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MEASUREMENT REPORT FCC Part 24 LTE

Applicant Name:
Samsung Electronics, Co. Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do 443-742, Korea

Date of Testing:
May 29, 2014
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1405211055.A3L

FCC ID :	A3LSMN900P
APPLICANT:	SAMSUNG ELECTRONICS, CO. LTD.

Application Type: Class II Permissive Change
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part(s): §2; §24
Test Procedure(s): ANSI/TIA-603-C-2004, KDB 971168 v02r01
EUT Type: Portable Handset
Model(s): SM-N900P
Test Device Serial No.: *identical prototype* [S/N: 3]
Class II Permissive Change: Adding additional bandwidths for LTE Band 25 operation.
Original Grant Date: September 11, 2013

Mode	Tx Frequency (MHz)	Emission Designator	Modulation	ERP/EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE Band 25	1850.7 - 1914.3	1M10G7D	QPSK	0.103	20.14
LTE Band 25	1850.7 - 1914.3	1M11W7D	16QAM	0.081	19.09
LTE Band 25	1851.5 - 1913.5	2M73G7D	QPSK	0.106	20.26
LTE Band 25	1851.5 - 1913.5	2M72W7D	16QAM	0.087	19.40
LTE Band 25	1857.5 - 1907.5	13M5G7D	QPSK	0.151	21.78
LTE Band 25	1857.5 - 1907.5	13M5W7D	16QAM	0.126	20.99
LTE Band 25	1860 - 1905	18M0G7D	QPSK	0.154	21.87
LTE Band 25	1860 - 1905	18M0G7D	16QAM	0.126	21.01

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



Randy Ortalez
President



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MEASUREMENT REPORT

FCC Part 24

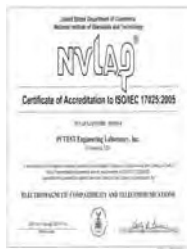
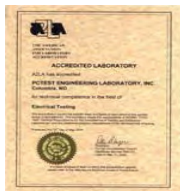


§2.1033 General Information



APPLICANT: Samsung Electronics, Co. Ltd.
APPLICANT ADDRESS: 129, Samsung-ro, Maetan dong,
 Yeongtong-gu, Suwon-si, Gyeonggi-do 443-742, Korea
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S): §2; §24
BASE MODEL: SM-N900P
FCC ID: A3LSMN900P
FCC CLASSIFICATION: PCS Licensed Transmitter Held to Ear (PCE)
FREQUENCY TOLERANCE: ±0.00025 % (2.5 ppm)
Test Device Serial No.: 3 Production Pre-Production Engineering
DATE(S) OF TEST: May 29, 2014
TEST REPORT S/N: 0Y1405211055.A3L

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. 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 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 Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2009 on January 10, 2012.

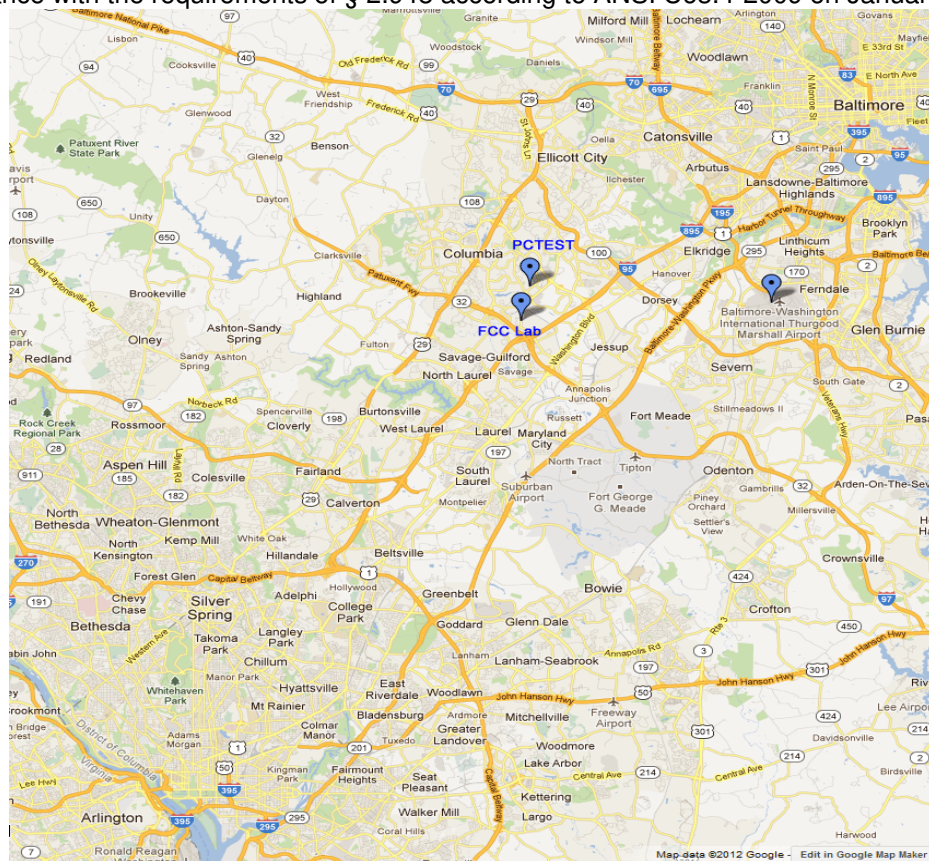


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMN900P**. The test data contained in this report pertains only to the emissions due to the EUT's LTE function.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO Rev 0/A (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1900 WCDMA/HSPA, Band 25 LTE, 802.11a/b/g/n/ac WLAN (DTS/NII), Bluetooth (1x,EDR, LE), NFC, ANT+



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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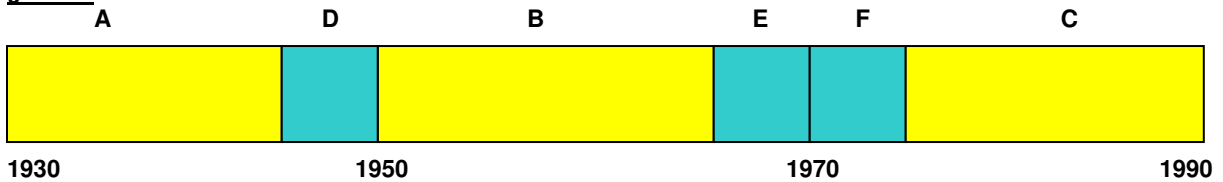
3.0 DESCRIPTION OF TESTS

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 **Samsung Portable Handset FCC ID: A3LSMN900P**.

3.2 PCS - Base Frequency Blocks

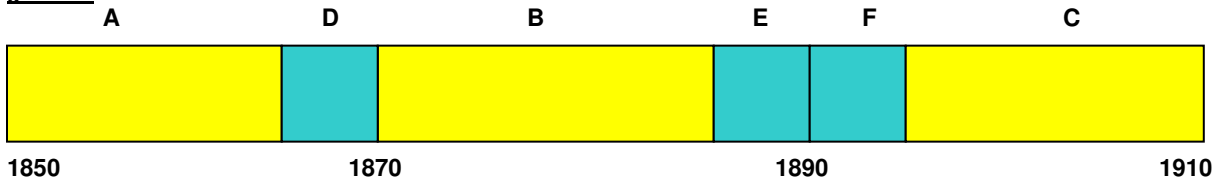
§24.229



BLOCK 1: 1930 – 1945 MHz (A)	BLOCK 4: 1965 – 1970 MHz (E)
BLOCK 2: 1945 – 1950 MHz (D)	BLOCK 5: 1970 – 1975 MHz (F)
BLOCK 3: 1950 – 1965 MHz (B)	BLOCK 6: 1975 – 1990 MHz (C)

3.3 PCS - Mobile Frequency Blocks

§24.229





BLOCK 1: 1850 – 1865 MHz (A)	BLOCK 4: 1885 – 1890 MHz (E)
BLOCK 2: 1865 – 1870 MHz (D)	BLOCK 5: 1890 – 1895 MHz (F)
BLOCK 3: 1870 – 1885 MHz (B)	BLOCK 6: 1895 – 1910 MHz (C)

3.4 Occupied Bandwidth

§2.1049

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.

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3.5 Spurious and Harmonic Emissions at Antenna Terminal



§2.1051 §24.238(a)(b)

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 or 1 MHz or greater for PCS band,. 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 for PCS 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.

3.6 Peak-Average Ratio

§24.232(d)

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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3.7 Radiated Power and Radiated Spurious Emissions

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Radiated spurious emissions are investigated indoors in a semi-anechoic chamber to determine the frequencies producing the worst case emissions. Final measurements for radiated power and radiated spurious emissions are performed on the 3 meter OATS per the guidelines of ANSI/TIA-603-C-2004. The measurement area is situated on an 18 meter x 20 meter galvanized 1/2" hardware cloth as the conducting ground plane. This material is sewn together in sections 4 feet wide and 60 feet long. A total of eighteen sections are required to cover the entire measurement area. Sections are laid across the width of the pad, overlapped 1" and sewn and soldered together at intervals of 3" (7.6 cm.) The terrain of the test site is reasonably flat and level. Power and cable to the test site are buried 18" deep into the ground outside the perimeter of the site. An all-weather non-metallic housing is situated on a 2 x 3 meter area adjacent to the measurement area to house the test equipment. 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 spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. 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. Emissions are also investigated with the receive antenna horizontally and vertically polarized. The level of the maximized emission is recorded with the spectrum analyzer using a peak detector with RBW = 1MHz, VBW = 3MHz for emissions greater than 1GHz. For emissions below 1GHz, the spectrum analyzer is set to RBW = 100kHz and VBW = 300kHz.

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:

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

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 $P_g \text{ [dBm]} - \text{cable loss [dB]}$.

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 $43 + 10\log_{10}(\text{Power}_{\text{[Watts]}})$ specified in 24.238(a).

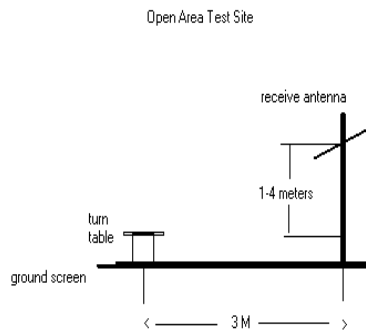




Figure 3-1. Diagram of 3-meter Test Range

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3.8 Frequency Stability / Temperature Variation

§2.1055



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. 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
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	5/29/2014	Annual	5/29/2015	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	3/29/2014	Annual	3/29/2015	N/A
-	LTx2	Licensed Transmitter Cable Set	1/30/2014	Annual	1/30/2015	N/A
Agilent	8447D	Broadband Amplifier	5/31/2013	Annual	5/31/2014	1937A03348
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	4/17/2014	Annual	4/17/2015	3008A00985
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/28/2013	Annual	10/28/2014	3613A00315
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	5/8/2014	Annual	5/8/2015	MY49432391
Anritsu	ML2495A	Power Meter	10/31/2013	Annual	10/31/2014	941001
Anritsu	MA2411B	Pulse Sensor	4/8/2014	Annual	4/8/2015	846215
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	6/26/2013	Annual	6/26/2014	121034
Emco	6502	Active Loop Antenna (10k - 30 MHz)	5/31/2012	Biennial	5/31/2014	267
Espec	ESX-2CA	Environmental Chamber	4/16/2014	Annual	4/16/2015	17620
Mini-Circuits	VHF-3100+	High Pass Filter	1/29/2014	Annual	1/29/2015	31144
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	4/23/2014	Annual	4/23/2015	112347
Seekonk	NC-100	Torque Wrench (8" lb)	3/5/2014	Biennial	3/5/2016	N/A
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	6/19/2013	Biennial	6/19/2015	A050307
Sunol	DRH-118	Horn Antenna (1-18 GHz)	6/19/2013	Biennial	6/19/2015	A042511
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/28/2014	Biennial	1/28/2016	A051107
VWR	62344-734	Thermometer with Clock	2/20/2014	Biennial	2/20/2016	140140336

Table 4-1. Test Equipment

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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).

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6.0 TEST RESULTS

6.1 Summary



Company Name: Samsung Electronics, Co. Ltd.
 FCC ID: A3LSMN900P
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 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
2.1051 24.238(a)	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
24.232(d)	Peak-Average Ratio	< 13 dB		PASS	Section, 7.0
2.1046	Transmitter Conducted Output Power	N/A		PASS	See RF Exposure Report
24.232(c)	Equivalent Isotropic Radiated Power (Band 25)	< 2 Watts max. EIRP	RADIATED	PASS	Section 6.2
2.1053 24.238(a)	Undesirable Emissions	$> 43 + 10\log_{10}(P[\text{Watts}])$ for all out-of-band emissions		PASS	Section, 6.3
2.1055	Frequency Stability	fundamental emissions stay within authorized frequency block (Part 24)		PASS	Section, 6.4

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 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 Equivalent Isotropic Radiated Power (EIRP)



§24.232(c) RSS-133(6.4)

	Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Back Cover	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
Band XXV LTE	1850.70	1.4	QPSK	Standard	1/0	10.51	8.17	V	18.68	0.074	-14.33
	1882.50	1.4	QPSK	Standard	1/0	10.76	8.24	V	19.00	0.079	-14.01
	1914.30	1.4	QPSK	Standard	1/0	11.82	8.32	V	20.14	0.103	-12.87
	1850.70	1.4	16-QAM	Standard	1/0	9.68	8.17	V	17.85	0.061	-15.16
	1882.50	1.4	16-QAM	Standard	1/0	10.46	8.24	V	18.70	0.074	-14.31
	1914.30	1.4	16-QAM	Standard	1/0	10.77	8.32	V	19.09	0.081	-13.92
	1851.50	3	QPSK	Standard	1/0	11.38	8.17	V	19.55	0.090	-13.46
	1882.50	3	QPSK	Standard	1/0	12.02	8.24	V	20.26	0.106	-12.75
	1913.50	3	QPSK	Standard	1/0	10.69	8.32	V	19.01	0.080	-14.00
	1851.50	3	16-QAM	Standard	1/0	10.52	8.17	V	18.69	0.074	-14.32
	1882.50	3	16-QAM	Standard	1/0	11.16	8.24	V	19.40	0.087	-13.61
	1913.50	3	16-QAM	Standard	1/0	10.05	8.32	V	18.37	0.069	-14.64
	1857.50	15	QPSK	Standard	1/0	13.09	8.17	V	21.26	0.134	-11.75
	1882.50	15	QPSK	Standard	1/0	12.06	8.24	V	20.30	0.107	-12.71
	1907.50	15	QPSK	Standard	1/0	13.46	8.32	V	21.78	0.151	-11.23
	1857.50	15	16-QAM	Standard	1/0	12.23	8.17	V	20.40	0.110	-12.61
	1882.50	15	16-QAM	Standard	1/0	11.25	8.24	V	19.49	0.089	-13.52
	1907.50	15	16-QAM	Standard	1/0	12.67	8.32	V	20.99	0.126	-12.02
	1860.00	20	QPSK	Standard	1/0	13.70	8.17	V	21.87	0.154	-11.14
	1882.50	20	QPSK	Standard	1/0	12.51	8.24	V	20.75	0.119	-12.26
1905.00	20	QPSK	Standard	1/0	13.44	8.32	V	21.76	0.150	-11.25	
1860.00	20	16-QAM	Standard	1/0	12.84	8.17	V	21.01	0.126	-12.00	
1882.50	20	16-QAM	Standard	1/0	11.31	8.24	V	19.55	0.090	-13.46	
1905.00	20	16-QAM	Standard	1/0	12.59	8.32	V	20.91	0.123	-12.10	

Table 6-2. EIRP Data (Band 25)

NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model B800BU contains an embedded NFC antenna.
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 V positioning. The data reported in the table above was measured in this test setup.

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6.3 Band 25 Radiated Spurious Emissions §2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1860.00 MHz
 MEASURED OUTPUT POWER: 21.87 dBm = 0.154 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 MHz
 BACK COVER: Standard
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 34.87 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3720.00	-45.68	9.49	-36.19	V	58.06
5580.00	-46.34	10.99	-35.36	V	57.23
7440.00	-43.73	11.01	-32.71	V	54.58
9300.00	-75.97	11.56	-64.41	V	86.28
11160.00	-74.73	12.88	-61.85	V	83.72
13020.00	-71.53	13.21	-58.32	V	80.19

Table 6-3. Radiated Spurious Data

NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model B800BU contains an embedded NFC antenna.
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 V positioning. The data reported in the table above was measured in this test setup.

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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Band 25 Radiated Spurious Measurements (continued)
§2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1882.50 MHz
 MEASURED OUTPUT POWER: 20.75 dBm = 0.119 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 MHz
 BACK COVER: Standard
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 33.75 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3765.00	-49.06	9.33	-39.73	V	60.48
5647.50	-50.51	11.22	-39.29	V	60.04
7530.00	-42.74	11.20	-31.53	V	52.28
9412.50	-75.72	11.61	-64.11	V	84.86
11295.00	-74.32	12.77	-61.54	V	82.29
13177.50	-70.01	12.80	-57.21	V	77.96

Table 6-4. Radiated Spurious Data

NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model B800BU contains an embedded NFC antenna.
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 V positioning. The data reported in the table above was measured in this test setup.

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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Band 25 Radiated Spurious Measurements (continued)
§2.1053 §24.238(a) RSS-133(6.5.1)

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 1905.00 MHz
 MEASURED OUTPUT POWER: 21.76 dBm = 0.150 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 20 MHz
 BACK COVER: Standard
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 34.76 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3810.00	-51.28	9.26	-42.02	V	63.78
5715.00	-45.70	11.44	-34.26	V	56.02
7620.00	-42.54	11.40	-31.14	V	52.90
9525.00	-75.96	11.86	-64.10	V	85.86
11430.00	-74.52	12.84	-61.68	V	83.44
13335.00	-69.66	12.56	-57.10	V	78.86

Table 6-5. Radiated Spurious Data

NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. This device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model B800BU contains an embedded NFC antenna.
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 V positioning. The data reported in the table above was measured in this test setup.

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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6.4 Band 25 Frequency Stability Measurements

§2.1055 §24.235 RSS-133(6.3)



OPERATING FREQUENCY: 1,882,500,000 Hz
 CHANNEL: 26365
 REFERENCE VOLTAGE: 3.8 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (° C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,882,500,011	11	0.0000006
100 %		- 30	1,882,499,983	-17	-0.0000009
100 %		- 20	1,882,499,978	-22	-0.0000012
100 %		- 10	1,882,499,992	-8	-0.0000004
100 %		0	1,882,500,018	18	0.0000010
100 %		+ 10	1,882,499,995	-5	-0.0000003
100 %		+ 20	1,882,499,989	-11	-0.0000006
100 %		+ 30	1,882,499,983	-17	-0.0000009
100 %		+ 40	1,882,499,996	-4	-0.0000002
100 %		+ 50	1,882,500,020	20	0.0000011
115 %	4.37	+ 20	1,882,499,975	-25	-0.0000013
BATT. ENDPOINT	3.50	+ 20	1,882,499,993	-7	-0.0000004

Table 6-6. Frequency Stability Data (Band 25)

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

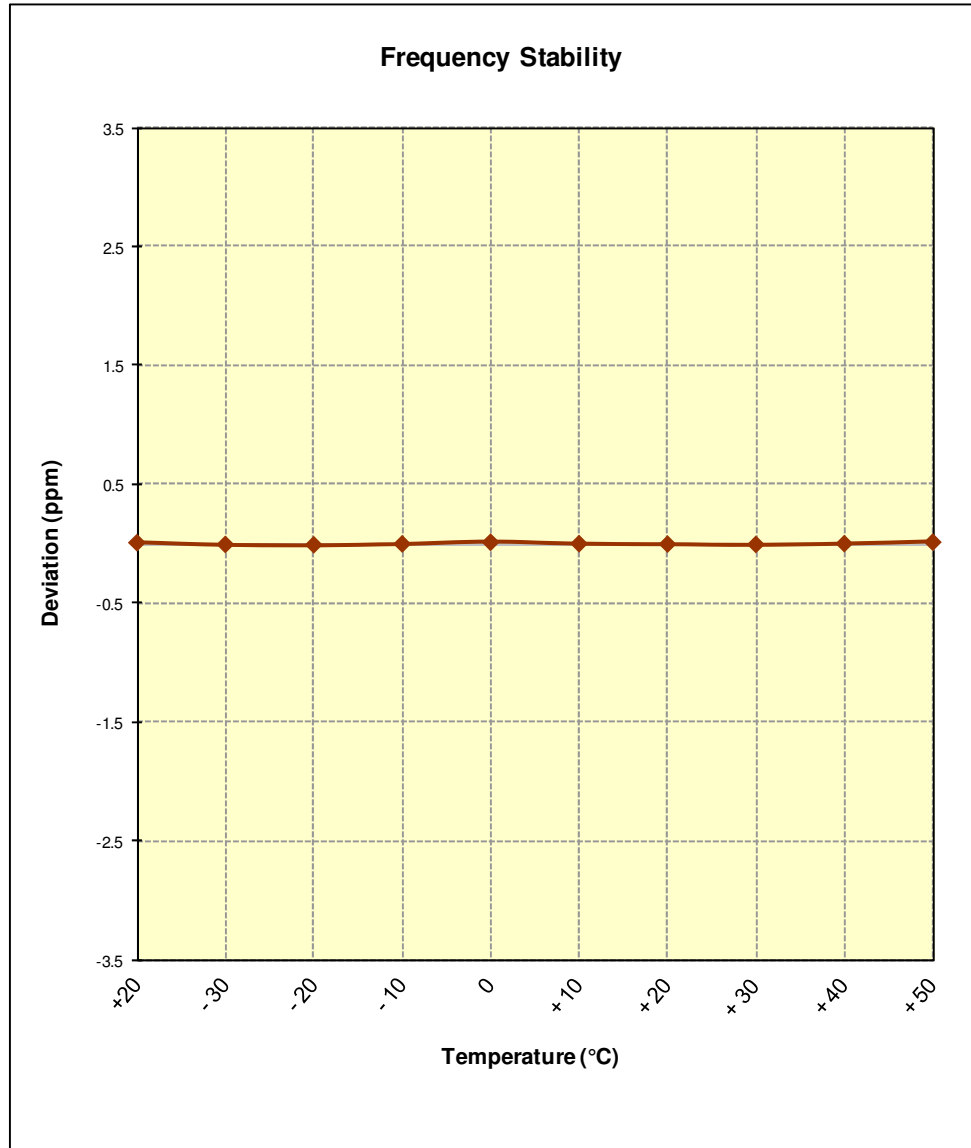


Figure 6-1. Frequency Stability Graph (Band 25)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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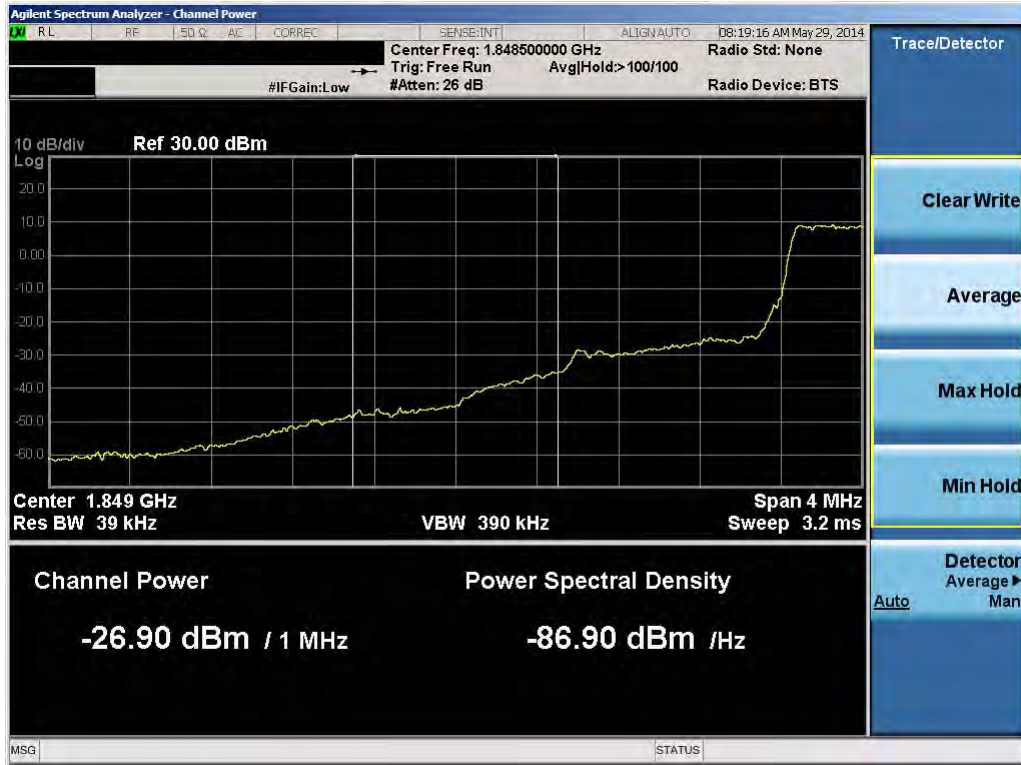
7.0 BAND 25 PLOTS OF EMISSIONS

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

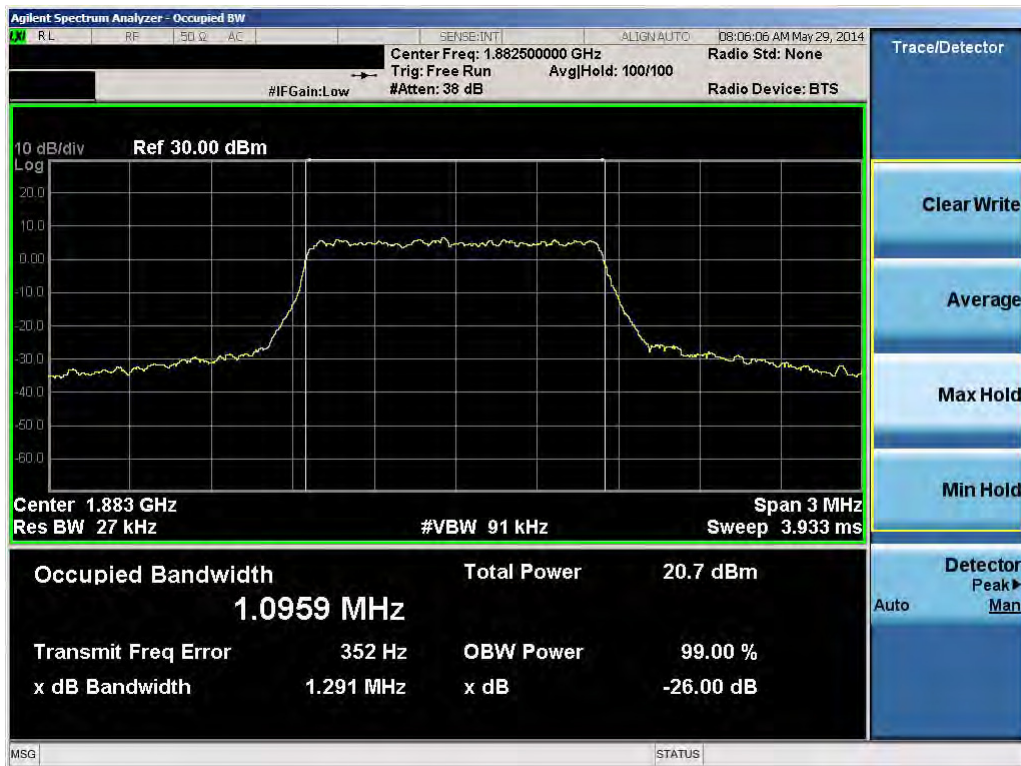


Plot 7-1. Lower Band Edge Plot (1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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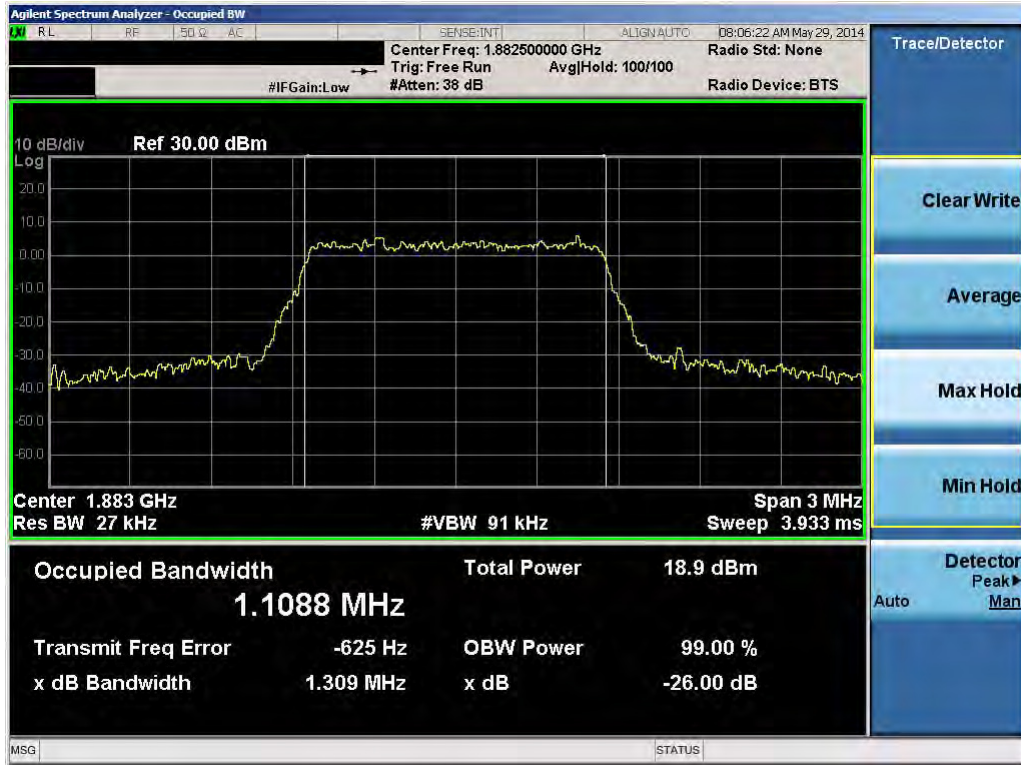


Plot 7-2. Lower Extended Band Edge Plot (1.4MHz QPSK – RB Size 6)

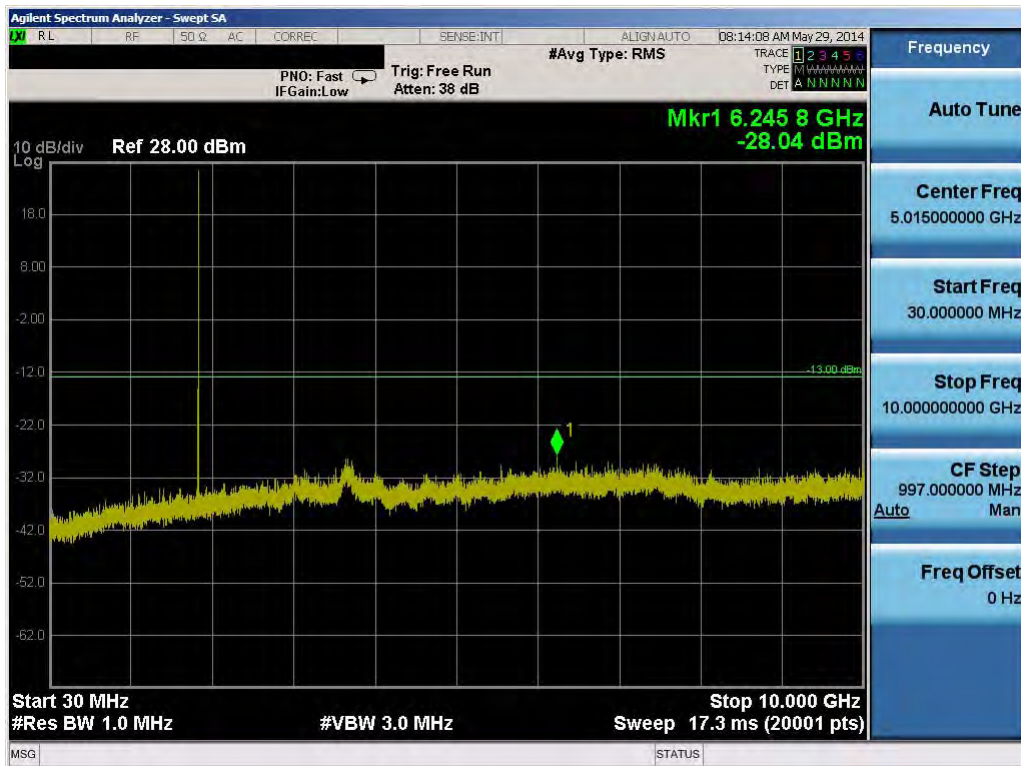


Plot 7-3. Occupied Bandwidth Plot (1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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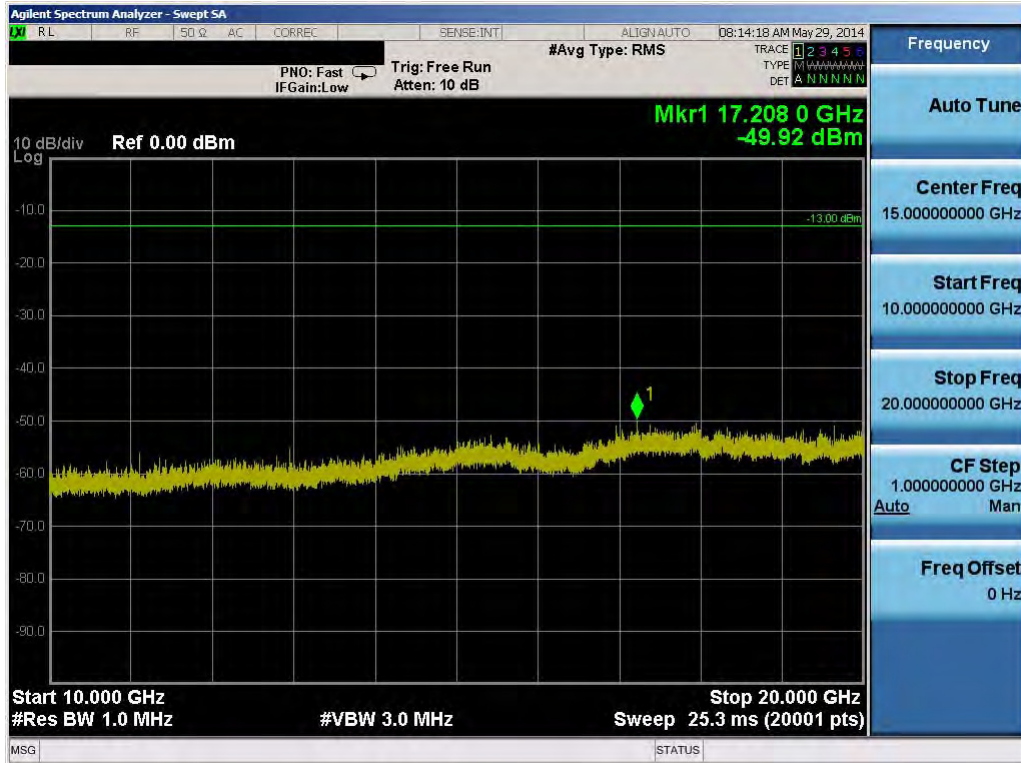


Plot 7-4. Occupied Bandwidth Plot (1.4MHz 16-QAM – RB Size 6)

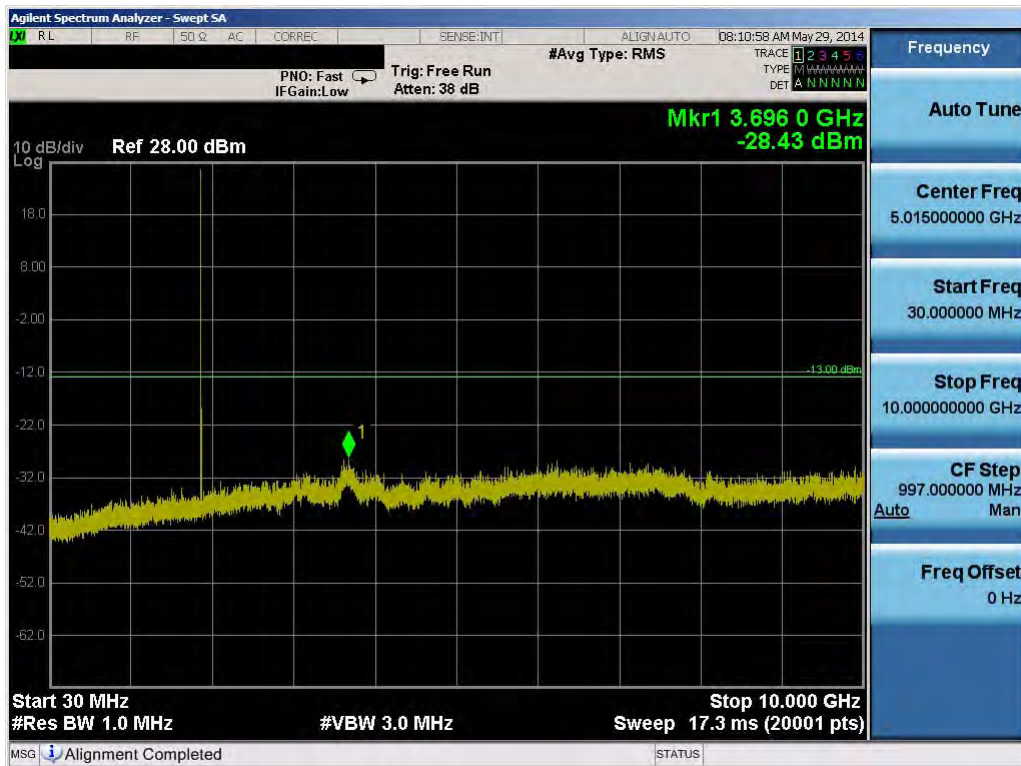


Plot 7-5. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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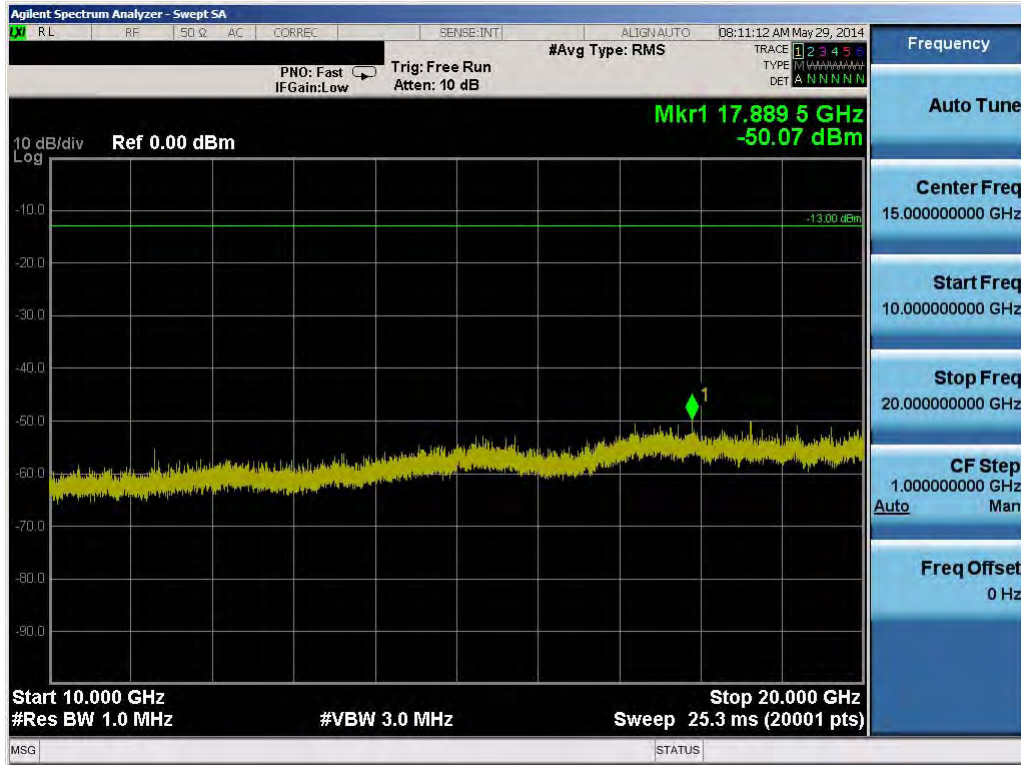


Plot 7-6. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

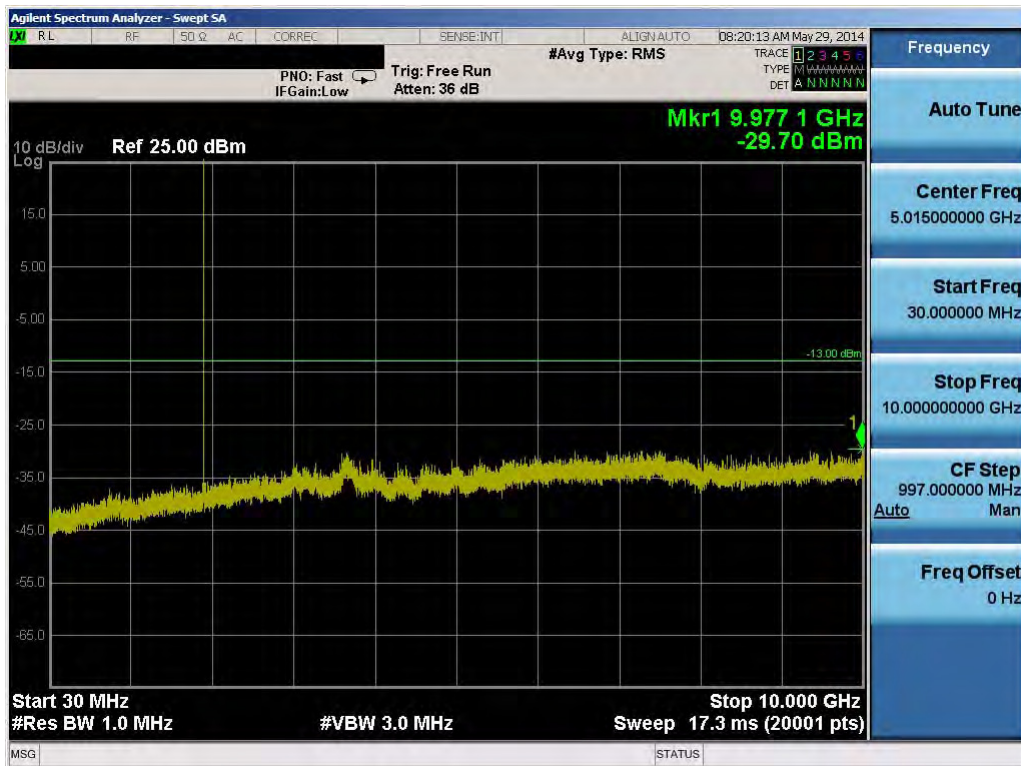


Plot 7-7. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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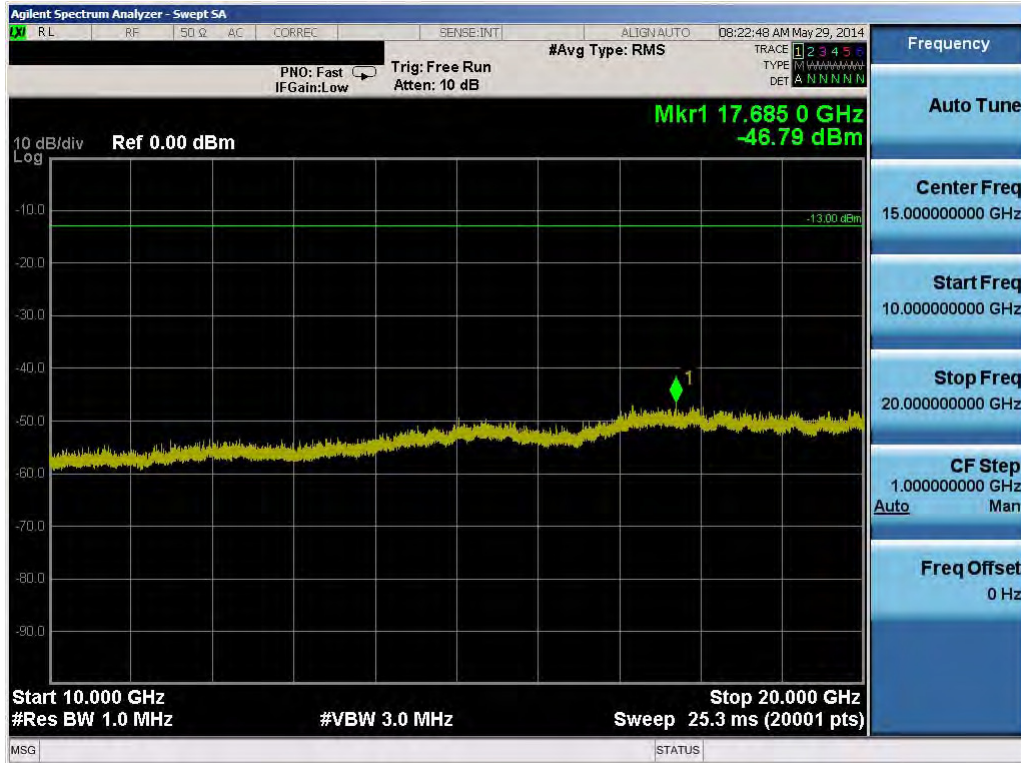


Plot 7-8. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-9. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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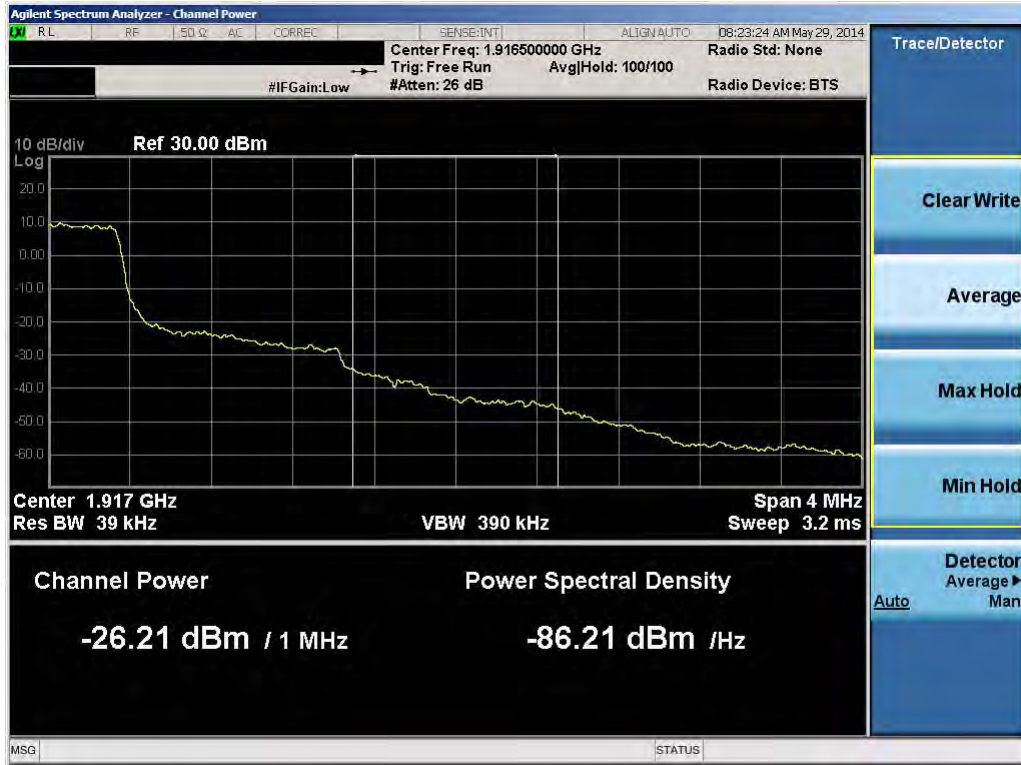


Plot 7-10. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

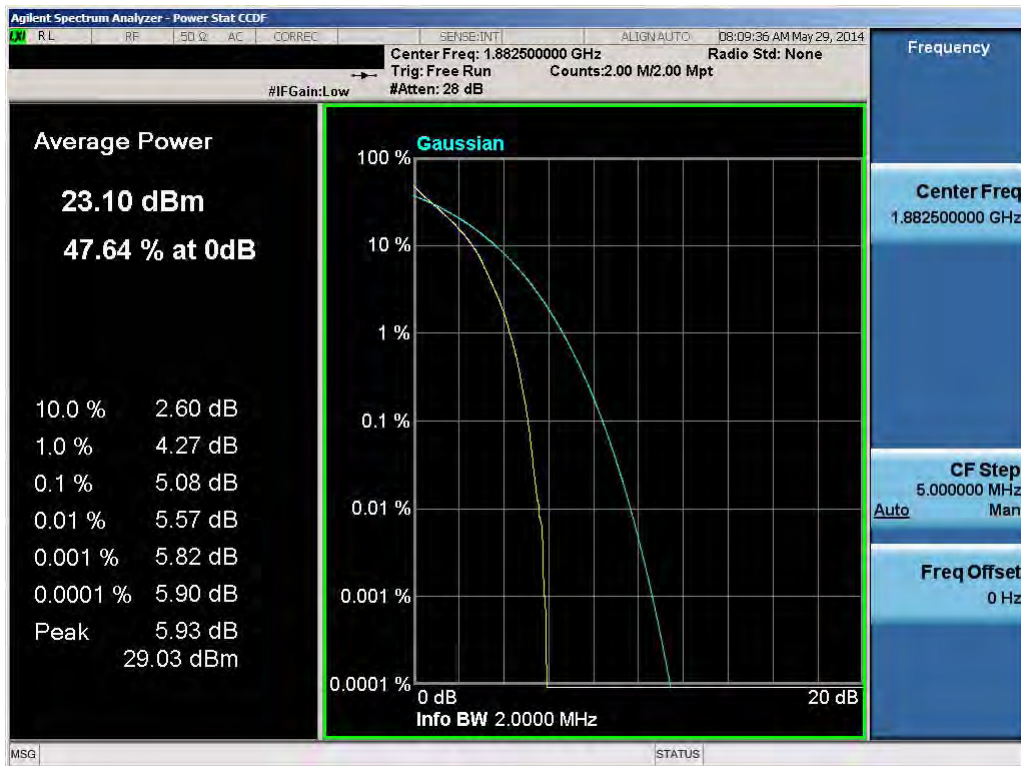


Plot 7-11. Upper Band Edge Plot (1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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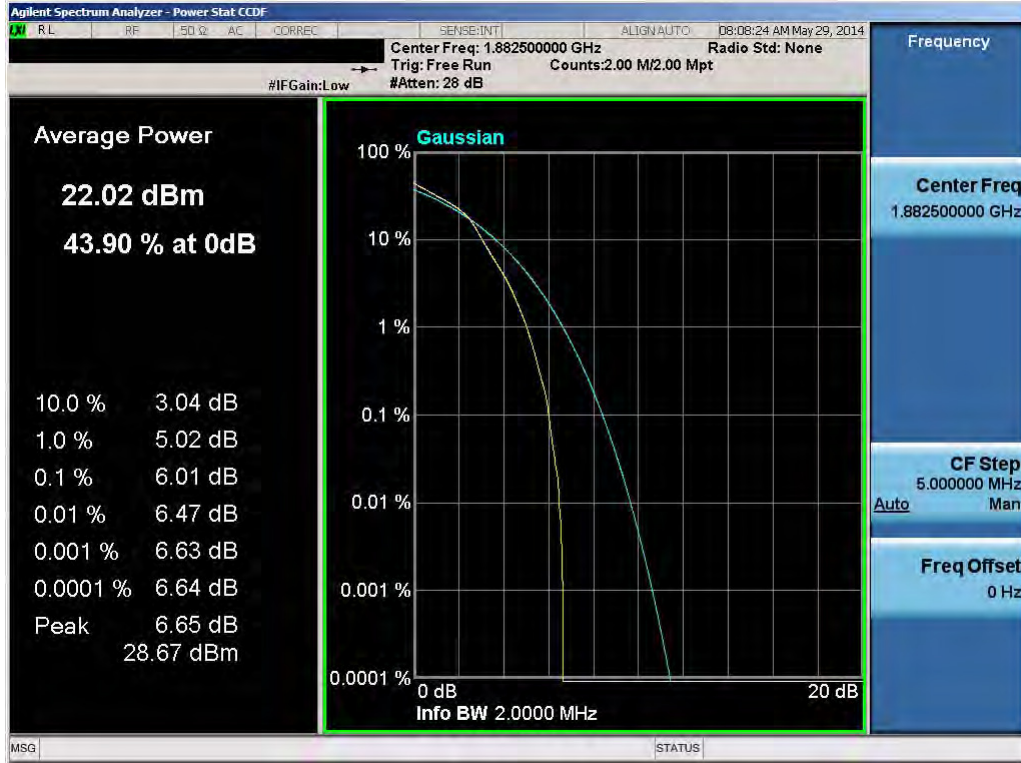


Plot 7-12. Upper Extended Band Edge Plot (1.4MHz QPSK – RB Size 6)

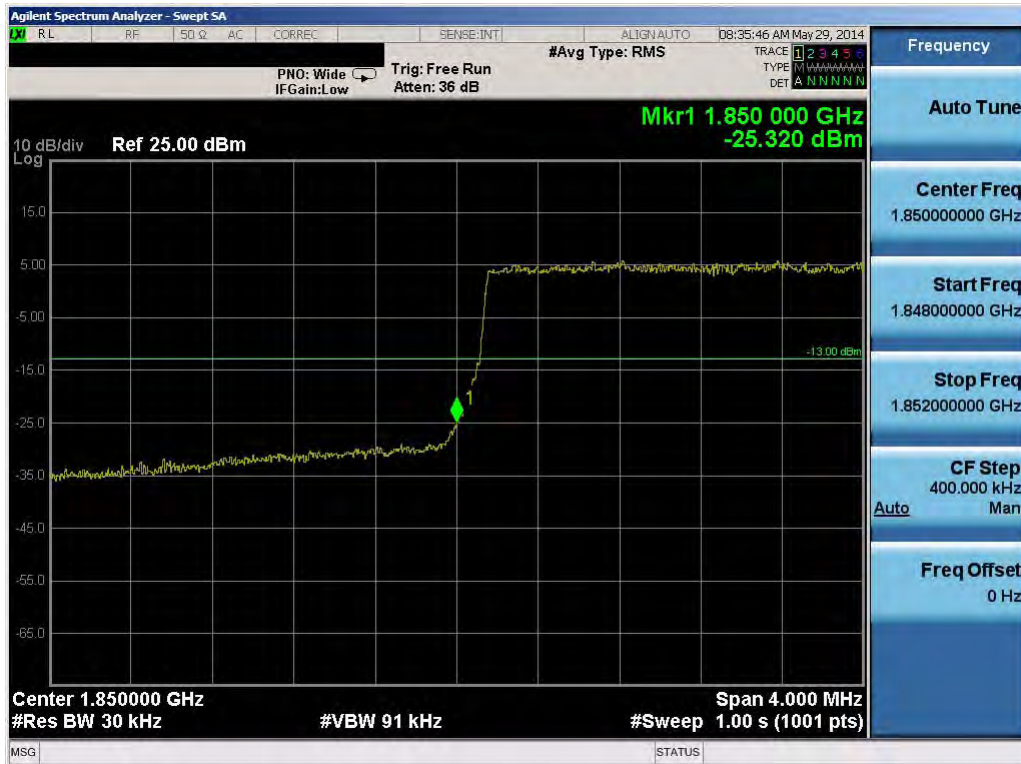


Plot 7-13. PAR Plot (1.4MHz QPSK – RB Size 6)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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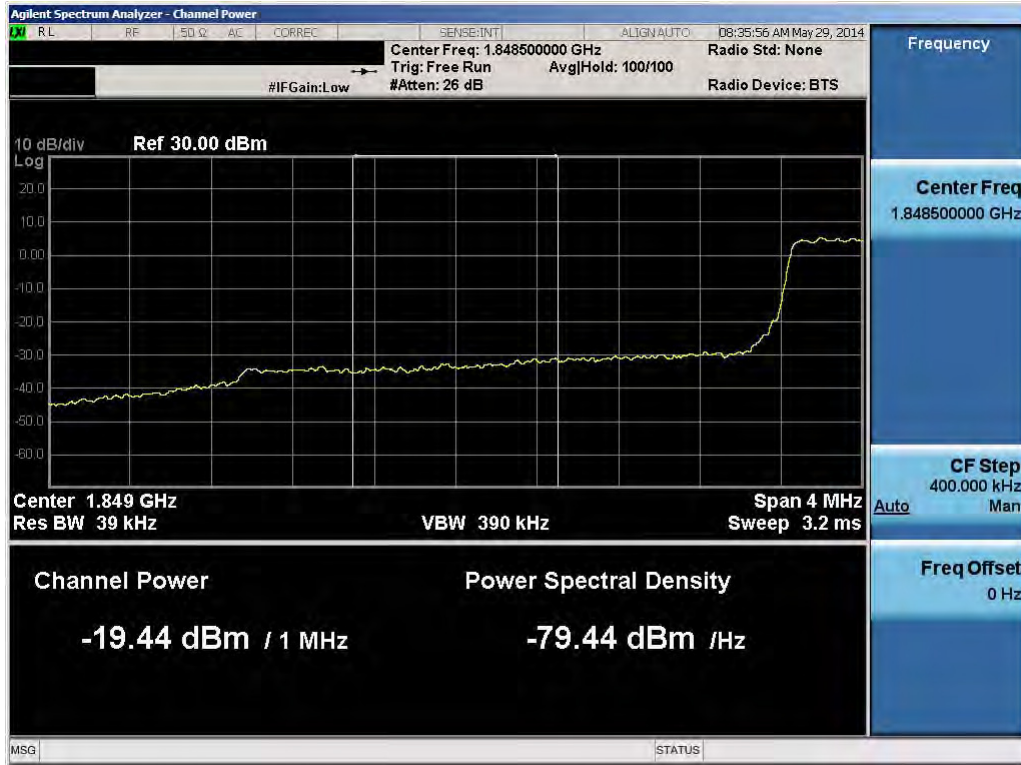


Plot 7-14. PAR Plot (1.4MHz 16-QAM – RB Size 6)

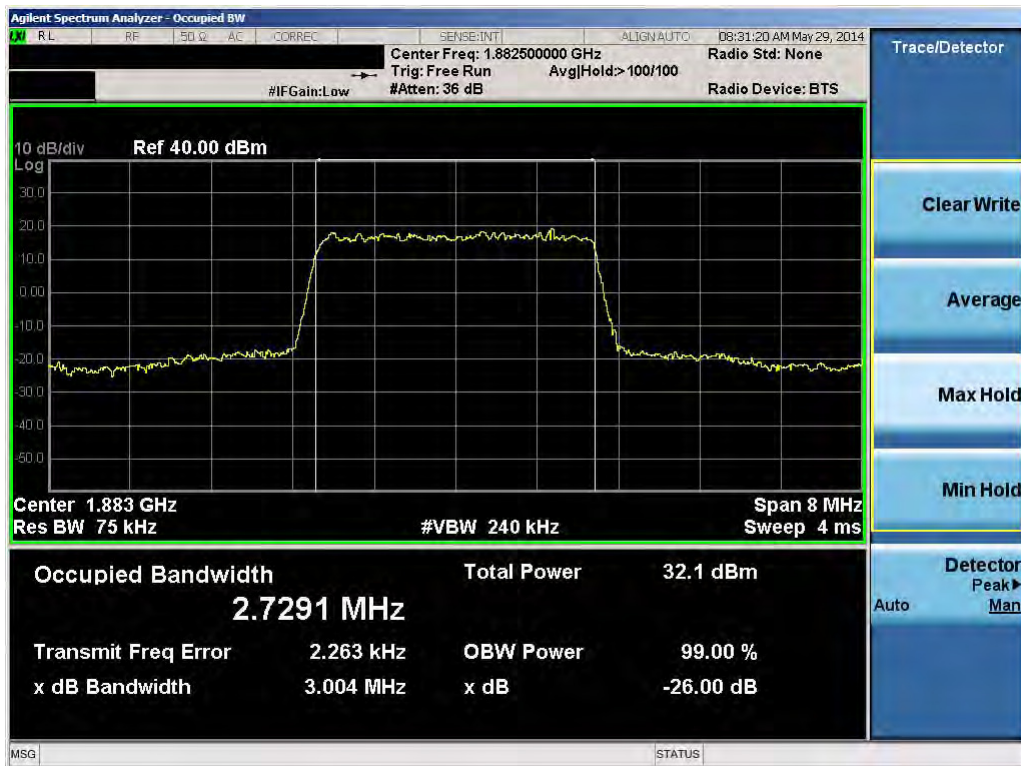


Plot 7-15. Lower Band Edge Plot (3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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Plot 7-16. Lower Extended Band Edge Plot (3.0MHz QPSK – RB Size 15)

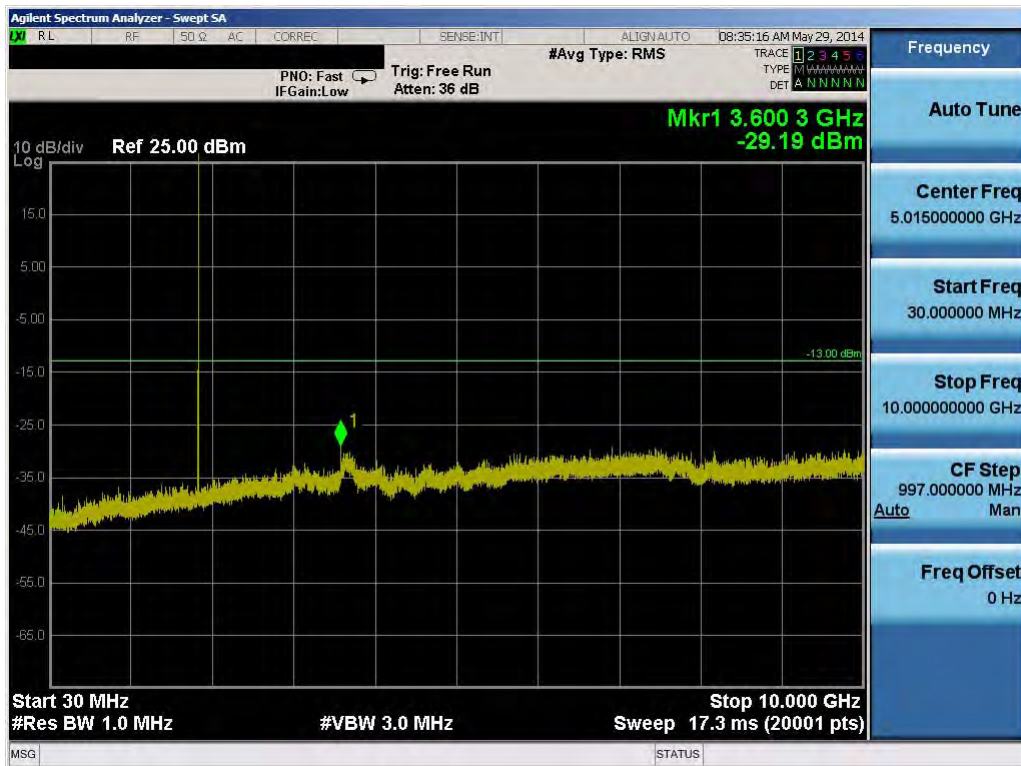


Plot 7-17. Occupied Bandwidth Plot (3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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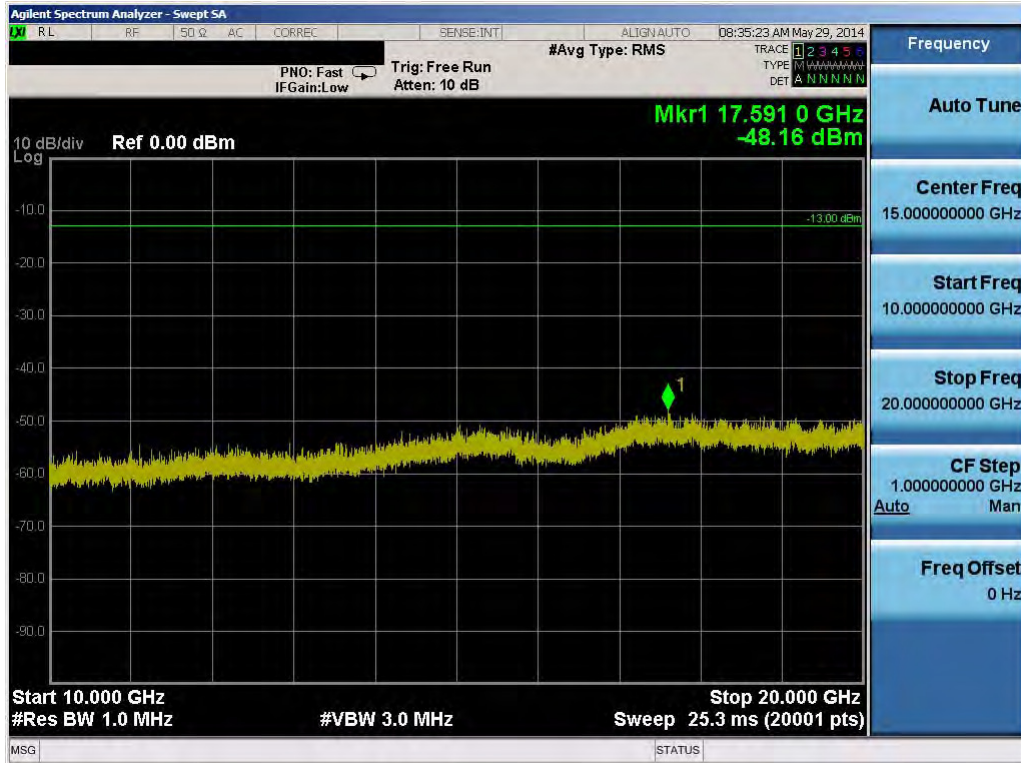


Plot 7-18. Occupied Bandwidth Plot (3.0MHz 16-QAM – RB Size 15)

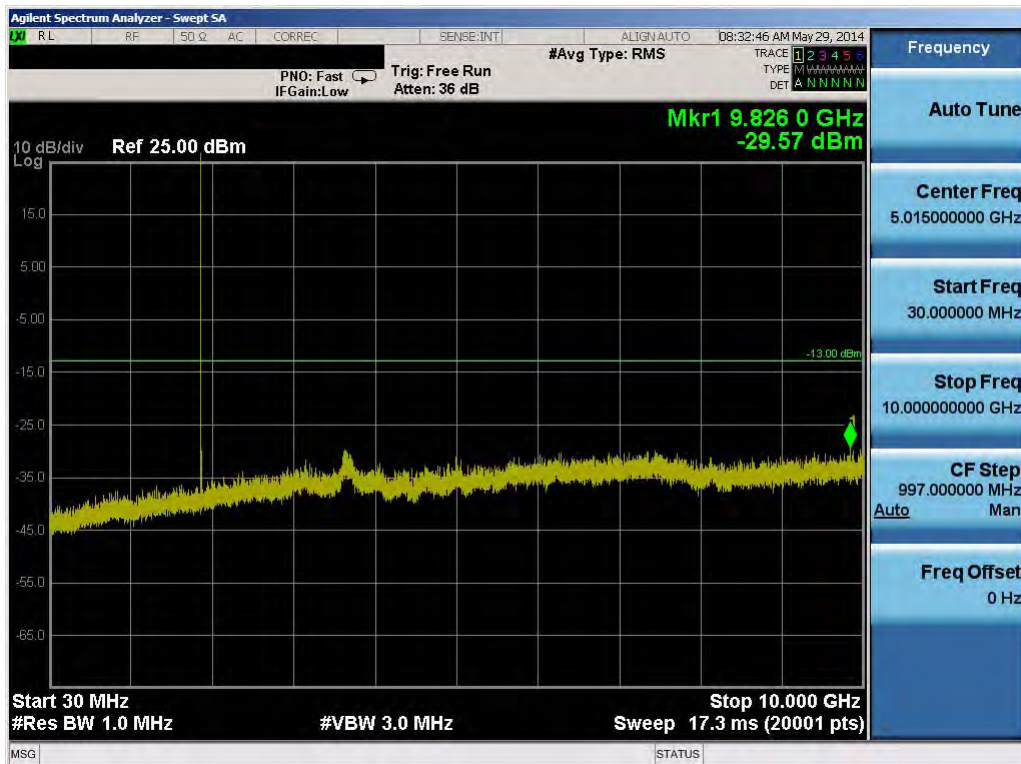


Plot 7-19. Conducted Spurious Plot (3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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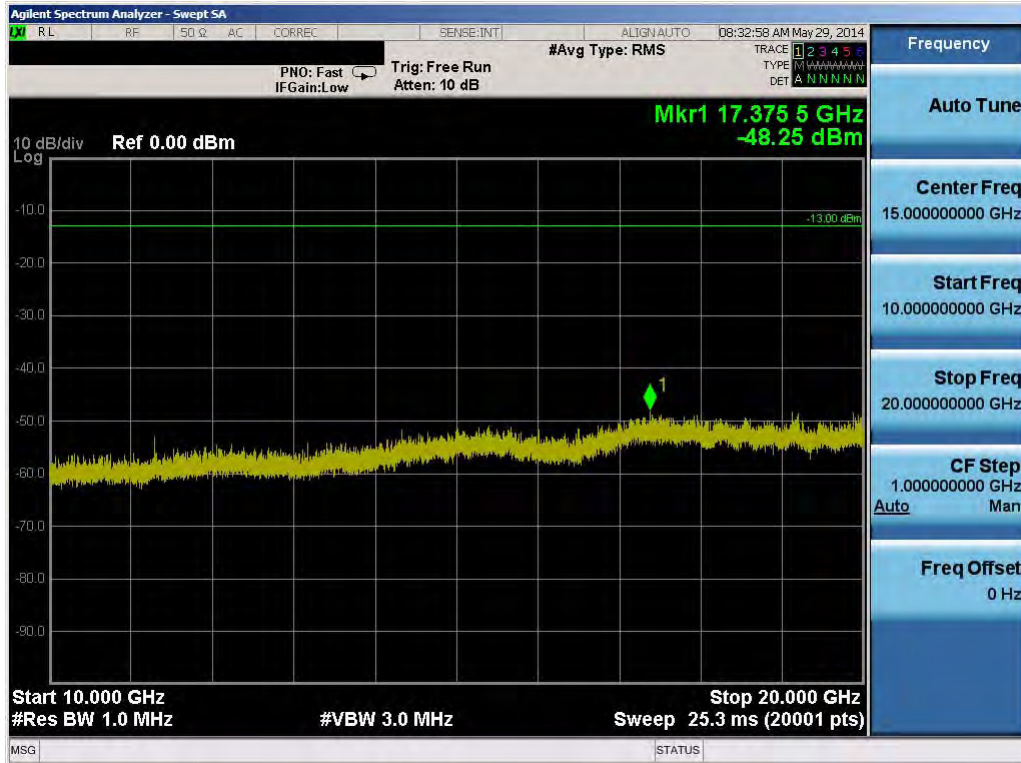


Plot 7-20. Conducted Spurious Plot (3.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

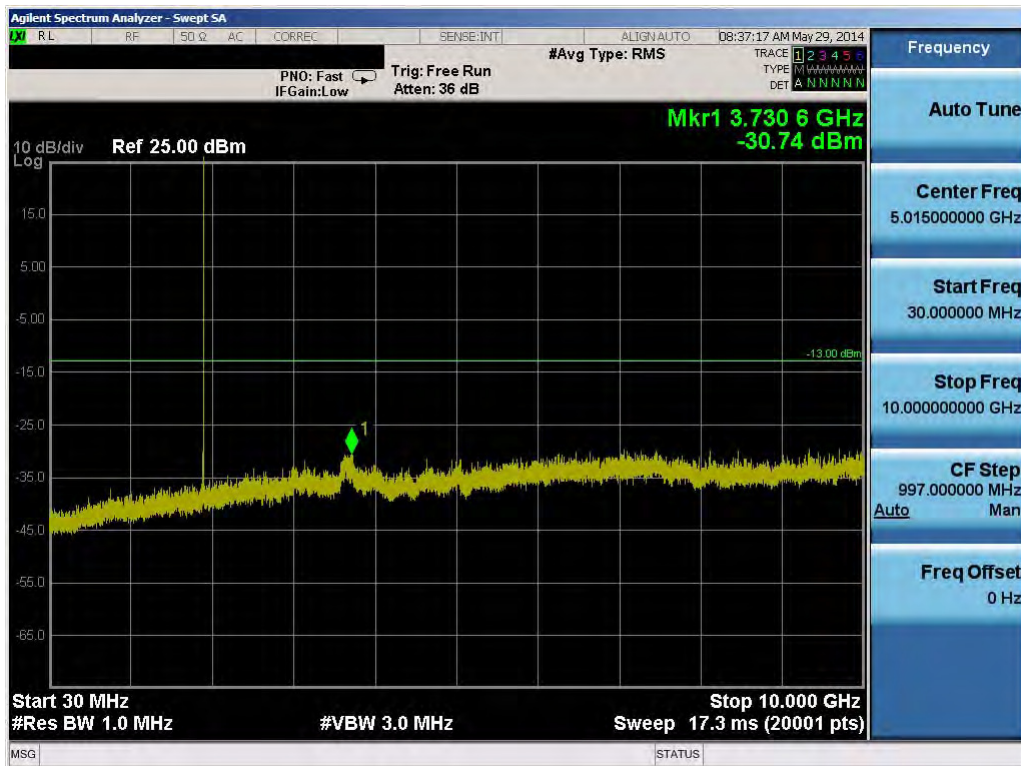


Plot 7-21. Conducted Spurious Plot (3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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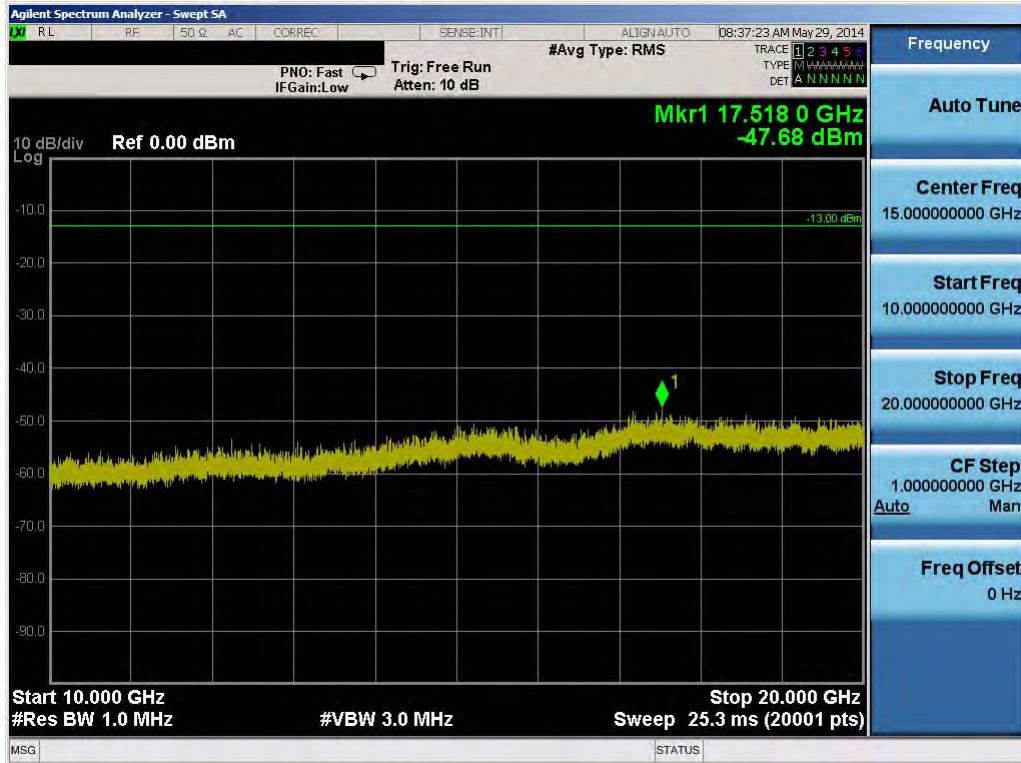


Plot 7-22. Conducted Spurious Plot (3.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-23. Conducted Spurious Plot (3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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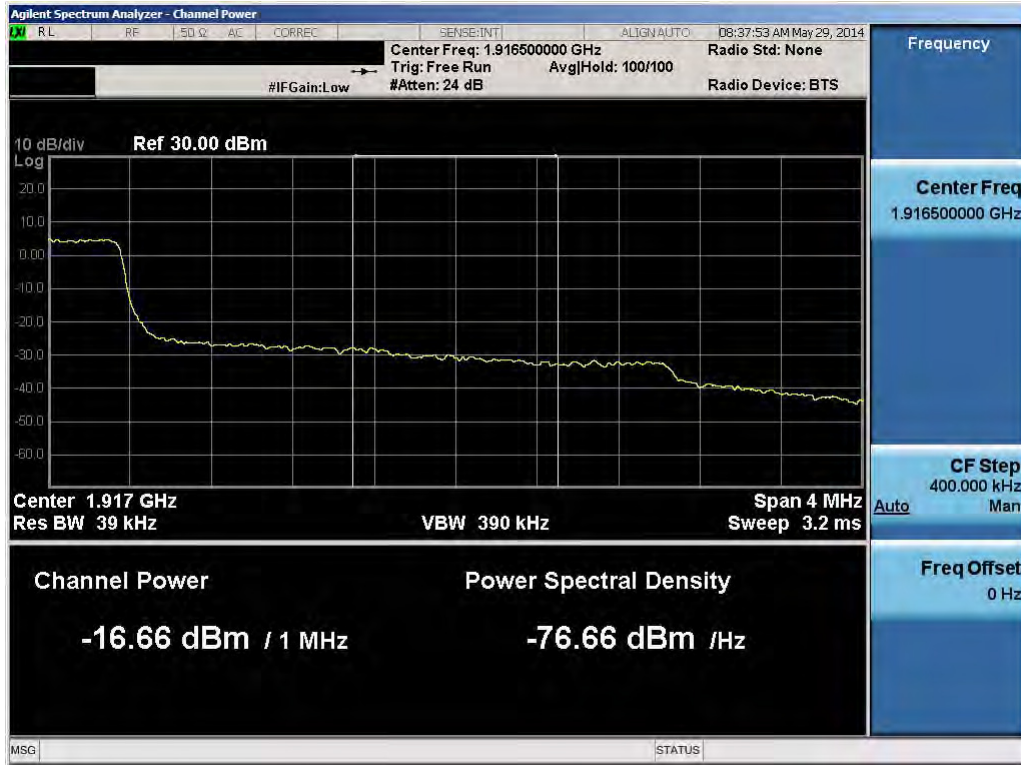


Plot 7-24. Conducted Spurious Plot (3.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

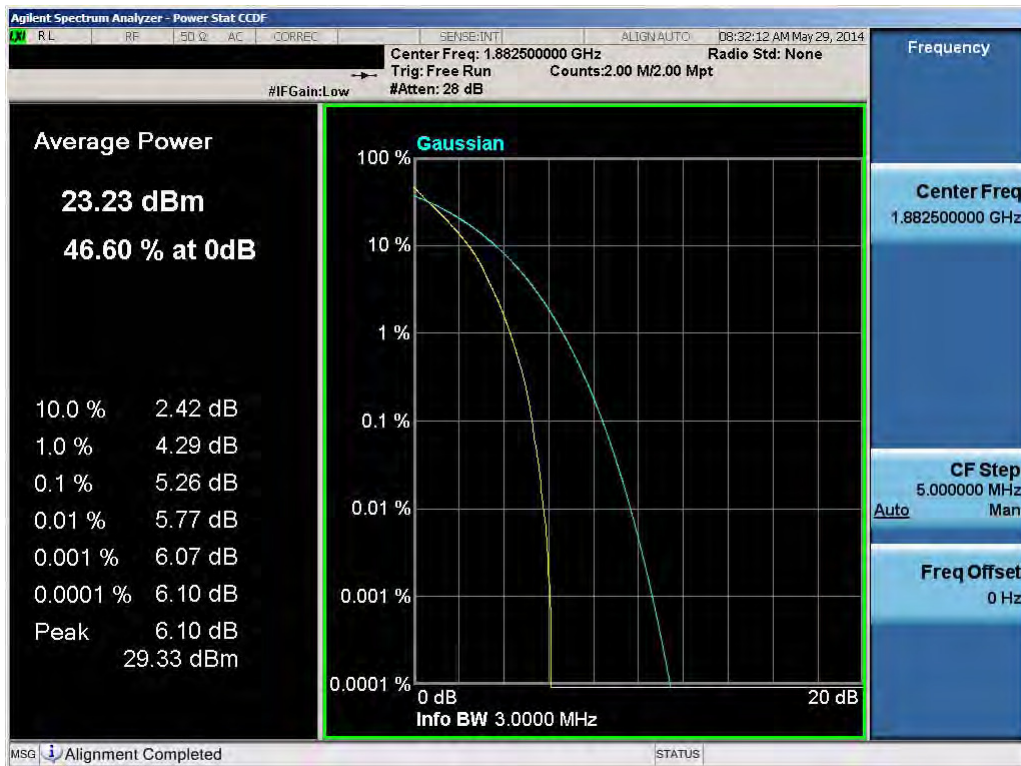


Plot 7-25. Upper Band Edge Plot (3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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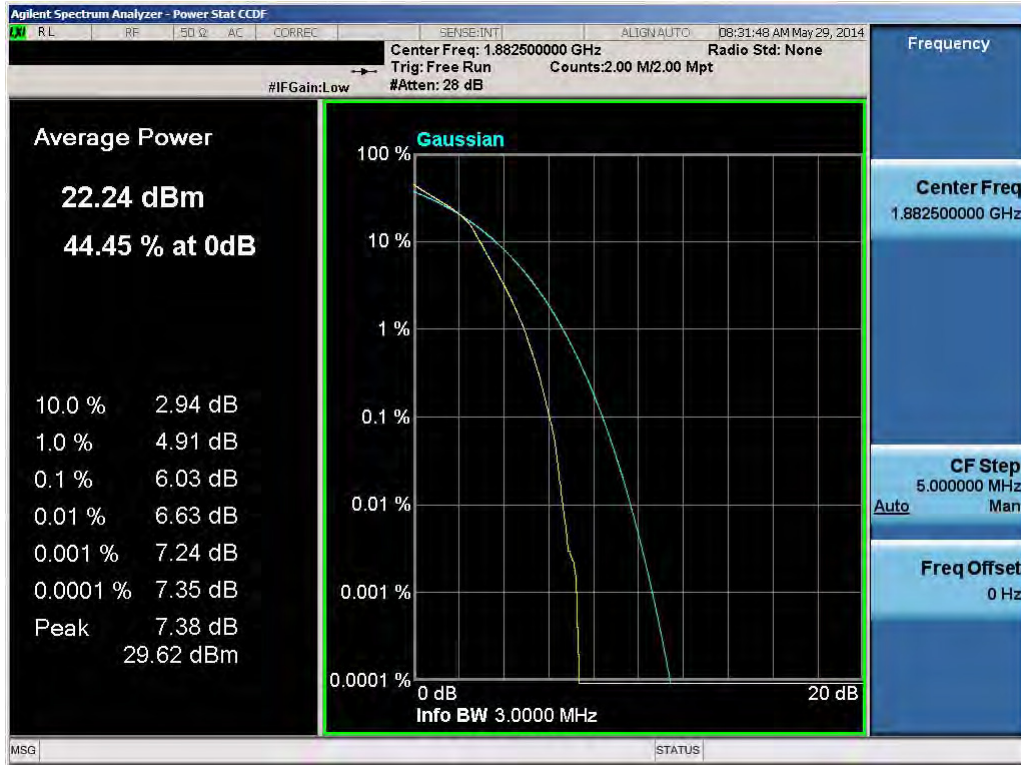


Plot 7-26. Upper Extended Band Edge Plot (3.0MHz QPSK – RB Size 15)



Plot 7-27. PAR Plot (3.0MHz QPSK – RB Size 15)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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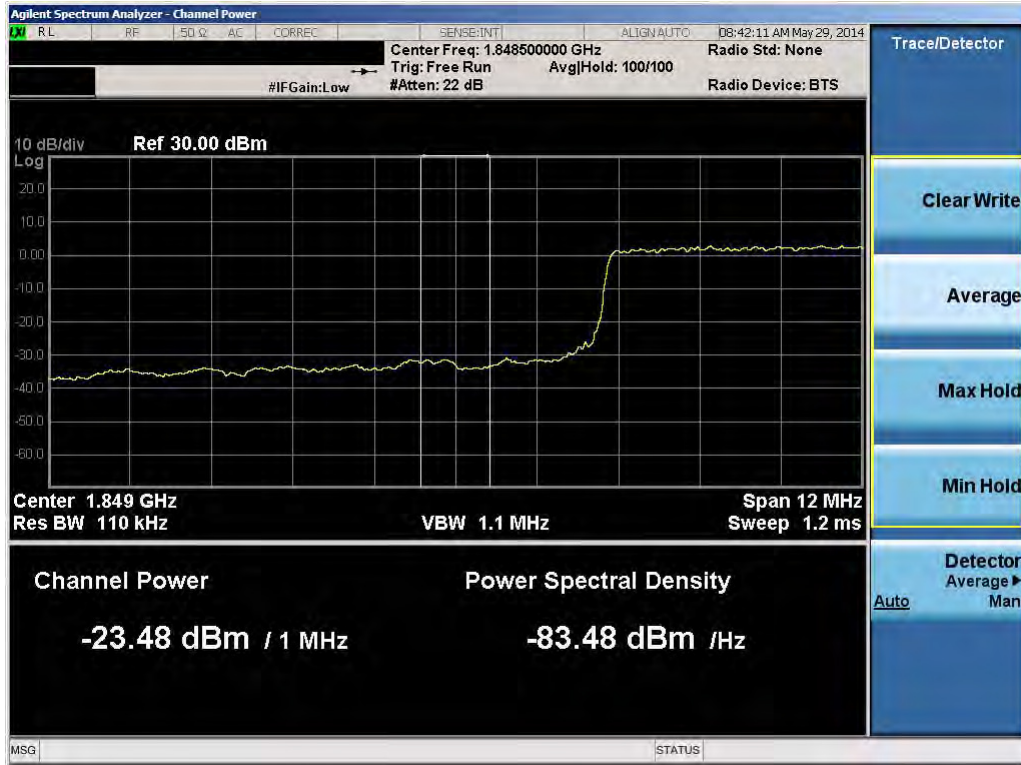


Plot 7-28. PAR Plot (3.0MHz 16-QAM – RB Size 15)

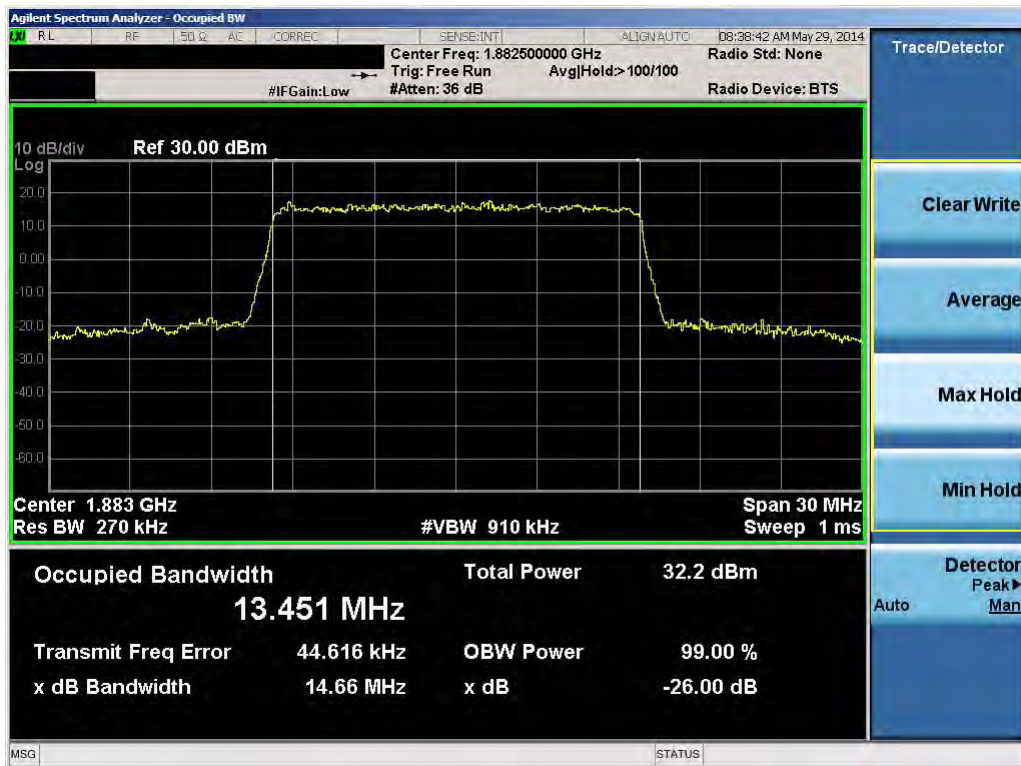


Plot 7-29. Lower Band Edge Plot (15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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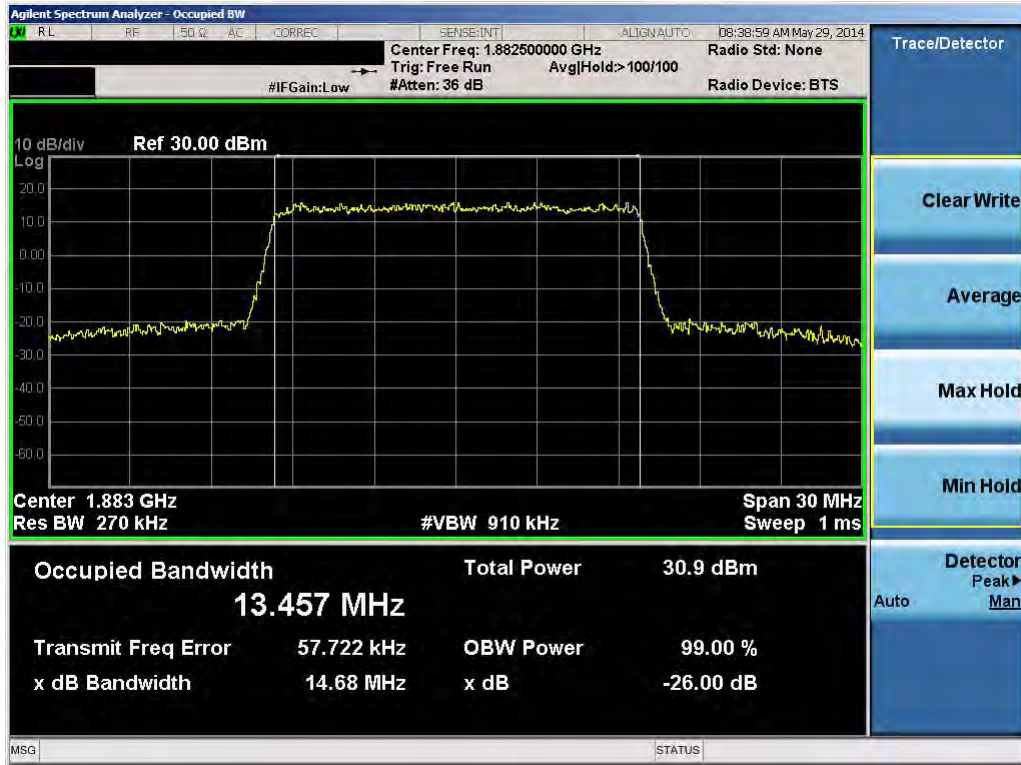


Plot 7-30. Lower Extended Band Edge Plot (15.0MHz QPSK – RB Size 75)

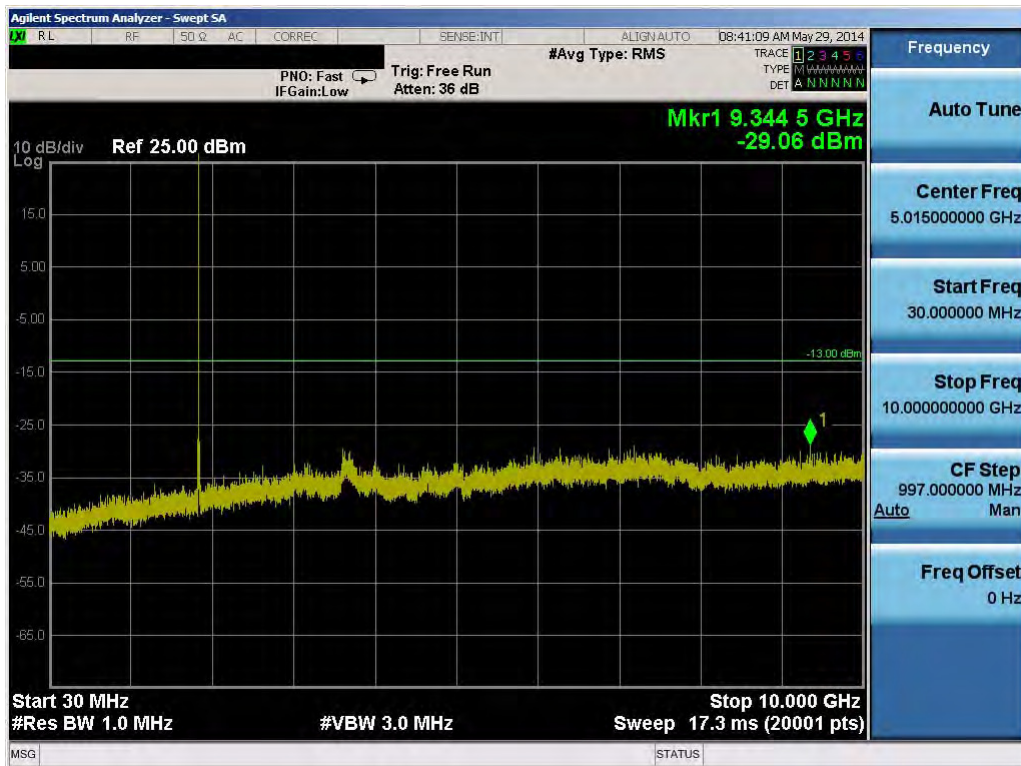


Plot 7-31. Occupied Bandwidth Plot (15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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Plot 7-32. Occupied Bandwidth Plot (15.0MHz 16-QAM – RB Size 75)

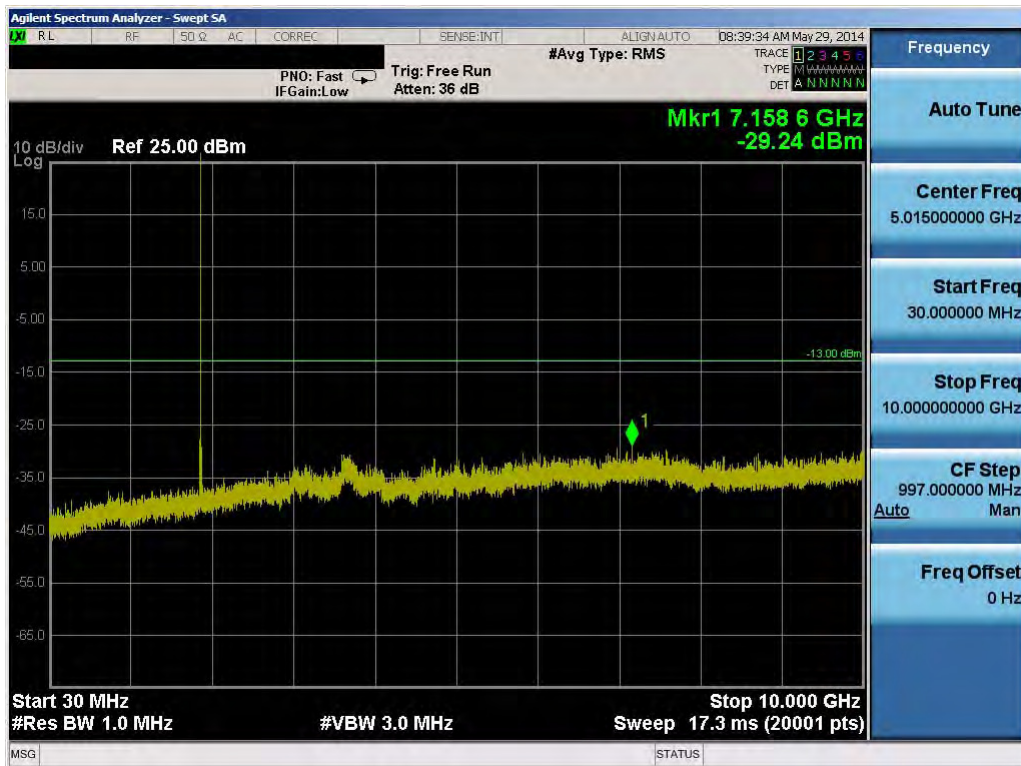


Plot 7-33. Conducted Spurious Plot (15.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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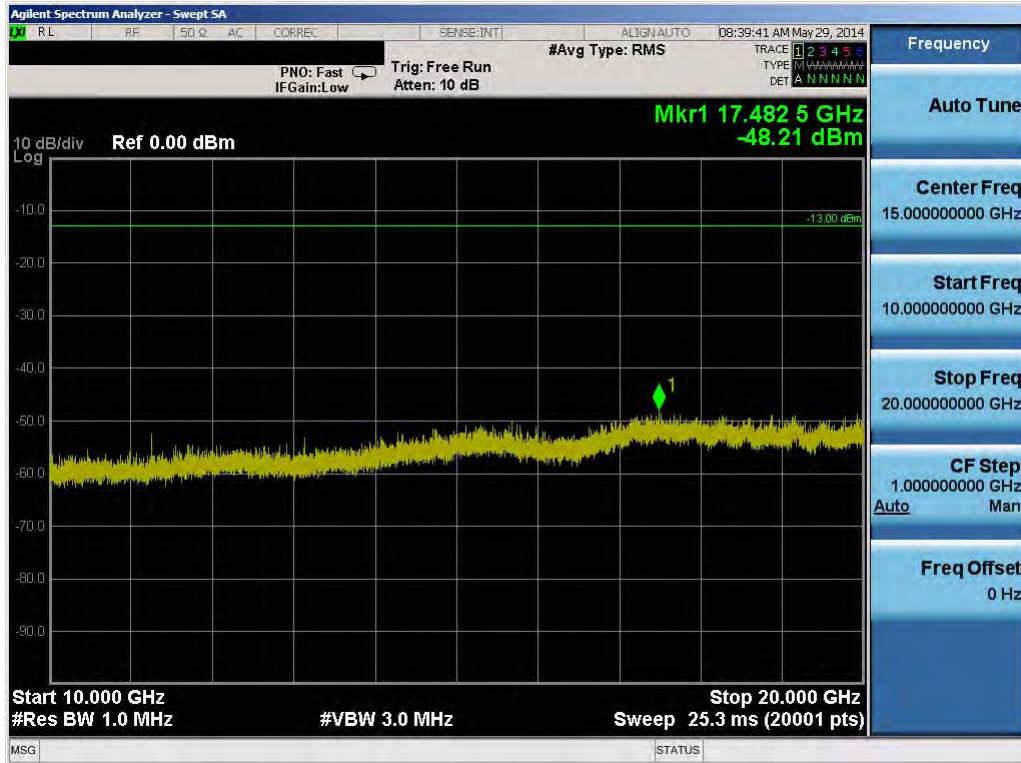


Plot 7-34. Conducted Spurious Plot (15.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

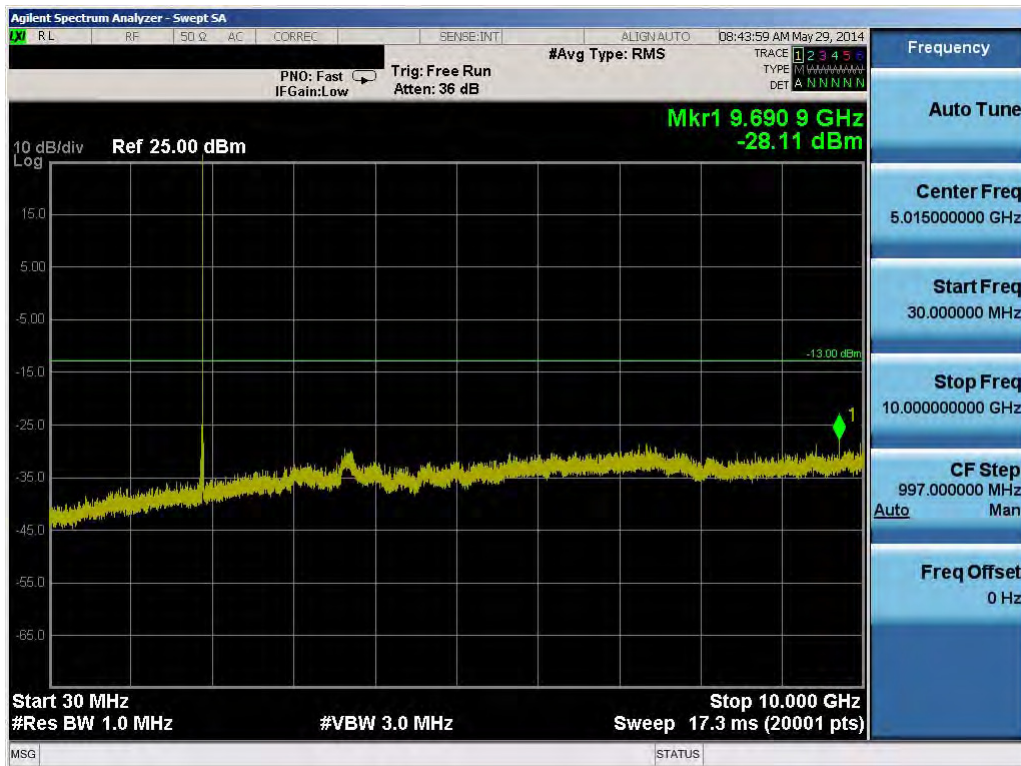


Plot 7-35. Conducted Spurious Plot (15.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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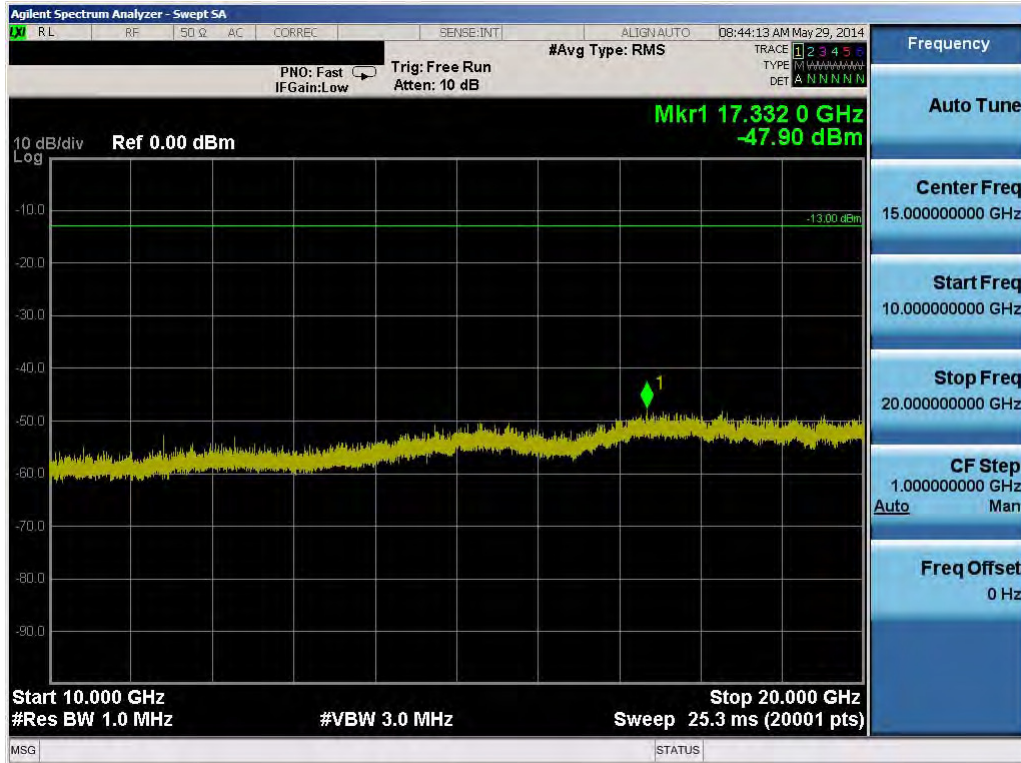


Plot 7-36. Conducted Spurious Plot (15.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-37. Conducted Spurious Plot (15.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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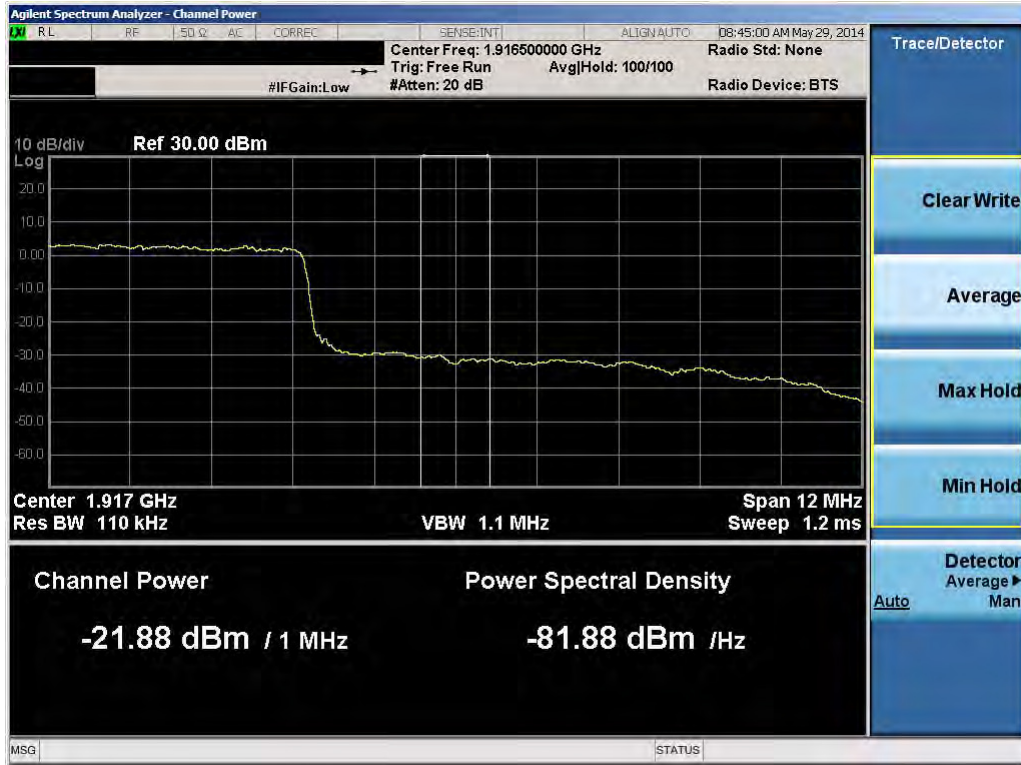


Plot 7-38. Conducted Spurious Plot (15.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

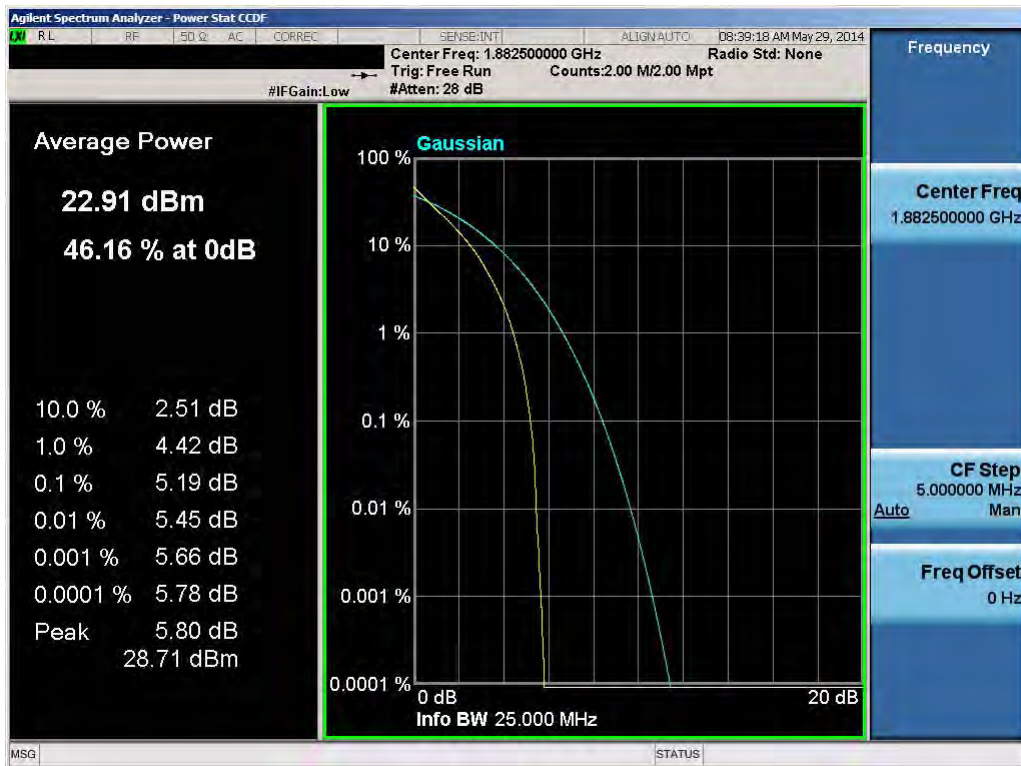


Plot 7-39. Upper Band Edge Plot (15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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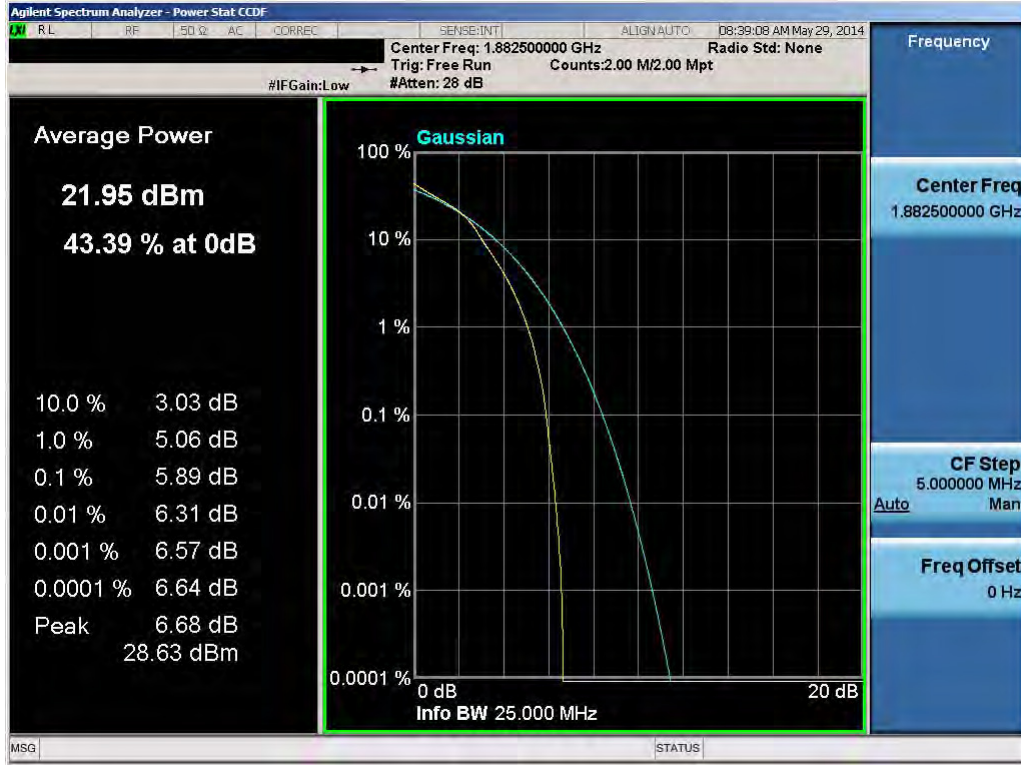


Plot 7-40. Upper Extended Band Edge Plot (15.0MHz QPSK – RB Size 75)

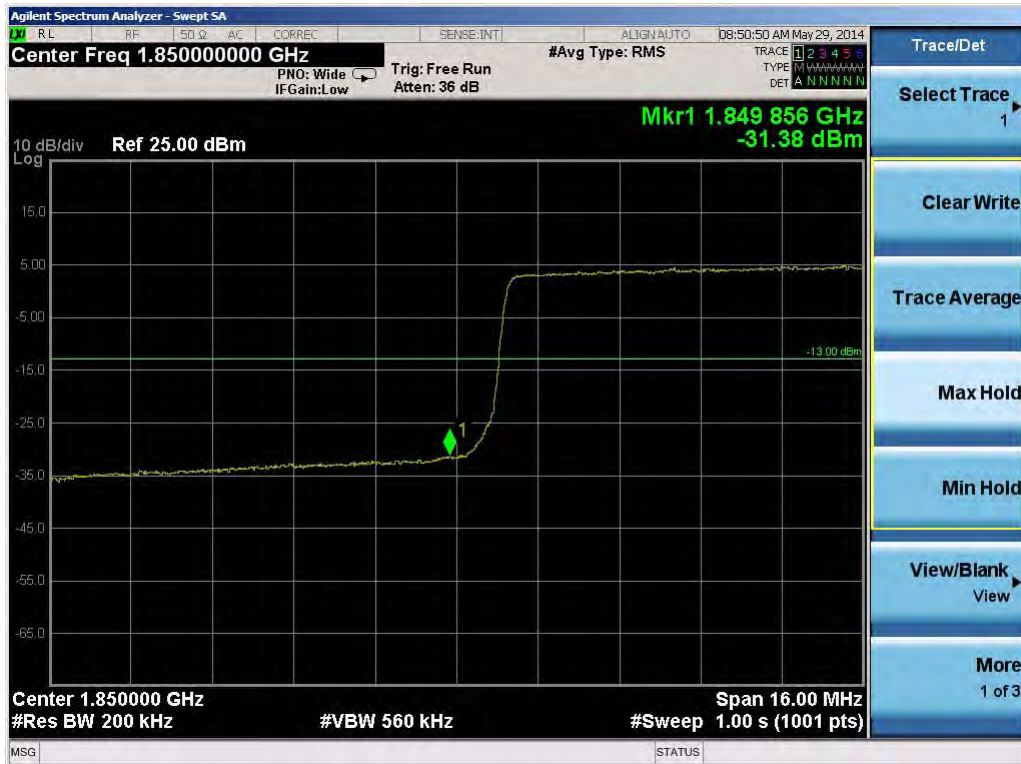


Plot 7-41. PAR Plot (15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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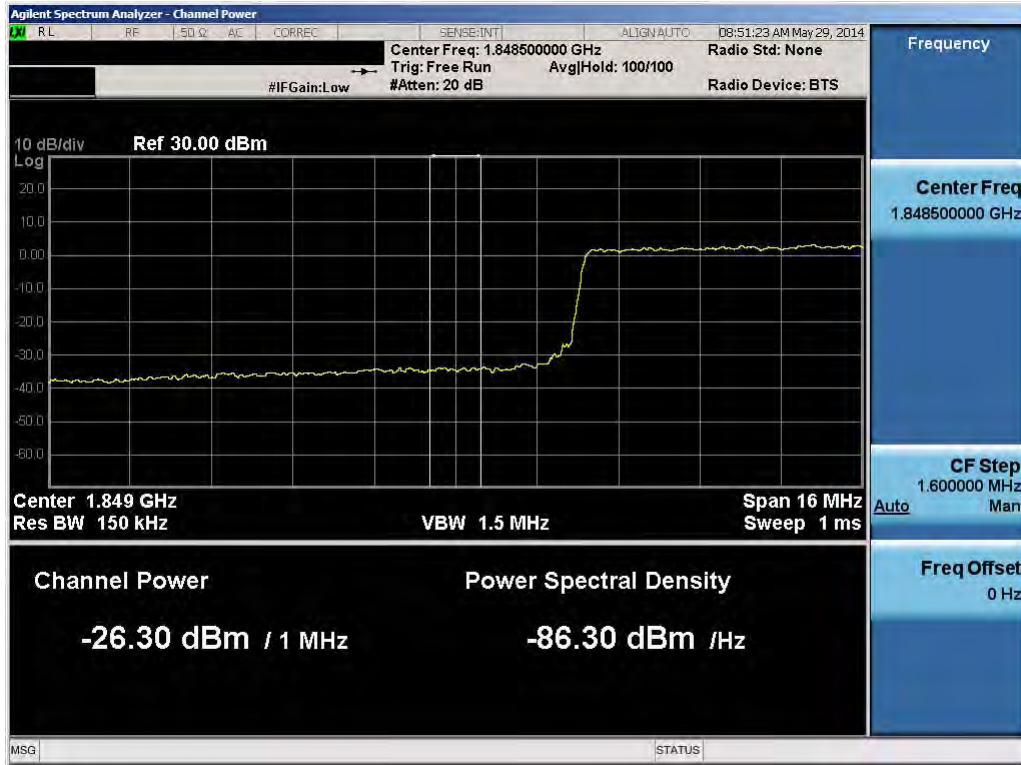


Plot 7-42. PAR Plot (15.0MHz 16-QAM – RB Size 75)

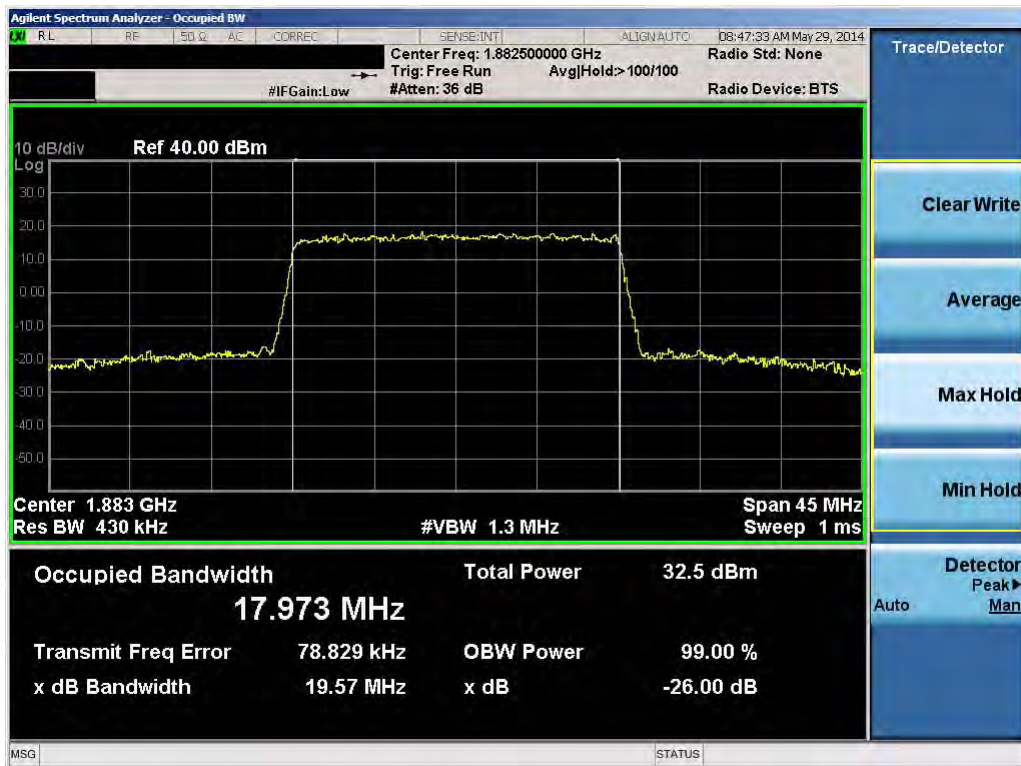


Plot 7-43. Lower Band Edge Plot (20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMN900P	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1405211055.A3L	Test Dates: May 29, 2014	EUT Type: Portable Handset		Page 40 of 48

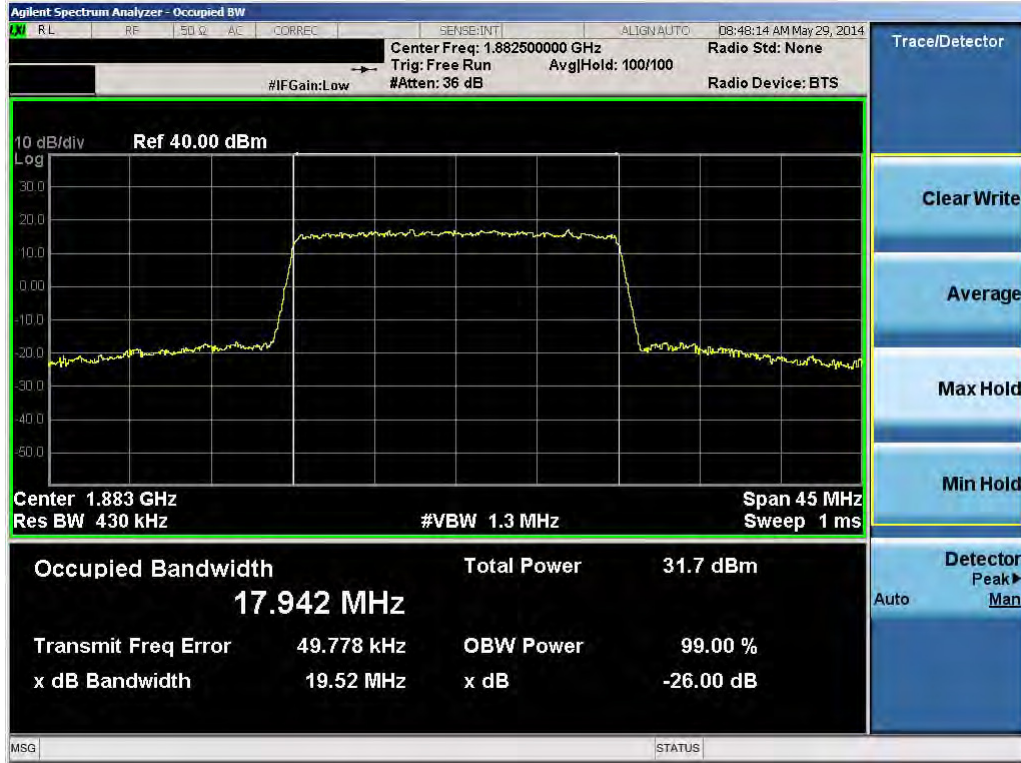


Plot 7-44. Lower Extended Band Edge Plot (20.0MHz QPSK – RB Size 100)

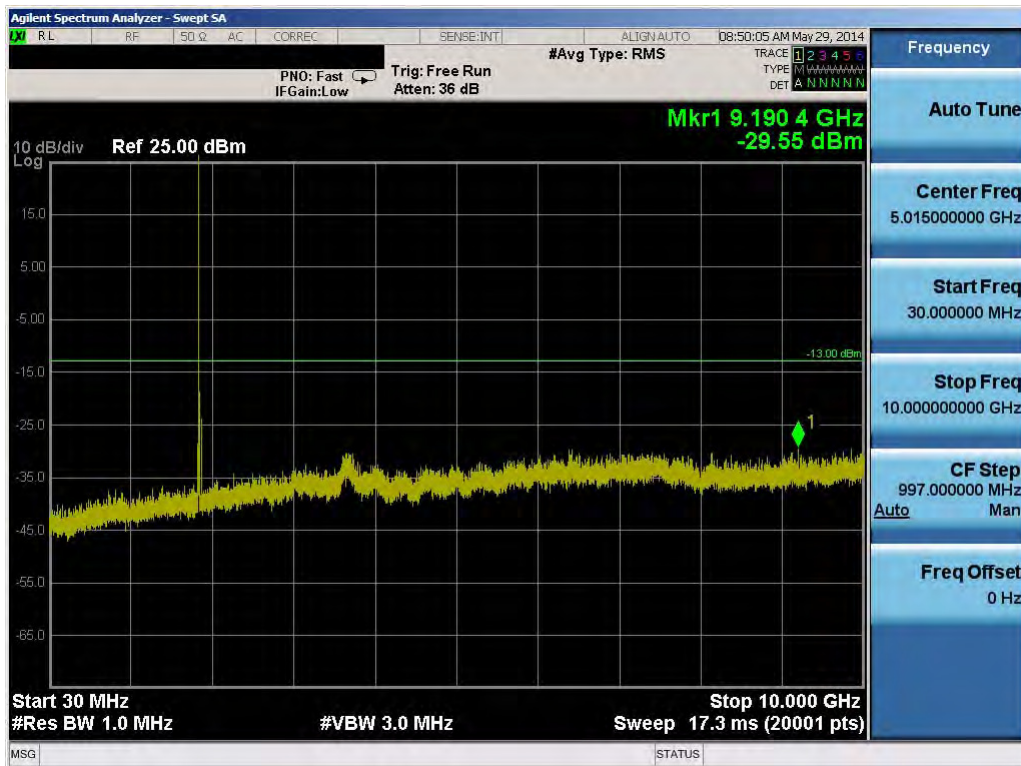


Plot 7-45. Occupied Bandwidth Plot (20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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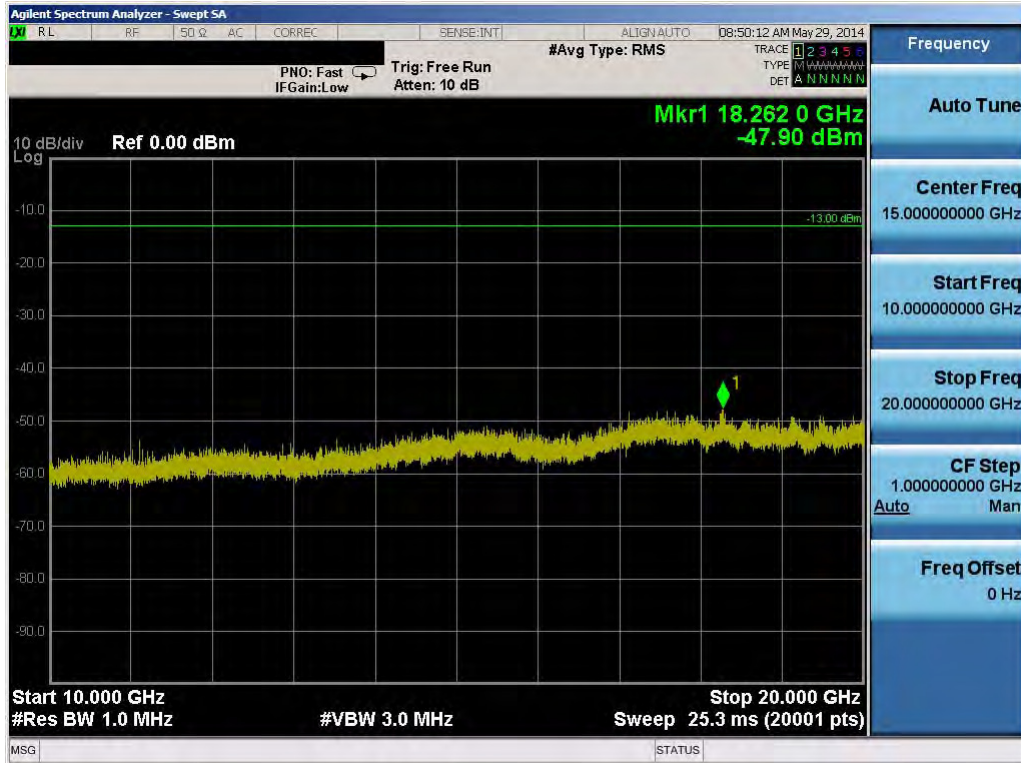


Plot 7-46. Occupied Bandwidth Plot (20.0MHz 16-QAM – RB Size 100)

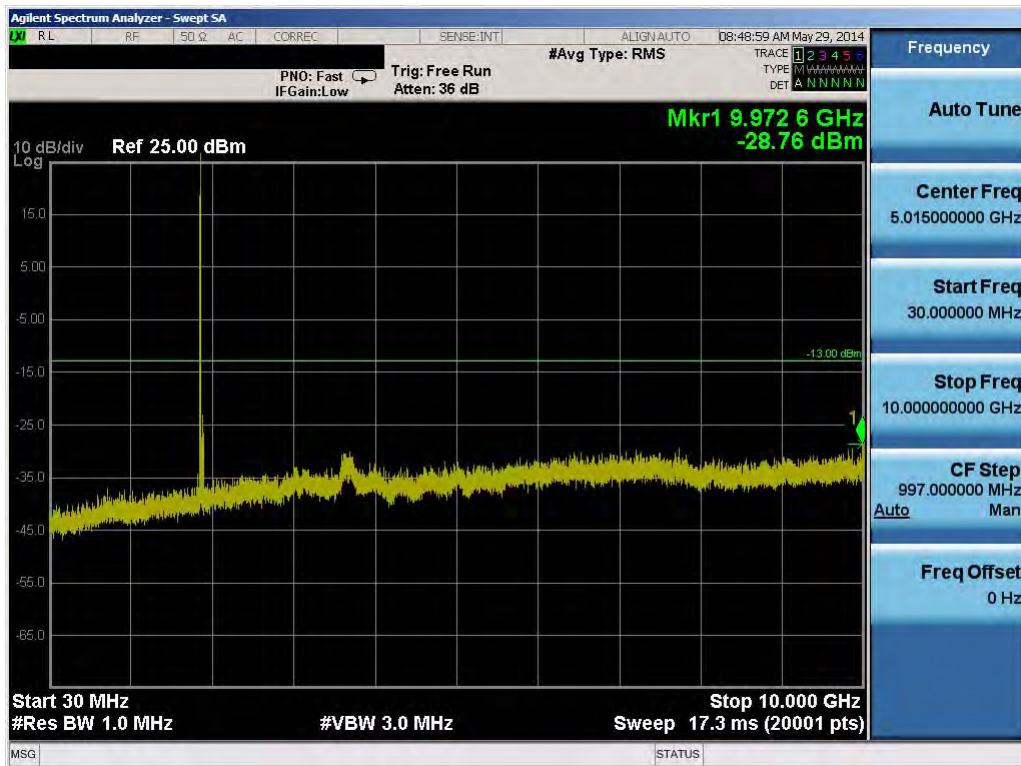


Plot 7-47. Conducted Spurious Plot (20.0MHz QPSK – RB Size 1, RB Offset 0– Low Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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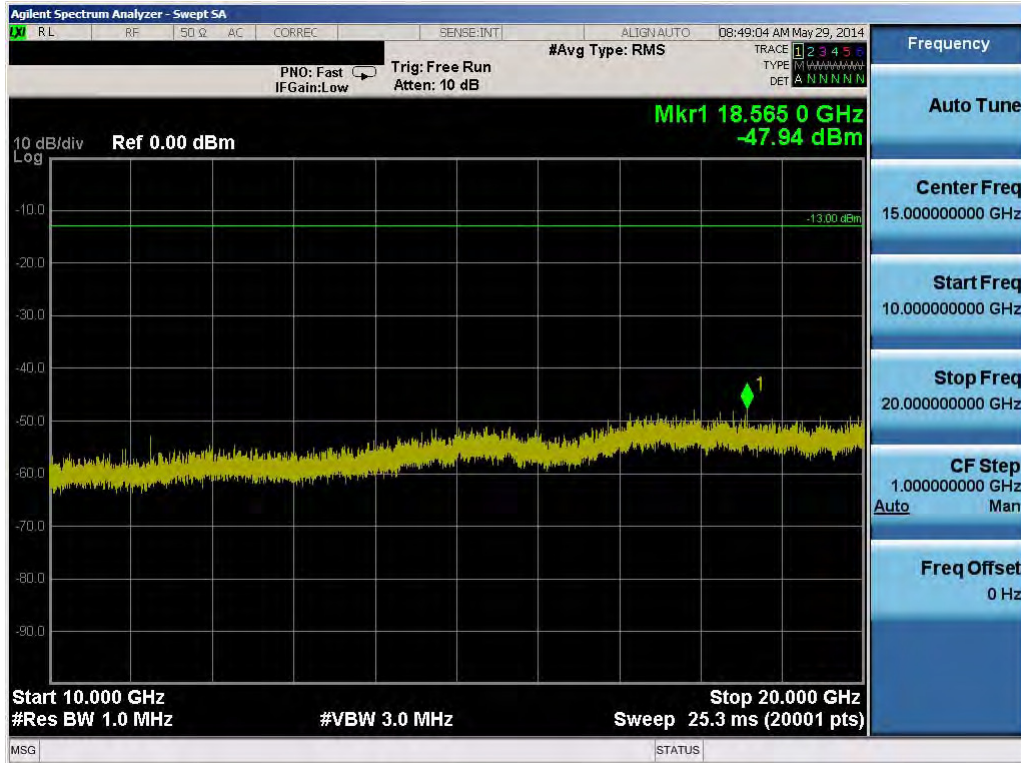


Plot 7-48. Conducted Spurious Plot (20.0MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

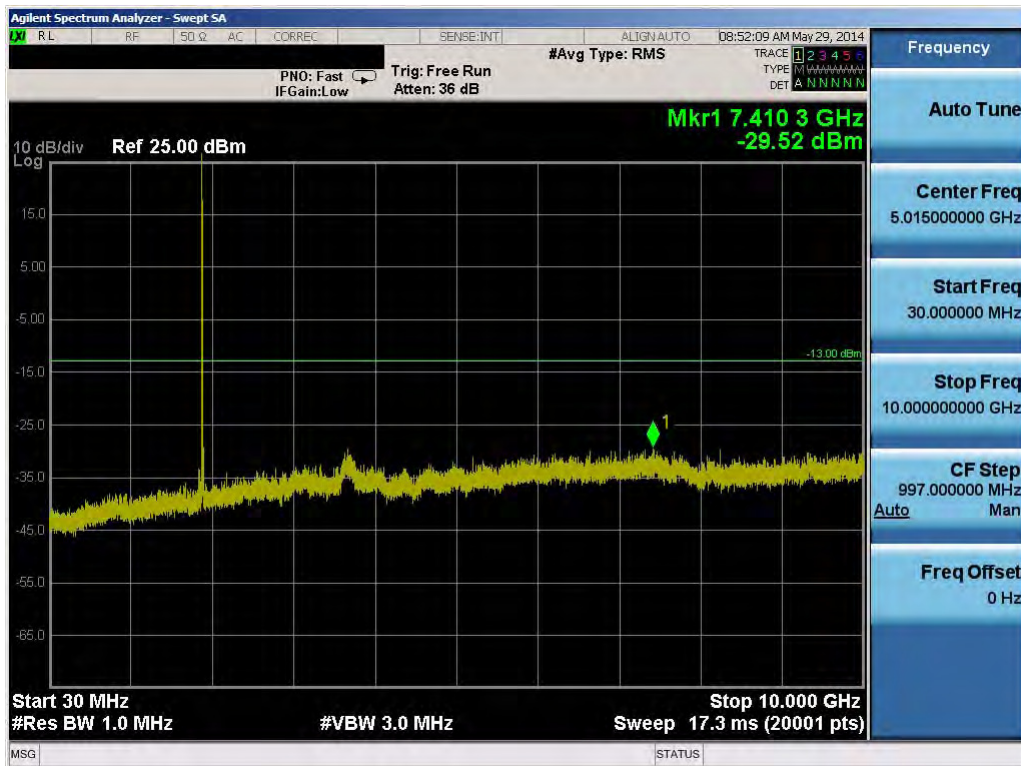


Plot 7-49. Conducted Spurious Plot (20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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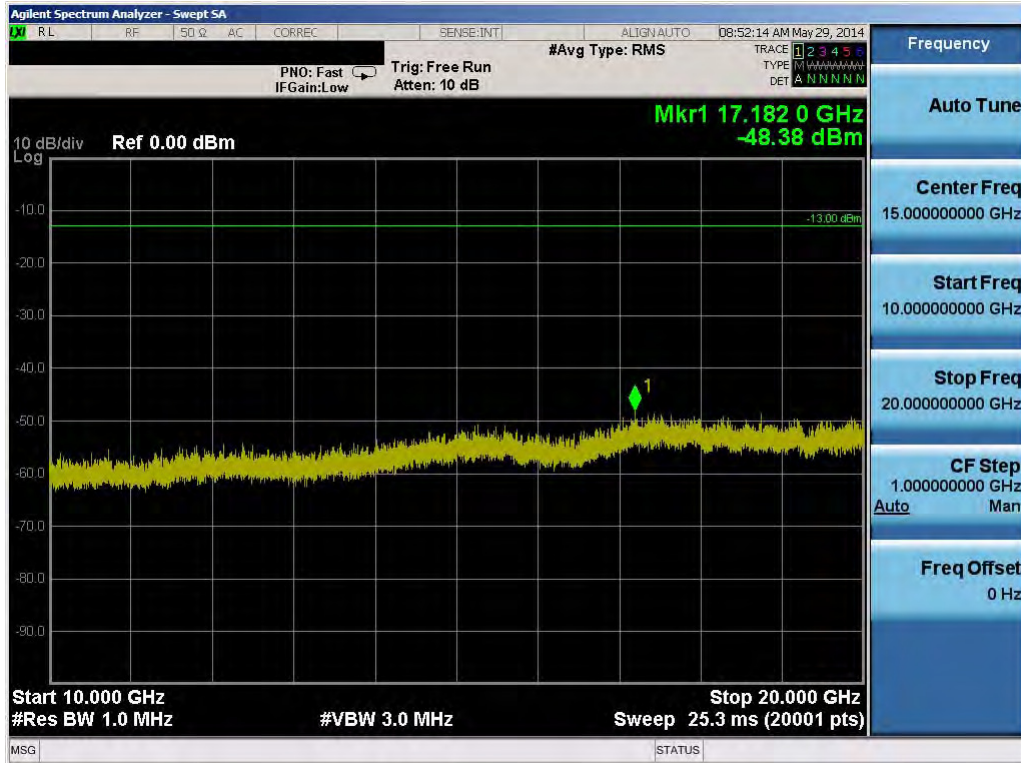


Plot 7-50. Conducted Spurious Plot (20.0MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)



Plot 7-51. Conducted Spurious Plot (20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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Plot 7-52. Conducted Spurious Plot (20.0MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

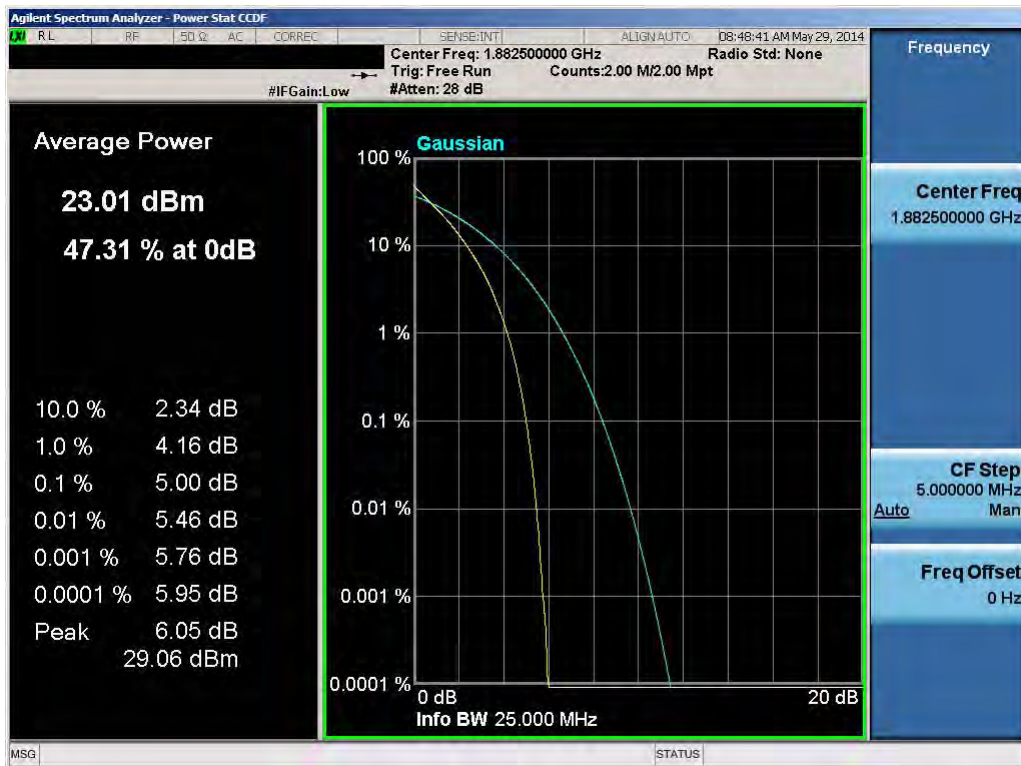


Plot 7-53. Upper Band Edge Plot (20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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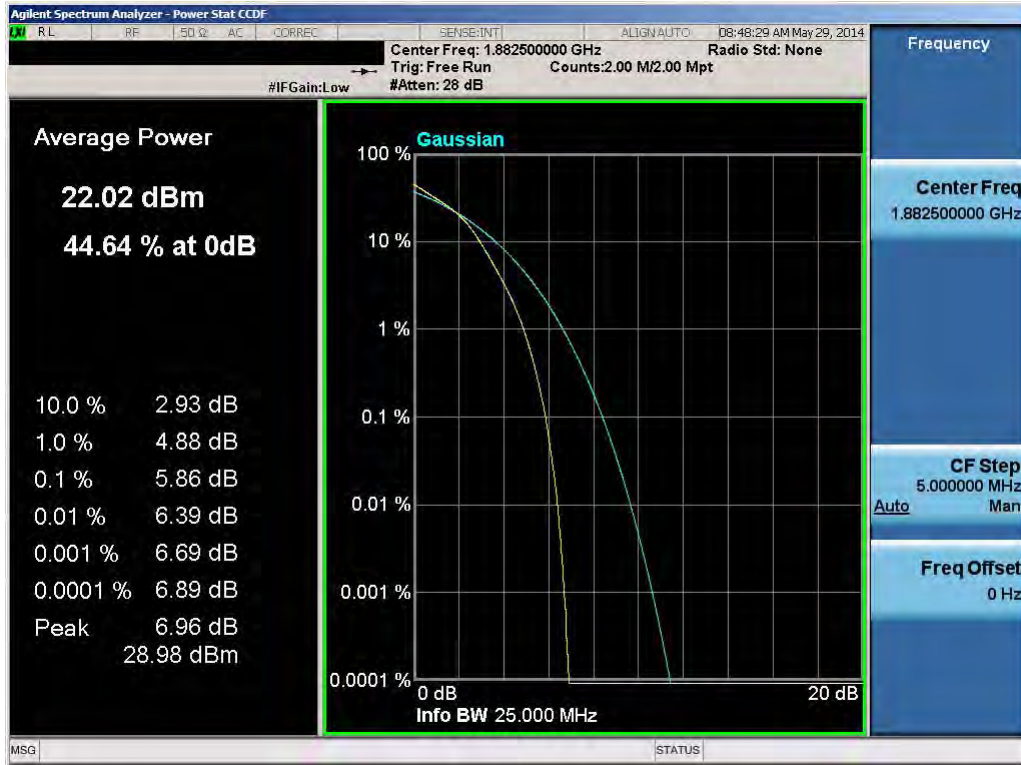


Plot 7-54. Upper Extended Band Edge Plot (20.0MHz QPSK – RB Size 100)



Plot 7-55. PAR Plot (20.0MHz QPSK – RB Size 100)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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Plot 7-56. PAR Plot (20.0MHz 16-QAM – RB Size 100)

FCC ID: A3LSMN900P		FCC Pt. 24 LTE MEASUREMENT REPORT (Class II Permissive Change)		Reviewed by: Quality Manager
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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMN900P** complies with all the requirements of Parts 2, 24 of the FCC rules for LTE operation only.

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