

PCTEST ENGINEERING LABORATORY, INC.

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### MEASUREMENT REPORT FCC Part 22, 24 & 27 LTE

#### **Applicant Name:**

Samsung Electronics Co., Ltd. 416 Maetan 3-Dong, Yeongtong-gu Suwon-si, Gyeonggi-do 443-742, Republic of Korea Date of Testing: 08/23 - 09/07/2012 Test Site/Location: PCTEST Lab., Columbia, MD, USA Test Report Serial No.: 0Y1208281251.A3L

# FCC ID : A3LSCHR950 APPLICANT: SAMSUNG ELECTRONICS CO., LTD. FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)

FCC Classification:PCS Licensed Transmitter Held to Ear (PCE)FCC Rule Part(s):§2; §22; §24; §27EUT Type:Portable HandsetModel(s):SCH-R950Test Device Serial No.:identical prototype [S/N: "10"]

		Channel			ERP	/EIRP
Mode	Tx Frequency	BW	Emission	Modulation	Max.	Max.
	(MHz)	(MHz)	Designator		Power	Power
		()			(W)	(dBm)
LTE Band 12	701.5 - 713.5	5	4M49G7W	QPSK	0.022	13.37
LTE Band 12	701.5 - 713.5	5	4M49W7W	16QAM	0.017	12.38
LTE Band 12	704 - 711	10	8M98G7W	QPSK	0.023	13.53
LTE Band 12	704 - 711	10	8M96W7W	16QAM	0.018	12.56
LTE Band 5	826.5 - 846.5	5	4M48G7W	QPSK	0.116	20.65
LTE Band 5	826.5 - 846.5	5	4M47W7W	16QAM	0.091	19.61
LTE Band 5	829 - 844	10	8M97G7W	QPSK	0.109	20.39
LTE Band 5	829 - 844	10	8M96W7W	16QAM	0.090	19.53
LTE Band 4	1712.5 - 1752.5	5	4M48G7W	QPSK	0.035	15.39
LTE Band 4	1712.5 - 1752.5	5	4M48W7W	16QAM	0.027	14.30
LTE Band 4	1715 - 1750	10	8M93G7W	QPSK	0.039	15.93
LTE Band 4	1715 - 1750	10	8M94W7W	16QAM	0.032	15.04
LTE Band 2	1852.5 - 1907.5	5	4M48G7W	QPSK	0.069	18.39
LTE Band 2	1852.5 - 1907.5	5	4M48W7W	16QAM	0.055	17.42
LTE Band 2	1855 - 1905	10	8M96G7W	QPSK	0.065	18.12
LTE Band 2	1855 - 1905	10	8M96W7W	16QAM	0.052	17.14

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.

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.

andy Ortanez President



FCC ID: A3LSCHR950		PCTEST	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT	Reviewed by:
		····· V (**)******************	(CERTIFICATION)	Quality Manager
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### MEASUREMENT REPORT FCC Part 22, 24 & 27



#### §2.1033 General Information

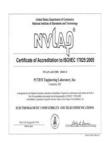
APPLICANT:	Samsung Electronics Co., Ltd.
APPLICANT ADDRESS:	416 Maetan 3-Dong, Yeongtong-gu
	Suwon-si, Gyeonggi-do, 443-742, Republic of Korea
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	7185 Oakland Mills Road, Columbia, MD 21045 USA
FCC RULE PART(S):	§2; §22; §24; §27
BASE MODEL:	SCH-R950
FCC ID:	A3LSCHR950
FCC CLASSIFICATION:	PCS Licensed Transmitter Held to Ear (PCE)
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)
Test Device Serial No.:	"10"
DATE(S) OF TEST:	08/23 - 09/07/2012
TEST REPORT S/N:	0Y1208281251.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. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules.
- 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.



- 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 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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#### INTRODUCTION 1.0

#### 1.1 Scope

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

#### 1.2 Testing Facility

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

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

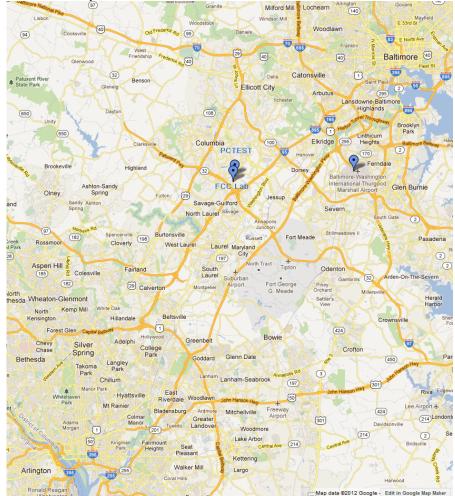


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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### 2.0 PRODUCT INFORMATION

#### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSCHR950**. 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:

850/1700/1900 CDMA/EvDO Rev 0 (BC0, BC15, BC1), Band 2, 4, 5, 12 (5MHz/10MHz BW) LTE, 802.11a/b/g/n WLAN (DTS/NII), Bluetooth (1x,EDR, LE), NFC

**Note:** This device allows for simultaneous transmission of 1x CDMA with LTE (SVLTE). See Section 3.13 for more information on SVLTE capabilities.

#### 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(a)(5).

Please see attachment for FCC ID label and label location.

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#### **DESCRIPTION OF TESTS** 3.0

#### 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) was used in the measurement of the Samsung Portable Handset FCC ID: A3LSCHR950.

#### **Block A Frequency Range** 3.2 §27.5(c)

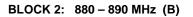
698-746 MHz band. The following frequencies are available for licensing pursuant to this part in the 698-746 MHz band: (1) Three paired channel blocks of 12 megahertz each are available for assignment as follows:

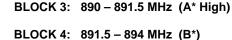
Block A: 698-704 MHz and 728-734 MHz; Block B: 704-710 MHz and 734-740 MHz; and Block C: 710-716 MHz and 740-746 MHz.

#### 3.3 **Cellular - Base Frequency Blocks**

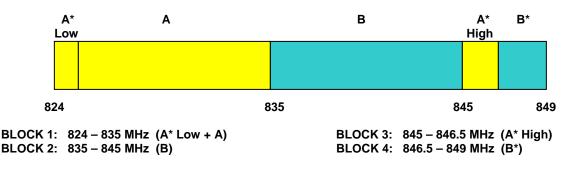


BLOCK 1: 869 - 880 MHz (A\* Low + A)

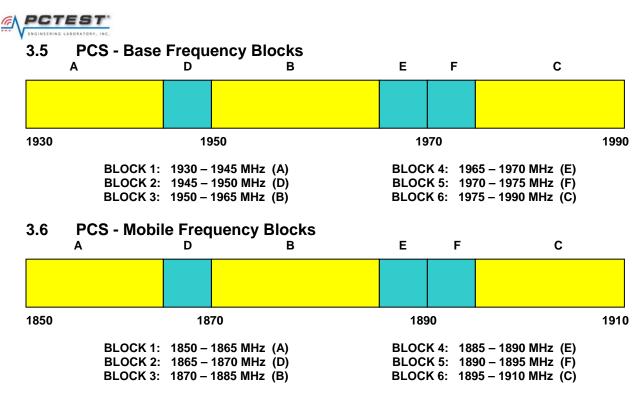




#### 3.4 **Cellular - Mobile Frequency Blocks**



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#### 3.7 AWS - Base Frequency Blocks

§27.5(h)

			BASE				
2110	0 21	20 21	30 21	35 21	40 21	45	2155
	А	В	с	D	E	F	
	BLOCK 2: 21	10 – 2120 MHz (A) 20 – 2130 MHz (B) 30 – 2135 MHz (C)		BLOCK	( 5:   2140 -	- - 2140 MHz (D) - 2145 MHz (E) - 2155 MHz (E)	



<u>§27.5(h)</u>

			MOBILE				
1710	17	20 17	7 <b>30</b> 17	735 17 	40 17	45	1755
	A	в	с	D	E	F	
		10 – 1720 MHz (A)				1740 MHz (D)	

BLOCK 2: 1720 – 1730 MHz (B) BLOCK 3: 1730 – 1735 MHz (C) BLOCK 4: 1735 – 1740 MHz (D) BLOCK 5: 1740 – 1745 MHz (E) BLOCK 6: 1745 – 1755 MHz (F)

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### 3.9 Occupied Bandwidth §2.1049, RSS-Gen (4.6.1)

The implementation of this test is performed by the spectrum analyzer's occupied bandwidth function. The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

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

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for Parts 22 and 27.53(g) and 1 MHz or greater for Parts 24 and 27.53(h). However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

### 3.11 Peak-Average Ratio

#### §24.232(d), §27.50(d)(5), RSS-133 (6.4)

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

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#### **3.12** Radiated Power and Radiated Spurious Emissions §2.1053, §22.913(a)(2), 22.917(a), 24.232(c), 24.238(a), §27.53(g)(h), 27.50(d)(4), 27.50(c)(10), RSS-132(4.5.1.2), RSS-133 (6.5.1)

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 78cm high PVC support structure is placed on top of the turntable. A 3/4" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

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

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

 $P_{d [dBm]} = P_{g [dBm]} - cable loss_{[dB]} + antenna gain_{[dBd/dBi]}$ 

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  $P_{g \text{ [dBm]}}$  – cable loss  $_{\text{[dB]}}$ .

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 + 10log<sub>10</sub>(Power <sub>[Watts]</sub>) specified in 22.917(a), 24.238(a), and 27.53(g)(h).

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#### **SVLTE Transmission Capabilities** 3.13

This device is capable of operating in SVLTE mode in the following cases:

No.	Capable Transmit Configurations
1	1X CDMA 850 Voice + LTE 700 MHz Data
2	1X CDMA 1700 Voice + LTE 700 MHz Data
3	1X CDMA 1900 Voice + LTE 700 MHz Data
4	1X CDMA 850 Voice + LTE 800 MHz Data
5	1X CDMA 1700 Voice + LTE 800 MHz Data
6	1X CDMA 1900 Voice + LTE 800 MHz Data
7	1X CDMA 850 Voice + LTE 1700 MHz Data
8	1X CDMA 1700 Voice + LTE 1700 MHz Data
9	1X CDMA 1900 Voice + LTE 1700 MHz Data
10	1X CDMA 850 Voice + LTE 1900 MHz Data
11	1X CDMA 1700 Voice + LTE 1900 MHz Data
12	1X CDMA 1900 Voice + LTE 1900 MHz Data

Table 3-1. SVLTE Transmit Configurations

All modes of SVLTE operation were investigated. It was determined that this device did not produce any intermodulation products that were within 25dB of the spurious emission limit so the emissions are not shown in this report.

#### 3.14 Frequency Stability / Temperature Variation §2.1055, 22.355, 24.235, §27.54, RSS-132 (4.3), RSS-133 (6.3)

The frequency stability of the transmitter is measured by:

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

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

#### Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).

2. The equipment is turned on in a "standby" condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A sufficient stabilization period at each temperature shall be used prior to each frequency requirement.

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### 4.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	LTx1	Licensed Transmitter Cable Set	1/25/2012	Annual	1/25/2013	N/A
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/10/2012	Annual	7/10/2013	N/A
-	RE2	Radiated Emissions Cable Set (VHF/UHF)	2/13/2012	Annual	2/13/2013	N/A
Agilent	8447D	Broadband Amplifier	5/8/2012	Annual	5/8/2013	1937A03348
Agilent	E8257D	(250kHz-20GHz) Signal Generator	4/5/2012	Annual	4/5/2013	MY45470194
Agilent	N9020A	MXA Signal Analyzer	10/10/2011	Annual	10/10/2012	US46470561
Espec	ESX-2CA	Environmental Chamber	4/4/2012	Annual	4/4/2013	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Biennial	7/22/2013	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	5/30/2012	Biennial	5/30/2014	135427
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	10/1/2010	Biennial	10/1/2012	128337
Mini-Circuits	VHF-1200+	High Pass Filter	1/15/2012	Annual	1/15/2013	30923
Mini-Circuits	VHF-3100+	High Pass Filter	1/15/2012	Annual	1/15/2013	30841
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Biennial	10/7/2013	103962
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	6/26/2012	Annual	6/26/2013	100071
Rohde & Schwarz	TS-PR26	18-26.5 GHz Pre-Amplifier	5/30/2012	Annual	5/30/2013	100040
Rohde & Schwarz	ESU26	EMI Test Receiver	12/15/2011	Annual	12/15/2012	100342
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/14/2011	Biennial	11/14/2013	9105-2404
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107

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 2<sup>nd</sup> 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:	A3LSCHR950
FCC Classification:	PCS Licensed Transmitter Held to Ear (PCE)
Mode(s):	LTE

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Result	Reference		
TRANSMITTER MO	TRANSMITTER MODE (TX)							
2.1049	RSS-Gen (4.6.1) RSS-133 (2.3)	Occupied Bandwidth	N/A		PASS	Section 7.0, 8.0, 9.0, 10.0		
2.1051, 22.917(a), 24.238(a), 27.53(g)(h)	RSS-133 (6.5.1)	Band Edge / Conducted Spurious Emissions	< 43 + 10log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of-band emissions	CONDUCTED	PASS	Section 7.0, 8.0, 9.0, 10.0		
24.232(d), 27.50(d)(5)	RSS-133 (6.4)	Peak-Average Ratio	< 13 dB		PASS	Section 9.0, 10.0		
2.1046	RSS-132 (4.4) RSS-133 (4.1)	Transmitter Conducted Output Power	N/A		PASS	See RF Exposure Report		
22.913(a)(2)	RSS-132 (4.4) [SRSP- 503(5.1.3)]	Effective Radiated Power (Band 5)	< 7 Watts max. ERP		PASS	Section 6.2		
27.50(c)(10)	N/A	Effective Radiated Power (Band 12)	< 3 Watts max. ERP		PASS	Section 6.2		
24.232(c)	RSS-133 (6.4) [SRSP-510 (5.1.2)]	Equivalent Isotropic Radiated Power (Band 2)	< 2 Watts max. EIRP		PASS	Section 6.3		
27.50(d)(4)	N/A	Equivalent Isotropic Radiated Power (Band 4)	< 1 Watts max. EIRP	RADIATED	PASS	Section 6.3		
2.1053, 27.53(g)(h), 22.917(a), 24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Undesirable Emissions	< 43 + 10log <sub>10</sub> (P[Watts]) for all out-of-band emissions		PASS	Section 6.4, 6.5, 6.6, 6.7		
2.1055, 27.54, 22.355, 24.235	RSS-132 (4.3) RSS-133 (6.3)	Frequency Stability	< 2.5 ppm (Part 22) and fundamental emissions stay within authorized frequency block (Part 24, 27)		PASS	Section 6.8, 6.9, 6.10, 6.11		

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

<u>Notes:</u> 1) All modulations, RB configurations, and channel bandwidths were investigated. The test results shown in the following sections represent the worst case emissions.

2) The analyzer plots shown in Sections 7.0, 8.0, 9.0, and 10.0 were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.

3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.

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#### 6.2 Effective Radiated Power (ERP) §22.913(a)(2), §27.50(c)(10)

Freq [MHz]	BW [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	Margin [dB]
701.5	5	QPSK	Standard	1/0	11.32	2.05	Н	13.37	0.022	-21.40
707.5	5	QPSK	Standard	1/24	10.19	2.14	н	12.33	0.017	-22.44
713.5	5	QPSK	Standard	1/0	9.22	2.23	Н	11.45	0.014	-23.32
701.5	5	16-QAM	Standard	1/0	10.33	2.05	Н	12.38	0.017	-22.39
707.5	5	16-QAM	Standard	1/24	9.07	2.14	Н	11.21	0.013	-23.56
713.5	5	16-QAM	Standard	1/0	8.15	2.23	Н	10.38	0.011	-24.39
704.0	10	QPSK	Standard	1/0	11.48	2.05	Н	13.53	0.023	-21.24
707.5	10	QPSK	Standard	1/0	10.46	2.14	Н	12.60	0.018	-22.17
711.0	10	QPSK	Standard	1/0	9.64	2.23	Н	11.87	0.015	-22.90
704.0	10	16-QAM	Standard	1/0	10.51	2.05	Н	12.56	0.018	-22.21
707.5	10	16-QAM	Standard	1/0	9.31	2.14	Н	11.45	0.014	-23.32
711.0	10	16-QAM	Standard	1/0	8.55	2.23	Н	10.78	0.012	-23.99

Table 6-2. ERP Data (Band 12)

Freq [MHz]	BW [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	Margin [dB]
826.5	5	QPSK	Standard	1/24	15.17	4.71	V	19.88	0.097	-18.57
836.5	5	QPSK	Standard	1/24	15.13	4.80	V	19.93	0.099	-18.52
846.5	5	QPSK	Standard	1/0	15.75	4.90	V	20.65	0.116	-17.81
826.5	5	16-QAM	Standard	1/24	14.10	4.71	V	18.81	0.076	-19.64
836.5	5	16-QAM	Standard	1/24	14.15	4.80	V	18.95	0.079	-19.50
846.5	5	16-QAM	Standard	1/0	14.71	4.90	V	19.61	0.091	-18.85
829.0	10	QPSK	Standard	1/0	15.26	4.71	V	19.97	0.099	-18.48
836.5	10	QPSK	Standard	1/24	15.27	4.80	V	20.07	0.102	-18.38
844.0	10	QPSK	Standard	1/24	15.49	4.90	V	20.39	0.109	-18.07
829.0	10	16-QAM	Standard	1/0	14.33	4.71	V	19.04	0.080	-19.41
836.5	10	16-QAM	Standard	1/24	14.41	4.80	V	19.21	0.083	-19.24
844.0	10	16-QAM	Standard	1/24	14.63	4.90	V	19.53	0.090	-18.93

Table 6-3. ERP Data (Band 5)

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

3. The worst case test configuration was found in the horizontal polarization setup for all bands except Band 5 where the worst case setup was vertical polarization.

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#### 6.3 Equivalent Isotropic Radiated Power (EIRP) §27.50(d)(4), §24.232(c)

Freq [MHz]	BW [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
1712.5	5	QPSK	Standard	1/24	5.01	8.47	Н	13.48	0.022	-16.52
1732.5	5	QPSK	Standard	1/0	5.06	8.54	Н	13.60	0.023	-16.40
1752.5	5	QPSK	Standard	1/24	6.79	8.60	Н	15.39	0.035	-14.61
1712.5	5	16-QAM	Standard	1/24	4.00	8.47	Н	12.47	0.018	-17.53
1732.5	5	16-QAM	Standard	1/0	4.11	8.54	Н	12.65	0.018	-17.35
1752.5	5	16-QAM	Standard	1/24	5.70	8.60	Н	14.30	0.027	-15.70
1715.0	10	QPSK	Standard	1/49	6.27	8.47	Н	14.74	0.030	-15.26
1732.5	10	QPSK	Standard	1/0	7.39	8.54	Н	15.93	0.039	-14.07
1750.0	10	QPSK	Standard	1/49	7.12	8.60	Н	15.72	0.037	-14.28
1715.0	10	16-QAM	Standard	1/49	5.31	8.47	Н	13.78	0.024	-16.22
1732.5	10	16-QAM	Standard	1/0	6.50	8.54	Н	15.04	0.032	-14.96
1750.0	10	16-QAM	Standard	1/49	6.07	8.60	Н	14.67	0.029	-15.33

Table 6-4. EIRP Data (Band 4)

Freq [MHz]	BW [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
1852.5	5	QPSK	Standard	1/0	9.83	8.56	Н	18.39	0.069	-14.62
1880.0	5	QPSK	Standard	1/0	9.50	8.55	Н	18.05	0.064	-14.96
1907.5	5	QPSK	Standard	1/0	8.61	8.54	Н	17.15	0.052	-15.86
1852.5	5	16-QAM	Standard	1/0	8.86	8.56	Н	17.42	0.055	-15.59
1880.0	5	16-QAM	Standard	1/0	8.35	8.55	Н	16.90	0.049	-16.11
1907.5	5	16-QAM	Standard	1/0	7.50	8.54	Н	16.04	0.040	-16.97
1855.0	10	QPSK	Standard	1/0	9.56	8.56	Н	18.12	0.065	-14.89
1880.0	10	QPSK	Standard	1/0	9.19	8.55	Н	17.74	0.059	-15.27
1905.0	10	QPSK	Standard	1/0	8.41	8.54	Н	16.95	0.050	-16.06
1855.0	10	16-QAM	Standard	1/0	8.58	8.56	Н	17.14	0.052	-15.87
1880.0	10	16-QAM	Standard	1/0	8.16	8.55	Н	16.71	0.047	-16.30
1905.0	10	16-QAM	Standard	1/0	7.38	8.54	Н	15.92	0.039	-17.09

Table 6-5. EIRP Data (Band 2)

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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### 6.4 Band 12 Radiated Spurious Emissions §2.1053, §27.53(g)

#### **Field Strength of SPURIOUS Radiation**

704	MHz	
23	060	_
13.53	dBm =	<u>0.023</u> W
QPSK	_	
10 MHz	_	
3	meters	
43 + 10 log <sub>10</sub> (W)	26.53	dBc
	23 13.53 QPSK 10 MHz 3	QPSK 10 MHz 3 meters

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1408.00	-55.04	3.59	-51.45	Н	64.98
2112.00	-58.84	3.88	-54.96	Н	68.49
2816.00	-88.91	5.00	-83.90	Н	97.44
3520.00	-91.71	6.25	-85.46	Н	99.00
4224.00	-90.61	7.21	-83.40	Н	96.94

Table 6-6. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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# Band 12 Radiated Spurious Measurements (continued) §2.1053, §27.53(g)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	707.	50	MHz
CHANNEL:	230	95	_
EASURED OUTPUT POWER:	12.60	dBm =	<u>0.018</u> W
MODULATION SIGNAL:	QPSK	-	
BANDWIDTH:	10 MHz	-	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	25.60	dBc
			-

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1415.00	-55.94	3.64	-52.30	Н	64.90
2122.50	-58.92	3.90	-55.02	Н	67.62
2830.00	-88.76	5.02	-83.75	Н	96.35
3537.50	-91.60	6.25	-85.35	Н	97.95
4245.00	-90.68	7.24	-83.44	Н	96.04

Table 6-7. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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#### Band 12 Radiated Spurious Measurements (continued) §2.1053, §27.53(g)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	711.	00	MHz
CHANNEL:	231	30	_
EASURED OUTPUT POWER:	11.87	dBm =	<u>0.015</u> W
MODULATION SIGNAL:	QPSK	-	
BANDWIDTH:	10 MHz	-	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	24.87	dBc
			-

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1422.00	-55.85	3.69	-52.16	Н	64.03
2133.00	-59.68	3.92	-55.75	Н	67.62
2844.00	-88.62	5.03	-83.59	Н	95.46
3555.00	-91.48	6.25	-85.23	Н	97.10
4266.00	-90.70	7.25	-83.45	Н	95.32

Table 6-8. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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#### 6.5 Band 5 Radiated Spurious Emissions §2.1053, 22.917(a); RSS-132 (4.5.1)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	826.50		MHz	
CHANNEL:	204	20425		
EASURED OUTPUT POWER:	19.88	dBm =	0.097 W	
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5 MHz			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W)	32.88	dBc	

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1653.00	-46.75	2.50	-44.25	V	64.13
2479.50	-45.01	2.82	-42.19	V	62.07
3306.00	-45.13	5.52	-39.61	V	59.50
4132.50	-44.07	7.08	-36.99	V	56.87
4959.00	-52.39	7.91	-44.48	V	64.36

Table 6-9. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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# Band 5 Radiated Spurious Measurements (continued) §2.1053, 22.917(a); RSS-132 (4.5.1)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.	.50	MHz
CHANNEL:	205	25	_
EASURED OUTPUT POWER:	19.93	dBm =	<u>0.099</u> W
MODULATION SIGNAL:	QPSK	-	
BANDWIDTH:	5 MHz	_	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	32.93	dBc
			-

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1673.00	-37.48	2.34	-35.14	V	55.07
2509.50	-47.80	2.84	-44.96	V	64.90
3346.00	-48.57	5.64	-42.92	V	62.86
4182.50	-41.12	7.14	-33.97	V	53.91
5019.00	-52.66	7.97	-44.69	V	64.62

Table 6-10. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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# Band 5 Radiated Spurious Measurements (continued) §2.1053, 22.917(a); RSS-132 (4.5.1)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:		50	MHz
CHANNEL:	206	25	_
EASURED OUTPUT POWER:	20.65	dBm =	0.116 W
MODULATION SIGNAL:	QPSK	-	
BANDWIDTH:	5 MHz	_	
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10}(W) =$	33.65	dBc
			-

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1693.00	-42.64	2.18	-40.46	V	61.10
2539.50	-44.21	3.04	-41.17	V	61.81
3386.00	-48.55	5.76	-42.78	V	63.43
4232.50	-48.16	7.20	-40.96	V	61.60
5079.00	-54.78	8.00	-46.78	V	67.42

Table 6-11. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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# 6.6 Band 4 Radiated Spurious Emissions §2.1053, §27.53(h)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	171	MHz	
CHANNEL:	199	975	_
EASURED OUTPUT POWER:	13.48	dBm =	0.022 W
MODULATION SIGNAL:	QPSK	- -	
BANDWIDTH:	5 MHz	_	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W)	26.48	dBc

LEVEL @ ANTENNA TERMINALS (dBm)	SUB STITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
-50.13	8.09	-42.04	Н	55.52
-53.25	10.21	-43.04	Н	56.52
-57.58	11.31	-46.27	Н	59.75
-61.21	13.02	-48.19	Н	61.67
-89.78	13.01	-76.77	Н	90.24
	ANTENNA TERMINALS (dBm) -50.13 -53.25 -57.58 -61.21 -89.78	AN TENNA TER MINALS (dBm)         SUBSTITUTE ANTENNA GAIN (dBi)           -50.13         8.09           -53.25         10.21           -57.58         11.31           -61.21         13.02           -89.78         13.01	AN TENNA TER MINALS (dBm)         SUBSTITUTE ANTENNA GAIN (dBi)         EMISSION LEVEL (dBm)           -50.13         8.09         -42.04           -53.25         10.21         -43.04           -57.58         11.31         -46.27           -61.21         13.02         -48.19	AN TENNA TER MINALS (dBm)         SUBSTITUTE ANTENNA GAIN (dBi)         EMISSION LEVEL (dBm)         POL (H/V)           -50.13         8.09         -42.04         H           -53.25         10.21         -43.04         H           -57.58         11.31         -46.27         H           -61.21         13.02         -48.19         H

Table 6-12. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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#### Band 4 Radiated Spurious Measurements (continued) §2.1053, §27.53(h)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1732	.50	MHz
CHANNEL:	201	75	
EASURED OUTPUT POWER:	13.60	dBm =	W
MODULATION SIGNAL:	QPSK	-	
BANDWIDTH:	5 MHz	_	
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10} (W) =$	26.60	dBc
			_

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3465.00	-52.03	8.26	-43.76	Н	57.36
5197.50	-49.16	10.26	-38.90	Н	52.51
6930.00	-56.16	11.42	-44.74	Н	58.34
8662.50	-55.78	13.07	-42.71	Н	56.31
10395.00	-89.82	13.12	-76.70	н	90.30

Table 6-13. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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#### Band 4 Radiated Spurious Measurements (continued) §2.1053, §27.53(h)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1752	MHz	
CHANNEL:	203	75	_
EASURED OUTPUT POWER:	15.39	dBm =	<u>0.035</u> W
MODULATION SIGNAL:	QPSK	-	
BANDWIDTH:	5 MHz	_	
DISTANCE:	3	meters	
LIMIT:	$43 + 10 \log_{10} (W) =$	28.39	dBc
			-

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3505.00	-47.47	8.40	-39.07	Н	54.46
5257.50	-52.67	10.32	-42.35	Н	57.74
7010.00	-57.65	11.51	-46.14	н	61.52
8762.50	-60.05	13.11	-46.94	Н	62.33
10515.00	-89.67	13.20	-76.47	Н	91.86

Table 6-14. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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### 6.7 Band 2 Radiated Spurious Emissions §2.1053, 24.238(a); RSS-133 (6.5.1)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	185	MHz		
CHANNEL:	186	18625		
EASURED OUTPUT POWER:	18.39	dBm =	0.069 W	
MODULATION SIGNAL:	QPSK			
BANDWIDTH:	5 MHz			
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	31.39	dBc	

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUB STITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3705.00	-37.38	8.40	-28.98	Н	47.37
5557.50	-40.28	10.63	-29.65	Н	48.04
7410.00	-35.40	11.84	-23.57	Н	41.95
9262.50	-51.11	13.29	-37.82	н	56.20
11115.00	-49.08	13.50	-35.58	Н	53.96

#### NOTES:

Table 6-15. Radiated Spurious Data

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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# Band 2 Radiated Spurious Measurements (continued) §2.1053, 24.238(a); RSS-133 (6.5.1)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880	.00	MHz	
CHANNEL:	189	00	_	
EASURED OUTPUT POWER:	18.05	dBm =	0.064 V	Ν
MODULATION SIGNAL:	QPSK	-		
BANDWIDTH:	5 MHz	_		
DISTANCE:	3	meters		
LIMIT:	$43 + 10 \log_{10} (W) =$	31.05	dBc	
			-	

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-39.67	8.42	-31.25	Н	49.30
5640.00	-37.36	10.66	-26.70	Н	44.75
7520.00	-39.72	11.92	-27.80	Н	45.84
9400.00	-54.50	13.24	-41.26	Н	59.31
11280.00	-51.07	13.49	-37.58	Н	55.63

Table 6-16. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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# Band 2 Radiated Spurious Measurements (continued) §2.1053, 24.238(a); RSS-133 (6.5.1)

#### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1907.50		MHz
CHANNEL:	191	75	_
EASURED OUTPUT POWER:	17.15	dBm =	<u>0.052</u> W
MODULATION SIGNAL:	QPSK	-	
BANDWIDTH:	5 MHz	-	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	30.15	dBc
			-

FREQ (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3815.00	-43.11	8.55	-34.56	Н	51.71
5722.50	-36.29	10.69	-25.60	Н	42.75
7630.00	-33.75	12.05	-21.70	Н	38.85
9537.50	-35.83	13.20	-22.63	Н	39.77
11445.00	-45.83	13.43	-32.40	Н	49.55

Table 6-17. Radiated Spurious Data

#### NOTES:

1. This device was tested under all bandwidths, and RB configurations, and modulations. In Band 12 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 10MHz BW. In Bands 4, 5 and 2 LTE, the highest spurious emissions were found in QPSK modulation with RB size = 1 and RB offset = 0 using 5MHz BW.

2. This unit was tested with its standard battery.

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# 6.8 Band 12 Frequency Stability Measurements §2.1055, 27.54

OPERATING FREQUENCY:707,500,000HzCHANNEL:23790

REFERENCE VOLTAGE: 3.7 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	707,500,008	8	0.000001
100 %		- 30	707,499,996	-4	-0.000001
100 %		- 20	707,500,010	10	0.000001
100 %		- 10	707,499,998	-2	0.000000
100 %		0	707,500,004	4	0.000001
100 %		+ 10	707,500,009	9	0.000001
100 %		+ 20	707,500,019	19	0.000003
100 %		+ 30	707,500,006	6	0.000001
100 %		+ 40	707,499,990	-10	-0.000001
100 %		+ 50	707,500,005	5	0.000001
115 %	4.26	+ 20	707,500,008	8	0.000001
85 %	3.41	+ 20	707,500,005	5	0.000001

Table 6-18. Frequency Stability Data (Band 12)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Band 12 Frequency Stability Measurements (Cont'd) §2.1055, 27.54

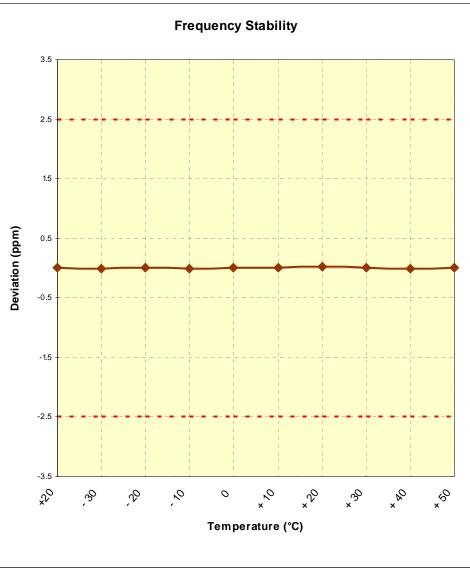


Figure 6-1. Frequency Stability Graph (Band 12)

FCC ID: A3LSCHR950	PCTEST	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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# 6.9 Band 5 Frequency Stability Measurements §2.1055, 22.355; RSS-132 (4.3)

OPERATING FREQUENCY: 836,500,000 Hz

 CHANNEL:
 20525

 REFERENCE VOLTAGE:
 3.7
 VDC

DEVIATION LIMIT: <u>± 0.00025</u> % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	836,500,009	9	0.000001
100 %		- 30	836,500,011	11	0.000001
100 %		- 20	836,500,014	14	0.000002
100 %		- 10	836,499,997	-3	0.000000
100 %		0	836,499,996	-4	0.000000
100 %		+ 10	836,500,004	4	0.000000
100 %		+ 20	836,500,007	7	0.000001
100 %		+ 30	836,499,995	-5	-0.000001
100 %		+ 40	836,499,992	-8	-0.000001
100 %		+ 50	836,500,006	6	0.000001
115 %	4.26	+ 20	836,499,995	-5	-0.000001
85 %	3.41	+ 20	836,500,005	5	0.000001

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

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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# Band 5 Frequency Stability Measurements (Cont'd) §2.1055, 22.355; RSS-132 (4.3)

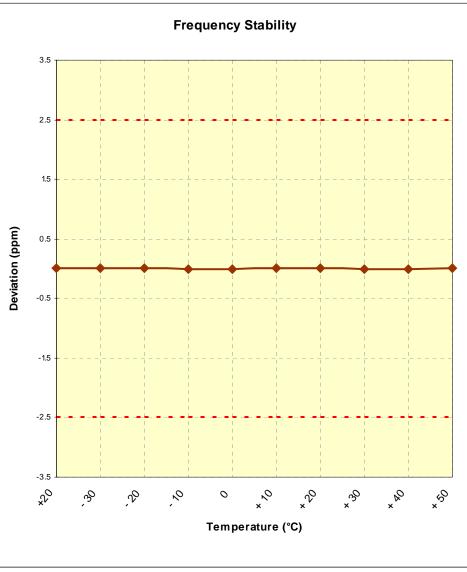


Figure 6-2. Frequency Stability Graph (Band 5)

FCC ID: A3LSCHR950	PCTEST	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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# 6.10 Band 4 Frequency Stability Measurements §2.1055, 27.54

OPERATING FREQUENCY: 1,732,500,000 Hz

CHANNEL: 20175

REFERENCE VOLTAGE: 3.7 VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,732,500,007	7	0.000000
100 %		- 30	1,732,499,987	-13	-0.000001
100 %		- 20	1,732,500,010	10	0.000001
100 %		- 10	1,732,499,986	-14	-0.000001
100 %		0	1,732,499,989	-11	-0.000001
100 %		+ 10	1,732,500,010	10	0.000001
100 %		+ 20	1,732,499,998	-2	0.000000
100 %		+ 30	1,732,499,991	-9	-0.000001
100 %		+ 40	1,732,500,021	21	0.000001
100 %		+ 50	1,732,500,007	7	0.000000
115 %	4.26	+ 20	1,732,499,985	-15	-0.000001
85 %	3.41	+ 20	1,732,500,007	7	0.000000

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

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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12/10/09



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

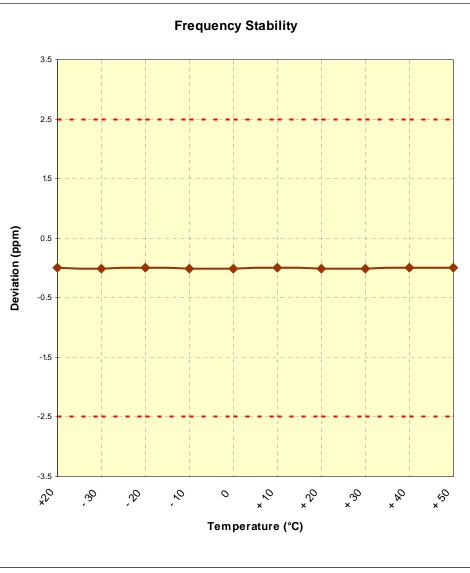


Figure 6-3. Frequency Stability Graph (Band 4)

FCC ID: A3LSCHR950	<u> <u> <u> </u> <u> PCTEST</u> </u></u>	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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### 6.11 Band 2 Frequency Stability Measurements §2.1055, 24.235, RSS-133 (6.3)

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: \_\_\_\_\_ 18900

REFERENCE VOLTAGE: <u>3.7</u> VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,879,999,996	-4	0.000000
100 %		- 30	1,879,999,990	-10	-0.000001
100 %		- 20	1,880,000,008	8	0.000000
100 %		- 10	1,880,000,011	11	0.000001
100 %		0	1,880,000,005	5	0.000000
100 %		+ 10	1,879,999,993	-7	0.000000
100 %		+ 20	1,880,000,004	4	0.000000
100 %		+ 30	1,880,000,010	10	0.000001
100 %		+ 40	1,879,999,987	-13	-0.000001
100 %		+ 50	1,880,000,008	8	0.000000
115 %	4.26	+ 20	1,880,000,017	17	0.000001
85 %	3.41	+ 20	1,880,000,010	10	0.000001

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

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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# Band 2 Frequency Stability Measurements (Cont'd) §2.1055, 24.235, RSS-133 (6.3)

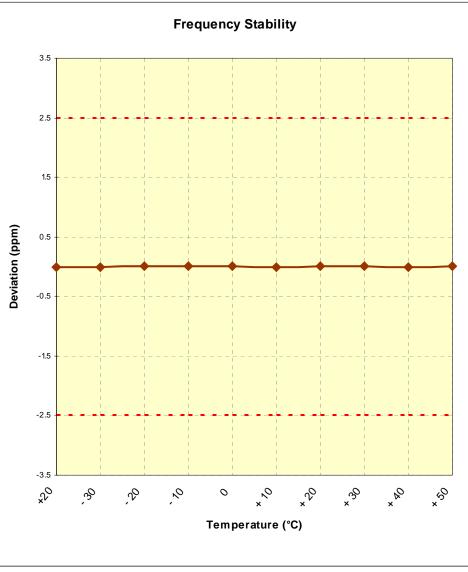


Figure 6-4. Frequency Stability Graph (Band 2)

FCC ID: A3LSCHR950	PCTEST	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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## 7.0 BAND 12 PLOTS OF EMISSIONS



Plot 7-1. Lower Band Edge Plot (5MHz QPSK - RB Size 25)



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Plot 7-3. Occupied Bandwidth Plot (5MHz QPSK – RB Size 25)



Plot 7-4. Occupied Bandwidth Plot (5MHz 16-QAM – RB Size 25)

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Plot 7-5. Occupied Bandwidth Plot (10MHz QPSK – RB Size 50)



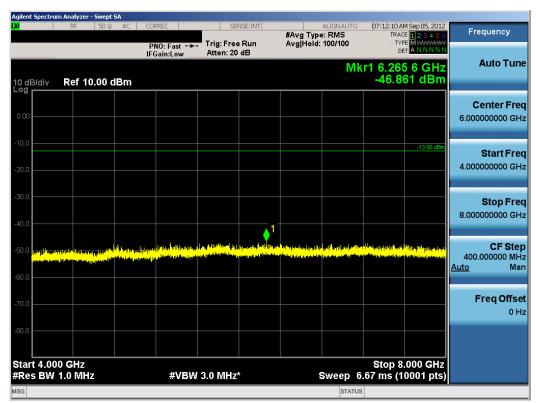
#### Plot 7-6. Occupied Bandwidth Plot (10MHz 16-QAM - RB Size 50)

FCC ID: A3LSCHR950	<u> <u> <u> </u> <u> PCTEST</u> </u></u>	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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			12/10/09



Agilent Spectru	ım Analyzer -	Swept SA								
<mark>l XI</mark>	RF	50 Ω AC	CORREC	SEM	ISE:INT	#Avg Type	ALIGNAUTO	TRAC	M Sep 05, 2012	Frequency
			PNO: Fast ↔	📕 Trig: Free		Avg Hold:		TY		
			IFGain:Low	Atten: 38	dB					Auto Tomo
							Mkr1	3.150 8	17 GHz	Auto Tune
10 dB/div	Ref 28	.00 dBm						-28.2	17 dBm	
10.0										Center Freq
18.0										2.015000000 GHz
8.00										Start Freq
										30.000000 MHz
-2.00										30.000000 MHZ
-12.0									-13.00 dBm	Stop Freq
										4.000000000 GHz
-22.0								1		
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-42.0									<u> </u>	
-52.0										Freq Offset
										0 Hz
-62.0										
<b>0</b> 4	al 1_							<b>O</b> (1 + 1 + 1		
Start 30 M #Res BW		, <u> </u>	#\/P\	V 3.0 MHz*			Swoon_6	Stop 4	.000 GHz 0001 pts)	
			#404	* 3.0 IVINZ				1	ooo r pis)	
MSG							STATUS	3		

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



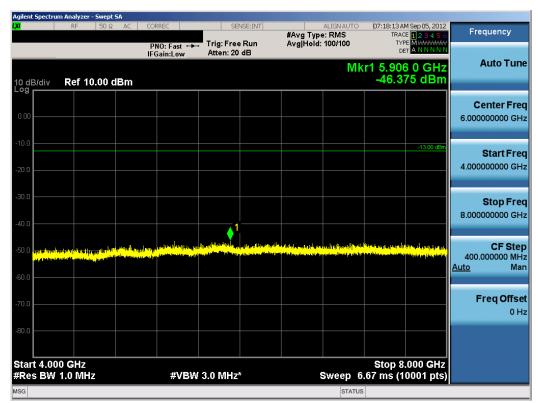
Plot 7-8. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSCHR950	<u> <u> <u> </u> <u> PCTEST</u> </u></u>	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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Agilent Spectru	m Analyzer -	Swept SA								
XI	RF	50 Ω AC	CORREC	SENS	E:INT	#Avg Type	RMS	TRAC	4 Sep 05, 2012	Frequency
			PNO: Fast ↔ IFGain:Low	. Trig: Free F Atten: 38 d		Avg Hold:		TYF De		Auto Tune
10 dB/div Log	Ref 28	.00 dBm	1				MKr1	3.208 7	79 GHz 64 dBm	
18.0										Center Freq 2.015000000 GHz
-2.00										Start Freq 30.000000 MHz
-12.0								1		<b>Stop Freq</b> 4.000000000 GHz
A Self-Self-Self-Self-Self-Self-Self-Self-			lan, a gan a ta sa	ergenetica productor de la companya de la companya Productor de la companya de la company			n die jaar de die best Gewange verste de teel		ernior rateme.	<b>CF Step</b> 397.000000 MHz <u>Auto</u> Mar
-42.0										Freq Offse 0 Hz
-62.0	147							Stop 4	000 GHz	
#Res BW			#VBW	3.0 MHz*		s	Sweep 6	67 ms (1	000 GH2 0001 pts)	
MSG							STATU	S		

Plot 7-9. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



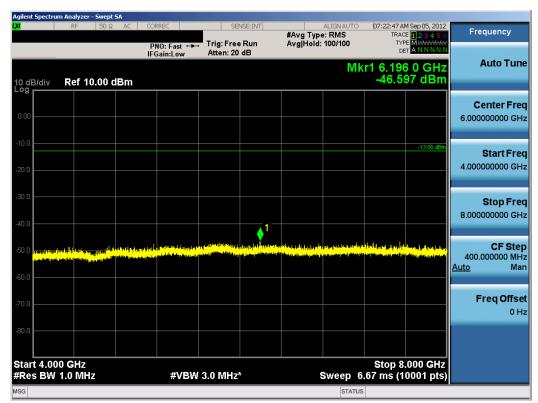
Plot 7-10. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSCHR950	PCTEST	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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	Spectrun	n Analyzer	- Swept	SA								
XI		RF	50 Ω	AC	CORREC	SE	NSE:INT	#Avg Typ	ALIGNAUTO	TRAC	M Sep 05, 2012	Frequency
					PNO: Fast 🔸	Trig: Free		Avg Hold		TYI		
					IFGain:Low	Atten: 38	dB					Auto Tune
									Mkr1	2.678 3	87 GHz	Auto Tune
10 dB	3/div	Ref 2	8.00 (	dBm						-27.6	47 dBm	
Log												
18.0												Center Free
10.0												2.015000000 GH
8.00												Start Free
-2.00												30.000000 MH
-2.00												
-12.0											-13.00 dBm	
-12.0											-13.00 000	Stop Fre
												4.00000000 GH
-22.0												
-32.0						<b>.</b>	الرئيس أليش	والمراجع المتحد والمتحد	dundroopt (Digits	a da balia and dia ana ang si		CF Step
-32.0	a substantion of the second	harden land					(Level) (Level)	North States and States and	and the second secon	Contract of the grout of	and mail of Class Sup. Sector Militation . As	397.000000 MH
-42.0	al a section of	Allariania	a lapaka sa bi	() and the factor (								<u>Auto</u> Ma
-42.0												
-52.0												Freq Offse
-02.0												он
-62.0												
-62.0												
	: 30 M									Stop 4	.000 GHz	
#Res	BW	1.0 MH	z		#VBW	/ 3.0 MHz	*		Sweep 6	.67 ms (1	0001 pts)	
ISG									STATU	5		

Plot 7-11. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



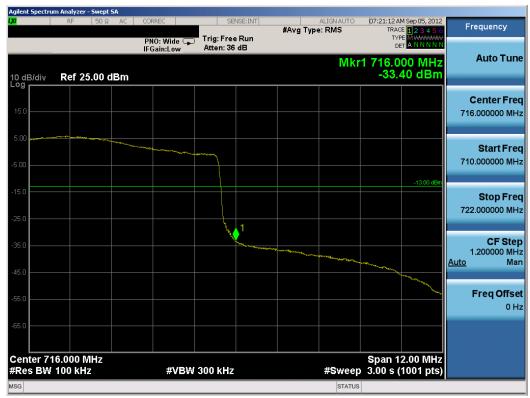
Plot 7-12. Conducted Spurious Plot (10MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: A3LSCHR950	PCTEST.	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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	Analyzer - Swept S									
l XI	RF 50 Ω	AC CC	ORREC	SEN	ISE:INT	#Avg Type	ALIGNAUTO		M Sep 05, 2012 E <b>1 2 3 4 5 6</b>	Frequency
		PI IF	NO: Wide 🖵 Gain:Low	Trig: Free Atten: 36		ming the		TYP		
10 dB/div Log	Ref 25.00 d	Bm					Mkr	1 716.0 -26.3	00 MHz 84 dBm	Auto Tune
15.0										Center Freq 716.000000 MHz
-5.00										Start Freq 710.000000 MHz
-15.0					1				-13.00 dBm	<b>Stop Freq</b> 722.000000 MHz
-35.0					Lange Contraction of the second secon	and the second se	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			<b>CF St</b> ep 1.200000 MHz <u>Auto</u> Mar
-45.0								and the second		Freq Offset 0 Hz
-65.0 Center 716	5.000 MHz							Span 1	2.00 MHz	
#Res BW 1			#VBW	300 kHz				3.00 s (	1001 pts)	
MSG							STATUS			

Plot 7-13. Upper Band Edge Plot (5MHz QPSK - RB Size 25)



Plot 7-14. Upper Band Edge Plot (10MHz QPSK - RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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## 8.0 BAND 5 PLOTS OF EMISSIONS





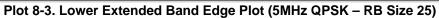


Plot 8-2. Lower Band Edge Plot (10MHz QPSK – RB Size 50)

FCC ID: A3LSCHR950	PCTEST.	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager			
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igilent Spectru XI	RF	50 Ω AC	CORREC	SENSE:INT		ALIGN AUTO	02-14-19.0	4 Sep 01, 2012	
	R.F.	JUX AC	CORREC		#Avg Type		US.14.10PI TRAC	E 1 2 3 4 5 6	Frequency
			PNO: Wide 🕞	Trig: Free Run			TYF	E 1 2 3 4 5 6 E M WWWWWW T A N N N N N	
			IFGain:Low	Atten: 36 dB					Auto Tu
						Mkr	1 822.9	96 MHz	Auto Tu
0 dB/div	Ref 2	5.00 dBm					-29.	30 dBm	
.og									
									Center Fr
15.0									821.000000 M
5.00									Otort Fr
									Start Fr
5.00									819.000000 M
								-13.00 dBm	
5.0									Stop Fr
									823.000000 M
25.0								1	020.000000 1
35.0									CF St
									400.000 k <u>Auto</u> N
15.0									Auto W
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~									
5.0									Freq Offs
									0
5.0									
.3.0									
start 819	.000 MI	lz					Stop 823.	000 MHz	
Res BW			#VBW	/ 300 kHz		#Sweep	3.00 s (	1001 pts)	
SG						STATUS			





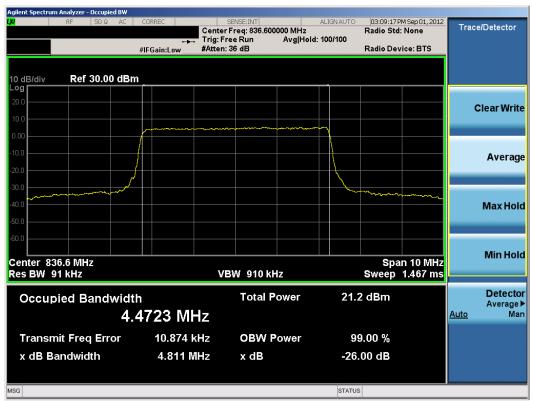
Plot 8-4. Lower Extended Band Edge Plot (10MHz QPSK - RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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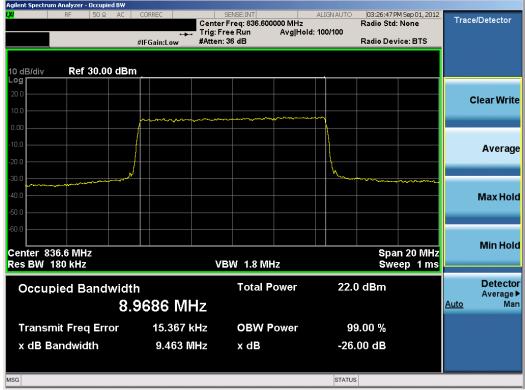
Plot 8-5. Occupied Bandwidth Plot (5MHz QPSK - RB Size 25)



Plot 8-6. Occupied Bandwidth Plot (5MHz 16-QAM - RB Size 25)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Plot 8-7. Occupied Bandwidth Plot (10MHz QPSK – RB Size 50)



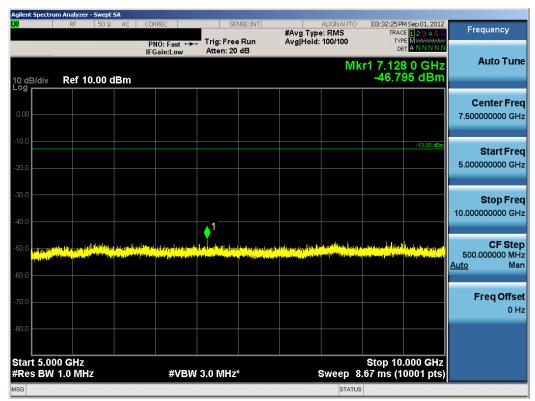
#### Plot 8-8. Occupied Bandwidth Plot (10MHz 16-QAM - RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager				
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Agilent Spe	ectrum /	Analyze	r - Swepl	t SA								
L <mark>XI</mark>		RF	50 \$	2 AC	CORREC	SE	NSE:INT	#Avg Typ	ALIGN AUTO		M Sep 01, 2012	Frequency
					PNO: Fast 🔸	Trig: Free	Run	Avg Hold:		TY	← 1 2 3 4 5 6 PE MWWWWWW ET A N N N N N	
					IFGain:Low	Atten: 38	dB			DI		
									Mkr1	3.316 6	61 GHz	Auto Tune
10 dB/di	iv	Ref 2	8.00	dBm						-27.9	38 dBm	
												Center Freq
18.0		_										2.515000000 GHz
8.00												
												Start Freq
-2.00			_									30.000000 MHz
-12.0		_									-13.00 dBm	Stop Freq
												5.000000000 GHz
-22.0			<mark>,</mark>					1-				
								<b></b>				
-32.0		_	_ <mark> </mark>	1. J	l martin la construction de la cons	internet literated at	in pro- 1991 (1991), Alignet			a an	La tra La providentes	CF Step 497.000000 MHz
with the second s	ul, ju			and a second second	l <mark>mangalah karapatan karapatan karapatan karapatan karapatan karapatan karapatan karapatan karapatan karapatan Karapatan karapatan k</mark>	فللمائز فيناسر فيراسية				La particular distanti da d	HARPING AND INCOME.	Auto Man
-42.0												
-52.0												Freq Offset
												0 Hz
-62.0												
Start 3			-		-40 (P)14					Stop 5	.000 GHz	
#Res B	5WW 11	0 1411	12		#VBW	/ 3.0 MHz					0001 pts)	
MSG									STATU	s		

Plot 8-9. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



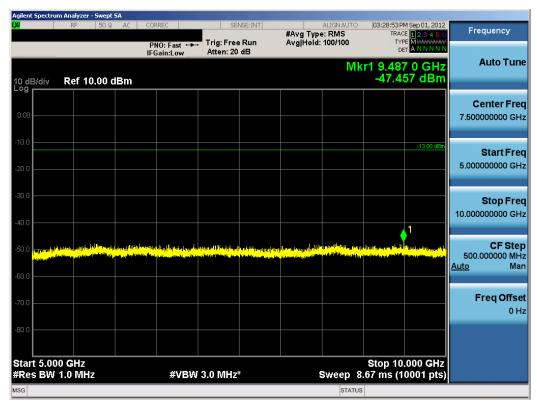
Plot 8-10. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSCHR950	<u>PCTEST</u>	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Agilent Spectru										
L <mark>XI</mark>	RF	50Ω A0	C CORREC	SE	NSE:INT	#Avg Typ	ALIGNAUTO		M Sep 01, 2012	Frequency
			PNO: Fast +	📕 Trig: Free		Avg Hold:	100/100	TYP		
			IFGain:Low	Atten: 38	dB					Auto Tune
							Mkr1	3.270 9	37 GHz	Autorune
10 dB/div Log	Ref 28	.00 dBn	n					-27.2	32 dBm	
- <sup>v</sup> g										Center Freq
18.0										2.515000000 GHz
										2.515000000 GH2
8.00										
										Start Freq
-2.00										30.000000 MHz
-12.0									-13.00 dBm	01 E
										Stop Freq
-22.0						<u> </u>				5.00000000 GHz
						<b>♀</b> `				
-32.0				والتأثر وحادا والزار والحالية	a de			مدر و الم الم الم محمد و الم الم	ter mehrinden der	CF Step
	i dia dia 1999 Mandalaria dia 1999			A STATE OF STREET, MANUSCREET, STREET,			LL CLASSING	A REAL PROPERTY AND A REAL PROPERTY A REAL PROPERTY AND A REAL PROPERTY AND A REAL PRO	A State of the second sec	497.000000 MHz Auto Man
-42.0										
-52.0										Freq Offset
										0 Hz
-62.0										
Start 30 P	л <b>ы</b> 7							Stop 5	.000 GHz	
#Res BW			#VB	W 3.0 MHz	*		Sweep 8	3.67 ms (1	0000 GHZ	
MSG							STATU			

Plot 8-11. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



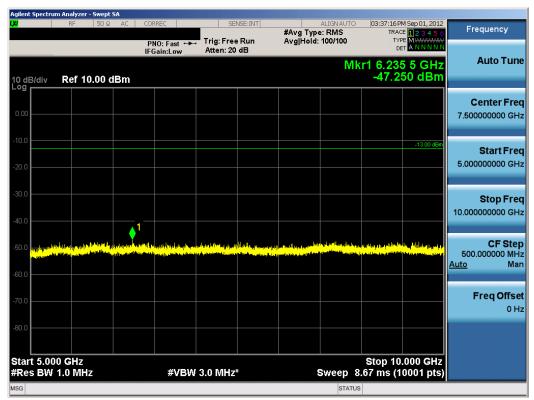
Plot 8-12. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)

FCC ID: A3LSCHR950	<u> <u> <u> </u> <u> PCTEST</u> </u></u>	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Agilent Spectrum Analyzer - Swept SA					
LX4 RF 50Ω AC	CORREC	SENSE:INT	ALIGN AUTO		Frequency
	PNO: Fast 🔸	Trig: Free Run	#Avg Type: RMS Avg Hold: 100/100	TRACE <b>12345</b> 6 TYPE M <del>WWWWW</del> DET ANNNNN	
	IFGain:Low	Atten: 38 dB		DET A N N N N N	
			Mkr	1 3.316 661 GHz	Auto Tune
10 dB/div Ref 28.00 dBm				-27.739 dBm	
10 dB/div Ref 28.00 dBm				21.100 0.011	
					Center Freq
18.0					2.515000000 GHz
10.0					2.515000000 GHZ
8.00					Start Freq
					30.000000 MHz
-2.00					30.000000 WHZ
-12.0				-13.00 dBm	Stop Freq
					5.000000000 GHz
-22.0			1		5.00000000 GH2
			• • '		
-32.0		الدارة والمترو التروي المرور الماري ورور	ent bill to a line in st		CF Step
-32.0		No. of the second statements in the second			497.000000 MHz
and the state of the					<u>Auto</u> Man
-42.0					
					Freq Offset
-52.0					0 Hz
					0 112
-62.0					
Start 30 MHz				Stop 5.000 GHz	
#Res BW 1.0 MHz	#VBW 3	.0 WHZ*	Sweep	8.67 ms (10001 pts)	
MSG			STATU	JS	

Plot 8-13. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 8-14. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

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Agilent Spectrur					_						
	RF	50 Ω AC	CORREC	SE	NSE:INT	#Avg Typ	ALIGNAUTO		M Sep 01, 2012	Frequer	ncy
			PNO: Wide 🗔	Trig: Free		*~v9 i9p	e. AMS	TY	ETANNNNN		
			IFGain:Low	Atten: 36	dB						_
							Mkr	1 849.0	00 MHz	Auto	Tun
10 dB/div	Ref 25.	00 dBm						-26.4	50 dBm		
										Cente	er Fre
15.0										849.0000	00 MH
5.00										-	
											tFre
-5.00										848.0000	00 MH
									-13.00 dBm		
-15.0				1						Sto	p Fre
				and the second s	1					850.0000	
-25.0				- Andrew	<u>'</u>					830.0000	
					and the second second						
-35.0								and the second s			F Ste
										200.0 Auto	00 kH Ma
45.0										Auto	IVIA
-55.0										Freq	Offse
											0 H
65.0											
Center 84		Ηz						Span 2	.000 MHz 1001 pts)		
#Res BW	51 kHz		#VBW	150 kHz			#Sweep	3.00 s (	1001 pts)		
ISG							STATUS				
									<u> </u>		

Plot 8-15. Upper Band Edge Plot (5MHz QPSK – RB Size 25)

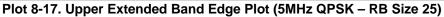


Plot 8-16. Upper Band Edge Plot (10MHz QPSK - RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Agilent Spectrur	-	-							
	RF	50Ω AC	CORREC	SENSE		ALIGNAUTO	03:20:40 PM Sep TRACE	23456	Frequency
			PNO: Wide 🕞	Trig: Free R	un	5 . ,		NNNN	
			IFGain:Low	Atten: 36 dE	1				Auto Tun
						Mk	r1 849.000 -23.244	MHZ	Autorun
10 dB/div Log	Ref 25.	00 dBm					-23.244	aBm	
									Center Fre
15.0									851.000000 MH
5.00									
									Start Fre
-5.00									849.000000 MH
-15.0								13.00 dBm	
1									Stop Fre
-25.0									853.000000 MH
	_								
-35.0									CF Ste
									400.000 kH <u>∖uto</u> Ma
-45.0									<u>(dto</u> Wia
-55.0									Freq Offse
									0 H
-65.0									
Start 849. #Res BW			#\/P\	/ 300 kHz		#Swoo	Stop 853.00 p 3.00 s (100	U WIHZ	
	TUU KHZ		#VDV	7 JUU KHZ				, pre)	
ISG						STATU	s		





Plot 8-18. Upper Extended Band Edge Plot (10MHz QPSK – RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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### 9.0 BAND 4 PLOTS OF EMISSIONS





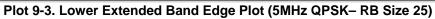


Plot 9-2. Lower Band Edge Plot (10MHz QPSK – RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Agilent Spectru	-	-							
	RF	50Ω AC	CORREC	SENSE:INT	#Avg Type	ALIGN AUTO	03:58:56 PM TRAC	4 Aug 31, 2012	Frequency
			PNO: Fast 🕞 IFGain:Low	Trig: Free Run Atten: 36 dB			TYF	E 123456 E WWWWWWW T A N N N N N	
			IFGain:Low	Atten: 00 db		Mket		00 GHz	Auto Tune
10 dB/div	Ref 25	5.00 dBm					-13.0	60 dBm	
									Center Free
15.0									1.707000000 GH:
5.00									
3.00									Start Free
-5.00									1.705000000 GH
								-13.00 dBm	
-15.0									Stop Free
									1.709000000 GH:
-25.0			an francisco de la constitución de	······					
									CF Ste
-35.0									400.000 kH
-45.0									<u>Auto</u> Mar
-0.0									
-55.0									Freq Offse
									0 Н
-65.0									
Start 1.70	05000 GI	Hz				s	top 1.709	000 GHz	
#Res BW			#VBW	3.0 MHz		#Sweep	3.00 s (	1001 pts)	
MSG						STATUS			





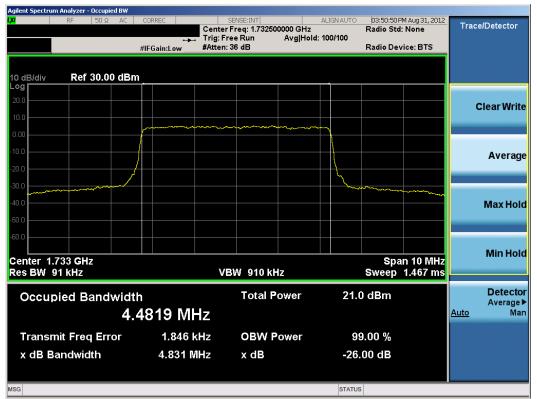
Plot 9-4. Lower Extended Band Edge Plot (10MHz QPSK- RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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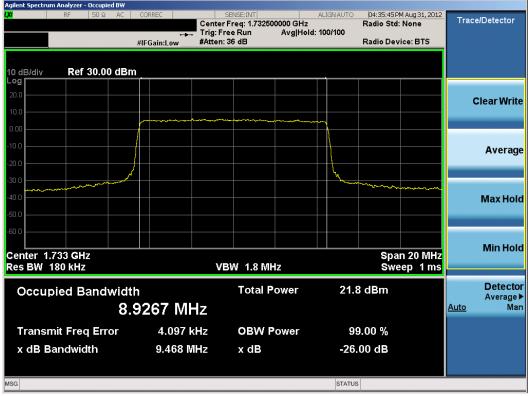
Plot 9-5. Occupied Bandwidth Plot (5MHz QPSK – RB Size 25)



Plot 9-6. Occupied Bandwidth Plot (5MHz 16-QAM – RB Size 25)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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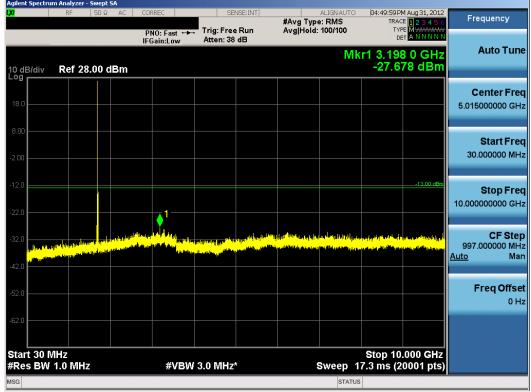
Plot 9-7. Occupied Bandwidth Plot (10MHz QPSK - RB Size 50)



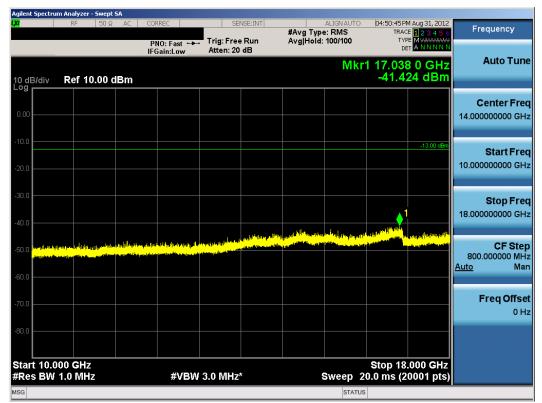
Plot 9-8. Occupied Bandwidth Plot (10MHz 16-QAM - RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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0Y1208281251.A3L	08/23 - 09/07/2012	Portable Handset	Fage 50 01 75
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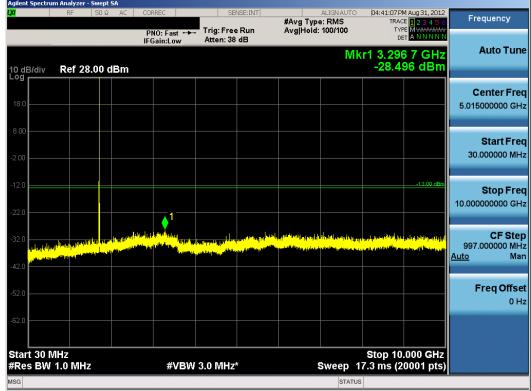
Plot 9-9. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



Plot 9-10. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Plot 9-11. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



Plot 9-12. Conducted Spurious Plot (10MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Agilent Spectrum Analyzer - Swept SA					
LXU RF 50 Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	04:53:34 PM Aug 31, 2012 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast 🔸	Trig: Free Run	Avg Hold: 100/100	TYPE MWWWWW DET A N N N N N	
	IFGain:Low	Atten: 38 dB		DET A N N N N N	
			Mk	r1 3.403 3 GHz	Auto Tune
10 dB/div Ref 28.00 dBm				-28.054 dBm	
Log					
					Center Freq
18.0					5.015000000 GHz
8.00					
					Start Freq
-2.00					30.000000 MHz
-12.0				-13.00 dBm	
					Stop Freq
-22.0					10.00000000 GHz
-22.0					
	And an address of the later	يطلق بين ان	industrian states states and	. In	CF Step
-32.0	Shine I with the ask		and the second	a a bar and a failed and a shake a shake a shake	997.000000 MHz
and a state of the second s		a line of the second			<u>Auto</u> Man
-42.0					
					Freq Offset
-52.0					0 Hz
					0 H2
-62.0					
				<b>2</b> 4	
Start 30 MHz	#) (D)4/	3.0 MHz*	Swoon 4	Stop 10.000 GHz	
#Res BW 1.0 MHz	#VBW	3.0 MIHZ"	-	7.3 ms (20001 pts)	
MSG			STATUS		

Plot 9-13. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)



Plot 9-14. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - High Channel)

FCC ID: A3LSCHR950	<u> <u> <u> </u> <u> PCTEST</u> </u></u>	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 59 of 75	
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gilent Spectrum Analyzer - Swept SA					
KI RF 50Ω AC	CORREC	SENSE:INT	ALIGNAUTO #Avg Type: RMS	04:26:29 PM Aug 31, 2012	Frequency
		g:FreeRun :en:36 dB	HAY YI YPE. CM3	TRACE 123456 TYPE MWWWW DET A N N N N N	
	II OGINIZON		Mkr1	1.755 000 GHz	Auto Tune
10 dB/div Ref 25.00 dBm				-26.00 dBm	
					Center Free
15.0					1.755000000 GH
5.00					
					Start Free
5.00					1.754000000 GH
15.0				-13.00 dBm	
- 13.01		. 1			Stop Fre
-25.0					1.756000000 GH
25.0					CF Ster
-35.0					200.000 kH Auto Ma
45.0					<u>Auto</u> Mai
					Freq Offse
-55.0					0 н
-65.0					
Center 1.755000 GHz #Res BW 51 kHz	#VBW 150	kHz	#Sweep	Span 2.000 MHz 3.00 s (1001 pts)	
ISG			STATUS		

Plot 9-15. Upper Band Edge Plot (5MHz QPSK – RB Size 25)

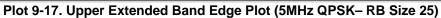


Plot 9-16. Upper Band Edge Plot (10MHz QPSK - RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Agilent Spectrum									
l XI	RF 50 S	2 AC	CORREC	SENSE:IN	#Avg Typ	ALIGN AUTO	04:27:17 Pf TRAC	M Aug 31, 2012	Frequency
			PNO: Fast 🖵 IFGain:Low	Trig: Free Run Atten: 36 dB	The state of the s	e. 1400	TYF	E 123456 PE MWWWWW A N N N N N	
	Ref 25.00	dBm				Mkr1	1.756 0 -13.4	00 GHz 76 dBm	Auto Tune
15.0									Center Fred 1.758000000 GHz
-5.00								-13.00 dBm	Start Fred 1.756000000 GH
-15.0								-13.00 0001	<b>Stop Fre</b> 1.760000000 GH
35.0									<b>CF Ste</b> 400.000 kH <u>Auto</u> Ma
55.0									Freq Offse 0 H
-65.0	000 GHz						top 1.760	0000 GHz	
#Res BW 1			#VBV	/ 3.0 MHz		#Sweep	3.00 s (	1001 pts)	
130						STATUS			

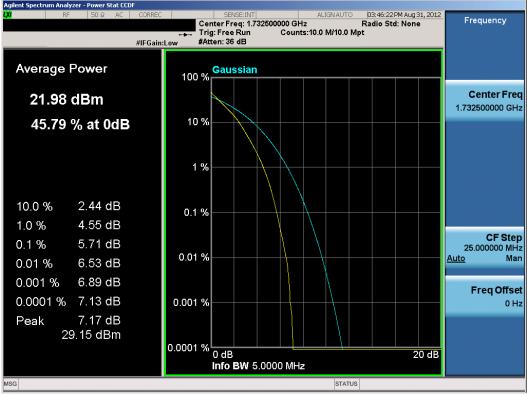




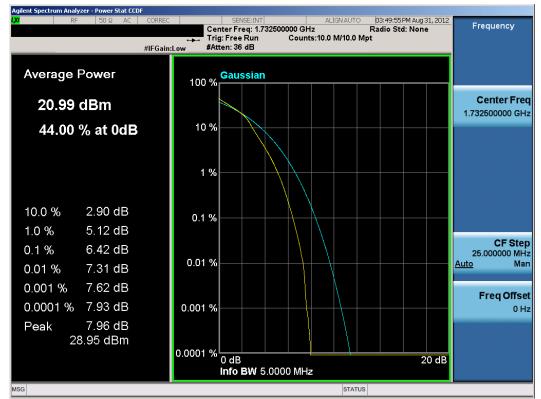
Plot 9-18. Upper Extended Band Edge Plot (10MHz QPSK- RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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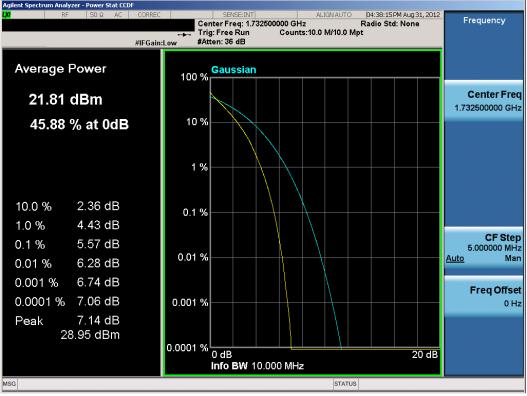




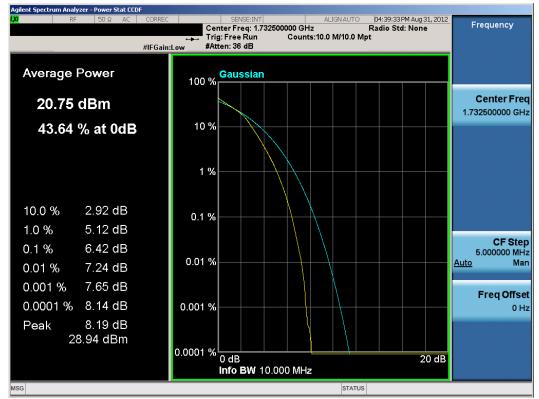
#### Plot 9-20. PAR Plot (5MHz 16QAM - RB Size 25)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager		
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#### Plot 9-22. PAR Plot (10MHz 16QAM - RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager		
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## 10.0 BAND 2 PLOTS OF EMISSIONS



Plot 10-1. Lower Band Edge Plot (5MHz QPSK – RB Size 25)

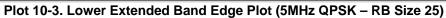


Plot 10-2. Lower Band Edge Plot (10MHz QPSK – RB Size 50)

FCC ID: A3LSCHR950	PCTEST.	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Agilent Spect X/		-		000050	05				05 40 00 0			
<mark>XJ</mark>	R	= 50	Ω AC	CORREC	SEI	NSE:INT	#Avg Type	ALIGNAUTO e: RMS	U5:13:20 P	M Aug 31, 2012	Frequer	ncy
				PNO: Fast 🕞	Trig: Free				TY	E 123456 E M <del>aaaaa</del> T A N N N N N		
				IFGain:Low	Atten: 36	dB					Auto	Tun
								Mkr1	1.849 0	00 GHz	Auto	, run
10 dB/div	Re	f 25.00	dBm						-13.1	50 dBm		
- <sup>og</sup>												
											Cente	
15.0											1.8470000	00 GH
5.00											<b>0</b> 1	
												tFre
-5.00											1.8450000	00 GF
										-13.00 dBm		
-15.0										7	Sto	p Fre
										. Starter	1.8490000	
-25.0						والارتيان ومودي الرور ورور	Carlot and the state of the sta	والمراجع وال	all for the stand to the stand of the stand		1.0450000	00 01
			and the second									
35.0												F Ste
											400.0 Auto	100 kH Ma
45.0											Auto	IVIa
55.0											Freq	Offs
												0 F
.65.0												
85.U												
Start 1.8	34500	0 GHz						S	top 1.849	9000 GHz		
≠Res BV				#VBV	/ 3.0 MHz			#Sweep	3.00 s (	1001 pts)		
SG								STATUS				





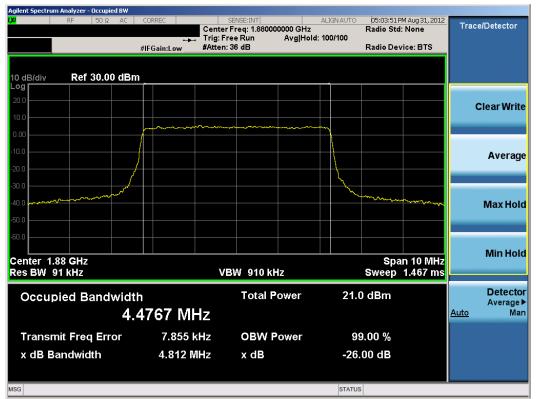
Plot 10-4. Lower Extended Band Edge Plot (10MHz QPSK - RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager		
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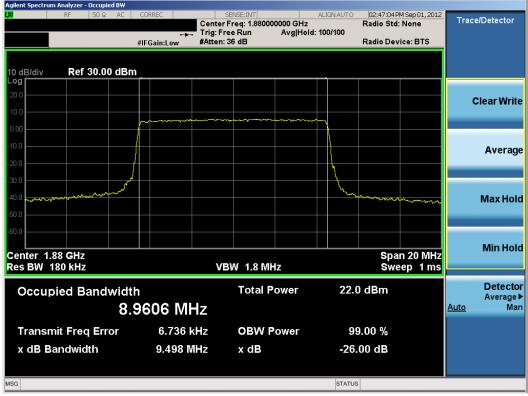
Plot 10-5. Occupied Bandwidth Plot (5MHz QPSK - RB Size 25)



Plot 10-6. Occupied Bandwidth Plot (5MHz 16-QAM - RB Size 25)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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Plot 10-7. Occupied Bandwidth Plot (10MHz QPSK - RB Size 50)

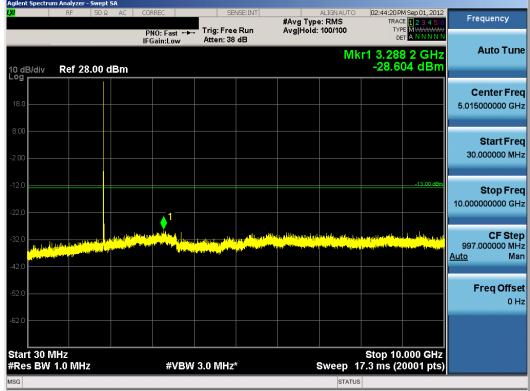


Plot 10-8. Occupied Bandwidth Plot (10MHz 16-QAM - RB Size 50)

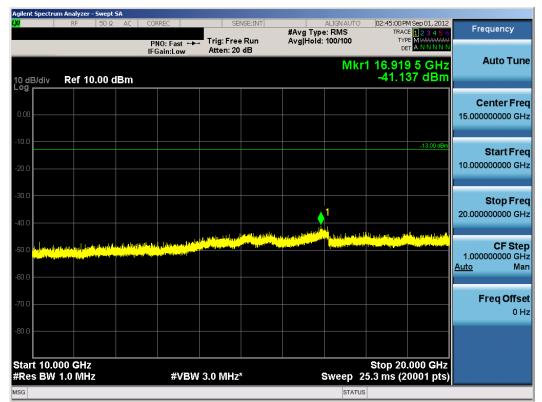
FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager		
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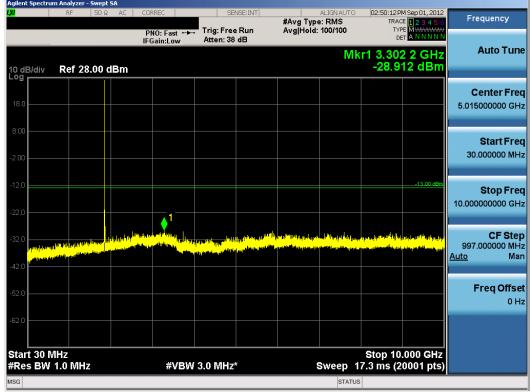
Plot 10-9. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Low Channel)



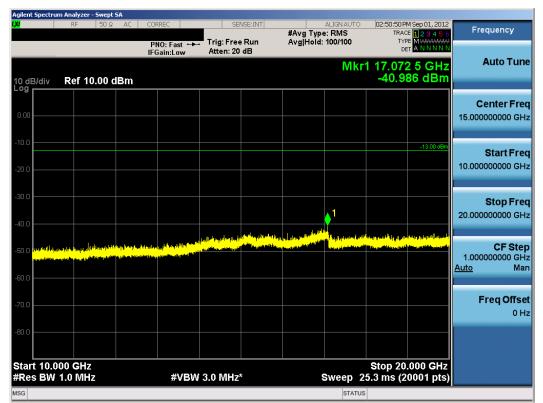
Plot 10-10. Conducted Spurious Plot (10MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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Plot 10-11. Conducted Spurious Plot (10MHz QPSK - RB Size 1, RB Offset 0 - Mid Channel)



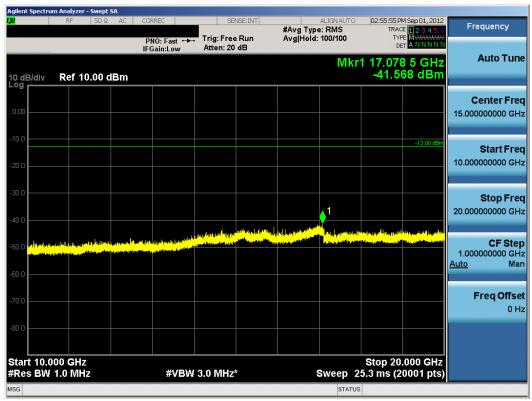
Plot 10-12. Conducted Spurious Plot (10MHz QPSK – RB Size 1, RB Offset 0 – Mid Channel)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager	
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Agilent Spect	trum Analyzer	- Swept SA									
LXI	RF	50 Ω A	C CORREC		SEI	ISE:INT	#Avg Type	ALIGNAUTO	TRAC	4 Sep 01, 2012	Frequency
			PNO: F IFGain:I	ast ↔⊷ .ow	Trig: Free Atten: 38		Avg Hold:	100/100	t yf De	E M <del>WWWWW</del> T A N N N N N	
								Mk	r1 3.801	7 GHz 06 dBm	Auto Tune
10 dB/div Log	Ref 2	8.00 dBn	n						-24.8	06 dBm	
											Center Freq
18.0											5.015000000 GHz
8.00											
											Start Freq
-2.00											30.000000 MHz
-12.0										-13.00 dBm	
				. 1							<b>Stop Freq</b> 10.000000000 GHz
-22.0				- <b>†</b> †							
-32.0	den produktion and selected	a and a start			antoriale antoria	and all out of the state	equilibrity and let	http://www.ka.e.gl	and maker date		CF Step
a dela car a contra car		A CONTRACTOR OF STREET	A CONTRACTOR OF	New York	NAMES OF TAXABLE PARTY.	and the second		مال ام الأفتين (المالية الم	and the second distribution of the second	n pl. ja distri i ne inema de	997.000000 MHz <u>Auto</u> Man
-42.0											
-52.0											Freq Offset
											0 Hz
-62.0											
Start 30 #Res BV	MHZ N 1.0 MH	Z	4	≠vBW :	3.0 MHz*			Sweep 1	Stop 10 7.3 ms (2	000 GHz 0001 pts)	
MSG								STATUS			

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



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

FCC ID: A3LSCHR950	<u> <u> <u> </u> <u> PCTEST</u> </u></u>	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager		
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Agilent Spectrum	-	-								
<mark>XI</mark>	RF 50	DΩ AC	CORREC	SE	VSE:INT	#Avg Type	ALIGNAUTO e: RMS	05:25:27 Pf TRAC	M Aug 31, 2012	Frequency
			PNO: Wide 🕞 IFGain:Low	Trig: Free Atten: 36					E 1 2 3 4 5 6 E MWWWW T A NNNNN	Auto Tune
10 dB/div	Ref 25.0	0 dBm					IVIKET	-25.3	00 GHz 20 dBm	
15.0										Center Fred 1.910000000 GHz
5.00										1.91000000 9Hz
-5.00										Start Fred 1.909000000 GHz
									-13.00 dBm	
-15.0				and the second s	1					Stop Fred 1.911000000 GHz
-25.0					A State and a state of the stat	and a many second of the second	د مارور روبد د می مرد را می ورد را می ورد را می ورد روبه د مرد روبه روبه روبه روبه روبه روبه روبه روبه	-Johnson Johnson		
-35.0										CF Step 200.000 kHz Auto Mar
-45.0										
-55.0										Freq Offset 0 Hz
-65.0										
Center 1.9 #Res BW 5	10000 GH 51 kHz	Iz	#VBW	/ 150 kHz			#Sweep	Span 2 3.00 s (	.000 MHz 1001 pts)	
MSG							STATUS			

Plot 10-15. Upper Band Edge Plot (5MHz QPSK – RB Size 25)



Plot 10-16. Upper Band Edge Plot (10MHz QPSK - RB Size 50)

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Agilent Spectru X/	RF	50 Ω AC	CORREC	SENSE:INT	ALIGN		Aug 31, 2012	
<b>4</b>	Tu	100 % AC	CONTREC		#Avg Type: RMS	S TRACE	123456	Frequency
			PNO: Fast 🕞	Trig: Free Run Atten: 36 dB		TYPE	123456 M <del>MMMMM</del> ANNNNN	
			IFGain:Low	Atten: 36 dB				Auto Tur
					M	kr1 1.911 00 -13.02	00 GHz	Autoru
l0 dB/div	Ref 2	5.00 dBm				-13.02	1 dBm	
.og								
								Center Fre
15.0								1.913000000 GH
5.00								
								Start Fre
5.00								1.911000000 GH
1								
15.0							-13.00 dBm	
10.0	Same a							Stop Fre
	- a subrust	and the second s		and and a state of the state of				1.915000000 GH
25.0					and the second se	and the second s		
							A STREET OF THE OWNER OF THE OWNER	CF Ste
35.0								400.000 ki
								Auto Ma
45.0								
55.0								Freq Offs
								01
65.0								
start 1.91	1000 G	Hz				Stop 1.915	000 GHz	
Res BW			#VBV	/ 3.0 MHz	#S\	weep 3.00 s (1	001 pts)	
SG						STATUS		

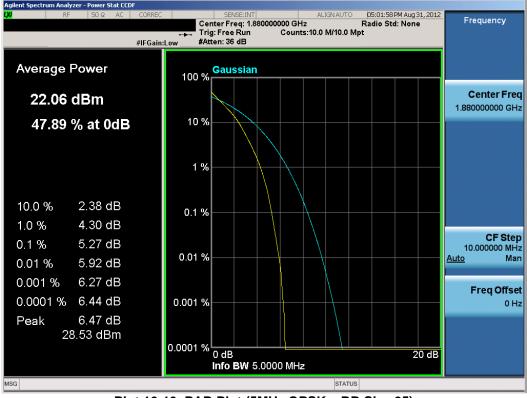




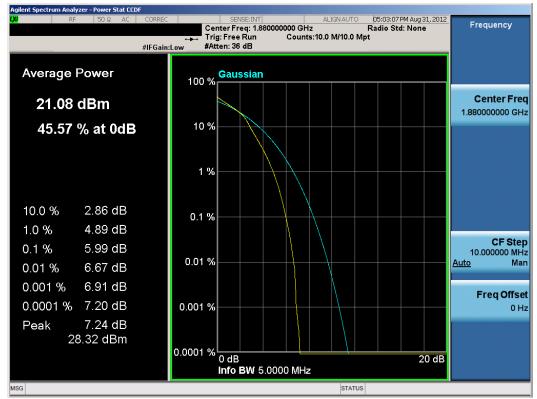
Plot 10-18. Upper Extended Band Edge Plot (10MHz QPSK – RB Size 50)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
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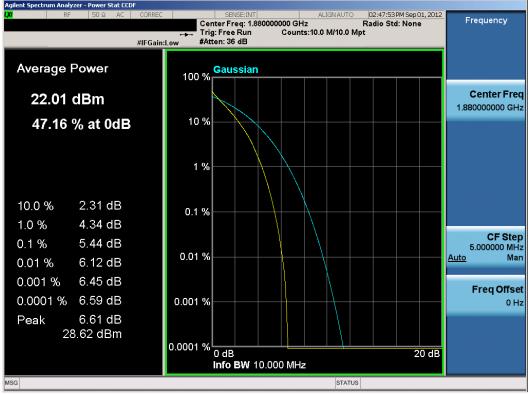




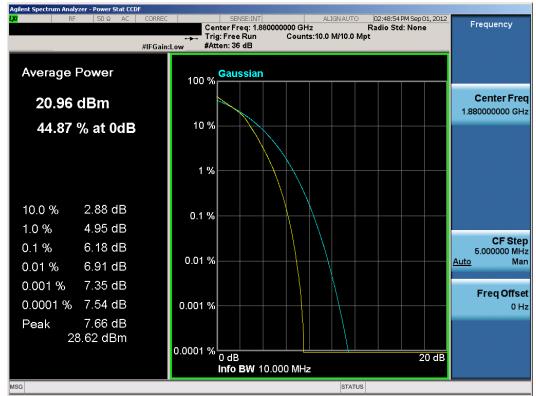
#### Plot 10-20. PAR Plot (5MHz 16QAM - RB Size 25)

FCC ID: A3LSCHR950		FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager				
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### Plot 10-22. PAR Plot (10MHz 16QAM - RB Size 50)

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# 11.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSCHR950** complies with all the requirements of Parts 2, 22, 24 and 27 of the FCC rules for LTE operation only.

FCC ID: A3LSCHR950	PCTEST	FCC Pt. 22-24-27 LTE MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager			
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