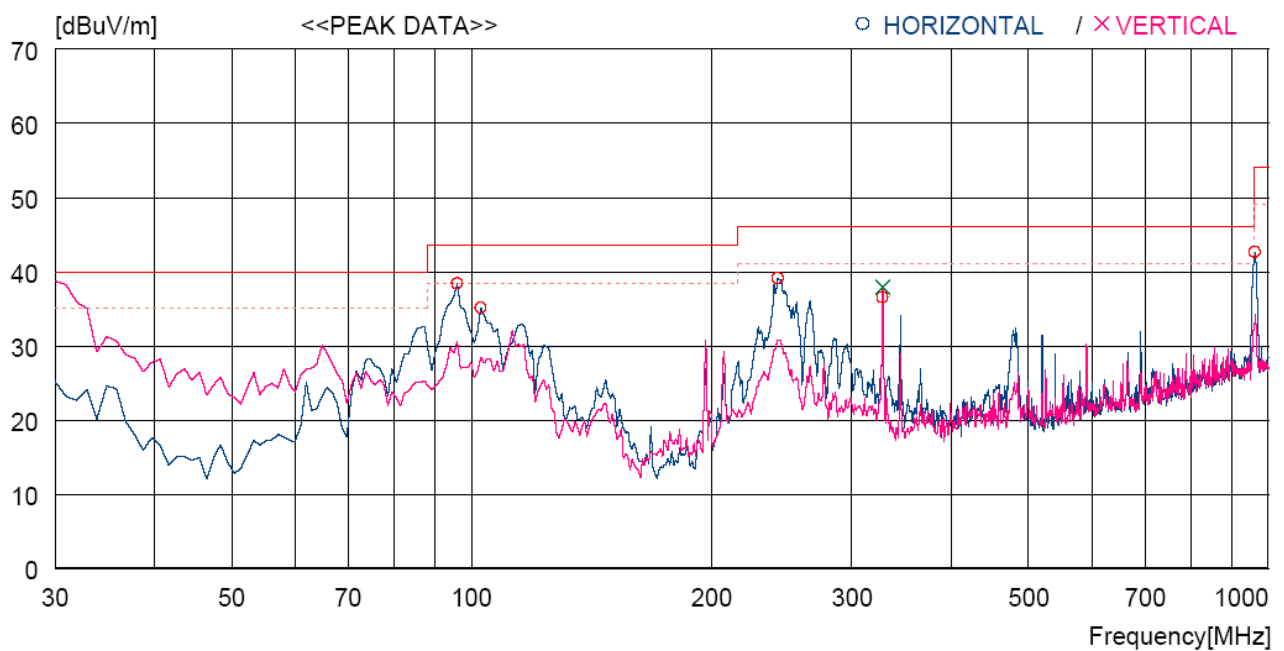
Result : PASSED

EUT : WLAN Module

Date: June 09, 2015

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

-.Ant0, Ant1 and Multiple transmit with Low, Middle and High Channels were tested, but the worst data were recorded.



| No.                    | FREQ<br>[MHz] | READING<br>PEAK<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|---------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                           |                       |              |              |                    |                   |                |                 |                |
| 1                      | 95.960        | 50.9                      | 12.7                  | 7.9          | 33.1         | 38.4               | 43.5              | 5.1            | 300             | 359            |
| 2                      | 102.750       | 46.8                      | 13.4                  | 8.0          | 33.1         | 35.1               | 43.5              | 8.4            | 200             | 0              |
| 3                      | 242.430       | 49.6                      | 13.4                  | 9.1          | 33.0         | 39.1               | 46.0              | 6.9            | 100             | 146            |
| 4                      | 327.790       | 44.5                      | 15.4                  | 9.6          | 33.0         | 36.5               | 46.0              | 9.5            | 100             | 359            |
| 5                      | 961.187       | 38.1                      | 23.8                  | 12.6         | 31.9         | 42.6               | 54.0              | 11.4           | 100             | 359            |
| ----- Vertical -----   |               |                           |                       |              |              |                    |                   |                |                 |                |
| 6                      | 327.790       | 45.9                      | 15.4                  | 9.6          | 33.0         | 37.9               | 46.0              | 8.1            | 200             | 359            |

#### 7.4.3.2 Test data for Below 30 MHz

- Test Date : June 09, 2015
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

| Frequency (MHz)                                 | Reading (dBμV) | Ant. Pol. (H/V) | Ant. Height (m) | Angle (°) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|-------------------------------------------------|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| It was not observed any emissions from the EUT. |                |                 |                 |           |                    |            |                        |                 |             |

#### 7.4.3.3 Test data for above 1 GHz

- Test Date : June 09, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 40 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

| Frequency (MHz)                                 | Reading (dBμV) | Ant. Pol. (H/V) | Ant. Height (m) | Angle (°) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|-------------------------------------------------|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| It was not observed any emissions from the EUT. |                |                 |                 |           |                    |            |                        |                 |             |



Tested by: Jun-Hui, Lee / Senior Engineer

## 8. RADIATED RESTRICTED BAND EDGE MEASUREMENTS

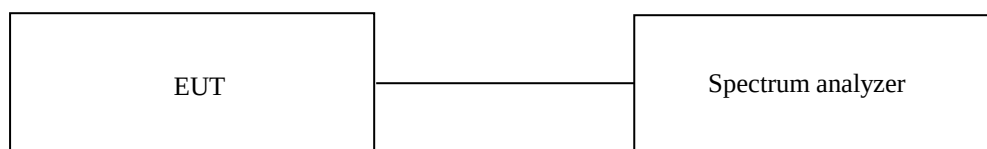
### 8.1 Operating environment

Temperature : 24 °C  
Relative humidity : 50 % R.H.

### 8.2 Test set-up for conducted measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable above the ground plane.

The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.



### 8.3 Test equipment used

|               |                   |                          |              |                    |
|---------------|-------------------|--------------------------|--------------|--------------------|
| ■ - FSV40     | Rohde & Schwarz   | Signal Analyzer          | 101009       | Jul. 30, 2014 (1Y) |
| ■ - ESCI      | Rohde & Schwarz   | Test Receiver            | 101012       | Nov. 03, 2014 (1Y) |
| ■ - 310N      | Sonoma Instrument | Pre-Amplifier            | 312544       | Apr. 29, 2015 (1Y) |
| ■ - SCU-18    | Rohde & Schwarz   | Pre-Amplifier            | 10041        | Nov. 25, 2014 (1Y) |
| ■ - DT3000    | Innco System      | Turn Table               | 930611       | N/A                |
| ■ - MA4000-EP | Innco System      | Antenna Master           | 3320611      | N/A                |
| ■ - VULB9163  | Schwarzbeck       | TRILOG Broadband Antenna | 9163-421     | Jul. 10, 2014 (2Y) |
| ■ - BBHA9120D | Schwarzbeck       | Horn Antenna             | BBHA9120D294 | Sep. 05, 2013 (2Y) |
| ■ - BBHA9170  | Schwarzbeck       | Horn Antenna             | BBHA9170178  | Sep. 05, 2013 (2Y) |

All test equipment used is calibrated on a regular basis.

## 8.4 Test data for Frequency 5 150 band

### 8.4.1 Test data for 802.11a RLAN Mode

#### 8.4.1.1 Test data for Antenna 0

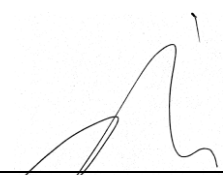
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-------------------|--------------------|----------------|
| 5 150.00           | 39.52             | Peak             | H                  | 31.00          | 11.50         | 42.20       | 39.82             | 74.00              | 34.18          |
|                    | 25.86             | Average          | H                  |                |               |             | 26.16             | 54.00              | 27.84          |
|                    | 41.50             | Peak             | V                  |                |               |             | 41.80             | 74.00              | 32.20          |
|                    | 27.53             | Average          | V                  |                |               |             | 27.83             | 54.00              | 26.17          |
| 5 350.00           | 38.18             | Peak             | H                  | 31.30          | 11.70         | 42.20       | 38.98             | 74.00              | 35.02          |
|                    | 23.43             | Average          | H                  |                |               |             | 24.23             | 54.00              | 29.77          |
|                    | 37.26             | Peak             | V                  |                |               |             | 38.06             | 74.00              | 35.94          |
|                    | 26.84             | Average          | V                  |                |               |             | 27.64             | 54.00              | 26.36          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Jun-Hui, Lee / Senior Engineer

#### 8.4.1.2 Test data for Antenna 1

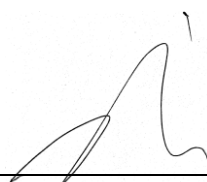
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-------------------|--------------------|----------------|
| 5 150.00           | 41.09             | Peak             | H                  | 31.00          | 11.50         | 42.20       | 41.39             | 74.00              | 32.61          |
|                    | 27.82             | Average          | H                  |                |               |             | 28.12             | 54.00              | 25.88          |
|                    | 44.83             | Peak             | V                  |                |               |             | 45.13             | 74.00              | 28.87          |
|                    | 27.25             | Average          | V                  |                |               |             | 27.55             | 54.00              | 26.45          |
| 5 350.00           | 36.26             | Peak             | H                  | 31.30          | 11.70         | 42.20       | 37.06             | 74.00              | 36.94          |
|                    | 22.77             | Average          | H                  |                |               |             | 23.57             | 54.00              | 30.43          |
|                    | 37.59             | Peak             | V                  |                |               |             | 38.39             | 74.00              | 35.61          |
|                    | 23.05             | Average          | V                  |                |               |             | 23.85             | 54.00              | 30.15          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Jun-Hui, Lee / Senior Engineer

### 8.4.1.3 Test data for Multiple transmit

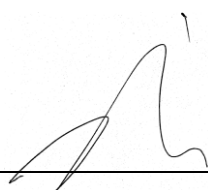
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dB $\mu$ V) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|-------------------------|------------------|--------------------|----------------|---------------|-------------|-------------------------|--------------------------|----------------|
| 5 150.00           | 40.54                   | Peak             | H                  | 31.00          | 11.50         | 42.20       | 40.84                   | 74.00                    | 33.16          |
|                    | 27.71                   | Average          | H                  |                |               |             | 28.01                   | 54.00                    | 25.99          |
|                    | 48.20                   | Peak             | V                  |                |               |             | 48.50                   | 74.00                    | 25.50          |
|                    | 30.31                   | Average          | V                  |                |               |             | 30.61                   | 54.00                    | 23.39          |
| 5 350.00           | 36.87                   | Peak             | H                  | 31.30          | 11.70         | 42.20       | 37.67                   | 74.00                    | 36.33          |
|                    | 23.11                   | Average          | H                  |                |               |             | 23.91                   | 54.00                    | 30.09          |
|                    | 37.23                   | Peak             | V                  |                |               |             | 38.03                   | 74.00                    | 35.97          |
|                    | 23.56                   | Average          | V                  |                |               |             | 24.36                   | 54.00                    | 29.64          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dB $\mu$ V/m) - Emission Level (dB $\mu$ V/m)



Tested by: Jun-Hui, Lee / Senior Engineer

## 8.4.2 Test data for 802.11n\_HT20 RLAN Mode

### 8.4.2.1 Test data for Antenna 0

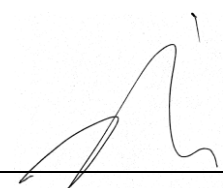
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-------------------|--------------------|----------------|
| 5 150.00           | 37.44             | Peak             | H                  | 31.00          | 11.50         | 42.20       | 37.74             | 74.00              | 36.26          |
|                    | 26.45             | Average          | H                  |                |               |             | 26.75             | 54.00              | 27.25          |
|                    | 41.86             | Peak             | V                  |                |               |             | 42.16             | 74.00              | 31.84          |
|                    | 28.80             | Average          | V                  |                |               |             | 29.10             | 54.00              | 24.90          |
| 5 350.00           | 39.14             | Peak             | H                  | 31.30          | 11.70         | 42.20       | 39.94             | 74.00              | 34.06          |
|                    | 22.32             | Average          | H                  |                |               |             | 23.12             | 54.00              | 30.88          |
|                    | 37.68             | Peak             | V                  |                |               |             | 38.48             | 74.00              | 35.52          |
|                    | 24.52             | Average          | V                  |                |               |             | 25.32             | 54.00              | 28.68          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Jun-Hui, Lee / Senior Engineer

#### 8.4.2.2 Test data for Antenna 1

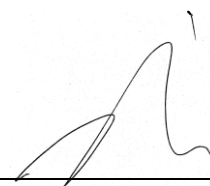
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dB $\mu$ V) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dB $\mu$ V/m) | Limits<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|-------------------------|------------------|--------------------|----------------|---------------|-------------|-------------------------|--------------------------|----------------|
| 5 150.00           | 40.82                   | Peak             | H                  | 31.00          | 11.50         | 42.20       | 41.12                   | 74.00                    | 32.88          |
|                    | 24.69                   | Average          | H                  |                |               |             | 24.99                   | 54.00                    | 29.01          |
|                    | 45.28                   | Peak             | V                  |                |               |             | 45.58                   | 74.00                    | 28.42          |
|                    | 28.87                   | Average          | V                  |                |               |             | 29.17                   | 54.00                    | 24.83          |
| 5 350.00           | 37.26                   | Peak             | H                  | 31.30          | 11.70         | 42.20       | 38.06                   | 74.00                    | 35.94          |
|                    | 23.54                   | Average          | H                  |                |               |             | 24.34                   | 54.00                    | 29.66          |
|                    | 38.02                   | Peak             | V                  |                |               |             | 38.82                   | 74.00                    | 35.18          |
|                    | 23.19                   | Average          | V                  |                |               |             | 23.99                   | 54.00                    | 30.01          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dB $\mu$ V/m) - Emission Level (dB $\mu$ V/m)



Tested by: Jun-Hui, Lee / Senior Engineer

### 8.4.2.3 Test data for Multiple transmit

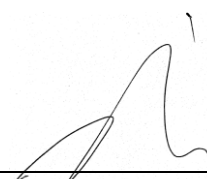
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-------------------|--------------------|----------------|
| 5 150.00           | 43.28             | Peak             | H                  | 31.00          | 11.50         | 42.20       | 43.58             | 74.00              | 30.42          |
|                    | 27.51             | Average          | H                  |                |               |             | 27.81             | 54.00              | 26.19          |
|                    | 48.07             | Peak             | V                  |                |               |             | 48.37             | 74.00              | 25.63          |
|                    | 30.15             | Average          | V                  |                |               |             | 30.45             | 54.00              | 23.55          |
| 5 350.00           | 37.48             | Peak             | H                  | 31.30          | 11.70         | 42.20       | 38.28             | 74.00              | 35.72          |
|                    | 22.96             | Average          | H                  |                |               |             | 23.76             | 54.00              | 30.24          |
|                    | 37.69             | Peak             | V                  |                |               |             | 38.49             | 74.00              | 35.51          |
|                    | 23.37             | Average          | V                  |                |               |             | 24.17             | 54.00              | 29.83          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Jun-Hui, Lee / Senior Engineer

### 8.4.3 Test data for 802.11n\_HT40 RLAN Mode

#### 8.4.3.1 Test data for Antenna 0

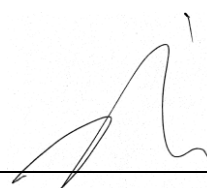
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-------------------|--------------------|----------------|
| 5 150.00           | 42.65             | Peak             | H                  | 31.00          | 11.50         | 42.20       | 42.95             | 74.00              | 31.05          |
|                    | 25.70             | Average          | H                  |                |               |             | 26.00             | 54.00              | 28.00          |
|                    | 47.17             | Peak             | V                  |                |               |             | 47.47             | 74.00              | 26.53          |
|                    | 28.98             | Average          | V                  |                |               |             | 29.28             | 54.00              | 24.72          |
| 5 350.00           | 37.30             | Peak             | H                  | 31.30          | 11.70         | 42.20       | 38.10             | 74.00              | 35.90          |
|                    | 23.41             | Average          | H                  |                |               |             | 24.21             | 54.00              | 29.79          |
|                    | 37.09             | Peak             | V                  |                |               |             | 37.89             | 74.00              | 36.11          |
|                    | 22.77             | Average          | V                  |                |               |             | 23.57             | 54.00              | 30.43          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Jun-Hui, Lee / Senior Engineer

### 8.4.3.2 Test data for Antenna 1

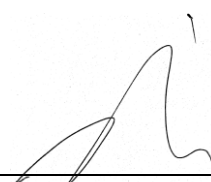
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-------------------|--------------------|----------------|
| 5 150.00           | 39.21             | Peak             | H                  | 31.00          | 11.50         | 42.20       | 39.51             | 74.00              | 34.49          |
|                    | 22.87             | Average          | H                  |                |               |             | 23.17             | 54.00              | 30.83          |
|                    | 45.99             | Peak             | V                  |                |               |             | 46.29             | 74.00              | 27.71          |
|                    | 27.12             | Average          | V                  |                |               |             | 27.42             | 54.00              | 26.58          |
| 5 350.00           | 37.51             | Peak             | H                  | 31.30          | 11.70         | 42.20       | 38.31             | 74.00              | 35.69          |
|                    | 22.78             | Average          | H                  |                |               |             | 23.58             | 54.00              | 30.42          |
|                    | 37.62             | Peak             | V                  |                |               |             | 38.42             | 74.00              | 35.58          |
|                    | 23.68             | Average          | V                  |                |               |             | 24.48             | 54.00              | 29.52          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Jun-Hui, Lee / Senior Engineer

### 8.4.3.3 Test data for Multiple transmit

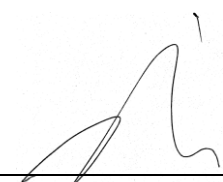
- Test Date : June 07, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,  
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : Pass

| Frequency<br>(MHz) | Reading<br>(dBμV) | Detector<br>Mode | Ant. Pol.<br>(H/V) | Ant.<br>Factor | Cable<br>Loss | Amp<br>Gain | Total<br>(dBμV/m) | Limits<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------|--------------------|----------------|---------------|-------------|-------------------|--------------------|----------------|
| 5 150.00           | 44.17             | Peak             | H                  | 31.00          | 11.50         | 42.20       | 44.47             | 74.00              | 29.53          |
|                    | 26.50             | Average          | H                  |                |               |             | 26.80             | 54.00              | 27.20          |
|                    | 48.23             | Peak             | V                  |                |               |             | 48.53             | 74.00              | 25.47          |
|                    | 28.68             | Average          | V                  |                |               |             | 28.98             | 54.00              | 25.02          |
| 5 350.00           | 37.28             | Peak             | H                  | 31.30          | 11.70         | 42.20       | 38.08             | 74.00              | 35.92          |
|                    | 23.49             | Average          | H                  |                |               |             | 24.29             | 54.00              | 29.71          |
|                    | 36.73             | Peak             | V                  |                |               |             | 37.53             | 74.00              | 36.47          |
|                    | 22.38             | Average          | V                  |                |               |             | 23.18             | 54.00              | 30.82          |

Tabulated test data for Restricted Band

Remark - "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Emission Level (dBμV/m)



Tested by: Jun-Hui, Lee / Senior Engineer