

## MEASUREMENT REPORT

### FCC PART 15.407 / IC RSS-210 802.11a/n/ac (UNII)

**Applicant Name:**

LG Electronics MobileComm U.S.A  
60-39, Gasan-dong, Gumchon-gu,  
Seoul, Korea

**Date of Testing:**

7/16 - 8/6/2013

**Test Site/Location:**

PCTEST Lab, Columbia, MD, USA

**Test Report Serial No.:**

0Y1307011142.ZNF

**FCC ID:**

**ZNFD803**

**IC CERTIFICATION NO.:**

**2703C-D803**

**APPLICANT:**

**LG Electronics MobileComm U.S.A**

**Application Type:**

Certification

**Model(s):**

LG-D803, LGD803, D803

**EUT Type:**

Portable Handset

**FCC Classification:**

Unlicensed National Information Infrastructure (UNII)

**FCC Rule Part(s):**

Part 15.407 (UNII Band 1-4), 15.247 (UNII Band 4, 802.11ac)

**Test Procedure(s):**

KDB 789033 v01r03, KDB 644545 D02 v01 Alternative Guidance.

| Mode     | UNII Band | Channel Bandwidth (MHz) | Tx Frequency (MHz) | Conducted Power |                  |
|----------|-----------|-------------------------|--------------------|-----------------|------------------|
|          |           |                         |                    | Max. Power (mW) | Max. Power (dBm) |
| 802.11a  | 1         | 20                      | 5180 - 5240        | 12.274          | 10.89            |
|          | 2         | 20                      | 5260 - 5320        | 12.274          | 10.89            |
|          | 3         | 20                      | 5500 - 5700        | 11.641          | 10.66            |
|          | 4         | 20                      | 5745 - 5825        | 9.661           | 9.85             |
| 802.11n  | 1         | 20                      | 5180 - 5240        | 11.482          | 10.60            |
|          | 2         | 20                      | 5260 - 5320        | 11.940          | 10.77            |
|          | 3         | 20                      | 5500 - 5700        | 11.143          | 10.47            |
|          | 4         | 20                      | 5745 - 5825        | 9.616           | 9.83             |
| 802.11n  | 1         | 40                      | 5190 - 5230        | 11.695          | 10.68            |
|          | 2         | 40                      | 5270 - 5310        | 12.531          | 10.98            |
|          | 3         | 40                      | 5510 - 5670        | 11.967          | 10.78            |
|          | 4         | 40                      | 5755 - 5795        | 9.750           | 9.89             |
| 802.11ac | 1         | 80                      | 5210               | 9.638           | 9.84             |
|          | 2         | 80                      | 5290               | 9.333           | 9.70             |
|          | 3         | 80                      | 5530               | 9.886           | 9.95             |
|          | 4         | 80                      | 5775               | 8.035           | 9.05             |

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in KDB 789033. Test results reported herein relate only to the item(s) tested. I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

  
Randy Ortner  
President



|                                             |                                                                                     |                                                                            |                                                                                       |                                        |
|---------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFD803                      |  | <b>FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1307011142.ZNF | <b>Test Dates:</b><br>7/16 - 8/6/2013                                               | <b>EUT Type:</b><br>Portable Handset                                       |                                                                                       | Page 1 of 104                          |

## TABLE OF CONTENTS

|                                                        |     |
|--------------------------------------------------------|-----|
| FCC PART 15.407 MEASUREMENT REPORT .....               | 3   |
| 1.0 INTRODUCTION.....                                  | 4   |
| 1.1 SCOPE.....                                         | 4   |
| 1.2 PCTEST TEST LOCATION.....                          | 4   |
| 2.0 PRODUCT INFORMATION .....                          | 5   |
| 2.1 EQUIPMENT DESCRIPTION.....                         | 5   |
| 2.2 DEVICE CAPABILITIES .....                          | 5   |
| 2.3 TEST CONFIGURATION .....                           | 5   |
| 2.4 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS.....       | 5   |
| 2.5 LABELING REQUIREMENTS .....                        | 5   |
| 3.0 DESCRIPTION OF TEST .....                          | 6   |
| 3.1 EVALUATION PROCEDURE.....                          | 6   |
| 3.2 AC LINE CONDUCTED EMISSIONS.....                   | 6   |
| 3.3 RADIATED EMISSIONS .....                           | 7   |
| 4.0 ANTENNA REQUIREMENTS .....                         | 8   |
| 5.0 TEST EQUIPMENT CALIBRATION DATA.....               | 9   |
| 6.0 TEST RESULTS .....                                 | 10  |
| 6.1 SUMMARY .....                                      | 10  |
| 6.2 26DB BANDWIDTH MEASUREMENT – 802.11A/N/AC .....    | 11  |
| 6.3 UNII OUTPUT POWER MEASUREMENT – 802.11A/N/AC ..... | 34  |
| 6.4 PEAK POWER SPECTRAL DENSITY – 802.11A/N/AC .....   | 37  |
| 6.5 PEAK EXCURSION RATIO – 802.11A/N/AC.....           | 58  |
| 6.6 FREQUENCY STABILITY .....                          | 62  |
| 6.7 RADIATED SPURIOUS EMISSION MEASUREMENTS.....       | 66  |
| 6.8 RADIATED BAND EDGE MEASUREMENTS (20MHZ BW) .....   | 75  |
| 6.9 RADIATED BAND EDGE MEASUREMENTS (40MHZ BW) .....   | 82  |
| 6.10 RADIATED BAND EDGE MEASUREMENTS (80MHZ BW) .....  | 89  |
| 6.11 LINE-CONDUCTED TEST DATA.....                     | 96  |
| 7.0 CONCLUSION .....                                   | 104 |

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 2 of 104                   |



# MEASUREMENT REPORT

## FCC Part 15.407



### § 2.1033 General Information

**APPLICANT:** LG Electronics MobileComm U.S.A

**APPLICANT ADDRESS:** 60-39, Gasan-dong, Gumchon-gu,  
Seoul, Korea,

**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.

**TEST SITE ADDRESS:** 7185 Oakland Mills Road, Columbia, MD 21046 USA

**FCC RULE PART(S):** Part 15.407

**IC SPECIFICATION(S):** RSS-210 Issue 8

**MODEL NAME:** LG-D803

**FCC ID:** ZNFD803

**Test Device Serial No.:** BT/WIFI Conduction, ☐ Production ☒ Pre-Production ☐ Engineering  
BT/WIFI Radiation

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

**DATE(S) OF TEST:** 7/16 - 8/6/2013

**TEST REPORT S/N:** 0Y1307011142.ZNF

### Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.



- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.



|                                             |                                                                                     |                                                                            |                                                                                       |                                        |
|---------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFD803                      |  | <b>FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION)</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1307011142.ZNF | <b>Test Dates:</b><br>7/16 - 8/6/2013                                               | <b>EUT Type:</b><br>Portable Handset                                       |                                                                                       | Page 3 of 104                          |

## 1.0 INTRODUCTION

### 1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

### 1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on February 15, 2012.

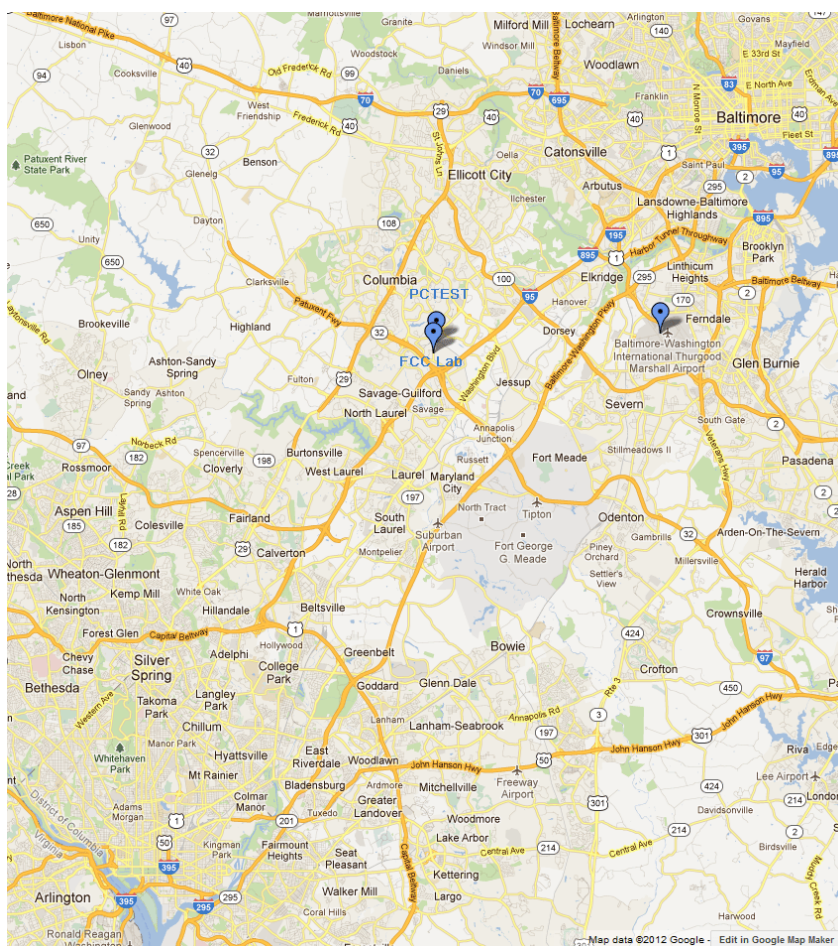


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 4 of 104                   |

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LG Portable Handset FCC ID: ZNFD803**. The test data contained in this report pertains only to the emissions due to the EUT's UNII transmitter.

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Band 4, 7, 17 LTE, 802.11a/b/g/n/ac WLAN (DTS/NII), Bluetooth (1x,EDR, LE), NFC

**Note:** 5GHz WLAN (DTS/NII) operation is possible in 20MHz, 40MHz, and 80MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B2)b) of KDB 789033. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The maximum achievable duty cycles are as follows:

- 802.11a/n 20MHz Bandwidth – 95.5%
- 802.11n 40MHz Bandwidth – 90.1%
- 802.11ac 80MHz Bandwidth – 83.4%

### 2.3 Test Configuration

The LG Portable Handset FCC ID: ZNFD803 was tested per the guidance of KDB 789033. ANSI C63.10-2009 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. U-NII procedures and limits were applied for operations in the frequency band from 5.725-5.850 GHz in accordance with KDB 644545 D02 v01 to demonstrate compliance with 15.247 requirements. See Sections 3.2, 3.3, and 6.1 of this test report for a description of the AC line conducted emissions, radiated emissions, and antenna port conducted emissions test setups, respectively.

### 2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

### 2.5 Labeling Requirements

Per 2.1074 & 15.19; Docket 95-19

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(a)(5).

Please see attachment for FCC ID label and label location.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 5 of 104                   |

## 3.0 DESCRIPTION OF TEST

### 3.1 Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009) and the guidance provided in KDB 789033 were used in the measurement of **LG Portable Handset FCC ID: ZNFD803**.

Deviation from measurement procedure.....None

### 3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by ETS Lindgren RF Enclosures. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is an ETS Lindgren Model LPRX-4X30 (100dB Attenuation, 14kHz-18GHz) and the two EMI/RFI filters are ETS Lindgren Model LRW-2030-S1 (100dB Minimum Insertion Loss, 14kHz – 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was also maximized by varying: power lines, the mode of operation or resolution, clock or data exchange speed, scrolling H pattern to the EUT and/or support equipment whichever determined the worst-case emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 6.9. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 8.51.0.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 6 of 104                   |

### 3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 78cm high PVC support structure is placed on top of the turntable. A ¾" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by varying: the mode of operation or resolution, clock or data rate, scrolling H pattern to the EUT and/or support equipment, and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          | Page 7 of 104                                                                         |                                 |

## 4.0 ANTENNA REQUIREMENTS

### Excerpt from §15.203 of the FCC Rules/Regulations:

“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 the Portable Handset are **permanently attached**.
- There are no provisions for connection to an external antenna.

### Conclusion:

The LG Portable Handset FCC ID: ZNFD803 unit complies with the requirement of §15.203.

| Band 1 |                 | Band 2 |                 | Band 3 |                 | Band 4 |                 |
|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|
| Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) |
| 36     | 5180            | 52     | 5260            | 100    | 5500            | 149    | 5745            |
| :      | :               | :      | :               | :      | :               | :      | :               |
| 42     | 5210            | 56     | 5280            | 116    | 5580            | 157    | 5785            |
| :      | :               | :      | :               | :      | :               | :      | :               |
| 48     | 5240            | 64     | 5320            | 144    | 5720            | 165    | 5825            |

Table 4-1. 802.11a / 802.11n (20MHz) Frequency / Channel Operations

| Band 1 |                 | Band 2 |                 | Band 3 |                 | Band 4 |                 |
|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|
| Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) |
| 38     | 5190            | 54     | 5270            | 102    | 5510            | 151    | 5755            |
| :      | :               | :      | :               | :      | :               | :      | :               |
| 46     | 5230            | 62     | 5310            | 110    | 5550            | 159    | 5795            |
|        |                 |        |                 | :      | :               |        |                 |
|        |                 |        |                 | 142    | 5710            |        |                 |

Table 4-2. 802.11n (40MHz BW) Frequency / Channel Operations

| Band 1 |                 | Band 2 |                 | Band 3 |                 | Band 4 |                 |
|--------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|
| Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) | Ch.    | Frequency (MHz) |
| 42     | 5210            | 58     | 5290            | 106    | 5530            | 155    | 5755            |

Table 4-3. 802.11ac (80MHz BW) Frequency / Channel Operations

|                                      |                                                                                     |                                                                     |  |  |  |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|--|--|--|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  |  |  |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                       |  |  |  | Page 8 of 104                                                                         |                                 |

## 5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

| Manufacturer      | Model            | Description                            | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-------------------|------------------|----------------------------------------|------------|--------------|------------|---------------|
| -                 | RE1              | Radiated Emissions Cable Set (UHF/EHF) | 3/29/2013  | Annual       | 3/29/2014  | N/A           |
| -                 | WL25-1           | Conducted Cable Set (25GHz)            | 1/16/2013  | Annual       | 1/16/2014  | N/A           |
| -                 | WL40-1           | Conducted Cable Set (40GHz)            | 1/17/2013  | Annual       | 1/17/2014  | N/A           |
| Agilent           | N9020A           | MXA Signal Analyzer                    | 10/9/2012  | Annual       | 10/9/2013  | US46470561    |
| Agilent           | N9030A           | PXA Signal Analyzer (44GHz)            | 1/11/2013  | Annual       | 1/11/2014  | MY52350166    |
| Anritsu           | MA2411B          | Pulse Sensor                           | 9/19/2012  | Annual       | 9/19/2013  | 1027293       |
| Anritsu           | ML2495A          | Power Meter                            | 10/11/2012 | Annual       | 10/11/2013 | 1039008       |
| ETS Lindgren      | 3117             | 1-18 GHz DRG Horn (Medium)             | 7/22/2011  | Biennial     | 7/22/2013  | 125518        |
| ETS Lindgren      | 3160-09          | 18-26.5 GHz Standard Gain Horn         | 5/30/2012  | Biennial     | 5/30/2014  | 135427        |
| ETS Lindgren      | 3160-10          | 26.5-40 GHz Standard Gain Horn         | 6/6/2012   | Biennial     | 6/6/2014   | 130993        |
| Mini-Circuits     | VHF-3100+        | High Pass Filter                       | 1/17/2013  | Annual       | 1/17/2014  | 30841         |
| Mini-Circuits     | VHF-8400+        | 3.4GHz - 9.9GHz High Pass Filter       | 1/17/2013  | Annual       | 1/17/2014  | 31048         |
| Rohde & Schwarz   | TS-PR18          | 1-18 GHz Pre-Amplifier                 | 5/31/2013  | Annual       | 5/31/2014  | 100071        |
| Rohde & Schwarz   | TS-PR26          | 18-26.5 GHz Pre-Amplifier              | 5/31/2013  | Annual       | 5/31/2014  | 100040        |
| Rohde & Schwarz   | ESU26            | EMI Test Receiver                      | 2/25/2013  | Annual       | 2/25/2014  | 100342        |
| Rohde & Schwarz   | TS-PR40          | 26.5-40 GHz Pre-Amplifier              | 6/6/2012   | Biennial     | 6/6/2014   | 100037        |
| Solar Electronics | 8012-50-R-24-BNC | LISN                                   | 6/20/2013  | Biennial     | 6/20/2015  | 310233        |
| Sunol             | JB5              | Bi-Log Antenna (30M - 5GHz)            | 1/26/2012  | Biennial     | 1/26/2014  | A051107       |

**Table 5-1. Annual Test Equipment Calibration Schedule**

**Note:**

For equipment listed above that has a calibration due date that falls within the test date range, care was taken to ensure that this equipment was utilized prior to the calibration due date.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          | Page 9 of 104                                                                         |                                 |

## 6.0 TEST RESULTS

### 6.1 Summary

Company Name: LG Electronics MobileComm U.S.A  
 FCC ID: ZNFD803  
 Method/System: Unlicensed National Information Infrastructure (UNII)  
 Data Rate(s) Tested: 6, 9, 12, 18, 24, 36, 48, 54Mbps (802.11a)  
6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2 (n – 20MHz)  
13.5/15, 27/30, 40.5/45, 54/60, 81/90, 108/120, 121.5/135, 135/150 (n – 40MHz BW)  
29.3/32.5Mbps, 58.5/65Mbps, 87.8/97.5Mbps, 117/130Mbps, 175.5/195Mbps,  
234/260Mbps, 263.3/292.5Mbps, 292.5/325Mbps, 351/390Mbps, 390/433.3Mbps  
(ac – 80MHz BW)

| FCC Part Section(s)            | RSS Section(s)    | Test Description                                                              | Test Limit                                                                                                                                                                              | Test Condition | Test Result | Reference           |
|--------------------------------|-------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------|---------------------|
| <b>TRANSMITTER MODE (TX)</b>   |                   |                                                                               |                                                                                                                                                                                         |                |             |                     |
| N/A                            | RSS-210 [A9.2]    | 26dB Bandwidth [FCC]<br>Occupied Bandwidth [IC]                               | N/A                                                                                                                                                                                     | CONDUCTED      | PASS        | Section 6.2         |
| 15.407 (a)(1)                  | RSS-210 [A9.2]    | Maximum Conducted Output Power                                                | < 4 + 10log <sub>10</sub> (BW) dBm (5150-5250MHz) [FCC]<br>< 10 + 10log <sub>10</sub> (BW) dBm (5150-5250MHz) [IC]<br>< 11 + 10log <sub>10</sub> (B) dBm (5250-5350MHz, 5470 – 5725MHz) |                | PASS        | Section 6.3         |
| 15.407 (a)(1), (5)             | RSS-210 [A9.2]    | Peak Power Spectral Density                                                   | < 4 dBm/MHz (5150-5250) [FCC]<br>< 10dBm/MHz (5150-5250) [IC]<br>< 11dBm/MHz (5250-5350)<br>< 11dBm/MHz (5470-5725)                                                                     |                | PASS        | Section 6.4         |
| 15.407(a)(6)                   | N/A               | Peak Excursion                                                                | < 13 dB/MHz maximum difference                                                                                                                                                          |                | PASS        | Section 6.5         |
| 15.407(g)                      | N/A               | Frequency Stability                                                           | N/A                                                                                                                                                                                     |                | PASS        | Section 6.6         |
| 15.407(h)                      | RSS-210 [A9.3]    | Dynamic Frequency Selection                                                   | See DFS Test Report                                                                                                                                                                     |                | PASS        | See DFS Test Report |
| 15.407(b)(1), (2),(3)          | RSS-210 [A9.2]    | Undesirable Emissions                                                         | < -27 dBm/MHz EIRP (5150-5350MHz, 5470-5725MHz)                                                                                                                                         | RADIATED       | PASS        | Section 6.7, 6.8    |
| 15.205, 15.407(b)(1), (5), (6) | RSS-Gen [7.2.3.2] | General Field Strength Limits (Restricted Bands and Radiated Emission Limits) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-210 table 3 limits)                                                                                 |                | PASS        | Section 6.9         |
| 15.207                         | RSS-Gen [7.2.2]   | AC Conducted Emissions 150kHz – 30MHz                                         | < FCC 15.207 limits or<br>< RSS-Gen table 2 limits                                                                                                                                      | LINE CONDUCTED | PASS        | Section 6.11        |

**Table 6-1. Summary of Test Results**

#### Notes:

- 1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST "UNII Automation", Version 2.0.

|                                      |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 10 of 104                  |

## 6.2 26dB Bandwidth Measurement – 802.11a/n/ac

### Test Overview and Limit

The bandwidth at 26dB 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 duty cycle, at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

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

### Test Procedure Used

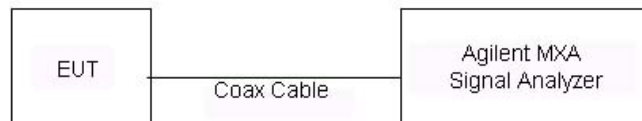
KDB 789033 v01r03 – Section D

### Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to  $X = 26$ . The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth
3.  $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = max hold

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 6-1. Test Instrument & Measurement Setup**

### Test Notes

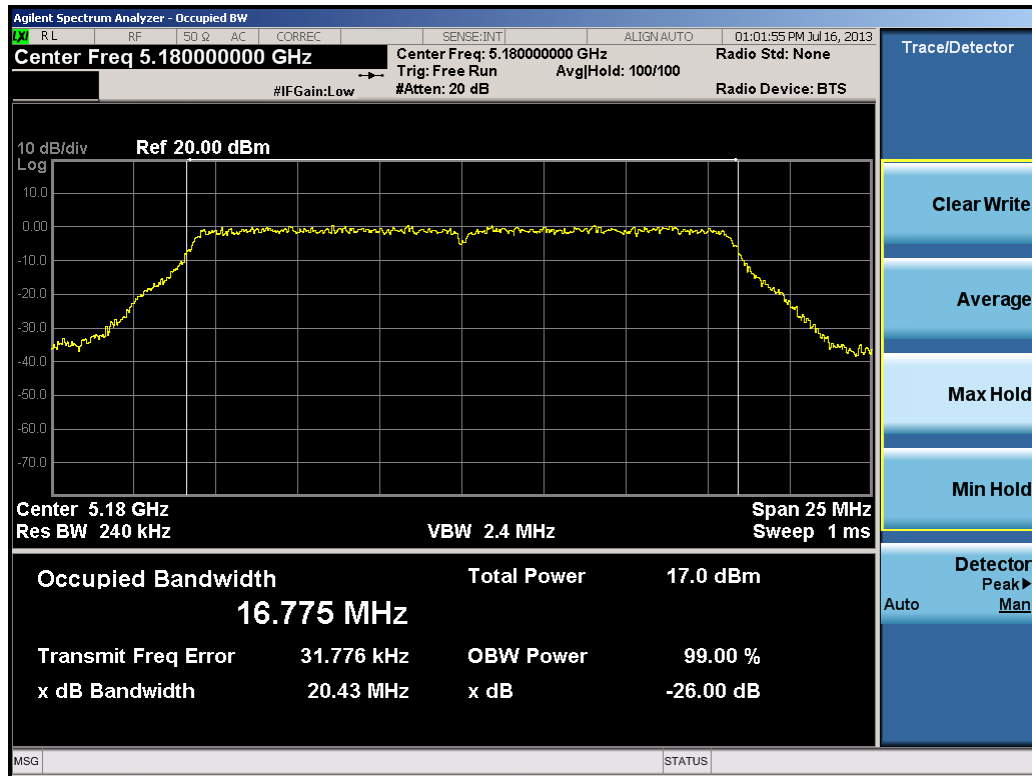
None

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          | Page 11 of 104                                                                        |                                 |

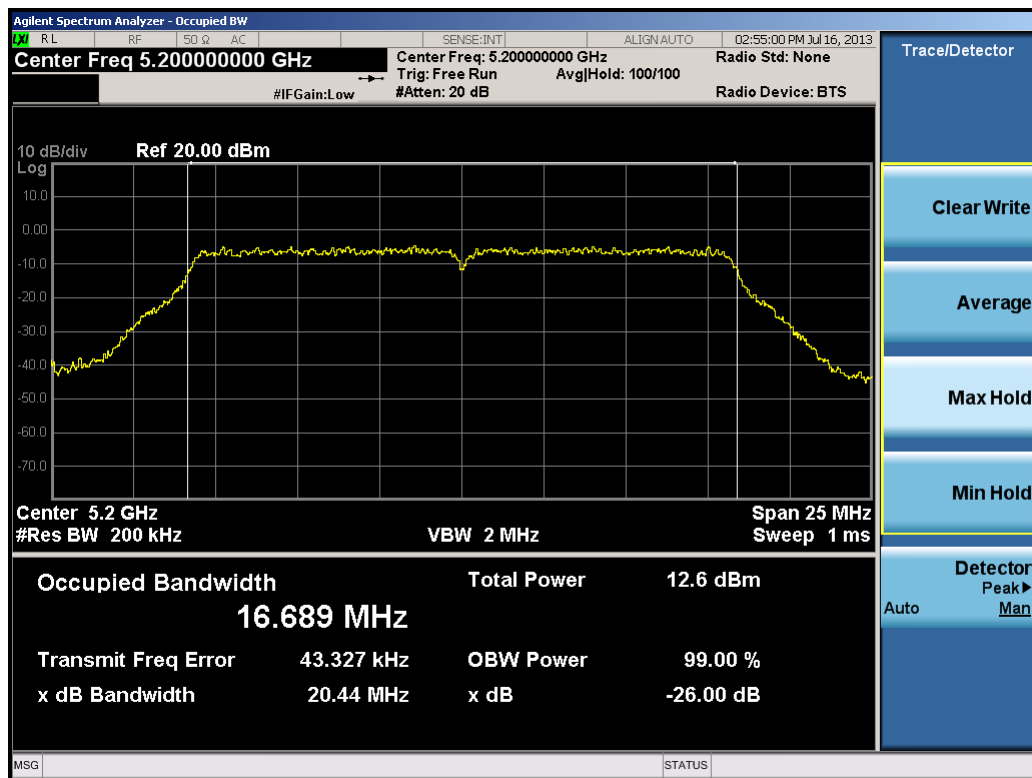
|         | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured 26dB Bandwidth [MHz] |          | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured 26dB Bandwidth [MHz] |
|---------|-----------------|-------------|-------------|------------------|-------------------------------|----------|-----------------|-------------|-------------|------------------|-------------------------------|
| Band I  | 5180            | 36          | a           | 6                | 20.43                         | Band III | 5500            | 100         | a           | 6                | 20.16                         |
|         | 5200            | 40          | a           | 6                | 20.44                         |          | 5580            | 116         | a           | 6                | 20.29                         |
|         | 5240            | 48          | a           | 6                | 20.21                         |          | 5720            | 144         | a           | 6                | 20.40                         |
|         | 5180            | 36          | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.70                         |          | 5500            | 100         | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.67                         |
|         | 5200            | 40          | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.78                         |          | 5580            | 116         | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.70                         |
|         | 5240            | 48          | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.61                         |          | 5720            | 144         | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.65                         |
|         | 5190            | 38          | n (40MHz)   | 13.5/15 (MCS0)   | 39.80                         |          | 5510            | 102         | n (40MHz)   | 13.5/15 (MCS0)   | 39.66                         |
|         | 5230            | 46          | n (40MHz)   | 13.5/15 (MCS0)   | 39.40                         |          | 5550            | 110         | n (40MHz)   | 13.5/15 (MCS0)   | 39.57                         |
|         | 5210            | 42          | ac (80MHz)  | 29.3/32.5 (MCS0) | 82.47                         |          | 5710            | 142         | n (40MHz)   | 13.5/15 (MCS0)   | 39.63                         |
|         |                 |             |             |                  |                               |          | 5530            | 106         | ac (80MHz)  | 29.3/32.5 (MCS0) | 81.78                         |
| Band II | 5260            | 52          | a           | 6                | 20.35                         | Band IV  | 5690            | 138         | ac (80MHz)  | 29.3/32.5 (MCS0) | 82.18                         |
|         | 5280            | 56          | a           | 6                | 20.30                         |          | 5745            | 149         | a           | 6                | 20.44                         |
|         | 5320            | 64          | a           | 6                | 20.25                         |          | 5785            | 157         | a           | 6                | 20.17                         |
|         | 5260            | 52          | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.73                         |          | 5825            | 165         | a           | 6                | 20.24                         |
|         | 5280            | 56          | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.76                         |          | 5745            | 149         | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.42                         |
|         | 5320            | 64          | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.65                         |          | 5785            | 157         | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.82                         |
|         | 5270            | 54          | n (40MHz)   | 13.5/15 (MCS0)   | 39.57                         |          | 5825            | 165         | n (20MHz)   | 6.5/7.2 (MCS0)   | 20.58                         |
|         | 5310            | 62          | n (40MHz)   | 13.5/15 (MCS0)   | 39.75                         |          | 5755            | 151         | n (40MHz)   | 13.5/15 (MCS0)   | 39.66                         |
|         | 5290            | 58          | ac (80MHz)  | 29.3/32.5 (MCS0) | 81.76                         |          | 5795            | 159         | n (40MHz)   | 13.5/15 (MCS0)   | 39.58                         |
|         |                 |             |             |                  |                               |          | 5775            | 155         | ac (80MHz)  | 29.3/32.5 (MCS0) | 81.81                         |

**Table 6-2. Conducted Bandwidth Measurements**

|                                      |                                                                                     |                                                                        |  |  |  |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|--|--|--|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  |  |  |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |  |  |  | Page 12 of 104                                                                        |                                 |

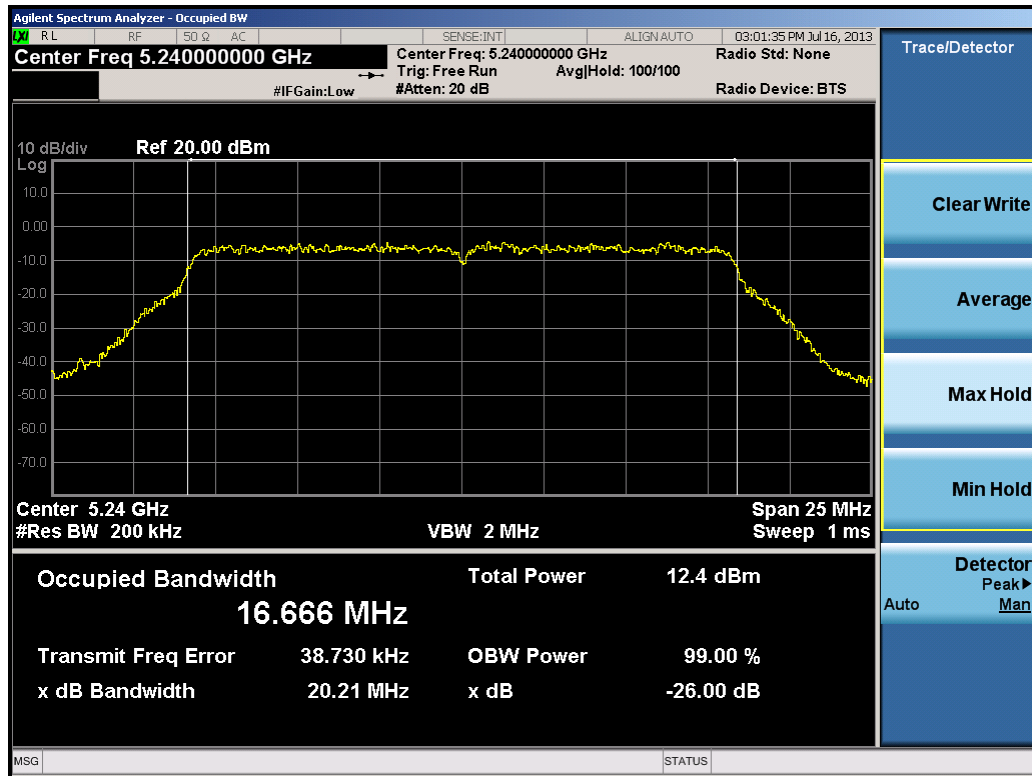


Plot 6-1. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 36)

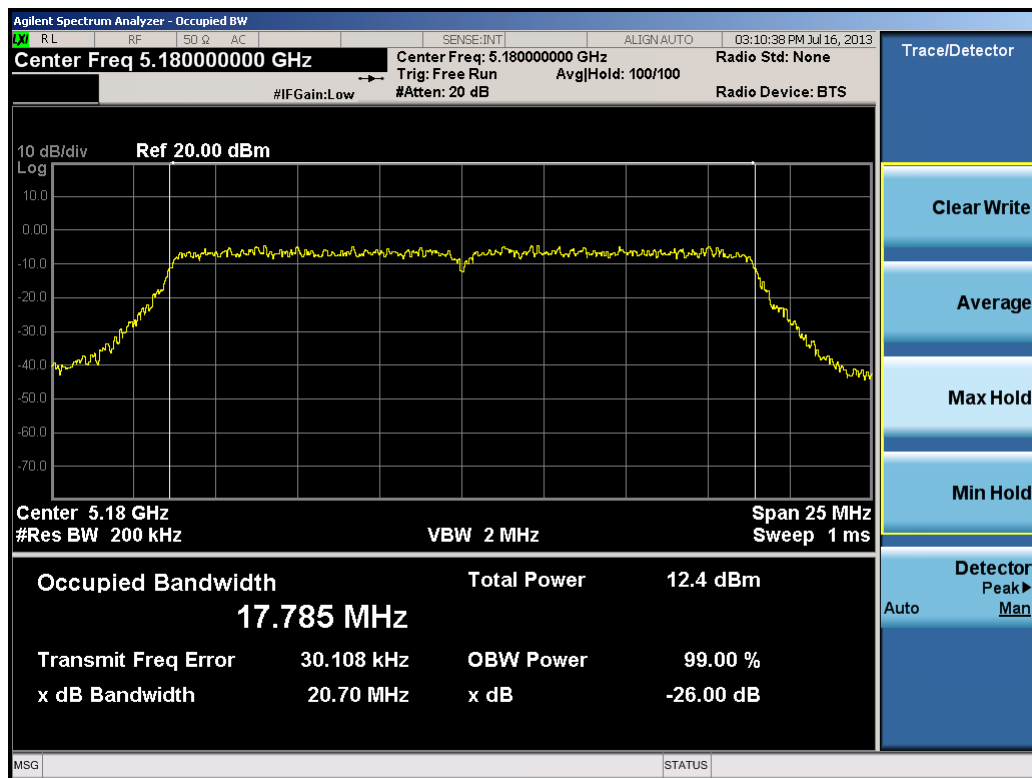


Plot 6-2. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 40)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 13 of 104                  |

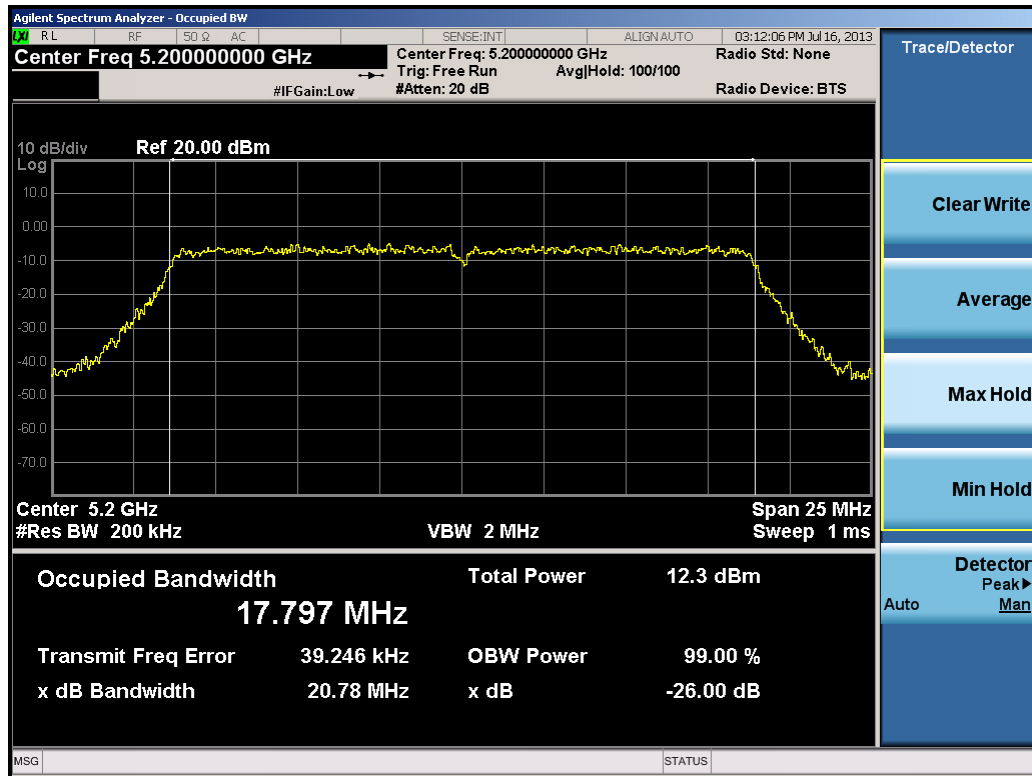


Plot 6-3. 26dB Bandwidth Plot (802.11a (UNII Band 1) – Ch. 48)

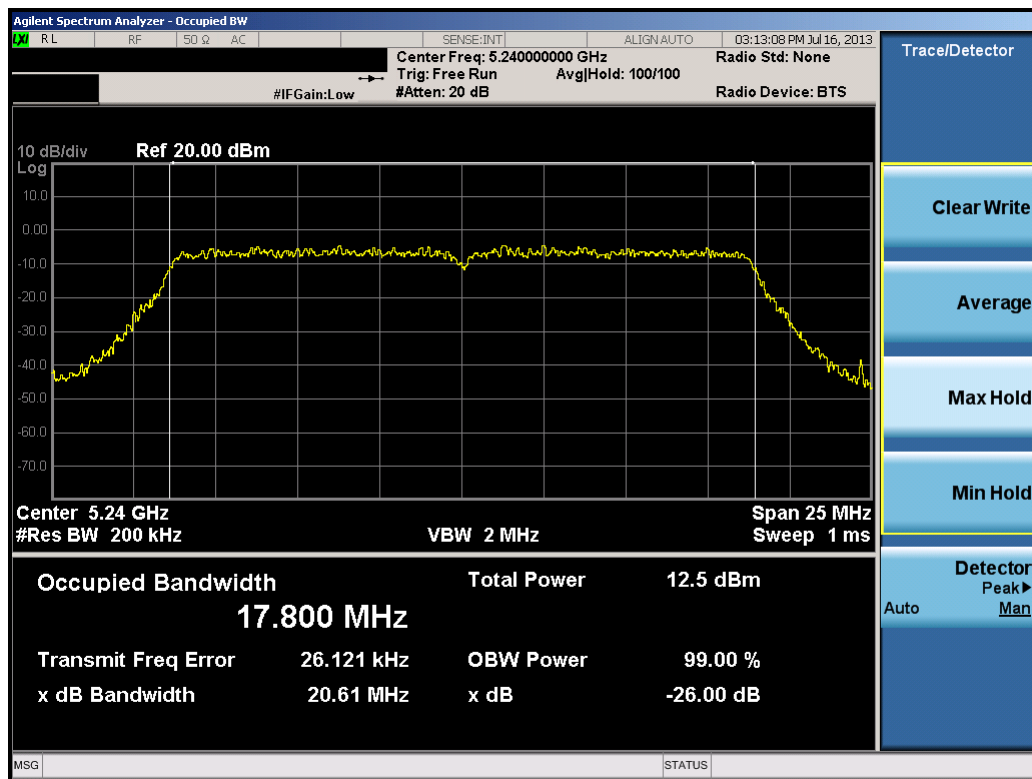


Plot 6-4. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 14 of 104                  |

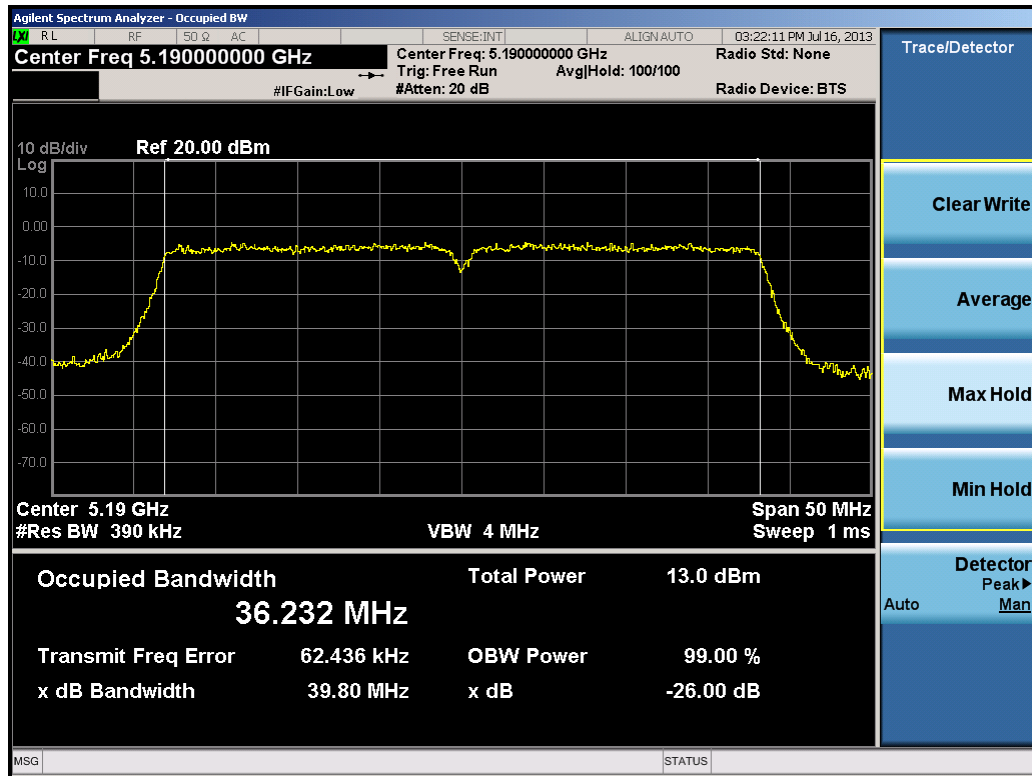


Plot 6-5. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

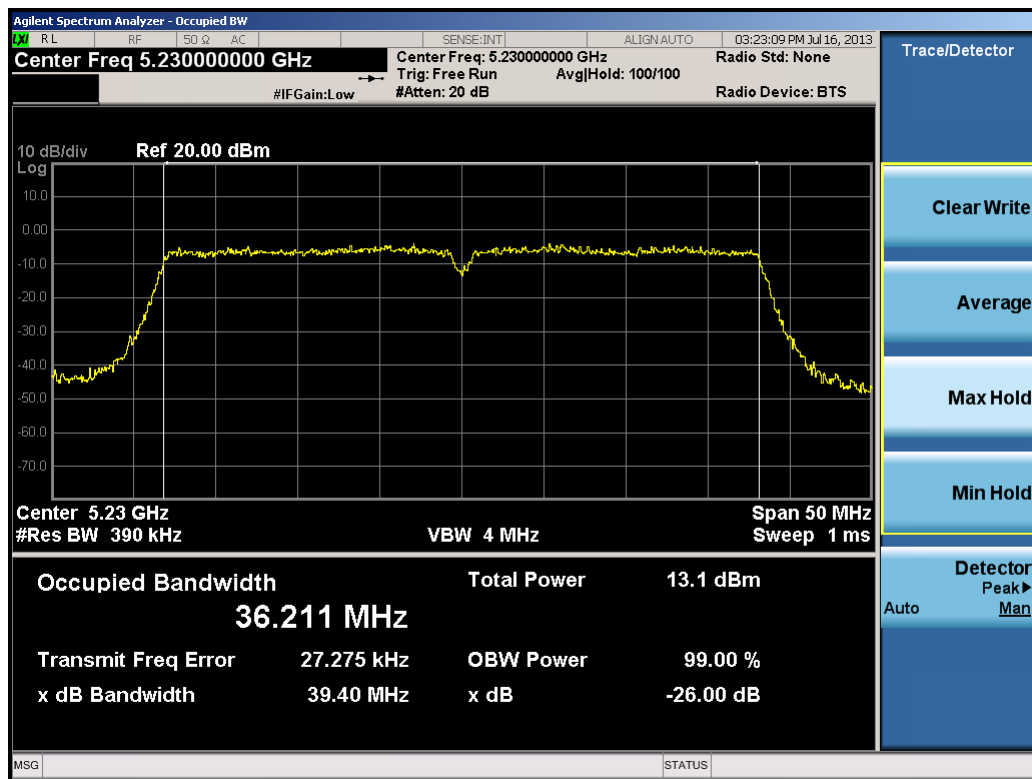


Plot 6-6. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 15 of 104                  |

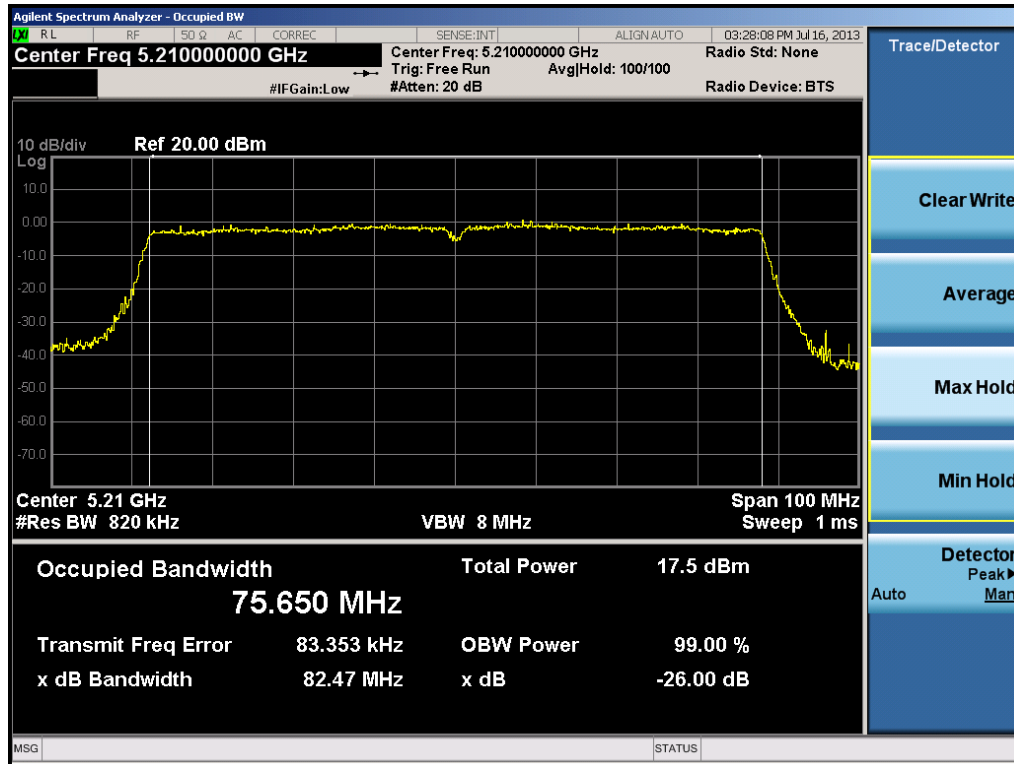


Plot 6-7. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

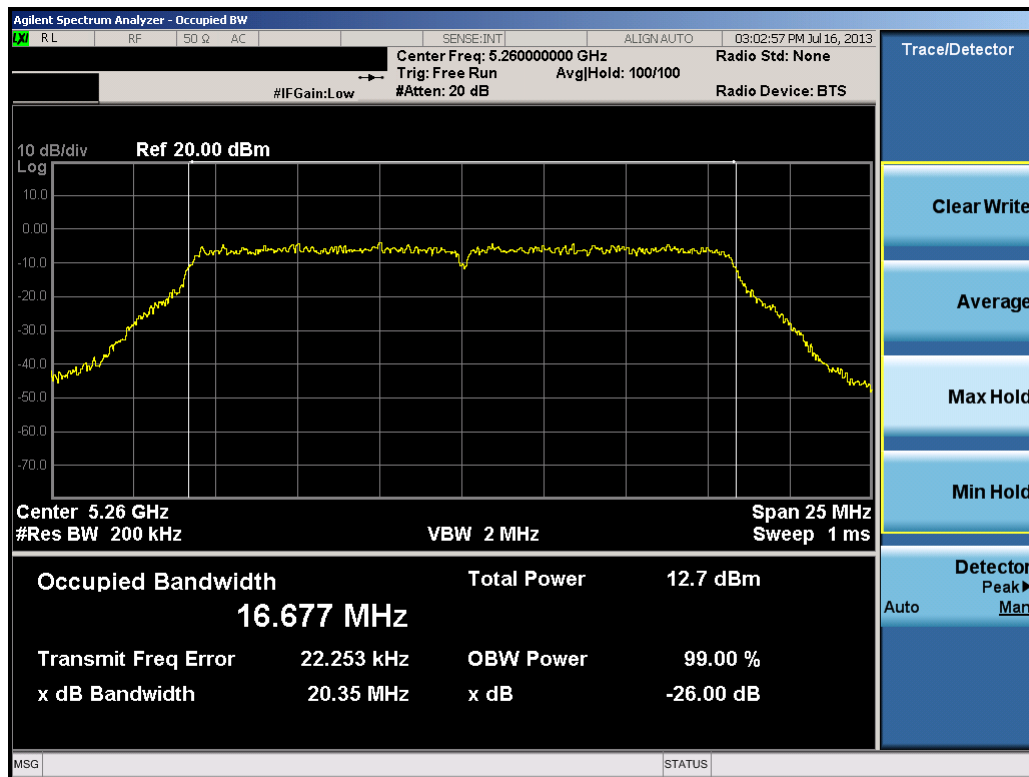


Plot 6-8. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 16 of 104                  |

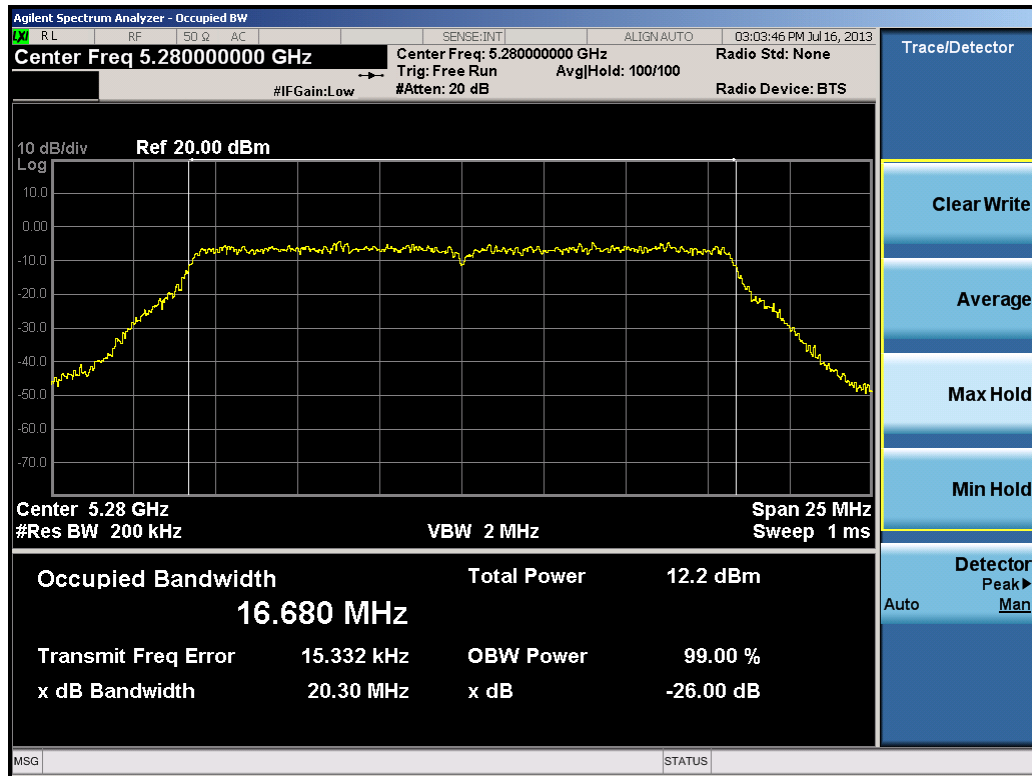


Plot 6-9. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

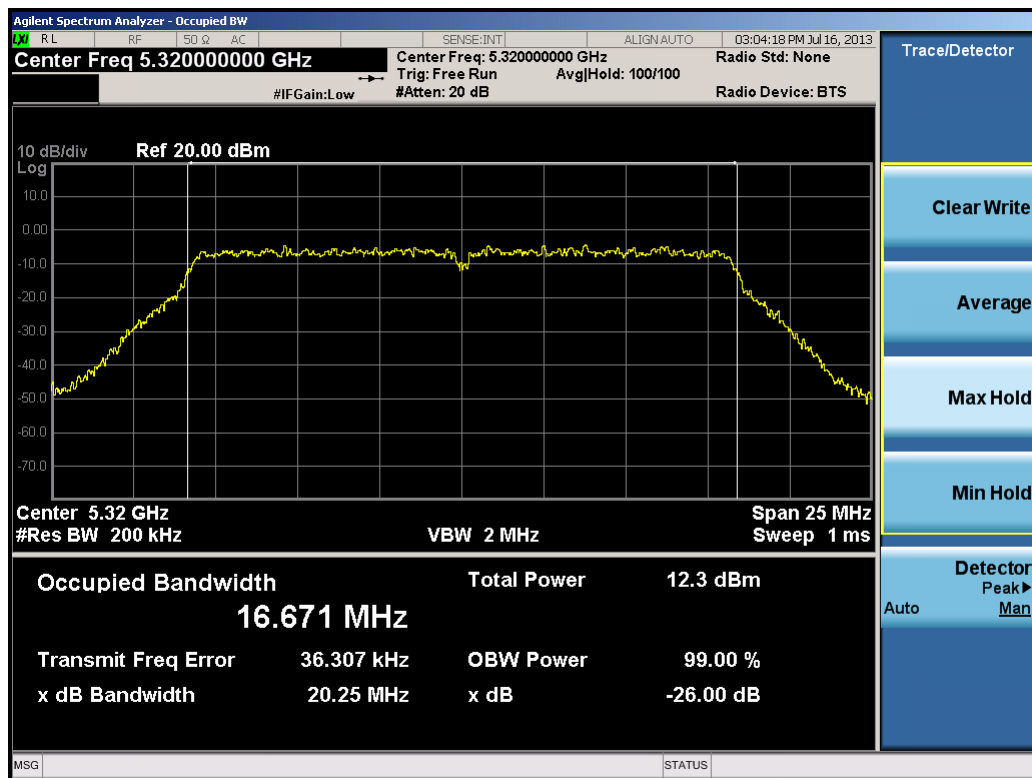


Plot 6-10. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 52)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 17 of 104                  |

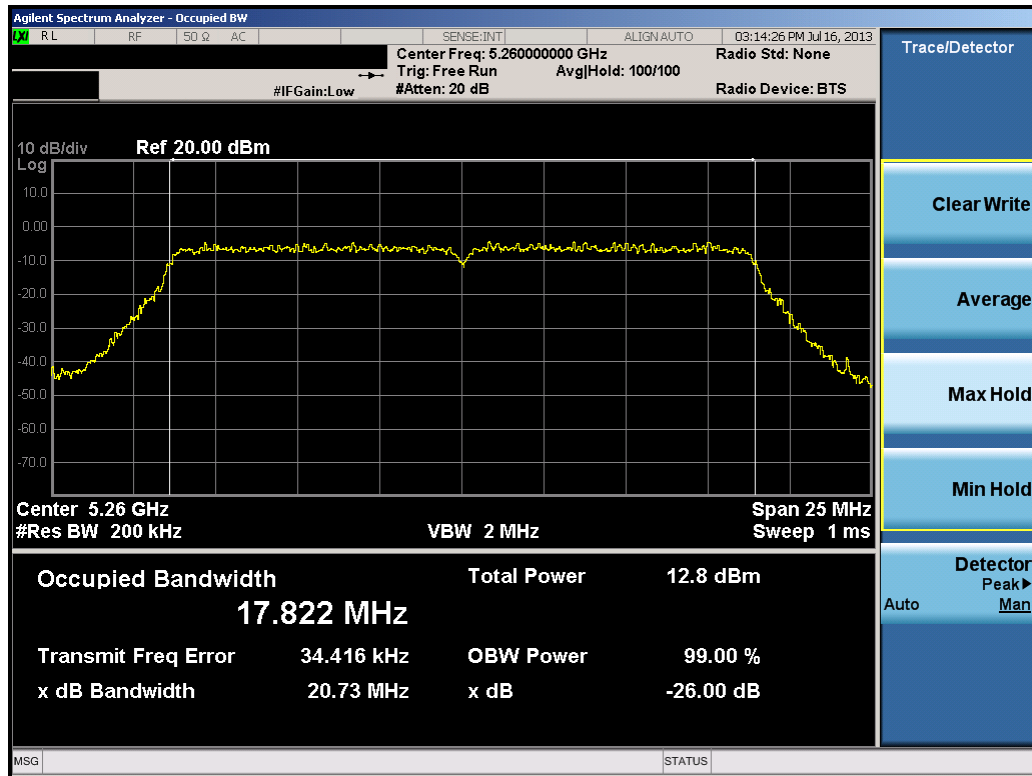


Plot 6-11. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 56)

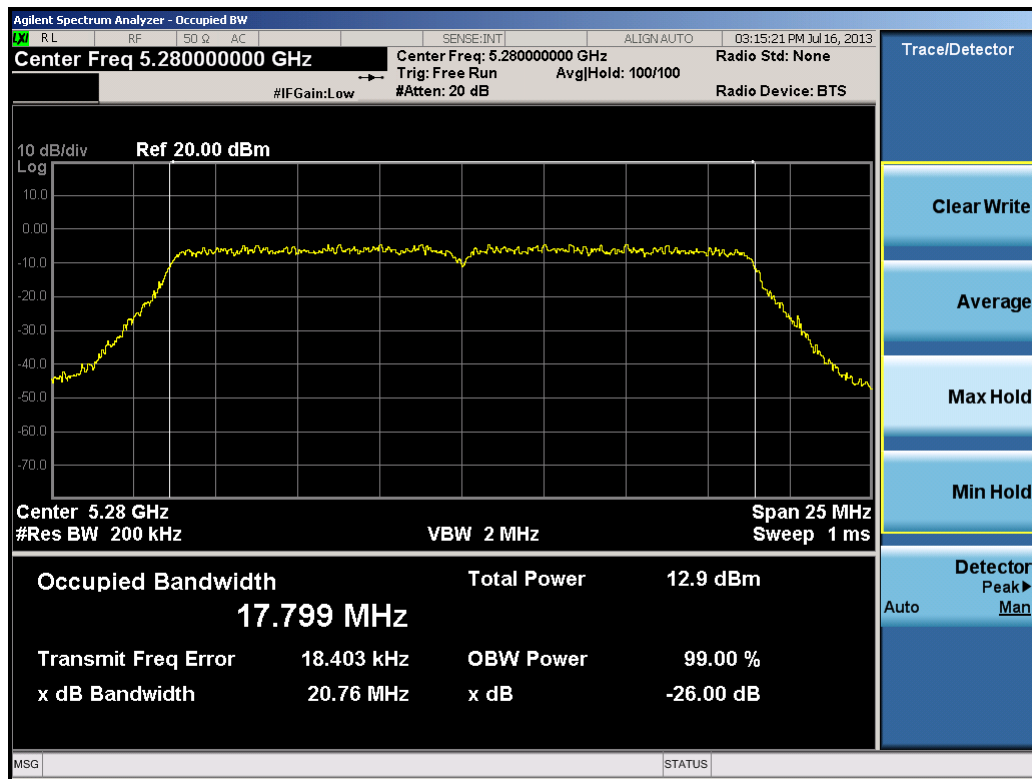


Plot 6-12. 26dB Bandwidth Plot (802.11a (UNII Band 2) – Ch. 64)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 18 of 104                  |

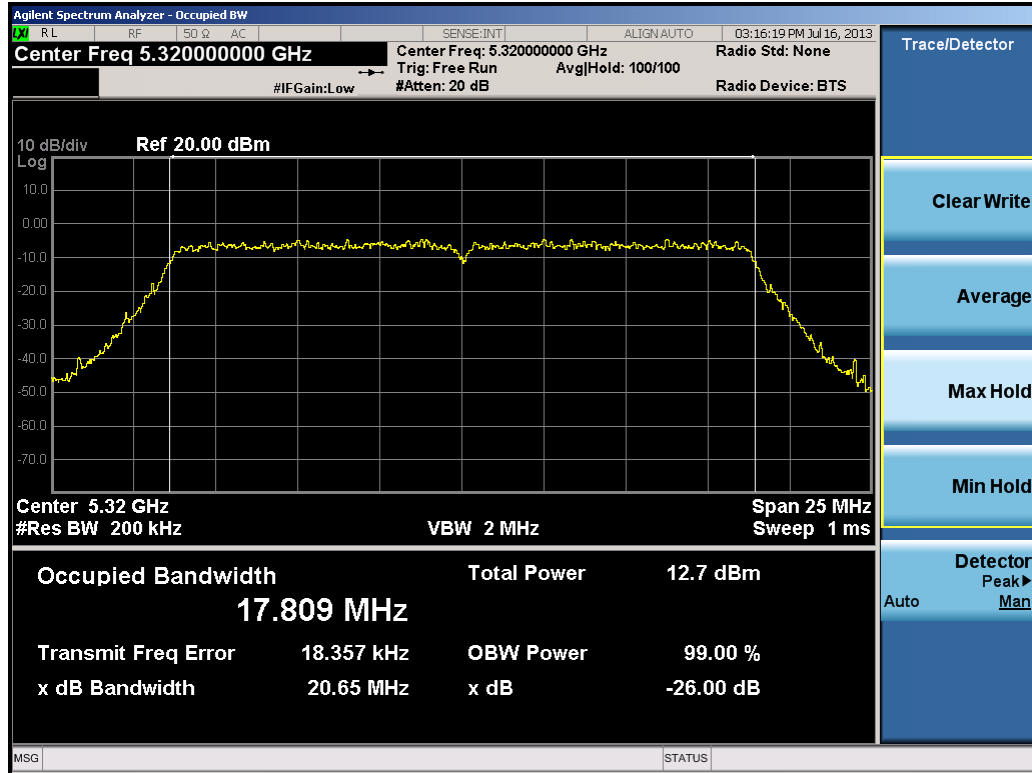


Plot 6-13. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 52)

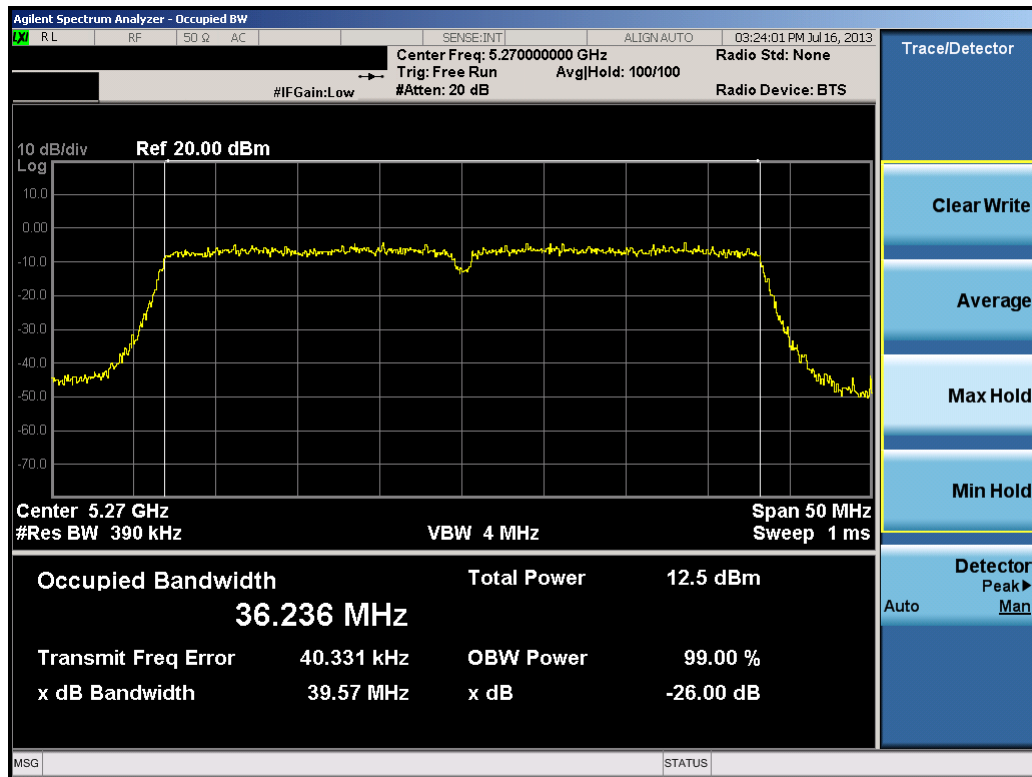


Plot 6-14. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 56)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 19 of 104                  |

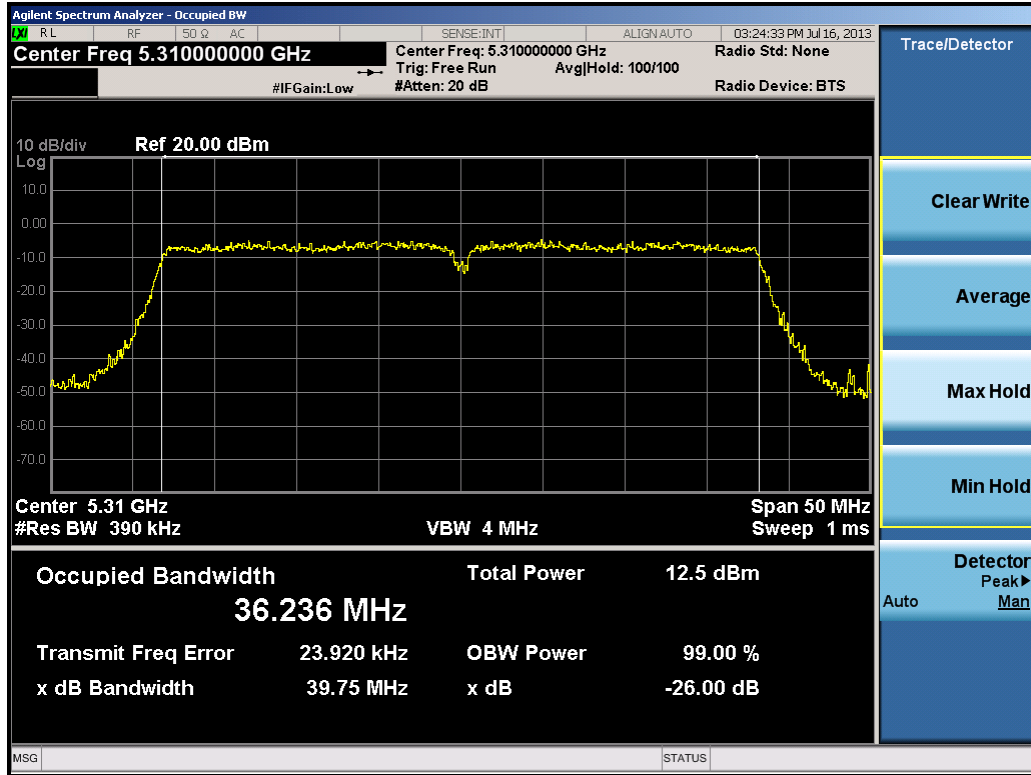


Plot 6-15. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 64)

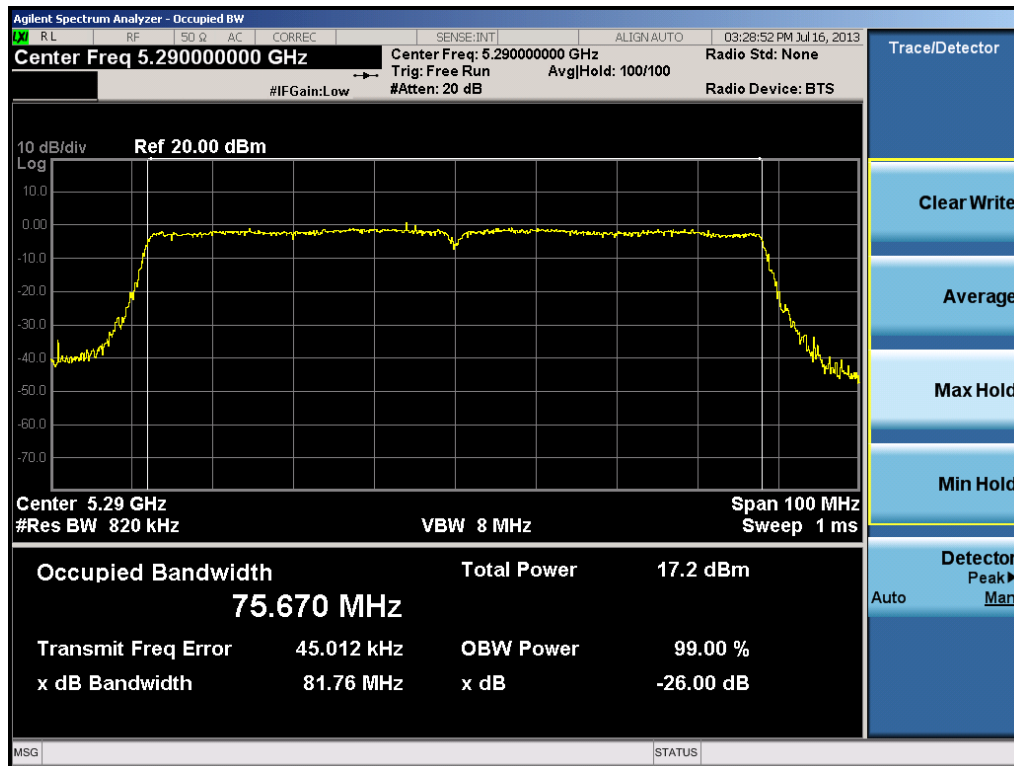


Plot 6-16. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2) – Ch. 54)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 20 of 104                  |

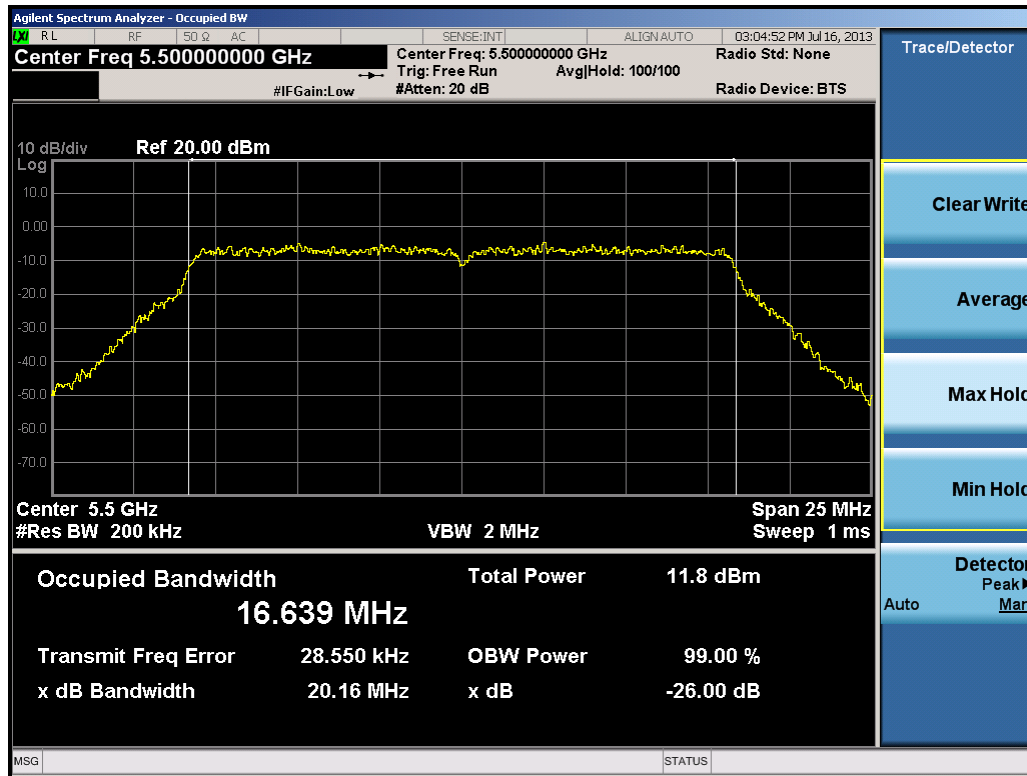


Plot 6-17. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 2) – Ch. 62)

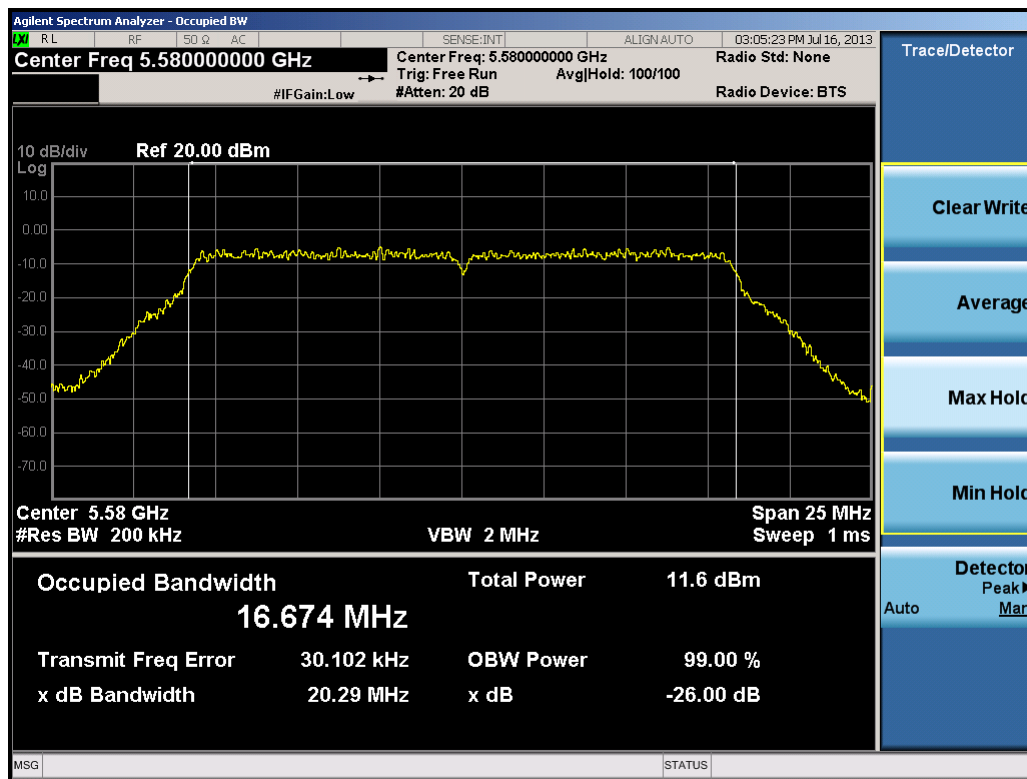


Plot 6-18. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2) – Ch. 58)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 21 of 104                  |

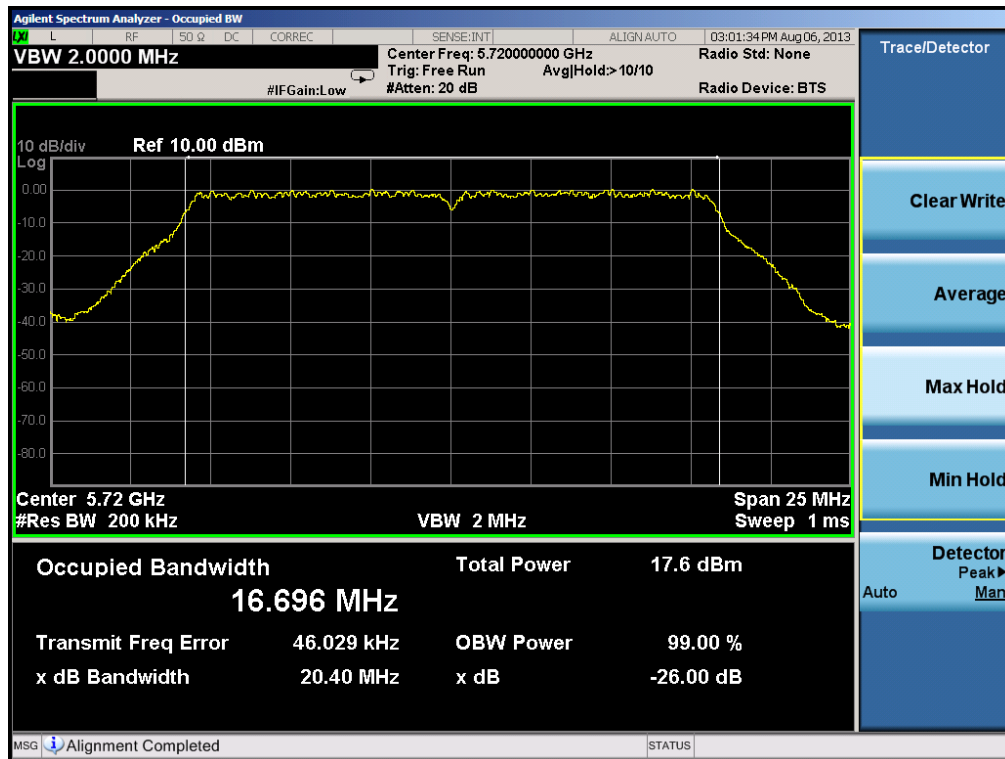


Plot 6-19. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 100)

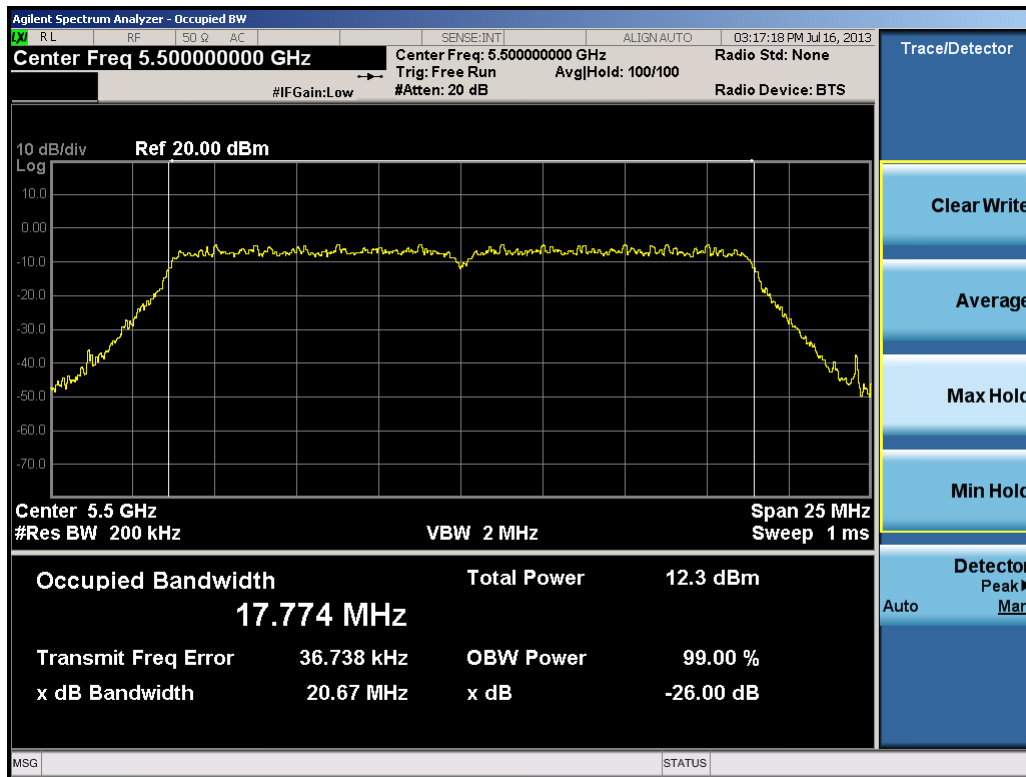


Plot 6-20. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 116)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 22 of 104                  |

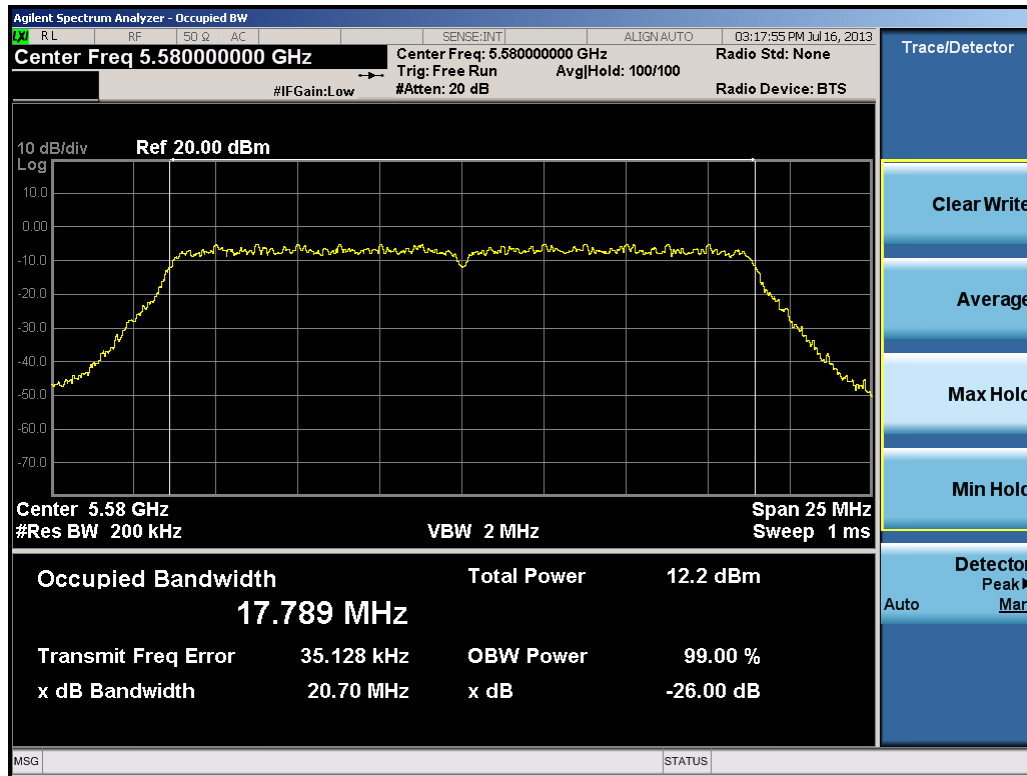


Plot 6-21. 26dB Bandwidth Plot (802.11a (UNII Band 3) – Ch. 144)

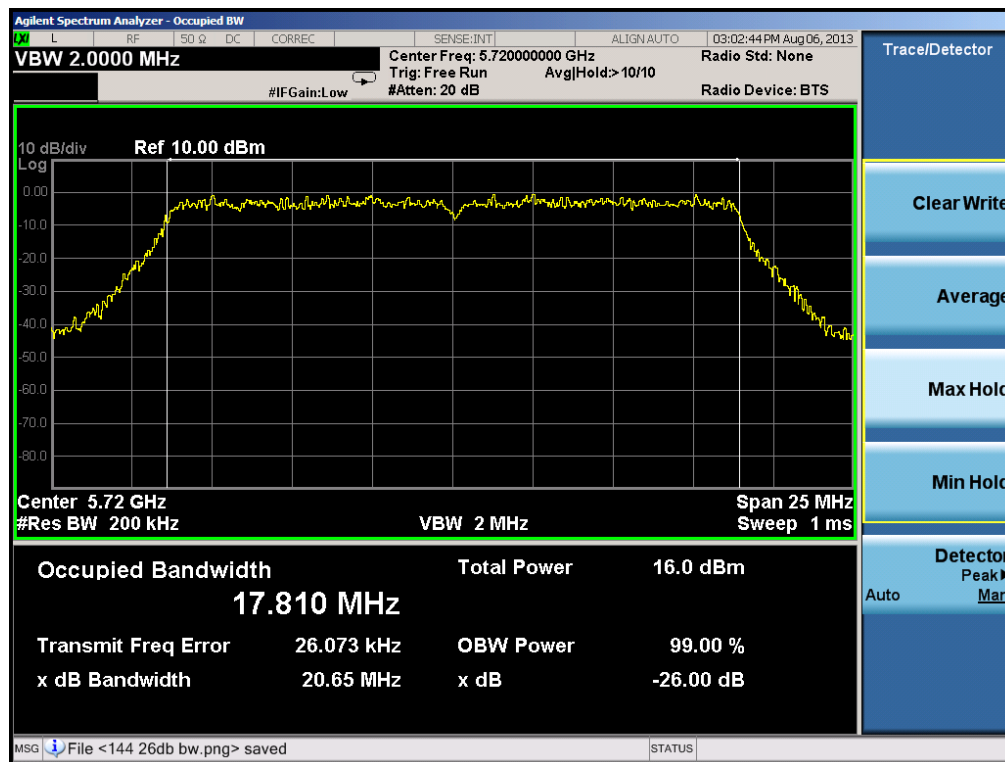


Plot 6-22. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 100)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 23 of 104                  |

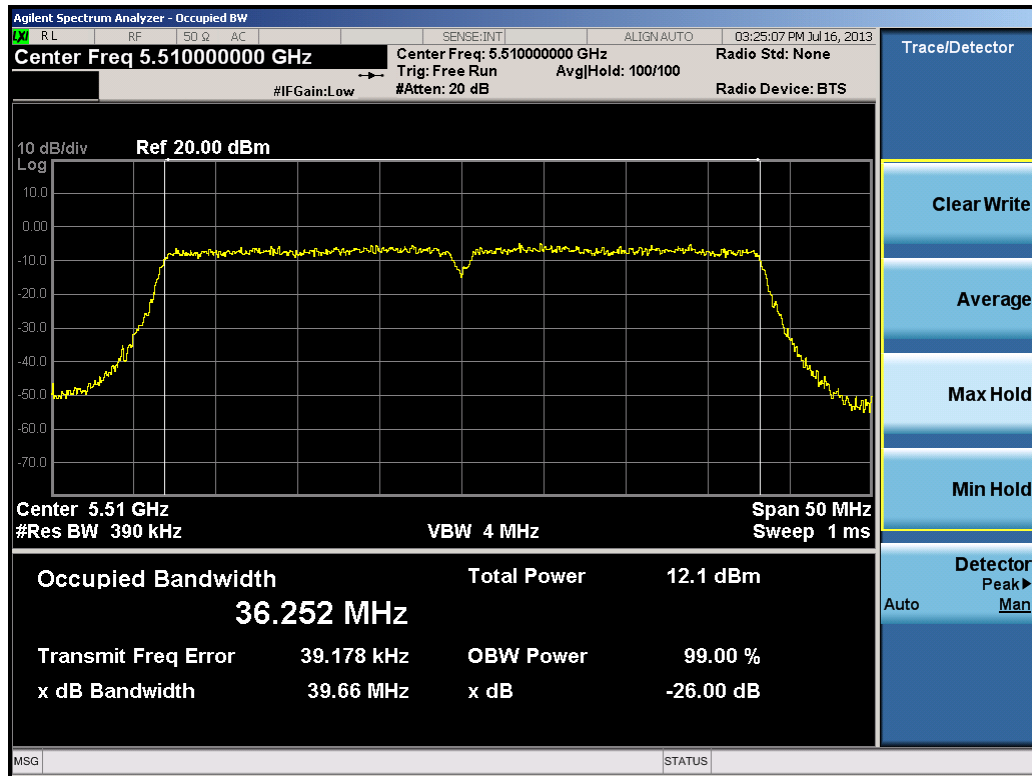


Plot 6-23. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 116)

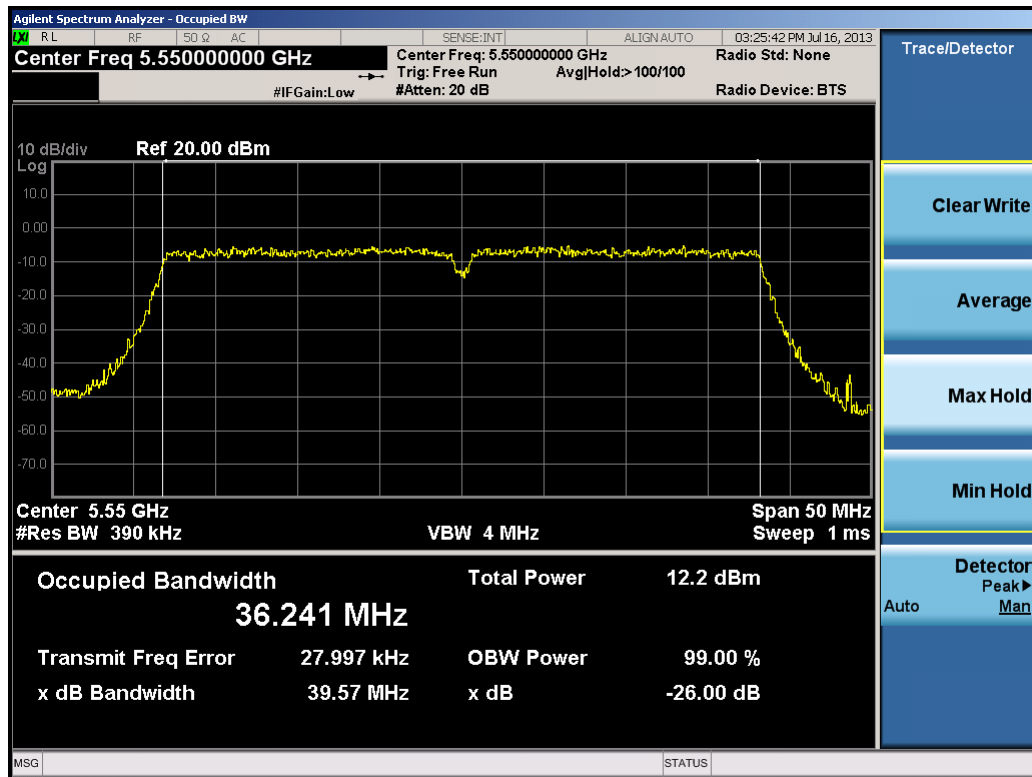


Plot 6-24. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 144)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 24 of 104                  |

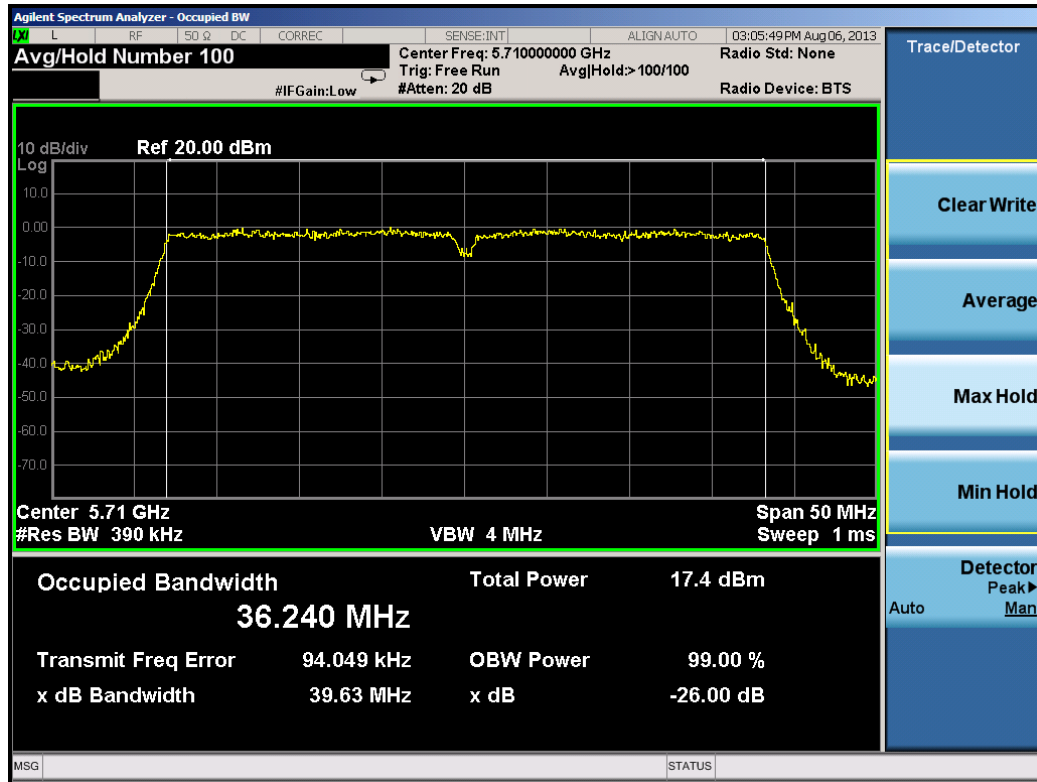


Plot 6-25. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 102)

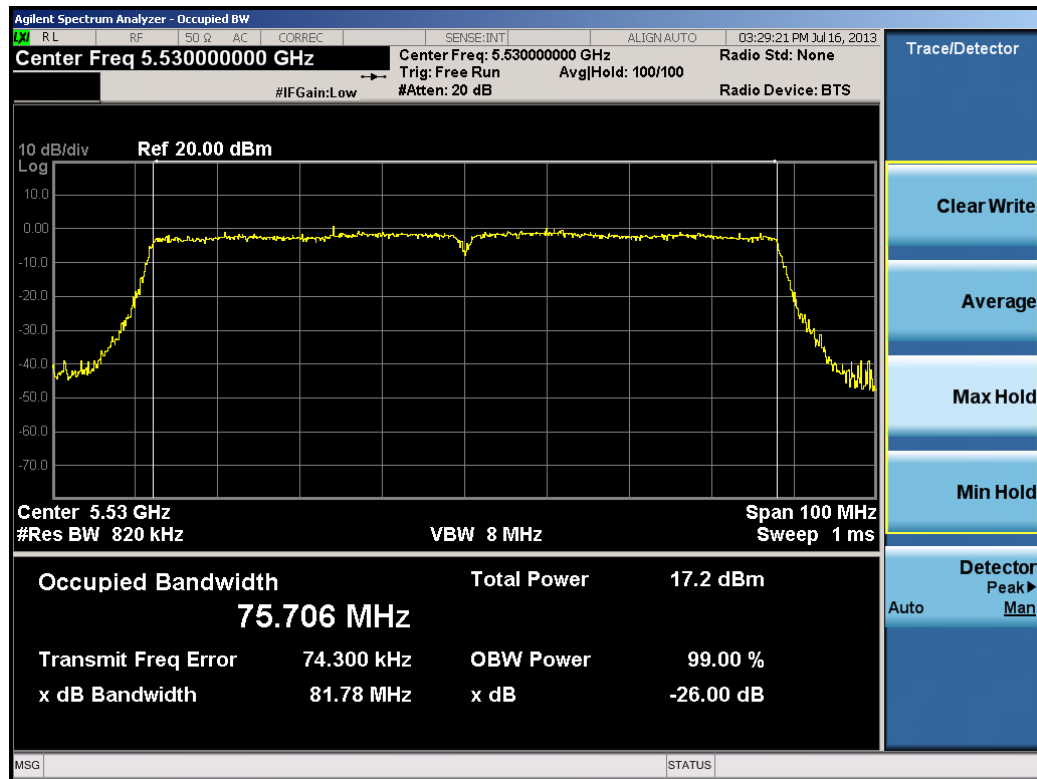


Plot 6-26. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 110)

|                                      |                                               |                                                                        |    |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |    | Page 25 of 104                  |

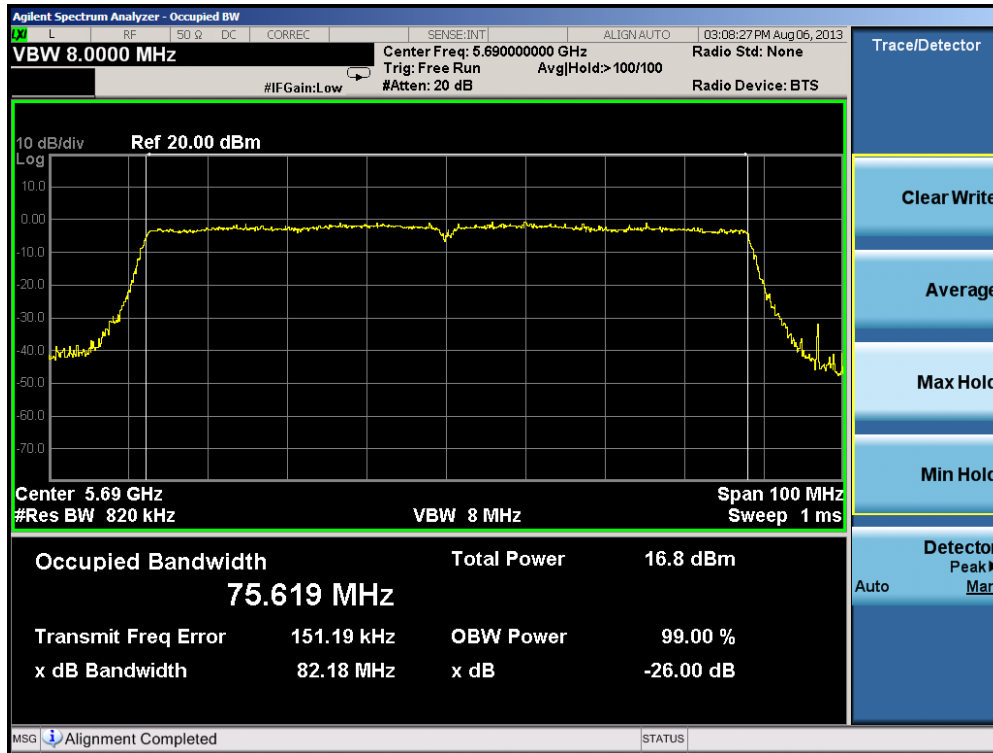


Plot 6-27. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 142)

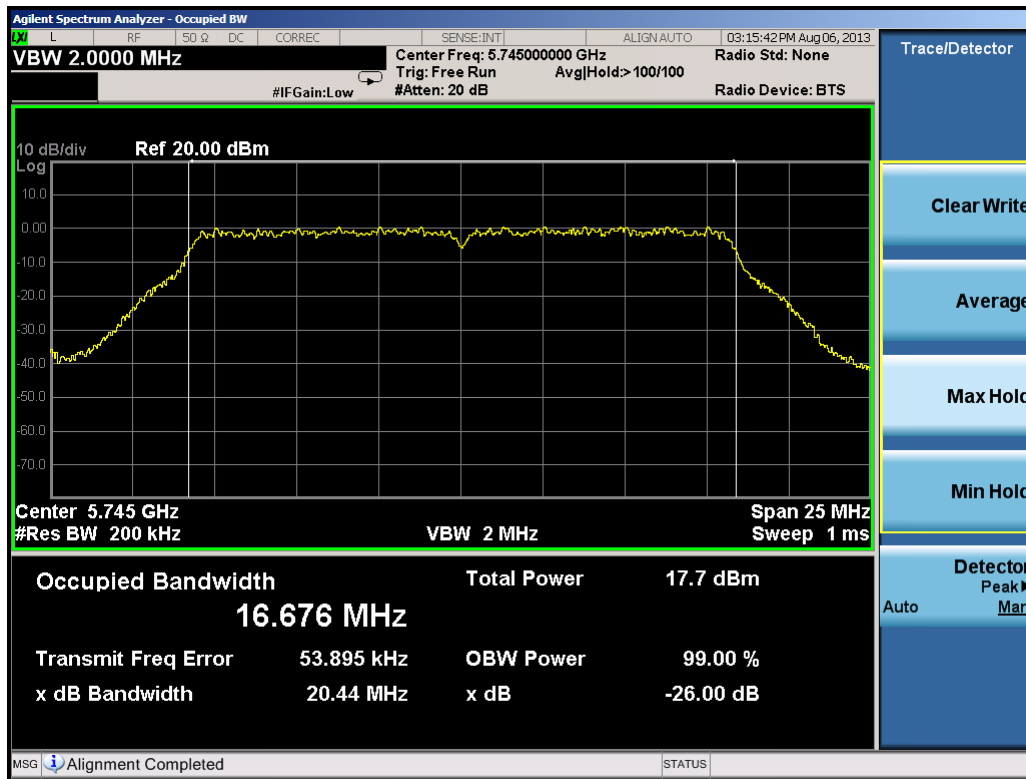


Plot 6-28. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 106)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 26 of 104                  |

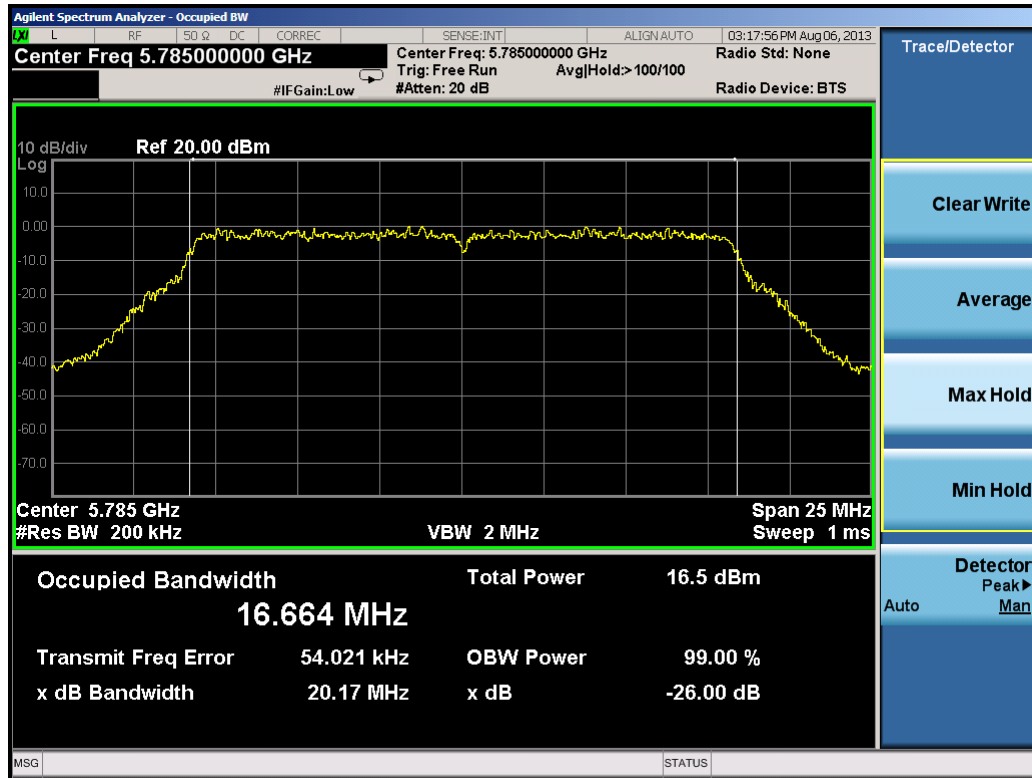


Plot 6-29. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 138)

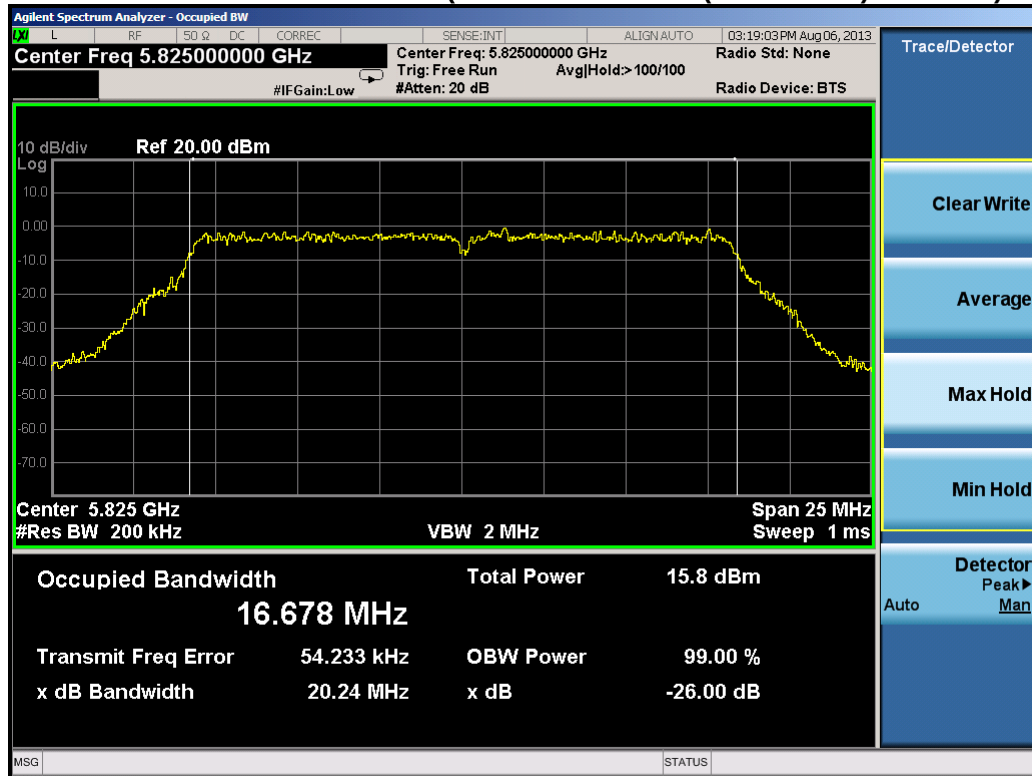


Plot 6-30. 26dB Bandwidth Plot (20MHz BW 802.11a (UNII Band 4) – Ch. 149)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 27 of 104                  |

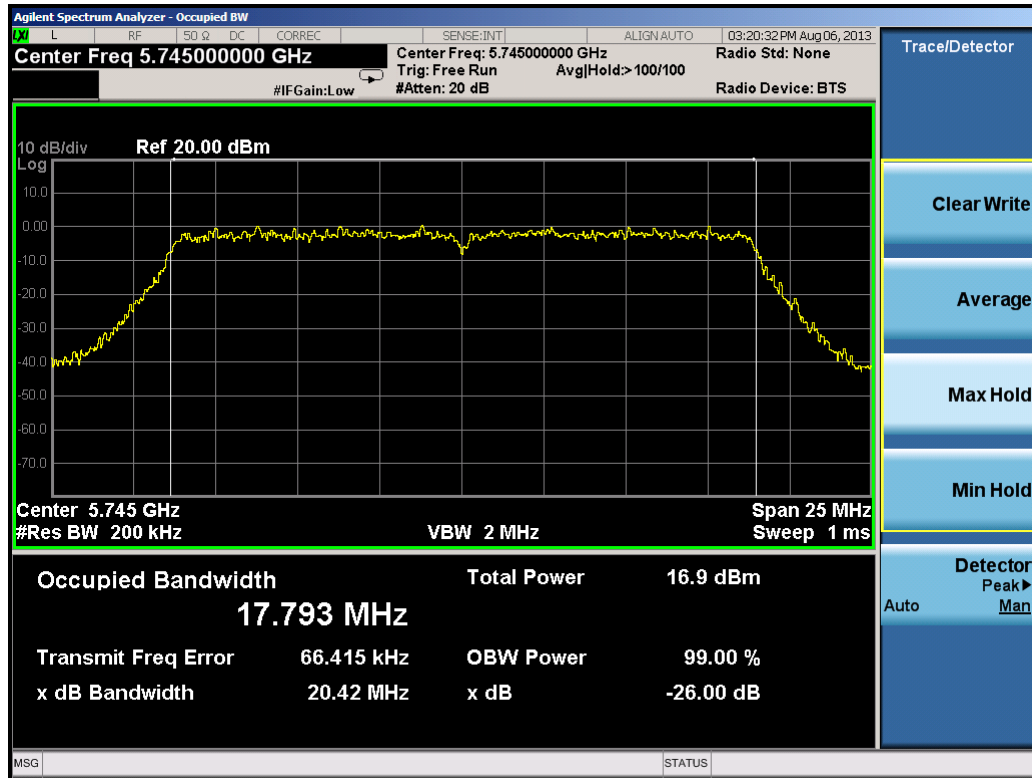


Plot 6-31. 26dB Bandwidth Plot (20MHz BW 802.11a (UNII Band 4) – Ch. 157)

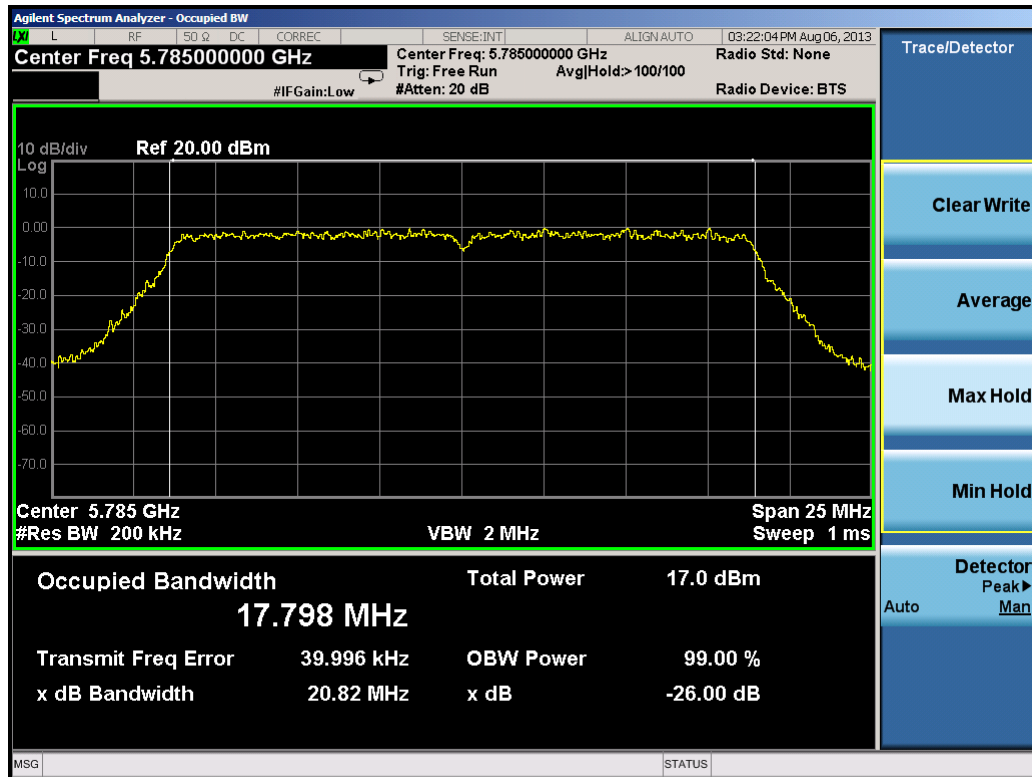


Plot 6-32. 26dB Bandwidth Plot (20MHz BW 802.11a (UNII Band 4) – Ch. 165)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 28 of 104                  |

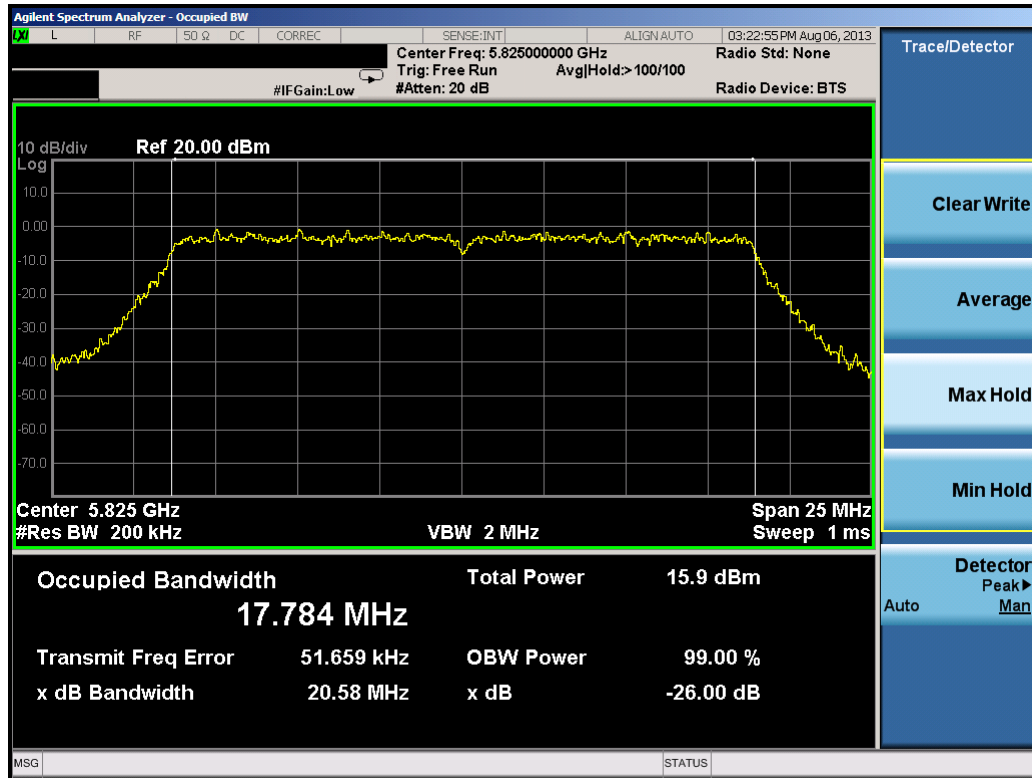


Plot 6-33. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 4) – Ch. 149)

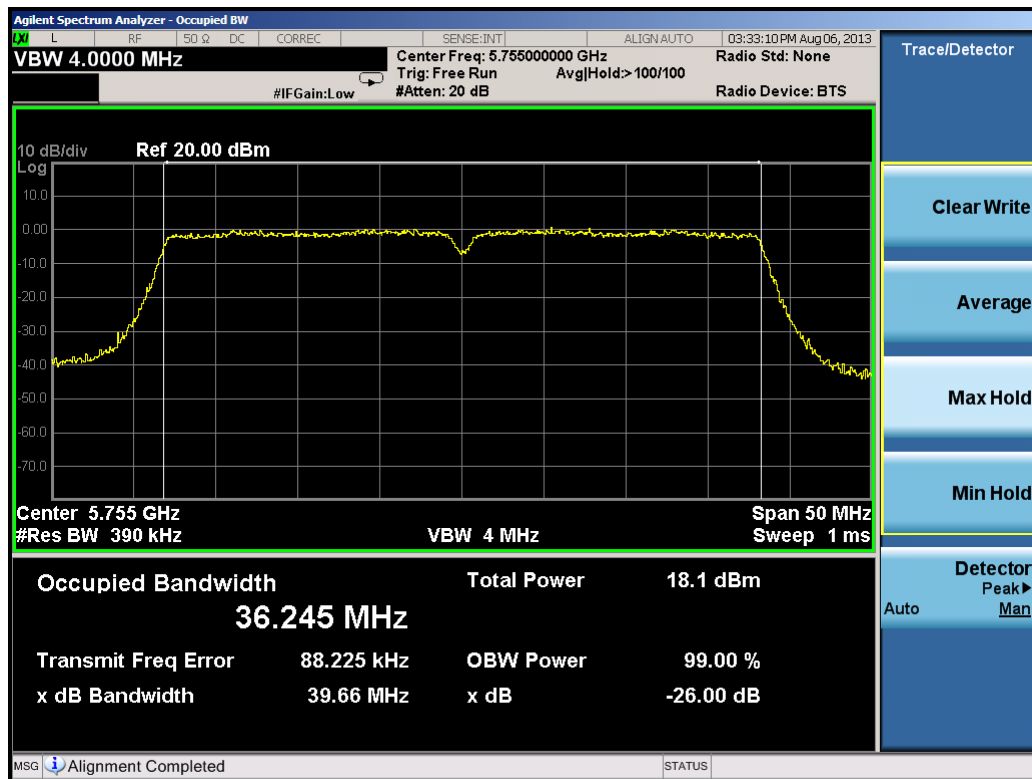


Plot 6-34. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 4) – Ch. 157)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 29 of 104                  |

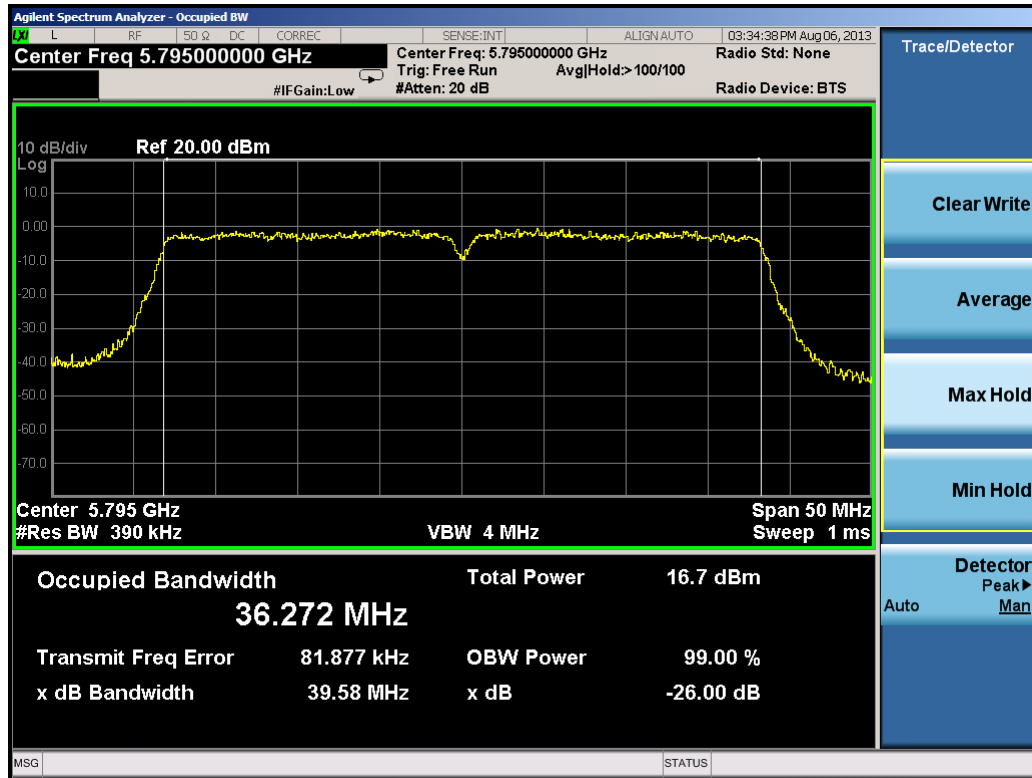


Plot 6-35. 26dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 4) – Ch. 165)

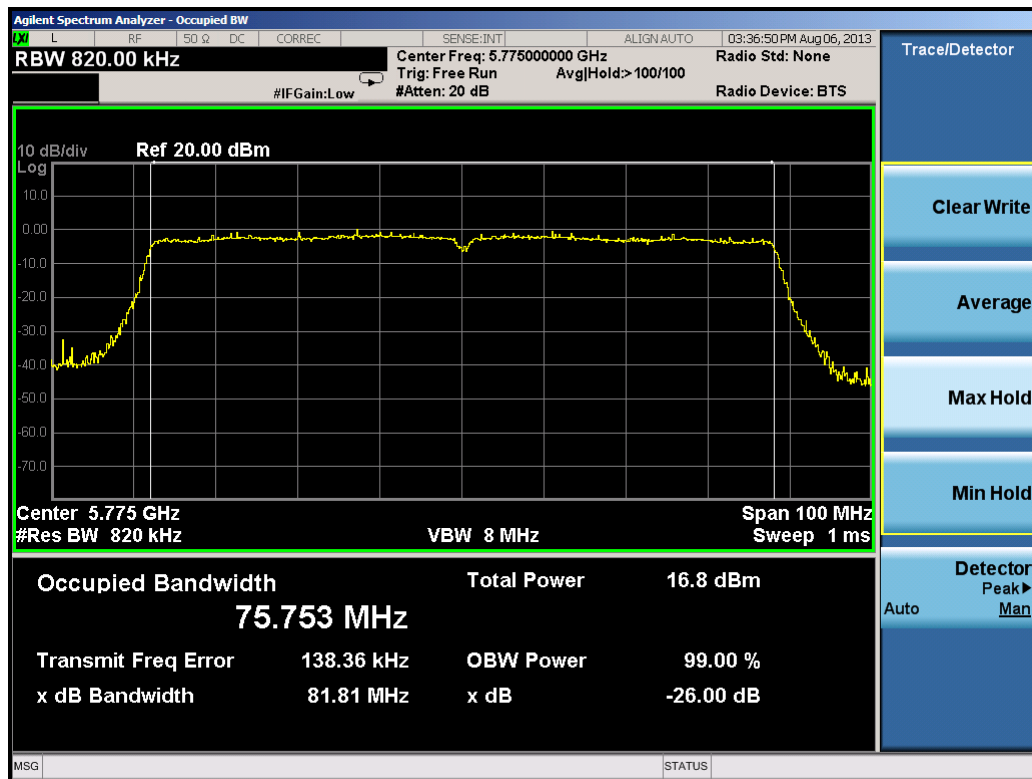


Plot 6-36. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 4) – Ch. 151)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 30 of 104                  |

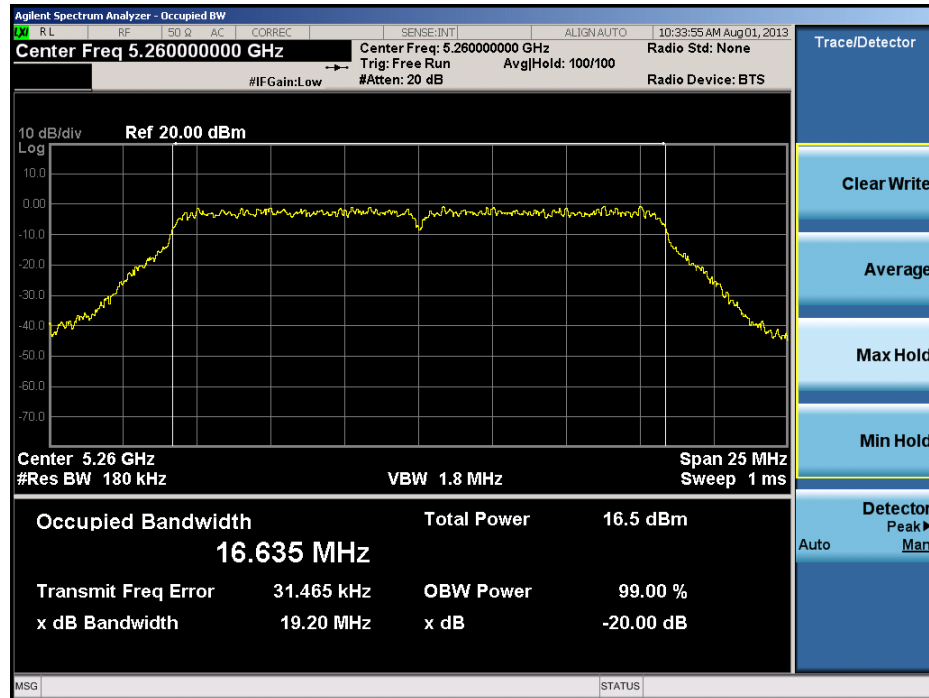


Plot 6-37. 26dB Bandwidth Plot (40MHz BW 802.11n (UNII Band 4) – Ch. 159)

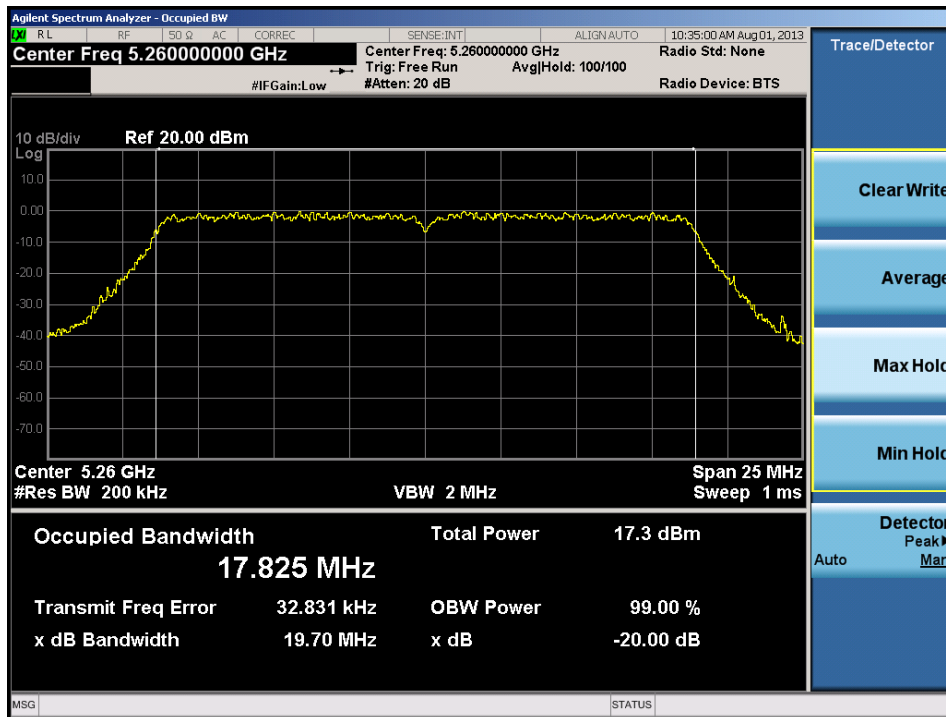


Plot 6-38. 26dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 4) – Ch. 155)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 31 of 104                  |



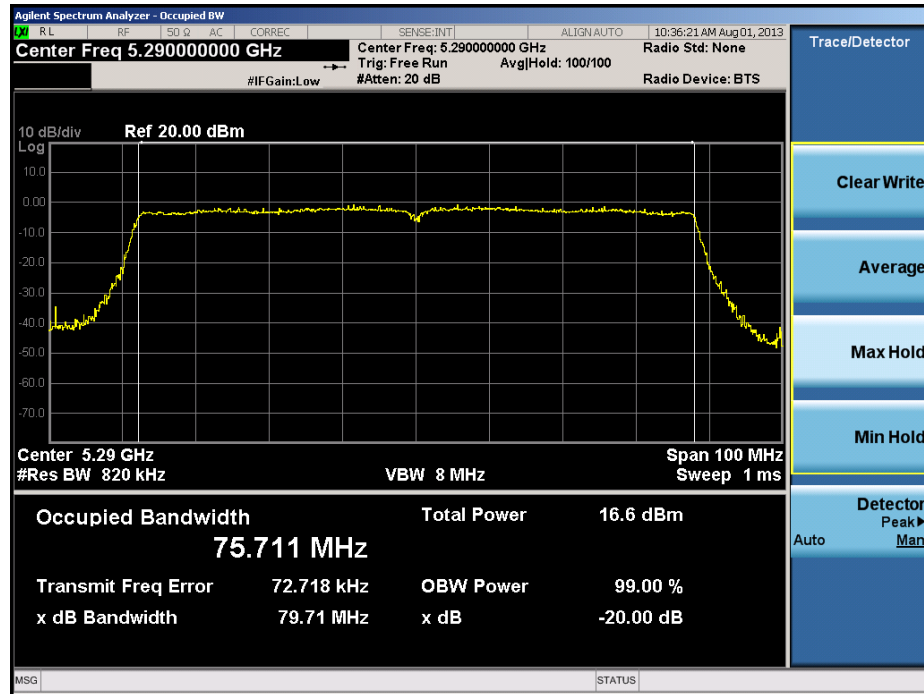
Plot 6-39. 20dB Bandwidth Plot (20MHz BW 802.11a (UNII Band 2) – Ch. 52)



Plot 6-40. 20dB Bandwidth Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 52)

**Note:** The 20dB bandwidth plot of the UNII Band 2 low channel for both 802.11a and 802.11n was found to be within 20MHz and is, therefore, operating solely within the UNII Band 2 frequencies as per KDB 644545 v01r01.

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 32 of 104                  |



Plot 6-41. 20dB Bandwidth Plot (80MHz BW 802.11ac (UNII Band 2) – Ch. 58)

**Note:** The 20dB bandwidth plot of the UNII Band 2 low channel was found to be within 80MHz and is, therefore, operating solely within the UNII Band 2 frequencies as per KDB 644545 v01r01.

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 33 of 104                  |

### 6.3 UNII Output Power Measurement – 802.11a/n/ac §15.407 (a); RSS-210 [A9.2]

#### Test Overview and Limits

A transmitter antenna terminal of the EUT is connected to the input of an RF pulse power sensor. Measurement is made using a broadband average power meter while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies.

***In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is the lesser of 50mW (16.99dBm) and  $4 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 4 \text{ dBm} + 10\log_{10}(20.21) = 17.06\text{dBm}$ .***

***In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and  $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(20.25) = 24.06\text{dBm}$ .***

***In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) and  $11 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 11 \text{ dBm} + 10\log_{10}(20.16) = 24.04\text{dBm}$ .***

***In the 5.725 – 5.825GHz band, the maximum permissible conducted output power is the lesser of 1000mW (30dBm) and  $17 \text{ dBm} + 10\log_{10}(26\text{dB BW}) = 17 \text{ dBm} + 10\log_{10}(20.17) = 30.05\text{dBm}$ .***

#### Test Procedure Used

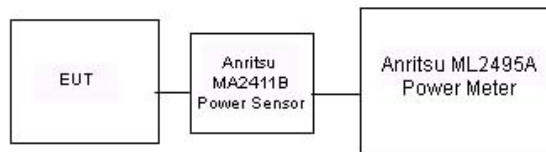
KDB 789033 v01r03 – Section E)3)b) Method PM-G  
KDB 644545 D02 v01

#### Test Settings

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 6-2. Test Instrument & Measurement Setup**

#### Test Notes

In the conducted power tables below, channels that straddle the upper UNII-3 and UNII-4 Band Edge at 5725MHz are highlighted in orange. These channels were evaluated in accordance with requirements of KDB 644545 D01 Section F(3). Accordingly, the power for the portion of the emission occurring within each UNII Band must comply with that particular power limit (i.e. UNII-3 = 250mW, UNII-4 = 1Watt). The powers shown in the tables that follow are the powers for the entire channel bandwidth. It is confirmed that the maximum conducted output power of the entire signal complies with the limits of the respective Band of operation. Therefore the portion of the signal within each band also complies with the limits for that band. Thus the highlighted channels comply with Part 15.407(a).

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          | Page 34 of 104                                                                        |                                 |

| Mode    | Freq<br>[MHz] | Channel | Detector | 802.11a Conducted Power [dBm] |       |       |       |       |       |       |       |
|---------|---------------|---------|----------|-------------------------------|-------|-------|-------|-------|-------|-------|-------|
|         |               |         |          | Data Rate [Mbps]              |       |       |       |       |       |       |       |
|         |               |         |          | 6                             | 9     | 12    | 18    | 24    | 36    | 48    | 54    |
| 802.11a | 5180          | 36      | AVG      | 10.52                         | 10.58 | 10.67 | 10.59 | 10.69 | 10.64 | 10.67 | 10.63 |
| 802.11a | 5200          | 40      | AVG      | 10.65                         | 10.87 | 10.80 | 10.89 | 10.79 | 10.81 | 10.86 | 10.41 |
| 802.11a | 5220          | 44      | AVG      | 10.50                         | 10.61 | 10.68 | 10.54 | 10.61 | 10.54 | 10.54 | 10.36 |
| 802.11a | 5240          | 48      | AVG      | 10.48                         | 10.42 | 10.46 | 10.45 | 10.45 | 10.48 | 10.49 | 10.25 |
| 802.11a | 5260          | 52      | AVG      | 10.58                         | 10.79 | 10.61 | 10.73 | 10.74 | 10.70 | 10.89 | 10.50 |
| 802.11a | 5280          | 56      | AVG      | 10.73                         | 10.76 | 10.76 | 10.70 | 10.70 | 10.65 | 10.80 | 10.55 |
| 802.11a | 5300          | 60      | AVG      | 10.64                         | 10.62 | 10.72 | 10.72 | 10.61 | 10.57 | 10.68 | 10.47 |
| 802.11a | 5320          | 64      | AVG      | 10.66                         | 10.65 | 10.62 | 10.65 | 10.60 | 10.52 | 10.60 | 10.43 |
| 802.11a | 5500          | 100     | AVG      | 10.57                         | 10.53 | 10.58 | 10.66 | 10.53 | 10.51 | 10.54 | 10.25 |
| 802.11a | 5520          | 104     | AVG      | 10.44                         | 10.40 | 10.56 | 10.46 | 10.49 | 10.32 | 10.43 | 10.29 |
| 802.11a | 5540          | 108     | AVG      | 10.44                         | 10.34 | 10.39 | 10.38 | 10.30 | 10.24 | 10.42 | 9.94  |
| 802.11a | 5560          | 112     | AVG      | 9.94                          | 9.92  | 9.97  | 9.92  | 10.02 | 9.82  | 10.05 | 9.85  |
| 802.11a | 5580          | 116     | AVG      | 10.11                         | 10.12 | 10.29 | 10.16 | 10.06 | 10.09 | 10.22 | 9.98  |
| 802.11a | 5660          | 132     | AVG      | 9.89                          | 9.87  | 9.94  | 9.84  | 9.81  | 9.91  | 9.93  | 9.71  |
| 802.11a | 5680          | 136     | AVG      | 9.74                          | 9.80  | 9.84  | 9.85  | 9.74  | 9.71  | 10.02 | 9.62  |
| 802.11a | 5700          | 140     | AVG      | 9.63                          | 9.75  | 9.71  | 9.69  | 9.66  | 9.73  | 9.89  | 9.45  |
| 802.11a | 5720          | 144     | AVG      | 9.68                          | 9.71  | 9.75  | 9.70  | 9.62  | 9.63  | 9.64  | 9.72  |
| 802.11a | 5745          | 149     | AVG      | 9.63                          | 9.84  | 9.84  | 9.76  | 9.73  | 9.60  | 9.71  | 9.48  |
| 802.11a | 5765          | 153     | AVG      | 9.66                          | 9.58  | 9.64  | 9.71  | 9.58  | 9.64  | 9.54  | 9.59  |
| 802.11a | 5785          | 157     | AVG      | 9.20                          | 9.58  | 9.50  | 9.60  | 9.18  | 9.70  | 9.85  | 9.64  |
| 802.11a | 5805          | 161     | AVG      | 9.73                          | 9.69  | 9.72  | 9.24  | 9.36  | 9.44  | 9.56  | 9.42  |
| 802.11a | 5825          | 165     | AVG      | 9.44                          | 9.45  | 9.50  | 9.57  | 9.67  | 9.49  | 9.70  | 9.34  |

Table 6-3. 802.11a (UNII) Maximum Conducted Output Power

| Mode    | Freq<br>[MHz] | Channel | Detector | 20MHz BW 802.11n (5GHz) Conducted Power [dBm] |         |           |         |         |         |         |         |
|---------|---------------|---------|----------|-----------------------------------------------|---------|-----------|---------|---------|---------|---------|---------|
|         |               |         |          | Data Rate [Mbps]                              |         |           |         |         |         |         |         |
|         |               |         |          | 6.5/7.2                                       | 13/14.4 | 19.5/21.7 | 26/28.9 | 39/43.4 | 52/57.8 | 58.5/65 | 65/72.2 |
| 802.11n | 5180          | 36      | AVG      | 10.57                                         | 10.60   | 10.54     | 10.51   | 10.47   | 10.47   | 10.42   | 10.46   |
| 802.11n | 5200          | 40      | AVG      | 10.54                                         | 10.46   | 10.40     | 10.47   | 10.43   | 10.30   | 10.39   | 10.34   |
| 802.11n | 5220          | 44      | AVG      | 10.41                                         | 10.43   | 10.48     | 10.35   | 10.27   | 10.27   | 10.35   | 10.29   |
| 802.11n | 5240          | 48      | AVG      | 10.26                                         | 10.30   | 10.41     | 10.26   | 10.33   | 10.22   | 10.30   | 10.27   |
| 802.11n | 5260          | 52      | AVG      | 10.77                                         | 10.62   | 10.68     | 10.64   | 10.60   | 10.62   | 10.60   | 10.62   |
| 802.11n | 5280          | 56      | AVG      | 10.57                                         | 10.62   | 10.53     | 10.69   | 10.65   | 10.41   | 10.58   | 10.49   |
| 802.11n | 5300          | 60      | AVG      | 10.52                                         | 10.52   | 10.53     | 10.53   | 10.52   | 10.51   | 10.49   | 10.43   |
| 802.11n | 5320          | 64      | AVG      | 10.49                                         | 10.58   | 10.48     | 10.40   | 10.50   | 10.38   | 10.45   | 10.45   |
| 802.11n | 5500          | 100     | AVG      | 10.36                                         | 10.29   | 10.33     | 10.43   | 10.42   | 10.28   | 10.43   | 10.38   |
| 802.11n | 5520          | 104     | AVG      | 10.47                                         | 10.31   | 10.40     | 10.36   | 10.29   | 10.28   | 10.28   | 10.33   |
| 802.11n | 5540          | 108     | AVG      | 10.31                                         | 10.35   | 10.37     | 10.27   | 10.36   | 10.33   | 10.32   | 10.31   |
| 802.11n | 5560          | 112     | AVG      | 10.25                                         | 10.29   | 10.24     | 10.30   | 10.26   | 10.23   | 10.20   | 10.16   |
| 802.11n | 5580          | 116     | AVG      | 10.19                                         | 10.26   | 10.14     | 10.15   | 10.19   | 10.19   | 10.20   | 10.11   |
| 802.11n | 5660          | 132     | AVG      | 9.90                                          | 9.89    | 9.91      | 9.95    | 9.80    | 9.89    | 9.77    | 9.80    |
| 802.11n | 5680          | 136     | AVG      | 9.82                                          | 9.81    | 9.75      | 9.82    | 9.74    | 9.83    | 9.73    | 9.72    |
| 802.11n | 5700          | 140     | AVG      | 9.72                                          | 9.79    | 9.82      | 9.73    | 9.72    | 9.78    | 9.72    | 9.72    |
| 802.11n | 5720          | 144     | AVG      | 9.76                                          | 9.72    | 9.78      | 9.71    | 9.64    | 9.69    | 9.66    | 9.67    |
| 802.11n | 5745          | 149     | AVG      | 9.76                                          | 9.67    | 9.65      | 9.83    | 9.83    | 9.70    | 9.73    | 9.71    |
| 802.11n | 5765          | 153     | AVG      | 9.78                                          | 9.71    | 9.66      | 9.51    | 9.64    | 9.61    | 9.56    | 9.50    |
| 802.11n | 5785          | 157     | AVG      | 9.63                                          | 9.69    | 9.83      | 9.74    | 9.52    | 9.55    | 9.61    | 9.53    |
| 802.11n | 5805          | 161     | AVG      | 9.64                                          | 9.53    | 9.48      | 9.58    | 9.53    | 9.54    | 9.48    | 9.54    |
| 802.11n | 5825          | 165     | AVG      | 9.47                                          | 9.51    | 9.49      | 9.48    | 9.40    | 9.34    | 9.34    | 9.42    |

Table 6-4. 20MHz BW 802.11n (UNII) Maximum Conducted Output Power

|                                      |                                                                                     |                                                                        |  |  |  |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|--|--|--|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  |  |  |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |  |  |  | Page 35 of 104                                                                        |                                 |

| Mode    | Freq<br>[MHz] | Channel | Detector | 40MHz BW 802.11n (5GHz) Conducted Power [dBm] |       |         |       |       |         |           |         |
|---------|---------------|---------|----------|-----------------------------------------------|-------|---------|-------|-------|---------|-----------|---------|
|         |               |         |          | Data Rate [Mbps]                              |       |         |       |       |         |           |         |
|         |               |         |          | 13.5/15                                       | 27/30 | 40.5/45 | 54/60 | 81/90 | 108/120 | 121.5/135 | 135/150 |
| 802.11n | 5190          | 38      | AVG      | 10.68                                         | 10.39 | 10.38   | 10.61 | 10.42 | 10.66   | 10.36     | 10.38   |
| 802.11n | 5230          | 46      | AVG      | 10.65                                         | 10.19 | 10.54   | 10.41 | 9.95  | 10.41   | 10.57     | 10.54   |
| 802.11n | 5270          | 54      | AVG      | 10.94                                         | 10.56 | 10.71   | 10.98 | 10.75 | 10.62   | 10.98     | 10.97   |
| 802.11n | 5310          | 62      | AVG      | 10.59                                         | 10.40 | 10.80   | 10.89 | 10.37 | 10.82   | 10.51     | 10.35   |
| 802.11n | 5510          | 102     | AVG      | 10.62                                         | 10.43 | 10.57   | 10.48 | 10.49 | 10.40   | 10.43     | 10.36   |
| 802.11n | 5550          | 110     | AVG      | 10.78                                         | 10.47 | 10.45   | 10.42 | 10.33 | 10.57   | 10.27     | 10.26   |
| 802.11n | 5670          | 134     | AVG      | 10.11                                         | 10.07 | 9.89    | 10.14 | 9.82  | 9.86    | 10.13     | 9.76    |
| 802.11n | 5710          | 142     | AVG      | 10.01                                         | 10.06 | 10.00   | 9.97  | 9.97  | 9.96    | 10.03     | 10.00   |
| 802.11n | 5755          | 151     | AVG      | 9.31                                          | 9.08  | 9.25    | 9.41  | 9.39  | 9.30    | 9.39      | 9.25    |
| 802.11n | 5795          | 159     | AVG      | 9.89                                          | 9.31  | 9.19    | 9.23  | 9.29  | 9.83    | 9.60      | 9.79    |

Table 6-5. 40MHz BW 802.11n (UNII) Maximum Conducted Output Power

| Mode     | Freq<br>[MHz] | Channel | Data Rate |
|----------|---------------|---------|-----------|
|          |               |         | 6.5Mbps   |
|          |               |         | MCS0      |
| 802.11ac | 5180          | 36*     | 9.31      |
| 802.11ac | 5200          | 40      | 9.38      |
| 802.11ac | 5240          | 48*     | 9.42      |
| 802.11ac | 5260          | 52*     | 9.77      |
| 802.11ac | 5280          | 56      | 9.54      |
| 802.11ac | 5320          | 64*     | 9.54      |
| 802.11ac | 5500          | 100     | 9.51      |
| 802.11ac | 5580          | 116*    | 9.20      |
| 802.11ac | 5700          | 140     | 8.58      |
| 802.11ac | 5720          | 144     | 9.19      |
| 802.11ac | 5745          | 149*    | 8.61      |
| 802.11ac | 5785          | 157*    | 8.46      |
| 802.11ac | 5825          | 165     | 8.22      |

Table 6-6. 20MHz BW 802.11ac (UNII) Maximum Conducted Output Power

| Mode     | Freq<br>[MHz] | Channel | Data Rate |
|----------|---------------|---------|-----------|
|          |               |         | 13.5Mbps  |
|          |               |         | MCS0      |
| 802.11ac | 5190          | 38      | 9.66      |
| 802.11ac | 5230          | 46      | 9.19      |
| 802.11ac | 5270          | 54      | 9.56      |
| 802.11ac | 5310          | 62      | 9.37      |
| 802.11ac | 5510          | 102     | 9.49      |
| 802.11ac | 5550          | 110     | 9.24      |
| 802.11ac | 5670          | 134     | 8.86      |
| 802.11ac | 5710          | 142     | 8.84      |
| 802.11ac | 5755          | 151     | 8.12      |
| 802.11ac | 5795          | 159     | 8.24      |

Table 6-7. 40MHz BW 802.11ac (UNII) Maximum Conducted Output Power

| Mode     | Freq<br>[MHz] | Channel | Detector | 80MHz BW 802.11ac (5GHz) Conducted Power [dBm] |         |           |         |           |         |             |           |         |           |
|----------|---------------|---------|----------|------------------------------------------------|---------|-----------|---------|-----------|---------|-------------|-----------|---------|-----------|
|          |               |         |          | Data Rate [Mbps]                               |         |           |         |           |         |             |           |         |           |
|          |               |         |          | 29.3/32.5                                      | 58.5/65 | 87.8/97.5 | 117/130 | 175.5/195 | 234/260 | 263.3/292.5 | 292.5/325 | 351/390 | 390/433.3 |
| 802.11ac | 5210          | 42      | AVG      | 9.75                                           | 9.73    | 9.63      | 9.68    | 9.74      | 9.69    | 9.84        | 9.69      | 9.69    | 9.59      |
| 802.11ac | 5290          | 58      | AVG      | 9.70                                           | 9.54    | 9.60      | 9.50    | 9.63      | 9.52    | 9.60        | 9.58      | 9.50    | 9.58      |
| 802.11ac | 5530          | 106     | AVG      | 9.83                                           | 9.80    | 9.73      | 9.72    | 9.70      | 9.82    | 9.95        | 9.78      | 9.72    | 9.70      |
| 802.11ac | 5690          | 138     | AVG      | 9.15                                           | 9.13    | 9.05      | 9.07    | 9.14      | 9.10    | 9.02        | 9.06      | 9.11    | 9.05      |
| 802.11ac | 5775          | 155     | AVG      | 9.04                                           | 8.94    | 8.95      | 8.98    | 9.01      | 8.99    | 9.02        | 9.05      | 8.96    | 8.84      |

Table 6-8. 80MHz BW 802.11ac (UNII) Maximum Conducted Output Power

|                                      |                                                                                     |                                                                        |  |  |  |  |  |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|--|--|--|--|--|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  |  |  |  |  |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |  |  |  |  |  | Page 36 of 104                                                                        |                                 |

## 6.4 Peak Power Spectral Density – 802.11a/n/ac

§15.407 (a)(1),(5) / RSS-210 [A9.2]

### Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies. Method SA-2, as defined in KDB 789033, was used to measure the power spectral density.

### Test Procedure Used

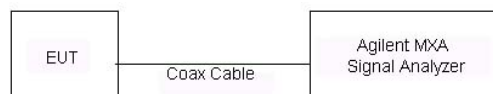
KDB 789033 v01r03 – Section F  
KDB 644545 D02 v01

### Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Number of sweep points  $\geq 2 \times (\text{span}/\text{RBW})$
6. Sweep time = auto
7. Detector = power averaging (RMS)
8. Trigger was set to free run.
9. Reference level offset =  $10 \times \log(1/\text{duty cycle})$  was applied.
  - a. 802.11a/n (20MHz BW):  $10 \times \log(1/95.5\%) = 0.20 \text{ dB}$
  - b. 802.11n (40MHz BW):  $10 \times \log(1/90.1\%) = 0.41 \text{ dB}$
  - c. 802.11ac (80MHz BW):  $10 \times \log(1/83.4\%) = 0.79 \text{ dB}$
10. Trace was averaged over 100 sweeps
11. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



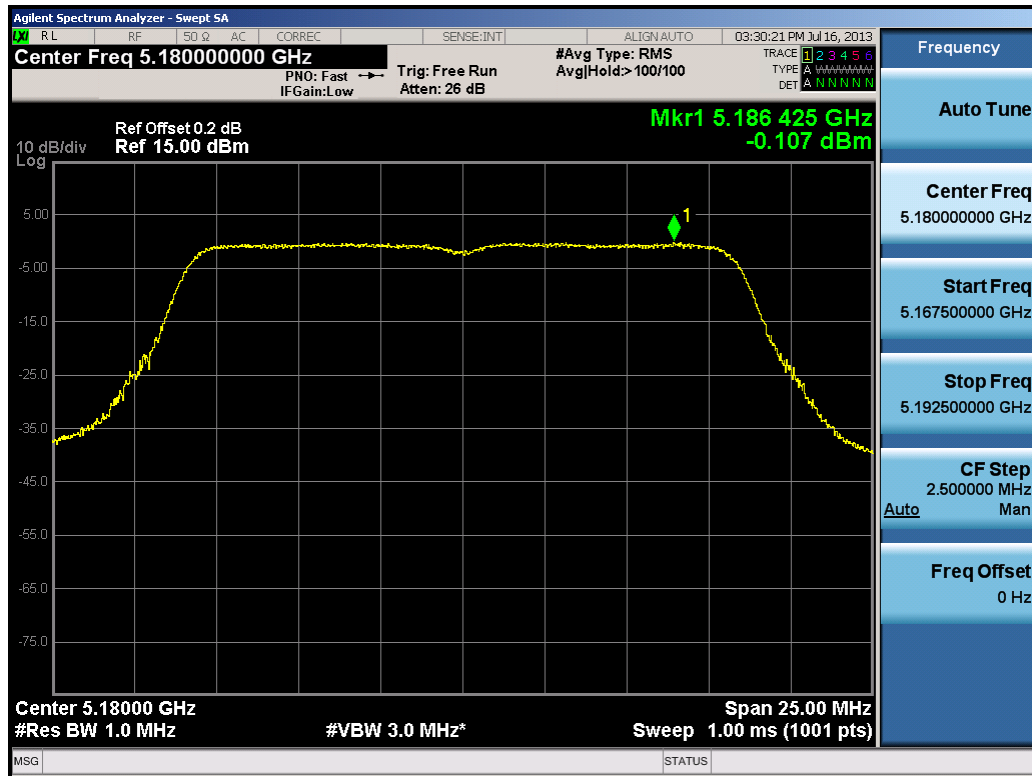
**Figure 6-3. Test Instrument & Measurement Setup**

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 37 of 104                  |

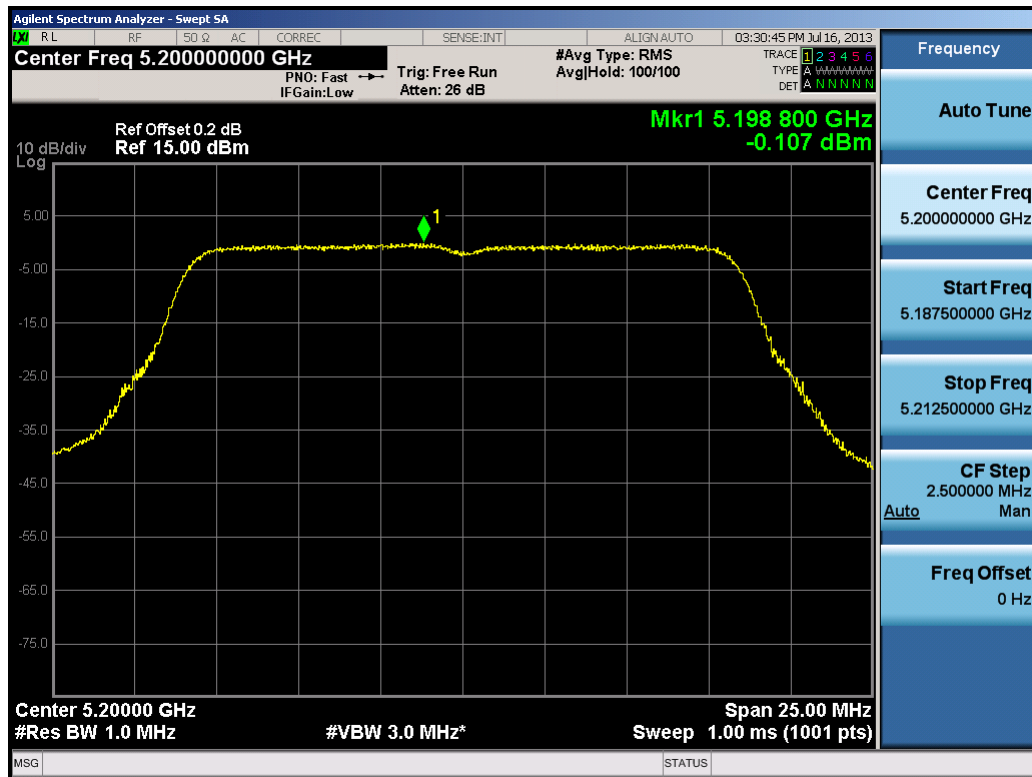
|          | Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured Power Density [dBm] | Max Permissible Power Density | Margin [dB] |
|----------|-----------------|-------------|-------------|------------------|------------------------------|-------------------------------|-------------|
| Band I   | 5180            | 36          | a           | 6                | -0.107                       | 4.0                           | -4.11       |
|          | 5200            | 40          | a           | 6                | -0.107                       | 4.0                           | -4.11       |
|          | 5240            | 48          | a           | 6                | 0.147                        | 4.0                           | -3.85       |
|          | 5180            | 36          | n (20MHz)   | 6.5/7.2 (MCS0)   | -0.524                       | 4.0                           | -4.52       |
|          | 5200            | 40          | n (20MHz)   | 6.5/7.2 (MCS0)   | -0.568                       | 4.0                           | -4.57       |
|          | 5240            | 48          | n (20MHz)   | 6.5/7.2 (MCS0)   | -0.347                       | 4.0                           | -4.35       |
|          | 5190            | 38          | n (40MHz)   | 13.5/15 (MCS0)   | -3.174                       | 4.0                           | -7.17       |
|          | 5230            | 46          | n (40MHz)   | 13.5/15 (MCS0)   | -3.506                       | 4.0                           | -7.51       |
|          | 5210            | 42          | ac (80MHz)  | 29.3/32.5 (MCS0) | -6.988                       | 4.0                           | -10.99      |
|          | 5260            | 52          | a           | 6                | 0.151                        | 11.0                          | -10.85      |
| Band II  | 5280            | 56          | a           | 6                | 0.079                        | 11.0                          | -10.92      |
|          | 5320            | 64          | a           | 6                | 0.038                        | 11.0                          | -10.96      |
|          | 5260            | 52          | n (20MHz)   | 6.5/7.2 (MCS0)   | -0.375                       | 11.0                          | -11.38      |
|          | 5280            | 56          | n (20MHz)   | 6.5/7.2 (MCS0)   | 0.000                        | 11.0                          | -11.00      |
|          | 5320            | 64          | n (20MHz)   | 6.5/7.2 (MCS0)   | -0.142                       | 11.0                          | -11.14      |
|          | 5270            | 54          | n (40MHz)   | 13.5/15 (MCS0)   | -2.831                       | 11.0                          | -13.83      |
|          | 5310            | 62          | n (40MHz)   | 13.5/15 (MCS0)   | -3.279                       | 11.0                          | -14.28      |
|          | 5290            | 58          | ac (80MHz)  | 29.3/32.5 (MCS0) | -7.102                       | 11.0                          | -18.10      |
|          | 5500            | 100         | a           | 6                | -0.320                       | 11.0                          | -11.32      |
|          | 5580            | 116         | a           | 6                | -0.426                       | 11.0                          | -11.43      |
| Band III | 5720            | 144         | a           | 6                | -0.850                       | 11.0                          | -11.85      |
|          | 5500            | 100         | n (20MHz)   | 6.5/7.2 (MCS0)   | -0.688                       | 11.0                          | -11.69      |
|          | 5580            | 116         | n (20MHz)   | 6.5/7.2 (MCS0)   | -0.702                       | 11.0                          | -11.70      |
|          | 5720            | 144         | n (20MHz)   | 6.5/7.2 (MCS0)   | -0.970                       | 11.0                          | -11.97      |
|          | 5510            | 102         | n (40MHz)   | 13.5/15 (MCS0)   | -3.374                       | 11.0                          | -14.37      |
|          | 5550            | 110         | n (40MHz)   | 13.5/15 (MCS0)   | -3.505                       | 11.0                          | -14.51      |
|          | 5710            | 142         | n (40MHz)   | 13.5/15 (MCS0)   | -3.570                       | 11.0                          | -14.57      |
|          | 5530            | 106         | ac (80MHz)  | 29.3/32.5 (MCS0) | -7.106                       | 11.0                          | -18.11      |
|          | 5690            | 138         | ac (80MHz)  | 29.3/32.5 (MCS0) | -8.340                       | 11.0                          | -19.34      |
|          | 5745            | 149         | a           | 6                | -0.630                       | 11.0                          | -11.63      |
| Band IV  | 5785            | 157         | a           | 6                | -2.000                       | 11.0                          | -13.00      |
|          | 5825            | 165         | a           | 6                | -2.380                       | 11.0                          | -13.38      |
|          | 5745            | 149         | n (20MHz)   | 6.5/7.2 (MCS0)   | -1.560                       | 11.0                          | -12.56      |
|          | 5785            | 157         | n (20MHz)   | 6.5/7.2 (MCS0)   | -2.080                       | 11.0                          | -13.08      |
|          | 5825            | 165         | n (20MHz)   | 6.5/7.2 (MCS0)   | -2.700                       | 11.0                          | -13.70      |
|          | 5755            | 151         | n (40MHz)   | 13.5/15 (MCS0)   | -4.670                       | 11.0                          | -15.67      |
|          | 5795            | 159         | n (40MHz)   | 13.5/15 (MCS0)   | -4.680                       | 11.0                          | -15.68      |
|          | 5775            | 155         | ac (80MHz)  | 29.3/32.5 (MCS0) | -9.110                       | 11.0                          | -20.11      |

**Table 6-9. Conducted Power Spectral Density Measurements**

|                                      |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 38 of 104                  |

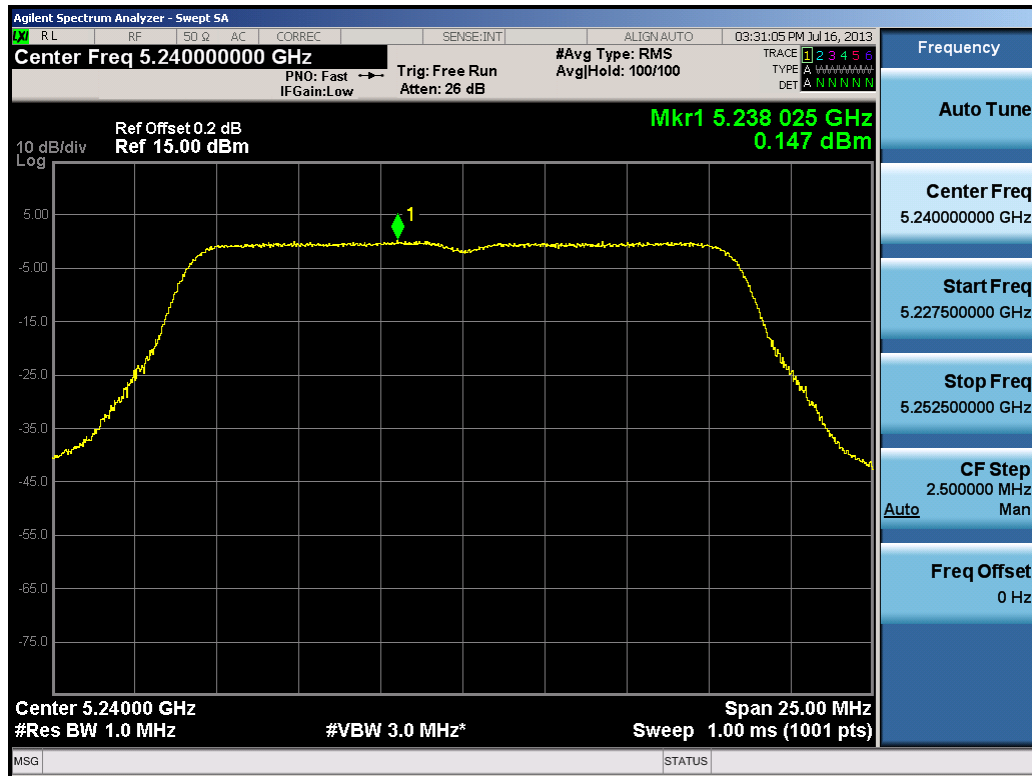


Plot 6-42. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 36)

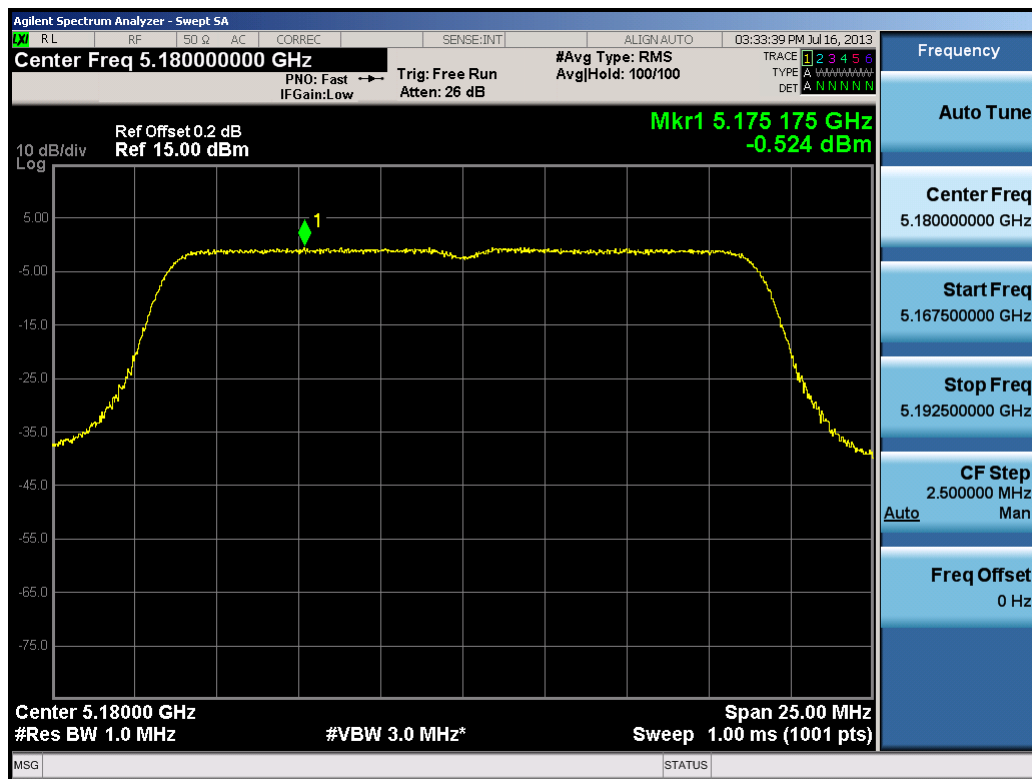


Plot 6-43. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 40)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 39 of 104                  |

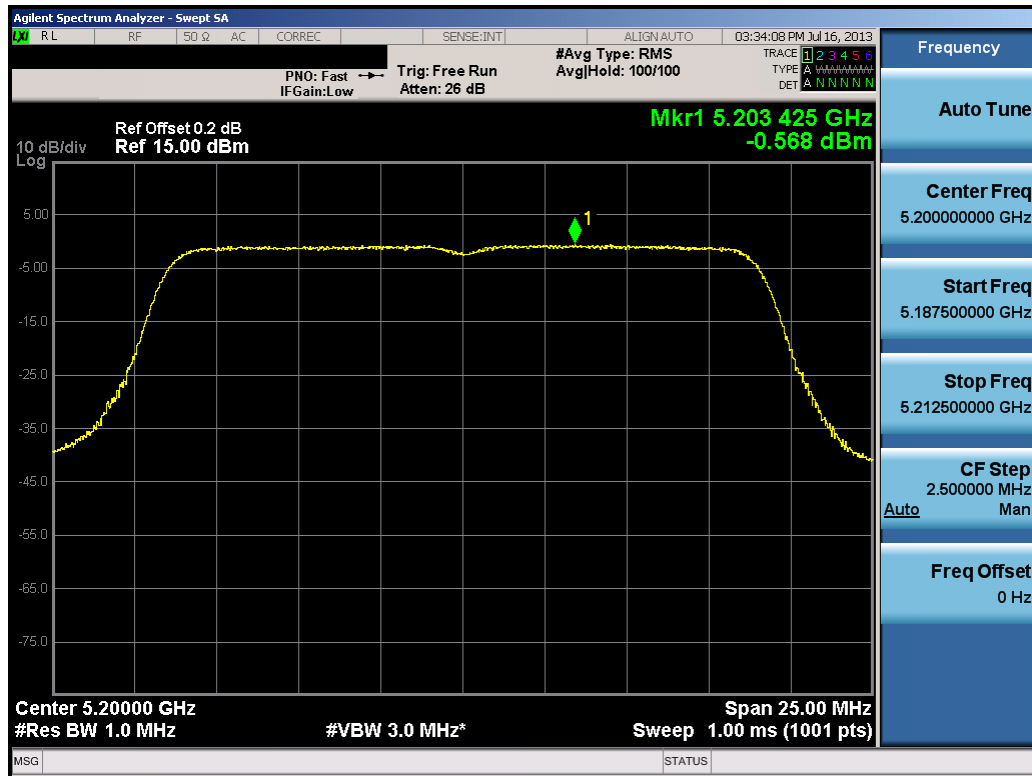


Plot 6-44. Peak Power Spectral Density Plot (802.11a (UNII Band 1) – Ch. 48)

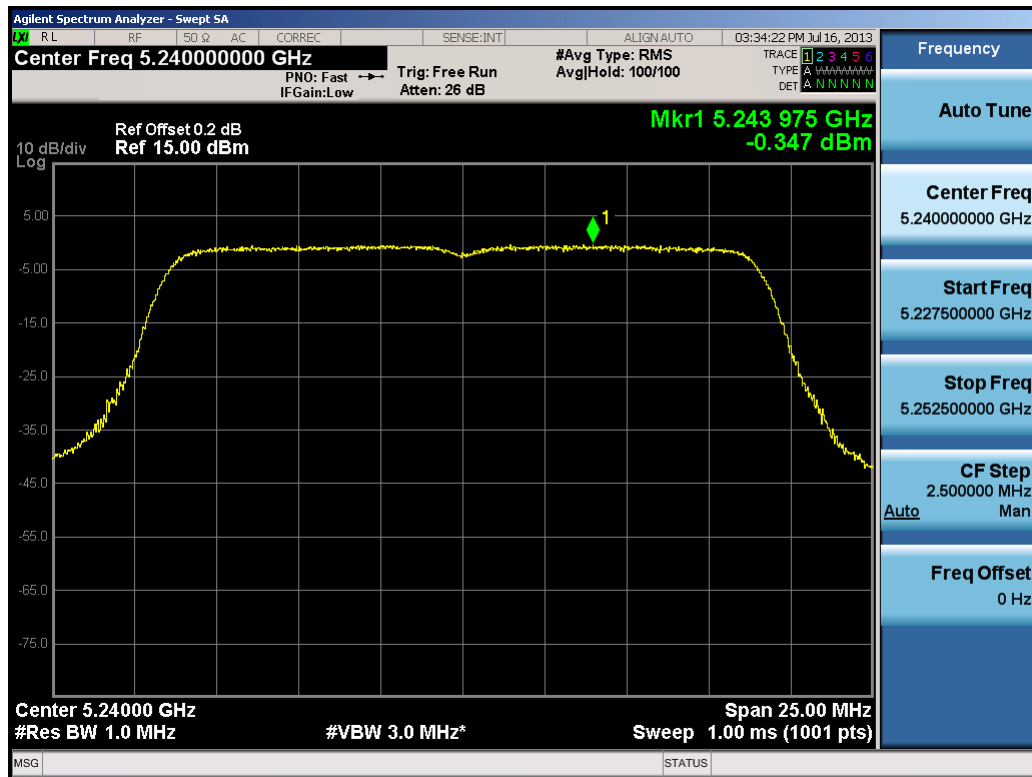


Plot 6-45. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 36)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 40 of 104                  |

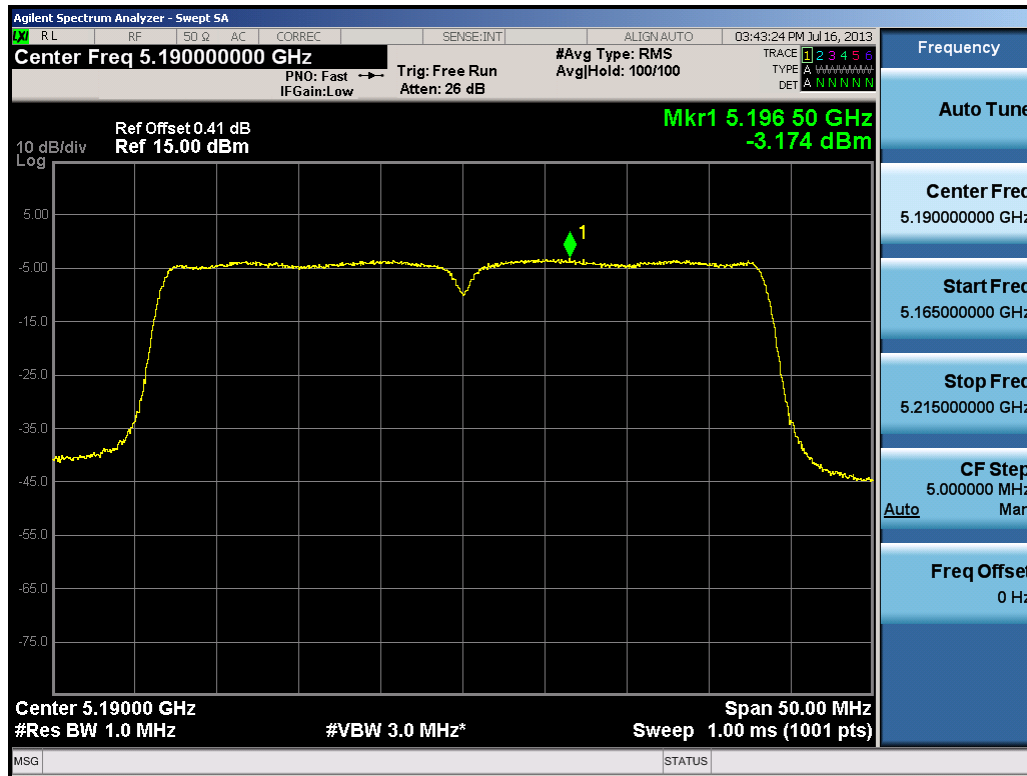


Plot 6-46. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 40)

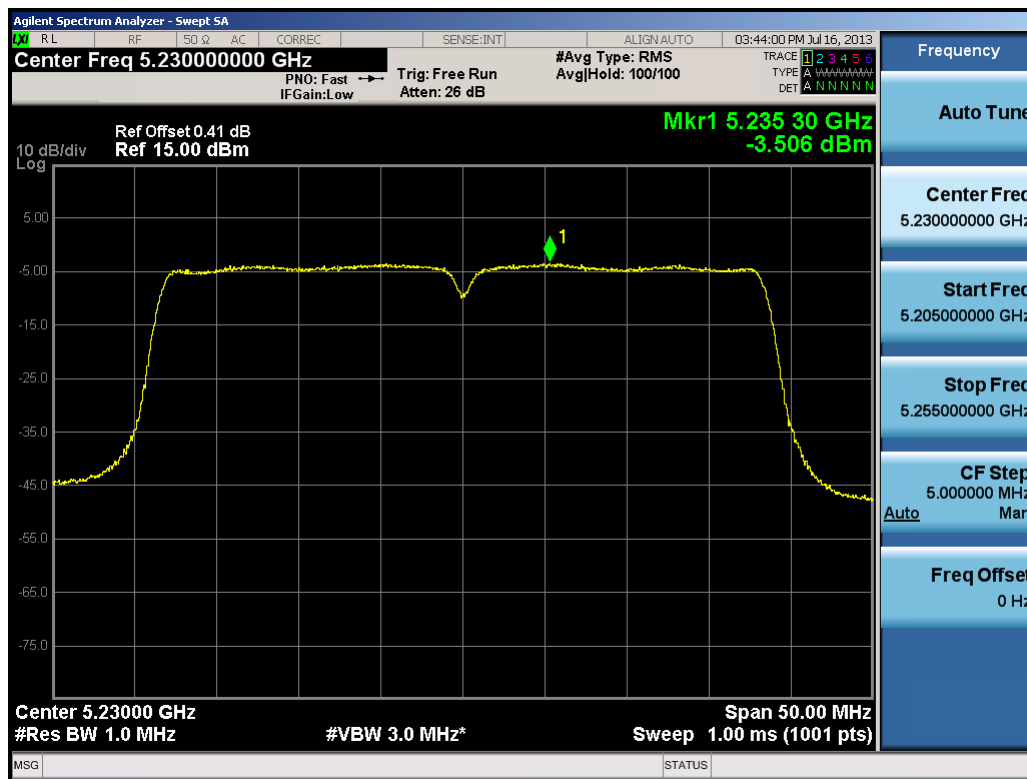


Plot 6-47. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 1) – Ch. 48)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 41 of 104                  |

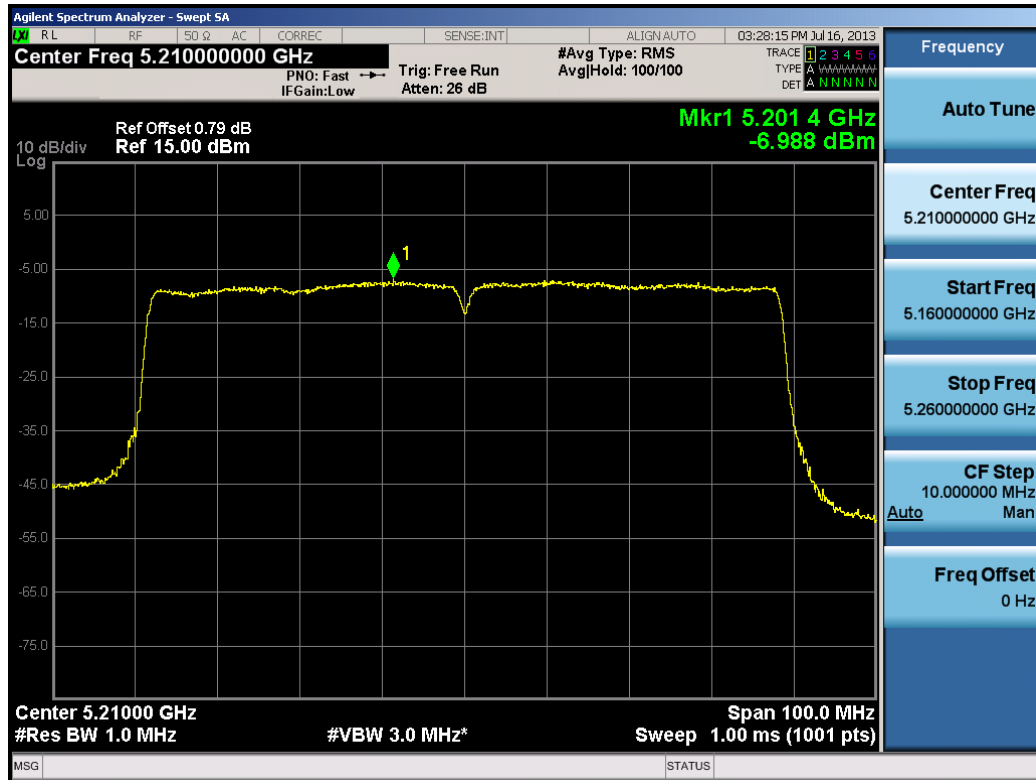


Plot 6-48. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 38)

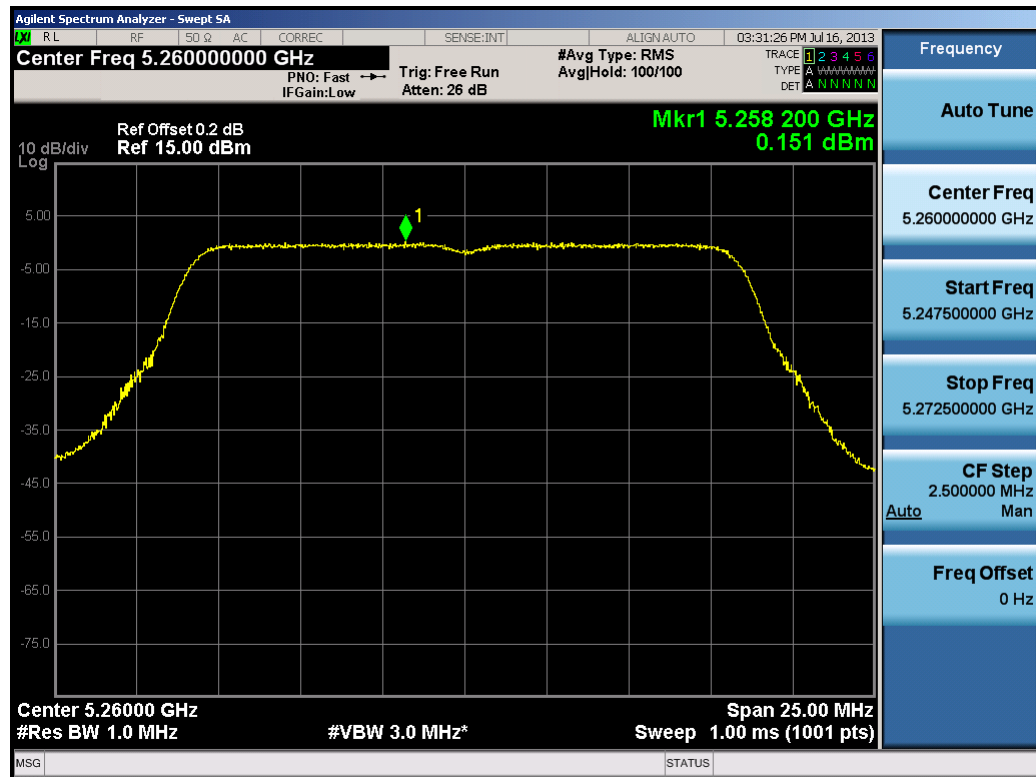


Plot 6-49. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 1) – Ch. 46)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 42 of 104                  |

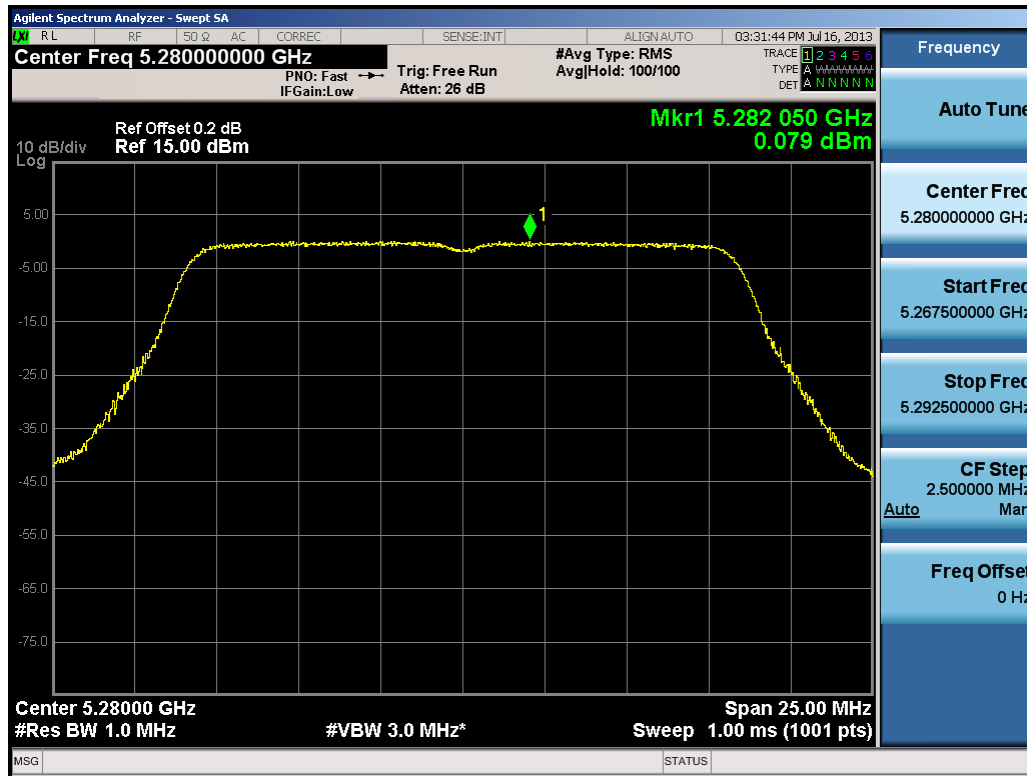


Plot 6-50. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 1) – Ch. 42)

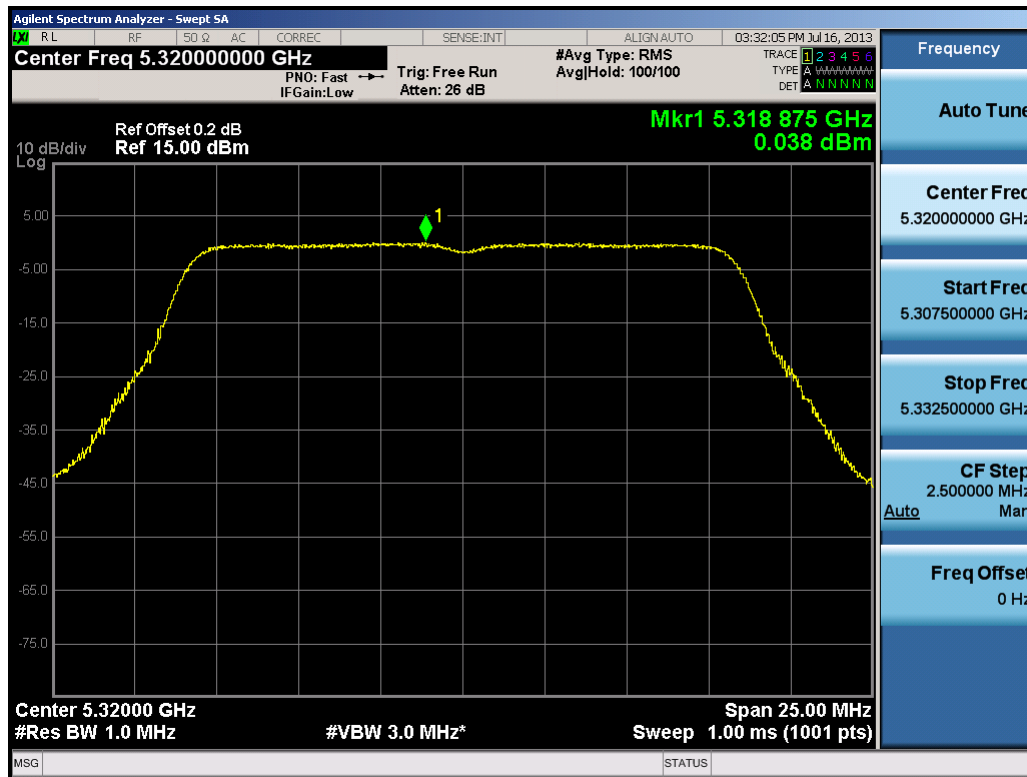


Plot 6-51. Peak Power Spectral Density Plot (802.11a (UNII Band 2) – Ch. 52)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 43 of 104                  |

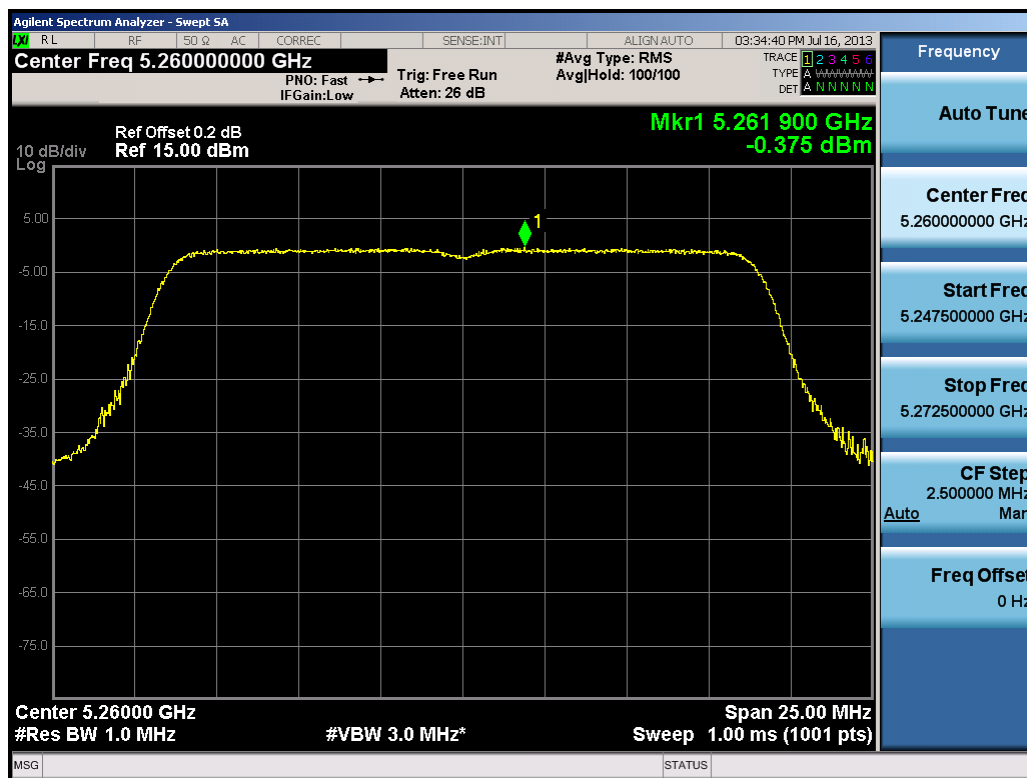


Plot 6-52. Peak Power Spectral Density Plot (802.11a (UNII Band 2) – Ch. 56)

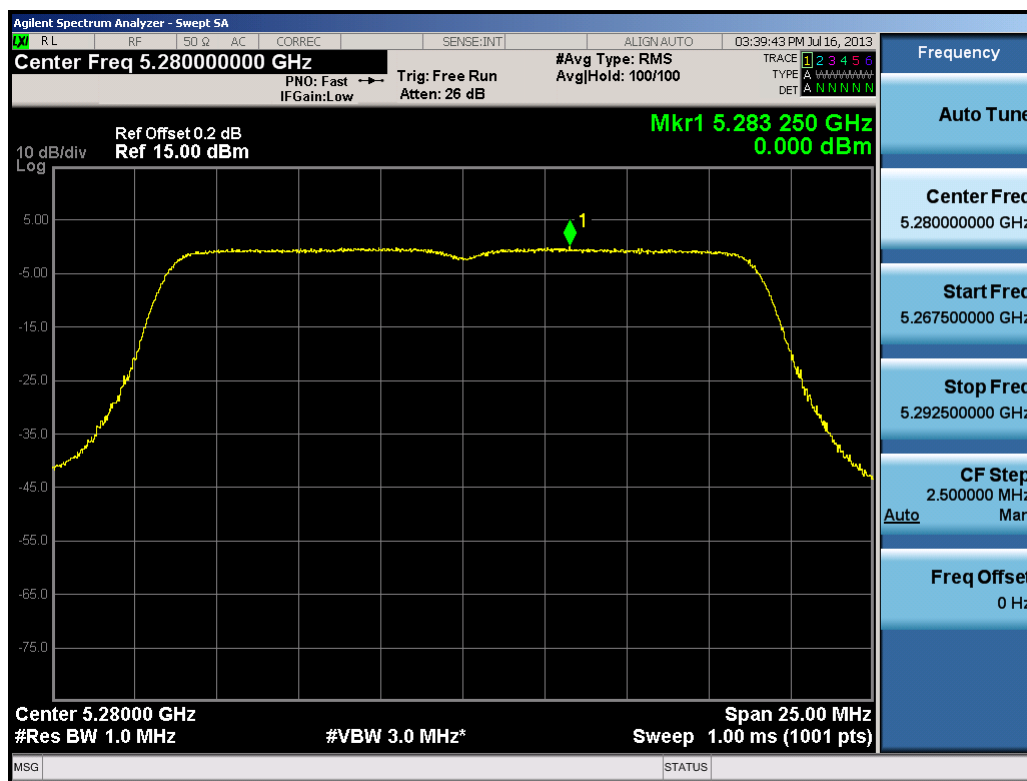


Plot 6-53. Peak Power Spectral Density Plot (802.11a (UNII Band 2) – Ch. 64)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 44 of 104                  |

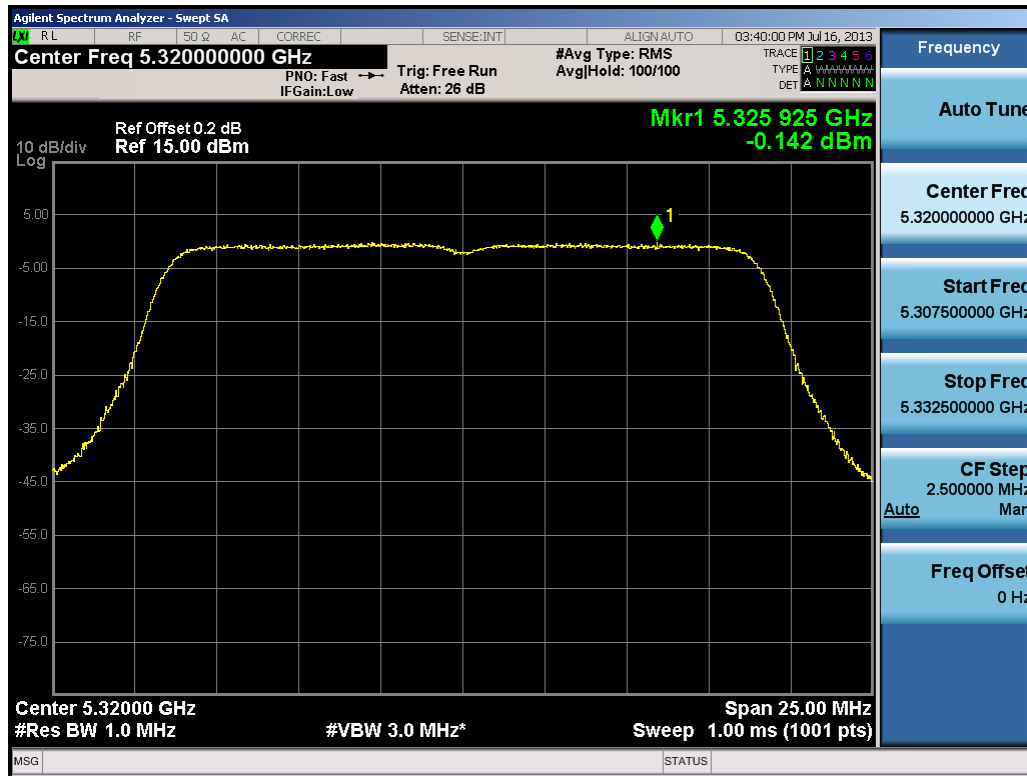


Plot 6-54. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 52)

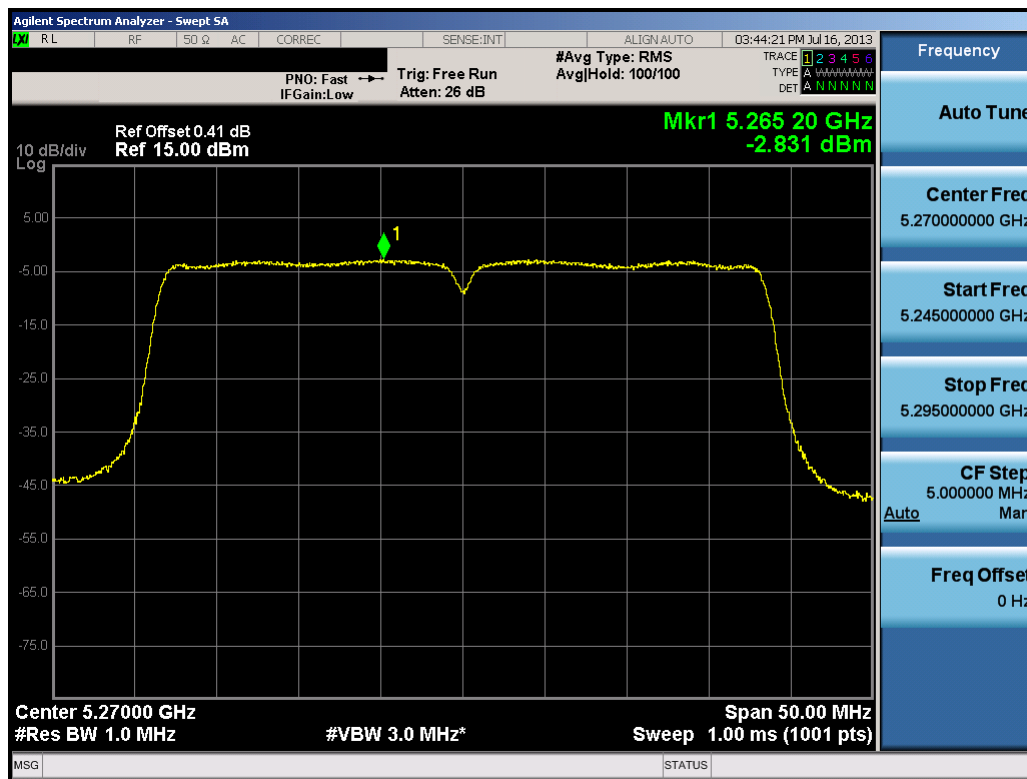


Plot 6-55. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 56)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 45 of 104                  |

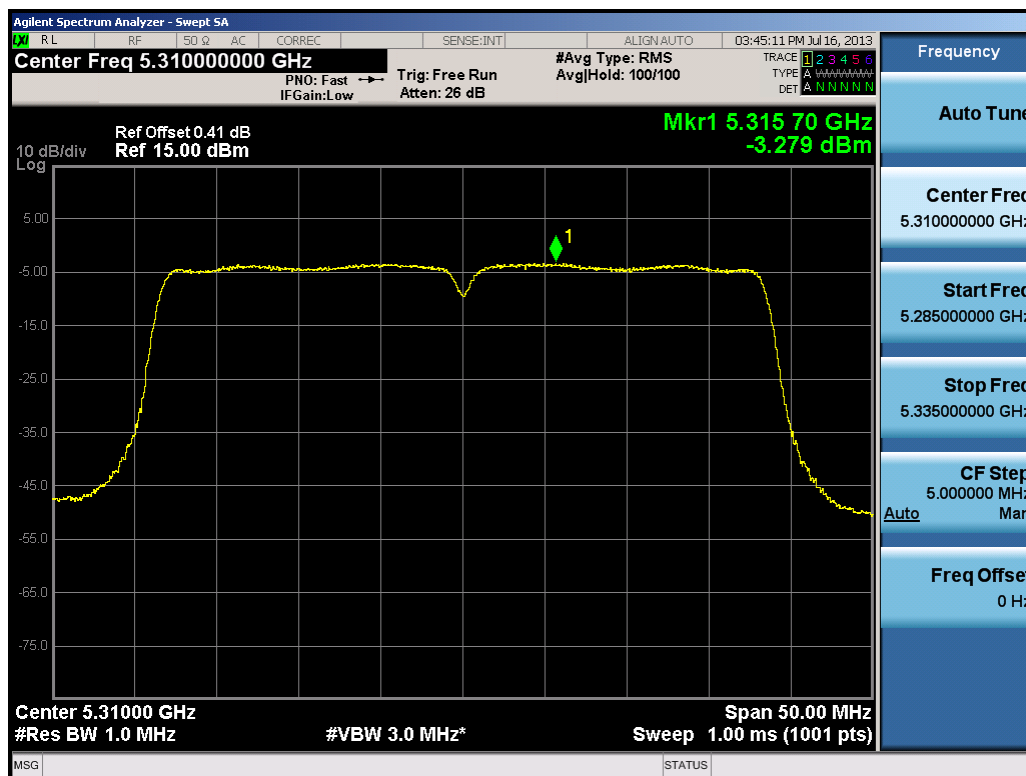


Plot 6-56. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 2) – Ch. 64)

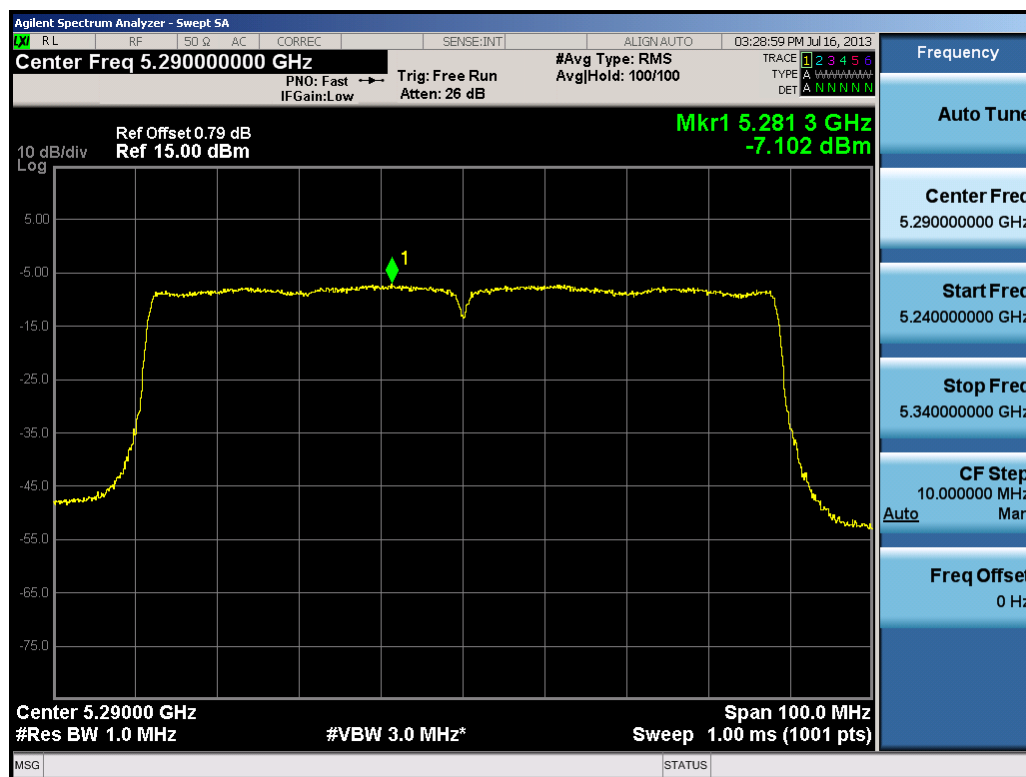


Plot 6-57. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2) – Ch. 54)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 46 of 104                  |

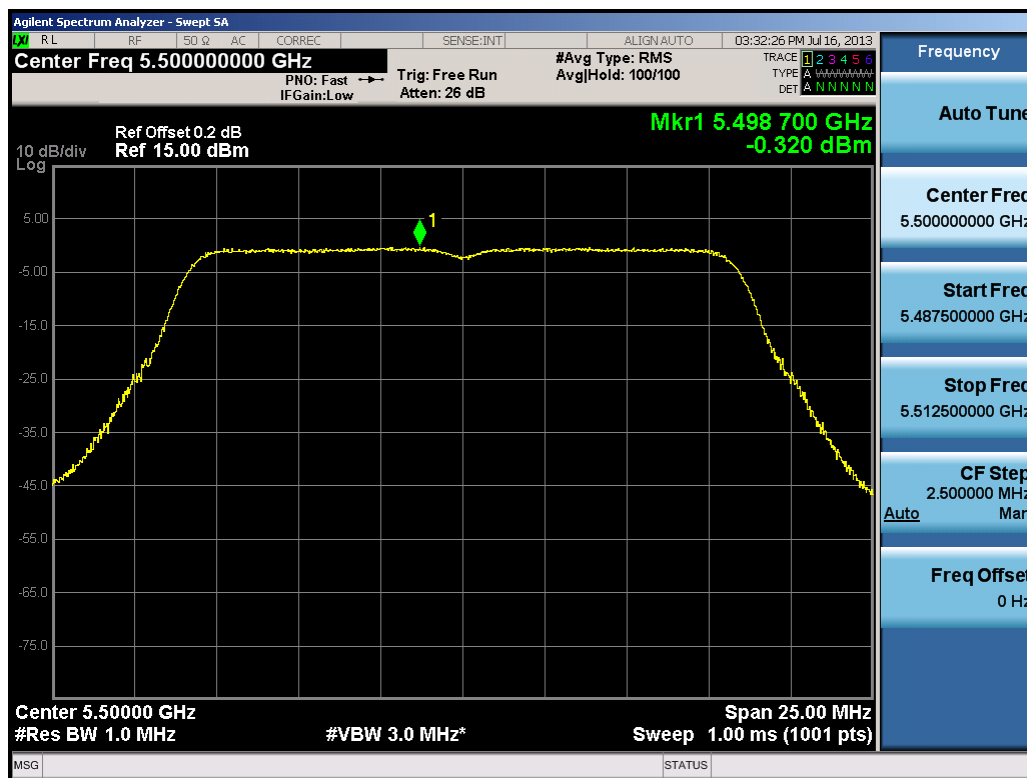


Plot 6-58. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 2) – Ch. 62)

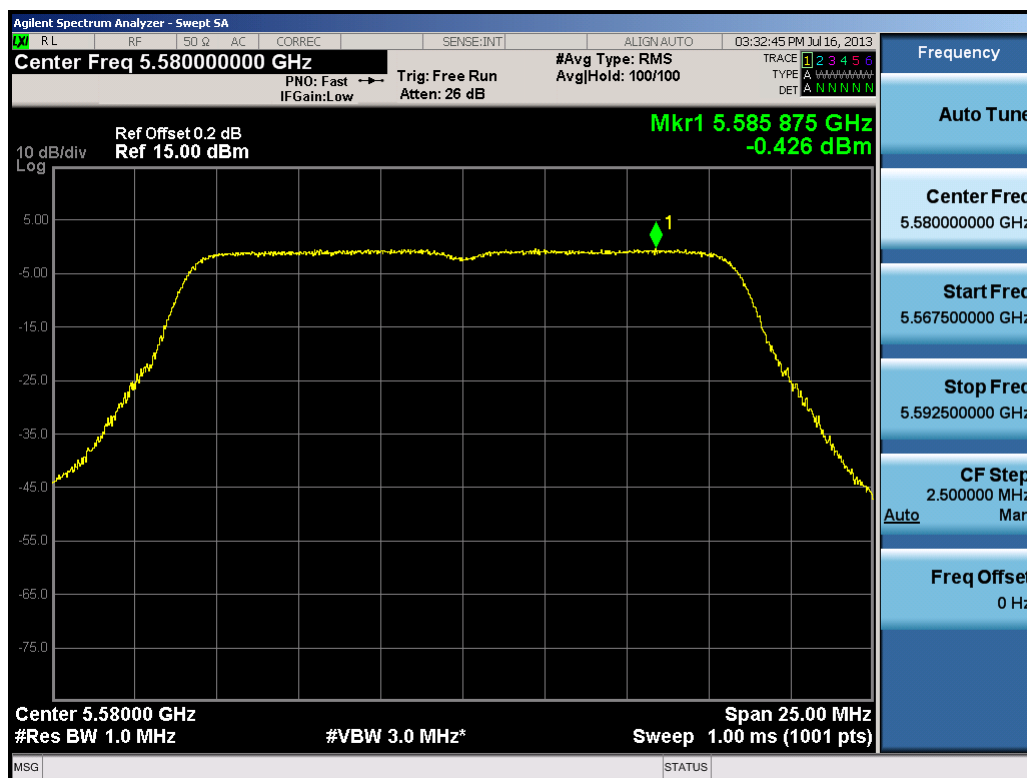


Plot 6-59. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 2) – Ch. 58)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 47 of 104                  |

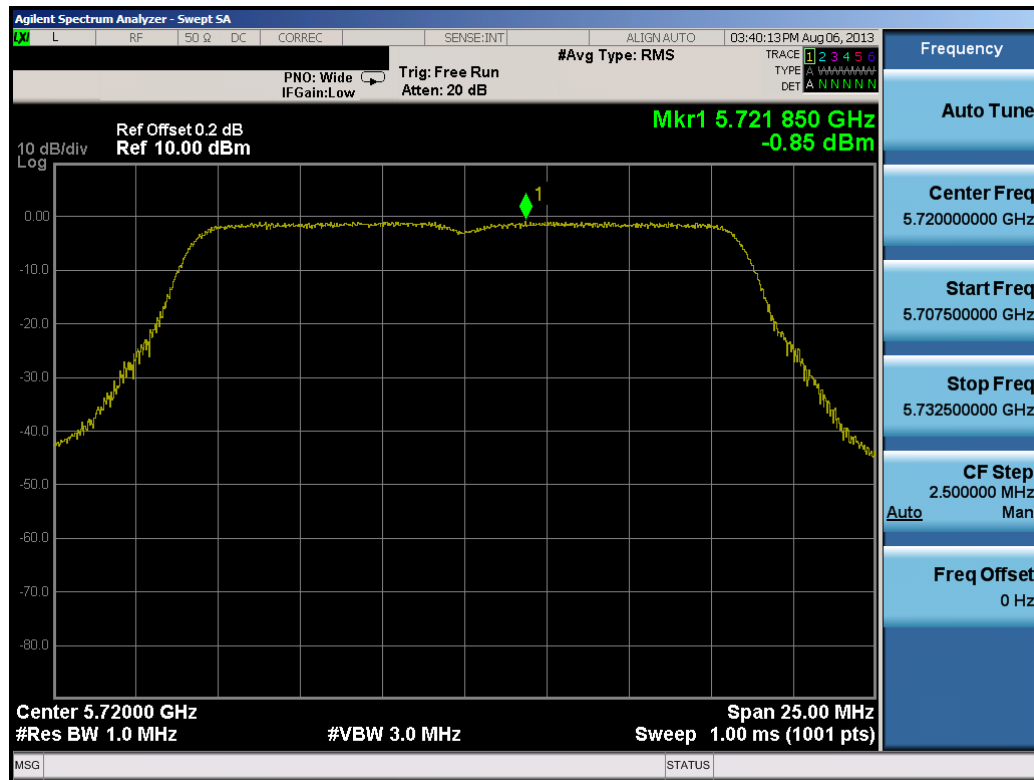


Plot 6-60. Peak Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 100)

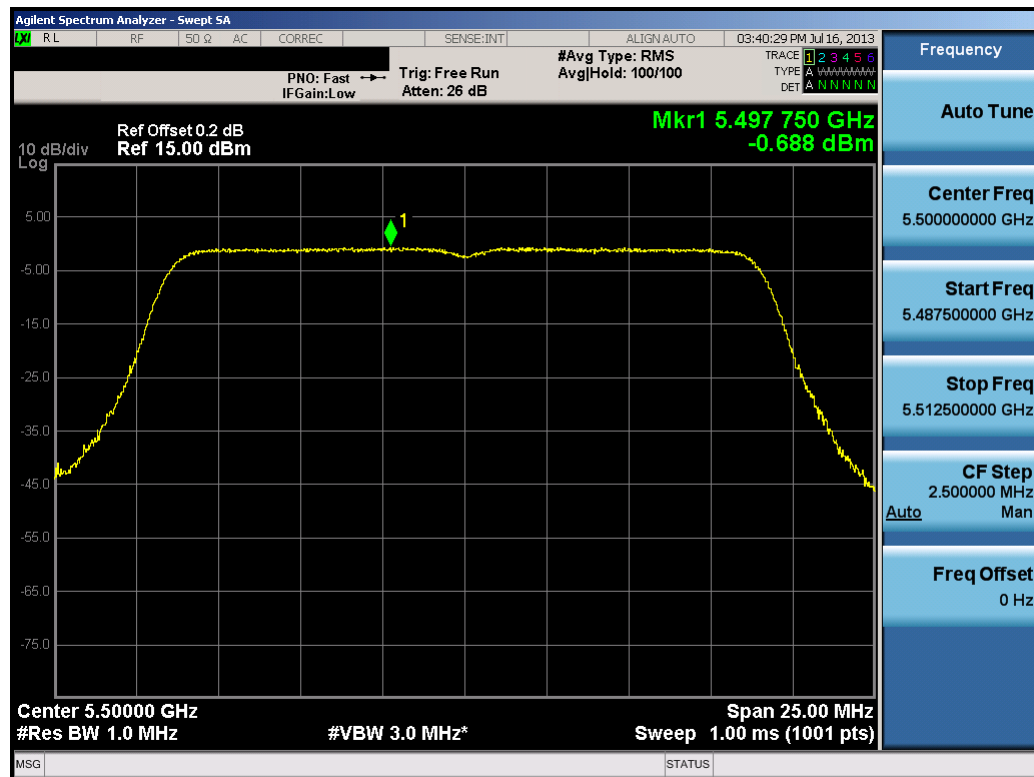


Plot 6-61. Peak Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 116)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 48 of 104                  |

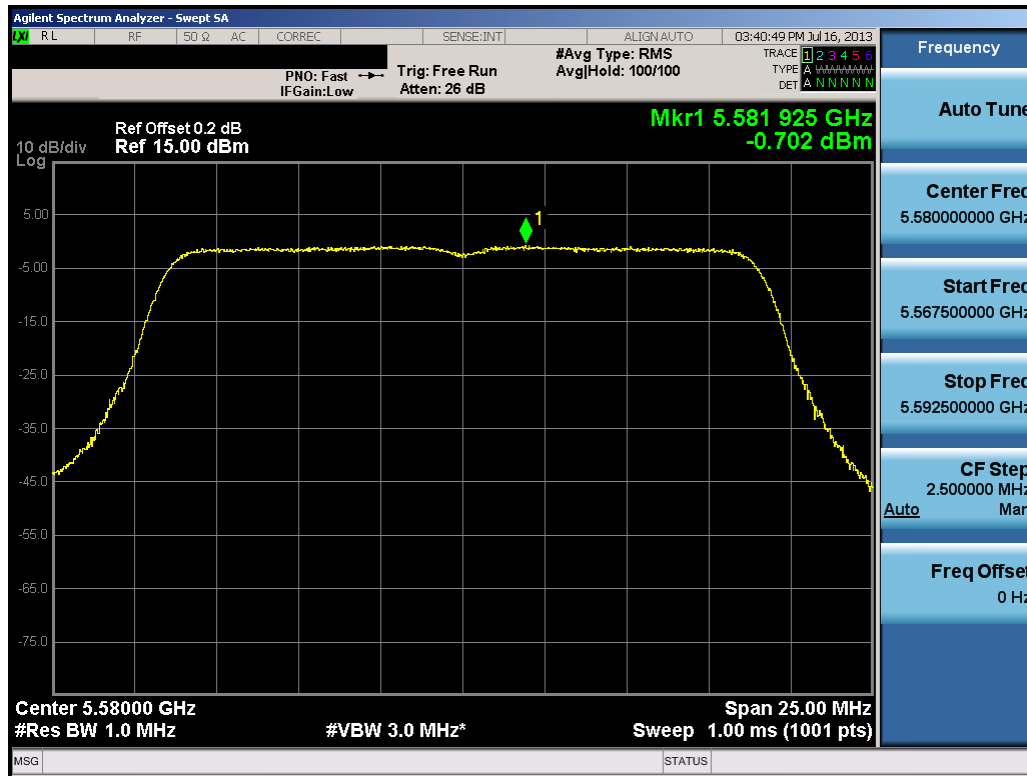


Plot 6-62. Peak Power Spectral Density Plot (802.11a (UNII Band 3) – Ch. 144)

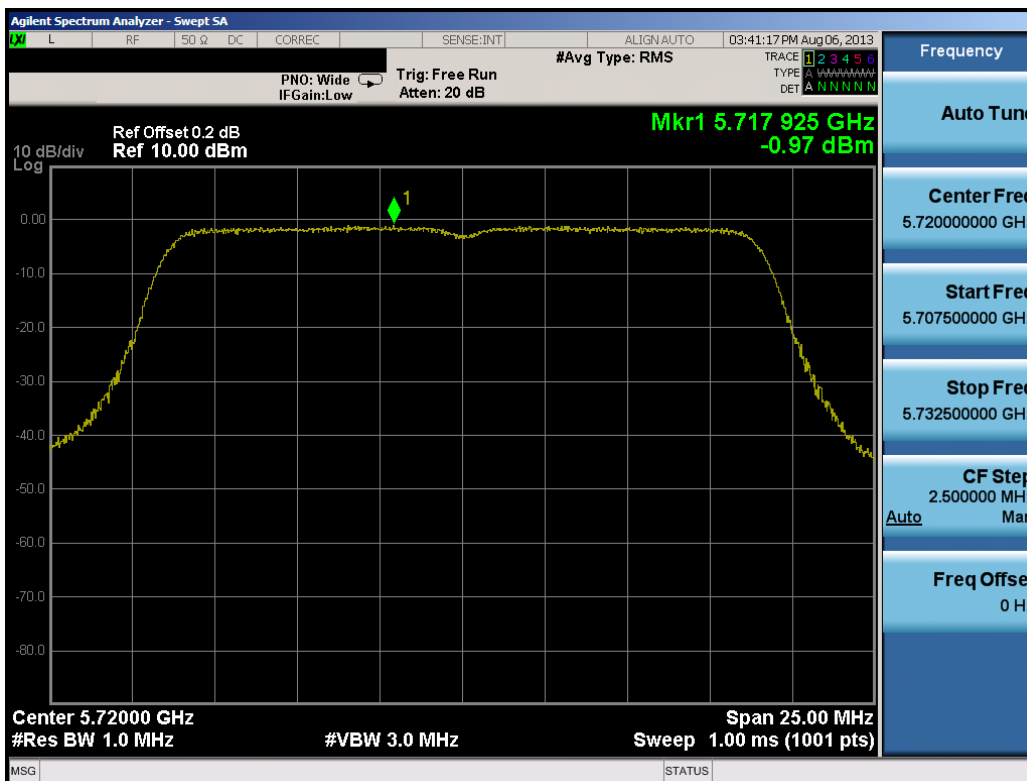


Plot 6-63. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 100)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 49 of 104                  |

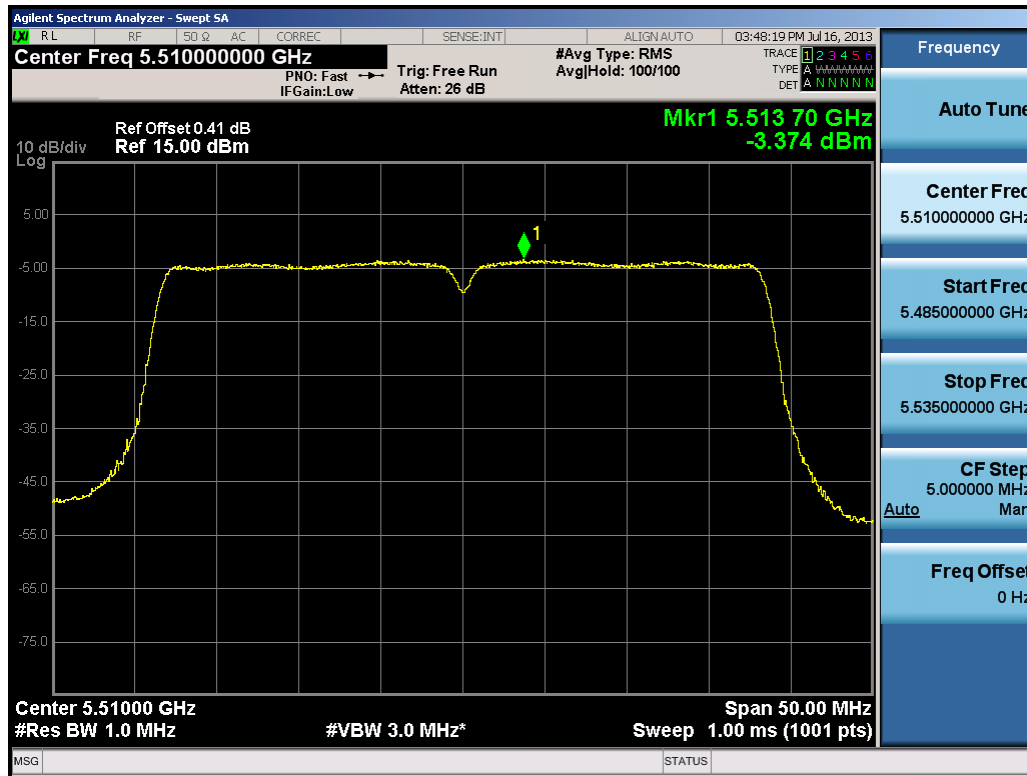


Plot 6-64. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 116)

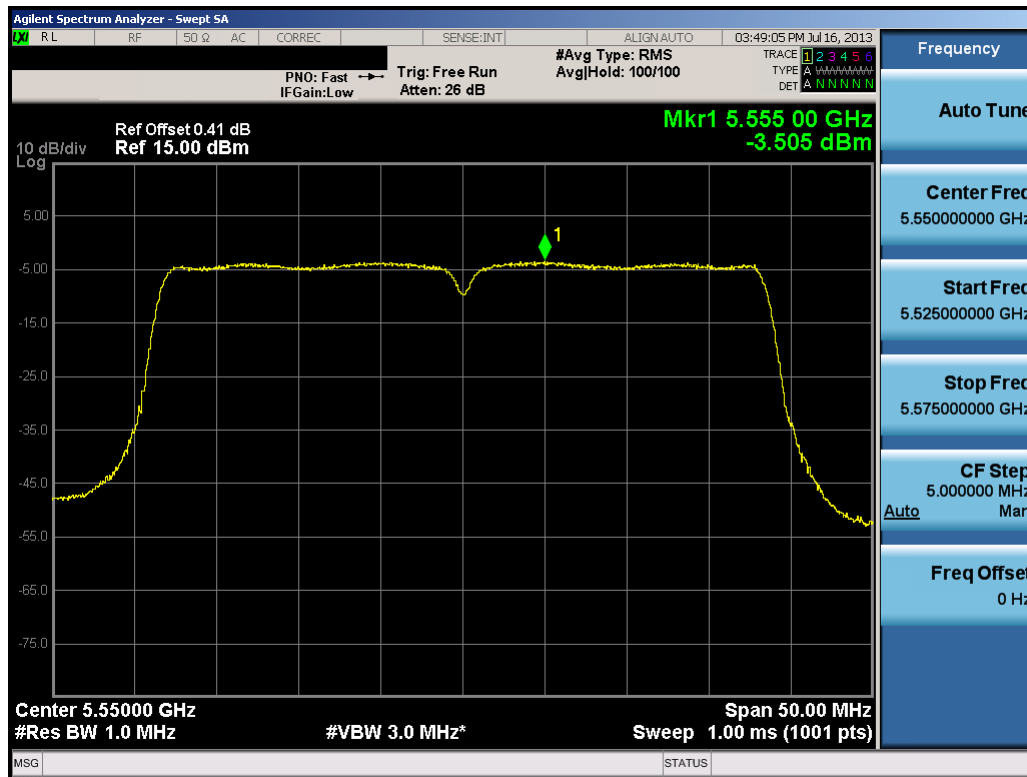


Plot 6-65. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 3) – Ch. 144)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 50 of 104                  |

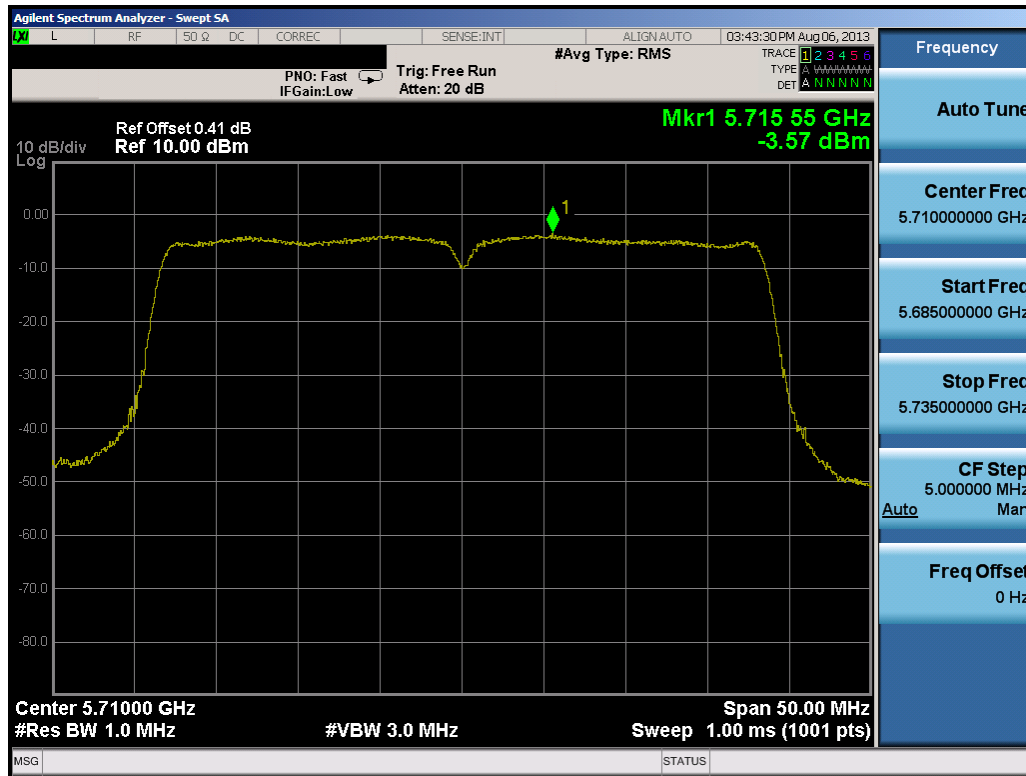


Plot 6-66. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 102)

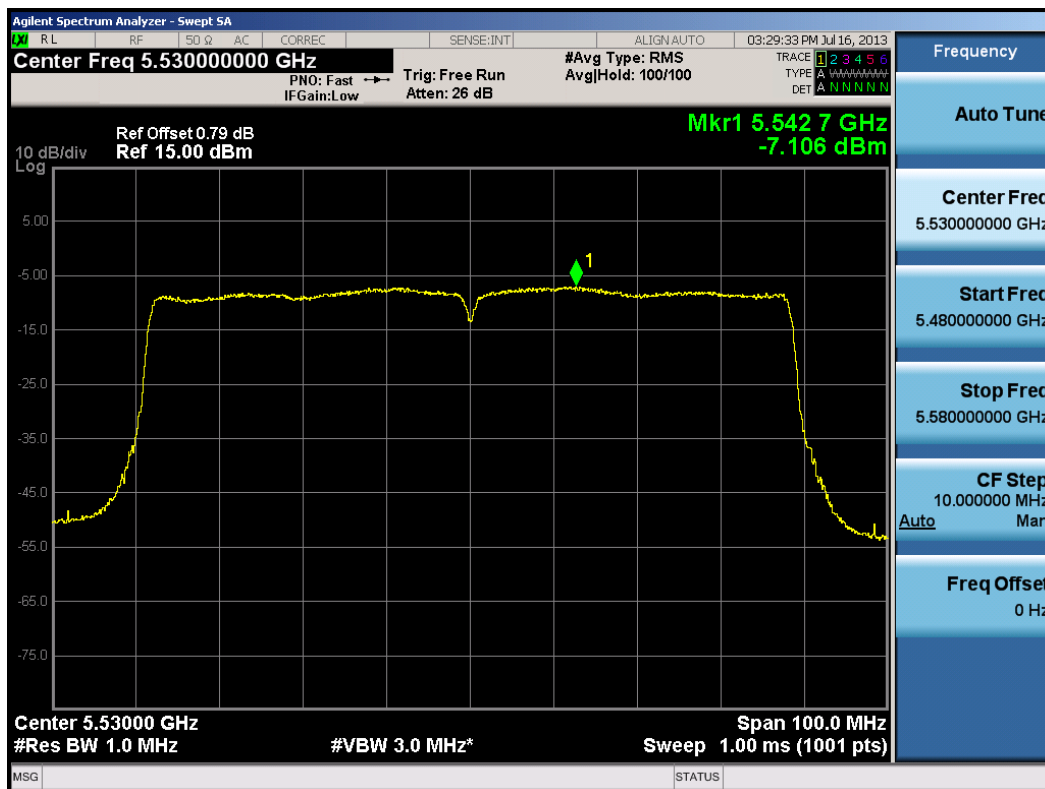


Plot 6-67. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 110)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 51 of 104                  |

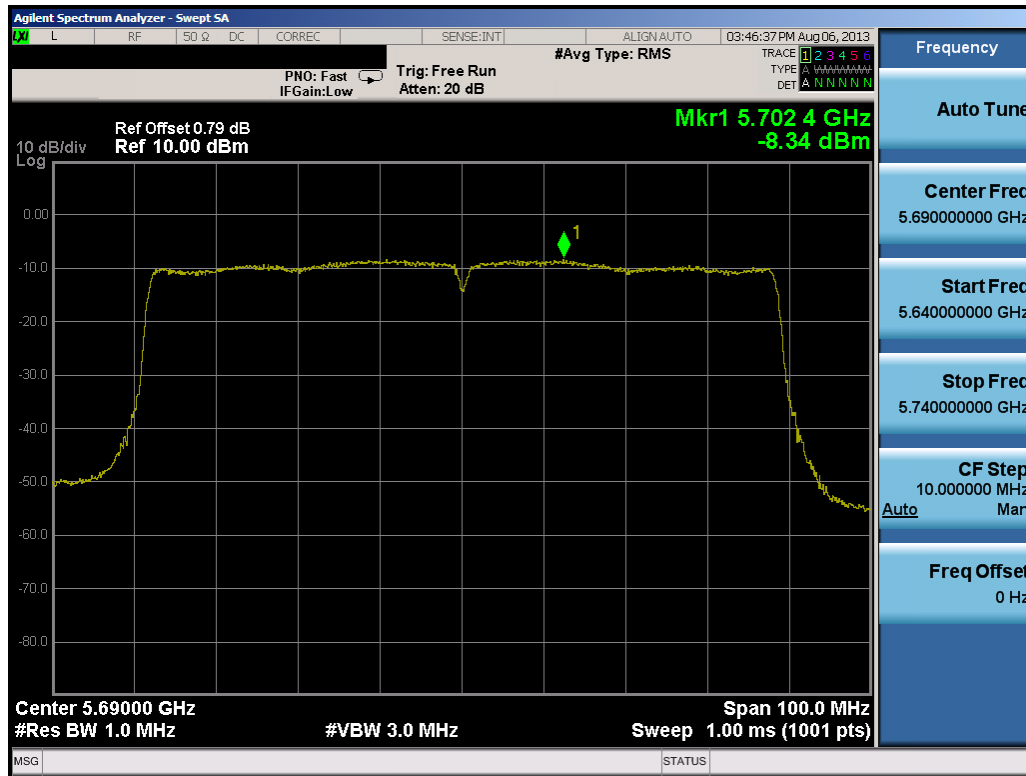


Plot 6-68. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 3) – Ch. 142)

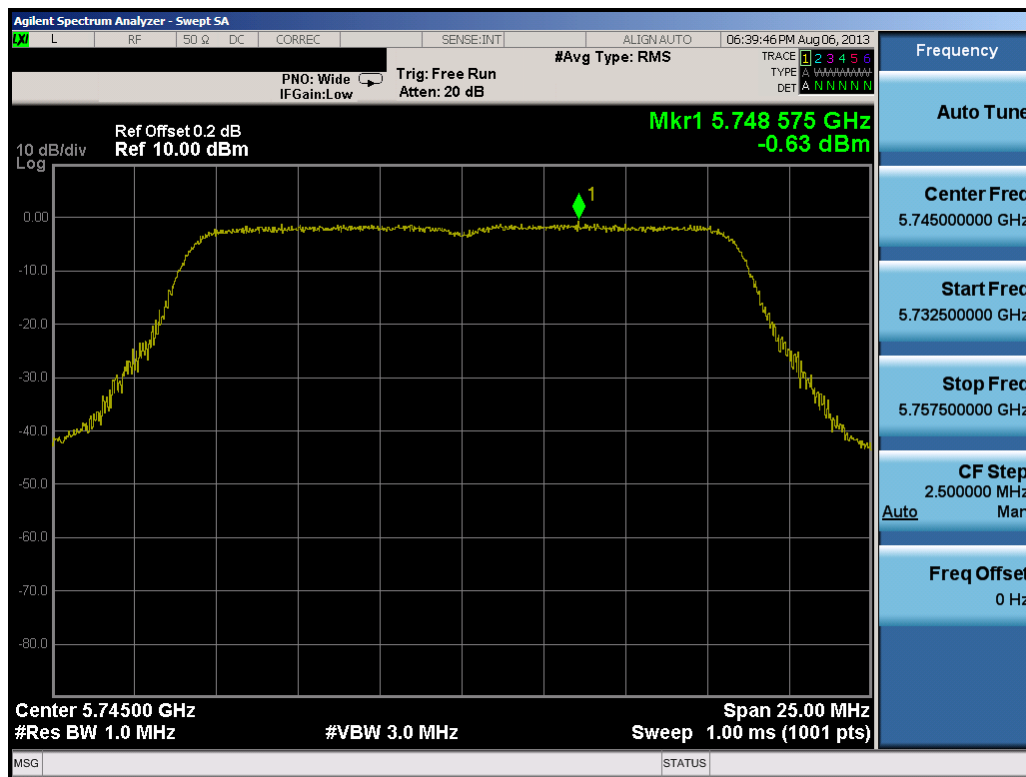


Plot 6-69. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 106)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 52 of 104                  |

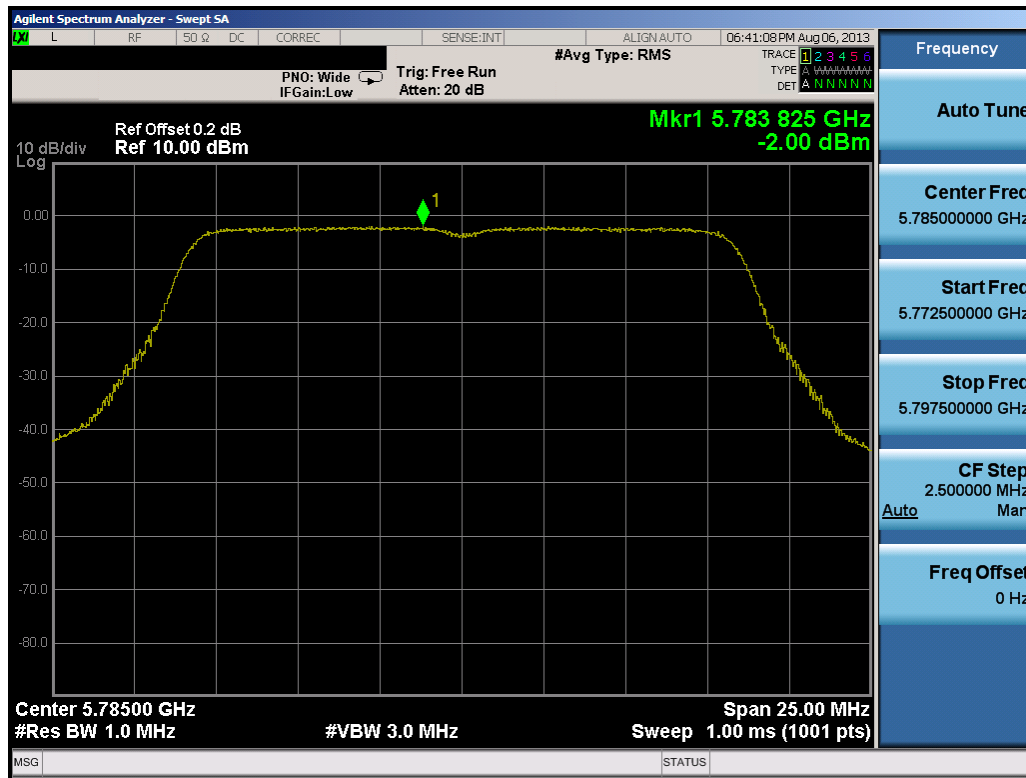


Plot 6-70. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 3) – Ch. 138)

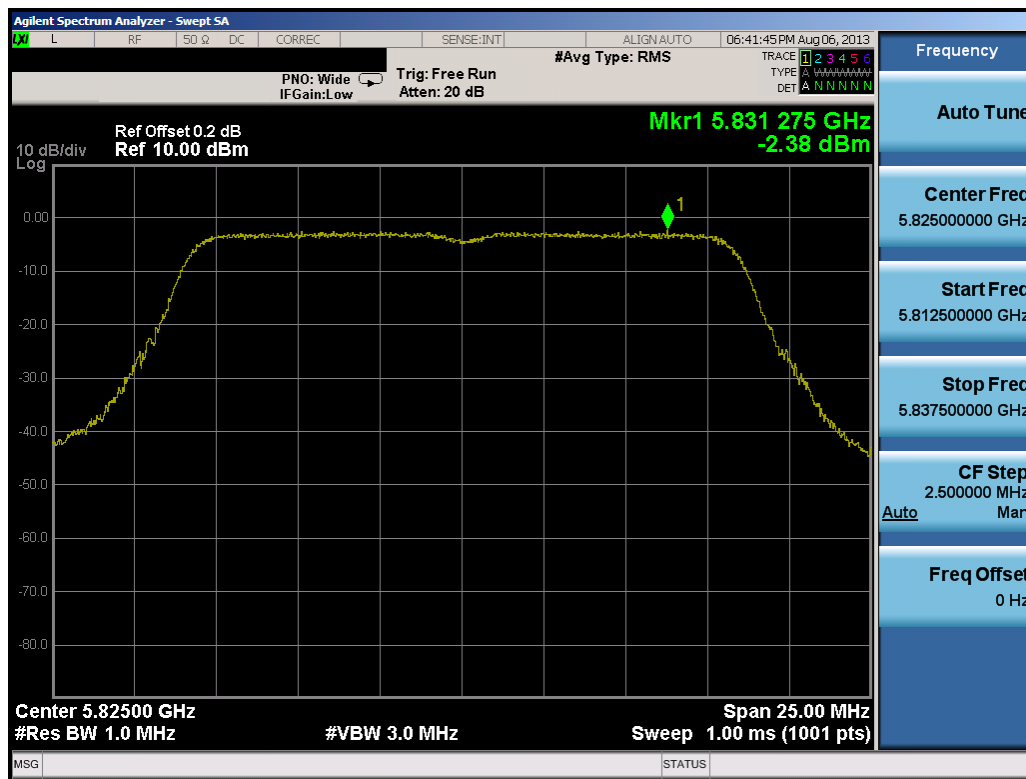


Plot 6-71. Peak Power Spectral Density Plot (20MHz BW 802.11a (UNII Band 4) – Ch. 149)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 53 of 104                  |

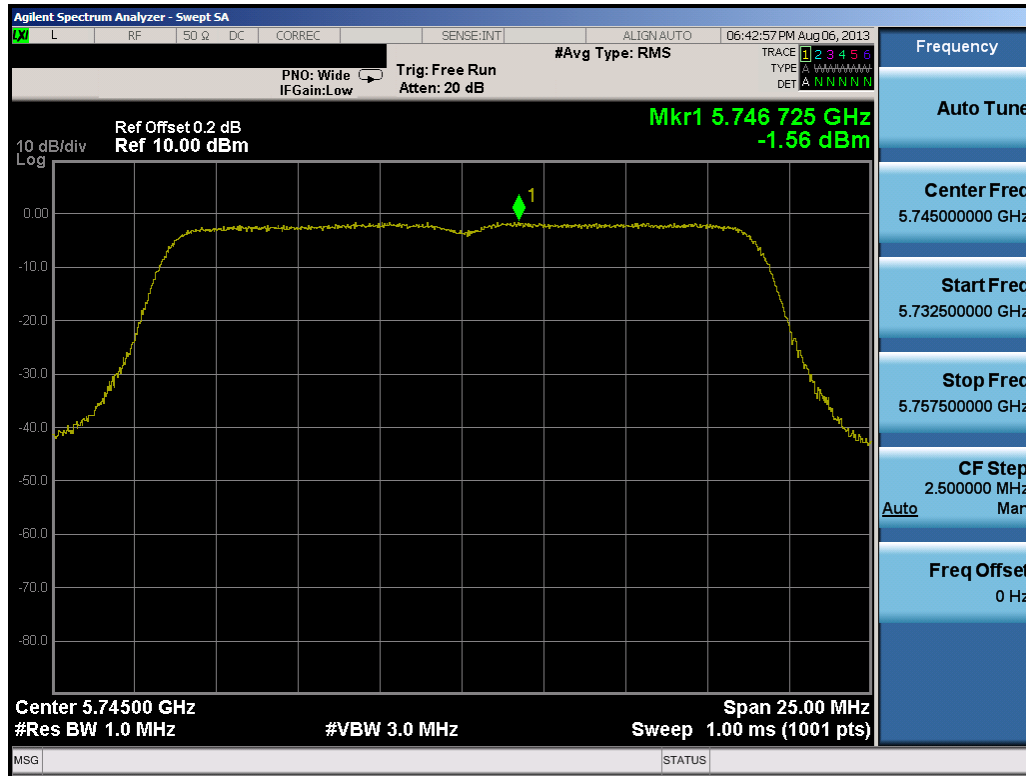


Plot 6-72. Peak Power Spectral Density Plot (20MHz BW 802.11a (UNII Band 4) – Ch. 157)

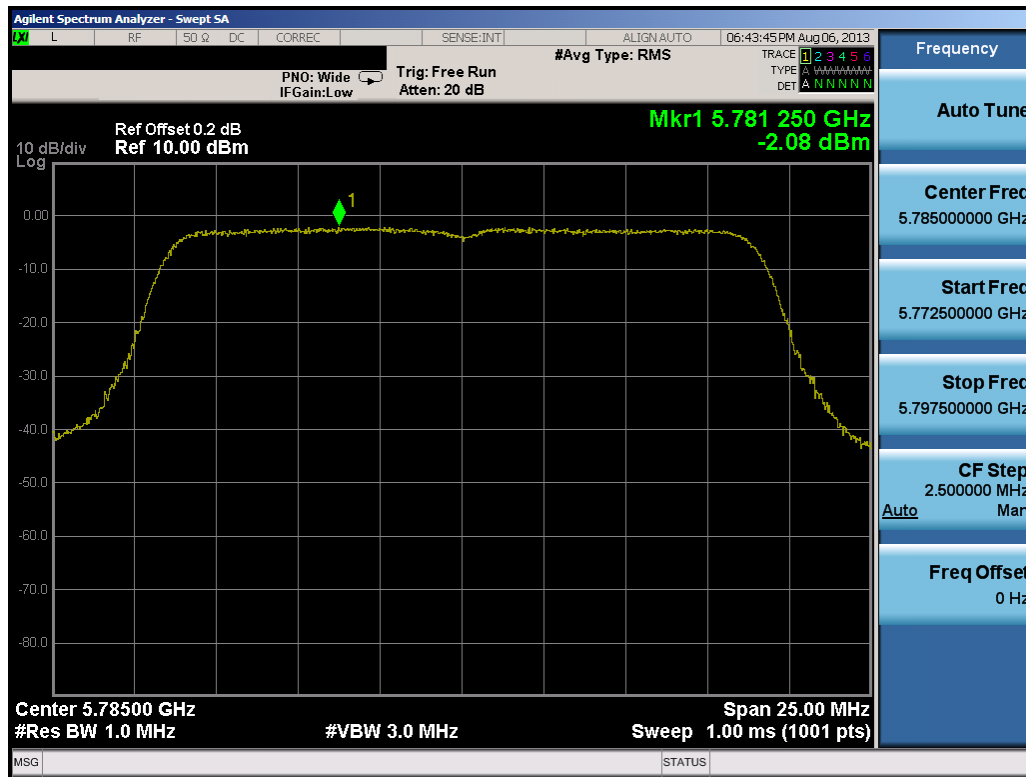


Plot 6-73. Peak Power Spectral Density Plot (20MHz BW 802.11a (UNII Band 4) – Ch. 165)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 54 of 104                  |

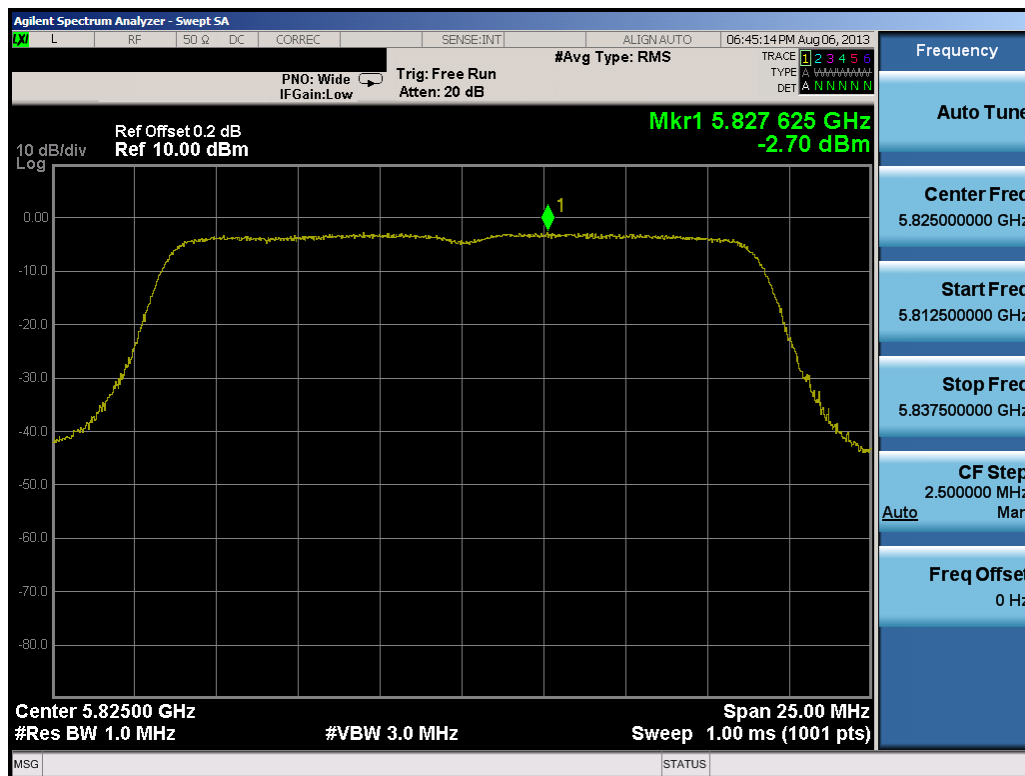


Plot 6-74. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 4) – Ch. 149)

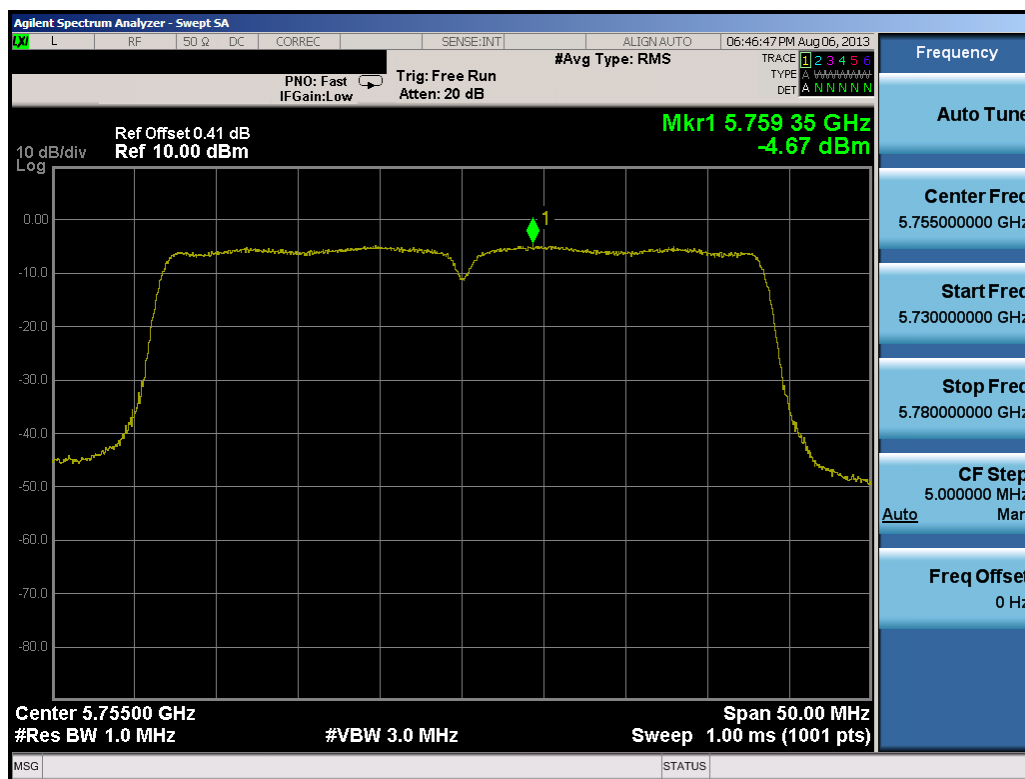


Plot 6-75. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 4) – Ch. 157)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 55 of 104                  |

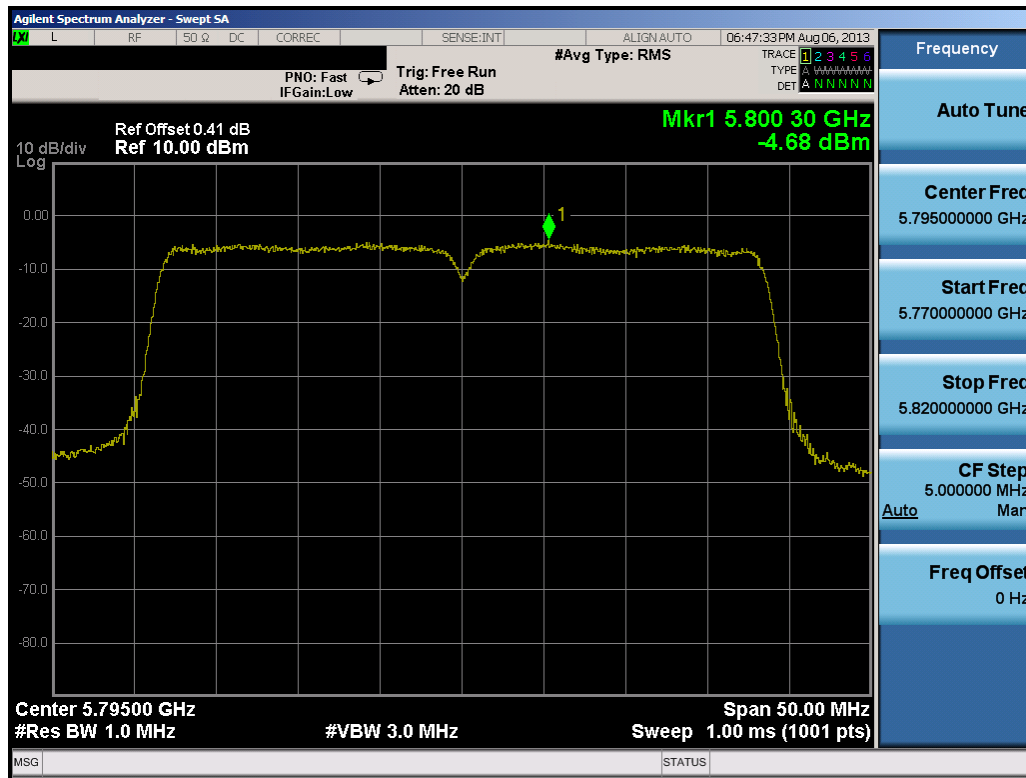


Plot 6-76. Peak Power Spectral Density Plot (20MHz BW 802.11n (UNII Band 4) – Ch. 165)

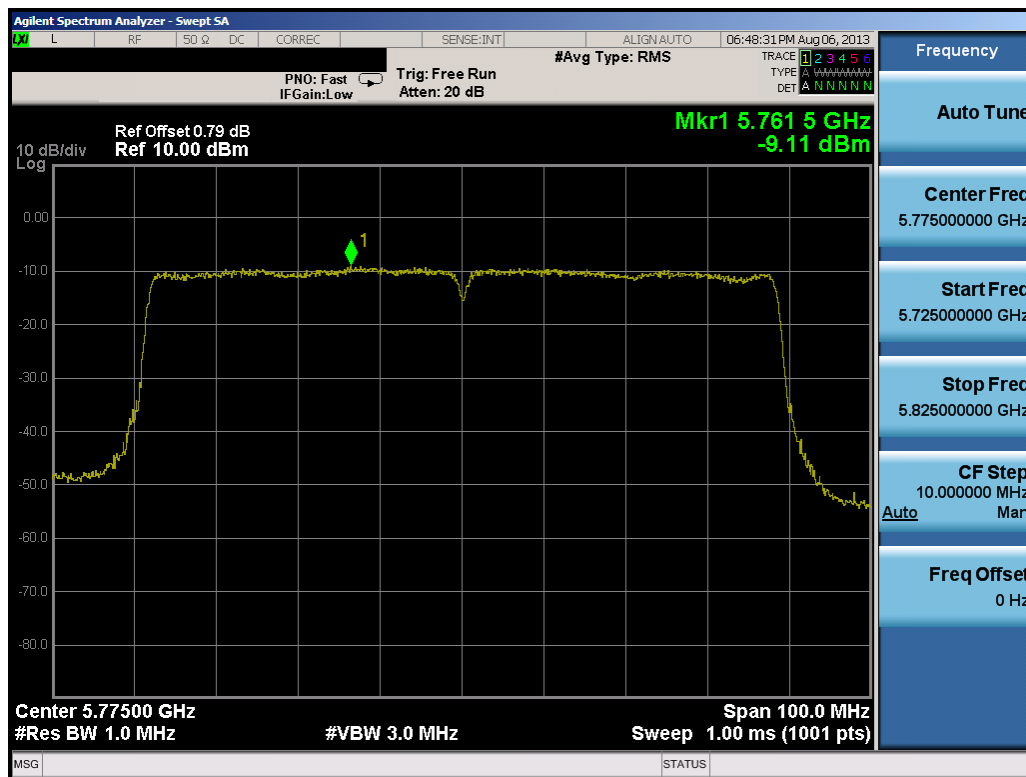


Plot 6-77. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 4) – Ch. 151)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 56 of 104                  |



Plot 6-78. Peak Power Spectral Density Plot (40MHz BW 802.11n (UNII Band 4) – Ch. 159)



Plot 6-79. Peak Power Spectral Density Plot (80MHz BW 802.11ac (UNII Band 4) – Ch. 155)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 57 of 104                  |

## 6.5 Peak Excursion Ratio – 802.11a/n/ac §15.407(a)(6)

### Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies. Method SA-2, as defined in KDB 789033, was used to capture the average trace used to make the peak excursion measurement.

***The largest permissible difference between the modulation envelope (measured using a peak hold function) and the maximum power spectral density is 13 dBm/MHz.***

### Test Procedure Used

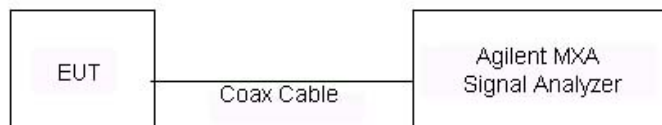
KDB 789033 v01r03 – Section G  
KDB 644545 D02 v01

### Test Settings

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz
4. VBW = 3MHz
5. Detector = peak
6. Trace mode = max hold
7. Trace was allowed to stabilize
8. The peak search function of the spectrum analyzer was used to find the peak of the spectrum. This level was compared to the peak power density level found from the previous section to determine the peak excursion.

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 6-4. Test Instrument & Measurement Setup**

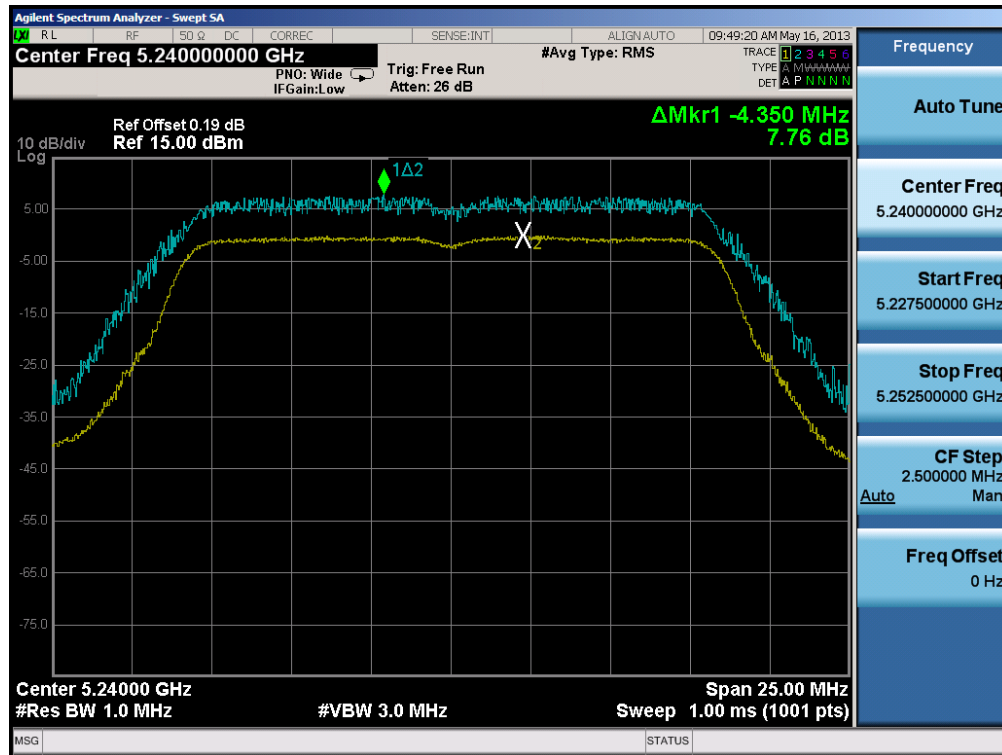
### Test Notes

The peak excursion was investigated for all signal types, modulation types, channel bandwidths, and variations in signal parameters and the worst case data is shown below. Only the worst case modulation mode on a single channel among all bands is reported since that is sufficient to demonstrate compliance to the peak excursion requirement per KDB 789033 v01r03.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 58 of 104                  |

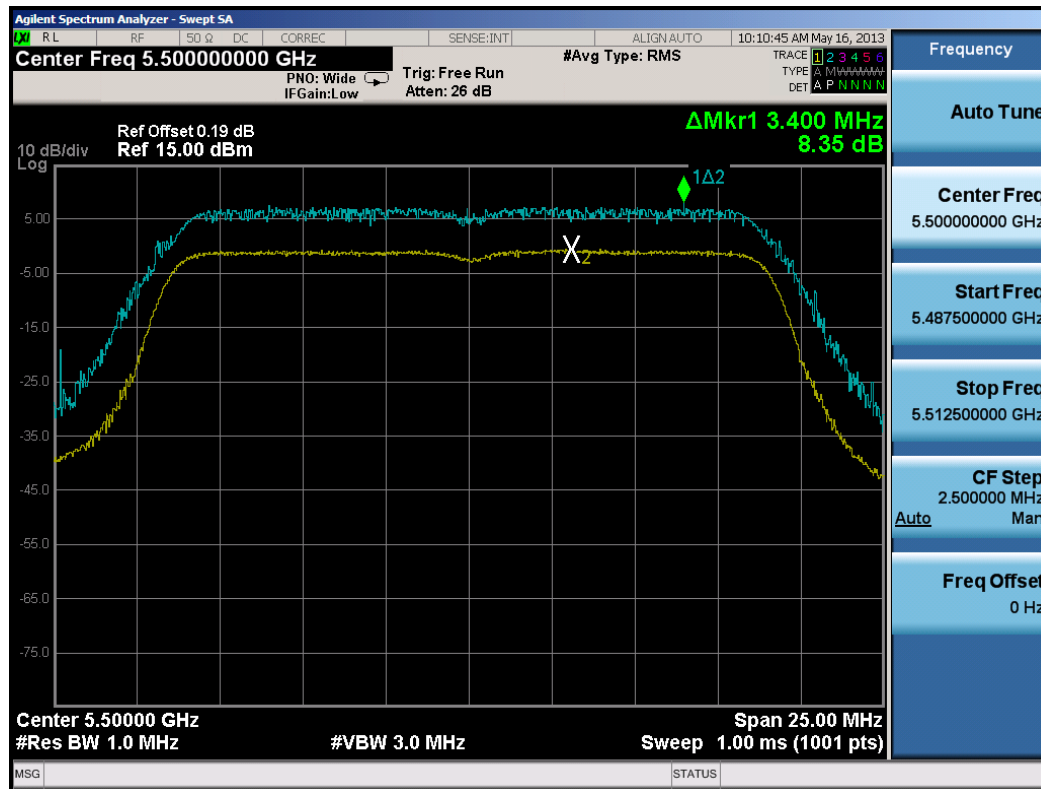
| Frequency [MHz] | Channel No. | 802.11 Mode | Data Rate [Mbps] | Measured Peak Excursion Ratio [dBm] | Max Permissible Peak Excursion Ratio [dBm/MHz] | Margin [dB] |
|-----------------|-------------|-------------|------------------|-------------------------------------|------------------------------------------------|-------------|
| 5240            | 48          | a           | 6                | 7.76                                | 13.0                                           | -5.24       |
| 5500            | 100         | n (20MHz)   | 6.5/7.2 (MCS0)   | 8.35                                | 13.0                                           | -4.65       |
| 5510            | 102         | n (40MHz)   | 13.5/15 (MCS0)   | 7.95                                | 13.0                                           | -5.05       |
| 5530            | 106         | ac (80MHz)  | 29.3/32.5 (MCS0) | 8.03                                | 13.0                                           | -4.97       |

**Table 6-10. Conducted Peak Excursion Ratio Measurements**

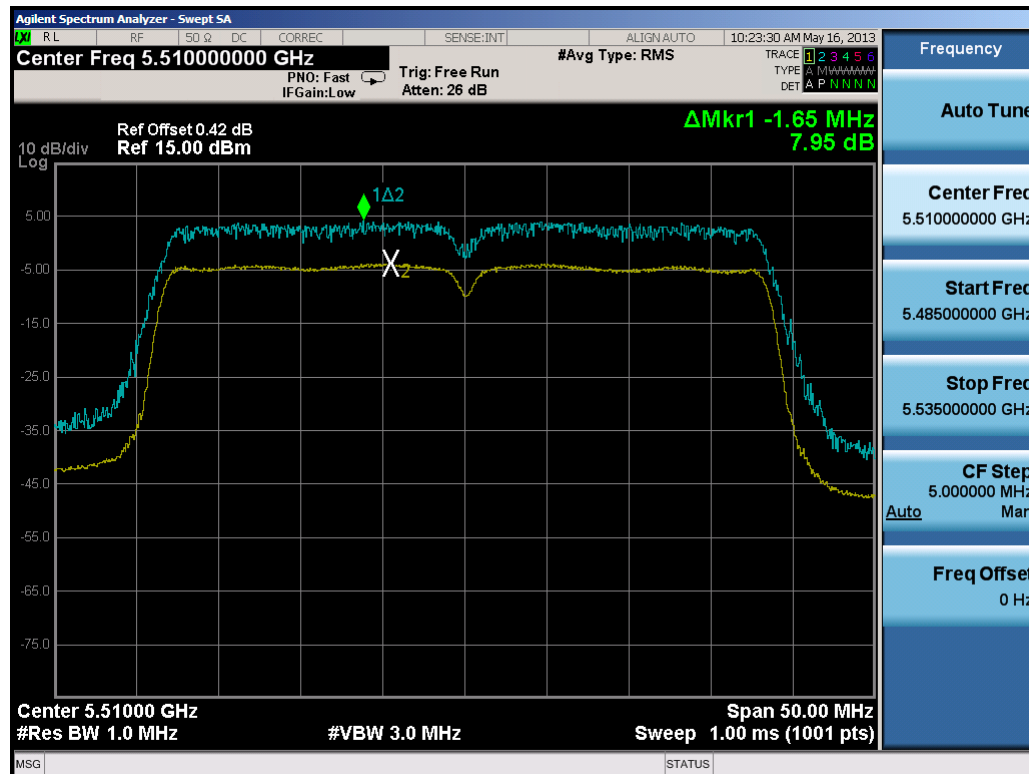


**Plot 6-80. Peak Excursion Ratio Plot (802.11a)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 59 of 104                  |

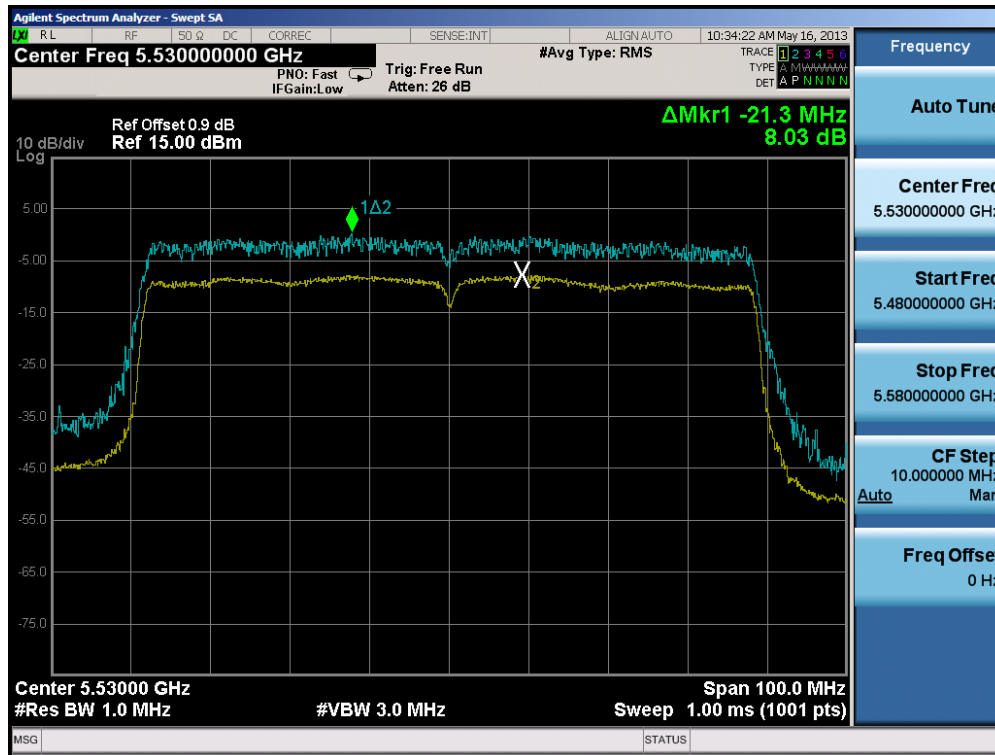


Plot 6-81. Peak Excursion Ratio Plot (20MHz BW 802.11n)



Plot 6-82. Peak Excursion Ratio Plot (40MHz BW 802.11n)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 60 of 104                  |



Plot 6-83. Peak Excursion Ratio Plot (80MHz BW 802.11ac)

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 61 of 104                  |

## 6.6 Frequency Stability

### §15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° 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. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,180,000,000 Hz  
 CHANNEL: 36  
 REFERENCE VOLTAGE: 3.8 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (° C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.80        | + 20 (Ref) | 5,180,000,026  | 26              | 0.00000050    |
| 100 %          |             | - 30       | 5,180,000,005  | 5               | 0.00000010    |
| 100 %          |             | - 20       | 5,180,000,003  | 3               | 0.00000005    |
| 100 %          |             | - 10       | 5,180,000,010  | 10              | 0.00000020    |
| 100 %          |             | 0          | 5,180,000,014  | 14              | 0.00000028    |
| 100 %          |             | + 10       | 5,180,000,021  | 21              | 0.00000040    |
| 100 %          |             | + 20       | 5,180,000,006  | 6               | 0.00000011    |
| 100 %          |             | + 30       | 5,180,000,015  | 15              | 0.00000029    |
| 100 %          |             | + 40       | 5,180,000,019  | 19              | 0.00000037    |
| 100 %          |             | + 50       | 5,180,000,012  | 12              | 0.00000024    |
| 115 %          | 4.37        | + 20       | 5,180,000,011  | 11              | 0.00000020    |
| BATT. ENDPOINT | 3.40        | + 20       | 5,180,000,026  | 26              | 0.00000051    |

**Table 6-11. Frequency Stability Measurements for UNII Band 1 (Ch. 36)**

#### 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 deviation 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.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          | Page 62 of 104                                                                        |                                 |

## Frequency Stability (Cont'd)

### §15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° 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. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,260,000,000 Hz

CHANNEL: 52

REFERENCE VOLTAGE: 3.8 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (° C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.80        | + 20 (Ref) | 5,260,000,019  | 19              | 0.00000036    |
| 100 %          |             | - 30       | 5,260,000,029  | 29              | 0.00000055    |
| 100 %          |             | - 20       | 5,260,000,012  | 12              | 0.00000024    |
| 100 %          |             | - 10       | 5,260,000,004  | 4               | 0.00000008    |
| 100 %          |             | 0          | 5,260,000,004  | 4               | 0.00000008    |
| 100 %          |             | + 10       | 5,260,000,001  | 1               | 0.00000002    |
| 100 %          |             | + 20       | 5,260,000,013  | 13              | 0.00000024    |
| 100 %          |             | + 30       | 5,260,000,005  | 5               | 0.00000010    |
| 100 %          |             | + 40       | 5,260,000,019  | 19              | 0.00000036    |
| 100 %          |             | + 50       | 5,260,000,025  | 25              | 0.00000048    |
| 115 %          | 4.37        | + 20       | 5,260,000,008  | 8               | 0.00000015    |
| BATT. ENDPOINT | 3.40        | + 20       | 5,260,000,029  | 29              | 0.00000055    |

**Table 6-12. Frequency Stability Measurements for UNII Band 2 (Ch. 52)**

### 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 deviation 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.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          | Page 63 of 104                                                                        |                                 |

## Frequency Stability (Cont'd)

### §15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° 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. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,500,000,000 Hz

CHANNEL: 100

REFERENCE VOLTAGE: 3.8 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (° C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.80        | + 20 (Ref) | 5,500,000,020  | 20              | 0.00000036    |
| 100 %          |             | - 30       | 5,500,000,021  | 21              | 0.00000038    |
| 100 %          |             | - 20       | 5,500,000,029  | 29              | 0.00000052    |
| 100 %          |             | - 10       | 5,500,000,027  | 27              | 0.00000048    |
| 100 %          |             | 0          | 5,500,000,004  | 4               | 0.00000007    |
| 100 %          |             | + 10       | 5,500,000,019  | 19              | 0.00000035    |
| 100 %          |             | + 20       | 5,500,000,023  | 23              | 0.00000042    |
| 100 %          |             | + 30       | 5,500,000,019  | 19              | 0.00000034    |
| 100 %          |             | + 40       | 5,500,000,014  | 14              | 0.00000026    |
| 100 %          |             | + 50       | 5,500,000,006  | 6               | 0.00000011    |
| 115 %          | 4.37        | + 20       | 5,500,000,007  | 7               | 0.00000013    |
| BATT. ENDPOINT | 3.40        | + 20       | 5,500,000,002  | 2               | 0.00000003    |

**Table 6-13. Frequency Stability Measurements for UNII Band 3 (Ch. 100)**

### 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 deviation 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.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          | Page 64 of 104                                                                        |                                 |

## Frequency Stability (Cont'd)

### §15.407(g)

The EUT was placed inside of an environmental chamber as the temperature in the chamber was varied between -30°C and +50°C. The temperature was incremented by 10° 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. Data for the worst case channel is shown below.

OPERATING FREQUENCY: 5,745,000,000 Hz

CHANNEL: 149

REFERENCE VOLTAGE: 3.8 VDC

| VOLTAGE (%)    | POWER (VDC) | TEMP (° C) | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.80        | + 20 (Ref) | 5,745,000,010  | 10              | 0.00000018    |
| 100 %          |             | - 30       | 5,745,000,018  | 18              | 0.00000032    |
| 100 %          |             | - 20       | 5,745,000,016  | 16              | 0.00000027    |
| 100 %          |             | - 10       | 5,745,000,008  | 8               | 0.00000013    |
| 100 %          |             | 0          | 5,745,000,013  | 13              | 0.00000023    |
| 100 %          |             | + 10       | 5,745,000,015  | 15              | 0.00000026    |
| 100 %          |             | + 20       | 5,745,000,012  | 12              | 0.00000021    |
| 100 %          |             | + 30       | 5,745,000,005  | 5               | 0.00000009    |
| 100 %          |             | + 40       | 5,745,000,015  | 15              | 0.00000027    |
| 100 %          |             | + 50       | 5,745,000,003  | 3               | 0.00000006    |
| 115 %          | 4.37        | + 20       | 5,745,000,014  | 14              | 0.00000024    |
| BATT. ENDPOINT | 3.40        | + 20       | 5,745,000,001  | 1               | 0.00000001    |

**Table 6-14. Frequency Stability Measurements for UNII Band 4 (Ch. 149)**

### 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 deviation 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.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          | Page 65 of 104                                                                        |                                 |

## 6.7 Radiated Spurious Emission Measurements

§15.407(b)(1), (6), §15.205, §15.209; RSS-210 [A9.2]

### Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n (20/40 MHz BW), and 802.11ac (20/40/80 MHz BW)), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

***All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-15 per Section 15.209.***

| Frequency         | Field Strength<br>[μV/m] | Measured Distance<br>[Meters] |
|-------------------|--------------------------|-------------------------------|
| 0.009 – 0.490 MHz | 2400/F (kHz)             | 300                           |
| 0.490 – 1.705 MHz | 24000/F (kHz)            | 30                            |
| 1.705 – 30.00 MHz | 30                       | 30                            |
| 30.00 – 88.00 MHz | 100                      | 3                             |
| 88.00 – 216.0 MHz | 150                      | 3                             |
| 216.0 – 960.0 MHz | 200                      | 3                             |
| Above 960.0 MHz   | 500                      | 3                             |

**Table 6-15. Radiated Limits**

### Test Procedures Used

KDB 789033 v01r03 – Section H

KDB 644545 D02 v01

### Test Settings

#### Average Measurements above 1GHz (Method AD)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be  $\geq 2 \times \text{span/RBW}$ )
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 66 of 104                  |

### Peak Measurements above 1GHz

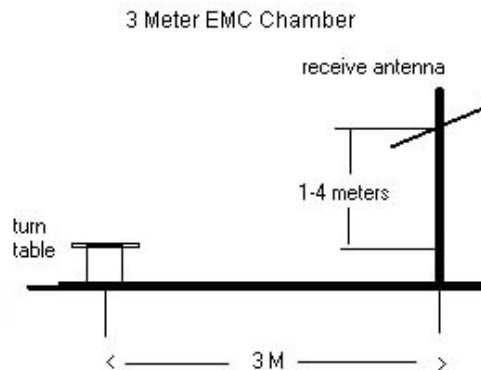
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

### Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = 120kHz
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



**Figure 6-5. Test Instrument & Measurement Setup**

|                                      |                                               |                                                                        |    |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |    | Page 67 of 104                  |

## Test Notes

1. All radiated spurious emissions levels were measured in a radiated test setup per the guidance of KDB 789033 v01r03 Section H.
2. All spurious emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-11. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a “conversion” factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. The EUT is supplied with nominal AC voltage and/or a new/fully-recharged battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
6. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. Average levels at -135dBm and peak levels at -125dBm represent the analyzer noise floor and signify that no emission was detected.
8. No radiated spurious emissions were detected in Band 1 from 5150 – 5250MHz while the EUT was transmitting in Band 2.

## Sample Calculations

### Determining Spurious Emissions Levels

- o Field Strength Level  $_{[dB\mu V/m]} = \text{Analyzer Level }_{[dBm]} + 107 + \text{AFCL }_{[dB/m]}$
- o  $\text{AFCL }_{[dB/m]} = \text{Antenna Factor }_{[dB/m]} + \text{Cable Loss }_{[dB]}$
- o  $\text{Margin }_{[dB]} = \text{Field Strength Level }_{[dB\mu V/m]} - \text{Limit }_{[dB\mu V/m]}$

### Radiated Band Edge Measurement Offset

- o The amplitude offset shown in the radiated restricted band edge plots in Section 6.8 was calculated using the formula:  

$$\text{Offset (dB)} = (\text{Antenna Factor} + \text{Cable Loss} + 10 \text{ dB Attenuator}) - \text{Preamplifier Gain}$$
- o A duty cycle correction equal to  $10 \cdot \log(1/\text{duty cycle})$  was added to the formula above for average measurements.

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 68 of 104                  |

## Radiated Spurious Emission Measurements (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5180MHz  
Channel: 36

| Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| 10360.00        | -97.89               | Peak     | H          | 48.17       | 0.00                            | 57.28                         | 68.20                | -10.92      |
| * 15540.00      | -135.00              | Average  | H          | 54.56       | 0.00                            | 26.56                         | 53.98                | -27.42      |
| * 15540.00      | -125.00              | Peak     | H          | 54.56       | 0.00                            | 36.56                         | 73.98                | -37.42      |
| * 20720.00      | -101.48              | Average  | H          | 44.53       | -9.54                           | 40.51                         | 53.98                | -13.47      |
| * 20720.00      | -100.37              | Peak     | H          | 44.53       | -9.54                           | 41.62                         | 73.98                | -32.36      |
| 25900.00        | -125.00              | Peak     | H          | 43.10       | 0.00                            | 25.10                         | 68.20                | -43.10      |

**Table 6-16. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5200MHz  
Channel: 40

| Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| 10400.00        | -97.80               | Peak     | H          | 48.09       | 0.00                            | 57.29                         | 68.20                | -10.91      |
| * 15600.00      | -135.00              | Average  | H          | 54.42       | 0.00                            | 26.42                         | 53.98                | -27.56      |
| * 15600.00      | -125.00              | Peak     | H          | 54.42       | 0.00                            | 36.42                         | 73.98                | -37.56      |
| * 20800.00      | -103.21              | Average  | H          | 44.49       | -9.54                           | 38.74                         | 53.98                | -15.24      |
| * 20800.00      | -100.69              | Peak     | H          | 44.49       | -9.54                           | 41.26                         | 73.98                | -32.72      |
| 26000.00        | -125.00              | Peak     | H          | 42.76       | 0.00                            | 24.76                         | 68.20                | -43.44      |

**Table 6-17. Radiated Measurements**

|                                      |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 69 of 104                  |

## Radiated Spurious Emission Measurements (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5240MHz  
Channel: 48

| Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| 10480.00        | -97.77               | Peak     | H          | 48.03       | 0.00                            | 57.26                         | 68.20                | -10.94      |
| * 15720.00      | -135.00              | Average  | H          | 54.45       | 0.00                            | 26.45                         | 53.98                | -27.53      |
| * 15720.00      | -125.00              | Peak     | H          | 54.45       | 0.00                            | 36.45                         | 73.98                | -37.53      |
| * 20960.00      | -104.80              | Average  | H          | 44.47       | -9.54                           | 37.13                         | 53.98                | -16.85      |
| * 20960.00      | -101.37              | Peak     | H          | 44.47       | -9.54                           | 40.56                         | 73.98                | -33.42      |
| 26200.00        | -125.00              | Peak     | H          | 42.71       | 0.00                            | 24.71                         | 68.20                | -43.49      |

**Table 6-18. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5260MHz  
Channel: 52

| Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| 10520.00        | -97.77               | Peak     | H          | 48.18       | 0.00                            | 57.40                         | 68.20                | -10.80      |
| * 15780.00      | -135.00              | Average  | H          | 54.53       | 0.00                            | 26.53                         | 53.98                | -27.45      |
| * 15780.00      | -125.00              | Peak     | H          | 54.53       | 0.00                            | 36.53                         | 73.98                | -37.45      |
| * 21040.00      | -104.48              | Average  | H          | 44.53       | -9.54                           | 37.51                         | 53.98                | -16.47      |
| * 21040.00      | -102.82              | Peak     | H          | 44.53       | -9.54                           | 39.17                         | 73.98                | -34.81      |
| 26300.00        | -125.00              | Peak     | H          | 43.10       | 0.00                            | 25.10                         | 68.20                | -43.10      |

**Table 6-19. Radiated Measurements**

|                                      |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 70 of 104                  |

## Radiated Spurious Emission Measurements (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5280MHz  
Channel: 56

| Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| 10560.00        | -98.02               | Peak     | H          | 48.49       | 0.00                            | 57.47                         | 68.20                | -10.73      |
| * 15840.00      | -135.00              | Average  | H          | 54.66       | 0.00                            | 26.66                         | 53.98                | -27.32      |
| * 15840.00      | -125.00              | Peak     | H          | 54.66       | 0.00                            | 36.66                         | 73.98                | -37.32      |
| * 21120.00      | -104.55              | Average  | H          | 44.49       | -9.54                           | 37.40                         | 53.98                | -16.58      |
| * 21120.00      | -102.52              | Peak     | H          | 44.49       | -9.54                           | 39.43                         | 73.98                | -34.55      |
| 26400.00        | -125.00              | Peak     | H          | 42.76       | 0.00                            | 24.76                         | 68.20                | -43.44      |

**Table 6-20. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5320MHz  
Channel: 64

| Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| * 10640.00      | -106.30              | Average  | H          | 49.07       | 0.00                            | 49.76                         | 53.98                | -4.22       |
| * 10640.00      | -96.17               | Peak     | H          | 49.07       | 0.00                            | 59.89                         | 73.98                | -14.09      |
| * 15960.00      | -135.00              | Average  | H          | 54.99       | 0.00                            | 26.99                         | 53.98                | -26.99      |
| * 15960.00      | -125.00              | Peak     | H          | 54.99       | 0.00                            | 36.99                         | 73.98                | -36.99      |
| * 21280.00      | -105.34              | Average  | H          | 44.47       | -9.54                           | 36.59                         | 53.98                | -17.39      |
| * 21280.00      | -101.66              | Peak     | H          | 44.47       | -9.54                           | 40.27                         | 73.98                | -33.71      |
| 26600.00        | -125.00              | Peak     | H          | 42.71       | 0.00                            | 24.71                         | 68.20                | -43.49      |

**Table 6-21. Radiated Measurements**

## Radiated Spurious Emission Measurements (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5500MHz  
Channel: 100

|   | Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|---|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| * | 11000.00        | -106.92              | Average  | H          | 49.89       | 0.00                            | 49.97                         | 53.98                | -4.01       |
| * | 11000.00        | -98.03               | Peak     | H          | 49.89       | 0.00                            | 58.86                         | 73.98                | -15.12      |
|   | 16500.00        | -125.00              | Peak     | H          | 56.14       | 0.00                            | 38.14                         | 68.20                | -30.06      |
|   | 22000.00        | -101.19              | Peak     | H          | 44.53       | -9.54                           | 40.80                         | 68.20                | -27.40      |
|   | 27500.00        | -125.00              | Peak     | H          | 43.10       | 0.00                            | 25.10                         | 68.20                | -43.10      |

**Table 6-22. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5580MHz  
Channel: 116

|   | Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|---|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| * | 11160.00        | -106.21              | Average  | H          | 50.05       | 0.00                            | 50.84                         | 53.98                | -3.14       |
| * | 11160.00        | -97.37               | Peak     | H          | 50.05       | 0.00                            | 59.68                         | 73.98                | -14.30      |
|   | 16740.00        | -125.00              | Peak     | H          | 56.20       | 0.00                            | 38.20                         | 68.20                | -30.00      |
| * | 22320.00        | -104.63              | Average  | H          | 44.49       | -9.54                           | 37.32                         | 53.98                | -16.66      |
| * | 22320.00        | -102.21              | Peak     | H          | 44.49       | -9.54                           | 39.74                         | 73.98                | -34.24      |
|   | 27900.00        | -125.00              | Peak     | H          | 42.76       | 0.00                            | 24.76                         | 68.20                | -43.44      |

**Table 6-23. Radiated Measurements**

|                                      |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 72 of 104                  |

## Radiated Spurious Emission Measurements (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5700MHz  
Channel: 140

|   | Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|---|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| * | 11400.00        | -106.29              | Average  | H          | 49.82       | 0.00                            | 50.53                         | 53.98                | -3.45       |
| * | 11400.00        | -98.26               | Peak     | H          | 49.82       | 0.00                            | 58.56                         | 73.98                | -15.42      |
|   | 17100.00        | -125.00              | Peak     | H          | 57.45       | 0.00                            | 39.45                         | 68.20                | -28.75      |
| * | 22800.00        | -105.47              | Average  | H          | 44.47       | -9.54                           | 36.46                         | 53.98                | -17.52      |
| * | 22800.00        | -101.93              | Peak     | H          | 44.47       | -9.54                           | 40.00                         | 73.98                | -33.98      |
|   | 28500.00        | -125.00              | Peak     | H          | 42.71       | 0.00                            | 24.71                         | 68.20                | -43.49      |

**Table 6-24. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5745MHz  
Channel: 149

|   | Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dB $\mu$ V/m] | Limit [dB $\mu$ V/m] | Margin [dB] |
|---|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------------|----------------------|-------------|
| * | 11490.00        | -112.86              | Avg      | H          | 50.95       | 0.00                            | 45.09                         | 53.98                | -8.89       |
| * | 11490.00        | -101.09              | Peak     | H          | 50.95       | 0.00                            | 56.86                         | 73.98                | -17.12      |
|   | 17235.00        | -125.00              | Peak     | H          | 59.91       | 0.00                            | 41.91                         | 68.20                | -26.29      |
| * | 22980.00        | -114.87              | Avg      | H          | 63.39       | -9.54                           | 45.98                         | 53.98                | -8.00       |
| * | 22980.00        | -103.06              | Peak     | H          | 63.39       | -9.54                           | 57.79                         | 73.98                | -16.19      |
|   | 287235.00       | -125.00              | Peak     | H          | 43.10       | 0.00                            | 25.10                         | 68.20                | -43.10      |

**Table 6-25. Radiated Measurements**

|                                      |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 73 of 104                  |

## Radiated Spurious Emission Measurements (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5785MHz  
Channel: 157

| Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11570.00      | -112.86              | Avg      | H          | 50.24       | 0.00                            | 44.39                   | 53.98          | -9.59       |
| * 11570.00      | -100.60              | Peak     | H          | 50.24       | 0.00                            | 56.65                   | 73.98          | -17.33      |
| 17355.00        | -125.00              | Peak     | H          | 59.73       | 0.00                            | 41.73                   | 68.20          | -26.47      |
| 23140.00        | -125.00              | Peak     | H          | 44.49       | 0.00                            | 26.49                   | 68.20          | -41.71      |
| 28925.00        | -125.00              | Peak     | H          | 42.76       | 0.00                            | 24.76                   | 68.20          | -43.44      |

**Table 6-26. Radiated Measurements**

Worst Case Mode: 802.11a  
Worst Case Transfer Rate: 6 Mbps  
Distance of Measurements: 1 & 3 Meters  
Operating Frequency: 5825MHz  
Channel: 165

| Frequency [MHz] | Analyzer Level [dBm] | Detector | Pol. [H/V] | AFCL [dB/m] | Distance Correction Factor [dB] | Field Strength [dBμV/m] | Limit [dBμV/m] | Margin [dB] |
|-----------------|----------------------|----------|------------|-------------|---------------------------------|-------------------------|----------------|-------------|
| * 11650.00      | -112.82              | Avg      | H          | 50.33       | 0.00                            | 44.51                   | 53.98          | -9.47       |
| * 11650.00      | -100.87              | Peak     | H          | 50.33       | 0.00                            | 56.46                   | 73.98          | -17.52      |
| 17475.00        | -125.00              | Peak     | H          | 59.67       | 0.00                            | 41.67                   | 68.20          | -26.53      |
| 23300.00        | -125.00              | Peak     | H          | 44.47       | 0.00                            | 26.47                   | 68.20          | -41.73      |
| 29125.00        | -125.00              | Peak     | H          | 42.71       | 0.00                            | 24.71                   | 68.20          | -43.49      |

**Table 6-27. Radiated Measurements**

|                                      |                                                                                     |                                                                     |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                       |                                                                                       | Page 74 of 104                  |

## 6.8 Radiated Band Edge Measurements (20MHz BW)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

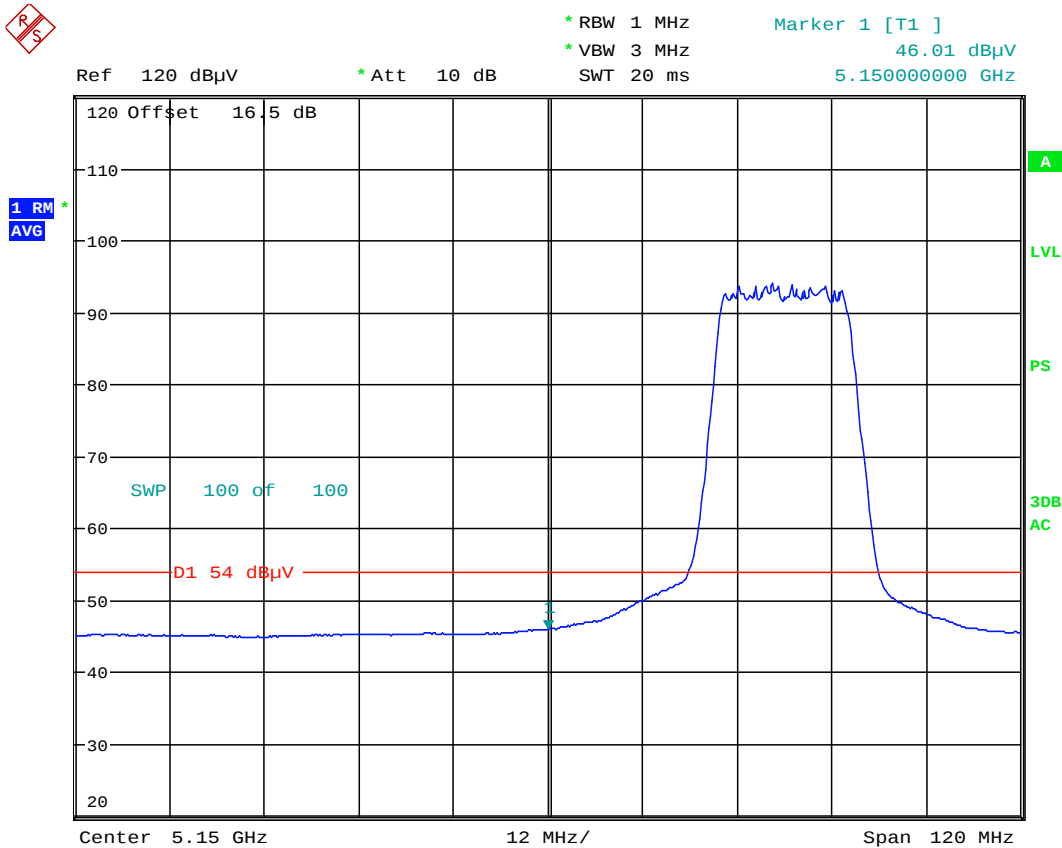
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5180MHz

Channel: 36

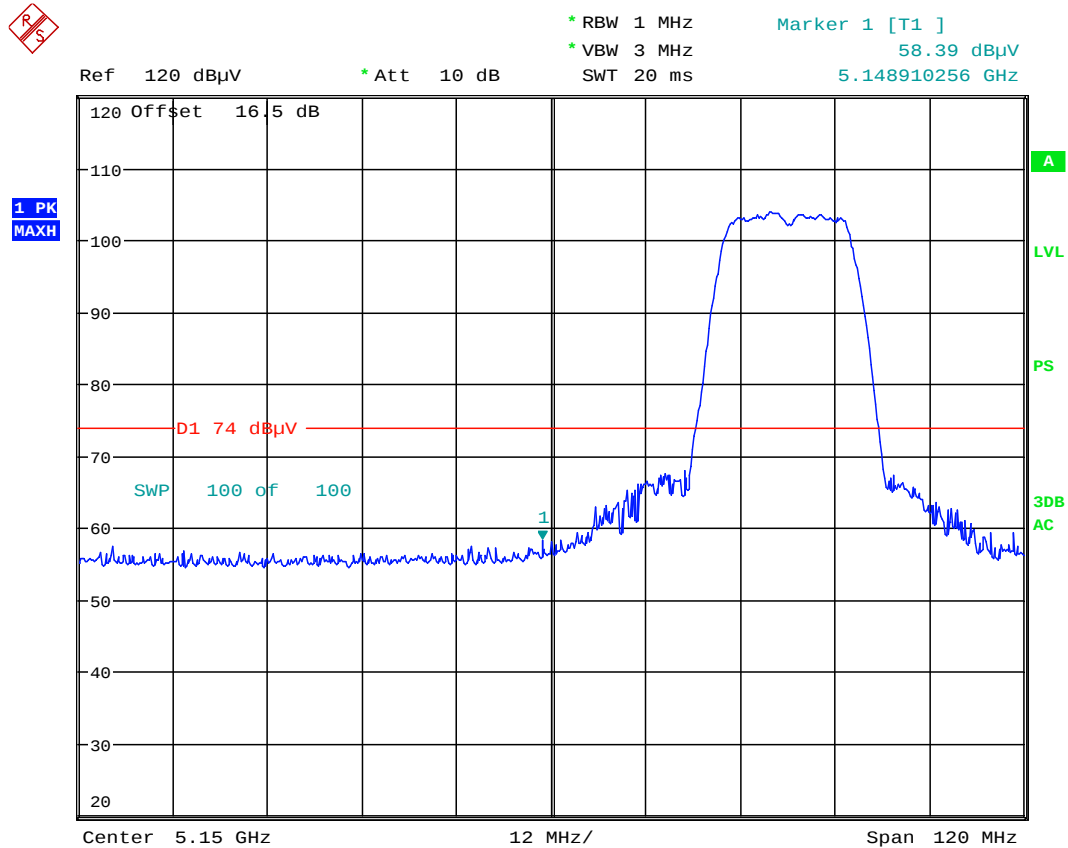


Date: 17.JUL.2013 15:51:37

**Plot 6-84. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 75 of 104                  |

# Radiated Band Edge Measurements (20MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 15:52:18

**Plot 6-85. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 76 of 104                  |

# Radiated Band Edge Measurements (20MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

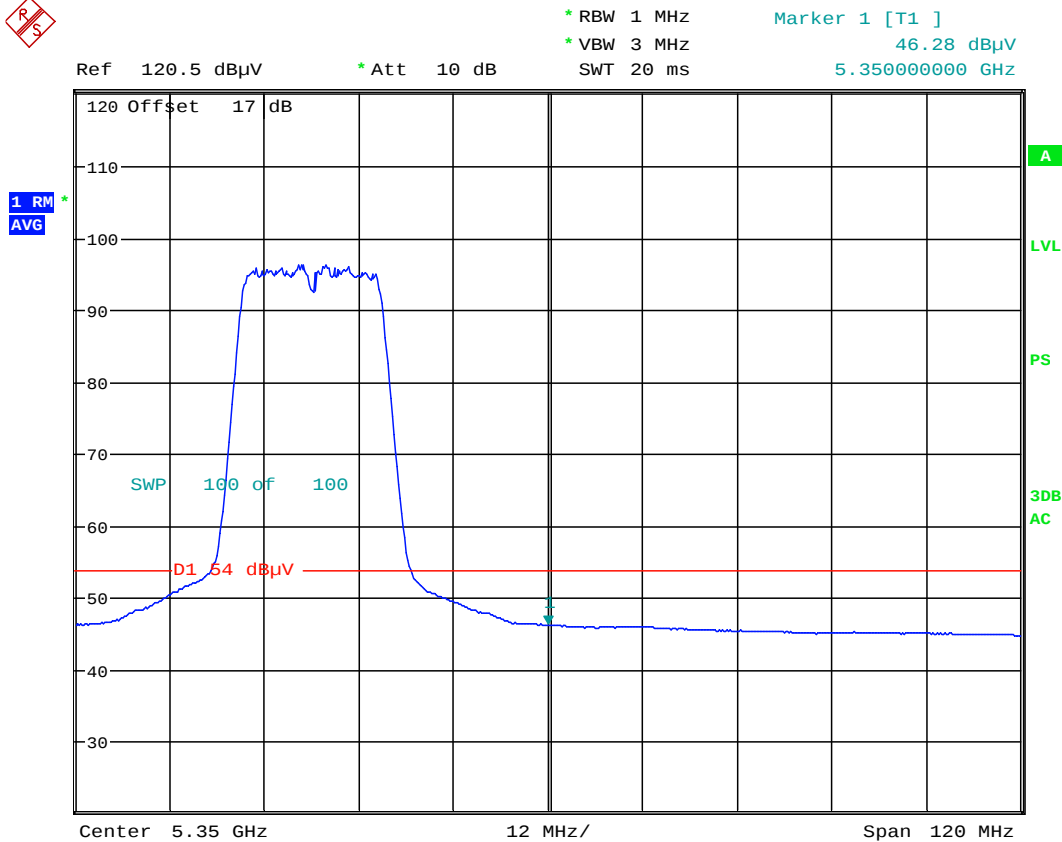
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5320MHz

Channel: 64

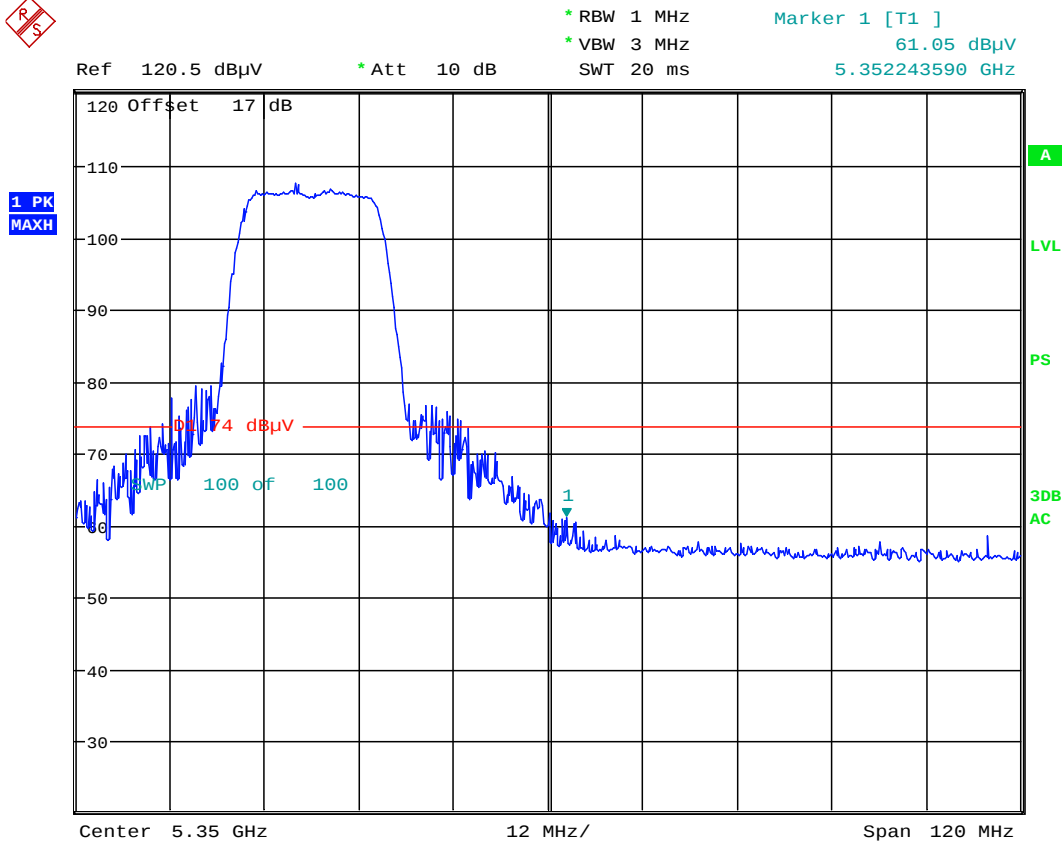


Date: 17.JUL.2013 16:23:08

**Plot 6-86. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2)**

|                                      |                                               |                                                                        |    |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |    | Page 77 of 104                  |

# Radiated Band Edge Measurements (20MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 16:24:35

**Plot 6-87. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2)**

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 78 of 104                  |

# Radiated Band Edge Measurements (20MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

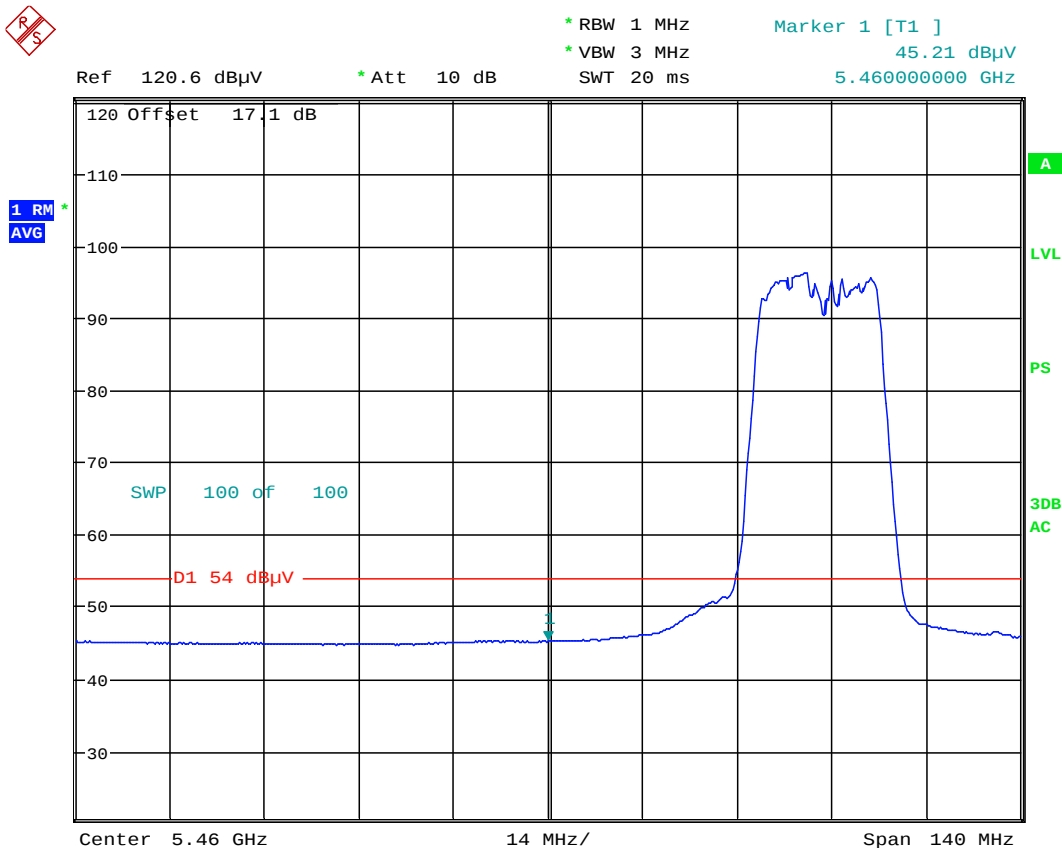
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5500MHz

Channel: 100

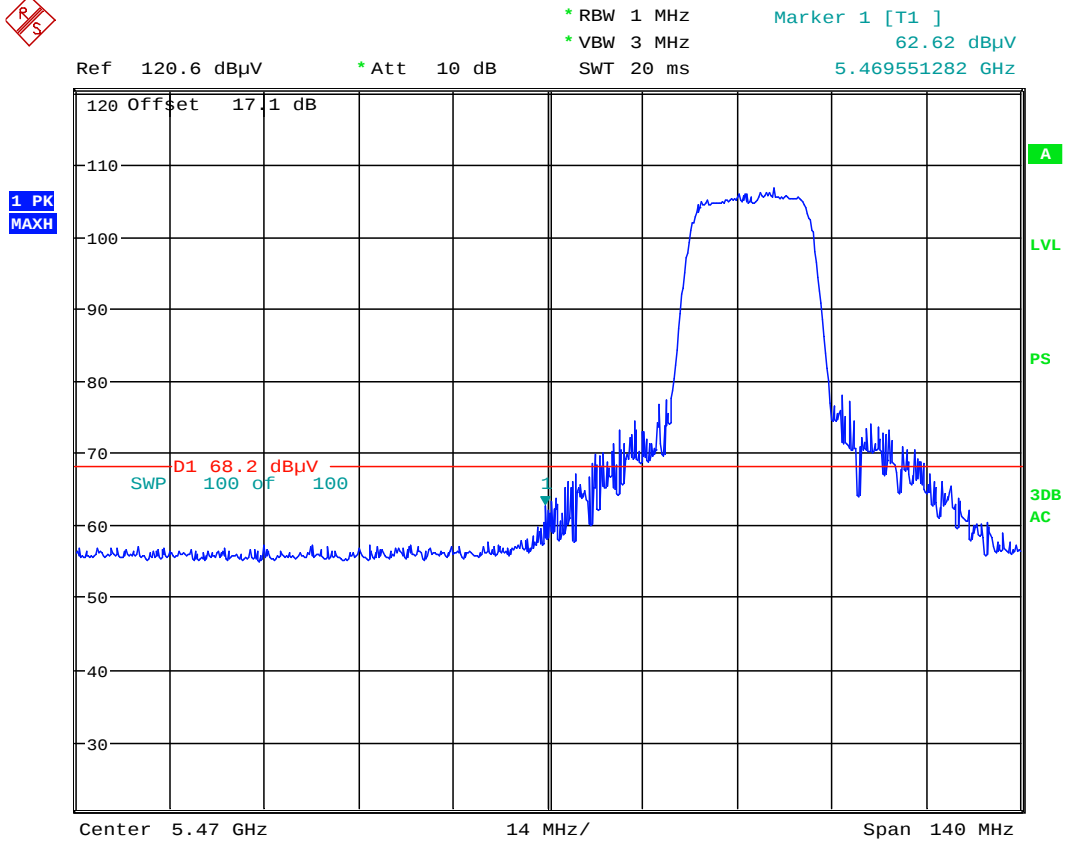


Date: 17.JUL.2013 16:29:22

**Plot 6-88. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 3)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 79 of 104                  |

# Radiated Band Edge Measurements (20MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 16:31:30

**Plot 6-89. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 3)**

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 80 of 104                  |

## Radiated Band Edge Measurements (20MHz BW) (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

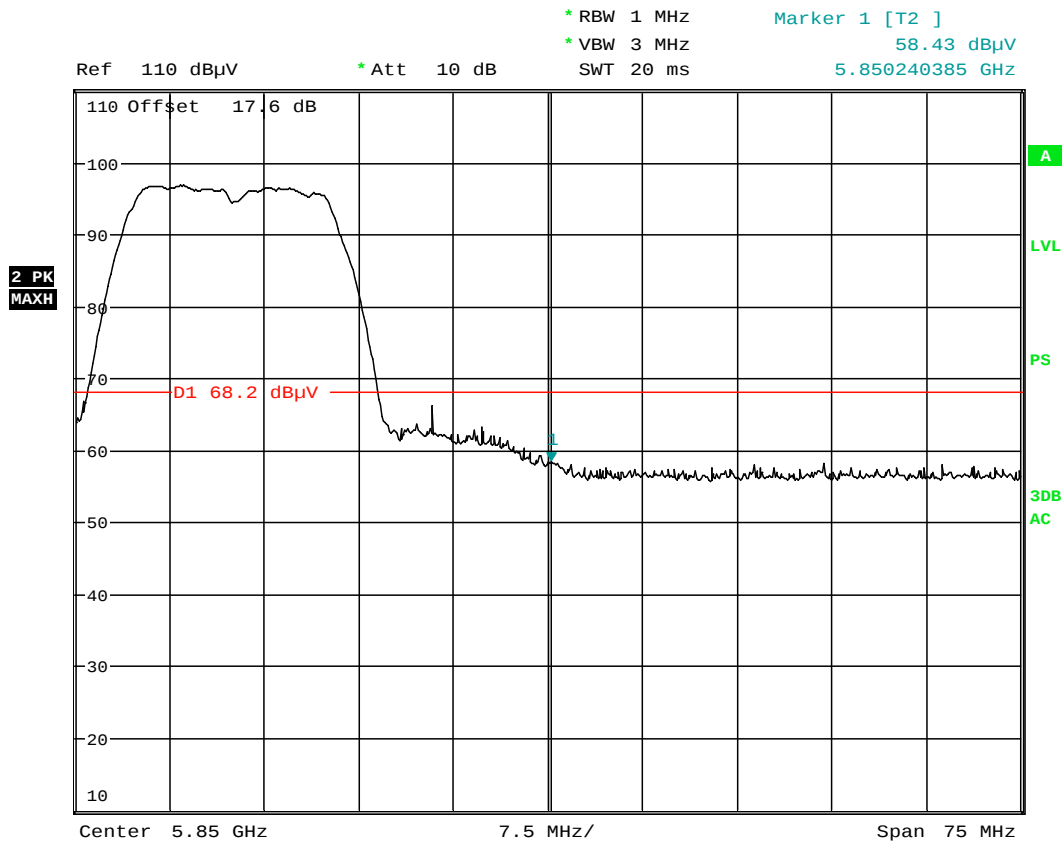
Worst Case Mode: 802.11n (20MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5825MHz

Channel: 165



Date: 6.AUG.2013 21:06:04

**Plot 6-90. Radiated Non-restricted Upper Band Edge Plot (Peak – UNII Band 4)**

|                                      |                                               |                                                                        |    |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |    | Page 81 of 104                  |

## 6.9 Radiated Band Edge Measurements (40MHz BW)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

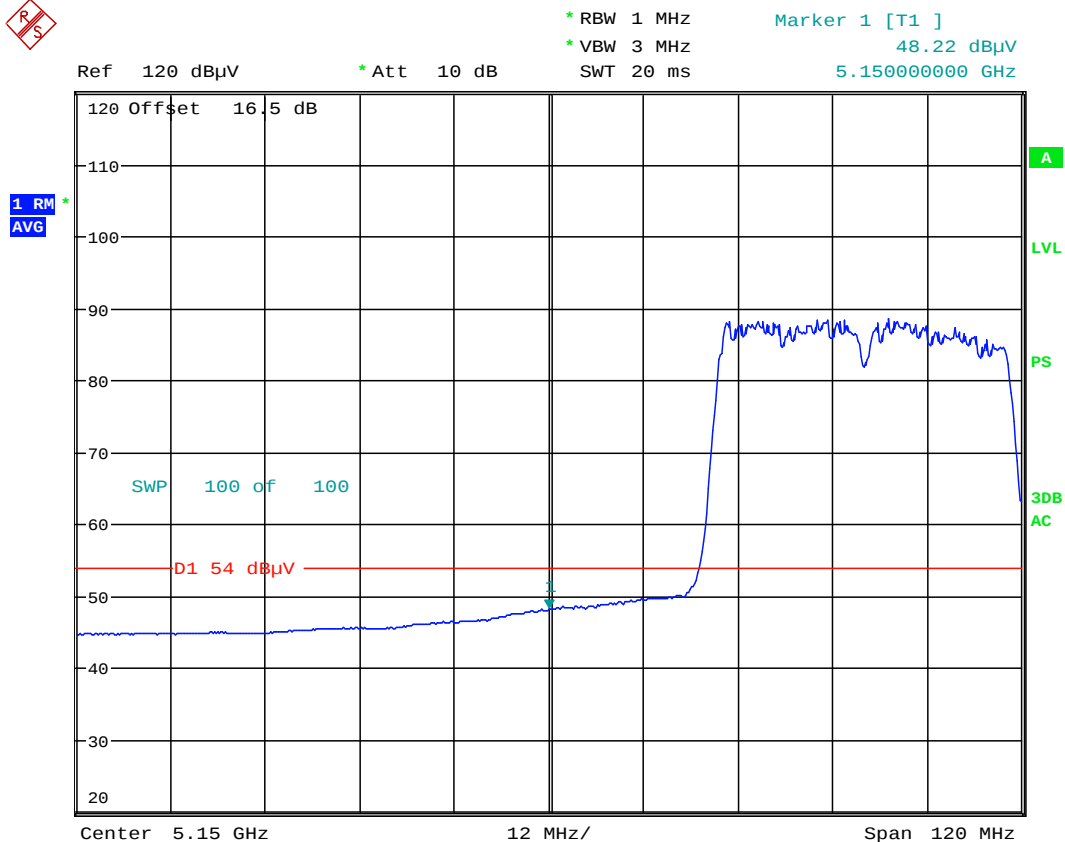
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5190MHz

Channel: 38

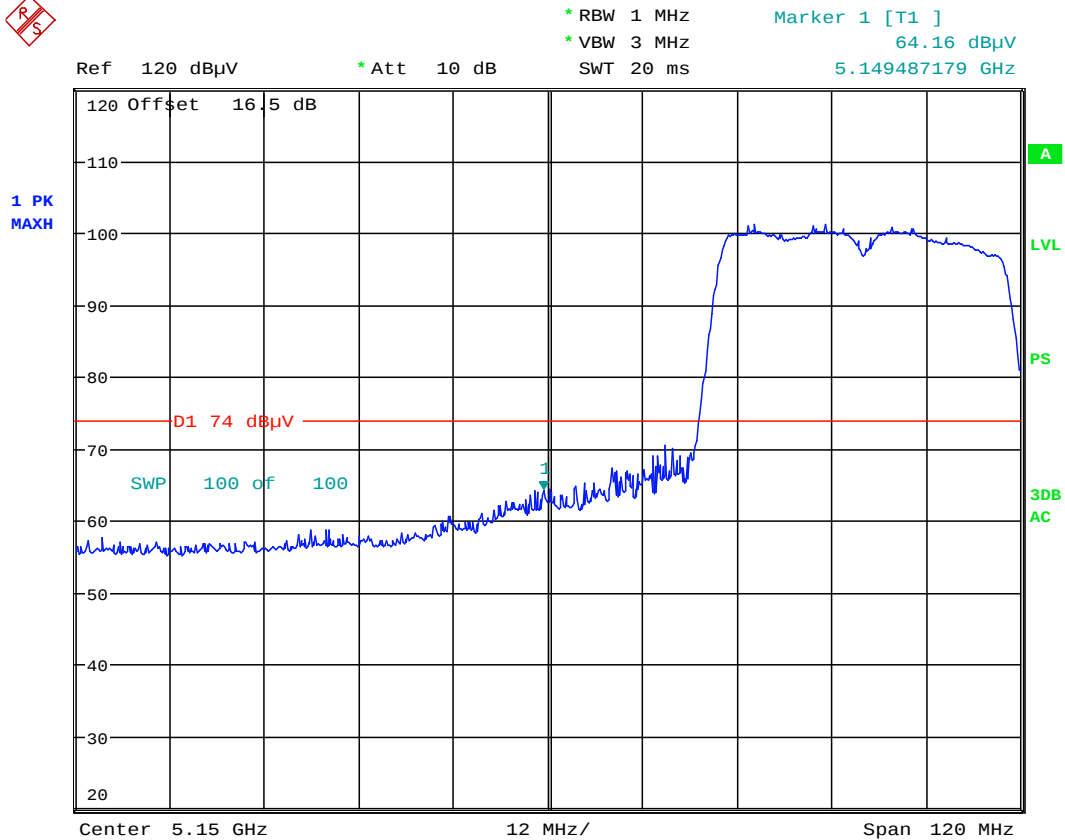


Date: 17.JUL.2013 16:01:15

**Plot 6-91. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)**

|                                      |                                               |                                                                        |    |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |    | Page 82 of 104                  |

# Radiated Band Edge Measurements (40MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 16:00:27

**Plot 6-92. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)**

|                                      |                                                                                     |                                                                        |                                                                                       |                                 |
|--------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------|
| FCC ID: ZNFD803                      |  | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                                                      | EUT Type:<br>Portable Handset                                          |                                                                                       | Page 83 of 104                  |

## Radiated Band Edge Measurements (40MHz BW) (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

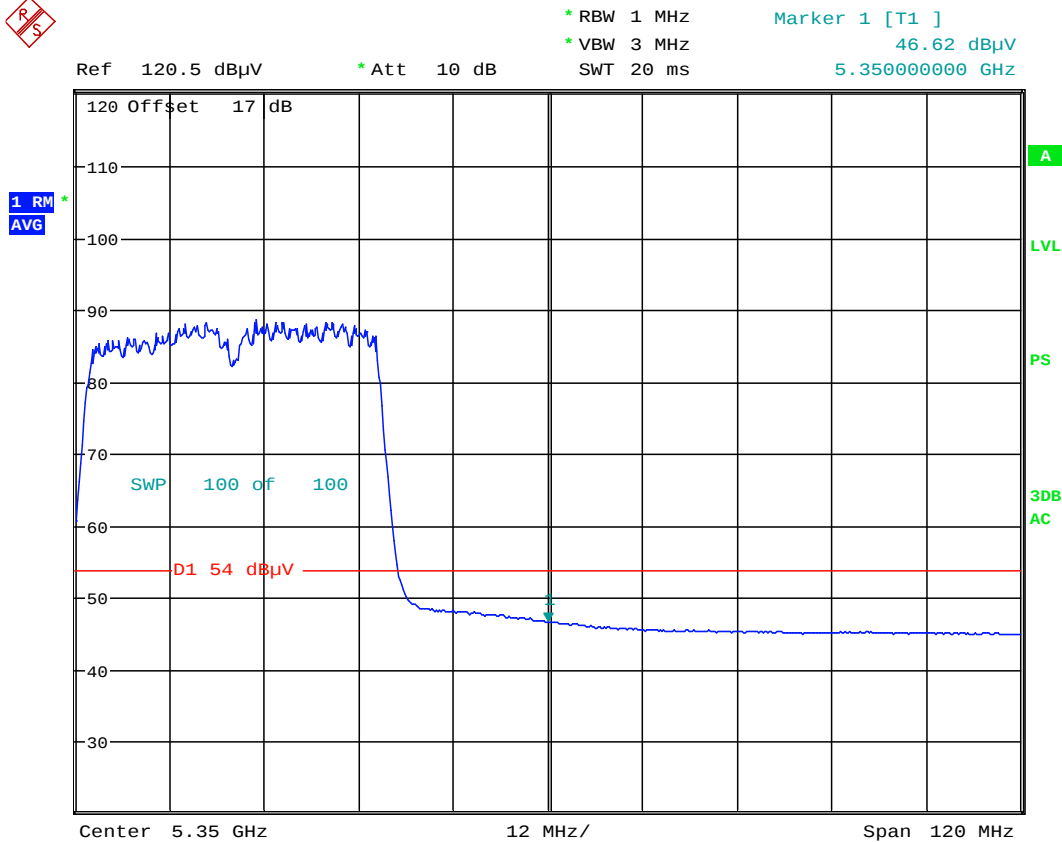
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5310MHz

Channel: 62

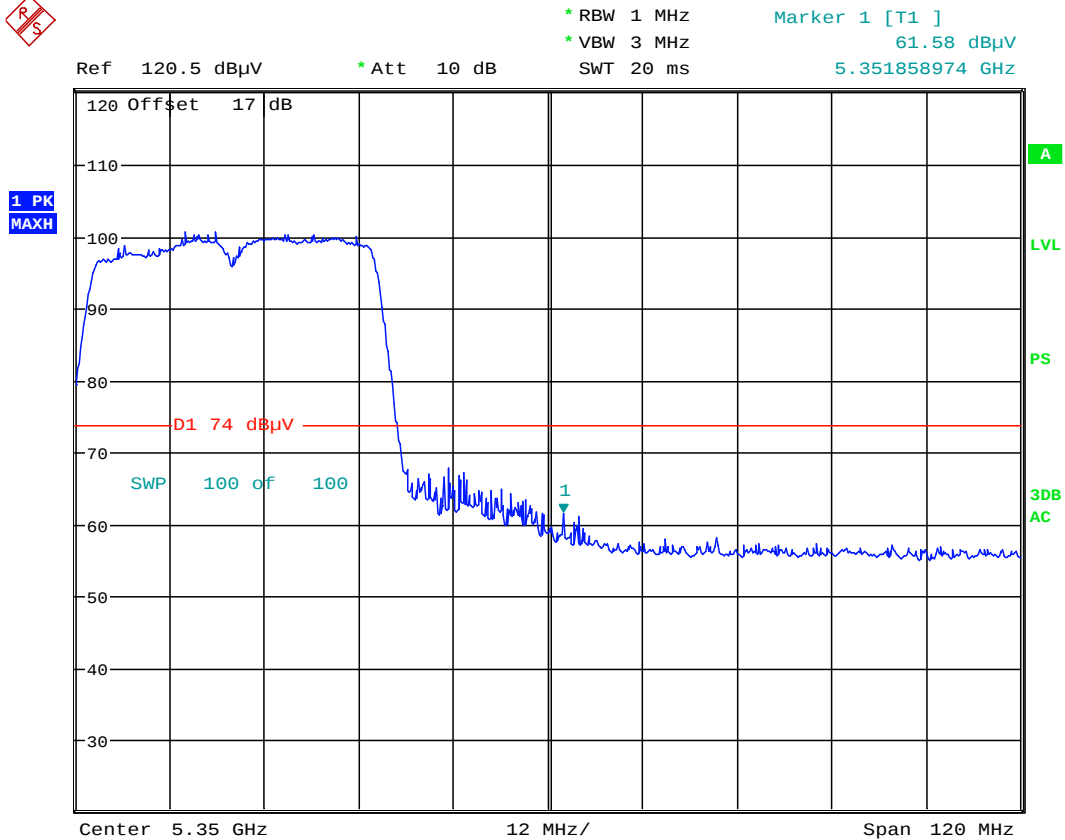


Date: 17.JUL.2013 16:18:00

**Plot 6-93. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2)**

|                                      |                                               |                                                                        |    |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |    | Page 84 of 104                  |

# Radiated Band Edge Measurements (40MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 16:17:24

**Plot 6-94. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2)**

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 85 of 104                  |

## Radiated Band Edge Measurements (40MHz BW) (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

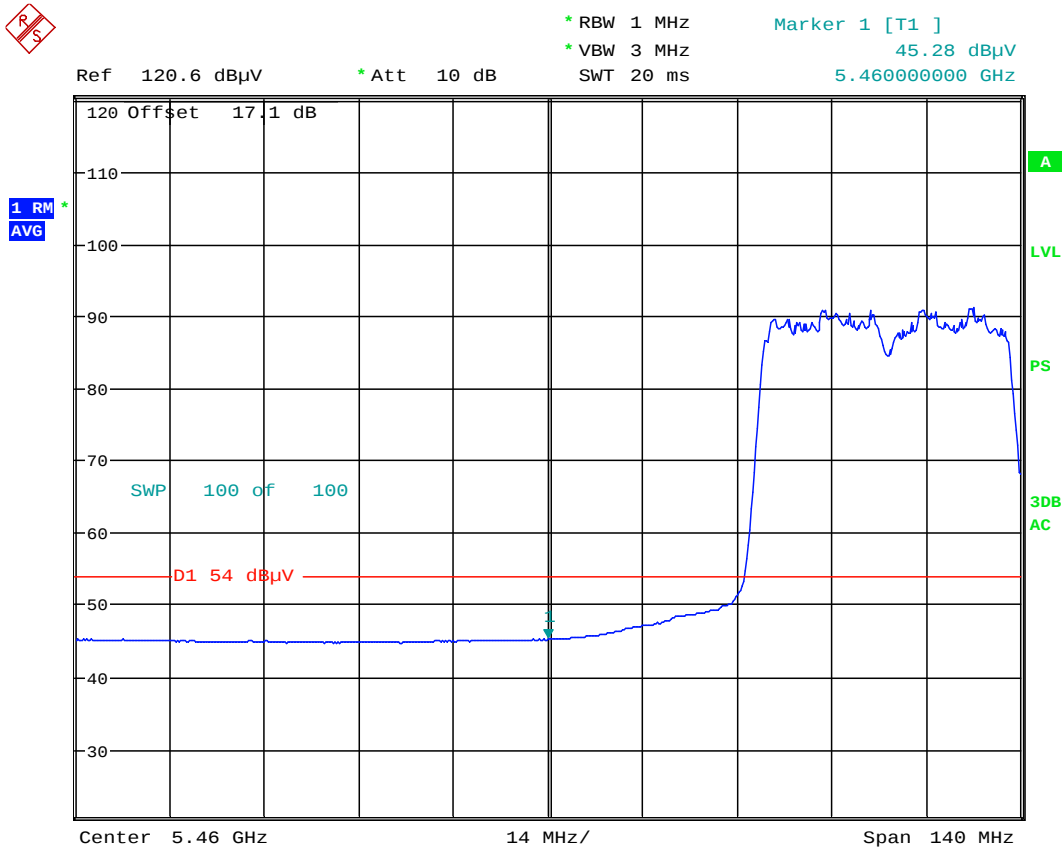
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5510MHz

Channel: 102

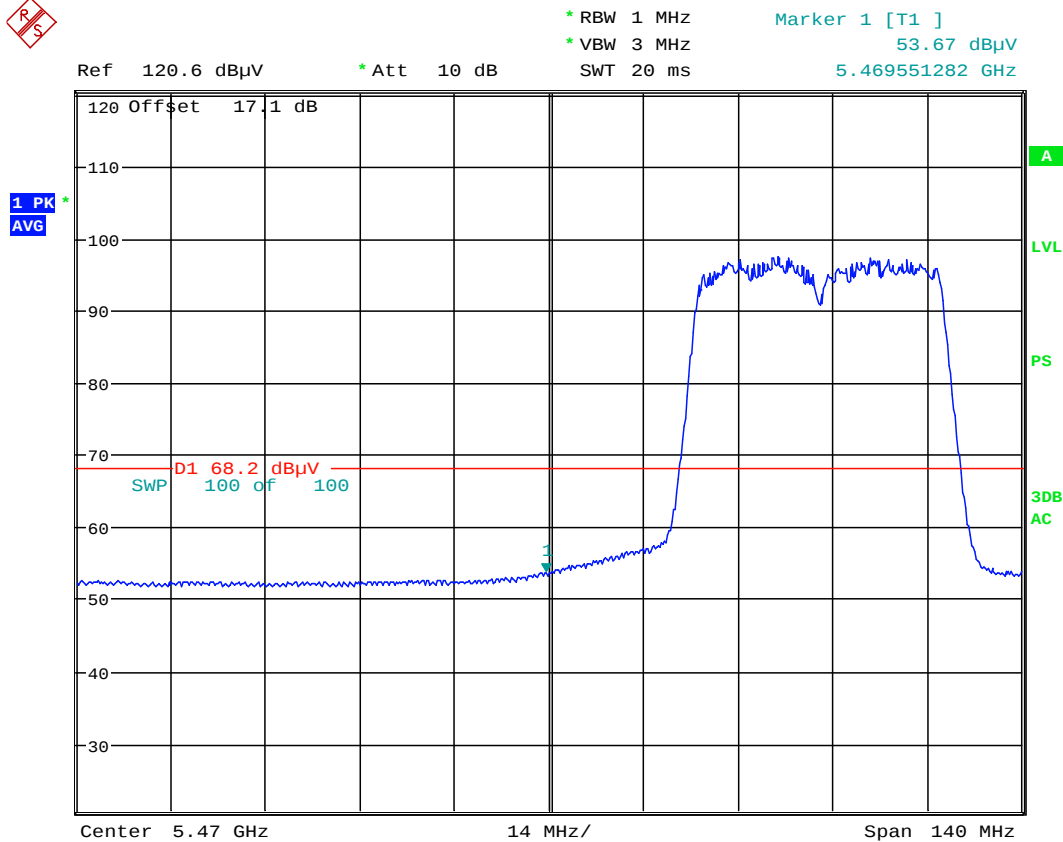


Date: 17.JUL.2013 16:37:33

**Plot 6-95. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 3)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 86 of 104                  |

# Radiated Band Edge Measurements (40MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 16:35:51

**Plot 6-96. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 3)**

|                                      |                                               |                                                                        |    |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |    | Page 87 of 104                  |

# Radiated Band Edge Measurements (40MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

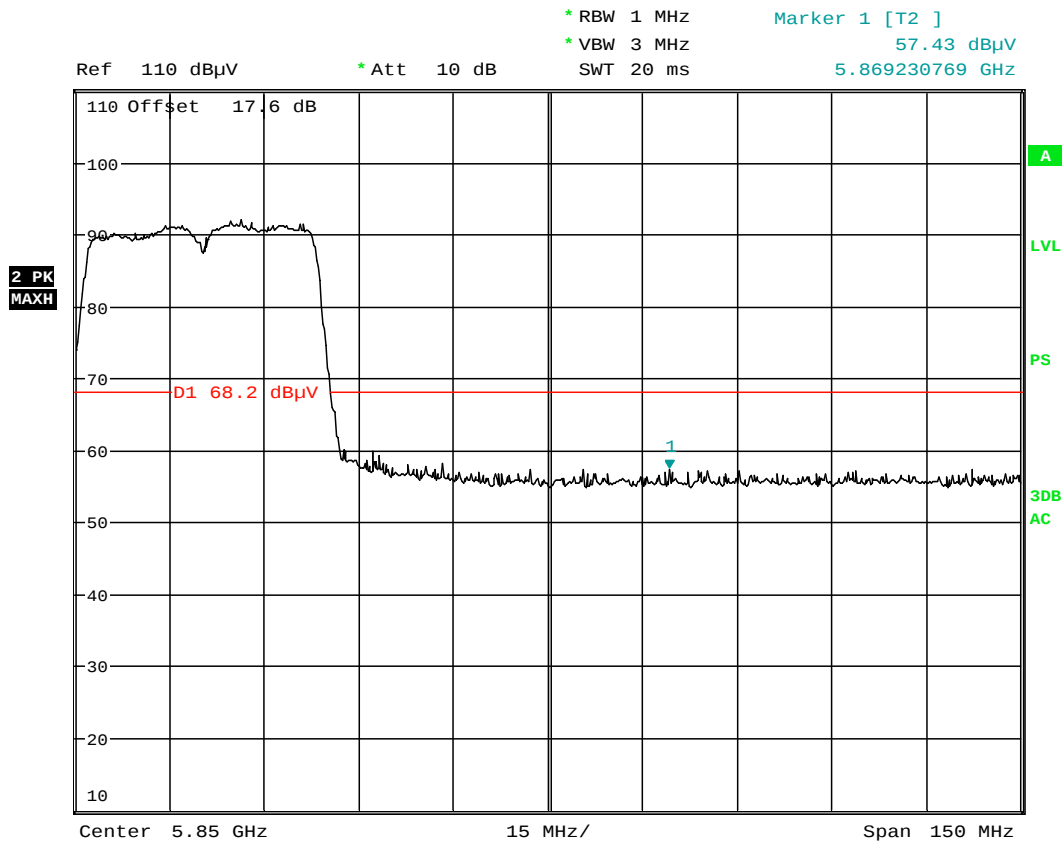
Worst Case Mode: 802.11n (40MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5795MHz

Channel: 159



Date: 6.AUG.2013 21:09:13

**Plot 6-97. Radiated Non-restricted Upper Band Edge Plot (Peak – UNII Band 4)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 88 of 104                  |

## 6.10 Radiated Band Edge Measurements (80MHz BW)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

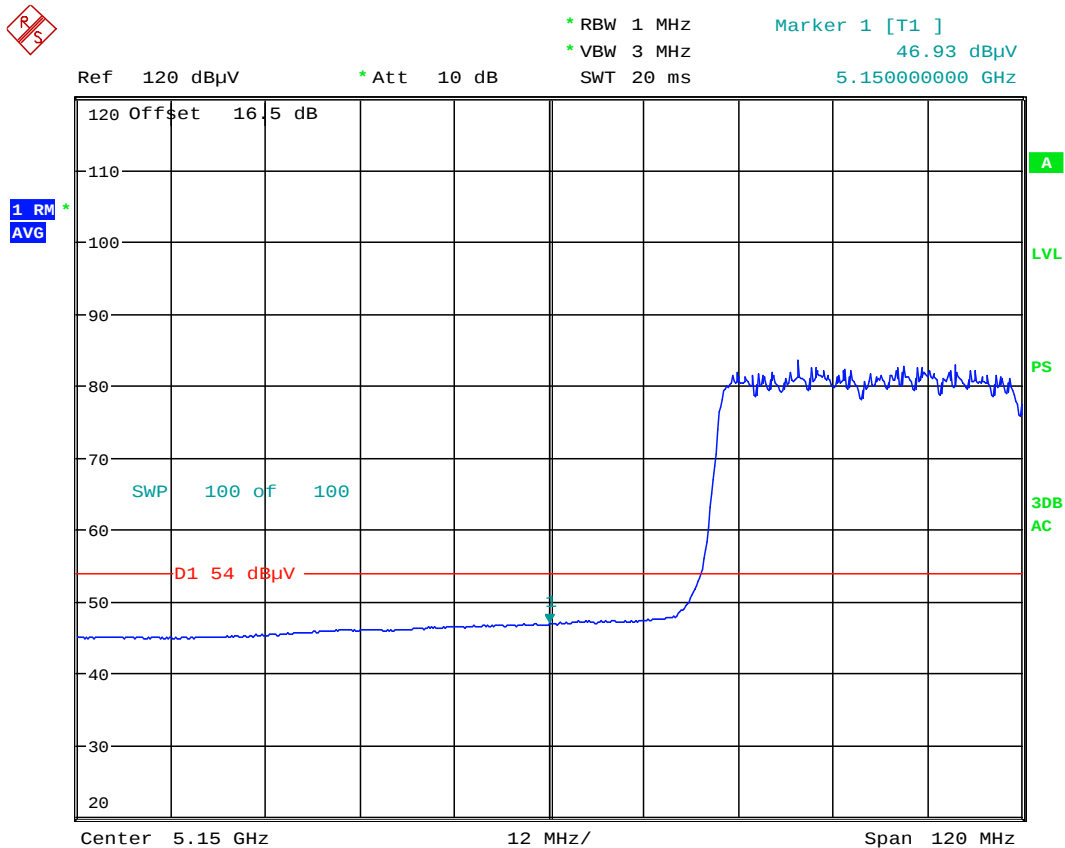
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5210MHz

Channel: 42

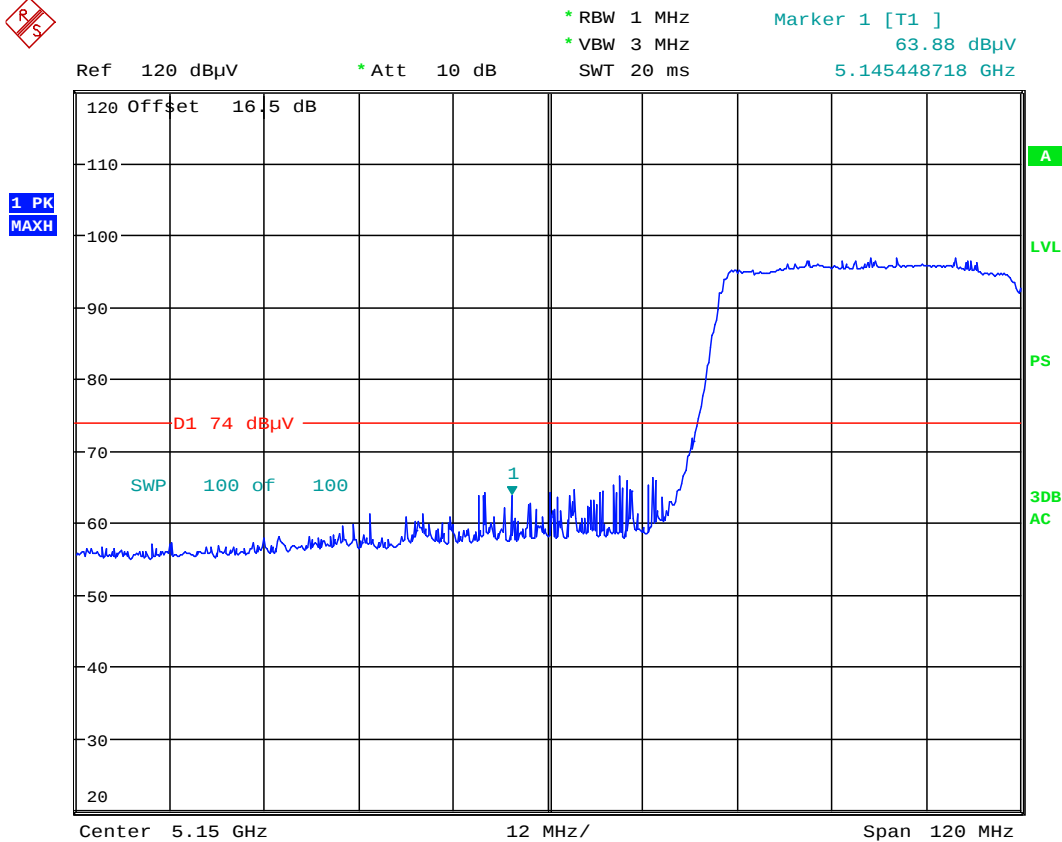


Date: 17.JUL.2013 16:05:48

**Plot 6-98. Radiated Restricted Lower Band Edge Plot (Average – UNII Band 1)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 89 of 104                  |

# Radiated Band Edge Measurements (80MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 16:06:55

**Plot 6-99. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 1)**

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 90 of 104                  |

## Radiated Band Edge Measurements (80MHz BW) (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

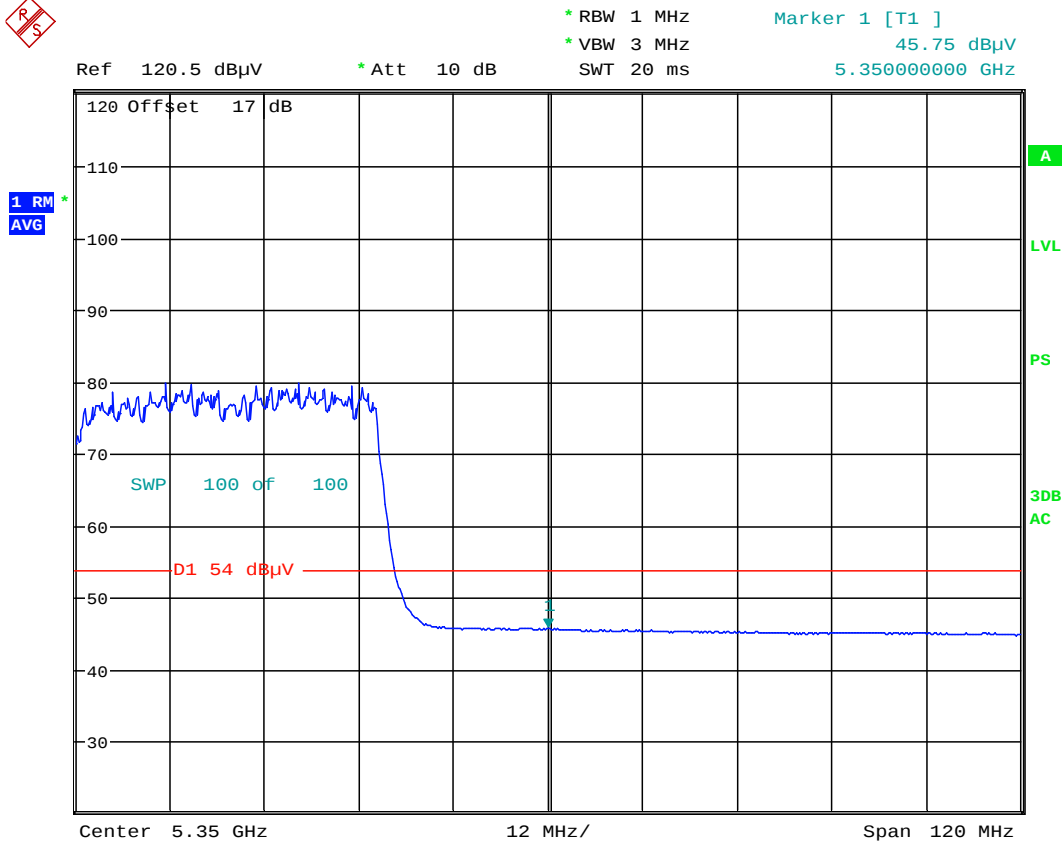
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5290MHz

Channel: 58

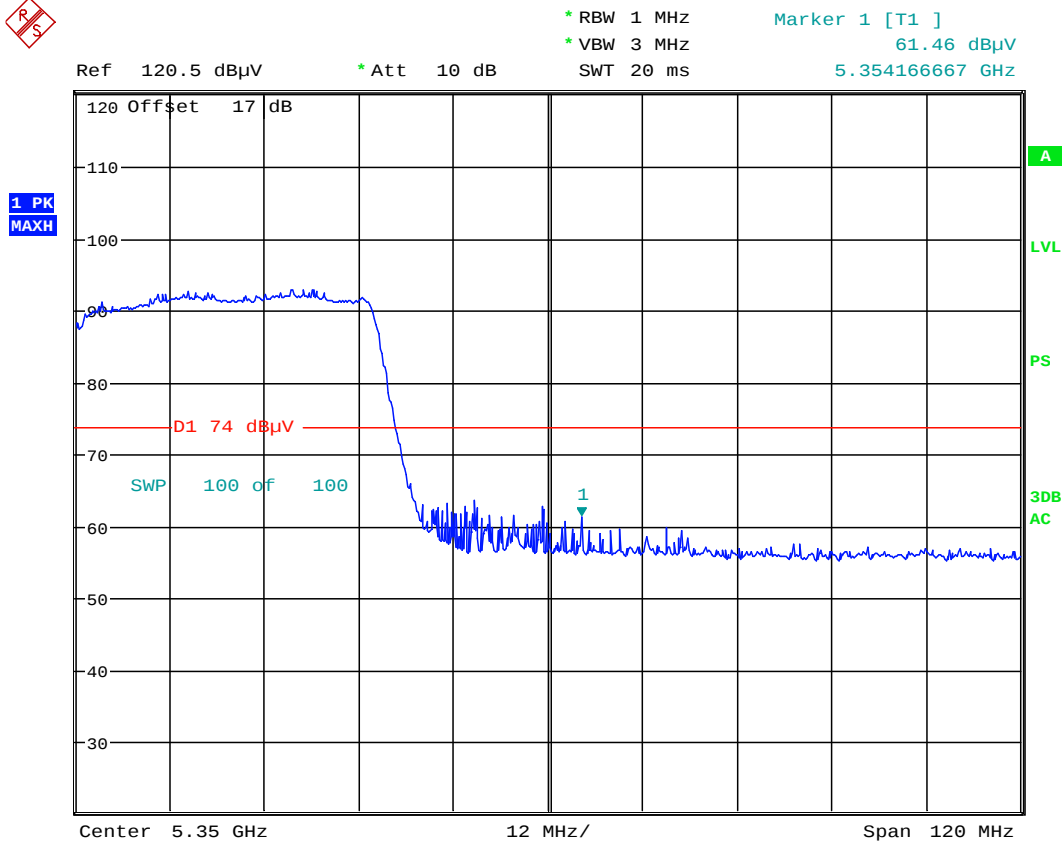


Date: 17.JUL.2013 16:11:52

**Plot 6-100. Radiated Restricted Upper Band Edge Plot (Average – UNII Band 2)**

|                                      |                                               |                                                                        |    |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |    | Page 91 of 104                  |

# Radiated Band Edge Measurements (80MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 16:13:42

**Plot 6-101. Radiated Restricted Upper Band Edge Plot (Peak – UNII Band 2)**

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 92 of 104                  |

## Radiated Band Edge Measurements (80MHz BW) (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

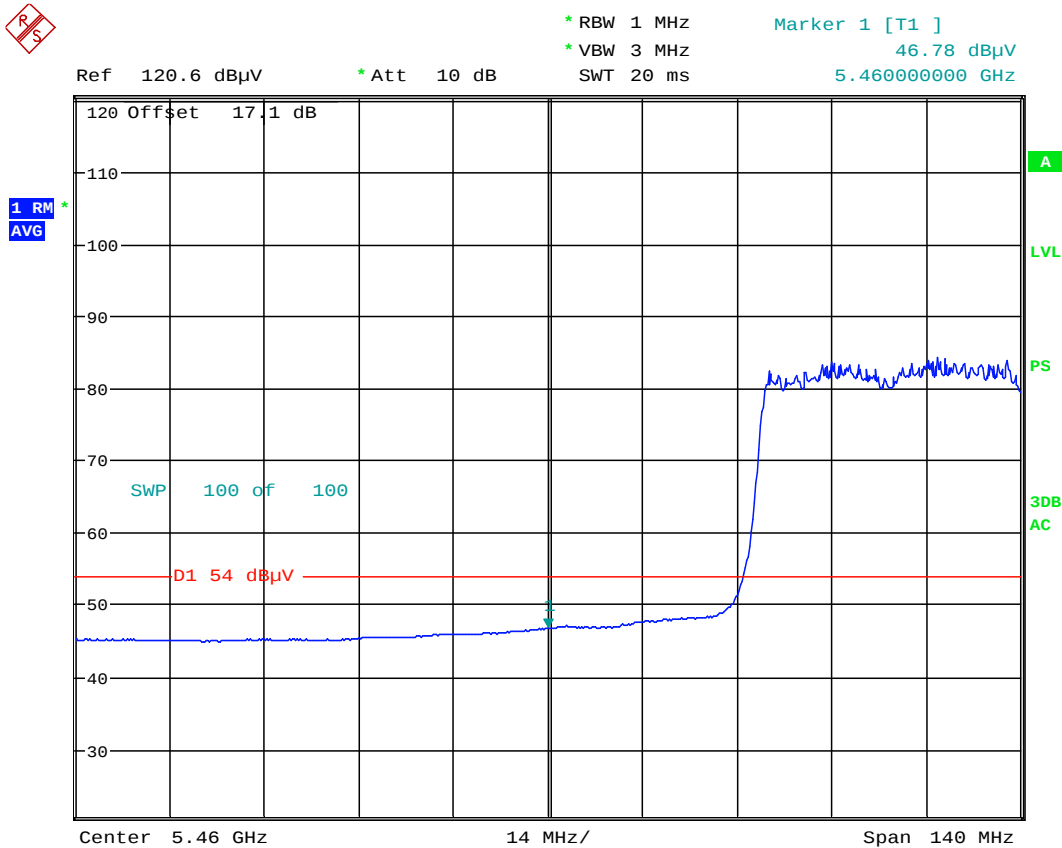
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5530MHz

Channel: 106

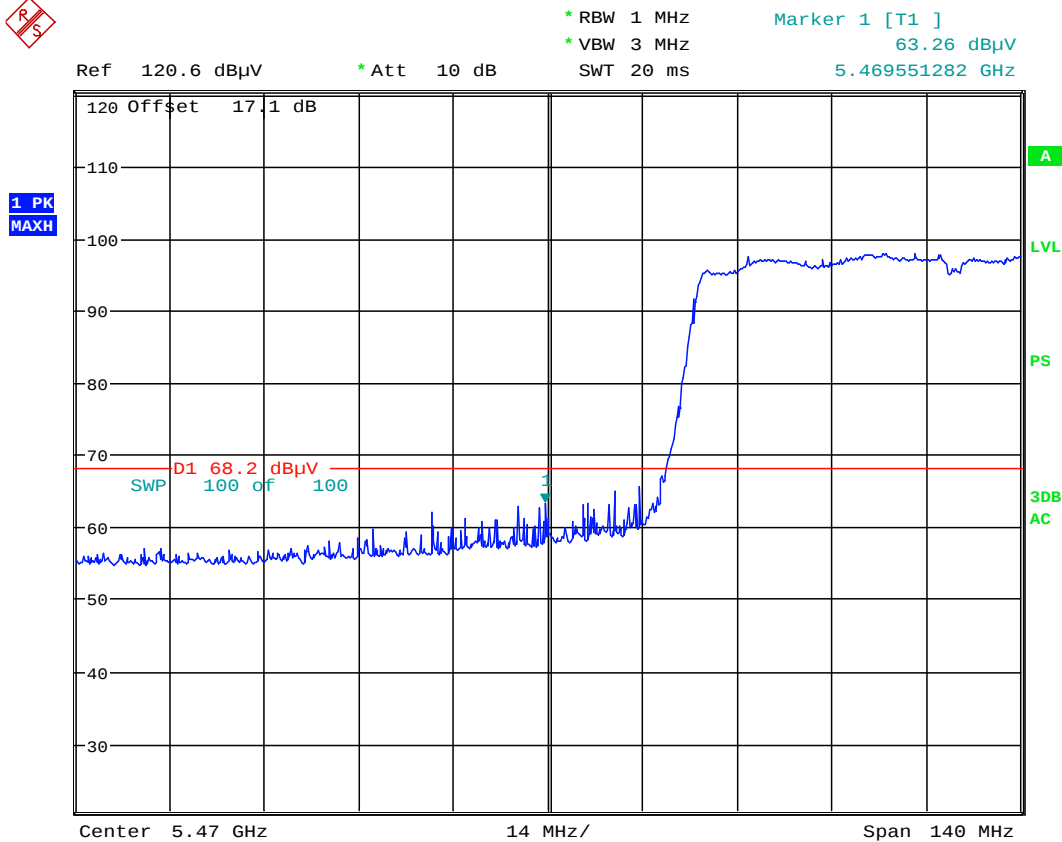


Date: 17.JUL.2013 16:48:57

**Plot 6-102. Radiated Restricted Lower Band Edge Plot (Average - UNII Band 3)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 93 of 104                  |

# Radiated Band Edge Measurements (80MHz BW) (Cont'd) §15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]



Date: 17.JUL.2013 16:51:33

**Plot 6-103. Radiated Restricted Lower Band Edge Plot (Peak – UNII Band 3)**

|                                      |                                        |                                                                        |    |                                 |
|--------------------------------------|----------------------------------------|------------------------------------------------------------------------|----|---------------------------------|
| FCC ID: ZNFD803                      | PCTEST<br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013         | EUT Type:<br>Portable Handset                                          |    | Page 94 of 104                  |

## Radiated Band Edge Measurements (80MHz BW) (Cont'd)

§15.407(b)(1) and (2), §15.205 & §15.209; RSS-210 [A9.2]

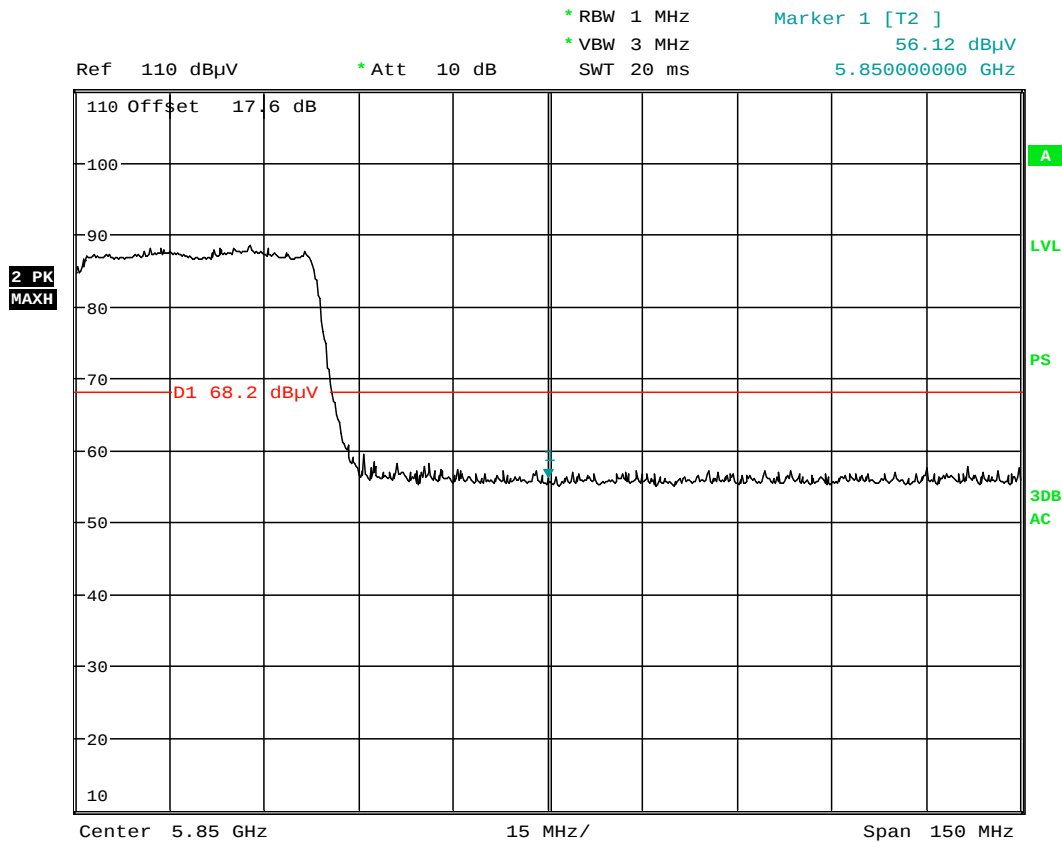
Worst Case Mode: 802.11ac (80MHz)

Worst Case Transfer Rate: MCS0

Distance of Measurements: 3 Meters

Operating Frequency: 5775MHz

Channel: 155



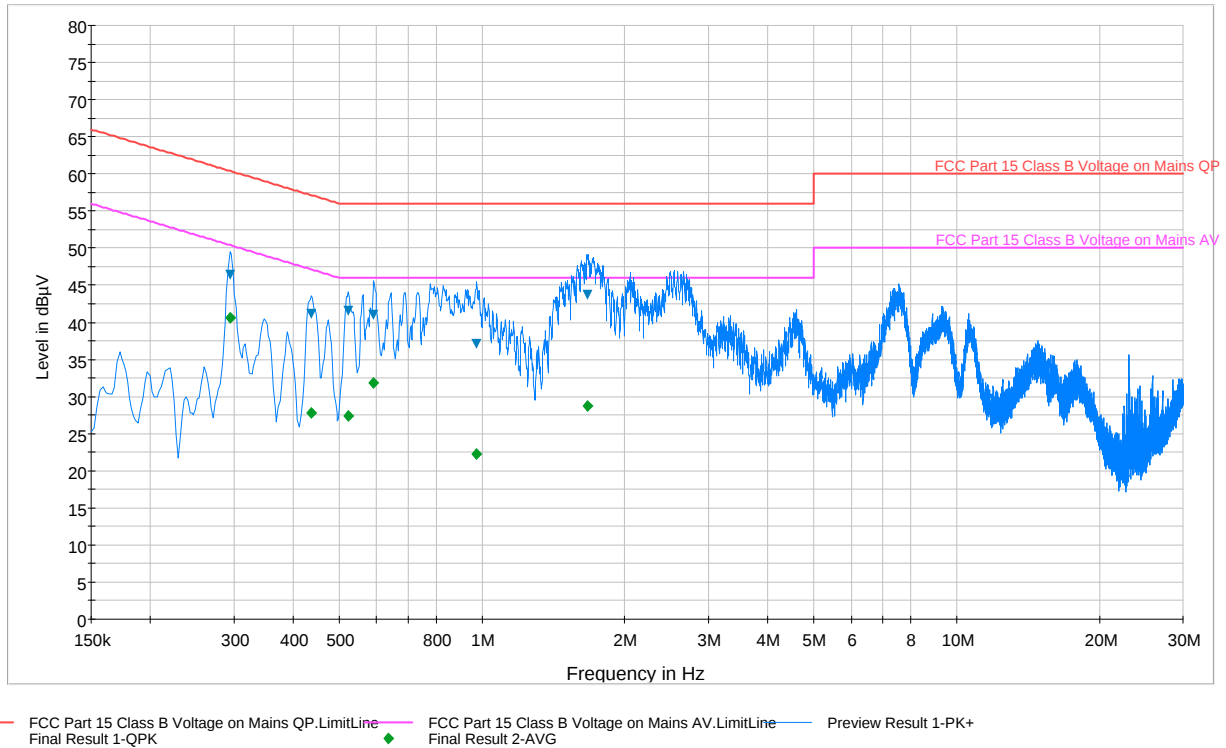
Date: 6.AUG.2013 21:10:27

**Plot 6-104. Radiated Non-restricted Upper Band Edge Plot (Peak – UNII Band 4)**

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 95 of 104                  |

## 6.11 Line-Conducted Test Data

### §15.207; RSS-Gen [7.2.2]



**Plot 6-105. Line Conducted Plot with 802.11a UNII Band 1 (L1)**

| Frequency<br>MHz | Line | Corr.<br>dB | QuasiPeak<br>dBµV | Limit<br>dBµV | Margin<br>dB | Average<br>dBµV | Limit<br>dBµV | Margin<br>dB |
|------------------|------|-------------|-------------------|---------------|--------------|-----------------|---------------|--------------|
| 0.294            | L1   | 0.1         | 46.50             | 60.40         | 13.90        | 40.60           | 50.40         | 9.80         |
| 0.436            | L1   | 0.0         | 41.10             | 57.10         | 16.00        | 27.90           | 47.10         | 19.20        |
| 0.524            | L1   | 0.0         | 41.50             | 56.00         | 14.50        | 27.30           | 46.00         | 18.70        |
| 0.591            | L1   | 0.0         | 41.00             | 56.00         | 15.00        | 31.90           | 46.00         | 14.10        |
| 0.974            | L1   | 0.1         | 37.10             | 56.00         | 18.90        | 22.20           | 46.00         | 23.80        |
| 1.667            | L1   | 0.2         | 43.80             | 56.00         | 12.20        | 28.70           | 46.00         | 17.30        |

**Table 6-28. Line Conducted Data with 802.11a UNII Band 1 (L1)**

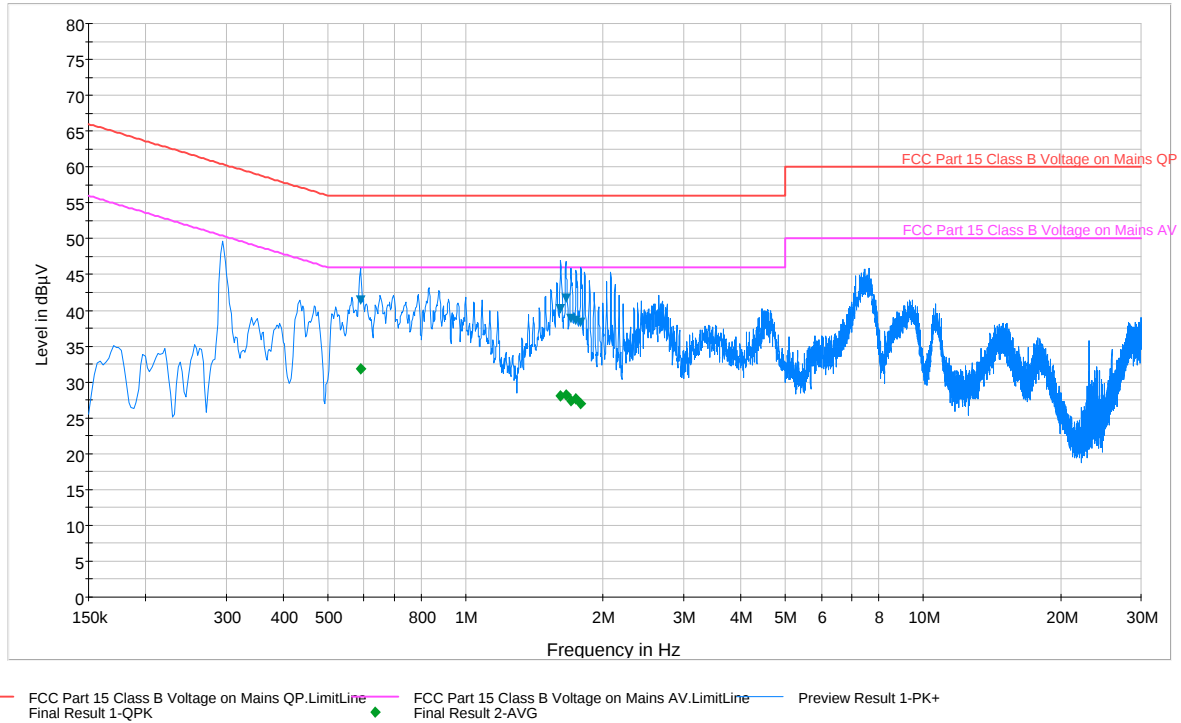
#### Notes:

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 36. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- L1 = Phase; N = Neutral
- Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
- Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
- Traces shown in plot are made using a peak detector.
- Deviations to the Specifications: None.

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 96 of 104                  |

## Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



**Plot 6-106. Line Conducted Plot with 802.11a UNII Band 1 (N)**

| Frequency<br>MHz | Line | Corr.<br>dB | QuasiPeak<br>dBµV | Limit<br>dBµV | Margin<br>dB | Average<br>dBµV | Limit<br>dBµV | Margin<br>dB |
|------------------|------|-------------|-------------------|---------------|--------------|-----------------|---------------|--------------|
| 0.589            | N    | 0.1         | 41.40             | 56.00         | 14.60        | 31.80           | 46.00         | 14.20        |
| 1.615            | N    | 0.2         | 40.20             | 56.00         | 15.80        | 28.00           | 46.00         | 18.00        |
| 1.658            | N    | 0.2         | 41.60             | 56.00         | 14.40        | 28.20           | 46.00         | 17.80        |
| 1.703            | N    | 0.2         | 38.90             | 56.00         | 17.10        | 27.40           | 46.00         | 18.60        |
| 1.745            | N    | 0.2         | 38.60             | 56.00         | 17.40        | 27.60           | 46.00         | 18.40        |
| 1.788            | N    | 0.2         | 38.30             | 56.00         | 17.70        | 27.00           | 46.00         | 19.00        |

**Table 6-29. Line Conducted Data with 802.11a UNII Band 1 (N)**

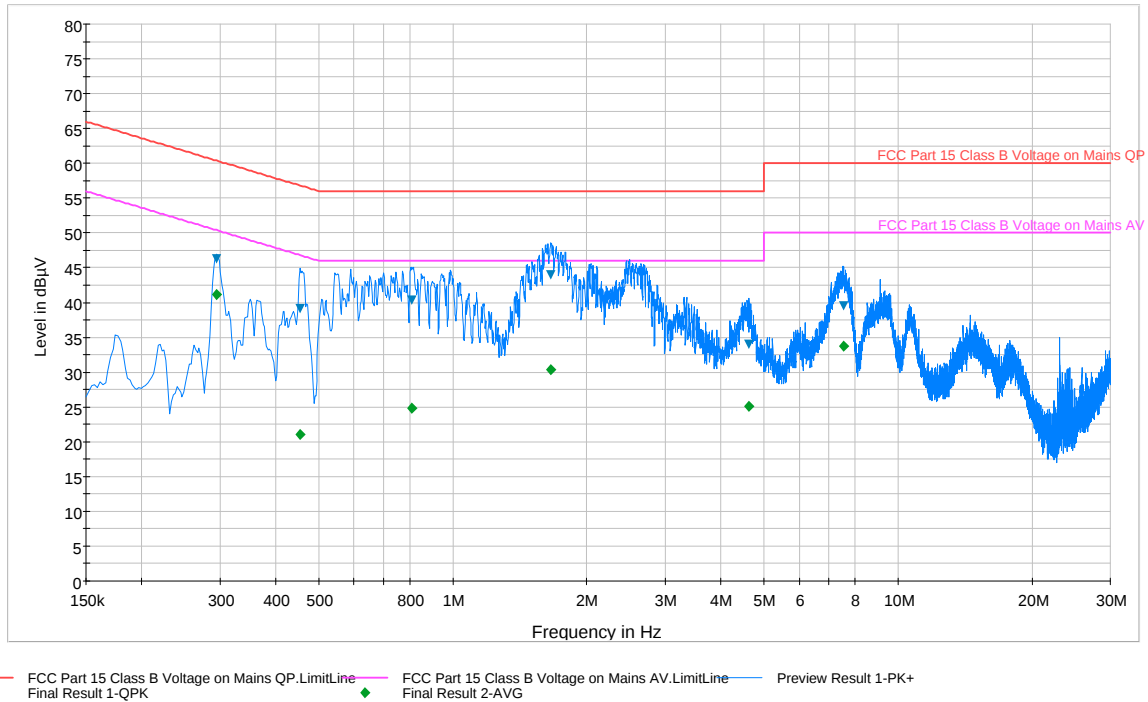
**Notes:**

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 36. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- L1 = Phase; N = Neutral
- Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
- Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
- Traces shown in plot are made using a peak detector.
- Deviations to the Specifications: None.

|                                      |                                               |                                                                        |           |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|-----------|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) | <b>LG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |           | Page 97 of 104                  |

## Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



Plot 6-107. Line Conducted Plot with 802.11a UNII Band 2 (L1)

| Frequency<br>MHz | Line | Corr.<br>dB | QuasiPeak<br>dBµV | Limit<br>dBµV | Margin<br>dB | Average<br>dBµV | Limit<br>dBµV | Margin<br>dB |
|------------------|------|-------------|-------------------|---------------|--------------|-----------------|---------------|--------------|
| 0.294            | L1   | 0.1         | 46.30             | 60.40         | 14.10        | 41.10           | 50.40         | 9.30         |
| 0.454            | L1   | 0.0         | 39.10             | 56.80         | 17.70        | 21.10           | 46.80         | 25.70        |
| 0.809            | L1   | 0.1         | 40.30             | 56.00         | 15.70        | 24.80           | 46.00         | 21.20        |
| 1.660            | L1   | 0.2         | 44.00             | 56.00         | 12.00        | 30.30           | 46.00         | 15.70        |
| 4.632            | L1   | 0.3         | 33.90             | 56.00         | 22.10        | 25.10           | 46.00         | 20.90        |
| 7.546            | L1   | 0.4         | 39.50             | 60.00         | 20.50        | 33.70           | 50.00         | 16.30        |

Table 6-30. Line Conducted Data with 802.11a UNII Band 2 (L1)

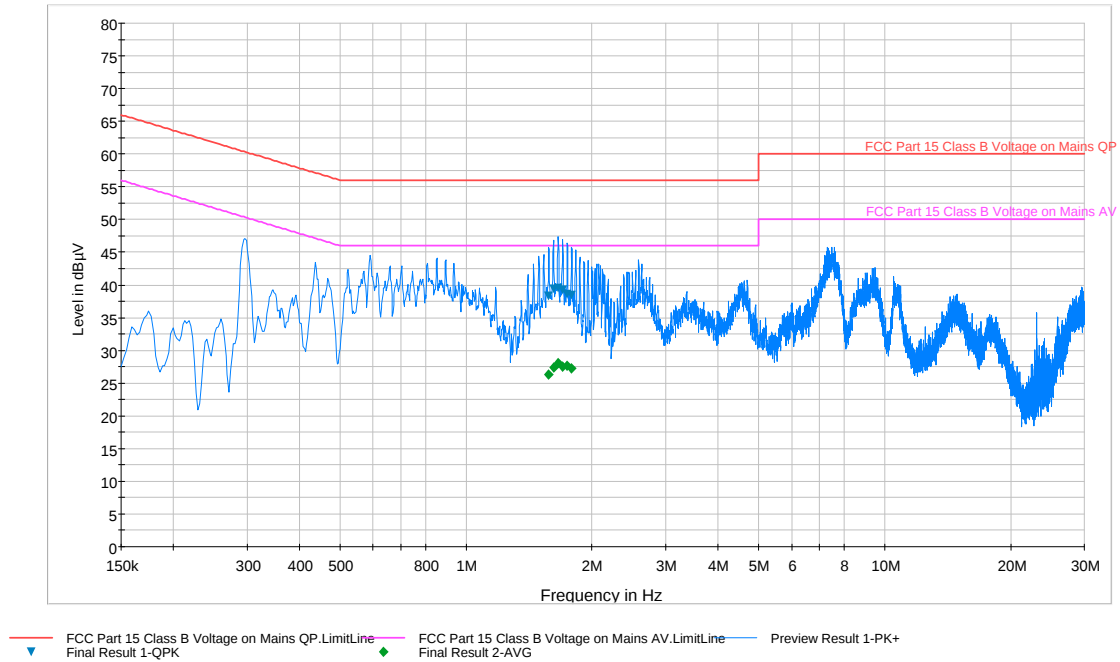
### Notes:

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 52. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- L1 = Phase; N = Neutral
- Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
- Margin (dB) = QP/AVLimit (dBµV) - QP/AV Level (dBµV)
- Traces shown in plot are made using a peak detector.
- Deviations to the Specifications: None.

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 98 of 104                  |

## Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



**Plot 6-108. Line Conducted Plot with 802.11a UNII Band 2 (N)**

| Frequency<br>MHz | Line | Corr.<br>dB | QuasiPeak<br>dBµV | Limit<br>dBµV | Margin<br>dB | Average<br>dBµV | Limit<br>dBµV | Margin<br>dB |
|------------------|------|-------------|-------------------|---------------|--------------|-----------------|---------------|--------------|
| 1.577            | N    | 0.2         | 38.30             | 56.00         | 17.70        | 26.30           | 46.00         | 19.70        |
| 1.619            | N    | 0.2         | 39.50             | 56.00         | 16.50        | 27.40           | 46.00         | 18.60        |
| 1.660            | N    | 0.2         | 39.50             | 56.00         | 16.50        | 28.10           | 46.00         | 17.90        |
| 1.703            | N    | 0.2         | 39.30             | 56.00         | 16.70        | 27.50           | 46.00         | 18.50        |
| 1.745            | N    | 0.2         | 38.60             | 56.00         | 17.40        | 27.60           | 46.00         | 18.40        |
| 1.788            | N    | 0.2         | 38.50             | 56.00         | 17.50        | 27.30           | 46.00         | 18.70        |

**Table 6-31. Line Conducted Data with 802.11a UNII Band 2 (N)**

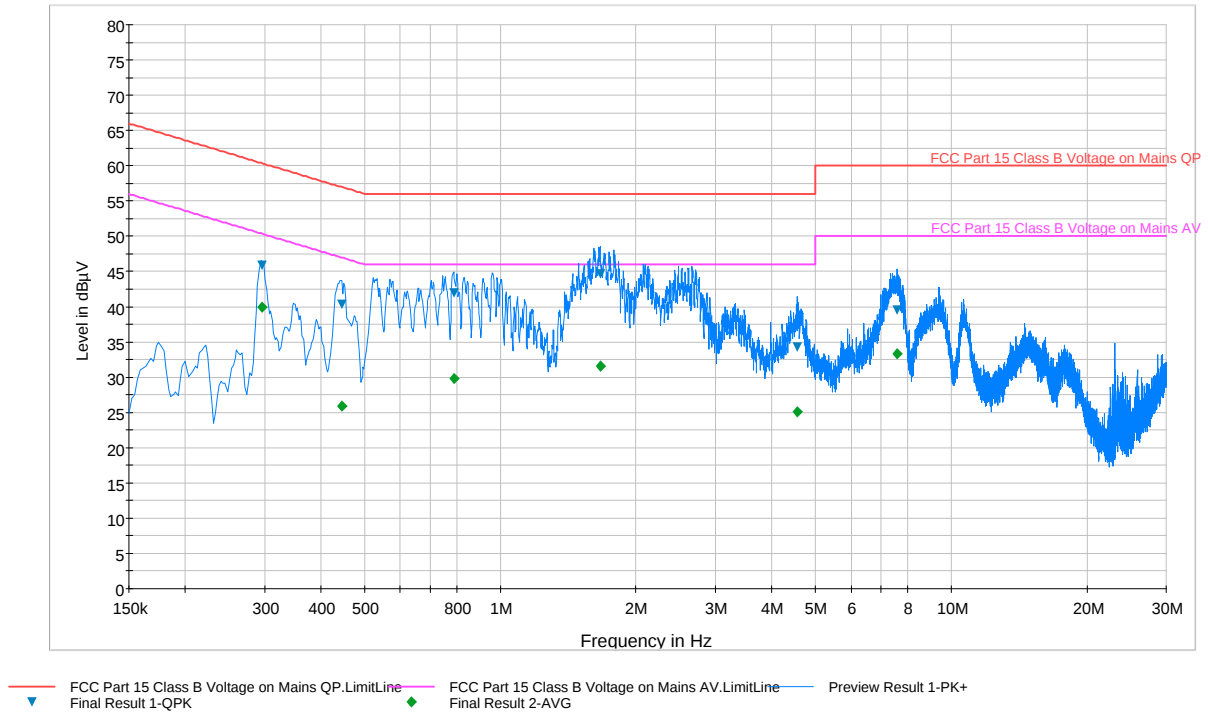
**Notes:**

- All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 52. The emissions found were not affected by the choice of channel used during testing.
- The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
- L1 = Phase; N = Neutral
- Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
- QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
- Margin (dB) = QP/AV Limit (dBµV) - QP/AV Level (dBµV)
- Traces shown in plot are made using a peak detector.
- Deviations to the Specifications: None.

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 99 of 104                  |

## Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



**Plot 6-109. Line Conducted Plot with 802.11a UNII Band 3 (L1)**

| Frequency<br>MHz | Line | Corr.<br>dB | QuasiPeak<br>dBμV | Limit<br>dBμV | Margin<br>dB | Average<br>dBμV | Limit<br>dBμV | Margin<br>dB |
|------------------|------|-------------|-------------------|---------------|--------------|-----------------|---------------|--------------|
| 0.296            | L1   | 0.1         | 45.80             | 60.30         | 14.50        | 40.00           | 50.30         | 10.30        |
| 0.445            | L1   | 0.0         | 40.30             | 57.00         | 16.70        | 25.90           | 47.00         | 21.10        |
| 0.789            | L1   | 0.1         | 41.90             | 56.00         | 14.10        | 29.80           | 46.00         | 16.20        |
| 1.664            | L1   | 0.2         | 44.70             | 56.00         | 11.30        | 31.60           | 46.00         | 14.40        |
| 4.562            | L1   | 0.3         | 34.20             | 56.00         | 21.80        | 25.10           | 46.00         | 20.90        |
| 7.580            | L1   | 0.4         | 39.50             | 60.00         | 20.50        | 33.40           | 50.00         | 16.60        |

**Table 6-32. Line Conducted Plot with 802.11a UNII Band 3 (L1)**

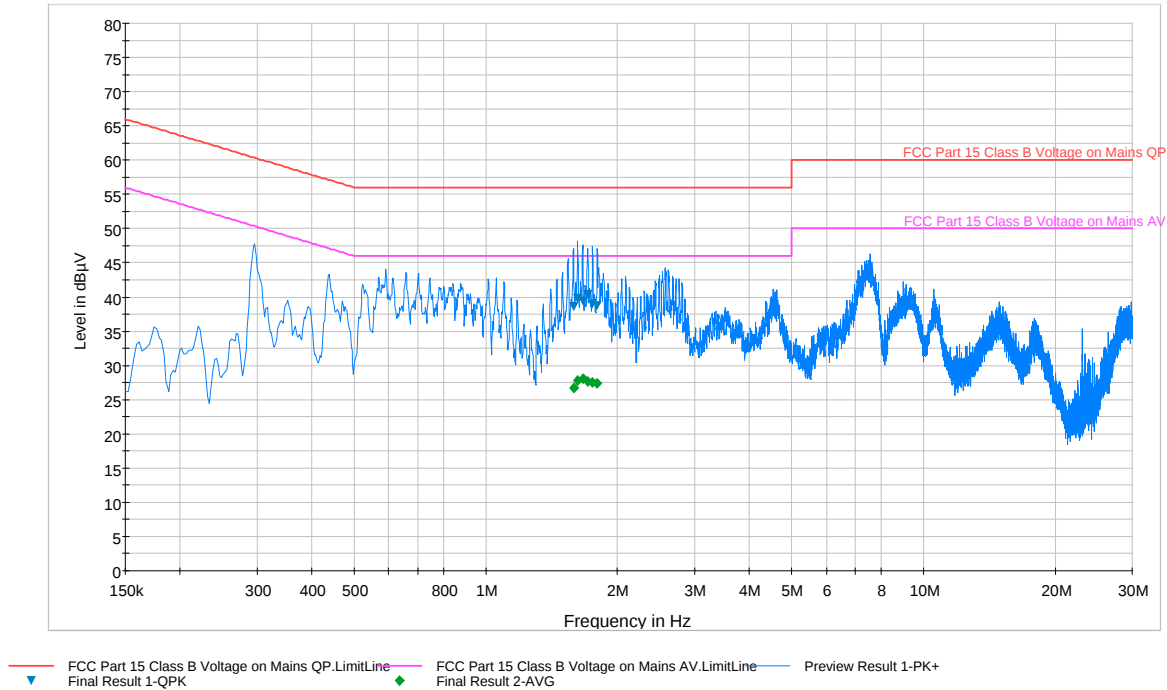
### Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 100. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. L1 = Phase; N = Neutral
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
6. Margin (dB) = QP/AVLimit (dBμV) - QP/AV Level (dBμV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 100 of 104                 |

## Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



**Plot 6-110. Line Conducted Plot with 802.11a UNII Band 3 (N)**

| Frequency<br>MHz | Line | Corr.<br>dB | QuasiPeak<br>dBµV | Limit<br>dBµV | Margin<br>dB | Average<br>dBµV | Limit<br>dBµV | Margin<br>dB |
|------------------|------|-------------|-------------------|---------------|--------------|-----------------|---------------|--------------|
| 1.586            | N    | 0.2         | 38.60             | 56.00         | 17.40        | 26.70           | 46.00         | 19.30        |
| 1.622            | N    | 0.2         | 39.80             | 56.00         | 16.20        | 27.80           | 46.00         | 18.20        |
| 1.664            | N    | 0.2         | 39.50             | 56.00         | 16.50        | 28.00           | 46.00         | 18.00        |
| 1.709            | N    | 0.2         | 40.30             | 56.00         | 15.70        | 27.60           | 46.00         | 18.40        |
| 1.752            | N    | 0.2         | 39.00             | 56.00         | 17.00        | 27.60           | 46.00         | 18.40        |
| 1.797            | N    | 0.2         | 38.70             | 56.00         | 17.30        | 27.30           | 46.00         | 18.70        |

**Table 6-33. Line Conducted Data with 802.11a UNII Band 3 (N)**

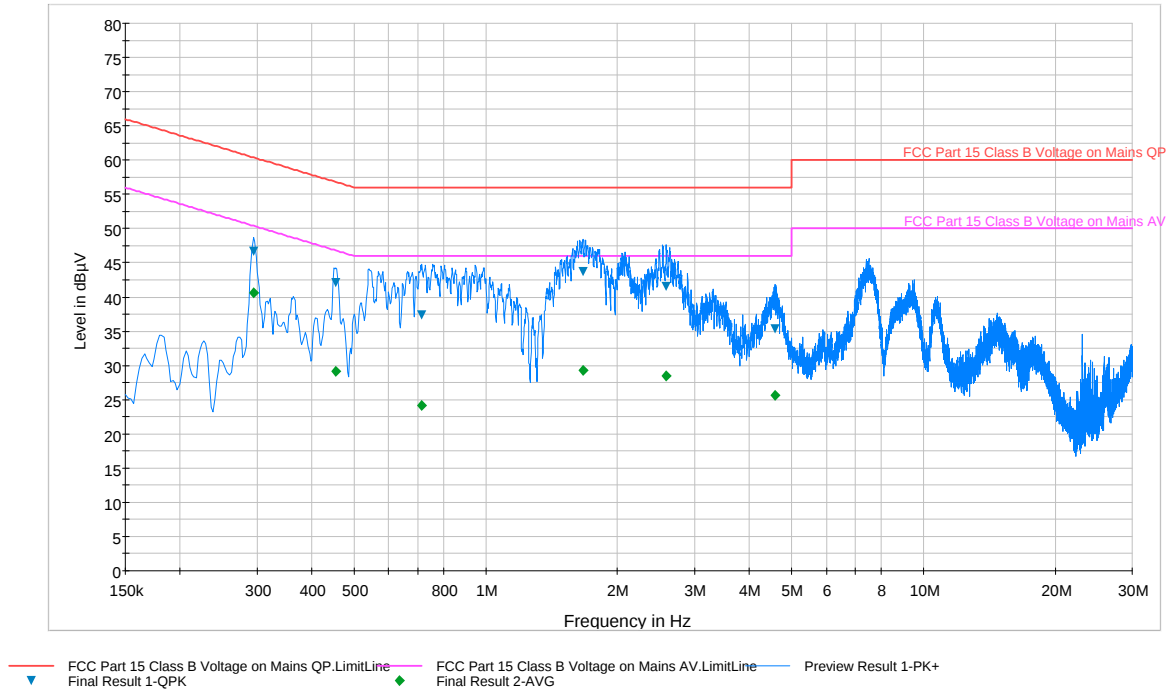
### Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 100. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. L1 = Phase; N = Neutral
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Corr. (dB)
6. Margin (dB) = QP/AV Limit (dBµV) - QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 101 of 104                 |

## Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



**Plot 6-111. Line Conducted Plot with 802.11a UNII Band 4 (L1)**

| Frequency<br>MHz | Line | Corr.<br>dB | QuasiPeak<br>dBµV | Limit<br>dBµV | Margin<br>dB | Average<br>dBµV | Limit<br>dBµV | Margin<br>dB |
|------------------|------|-------------|-------------------|---------------|--------------|-----------------|---------------|--------------|
| 0.294            | L1   | 0.1         | 46.60             | 60.40         | 13.80        | 40.70           | 50.40         | 9.70         |
| 0.454            | L1   | 0.0         | 42.10             | 56.80         | 14.70        | 29.10           | 46.80         | 17.70        |
| 0.715            | L1   | 0.1         | 37.30             | 56.00         | 18.70        | 24.10           | 46.00         | 21.90        |
| 1.664            | L1   | 0.2         | 43.70             | 56.00         | 12.30        | 29.30           | 46.00         | 16.70        |
| 2.582            | L1   | 0.2         | 41.60             | 56.00         | 14.40        | 28.50           | 46.00         | 17.50        |
| 4.583            | L1   | 0.3         | 35.40             | 56.00         | 20.60        | 25.70           | 46.00         | 20.30        |

**Table 6-34. Line Conducted Data with 802.11a UNII Band 4 (L1)**

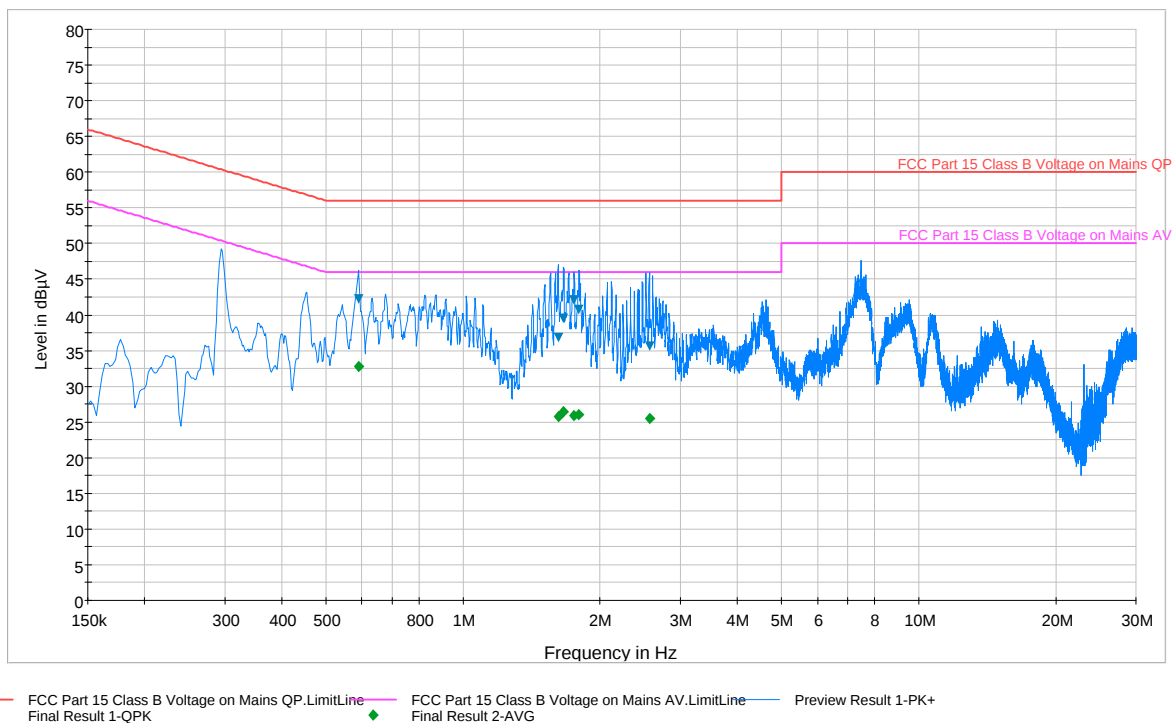
### Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 157. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. Factor (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Factor (dB)
5. Margin (dB) = QP/AV Limit (dBµV) – QP/AV Level (dBµV)
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 102 of 104                 |

## Line-Conducted Test Data (Cont'd)

§15.207; RSS-Gen [7.2.2]



**Plot 6-112. Line Conducted Plot with 802.11a UNII Band 4 (N)**

| Frequency<br>MHz | Line | Corr.<br>dB | QuasiPeak<br>dBµV | Limit<br>dBµV | Margin<br>dB | Average<br>dBµV | Limit<br>dBµV | Margin<br>dB |
|------------------|------|-------------|-------------------|---------------|--------------|-----------------|---------------|--------------|
| 1.586            | N    | 0.2         | 38.60             | 56.00         | 17.40        | 26.70           | 46.00         | 19.30        |
| 1.622            | N    | 0.2         | 39.80             | 56.00         | 16.20        | 27.80           | 46.00         | 18.20        |
| 1.664            | N    | 0.2         | 39.50             | 56.00         | 16.50        | 28.00           | 46.00         | 18.00        |
| 1.709            | N    | 0.2         | 40.30             | 56.00         | 15.70        | 27.60           | 46.00         | 18.40        |
| 1.752            | N    | 0.2         | 39.00             | 56.00         | 17.00        | 27.60           | 46.00         | 18.40        |
| 1.797            | N    | 0.2         | 38.70             | 56.00         | 17.30        | 27.30           | 46.00         | 18.70        |

**Table 6-35. Line Conducted Data with 802.11a UNII Band 4 (N)**

### Notes:

1. All modes of operation, data rates, and test channels were investigated and the worst-case emissions are reported in 802.11a mode using 6Mbps on Channel 157. The emissions found were not affected by the choice of channel used during testing.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 of the Title 47 CFR.
3. Factor (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dBµV) = QP/AV Analyzer/Receiver Level (dBµV) + Factor (dB)
5. Margin (dB) = QP/AV Limit (dBµV) – QP/AV Level (dBµV)
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.

|                                      |                                               |                                                                        |  |                                 |
|--------------------------------------|-----------------------------------------------|------------------------------------------------------------------------|--|---------------------------------|
| FCC ID: ZNFD803                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1307011142.ZNF | Test Dates:<br>7/16 - 8/6/2013                | EUT Type:<br>Portable Handset                                          |  | Page 103 of 104                 |

## 7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFD803** is in compliance with Part 15E of the FCC Rules.

|                                             |                                                                                     |                                                                                |                                                                                       |                                        |
|---------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|
| <b>FCC ID:</b> ZNFD803                      |  | <b>FCC Pt. 15.407 802.11a/n/ac UNII MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1307011142.ZNF | <b>Test Dates:</b><br>7/16 - 8/6/2013                                               | <b>EUT Type:</b><br>Portable Handset                                           |                                                                                       | Page 104 of 104                        |