



MEASUREMENT REPORT

FCC Part 90

Applicant:

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

Date of Testing:

March 17 - 28, 2014

Test Site/Location:

PCTEST Lab., Columbia, MD, USA

Test Report Serial No.:

0Y1403170568.A3L

FCC ID:

A3LSPHL710T

APPLICANT:

SAMSUNG ELECTRONICS, CO. LTD.

Applicant Type:

Certification

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part:

§90.691

EUT Type:

Portable Handset

Model(s):

SPH-L710T

Test Device Serial No.:

identical prototype [S/N: 17MAR-2, 17MAR-15, 17MAR-1, 17MAR-3, 17MAR-5]

Mode	Tx Frequency (MHz)	Emission Designator	Cond. PWR	
			Max. Power	Max. Power
CDMA800 (BC10)	817.9 - 823.1	1M28F9W	0.306	24.86
LTE Band 26	814.7 - 823	1M10G7D	0.282	24.50
LTE Band 26	814.7 - 823	1M10W7D	0.222	23.46
LTE Band 26	815.5 - 822.5	2M69G7D	0.281	24.48
LTE Band 26	815.5 - 822.5	2M69W7D	0.224	23.50
LTE Band 26	816.5 - 821.5	4M53G7D	0.282	24.50
LTE Band 26	816.5 - 821.5	4M52W7D	0.223	23.49
LTE Band 26	819	9M04G7D	0.256	24.09
LTE Band 26	819	9M01W7D	0.190	22.78

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.


Randy Ortanez
President

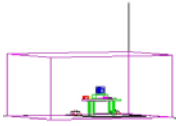


FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset	Page 1 of 45	

TABLE OF CONTENTS

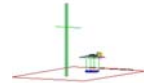
FCC PART 90 MEASUREMENT REPORT.....	3
1.0 INTRODUCTION	4
1.1 SCOPE	4
1.2 TESTING FACILITY	4
2.0 PRODUCT INFORMATION.....	5
2.1 EQUIPMENT DESCRIPTION	5
2.2 DEVICE CAPABILITIES.....	5
2.3 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS	5
3.0 DESCRIPTION OF TESTS	6
3.1 EVALUATION PROCEDURE	6
3.2 OCCUPIED BANDWIDTH	6
3.3 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.....	6
3.4 RADIATED POWER AND RADIATED SPURIOUS EMISSIONS	7
3.5 FREQUENCY STABILITY / TEMPERATURE VARIATION	8
4.0 TEST EQUIPMENT CALIBRATION DATA	9
5.0 SAMPLE CALCULATIONS	10
6.0 TEST RESULTS.....	11
6.1 SUMMARY.....	11
6.2 CONDUCTED POWER OUTPUT DATA	12
6.3 OCCUPIED BANDWIDTH	14
6.4 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.....	20
6.5 RADIATED SPURIOUS EMISSIONS MEASUREMENTS	35
6.6 FREQUENCY STABILITY / TEMPERATURE VARIATION	40
7.0 CONCLUSION.....	45

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 2 of 45



MEASUREMENT REPORT

BC10 CDMA

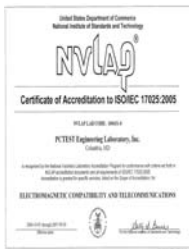
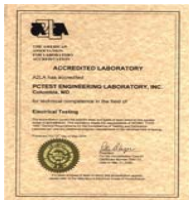


§2.1033 General Information

APPLICANT: Samsung Electronics, Co. Ltd.
APPLICANT ADDRESS: 129, Samsung-ro, Maetan dong,
 Yeongtong-gu, Suwon-si, Gyeonggi-do 443-742, Korea
TEST SITE: PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS: 7185 Oakland Mills Road, Columbia, MD 21045 USA
BASE MODEL: SPH-L710T
FCC CLASSIFICATION: PCS Licensed Transmitter Held to Ear (PCE)
MODE: LTE
FREQUENCY TOLERANCE: $\pm 0.00025\%$ (2.5 ppm)
Test Device Serial No.: 17MAR-2, 17MAR-15,
 17MAR-1, 17MAR-3, ☐ Production ☒ Pre-Production ☐ Engineering
 17MAR-5
DATE(S) OF TEST: March 17 - 28, 2014
TEST REPORT S/N: 0Y1403170568.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.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 3 of 45

1.0 INTRODUCTION

1.1 Scope

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

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern't'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See **Figure 1-1**).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility 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.

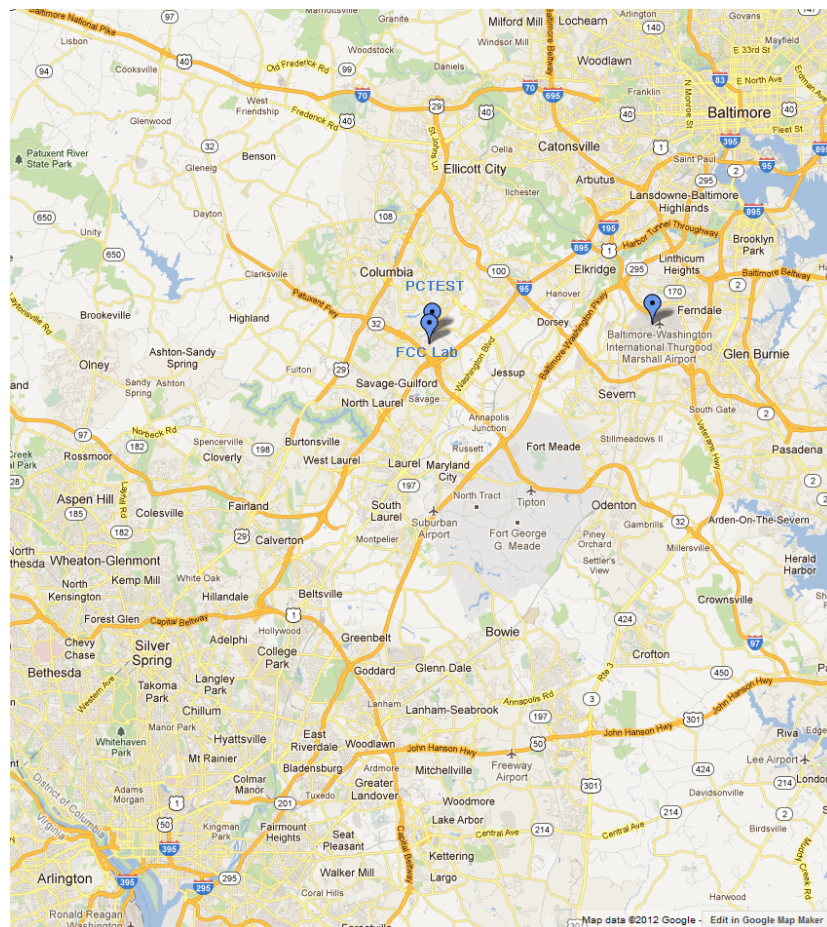


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDo / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 4 of 45

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSPHL710T**. The EUT consisted of the following component(s):

Trade Name / Base Model	FCC ID	Description
Samsung / Model: SPH-L710T	A3LSPHL710T	Portable Handset

Table 2-1. EUT Equipment Description

Note: All data contained in this report is applicable for the device operation in the BC10 (817 – 824 MHz). Test data shown supports the devices compliance with §90.691 of the FCC Rules and Regulation.

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA (BC0, BC1, BC10), Band 25 (3, 5, 10MHz BW), 41 (10, 15, 20MHz BW), 26 (1.4, 3, 5, 10MHz BW) LTE, 802.11a/b/g/n WLAN, 802.11a/n UNII, Bluetooth (1x, EDR, LE), NFC

2.3 EMI Suppression Device(s)/Modifications

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

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 5 of 45

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the “Land Mobile FM or PM – Communications Equipment Measurements and Performance Standards” (ANSI/TIA-603-C-2004) was used in the measurement of the measurement of the **Samsung Portable Handset FCC ID: A3LSPHL710T**.

3.2 Occupied Bandwidth

§2.1049

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.

3.3 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, §90.691

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.

Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 6 of 45

3.4 Radiated Power and Radiated Spurious Emissions

§2.1053, §90.635, §90.691

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 $43 + 10\log_{10}(\text{Power [Watts]})$ specified in 90.691.

For fundamental radiated power measurements, the guidance of KDB 971168 is used to record the EUT power level that is subsequently matched via the aforementioned substitution method given in ANSI/TIA-603-C-2004.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 7 of 45

3.5 Frequency Stability / Temperature Variation

§2.1055, 90.213(a)

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

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

Specification – For Part 90.213, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes 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.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset	Page 8 of 45	

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)	3/29/2013	Annual	3/29/2014	N/A
-	LTX3	Licensed Transmitter Cable Set	1/30/2014	Annual	1/30/2015	N/A
Agilent	8447D	Broadband Amplifier	5/31/2013	Annual	5/31/2014	2443A01900
Agilent	N5183A	MXG Analog Signal Generator	1/16/2014	Annual	1/16/2015	MY50141900
Agilent	N9030A	PXA Signal Analyzer (44GHz)	1/17/2014	Annual	1/17/2015	MY52350166
Agilent	E5515C	Wireless Communications Test Set	N/A			GB46110872
Emco	3115	Horn Antenna (1-18GHz)	1/30/2014	Biennial	1/30/2016	9704-5182
Espec	ESX-2CA	Environmental Chamber	4/16/2013	Annual	4/16/2014	17620
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2014	Biennial	3/12/2016	128337
Mini-Circuits	VHF-1200+	High Pass Filter	1/27/2014	Annual	1/27/2015	30923
Mini-Circuits	PWR-SENS-4RMS	USB Power Sensor	4/17/2013	Annual	4/17/2014	11210140001
Rohde & Schwarz	CMW500	LTE Radio Communication Tester	N/A			100976
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	5/31/2013	Annual	5/31/2014	100071
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	1/27/2014	Annual	1/27/2015	100342
Schwarzbeck	UHA 9105	Dipole Antenna (400 - 1GHz) Rx	11/1/2013	Biennial	11/1/2015	91052523RX
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/28/2014	Biennial	1/28/2016	A051107

Table 4-1. Test Equipment

Notes:

Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 9 of 45

5.0 SAMPLE CALCULATIONS

Emission Designator

Emission Designator = 1M25F9W

CDMA BW = 1.25 MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination (Audio/Data) (Measured at the 99.75% power bandwidth)

Spurious Radiated Emission – BC10

Example: Channel 476 CDMA BC10 Mode 3rd Harmonic (2453.70MHz)

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 2453.70 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80) = 50.3 dBc.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 10 of 45

6.0 TEST RESULTS

6.1 Summary

Company Name: Samsung Electronics, Co. Ltd.
 FCC ID: A3LSPHL710T
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE
 Band: Band Class 10 / Band 26

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 6.3
§2.1051, §90.691	Band Edge / Conducted Spurious Emissions	$> 50 + 10\log_{10}(P[\text{Watts}])$ at Band Edge and for all out-of-band emissions within 37.5kHz of Block Edge		PASS	Section 6.4
§2.1046, §90.635	Conducted Power	< 100 Watts		PASS	Section 6.2
§2.1055, §90.213	Frequency Stability	< 2.5 ppm		PASS	Section 6.6
§2.1053, §90.691	Undesirable Emissions	$> 43 + 10\log_{10}(P[\text{Watts}])$ for all out-of-band emissions	RADIATED	PASS	Section 6.5

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 Sections 6.3, 6.4 were 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.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset	Page 11 of 45	

6.2 Conducted Power Output Data

§90.635

Test Overview

The transmitter output power was measured in a conducted setup at the antenna terminal. The power was measured for all supported modes of operation on an Agilent MXA Signal Analyzer.

Test Procedure Used

KDB 971168 v02r01 – Section 5.2.1

Test Settings

1. RBW = 1 - 5% of the OBW, not to exceed 1 MHz
2. VBW $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ span / RBW
5. Detector = RMS
6. Trace average 100 traces in power averaging mode

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

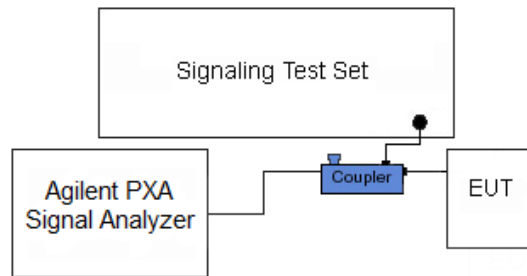


Figure 6-1. Test Instrument & Measurement Setup

Test Notes

None.

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 12 of 45

Conducted Power Output Data

§90.635

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Cond. PWR [dBm]	Cond. PWR [Watts]	Cond. PWR Limit [dBm]	Margin [dB]
814.70	1.4	QPSK	24.2	0.263	50.00	-25.80
823.30	1.4	QPSK	24.50	0.282	50.00	-25.50
814.70	1.4	16-QAM	23.37	0.217	50.00	-26.63
823.30	1.4	16-QAM	23.46	0.222	50.00	-26.54
815.50	3	QPSK	24.11	0.258	50.00	-25.89
822.50	3	QPSK	24.48	0.281	50.00	-25.52
815.50	3	16-QAM	22.5	0.178	50.00	-27.50
822.50	3	16-QAM	23.50	0.224	50.00	-26.50
816.50	5	QPSK	24.3	0.269	50.00	-25.70
821.50	5	QPSK	24.50	0.282	50.00	-25.50
816.50	5	16-QAM	23.32	0.215	50.00	-26.68
821.50	5	16-QAM	23.49	0.223	50.00	-26.51
819.00	10	QPSK	24.09	0.256	50.00	-25.91
819.00	10	16-QAM	22.78	0.190	50.00	-27.22

Table 6-2. LTE Band 26 Conducted Power Output Data

Frequency [MHz]	BC10 [Channel]	Battery Type	Cond. PWR [dBm]	Cond. PWR [Watts]	Cond. PWR Limit [dBm]	Margin [dB]
817.90	476	Standard	24.86	0.306	50.00	-25.14
823.10	684	Standard	24.74	0.298	50.00	-25.26

Table 6-3. CDMA BC10 Conducted Power Output Data

NOTES:

1. For CDMA mode, this device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model EB-L1G6LLA contains an embedded NFC antenna.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 13 of 45

6.3 Occupied Bandwidth

§2.1049

Test Overview

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. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

KDB 971168 v02r01 – Section 4.2

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

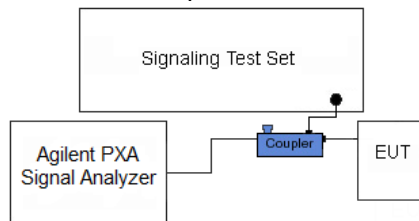
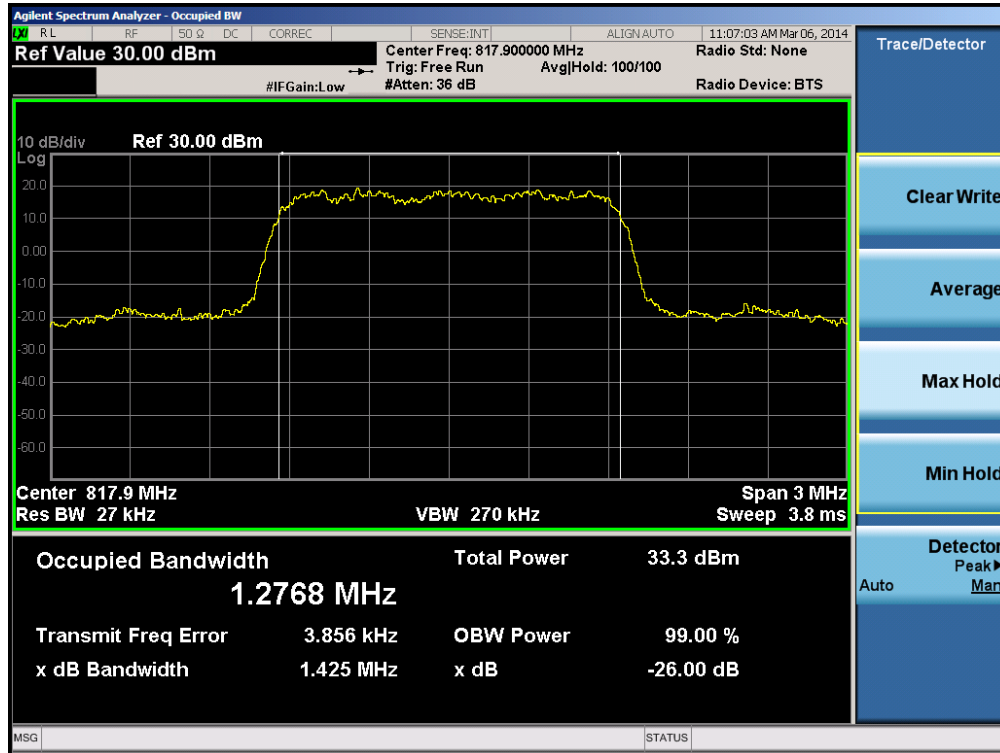


Figure 6-2. Test Instrument & Measurement Setup

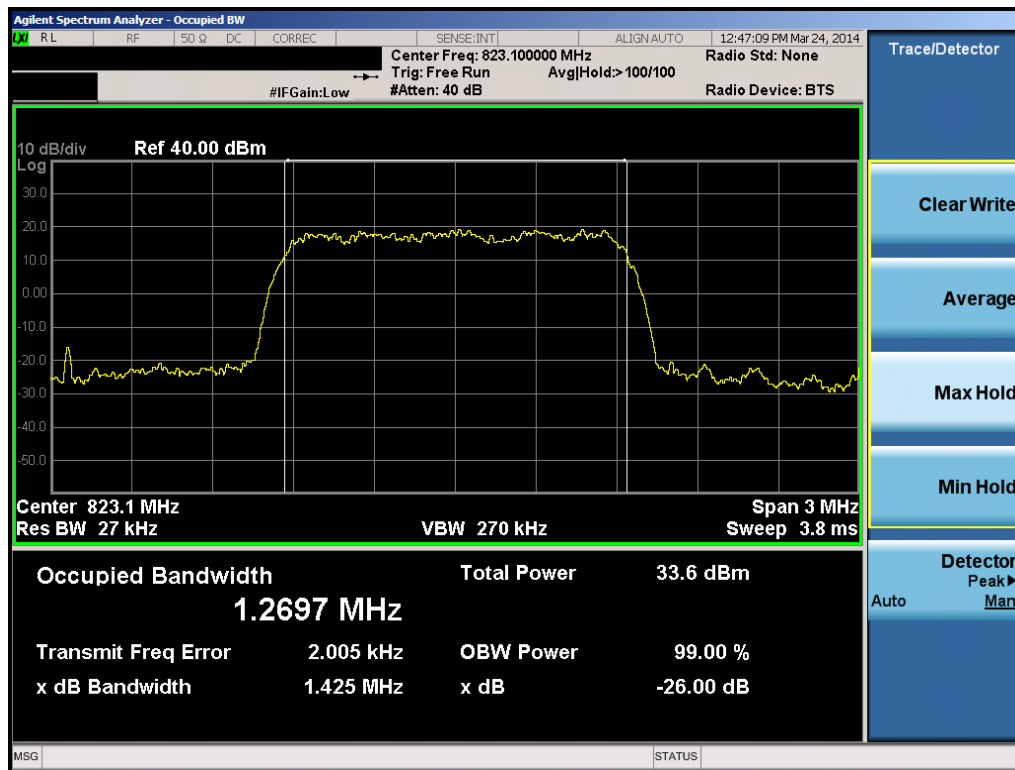
Test Notes

None.

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 14 of 45

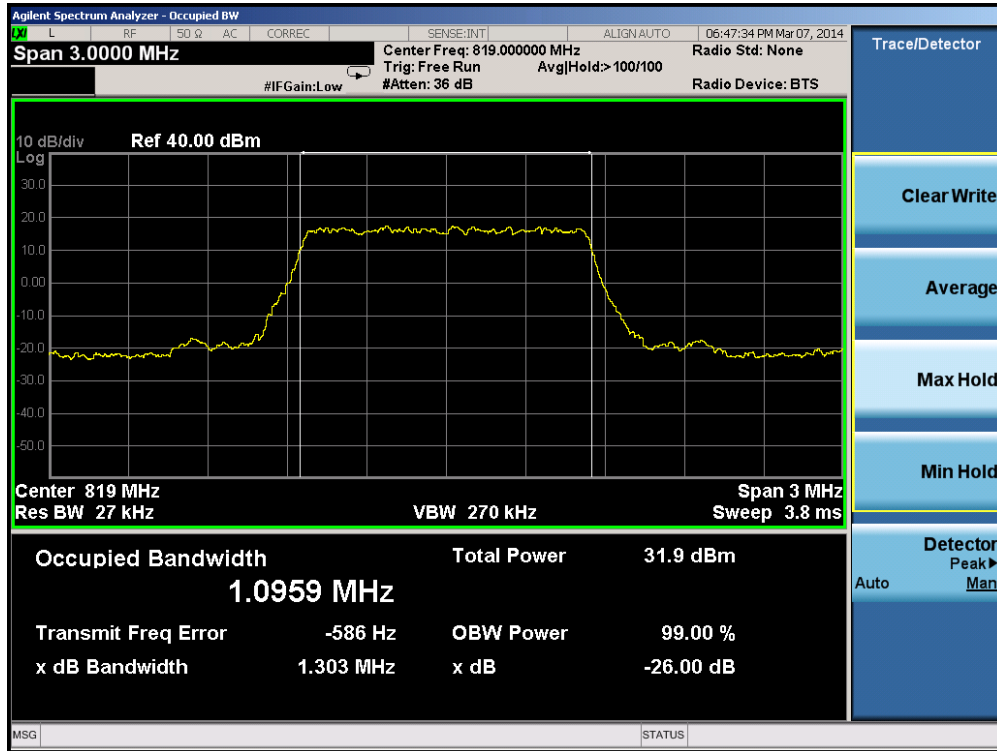


Plot 6-1. Occupied Bandwidth Plot (CDMA BC10 Ch. 476)

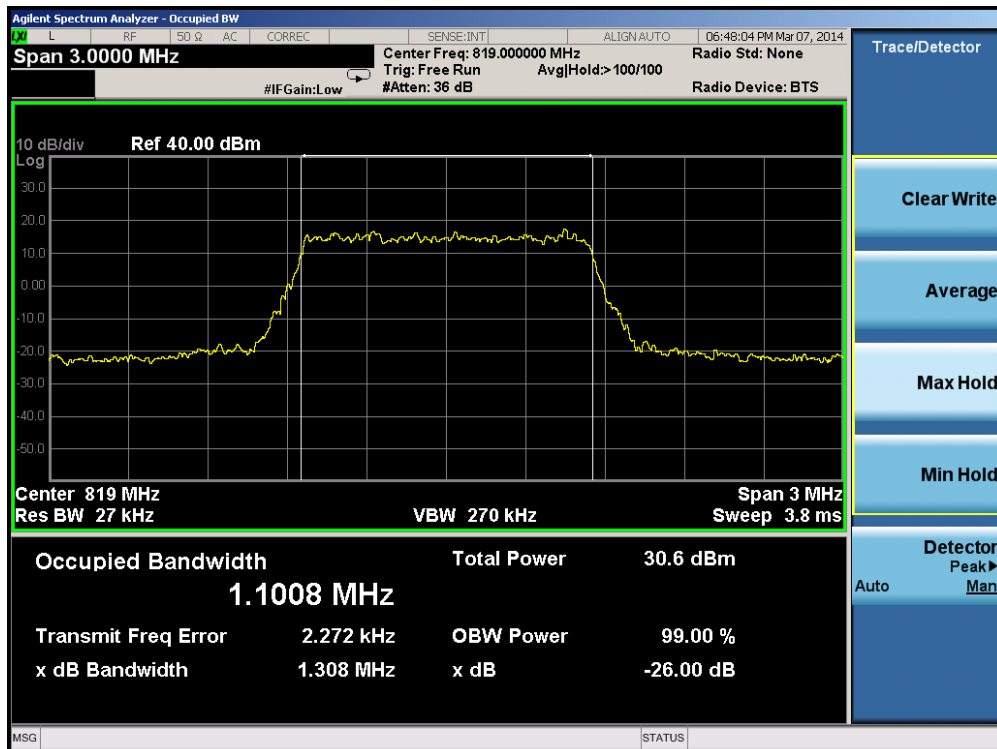


Plot 6-2. Occupied Bandwidth Plot (CDMA BC10 Ch. 684)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 15 of 45

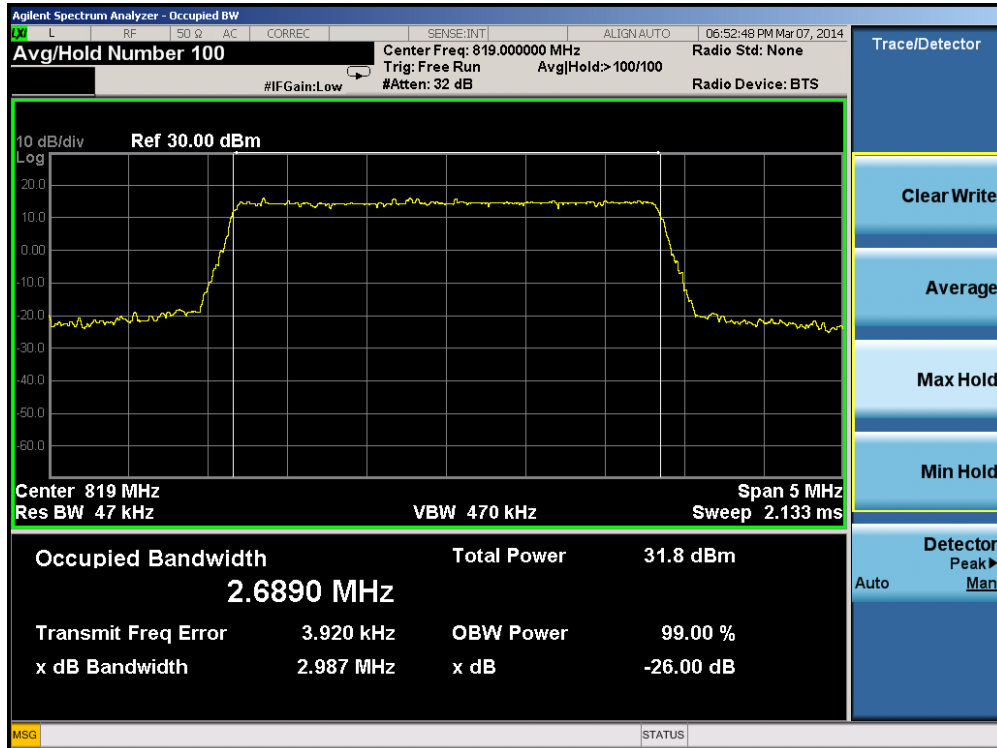


Plot 6-3. Occupied Bandwidth Plot (LTE Band 26 1.4MHz QPSK – RB Size 6– Low Channel)

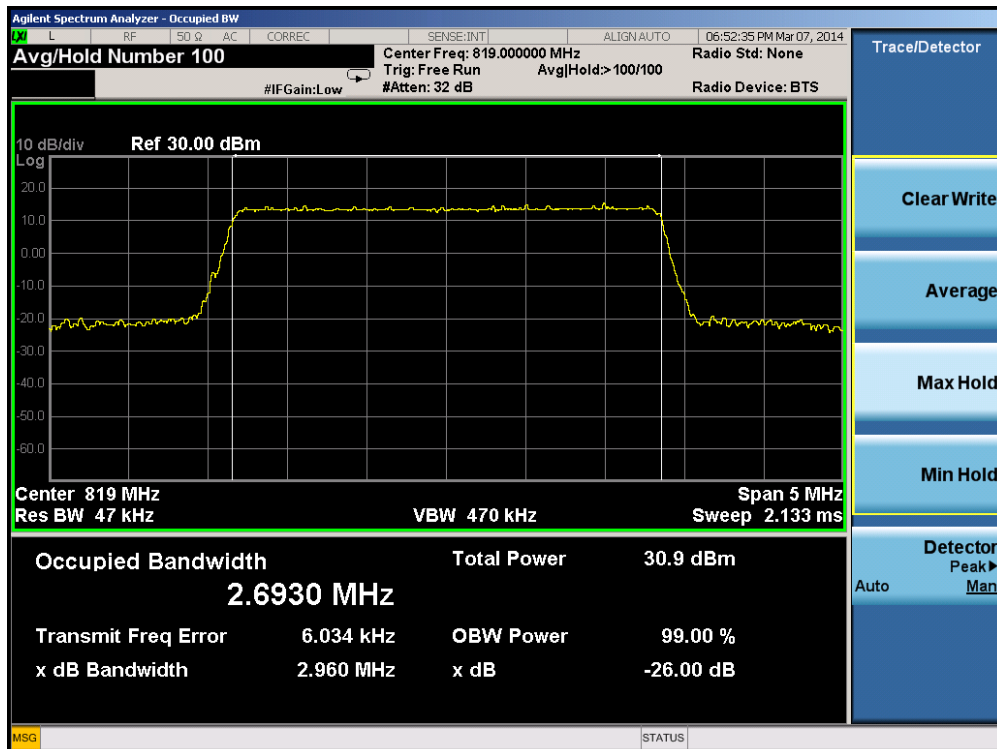


Plot 6-4. Occupied Bandwidth Plot (LTE Band 26 1.4MHz 16-QAM – RB Size 6– Low Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 16 of 45

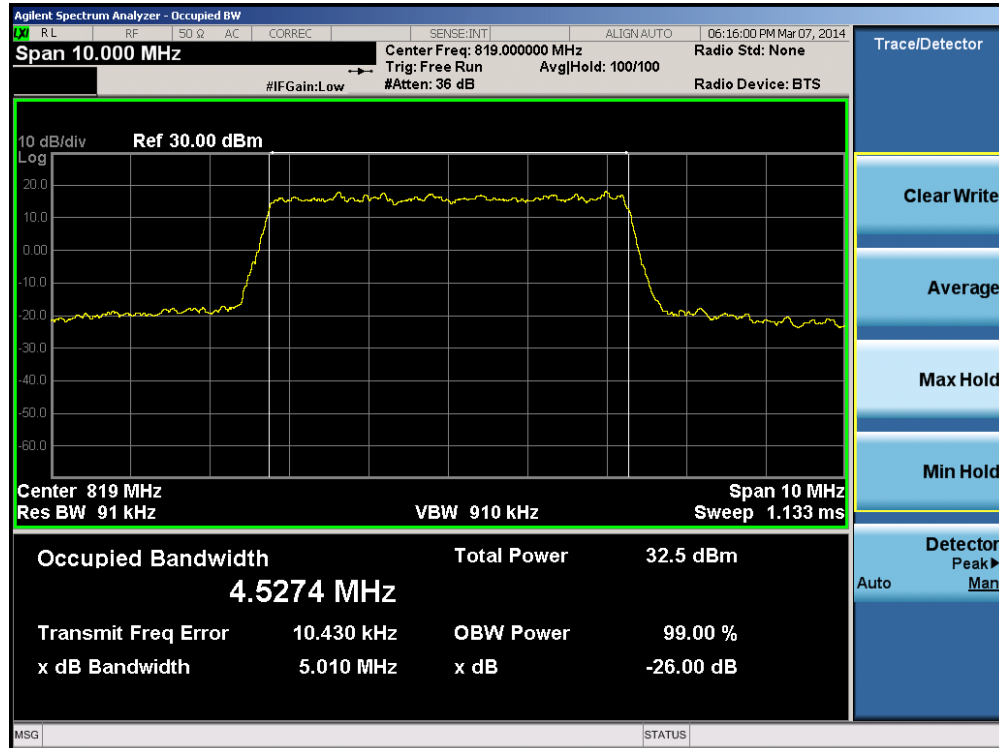


Plot 6-5. Occupied Bandwidth Plot (LTE Band 26 3MHz QPSK – RB Size 15– Low Channel)

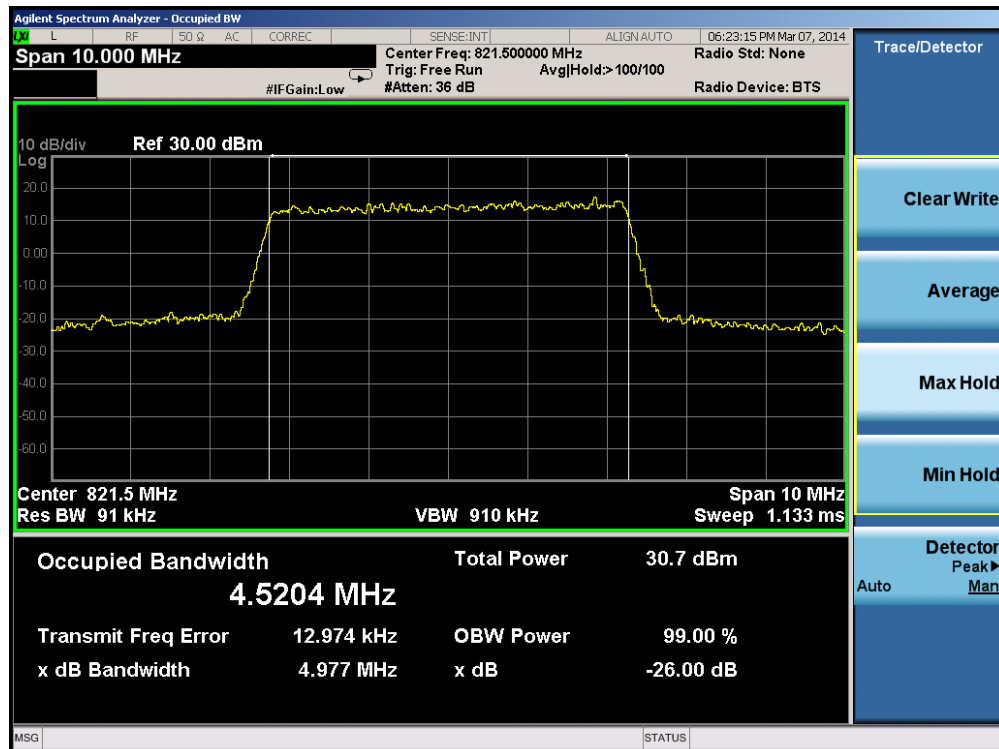


Plot 6-6. Occupied Bandwidth Plot (LTE Band 26 3MHz 16-QAM – RB Size 15– Low Channel))

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 17 of 45

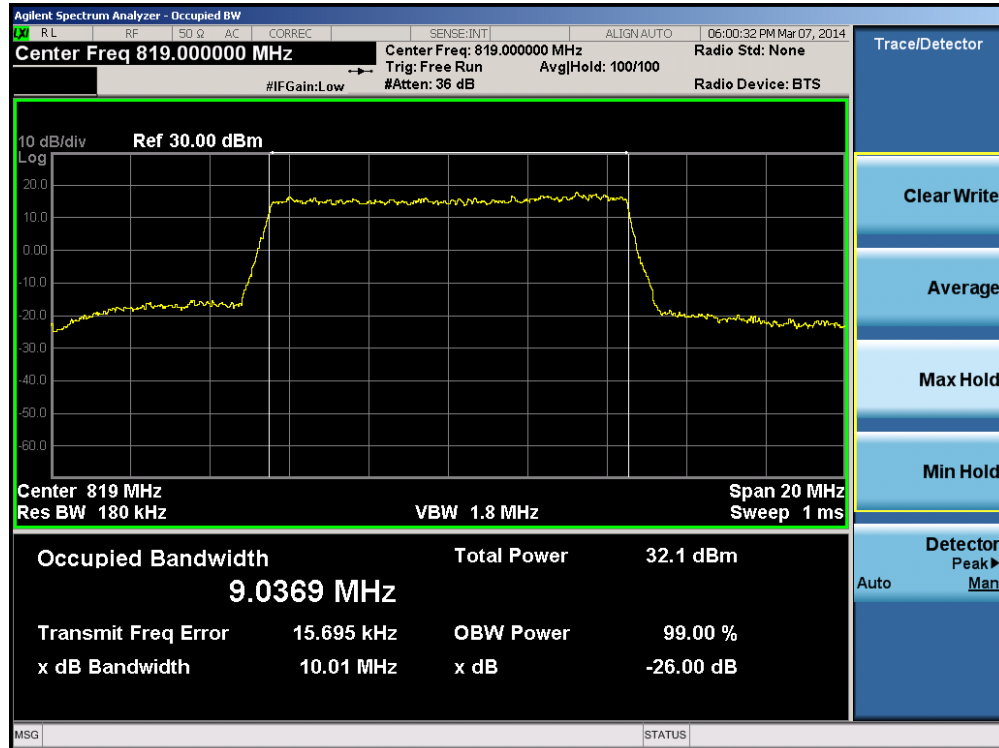


Plot 6-7. Occupied Bandwidth Plot (LTE Band 26 5MHz QPSK – RB Size 25– Low Channel)

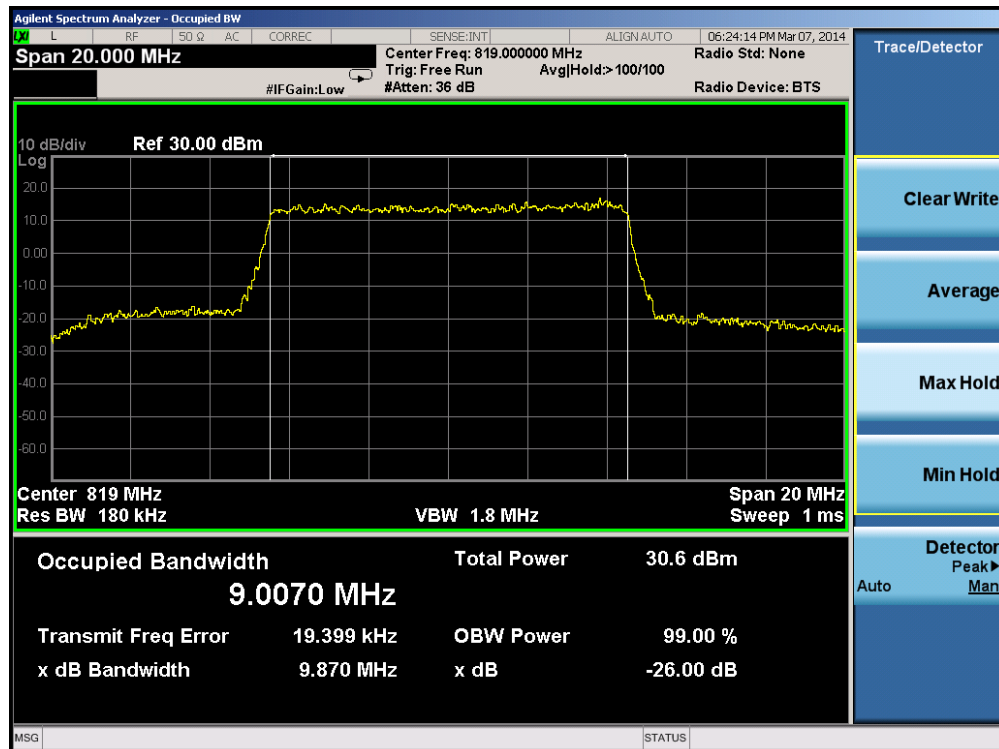


Plot 6-8. Occupied Bandwidth Plot (LTE Band 26 5MHz 16-QAM – RB Size 25– Low Channel))

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 18 of 45



Plot 6-9. Occupied Bandwidth Plot (LTE Band 26 10MHz QPSK – RB Size 50)



Plot 6-10. Occupied Bandwidth Plot (LTE Band 26 10MHz 16-QAM – RB Size 50)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 19 of 45

6.4 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051 §90.691

Test Overview

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. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible attenuation level of any spurious emission outside 37kHz of the block edges is $43 + \log_{10}(P_{\text{Watts}})$ (where P is the transmitter power in Watts). The minimum permissible attenuation level of any spurious emission within 37kHz of the block edges is $50 + \log_{10}(P_{\text{Watts}})$.

Test Procedure Used

KDB 971168 v02r01 – Section 6.0

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = max hold
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

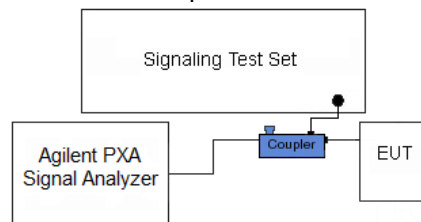
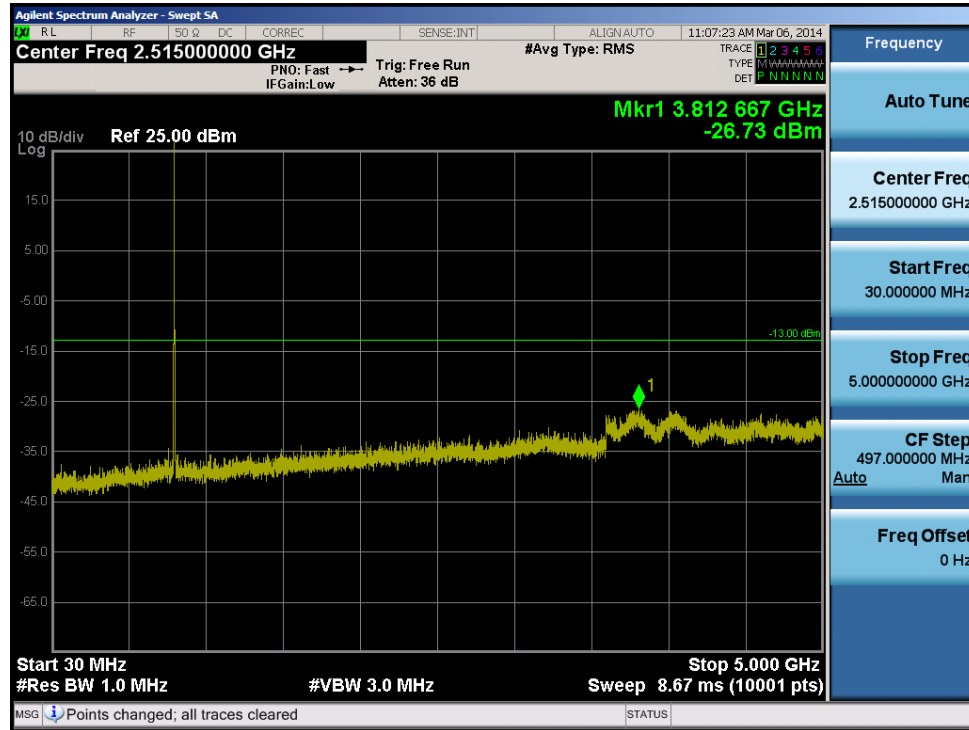


Figure 6-3. Test Instrument & Measurement Setup

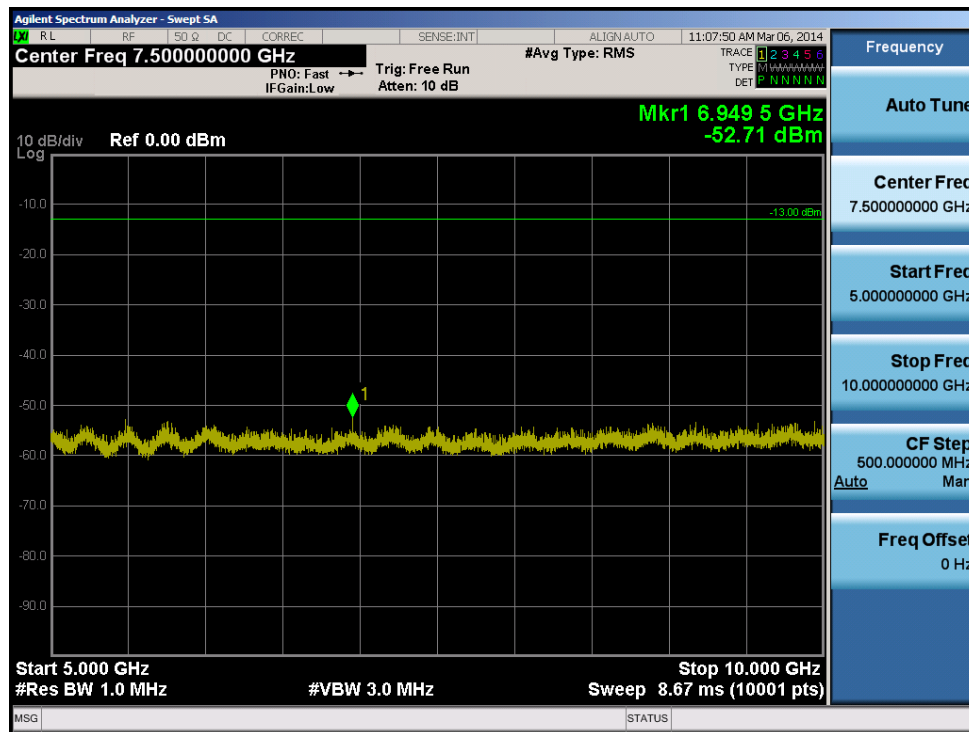
Test Setup

Adjacent Channel Power plots are provided in this section to show that the power of any emission within 37.5kHz of the block edges are less than $50 + \log_{10}(P_{\text{Watts}})$.

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 20 of 45

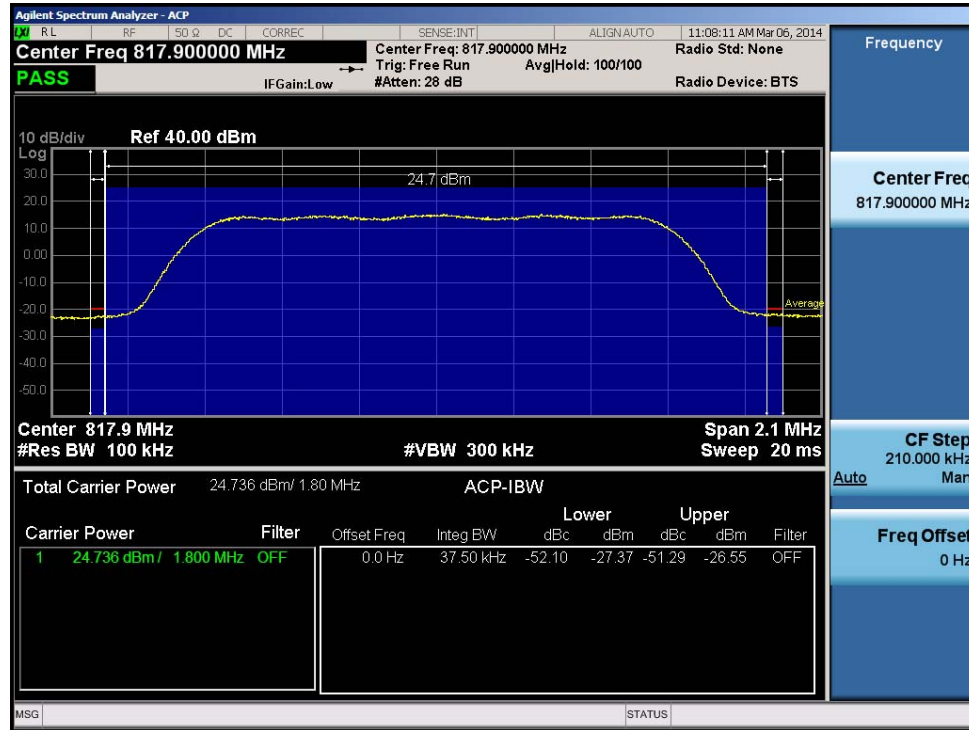


Plot 6-11. Conducted Spurious Plot (CDMA BC10 Ch. 476)



Plot 6-12. Conducted Spurious Plot (CDMA BC10 Ch. 476)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 21 of 45

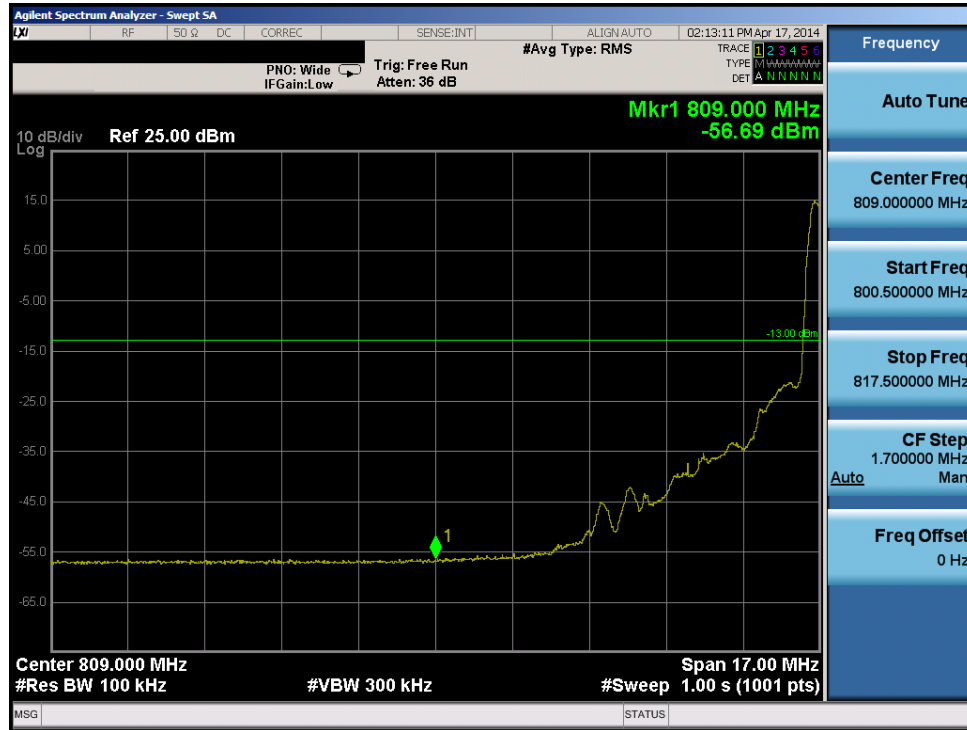


Plot 6-13. Channel Edge Plot (CDMA BC10 Ch. 476)

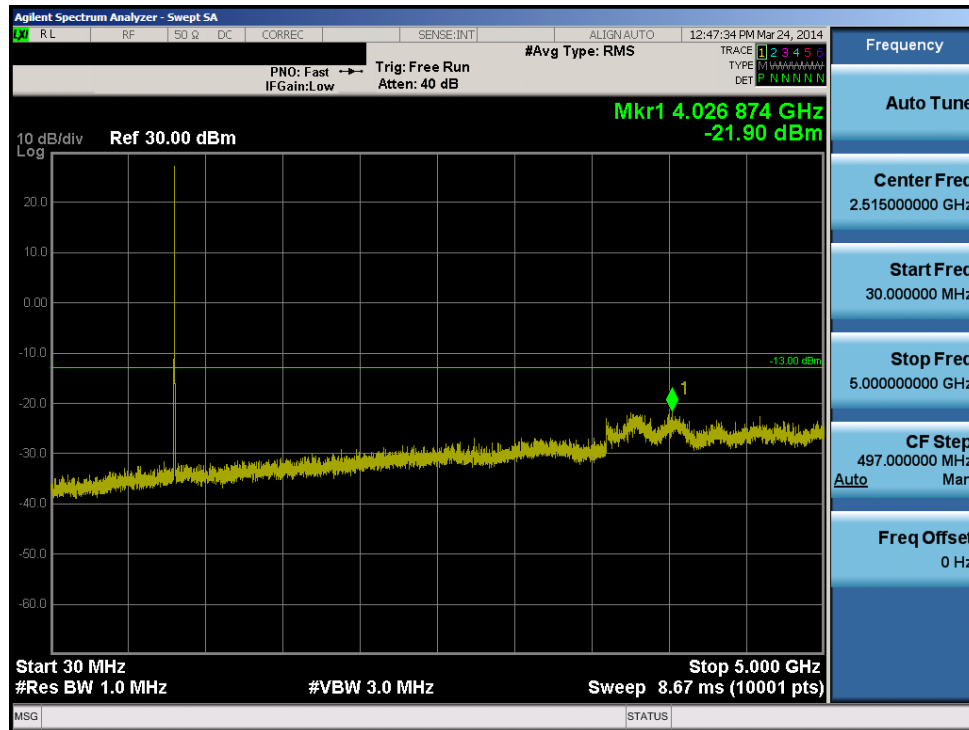


Plot 6-14. Inner Extended Band Edge Plot (CDMA BC10 Ch. 476)

FCC ID: A3LSPHL710T	 Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION 		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset	Page 22 of 45

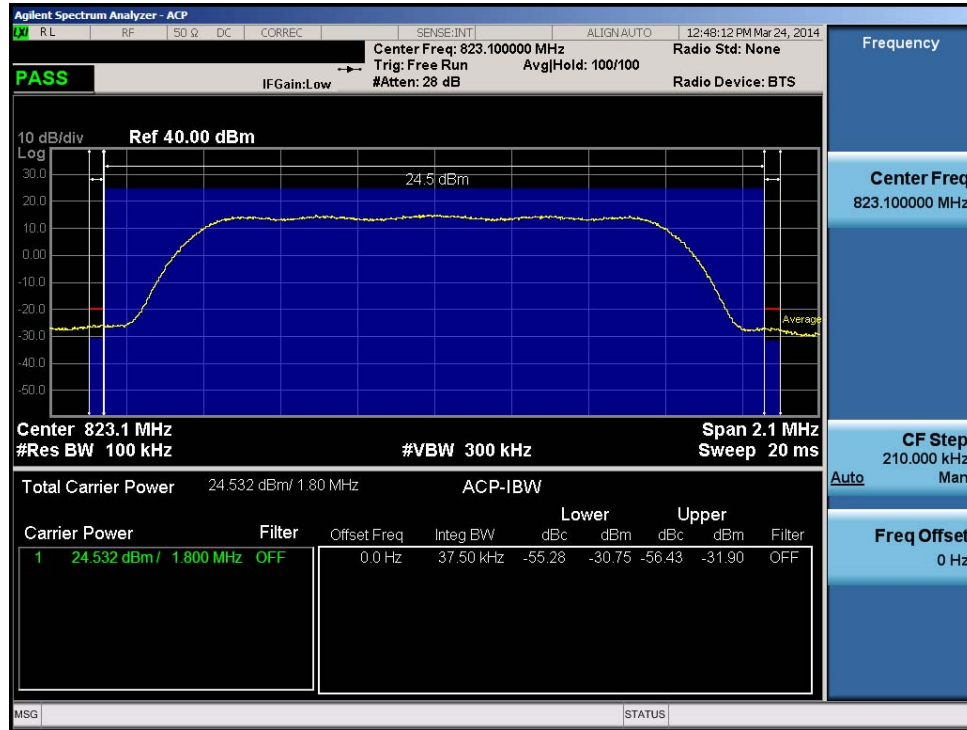


Plot 6-15. Outer Extended Band Edge Plot (CDMA BC10 Ch. 476)



Plot 6-16. Conducted Spurious Plot (CDMA BC10 Ch. 684)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 23 of 45



Plot 6-17. Channel Edge Plot (CDMA BC10 Ch. 684)

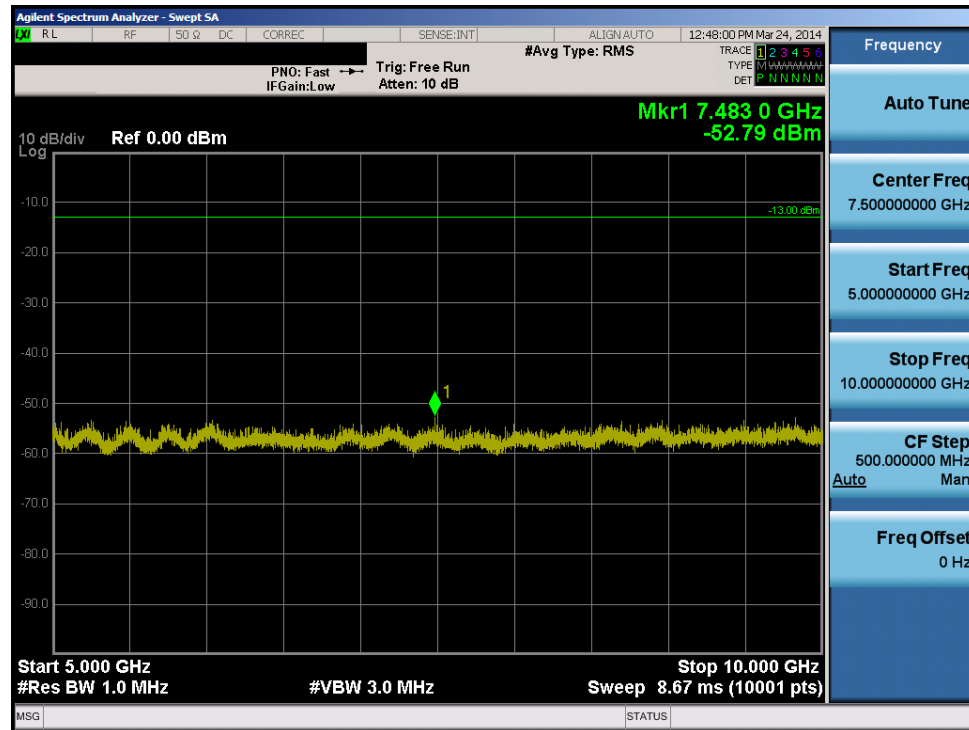


Plot 6-18. Inner Extended Band Edge Plot (CDMA BC10 Ch. 684)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 24 of 45

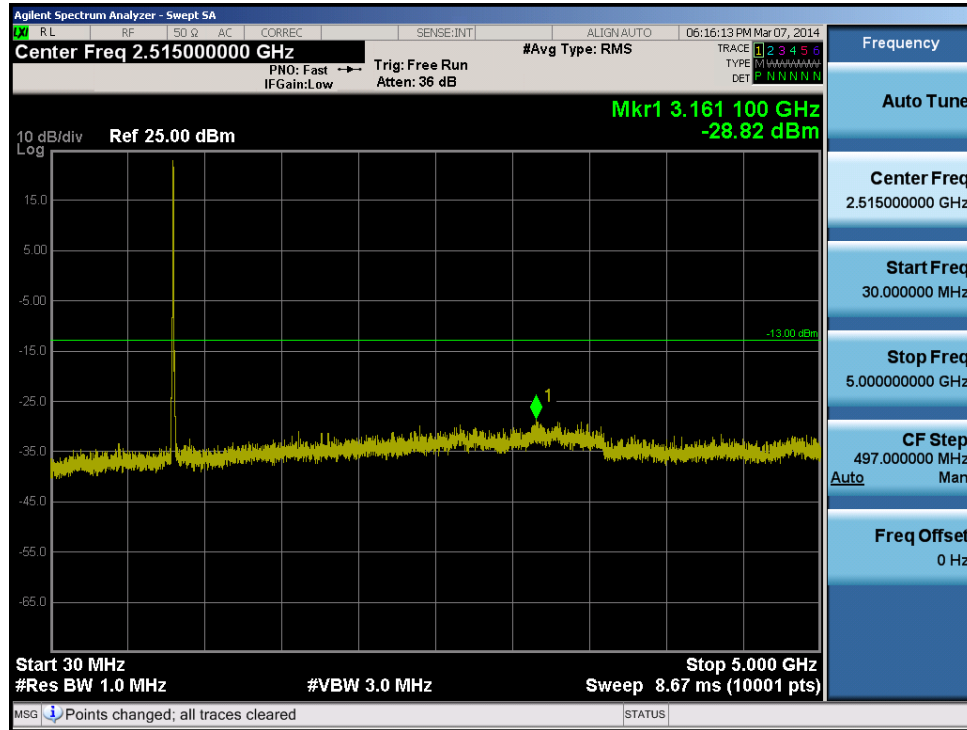


Plot 6-19. Outer Extended Band Edge Plot (CDMA BC10 Ch. 684)

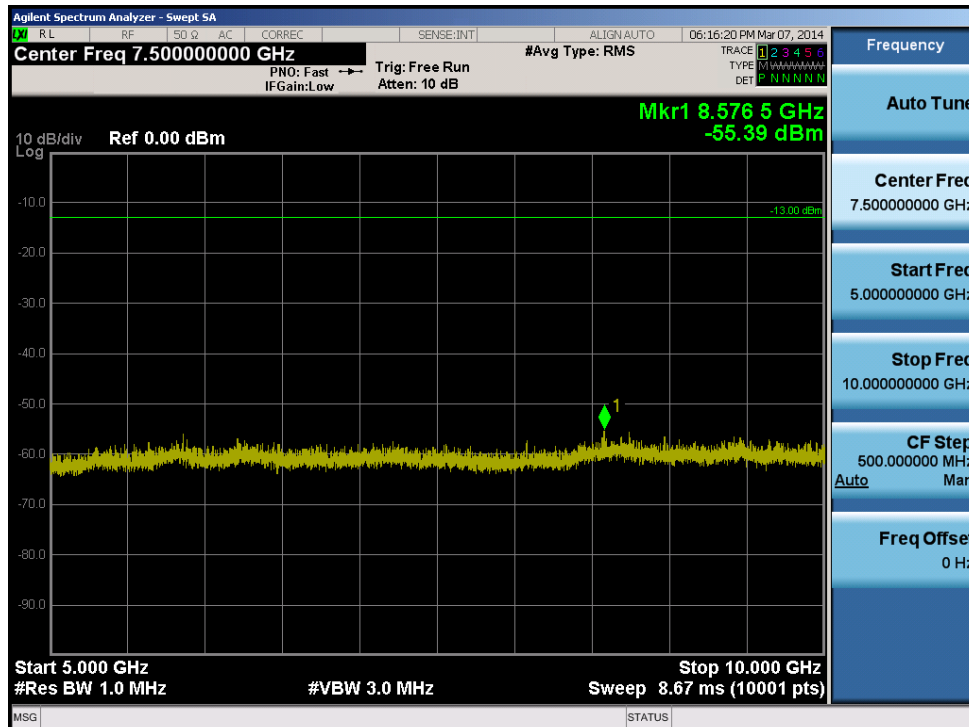


Plot 6-20. Conducted Spurious Plot (CDMA BC10 Ch. 684)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 25 of 45

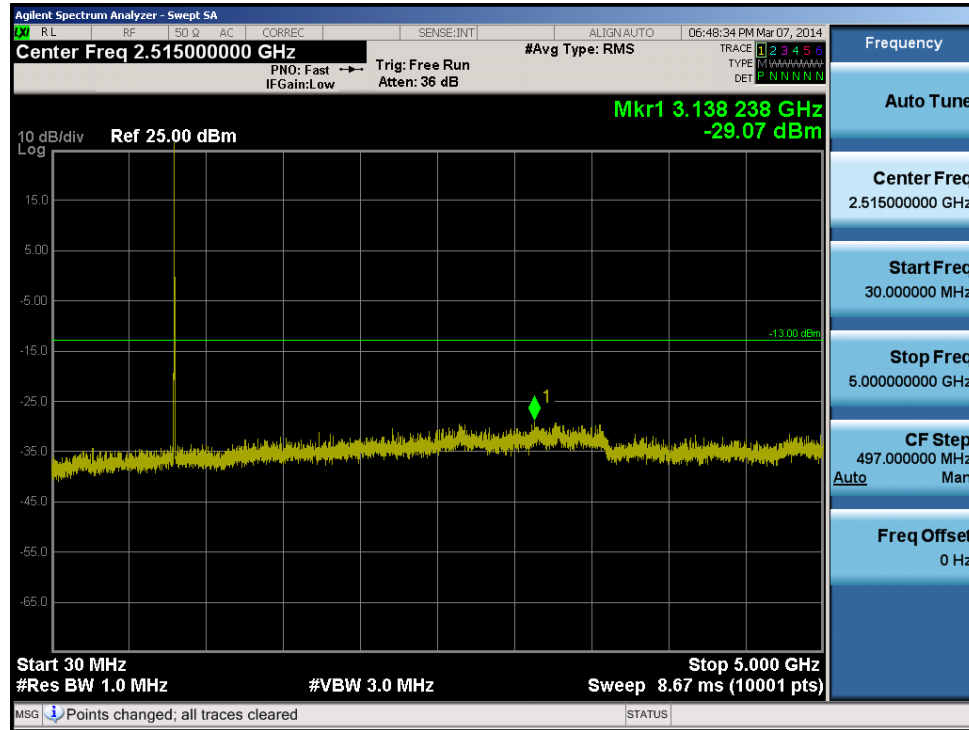


Plot 6-21. Conducted Spurious Plot (LTE Band 26 1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

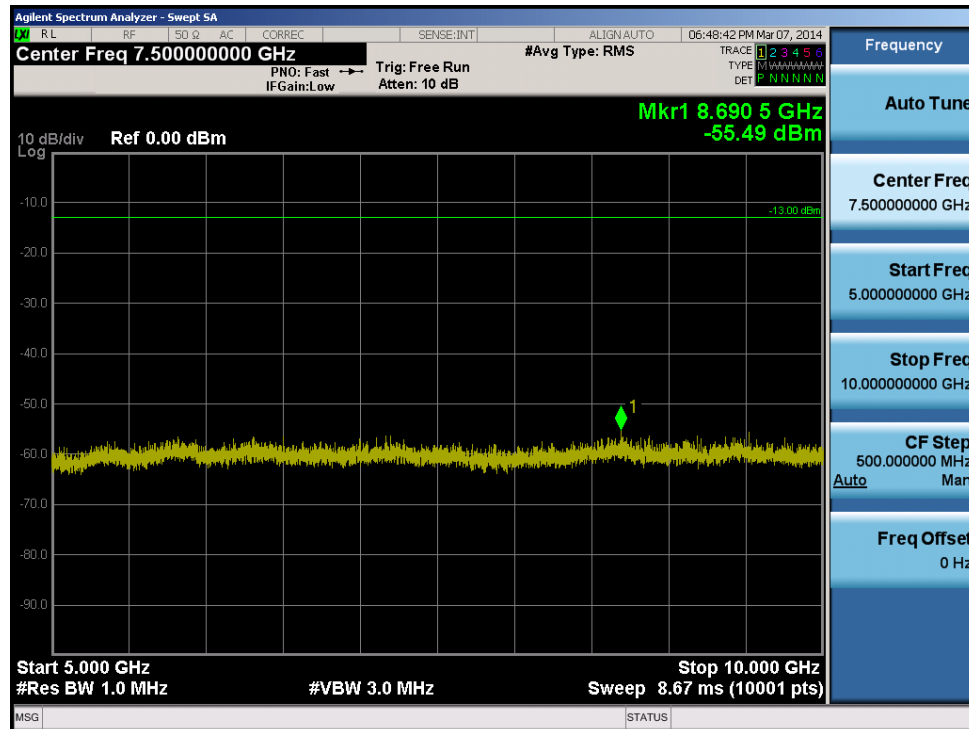


Plot 6-22. Conducted Spurious Plot (LTE Band 26 1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 26 of 45

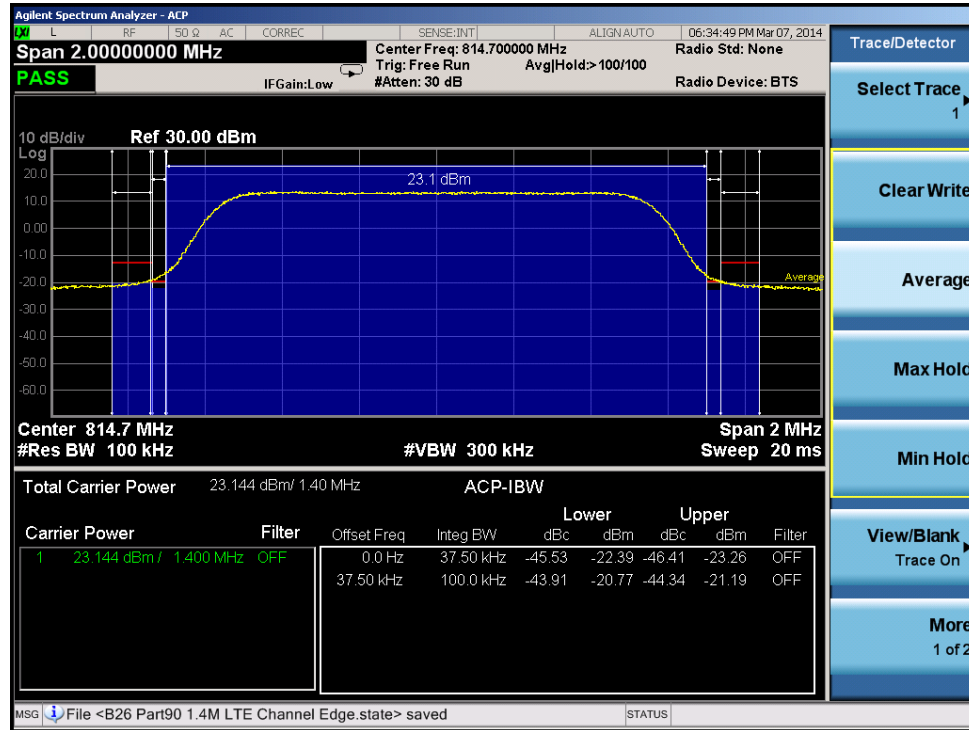


Plot 6-23. Conducted Spurious Plot (LTE Band 26 1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

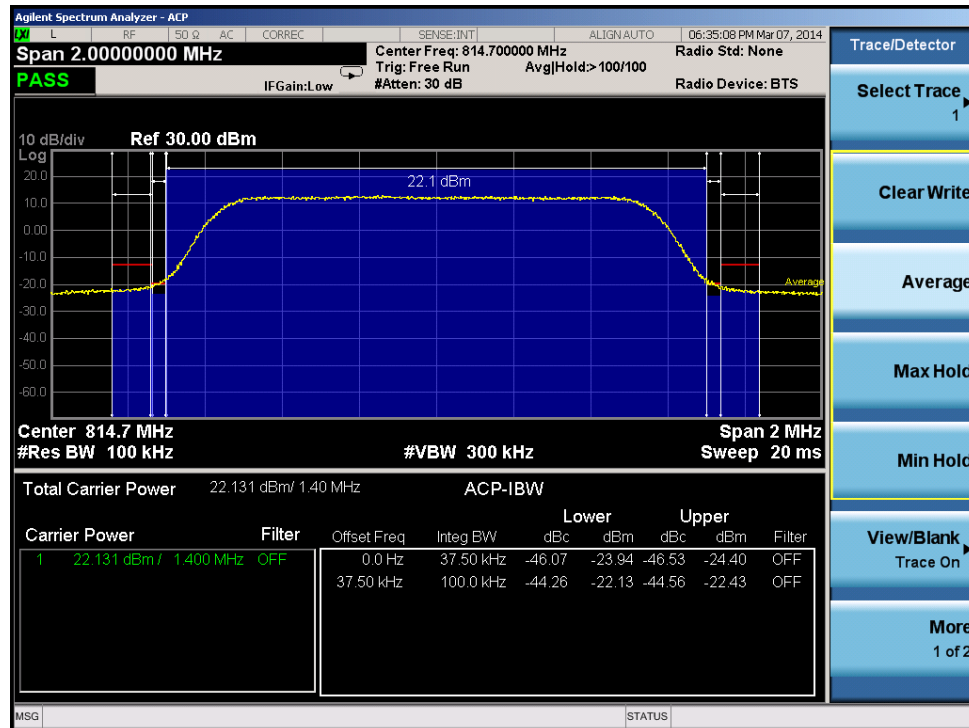


Plot 6-24. Conducted Spurious Plot (LTE Band 26 1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDo / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 27 of 45

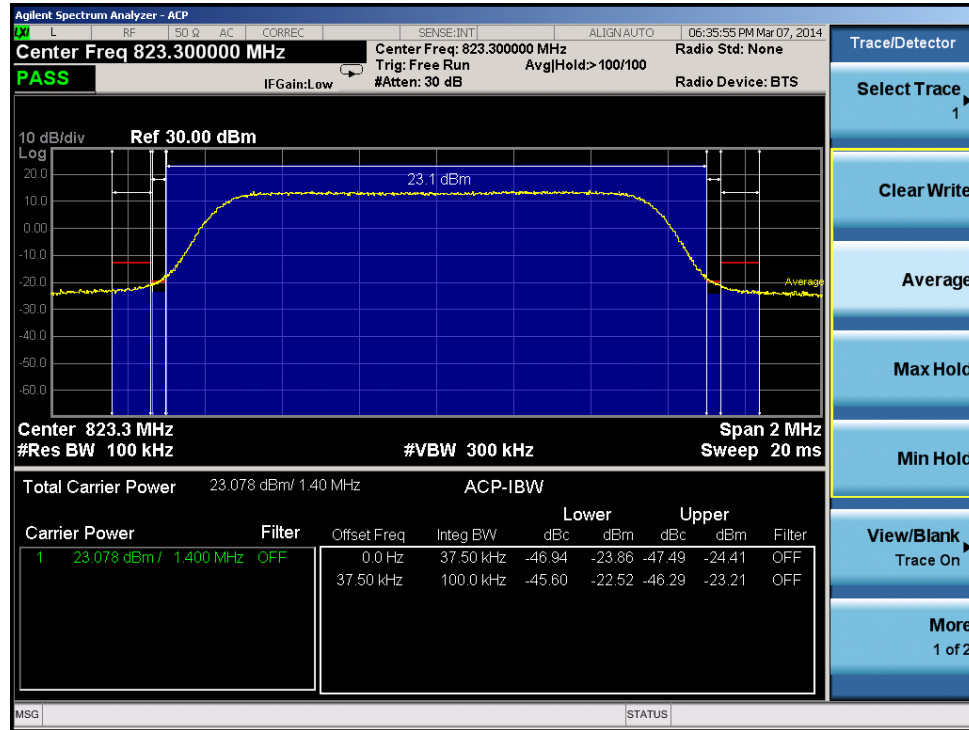


Plot 6-25. Channel Edge Plot (LTE Band 26 1.4MHz QPSK – RB Size 6– Low Channel)

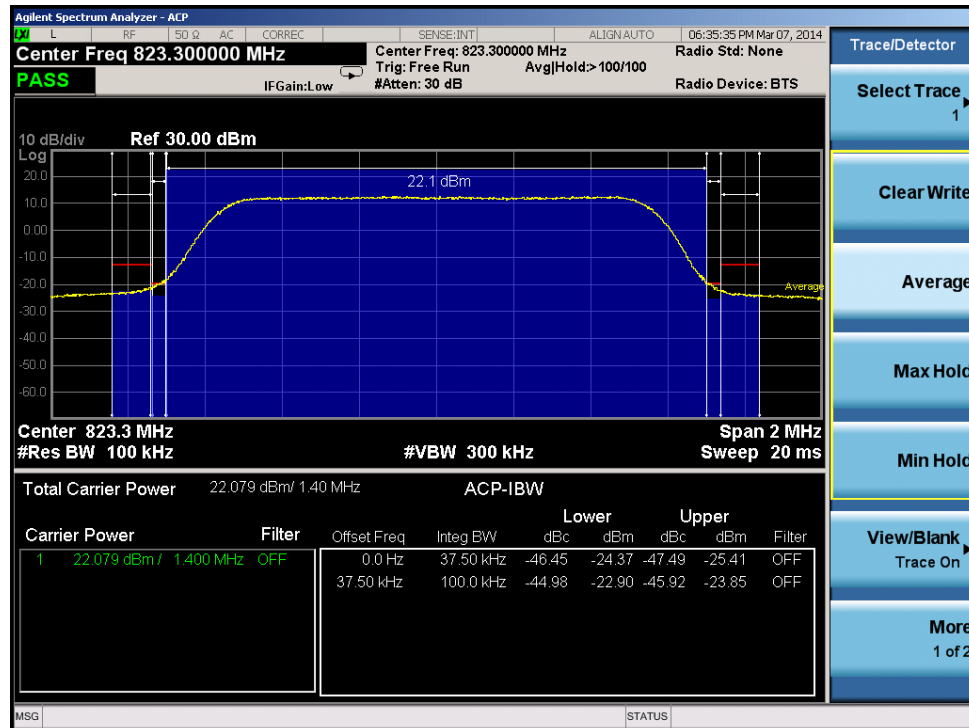


Plot 6-26. Channel Edge Plot (LTE Band 26 1.4MHz 16-QAM – RB Size 6– Low Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 28 of 45

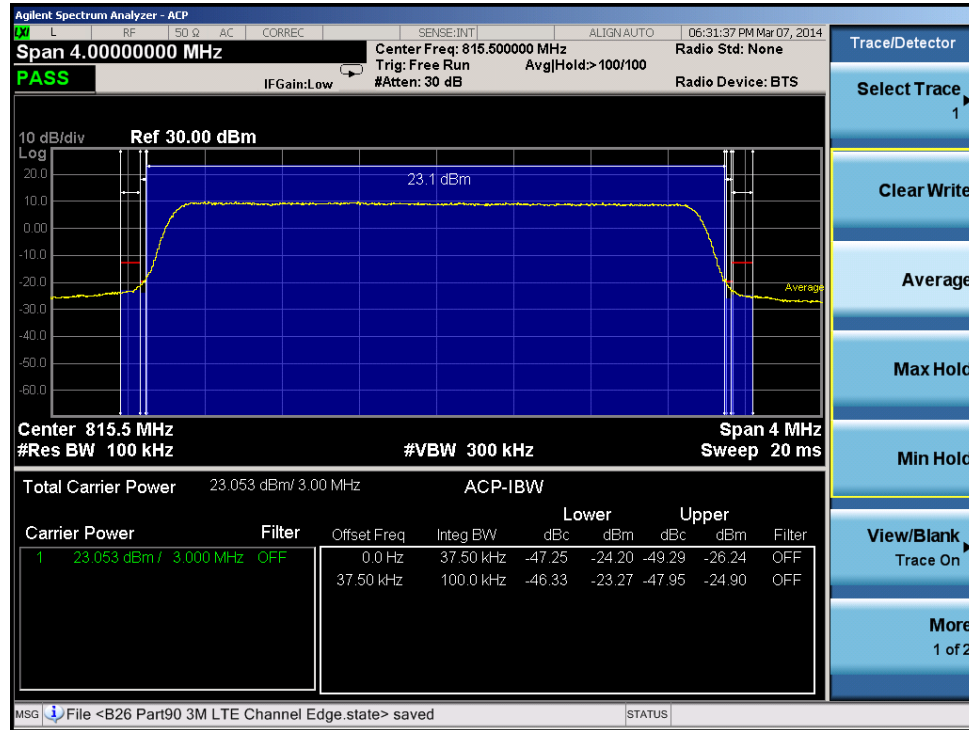


Plot 6-27. Channel Edge Plot (LTE Band 26 1.4MHz QPSK – RB Size 6 – High Channel)

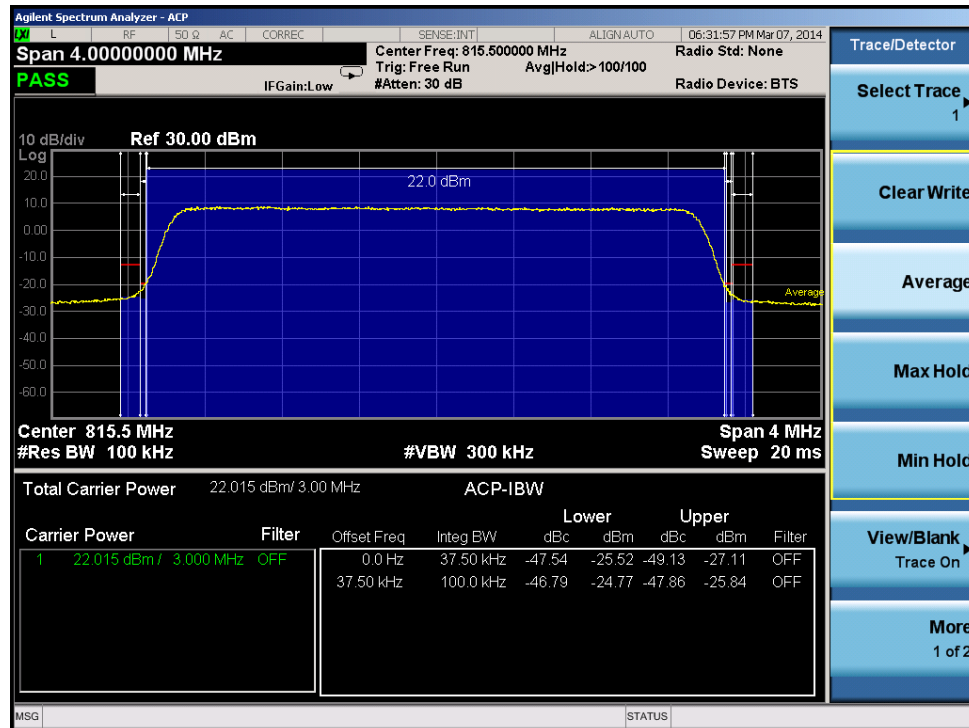


Plot 6-28. Channel Edge Plot (LTE Band 26 1.4MHz 16-QAM – RB Size 6 – High Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 29 of 45

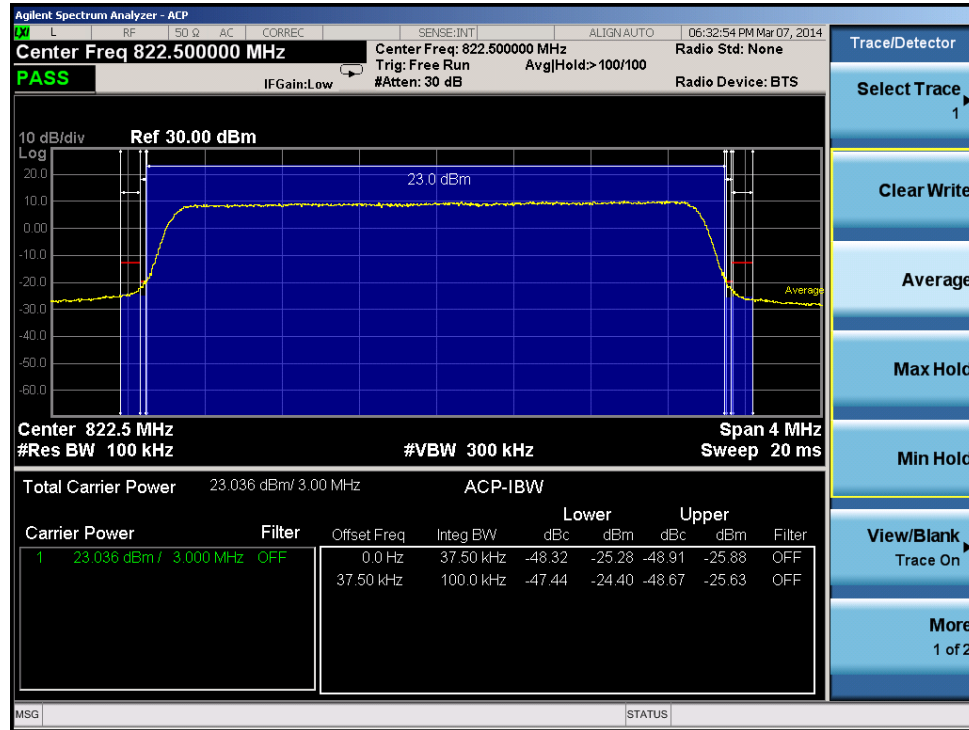


Plot 6-29. Channel Edge Plot (LTE Band 26 3MHz QPSK – RB Size 15– Low Channel)

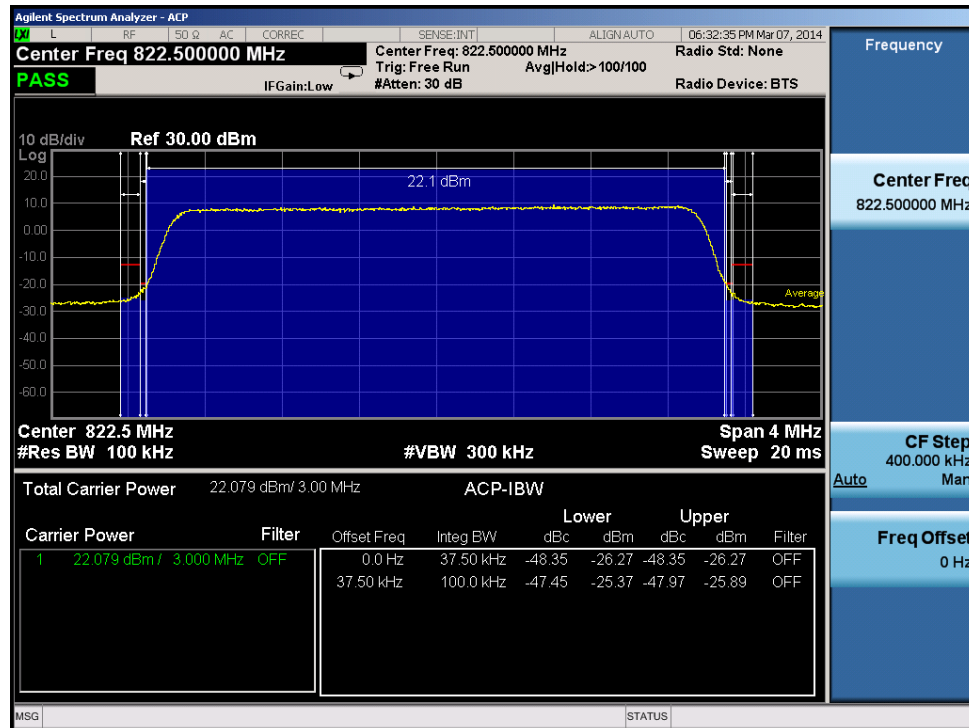


Plot 6-30. Channel Edge Plot (LTE Band 26 3MHz 16-QAM – RB Size 15– Low Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 30 of 45

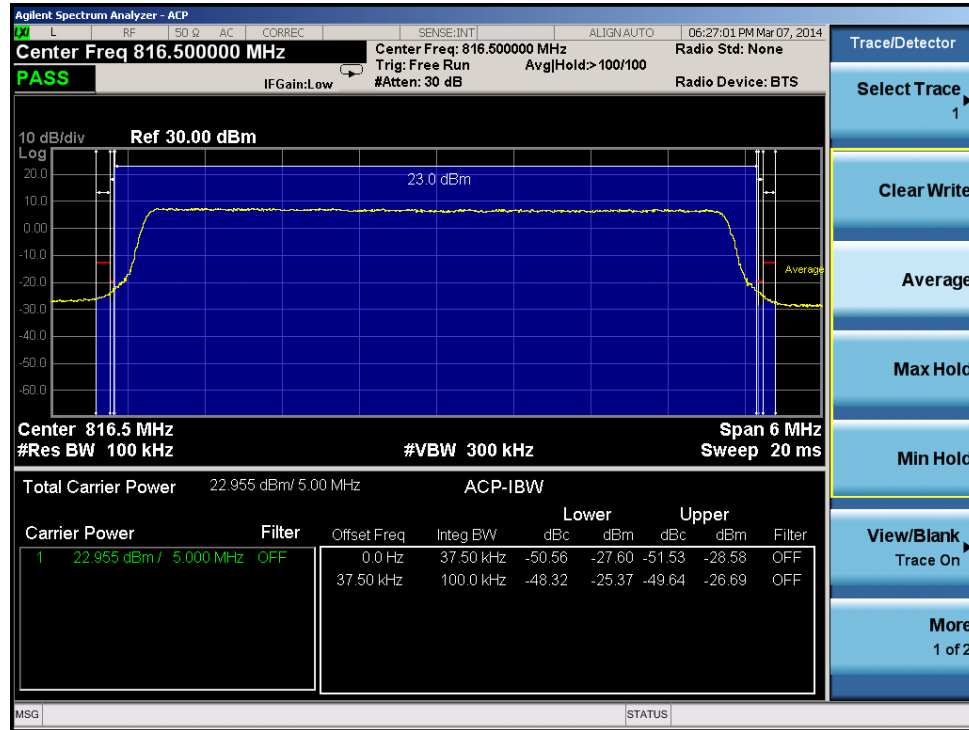


Plot 6-31. Channel Edge Plot (LTE Band 26 3MHz QPSK – RB Size 15 – High Channel)

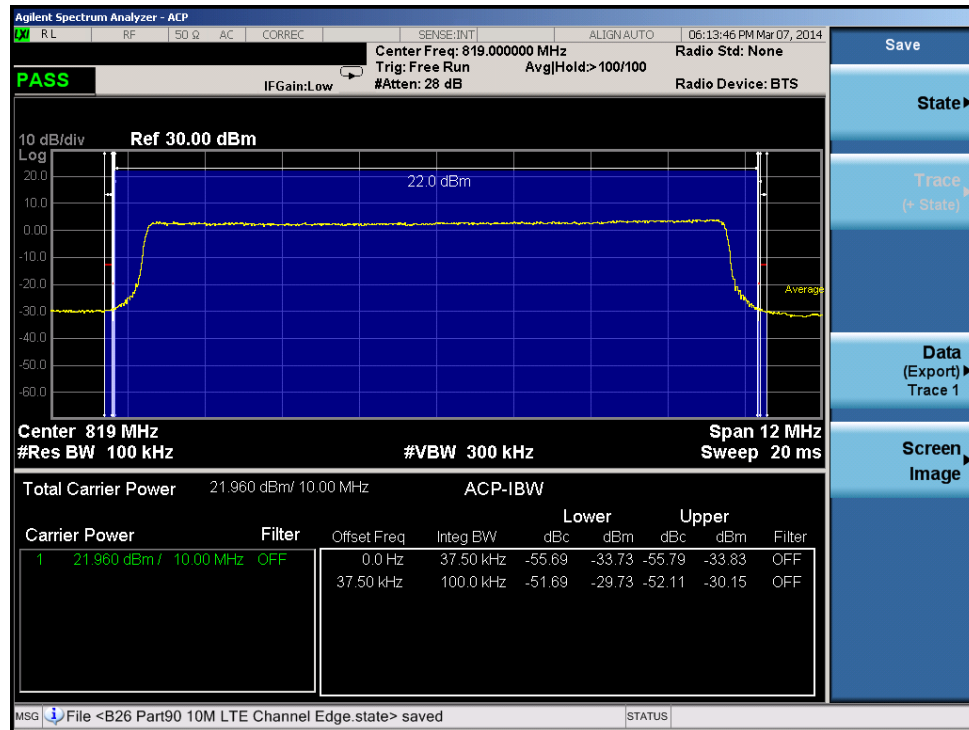


Plot 6-32. Channel Edge Plot (LTE Band 26 3MHz 16-QAM – RB Size 15 – High Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 31 of 45

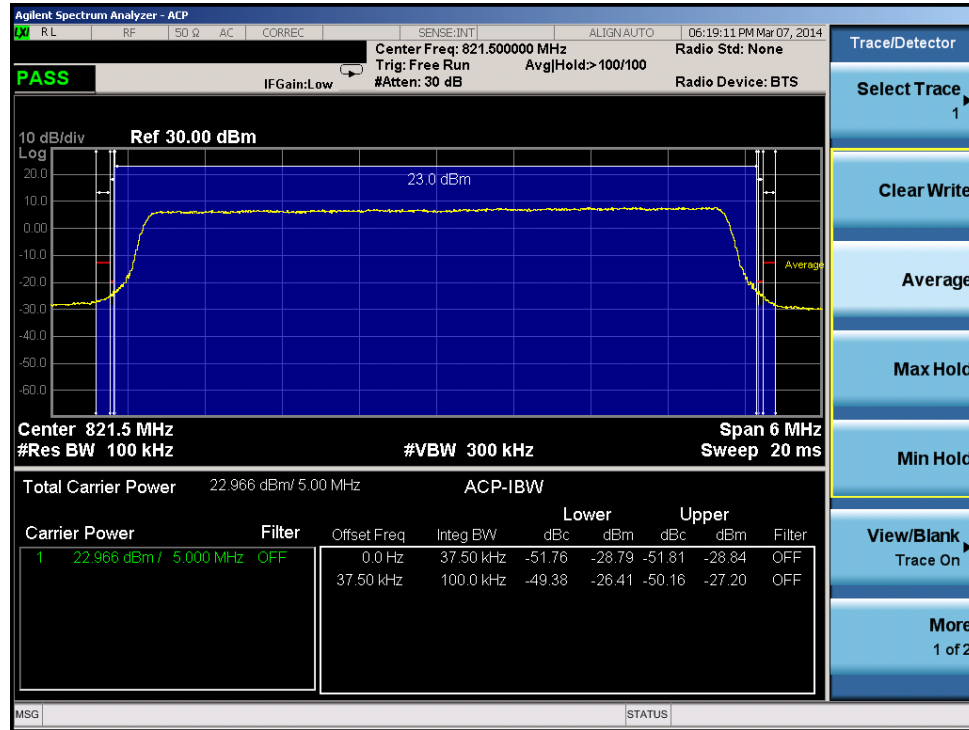


Plot 6-33. Channel Edge Plot (LTE Band 26 5MHz QPSK – RB Size 25– Low Channel)

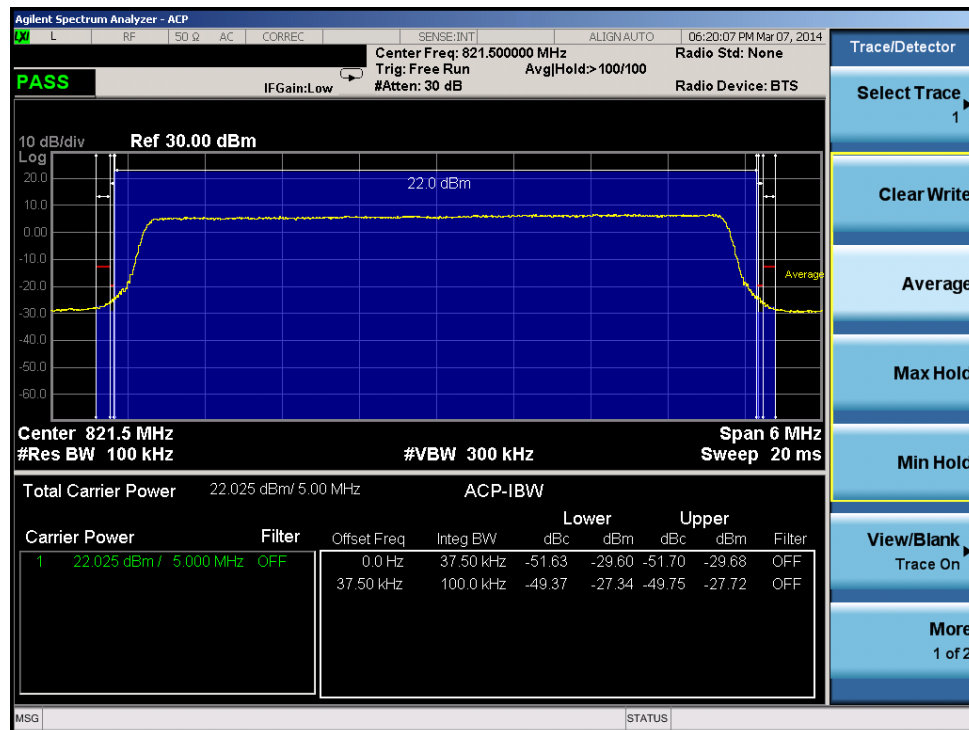


Plot 6-34. Channel Edge Plot (LTE Band 26 5MHz 16-QAM – RB Size 25– Low Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 32 of 45

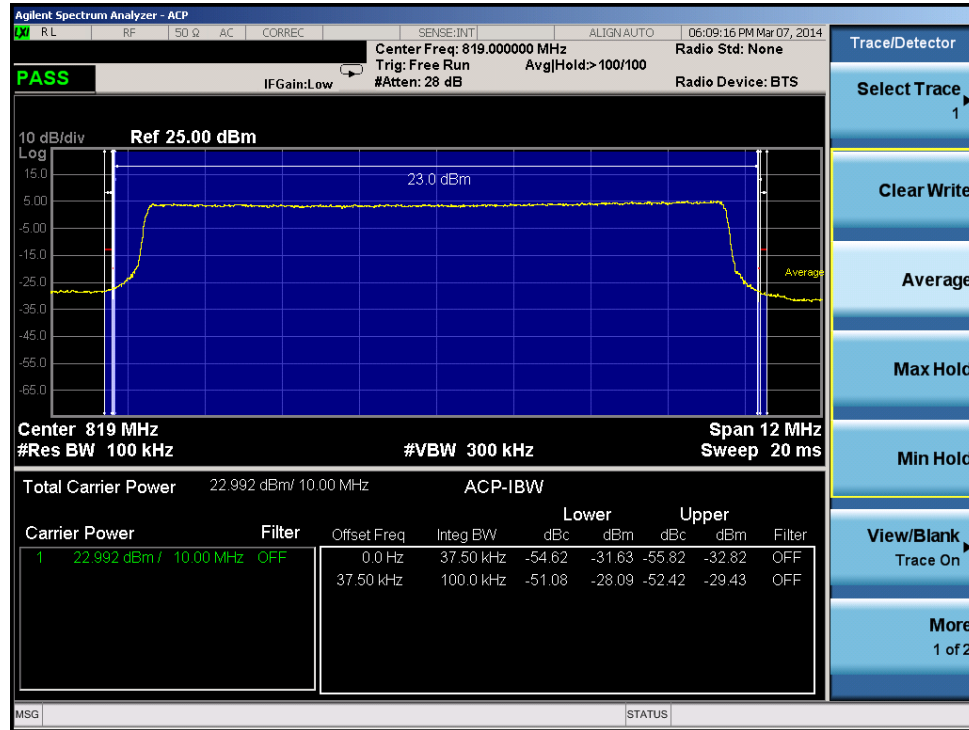


Plot 6-35. Channel Edge Plot (LTE Band 26 5MHz QPSK – RB Size 25 – High Channel)

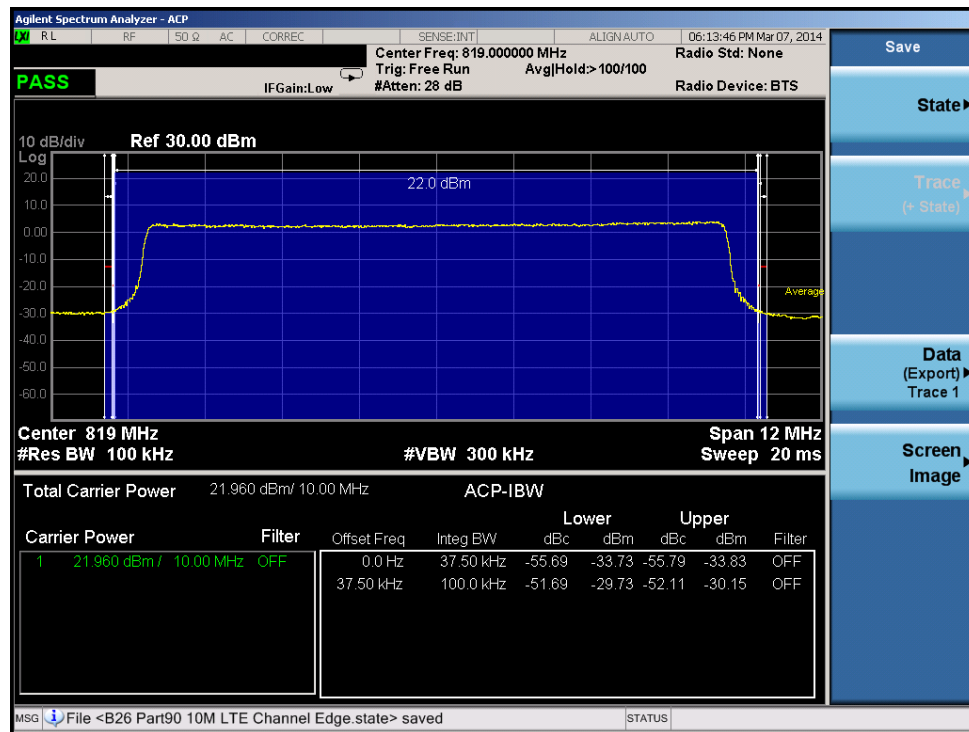


Plot 6-36. Channel Edge Plot (LTE Band 26 5MHz 16-QAM – RB Size 25– High Channel)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 33 of 45



Plot 6-37. Channel Edge Plot (LTE Band 26 10MHz QPSK – RB Size 50)



Plot 6-38. Channel Edge Plot (LTE Band 26 10MHz 16-QAM – RB Size 50)

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 34 of 45

6.5 Radiated Spurious Emissions Measurements

§2.1053, §90.691

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

Test Procedures Used

KDB 971168 v02r01 – Section 5.8

ANSI/TIA-603-C-2004 – Section 2.2.12

Test Settings

7. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
8. VBW $\geq 3 \times$ RBW
9. Span = 1.5 times the OBW
10. No. of sweep points $\geq 2 \times$ span / RBW
11. Detector = Peak
12. Trace mode = max hold
13. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

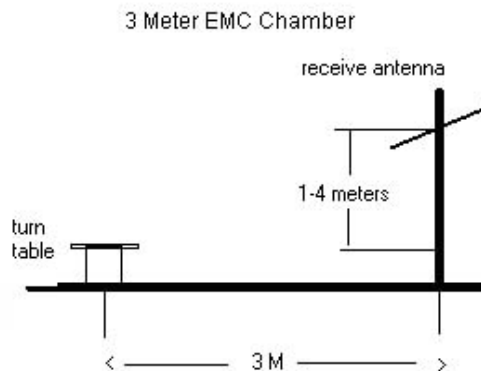


Figure 6-4. Test Instrument & Measurement Setup

FCC ID: A3LSPHL710T	PCTEST ENGINEERING LABORATORY, INC.	Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION	SAMSUNG	Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 35 of 45

Radiated Spurious Emissions Measurements

§2.1053, §90.691

Field Strength of SPURIOUS Radiation for LTE Band 26

OPERATING FREQUENCY: 816.50 MHz

CHANNEL: 26715

MEASURED OUTPUT POWER: 24.30 dBm = 0.269 W

MODULATION SIGNAL: QPSK

BANDWIDTH: 5.0 MHz

DISTANCE: 3 meters

LIMIT: $43 + 10 \log_{10} (W)$ -13.00 dBm

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	EUT Polarization (H/V)	Margin [dB]
1633.00	-56.31	6.56	-49.74	H	-36.7
2449.50	42.35	-125.00	-82.65	H	-69.7
3266.00	45.33	-125.00	-79.67	H	-66.7
4082.50	47.67	-125.00	-77.33	H	-64.3
4899.00	49.70	-125.00	-75.30	H	-62.3
5715.50	52.08	-125.00	-72.92	H	-59.9

Table 6-4. Radiated Spurious Data (Ch. 26697)

NOTES:

1. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model EB-L1G6LLA contains an embedded NFC antenna.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 36 of 45

Radiated Spurious Emissions Measurements

§2.1053, §90.691

Field Strength of SPURIOUS Radiation for LTE Band 26

OPERATING FREQUENCY: 821.50 MHz

CHANNEL: 26765

MEASURED OUTPUT POWER: 24.50 dBm = 0.282 W

MODULATION SIGNAL: QPSK

BANDWIDTH: 5.0 MHz

DISTANCE: 3 meters

LIMIT: $43 + 10 \log_{10} (W)$ -13.00 dBm

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	EUT Polarization (H/V)	Margin [dB]
1643.00	-58.92	6.56	-52.36	H	-39.4
2464.50	42.37	-125.00	-82.63	H	-69.6
3286.00	45.39	-125.00	-79.61	H	-66.6
4107.50	47.67	-125.00	-77.33	H	-64.3
4929.00	49.78	-125.00	-75.22	H	-62.2
5750.50	52.15	-125.00	-72.85	H	-59.8

Table 6-5. Radiated Spurious Data (Ch. 26783)

NOTES:

1. For LTE mode, the device was tested under all modulations, RB sizes and offsets, and channel bandwidth configurations and the worst case emissions are reported with 1 RB.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model EB-L1G6LLA contains an embedded NFC antenna.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 37 of 45

Radiated Spurious Emissions Measurements

§2.1053, §90.691

Field Strength of SPURIOUS Radiation for CDMA BC10

OPERATING FREQUENCY: 817.90 MHz

CHANNEL: 476

MEASURED OUTPUT POWER: 24.86 dBm = 0.306 W

MODULATION SIGNAL: CDMA

DISTANCE: 3 meters

LIMIT: $43 + 10 \log_{10} (W)$ -13.00 dBm

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	EUT Polarization (H/V)	Margin [dB]
1635.80	-54.07	6.56	-47.51	H	-34.5
2453.70	42.36	-125.00	-82.64	H	-69.6
3271.60	-56.94	7.36	-49.58	H	-36.6
4089.50	47.66	-125.00	-77.34	H	-64.3
4907.40	49.72	-125.00	-75.28	H	-62.3
5725.30	52.10	-125.00	-72.90	H	-59.9

Table 6-6. Radiated Spurious Data (Ch. 476)

NOTES:

1. For CDMA mode, this device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model EB-L1G6LLA contains an embedded NFC antenna.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 38 of 45

Radiated Spurious Emissions Measurements

§2.1053, §90.691

Field Strength of SPURIOUS Radiation for CDMA BC10

OPERATING FREQUENCY: 823.10 MHz

CHANNEL: 684

MEASURED OUTPUT POWER: 24.74 dBm = 0.298 W

MODULATION SIGNAL: CDMA

DISTANCE: 3 meters

LIMIT: $43 + 10 \log_{10} (W)$ -13.00 dBm

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	EUT Polarization (H/V)	Margin [dB]
1646.20	-59.35	6.56	-52.79	H	-39.8
2469.30	42.38	-125.00	-82.62	H	-69.6
3292.40	45.41	-125.00	-79.59	H	-66.6
4115.50	47.67	-125.00	-77.33	H	-64.3
4938.60	49.80	-125.00	-75.20	H	-62.2
5761.70	52.16	-125.00	-72.84	H	-59.8

Table 6-7. Radiated Spurious Data (Ch. 684)

NOTES:

1. For CDMA mode, this device was tested under all R.C.s and S.O.s and the worst case is reported with RC3/SO55 with "All Up" power control bits.
2. The EUT is supplied with a new/fully-recharged battery. The battery for this model EB-L1G6LLA contains an embedded NFC antenna.
3. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 39 of 45

6.6 Frequency Stability / Temperature Variation

§2.1055, §90.213

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

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

The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

Test Procedure Used

ANSI/TIA-603-C-2004

Test Settings

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 fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

The primary supply voltage could not be decreased to 85% of the nominal value for the battery because the battery end point is at 3.4V.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 40 of 45

Frequency Stability / Temperature Variation

§2.1055, §90.213

OPERATING FREQUENCY: 816,500,000 Hz
 CHANNEL: 26715
 REFERENCE VOLTAGE: 3.80 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	816,499,995	-5	-0.0000006
100 %		- 30	816,499,999	-1	-0.0000001
100 %		- 20	816,500,010	10	0.0000012
100 %		- 10	816,500,026	26	0.0000032
100 %		0	816,500,008	8	0.0000010
100 %		+ 10	816,499,989	-11	-0.0000013
100 %		+ 20	816,500,002	2	0.0000002
100 %		+ 30	816,500,020	20	0.0000024
100 %		+ 40	816,500,023	23	0.0000028
100 %		+ 50	816,499,988	-12	-0.0000015
115 %	4.37	+ 20	816,499,971	-29	-0.0000036
BATT. ENDPOINT	3.40	+ 20	816,500,007	7	0.0000009

Table 6-8. LTE Band 26 Frequency Stability Data (Ch. 26697)

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION			Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset			Page 41 of 45

Frequency Stability / Temperature Variation

§2.1055, §90.213

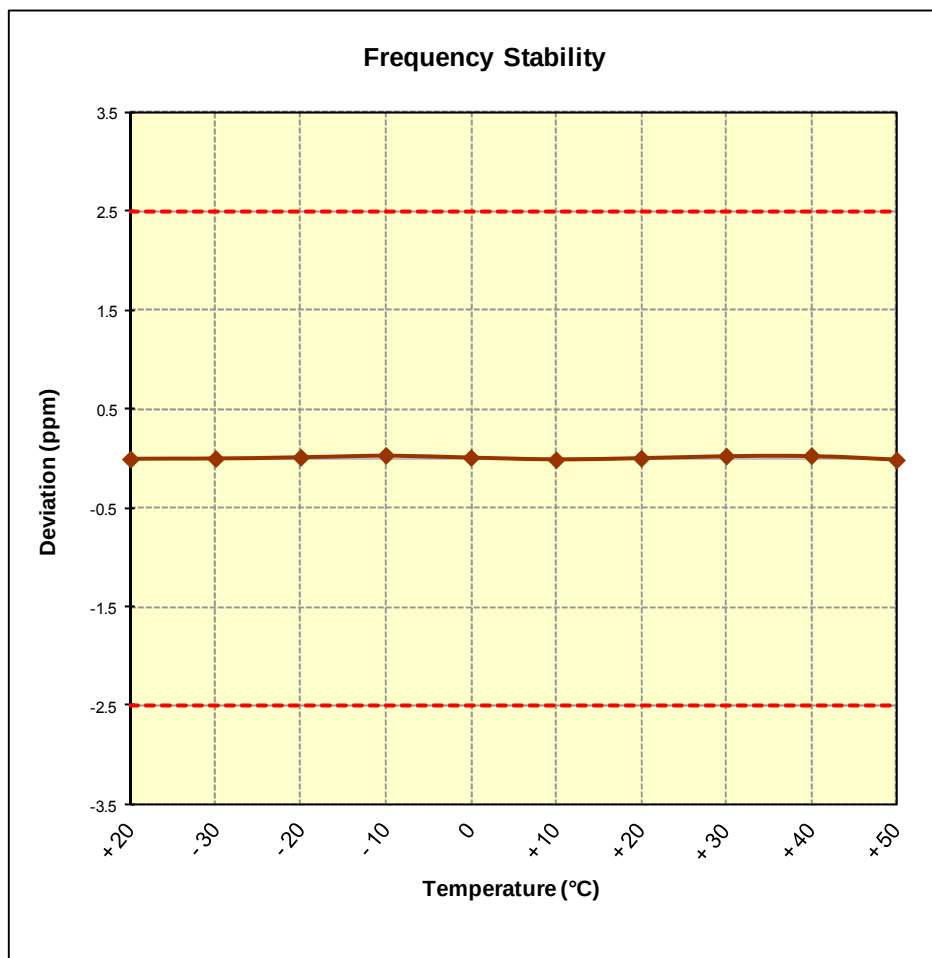


Table 6-9. LTE Band 26 Frequency Stability Data (Ch. 26697)

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 42 of 45

Frequency Stability / Temperature Variation

§2.1055, §90.213

OPERATING FREQUENCY: 817,900,000 Hz
 CHANNEL: 476
 REFERENCE VOLTAGE: 3.80 VDC
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	817,900,011	11	0.0000013
100 %		- 30	817,900,004	4	0.0000005
100 %		- 20	817,899,980	-20	-0.0000024
100 %		- 10	817,899,979	-21	-0.0000026
100 %		0	817,899,988	-12	-0.0000015
100 %		+ 10	817,899,981	-19	-0.0000023
100 %		+ 20	817,899,977	-23	-0.0000028
100 %		+ 30	817,899,991	-9	-0.0000011
100 %		+ 40	817,899,990	-10	-0.0000012
100 %		+ 50	817,900,004	4	0.0000005
115 %		+ 20	817,899,983	-17	-0.0000021
BATT. ENDPOINT	3.40	+ 20	817,900,007	7	0.0000009

Table 6-10. CDMA BC10 Frequency Stability Data (Ch. 476)

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION			Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset			Page 43 of 45

Frequency Stability / Temperature Variation

§2.1055, §90.213

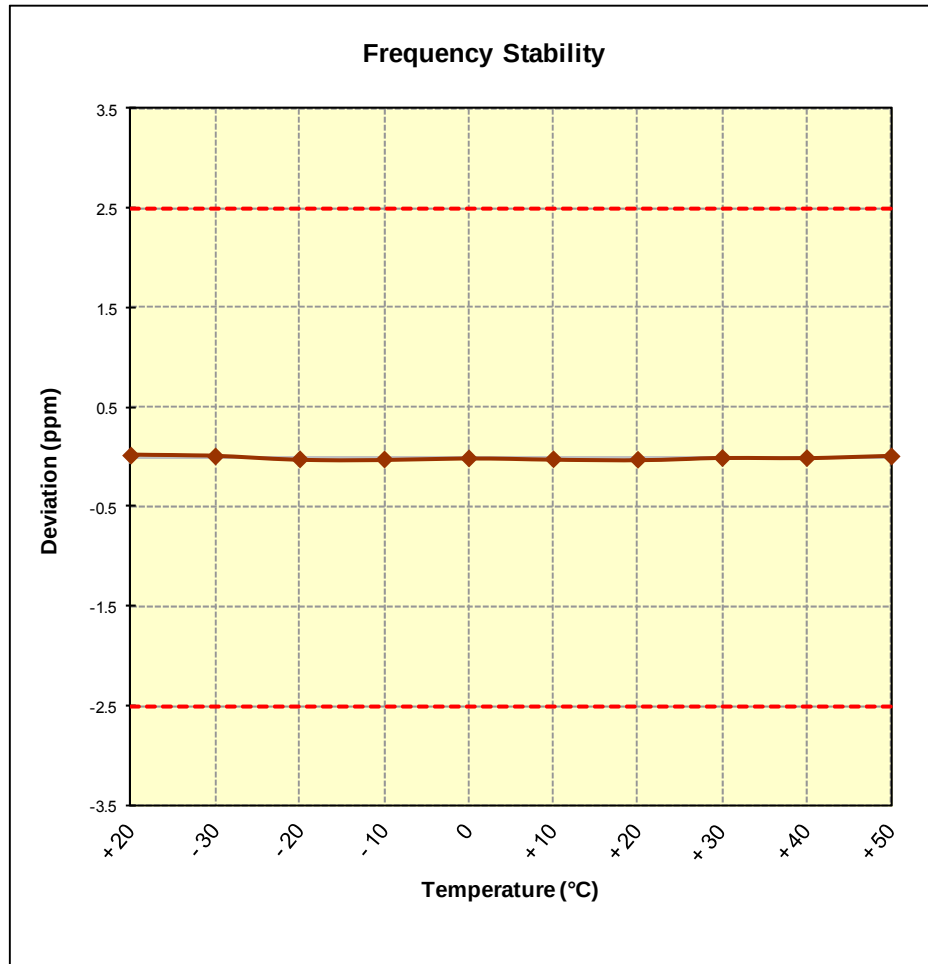


Table 6-11. CDMA BC10 Frequency Stability Data (Ch. 476)

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 44 of 45

7.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSPHL710T** complies with all the requirements of Parts 90 of the FCC rules.

FCC ID: A3LSPHL710T		Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION		Reviewed by: Quality Manager
Test Report S/N: 0Y1403170568.A3L	Test Dates: March 17 - 28, 2014	EUT Type: Portable Handset		Page 45 of 45