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MEASUREMENT REPORT FCC Part 22, 24, 27 LTE

Applicant Name:
Continental Automotive Systems Inc.
21440 West Lake Cook Rd.
Deer Park, IL 60010
USA

Date of Testing:
April 23 - 30, 2013
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1304190675.LHJ

FCC ID :	LHJ-LNAD
APPLICANT:	CONTINENTAL AUTOMOTIVE SYSTEMS INC.

FCC Classification: PCS Licensed Transmitter (PCB)
FCC Rule Part(s): §2; §22; §24; §27
EUT Type: Wireless Modem Module
Model(s): LNAD
Test Device Serial No.: identical prototype [S/N: N/A]

Mode	Tx Frequency (MHz)	Emission Designator	Modulation	Conducted Power	
				Max. Power (W)	Max. Power (dBm)
LTE Band 17	706.5 - 713.5	4M47G7D	QPSK	0.269	24.30
LTE Band 17	706.5 - 713.5	4M47W7D	16QAM	0.220	23.42
LTE Band 17	709 - 711	8M92G7D	QPSK	0.261	24.16
LTE Band 17	709 - 711	8M90W7D	16QAM	0.227	23.56
LTE Band 5	826.5 - 846.5	4M46G7D	QPSK	0.213	23.29
LTE Band 5	826.5 - 846.5	4M49W7D	16QAM	0.153	21.86
LTE Band 5	829 - 844	8M96G7D	QPSK	0.195	22.89
LTE Band 5	829 - 844	8M95W7D	16QAM	0.149	21.73
LTE Band 4	1712.5 - 1752.5	4M48G7D	QPSK	0.177	22.48
LTE Band 4	1712.5 - 1752.5	4M48W7D	16QAM	0.139	21.42
LTE Band 4	1715 - 1750	8M98G7D	QPSK	0.166	22.21
LTE Band 4	1715 - 1750	8M93W7D	16QAM	0.140	21.46
LTE Band 2	1852.5 - 1907.5	4M48G7D	QPSK	0.209	23.21
LTE Band 2	1852.5 - 1907.5	4M48W7D	16QAM	0.167	22.22
LTE Band 2	1855 - 1905	8M95G7D	QPSK	0.215	23.33
LTE Band 2	1855 - 1905	8M92W7D	16QAM	0.177	22.49

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested. I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



Rainy Ortanez
President

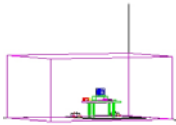


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T A B L E O F C O N T E N T S

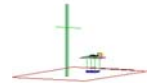
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FCC Part 22, 24, 27



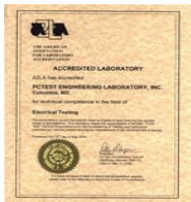
§2.1033 General Information



APPLICANT: Continental Automotive Systems Inc.
APPLICANT ADDRESS: 21440 West Lake Cook Rd.
 Deer Park, IL 60010, USA
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 7185 Oakland Mills Road, Columbia, MD 21045 USA
FCC RULE PART(S): §2; §22; §24; §27
BASE MODEL: LNAD
FCC ID: LHJ-LNAD
FCC CLASSIFICATION: PCS Licensed Transmitter (PCB)
FREQUENCY TOLERANCE: ±0.00025 % (2.5 ppm)
Test Device Serial No.: N/A Production Pre-Production Engineering
DATE(S) OF TEST: April 23 - 30, 2013
TEST REPORT S/N: 0Y1304190675.LHJ

Test Facility / Accreditations

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

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



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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 and the Industry Canada Certification and Engineering Bureau.

1.2 Testing Facility

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

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on February 15, 2012.

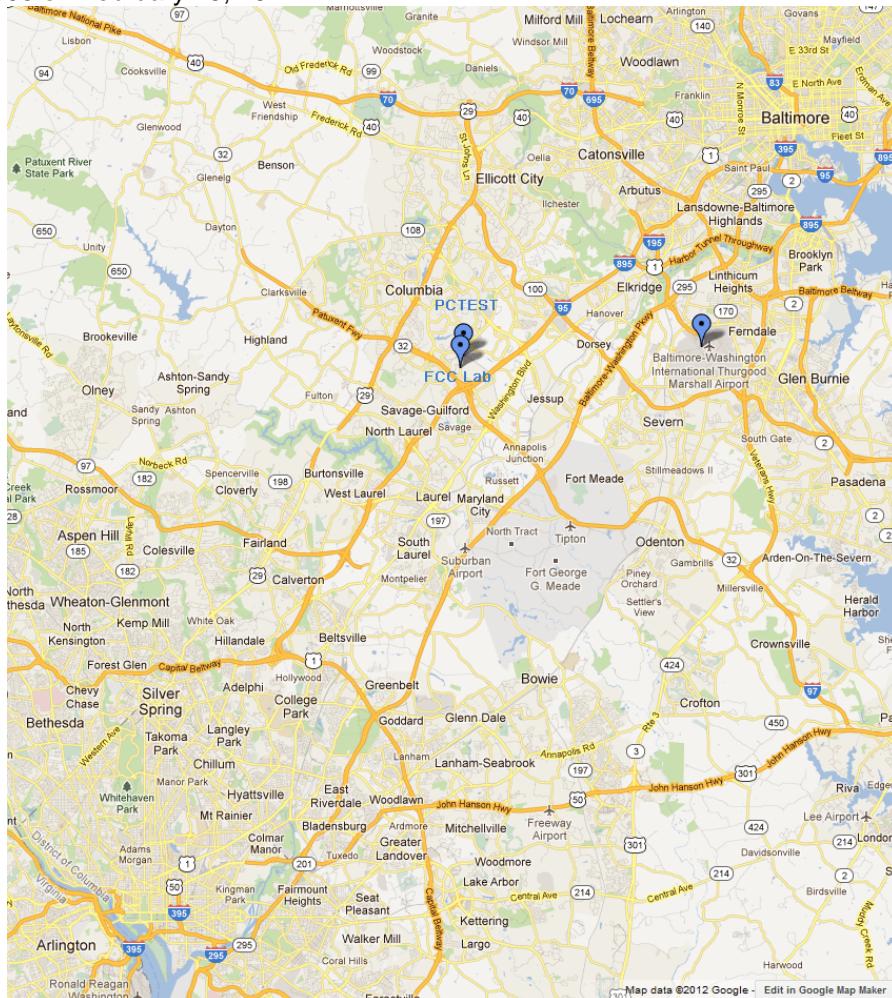




Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

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

During testing, power was provided via DC Power Supply. The EUT was set to continuous transmission at max power through connection to a CMW500 LTE Call Box. All modulations (QPSK, 16QAM), RB sizes and RB offsets were investigated. Worst case emissions are reported.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 WCDMA, Band 2, 4, 5, 17 LTE



2.3 EMI Suppression Device(s)/Modifications

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

2.4 Labeling Requirements

Per 2.925

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

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The measurement procedures described in the document titled “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-C-2004) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168) were used in the measurement of the **Continental Wireless Modem Module FCC ID: LHJ-LNAD**.

3.1 Block C Frequency Range

§27.5(b)(3)

Two paired channels of 11 megahertz each are available for assignment in Block C in the 746-757 MHz and 776-787 MHz bands. In the event that no licenses for two channels in this Block C are assigned based on the results of the first auction in which such licenses were offered because the auction results do not satisfy the applicable reserve price, the spectrum in the 746-757 MHz and 776-787 MHz bands will instead be made available for assignment at a subsequent auction as follows: (i) Two paired channels of 6 megahertz each available for assignment in Block C1 in the 746-752 MHz and 776-782 MHz bands. (ii) Two paired channels of 5 megahertz each available for assignment in Block C2 in the 752-757 MHz and 782-787 MHz bands.

3.2 Block A Frequency Range

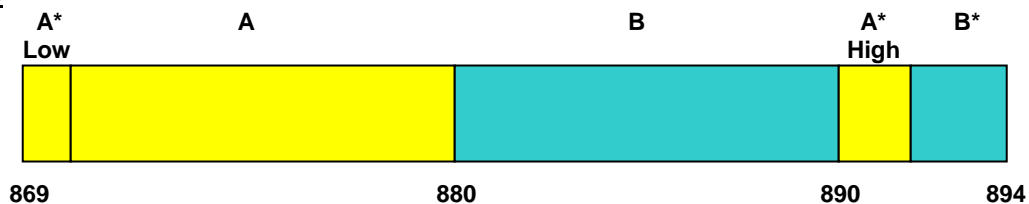
§27.5(c)

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

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



3.3 Cellular - Base Frequency Blocks

§24.905



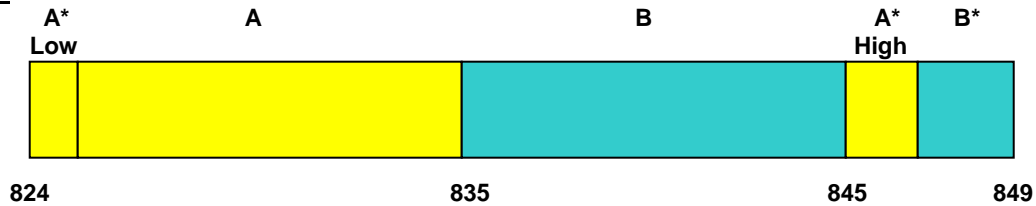
BLOCK 1: 869 – 880 MHz (A* Low + A)
BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)
BLOCK 4: 891.5 – 894 MHz (B*)

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3.4 Cellular - Mobile Frequency Blocks

§24.905

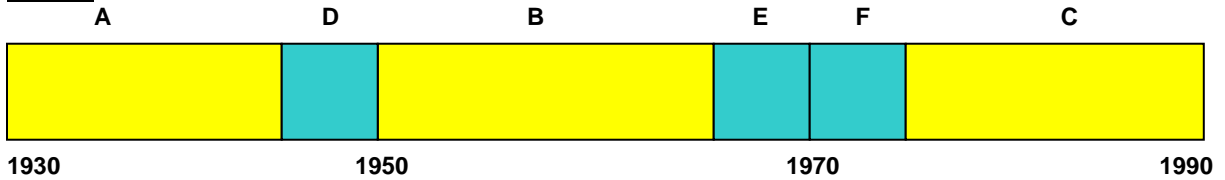


BLOCK 1: 824 – 835 MHz (A* Low + A)
 BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A* High)
 BLOCK 4: 846.5 – 849 MHz (B*)

3.5 PCS - Base Frequency Blocks

§24.229

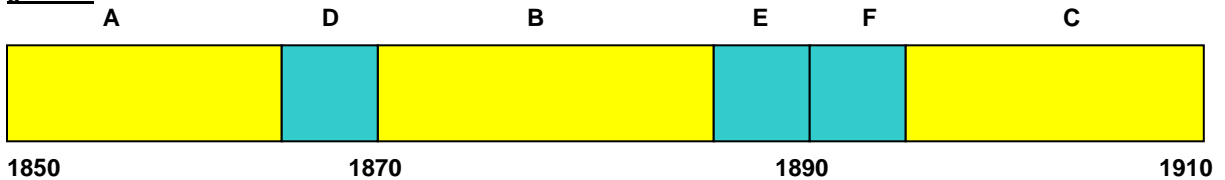


BLOCK 1: 1930 – 1945 MHz (A)
 BLOCK 2: 1945 – 1950 MHz (D)
 BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 4: 1965 – 1970 MHz (E)
 BLOCK 5: 1970 – 1975 MHz (F)
 BLOCK 6: 1975 – 1990 MHz (C)

3.6 PCS - Mobile Frequency Blocks

§24.229

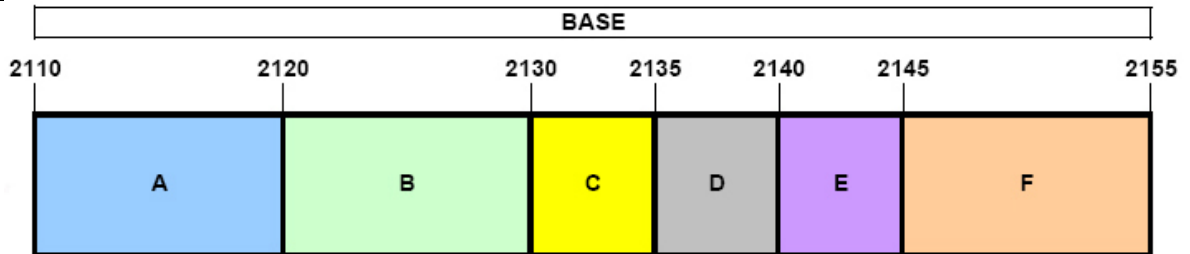


BLOCK 1: 1850 – 1865 MHz (A)
 BLOCK 2: 1865 – 1870 MHz (D)
 BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 4: 1885 – 1890 MHz (E)
 BLOCK 5: 1890 – 1895 MHz (F)
 BLOCK 6: 1895 – 1910 MHz (C)



3.7 AWS - Base Frequency Blocks

§27.5(h)



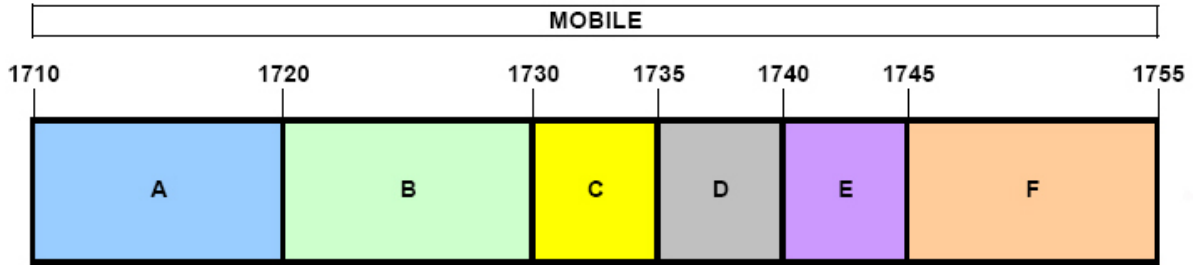
BLOCK 1: 2110 – 2120 MHz (A)
 BLOCK 2: 2120 – 2130 MHz (B)
 BLOCK 3: 2130 – 2135 MHz (C)

BLOCK 4: 2135 – 2140 MHz (D)
 BLOCK 5: 2140 – 2145 MHz (E)
 BLOCK 6: 2145 – 2155 MHz (E)

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3.8 AWS - Mobile Frequency Blocks

§27.5(h)



BLOCK 1: 1710 – 1720 MHz (A)
 BLOCK 2: 1720 – 1730 MHz (B)
 BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 4: 1735 – 1740 MHz (D)
 BLOCK 5: 1740 – 1745 MHz (E)
 BLOCK 6: 1745 – 1755 MHz (F)

3.9 Occupied Bandwidth

§2.1049 RSS-Gen(4.6.1) RSS-133(2.3) RSS-139(2.3)

The implementation of this test is performed by the spectrum analyzer’s occupied bandwidth function. 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.

3.10 Spurious and Harmonic Emissions at Antenna Terminal



§2.1051 §22.917(a)(b) §24.238(a)(b) §27.53(f) §27.53(c.5) §27.53(g) §27.53(h) RSS-132(4.5.1) RSS-133(6.5.1) RSS-139(6.5.1)

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th 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 100 kHz or greater for Cell band, 698–746 MHz band, 776-788 MHz band, or 1 MHz or greater for PCS band, AWS band. However, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30kHz may be employed for 776-788MHz band. 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 for PCS band, AWS band. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

3.11 Peak-Average Ratio

§24.232(d) §27.50(d.5) RSS-132(5.4) RSS-133(6.4) RSS-139(6.4)

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

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3.12 Radiated Spurious Emissions

§2.1053 §22.913(a.2) §22.917(a) §24.232(c) §24.238(a) §27.50(b.10) §27.50(c.10) §27.50(d.4) §27.53(f) §27.53(g) RSS-132(4.4) RSS-132(4.5.1) RSS-133(6.4) RSS-133(6.5.1) RSS-139(6.5.1)

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



The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer "Channel Power" function with the integration band set to the emissions' occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168.

Per the guidance of ANSI/TIA-603-C-2004, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_d [dBm] = P_g [dBm] - \text{cable loss} [dB] + \text{antenna gain} [dBd/dBi]$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g [dBm] - \text{cable loss} [dB]$.

The calculated P_d levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of $43 + 10\log_{10}(\text{Power} [Watts])$ specified in 22.917(a) and 24.238(a).

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3.13 Frequency Stability / Temperature Variation

§2.1055 §22.863 §22.905 §24.229 §24.235 §27.5(b) §27.5(c) §27.5(h) §27.54 RSS-132(4.3) RSS-133(6.3) RSS-139(6.3)



The frequency stability of the transmitter is measured by:

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

Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block for Part 24 and 27. The frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency for Part 22.

Time Period and Procedure:

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



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4.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTX1	Licensed Transmitter Cable Set	1/17/2013	Annual	1/17/2014	N/A
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	3/29/2013	Annual	3/29/2014	N/A
Agilent	8447D	Broadband Amplifier	5/8/2012	Annual	5/8/2013	2443A01900
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	4/18/2013	Annual	4/18/2014	MY49432391
Agilent	N5183A	MXG Analog Signal Generator	1/6/2013	Annual	1/6/2014	MY50141900
Agilent	N9030A	PXA Signal Analyzer (44GHz)	1/11/2013	Annual	1/11/2014	MY52350166
Agilent	87405C	Pre-amplifier (0.1 - 18 GHz)	3/11/2013	Annual	3/11/2014	MY53010007
Espec	ESX-2CA	Environmental Chamber	4/16/2013	Annual	4/16/2014	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Biennial	7/22/2013	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	5/30/2012	Biennial	5/30/2014	135427
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	11/7/2012	Biennial	11/7/2014	128338
Mini-Circuits	VHF-1200+	High Pass Filter	1/17/2013	Annual	1/17/2014	30923
Mini-Circuits	VHF-3100+	High Pass Filter	1/17/2013	Annual	1/17/2014	30841
Mini-Circuits	PWR-SENS-4RMS	USB Power Sensor	4/17/2013	Annual	4/17/2014	11210140001
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Biennial	10/7/2013	103962
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	6/26/2012	Annual	6/26/2013	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/30/2012	Annual	5/30/2013	100040
Rohde & Schwarz	ESU26	EMI Test Receiver	2/25/2013	Annual	2/25/2014	100342
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/14/2011	Biennial	11/14/2013	9105-2404
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	11/14/2011	Biennial	11/14/2013	9105-2403
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2012	Triennial	3/5/2015	N/A
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107

Table 4-1. Test Equipment

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Page 11 of 78	

5.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz
 G = Phase Modulation
 7 = Quantized/Digital Info
 D = Amplitude/Angle Modulated

16QAM Modulation



Emission Designator = 8M45W7D

LTE BW = 8.45 MHz
 W = Amplitude/Angle Modulated
 7 = Quantized/Digital Info
 D = Combination (Audio/Data)

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80).

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Page 12 of 78	

6.0 TEST RESULTS

6.1 Summary



Company Name: Continental Automotive Systems Inc.
 FCC ID: LHJ-LNAD
 FCC Classification: PCS Licensed Transmitter (PCB)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Result	Reference
TRANSMITTER MODE (TX)					
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section, 7.0, 8.0, 9.0, 10.0
2.1051 22.917(a) 24.238(a) 27.53(f) 27.53(g) 27.53(h)	Band Edge / Conducted Spurious Emissions	$> 43 + 10\log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions		PASS	Section 7.0, 8.0, 9.0, 10.0
24.232(d) 27.50(d.5)	Peak-Average Ratio	< 13 dB		PASS	Section 9.0, 10.0
2.1046	Transmitter Conducted Output Power	N/A		PASS	Section 6.2
2.1053 22.917(a) 24.238(a) 27.53(f) 27.53(g) 27.53(h)	Undesirable Emissions	$< 43 + 10\log_{10}(P[\text{Watts}])$ for all out-of-band emissions	RADIATED	PASS	Section 6.3, 6.4, 6.5, 6.6
2.1055. 22.355 24.235 27.5(b) 27.54	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24, 27)		PASS	Section 6.7, 6.8, 6.9, 6.10

Table 6-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in Section 7.0 8.0 9.0 10.0 were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.

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6.2 Conducted Power

§22.913(a.2) §27.50(b.10) §27.50(c.10) RSS-132(4.4) §24.232(c) §27.50(d.4) RSS-133(6.4) RSS-139(6.4)

The **Continental Wireless Modem Module FCC ID: LHJ-LNAD** was connected to the CMW500 LTE Callbox via RF Cable. Transmit power readings were taken from the CMW500. This unit was tested while being powered by a 12V DC Power Supply. Results are reported below.

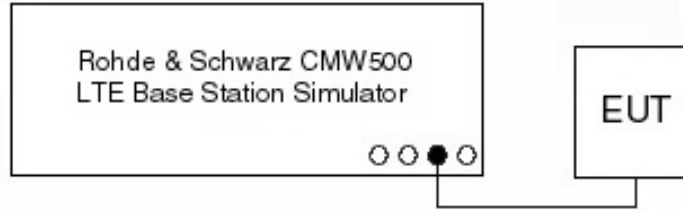






Figure 6-1. Conducted Output Power Test Setup Diagram

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 14 of 78



Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]
706.5	23755	5	QPSK	1	0	23.70
706.5	23755	5	QPSK	1	12	23.69
706.5	23755	5	QPSK	1	24	23.83
706.5	23755	5	QPSK	12	6	23.10
706.5	23755	5	QPSK	25	0	23.08
706.5	23755	5	16-QAM	1	0	22.74
706.5	23755	5	16-QAM	1	12	22.70
706.5	23755	5	16-QAM	1	24	23.14
706.5	23755	5	16-QAM	12	6	22.20
706.5	23755	5	16-QAM	25	0	21.96
710.0	23790	5	QPSK	1	0	23.87
710.0	23790	5	QPSK	1	12	23.97
710.0	23790	5	QPSK	1	24	23.79
710.0	23790	5	QPSK	12	6	23.14
710.0	23790	5	QPSK	25	0	23.20
710.0	23790	5	16-QAM	1	0	23.29
710.0	23790	5	16-QAM	1	12	23.31
710.0	23790	5	16-QAM	1	24	23.23
710.0	23790	5	16-QAM	12	6	22.22
710.0	23790	5	16-QAM	25	0	22.07
713.5	23825	5	QPSK	1	0	24.26
713.5	23825	5	QPSK	1	12	24.26
713.5	23825	5	QPSK	1	24	24.30
713.5	23825	5	QPSK	12	6	23.11
713.5	23825	5	QPSK	25	0	23.13
713.5	23825	5	16-QAM	1	0	23.24
713.5	23825	5	16-QAM	1	12	23.35
713.5	23825	5	16-QAM	1	24	23.42
713.5	23825	5	16-QAM	12	6	22.03
713.5	23825	5	16-QAM	25	0	22.15
709	23780	10	QPSK	1	0	24.71
709	23780	10	QPSK	1	25	23.72
709	23780	10	QPSK	1	49	23.84
709	23780	10	QPSK	25	12	22.99
709	23780	10	QPSK	50	0	23.12
709	23780	10	16QAM	1	0	23.23
709	23780	10	16QAM	1	25	22.24
709	23780	10	16QAM	1	49	22.36
709	23780	10	16QAM	25	12	21.84
709	23780	10	16QAM	50	0	22.06
710.0	23790	10	QPSK	1	0	23.76
710.0	23790	10	QPSK	1	25	23.88
710.0	23790	10	QPSK	1	49	23.69
710.0	23790	10	QPSK	25	12	22.34
710.0	23790	10	QPSK	50	0	22.41
710.0	23790	10	16QAM	1	0	22.64
710.0	23790	10	16QAM	1	25	23.06
710.0	23790	10	16QAM	1	49	22.74
710.0	23790	10	16QAM	25	12	21.22
710.0	23790	10	16QAM	50	0	21.42
711	23800	10	QPSK	1	0	23.74
711	23800	10	QPSK	1	25	23.80
711	23800	10	QPSK	1	49	24.16
711	23800	10	QPSK	25	12	22.48
711	23800	10	QPSK	50	0	22.46
711	23800	10	16QAM	1	0	23.43
711	23800	10	16QAM	1	25	23.32
711	23800	10	16QAM	1	49	23.56
711	23800	10	16QAM	25	12	21.63
711	23800	10	16QAM	50	0	21.56

Table 6-2. Conducted Power Data (Band 17)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Page 15 of 78	



Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]
826.5	20425	5	QPSK	1	0	23.15
826.5	20425	5	QPSK	1	12	23.29
826.5	20425	5	QPSK	1	24	23.01
826.5	20425	5	QPSK	12	6	22.43
826.5	20425	5	QPSK	25	0	22.32
826.5	20425	5	16-QAM	1	0	21.82
826.5	20425	5	16-QAM	1	12	21.86
826.5	20425	5	16-QAM	1	24	21.77
826.5	20425	5	16-QAM	12	6	20.47
826.5	20425	5	16-QAM	25	0	20.51
836.5	20525	5	QPSK	1	0	22.47
836.5	20525	5	QPSK	1	12	22.35
836.5	20525	5	QPSK	1	24	22.26
836.5	20525	5	QPSK	12	6	20.48
836.5	20525	5	QPSK	25	0	20.33
836.5	20525	5	16-QAM	1	0	21.38
836.5	20525	5	16-QAM	1	12	21.25
836.5	20525	5	16-QAM	1	24	21.22
836.5	20525	5	16-QAM	12	6	19.50
836.5	20525	5	16-QAM	25	0	19.15
846.5	20625	5	QPSK	1	0	22.36
846.5	20625	5	QPSK	1	12	22.25
846.5	20625	5	QPSK	1	24	22.40
846.5	20625	5	QPSK	12	6	21.00
846.5	20625	5	QPSK	25	0	21.04
846.5	20625	5	16-QAM	1	0	21.31
846.5	20625	5	16-QAM	1	12	21.34
846.5	20625	5	16-QAM	1	24	21.43
846.5	20625	5	16-QAM	12	6	19.92
846.5	20625	5	16-QAM	25	0	19.84
829	20450	10	QPSK	1	0	22.89
829	20450	10	QPSK	1	25	22.77
829	20450	10	QPSK	1	49	22.79
829	20450	10	QPSK	25	12	21.12
829	20450	10	QPSK	50	0	21.16
829	20450	10	16QAM	1	0	21.59
829	20450	10	16QAM	1	25	21.48
829	20450	10	16QAM	1	49	21.48
829	20450	10	16QAM	25	12	20.04
829	20450	10	16QAM	50	0	20.25
836.5	20525	10	QPSK	1	0	22.56
836.5	20525	10	QPSK	1	25	22.47
836.5	20525	10	QPSK	1	49	22.46
836.5	20525	10	QPSK	25	12	21.10
836.5	20525	10	QPSK	50	0	21.14
836.5	20525	10	16QAM	1	0	21.70
836.5	20525	10	16QAM	1	25	21.41
836.5	20525	10	16QAM	1	49	21.57
836.5	20525	10	16QAM	25	12	20.01
836.5	20525	10	16QAM	50	0	20.00
844	20600	10	QPSK	1	0	22.28
844	20600	10	QPSK	1	25	22.20
844	20600	10	QPSK	1	49	22.13
844	20600	10	QPSK	25	12	20.99
844	20600	10	QPSK	50	0	21.04
844	20600	10	16QAM	1	0	21.73
844	20600	10	16QAM	1	25	21.07
844	20600	10	16QAM	1	49	21.24
844	20600	10	16QAM	25	12	20.17
844	20600	10	16QAM	50	0	20.23

Table 6-3. Conducted Power Data (Band 5)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Page 16 of 78	



Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]
1712.5	19975	5	QPSK	1	0	21.96
1712.5	19975	5	QPSK	1	12	21.90
1712.5	19975	5	QPSK	1	24	21.79
1712.5	19975	5	QPSK	12	6	20.74
1712.5	19975	5	QPSK	25	0	20.82
1712.5	19975	5	16-QAM	1	0	21.07
1712.5	19975	5	16-QAM	1	12	20.74
1712.5	19975	5	16-QAM	1	24	20.74
1712.5	19975	5	16-QAM	12	6	19.70
1712.5	19975	5	16-QAM	25	0	19.94
1732.5	20175	5	QPSK	1	0	22.22
1732.5	20175	5	QPSK	1	12	22.18
1732.5	20175	5	QPSK	1	24	22.03
1732.5	20175	5	QPSK	12	6	20.64
1732.5	20175	5	QPSK	25	0	20.60
1732.5	20175	5	16-QAM	1	0	21.41
1732.5	20175	5	16-QAM	1	12	21.20
1732.5	20175	5	16-QAM	1	24	21.36
1732.5	20175	5	16-QAM	12	6	19.55
1732.5	20175	5	16-QAM	25	0	19.65
1752.5	20375	5	QPSK	1	0	22.29
1752.5	20375	5	QPSK	1	12	22.22
1752.5	20375	5	QPSK	1	24	22.48
1752.5	20375	5	QPSK	12	6	21.05
1752.5	20375	5	QPSK	25	0	21.01
1752.5	20375	5	16-QAM	1	0	21.22
1752.5	20375	5	16-QAM	1	12	21.16
1752.5	20375	5	16-QAM	1	24	21.42
1752.5	20375	5	16-QAM	12	6	20.04
1752.5	20375	5	16-QAM	25	0	20.17
1715	20000	10	QPSK	1	0	21.98
1715	20000	10	QPSK	1	25	22.05
1715	20000	10	QPSK	1	49	21.84
1715	20000	10	QPSK	25	12	20.80
1715	20000	10	QPSK	50	0	20.74
1715	20000	10	16QAM	1	0	21.31
1715	20000	10	16QAM	1	25	21.40
1715	20000	10	16QAM	1	49	21.21
1715	20000	10	16QAM	25	12	19.65
1715	20000	10	16QAM	50	0	19.88
1732.5	20175	10	QPSK	1	0	21.96
1732.5	20175	10	QPSK	1	25	22.07
1732.5	20175	10	QPSK	1	49	21.87
1732.5	20175	10	QPSK	25	12	20.79
1732.5	20175	10	QPSK	50	0	20.73
1732.5	20175	10	16QAM	1	0	21.43
1732.5	20175	10	16QAM	1	25	21.46
1732.5	20175	10	16QAM	1	49	20.36
1732.5	20175	10	16QAM	25	12	19.96
1732.5	20175	10	16QAM	50	0	19.80
1750	20350	10	QPSK	1	0	22.21
1750	20350	10	QPSK	1	25	22.20
1750	20350	10	QPSK	1	49	22.10
1750	20350	10	QPSK	25	12	21.02
1750	20350	10	QPSK	50	0	21.02
1750	20350	10	16QAM	1	0	20.87
1750	20350	10	16QAM	1	25	20.84
1750	20350	10	16QAM	1	49	20.58
1750	20350	10	16QAM	25	12	20.24
1750	20350	10	16QAM	50	0	20.03

Table 6-4. Conducted Power Data (Band 4)

FCC ID: LHH-LNAD	 FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Page 17 of 78

Frequency [MHz]	Channel	Bandwidth [MHz]	Modulation	RB Size	RB Offset	Conducted Power [dBm]
1852.5	18625	5	QPSK	1	0	22.93
1852.5	18625	5	QPSK	1	12	22.90
1852.5	18625	5	QPSK	1	24	23.07
1852.5	18625	5	QPSK	12	6	21.61
1852.5	18625	5	QPSK	25	0	21.51
1852.5	18625	5	16-QAM	1	0	21.82
1852.5	18625	5	16-QAM	1	12	21.74
1852.5	18625	5	16-QAM	1	24	21.90
1852.5	18625	5	16-QAM	12	6	20.75
1852.5	18625	5	16-QAM	25	0	20.53
1880.0	18900	5	QPSK	1	0	23.21
1880.0	18900	5	QPSK	1	12	23.13
1880.0	18900	5	QPSK	1	24	23.16
1880.0	18900	5	QPSK	12	6	21.89
1880.0	18900	5	QPSK	25	0	21.80
1880.0	18900	5	16-QAM	1	0	22.22
1880.0	18900	5	16-QAM	1	12	22.00
1880.0	18900	5	16-QAM	1	24	22.14
1880.0	18900	5	16-QAM	12	6	21.00
1880.0	18900	5	16-QAM	25	0	20.82
1907.5	19175	5	QPSK	1	0	22.60
1907.5	19175	5	QPSK	1	12	22.61
1907.5	19175	5	QPSK	1	24	22.47
1907.5	19175	5	QPSK	12	6	21.21
1907.5	19175	5	QPSK	25	0	21.19
1907.5	19175	5	16-QAM	1	0	21.24
1907.5	19175	5	16-QAM	1	12	21.28
1907.5	19175	5	16-QAM	1	24	21.17
1907.5	19175	5	16-QAM	12	6	20.33
1907.5	19175	5	16-QAM	25	0	20.15
1855	18650	10	QPSK	1	0	22.66
1855	18650	10	QPSK	1	25	22.71
1855	18650	10	QPSK	1	49	22.91
1855	18650	10	QPSK	25	12	21.50
1855	18650	10	QPSK	50	0	21.56
1855	18650	10	16QAM	1	0	21.50
1855	18650	10	16QAM	1	25	21.58
1855	18650	10	16QAM	1	49	21.59
1855	18650	10	16QAM	25	12	20.66
1855	18650	10	16QAM	50	0	20.70
1880.0	18900	10	QPSK	1	0	23.05
1880.0	18900	10	QPSK	1	25	23.06
1880.0	18900	10	QPSK	1	49	23.33
1880.0	18900	10	QPSK	25	12	21.94
1880.0	18900	10	QPSK	50	0	21.99
1880.0	18900	10	16QAM	1	0	21.93
1880.0	18900	10	16QAM	1	25	21.97
1880.0	18900	10	16QAM	1	49	22.49
1880.0	18900	10	16QAM	25	12	21.04
1880.0	18900	10	16QAM	50	0	21.11
1905	19150	10	QPSK	1	0	23.18
1905	19150	10	QPSK	1	25	23.17
1905	19150	10	QPSK	1	49	23.16
1905	19150	10	QPSK	25	12	21.77
1905	19150	10	QPSK	50	0	21.81
1905	19150	10	16QAM	1	0	21.86
1905	19150	10	16QAM	1	25	21.79
1905	19150	10	16QAM	1	49	21.77
1905	19150	10	16QAM	25	12	20.80
1905	19150	10	16QAM	50	0	20.93

Table 6-5. Conducted Power Data (Band 2)

FCC ID: LHH-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Page 18 of 78	

6.3 Band 17 Radiated Spurious Emissions §2.1053 §27.53(g)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 706.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
1413.00	-48.20	3.63	-44.57	H	-31.57
2119.50	-81.57	3.90	-77.68	H	-64.68
2826.00	-79.71	5.01	-74.70	H	-61.70
3532.50	-80.21	6.25	-73.96	H	-60.96
4239.00	-79.64	7.23	-72.41	H	-59.41
4945.50	-78.83	7.86	-70.97	H	-57.97

Table 6-6. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 17 Radiated Spurious Measurements (continued)
§2.1053 §27.53(g)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 710.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
1420.00	-48.67	3.68	-44.99	H	-31.99
2130.00	-81.56	3.92	-77.64	H	-64.64
2840.00	-79.65	5.02	-74.63	H	-61.63
3550.00	-80.13	6.25	-73.88	H	-60.88
4260.00	-79.63	7.25	-72.38	H	-59.38
4970.00	-78.87	7.90	-70.97	H	-57.97

Table 6-7. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 17 Radiated Spurious Measurements (continued)
§2.1053 §27.53(g)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 713.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
1427.00	-49.48	3.73	-45.75	H	-32.75
2140.50	-81.55	3.94	-77.61	H	-64.61
2854.00	-79.59	5.04	-74.55	H	-61.55
3567.50	-80.04	6.25	-73.79	H	-60.79
4281.00	-79.57	7.25	-72.32	H	-59.32
4994.50	-78.91	7.94	-70.97	H	-57.97

Table 6-8. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The “H” positioning is defined with the EUT lying flat on the test surface, the “H2” positioning is defined with the EUT standing up on its side, and the “V” positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.4 Band 5 Radiated Spurious Emissions

§2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 826.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
1653.00	-44.89	2.50	-42.40	H	-29.40
2479.50	-41.66	2.82	-38.85	H	-25.85
3306.00	-79.72	5.52	-74.19	H	-61.19
4132.50	-79.41	7.08	-72.33	H	-59.33
4959.00	-78.88	7.91	-70.97	H	-57.97
5785.50	-45.58	8.51	-37.07	H	-24.07

Table 6-9. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 5 Radiated Spurious Measurements (continued)
§2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 836.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
1673.00	-45.03	2.34	-42.70	H	-29.70
2509.50	-41.54	2.84	-38.70	H	-25.70
3346.00	-79.83	5.64	-74.18	H	-61.18
4182.50	-79.50	7.14	-72.36	H	-59.36
5019.00	-78.86	7.97	-70.89	H	-57.89
5855.50	-42.97	8.46	-34.51	H	-21.51

Table 6-10. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 5 Radiated Spurious Measurements (continued)
§2.1053 §22.917(a) RSS-132(4.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 846.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
1693.00	-44.41	2.18	-42.23	H	-29.23
2539.50	-42.25	3.04	-39.21	H	-26.21
3386.00	-79.94	5.76	-74.17	H	-61.17
4232.50	-79.59	7.20	-72.39	H	-59.39
5079.00	-78.72	8.00	-70.72	H	-57.72
5925.50	-44.30	8.42	-35.87	H	-22.87

Table 6-11. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.5 Band 4 Radiated Spurious Emissions

§2.1053 §27.53(h) RSS-139(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1712.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
3425.00	-47.44	8.09	-39.34	H	-26.34
5137.50	-48.75	10.21	-38.54	H	-25.54
6850.00	-80.49	11.31	-69.18	H	-56.18
8562.50	-79.97	13.02	-66.95	H	-53.95
10275.00	-76.86	13.01	-63.85	H	-50.85
11987.50	-74.26	13.21	-61.05	H	-48.05

Table 6-12. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 4 Radiated Spurious Measurements (continued)
§2.1053 §27.53(h) RSS-139(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1732.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
3465.00	-46.37	8.26	-38.10	H	-25.10
5197.50	-48.64	10.26	-38.38	H	-25.38
6930.00	-80.31	11.42	-68.89	H	-55.89
8662.50	-79.92	13.07	-66.86	H	-53.86
10395.00	-77.08	13.12	-63.96	H	-50.96
12127.50	-74.05	13.25	-60.80	H	-47.80

Table 6-13. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

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Band 4 Radiated Spurious Measurements (continued)
§2.1053 §27.53(h) RSS-139(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1752.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
3505.00	-44.54	8.40	-36.14	H	-23.14
5257.50	-46.69	10.32	-36.37	H	-23.37
7010.00	-80.17	11.51	-68.66	H	-55.66
8762.50	-79.86	13.11	-66.75	H	-53.75
10515.00	-77.08	13.20	-63.88	H	-50.88
12267.50	-73.90	13.31	-60.58	H	-47.58

Table 6-14. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The “H” positioning is defined with the EUT lying flat on the test surface, the “H2” positioning is defined with the EUT standing up on its side, and the “V” positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.6 Band 2 Radiated Spurious Emissions

§2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1852.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
3705.00	-44.93	8.40	-36.53	H	-23.53
5557.50	-40.22	10.63	-29.59	H	-16.59
7410.00	-80.00	11.84	-68.16	H	-55.16
9262.50	-47.22	13.29	-33.93	H	-20.93
11115.00	-43.85	13.50	-30.35	H	-17.35
12967.50	-72.44	13.68	-58.76	H	-45.76

Table 6-15. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 2 Radiated Spurious Measurements (continued)
§2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1880.00 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
3760.00	-46.95	8.42	-38.52	H	-25.52
5640.00	-40.26	10.66	-29.60	H	-16.60
7520.00	-79.89	11.92	-67.96	H	-54.96
9400.00	-47.73	13.24	-34.49	H	-21.49
11280.00	-44.70	13.49	-31.21	H	-18.21
13160.00	-72.08	13.83	-58.25	H	-45.25

Table 6-16. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 2 Radiated Spurious Measurements (continued)
§2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1907.50 MHz
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	Margin (dB)
3815.00	-44.51	8.55	-35.97	H	-22.97
5722.50	-38.69	10.69	-28.00	H	-15.00
7630.00	-79.89	12.05	-67.85	H	-54.85
9537.50	-49.83	13.20	-36.63	H	-23.63
11445.00	-45.45	13.43	-32.02	H	-19.02
13352.50	-72.37	14.00	-58.36	H	-45.36

Table 6-17. Radiated Spurious Data

NOTES:

1. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported in the table above.
2. This unit was tested while being powered by a 12V DC Power Supply.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The "H" positioning is defined with the EUT lying flat on the test surface, the "H2" positioning is defined with the EUT standing up on its side, and the "V" positioning is defined with the EUT standing upright. The worst case test configuration was found with the EUT in the horizontal positioning. The data reported in the table above was measured in this test setup.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.7 Band 17 Frequency Stability Measurements

\$2.1055 \$22.355 \$27.54



OPERATING FREQUENCY: 710,000,000 Hz
 CHANNEL: 23090
 REFERENCE VOLTAGE: 12 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (° C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	12.00	+ 20 (Ref)	709,999,982	-18	-0.0000025
100 %		- 30	709,999,983	-17	-0.0000024
100 %		- 20	709,999,986	-14	-0.0000020
100 %		- 10	710,000,006	6	0.0000008
100 %		0	709,999,995	-5	-0.0000007
100 %		+ 10	709,999,996	-4	-0.0000006
100 %		+ 20	710,000,014	14	0.0000020
100 %		+ 30	709,999,990	-10	-0.0000014
100 %		+ 40	709,999,992	-8	-0.0000011
100 %		+ 50	710,000,009	9	0.0000013
115 %		13.80	+ 20	709,999,996	-4
BATT. ENDPOINT	10.20	+ 20	710,000,012	12	0.0000017

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

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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Band 17 Frequency Stability Measurements (Cont'd)
§2.1055 §22.355 §27.54

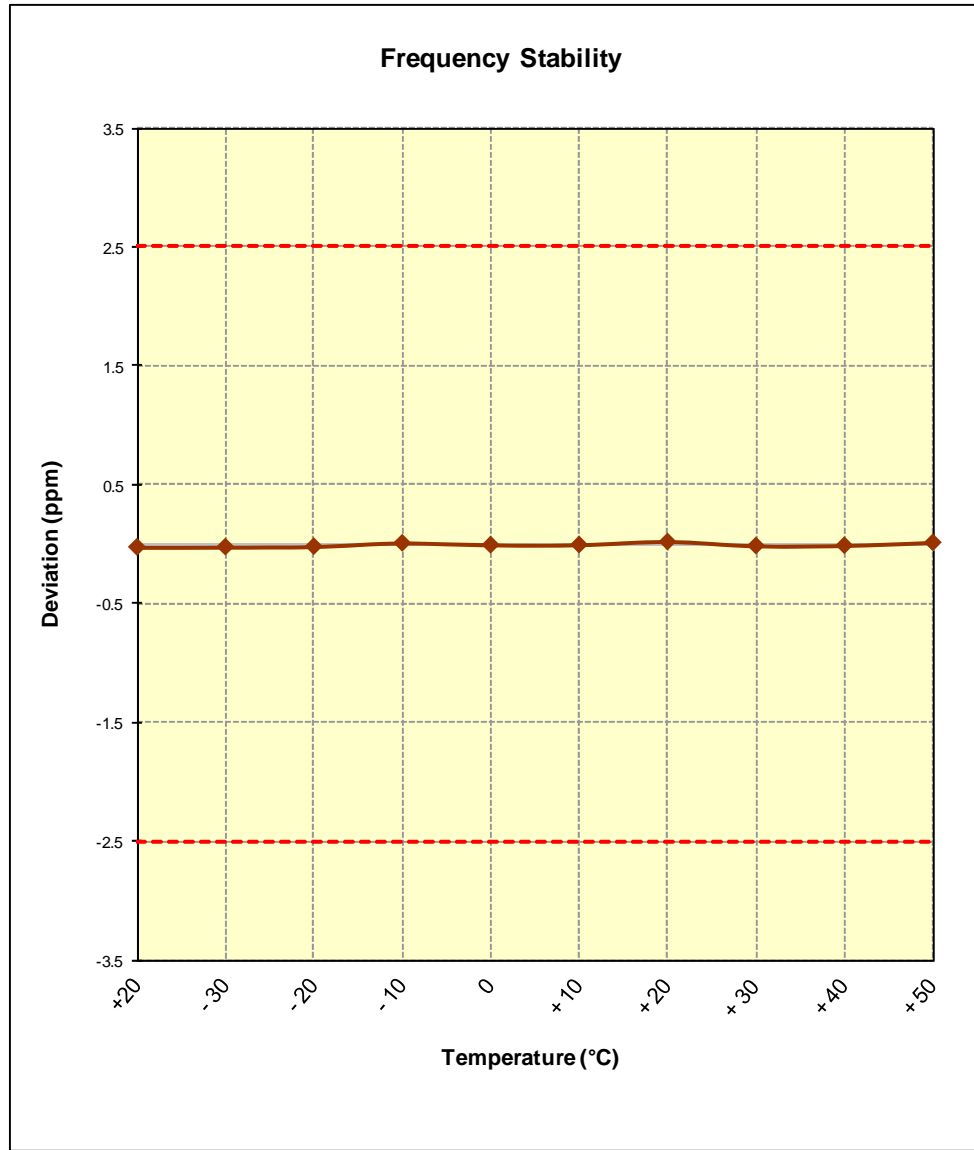




Figure 6-1. Frequency Stability Graph (Band 17)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.8 Band 5 Frequency Stability Measurements

§2.1055 §22.355 RSS-132(4.3)

OPERATING FREQUENCY: 836,500,000 Hz
 CHANNEL: 20525
 REFERENCE VOLTAGE: 12 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (° C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	12.00	+ 20 (Ref)	836,499,982	-18	-0.0000022
100 %		- 30	836,500,025	25	0.0000030
100 %		- 20	836,499,980	-20	-0.0000024
100 %		- 10	836,500,008	8	0.0000010
100 %		0	836,499,980	-20	-0.0000024
100 %		+ 10	836,500,009	9	0.0000011
100 %		+ 20	836,500,011	11	0.0000013
100 %		+ 30	836,499,998	-2	-0.0000002
100 %		+ 40	836,499,980	-20	-0.0000024
100 %		+ 50	836,500,016	16	0.0000019
115 %		13.80	+ 20	836,499,991	-9
BATT. ENDPOINT	10.20	+ 20	836,500,020	20	0.0000024

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

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 5 Frequency Stability Measurements (Cont'd)
§2.1055 §22.355 RSS-132(4.3)

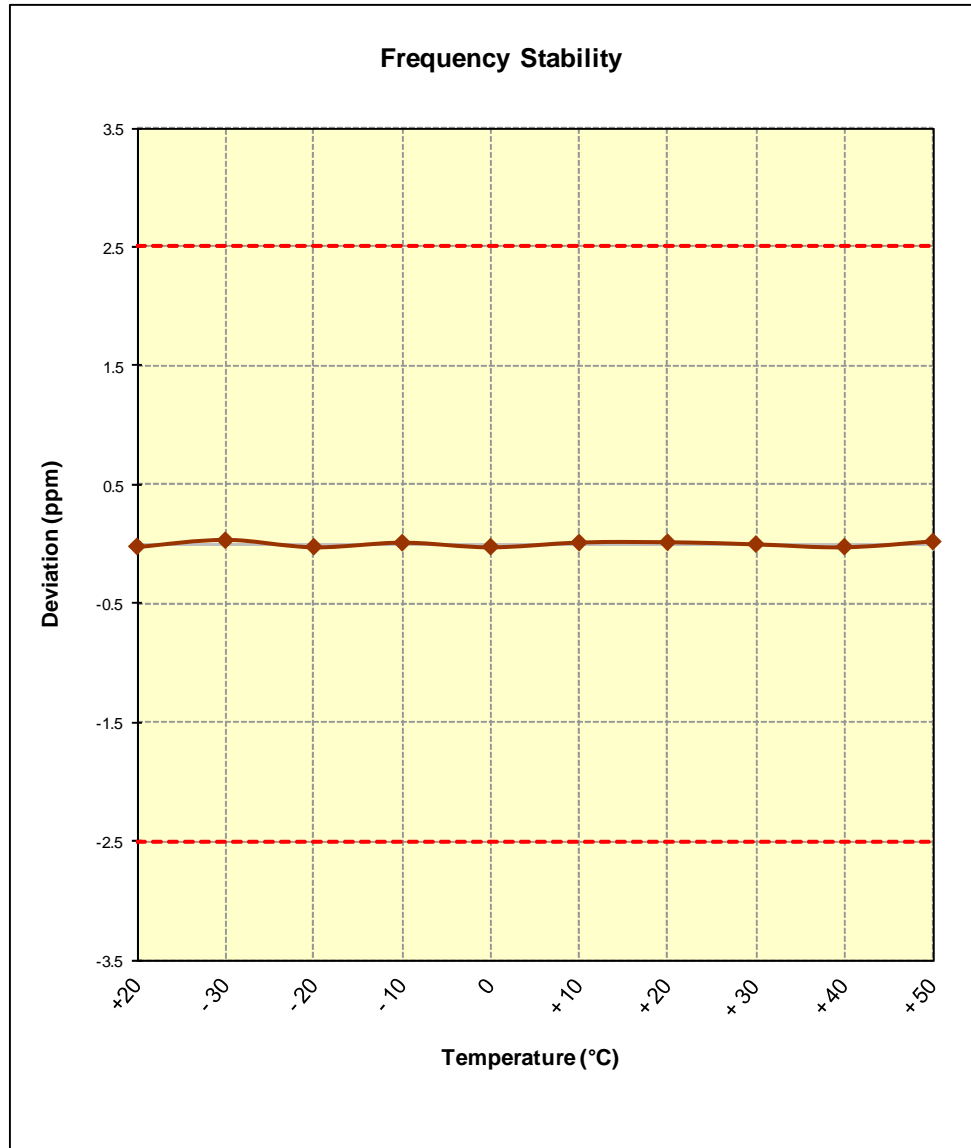




Figure 6-2. Frequency Stability Graph (Band 5)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.9 Band 4 Frequency Stability Measurements §2.1055 §27.54 RSS-139(6.3)



OPERATING FREQUENCY: 1,732,500,000 Hz
 CHANNEL: 20175
 REFERENCE VOLTAGE: 12 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (° C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	12.00	+ 20 (Ref)	1,732,499,982	-18	-0.0000010
100 %		- 30	1,732,500,057	57	0.0000033
100 %		- 20	1,732,499,977	-23	-0.0000013
100 %		- 10	1,732,499,999	-1	-0.0000001
100 %		0	1,732,500,003	3	0.0000002
100 %		+ 10	1,732,500,036	36	0.0000021
100 %		+ 20	1,732,499,961	-39	-0.0000023
100 %		+ 30	1,732,499,990	-10	-0.0000006
100 %		+ 40	1,732,499,983	-17	-0.0000010
100 %		+ 50	1,732,499,973	-27	-0.0000016
115 %	13.80	+ 20	1,732,499,973	-27	-0.0000016
BATT. ENDPOINT	10.20	+ 20	1,732,499,980	-20	-0.0000012

Table 6-20. Frequency Stability Data (Band 4)

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 4 Frequency Stability Measurements (Cont'd)
§2.1055 §§27.54 RSS-139(6.3)

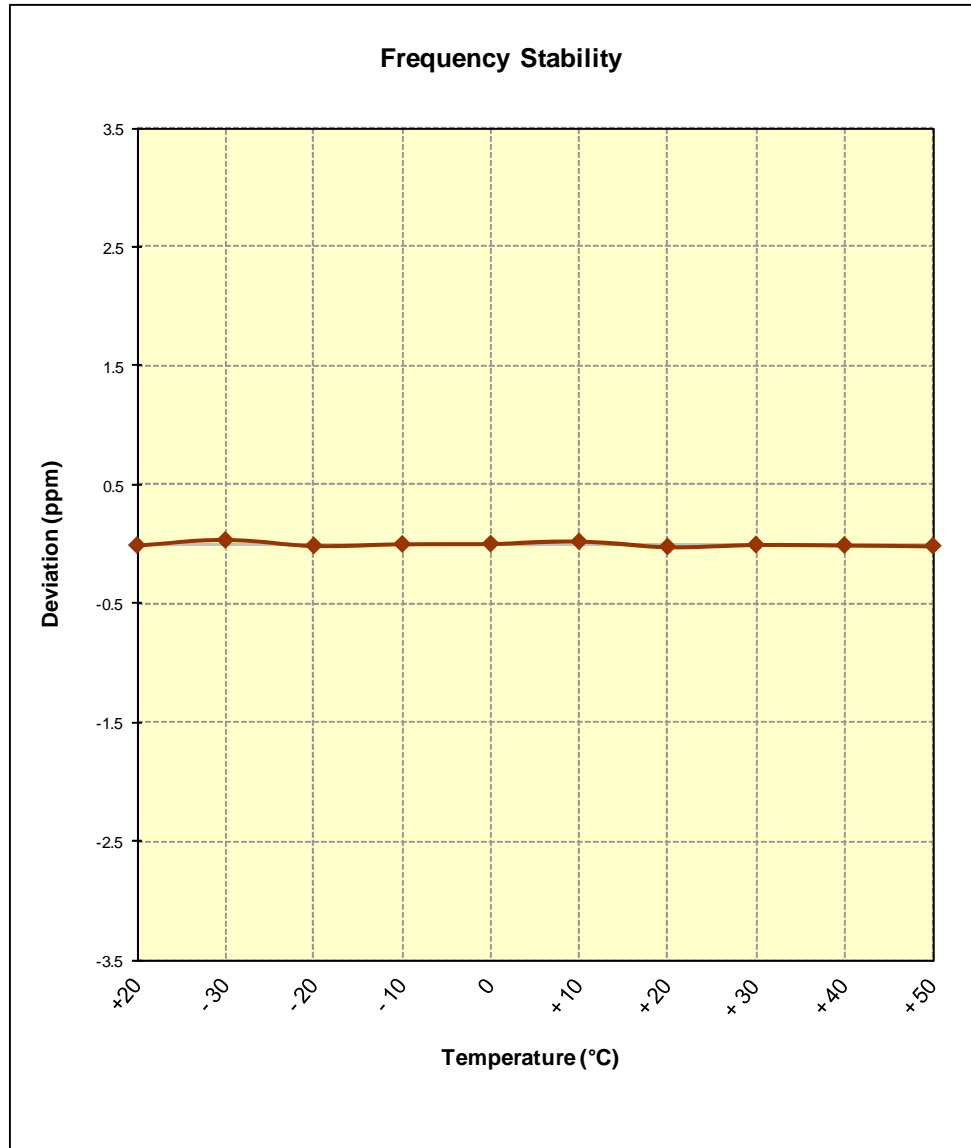


Figure 6-3. Frequency Stability Graph (Band 4)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 36 of 78

6.10 Band 2 Frequency Stability Measurements

§2.1055 §24.235 RSS-133(6.3)



OPERATING FREQUENCY: 1,880,000,000 Hz
 CHANNEL: 18900
 REFERENCE VOLTAGE: 12 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (° C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	12.00	+ 20 (Ref)	1,879,999,977	-23	-0.0000012
100 %		- 30	1,880,000,012	12	0.0000006
100 %		- 20	1,879,999,936	-64	-0.0000034
100 %		- 10	1,880,000,042	42	0.0000022
100 %		0	1,879,999,936	-64	-0.0000034
100 %		+ 10	1,880,000,012	12	0.0000006
100 %		+ 20	1,879,999,970	-30	-0.0000016
100 %		+ 30	1,880,000,019	19	0.0000010
100 %		+ 40	1,880,000,054	54	0.0000029
100 %		+ 50	1,879,999,969	-31	-0.0000016
115 %		13.80	+ 20	1,879,999,947	-53
BATT. ENDPOINT	10.20	+ 20	1,879,999,968	-32	-0.0000017

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

Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain in-band when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Page 37 of 78	

Band 2 Frequency Stability Measurements (Cont'd)
§2.1055 §24.235 RSS-133(6.3)

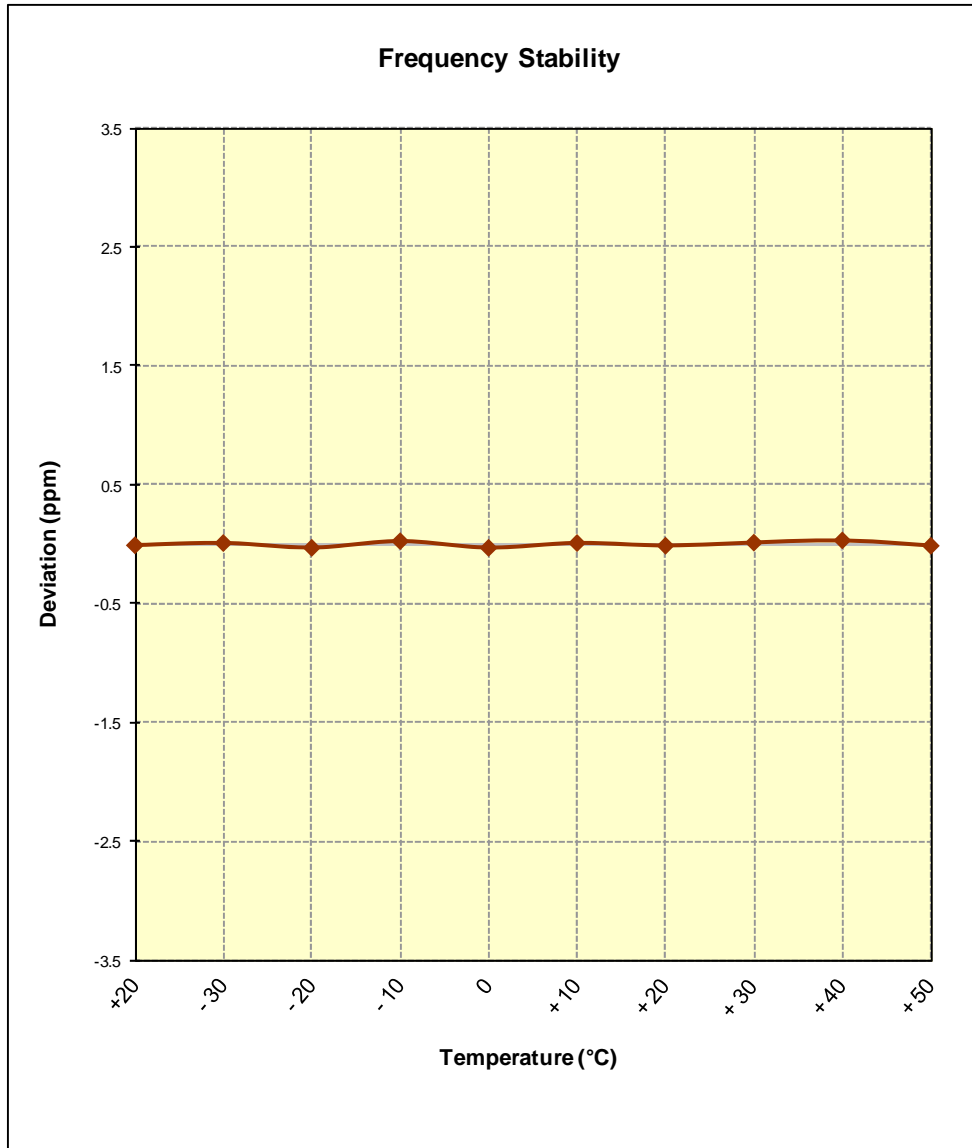


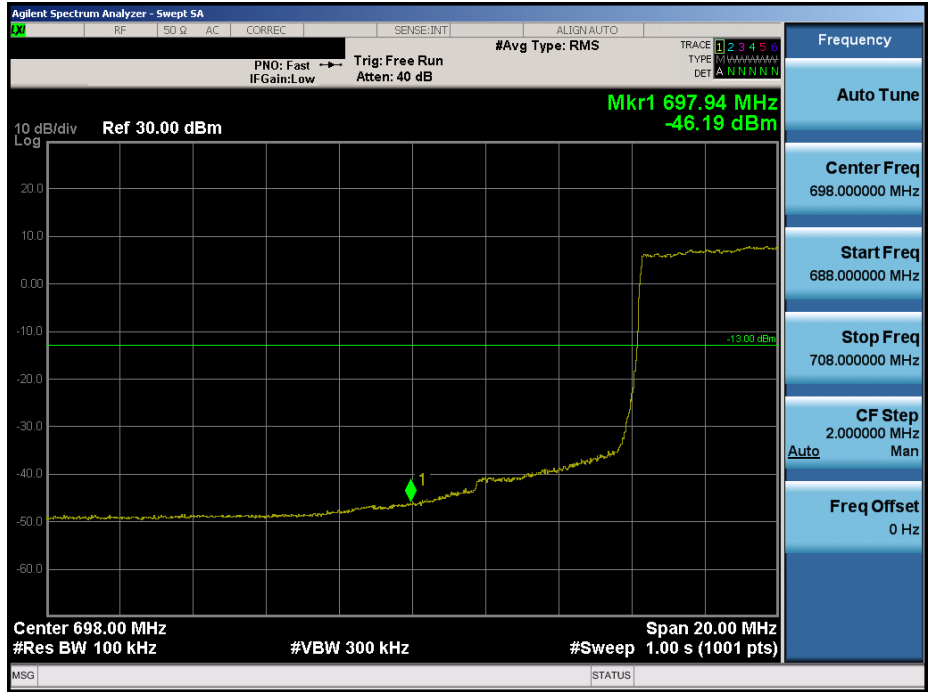


Figure 6-4. Frequency Stability Graph (Band 2)

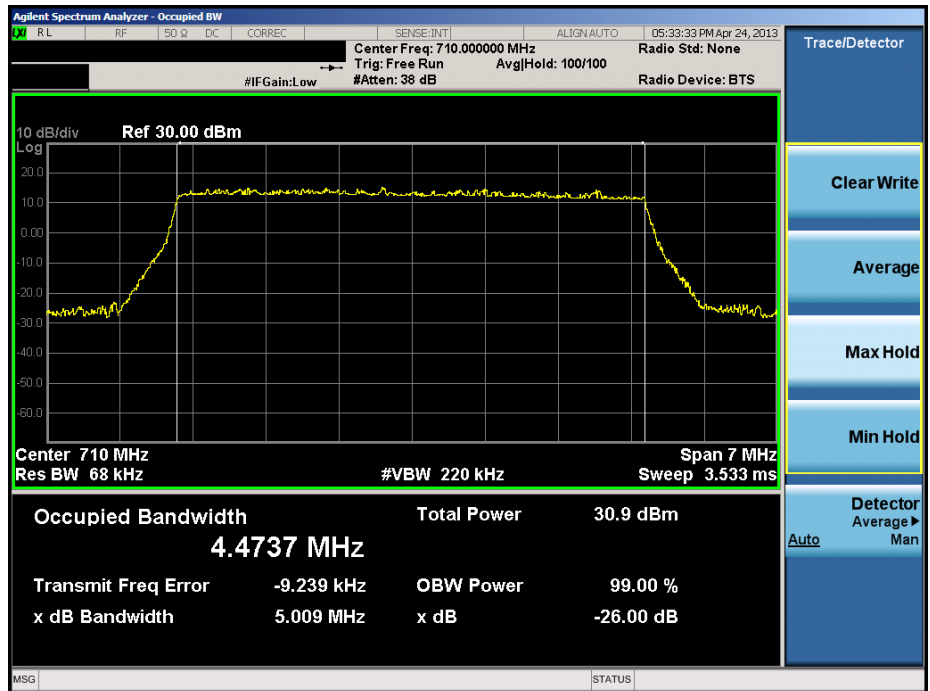
FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Page 38 of 78	

7.0 BAND 17 PLOTS OF EMISSIONS

Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.

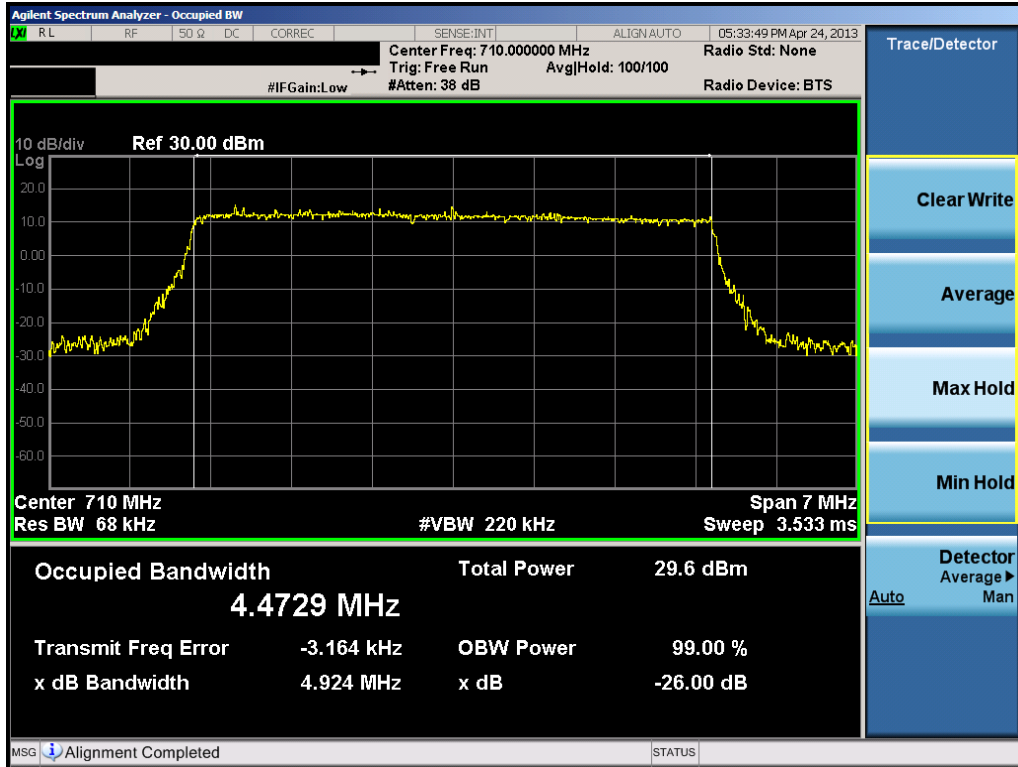


Plot 7-1. Lower Band Edge Plot (5.0MHz QPSK – RB Size 25)



Plot 7-2. Occupied Bandwidth Plot (5.0MHz QPSK – RB Size 25)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 39 of 78



Plot 7-3. Occupied Bandwidth Plot (5.0MHz 16-QAM – RB Size 25)

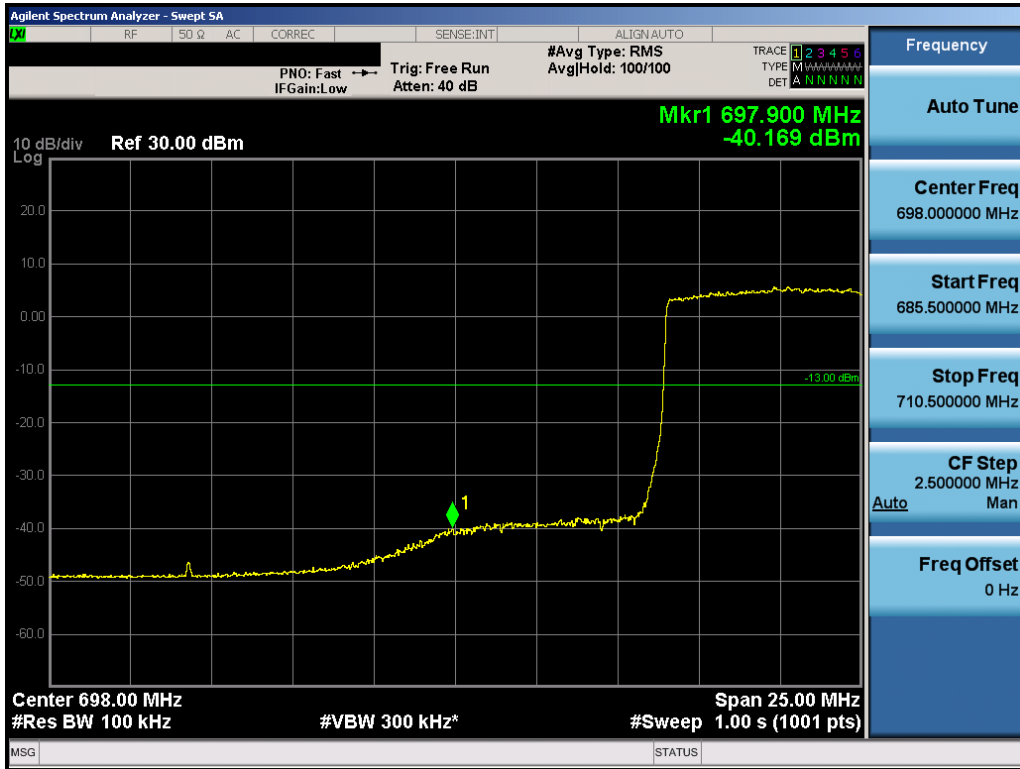


Plot 7-4. Upper Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 40 of 78

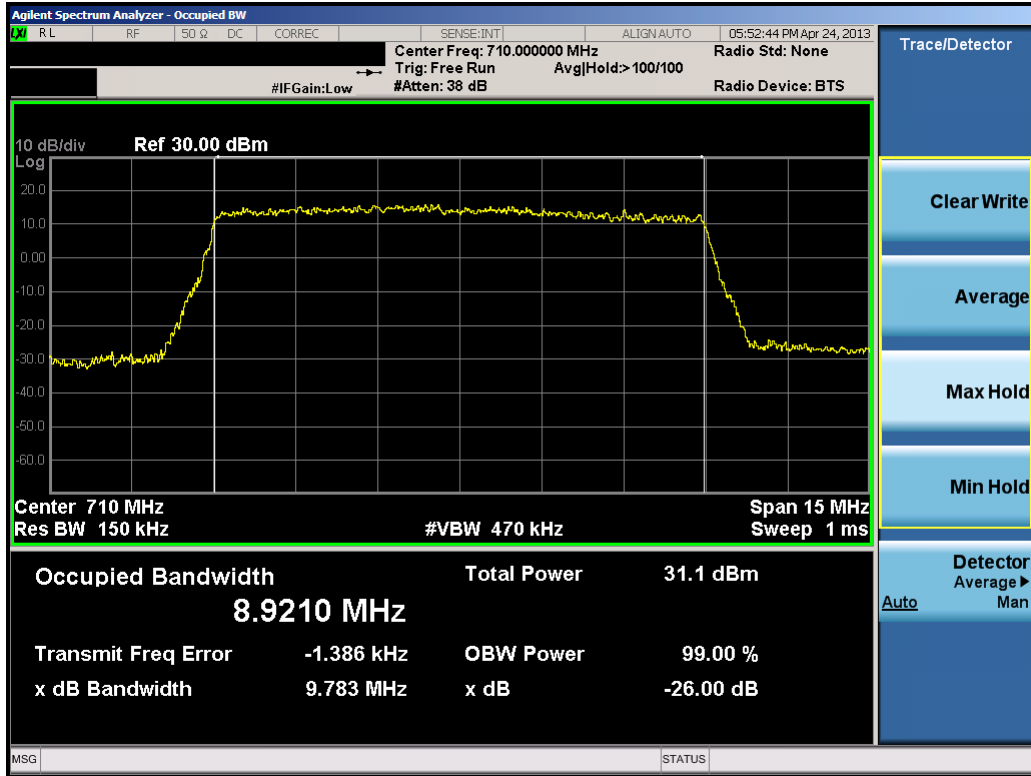


Plot 7-5. Upper Extended Band Edge Plot (5.0MHz QPSK – RB Size 25)

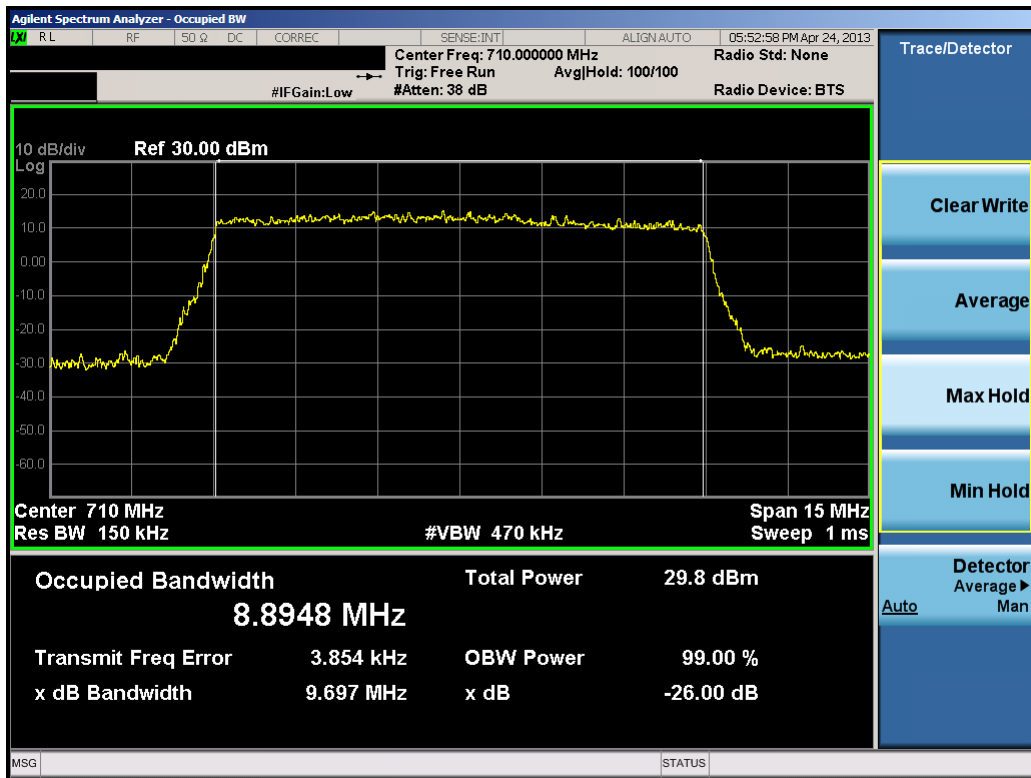


Plot 7-6. Lower Band Edge Plot (10.0MHz QPSK – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 41 of 78

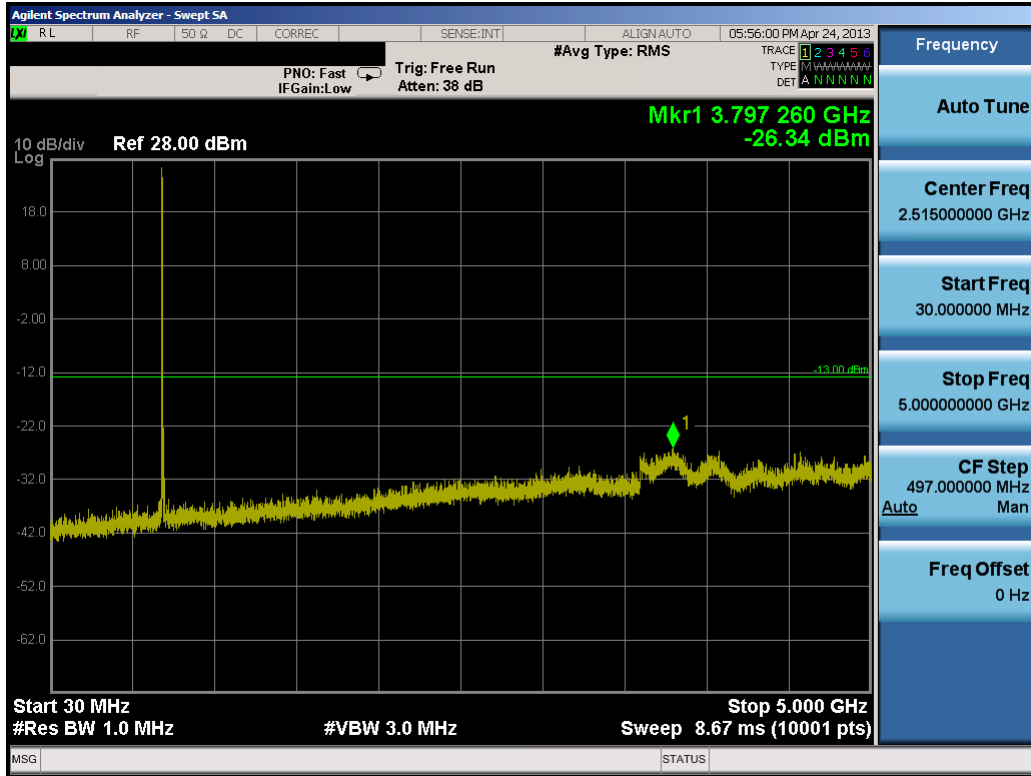


Plot 7-7. Occupied Bandwidth Plot (10.0MHz QPSK – RB Size 50)

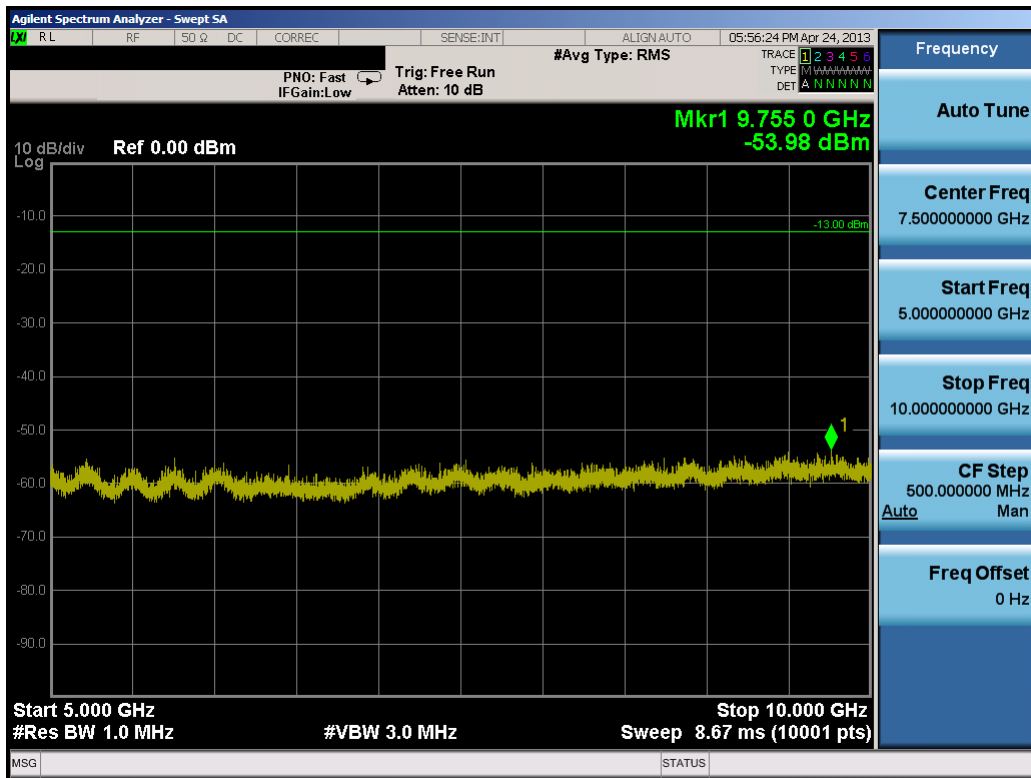


Plot 7-8. Occupied Bandwidth Plot (10.0MHz 16-QAM – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 42 of 78

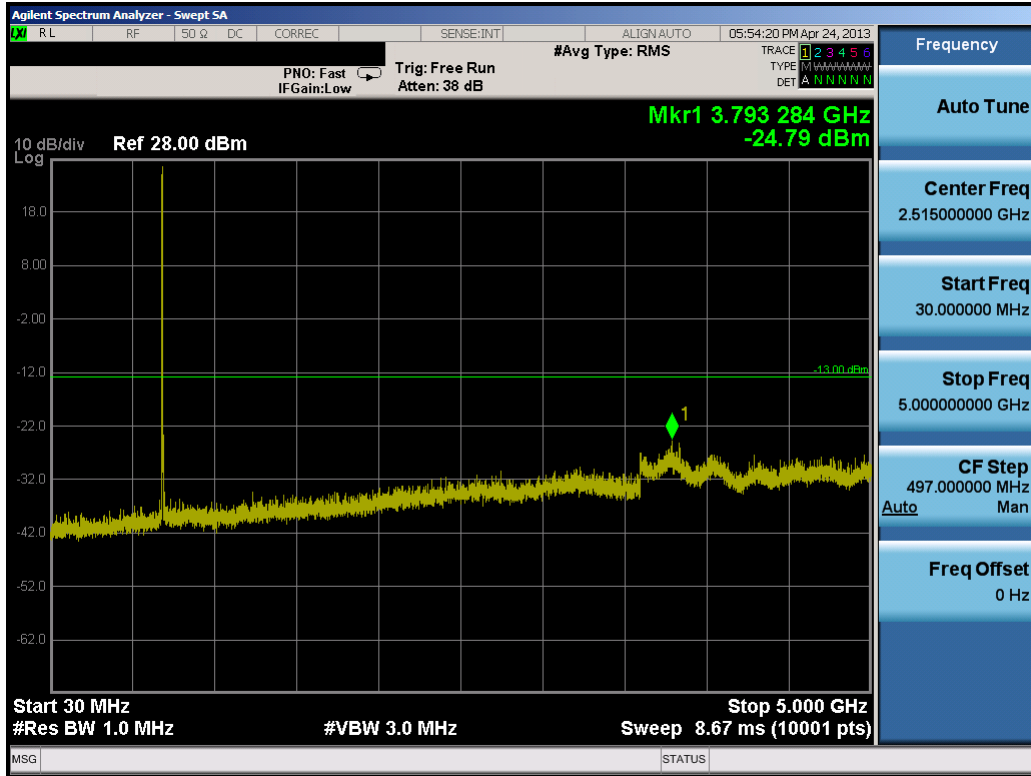


Plot 7-9. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)

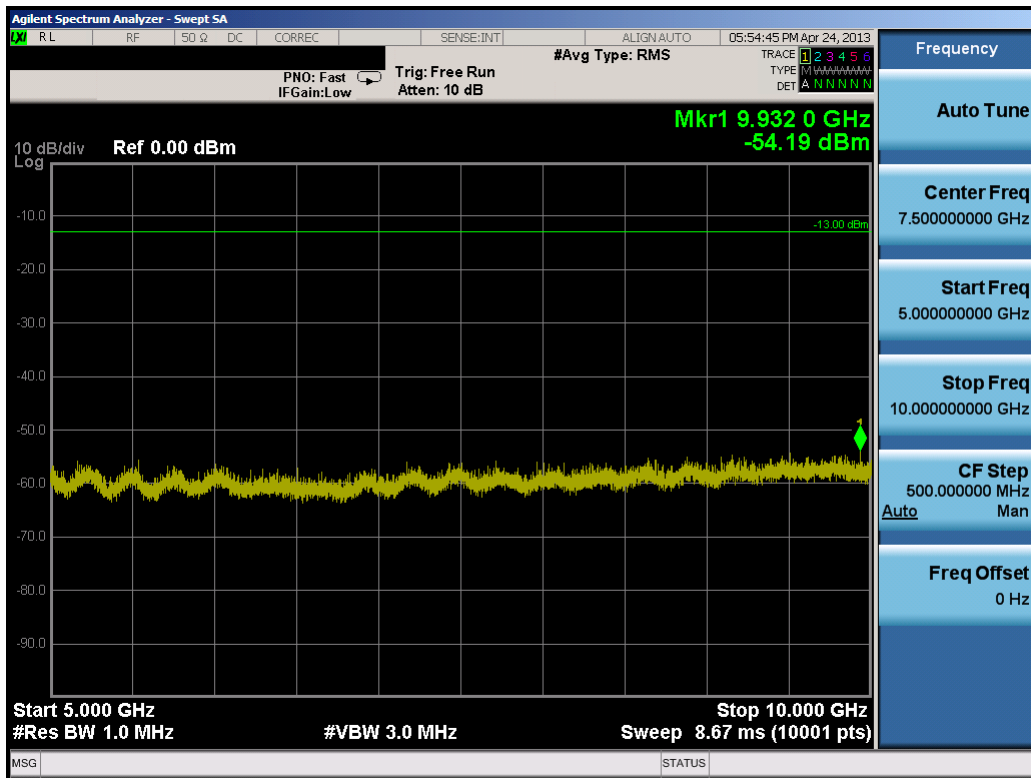


Plot 7-10. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 43 of 78

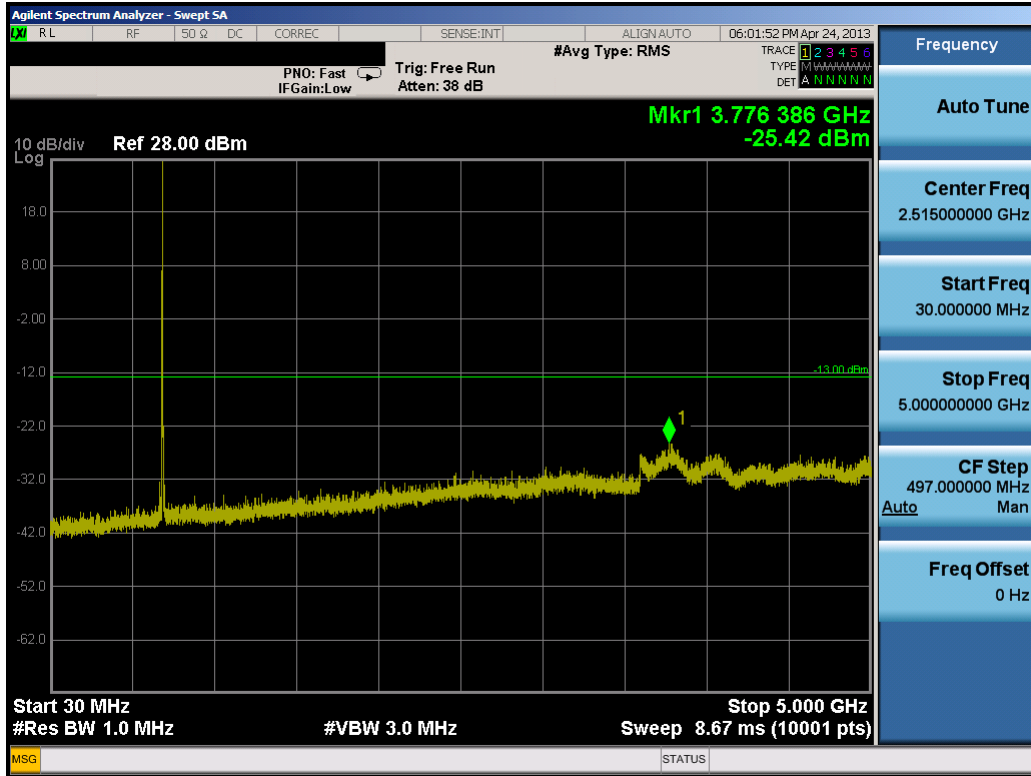


Plot 7-11. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

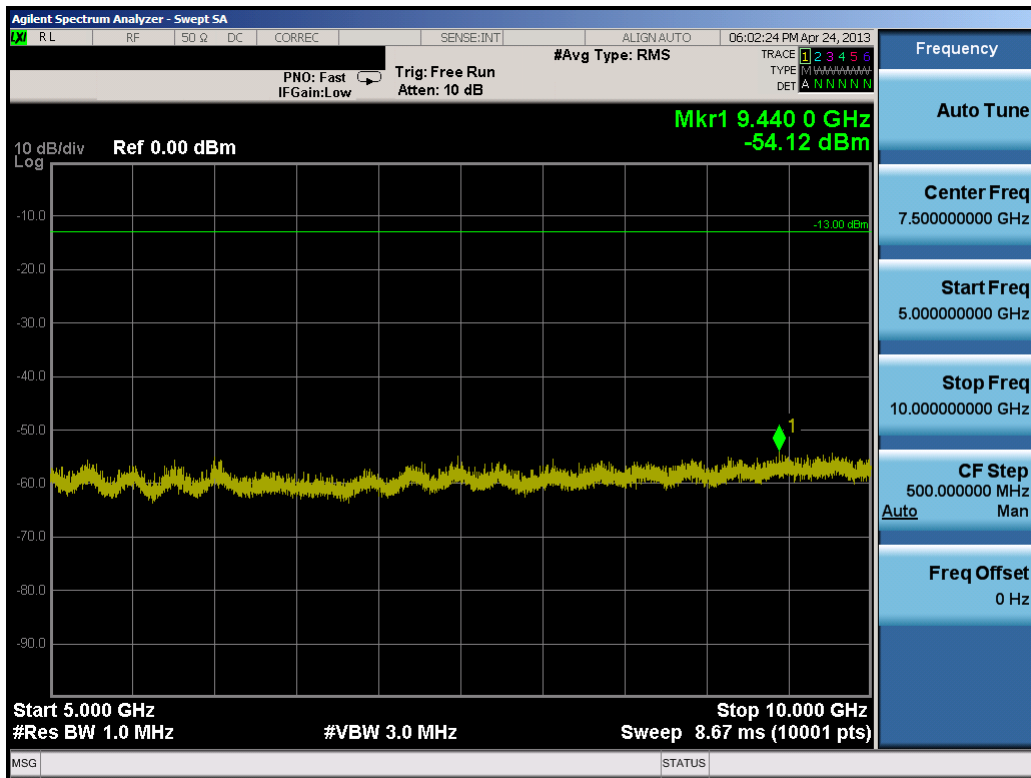


Plot 7-12. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 44 of 78

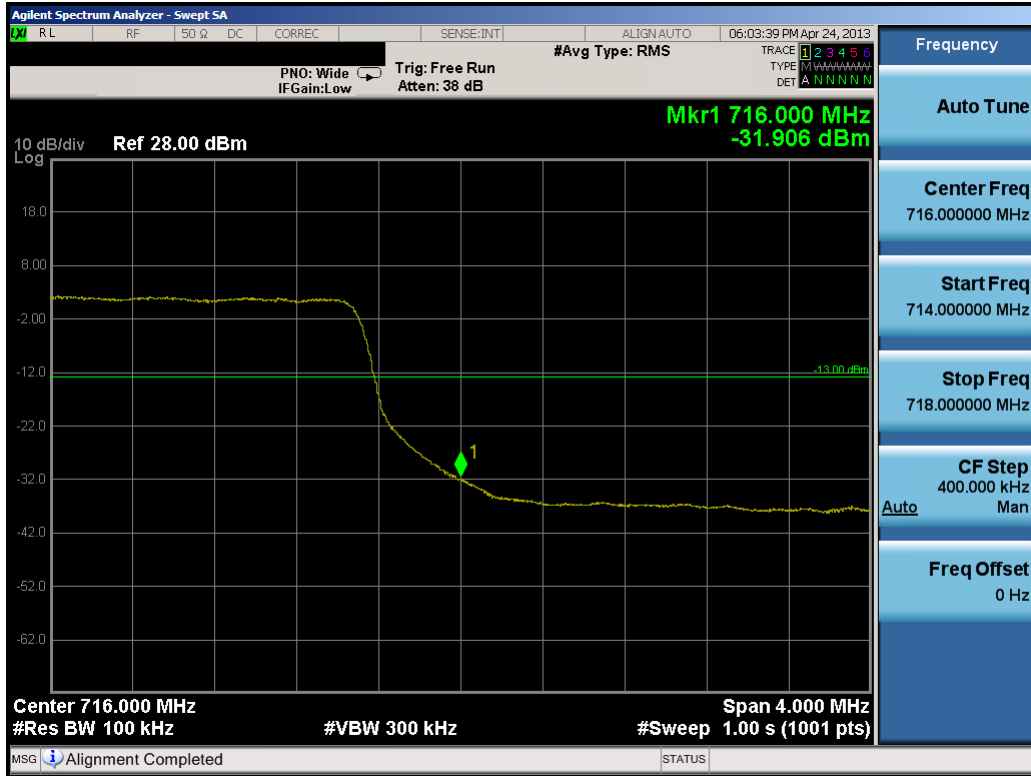


Plot 7-13. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

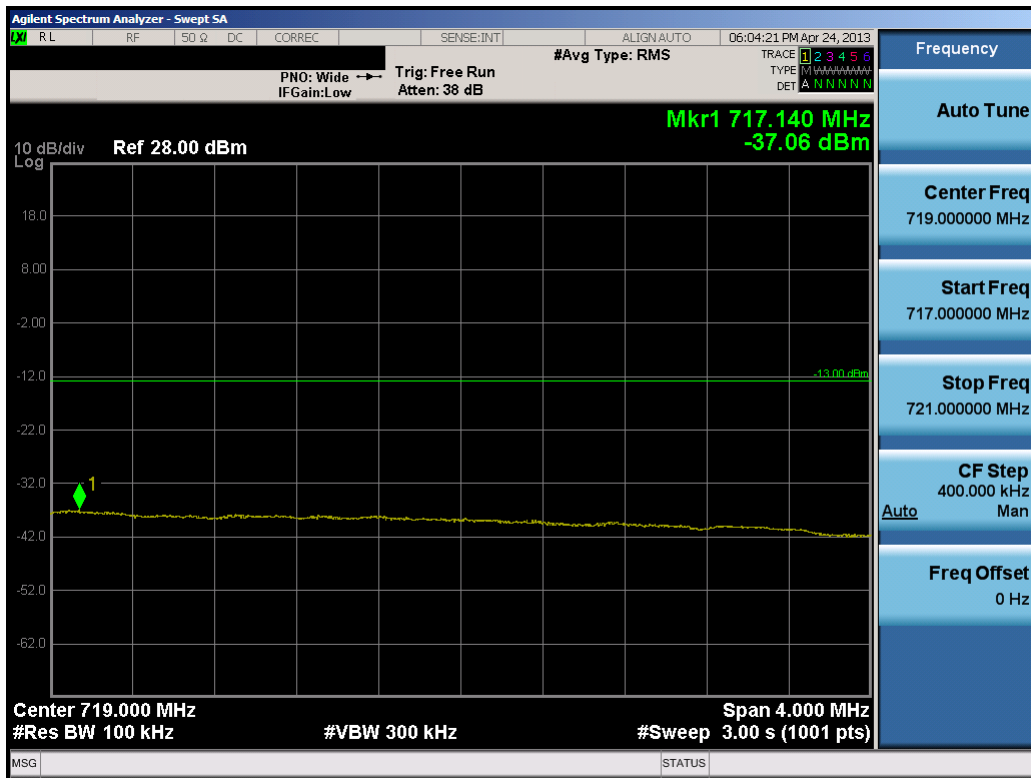


Plot 7-14. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 45 of 78



Plot 7-15. Upper Band Edge Plot (10.0MHz QPSK – RB Size 50)

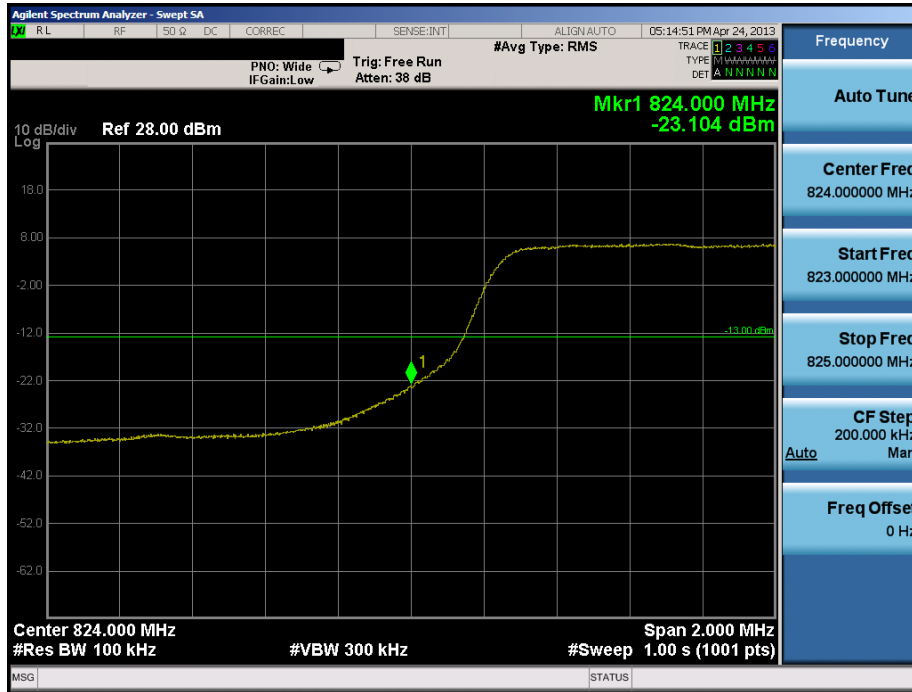


Plot 7-16. Upper Extended Band Edge Plot (10.0MHz QPSK – RB Size 50)

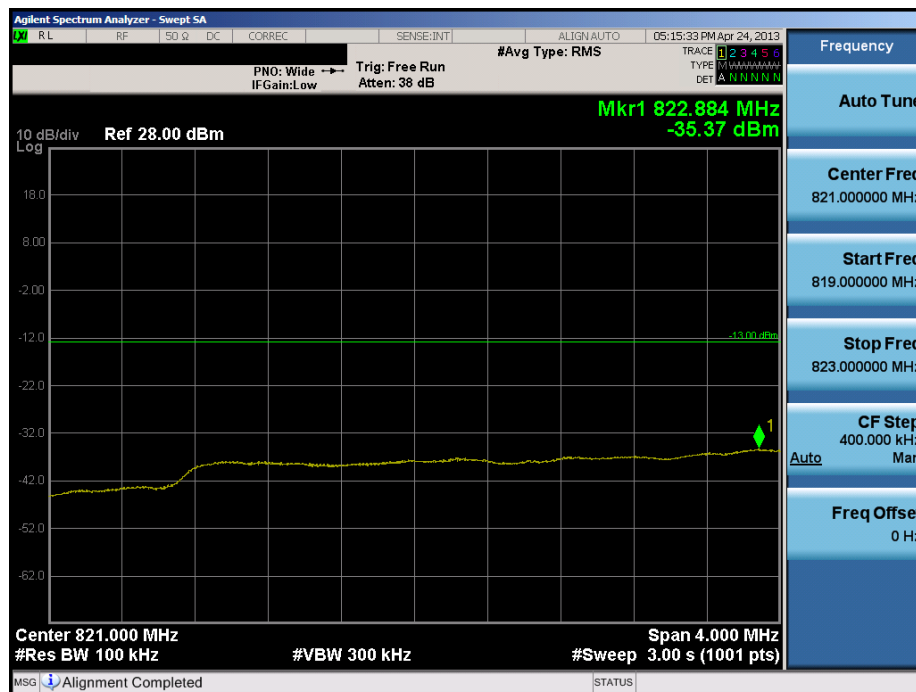
FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 46 of 78

8.0 BAND 5 PLOTS OF EMISSIONS

Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.

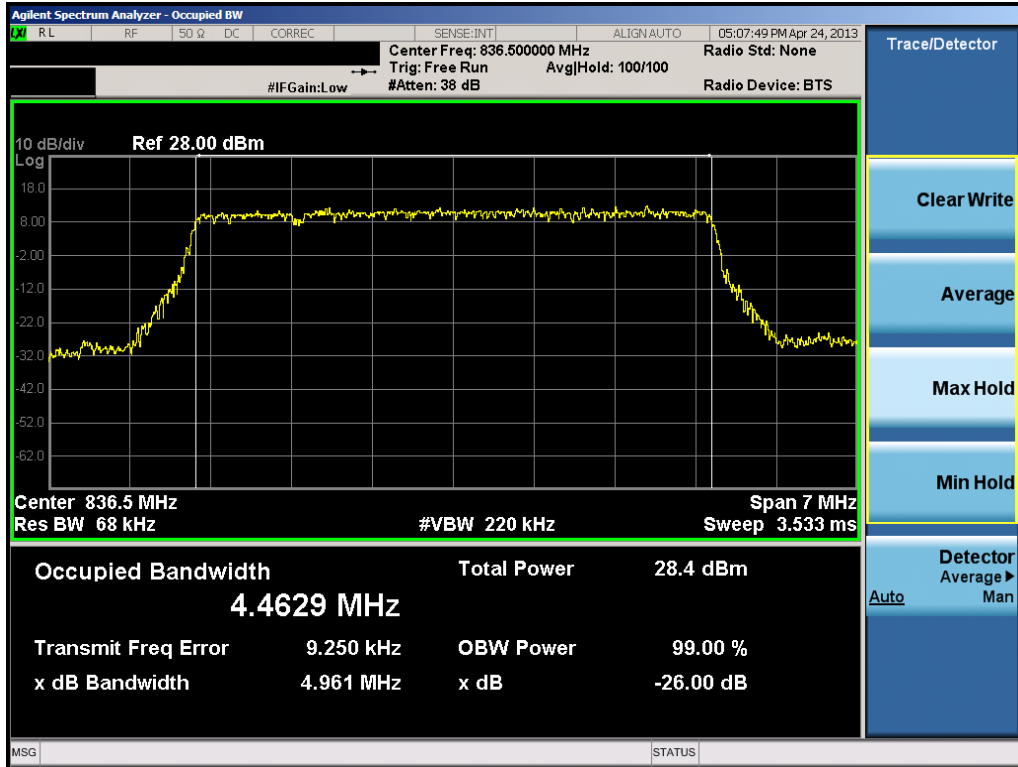


Plot 8-1. Lower Band Edge Plot (5.0MHz QPSK – RB Size 25)

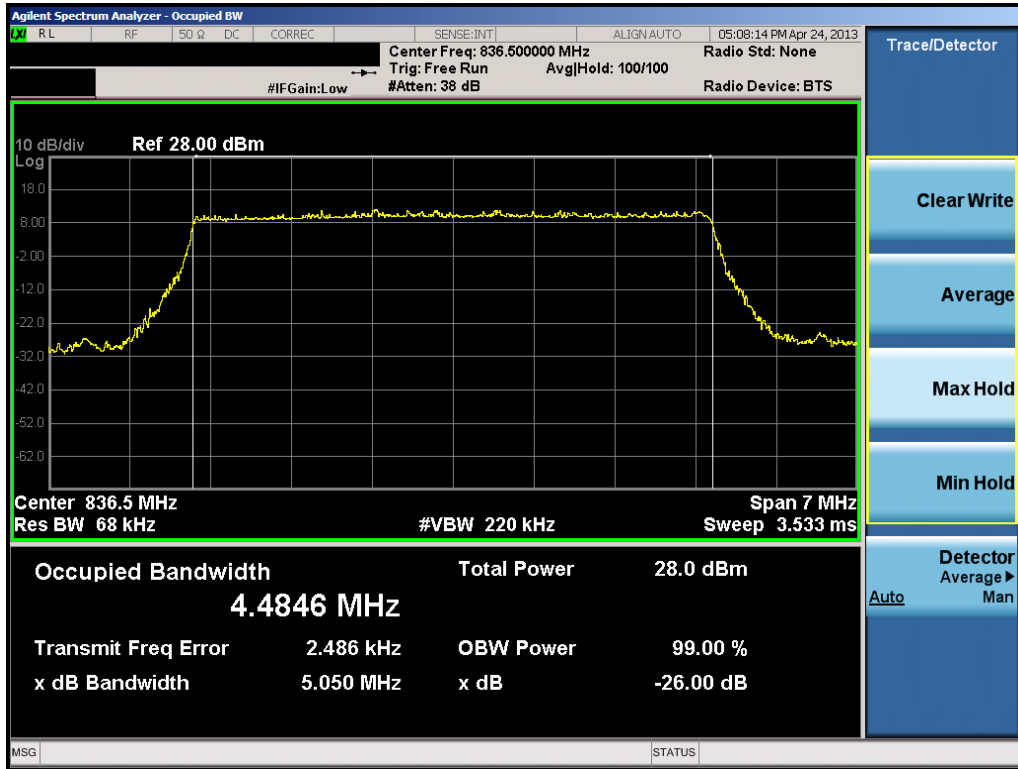


Plot 8-2. Lower Extended Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 47 of 78



Plot 8-3. Occupied Bandwidth Plot (5.0MHz QPSK – RB Size 25)



Plot 8-4. Occupied Bandwidth Plot (5.0MHz 16-QAM – RB Size 25)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 48 of 78

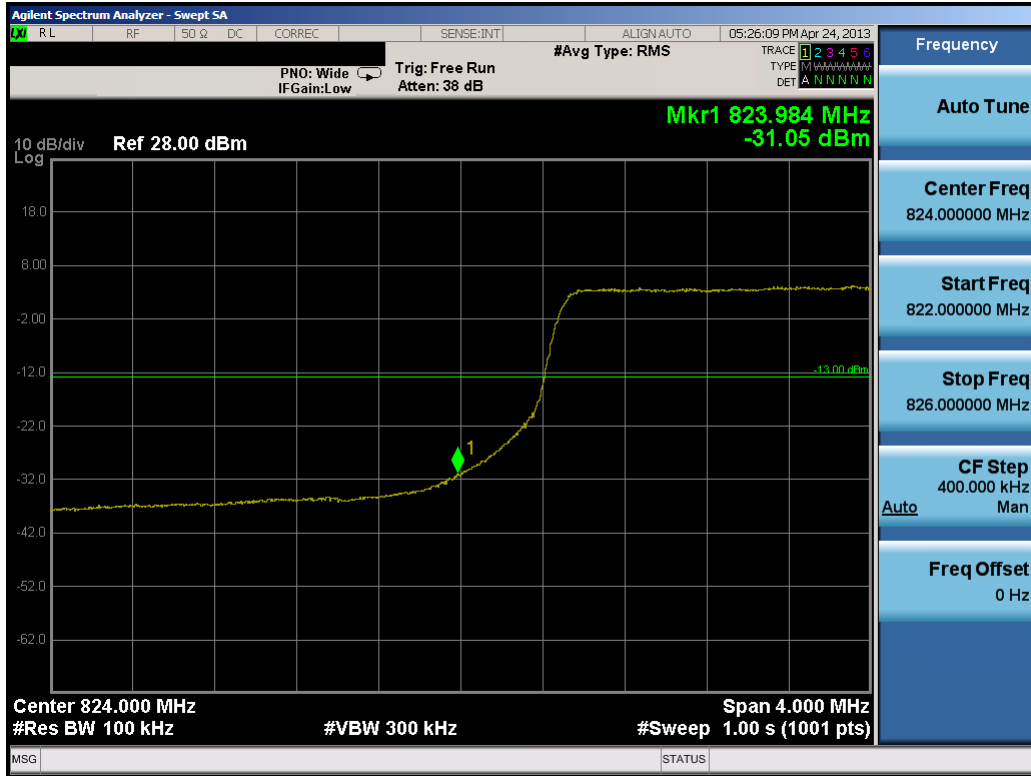


Plot 8-5. Upper Band Edge Plot (5.0MHz QPSK – RB Size 25)



Plot 8-6. Upper Extended Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 49 of 78

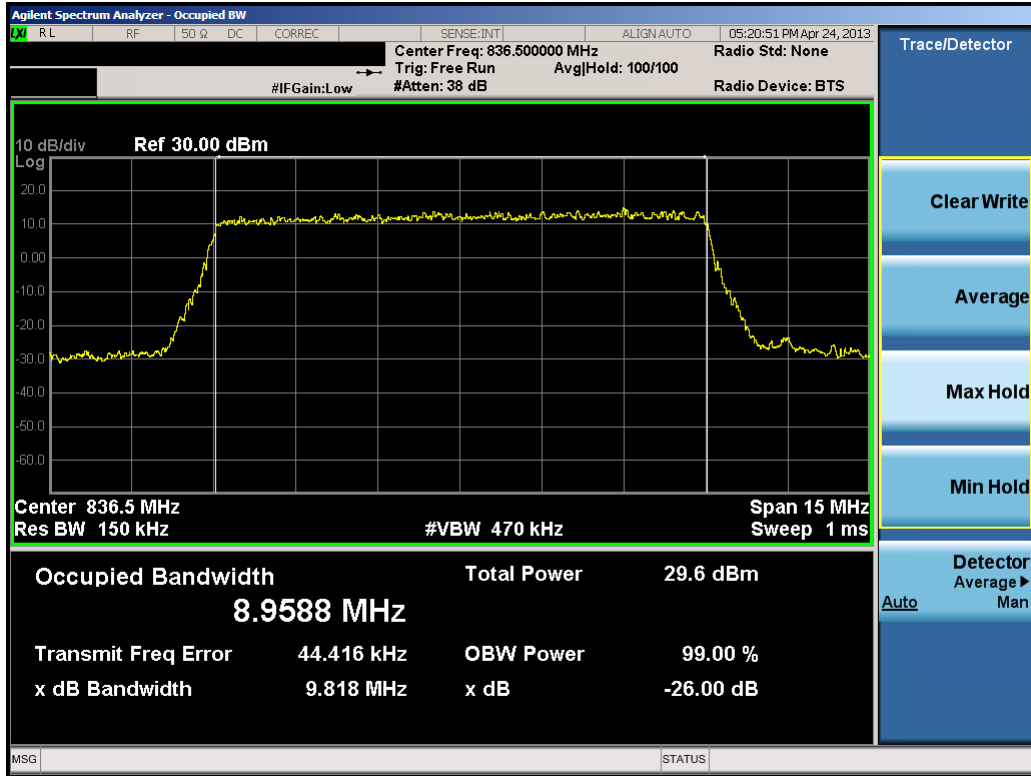


Plot 8-7. Lower Band Edge Plot (10.0MHz QPSK – RB Size 50)

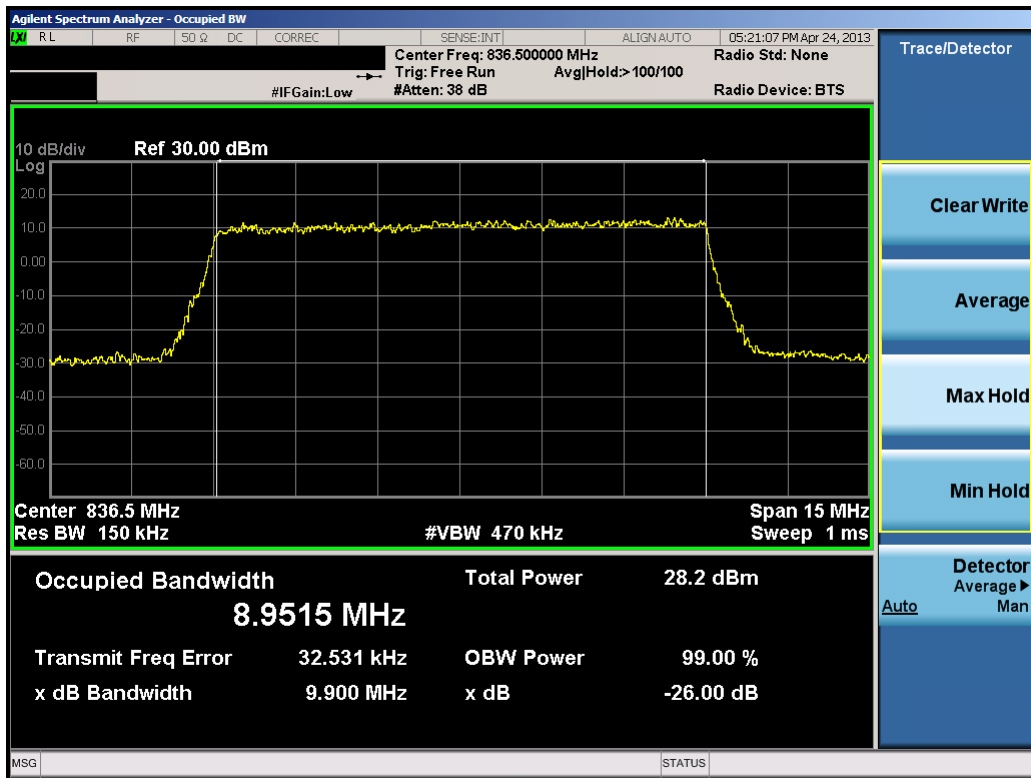


Plot 8-8. Lower Extended Band Edge Plot (10.0MHz QPSK – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 50 of 78

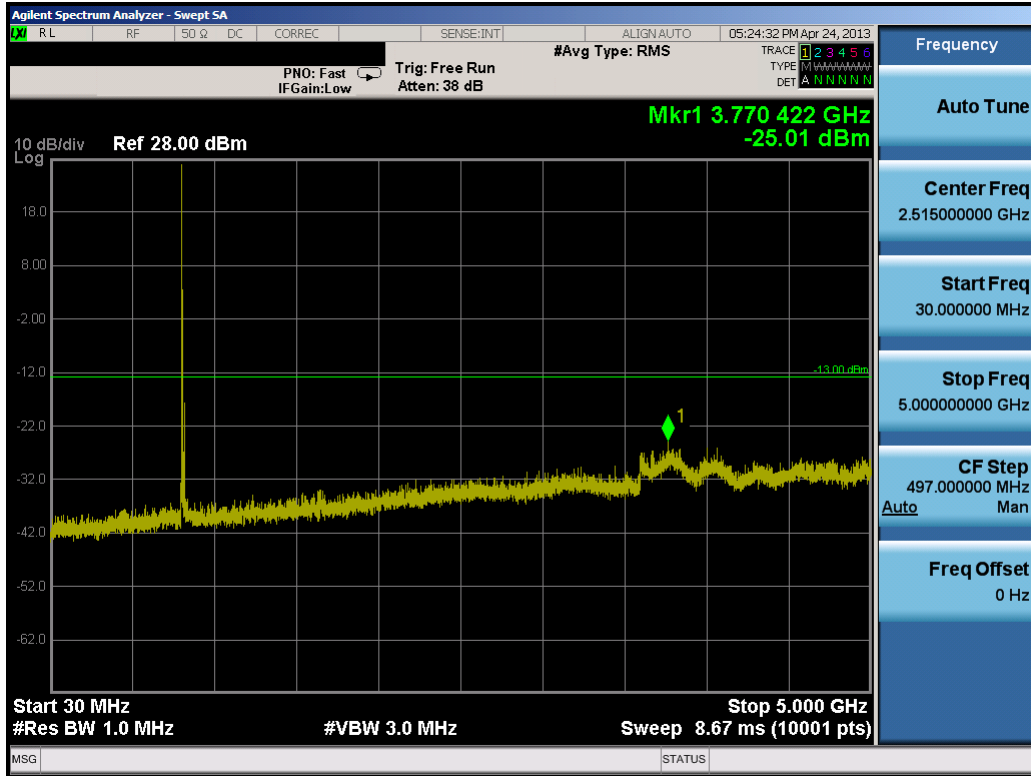


Plot 8-9. Occupied Bandwidth Plot (10.0MHz QPSK – RB Size 50)

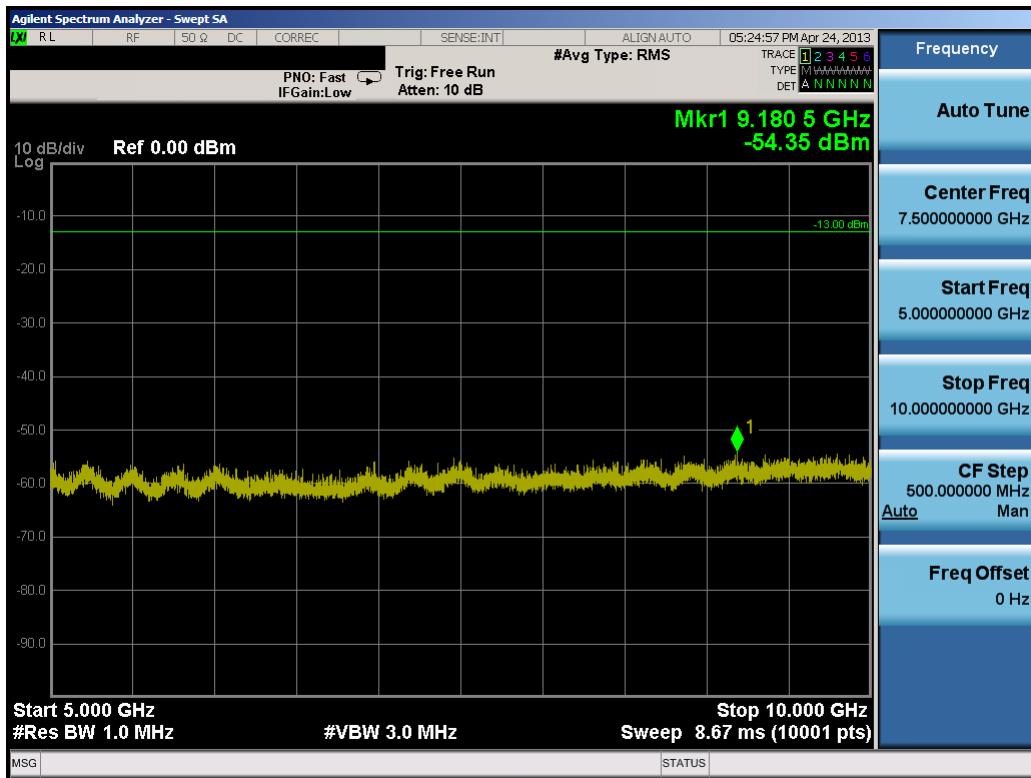


Plot 8-10. Occupied Bandwidth Plot (10.0MHz 16-QAM – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
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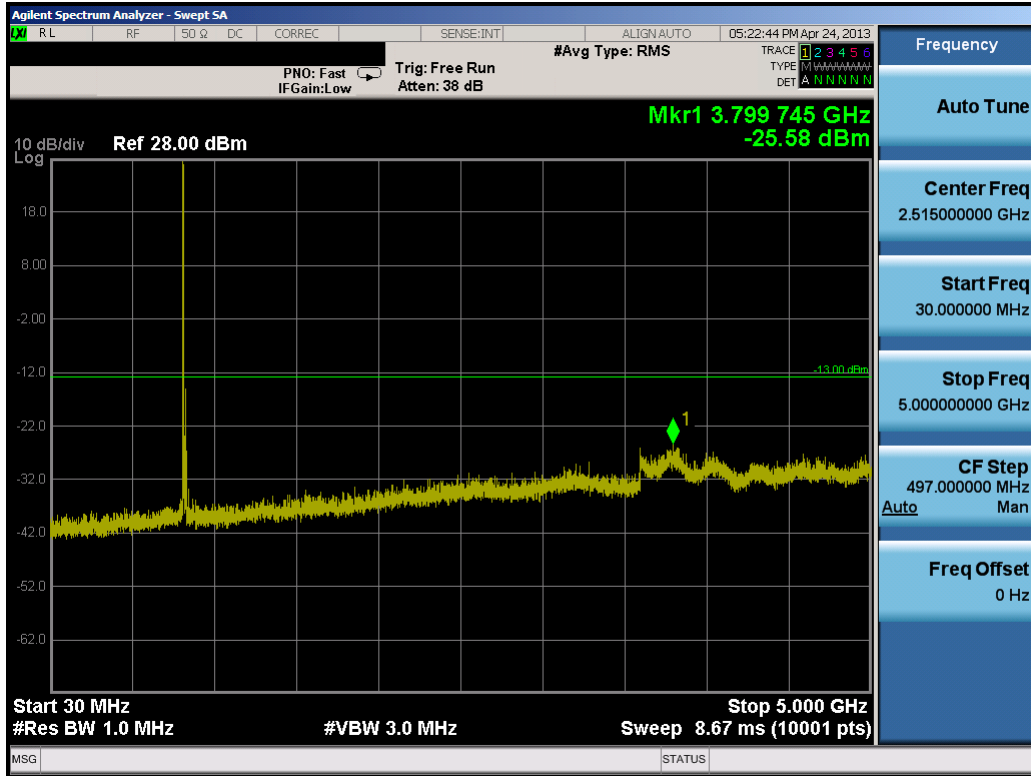


Plot 8-11. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)

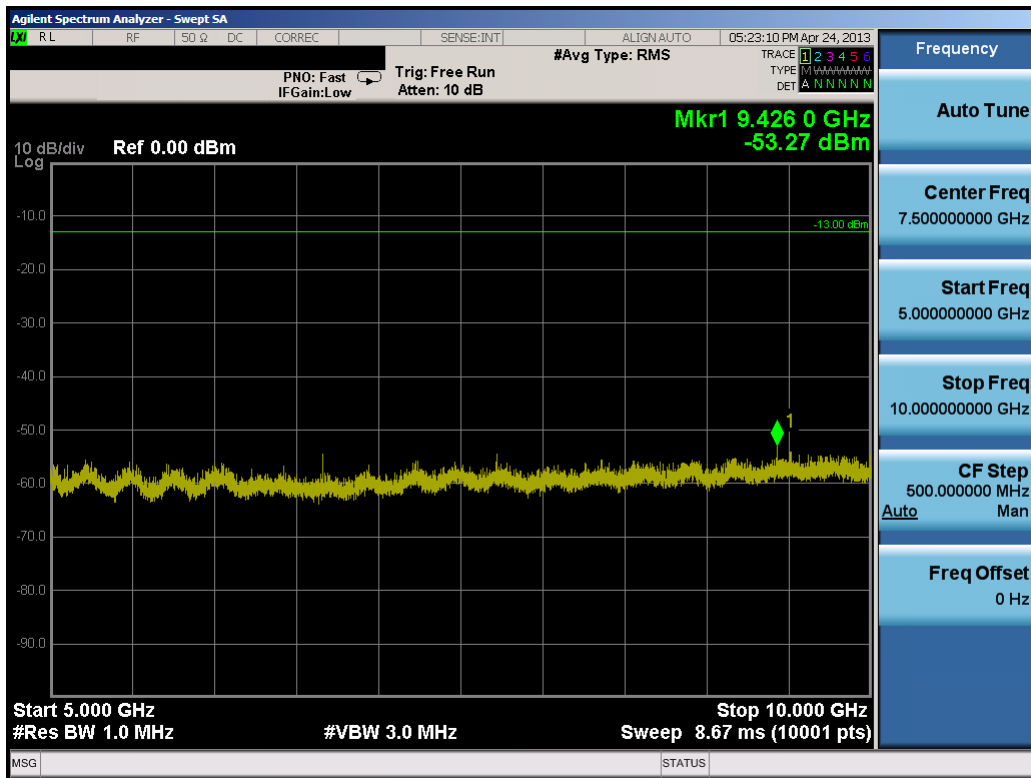


Plot 8-12. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)



FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 52 of 78

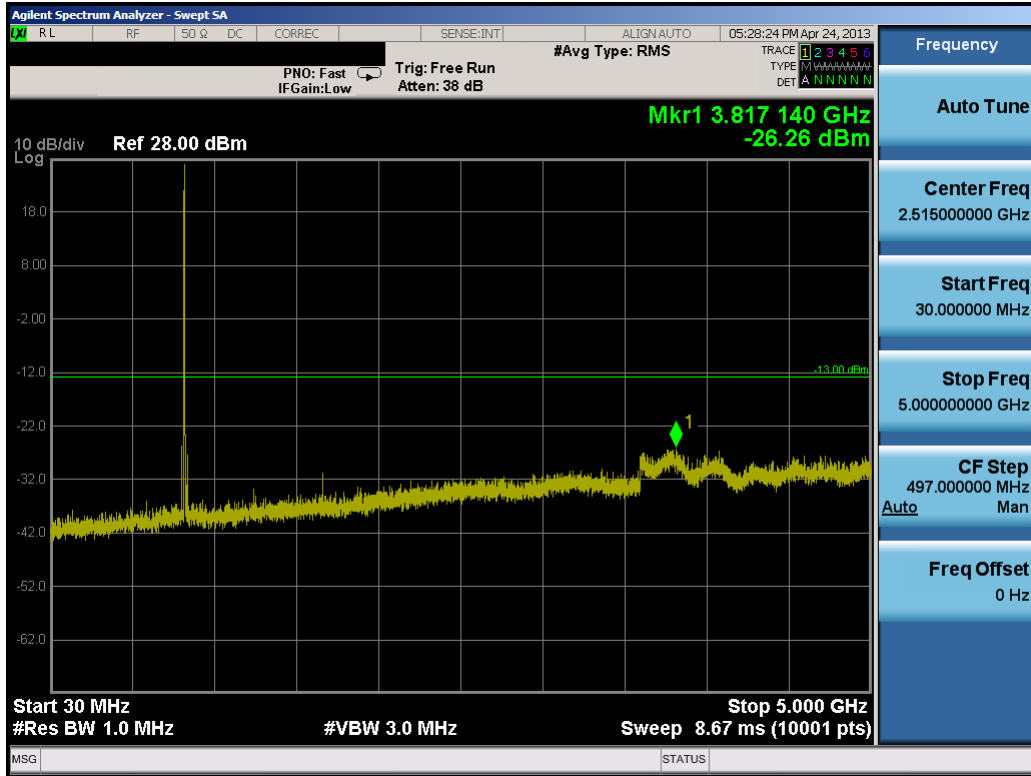


Plot 8-13. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

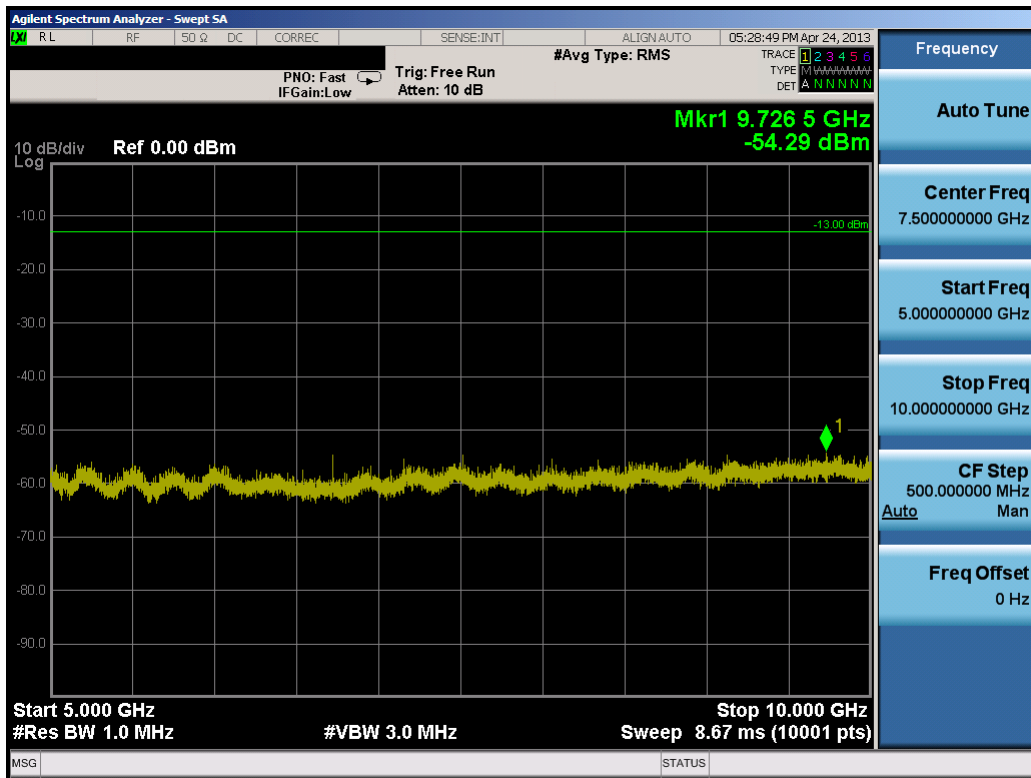


Plot 8-14. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 53 of 78



Plot 8-15. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

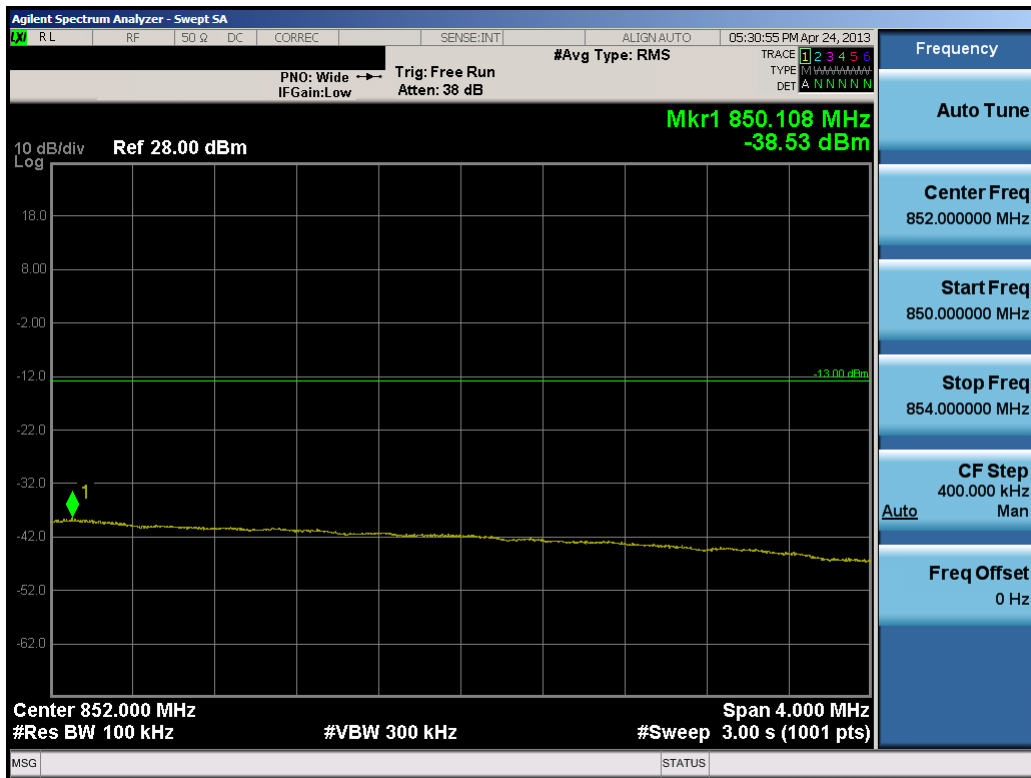


Plot 8-16. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 54 of 78



Plot 8-17. Upper Band Edge Plot (10.0MHz QPSK – RB Size 50)

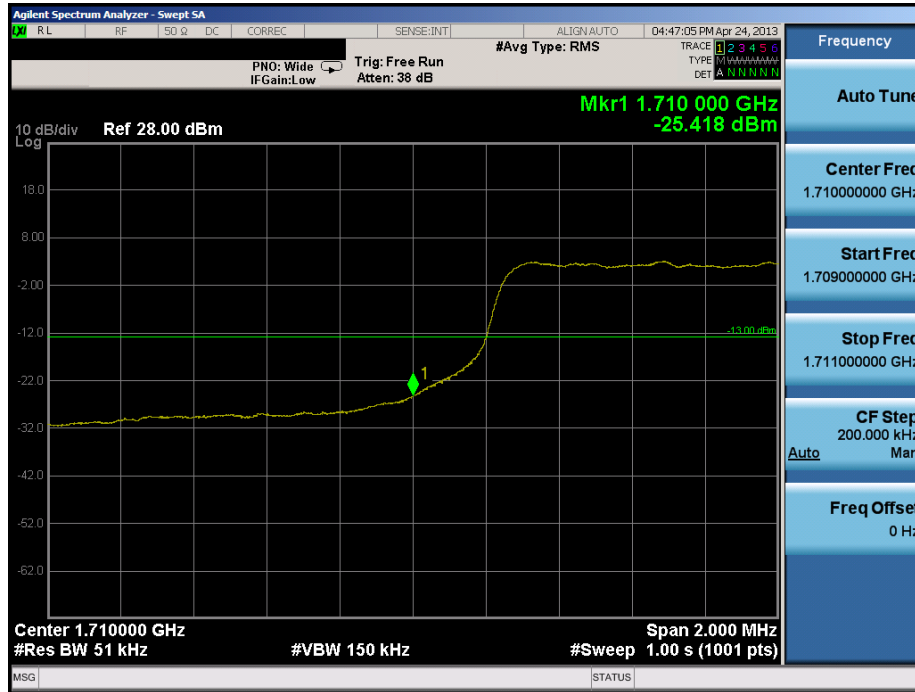


Plot 8-18. Upper Extended Band Edge Plot (10.0MHz QPSK – RB Size 50)

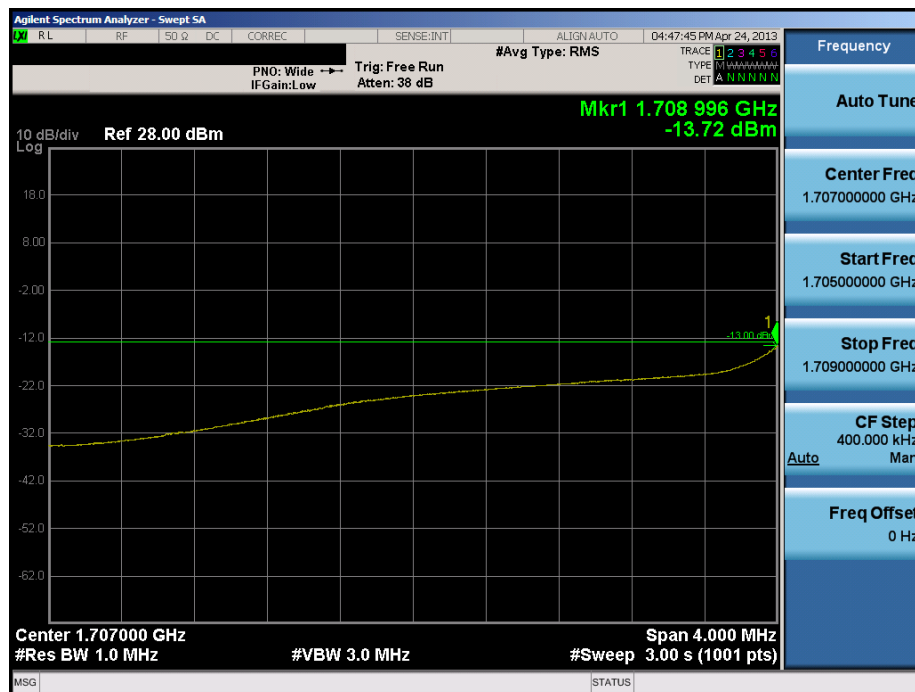
FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 55 of 78

9.0 BAND 4 PLOTS OF EMISSIONS

Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.

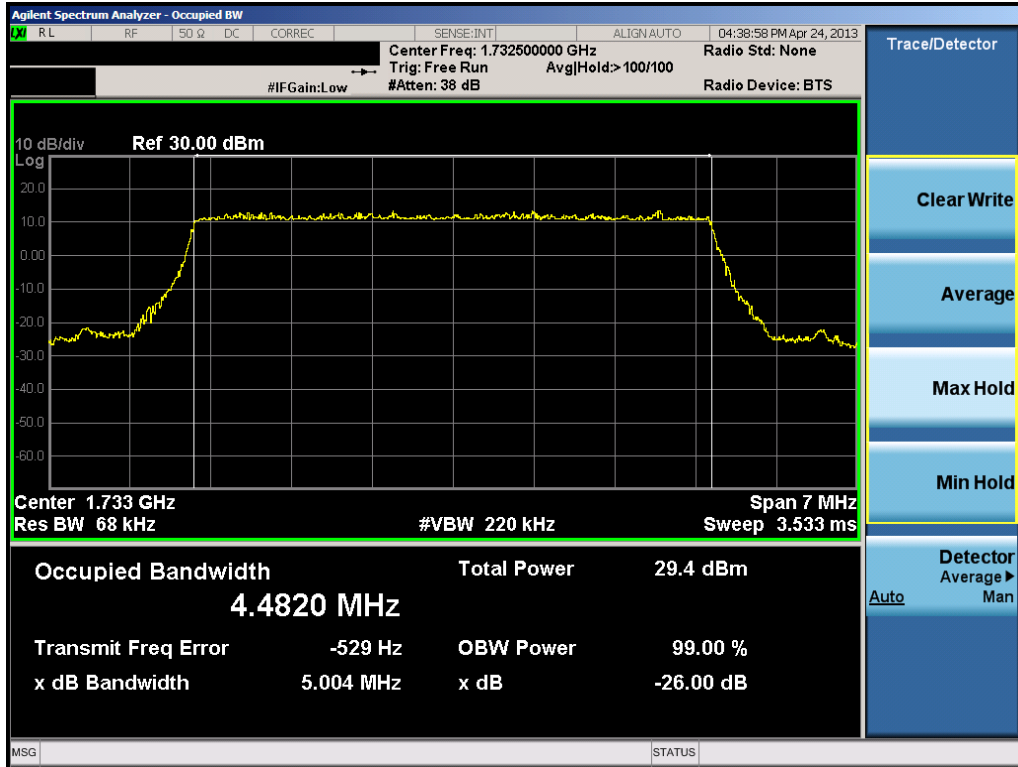


Plot 9-1. Lower Band Edge Plot (5.0MHz QPSK – RB Size 25)

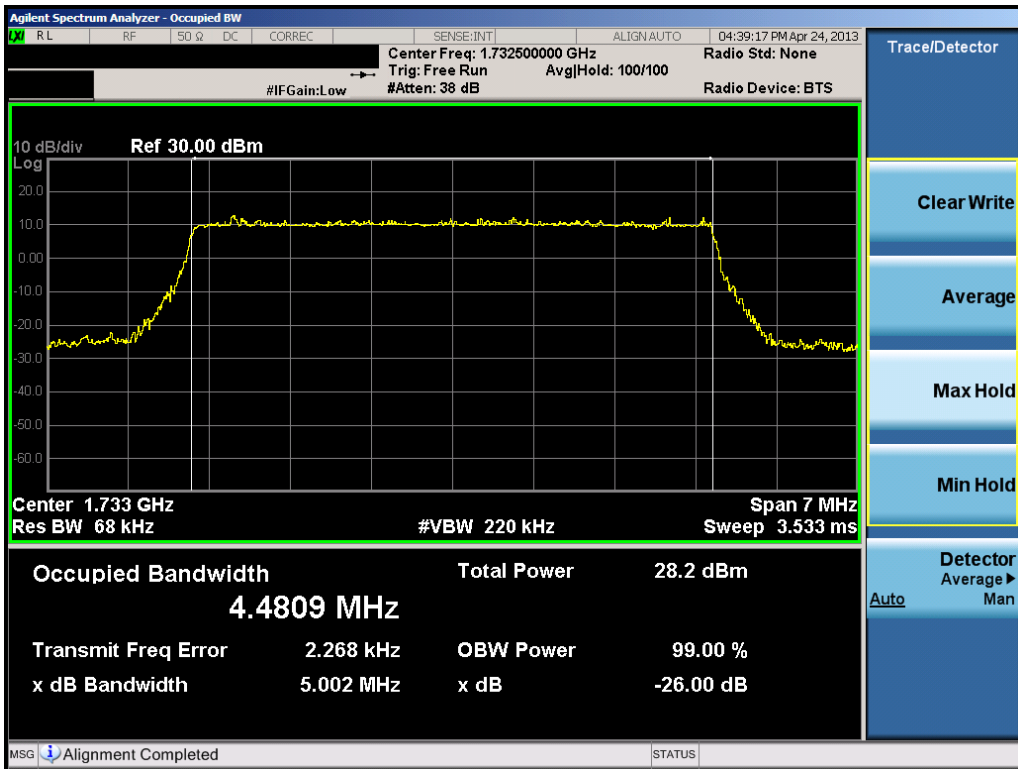


Plot 9-2. Lower Extended Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 56 of 78



Plot 9-3. Occupied Bandwidth Plot (5.0MHz QPSK – RB Size 25)

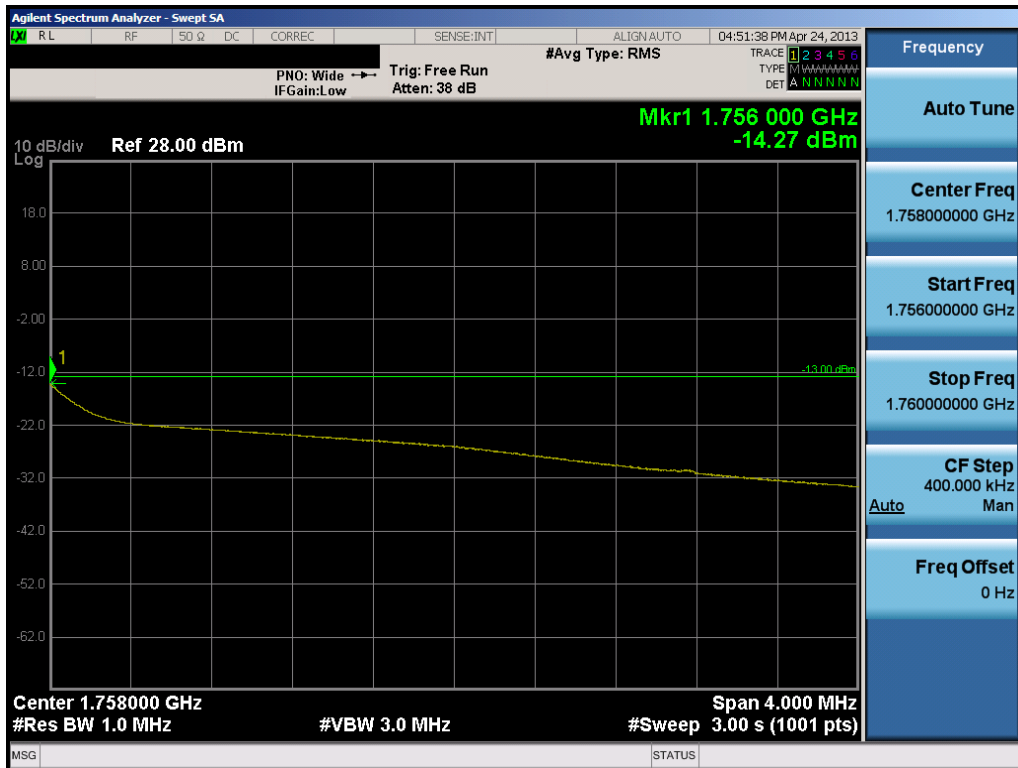


Plot 9-4. Occupied Bandwidth Plot (5.0MHz 16-QAM – RB Size 25)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 57 of 78

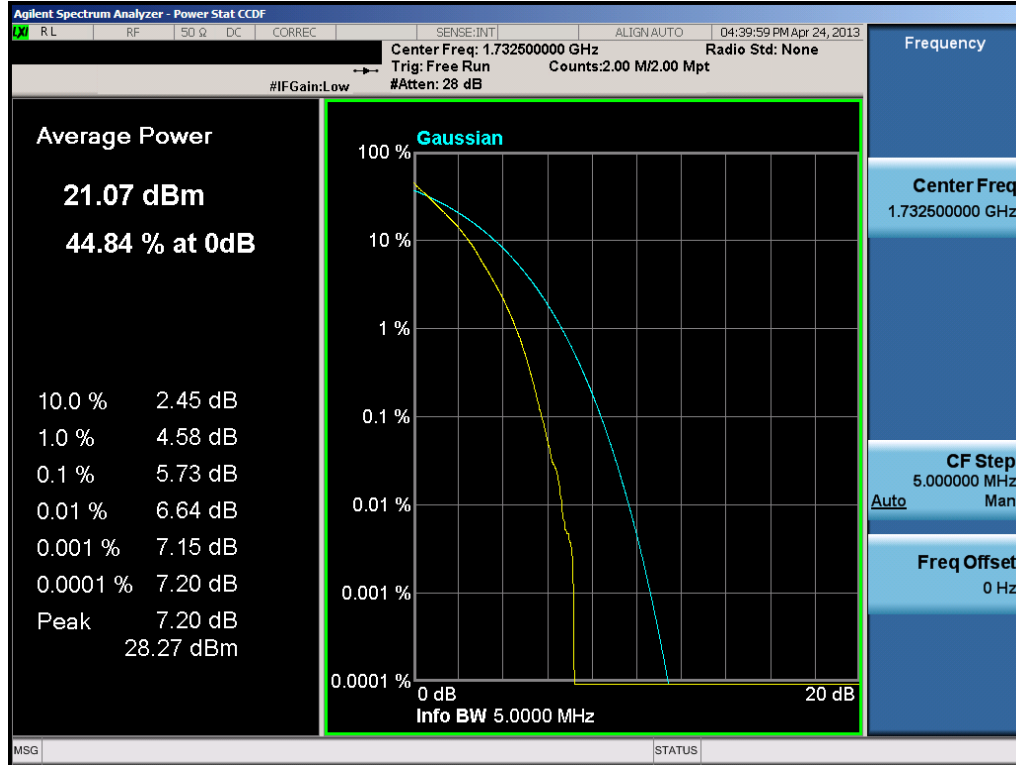


Plot 9-5. Upper Band Edge Plot (5.0MHz QPSK – RB Size 25)

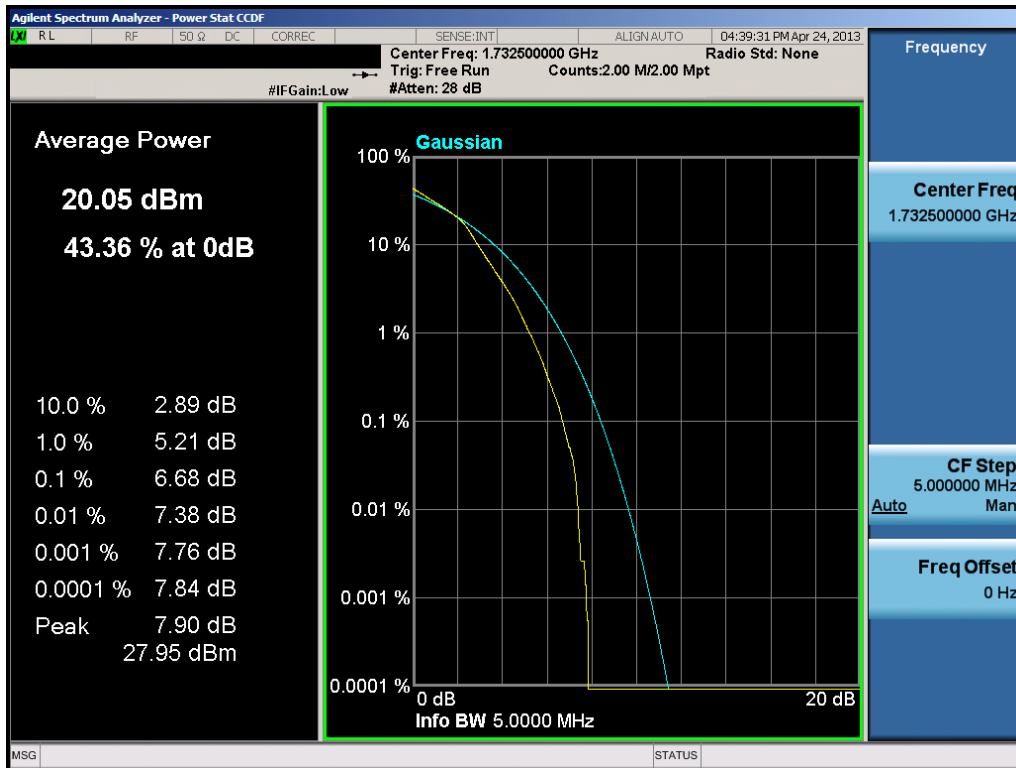


Plot 9-6. Upper Extended Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 58 of 78

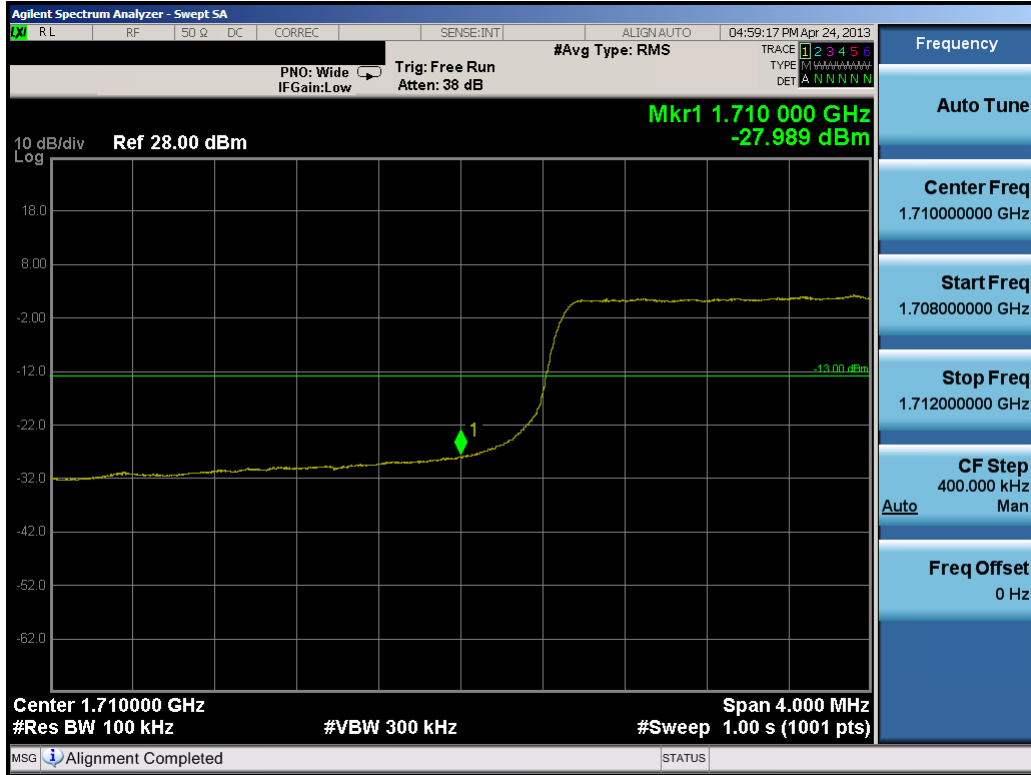


Plot 9-7. PAR Plot (5.0MHz QPSK – RB Size 25)

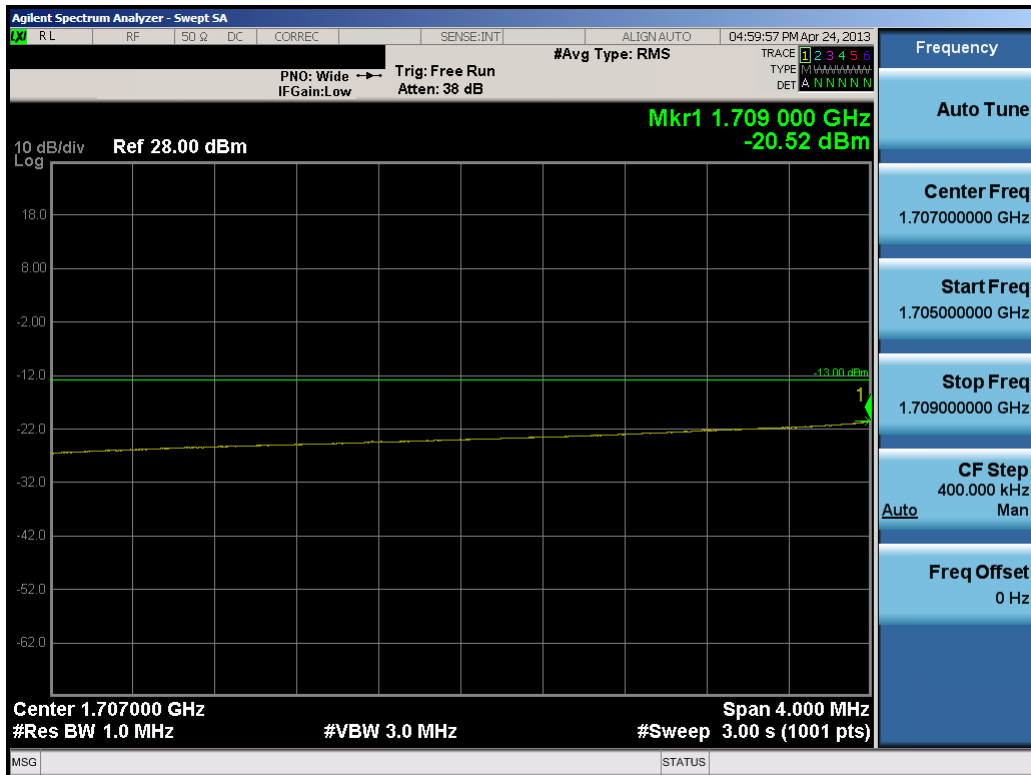


Plot 9-8. PAR Plot (5.0MHz 16-QAM – RB Size 25)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 59 of 78

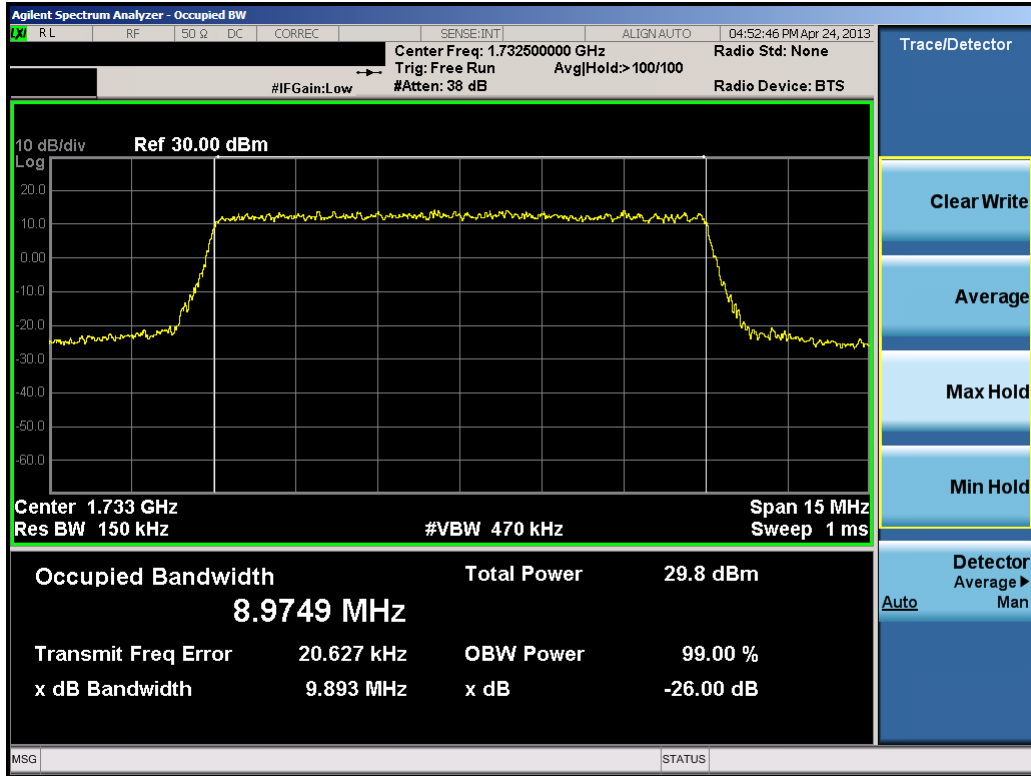


Plot 9-9. Lower Band Edge Plot (10.0MHz QPSK – RB Size 50)

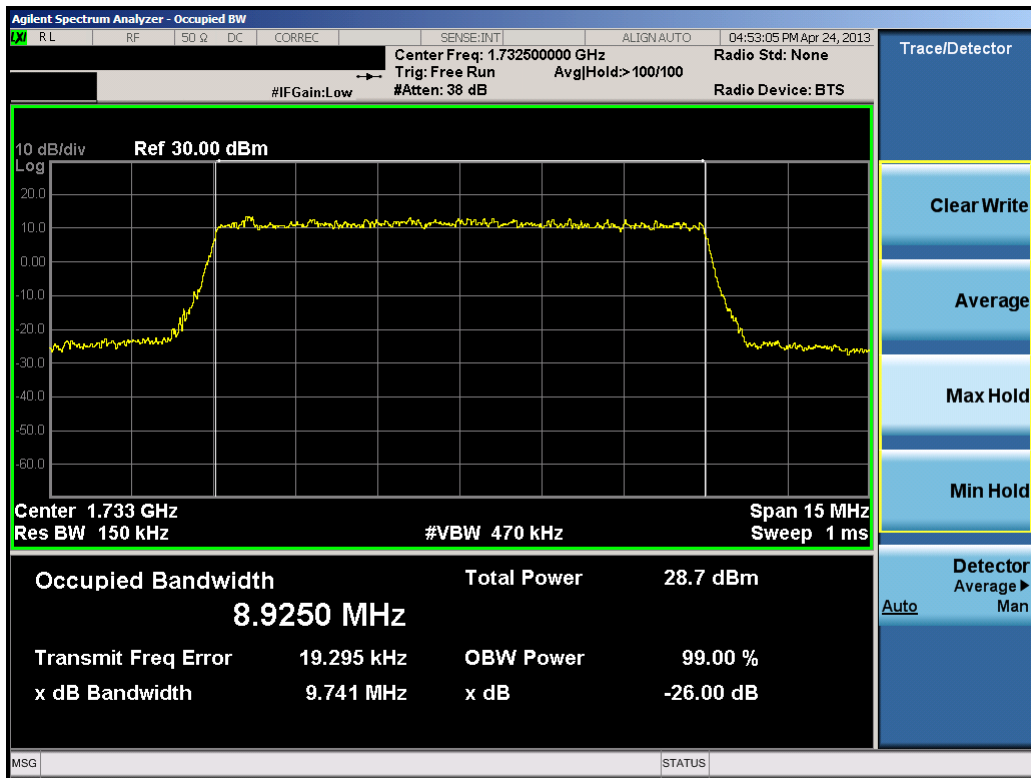


Plot 9-10. Lower Extended Band Edge Plot (10.0MHz QPSK – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 60 of 78

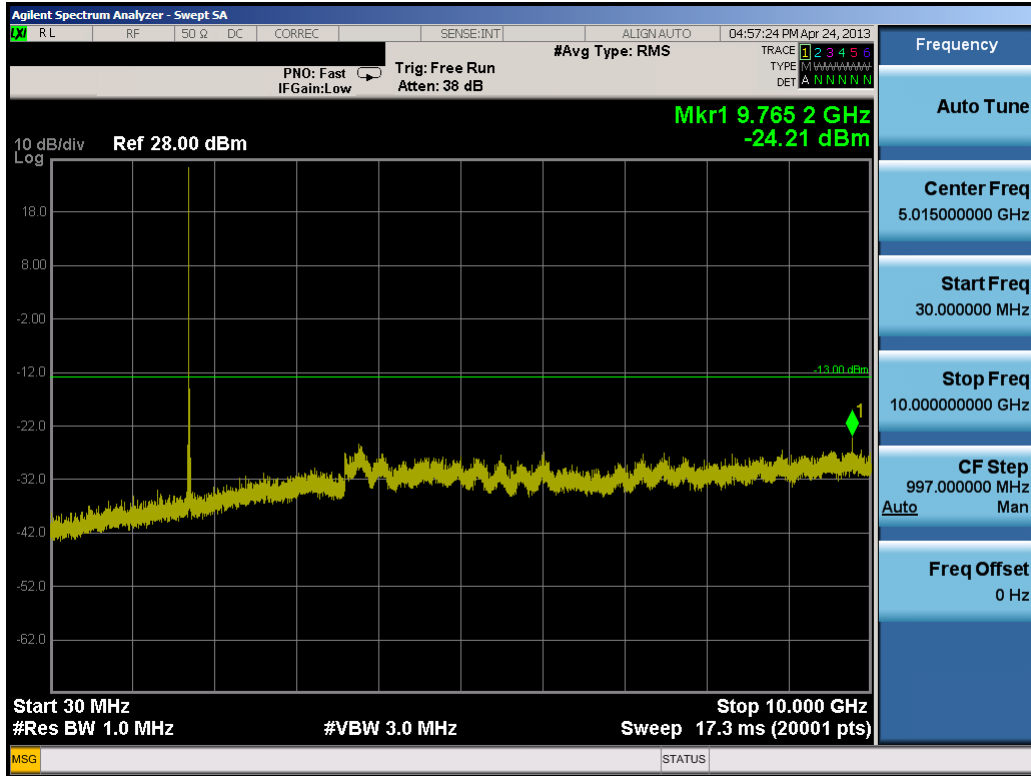


Plot 9-11. Occupied Bandwidth Plot (10.0MHz QPSK – RB Size 50)

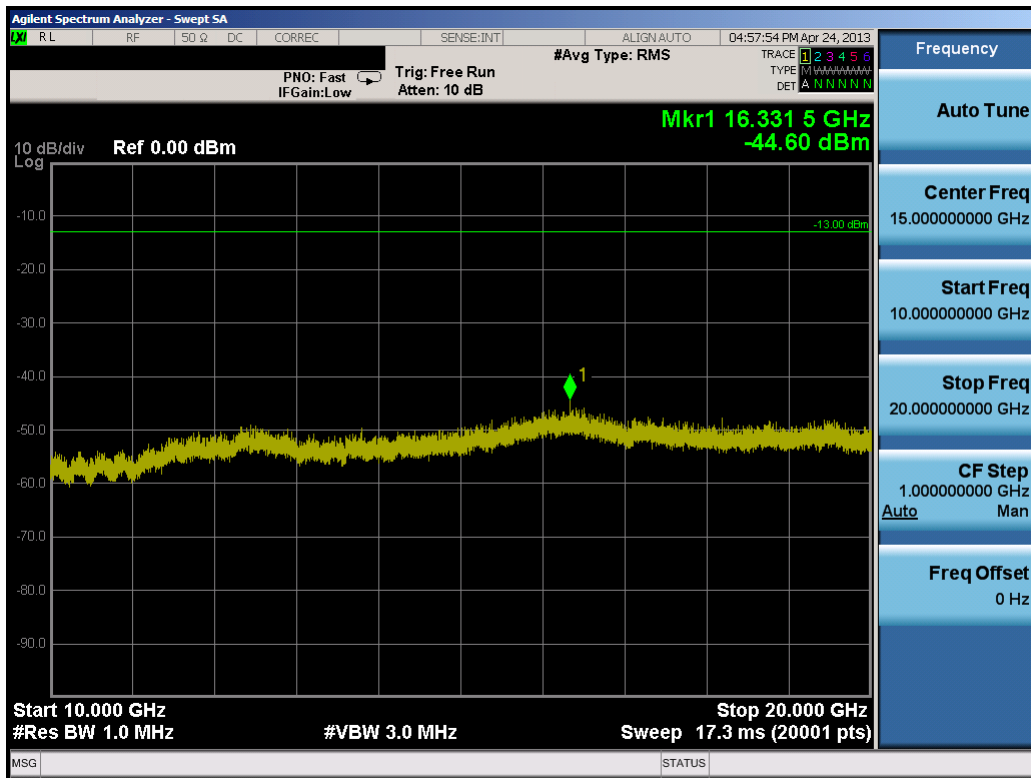


Plot 9-12. Occupied Bandwidth Plot (10.0MHz 16-QAM – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 61 of 78

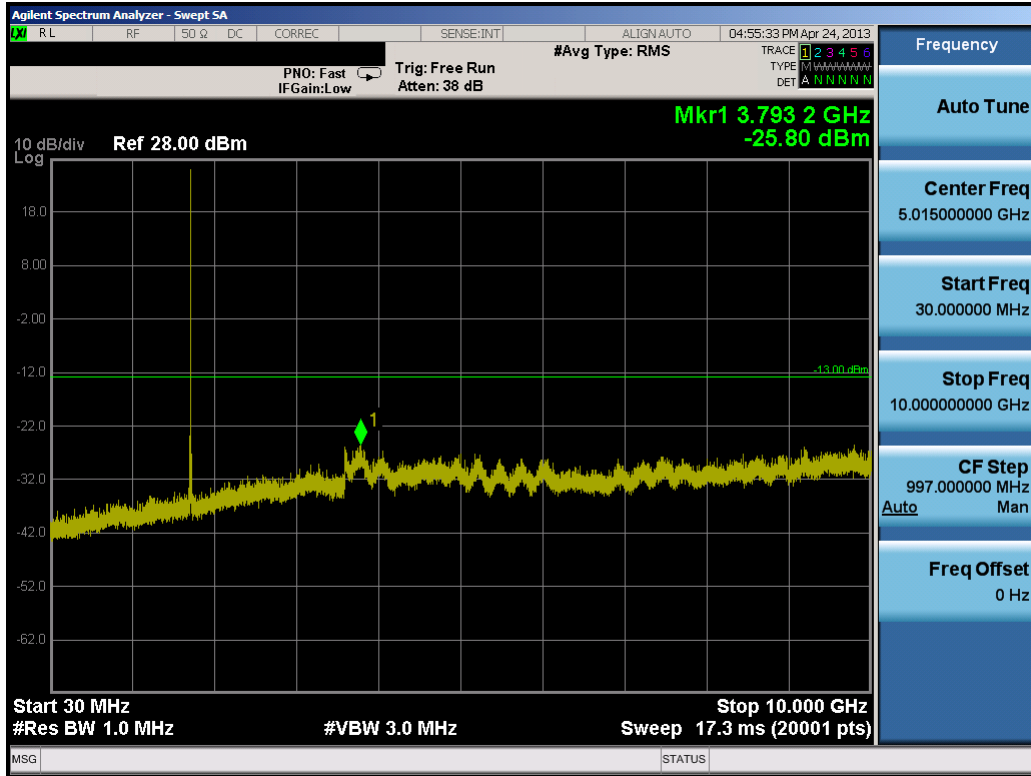


Plot 9-13. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)

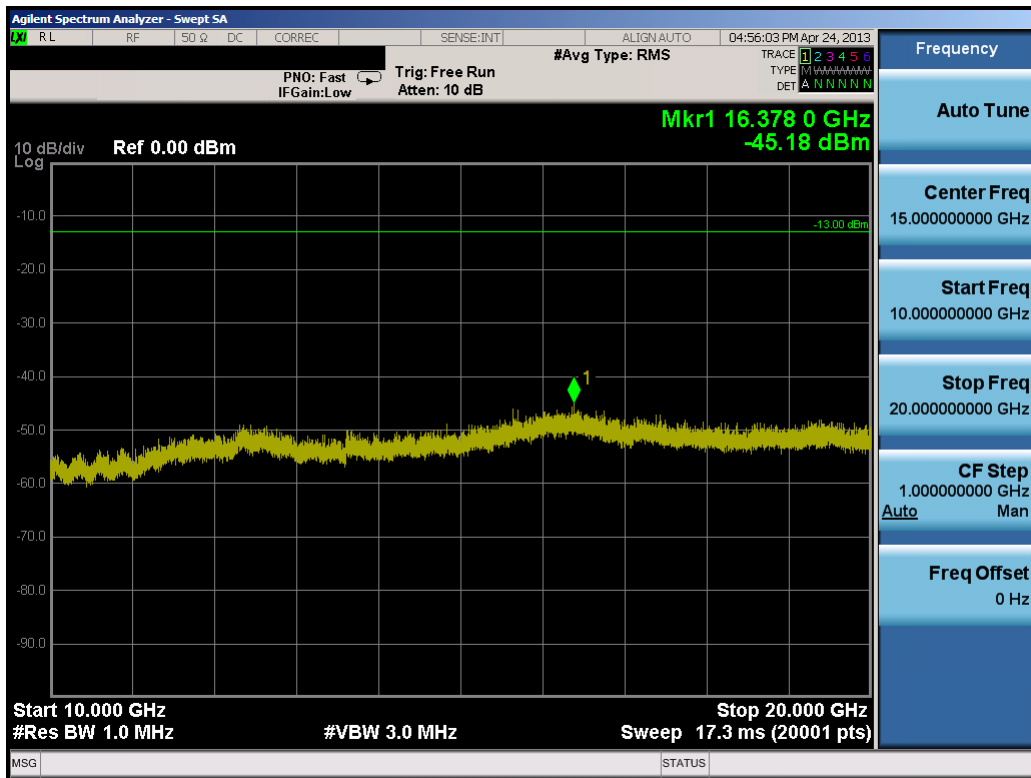


Plot 9-14. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: LHH-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHH	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 62 of 78

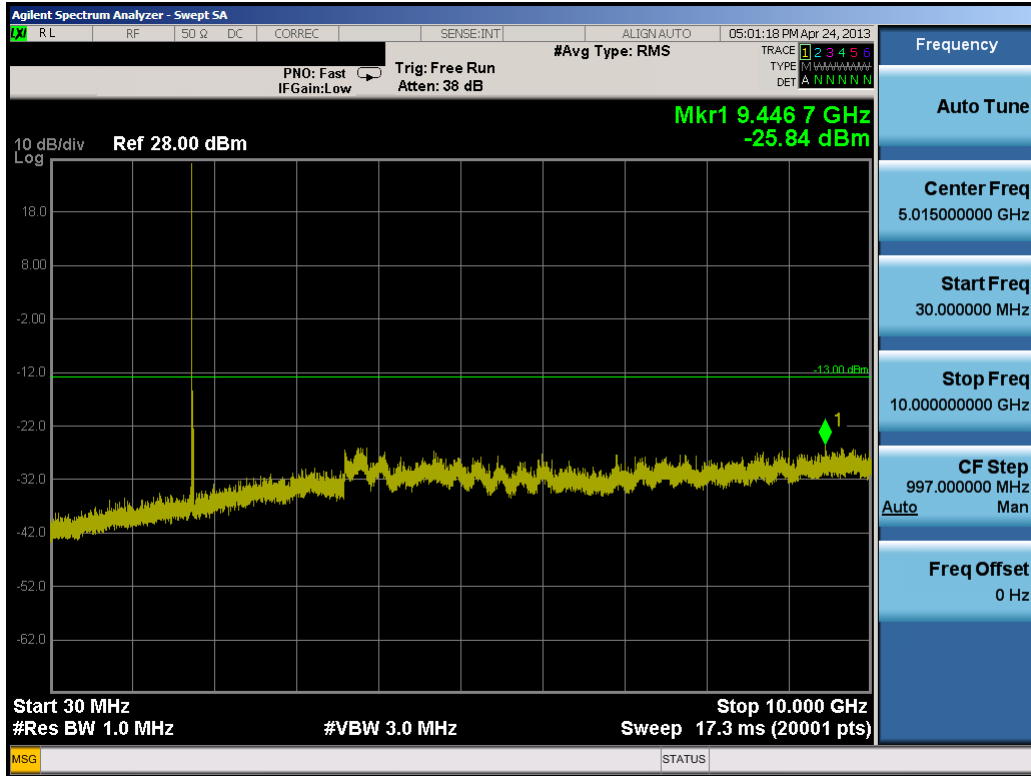


Plot 9-15. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

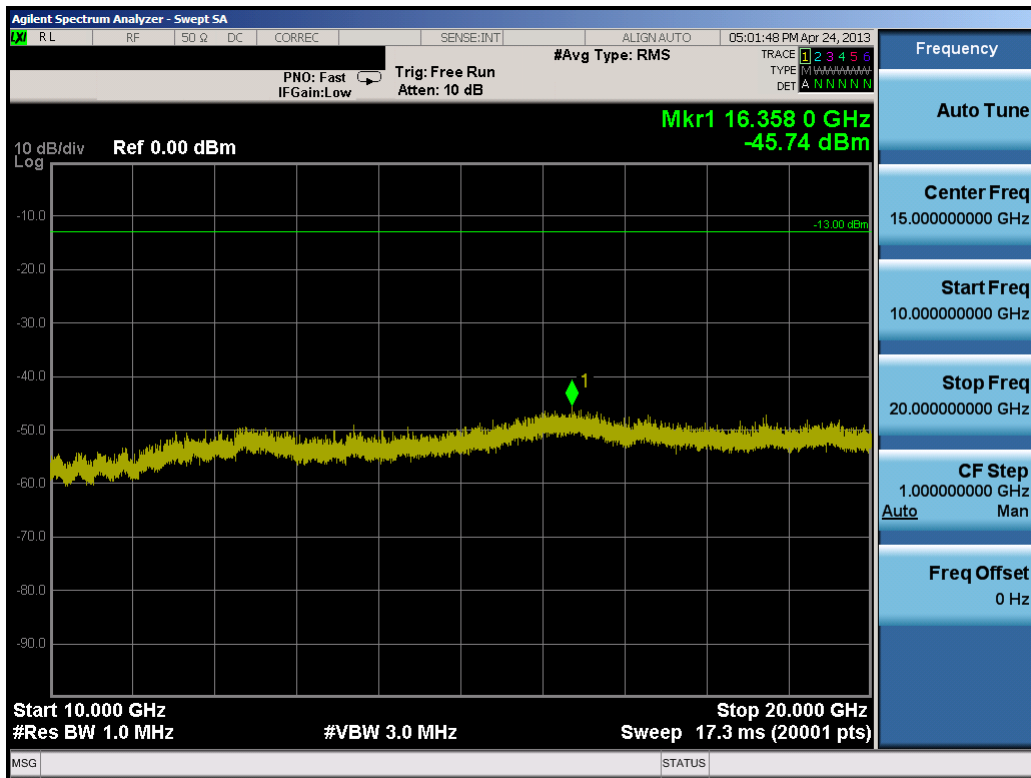


Plot 9-16. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
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Plot 9-17. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

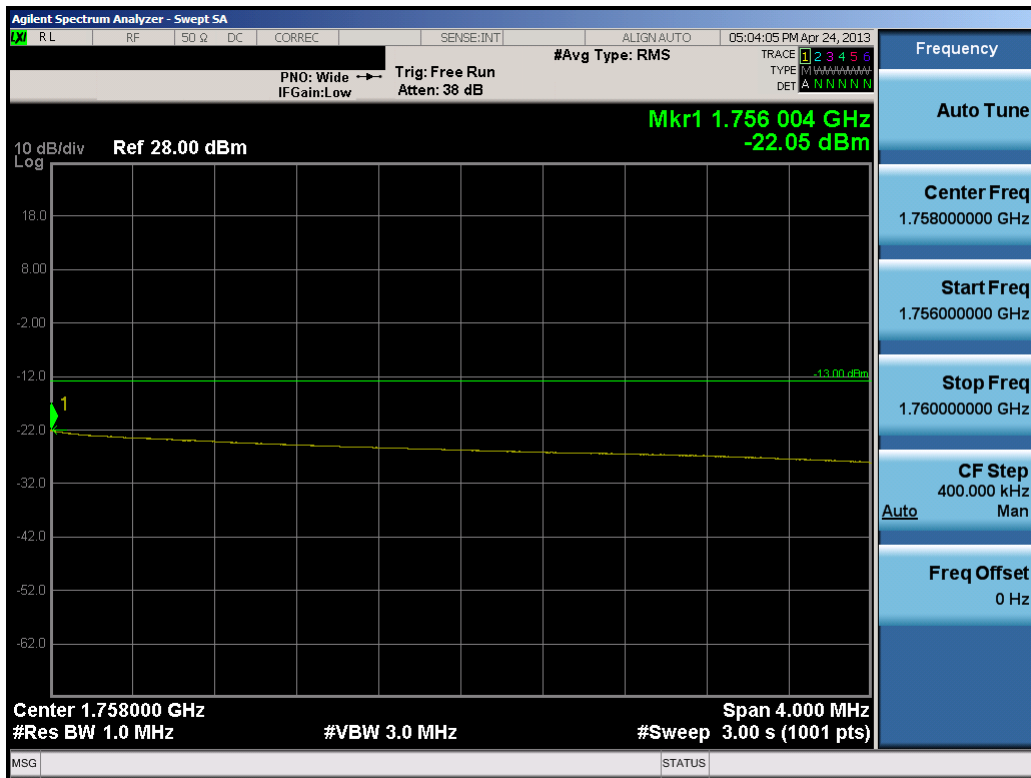


Plot 9-18. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 64 of 78

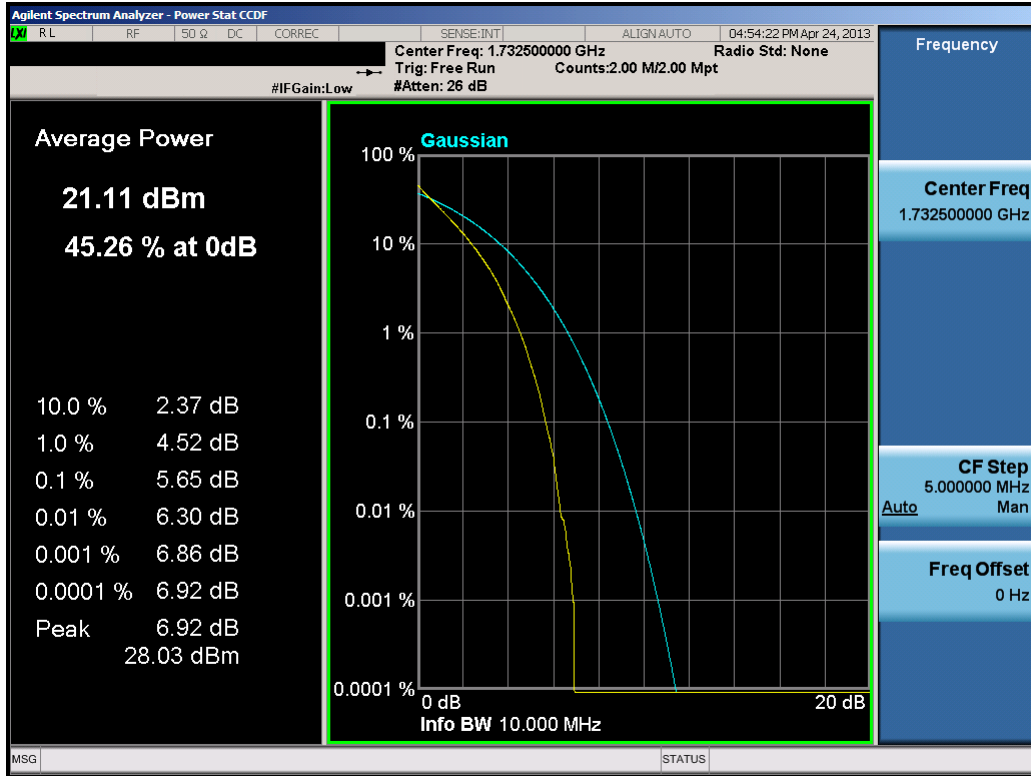


Plot 9-19. Upper Band Edge Plot (10.0MHz QPSK – RB Size 50)

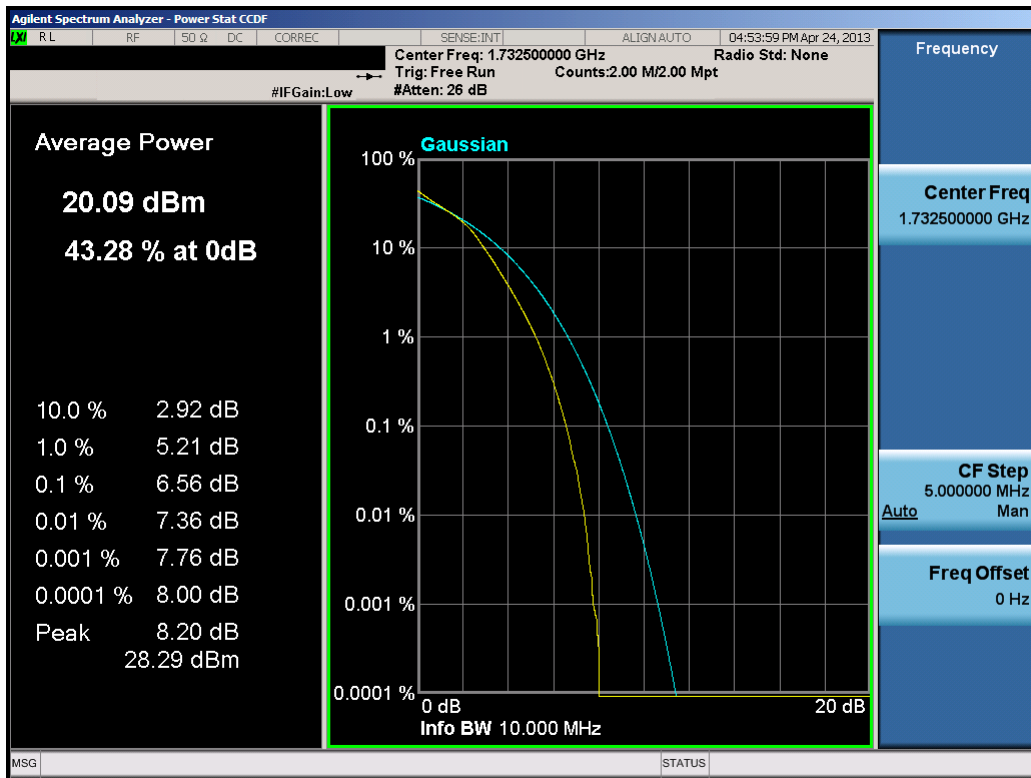


Plot 9-20. Upper Extended Band Edge Plot (10.0MHz QPSK – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
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Plot 9-21. PAR Plot (10.0MHz QPSK – RB Size 50)



Plot 9-22. PAR Plot (10.0MHz 16-QAM – RB Size 50)

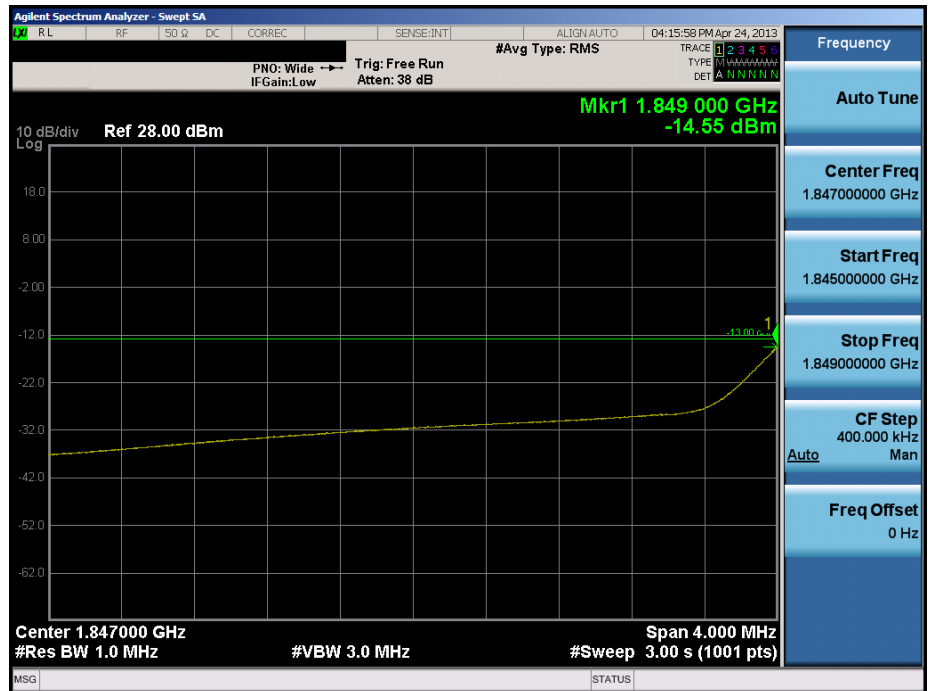
FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 66 of 78

10.0 BAND 2 PLOTS OF EMISSIONS

Note: All bandwidths, RB configurations, and modulations were investigated. The worst case test results are reported below.

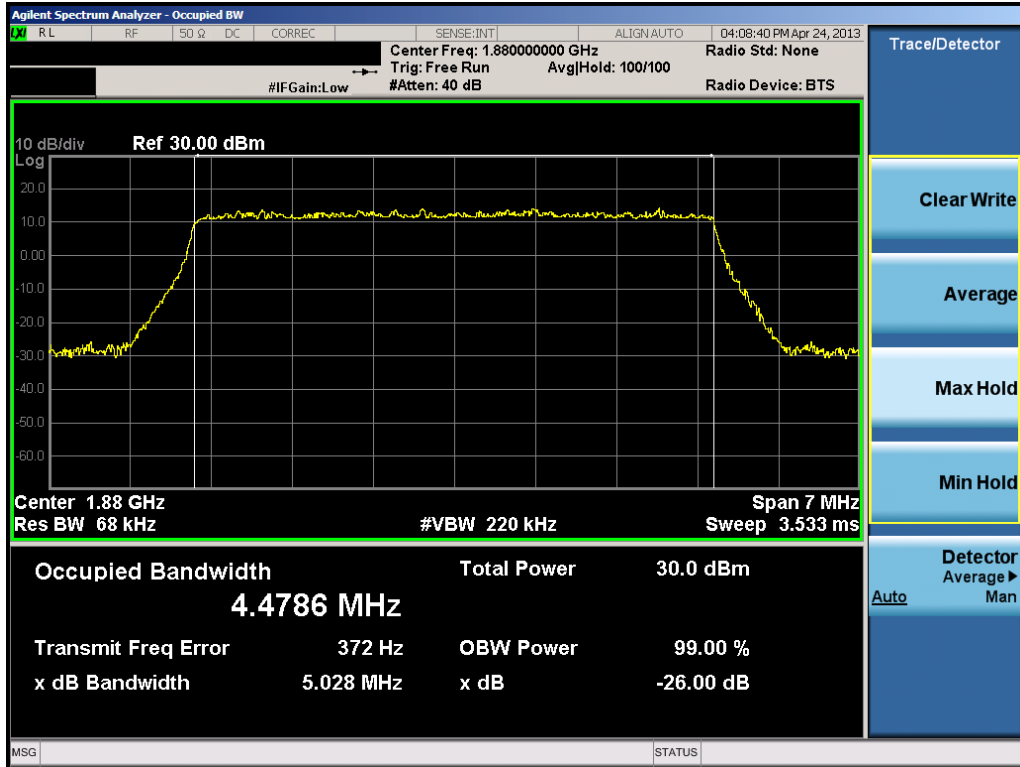


Plot 10-1. Lower Band Edge Plot (5.0MHz QPSK – RB Size 25)

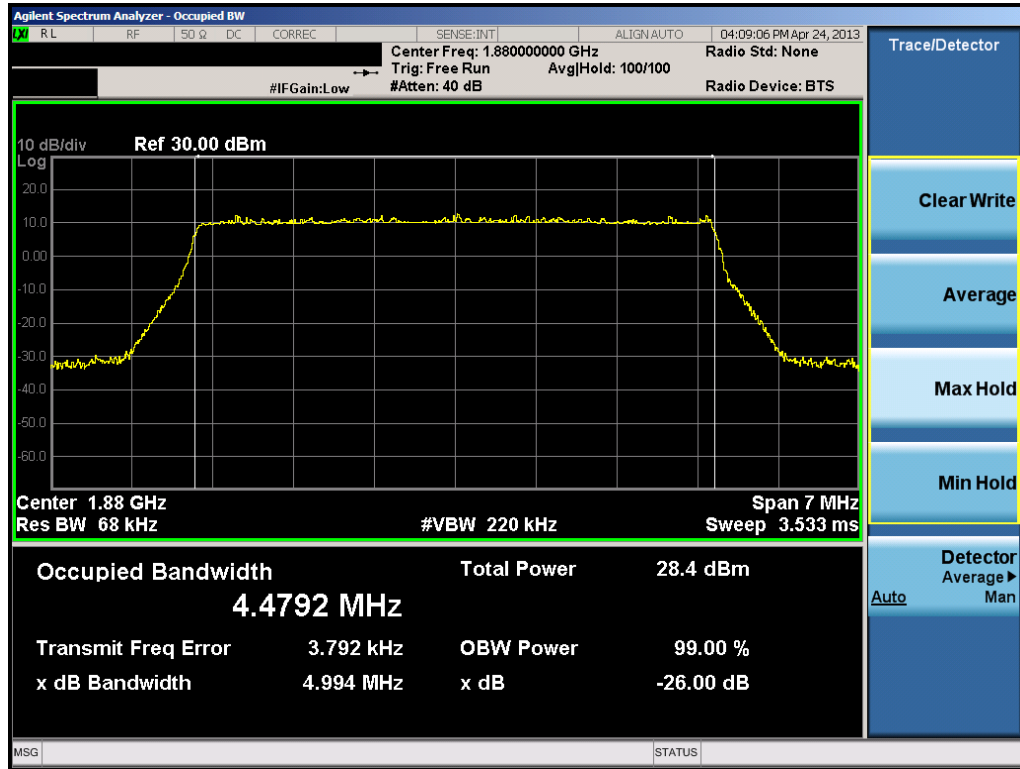


Plot 10-2. Lower Extended Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module	Reviewed by: Quality Manager
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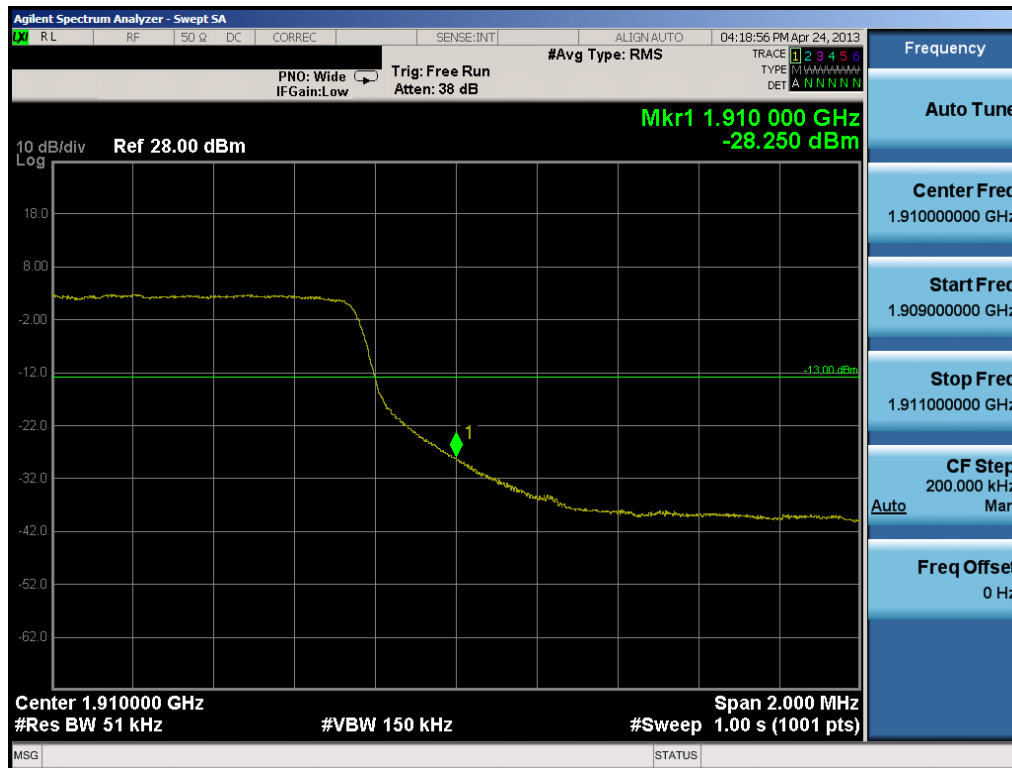


Plot 10-3. Occupied Bandwidth Plot (5.0MHz QPSK – RB Size 25)



Plot 10-4. Occupied Bandwidth Plot (5.0MHz 16-QAM – RB Size 25)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 68 of 78

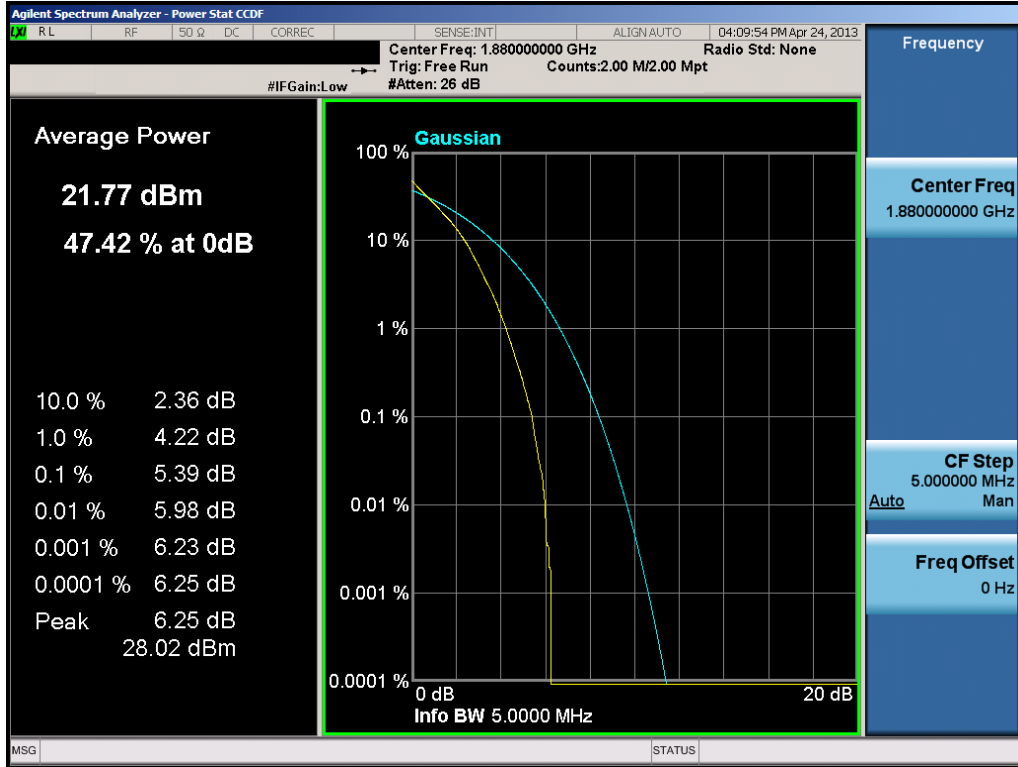


Plot 10-5. Upper Band Edge Plot (5.0MHz QPSK – RB Size 25)

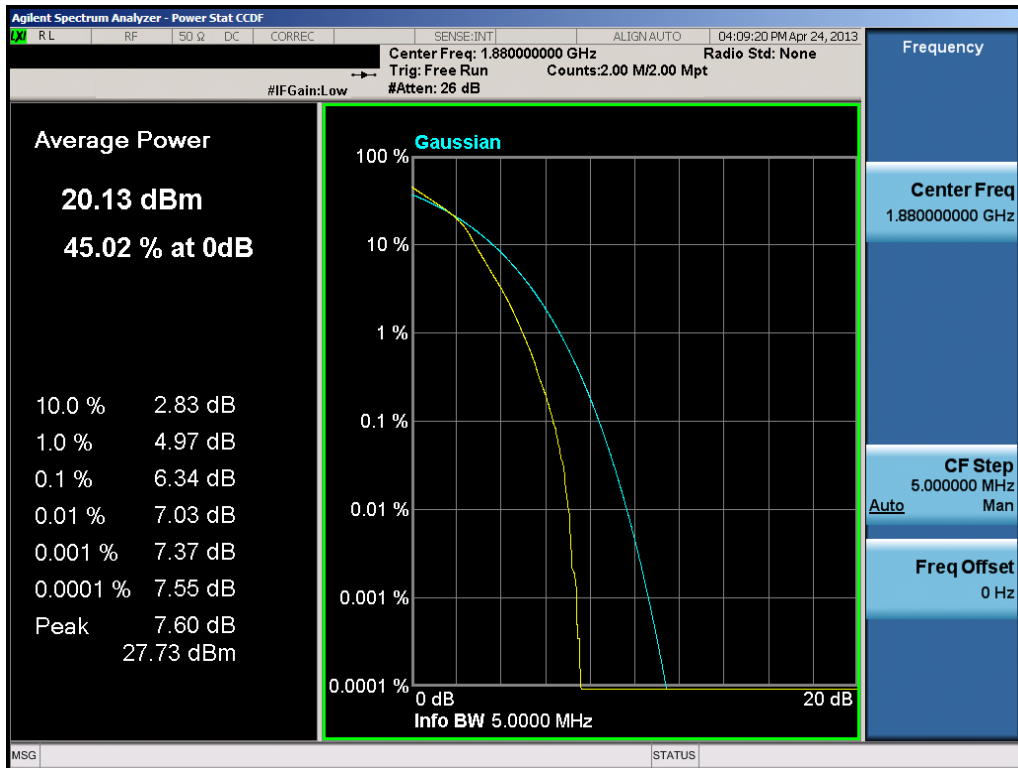


Plot 10-6. Upper Extended Band Edge Plot (5.0MHz QPSK – RB Size 25)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 69 of 78

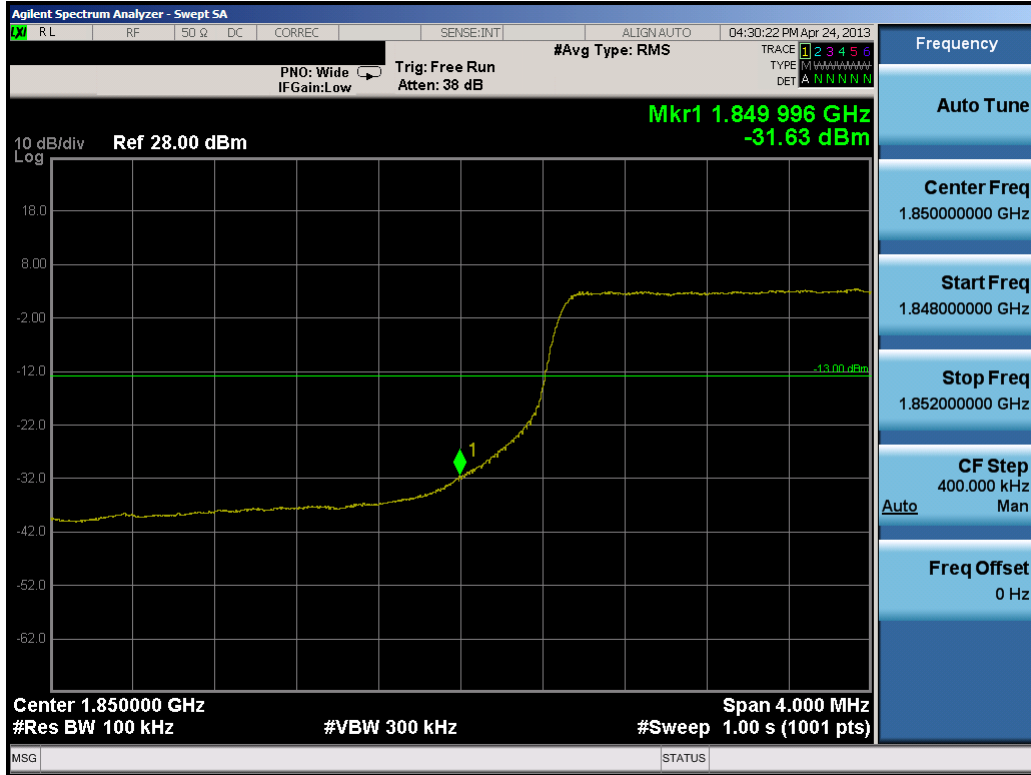


Plot 10-7. PAR Plot (5.0MHz QPSK – RB Size 25)

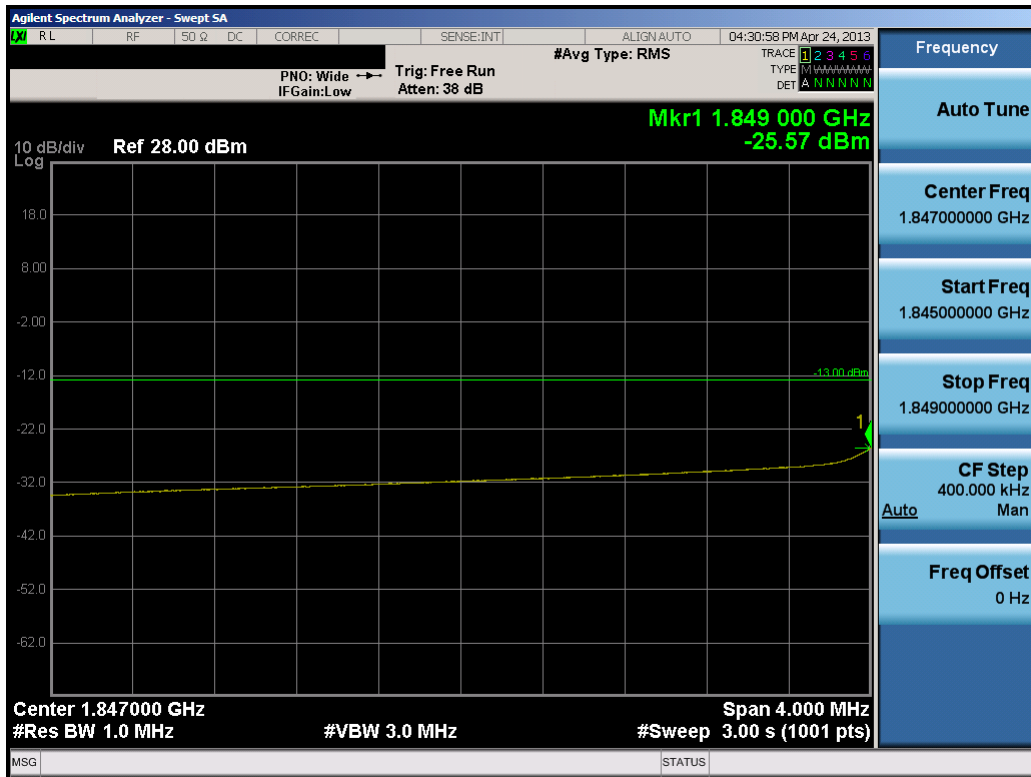


Plot 10-8. PAR Plot (5.0MHz 16-QAM – RB Size 25)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 70 of 78

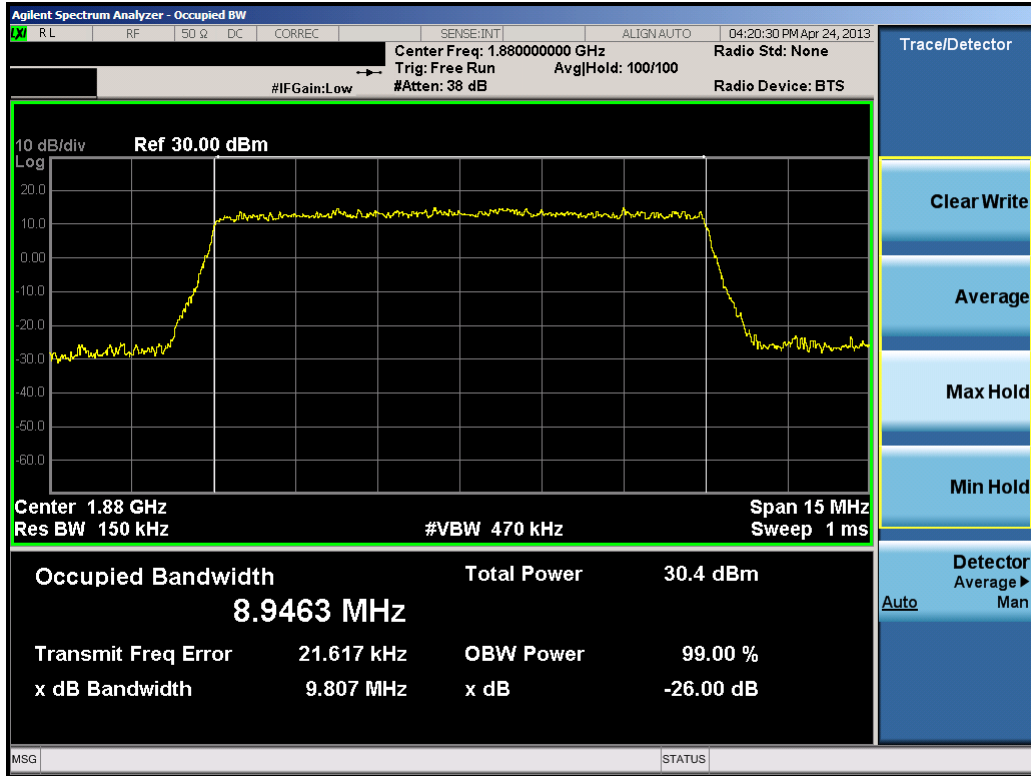


Plot 10-9. Lower Band Edge Plot (10.0MHz QPSK – RB Size 50)

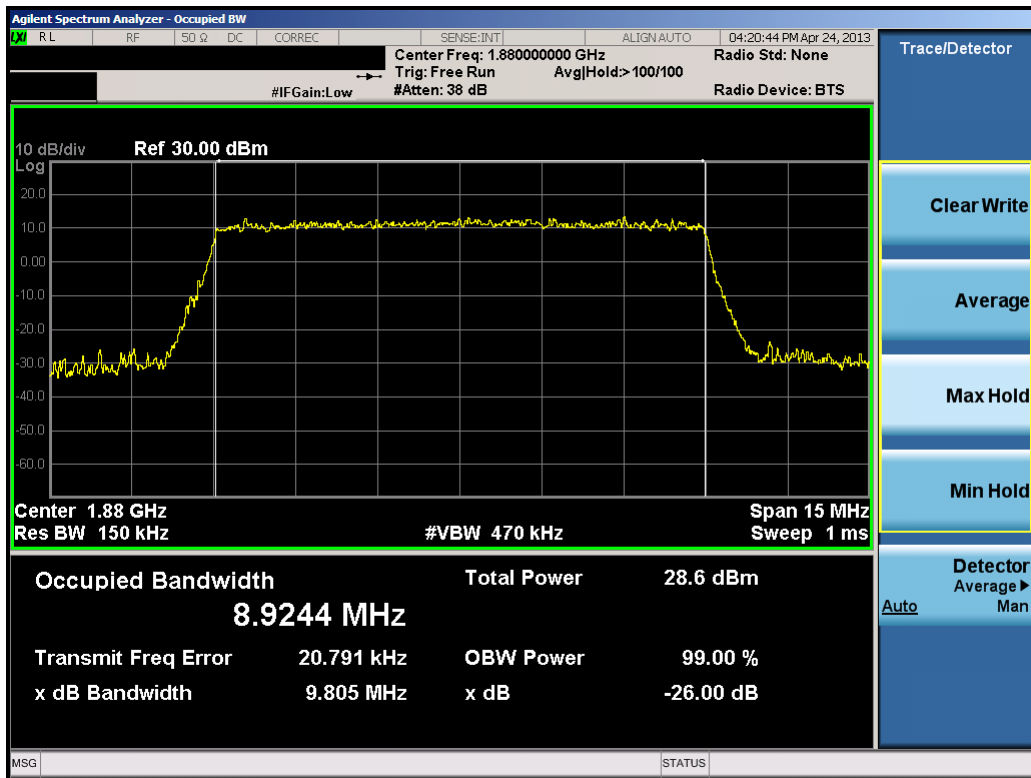


Plot 10-10. Lower Extended Band Edge Plot (10.0MHz QPSK – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
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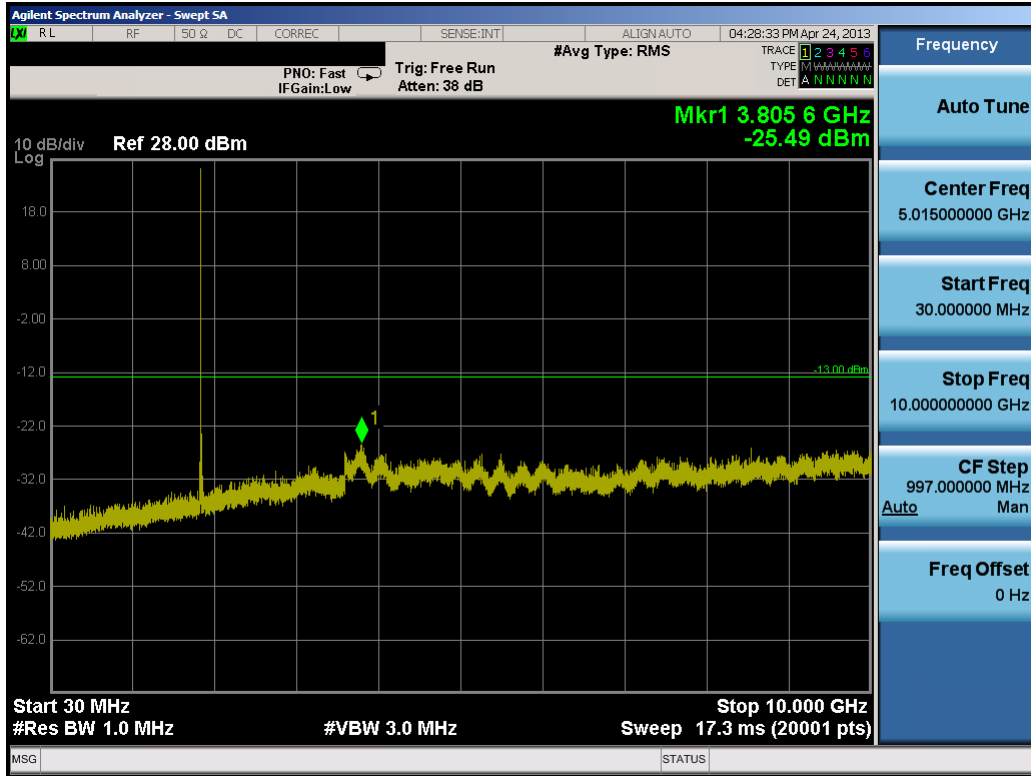


Plot 10-11. Occupied Bandwidth Plot (10.0MHz QPSK – RB Size 50)

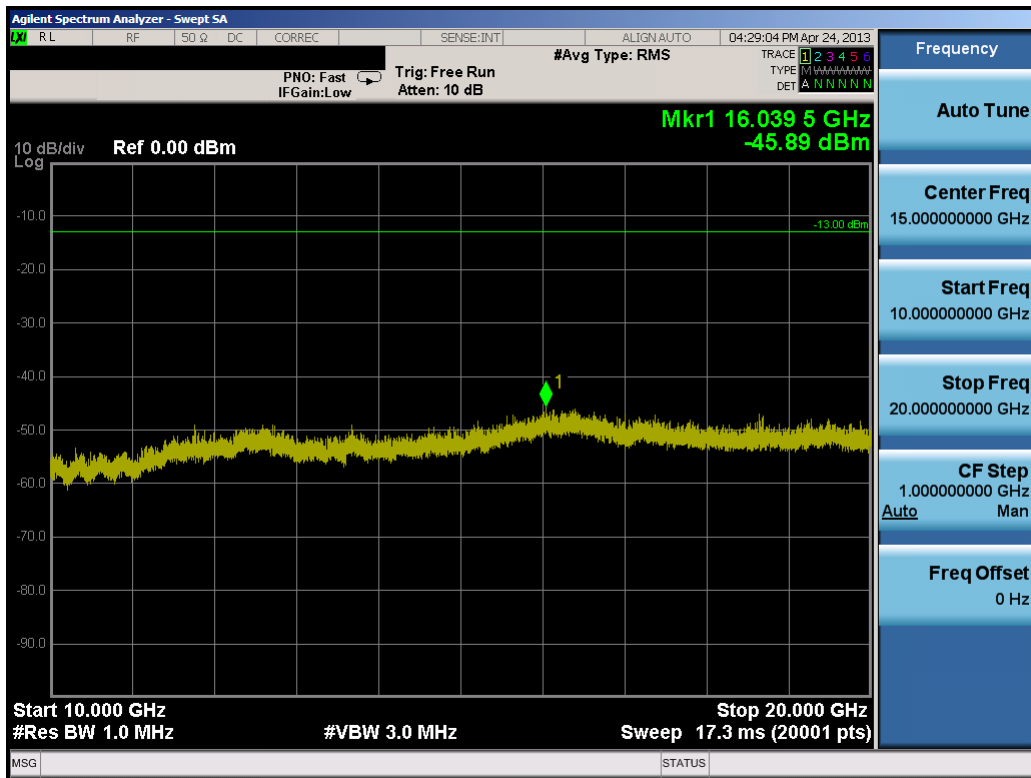


Plot 10-12. Occupied Bandwidth Plot (10.0MHz 16-QAM – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
Test Report S/N: 0Y1304190675.LHJ	Test Dates: April 23 - 30, 2013	EUT Type: Wireless Modem Module		Page 72 of 78

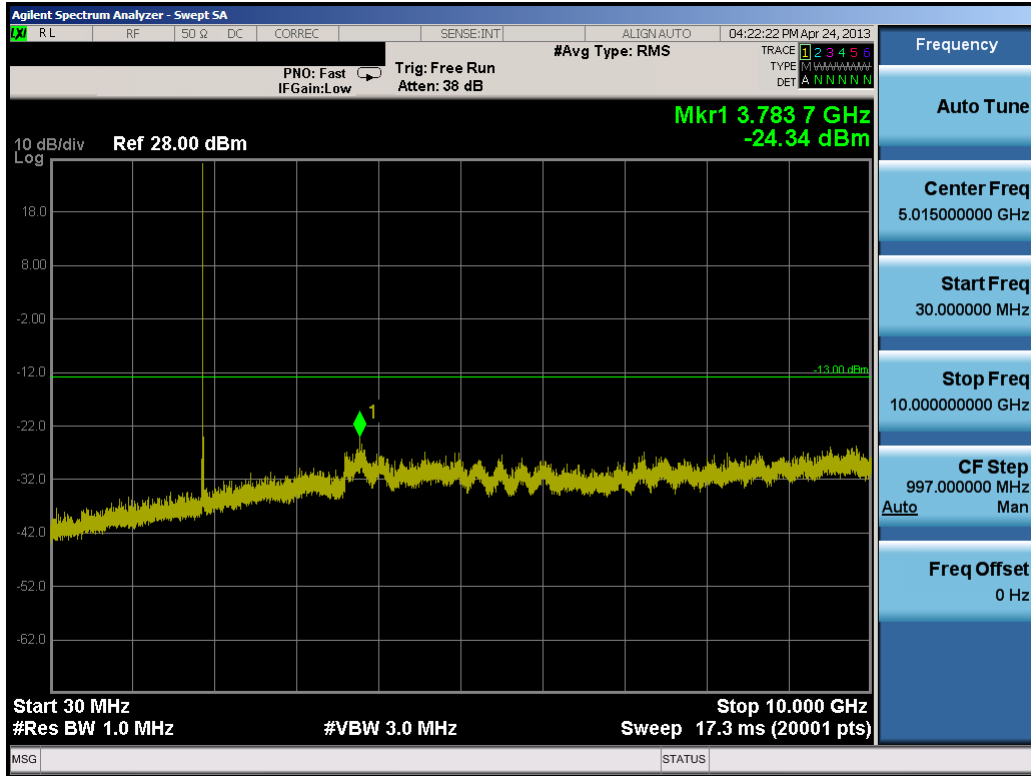


Plot 10-13. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)

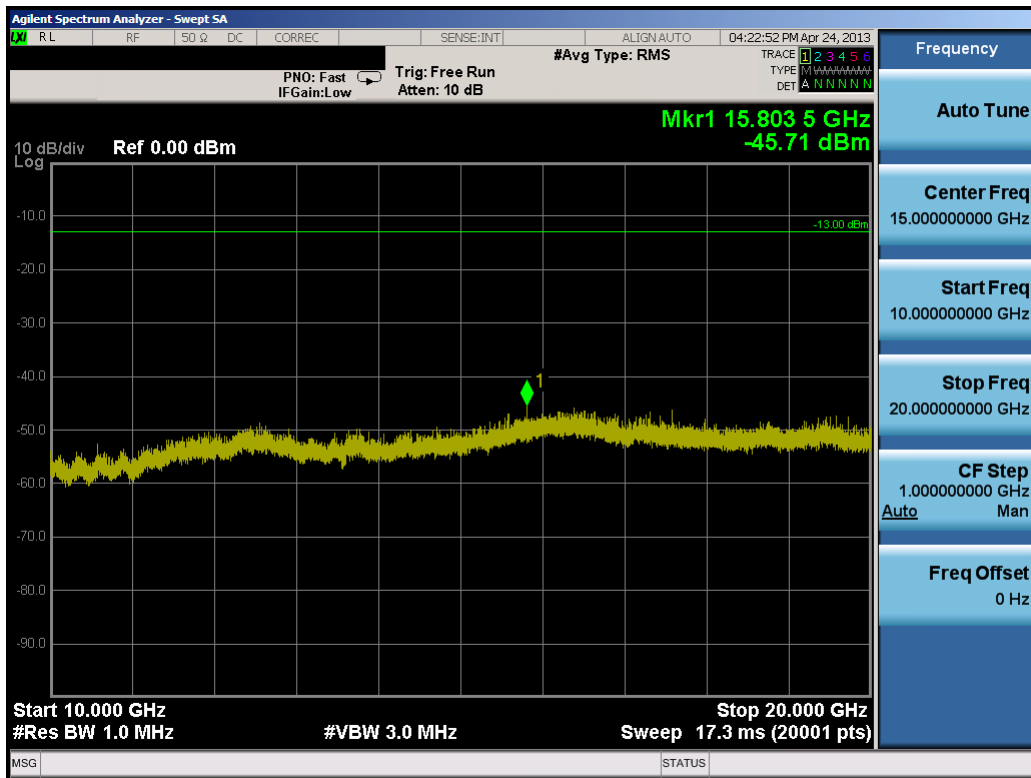


Plot 10-14. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
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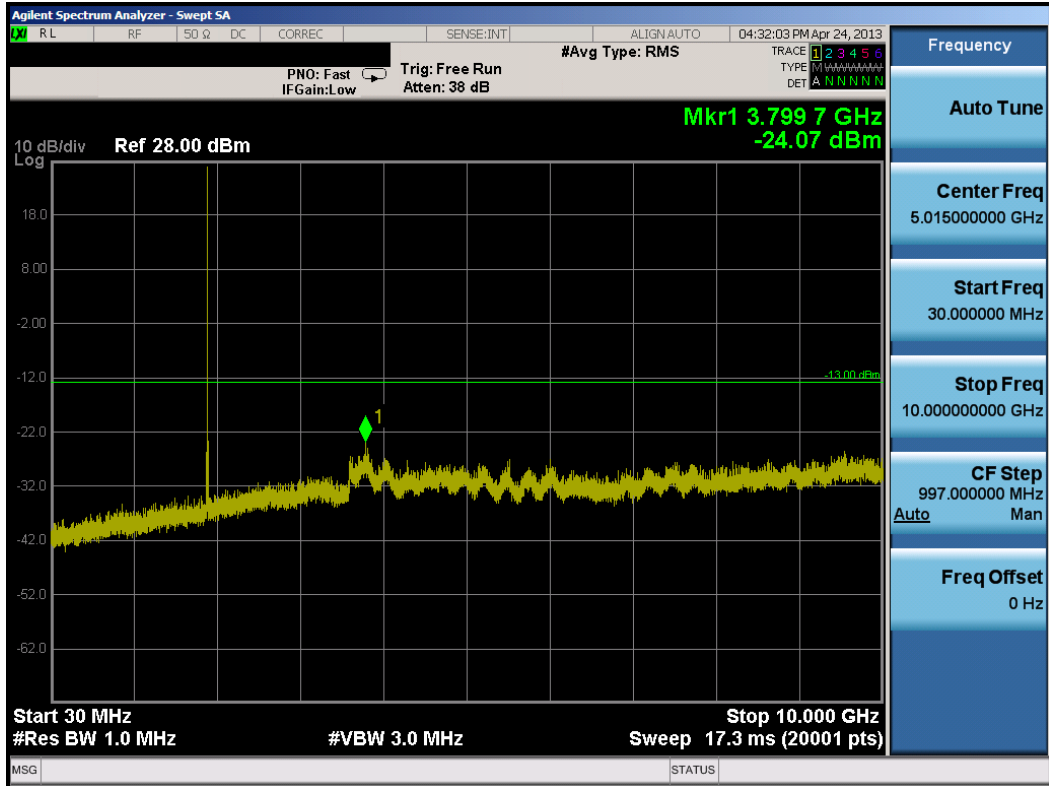


Plot 10-15. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

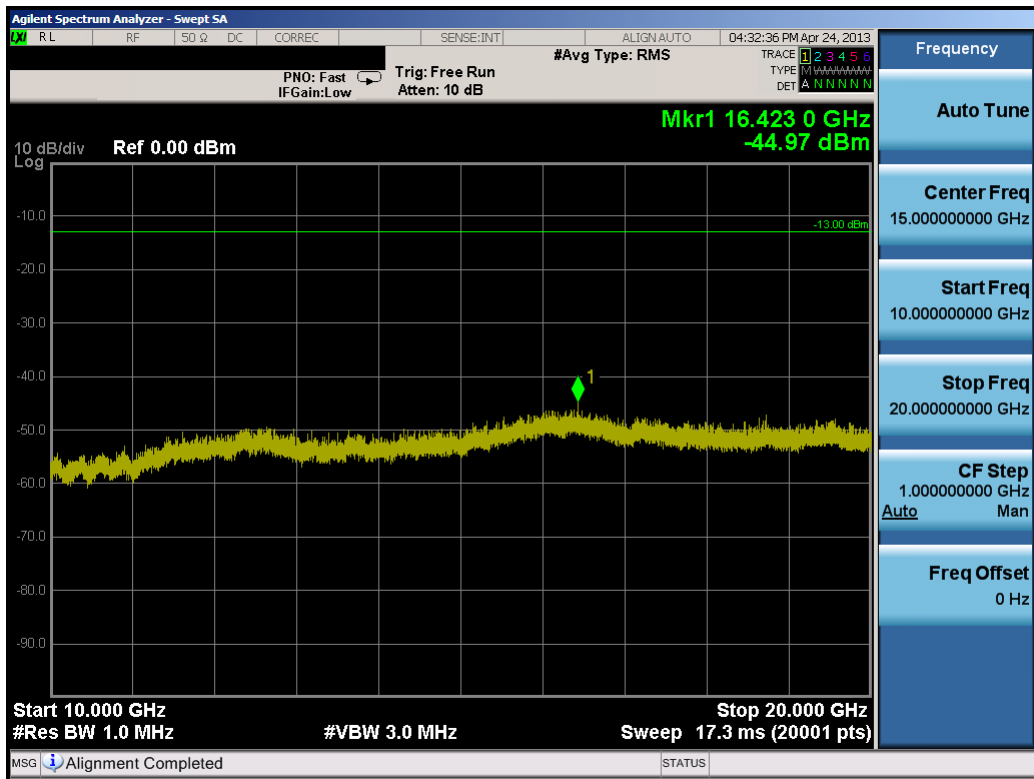


Plot 10-16. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
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Plot 10-17. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

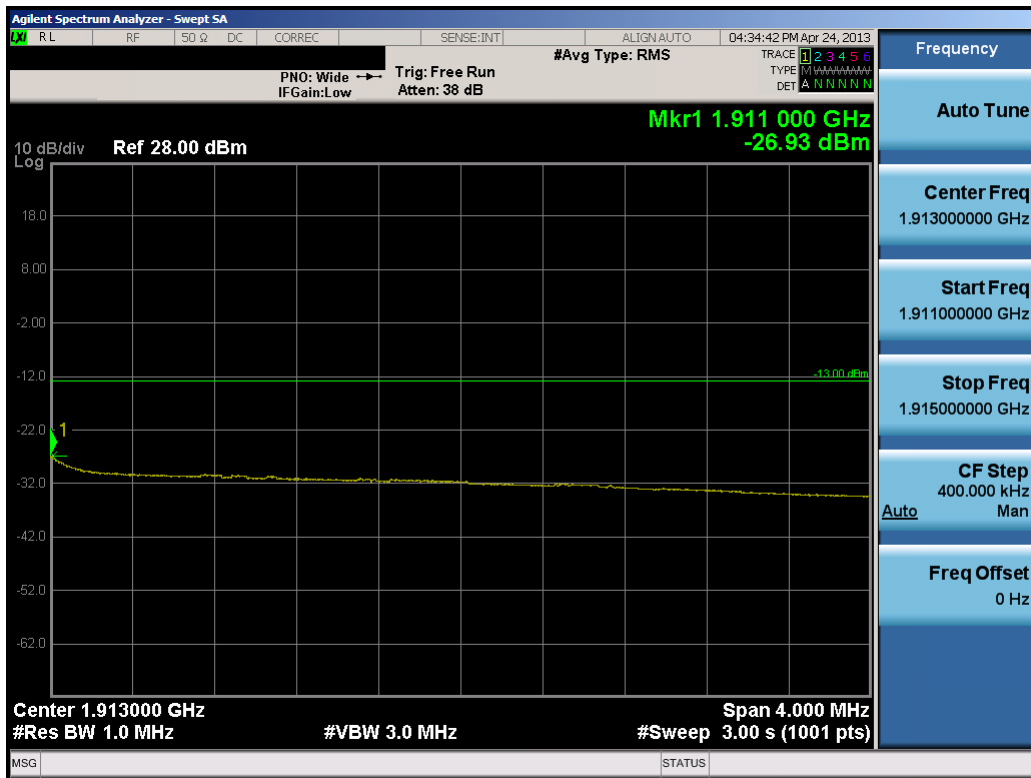


Plot 10-18. Conducted Spurious Plot (10.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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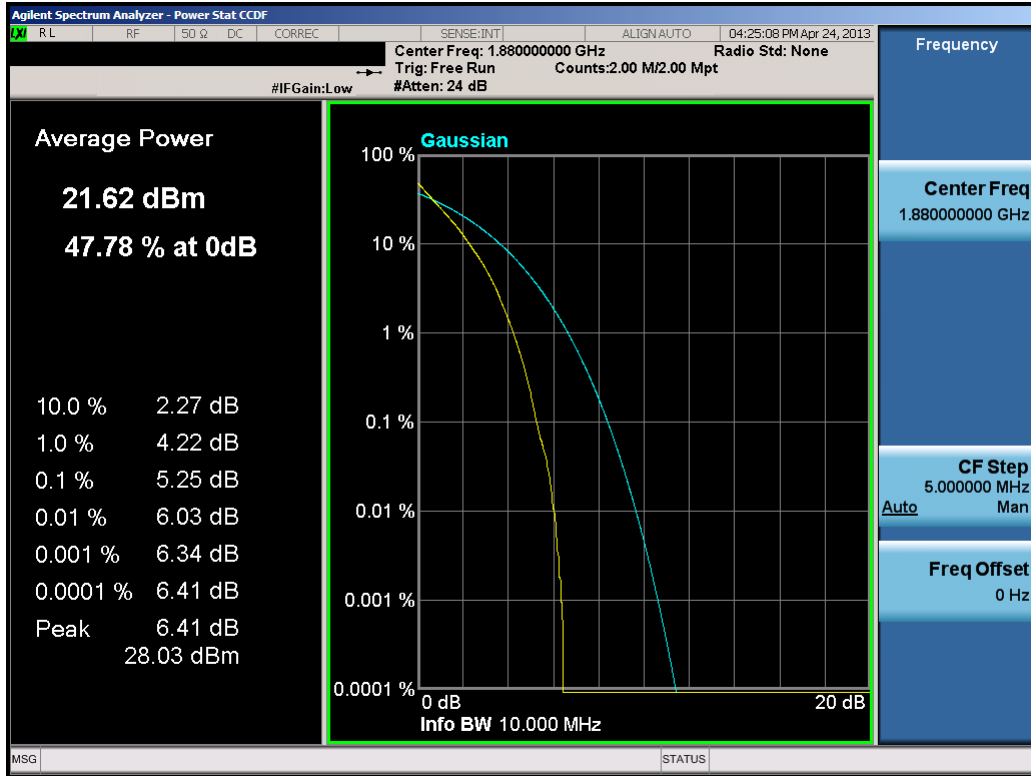


Plot 10-19. Upper Band Edge Plot (10.0MHz QPSK – RB Size 50)

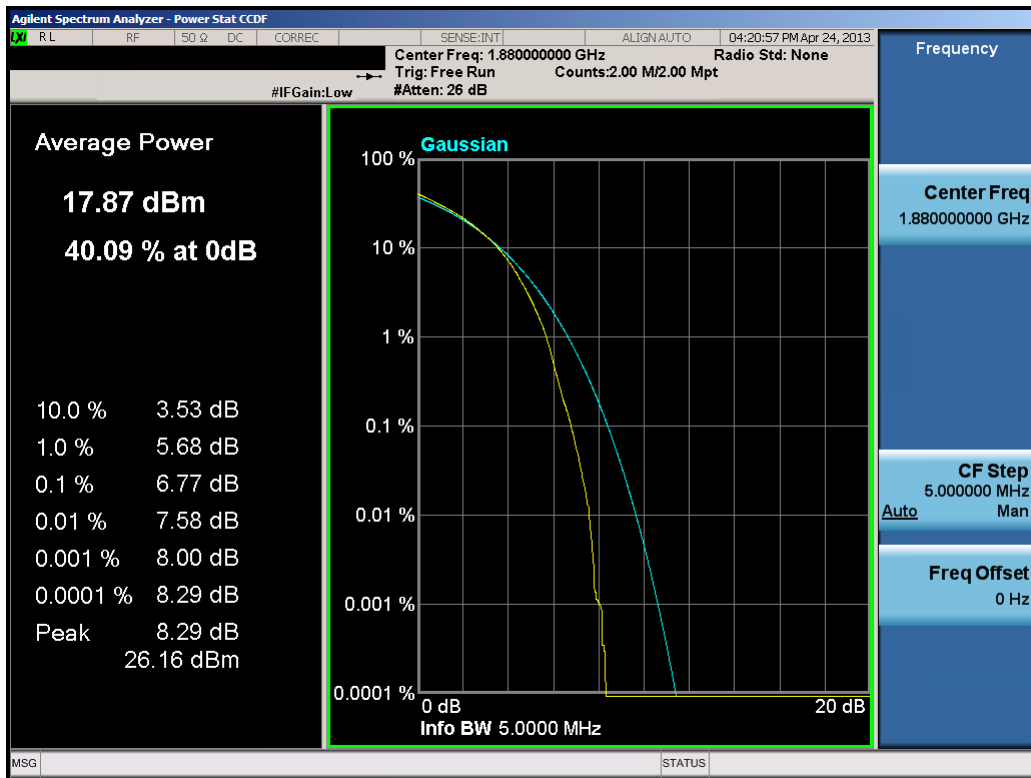


Plot 10-20. Upper Extended Band Edge Plot (10.0MHz QPSK – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
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Plot 10-21. PAR Plot (10.0MHz QPSK – RB Size 50)





Plot 10-22. PAR Plot (10.0MHz 16-QAM – RB Size 50)

FCC ID: LHJ-LNAD	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)	Continental	Reviewed by: Quality Manager
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11.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Continental Wireless Modem Module FCC ID: LHJ-LNAD** complies with all the requirements of Parts 2, 22, 24, 27 of the FCC rules for LTE operation only.

FCC ID: LHJ-LNAD		FCC Pt. 22, 24, 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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