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MEASUREMENT REPORT FCC Part 90 Band Class 10 CDMA

Applicant:
Samsung Electronics Co., Ltd.
416 Maetan 3-Dong, Yeongtong-gu
Suwon-si, Gyeonggi-do
443-742, Republic of Korea

Date of Testing:
03/29 - 04/18/2012
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0Y1204170522.A3L

FCC ID:	A3LSPHL710
APPLICANT:	SAMSUNG ELECTRONICS CO., LTD.

Applicant Type: Certification
Model: SPH-L710
EUT Type: Portable Handset
FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
FCC Rule Part: §90.691
Test Procedure(s): ANSI/TIA-603-C-2004
Test Device Serial No.: *identical prototype* [S/N: #6, #9]

	Mode	Tx Frequency (MHz)	Emission Designator	ERP/EIRP	
				Max. Power (W)	Max. Power (dBm)
Tx #1	CDMA800 (BC10)	817.9 - 823.1	1M28F9W	0.053	17.21
Tx #2	EvDO (BC10)	817.9 - 823.1	1M28F9W	0.057	17.56

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



FCC ID: A3LSPHL710		BC10 CDMA / EvDO MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1204170522.A3L	Test Dates: 03/29 - 04/18/2012	EUT Type: Portable Handset		Page 1 of 31

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MEASUREMENT REPORT

BC10 CDMA



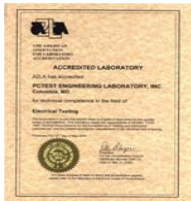
§2.1033 General Information



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 21046 USA
BASE MODEL: SPH-L710
FCC CLASSIFICATION: PCS Licensed Transmitter Held to Ear (PCE)
MODE: CDMA / EvDO
FREQUENCY TOLERANCE: ±0.00025 % (2.5 ppm)
Test Device Serial No.: #6, #9 Production Pre-Production Engineering
DATE(S) OF TEST: 03/29 - 04/18/2012
TEST REPORT S/N: 0Y1204170522.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 and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.



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1.0 INTRODUCTION

1.1 Scope

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

1.2 Testing Facility

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

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

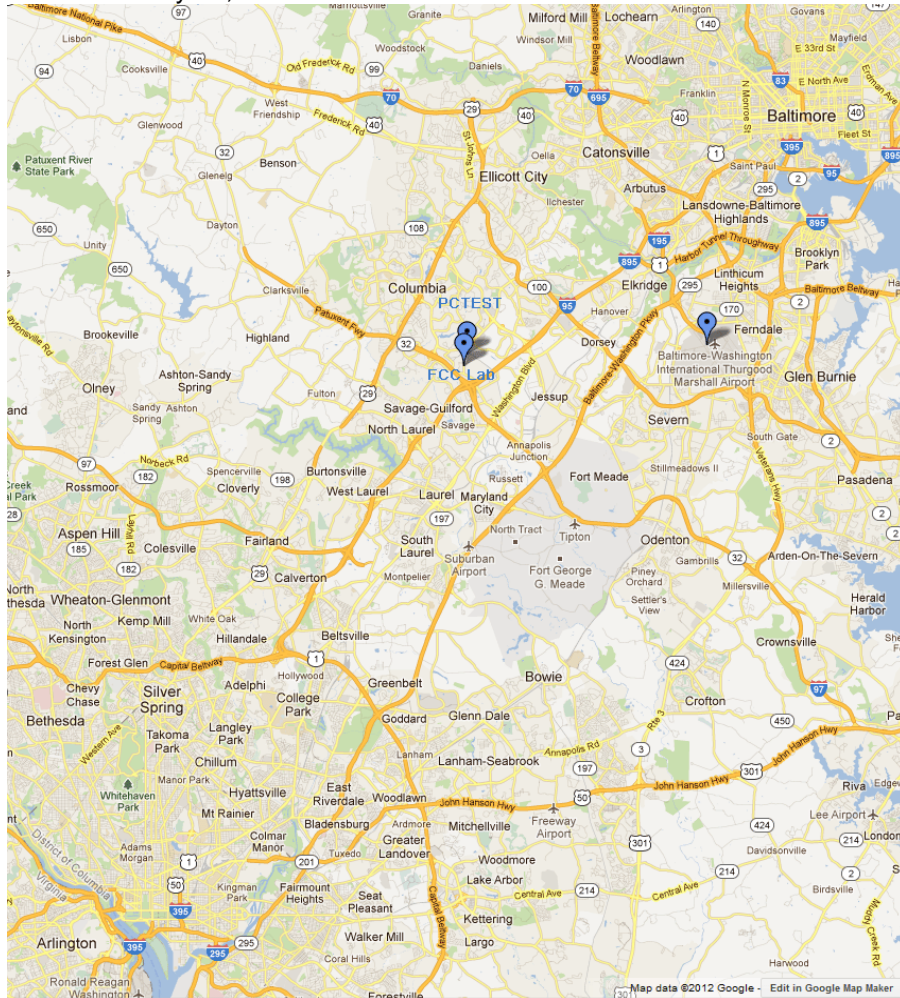




Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSPHL710**. The EUT consisted of the following component(s):

Trade Name / Base Model	FCC ID	Description
Samsung / Model: SPH-L710	A3LSPHL710	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/EvDO Rev 0 (BC0, BC1, BC10), Band 25 LTE (5MHz BW), 802.11a/b/g/n WLAN, 802.11a/n UNII, Bluetooth (1x,EDR,LE), NFC

* UNII and 802.11n 5GHz WLAN support 20MHz and 40MHz channel bandwidths.

This device contains two transmit chains containing the following technologies:

Tx Chain 1: Cellular/PCS (BC0, BC1, BC10) 1x Voice CDMA

Tx Chain 2: Cellular/PCS (BC0, BC1, BC10) EvDO (Rev. 0/A), LTE Band 25



This device allows for simultaneous transmission of 1x CDMA with LTE (5MHz BW only) and 1x CDMA with EvDO. EvDO with LTE is not a possible simultaneous transmission capability.

2.3 Test Configuration

The **Samsung Portable Handset FCC ID: A3LSPHL710** was tested per the guidance of ANSI/TIA-603-C-2004. See Section 3.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

2.4 EMI Suppression Device(s)/Modifications

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

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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 the measurement of the **Samsung Portable Handset FCC ID: A3LSPHL710**.

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 occupied bandwidth was measured using the signal analyzers’ “Occupied Bandwidth” measurement function.

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 $116 \text{ Log}_{10}(f/6.1)$ decibels or $50 + 10 \text{ Log}_{10}(P)$ 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 $43 + 10 \text{ Log}_{10}(P)$ 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.

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.

3.4 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

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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 the table at a distance of 3 meters from the receive antenna. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. The receive antenna is mounted to a bore-sight mechanism on a mast that is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Emissions are also investigated with the receive antenna horizontally and vertically polarized. The level of the maximized radiated spurious emissions is recorded with the spectrum analyzer using a peak detector with RBW = 1MHz, VBW = 3MHz for emissions greater than 1GHz. For emissions below 1GHz, the spectrum analyzer is set to RBW = 100kHz and VBW = 300kHz.

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 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.

SVDO (Simultaneous Voice and EvDO)



This device also supports SVDO capability with the device able to transmit 1x CDMA voice and EvDO simultaneously. Emissions were investigated in all different configurations to determine the worst case emissions. No emissions were found to be within 20dB of the applicable radiated limit.

3.5 Frequency Stability / Temperature Variation

§2.1055

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.



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- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

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

Time Period and Procedure:

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

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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)	6/7/2011	Annual	6/7/2012	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	3/17/2011	Annual	4/17/2012	1937A03348
Agilent	E4432B	ESG-D Series Signal Generator	3/15/2012	Annual	3/15/2013	US40053896
Agilent	E4448A	PSA (3Hz-50GHz) Spectrum Analyzer	2/15/2012	Annual	2/15/2013	US42510244
Agilent	E5515C	Wireless Communications Test Set	10/14/2011	Annual	10/14/2012	GB41450275
Agilent	N9020A	MXA Signal Analyzer	10/10/2011	Annual	10/10/2012	US46470561
Espec	ESX-2CA	Environmental Chamber	4/21/2011	Annual	4/21/2012	17620
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	7/22/2011	Annual	7/22/2012	125518
ETS Lindgren	3160-09	18-26.5 GHz Standard Gain Horn	5/31/2011	Annual	5/31/2012	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	RS-PR18	1-18 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100071
Rohde & Schwarz	RS-PR26	18-26.5 GHz Pre-Amplifier	6/9/2011	Annual	6/9/2012	100040
Rohde & Schwarz	ESU26	EMI Test Receiver	4/27/2011	Annual	4/27/2012	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

Note:

The Agilent Broadband Amplifier (Model: 8447D) was not used for testing after its calibration due date.

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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 – Cellular Band

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

The average receive power meter 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 power meter. 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.

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6.0 TEST RESULTS

6.1 Summary



Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSPHL710
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): CDMA / EvDO
 Band: Band Class 10

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
§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	CONDUCTED	PASS	Section 7.0
§2.1046	Transmitter Conducted Output Power	N/A		PASS	RF Exposure Report
§90.635	Effective Radiated Power	< 100 Watts max. ERP	RADIATED	PASS	Section 6.2
§2.1053, §90.691	Undesirable Emissions	$< 43 + 10\log_{10}(P[\text{Watts}])$ for all out-of-band emissions		PASS	Sections 6.3
§2.1055, §90.213	Frequency Stability	< 2.5 ppm		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 Section 7.0 were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.

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6.2 Effective Radiated Power Output Data

§90.635

Frequency [MHz]	Mode BC10 [Channel]	Battery Type	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
817.90	Ch. 476	Standard	12.33	4.58	H	16.91	0.049	38.45	-21.55
823.10	Ch. 684	Standard	12.57	4.64	H	17.21	0.053	38.45	-21.24



Table 6-2. Effective Radiated Power Output Data (1x CDMA)

Frequency [MHz]	Mode BC10 [Channel]	Battery Type	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
817.90	Ch. 476	Standard	12.98	4.58	H	17.56	0.057	38.45	-20.90
823.10	Ch. 684	Standard	12.90	4.64	H	17.54	0.057	38.45	-20.91

Table 6-3. Effective Radiated Power Output Data (EvDO)

NOTES:

1. This device was tested under all configurations and all modes across both transmit antennas. In the first transmitter, the worst case 1x CDMA configuration was found with the device set to "All Up Bits" using RC3/S055. On the second transmitter, the worst case EvDO configuration was found in EvDO Rev. 0 with the device set to "All Up Bits".
2. This unit was tested with its standard battery. The NFC antenna is integrated into the standard battery and is the only battery available from the manufacturer for this device. 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 BC10 CDMA Radiated Measurements §2.1053, §90.691

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 817.90 MHz
 CHANNEL: 476
 MEASURED OUTPUT POWER: 16.91 dBm = 0.049 W
 MODULATION SIGNAL: 1x CDMA
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 29.91 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1635.80	-38.43	4.88	-33.55	H	50.45
2453.70	-35.64	5.15	-30.49	H	47.40
3271.60	-44.36	7.49	-36.87	H	53.77
4089.50	-51.89	9.15	-42.75	H	59.65
4907.40	-46.17	9.95	-36.21	H	53.12

Table 6-4. Radiated Spurious Data (1x CDMA Mode – BC10 Ch. 476)

NOTES:

1. This device was tested under all configurations and all modes across both transmit antennas. In the first transmitter, the worst case 1x CDMA configuration was found with the device set to "All Up Bits" using RC3/SO55. On the second transmitter, the worst case EvDO configuration was found in EvDO Rev. 0 with the device set to "All Up Bits".
2. This unit was tested with its standard battery. The NFC antenna is integrated into the standard battery and is the only battery available from the manufacturer for this device. 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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BC10 CDMA Radiated Measurements (Cont'd)
§2.1053, §90.691

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 823.10 MHz
 CHANNEL: 684
 MEASURED OUTPUT POWER: 17.21 dBm = 0.053 W
 MODULATION SIGNAL: 1x CDMA
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 30.21 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1646.20	-32.40	4.77	-27.62	H	44.83
2469.30	-37.48	5.06	-32.42	H	49.63
3292.40	-48.49	7.57	-40.92	H	58.13
4115.50	-52.40	9.19	-43.22	H	60.43
4938.60	-48.25	10.00	-38.25	H	55.46

Table 6-5. Radiated Spurious Data (1x CDMA Mode – BC10 Ch. 684)

NOTES:

1. This device was tested under all configurations and all modes across both transmit antennas. In the first transmitter, the worst case 1x CDMA configuration was found with the device set to "All Up Bits" using RC3/SO55. On the second transmitter, the worst case EvDO configuration was found in EvDO Rev. 0 with the device set to "All Up Bits".
2. This unit was tested with its standard battery. The NFC antenna is integrated into the standard battery and is the only battery available from the manufacturer for this device. 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.

FCC ID: A3LSPHL710		BC10 CDMA / EvDO MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.4 BC10 EvDO Radiated Measurements (Cont'd)
§2.1053, §90.691

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 817.90 MHz
 CHANNEL: 476
 MEASURED OUTPUT POWER: 17.56 dBm = 0.057 W
 MODULATION SIGNAL: EvDO
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10}(W) =$ 30.56 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1635.80	-26.07	2.73	-23.34	H	40.89
2453.70	-37.82	3.00	-34.82	H	52.37
3271.60	-44.75	5.34	-39.41	H	56.96
4089.50	-49.84	7.00	-42.84	H	60.39
4907.40	-50.39	7.80	-42.58	H	60.14

Table 6-6. Radiated Spurious Data (EvDO Mode – BC10 Ch. 476)

NOTES:

1. This device was tested under all configurations and all modes across both transmit antennas. In the first transmitter, the worst case 1x CDMA configuration was found with the device set to "All Up Bits" using RC3/SO55. On the second transmitter, the worst case EvDO configuration was found in EvDO Rev. 0 with the device set to "All Up Bits".
2. This unit was tested with its standard battery. The NFC antenna is integrated into the standard battery and is the only battery available from the manufacturer for this device. 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.

FCC ID: A3LSPHL710		BC10 CDMA / EvDO MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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BC10 EvDO Radiated Measurements (Cont'd)
§2.1053, §90.691

Field Strength of SPURIOUS Radiation



OPERATING FREQUENCY: 823.10 MHz
 CHANNEL: 684
 MEASURED OUTPUT POWER: 17.54 dBm = 0.057 W
 MODULATION SIGNAL: EvDO
 DISTANCE: 3 meters
 LIMIT: $43 + 10 \log_{10} (W) =$ 30.54 dBc

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	(dBc)
1646.20	-30.19	2.62	-27.57	H	45.11
2469.30	-39.83	2.91	-36.91	H	54.45
3292.40	-47.32	5.42	-41.89	H	59.43
4115.50	-52.81	7.04	-45.78	H	63.32
4938.60	-46.12	7.85	-38.27	H	55.81

Table 6-7. Radiated Spurious Data (EvDO Mode – BC10 Ch. 684)

NOTES:

1. This device was tested under all configurations and all modes across both transmit antennas. In the first transmitter, the worst case 1x CDMA configuration was found with the device set to "All Up Bits" using RC3/SO55. On the second transmitter, the worst case EvDO configuration was found in EvDO Rev. 0 with the device set to "All Up Bits".
2. This unit was tested with its standard battery. The NFC antenna is integrated into the standard battery and is the only battery available from the manufacturer for this device. 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.

FCC ID: A3LSPHL710		BC10 CDMA / EvDO MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.5 BC10 CDMA Frequency Stability Measurements

§2.1055, §90.213

OPERATING FREQUENCY: 823,100,000 Hz
 CHANNEL: 684
 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)	823,100,013	13	0.000002
100 %		- 30	823,100,009	9	0.000001
100 %		- 20	823,100,012	12	0.000001
100 %		- 10	823,099,989	-11	-0.000001
100 %		0	823,100,006	6	0.000001
100 %		+ 10	823,099,990	-10	-0.000001
100 %		+ 20	823,099,985	-15	-0.000002
100 %		+ 30	823,100,011	11	0.000001
100 %		+ 40	823,100,017	17	0.000002
100 %		+ 50	823,100,007	7	0.000001
115 %	4.26	+ 20	823,100,019	19	0.000002
BATT. ENDPOINT	3.40	+ 20	823,100,012	12	0.000001

Table 6-8. Frequency Stability Data (1x CDMA Mode – Ch. 476)

FCC ID: A3LSPHL710		BC10 CDMA / EVDO MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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BC10 CDMA Frequency Stability Measurements (Cont'd)
§2.1055, §90.213

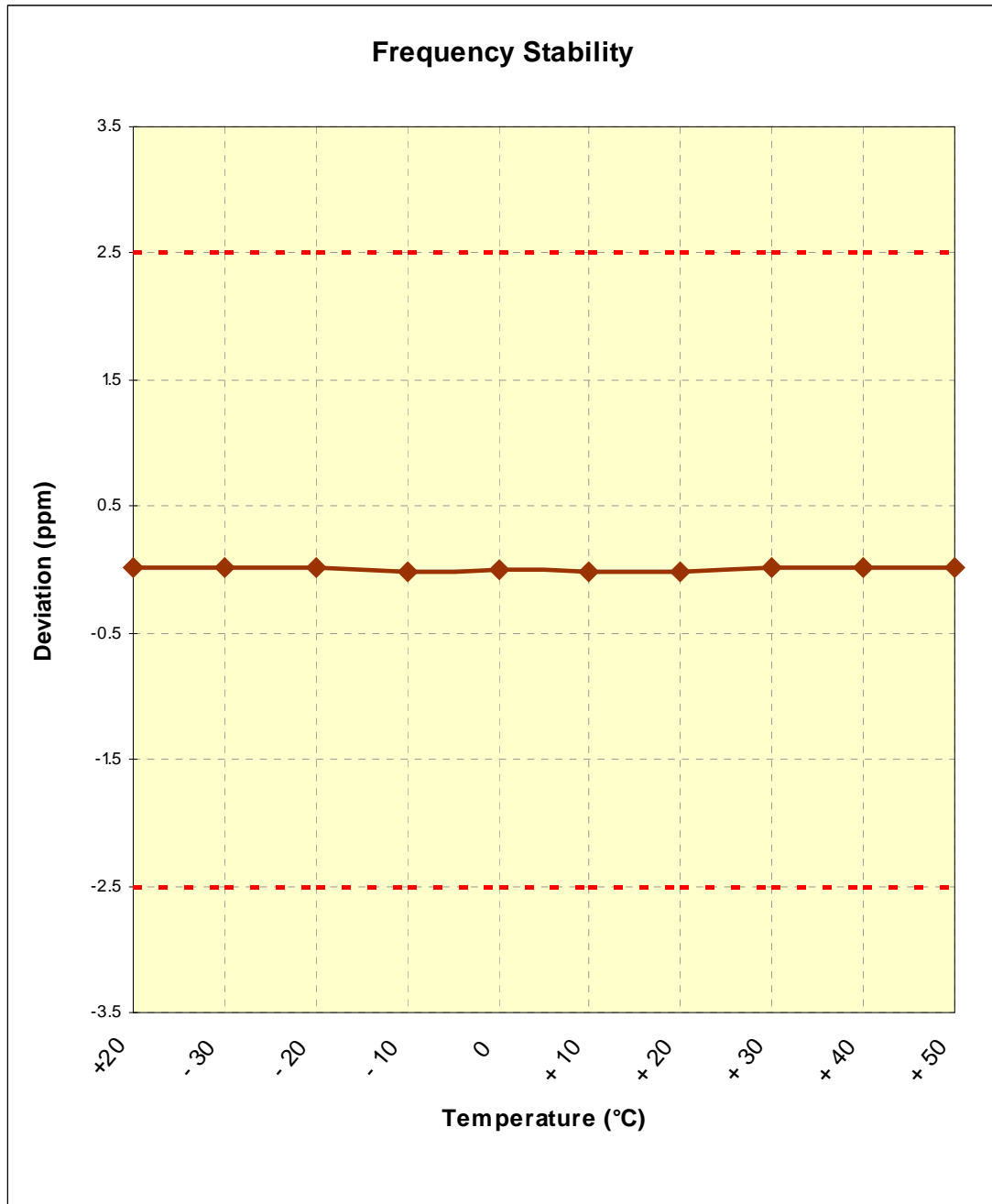


Figure 6-1. Frequency Stability Graph (1x CDMA Mode – Ch. 684)

FCC ID: A3LSPHL710		BC10 CDMA / EVDO MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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6.6 BC10 EvDO Frequency Stability Measurements

§2.1055, §90.213

OPERATING FREQUENCY: 823,100,000 Hz
 CHANNEL: 684
 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)	823,100,004	4	0.000000
100 %		- 30	823,099,991	-9	-0.000001
100 %		- 20	823,100,012	12	0.000001
100 %		- 10	823,100,008	8	0.000001
100 %		0	823,100,007	7	0.000001
100 %		+ 10	823,100,004	4	0.000000
100 %		+ 20	823,099,991	-9	-0.000001
100 %		+ 30	823,100,017	17	0.000002
100 %		+ 40	823,100,006	6	0.000001
100 %		+ 50	823,099,987	-13	-0.000002
115 %	4.26	+ 20	823,099,991	-9	-0.000001
BATT. ENDPOINT	3.40	+ 20	823,100,015	15	0.000002

Table 6-9. Frequency Stability Data (EvDO Mode – Ch. 476)

FCC ID: A3LSPHL710		BC10 CDMA / EvDO MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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BC10 EvDO Frequency Stability Measurements (Cont'd)
§2.1055, §90.213

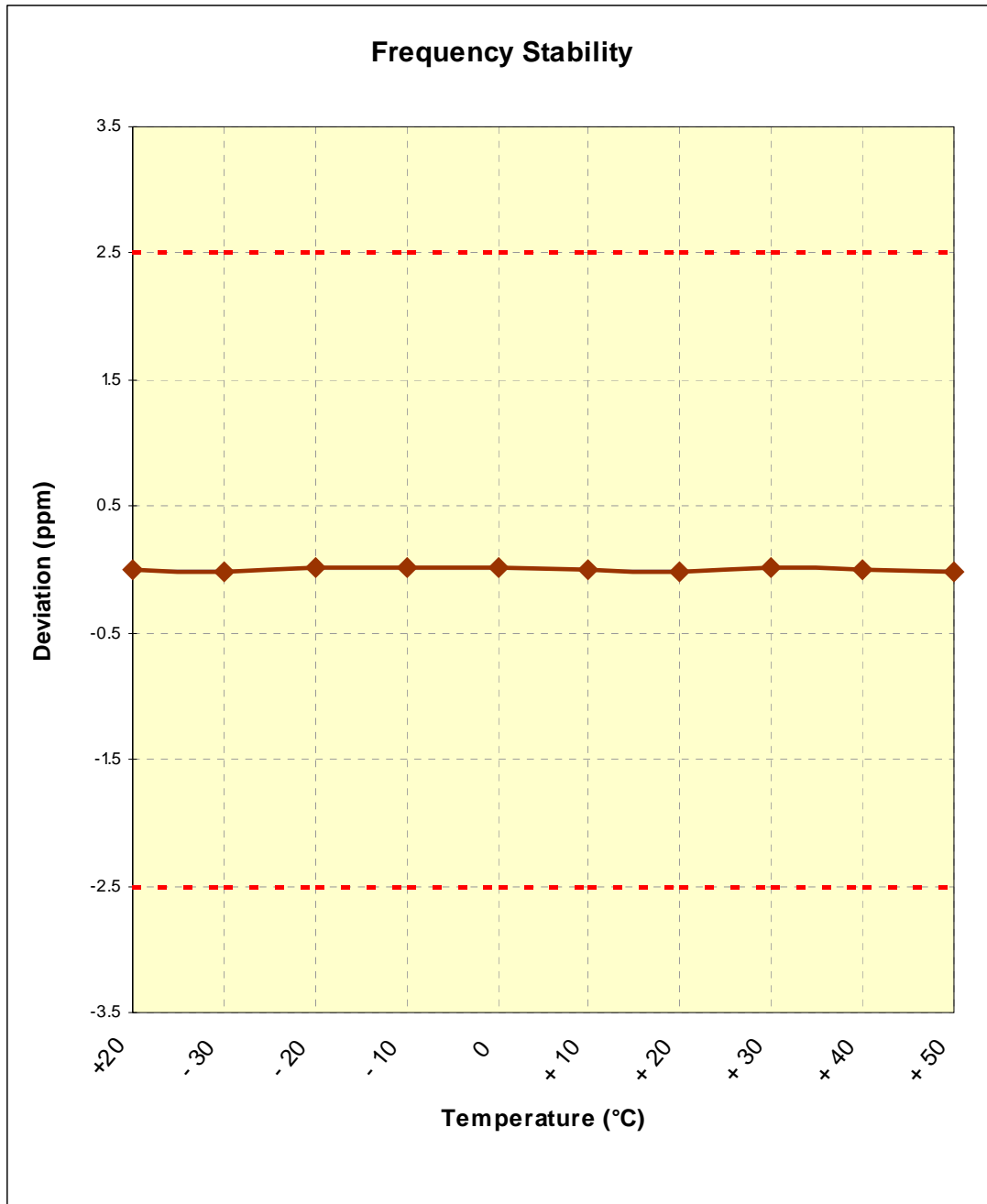
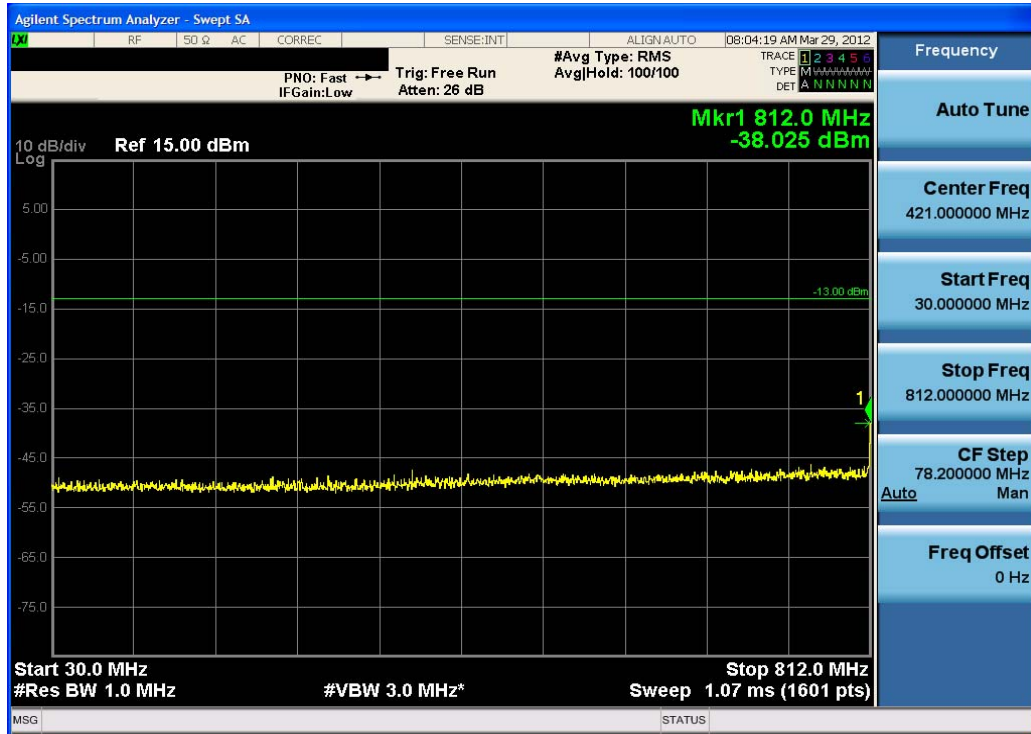


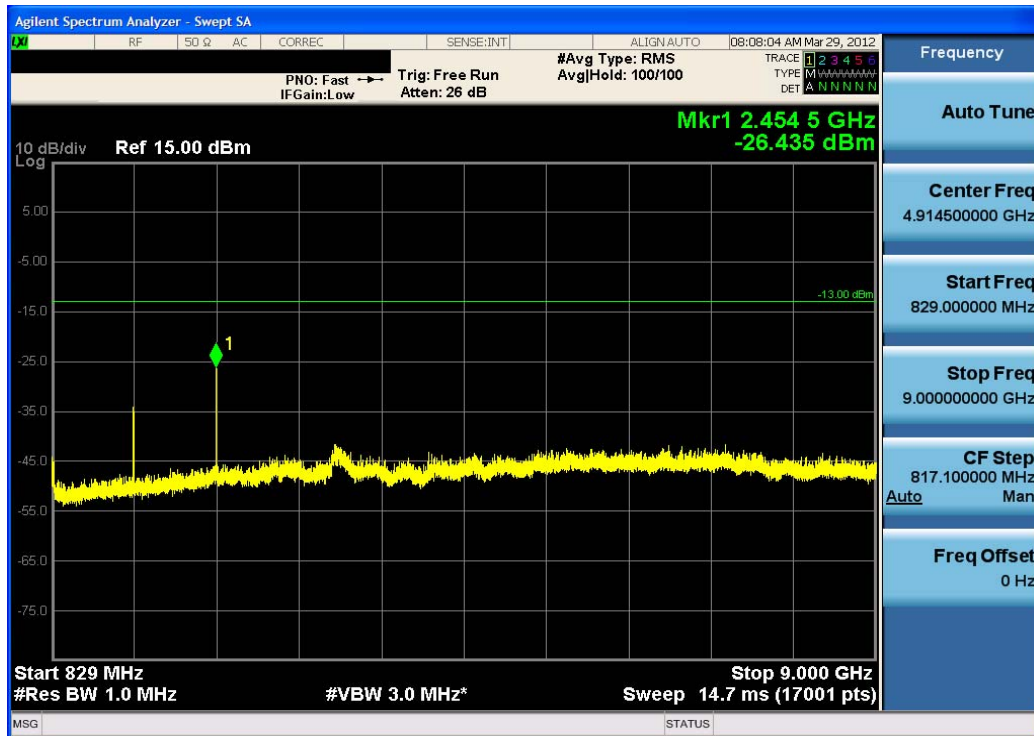
Figure 6-2. Frequency Stability Data (EvDO Mode – Ch. 684)

FCC ID: A3LSPHL710	PCTEST ENGINEERING LABORATORY, INC.	BC10 CDMA / EvDO MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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7.0 PLOT(S) OF EMISSIONS – 1X CDMA

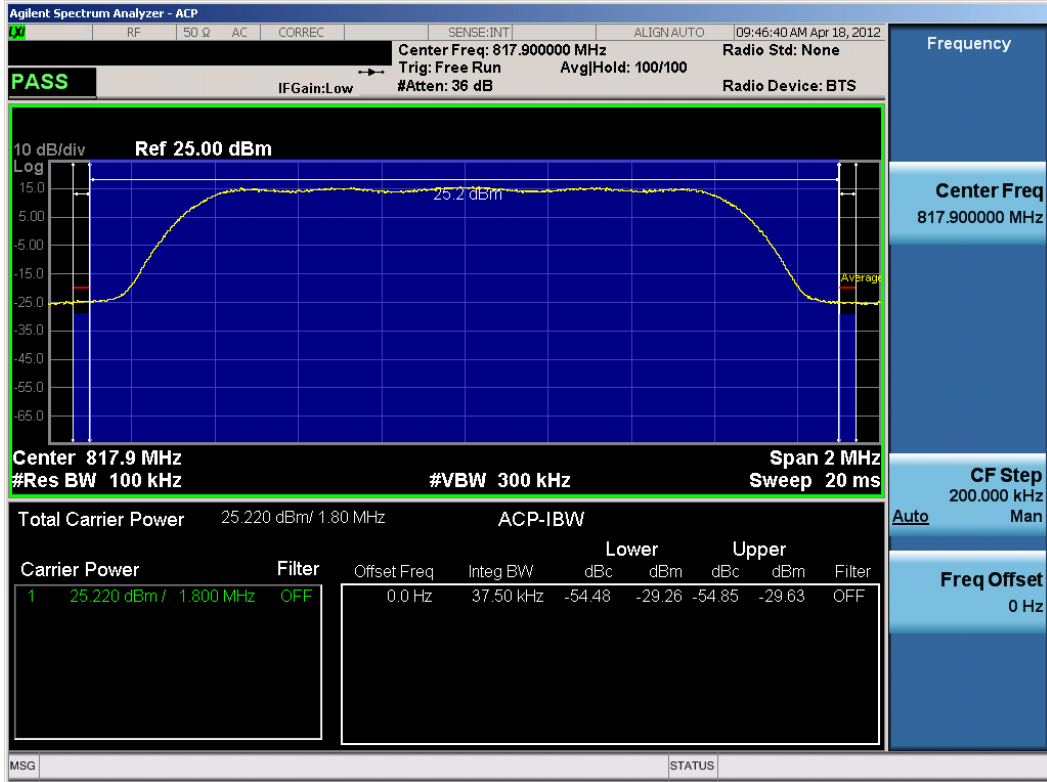


Plot 7-1. Conducted Spurious Plot (BC10 CDMA Ch. 476)



Plot 7-2. Conducted Spurious Plot (BC10 CDMA Ch. 476)

FCC ID: A3LSPHL710	PCTEST ENGINEERING LABORATORY, INC.	BC10 CDMA / EVDO MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 7-3. Channel Edge Plot (BC10 CDMA Ch. 476) - \$90.691

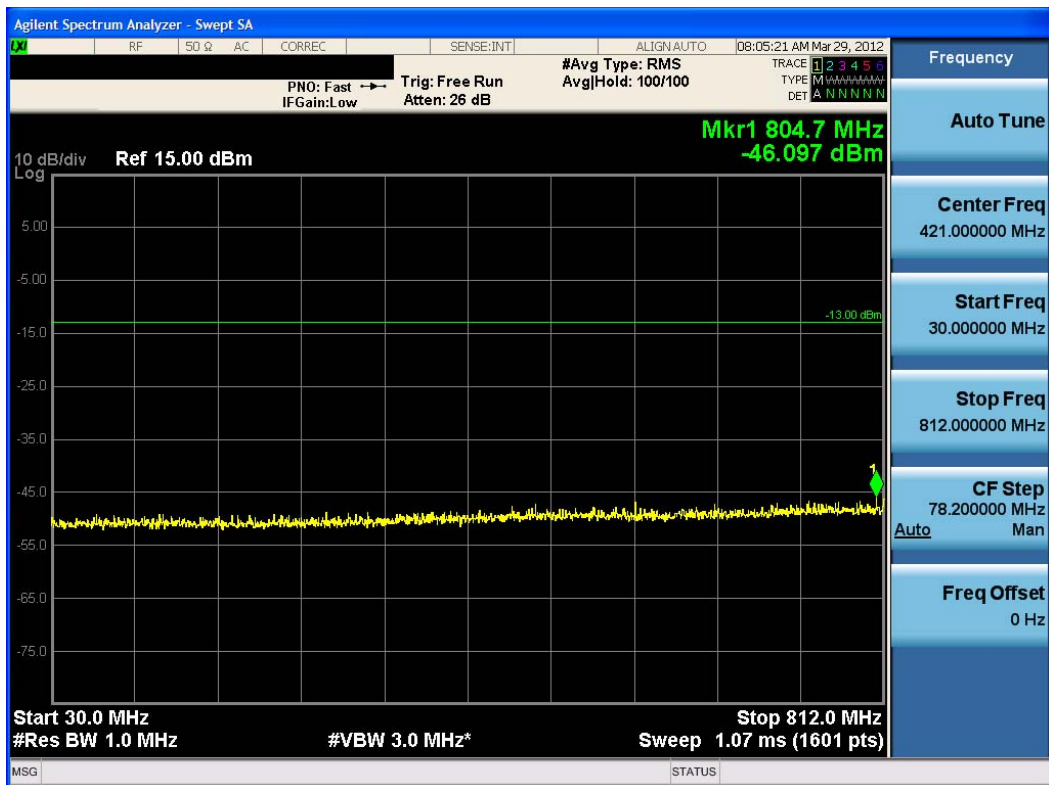


Plot 7-4. 4MHz Span Plot (BC10 CDMA Ch. 476)

FCC ID: A3LSPHL710	PCTEST ENGINEERING LABORATORY, INC.	BC10 CDMA / EvDO MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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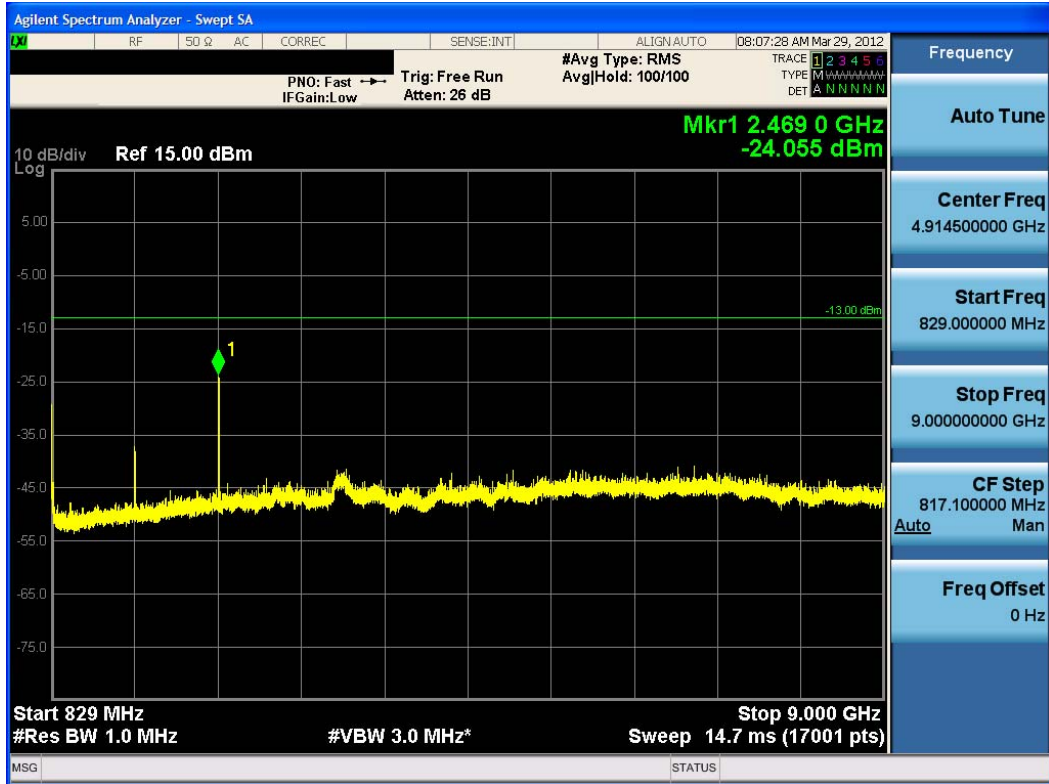


Plot 7-5. Occupied Bandwidth Plot (BC10 CDMA Ch. 684)

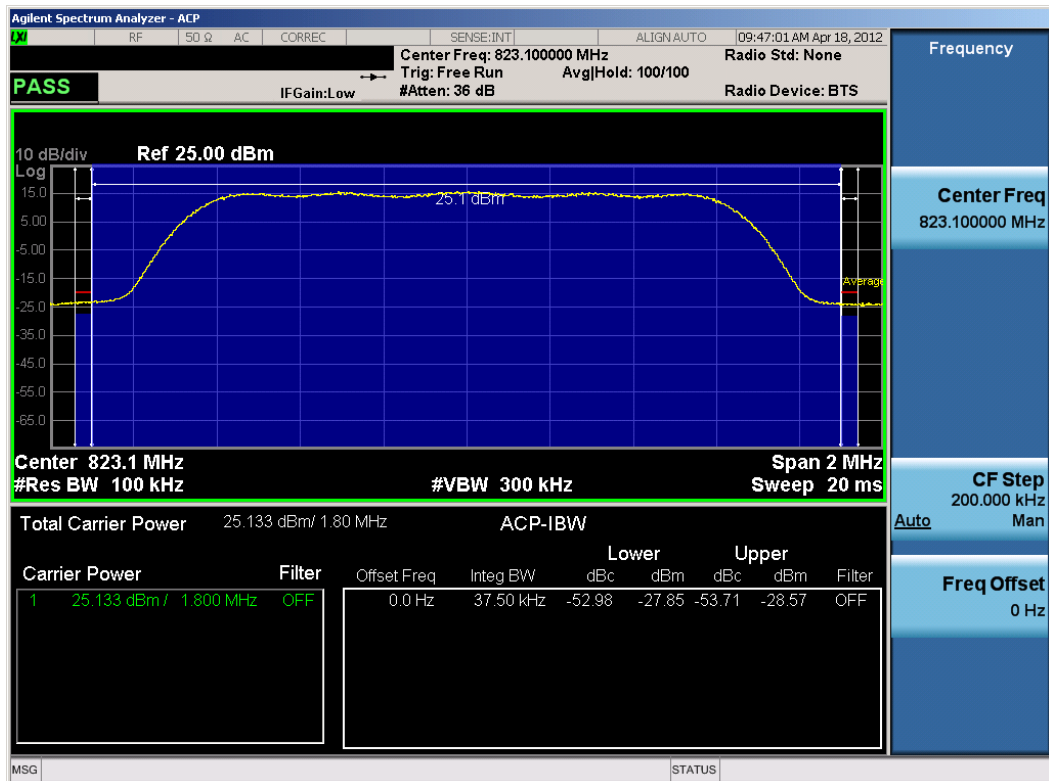


Plot 7-6. Conducted Spurious Plot (BC10 CDMA Ch. 684)

FCC ID: A3LSPHL710	PCTEST ENGINEERING LABORATORY, INC.	BC10 CDMA / EVDO MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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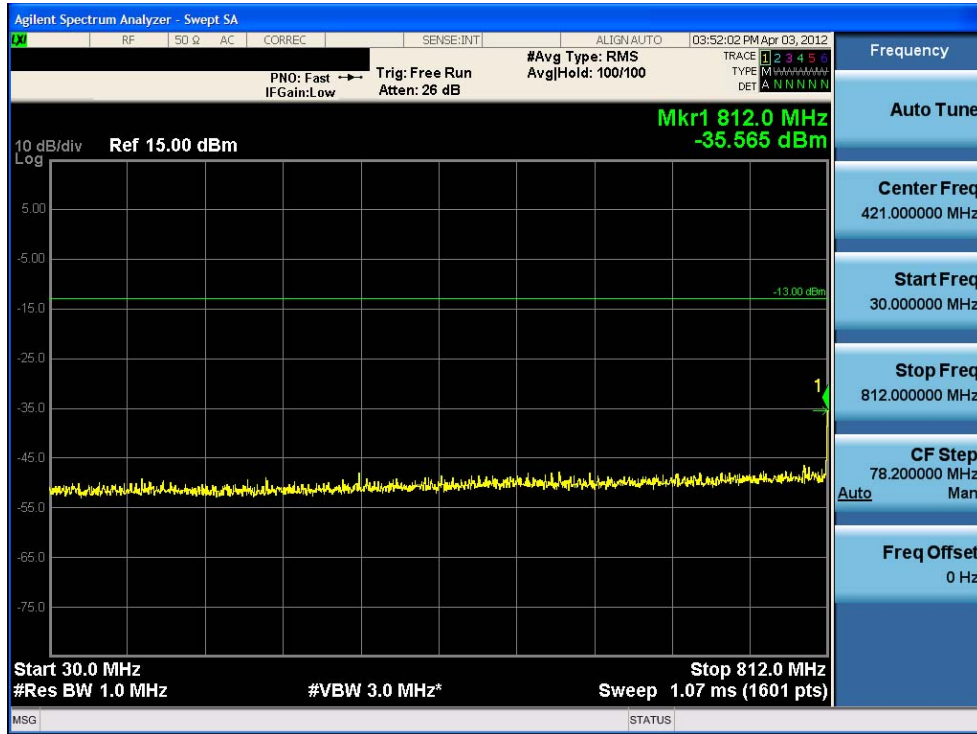
Plot 7-7. Conducted Spurious Plot (BC10 CDMA Ch. 684)



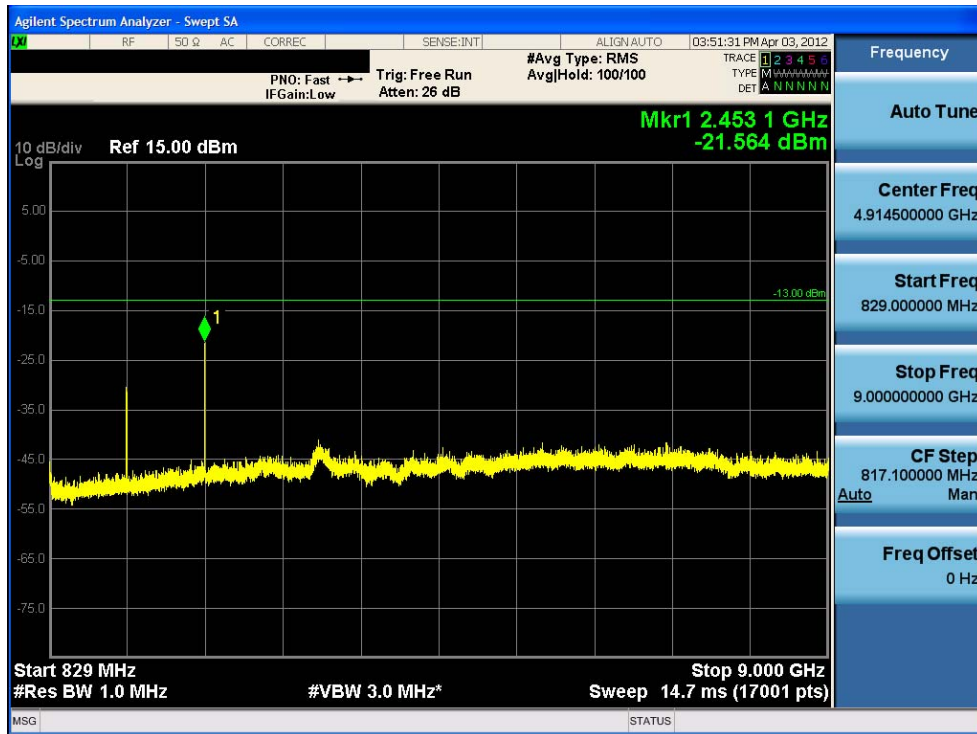
Plot 7-8. Channel Edge Plot (BC10 CDMA Ch. 684) - \$90.691

FCC ID: A3LSPHL710	PCTEST ENGINEERING LABORATORY, INC.	BC10 CDMA / EVDO MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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8.0 PLOT(S) OF EMISSIONS – EVDO

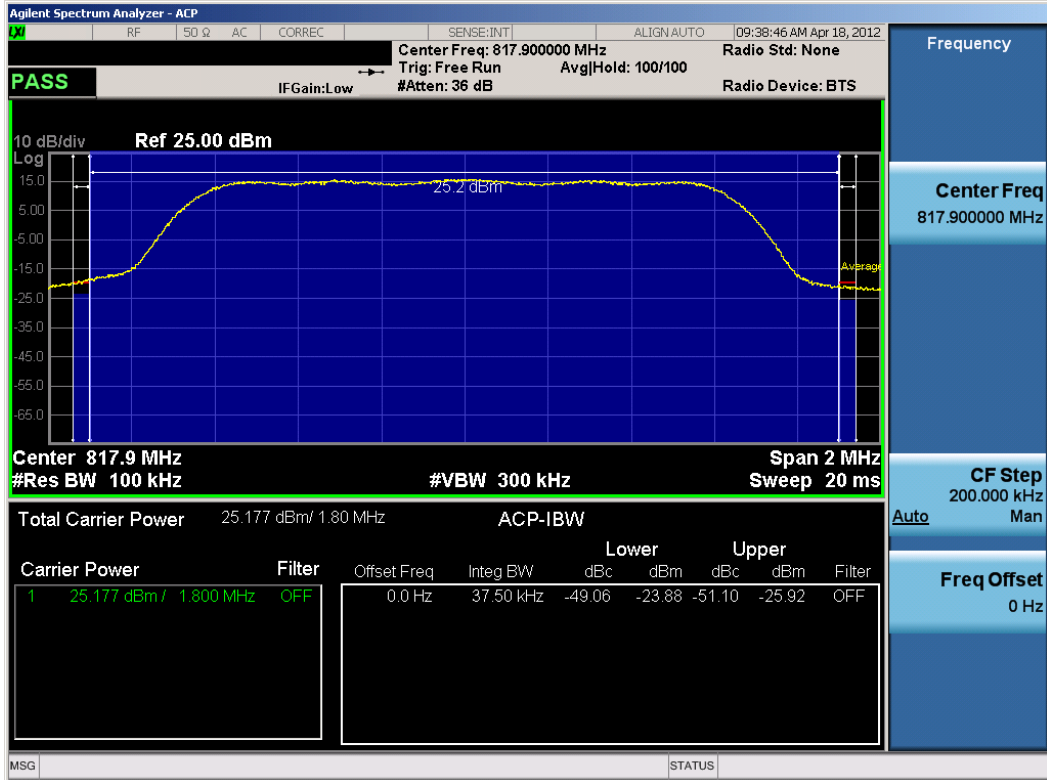


Plot 8-1. Conducted Spurious Plot (BC10 CDMA Ch. 476)



Plot 8-2. Conducted Spurious Plot (BC10 CDMA Ch. 476)

FCC ID: A3LSPHL710		BC10 CDMA / EVDO MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
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Plot 8-3. Channel Edge Plot (BC10 CDMA Ch. 476) - \$90.691

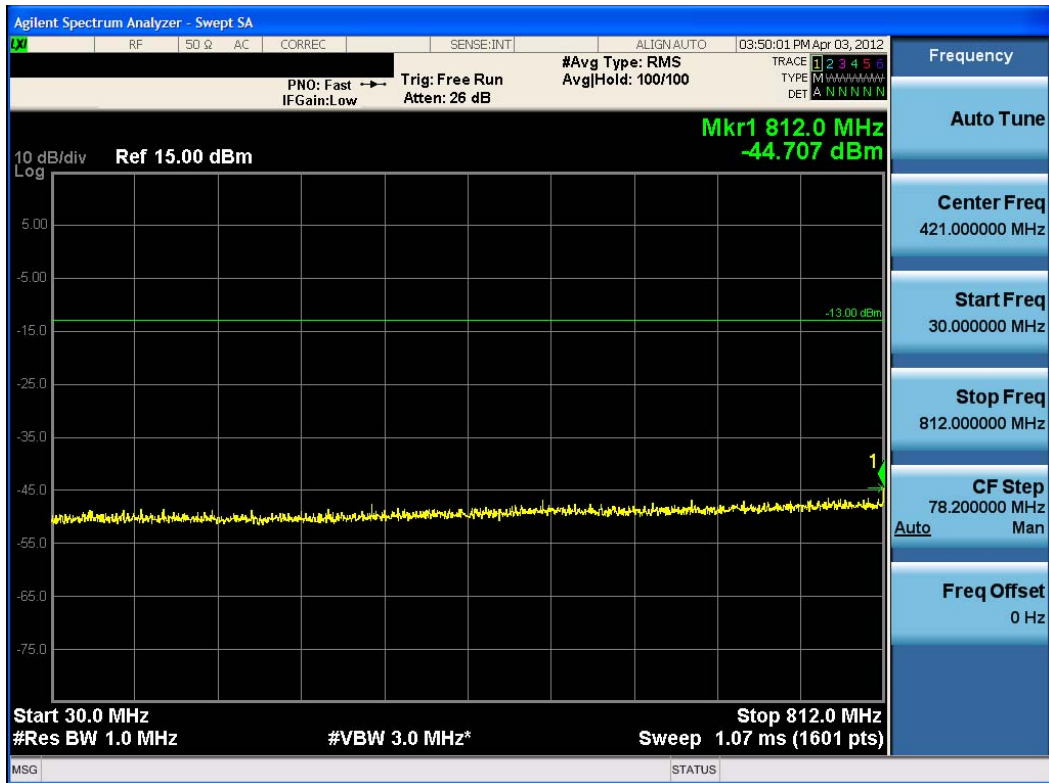


Plot 8-4. 4MHz Span Plot (BC10 CDMA Ch. 476)

FCC ID: A3LSPHL710	PCTEST ENGINEERING LABORATORY, INC.	BC10 CDMA / EvDO MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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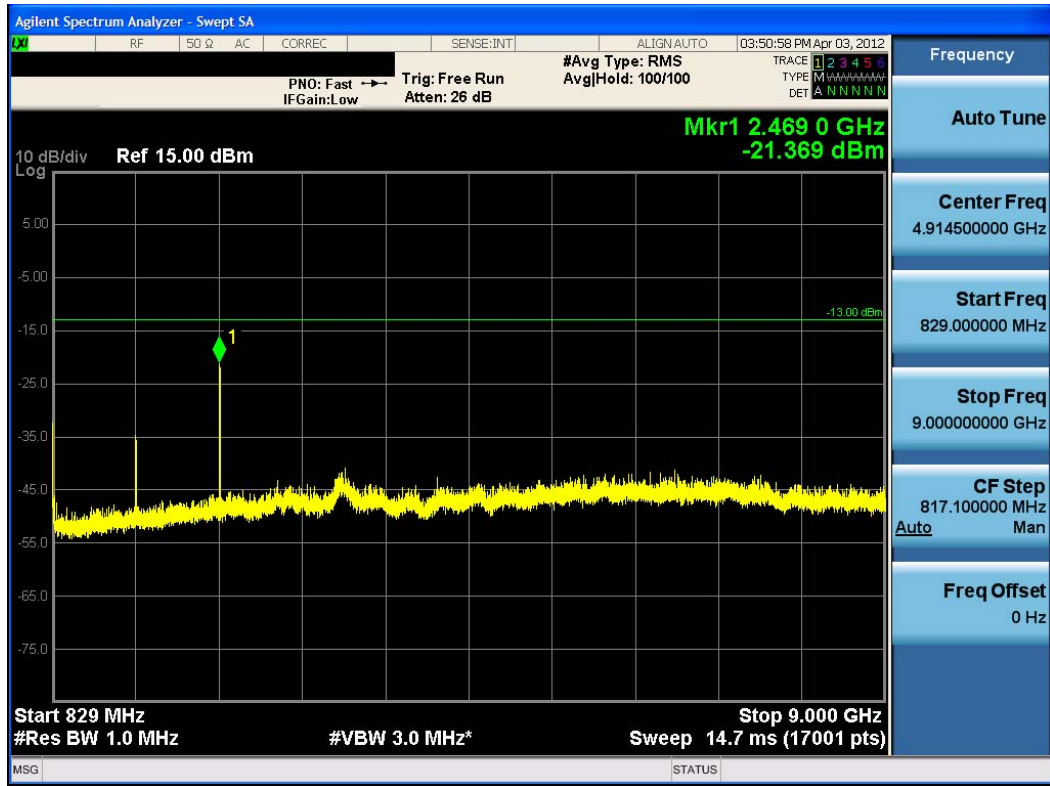


Plot 8-5. Occupied Bandwidth Plot (BC10 CDMA Ch. 684)

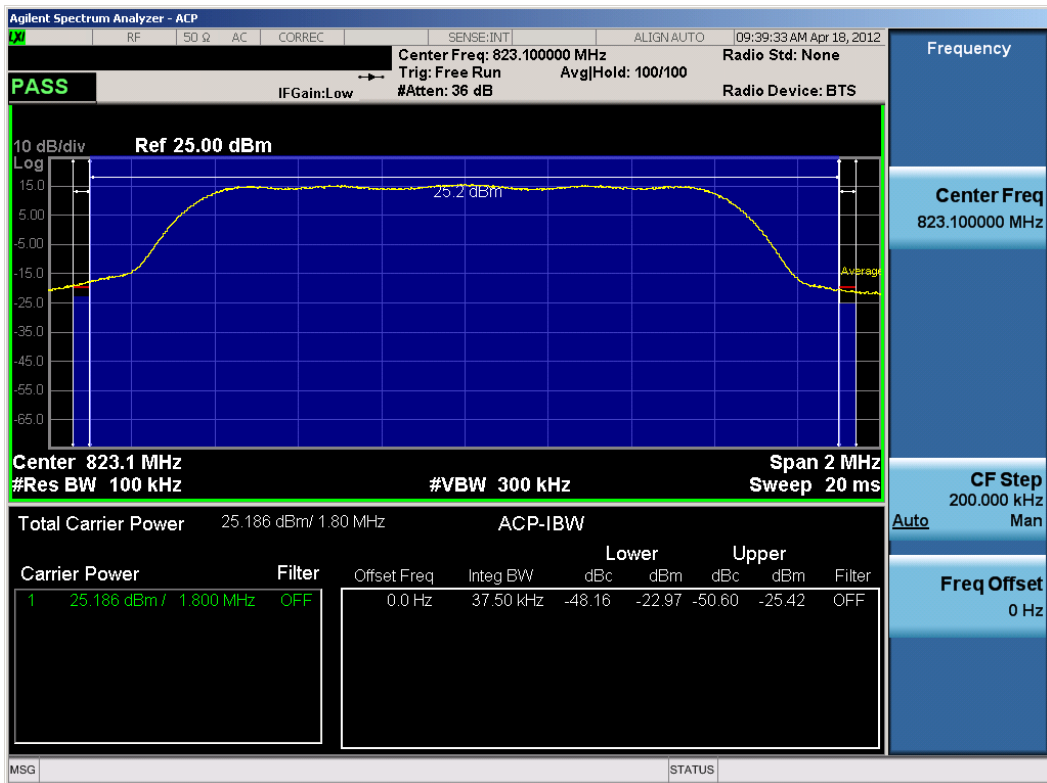


Plot 8-6. Conducted Spurious Plot (BC10 CDMA Ch. 684)

FCC ID: A3LSPHL710	PCTEST ENGINEERING LABORATORY, INC.	BC10 CDMA / EVDO MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Reviewed by: Quality Manager
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Plot 8-7. Conducted Spurious Plot (BC10 CDMA Ch. 684)





Plot 8-8. Channel Edge Plot (BC10 CDMA Ch. 684) - \$90.691

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9.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSPHL710** complies with all the requirements of Parts 90 of the FCC rules.

FCC ID: A3LSPHL710	 BC10 CDMA / EVDO MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1204170522.A3L	Test Dates: 03/29 - 04/18/2012	EUT Type: Portable Handset		Page 31 of 31