



# PCTEST ENGINEERING LABORATORY, INC.

7185 Oakland Mills Road, Columbia, MD 21045 USA  
Tel. 410.290.6652 / Fax 410.290.6654  
http://www.pctestlab.com



## 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:**  
5/22 - 6/10/2014  
**Test Site/Location:**  
PCTEST Lab., Columbia, MD, USA  
**Test Report Serial No.:**  
0Y1405221059.A3L

|                   |                                      |
|-------------------|--------------------------------------|
| <b>FCC ID:</b>    | <b>A3LSMG860P</b>                    |
| <b>APPLICANT:</b> | <b>SAMSUNG ELECTRONICS, CO. LTD.</b> |

**Applicant Type:** Certification  
**FCC Classification:** PCS Licensed Transmitter Held to Ear (PCE)  
**FCC Rule Part:** §90.691  
**EUT Type:** Portable Handset  
**Model(s):** SM-G860P  
**Test Device Serial No.:** *identical prototype* [S/N: SP1D7290341K]  
**Test Procedure(s):** ANSI/TIA-603-C-2004, KDB 971168 v02r01

| Mode           | Tx Frequency (MHz) | Emission Designator | Cond. PWR  |            |
|----------------|--------------------|---------------------|------------|------------|
|                |                    |                     | Max. Power | Max. Power |
| CDMA800 (BC10) | 817.9 - 823.1      | 1M28F9W             | 0.288      | 24.59      |
| LTE Band 26    | 814.7 - 823.3      | 1M12G7D             | 0.219      | 23.40      |
| LTE Band 26    | 814.7 - 823.3      | 1M12W7D             | 0.167      | 22.24      |
| LTE Band 26    | 815.5 - 822.5      | 2M70G7D             | 0.218      | 23.38      |
| LTE Band 26    | 815.5 - 822.5      | 2M69W7D             | 0.168      | 22.25      |
| LTE Band 26    | 816.5 - 821.5      | 4M50G7D             | 0.214      | 23.31      |
| LTE Band 26    | 816.5 - 821.5      | 4M50W7D             | 0.166      | 22.20      |
| LTE Band 26    | 819                | 8M99G7D             | 0.208      | 23.18      |
| LTE Band 26    | 819                | 8M97W7D             | 0.164      | 22.16      |

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

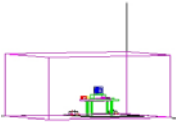


|   |   |                                      |  |
|---|---|--------------------------------------|--|
| <b>FCC ID:</b> A3LSMG860P                   | <b>Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br/>CERTIFICATION</b> |                                      | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1405221059.A3L | <b>Test Dates:</b><br>5/22 - 6/10/2014                                | <b>EUT Type:</b><br>Portable Handset | Page 1 of 38                           |

# T A B L E O F C O N T E N T S

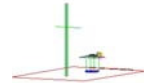
|  |  |    |
|--|--|----|
| FCC PART 90 MEASUREMENT REPORT.....                          |  | 3  |
| 1.0 INTRODUCTION.....  |  | 4  |
| 1.1 SCOPE.....   |  | 4  |
| 1.2 TESTING FACILITY.....                                    |  | 4  |
| 2.0 PRODUCT INFORMATION.....                                 |  | 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 RADIATED SPURIOUS EMISSIONS MEASUREMENTS.....            |  | 13 |
| 6.4 FREQUENCY STABILITY / TEMPERATURE VARIATION.....         |  | 17 |
| 7.0 CDMA PLOTS OF EMISSIONS.....                             |  | 21 |
| 8.0 LTE PLOTS OF EMISSIONS.....                              |  | 28 |
| 9.0 CONCLUSION.....  |  | 38 |

|   |   |   |   |  |
|---|---|---|---|--|
| <b>FCC ID:</b> A3LSMG860P                   |  | <b>Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br/>CERTIFICATION</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1405221059.A3L | <b>Test Dates:</b><br>5/22 - 6/10/2014  | <b>EUT Type:</b><br>Portable Handset                                  | Page 2 of 38  |  |



# MEASUREMENT REPORT

## BC10 CDMA



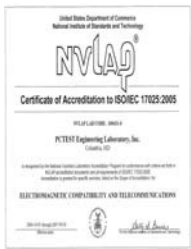
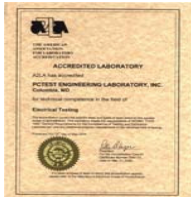
### §2.1033 General Information



**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:** SM-G860P  
**FCC CLASSIFICATION:** PCS Licensed Transmitter Held to Ear (PCE)  
**MODE:** LTE  
**FREQUENCY TOLERANCE:** ±0.00025 % (2.5 ppm)  
**Test Device Serial No.:** SP1D7290341K       Production     Pre-Production     Engineering  
**DATE(S) OF TEST:** 5/22 - 6/10/2014  
**TEST REPORT S/N:** 0Y1405221059.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.



|   |   |   |   |  |
|---|---|---|---|--|
| <b>FCC ID:</b> A3LSMG860P                   |  | <b>Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br/>CERTIFICATION</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1405221059.A3L | <b>Test Dates:</b><br>5/22 - 6/10/2014  | <b>EUT Type:</b><br>Portable Handset                                  | Page 3 of 38  |  |

# 1.0 INTRODUCTION

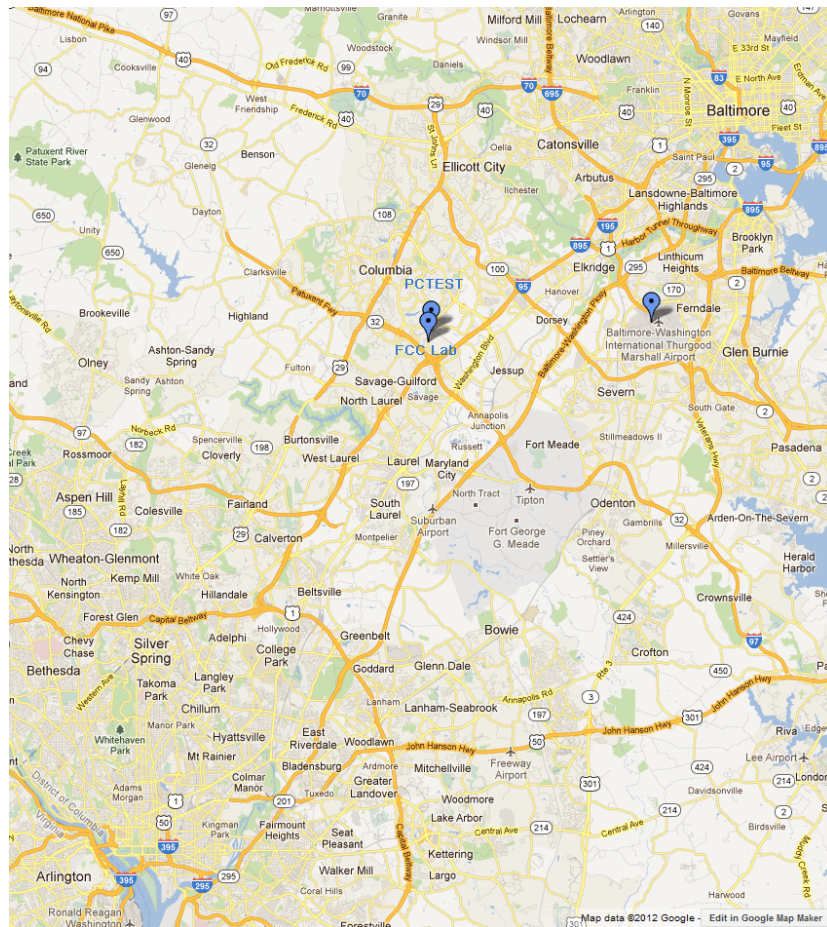
## 1.1 Scope

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 Internt'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: A3LSMG860P                   |  | Part 90 CDMA / EvDo / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 |   | Page 4 of 38                    |

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG860P**. The EUT consisted of the following component(s):

| Trade Name / Base Model   | FCC ID     | Description      |
|---------------------------|------------|------------------|
| Samsung / Model: SM-G860P | A3LSMG860P | 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), 850/1900 GPRS/EDGE, 850/1900 WCDMA/HSPA, Multi-Band LTE, 802.11a/b/g/n/ac WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC, ANT+

### 2.3 EMI Suppression Device(s)/Modifications

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

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 5 of 38  |                                 |

## 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: A3LSMG860P**.

### 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 10<sup>th</sup> 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.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 6 of 38  |                                 |

### 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. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Clause 5, Figure 5.7 of ANSI C63.4-2009. 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 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: A3LSMG860P                   |  <b>Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION</b> |                               |  <b>Reviewed by:</b><br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset | Page 7 of 38   |

### 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 ±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: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 8 of 38  |                                 |

## 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) | 3/25/2014  | Annual       | 3/25/2015  | 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         | N9020A            | MXA Signal Analyzer                    | 10/29/2013 | Annual       | 10/29/2014 | US46470561    |
| Agilent         | E4448A            | PSA (3Hz-50GHz) Spectrum Analyzer      | 4/16/2014  | Annual       | 4/16/2015  | US42510244    |
| Emco            | 6502              | Active Loop Antenna (10k - 30 MHz)     | 5/31/2012  | Biennial     | 5/31/2014  | 267           |
| Espec           | ESX-2CA           | Environmental Chamber                  | 4/16/2014  | Annual       | 4/16/2015  | 17620         |
| ETS Lindgren    | 3117              | 1-18 GHz DRG Horn (Medium)             | 4/8/2014   | Biennial     | 4/8/2016   | 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                | 3/12/2014  | Biennial     | 3/12/2016  | 128337        |
| K & L           | 13SH10-1000/U1000 | N Type High Pass Filter                | 5/22/2014  | Annual       | 5/22/2015  | 1             |
| Mini-Circuits   | SSG-4000HP        | USB Synthesized Signal Generator       | N/A        |              |            | 11208010032   |
| Mini-Circuits   | PWR-SENS-4RMS     | USB Power Sensor                       | 4/9/2014   | Annual       | 4/9/2015   | 11401010036   |
| Mini-Circuits   | TVA-11-422        | RF Power Amp                           | N/A        |              |            | QA1303002     |
| Rohde & Schwarz | CMU200            | Base Station Simulator                 | N/A        |              |            | 836536/0005   |
| Rohde & Schwarz | TS-PR18           | 1-18 GHz Pre-Amplifier                 | 5/31/2013  | Annual       | 5/31/2014  | 100071        |
| Rohde & Schwarz | TS-PR26           | 18-26.5 GHz Pre-Amplifier              | 5/31/2013  | Annual       | 5/31/2014  | 100040        |
| Rohde & Schwarz | ESU26             | EMI Test Receiver (26.5GHz)            | 1/27/2014  | Annual       | 1/27/2015  | 100342        |
| Schwarzbeck     | UHA 9105          | Dipole Antenna (400 - 1GHz) Rx         | 11/21/2013 | Biennial     | 11/21/2015 | 9105-2404     |
| Seekonk         | NC-100            | Torque Wrench (8" lb)                  | 4/16/2014  | Annual       | 4/16/2015  | N/A           |
| Sunol           | JB5               | Bi-Log Antenna (30M - 5GHz)            | 1/28/2014  | Biennial     | 1/28/2016  | A051107       |

**Table 4-1. Test Equipment**

**Notes:**

1. For equipment listed above that has a calibration due date that falls within the test date range, care was taken to ensure that this equipment was utilized prior to the calibration due date.
2. Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 9 of 38  |                                 |

## 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 3<sup>rd</sup> 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: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 10 of 38   |                                 |

## 6.0 TEST RESULTS

### 6.1 Summary



Company Name: Samsung Electronics, Co. Ltd.  
 FCC ID: A3LSMG860P  
 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    |
|---------------------|--|---|----------------|-------------|--------------|
| §2.1051,<br>§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,<br>§90.635 | Conducted Power                          | $< 100$ Watts   |                | PASS        | Section 6.2  |
| §2.1055,<br>§90.213 | Frequency Stability                      | $< 2.5$ ppm   |                | PASS        | Section 6.4  |
| §2.1053,<br>§90.691 | Undesirable Emissions                    | $> 43 + 10\log_{10}(P[\text{Watts}])$ for all out-of-band emissions   | RADIATED       | PASS        | Sections 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 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: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 11 of 38   |                                 |

## 6.2 Conducted Power Output Data

§90.635

| Frequency [MHz] | BC10 [Channel] | Battery Type | Cond. PWR [dBm] | Cond. PWR Limit [dBm] | Margin [dB] |
|-----------------|----------------|--------------|-----------------|-----------------------|-------------|
| 817.90          | 476            | Standard     | 24.51           | 50.00                 | -25.49      |
| 823.10          | 684            | Standard     | 24.59           | 50.00                 | -25.41      |



**Table 6-2. CDMA BC 10 Conducted Power Output Data**

| Frequency [MHz] | Channel Bandwidth [MHz] | Mod.   | Cond. PWR [dBm] | Cond. PWR Limit [dBm] | Margin [dB] |
|-----------------|-------------------------|--------|-----------------|-----------------------|-------------|
| 814.70          | 1.4                     | QPSK   | 23.4            | 50.00                 | -26.60      |
| 823.30          | 1.4                     | QPSK   | 23.25           | 50.00                 | -26.75      |
| 814.70          | 1.4                     | 16-QAM | 22.24           | 50.00                 | -27.76      |
| 823.30          | 1.4                     | 16-QAM | 22.12           | 50.00                 | -27.88      |
| 815.50          | 3                       | QPSK   | 23.38           | 50.00                 | -26.62      |
| 822.50          | 3                       | QPSK   | 23.29           | 50.00                 | -26.71      |
| 815.50          | 3                       | 16-QAM | 22.25           | 50.00                 | -27.75      |
| 822.50          | 3                       | 16-QAM | 22.15           | 50.00                 | -27.85      |
| 816.50          | 5                       | QPSK   | 23.31           | 50.00                 | -26.69      |
| 821.50          | 5                       | QPSK   | 23.30           | 50.00                 | -26.70      |
| 816.50          | 5                       | 16-QAM | 22.19           | 50.00                 | -27.81      |
| 821.50          | 5                       | 16-QAM | 22.20           | 50.00                 | -27.80      |
| 819.00          | 10                      | QPSK   | 23.18           | 50.00                 | -26.82      |
| 819.00          | 10                      | 16-QAM | 22.16           | 50.00                 | -27.84      |

**Table 6-3. LTE Band 26 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-BG900BBU contains an embedded NFC antenna.

|                                      |  |   |                                 |
|--------------------------------------|--|---|---------------------------------|
| FCC ID: A3LSMG860P                   |  Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014  | EUT Type:<br>Portable Handset   | Page 12 of 38                   |

### 6.3 Radiated Spurious Emissions Measurements

§2.1053, §90.691

#### Field Strength of SPURIOUS Radiation for CDMA Band Class 10

OPERATING FREQUENCY: 817.90 MHz

CHANNEL: 476

MEASURED OUTPUT POWER: 24.51 dBm = 0.282 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] | Ant. Pol. [H/V] | EUT Pol. [H/H2/V] | Margin (dB) |
|-----------------|----------------------------------|-------------------------------|-------------------------------|-----------------|-------------------|-------------|
| 1635.80         | -37.35                           | 6.56                          | -30.79                        | H               | H                 | -17.8       |
| 2453.70         | -46.27                           | 7.26                          | -39.00                        | H               | H                 | -26.0       |
| 3271.60         | -59.26                           | 7.36                          | -51.91                        | H               | H                 | -38.9       |
| 4089.50         | -60.36                           | 7.91                          | -52.45                        | H               | H                 | -39.4       |
| 4907.40         | -59.00                           | 8.71                          | -50.30                        | H               | H                 | -37.3       |

**Table 6-4. 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-BG900BBU 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: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 13 of 38   |                                 |

OPERATING FREQUENCY: 823.10 MHz

CHANNEL: 684

MEASURED OUTPUT POWER: 24.59 dBm = 0.288 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] | Ant. Pol. [H/V] | EUT Pol. [H/H2/V] | Margin (dB) |
|-----------------|----------------------------------|-------------------------------|-------------------------------|-----------------|-------------------|-------------|
| 1646.20         | -48.16                           | 6.56                          | -41.60                        | H               | H                 | -28.6       |
| 2469.30         | -43.85                           | 7.29                          | -36.56                        | H               | H                 | -23.6       |
| 3292.40         | -61.04                           | 7.36                          | -53.68                        | H               | H                 | -40.7       |
| 4115.50         | -60.27                           | 8.00                          | -52.27                        | H               | H                 | -39.3       |
| 4938.60         | -57.64                           | 8.73                          | -48.91                        | H               | H                 | -35.9       |

**Table 6-5. 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-BG900BBU 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: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 14 of 38   |                                 |

# Radiated Spurious Emissions Measurements

§2.1053, §90.691

## Field Strength of SPURIOUS Radiation for LTE Band 26

OPERATING FREQUENCY: 814.70 MHz

CHANNEL: 26697

MEASURED OUTPUT POWER: 23.40 dBm = 0.219 W

MODULATION SIGNAL: QPSK

BANDWIDTH: 1.4 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] | Ant. Pol. [H/V] | EUT Pol. [H/H2/V] | Margin (dB) |
|-----------------|----------------------------------|-------------------------------|-------------------------------|-----------------|-------------------|-------------|
| 1629.40         | -35.93                           | 6.56                          | -29.37                        | H               | H                 | -16.4       |
| 2444.10         | -38.19                           | 7.25                          | -30.94                        | H               | H                 | -17.9       |
| 3258.80         | -60.75                           | 7.35                          | -53.39                        | H               | H                 | -40.4       |
| 4073.50         | -60.39                           | 7.84                          | -52.54                        | H               | H                 | -39.5       |
| 4888.20         | -54.46                           | 8.70                          | -45.76                        | H               | H                 | -32.8       |
| 5702.90         | -58.67                           | 9.09                          | -49.57                        | H               | H                 | -36.6       |

**Table 6-6. 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-BG900BBU 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: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 15 of 38   |                                 |

OPERATING FREQUENCY: 823.30 MHz

CHANNEL: 26783

MEASURED OUTPUT POWER: 23.25 dBm = 0.211 W

MODULATION SIGNAL: QPSK

BANDWIDTH: 1.4 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] | Ant. Pol. [H/V] | EUT Pol. [H/H2/V] | Margin (dB) |
|-----------------|----------------------------------|-------------------------------|-------------------------------|-----------------|-------------------|-------------|
| 1646.60         | -42.24                           | 6.56                          | -35.68                        | H               | H                 | -22.7       |
| 2469.90         | -48.06                           | 7.29                          | -40.77                        | H               | H                 | -40.8       |
| 3293.20         | -60.25                           | 7.36                          | -52.89                        | H               | H                 | -39.9       |
| 4116.50         | -64.12                           | 8.00                          | -56.12                        | H               | H                 | -56.1       |
| 4939.80         | -55.58                           | 8.73                          | -46.84                        | H               | H                 | -33.8       |
| 5763.10         | -58.77                           | 9.19                          | -49.58                        | H               | H                 | -49.6       |

**Table 6-7. Radiated Spurious Data (Ch. 26783)**

**NOTES:**

- 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.
- The EUT is supplied with a new/fully-recharged battery. The battery for this model EB-BG900BBU contains an embedded NFC antenna.
- 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: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 16 of 38   |                                 |



## 6.4 Frequency Stability / Temperature Variation

§2.1055, §90.213

OPERATING FREQUENCY: 817,900,000 Hz  
 CHANNEL: 476  
 REFERENCE VOLTAGE: 3.85 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

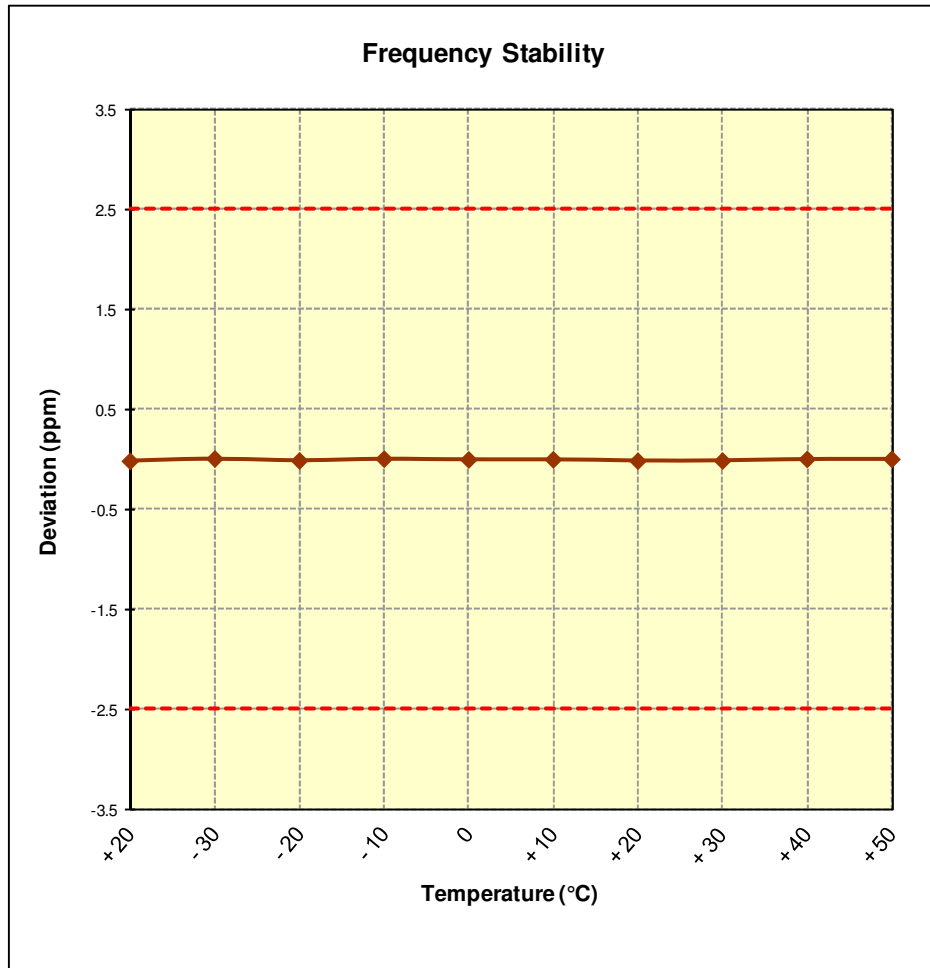
| VOLTAGE (%)    | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.85        | + 20 (Ref) | -20            | -20             | -0.0000024    |
| 100 %          |             | - 30       | -1             | -1              | -0.0000001    |
| 100 %          |             | - 20       | -16            | -16             | -0.0000020    |
| 100 %          |             | - 10       | -2             | -2              | -0.0000002    |
| 100 %          |             | 0          | -8             | -8              | -0.0000009    |
| 100 %          |             | + 10       | -7             | -7              | -0.0000009    |
| 100 %          |             | + 20       | -18            | -18             | -0.0000022    |
| 100 %          |             | + 30       | -17            | -17             | -0.0000021    |
| 100 %          |             | + 40       | -4             | -4              | -0.0000005    |
| 100 %          |             | + 50       | -4             | -4              | -0.0000004    |
| 115 %          |             | 4.43       | + 20           | -6              | -6            |
| BATT. ENDPOINT | 3.40        | + 20       | -16            | -16             | -0.0000020    |

Table 6-8. CDMA Band 10 Frequency Stability Data (Ch. 476)

|                                      |   |   |   |                                 |
|--------------------------------------|---|---|---|---------------------------------|
| FCC ID: A3LSMG860P                   |  | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014   | EUT Type:<br>Portable Handset                                 | Page 17 of 38   |                                 |

**Frequency Stability / Temperature Variation**

§2.1055, §90.213



**Table 6-9. CDMA Band 10 Frequency Stability Data (Ch. 476)**

|                                      |  |   |         |                                 |
|--------------------------------------|--|---|---------|---------------------------------|
| FCC ID: A3LSMG860P                   | PCTEST<br>ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION | SAMSUNG | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014        | EUT Type:<br>Portable Handset                                 |         | Page 18 of 38                   |

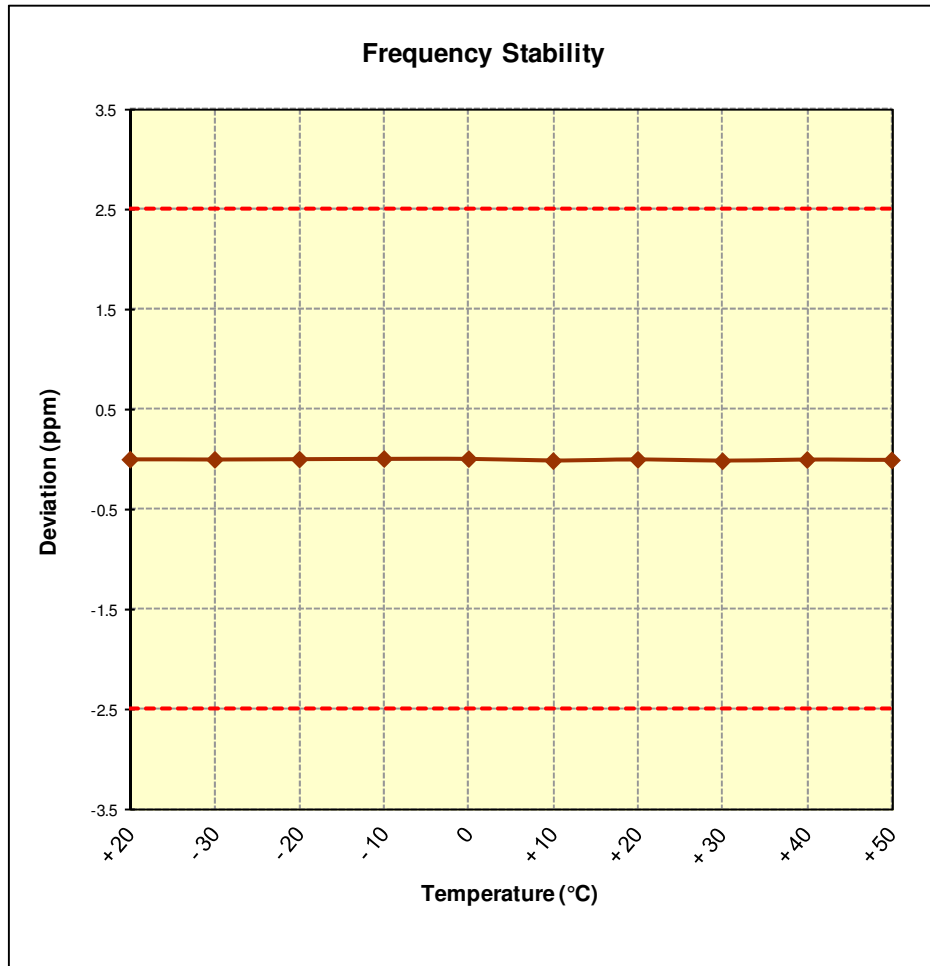
OPERATING FREQUENCY: 814,700,000 Hz  
 CHANNEL: 26697  
 REFERENCE VOLTAGE: 3.85 VDC  
 DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

| VOLTAGE (%)    | POWER (VDC) | TEMP (°C)  | FREQUENCY (Hz) | Freq. Dev. (Hz) | Deviation (%) |
|----------------|-------------|------------|----------------|-----------------|---------------|
| 100 %          | 3.85        | + 20 (Ref) | -6             | -6              | -0.0000007    |
| 100 %          |             | - 30       | -7             | -7              | -0.0000009    |
| 100 %          |             | - 20       | -5             | -5              | -0.0000007    |
| 100 %          |             | - 10       | -1             | -1              | -0.0000001    |
| 100 %          |             | 0          | -1             | -1              | -0.0000002    |
| 100 %          |             | + 10       | -18            | -18             | -0.0000022    |
| 100 %          |             | + 20       | -7             | -7              | -0.0000009    |
| 100 %          |             | + 30       | -19            | -19             | -0.0000023    |
| 100 %          |             | + 40       | -9             | -9              | -0.0000011    |
| 100 %          |             | + 50       | -12            | -12             | -0.0000015    |
| 115 %          |             | 4.43       | + 20           | -4              | -4            |
| BATT. ENDPOINT | 3.40        | + 20       | -14            | -14             | -0.0000017    |

**Table 6-10. LTE Band 26 Frequency Stability Data (Ch. 26697)**

**Frequency Stability / Temperature Variation**

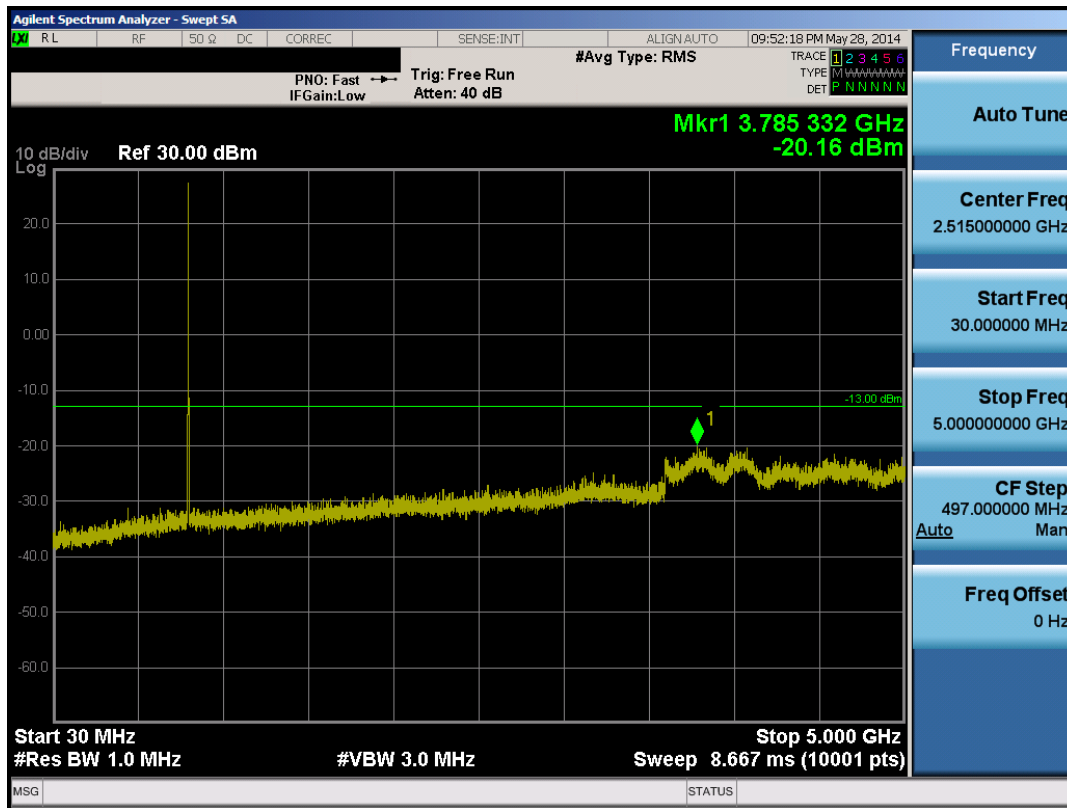
§2.1055, §90.213



**Table 6-11. LTE Band 26 Frequency Stability Data (Ch. 26697)**

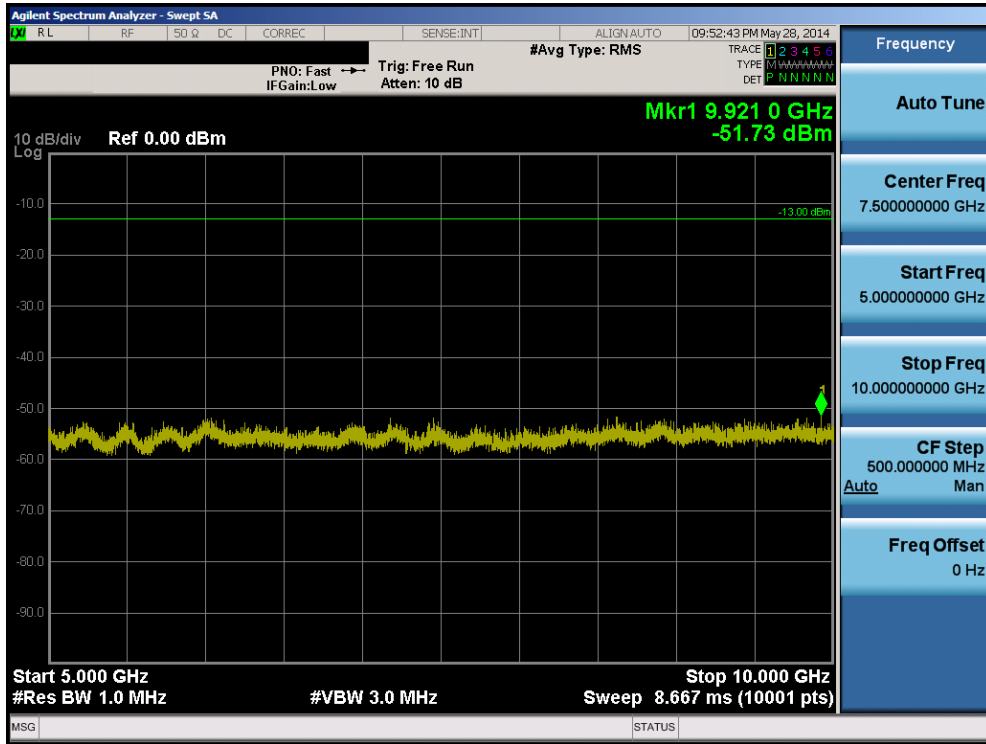
|   |  |   |               |  |
|---|--|---|---------------|--|
| <b>FCC ID:</b> A3LSMG860P                   |  | <b>Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br/>CERTIFICATION</b> |               | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1405221059.A3L | <b>Test Dates:</b><br>5/22 - 6/10/2014 | <b>EUT Type:</b><br>Portable Handset                                  | Page 20 of 38 |  |

## 7.0 CDMA PLOTS OF EMISSIONS

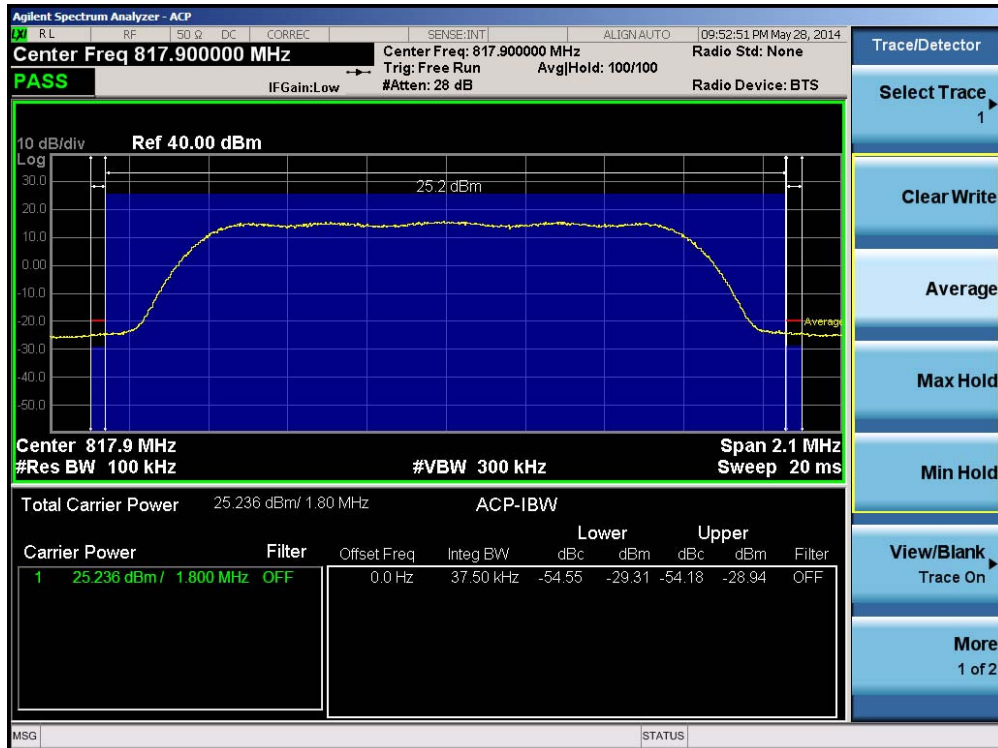


**Plot 7-1. Conducted Spurious Plot (Ch. 476)**

|                                      |                                     |   |  |                                 |
|--------------------------------------|-------------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   | PCTEST ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014     | EUT Type:<br>Portable Handset                                 |  | Page 21 of 38                   |



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



Plot 7-3. Channel Edge Plot (Ch. 476)

|                                      |                                 |   |  |                                 |
|--------------------------------------|---------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   |                                 | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014 | EUT Type:<br>Portable Handset                                 |  | Page 22 of 38                   |

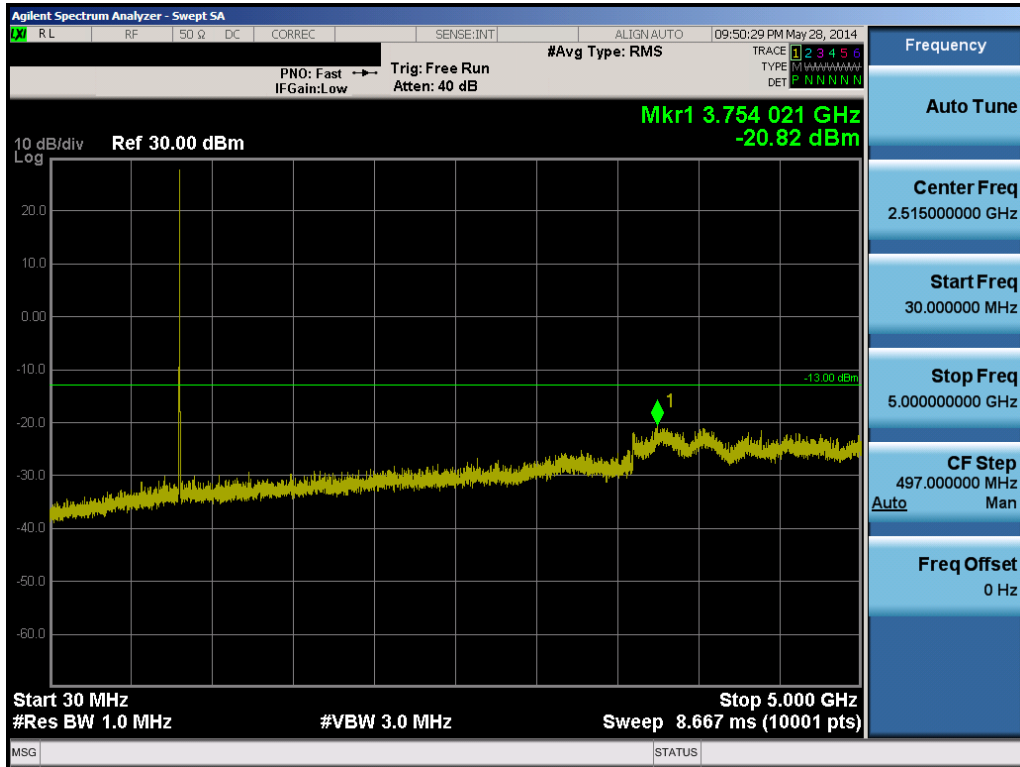


Plot 7-4. Inner Extended Band Edge Plot (Ch. 476)

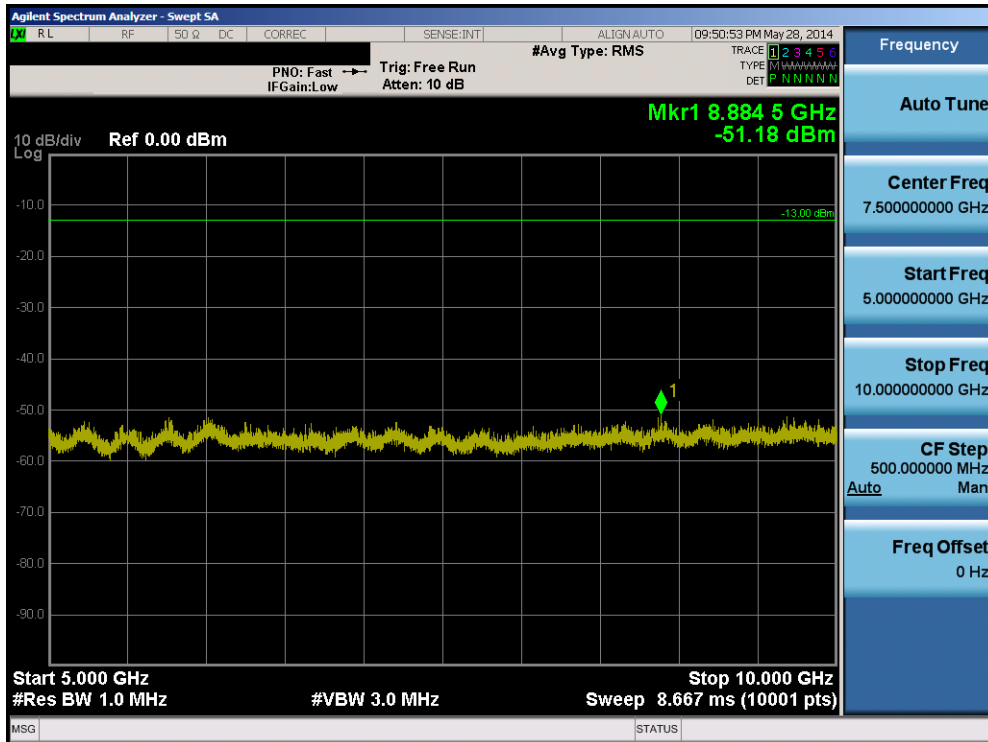


Plot 7-5. Outer Extended Band Edge Plot (Ch. 476)

|                                      |  |   |  |                                 |
|--------------------------------------|--|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   | PCTEST<br>ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014        | EUT Type:<br>Portable Handset                                 |  | Page 23 of 38                   |

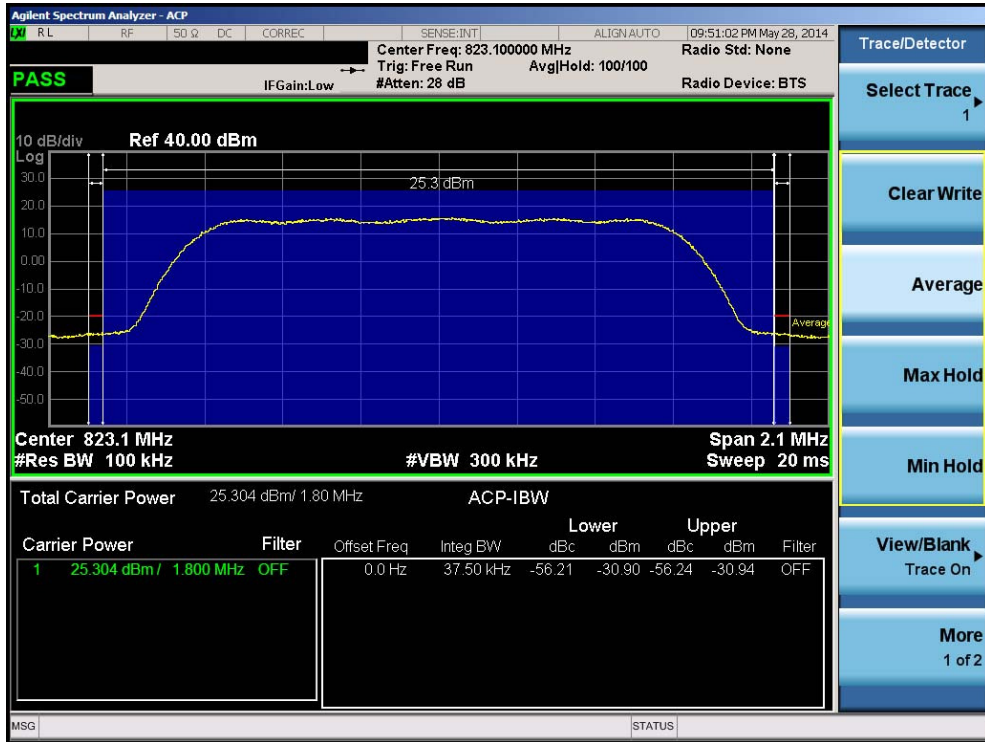


Plot 7-6. Conducted Spurious Plot (Ch. 684)



Plot 7-7. Conducted Spurious Plot (Ch. 684)

|                                      |  |   |  |                                 |
|--------------------------------------|--|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   | PCTEST<br>ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014        | EUT Type:<br>Portable Handset                                 |  | Page 24 of 38                   |



Plot 7-8. Channel Edge Plot (Ch. 684)

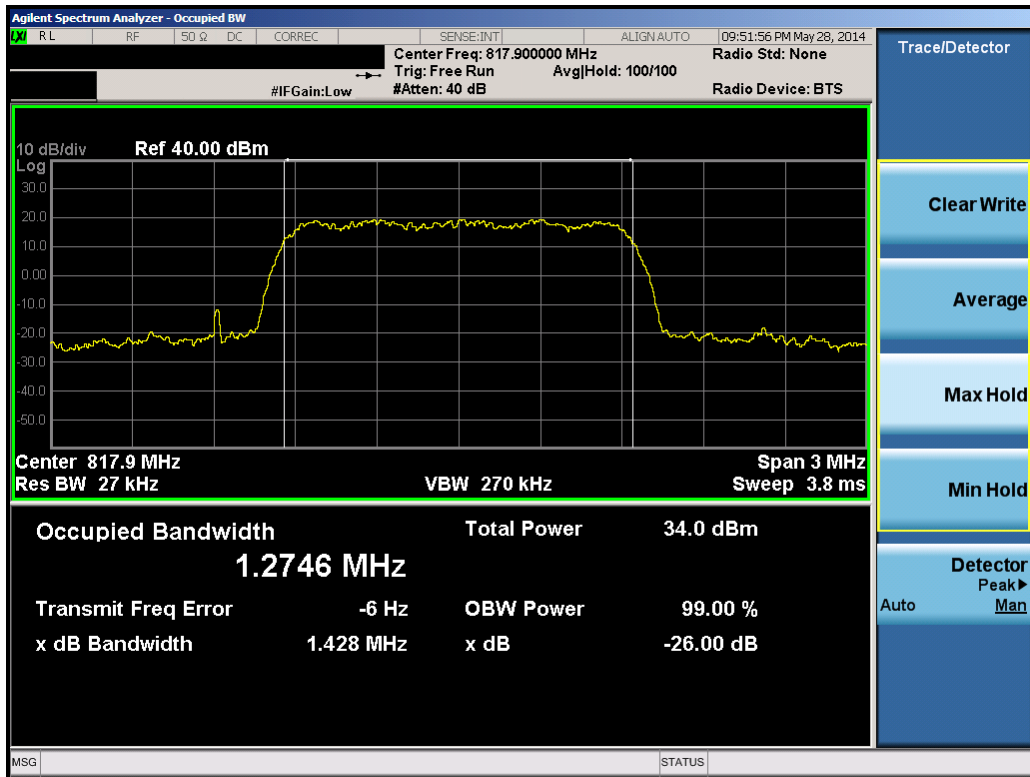


Plot 7-9. Inner Extended Band Edge Plot (Ch. 684)

|                                      |  |   |  |                                 |
|--------------------------------------|--|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   | PCTEST<br>ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014        | EUT Type:<br>Portable Handset                                 |  | Page 25 of 38                   |

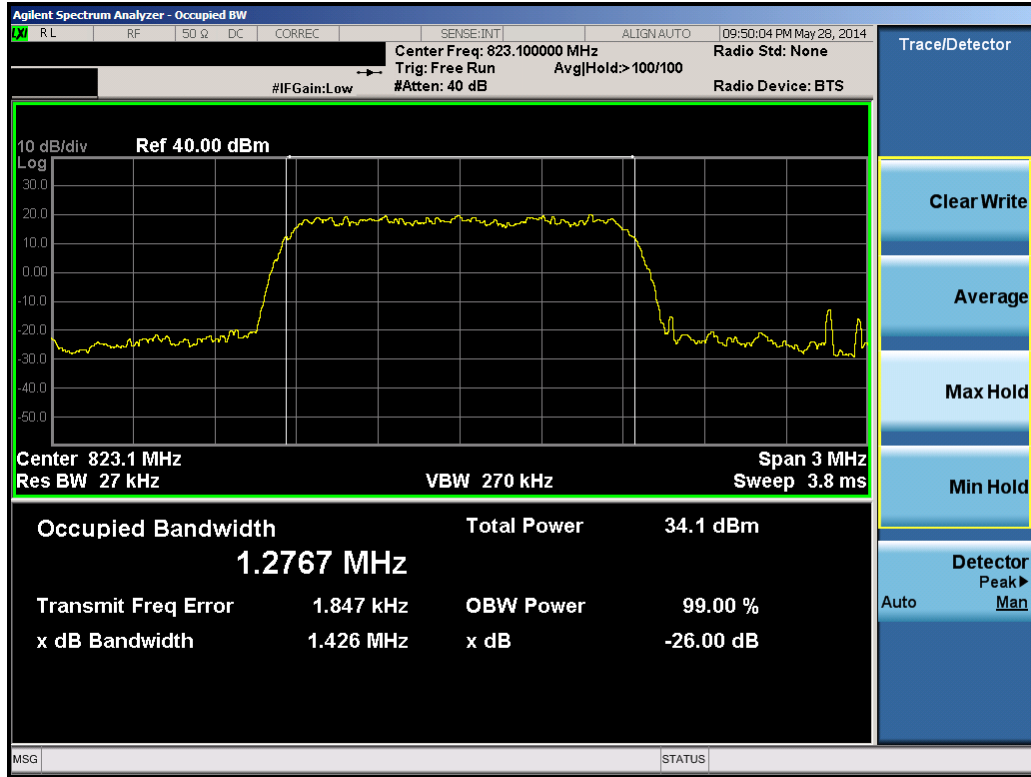


Plot 7-10. Outer Extended Band Edge Plot (Ch. 684)



Plot 7-11. Occupied Bandwidth Plot (Ch. 476)

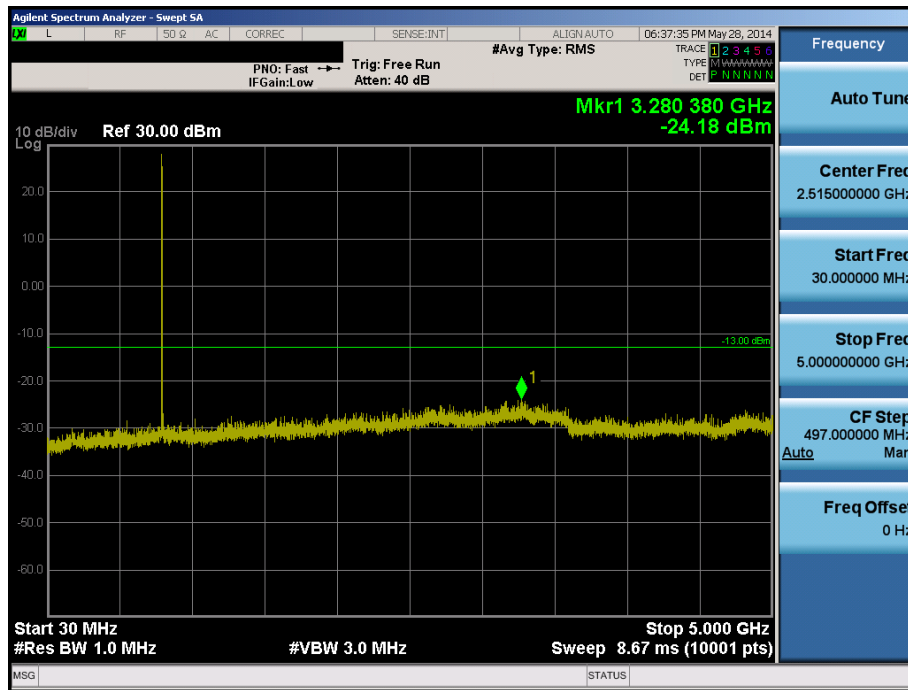
|                                      |   |   |                |                                 |
|--------------------------------------|---|---|----------------|---------------------------------|
| FCC ID: A3LSMG860P                   | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION | <b>SAMSUNG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014               | EUT Type:<br>Portable Handset                                 |                | Page 26 of 38                   |



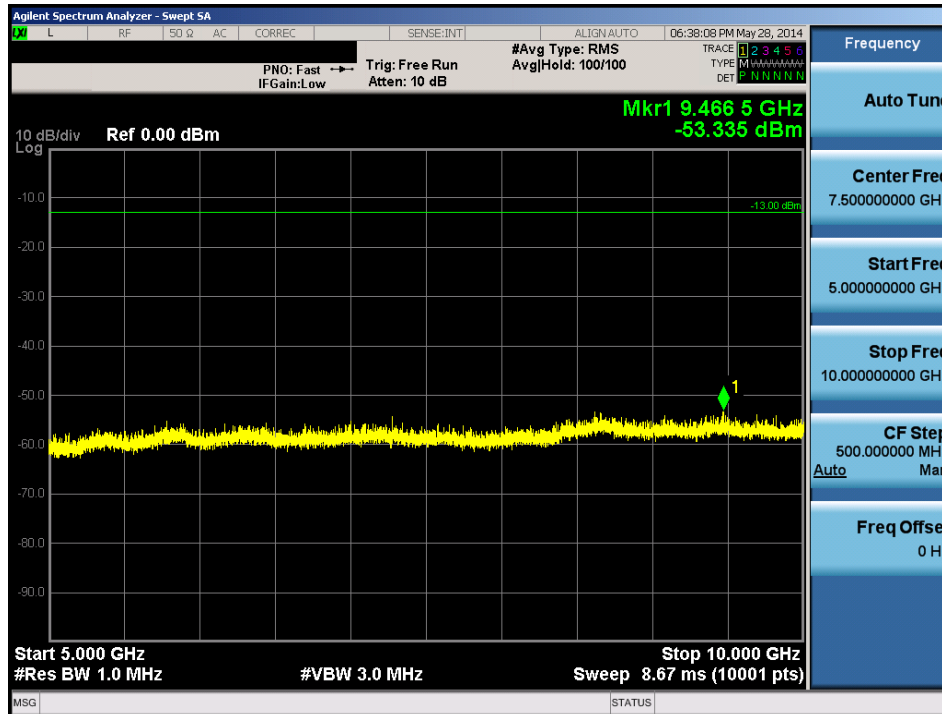
Plot 7-12. Occupied Bandwidth Plot (Ch. 684)

|                                      |                                     |   |  |                                 |
|--------------------------------------|-------------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   | PCTEST ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014     | EUT Type:<br>Portable Handset                                 |  | Page 27 of 38                   |

## 8.0 LTE PLOTS OF EMISSIONS

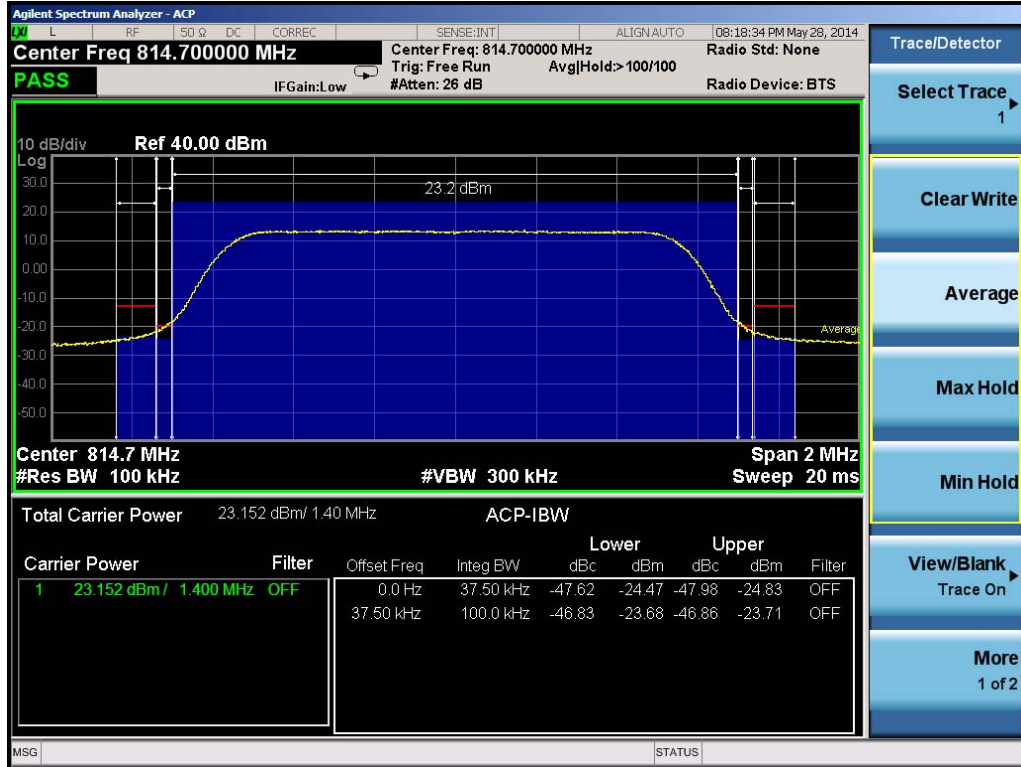


Plot 8-1. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

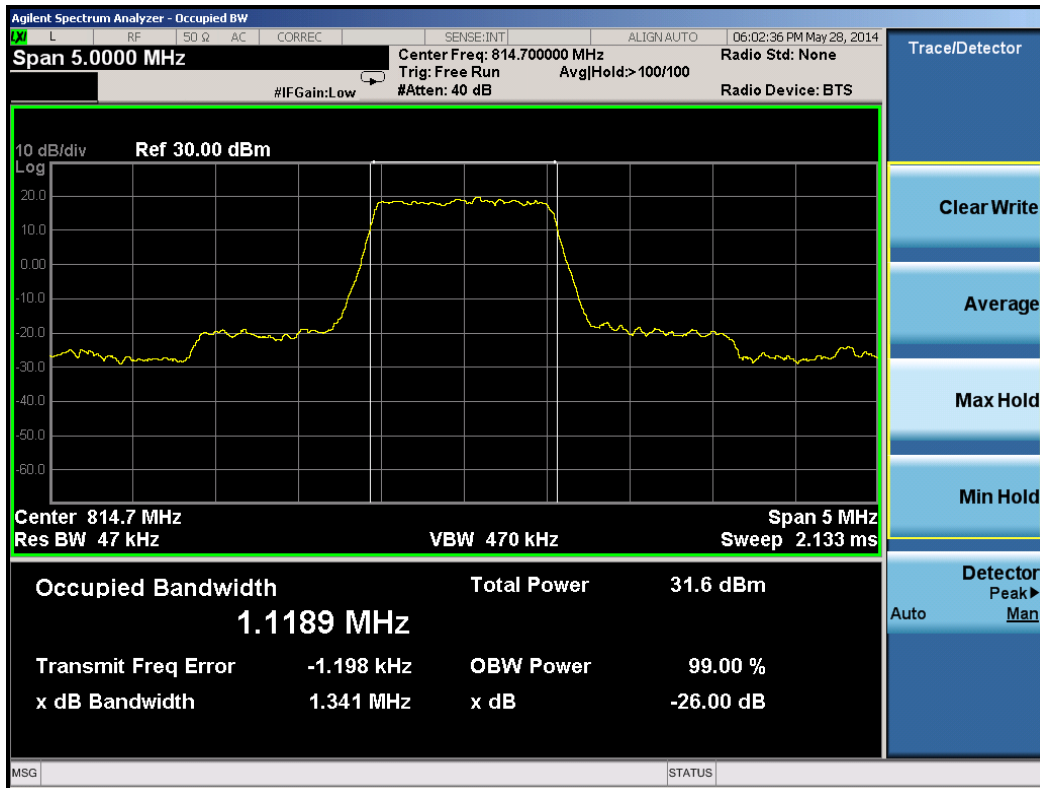


Plot 8-2. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – Low Channel)

|                                      |                                 |   |                                 |
|--------------------------------------|---------------------------------|---|---------------------------------|
| FCC ID: A3LSMG860P                   |                                 | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |                                 |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014 | EUT Type:<br>Portable Handset                                 | Reviewed by:<br>Quality Manager |
|                                      |                                 |   | Page 28 of 38                   |

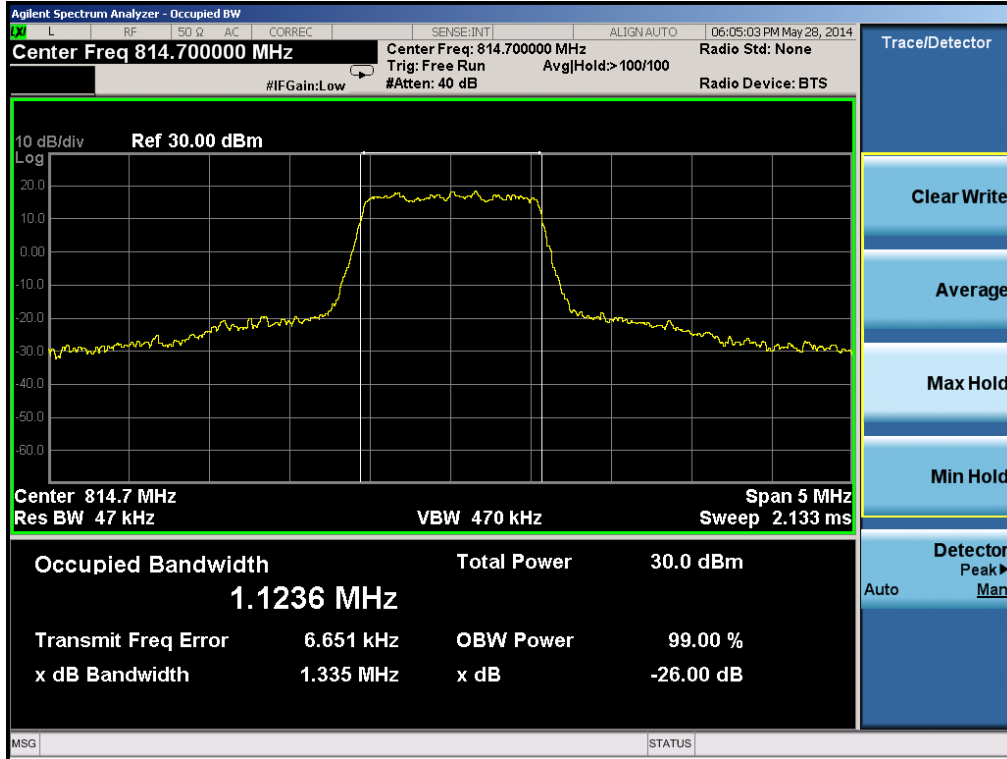


Plot 8-3. Channel Edge Plot (1.4MHz QPSK – RB Size 6– Low Channel)

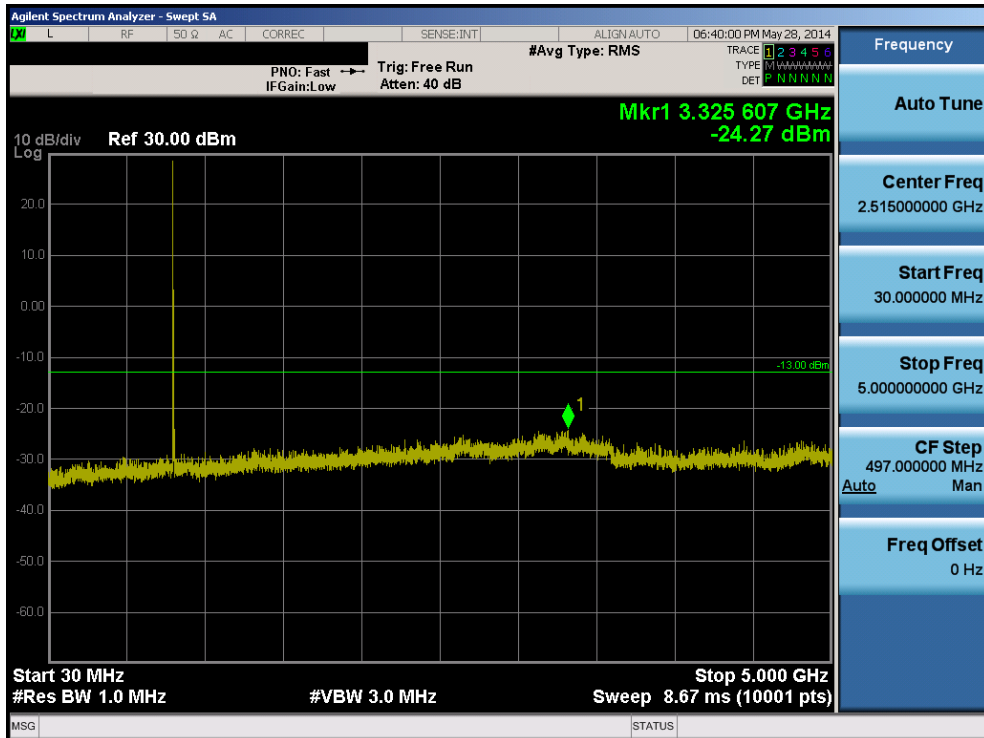


Plot 8-4. Occupied Bandwidth Plot (1.4MHz QPSK – RB Size 6– Low Channel)

|                                      |   |   |                |                                 |
|--------------------------------------|---|---|----------------|---------------------------------|
| FCC ID: A3LSMG860P                   | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION | <b>SAMSUNG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014               | EUT Type:<br>Portable Handset                                 |                | Page 29 of 38                   |

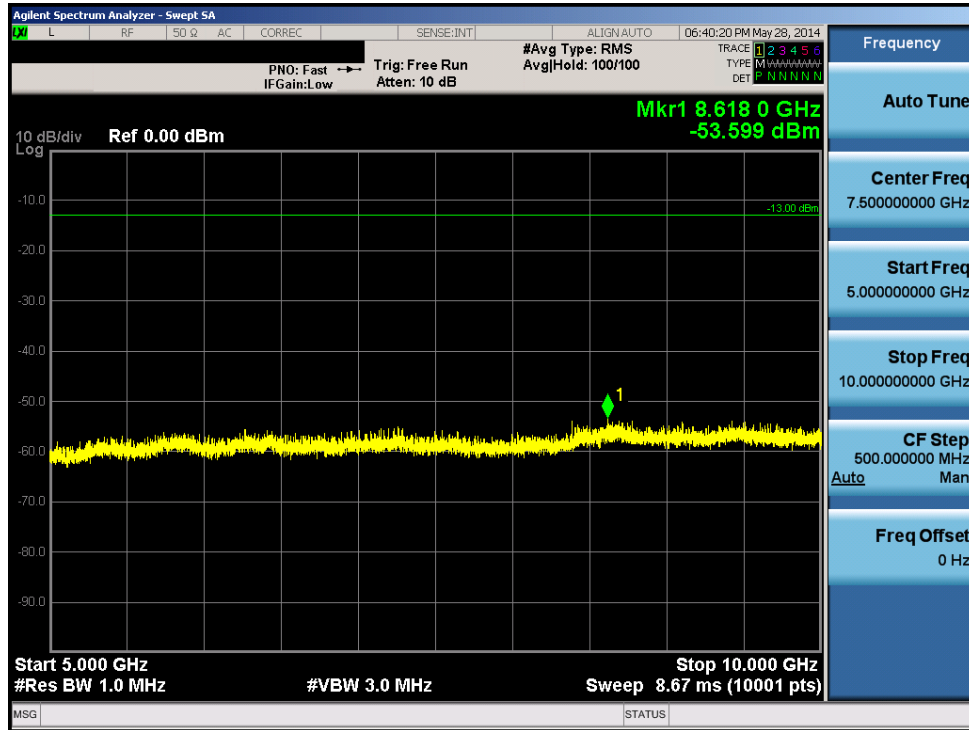


Plot 8-5. Occupied Bandwidth Plot (1.4MHz 16-QAM – RB Size 6– Low Channel)

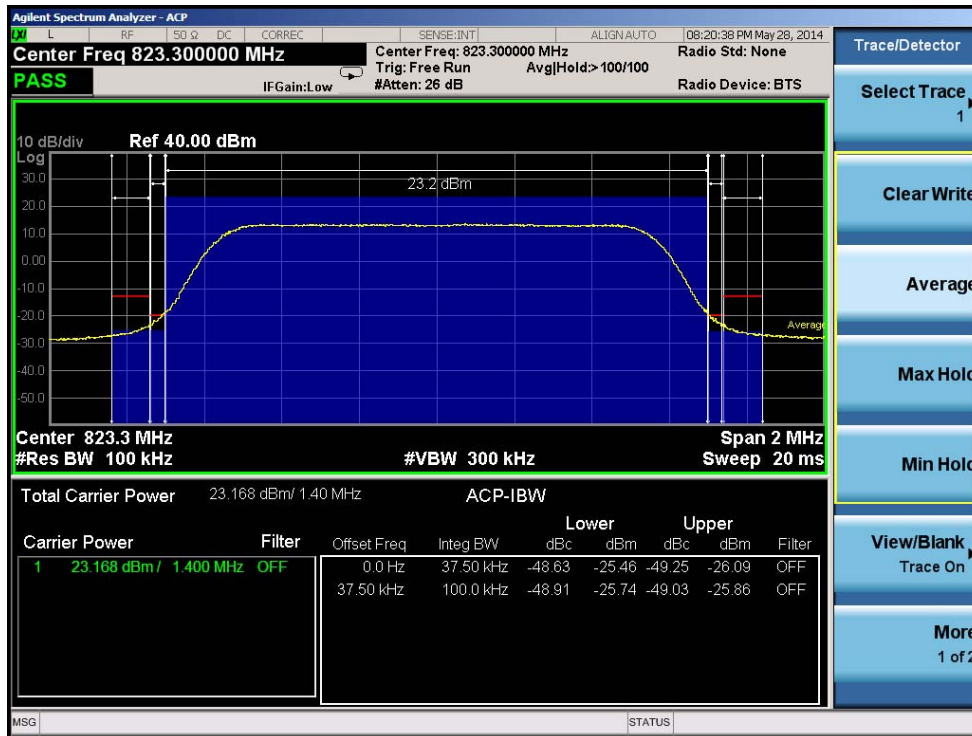


Plot 8-6. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

|                                      |                                 |   |  |                                 |
|--------------------------------------|---------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   |                                 | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014 | EUT Type:<br>Portable Handset                                 |  | Page 30 of 38                   |

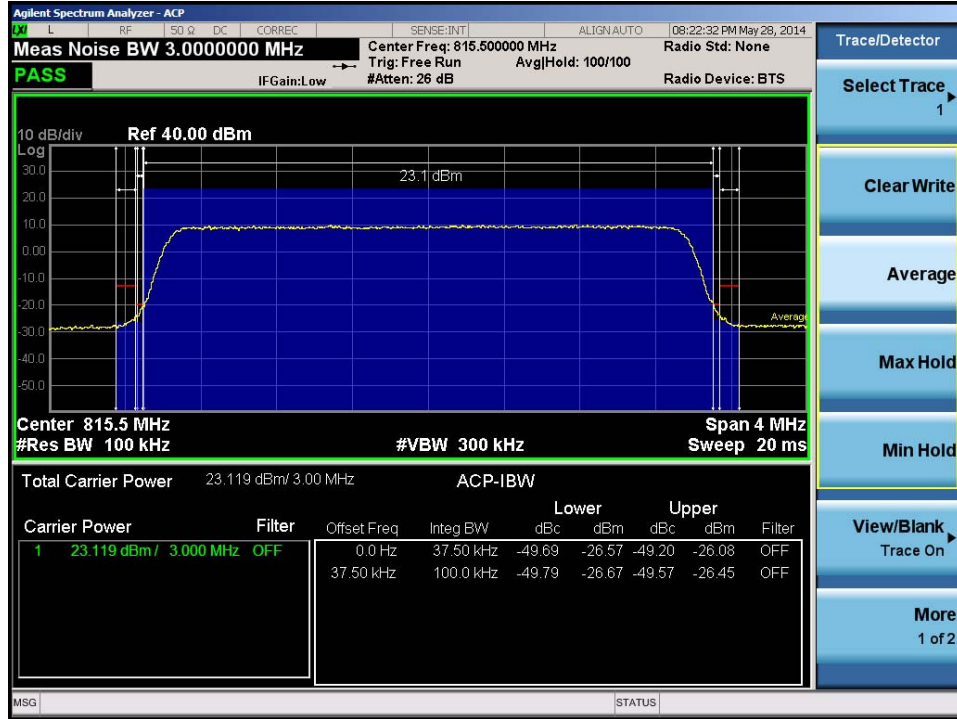


Plot 8-7. Conducted Spurious Plot (1.4MHz QPSK – RB Size 1, RB Offset 0 – High Channel)

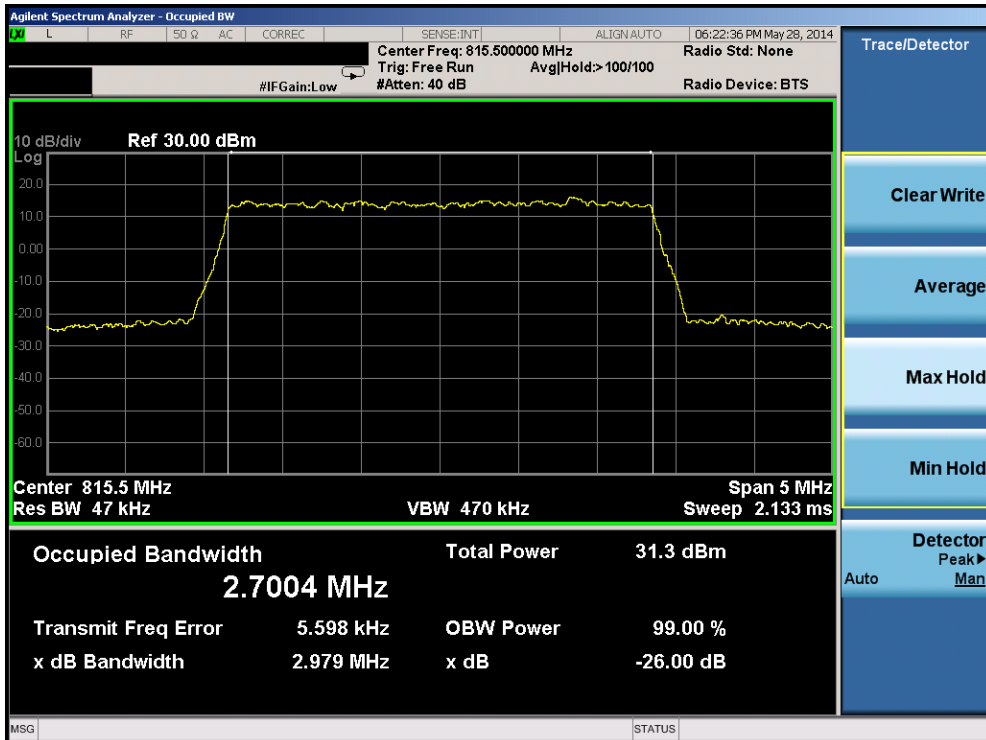


Plot 8-8. Channel Edge Plot (1.4MHz QPSK – RB Size 6 – High Channel)

|                                      |                                 |   |  |                                 |
|--------------------------------------|---------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   |                                 | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014 | EUT Type:<br>Portable Handset                                 |  | Page 31 of 38                   |

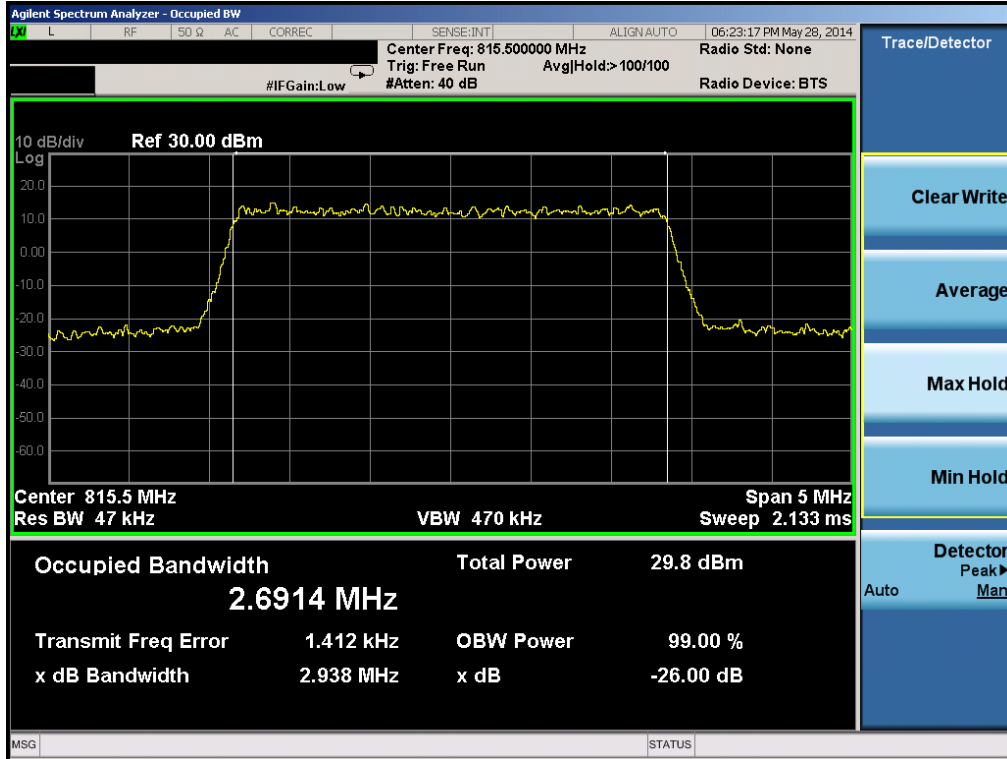


Plot 8-9. Channel Edge Plot (3MHz QPSK – RB Size 15– Low Channel)

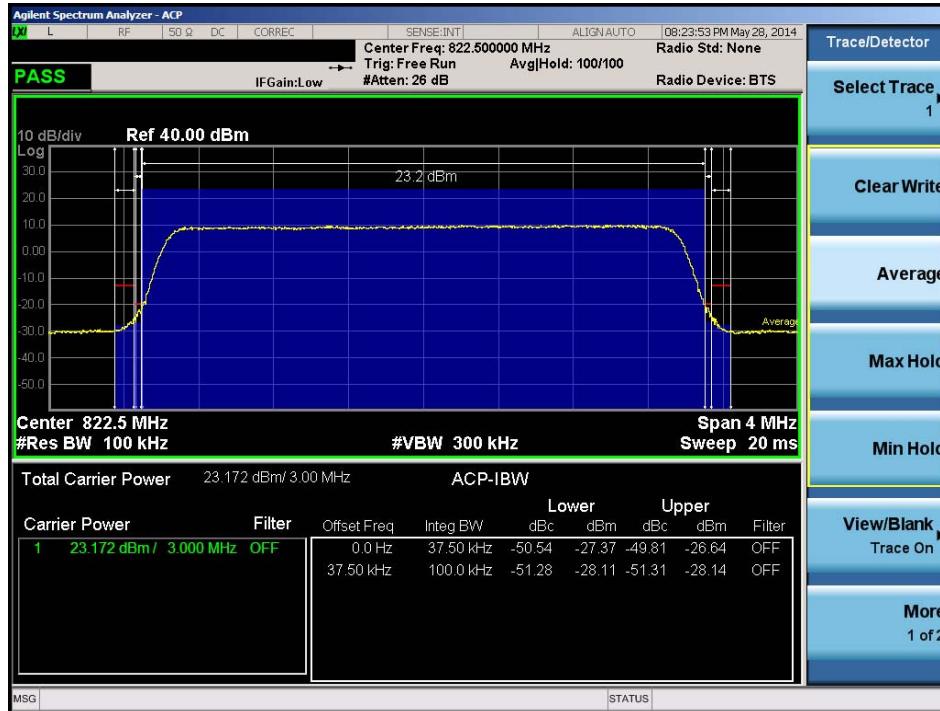


Plot 8-10. Occupied Bandwidth Plot (3MHz QPSK – RB Size 15– Low Channel)

|                                      |                                 |   |  |                                 |
|--------------------------------------|---------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   |                                 | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014 | EUT Type:<br>Portable Handset                                 |  | Page 32 of 38                   |

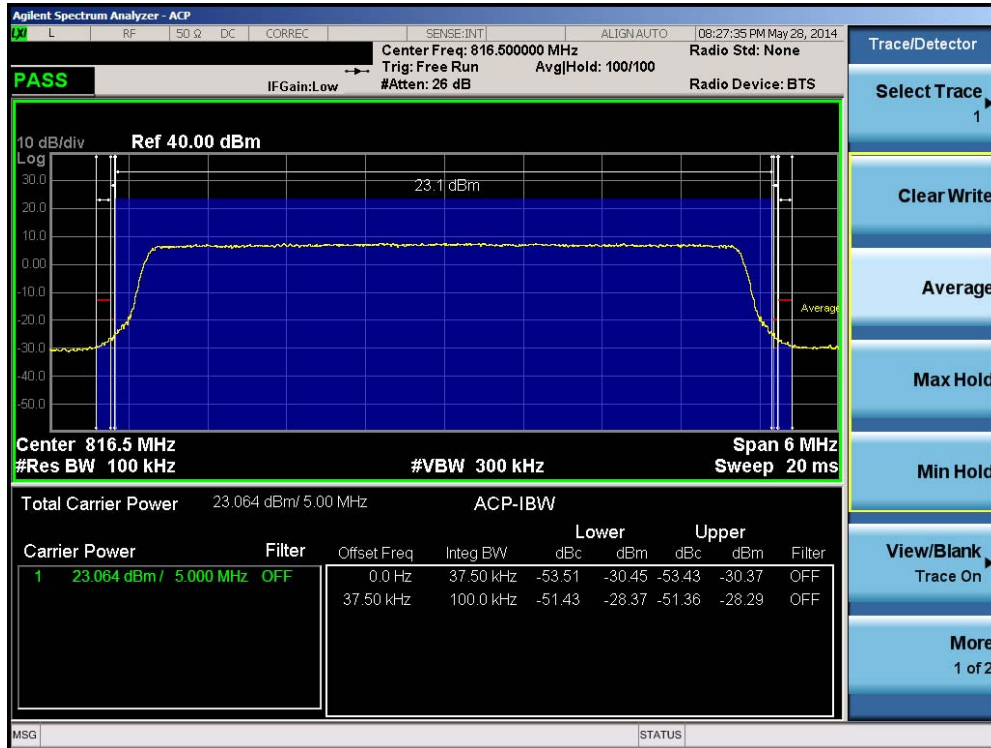


Plot 8-11. Occupied Bandwidth Plot (3MHz 16-QAM – RB Size 15– Low Channel)

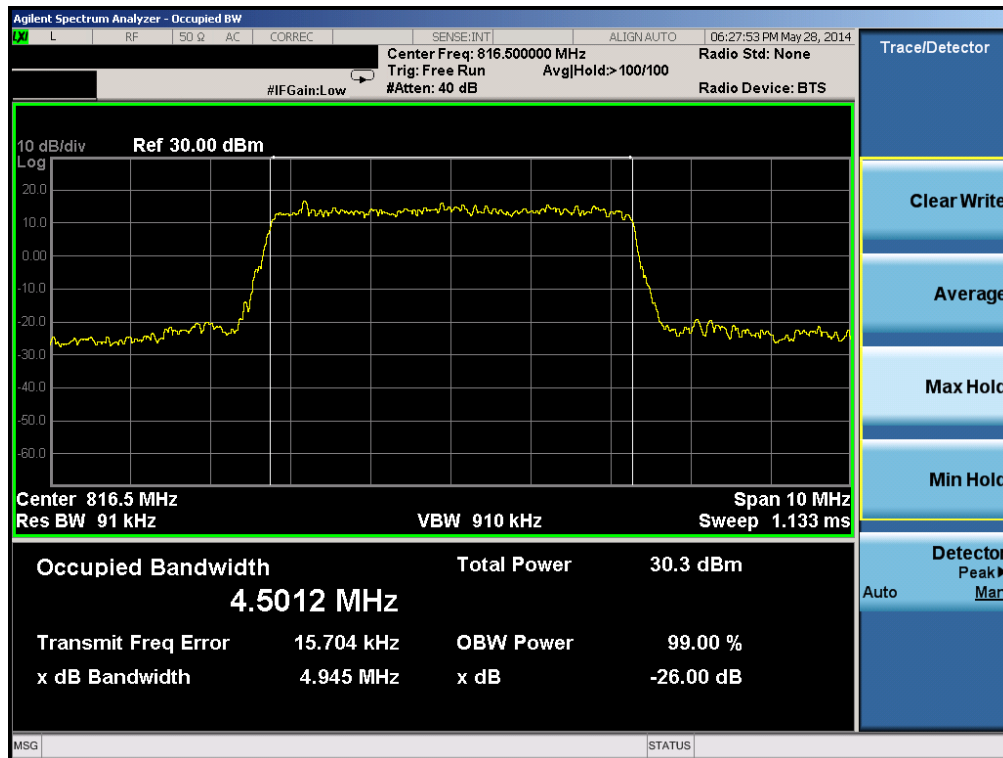


Plot 8-12. Channel Edge Plot (3MHz QPSK – RB Size 15 – High Channel)

|                                      |                                 |   |  |                                 |
|--------------------------------------|---------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   |                                 | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014 | EUT Type:<br>Portable Handset                                 |  | Page 33 of 38                   |

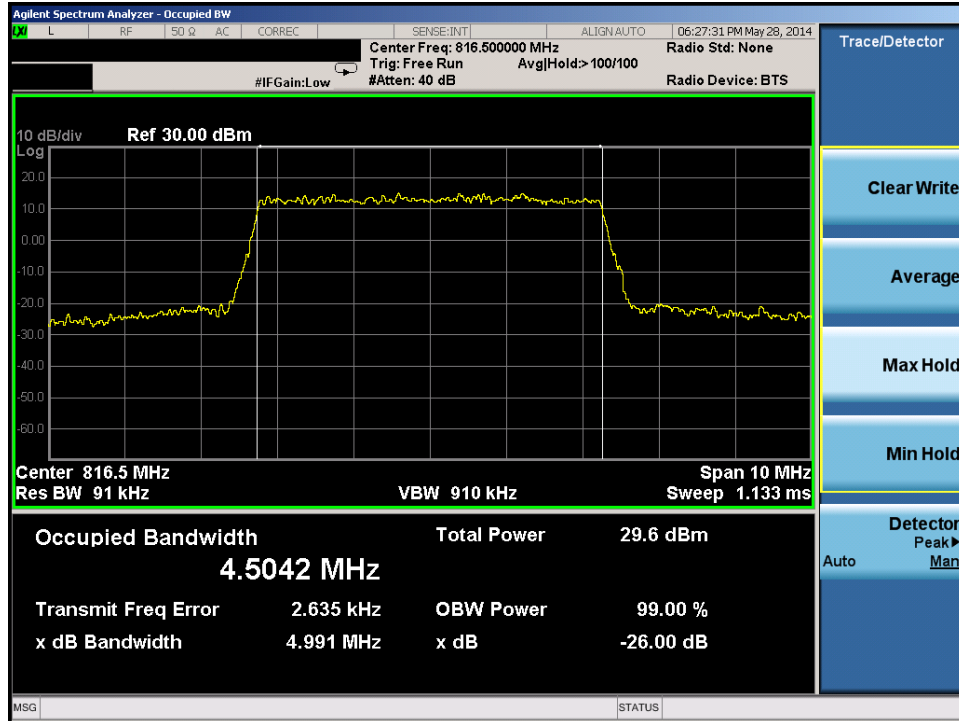


Plot 8-13. Channel Edge Plot (5MHz QPSK – RB Size 25– Low Channel)

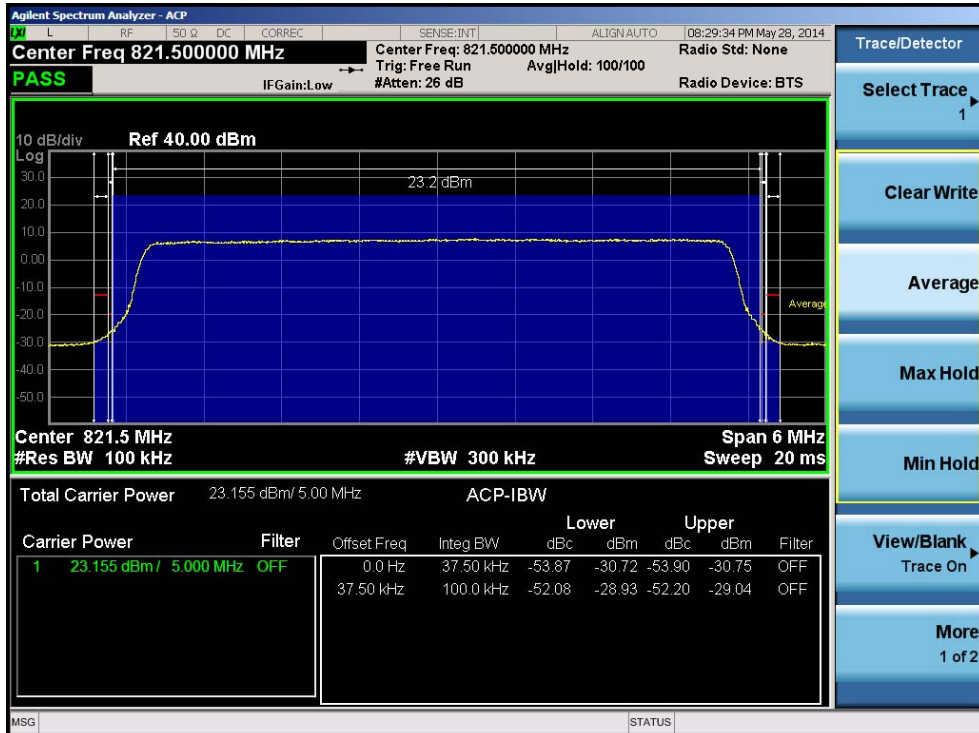


Plot 8-14. Occupied Bandwidth Plot (5MHz QPSK – RB Size 25– Low Channel)

|                                      |                                 |   |  |                                 |
|--------------------------------------|---------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   |                                 | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014 | EUT Type:<br>Portable Handset                                 |  | Page 34 of 38                   |

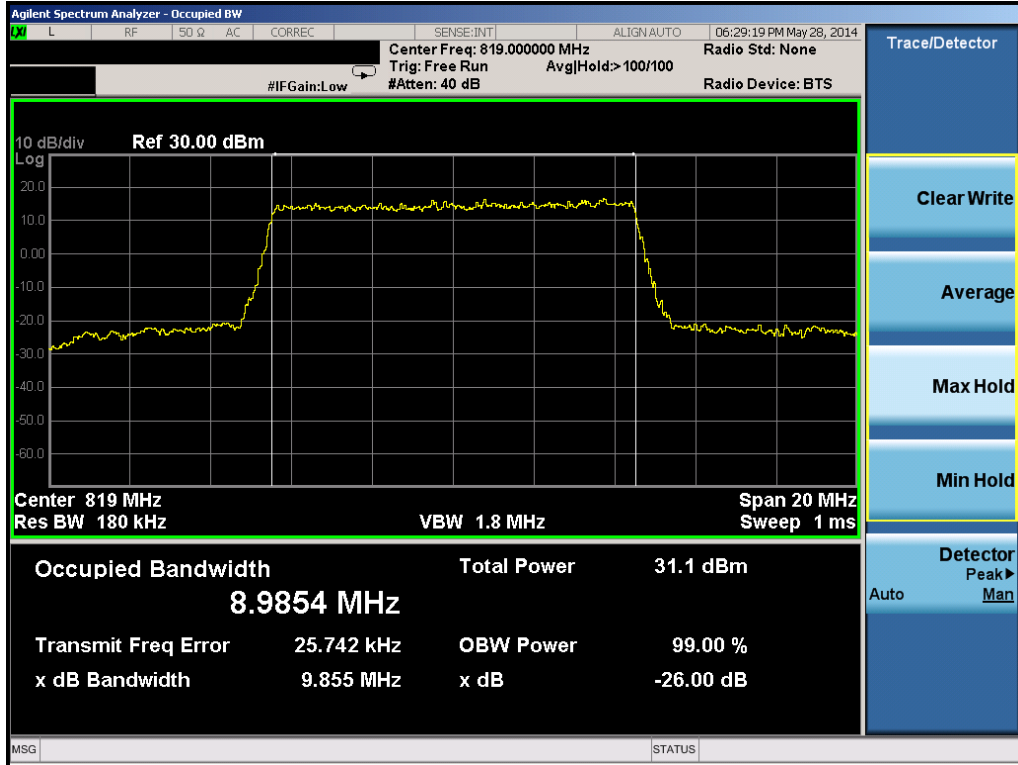


Plot 8-15. Occupied Bandwidth Plot (5MHz 16-QAM – RB Size 25– Low Channel))

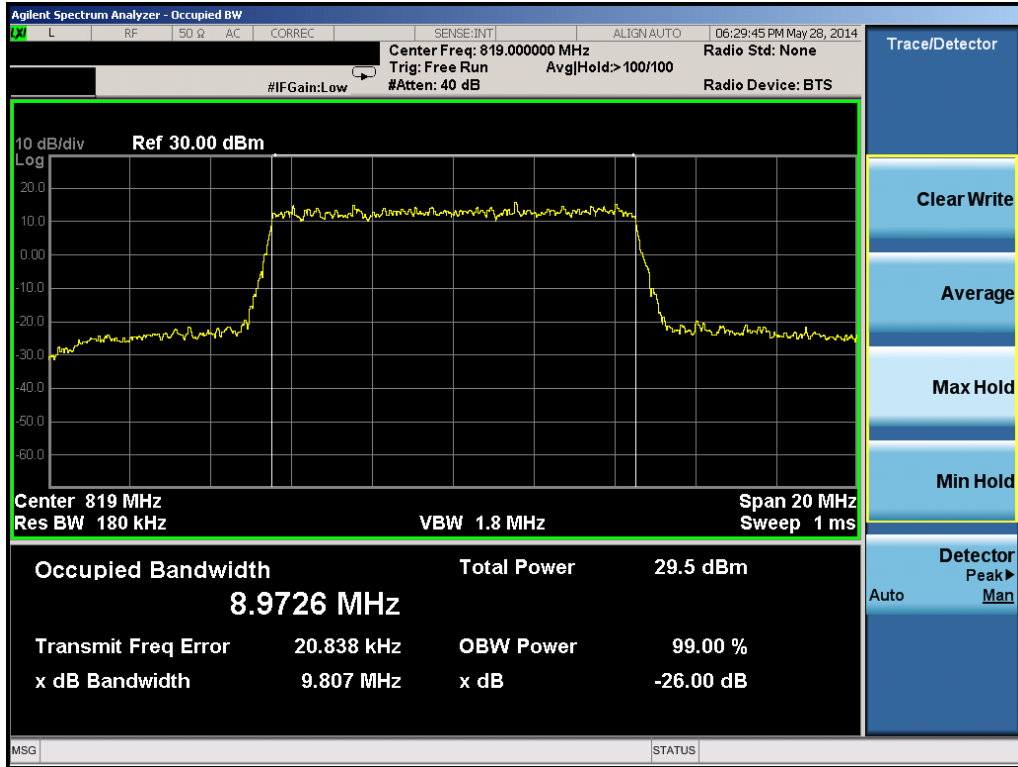


Plot 8-16. Channel Edge Plot (5MHz QPSK – RB Size 25 – High Channel)

|                                      |                                 |   |  |                                 |
|--------------------------------------|---------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   |                                 | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014 | EUT Type:<br>Portable Handset                                 |  | Page 35 of 38                   |

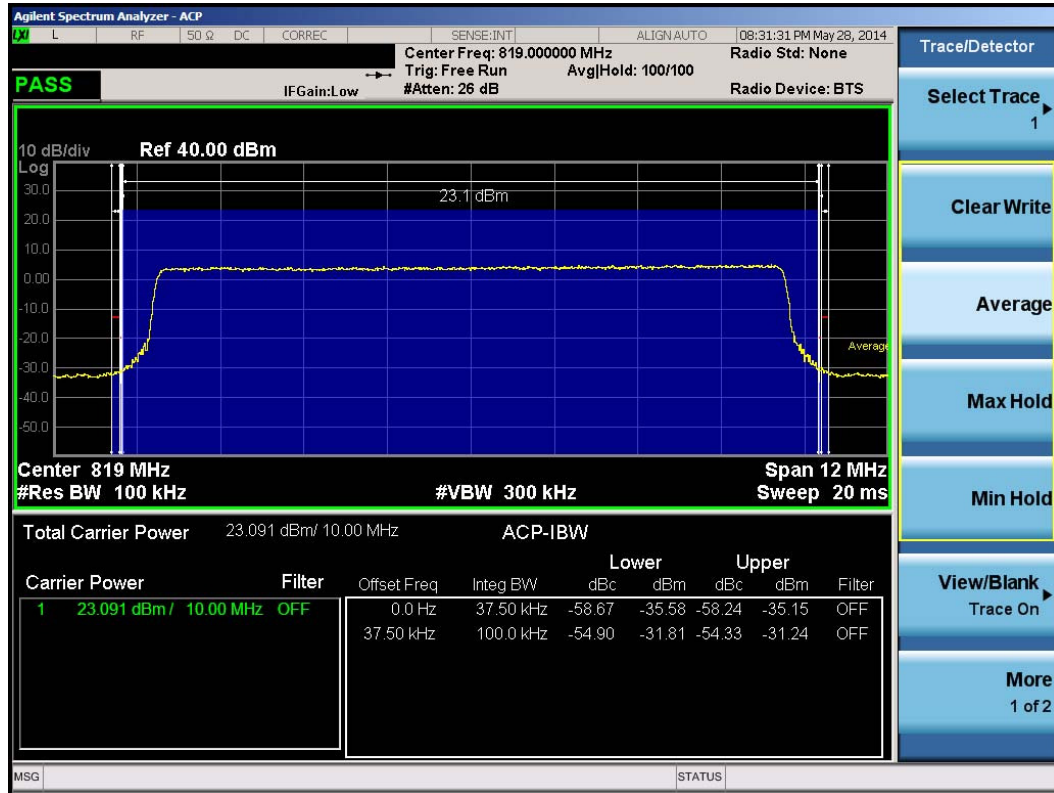


Plot 8-17. Occupied Bandwidth Plot (10MHz QPSK – RB Size 50)



Plot 8-18. Occupied Bandwidth Plot (10MHz 16-QAM – RB Size 50)

|                                      |                                     |   |  |                                 |
|--------------------------------------|-------------------------------------|---|--|---------------------------------|
| FCC ID: A3LSMG860P                   | PCTEST ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION |  | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014     | EUT Type:<br>Portable Handset                                 |  | Page 36 of 38                   |





**Plot 8-19. Channel Edge Plot (10MHz QPSK – RB Size 50)**

|                                      |   |   |                |                                 |
|--------------------------------------|---|---|----------------|---------------------------------|
| FCC ID: A3LSMG860P                   | <b>PCTEST</b><br>ENGINEERING LABORATORY, INC. | Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br>CERTIFICATION | <b>SAMSUNG</b> | Reviewed by:<br>Quality Manager |
| Test Report S/N:<br>0Y1405221059.A3L | Test Dates:<br>5/22 - 6/10/2014               | EUT Type:<br>Portable Handset                                 |                | Page 37 of 38                   |

## 9.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG860P** complies with all the requirements of Parts 90 of the FCC rules.

|   |   |   |   |  |
|---|---|---|---|--|
| <b>FCC ID:</b> A3LSMG860P                   |  | <b>Part 90 CDMA / EvDO / LTE MEASUREMENT REPORT<br/>CERTIFICATION</b> |  | <b>Reviewed by:</b><br>Quality Manager |
| <b>Test Report S/N:</b><br>0Y1405221059.A3L | <b>Test Dates:</b><br>5/22 - 6/10/2014  | <b>EUT Type:</b><br>Portable Handset                                  | Page 38 of 38   |  |