



# PCTEST ENGINEERING LABORATORY, INC.

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## MEASUREMENT REPORT FCC Part 27

**Applicant Name:**  
Novatel Wireless Inc.  
9645 Scranton Road, Suite 205  
San Diego, CA 92121-3030  
United States

**Date of Testing:**  
June 27 - July 29, 2011  
**Test Site/Location:**  
PCTEST Lab., Columbia, MD, USA  
**Test Report Serial No.:**  
0Y1106221044.PKR

**FCC ID:** PKRNVWMC679  
**APPLICANT:** NOVATEL WIRELESS INC.

**Application Type:** Certification  
**FCC Classification:** PCS Licensed Transmitter (PCB)  
**FCC Rule Part(s):** §2; §27  
**EUT Type:** 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem  
**Model(s):** MC679  
**Tx Frequency Range:** 1710.7 - 1754.3MHz (1.4MHz BW AWS), 1711.5 - 1753.5MHz (3MHz BW AWS), 1712.5 - 1752.5MHz (5MHz BW AWS), 1715 - 1750MHz (10MHz BW AWS), 1717.5 - 1747.5MHz (15MHz BW AWS), 1720 - 1745MHz (20MHz BW AWS), 706.5 - 713.5MHz (5MHz BW Band 17), 709 - 711MHz (10MHz BW Band 17)  
**Max. RF Output Power:** 0.094 W EIRP (1.4MHz BW, QPSK, AWS Band) (19.71 dBm)  
0.067 W EIRP (1.4MHz BW, 16-QAM, AWS Band) (18.28 dBm)  
0.091 W EIRP (3MHz BW, QPSK, AWS Band) (19.58 dBm)  
0.071 W EIRP (3MHz BW, 16-QAM, AWS Band) (18.53 dBm)  
0.085 W EIRP (5MHz BW, QPSK, AWS Band) (19.28 dBm)  
0.068 W EIRP (5MHz BW, 16-QAM, AWS Band) (18.34 dBm)  
0.084 W EIRP (10MHz BW, QPSK, AWS Band) (19.26 dBm)  
0.064 W EIRP (10MHz BW, 16-QAM, AWS Band) (18.06 dBm)  
0.087 W EIRP (15MHz BW, QPSK, AWS Band) (19.38 dBm)  
0.073 W EIRP (15MHz BW, 16-QAM, AWS Band) (18.66 dBm)  
0.097 W EIRP (20MHz BW, QPSK, AWS Band) (19.88 dBm)  
0.08 W EIRP (20MHz BW, 16-QAM, AWS Band) (19.02 dBm)  
0.159 W EIRP (5MHz BW, QPSK, Band 17) (22.02 dBm)  
0.132 W EIRP (5MHz BW, 16-QAM, Band 17) (21.21 dBm)  
0.149 W EIRP (10MHz BW, QPSK, Band 17) (21.73 dBm)  
0.116 W EIRP (10MHz BW, 16-QAM, Band 17) (20.65 dBm)  
**Emission Designator(s):** 1M09G7D (1.4MHz BW, QPSK, AWS), 1M08W7D (1.4MHz BW, 16-QAM, AWS), 2M69G7D (3MHz BW, QPSK, AWS), 2M68W7D (3MHz BW, 16-QAM, AWS), 4M48G7D (5MHz BW, QPSK, AWS), 4M48W7D (5MHz BW, 16-QAM, AWS), 8M93G7D (10MHz BW, QPSK, AWS), 8M95W7D (10MHz BW, 16-QAM, AWS), 13M40G7D (15MHz BW, QPSK, AWS), 13M41W7D (15MHz BW, 16-QAM, AWS), 17M87G7D (20MHz BW, QPSK, AWS), 17M88W7D (20MHz BW, 16-QAM, AWS), 4M48G7D (5MHz BW, QPSK, Band 17), 4M48W7D (5MHz BW, 16-QAM, Band 17), 8M91G7D (10MHz BW, QPSK, Band 17), 8M91W7D (10MHz BW, 16-QAM, Band 17)  
**Test Device Serial No.:** *identical prototype* [S/N: LN010611600421, LN010611600444]

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

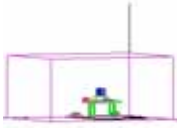


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| <b>FCC ID:</b> PKRNVWMC679                  |   | <b>FCC Pt. 27 LTE MEASUREMENT REPORT<br/>(CERTIFICATION)</b>                      |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1106221044.PKR | <b>Test Dates:</b><br>June 27 - July 29, 2011 | <b>EUT Type:</b><br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 1 of 83                           |

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# MEASUREMENT REPORT

## FCC Part 27

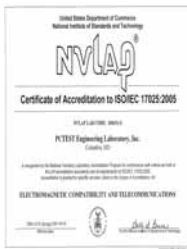


### §2.1033 General Information



**APPLICANT:** Novatel Wireless Inc.  
**APPLICANT ADDRESS:** 9645 Scranton Road, Suite 205  
 San Diego, CA 92121-3030, United States  
**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.  
**TEST SITE ADDRESS:** 6660-B Dobbin Road, Columbia, MD 21045 USA  
**FCC RULE PART(S):** §2; §27  
**BASE MODEL:** MC679  
**FCC ID:** PKRNVWMC679  
**FCC CLASSIFICATION:** PCS Licensed Transmitter (PCB)  
**EMISSION DESIGNATOR(S):** 1M09G7D (1.4MHz BW, QPSK, AWS), 1M08W7D (1.4MHz BW, 16-QAM, AWS),  
 2M69G7D (3MHz BW, QPSK, AWS), 2M68W7D (3MHz BW, 16-QAM, AWS),  
 4M48G7D (5MHz BW, QPSK, AWS), 4M48W7D (5MHz BW, 16-QAM, AWS),  
 8M93G7D (10MHz BW, QPSK, AWS), 8M95W7D (10MHz BW, 16-QAM, AWS),  
 13M40G7D (15MHz BW, QPSK, AWS), 13M41W7D (15MHz BW, 16-QAM, AWS),  
 17M87G7D (20MHz BW, QPSK, AWS), 17M88W7D (20MHz BW, 16-QAM, AWS),  
 4M48G7D (5MHz BW, QPSK, Band 17), 4M48W7D (5MHz BW, 16-QAM, Band 17),  
 8M91G7D (10MHz BW, QPSK, Band 17), 8M91W7D (10MHz BW, 16-QAM, Band 17)  
**FREQUENCY TOLERANCE:** ±0.00025 % (2.5 ppm)  
**Test Device Serial No.:** LN010611600421,  Production  Pre-Production  Engineering  
 LN010611600444  
**DATE(S) OF TEST:** June 27 - July 29, 2011  
**TEST REPORT S/N:** 0Y1106221044.PKR

### Test Facility / Accreditations

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



- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

|                                      |   |  |   |                                 |
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# 1.0 INTRODUCTION

## 1.1 Scope

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

## 1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity area, 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 on January 28, 2009.

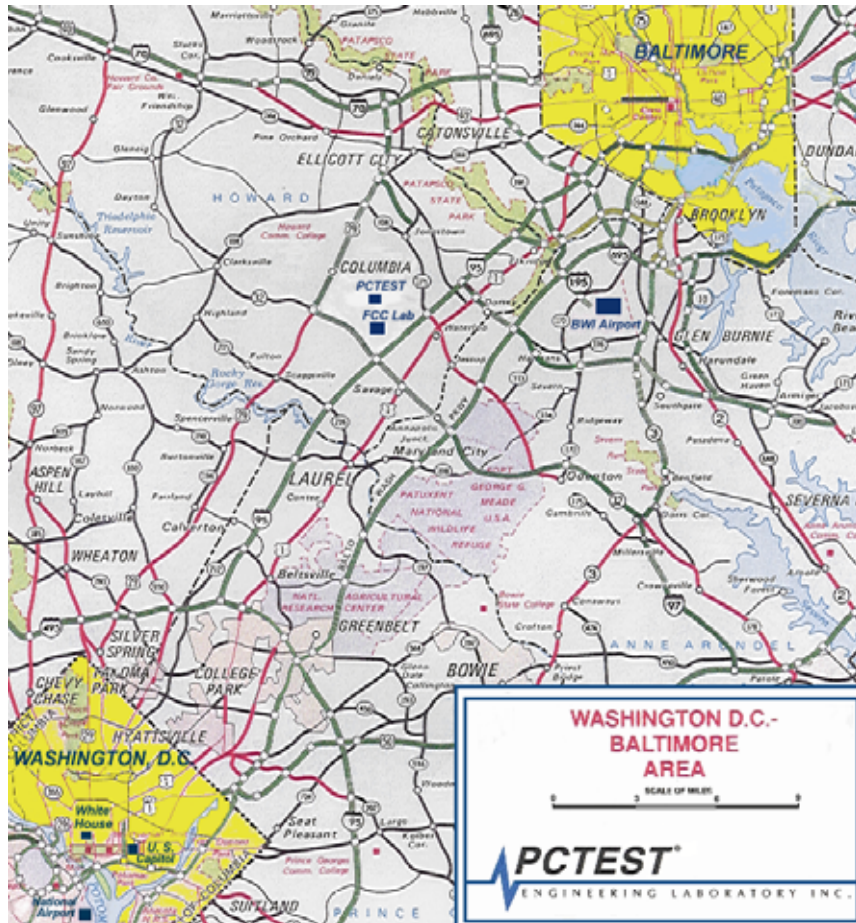


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Novatel 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem FCC ID: PKRNVWMC679**. 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   |
|-------------------------|-------------|---|
| Novatel / Model: MC679  | PKRNVWMC679 | 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |

**Table 2-1. EUT Equipment Description**

The EUT is capable of LTE operations in Band 4 (1710 – 1755MHz) and Band 17 (704 – 716MHz). All testing was performed with the EUT connected to a laptop PC via USB connection. The EUT was set in its standard, angled position (see test setup photos).

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

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

### 2.3 Labeling Requirements

Per 2.925

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



Per 15.19; Docket 95-19

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

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

The label shall be permanently affixed at a conspicuous location on the device; instruction manual or pamphlet supplied to the user and be readily visible to the purchaser at the time of purchase. However, when the device is so small wherein placement of the label with specified statement is not practical, only the trade name and FCC ID must be displayed on the device per Section 15.19(b)(2).

Please see attachment for FCC ID label and label location.

|                                      |   |  |   |                                 |
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### 3.0 DESCRIPTION OF TESTS

#### 3.1 Measurement Procedure

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

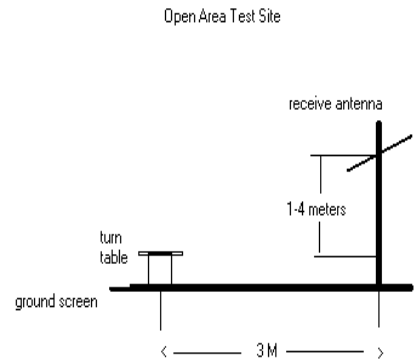


Figure 3-1. Diagram of 3-meter outdoor test range

Deviation from Measurement Procedure.....None

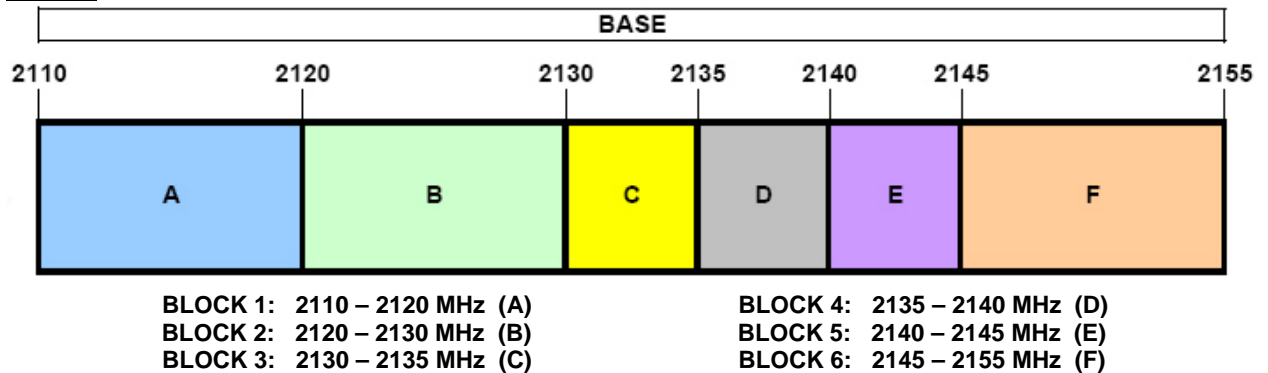
#### 3.2 Occupied Bandwidth Emission Limits

§2.1049, §27.53(h)(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 AWS - Base Frequency Blocks

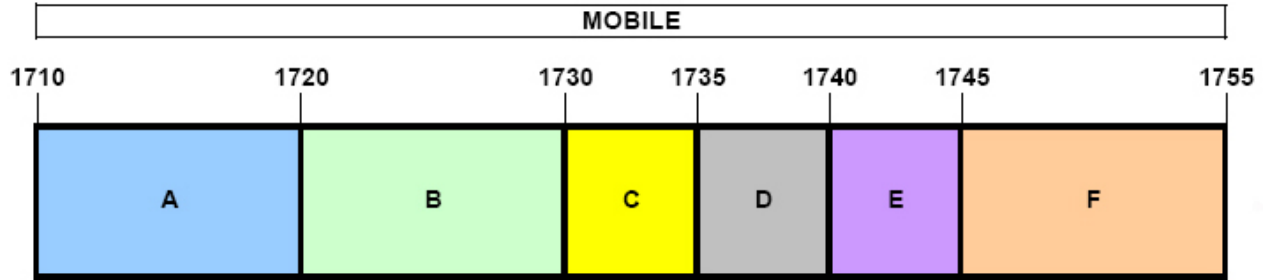
§27.5(h)



|                                      |  |  |  |                                 |
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### 3.4 AWS - Mobile Frequency Blocks

§27.5(h)



BLOCK 1: 1710 – 1720 MHz (A)

BLOCK 4: 1735 – 1740 MHz (D)

BLOCK 2: 1720 – 1730 MHz (B)

BLOCK 5: 1740 – 1745 MHz (E)

BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 6: 1745 – 1755 MHz (F)

### 3.5 Block B and C Frequency Range (704–710 and 710–716 MHz)



§27.5(c)

Three paired channel blocks of 12 MHz 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. Two unpaired channel blocks of 6 MHz each are available for assignment as follows: Block D: 716-722 MHz; and Block E: 722-728 MHz.

### 3.6 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, §27.53(c), §27.53(d)

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. 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.

|                                      |   |  |   |                                 |
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### 3.7 Radiated Power and Radiated Spurious Emissions §2.1053, §27.53(c), §27.53(d)

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. This device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation.

### 3.8 Peak-Average Ratio §27.50(d)(5)

A peak to average ratio measurement is performed at the conducted port of the EUT. 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.

### 3.9 Frequency Stability / Temperature Variation §2.1055, §27.54



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 – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency.*

#### Time Period and Procedure:

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

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## 4.0 TEST EQUIPMENT CALIBRATION DATA

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

| Manufacturer    | Model     | Description                        | Cal Date   | Cal Interval | Cal Due    | Serial Number |
|-----------------|-----------|------------------------------------|------------|--------------|------------|---------------|
| -               | 263-10dB  | (DC-18GHz) 10 dB Attenuator        | N/A        |              | N/A        | N/A           |
| -               | No.166    | (1000-26500MHz) Microwave RF Cable | N/A        |              | N/A        | N/A           |
| -               | No.167    | (100kHz - 100MHz) RG58 Coax Cable  | N/A        |              | N/A        | N/A           |
| Agilent         | 8449B     | (1-26.5GHz) Pre-Amplifier          | 2/8/2011   | Annual       | 2/8/2012   | 3008A00985    |
| Agilent         | E4407B    | ESA Spectrum Analyzer              | 4/5/2011   | Annual       | 4/5/2012   | US39210313    |
| Agilent         | E8257D    | (250kHz-20GHz) Signal Generator    | 4/8/2011   | Annual       | 4/8/2012   | MY45470194    |
| Agilent         | N9020A    | MXA Signal Analyzer                | 9/8/2010   | Annual       | 9/8/2011   | US46470561    |
| Anritsu         | ML2495A   | Power Meter                        | 10/13/2010 | Annual       | 10/13/2011 | 941001        |
| Anritsu         | MA2411B   | Pulse Sensor                       | N/A        | Annual       |            | 1027293       |
| Espec           | ESX-2CA   | Environmental Chamber              | 4/21/2011  | Annual       | 4/21/2012  | 17620         |
| MiniCircuits    | VHF-1300+ | High Pass Filter                   | N/A        |              | N/A        | 30716         |
| MiniCircuits    | VHF-3100+ | High Pass Filter                   | N/A        |              | N/A        | 30721         |
| Pasternack      | PE2208-6  | Bidirectional Coupler              | N/A        |              | N/A        | N/A           |
| Rohde & Schwarz | CMU200    | Base Station Simulator             | N/A        |              |            | 836536/0005   |
| Rohde & Schwarz | CMW500    | LTE Radio Communication Tester     | 8/30/2010  | Annual       | 8/30/2011  | 100976        |
| Schwarzbeck     | UHA9105   | Dipole Antenna (400 - 1GHz) Rx     | 8/17/2009  | Biennial     | 8/17/2011  | 9105-2404     |
| Schwarzbeck     | UHA9105   | Dipole Antenna (400 - 1GHz) Tx     | 8/17/2009  | Biennial     | 8/17/2011  | 9105-2403     |
| Sunol           | DRH-118   | Horn Antenna (1 - 18GHz)           | 7/5/2011   | Biennial     | 7/5/2013   | A050307       |
| Sunol           | JB5       | Bi-Log Antenna (30M - 5GHz)        | 8/17/2009  | Biennial     | 8/17/2011  | A051107       |
| Sunol           | DRH-118   | Horn Antenna (1-18 GHz)            | 6/17/2011  | Biennial     | 6/17/2013  | A042511       |

**Table 4-1. Test Equipment**

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 9 of 83                    |

## 5.0 SAMPLE CALCULATIONS

### Emission Designator

#### **Emission Designator = 4M25G7D**

QPSK BW = 4.25 MHz

G = Phase Modulation

7 = Two or more channels containing quantized or digital information

D = Data transmission, telemetry, telecommand

#### **Emission Designator = 3M35W7D**

16-QAM BW = 3.35 MHz

W = Quadrature Amplitude Modulation



7 = Two or more channels containing quantized or digital information

D = Data transmission, telemetry, telecommand

### Spurious Radiated Emission – AWS Band

#### **Example: Channel 20150 AWS Mode 2<sup>nd</sup> Harmonic (3460.0 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 terminal 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 3460.0 MHz. So 6.1 dB is added to the signal generator reading of  $-30.9$  dBm yielding  $-24.80$  dBm. The fundamental EIRP was 25.501 dBm so this harmonic was  $25.501$  dBm  $- (-24.80) = 50.3$  dBc.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 10 of 83                   |

## 6.0 TEST RESULTS

### 6.1 Summary

Company Name: Novatel Wireless Inc.  
 FCC ID: PKRNVWMC679  
 FCC Classification: PCS Licensed Transmitter (PCB)  
 Mode(s): LTE



| FCC Part Section(s)          | Test Description                          | Test Limit   | Test Condition | Test Result | Reference         |
|------------------------------|---|--|----------------|-------------|-------------------|
| <b>TRANSMITTER MODE (TX)</b> |   |  |                |             |                   |
| 2.1049, 27.53(h)(1)          | Occupied Bandwidth                        | N/A  | CONDUCTED      | PASS        | Sections 7.0, 8.0 |
| 2.1051, 27.53(g), 27.53(h)   | Band Edge / Conducted Spurious Emissions  | < 43 + 10log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of-band emissions |                | PASS        | Sections 7.0, 8.0 |
| 27.50(d)(5)                  | Peak-Average Ratio                        | < 13 dB  |                | PASS        | Sections 7.0, 8.0 |
| 2.1046                       | Transmitter Conducted Output Power        | N/A  |                | PASS        | Section 6.2       |
| 27.50(c)(9)                  | Effective Radiated Power (Band 17)        | < 3 Watts max. ERP   | RADIATED       | PASS        | Section 6.4       |
| 27.50(d)(4)                  | Equivalent Isotropic Radiated Power (AWS) | < 1 Watts max. EIRP  |                | PASS        | Section 6.3       |
| 2.1053, 27.53(g), 27.53(h)   | Undesirable Emissions                     | < 43 + 10log <sub>10</sub> (P[Watts]) for all out-of-band emissions                  |                | PASS        | Section 6.5, 6.6  |
| 2.1055, 27.54                | Frequency Stability                       | < 2.5 ppm  |                | PASS        | Section 6.7, 6.8  |

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

#### NOTES:

The following notes refer to the conducted plots shown in Sections 7.0 and 8.0 of this report:

- All band edge plots were performed with the EUT transmitting with 1RB at the outermost offset (Offset 0 for lower band edge and maximum offset for upper band edge).
- All out of band conducted spurious emissions 1MHz removed from the band edge, occupied bandwidth, and peak-to-average ratio plots were performed with the EUT transmitting with the maximum number of RB's for each channel bandwidth.
- All out of band conducted spurious emissions plots were performed with the EUT transmitting with 1RB and an RB offset of 0.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 11 of 83                   |

## 6.2 Transmitter Conducted Output Power

### §2.1046

The **Novatel 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem FCC ID: PKRNVWMC679** was connected to a Rohde & Schwarz CMW500 LTE eNodeB simulator. The EUT was configured to transmit continuously using different resource block configurations for all available channel bandwidths with QPSK and 16-QAM modulations in Band 4 and Band 17 in order to determine the maximum conducted output power.

All conducted power measurements were recorded from the CMW500. The test setup is as shown below.

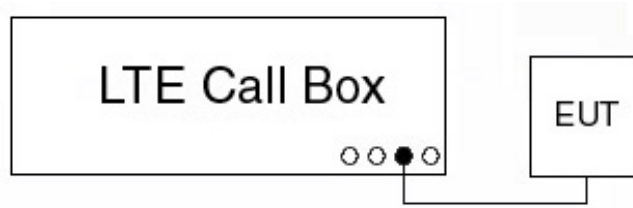




Figure 6-1. Test Setup Diagram



|   |  |   |  |
|---|--|---|--|
| FCC ID: PKRNVWMC679                         |  <b>FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b> |   |  <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1106221044.PKR | <b>Test Dates:</b><br>June 27 - July 29, 2011  | <b>EUT Type:</b><br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem | Page 12 of 83  |

## Transmitter Conducted Output Power (Cont'd)

**§2.1046**

| Frequency [MHz] | Uplink Channel Number | BW [MHz] | RB Size | RB Offset | Modulation | Maximum Average Power [dBm] |
|-----------------|-----------------------|----------|---------|-----------|------------|-----------------------------|
| 1710.7          | 19957                 | 1.4      | 1       | 0         | QPSK       | 22.90                       |
| 1710.7          | 19957                 | 1.4      | 1       | 5         | QPSK       | 22.87                       |
| 1710.7          | 19957                 | 1.4      | 3       | 2         | QPSK       | 22.98                       |
| 1710.7          | 19957                 | 1.4      | 6       | 0         | QPSK       | 21.94                       |
| 1710.7          | 19957                 | 1.4      | 1       | 0         | 16-QAM     | 22.24                       |
| 1710.7          | 19957                 | 1.4      | 1       | 5         | 16-QAM     | 22.39                       |
| 1710.7          | 19957                 | 1.4      | 3       | 2         | 16-QAM     | 22.18                       |
| 1710.7          | 19957                 | 1.4      | 6       | 0         | 16-QAM     | 21.41                       |
| 1711.5          | 19965                 | 3        | 1       | 0         | QPSK       | 22.86                       |
| 1711.5          | 19965                 | 3        | 1       | 14        | QPSK       | 23.06                       |
| 1711.5          | 19965                 | 3        | 8       | 4         | QPSK       | 21.85                       |
| 1711.5          | 19965                 | 3        | 15      | 0         | QPSK       | 21.69                       |
| 1711.5          | 19965                 | 3        | 1       | 0         | 16-QAM     | 21.88                       |
| 1711.5          | 19965                 | 3        | 1       | 14        | 16-QAM     | 21.87                       |
| 1711.5          | 19965                 | 3        | 8       | 4         | 16-QAM     | 20.89                       |
| 1711.5          | 19965                 | 3        | 15      | 0         | 16-QAM     | 20.96                       |
| 1712.5          | 19975                 | 5        | 1       | 0         | QPSK       | 23.04                       |
| 1712.5          | 19975                 | 5        | 1       | 24        | QPSK       | 23.02                       |
| 1712.5          | 19975                 | 5        | 12      | 6         | QPSK       | 21.34                       |
| 1712.5          | 19975                 | 5        | 25      | 0         | QPSK       | 21.78                       |
| 1712.5          | 19975                 | 5        | 1       | 0         | 16-QAM     | 22.01                       |
| 1712.5          | 19975                 | 5        | 1       | 24        | 16-QAM     | 22.13                       |
| 1712.5          | 19975                 | 5        | 12      | 6         | 16-QAM     | 20.97                       |
| 1712.5          | 19975                 | 5        | 25      | 0         | 16-QAM     | 21.06                       |
| 1715            | 20000                 | 10       | 1       | 0         | QPSK       | 22.83                       |
| 1715            | 20000                 | 10       | 1       | 49        | QPSK       | 22.74                       |
| 1715            | 20000                 | 10       | 25      | 12        | QPSK       | 22.02                       |
| 1715            | 20000                 | 10       | 50      | 0         | QPSK       | 21.84                       |
| 1715            | 20000                 | 10       | 1       | 0         | 16-QAM     | 22.30                       |
| 1715            | 20000                 | 10       | 1       | 49        | 16-QAM     | 22.20                       |
| 1715            | 20000                 | 10       | 25      | 12        | 16-QAM     | 20.86                       |
| 1715            | 20000                 | 10       | 50      | 0         | 16-QAM     | 20.93                       |
| 1717.5          | 20025                 | 15       | 1       | 0         | QPSK       | 23.22                       |
| 1717.5          | 20025                 | 15       | 1       | 74        | QPSK       | 22.96                       |
| 1717.5          | 20025                 | 15       | 36      | 18        | QPSK       | 21.96                       |
| 1717.5          | 20025                 | 15       | 75      | 0         | QPSK       | 21.98                       |
| 1717.5          | 20025                 | 15       | 1       | 0         | 16-QAM     | 22.26                       |
| 1717.5          | 20025                 | 15       | 1       | 74        | 16-QAM     | 22.01                       |
| 1717.5          | 20025                 | 15       | 36      | 18        | 16-QAM     | 21.16                       |
| 1717.5          | 20025                 | 15       | 75      | 0         | 16-QAM     | 20.98                       |
| 1720            | 20050                 | 20       | 1       | 0         | QPSK       | 22.80                       |
| 1720            | 20050                 | 20       | 1       | 99        | QPSK       | 22.90                       |
| 1720            | 20050                 | 20       | 50      | 25        | QPSK       | 21.94                       |
| 1720            | 20050                 | 20       | 100     | 0         | QPSK       | 21.85                       |
| 1720            | 20050                 | 20       | 1       | 0         | 16-QAM     | 22.12                       |
| 1720            | 20050                 | 20       | 1       | 99        | 16-QAM     | 22.21                       |
| 1720            | 20050                 | 20       | 50      | 25        | 16-QAM     | 20.97                       |
| 1720            | 20050                 | 20       | 100     | 0         | 16-QAM     | 20.91                       |

**Table 6-2. Maximum Conducted Output Power (Low Channel, AWS Band)**

|                                      |   |  |  |   |                                 |
|--------------------------------------|---|--|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  |   | Page 13 of 83                   |





## Transmitter Conducted Output Power (Cont'd)

**§2.1046**

| Frequency [MHz] | Uplink Channel Number | BW [MHz] | RB Size | RB Offset | Modulation | Maximum Average Power [dBm] |
|-----------------|-----------------------|----------|---------|-----------|------------|-----------------------------|
| 1732.5          | 20175                 | 1.4      | 1       | 0         | QPSK       | 22.94                       |
| 1732.5          | 20175                 | 1.4      | 1       | 5         | QPSK       | 22.84                       |
| 1732.5          | 20175                 | 1.4      | 3       | 2         | QPSK       | 22.91                       |
| 1732.5          | 20175                 | 1.4      | 6       | 0         | QPSK       | 21.94                       |
| 1732.5          | 20175                 | 1.4      | 1       | 0         | 16-QAM     | 22.15                       |
| 1732.5          | 20175                 | 1.4      | 1       | 5         | 16-QAM     | 22.27                       |
| 1732.5          | 20175                 | 1.4      | 3       | 2         | 16-QAM     | 22.03                       |
| 1732.5          | 20175                 | 1.4      | 6       | 0         | 16-QAM     | 21.37                       |
| 1732.5          | 20175                 | 3        | 1       | 0         | QPSK       | 22.82                       |
| 1732.5          | 20175                 | 3        | 1       | 14        | QPSK       | 22.78                       |
| 1732.5          | 20175                 | 3        | 8       | 4         | QPSK       | 22.14                       |
| 1732.5          | 20175                 | 3        | 15      | 0         | QPSK       | 21.93                       |
| 1732.5          | 20175                 | 3        | 1       | 0         | 16-QAM     | 22.30                       |
| 1732.5          | 20175                 | 3        | 1       | 14        | 16-QAM     | 22.23                       |
| 1732.5          | 20175                 | 3        | 8       | 4         | 16-QAM     | 21.11                       |
| 1732.5          | 20175                 | 3        | 15      | 0         | 16-QAM     | 21.08                       |
| 1732.5          | 20175                 | 5        | 1       | 0         | QPSK       | 22.28                       |
| 1732.5          | 20175                 | 5        | 1       | 24        | QPSK       | 22.18                       |
| 1732.5          | 20175                 | 5        | 12      | 6         | QPSK       | 21.31                       |
| 1732.5          | 20175                 | 5        | 25      | 0         | QPSK       | 21.35                       |
| 1732.5          | 20175                 | 5        | 1       | 0         | 16-QAM     | 21.38                       |
| 1732.5          | 20175                 | 5        | 1       | 24        | 16-QAM     | 21.20                       |
| 1732.5          | 20175                 | 5        | 12      | 6         | 16-QAM     | 20.27                       |
| 1732.5          | 20175                 | 5        | 25      | 0         | 16-QAM     | 20.31                       |
| 1732.5          | 20175                 | 10       | 1       | 0         | QPSK       | 22.58                       |
| 1732.5          | 20175                 | 10       | 1       | 49        | QPSK       | 22.75                       |
| 1732.5          | 20175                 | 10       | 25      | 12        | QPSK       | 21.95                       |
| 1732.5          | 20175                 | 10       | 50      | 0         | QPSK       | 21.93                       |
| 1732.5          | 20175                 | 10       | 1       | 0         | 16-QAM     | 22.24                       |
| 1732.5          | 20175                 | 10       | 1       | 49        | 16-QAM     | 22.14                       |
| 1732.5          | 20175                 | 10       | 25      | 12        | 16-QAM     | 20.87                       |
| 1732.5          | 20175                 | 10       | 50      | 0         | 16-QAM     | 20.97                       |
| 1732.5          | 20175                 | 15       | 1       | 0         | QPSK       | 22.96                       |
| 1732.5          | 20175                 | 15       | 1       | 74        | QPSK       | 22.93                       |
| 1732.5          | 20175                 | 15       | 36      | 18        | QPSK       | 22.06                       |
| 1732.5          | 20175                 | 15       | 75      | 0         | QPSK       | 22.00                       |
| 1732.5          | 20175                 | 15       | 1       | 0         | 16-QAM     | 22.06                       |
| 1732.5          | 20175                 | 15       | 1       | 74        | 16-QAM     | 22.03                       |
| 1732.5          | 20175                 | 15       | 36      | 18        | 16-QAM     | 21.12                       |
| 1732.5          | 20175                 | 15       | 75      | 0         | 16-QAM     | 21.02                       |
| 1732.5          | 20175                 | 20       | 1       | 0         | QPSK       | 22.89                       |
| 1732.5          | 20175                 | 20       | 1       | 99        | QPSK       | 22.79                       |
| 1732.5          | 20175                 | 20       | 50      | 25        | QPSK       | 22.07                       |
| 1732.5          | 20175                 | 20       | 100     | 0         | QPSK       | 22.11                       |
| 1732.5          | 20175                 | 20       | 1       | 0         | 16-QAM     | 22.09                       |
| 1732.5          | 20175                 | 20       | 1       | 99        | 16-QAM     | 21.99                       |
| 1732.5          | 20175                 | 20       | 50      | 25        | 16-QAM     | 21.16                       |
| 1732.5          | 20175                 | 20       | 100     | 0         | 16-QAM     | 21.10                       |

**Table 6-3. Maximum Conducted Output Power (Mid Channel, AWS Band)**



|                                      |   |  |  |   |                                 |
|--------------------------------------|---|--|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  |   | Page 14 of 83                   |

## Transmitter Conducted Output Power (Cont'd)

**§2.1046**

| Frequency [MHz] | Uplink Channel Number | BW [MHz] | RB Size | RB Offset | Modulation | Maximum Average Power [dBm] |
|-----------------|-----------------------|----------|---------|-----------|------------|-----------------------------|
| 1754.3          | 20393                 | 1.4      | 1       | 0         | QPSK       | 22.81                       |
| 1754.3          | 20393                 | 1.4      | 1       | 5         | QPSK       | 22.80                       |
| 1754.3          | 20393                 | 1.4      | 3       | 2         | QPSK       | 22.86                       |
| 1754.3          | 20393                 | 1.4      | 6       | 0         | QPSK       | 21.81                       |
| 1754.3          | 20393                 | 1.4      | 1       | 0         | 16-QAM     | 22.22                       |
| 1754.3          | 20393                 | 1.4      | 1       | 5         | 16-QAM     | 22.19                       |
| 1754.3          | 20393                 | 1.4      | 3       | 2         | 16-QAM     | 22.02                       |
| 1754.3          | 20393                 | 1.4      | 6       | 0         | 16-QAM     | 21.25                       |
| 1753.5          | 20385                 | 3        | 1       | 0         | QPSK       | 22.81                       |
| 1753.5          | 20385                 | 3        | 1       | 14        | QPSK       | 22.86                       |
| 1753.5          | 20385                 | 3        | 8       | 4         | QPSK       | 21.81                       |
| 1753.5          | 20385                 | 3        | 15      | 0         | QPSK       | 21.82                       |
| 1753.5          | 20385                 | 3        | 1       | 0         | 16-QAM     | 21.97                       |
| 1753.5          | 20385                 | 3        | 1       | 14        | 16-QAM     | 21.76                       |
| 1753.5          | 20385                 | 3        | 8       | 4         | 16-QAM     | 20.92                       |
| 1753.5          | 20385                 | 3        | 15      | 0         | 16-QAM     | 20.91                       |
| 1752.5          | 20375                 | 5        | 1       | 0         | QPSK       | 22.81                       |
| 1752.5          | 20375                 | 5        | 1       | 24        | QPSK       | 22.84                       |
| 1752.5          | 20375                 | 5        | 12      | 6         | QPSK       | 21.98                       |
| 1752.5          | 20375                 | 5        | 25      | 0         | QPSK       | 21.86                       |
| 1752.5          | 20375                 | 5        | 1       | 0         | 16-QAM     | 21.91                       |
| 1752.5          | 20375                 | 5        | 1       | 24        | 16-QAM     | 21.98                       |
| 1752.5          | 20375                 | 5        | 12      | 6         | 16-QAM     | 20.97                       |
| 1752.5          | 20375                 | 5        | 25      | 0         | 16-QAM     | 21.02                       |
| 1750            | 20350                 | 10       | 1       | 0         | QPSK       | 22.70                       |
| 1750            | 20350                 | 10       | 1       | 49        | QPSK       | 22.61                       |
| 1750            | 20350                 | 10       | 25      | 12        | QPSK       | 21.85                       |
| 1750            | 20350                 | 10       | 50      | 0         | QPSK       | 21.90                       |
| 1750            | 20350                 | 10       | 1       | 0         | 16-QAM     | 22.19                       |
| 1750            | 20350                 | 10       | 1       | 49        | 16-QAM     | 22.21                       |
| 1750            | 20350                 | 10       | 25      | 12        | 16-QAM     | 21.30                       |
| 1750            | 20350                 | 10       | 50      | 0         | 16-QAM     | 20.93                       |
| 1747.5          | 20325                 | 15       | 1       | 0         | QPSK       | 23.02                       |
| 1747.5          | 20325                 | 15       | 1       | 74        | QPSK       | 22.90                       |
| 1747.5          | 20325                 | 15       | 36      | 18        | QPSK       | 22.19                       |
| 1747.5          | 20325                 | 15       | 75      | 0         | QPSK       | 22.04                       |
| 1747.5          | 20325                 | 15       | 1       | 0         | 16-QAM     | 22.15                       |
| 1747.5          | 20325                 | 15       | 1       | 74        | 16-QAM     | 22.06                       |
| 1747.5          | 20325                 | 15       | 36      | 18        | 16-QAM     | 21.06                       |
| 1747.5          | 20325                 | 15       | 75      | 0         | 16-QAM     | 20.88                       |
| 1745            | 20300                 | 20       | 1       | 0         | QPSK       | 22.73                       |
| 1745            | 20300                 | 20       | 1       | 99        | QPSK       | 22.77                       |
| 1745            | 20300                 | 20       | 50      | 25        | QPSK       | 22.16                       |
| 1745            | 20300                 | 20       | 100     | 0         | QPSK       | 21.89                       |
| 1745            | 20300                 | 20       | 1       | 0         | 16-QAM     | 21.95                       |
| 1745            | 20300                 | 20       | 1       | 99        | 16-QAM     | 22.06                       |
| 1745            | 20300                 | 20       | 50      | 25        | 16-QAM     | 21.11                       |
| 1745            | 20300                 | 20       | 100     | 0         | 16-QAM     | 20.85                       |

**Table 6-4. Maximum Conducted Output Power (High Channel, AWS Band)**



|                                      |   |  |  |   |                                 |
|--------------------------------------|---|--|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  |   | Page 15 of 83                   |

## Transmitter Conducted Output Power (Cont'd)

**§2.1046**

| Frequency [MHz] | Uplink Channel Number | BW [MHz] | RB Size | RB Offset | Modulation | Maximum Average Power [dBm] |
|-----------------|-----------------------|----------|---------|-----------|------------|-----------------------------|
| 706.5           | 23755                 | 5        | 1       | 0         | QPSK       | 22.96                       |
| 706.5           | 23755                 | 5        | 1       | 24        | QPSK       | 23.03                       |
| 706.5           | 23755                 | 5        | 12      | 6         | QPSK       | 21.85                       |
| 706.5           | 23755                 | 5        | 25      | 0         | QPSK       | 21.92                       |
| 706.5           | 23755                 | 5        | 1       | 0         | 16-QAM     | 22.04                       |
| 706.5           | 23755                 | 5        | 1       | 24        | 16-QAM     | 22.25                       |
| 706.5           | 23755                 | 5        | 12      | 6         | 16-QAM     | 20.90                       |
| 706.5           | 23755                 | 5        | 25      | 0         | 16-QAM     | 20.92                       |
| 709             | 23780                 | 10       | 1       | 0         | QPSK       | 22.66                       |
| 709             | 23780                 | 10       | 1       | 49        | QPSK       | 22.61                       |
| 709             | 23780                 | 10       | 25      | 12        | QPSK       | 22.15                       |
| 709             | 23780                 | 10       | 50      | 0         | QPSK       | 21.98                       |
| 709             | 23780                 | 10       | 1       | 0         | 16-QAM     | 22.09                       |
| 709             | 23780                 | 10       | 1       | 49        | 16-QAM     | 22.12                       |
| 709             | 23780                 | 10       | 25      | 12        | 16-QAM     | 21.60                       |
| 709             | 23780                 | 10       | 50      | 0         | 16-QAM     | 21.02                       |
| 710             | 23790                 | 5        | 1       | 0         | QPSK       | 22.97                       |
| 710             | 23790                 | 5        | 1       | 24        | QPSK       | 22.89                       |
| 710             | 23790                 | 5        | 12      | 6         | QPSK       | 21.89                       |
| 710             | 23790                 | 5        | 25      | 0         | QPSK       | 22.01                       |
| 710             | 23790                 | 5        | 1       | 0         | 16-QAM     | 22.13                       |
| 710             | 23790                 | 5        | 1       | 24        | 16-QAM     | 22.01                       |
| 710             | 23790                 | 5        | 12      | 6         | 16-QAM     | 20.93                       |
| 710             | 23790                 | 5        | 25      | 0         | 16-QAM     | 20.98                       |
| 710             | 23790                 | 10       | 1       | 0         | QPSK       | 22.78                       |
| 710             | 23790                 | 10       | 1       | 49        | QPSK       | 22.59                       |
| 710             | 23790                 | 10       | 25      | 12        | QPSK       | 22.06                       |
| 710             | 23790                 | 10       | 50      | 0         | QPSK       | 21.92                       |
| 710             | 23790                 | 10       | 1       | 0         | 16-QAM     | 22.20                       |
| 710             | 23790                 | 10       | 1       | 49        | 16-QAM     | 22.12                       |
| 710             | 23790                 | 10       | 25      | 12        | 16-QAM     | 21.52                       |
| 710             | 23790                 | 10       | 50      | 0         | 16-QAM     | 21.05                       |
| 713.5           | 23825                 | 5        | 1       | 0         | QPSK       | 22.92                       |
| 713.5           | 23825                 | 5        | 1       | 24        | QPSK       | 22.83                       |
| 713.5           | 23825                 | 5        | 12      | 6         | QPSK       | 21.79                       |
| 713.5           | 23825                 | 5        | 25      | 0         | QPSK       | 21.88                       |
| 713.5           | 23825                 | 5        | 1       | 0         | 16-QAM     | 22.01                       |
| 713.5           | 23825                 | 5        | 1       | 24        | 16-QAM     | 21.99                       |
| 713.5           | 23825                 | 5        | 12      | 6         | 16-QAM     | 20.74                       |
| 713.5           | 23825                 | 5        | 25      | 0         | 16-QAM     | 21.08                       |
| 711             | 23800                 | 10       | 1       | 0         | QPSK       | 22.88                       |
| 711             | 23800                 | 10       | 1       | 49        | QPSK       | 22.62                       |
| 711             | 23800                 | 10       | 25      | 12        | QPSK       | 22.15                       |
| 711             | 23800                 | 10       | 50      | 0         | QPSK       | 22.01                       |
| 711             | 23800                 | 10       | 1       | 0         | 16-QAM     | 22.29                       |
| 711             | 23800                 | 10       | 1       | 49        | 16-QAM     | 22.21                       |
| 711             | 23800                 | 10       | 25      | 12        | 16-QAM     | 21.54                       |
| 711             | 23800                 | 10       | 50      | 0         | 16-QAM     | 21.01                       |

**Table 6-5. Maximum Conducted Output Power (Band 17)**

|                                      |   |  |  |   |                                 |
|--------------------------------------|---|--|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION) |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  |   | Page 16 of 83                   |

### 6.3 Equivalent Isotropic Radiated Power Output Data §27.50(d)(4)

|             | Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | RB Size/Offset | Measured Level [dBm] | Substitute Level [dBm] | Antenna Gain [dBi] | Pol [H/V]    | EIRP [dBm]   | EIRP [Watts] | Power |
|-------------|-----------------|-------------------------|--------|----------------|----------------------|------------------------|--------------------|--------------|--------------|--------------|-------|
| Band IV LTE | 1710.70         | 1.4                     | QPSK   | 1 / 5          | -20.89               | 10.44                  | 8.08               | H            | 18.52        | 0.071        | USB   |
|             | 1732.50         | 1.4                     | QPSK   | 1 / 0          | -19.59               | 11.74                  | 7.97               | H            | <b>19.71</b> | 0.094        | USB   |
|             | 1754.30         | 1.4                     | QPSK   | 1 / 0          | -21.33               | 10.00                  | 7.86               | H            | 17.86        | 0.061        | USB   |
|             | 1710.70         | 1.4                     | 16-QAM | 1 / 5          | -22.28               | 9.05                   | 8.08               | H            | 17.13        | 0.052        | USB   |
|             | 1732.50         | 1.4                     | 16-QAM | 1 / 0          | -21.02               | 10.31                  | 7.97               | H            | <b>18.28</b> | 0.067        | USB   |
|             | 1754.30         | 1.4                     | 16-QAM | 1 / 0          | -22.61               | 8.72                   | 7.86               | H            | 16.58        | 0.045        | USB   |
|             | 1711.50         | 3                       | QPSK   | 1 / 14         | -19.95               | 11.38                  | 8.08               | H            | 19.46        | 0.088        | USB   |
|             | 1732.50         | 3                       | QPSK   | 1 / 0          | -19.72               | 11.61                  | 7.97               | H            | <b>19.58</b> | 0.091        | USB   |
|             | 1753.50         | 3                       | QPSK   | 1 / 0          | -20.52               | 10.81                  | 7.86               | H            | 18.67        | 0.074        | USB   |
|             | 1711.50         | 3                       | 16-QAM | 1 / 14         | -21.10               | 10.23                  | 8.08               | H            | 18.31        | 0.068        | USB   |
|             | 1732.50         | 3                       | 16-QAM | 1 / 0          | -20.77               | 10.56                  | 7.97               | H            | <b>18.53</b> | 0.071        | USB   |
|             | 1753.50         | 3                       | 16-QAM | 1 / 0          | -21.61               | 9.72                   | 7.86               | H            | 17.58        | 0.057        | USB   |
|             | 1712.50         | 5                       | QPSK   | 1 / 24         | -20.75               | 10.58                  | 8.08               | H            | 18.66        | 0.073        | USB   |
|             | 1732.50         | 5                       | QPSK   | 1 / 0          | -20.02               | 11.31                  | 7.97               | H            | <b>19.28</b> | 0.085        | USB   |
|             | 1752.50         | 5                       | QPSK   | 1 / 0          | -19.98               | 11.35                  | 7.86               | H            | 19.21        | 0.083        | USB   |
|             | 1712.50         | 5                       | 16-QAM | 1 / 24         | -21.82               | 9.51                   | 8.08               | H            | 17.59        | 0.057        | USB   |
|             | 1732.50         | 5                       | 16-QAM | 1 / 0          | -20.96               | 10.37                  | 7.97               | H            | <b>18.34</b> | 0.068        | USB   |
|             | 1752.50         | 5                       | 16-QAM | 1 / 0          | -21.05               | 10.28                  | 7.86               | H            | 18.14        | 0.065        | USB   |
|             | 1715.00         | 10                      | QPSK   | 1 / 49         | -20.95               | 10.38                  | 8.08               | H            | 18.46        | 0.070        | USB   |
|             | 1732.50         | 10                      | QPSK   | 1 / 0          | -20.34               | 10.99                  | 7.97               | H            | 18.96        | 0.079        | USB   |
|             | 1750.00         | 10                      | QPSK   | 1 / 0          | -19.93               | 11.40                  | 7.86               | H            | <b>19.26</b> | 0.084        | USB   |
|             | 1715.00         | 10                      | 16-QAM | 1 / 49         | -21.96               | 9.37                   | 8.08               | H            | 17.45        | 0.056        | USB   |
|             | 1732.50         | 10                      | 16-QAM | 1 / 0          | -21.26               | 10.07                  | 7.97               | H            | 18.04        | 0.064        | USB   |
|             | 1750.00         | 10                      | 16-QAM | 1 / 0          | -21.13               | 10.20                  | 7.86               | H            | <b>18.06</b> | 0.064        | USB   |
|             | 1717.50         | 15                      | QPSK   | 1 / 0          | -21.14               | 10.19                  | 8.08               | H            | 18.27        | 0.067        | USB   |
|             | 1732.50         | 15                      | QPSK   | 1 / 74         | -20.38               | 10.95                  | 7.97               | H            | 18.92        | 0.078        | USB   |
|             | 1747.50         | 15                      | QPSK   | 1 / 0          | -19.81               | 11.52                  | 7.86               | H            | <b>19.38</b> | 0.087        | USB   |
|             | 1717.50         | 15                      | 16-QAM | 1 / 0          | -22.25               | 9.08                   | 8.08               | H            | 17.16        | 0.052        | USB   |
|             | 1732.50         | 15                      | 16-QAM | 1 / 74         | -21.00               | 10.33                  | 7.97               | H            | 18.30        | 0.068        | USB   |
|             | 1747.50         | 15                      | 16-QAM | 1 / 0          | -20.53               | 10.80                  | 7.86               | H            | <b>18.66</b> | 0.073        | USB   |
| 1720.00     | 20              | QPSK                    | 1 / 0  | -20.32         | 11.01                | 8.08                   | H                  | 19.09        | 0.081        | USB          |       |
| 1732.50     | 20              | QPSK                    | 1 / 99 | -19.42         | 11.91                | 7.97                   | H                  | <b>19.88</b> | 0.097        | USB          |       |
| 1745.00     | 20              | QPSK                    | 1 / 99 | -19.75         | 11.58                | 7.86                   | H                  | 19.44        | 0.088        | USB          |       |
| 1720.00     | 20              | 16-QAM                  | 1 / 0  | -21.04         | 10.29                | 8.08                   | H                  | 18.37        | 0.069        | USB          |       |
| 1732.50     | 20              | 16-QAM                  | 1 / 99 | -20.28         | 11.05                | 7.97                   | H                  | <b>19.02</b> | 0.080        | USB          |       |
| 1745.00     | 20              | 16-QAM                  | 1 / 99 | -20.84         | 10.49                | 7.86                   | H                  | 18.35        | 0.068        | USB          |       |



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

**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.

This device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the horizontal, slide out setup. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)                          |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 17 of 83                   |

## 6.4 Effective Radiated Power Output Data §27.50(c)(9)

|               | Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | RB Size/Offset | Measured Level [dBm] | Substitute Level [dBm] | Antenna Gain [dBd] | PoI [H/V] | EIRP [dBm]   | EIRP [Watts] | Power |
|---------------|-----------------|-------------------------|--------|----------------|----------------------|------------------------|--------------------|-----------|--------------|--------------|-------|
| Band XVII LTE | 706.50          | 5                       | QPSK   | 1 / 24         | -14.95               | 20.21                  | 0.00               | H         | 20.21        | 0.105        | USB   |
|               | 710.00          | 5                       | QPSK   | 1 / 24         | -15.00               | 20.16                  | 0.00               | H         | 20.16        | 0.104        | USB   |
|               | 713.50          | 5                       | QPSK   | 1 / 0          | -15.24               | 22.02                  | 0.00               | H         | <b>22.02</b> | 0.159        | USB   |
|               | 706.50          | 5                       | 16-QAM | 1 / 24         | -15.84               | 19.32                  | 0.00               | H         | 19.32        | 0.086        | USB   |
|               | 710.00          | 5                       | 16-QAM | 1 / 24         | -15.58               | 19.58                  | 0.00               | H         | 19.58        | 0.091        | USB   |
|               | 713.50          | 5                       | 16-QAM | 1 / 0          | -16.05               | 21.21                  | 0.00               | H         | <b>21.21</b> | 0.132        | USB   |
|               | 709.00          | 10                      | QPSK   | 1 / 49         | -15.62               | 21.64                  | 0.00               | H         | 21.64        | 0.146        | USB   |
|               | 710.00          | 10                      | QPSK   | 25 / 12        | -15.57               | 21.69                  | 0.00               | H         | 21.69        | 0.148        | USB   |
|               | 711.00          | 10                      | QPSK   | 1 / 0          | -15.53               | 21.73                  | 0.00               | H         | <b>21.73</b> | 0.149        | USB   |
|               | 709.00          | 10                      | 16-QAM | 1 / 49         | -16.64               | 20.62                  | 0.00               | H         | 20.62        | 0.115        | USB   |
|               | 710.00          | 10                      | 16-QAM | 25 / 12        | -16.72               | 20.54                  | 0.00               | H         | 20.54        | 0.113        | USB   |
|               | 711.00          | 10                      | 16-QAM | 1 / 0          | -16.61               | 20.65                  | 0.00               | H         | <b>20.65</b> | 0.116        | USB   |



**Table 6-7. Effective Radiated Power Output Data (Band 17)**

### 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.

This device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the horizontal, slide out setup. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 18 of 83                   |



## 6.5 Band 4 (AWS) LTE Radiated Measurements §2.1053, §27.53(h)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1720.00 MHz  
 CHANNEL: 20050  
 MEASURED OUTPUT POWER: 19.880 dBm = 0.097 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 20 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  32.88 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------|
| 3440.00         | -38.01                          | 9.34                          | -28.67                        | H         | 48.5  |
| 5160.00         | -51.50                          | 10.96                         | -40.55                        | H         | 60.4  |
| 6880.00         | -84.44                          | 10.52                         | -73.93                        | H         | 93.8  |
| 8600.00         | -80.92                          | 11.07                         | -69.85                        | H         | 89.7  |



**Table 6-8. Radiated Spurious Data (20MHz BW, QPSK, AWS Band – Ch. 20050)**

#### 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 in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation. This unit was tested while powered via USB connection to a laptop PC. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the EUT in its standard configuration while connected to a horizontal USB port of a laptop PC. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 19 of 83                   |

**Band 4 (AWS) LTE Radiated Measurements (Cont'd)**  
**§2.1053, §27.53(h)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 1732.50 MHz  
 CHANNEL: 20175  
 MEASURED OUTPUT POWER: 19.880 dBm = 0.097 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 20 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  32.88 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------|
| 3465.00         | -42.44                          | 9.47                          | -32.98                        | H         | 52.9  |
| 5197.50         | -50.82                          | 10.87                         | -39.95                        | H         | 59.8  |
| 6930.00         | -84.63                          | 10.68                         | -73.95                        | H         | 93.8  |
| 8662.50         | -80.98                          | 11.25                         | -69.74                        | H         | 89.6  |



**Table 6-9. Radiated Spurious Data (20MHz BW, QPSK, AWS Band – Ch. 20175)**

**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 in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation. This unit was tested while powered via USB connection to a laptop PC. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the EUT in its standard configuration while connected to a horizontal USB port of a laptop PC. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
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| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 20 of 83                   |

**Band 4 (AWS) LTE Radiated Measurements (Cont'd)**  
**§2.1053, §27.53(h)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 1745.00 MHz  
 CHANNEL: 20300  
 MEASURED OUTPUT POWER: 19.880 dBm = 0.097 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 20 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  32.88 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBi) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------|
| 3490.00         | -45.33                          | 9.54                          | -35.79                        | H         | 55.7  |
| 5235.00         | -50.92                          | 10.69                         | -40.24                        | H         | 60.1  |
| 6980.00         | -84.78                          | 10.81                         | -73.98                        | H         | 93.9  |
| 8725.00         | -81.12                          | 11.40                         | -69.71                        | H         | 89.6  |



**Table 6-10. Radiated Spurious Data (20MHz BW, QPSK, AWS Band – Ch. 20300)**

**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 in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation. This unit was tested while powered via USB connection to a laptop PC. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the EUT in its standard configuration while connected to a horizontal USB port of a laptop PC. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)                          |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 21 of 83                   |

## 6.6 Band 17 LTE Radiated Measurements §2.1053, §27.53(g)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 706.50 MHz  
 CHANNEL: 23755  
 MEASURED OUTPUT POWER: 22.020 dBm = 0.159 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  35.02 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------|
| 1413.00         | -52.66                          | 5.80                          | -46.86                        | H         | 66.7  |
| 2119.50         | -51.61                          | 6.48                          | -45.13                        | H         | 65.0  |
| 2826.00         | -93.98                          | 7.70                          | -86.28                        | H         | 106.2 |
| 3532.50         | -90.77                          | 7.47                          | -83.29                        | H         | 103.2 |



**Table 6-11. Radiated Spurious Data (5MHz BW, QPSK, Band 17 – 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 in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation. This unit was tested while powered via USB connection to a laptop PC. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the EUT in its standard configuration while connected to a horizontal USB port of a laptop PC. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 22 of 83                   |

**Band 17 LTE Radiated Measurements (Cont'd)**  
**§2.1053, §27.53(g)**

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 710.00 MHz  
 CHANNEL: 23790  
 MEASURED OUTPUT POWER: 22.020 dBm = 0.159 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  35.02 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------|
| 1258.30         | -53.50                          | 5.84                          | -47.66                        | H         | 67.5  |
| 1339.00         | -37.41                          | 6.48                          | -30.93                        | H         | 50.8  |
| 1411.45         | -47.48                          | 7.69                          | -39.79                        | H         | 59.7  |
| 2130.00         | -50.67                          | 7.50                          | -43.17                        | H         | 63.1  |



**Table 6-12. Radiated Spurious Data (5MHz BW, QPSK, Band 17 – 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 in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation. This unit was tested while powered via USB connection to a laptop PC. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the EUT in its standard configuration while connected to a horizontal USB port of a laptop PC. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)                          |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 23 of 83                   |



**Band 17 LTE Radiated Measurements (Cont'd)**  
§2.1053, §27.53(g)

**Field Strength of SPURIOUS Radiation**

OPERATING FREQUENCY: 713.50 MHz  
 CHANNEL: 23825  
 MEASURED OUTPUT POWER: 22.020 dBm = 0.159 W  
 MODULATION SIGNAL: QPSK  
 BANDWIDTH: 5 MHz  
 DISTANCE: 3 meters  
 LIMIT:  $43 + 10 \log_{10}(W) =$  35.02 dBc

| FREQUENCY (MHz) | LEVEL @ ANTENNA TERMINALS (dBm) | SUBSTITUTE ANTENNA GAIN (dBd) | SPURIOUS EMISSION LEVEL (dBm) | POL (H/V) | (dBc) |
|-----------------|---------------------------------|-------------------------------|-------------------------------|-----------|-------|
| 1427.00         | -56.68                          | 5.87                          | -50.81                        | H         | 70.7  |
| 2140.50         | -50.37                          | 6.48                          | -43.89                        | H         | 63.8  |
| 2854.00         | -93.82                          | 7.67                          | -86.14                        | H         | 106.0 |
| 3567.50         | -90.75                          | 7.53                          | -83.22                        | H         | 103.1 |



**Table 6-13. Radiated Spurious Data (5MHz BW, QPSK, Band 17 – 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 in Band 4 using 20MHz Bandwidth and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation. This unit was tested while powered via USB connection to a laptop PC. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the EUT in its standard configuration while connected to a horizontal USB port of a laptop PC. The data reported in the table above was measured in this test setup.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)                          |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 24 of 83                   |



## 6.7 Band 4 (AWS) LTE Frequency Stability Measurements

§2.1055, §27.54

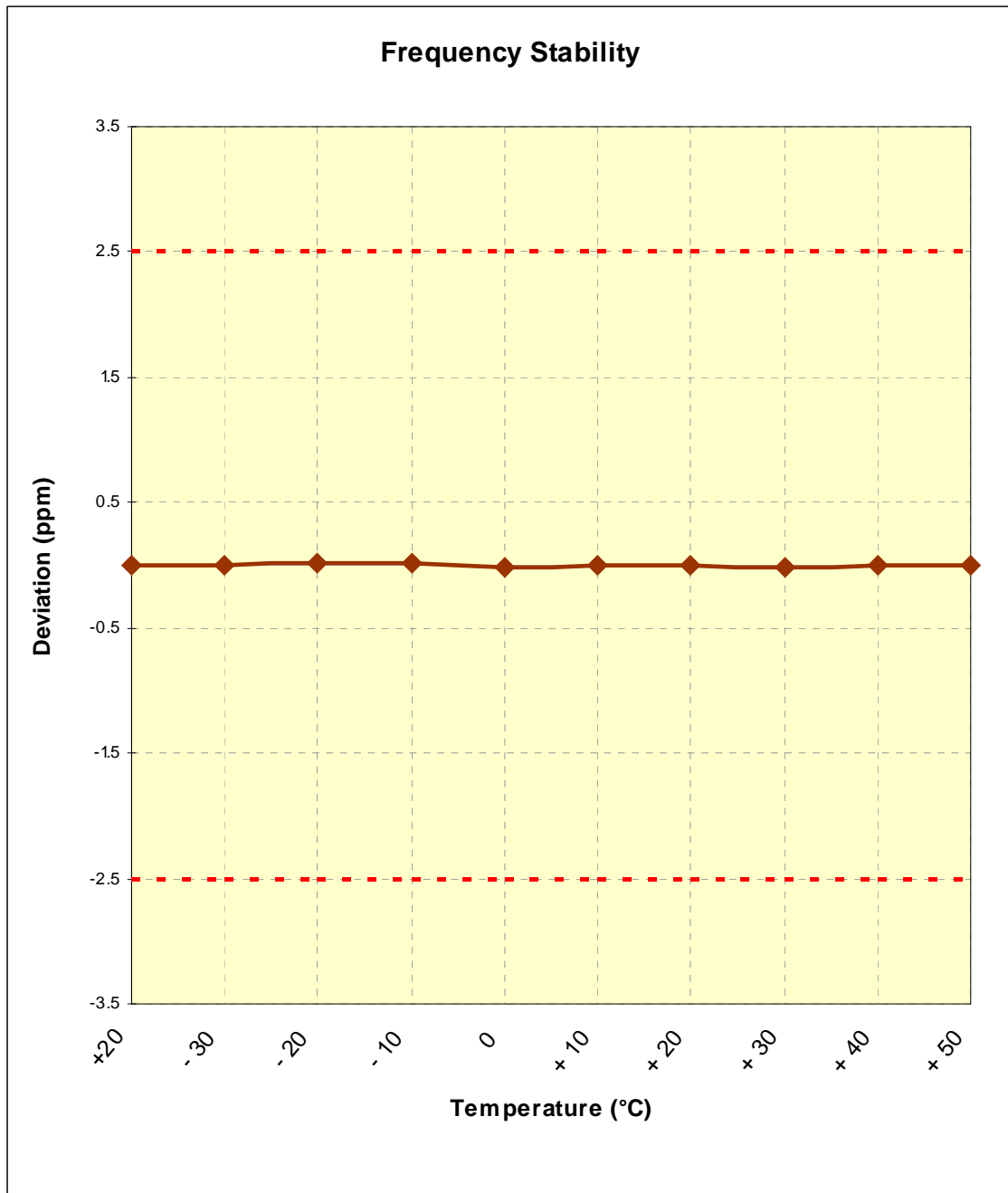
OPERATING FREQUENCY: 1,732,500,000 Hz  
 CHANNEL: 20175  
 REFERENCE VOLTAGE: 5 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

| VOLTAGE (%) | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|-------------|------------|----------------|-----------------|---------------|
| 100 %       | 5.00        | + 20 (Ref) | 1,732,499,997  | -3              | 0.000000      |
| 100 %       |             | - 30       | 1,732,500,005  | 5               | 0.000000      |
| 100 %       |             | - 20       | 1,732,500,015  | 15              | 0.000001      |
| 100 %       |             | - 10       | 1,732,500,023  | 23              | 0.000001      |
| 100 %       |             | 0          | 1,732,499,983  | -17             | -0.000001     |
| 100 %       |             | + 10       | 1,732,500,009  | 9               | 0.000001      |
| 100 %       |             | + 20       | 1,732,499,990  | -10             | -0.000001     |
| 100 %       |             | + 30       | 1,732,499,981  | -19             | -0.000001     |
| 100 %       |             | + 40       | 1,732,500,005  | 5               | 0.000000      |
| 100 %       |             | + 50       | 1,732,500,013  | 13              | 0.000001      |
| 115 %       |             | 5.75       | + 20           | 1,732,500,012   | 12            |
| 85 %        | 4.25        | + 20       | 1,732,499,988  | -12             | -0.000001     |



**Table 6-14. Frequency Stability Data (20MHz BW, QPSK, Band 4 (AWS) – Ch. 20175)**

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 25 of 83                   |

**Band 4 (AWS) LTE Frequency Stability Measurements (Cont'd)**  
§2.1055, §27.54



**Figure 6-2. Frequency Stability Graph (20MHz BW, QPSK, Band 4 (AWS) – Ch. 20175)**

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |   | Page 26 of 83                   |



## 6.8 Band 17 LTE Frequency Stability Measurements

\$2.1055, \$27.54

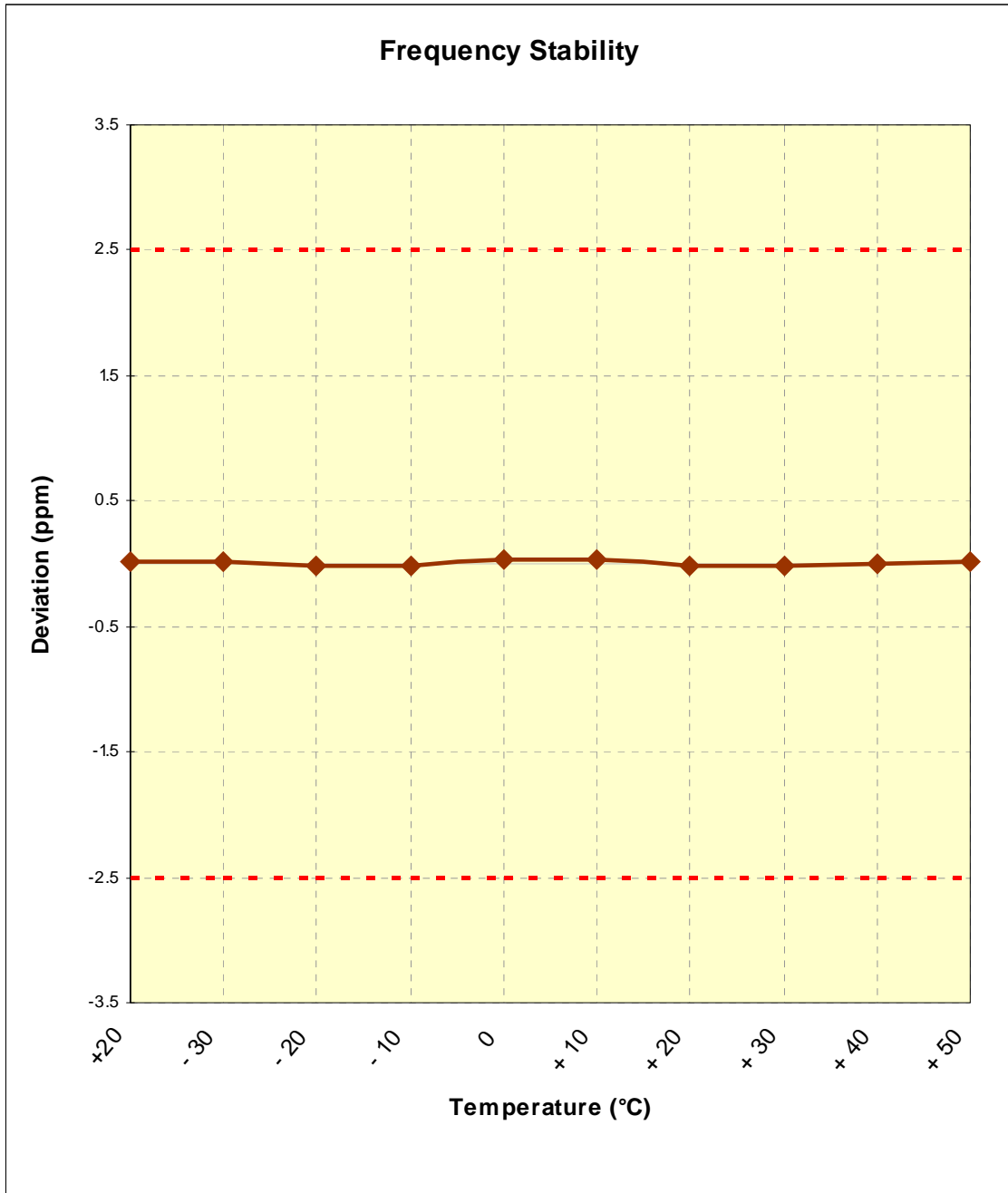
OPERATING FREQUENCY: 710,000,000 Hz  
 CHANNEL: 23790  
 REFERENCE VOLTAGE: 5 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

| VOLTAGE (%) | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|-------------|-------------|------------|----------------|-----------------|---------------|
| 100 %       | 5.00        | + 20 (Ref) | 710,000,008    | 8               | 0.000001      |
| 100 %       |             | - 30       | 710,000,010    | 10              | 0.000001      |
| 100 %       |             | - 20       | 709,999,983    | -17             | -0.000002     |
| 100 %       |             | - 10       | 709,999,988    | -12             | -0.000002     |
| 100 %       |             | 0          | 710,000,020    | 20              | 0.000003      |
| 100 %       |             | + 10       | 710,000,027    | 27              | 0.000004      |
| 100 %       |             | + 20       | 709,999,990    | -10             | -0.000001     |
| 100 %       |             | + 30       | 709,999,986    | -14             | -0.000002     |
| 100 %       |             | + 40       | 710,000,003    | 3               | 0.000000      |
| 100 %       |             | + 50       | 710,000,006    | 6               | 0.000001      |
| 115 %       | 5.75        | + 20       | 710,000,016    | 16              | 0.000002      |
| 85 %        | 4.25        | + 20       | 709,999,983    | -17             | -0.000002     |

**Table 6-15. Frequency Stability Data (5MHz BW, QPSK, Band 17 – Ch. 23790)**

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011  | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem | Page 27 of 83   |                                 |

**PCS LTE Frequency Stability Measurements (Cont'd)**  
§2.1055, §27.54

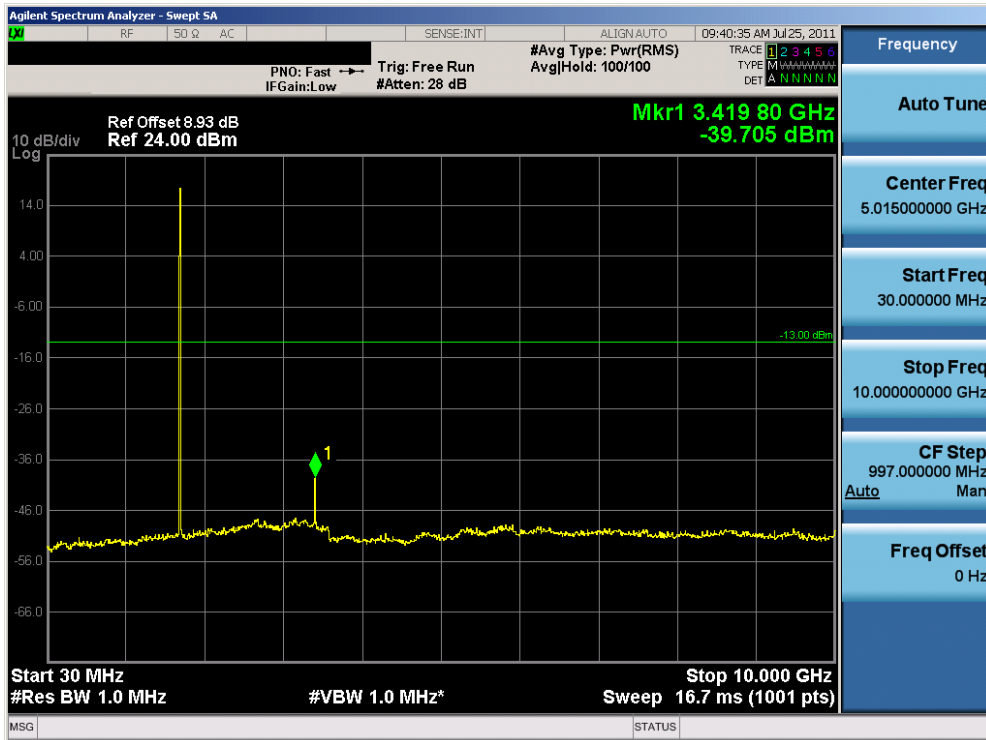


**Figure 6-3. Frequency Stability Graph (5MHz BW, QPSK, Band 17 – Ch. 23790)**

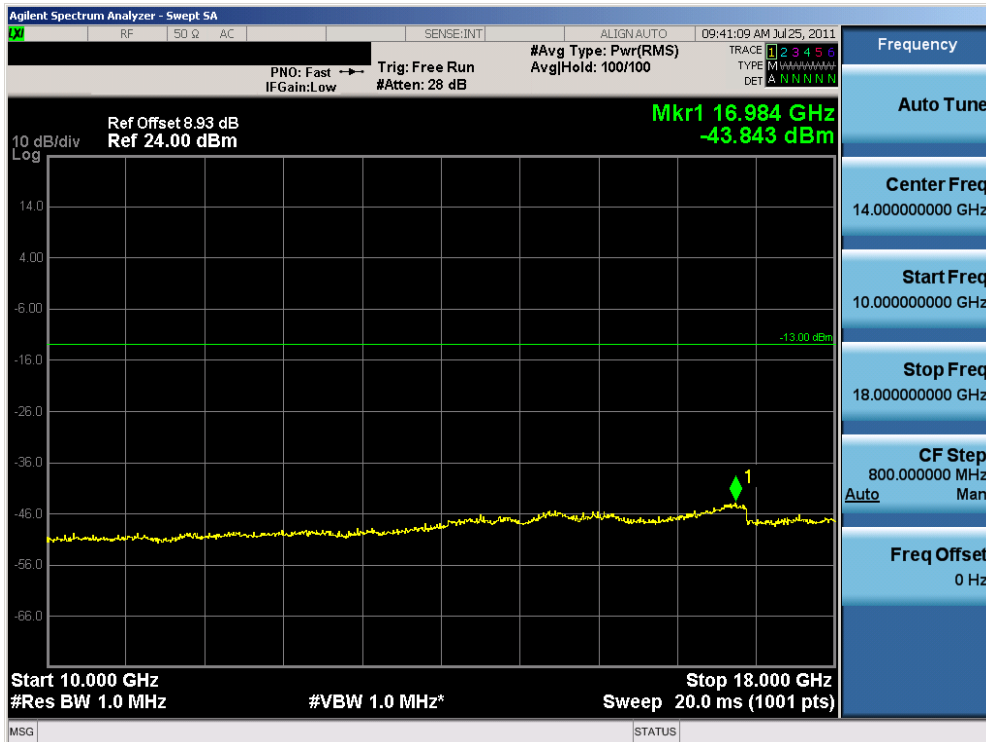
|   |   |   |  |  |
|---|---|---|--|--|
| <b>FCC ID:</b> PKRNVWMC679                  |   | <b>FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)</b>                          |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1106221044.PKR | <b>Test Dates:</b><br>June 27 - July 29, 2011 | <b>EUT Type:</b><br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 28 of 83                          |



## 7.0 PLOT(S) OF EMISSIONS – AWS BAND



**Plot 7-1. Conducted Spurious Plot (1.4MHz BW, QPSK, AWS Band – Low Channel)**

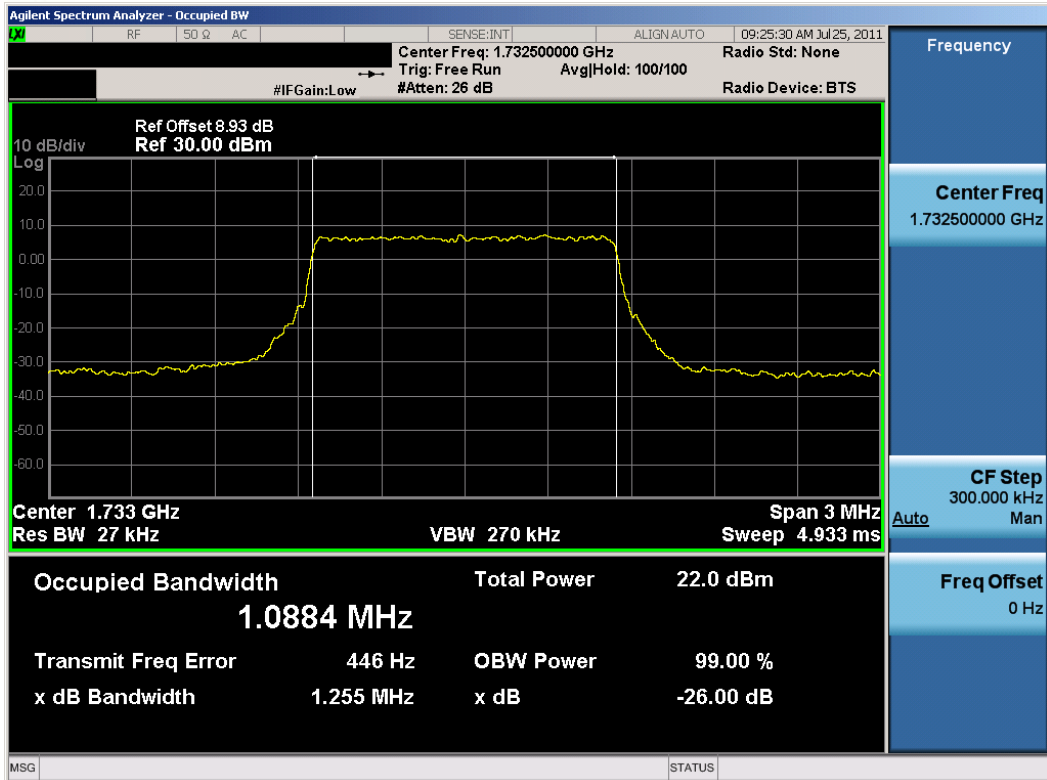


**Plot 7-2. Conducted Spurious Plot (1.4MHz BW, QPSK, AWS Band – Low Channel)**

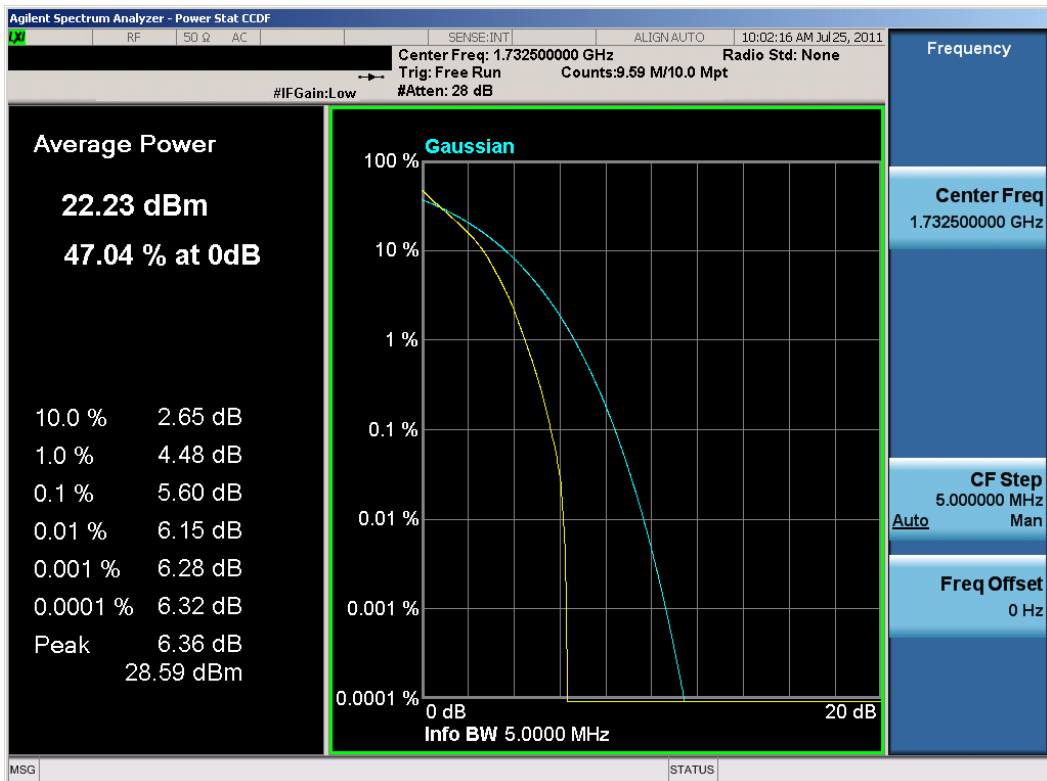
|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | <b>FCC Pt. 27 LTE MEASUREMENT REPORT<br/>(CERTIFICATION)</b>               |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 29 of 83                   |





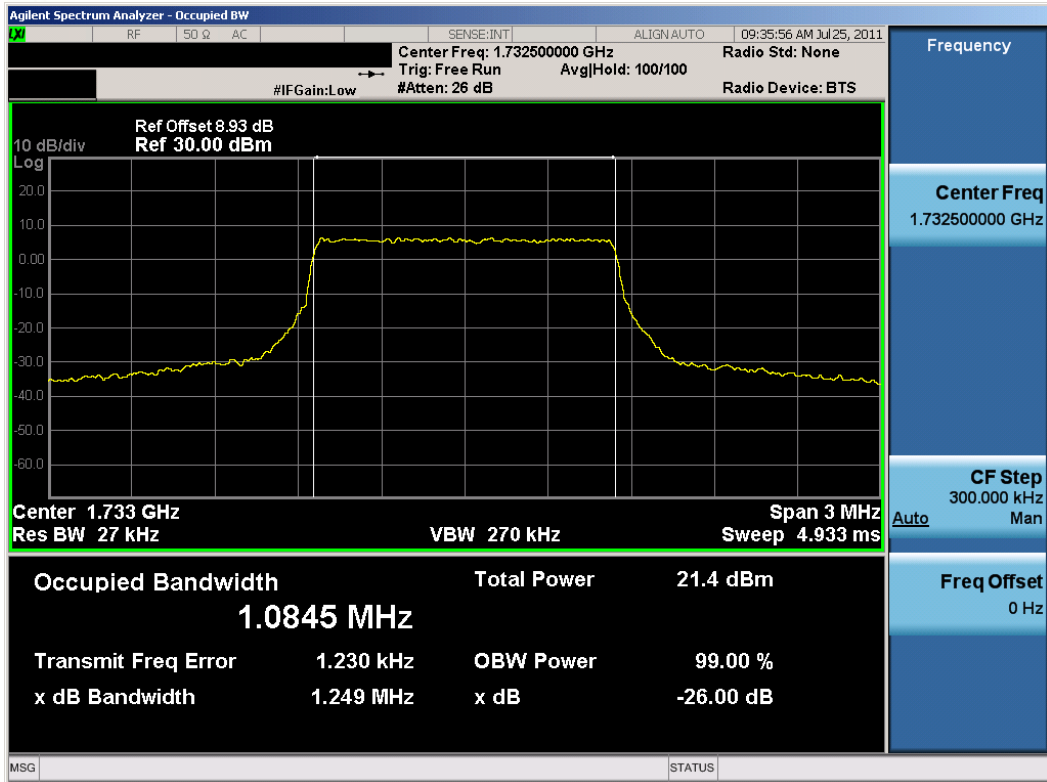


Plot 7-7. Occupied Bandwidth Plot (1.4MHz BW, QPSK, AWS Band – Mid Channel)

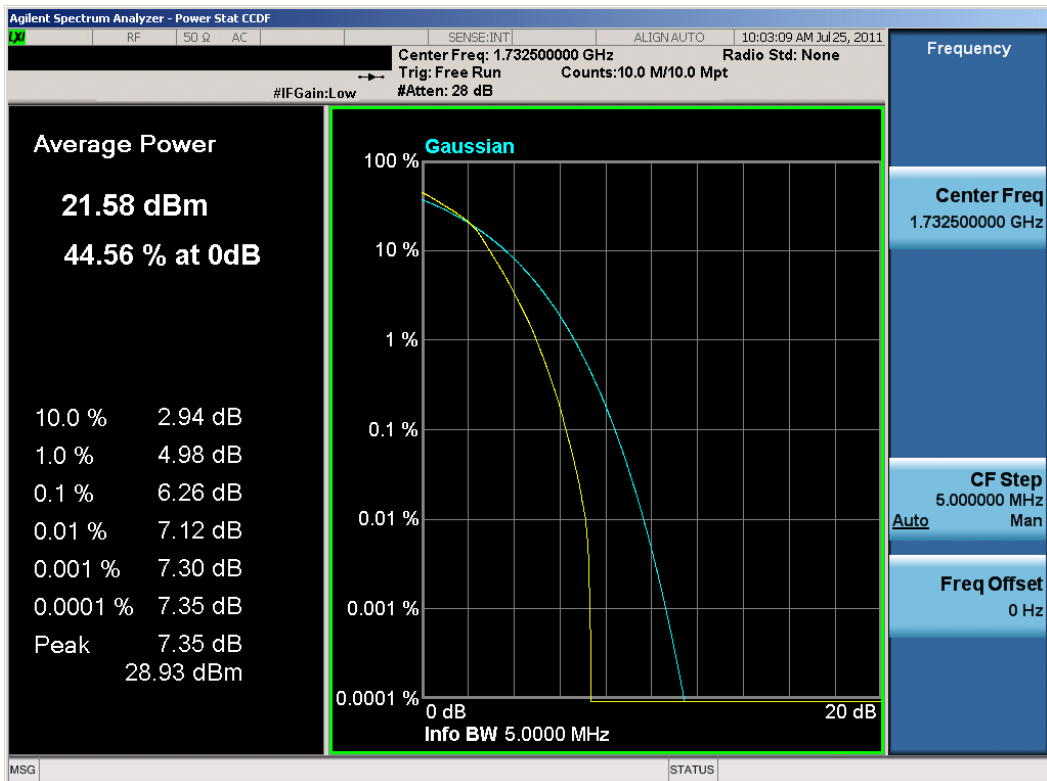


Plot 7-8. Peak-Average Ratio Plot (1.4MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 32 of 83                   |

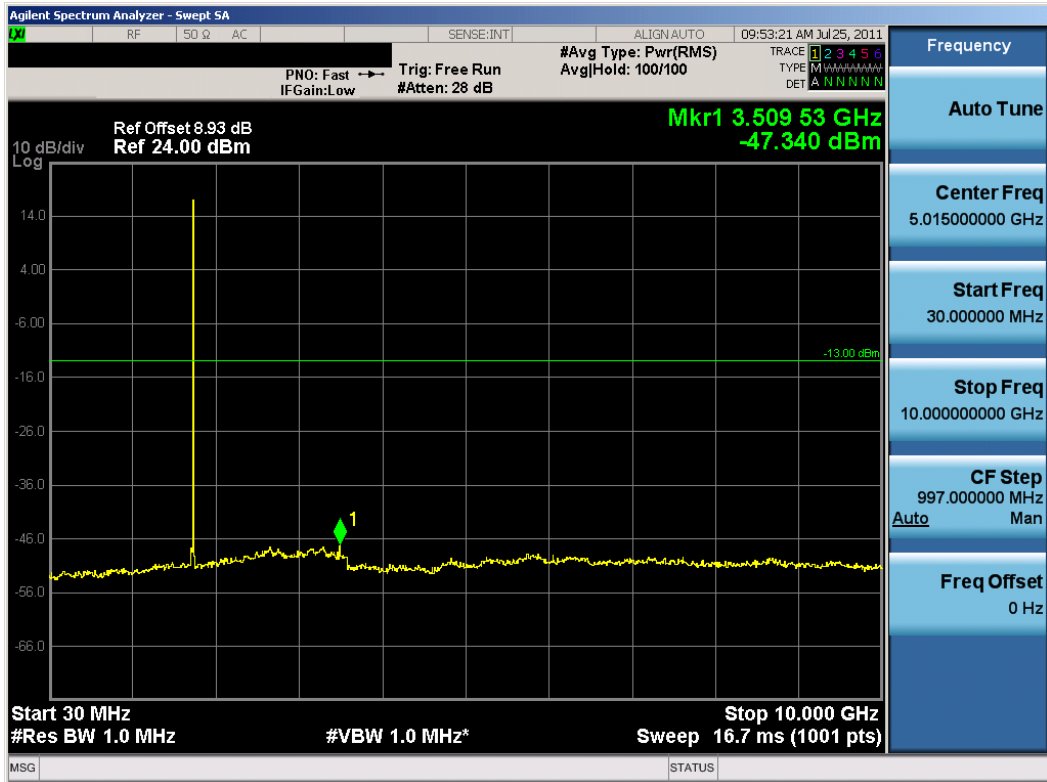


Plot 7-9. Occupied Bandwidth Plot (1.4MHz BW, 16-QAM, AWS Band – Mid Channel)

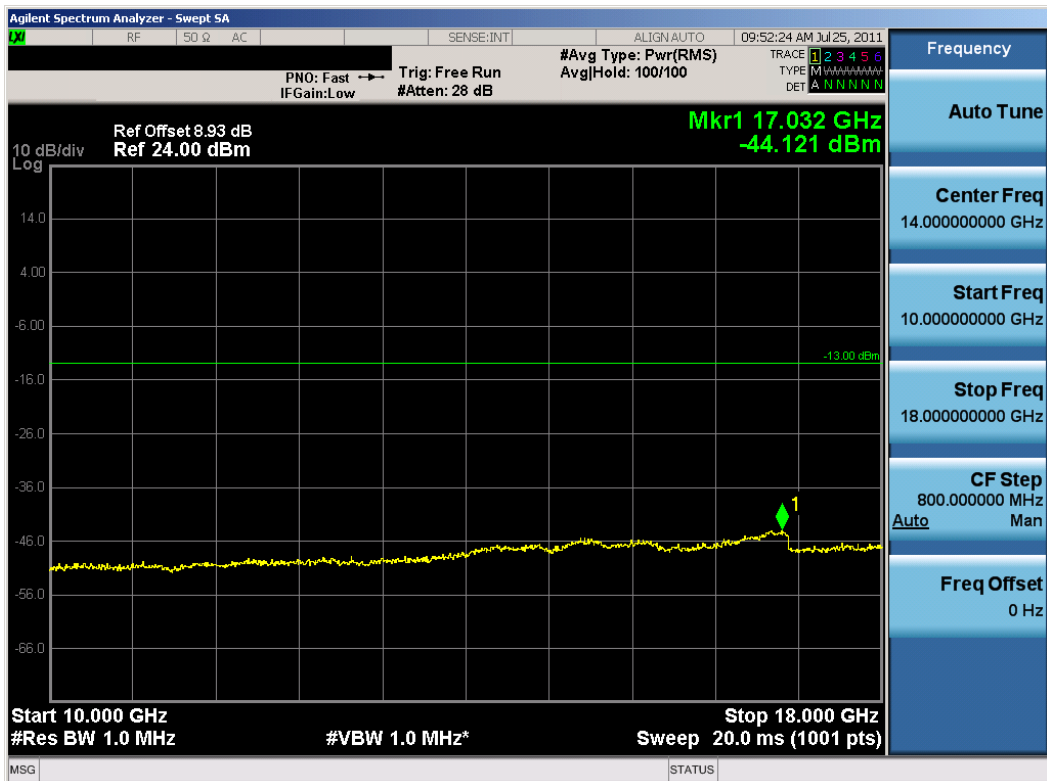


Plot 7-10. Peak-Average Ratio Plot (1.4MHz BW, 16-QAM, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 33 of 83                   |



Plot 7-11. Conducted Spurious Plot (1.4MHz BW, QPSK, AWS Band – High Channel)

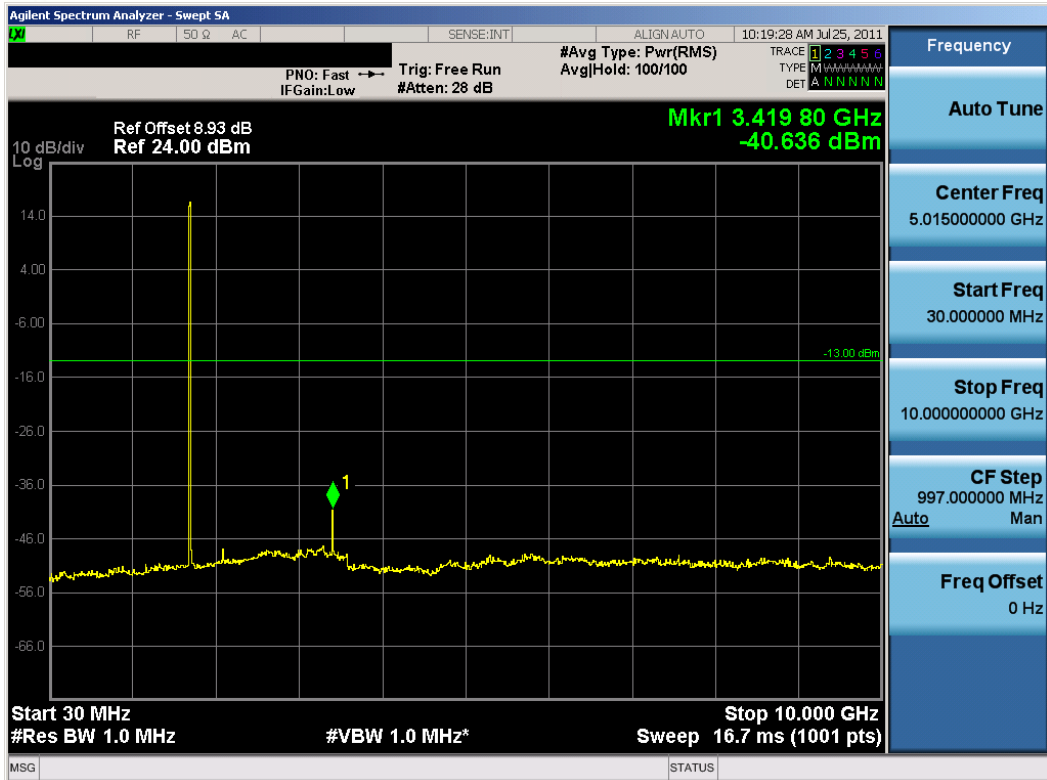


Plot 7-12. Conducted Spurious Plot (1.4MHz BW, QPSK, AWS Band – High Channel)

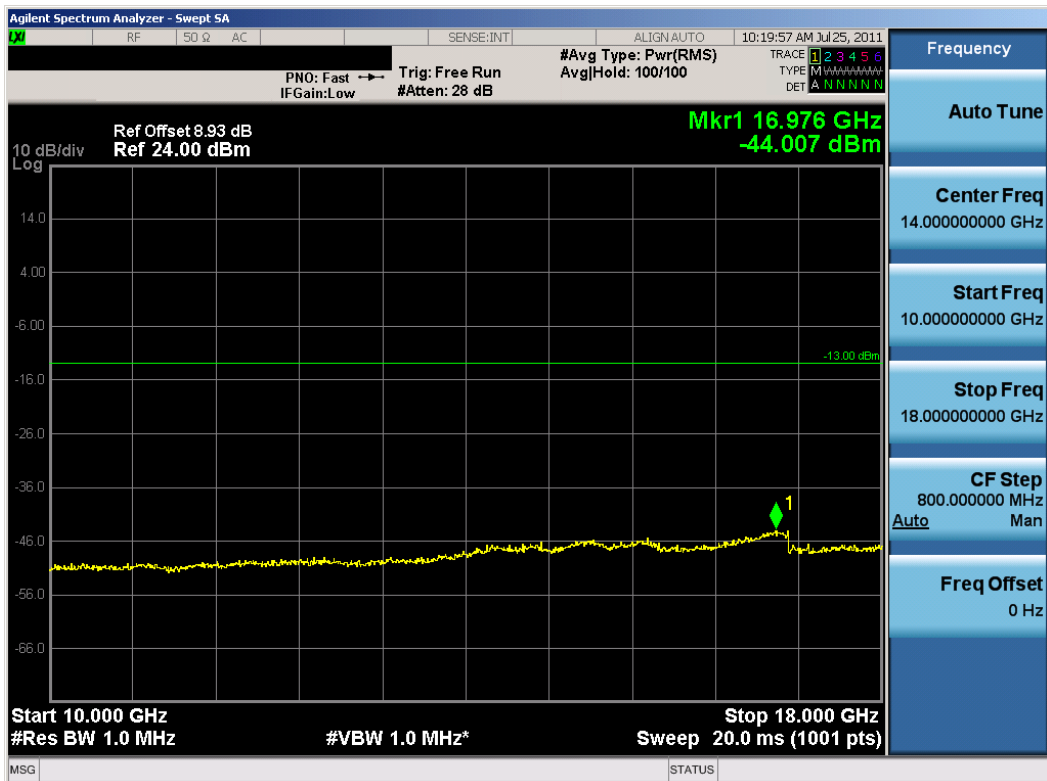
|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 34 of 83                   |







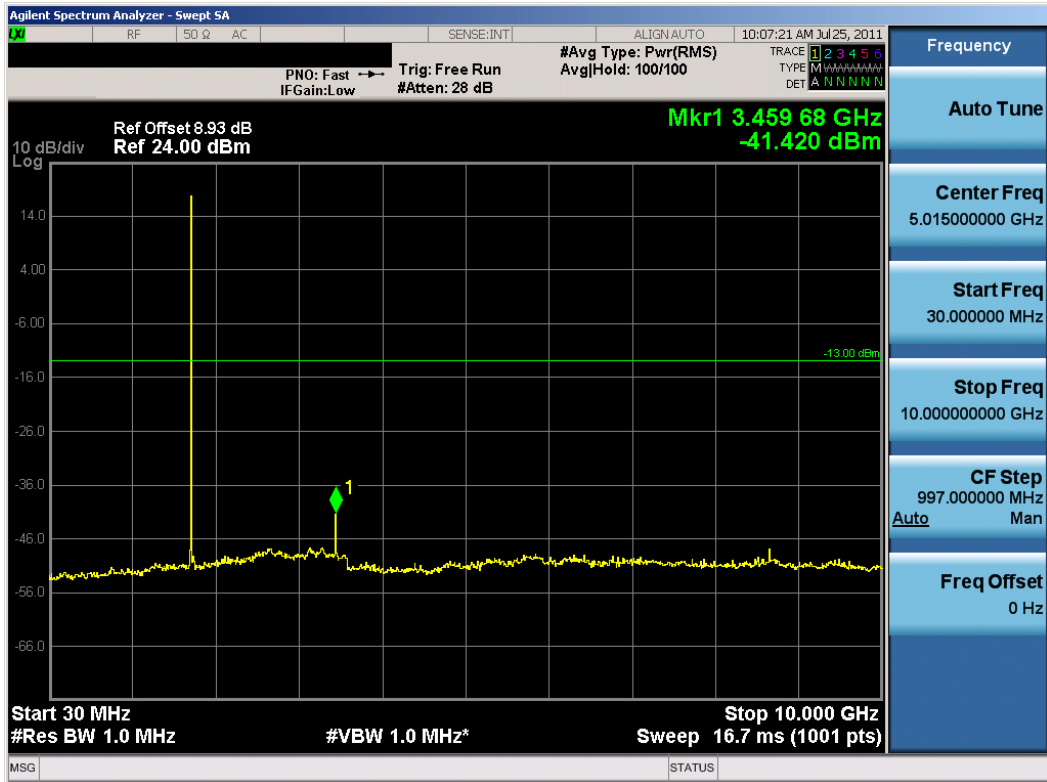
Plot 7-15. Conducted Spurious Plot (3MHz BW, QPSK, AWS Band – Low Channel)



Plot 7-16. Conducted Spurious Plot (3MHz BW, QPSK, AWS Band – Low Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 36 of 83                   |



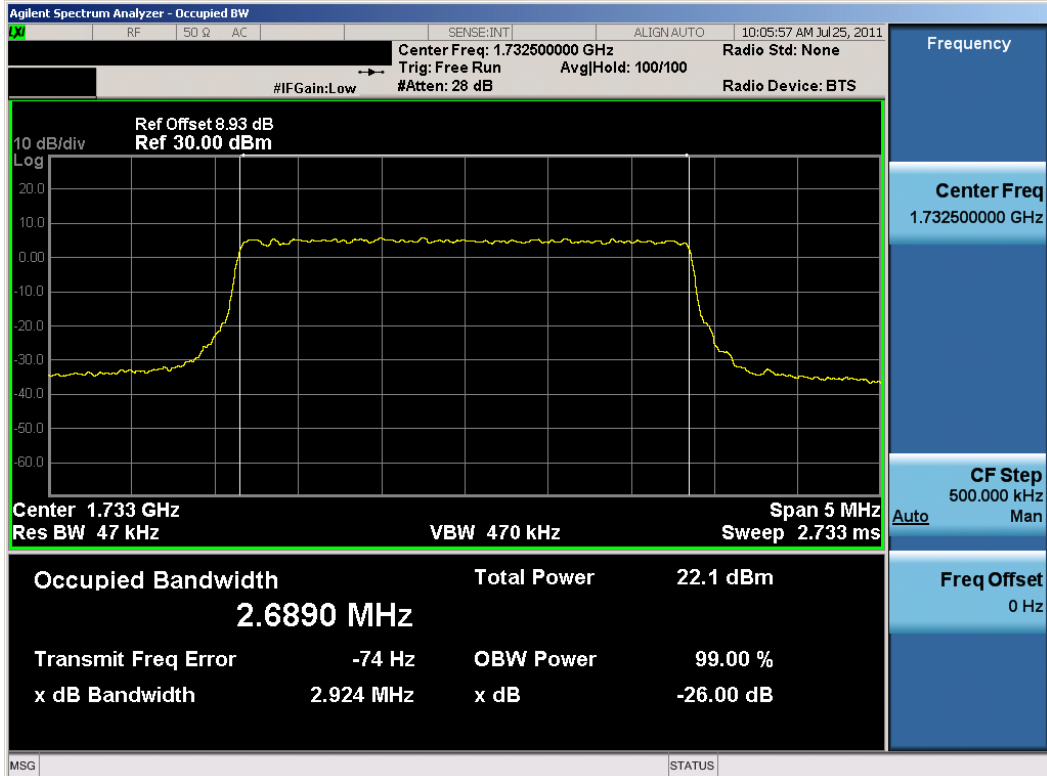


Plot 7-19. Conducted Spurious Plot (3MHz BW, QPSK, AWS Band – Mid Channel)

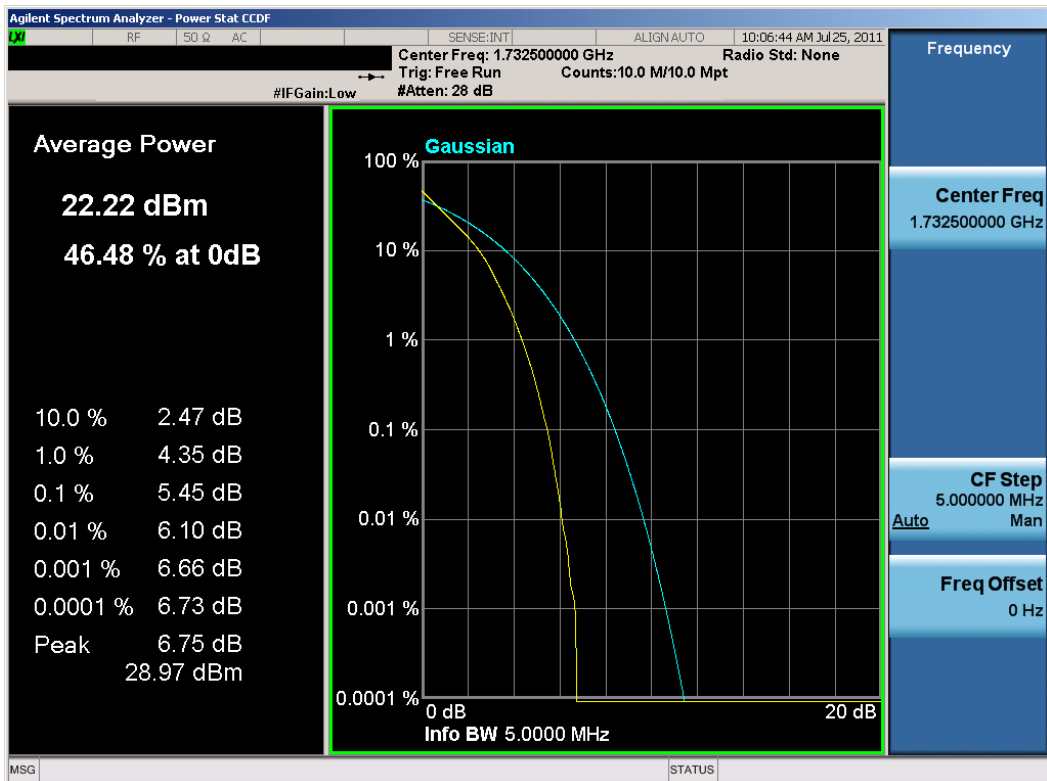


Plot 7-20. Conducted Spurious Plot (3MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 38 of 83                   |

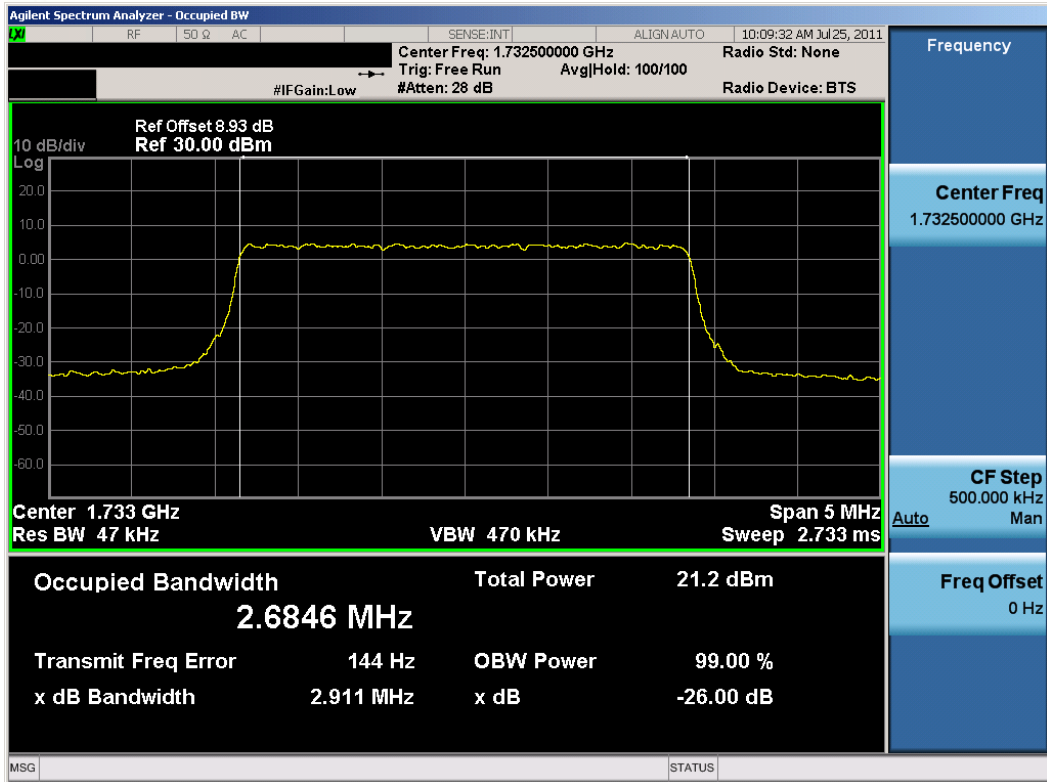


Plot 7-21. Occupied Bandwidth Plot (3MHz BW, QPSK, AWS Band – Mid Channel)

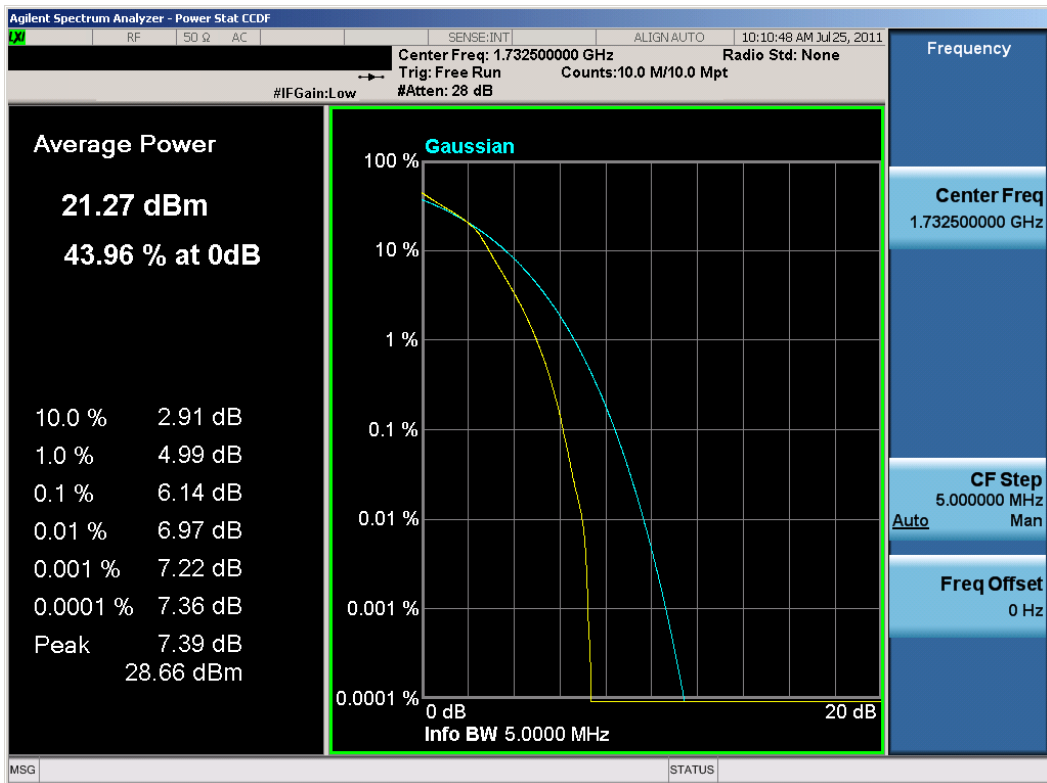


Plot 7-22. Peak-Average Ratio Plot (3MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 39 of 83                   |

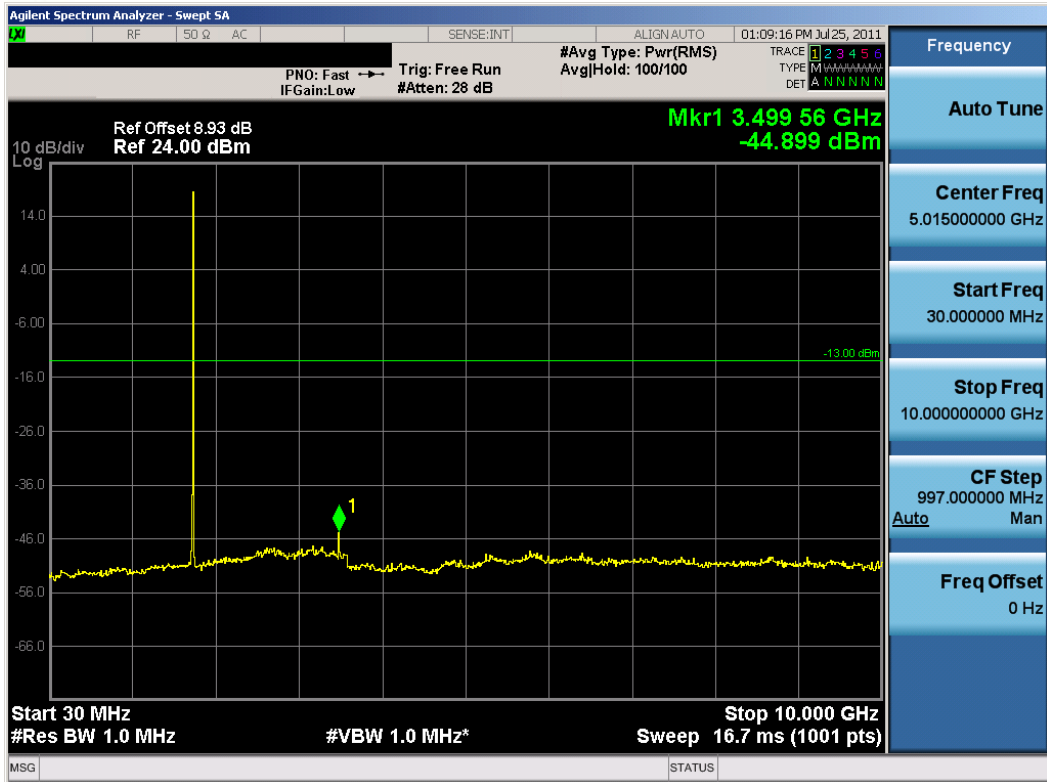


Plot 7-23. Occupied Bandwidth Plot (3MHz BW, 16-QAM, AWS Band – Mid Channel)



Plot 7-24. Peak-Average Ratio Plot (3MHz BW, 16-QAM, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 40 of 83                   |



Plot 7-25. Conducted Spurious Plot (3MHz BW, QPSK, AWS Band – High Channel)

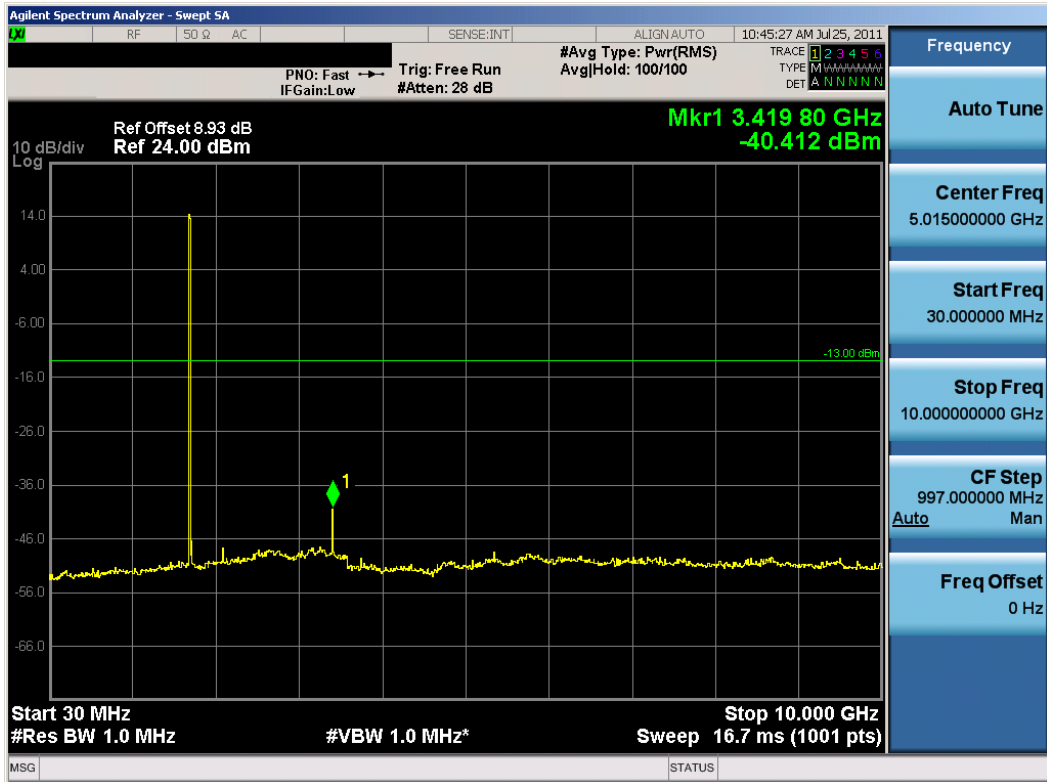


Plot 7-26. Conducted Spurious Plot (3MHz BW, QPSK, AWS Band – High Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 41 of 83                   |





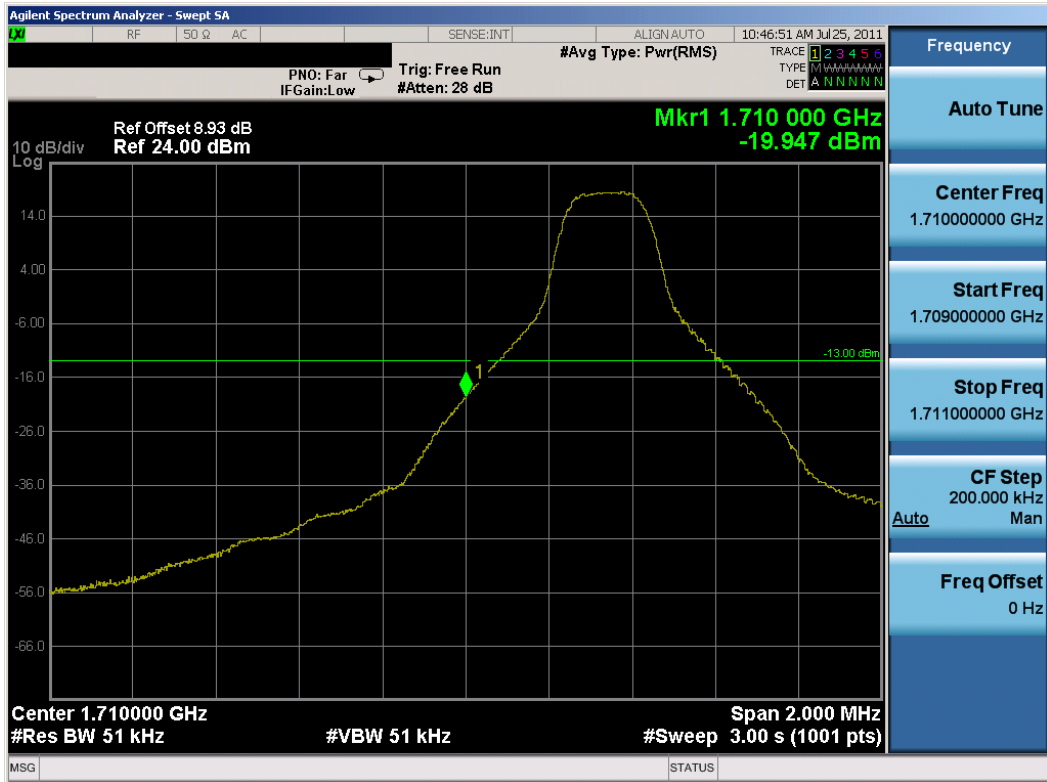


Plot 7-29. Conducted Spurious Plot (5MHz BW, QPSK, AWS Band – Low Channel)

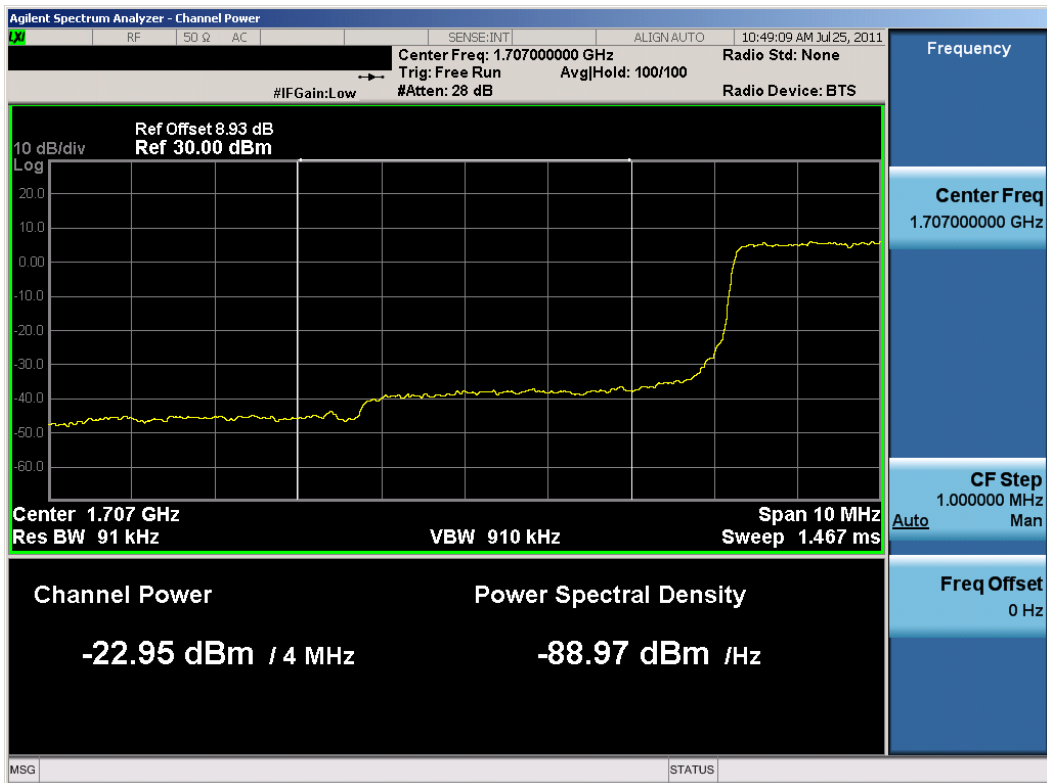


Plot 7-30. Conducted Spurious Plot (5MHz BW, QPSK, AWS Band – Low Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 43 of 83                   |



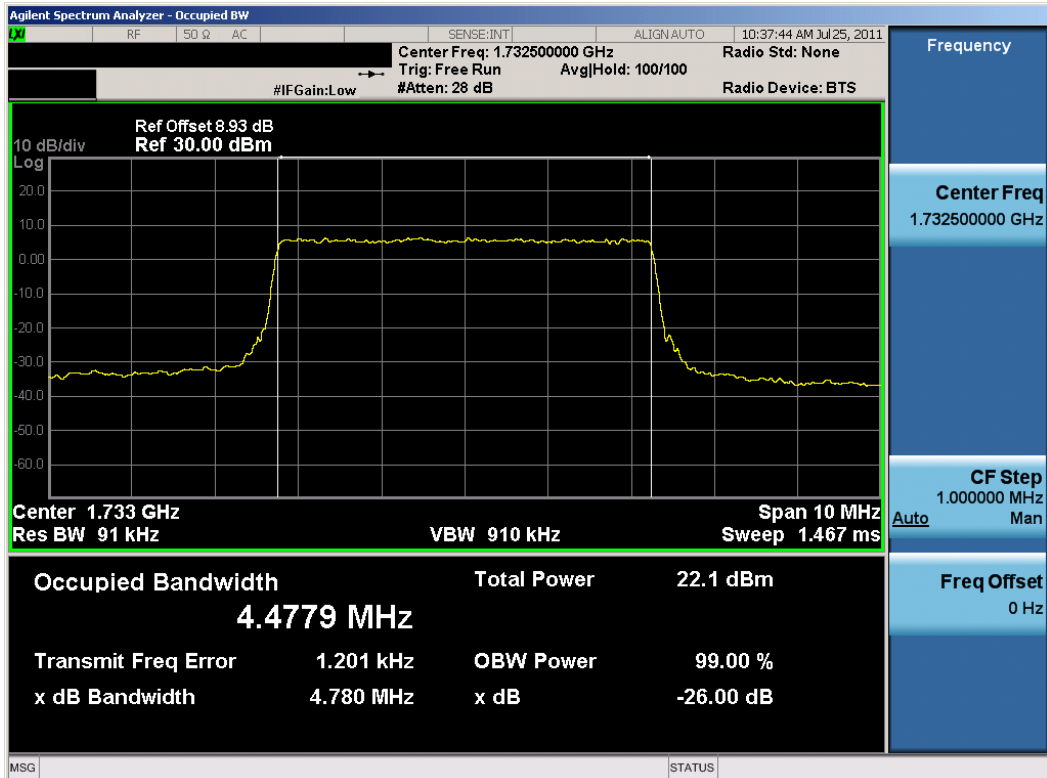
Plot 7-31. Band Edge Plot (5MHz BW, QPSK, AWS Band – Low Channel)



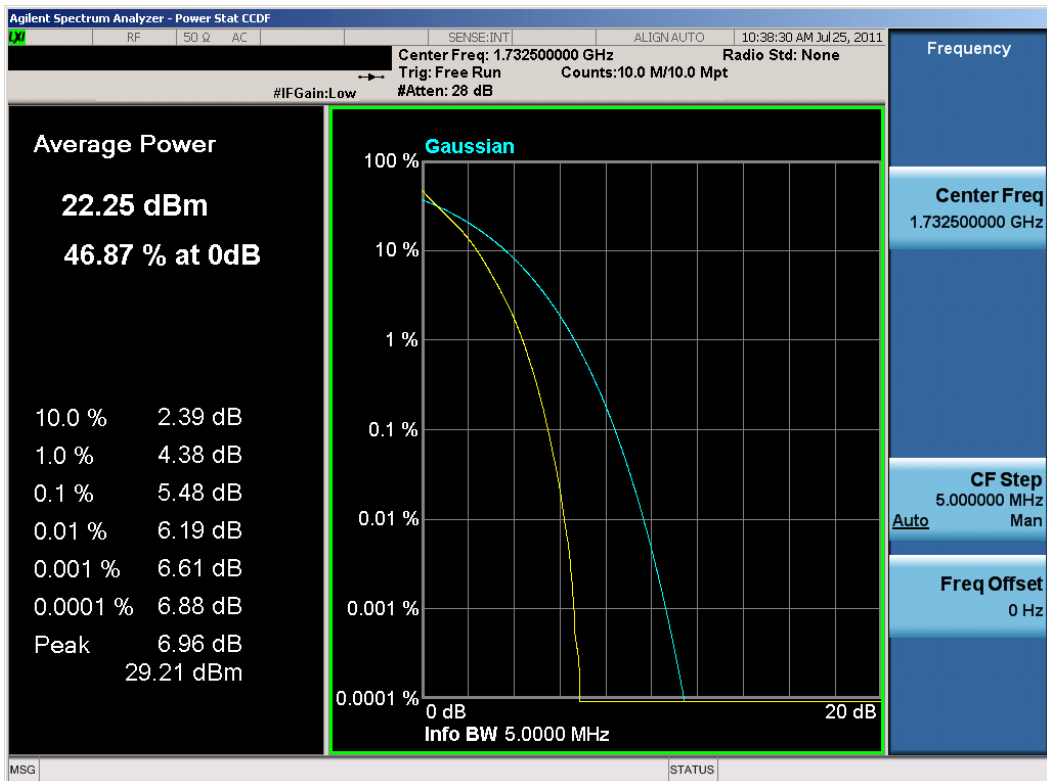
Plot 7-32. Extended Band Edge Plot (5MHz BW, QPSK, AWS Band – Low Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 44 of 83                   |



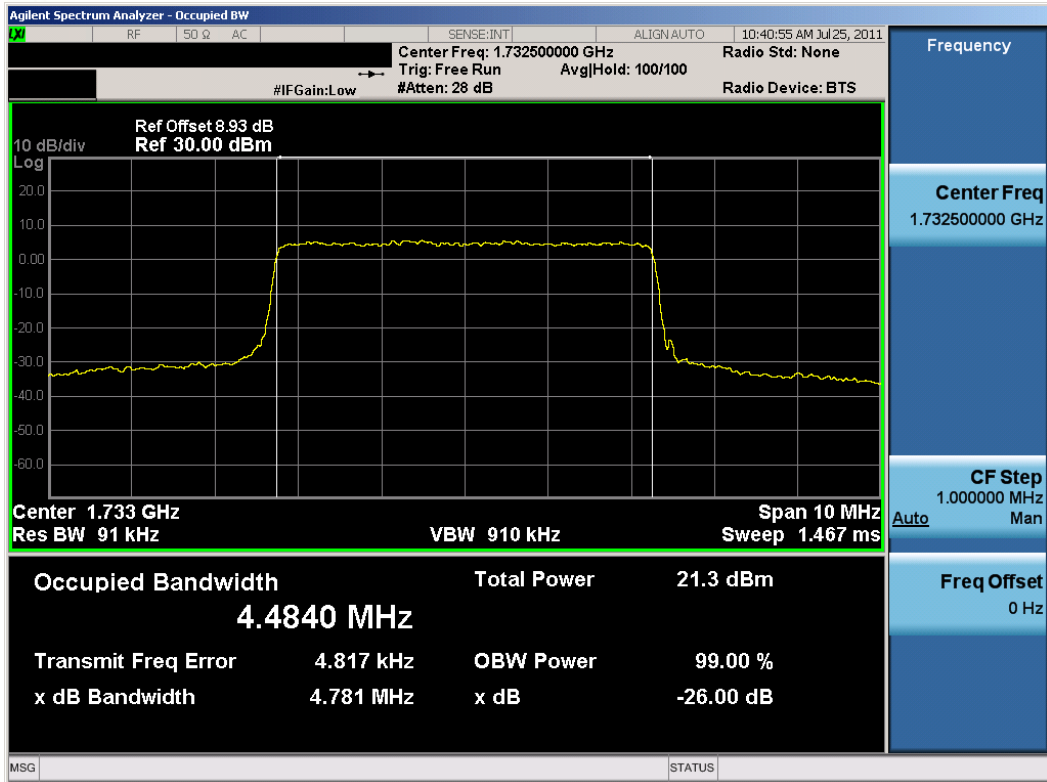


Plot 7-35. Occupied Bandwidth Plot (5MHz BW, QPSK, AWS Band – Mid Channel)

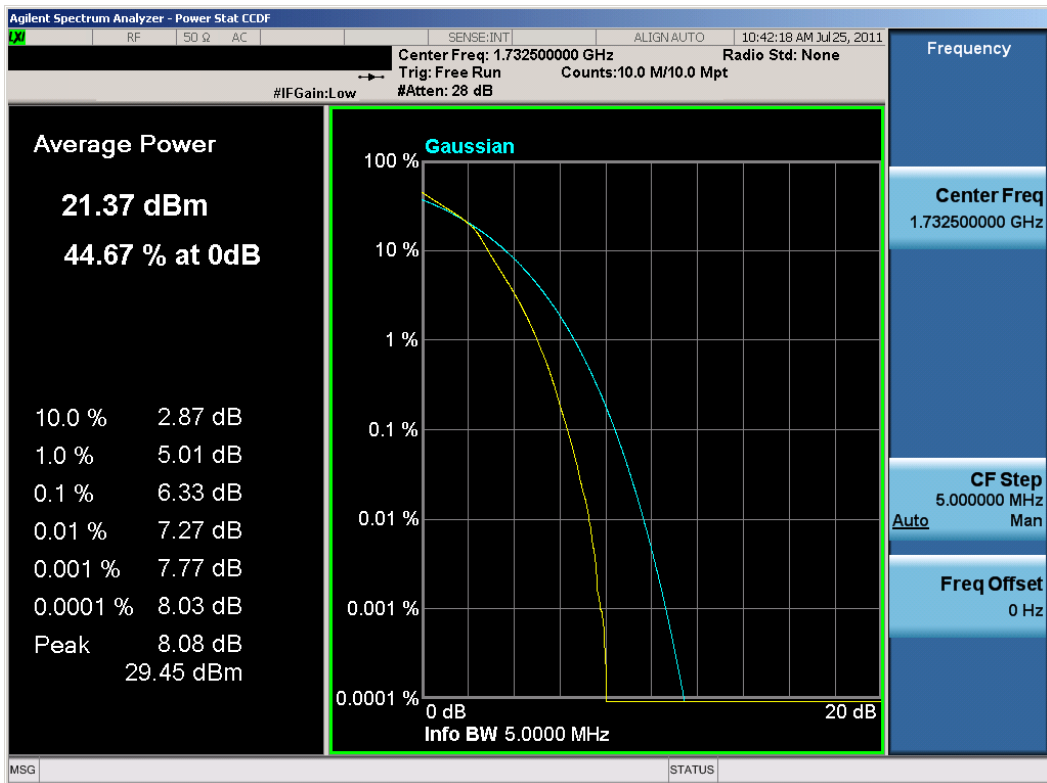


Plot 7-36. Peak-Average Ratio Plot (5MHz BW, QPSK, AWS Band – Mid Channel)

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|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 46 of 83                   |



Plot 7-37. Occupied Bandwidth Plot (5MHz BW, 16-QAM, AWS Band – Mid Channel)



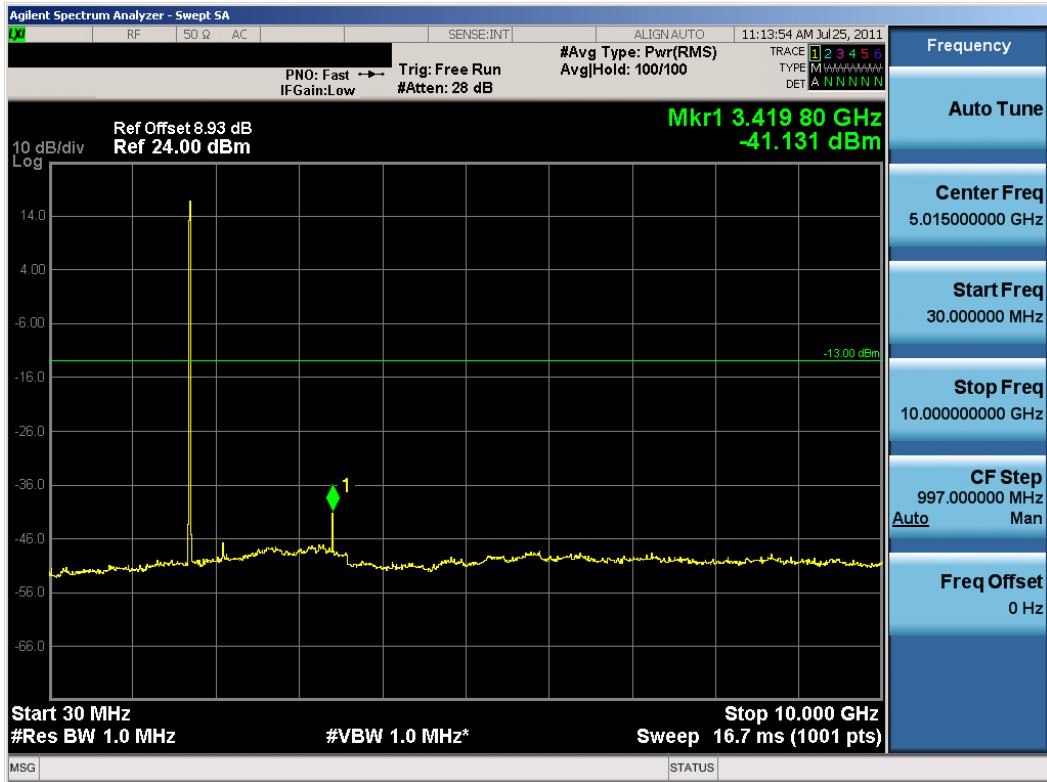
Plot 7-38. Peak-Average Ratio Plot (5MHz BW, 16-QAM, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 47 of 83                   |









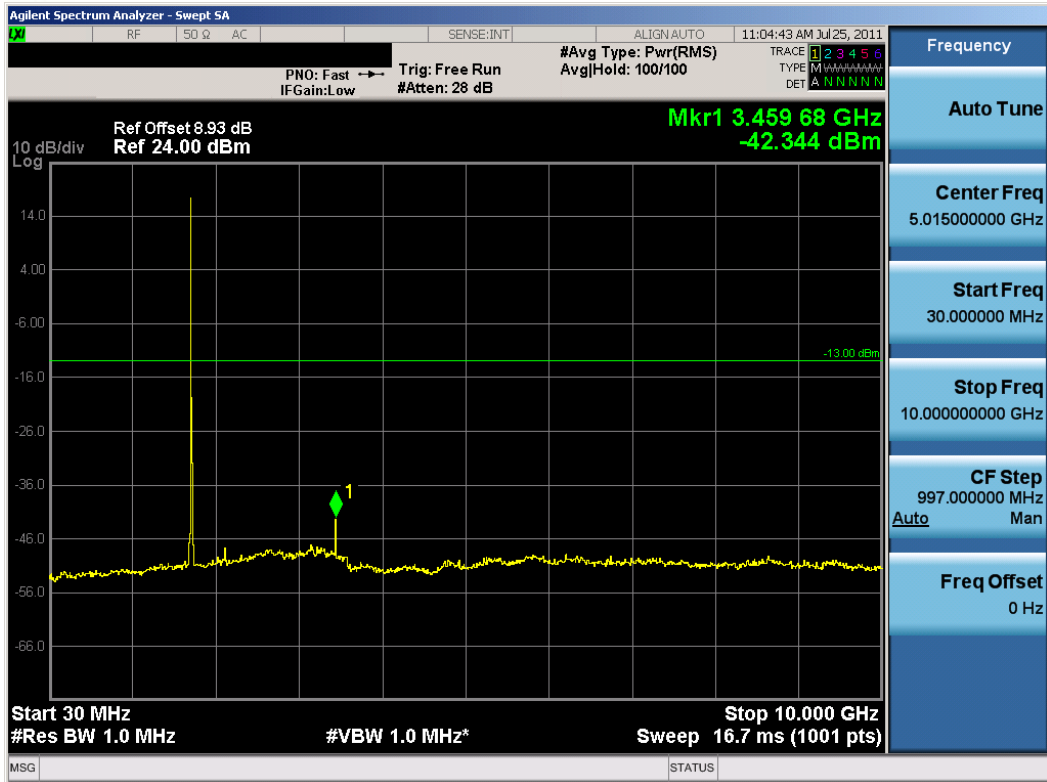
Plot 7-43. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – Low Channel)



Plot 7-44. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – Low Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 50 of 83                   |



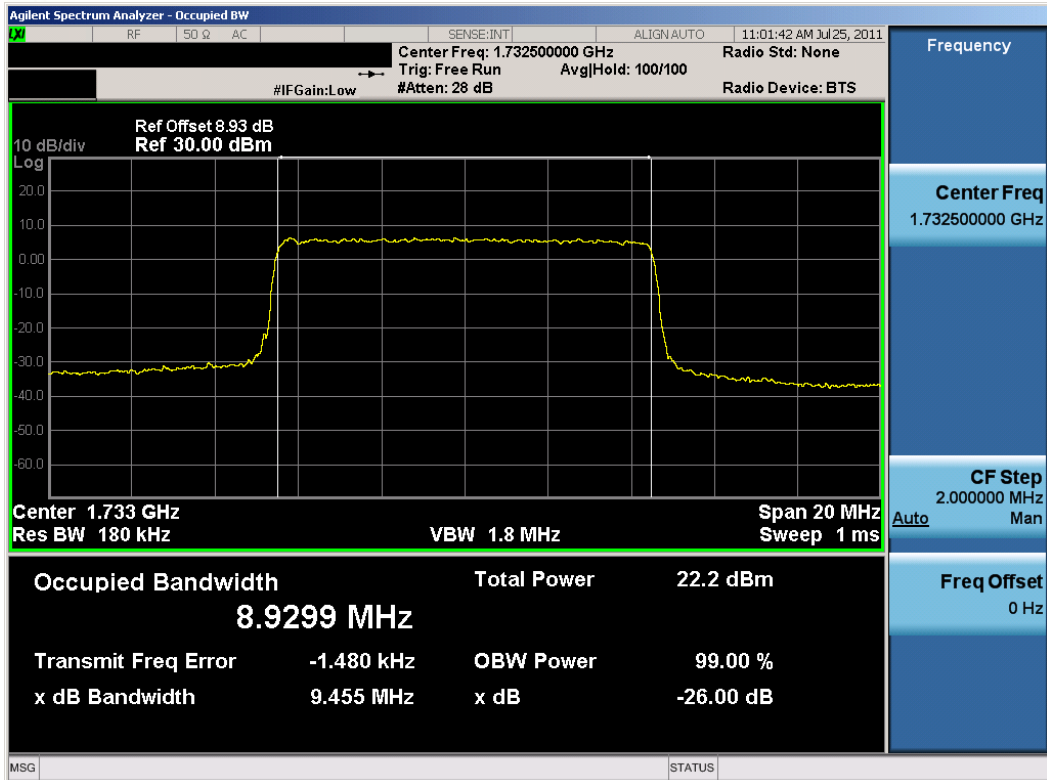


Plot 7-47. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – Mid Channel)

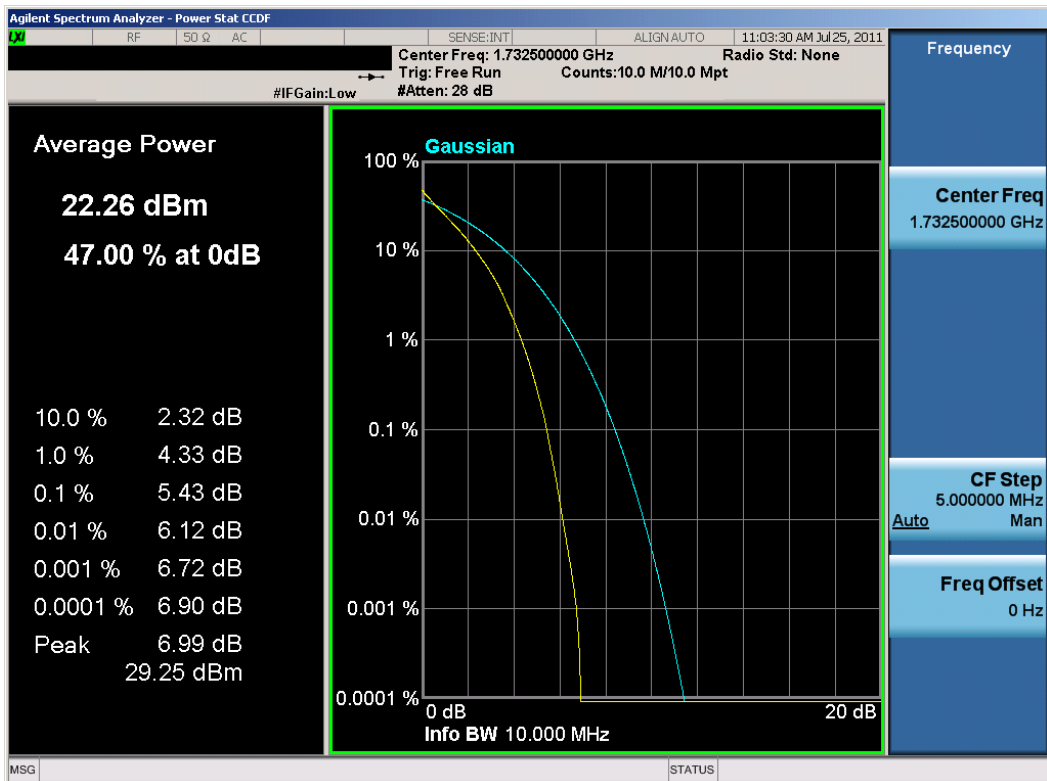


Plot 7-48. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 52 of 83                   |

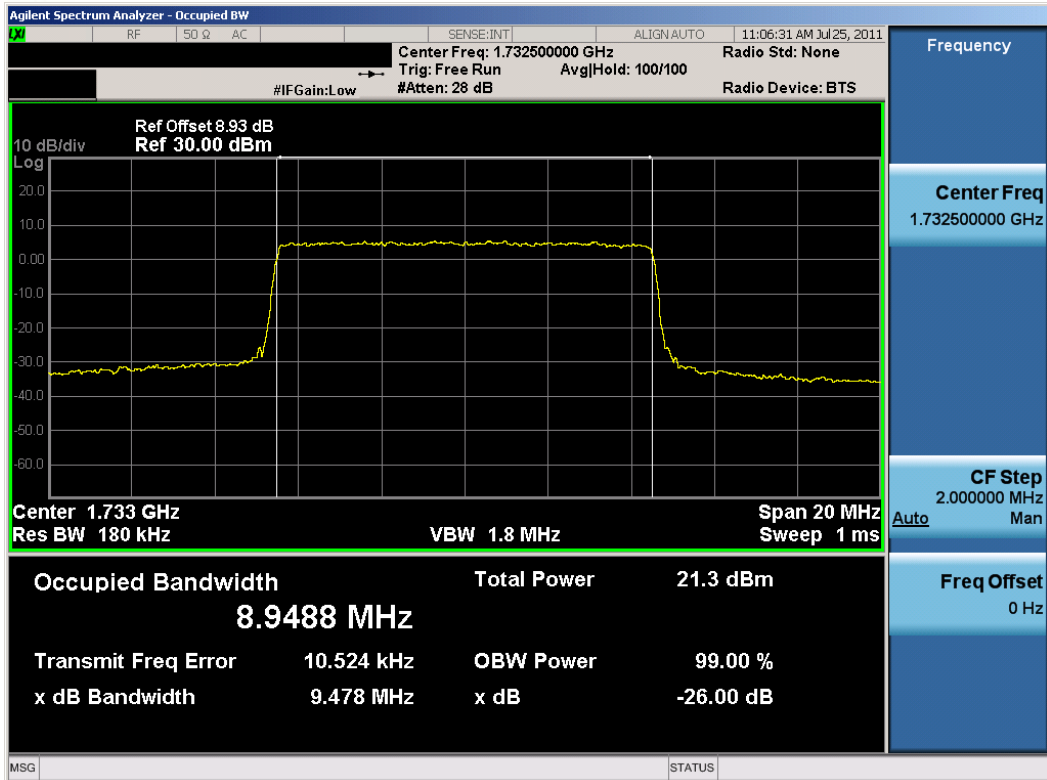


Plot 7-49. Occupied Bandwidth Plot (10MHz BW, QPSK, AWS Band – Mid Channel)

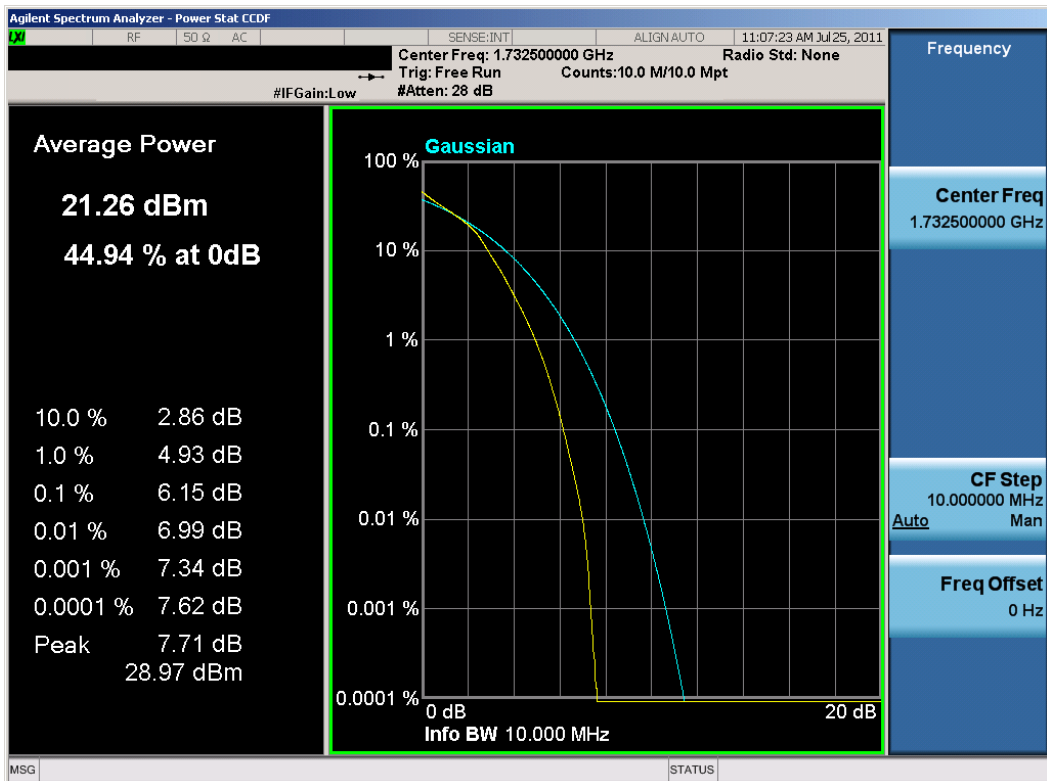


Plot 7-50. Peak-Average Ratio Plot (10MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 53 of 83                   |

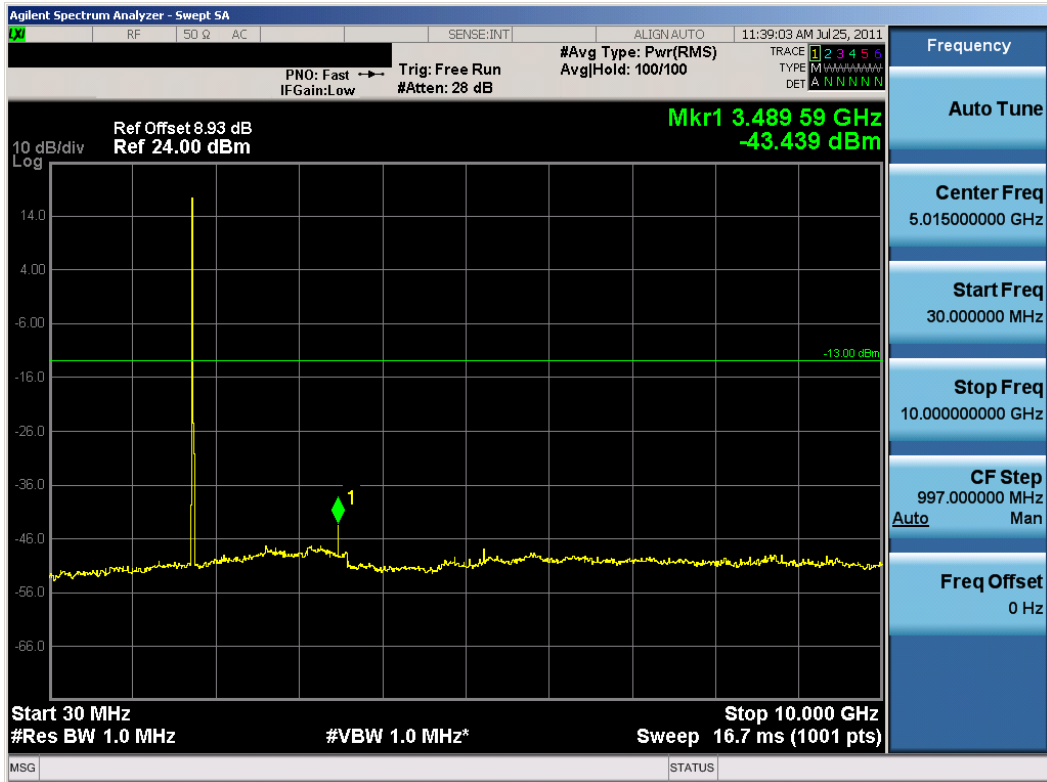


Plot 7-51. Occupied Bandwidth Plot (10MHz BW, 16-QAM, AWS Band – Mid Channel)



Plot 7-52. Peak-Average Ratio Plot (10MHz BW, 16-QAM, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
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| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 54 of 83                   |



Plot 7-53. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – High Channel)

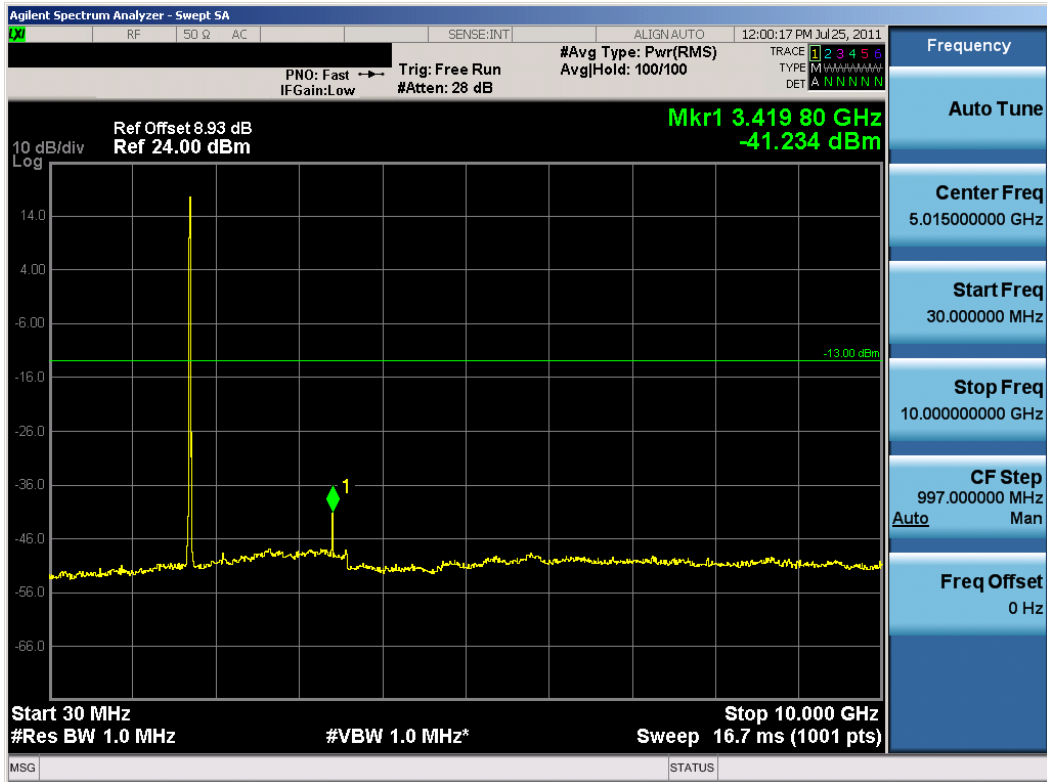


Plot 7-54. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – High Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 55 of 83                   |







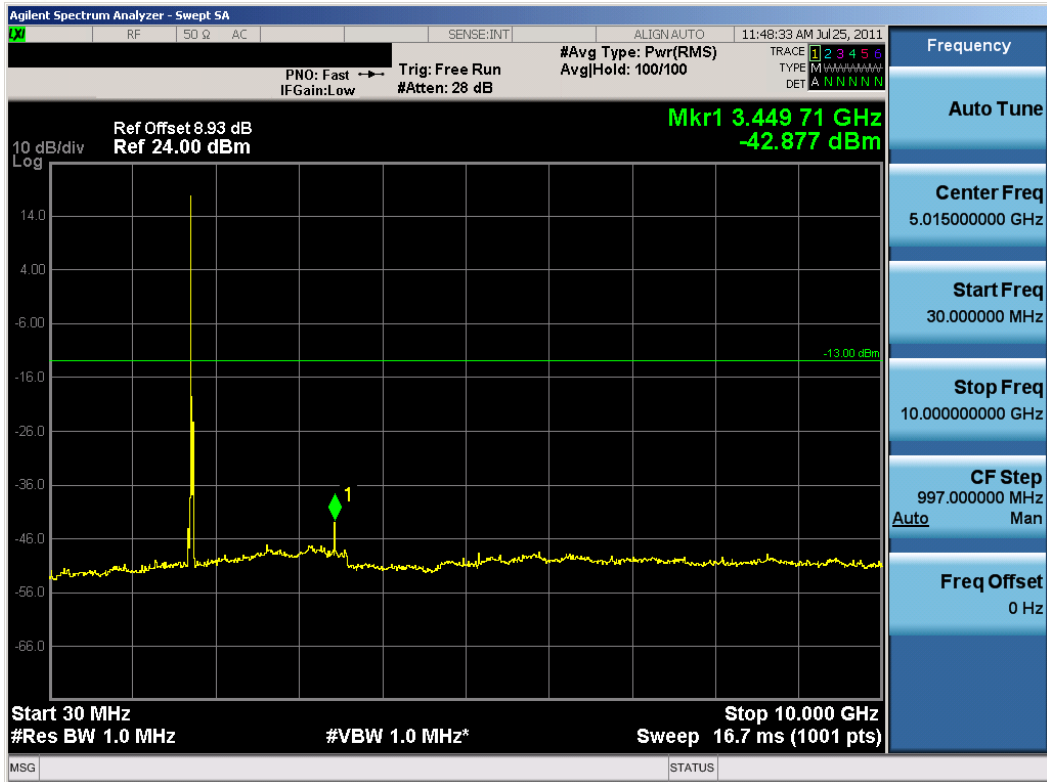
Plot 7-57. Conducted Spurious Plot (15MHz BW, QPSK, AWS Band – Low Channel)



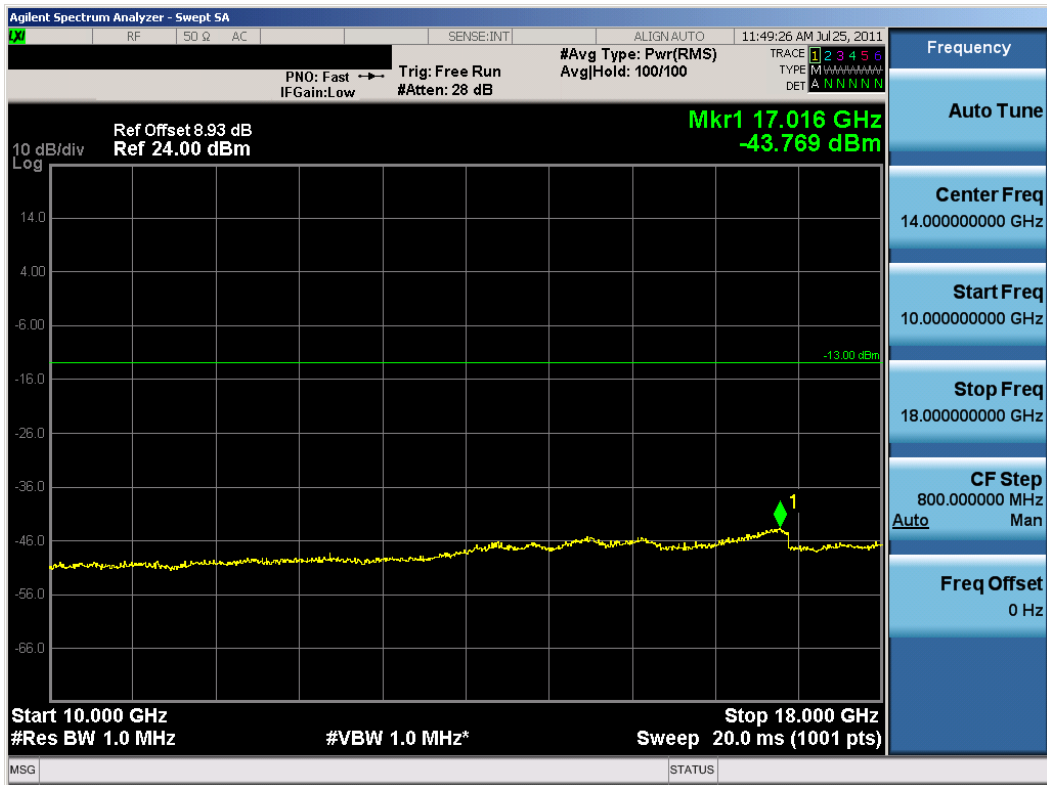
Plot 7-58. Conducted Spurious Plot (15MHz BW, QPSK, AWS Band – Low Channel)

|                                      |  |  |  |                                 |
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| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 57 of 83                   |



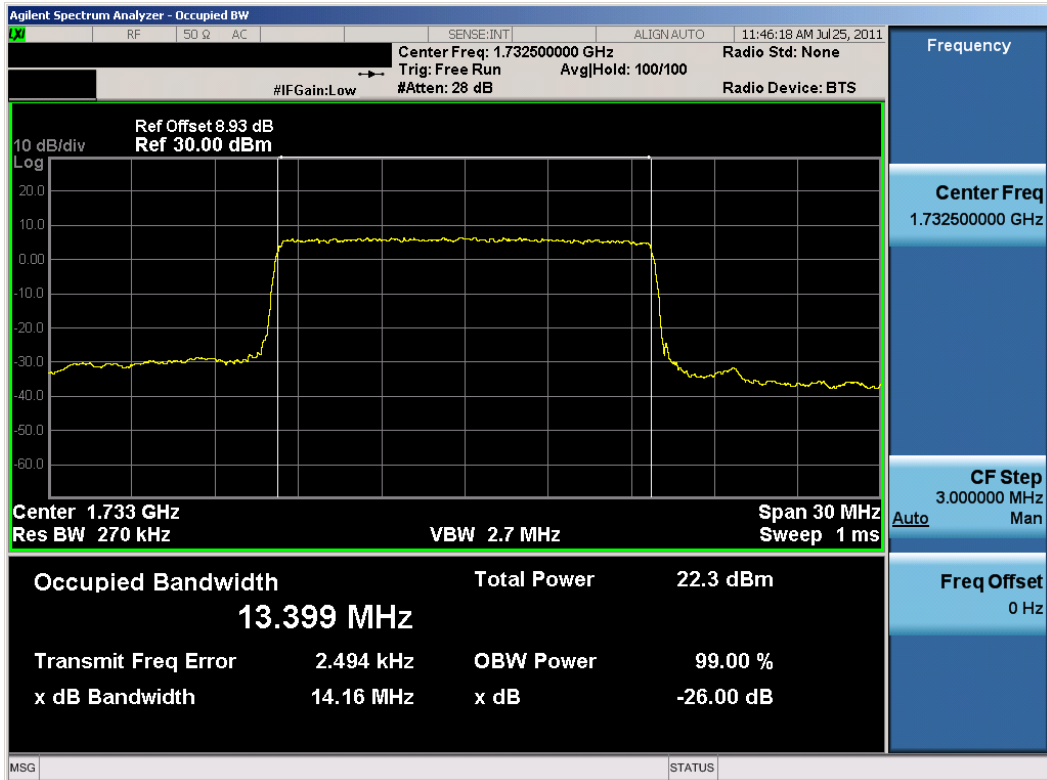


Plot 7-61. Conducted Spurious Plot (15MHz BW, QPSK, AWS Band – Mid Channel)

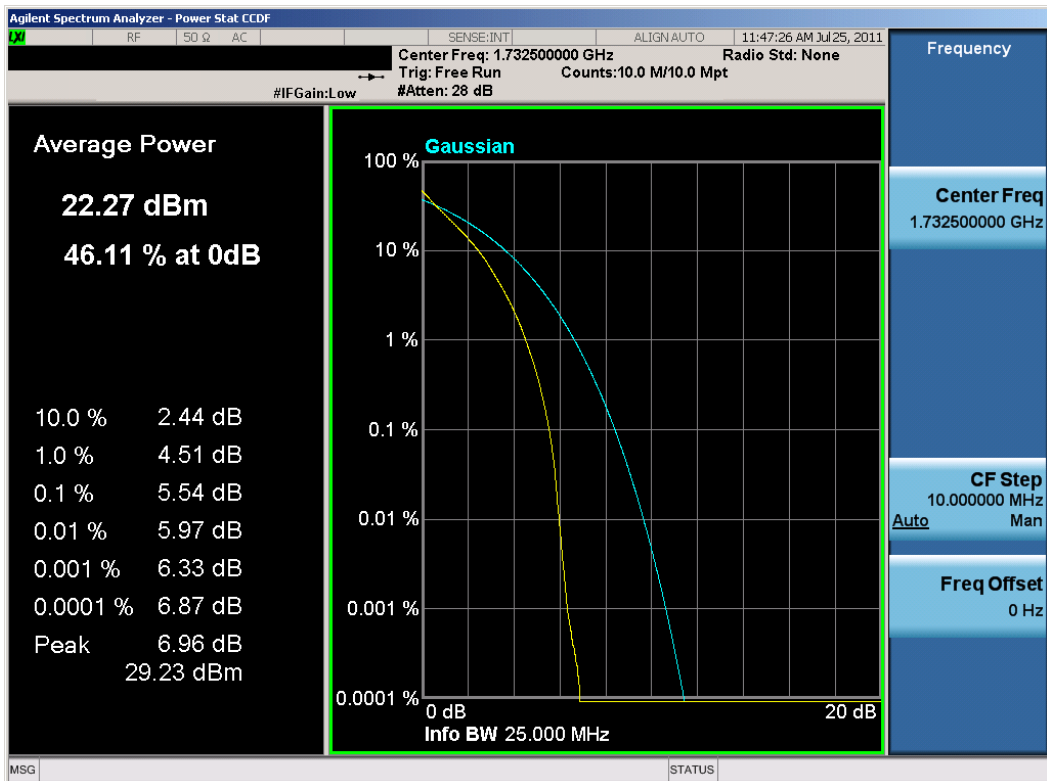


Plot 7-62. Conducted Spurious Plot (15MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 59 of 83                   |

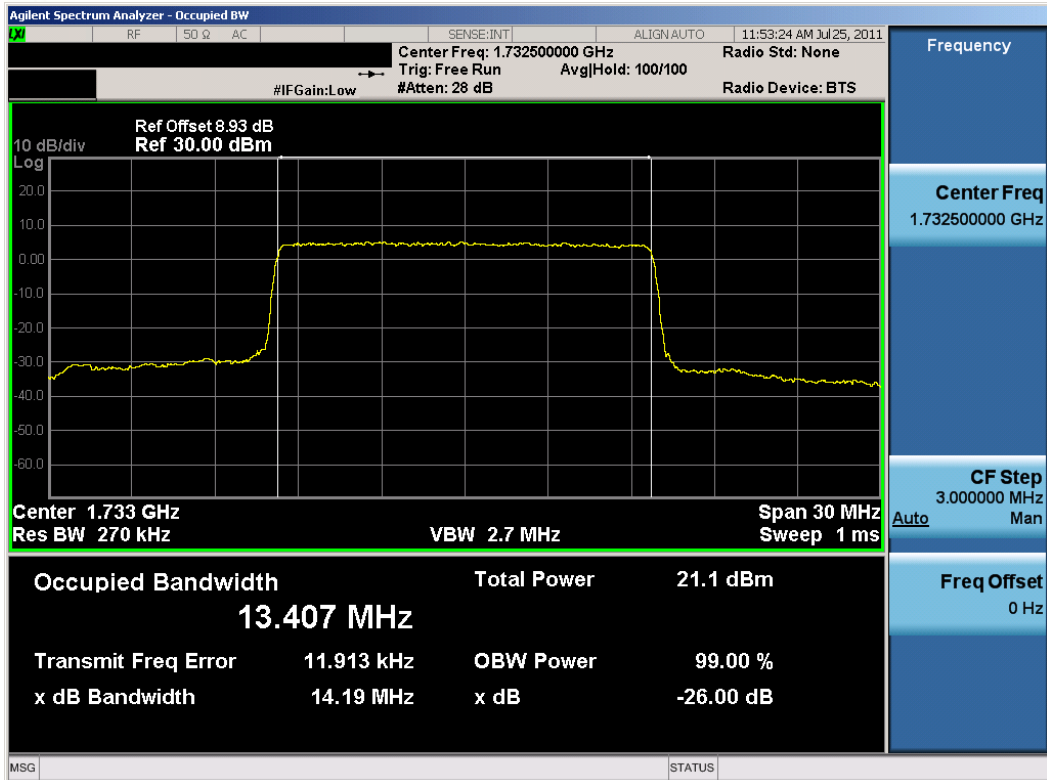


Plot 7-63. Occupied Bandwidth Plot (15MHz BW, QPSK, AWS Band – Mid Channel)

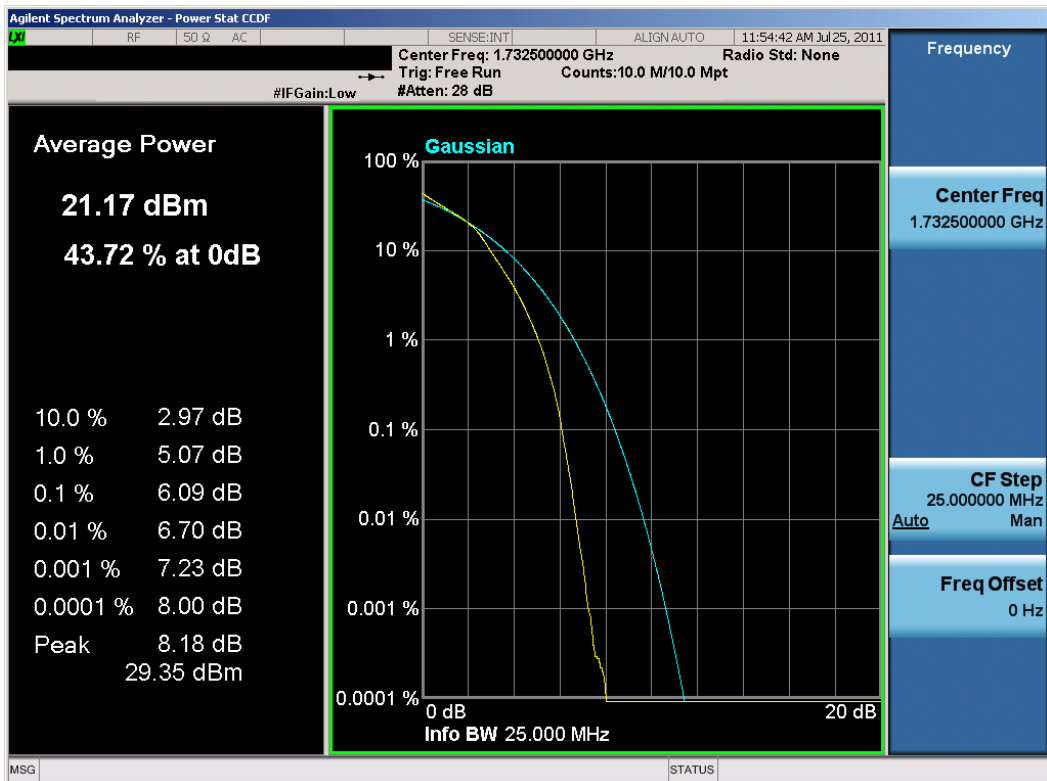


Plot 7-64. Peak-Average Ratio Plot (15MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 60 of 83                   |



Plot 7-65. Occupied Bandwidth Plot (15MHz BW, 16-QAM, AWS Band – Mid Channel)



Plot 7-66. Peak-Average Ratio Plot (15MHz BW, 16-QAM, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 61 of 83                   |

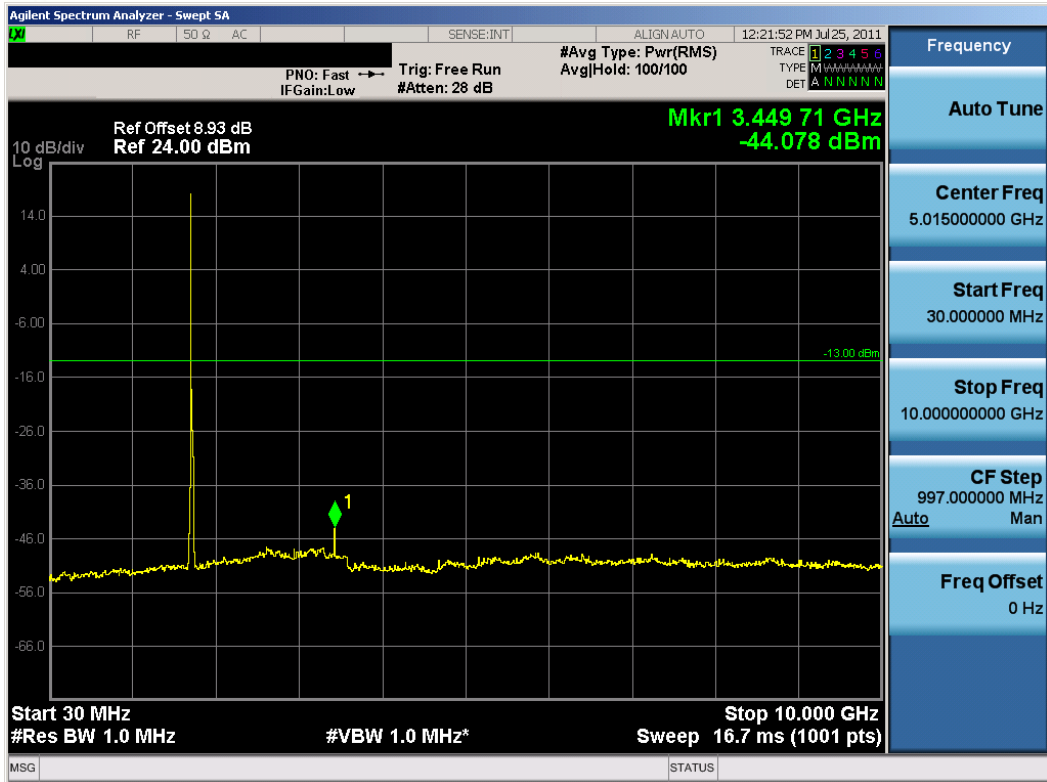










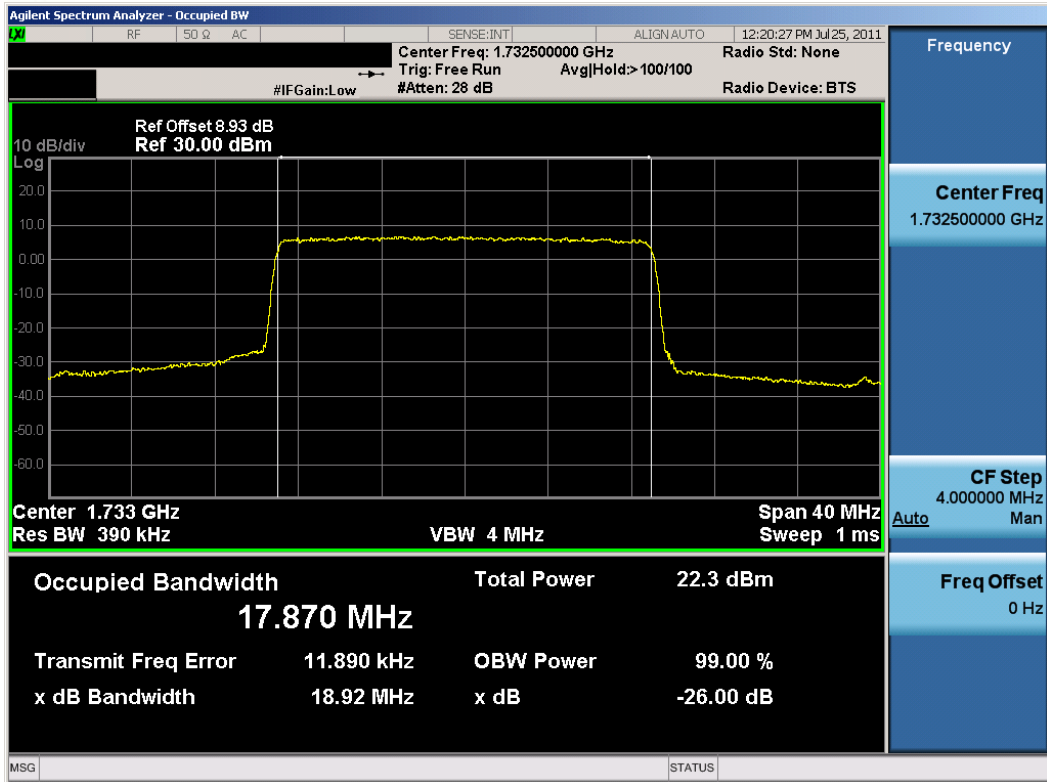


Plot 7-75. Conducted Spurious Plot (20MHz BW, QPSK, AWS Band – Mid Channel)

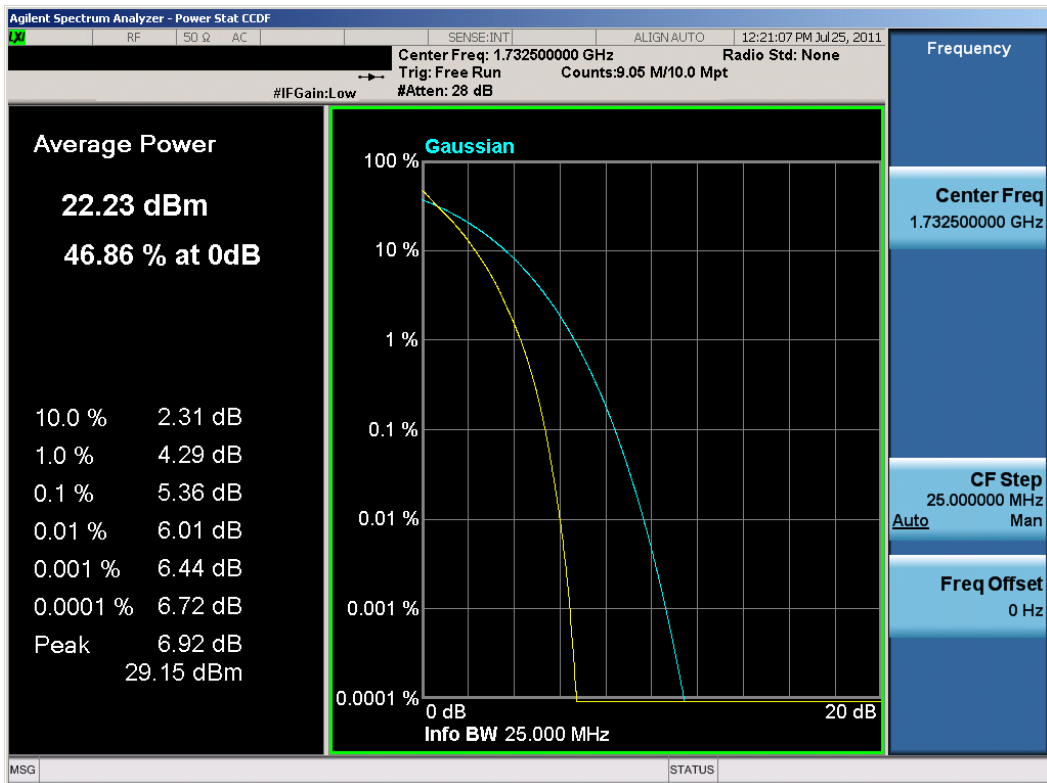


Plot 7-76. Conducted Spurious Plot (20MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 66 of 83                   |

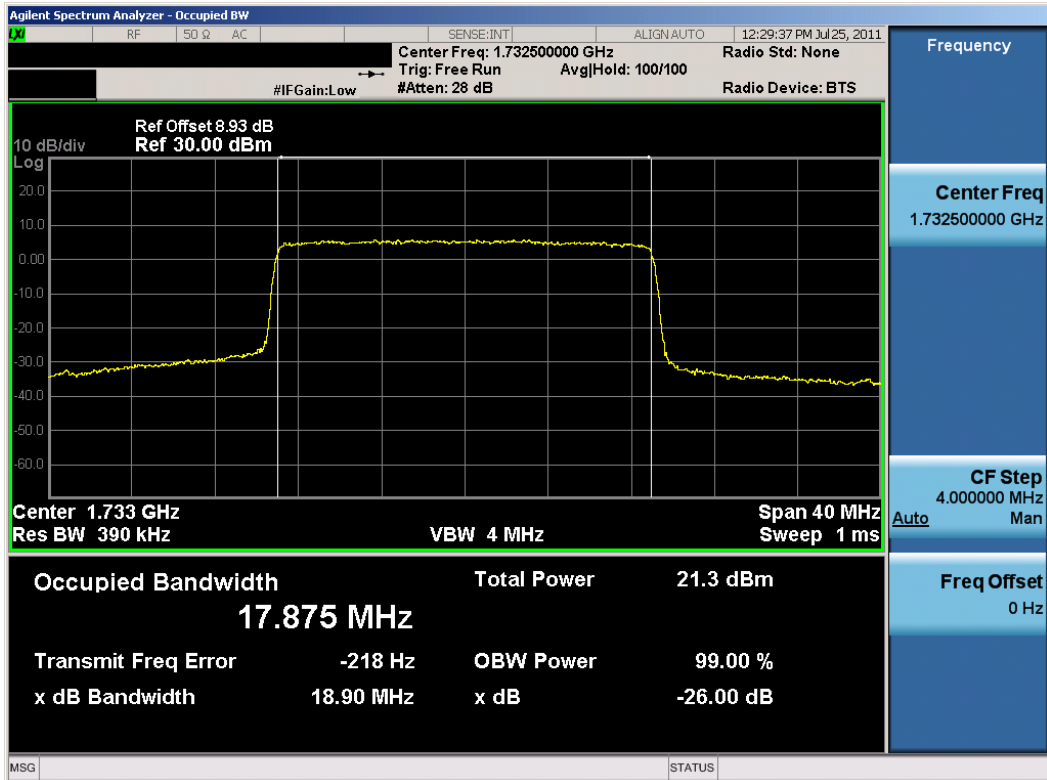


Plot 7-77. Occupied Bandwidth Plot (20MHz BW, QPSK, AWS Band – Mid Channel)

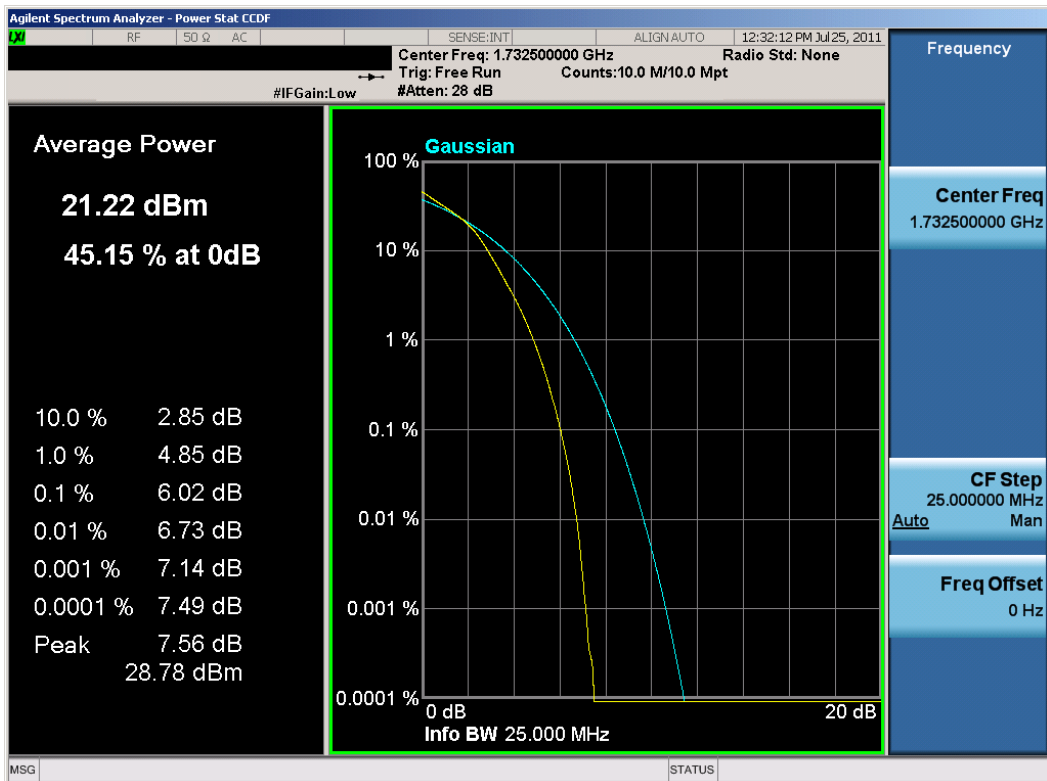


Plot 7-78. Peak-Average Ratio Plot (20MHz BW, QPSK, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 67 of 83                   |

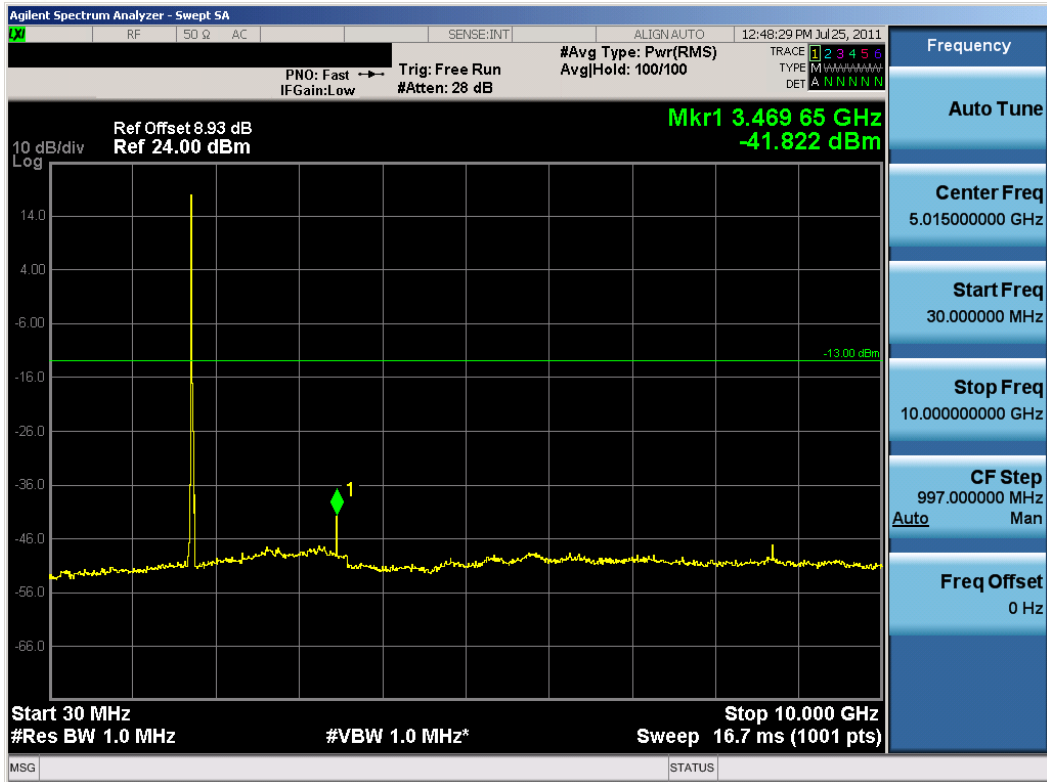


Plot 7-79. Occupied Bandwidth Plot (20MHz BW, 16-QAM, AWS Band – Mid Channel)



Plot 7-80. Peak-Average Ratio Plot (20MHz BW, 16-QAM, AWS Band – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 68 of 83                   |



Plot 7-81. Conducted Spurious Plot (20MHz BW, QPSK, AWS Band – High Channel)



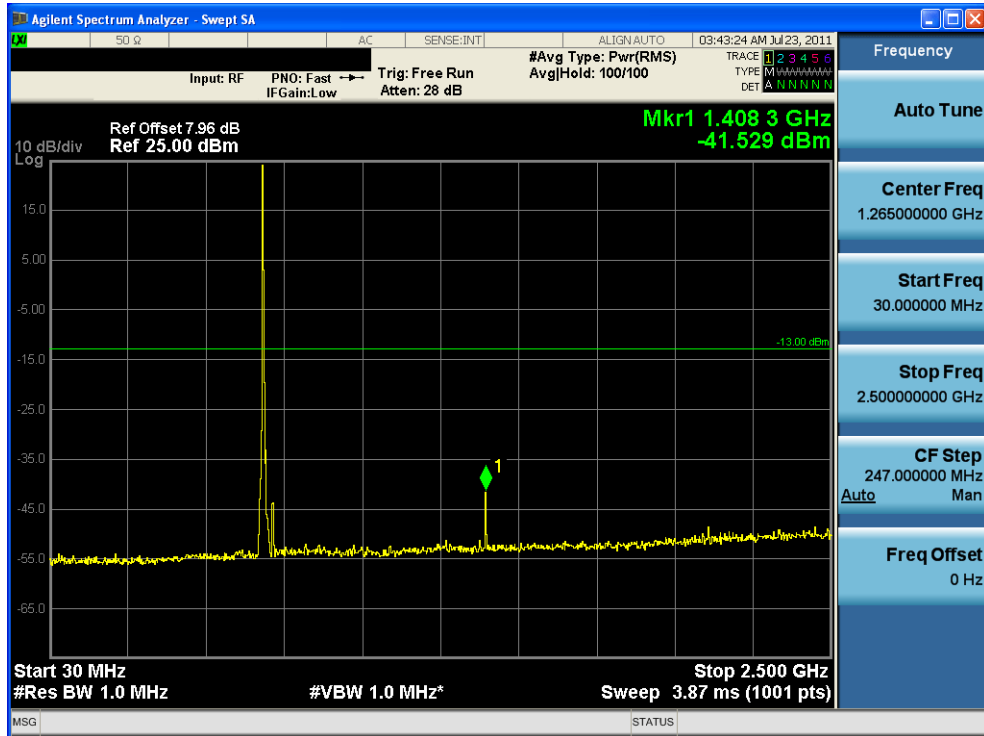
Plot 7-82. Conducted Spurious Plot (20MHz BW, QPSK, AWS Band – High Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 69 of 83                   |

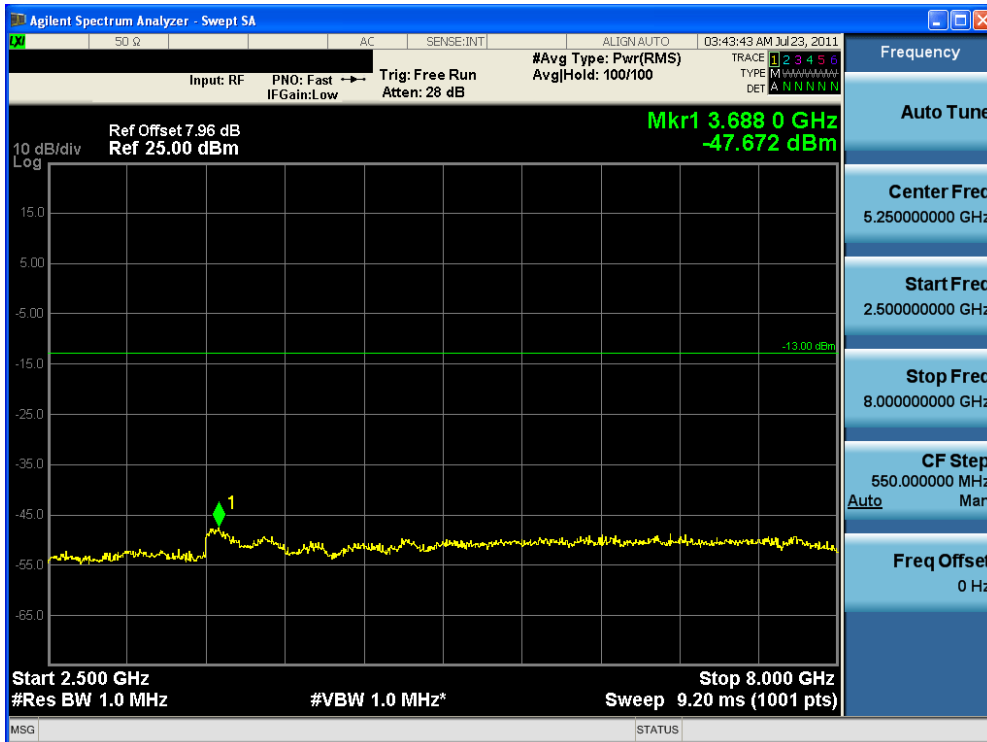




## 8.0 PLOT(S) OF EMISSIONS – BAND 17



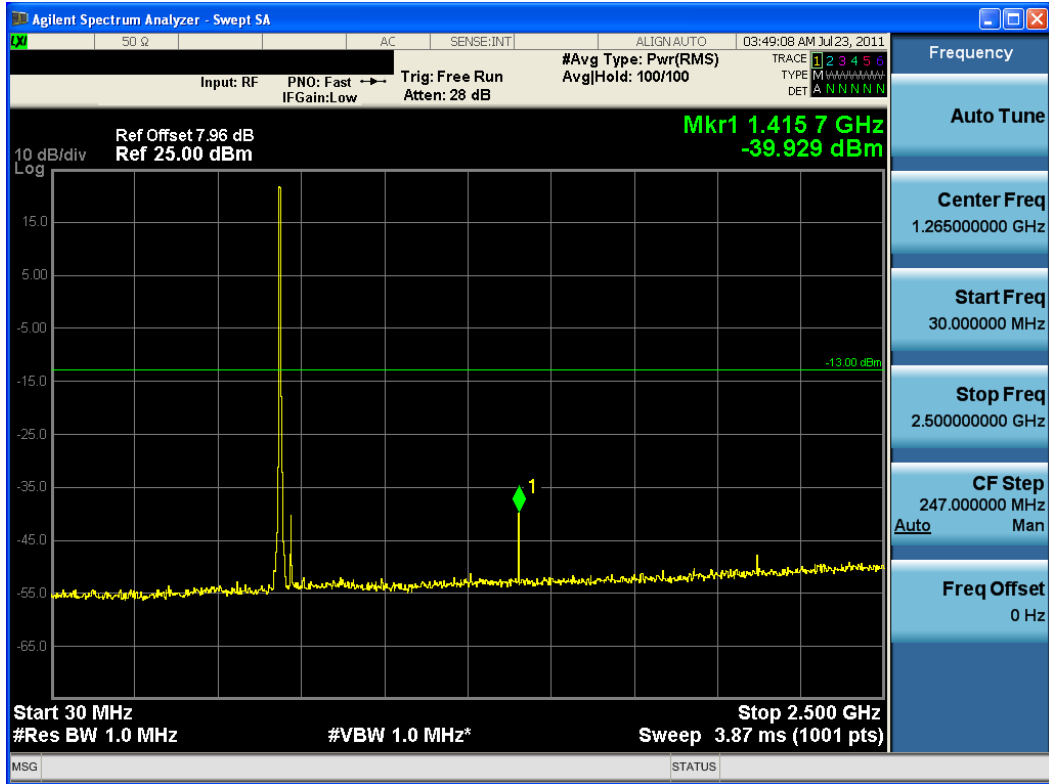
**Plot 8-1. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – Low Channel)**



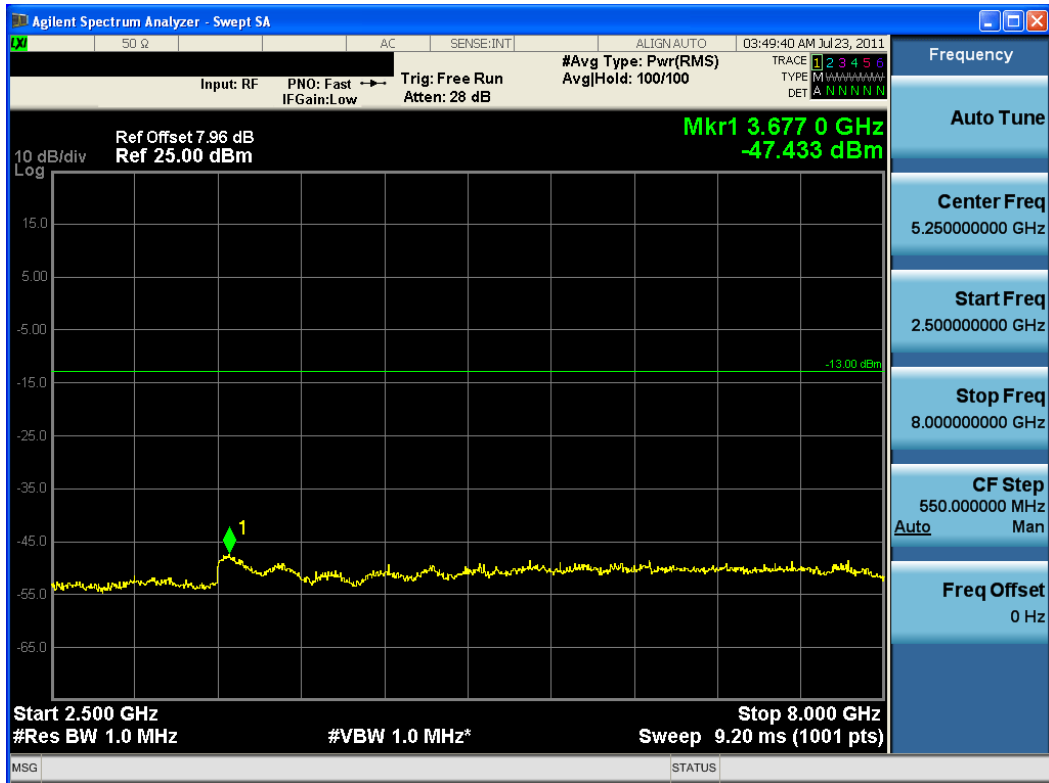
**Plot 8-2. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – Low Channel)**

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 71 of 83                   |



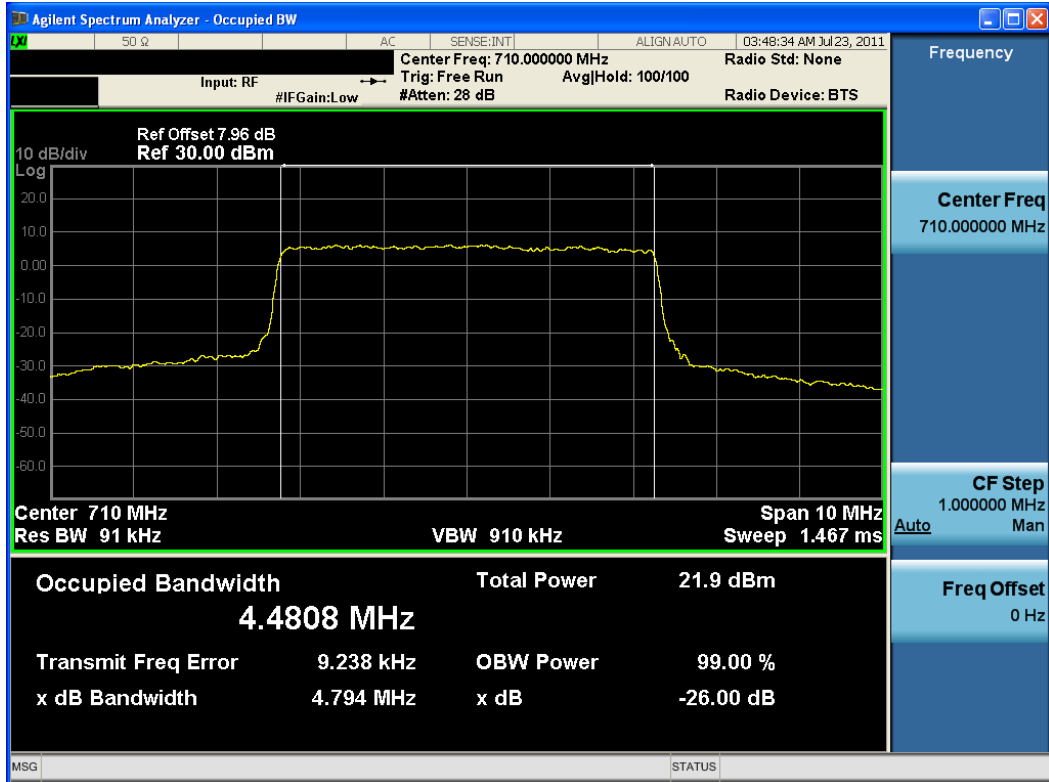


Plot 8-5. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – Mid Channel)

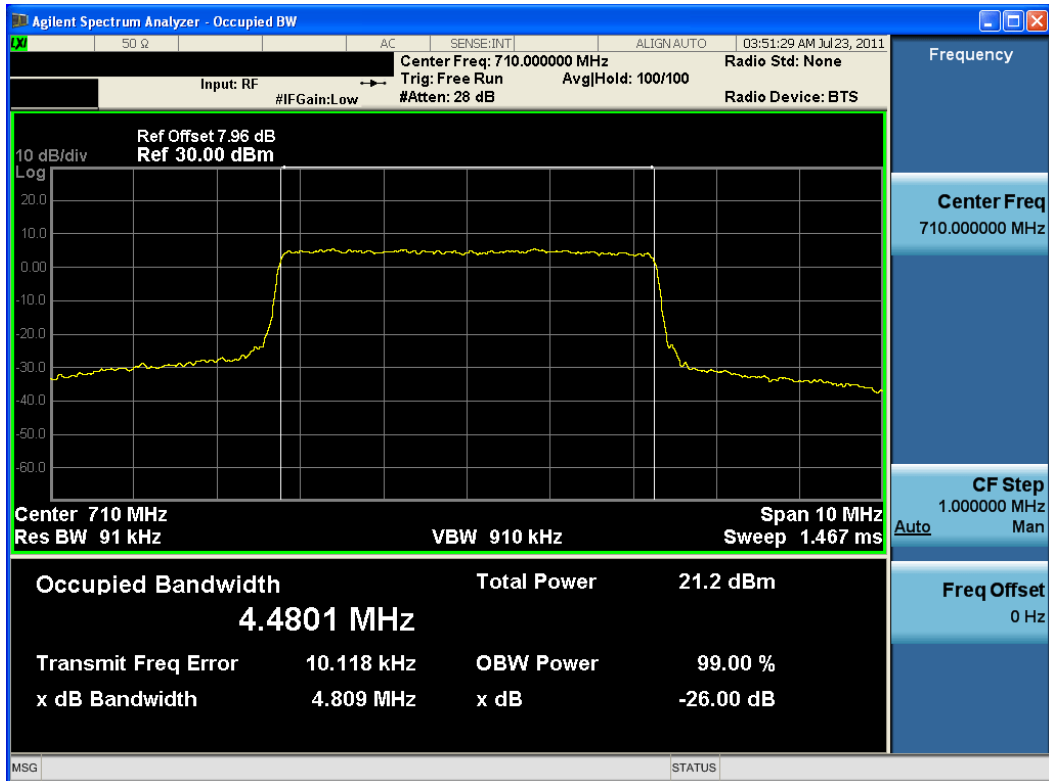


Plot 8-6. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 73 of 83                   |

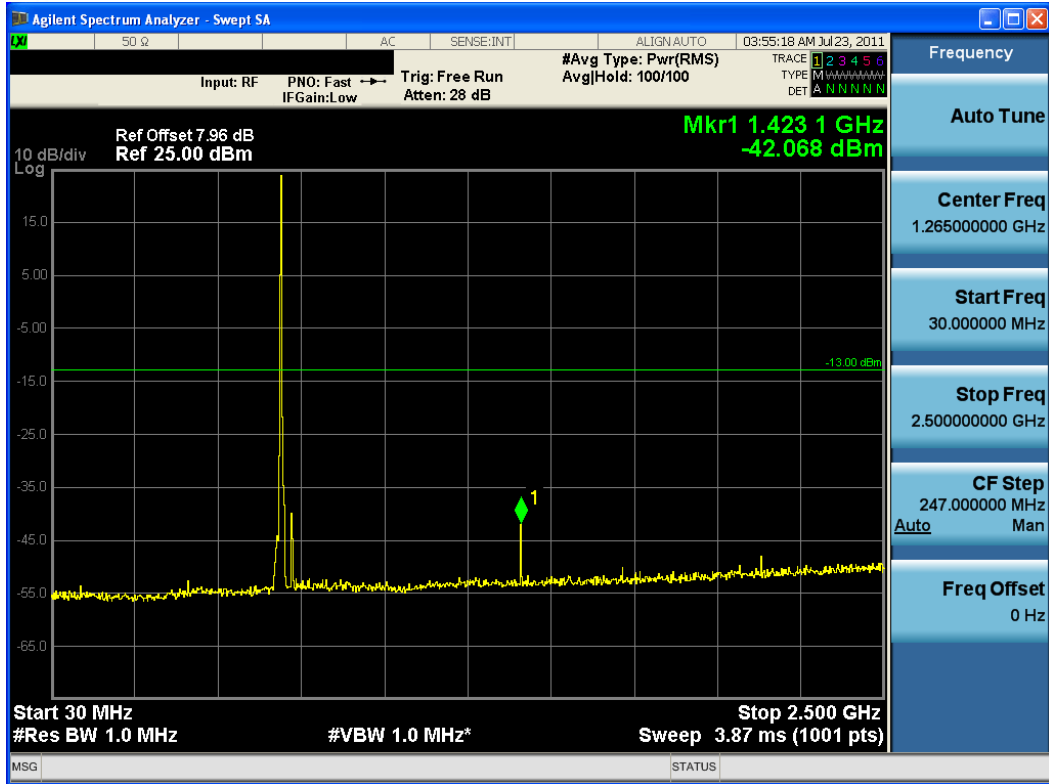


Plot 8-7. Occupied Bandwidth Plot (5MHz BW, QPSK, Band 17 – Mid Channel)

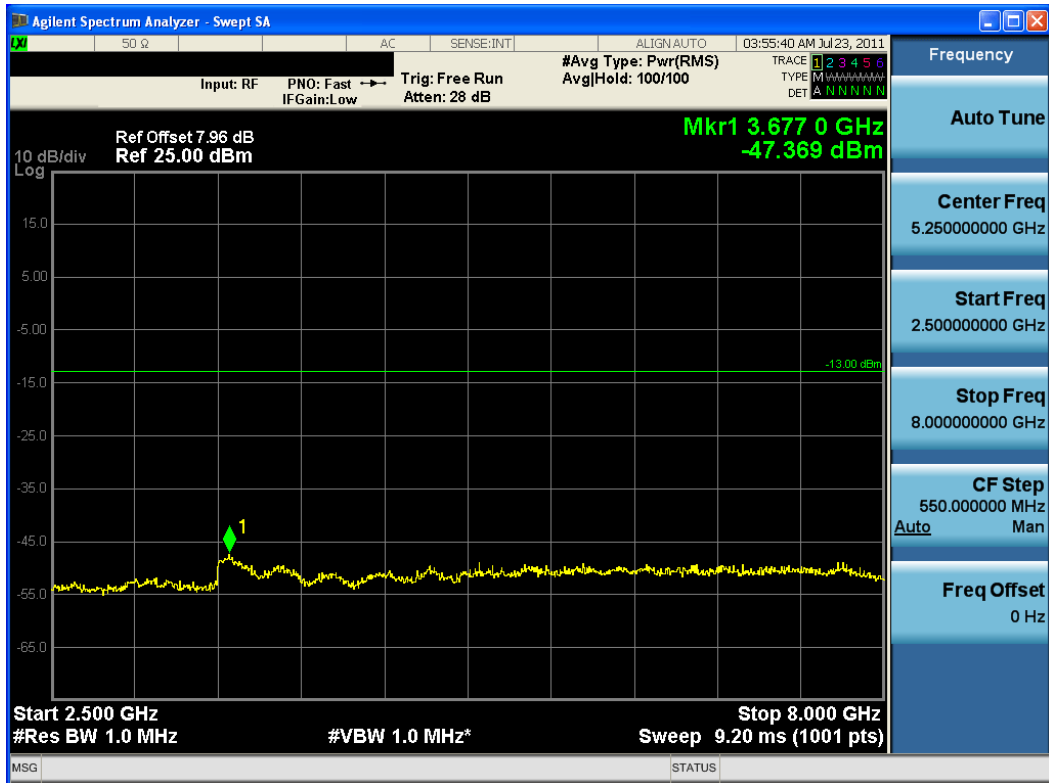


Plot 8-8. Occupied Bandwidth Plot (5MHz BW, 16-QAM, Band 17 – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 74 of 83                   |



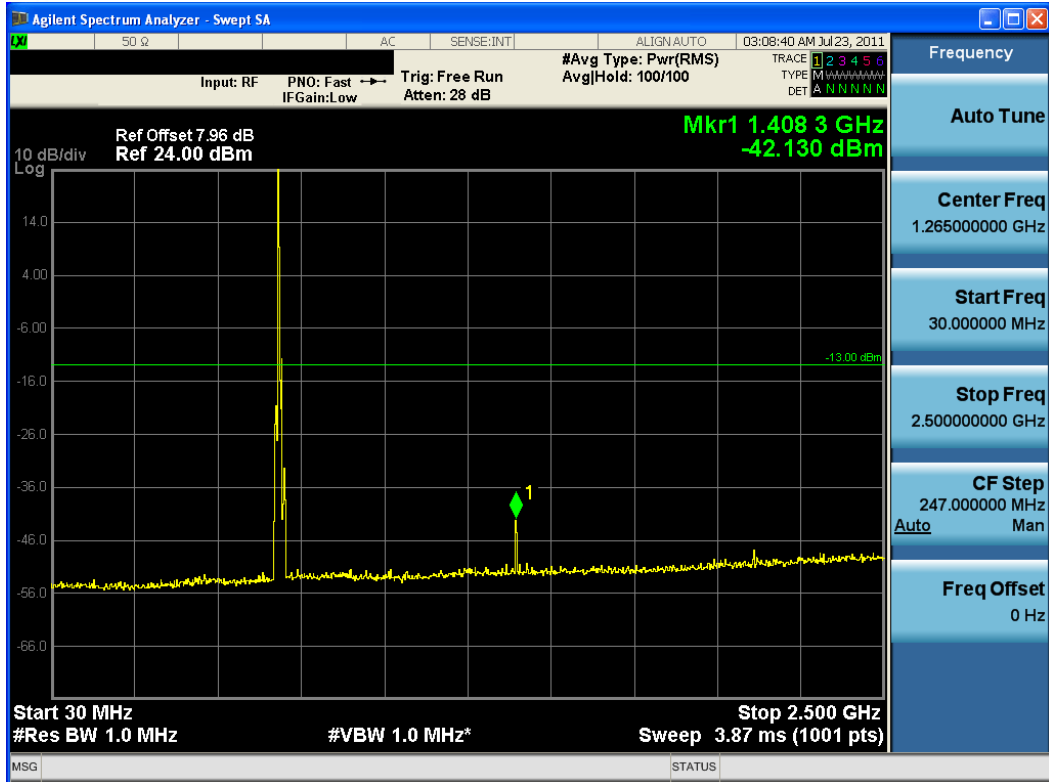
Plot 8-9. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – High Channel)



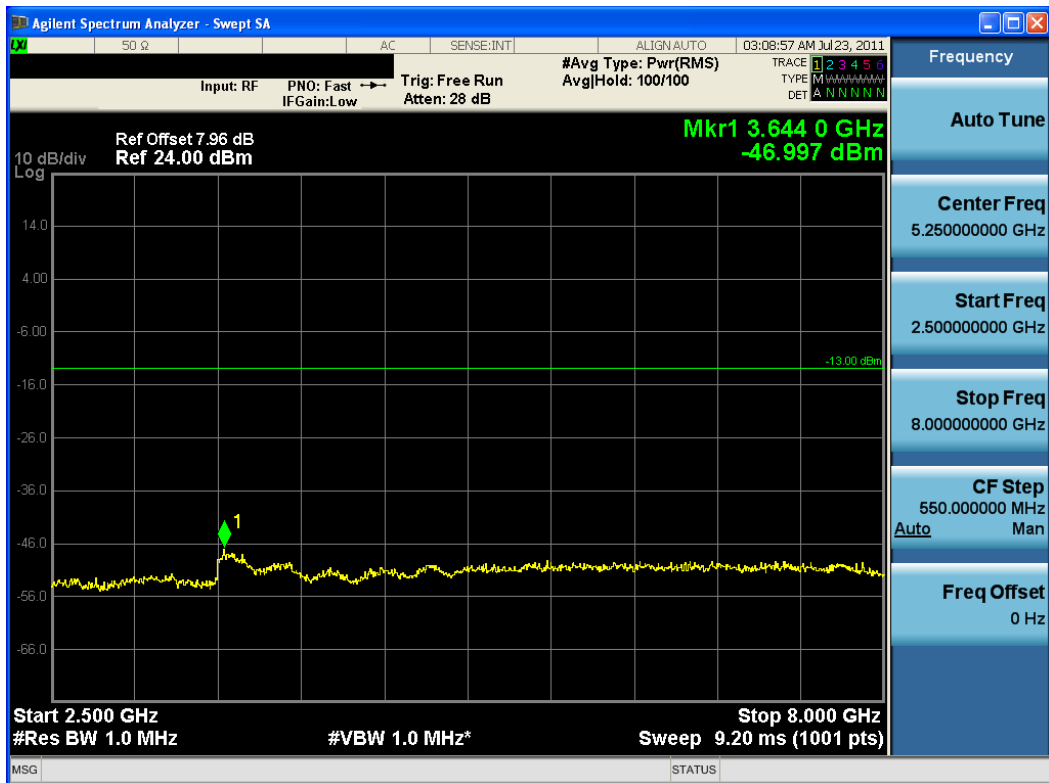
Plot 8-10. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – High Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 75 of 83                   |





Plot 8-13. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – Low Channel)

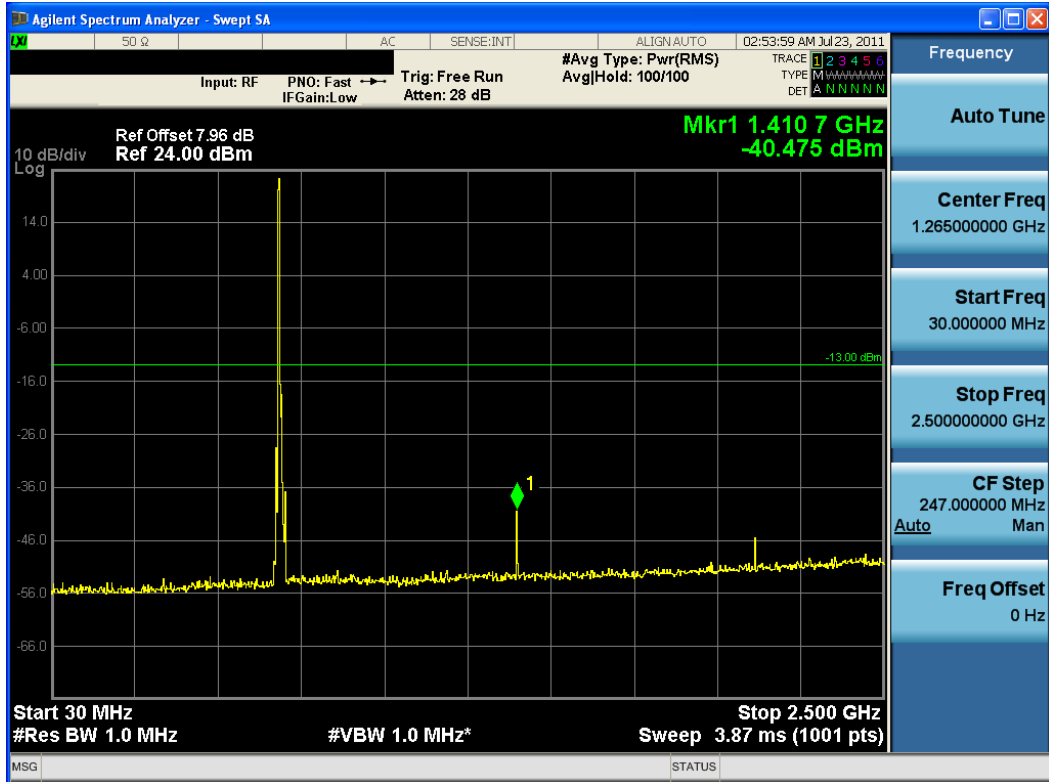


Plot 8-14. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – Low Channel)

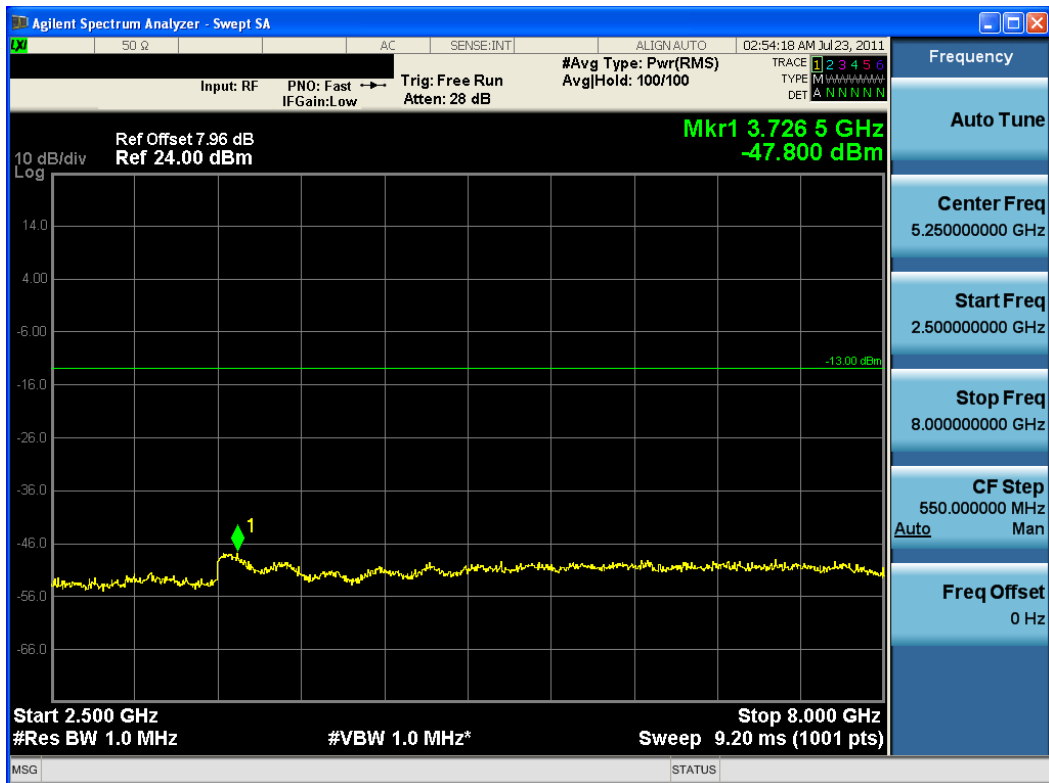
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| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)                          |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 77 of 83                   |





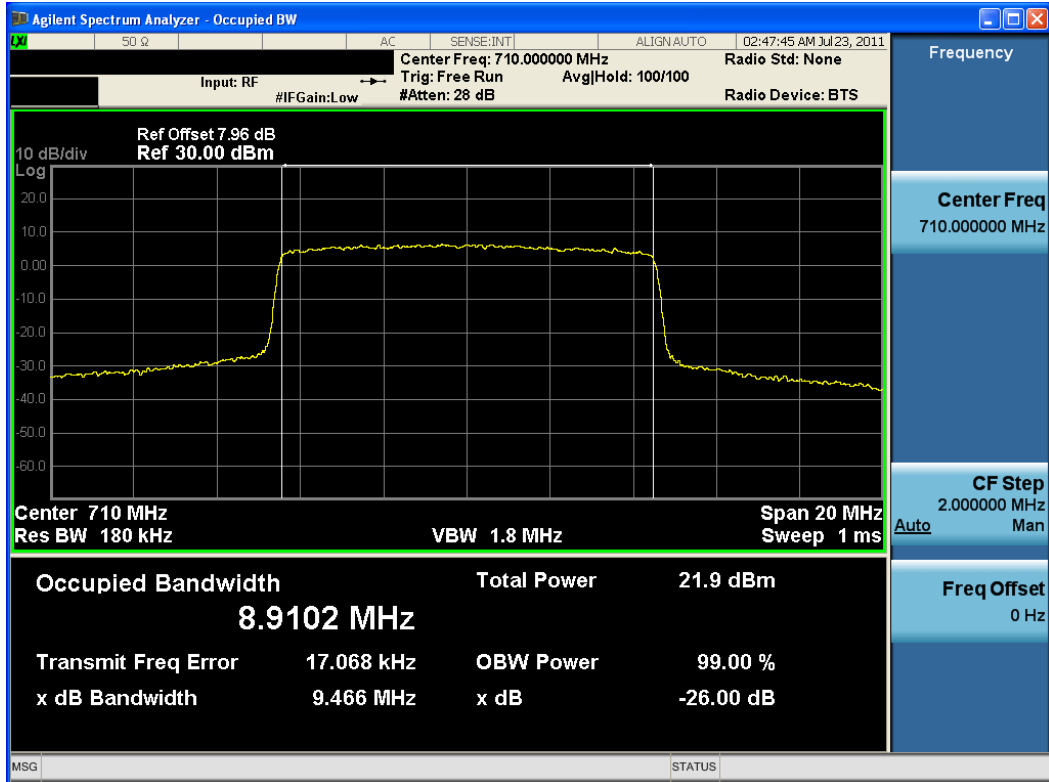


Plot 8-17. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – Mid Channel)

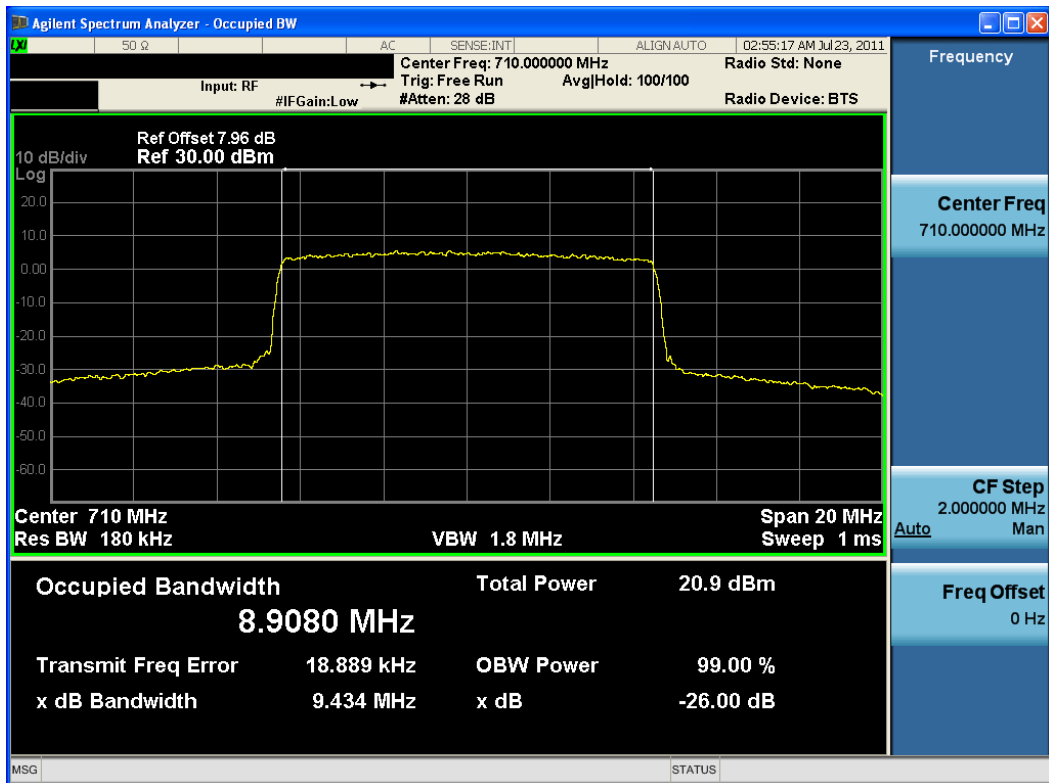


Plot 8-18. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – Mid Channel)

|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 79 of 83                   |



Plot 8-19. Occupied Bandwidth Plot (10MHz BW, QPSK, Band 17 – Mid Channel)



Plot 8-20. Occupied Bandwidth Plot (10MHz BW, 16-QAM, Band 17 – Mid Channel)



|                                      |  |  |  |                                 |
|--------------------------------------|--|--|--|---------------------------------|
| FCC ID: PKRNVWMC679                  |  | FCC Pt. 27 LTE MEASUREMENT REPORT<br>(CERTIFICATION)                       |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1106221044.PKR | Test Dates:<br>June 27 - July 29, 2011 | EUT Type:<br>850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem |  | Page 80 of 83                   |





## 9.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Novatel 850/1900 GSM/GPRS/EDGE/WCDMA/HSPA and Band 4/17 LTE USB Modem FCC ID: PKRNVWMC679** complies with all the requirements of Parts 2 and 27 of the FCC rules for LTE operation only.

|                                      |   |  |   |                                 |
|--------------------------------------|---|--|---|---------------------------------|
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