



# HCT CO., LTD.

## CERTIFICATE OF COMPLIANCE

### FCC Certification

**Applicant Name:**  
LG Electronics MobileComm U.S.A., Inc.

**Address:**  
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

**Date of Issue:**

July 08, 2014

**Test Site/Location:**

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

**Report No.:** HCT-R-1407-F005-3

**HCT FRN:** 0005866421

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

|                  |                                                 |
|------------------|-------------------------------------------------|
| <b>FCC ID</b>    | <b>: ZNFV480</b>                                |
| <b>IC</b>        | <b>: 2703C-V480</b>                             |
| <b>APPLICANT</b> | <b>: LG Electronics MobileComm U.S.A., Inc.</b> |

**FCC/ IC Model(s):** LG-V480

**Additional FCC/ IC Model(s):** LGV480, V480

**EUT Type:** 2.4/5GHz BT/WiFi Tablet

**Max. RF Output Power:** Wi-Fi 802.11a (5180~5240) (8.33 dBm)/ Wi-Fi 802.11a (5260~5320) (8.80 dBm)/  
Wi-Fi 802.11a (5500~5700) (8.70 dBm)/ Wi-Fi 802.11n\_20 MHz BW (5180~5240) (7.42 dBm)/  
Wi-Fi 802.11n\_20 MHz BW(5260~5320)(7.83 dBm)/ Wi-Fi 802.11n\_20 MHz BW(5500~5700)(7.60 dBm)/  
Wi-Fi 802.11n\_40 MHz BW(5190~5230) (6.72 dBm)/ Wi-Fi 802.11n\_40 MHz BW (5270~5310) (6.75 dBm)/  
Wi-Fi 802.11n\_40 MHz BW (5510~5670) (7.78 dBm)

**Frequency Range:** 20 MHz BW: 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2A)/  
5500 MHz - 5700 MHz (UNII 2C)  
40 MHz BW: 5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2A)/  
5510 MHz - 5670 MHz (UNII 2C)

**Modulation type** OFDM

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

**FCC Rule Part(s):** Part 15.407

**IC Rule :** RSS-210 Issue 8 , RSS-GEN Issue 3

**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**  
**: Jong Seok Lee**  
**Test Engineer of RF Team**

**Approved by**  
**: Chang Seok Choi**  
**Manager of RF Team**

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|                                             |                                          |                                          |                           |                                                  |
|---------------------------------------------|------------------------------------------|------------------------------------------|---------------------------|--------------------------------------------------|
| <b>FCC PT.15.407<br/>TEST REPORT</b>        | <b>FCC &amp; IC CERTIFICATION REPORT</b> |                                          |                           | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| <b>Test Report No.</b><br>HCT-R-1407-F005-3 | <b>Date of Issue:</b><br>July 08, 2014   | <b>EUT Type:</b> 2.4/5GHz BT/WiFi Tablet | <b>FCC ID:</b><br>ZNFV480 | <b>IC:</b><br>2703C-V480                         |

## Version

| TEST REPORT NO.   | DATE          | DESCRIPTION                                           |
|-------------------|---------------|-------------------------------------------------------|
| HCT-R-1407-F005   | July 01, 2014 | - First Approval Report                               |
| HCT-R-1407-F005-1 | July 01, 2014 | - Revised the IC Rule on Page 1                       |
| HCT-R-1407-F005-2 | July 04, 2014 | - Retest the 20dB Bandwidth                           |
| HCT-R-1407-F005-3 | July 08, 2014 | - Add the Band Edge Plot for 5250 MHz on Page 126-128 |

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## 1. GENERAL INFORMATION

**Applicant:** LG Electronics MobileComm U.S.A., Inc.  
**Address:** 1000 Sylvan Avenue, Englewood Cliffs NJ 07632  
**FCC ID:** ZNFV480  
**IC:** 2703C-V480  
**EUT Type:** 2.4/5GHz BT/WiFi Tablet  
**FCC/IC Model name(s):** LG-V480  
**Additional FCC/IC Model name(s):** LGV480, V480  
**Date(s) of Tests:** June 17, 2014 ~ July 04, 2014  
**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>EUT Type</b>                      | 2.4/5GHz BT/WiFi Tablet                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>FCC/IC Model Name</b>             | LG-V480                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Additional FCC/ IC Model Name</b> | LGV480, V480                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Power Supply</b>                  | DC 3.7 V                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Frequency Range</b>               | TX_20 MHz BW:<br>40 MHz BW:<br><br>RX_20 MHz BW:<br>40 MHz BW:                                                                                                                                                                                                                                                                                                                                                          | 5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2A)/<br>5500 MHz - 5700 MHz (UNII 2C) where) Not supported 5600 MHz – 5640 MHz<br>5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2A)/<br>5510 MHz - 5670 MHz (UNII 2C) where) Not supported 5590 MHz – 5630 MHz<br><br>5180 MHz - 5240 MHz (UNII 1)/ 5260 MHz - 5320 MHz (UNII 2A)/<br>5500 MHz - 5700 MHz (UNII 2C) where) Not supported 5600 MHz – 5640 MHz<br>5190 MHz - 5230 MHz (UNII 1)/ 5270 MHz - 5310 MHz (UNII 2A)/<br>5510 MHz - 5670 MHz (UNII 2C) where) Not supported 5590 MHz – 5630 MHz |
| <b>Max. RF Output Power:</b>         | Wi-Fi 802.11a (5180~5240) (8.33 dBm)/ Wi-Fi 802.11a (5260~5320) (8.80 dBm)/<br>Wi-Fi 802.11a (5500~5700) (8.70 dBm)/ Wi-Fi 802.11n_20 MHz BW (5180~5240) (7.42 dBm)/<br>Wi-Fi 802.11n_20 MHz BW(5260~5320)(7.83 dBm)/ Wi-Fi 802.11n_20 MHz BW(5500~5700)(7.60 dBm)/<br>Wi-Fi 802.11n_40 MHz BW(5190~5230) (6.72 dBm)/ Wi-Fi 802.11n_40 MHz BW (5270~5310) (6.75 dBm)/<br>Wi-Fi 802.11n_40 MHz BW (5510~5670) (7.78 dBm) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Modulation Type</b>               | OFDM(802.11a, 802.11n_20 MHz, 802.11n_40 MHz)                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Antenna Specification</b>         | Manufacturer: ace technologyA<br>Antenna type: Planar Inverted F Antenna<br>Peak Gain : -1.83 dBi                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

|                                             |                                          |                                          |                           |                                                  |
|---------------------------------------------|------------------------------------------|------------------------------------------|---------------------------|--------------------------------------------------|
| <b>FCC PT.15.407 TEST REPORT</b>            | <b>FCC &amp; IC CERTIFICATION REPORT</b> |                                          |                           | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| <b>Test Report No.</b><br>HCT-R-1407-F005-3 | <b>Date of Issue:</b><br>July 08, 2014   | <b>EUT Type:</b> 2.4/5GHz BT/WiFi Tablet | <b>FCC ID:</b><br>ZNFV480 | <b>IC:</b><br>2703C-V480                         |

### 3. TEST METHODOLOGY

The measurement procedure described in FCC KDB 789033 D01 General UNII Test Procedures Old Rules v01r04 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.

| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## 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 directional gain of this E.U.T antenna exceeds 6 dBi
- \* The E.U.T Complies with the requirement of §15.203, §15.407, RSS-GEN 7.1.2

|                                             |                                          |                                          |                           |                                                  |
|---------------------------------------------|------------------------------------------|------------------------------------------|---------------------------|--------------------------------------------------|
| <b>FCC PT.15.407<br/>TEST REPORT</b>        | <b>FCC &amp; IC CERTIFICATION REPORT</b> |                                          |                           | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| <b>Test Report No.</b><br>HCT-R-1407-F005-3 | <b>Date of Issue:</b><br>July 08, 2014   | <b>EUT Type:</b> 2.4/5GHz BT/WiFi Tablet | <b>FCC ID:</b><br>ZNFV480 | <b>IC:</b><br>2703C-V480                         |

## 7. SUMMARY OF TEST RESULTS

### 7.1 FCC Part

| Test Description                                                             | FCC Part Section(s)             | Test Limit                                                                                                                                                                                          | Test Condition | Test Result |
|------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|
| 26dB Bandwidth                                                               | §15.407 (for Power Measurement) | NA                                                                                                                                                                                                  | CONDUCTED      | PASS        |
| Maximum Conducted Output Power,                                              | §15.407(a)(1)                   | < 50 mW or $4+10 \log_{10}$ (BW) dBm (5150-5250 MHz)<br>< 250 mW or $11+10 \log_{10}$ (BW) dBm (5250-5350 MHz)<br>< 250 mW or $11+10 \log_{10}$ (BW) dBm (5470-5725 MHz)<br>Whichever power is less |                | PASS        |
| Peak Power Spectral Density                                                  | §15.407(a)(1), (5)              | <4 dBm/ MHz (5150-5250)<br><11 dBm/ MHz (5250-5350)<br><11 dBm/ MHz (5470-5725)                                                                                                                     |                | PASS        |
| Peak Excursion                                                               | §15.407(a)(6)                   | <13 dB/ MHz maximum difference                                                                                                                                                                      |                | PASS        |
| Frequency Stability                                                          | §15.407(g)                      | NA                                                                                                                                                                                                  |                | NA          |
| AC Conducted Emissions 150 kHz-30 MHz                                        | §15.207                         | <FCC 15.207 limits                                                                                                                                                                                  |                | NA          |
| Undesirable Emissions                                                        | §15.407(b)(1), (2), (3)         | <-27 dBm/ MHz EIRP (5150-5350 MHz, 5470-5725 MHz)                                                                                                                                                   | 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        |

## 7.2 IC Part

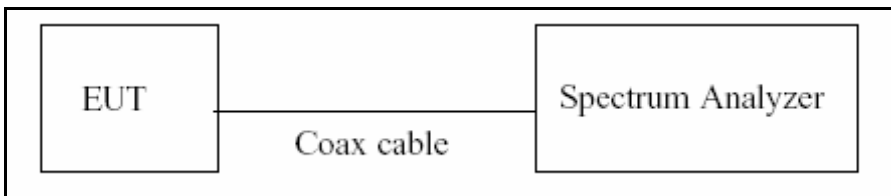
| Test Description                                                                   | IC Part Section(s)        | Test Limit                                                                                                                                                                                                           | Test Condition | Test Result |
|------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|
| 99% Bandwidth(IC)                                                                  | RSS-GEN 4.6.1             | NA                                                                                                                                                                                                                   | CONDUCTED      | PASS        |
| Maximum Conducted Output Power,                                                    | RSS-210 [A9.2]            | < 250 mW or $11+10 \log_{10}$ (BW) dBm<br>(5250-5350 MHz)<br>< 250 mW or $11+10 \log_{10}$ (BW) dBm<br>(5470-5600 & 5650-5725 MHz)<br>Whichever power is less                                                        |                | PASS        |
| Maximum e.i.r.p                                                                    |                           | < 200 mW or $10+10 \log_{10}$ (BW) dBm<br>(5150-5250 MHz)<br>< 1 W or $17+10 \log_{10}$ (BW) dBm<br>(5250-5350 MHz)<br>< 1 W or $17+10 \log_{10}$ (BW) dBm<br>(5470-5600 & 5650-5725 MHz)<br>Whichever power is less |                |             |
| Peak Power Spectral Density                                                        | RSS-210 [A9.2]            | <10 dBm/ MHz(e.i.r.p.)<br>(5150-5250)<br><11 dBm/ MHz<br>(5250-5350)<br><11 dBm/ MHz<br>(5470-5600 & 5650-5725 MHz)                                                                                                  |                | PASS        |
| AC Conducted Emissions<br>150 kHz-30 MHz                                           | RSS-GEN, Section<br>7.2.4 | RSS-GEN<br>section 7.2.4 table 4                                                                                                                                                                                     |                | NA          |
| Undesirable Emissions                                                              | RSS-210 [A8.5]            | <-27 dBm/ MHz EIRP<br>(5150-5350 MHz,<br>5470-5600 MHz<br>5650-5725 MHz)                                                                                                                                             | RADIATED       | PASS        |
| General Field Strength<br>Limits(Restricted Bands and<br>Radiated Emission Limits) | RSS-GEN, Section<br>7.2.3 | Emissions in restricted bands<br>must meet the radiated limits<br>detailed in 15.209                                                                                                                                 |                | PASS        |
| Receiver Spurious Emissions                                                        | RSS-GEN, Section<br>7.2.3 | cf. Section 8.8.3                                                                                                                                                                                                    |                | 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( 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 =  $10 \cdot \log(1/\text{Duty Cycle})$

|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

# □ Duty Cycle Factor

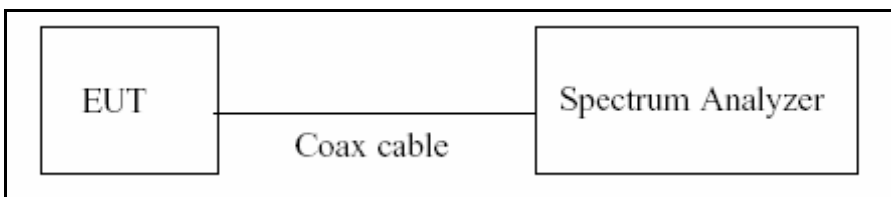
| Mode                      | Data Rate | T <sub>on</sub><br>(ms) | T <sub>total</sub><br>(ms) | Duty Cycle | Duty Cycle Factor |
|---------------------------|-----------|-------------------------|----------------------------|------------|-------------------|
| 802.11a Mode              | 6         | 2.030                   | 2.130                      | 0.95305164 | 0.209             |
|                           | 9         | 1.359                   | 1.458                      | 0.93209877 | 0.305             |
|                           | 12        | 1.028                   | 1.126                      | 0.91296625 | 0.395             |
|                           | 18        | 0.692                   | 0.790                      | 0.87594937 | 0.575             |
|                           | 24        | 0.522                   | 0.622                      | 0.83922830 | 0.761             |
|                           | 36        | 0.355                   | 0.454                      | 0.78193833 | 1.068             |
|                           | 48        | 0.272                   | 0.370                      | 0.73513514 | 1.336             |
|                           | 54        | 0.243                   | 0.342                      | 0.71052632 | 1.484             |
| 802.11n Mode<br>20 MHz BW | 6.5       | 1.875                   | 1.974                      | 0.94984802 | 0.223             |
|                           | 13        | 0.951                   | 1.050                      | 0.90571429 | 0.430             |
|                           | 19.5      | 0.644                   | 0.742                      | 0.86792453 | 0.615             |
|                           | 26        | 0.488                   | 0.586                      | 0.83276451 | 0.795             |
|                           | 39        | 0.335                   | 0.434                      | 0.77188940 | 1.124             |
|                           | 52        | 0.256                   | 0.353                      | 0.72521246 | 1.395             |
|                           | 58.5      | 0.231                   | 0.330                      | 0.70000000 | 1.549             |
|                           | 65        | 0.211                   | 0.310                      | 0.68064516 | 1.671             |
| 802.11n Mode<br>40 MHz BW | 13.5      | 0.916                   | 1.020                      | 0.89803922 | 0.467             |
|                           | 27        | 0.471                   | 0.572                      | 0.82342657 | 0.844             |
|                           | 40.5      | 0.322                   | 0.423                      | 0.76122931 | 1.185             |
|                           | 54        | 0.247                   | 0.347                      | 0.71181556 | 1.476             |
|                           | 81        | 0.175                   | 0.275                      | 0.63636364 | 1.963             |
|                           | 108       | 0.136                   | 0.236                      | 0.57627119 | 2.394             |
|                           | 121.5     | 0.122                   | 0.223                      | 0.54708520 | 2.619             |
|                           | 135       | 0.116                   | 0.216                      | 0.53703704 | 2.700             |

## 8.2 26 dB 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(issued 06/06/2014), at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26 dB bandwidth.

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

### □ TEST CONFIGURATION



### □ TEST PROCEDURE

The transmitter output is connected to the Spectrum Analyzer.

The Spectrum Analyzer is set to (C in KDB 789033, 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 RESULTS

### Conducted 26 dB Bandwidth Measurements for 802.11a

| 802.11a Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5180            | 36          | 21.97                       | N/A                        | Pass        |
| 5200            | 40          | 21.63                       | N/A                        | Pass        |
| 5240            | 48          | 21.68                       | N/A                        | Pass        |

### Conducted 26 dB Bandwidth Measurements for 802.11a

| 802.11a Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5260            | 52          | 22.02                       | N/A                        | Pass        |
| 5300            | 60          | 21.87                       | N/A                        | Pass        |
| 5320            | 64          | 21.74                       | N/A                        | Pass        |

### Conducted 26 dB Bandwidth Measurements for 802.11a

| 802.11a Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5500            | 100         | 21.50                       | N/A                        | Pass        |
| 5580            | 116         | 21.68                       | N/A                        | Pass        |
| 5700            | 140         | 21.58                       | N/A                        | Pass        |

# □ TEST RESULTS

20 MHz BW

## Conducted 26 dB Bandwidth Measurements for 802.11n

| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5180            | 36          | 22.09                       | N/A                        | Pass        |
| 5200            | 40          | 22.00                       | N/A                        | Pass        |
| 5240            | 48          | 22.10                       | N/A                        | Pass        |

## Conducted 26 dB Bandwidth Measurements for 802.11n

| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5260            | 52          | 22.18                       | N/A                        | Pass        |
| 5300            | 60          | 22.42                       | N/A                        | Pass        |
| 5320            | 64          | 22.02                       | N/A                        | Pass        |

## Conducted 26 dB Bandwidth Measurements for 802.11n

| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5500            | 100         | 22.10                       | N/A                        | Pass        |
| 5580            | 116         | 22.20                       | N/A                        | Pass        |
| 5700            | 140         | 22.31                       | N/A                        | Pass        |

40 MHz BW

Conducted 26 dB Bandwidth Measurements for 802.11n

| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5190            | 38          | 43.40                       | N/A                        | Pass        |
| 5230            | 46          | 43.09                       | N/A                        | Pass        |

Conducted 26 dB Bandwidth Measurements for 802.11n

| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5270            | 54          | 43.13                       | N/A                        | Pass        |
| 5310            | 62          | 42.38                       | N/A                        | Pass        |

Conducted 26 dB Bandwidth Measurements for 802.11n

| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5510            | 102         | 42.74                       | N/A                        | Pass        |
| 5550            | 110         | 42.77                       | N/A                        | Pass        |
| 5670            | 134         | 44.07                       | N/A                        | Pass        |

Note :

1. In order to simplify the report, attached plots were only the most wide channel.

## □ 20 dB BW TEST RESULTS(Additional Test)

### Conducted 20 dB Bandwidth Measurements for 802.11a

| 802.11a Mode        |             |             |         | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---------------------|-------------|-------------|---------|--------------------------|-------------------------|-------------|
| Frequency [MHz]     |             | Channel No. |         |                          |                         |             |
| 5240                |             | 48          |         | 18.32                    | N/A                     | Pass        |
| Voltage Power (VDC) | Temp. ( □ ) | Fre. (MHz)  | Ch. No. | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
| 100%                | -30         | 5260        | 52      | 18.37                    | N/A                     | Pass        |
| 100%                | +50         |             |         | 18.43                    | N/A                     | Pass        |
| 100%                | +20(Ref)    |             |         | 18.35                    | N/A                     | Pass        |
| 115%                |             |             |         | 18.46                    | N/A                     | Pass        |
| Batt. Endpoint      |             |             |         | 18.46                    | N/A                     | Pass        |

### Conducted 20 dB Bandwidth Measurements for 802.11n\_20 MHz BW

| 802.11a Mode        |             |             |         | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---------------------|-------------|-------------|---------|--------------------------|-------------------------|-------------|
| Frequency [MHz]     |             | Channel No. |         |                          |                         |             |
| 5240                |             | 48          |         | 19.22                    | N/A                     | Pass        |
| Voltage Power (VDC) | Temp. ( □ ) | Fre. (MHz)  | Ch. No. | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
| 100%                | -30         | 5260        | 52      | 19.34                    | N/A                     | Pass        |
| 100%                | +50         |             |         | 19.25                    | N/A                     | Pass        |
| 100%                | +20(Ref)    |             |         | 19.26                    | N/A                     | Pass        |
| 115%                |             |             |         | 19.18                    | N/A                     | Pass        |
| Batt. Endpoint      |             |             |         | 19.35                    | N/A                     | Pass        |

### Conducted 20 dB Bandwidth Measurements for 802.11n\_40 MHz BW

| 802.11a Mode        |             |             |         | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---------------------|-------------|-------------|---------|--------------------------|-------------------------|-------------|
| Frequency [MHz]     |             | Channel No. |         |                          |                         |             |
| 5230                |             | 46          |         | 37.73                    | N/A                     | Pass        |
| Voltage Power (VDC) | Temp. ( □ ) | Fre. (MHz)  | Ch. No. | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
| 100%                | -30         | 5270        | 54      | 37.65                    | N/A                     | Pass        |
| 100%                | +50         |             |         | 37.78                    | N/A                     | Pass        |
| 100%                | +20(Ref)    |             |         | 37.84                    | N/A                     | Pass        |
| 115%                |             |             |         | 37.79                    | N/A                     | Pass        |
| Batt. Endpoint      |             |             |         | 37.72                    | N/A                     | Pass        |

Conducted 20 dB Bandwidth Measurements for 802.11a

| 802.11a Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5660            | 132         | 19.48                       | N/A                        | Pass        |

Conducted 20 dB Bandwidth Measurements for 802.11n\_20 MHz BW

| 802.11a Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5660            | 132         | 19.90                       | N/A                        | Pass        |

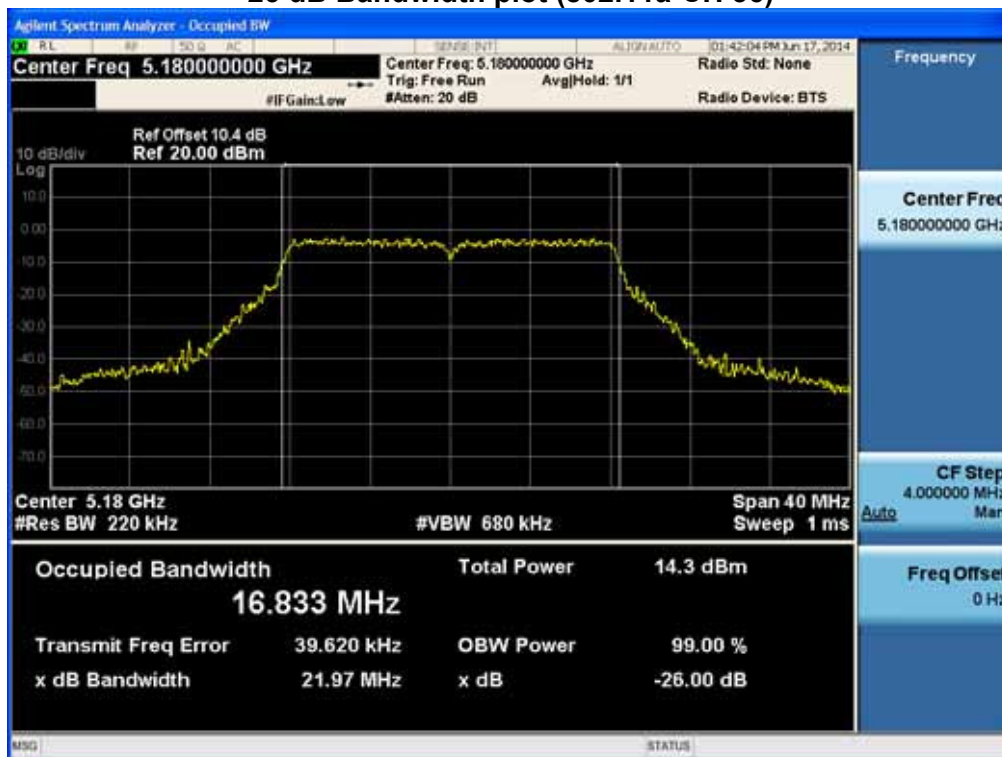
Conducted 20 dB Bandwidth Measurements for 802.11n\_40 MHz BW

| 802.11a Mode    |             | Measured Bandwidth<br>[MHz] | Minimum Bandwidth<br>[MHz] | Pass / Fail |
|-----------------|-------------|-----------------------------|----------------------------|-------------|
| Frequency [MHz] | Channel No. |                             |                            |             |
| 5670            | 134         | 39.33                       | N/A                        | Pass        |

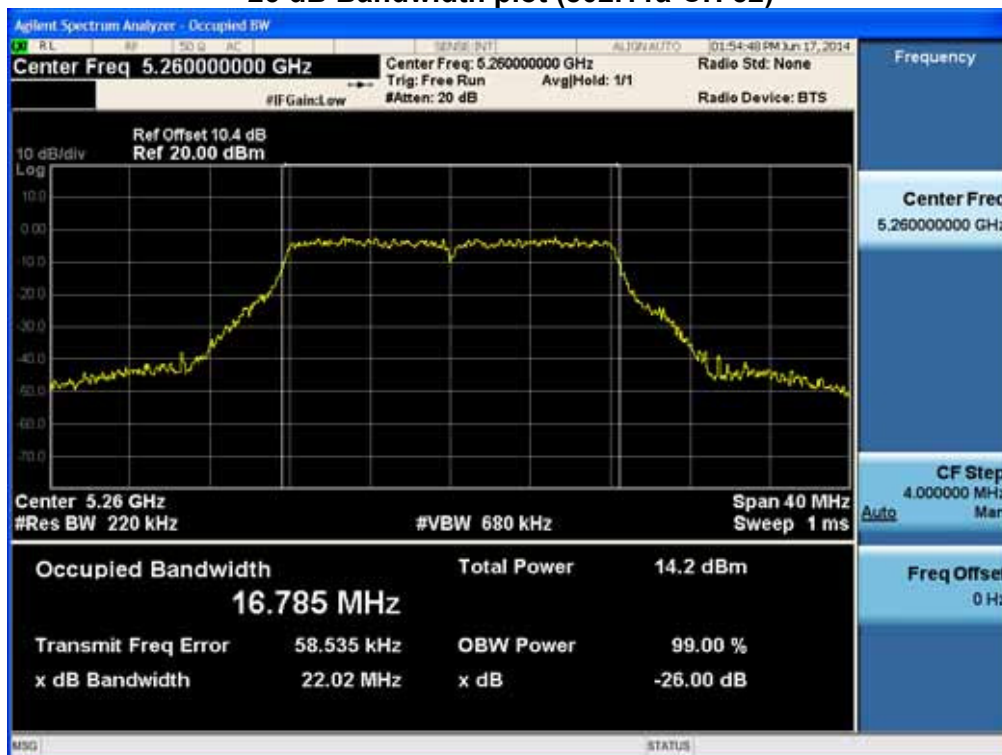
Note : We performed the 20 dB BW test to prove that no part of the fundamental emissions of any UNII2 band signal lies within the UNII band 1. Also, we performed the 20 dB BW test to prove that no part of the fundamental emissions of any channel 132 and 134 signal lies within the TDWR band.

## RESULT PLOTS

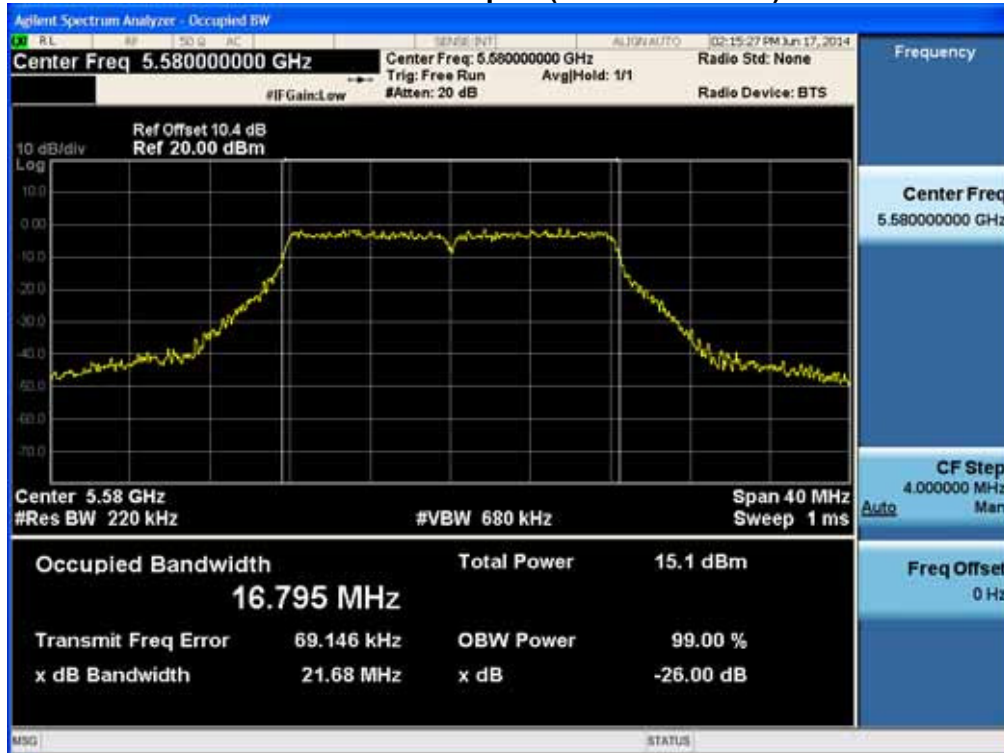
26 dB Bandwidth plot (802.11a-CH 36)



26 dB Bandwidth plot (802.11a-CH 52)

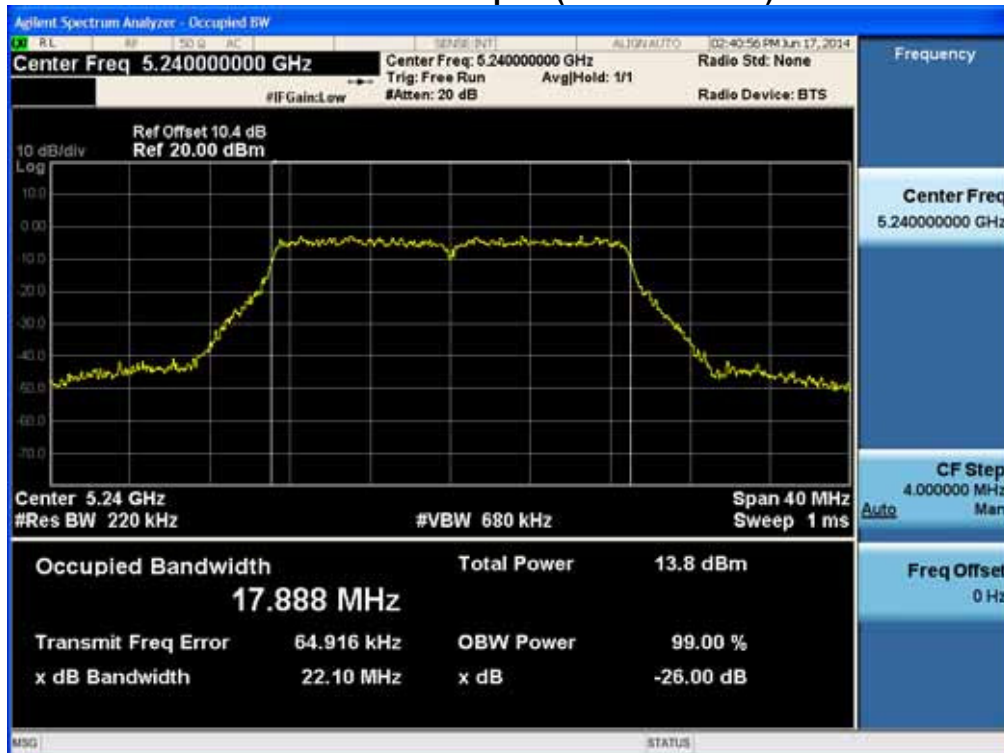


26 dB Bandwidth plot (802.11a-CH 116)



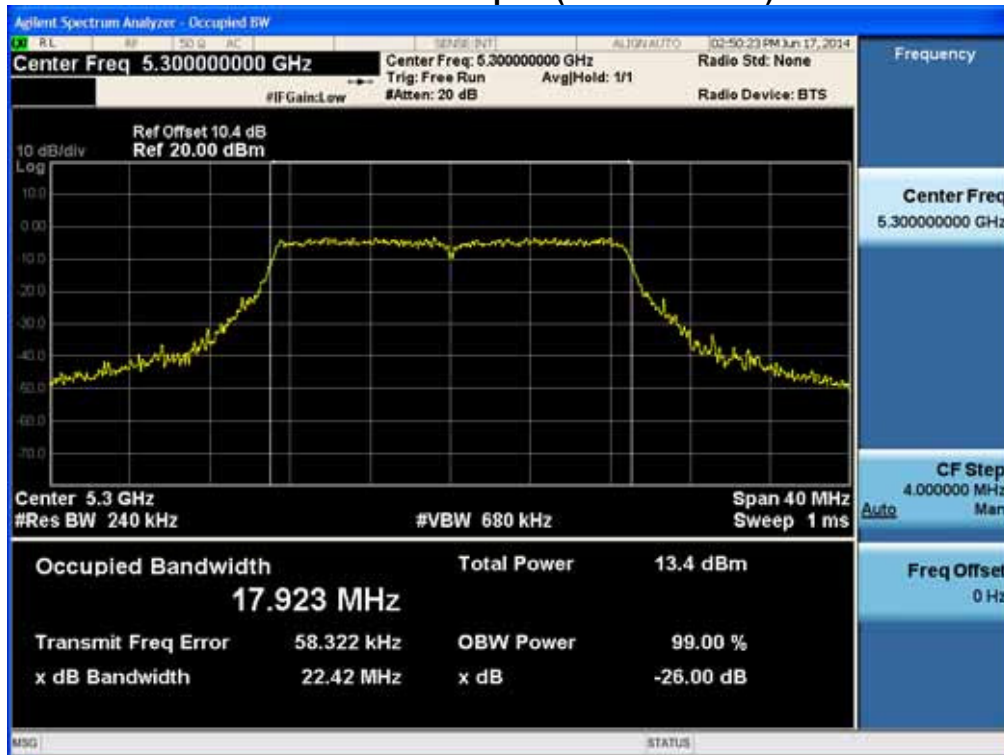
20 MHz BW

26 dB Bandwidth plot (802.11n-CH 48)

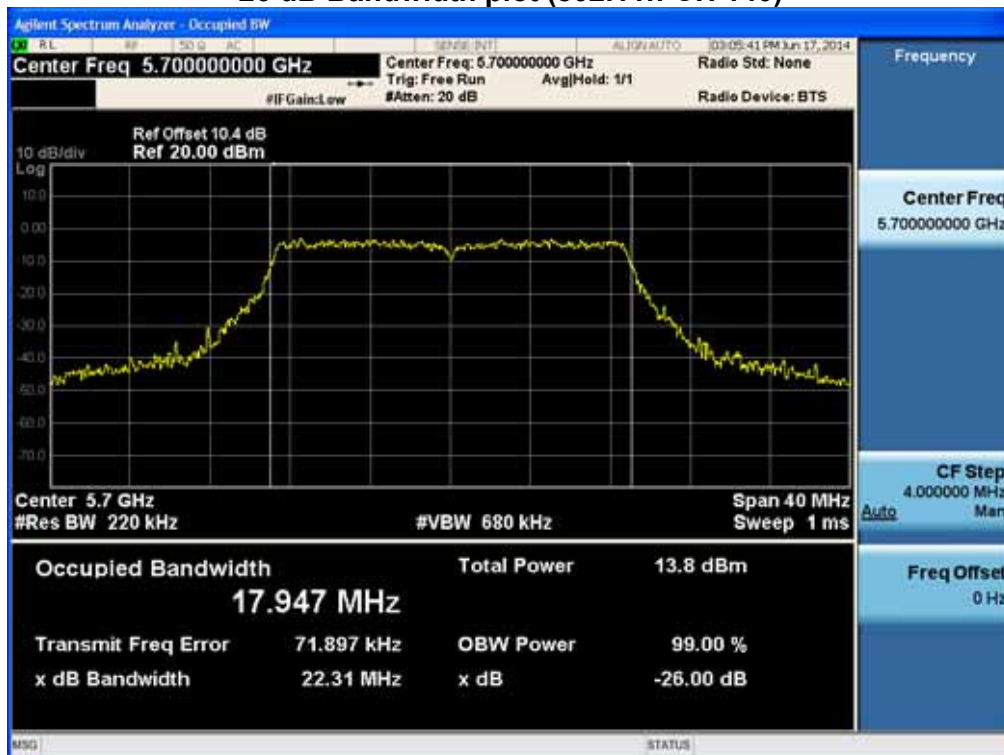


|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

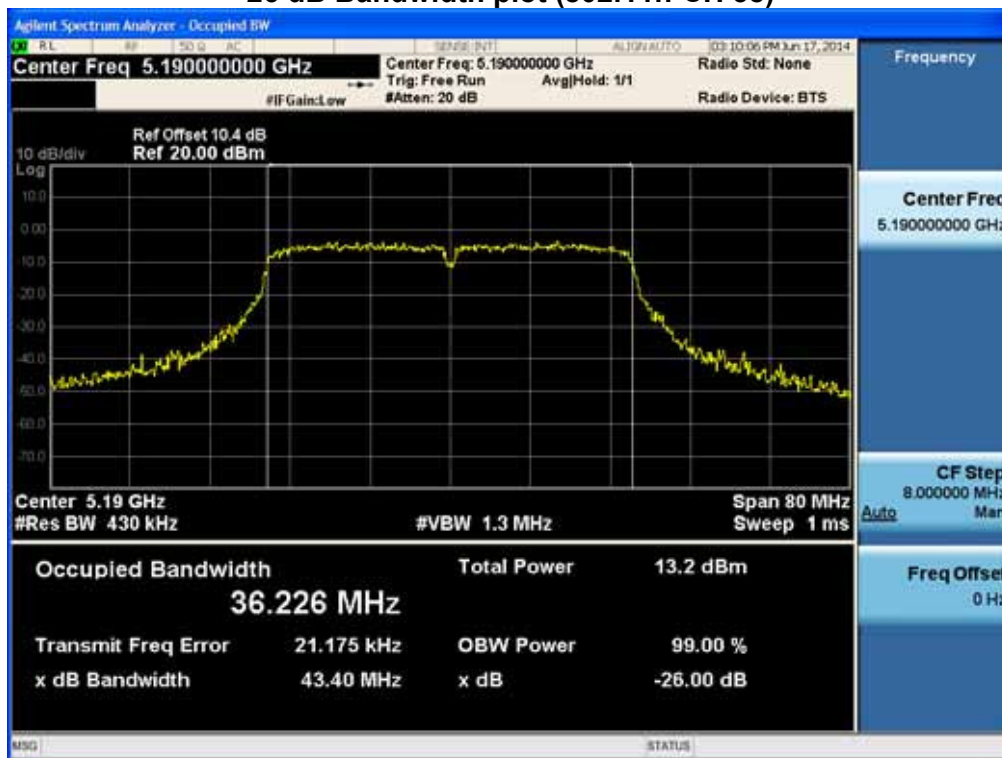
### 26 dB Bandwidth plot (802.11n-CH 60)



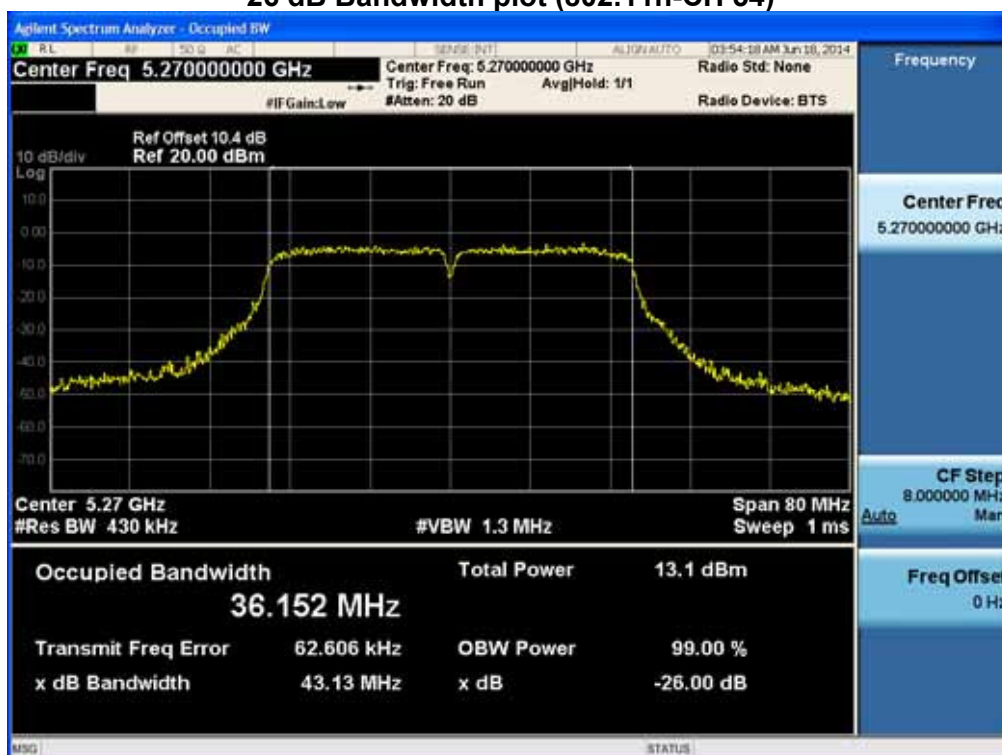
### 26 dB Bandwidth plot (802.11n-CH 140)



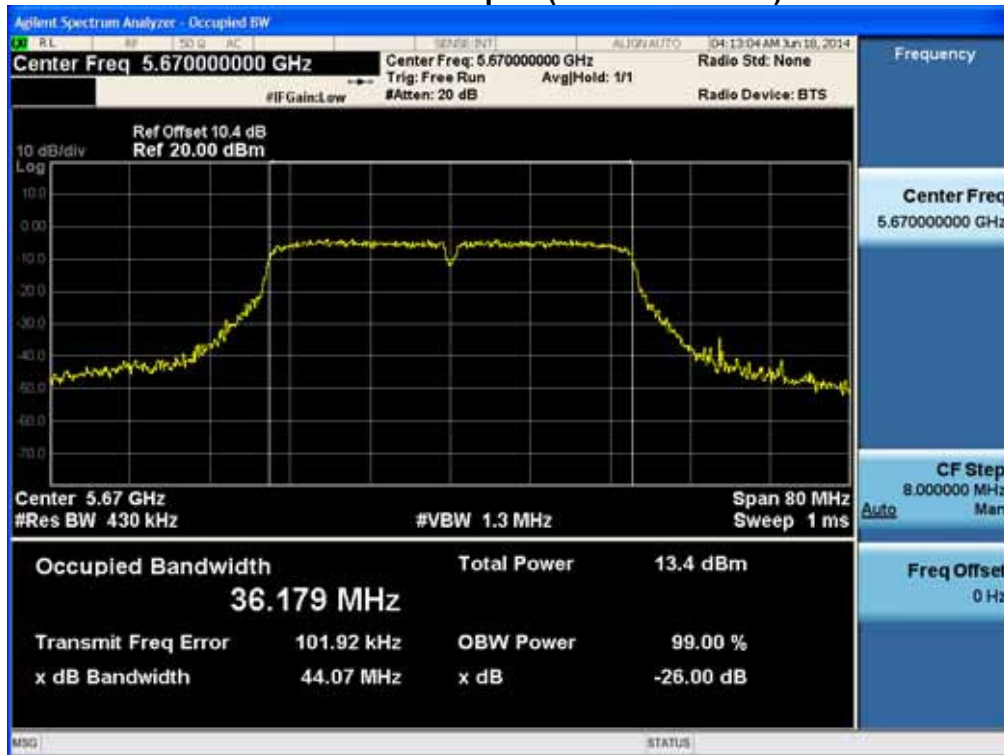
26 dB Bandwidth plot (802.11n-CH 38)



26 dB Bandwidth plot (802.11n-CH 54)



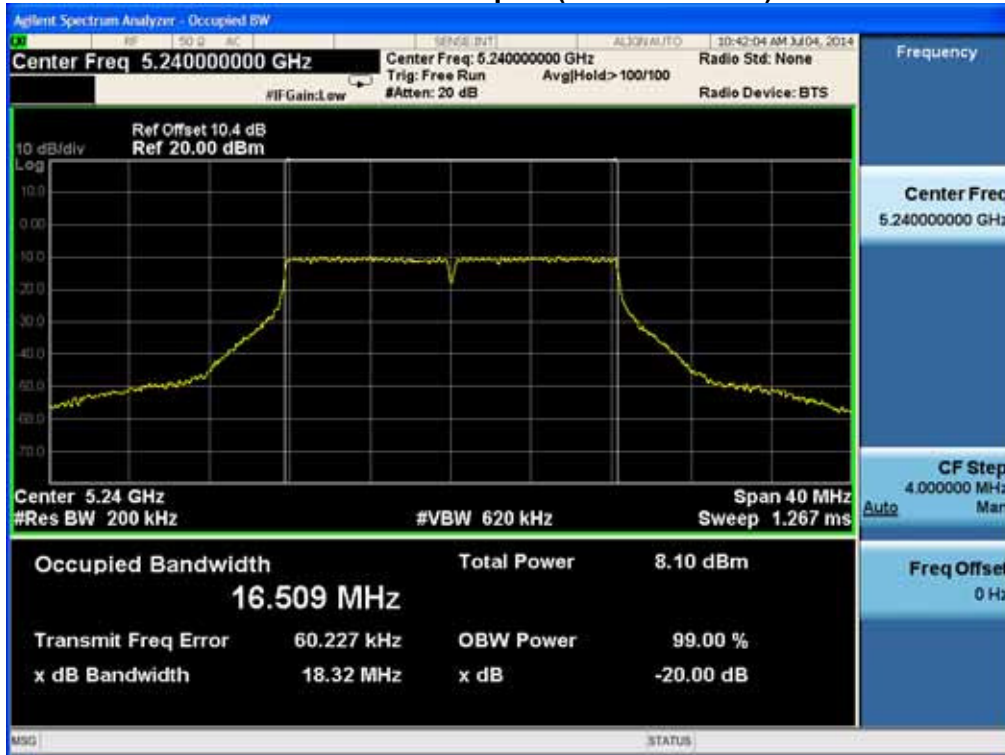
26 dB Bandwidth plot (802.11n-CH 134)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## RESULT PLOTS(20 dB Bandwidth)

20 dB Bandwidth plot (802.11a-CH 48)

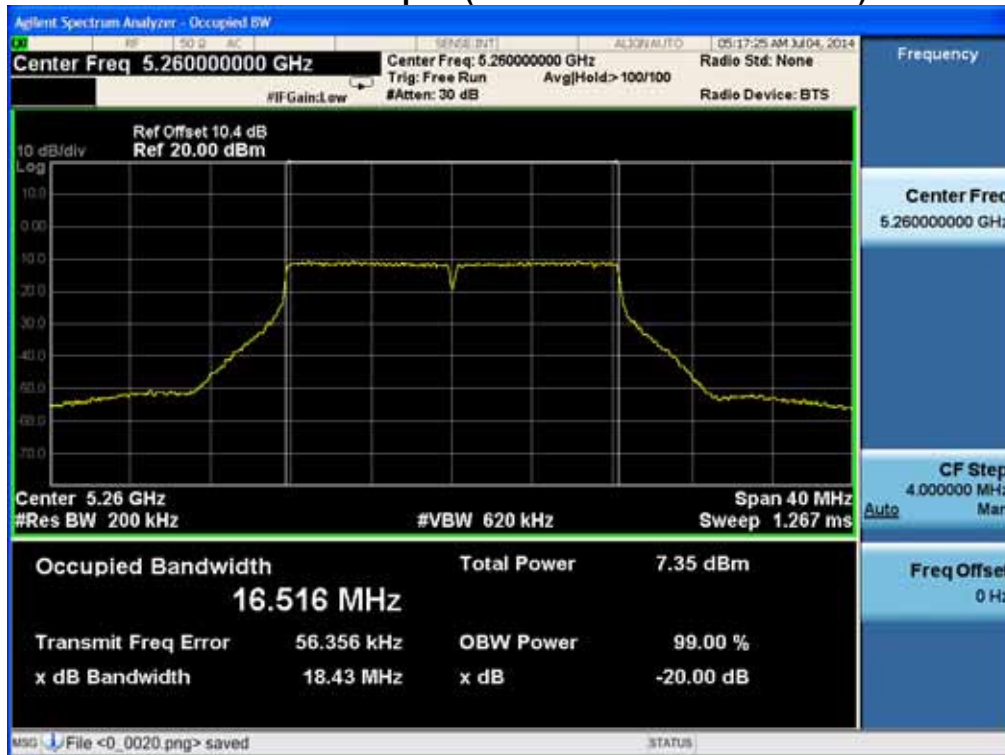


20 dB Bandwidth plot (802.11a-CH 52 / 100% / -30 dB)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

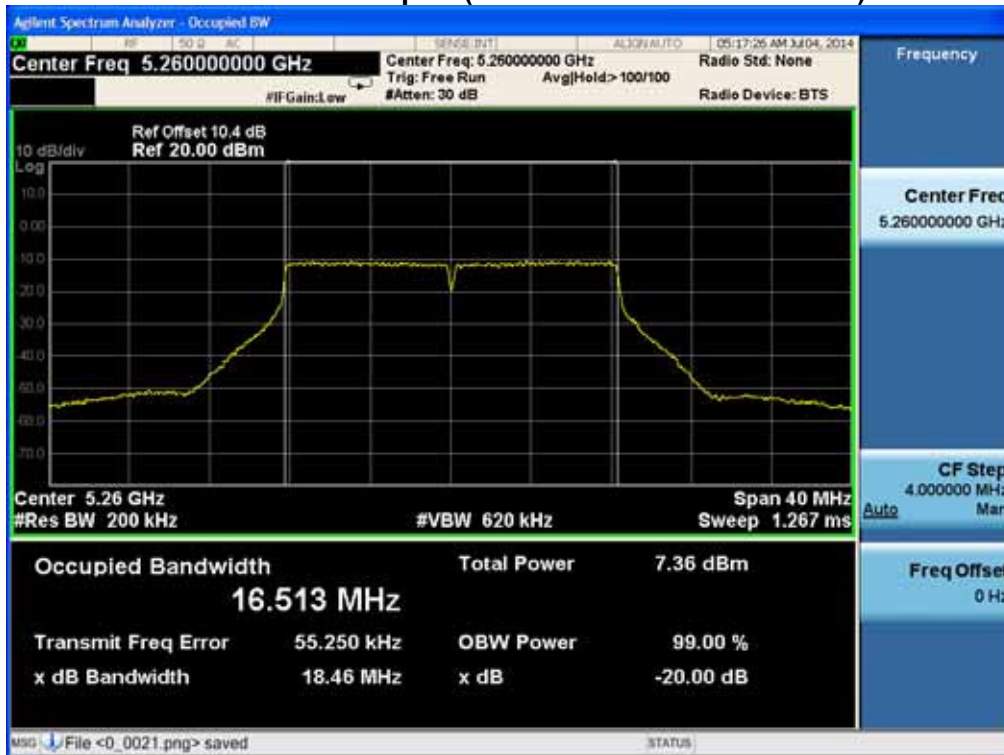
20 dB Bandwidth plot (802.11a-CH 52 / 100% / 50  $\mu$ )



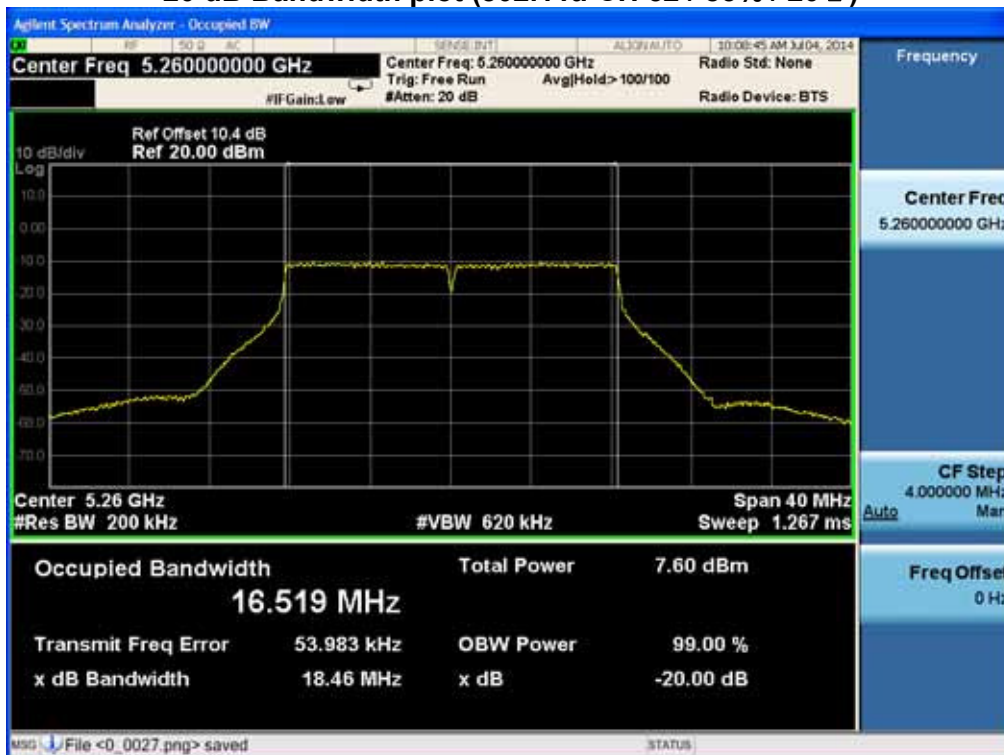
20 dB Bandwidth plot (802.11a-CH 52 / 100% / 20  $\mu$ )



### 20 dB Bandwidth plot (802.11a-CH 52 / 115% / 20 dB)



### 20 dB Bandwidth plot (802.11a-CH 52 / 85% / 20 dB)



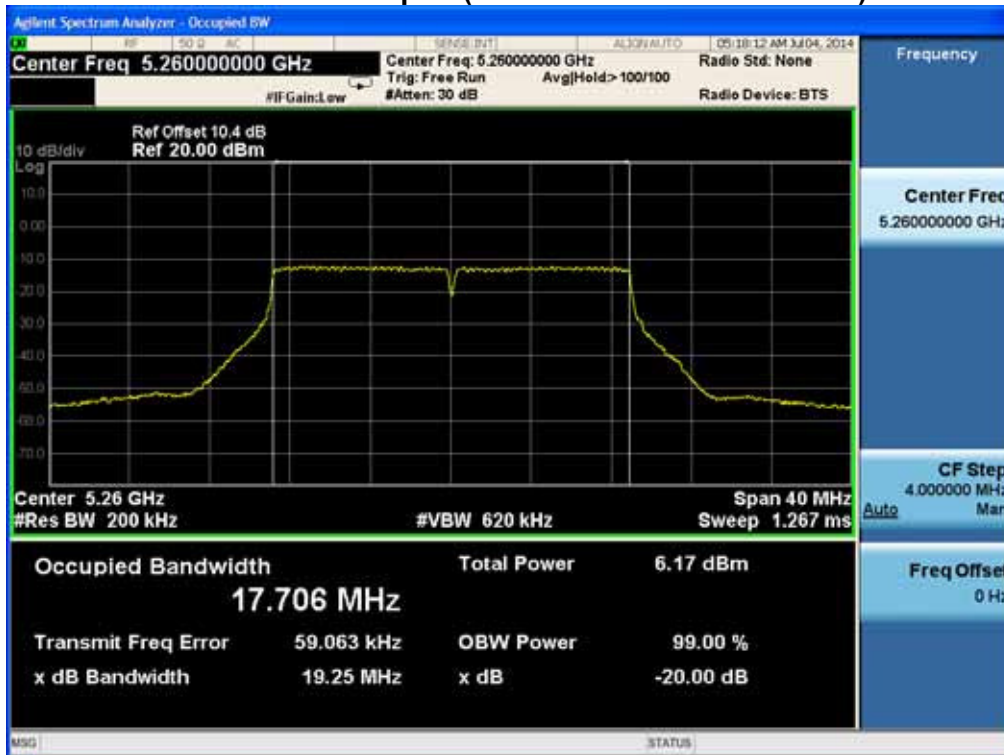
## 20 dB Bandwidth plot (802.11n-CH 48)



## 20 dB Bandwidth plot (802.11n-CH 52 / 100% / -30 dB)



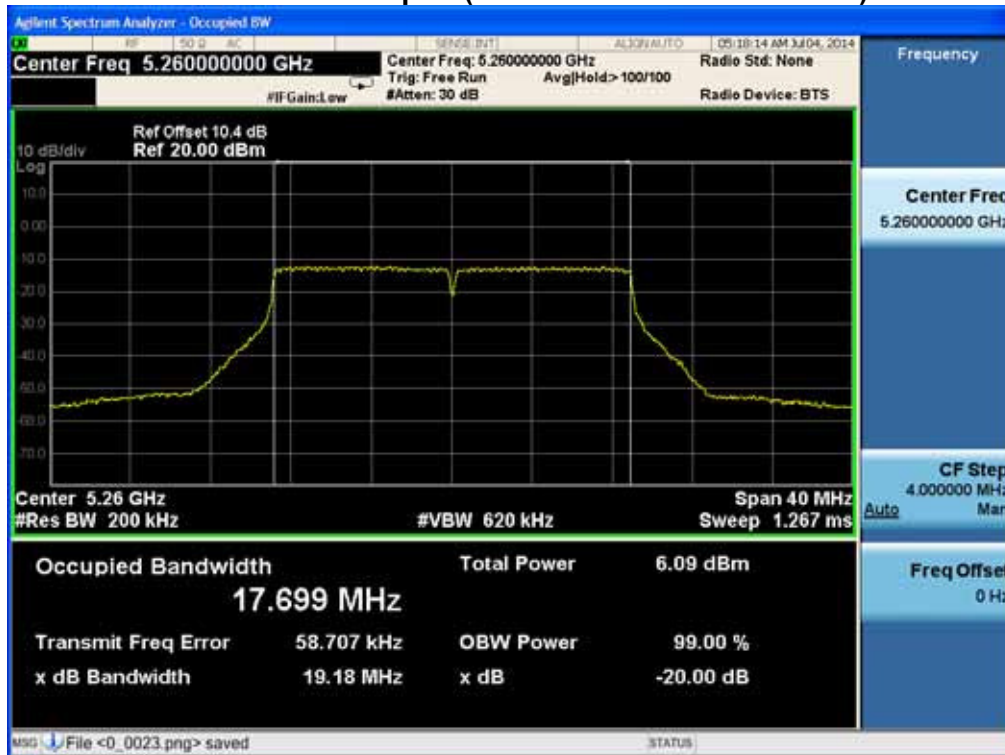
### 20 dB Bandwidth plot (802.11n-CH 52 / 100% / 50 $\mu$ )



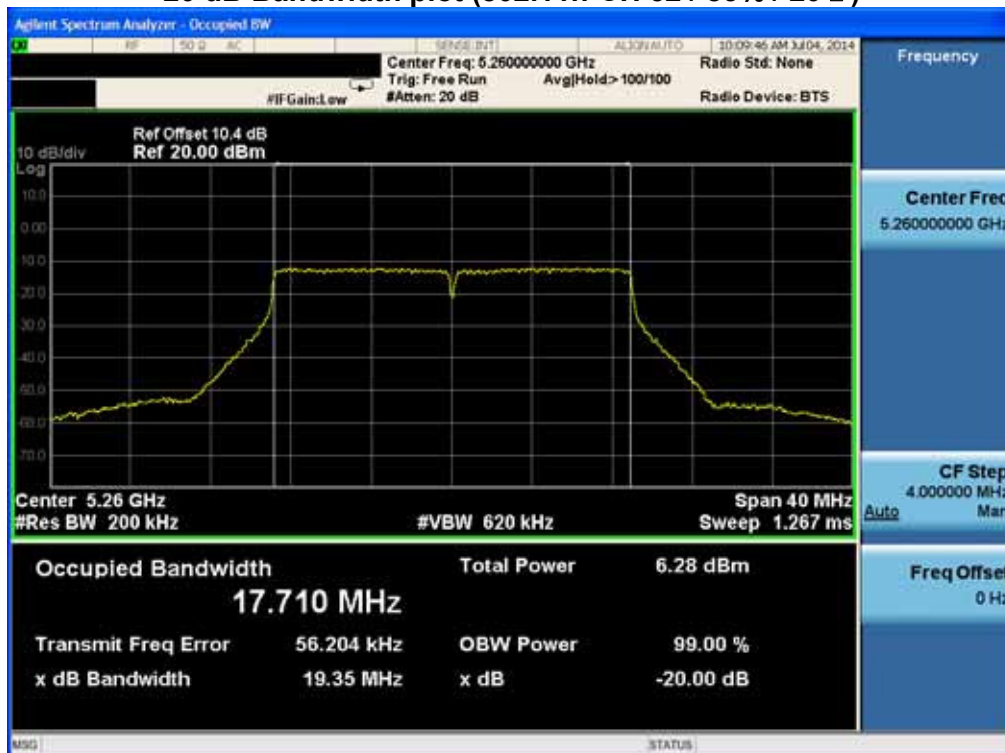
### 20 dB Bandwidth plot (802.11n-CH 52 / 100% / 20 $\mu$ )



### 20 dB Bandwidth plot (802.11n-CH 52 / 115% / 20 dB)



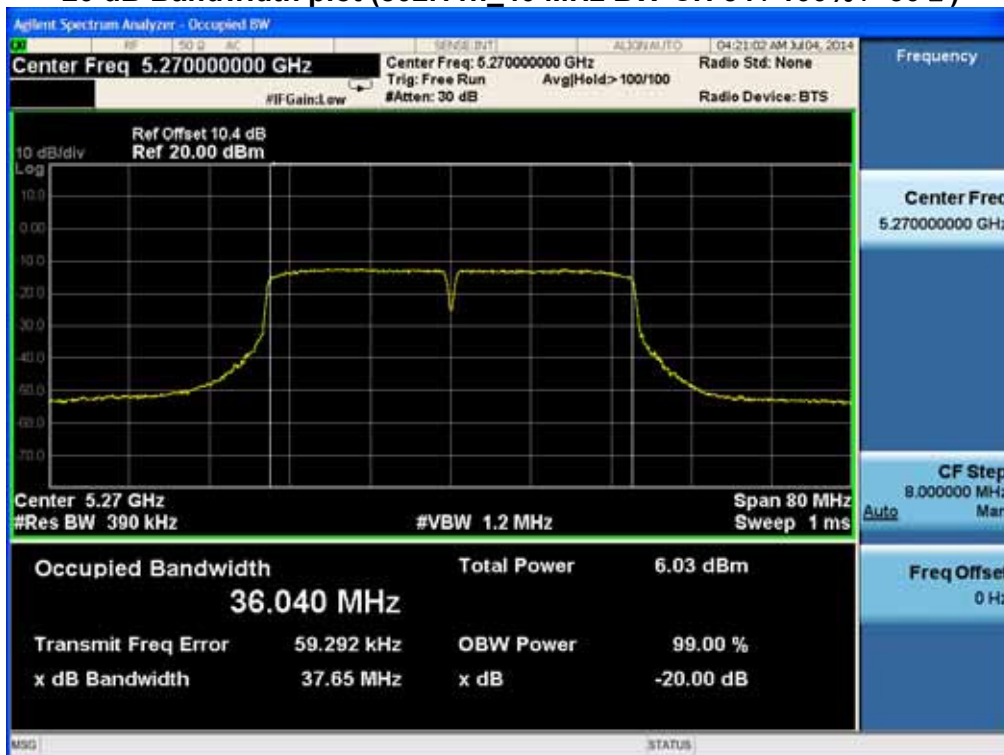
### 20 dB Bandwidth plot (802.11n-CH 52 / 85% / 20 dB)



### 20 dB Bandwidth plot (802.11n\_40 MHz BW-CH 46)



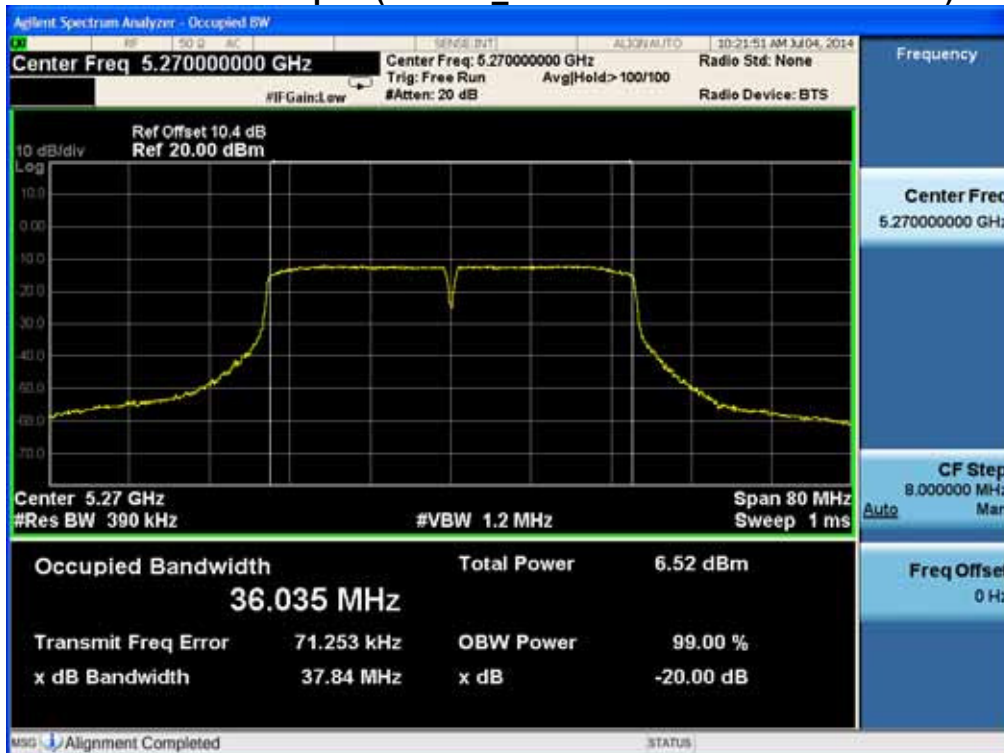
### 20 dB Bandwidth plot (802.11n\_40 MHz BW-CH 54 / 100% / -30 dB)



## 20 dB Bandwidth plot (802.11n\_40 MHz BW-CH 54 / 100% / 50 □)



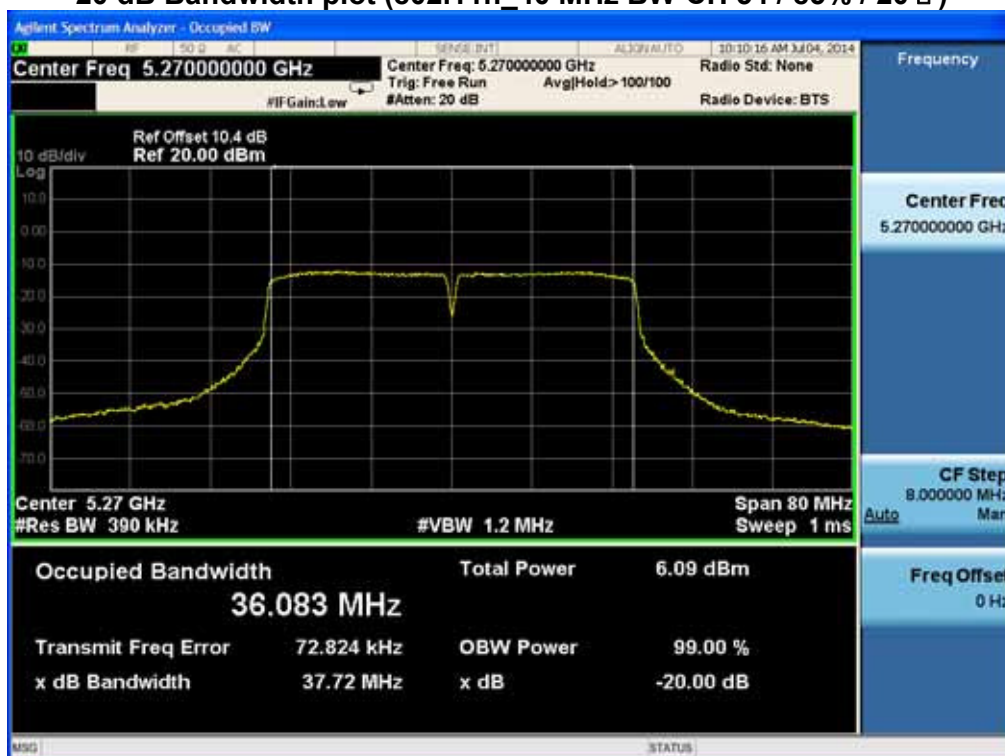
## 20 dB Bandwidth plot (802.11n\_40 MHz BW-CH 54 / 100% / 20 □)



## 20 dB Bandwidth plot (802.11n\_40 MHz BW-CH 54 / 115% / 20 dB)



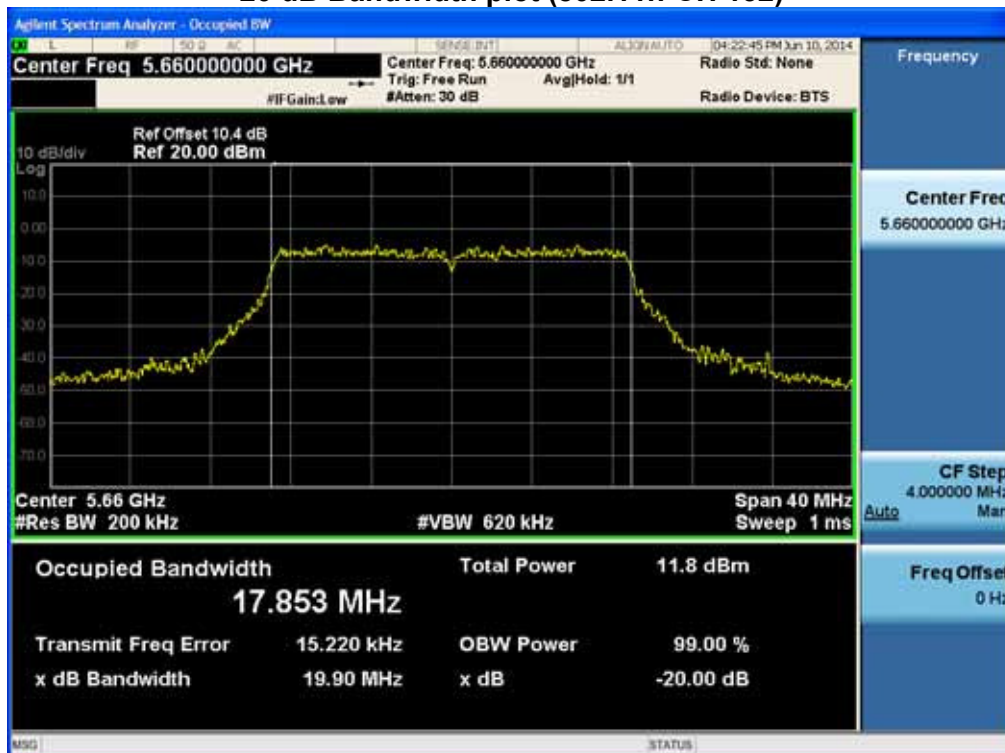
## 20 dB Bandwidth plot (802.11n\_40 MHz BW-CH 54 / 85% / 20 dB)



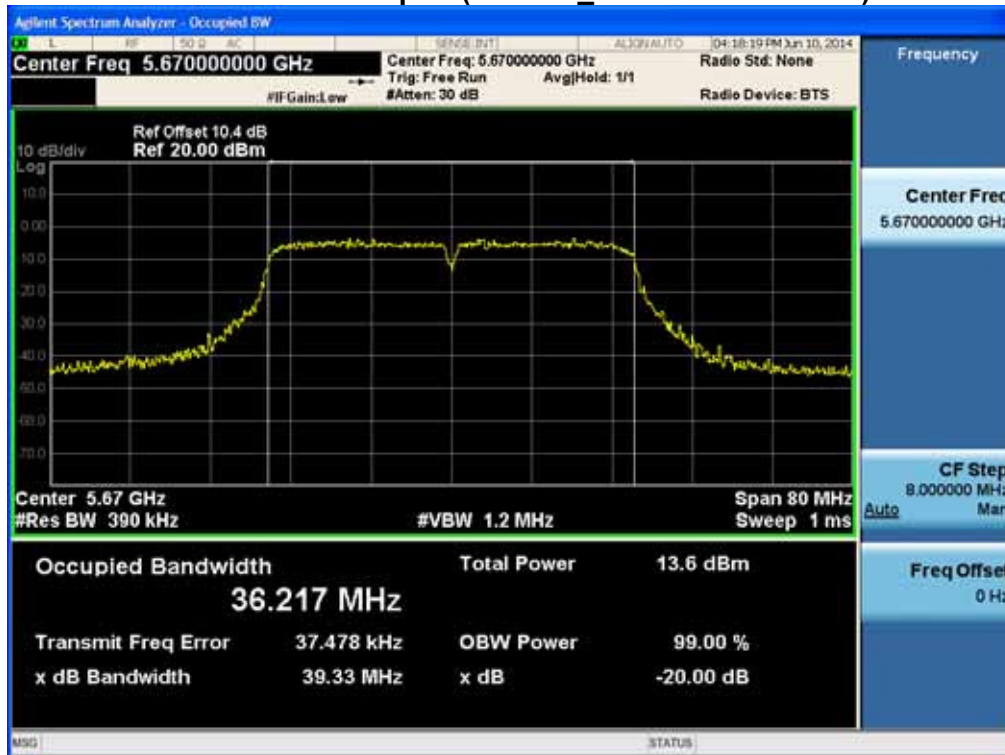
20 dB Bandwidth plot (802.11a-CH 132)



20 dB Bandwidth plot (802.11n-CH 132)



20 dB Bandwidth plot (802.11n\_40 MHz BW-CH 134)



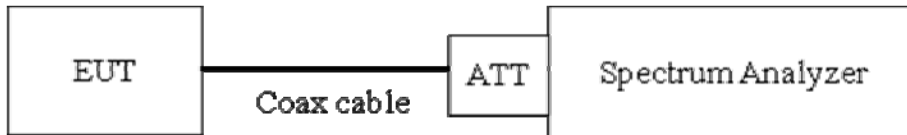
## 8.3 99% BANDWIDTH MEASUREMENT

### limit

None; for IC reporting purposes only

The 99 % bandwidth is used to determine the conducted power limits(for IC).

### □ TEST CONFIGURATION



### □ TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to as close to 1% of the selected span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RBW = 1% of the total span

VBW  $\geq 3 \times$  RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Allow the trace to stabilize

Conducted 99% Bandwidth Measurements for 802.11a

| 802.11a Mode    |             | Measured Bandwidth<br>[MHz] |
|-----------------|-------------|-----------------------------|
| Frequency [MHz] | Channel No. |                             |
| 5180            | 36          | 17.077                      |
| 5200            | 40          | 17.071                      |
| 5240            | 48          | 16.953                      |
| 5260            | 52          | 17.061                      |
| 5300            | 60          | 17.008                      |
| 5320            | 64          | 16.941                      |
| 5500            | 100         | 16.911                      |
| 5580            | 116         | 17.025                      |
| 5700            | 140         | 16.981                      |

Conducted 99% Bandwidth Measurements for 802.11n\_20 MHz BW

| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] |
|-----------------|-------------|-----------------------------|
| Frequency [MHz] | Channel No. |                             |
| 5180            | 36          | 18.148                      |
| 5200            | 40          | 18.014                      |
| 5240            | 48          | 18.023                      |
| 5260            | 52          | 18.050                      |
| 5300            | 60          | 18.039                      |
| 5320            | 64          | 18.090                      |
| 5500            | 100         | 18.052                      |
| 5580            | 116         | 18.007                      |
| 5700            | 140         | 18.054                      |

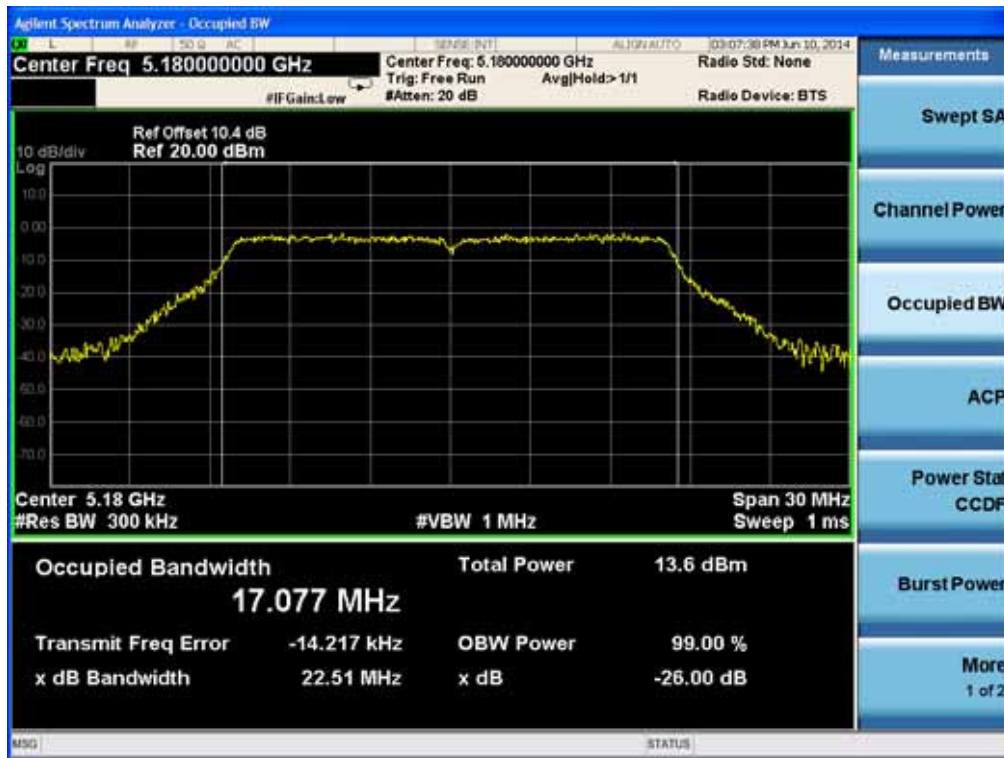
Conducted 99% Bandwidth Measurements for 802.11n\_40 MHz BW

| 802.11n Mode    |             | Measured Bandwidth<br>[MHz] |
|-----------------|-------------|-----------------------------|
| Frequency [MHz] | Channel No. |                             |
| 5190            | 38          | 36.859                      |
| 5230            | 46          | 36.499                      |
| 5270            | 54          | 36.483                      |
| 5310            | 62          | 36.361                      |
| 5510            | 102         | 36.457                      |
| 5550            | 110         | 36.341                      |
| 5670            | 134         | 36.417                      |

Note :

1. In order to simplify the report, attached plots were only the most wide channel.

### 99% Bandwidth plot (802.11a-CH36)



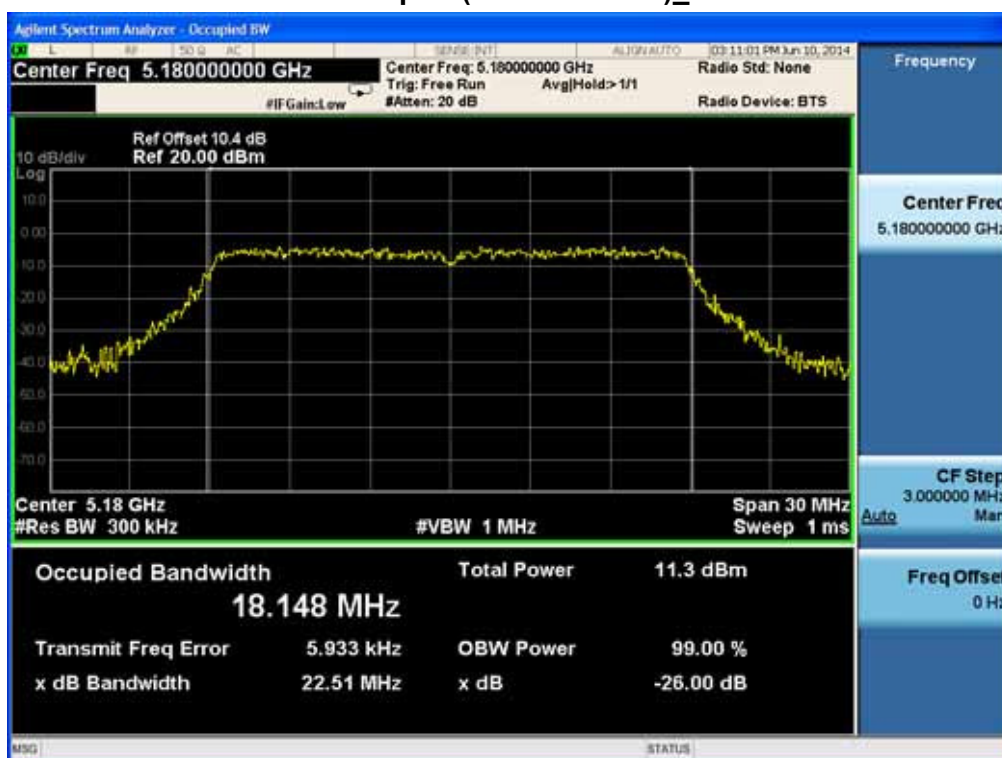
### 99% Bandwidth plot (802.11a-CH52)



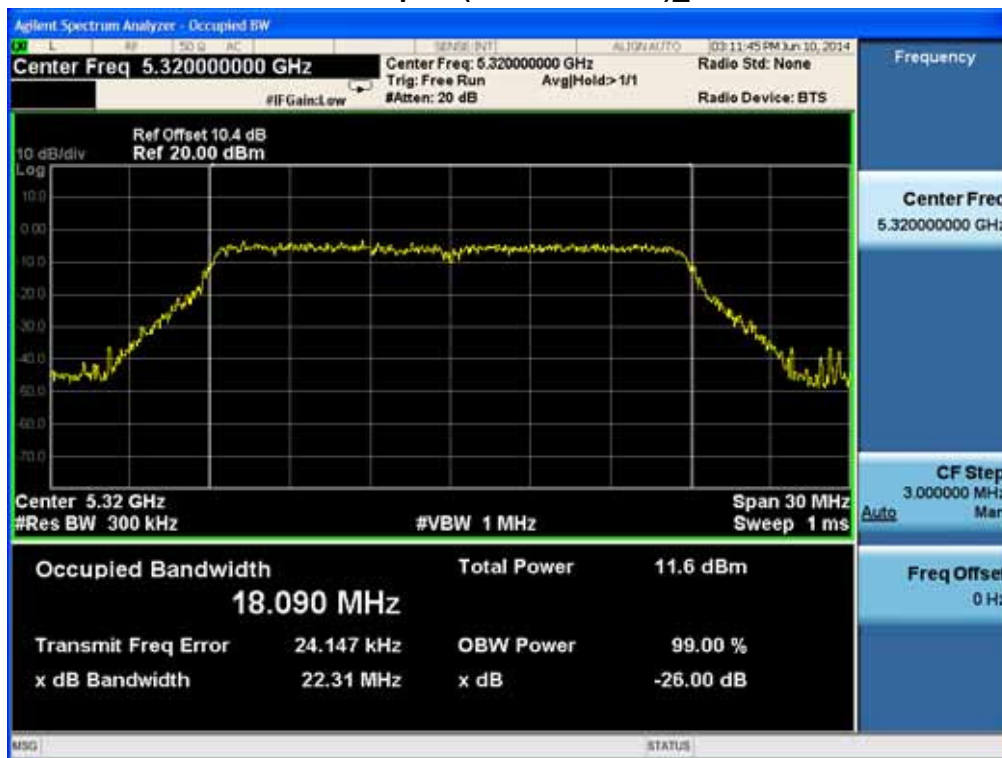
### 99% Bandwidth plot (802.11a-CH116)



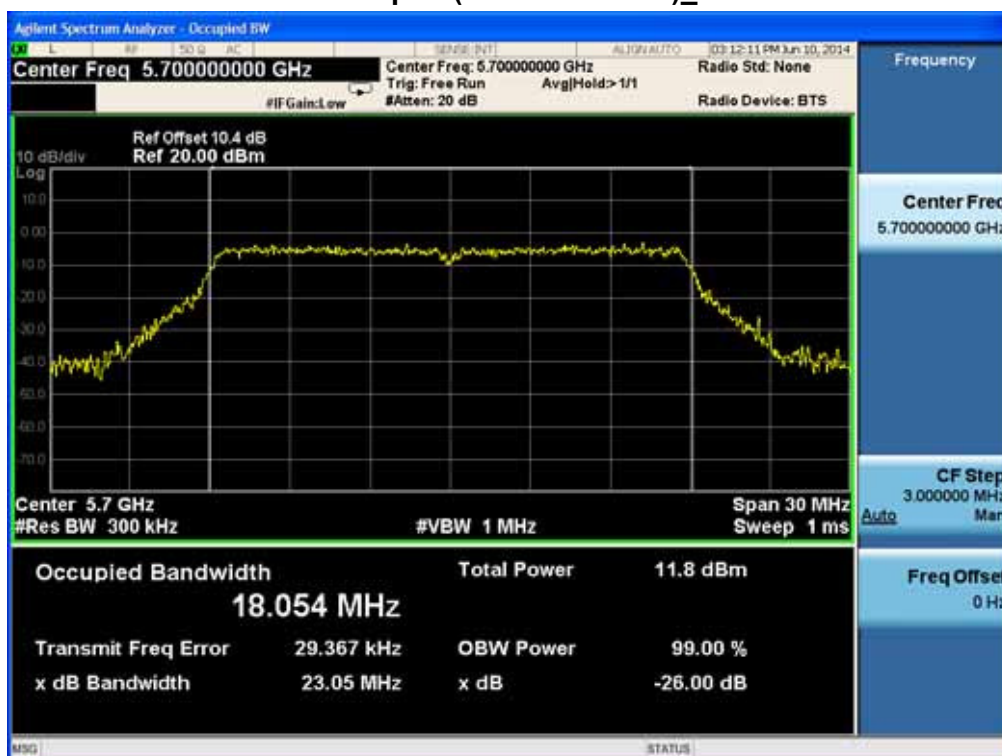
### 99% Bandwidth plot (802.11n-CH36)\_20 MHz BW



### 99% Bandwidth plot (802.11n-CH64)\_20 MHz BW



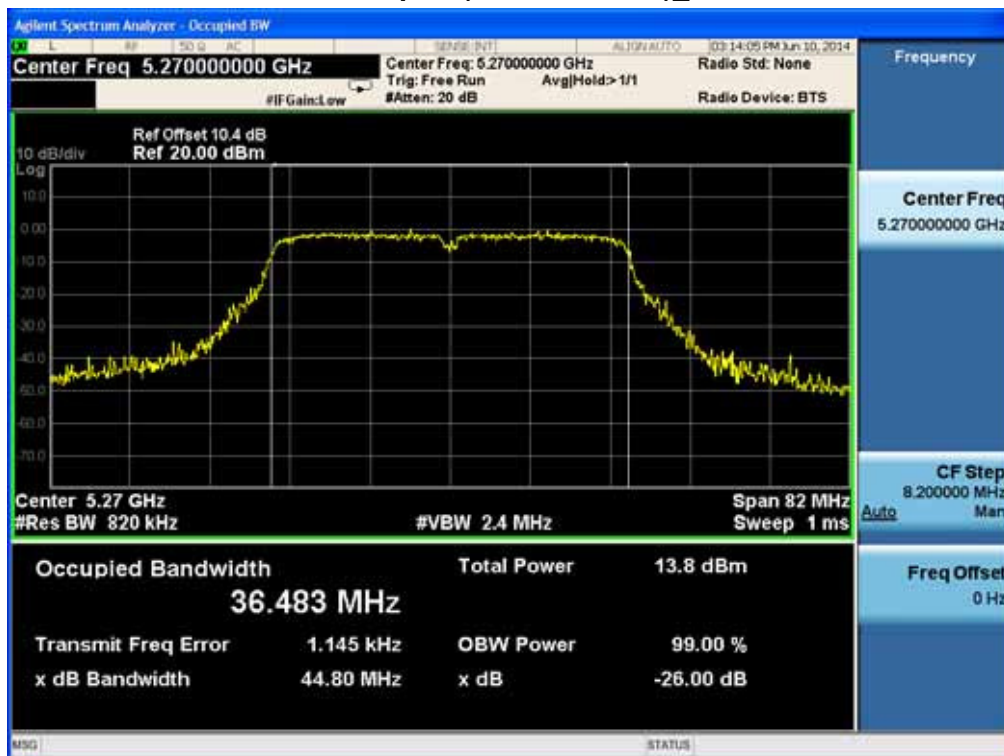
### 99% Bandwidth plot (802.11n-CH140)\_20 MHz BW



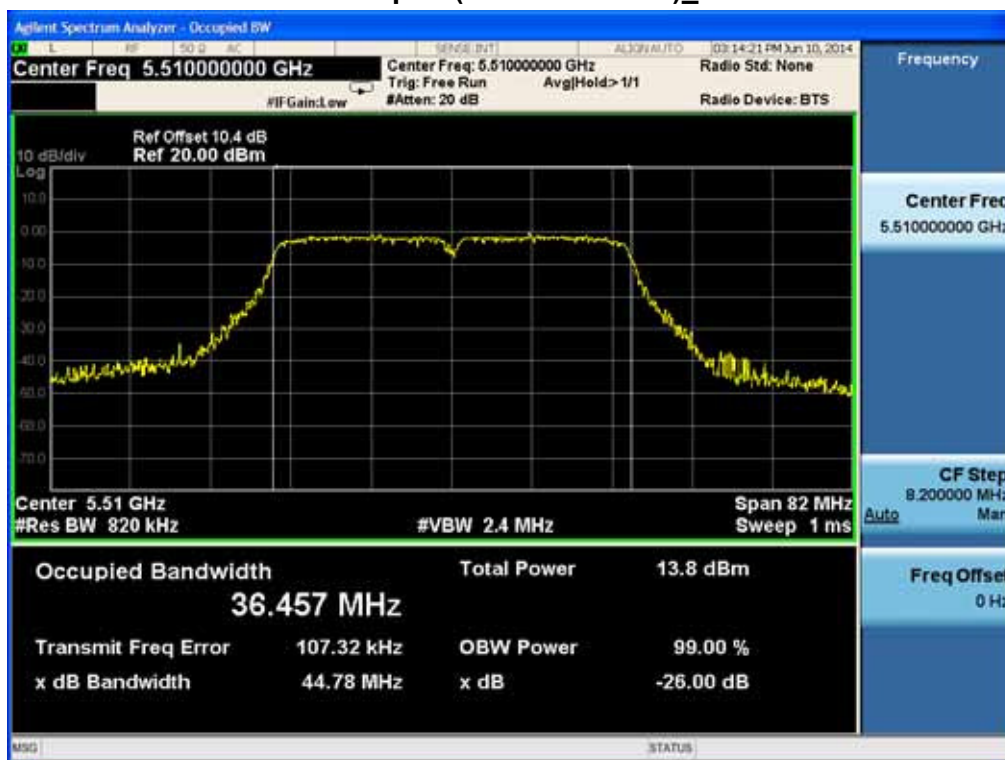
### 99% Bandwidth plot (802.11n-CH38)\_40 MHz BW



### 99% Bandwidth plot (802.11n-CH54)\_40 MHz BW



99% Bandwidth plot (802.11n-CH102)\_40 MHz BW



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## 8.4 OUTPUT POWER MEASUREMENT

### Test Requirements and limit, §15.247(b)(3) & RSS-210

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.

In the 5.15 – 5.25 GHz band, the maximum permissible conducted output power is the lesser of 50 mW (16.99 dBm) and  $4 \text{ dBm} + 10 \log_{10} (26 \text{ dB BW})$ .

In the 5.25 – 5.35 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and  $11 \text{ dBm} + 10 \log_{10} (26 \text{ dB BW})$ .

In the 5.47 – 5.725 GHz band, the maximum permissible conducted output power is the lesser of 250 mW (23.98 dBm) and  $11 \text{ dBm} + 10 \log_{10} (26 \text{ dB BW})$ .

#### □ Limit

##### 1. Maximum Conducted Output Power :

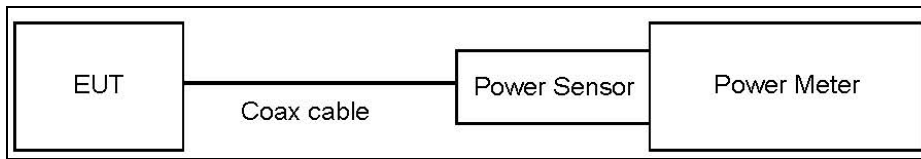
| Band    | Mode      | Limit (dBm)       |
|---------|-----------|-------------------|
| UNII 1  | 802.11a,n | 16.99(Only FCC)   |
| UNII 2A | 802.11a,n | 23.98(FCC and IC) |
| UNII 2C | 802.11a,n | 23.98(FCC and IC) |

##### 2. Maximum EIRP(for IC) :

| Band    | Mode      | Limit (dBm) |
|---------|-----------|-------------|
| UNII 1  | 802.11a,n | 23.01       |
| UNII 2A | 802.11a,n | 30          |
| UNII 2C | 802.11a,n | 30          |

Note : The gap of Conducted limit and EIRP limit is about 6 dB. The antenna gain of EUT is not exceed 6 dBi. Therefore, if conducted power is pass, EIRP is also pass. So, we attached only conducted power table.

## □ TEST CONFIGURATION(20 MHz BW)



## □ TEST PROCEDURE(20 MHz BW)

We tested according to Method E)3)a) in KDB 789033(issued 06/06/2014).

### ▪ Average Power

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.

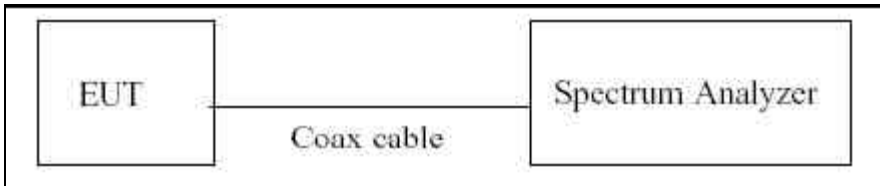
Note :

1. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

| Band    | Frequency(MHz) | Loss(dB) |
|---------|----------------|----------|
| UNII 1  | 5180           | 10.30    |
|         | 5190           | 10.29    |
|         | 5200           | 10.28    |
|         | 5230           | 10.29    |
|         | 5240           | 10.34    |
| UNII 2  | 5260           | 10.37    |
|         | 5270           | 10.38    |
|         | 5300           | 10.40    |
|         | 5310           | 10.39    |
|         | 5320           | 10.39    |
| UNII 2e | 5500           | 10.35    |
|         | 5510           | 10.36    |
|         | 5550           | 10.41    |
|         | 5580           | 10.43    |
|         | 5670           | 10.43    |

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

## □ TEST CONFIGURATION(40 MHz BW)



## □ TEST PROCEDURE(40 MHz BW)

The transmitter output is connected to the Spectrum Analyzer. We use the spectrum analyzer's integrated band power measurement function. We tested according to Method SA-2 in KDB 789033(issued 06/06/2014).

The Spectrum Analyzer is set to

### ▪ Average Power

1. Measure the duty cycle.
2. Set span to encompass the 26 dB EBW of the signal.
3. RBW = 1 MHz.
4. VBW  $\geq$  3 MHz.
5. Number of points in sweep  $\geq 2 \times \text{span} / \text{RBW}$ .
6. Sweep time = auto.
7. Detector = RMS.
8. Do not use sweep triggering. Allow the sweep to "free run".
9. Trace average at least 100 traces in power averaging(RMS) mode
10. Integrated bandwidth = OBW
11. 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.

|                                             |                                          |                                          |                           |                                                  |
|---------------------------------------------|------------------------------------------|------------------------------------------|---------------------------|--------------------------------------------------|
| <b>FCC PT.15.407<br/>TEST REPORT</b>        | <b>FCC &amp; IC CERTIFICATION REPORT</b> |                                          |                           | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| <b>Test Report No.</b><br>HCT-R-1407-F005-3 | <b>Date of Issue:</b><br>July 08, 2014   | <b>EUT Type:</b> 2.4/5GHz BT/WiFi Tablet | <b>FCC ID:</b><br>ZNFV480 | <b>IC:</b><br>2703C-V480                         |

#### □ Sample Calculation (Conducted)

Output Power = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

#### □ Sample Calculation (EIRP)

Output Power = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor + Ant gain

Note :

1. Spectrum reading values are not plot data. The power results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

| Band    | Frequency(MHz) | Loss(dB) |
|---------|----------------|----------|
| UNII 1  | 5180           | 10.30    |
|         | 5190           | 10.29    |
|         | 5200           | 10.28    |
|         | 5230           | 10.29    |
|         | 5240           | 10.34    |
| UNII 2  | 5260           | 10.37    |
|         | 5270           | 10.38    |
|         | 5300           | 10.40    |
|         | 5310           | 10.39    |
|         | 5320           | 10.39    |
| UNII 2e | 5500           | 10.35    |
|         | 5510           | 10.36    |
|         | 5550           | 10.41    |
|         | 5580           | 10.43    |
|         | 5670           | 10.43    |

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

# □ TEST RESULTS

20 MHz BW

## Conducted Output Power Measurements (802.11a Mode: 5180~5240)

| 802.11a Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5180            | 36          | 6           | 7.57                | 0.209             | 7.78                                    | 16.99       |
|                 |             | 9           | 7.47                | 0.305             | 7.77                                    | 16.99       |
|                 |             | 12          | 7.34                | 0.395             | 7.73                                    | 16.99       |
|                 |             | 18          | 7.19                | 0.575             | 7.77                                    | 16.99       |
|                 |             | 24          | 6.98                | 0.761             | 7.74                                    | 16.99       |
|                 |             | 36          | 6.68                | 1.068             | 7.75                                    | 16.99       |
|                 |             | 48          | 6.29                | 1.336             | 7.62                                    | 16.99       |
|                 |             | 54          | 6.17                | 1.484             | 7.65                                    | 16.99       |
| 5200            | 40          | 6           | 8.04                | 0.209             | 8.25                                    | 16.99       |
|                 |             | 9           | 7.87                | 0.305             | 8.18                                    | 16.99       |
|                 |             | 12          | 7.86                | 0.395             | 8.26                                    | 16.99       |
|                 |             | 18          | 7.73                | 0.575             | 8.31                                    | 16.99       |
|                 |             | 24          | 7.44                | 0.761             | 8.20                                    | 16.99       |
|                 |             | 36          | 6.99                | 1.068             | 8.06                                    | 16.99       |
|                 |             | 48          | 6.74                | 1.336             | 8.07                                    | 16.99       |
|                 |             | 54          | 6.72                | 1.484             | 8.20                                    | 16.99       |
| 5240            | 48          | 6           | 8.12                | 0.209             | 8.33                                    | 16.99       |
|                 |             | 9           | 7.96                | 0.305             | 8.26                                    | 16.99       |
|                 |             | 12          | 7.92                | 0.395             | 8.31                                    | 16.99       |
|                 |             | 18          | 7.69                | 0.575             | 8.27                                    | 16.99       |
|                 |             | 24          | 7.49                | 0.761             | 8.25                                    | 16.99       |
|                 |             | 36          | 7.05                | 1.068             | 8.12                                    | 16.99       |
|                 |             | 48          | 6.77                | 1.336             | 8.11                                    | 16.99       |
|                 |             | 54          | 6.66                | 1.484             | 8.15                                    | 16.99       |

# Conducted Output Power Measurements (802.11a Mode: 5260~5320)

| 802.11a Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5260            | 52          | 6           | 7.44                | 0.209             | 7.65                                    | 23.98       |
|                 |             | 9           | 7.33                | 0.305             | 7.64                                    | 23.98       |
|                 |             | 12          | 7.27                | 0.395             | 7.67                                    | 23.98       |
|                 |             | 18          | 7.05                | 0.575             | 7.63                                    | 23.98       |
|                 |             | 24          | 6.81                | 0.761             | 7.58                                    | 23.98       |
|                 |             | 36          | 6.44                | 1.068             | 7.51                                    | 23.98       |
|                 |             | 48          | 6.11                | 1.336             | 7.44                                    | 23.98       |
|                 |             | 54          | 6.00                | 1.484             | 7.48                                    | 23.98       |
| 5300            | 60          | 6           | 7.70                | 0.209             | 7.91                                    | 23.98       |
|                 |             | 9           | 7.58                | 0.305             | 7.89                                    | 23.98       |
|                 |             | 12          | 7.52                | 0.395             | 7.92                                    | 23.98       |
|                 |             | 18          | 7.28                | 0.575             | 7.85                                    | 23.98       |
|                 |             | 24          | 7.17                | 0.761             | 7.93                                    | 23.98       |
|                 |             | 36          | 6.74                | 1.068             | 7.81                                    | 23.98       |
|                 |             | 48          | 6.34                | 1.336             | 7.67                                    | 23.98       |
|                 |             | 54          | 6.24                | 1.484             | 7.72                                    | 23.98       |
| 5320            | 64          | 6           | 8.59                | 0.209             | 8.80                                    | 23.98       |
|                 |             | 9           | 8.47                | 0.305             | 8.78                                    | 23.98       |
|                 |             | 12          | 8.32                | 0.395             | 8.72                                    | 23.98       |
|                 |             | 18          | 8.13                | 0.575             | 8.70                                    | 23.98       |
|                 |             | 24          | 7.89                | 0.761             | 8.65                                    | 23.98       |
|                 |             | 36          | 7.54                | 1.068             | 8.61                                    | 23.98       |
|                 |             | 48          | 7.17                | 1.336             | 8.50                                    | 23.98       |
|                 |             | 54          | 7.07                | 1.484             | 8.56                                    | 23.98       |

# Conducted Output Power Measurements (802.11a Mode: 5500~5700)

| 802.11a Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5500            | 100         | 6           | 8.28                | 0.209             | 8.49                                    | 23.98       |
|                 |             | 9           | 8.13                | 0.305             | 8.44                                    | 23.98       |
|                 |             | 12          | 8.13                | 0.395             | 8.53                                    | 23.98       |
|                 |             | 18          | 7.97                | 0.575             | 8.54                                    | 23.98       |
|                 |             | 24          | 7.74                | 0.761             | 8.50                                    | 23.98       |
|                 |             | 36          | 7.51                | 1.068             | 8.58                                    | 23.98       |
|                 |             | 48          | 6.92                | 1.336             | 8.26                                    | 23.98       |
|                 |             | 54          | 6.90                | 1.484             | 8.38                                    | 23.98       |
| 5580            | 116         | 6           | 8.46                | 0.209             | 8.67                                    | 23.98       |
|                 |             | 9           | 8.40                | 0.305             | 8.70                                    | 23.98       |
|                 |             | 12          | 8.22                | 0.395             | 8.61                                    | 23.98       |
|                 |             | 18          | 7.86                | 0.575             | 8.44                                    | 23.98       |
|                 |             | 24          | 7.70                | 0.761             | 8.46                                    | 23.98       |
|                 |             | 36          | 7.44                | 1.068             | 8.50                                    | 23.98       |
|                 |             | 48          | 6.95                | 1.336             | 8.28                                    | 23.98       |
|                 |             | 54          | 6.79                | 1.484             | 8.27                                    | 23.98       |
| 5700            | 140         | 6           | 8.29                | 0.209             | 8.50                                    | 23.98       |
|                 |             | 9           | 8.05                | 0.305             | 8.35                                    | 23.98       |
|                 |             | 12          | 7.93                | 0.395             | 8.33                                    | 23.98       |
|                 |             | 18          | 7.79                | 0.575             | 8.37                                    | 23.98       |
|                 |             | 24          | 7.62                | 0.761             | 8.38                                    | 23.98       |
|                 |             | 36          | 7.13                | 1.068             | 8.20                                    | 23.98       |
|                 |             | 48          | 6.89                | 1.336             | 8.22                                    | 23.98       |
|                 |             | 54          | 6.67                | 1.484             | 8.15                                    | 23.98       |

### Conducted Output Power Measurements (802.11n Mode: 5180~5240)

| 802.11n Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5180            | 36          | 6.5         | 6.82                | 0.223             | 7.05                                    | 16.99       |
|                 |             | 13          | 6.59                | 0.430             | 7.02                                    | 16.99       |
|                 |             | 19.5        | 6.44                | 0.615             | 7.05                                    | 16.99       |
|                 |             | 26          | 6.16                | 0.795             | 6.95                                    | 16.99       |
|                 |             | 39          | 5.76                | 1.124             | 6.89                                    | 16.99       |
|                 |             | 52          | 5.44                | 1.395             | 6.84                                    | 16.99       |
|                 |             | 58.5        | 5.27                | 1.549             | 6.82                                    | 16.99       |
|                 |             | 65          | 5.21                | 1.671             | 6.88                                    | 16.99       |
| 5200            | 40          | 6.5         | 5.95                | 0.223             | 6.17                                    | 16.99       |
|                 |             | 13          | 5.75                | 0.430             | 6.18                                    | 16.99       |
|                 |             | 19.5        | 5.60                | 0.615             | 6.22                                    | 16.99       |
|                 |             | 26          | 5.43                | 0.795             | 6.23                                    | 16.99       |
|                 |             | 39          | 4.93                | 1.124             | 6.05                                    | 16.99       |
|                 |             | 52          | 4.66                | 1.395             | 6.06                                    | 16.99       |
|                 |             | 58.5        | 4.60                | 1.549             | 6.15                                    | 16.99       |
|                 |             | 65          | 4.36                | 1.671             | 6.03                                    | 16.99       |
| 5240            | 48          | 6.5         | 7.19                | 0.223             | 7.42                                    | 16.99       |
|                 |             | 13          | 6.97                | 0.430             | 7.40                                    | 16.99       |
|                 |             | 19.5        | 6.62                | 0.615             | 7.23                                    | 16.99       |
|                 |             | 26          | 6.48                | 0.795             | 7.27                                    | 16.99       |
|                 |             | 39          | 6.00                | 1.124             | 7.13                                    | 16.99       |
|                 |             | 52          | 5.75                | 1.395             | 7.14                                    | 16.99       |
|                 |             | 58.5        | 5.47                | 1.549             | 7.02                                    | 16.99       |
|                 |             | 65          | 5.37                | 1.671             | 7.04                                    | 16.99       |

### Conducted Output Power Measurements (802.11n Mode: 5260~5320)

| 802.11n Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5260            | 52          | 6.5         | 6.26                | 0.223             | 6.49                                    | 23.98       |
|                 |             | 13          | 6.10                | 0.430             | 6.53                                    | 23.98       |
|                 |             | 19.5        | 5.80                | 0.615             | 6.41                                    | 23.98       |
|                 |             | 26          | 5.60                | 0.795             | 6.39                                    | 23.98       |
|                 |             | 39          | 5.24                | 1.124             | 6.37                                    | 23.98       |
|                 |             | 52          | 4.80                | 1.395             | 6.20                                    | 23.98       |
|                 |             | 58.5        | 4.61                | 1.549             | 6.16                                    | 23.98       |
|                 |             | 65          | 4.64                | 1.671             | 6.31                                    | 23.98       |
| 5300            | 60          | 6.5         | 6.65                | 0.223             | 6.87                                    | 23.98       |
|                 |             | 13          | 6.48                | 0.430             | 6.91                                    | 23.98       |
|                 |             | 19.5        | 6.34                | 0.615             | 6.95                                    | 23.98       |
|                 |             | 26          | 5.85                | 0.795             | 6.64                                    | 23.98       |
|                 |             | 39          | 5.63                | 1.124             | 6.76                                    | 23.98       |
|                 |             | 52          | 5.38                | 1.395             | 6.77                                    | 23.98       |
|                 |             | 58.5        | 5.26                | 1.549             | 6.81                                    | 23.98       |
|                 |             | 65          | 4.89                | 1.671             | 6.56                                    | 23.98       |
| 5320            | 64          | 6.5         | 7.61                | 0.223             | 7.83                                    | 23.98       |
|                 |             | 13          | 7.28                | 0.430             | 7.71                                    | 23.98       |
|                 |             | 19.5        | 7.13                | 0.615             | 7.74                                    | 23.98       |
|                 |             | 26          | 6.87                | 0.795             | 7.67                                    | 23.98       |
|                 |             | 39          | 6.47                | 1.124             | 7.59                                    | 23.98       |
|                 |             | 52          | 6.20                | 1.395             | 7.59                                    | 23.98       |
|                 |             | 58.5        | 6.01                | 1.549             | 7.56                                    | 23.98       |
|                 |             | 65          | 5.98                | 1.671             | 7.65                                    | 23.98       |

### Conducted Output Power Measurements (802.11n Mode: 5500~5700)

| 802.11n Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5500            | 100         | 6.5         | 7.38                | 0.223             | 7.60                                    | 23.98       |
|                 |             | 13          | 6.97                | 0.430             | 7.40                                    | 23.98       |
|                 |             | 19.5        | 6.75                | 0.615             | 7.37                                    | 23.98       |
|                 |             | 26          | 6.41                | 0.795             | 7.20                                    | 23.98       |
|                 |             | 39          | 6.02                | 1.124             | 7.14                                    | 23.98       |
|                 |             | 52          | 5.79                | 1.395             | 7.19                                    | 23.98       |
|                 |             | 58.5        | 5.67                | 1.549             | 7.22                                    | 23.98       |
|                 |             | 65          | 5.61                | 1.671             | 7.28                                    | 23.98       |
| 5580            | 116         | 6.5         | 7.24                | 0.223             | 7.47                                    | 23.98       |
|                 |             | 13          | 7.05                | 0.430             | 7.48                                    | 23.98       |
|                 |             | 19.5        | 6.86                | 0.615             | 7.47                                    | 23.98       |
|                 |             | 26          | 6.54                | 0.795             | 7.33                                    | 23.98       |
|                 |             | 39          | 6.18                | 1.124             | 7.30                                    | 23.98       |
|                 |             | 52          | 5.91                | 1.395             | 7.30                                    | 23.98       |
|                 |             | 58.5        | 5.75                | 1.549             | 7.30                                    | 23.98       |
|                 |             | 65          | 5.54                | 1.671             | 7.21                                    | 23.98       |
| 5700            | 140         | 6.5         | 7.09                | 0.223             | 7.31                                    | 23.98       |
|                 |             | 13          | 6.86                | 0.430             | 7.29                                    | 23.98       |
|                 |             | 19.5        | 6.60                | 0.615             | 7.21                                    | 23.98       |
|                 |             | 26          | 6.59                | 0.795             | 7.39                                    | 23.98       |
|                 |             | 39          | 6.07                | 1.124             | 7.19                                    | 23.98       |
|                 |             | 52          | 5.63                | 1.395             | 7.03                                    | 23.98       |
|                 |             | 58.5        | 5.63                | 1.549             | 7.18                                    | 23.98       |
|                 |             | 65          | 5.28                | 1.671             | 6.95                                    | 23.98       |

Conducted Output Power Measurements (802.11n Mode: 5190~5230)

| 802.11n Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5190            | 38          | 13.5        | 6.25                | 0.467             | 6.72                                    | 16.99       |
|                 |             | 27          | 5.71                | 0.844             | 6.55                                    | 16.99       |
|                 |             | 40.5        | 5.41                | 1.185             | 6.59                                    | 16.99       |
|                 |             | 54          | 4.82                | 1.476             | 6.30                                    | 16.99       |
|                 |             | 81          | 4.38                | 1.963             | 6.35                                    | 16.99       |
|                 |             | 108         | 3.81                | 2.394             | 6.21                                    | 16.99       |
|                 |             | 121.5       | 3.66                | 2.619             | 6.28                                    | 16.99       |
|                 |             | 135         | 3.53                | 2.700             | 6.23                                    | 16.99       |
| 5230            | 46          | 13.5        | 6.00                | 0.467             | 6.46                                    | 16.99       |
|                 |             | 27          | 5.50                | 0.844             | 6.34                                    | 16.99       |
|                 |             | 40.5        | 5.21                | 1.185             | 6.39                                    | 16.99       |
|                 |             | 54          | 4.79                | 1.476             | 6.26                                    | 16.99       |
|                 |             | 81          | 4.35                | 1.963             | 6.32                                    | 16.99       |
|                 |             | 108         | 3.75                | 2.394             | 6.15                                    | 16.99       |
|                 |             | 121.5       | 3.70                | 2.619             | 6.32                                    | 16.99       |
|                 |             | 135         | 3.58                | 2.700             | 6.28                                    | 16.99       |

### Conducted Output Power Measurements (802.11n Mode: 5270~5310)

| 802.11n Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5270            | 54          | 13.5        | 6.17                | 0.467             | 6.64                                    | 23.98       |
|                 |             | 27          | 5.85                | 0.844             | 6.69                                    | 23.98       |
|                 |             | 40.5        | 5.55                | 1.185             | 6.74                                    | 23.98       |
|                 |             | 54          | 4.97                | 1.476             | 6.45                                    | 23.98       |
|                 |             | 81          | 4.29                | 1.963             | 6.25                                    | 23.98       |
|                 |             | 108         | 3.92                | 2.394             | 6.31                                    | 23.98       |
|                 |             | 121.5       | 3.70                | 2.619             | 6.32                                    | 23.98       |
|                 |             | 135         | 3.57                | 2.700             | 6.27                                    | 23.98       |
| 5310            | 62          | 13.5        | 6.27                | 0.467             | 6.73                                    | 23.98       |
|                 |             | 27          | 5.82                | 0.844             | 6.67                                    | 23.98       |
|                 |             | 40.5        | 5.57                | 1.185             | 6.75                                    | 23.98       |
|                 |             | 54          | 5.20                | 1.476             | 6.68                                    | 23.98       |
|                 |             | 81          | 4.60                | 1.963             | 6.56                                    | 23.98       |
|                 |             | 108         | 3.87                | 2.394             | 6.26                                    | 23.98       |
|                 |             | 121.5       | 3.64                | 2.619             | 6.25                                    | 23.98       |
|                 |             | 135         | 3.51                | 2.700             | 6.21                                    | 23.98       |

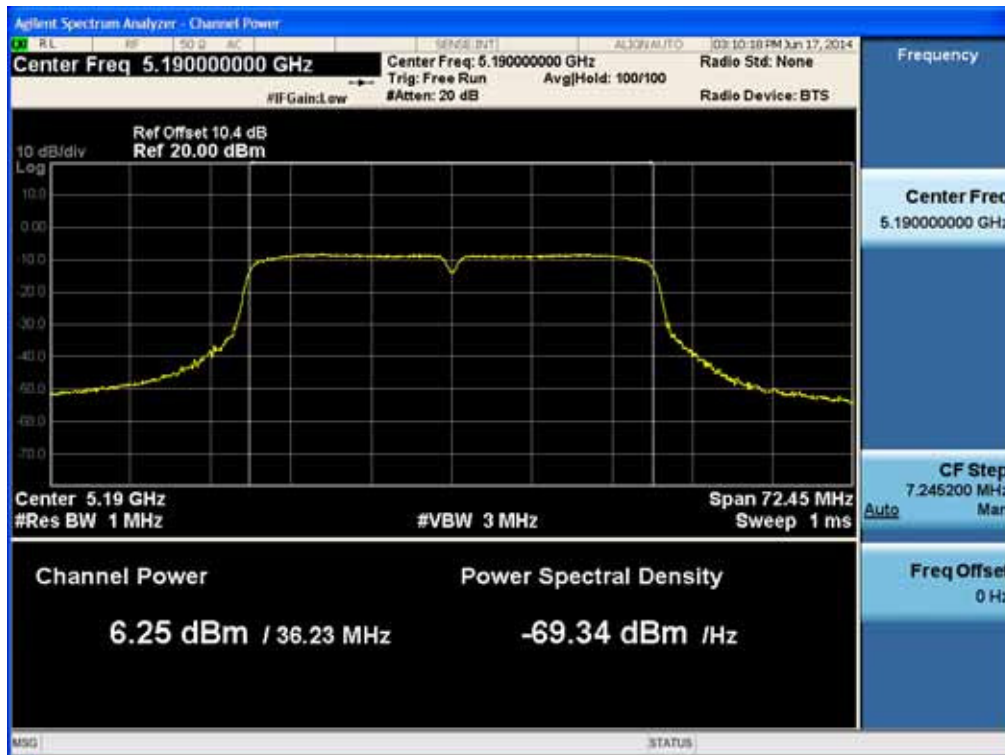
### Conducted Output Power Measurements (802.11n Mode: 5510~5670)

| 802.11n Mode    |             | Rate (Mbps) | Measured Power(dBm) | Duty Cycle Factor | Measured Power(dBm) + Duty Cycle Factor | Limit (dBm) |
|-----------------|-------------|-------------|---------------------|-------------------|-----------------------------------------|-------------|
| Frequency [MHz] | Channel No. |             |                     |                   |                                         |             |
| 5510            | 102         | 13.5        | 7.17                | 0.467             | 7.64                                    | 23.98       |
|                 |             | 27          | 6.70                | 0.844             | 7.54                                    | 23.98       |
|                 |             | 40.5        | 6.39                | 1.185             | 7.58                                    | 23.98       |
|                 |             | 54          | 5.90                | 1.476             | 7.38                                    | 23.98       |
|                 |             | 81          | 5.34                | 1.963             | 7.30                                    | 23.98       |
|                 |             | 108         | 4.94                | 2.394             | 7.34                                    | 23.98       |
|                 |             | 121.5       | 4.70                | 2.619             | 7.32                                    | 23.98       |
|                 |             | 135         | 4.44                | 2.700             | 7.14                                    | 23.98       |
| 5550            | 110         | 13.5        | 7.31                | 0.467             | 7.78                                    | 23.98       |
|                 |             | 27          | 6.85                | 0.844             | 7.69                                    | 23.98       |
|                 |             | 40.5        | 6.55                | 1.185             | 7.74                                    | 23.98       |
|                 |             | 54          | 5.95                | 1.476             | 7.43                                    | 23.98       |
|                 |             | 81          | 5.52                | 1.963             | 7.48                                    | 23.98       |
|                 |             | 108         | 5.15                | 2.394             | 7.54                                    | 23.98       |
|                 |             | 121.5       | 4.78                | 2.619             | 7.40                                    | 23.98       |
|                 |             | 135         | 4.61                | 2.700             | 7.31                                    | 23.98       |
| 5670            | 134         | 13.5        | 6.50                | 0.467             | 6.97                                    | 23.98       |
|                 |             | 27          | 6.15                | 0.844             | 6.99                                    | 23.98       |
|                 |             | 40.5        | 5.66                | 1.185             | 6.84                                    | 23.98       |
|                 |             | 54          | 5.47                | 1.476             | 6.94                                    | 23.98       |
|                 |             | 81          | 4.76                | 1.963             | 6.72                                    | 23.98       |
|                 |             | 108         | 4.14                | 2.394             | 6.53                                    | 23.98       |
|                 |             | 121.5       | 3.98                | 2.619             | 6.60                                    | 23.98       |
|                 |             | 135         | 3.92                | 2.700             | 6.62                                    | 23.98       |

Note : In order to simplify the report, attached plots were only the highest conducted power channel.

# RESULT PLOTS 40 MHz BW (5190 MHz ~5230 MHz)

## Conducted Output Power (802.11n-CH 38) 13.5 Mbps



## Conducted Output Power (802.11n-CH 46) 13.5 Mbps

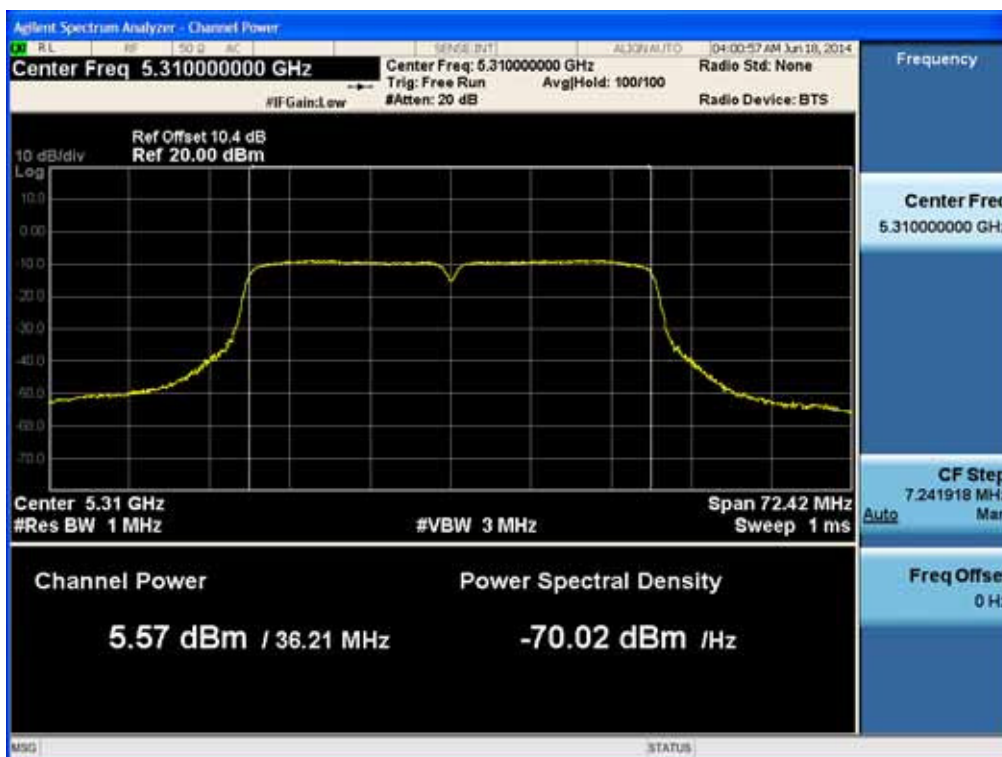


(5270 MHz ~5310 MHz)

### Conducted Output Power (802.11n-CH 54) 40.5 Mbps



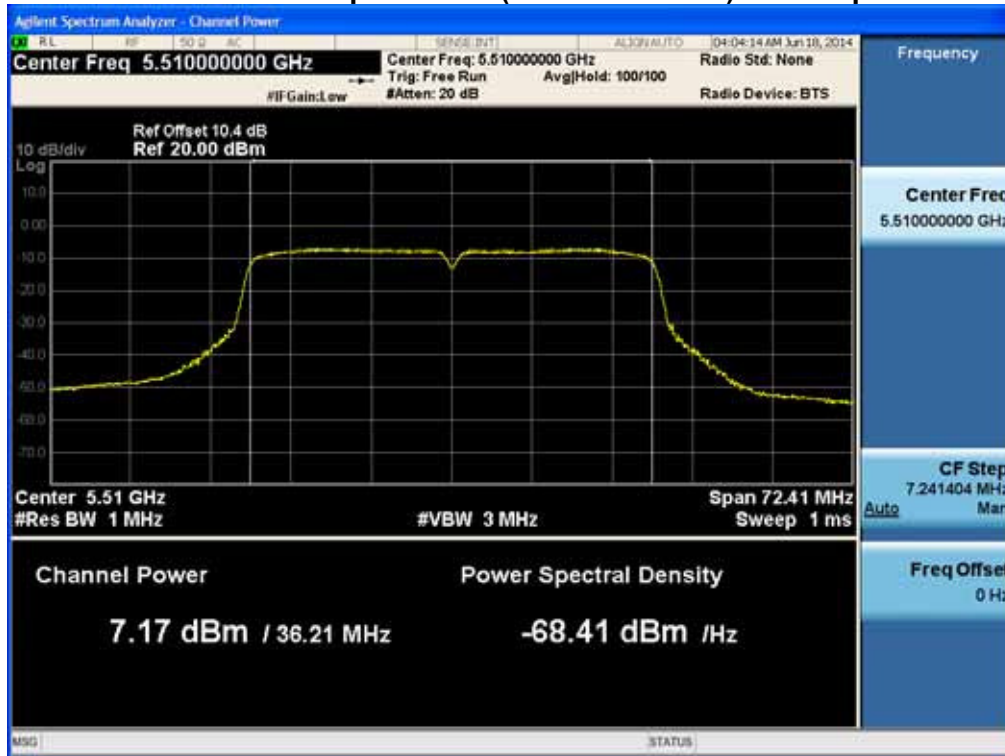
### Conducted Output Power (802.11n-CH 62) 40.5 Mbps



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

(5510 MHz ~5670 MHz)

### Conducted Output Power (802.11n-CH 102) 13.5 Mbps



### Conducted Output Power (802.11n-CH 110) 13.5 Mbps



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## Conducted Output Power (802.11n-CH 134) 27 Mbps



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## 8.5 POWER SPECTRAL DENSITY

The peak power 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

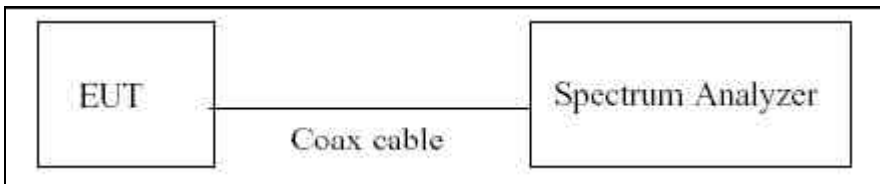
#### 1. Maximum Power Spectral Density :

| Band    | Mode      | Limit (dBm)                 |
|---------|-----------|-----------------------------|
| UNII 1  | 802.11a,n | 4(FCC), 10(e.i.r.p. for IC) |
| UNII 2A | 802.11a,n | 11(FCC and IC)              |
| UNII 2C | 802.11a,n | 11(FCC and IC)              |

Note : In case of UNII 1, The gap of PSD limit and EIRP Spectral Density limit is about 6 dB.

The antenna gain of EUT is not exceed 6 dBi. Therefore, if PSD is pass, EIRP Spectral Density is also pass. So, we attached only PSD table.

### □ 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\*span/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.

#### □ Sample Calculation (Conducted)

PSD = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor

#### □ Sample Calculation (EIRP)

EIRP Spectral Density = Reading Value + ATT loss + Cable loss(1 ea) + Duty Cycle Factor + Ant gain

Note :

1. Spectrum reading values are not plot data. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

| Band    | Frequency(MHz) | Loss(dB) |
|---------|----------------|----------|
| UNII 1  | 5180           | 10.30    |
|         | 5190           | 10.29    |
|         | 5200           | 10.28    |
|         | 5230           | 10.29    |
|         | 5240           | 10.34    |
| UNII 2  | 5260           | 10.37    |
|         | 5270           | 10.38    |
|         | 5300           | 10.40    |
|         | 5310           | 10.39    |
|         | 5320           | 10.39    |
| UNII 2e | 5500           | 10.35    |
|         | 5510           | 10.36    |
|         | 5550           | 10.41    |
|         | 5580           | 10.43    |
|         | 5670           | 10.43    |
|         | 5700           | 10.30    |

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

## □ TEST RESULTS

### Conducted Power Density Measurements

| Frequency<br>(MHz) | Channel<br>No. | Mode    | Test Result                           |                              |                                                                |                |           |
|--------------------|----------------|---------|---------------------------------------|------------------------------|----------------------------------------------------------------|----------------|-----------|
|                    |                |         | Measured<br>Power<br>Density<br>(dBm) | Duty Cycle<br>Factor<br>(dB) | Measured<br>Power<br>Density(dBm)<br>+<br>Duty Cycle<br>Factor | Limit<br>(dBm) | Pass/Fail |
| 5180               | 36             | 802.11a | -3.563                                | 0.208836                     | -3.354                                                         | 4              | Pass      |
| 5200               | 40             |         | -3.118                                | 0.57521                      | -2.543                                                         | 4              | Pass      |
| 5240               | 48             |         | -2.918                                | 0.208836                     | -2.709                                                         | 4              | Pass      |
| 5260               | 52             |         | -3.754                                | 0.395453                     | -3.359                                                         | 11             | Pass      |
| 5300               | 60             |         | -3.497                                | 0.761199                     | -2.736                                                         | 11             | Pass      |
| 5320               | 64             |         | -2.479                                | 0.208836                     | -2.270                                                         | 11             | Pass      |
| 5500               | 100            |         | -2.812                                | 1.068275                     | -1.744                                                         | 11             | Pass      |
| 5580               | 116            |         | -2.722                                | 0.305381                     | -2.417                                                         | 11             | Pass      |
| 5700               | 140            |         | -2.876                                | 0.208836                     | -2.667                                                         | 11             | Pass      |

### Conducted Power Density Measurements

| Frequency<br>(MHz) | Channel<br>No. | Mode                   | Test Result                           |                              |                                                                |                |           |
|--------------------|----------------|------------------------|---------------------------------------|------------------------------|----------------------------------------------------------------|----------------|-----------|
|                    |                |                        | Measured<br>Power<br>Density<br>(dBm) | Duty Cycle<br>Factor<br>(dB) | Measured<br>Power<br>Density(dBm)<br>+<br>Duty Cycle<br>Factor | Limit<br>(dBm) | Pass/Fail |
| 5180               | 36             | 802.11n<br>20MHz<br>BW | -4.511                                | 0.61518                      | -3.896                                                         | 4              | Pass      |
| 5200               | 40             |                        | -5.379                                | 0.794778                     | -4.584                                                         | 4              | Pass      |
| 5240               | 48             |                        | -4.200                                | 0.223459                     | -3.977                                                         | 4              | Pass      |
| 5260               | 52             |                        | -5.093                                | 0.430088                     | -4.663                                                         | 11             | Pass      |
| 5300               | 60             |                        | -4.764                                | 0.61518                      | -4.149                                                         | 11             | Pass      |
| 5320               | 64             |                        | -3.783                                | 0.223459                     | -3.560                                                         | 11             | Pass      |
| 5500               | 100            |                        | -2.847                                | 0.223459                     | -2.624                                                         | 11             | Pass      |
| 5580               | 116            |                        | -3.811                                | 0.430088                     | -3.381                                                         | 11             | Pass      |
| 5700               | 140            |                        | -4.222                                | 0.794778                     | -3.427                                                         | 11             | Pass      |

### Conducted Power Density Measurements

| Frequency<br>(MHz) | Channel<br>No. | Mode                | Test Result                           |                                 |                                                                |                |           |
|--------------------|----------------|---------------------|---------------------------------------|---------------------------------|----------------------------------------------------------------|----------------|-----------|
|                    |                |                     | Measured<br>Power<br>Density<br>(dBm) | Duty<br>Cycle<br>Factor<br>(dB) | Measured<br>Power<br>Density(dBm)<br>+<br>Duty Cycle<br>Factor | Limit<br>(dBm) | Pass/Fail |
| 5190               | 38             | 802.11n<br>40MHz BW | -8.290                                | 0.467047                        | -7.823                                                         | 4              | Pass      |
| 5230               | 46             |                     | -8.261                                | 0.467047                        | -7.794                                                         | 4              | Pass      |
| 5270               | 54             |                     | -8.011                                | 1.184845                        | -6.826                                                         | 11             | Pass      |
| 5310               | 62             |                     | -8.044                                | 1.184845                        | -6.859                                                         | 11             | Pass      |
| 5510               | 102            |                     | -7.259                                | 0.467047                        | -6.792                                                         | 11             | Pass      |
| 5550               | 110            |                     | -7.216                                | 0.467047                        | -6.749                                                         | 11             | Pass      |
| 5670               | 134            |                     | -7.894                                | 0.843751                        | -7.050                                                         | 11             | Pass      |

Note : In order to simplify the report, attached plots were only the highest PSD channel.

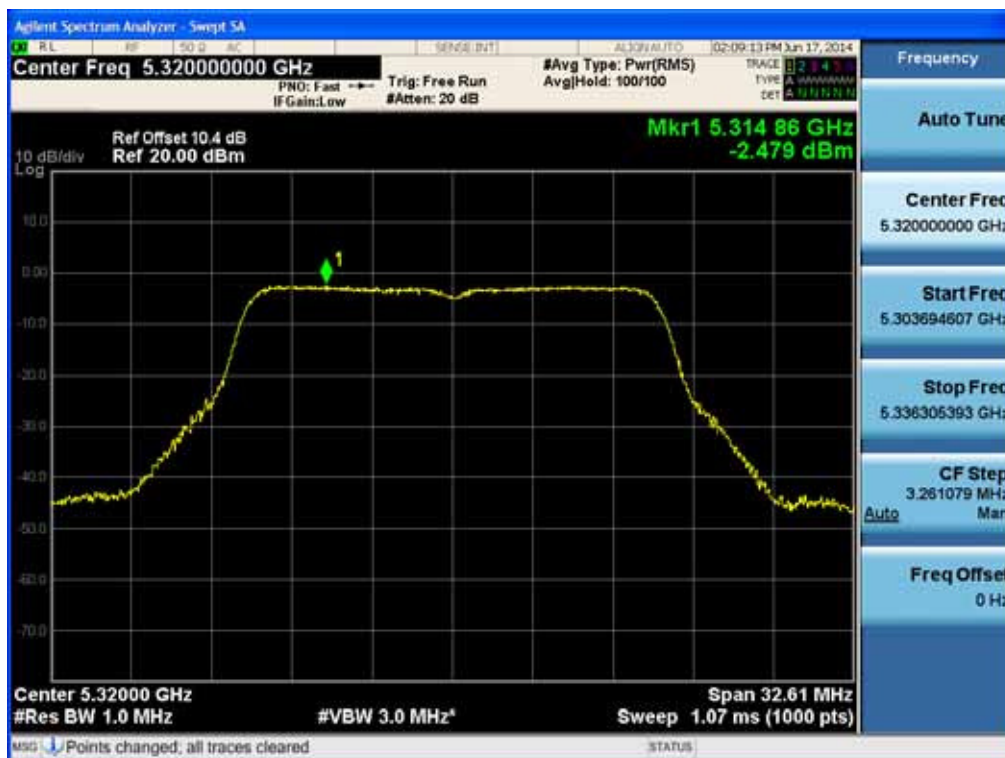
## RESULT PLOTS

### 20 MHz BW

Power Spectral Density (802.11a-CH 40)



Power Spectral Density (802.11a-CH 64)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## Power Spectral Density (802.11a-CH 100)



## Power Spectral Density (802.11n-CH 36)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

### Power Spectral Density (802.11n-CH 64)

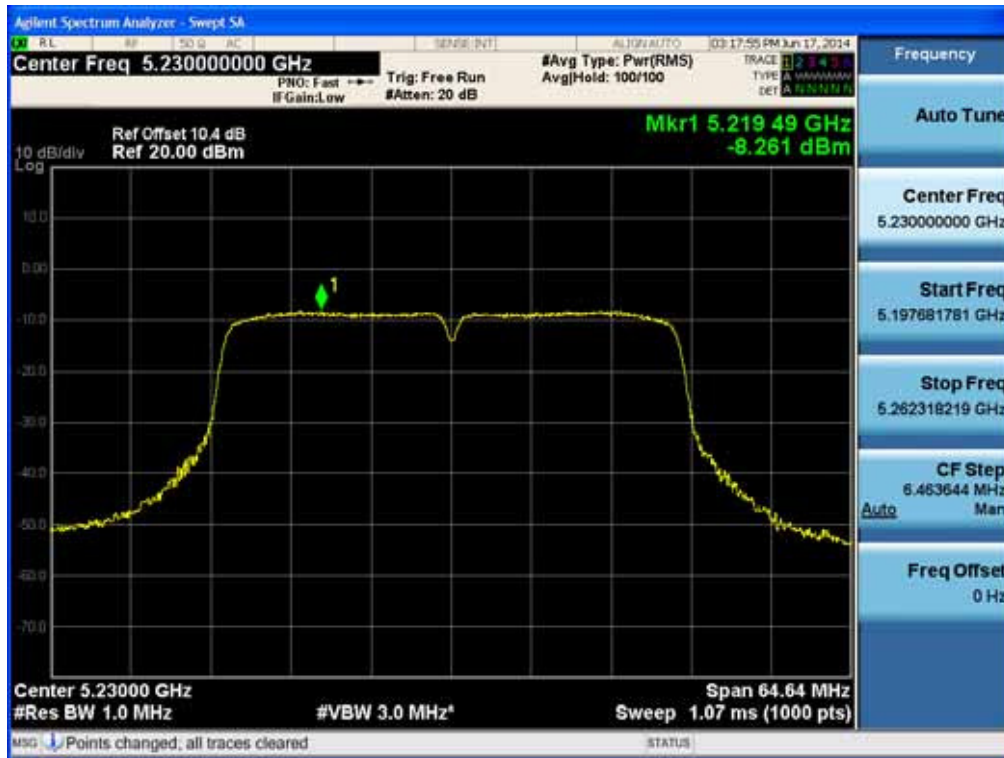


### Power Spectral Density (802.11n-CH 100)

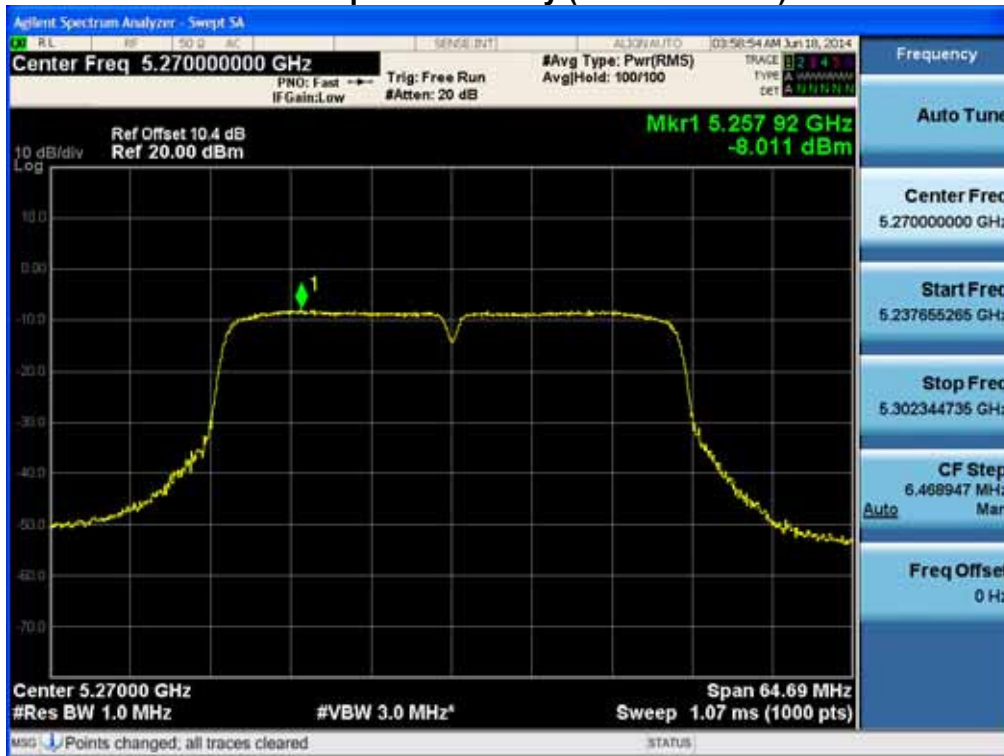


|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

### Power Spectral Density (802.11n-CH 46)

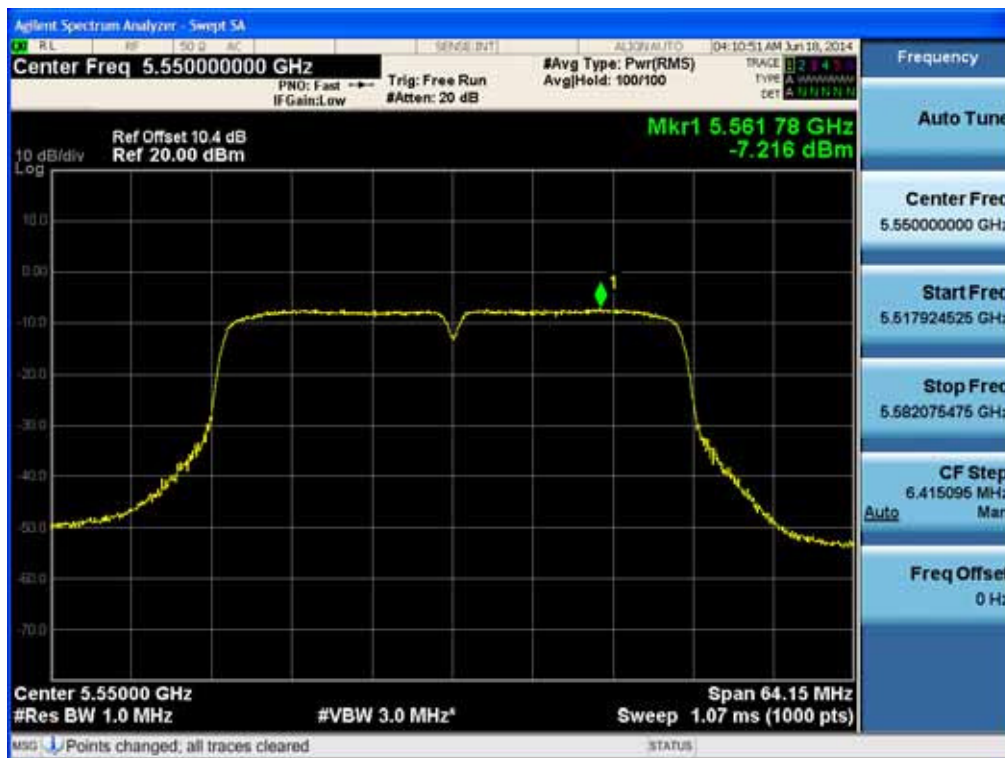


### Power Spectral Density (802.11n-CH 54)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## Power Spectral Density (802.11n-CH 110)

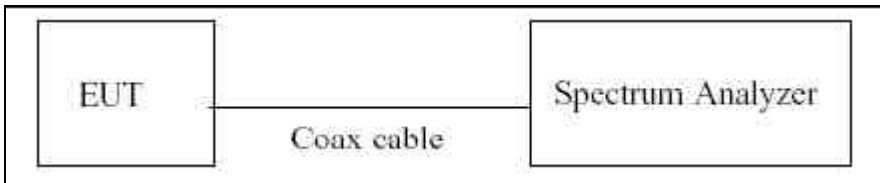


|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## 8.6 PEAK EXCURSION RATIO

The spectrum analyzer was connected to the antenna terminal while the EUT was operating in the continuous transmission mode at the appropriate center frequencies. The largest permissible difference between the modulation envelope(measured using a peak hold function) and the maximum conducted output power 13 dB/MHz.

### □ TEST CONFIGURATION



### □ TEST PROCEDURE

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

The spectrum analyzer is set to :

1. Span = Set the span to view the entire emission bandwidth.
2. RBW = 1 MHz
3. VBW  $\geq$  3 MHz
4. Detector Mode = Peak
5. Trace Mode = Max hold
6. Allow the sweeps to continue until the trace stabilizes.
7. Use the peak search function to find the peak of the spectrum.
8. Use the procedure to measure the PPSD
9. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

Note :

1. The PSD results in plot is already including the actual values of loss for the attenuator and cable combination.
2. Spectrum offset = Attenuator loss + Cable loss
3. We apply to the offset in the 5.2 GHz, 5.3 GHz and 5.6 GHz range that was rounded off to the closest tenth dB. Actual value of loss for the attenuator and cable combination is below table.

|                                             |                                          |                                          |                           |                                                  |
|---------------------------------------------|------------------------------------------|------------------------------------------|---------------------------|--------------------------------------------------|
| <b>FCC PT.15.407<br/>TEST REPORT</b>        | <b>FCC &amp; IC CERTIFICATION REPORT</b> |                                          |                           | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| <b>Test Report No.</b><br>HCT-R-1407-F005-3 | <b>Date of Issue:</b><br>July 08, 2014   | <b>EUT Type:</b> 2.4/5GHz BT/WiFi Tablet | <b>FCC ID:</b><br>ZNFV480 | <b>IC:</b><br>2703C-V480                         |

| Band    | Frequency(MHz) | Loss(dB) |
|---------|----------------|----------|
| UNII 1  | 5180           | 10.30    |
|         | 5190           | 10.29    |
|         | 5200           | 10.28    |
|         | 5230           | 10.29    |
|         | 5240           | 10.34    |
| UNII 2  | 5260           | 10.37    |
|         | 5270           | 10.38    |
|         | 5300           | 10.40    |
|         | 5310           | 10.39    |
|         | 5320           | 10.39    |
| UNII 2e | 5500           | 10.35    |
|         | 5510           | 10.36    |
|         | 5550           | 10.41    |
|         | 5580           | 10.43    |
|         | 5670           | 10.43    |
|         | 5700           | 10.30    |

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

## RESULT PLOTS

### Peak Excursion Ratio (802.11a-CH 36)



### Peak Excursion Ratio (802.11a-CH 40)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

### Peak Excursion Ratio (802.11a-CH 48)



### Peak Excursion Ratio (802.11a-CH 52)



### Peak Excursion Ratio (802.11a-CH 60)

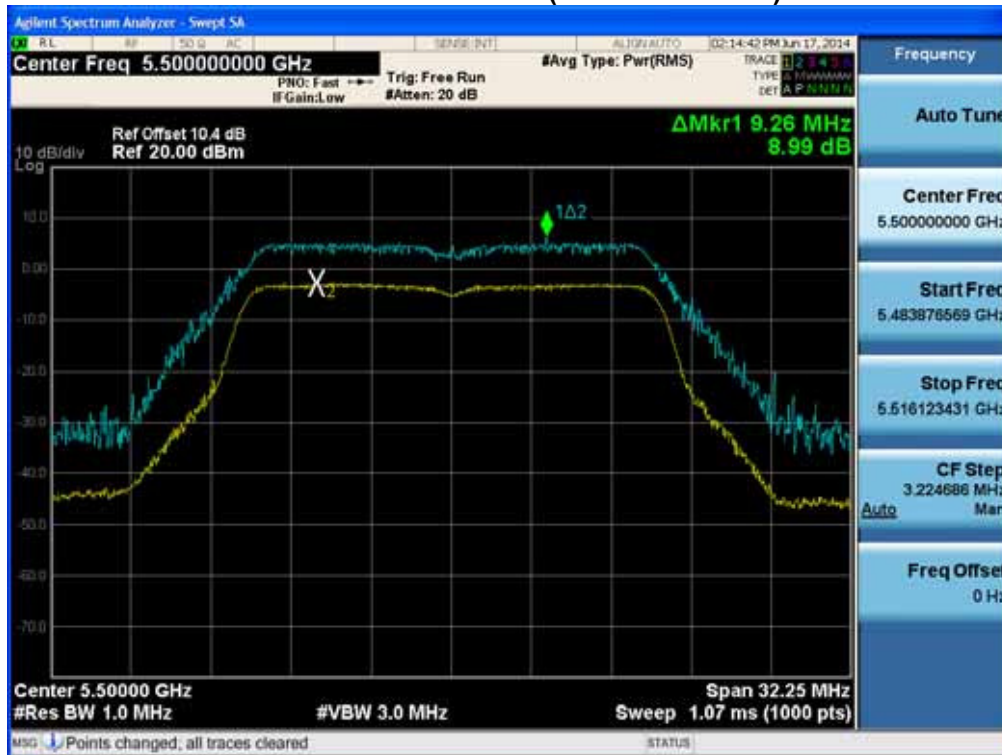


### Peak Excursion Ratio (802.11a-CH 64)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

### Peak Excursion Ratio (802.11a-CH 100)



### Peak Excursion Ratio (802.11a-CH 116)



## Peak Excursion Ratio (802.11a-CH 140)



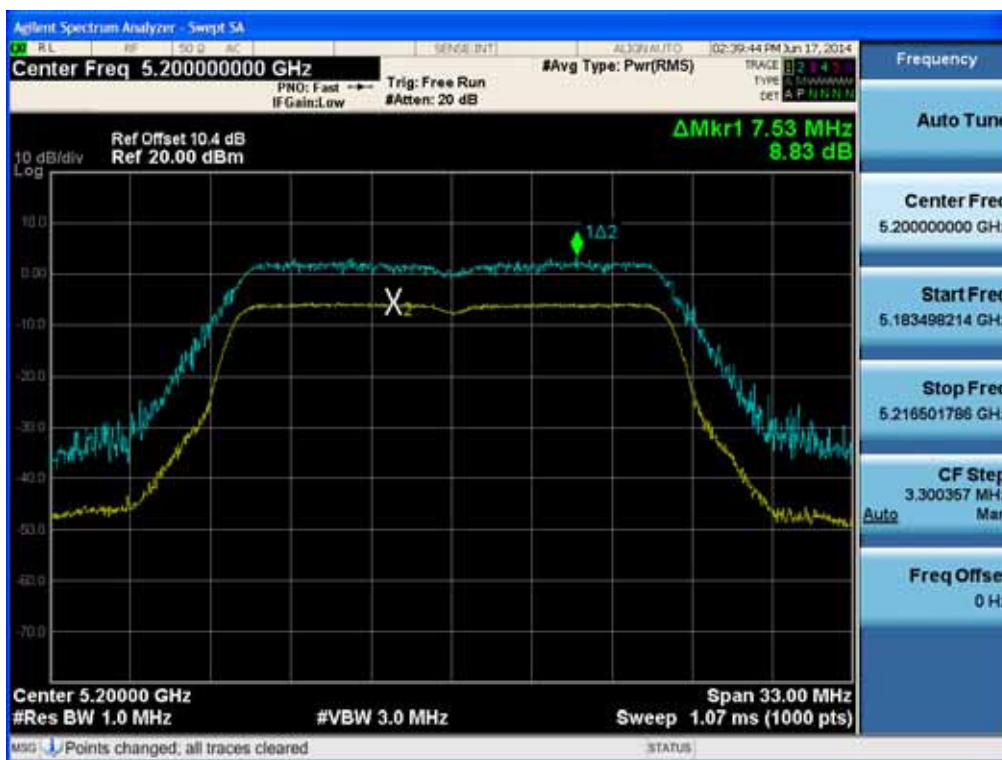
|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

20 MHz BW

### Peak Excursion Ratio (802.11n-CH 36)

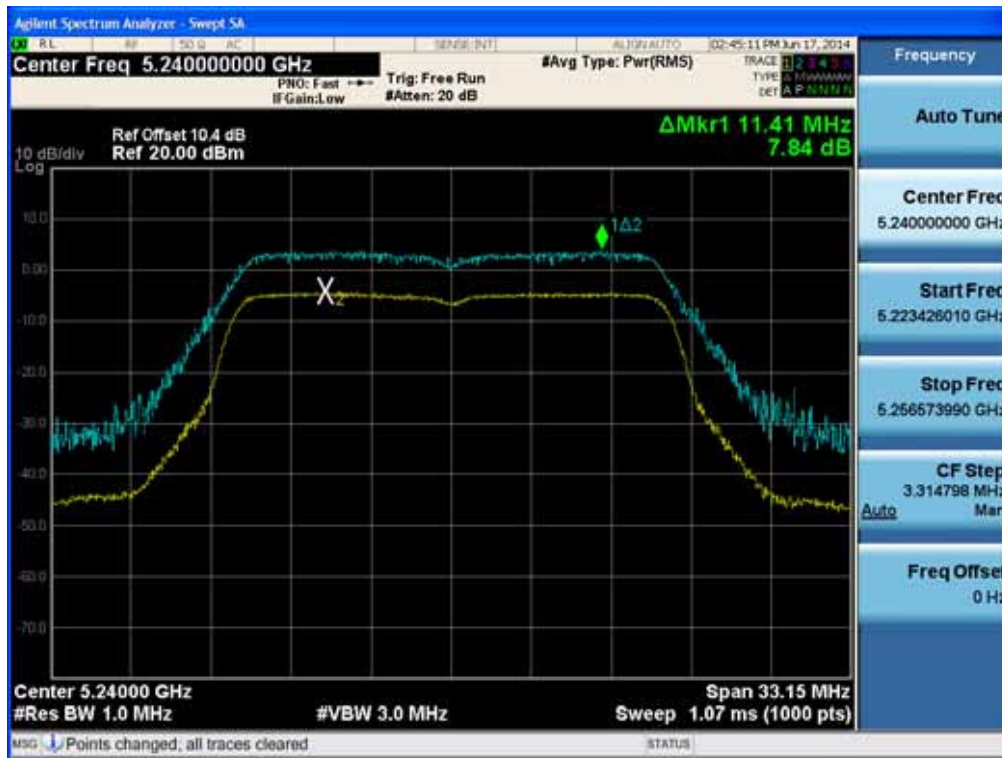


### Peak Excursion Ratio (802.11n-CH 40)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

### Peak Excursion Ratio (802.11n-CH 48)



### Peak Excursion Ratio (802.11n-CH 52)



### Peak Excursion Ratio (802.11n-CH 60)

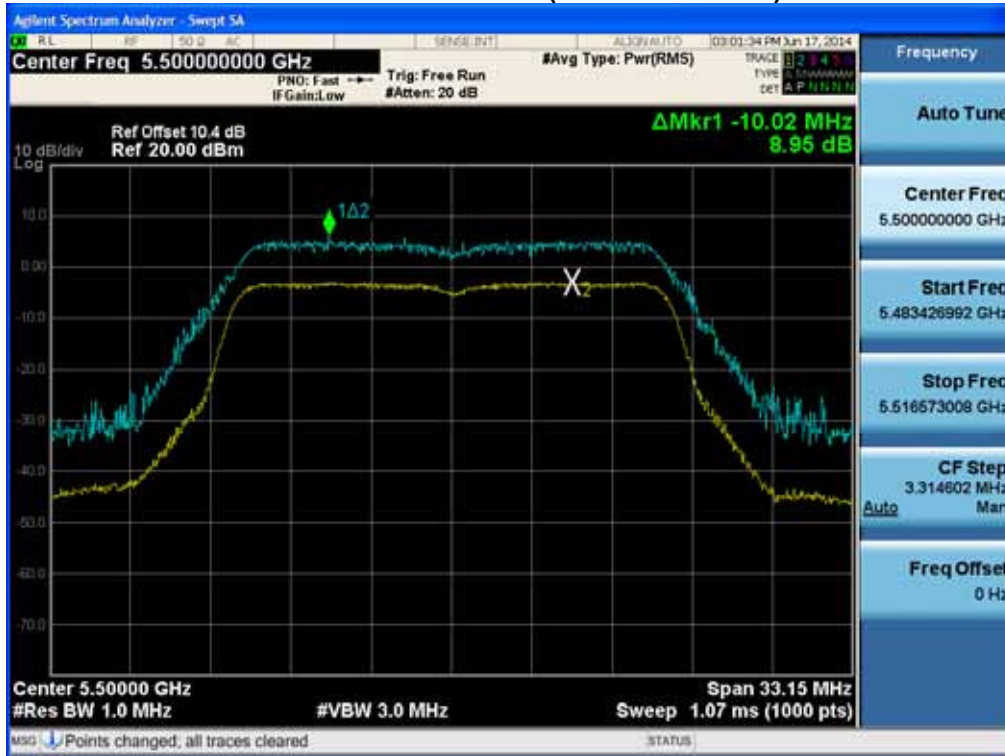


### Peak Excursion Ratio (802.11n-CH 64)

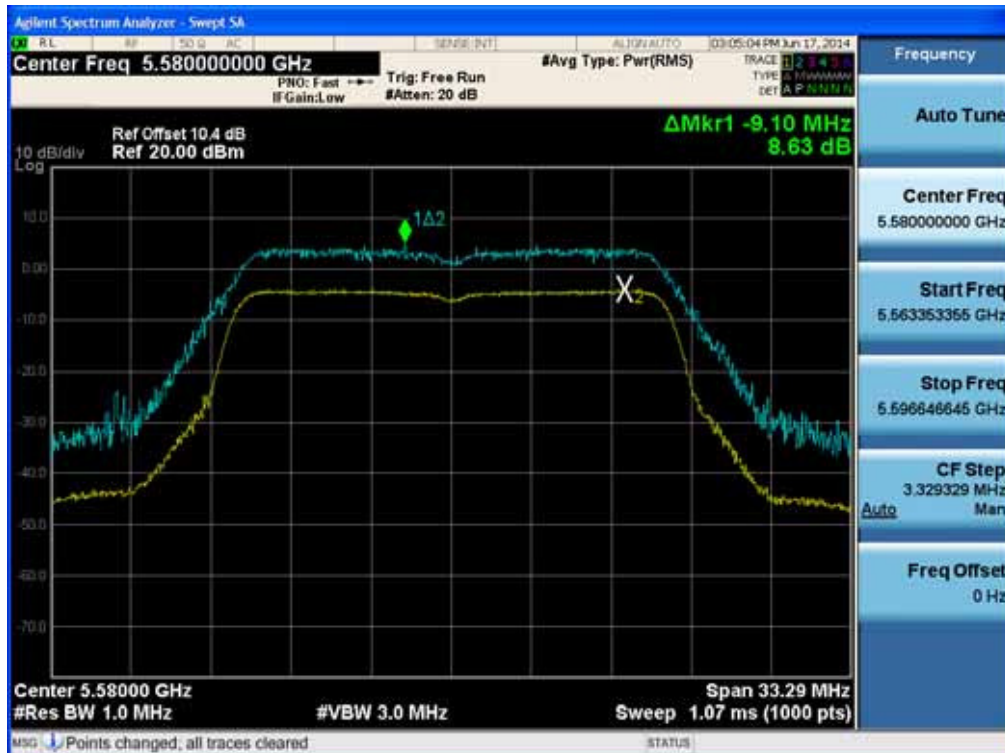


|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

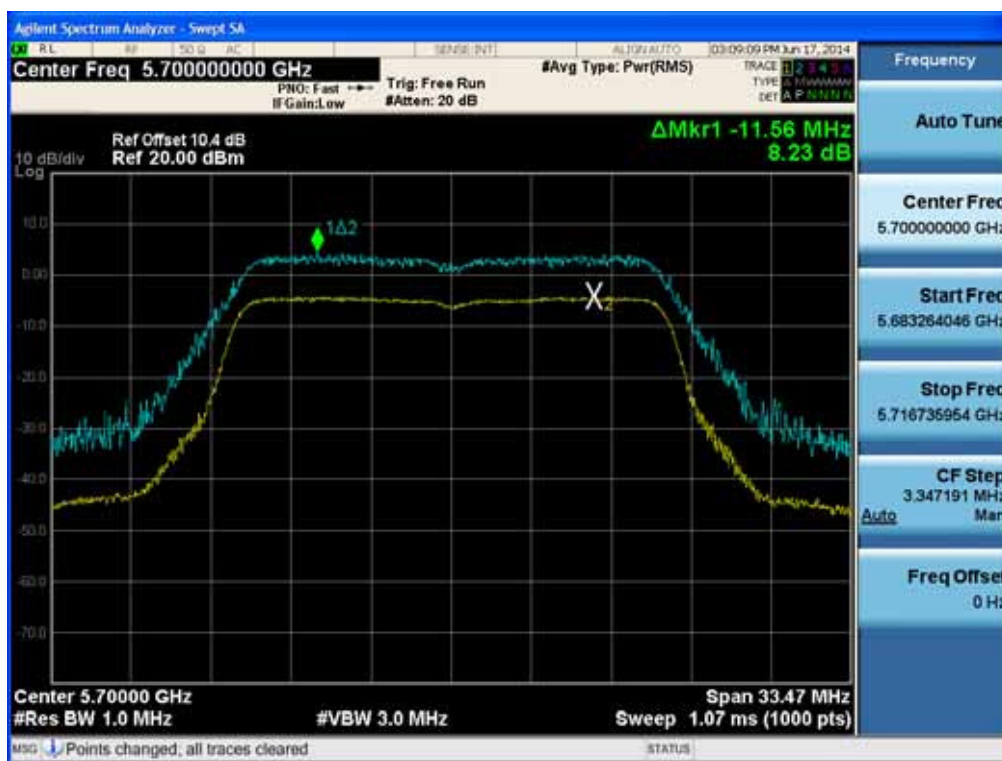
### Peak Excursion Ratio (802.11n-CH 100)



### Peak Excursion Ratio (802.11n-CH 116)



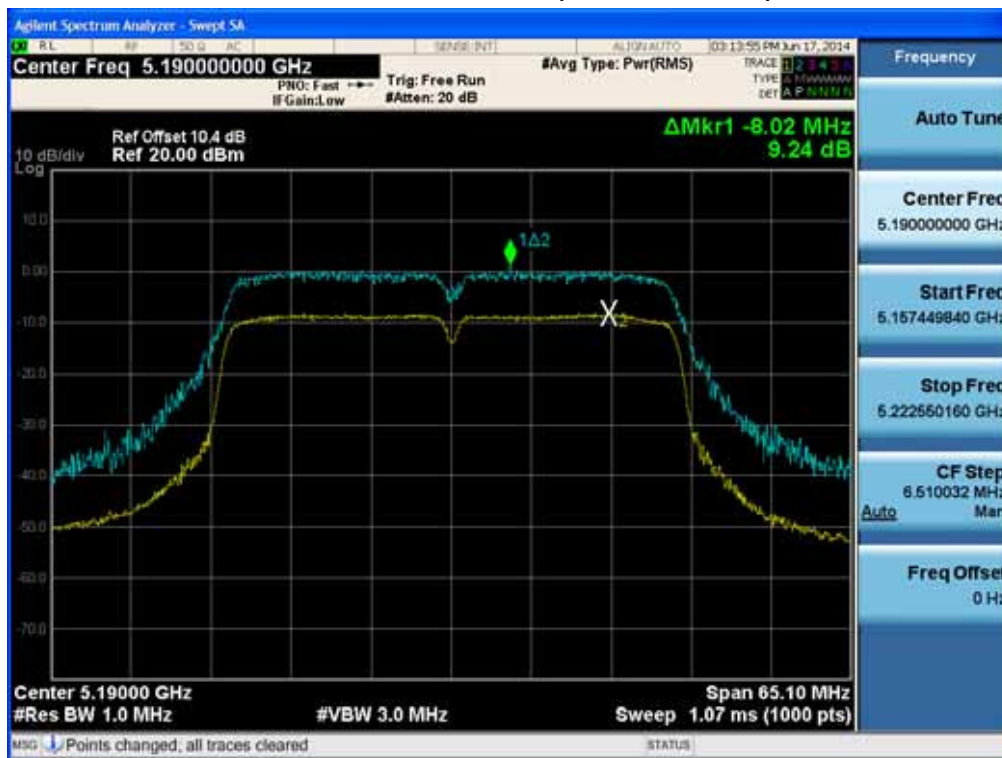
## Peak Excursion Ratio (802.11n-CH 140)



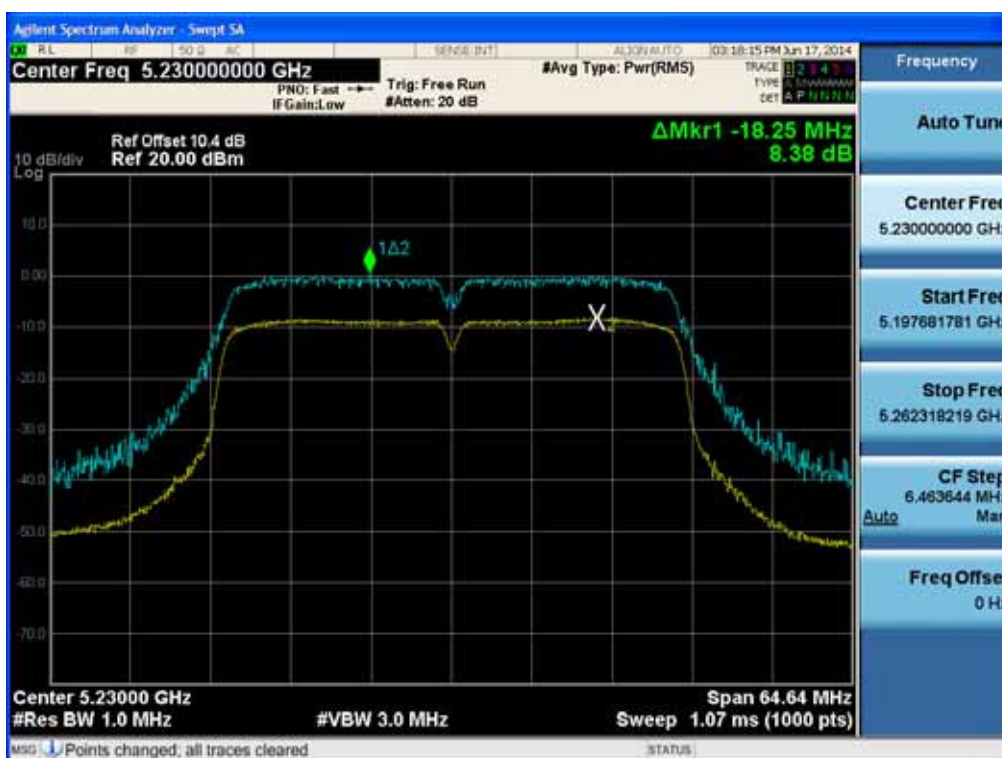
|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

40 MHz BW

### Peak Excursion Ratio (802.11n-CH 38)

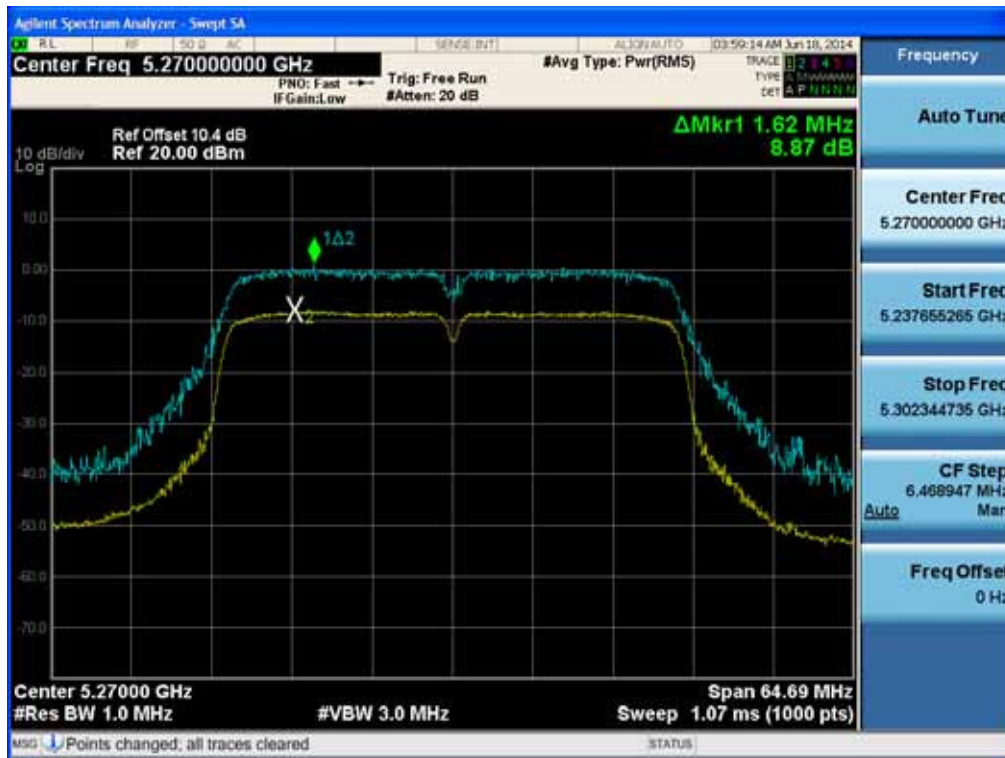


### Peak Excursion Ratio (802.11n-CH 46)

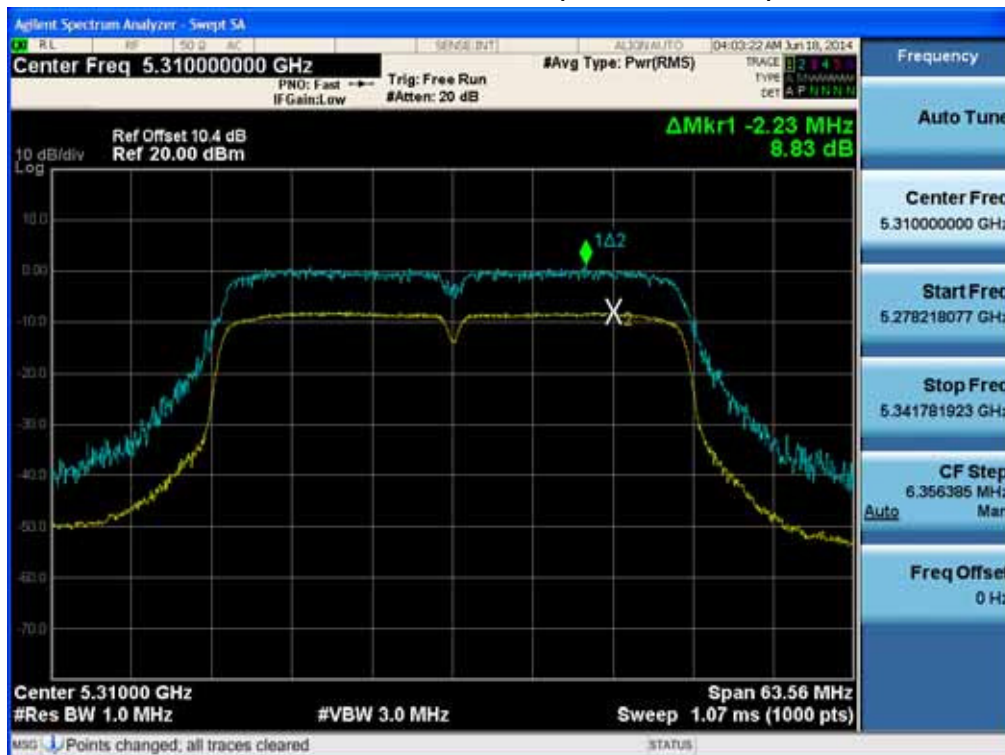


|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

### Peak Excursion Ratio (802.11n-CH 54)

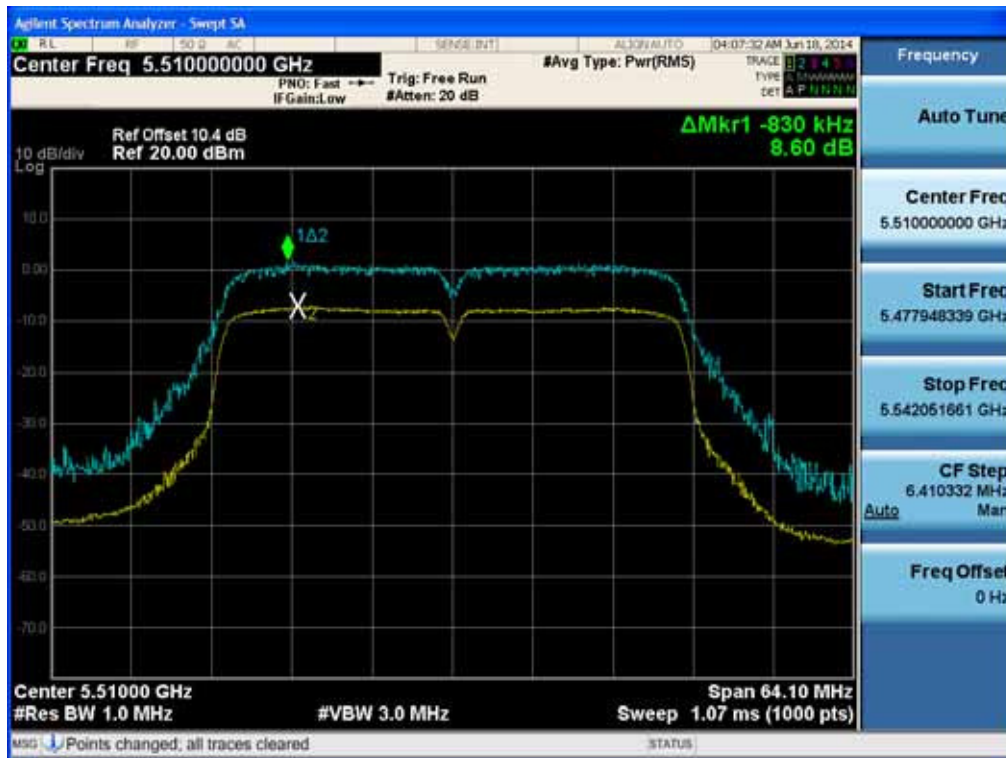


### Peak Excursion Ratio (802.11n-CH 62)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

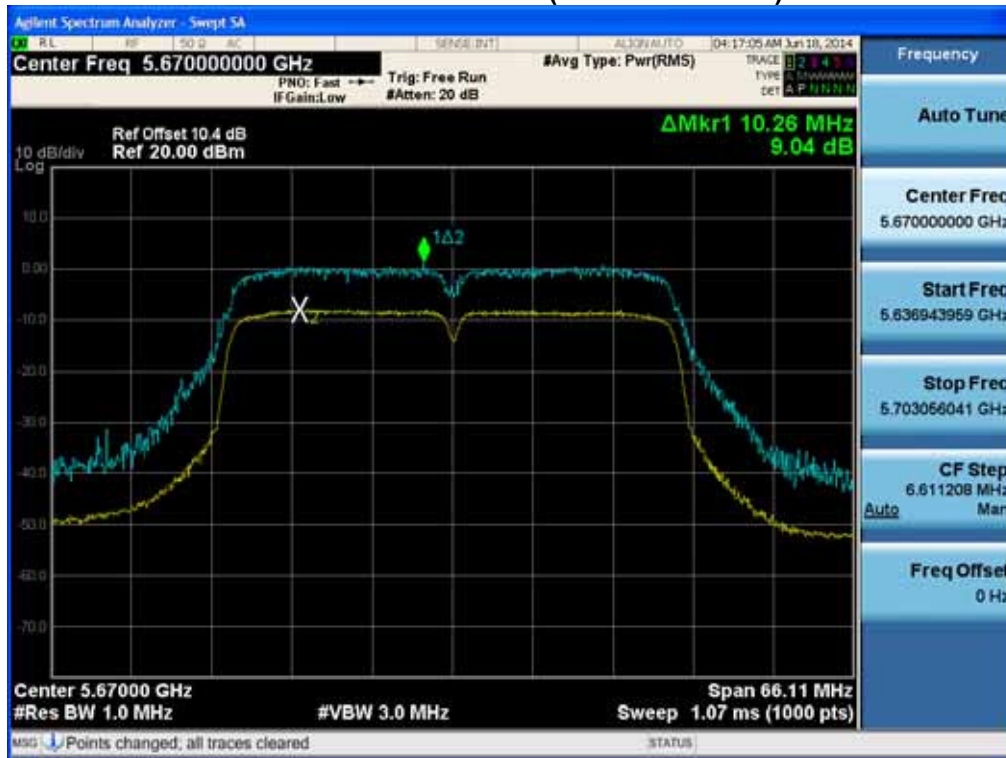
### Peak Excursion Ratio (802.11n-CH 102)



### Peak Excursion Ratio (802.11n-CH 110)



## Peak Excursion Ratio (802.11n-CH 134)



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## 8.7 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.

### 20 MHz BW

OPERATING BAND: UNII Band 1  
 OPERATING FREQUENCY: 5,180,000,000 Hz  
 CHANNEL: 36  
 REFERENCE VOLTAGE: 3.8 VDC

| Voltage (%)    | Power (VDC) | Temp. (°C) | Frequency (kHz) | Frequency Error (kHz) |
|----------------|-------------|------------|-----------------|-----------------------|
| 100%           | 3.80        | +20(Ref)   | 5 179 942.80    | 0                     |
| 100%           |             | -30        | 5 180 023.50    | 80.70                 |
| 100%           |             | -20        | 5 180 015.80    | 73.00                 |
| 100%           |             | -10        | 5 180 011.90    | 69.10                 |
| 100%           |             | 0          | 5 179 974.40    | 31.60                 |
| 100%           |             | +10        | 5 179 951.40    | 8.60                  |
| 100%           |             | +30        | 5 179 935.20    | -7.60                 |
| 100%           |             | +40        | 5 179 930.50    | -12.30                |
| 100%           |             | +50        | 5 179 929.10    | -13.70                |
| 115%           | 4.37        | +20        | 5 179 953.40    | 10.60                 |
| Batt. Endpoint | 3.23        | +20        | 5 179 961.26    | 18.46                 |

### 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 2A  
 OPERATING FREQUENCY: 5,260,000,000 Hz  
 CHANNEL: 52  
 REFERENCE VOLTAGE: 3.8 VDC

| Voltage (%)    | Power (VDC) | Temp. ( ° ) | Frequency (kHz) | Frequency Error (kHz) |
|----------------|-------------|-------------|-----------------|-----------------------|
| 100%           | 3.80        | +20(Ref)    | 5 259 939.80    | 0                     |
| 100%           |             | -30         | 5 260 029.64    | 89.84                 |
| 100%           |             | -20         | 5 260 018.48    | 78.68                 |
| 100%           |             | -10         | 5 260 012.38    | 72.58                 |
| 100%           |             | 0           | 5 259 984.20    | 44.40                 |
| 100%           |             | +10         | 5 259 955.32    | 15.52                 |
| 100%           |             | +30         | 5 259 938.75    | -1.05                 |
| 100%           |             | +40         | 5 259 931.35    | -8.45                 |
| 100%           |             | +50         | 5 259 930.36    | -9.44                 |
| 115%           | 4.37        | +20         | 5 259 949.32    | 9.52                  |
| Batt. Endpoint | 3.23        | +20         | 5 259 959.81    | 20.01                 |

**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 2C  
 OPERATING FREQUENCY: 5,500,000,000 Hz  
 CHANNEL: 100  
 REFERENCE VOLTAGE: 3.8 VDC

| Voltage (%)    | Power (VDC) | Temp. ( ° ) | Frequency (kHz) | Frequency Error (kHz) |
|----------------|-------------|-------------|-----------------|-----------------------|
| 100%           | 3.80        | +20(Ref)    | 5 499 937.00    | 0                     |
| 100%           |             | -30         | 5 500 026.84    | 89.84                 |
| 100%           |             | -20         | 5 500 022.17    | 85.17                 |
| 100%           |             | -10         | 5 500 016.84    | 79.84                 |
| 100%           |             | 0           | 5 499 984.32    | 47.32                 |
| 100%           |             | +10         | 5 499 961.42    | 24.42                 |
| 100%           |             | +30         | 5 499 938.31    | 1.31                  |
| 100%           |             | +40         | 5 499 935.49    | -1.51                 |
| 100%           |             | +50         | 5 499 928.36    | -8.64                 |
| 115%           | 4.37        | +20         | 5 499 959.35    | 22.35                 |
| Batt. Endpoint | 3.23        | +20         | 5 499 968.42    | 31.42                 |

**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.

#### 40 MHz BW

|                      |                  |
|----------------------|------------------|
| OPERATING BAND:      | UNII Band 1      |
| OPERATING FREQUENCY: | 5,190,000,000 Hz |
| CHANNEL:             | 38               |
| REFERENCE VOLTAGE:   | 3.8 VDC          |

| Voltage (%)    | Power (VDC) | Temp. ( ° ) | Frequency (kHz) | Frequency Error (kHz) |
|----------------|-------------|-------------|-----------------|-----------------------|
| 100%           | 3.80        | +20(Ref)    | 5 189 941.40    | 0                     |
| 100%           |             | -30         | 5 190 029.61    | 88.21                 |
| 100%           |             | -20         | 5 190 013.68    | 72.28                 |
| 100%           |             | -10         | 5 190 012.18    | 70.78                 |
| 100%           |             | 0           | 5 189 971.64    | 30.24                 |
| 100%           |             | +10         | 5 189 955.32    | 13.92                 |
| 100%           |             | +30         | 5 189 940.34    | -1.06                 |
| 100%           |             | +40         | 5 189 929.32    | -12.08                |
| 100%           |             | +50         | 5 189 927.11    | -14.29                |
| 115%           | 4.37        | +20         | 5 189 959.65    | 18.25                 |
| Batt. Endpoint | 3.23        | +20         | 5 189 974.03    | 32.63                 |

#### 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 2A  
 OPERATING FREQUENCY: 5,270,000,000 Hz  
 CHANNEL: 54  
 REFERENCE VOLTAGE: 3.8 VDC

| Voltage (%)    | Power (VDC) | Temp. ( ° ) | Frequency (kHz) | Frequency Error (kHz) |
|----------------|-------------|-------------|-----------------|-----------------------|
| 100%           | 3.80        | +20(Ref)    | 5 269 940.80    | 0                     |
| 100%           |             | -30         | 5 270 034.62    | 93.82                 |
| 100%           |             | -20         | 5 270 016.58    | 74.78                 |
| 100%           |             | -10         | 5 270 011.80    | 71.00                 |
| 100%           |             | 0           | 5 269 974.32    | 33.52                 |
| 100%           |             | +10         | 5 269 960.87    | 20.07                 |
| 100%           |             | +30         | 5 269 937.36    | -3.44                 |
| 100%           |             | +40         | 5 269 930.89    | -9.91                 |
| 100%           |             | +50         | 5 269 929.31    | -11.49                |
| 115%           | 4.37        | +20         | 5 269 960.24    | 19.44                 |
| Batt. Endpoint | 3.23        | +20         | 5 269 983.06    | 42.26                 |

**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 2C  
 OPERATING FREQUENCY: 5,510,000,000 Hz  
 CHANNEL: 102  
 REFERENCE VOLTAGE: 3.8 VDC

| Voltage (%)    | Power (VDC) | Temp. ( ° ) | Frequency (kHz) | Frequency Error (kHz) |
|----------------|-------------|-------------|-----------------|-----------------------|
| 100%           | 3.80        | +20(Ref)    | 5 509 937.80    | 0                     |
| 100%           |             | -30         | 5 510 039.46    | 101.66                |
| 100%           |             | -20         | 5 510 024.51    | 86.71                 |
| 100%           |             | -10         | 5 510 013.58    | 75.78                 |
| 100%           |             | 0           | 5 509 974.39    | 36.59                 |
| 100%           |             | +10         | 5 509 961.49    | 23.69                 |
| 100%           |             | +30         | 5 509 931.79    | -6.01                 |
| 100%           |             | +40         | 5 509 927.66    | -10.14                |
| 100%           |             | +50         | 5 509 925.35    | -12.45                |
| 115%           | 4.37        | +20         | 5 509 975.21    | 37.41                 |
| Batt. Endpoint | 3.23        | +20         | 5 509 987.85    | 50.05                 |

**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.

## 8.8 RADIATED MEASUREMENT.

### 8.8.1 RADIATED SPURIOUS EMISSIONS.

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

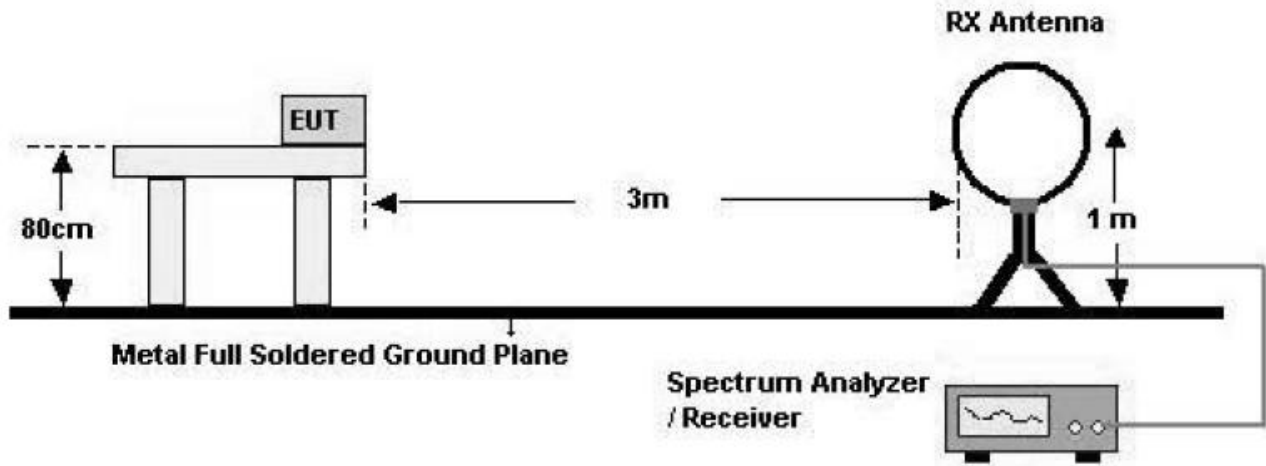
| Frequency (MHz) | Field Strength (uV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 0.009 – 0.490   | 2400/F(kHz)           | 300                      |
| 0.490 – 1.705   | 24000/F(kHz)          | 30                       |
| 1.705 – 30    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

#### □ §15.407, KDB 789033

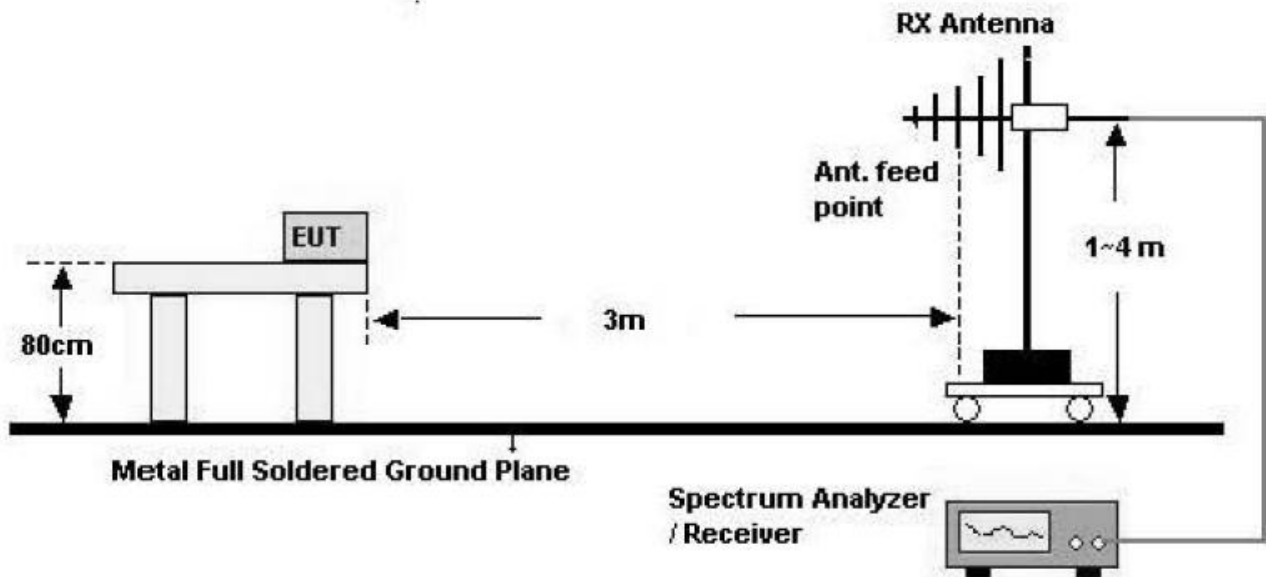
All harmonics that do not lie in a restricted band are subject to a peak limit of -27 dBm/MHz. At a distance of 3 meters the field strength limit in dBµV/m can be determined by adding a “conversion” factor of 95.2 dB to the EIRP limit of -27 dBm/MHz to obtain the limit for out of band spurious emissions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

## Test Configuration

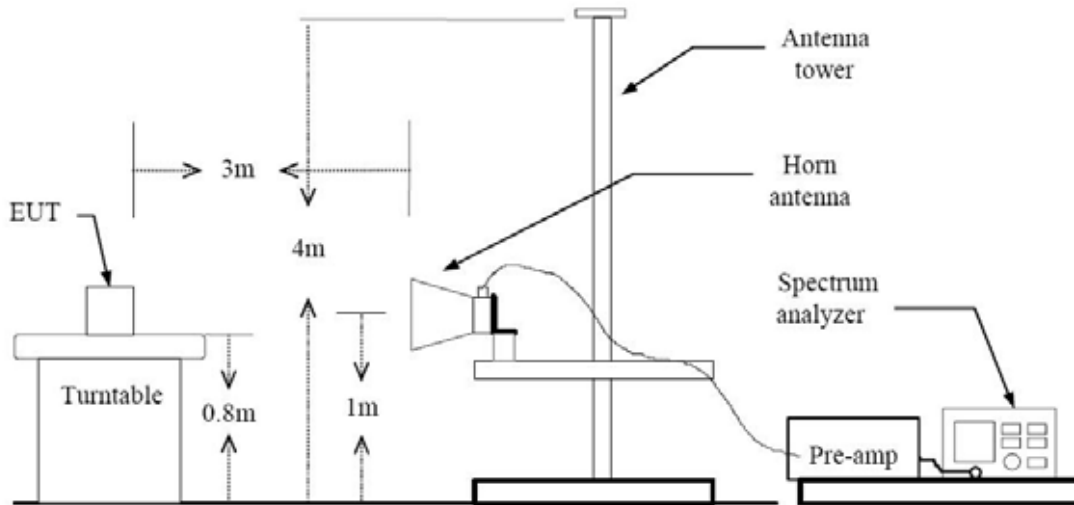
### Below 30 MHz



### 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.

| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

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 :**

1. We used the case 2 for 802.11a/g/n\_20/n\_40 mode to perform the average filed strength measurements.
2. The actual setting value of VBW for 802.11a/g/n\_20/n\_40

| Mode | Worst Data rate (Mbps) | T <sub>on</sub> (ms) | T <sub>total</sub> (ms) | Duty Cycle (%) | VBW(1/T) (Hz) | The actual setting value of VBW (Hz) |
|------|------------------------|----------------------|-------------------------|----------------|---------------|--------------------------------------|
| a    | 6                      | 2.030                | 2.130                   | 95.31          | 493           | 1000                                 |
| n_20 | 6.5                    | 1.875                | 1.974                   | 94.98          | 533           | 1000                                 |
| n_40 | 13.5                   | 0.916                | 1.020                   | 89.80          | 1092          | 3000                                 |

## 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 =  $40 \log (\text{specific distance} / \text{test distance})$  (dB)
4. Limit line = specific Limits (dB $\mu$ V) + 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   |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5180 MHz |
| Channel No.         | 36 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10360              | 62.06           | -6.51                 | V                 | 55.55             | 68.20             | 12.65          | PK     |
| 15540              | 62.55           | -6.42                 | V                 | 56.13             | 73.98             | 17.85          | PK     |
| 15540              | 48.77           | -6.42                 | V                 | 42.35             | 53.98             | 11.63          | AV     |
| 10360              | 62.13           | -6.51                 | H                 | 55.62             | 68.20             | 12.58          | PK     |
| 15540              | 62.68           | -6.42                 | H                 | 56.26             | 73.98             | 17.72          | PK     |
| 15540              | 48.82           | -6.42                 | H                 | 42.40             | 53.98             | 11.58          | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |          |
|---------------------|----------|
| Band :              | UNII 1   |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5200 MHz |
| Channel No.         | 40 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10400              | 62.68           | -6.49                 | V                 | 56.19             | 68.20             | 12.01          | PK     |
| 15600              | 62.64           | -7.15                 | V                 | 55.49             | 73.98             | 18.49          | PK     |
| 15600              | 48.86           | -7.15                 | V                 | 41.71             | 53.98             | 12.27          | AV     |
| 10400              | 62.78           | -6.49                 | H                 | 56.29             | 68.20             | 11.91          | PK     |
| 15600              | 62.84           | -7.15                 | H                 | 55.69             | 73.98             | 18.29          | PK     |
| 15600              | 48.90           | -7.15                 | H                 | 41.75             | 53.98             | 12.23          | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |          |
|---------------------|----------|
| Band :              | UNII 1   |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5240 MHz |
| Channel No.         | 48 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10480              | 62.59           | -6.96                 | V                 | 55.63             | 68.20             | 12.57          | PK     |
| 15720              | 62.61           | -6.62                 | V                 | 55.99             | 73.98             | 17.99          | PK     |
| 15720              | 48.40           | -6.62                 | V                 | 41.78             | 53.98             | 12.20          | AV     |
| 10480              | 62.66           | -6.96                 | H                 | 55.70             | 68.20             | 12.50          | PK     |
| 15720              | 62.72           | -6.96                 | H                 | 55.76             | 73.98             | 18.22          | PK     |
| 15720              | 48.44           | -6.62                 | H                 | 41.82             | 53.98             | 12.16          | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 1             |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5180 MHz           |
| Channel No.         | 36 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10360              | 62.10           | -6.51                 | V                 | 55.59             | 68.20             | 12.61          | PK     |
| 15540              | 62.54           | -6.42                 | V                 | 56.12             | 73.98             | 17.86          | PK     |
| 15540              | 48.80           | -6.42                 | V                 | 42.38             | 53.98             | 11.60          | AV     |
| 10360              | 62.31           | -6.51                 | H                 | 55.80             | 68.20             | 12.40          | PK     |
| 15540              | 62.66           | -6.42                 | H                 | 56.24             | 73.98             | 17.74          | PK     |
| 15540              | 48.81           | -6.42                 | H                 | 42.39             | 53.98             | 11.59          | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 1             |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5200 MHz           |
| Channel No.         | 40 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10400              | 62.66           | -6.49                 | V                 | 56.17             | 68.20             | 12.03          | PK     |
| 15600              | 62.70           | -7.15                 | V                 | 55.55             | 73.98             | 18.43          | PK     |
| 15600              | 48.88           | -7.15                 | V                 | 41.73             | 53.98             | 12.25          | AV     |
| 10400              | 62.81           | -6.49                 | H                 | 56.32             | 68.20             | 11.88          | PK     |
| 15600              | 62.88           | -7.15                 | H                 | 55.73             | 73.98             | 18.25          | PK     |
| 15600              | 48.90           | -7.15                 | H                 | 41.75             | 53.98             | 12.23          | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 1             |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5240 MHz           |
| Channel No.         | 48 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10480              | 62.61           | -6.96                 | V                 | 55.65             | 68.20             | 12.55          | PK     |
| 15720              | 62.69           | -6.62                 | V                 | 56.07             | 73.98             | 17.91          | PK     |
| 15720              | 48.42           | -6.62                 | V                 | 41.80             | 53.98             | 12.18          | AV     |
| 10480              | 62.70           | -6.96                 | H                 | 55.74             | 68.20             | 12.46          | PK     |
| 15720              | 62.70           | -6.96                 | H                 | 55.74             | 73.98             | 18.24          | PK     |
| 15720              | 48.43           | -6.62                 | H                 | 41.81             | 53.98             | 12.17          | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 1            |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5190 MHz          |
| Channel No.         | 38 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10380              | 62.18           | -5.38                 | V                 | 56.80             | 68.20             | 11.40          | PK     |
| 15570              | 63.17           | -6.41                 | V                 | 56.76             | 73.98             | 17.22          | PK     |
| 15570              | 48.67           | -6.41                 | V                 | 42.26             | 53.98             | 11.72          | AV     |
| 10380              | 62.23           | -5.38                 | H                 | 56.85             | 68.20             | 11.35          | PK     |
| 15570              | 63.57           | -6.41                 | H                 | 57.16             | 73.98             | 16.82          | PK     |
| 15570              | 48.71           | -6.41                 | H                 | 42.30             | 53.98             | 11.68          | 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 all data rate in 802.11n\_40 MHz BW. Worst case is 13.5 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 1            |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5230 MHz          |
| Channel No.         | 46 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10460              | 62.38           | -6.88                 | V                 | 55.50             | 68.20             | 12.70          | PK     |
| 15690              | 62.19           | -6.64                 | V                 | 55.55             | 73.98             | 18.43          | PK     |
| 15690              | 48.30           | -6.64                 | V                 | 41.66             | 53.98             | 12.32          | AV     |
| 10460              | 62.68           | -6.88                 | H                 | 55.80             | 68.20             | 12.40          | PK     |
| 15690              | 62.24           | -6.64                 | H                 | 55.60             | 73.98             | 18.38          | PK     |
| 15690              | 48.32           | -6.64                 | H                 | 41.68             | 53.98             | 12.30          | 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 all data rate in 802.11n\_40 MHz BW. Worst case is 13.5 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |          |
|---------------------|----------|
| Band :              | UNII 2A  |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5260 MHz |
| Channel No.         | 52 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10520              | 62.25           | -6.52                 | V                 | 55.73             | 68.20             | 12.47          | PK     |
| 15780              | 62.28           | -6.67                 | V                 | 55.61             | 73.98             | 18.37          | PK     |
| 15780              | 48.36           | -6.67                 | V                 | 41.69             | 53.98             | 12.29          | AV     |
| 10520              | 63.27           | -6.52                 | H                 | 56.75             | 68.20             | 11.45          | PK     |
| 15780              | 62.94           | -6.67                 | H                 | 56.27             | 73.98             | 17.71          | PK     |
| 15780              | 48.46           | -6.67                 | H                 | 41.79             | 53.98             | 12.19          | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |          |
|---------------------|----------|
| Band :              | UNII 2A  |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5300 MHz |
| Channel No.         | 60 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10600              | 62.25           | -6.72                 | V                 | 55.53             | 73.98             | 18.45          | PK     |
| 10600              | 48.53           | -6.72                 | V                 | 41.81             | 53.98             | 12.17          | AV     |
| 15900              | 62.49           | -7.00                 | V                 | 55.49             | 73.98             | 18.49          | PK     |
| 15900              | 48.66           | -7.00                 | V                 | 41.66             | 53.98             | 12.32          | AV     |
| 10600              | 62.38           | -6.72                 | H                 | 55.66             | 73.98             | 18.32          | PK     |
| 10600              | 48.58           | -6.72                 | H                 | 41.86             | 53.98             | 12.12          | AV     |
| 15900              | 62.80           | -7.00                 | H                 | 55.80             | 73.98             | 18.18          | PK     |
| 15900              | 48.69           | -7.00                 | H                 | 41.69             | 53.98             | 12.29          | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |          |
|---------------------|----------|
| Band :              | UNII 2A  |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5320 MHz |
| Channel No.         | 64 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10640              | 61.80           | -6.43                 | V                 | 55.37             | 73.98             | 18.61          | PK     |
| 10640              | 48.00           | -6.43                 | V                 | 41.57             | 53.98             | 12.41          | AV     |
| 15960              | 62.10           | -6.93                 | V                 | 55.17             | 73.98             | 18.81          | PK     |
| 15960              | 48.42           | -6.93                 | V                 | 41.49             | 53.98             | 12.49          | AV     |
| 10640              | 62.56           | -6.43                 | H                 | 56.13             | 73.98             | 17.85          | PK     |
| 10640              | 48.04           | -6.43                 | H                 | 41.61             | 53.98             | 12.37          | AV     |
| 15960              | 62.63           | -6.93                 | H                 | 55.70             | 73.98             | 18.28          | PK     |
| 15960              | 48.52           | -6.93                 | H                 | 41.59             | 53.98             | 12.39          | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2A            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5260 MHz           |
| Channel No.         | 52 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10520              | 62.21           | -6.52                 | V                 | 55.69             | 68.20             | 12.51          | PK     |
| 15780              | 62.47           | -6.67                 | V                 | 55.80             | 73.98             | 18.18          | PK     |
| 15780              | 48.40           | -6.67                 | V                 | 41.73             | 53.98             | 12.25          | AV     |
| 10520              | 63.30           | -6.52                 | H                 | 56.78             | 68.20             | 11.42          | PK     |
| 15780              | 62.98           | -6.67                 | H                 | 56.31             | 73.98             | 17.67          | PK     |
| 15780              | 48.45           | -6.67                 | H                 | 41.78             | 53.98             | 12.20          | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2A            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5300 MHz           |
| Channel No.         | 60 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10600              | 62.13           | -6.72                 | V                 | 55.41             | 73.98             | 18.57          | PK     |
| 10600              | 48.55           | -6.72                 | V                 | 41.83             | 53.98             | 12.15          | AV     |
| 15900              | 62.51           | -7.00                 | V                 | 55.51             | 73.98             | 18.47          | PK     |
| 15900              | 48.67           | -7.00                 | V                 | 41.67             | 53.98             | 12.31          | AV     |
| 10600              | 62.40           | -6.72                 | H                 | 55.68             | 73.98             | 18.30          | PK     |
| 10600              | 48.57           | -6.72                 | H                 | 41.85             | 53.98             | 12.13          | AV     |
| 15900              | 62.70           | -7.00                 | H                 | 55.70             | 73.98             | 18.28          | PK     |
| 15900              | 48.70           | -7.00                 | H                 | 41.70             | 53.98             | 12.28          | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2A            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5320 MHz           |
| Channel No.         | 64 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10640              | 62.31           | -6.43                 | V                 | 55.88             | 73.98             | 18.10          | PK     |
| 10640              | 47.99           | -6.43                 | V                 | 41.56             | 53.98             | 12.42          | AV     |
| 15960              | 62.37           | -6.93                 | V                 | 55.44             | 73.98             | 18.54          | PK     |
| 15960              | 48.45           | -6.93                 | V                 | 41.52             | 53.98             | 12.46          | AV     |
| 10640              | 62.69           | -6.43                 | H                 | 56.26             | 73.98             | 17.72          | PK     |
| 10640              | 48.03           | -6.43                 | H                 | 41.60             | 53.98             | 12.38          | AV     |
| 15960              | 62.84           | -6.93                 | H                 | 55.91             | 73.98             | 18.07          | PK     |
| 15960              | 48.50           | -6.93                 | H                 | 41.57             | 53.98             | 12.41          | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 2A           |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5270 MHz          |
| Channel No.         | 54 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10540              | 62.02           | -5.77                 | V                 | 56.25             | 68.20             | 11.95          | PK     |
| 15810              | 62.11           | -7.47                 | V                 | 54.64             | 73.98             | 19.34          | PK     |
| 15810              | 48.30           | -7.47                 | V                 | 40.83             | 53.98             | 13.15          | AV     |
| 10540              | 62.16           | -5.77                 | H                 | 56.39             | 68.20             | 11.81          | PK     |
| 15810              | 62.22           | -7.47                 | H                 | 54.75             | 73.98             | 19.23          | PK     |
| 15810              | 48.36           | -7.47                 | H                 | 40.89             | 53.98             | 13.09          | 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 all data rate in 802.11n\_40 MHz BW. Worst case is 13.5 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 2A           |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5310 MHz          |
| Channel No.         | 62 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 10620              | 62.26           | -6.36                 | V                 | 55.90             | 73.98             | 18.08          | PK     |
| 10620              | 48.60           | -6.36                 | V                 | 42.24             | 53.98             | 11.74          | AV     |
| 15930              | 61.79           | -6.77                 | V                 | 55.02             | 73.98             | 18.96          | PK     |
| 15930              | 48.25           | -6.77                 | V                 | 41.48             | 53.98             | 12.50          | AV     |
| 10620              | 62.43           | -6.36                 | H                 | 56.07             | 73.98             | 17.91          | PK     |
| 10620              | 48.62           | -6.36                 | H                 | 42.26             | 53.98             | 11.72          | AV     |
| 15930              | 61.87           | -6.77                 | H                 | 55.10             | 73.98             | 18.88          | PK     |
| 15930              | 48.27           | -6.77                 | H                 | 41.50             | 53.98             | 12.48          | 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 all data rate in 802.11n\_40 MHz BW. Worst case is 13.5 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |          |
|---------------------|----------|
| Band :              | UNII 2C  |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5500 MHz |
| Channel No.         | 100 Ch   |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11000              | 61.87           | -5.06                 | V                 | 56.81             | 73.98             | 17.17          | PK     |
| 11000              | 48.44           | -5.06                 | V                 | 43.38             | 53.98             | 10.60          | AV     |
| 16500              | 62.30           | -4.35                 | V                 | 57.95             | 68.20             | 10.25          | PK     |
| 11000              | 62.37           | -5.06                 | H                 | 57.31             | 73.98             | 16.67          | PK     |
| 11000              | 48.50           | -5.06                 | H                 | 43.44             | 53.98             | 10.54          | AV     |
| 16500              | 62.53           | -4.35                 | H                 | 58.18             | 68.20             | 10.02          | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |          |
|---------------------|----------|
| Band :              | UNII 2C  |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5580 MHz |
| Channel No.         | 116 Ch   |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11160              | 62.16           | -5.55                 | V                 | 56.61             | 73.98             | 17.37          | PK     |
| 11160              | 48.36           | -5.55                 | V                 | 42.81             | 53.98             | 11.17          | AV     |
| 16740              | 61.72           | -3.73                 | V                 | 57.99             | 68.20             | 10.21          | PK     |
| 11160              | 62.39           | -5.55                 | H                 | 56.84             | 73.98             | 17.14          | PK     |
| 11160              | 48.38           | -5.55                 | H                 | 42.83             | 53.98             | 11.15          | AV     |
| 16740              | 61.77           | -3.73                 | H                 | 58.04             | 68.20             | 10.16          | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |          |
|---------------------|----------|
| Band :              | UNII 2C  |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5700 MHz |
| Channel No.         | 140 Ch   |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11400              | 61.96           | -6.08                 | V                 | 55.88             | 73.98             | 18.10          | PK     |
| 11400              | 48.24           | -6.08                 | V                 | 42.16             | 53.98             | 11.82          | AV     |
| 17100              | 61.77           | -0.85                 | V                 | 60.92             | 68.20             | 7.28           | PK     |
| 11400              | 62.13           | -6.08                 | H                 | 56.05             | 73.98             | 17.93          | PK     |
| 11400              | 48.32           | -6.08                 | H                 | 42.24             | 53.98             | 11.74          | AV     |
| 17100              | 61.80           | -0.85                 | H                 | 60.95             | 68.20             | 7.25           | 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 all data rate in 802.11a. Worst case is 6 Mbps in 802.11a.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2C            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5500 MHz           |
| Channel No.         | 100 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11000              | 61.99           | -5.06                 | V                 | 56.93             | 73.98             | 17.05          | PK     |
| 11000              | 48.45           | -5.06                 | V                 | 43.39             | 53.98             | 10.59          | AV     |
| 16500              | 62.34           | -4.35                 | V                 | 57.99             | 68.20             | 10.21          | PK     |
| 11000              | 62.18           | -5.06                 | H                 | 57.12             | 73.98             | 16.86          | PK     |
| 11000              | 48.49           | -5.06                 | H                 | 43.43             | 53.98             | 10.55          | AV     |
| 16500              | 62.61           | -4.35                 | H                 | 58.26             | 68.20             | 9.94           | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2C            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5580 MHz           |
| Channel No.         | 116 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11160              | 62.23           | -5.55                 | V                 | 56.68             | 73.98             | 17.30          | PK     |
| 11160              | 48.35           | -5.55                 | V                 | 42.80             | 53.98             | 11.18          | AV     |
| 16740              | 61.78           | -3.73                 | V                 | 58.05             | 68.20             | 10.15          | PK     |
| 11160              | 62.37           | -5.55                 | H                 | 56.82             | 73.98             | 17.16          | PK     |
| 11160              | 48.39           | -5.55                 | H                 | 42.84             | 53.98             | 11.14          | AV     |
| 16740              | 61.83           | -3.73                 | H                 | 58.10             | 68.20             | 10.10          | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2C            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5700 MHz           |
| Channel No.         | 140 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11400              | 62.03           | -6.08                 | V                 | 55.95             | 73.98             | 18.03          | PK     |
| 11400              | 48.29           | -6.08                 | V                 | 42.21             | 53.98             | 11.77          | AV     |
| 17100              | 61.74           | -0.85                 | V                 | 60.89             | 68.20             | 7.31           | PK     |
| 11400              | 62.18           | -6.08                 | H                 | 56.10             | 73.98             | 17.88          | PK     |
| 11400              | 48.31           | -6.08                 | H                 | 42.23             | 53.98             | 11.75          | AV     |
| 17100              | 61.83           | -0.85                 | H                 | 60.98             | 68.20             | 7.22           | 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 all data rate in 802.11n\_20 MHz BW. Worst case is 6.5 Mbps in 802.11n\_20 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 2C           |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5510 MHz          |
| Channel No.         | 102 Ch            |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11020              | 61.93           | -5.86                 | V                 | 56.07             | 73.98             | 17.91          | PK     |
| 11020              | 48.06           | -5.86                 | V                 | 42.20             | 53.98             | 11.78          | AV     |
| 16530              | 62.03           | -3.75                 | V                 | 58.28             | 68.20             | 9.92           | PK     |
| 11020              | 62.16           | -5.86                 | H                 | 56.30             | 73.98             | 17.68          | PK     |
| 11020              | 48.08           | -5.86                 | H                 | 42.22             | 53.98             | 11.76          | AV     |
| 16530              | 62.11           | -3.75                 | H                 | 58.36             | 68.20             | 9.84           | 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 all data rate in 802.11n\_40 MHz BW. Worst case is 13.5 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 2C           |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5550 MHz          |
| Channel No.         | 110 Ch            |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11100              | 62.12           | -6.14                 | V                 | 55.98             | 73.98             | 18.00          | PK     |
| 11100              | 48.40           | -6.14                 | V                 | 42.26             | 53.98             | 11.72          | AV     |
| 16650              | 61.91           | -3.11                 | V                 | 58.80             | 68.20             | 9.40           | PK     |
| 11100              | 62.43           | -6.14                 | H                 | 56.29             | 73.98             | 17.69          | PK     |
| 11100              | 48.41           | -6.14                 | H                 | 42.27             | 53.98             | 11.71          | AV     |
| 16650              | 62.07           | -3.11                 | H                 | 58.96             | 68.20             | 9.24           | 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 all data rate in 802.11n\_40 MHz BW. Worst case is 13.5 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 2C           |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5670 MHz          |
| Channel No.         | 134 Ch            |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL-Amp G.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-----------------------|-------------------|-------------------|-------------------|----------------|--------|
| 11340              | 61.85           | -5.10                 | V                 | 56.75             | 73.98             | 17.23          | PK     |
| 11340              | 48.25           | -5.10                 | V                 | 43.15             | 53.98             | 10.83          | AV     |
| 17010              | 61.45           | -1.27                 | V                 | 60.18             | 68.20             | 8.02           | PK     |
| 11340              | 62.17           | -5.10                 | H                 | 57.07             | 73.98             | 16.91          | PK     |
| 11340              | 48.26           | -5.10                 | H                 | 43.16             | 53.98             | 10.82          | AV     |
| 17010              | 61.68           | -1.27                 | H                 | 60.41             | 68.20             | 7.79           | 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 all data rate in 802.11n\_40 MHz BW. Worst case is 13.5 Mbps in 802.11n\_40 MHz BW.
6. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

## 8.8.2 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   |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5180 MHz |
| Channel No.         | 36 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5150               | 49.96           | 8.79                    | H                 | 58.75             | 73.98             | 15.23          | PK     |
| 5150               | 36.73           | 8.79                    | H                 | 45.52             | 53.98             | 8.46           | AV     |
| 5150               | 49.87           | 8.79                    | V                 | 58.66             | 73.98             | 15.32          | PK     |
| 5150               | 36.70           | 8.79                    | V                 | 45.49             | 53.98             | 8.49           | AV     |

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 1             |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5180 MHz           |
| Channel No.         | 36 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5150               | 49.63           | 8.79                    | H                 | 58.42             | 73.98             | 15.56          | PK     |
| 5150               | 36.87           | 8.79                    | H                 | 45.66             | 53.98             | 8.32           | AV     |
| 5150               | 49.54           | 8.79                    | V                 | 58.33             | 73.98             | 15.65          | PK     |
| 5150               | 36.85           | 8.79                    | V                 | 45.64             | 53.98             | 8.34           | AV     |

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 1            |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5190 MHz          |
| Channel No.         | 38 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5150               | 52.17           | 8.79                    | H                 | 60.96             | 73.98             | 13.02          | PK     |
| 5150               | 37.76           | 8.79                    | H                 | 46.55             | 53.98             | 7.43           | AV     |
| 5150               | 51.71           | 8.79                    | V                 | 60.50             | 73.98             | 13.48          | PK     |
| 5150               | 37.71           | 8.79                    | V                 | 46.50             | 53.98             | 7.48           | AV     |

|                     |          |
|---------------------|----------|
| Band :              | UNII 2A  |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5320 MHz |
| Channel No.         | 64 Ch    |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5350               | 49.57           | 9.28                    | H                 | 58.85             | 73.98             | 15.13          | PK     |
| 5350               | 36.36           | 9.28                    | H                 | 45.64             | 53.98             | 8.34           | AV     |
| 5350               | 50.19           | 9.28                    | V                 | 59.47             | 73.98             | 14.51          | PK     |
| 5350               | 36.38           | 9.28                    | V                 | 45.66             | 53.98             | 8.32           | AV     |

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2A            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6 Mbps             |
| Operating Frequency | 5320 MHz           |
| Channel No.         | 64 Ch              |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5350               | 49.31           | 9.28                    | H                 | 58.59             | 73.98             | 15.39          | PK     |
| 5350               | 36.19           | 9.28                    | H                 | 45.47             | 53.98             | 8.51           | AV     |
| 5350               | 49.57           | 9.28                    | V                 | 58.85             | 73.98             | 15.13          | PK     |
| 5350               | 36.22           | 9.28                    | V                 | 45.50             | 53.98             | 8.48           | AV     |

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 2A           |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5310 MHz          |
| Channel No.         | 62 Ch             |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5350               | 49.78           | 9.28                    | H                 | 59.06             | 73.98             | 14.92          | PK     |
| 5350               | 36.00           | 9.28                    | H                 | 45.28             | 53.98             | 8.70           | AV     |
| 5350               | 50.34           | 9.28                    | V                 | 59.62             | 73.98             | 14.36          | PK     |
| 5350               | 36.07           | 9.28                    | V                 | 45.35             | 53.98             | 8.63           | AV     |

Band : UNII 2C

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5500 MHz

Channel No. 100 Ch

| Frequency<br>[MHz] | Reading<br>DBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5460               | 48.84           | 10.08                   | H                 | 58.92             | 73.98             | 15.06          | PK     |
| 5460               | 35.72           | 10.08                   | H                 | 45.80             | 53.98             | 8.18           | AV     |
| *5470              | 48.85           | 9.95                    | H                 | 58.80             | 68.20             | 9.40           | PK     |
| 5460               | 48.77           | 10.08                   | V                 | 58.85             | 73.98             | 15.13          | PK     |
| 5460               | 35.70           | 10.08                   | V                 | 45.78             | 53.98             | 8.20           | AV     |
| *5470              | 48.73           | 9.95                    | V                 | 58.68             | 68.20             | 9.52           | PK     |

Band : UNII 2C

Operation Mode: 802.11 a

Transfer Rate: 6 Mbps

Operating Frequency 5700 MHz

Channel No. 140 Ch

| Frequency<br>[MHz] | Reading<br>DBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| *5725              | 48.16           | 11.37                   | H                 | 59.53             | 68.20             | 8.67           | PK     |
| *5725              | 47.76           | 11.37                   | V                 | 59.13             | 68.20             | 9.07           | PK     |

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2C            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6 Mbps             |
| Operating Frequency | 5500 MHz           |
| Channel No.         | 100 Ch             |

| Frequency<br>[MHz] | Reading<br>DBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5460               | 48.92           | 10.08                   | H                 | 59.00             | 73.98             | 14.98          | PK     |
| 5460               | 35.61           | 10.08                   | H                 | 45.69             | 53.98             | 8.29           | AV     |
| *5470              | 48.91           | 9.95                    | H                 | 58.86             | 68.20             | 9.34           | PK     |
| 5460               | 48.63           | 10.08                   | V                 | 58.71             | 73.98             | 15.27          | PK     |
| 5460               | 35.54           | 10.08                   | V                 | 45.62             | 53.98             | 8.36           | AV     |
| *5470              | 48.56           | 9.95                    | V                 | 58.51             | 68.20             | 9.69           | PK     |

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2C            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5700 MHz           |
| Channel No.         | 140 Ch             |

| Frequency<br>[MHz] | Reading<br>DBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| *5725              | 47.60           | 11.37                   | H                 | 58.97             | 68.20             | 9.23           | PK     |
| *5725              | 47.51           | 11.37                   | V                 | 58.88             | 68.20             | 9.32           | AV     |

|                     |                   |
|---------------------|-------------------|
| Band :              | UNII 2C           |
| Operation Mode:     | 802.11n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps         |
| Operating Frequency | 5510 MHz          |
| Channel No.         | 102 Ch            |

| Frequency<br>[MHz] | Reading<br>dBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| 5460               | 48.45           | 10.08                   | H                 | 58.53             | 73.98             | 15.45          | PK     |
| 5460               | 35.58           | 10.08                   | H                 | 45.66             | 53.98             | 8.32           | AV     |
| *5470              | 52.37           | 9.95                    | H                 | 62.32             | 68.20             | 5.88           | PK     |
| 5460               | 48.16           | 10.08                   | V                 | 58.24             | 73.98             | 15.74          | PK     |
| 5460               | 35.54           | 10.08                   | V                 | 45.62             | 53.98             | 8.36           | AV     |
| *5470              | 52.02           | 9.95                    | V                 | 61.97             | 68.20             | 6.23           | PK     |

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2C            |
| Operation Mode:     | 802.11 n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps          |
| Operating Frequency | 5670 MHz           |
| Channel No.         | 134 Ch             |

| Frequency<br>[MHz] | Reading<br>DBuV | AN.+CL+AMP+ATT.<br>[dB] | ANT. POL<br>[H/V] | Total<br>[dBuV/m] | Limit<br>[dBuV/m] | Margin<br>[dB] | Detect |
|--------------------|-----------------|-------------------------|-------------------|-------------------|-------------------|----------------|--------|
| *5725              | 48.24           | 11.37                   | H                 | 59.61             | 68.20             | 8.59           | PK     |
| *5725              | 47.97           | 11.37                   | V                 | 59.34             | 68.20             | 8.86           | AV     |

#### Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + ATT
2. We have done all data rate in 802.11a/n mode test. . Worst case of EUT is lowest data rate in 802.11a/n.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. '\*' is radiated band edge test frequency.(not restricted band emissions)

## □ Additional Test (Band Edge for 5250 MHz)

|                     |          |
|---------------------|----------|
| Band :              | UNII 2A  |
| Operation Mode:     | 802.11 a |
| Transfer Rate:      | 6 Mbps   |
| Operating Frequency | 5260 MHz |
| Channel No.         | 52 Ch    |



|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2A            |
| Operation Mode:     | 802.11 n_20 MHz BW |
| Transfer Rate:      | 6.5 Mbps           |
| Operating Frequency | 5260 MHz           |
| Channel No.         | 52 Ch              |



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

|                     |                    |
|---------------------|--------------------|
| Band :              | UNII 2A            |
| Operation Mode:     | 802.11 n_40 MHz BW |
| Transfer Rate:      | 13.5 Mbps          |
| Operating Frequency | 5270 MHz           |
| Channel No.         | 54 Ch              |



|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

### 8.8.3 RECEIVER SPURIOUS EMISSIONS

IC Rule(s) RSS-GEN  
 Test Requirements: Blow the table  
 Operating conditions: Under normal test conditions  
 Method of testing: Radiated

S/A. Settings: F < 1 GHz: RBW: 120 kHz, VBW: 300 kHz (Quasi Peak)  
 F > 1 GHz: RBW: 1 MHz, VBW: 1 MHz (Peak)  
 Mode of operation: Receive

| Frequency<br>(MHz) | Field Strength<br>(microvolts/m at 3 meters) |
|--------------------|----------------------------------------------|
| 30 – 88            | 100                                          |
| 88 - 216           | 150                                          |
| 216 – 960          | 200                                          |
| Above 960          | 500                                          |

#### Operation Mode: Receive:

30 MHz ~ 1 GHz

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

Above 1 GHz

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

## 8.9 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 for 6 Mbps, Ch.64 and 802.11a\_HT20 mode in UNII 2. Because 802.11a\_HT20 mode in UNII 2 is worst case.

## RESULT PLOTS

### Conducted Emissions (Line 1)

EMI Auto Test(2)

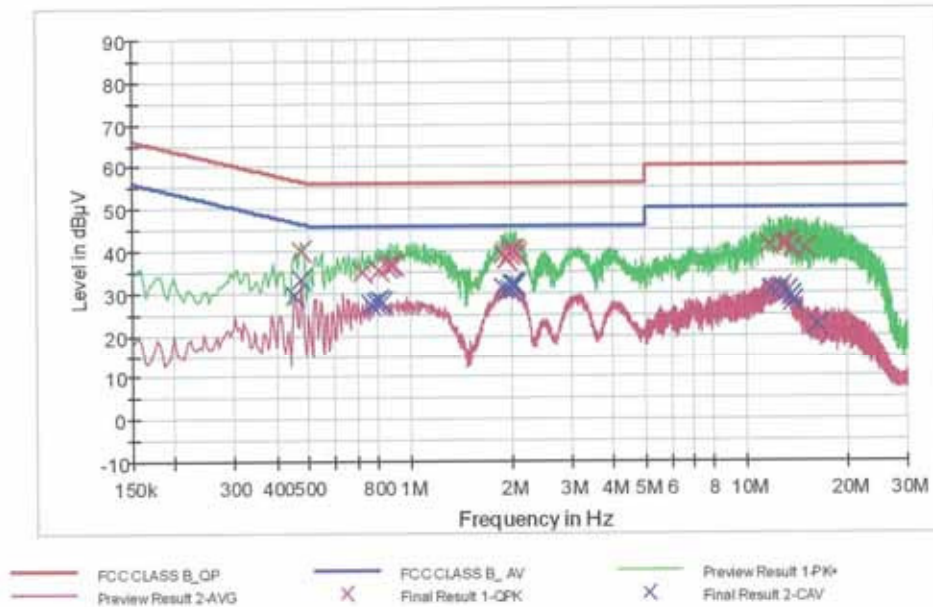
1 / 2

## HCT TEST Report

### Common Information

EUT: LG-V480  
 Manufacturer: LG  
 Test Site: SHIELD ROOM  
 Operating Conditions: WLAN MODE (5G)  
 Operator Name: K.S. KANG

FCC CLASS B



### Final Result 1

| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|--------|------|------------|-------------|--------------|
| 0.474000        | 39.8             | 9.000           | Off    | L1   | 9.7        | 16.6        | 56.4         |
| 0.720500        | 34.9             | 9.000           | Off    | L1   | 9.7        | 21.1        | 56.0         |
| 0.810500        | 35.3             | 9.000           | Off    | L1   | 9.7        | 20.7        | 56.0         |
| 0.855500        | 36.2             | 9.000           | Off    | L1   | 9.7        | 19.8        | 56.0         |
| 0.878000        | 36.6             | 9.000           | Off    | L1   | 9.7        | 19.4        | 56.0         |
| 0.900500        | 36.7             | 9.000           | Off    | L1   | 9.7        | 19.3        | 56.0         |
| 1.886000        | 39.3             | 9.000           | Off    | L1   | 9.8        | 16.7        | 56.0         |
| 1.940000        | 37.9             | 9.000           | Off    | L1   | 9.8        | 18.1        | 56.0         |
| 1.976000        | 39.0             | 9.000           | Off    | L1   | 9.8        | 17.0        | 56.0         |
| 1.994000        | 39.9             | 9.000           | Off    | L1   | 9.8        | 16.1        | 56.0         |
| 2.039000        | 39.9             | 9.000           | Off    | L1   | 9.9        | 16.1        | 56.0         |
| 2.066000        | 39.0             | 9.000           | Off    | L1   | 9.9        | 17.0        | 56.0         |
| 11.705000       | 41.3             | 9.000           | Off    | L1   | 10.5       | 18.7        | 60.0         |
| 12.902000       | 41.6             | 9.000           | Off    | L1   | 10.6       | 18.4        | 60.0         |
| 13.109000       | 41.6             | 9.000           | Off    | L1   | 10.6       | 18.4        | 60.0         |
| 13.307000       | 41.8             | 9.000           | Off    | L1   | 10.6       | 18.2        | 60.0         |

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EMI Auto Test(2)

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| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|--------|------|------------|-------------|--------------|
| 13.671500       | 40.2             | 9.000           | Off    | L1   | 10.6       | 19.8        | 60.0         |
| 15.084500       | 40.4             | 9.000           | Off    | L1   | 10.7       | 19.6        | 60.0         |

## Final Result 2

| Frequency (MHz) | CAverage (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.456000        | 29.6            | 9.000           | Off    | L1   | 9.7        | 17.2        | 46.8         |
| 0.478500        | 33.3            | 9.000           | Off    | L1   | 9.7        | 13.1        | 46.4         |
| 0.765500        | 27.5            | 9.000           | Off    | L1   | 9.7        | 18.5        | 46.0         |
| 0.788000        | 27.9            | 9.000           | Off    | L1   | 9.7        | 18.1        | 46.0         |
| 0.810500        | 28.4            | 9.000           | Off    | L1   | 9.7        | 17.6        | 46.0         |
| 0.833000        | 27.8            | 9.000           | Off    | L1   | 9.7        | 18.2        | 46.0         |
| 1.886000        | 31.2            | 9.000           | Off    | L1   | 9.8        | 14.8        | 46.0         |
| 1.976000        | 30.8            | 9.000           | Off    | L1   | 9.8        | 15.2        | 46.0         |
| 1.994000        | 32.2            | 9.000           | Off    | L1   | 9.8        | 13.8        | 46.0         |
| 2.016500        | 32.1            | 9.000           | Off    | L1   | 9.9        | 13.9        | 46.0         |
| 2.039000        | 31.9            | 9.000           | Off    | L1   | 9.9        | 14.1        | 46.0         |
| 2.061500        | 31.4            | 9.000           | Off    | L1   | 9.9        | 14.6        | 46.0         |
| 11.903000       | 30.9            | 9.000           | Off    | L1   | 10.5       | 19.1        | 50.0         |
| 12.699500       | 31.3            | 9.000           | Off    | L1   | 10.5       | 18.7        | 50.0         |
| 13.307000       | 30.1            | 9.000           | Off    | L1   | 10.6       | 19.9        | 50.0         |
| 13.505000       | 29.2            | 9.000           | Off    | L1   | 10.6       | 20.8        | 50.0         |
| 13.698500       | 27.9            | 9.000           | Off    | L1   | 10.6       | 22.1        | 50.0         |
| 16.254500       | 22.4            | 9.000           | Off    | L1   | 10.7       | 27.6        | 50.0         |

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|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## Conducted Emissions (Line 2)

EMI Auto Test(2)

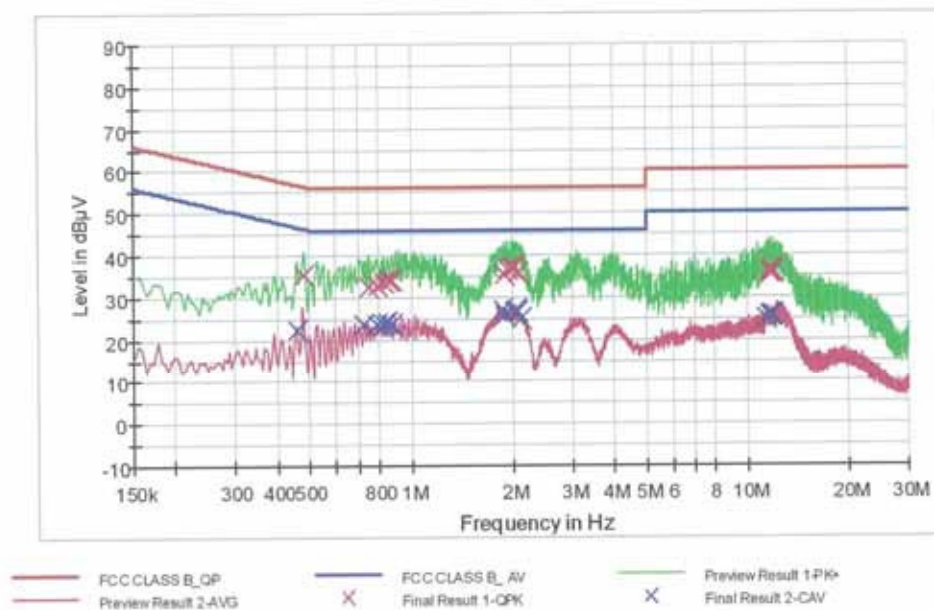
1 / 2

# HCT TEST Report

## Common Information

EUT: LG-V480  
 Manufacturer: LG  
 Test Site: SHIELD ROOM  
 Operating Conditions: WLAN MODE (5G)  
 Operator Name: K.S. KANG

FCC CLASS B



## Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----------------|--------|------|------------|-------------|--------------|
| 0.483000        | 35.4             | 9.000           | Off    | N    | 9.7        | 20.9        | 56.3         |
| 0.747500        | 32.3             | 9.000           | Off    | N    | 9.7        | 23.7        | 56.0         |
| 0.788000        | 32.8             | 9.000           | Off    | N    | 9.7        | 23.2        | 56.0         |
| 0.833000        | 33.6             | 9.000           | Off    | N    | 9.8        | 22.4        | 56.0         |
| 0.855500        | 34.3             | 9.000           | Off    | N    | 9.8        | 21.7        | 56.0         |
| 0.878000        | 34.3             | 9.000           | Off    | N    | 9.8        | 21.7        | 56.0         |
| 1.890500        | 35.4             | 9.000           | Off    | N    | 9.8        | 20.6        | 56.0         |
| 1.931000        | 36.7             | 9.000           | Off    | N    | 9.9        | 19.3        | 56.0         |
| 1.976000        | 37.1             | 9.000           | Off    | N    | 9.9        | 18.9        | 56.0         |
| 1.998500        | 36.9             | 9.000           | Off    | N    | 9.9        | 19.1        | 56.0         |
| 2.021000        | 36.9             | 9.000           | Off    | N    | 9.9        | 19.1        | 56.0         |
| 2.084000        | 36.0             | 9.000           | Off    | N    | 9.9        | 20.0        | 56.0         |
| 11.529500       | 35.8             | 9.000           | Off    | N    | 10.4       | 24.2        | 60.0         |
| 11.642000       | 36.1             | 9.000           | Off    | N    | 10.5       | 23.9        | 60.0         |
| 11.655500       | 36.3             | 9.000           | Off    | N    | 10.5       | 23.7        | 60.0         |
| 11.822000       | 36.0             | 9.000           | Off    | N    | 10.5       | 24.0        | 60.0         |

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EMI Auto Test(2)

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| Frequency (MHz) | QuasiPeak (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|------------------|-----------------|--------|------|------------|-------------|--------------|
| 11.898500       | 36.2             | 9.000           | Off    | N    | 10.5       | 23.8        | 60.0         |
| 11.912000       | 36.1             | 9.000           | Off    | N    | 10.5       | 23.9        | 60.0         |

### Final Result 2

| Frequency (MHz) | CAverage (dBμV) | Bandwidth (kHz) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) |
|-----------------|-----------------|-----------------|--------|------|------------|-------------|--------------|
| 0.460500        | 22.2            | 9.000           | Off    | N    | 9.7        | 24.5        | 46.7         |
| 0.725000        | 23.7            | 9.000           | Off    | N    | 9.7        | 22.3        | 46.0         |
| 0.788000        | 23.6            | 9.000           | Off    | N    | 9.7        | 22.4        | 46.0         |
| 0.833000        | 23.8            | 9.000           | Off    | N    | 9.8        | 22.2        | 46.0         |
| 0.851000        | 24.2            | 9.000           | Off    | N    | 9.8        | 21.8        | 46.0         |
| 0.878000        | 23.4            | 9.000           | Off    | N    | 9.8        | 22.6        | 46.0         |
| 1.863500        | 26.8            | 9.000           | Off    | N    | 9.8        | 19.2        | 46.0         |
| 1.890500        | 25.6            | 9.000           | Off    | N    | 9.8        | 20.4        | 46.0         |
| 2.021000        | 26.7            | 9.000           | Off    | N    | 9.9        | 19.3        | 46.0         |
| 2.061500        | 26.8            | 9.000           | Off    | N    | 9.9        | 19.2        | 46.0         |
| 2.084000        | 26.5            | 9.000           | Off    | N    | 9.9        | 19.5        | 46.0         |
| 2.111000        | 25.1            | 9.000           | Off    | N    | 9.9        | 20.9        | 46.0         |
| 11.286500       | 24.8            | 9.000           | Off    | N    | 10.4       | 25.2        | 50.0         |
| 11.529500       | 25.7            | 9.000           | Off    | N    | 10.4       | 24.3        | 50.0         |
| 11.700500       | 25.9            | 9.000           | Off    | N    | 10.5       | 24.1        | 50.0         |
| 11.727500       | 25.8            | 9.000           | Off    | N    | 10.5       | 24.2        | 50.0         |
| 11.867000       | 25.8            | 9.000           | Off    | N    | 10.5       | 24.2        | 50.0         |
| 11.912000       | 25.9            | 9.000           | Off    | N    | 10.5       | 24.1        | 50.0         |

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|                                      |                                 |                                   |                    |                                                  |
|--------------------------------------|---------------------------------|-----------------------------------|--------------------|--------------------------------------------------|
| FCC PT.15.407<br>TEST REPORT         | FCC & IC CERTIFICATION REPORT   |                                   |                    | <a href="http://www.hct.co.kr">www.hct.co.kr</a> |
| Test Report No.<br>HCT-R-1407-F005-3 | Date of Issue:<br>July 08, 2014 | EUT Type: 2.4/5GHz BT/WiFi Tablet | FCC ID:<br>ZNFV480 | IC:<br>2703C-V480                                |

## 9. LIST OF TEST EQUIPMENT

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

| Manufacturer    | Model / Equipment           | Calibration Date | Calibration Interval | Calibration Due | Serial No.             |
|-----------------|-----------------------------|------------------|----------------------|-----------------|------------------------|
| Rohde & Schwarz | ENV216/ LISN                | 01/29/2014       | Annual               | 01/29/2015      | 100073                 |
| Agilent         | E4440A/ Spectrum Analyzer   | 04/09/2014       | Annual               | 04/09/2015      | US45303008             |
| Agilent         | N9020A/ SIGNAL ANALYZER     | 05/23/2014       | Annual               | 05/23/2015      | MY51110063             |
| Agilent         | N1911A/Power Meter          | 01/24/2014       | Annual               | 01/24/2015      | MY45100523             |
| Agilent         | N1921A /POWER SENSOR        | 07/11/2013       | Annual               | 07/11/2014      | MY45241059             |
| Hewlett Packard | 11636B/Power Divider        | 10/22/2013       | Annual               | 10/22/2014      | 11377                  |
| Agilent         | 87300B/Directional Coupler  | 12/18/2013       | Annual               | 12/18/2014      | 3116A03621             |
| Hewlett Packard | 11667B / Power Splitter     | 01/27/2014       | Annual               | 01/27/2015      | 10545                  |
| DIGITAL         | EP-3010 /DC POWER SUPPLY    | 10/29/2013       | Annual               | 10/29/2014      | 3110117                |
| ITECH           | IT6720 / DC POWER SUPPLY    | 11/05/2013       | Annual               | 11/05/2014      | 0100021562870011<br>99 |
| TESCOM          | TC-3000C / BLUETOOTH TESTER | 04/11/2014       | Annual               | 04/11/2015      | 3000C000276            |
| Rohde & Schwarz | CBT / BLUETOOTH TESTER      | 05/07/2014       | Annual               | 05/07/2015      | 100422                 |
| Agilent         | 8493C / Attenuator(10 dB)   | 07/24/2013       | Annual               | 07/24/2014      | 76649                  |
| WEINSCHEL       | 2-3 / Attenuator(3 dB)      | 10/28/2013       | Annual               | 10/28/2014      | BR0617                 |

## 9.2 LIST OF TEST EQUIPMENT(Radiated Test)

| Manufacturer          | Model / Equipment                        | Calibration Date | Calibration Interval | Calibration Due | Serial No.  |
|-----------------------|------------------------------------------|------------------|----------------------|-----------------|-------------|
| Schwarzbeck           | VULB 9160/ TRILOG Antenna                | 12/17/2012       | Biennial             | 12/17/2014      | 3150        |
| Rohde & Schwarz       | ESCI / EMI TEST RECEIVER                 | 01/24/2014       | Annual               | 01/24/2015      | 100584      |
| HD                    | MA240/ Antenna Position Tower            | N/A              | N/A                  | N/A             | 556         |
| EMCO                  | 1050/ Turn Table                         | N/A              | N/A                  | N/A             | 114         |
| HD GmbH               | HD 100/ Controller                       | N/A              | N/A                  | N/A             | 13          |
| HD GmbH               | KMS 560/ SlideBar                        | N/A              | N/A                  | N/A             | 12          |
| Rohde & Schwarz       | SCU-18/ Signal Conditioning Unit         | 09/10/2013       | Annual               | 09/10/2014      | 10094       |
| CERNEX                | CBL18265035 / POWER AMP                  | 07/24/2013       | Annual               | 07/24/2014      | 22966       |
| CERNEX                | CBL26405040 / POWER AMP                  | 04/04/2014       | Annual               | 04/04/2015      | 19660       |
| Schwarzbeck           | BBHA 9120D/ Horn Antenna                 | 07/05/2013       | Biennial             | 07/05/2015      | 1151        |
| Schwarzbeck           | BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz) | 10/30/2012       | Biennial             | 10/30/2014      | BBHA9170124 |
| Rohde & Schwarz       | FSP / Spectrum Analyzer                  | 01/24/2014       | Annual               | 01/24/2015      | 839117/011  |
| Wainwright Instrument | WHF3.0/18G-10EF / High Pass Filter       | 02/03/2014       | Annual               | 02/03/2015      | F6          |
| Wainwright Instrument | WHNX6.0/26.5G-6SS / High Pass Filter     | 04/09/2014       | Annual               | 04/09/2015      | 1           |
| Wainwright Instrument | WHNX7.0/18G-8SS / High Pass Filter       | 04/04/2014       | Annual               | 04/04/2015      | 29          |
| TESCOM                | TC-3000C / BLUETOOTH TESTER              | 04/11/2014       | Annual               | 04/11/2015      | 3000C000276 |
| Rohde & Schwarz       | CBT / BLUETOOTH TESTER                   | 05/07/2014       | Annual               | 05/07/2015      | 100422      |
| Rohde & Schwarz       | LOOP ANTENNA                             | 08/14/2012       | Biennial             | 08/14/2014      | 100179      |
| CERNEX                | CBL06185030 / POWER AMP                  | 07/24/2013       | Annual               | 07/24/2014      | 22965       |
| CERNEX                | CBLU1183540 / POWER AMP                  | 07/24/2013       | Annual               | 07/24/2014      | 22964       |