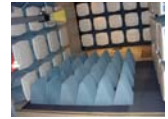




# PCTEST ENGINEERING LABORATORY, INC.

6660-B Dobbin Road, Columbia, MD 21045 USA  
Tel. 410.290.6652 / Fax 410.290.6654  
http://www.pctestlab.com



## MEASUREMENT REPORT FCC Part 22, 24 & 27

**Applicant Name:**  
LG Electronics MobileComm U.S.A  
1000 Sylvan Avenue  
Englewood Cliffs, NJ 07632  
United States

**Date of Testing:**  
Aug. 14 - October 01, 2012  
**Test Site/Location:**  
PCTEST Lab., Columbia, MD, USA  
**Test Report Serial No.:**  
0Y1207050902.ZNF

|                   |  |
|-------------------|--|
| <b>FCC ID :</b>   | <b>ZNFE971</b>                         |
| <b>APPLICANT:</b> | <b>LG ELECTRONICS MOBILECOMM U.S.A</b> |

**Application Type:** Certification  
**FCC Classification:** PCS Licensed Transmitter Held to Ear (PCE)  
**FCC Rule Part(s):** §2; §22; §24; §27  
**EUT Type:** Portable Handset  
**Model(s):** E971, LGE971, LG-E971  
**Test Device Serial No.:** identical prototype [S/N: 207KPWQ000057]

| Mode        | Tx Frequency (MHz) | Emission Designator | Modulation | ERP/EIRP       |                  |
|-------------|--------------------|---------------------|------------|----------------|------------------|
|             |                    |                     |            | Max. Power (W) | Max. Power (dBm) |
| LTE Band 17 | 706.5 - 713.5      | 4M49G7D             | QPSK       | 0.346          | 25.386           |
| LTE Band 17 | 706.5 - 713.5      | 4M49W7D             | 16QAM      | 0.299          | 24.756           |
| LTE Band 17 | 709 - 711          | 8M91G7D             | QPSK       | 0.333          | 25.225           |
| LTE Band 17 | 709 - 711          | 8M92W7D             | 16QAM      | 0.270          | 24.313           |
| LTE Band 5  | 826.5 - 846.5      | 4M47G7D             | QPSK       | 0.128          | 21.075           |
| LTE Band 5  | 826.5 - 846.5      | 4M47W7D             | 16QAM      | 0.115          | 20.615           |
| LTE Band 5  | 829 - 844          | 8M91G7D             | QPSK       | 0.120          | 20.785           |
| LTE Band 5  | 829 - 844          | 8M92W7D             | 16QAM      | 0.088          | 19.465           |
| LTE Band 7  | 2502.5 - 2567.5    | 4M47G7D             | QPSK       | 0.339          | 25.300           |
| LTE Band 7  | 2502.5 - 2567.5    | 4M48W7D             | 16QAM      | 0.250          | 23.980           |
| LTE Band 7  | 2505 - 2565        | 8M93G7D             | QPSK       | 0.444          | 26.470           |
| LTE Band 7  | 2505 - 2565        | 8M92W7D             | 16QAM      | 0.405          | 26.070           |
| LTE Band 7  | 2507.5 - 2562.5    | 13M38G7D            | QPSK       | 0.360          | 25.560           |
| LTE Band 7  | 2507.5 - 2562.5    | 13M36W7D            | 16QAM      | 0.444          | 26.470           |
| LTE Band 7  | 2510 - 2560        | 17M88G7D            | QPSK       | 0.405          | 26.070           |
| LTE Band 7  | 2510 - 2560        | 17M82W7D            | 16QAM      | 0.251          | 23.990           |
| LTE Band 2  | 1852.5 - 1907.5    | 4M52G7D             | QPSK       | 0.237          | 23.746           |
| LTE Band 2  | 1852.5 - 1907.5    | 4M51W7D             | 16QAM      | 0.180          | 22.556           |
| LTE Band 2  | 1855 - 1905        | 8M96G7D             | QPSK       | 0.213          | 23.276           |
| LTE Band 2  | 1855 - 1905        | 8M95W7D             | 16QAM      | 0.138          | 21.396           |

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. 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.

PCTEST certifies that no party to this application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.



Randy Ortanez  
President



|   |  |  |  |  |
|---|--|--|--|--|
| <b>FCC ID:</b> ZNFE971                      |  | <b>FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1207050902.ZNF | <b>Test Dates:</b><br>Aug. 14 - October 01, 2012 | <b>EUT Type:</b><br>Portable Handset                           |  | Page 1 of 101                          |

# T A B L E O F C O N T E N T S

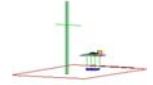
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|---|---|--|---|--|
| FCC ID: ZNFE971                             |  | <b>FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1207050902.ZNF | <b>Test Dates:</b><br>Aug. 14 - October 01, 2012                                    | <b>EUT Type:</b><br>Portable Handset                               | Page 2 of 101   |  |



# MEASUREMENT REPORT

## FCC Part 22, 24 & 27

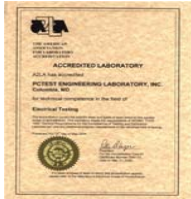


### §2.1033 General Information



**APPLICANT:** LG Electronics MobileComm U.S.A  
**APPLICANT ADDRESS:** 1000 Sylvan Avenue  
 Englewood Cliffs, NJ 07632, United States  
**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.  
**TEST SITE ADDRESS:** 7185 Oakland Mills Road, Columbia, MD 21046 USA  
**FCC RULE PART(S):** §2; §22; §24; §27  
**BASE MODEL:** E971  
**FCC ID:** ZNFE971  
**FCC CLASSIFICATION:** PCS Licensed Transmitter Held to Ear (PCE)  
**FREQUENCY TOLERANCE:** ±0.00025 % (2.5 ppm) for Band 5, within frequency block for Bands 2, 7 and 17  
**Test Device Serial No.:** 207KPWQ000057       Production     Pre-Production     Engineering  
**DATE(S) OF TEST:** Aug. 14 - October 01, 2012  
**TEST REPORT S/N:** 0Y1207050902.ZNF

### 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.

|   |  |   |  |
|---|--|---|--|
| <b>FCC ID:</b> ZNFE971                      |  <b>FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br/>(CERTIFICATION)</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1207050902.ZNF | <b>Test Dates:</b><br>Aug. 14 - October 01, 2012   | <b>EUT Type:</b><br>Portable Handset  | Page 3 of 101                          |

# 1.0 INTRODUCTION

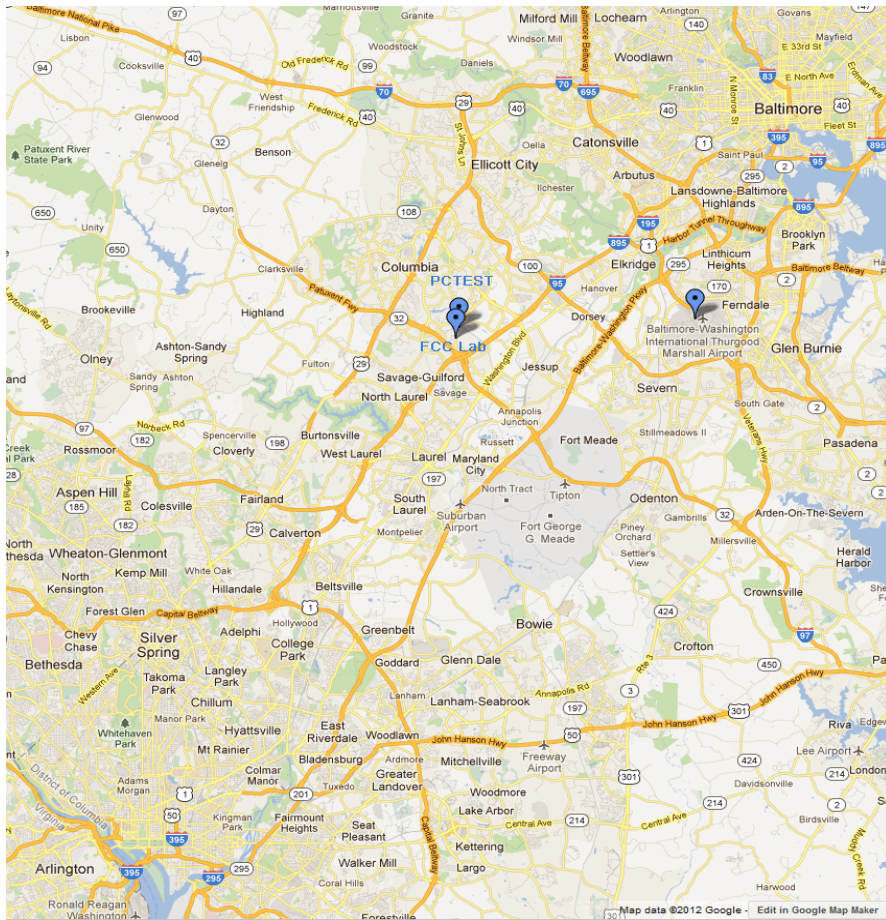
## 1.1 Scope

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 Intern't'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 C63.4-2003/2009 on January 10, 2012.



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

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 4 of 101                   |

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **LGE Portable Handset FCC ID: ZNFE971**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function. The EUT consisted of the following component(s):

| Trade Name / Base Model | FCC ID  | Description      |
|-------------------------|---------|------------------|
| LGE / Model: E971       | ZNFE971 | Portable Handset |

Table 2-1. EUT Equipment Description

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA, Band 2, 5, 7, 17 LTE, 802.11a/b/g/n WLAN (DTS/NII), Bluetooth (1x,EDR, LE), NFC

### 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.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              | Page 5 of 101   |                                 |

### 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.

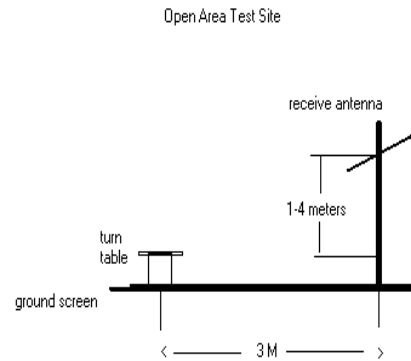


Figure 3-1. Diagram of 3-meter outdoor test range

Deviation from Measurement Procedure.....None

#### 3.2 Occupied Bandwidth

§2.1049, RSS-Gen (4.6.1)



The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

#### 3.3 Block A Frequency Range

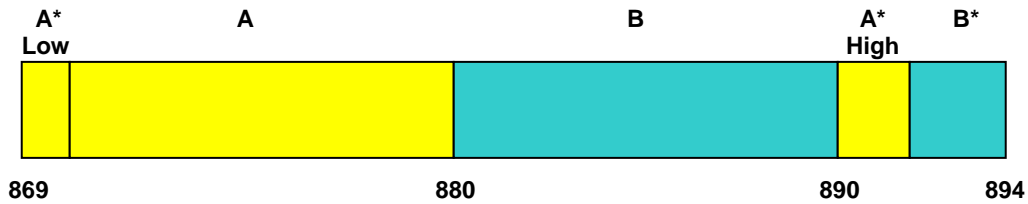
§27.5(c)

698-746 MHz band. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

- Block A: 698-704 MHz and 728-734 MHz;
- Block B: 704-710 MHz and 734-740 MHz; and
- Block C: 710-716 MHz and 740-746 MHz.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 6 of 101                   |

### 3.4 Cellular - Base Frequency Blocks



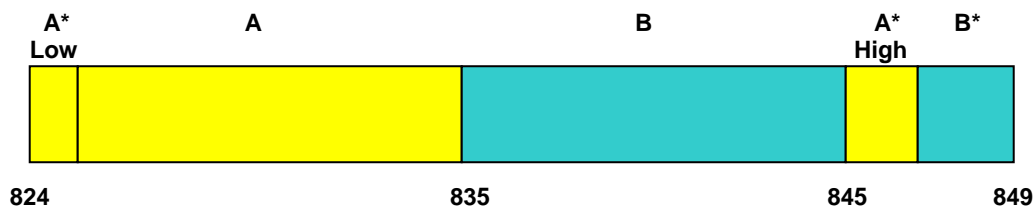
BLOCK 1: 869 – 880 MHz (A\* Low + A)

BLOCK 3: 890 – 891.5 MHz (A\* High)

BLOCK 2: 880 – 890 MHz (B)

BLOCK 4: 891.5 – 894 MHz (B\*)

### 3.5 Cellular - Mobile Frequency Blocks



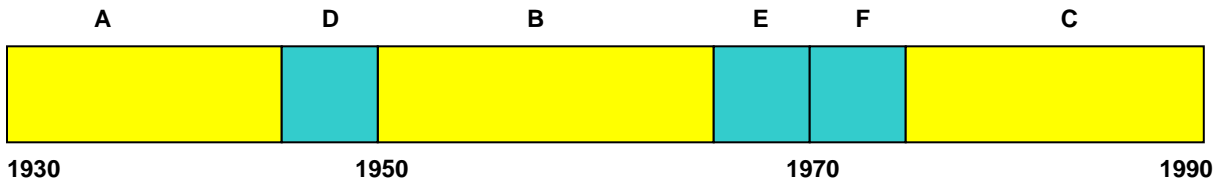
BLOCK 1: 824 – 835 MHz (A\* Low + A)

BLOCK 3: 845 – 846.5 MHz (A\* High)

BLOCK 2: 835 – 845 MHz (B)

BLOCK 4: 846.5 – 849 MHz (B\*)

### 3.6 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)

BLOCK 4: 1965 – 1970 MHz (E)

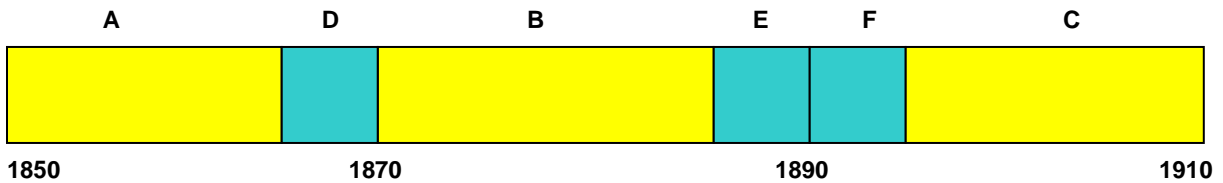
BLOCK 2: 1945 – 1950 MHz (D)

BLOCK 5: 1970 – 1975 MHz (F)

BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 6: 1975 – 1990 MHz (C)

### 3.7 PCS - Mobile Frequency Blocks



BLOCK 1: 1850 – 1865 MHz (A)



BLOCK 4: 1885 – 1890 MHz (E)

BLOCK 2: 1865 – 1870 MHz (D)

BLOCK 5: 1890 – 1895 MHz (F)

BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 6: 1895 – 1910 MHz (C)

|                                      |   |                               |  |   |                                 |
|--------------------------------------|---|-------------------------------|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  |                               | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset | Page 7 of 101  |   |                                 |

### **3.8 Spurious and Harmonic Emissions at Antenna Terminal** §2.1051, 22.917(a), 24.238(a), §27.53(g), §27.53(h); RSS-132 (4.5.1), RSS-133 (6.5.1)



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. 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. For Bands 5 and 17, Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. For Bands 2 and 4, 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.

### **3.9 Radiated Power and Radiated Spurious Emissions** §2.1053, 22.917(a), 24.238(a), §27.53(g), §27.53(h); RSS-132(4.5.1.2), RSS-133 (6.5.1)

Radiated power and 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.

### **3.10 Peak-Average Ratio** §24.232(d), §27.50(d)(5), RSS-133 (6.4)

A peak to average ratio measurement is performed at the conducted port of the EUT. For LTE signals, the spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              | Page 8 of 101   |                                 |



### 3.11 Frequency Stability / Temperature Variation

§2.1055, §22.355, §24.235, §27.54, RSS-132 (4.3), RSS-133 (6.3)



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. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

*Specification – For Band 5, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency. For Bands 2, 4, and 17 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.*

**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 sufficient stabilization period at each temperature shall be used prior to each frequency requirement.

|                                      |  |                               |   |                                 |
|--------------------------------------|--|-------------------------------|---|---------------------------------|
| FCC ID: ZNFE971                      |  <b>FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)</b> |                               |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012  | EUT Type:<br>Portable Handset |   | Page 9 of 101                   |



## 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         | 1/25/2012  | Annual       | 1/25/2013  | N/A           |
| -               | RE1       | Radiated Emissions Cable Set (UHF/EHF) | 7/10/2012  | Annual       | 7/10/2013  | N/A           |
| Agilent         | 8447D     | Broadband Amplifier                    | 5/8/2012   | Annual       | 5/8/2013   | 1937A03348    |
| Agilent         | E4448A    | PSA (3Hz-50GHz) Spectrum Analyzer      | 2/15/2012  | Annual       | 2/15/2013  | US42510244    |
| Agilent         | E8257D    | (250kHz-20GHz) Signal Generator        | 4/5/2012   | Annual       | 4/5/2013   | MY45470194    |
| Agilent         | N9020A    | MXA Signal Analyzer                    | 10/10/2011 | Annual       | 10/10/2012 | US46470561    |
| Agilent         | N9030A    | PXA Signal Analyzer                    | 2/23/2012  | Annual       | 2/23/2013  | MY49432391    |
| Anritsu         | MA2411B   | Power Sensor                           | 3/5/2012   | Annual       | 3/5/2013   | 846215        |
| Anritsu         | ML2495A   | Power Meter                            | 10/13/2011 | Annual       | 10/13/2012 | 1039008       |
| Espec           | ESX-2CA   | Environmental Chamber                  | 4/4/2012   | Annual       | 4/4/2013   | 17620         |
| 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  | Annual       | 5/30/2013  | 135427        |
| ETS Lindgren    | 3164-08   | Quad Ridge Horn Antenna                | 10/1/2010  | Biennial     | 10/1/2012  | 128337        |
| Mini-Circuits   | VHF-1200+ | High Pass Filter                       | 1/15/2012  | Annual       | 1/15/2013  | 30923         |
| Mini-Circuits   | VHF-3100+ | High Pass Filter                       | 1/15/2012  | Annual       | 1/15/2013  | 30841         |
| Rohde & Schwarz | CMW500    | LTE Radio Communication Tester         | N/A        |              | N/A        | 100976        |
| Rohde & Schwarz | RS-PR18   | 1-18 GHz Pre-Amplifier                 | 6/26/2012  | Annual       | 6/26/2013  | 100071        |
| Rohde & Schwarz | RS-PR26   | 18-26.5 GHz Pre-Amplifier              | 5/30/2012  | Annual       | 5/30/2013  | 100040        |
| Rohde & Schwarz | ESU26     | EMI Test Receiver                      | 12/15/2011 | Annual       | 12/15/2012 | 100342        |
| Schwarzbeck     | UHA 9105  | Dipole Antenna (400 - 1GHz) Rx         | 11/14/2011 | Biennial     | 11/14/2013 | 9105-2404     |
| Schwarzbeck     | UHA 9105  | Dipole Antenna (400 - 1GHz) Tx         | 11/14/2011 | Biennial     | 11/14/2013 | 9105-2403     |
| 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: Rohde & Schwarz Model: CMW500 was used for signaling purposes only and not for calibrated measurements. Care was taken to ensure that testing occurred while test equipment was in calibration.**

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
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| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              | Page 10 of 101  |                                 |

## 5.0 SAMPLE CALCULATIONS

### Emission Designator

#### 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 Band

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

The average receive power meter 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 terminals is adjusted to produce a reading of -81.0 dBm on the power meter. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 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).

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
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## 6.0 TEST RESULTS

### 6.1 Summary



Company Name: LG Electronics MobileComm U.S.A  
 FCC ID: ZNFE971  
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)  
 Mode(s): LTE

| FCC Part Section(s)                                    | RSS Section(s)                         | Test Description                                   | Test Limit   | Test Condition | Test Result | Reference                       |
|--|--|--|--|----------------|-------------|---------------------------------|
| <b>TRANSMITTER MODE (TX)</b>                           |  |  |  |                |             |                                 |
| 2.1049   | RSS-Gen (4.6.1)<br>RSS-133 (2.3)       | Occupied Bandwidth                                 | N/A  | CONDUCTED      | PASS        | Section 7.0                     |
| 2.1051, 22.917(a),<br>24.238(a), 27.53(g),<br>27.53(h) | RSS-133 (6.5.1)                        | Band Edge /<br>Conducted<br>Spurious Emissions     | < 43 + 10log <sub>10</sub> (P[Watts])<br>at Band Edge and for all<br>out-of-band emissions |                | PASS        | Section 7.0                     |
| 24.232(d),<br>27.50(d)(5)                              | RSS-133 (6.4)                          | Peak-Average Ratio                                 | < 13 dB  |                | PASS        | Section 7.0                     |
| 2.1046   | RSS-132 (4.4)<br>RSS-133 (4.1)         | Transmitter<br>Conducted Output<br>Power           | N/A  |                | PASS        | SAR Report                      |
| 22.913(a)(2)   | RSS-132 (4.4)<br>[SRSP-<br>503(5.1.3)] | Effective Radiated<br>Power (Band 5)               | < 7 Watts max. ERP   | RADIATED       | PASS        | Section 6.2                     |
| 27.50(c)(10)   |  | Effective Radiated<br>Power (Band 17)              | < 3 Watts max. ERP   |                | PASS        | Section 6.2                     |
| 24.232(c)  | RSS-133 (6.4)<br>[SRSP-510<br>(5.1.2)] | Equivalent Isotropic<br>Radiated Power<br>(Band 2) | < 2 Watts max. EIRP  |                | PASS        | Section 6.3                     |
| 27.50(d)(4)  |  | Equivalent Isotropic<br>Radiated Power<br>(Band 4) | < 1 Watts max. EIRP  |                | PASS        | Section 6.3                     |
| 2.1053, 22.917(a),<br>24.238(a), 27.53(g),<br>27.53(h) | RSS-132 (4.5.1)<br>RSS-133 (6.5.1)     | Undesirable<br>Emissions                           | < 43 + 10log <sub>10</sub> (P[Watts])<br>for all<br>out-of-band emissions                  |                | PASS        | Section 6.4,<br>6.5, 6.6, 6.7   |
| 2.1055, 27.54,<br>22.355, 24.235                       | RSS-132 (4.3)<br>RSS-133 (6.3)         | Frequency Stability                                | < 2.5 ppm  |                | PASS        | Section 6.8,<br>6.9, 6.10, 6.11 |

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

**Notes:**

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in Section **Error! Reference source not found.** were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT 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, attenuators, and couplers.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
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## 6.2 Effective Radiated Power Output Data

§22.913(a)(2), §27.50(c)(10)

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Battery  | RB Size/Offset | Measured Level [dBm] | Substitute Level [dBm] | Antenna Gain [dBd] | Pol [H/V] | ERP [dBm] | ERP [Watts] | Margin [dB] |
|-----------------|-------------------------|--------|----------|----------------|----------------------|------------------------|--------------------|-----------|-----------|-------------|-------------|
| 706.50          | 5                       | QPSK   | Standard | 1 / 0          | -14.85               | 23.27                  | 2.12               | H         | 25.39     | 0.346       | -9.39       |
| 710.00          | 5                       | QPSK   | Standard | 1 / 0          | -15.97               | 22.15                  | 2.20               | H         | 24.35     | 0.273       | -10.42      |
| 713.50          | 5                       | QPSK   | Standard | 1 / 0          | -15.67               | 22.45                  | 2.29               | H         | 24.74     | 0.298       | -10.03      |
| 706.50          | 5                       | 16-QAM | Standard | 1 / 0          | -15.48               | 22.64                  | 2.12               | H         | 24.76     | 0.299       | -10.02      |
| 710.00          | 5                       | 16-QAM | Standard | 1 / 0          | -16.42               | 21.70                  | 2.20               | H         | 23.90     | 0.246       | -10.87      |
| 713.50          | 5                       | 16-QAM | Standard | 1 / 0          | -16.84               | 21.28                  | 2.29               | H         | 23.57     | 0.228       | -11.20      |
| 709.00          | 10                      | QPSK   | Standard | 1 / 0          | -15.36               | 22.76                  | 2.12               | H         | 24.88     | 0.307       | -9.90       |
| 710.00          | 10                      | QPSK   | Standard | 1 / 0          | -15.10               | 23.02                  | 2.20               | H         | 25.22     | 0.333       | -9.55       |
| 711.00          | 10                      | QPSK   | Standard | 1 / 0          | -16.02               | 22.10                  | 2.29               | H         | 24.39     | 0.275       | -10.38      |
| 709.00          | 10                      | 16-QAM | Standard | 1 / 0          | -15.99               | 22.13                  | 2.12               | H         | 24.25     | 0.266       | -10.53      |
| 710.00          | 10                      | 16-QAM | Standard | 1 / 0          | -16.58               | 21.54                  | 2.20               | H         | 23.74     | 0.237       | -11.03      |
| 711.00          | 10                      | 16-QAM | Standard | 1 / 0          | -16.10               | 22.02                  | 2.29               | H         | 24.31     | 0.270       | -10.46      |

**Table 6-2. Effective Radiated Power Output Data (Band 17)**

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Battery  | RB Size/Offset | Measured Level [dBm] | Substitute Level [dBm] | Antenna Gain [dBd] | Pol [H/V] | ERP [dBm] | ERP [Watts] | Margin [dB] |
|-----------------|-------------------------|--------|----------|----------------|----------------------|------------------------|--------------------|-----------|-----------|-------------|-------------|
| 826.50          | 5                       | QPSK   | Standard | 1 / 0          | -17.69               | 14.79                  | 4.71               | H         | 19.50     | 0.089       | -18.95      |
| 836.50          | 5                       | QPSK   | Standard | 1 / 0          | -16.21               | 16.27                  | 4.80               | H         | 21.07     | 0.128       | -17.38      |
| 846.50          | 5                       | QPSK   | Standard | 1 / 0          | -16.90               | 15.58                  | 4.90               | H         | 20.48     | 0.112       | -17.98      |
| 826.50          | 5                       | 16-QAM | Standard | 1 / 0          | -17.90               | 14.58                  | 4.71               | H         | 19.29     | 0.085       | -19.16      |
| 836.50          | 5                       | 16-QAM | Standard | 1 / 0          | -16.67               | 15.81                  | 4.80               | H         | 20.61     | 0.115       | -17.84      |
| 846.50          | 5                       | 16-QAM | Standard | 1 / 0          | -17.80               | 14.68                  | 4.90               | H         | 19.58     | 0.091       | -18.88      |
| 829.00          | 10                      | QPSK   | Standard | 1 / 0          | -18.20               | 14.28                  | 4.71               | H         | 18.99     | 0.079       | -19.46      |
| 836.50          | 10                      | QPSK   | Standard | 1 / 0          | -16.50               | 15.98                  | 4.80               | H         | 20.78     | 0.120       | -17.67      |
| 844.00          | 10                      | QPSK   | Standard | 1 / 0          | -17.61               | 14.87                  | 4.90               | H         | 19.77     | 0.095       | -18.69      |
| 829.00          | 10                      | 16-QAM | Standard | 1 / 0          | -18.98               | 13.50                  | 4.71               | H         | 18.21     | 0.066       | -20.24      |
| 836.50          | 10                      | 16-QAM | Standard | 1 / 0          | -17.82               | 14.66                  | 4.80               | H         | 19.46     | 0.088       | -18.99      |
| 844.00          | 10                      | 16-QAM | Standard | 1 / 0          | -18.24               | 14.24                  | 4.90               | H         | 19.14     | 0.082       | -19.32      |



**Table 6-3. Effective Radiated Power Output Data (Band 5)**

### NOTES:

Equivalent Isotropic Radiated Power 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 level is recorded using the power meter. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

The EUT was tested in three orthogonal planes and in all possible test configurations and modulations. The worst case test configuration was found in the horizontal polarity for all setups. All possible modulations, configurations, RB sizes and offsets were tested and the worst case settings are described in the table above. The data reported in the table above was measured in this test setup.

|                                      |   |                               |  |   |                                 |
|--------------------------------------|---|-------------------------------|--|---|---------------------------------|
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| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset | Page 13 of 101   |   |                                 |

### 6.3 Equivalent Isotropic Radiated Power Output Data §24.232(c); §27.50(h)(2)

| Channel Bandwidth [MHz] | Mod.   | Battery  | RB Size/Offset | Measured Level [dBm] | Substitute Level [dBm] | Antenna Gain [dBi] | Pol [H/V] | EIRP [dBm] | EIRP [Watts] | Margin [dB] |
|-------------------------|--------|----------|----------------|----------------------|------------------------|--------------------|-----------|------------|--------------|-------------|
| 5                       | QPSK   | Standard | 1 / 0          | -16.70               | 16.79                  | 8.51               | H         | 25.30      | 0.339        | -4.70       |
| 5                       | QPSK   | Standard | 1 / 0          | -18.21               | 15.28                  | 8.53               | H         | 23.81      | 0.240        | -6.19       |
| 5                       | QPSK   | Standard | 1 / 0          | -19.03               | 14.46                  | 8.61               | H         | 23.07      | 0.203        | -6.93       |
| 5                       | 16-QAM | Standard | 1 / 0          | -18.02               | 15.47                  | 8.51               | H         | 23.98      | 0.250        | -6.02       |
| 5                       | 16-QAM | Standard | 1 / 0          | -22.60               | 10.89                  | 8.53               | H         | 19.42      | 0.087        | -10.58      |
| 5                       | 16-QAM | Standard | 1 / 0          | -19.44               | 14.05                  | 8.61               | H         | 22.66      | 0.185        | -7.34       |
| 10                      | QPSK   | Standard | 1 / 0          | -16.44               | 17.05                  | 8.51               | H         | 25.56      | 0.360        | -4.44       |
| 10                      | QPSK   | Standard | 1 / 0          | -20.12               | 13.37                  | 8.53               | H         | 21.90      | 0.155        | -8.10       |
| 10                      | QPSK   | Standard | 1 / 0          | -15.62               | 17.87                  | 8.60               | H         | 26.47      | 0.444        | -3.53       |
| 10                      | 16-QAM | Standard | 1 / 0          | -16.81               | 16.68                  | 8.51               | H         | 25.19      | 0.330        | -4.81       |
| 10                      | 16-QAM | Standard | 1 / 0          | -21.80               | 11.69                  | 8.53               | H         | 20.22      | 0.105        | -9.78       |
| 10                      | 16-QAM | Standard | 1 / 0          | -16.02               | 17.47                  | 8.60               | H         | 26.07      | 0.405        | -3.93       |
| 15                      | QPSK   | Standard | 1 / 0          | -16.90               | 16.59                  | 8.51               | H         | 25.56      | 0.360        | -4.44       |
| 15                      | QPSK   | Standard | 1 / 0          | -22.90               | 10.59                  | 8.53               | H         | 19.12      | 0.082        | -10.88      |
| 15                      | QPSK   | Standard | 1 / 0          | -18.10               | 15.39                  | 8.60               | H         | 23.99      | 0.251        | -6.01       |
| 15                      | 16-QAM | Standard | 1 / 0          | -18.02               | 15.47                  | 8.51               | H         | 26.47      | 0.444        | -3.53       |
| 15                      | 16-QAM | Standard | 1 / 0          | -23.30               | 10.19                  | 8.53               | H         | 18.72      | 0.074        | -11.28      |
| 15                      | 16-QAM | Standard | 1 / 0          | -18.90               | 14.59                  | 8.60               | H         | 23.19      | 0.208        | -6.81       |
| 20                      | QPSK   | Standard | 1 / 0          | -18.04               | 15.45                  | 8.51               | H         | 26.07      | 0.405        | -3.93       |
| 20                      | QPSK   | Standard | 1 / 0          | -23.14               | 10.35                  | 8.53               | H         | 18.88      | 0.077        | -11.12      |
| 20                      | QPSK   | Standard | 1 / 0          | -17.50               | 15.99                  | 8.59               | H         | 24.58      | 0.287        | -5.42       |
| 20                      | 16-QAM | Standard | 1 / 0          | -18.70               | 14.79                  | 8.51               | H         | 23.30      | 0.214        | -6.70       |
| 20                      | 16-QAM | Standard | 1 / 0          | -23.92               | 9.57                   | 8.53               | H         | 18.10      | 0.065        | -11.90      |
| 20                      | 16-QAM | Standard | 1 / 0          | -18.46               | 15.03                  | 8.59               | H         | 23.99      | 0.251        | -6.01       |

**Table 6-4. Equivalent Isotropic Radiated Power Output Data (Band 7)**

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Battery  | RB Size/Offset | Measured Level [dBm] | Substitute Level [dBm] | Antenna Gain [dBi] | Pol [H/V] | ERP [dBm] | ERP [Watts] | Margin [dB] |
|-----------------|-------------------------|--------|----------|----------------|----------------------|------------------------|--------------------|-----------|-----------|-------------|-------------|
| 1852.50         | 5                       | QPSK   | Standard | 1 / 0          | -17.71               | 15.19                  | 8.56               | H         | 23.75     | 0.237       | -9.26       |
| 1880.00         | 5                       | QPSK   | Standard | 1 / 0          | -21.10               | 11.80                  | 8.55               | H         | 20.35     | 0.108       | -12.66      |
| 1907.50         | 5                       | QPSK   | Standard | 1 / 0          | -21.65               | 11.25                  | 8.54               | H         | 19.79     | 0.095       | -13.22      |
| 1852.50         | 5                       | 16-QAM | Standard | 1 / 0          | -19.89               | 13.01                  | 8.56               | H         | 21.57     | 0.143       | -11.44      |
| 1880.00         | 5                       | 16-QAM | Standard | 1 / 0          | -18.89               | 14.01                  | 8.55               | H         | 22.56     | 0.180       | -10.45      |
| 1907.50         | 5                       | 16-QAM | Standard | 1 / 0          | -22.39               | 10.51                  | 8.54               | H         | 19.05     | 0.080       | -13.96      |
| 1855.00         | 10                      | QPSK   | Standard | 1 / 0          | -18.18               | 14.72                  | 8.56               | H         | 23.28     | 0.213       | -9.73       |
| 1880.00         | 10                      | QPSK   | Standard | 1 / 0          | -18.60               | 14.30                  | 8.55               | H         | 22.85     | 0.193       | -10.16      |
| 1905.00         | 10                      | QPSK   | Standard | 1 / 0          | -20.02               | 12.88                  | 8.54               | H         | 21.42     | 0.139       | -11.59      |
| 1855.00         | 10                      | 16-QAM | Standard | 1 / 0          | -20.06               | 12.84                  | 8.56               | H         | 21.40     | 0.138       | -11.61      |
| 1880.00         | 10                      | 16-QAM | Standard | 1 / 0          | -21.70               | 11.20                  | 8.55               | H         | 19.75     | 0.094       | -13.26      |
| 1905.00         | 10                      | 16-QAM | Standard | 1 / 0          | -22.31               | 10.59                  | 8.54               | H         | 19.13     | 0.082       | -13.88      |



**Table 6-5. Equivalent Isotropic Radiated Power Output Data (Band 2)**

**NOTES:**

Equivalent Isotropic Radiated Power 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 Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This level is recorded using the power meter. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

The EUT was tested in three orthogonal planes and in all possible test configurations and modulations. The worst case test configuration was found in the horizontal polarity for all setups. All possible modulations, configurations, RB sizes and offsets were tested and the worst case settings are described in the table above. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
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## 6.4 Band 17 Radiated Measurements

**\$2.1053, \$27.53(g)**

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 706.50 MHz  
 CHANNEL: 23755  
 MEASURED OUTPUT POWER: 25.39 dBm = 0.346 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  38.39 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 1413.00         | -48.47                          | 3.63                          | -44.84                        | H         | 70.23  |
| 2119.50         | -31.69                          | 3.90                          | -27.80                        | H         | 53.18  |
| 2826.00         | -88.80                          | 5.01                          | -83.79                        | H         | 109.18 |
| 3532.50         | -91.63                          | 6.25                          | -85.38                        | H         | 110.77 |
| 4239.00         | -90.66                          | 7.23                          | -83.43                        | H         | 108.82 |
| 4945.50         | -90.41                          | 7.86                          | -82.54                        | H         | 107.93 |



**Table 6-6. Radiated Spurious Data (Ch. 23755)**

#### 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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the vertical setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
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## Band 17 Radiated Measurements (cont'd)

§2.1053, §27.53(g)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 710.00 MHz  
 CHANNEL: 23790  
 MEASURED OUTPUT POWER: 24.35 dBm = 0.273 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  37.35 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 1420.00         | -49.74                          | 3.68                          | -46.06                        | H         | 70.42  |
| 2130.00         | -31.93                          | 3.92                          | -28.01                        | H         | 52.37  |
| 2840.00         | -88.66                          | 5.02                          | -83.63                        | H         | 107.99 |
| 3550.00         | -91.51                          | 6.25                          | -85.26                        | H         | 109.62 |
| 4260.00         | -90.70                          | 7.25                          | -83.45                        | H         | 107.80 |
| 4970.00         | -90.41                          | 7.90                          | -82.50                        | H         | 106.86 |



**Table 6-7. Radiated Spurious Data (Ch. 23790)**

#### 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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the vertical setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
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**Band 17 Radiated Measurements (cont'd)**  
**§2.1053, §27.53(g)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 713.50 MHz  
 CHANNEL: 23825  
 MEASURED OUTPUT POWER: 24.74 dBm = 0.298 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  37.74 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 1427.00         | -48.41                          | 3.73                          | -44.68                        | H         | 69.42  |
| 2140.50         | -30.92                          | 3.94                          | -26.98                        | H         | 51.72  |
| 2854.00         | -88.51                          | 5.04                          | -83.48                        | H         | 108.22 |
| 3567.50         | -91.40                          | 6.25                          | -85.15                        | H         | 109.89 |
| 4281.00         | -90.70                          | 7.25                          | -83.45                        | H         | 108.19 |
| 4994.50         | -90.41                          | 7.94                          | -82.47                        | H         | 107.21 |



**Table 6-8. Radiated Spurious Data (Ch. 23825)**

**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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the vertical setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
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## 6.5 Band 5 Radiated Measurements

§2.1053, §22.917(a)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 826.50 MHz  
 CHANNEL: 20425  
 MEASURED OUTPUT POWER: 19.50 dBm = 0.089 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  32.50 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 1653.00         | -48.30                          | 2.50                          | -45.80                        | H         | 65.30  |
| 2479.50         | -88.66                          | 2.82                          | -85.84                        | H         | 105.35 |
| 3306.00         | -90.74                          | 5.52                          | -85.22                        | H         | 104.73 |
| 4132.50         | -90.35                          | 7.08                          | -83.27                        | H         | 102.77 |
| 4959.00         | -90.41                          | 7.91                          | -82.50                        | H         | 102.00 |
| 5785.50         | -88.78                          | 8.51                          | -80.27                        | H         | 99.78  |



**Table 6-9. Radiated Spurious Data (Ch. 20450)**

**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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
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**Band 5 Radiated Measurements (cont'd)**  
**§2.1053, §22.917(a)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 836.50 MHz  
 CHANNEL: 20525  
 MEASURED OUTPUT POWER: 21.07 dBm = 0.128 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  34.07 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 1673.00         | -48.75                          | 2.34                          | -46.41                        | H         | 67.48  |
| 2509.50         | -88.51                          | 2.84                          | -85.68                        | H         | 106.75 |
| 3346.00         | -90.93                          | 5.64                          | -85.29                        | H         | 106.36 |
| 4182.50         | -90.48                          | 7.14                          | -83.33                        | H         | 104.41 |
| 5019.00         | -90.39                          | 7.97                          | -82.42                        | H         | 103.50 |
| 5855.50         | -88.48                          | 8.46                          | -80.01                        | H         | 101.09 |



**Table 6-10. Radiated Spurious Data (Ch. 20525)**

**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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                   |   |                            |   |   |                              |
|-----------------------------------|---|----------------------------|---|---|------------------------------|
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**Band 5 Radiated Measurements (cont'd)**  
**§2.1053, §22.917(a)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 846.50 MHz  
 CHANNEL: 20625  
 MEASURED OUTPUT POWER: 20.48 dBm = 0.112 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  33.48 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 1693.00         | -47.48                          | 2.18                          | -45.30                        | H         | 65.77  |
| 2539.50         | -88.62                          | 3.04                          | -85.58                        | H         | 106.05 |
| 3386.00         | -91.11                          | 5.76                          | -85.35                        | H         | 105.82 |
| 4232.50         | -90.60                          | 7.20                          | -83.40                        | H         | 103.87 |
| 5079.00         | -90.34                          | 8.00                          | -82.33                        | H         | 102.81 |
| 5925.50         | -88.17                          | 8.42                          | -79.75                        | H         | 100.23 |



**Table 6-11. Radiated Spurious Data (Ch. 20600)**

**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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
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## 6.6 Band 7 Radiated Measurements

§2.1053, §27.53(m)(4)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2505.00 MHz  
 CHANNEL: 20800  
 MEASURED OUTPUT POWER: 25.56 dBm = 0.360 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $55 + 10 \log_{10}(W) =$  50.56 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 5010.00         | -54.55                          | 10.97                         | -43.57                        | H         | 69.13  |
| 7515.00         | -52.57                          | 10.84                         | -41.73                        | H         | 67.29  |
| 10020.00        | -93.68                          | 12.31                         | -81.37                        | H         | 106.93 |
| 12525.00        | -92.84                          | 12.93                         | -79.91                        | H         | 105.47 |
| 15030.00        | -88.77                          | 12.28                         | -76.49                        | H         | 102.05 |
| 17535.00        | -86.28                          | 13.54                         | -72.74                        | H         | 98.30  |



**Table 6-12. Radiated Spurious Data (Ch. 20800)**

**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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
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**Band 7 Radiated Measurements (cont'd)**  
**§2.1053, §27.53(h)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 2535.00 MHz  
 CHANNEL: 21100  
 MEASURED OUTPUT POWER: 21.90 dBm = 0.155 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $55 + 10 \log_{10} (W) =$  46.90 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 5070.00         | -55.41                          | 11.00                         | -44.41                        | H         | 66.31  |
| 7605.00         | -54.11                          | 11.08                         | -43.03                        | H         | 64.93  |
| 10140.00        | -93.73                          | 12.41                         | -81.32                        | H         | 103.22 |
| 12675.00        | -92.89                          | 13.13                         | -79.76                        | H         | 101.66 |
| 15210.00        | -89.52                          | 13.36                         | -76.15                        | H         | 98.05  |
| 17745.00        | -86.97                          | 14.68                         | -72.29                        | H         | 94.19  |



**Table 6-13. Radiated Spurious Data (Ch. 21100)**

**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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                   |   |                            |   |   |                              |
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## Band 7 Radiated Measurements (cont'd)

§2.1053, §27.53(h)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 2565.00 MHz  
 CHANNEL: 21400  
 MEASURED OUTPUT POWER: 26.47 dBm = 0.444 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 10 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $55 + 10 \log_{10}(W) =$  51.47 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 5130.00         | -52.93                          | 10.97                         | -41.97                        | H         | 68.44  |
| 7695.00         | -52.62                          | 11.16                         | -41.46                        | H         | 67.93  |
| 10260.00        | -93.74                          | 12.47                         | -81.27                        | H         | 107.74 |
| 12825.00        | -92.49                          | 12.89                         | -79.61                        | H         | 106.08 |
| 15390.00        | -90.09                          | 14.37                         | -75.72                        | H         | 102.19 |
| 17955.00        | -86.97                          | 15.15                         | -71.82                        | H         | 98.29  |



**Table 6-14. Radiated Spurious Data (Ch. 21400)**

#### 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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                   |   |                            |   |   |                              |
|-----------------------------------|---|----------------------------|---|---|------------------------------|
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## 6.7 Band 2 Radiated Measurements

§2.1053, §24.238(a)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1852.50 MHz  
 CHANNEL: 18625  
 MEASURED OUTPUT POWER: 23.75 dBm = 0.237 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  36.75 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 3705.00         | -37.08                          | 8.40                          | -28.68                        | H         | 52.43  |
| 5557.50         | -93.77                          | 10.63                         | -83.14                        | H         | 106.89 |
| 7410.00         | -92.70                          | 11.84                         | -80.87                        | H         | 104.61 |
| 9262.50         | -92.35                          | 13.29                         | -79.06                        | H         | 102.81 |
| 11115.00        | -84.49                          | 13.50                         | -70.99                        | H         | 94.74  |
| 12967.50        | -84.45                          | 13.68                         | -70.78                        | H         | 94.52  |



**Table 6-15. Radiated Spurious Data (Ch. 18650)**

#### 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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |                               |   |   |                                 |
|--------------------------------------|---|-------------------------------|---|---|---------------------------------|
| FCC ID: ZNFE971                      |  |                               | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset | Page 24 of 101  |   |                                 |



**Band 2 Radiated Measurements (cont'd)**  
**§2.1053, §24.238(a)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 18900  
 MEASURED OUTPUT POWER: 20.35 dBm = 0.108 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  33.35 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 3760.00         | -28.31                          | 8.42                          | -19.89                        | H         | 40.24  |
| 5640.00         | -93.67                          | 10.66                         | -83.01                        | H         | 103.36 |
| 7520.00         | -92.67                          | 11.92                         | -80.74                        | H         | 101.09 |
| 9400.00         | -92.17                          | 13.24                         | -78.93                        | H         | 99.27  |
| 11280.00        | -86.68                          | 13.49                         | -73.19                        | H         | 93.54  |
| 13160.00        | -84.25                          | 13.83                         | -70.42                        | H         | 90.77  |



**Table 6-16. Radiated Spurious Data (Ch. 18900)**

**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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |                               |   |   |                                 |
|--------------------------------------|---|-------------------------------|---|---|---------------------------------|
| FCC ID: ZNFE971                      |  |                               | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset | Page 25 of 101  |   |                                 |

**Band 2 Radiated Measurements (cont'd)**  
**§2.1053, §24.238(a)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 1907.50 MHz  
 CHANNEL: 19175  
 MEASURED OUTPUT POWER: 19.79 dBm = 0.095 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10} (W) =$  32.79 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc)  |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|--------|
| 3815.00         | -27.86                          | 8.55                          | -19.31                        | H         | 39.10  |
| 5722.50         | -93.58                          | 10.69                         | -82.89                        | H         | 102.68 |
| 7630.00         | -92.65                          | 12.05                         | -80.60                        | H         | 100.39 |
| 9537.50         | -91.93                          | 13.20                         | -78.73                        | H         | 98.51  |
| 11445.00        | -86.95                          | 13.43                         | -73.52                        | H         | 93.31  |
| 13352.50        | -84.07                          | 14.00                         | -70.07                        | H         | 89.86  |



**Table 6-17. Radiated Spurious Data (Ch. 19150)**

**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 device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported at the maximum channel BW and respective settings for QPSK for all bands. This unit was tested with its standard battery. The EUT was tested in three orthogonal planes and in all possible test configurations, modulations, RB sizes and offsets and positioning. The worst case test configuration was found in the horizontal setup with an RB size of 1 and offset of 0. The data reported in the table above was measured in this test setup.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                           | Page 26 of 101  |                                 |

## 6.8 Band 17 Frequency Stability Measurements

§2.1055, §27.54, RSS-133 (6.3)



OPERATING FREQUENCY: 710,000,000 Hz  
 CHANNEL: 23090  
 REFERENCE VOLTAGE: 3.8 VDC

| VOLTAGE (%) | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|-------------|------------|----------------|-----------------|---------------|
| 100 %       | 3.80        | + 20 (Ref) | 709,999,984    | -16             | -0.000002     |
| 100 %       |             | - 30       | 709,999,988    | -12             | -0.000002     |
| 100 %       |             | - 20       | 710,000,019    | 19              | 0.000003      |
| 100 %       |             | - 10       | 710,000,022    | 22              | 0.000003      |
| 100 %       |             | 0          | 709,999,983    | -17             | -0.000002     |
| 100 %       |             | + 10       | 709,999,986    | -14             | -0.000002     |
| 100 %       |             | + 20       | 709,999,984    | -16             | -0.000002     |
| 100 %       |             | + 30       | 709,999,978    | -22             | -0.000003     |
| 100 %       |             | + 40       | 709,999,982    | -18             | -0.000003     |
| 100 %       |             | + 50       | 709,999,988    | -12             | -0.000002     |
| 115 %       | 4.37        | + 20       | 709,999,978    | -22             | -0.000003     |
| 85 %        | 3.23        | + 20       | 709,999,973    | -27             | -0.000004     |

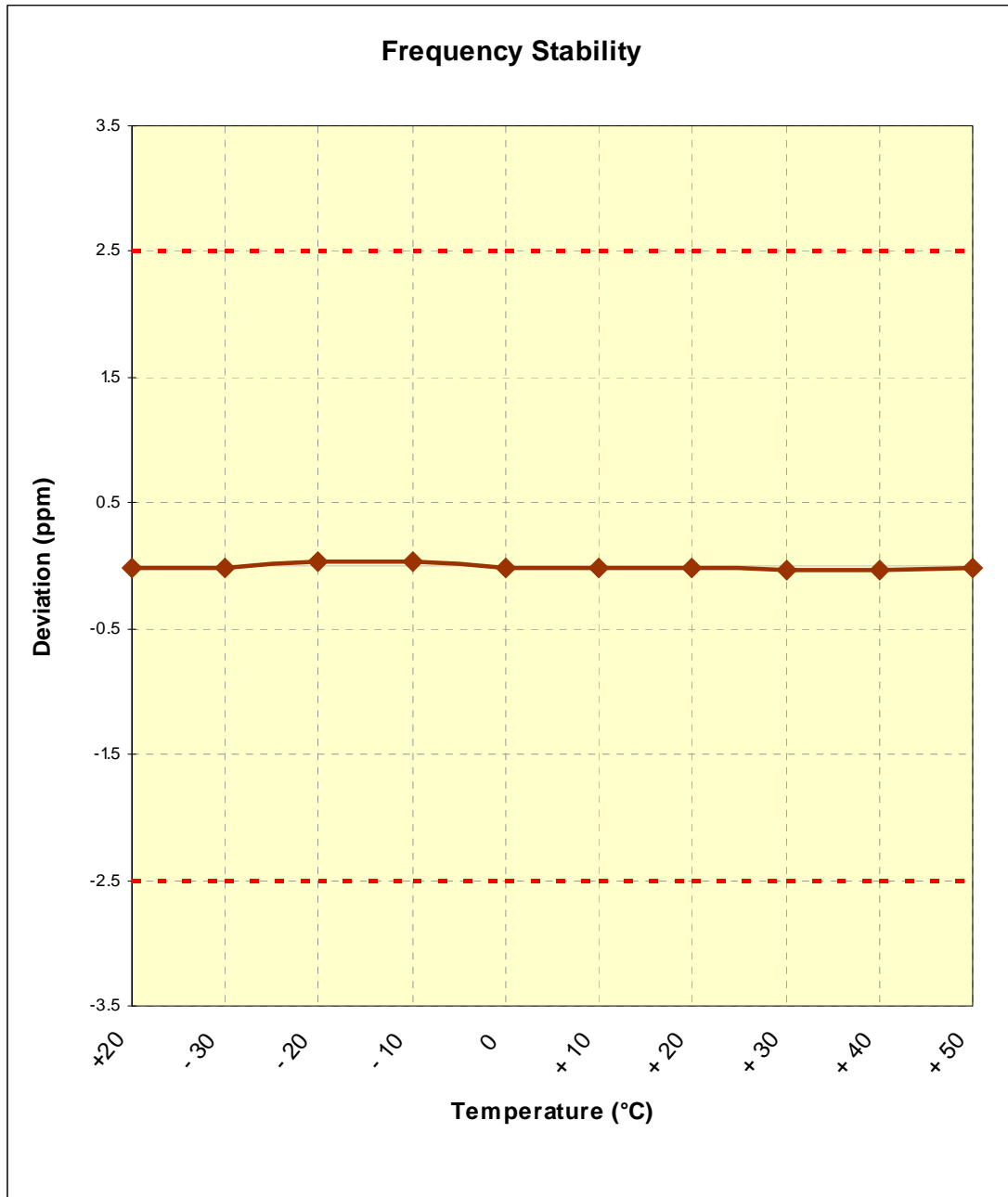
**Table 6-18. Frequency Stability Data (Band 17)**

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Note: Carrier Frequency Stability Measurements performed according to ANSI/TI/EIA-603-C-2004, Aug. 17, 2004

|                                      |   |                               |  |   |                                 |
|--------------------------------------|---|-------------------------------|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  |                               | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset |  | Page 27 of 101  |                                 |



**Band 17 Frequency Stability Measurements (Cont'd)**  
§2.1055, §27.54, RSS-133 (6.3)



**Figure 6-1. Frequency Stability Graph (Band 17)**

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Note: Carrier Frequency Stability Measurements performed according to ANSI/TI/EIA-603-C-2004, Aug. 17, 2004

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
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## 6.9 Band 5 Frequency Stability Measurements



\$2.1055, \$22.355

OPERATING FREQUENCY: 836,500,000 Hz  
 CHANNEL: 20525  
 REFERENCE VOLTAGE: 3.8 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

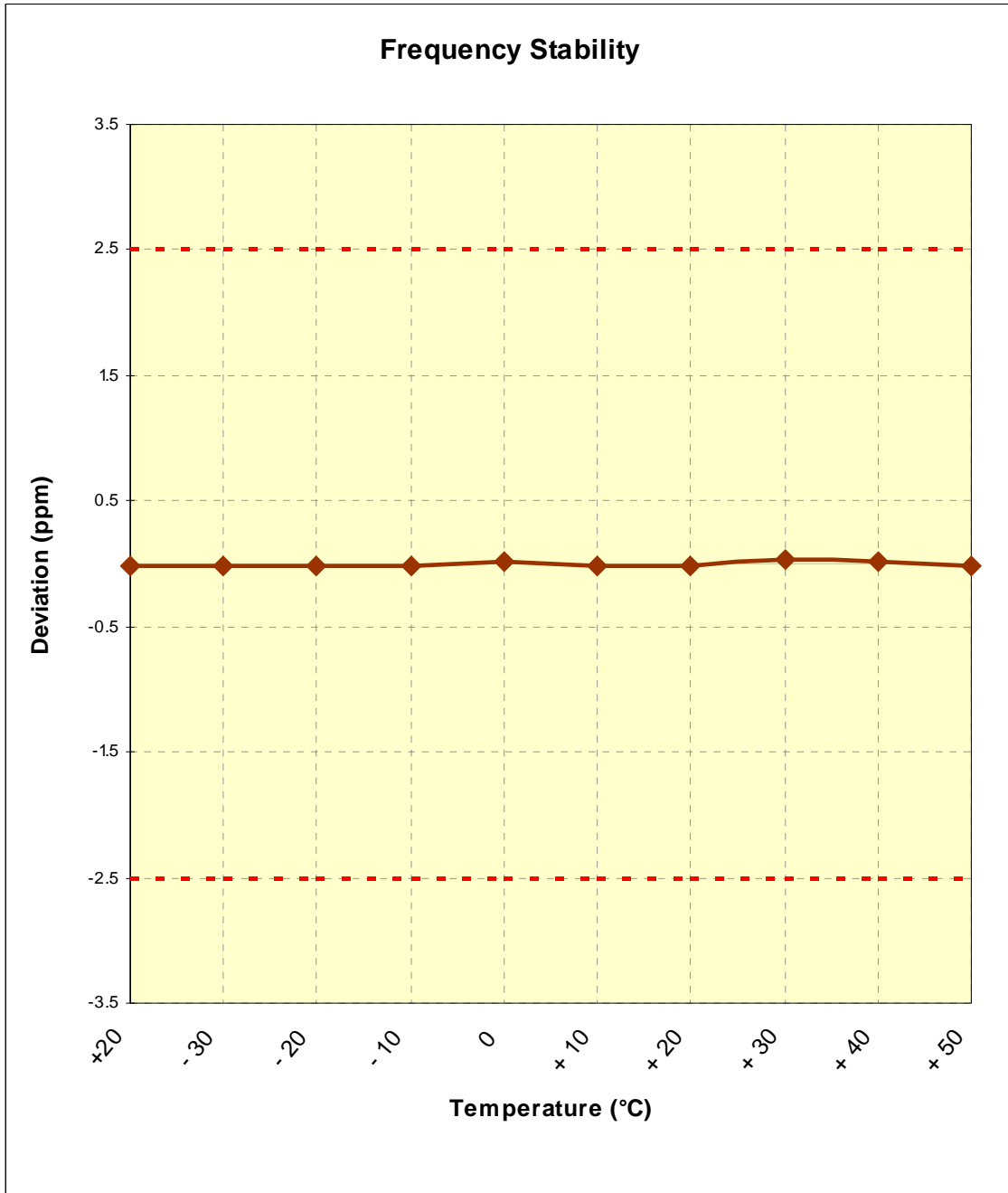
| VOLTAGE (%) | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|-------------|------------|----------------|-----------------|---------------|
| 100 %       | 3.80        | + 20 (Ref) | 836,499,982    | -18             | -0.000002     |
| 100 %       |             | - 30       | 836,499,989    | -11             | -0.000001     |
| 100 %       |             | - 20       | 836,499,983    | -17             | -0.000002     |
| 100 %       |             | - 10       | 836,499,986    | -14             | -0.000002     |
| 100 %       |             | 0          | 836,500,018    | 18              | 0.000002      |
| 100 %       |             | + 10       | 836,499,981    | -19             | -0.000002     |
| 100 %       |             | + 20       | 836,499,982    | -18             | -0.000002     |
| 100 %       |             | + 30       | 836,500,022    | 22              | 0.000003      |
| 100 %       |             | + 40       | 836,500,015    | 15              | 0.000002      |
| 100 %       |             | + 50       | 836,499,983    | -17             | -0.000002     |
| 115 %       | 4.37        | + 20       | 836,499,976    | -24             | -0.000003     |
| 85 %        | 3.23        | + 20       | 836,499,973    | -27             | -0.000003     |

**Table 6-19. Frequency Stability Data (Band 5)**

Note: Carrier Frequency Stability Measurements performed according to ANSI/TI/EIA-603-C-2004, Aug. 17, 2004



|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              | Page 29 of 101  |                                 |

**Band 5 Frequency Stability Measurements (Cont'd)**  
§2.1055, §22.355



**Figure 6-2. Frequency Stability Graph (Band 5)**

Note: Carrier Frequency Stability Measurements performed according to ANSI/TI/EIA-603-C-2004, Aug. 17, 2004

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 30 of 101                  |

### 6.10 Band 7 Frequency Stability Measurements

§2.1055, §27.54, RSS-133 (6.3)



OPERATING FREQUENCY: 2,535,000,000 Hz  
 CHANNEL: 21100  
 REFERENCE VOLTAGE: 3.8 VDC

| VOLTAGE (%) | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|-------------|------------|----------------|-----------------|---------------|
| 100 %       | 3.80        | + 20 (Ref) | 2,534,999,982  | -18             | -0.000001     |
| 100 %       |             | - 30       | 2,534,999,978  | -22             | -0.000001     |
| 100 %       |             | - 20       | 2,535,000,021  | 21              | 0.000001      |
| 100 %       |             | - 10       | 2,535,000,014  | 14              | 0.000001      |
| 100 %       |             | 0          | 2,535,000,017  | 17              | 0.000001      |
| 100 %       |             | + 10       | 2,534,999,977  | -23             | -0.000001     |
| 100 %       |             | + 20       | 2,534,999,982  | -18             | -0.000001     |
| 100 %       |             | + 30       | 2,535,000,022  | 22              | 0.000001      |
| 100 %       |             | + 40       | 2,534,999,983  | -17             | -0.000001     |
| 100 %       |             | + 50       | 2,534,999,981  | -19             | -0.000001     |
| 115 %       |             | 4.37       | + 20           | 2,534,999,976   | -24           |
| 85 %        | 3.23        | + 20       | 2,534,999,972  | -28             | -0.000001     |

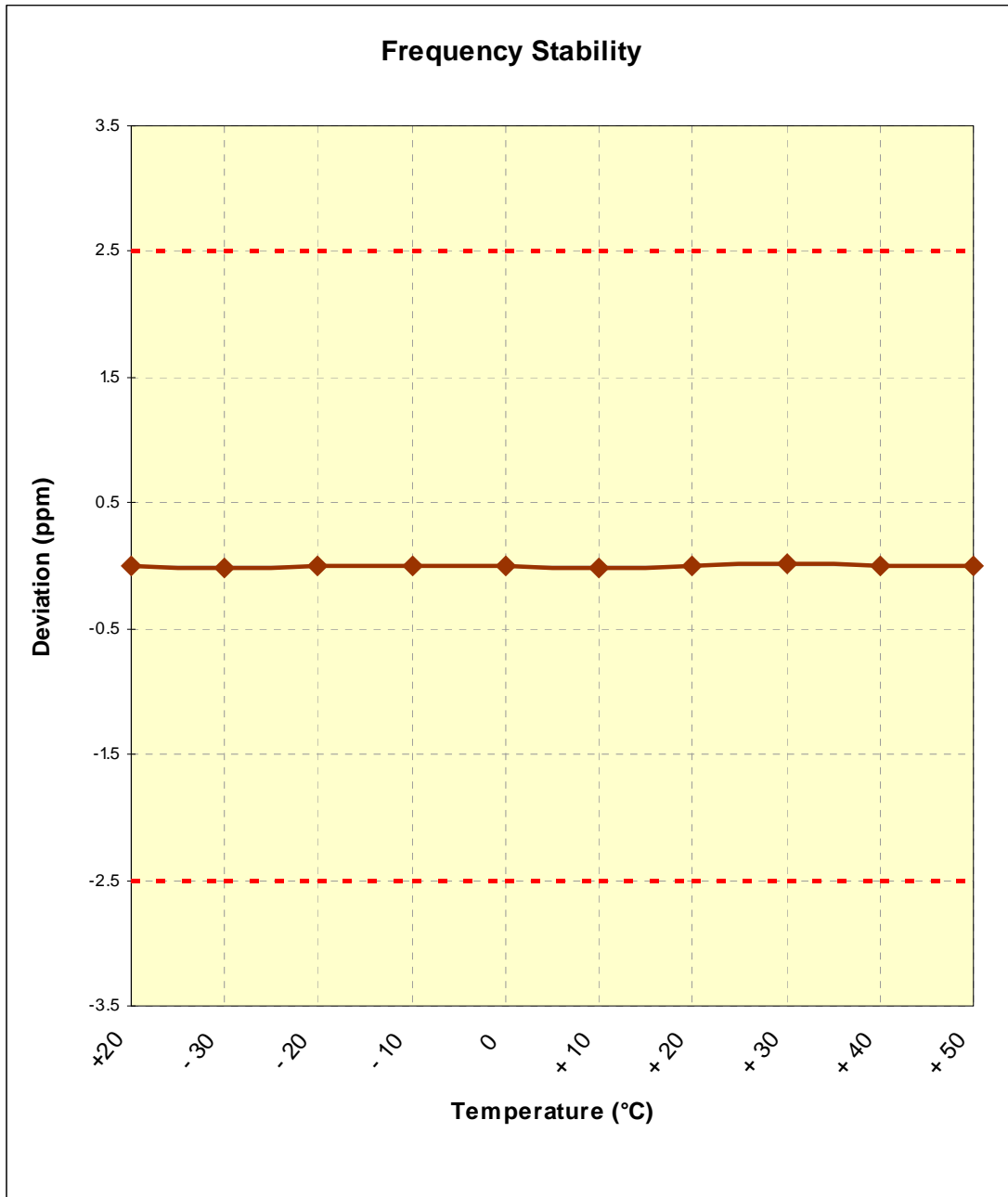
**Table 6-20. Frequency Stability Data (Band 7)**

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Note: Carrier Frequency Stability Measurements performed according to ANSI/TI/EIA-603-C-2004, Aug. 17, 2004



|                                      |   |                               |   |   |                                 |
|--------------------------------------|---|-------------------------------|---|---|---------------------------------|
| FCC ID: ZNFE971                      |  |                               | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
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**Band 7 Frequency Stability Measurements (Cont'd)**  
§2.1055, §27.54; RSS-133 (6.3)



The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Note: Carrier Frequency Stability Measurements performed according to ANSI/TI/EIA-603-C-2004, Aug. 17, 2004

|                                      |  |                               |   |                                 |
|--------------------------------------|--|-------------------------------|---|---------------------------------|
| FCC ID: ZNFE971                      |  <b>FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)</b> |                               |  | Reviewed by:<br>Quality Manager |
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## 6.11 Band 2 Frequency Stability Measurements

\$2.1055, \$24.235



OPERATING FREQUENCY: 1,880,000,000 Hz  
 CHANNEL: 18900  
 REFERENCE VOLTAGE: 3.8 VDC

| VOLTAGE (%) | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|-------------|------------|----------------|-----------------|---------------|
| 100 %       | 3.80        | + 20 (Ref) | 1,880,000,018  | 18              | 0.000001      |
| 100 %       |             | - 30       | 1,879,999,985  | -15             | -0.000001     |
| 100 %       |             | - 20       | 1,879,999,983  | -17             | -0.000001     |
| 100 %       |             | - 10       | 1,879,999,986  | -14             | -0.000001     |
| 100 %       |             | 0          | 1,879,999,980  | -20             | -0.000001     |
| 100 %       |             | + 10       | 1,879,999,983  | -17             | -0.000001     |
| 100 %       |             | + 20       | 1,879,999,982  | -18             | -0.000001     |
| 100 %       |             | + 30       | 1,880,000,020  | 20              | 0.000001      |
| 100 %       |             | + 40       | 1,879,999,983  | -17             | -0.000001     |
| 100 %       |             | + 50       | 1,879,999,984  | -16             | -0.000001     |
| 115 %       |             | 4.37       | + 20           | 1,879,999,978   | -22           |
| 85 %        | 3.23        | + 20       | 1,879,999,975  | -25             | -0.000001     |

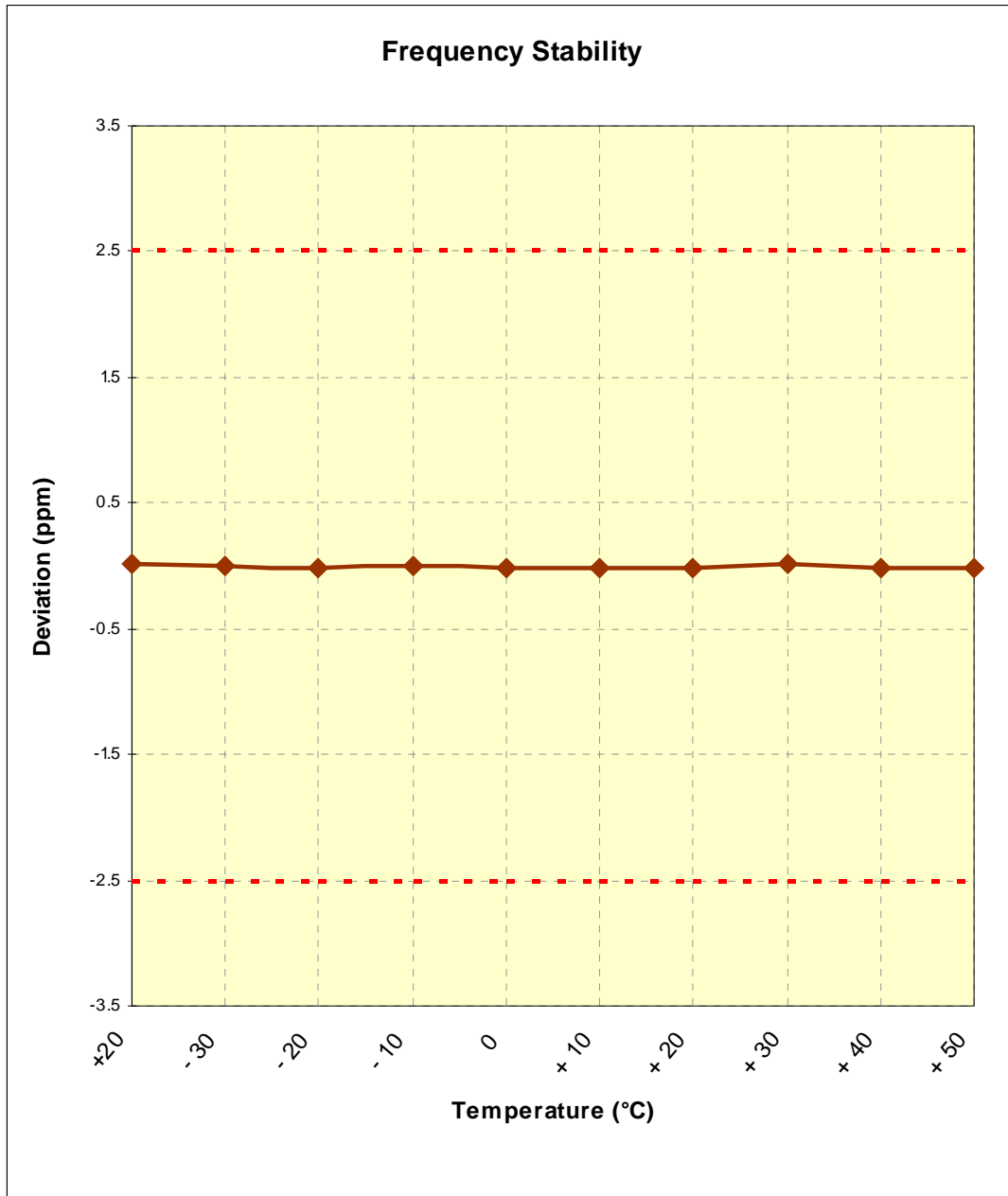
**Table 6-21. Frequency Stability Data (Band 2)**

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Note: Carrier Frequency Stability Measurements performed according to ANSI/TI/EIA-603-C-2004, Aug. 17, 2004

|                                      |   |                               |  |   |                                 |
|--------------------------------------|---|-------------------------------|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  |                               | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset |  | Page 33 of 101  |                                 |



**Band 2 Frequency Stability Measurements (Cont'd)**  
§2.1055, §24.235



**Figure 6-3. Frequency Stability Graph (Band 2)**

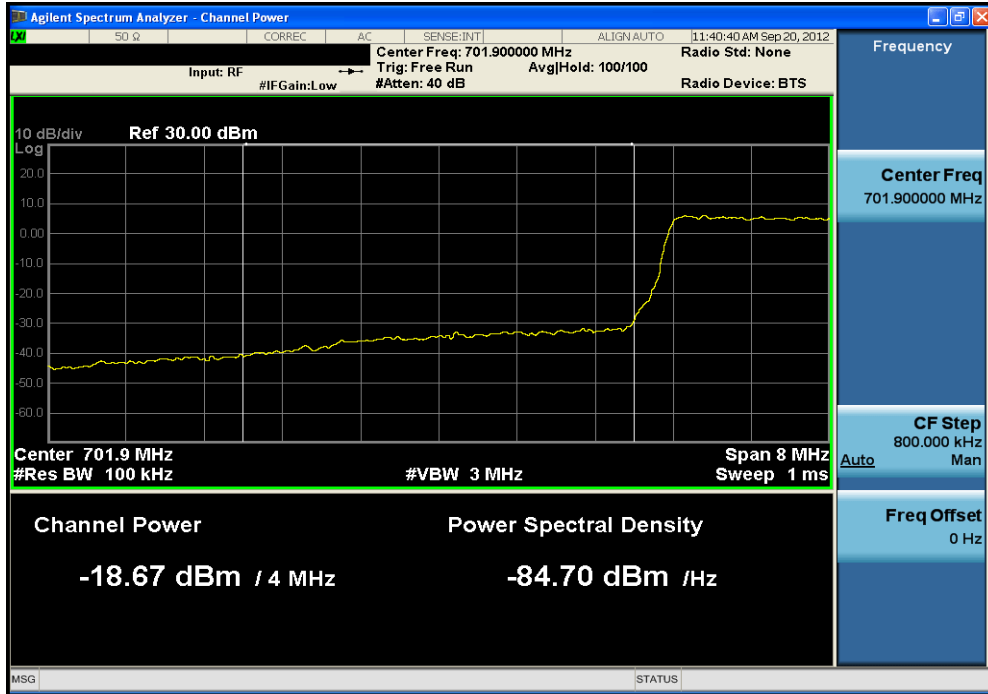
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

Note: Carrier Frequency Stability Measurements performed according to ANSI/TI/EIA-603-C-2004, Aug. 17, 2004

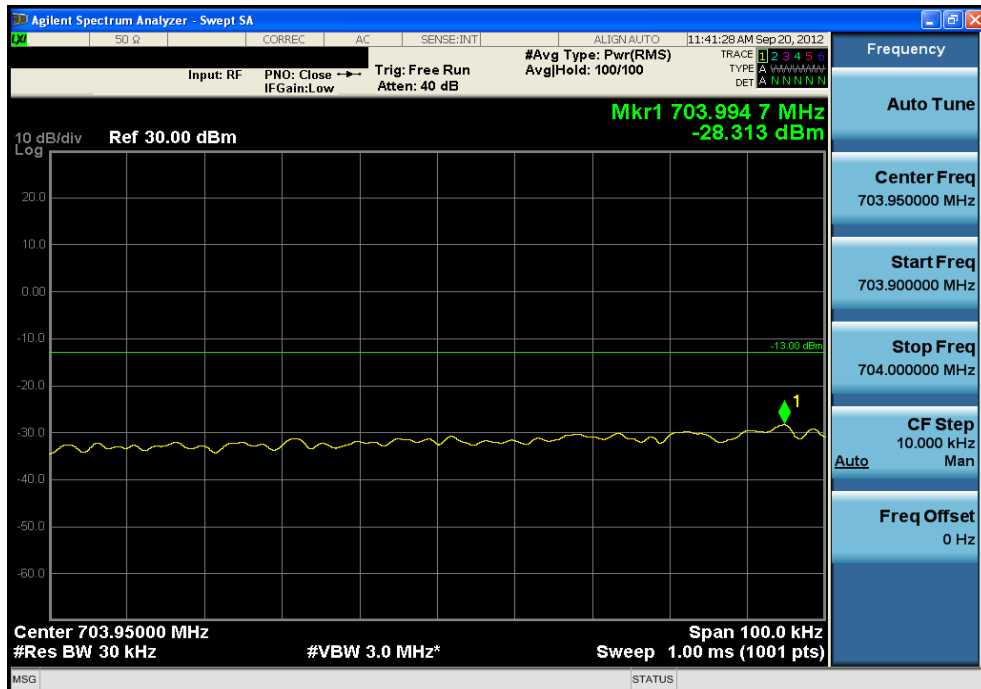
|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 34 of 101                  |

## 7.0 PLOT(S) OF EMISSIONS – BAND 17 (5 MHz)

Note: For all out-of-band spurious emissions, the RB sizes and offsets that produced the worst case emissions are indicated in the plot captions.

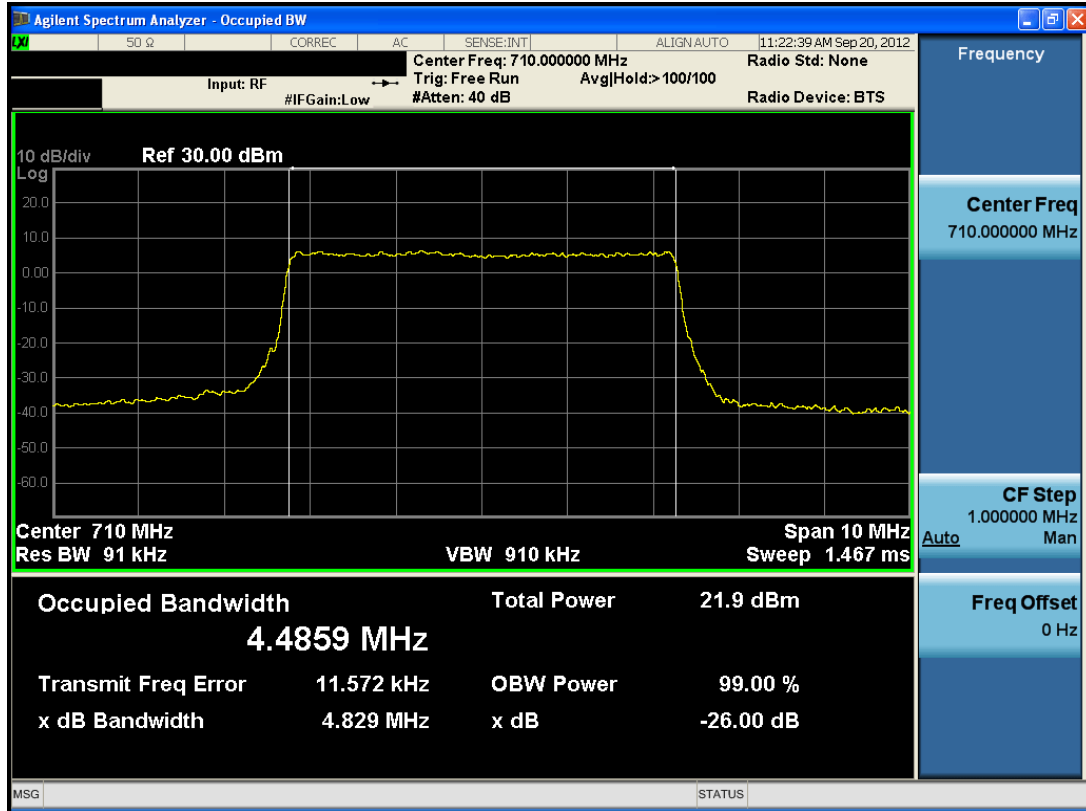


**Plot 7-1. Lower Band Edge Plot (QPSK – RB Size 25)**

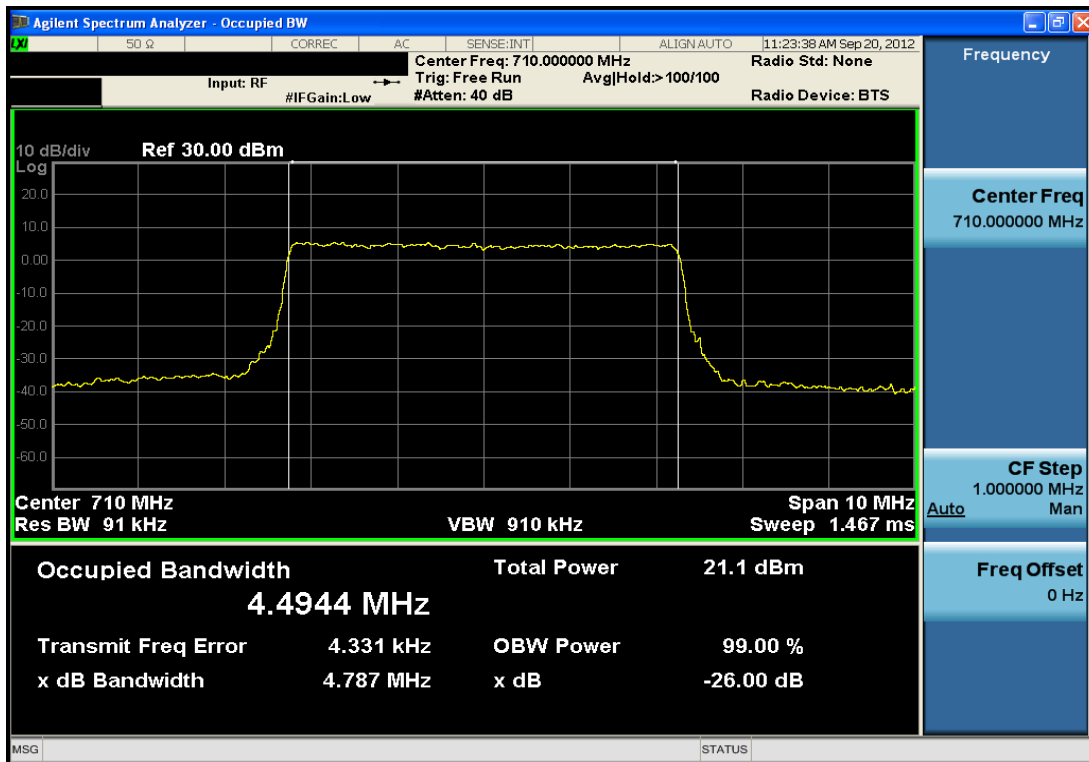


**Plot 7-2. Lower Band Edge Plot Plot (QPSK – RB Size 25)**

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 35 of 101                  |

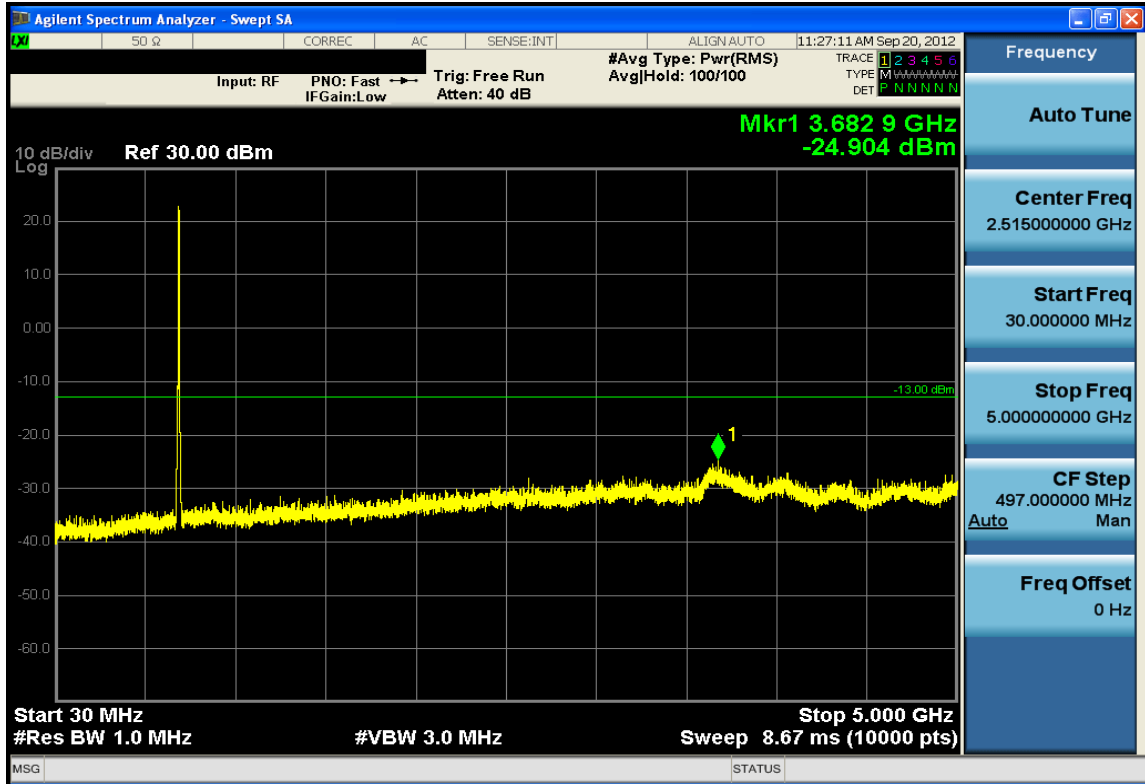


Plot 7-3. Occupied Bandwidth Plot (QPSK – RB Size 25)

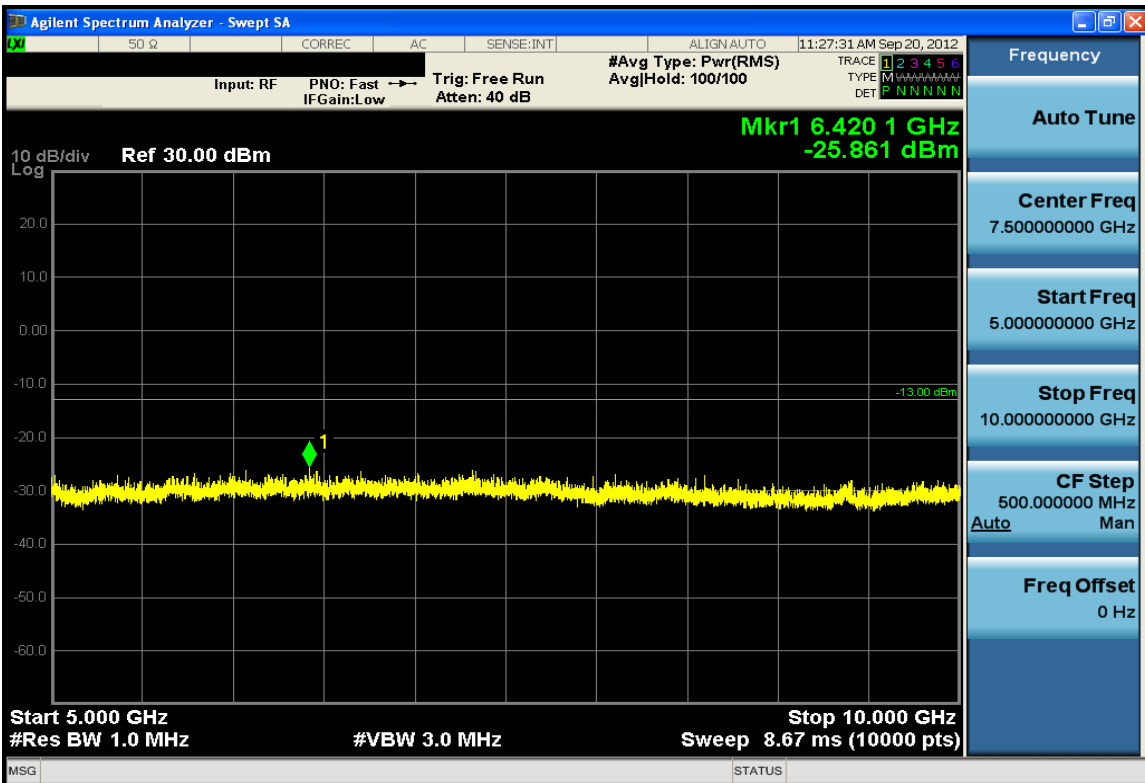


Plot 7-4. Occupied Bandwidth Plot (16-QAM – RB Size 25)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 36 of 101                  |

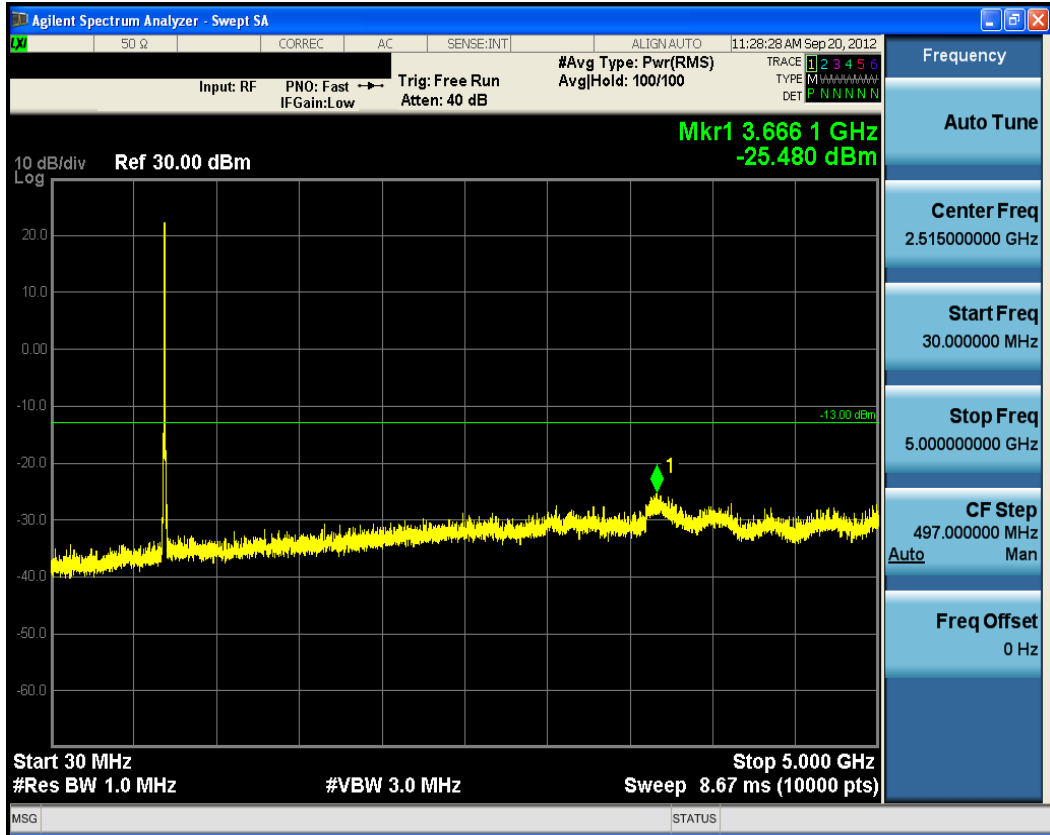


Plot 7-5. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

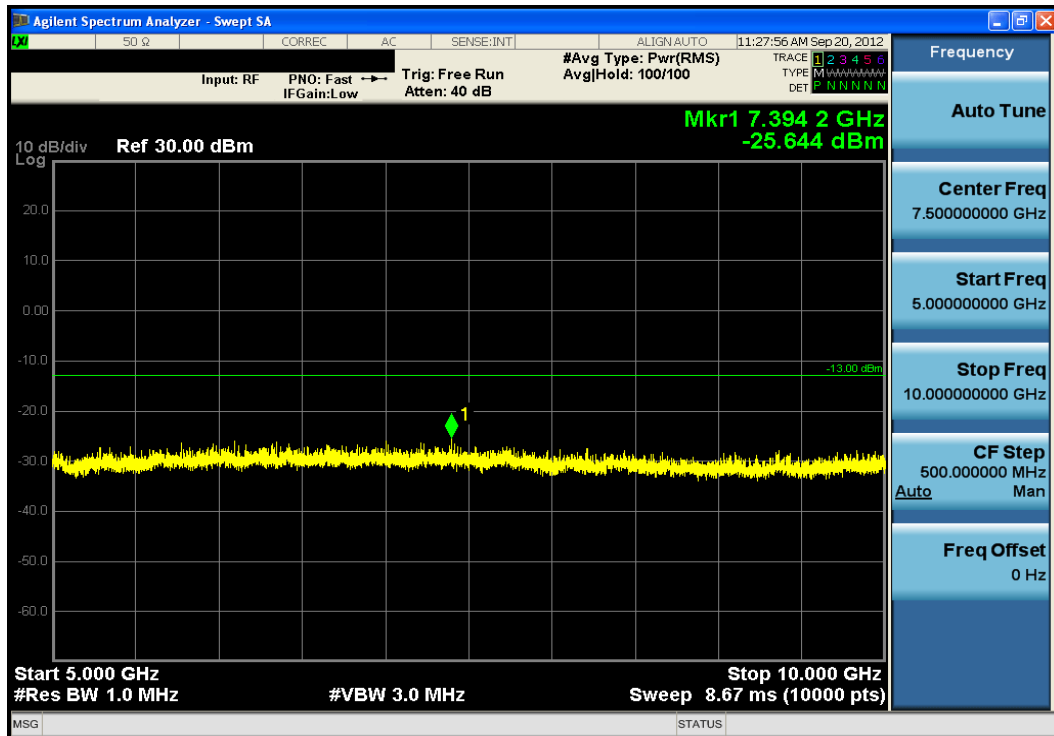


Plot 7-6. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)



|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 37 of 101                  |

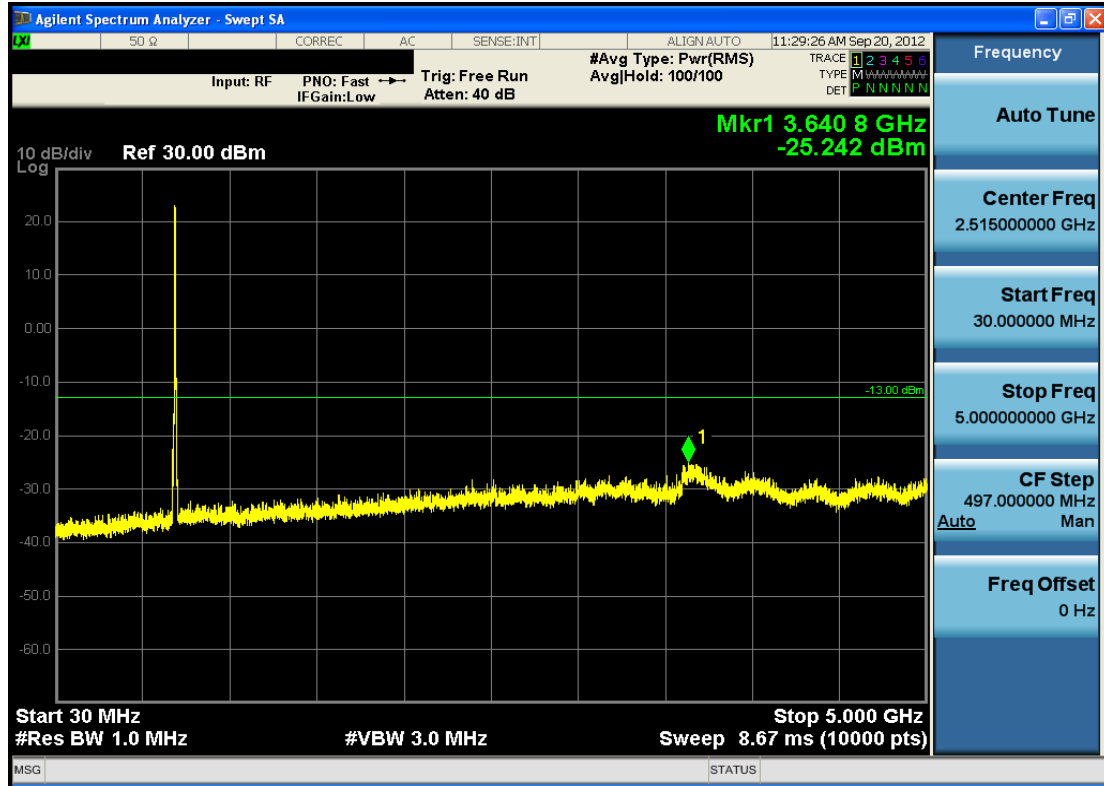


Plot 7-7. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

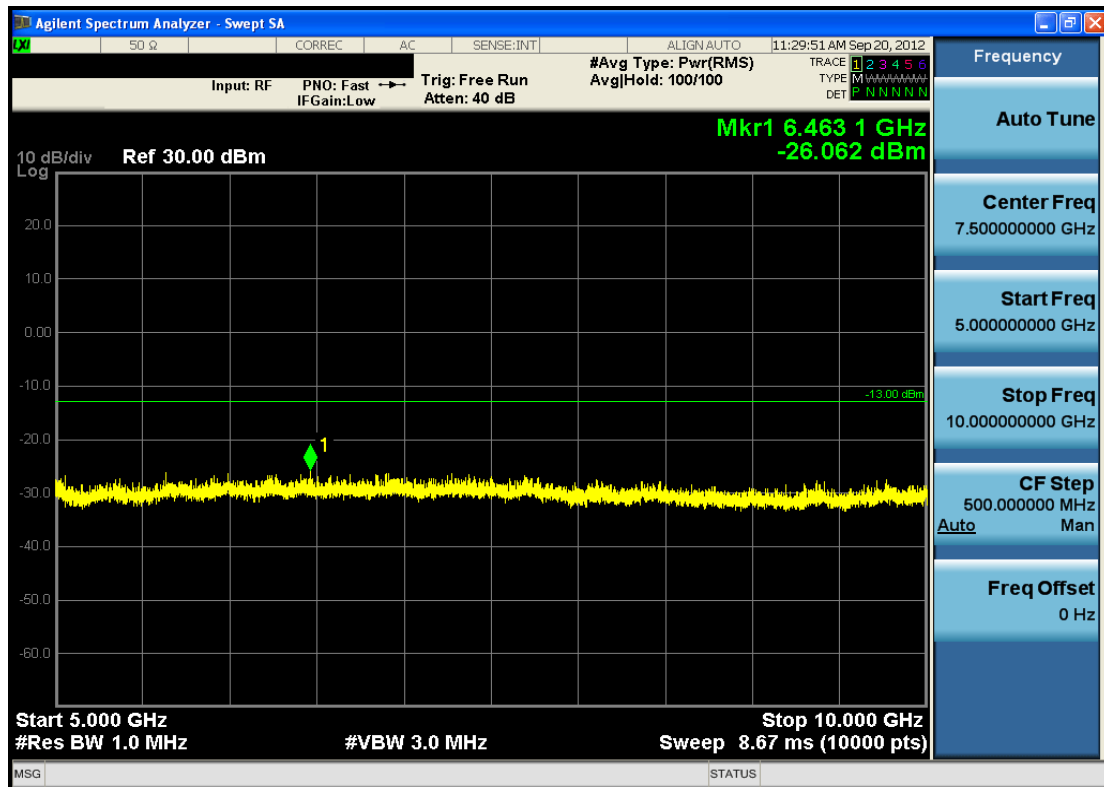


Plot 7-8. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 38 of 101                  |

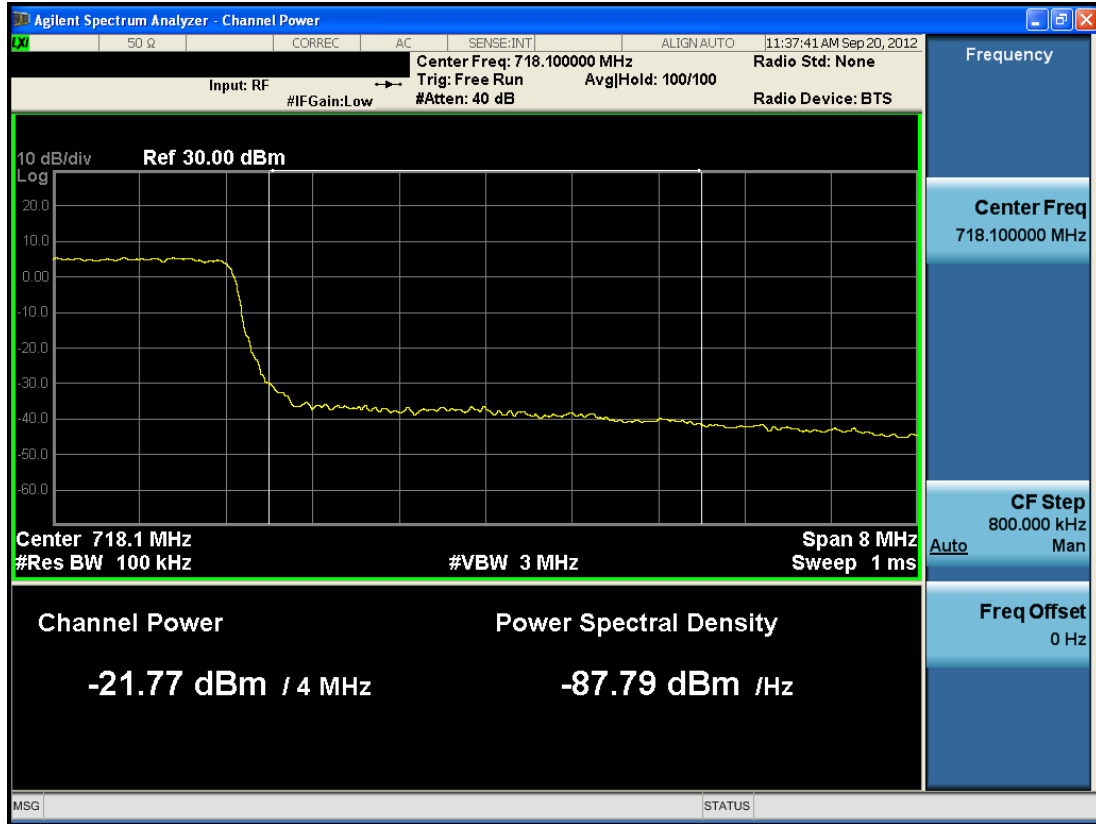


Plot 7-9. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-10. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

|                                      |   |  |    |                                 |
|--------------------------------------|---|--|----|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |    | Page 39 of 101                  |



Plot 7-11. Upper Band Edge Plot (QPSK – RB Size 25)

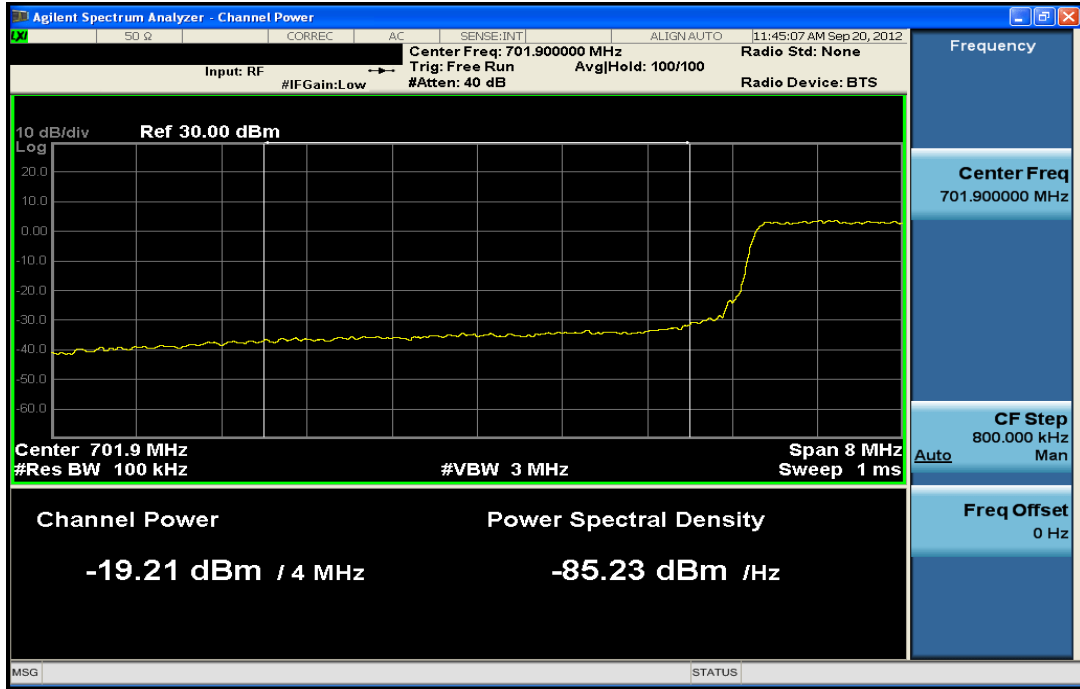


Plot 7-12. Upper Band Edge Plot (QPSK – RB Size 25)

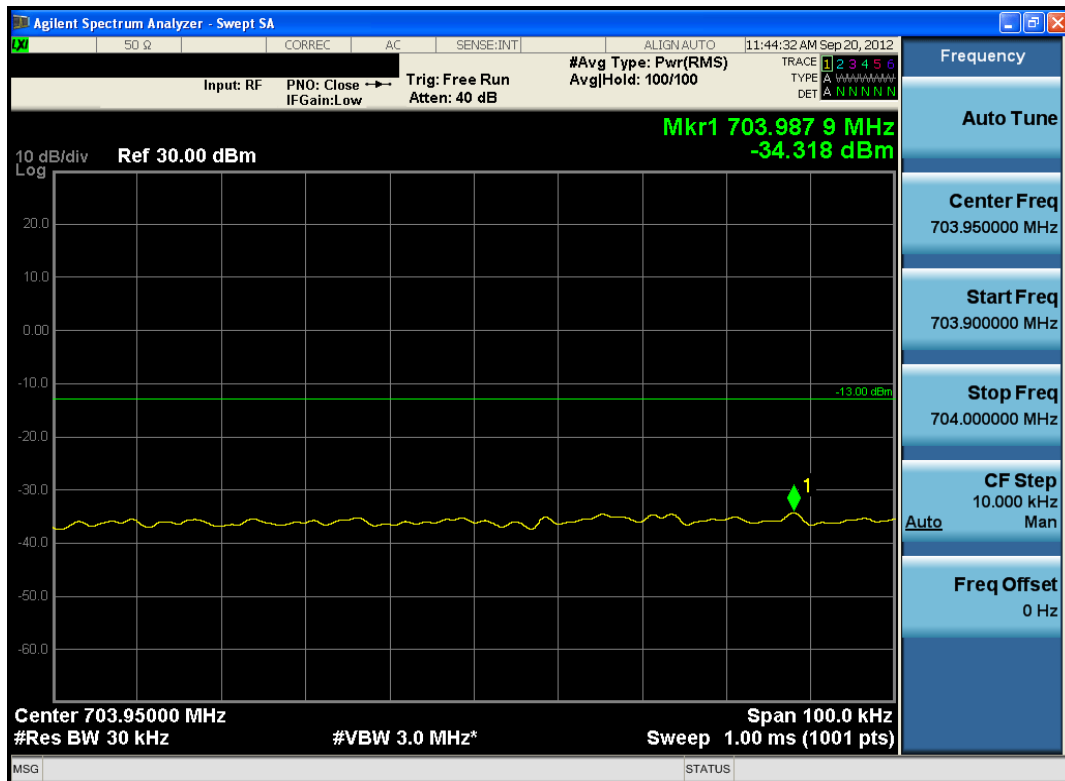
|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |  | Page 40 of 101                  |



## BAND 17 – 10 MHz BW

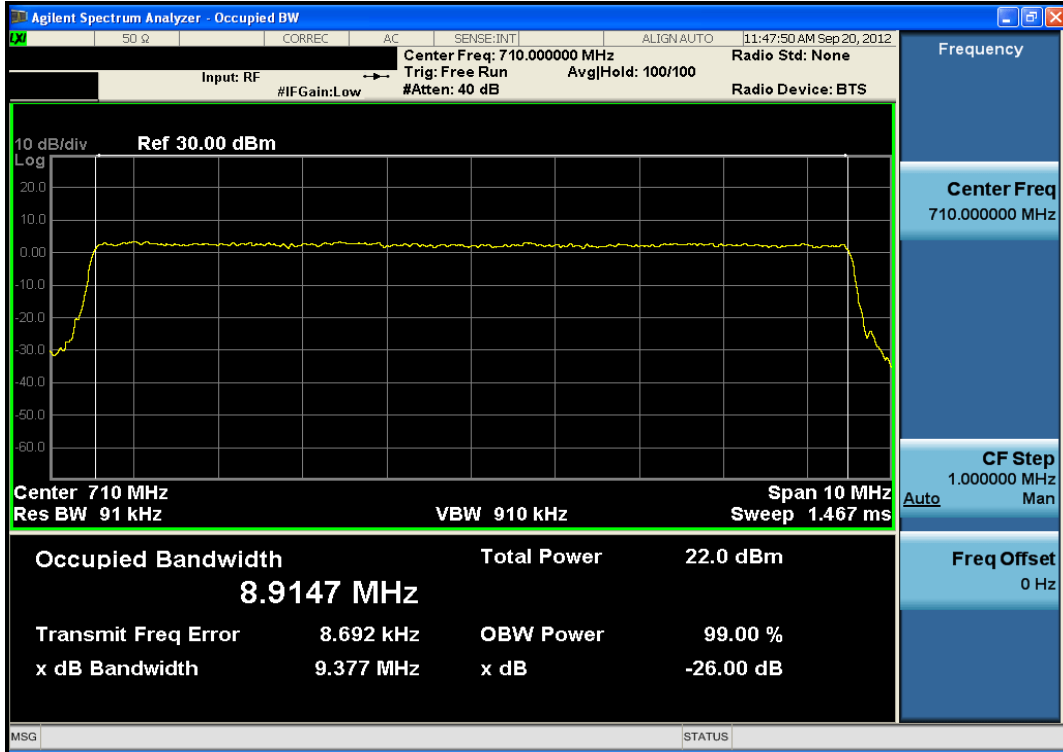


Plot 7-13. Lower Band Edge Plot (QPSK – RB Size 50)

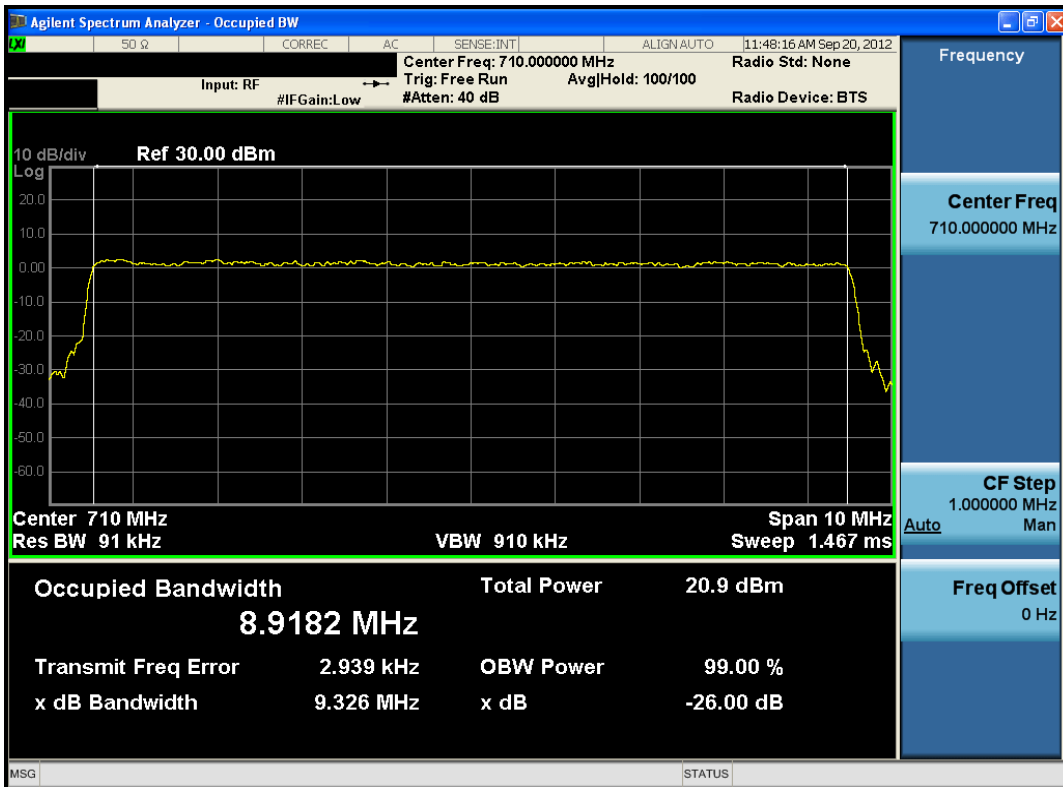


Plot 7-14. Lower Band Edge Plot (QPSK – RB Size 50)

|                                      |   |  |    |                                 |
|--------------------------------------|---|--|----|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |    | Page 41 of 101                  |

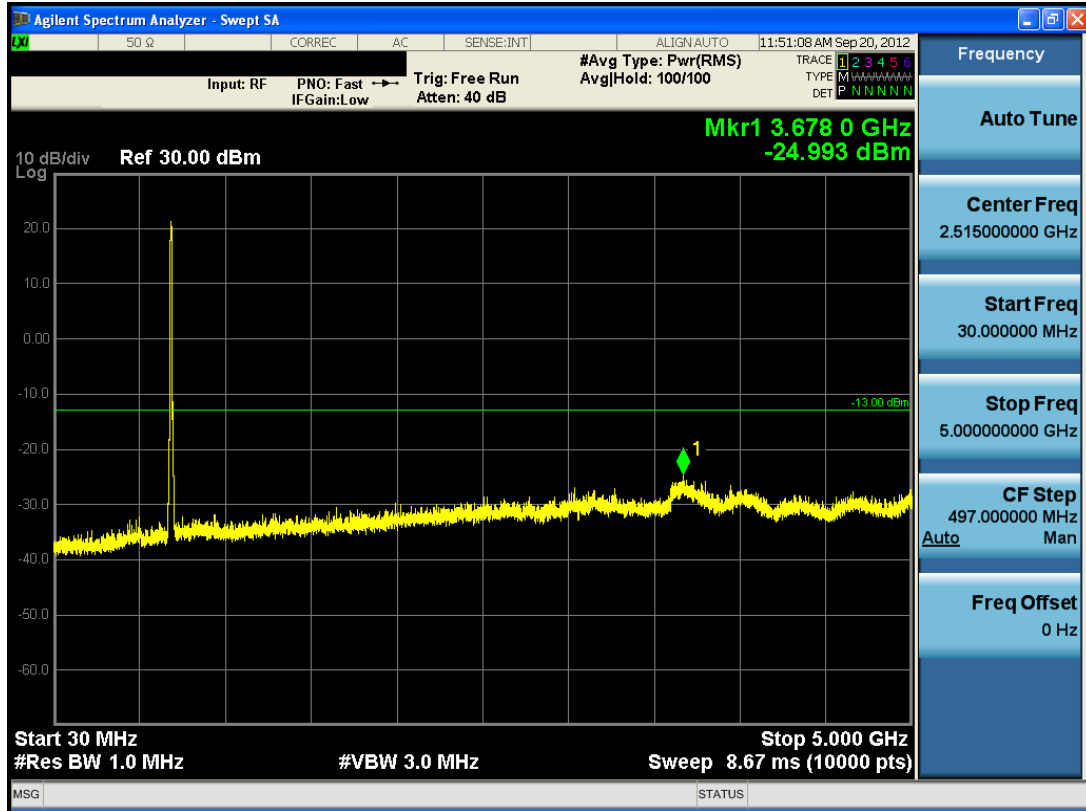


Plot 7-15. Occupied Bandwidth Plot (QPSK – RB Size 50)

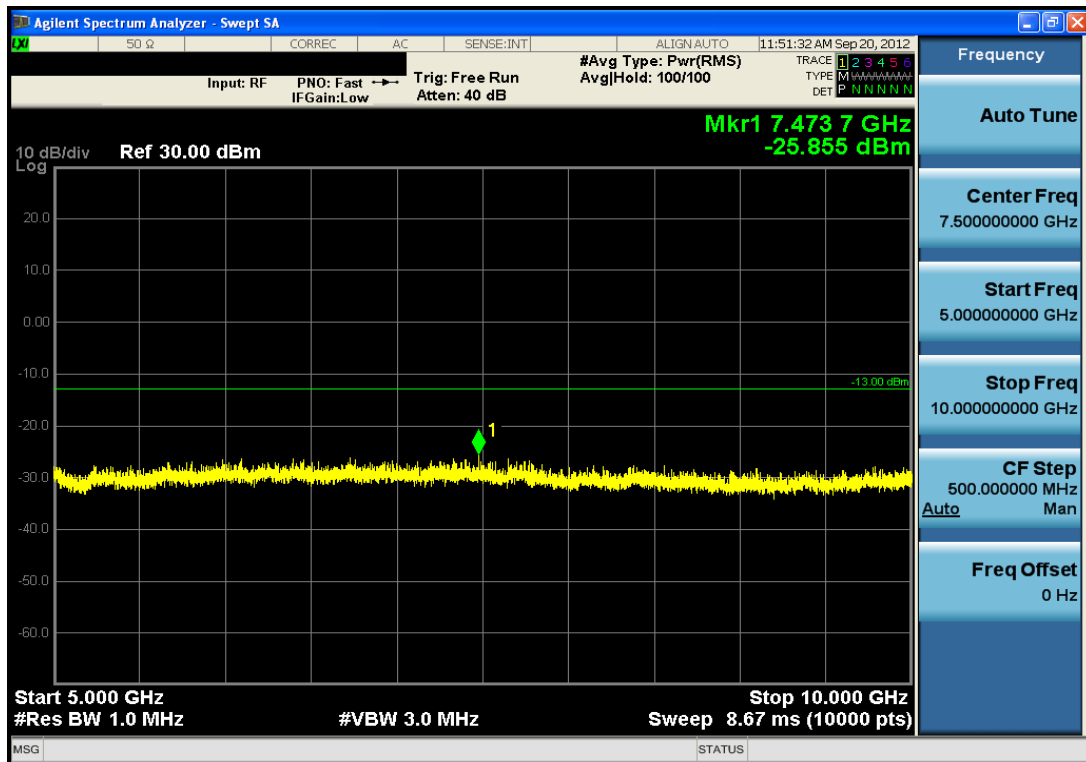


Plot 7-16. Occupied Bandwidth Plot (16-QAM – RB Size 50)



|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |  | Page 42 of 101                  |

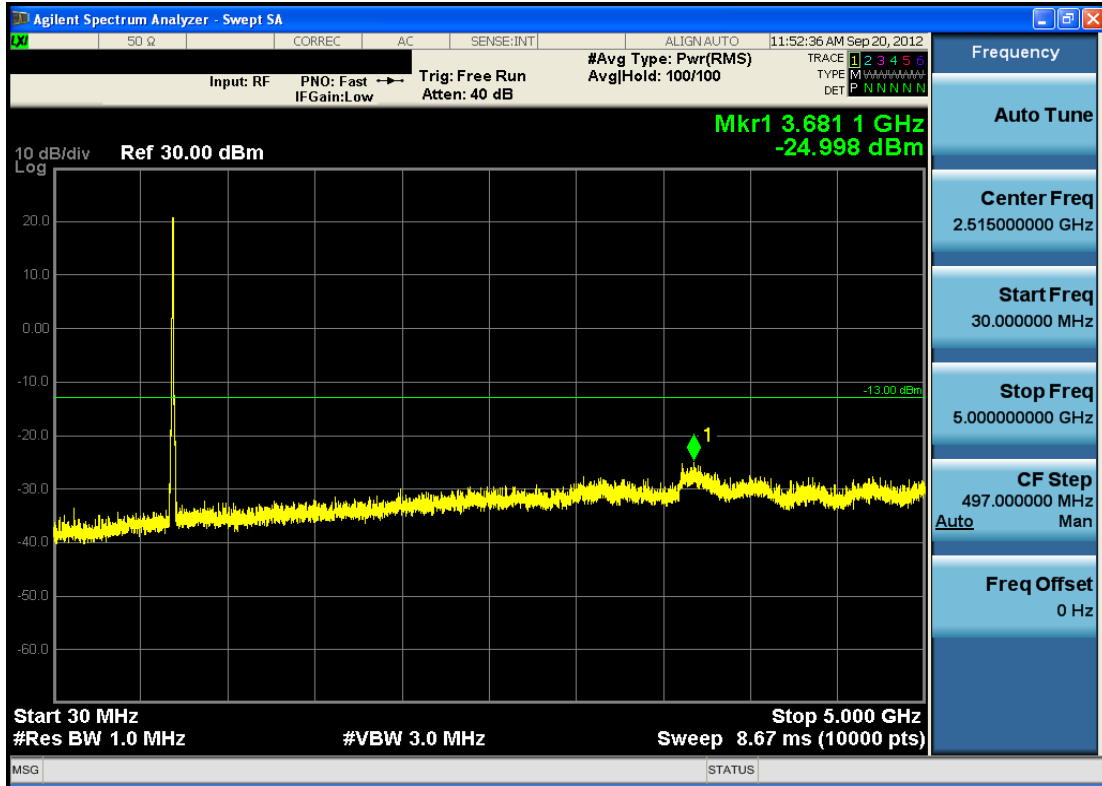


Plot 7-17. Conducted Spurious Plot (QPSK – RB Size 1, RB 0 – Low Channel)

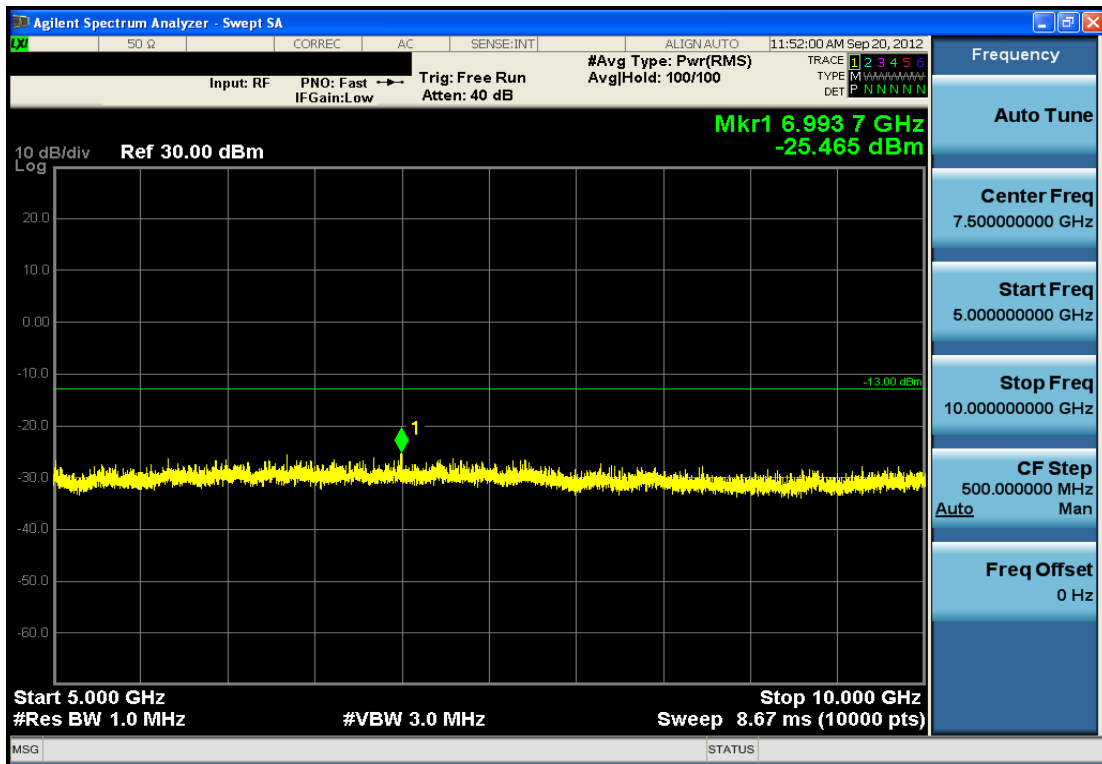


Plot 7-18. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)



|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 43 of 101                  |

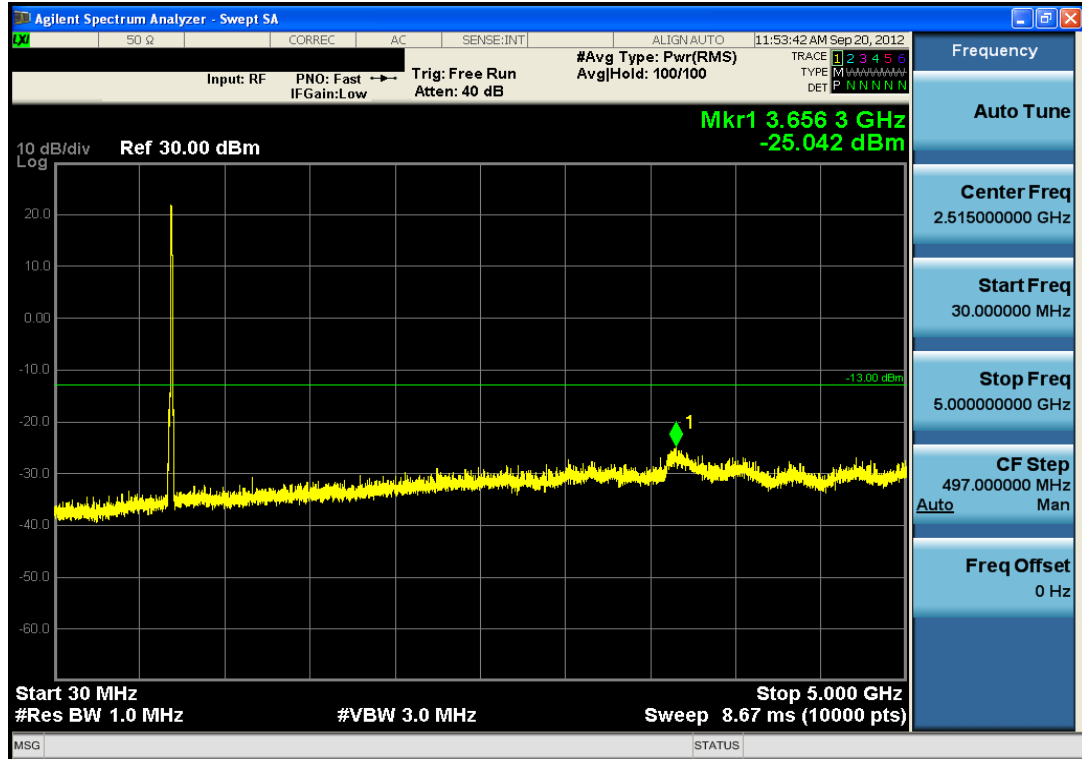


Plot 7-19. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

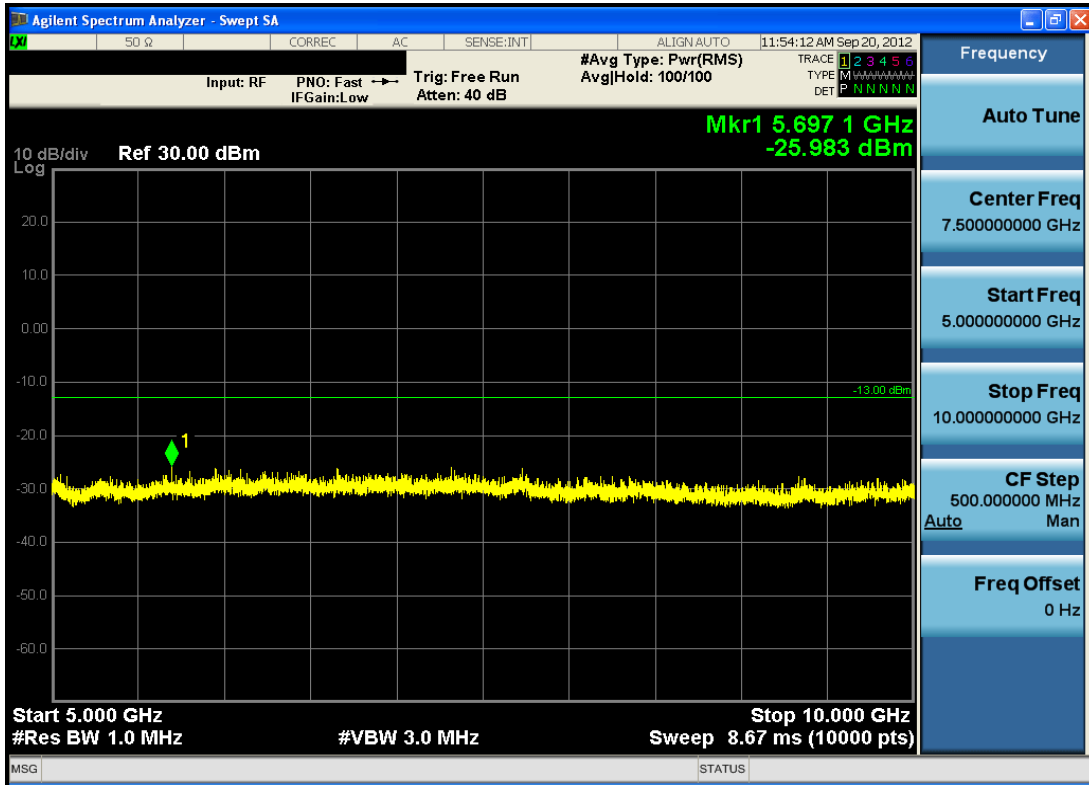


Plot 7-20. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 44 of 101                  |

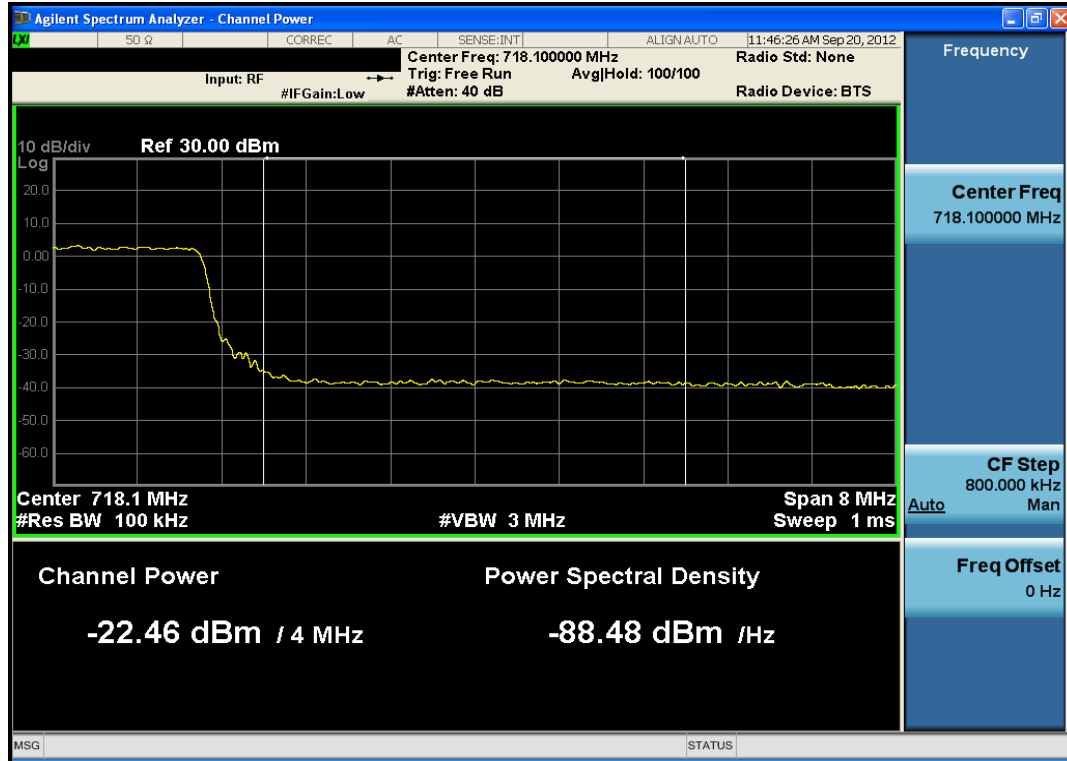


Plot 7-21. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

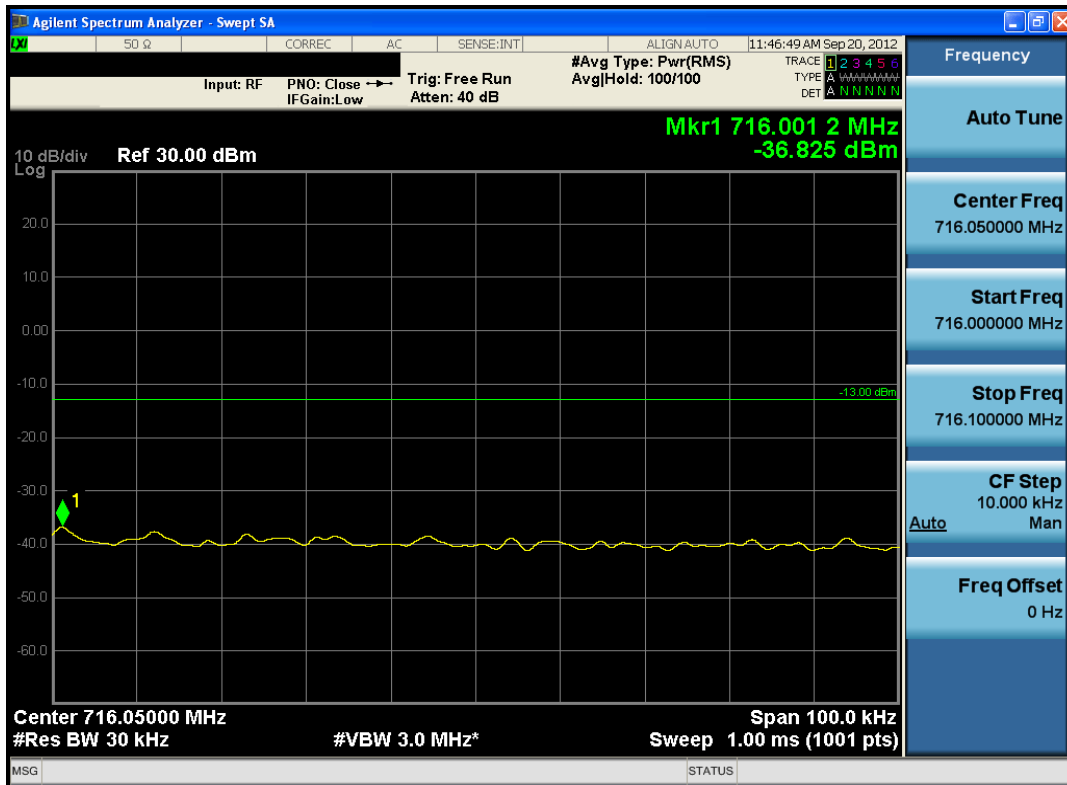


Plot 7-22. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 45 of 101                  |



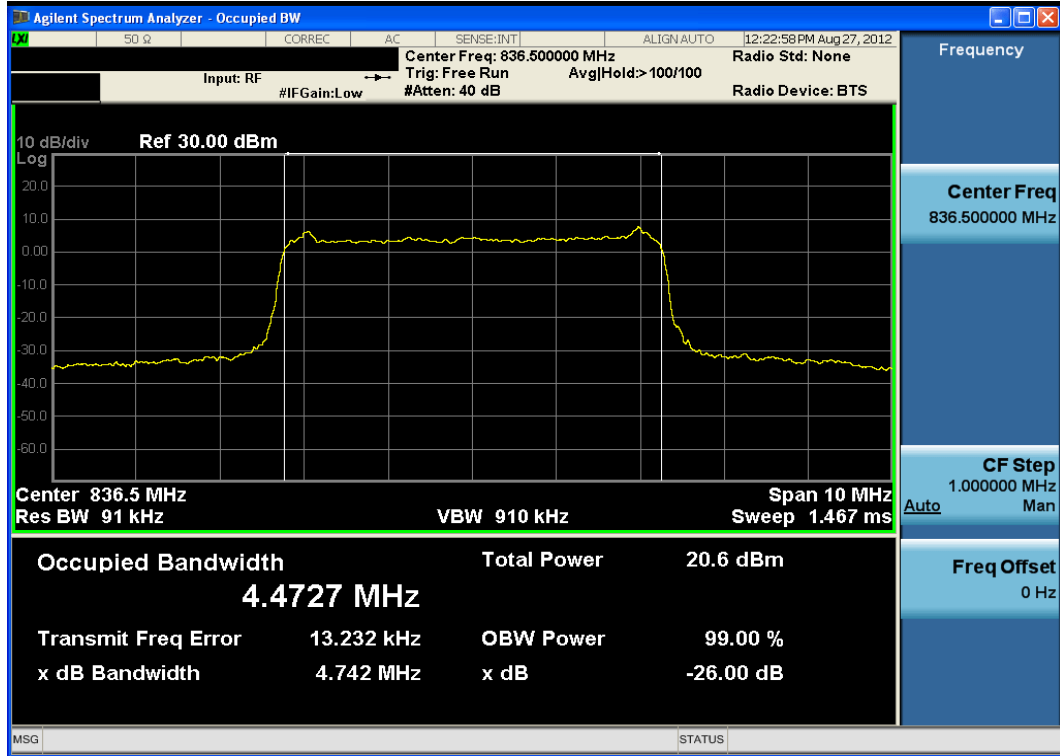
Plot 7-23. Upper Band Edge Plot (QPSK – RB Size 50)



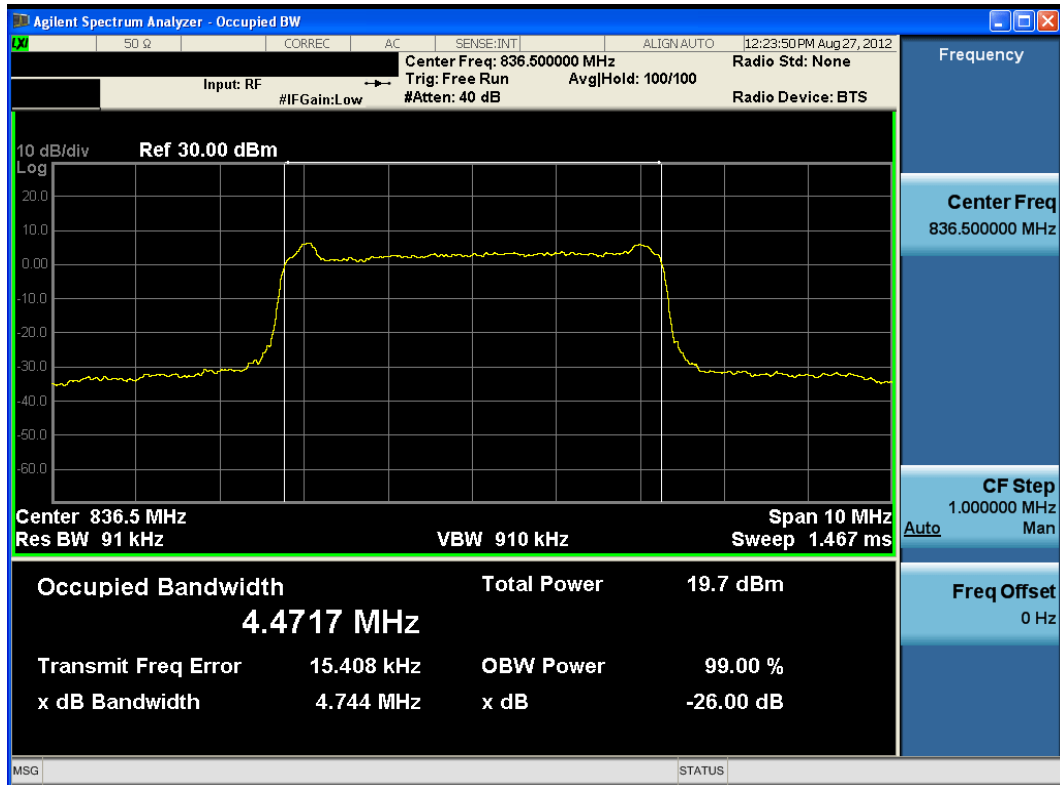
Plot 7-24. Upper Band Edge Plot (QPSK – RB Size 50)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 46 of 101                  |





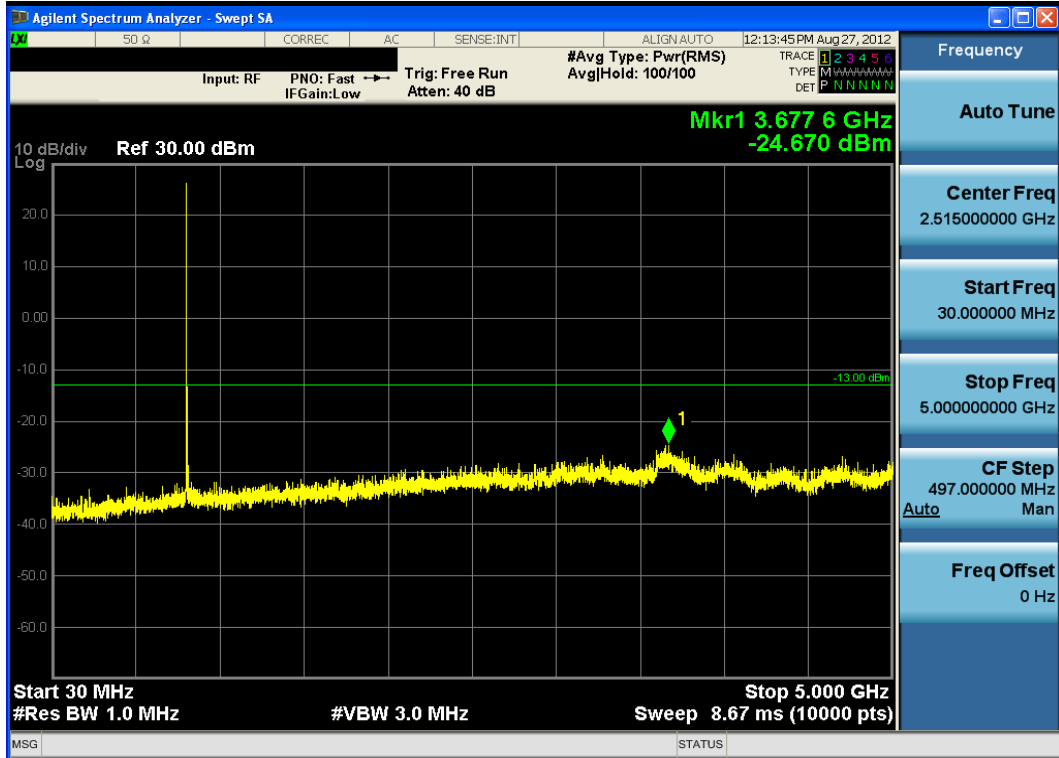
Plot 7-27. Occupied Bandwidth Plot (QPSK – RB Size 25)



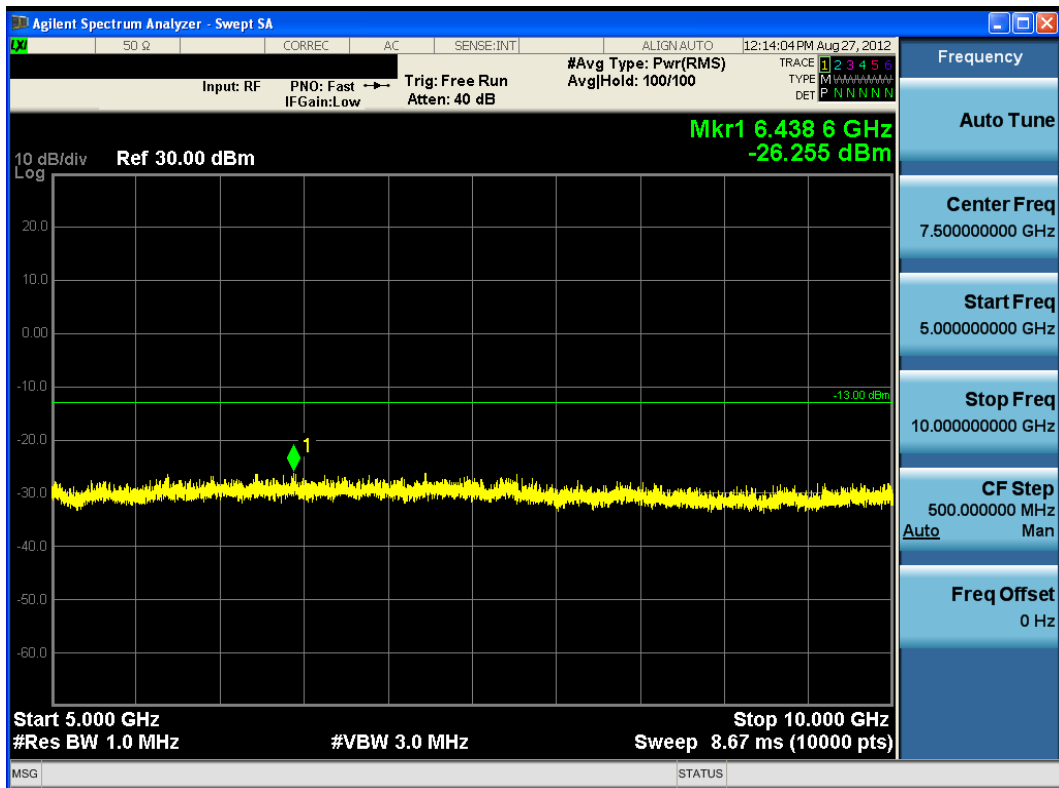
Plot 7-28. Occupied Bandwidth Plot (16-QAM – RB Size 25)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 48 of 101                  |



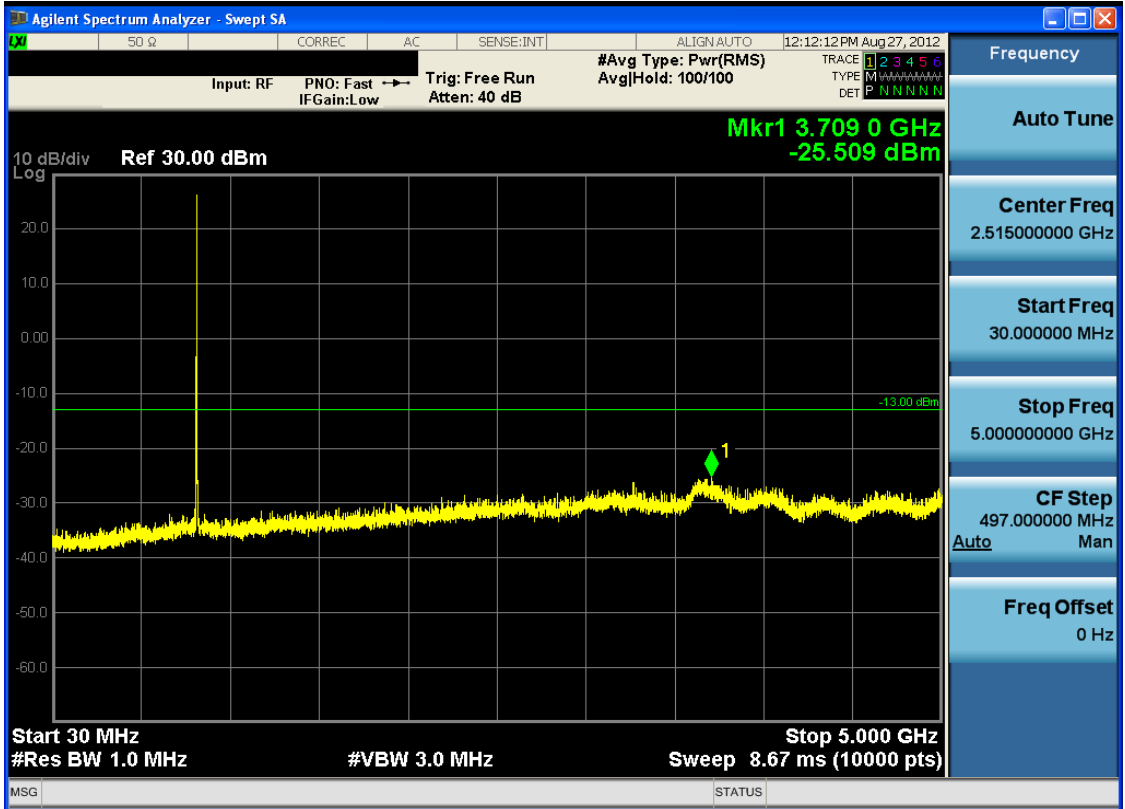


Plot 7-29. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

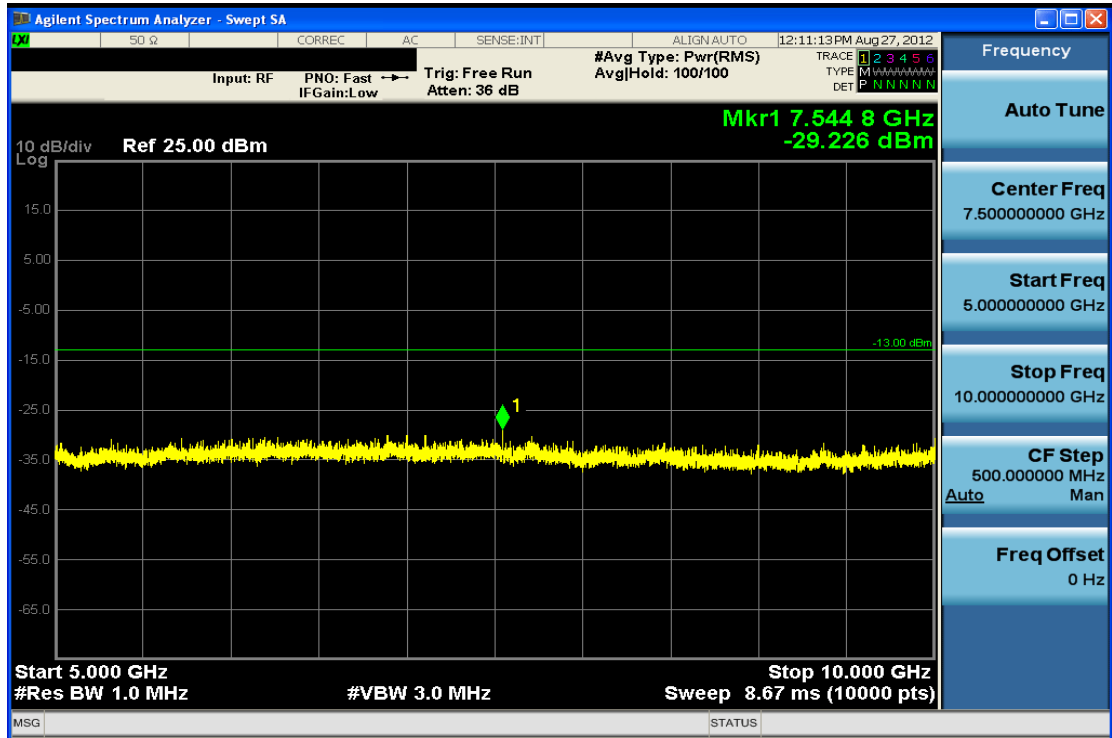


Plot 7-30. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

|                                      |   |   |    |                                 |
|--------------------------------------|---|---|----|---------------------------------|
| FCC ID: ZNFE971                      | PCTEST ENGINEERING LABORATORY, INC.       | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |    | Page 49 of 101                  |

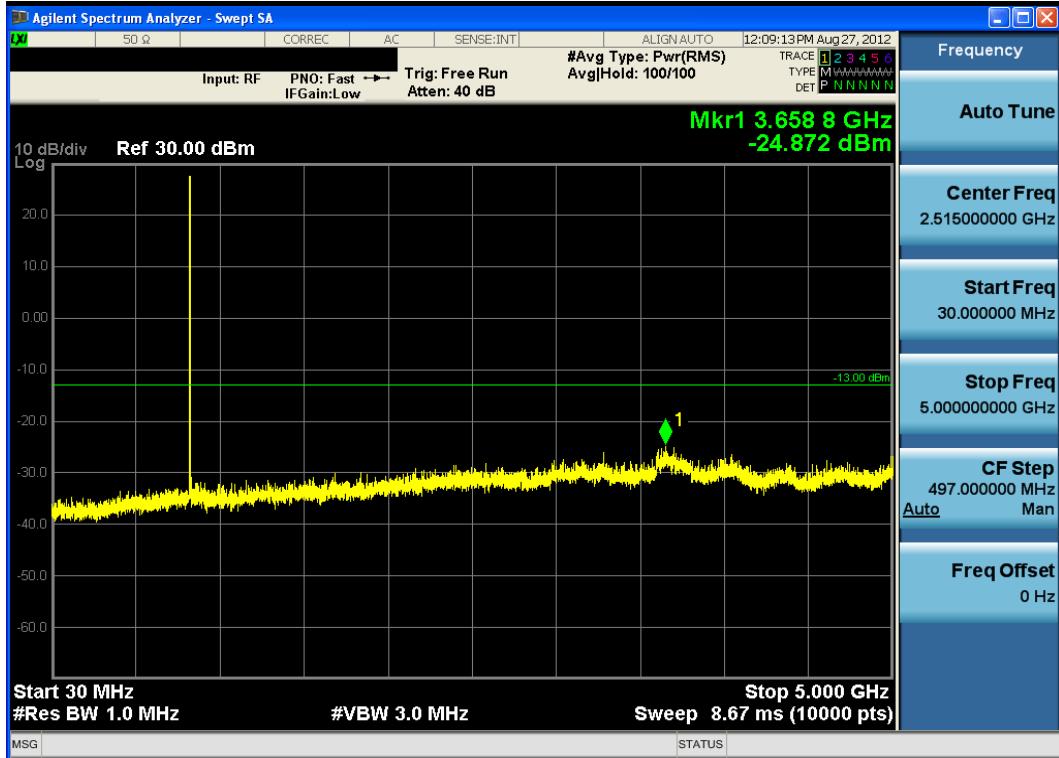


Plot 7-31. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

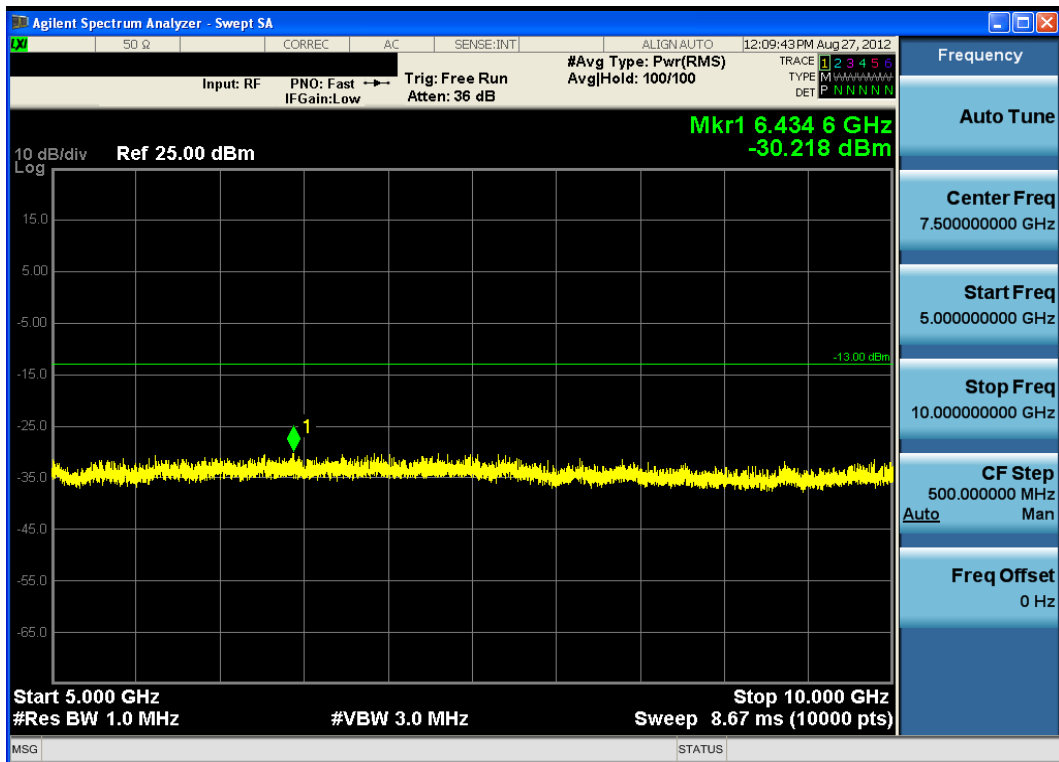


Plot 7-32. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 50 of 101                  |

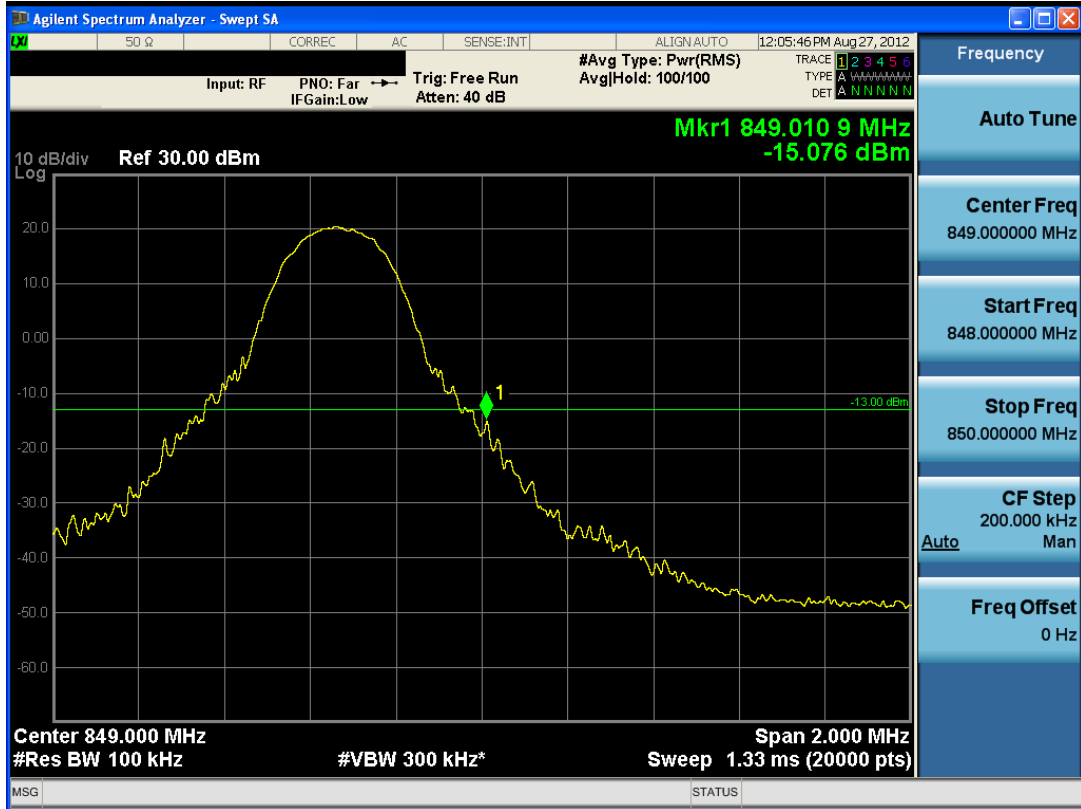


Plot 7-33. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-34. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 51 of 101                  |



Plot 7-35. Upper Band Edge Plot (QPSK – RB Size 1, Offset 24)



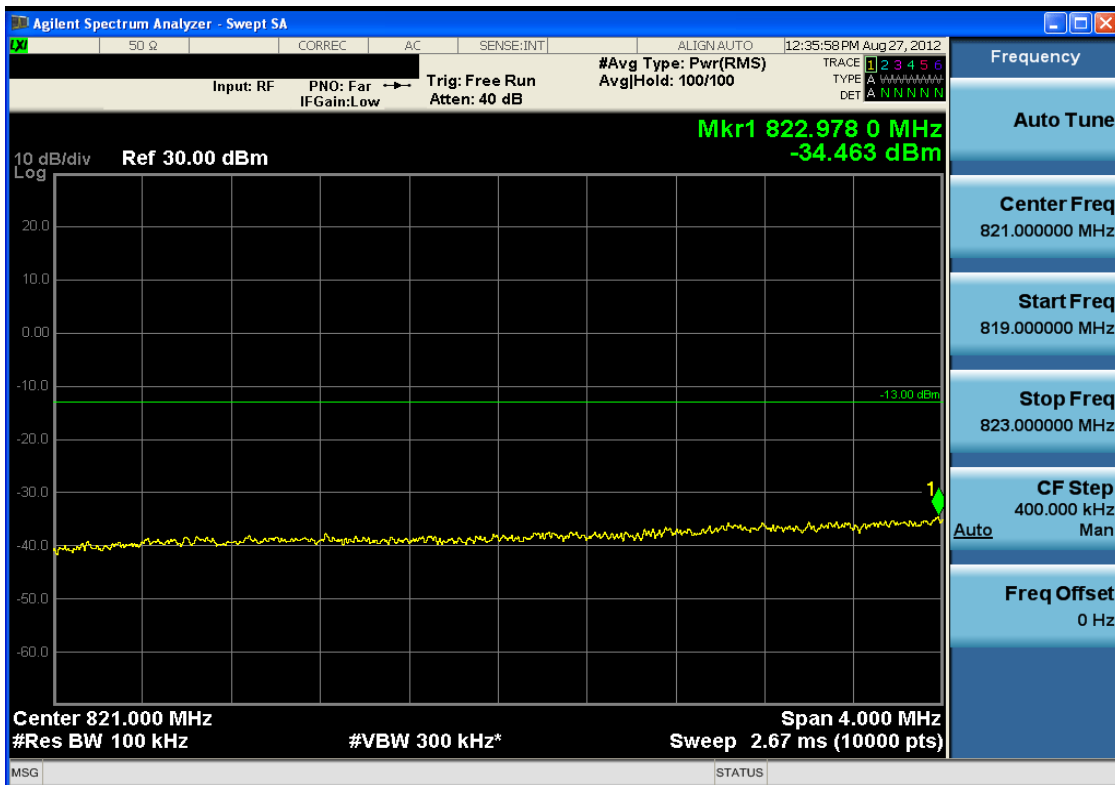
Plot 7-36. Upper Band Edge Plot (QPSK – RB Size 25)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 52 of 101                  |

**BAND 5 – 10 MHz BW**

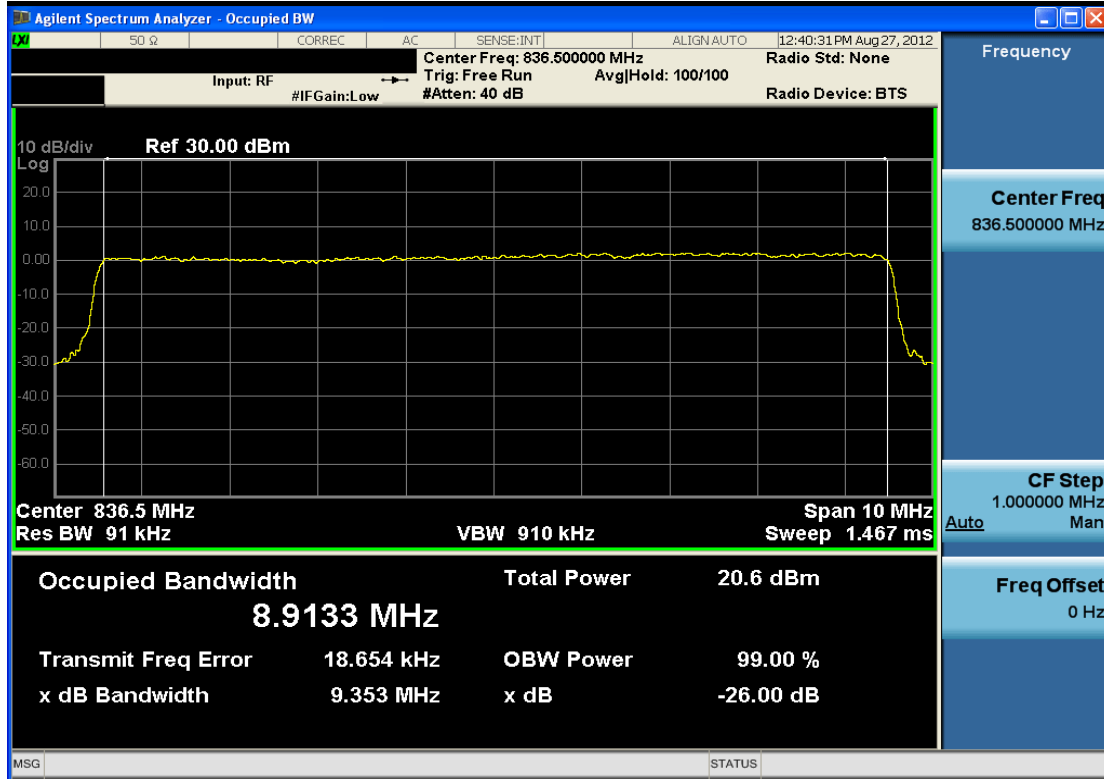


Plot 7-37. Lower Band Edge Plot (QPSK – RB Size 50)

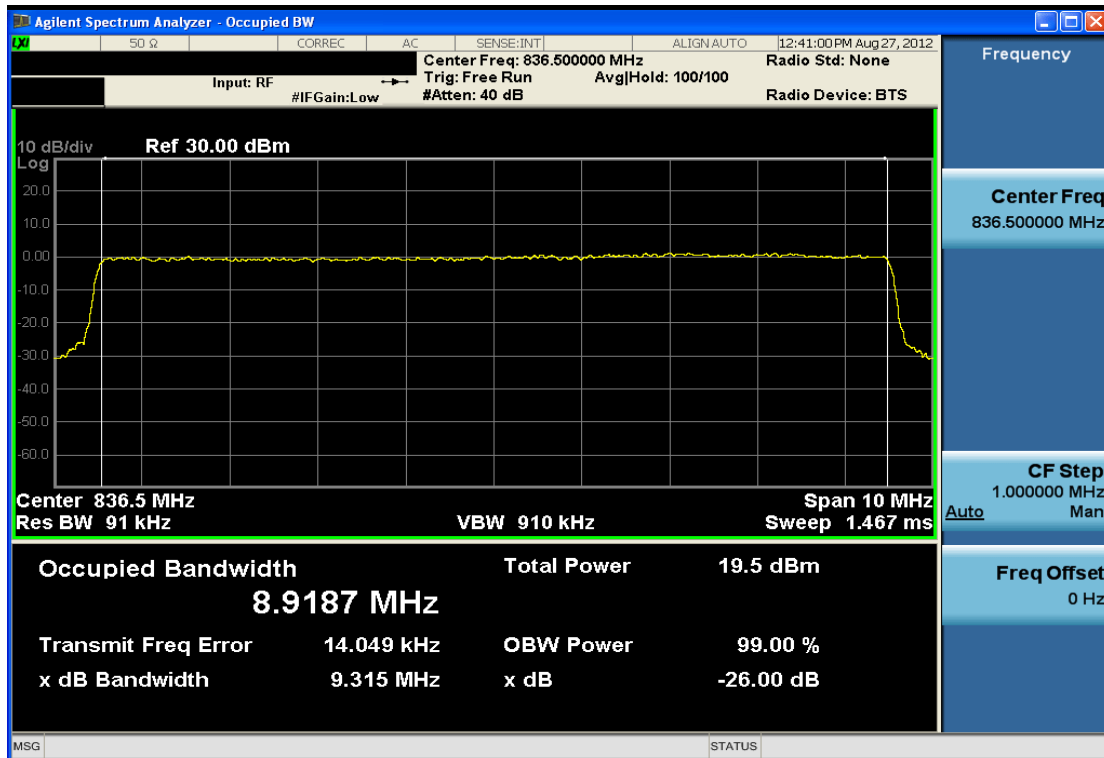


Plot 7-38. Lower Band Edge Plot (QPSK – RB Size 50)

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 53 of 101                  |

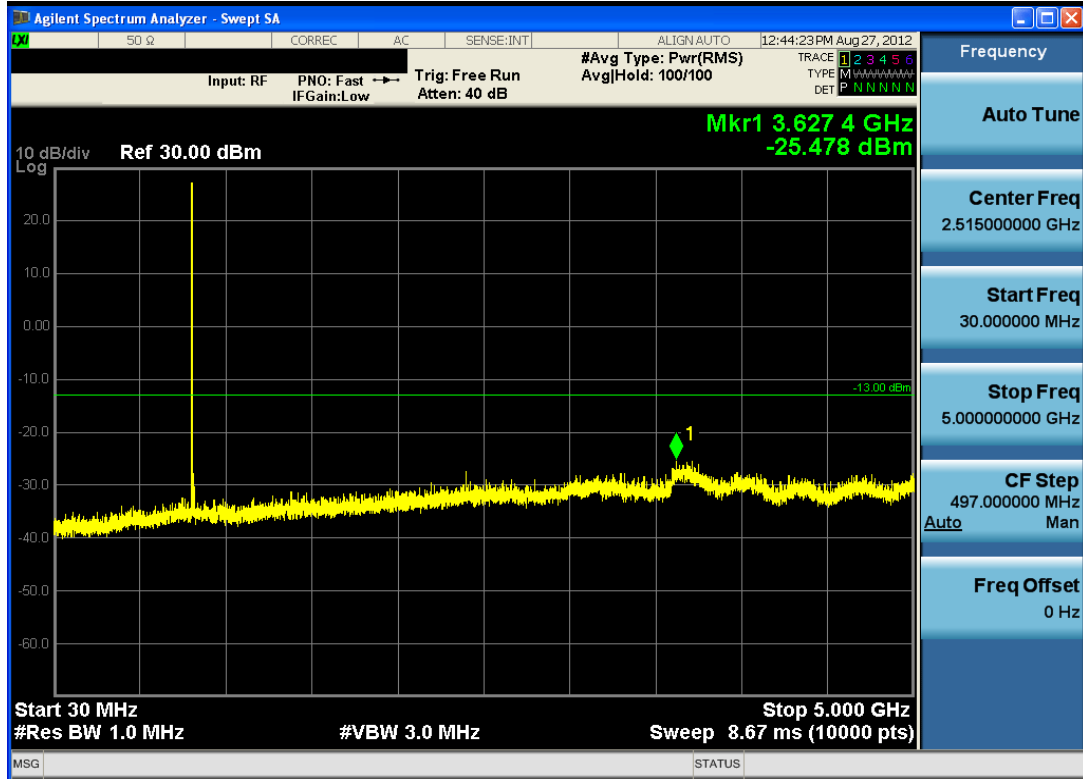


Plot 7-39. Occupied Bandwidth Plot (QPSK – RB Size 50)

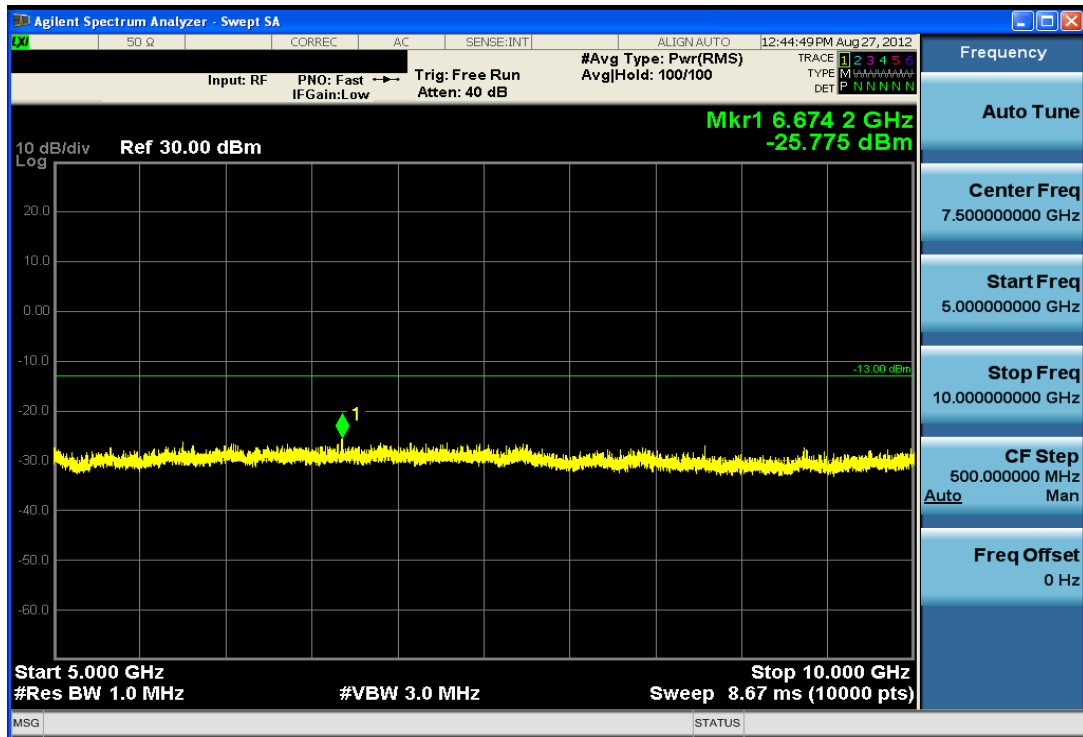


Plot 7-40. Occupied Bandwidth Plot (16-QAM – RB Size 50)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 54 of 101                  |

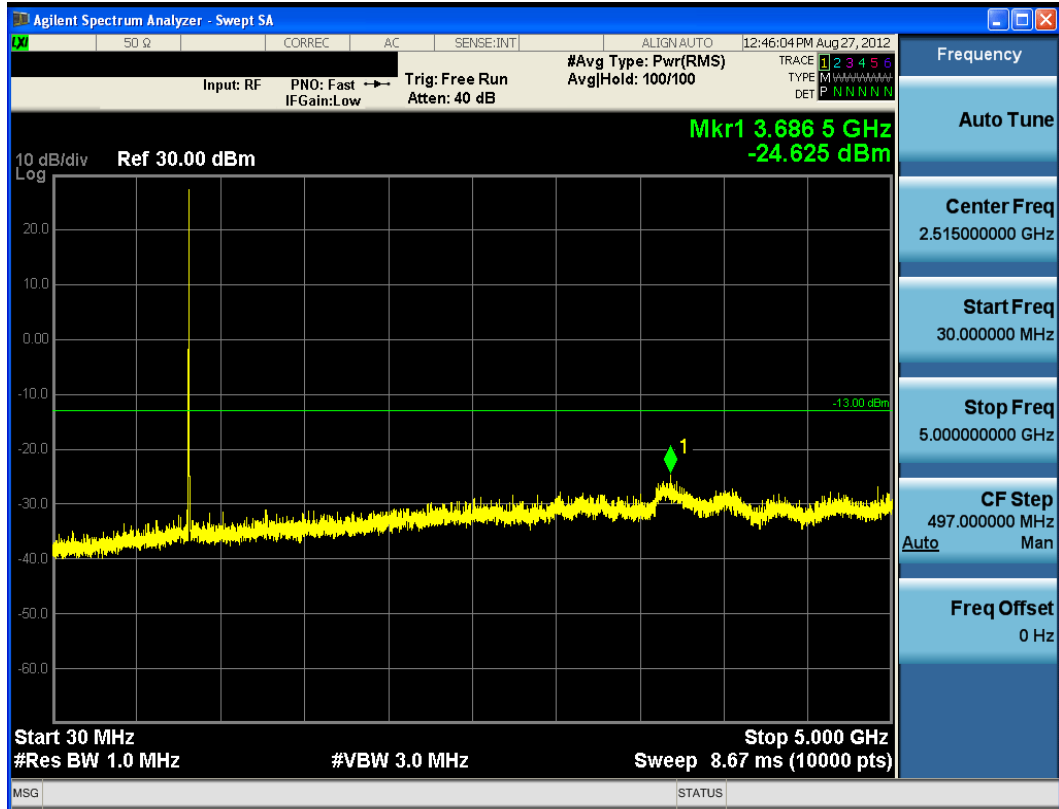


Plot 7-41. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

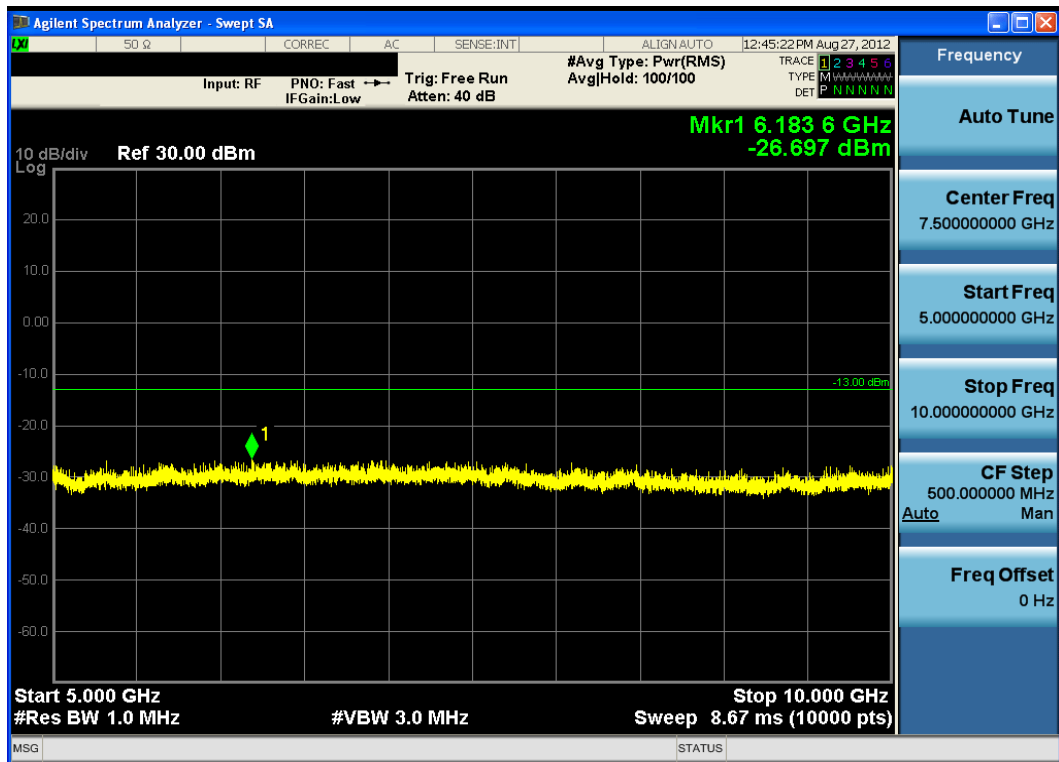


Plot 7-42. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)



|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 55 of 101                  |



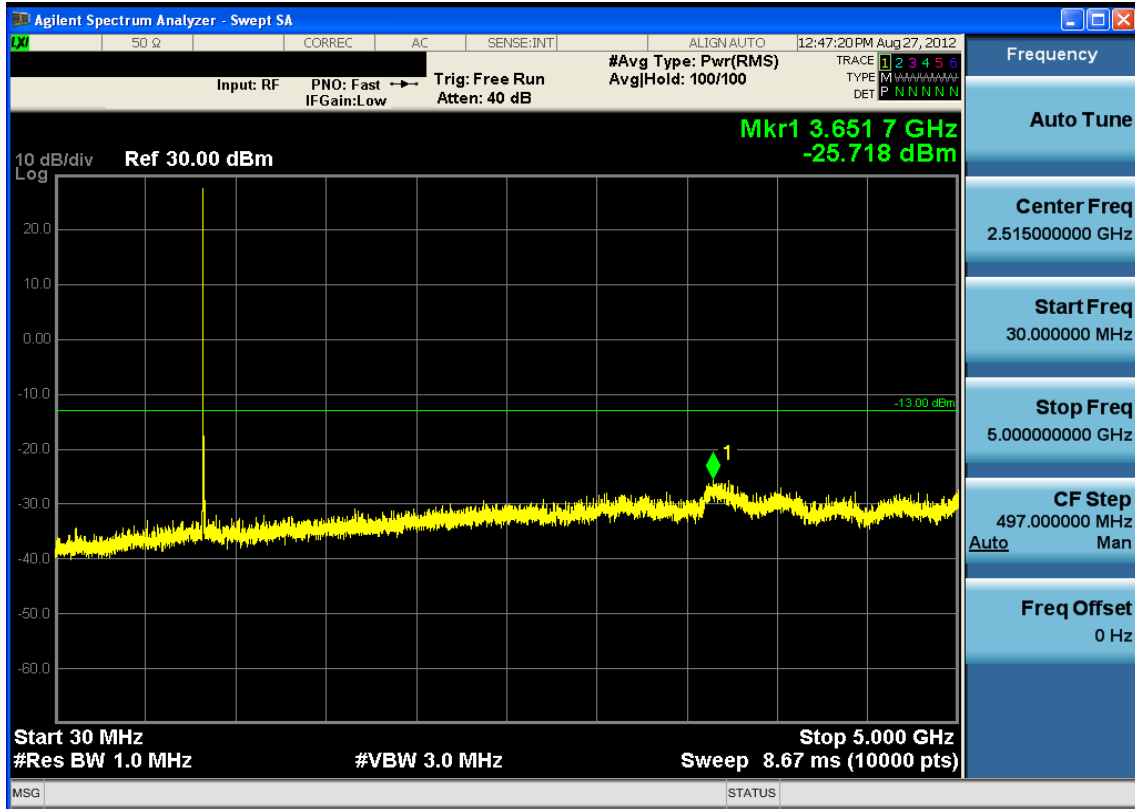
Plot 7-43. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)



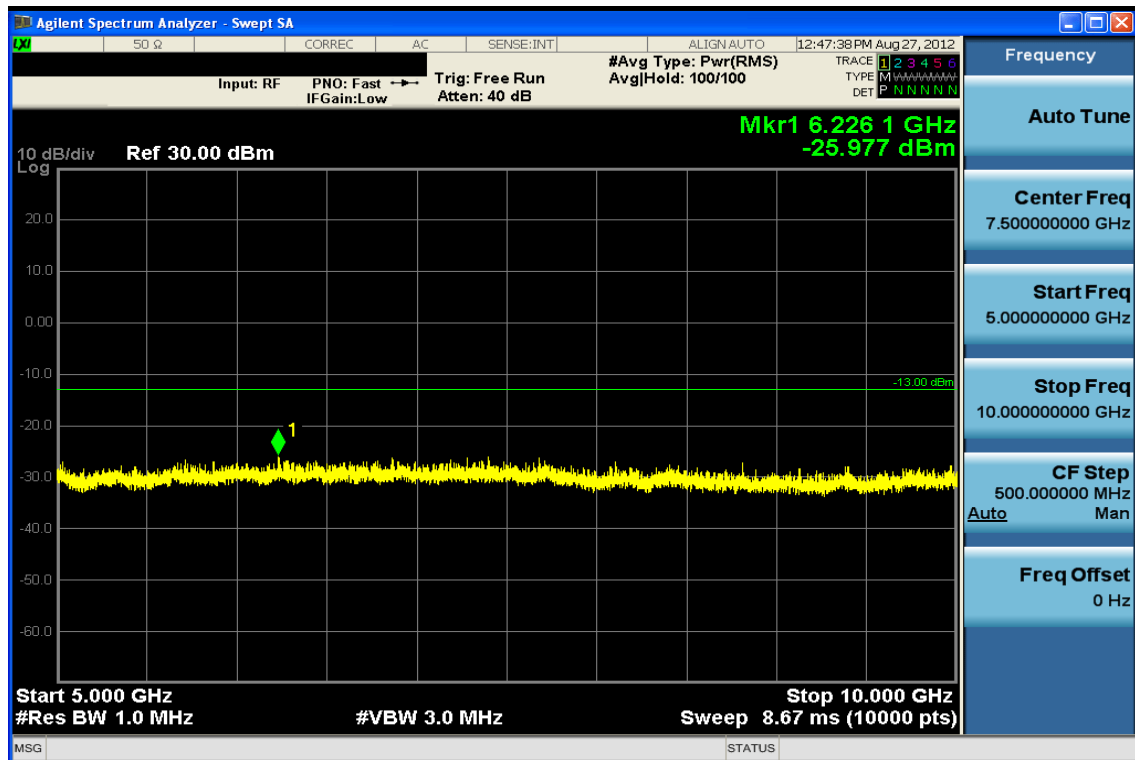
Plot 7-44. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 56 of 101                  |







Plot 7-45. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

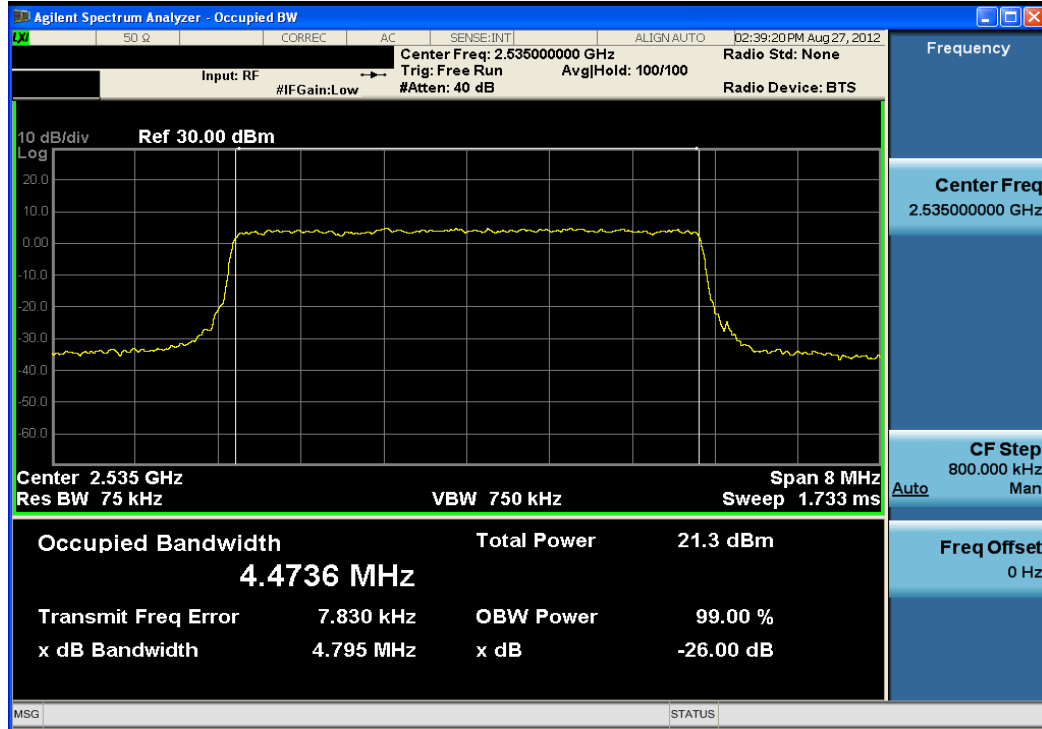


Plot 7-46. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

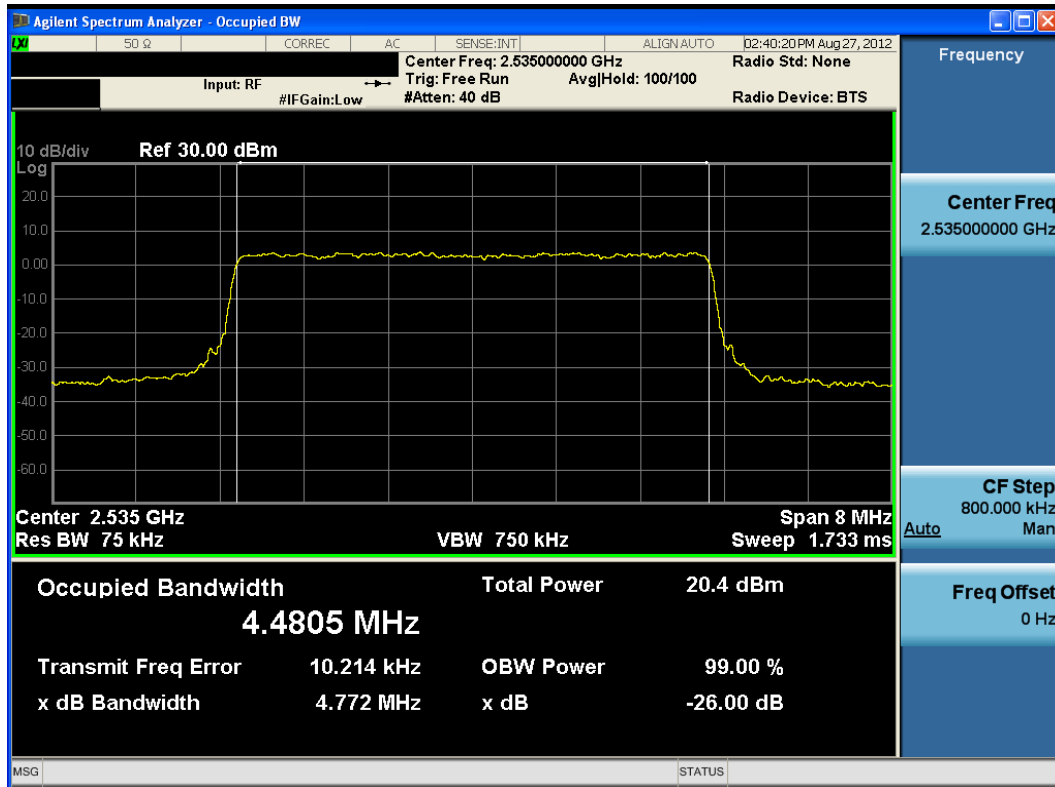
|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 57 of 101                  |





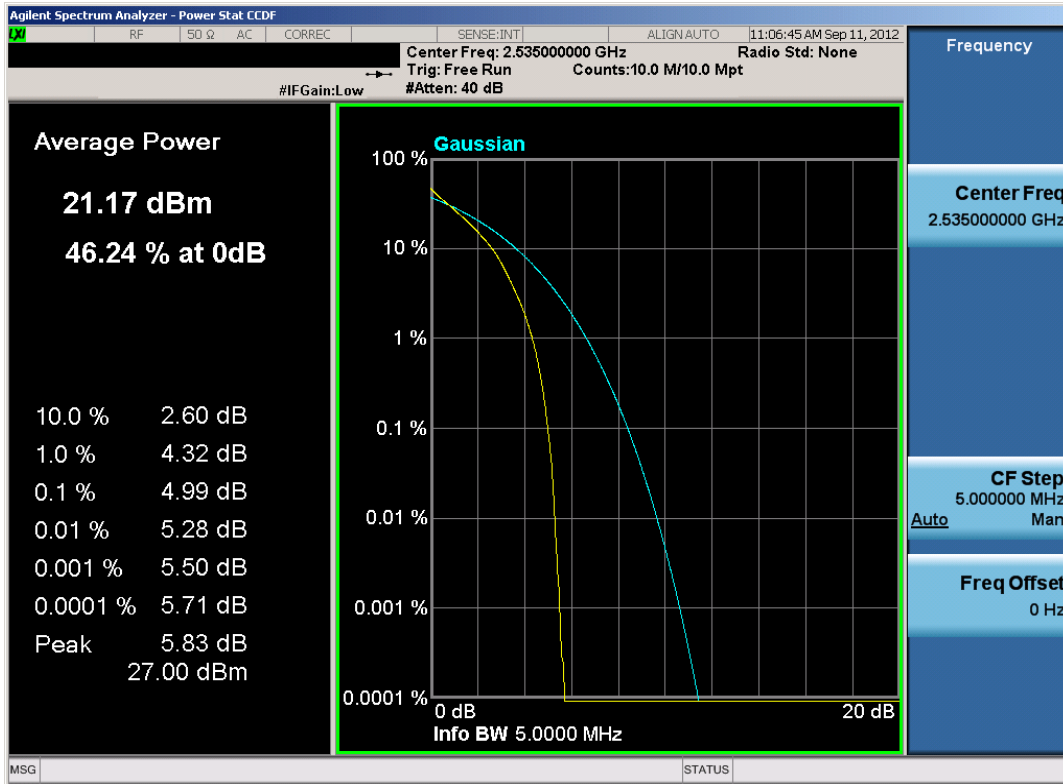


Plot 7-51. Occupied Bandwidth Plot (QPSK – RB Size 25)

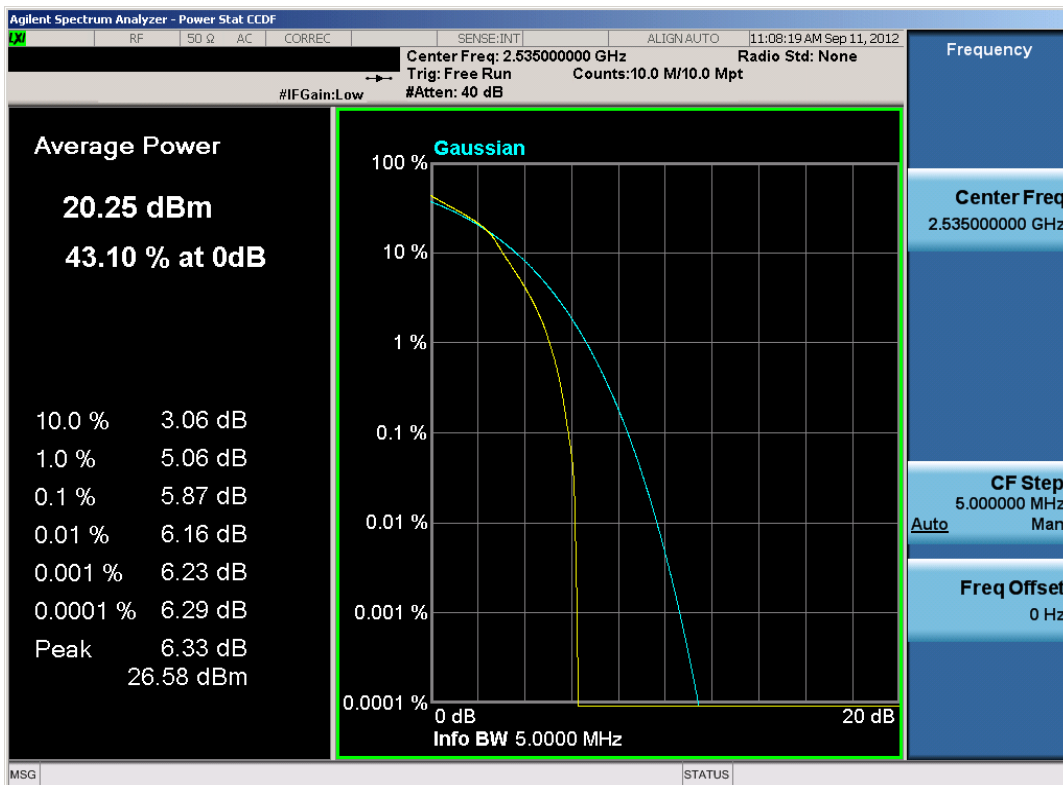


Plot 7-52. Occupied Bandwidth Plot (16-QAM – RB Size 25)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 60 of 101                  |

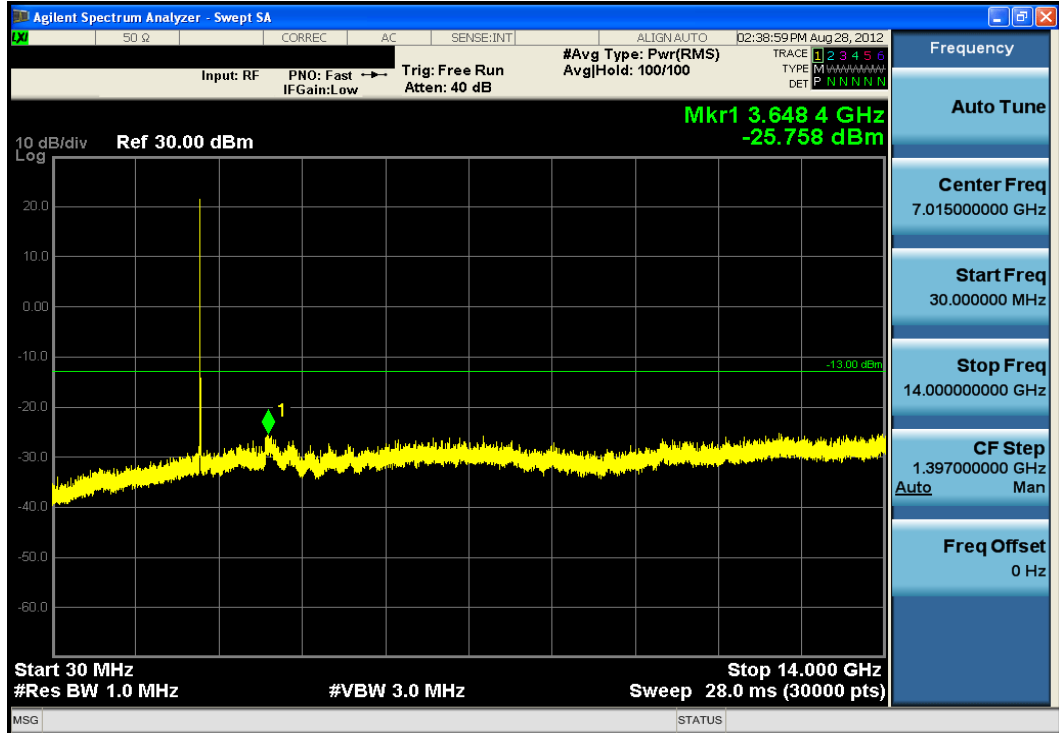


Plot 7-53. Peak to Average Ratio Plot (QPSK - RB Size 25)

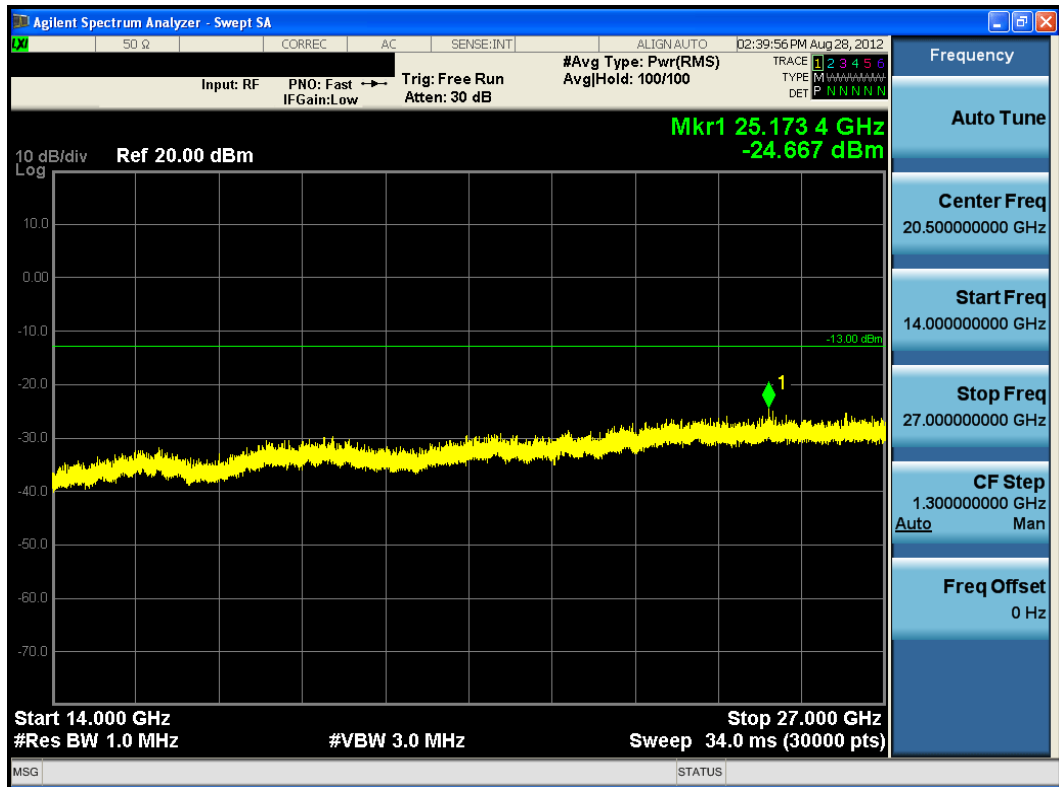


Plot 7-54. Peak to Average Ratio Plot (16QAM - RB Size 25)



|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |  | Page 61 of 101                  |

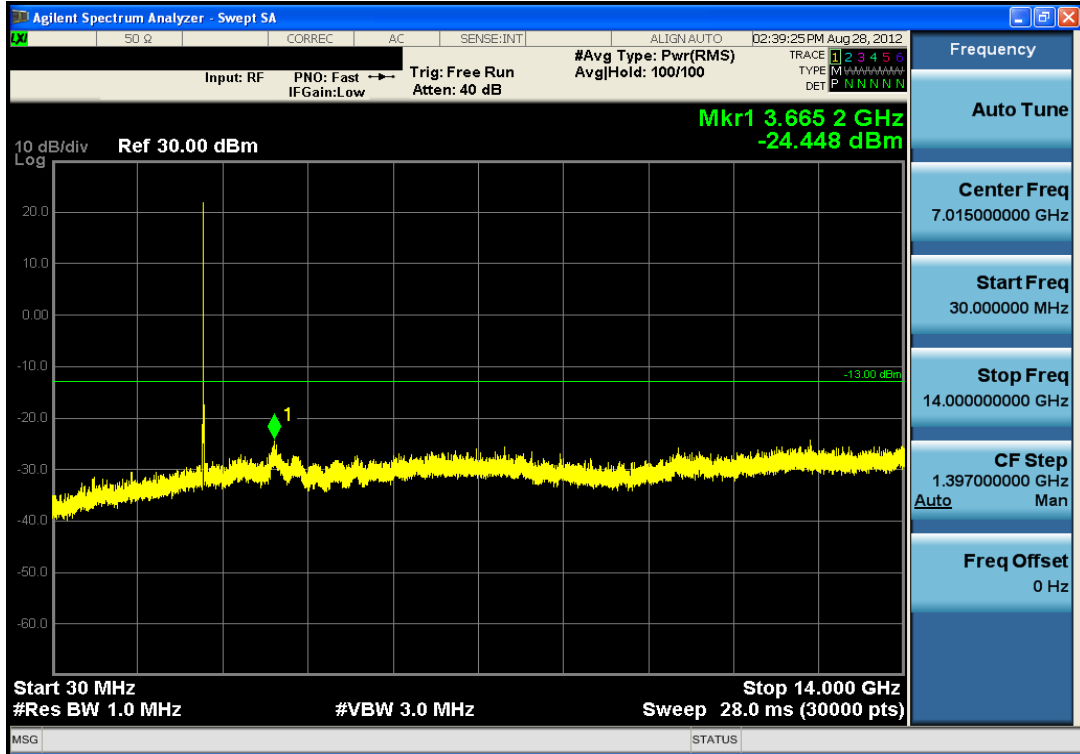


Plot 7-55. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

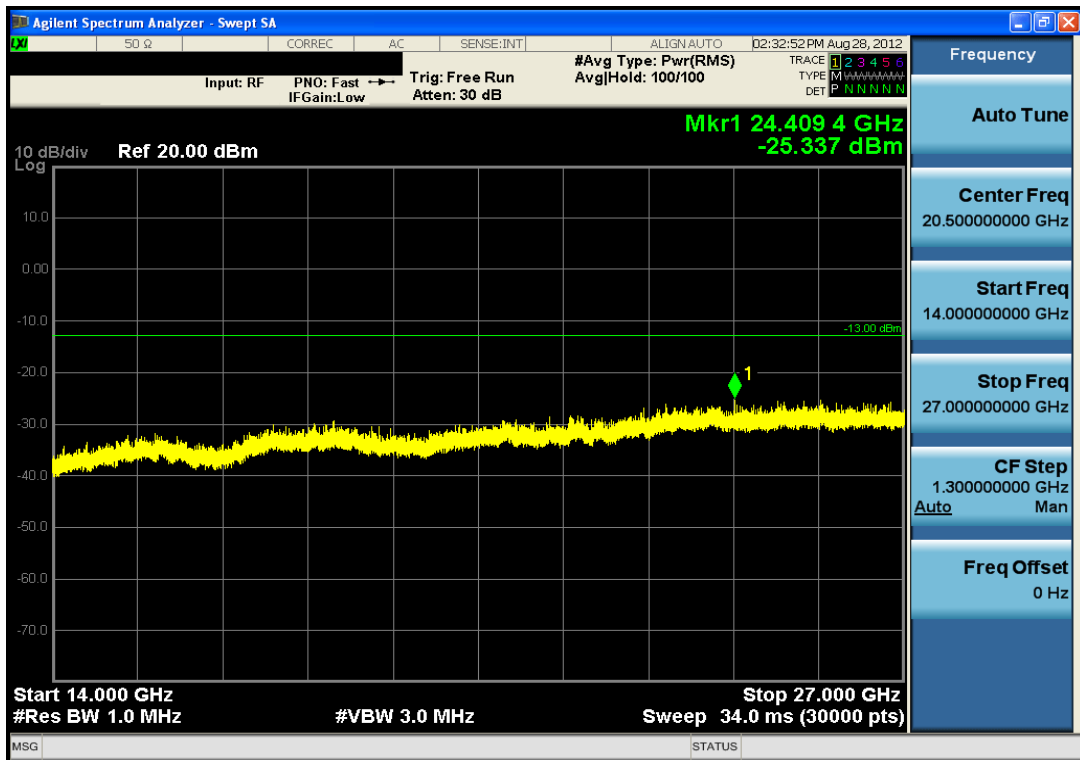


Plot 7-56. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 62 of 101                  |

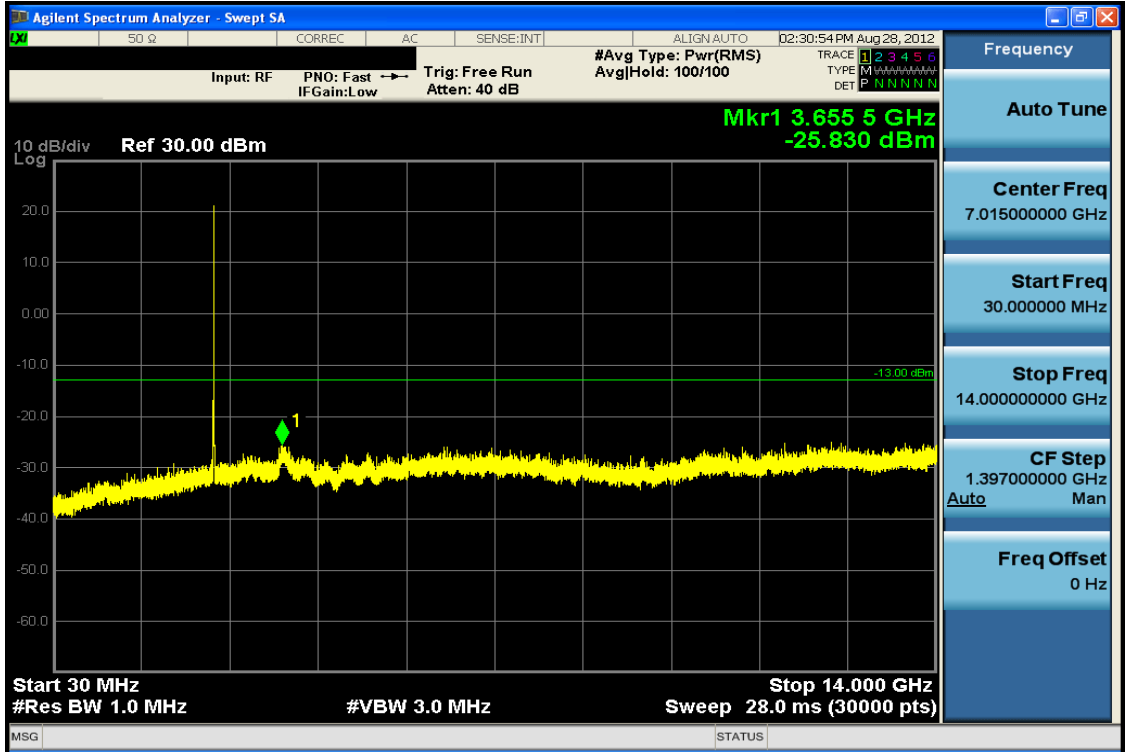


Plot 7-57. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

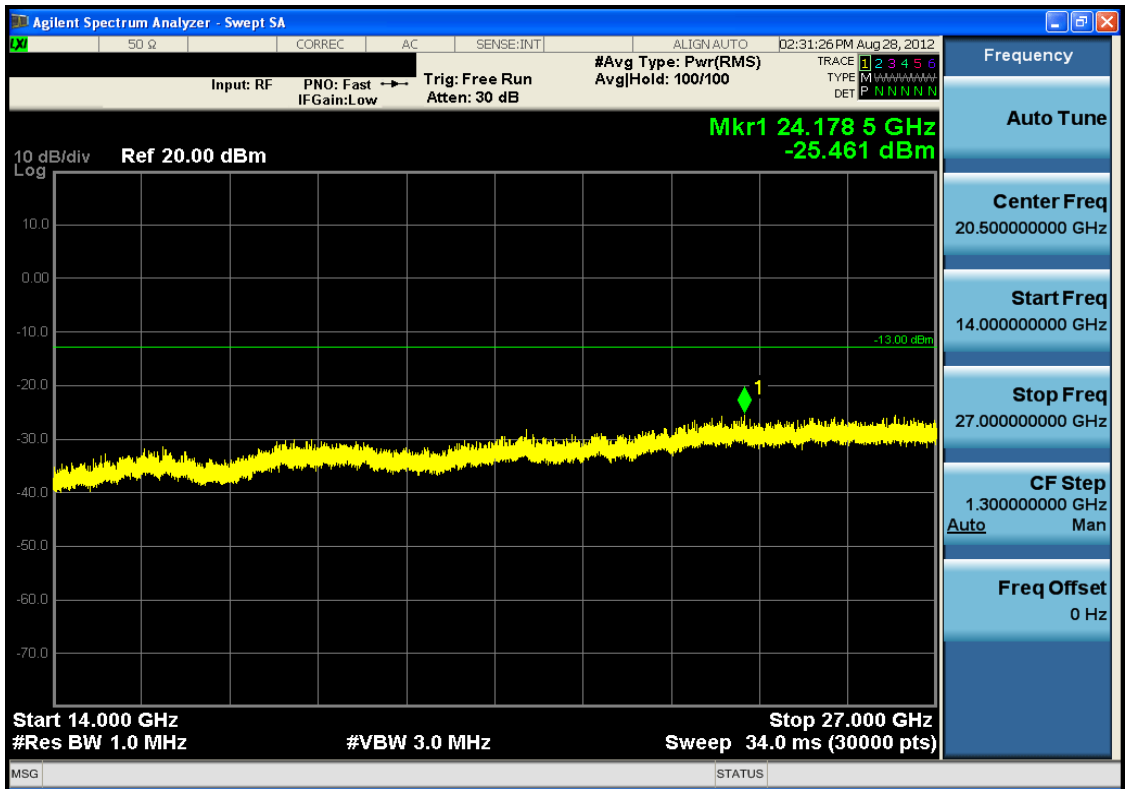


Plot 7-58. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 63 of 101                  |



Plot 7-59. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-60. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 64 of 101                  |





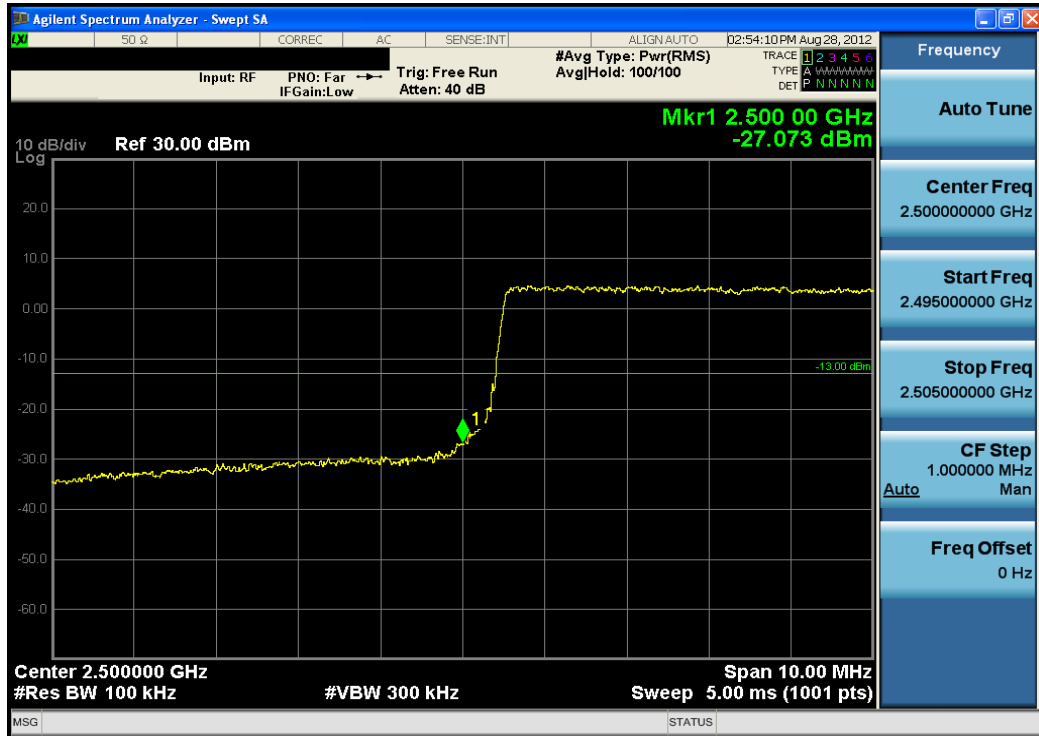
Plot 7-61. Upper Band Edge Plot (QPSK – RB Size 25)



Plot 7-62. Upper Band Edge Plot (QPSK – RB Size 25)

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 65 of 101                  |

**BAND 7 – 10 MHZ BW**

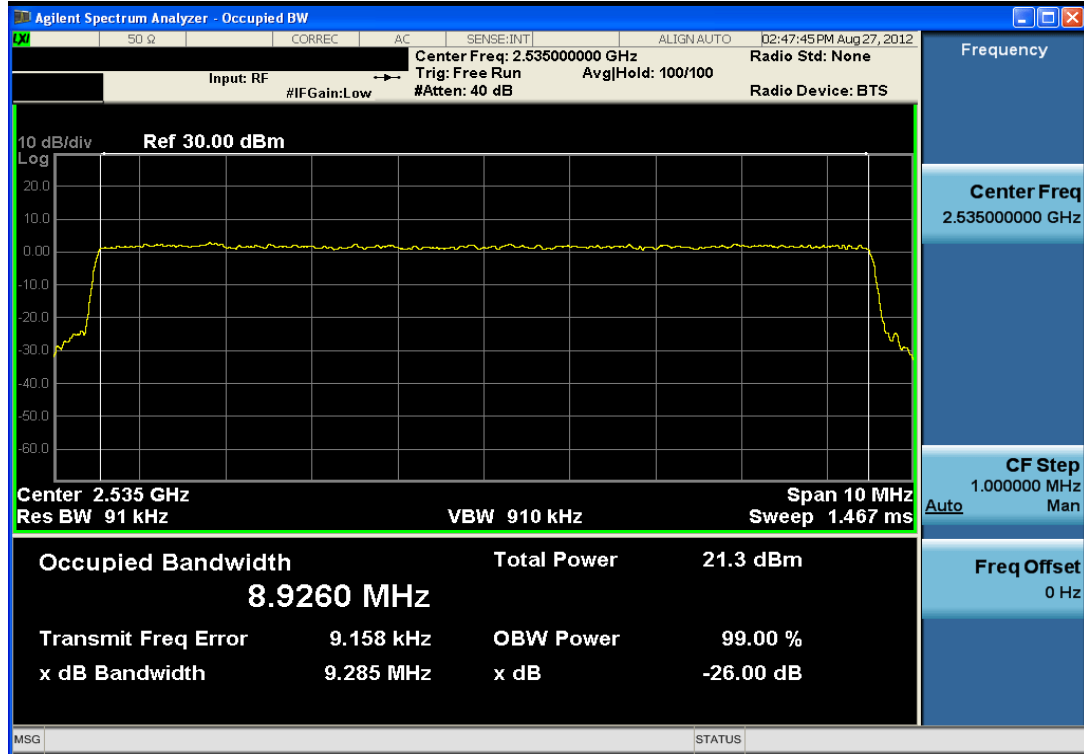


**Plot 7-63. Lower Band Edge Plot (QPSK – RB Size 50)**

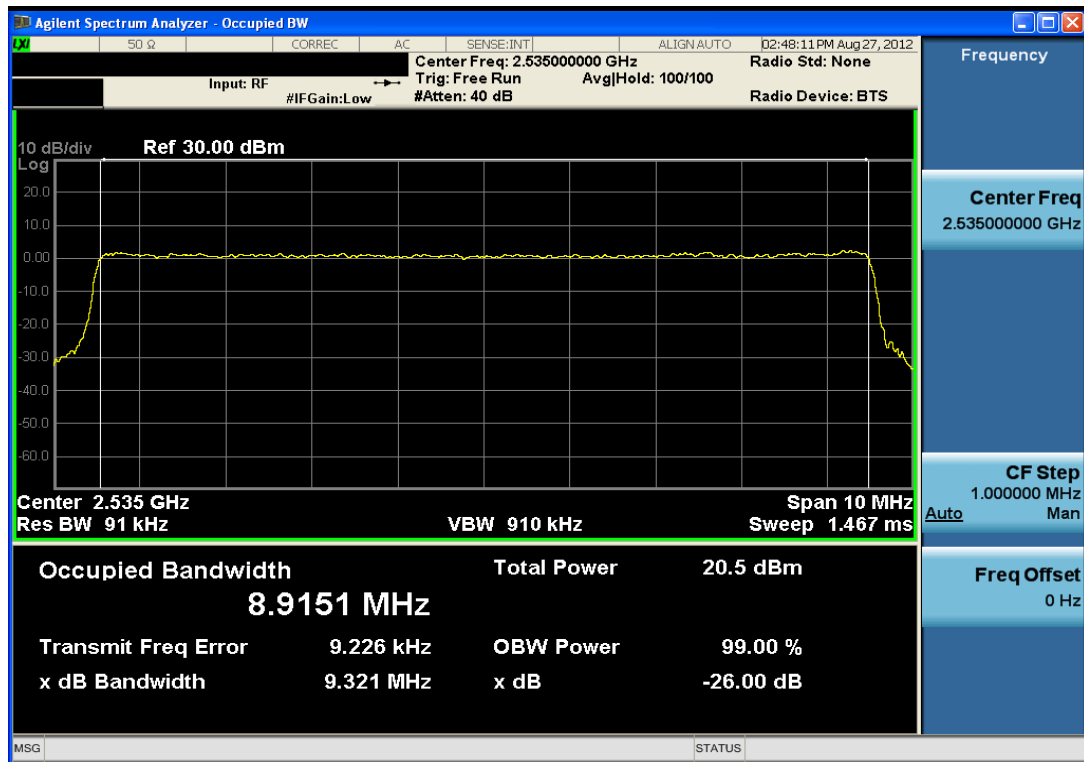


**Plot 7-64. Lower Band Edge Plot (QPSK – RB Size 50)**

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 66 of 101                  |

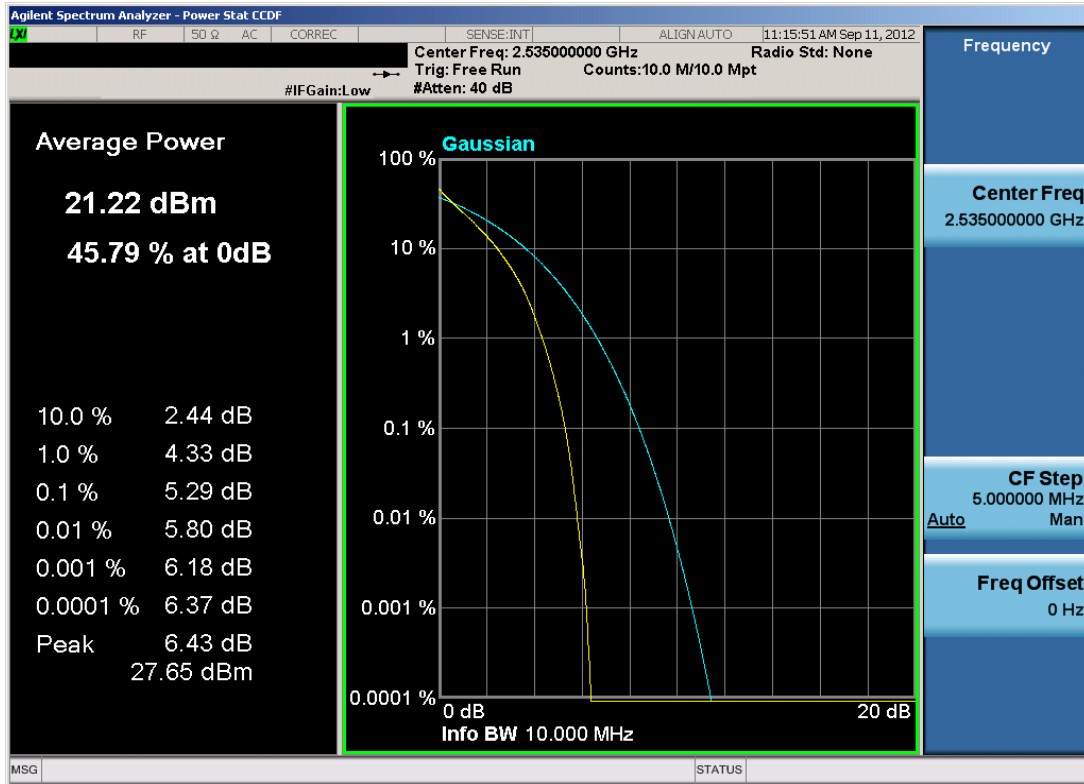


Plot 7-65. Occupied Bandwidth Plot (QPSK – RB Size 50)

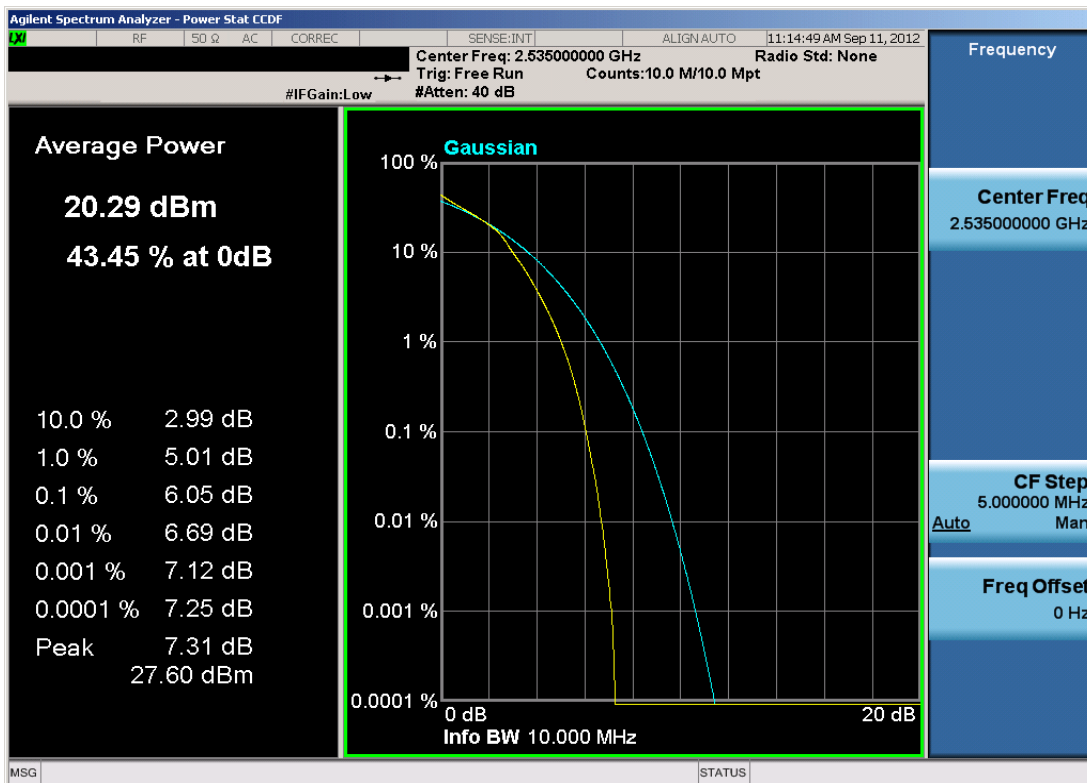


Plot 7-66. Occupied Bandwidth Plot (16-QAM – RB Size 50)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |  | Page 67 of 101                  |

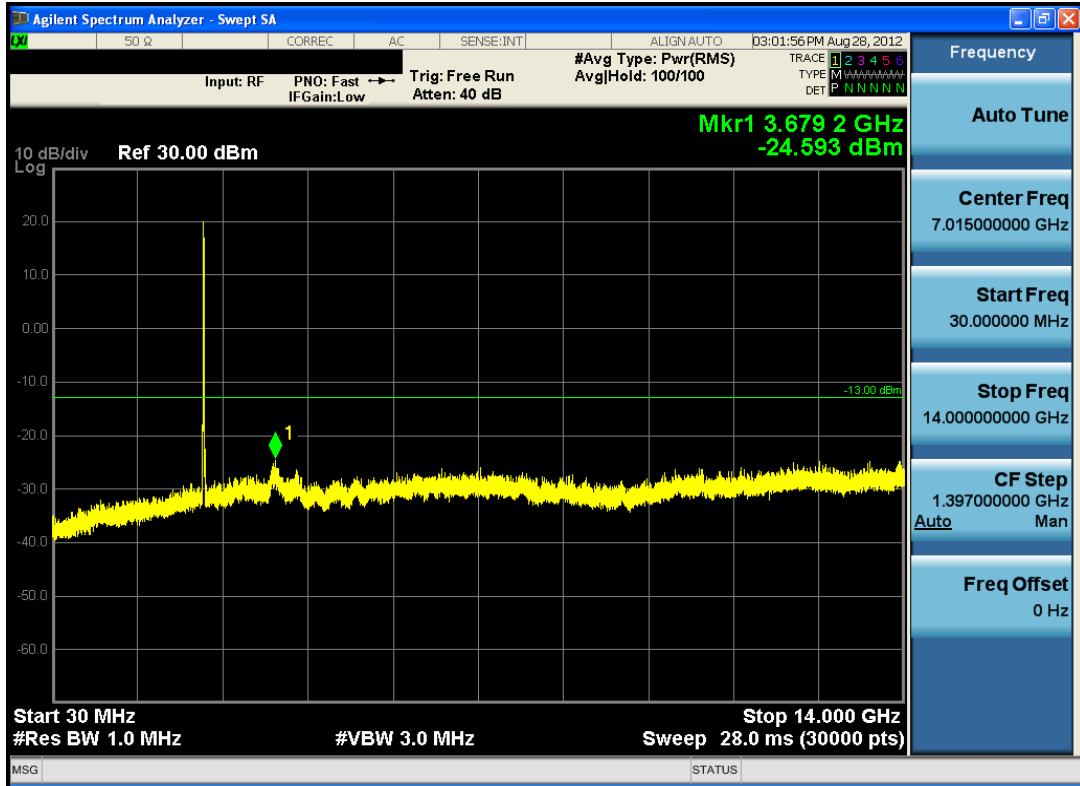


Plot 7-67. Peak to Average Ratio Plot (QPSK - RB Size 50)

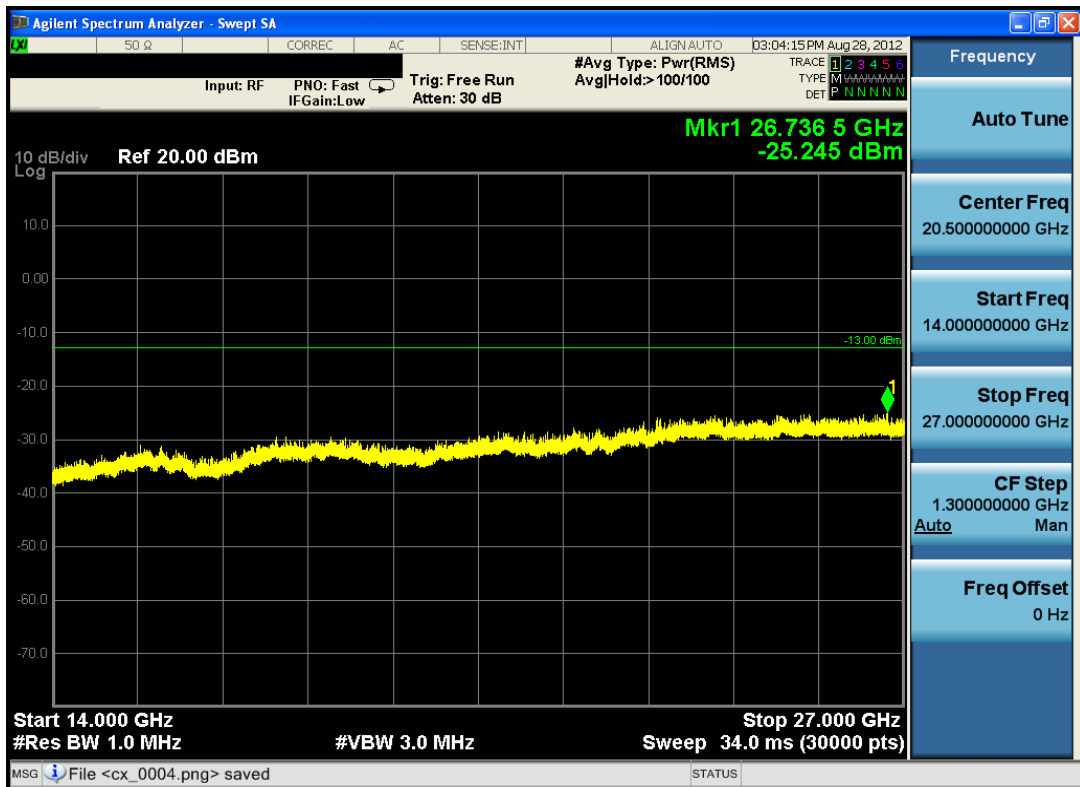


Plot 7-68. Peak to Average Ratio Plot (16QAM - RB Size 50)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |  | Page 68 of 101                  |

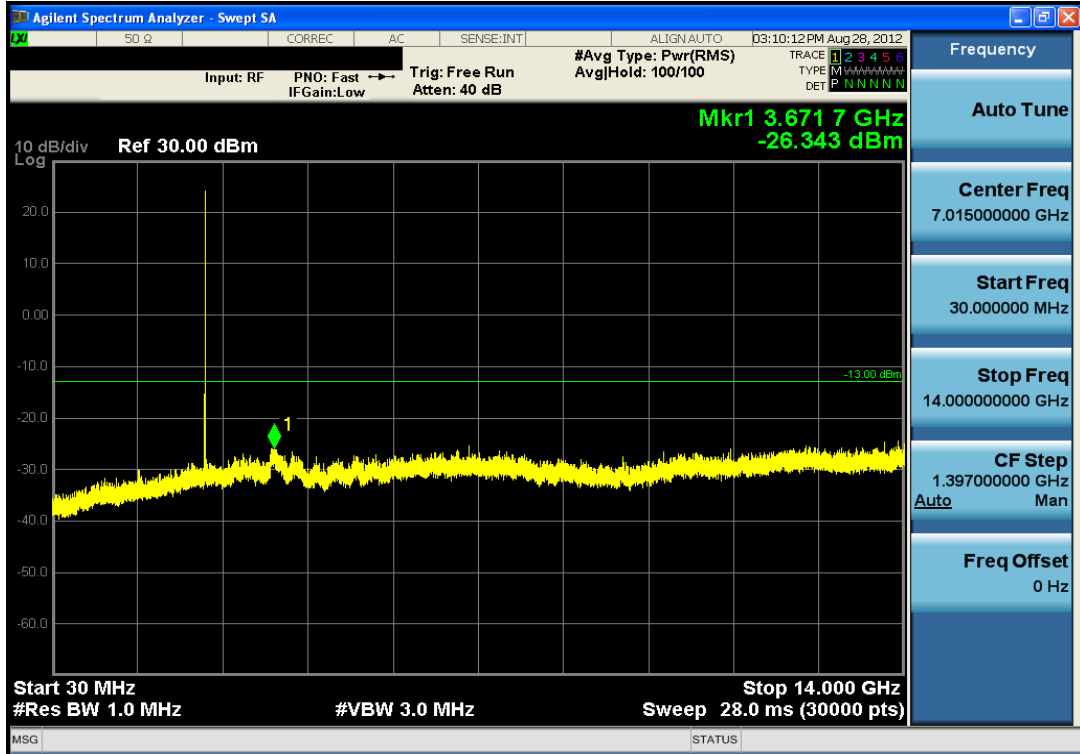


Plot 7-69. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

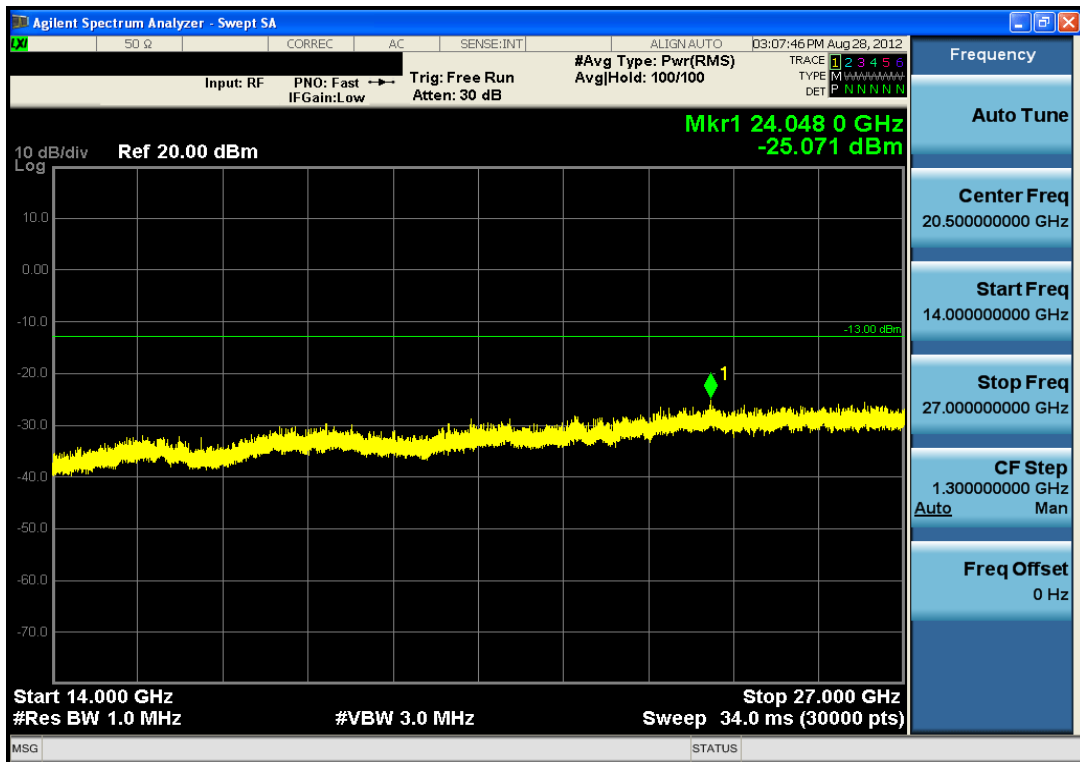


Plot 7-70. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)



|                                      |   |  |    |                                 |
|--------------------------------------|---|--|----|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |    | Page 69 of 101                  |

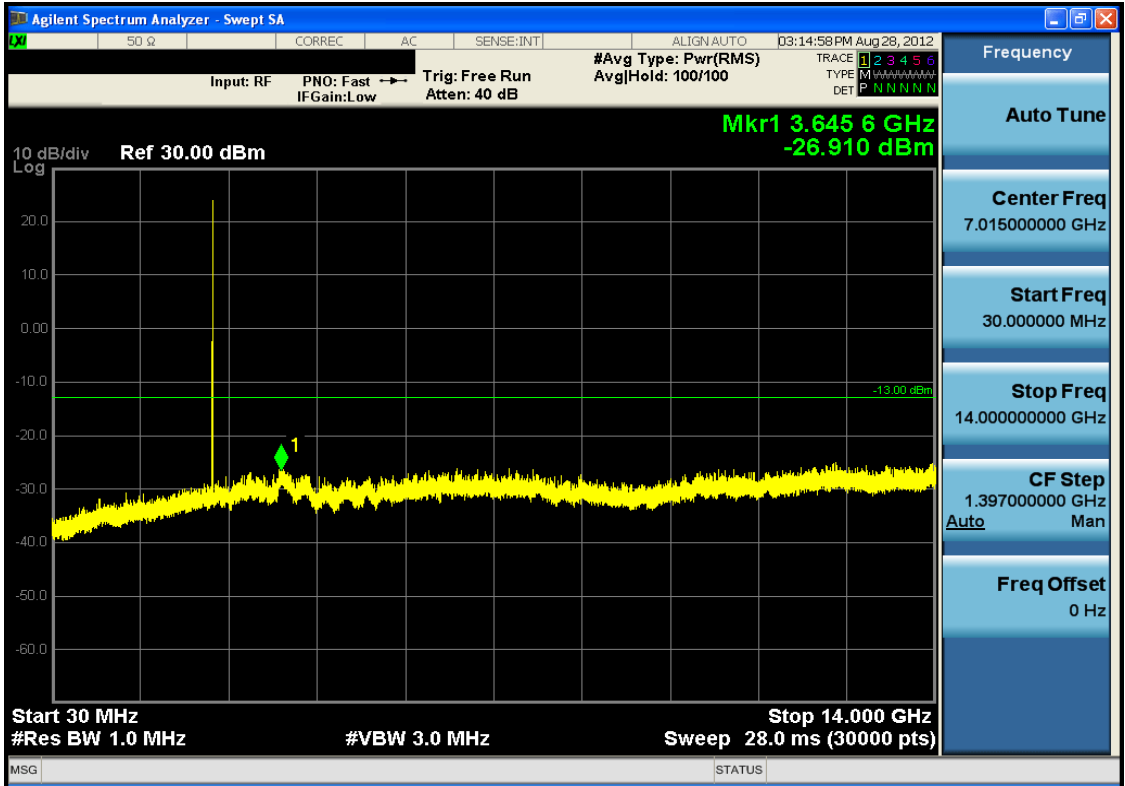


Plot 7-71. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

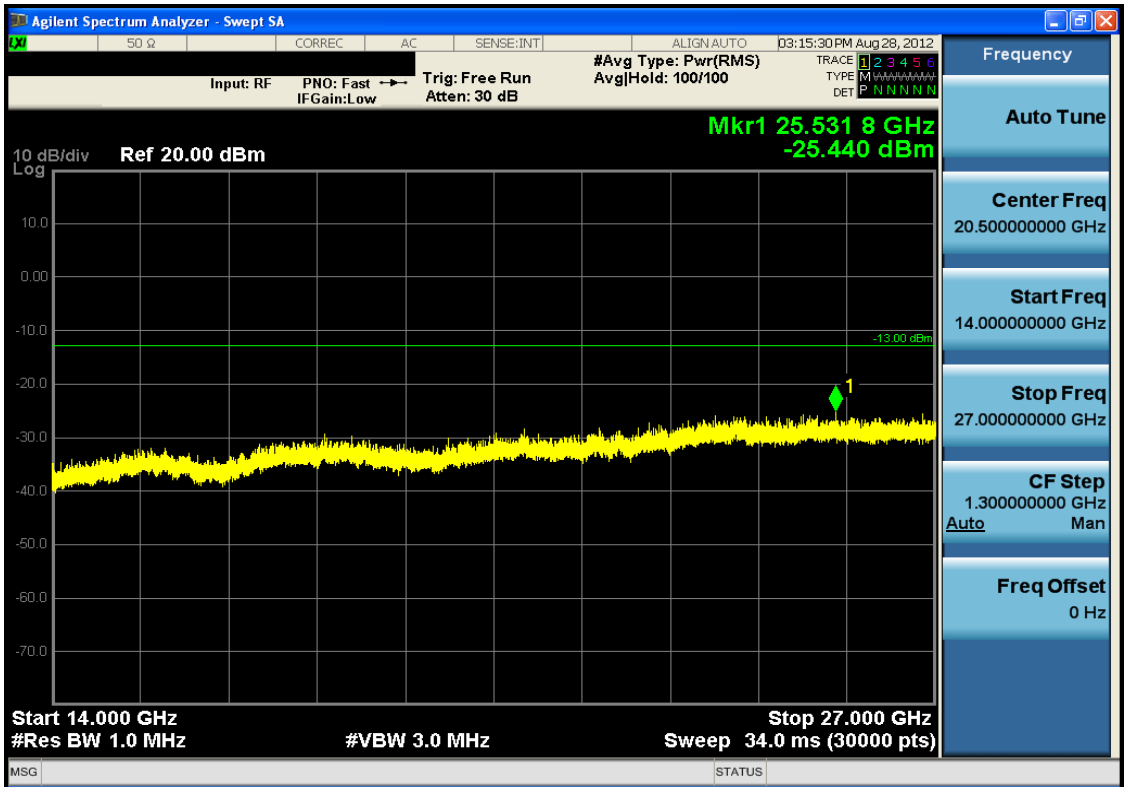


Plot 7-72. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 70 of 101                  |



Plot 7-73. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)



Plot 7-74. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 71 of 101                  |



Plot 7-75. Upper Band Edge Plot (QPSK – RB Size 1, Offset 49)

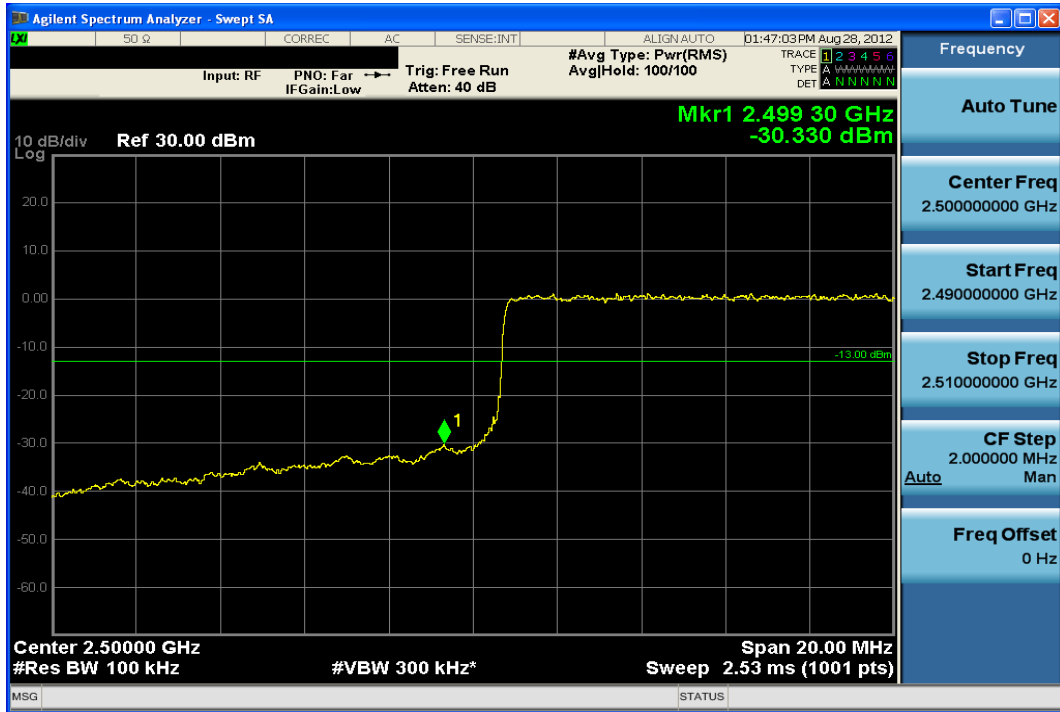


Plot 7-76. Upper Band Edge Plot (QPSK – RB Size 50)

|                                      |   |  |    |                                 |
|--------------------------------------|---|--|----|---------------------------------|
| FCC ID: ZNFE971                      | PCTEST<br>ENGINEERING LABORATORY, INC.    | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |    | Page 72 of 101                  |



**BAND 7 – 15 MHZ BW**

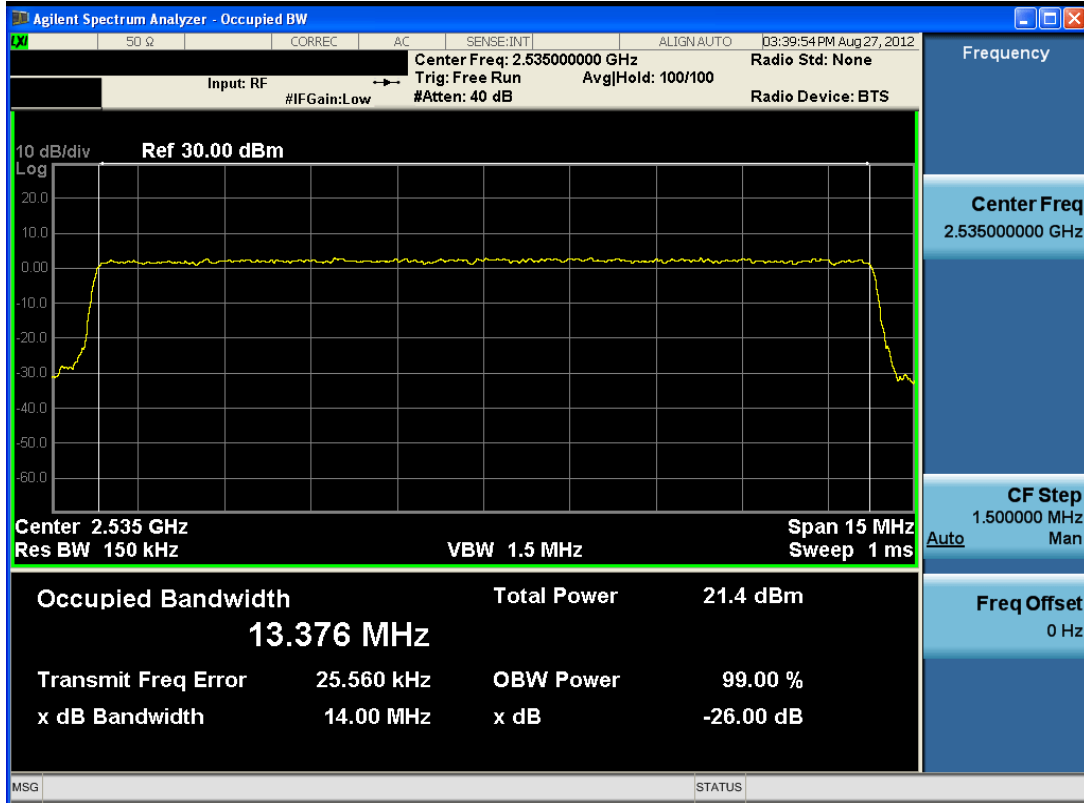


**Plot 7-49. Lower Band Edge Plot (QPSK – RB Size 75)**

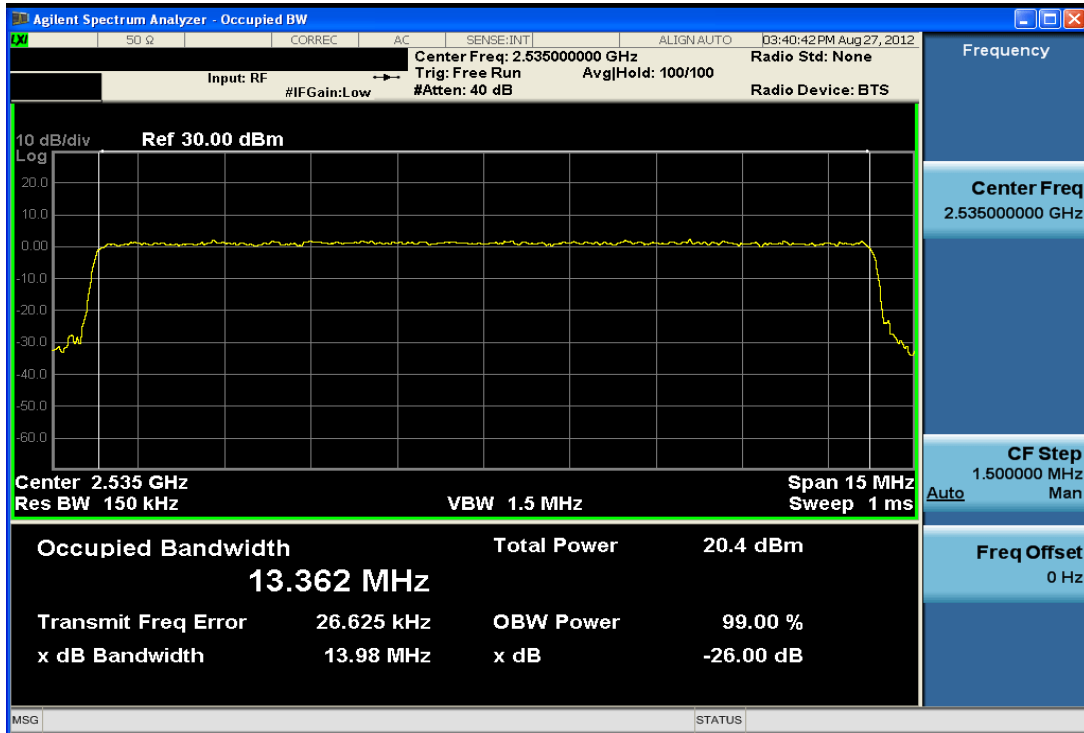


**Plot 7-50. Lower Band Edge Plot (QPSK – RB Size 75)**

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 73 of 101                  |

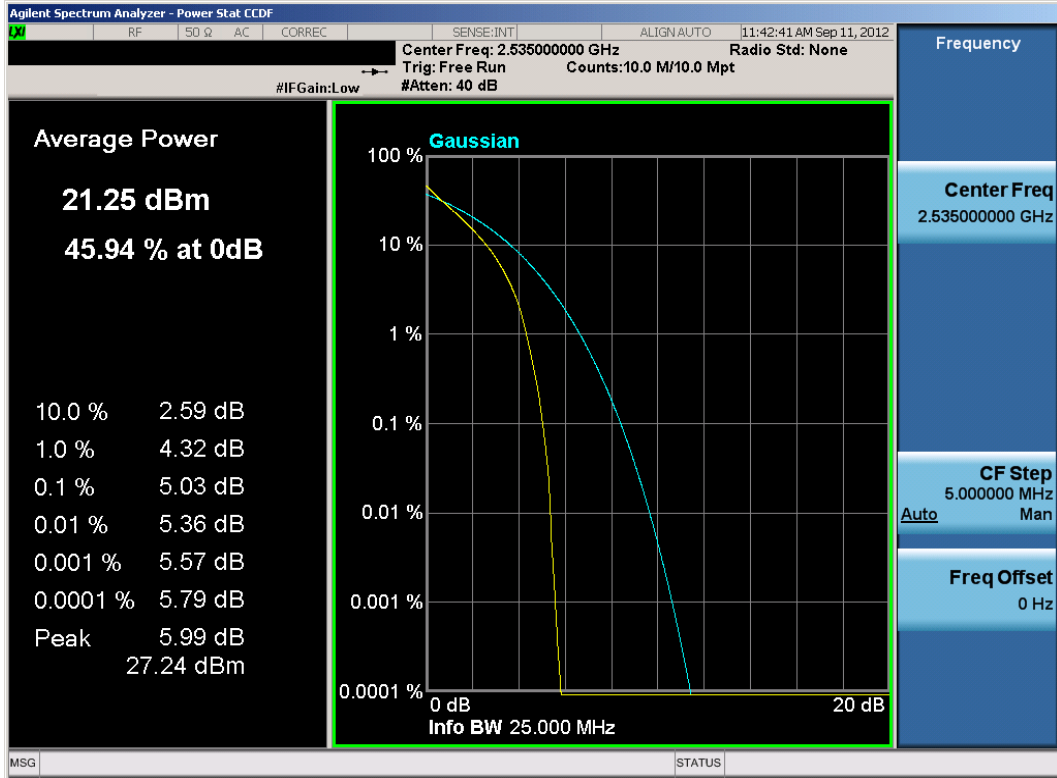


Plot 7-51. Occupied Bandwidth Plot (QPSK – RB Size 75)

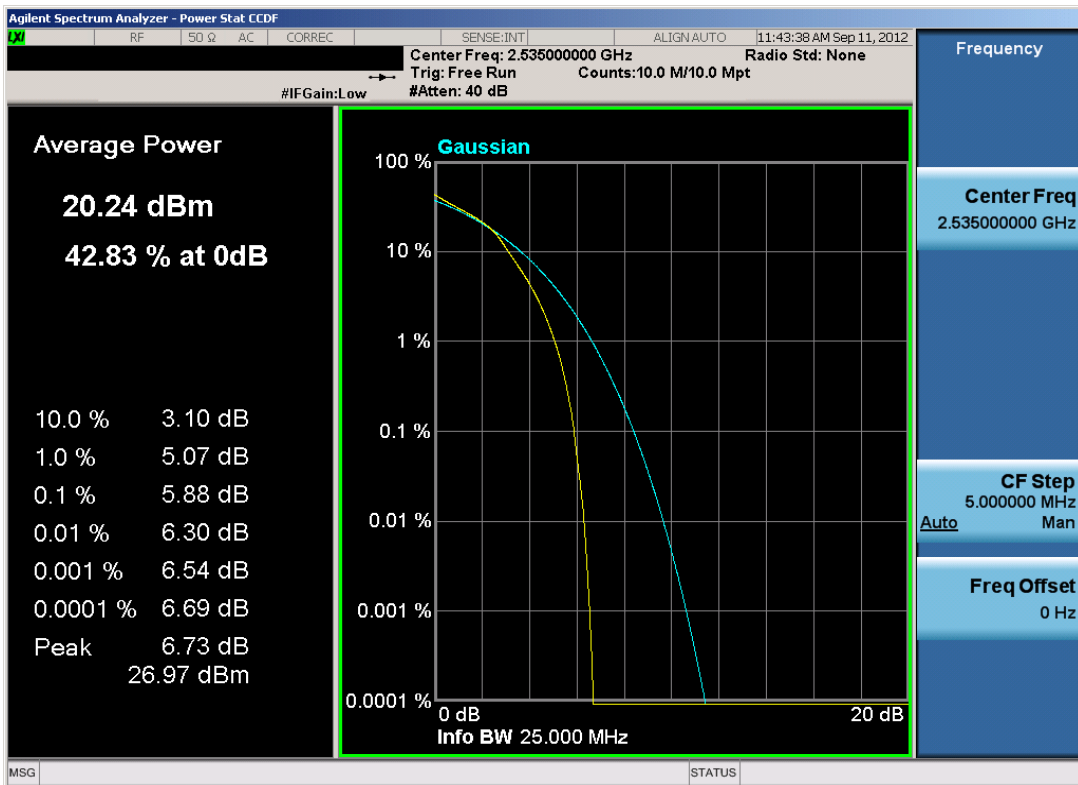


Plot 7-52. Occupied Bandwidth Plot (16-QAM – RB Size 75)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 74 of 101                  |

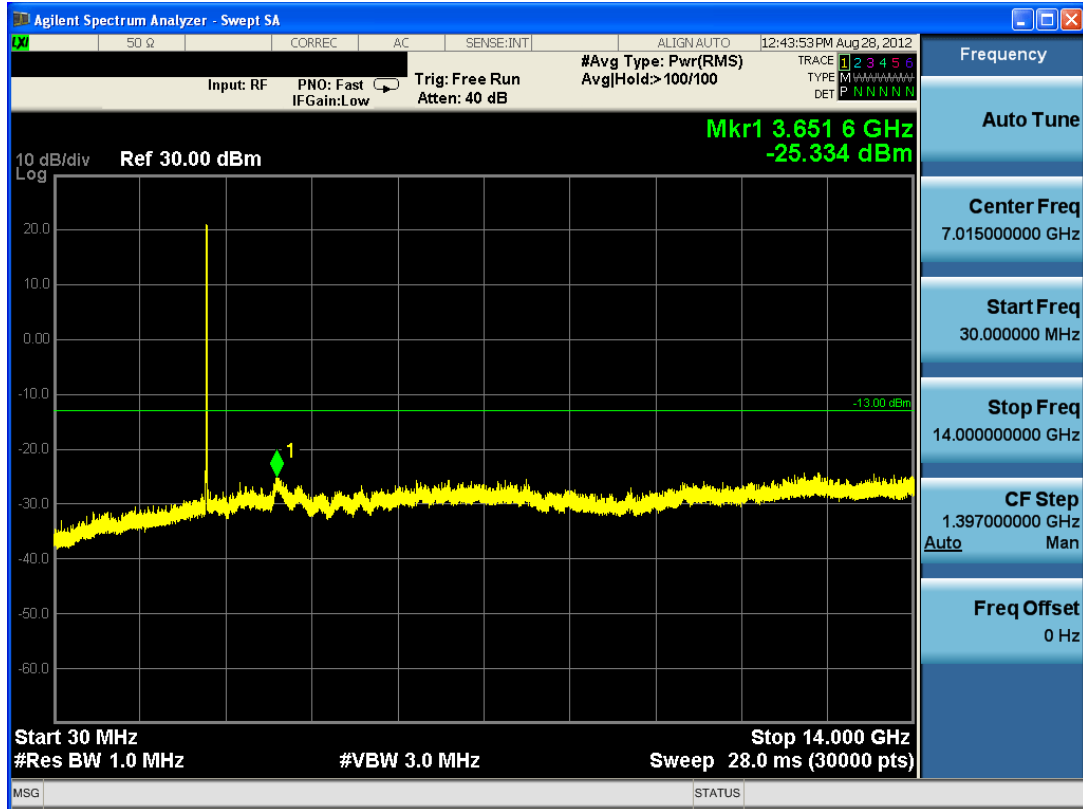


Plot 7-53. Peak to Average Ratio Plot (QPSK - RB Size 75)

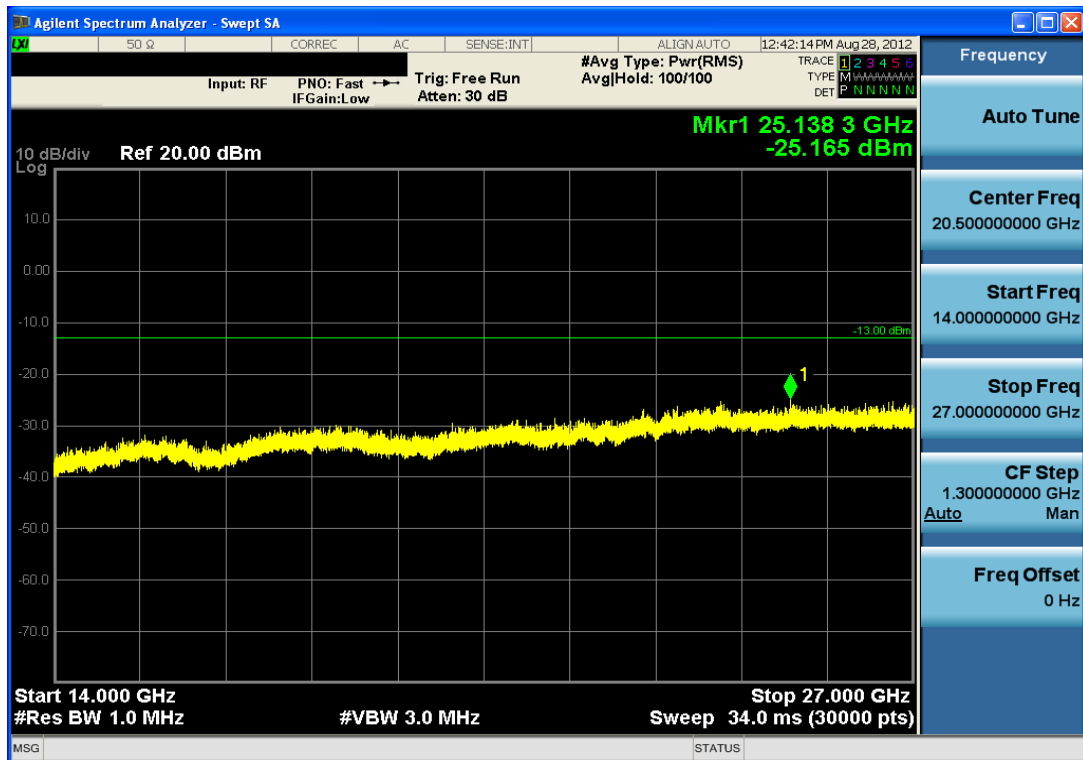


Plot 7-54. Peak to Average Ratio Plot (16QAM - RB Size 75)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |  | Page 75 of 101                  |

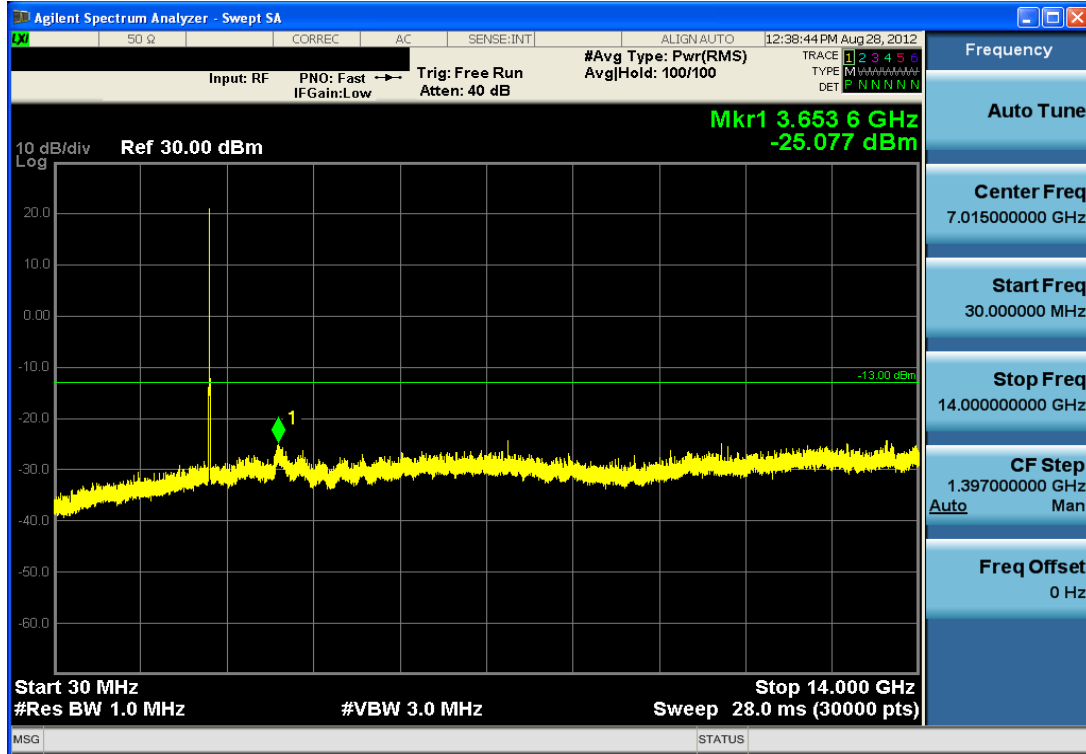


Plot 7-55. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

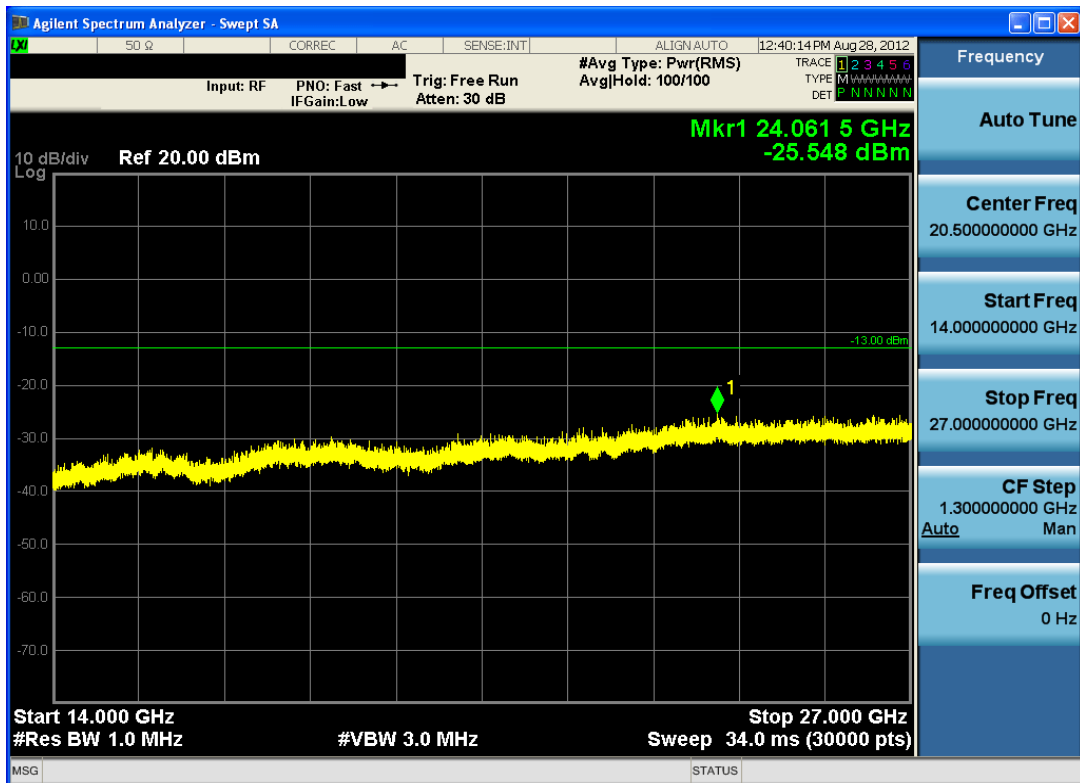


Plot 7-56. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 76 of 101                  |

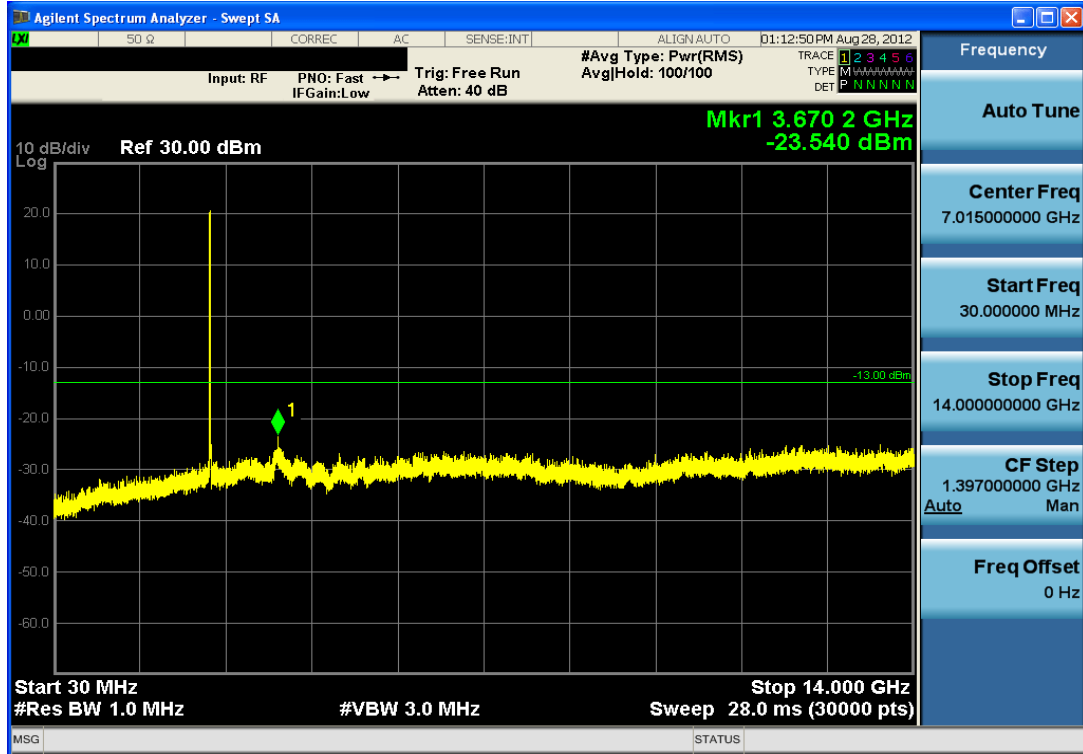


Plot 7-57. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

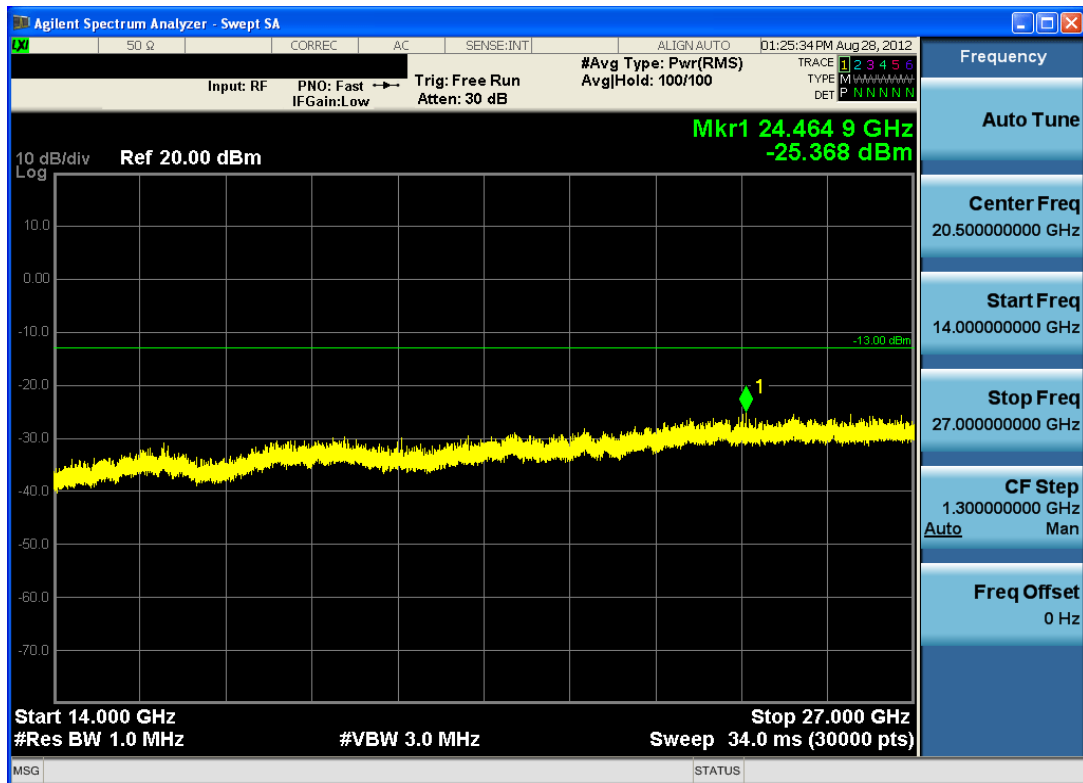


Plot 7-58. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

|                                      |   |  |    |                                 |
|--------------------------------------|---|--|----|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |    | Page 77 of 101                  |



Plot 7-59. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

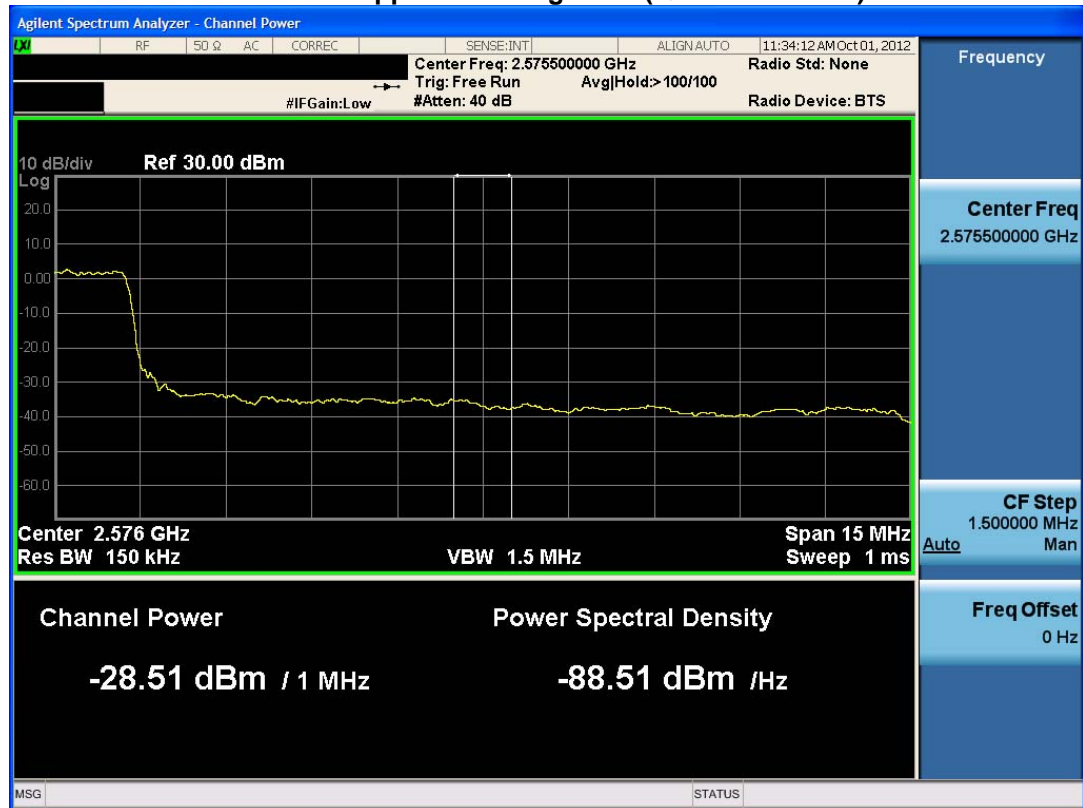


Plot 7-60. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 78 of 101                  |



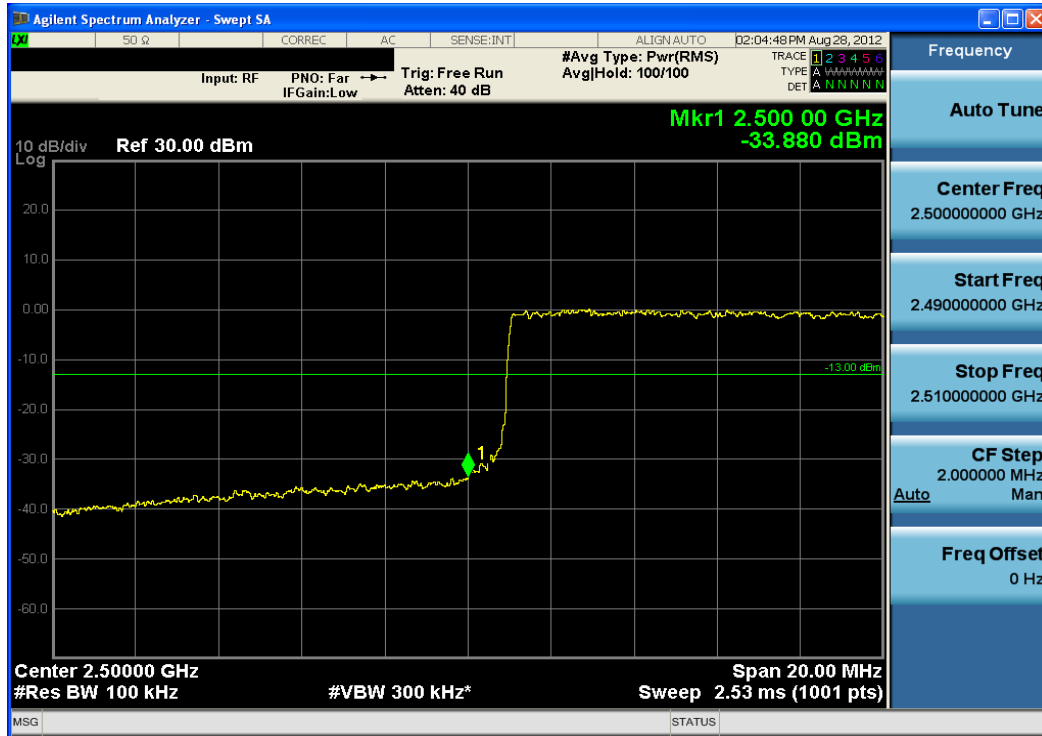
Plot 7-61. Upper Band Edge Plot (QPSK – RB Size)



Plot 7-62. Upper Band Edge Plot (QPSK – RB Size 75)

|                                      |   |  |    |                                 |
|--------------------------------------|---|--|----|---------------------------------|
| FCC ID: ZNFE971                      | PCTEST<br>ENGINEERING LABORATORY, INC.    | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) | LG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |    | Page 79 of 101                  |

**BAND 7 – 20 MHz BW**



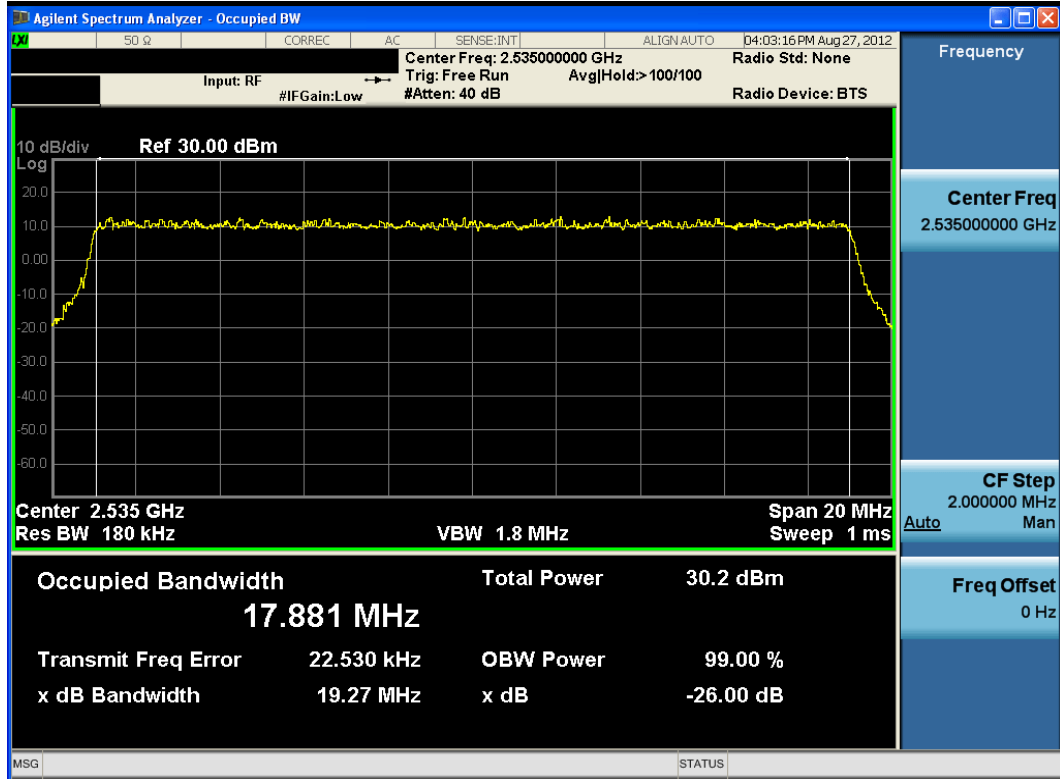
**Plot 7-63. Lower Band Edge Plot (QPSK – RB Size 100)**



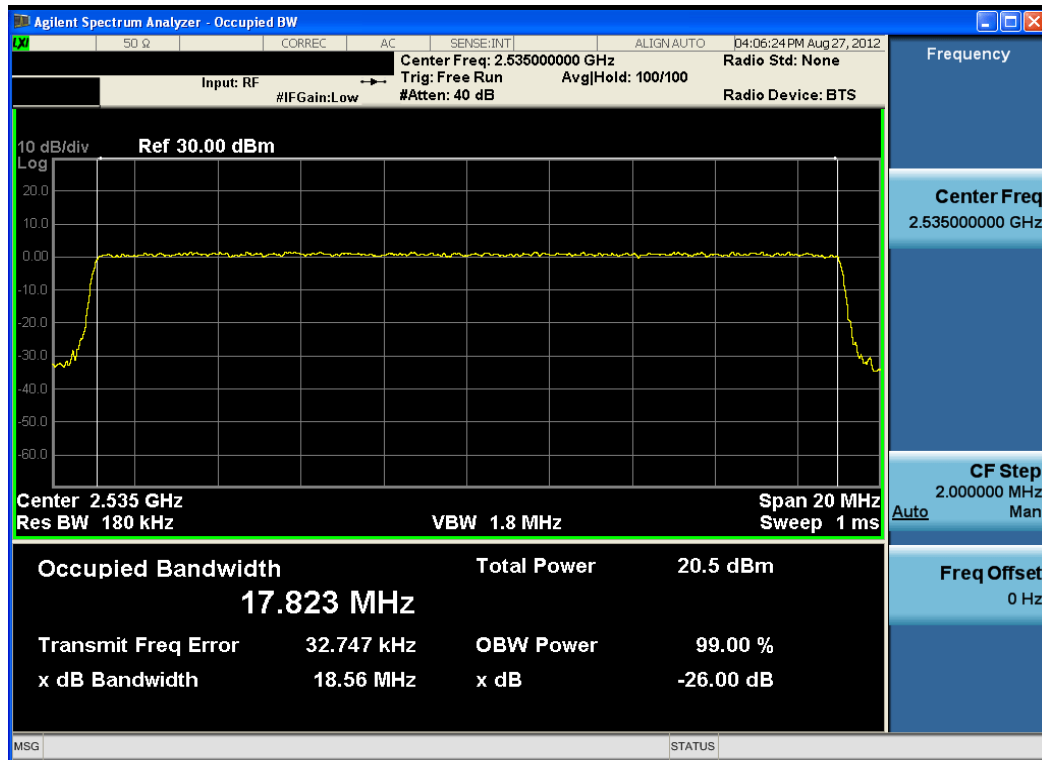
**Plot 7-64. Lower Band Edge Plot (QPSK – RB Size 100)**

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 80 of 101                  |



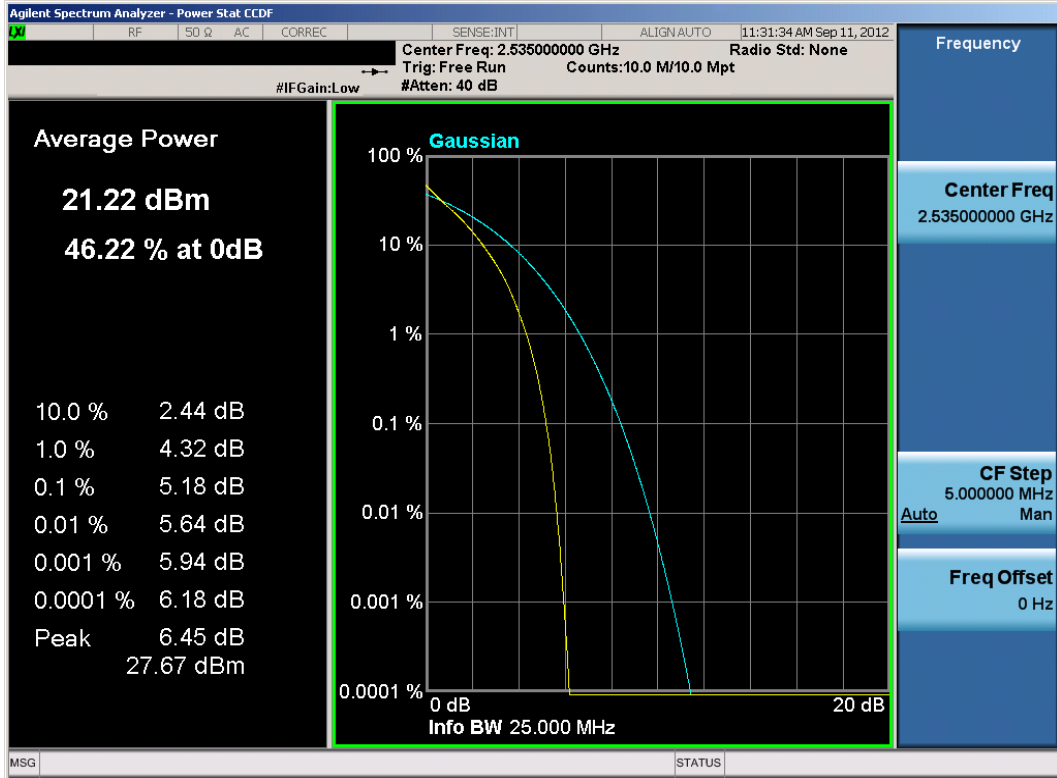


Plot 7-65. Occupied Bandwidth Plot (QPSK – RB Size 100)

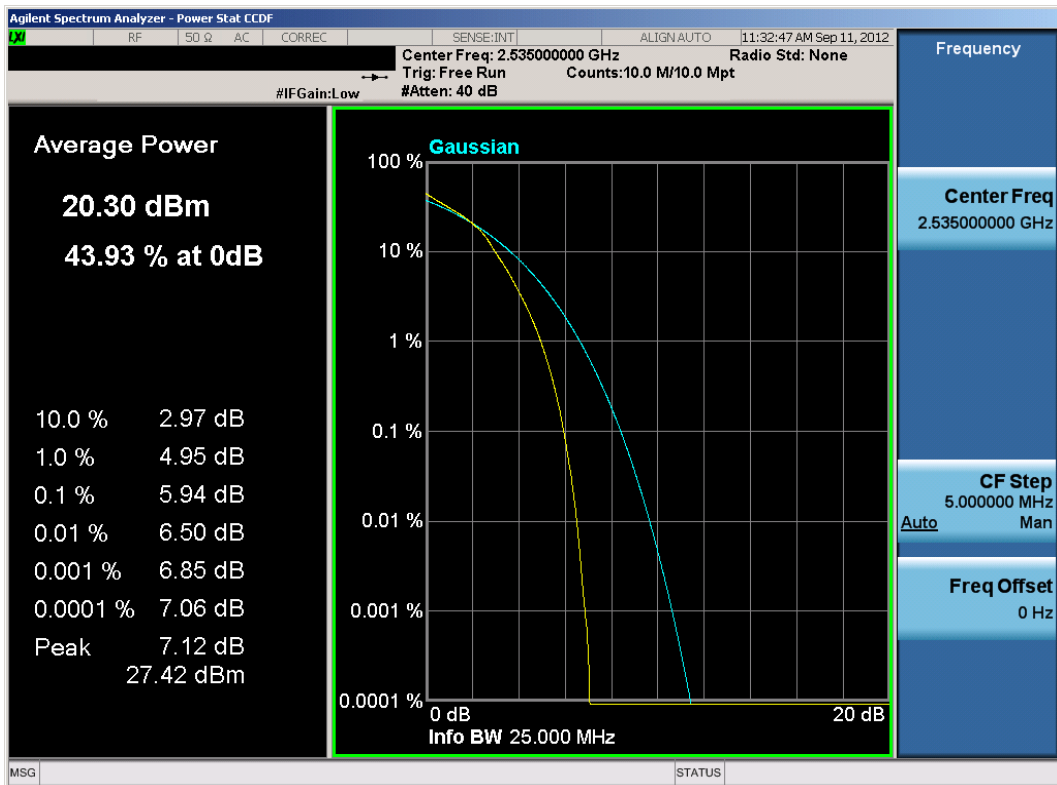


Plot 7-66. Occupied Bandwidth Plot (16-QAM – RB Size 100)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 81 of 101                  |

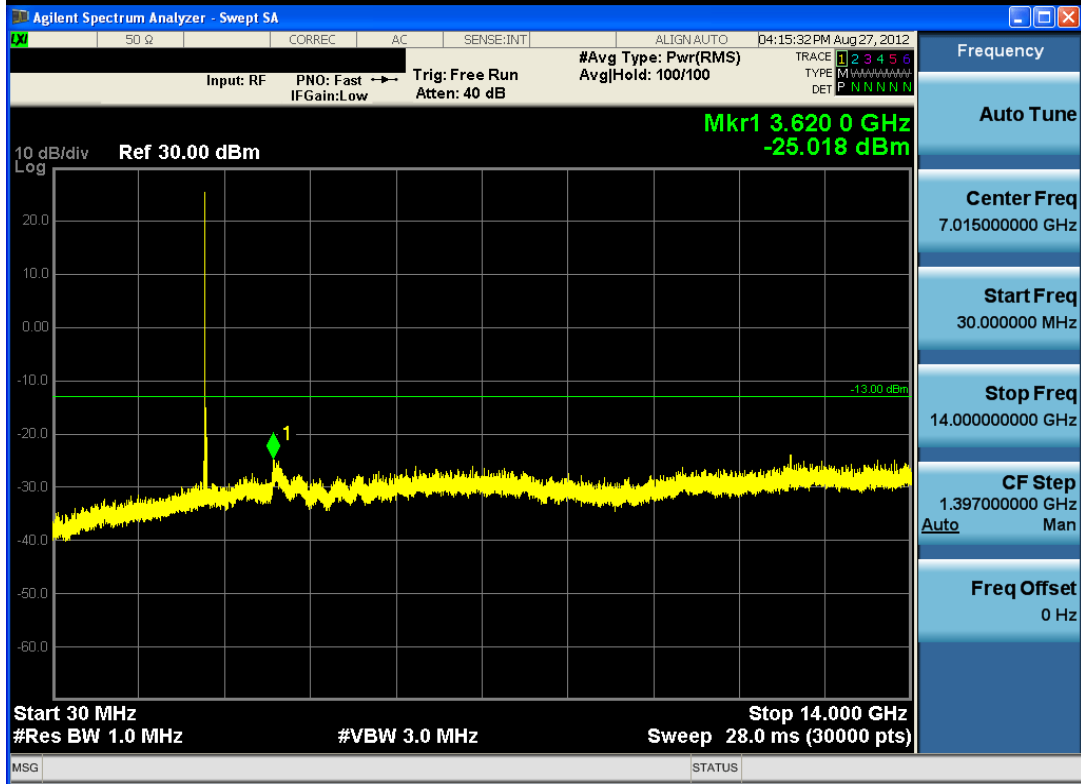


Plot 7-67. Peak to Average Ratio Plot (QPSK - RB Size 100)

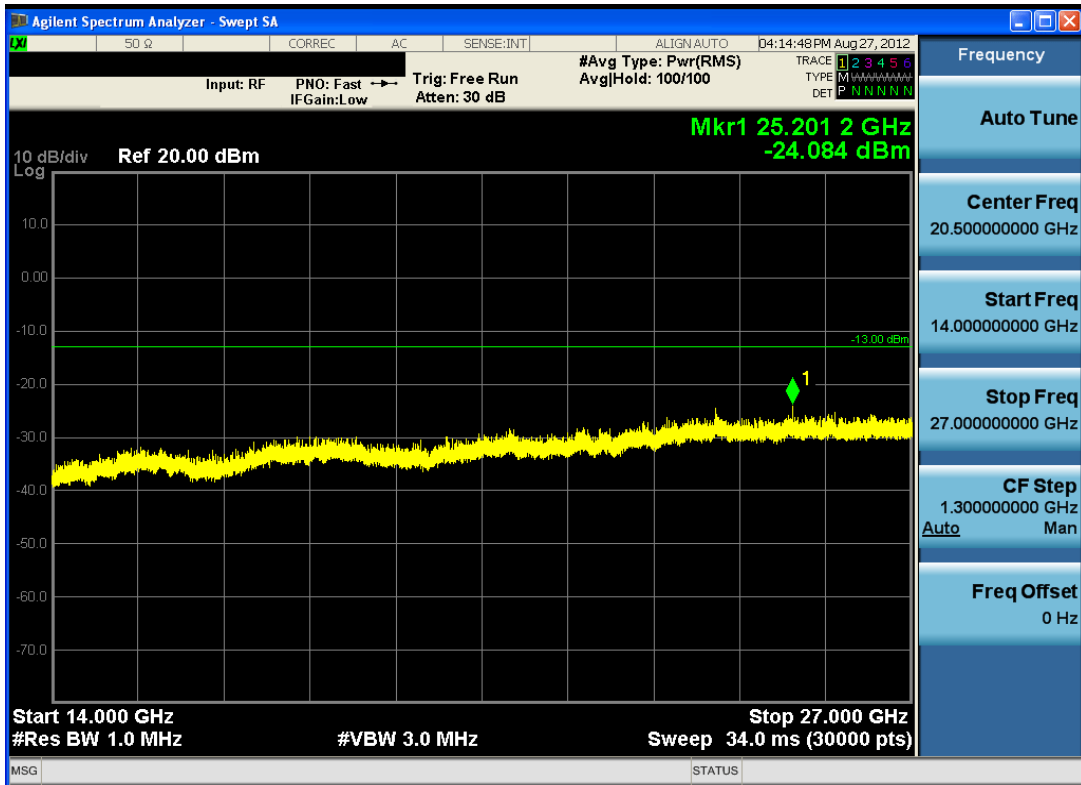


Plot 7-68. Peak to Average Ratio Plot (16QAM - RB Size 100)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012     | EUT Type:<br>Portable Handset                              |  | Page 82 of 101                  |

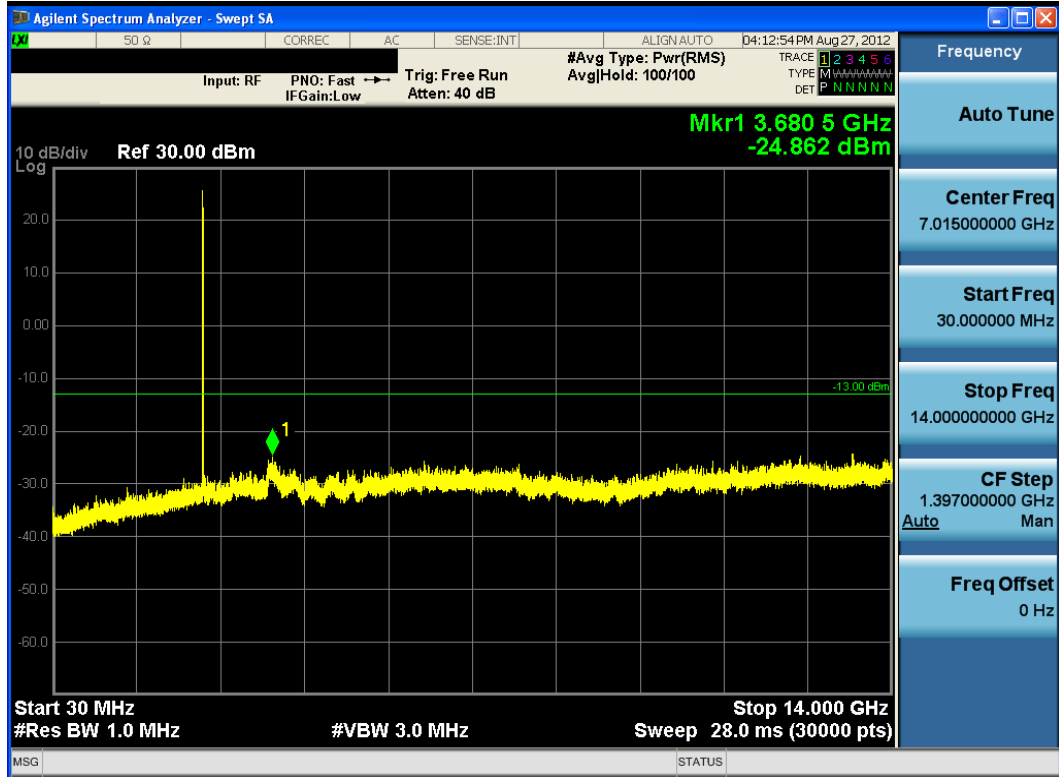


Plot 7-69. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0– Low Channel)

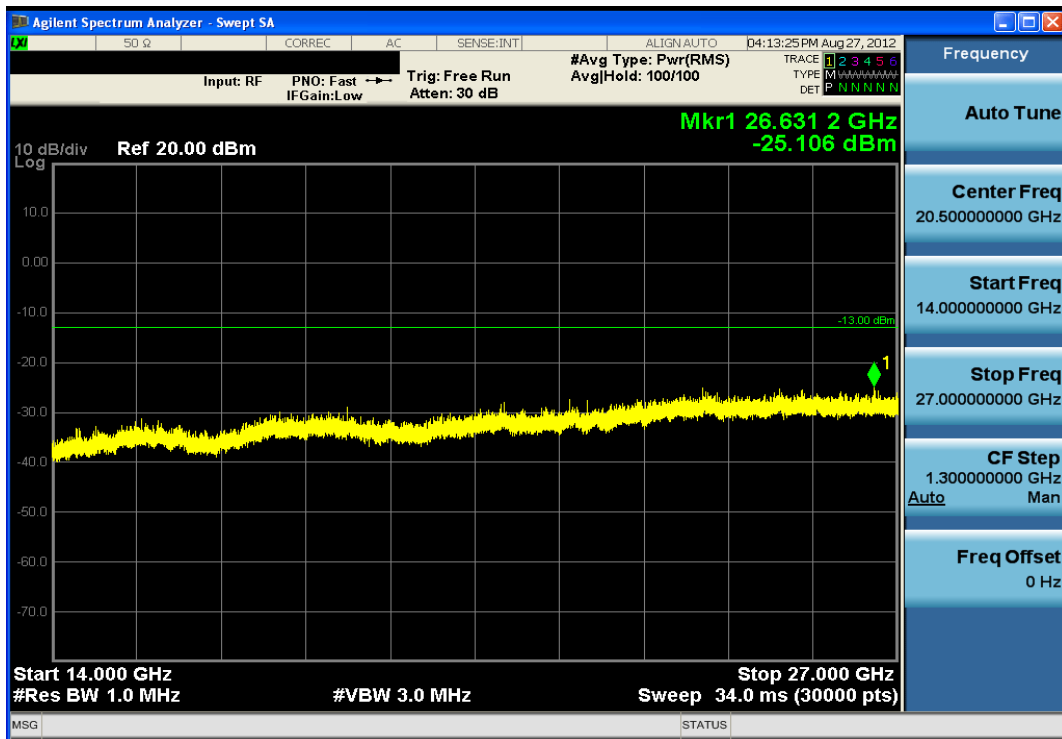


Plot 7-70. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)



|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 83 of 101                  |



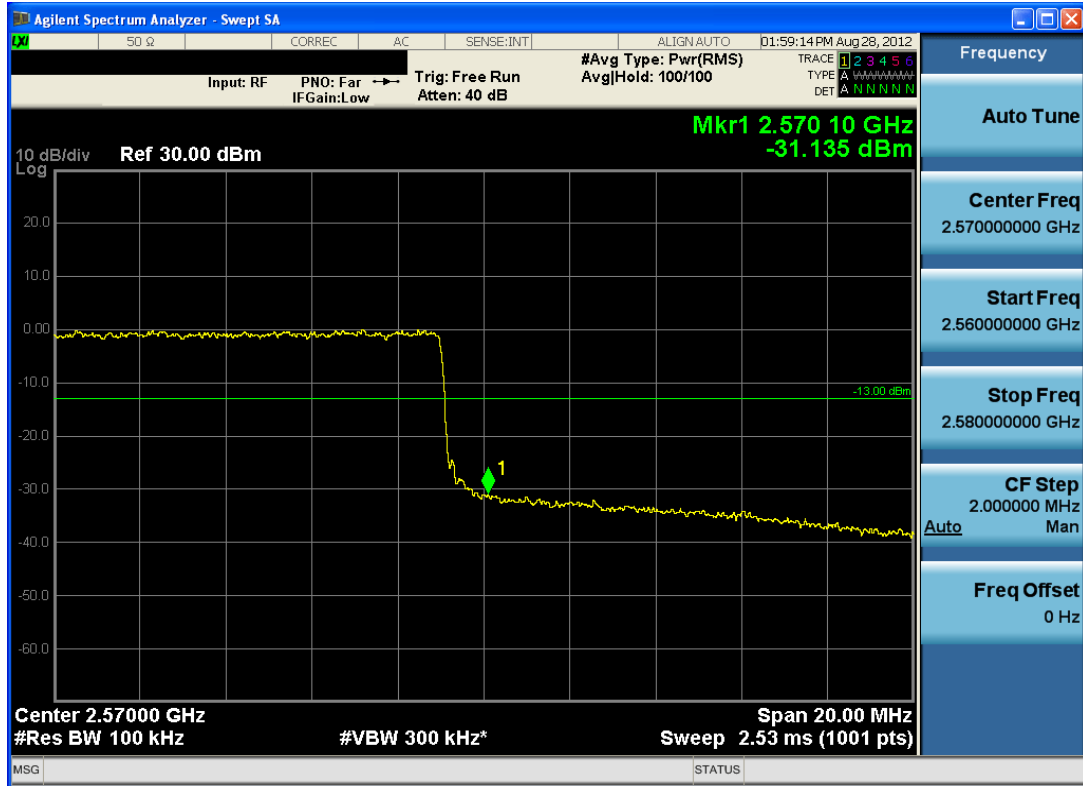
**Plot 7-71. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)**



**Plot 7-72. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)**

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: ZNFE971                      |  | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012   | EUT Type:<br>Portable Handset                              |   | Page 84 of 101                  |





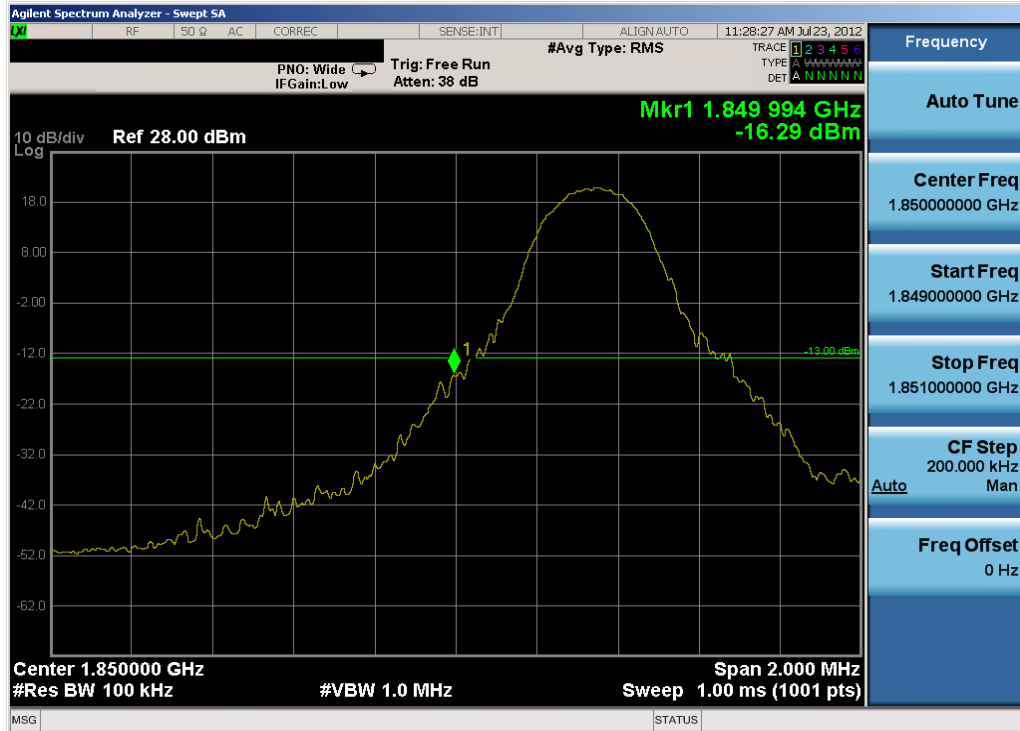
Plot 7-75. Upper Band Edge Plot (QPSK – RB Size 100)



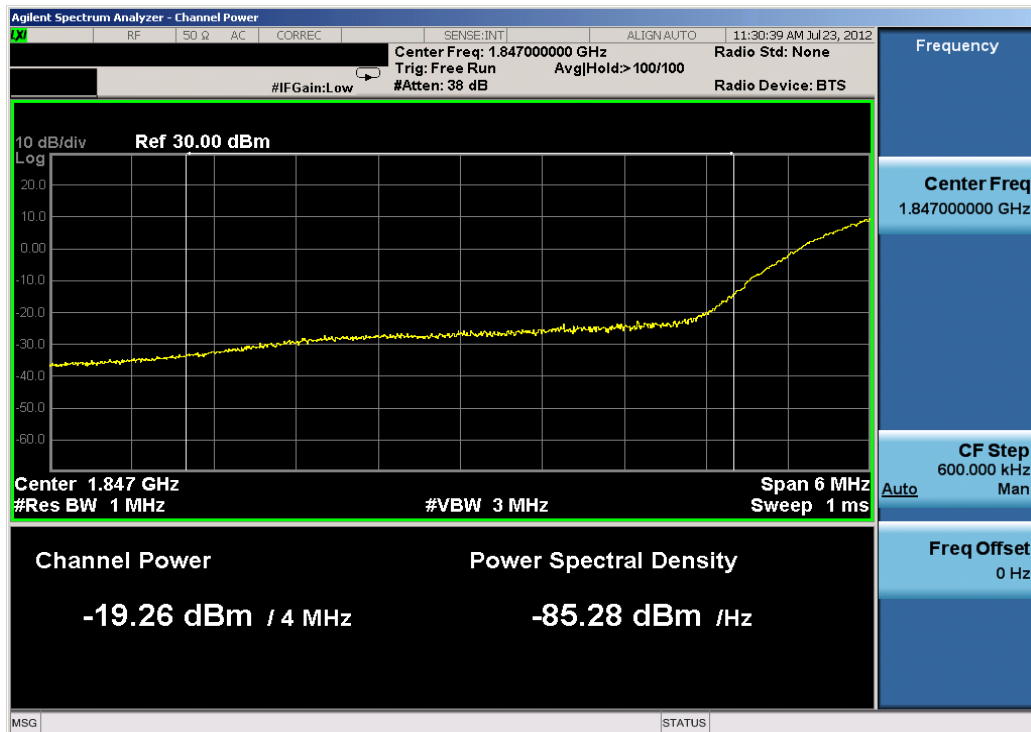
Plot 7-76. Upper Band Edge Plot (QPSK – RB Size 100)

|                                      |   |   |  |                                 |
|--------------------------------------|---|---|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                           |  | Page 86 of 101                  |

**BAND 2 – 5 MHz BW**

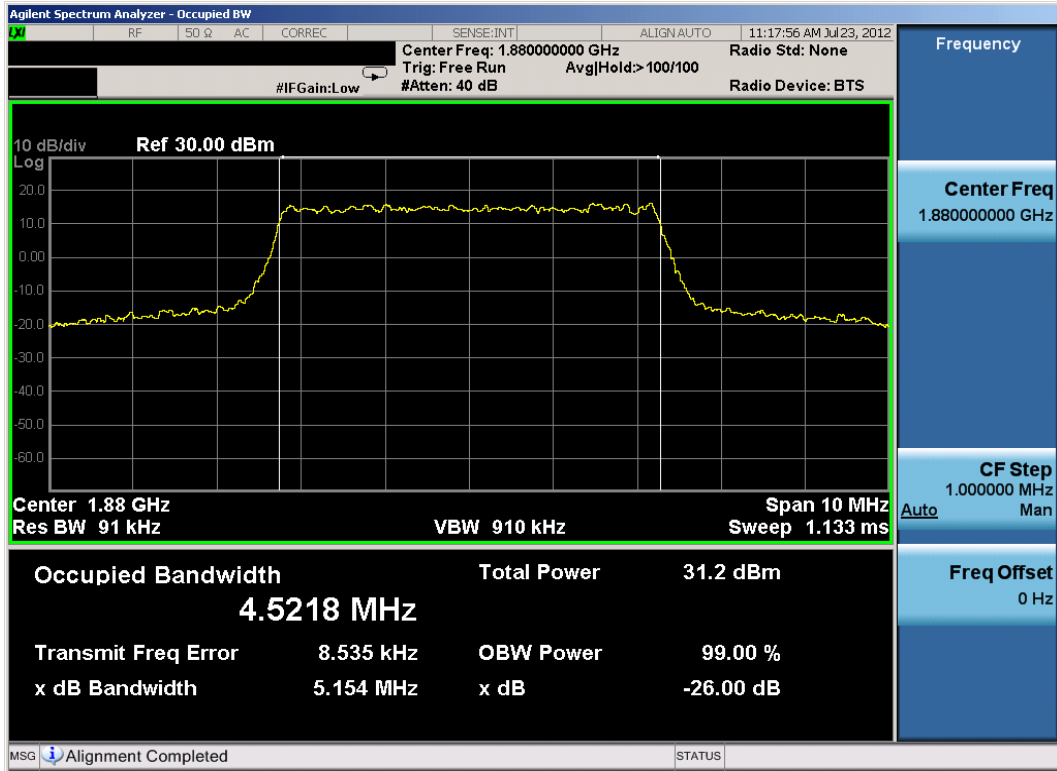


Plot 7-77. Lower Band Edge Plot (QPSK – RB Size 25)

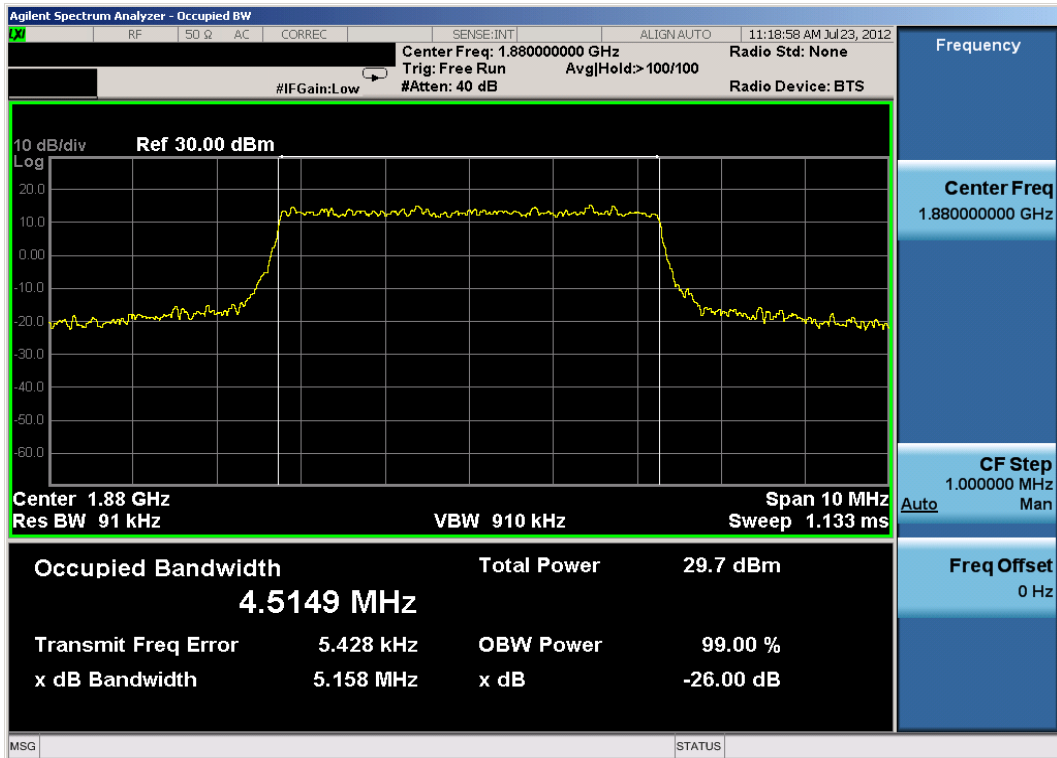


Plot 7-78. Lower Band Edge Plot (QPSK – RB Size 1, Offset 0)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 87 of 101                  |



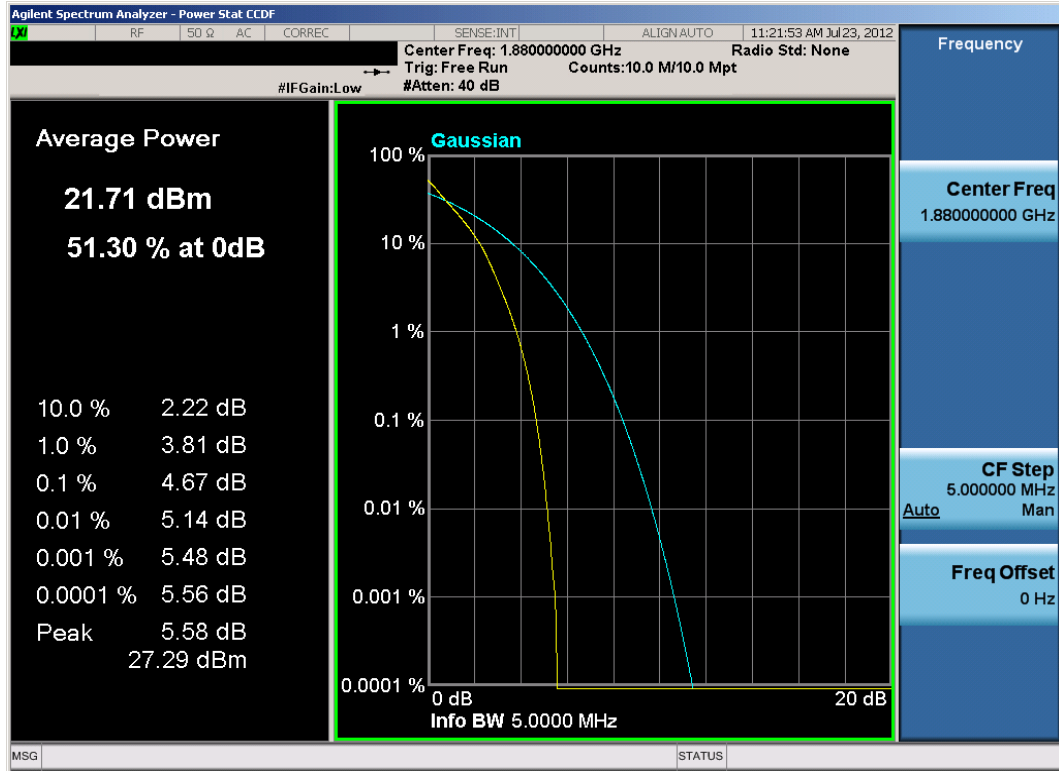
Plot 7-79. Occupied Bandwidth Plot (QPSK – RB Size 25)



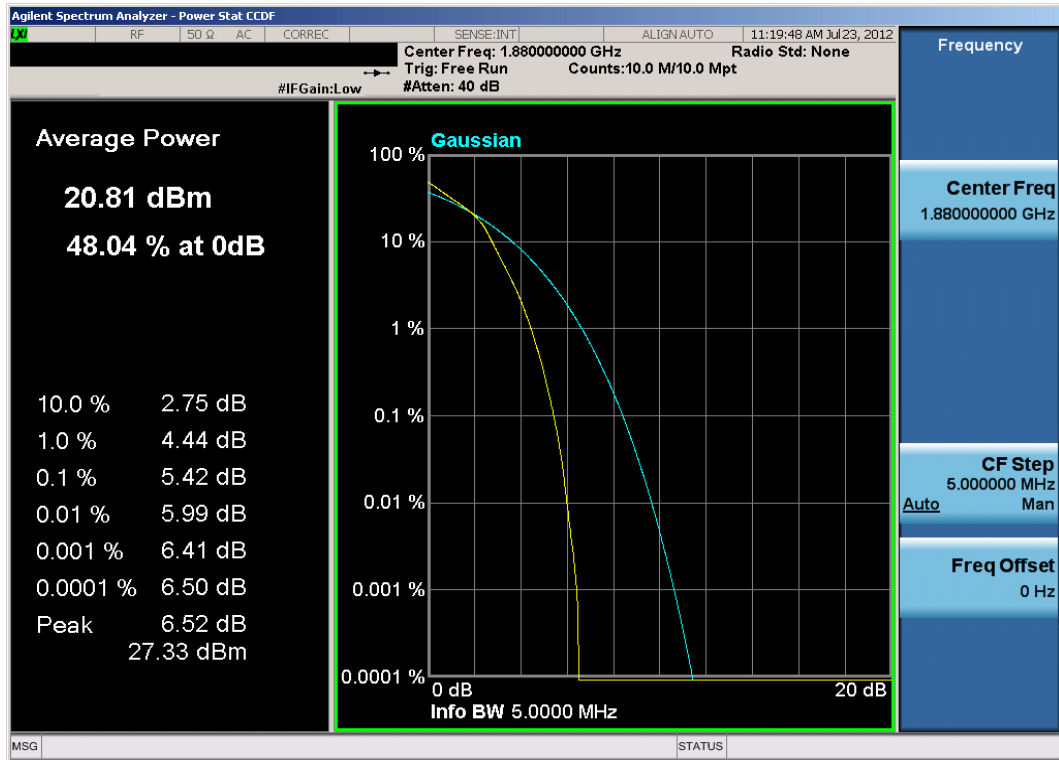
Plot 7-80. Occupied Bandwidth Plot (16-QAM – RB Size 25)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 88 of 101                  |



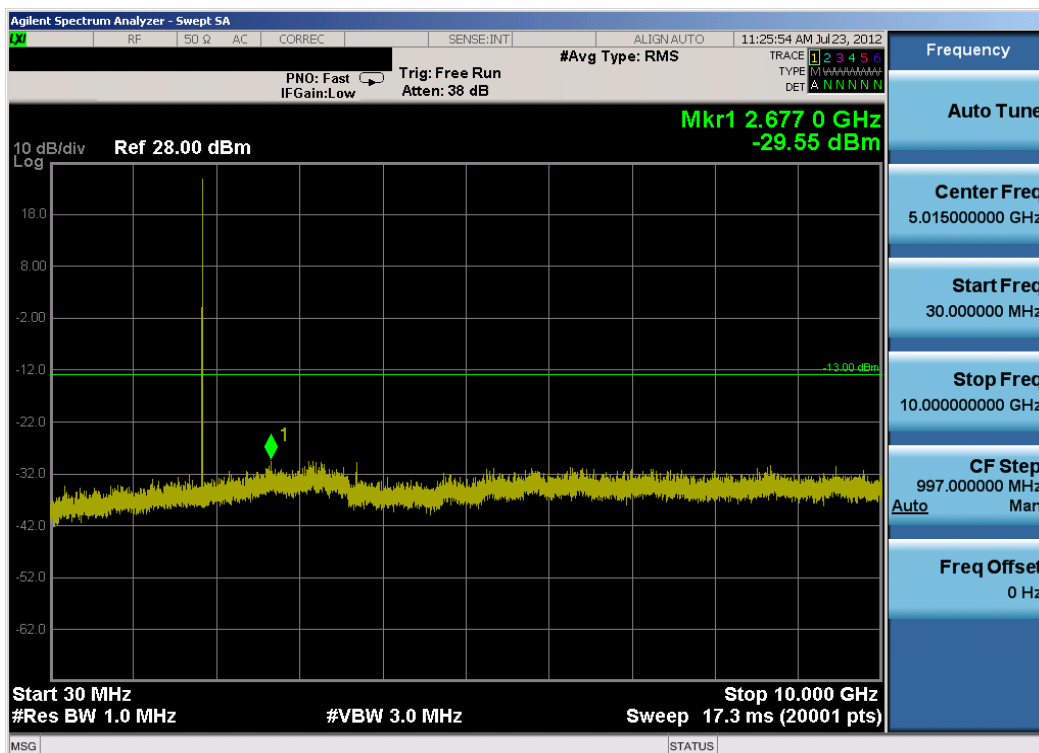


Plot 7-82. Peak to Average Ratio Plot (QPSK – RB Size 25)

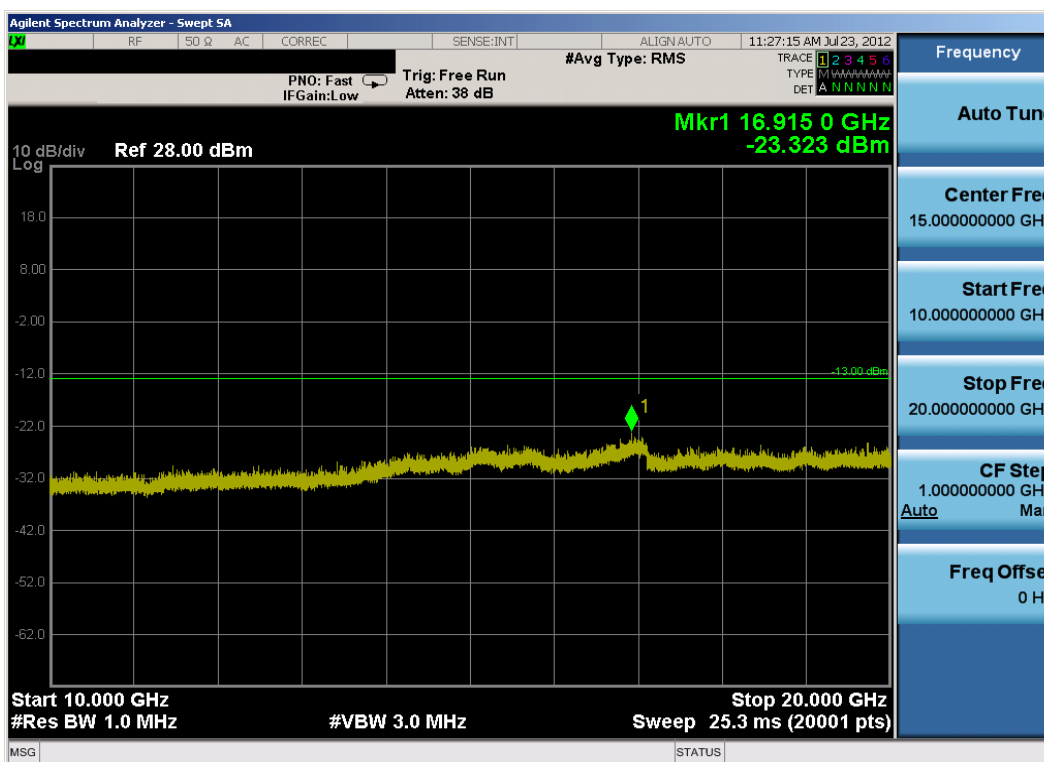


Plot 7-83. Peak to Average Ratio Plot (16QAM – RB Size 25)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 89 of 101                  |



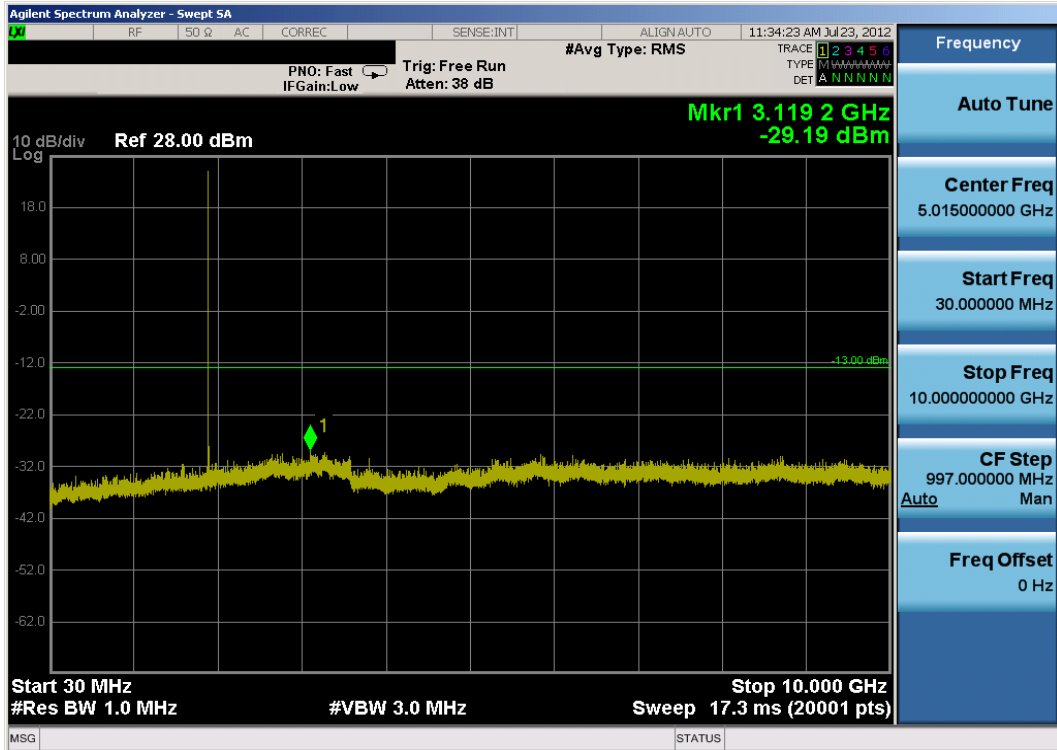
Plot 7-84. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)



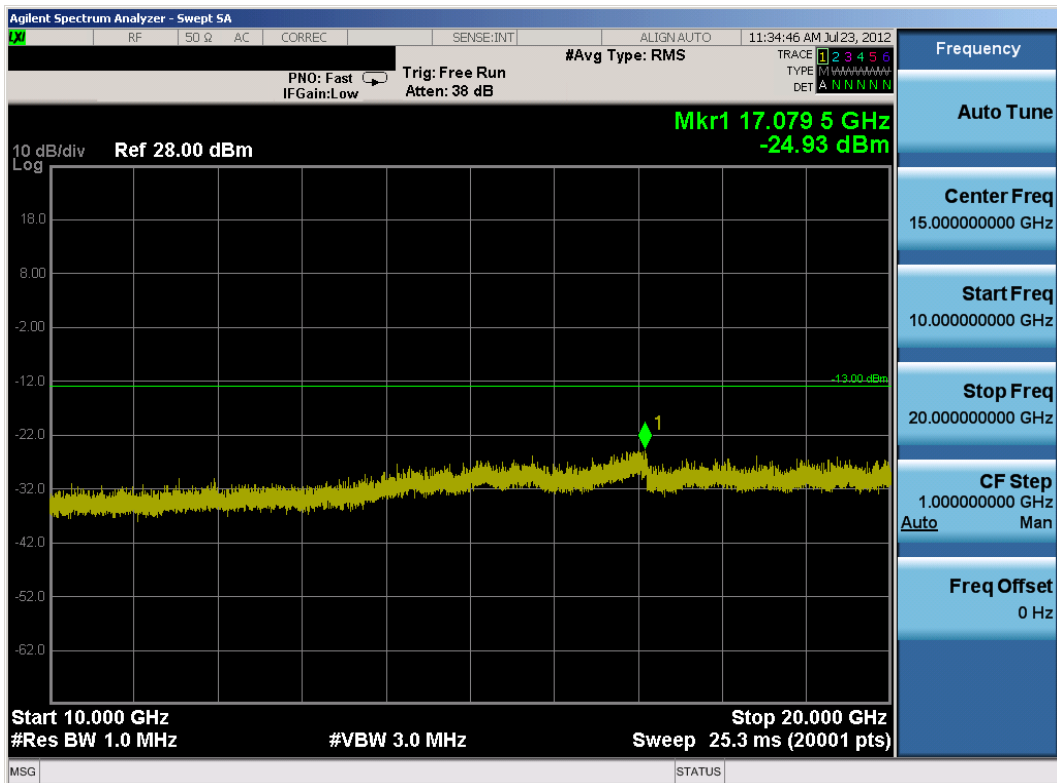
Plot 7-85. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
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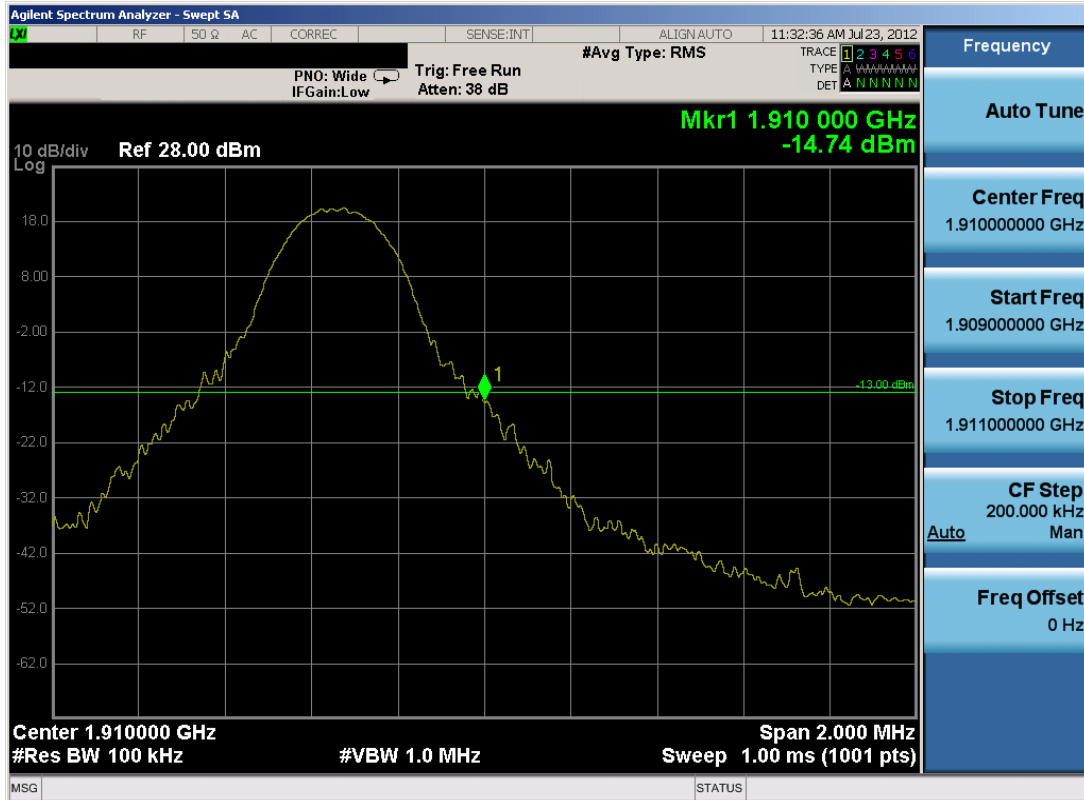


Plot 7-88. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

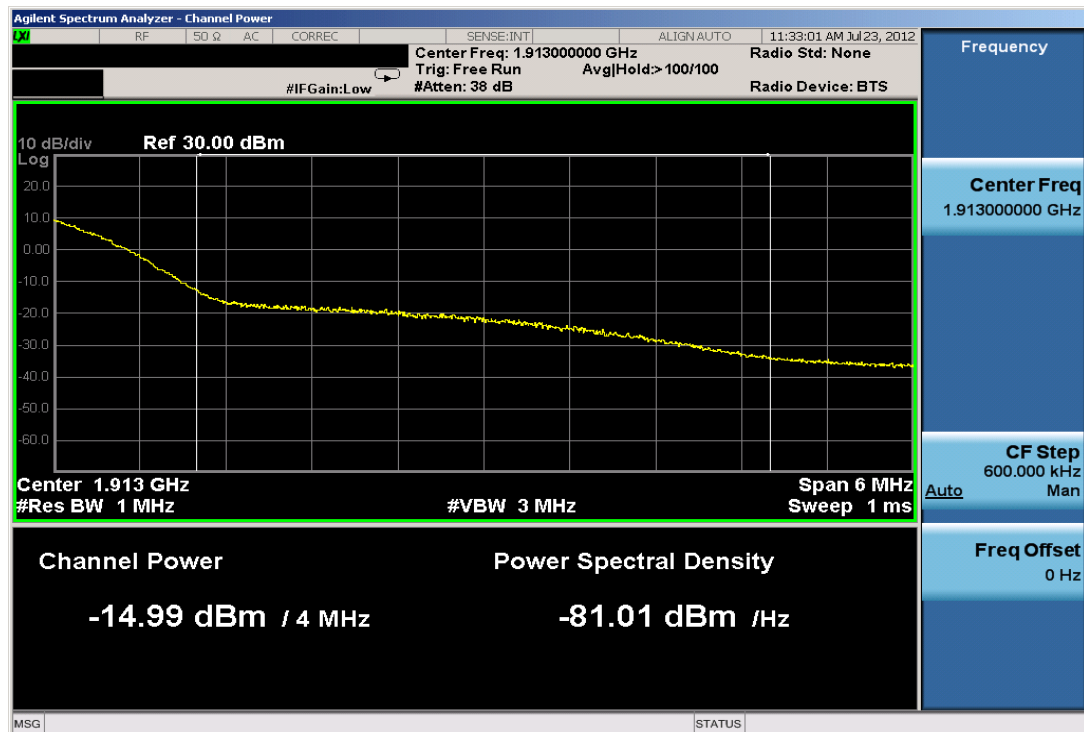


Plot 7-89. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – High Channel)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 92 of 101                  |



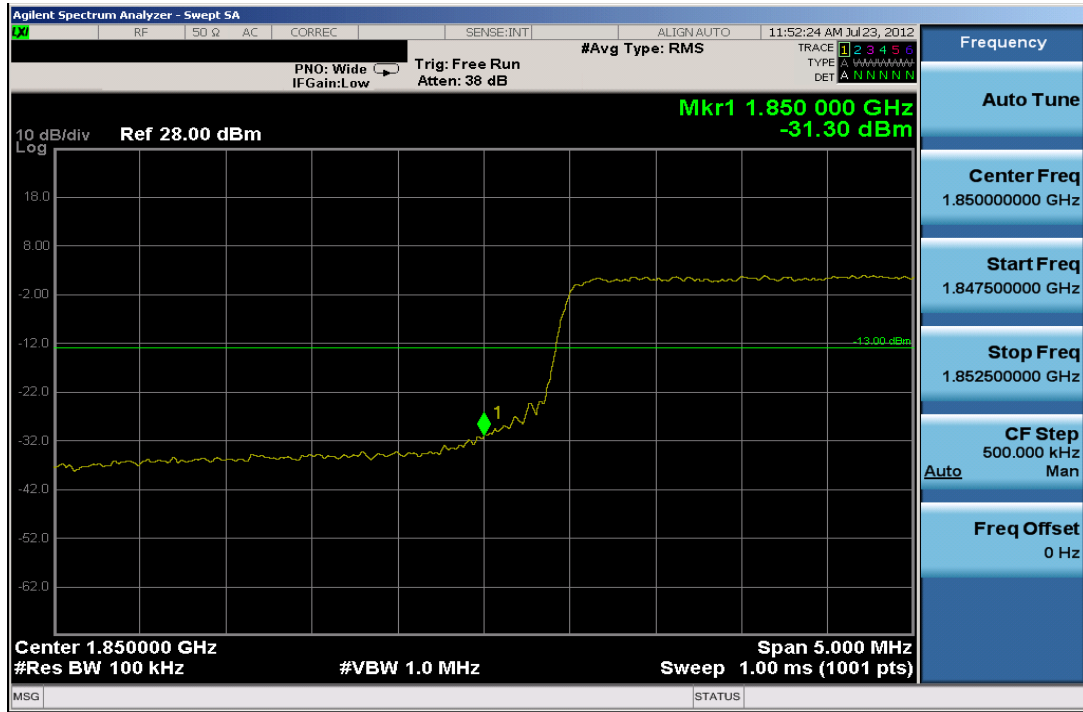
Plot 7-90. Upper Band Edge Plot (QPSK – RB Size 1, Offset 24)



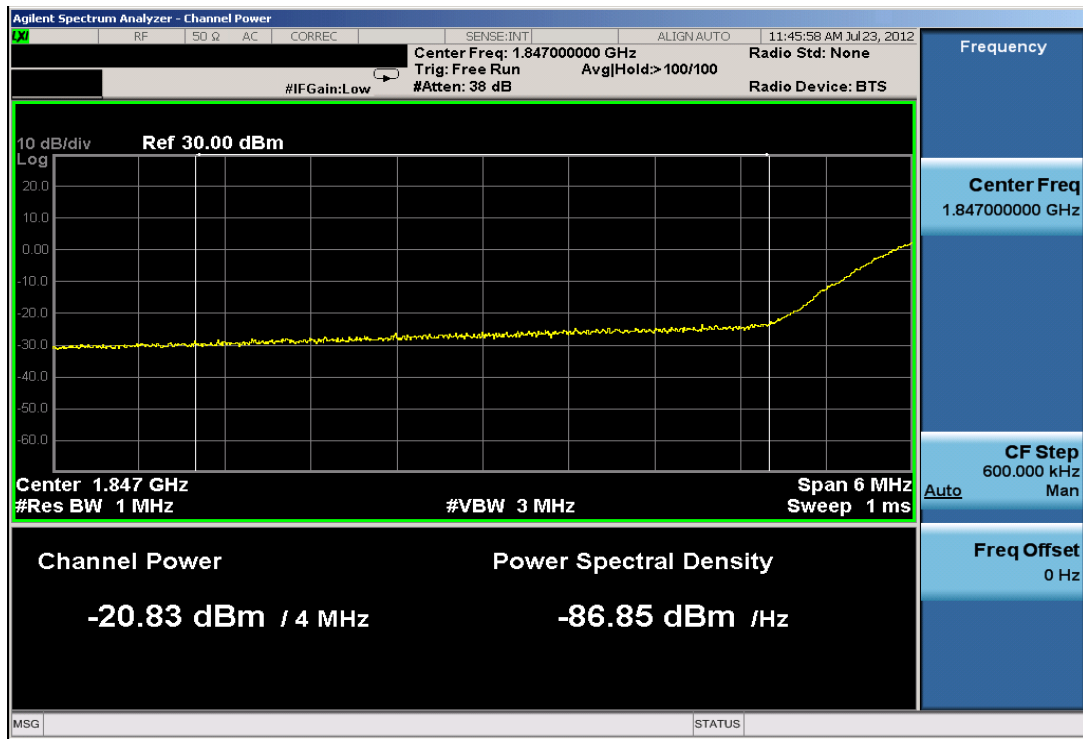
Plot 7-91. Upper Band Edge Plot (QPSK – RB Size 25)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
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**BAND 2 – 10 MHz BW**

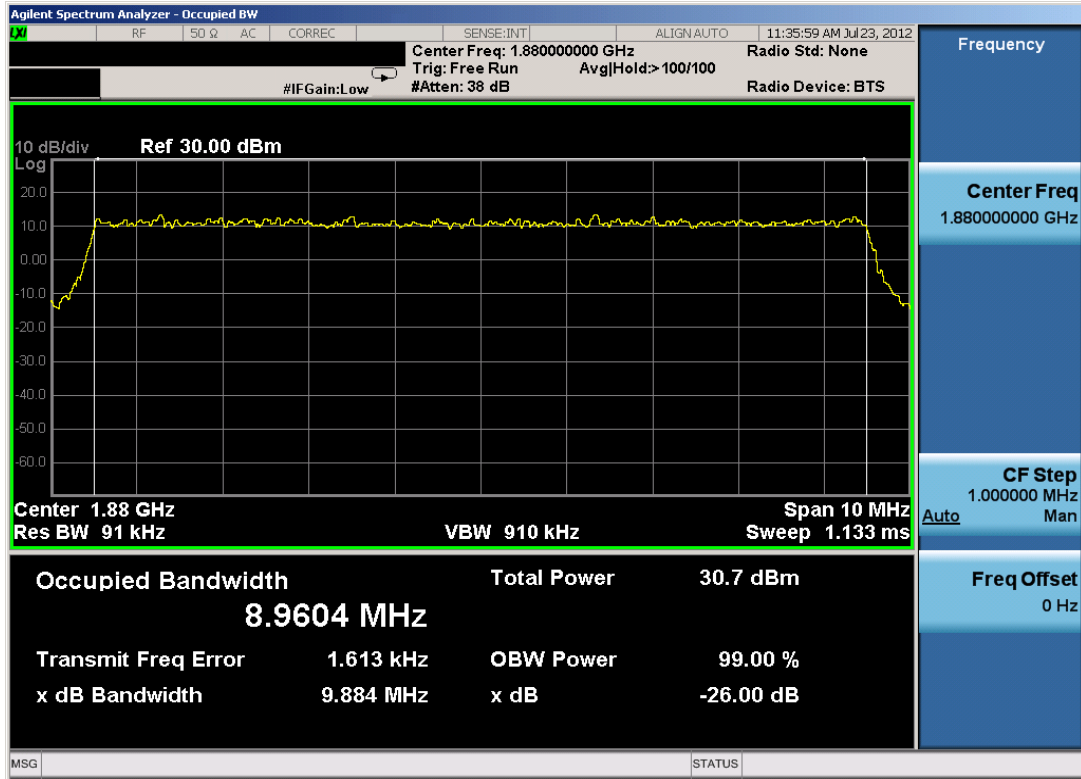


Plot 7-92. Lower Band Edge Plot (QPSK – RB Size 50)

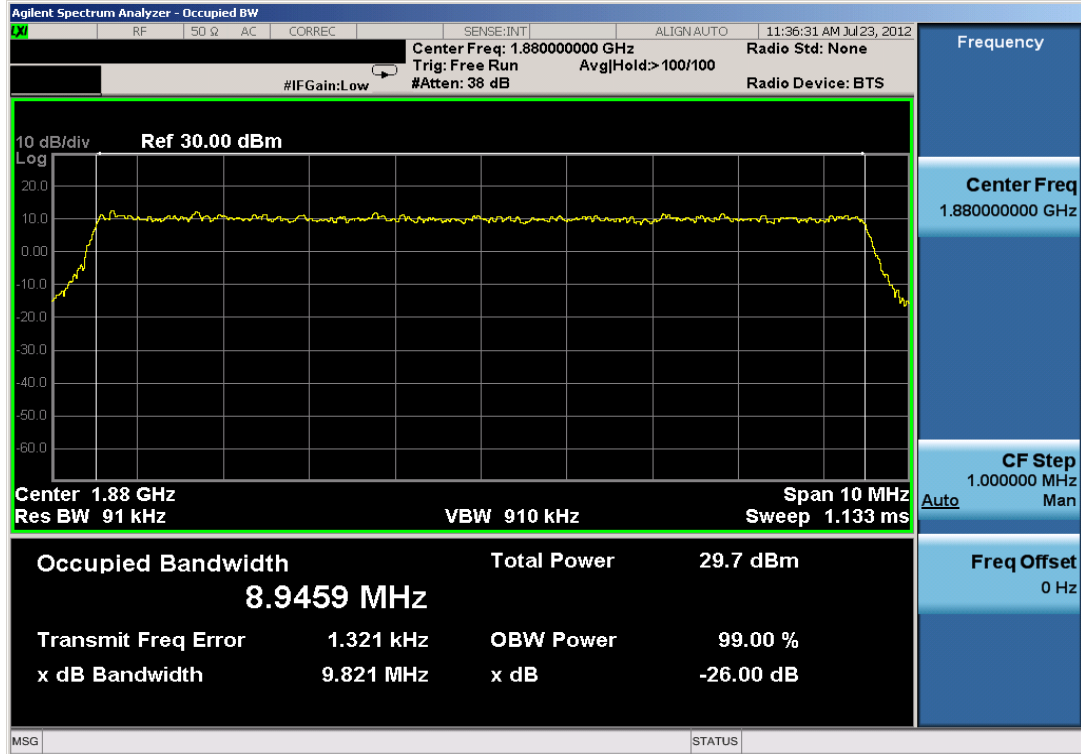


Plot 7-93. Lower Band Edge Plot (QPSK – RB Size 50)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 94 of 101                  |

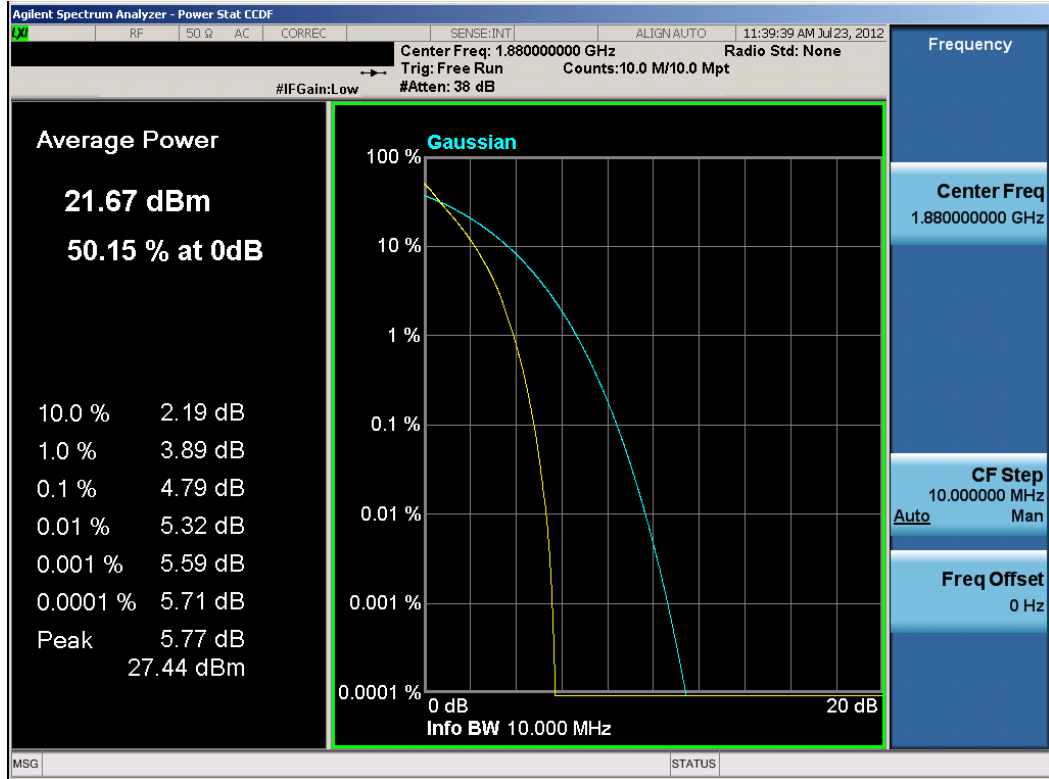


Plot 7-94. Occupied Bandwidth Plot (QPSK – RB Size 50)

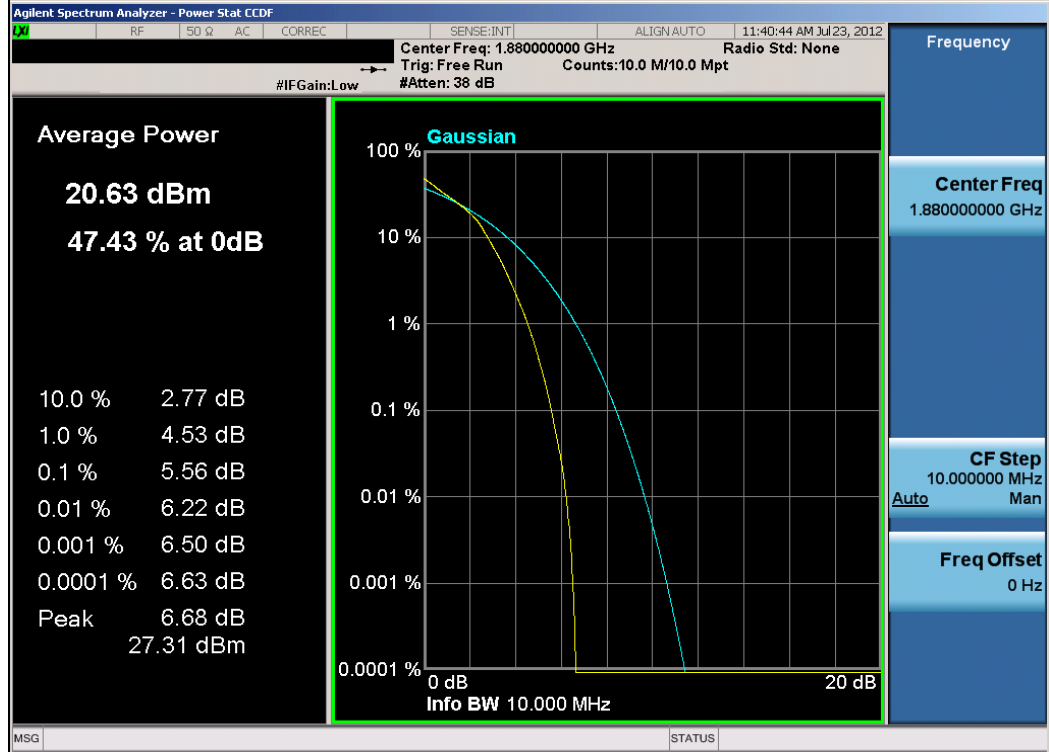


Plot 7-95. Occupied Bandwidth Plot (16-QAM – RB Size 50)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
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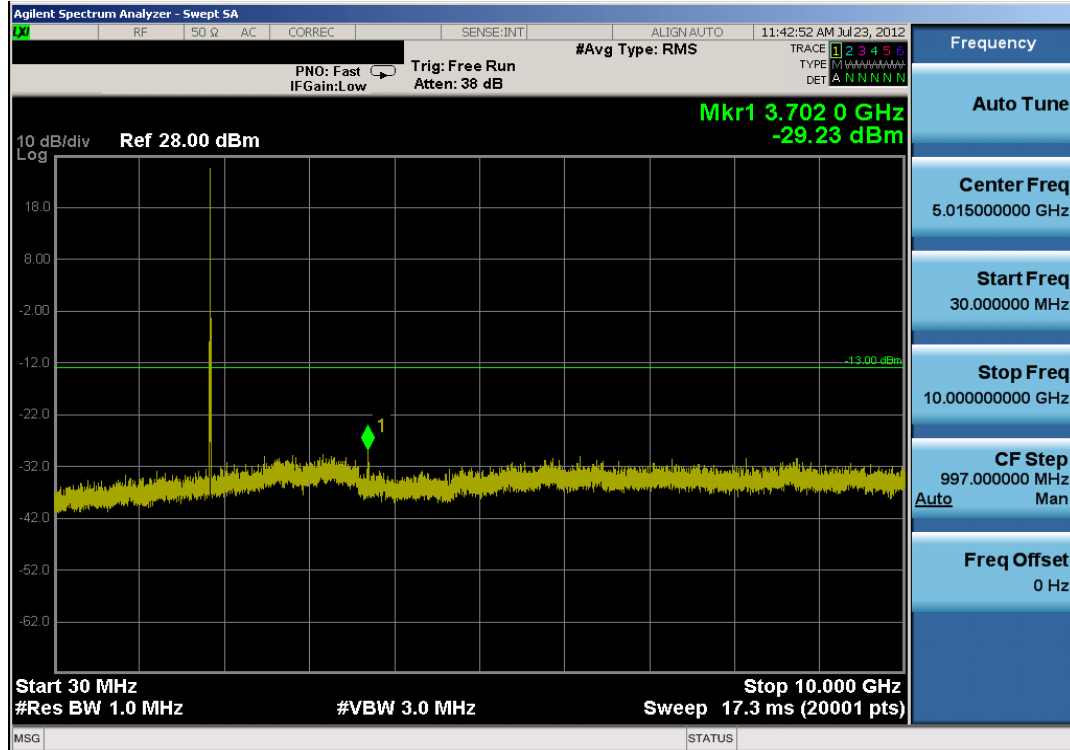
Plot 7-96. Peak to Average Ratio Plot (QPSK – RB Size 50)



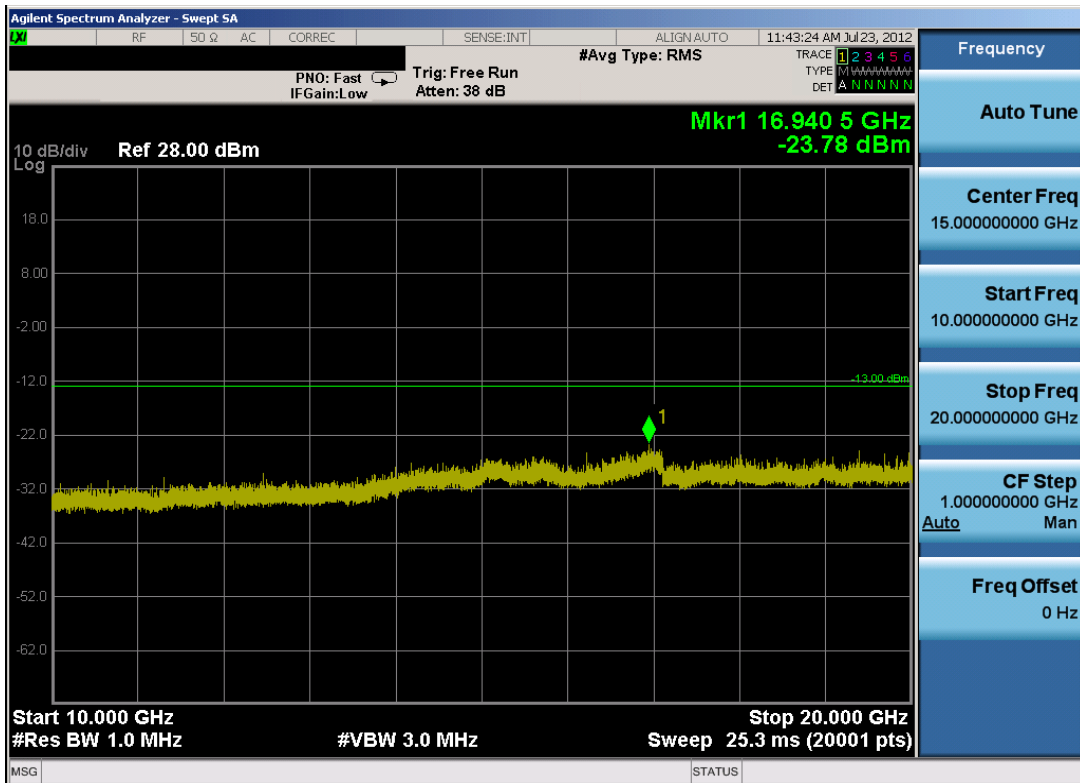
Plot 7-97. Peak to Average Ratio Plot (16QAM – RB Size 50)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 96 of 101                  |



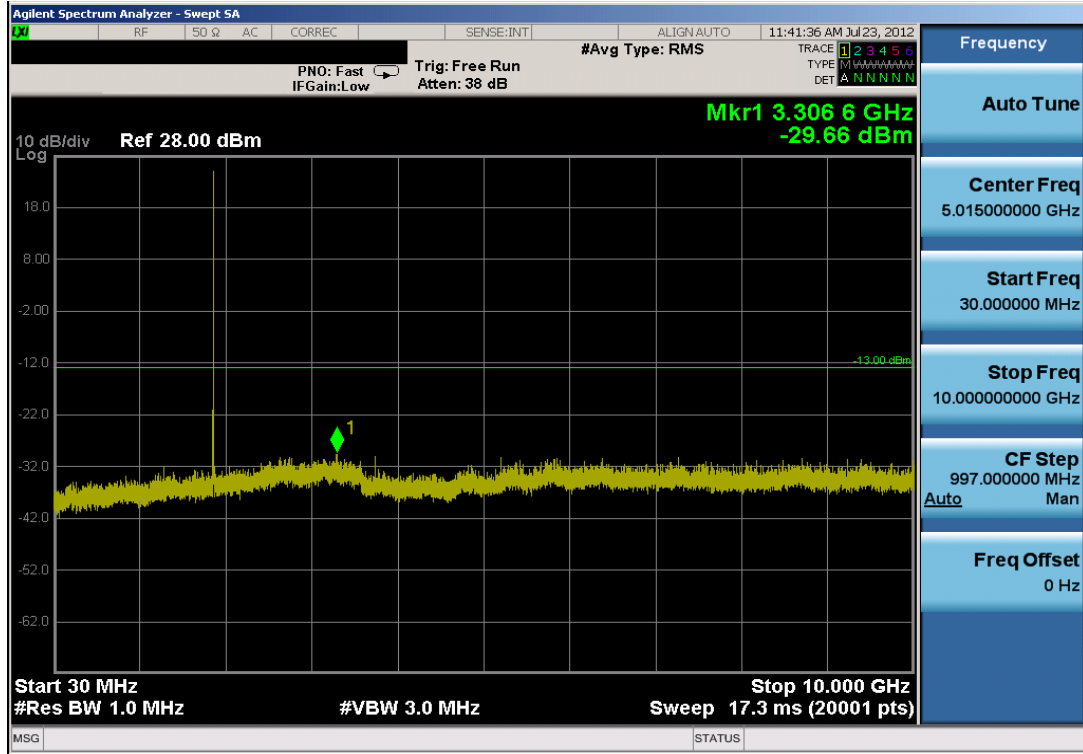


Plot 7-98. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

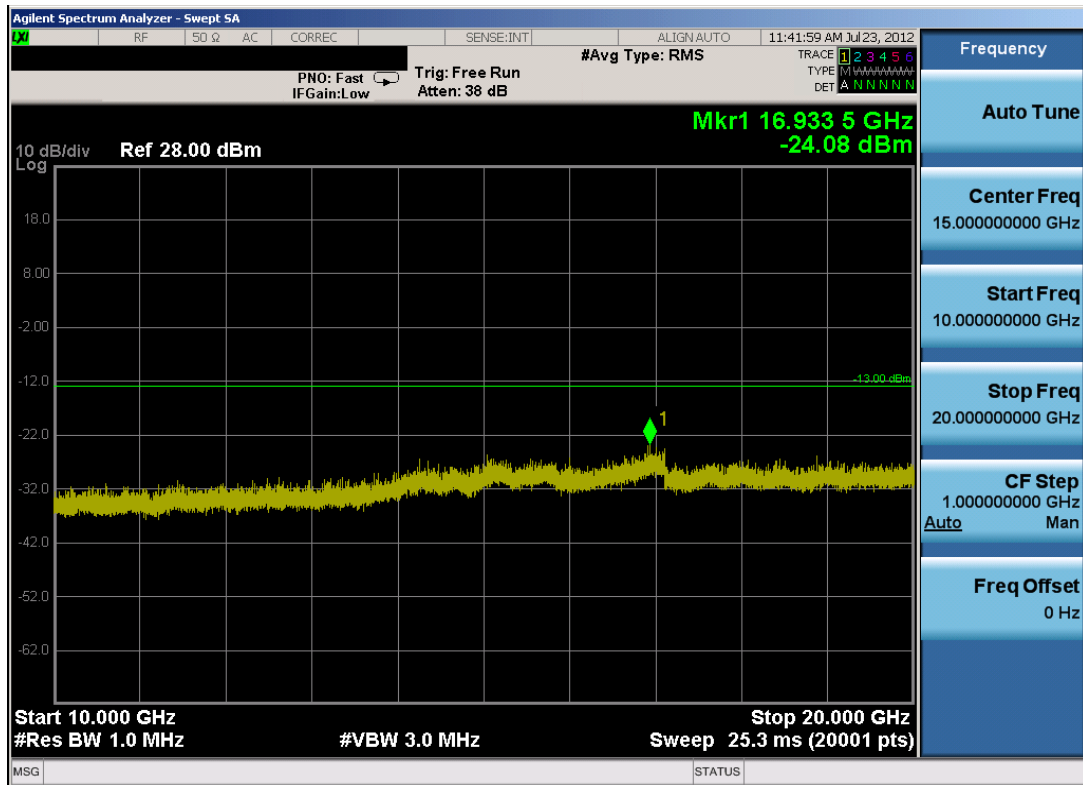


Plot 7-99. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Low Channel)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012 | EUT Type:<br>Portable Handset                              |  | Page 97 of 101                  |



Plot 7-100. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)



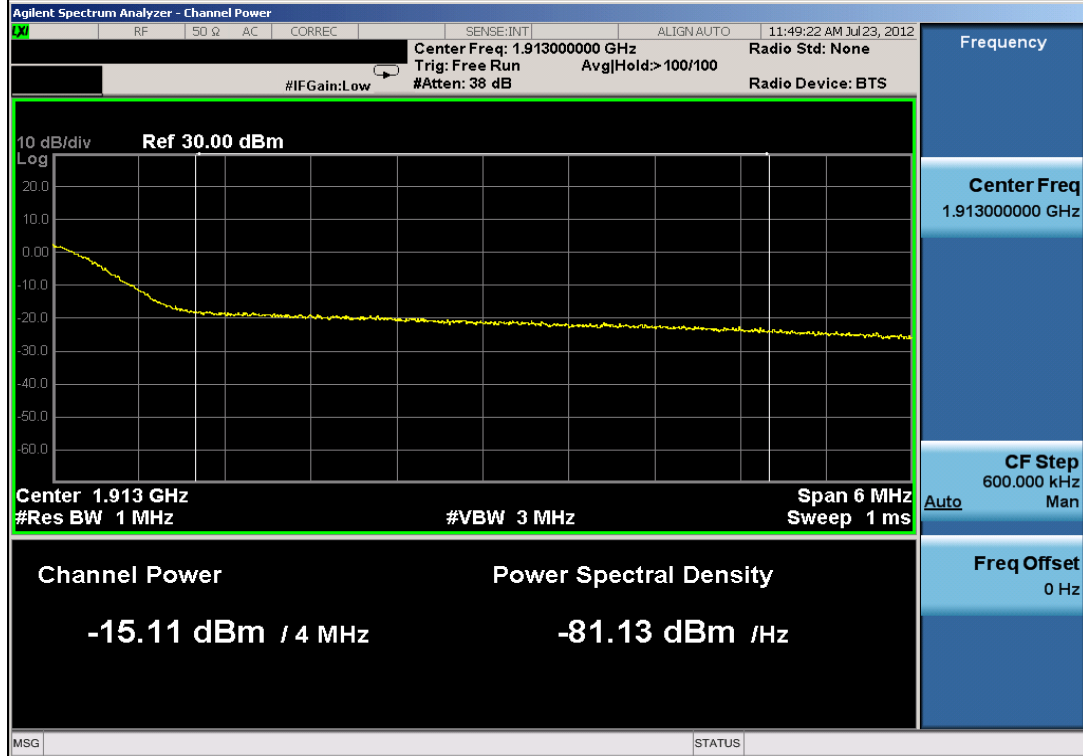
Plot 7-101. Conducted Spurious Plot (QPSK – RB Size 1, RB Offset 0 – Mid Channel)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
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Plot 7-104. Upper Band Edge Plot (QPSK – RB Size 50)





Plot 7-105. Upper Band Edge Plot (QPSK – RB Size 50)

|                                      |   |  |  |                                 |
|--------------------------------------|---|--|--|---------------------------------|
| FCC ID: ZNFE971                      |   | FCC Pt. 22-24-27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
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## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LGE Portable Handset** **FCC ID: ZNFE971** complies with all the requirements of Parts 2, 22, 24 and 27 of the FCC rules for LTE operation only.

|                                      |  |                               |   |                                 |
|--------------------------------------|--|-------------------------------|---|---------------------------------|
| FCC ID: ZNFE971                      |  <b>FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)</b> |                               |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1207050902.ZNF | Test Dates:<br>Aug. 14 - October 01, 2012  | EUT Type:<br>Portable Handset |   | Page 101 of 101                 |