



# PCTEST ENGINEERING LABORATORY, INC.

6660-B Dobbin Road, Columbia, MD 21045 USA

Tel. 410.290.6652 / Fax 410.290.6554

http://www.pctestlab.com



## MEASUREMENT REPORT

### FCC Part 22 & 24 / IC RSS-129/RSS-133

**Applicant Name:**

Elster Solutions, LLC  
208 S. Rogers Lane  
Raleigh, NC 27610  
United States

**Date of Testing:**

April 5, 2011

**Test Site/Location:**

PCTEST Lab., Columbia, MD, USA

**Test Report Serial No.:**

0Y1104130726.QZC

**FCC ID:**

QZCWWIC-CM1

**IC CERTIFICATION NO.:** 4557A-WWICCM1**APPLICANT:**

ELSTER SOLUTIONS, LLC

**Application Type:**

Certification

**FCC Classification:**

PCS Licensed Transmitter (PCB)

**FCC Rule Part(s):**

§2; §22(H), §24(E)

**IC Specification(s):**

RSS-129 Issue 2; RSS-133 Issue 5

**EUT Type:**

A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN

**Model(s):**

EA\_GKMOD\_C, EA\_GKMOD\_CX

**Tx Frequency Range:**

824.70 - 848.31MHz (Cell. CDMA) / 1851.25 - 1908.75MHz (PCS CDMA)

**Max. RF Output Power:**

24.28dBm Conducted (Cell. CDMA), 23.05dBm Conducted (PCS CDMA)

**Emission Designator(s):**

1M28F9W (CDMA) / 1M28F9W (PCS)

**Test Device Serial No.:**


identical prototype [S/N: 45678901, 34567890]

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.

**Grant Conditions:** Power output listed is conducted for Part 22 and Part 24.

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

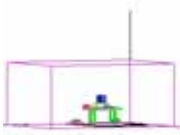


FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN			Page 1 of 37

# TABLE OF CONTENTS

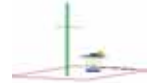
FCC PART 22 & 24 MEASUREMENT REPORT.....	3
1.0 INTRODUCTION .....	4
1.1 SCOPE .....	4
1.2 TESTING FACILITY.....	4
2.0 PRODUCT INFORMATION.....	5
2.1 EQUIPMENT DESCRIPTION .....	5
2.2 EMI SUPPRESSION DEVICE(S)/MODIFICATIONS .....	5
2.3 LABELING REQUIREMENTS.....	5
3.0 DESCRIPTION OF TESTS .....	6
3.1 MEASUREMENT PROCEDURE .....	6
3.2 OCCUPIED BANDWIDTH .....	6
3.3 CELLULAR - BASE FREQUENCY BLOCKS.....	6
3.4 CELLULAR - MOBILE FREQUENCY BLOCKS.....	7
3.5 PCS - BASE FREQUENCY BLOCKS .....	7
3.6 PCS - MOBILE FREQUENCY BLOCKS.....	7
3.7 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL.....	7
3.8 RADIATED POWER AND RADIATED SPURIOUS EMISSIONS .....	8
3.9 PEAK-AVERAGE RATIO.....	8
3.10 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 TRANSMITTER CONDUCTED OUTPUT POWER .....	12
6.3 ERP/EIRP CALCULATIONS.....	13
6.4 CELLULAR CDMA RADIATED MEASUREMENTS.....	14
6.5 PCS CDMA RADIATED MEASUREMENTS.....	17
6.6 CELLULAR CDMA FREQUENCY STABILITY MEASUREMENTS .....	20
6.7 PCS CDMA FREQUENCY STABILITY MEASUREMENTS.....	22
6.8 RECEIVER SPURIOUS EMISSIONS .....	24
7.0 PLOT(S) OF EMISSIONS .....	25
8.0 CONCLUSION.....	37

<b>FCC ID:</b> QZCWWIC-CM1		<b>FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1104130726.QZC	<b>Test Dates:</b> April 5, 2011	<b>EUT Type:</b> A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 2 of 37	



## MEASUREMENT REPORT

### FCC Part 22 & 24

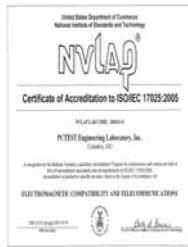


#### §2.1033 General Information



**APPLICANT:** Elster Solutions, LLC  
**APPLICANT ADDRESS:** 208 S. Rogers Lane  
 Raleigh, NC 27610, United States  
**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.  
**TEST SITE ADDRESS:** 6660-B Dobbin Road, Columbia, MD 21045 USA  
**FCC RULE PART(S):** §2; §22(H), §24(E)  
**IC SPECIFICATION(S):** RSS-129 Issue 2; RSS-133 Issue 5  
**BASE MODEL:** EA\_GKMOD\_C, EA\_GKMOD\_CX  
**FCC ID:** QZCWWIC-CM1  
**FCC CLASSIFICATION:** PCS Licensed Transmitter (PCB)  
**EMISSION DESIGNATOR(S):** 1M28F9W (CDMA) / 1M28F9W (PCS)  
**MODE:** CDMA  
**FREQUENCY TOLERANCE:**  $\pm 0.00025\%$  (2.5 ppm)  
**Test Device Serial No.:** 45678901, 34567890 ☐ Production ☒ Pre-Production ☐ Engineering  
**DATE(S) OF TEST:** April 5, 2011  
**TEST REPORT S/N:** 0Y1104130726.QZC

#### 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. 90864) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451A-1).
- 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 facility is an IC registered (2451A-1) test laboratory with the site description on file at Industry Canada.
- 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> QZCWWIC-CM1		<b>FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1104130726.QZC	<b>Test Dates:</b> April 5, 2011	<b>EUT Type:</b> A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 3 of 37

## 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 area, 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 in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. 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 January 28, 2009.

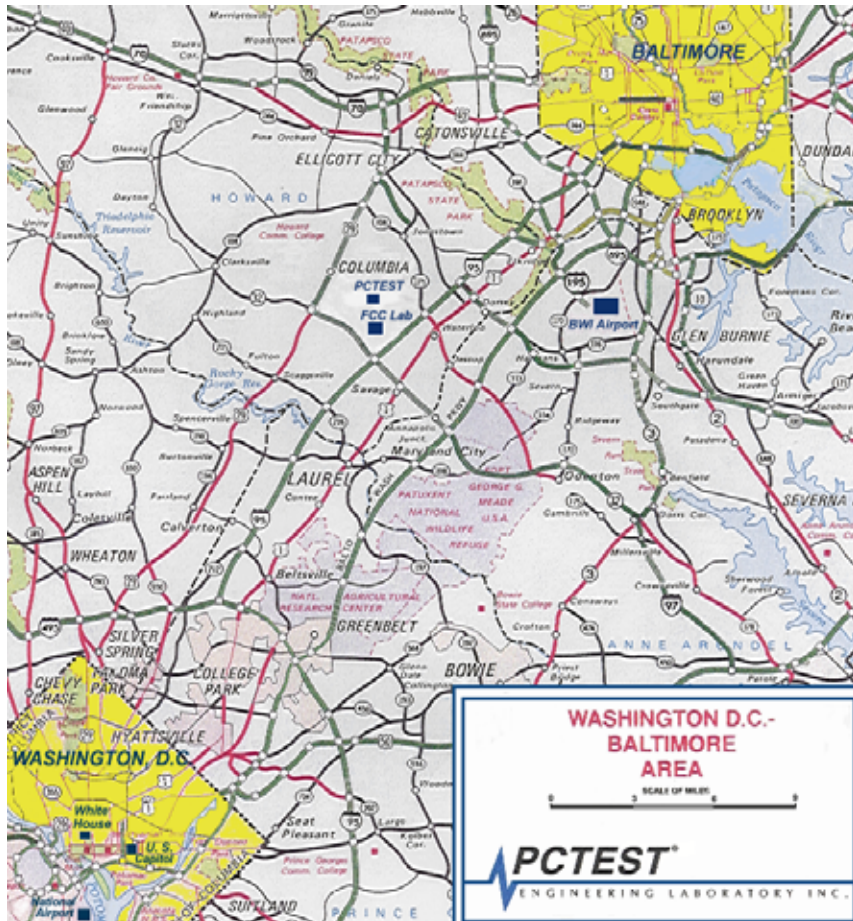


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 4 of 37

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Elster A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN FCC ID: QZCWWIC-CM1**. The EUT consisted of the following component(s):

Trade Name / Base Model	FCC ID	Description
Elster / Model: EA_GKMOD_C, EA_GKMOD_CX	QZCWWIC-CM1	A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN
Laird Technologies / TRA821/18503P	N/A	Antenex Phantom Low Profile Multi-Band 3dB-MEG Gain Antenna (White/Permanent Mount) with Patented Field Diversity

**Table 2-1. EUT Equipment Description**

The EUT is a modular form of the originally approved Ester FCC ID: QZCWWIC-C01. The A3 Alpha Module is being certified with an internal antenna and an external antenna option. Data for both are provided herein. For radiated spurious emissions the external antenna was determined to be worst case and was used during testing.

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

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

### 2.3 Labeling Requirements

#### Per 2.925

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



#### Per 15.19; Docket 95-19

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

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

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

Please see attachment for FCC ID label and label location.

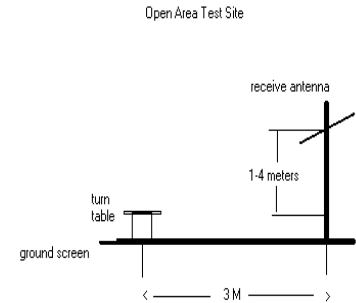
FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 5 of 37	



## 3.0 DESCRIPTION OF TESTS

### 3.1 Measurement Procedure

The radiated spurious measurements were made outdoors at a 3-meter test range (See Figure 3-1). The equipment under test is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This power level was recorded using a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This level is recorded with the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.



**Figure 3-1. Diagram of 3-meter outdoor test range**

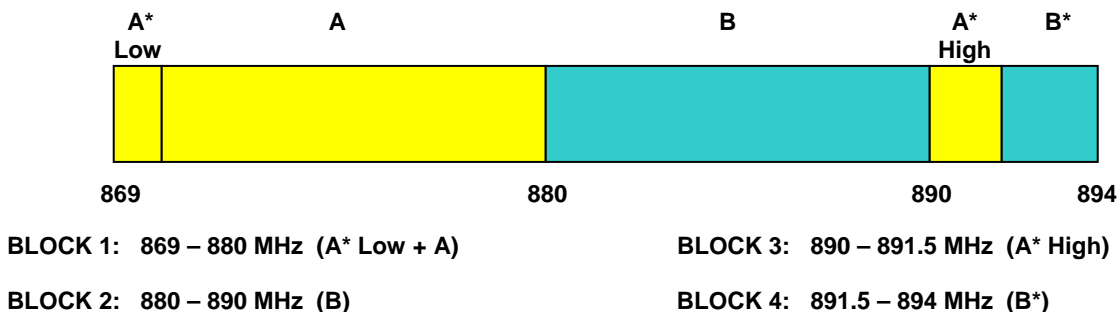
**Deviation from Measurement Procedure.....None**

### 3.2 Occupied Bandwidth

**§2.1049, RSS-Gen (4.6.1)**

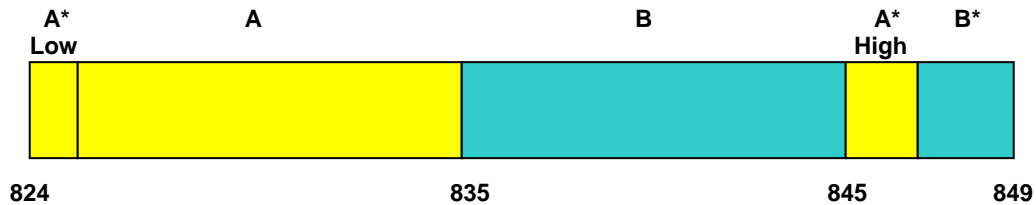
The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual. The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded. The span between the two recorded frequencies is the occupied bandwidth.

### 3.3 Cellular - Base Frequency Blocks



FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>Reviewed by:</b> Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 6 of 37

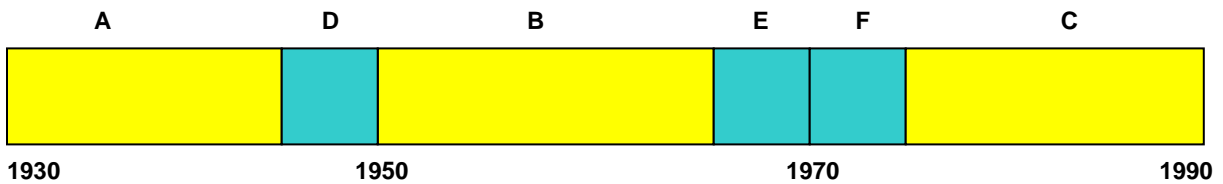
### 3.4 Cellular - Mobile Frequency Blocks



BLOCK 1: 824 – 835 MHz (A\* Low + A)  
BLOCK 2: 835 – 845 MHz (B)

BLOCK 3: 845 – 846.5 MHz (A\* High)  
BLOCK 4: 846.5 – 849 MHz (B\*)

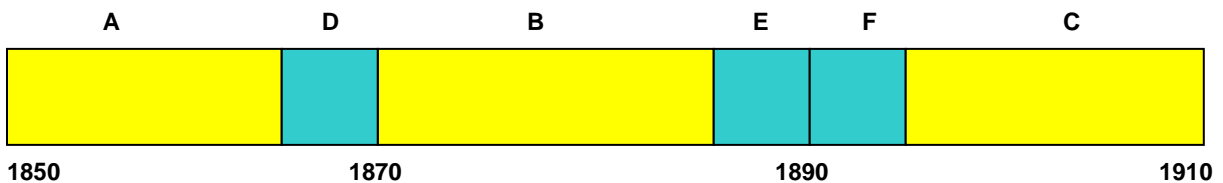
### 3.5 PCS - Base Frequency Blocks



BLOCK 1: 1930 – 1945 MHz (A)  
BLOCK 2: 1945 – 1950 MHz (D)  
BLOCK 3: 1950 – 1965 MHz (B)

BLOCK 4: 1965 – 1970 MHz (E)  
BLOCK 5: 1970 – 1975 MHz (F)  
BLOCK 6: 1975 – 1990 MHz (C)

### 3.6 PCS - Mobile Frequency Blocks





BLOCK 1: 1850 – 1865 MHz (A)  
BLOCK 2: 1865 – 1870 MHz (D)  
BLOCK 3: 1870 – 1885 MHz (B)

BLOCK 4: 1885 – 1890 MHz (E)  
BLOCK 5: 1890 – 1895 MHz (F)  
BLOCK 6: 1895 – 1910 MHz (C)

### 3.7 Spurious and Harmonic Emissions at Antenna Terminal

§2.1051, 22.917(a), 24.238(a)(b); RSS-132 (4.5.1), RSS-133 (6.5.1)

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 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.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 7 of 37

### 3.8 Radiated Power and Radiated Spurious Emissions

§2.1053, 22.913(a)(2), 22.917(a), 24.232(c), 24.238(a), RSS-129 (8.1.1), RSS-133 (6.5.1)

Radiated power and radiated spurious emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. This level is then measured with a broadband average power meter. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive average power meter reading. This spurious level is recorded with the power meter. For readings above 1 GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration. 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.

### 3.9 Peak-Average Ratio

§24.232(d), RSS-133 (6.4)

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

### 3.10 Frequency Stability / Temperature Variation

§2.1055, 22.355, 24.235, RSS-129 (9.2.1), RSS-133 (6.3)



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 – 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  $\pm 0.00025\%$  ( $\pm 2.5$  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 one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A sufficient stabilization period at each temperature shall be used prior to each frequency requirement.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 8 of 37





## 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
-	263-10dB	(DC-18GHz) 10 dB Attenuator	N/A		N/A	N/A
-	No.166	(1000-26500MHz) Microwave RF Cable	N/A		N/A	N/A
-	No.167	(100kHz - 100MHz) RG58 Coax Cable	N/A		N/A	N/A
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	2/8/2011	Annual	2/8/2012	3008A00985
Agilent	85650A	Quasi-Peak Adapter	4/7/2011	Annual	4/7/2012	3303A01872
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/13/2010	Annual	10/13/2011	3613A00315
Agilent	E4407B	ESA Spectrum Analyzer	4/5/2011	Annual	4/5/2012	US39210313
Agilent	E5515C	Wireless Communications Test Set	8/13/2010	Annual	8/13/2011	GB41450275
Agilent	N9020A	MXA Signal Analyzer	9/8/2010	Annual	9/8/2011	US46470561
Agilent	E5515C	Wireless Communications Test Set	2/8/2011	Annual	2/8/2012	GB45360985
Anritsu	ML2495A	Power Meter	10/13/2010	Annual	10/13/2011	941001
Anritsu	MA2411B	Pulse Sensor	N/A	Annual		1027293
Emco	3115	Horn Antenna (1-18GHz)	10/14/2009	Biennial	10/14/2011	9704-5182
Espec	ESX-2CA	Environmental Chamber	2/8/2011	Annual	2/8/2012	17620
MiniCircuits	VHF-1300+	High Pass Filter	N/A		N/A	30716
MiniCircuits	VHF-3100+	High Pass Filter	N/A		N/A	30721
Pasternack	PE2208-6	Bidirectional Coupler	N/A		N/A	N/A
Schwarzbeck	UHA9105	Dipole Antenna (400 - 1GHz) Rx	7/17/2009	Biennial	7/17/2011	9105-2404
Schwarzbeck	UHA9105	Dipole Antenna (400 - 1GHz) Tx	7/17/2009	Biennial	7/17/2011	9105-2403
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	5/14/2009	Biennial	5/14/2011	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	7/17/2009	Biennial	7/17/2011	A051107

**Table 4-1. Test Equipment**

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 9 of 37

## 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 - PCS Band

**Example: Channel 25 PCS Mode 2<sup>nd</sup> Harmonic (3702.50 MHz)**

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 3702.50 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: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN			Page 10 of 37

## 6.0 TEST RESULTS

### 6.1 Summary



Company Name: Elster Solutions, LLC  
 FCC ID: QZCWWIC-CM1  
 FCC Classification: PCS Licensed Transmitter (PCB)  
 Mode(s): CDMA

FCC Part Section(s)	RSS Sections	Test Description	Test Limit	Test Condition	Test Result	Reference
<b>TRANSMITTER MODE (TX)</b>						
2.1049, 22.917(a), 24.238(a)	RSS-Gen (4.6.1) RSS-133 (2.3)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0
2.1051, 22.917(a), 24.238(a)	RSS-129 (8.1.1) RSS-133 (6.5.1)	Band Edge / Conducted Spurious Emissions	< 43 + 10log <sub>10</sub> (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Section 7.0
24.232(d)	RSS-133 (6.4)	Peak-Average Ratio	< 13 dB		PASS	Section 7.0
2.1046	RSS-133 (4.1)	Transmitter Conducted Output Power	N/A		PASS	Section 6.2
22.913(a)(2), 24.238(a)	RSS-129 (9.1) RSS-133 (6.4)	ERP/EIRP Calculations	< 7 Watts (ERP) < 2 Watts (EIRP)		PASS	Section 6.3
2.1053, 22.917(a), 24.238(a)	RSS-129 (8.1.1) RSS-133 (6.5.1)	Undesirable Emissions	< 43 + 10log <sub>10</sub> (P[Watts]) for all out-of-band emissions		PASS	Sections 6.4, 6.5
2.1055, 22.355, 24.235	RSS-129 (9.2.1) RSS-133 (6.3)	Frequency Stability	< 2.5 ppm		PASS	Sections 6.6, 6.7
<b>RECEIVER MODE (RX) / DIGITAL EMISSIONS</b>						
N/A	RSS-129 (10(a,d)) RSS-133 (6.6)	Receiver Spurious Emissions Limits	< RSS-Gen limits [Section 6; Table 1]	RADIATED	PASS	Section 6.8

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

#### Note:

The conducted plots shown in this section, dated January 20, 2010, are of the original certification of the Elster module under FCC ID: QZCWWIC-C01. These plots are still applicable to this application with the proposed FCC ID of QZCWWIC-CM1 since there have been no changes to the originally certified device.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 11 of 37

## 6.2 Transmitter Conducted Output Power

### §2.1046



A base station simulator (Agilent Model: E5515C) was used to establish communication with the **Elster A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN FCC ID: QZCWWIC-CM1**. The base station simulator parameters were set to produce the maximum power from the EUT. 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. The CDMA conducted powers shown below are the same conducted powers reported in the original certification of this device granted under FCC ID: QZCWWIC-C01.

Band	Channel	SO55 [dBm]	SO55 [dBm]	TDSO SO32 [dBm]
	F-RC	RC1	RC3	RC3
	Vocoder Rate	Full	Full	N/A
Cellular	1013	24.22	24.08	23.82
	384	24.28	24.23	24.11
	777	23.85	23.78	23.65
PCS	25	22.96	22.93	22.78
	600	23.04	23.05	22.89
	1175	22.54	22.63	22.41

Table 6-2. Transmitter Conducted Output Power Measurements



Figure 6-1. Conducted Power Test Setup Diagram

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 12 of 37	

### 6.3 ERP/EIRP Calculations

The following tables include calculations of the ERP and EIRP for the CDMA module using both the internal antenna and the external antenna option.

Frequency [MHz]	Mode	Measured Conducted Power [dBm]	Antenna	Antenna Gain [dBi]	ERP [dBm]	ERP Limit [dBm]
824.70	CDMA850	24.22	Internal	5.00	27.07	38.45
836.52	CDMA850	24.28	Internal	5.00	27.13	38.45
848.31	CDMA850	23.85	Internal	5.00	26.70	38.45

**Table 6-3. Calculated ERP with Internal Antenna (Cellular Band)**

Frequency [MHz]	Mode	Measured Conducted Power [dBm]	Antenna	Antenna Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]
1851.25	CDMA1900	22.96	Internal	5.00	27.96	33.01
1880.00	CDMA1900	23.05	Internal	5.00	28.05	33.01
1908.75	CDMA1900	22.63	Internal	5.00	27.63	33.01



**Table 6-4. Calculated ERP with Internal Antenna (PCS Band)**

Frequency [MHz]	Mode	Measured Conducted Power [dBm]	Antenna	Antenna Gain [dBi]	ERP [dBm]	ERP Limit [dBm]
824.70	CDMA850	24.22	External	3.00	25.07	38.45
836.52	CDMA850	24.28	External	3.00	25.13	38.45
848.31	CDMA850	23.85	External	3.00	24.70	38.45

**Table 6-5. Calculated ERP with External Antenna (Cellular Band)**

Frequency [MHz]	Mode	Measured Conducted Power [dBm]	Antenna	Antenna Gain [dBi]	EIRP [dBm]	EIRP Limit [dBm]
1851.25	CDMA1900	22.96	External	3.00	25.96	33.01
1880.00	CDMA1900	23.05	External	3.00	26.05	33.01
1908.75	CDMA1900	22.63	External	3.00	25.63	33.01

**Table 6-6. Calculated ERP with External Antenna (PCS Band)**

<b>FCC ID:</b> QZCWWIC-CM1		<b>FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1104130726.QZC	<b>Test Dates:</b> April 5, 2011	<b>EUT Type:</b> A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 13 of 37



## 6.4 Cellular CDMA Radiated Measurements

§2.1053, 22.917(a), RSS-129 (8.1.1)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 824.70 MHz  
 CHANNEL: 1013  
 MODULATION SIGNAL: CDMA  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1649.40	-62.87	6.42	-56.46	V	-43.5
2474.10	-54.05	6.42	-47.64	V	-34.6
3298.80	-66.75	6.74	-60.01	V	-47.0
4123.50	-68.69	7.55	-61.14	V	-48.1
4948.20	-90.96	7.57	-83.40	V	-70.4



Table 6-7. Radiated Spurious Data (Cellular CDMA Mode – Ch. 1013)

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

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. This unit was tested while powered by an AC power source. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the external antenna mounted vertically on top of a 12" x 12" copper ground plane. The data reported in the table above was measured in this test setup.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 14 of 37

## Cellular CDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a), RSS-129 (8.1.1)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 836.52 MHz  
 CHANNEL: 384  
 MODULATION SIGNAL: CDMA  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1673.04	-63.65	6.43	-57.23	V	-44.2
2509.56	-54.30	6.77	-47.54	V	-34.5
3346.08	-65.54	7.55	-57.99	V	-45.0
4182.60	-66.18	7.81	-58.37	V	-45.4
5019.12	-90.19	9.02	-81.17	V	-68.2



Table 6-8. Radiated Spurious Data (Cellular CDMA Mode – Ch. 384)

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

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. This unit was tested while powered by an AC power source. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the external antenna mounted vertically on top of a 12" x 12" copper ground plane. The data reported in the table above was measured in this test setup.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 15 of 37

## Cellular CDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a), RSS-129 (8.1.1)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 848.31 MHz  
 CHANNEL: 777  
 MODULATION SIGNAL: CDMA  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
1696.62	-62.23	6.44	-55.79	V	-42.8
2544.93	-51.46	6.83	-44.63	V	-31.6
3393.24	-65.20	7.55	-57.65	V	-44.7
4241.55	-66.11	8.05	-58.06	V	-45.1
5089.86	-89.70	8.92	-80.78	V	-67.8



Table 6-9. Radiated Spurious Data (Cellular CDMA Mode – Ch. 777)

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

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. This unit was tested while powered by an AC power source. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the external antenna mounted vertically on top of a 12" x 12" copper ground plane. The data reported in the table above was measured in this test setup.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 16 of 37

## 6.5 PCS CDMA Radiated Measurements

§2.1053, 24.238(a), RSS-133 (6.5.1)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1851.25 MHz  
 CHANNEL: 25  
 MODULATION SIGNAL: CDMA  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
3702.50	-46.72	9.49	-37.23	V	-24.2
5553.75	-43.58	10.40	-33.18	V	-20.2
7405.00	-42.94	11.08	-31.86	V	-18.9
9256.25	-83.21	12.26	-70.95	V	-57.9
11107.50	-80.52	13.19	-67.33	V	-54.3



**Table 6-10. Radiated Spurious Data (PCS CDMA Mode – Ch. 25)**

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

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. This unit was tested while powered by an AC power source. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the external antenna mounted vertically on top of a 12" x 12" copper ground plane. The data reported in the table above was measured in this test setup.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 17 of 37

## PCS CDMA Radiated Measurements (Cont'd)

§2.1053, 24.238(a), RSS-133 (6.5.1)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1880.00 MHz  
 CHANNEL: 600  
 MODULATION SIGNAL: CDMA  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
3760.00	-47.65	9.43	-38.21	V	-25.2
5640.00	-50.96	10.24	-40.72	V	-27.7
7520.00	-51.73	11.12	-40.62	V	-27.6
9400.00	-83.37	12.32	-71.04	V	-58.0
11280.00	-79.87	13.17	-66.70	V	-53.7



Table 6-11. Radiated Spurious Data (PCS CDMA Mode – Ch. 600)

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

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. This unit was tested while powered by an AC power source. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the external antenna mounted vertically on top of a 12" x 12" copper ground plane. The data reported in the table above was measured in this test setup.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 18 of 37



## PCS CDMA Radiated Measurements (Cont'd)

§2.1053, 24.238(a), RSS-133 (6.5.1)

### Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY: 1908.75 MHz  
 CHANNEL: 1175  
 MODULATION SIGNAL: CDMA  
 DISTANCE: 3 meters  
 LIMIT: -13 dBm

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	SPURIOUS EMISSION LEVEL (dBm)	POL (H/V)	MARGIN (dB)
3817.50	-56.40	9.37	-47.02	V	-34.0
5726.25	-45.71	10.08	-35.63	V	-22.6
7635.00	-46.87	11.21	-35.66	V	-22.7
9543.75	-83.39	12.38	-71.02	V	-58.0
11452.50	-79.23	13.15	-66.08	V	-53.1



Table 6-12. Radiated Spurious Data (PCS CDMA Mode – Ch. 1175)

#### NOTES:

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. Final power measurements are made with a broadband average power meter. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same spectrum analyzer reading. This spurious level is recorded using the power meter. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

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. This unit was tested while powered by an AC power source. The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case test configuration was found with the external antenna mounted vertically on top of a 12" x 12" copper ground plane. The data reported in the table above was measured in this test setup.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 19 of 37

## 6.6 Cellular CDMA Frequency Stability Measurements

§2.1055, 22.355, RSS-129 (9.2.1)

OPERATING FREQUENCY: 836,520,000 Hz



CHANNEL: 384

REFERENCE VOLTAGE: 120 VAC

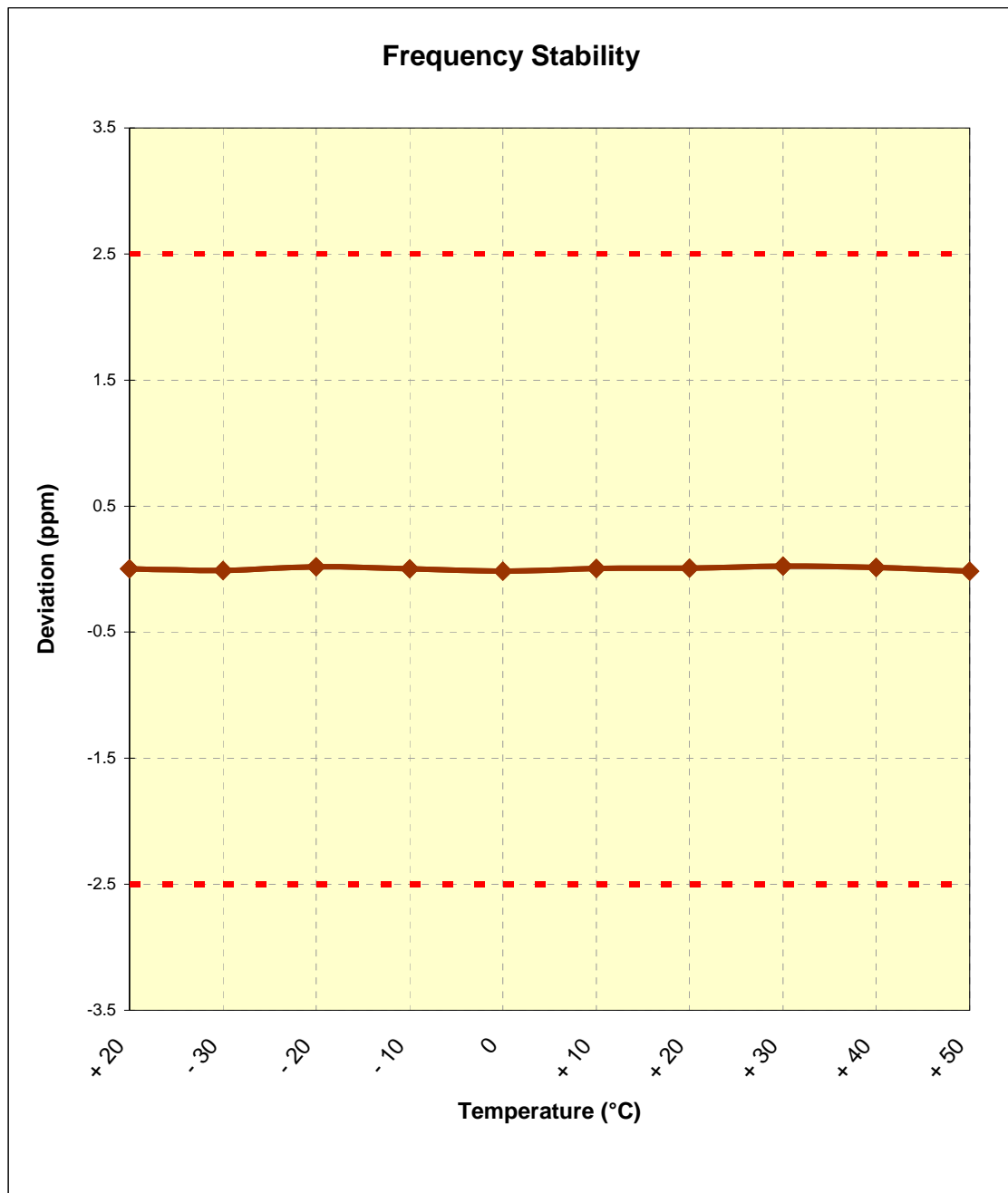
DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	120.00	+ 20 (Ref)	836,520,002	2	0.000000
100 %		- 30	836,519,991	-9	-0.000001
100 %		- 20	836,520,015	15	0.000002
100 %		- 10	836,520,003	3	0.000000
100 %		0	836,519,987	-13	-0.000002
100 %		+ 10	836,520,004	4	0.000000
100 %		+ 20	836,520,006	6	0.000001
100 %		+ 30	836,520,020	20	0.000002
100 %		+ 40	836,520,012	12	0.000001
100 %		+ 50	836,519,986	-14	-0.000002
115 %	138.00	+ 20	836,519,990	-10	-0.000001
85 %	102.00	+ 20	836,520,005	5	0.000001

**Table 6-13. Frequency Stability Data (Cellular CDMA Mode – Ch. 384)**

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 20 of 37	

**Cellular CDMA Frequency Stability Measurements (Cont'd)**  
**§2.1055, 22.355, RSS-129 (9.2.1)**



**Figure 6-2. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)**

FCC ID: QZCWWIC-CM1			FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 21 of 37

## 6.7 PCS CDMA Frequency Stability Measurements

### §2.1055, 24.235, RSS-133 (6.3)

OPERATING FREQUENCY: 1,880,000,000 Hz



CHANNEL: 600

REFERENCE VOLTAGE: 120 VAC

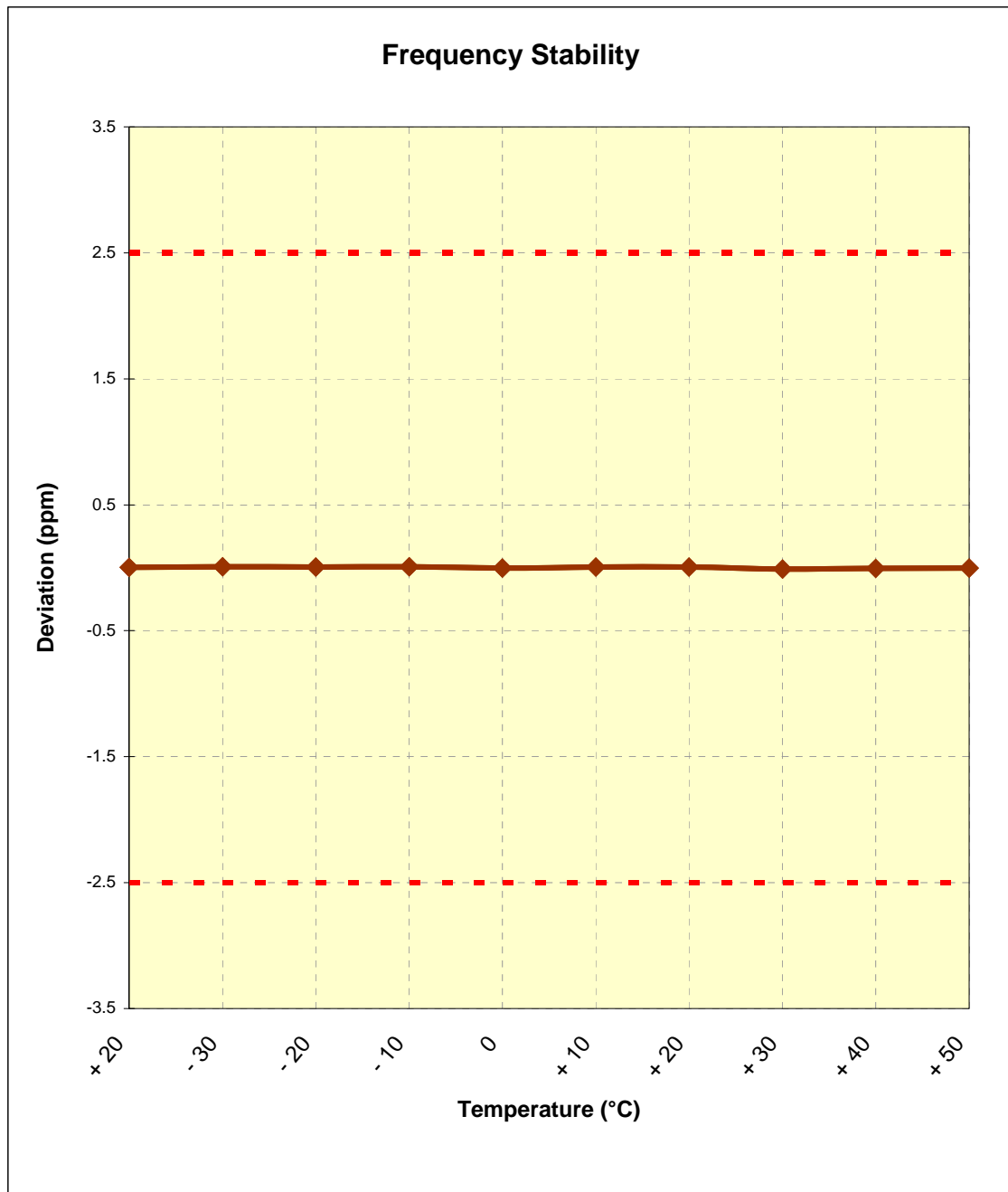
DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	120.00	+ 20 (Ref)	1,880,000,005	5	0.000000
100 %		- 30	1,880,000,016	16	0.000001
100 %		- 20	1,880,000,011	11	0.000001
100 %		- 10	1,880,000,017	17	0.000001
100 %		0	1,879,999,995	-5	0.000000
100 %		+ 10	1,880,000,012	12	0.000001
100 %		+ 20	1,880,000,010	10	0.000001
100 %		+ 30	1,879,999,981	-19	-0.000001
100 %		+ 40	1,879,999,990	-10	-0.000001
100 %		+ 50	1,879,999,994	-6	0.000000
115 %	138.00	+ 20	1,879,999,983	-17	-0.000001
85 %	102.00	+ 20	1,880,000,003	3	0.000000

Table 6-14. Frequency Stability Data (PCS CDMA Mode – Ch. 600)

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 22 of 37	

**PCS CDMA Frequency Stability Measurements (Cont'd)**  
**§2.1055, 24.235, RSS-133 (6.3)**



**Figure 6-3. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)**

<b>FCC ID:</b> QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	<b>FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)</b>	<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1104130726.QZC	<b>Test Dates:</b> April 5, 2011	<b>EUT Type:</b> A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 23 of 37

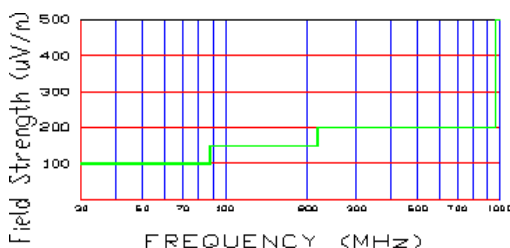


## 6.8 Receiver Spurious Emissions

RSS-129 (10(a,d)), RSS-133 (6.6)

Frequency [MHz]	Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
68.94	-78.39	10.38	V	1.2	289	38.99	40.00	-1.01
95.75	-85.54	11.44	V	1.0	196	32.90	43.52	-10.62
124.79	-92.14	12.97	H	1.0	115	27.83	43.52	-15.69
136.73	-91.77	13.54	H	1.0	143	28.76	43.52	-14.76
148.85	-91.03	14.06	V	1.1	139	30.04	43.52	-13.48
241.17	-95.64	14.06	H	1.3	311	25.42	46.02	-20.60

**Table 6-15. Radiated Measurements at 3-meters**





**Figure 6-4. 3-Meter Limits**

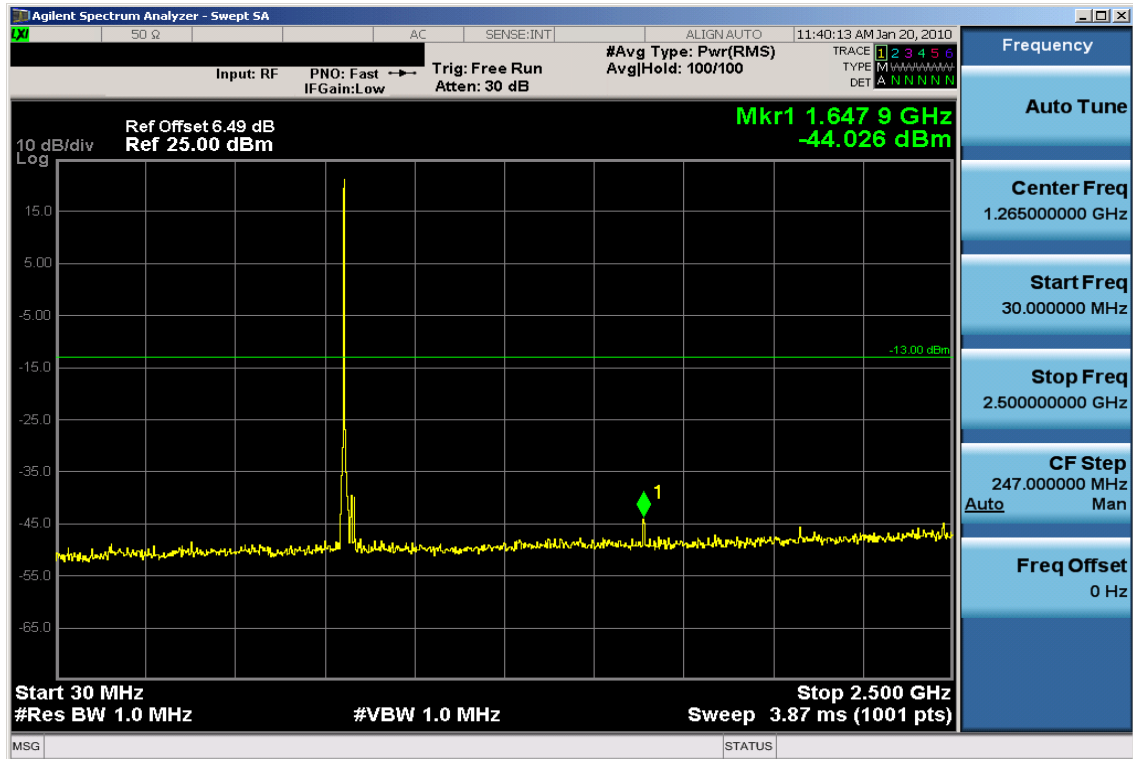
### NOTES:

1. All modes of operation were investigated and the worst-case emissions are reported.
2. The EUT was set to receive mode in the middle channel of operation.
3. Radiated emissions were measured from 30MHz to three times that of the highest tunable frequency or local oscillator.
4. The radiated limits are shown on Figure 6-4. Above 960MHz the limit is 500 $\mu$ V/m.

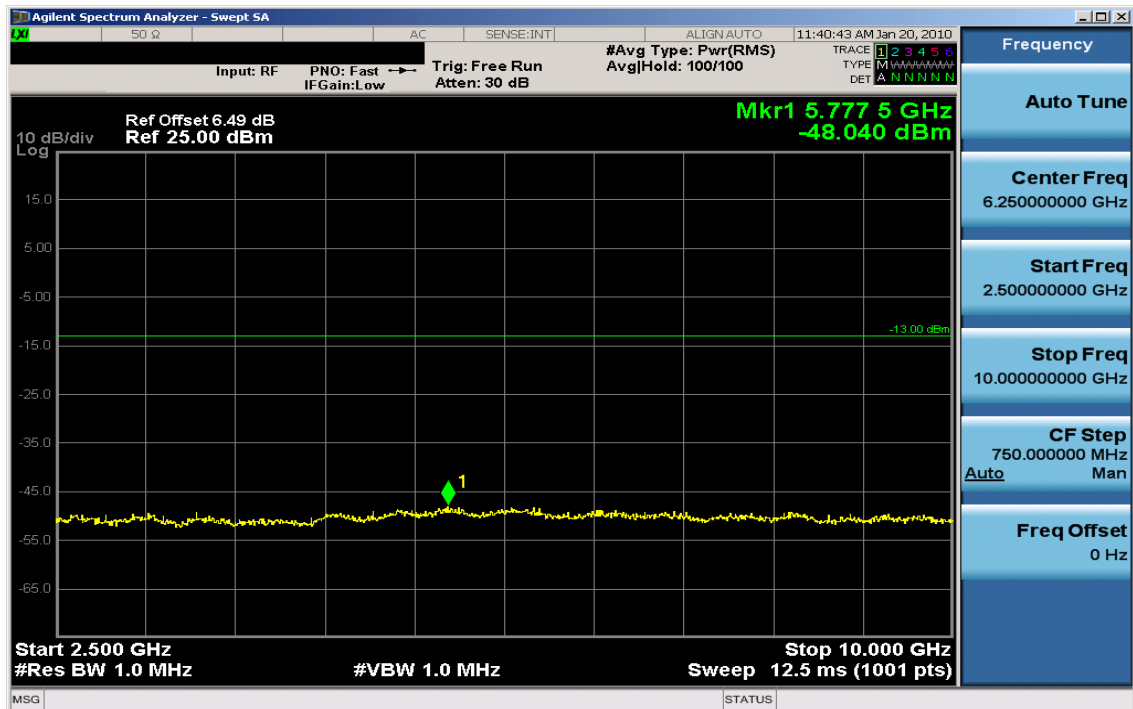
1. All readings are calibrated by a Signal Generator with accuracy traceable to the National Institute of Standards and Technology (NIST).
2. AFCL = Antenna Factor and Cable Loss
3. Measurements are made using CISPR quasi-peak mode. Average measurements are recorded above 1GHz.

FCC ID: QZCWWIC-CM1		FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 24 of 37

## 7.0 PLOT(S) OF EMISSIONS

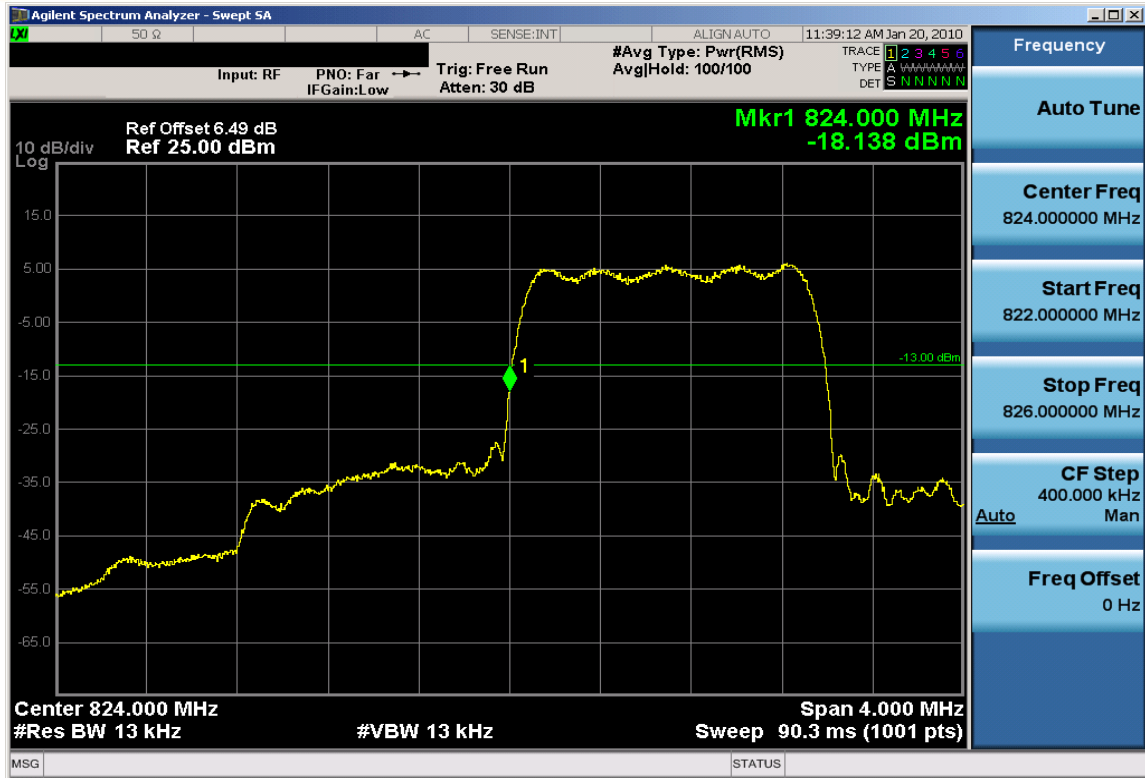


Plot 7-1. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 1013)

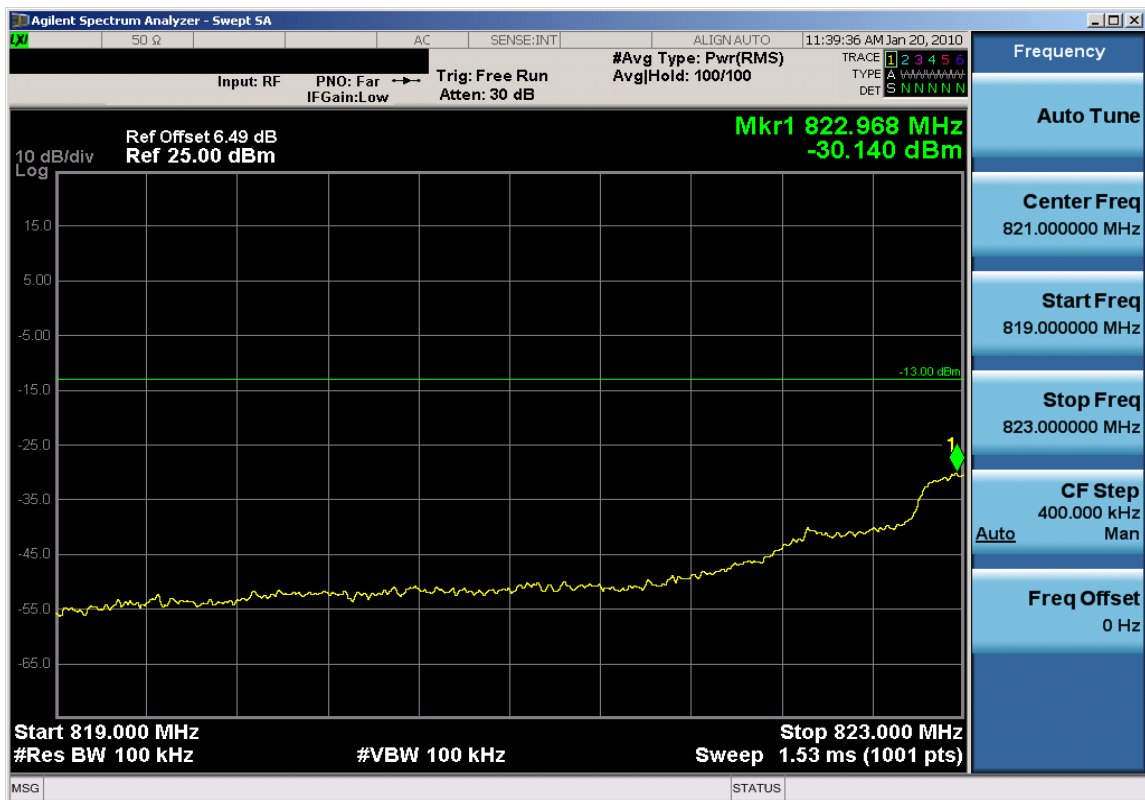


Plot 7-2. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 1013)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 25 of 37

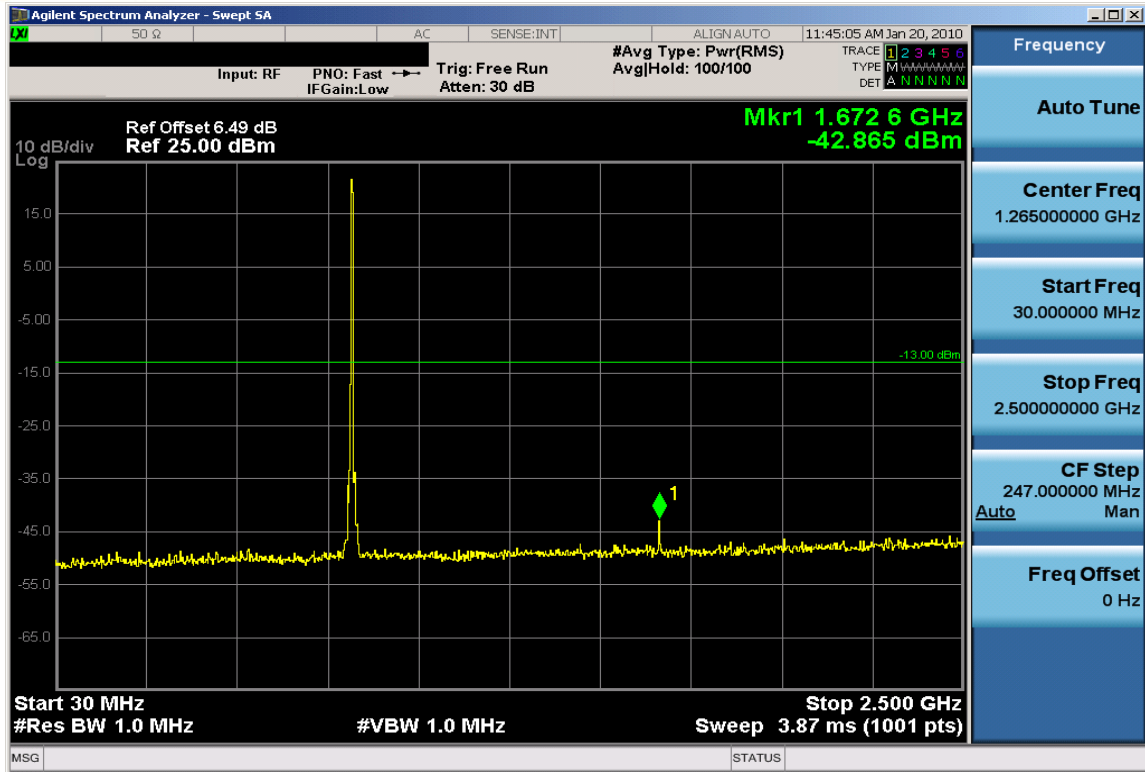


Plot 7-3. Band Edge Plot (Cellular CDMA Mode – Ch. 1013)

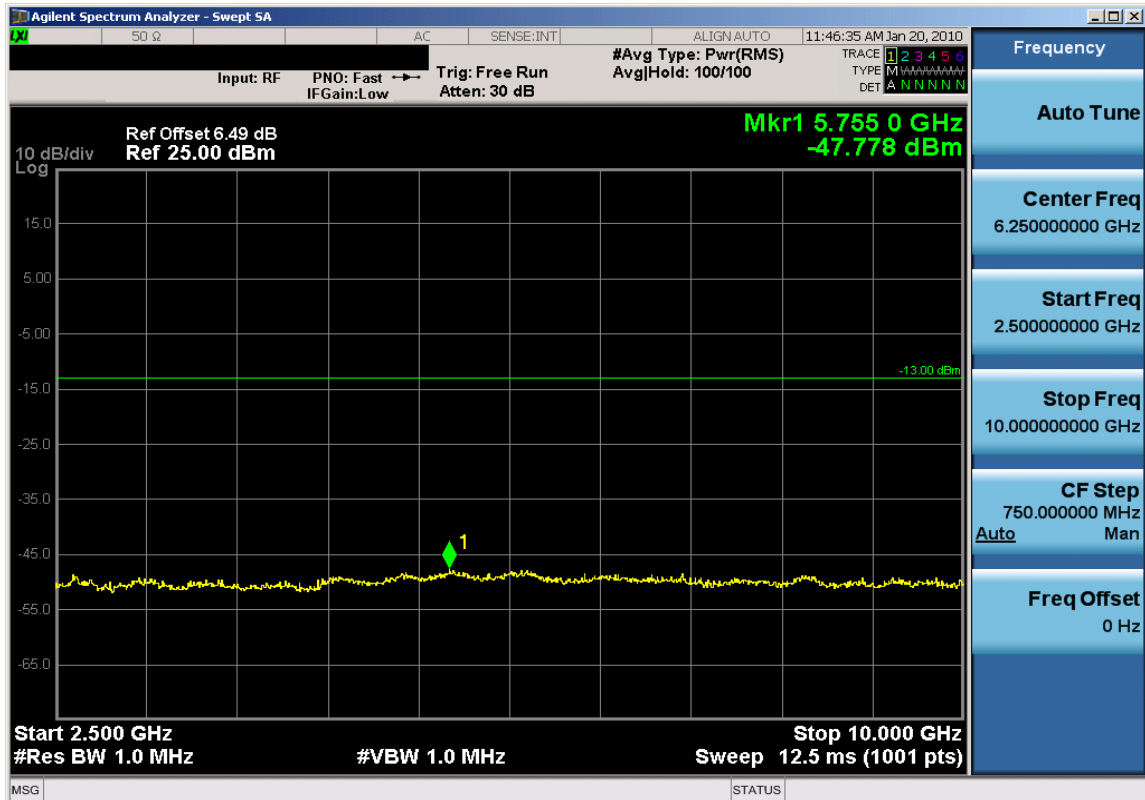


Plot 7-4. 4MHz Span Plot (Cellular CDMA Mode – Ch. 1013)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 26 of 37

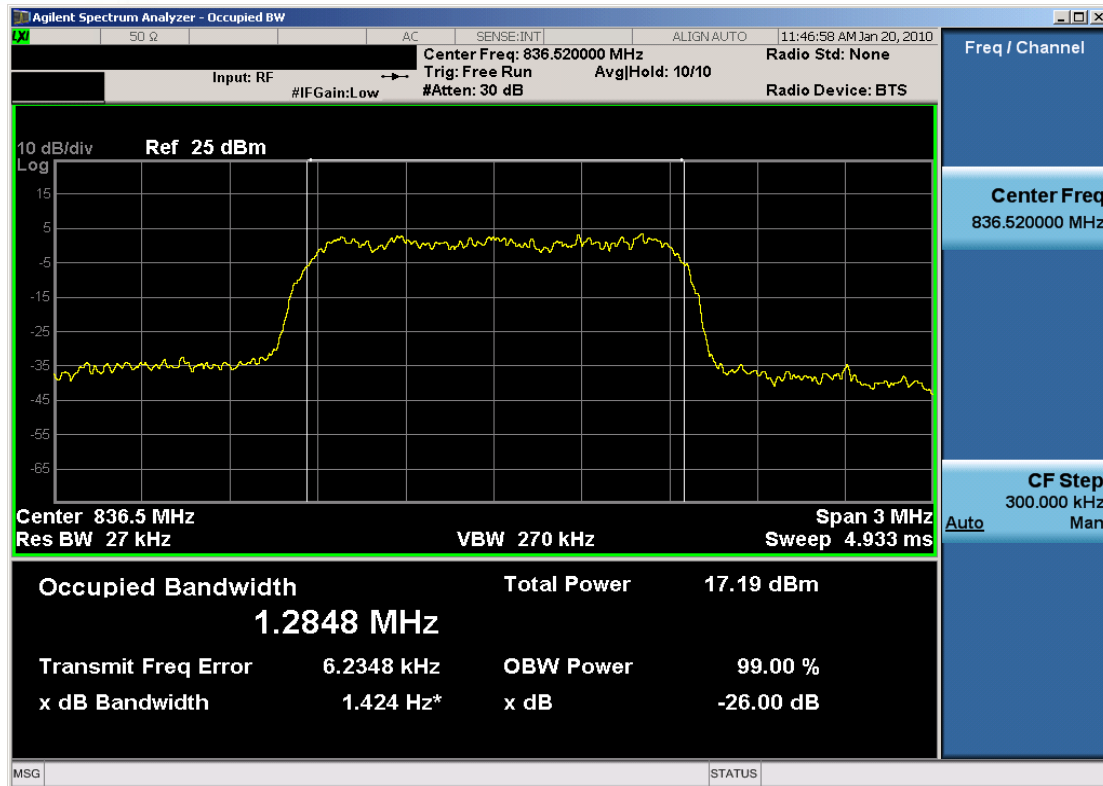


Plot 7-5. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 384)

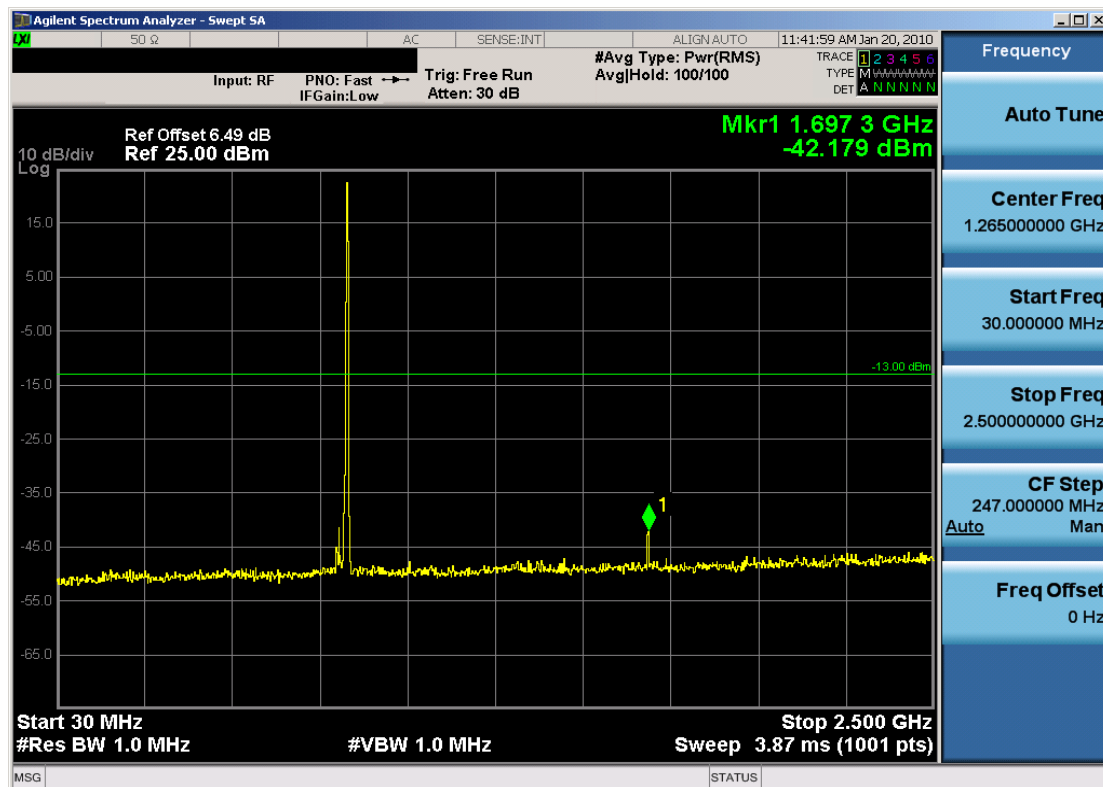


Plot 7-6. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 384)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 27 of 37

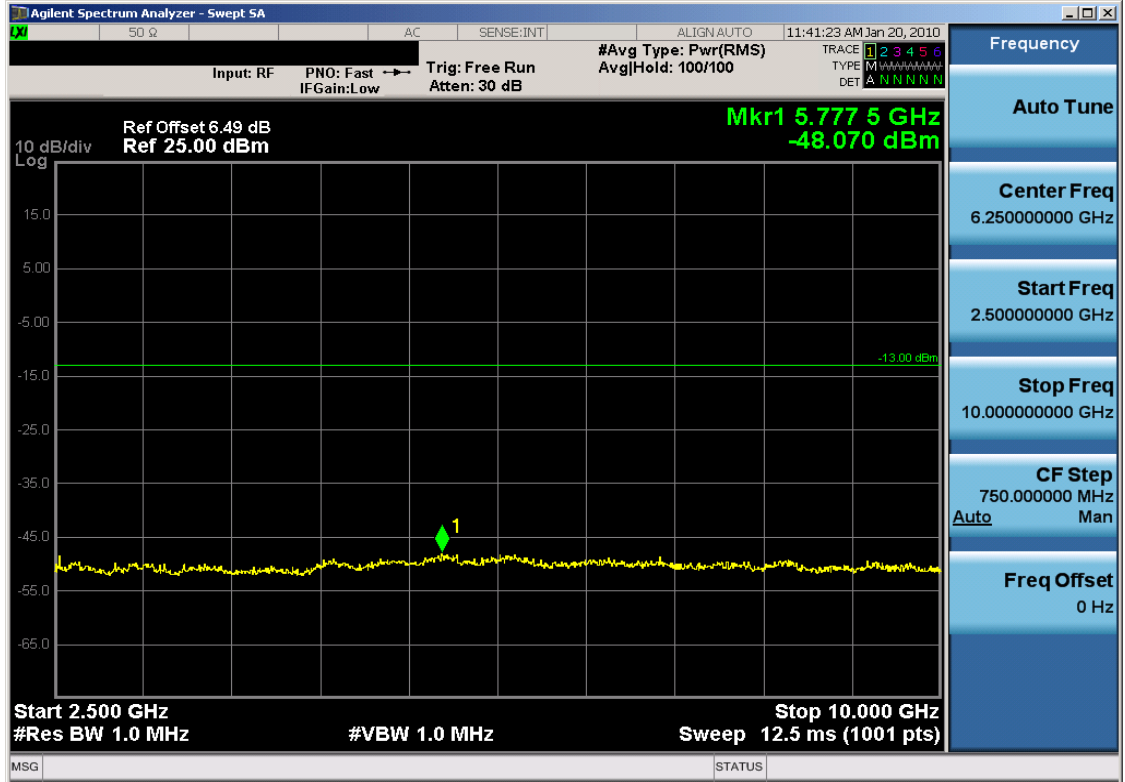


Plot 7-7. Occupied Bandwidth Plot (Cellular CDMA Mode – Ch. 384)

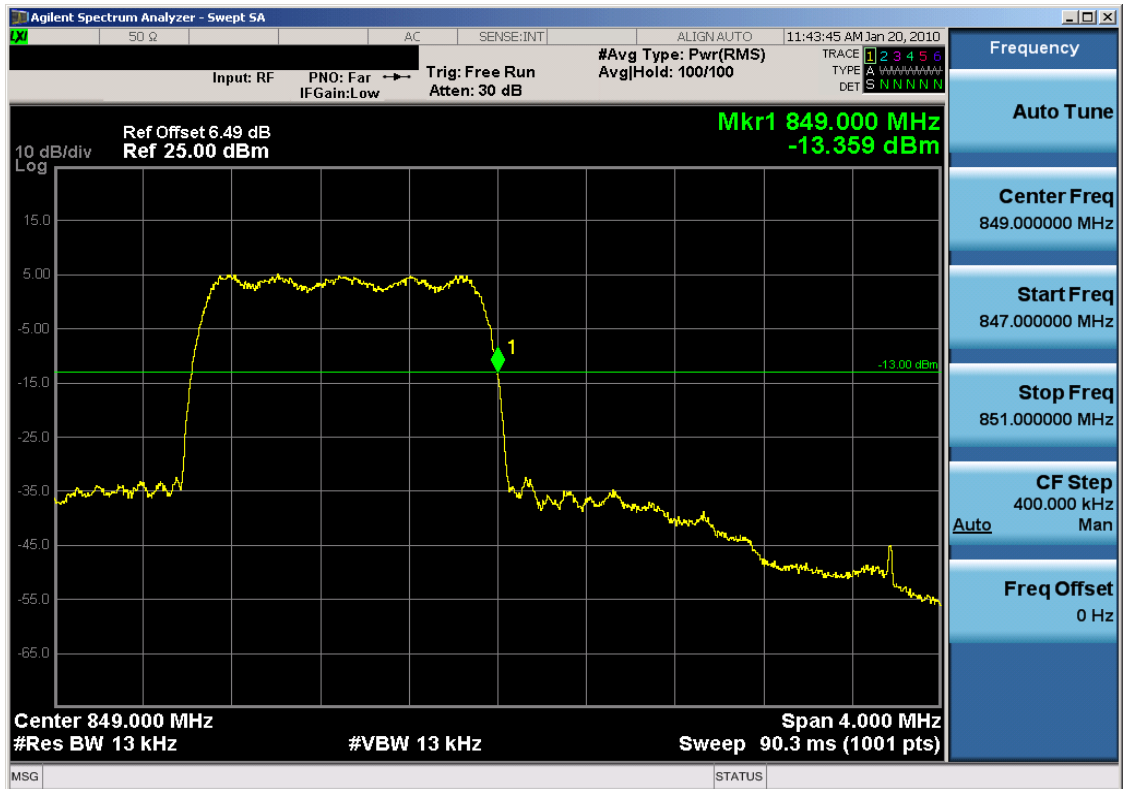


Plot 7-8. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 28 of 37

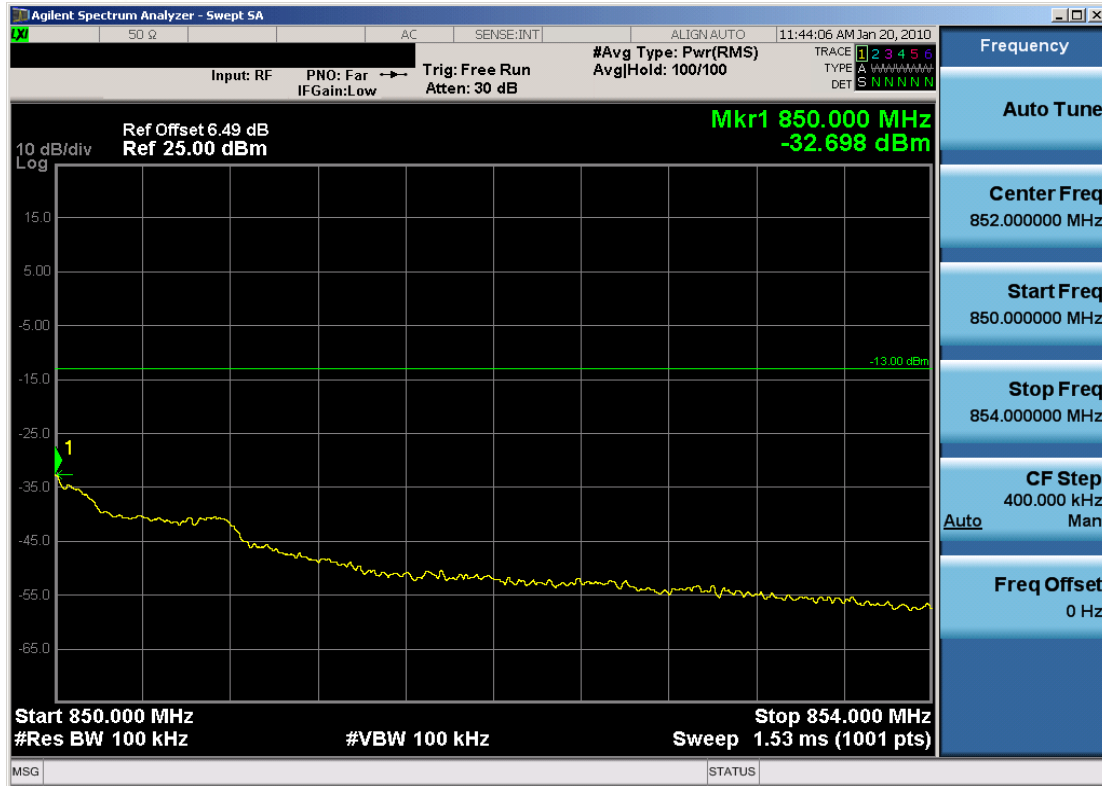


Plot 7-9. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)

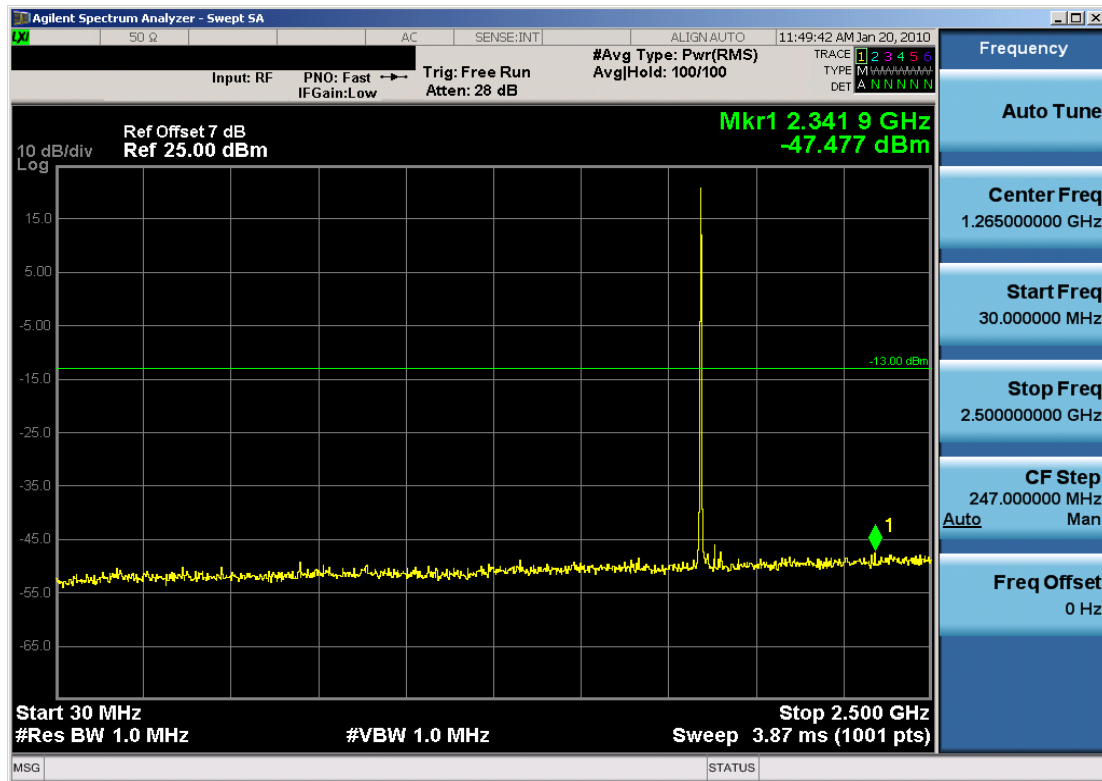


Plot 7-10. Band Edge Plot (Cellular CDMA Mode – Ch. 777)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 29 of 37



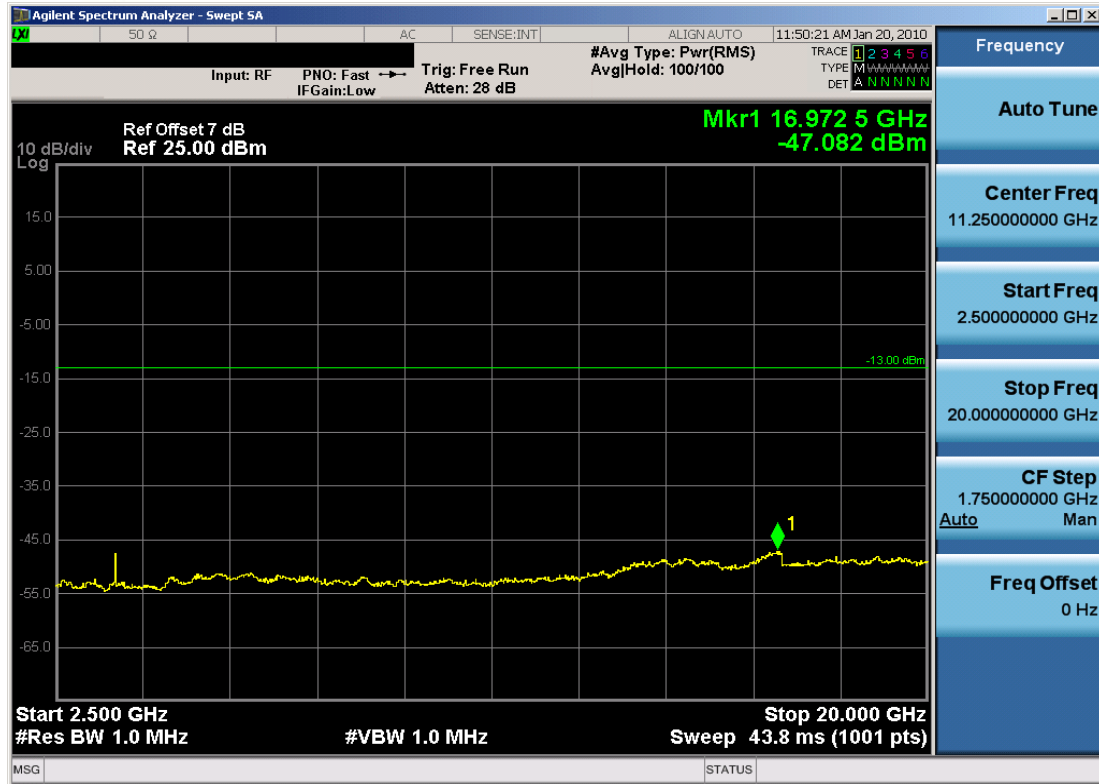
Plot 7-11. 4MHz Span Plot (Cellular CDMA Mode – Ch. 777)



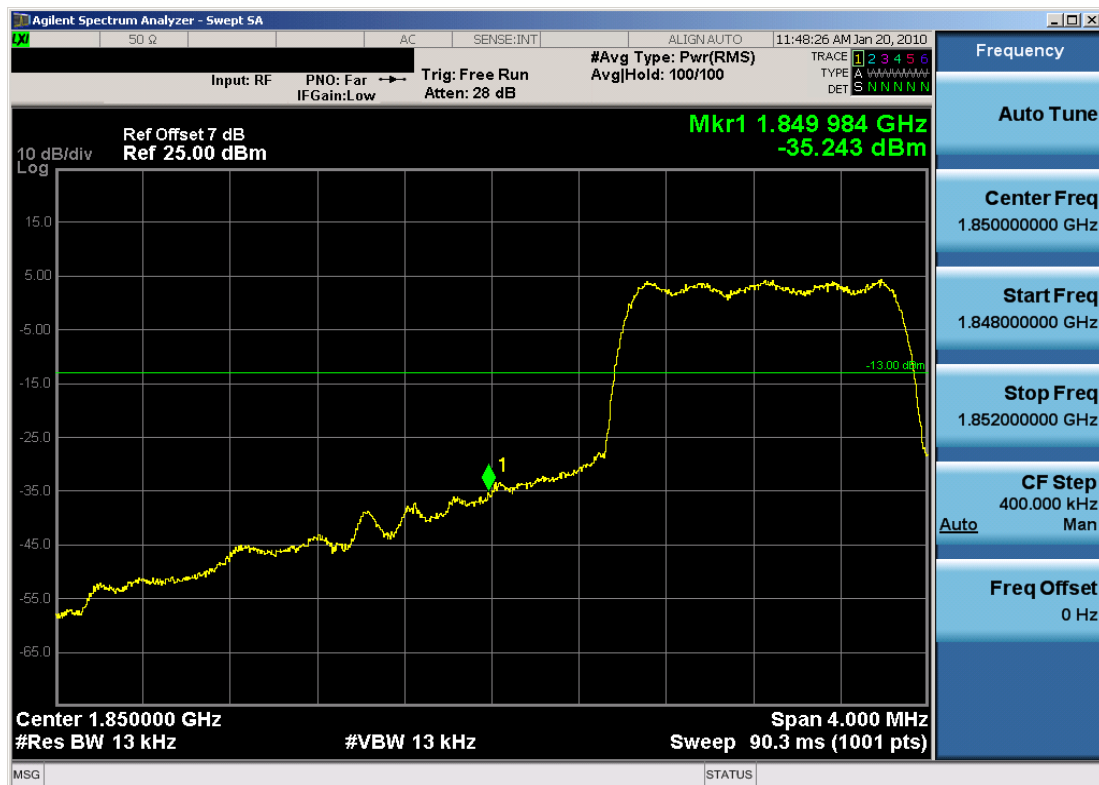
Plot 7-12. Conducted Spurious Plot (PCS CDMA Mode – Ch. 25)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 30 of 37





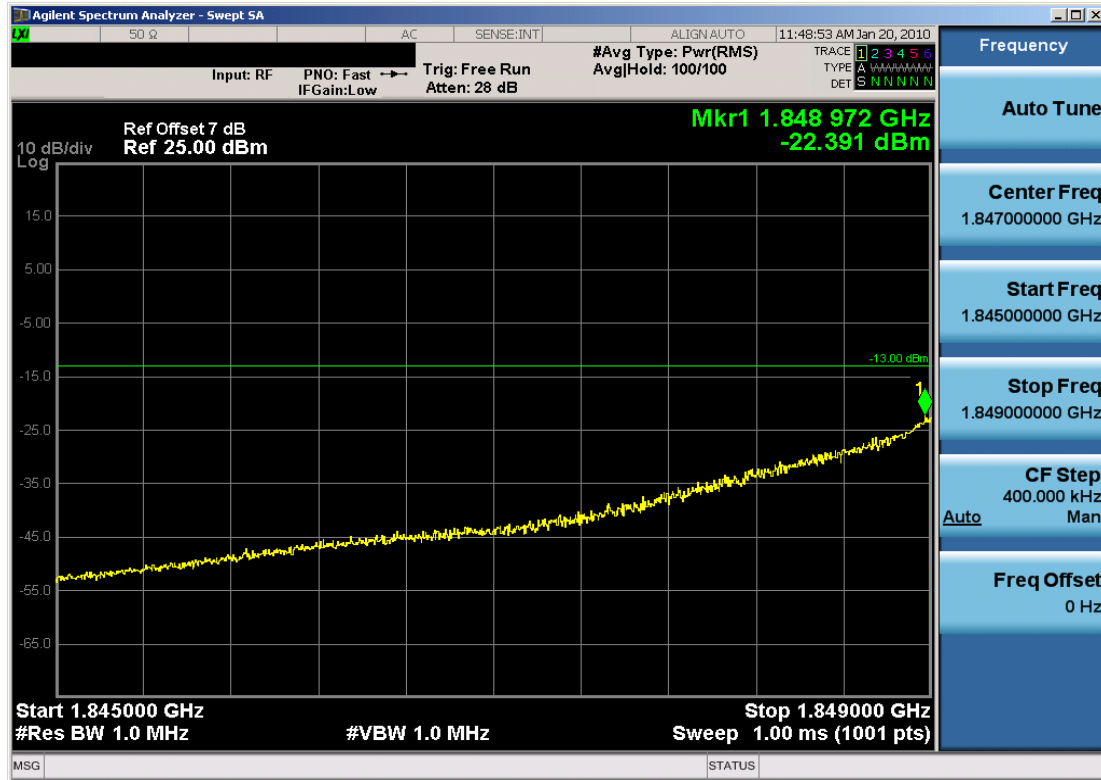


### Plot 7-13. Conducted Spurious Plot (PCS CDMA Mode – Ch. 25)

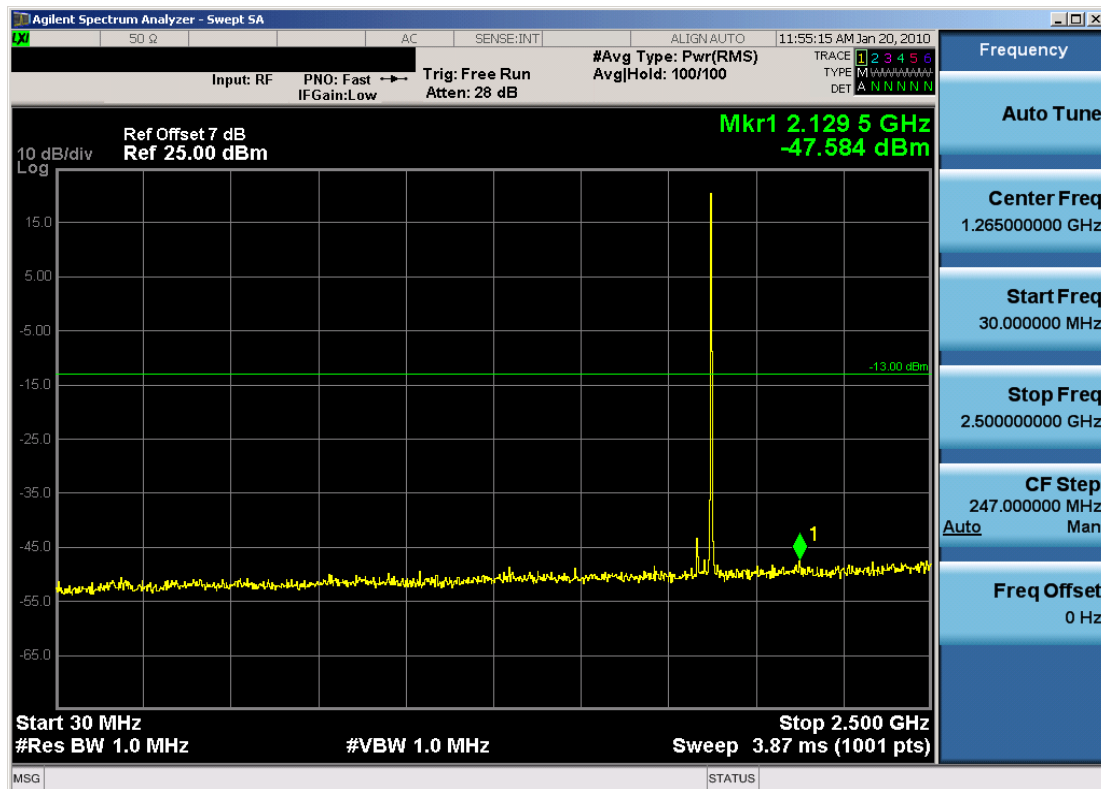


### Plot 7-14. Band Edge Plot (PCS CDMA Mode – Ch. 25)



FCC ID: QZCWWIC-CM1	 <b>FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)</b> 		Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 31 of 37

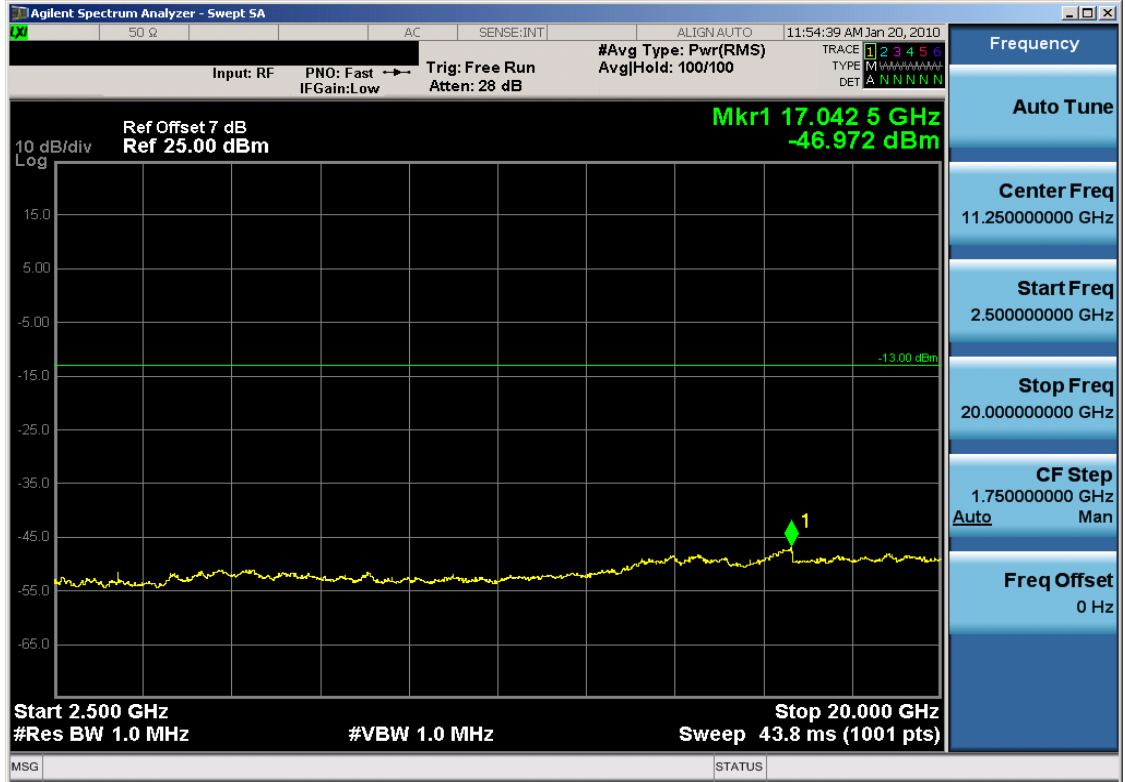


#### Plot 7-15. 4MHz Span Plot (PCS CDMA Mode – Ch. 25)

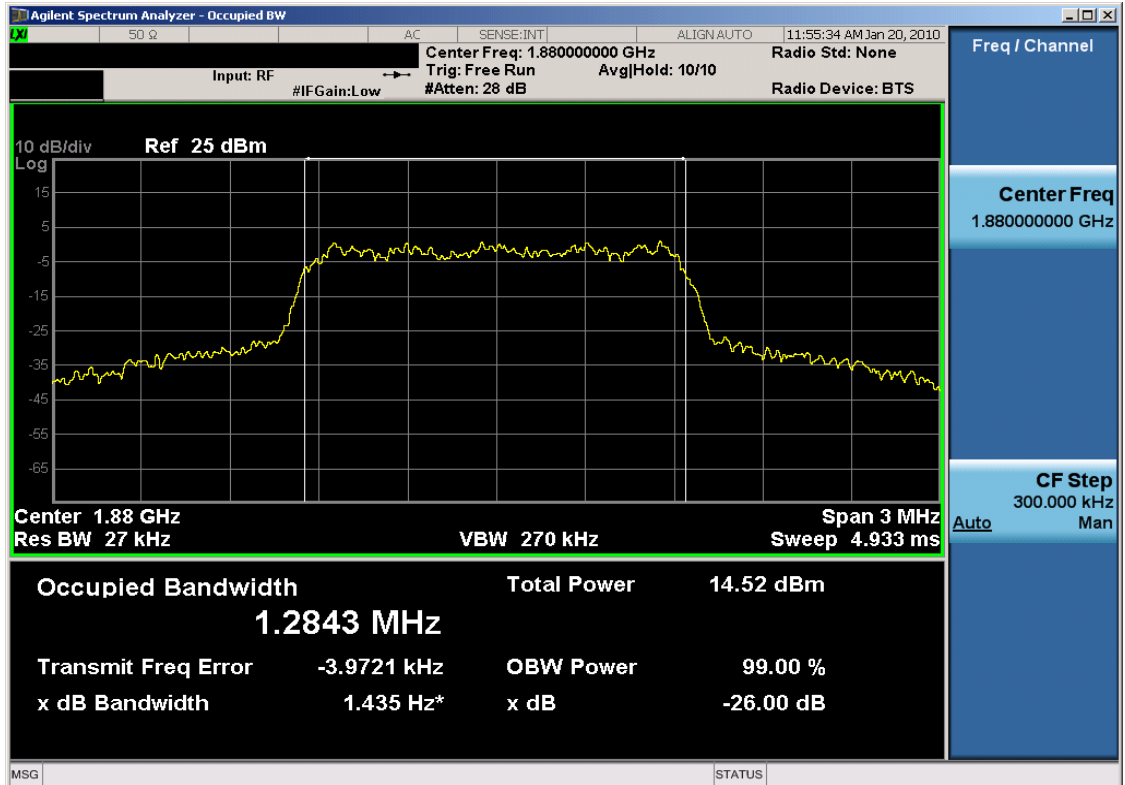


### Plot 7-16. Conducted Spurious Plot (PCS CDMA Mode – Ch. 600)

FCC ID: QZCWWIC-CM1	 <b>FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)</b> 		<b>Reviewed by:</b> Quality Manager
<b>Test Report S/N:</b> 0Y1104130726.QZC	<b>Test Dates:</b> April 5, 2011	<b>EUT Type:</b> A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN	Page 32 of 37

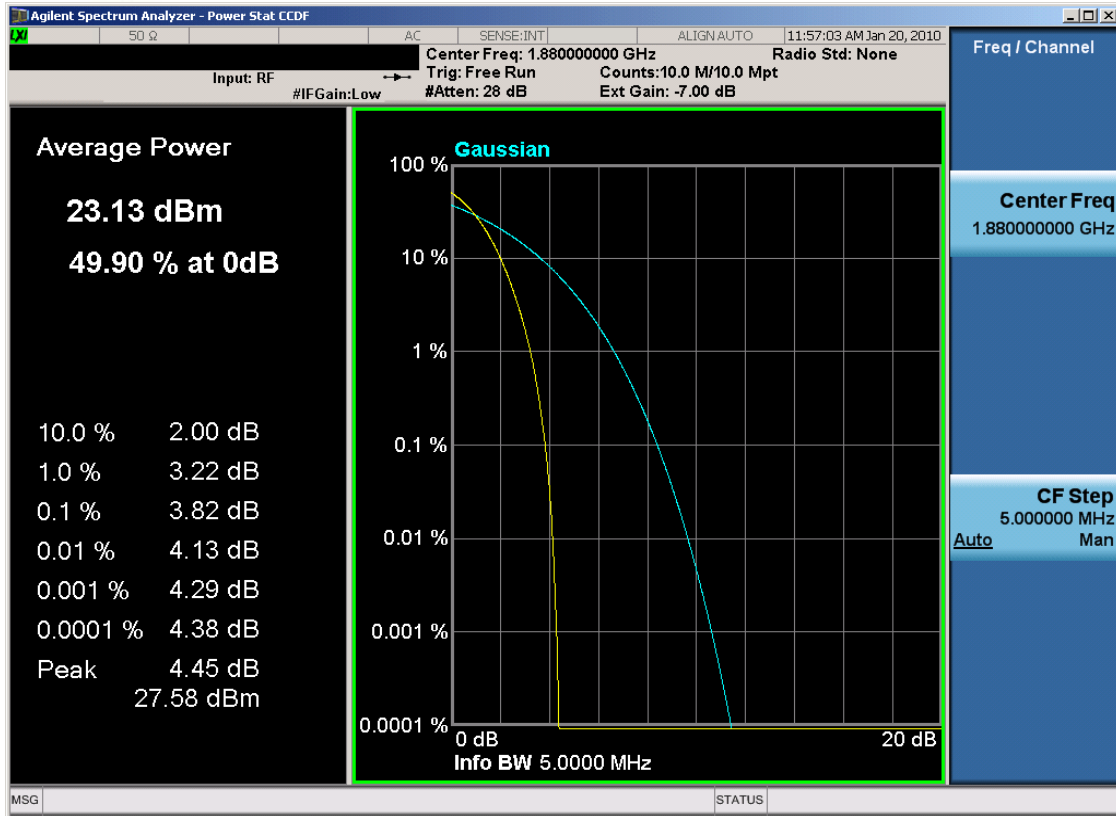


Plot 7-17. Conducted Spurious Plot (PCS CDMA Mode – Ch. 600)

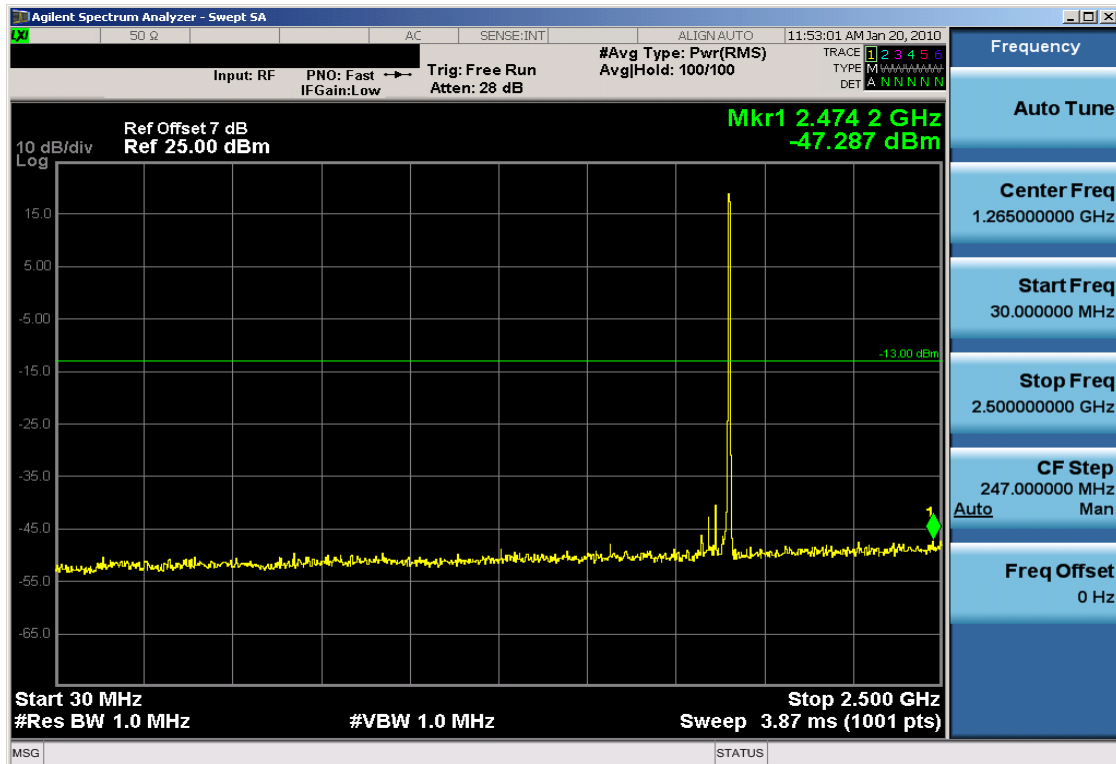


Plot 7-18. Occupied Bandwidth Plot (PCS CDMA Mode – Ch. 600)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 33 of 37

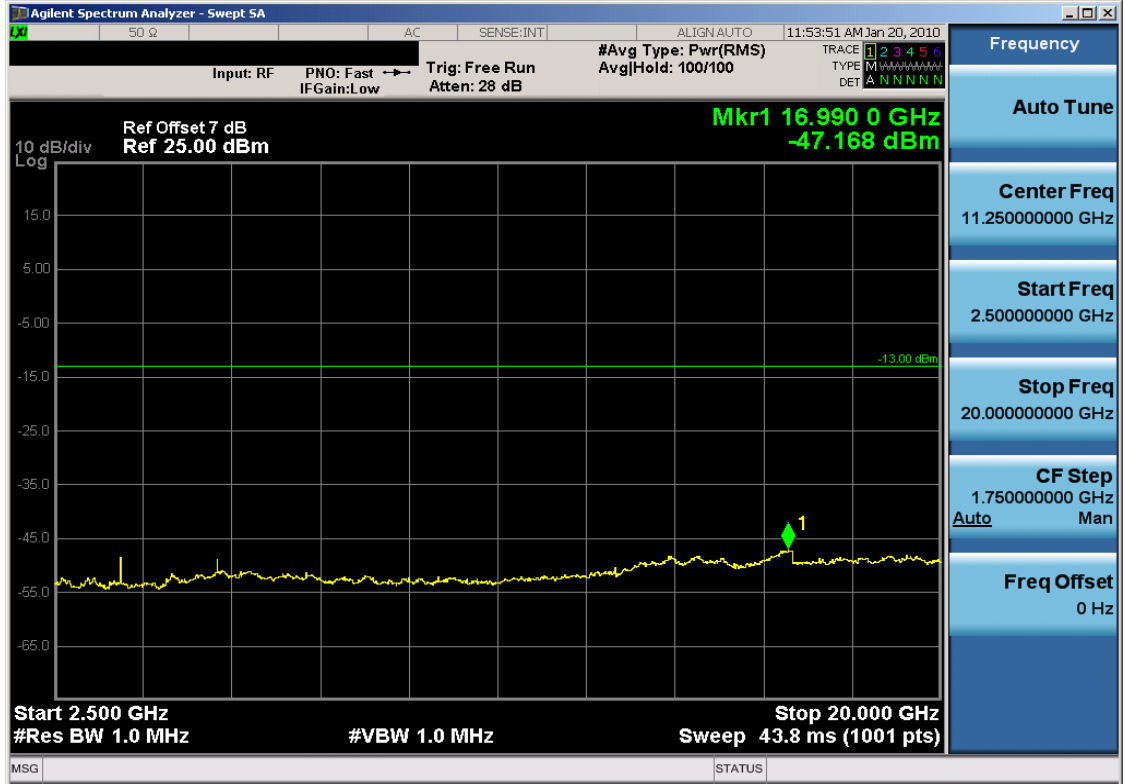


Plot 7-19. Peak-Average Ratio Plot (PCS CDMA Mode – Ch. 600)



Plot 7-20. Conducted Spurious Plot (PCS CDMA Mode – Ch. 1175)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 34 of 37

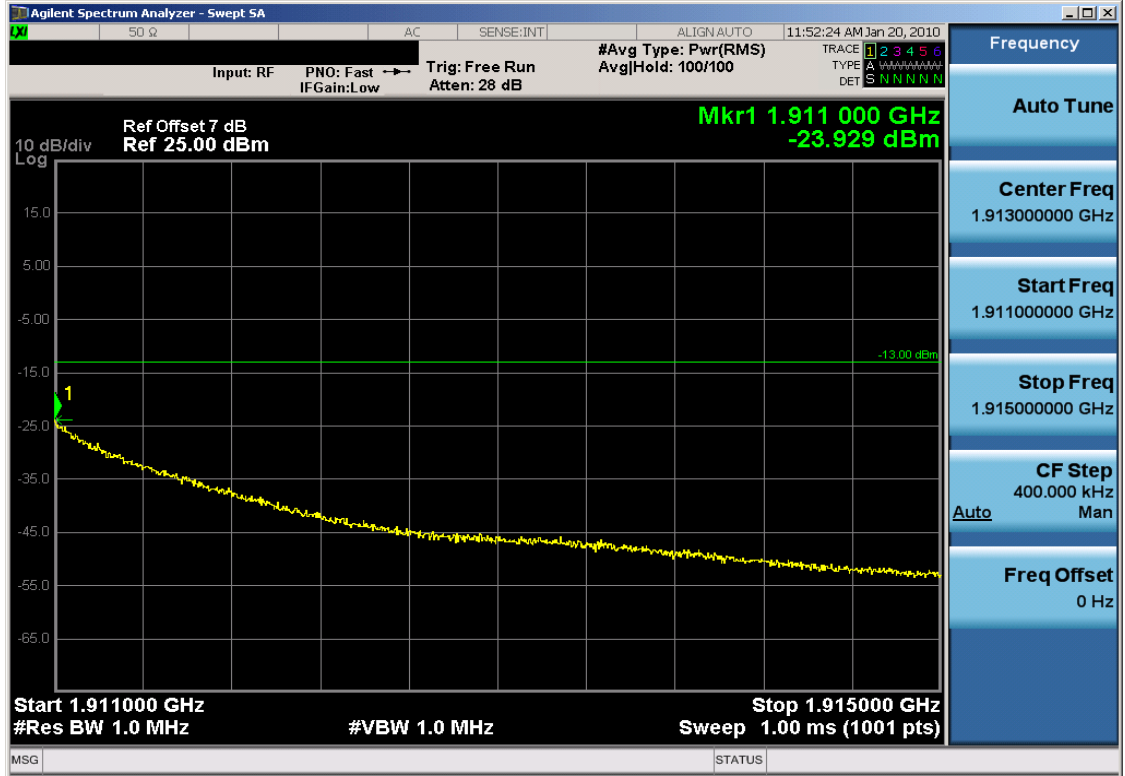


Plot 7-21. Conducted Spurious Plot (PCS CDMA Mode – Ch. 1175)



Plot 7-22. Band Edge Plot (PCS CDMA Mode – Ch. 1175)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 35 of 37





Plot 7-23. 4MHz Span Plot (PCS CDMA Mode – Ch. 1175)

FCC ID: QZCWWIC-CM1	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)	<b>elster</b>	Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN		Page 36 of 37

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Elster A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN FCC ID: QZCWWIC-CM1** complies with all the requirements of Parts 2, 22, and 24 of the FCC rules and RSS-129 and RSS-133 of the Industry Canada rules.

FCC ID: QZCWWIC-CM1		 FCC Pt. 22/24 CDMA MEASUREMENT REPORT (CERTIFICATION)			Reviewed by: Quality Manager
Test Report S/N: 0Y1104130726.QZC	Test Dates: April 5, 2011	EUT Type: A3 Alpha Module with CDMA Wireless WIC and 900MHz LAN			Page 37 of 37