

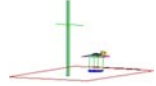


PCTEST ENGINEERING LABORATORY, INC.

7185 Oakland Mills Road, Columbia, MD 21046 USA

Tel. 410.290.6652 / Fax 410.290.6654

http://www.pctestlab.com



MEASUREMENT REPORT FCC Part 24 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:

08/20 - 09/07/2012

Test Site/Location:

PCTEST Lab., Columbia, MD, USA

Test Report Serial No.:

0Y1208241237.A3L

FCC ID: A3LSPHL900

APPLICANT: SAMSUNG ELECTRONICS CO., LTD.

Application Type:

Certification

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part(s):

§2; §24

EUT Type:

Portable Handset

Model(s):

SPH-L900

Test Device Serial No.:

identical prototype [S/N: #10]

Mode	Tx Frequency (MHz)	Emission Designator	Modulation	ERP/EIRP	
				Max. Power (W)	Max. Power (dBm)
LTE Band 25	1852.5 - 1912.5	4M48G7W	QPSK	0.092	19.625
LTE Band 25	1852.5 - 1912.5	4M48W7W	16QAM	0.074	18.705

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.


Randy Ortanez
President

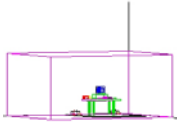


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MEASUREMENT REPORT

FCC Part 24

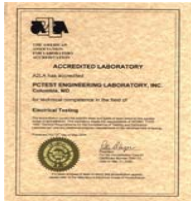


§2.1033 General Information

APPLICANT: Samsung Electronics Co., Ltd.
APPLICANT ADDRESS: 416 Maetan 3-Dong, Yeongtong-gu
 Suwon-si, Gyeonggi-do
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 7185 Oakland Mills Road, Columbia, MD 21046 USA
FCC RULE PART(S): §2; §24
FCC ID: A3LSPHL900
FCC CLASSIFICATION: PCS Licensed Transmitter Held to Ear (PCE)
MODULATIONS: QPSK, 16-QAM (Uplink)
FREQUENCY TOLERANCE: Emission must remain in band
Test Device Serial No.: #10 ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST: 08/20 - 09/07/2012
TEST REPORT S/N: 0Y1208241237.A3L

Test Facility / Accreditations

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



- PCTEST facility is an FCC registered (PCTEST Reg. No. 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.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

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1.0 INTRODUCTION

1.1 Scope

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

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington 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 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 C63.4-2003/9 on February 15, 2012.

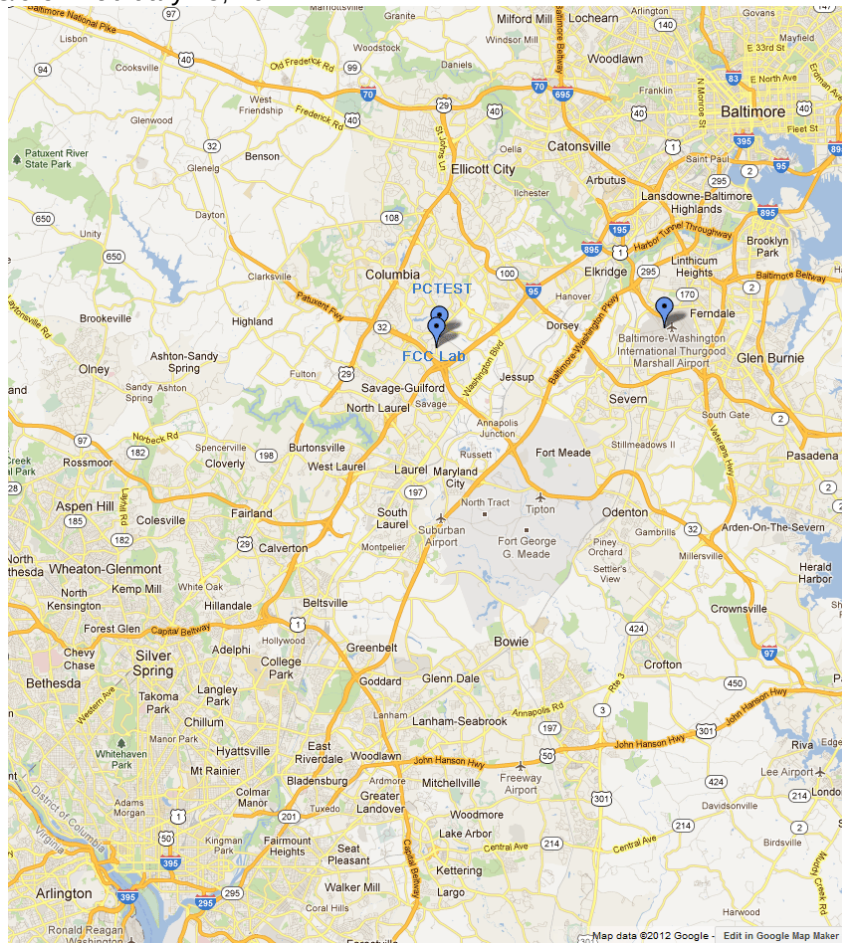


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSPHL900**. The test data contained in this report pertains to the emissions from the EUT's LTE operation. The CMW500 call box was used to set the EUT to transmit at full power. Each available modulation type (i.e. QPSK, 16-QAM) and RB size/RB offset combination was tested to determine the configuration producing the highest power and the worst case emissions.

2.2 EUT Capabilities

This device supports the following capabilities:

850/1900 CDMA/EvDO Rev 0/A (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 1900 WCDMA/HSPA, Band 25 LTE (5MHz BW), 802.11a/b/g/n WLAN (DTS/NII), Bluetooth (1x,EDR, LE), NFC

This device allows for simultaneous transmission of 1x CDMA with LTE (5MHz BW).

2.3 EMI Suppression Device(s)/Modifications

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

2.4 Labeling Requirements

Per 2.925

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

Per 15.19; Docket 95-19

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

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

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

Please see attachment for FCC ID label and label location.

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3.0 DESCRIPTION OF TESTS

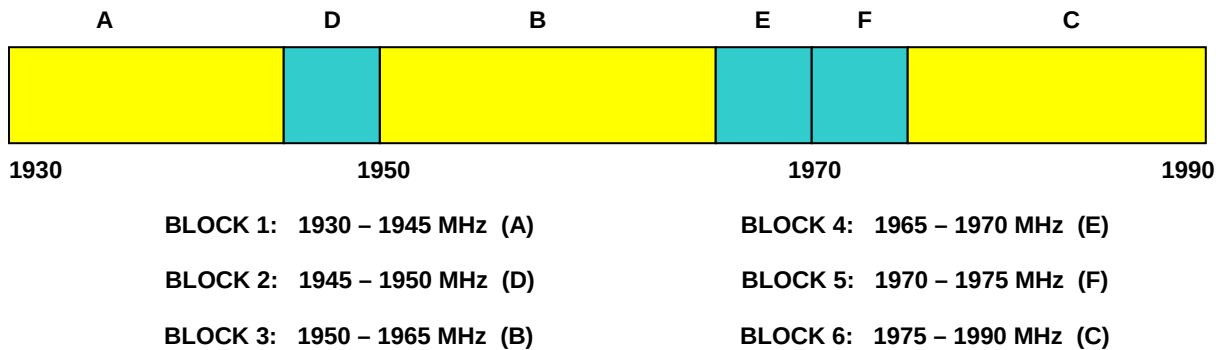
3.1 Evaluation Procedure

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 **Samsung Portable Handset FCC ID: A3LSPHL900**.

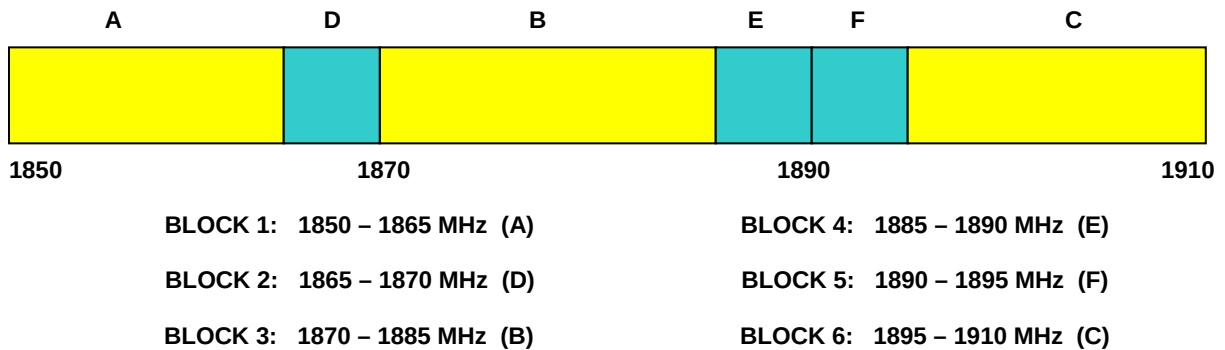
Deviation from Measurement Procedure.....None

3.2 PCS - Base Frequency Blocks

§24.229 (a)(b)(c)



PCS - Mobile Frequency Blocks



The paired frequency blocks 1910–1915 MHz and 1990–1995 MHz are available for assignment in the 175 Economic Areas defined in §90.7 of this chapter. The 1910–1915 MHz block shall be used for mobile/portable station transmissions while the 1990–1995 MHz block shall be used for base station transmissions.

3.3 Occupied Bandwidth Emission

§2.1049, RSS-Gen (4.6.1)

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The spectrum analyzers' "occupied bandwidth" measurement function was used to record the occupied bandwidth in accordance with KDB 971168.

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3.4 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, 24.238(a)(b); RSS-133 (6.5.1)

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

3.5 Radiated Power and Radiated Spurious Emissions

§24.232(c), 24.238(a); 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 ¾" (~1.9cm) sheet of high density polyethylene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

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

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

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

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 22.917(a) and 24.238(a).

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SVLTE

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

Ref.	Simultaneous Transmit Configurations
A	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + LTE B25 Data
B	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + 2.4 GHz WIFI
C	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + 5 GHz WIFI
D	GSM850/1900/ WCDMA1900 Voice + 2.4 GHz WIFI
E	GSM850/1900/ WCDMA1900 Voice + 5 GHz WIFI
F	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice + LTE B25 Data + 2.4 GHz WIFI
G	BC0/BC1/BC10 850/1900 MHz 1x-RTT CDMA Voice / Data + 2.4 GHz WIFI
H	GSM 850/1900 GPRS/EDGE Data + 2.4 GHz WIFI
I	WCDMA 1900 Data + 2.4 GHz WIFI
J	LTE B25 Data + 2.4 GHz WIFI

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.

3.6 Peak-Average Ratio

§24.232(d); RSS-133 (6.4)

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

3.7 Frequency Stability / Temperature Variation

§2.1055, §24.235; 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 environmental chamber.
- 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.

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Specification – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

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)	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
-	LTx2	Licensed Transmitter Cable Set	2/17/2012	Annual	2/17/2013	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-3100+	High Pass Filter	1/15/2012	Annual	1/15/2013	30841
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	10/7/2011	Annual	10/7/2012	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
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/26/2012	Biennial	1/26/2014	A051107

Table 4-1. Test Equipment

5.0 SAMPLE CALCULATIONS

Note: Bandwidth and EIRP values listed below in this section are not representative of actual measurements. They are listed as examples only.

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 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: A3LSPHL900
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE

FCC Part Section(s)	RSS Sections(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (Tx)						
2.1049	RSS-Gen (4.6.1)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0
2.1051, 24.238(a)	RSS-133 (6.5.1)	Band Edge / Conducted Spurious Emissions (*)	$< 43 + 10\log_{10}(P[\text{Watts}])$		PASS	Section 7.0
24.232(d)	RSS-133 (6.4)	Peak-Average Ratio	$< 13 \text{ dB}$		PASS	Section 7.0
2.1046	RSS-133 (4.1)	Transmitter Conducted Output Power Measurements	N/A		N/A	SAR Report
2.1055, 24.235	RSS-133 (6.3)	Frequency Stability	Fundamental emissions must stay within the allotted band		PASS	Section 6.4
24.232(c)	RSS-133 (6.4) [SRSP-510(5.1.2)]	Equivalent Isotropic Radiated Power	$< 2 \text{ Watts max. EIRP}$	RADIATED	PASS	Section 6.2
2.1053, 24.238(a)	RSS-133 (6.5.1)	Single Transmit Undesirable Out-of-Band Emissions	$< 43 + 10\log_{10}(P[\text{Watts}])$ for all out-of-band emissions		PASS	Section 6.3

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.
- 4) For out of band conducted spurious emissions (including those at the band edges), the emissions of both QPSK and 16-QAM modulations were investigated with all RB configurations. The worst case transmitter emissions are shown in Section 7.0.

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6.2 Equivalent Isotropic Radiated Power

§24.232(c); RSS-133 (6.4) [SRSP-510(5.1.2)]

	Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Margin [dB]
Band XXV LTE	1852.50	5	QPSK	Standard	1 / 0	10.81	8.56	H	19.37	0.086	-13.64
	1882.50	5	QPSK	Standard	1 / 0	11.08	8.55	H	19.63	0.092	-13.38
	1912.50	5	QPSK	Standard	1 / 24	10.13	8.53	H	18.66	0.074	-14.35
	1852.50	5	16-QAM	Standard	1 / 0	9.88	8.56	H	18.44	0.070	-14.57
	1882.50	5	16-QAM	Standard	1 / 0	10.16	8.55	H	18.71	0.074	-14.30
	1912.50	5	16-QAM	Standard	1 / 24	9.06	8.53	H	17.59	0.057	-15.42

Table 6-2. Band 25 LTE - Equivalent Isotropic Radiated Power Output Data

Notes:

1. This device was tested under all modulations, RB sizes and offsets and channel bandwidth configurations and the worst case emissions are reported with 5MHz BW while transmitting with 1 resource block with an offset of 0 using QPSK modulation for LTE
2. This unit was tested with its standard battery. All spurious emissions were investigated and the worst case emissions were found with the EUT powered by this battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the horizontal setup. The data reported in the table above was measured in this test setup.

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6.3 LTE Radiated Measurements

§2.1053, §24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1852.50 MHz
 CHANNEL: 26065
 MEASURED OUTPUT POWER: 19.37 dBm = 0.086 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) = 32.37$ dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3705.00	-37.55	8.40	-29.15	H	48.52
5557.50	-35.84	10.63	-25.22	H	44.58
7410.00	-39.39	11.84	-27.55	H	46.92
9262.50	-49.30	13.29	-36.01	H	55.38
11115.00	-49.91	13.50	-36.41	H	55.78

Table 6-3. Radiated Spurious Data (Band 25 LTE - Ch 26065)

Notes:

1. This device was tested under all modulations, RB sizes and offsets and channel bandwidth configurations and the worst case emissions are reported with 5MHz BW while transmitting with 1 resource block with an offset of 0 using QPSK modulation for LTE
2. This unit was tested with its standard battery. All spurious emissions were investigated and the worst case emissions were found with the EUT powered by this battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the horizontal setup. The data reported in the table above was measured in this test setup.

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LTE Radiated Measurements (Cont'd)

§2.1053, §24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1882.50 MHz
 CHANNEL: 26365
 MEASURED OUTPUT POWER: 19.63 dBm = 0.092 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 32.63 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3765.00	-37.42	8.44	-28.98	H	48.61
5647.50	-40.22	10.66	-29.56	H	49.19
7530.00	-44.86	11.94	-32.92	H	52.55
9412.50	-49.86	13.23	-36.62	H	56.25
11295.00	-54.38	13.48	-40.90	H	60.52

Table 6-4. Radiated Spurious Data (Band 25 LTE - Ch 26365)

Notes:

1. This device was tested under all modulations, RB sizes and offsets and channel bandwidth configurations and the worst case emissions are reported with 5MHz BW while transmitting with 1 resource block with an offset of 0 using QPSK modulation for LTE
2. This unit was tested with its standard battery. All spurious emissions were investigated and the worst case emissions were found with the EUT powered by this battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the horizontal setup. The data reported in the table above was measured in this test setup.

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LTE Radiated Measurements (Cont'd)

§2.1053, §24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1912.50 MHz
 CHANNEL: 26665
 MEASURED OUTPUT POWER: 18.66 dBm = 0.074 W
 MODULATION SIGNAL: QPSK
 BANDWIDTH: 5 MHz
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 31.66 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
3825.00	-38.00	8.57	-29.43	H	48.10
5737.50	-41.49	10.69	-30.80	H	49.47
7650.00	-41.54	12.07	-29.47	H	48.13
9562.50	-50.33	13.20	-37.13	H	55.79
11475.00	-54.37	13.42	-40.95	H	59.62

Table 6-5. Radiated Spurious Data (Band 25 LTE - Ch 26665)

Notes:

1. This device was tested under all modulations, RB sizes and offsets and channel bandwidth configurations and the worst case emissions are reported with 5MHz BW while transmitting with 1 resource block with an offset of 0 using QPSK modulation for LTE
2. This unit was tested with its standard battery. All spurious emissions were investigated and the worst case emissions were found with the EUT powered by this battery.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found in the horizontal setup. The data reported in the table above was measured in this test setup.

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6.4 LTE Frequency Stability Measurements

\$2.1055, \$27.54

OPERATING FREQUENCY: 1,882,500,000 Hz

CHANNEL: 26365

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	707,499,992	-8	-0.000001
100 %		- 30	707,499,985	-15	-0.000002
100 %		- 20	707,499,983	-17	-0.000002
100 %		- 10	707,500,030	30	0.000004
100 %		0	707,500,013	13	0.000002
100 %		+ 10	707,500,006	6	0.000001
100 %		+ 20	707,499,989	-11	-0.000002
100 %		+ 30	707,499,985	-15	-0.000002
100 %		+ 40	707,500,013	13	0.000002
100 %		+ 50	707,499,982	-18	-0.000003
115 %	4.26	+ 20	707,500,023	23	0.000003
85 %	3.41	+ 20	707,500,010	10	0.000001

Table 6-6. Frequency Stability Data

LTE Frequency Stability Measurements (Cont'd)

§2.1055, §27.54

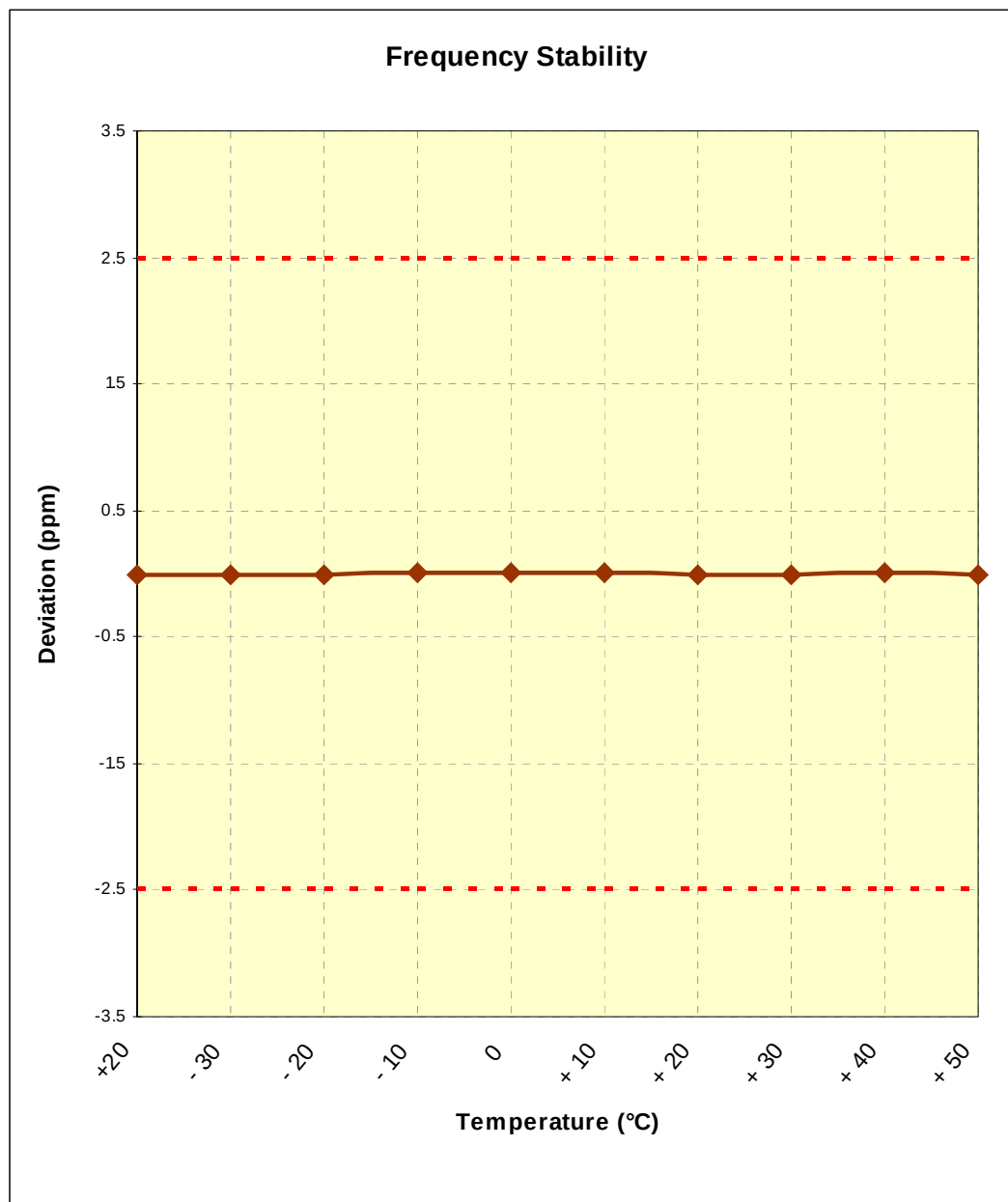
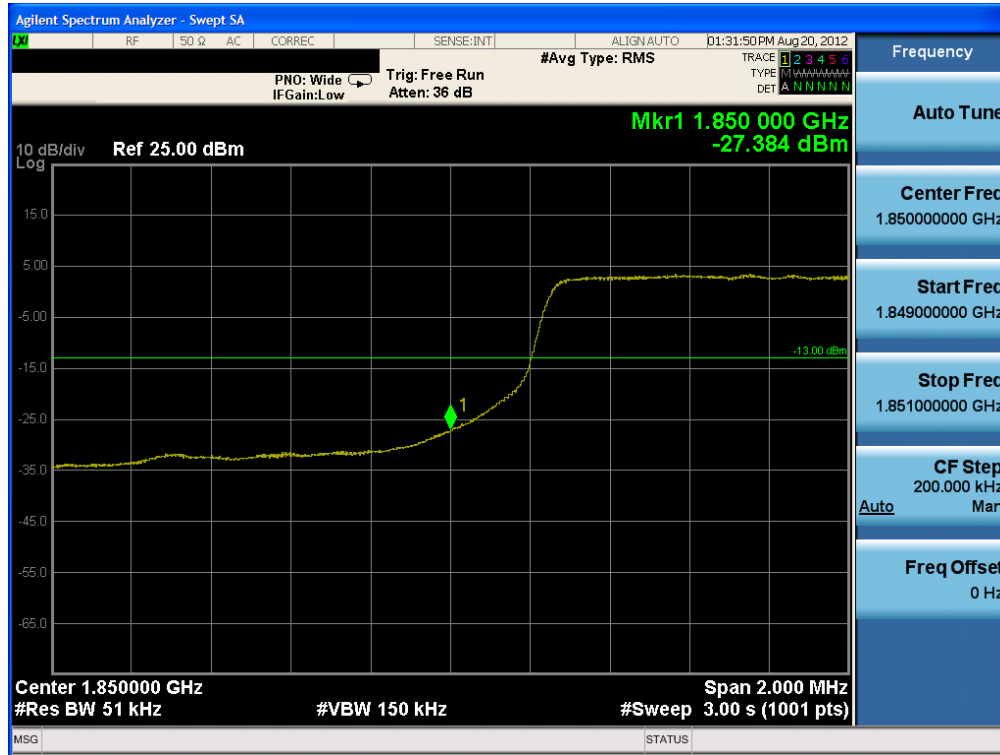


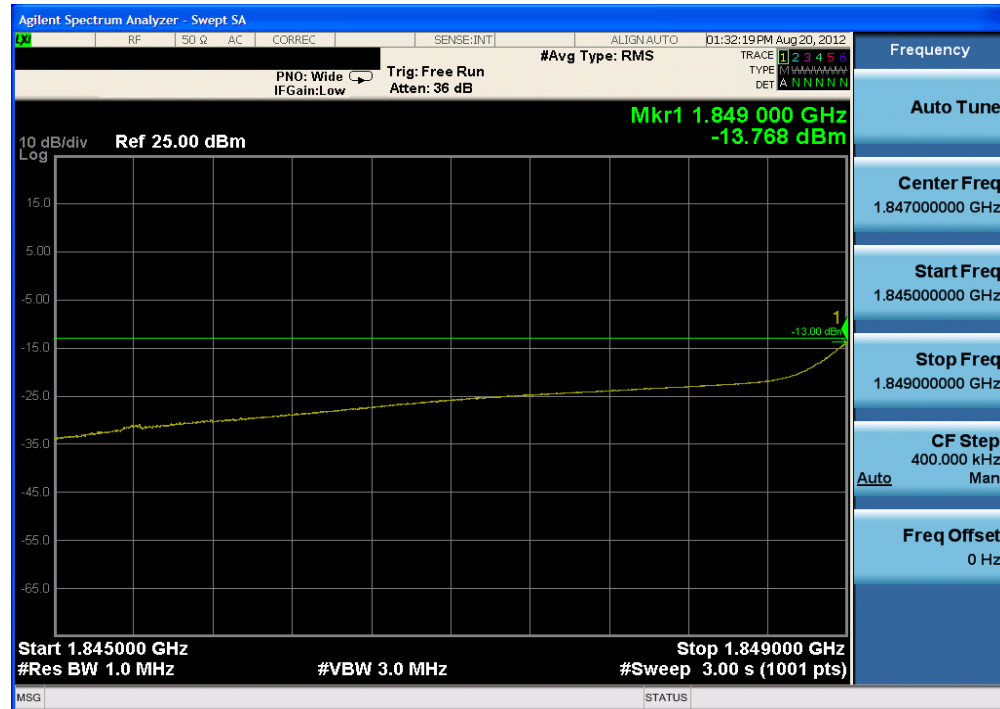
Figure 6-1. Frequency Stability Graph

FCC ID: A3LSPHL900	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 24 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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7.0 PLOT(S) OF EMISSIONS

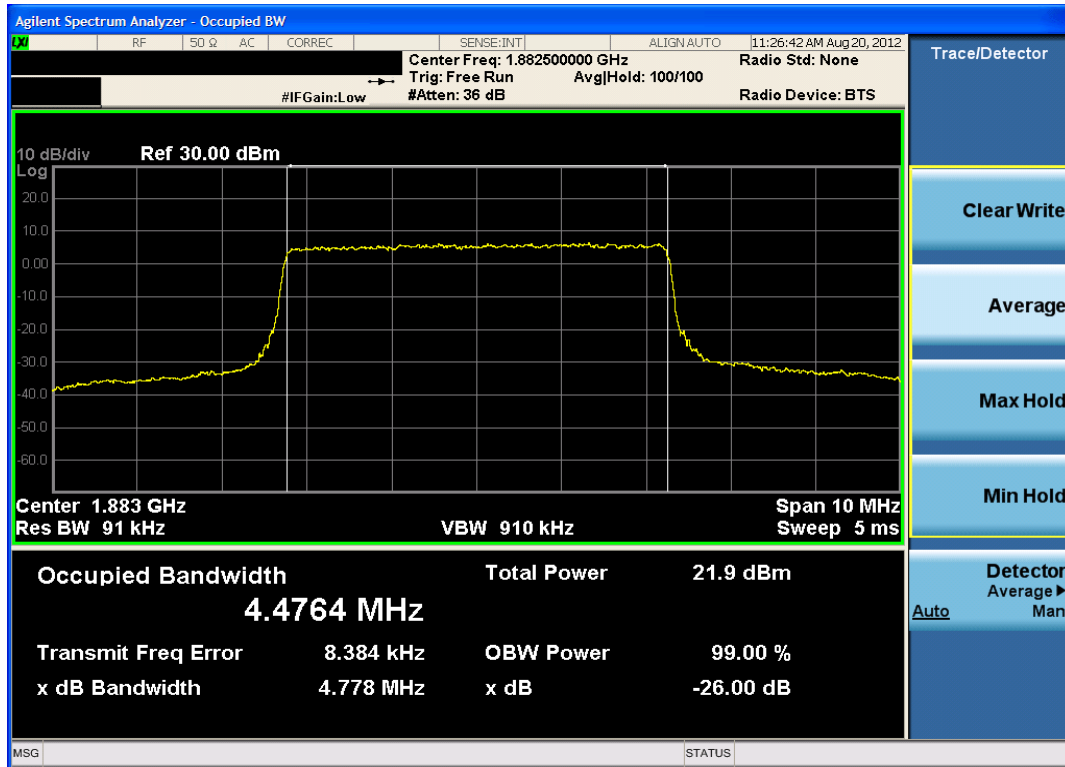


Plot 7-1. Lower Band Edge Plot (QPSK – 5MHz BW - RB Size 25)

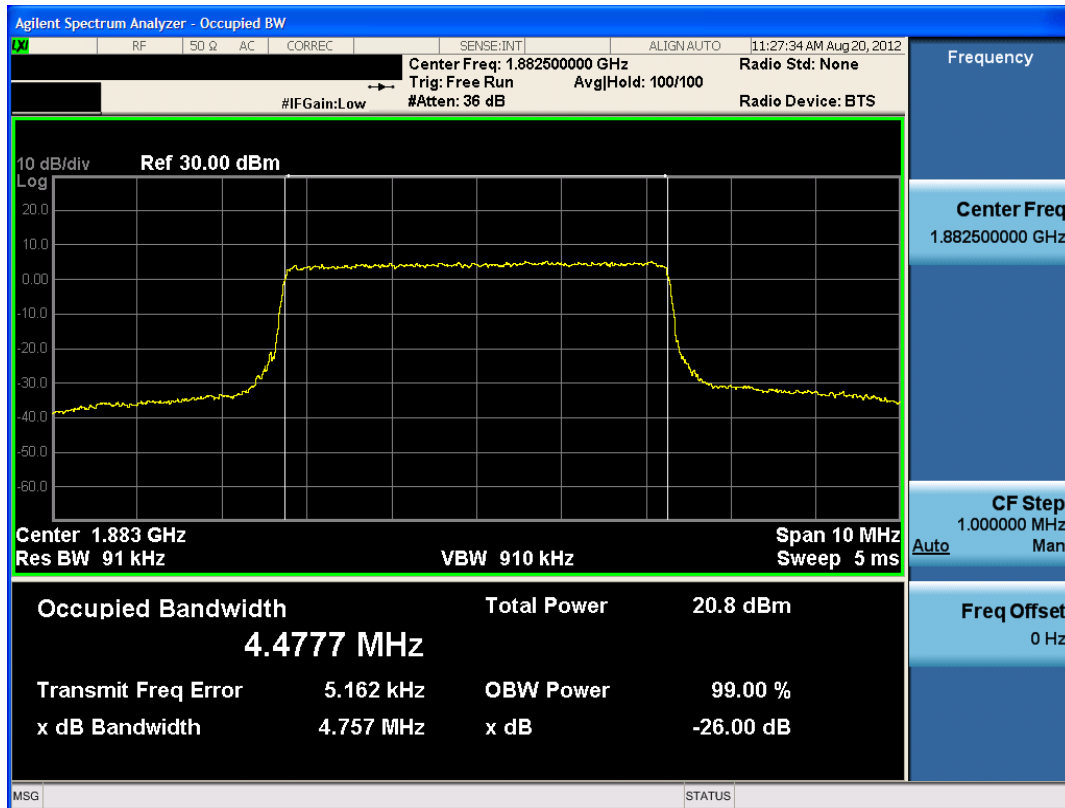


Plot 7-2. Lower Extended Band Edge Plot (QPSK – 5MHz BW – RB Size 25)

FCC ID: A3LSPHL900	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 24 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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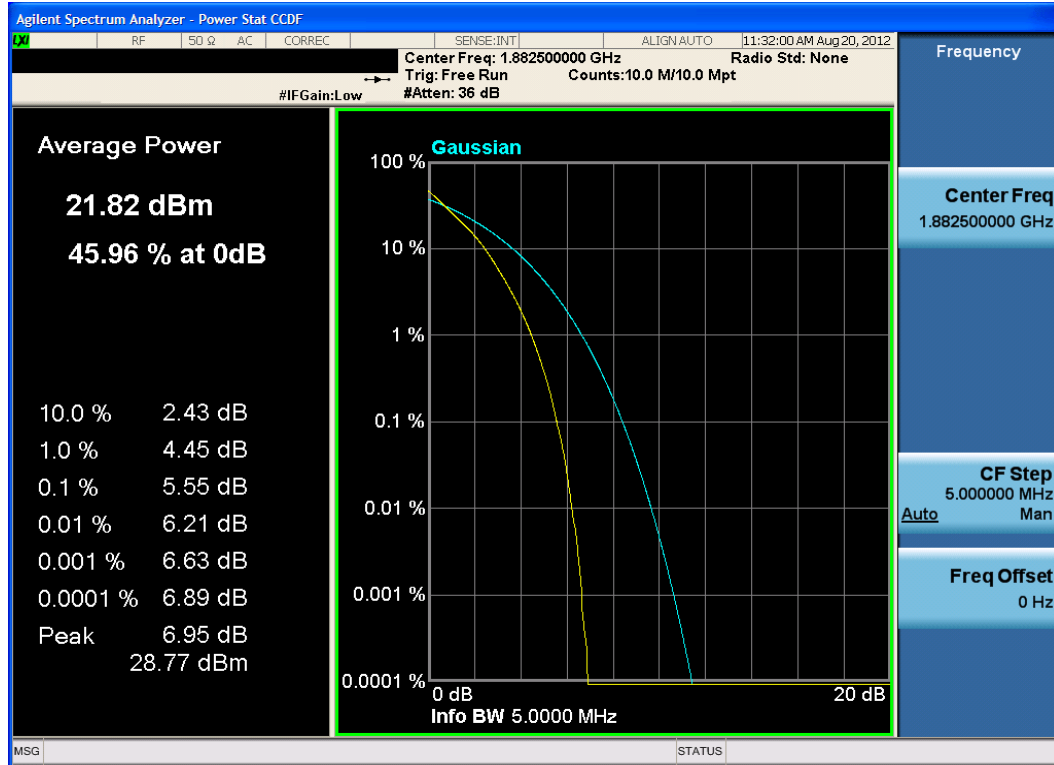


Plot 7-3. Occupied Bandwidth Plot (QPSK – 5MHz BW – RB Size 25)

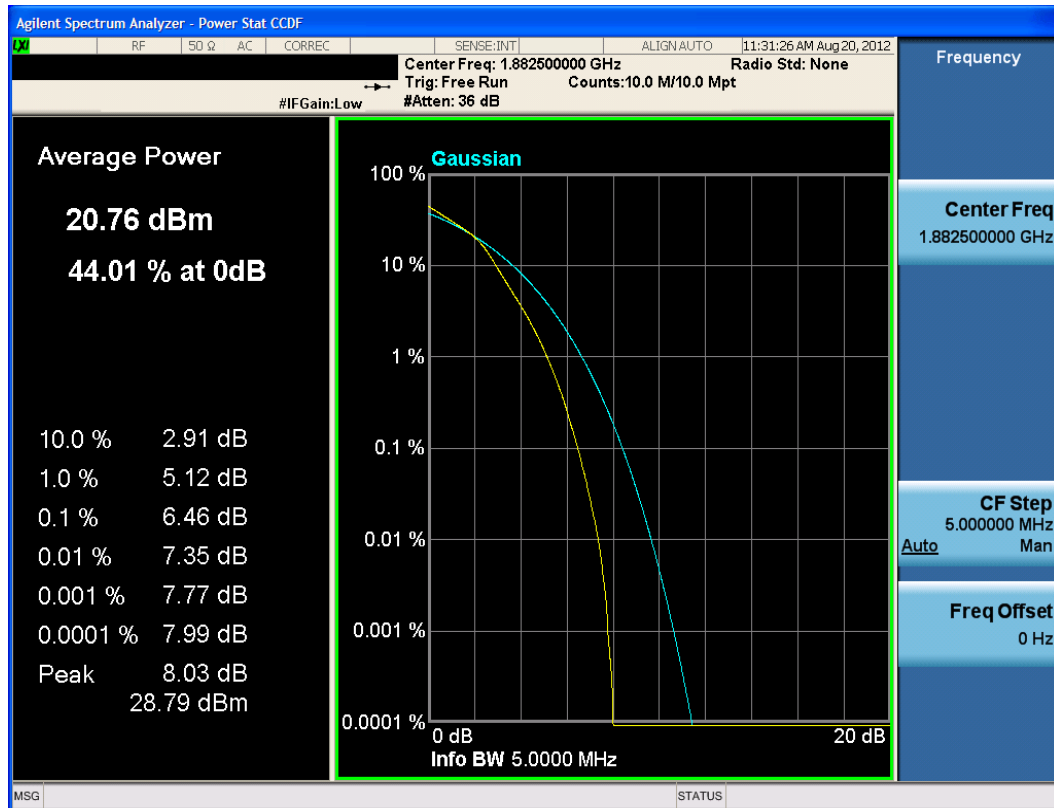


Plot 7-4. Occupied Bandwidth Plot (16-QAM – 5MHz BW – RB Size 25)

FCC ID: A3LSPHL900	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 24 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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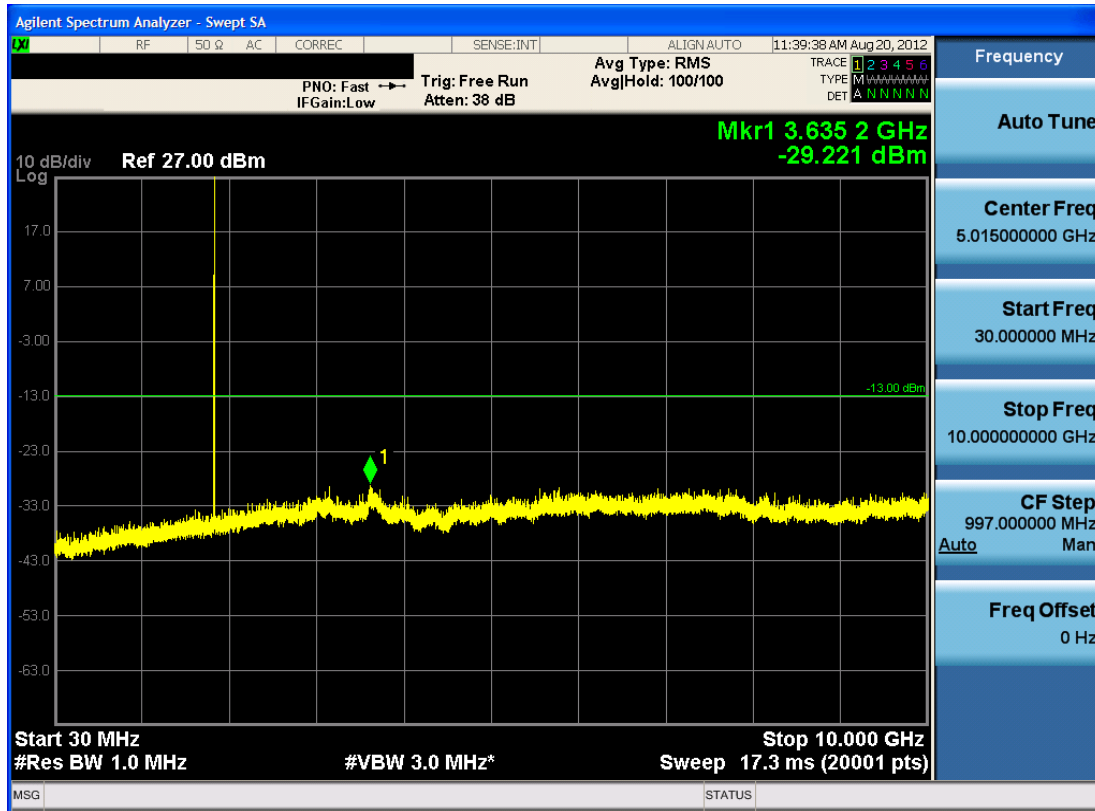


Plot 7-5. Peak-Average Ratio Plot (QPSK – 5MHz BW – RB Size 25)

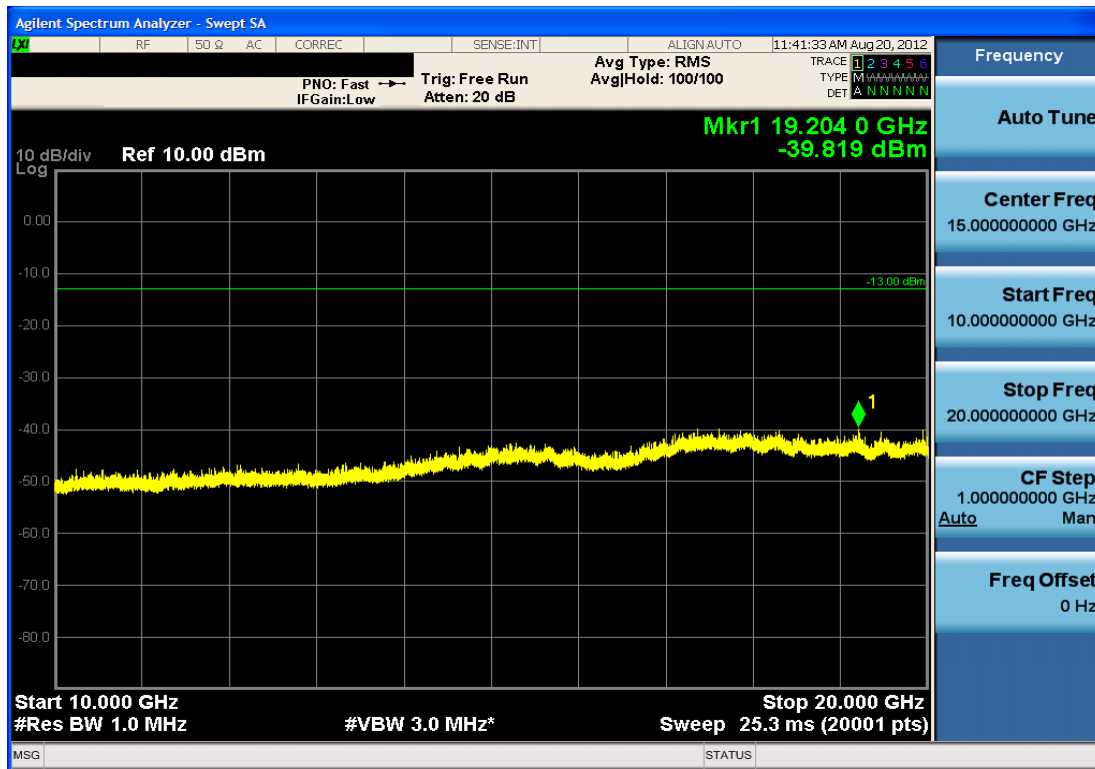


Plot 7-6. Peak-Average Ratio Plot (16-QAM – 5MHz BW – RB Size 25)

FCC ID: A3LSPHL900	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 24 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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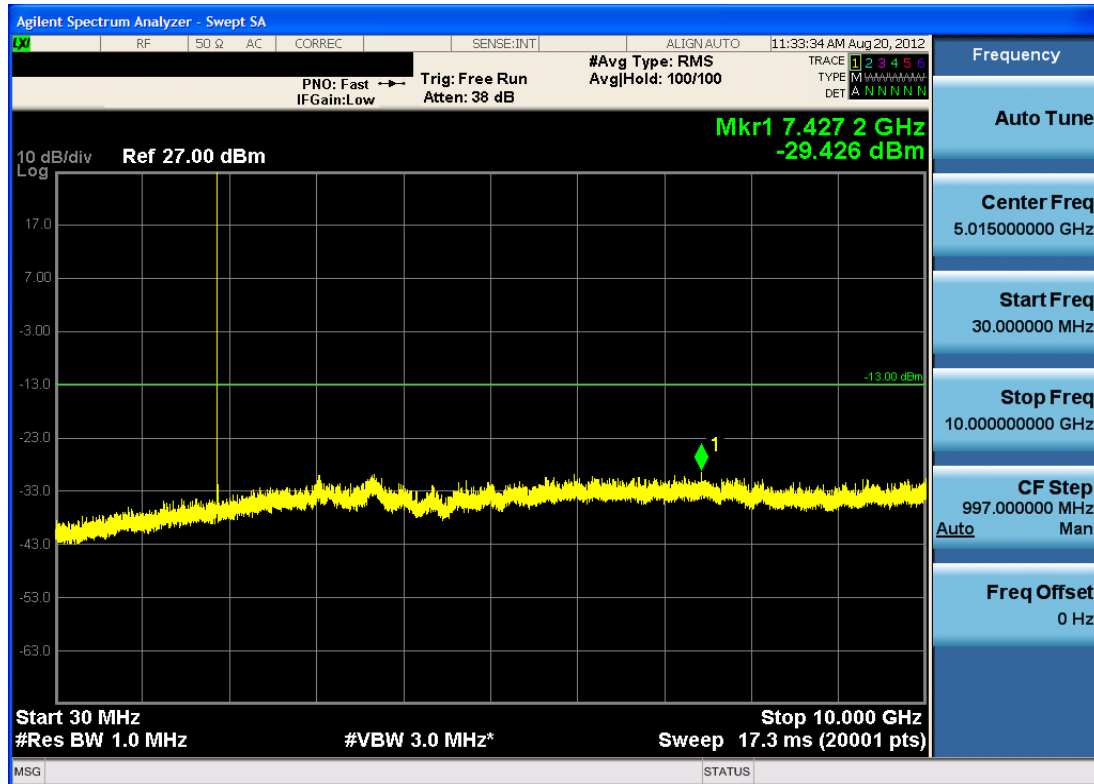


Plot 7-7. Conducted Spurious Plot (Low Channel - QPSK - 5MHz BW - RB Size 1, RB Offset 0)

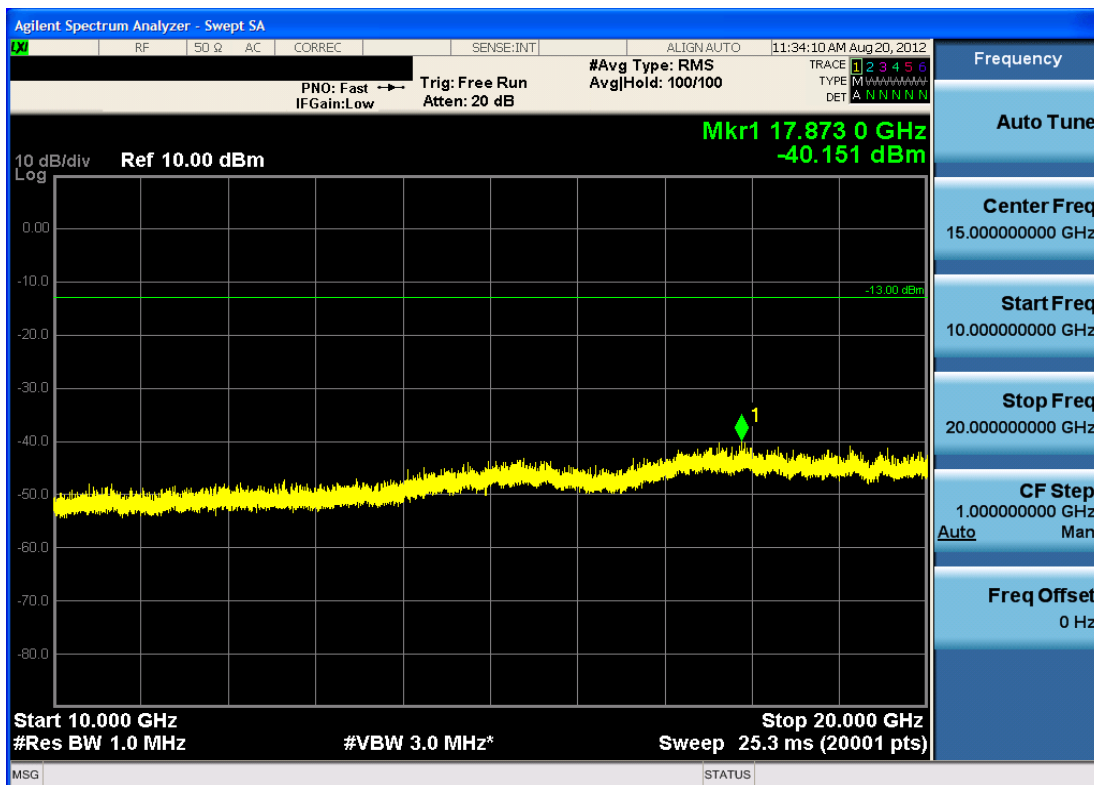


Plot 7-8. Conducted Spurious Plot (Low Channel - QPSK - 5MHz BW - RB Size 1, RB Offset 0)

FCC ID: A3LSPHL900	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 24 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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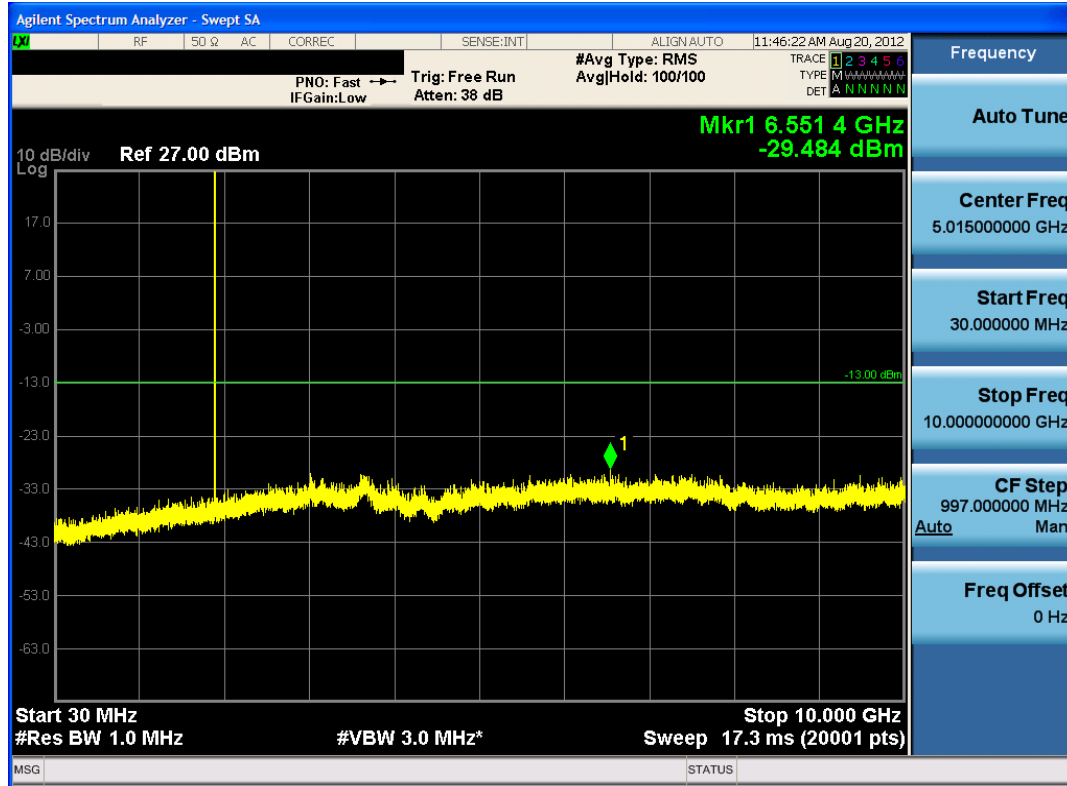


Plot 7-9. Conducted Spurious Plot (Mid Channel - QPSK – 5MHz BW - RB Size 1, Offset 0)

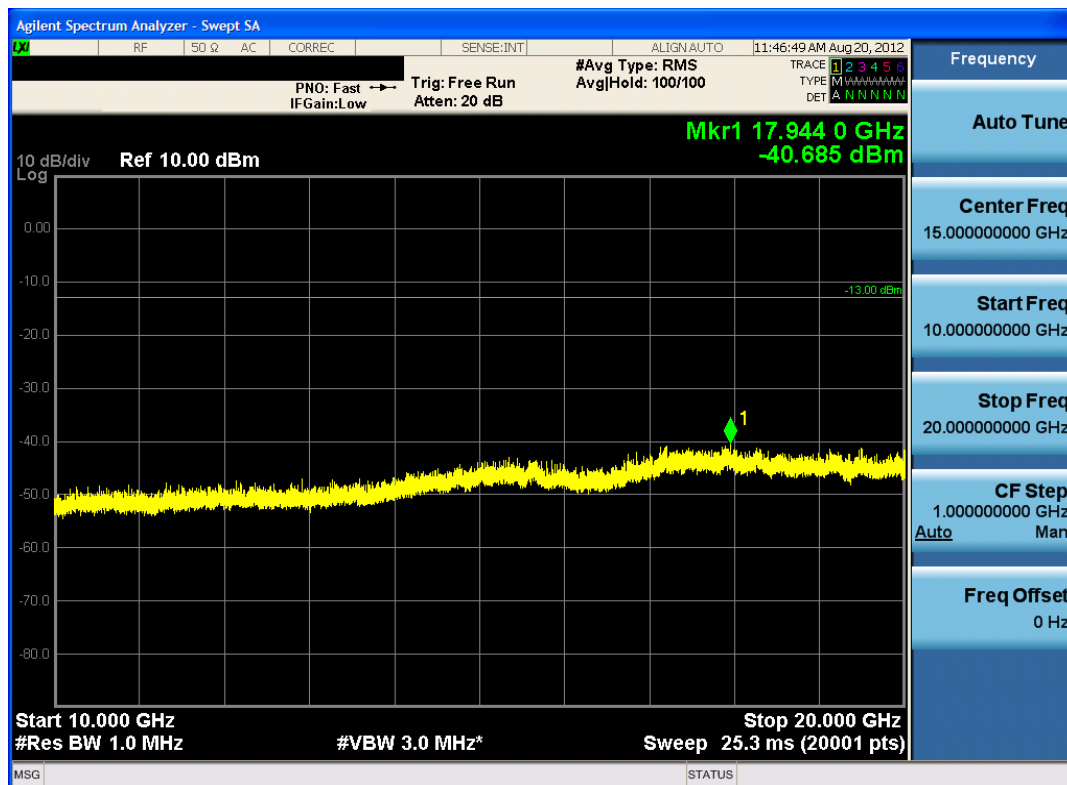


Plot 7-10. Conducted Spurious Plot (Mid Channel - QPSK – 5MHz BW – RB Size 1, Offset 0)

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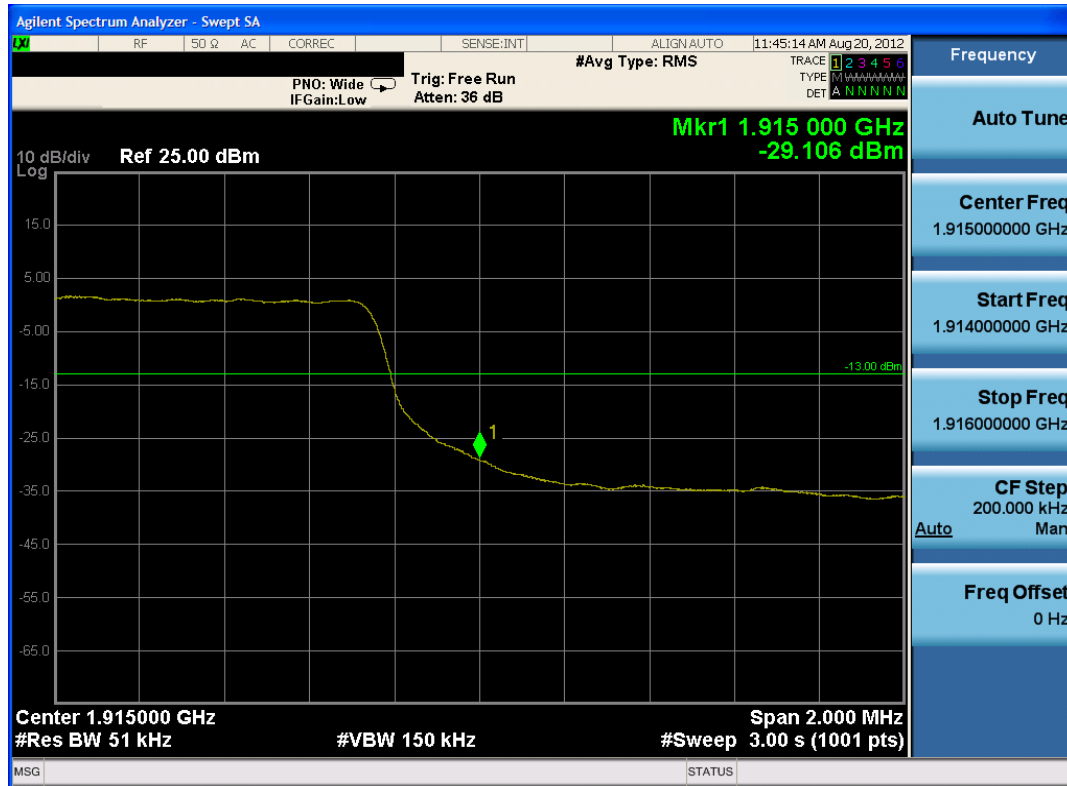


Plot 7-11. Conducted Spurious Plot (High Channel - QPSK - 5MHz BW - RB Size 1, Offset 0)

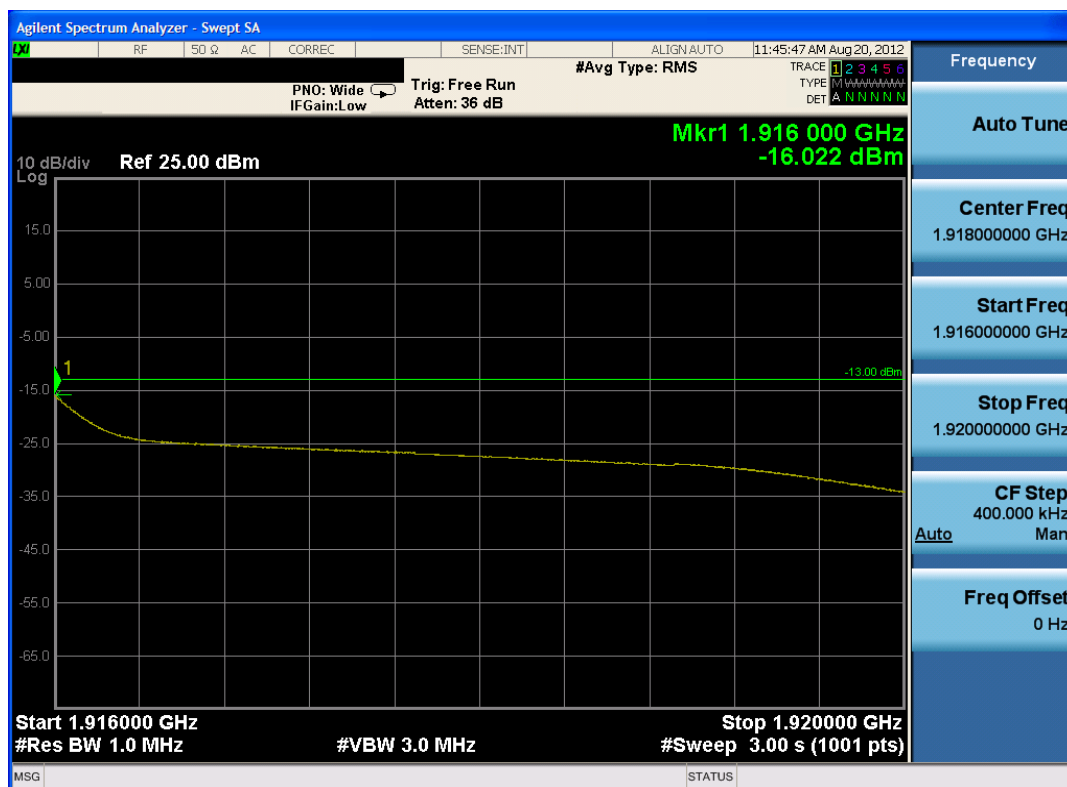


Plot 7-12. Conducted Spurious Plot (High Channel - QPSK - 5MHz BW - RB Size 1, Offset 0)

FCC ID: A3LSPHL900	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 24 LTE MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-13. Upper Band Edge Plot (QPSK – 5MHz BW – RB Size 25)



Plot 7-14. Upper Extended Band Edge Plot (QPSK – 5MHz BW – RB Size 25)

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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: A3LSPHL900** complies with all the requirements of Parts 2 and 27 of the FCC rules.

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