

# FCC UNII REPORT

## FCC Certification

**Applicant Name:**  
LG Electronics

**Address:**  
222, LG-ro Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 457-713  
Korea

**Date of Issue:**

June 30, 2015

**Test Site/Location:**

HCT CO., LTD., 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

**Report No.:** HCT-R-1506-F074

**HCT FRN:** 0005866421

**IC Recognition No.:** 5944A-3

**FCC ID** : BEJ9QK-DMWL1NB6

**APPLICANT** : LG Electronics

**FCC/IC Model(s):** WL1NB6  
**EUT Type:** Wireless Adapter Card

**Max. RF Output Power:** UNII 1: 5 156 MHz ~ 5 200MHz (3.730 dBm)  
**(Average)** UNII 3: 5 730 MHz ~ 5 821MHz (-2.014 dBm)

**Frequency Range:** UNII 1: 5 156 MHz ~ 5 200MHz  
UNII 3: 5 730 MHz ~ 5 821MHz

**Modulation type** GFSK

**FCC Classification:** Unlicensed National Information Infrastructure(UNII)

**Engineering Statement:**

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998, 21 U.S.C. 853(a)



**Report prepared by**  
**: Kyung Soo Kang**  
**Test engineer of RF Team**



**Approved by**  
**: Sang Jun Lee**  
**Manager of RF Team**

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

## Version

| TEST REPORT NO. | DATE          | DESCRIPTION             |
|-----------------|---------------|-------------------------|
| HCT-R-1506-F074 | June 30, 2015 | - First Approval Report |
|                 |               |                         |
|                 |               |                         |
|                 |               |                         |

## Table of Contents

|                                                                         |    |
|-------------------------------------------------------------------------|----|
| 1. GENERAL INFORMATION .....                                            | 4  |
| 2. EUT DESCRIPTION .....                                                | 4  |
| 3. TEST METHODOLOGY .....                                               | 5  |
| 3.1 EUT CONFIGURATION .....                                             | 5  |
| 3.2 EUT EXERCISE .....                                                  | 5  |
| 3.3 GENERAL TEST PROCEDURES .....                                       | 5  |
| 3.4 DESCRIPTION OF TEST MODES .....                                     | 5  |
| 4. INSTRUMENT CALIBRATION.....                                          | 6  |
| 5. FACILITIES AND ACCREDITATIONS .....                                  | 6  |
| 5.1 FACILITIES .....                                                    | 6  |
| 5.2 EQUIPMENT .....                                                     | 6  |
| 6. ANTENNA REQUIREMENTS .....                                           | 7  |
| 7. SUMMARY OF TEST RESULTS .....                                        | 8  |
| 8. TEST RESULT .....                                                    | 9  |
| 8.1 DUTY CYCLE.....                                                     | 9  |
| 8.2 EMISSION BANDWIDTH AND MINIMUM EMISSION BANDWIDTH MEASUREMENT ..... | 10 |
| 8.3 OUTPUT POWER MEASUREMENT .....                                      | 17 |
| 8.4 POWER SPECTRAL DENSITY .....                                        | 19 |
| 8.5 FREQUENCY STABILITY .....                                           | 23 |
| 8.6 RADIATED MEASUREMENT.....                                           | 25 |
| 8.6.1 RADIATED SPURIOUS EMISSIONS.....                                  | 25 |
| 8.6.2 RADIATED RESTRICTED BAND EDGE MEASUREMENTS .....                  | 37 |
| 8.7 POWERLINE CONDUCTED EMISSIONS .....                                 | 39 |
| 9. LIST OF TEST EQUIPMENT .....                                         | 44 |
| 9.1 LIST OF TEST EQUIPMENT(Conducted Test) .....                        | 44 |
| 9.2 LIST OF TEST EQUIPMENT(Radiated Test).....                          | 45 |

## 1. GENERAL INFORMATION

**Applicant:** LG Electronics

**Address:** 222, LG-ro Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 457-713 Korea

**FCC ID:** BEJ9QK-DMWL1NB6

**EUT Type:** Wireless Adapter Card

**FCC/IC Model name(s):** WL1NB6

**Date(s) of Tests:** June 08, 2015 ~ June 25, 2015

**Place of Tests:** HCT Co., Ltd.  
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea.  
(IC Recognition No. : 5944A-3)

## 2. EUT DESCRIPTION

|                              |                                                                                                                                                         |                      |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>FCC Model Name</b>        | WL1NB6                                                                                                                                                  |                      |
| <b>EUT Type</b>              | Wireless Adapter Card                                                                                                                                   |                      |
| <b>Power Supply</b>          | DC 3.3 V                                                                                                                                                |                      |
| <b>Frequency Range</b>       | UNII 1                                                                                                                                                  | 5 156 MHz ~ 5 200MHz |
|                              | UNII 3                                                                                                                                                  | 5 730 MHz ~ 5 821MHz |
| <b>Modulation Type</b>       | GFSK                                                                                                                                                    |                      |
| <b>Antenna Specification</b> | Manufacturer: LG Innotek Co., Ltd.<br>Antenna type:PCB Antenna<br>Peak Gain : 0.55 dBi (5156~5200 MHz UNII1 BAND) / 1.30 dBi (5730~5821 MHz UNII3 BAND) |                      |

### 3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D02 General UNII Test Procedures New Rules v01 dated June 06, 2014 entitled “ Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices Part15, Subpart E” and the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.4-2003) were used in the measurement.

#### 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### 3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.407 under the FCC Rules Part 15 Subpart E.

#### 3.3 GENERAL TEST PROCEDURES

##### Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

##### Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

##### Conducted Antenna Terminal

See Section from 8.1 to 8.4.(KDB 789033)

### 3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

## 4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards

## 5. FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated February 28, 2014 (Registration Number: 90661)

### 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

## 6. ANTENNA REQUIREMENTS

### According to FCC 47 CFR §15.203, §15.407, RSS-GEN 7.1.2

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

\* The antennas of this E.U.T are permanently attached.

\* The E.U.T Complies with the requirement of §15.203, §15.407, RSS-GEN 7.1.2

## 7. SUMMARY OF TEST RESULTS

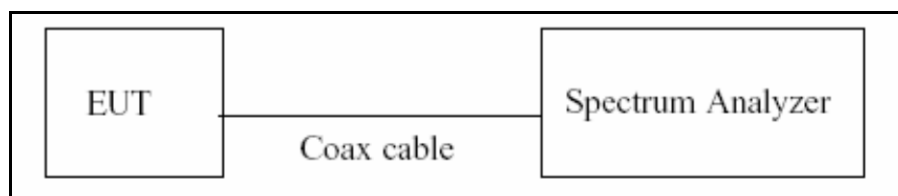
| Test Description                                                             | FCC Part Section(s)             | Test Limit                                                                                                                                | Test Condition | Test Result |
|------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|
| 26dB Bandwidth                                                               | §15.407 (for Power Measurement) | N/A                                                                                                                                       | CONDUCTED      | PASS        |
| 6 dB Bandwidth                                                               | §15.407(e)                      | >500 kHz<br>(5725-5850 MHz)                                                                                                               |                | PASS        |
| Maximum Conducted Output Power,                                              | §15.407(a)(1)                   | < 250 mW<br>(5150-5250 MHz)<br><1 W<br>(5725-5850 MHz)                                                                                    |                | PASS        |
| Peak Power Spectral Density                                                  | §15.407(a)(1), (5)              | <11 dBm/ MHz (5150-5250 MHz)<br><30 dBm/500 kHz(5725-5850 MHz)                                                                            |                | PASS        |
| Frequency Stability                                                          | §15.407(g)                      | N/A                                                                                                                                       |                | N/A         |
| AC Conducted Emissions<br>150 kHz-30 MHz                                     | §15.207                         | <FCC 15.207 limits                                                                                                                        |                | N/A         |
| Undesirable Emissions                                                        | §15.407(b)(1), (2), (3)         | <-27 dBm/ MHz EIRP (UNII1)<br><-17 dBm/MHz EIRP within 5715-5725 MHz and 5850-5860 MHz,<br><-27 dBm/MHz EIRP outside 5715-5850 MHz(UNII3) | RADIATED       | PASS        |
| General Field Strength Limits(Restricted Bands and Radiated Emission Limits) | §15.205, 5.407(b)(1), (5), (6)  | Emissions in restricted bands must meet the radiated limits detailed in 15.209                                                            |                | PASS        |

## 8. TEST RESULT

### 8.1 DUTY CYCLE

The zero-span mode on a spectrum analyzer or EMI receiver ,if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set  $RBW \geq EBW$  if possible; otherwise, set RBW to the largest available value. Set  $VBW \geq RBW$ . Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are  $> 50/T$ , where  $T$  is defined in section B)1)a), and the number of sweep points across duration  $T$  exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if  $T \leq 16.7$  microseconds.)

#### ■ TEST CONFIGURATION



#### ■ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer. We tested according to the zero-span measurement method, (B.2 in KDB 789033 D02, issued 06/06/2014)

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if  $T \leq 6.25$  microseconds. ( $50/6.25 = 8$ )

The zero-span method was used because all measured  $T$  data are  $> 6.25$  microseconds and both RBW and VBW are  $> 50/T$ .

1. RBW = 8 MHz (the largest available value)
2. VBW = 8 MHz ( $\geq$  RBW)
3. SPAN = 0 Hz
4. Detector = Peak
5. Number of points in sweep  $> 100$
6. Trace mode = Clear write
7. Measure  $T_{total}$  and  $T_{on}$
8. Calculate Duty Cycle =  $T_{on} / T_{total}$  and Duty Cycle Factor =  $10 \cdot \log(1/\text{Duty Cycle})$

#### ■ Duty Cycle Factor

| $T_{on}$<br>(ms) | $T_{total}$<br>(ms) | Duty Cycle | Duty Cycle Factor<br>(dB) |
|------------------|---------------------|------------|---------------------------|
| -                | -                   | 100 %      | 0                         |

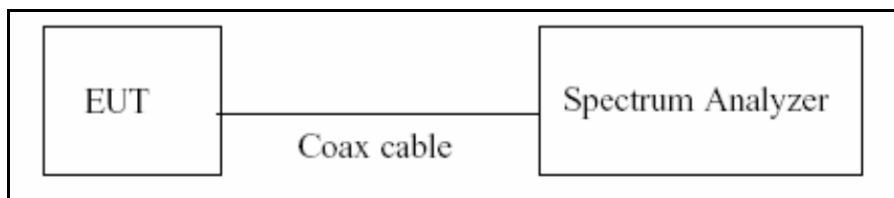
## 8.2 EMISSION BANDWIDTH AND MINIMUM EMISSION BANDWIDTH MEASUREMENT

The bandwidth at 26 dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum power control level, as defined in KDB 789033 D02(issued 06/06/2014), at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth and 6 dB bandwidth.

The 26 dB bandwidth is used to determine the conducted power limits.

The 6 dB bandwidth is at least 500 kHz.

### ■ TEST CONFIGURATION



### ■ TEST PROCEDURE(26 dB Bandwidth)

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to( C.1 in KDB 789033 D02, issued 06/06/2014)

1. RBW = approximately 1 % of the emission bandwidth
2. VBW > RBW
3. Detector = Peak
4. Trace mode = max hold
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Note : We tested 26 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 26 dB.

**■ TEST PROCEDURE(6 dB Bandwidth)**

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to( C.2 in KDB 789033 D02, issued 06/06/2014)

1. RBW = 100 kHz
2. VBW  $\geq$  3\*RBW
3. Detector = Peak
4. Trace mode = max hold
5. Allow the trace to stabilize
6. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points(upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note : We tested 6 dB bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer. X dB is set 6 dB.

## Conducted 26 dB Bandwidth

### ■ TEST RESULTS

#### Conducted 26 dB Bandwidth Measurements for UNII 1

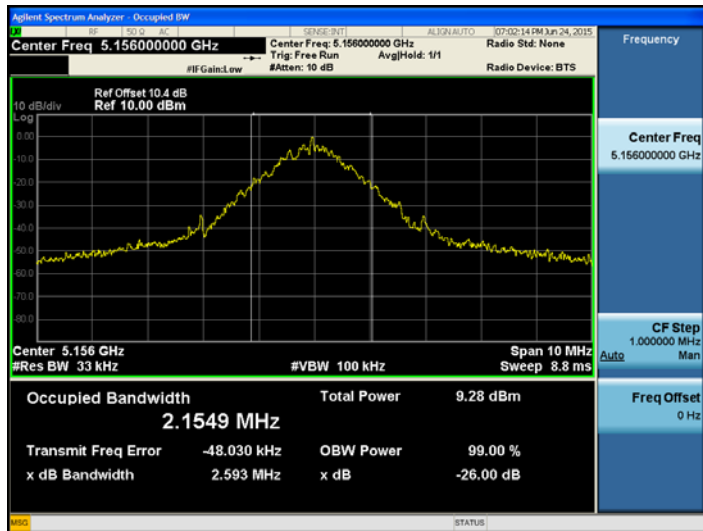
| UNII 1          |      | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] |      |                             |                            |             |
| 5156            | Low  | 2.593                       | N/A                        | Pass        |
| 5177            | Mid  | 2.641                       | N/A                        | Pass        |
| 5200            | High | 2.700                       | N/A                        | Pass        |

#### Conducted 26 dB Bandwidth Measurements for UNII 3

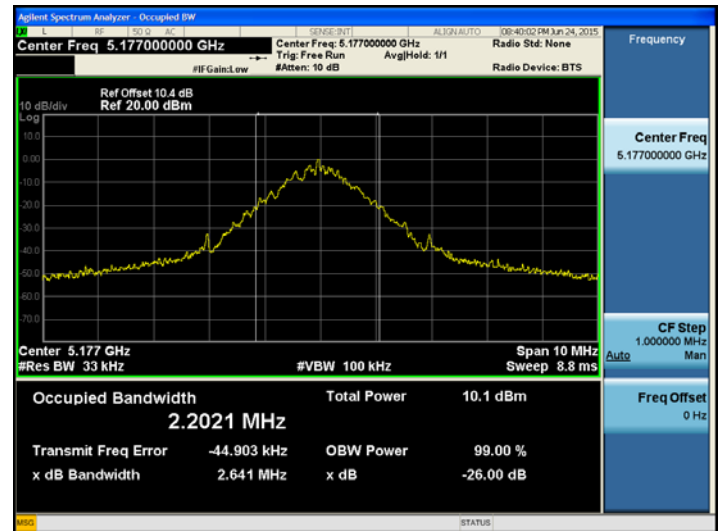
| UNII 3          |      | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] |      |                             |                            |             |
| 5730            | Low  | 4.110                       | N/A                        | Pass        |
| 5777            | Mid  | 4.148                       | N/A                        | Pass        |
| 5821            | High | 4.395                       | N/A                        | Pass        |

■ TEST Plot for UNII 1

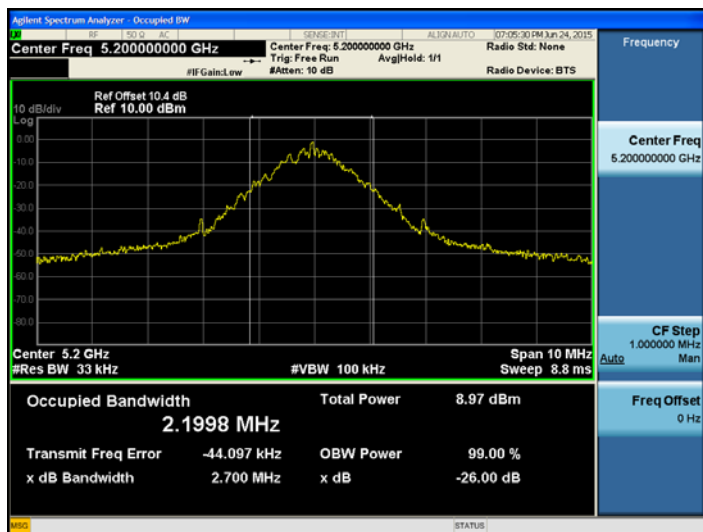
UNII 1 BAND 26dB Bandwidth Low



UNII 1 BAND 26dB Bandwidth Mid

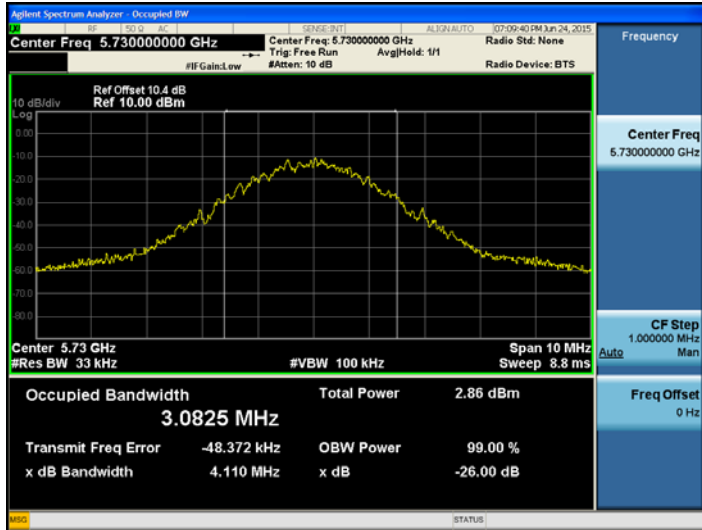


UNII 1 BAND 26dB Bandwidth High

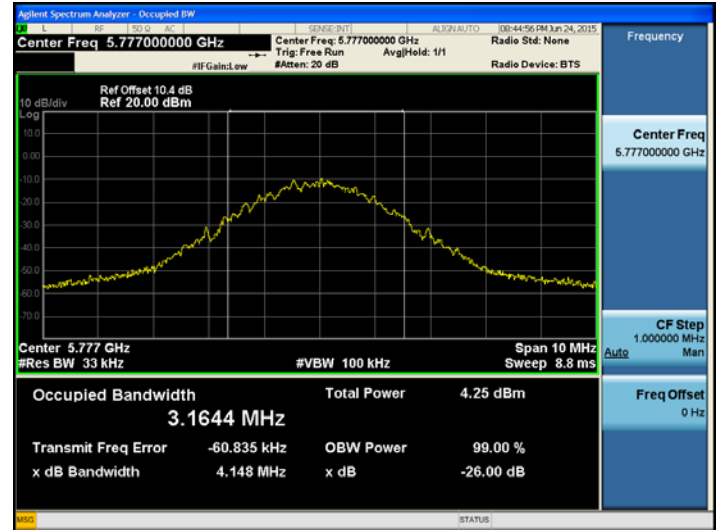


■ TEST Plot for UNII 3

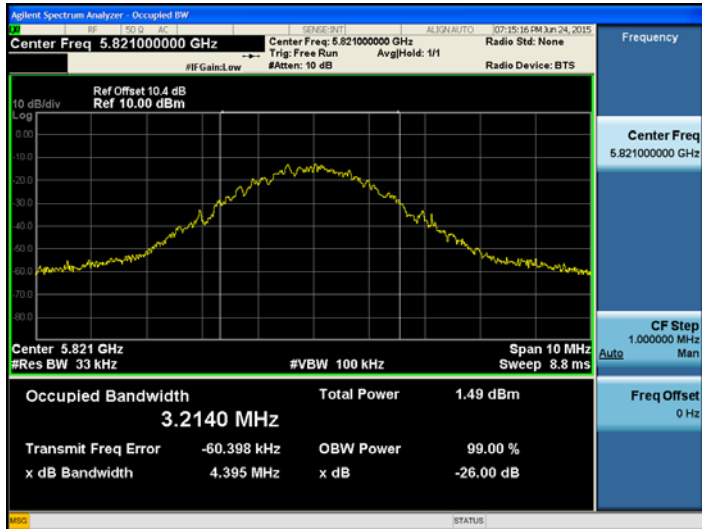
UNII 3 BAND 26dB Bandwidth Low



UNII 3 BAND 26dB Bandwidth Mid



UNII 3 BAND 26dB Bandwidth High



## Conducted 6 dB Bandwidth

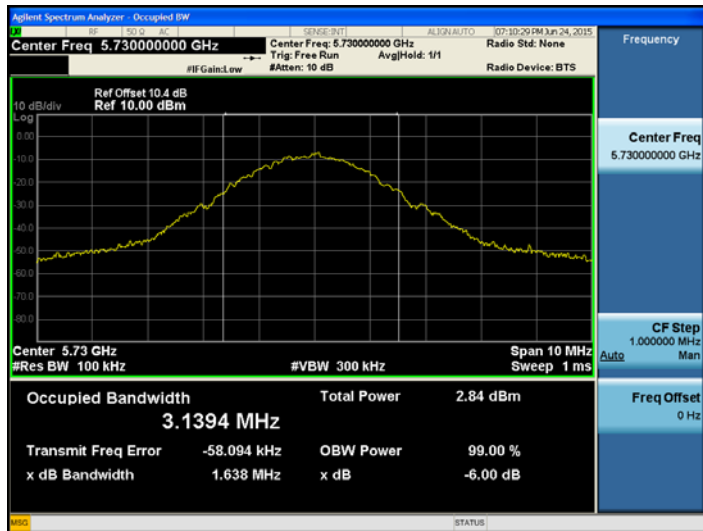
### ■ TEST RESULTS

#### Conducted 6 dB Bandwidth Measurements for UNII 3

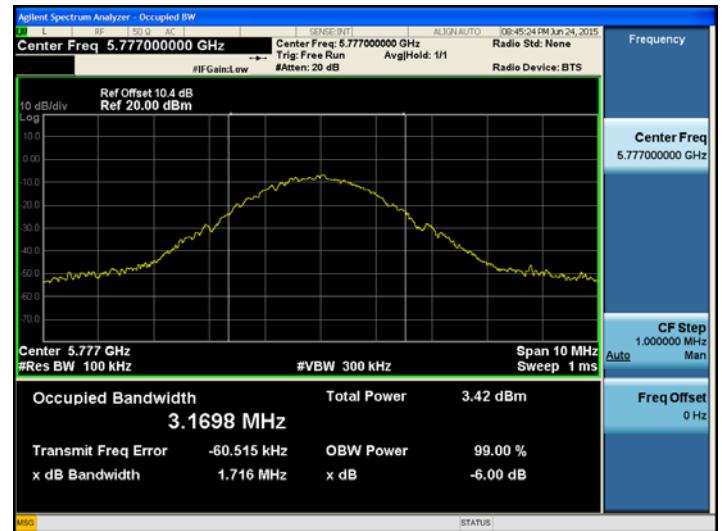
| UNII 3          |      | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] |      |                             |                            |             |
| 5730            | Low  | 1.638                       | 0.5                        | Pass        |
| 5777            | Mid  | 1.716                       | 0.5                        | Pass        |
| 5821            | High | 1.687                       | 0.5                        | Pass        |

■ TEST Plot

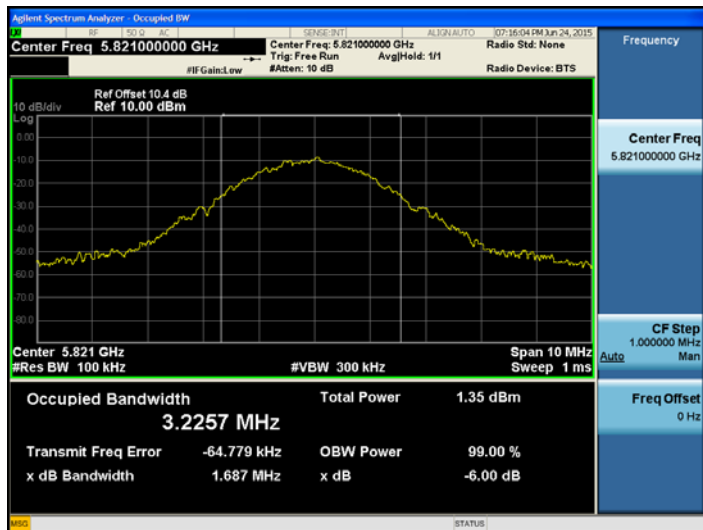
UNII 3 BAND 6dB Bandwidth Low



UNII 3 BAND 6dB Bandwidth Mid



UNII 3 BAND 6dB Bandwidth High



### 8.3 OUTPUT POWER MEASUREMENT

#### Test Requirements and limit, §15.407(a)(1)

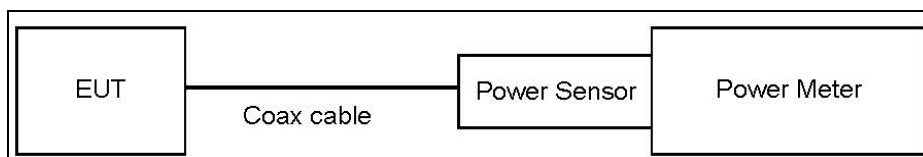
A transmitter antenna terminal of EUT is connected to the input of a Power meter or Spectrum Analyzer .Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

#### ■ Limit

Maximum Conducted Output Power :

| Band   | Limit<br>(dBm) |
|--------|----------------|
| UNII 1 | 23.98          |
| UNII 3 | 30             |

#### ■ TEST CONFIGURATION



#### ■ TEST PROCEDURE

- Average Power (Procedure E.3.a in KDB 789033, issued 06/06/2014).
  1. Measure the duty cycle.
  2. Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
  3. 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.

Note :

1. Actual value of loss for the attenuator and cable combination is below table.

| Band      | Loss(dB) |
|-----------|----------|
| UNII 1, 3 | 10.4     |

(Actual value of loss for the attenuator and cable combination)

**■ TEST RESULTS****Conducted Output Power Measurements**

| UNII 1 (GFSK)      |      | Measured<br>Power(dBm) | Limit<br>(dBm) |
|--------------------|------|------------------------|----------------|
| Frequency<br>[MHz] |      |                        |                |
| 5156               | Low  | 3.730                  | 23.98          |
| 5177               | Mid  | 3.430                  | 23.98          |
| 5200               | High | 3.110                  | 23.98          |

**■ TEST RESULTS****Conducted Output Power Measurements**

| UNII 3 (GFSK)      |      | Measured<br>Power(dBm) | Limit<br>(dBm) |
|--------------------|------|------------------------|----------------|
| Frequency<br>[MHz] |      |                        |                |
| 5730               | Low  | -2.014                 | 30             |
| 5777               | Mid  | -2.415                 | 30             |
| 5821               | High | -2.869                 | 30             |

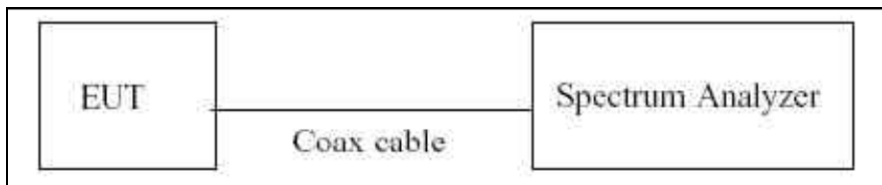
## 8.4 POWER SPECTRAL DENSITY

The power spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

### ■ Limit

| Band   | Limit          |
|--------|----------------|
| UNII 1 | 11 dBm/MHz     |
| UNII 3 | 30 dBm/500 kHz |

### ■ TEST CONFIGURATION



### ■ TEST PROCEDURE

We tested according to Method in KDB 789033(issued 06/06/2014).

The spectrum analyzer is set to :

1. Set span to encompass the entire emission bandwidth(EBW) of the signal.
2. RBW = 1 MHz.
3. VBW  $\geq$  3 MHz.
4. Number of points in sweep  $\geq 2 \times \text{span} / \text{RBW}$ .
5. Sweep time = auto.
6. Detector = RMS(i.e., power averaging), if available. Otherwise, use sample detector mode.
7. Do not use sweep triggering. Allow the sweep to “free run”.
8. Trace average at least 100 traces in power averaging(RMS) mode
9. Use the peak search function on the spectrum analyzer to find the peak of the spectrum.
10. If Method SA-2 was used, add  $10 \log(1/x)$ , where x is the duty cycle, to the peak of the spectrum.

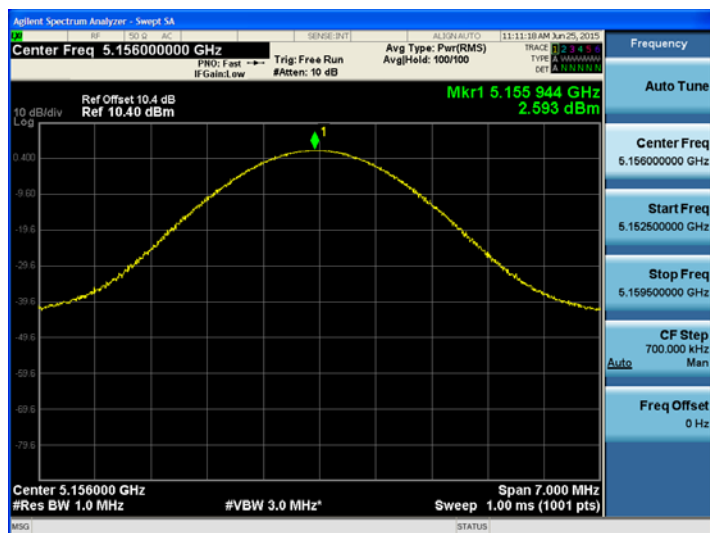
## TEST RESULTS

### Conducted Power Density Measurements

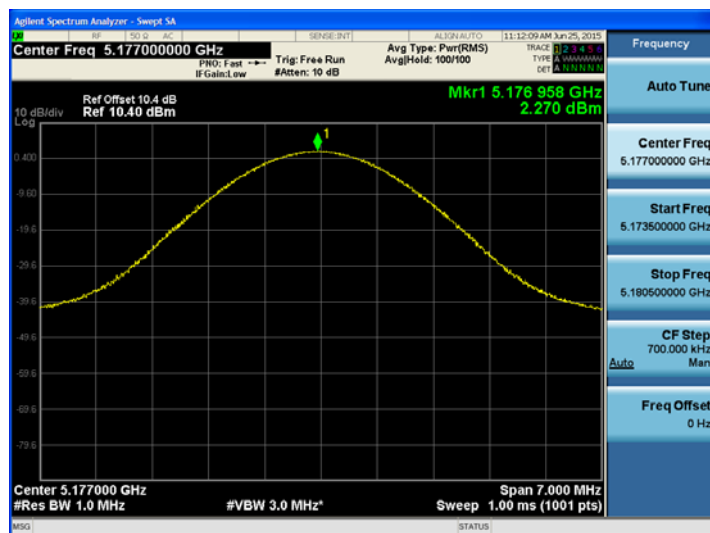
| Frequency (MHz) |      | Mode | Test Result                  |             |           |
|-----------------|------|------|------------------------------|-------------|-----------|
|                 |      |      | Measured Power Density (dBm) | Limit (dBm) | Pass/Fail |
| 5156            | Low  | GFSK | 2.593                        | 11          | Pass      |
| 5177            | Mid  |      | 2.270                        |             | Pass      |
| 5200            | High |      | 1.905                        |             | Pass      |
| 5730            | Low  | GFSK | -6.215                       | 30          | Pass      |
| 5777            | Mid  |      | -6.798                       |             | Pass      |
| 5821            | High |      | -7.457                       |             | Pass      |

TEST Plot

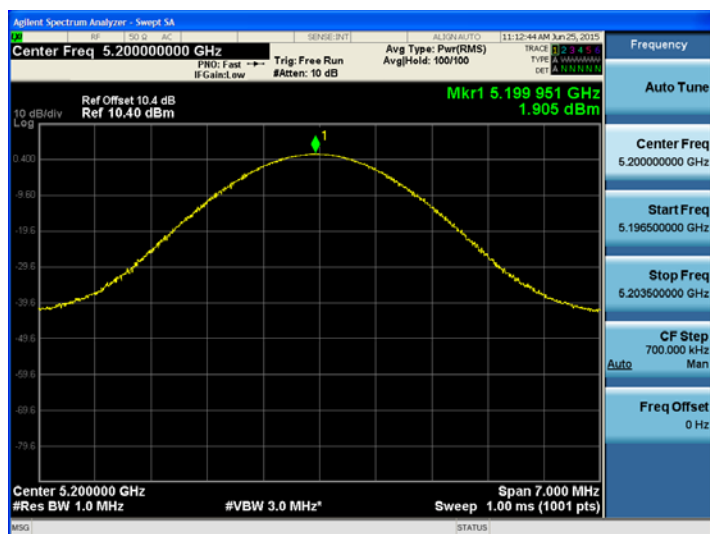
UNII 1 BAND PSD Low



UNII 1 BAND PSD Mid

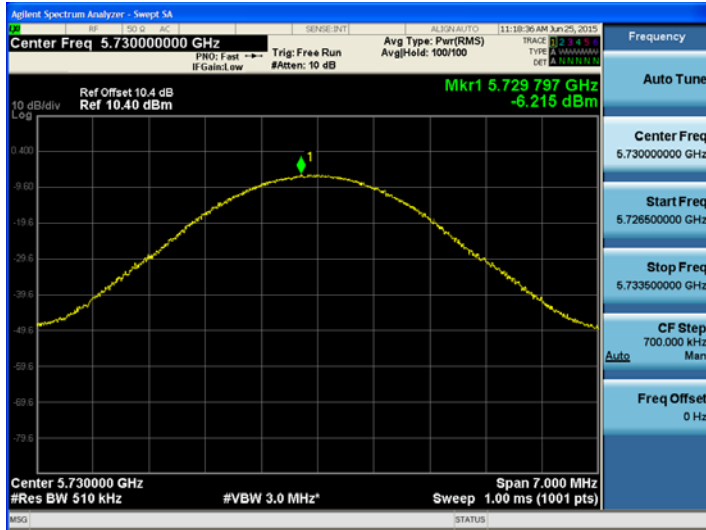


UNII 1 BAND PSD High

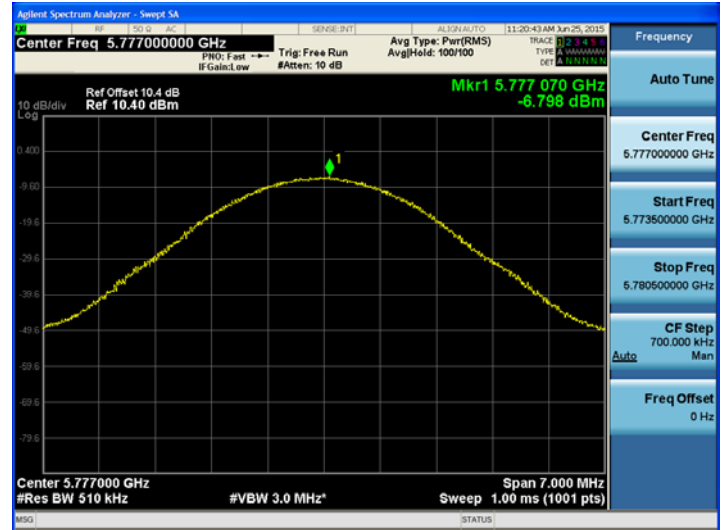


TEST Plot

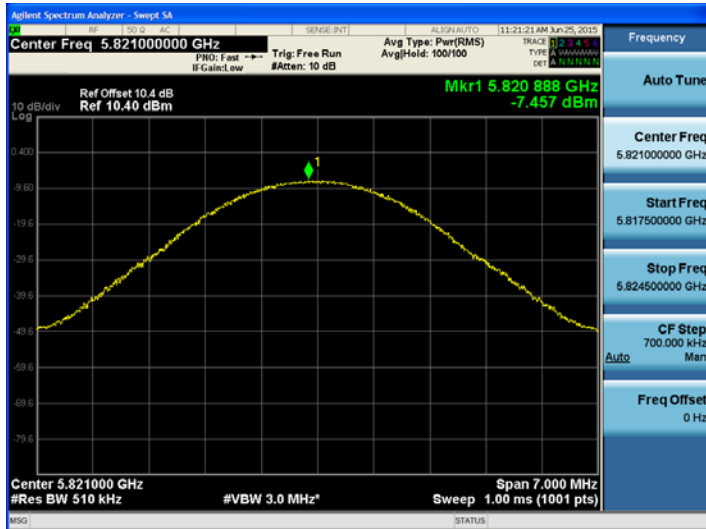
UNII 3 BAND PSD Low



UNII 3 BAND PSD Mid



UNII 3 BAND PSD High



## 8.5 FREQUENCY STABILITY.

The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between -30 °C and 50 °C. The temperature was incremented by 10 °C intervals and the unit was allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

OPERATING BAND: UNII Band 1  
OPERATING FREQUENCY: 5,156,000,000 Hz  
CHANNEL: Low  
REFERENCE VOLTAGE: 3.3 VDC

| Voltage (%) | Power (VDC) | Temp. (°C) | Frequency (kHz) | Frequency Error (kHz) |
|-------------|-------------|------------|-----------------|-----------------------|
| 100%        | 3.30        | +20(Ref)   | 5155967.40      | -32.60                |
| 100%        |             | -30        | 5155950.50      | -49.50                |
| 100%        |             | -20        | 5155955.60      | -44.40                |
| 100%        |             | -10        | 5155958.90      | -41.10                |
| 100%        |             | 0          | 5155963.90      | -36.10                |
| 100%        |             | +10        | 5155965.50      | -34.50                |
| 100%        |             | +30        | 5155970.50      | -29.50                |
| 100%        |             | +40        | 5155974.60      | -25.40                |
| 100%        |             | +50        | 5155978.80      | -21.20                |
| MAX         | 3.45        | +20        | 5155971.50      | -28.50                |
| MIN         | 3.15        | +20        | 5155964.50      | -35.50                |

### Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

OPERATING BAND: UNII Band 3  
OPERATING FREQUENCY: 5,730,000,000 Hz  
CHANNEL: Low  
REFERENCE VOLTAGE: 3.3 VDC

| Voltage (%) | Power (VDC) | Temp. (°C) | Frequency (kHz) | Frequency Error (kHz) |
|-------------|-------------|------------|-----------------|-----------------------|
| 100%        | 3.30        | +20(Ref)   | 5729963.60      | -36.40                |
| 100%        |             | -30        | 5729947.00      | -53.00                |
| 100%        |             | -20        | 5729950.50      | -49.50                |
| 100%        |             | -10        | 5729954.50      | -45.50                |
| 100%        |             | 0          | 5729958.60      | -41.40                |
| 100%        |             | +10        | 5729963.00      | -37.00                |
| 100%        |             | +30        | 5729966.60      | -33.40                |
| 100%        |             | +40        | 5729970.50      | -29.50                |
| 100%        |             | +50        | 5729974.70      | -25.30                |
| MAX         | 3.45        | +20        | 5729967.50      | -32.50                |
| MIN         | 3.15        | +20        | 5729960.50      | -39.50                |

#### Note:

Based on the results of the frequency stability test shown above the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency error noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

## 8.6 RADIATED MEASUREMENT

### 8.6.1 RADIATED SPURIOUS EMISSIONS.

Test Requirements and limit, §15.205, §15.209, §15.407

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

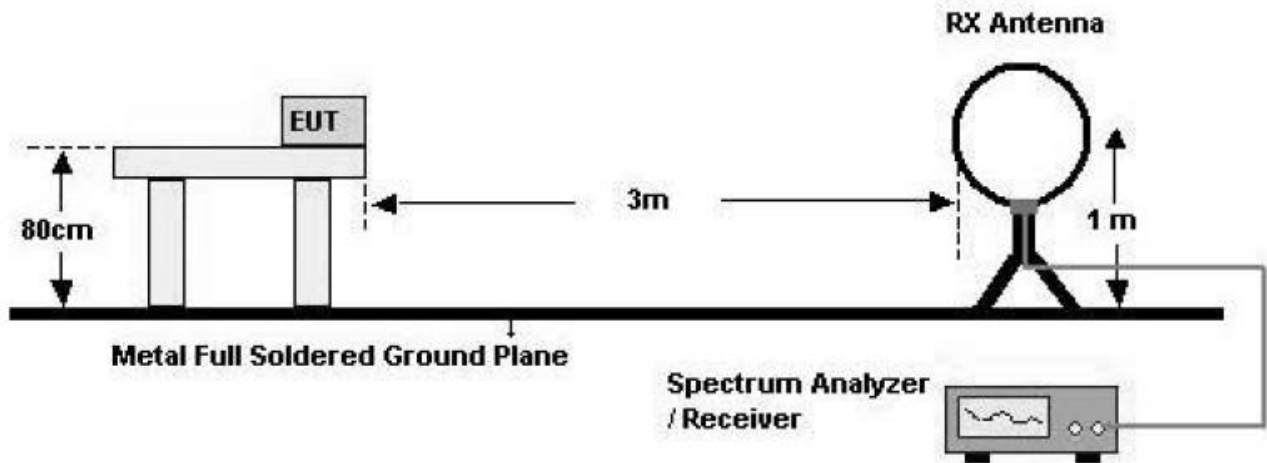
#### ■ §15.407, KDB 789033 D02

All harmonics that do not lie in a restricted band are subject to a peak limit of -27 dBm/MHz. At a distance of 3 meters the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2 dB to the EIRP limit of -27 dBm/MHz to obtain the limit for out of band spurious emissions of 68.2 dBμV/m.

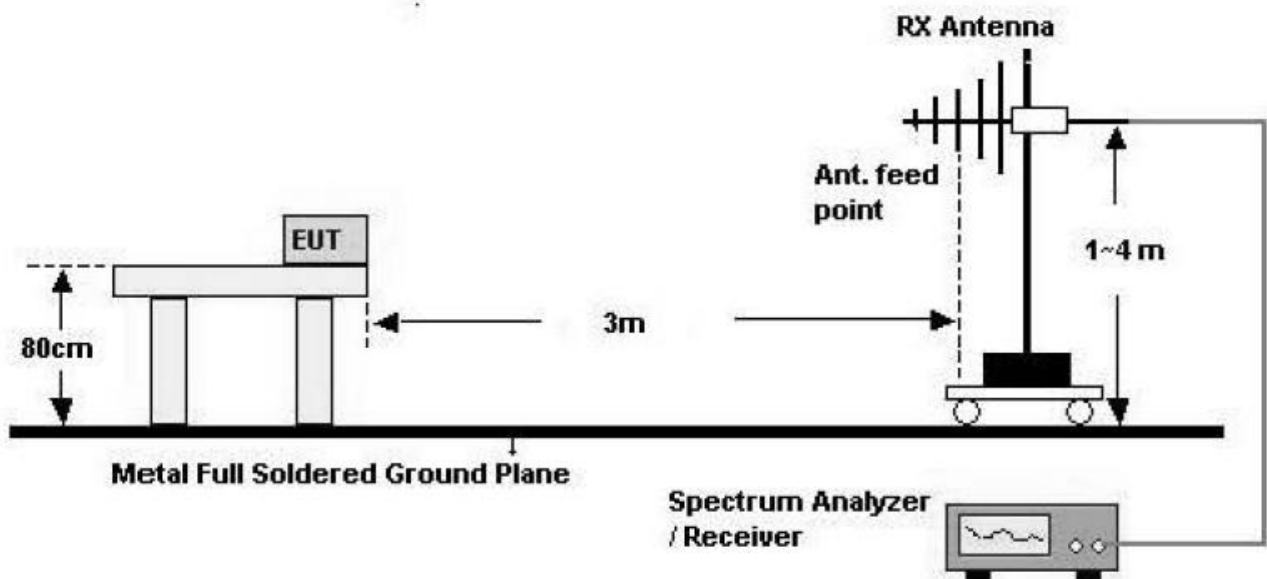
Especially, for transmitter operating in the 5725 Mhz – 5850 MHz : all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequency 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

## Test Configuration

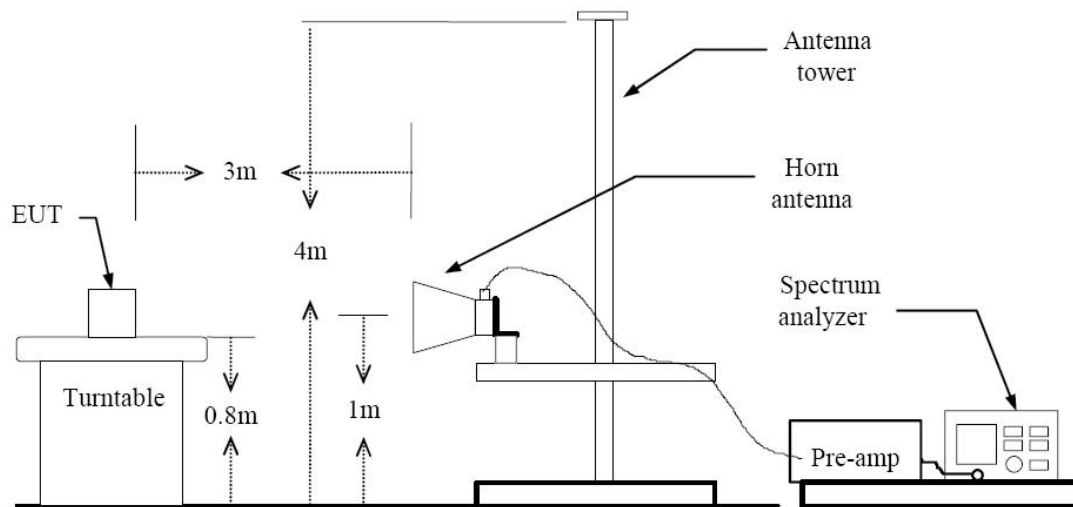
### Below 30 MHz



### 30 MHz - 1 GHz



## Above 1 GHz



## TEST PROCEDURE USED

ANSI C63.4(2003)

Method H)5) in KDB 789033, issued 06/06/2014 (Peak)

Method H)6)d) in KDB 789033, issued 06/06/2014 (Average)

### . Spectrum setting:

- Peak.

1. RBW = 1 MHz

2. VBW  $\geq$  3 MHz

3. Detector = Peak

4. Sweep Time = auto

5. Trace mode = max hold

6. Allow sweeps to continue until the trace stabilizes.

7. Note that if the transmission is not continuous, the time required for the trace to stabilize will increase by a factor of approximately  $1/x$ , where  $x$  is the duty cycle.

- Average ( Method VB :Averaging using reduced video bandwidth)

1. RBW = 1 MHz

2. VBW

2.1. If the EUT is configured to transmit with duty cycle  $\geq$  98 percent, set  $VBW \leq RBW/100$ (i.e., 10 kHz) but not less than 10 Hz.

2.2. If the EUT duty cycle is  $<$  98 percent, set  $VBW \geq 1/T$ , where  $T$  is the minimum transmission duration.

3. The analyzer is set to linear detector mode.

4. Detector = Peak.
5. Sweep time = auto.
6. Trace mode = max hold.
7. Allow max hold to run for at least 50 traces if the transmitted signal is continuous or has at least 98 percent duty cycle. For lower duty cycles, increase the minimum number of traces by a factor of  $1/x$ , where  $x$  is the duty cycle.

**Note :**

The actual setting value of VBW.

| Mode   | T <sub>on</sub><br>(ms) | T <sub>total</sub><br>(ms) | Duty Cycle<br>(%) |
|--------|-------------------------|----------------------------|-------------------|
| UNII 1 | -                       | -                          | 100               |
| UNII 3 | -                       | -                          | 100               |

## TEST RESULTS

9 kHz – 30MHz

**Operation Mode:** Normal Mode

| Frequency               | Reading    | Ant. factor | Cable loss | Ant. POL | Total        | Limit        | Margin |
|-------------------------|------------|-------------|------------|----------|--------------|--------------|--------|
| MHz                     | dB $\mu$ V | dB /m       | dB         | (H/V)    | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| No Critical peaks found |            |             |            |          |              |              |        |

### Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

## TEST RESULTS

### Below 1 GHz

**Operation Mode:** Normal Mode

| Frequency               | Reading    | Ant. factor | Cable loss | Ant. POL | Total        | Limit        | Margin |
|-------------------------|------------|-------------|------------|----------|--------------|--------------|--------|
| MHz                     | dB $\mu$ V | dB /m       | dB         | (H/V)    | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| No Critical peaks found |            |             |            |          |              |              |        |

### Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

## Above 1 GHz

Band : UNII 1  
Operating Frequency 5156 MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 10312              | 67.00           | -2.21                 | V                 | 64.79             | 68.20             | 3.41           | PK                  |
| 15468              | 57.93           | -1.95                 | V                 | 55.98             | 73.98             | 18.00          | PK                  |
| 15468              | 44.58           | -1.95                 | V                 | 42.63             | 53.98             | 11.35          | AV                  |
| 10312              | 66.12           | -2.21                 | H                 | 63.91             | 68.20             | 4.29           | PK                  |
| 15468              | 59.25           | -1.95                 | H                 | 57.30             | 73.98             | 16.68          | PK                  |
| 15468              | 45.59           | -1.95                 | H                 | 43.64             | 53.98             | 10.34          | AV                  |

### Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : UNII 1

Operating Frequency 5177 MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 10354              | 67.20           | -2.16                 | V                 | 65.04             | 68.20             | 3.16           | PK                  |
| 15531              | 59.60           | -2.51                 | V                 | 57.09             | 73.98             | 16.89          | PK                  |
| 15531              | 45.67           | -2.51                 | V                 | 43.16             | 53.98             | 10.82          | AV                  |
| 10354              | 65.75           | -2.16                 | H                 | 63.59             | 68.20             | 4.61           | PK                  |
| 15531              | 59.46           | -2.51                 | H                 | 56.95             | 73.98             | 17.03          | PK                  |
| 15531              | 45.92           | -2.51                 | H                 | 43.41             | 53.98             | 10.57          | AV                  |

#### Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : UNII 1

Operating Frequency 5200MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 10400              | 66.62           | -2.59                 | V                 | 64.03             | 68.20             | 4.17           | PK                  |
| 15600              | 59.61           | -1.62                 | V                 | 57.99             | 73.98             | 15.99          | PK                  |
| 15600              | 46.05           | -1.62                 | V                 | 44.43             | 53.98             | 9.55           | AV                  |
| 10400              | 64.86           | -2.59                 | H                 | 62.27             | 68.20             | 5.93           | PK                  |
| 15600              | 58.99           | -1.62                 | H                 | 57.37             | 73.98             | 16.61          | PK                  |
| 15600              | 45.14           | -1.62                 | H                 | 43.52             | 53.98             | 10.46          | AV                  |

#### Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : UNII 3

Operating Frequency 5730MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 11460              | 62.94           | -1.70                 | V                 | 61.24             | 73.98             | 12.74          | PK                  |
| 11460              | 51.40           | -1.70                 | V                 | 49.70             | 53.98             | 4.28           | AV                  |
| 17235              | 58.54           | 2.52                  | V                 | 61.06             | 68.20             | 7.14           | PK                  |
| 11460              | 62.18           | -1.70                 | H                 | 60.48             | 73.98             | 13.50          | PK                  |
| 11460              | 51.06           | -1.70                 | H                 | 49.36             | 53.98             | 4.62           | AV                  |
| 17235              | 58.26           | 2.52                  | H                 | 60.78             | 68.20             | 7.42           | PK                  |

#### Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : UNII 3

Operating Frequency 5777 MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 11554              | 61.51           | -2.08                 | V                 | 59.43             | 73.98             | 14.55          | PK                  |
| 11554              | 50.12           | -2.08                 | V                 | 48.04             | 53.98             | 5.94           | AV                  |
| 17355              | 59.14           | 2.67                  | V                 | 61.81             | 68.20             | 6.39           | PK                  |
| 11554              | 61.28           | -2.08                 | H                 | 59.20             | 73.98             | 14.78          | PK                  |
| 11554              | 49.56           | -2.08                 | H                 | 47.48             | 53.98             | 6.50           | AV                  |
| 17355              | 59.05           | 2.67                  | H                 | 61.72             | 68.20             | 6.48           | PK                  |

#### Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

Band : UNII 3

Operating Frequency 5821 MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 11642              | 61.88           | -2.36                 | V                 | 59.52             | 73.98             | 14.46          | PK                  |
| 11642              | 49.38           | -2.36                 | V                 | 47.02             | 53.98             | 6.96           | AV                  |
| 17463              | 59.67           | 3.81                  | V                 | 63.48             | 68.20             | 4.72           | PK                  |
| 11642              | 61.05           | -2.36                 | H                 | 58.69             | 73.98             | 15.29          | PK                  |
| 11642              | 48.86           | -2.36                 | H                 | 46.50             | 53.98             | 7.48           | AV                  |
| 14763              | 59.33           | 3.81                  | H                 | 63.14             | 68.20             | 5.06           | PK                  |

#### Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

## 8.6.2 RADIATED RESTRICTED BAND EDGE MEASUREMENTS

### Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Band : UNII 1  
Operating Frequency 5156 MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 5150               | 56.93           | 3.13                    | H                 | 60.06             | 73.98             | 13.92          | PK                  |
| 5150               | 45.40           | 3.13                    | H                 | 48.53             | 53.98             | 5.45           | AV                  |
| 5150               | 55.89           | 3.13                    | V                 | 59.02             | 73.98             | 14.96          | PK                  |
| 5150               | 44.86           | 3.13                    | V                 | 47.99             | 53.98             | 5.99           | AV                  |

Band : UNII 3  
Operating Frequency 5730 MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 5725               | 66.29           | 4.08                    | H                 | 70.37             | 78.20             | 7.83           | PK                  |
| 5725               | 65.45           | 4.08                    | V                 | 69.53             | 78.20             | 8.67           | PK                  |
| 5715               | 57.23           | 3.99                    | H                 | 61.22             | 68.20             | 6.99           | PK                  |
| 5715               | 57.12           | 3.99                    | V                 | 61.11             | 68.20             | 7.10           | PK                  |

Band : UNII 3

Operating Frequency 5821 MHz

| Frequency<br>[MHz] | Reading<br>dBuV | AF.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Measurement<br>Type |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|---------------------|
| 5850               | 55.94           | 4.40                    | H                 | 60.34             | 78.20             | 17.86          | PK                  |
| 5850               | 55.75           | 4.40                    | V                 | 60.15             | 78.20             | 18.05          | PK                  |
| 5860               | 55.48           | 4.42                    | H                 | 59.90             | 68.20             | 8.30           | PK                  |
| 5860               | 55.26           | 4.42                    | V                 | 59.68             | 68.20             | 8.52           | PK                  |

## 8.7 POWERLINE CONDUCTED EMISSIONS

### Test Requirements and limit, §15.207

For an intentional radiator which 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 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

| Frequency Range (MHz) | Limits (dBμV) |          |
|-----------------------|---------------|----------|
|                       | Quasi-peak    | Average  |
| 0.15 to 0.50          | 66 to 56      | 56 to 46 |
| 0.50 to 5             | 56            | 46       |
| 5 to 30               | 60            | 50       |

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

### Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference groundplane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. We are performed the AC Power Line Conducted Emission test at low channel in UNII 3.  
Because the low channel in UNII 3 is worst case.

### Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

## RESULT PLOTS

### Conducted Emissions (Line 1)

EMI Auto Test(6)

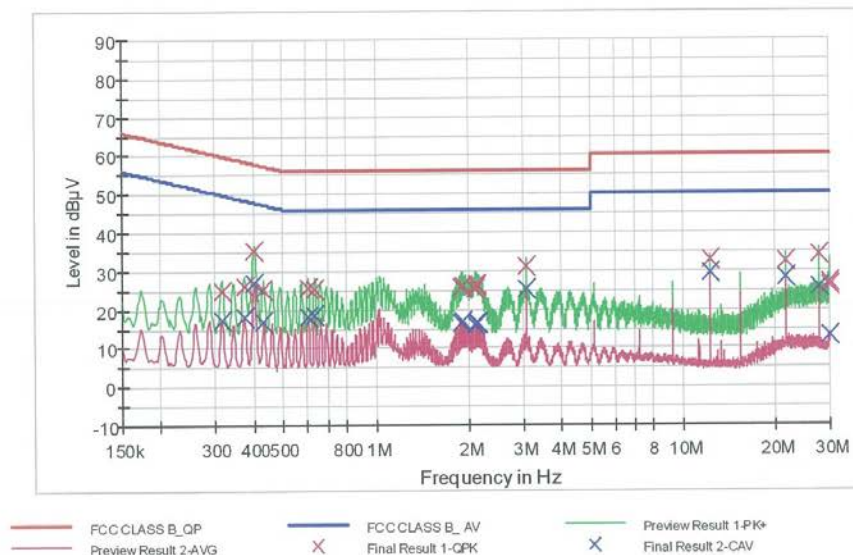
1 / 2

## HCT TEST Report

### Common Information

EUT: LG\_WL1NB6  
Manufacturer: LG  
Test Site: SHIELD ROOM  
Operating Conditions: WLAN MODE\_5G  
Operator Name: JL CHO

FCC CLASS B



### Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|--------|------|------------|-------------|--------------|
| 0.316000        | 24.8             | 9.000           | Off    | L1   | 9.7        | 35.0        | 59.8         |
| 0.374000        | 26.1             | 9.000           | Off    | L1   | 9.7        | 32.3        | 58.4         |
| 0.402000        | 35.3             | 9.000           | Off    | L1   | 9.7        | 22.5        | 57.8         |
| 0.430000        | 25.2             | 9.000           | Off    | L1   | 9.7        | 32.1        | 57.3         |
| 0.604000        | 25.8             | 9.000           | Off    | L1   | 9.6        | 30.2        | 56.0         |
| 0.634000        | 25.3             | 9.000           | Off    | L1   | 9.7        | 30.7        | 56.0         |
| 1.894000        | 25.8             | 9.000           | Off    | L1   | 9.8        | 30.2        | 56.0         |
| 1.924000        | 26.0             | 9.000           | Off    | L1   | 9.8        | 30.0        | 56.0         |
| 2.100000        | 25.1             | 9.000           | Off    | L1   | 9.8        | 30.9        | 56.0         |
| 2.124000        | 26.4             | 9.000           | Off    | L1   | 9.8        | 29.6        | 56.0         |
| 2.128000        | 26.0             | 9.000           | Off    | L1   | 9.8        | 30.0        | 56.0         |
| 3.072000        | 31.1             | 9.000           | Off    | L1   | 9.8        | 24.9        | 56.0         |
| 12.288000       | 33.1             | 9.000           | Off    | L1   | 10.1       | 26.9        | 60.0         |
| 21.504000       | 32.5             | 9.000           | Off    | L1   | 10.3       | 27.5        | 60.0         |
| 27.648000       | 34.1             | 9.000           | Off    | L1   | 10.4       | 25.9        | 60.0         |
| 29.960000       | 26.2             | 9.000           | Off    | L1   | 10.5       | 33.8        | 60.0         |

6/24/2015

2:45:45

## EMI Auto Test(6)

2 / 2

| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|--------|------|------------|-------------|--------------|
| 29.966000       | 26.2             | 9.000           | Off    | L1   | 10.5       | 33.8        | 60.0         |
| 29.998000       | 26.8             | 9.000           | Off    | L1   | 10.5       | 33.2        | 60.0         |

## Final Result 2

| Frequency (MHz) | CAverage (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.316000        | 17.2            | 9.000           | Off    | L1   | 9.7        | 32.6        | 49.8         |
| 0.374000        | 18.2            | 9.000           | Off    | L1   | 9.7        | 30.2        | 48.4         |
| 0.402000        | 27.1            | 9.000           | Off    | L1   | 9.7        | 20.7        | 47.8         |
| 0.432000        | 16.9            | 9.000           | Off    | L1   | 9.7        | 30.3        | 47.2         |
| 0.604000        | 18.1            | 9.000           | Off    | L1   | 9.6        | 27.9        | 46.0         |
| 0.632000        | 18.4            | 9.000           | Off    | L1   | 9.6        | 27.6        | 46.0         |
| 1.898000        | 16.7            | 9.000           | Off    | L1   | 9.8        | 29.3        | 46.0         |
| 1.926000        | 16.8            | 9.000           | Off    | L1   | 9.8        | 29.2        | 46.0         |
| 2.098000        | 16.1            | 9.000           | Off    | L1   | 9.8        | 29.9        | 46.0         |
| 2.128000        | 16.3            | 9.000           | Off    | L1   | 9.8        | 29.7        | 46.0         |
| 2.156000        | 16.4            | 9.000           | Off    | L1   | 9.8        | 29.6        | 46.0         |
| 3.072000        | 25.3            | 9.000           | Off    | L1   | 9.8        | 20.7        | 46.0         |
| 12.288000       | 29.4            | 9.000           | Off    | L1   | 10.1       | 20.6        | 50.0         |
| 21.504000       | 28.1            | 9.000           | Off    | L1   | 10.3       | 21.9        | 50.0         |
| 27.648000       | 25.7            | 9.000           | Off    | L1   | 10.4       | 24.3        | 50.0         |
| 29.928000       | 13.0            | 9.000           | Off    | L1   | 10.5       | 37.0        | 50.0         |
| 29.960000       | 13.1            | 9.000           | Off    | L1   | 10.5       | 36.9        | 50.0         |
| 29.998000       | 13.2            | 9.000           | Off    | L1   | 10.5       | 36.8        | 50.0         |

6/24/2015

2:45:45

## Conducted Emissions (Line 2)

EMI Auto Test(6)

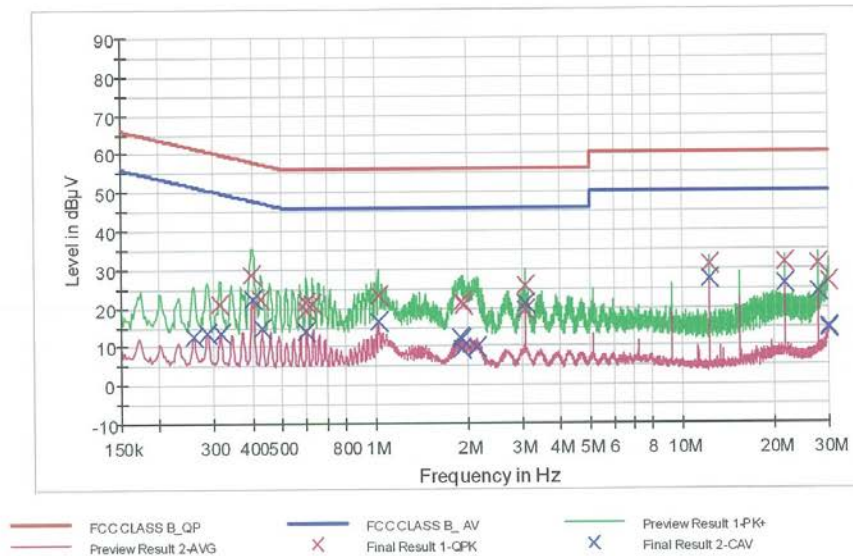
1 / 2

### HCT TEST Report

#### Common Information

EUT: LG\_WL1NB6  
Manufacturer: LG  
Test Site: SHIELD ROOM  
Operating Conditions: WLAN MODE\_5G  
Operator Name: JL CHO

FCC CLASS B



#### Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|--------|------|------------|-------------|--------------|
| 0.314000        | 21.2             | 9.000           | Off    | N    | 9.7        | 38.7        | 59.9         |
| 0.398000        | 28.7             | 9.000           | Off    | N    | 9.7        | 29.2        | 57.9         |
| 0.426000        | 22.5             | 9.000           | Off    | N    | 9.7        | 34.8        | 57.3         |
| 0.596000        | 19.6             | 9.000           | Off    | N    | 9.6        | 36.4        | 56.0         |
| 0.600000        | 21.4             | 9.000           | Off    | N    | 9.6        | 34.6        | 56.0         |
| 0.626000        | 21.2             | 9.000           | Off    | N    | 9.6        | 34.8        | 56.0         |
| 1.024000        | 23.1             | 9.000           | Off    | N    | 9.7        | 32.9        | 56.0         |
| 1.908000        | 21.6             | 9.000           | Off    | N    | 9.8        | 34.4        | 56.0         |
| 1.940000        | 20.7             | 9.000           | Off    | N    | 9.8        | 35.3        | 56.0         |
| 3.070000        | 25.8             | 9.000           | Off    | N    | 9.8        | 30.2        | 56.0         |
| 3.074000        | 25.9             | 9.000           | Off    | N    | 9.8        | 30.1        | 56.0         |
| 3.078000        | 19.5             | 9.000           | Off    | N    | 9.8        | 36.5        | 56.0         |
| 12.288000       | 31.1             | 9.000           | Off    | N    | 10.1       | 28.9        | 60.0         |
| 21.504000       | 31.8             | 9.000           | Off    | N    | 10.3       | 28.2        | 60.0         |
| 27.650000       | 31.1             | 9.000           | Off    | N    | 10.4       | 28.9        | 60.0         |
| 29.952000       | 26.4             | 9.000           | Off    | N    | 10.5       | 33.6        | 60.0         |

6/24/2015

2:59:04

## EMI Auto Test(6)

2 / 2

| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|--------|------|------------|-------------|--------------|
| 29.986000       | 26.4             | 9.000           | Off    | N    | 10.5       | 33.6        | 60.0         |
| 29.994000       | 26.5             | 9.000           | Off    | N    | 10.5       | 33.5        | 60.0         |

## Final Result 2

| Frequency (MHz) | CAverage (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.258000        | 12.5            | 9.000           | Off    | N    | 9.7        | 39.0        | 51.5         |
| 0.286000        | 13.7            | 9.000           | Off    | N    | 9.7        | 36.9        | 50.6         |
| 0.316000        | 13.7            | 9.000           | Off    | N    | 9.7        | 36.1        | 49.8         |
| 0.402000        | 22.5            | 9.000           | Off    | N    | 9.7        | 25.3        | 47.8         |
| 0.430000        | 14.6            | 9.000           | Off    | N    | 9.7        | 32.7        | 47.3         |
| 0.600000        | 13.9            | 9.000           | Off    | N    | 9.6        | 32.1        | 46.0         |
| 1.024000        | 16.3            | 9.000           | Off    | N    | 9.7        | 29.7        | 46.0         |
| 1.888000        | 12.1            | 9.000           | Off    | N    | 9.8        | 33.9        | 46.0         |
| 1.906000        | 9.5             | 9.000           | Off    | N    | 9.8        | 36.5        | 46.0         |
| 1.914000        | 11.7            | 9.000           | Off    | N    | 9.8        | 34.3        | 46.0         |
| 2.134000        | 9.6             | 9.000           | Off    | N    | 9.8        | 36.4        | 46.0         |
| 3.072000        | 21.0            | 9.000           | Off    | N    | 9.8        | 25.0        | 46.0         |
| 12.288000       | 27.2            | 9.000           | Off    | N    | 10.1       | 22.8        | 50.0         |
| 21.504000       | 26.2            | 9.000           | Off    | N    | 10.3       | 23.8        | 50.0         |
| 27.648000       | 24.1            | 9.000           | Off    | N    | 10.4       | 25.9        | 50.0         |
| 29.880000       | 14.4            | 9.000           | Off    | N    | 10.5       | 35.6        | 50.0         |
| 29.944000       | 14.8            | 9.000           | Off    | N    | 10.5       | 35.2        | 50.0         |
| 29.986000       | 14.6            | 9.000           | Off    | N    | 10.5       | 35.4        | 50.0         |

6/24/2015

2:59:04

## 9. LIST OF TEST EQUIPMENT

### 9.1 LIST OF TEST EQUIPMENT(Conducted Test)

| Manufacturer    | Model / Equipment          | Calibration Date | Calibration Interval | Serial No.         |
|-----------------|----------------------------|------------------|----------------------|--------------------|
| Rohde & Schwarz | ENV216/ LISN               | 01/13/2015       | Annual               | 100073             |
| Agilent         | E4440A/ Spectrum Analyzer  | 03/18/2015       | Annual               | US45303008         |
| Agilent         | N9020A/ SIGNAL ANALYZER    | 04/29/2015       | Annual               | MY51110063         |
| Agilent         | N1911A/Power Meter         | 01/15/2015       | Annual               | MY45100523         |
| Agilent         | N1921A /POWER SENSOR       | 07/09/2014       | Annual               | MY45241059         |
| Agilent         | 87300B/Directional Coupler | 12/08/2014       | Annual               | 3116A03621         |
| Hewlett Packard | 11667B / Power Splitter    | 04/29/2015       | Annual               | 11275              |
| ITECH           | IT6720 / DC POWER SUPPLY   | 11/04/2014       | Annual               | 010002156287001199 |
| Agilent         | 8493C / Attenuator(10 dB)  | 07/21/2014       | Annual               | 76649              |

## 9.2 LIST OF TEST EQUIPMENT(Radiated Test)

| Manufacturer          | Model / Equipment                              | Calibration Date | Calibration Interval | Serial No.  |
|-----------------------|------------------------------------------------|------------------|----------------------|-------------|
| Schwarzbeck           | VULB 9160/ TRILOG Antenna                      | 10/10/2014       | Biennial             | 3368        |
| HD                    | MA240/ Antenna Position Tower                  | N/A              | N/A                  | 556         |
| EMCO                  | 1050/ Turn Table                               | N/A              | N/A                  | 114         |
| HD GmbH               | HD 100/ Controller                             | N/A              | N/A                  | 13          |
| HD GmbH               | KMS 560/ SlideBar                              | N/A              | N/A                  | 12          |
| Rohde & Schwarz       | SCU-18/ Signal Conditioning Unit               | 09/04/2014       | Annual               | 10094       |
| CERNEX                | CBL18265035 / POWER AMP                        | 07/23/2014       | Annual               | 22966       |
| Schwarzbeck           | BBHA 9120D/ Horn Antenna                       | 07/05/2013       | Biennial             | 1151        |
| Schwarzbeck           | BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)       | 07/05/2013       | Biennial             | BBHA9170541 |
| Rohde & Schwarz       | FSP / Spectrum Analyzer                        | 10/23/2014       | Annual               | 836650/016  |
| Wainwright Instrument | WHNX7.0/18G-8SS / High Pass Filter             | 08/04/2014       | Annual               | 5           |
| Wainwright Instrument | WRCJV5100/5850-40/50-8EEK / Band Reject Filter | 01/29/2015       | Annual               | 2           |
| Rohde & Schwarz       | LOOP ANTENNA                                   | 09/03/2014       | Biennial             | 1513-175    |
| CERNEX                | CBL06185030 / POWER AMP                        | 07/21/2014       | Annual               | 22965       |
| CERNEX                | CBLU1183540 / POWER AMP                        | 07/21/2014       | Annual               | 22964       |