



PCTEST ENGINEERING LABORATORY, INC.

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MEASUREMENT REPORT

FCC Part 27 LTE

Applicant Name:

Samsung Electronics, Co. Ltd.
18600 Broadwick St.
Rancho Dominguez, CA 90220
United States

Date of Testing:

Nov. 28 - Dec. 7, 2011

Test Site/Location:

PCTEST Lab., Columbia, MD, USA

Test Report Serial No.:

0Y1111161986-R1.A3L

FCC ID: A3LSGHI717

APPLICANT: SAMSUNG ELECTRONICS, CO. LTD.

Application Type:

Certification

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s):

§2; §27

EUT Type:

Portable Handset

Model(s):

SGH-i717

Tx Frequency Range:

1712.5 - 1752.5MHz (5MHz BW AWS), 1715 - 1750MHz (10MHz BW AWS),
706.5 - 713.5MHz (5MHz BW Band 17), 709 - 711MHz (10MHz BW Band 17)

Max. RF Output Power:

0.284 W EIRP (5MHz BW, QPSK, AWS Band) (24.53 dBm)
0.211 W EIRP (5MHz BW, 16-QAM, AWS Band) (23.25 dBm)
0.246 W EIRP (10MHz BW, QPSK, AWS Band) (23.91 dBm)
0.203 W EIRP (10MHz BW, 16-QAM, AWS Band) (23.07 dBm)
0.049 W ERP (5MHz BW, QPSK, Band 17) (16.88 dBm)
0.061 W ERP (5MHz BW, 16-QAM, Band 17) (17.83 dBm)
0.044 W ERP (10MHz BW, QPSK, Band 17) (16.47 dBm)
0.037 W ERP (10MHz BW, 16-QAM, Band 17) (15.63 dBm)

Emission**Designator(s):**

4M55G7D (5MHz BW, QPSK, AWS), 4M55W7D (5MHz BW, 16-QAM, AWS),
8M94G7D (10MHz BW, QPSK, AWS), 8M95W7D (10MHz BW, 16-QAM, AWS)
4M56G7D (5MHz BW, QPSK, Band 17), 4M54W7D (5MHz BW, 16-QAM, Band
17), 8M92G7D (10MHz BW, QPSK, Band 17), 8M92W7D (10MHz BW, 16-QAM,
Band 17)

Test Device Serial No.: identical prototype [S/N: N/A]

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

***This revised Test Report (S/N: 0Y1111161986-R1.A3L) supersedes and replaces the previously issued test report on the same subject EUT for the same type of testing as indicated. Please discard and destroy the previously issued test report (S/N: 0Y1111161986.A3L) and dispose of it accordingly.**

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

Randy Orlanez
President

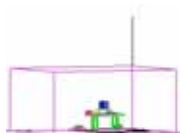


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MEASUREMENT REPORT

FCC Part 27



§2.1033 General Information

APPLICANT: Samsung Electronics, Co. Ltd.
APPLICANT ADDRESS: 18600 Broadwick St.
 Rancho Dominguez, CA 90220, United States
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S): §2; §27
BASE MODEL: SGH-i717
FCC ID: A3LSGHI717
FCC CLASSIFICATION: PCS Licensed Transmitter Held to Ear (PCE)
EMISSION DESIGNATOR(S): 4M55G7D (5MHz BW, QPSK, AWS), 4M55W7D (5MHz BW, 16-QAM, AWS),
 8M94G7D (10MHz BW, QPSK, AWS), 8M95W7D (10MHz BW, 16-QAM, AWS),
 4M56G7D (5MHz BW, QPSK, Band 17), 4M54W7D (5MHz BW, 16-QAM, Band 17),
 8M92G7D (10MHz BW, QPSK, Band 17), 8M92W7D (10MHz BW, 16-QAM, Band 17)
FREQUENCY TOLERANCE: $\pm 0.00025\%$ (2.5 ppm)
Test Device Serial No.: N/A ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST: Nov. 28 - Dec. 7, 2011
TEST REPORT S/N: 0Y1111161986-R1.A3L

Test Facility / Accreditations

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



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

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1.0 INTRODUCTION

1.1 Scope

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

1.2 Testing Facility

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

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

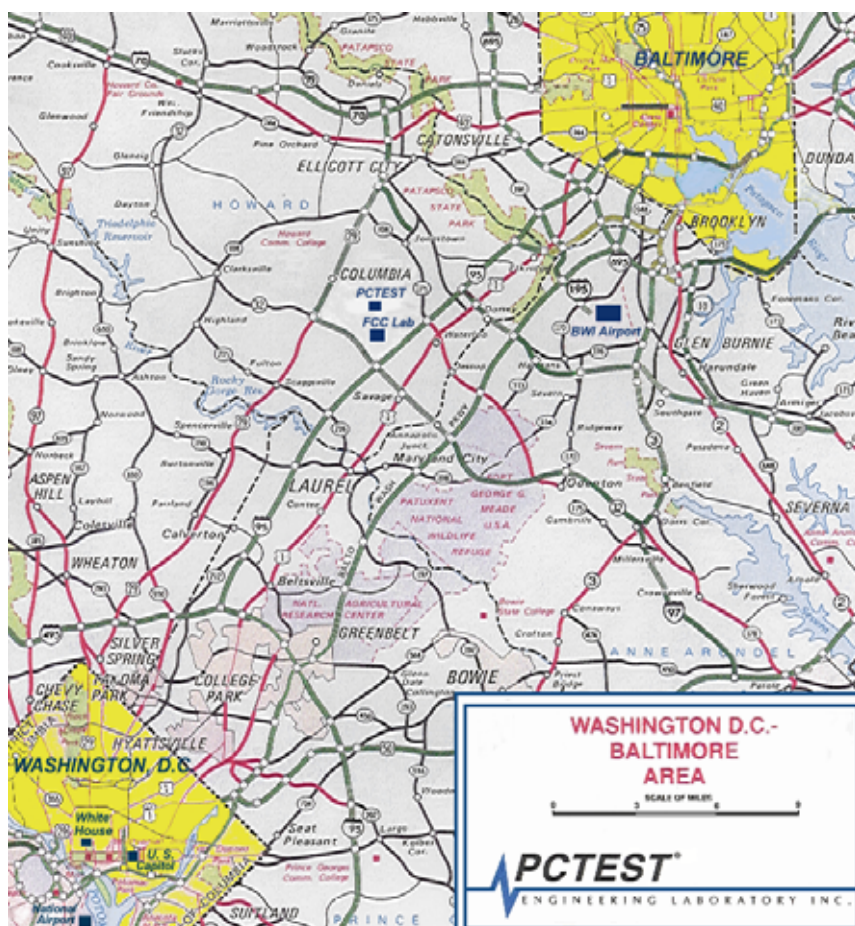


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSGHI717**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function. The EUT consisted of the following component(s):

Trade Name / Base Model	FCC ID	Description
Samsung / Model: SGH-i717	A3LSGHI717	Portable Handset

Table 2-1. EUT Equipment Description

The EUT is capable of LTE operations in Band 4 (1710 – 1755MHz) and Band 17 (704 – 716MHz). The EUT was set in its standard, angled position (see test setup photos).

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Band 4, 17 LTE, 802.11a/b/g/n WLAN, 802.11a/n UNII, Bluetooth, NFC

2.3 EMI Suppression Device(s)/Modifications

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

2.4 Labeling Requirements

Per 2.925

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

Per 15.19; Docket 95-19

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

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

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

Please see attachment for FCC ID label and label location.

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3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

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

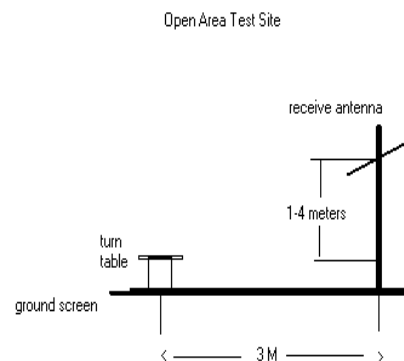


Figure 3-1. Diagram of 3-meter outdoor test range

Deviation from Measurement Procedure.....None

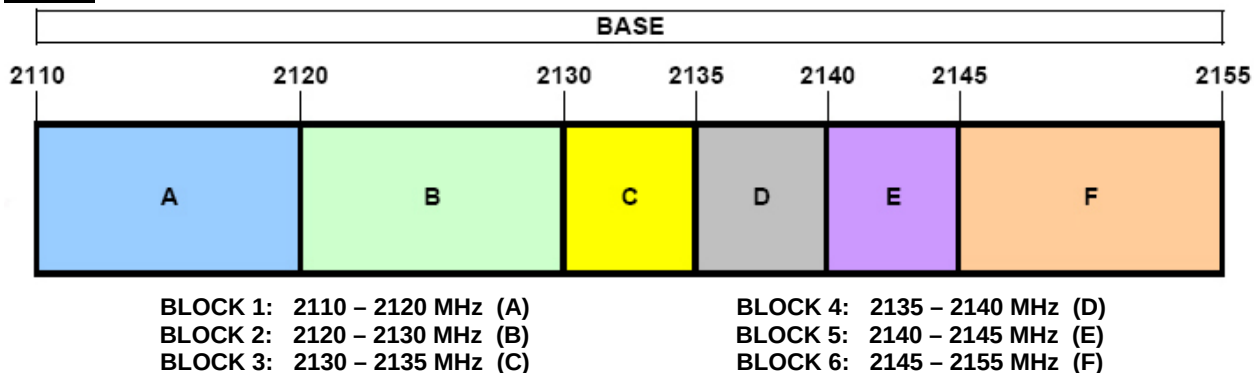
3.2 Occupied Bandwidth Emission Limits

§2.1049, §27.53(h)(1)

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

3.3 AWS - Base Frequency Blocks

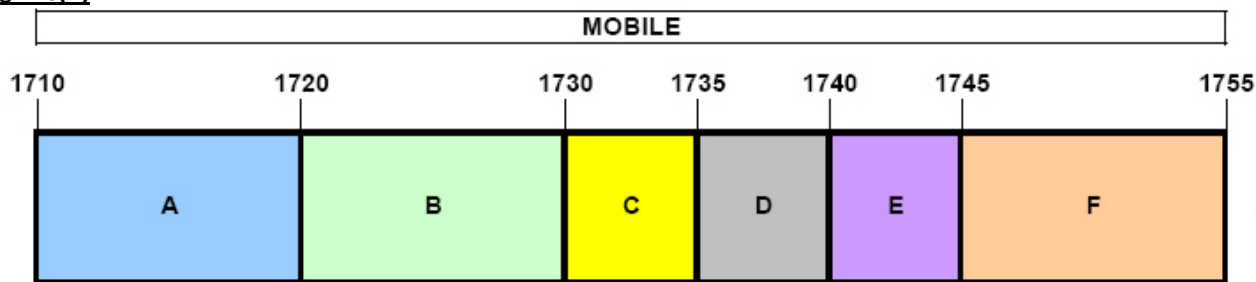
§27.5(h)



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3.4 AWS - Mobile Frequency Blocks

§27.5(h)



BLOCK 1: 1710 – 1720 MHz (A)

BLOCK 4: 1735 – 1740 MHz (D)

BLOCK 2: 1720 – 1730 MHz (B)

BLOCK 5: 1740 – 1745 MHz (E)

BLOCK 3: 1730 – 1735 MHz (C)

BLOCK 6: 1745 – 1755 MHz (F)

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

§27.5(c)

Three paired channel blocks of 12 MHz each are available for assignment as follows: Block A: 698-704 MHz and 728-734 MHz; Block B: 704-710 MHz and 734-740 MHz; and Block C: 710-716 MHz and 740-746 MHz. Two unpaired channel blocks of 6 MHz each are available for assignment as follows: Block D: 716-722 MHz; and Block E: 722-728 MHz.

3.6 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, §27.53(c), §27.53(d)

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 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 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

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3.7 Radiated Power and Radiated Spurious Emissions

§2.1053, §27.53(c), §27.53(d)

Radiated power and radiated spurious emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This level is then measured with a broadband average power meter. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive average power meter reading. This spurious level is recorded with the power meter. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. This device was tested under all modulations and channel bandwidth configurations and the worst case emissions are reported in Band 4 and in Band 17 using 5MHz Bandwidth. For both Band 4 and 17, the worst case emissions employed 1RB (with offset 0) and QPSK modulation.

3.8 Peak-Average Ratio

§27.50(d)(5)

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

3.9 Frequency Stability / Temperature Variation

§2.1055, §27.54

The frequency stability of the transmitter is measured by:

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

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

Time Period and Procedure:

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

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4.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	263-10dB	(DC-18GHz) 10 dB Attenuator	N/A		N/A	N/A
-	No.166	(1000-26500MHz) Microwave RF Cable	N/A		N/A	N/A
-	No.167	(100kHz - 100MHz) RG58 Coax Cable	N/A		N/A	N/A
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	2/8/2011	Annual	2/8/2012	3008A00985
Agilent	E5515C	Wireless Communications Test Set	2/8/2011	Annual	2/8/2012	GB45360985
Agilent	E4407B	ESA Spectrum Analyzer	4/5/2011	Annual	4/5/2012	US39210313
Agilent	85650A	Quasi-Peak Adapter	4/7/2011	Annual	4/7/2012	3303A01872
Agilent	85650A	Quasi-Peak Adapter	4/7/2011	Annual	4/7/2012	2043A00301
Agilent	8566B	(100Hz-22GHz) Spectrum Analyzer	4/7/2011	Annual	4/7/2012	3638A08713
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/8/2011	Annual	4/8/2012	MY45470194
Agilent	E5515C	Wireless Communications Test Set	7/6/2011	Annual	7/6/2012	GB41450275
Agilent	N9038A	MXE EMI Receiver	8/5/2011	Annual	8/5/2012	MY51210133
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/10/2011	Annual	10/10/2012	3613A00315
Agilent	E5515C	Wireless Communications Test Set	10/10/2011	Annual	10/10/2012	GB46110872
Agilent	E8267C	Vector Signal Generator	10/10/2011	Annual	10/10/2012	US42340152
Agilent	N9020A	MXA Signal Analyzer	10/10/2011	Annual	10/10/2012	US46470561
Anritsu	MA2411B	Pulse Sensor	10/13/2011	Annual	10/13/2012	1027293
Anritsu	ML2495A	Power Meter	10/13/2011	Annual	10/13/2012	1039008
Compliance Design	Roberts	Dipole Set	4/7/2010	Biennial	4/7/2012	146
Compliance Design	Roberts	Dipole Set	4/7/2010	Biennial	4/7/2012	147
Emco	3115	Horn Antenna (1-18GHz)	4/8/2010	Biennial	4/8/2012	9205-3874
Espec	ESX-2CA	Environmental Chamber	4/21/2011	Annual	4/21/2012	17620
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	5/31/2011	Annual	5/31/2012	135427
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Annual	7/22/2012	125518
Gigatronics	80701A	(0.05-18GHz) Power Sensor	10/12/2011	Annual	10/12/2012	1833460
Gigatronics	8651A	Universal Power Meter	10/12/2011	Annual	10/12/2012	8650319
K & L	11SH10	Band Pass Filter	N/A		N/A	1300/4000
K & L	11SH10	Band Pass Filter	N/A		N/A	4000/12000
MiniCircuits	VHF-1300+	High Pass Filter	N/A		N/A	30716
MiniCircuits	VHF-3100+	High Pass Filter	N/A		N/A	30721
Pasternack	PE2208-6	Bidirectional Coupler	N/A		N/A	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	4/19/2011	Annual	4/19/2012	107826
Rohde & Schwarz	CMU200	Base Station Simulator	6/1/2011	Annual	6/1/2012	833855/0010
Rohde & Schwarz	RS-PR18	1-18 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100071
Rohde & Schwarz	RS-PR26	18-26.5 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100040
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/5/2011	Annual	8/5/2012	112347
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	8/25/2011	Annual	8/25/2012	100976
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Annual	10/7/2012	103962
Rohde & Schwarz	CMU200	Base Station Simulator	N/A			836536/0005
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Tx	10/3/2011	Biennial	10/3/2013	91052522TX
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	10/3/2011	Biennial	10/3/2013	91052523RX
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	12/17/2009	Biennial	12/17/2011	A051107
Sunol	DRH-118	Horn Antenna (1-18 GHz)	6/17/2011	Biennial	6/17/2013	A042511
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	7/5/2011	Biennial	7/5/2013	A050307

Table 4-1. Test Equipment

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5.0 SAMPLE CALCULATIONS

Emission Designator

Emission Designator = 4M25G7D

QPSK BW = 4.25 MHz

G = Phase Modulation

7 = Two or more channels containing quantized or digital information

D = Data transmission, telemetry, telecommand

Emission Designator = 3M35W7D

16-QAM BW = 3.35 MHz

W = Quadrature Amplitude Modulation

7 = Two or more channels containing quantized or digital information

D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – AWS Band

Example: Channel 20150 AWS Mode 2nd Harmonic (3460.0 MHz)

The spectrum analyzer reading at 3 meters with the EUT on the turntable was –81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminal is adjusted to produce a reading of –81.0 dBm on the power meter. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3460.0 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80) = 50.3 dBc.

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6.0 TEST RESULTS

6.1 Summary

Company Name: Samsung Electronics, Co. Ltd.
 FCC ID: A3LSGHI717
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
2.1049, 27.53(h)(1)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Sections 7.0, 8.0
2.1051, 27.53(g), 27.53(h)	Band Edge / Conducted Spurious Emissions	$< 43 + 10\log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions		PASS	Sections 7.0, 8.0
27.50(d)(5)	Peak-Average Ratio	$< 13 \text{ dB}$		PASS	Sections 7.0, 8.0
2.1046	Transmitter Conducted Output Power	N/A		PASS	Section 6.2
27.50(c)(9)	Effective Radiated Power (Band 17)	$< 30 \text{ Watts max. ERP}$	RADIATED	PASS	Section 6.4
27.50(d)(4)	Equivalent Isotropic Radiated Power (AWS)	$< 1 \text{ Watts max. EIRP}$		PASS	Section 6.3
2.1053, 27.53(g), 27.53(h)	Undesirable Emissions	$< 43 + 10\log_{10}(P[\text{Watts}])$ for all out-of-band emissions		PASS	Section 6.5, 6.6
2.1055, 27.54	Frequency Stability	$< 2.5 \text{ ppm}$		PASS	Section 6.7, 6.8

Table 6-1. Summary of Test Results

NOTES:

The following notes refer to the conducted plots shown in Sections 7.0 and 8.0 of this report. The configurations below were chosen for each measurement since they resulted in the worst case emissions:

- Band edge plots for 5MHz operation were performed with the EUT transmitting with 1RB at the outermost offset (Offset 0 for lower band edge and maximum offset for upper band edge). Band edge plots for 10MHz operation were performed with the EUT transmitting with the maximum number of RB's.
- All out of band conducted spurious emissions 1MHz removed from the band edge, occupied bandwidth, and peak-to-average ratio plots were performed with the EUT transmitting with the maximum number of RB's for each channel bandwidth.
- All out of band conducted spurious emissions plots were performed with the EUT transmitting with 1RB and an RB offset of 0.

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6.2 Transmitter Conducted Output Power

§2.1046

The **Samsung Portable Handset FCC ID: A3LSGHI717** was connected to a Rohde & Schwarz CMW500 LTE eNodeB simulator. The EUT was configured to transmit continuously using different resource block configurations for all available channel bandwidths with QPSK and 16-QAM modulations in Band 4 and Band 17 in order to determine the maximum conducted output power.

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



Figure 6-1. Test Setup Diagram

Freq. (MHz)	3GPP LTE Band	MCS Level	Modulation	Bandwidth	RB Size	Resource Block Offset	Maximum Average Power [dBm]	Target Power	Samsung MPR	MPR Allowed by 3GPP
1712.5	Band 4	0	QPSK	5 MHz	1	0	22.95	22.9	0	0
1712.5		11	16QAM	5 MHz	1	0	22.00	21.9	1	0-1
1712.5		0	QPSK	5 MHz	1	24	23.05	22.9	0	0
1712.5		11	16QAM	5 MHz	1	24	22.11	21.9	1	0-1
1712.5		0	QPSK	5 MHz	12	6	21.90	21.9	1	0-1
1712.5		11	16QAM	5 MHz	12	6	20.87	20.9	2	0-2
1712.5		0	QPSK	5 MHz	25	0	22.02	21.9	1	0-1
1712.5		11	16QAM	5 MHz	25	0	21.19	20.9	2	0-2
1715		0	QPSK	10 MHz	1	0	22.95	22.9	0	0
1715		11	16QAM	10 MHz	1	0	21.89	21.9	1	0-1
1715		0	QPSK	10 MHz	1	49	23.08	22.9	0	0
1715		11	16QAM	10 MHz	1	49	22.01	21.9	1	0-1
1715		0	QPSK	10 MHz	25	12	22.09	21.9	1	0-1
1715		11	16QAM	10 MHz	25	12	21.71	21.9	1	0-2
1715		0	QPSK	10 MHz	50	0	22.13	21.9	1	0-1
1715		11	16QAM	10 MHz	50	0	21.34	20.9	2	0-2

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

Freq. (MHz)	3GPP LTE Band	MCS Level	Modulation	Bandwidth	RB Size	Resource Block Offset	Maximum Average Power [dBm]	Target Power	Samsung MPR	MPR Allowed by 3GPP
1732.5	Band 4	0	QPSK	5 MHz	1	0	23.02	22.9	0	0
1732.5		11	16QAM	5 MHz	1	0	22.08	21.9	1	0-1
1732.5		0	QPSK	5 MHz	1	24	22.96	22.9	0	0
1732.5		11	16QAM	5 MHz	1	24	22.11	21.9	1	0-1
1732.5		0	QPSK	5 MHz	12	6	21.97	21.9	1	0-1
1732.5		11	16QAM	5 MHz	12	6	20.80	20.9	2	0-2
1732.5		0	QPSK	5 MHz	25	0	22.05	21.9	1	0-1
1732.5		11	16QAM	5 MHz	25	0	21.17	20.9	2	0-2
1732.5		0	QPSK	10 MHz	1	0	22.94	22.9	0	0
1732.5		11	16QAM	10 MHz	1	0	21.89	21.9	1	0-1
1732.5		0	QPSK	10 MHz	1	49	22.94	22.9	0	0
1732.5		11	16QAM	10 MHz	1	49	21.93	21.9	1	0-1
1732.5		0	QPSK	10 MHz	25	12	22.02	21.9	1	0-1
1732.5		11	16QAM	10 MHz	25	12	21.44	21.9	1	0-2
1732.5		0	QPSK	10 MHz	50	0	22.09	21.9	1	0-1
1732.5		11	16QAM	10 MHz	50	0	21.23	20.9	2	0-2

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

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Transmitter Conducted Output Power (Cont'd)

§2.1046

Freq. (MHz)	3GPP LTE Band	MCS Level	Modulation	Bandwidth	RB Size	Resource Block Offset	Maximum Average Power [dBm]	Target Power	Samsung MPR	MPR Allowed by 3GPP
1752.5	Band 4	0	QPSK	5 MHz	1	0	22.93	22.9	0	0
1752.5		11	16QAM	5 MHz	1	0	21.94	21.9	1	0-1
1752.5		0	QPSK	5 MHz	1	24	22.89	22.9	0	0
1752.5		11	16QAM	5 MHz	1	24	22.00	21.9	1	0-1
1752.5		0	QPSK	5 MHz	12	6	21.90	21.9	1	0-1
1752.5		11	16QAM	5 MHz	12	6	20.74	20.9	2	0-2
1752.5		0	QPSK	5 MHz	25	0	21.95	21.9	1	0-1
1752.5		11	16QAM	5 MHz	25	0	21.14	20.9	2	0-2
1750		0	QPSK	10 MHz	1	0	22.93	22.9	0	0
1750		11	16QAM	10 MHz	1	0	21.70	21.9	1	0-1
1750		0	QPSK	10 MHz	1	49	22.89	22.9	0	0
1750		11	16QAM	10 MHz	1	49	21.65	21.9	1	0-1
1750		0	QPSK	10 MHz	25	12	21.93	21.9	1	0-1
1750		11	16QAM	10 MHz	25	12	21.40	21.9	1	0-2
1750		0	QPSK	10 MHz	50	0	22.02	21.9	1	0-1
1750		11	16QAM	10 MHz	50	0	21.07	20.9	2	0-2

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

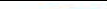
Freq. (MHz)	3GPP LTE Band	MCS Level	Modulation	Bandwidth	RB Size	Resource Block Offset	Maximum Average Power [dBm]	Target Power	Samsung MPR	MPR Allowed by 3GPP
706.5	Band 17	0	QPSK	5 MHz	1	0	22.34	22.5	0	0
706.5		11	16QAM		1	0	21.30	21.5	1	0-1
706.5		0	QPSK		1	24	22.33	22.5	0	0
706.5		20	16QAM		1	24	21.29	21.5	1	0-1
706.5		0	QPSK		12	6	21.42	21.5	1	0-1
706.5		11	16QAM		12	6	20.23	20.5	2	0-2
706.5		0	QPSK		25	0	21.52	21.5	1	0-1
706.5		11	16QAM		25	0	20.79	20.5	2	0-2
713.5		0	QPSK		1	0	22.32	22.5	0	0
713.5		11	16QAM		1	0	21.73	21.5	1	0-1
713.5		0	QPSK		1	24	22.22	22.5	0	0
713.5		20	16QAM		1	24	21.64	21.5	1	0-1
713.5		0	QPSK		12	6	21.44	21.5	1	0-1
713.5		11	16QAM		12	6	20.24	20.5	2	0-2
713.5		0	QPSK		25	0	21.50	21.5	1	0-1
713.5		11	16QAM		25	0	20.68	20.5	2	0-2

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

FCC ID: A3LSGH1717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
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Freq. (Mhz)	3GPP LTE Band	MCS Level	Modulation	Bandwidth	RB Size	Resource Block Offset	Maximum Average Power [dBm]	Target Power	Samsung MPR	MPR Allowed by 3GPP
710	Band 17	0	QPSK	5 MHz	1	0	22.45	22.5	0	0
710		11	16QAM	5 MHz	1	0	21.35	21.5	1	0-1
710		0	QPSK	5 MHz	1	24	22.36	22.5	0	0
710		20	16QAM	5 MHz	1	24	21.24	21.5	1	0-1
710		0	QPSK	5 MHz	12	6	21.58	21.5	1	0-1
710		11	16QAM	5 MHz	12	6	20.26	20.5	2	0-2
710		0	QPSK	5 MHz	25	0	21.56	21.5	1	0-1
710		11	16QAM	5 MHz	25	0	20.80	20.5	2	0-2
710		0	QPSK	10 MHz	1	0	22.54	22.5	0	0
710		11	16QAM	10 MHz	1	0	21.18	21.5	1	0-1
710		0	QPSK	10 MHz	1	49	22.20	22.5	0	0
710		20	16QAM	10 MHz	1	49	21.10	21.5	1	0-1
710		0	QPSK	10 MHz	25	12	21.68	21.5	1	0-1
710		11	16QAM	10 MHz	25	12	21.25	21.5	1	0-2
710		0	QPSK	10 MHz	50	0	21.58	21.5	1	0-1
710		11	16QAM	10 MHz	50	0	20.85	20.5	2	0-2

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

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION) 			Reviewed by: Quality Manager
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6.3 Equivalent Isotropic Radiated Power Output Data §27.50(d)(4)

	Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	RB Size/Offset	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery
Band IV LTE	1712.50	5	QPSK	1 / 24	-16.71	15.80	8.33	H	24.13	0.259	Standard
	1732.50	5	QPSK	1 / 0	-16.21	16.30	8.23	H	24.53	0.284	Standard
	1752.50	5	QPSK	1 / 24	-16.73	15.78	8.12	H	23.90	0.245	Standard
	1712.50	5	16-QAM	1 / 24	-17.64	14.61	8.33	H	22.94	0.197	Standard
	1732.50	5	16-QAM	1 / 0	-17.23	15.02	8.23	H	23.25	0.211	Standard
	1752.50	5	16-QAM	1 / 24	-17.60	14.65	8.12	H	22.77	0.189	Standard
	1715.00	10	QPSK	1 / 49	-17.10	15.15	8.33	H	23.48	0.223	Standard
	1732.50	10	QPSK	1 / 0	-16.57	15.68	8.23	H	23.91	0.246	Standard
	1750.00	10	QPSK	1 / 0	-16.81	15.44	8.12	H	23.56	0.227	Standard
	1715.00	10	16-QAM	1 / 49	-18.15	14.10	8.33	H	22.43	0.175	Standard
	1732.50	10	16-QAM	1 / 0	-17.41	14.84	8.23	H	23.07	0.203	Standard
	1750.00	10	16-QAM	1 / 0	-17.67	14.58	8.12	H	22.70	0.186	Standard

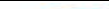
Table 6-7. Equivalent Isotropic Radiated Power Output Data (Band 4)

NOTES:

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

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This level is recorded using the power meter. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

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

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6.4 Effective Radiated Power Output Data

§27.50(c)(9)

	Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	RB Size/Offset	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	Battery
Band XVII LTE	706.50	5	QPSK	1 / 24	-21.37	15.84	0.00	V	15.84	0.038	Standard
	710.00	5	QPSK	1 / 24	-20.33	16.88	0.00	V	16.88	0.049	Standard
	713.50	5	QPSK	1 / 0	-20.47	16.74	0.00	V	16.74	0.047	Standard
	706.50	5	16-QAM	1 / 24	-22.23	14.98	0.00	V	14.98	0.031	Standard
	710.00	5	16-QAM	1 / 24	-21.29	15.92	0.00	V	15.92	0.039	Standard
	713.50	5	16-QAM	1 / 0	-21.41	17.83	0.00	V	17.83	0.061	Standard
	710.00	10	QPSK	1 / 49	-20.74	16.47	0.00	V	16.47	0.044	Standard
	710.00	10	16-QAM	1 / 49	-21.58	15.63	0.00	V	15.63	0.037	Standard

Table 6-8. Effective Radiated Power Output Data (Band 17)

NOTES:

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

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This level is recorded using the power meter. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

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

FCC ID: A3LSGHI717	 FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION) 			Reviewed by: Quality Manager
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6.5 Band 4 (AWS) LTE Radiated Measurements

§2.1053, §27.53(h)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1712.50 MHz
 CHANNEL: 19975
 MEASURED OUTPUT POWER: 24.13 dBm = 0.259 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 37.13 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3425.00	-43.46	9.34	-34.12	H	58.2
5137.50	-48.63	10.96	-37.68	H	61.8
6850.00	-44.38	10.52	-33.86	H	58.0
8562.50	-43.02	11.07	-31.95	H	56.1

Table 6-9. Radiated Spurious Data (5MHz BW, QPSK, AWS Band – Ch. 19975)

NOTES:

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

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

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

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Band 4 (AWS) LTE Radiated Measurements (Cont'd)

§2.1053, §27.53(h)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1732.50 MHz
 CHANNEL: 20175
 MEASURED OUTPUT POWER: 24.53 dBm = 0.284 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 37.53 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3465.00	-52.74	9.47	-43.28	H	67.8
5197.50	-49.68	10.87	-38.81	H	63.3
6930.00	-47.05	10.68	-36.37	H	60.9
8662.50	-80.98	11.25	-69.74	H	94.3

Table 6-10. Radiated Spurious Data (5MHz BW, QPSK, AWS Band – Ch. 20175)

NOTES:

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

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

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

FCC ID: A3LSGHI717			FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 4 (AWS) LTE Radiated Measurements (Cont'd)

§2.1053, §27.53(h)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1752.50 MHz
 CHANNEL: 20325
 MEASURED OUTPUT POWER: 23.90 dBm = 0.245 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 36.90 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3505.00	-51.07	9.54	-41.53	H	65.4
5257.50	-50.78	10.69	-40.10	H	64.0
7010.00	-47.31	10.81	-36.50	H	60.4
8762.50	-81.12	11.40	-69.71	H	93.6

Table 6-11. Radiated Spurious Data (5MHz BW, QPSK, AWS Band – Ch. 20300)

NOTES:

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

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

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

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6.6 Band 17 LTE Radiated Measurements

§2.1053, §27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 706.50 MHz
CHANNEL: 23755
MEASURED OUTPUT POWER: 15.84 dBm = 0.038 W
MODULATION SIGNAL: QPSK
BANDWIDTH: 5 MHz
DISTANCE: 3 meters
LIMIT: $43 + 10 \log_{10} (W) =$ 28.84 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1413.00	-50.67	5.80	-44.87	H	69.0
2119.50	-53.80	6.48	-47.32	H	71.5
2826.00	-54.90	7.70	-47.20	H	71.3
3532.50	-90.77	7.47	-83.29	H	107.4

Table 6-12. Radiated Spurious Data (5MHz BW, QPSK, Band 17 – Ch. 23755)

NOTES:

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

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

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

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 17 LTE Radiated Measurements (Cont'd)

§2.1053, §27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 710.00 MHz
 CHANNEL: 23790
 MEASURED OUTPUT POWER: 16.88 dBm = 0.049 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 29.88 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
2130.00	-47.29	5.84	-41.45	H	66.0
2840.00	-55.92	6.48	-49.44	H	74.0
3550.00	-93.90	7.69	-86.21	H	110.7
4260.00	-90.76	7.50	-83.26	H	107.8

Table 6-13. Radiated Spurious Data (5MHz BW, QPSK, Band 17 – Ch. 23790)

NOTES:

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

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

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

FCC ID: A3LSGHI717		FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Band 17 LTE Radiated Measurements (Cont'd)

§2.1053, §27.53(g)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 713.50 MHz
CHANNEL: 23825
MEASURED OUTPUT POWER: 16.74 dBm = 0.047 W
MODULATION SIGNAL: QPSK
BANDWIDTH: 5 MHz
DISTANCE: 3 meters
LIMIT: $43 + 10 \log_{10} (W) =$ 29.74 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1427.00	-55.13	5.87	-49.26	H	73.2
2140.50	-55.81	6.48	-49.33	H	73.2
2854.00	-93.82	7.67	-86.14	H	110.0
3567.50	-90.75	7.53	-83.22	H	107.1

Table 6-14. Radiated Spurious Data (5MHz BW, QPSK, Band 17 – Ch. 23825)

NOTES:

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

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

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

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6.7 Band 4 (AWS) LTE Frequency Stability Measurements

\$2.1055, \$27.54

OPERATING FREQUENCY: 1,732,500,000 Hz

CHANNEL: 20175

REFERENCE VOLTAGE: 5 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

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

Table 6-15. Frequency Stability Data (20MHz BW, QPSK, Band 4 (AWS) – Ch. 20175)

FCC ID: A3LSGHI717	 FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
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Band 4 (AWS) LTE Frequency Stability Measurements (Cont'd)

§2.1055, §27.54

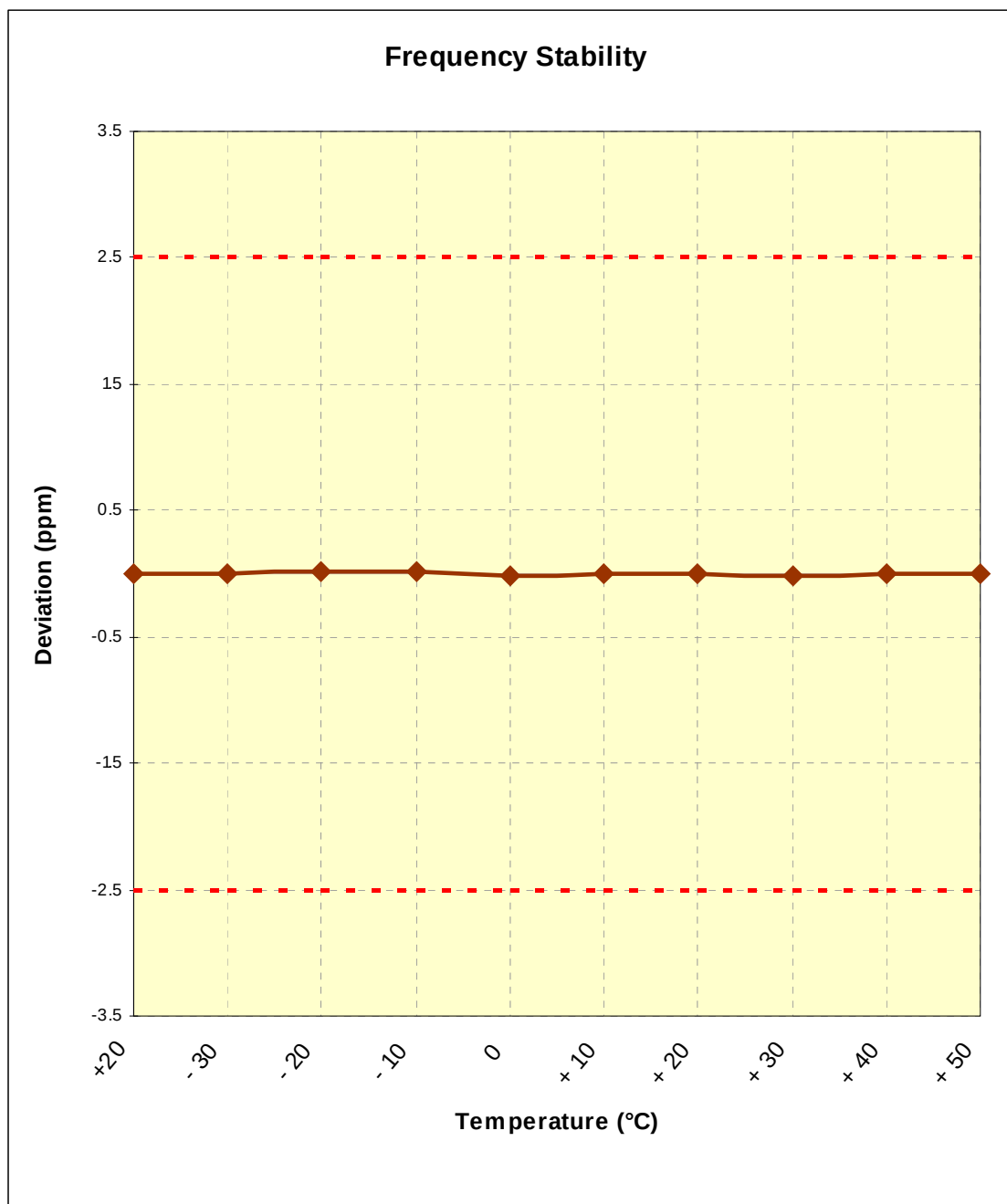


Figure 6-2. Frequency Stability Graph (20MHz BW, QPSK, Band 4 (AWS) – Ch. 20175)

FCC ID: A3LSGHI717	 FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		 Reviewed by: Quality Manager
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6.8 Band 17 LTE Frequency Stability Measurements

\$2.1055, \$27.54

OPERATING FREQUENCY: 710,000,000 Hz

CHANNEL: 23790

REFERENCE VOLTAGE: 5 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

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

Table 6-16. Frequency Stability Data (5MHz BW, QPSK, Band 17 – Ch. 23790)

PCS LTE Frequency Stability Measurements (Cont'd)

§2.1055, §27.54

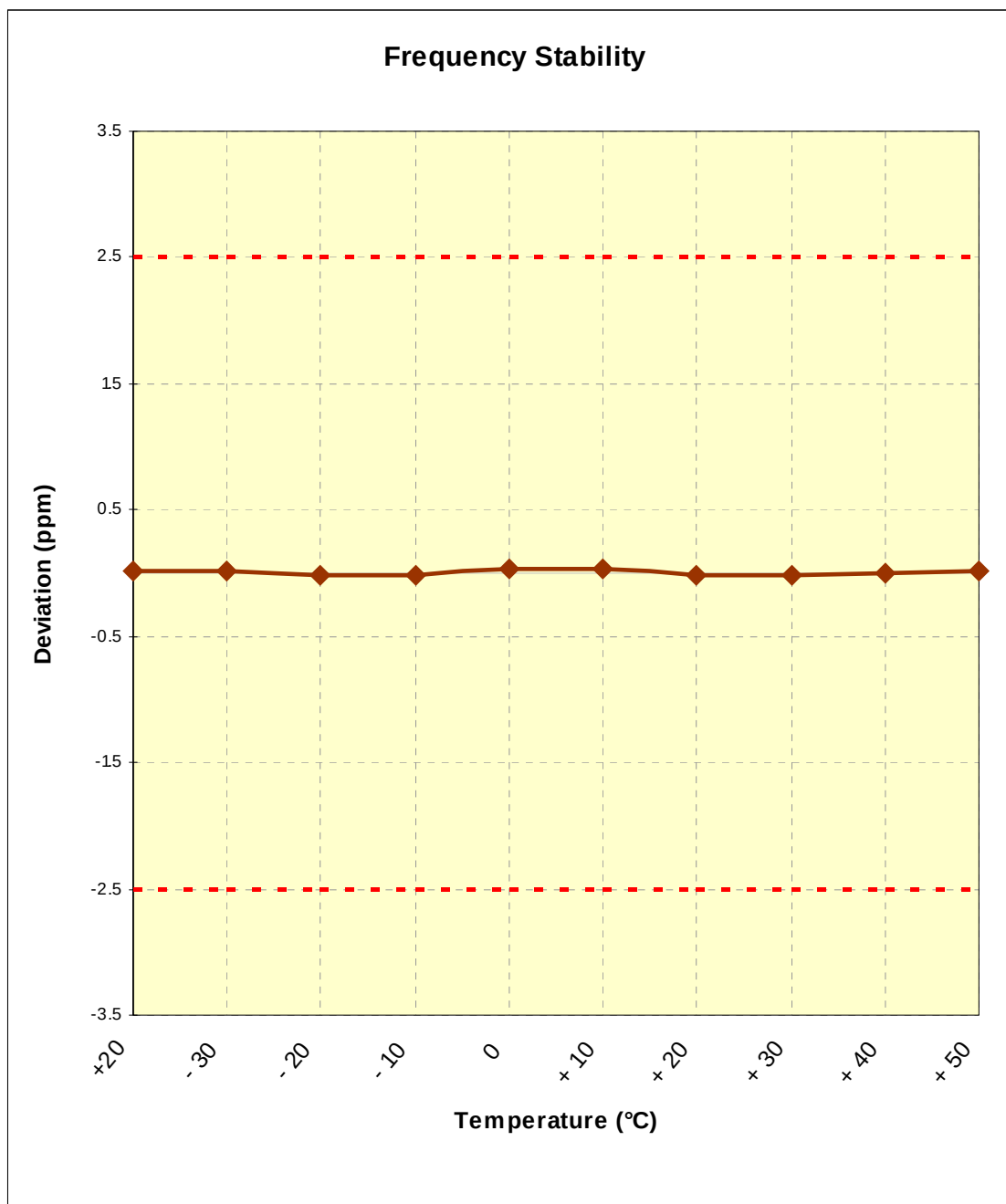
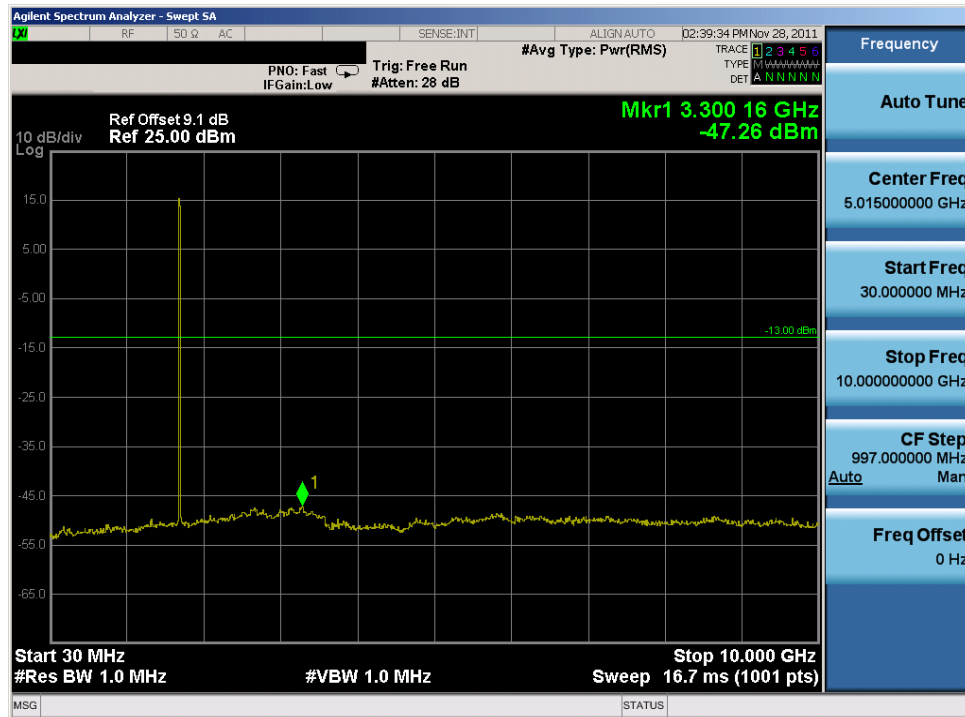


Figure 6-3. Frequency Stability Graph (5MHz BW, QPSK, Band 17 – Ch. 23790)

FCC ID: A3LSGHI717			FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION) 	Reviewed by: Quality Manager
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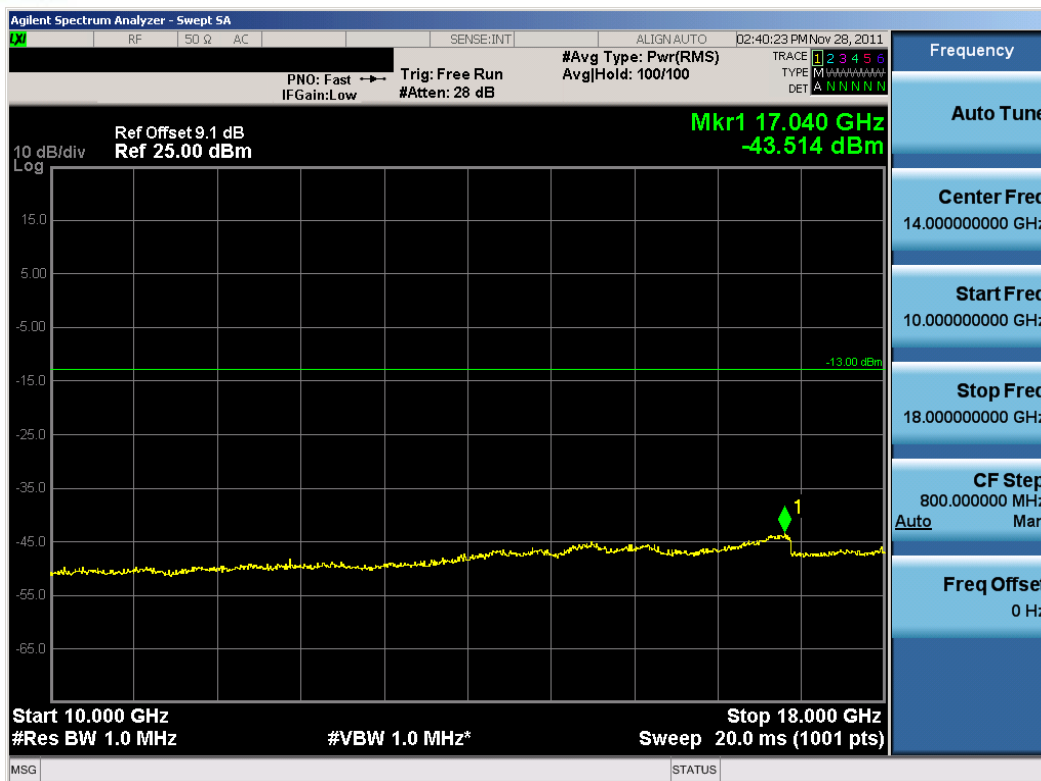
7.0 PLOT(S) OF EMISSIONS – AWS BAND

Emissions were investigated with both QPSK and 16-QAM modulations. Worst case emissions were found while operating with QPSK modulation. For all band edge emissions, a resolution bandwidth of 1% of the emission bandwidth is used to measure the band edge. For band edge emissions, 1 RB allocation represents the worst case emissions. Since the emission bandwidth at 1 RB is approximately 556 kHz, all band edge emissions were measured with a RBW of at least 10kHz to demonstrate compliance at the band edge.

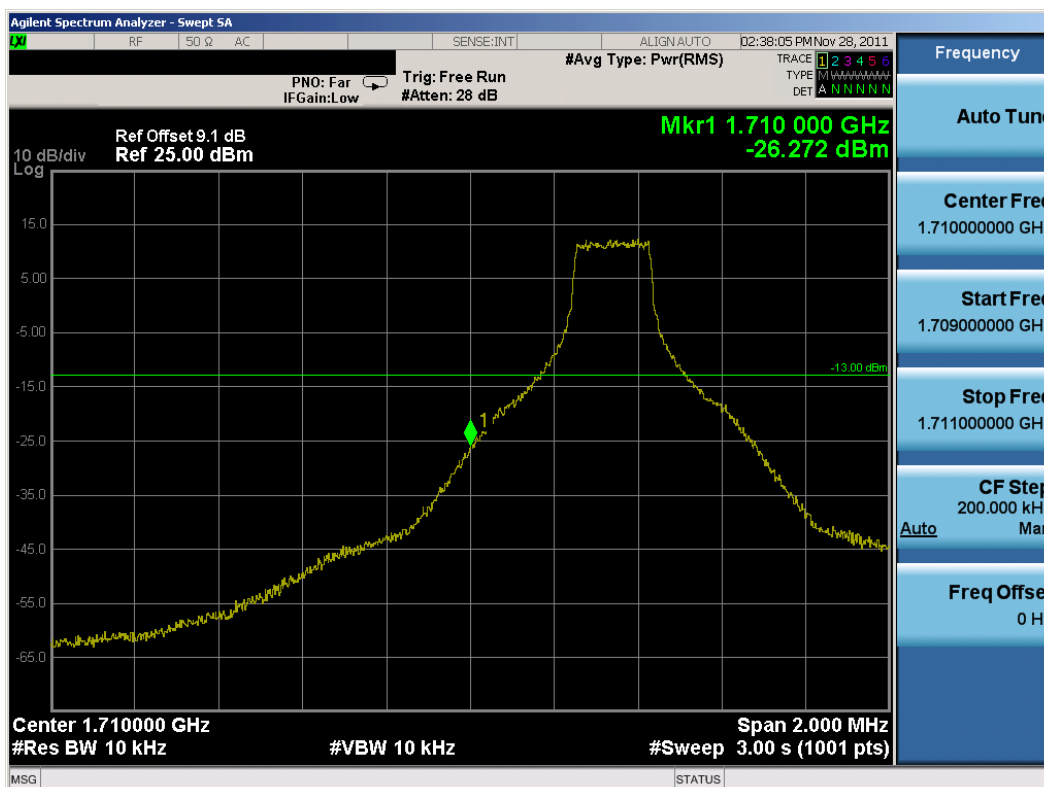


Plot 7-1. Conducted Spurious Plot (5MHz BW, QPSK, AWS Band – Low Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-2. Conducted Spurious Plot (5MHz BW, QPSK, AWS Band – Low Channel)

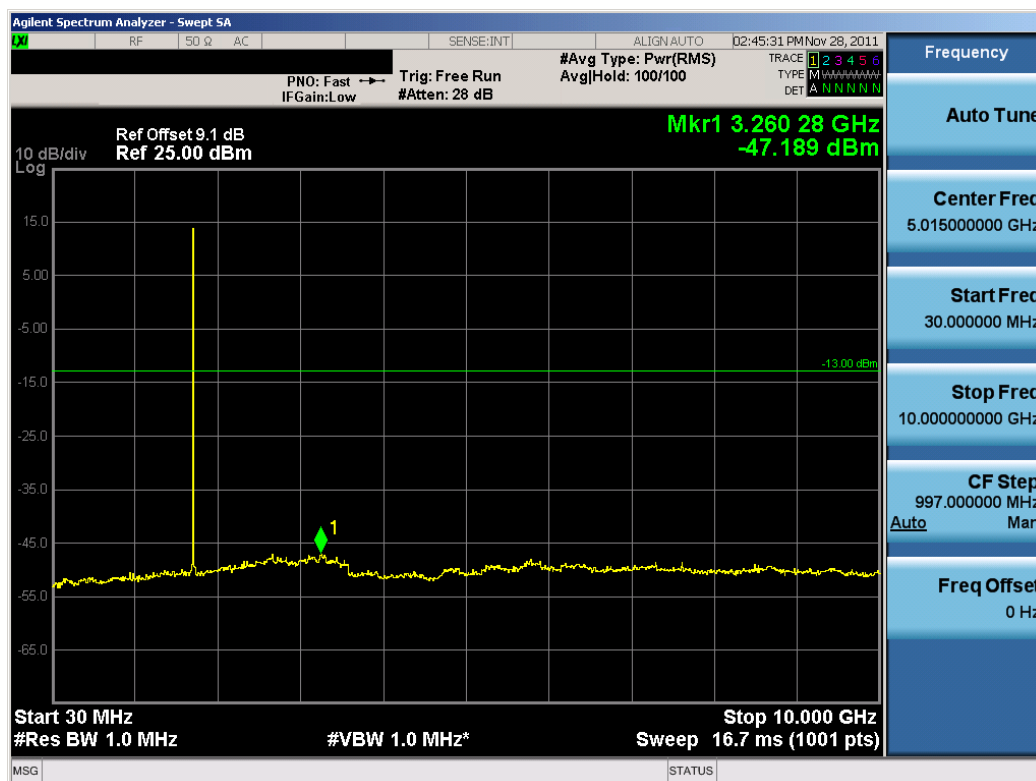


Plot 7-3. Band Edge Plot (5MHz BW, QPSK, AWS Band – Low Channel)

FCC ID: A3LSGH1717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 7-4. Extended Band Edge Plot (5MHz BW, QPSK, AWS Band – Low Channel)

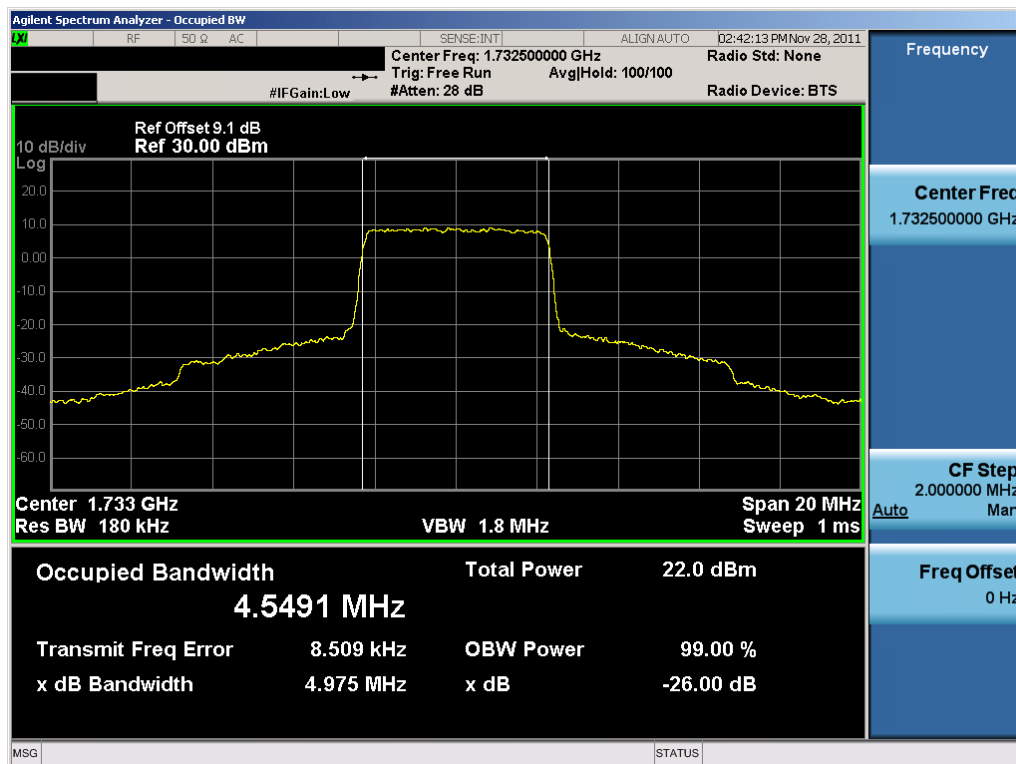


Plot 7-5. Conducted Spurious Plot (5MHz BW, QPSK, AWS Band – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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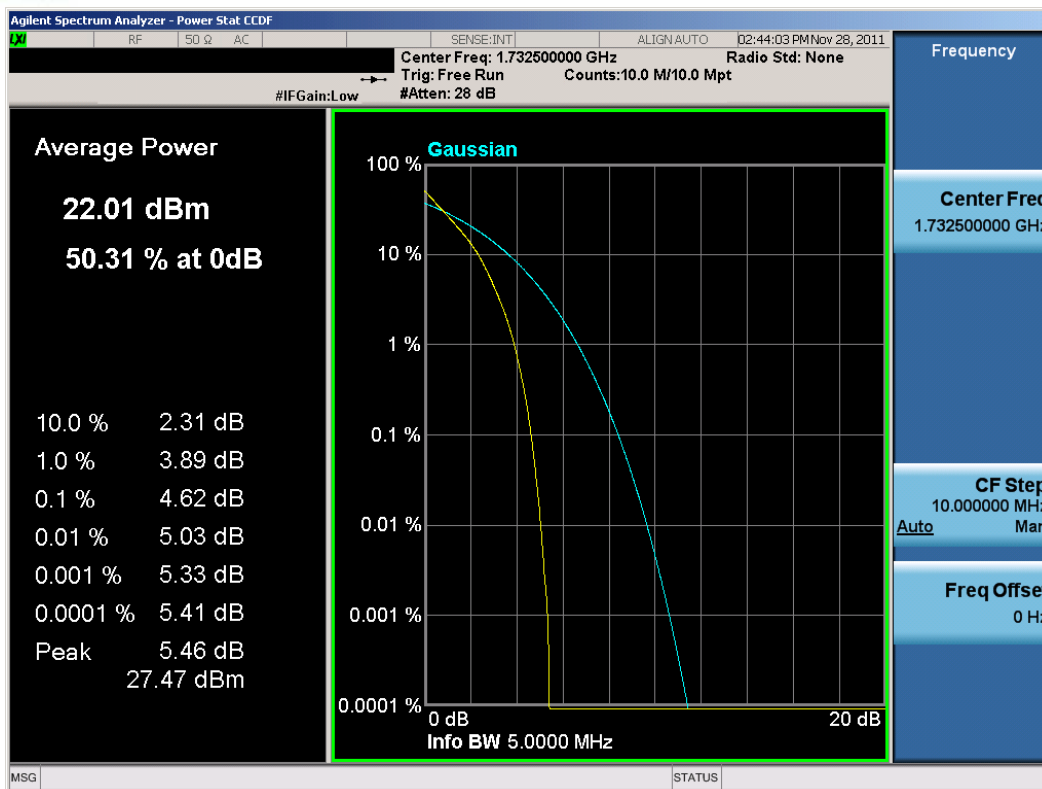


Plot 7-6. Conducted Spurious Plot (5MHz BW, QPSK, AWS Band – Mid Channel)

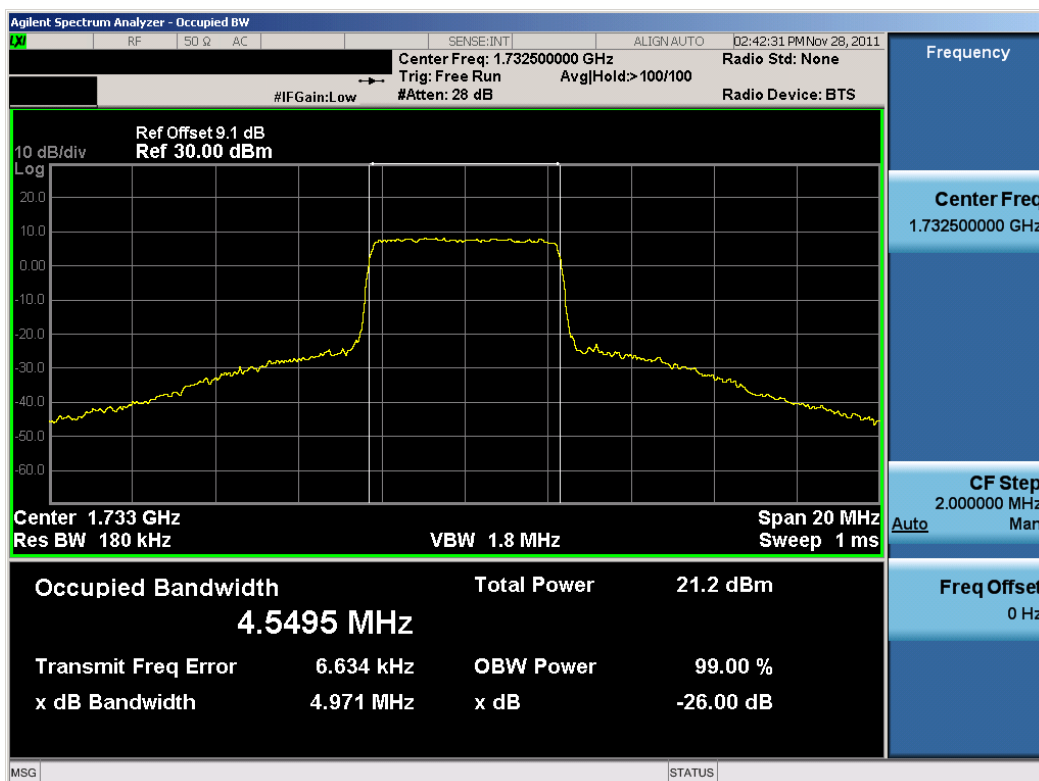


Plot 7-7. Occupied Bandwidth Plot (5MHz BW, QPSK, AWS Band – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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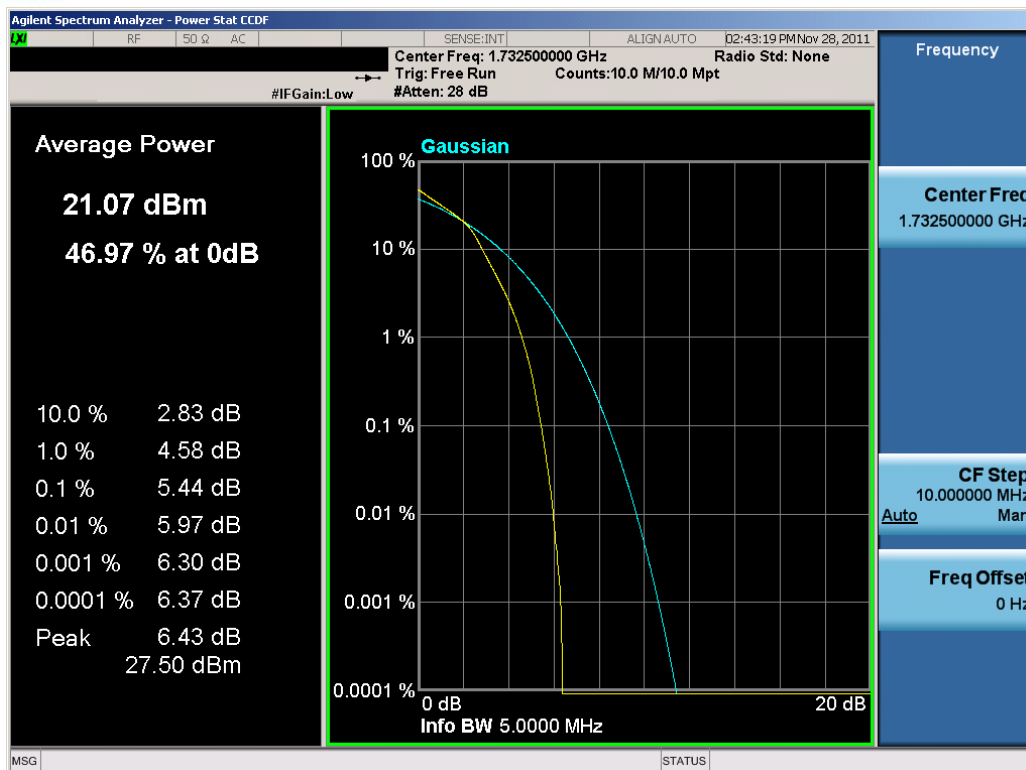


Plot 7-8. Peak-Average Ratio Plot (5MHz BW, QPSK, AWS Band – Mid Channel)

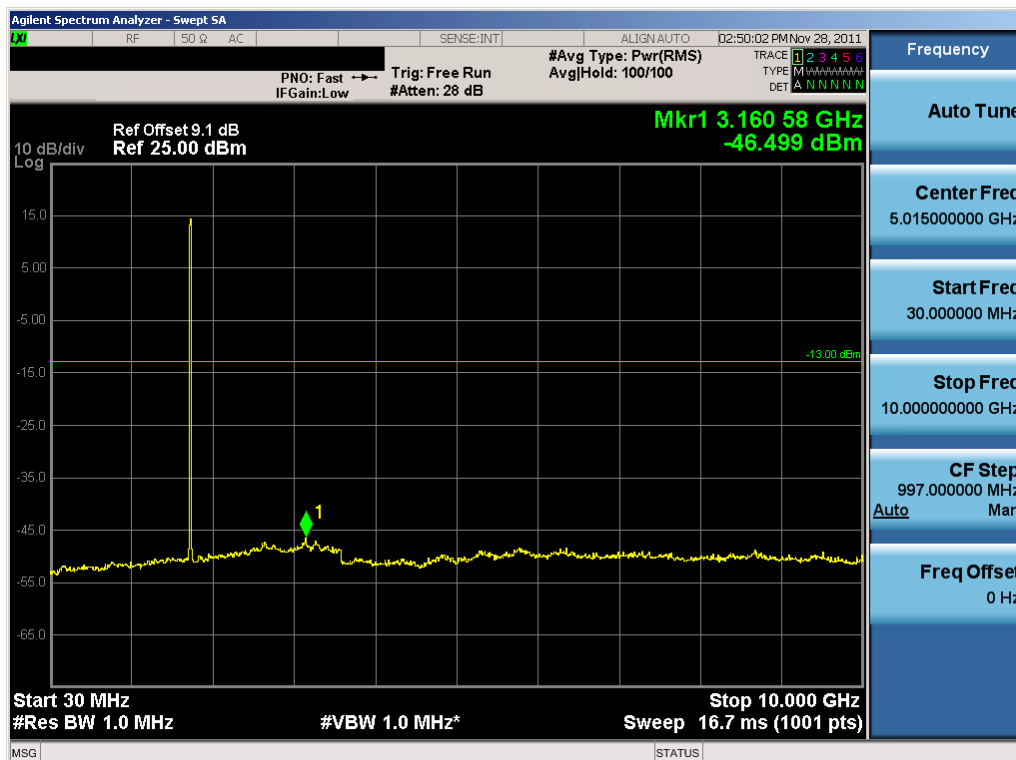


Plot 7-9. Occupied Bandwidth Plot (5MHz BW, 16-QAM, AWS Band – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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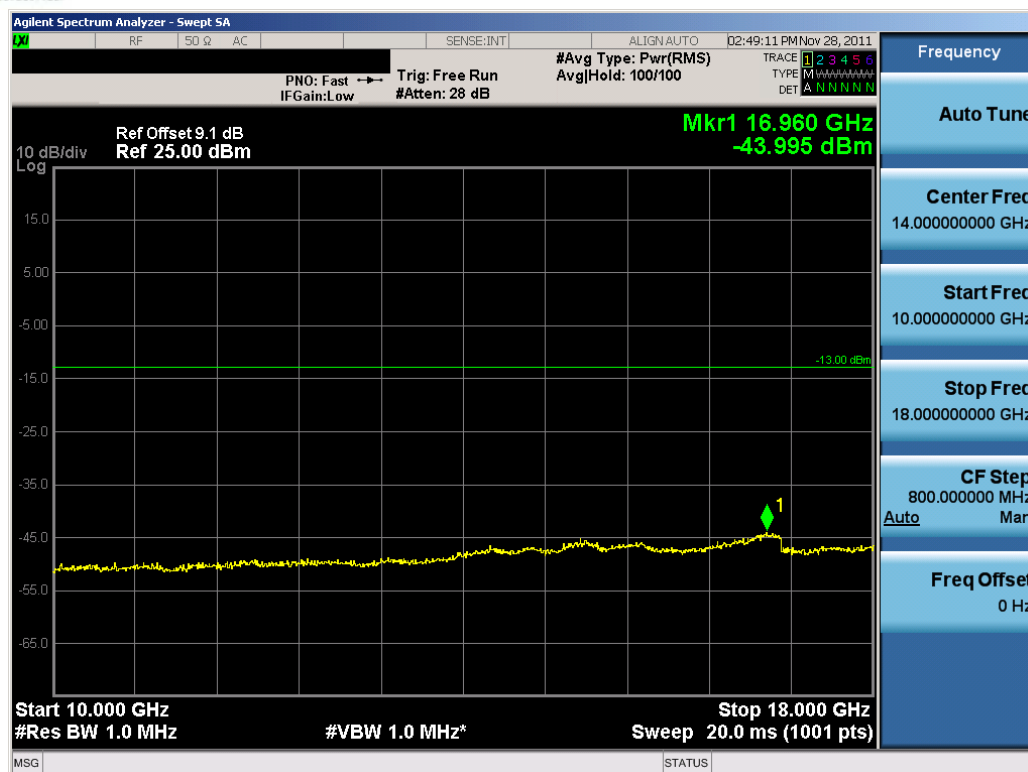


Plot 7-10. Peak-Average Ratio Plot (5MHz BW, 16-QAM, AWS Band – Mid Channel)

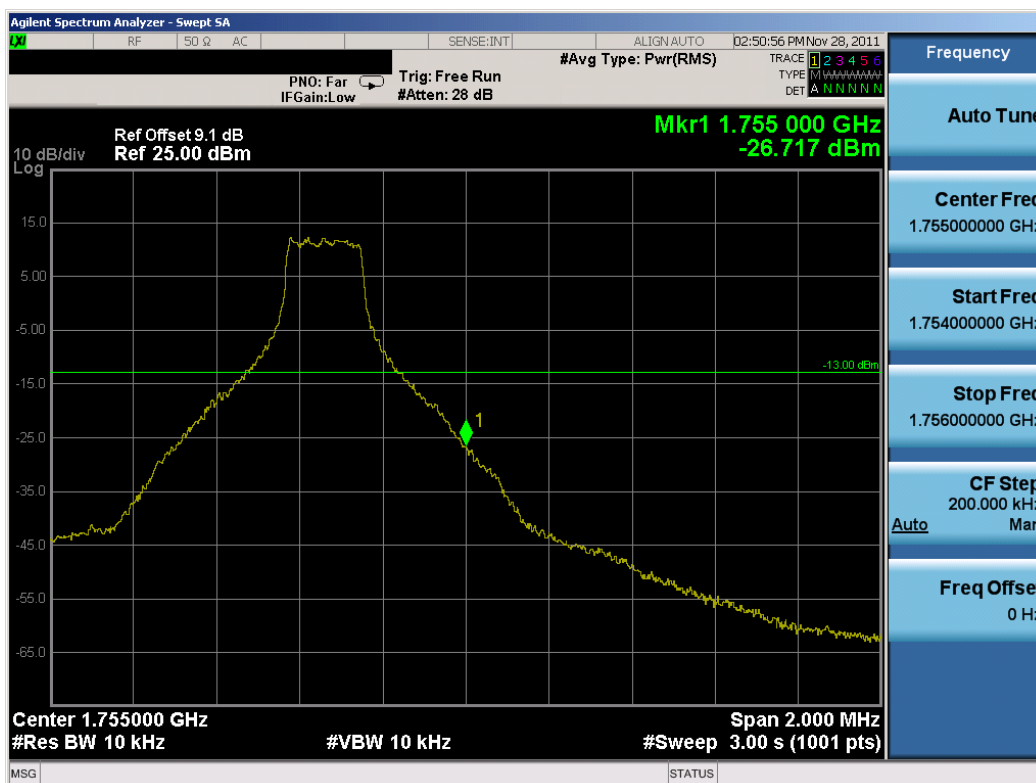


Plot 7-11. Conducted Spurious Plot (5MHz BW, QPSK, AWS Band – High Channel)

FCC ID: A3LSGH1717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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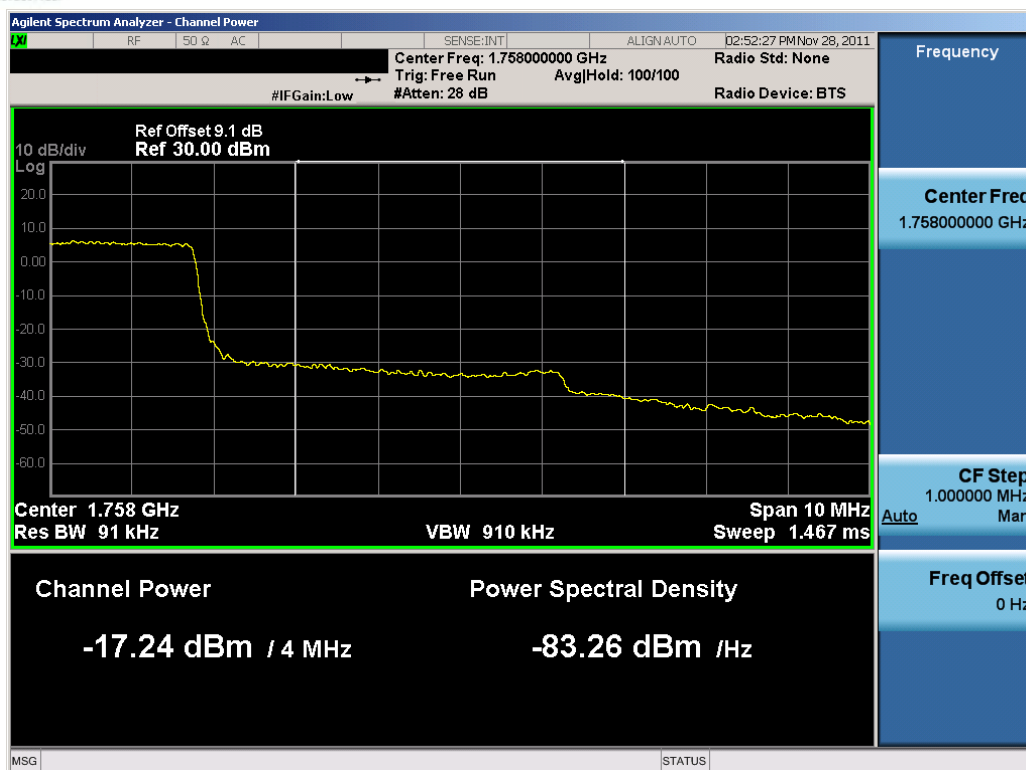


Plot 7-12. Conducted Spurious Plot (5MHz BW, QPSK, AWS Band – High Channel)

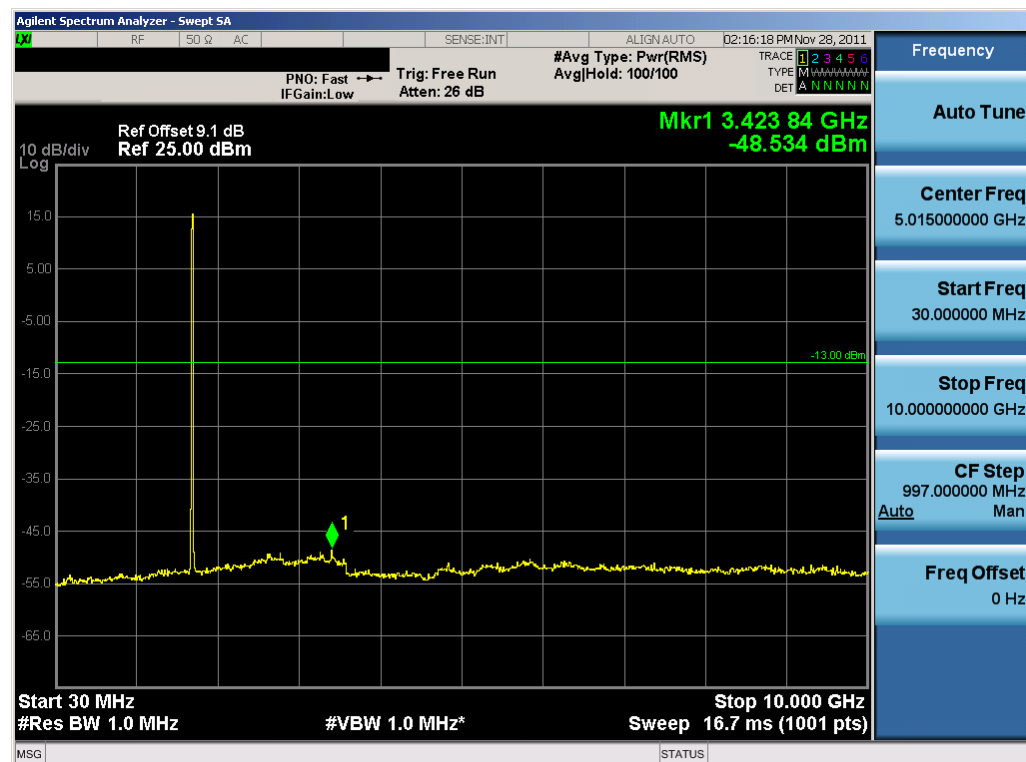


Plot 7-13. Band Edge Plot (5MHz BW, QPSK, AWS Band – High Channel)

FCC ID: A3LSGH1717			FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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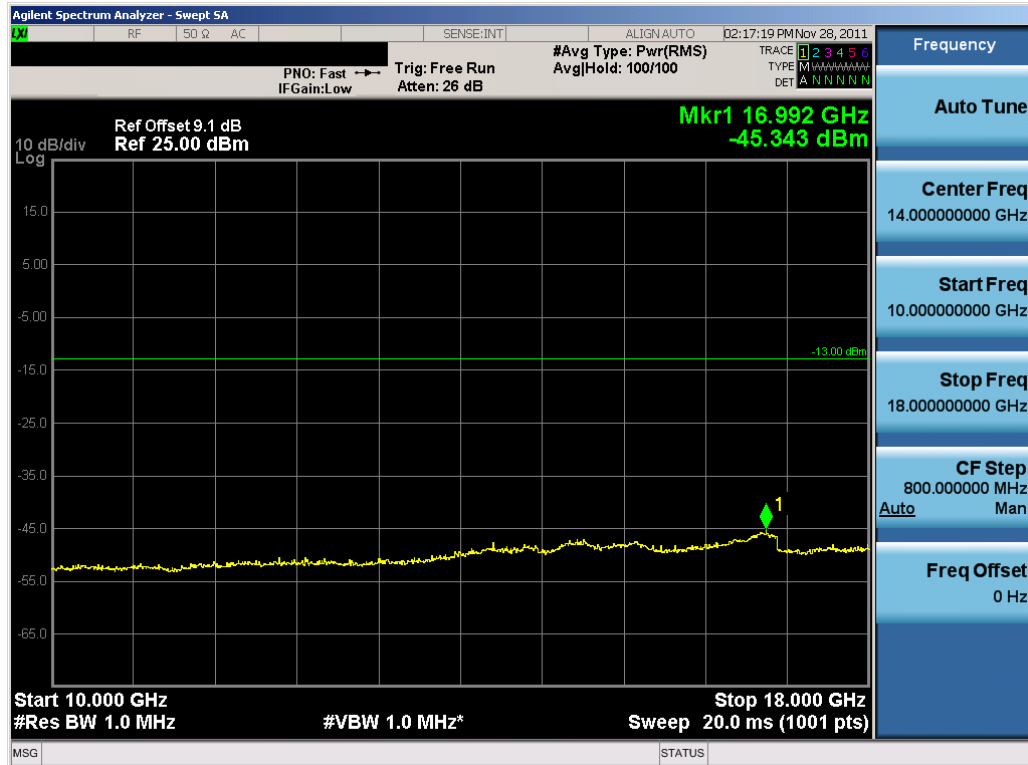


Plot 7-14. Extended Band Edge Plot (5MHz BW, QPSK, AWS Band – High Channel)



Plot 7-15. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – Low Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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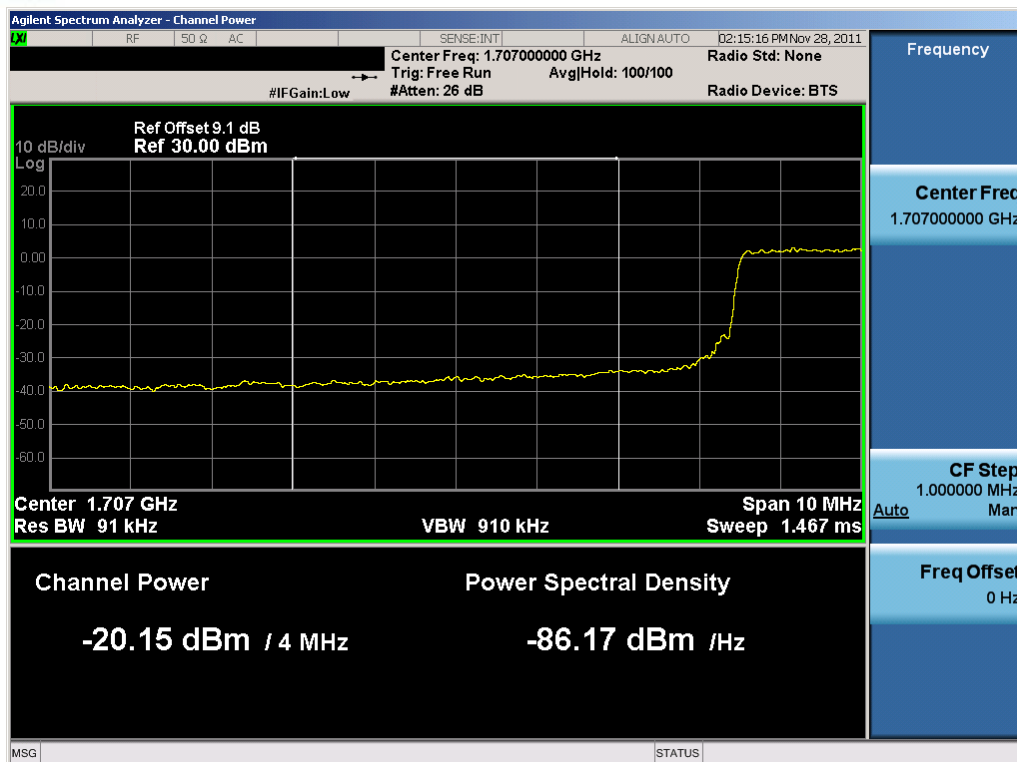


Plot 7-16. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – Low Channel)

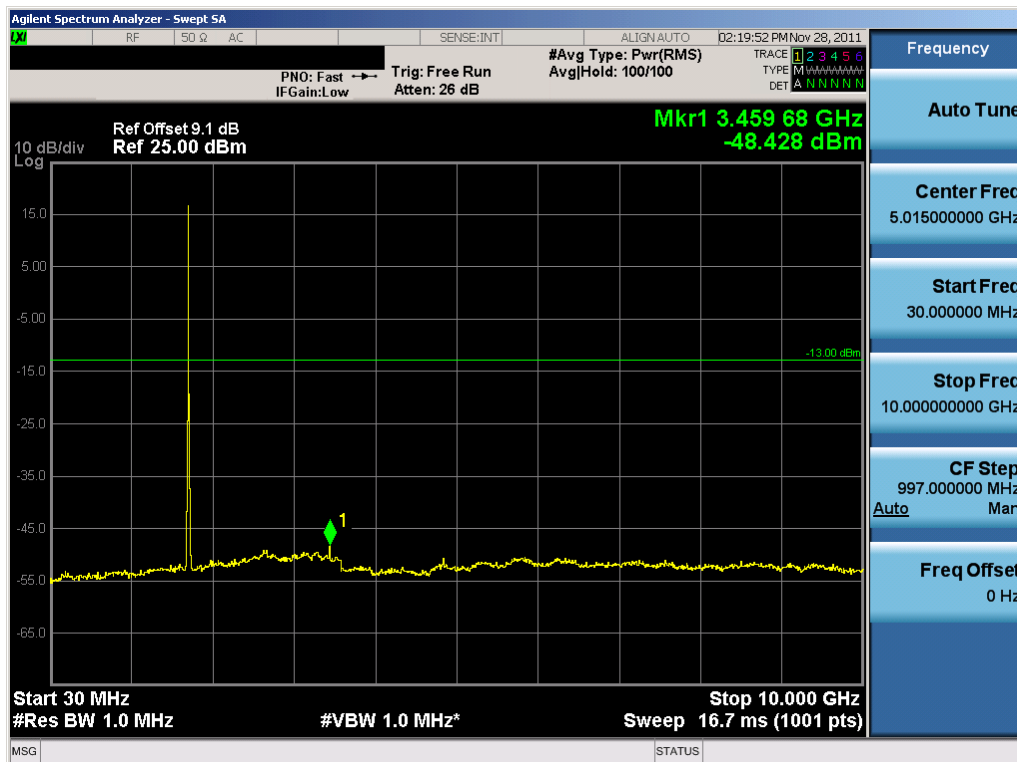


Plot 7-17. Band Edge Plot (10MHz BW, QPSK, AWS Band – Low Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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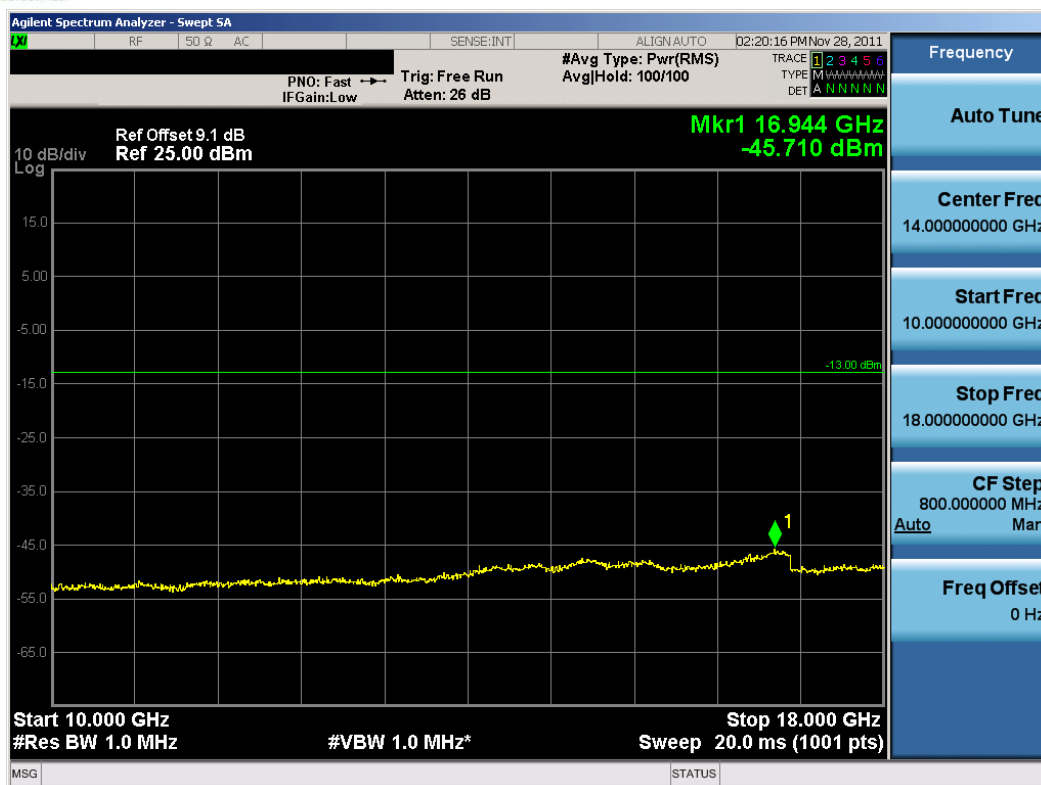


Plot 7-18. Extended Band Edge Plot (10MHz BW, QPSK, AWS Band – Low Channel)

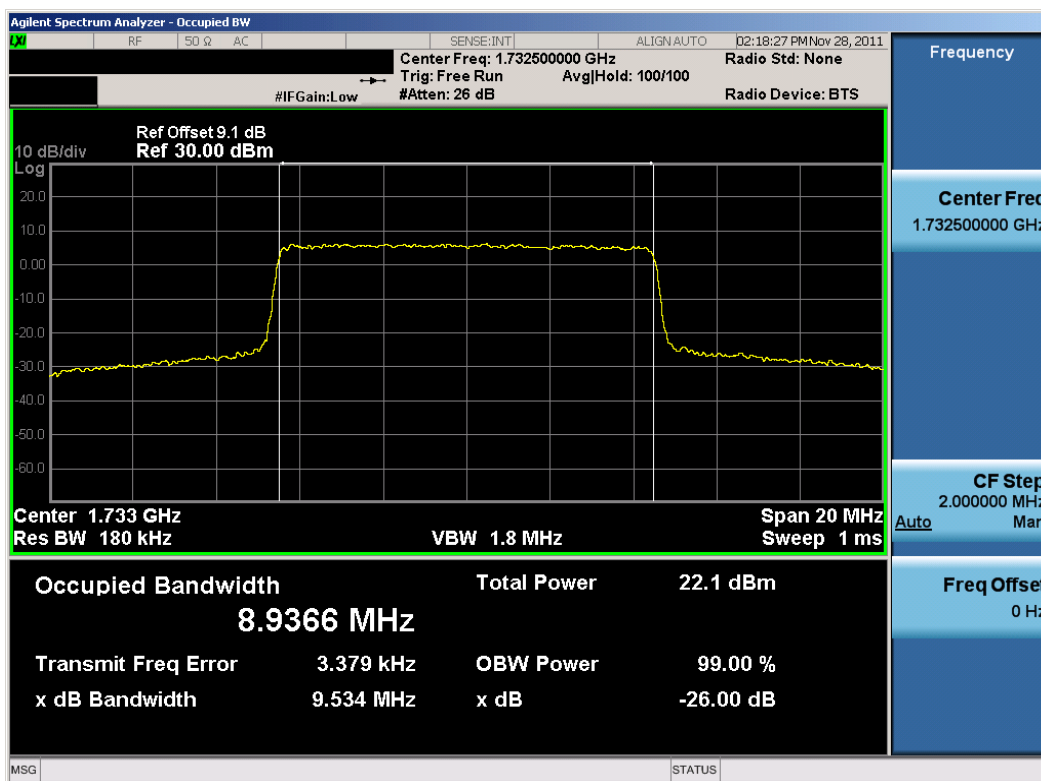


Plot 7-19. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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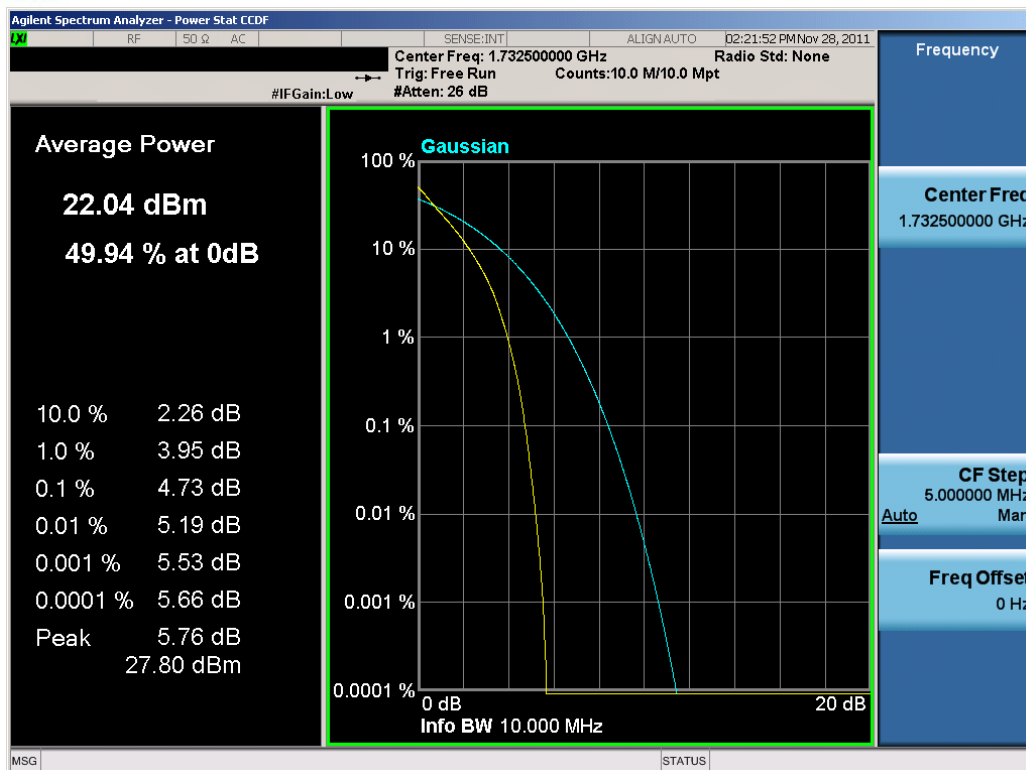


Plot 7-20. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – Mid Channel)

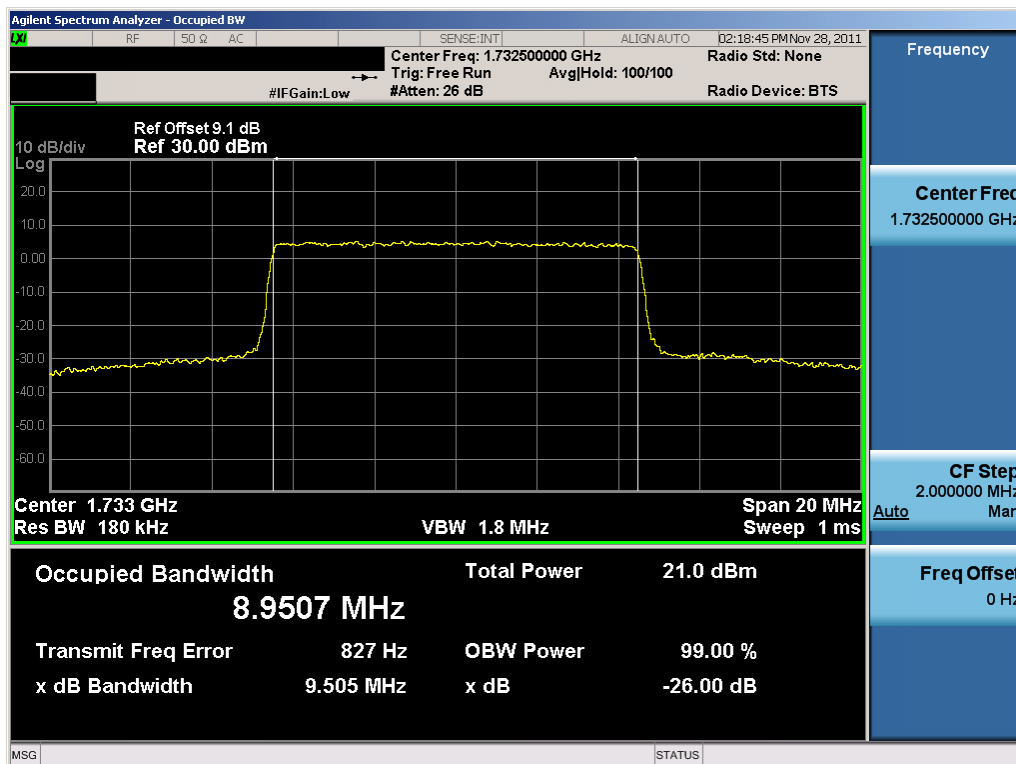


Plot 7-21. Occupied Bandwidth Plot (10MHz BW, QPSK, AWS Band – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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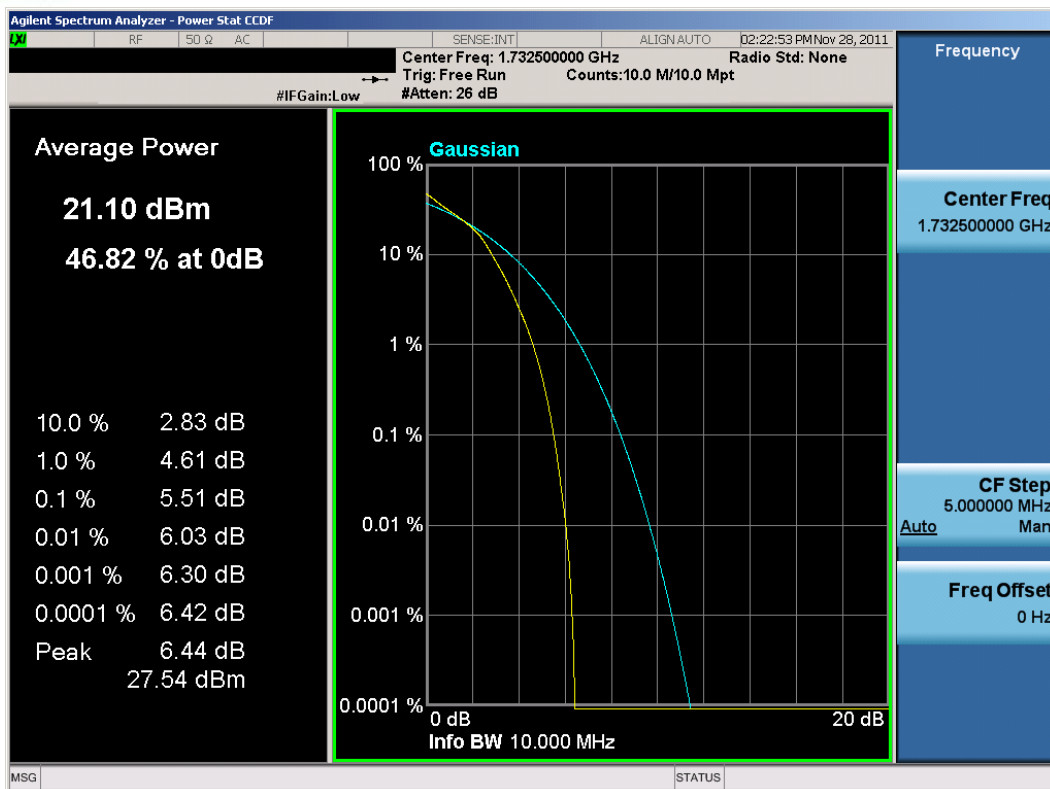


Plot 7-22. Peak-Average Ratio Plot (10MHz BW, QPSK, AWS Band – Mid Channel)

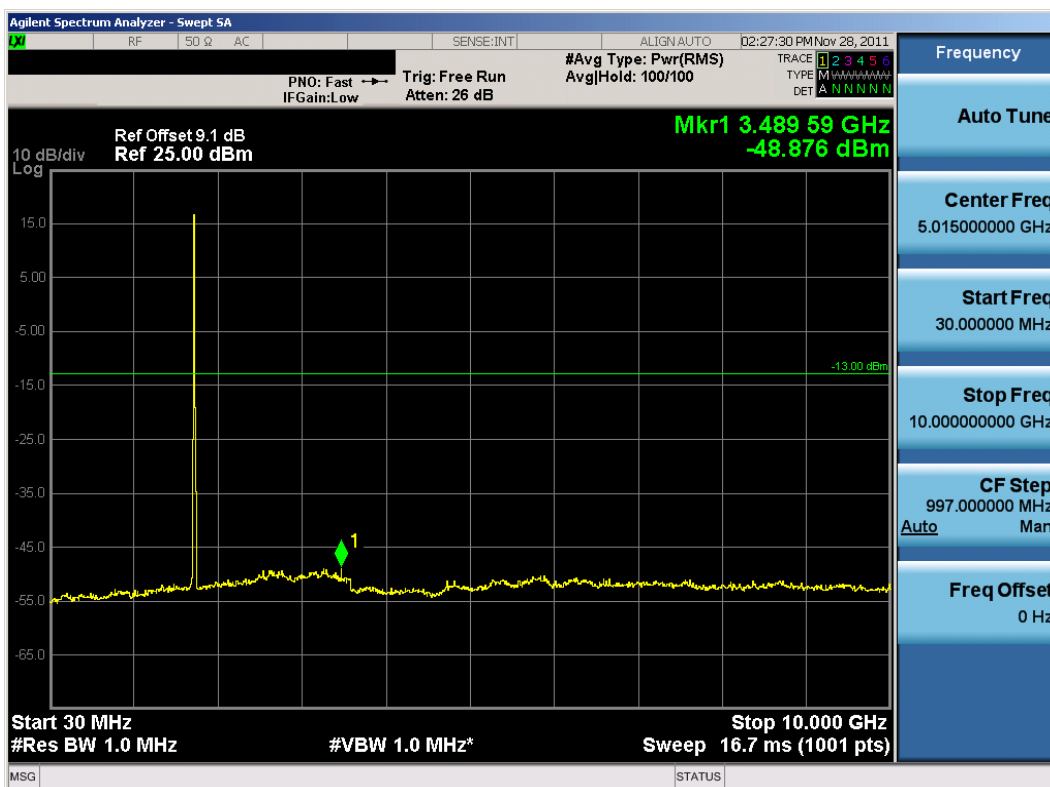


Plot 7-23. Occupied Bandwidth Plot (10MHz BW, 16-QAM, AWS Band – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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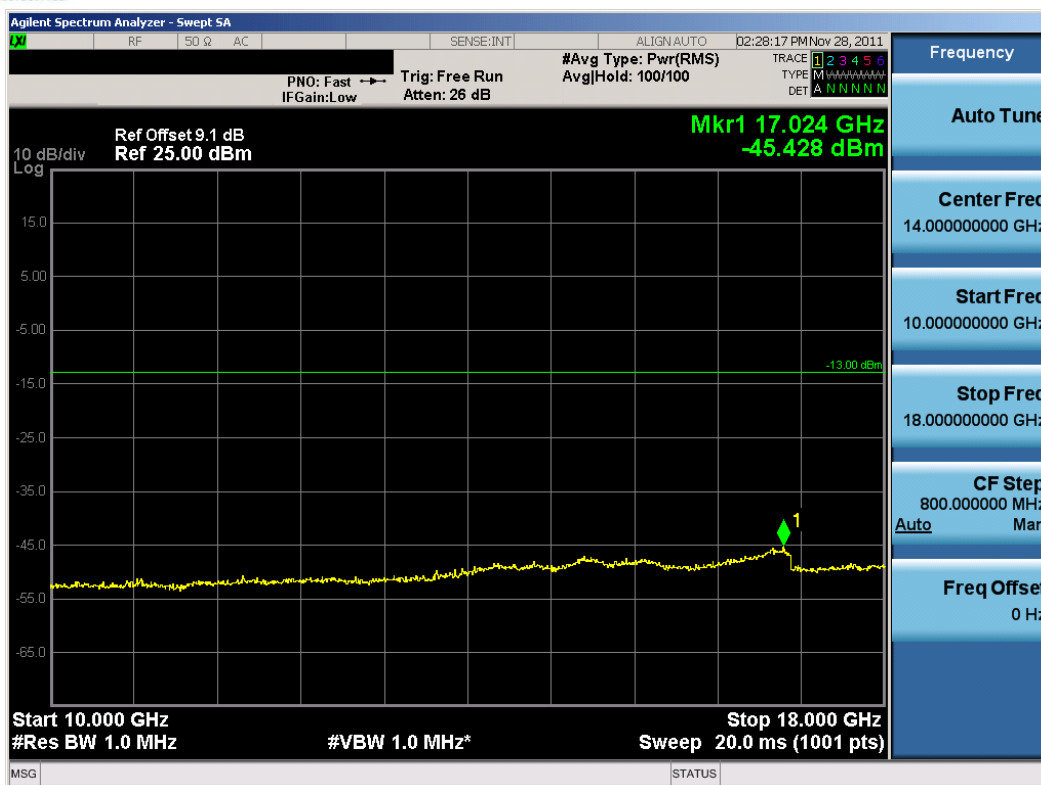


Plot 7-24. Peak-Average Ratio Plot (10MHz BW, 16-QAM, AWS Band – Mid Channel)

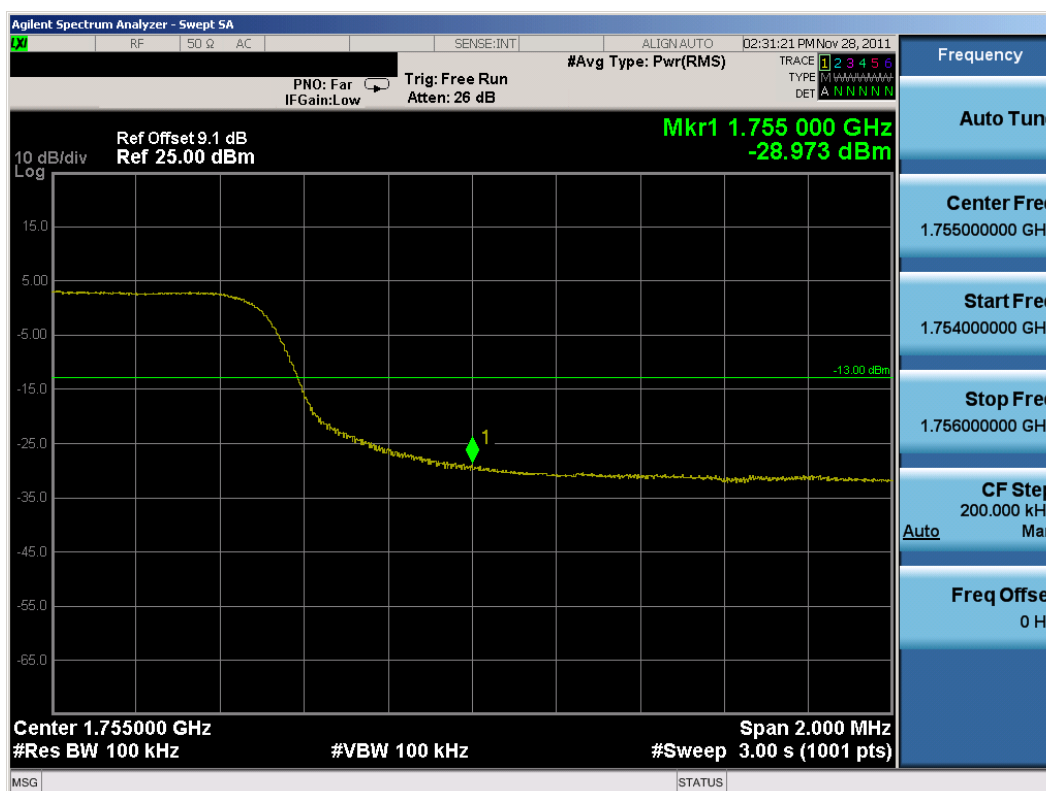


Plot 7-25. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – High Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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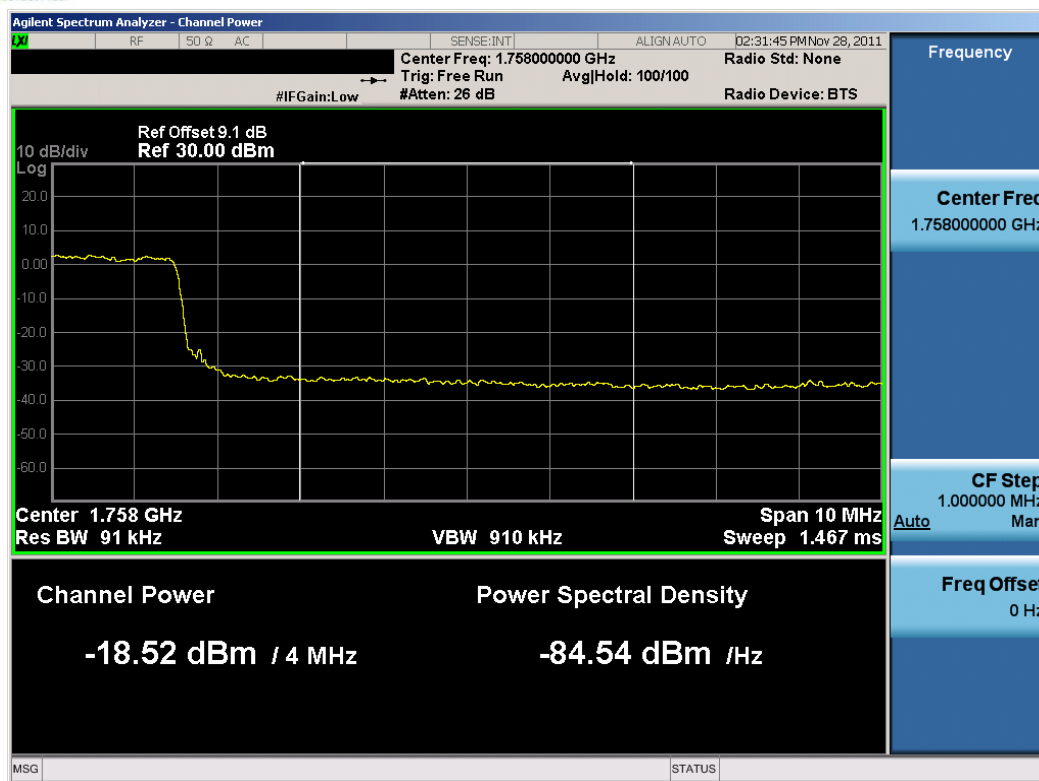


Plot 7-26. Conducted Spurious Plot (10MHz BW, QPSK, AWS Band – High Channel)



Plot 7-27. Band Edge Plot (10MHz BW, QPSK, AWS Band – High Channel)

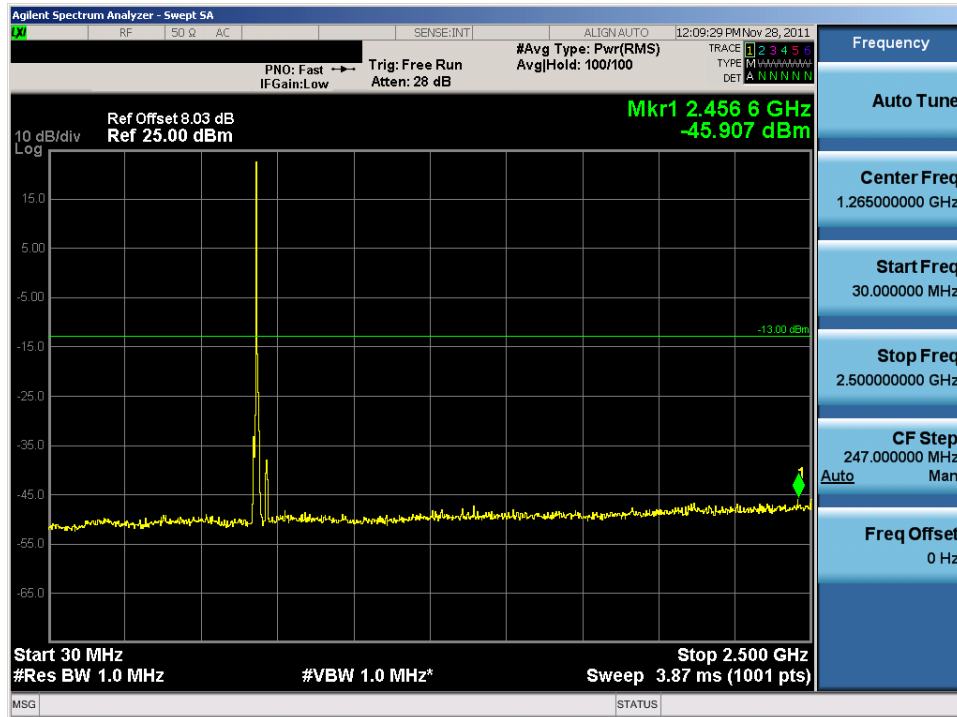
FCC ID: A3LSGH17	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1111161986-R1.A3L	Test Dates: Nov. 28 - Dec. 7, 2011	EUT Type: Portable Handset	Page 40 of 54



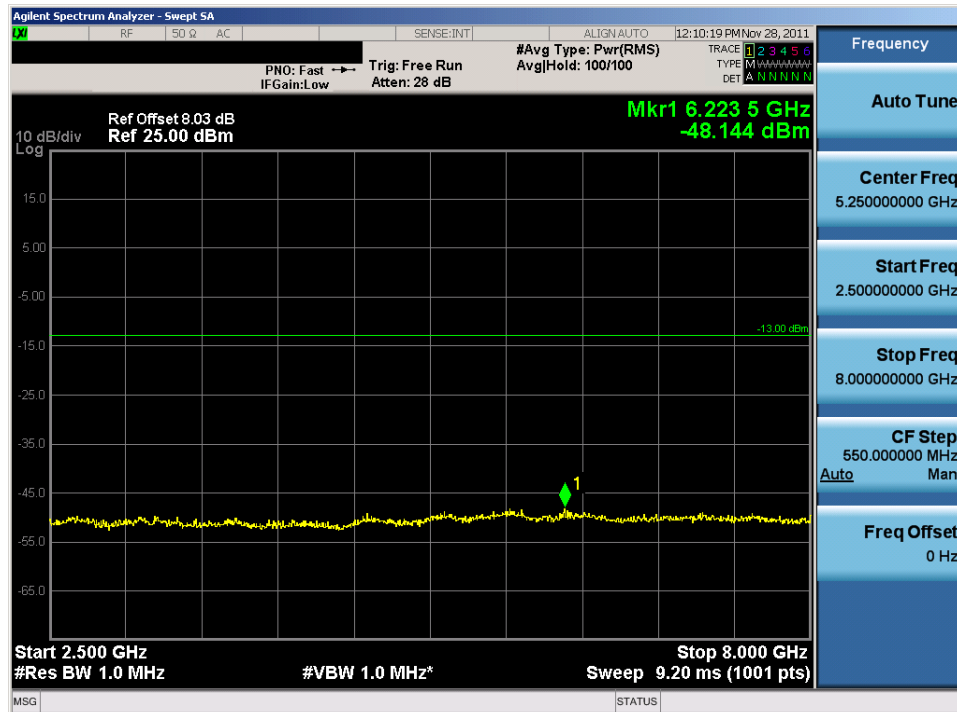
Plot 7-28. Extended Band Edge Plot (10MHz BW, QPSK, AWS Band – High Channel)

FCC ID: A3LSGHI717	 FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		 Reviewed by: Quality Manager
Test Report S/N: 0Y1111161986-R1.A3L	Test Dates: Nov. 28 - Dec. 7, 2011	EUT Type: Portable Handset	Page 41 of 54

8.0 PLOT(S) OF EMISSIONS – BAND 17

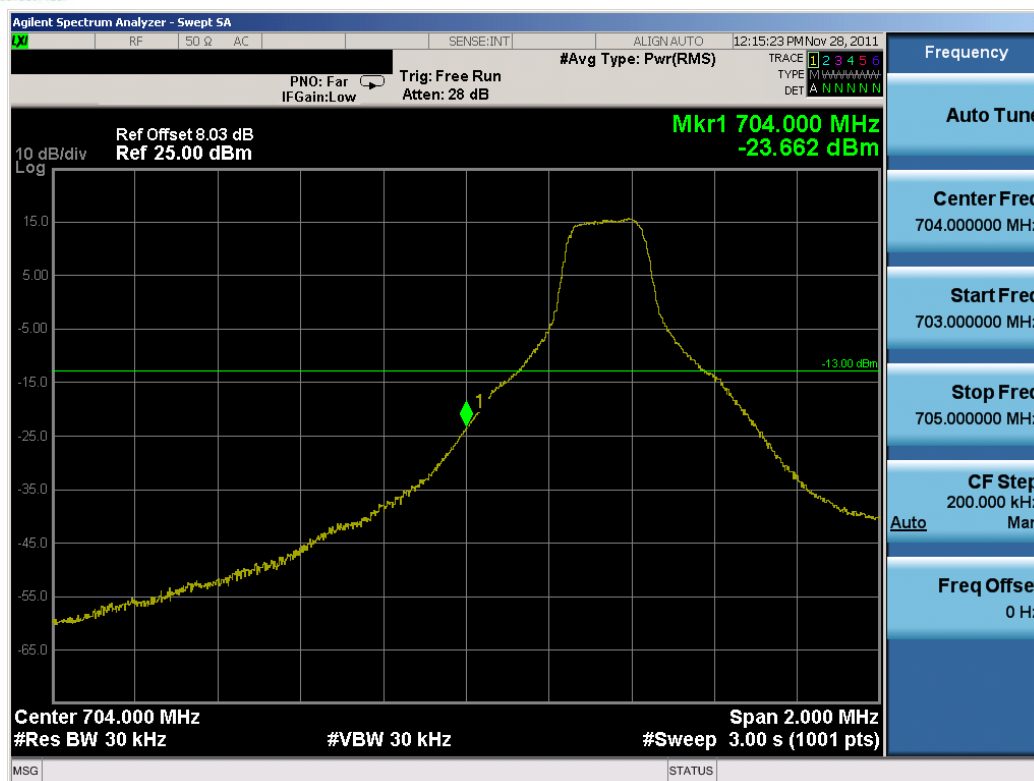


Plot 8-1. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – Low Channel)



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

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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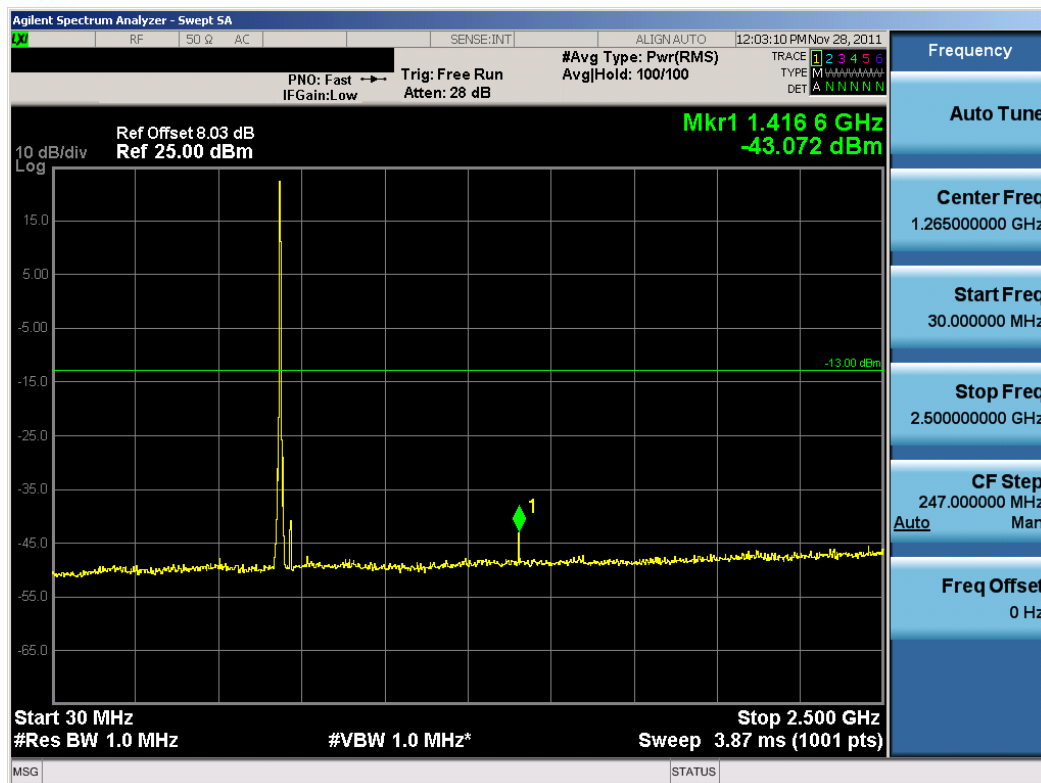


Plot 8-3. Band Edge Plot (5MHz BW, QPSK, Band 17 – Low Channel)

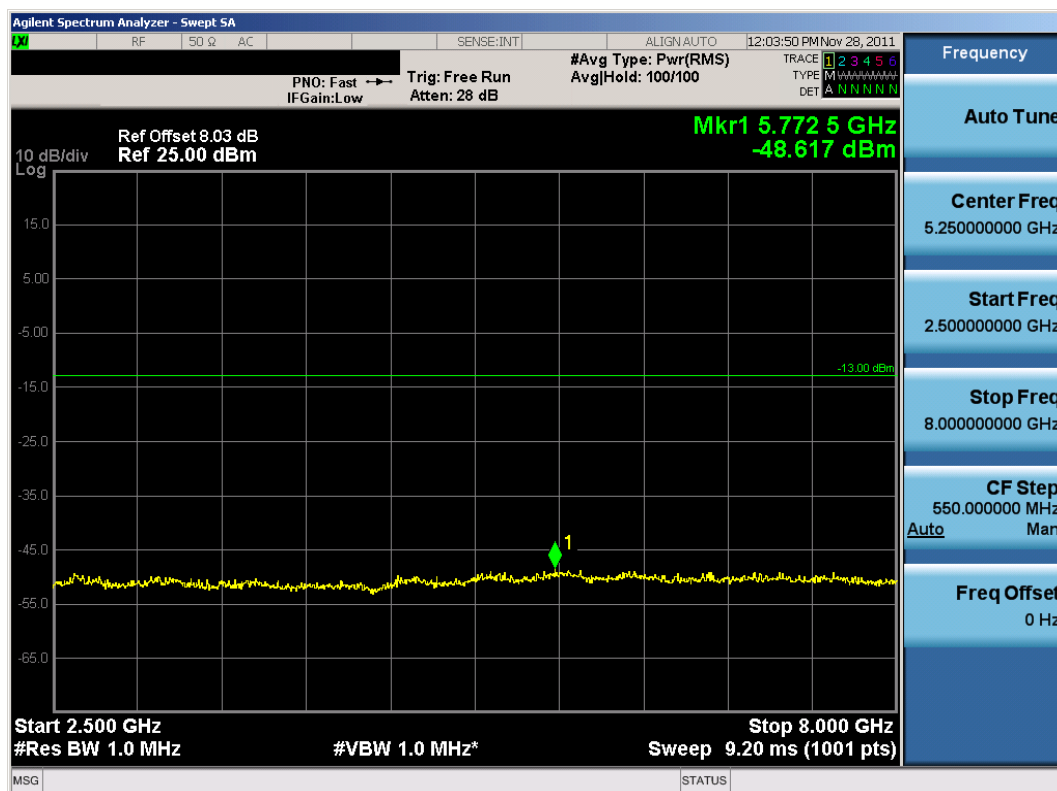


Plot 8-4. Extended Band Edge Plot (5MHz BW, QPSK, Band 17 – Low Channel)

FCC ID: A3LSGHI717	 FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
Test Report S/N: 0Y1111161986-R1.A3L	Test Dates: Nov. 28 - Dec. 7, 2011	EUT Type: Portable Handset	Page 43 of 54

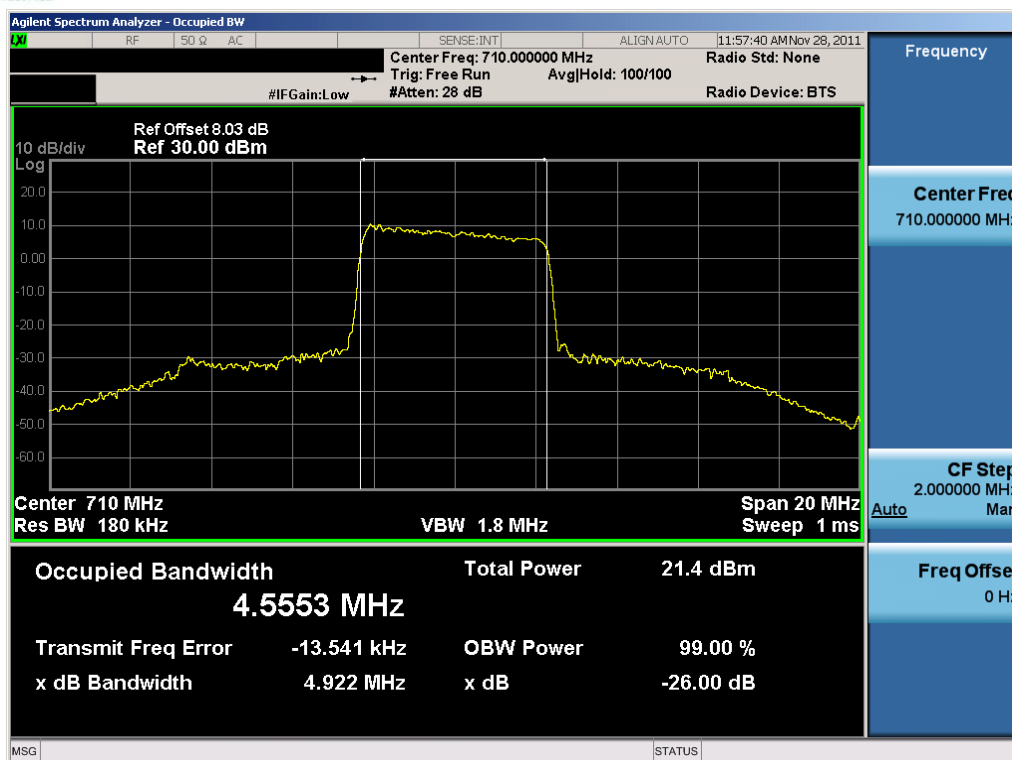


Plot 8-5. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – Mid Channel)

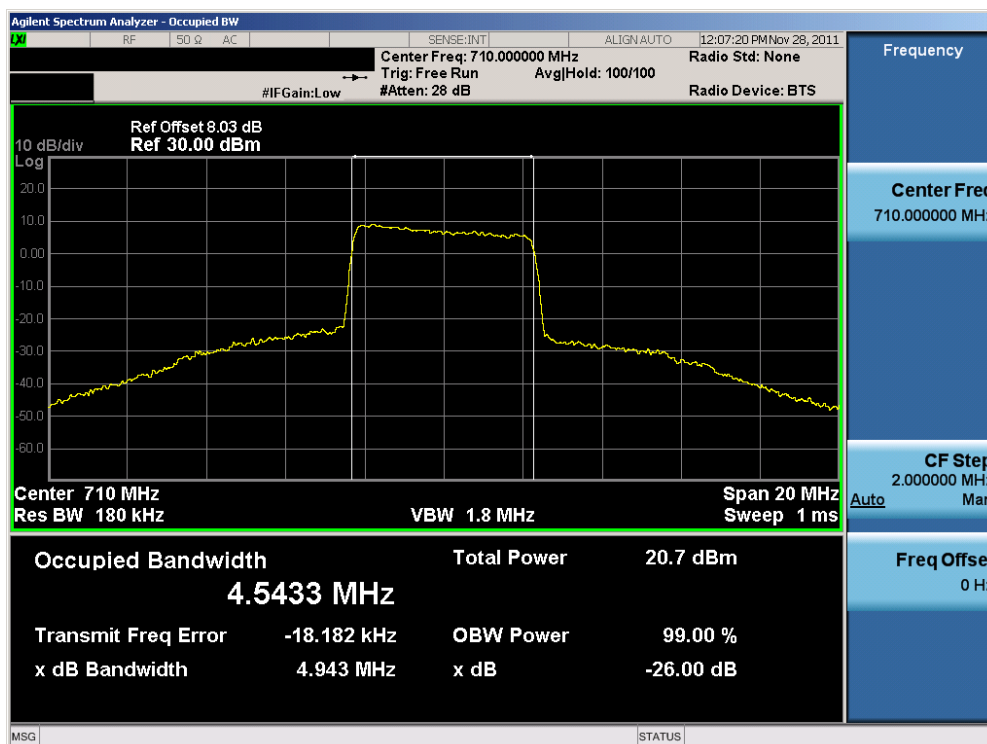


Plot 8-6. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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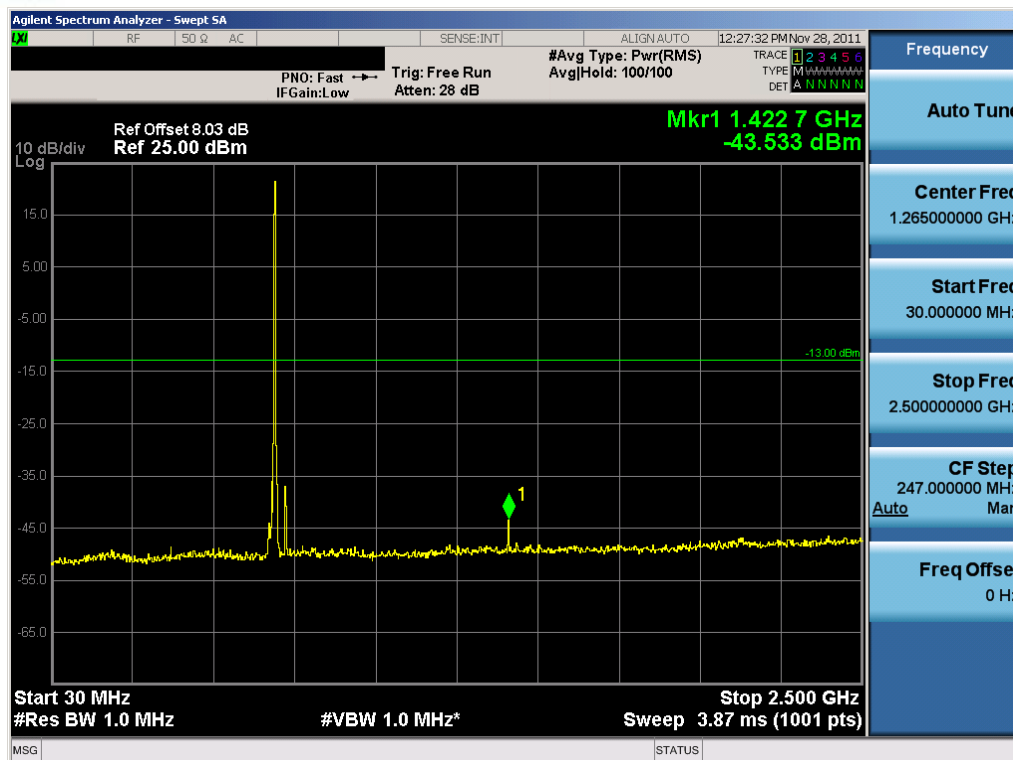


Plot 8-7. Occupied Bandwidth Plot (5MHz BW, QPSK, Band 17 – Mid Channel)

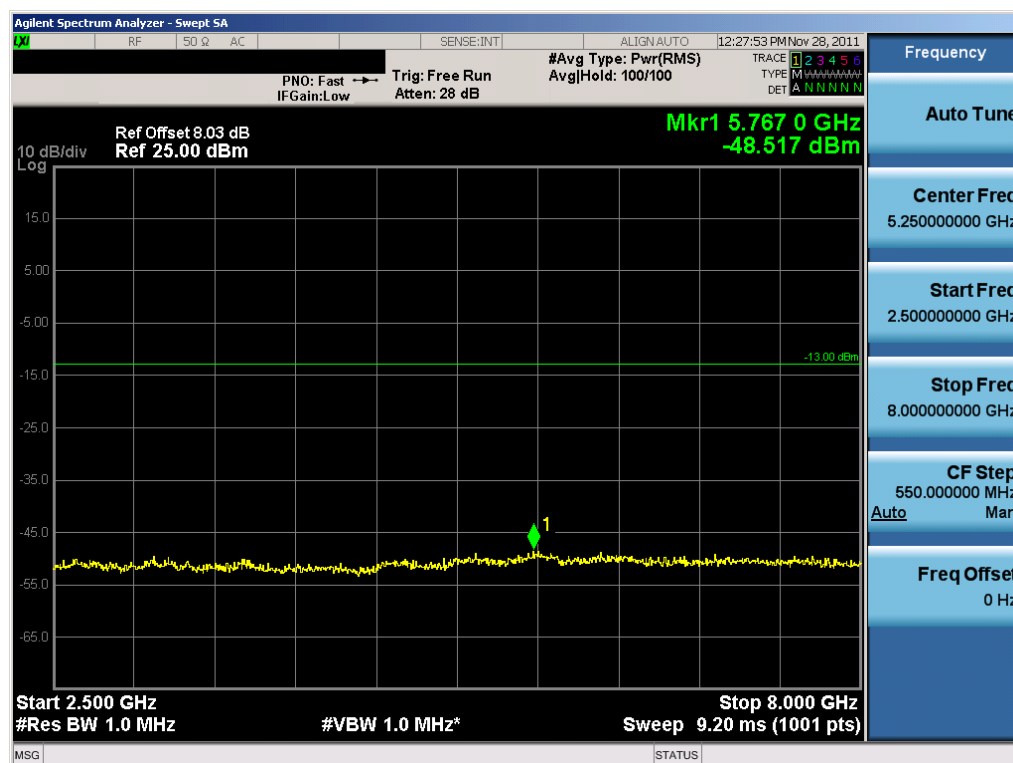


Plot 8-8. Occupied Bandwidth Plot (5MHz BW, 16-QAM, Band 17 – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1111161986-R1.A3L	Test Dates: Nov. 28 - Dec. 7, 2011	EUT Type: Portable Handset	Page 45 of 54

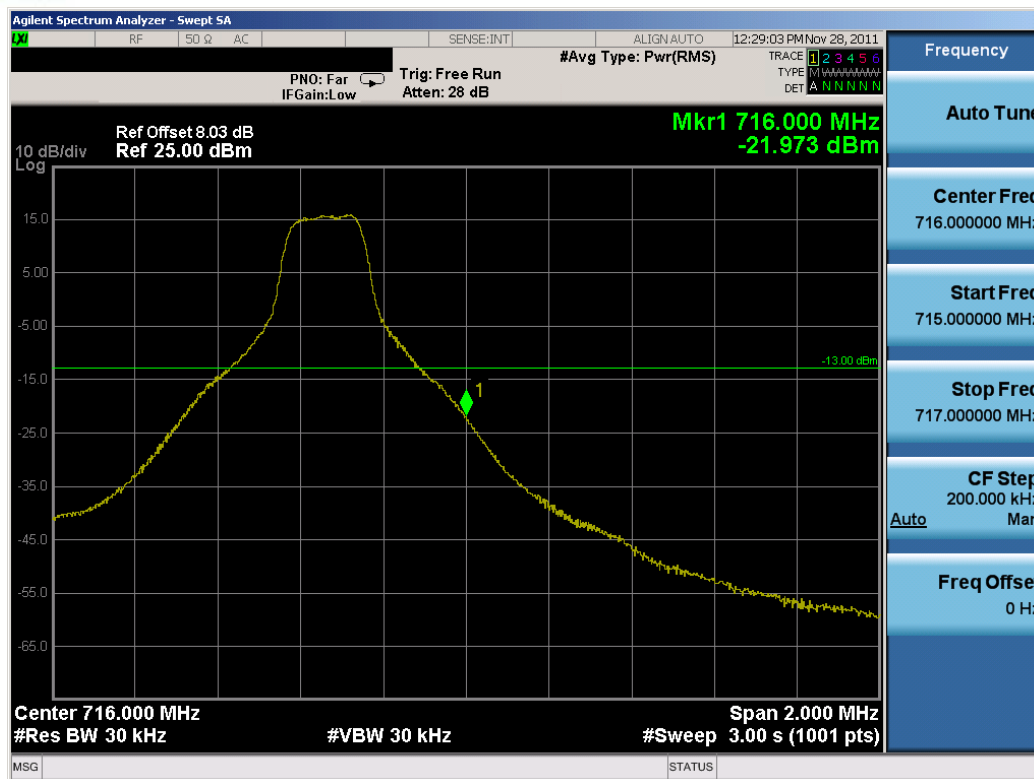


Plot 8-9. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – High Channel)

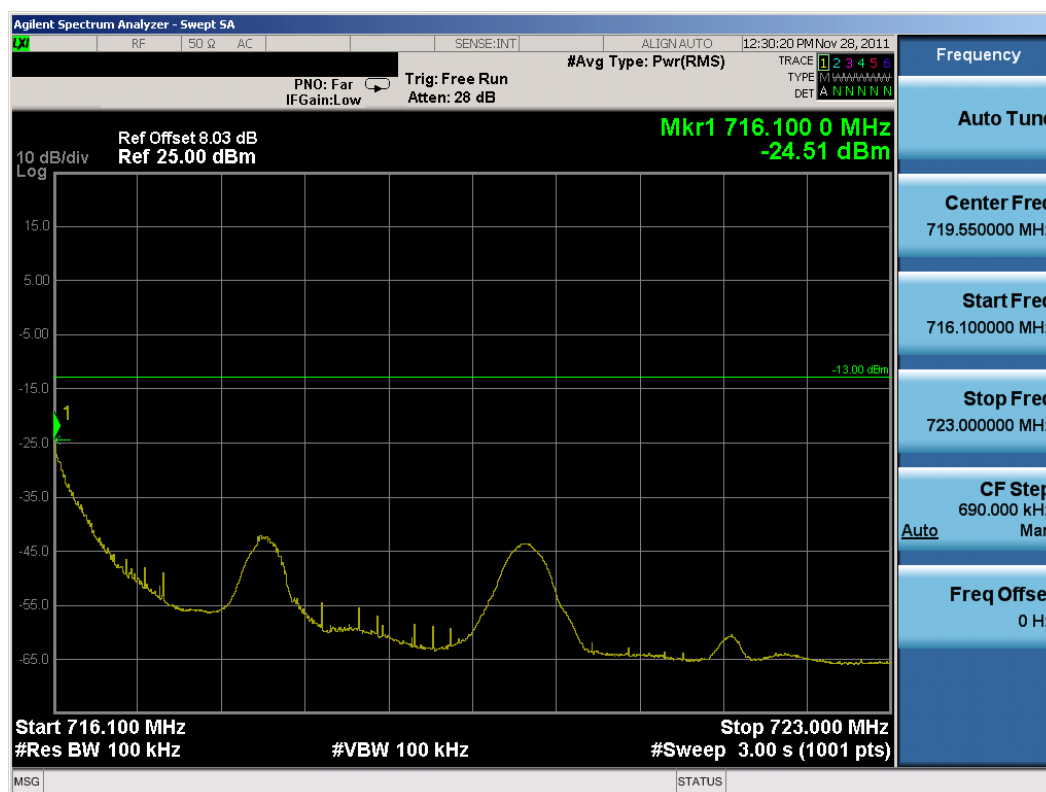


Plot 8-10. Conducted Spurious Plot (5MHz BW, QPSK, Band 17 – High Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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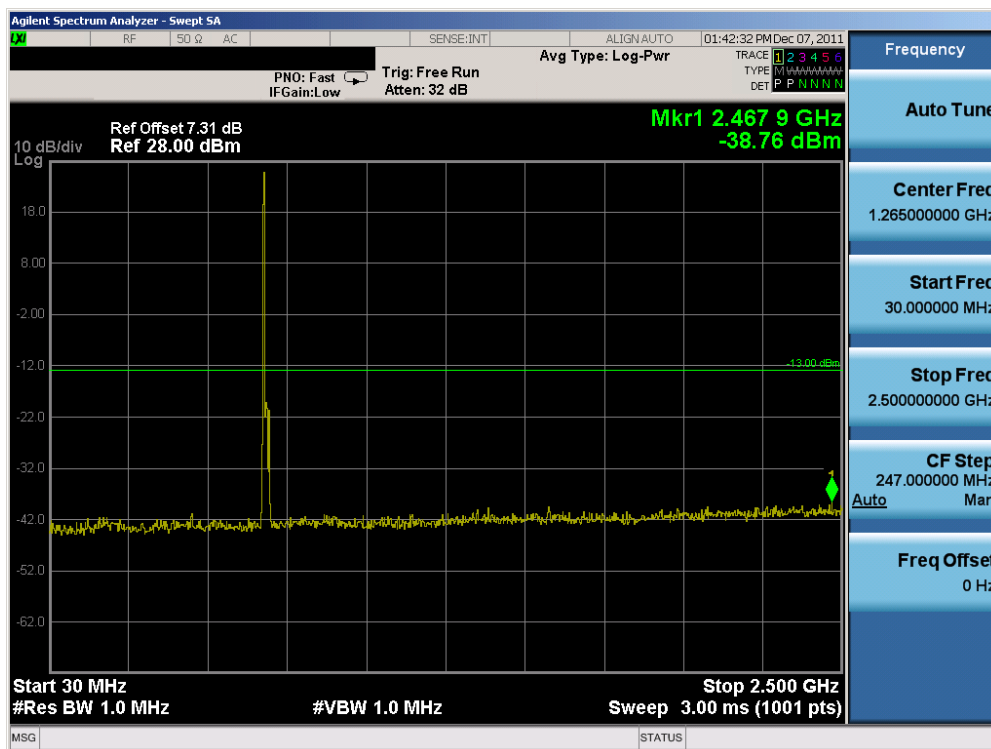


Plot 8-11. Band Edge Plot (5MHz BW, QPSK, Band 17 – High Channel)

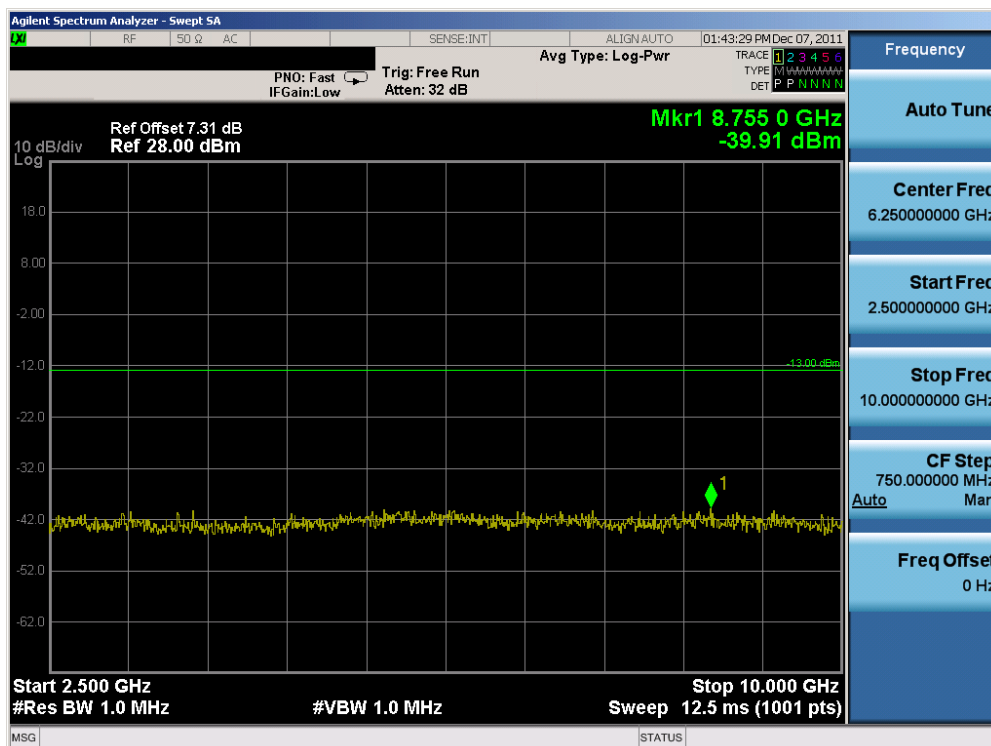


Plot 8-12. Extended Band Edge Plot (5MHz BW, QPSK, Band 17 – High Channel)

FCC ID: A3LSGHI717	 FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION) 		Reviewed by: Quality Manager
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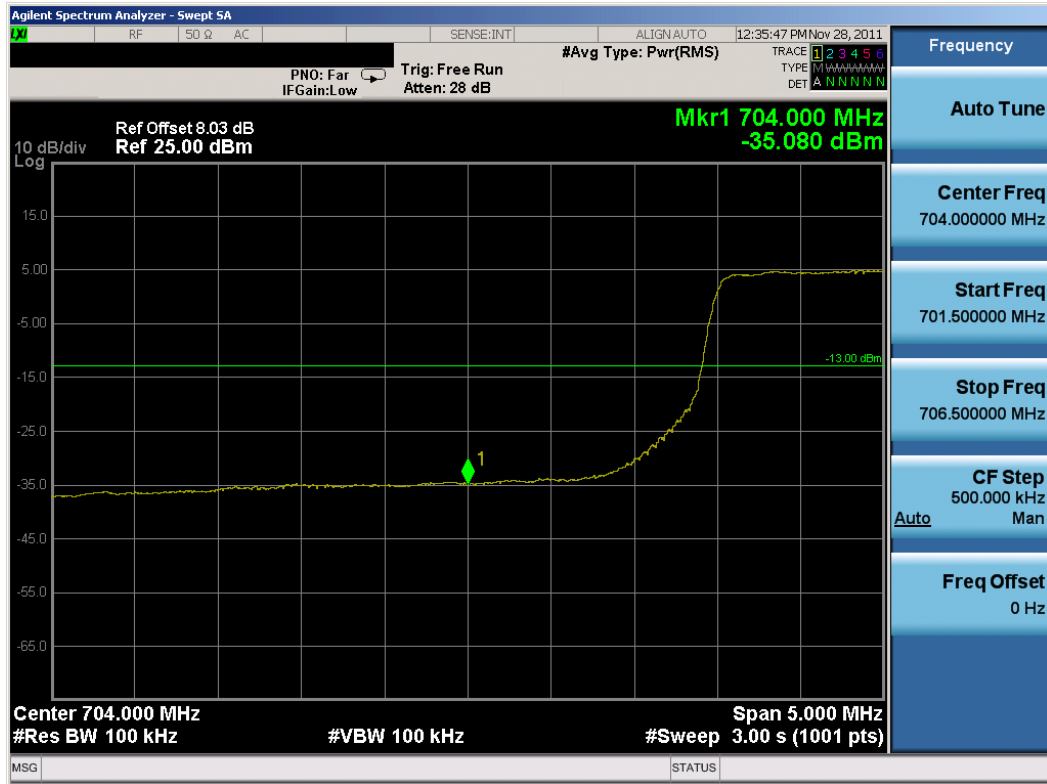


Plot 8-13. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – Low Channel)

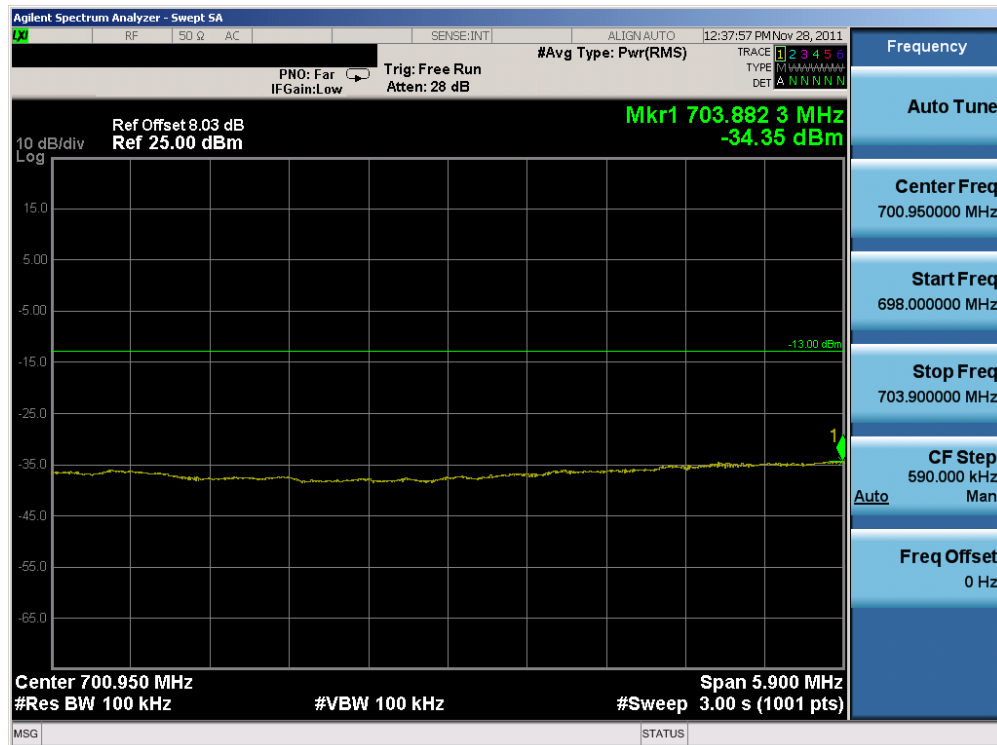


Plot 8-14. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – Low Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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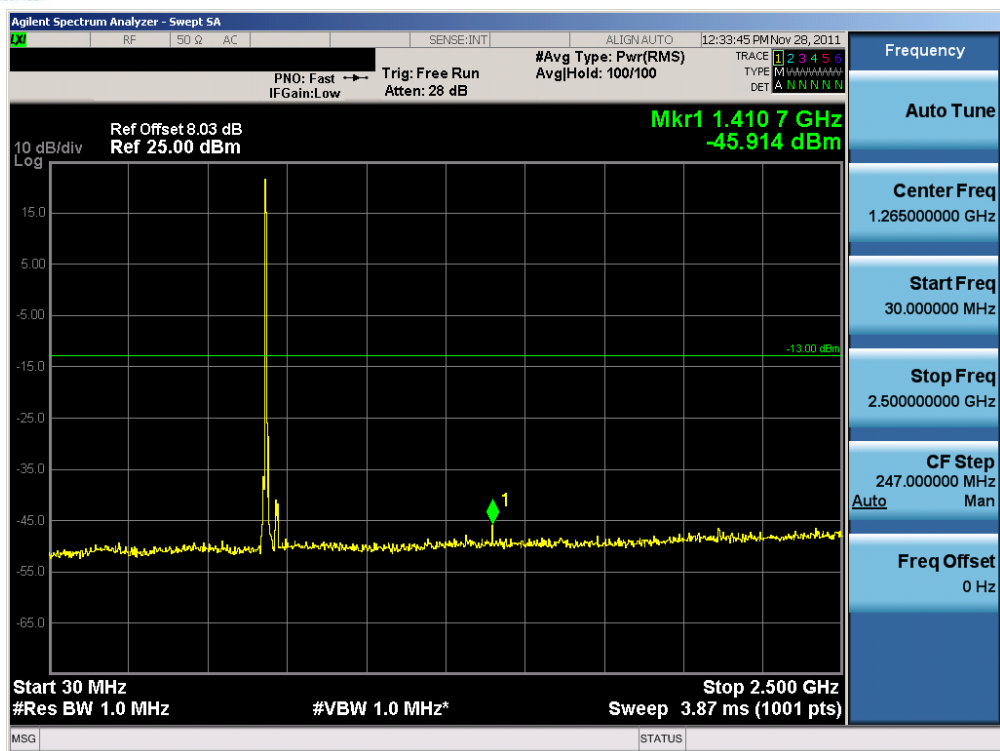


Plot 8-15. Band Edge Plot (10MHz BW, QPSK, Band 17 – Low Channel)

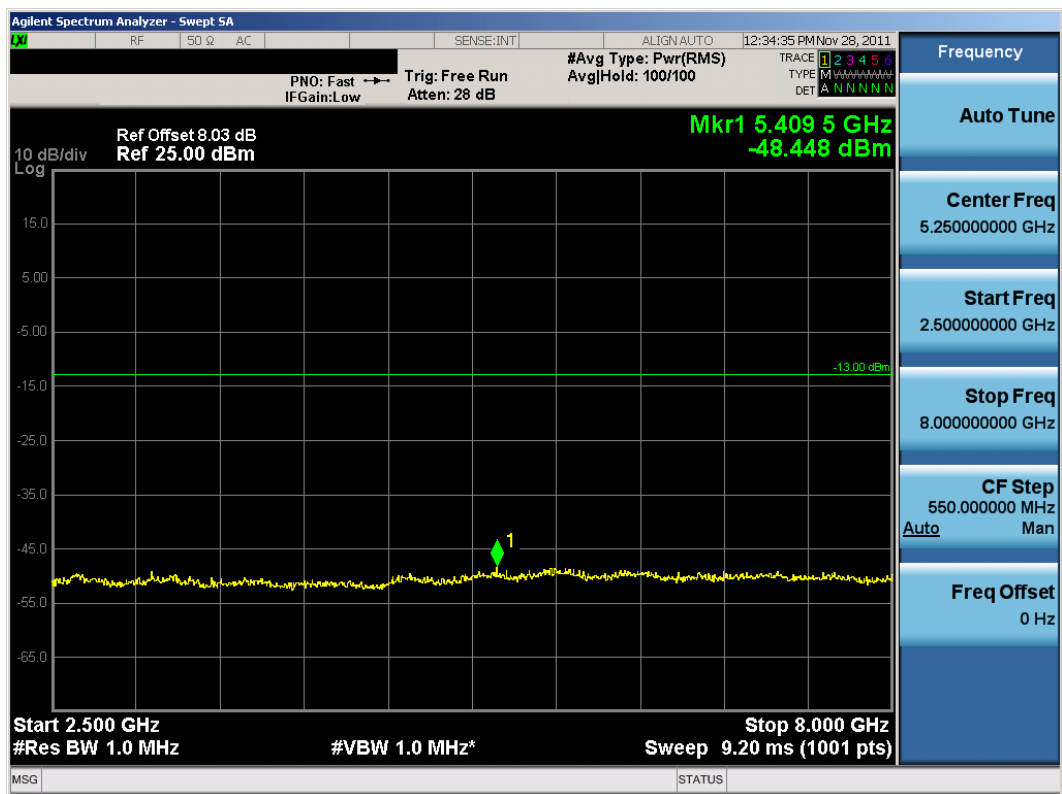


Plot 8-16. Extended Band Edge Plot (10MHz BW, QPSK, Band 17 – Low Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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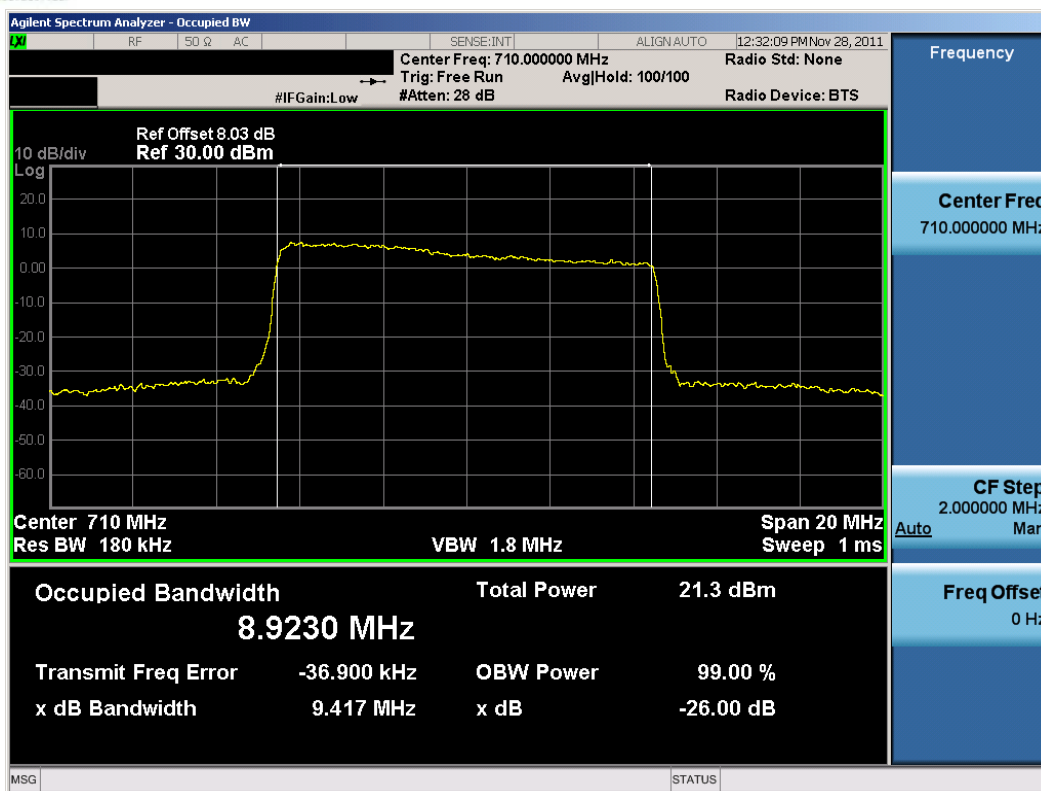


Plot 8-17. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – Mid Channel)

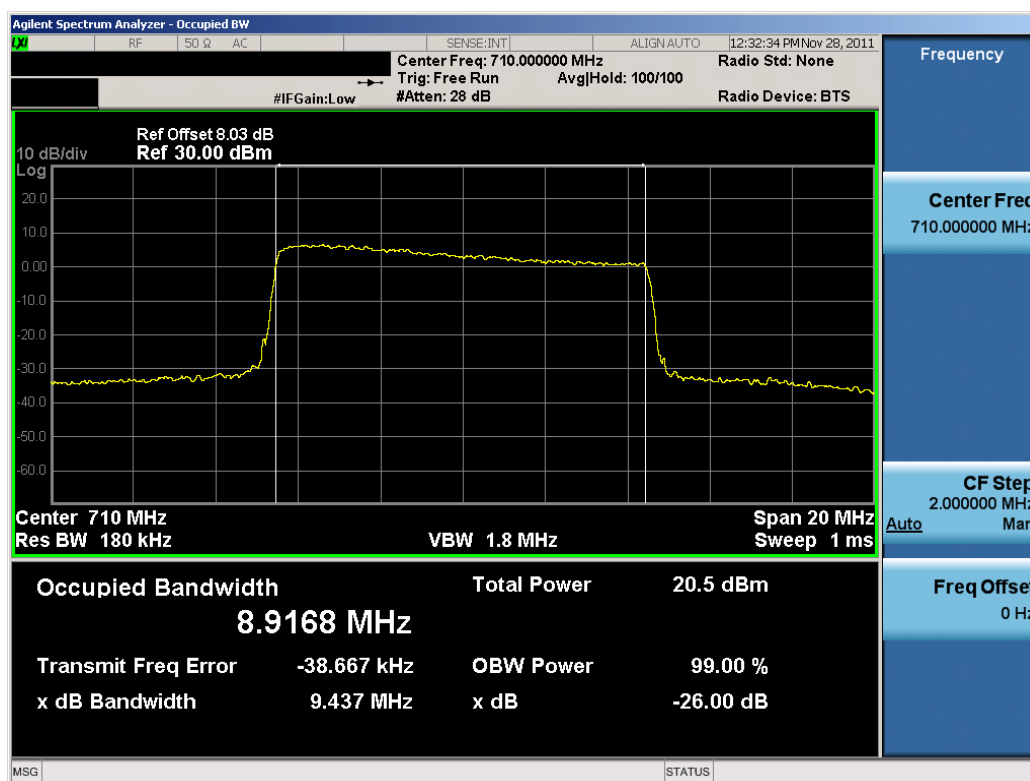


Plot 8-18. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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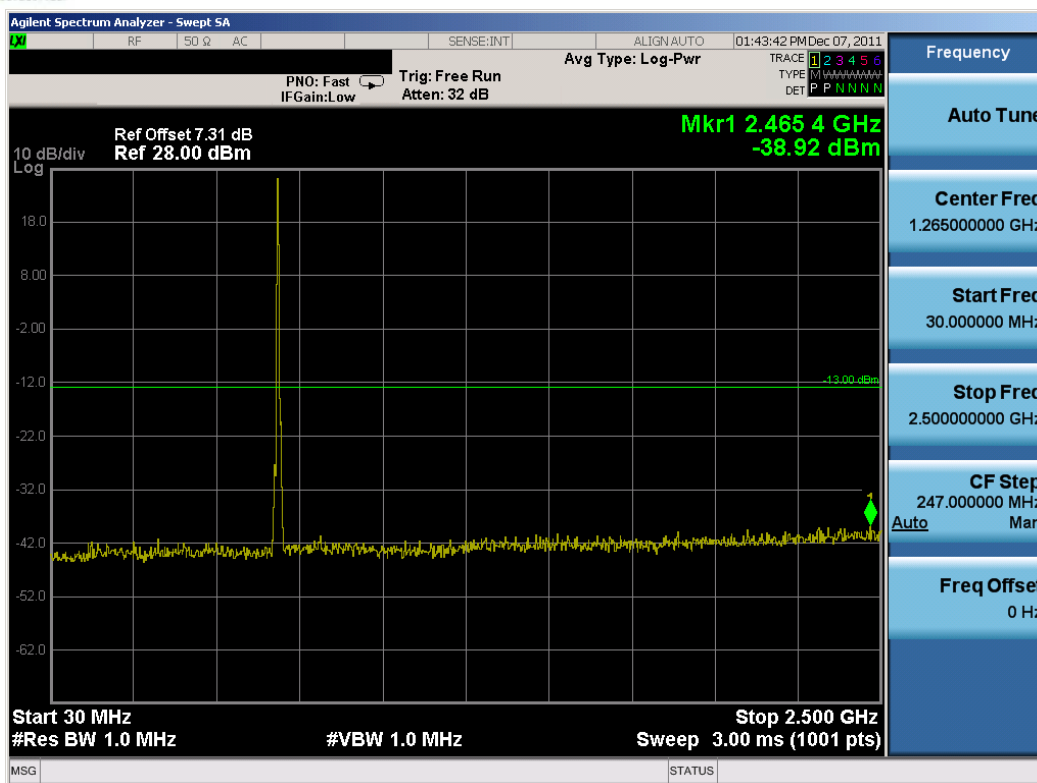


Plot 8-19. Occupied Bandwidth Plot (10MHz BW, QPSK, Band 17 – Mid Channel)

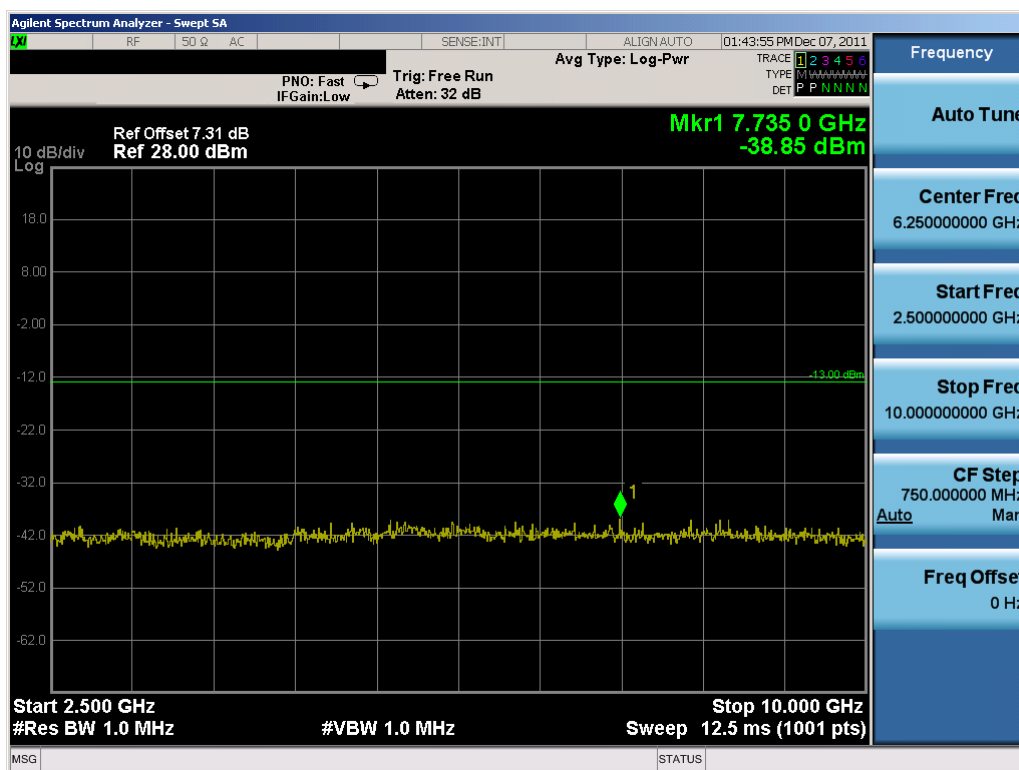


Plot 8-20. Occupied Bandwidth Plot (10MHz BW, 16-QAM, Band 17 – Mid Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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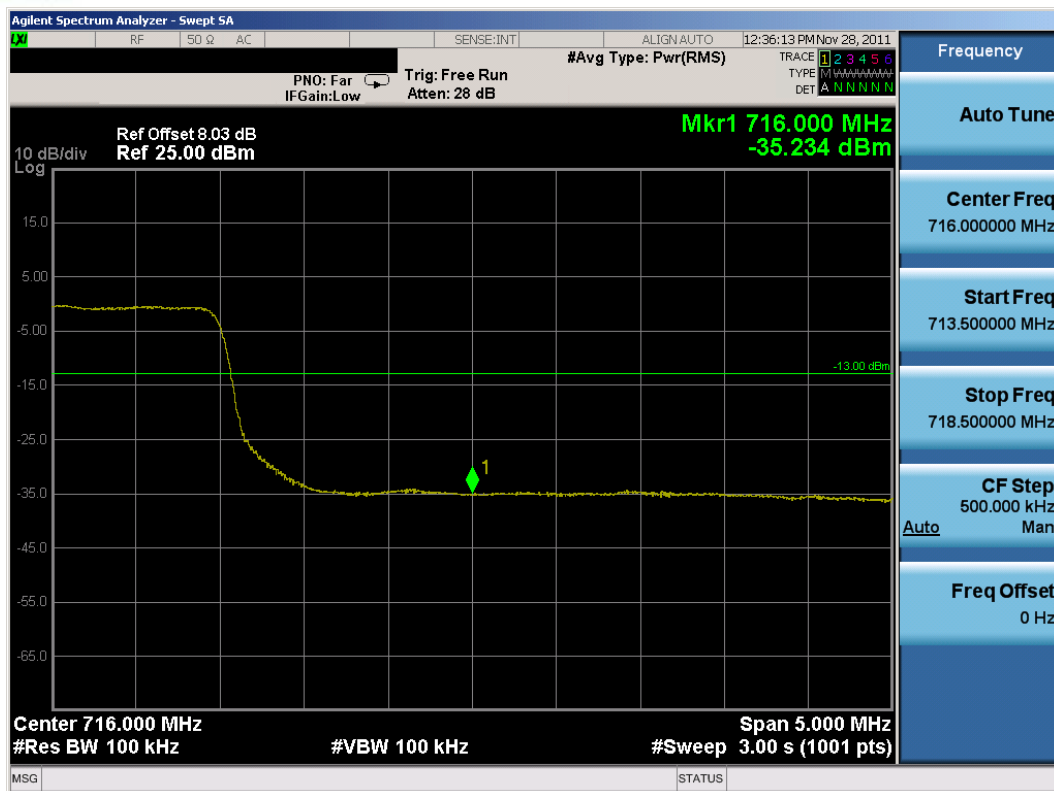


Plot 8-21. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – High Channel)

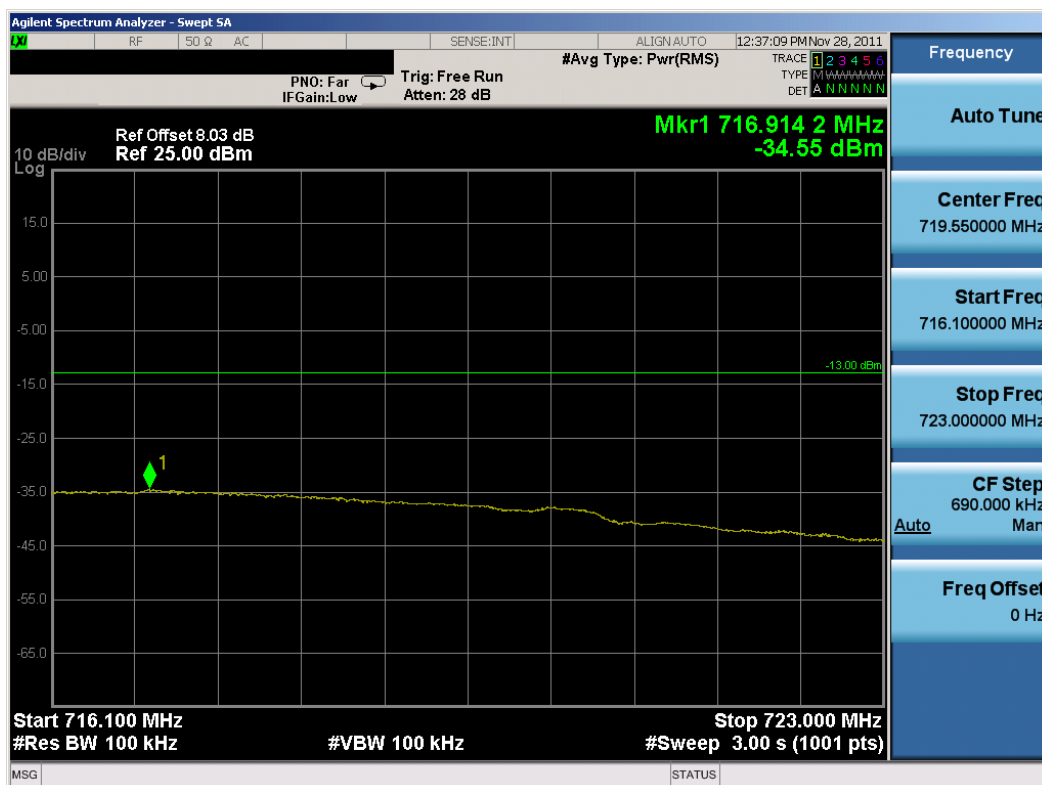


Plot 8-22. Conducted Spurious Plot (10MHz BW, QPSK, Band 17 – High Channel)

FCC ID: A3LSGHI717	FCC Pt. 27 LTE MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 8-23. Band Edge Plot (10MHz BW, QPSK, Band 17 - High Channel)



Plot 8-24. Extended Band Edge Plot (10MHz BW, QPSK, Band 17 - High Channel)

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9.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSGHI717** complies with all the requirements of Parts 2 and 27 of the FCC Rules for LTE operation only.

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