



# PCTEST ENGINEERING LABORATORY, INC.

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<http://www.pctestlab.com>



## MEASUREMENT REPORT FCC Part 90 LTE Band 14

**Applicant Name:**  
Harris Corporation  
150 Apollo Drive  
Chelmsford, MA 01824  
USA

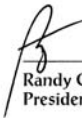
**Date of Testing:**  
8/12/2013, 11/28/2013  
**Test Site/Location:**  
PCTEST Lab., Columbia, MD, USA  
**Test Report Serial No.:**  
0Y1311182188.BV8

|                   |                           |
|-------------------|---------------------------|
| <b>FCC ID:</b>    | <b>BV8BBPBM113</b>        |
| <b>APPLICANT:</b> | <b>HARRIS CORPORATION</b> |



**Application Type:** Class II Permissive Change  
**FCC Classification:** Licensed Non-Broadcast Transmitter (TNB)  
**FCC Rule Part(s):** §2; §90  
**EUT Type:** Wireless Module  
**Model(s):** PBM-113  
**Test Device Serial No.:** *identical prototype* [S/N: Unit#2]  
**Test Procedure(s):** ANSI/TIA-603-C-2004, KDB 971168  
**Class II Perm. Change:** Adding Band 14 LTE (788-798 MHz) under Part 90  
**Original Grant Date:** April 19, 2013

| Mode        | BW (MHz) | Emission Designator | Tx Frequency (MHz) | Modulation | Conducted Power |                  |
|-------------|----------|---------------------|--------------------|------------|-----------------|------------------|
|             |          |                     |                    |            | Max. Power (W)  | Max. Power (dBm) |
| LTE Band 14 | 5        | 4M49G7D             | 790.5 - 795.5      | QPSK       | 0.207           | 23.15            |
| LTE Band 14 | 5        | 4M50W7D             | 790.5 - 795.5      | 16-QAM     | 0.221           | 23.45            |
| LTE Band 14 | 10       | 8M94G7D             | 793                | QPSK       | 0.219           | 23.40            |
| LTE Band 14 | 10       | 8M94W7D             | 793                | 16-QAM     | 0.213           | 23.28            |

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 §2.947. 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 Ortanez  
President

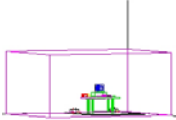


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|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: BV8BBPBM113                  |  | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013  | EUT Type:<br>Wireless Module                                      |   | Page 1 of 36                    |

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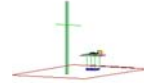
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## MEASUREMENT REPORT

### FCC Part 90

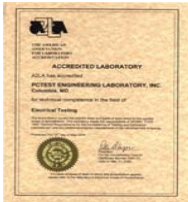


#### §2.1033 General Information



**APPLICANT:** Harris Corporation  
**APPLICANT ADDRESS:** 150 Apollo Drive  
 Chelmsford, MA 01824, USA  
**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.  
**TEST SITE ADDRESS:** 6660-B Dobbin Road, Columbia, MD 21045 USA  
**FCC RULE PART(S):** §2; §90  
**BASE MODEL:** PBM-113  
**FCC ID:** BV8BBPBM113  
**FCC CLASSIFICATION:** Licensed Non-Broadcast Transmitter (TNB)  
**MODULATIONS:** LTE (QPSK/16-QAM)  
**FREQUENCY TOLERANCE:** 1.25ppm  
**Test Device Serial No.:** Unit#2 ☐ Production ☒ Pre-Production ☐ Engineering  
**DATE(S) OF TEST:** 8/12/2013, 11/28/2013  
**TEST REPORT S/N:** 0Y1110271887-R2.BV8

#### Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab. located in Columbia, MD 21045, U.S.A.



- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) 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 (2451A-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 (2451A-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.

|                                      |   |   |   |                                 |
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## 1.0 INTRODUCTION

### 1.1 Scope

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

### 1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Internt'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 in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on January 28, 2009.

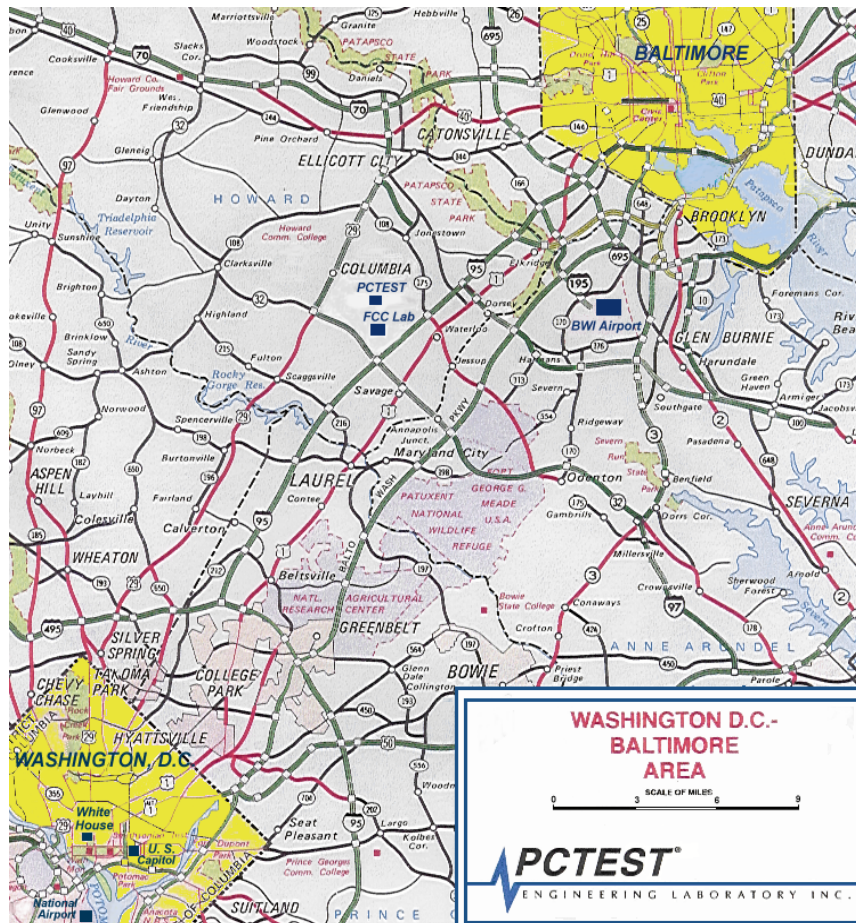


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Harris Wireless Module FCC ID: BV8BBPBM113**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

During testing, the EUT was attached to a Harris Test Jig (USBMA-SMA v1.2) that powered the EUT. Power was provided via DC Power Supply. The EUT was set to continuous transmission at max power through connection to a CMW500 LTE Call Box. All modulations (QPSK, 16QAM) and RB sizes and RB offsets were investigated. Worst case emissions are reported.

During radiated testing, the EUT was connected to the *Laird* B7603 Mobile Load Coil Antenna. The gain of this antenna is 4 dBi, and the loss of the attached cable is 2.7 dB. This *Laird* antenna is only used to provide a termination to the main antenna port during various radiated measurements. Additionally, it will not be marketed with the EUT.

### 2.2 EUT Capabilities

The EUT has the following capabilities: LTE operating in Band 13 and Band 14

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

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

### 2.4 Labeling Requirements

Per 2.925

The FCC identifier shall be permanently affixed to the equipment and shall be readily visible to the purchaser at the time of purchase.



Per 15.19; Docket 95-19

In addition to this requirement, a device subject to certification shall be labeled as follows:

*This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

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(b)(2).

Please see attachment for FCC ID label and label location.

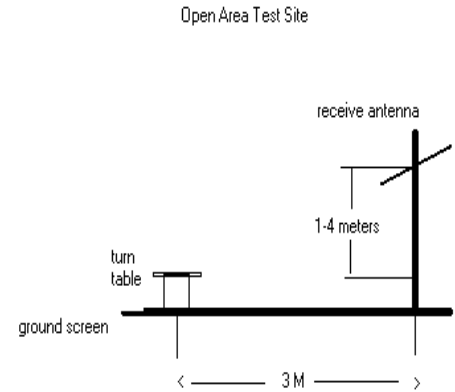
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## 3.0 DESCRIPTION OF TESTS

### 3.1 Measurement Procedure

The radiated spurious measurements were made outdoors at a 3-meter test range (See Figure 3-1). The equipment under test is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This power level was recorded using a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level is recorded with the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.



**Figure 3-1. Diagram of 3-meter outdoor test range**

Deviation from Measurement Procedure.....None

### 3.2 Occupied Bandwidth Emission Limits

#### §2.1049

- On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.
- Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

### 3.3 Spurious and Harmonic Emissions at Antenna Terminal

#### §2.1051, §90.543(e).

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic.

For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.
- On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least  $43 + 10 \log(P)$  dB.



|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
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### 3.4 Radiated Spurious Emissions

§2.1053, §90.543(e)(2), §90.543(f).

Radiated spurious emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This level is then measured with a broadband average power meter. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive average power meter reading. This spurious level is recorded with the power meter. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.

Additionally, all emissions including harmonics in the band 1559-1610MHz shall be limited to -70dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80dBW EIRP for discrete emissions of less than 700Hz bandwidth.

|                                      |   |   |   |                                 |
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### 3.5 Frequency Stability / Temperature Variation

§2.1055, §90.539(e)



The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment.

*Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.000125\%$  ( $\pm 1.25$  ppm) of the center frequency.*

#### Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

|                                      |   |   |   |                                 |
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## 4.0 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 |
|-----------------|-----------|--|-----------|--------------|-----------|---------------|
| -               | LTx1      | Licensed Transmitter Cable Set         | 1/17/2013 | Annual       | 1/17/2014 | N/A           |
| -               | RE1       | Radiated Emissions Cable Set (UHF/EHF) | 3/29/2013 | Annual       | 3/29/2014 | N/A           |
| Agilent         | N9030A    | PXA Signal Analyzer (44GHz)            | 1/11/2013 | Annual       | 1/11/2014 | MY52350166    |
| ETS Lindgren    | 3117      | 1-18 GHz DRG Horn (Medium)             | 7/24/2013 | Biennial     | 7/24/2015 | 125518        |
| ETS Lindgren    | 3160-09   | 18-26.5 GHz Standard Gain Horn         | 5/30/2012 | Biennial     | 5/30/2014 | 135427        |
| ETS Lindgren    | 3164-08   | Quad Ridge Horn Antenna                | 11/7/2012 | Biennial     | 11/7/2014 | 128337        |
| Mini-Circuits   | VHF-1200+ | High Pass Filter                       | 1/17/2013 | Annual       | 1/17/2014 | 30923         |
| Rohde & Schwarz | CMW500    | LTE Radio Communication Tester         | N/A       |              | N/A       | 100976        |
| 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        |
| Seekonk         | NC-100    | Torque Wrench (8" lb)                  | 3/5/2012  | Triennial    | 3/5/2015  | N/A           |
| Sunol           | JB5       | Bi-Log Antenna (30M - 5GHz)            | 1/26/2012 | Biennial     | 1/26/2014 | A051107       |

**Table 4-1. Test Equipment**

**Note:** Equipment in the table above with "N/A" for calibration date was only used to establish a connection with the EUT. This equipment was not used to make calibrated measurements.

|                                      |   |   |   |                                 |
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## 5.0 SAMPLE CALCULATIONS

The calculations below are examples only and do not necessarily relate to the EUT.

### QPSK Modulation

**Emission Designator = 8M62G7D**

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Amplitude/Angle Modulated

### 16QAM Modulation

**Emission Designator = 8M45W7D**

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated



7 = Quantized/Digital Info

D = Combination (Audio/Data)

### Spurious Radiated Emission – LTE

#### **Example: Middle Channel LTE Mode 2<sup>nd</sup> Harmonic (1564 MHz)**

The spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminal is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1402.0 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm - (-24.80) = 50.3 dBc.

|                                      |   |   |   |                                 |
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## 6.0 TEST RESULTS



### 6.1 Summary

Company Name: Harris Corporation  
 FCC ID: BV8BBPBM113  
 FCC Classification: Licensed Non-Broadcast Transmitter (TNB)  
 Mode(s): LTE

| FCC Part Section(s)          | Test Description                               | Test Limit  | Test Condition | Test Result | Reference   |
|------------------------------|--|---|----------------|-------------|-------------|
| <b>TRANSMITTER MODE (TX)</b> |  |   |                |             |             |
| 2.1049                       | Occupied Bandwidth                             | N/A   | CONDUCTED      | PASS        | Section 7.0 |
| 2.1051, 90.543(e)            | Band Edge / Conducted Spurious Emissions       | > 43 + 10log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of-band emissions<br><65 + 10 log (P[Watts]) in a 6.25kHz bandwidth for emissions in the 769–775 MHz and 799-805 MHz bands |                | PASS        | Section 7.0 |
| 2.1046                       | Transmitter Conducted Output Power             | N/A   |                | PASS        | Section 6.2 |
| 2.1053, 90.543(e)            | Undesirable Emissions                          | < 43 + 10log <sub>10</sub> (P[Watts]) for all out-of-band emissions   | RADIATED       | PASS        | Section 6.3 |
| 2.1053, 90.543(f)            | Undesirable Emissions in the 1559-1610MHz band | < -40dBm/MHz EIRP (wideband)<br>< -50dBm EIRP (narrowband)  |                | PASS        | Section 6.5 |
| 2.1055, 90.539(e)            | Frequency Stability                            | < 1.25 ppm  |                | PASS        | Section 6.6 |

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

**Note:** Some plots in this report are taken from the original certification test report, since the samples for this C2PC and the original certification samples are electrically identical. As the entire Band 14 (788-798MHz) was not allowed at the time of the original certification, only the appropriate plots that are applicable to this test report are taken.

|                                      |   |   |   |                                 |
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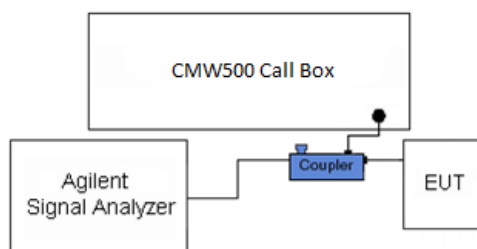
## 6.2 Conducted Output Power

### §2.1046

The **Harris Wireless Module FCC ID: BV8BBPBM113** was powered by a DC Power supply through a test PCB. Via RF Cable, the Main Antenna port of the EUT was connected to a spectrum analyzer while the CMW500 LTE Callbox was used only to establish a connection. Transmit power readings were taken from the spectrum analyzer per Section 5.2.1 of KDB 971168.

Instrument settings:

- a.) Span set to > 1.5 times the OBW.
- b.) RBW set to 1 – 5% of OBW (not more than 1MHz)
- c.) VBW set to 3MHz.
- d.) Number of sweep points set to 5000 (>2\*span/RBW)
- e.) Sweep time set to auto couple
- f.) Detector set to RMS
- g.) Trace averaged at least 100 traces in RMS power averaging mode.
- h.) Since duty cycle of >98% cannot be achieved, signal gating was implemented by the spectrum analyzer to ensure that power was measured only when the EUT is actively transmitting at full power.
- i.) Channel Power Function utilized to integrate power across the OBW



**Figure 6-1. Conducted Output Power Test Setup Diagram**

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 12 of 36                   |

| Freq. (MHz) | MCS Level | Mod.  | BW     | RB Size | RB Offset | Maximum Average Power [dBm] |
|-------------|-----------|-------|--------|---------|-----------|-----------------------------|
| 790.5       | 0         | QPSK  | 5 MHz  | 1       | 0         | 21.80                       |
| 790.5       | 11        | 16QAM | 5 MHz  | 1       | 0         | 22.30                       |
| 790.5       | 0         | QSPK  | 5 MHz  | 1       | 24        | 22.64                       |
| 790.5       | 11        | 16QAM | 5 MHz  | 1       | 24        | 22.85                       |
| 790.5       | 0         | QPSK  | 5 MHz  | 12      | 6         | 21.58                       |
| 790.5       | 11        | 16QAM | 5 MHz  | 12      | 6         | 22.10                       |
| 790.5       | 0         | QSPK  | 5 MHz  | 25      | 0         | 21.99                       |
| 790.5       | 11        | 16QAM | 5 MHz  | 25      | 0         | 22.34                       |
| 795.5       | 0         | QPSK  | 5 MHz  | 1       | 0         | 23.15                       |
| 795.5       | 11        | 16QAM | 5 MHz  | 1       | 0         | 23.24                       |
| 795.5       | 0         | QPSK  | 5 MHz  | 1       | 24        | 23.07                       |
| 795.5       | 11        | 16QAM | 5 MHz  | 1       | 24        | 23.45                       |
| 795.5       | 0         | QPSK  | 5 MHz  | 12      | 6         | 22.38                       |
| 795.5       | 11        | 16QAM | 5 MHz  | 12      | 6         | 23.05                       |
| 795.5       | 0         | QPSK  | 5 MHz  | 25      | 0         | 22.94                       |
| 795.5       | 11        | 16QAM | 5 MHz  | 25      | 0         | 22.97                       |
| 793         | 0         | QPSK  | 10 MHz | 1       | 0         | 22.25                       |
| 793         | 11        | 16QAM | 10 MHz | 1       | 0         | 22.27                       |
| 793         | 0         | QPSK  | 10 MHz | 1       | 49        | 23.40                       |
| 793         | 11        | 16QAM | 10 MHz | 1       | 49        | 23.28                       |
| 793         | 0         | QPSK  | 10 MHz | 25      | 12        | 22.71                       |
| 793         | 11        | 16QAM | 10 MHz | 25      | 12        | 22.86                       |
| 793         | 0         | QPSK  | 10 MHz | 50      | 0         | 22.15                       |
| 793         | 11        | 16QAM | 10 MHz | 50      | 0         | 22.56                       |

**Table 6-2. Maximum Average Conducted Output Power**

### 6.3 Radiated Spurious Emissions

§2.1053, §90.543(e)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 790.50 MHz  
 BW / MODULATION SIGNAL: 5MHz QPSK  
 DISTANCE: 3 meters  
 LIMIT: -13.00 dBm

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | Margin (dB) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------------|
| 2371.50         | -57.10                          | 8.57                          | -48.53                        | V         | -35.5       |
| 3162.00         | -84.48                          | 8.68                          | -75.79                        | V         | -62.8       |
| 3952.50         | -126.93                         | 8.95                          | -117.98                       | V         | -105.0      |
| 4743.00         | -126.92                         | 11.20                         | -115.72                       | V         | -102.7      |



**Table 6-3. Radiated Spurious Data (5MHz)**

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This unit was tested while powered by a DC power supply. The EUT was tested in three orthogonal planes and in all test configurations and positioning. The worst case emissions were found while testing in QPSK modulation, 1RB size, and 0 RB Offset. The worst case emissions were found with the EUT in the horizontally flat position, with the antenna sitting vertical. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: BV8BBPBM113                  |  | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013  | EUT Type:<br>Wireless Module                                      |   | Page 14 of 36                   |



## Radiated Spurious Emissions (Cont'd)

§2.1053, §90.543(e)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 795.50 MHz  
 BW / MODULATION SIGNAL: 5MHz QPSK  
 DISTANCE: 3 meters  
 LIMIT: -13.00 dBm

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | Margin (dB) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------------|
| 2386.50         | -56.18                          | 8.51                          | -47.67                        | V         | -34.7       |
| 4116.50         | -54.87                          | 8.66                          | -46.21                        | V         | -33.2       |
| 5846.50         | -50.75                          | 8.96                          | -41.79                        | V         | -28.8       |
| 7576.50         | -56.77                          | 11.19                         | -45.57                        | V         | -32.6       |



**Table 6-4. Radiated Spurious Data (5MHz BW)**

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This unit was tested while powered by a DC power supply. The EUT was tested in three orthogonal planes and in all test configurations and positioning. The worst case emissions were found while testing in QPSK modulation, 1RB size, and 0 RB Offset. The worst case emissions were found with the EUT in the horizontally flat position, with the antenna sitting vertical. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: BV8BBPBM113                  |  | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013  | EUT Type:<br>Wireless Module                                      |   | Page 15 of 36                   |

## Radiated Spurious Emissions (Cont'd)

§2.1053, §90.543(e)

### Field Strength of SPURIOUS Radiation

|                         |            |        |
|-------------------------|------------|--------|
| OPERATING FREQUENCY:    | 793.000    | MHz    |
| BW / MODULATION SIGNAL: | 10MHz QPSK |        |
| DISTANCE:               | 3          | meters |
| LIMIT:                  | -13.00     | dBm    |

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | Margin (dB) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------------|
| 2379.00         | -54.84                          | 8.56                          | -46.28                        | V         | -33.3       |
| 3172.00         | -83.83                          | 8.68                          | -75.15                        | V         | -62.2       |
| 3965.00         | -53.20                          | 8.95                          | -44.25                        | V         | -31.2       |
| 4758.00         | -83.29                          | 11.20                         | -72.08                        | V         | -59.1       |



**Table 6-5. Radiated Spurious Data (10MHz BW)**

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This unit was tested while powered by a DC power supply. The EUT was tested in three orthogonal planes and in all test configurations and positioning. The worst case emissions were found while testing in QPSK modulation, 1RB size, and 0 RB Offset. The worst case emissions were found with the EUT in the horizontally flat position, with the antenna sitting vertical. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: BV8BBPBM113                  |  | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013  | EUT Type:<br>Wireless Module                                      |   | Page 16 of 36                   |

## 6.4 Radiated Spurious Emissions in 1559 – 1610MHz Band

§2.1053, §90.543(f)

All spurious emissions found in the 1559-1610 MHz band were wideband emissions and the limit of -70dBW/MHz (-40dBm/MHz) was applied. Measurements in table below utilized resolution bandwidth of 1MHz.

### Field Strength of SPURIOUS Radiation

|                          |            |         |
|--------------------------|------------|---------|
| OPERATING FREQUENCY:     | 790.50     | MHz     |
| BW / MODULATION:         | 5 MHz QPSK |         |
| DISTANCE:                | 3          | meters  |
| WIDEBAND EMISSION LIMIT: | -40        | dBm/MHz |

| FREQUENCY (MHz) | EMISSION TYPE | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | MARGIN (dB) |
|-----------------|---------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------------|
| 1581.00         | WIDEBAND      | -61.58                          | 8.44                          | -53.14                        | V         | -13.14      |



**Table 6-6. Radiated Spurious Data (5Mhz)**

### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This unit was tested while powered by a DC power supply. The EUT was tested in three orthogonal planes and in all test configurations and positioning. The worst case emissions were found while testing in QPSK modulation, 1RB size, and 24 RB Offset. The worst case emissions were found with the EUT in the horizontally flat position, with the antenna sitting vertical. The data reported in the table above was measured in this test setup.

|                                     |   |   |   |                                 |
|-------------------------------------|---|---|---|---------------------------------|
| FCC ID: BV8BBPBM113                 |  | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y131182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013  | EUT Type:<br>Wireless Module                                      |   | Page 17 of 36                   |

## Radiated Spurious Emissions in 1559 – 1610MHz Band (Cont'd)

§2.1053, §90.543(f)

### Field Strength of SPURIOUS Radiation

|                          |            |         |
|--------------------------|------------|---------|
| OPERATING FREQUENCY:     | 795.50     | MHz     |
| BW / MODULATION:         | 5 MHz QPSK |         |
| DISTANCE:                | 3          | meters  |
| WIDEBAND EMISSION LIMIT: | -40        | dBm/MHz |

| FREQ (MHz) | EMISSION TYPE | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | MARGIN (dB) |
|------------|---------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------------|
| 1591.00    | WIDEBAND      | -61.03                          | 8.46                          | -52.57                        | V         | -12.57      |



Table 6-7. Radiated Spurious Data (5MHz)

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This unit was tested while powered by a DC power supply. The EUT was tested in three orthogonal planes and in all test configurations and positioning. The worst case emissions were found while testing in QPSK modulation, 1RB size, and 24 RB Offset. The worst case emissions were found with the EUT in the horizontally flat position, with the antenna sitting vertical. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: BV8BBPBM113                  |  | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013  | EUT Type:<br>Wireless Module                                      |   | Page 18 of 36                   |

## Radiated Spurious Emissions in 1559 – 1610MHz Band (Cont'd)

§2.1053, §90.543(f)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 793.00 MHz  
 BW / MODULATION: 10 MHz QPSK  
 DISTANCE: 3 meters  
 WIDEBAND EMISSION LIMIT: -40 dBm/MHz

| FREQUENCY (MHz) | EMISSION TYPE | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | MARGIN (dB) |
|-----------------|---------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------------|
| 1586.00         | WIDEBAND      | -58.12                          | 8.42                          | -49.70                        | V         | -9.70       |



**Table 6-8. Radiated Spurious Data (10MHz)**

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

This unit was tested while powered by a DC power supply. The EUT was tested in three orthogonal planes and in all test configurations and positioning. The worst case emissions were found while testing in QPSK modulation, 1RB size, and 24 RB Offset. The worst case emissions were found with the EUT in the horizontally flat position, with the antenna sitting vertical. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: BV8BBPBM113                  |  | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013  | EUT Type:<br>Wireless Module                                      |   | Page 19 of 36                   |

## 6.5 Frequency Stability Measurements

\$2.1055, \$90.539(e)

OPERATING FREQUENCY: 795,500,000 Hz

REFERENCE VOLTAGE: 3.3 VDC

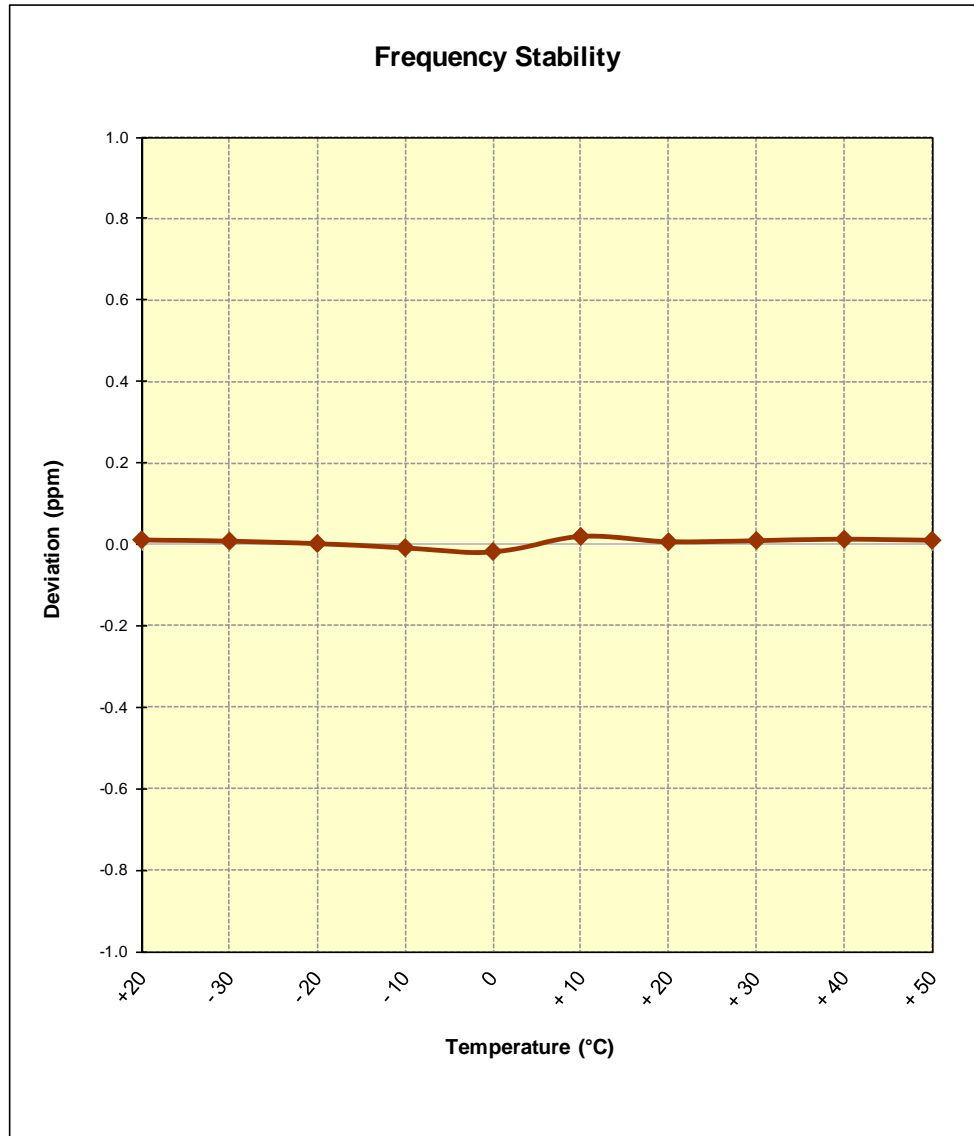
DEVIATION LIMIT: +/- 0.000125% or 1.25 ppm

| VOLTAGE (%)      | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Average Freq. Dev. (Hz) | Deviation (%) |
|------------------|-------------|------------|----------------|-------------------------|---------------|
| 100 %            | 3.30        | + 20 (Ref) | 795,500,009    | 8.62                    | 0.0000011     |
| 100 %            |             | - 30       | 795,500,006    | 6.19                    | 0.0000008     |
| 100 %            |             | - 20       | 795,500,002    | 1.58                    | 0.0000002     |
| 100 %            |             | - 10       | 795,499,994    | -6.48                   | -0.0000008    |
| 100 %            |             | 0          | 795,499,986    | -14.14                  | -0.0000018    |
| 100 %            |             | + 10       | 795,500,015    | 15.30                   | 0.0000019     |
| 100 %            |             | + 20       | 795,500,005    | 4.95                    | 0.0000006     |
| 100 %            |             | + 30       | 795,500,007    | 7.46                    | 0.0000009     |
| 100 %            |             | + 40       | 795,500,010    | 9.89                    | 0.0000012     |
| 100 %            |             | + 50       | 795,500,008    | 7.92                    | 0.0000010     |
| 115 %            | 3.79        | + 20       | 795,500,002    | 1.78                    | 0.0000002     |
| Battery Endpoint | 2.60        | + 20       | 795,500,009    | 8.50                    | 0.0000011     |

Table 6-9. Frequency Stability Data



**Frequency Stability Measurements (Cont'd)**  
**§2.1055, §90.539(e)**



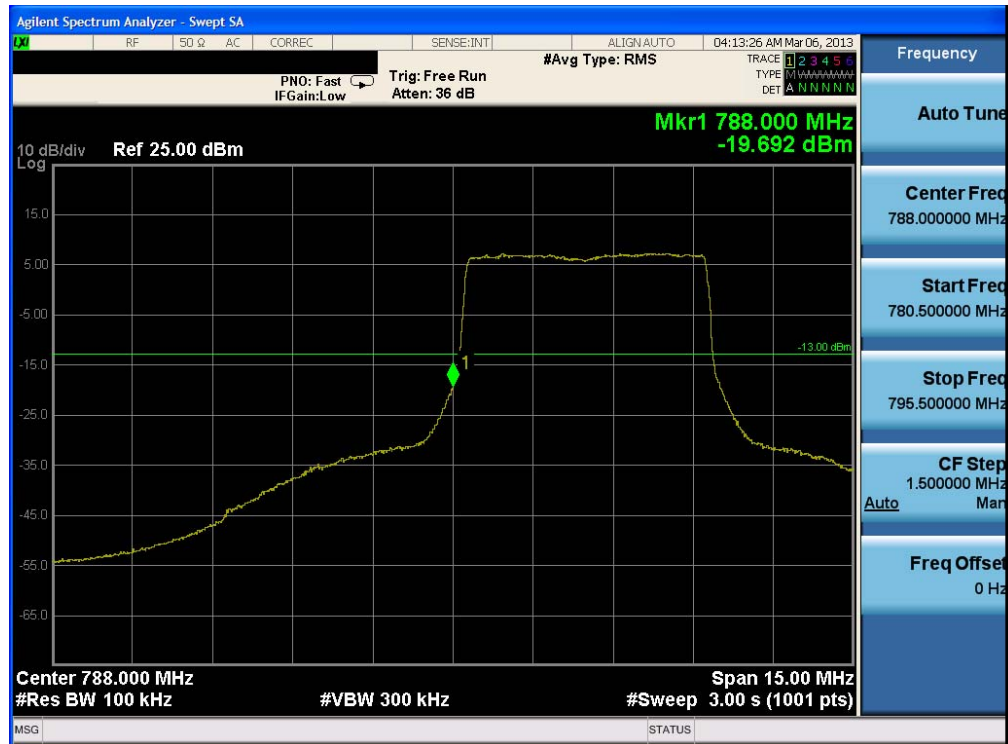
**Figure 6-2. Frequency Stability Graph**

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 21 of 36                   |

## 7.0 5 MHz BANDWIDTH - PLOT(S) OF EMISSIONS



Plot 7-1. Lower Band Edge Plot (QPSK, 25RB)

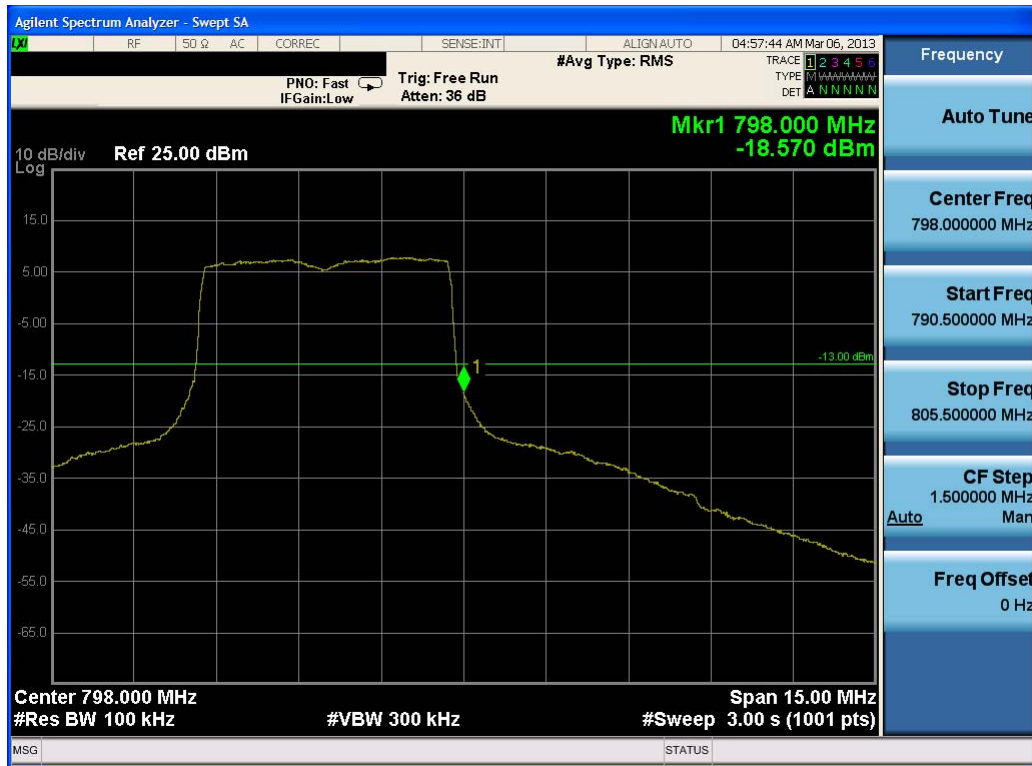


Plot 7-2. Lower Band Edge Plot (16QAM, 25RB)

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 22 of 36                   |

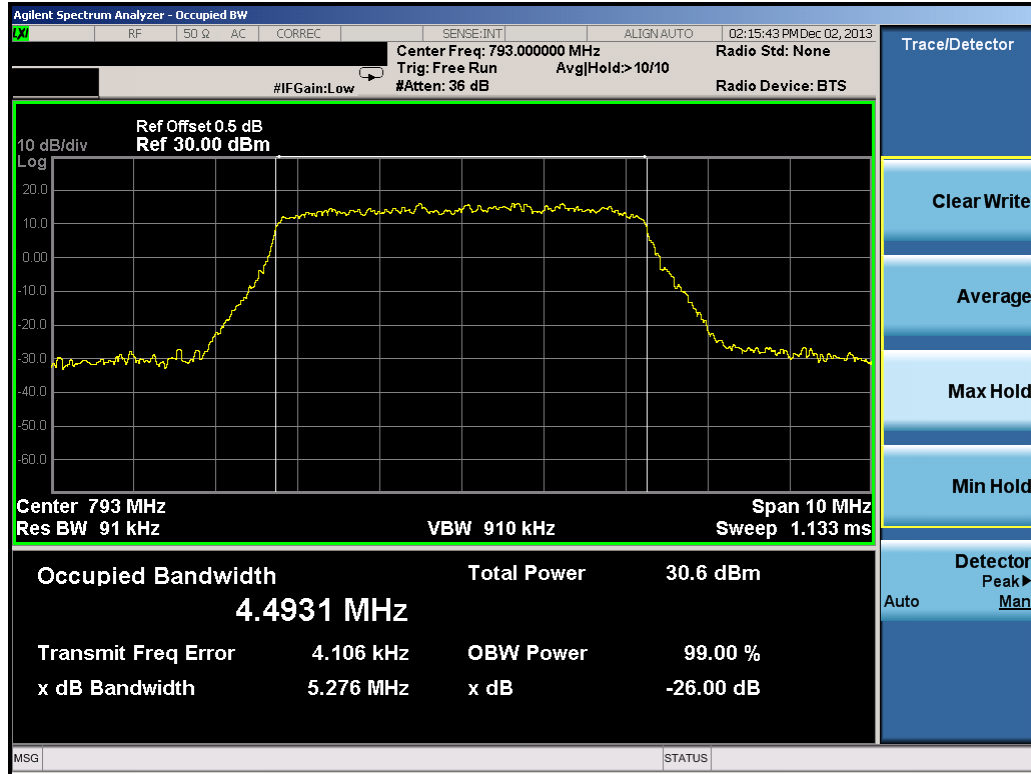


Plot 7-3. Upper Band Edge Plot (QPSK, 25RB)

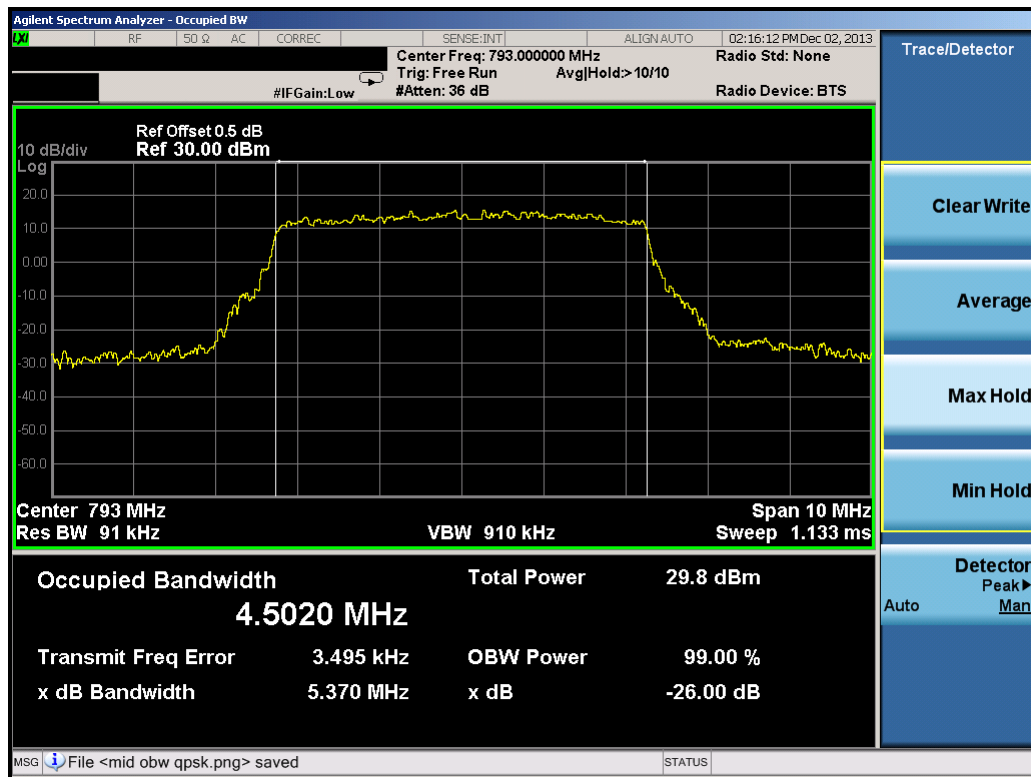


Plot 7-4. Upper Band Edge Plot (16QAM, 25RB)

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 23 of 36                   |



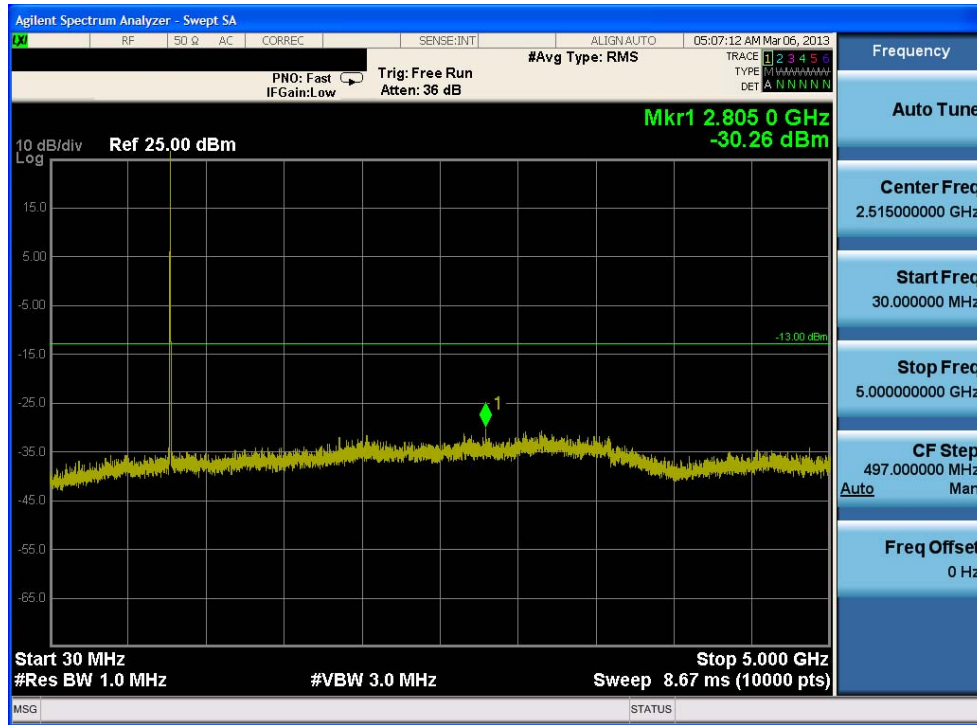
Plot 7-5. Occupied Bandwidth Plot (QPSK, 25RB)



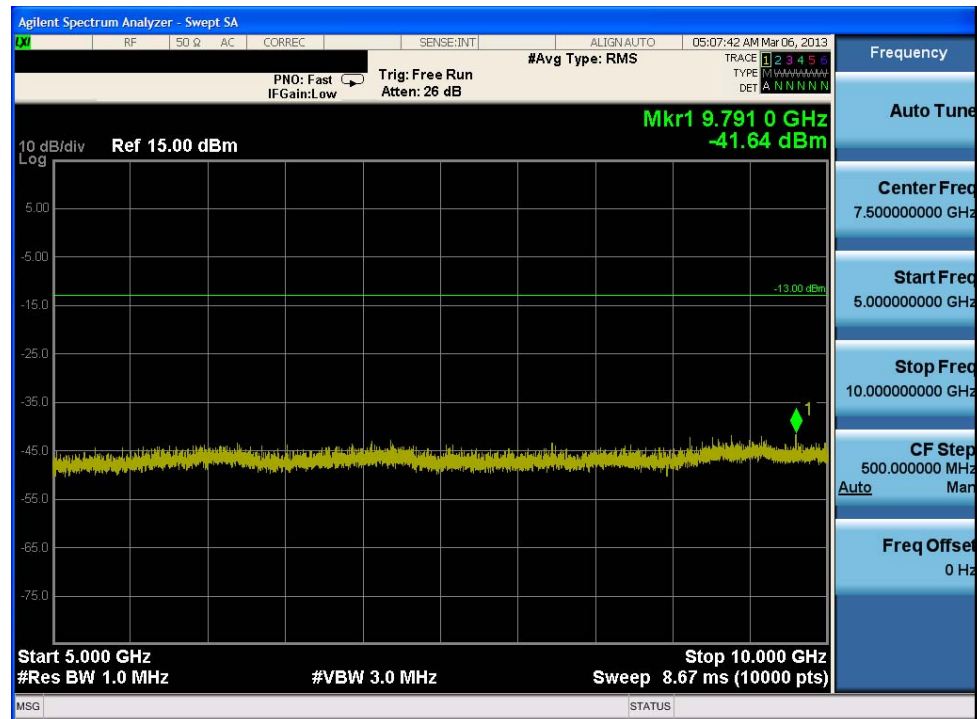
Plot 7-6. Occupied Bandwidth Plot (16QAM, 25RB)

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 24 of 36                   |

**Out-of-Band Spurious Emissions Note:** For the following conducted spurious emission plots, all modulations and RB configurations were tested. Worst case emissions were found in 16-QAM modulation, 1RB, and 0 RB Offset operating at 793MHz. Worst case plots are reported below:



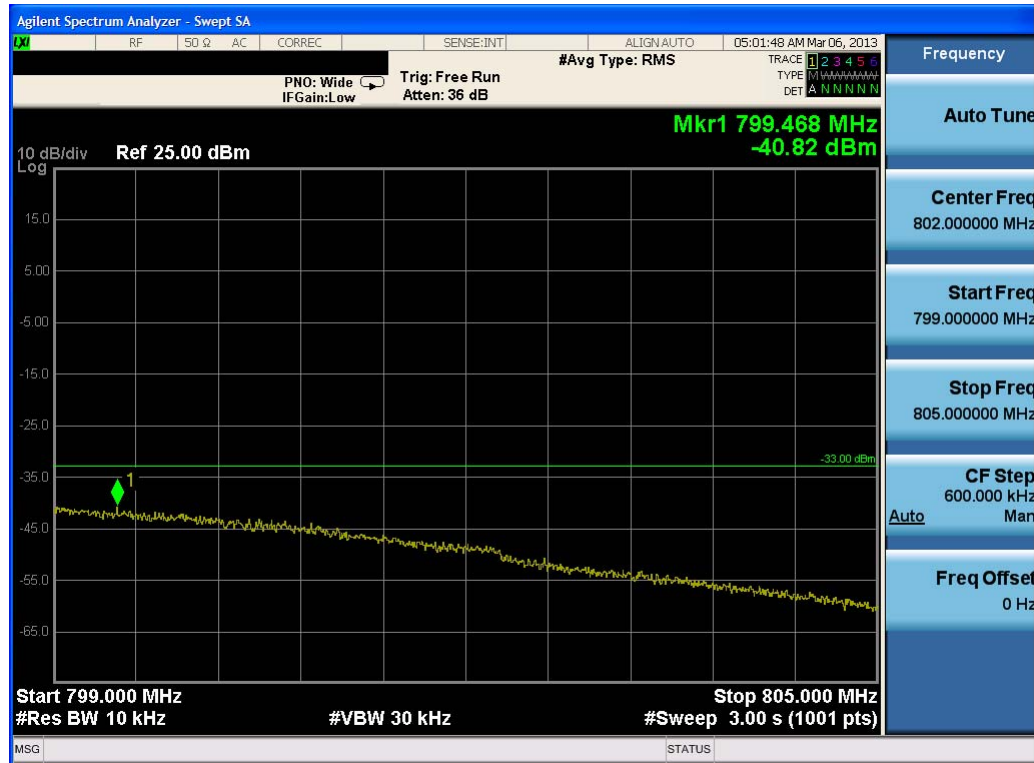
Plot 7-7. Conducted Spurious Plot



Plot 7-8. Conducted Spurious Plot

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 25 of 36                   |

**Emissions Mask Note:** For the following conducted emissions plots in the 769-775MHz and the 799 – 805MHz band, the FCC limit is  $65 + 10\log_{10}(P_{\text{Watts}}) = -35\text{dBm}$  in a 6.25kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25kHz with the available equipment, a bandwidth of 10kHz was used instead to show compliance. By using a 10kHz bandwidth, the limit was adjusted by  $10\log_{10}(10\text{kHz}/6.25\text{kHz}) = 2.04\text{dB}$ . Thus, the limit shown in all plots in the 799 – 805MHz band for all available modulation types was  $-35\text{dBm} + 2.04\text{dB} = -32.96\text{dBm}$ .



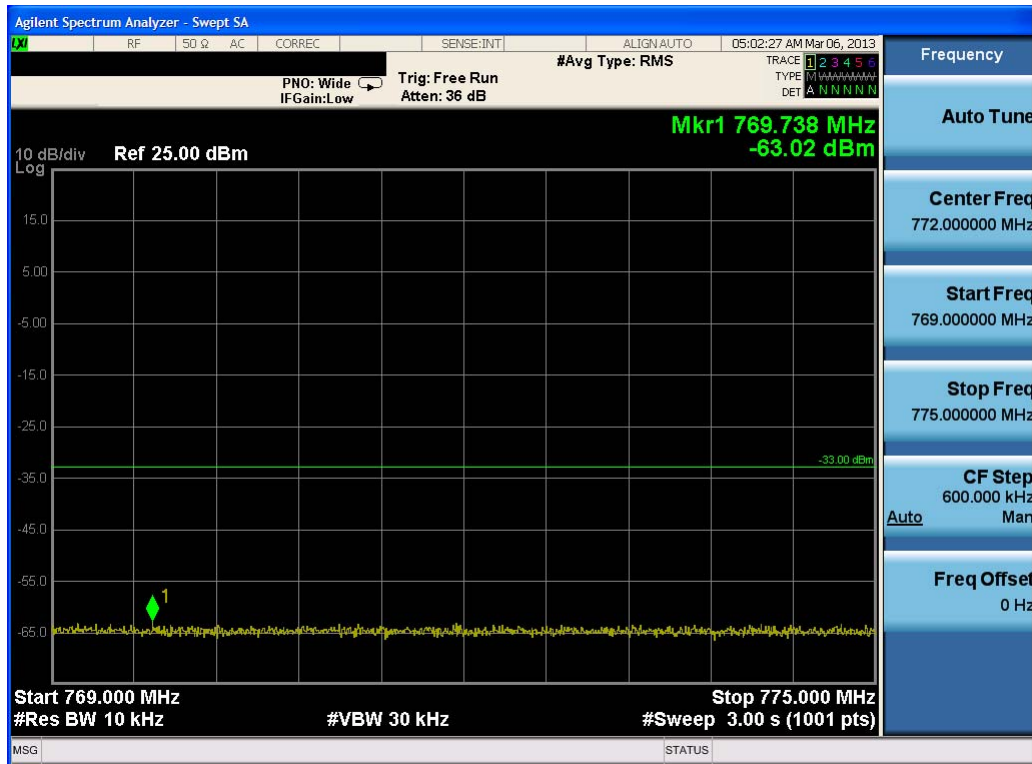
**Plot 7-9. Conducted Emissions Mask (799-805 MHz) Plot (QPSK, 25RB, High Channel)**

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 26 of 36                   |



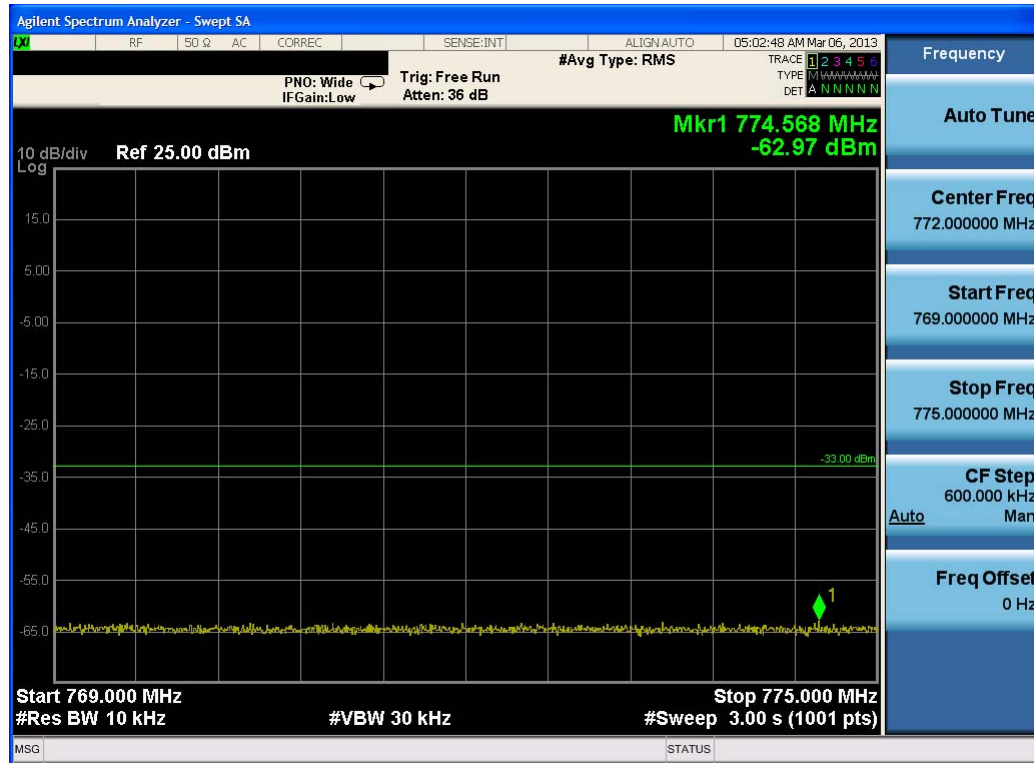


Plot 7-10. Conducted Emissions Mask (799-805 MHz) Plot (16QAM, 25RB, High Channel)



Plot 7-11. Conducted Emissions Mask (769-775 MHz) Plot (QPSK, 25RB, Low Channel)

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 27 of 36                   |



**Plot 7-12. Conducted Emissions Mask (769-775 MHz) Plot (16QAM, 25RB, Low Channel)**

## 8.0 10MHZ BANDWIDTH - PLOT(S) OF EMISSIONS



Plot 8-1. Lower Band Edge Plot (QPSK, 50RB)



Plot 8-2. Lower Band Edge Plot (16QAM, 50RB)

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 29 of 36                   |

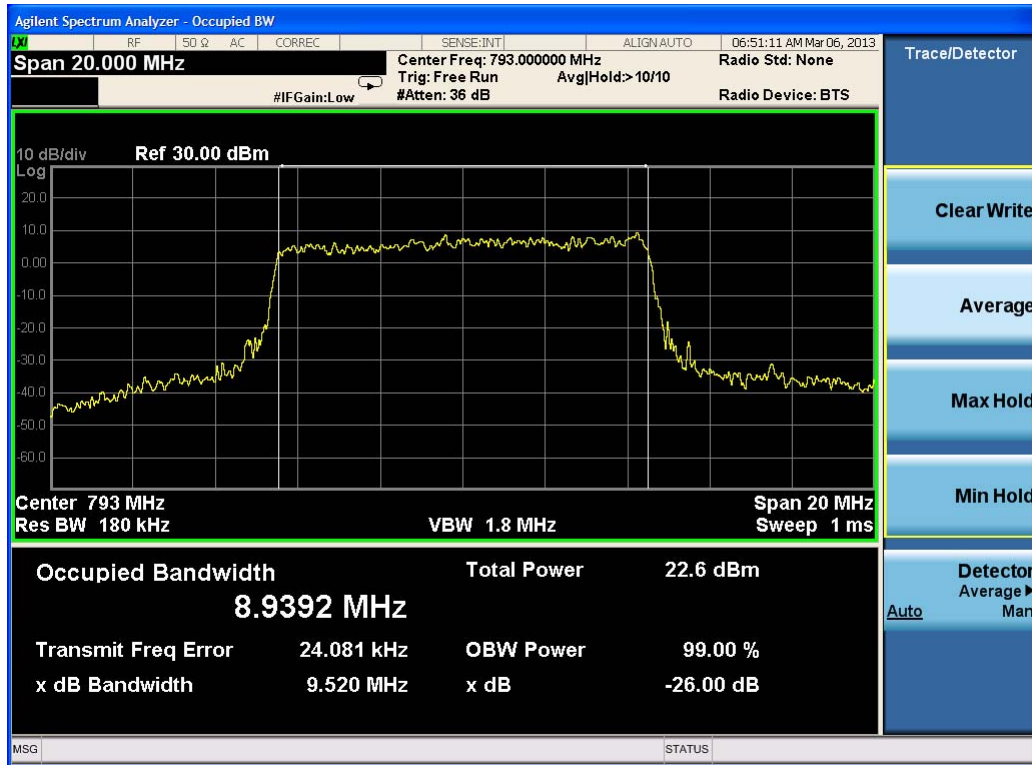


Plot 8-3. Upper Band Edge Plot (QPSK, 50RB)

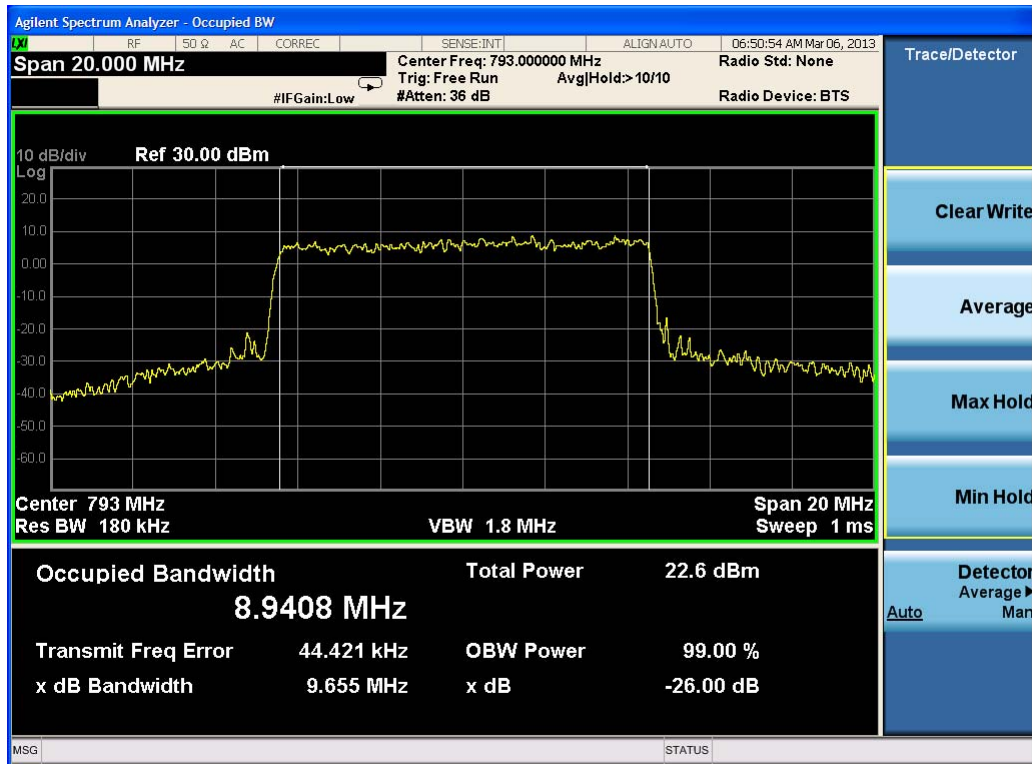


Plot 8-4. Upper Band Edge Plot (16QAM, 50RB)

|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 30 of 36                   |



Plot 8-5. Occupied Bandwidth Plot (QPSK, 50RB)

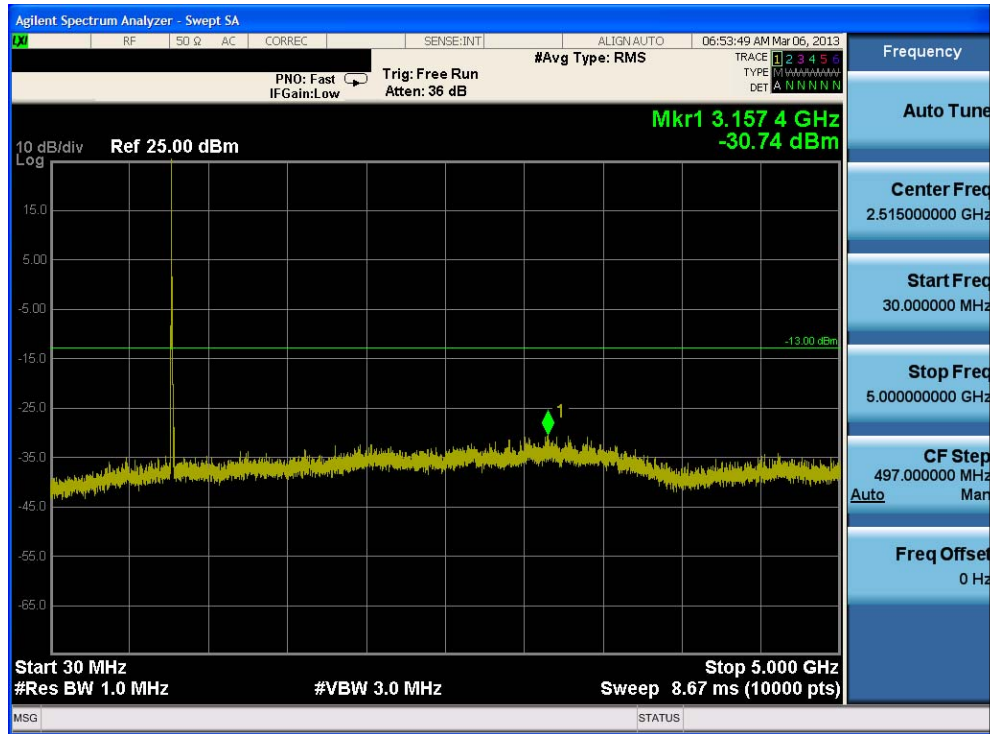


Plot 8-6. Occupied Bandwidth Plot (16QAM, 50RB)

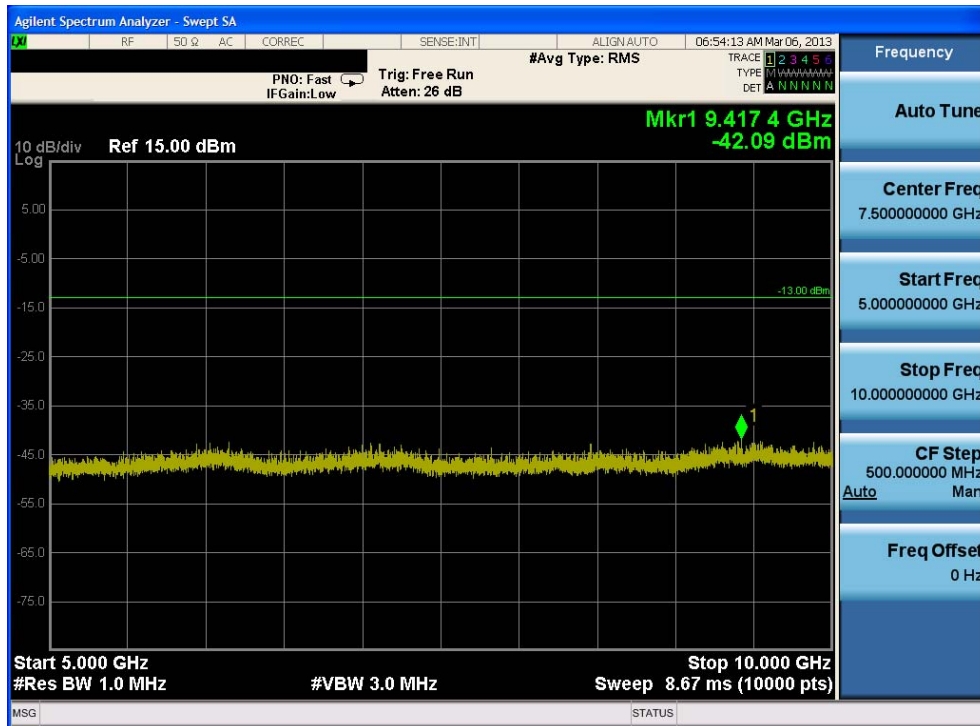
|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 31 of 36                   |



**Out-of-Band Spurious Emissions Note:** For the following conducted spurious emission plots, all modulations bandwidths, and RB configurations were tested. Worst case emissions were found in 16-QAM modulation, 1RB, and 0 RB Offset. Worst case plots are reported below:



**Plot 8-7. Conducted Spurious Plot**

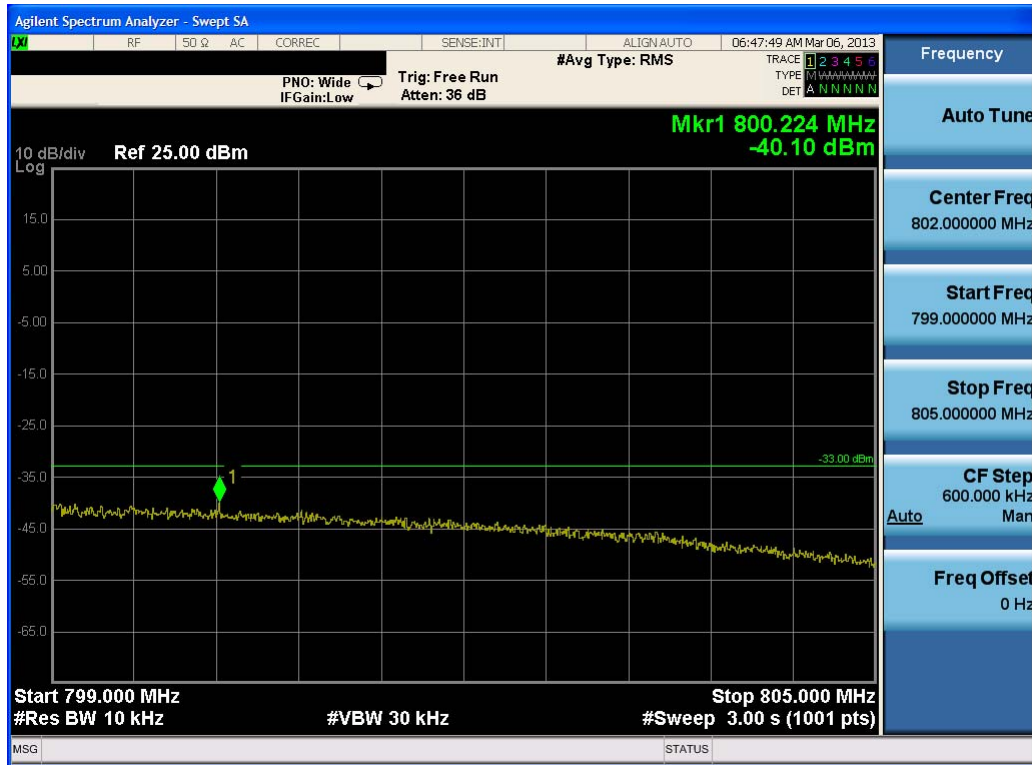


**Plot 8-8. Conducted Spurious Plot**

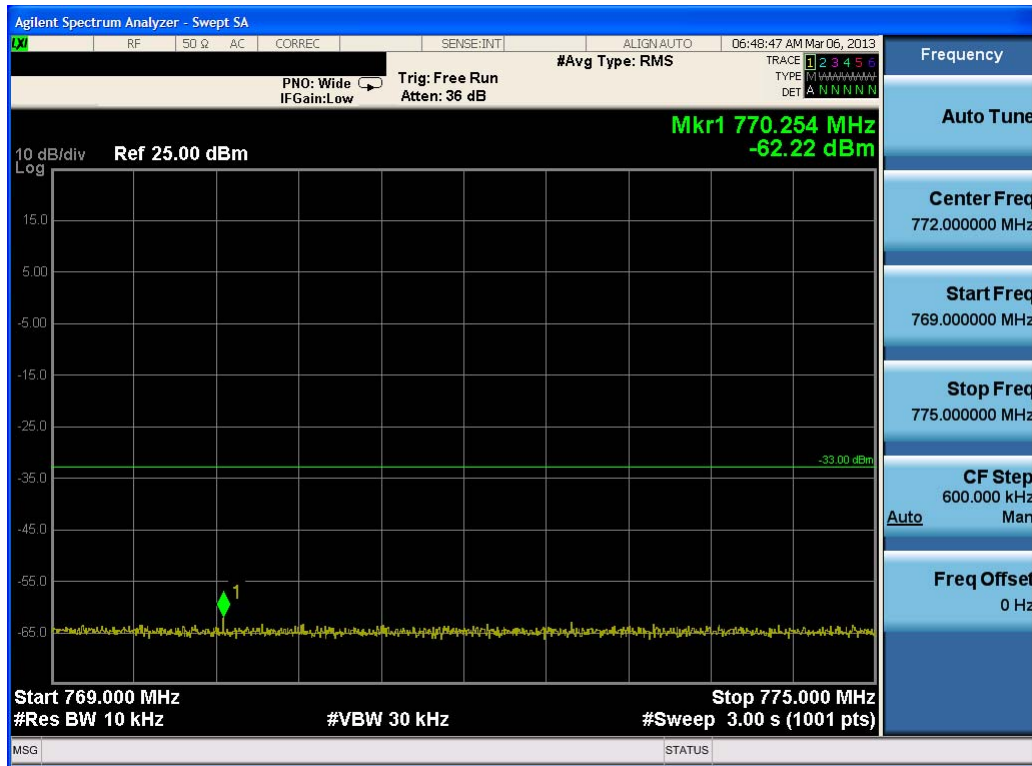
|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 32 of 36                   |





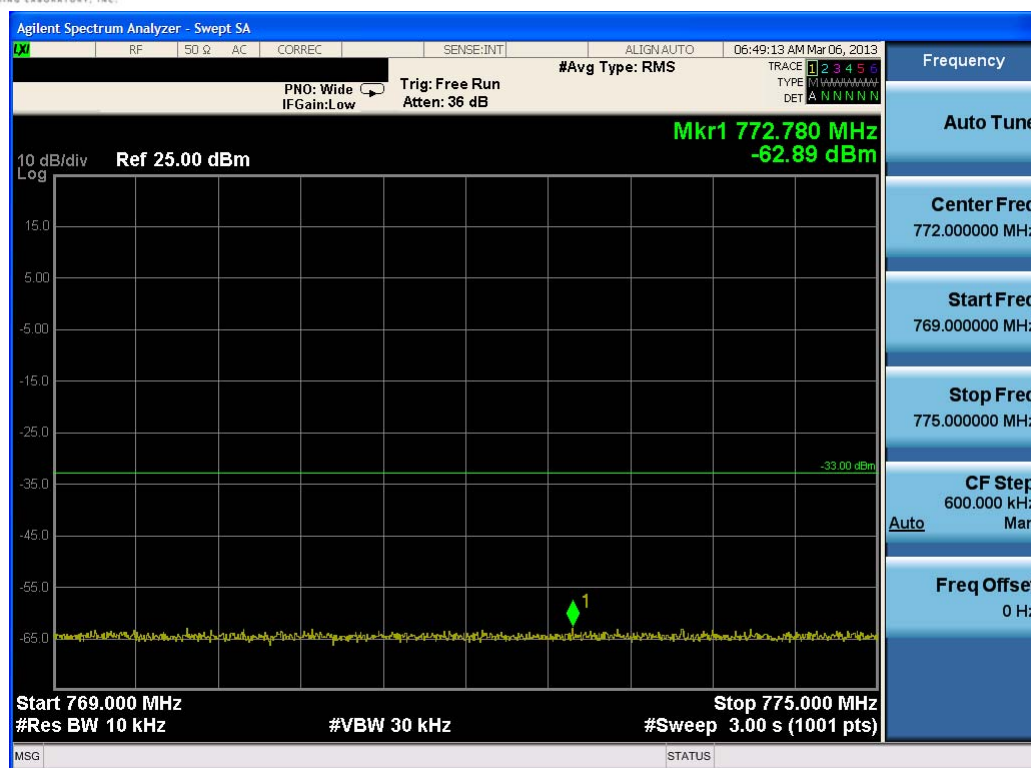


Plot 8-10. Conducted Emissions Mask (799-805 MHz) Plot (16QAM, 50RB)



Plot 8-11. Conducted Emissions Mask (769-775 MHz) Plot (QPSK, 50RB)



|                                      |   |   |               |                                 |
|--------------------------------------|---|---|---------------|---------------------------------|
| FCC ID: BV8BBPBM113                  | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 90 LTE MEASUREMENT REPORT<br>(CLASS II PERMISSIVE CHANGE) | <b>HARRIS</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1311182188.BV8 | Test Dates:<br>8/12/2013, 11/28/2013          | EUT Type:<br>Wireless Module                                      |               | Page 34 of 36                   |



### Plot 8-12. Conducted Emissions Mask (769-775 MHz) Plot (16QAM, 50RB)

## 9.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Harris Wireless Module FCC ID: BV8BBPBM113** complies with all the requirements of Parts 2 and 90 of the FCC rules.

|   |   |   |   |  |
|---|---|---|---|--|
| <b>FCC ID:</b> BV8BBPBM113                  |  | <b>FCC Pt. 90 LTE MEASUREMENT REPORT<br/>(CLASS II PERMISSIVE CHANGE)</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1311182188.BV8 | <b>Test Dates:</b><br>8/12/2013, 11/28/2013   | <b>EUT Type:</b><br>Wireless Module                                       | Page 36 of 36   |  |