PCTEST ENGINEERING LABORATORY, INC.
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http://www.pctestlab.com

CERTIFICATE OF COMPLIANCE
FCC Part 22 & 24 Certification

Applicant Name:
Panasonic Corporation of North America
One Panasonic Way, 4B-8
Secaucus, NJ 07094
United States

Date of Testing:
March 05, 2009
Test Site/Location:
PCTEST Lab., Columbia, MD, USA
Test Report Serial No.:
0901090074.ACJ

FCC ID:	**ACJ9TGCF-U13**
APPLICANT:	**PANASONIC CORPORATION OF NORTH AMERICA**

Application Type:	Certification
FCC Classification:	PCS Licensed Transmitter (PCB)
FCC Rule Part(s):	§2; §22(H), §24(E)
EUT Type:	Toughbook Model: CF-U1
Model(s):	CF-U1
Tx Frequency Range:	824.20 - 848.80MHz (Cell. GSM) / 1850.20 - 1909.80MHz (PCS GSM)
	826.40 - 846.60MHz (Cell. WCDMA) / 1852.4 - 1907.6MHz (PCS WCDMA)
	824.70 - 848.31MHz (Cell. CDMA) / 1851.25 - 1908.75MHz (PCS CDMA)
Max. RF Output Power:	3.882 W ERP Cell. GSM (35.89 dBm) / 1.102 W EIRP PCS GSM (30.42 dBm)
	0.83 W ERP EDGE850 (29.19 dBm) / 0.365 W EIRP EDGE1900 (25.62 dBm)
	0.71 W ERP Cell. WCDMA (28.51 dBm) / 0.219 W EIRP PCS WCDMA (23.4 dBm)
	0.589 W ERP Cell. CDMA (27.7 dBm) / 0.277 W EIRP PCS CDMA (24.43 dBm)
Emission Designator(s):	246KGXW (Cellular GSM), 242KGXW (PCS GSM)
	245KG7W (EDGE850), 242KG7W (EDGE1900)
	4M16F9W (Cellular WCDMA), 4M17F9W (PCS WCDMA)
	1M27F9W (Cellular CDMA), 1M27F9W (PCS CDMA)
Test Device Serial No.:	*identical prototype* [S/N: N/A]

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 ERP for Part 22 and EIRP for Part 24.

PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

Randy Ortanez
President

ACCREDITED
TESTING LABORATORY
CERTIFICATE #2041.01

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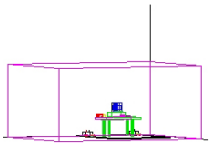

MEASUREMENT REPORT
FCC Part 22 & 24

§2.1033 General Information

APPLICANT:	Panasonic Corporation of North America
APPLICANT ADDRESS:	One Panasonic Way, 4B-8 Secaucus, NJ 07094
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)
BASE MODEL:	CF-U1
FCC ID:	ACJ9TGCF-U13
FCC CLASSIFICATION:	PCS Licensed Transmitter (PCB)
EMISSION DESIGNATOR(S):	246KGXW (Cellular GSM), 242KGXW (PCS GSM) 245KG7W (EDGE850), 242KG7W (EDGE1900) 4M16F9W (Cellular WCDMA), 4M17F9W (PCS WCDMA) 1M27F9W (Cellular CDMA), 1M27F9W (PCS CDMA)
MODE:	GSM/GPRS/EDGE/CDMA/WCDMA
FREQUENCY TOLERANCE:	±0.00025 % (2.5 ppm)
Test Device Serial No.:	N/A ☐ Production ☒ Pre-Production ☐ Engineering
DATE(S) OF TEST:	March 05, 2009
TEST REPORT S/N:	0901090074.ACJ

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 (IC-2451).
- 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 (IC-2451) 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.

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1.0 INTRODUCTION

1.1 Scope

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

1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity are, 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 27, 2006.

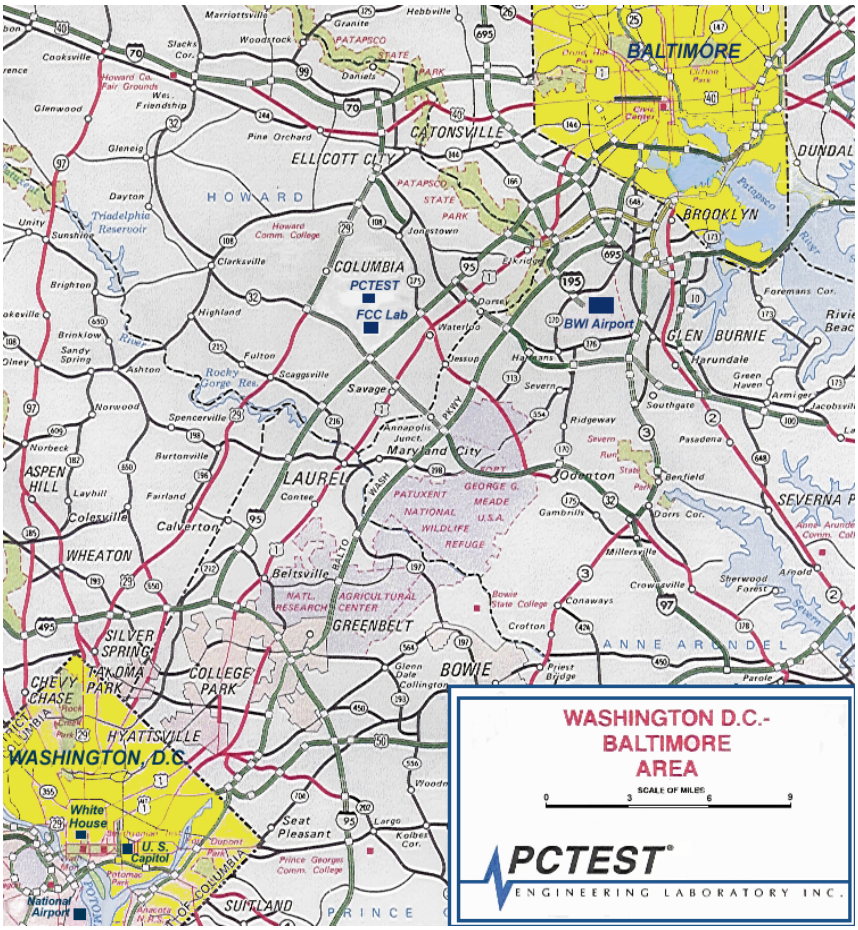

Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Panasonic Toughbook Model: CF-U1 FCC ID: ACJ9TGCF-U13**. The EUT consisted of the following component(s):

Trade Name / Base Model	FCC ID	Description
Panasonic / Model: CF-U1	ACJ9TGCF-U13	Toughbook Model: CF-U1

Table 2-1. EUT Equipment Description

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.

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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 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. 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. 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.

Deviation from Measurement Procedure……...None

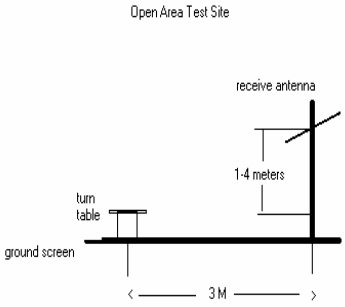


Figure 3-1. Diagram of 3-meter outdoor test range

3.2 Occupied Bandwidth Emission Limits

§2.1049, 22.917(a), 24.238(a)

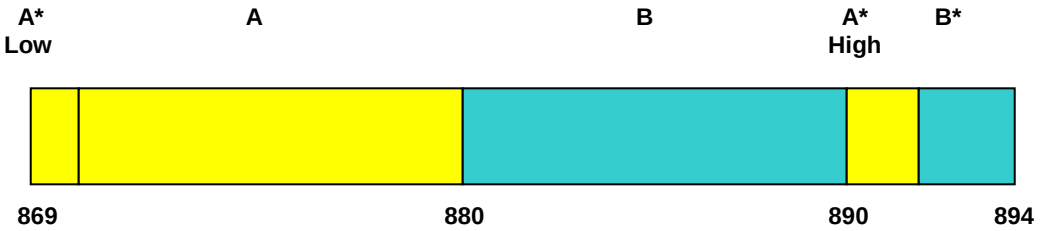
a. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB.

b. 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.

c. When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

d. The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

3.3 Cellular - Base Frequency Blocks



BLOCK 1: 869 – 880 MHz (A* Low + A)

BLOCK 2: 880 – 890 MHz (B)

BLOCK 3: 890 – 891.5 MHz (A* High)

BLOCK 4: 891.5 – 894 MHz (B*)

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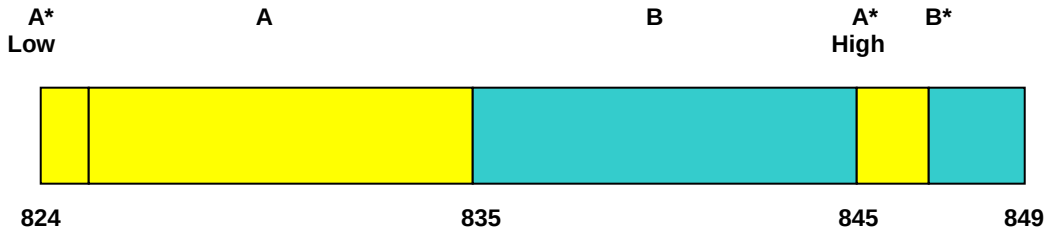
3.4 Cellular - Mobile Frequency Blocks



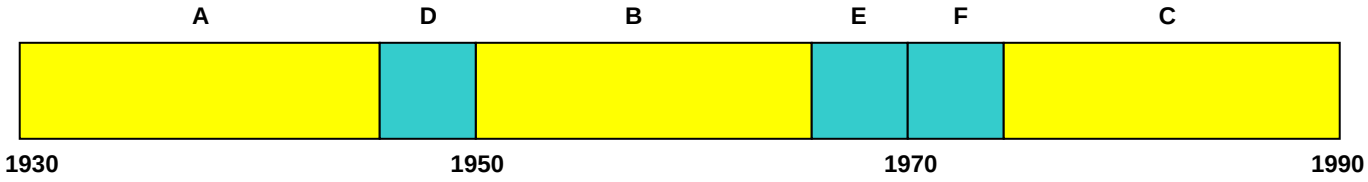
BLOCK 1: 824 – 835 MHz (A* Low + A)

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)

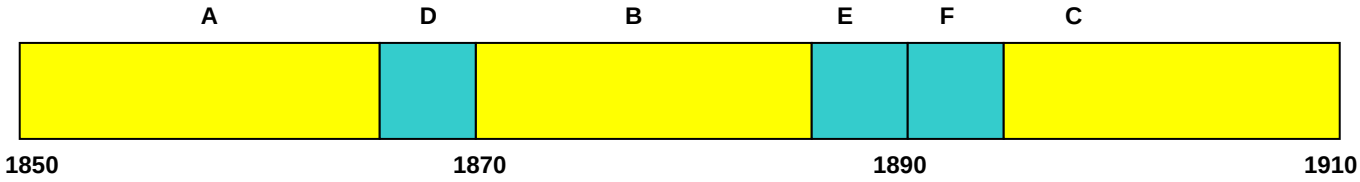
BLOCK 3: 1950 – 1965 MHz (B)

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)

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.

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3.8 Radiated Spurious and Harmonic Emissions

§2.1053, 22.917(a), 24.238(a)

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz.

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

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. The conducted power at the terminals of the dipole is measured. The ERP is recorded.

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

A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

Spurious and harmonic radiated emissions are measured outdoors at our 3-meter test range. The equipment under test is placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10^{th} 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 spectrum analyzer reading. This level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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.

3.9 Peak-Average Ratio

§24.232(d)

A peak to average ratio measurement is performed at the conducted port of the EUT. For CDMA and WCDMA 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. For GSM signals, an average and a peak trace are used on a spectrum analyzer to determine the largest deviation between the average and the peak power of the EUT in a bandwidth greater than the emission bandwidth.

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3.10 Frequency Stability / Temperature Variation

§2.1055, 22.355, 24.235

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 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 ±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 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 period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

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4.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	263-10dB	(DC-18GHz) 10 dB Attenuator	N/A		N/A	N/A
-	No.165	(30MHz - 1000MHz) RG58 Coax Cable	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	11713A	Attenuation/Switch Driver	12/4/2008	Annual	12/4/2009	3439A02645
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	12/4/2008	Annual	12/4/2009	3008A00985
Agilent	8495A	(0-70dB) DC-4GHz Attenuator	N/A		N/A	N/A
Agilent	85650A	Quasi-Peak Adapter	3/13/2008	Annual	3/13/2009	2043A00301
Agilent	8566B	(100Hzû22GHz) Spectrum Analyzer	12/5/2008	Annual	12/5/2009	3638A08713
Agilent	8566B	Opt. 462 Impulse Bandwidth	12/5/2008	Annual	12/5/2009	3701A22204
Agilent	8591A	(9kHz-1.8GHz) Spectrum Analyzer	8/19/2008	Annual	8/19/2009	3144A02458
Agilent	8648D	(9kHz-4GHz) Signal Generator	10/11/2007	Biennial	10/11/2009	3613A00315
Agilent	8901A	Modulation Analyzer	8/18/2008	Annual	8/18/2009	2432A03467
Agilent	8903B	Audio Analyzer	8/18/2008	Annual	8/18/2009	3011A09025
Agilent	E4407B	ESA Spectrum Analyzer	3/13/2008	Annual	3/13/2009	US39210313
Agilent	E4432B	ESG-D Series Signal Generator	8/18/2008	Annual	8/18/2009	US40053896
Agilent	E4448A	(3Hz-50GHz) Spectrum Analyzer	12/5/2008	Annual	12/5/2009	US42510244
Agilent	E5515C	Wireless Communications Test Set	6/8/2007	Biennial	6/8/2009	GB46110872
Agilent	E5515C	Wireless Communications Test Set	6/8/2007	Biennial	6/8/2009	GB46310798
Agilent	E5515C	Wireless Communications Test Set	9/10/2008	Biennial	9/10/2010	GB41450275
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/8/2007	Biennial	3/8/2009	MY45470194
Compliance Design	Roberts	Dipole Set	11/9/2007	Biennial	11/9/2009	146
Compliance Design	Roberts	Dipole Set	11/9/2007	Biennial	11/9/2009	147
Emco	3115	Horn Antenna (1-18GHz)	9/24/2007	Biennial	9/24/2009	9704-5182
Emco	3115	Horn Antenna (1-18GHz)	10/4/2007	Biennial	10/4/2009	9205-3874
Espec	ESX-2CA	Environmental Chamber	3/12/2008	Annual	3/12/2009	17620
Gigatronics	80701A	(0.05-18GHz) Power Sensor	8/18/2008	Annual	8/18/2009	1833460
Gigatronics	8651A	Universal Power Meter	8/18/2008	Annual	8/18/2009	1835299
Gigatronics	8651A	Universal Power Meter	8/18/2008	Annual	8/18/2009	8650319
K & L	11SH10	Band Pass Filter	N/A	Annual	N/A	1300/4000
K & L	11SH10	Band Pass Filter	N/A	Annual	N/A	4000/12000
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
Rohde & Schwarz	CMU200	Base Station Simulator	5/29/2008	Annual	5/29/2009	836371/0079
Rohde & Schwarz	CMU200	Base Station Simulator	7/23/2008	Annual	7/23/2009	109892
Rohde & Schwarz	NRVD	Dual Channel Power Meter	8/20/2008	Biennial	8/20/2010	101695
Rohde & Schwarz	NRVS	Single Channel Power Meter	7/3/2007	Biennial	7/3/2009	835360/0079
Rohde & Schwarz	NRV-Z32	Peak Power Sensor (100uW-2W)	12/5/2008	Biennial	12/5/2010	100155
Rohde & Schwarz	NRV-Z33	Peak Power Sensor (1mW-20W)	12/5/2008	Biennial	12/5/2010	100004
Rohde & Schwarz	NRV-Z53	Power Sensor	7/3/2007	Biennial	7/3/2009	846076/0007
Schwarzbeck	UHA9105	Dipole Antenna (400 - 1GHz) Rx	6/19/2007	Biennial	6/18/2009	9105-2404
Schwarzbeck	UHA9105	Dipole Antenna (400 - 1GHz) Tx	6/19/2007	Biennial	6/18/2009	9105-2403
Solar Electronics	8012-50-R-24-BNC	LISN	11/8/2007	Biennial	11/8/2009	310233
Sunol	DRH-118	Horn Antenna (1 - 18GHz)	5/9/2007	Biennial	5/9/2009	A050307

Table 4-1. Test Equipment

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5.0 SAMPLE CALCULATIONS

GSM Emission Designator

Emission Designator = 250KGXW

GSM BW = 250 kHz
G = Phase Modulation
X = Cases not otherwise covered
W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M16F9W

WCDMA BW = 4.16 MHz
F = Frequency Modulation
9 = Composite Digital Info
W = Combination (Audio/Data) (Measured at the 99.75% power bandwidth)

CDMA Emission Designator

Emission Designator = 1M27F9W

CDMA BW = 1.27 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: GSM Channel 512 PCS Mode 2nd Harmonic (3700.40 MHz)

The receive 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 receive analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 3700.40 MHz. So 6.1 dB is added to the signal generator reading of –30.9 dBm yielding –24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm – (-24.80) = 50.3 dBc.

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6.0 TEST RESULTS

6.1 Summary

Company Name: Panasonic Corporation of North America

FCC ID: ACJ9TGCF-U13

FCC Classification: PCS Licensed Transmitter (PCB)

Mode(s): GSM/GPRS/EDGE/CDMA/WCDMA

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
2.1049, 22.917(a), 24.238(a)	Occupied Bandwidth	N/A	CONDUCTED	PASS	Section 7.0
2.1051, 22.917(a), 24.238(a)	Band Edge / Conducted Spurious Emissions	< 43 + $\log_{10}$ (P[Watts]) at Band Edge and for all out-of-band emissions		PASS	Section 7.0
24.232(d)	Peak-Average Ratio	< 13 dB		PASS	Section 7.0
22.913(a)(2)	Effective Radiated Power	< 7 Watts max. ERP (<6.3 Watts max. ERP (IC))	RADIATED	PASS	Section 6.2
24.232(c)	Equivalent Isotropic Radiated Power	< 2 Watts max. EIRP		PASS	Section 6.3
2.1053, 22.917(a), 24.238(a)	Undesirable Emissions	< 43 + $\log_{10}$ (P[Watts]) for all out-of-band emissions		PASS	Sections 6.4, 6.5, 6.7, 6.8
2.1055, 22.355, 24.235	Frequency Stability	< 2.5 ppm		PASS	Sections 6.10, 6.11, 6.13, 6.14
RECEIVER MODE (RX) / DIGITAL EMISSIONS					
15.107	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.107 limits	LINE CONDUCTED	PASS	Pt. 15B Test Report
15.109	General Field Strength Limits (Restricted Bands and Radiated Emissions Limits)	< FCC 15.109 limits	RADIATED (30MHz-1GHz) (1-25 GHz)	PASS	Pt. 15B Test Report
RF EXPOSURE (SAR)					
2.1091 / 2.1093	SAR Test	1.6 W/kg (SAR Limit)	SAR	PASS	SAR Report

Table 6-1. Summary of Test Results

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6.2 Effective Radiated Power Output Data

§22.913(a)(2)

POWER: PCL "5" (Cellular GSM Mode)

Frequency [MHz]	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	Battery Type
824.20	-5.850	34.83	0.00	H	34.83	3.041	Standard
836.60	-4.790	35.89	0.00	H	35.89	3.882	Standard
848.80	-5.940	34.74	0.00	H	34.74	2.979	Standard
836.60	-11.490	29.19	0.00	H	29.19	0.830	Standard

Table 6-2. Effective Radiated Power Output Data (GSM)

POWER: All "1" bits (Cellular WCDMA Mode)

Frequency [MHz]	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	Battery Type
826.40	-12.170	28.51	0.00	H	28.51	0.710	Standard
836.60	-13.150	27.53	0.00	H	27.53	0.566	Standard
846.60	-14.040	26.64	0.00	H	26.64	0.461	Standard

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

POWER: All "1" bits (Cellular CDMA Mode)

Frequency [MHz]	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBd]	Pol [H/V]	ERP [dBm]	ERP [Watts]	Battery Type
824.70	-14.900	25.78	0.00	H	25.78	0.378	Standard
836.52	-12.980	27.70	0.00	H	27.70	0.589	Standard
848.31	-14.970	25.71	0.00	H	25.71	0.372	Standard

Table 6-4. Effective Radiated Power Output Data (CDMA)

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6.3 Equivalent Isotropic Radiated Power Output Data

§24.232(c)

POWER: PCL "0" (PCS GSM Mode)

Frequency [MHz]	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
1850.20	-14.000	21.96	8.00	V	29.96	0.991	Standard
1880.00	-15.400	20.56	8.00	V	28.56	0.718	Standard
1909.80	-13.540	22.42	8.00	V	30.42	1.102	Standard
1900.80	-18.340	17.62	8.00	V	25.62	0.365	Standard

Table 6-5. Equivalent Isotropic Radiated Power Output Data (GSM)

POWER: All "1" bits (PCS WCDMA Mode)

Frequency [MHz]	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
1852.40	-20.560	15.40	8.00	V	23.40	0.219	Standard
1880.00	-20.650	15.31	8.00	V	23.31	0.214	Standard
1907.60	-20.600	15.36	8.00	V	23.36	0.217	Standard

Table 6-6. Equivalent Isotropic Radiated Power Output Data (WCDMA)

POWER: All "1" bits (PCS CDMA Mode)

Frequency [MHz]	Measured Level [dBm]	Substitute Level [dBm]	Antenna Gain [dBi]	Pol [H/V]	EIRP [dBm]	EIRP [Watts]	Battery Type
1851.25	-19.530	16.43	8.00	V	24.43	0.277	Standard
1880.00	-20.270	15.69	8.00	V	23.69	0.234	Standard
1908.75	-20.430	15.53	8.00	V	23.53	0.225	Standard

Table 6-7. Equivalent Isotropic Radiated Power Output Data (CDMA)

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6.4 Cellular GSM Radiated Measurements

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	824.20	MHz		
CHANNEL:	128			
MEASURED OUTPUT POWER:	35.890	dBm	=	3.882 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	48.89	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1648.40	-39.14	6.08	-33.06	H	69.0
2472.60	-46.91	6.53	-40.38	H	76.3
3296.80	-94.05	6.87	-87.18	H	123.1
4121.00	-91.87	7.21	-84.66	H	120.6
4945.20	-91.09	8.37	-82.72	H	118.6

Table 6-8. Radiated Spurious Data (Cellular GSM Mode – Ch. 128)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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Cellular GSM Radiated Measurements (Cont'd)

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.60	MHz		
CHANNEL:	190			
MEASURED OUTPUT POWER:	35.890	dBm	=	3.882 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	48.89	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1673.20	-45.21	6.09	-39.12	H	75.0
2509.80	-49.73	6.55	-43.17	H	79.1
3346.40	-93.92	6.89	-87.03	H	122.9
4183.00	-92.08	7.43	-84.65	H	120.5
5019.60	-90.77	8.35	-82.42	H	118.3

Table 6-9. Radiated Spurious Data (Cellular GSM Mode – Ch. 190)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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Cellular GSM Radiated Measurements (Cont'd)

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	848.80	MHz		
CHANNEL:	251			
MEASURED OUTPUT POWER:	35.890	dBm	=	3.882 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	48.89	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1697.60	-42.08	6.09	-35.99	H	71.9
2546.40	-30.97	6.57	-24.40	H	60.3
3395.20	-93.79	6.91	-86.88	H	122.8
4244.00	-92.28	7.65	-84.63	H	120.5
5092.80	-90.42	8.33	-82.09	H	118.0

Table 6-10. Radiated Spurious Data (Cellular GSM Mode – Ch. 251)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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6.5 Cellular WCDMA Radiated Measurements

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	826.40	MHz		
CHANNEL:	4132			
MEASURED OUTPUT POWER:	28.510	dBm	=	0.710 W
MODULATION SIGNAL:	WCDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	41.51	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1652.80	-56.12	6.08	-50.04	H	78.5
2479.20	-57.57	6.54	-51.04	H	79.5
3305.60	-94.03	6.88	-87.15	H	115.7
4132.00	-91.91	7.25	-84.66	H	113.2
4958.40	-91.04	8.37	-82.67	H	111.2

Table 6-11. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4132)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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Cellular WCDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.60	MHz		
CHANNEL:	4183			
MEASURED OUTPUT POWER:	28.510	dBm	=	0.710 W
MODULATION SIGNAL:	WCDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	41.51	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1673.20	-54.23	6.09	-48.14	H	76.7
2509.80	-53.55	6.55	-46.99	H	75.5
3346.40	-93.94	6.89	-87.05	H	115.6
4183.00	-92.05	7.40	-84.65	H	113.2
5019.60	-90.81	8.35	-82.46	H	111.0

Table 6-12. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4183)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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Cellular WCDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	846.60	MHz		
CHANNEL:	4233			
MEASURED OUTPUT POWER:	28.510	dBm	=	0.710 W
MODULATION SIGNAL:	WCDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	41.51	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1693.20	-56.71	6.09	-50.62	H	79.1
2539.80	-62.90	6.57	-56.33	H	84.8
3386.40	-93.81	6.91	-86.91	H	115.4
4233.00	-92.25	7.62	-84.63	H	113.1
5079.60	-90.49	8.33	-82.15	H	110.7

Table 6-13. Radiated Spurious Data (Cellular WCDMA Mode – Ch. 4233)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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6.6 Cellular CDMA Radiated Measurements

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	824.70	MHz		
CHANNEL:	1013			
MEASURED OUTPUT POWER:	27.700	dBm	=	0.589 W
MODULATION SIGNAL:	CDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	40.70	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1649.40	-56.24	6.08	-50.16	H	77.9
2474.10	-96.68	6.53	-90.15	H	117.8
3298.80	-94.05	6.87	-87.17	H	114.9
4123.50	-91.88	7.21	-84.66	H	112.4
4948.20	-91.08	8.37	-82.71	H	110.4

Table 6-14. 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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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Cellular CDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	836.52	MHz		
CHANNEL:	384			
MEASURED OUTPUT POWER:	27.700	dBm	=	0.589 W
MODULATION SIGNAL:	CDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	40.70	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1673.04	-54.71	6.09	-48.63	H	76.3
2509.56	-96.55	6.55	-90.00	H	117.7
3346.08	-93.92	6.89	-87.03	H	114.7
4182.60	-92.08	7.43	-84.65	H	112.3
5019.12	-90.77	8.35	-82.42	H	110.1

Table 6-15. 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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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Cellular CDMA Radiated Measurements (Cont'd)

§2.1053, 22.917(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	848.31	MHz		
CHANNEL:	777			
MEASURED OUTPUT POWER:	27.700	dBm	=	0.589 W
MODULATION SIGNAL:	CDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	40.70	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBd)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
1696.62	-53.89	6.09	-47.80	H	75.5
2544.93	-96.42	6.57	-89.85	H	117.6
3393.24	-93.80	6.91	-86.89	H	114.6
4241.55	-92.28	7.65	-84.63	H	112.3
5089.86	-90.44	8.33	-82.11	H	109.8

Table 6-16. 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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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6.7 PCS GSM Radiated Measurements

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1850.20	MHz		
CHANNEL:	512			
MEASURED OUTPUT POWER:	30.420	dBm	=	1.102 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	43.42	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3700.40	-50.56	9.02	-41.54	V	72.0
5550.60	-40.58	10.40	-30.18	V	60.6
7400.80	-82.55	10.50	-72.05	V	102.5
9251.00	-75.52	11.85	-63.68	V	94.1
11101.20	-75.34	12.76	-62.58	V	93.0

Table 6-17. Radiated Spurious Data (PCS GSM Mode – Ch. 512)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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.This unit was tested with its standard battery.

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PCS GSM Radiated Measurements (Cont'd)

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	661			
MEASURED OUTPUT POWER:	30.420	dBm	=	1.102 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	43.42	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-49.45	8.99	-40.46	V	70.9
5640.00	-37.88	10.40	-27.48	V	57.9
7520.00	-82.41	10.62	-71.79	V	102.2
9400.00	-72.76	11.70	-61.06	V	91.5
11280.00	-75.44	12.69	-62.76	V	93.2

Table 6-18. Radiated Spurious Data (PCS GSM Mode – Ch. 661)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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PCS GSM Radiated Measurements (Cont'd)

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1909.80	MHz		
CHANNEL:	810			
MEASURED OUTPUT POWER:	30.420	dBm	=	1.102 W
MODULATION SIGNAL:	GSM (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	43.42	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3819.60	-48.76	8.97	-39.79	V	70.2
5729.40	-37.90	10.40	-27.50	V	57.9
7639.20	-82.09	10.71	-71.37	V	101.8
9549.00	-71.08	11.64	-59.44	V	89.9
11458.80	-75.55	12.62	-62.93	V	93.4

Table 6-19. Radiated Spurious Data (PCS GSM Mode – Ch. 810)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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6.8 PCS WCDMA Radiated Measurements

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1852.40	MHz		
CHANNEL:	9262			
MEASURED OUTPUT POWER:	23.400	dBm	=	0.219 W
MODULATION SIGNAL:	WCDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	36.40	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3704.80	-48.23	9.01	-39.22	V	62.6
5557.20	-48.74	10.40	-38.34	V	61.7
7409.60	-82.55	10.51	-72.03	V	95.4
9262.00	-75.32	11.83	-63.48	V	86.9
11114.40	-75.35	12.75	-62.59	V	86.0

Table 6-20. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9262)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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PCS WCDMA Radiated Measurements (Cont'd)

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	9400			
MEASURED OUTPUT POWER:	23.400	dBm	=	0.219 W
MODULATION SIGNAL:	WCDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	36.40	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-41.65	8.99	-32.66	V	56.1
5640.00	-51.28	10.40	-40.88	V	64.3
7520.00	-82.41	10.62	-71.79	V	95.2
9400.00	-72.76	11.70	-61.06	V	84.5
11280.00	-75.44	12.69	-62.76	V	86.2

Table 6-21. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9400)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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PCS WCDMA Radiated Measurements (Cont'd)

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1907.60	MHz		
CHANNEL:	9538			
MEASURED OUTPUT POWER:	23.400	dBm	=	0.219 W
MODULATION SIGNAL:	WCDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	36.40	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3815.20	-36.58	8.97	-27.61	V	51.0
5722.80	-45.63	10.40	-35.23	V	58.6
7630.40	-82.11	10.71	-71.40	V	94.8
9538.00	-71.05	11.63	-59.41	V	82.8
11445.60	-75.54	12.62	-62.92	V	86.3

Table 6-22. Radiated Spurious Data (PCS WCDMA Mode – Ch. 9538)

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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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6.9 PCS CDMA Radiated Measurements

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1851.25	MHz		
CHANNEL:	25			
MEASURED OUTPUT POWER:	24.430	dBm	=	0.277 W
MODULATION SIGNAL:	CDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	37.43	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3702.50	-44.39	9.02	-35.38	V	59.8
5553.75	-45.72	10.40	-35.32	V	59.8
7405.00	-85.96	10.51	-75.45	V	99.9
9256.25	-85.18	11.84	-73.34	V	97.8
11107.50	-82.75	12.76	-69.99	V	94.4

Table 6-23. 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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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PCS CDMA Radiated Measurements (Cont'd)

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1880.00	MHz		
CHANNEL:	600			
MEASURED OUTPUT POWER:	24.430	dBm	=	0.277 W
MODULATION SIGNAL:	CDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	37.43	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3760.00	-35.84	8.99	-26.84	V	51.3
5640.00	-46.70	10.40	-36.30	V	60.7
7520.00	-85.96	10.62	-75.34	V	99.8
9400.00	-84.96	11.70	-73.26	V	97.7
11280.00	-82.03	12.69	-69.34	V	93.8

Table 6-24. 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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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PCS CDMA Radiated Measurements (Cont'd)

§2.1053, 24.238(a)

Field Strength of SPURIOUS Radiation

OPERATING FREQUENCY:	1908.75	MHz		
CHANNEL:	1175			
MEASURED OUTPUT POWER:	24.430	dBm	=	0.277 W
MODULATION SIGNAL:	CDMA (Internal)			
DISTANCE:	3	meters		
LIMIT:	43 + 10 $\log_{10}$ (W)	37.43	dBc	

FREQUENCY (MHz)	LEVEL @ ANTENNA TERMINALS (dBm)	SUBSTITUTE ANTENNA GAIN (dBi)	CORRECT GENERATOR LEVEL (dBm)	POL (H/V)	(dBc)
3817.50	-28.78	8.97	-19.81	V	44.2
5726.25	-47.98	10.40	-37.58	V	62.0
7635.00	-40.96	10.71	-30.25	V	54.7
9543.75	-84.76	11.64	-73.12	V	97.6
11452.50	-81.33	12.62	-68.71	V	93.1

Table 6-25. 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 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5 MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. 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 spurious level is recorded. 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 configurations and the highest power is reported in WCDMA mode with HSDPA Active at 12.2 kbps RMC and TPC bits all set to "1" and in GSM mode and using a Power Control Level of "0" in the PCS Band and "5" in the Cellular Band. In 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. This unit was tested with its standard battery.

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6.10 Cellular GSM Frequency Stability Measurements

§2.1055, 22.355

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL: 190

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	836,600,018	18	0.000002
100 %		- 30	836,600,024	24	0.000003
100 %		- 20	836,599,981	-19	-0.000002
100 %		- 10	836,600,022	22	0.000003
100 %		0	836,599,977	-23	-0.000003
100 %		+ 10	836,599,983	-17	-0.000002
100 %		+ 20	836,600,018	18	0.000002
100 %		+ 30	836,600,021	21	0.000003
100 %		+ 40	836,599,984	-16	-0.000002
100 %		+ 50	836,599,982	-18	-0.000002
115 %	4.26	+ 20	836,599,974	-26	-0.000003
BATT. ENDPOINT	3.40	+ 20	836,599,969	-31	-0.000004

Table 6-26. Frequency Stability Data (Cellular GSM Mode – Ch. 190)

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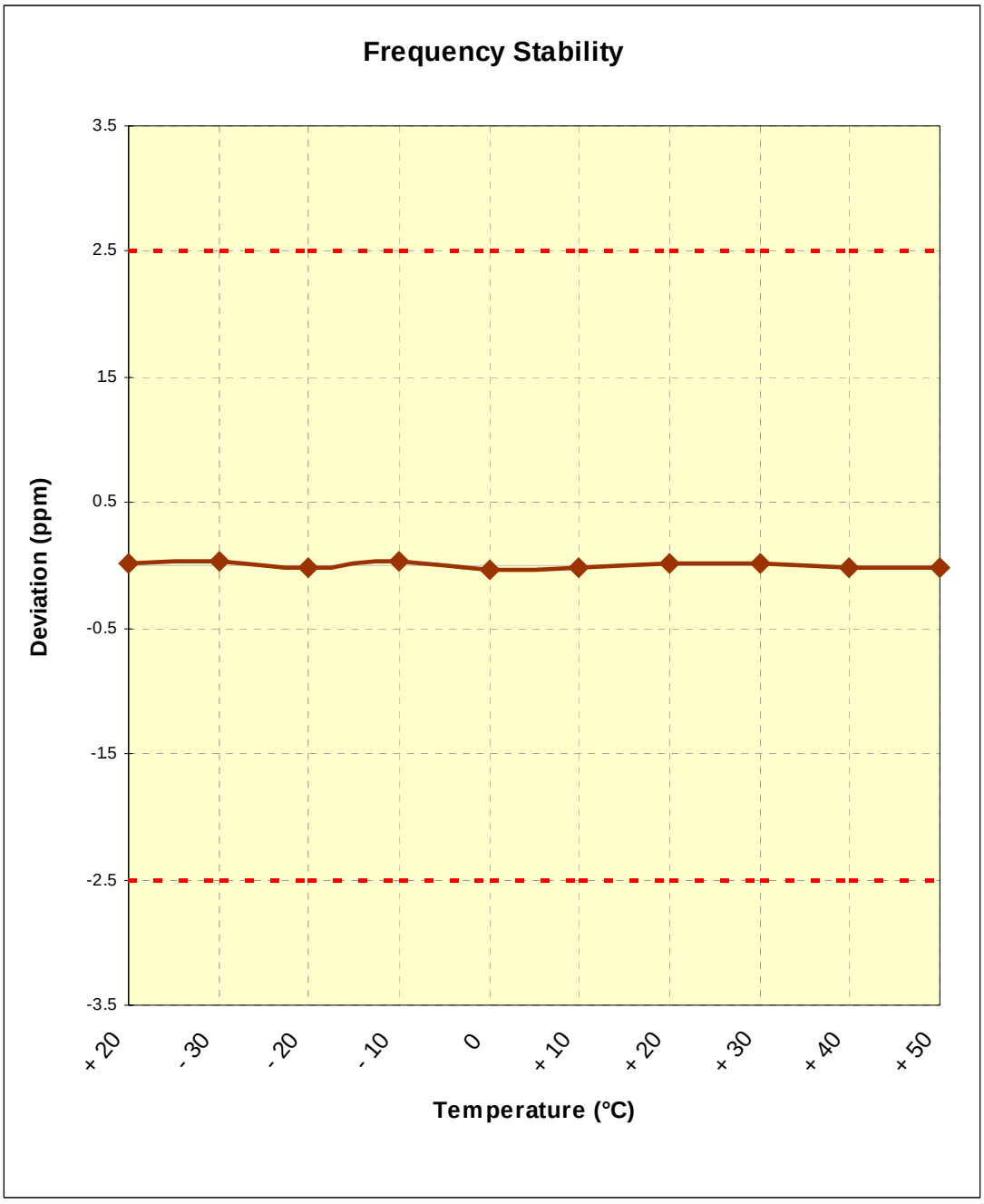
Cellular GSM Frequency Stability Measurements (Cont'd)
§2.1055, 22.355



Plot 6-1. Frequency Stability Graph (Cellular GSM Mode – Ch. 190)

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6.11 Cellular WCDMA Frequency Stability Measurements

§2.1055, 22.355

OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL: 4183

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	836,599,981	-19	-0.000002
100 %		- 30	836,599,973	-27	-0.000003
100 %		- 20	836,599,985	-15	-0.000002
100 %		- 10	836,599,978	-22	-0.000003
100 %		0	836,599,965	-35	-0.000004
100 %		+ 10	836,599,988	-12	-0.000001
100 %		+ 20	836,599,981	-19	-0.000002
100 %		+ 30	836,599,978	-22	-0.000003
100 %		+ 40	836,599,974	-26	-0.000003
100 %		+ 50	836,600,017	17	0.000002
115 %	4.26	+ 20	836,599,972	-28	-0.000003
BATT. ENDPOINT	3.40	+ 20	836,599,967	-33	-0.000004

Table 6-27. Frequency Stability Data (Cellular WCDMA Mode – Ch. 4183)

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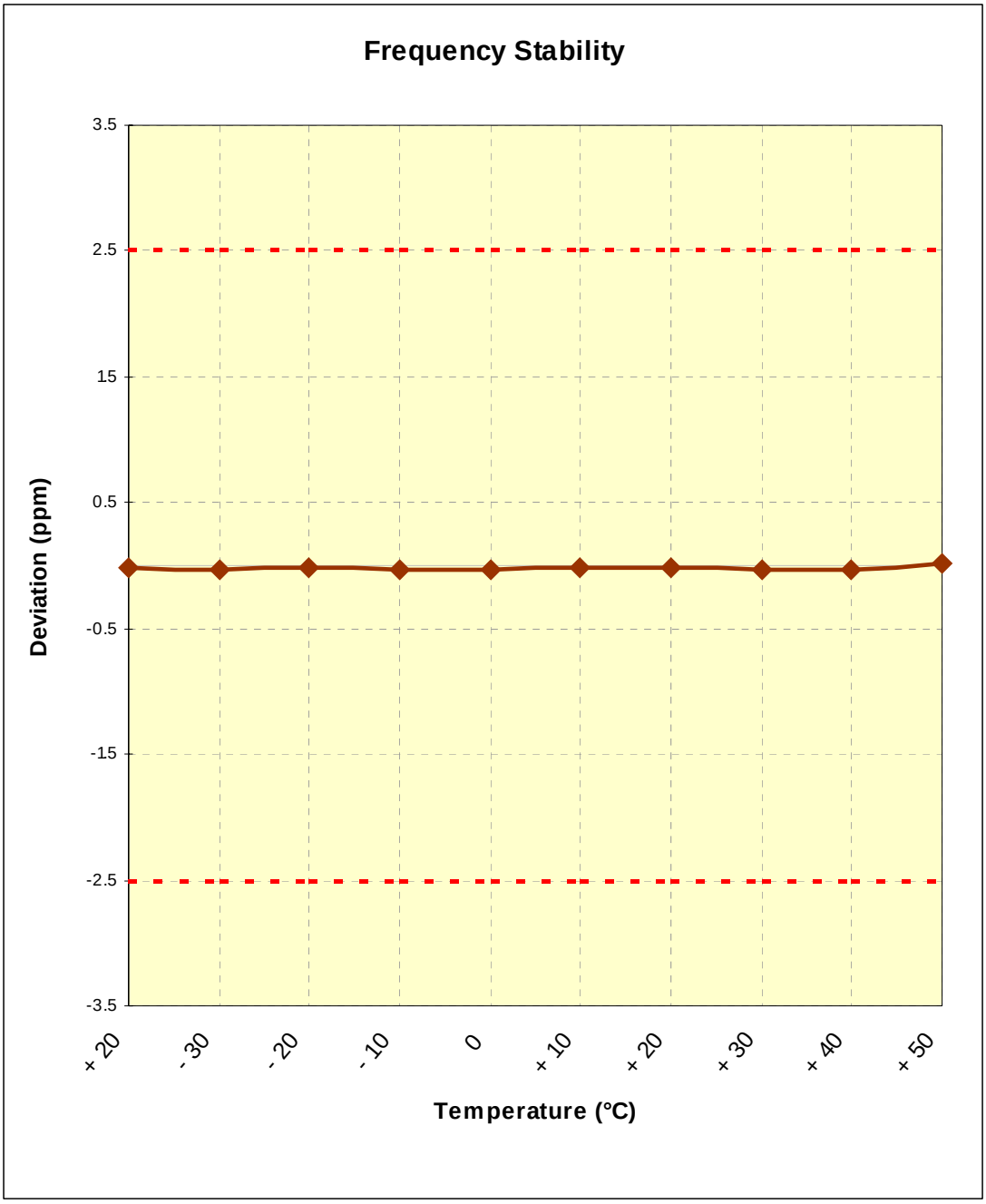
Cellular WCDMA Frequency Stability Measurements (Cont'd)

§2.1055, 22.355



Plot 6-2. Frequency Stability Graph (Cellular WCDMA Mode – Ch. 4183)

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6.12 Cellular CDMA Frequency Stability Measurements

§2.1055, 22.355

OPERATING FREQUENCY: 836,520,000 Hz

CHANNEL: 384

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	836,520,021	21	0.000003
100 %		- 30	836,519,983	-17	-0.000002
100 %		- 20	836,519,975	-25	-0.000003
100 %		- 10	836,519,973	-27	-0.000003
100 %		0	836,519,988	-12	-0.000001
100 %		+ 10	836,519,972	-28	-0.000003
100 %		+ 20	836,520,021	21	0.000003
100 %		+ 30	836,519,983	-17	-0.000002
100 %		+ 40	836,519,981	-19	-0.000002
100 %		+ 50	836,519,986	-14	-0.000002
115 %	4.26	+ 20	836,519,972	-28	-0.000003
BATT. ENDPOINT	3.40	+ 20	836,519,962	-38	-0.000005

Table 6-28. Frequency Stability Data (Cellular CDMA Mode – Ch. 384)

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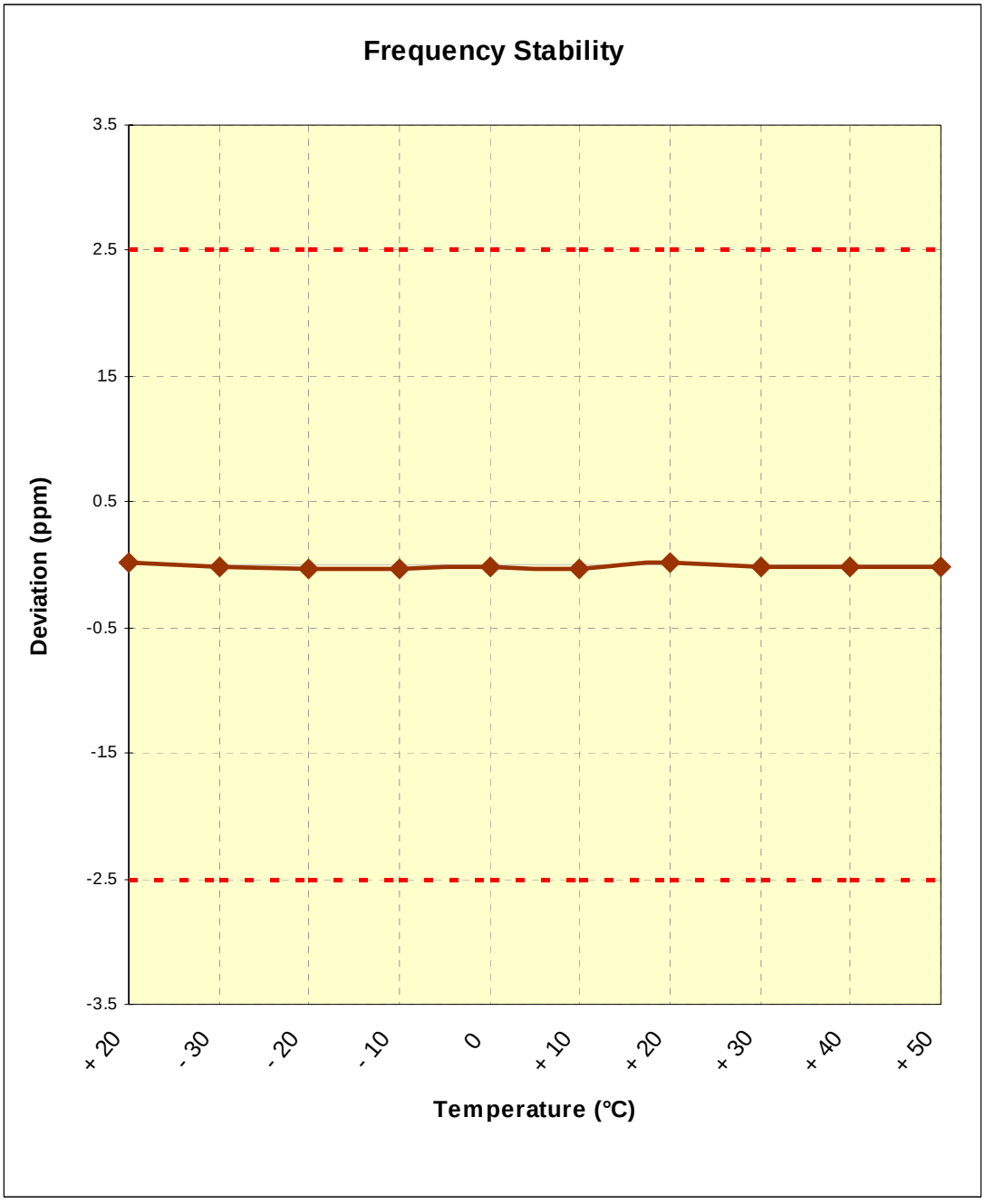
Cellular CDMA Frequency Stability Measurements (Cont'd)

§2.1055, 22.355



Plot 6-3. Frequency Stability Graph (Cellular CDMA Mode – Ch. 384)

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6.13 PCS GSM Frequency Stability Measurements

§2.1055, 24.235

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 661

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,879,999,985	-15	-0.000001
100 %		- 30	1,879,999,988	-12	-0.000001
100 %		- 20	1,879,999,981	-19	-0.000001
100 %		- 10	1,880,000,010	10	0.000001
100 %		0	1,880,000,014	14	0.000001
100 %		+ 10	1,879,999,991	-9	0.000000
100 %		+ 20	1,879,999,985	-15	-0.000001
100 %		+ 30	1,879,999,982	-18	-0.000001
100 %		+ 40	1,879,999,978	-22	-0.000001
100 %		+ 50	1,879,999,981	-19	-0.000001
115 %	4.26	+ 20	1,879,999,976	-24	-0.000001
BATT. ENDPOINT	3.40	+ 20	1,879,999,968	-32	-0.000002

Table 6-29. Frequency Stability Data (PCS GSM Mode – Ch. 661)

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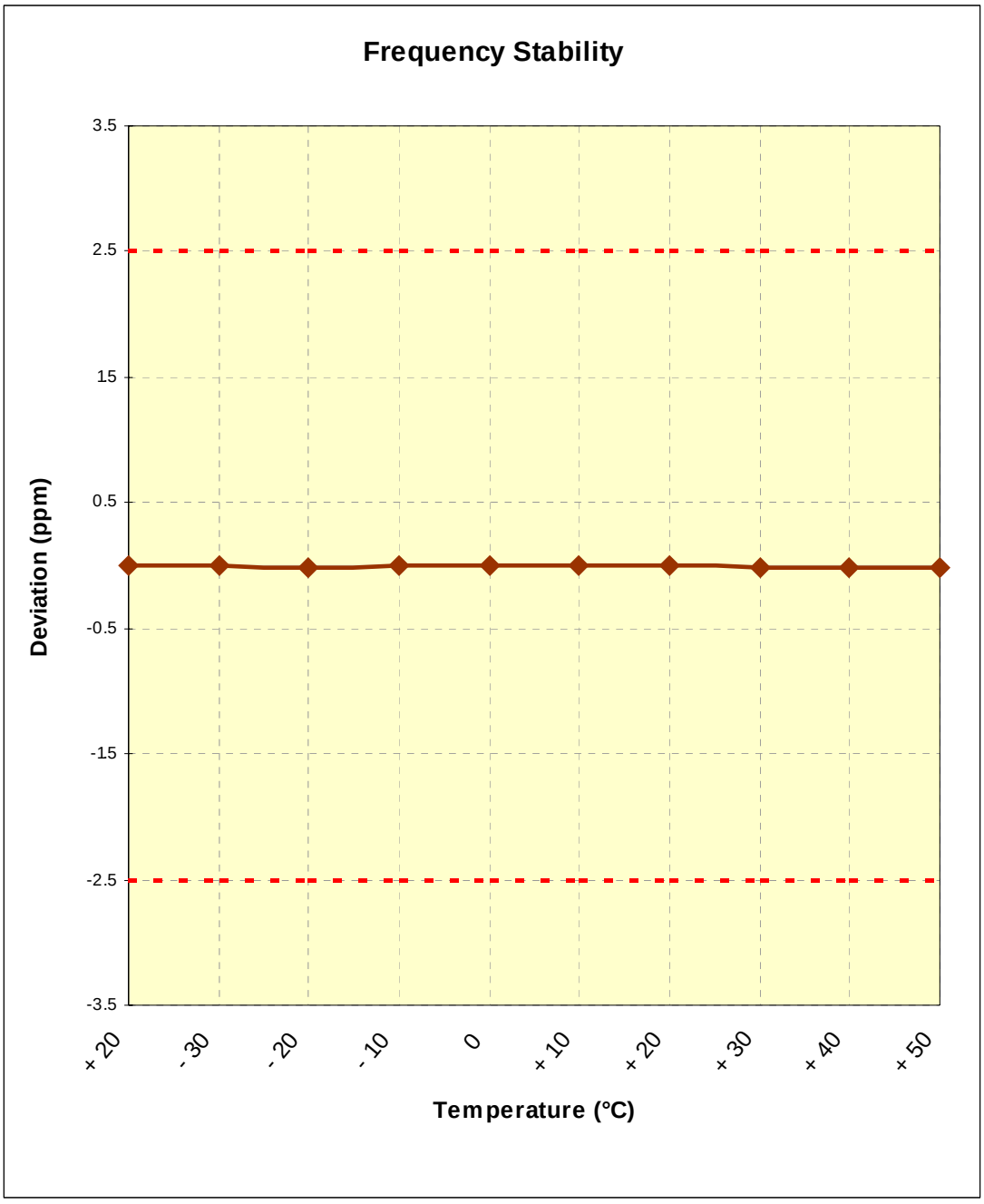
PCS GSM Frequency Stability Measurements (Cont'd)

§2.1055, 24.235



Plot 6-4. Frequency Stability Graph (PCS GSM Mode – Ch. 661)

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6.14 PCS WCDMA Frequency Stability Measurements

§2.1055, 24.235

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 9400

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,879,999,978	-22	-0.000001
100 %		- 30	1,879,999,987	-13	-0.000001
100 %		- 20	1,879,999,976	-24	-0.000001
100 %		- 10	1,879,999,983	-17	-0.000001
100 %		0	1,879,999,989	-11	-0.000001
100 %		+ 10	1,880,000,010	10	0.000001
100 %		+ 20	1,879,999,978	-22	-0.000001
100 %		+ 30	1,879,999,986	-14	-0.000001
100 %		+ 40	1,879,999,971	-29	-0.000002
100 %		+ 50	1,879,999,988	-12	-0.000001
115 %	4.26	+ 20	1,879,999,973	-27	-0.000001
BATT. ENDPOINT	3.40	+ 20	1,879,999,961	-39	-0.000002

Table 6-30. Frequency Stability Data (PCS WCDMA Mode – Ch. 9400)

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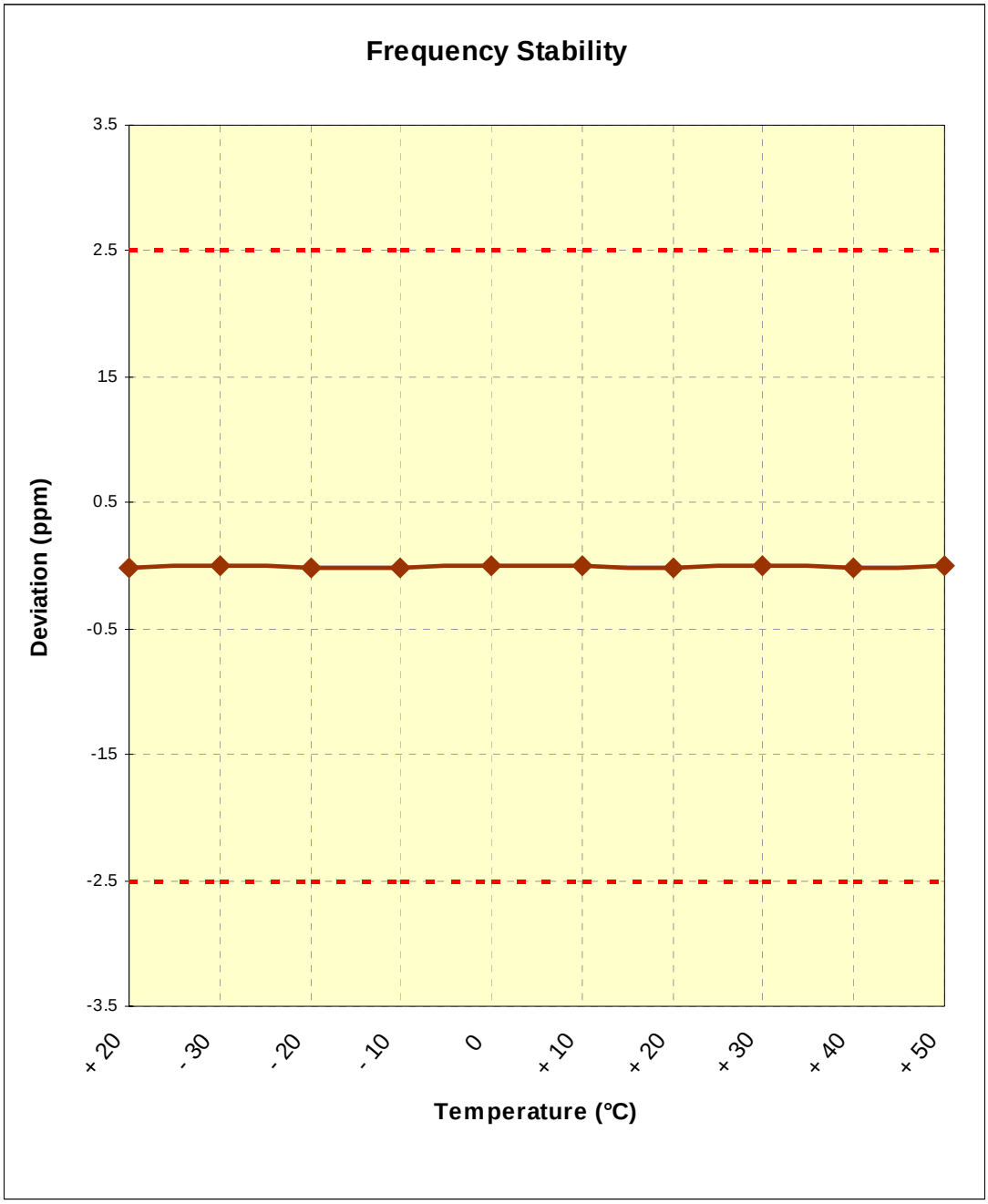
PCS WCDMA Frequency Stability Measurements (Cont'd)

§2.1055, 24.235



Plot 6-5. Frequency Stability Graph (PCS WCDMA Mode – Ch. 9400)

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6.15 PCS CDMA Frequency Stability Measurements

§2.1055, 24.235

OPERATING FREQUENCY: 1,880,000,000 Hz

CHANNEL: 600

REFERENCE VOLTAGE: 3.7 VDC

DEVIATION LIMIT: ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,879,999,982	-18	-0.000001
100 %		- 30	1,880,000,021	21	0.000001
100 %		- 20	1,879,999,984	-16	-0.000001
100 %		- 10	1,879,999,979	-21	-0.000001
100 %		0	1,879,999,981	-19	-0.000001
100 %		+ 10	1,880,000,014	14	0.000001
100 %		+ 20	1,880,000,018	18	0.000001
100 %		+ 30	1,879,999,983	-17	-0.000001
100 %		+ 40	1,879,999,979	-21	-0.000001
100 %		+ 50	1,879,999,981	-19	-0.000001
115 %	4.26	+ 20	1,879,999,971	-29	-0.000002
BATT. ENDPOINT	3.40	+ 20	1,879,999,974	-26	-0.000001

Table 6-31. Frequency Stability Data (PCS CDMA Mode – Ch. 600)

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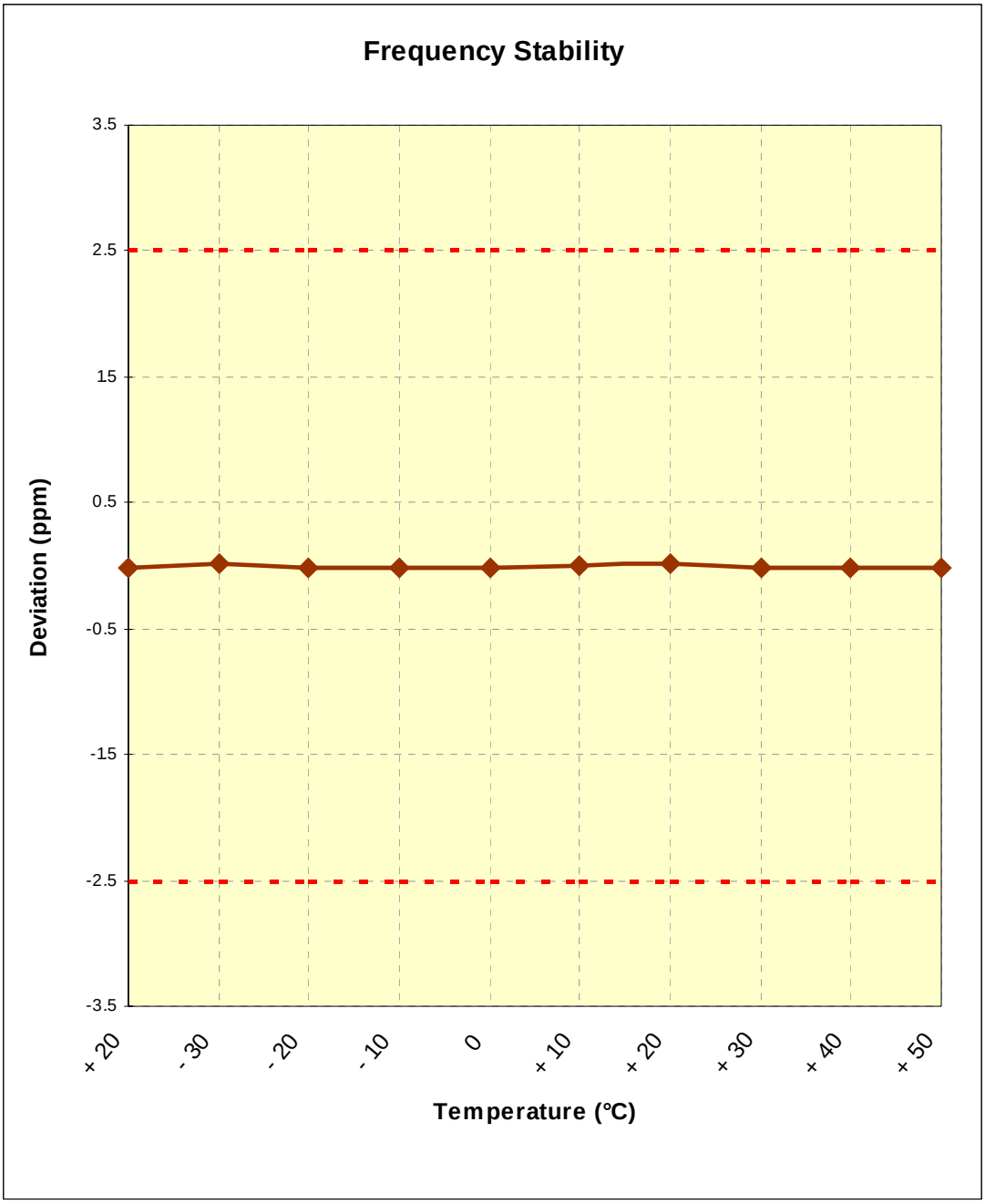
PCS CDMA Frequency Stability Measurements (Cont'd)

§2.1055, 24.235



Plot 6-6. Frequency Stability Graph (PCS CDMA Mode – Ch. 600)

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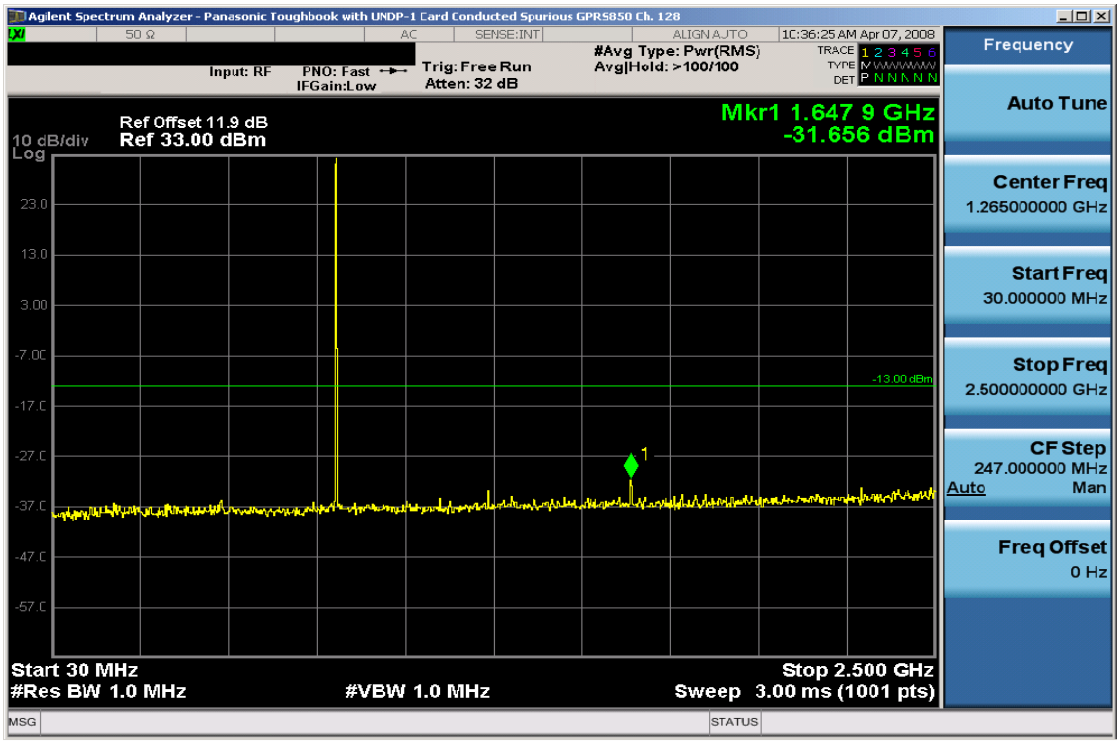
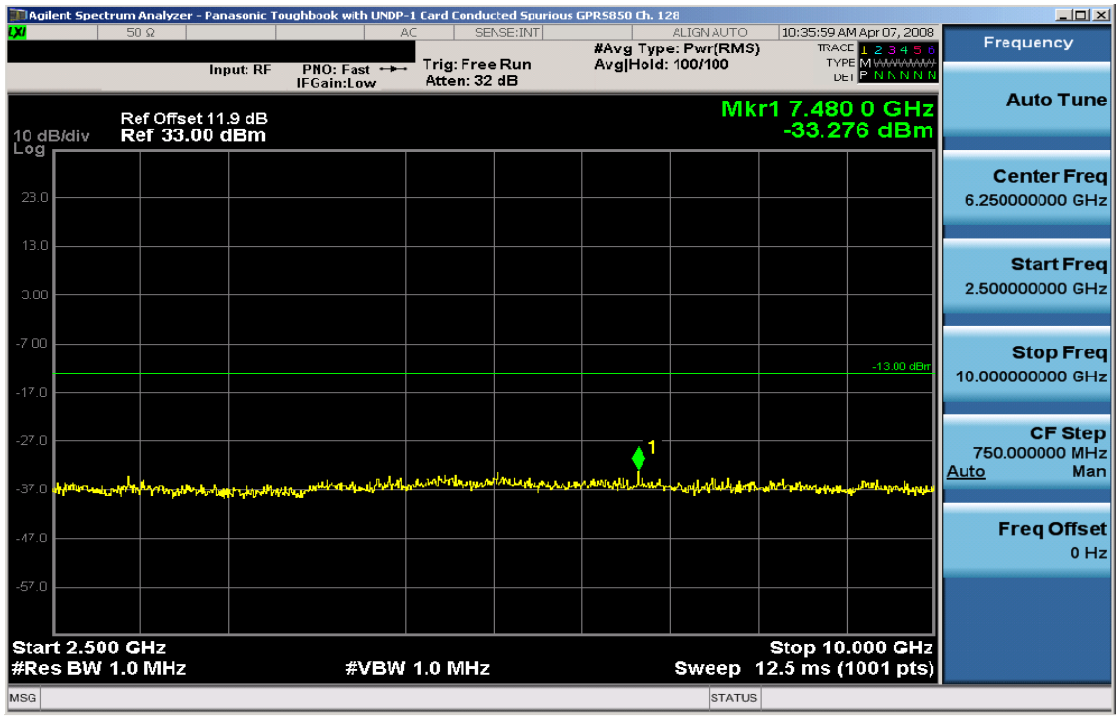
7.0 PLOTS OF EMISSIONS



Plot 7-1. Conducted Spurious Plot (Cellular GSM Mode – Ch. 128)



Plot 7-2. Conducted Spurious Plot (Cellular GSM Mode – Ch. 128)

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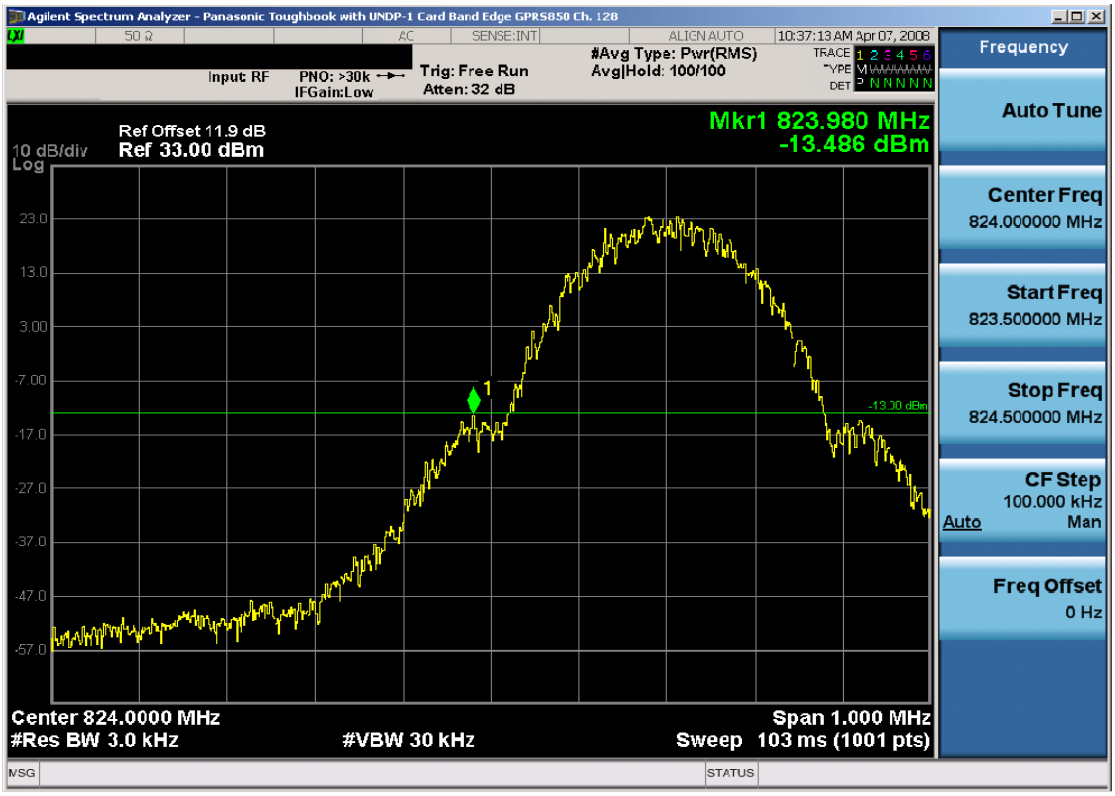
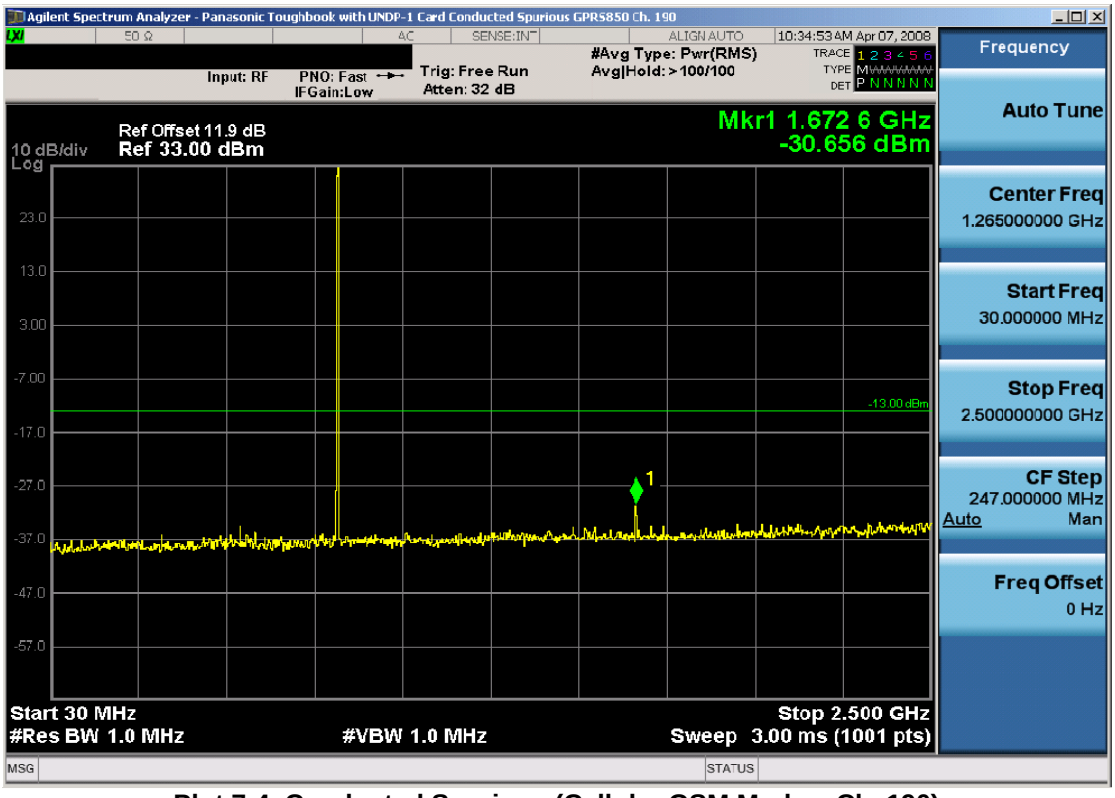


Plot 7-3. Band Edge Plot (Cellular GSM Mode – Ch. 128)



Plot 7-4. Conducted Spurious (Cellular GSM Mode – Ch. 190)

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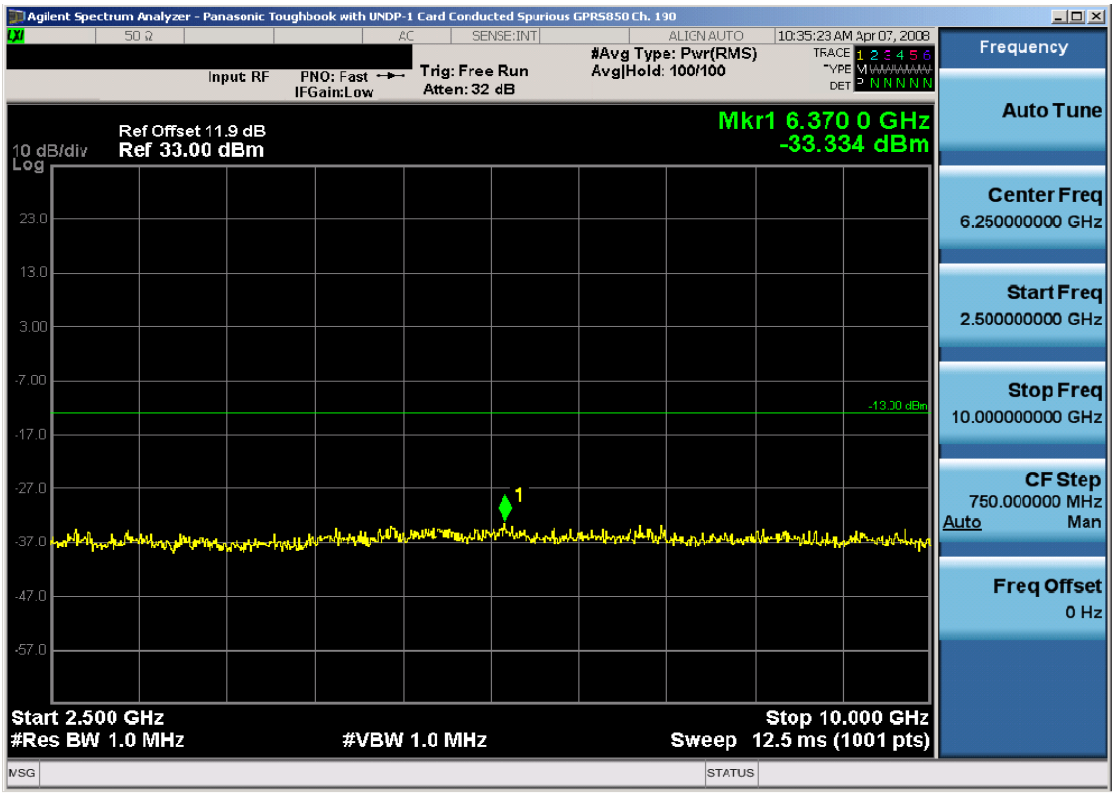
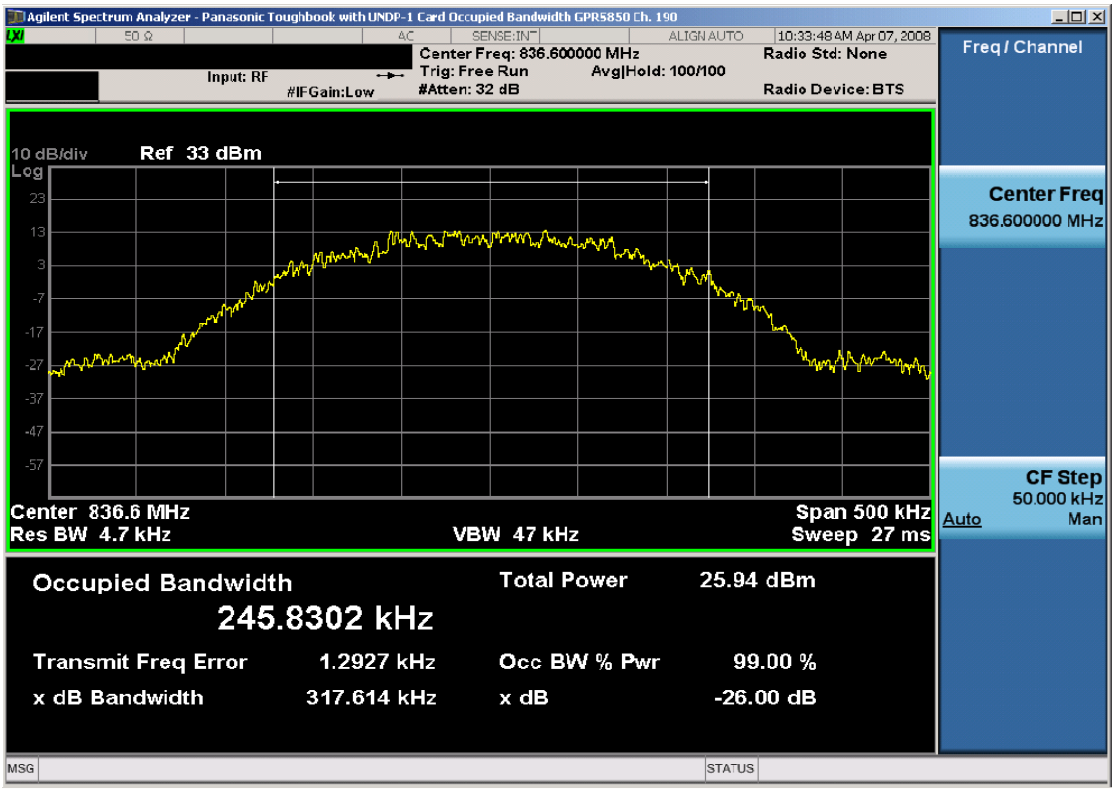


Plot 7-5. Conducted Spurious Plot (Cellular GSM Mode – Ch. 190)



Plot 7-6. Occupied Bandwidth Plot (Cellular GSM Mode – Ch. 190)

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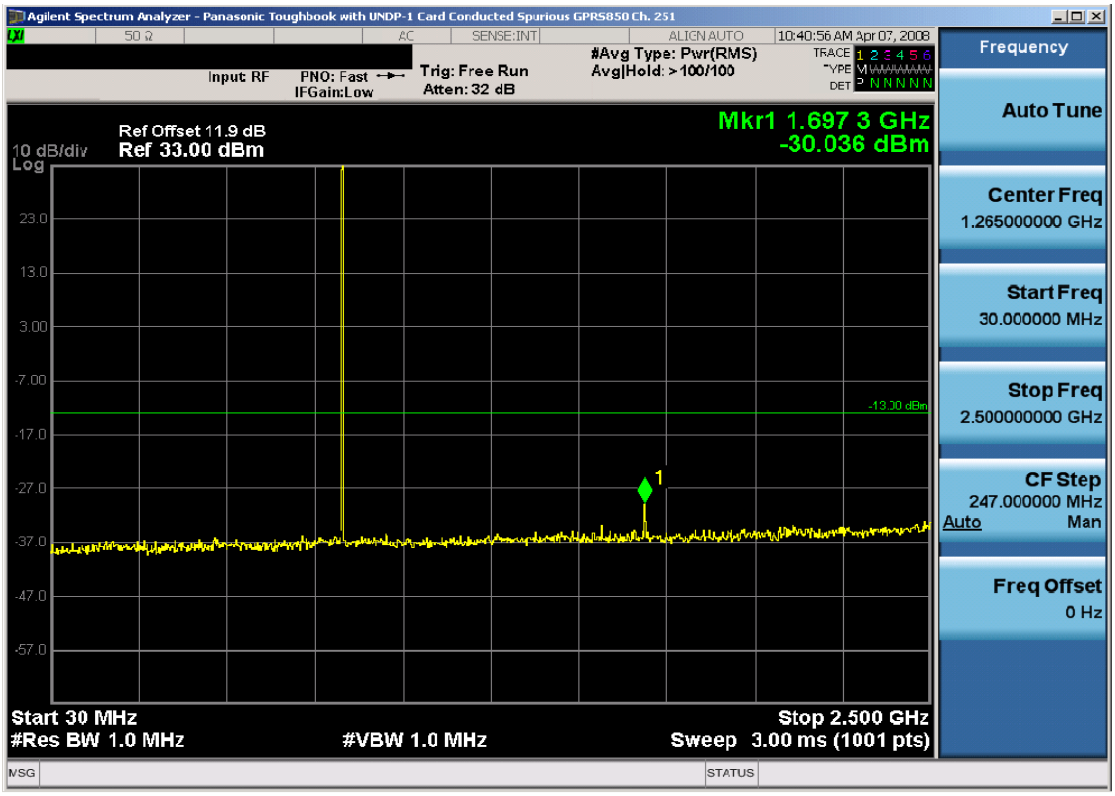
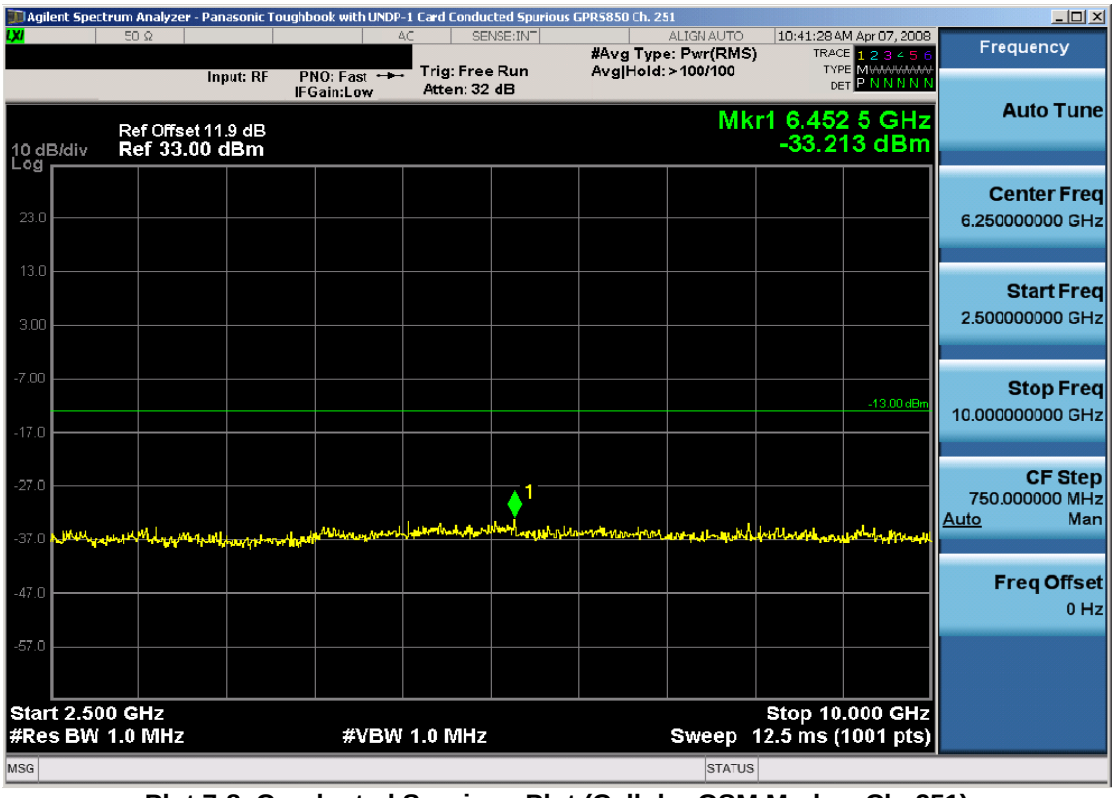


Plot 7-7. Conducted Spurious Plot (Cellular GSM Mode – Ch. 251)



Plot 7-8. Conducted Spurious Plot (Cellular GSM Mode – Ch. 251)

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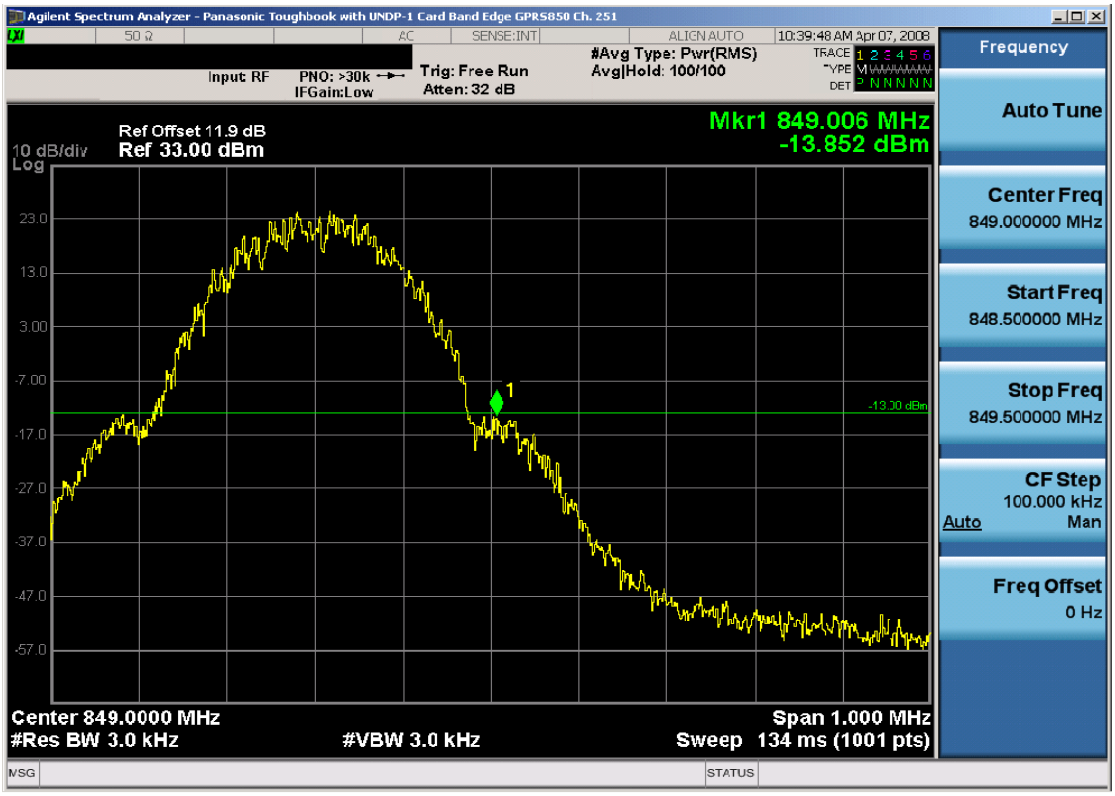
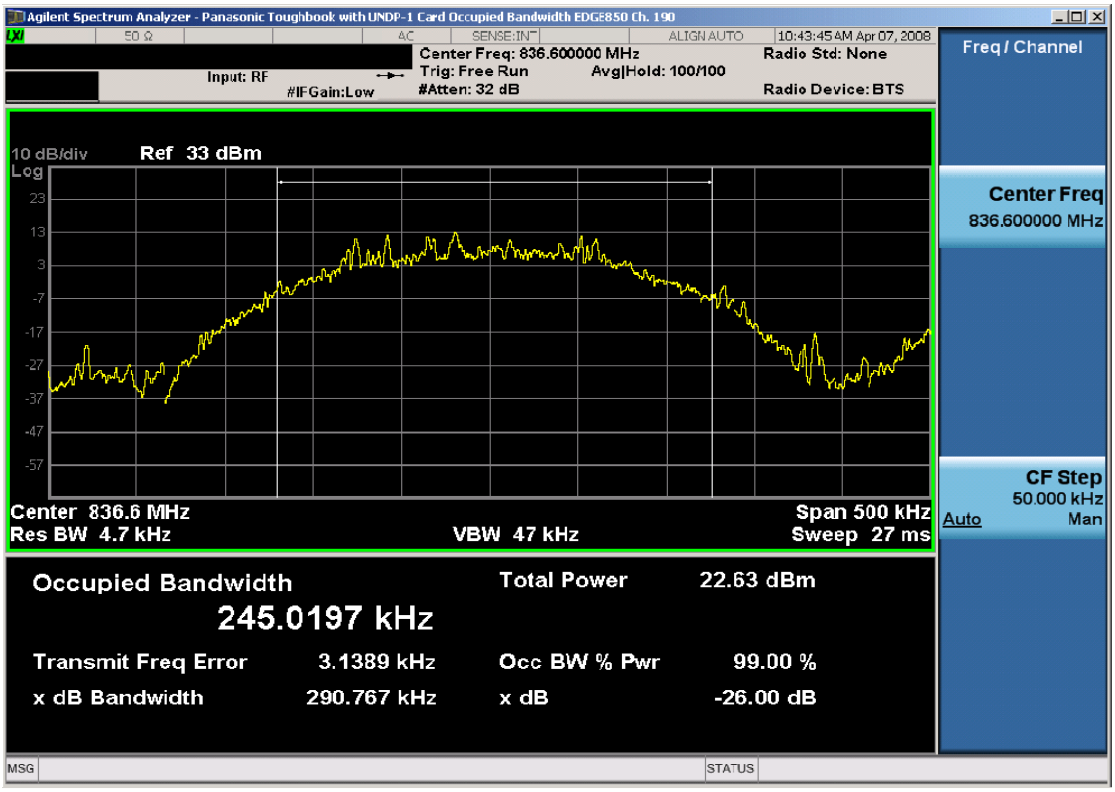


Plot 7-9. Band Edge Plot (Cellular GSM Mode – Ch. 251)



Plot 7-10. Occupied Bandwidth Plot (EDGE850 Mode – Ch. 190)

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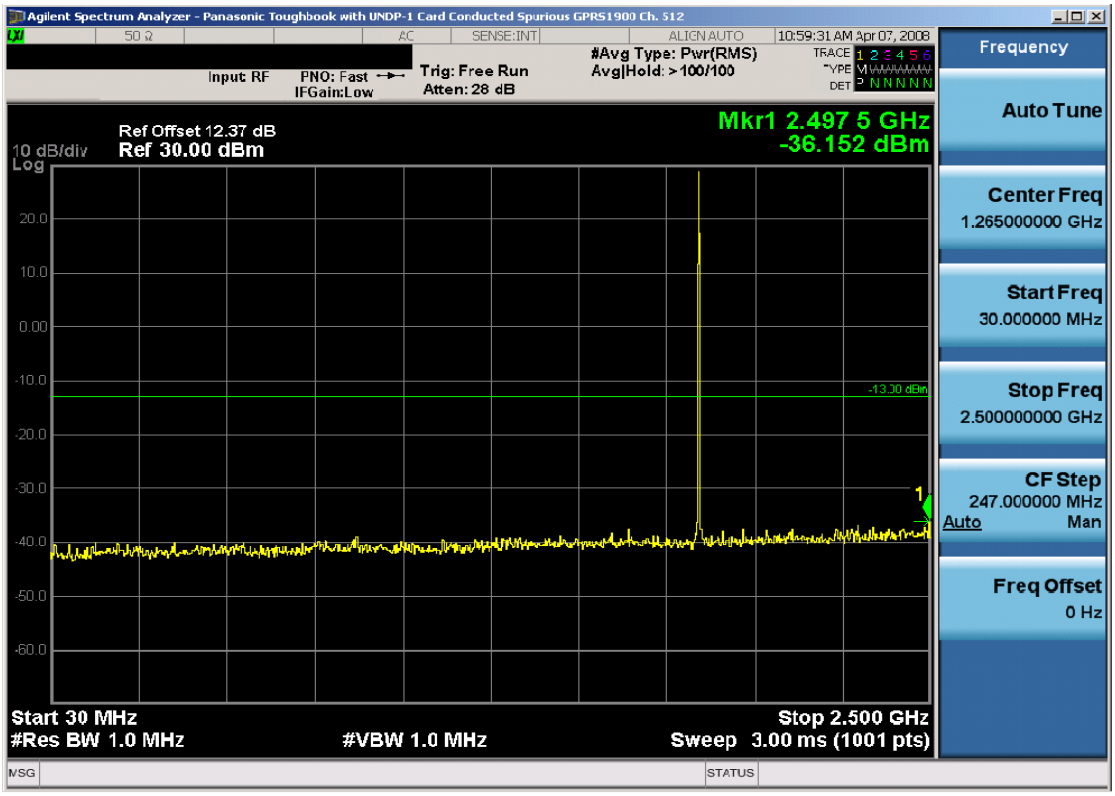

Plot 7-11. Conducted Spurious Plot (PCS GSM Mode – Ch. 512)

Plot 7-12. Conducted Spurious Plot (PCS GSM Mode – Ch. 512)

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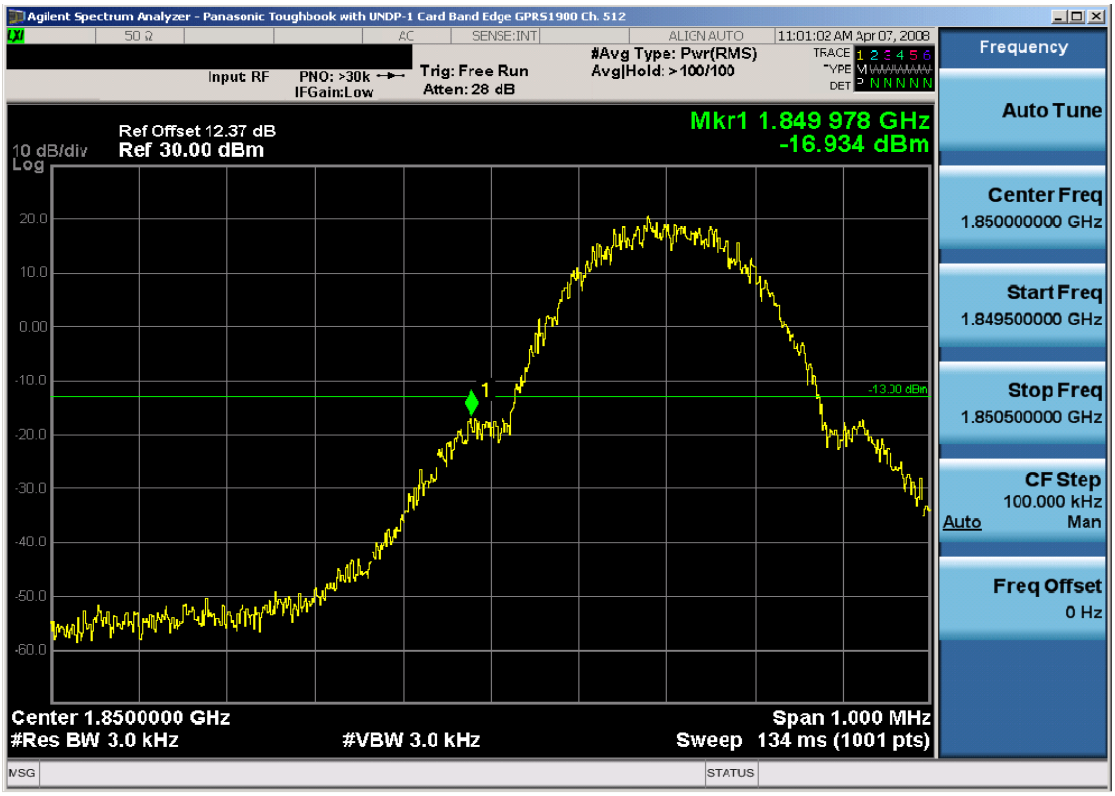
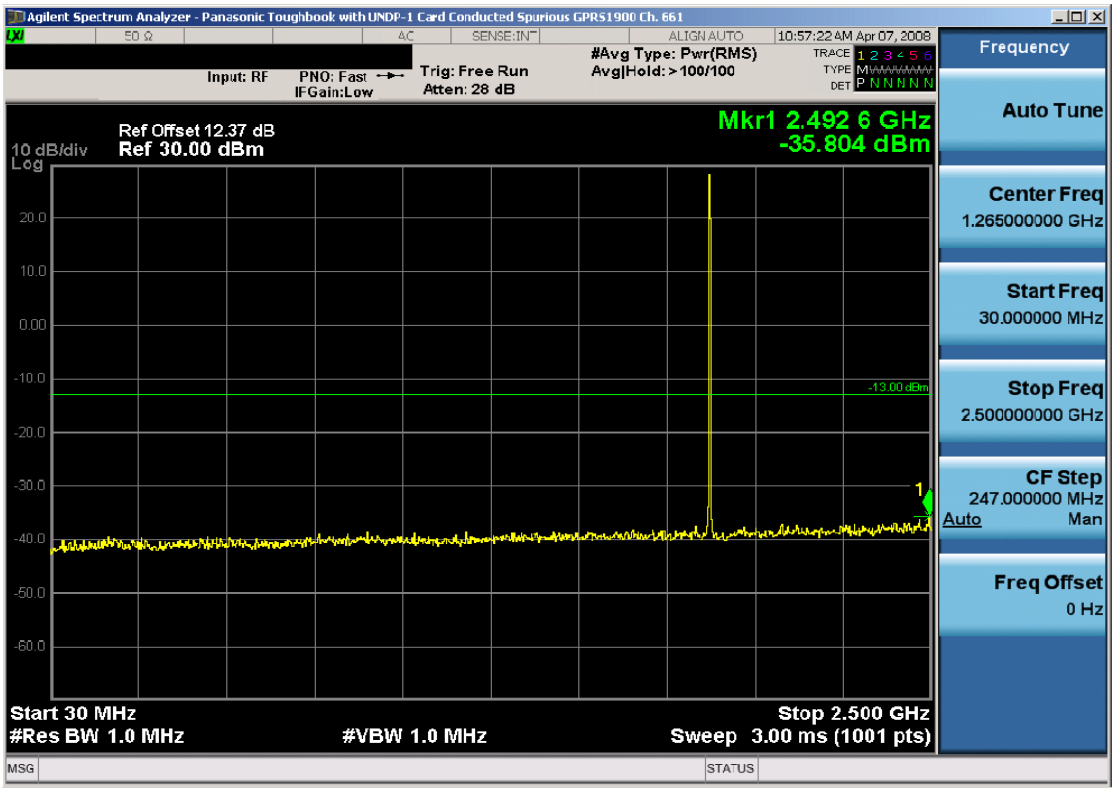


Plot 7-13. Band Edge Plot (PCS GSM Mode – Ch. 512)



Plot 7-14. Conducted Spurious Plot (PCS GSM Mode – Ch. 661)

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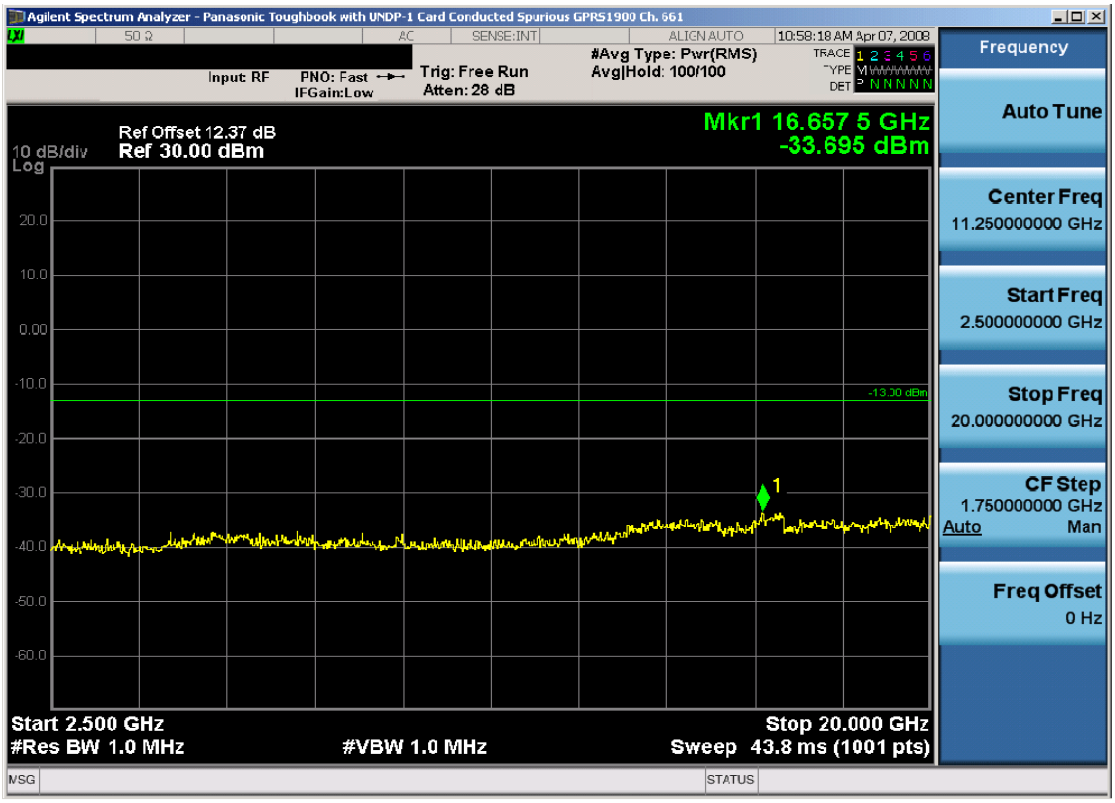
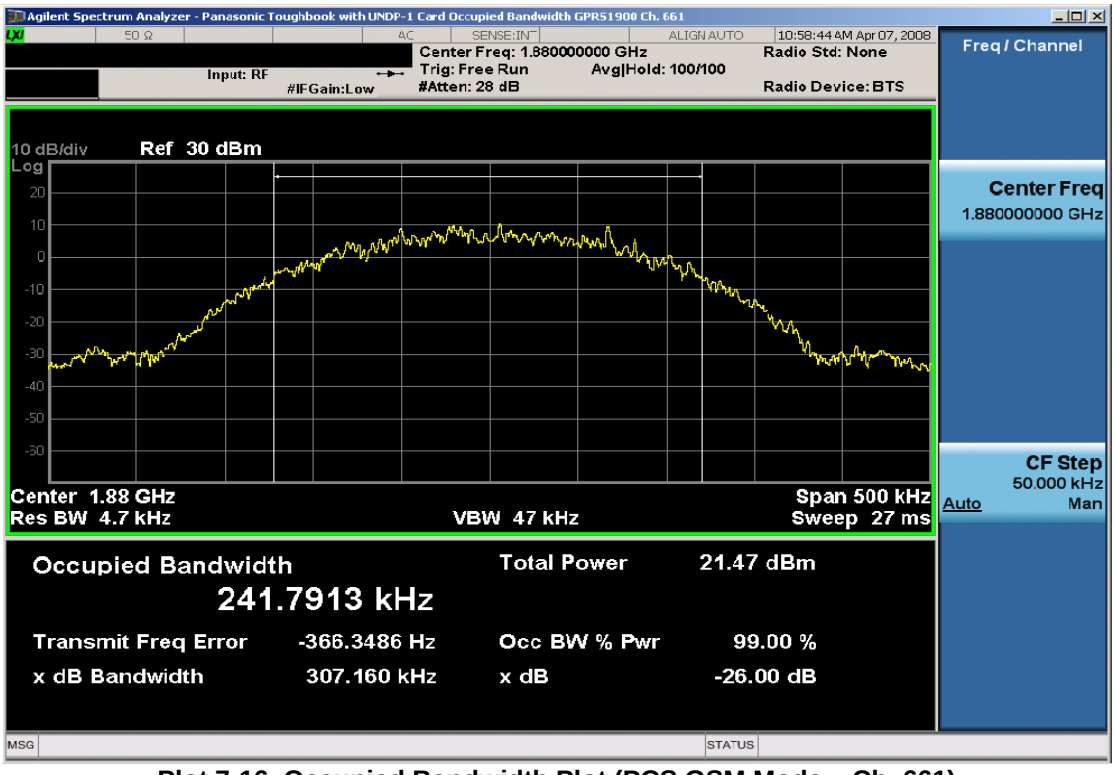


Plot 7-15. Conducted Spurious Plot (PCS GSM Mode – Ch. 661)



Plot 7-16. Occupied Bandwidth Plot (PCS GSM Mode – Ch. 661)

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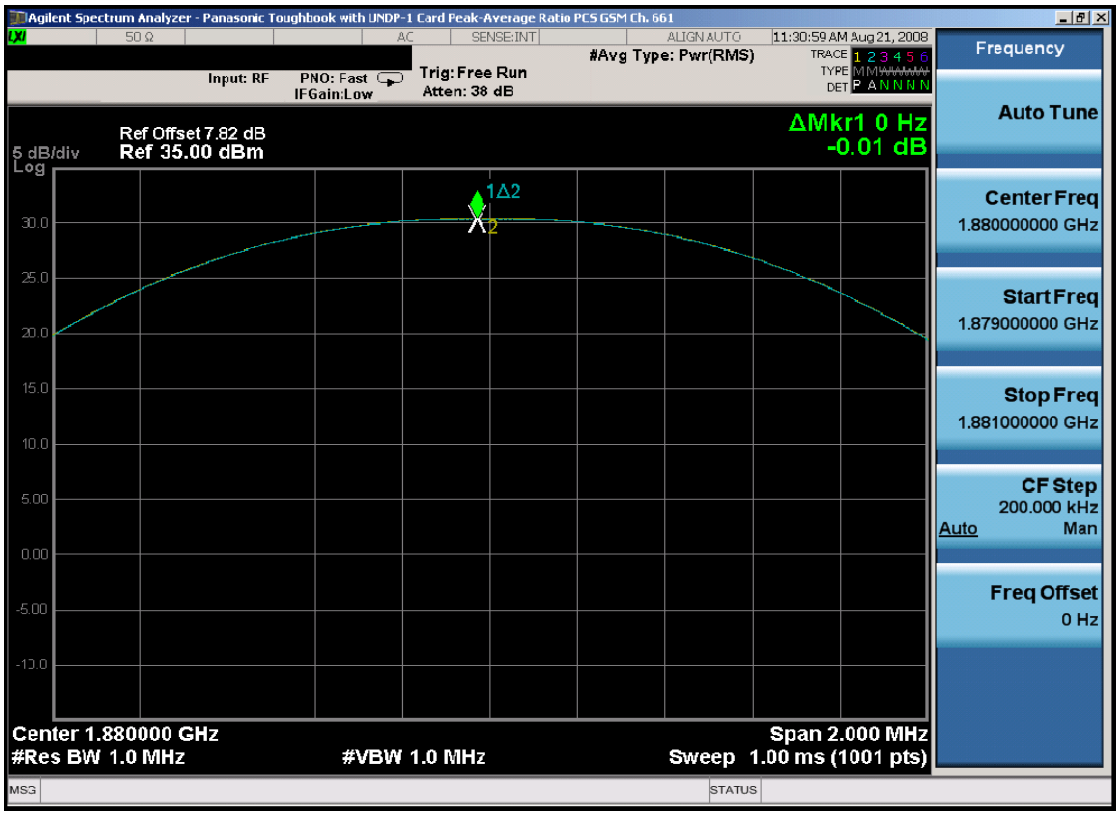
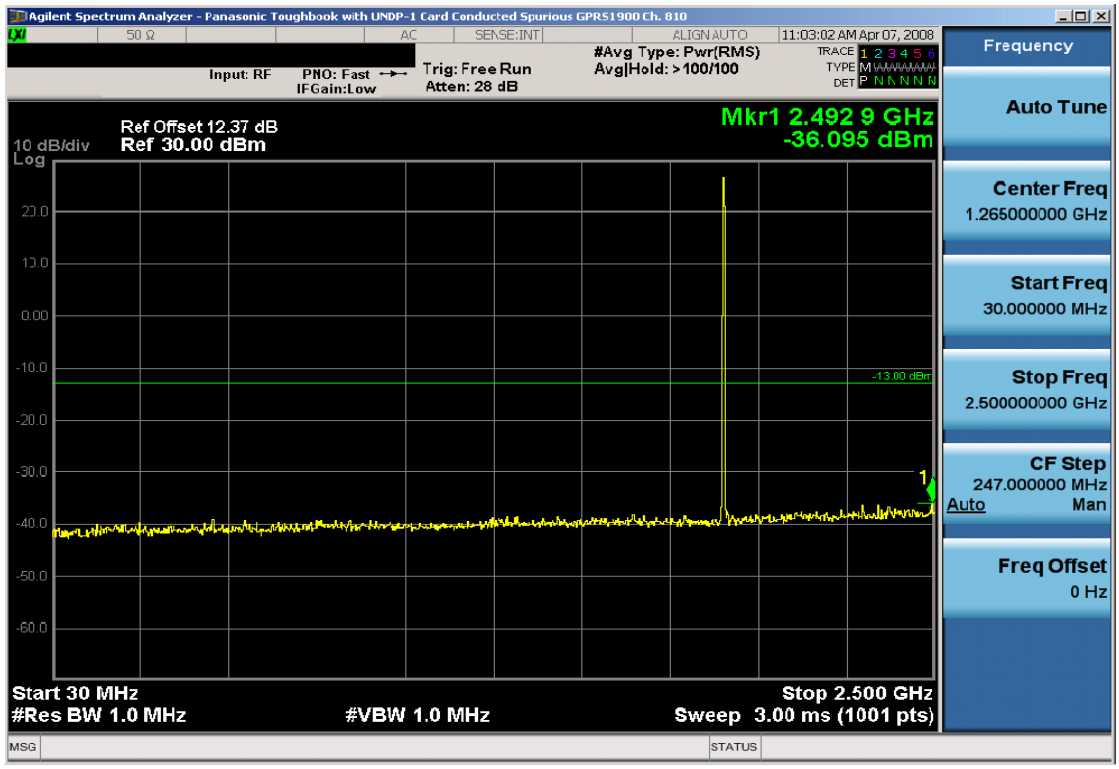


Plot 7-17. Peak-Average Ratio Plot (PCS GSM Mode – Ch. 661)



Plot 7-18. Conducted Spurious Plot (PCS GSM Mode – Ch. 810)

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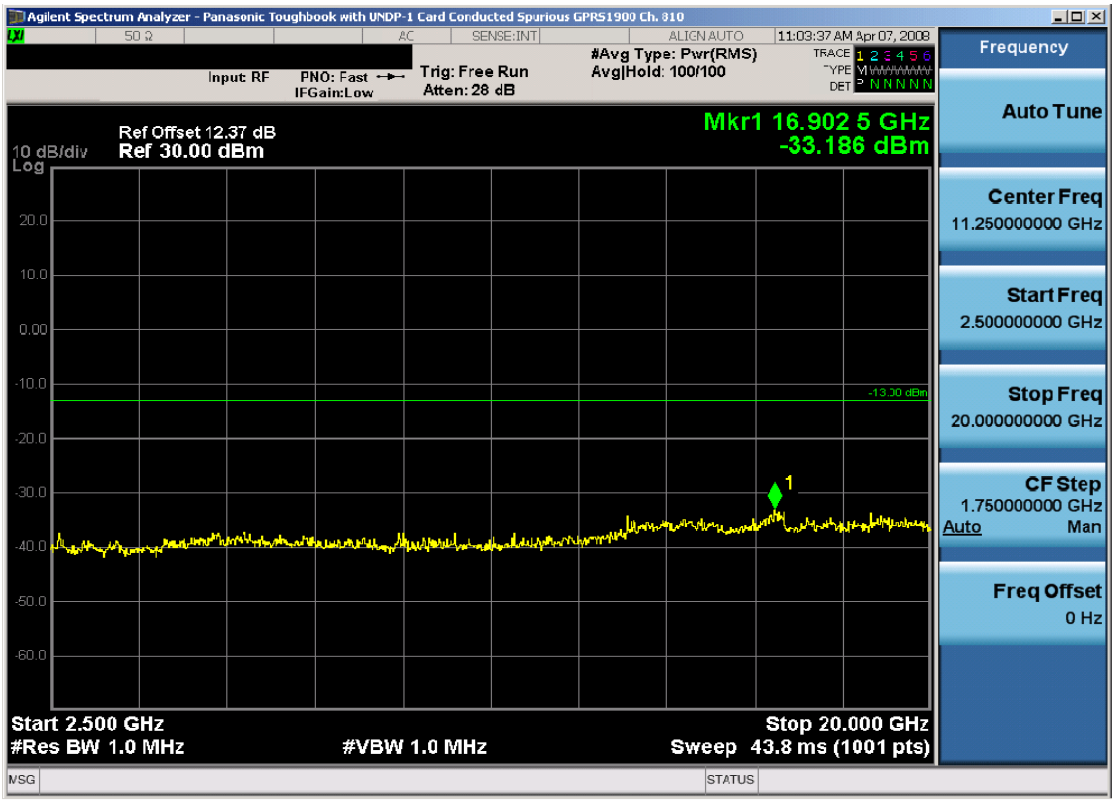
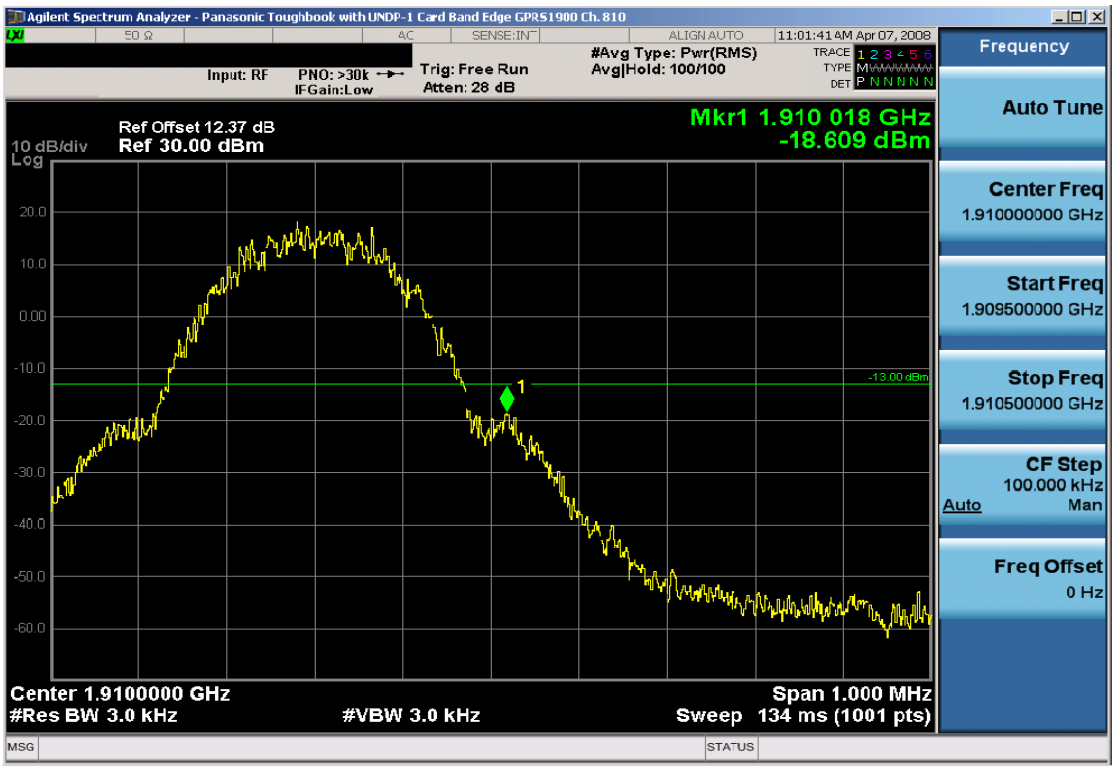


Plot 7-19. Conducted Spurious Plot (PCS GSM Mode – Ch. 810)



Plot 7-20. Band Edge Plot (PCS GSM Mode – Ch. 810)

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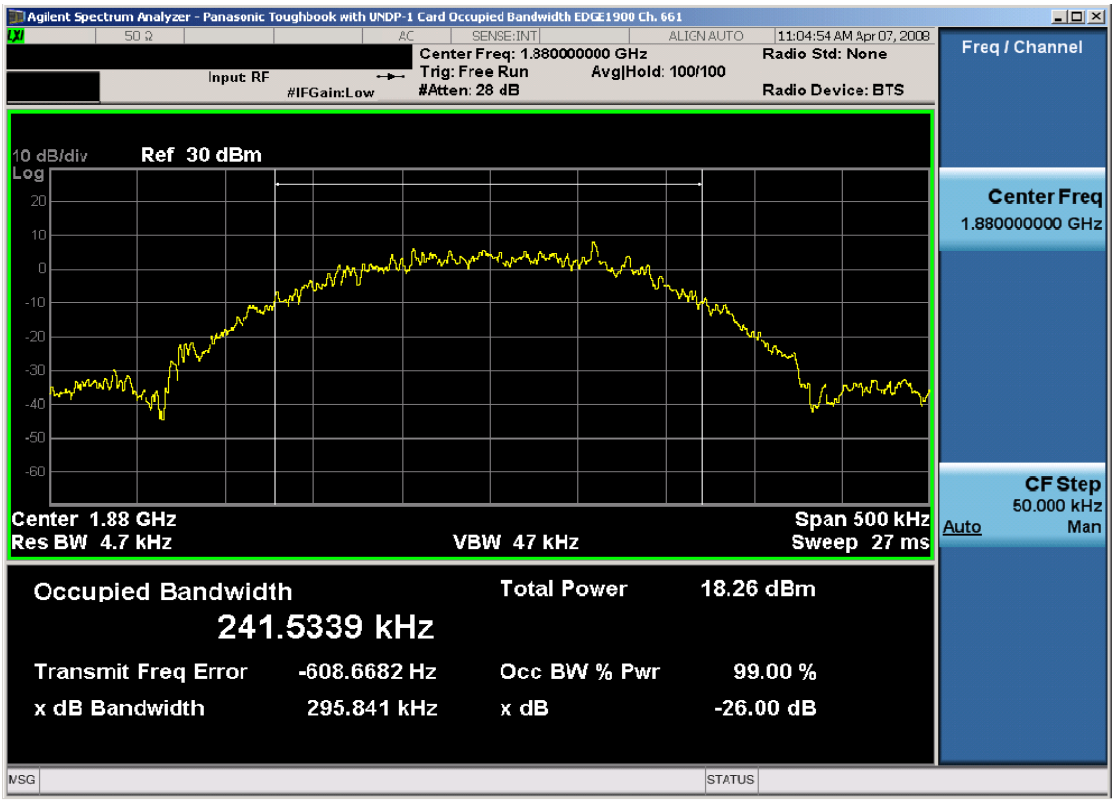
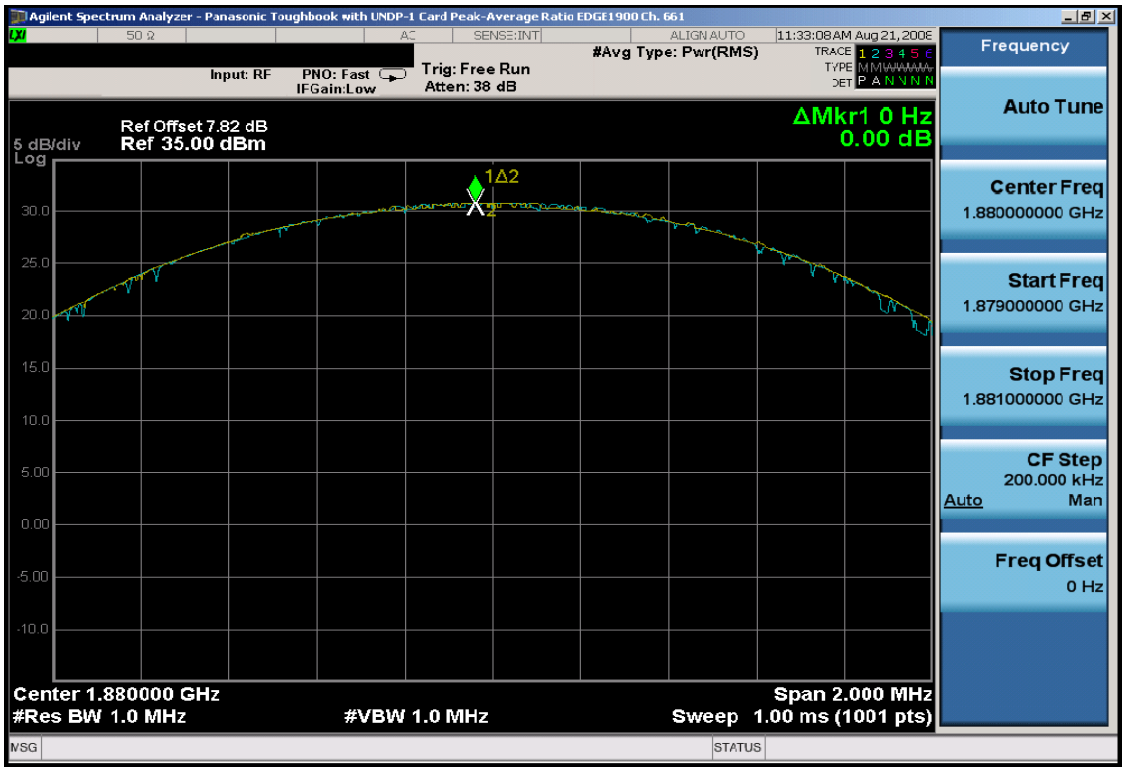


Plot 7-21. Occupied Bandwidth Plot (EDGE1900 Mode – Ch. 661)



Plot 7-22. Peak-Average Ratio Plot (EDGE1900 Mode – Ch. 661)

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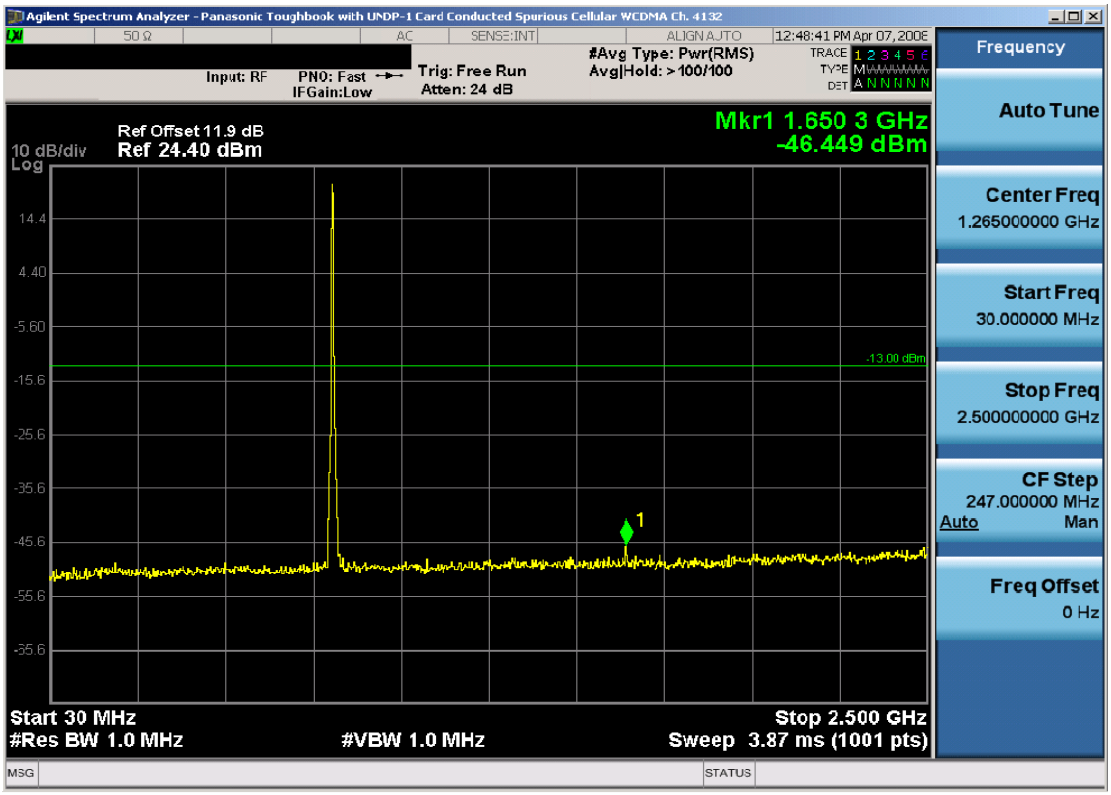
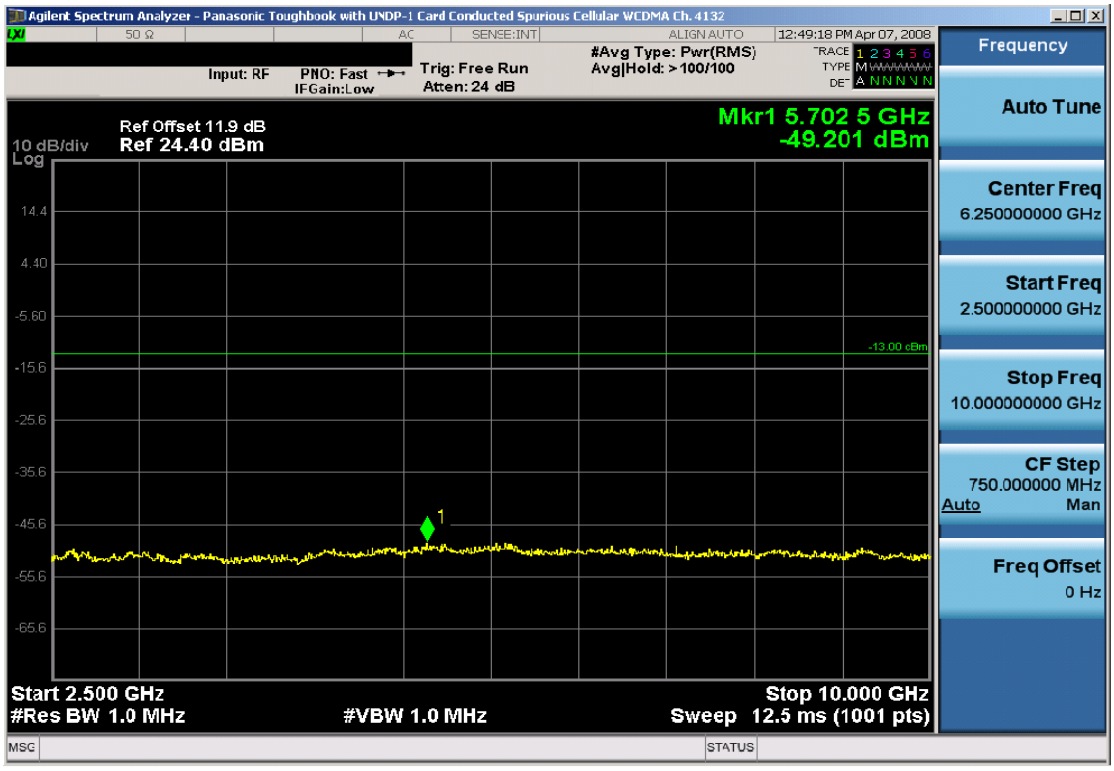


Plot 7-23. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)



Plot 7-24. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4132)

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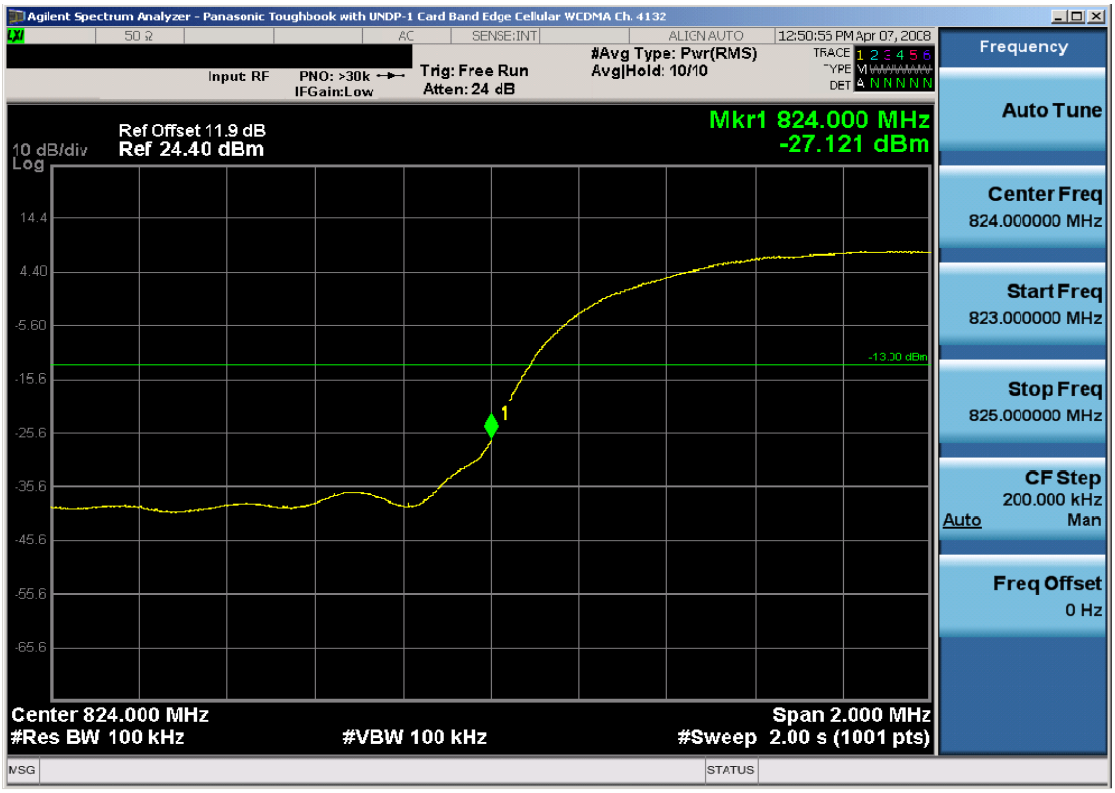
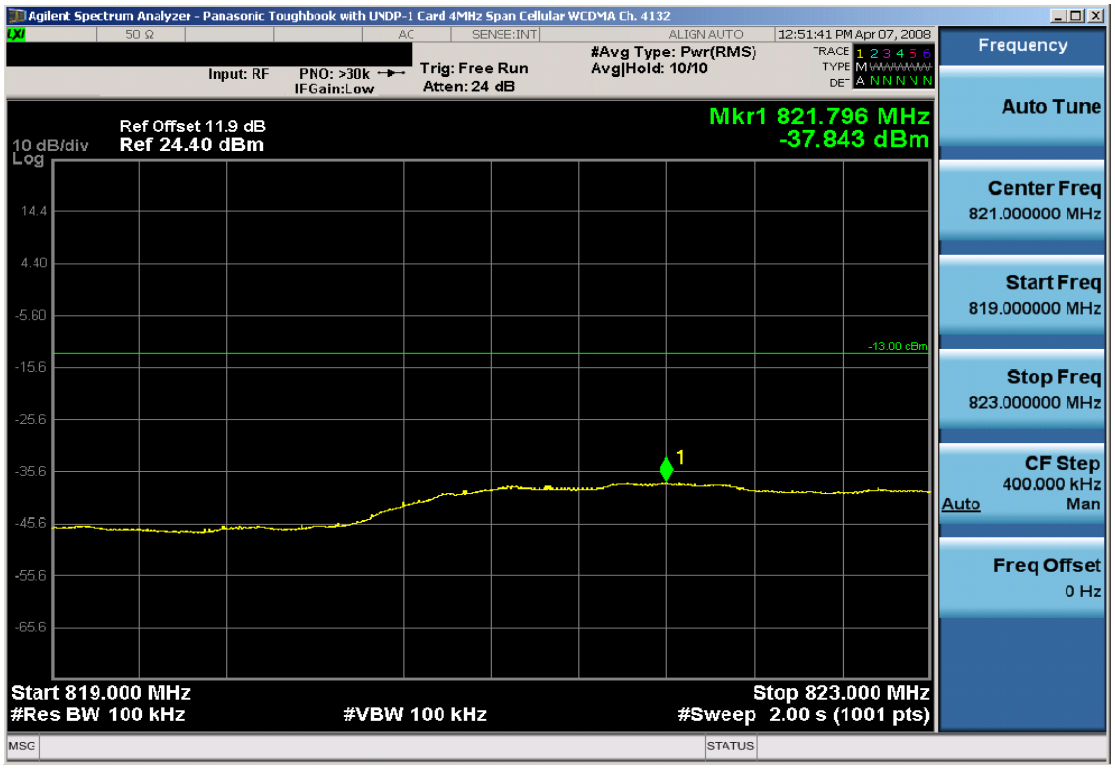


Plot 7-25. Band Edge Plot (Cellular WCDMA Mode – Ch. 4132)



Plot 7-26. 4MHz Span Plot (Cellular WCDMA Mode – Ch. 4132)

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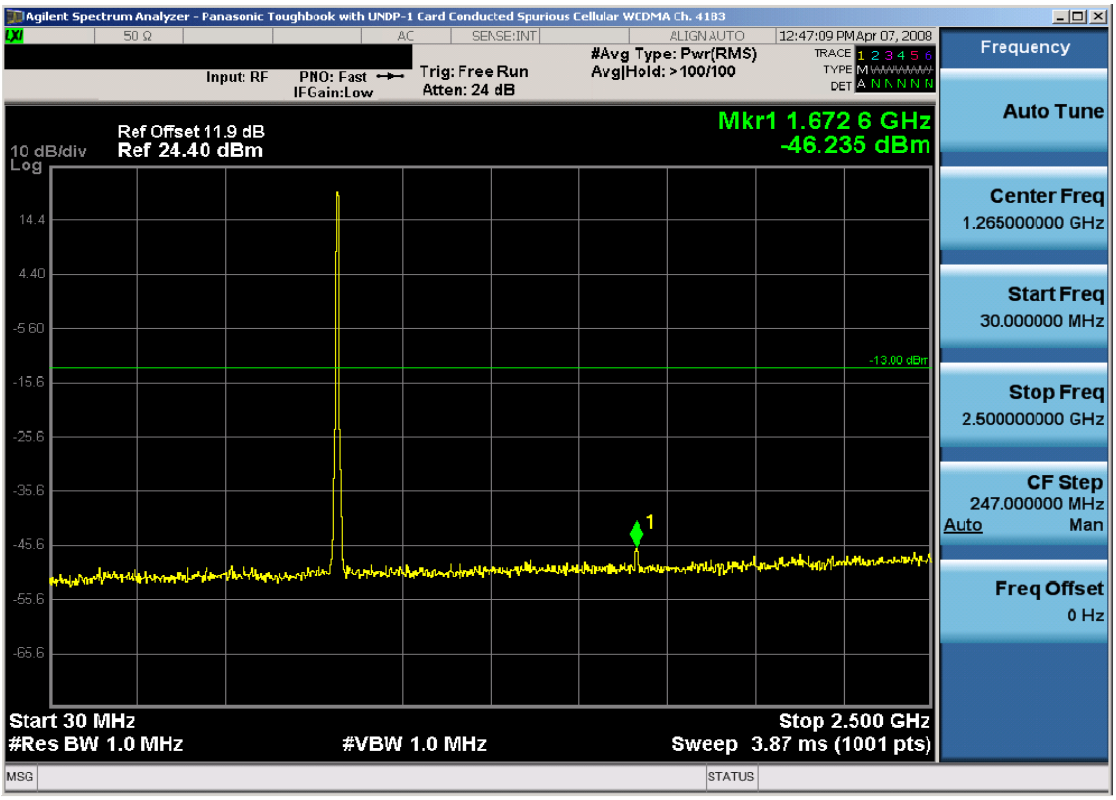
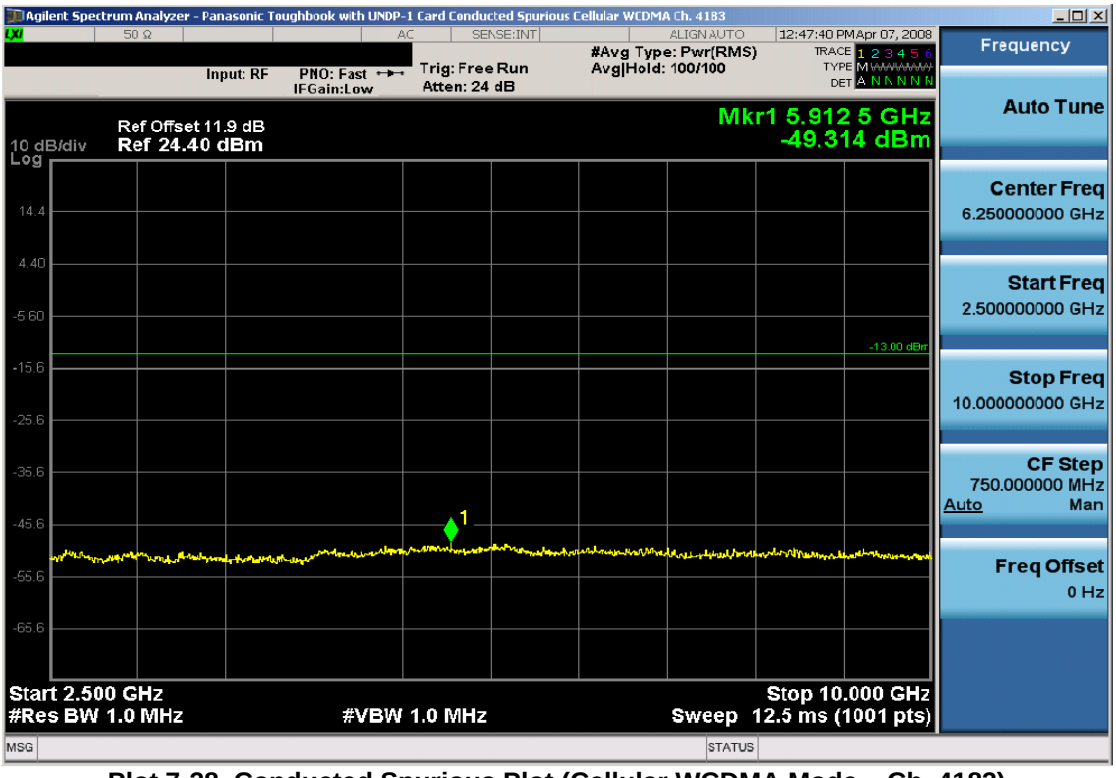


Plot 7-27. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)



Plot 7-28. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4183)

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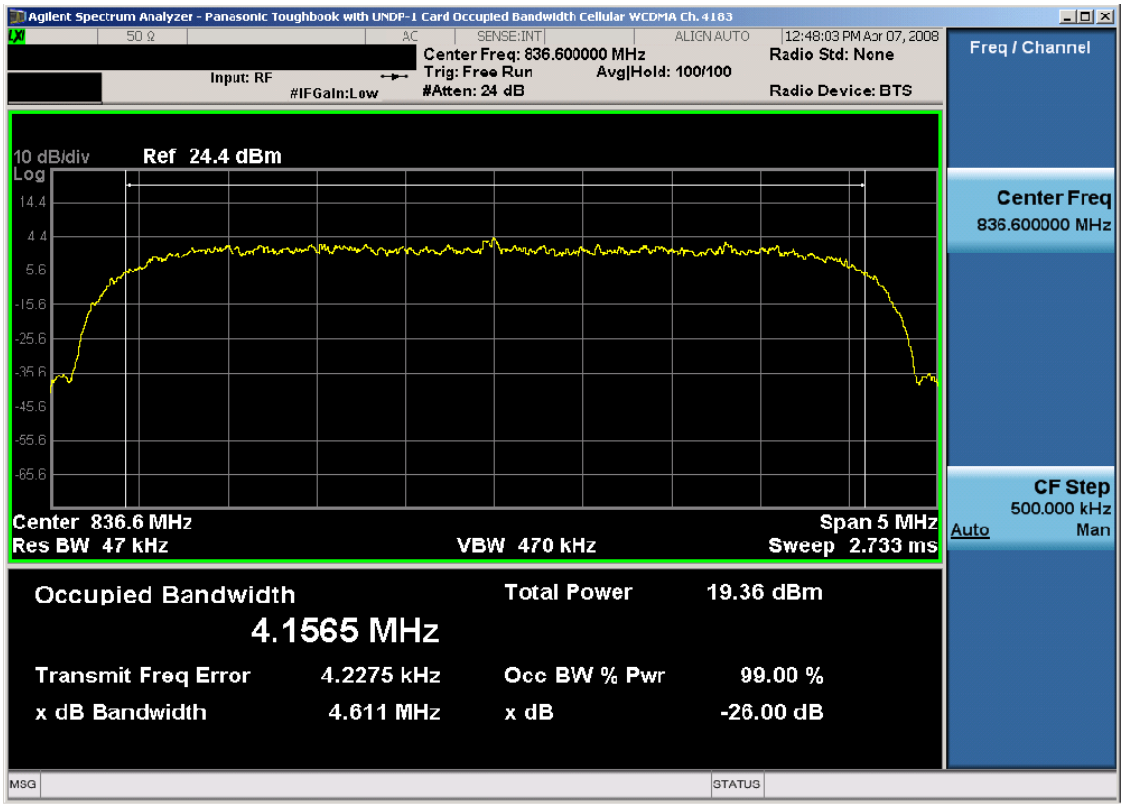
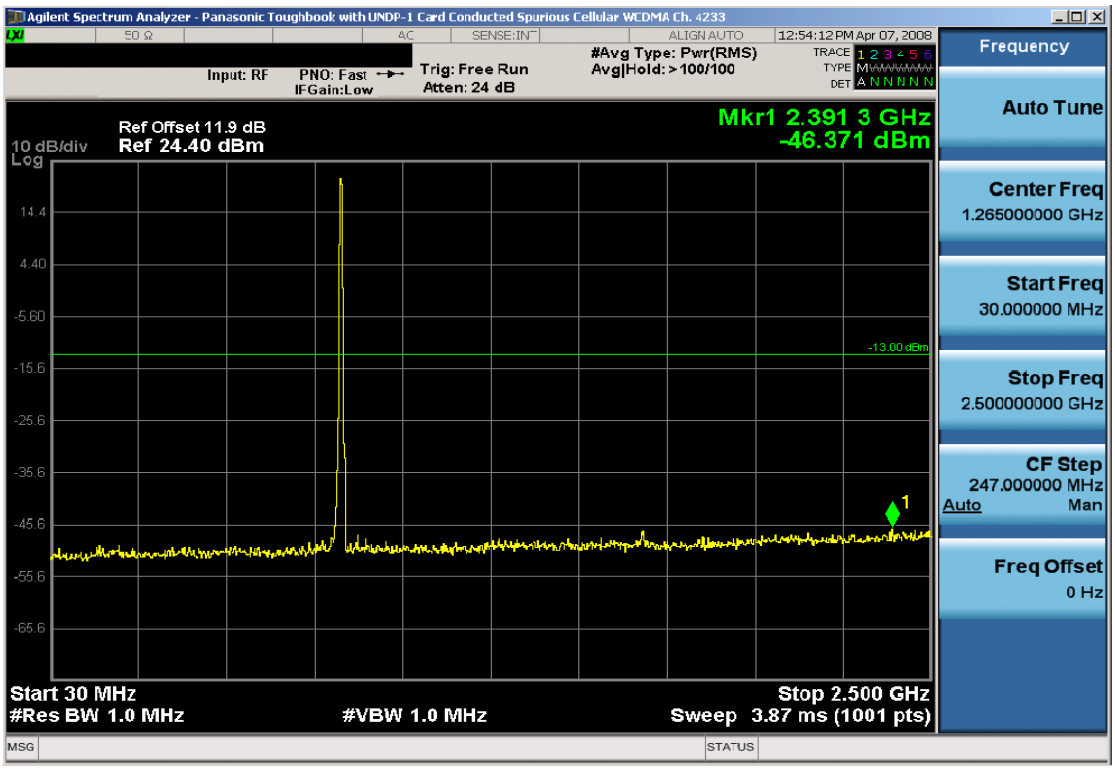


Plot 7-29. Occupied Bandwidth Plot (Cellular WCDMA Mode – Ch. 4183)



Plot 7-30. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)

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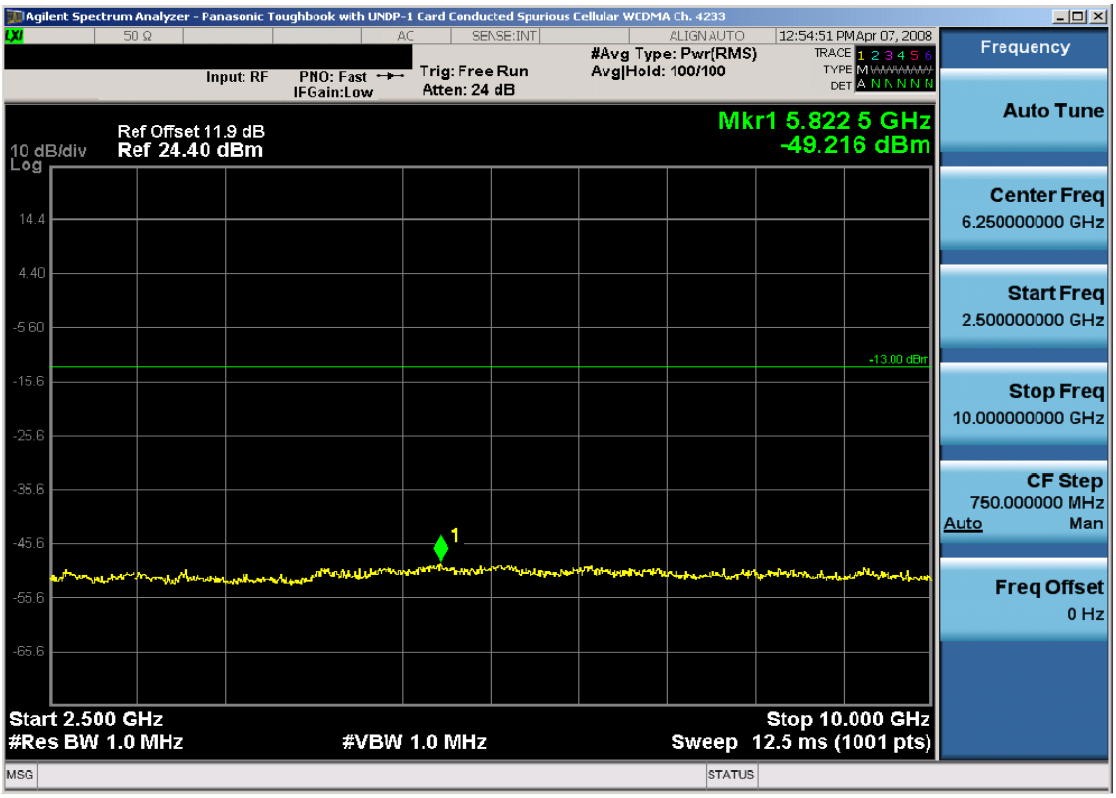
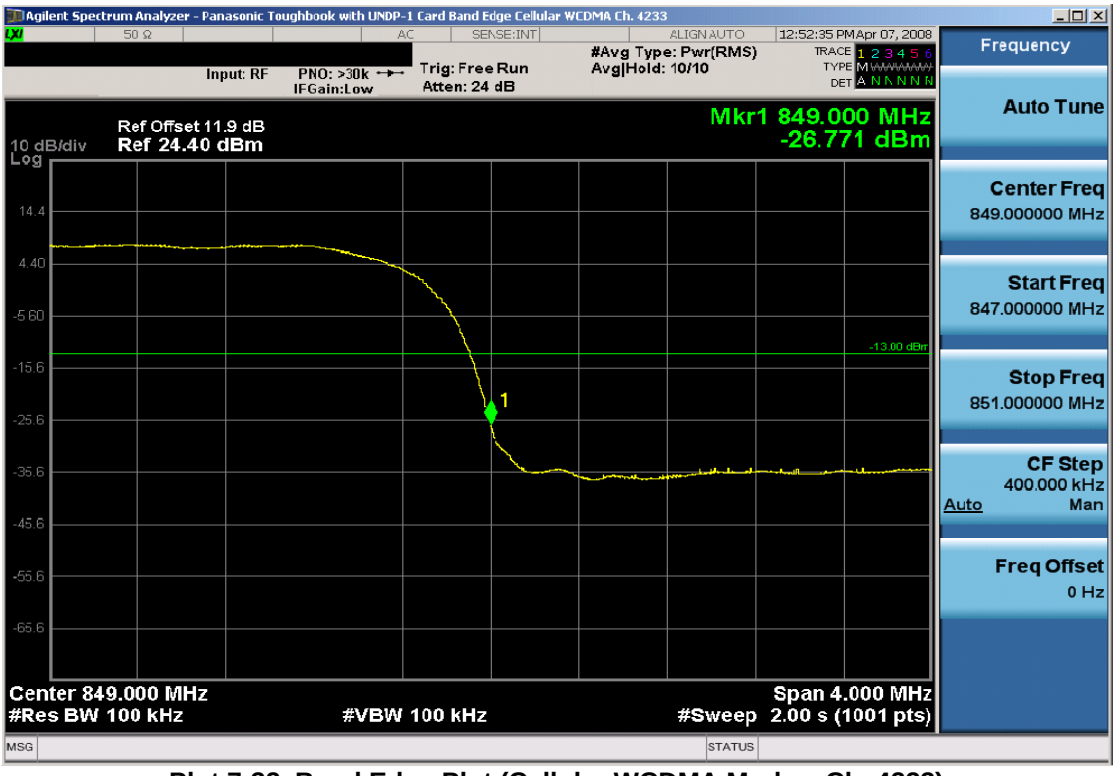


Plot 7-31. Conducted Spurious Plot (Cellular WCDMA Mode – Ch. 4233)



Plot 7-32. Band Edge Plot (Cellular WCDMA Mode – Ch. 4233)

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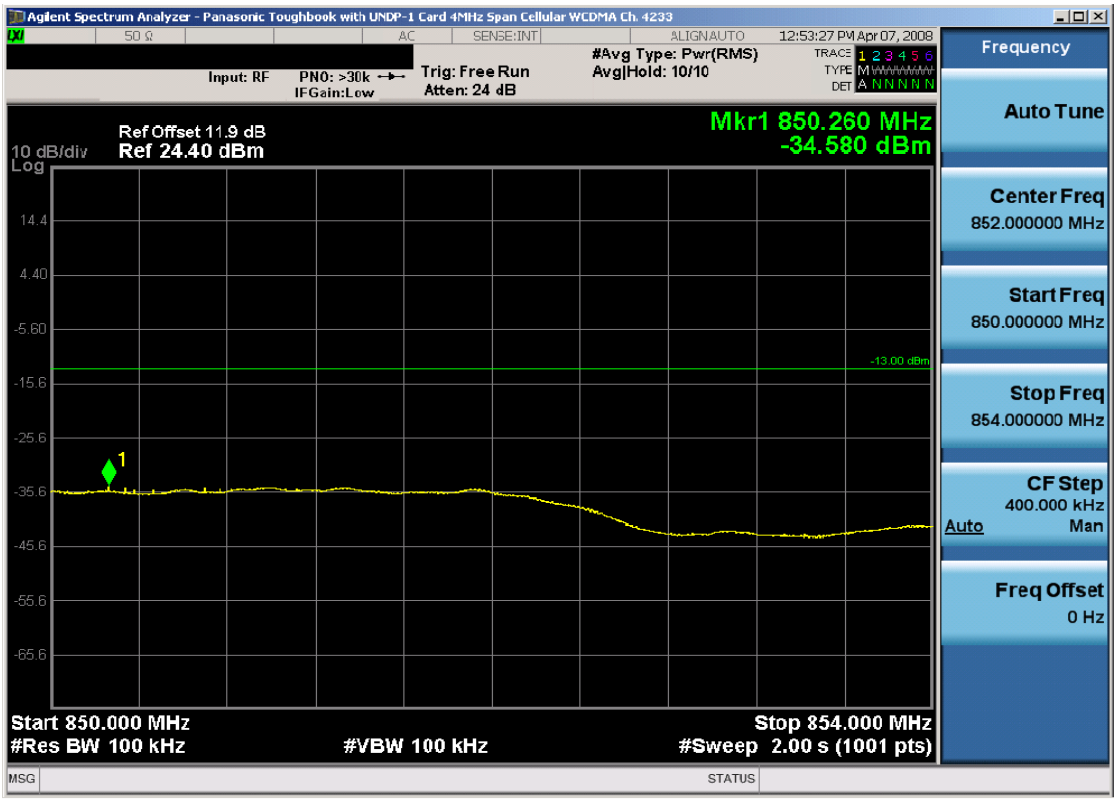
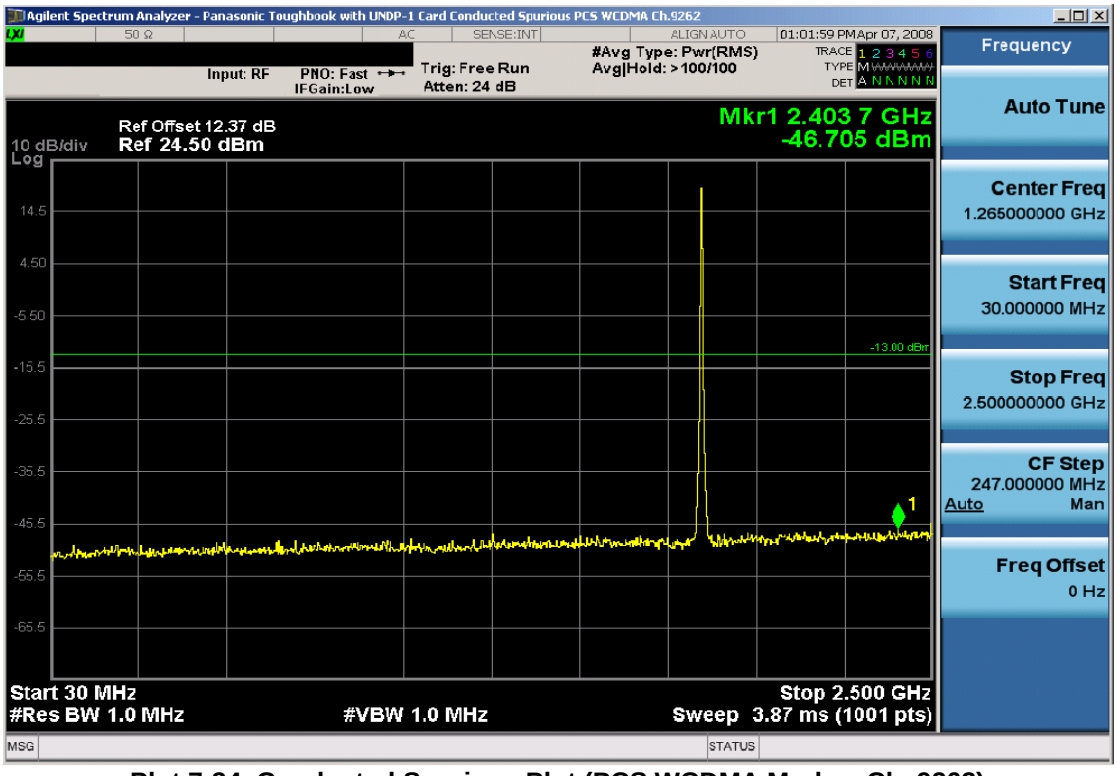


Plot 7-33. 4MHz Span Plot (Cellular WCDMA Mode – Ch. 4233)



Plot 7-34. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)

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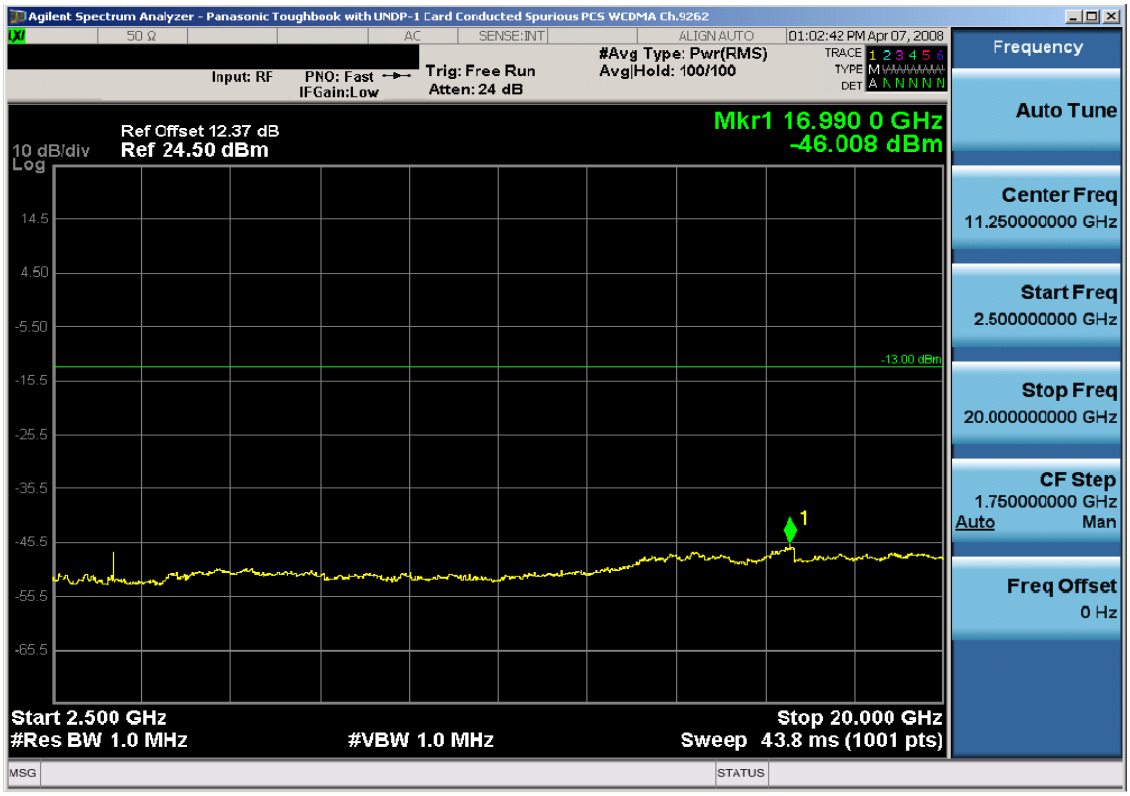
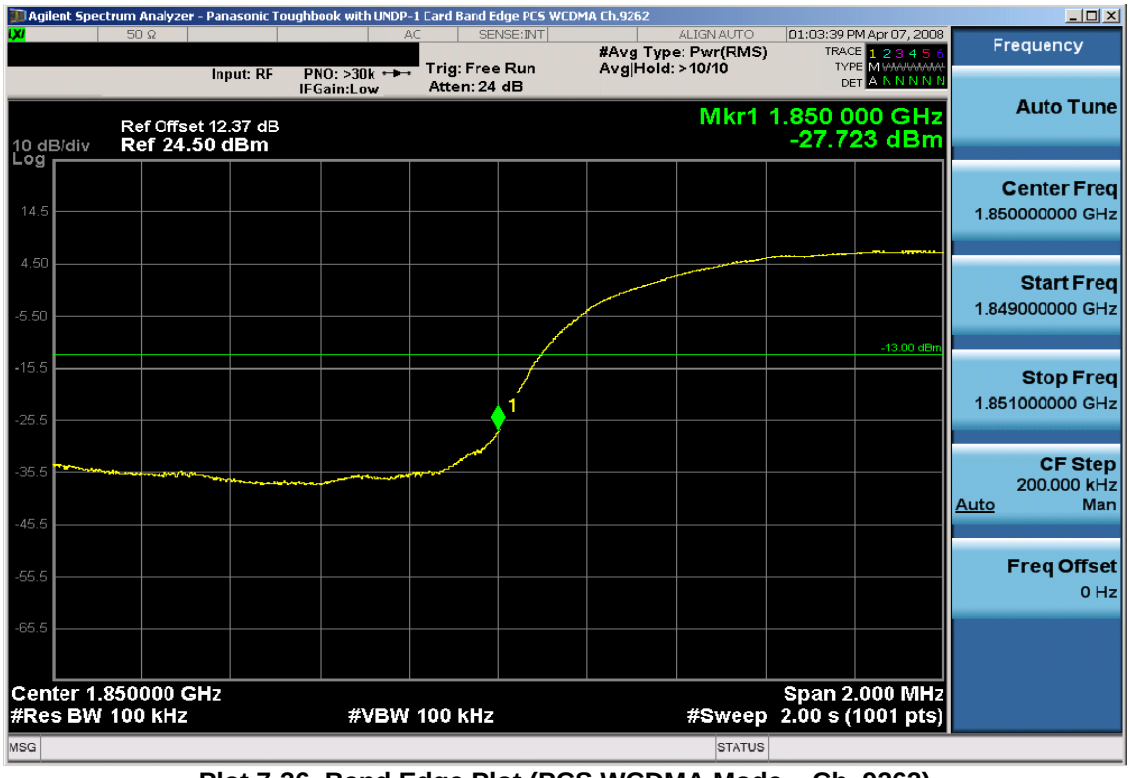


Plot 7-35. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9262)



Plot 7-36. Band Edge Plot (PCS WCDMA Mode – Ch. 9262)

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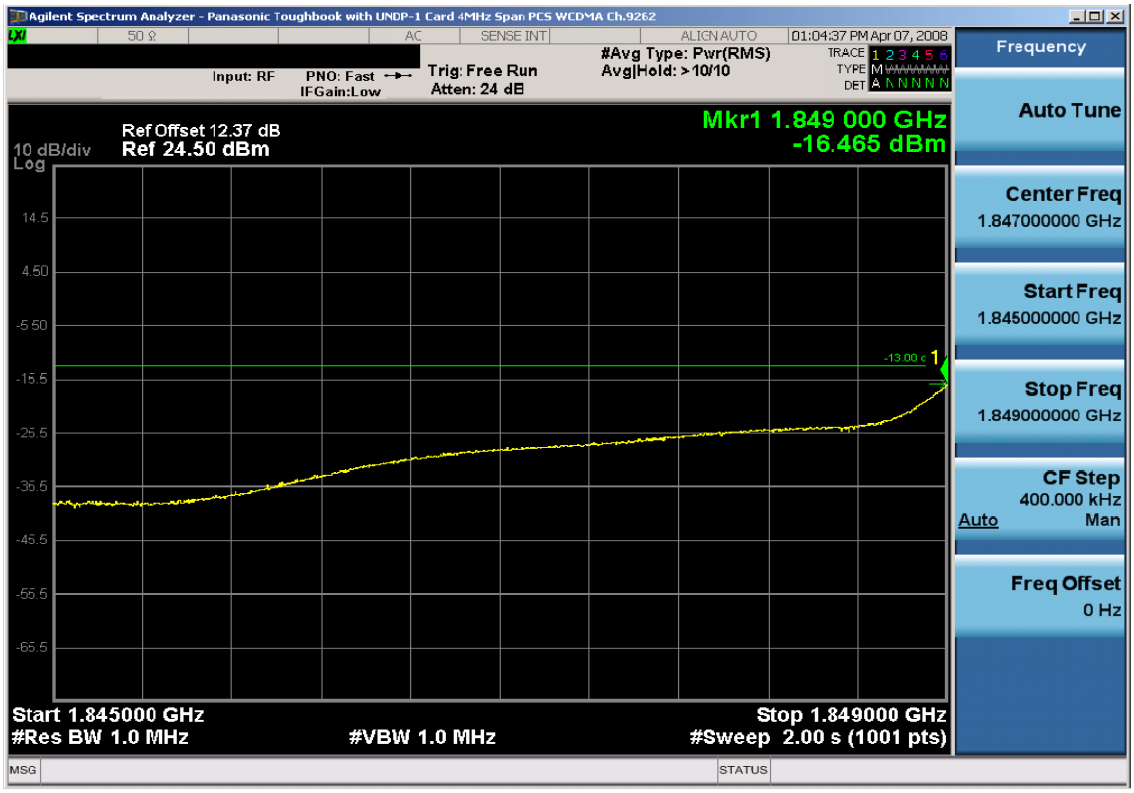
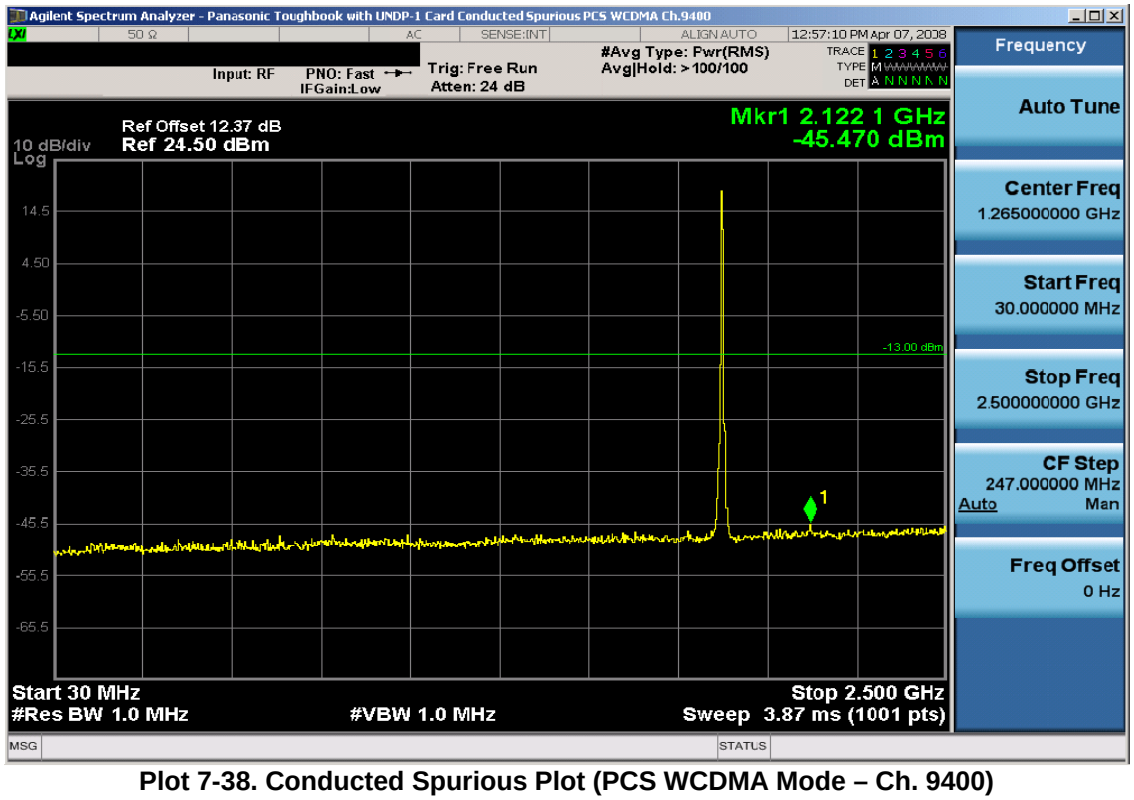


Plot 7-37. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9262)



Plot 7-38. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9400)

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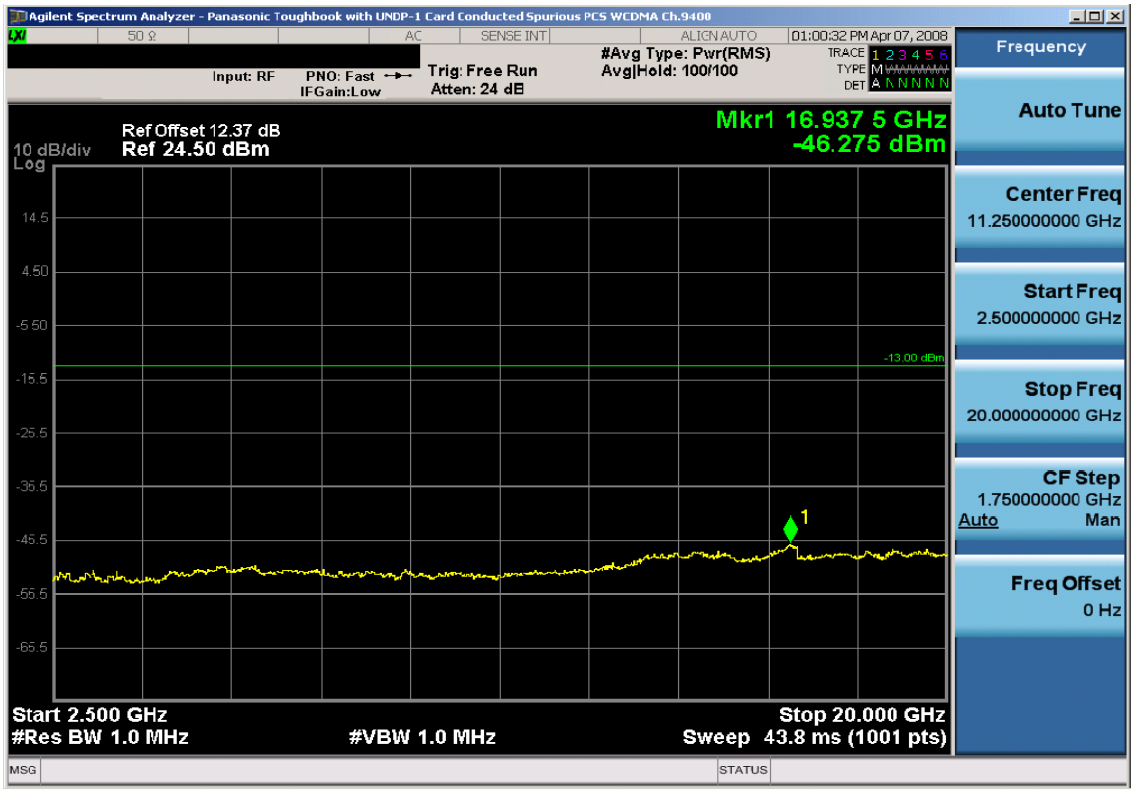
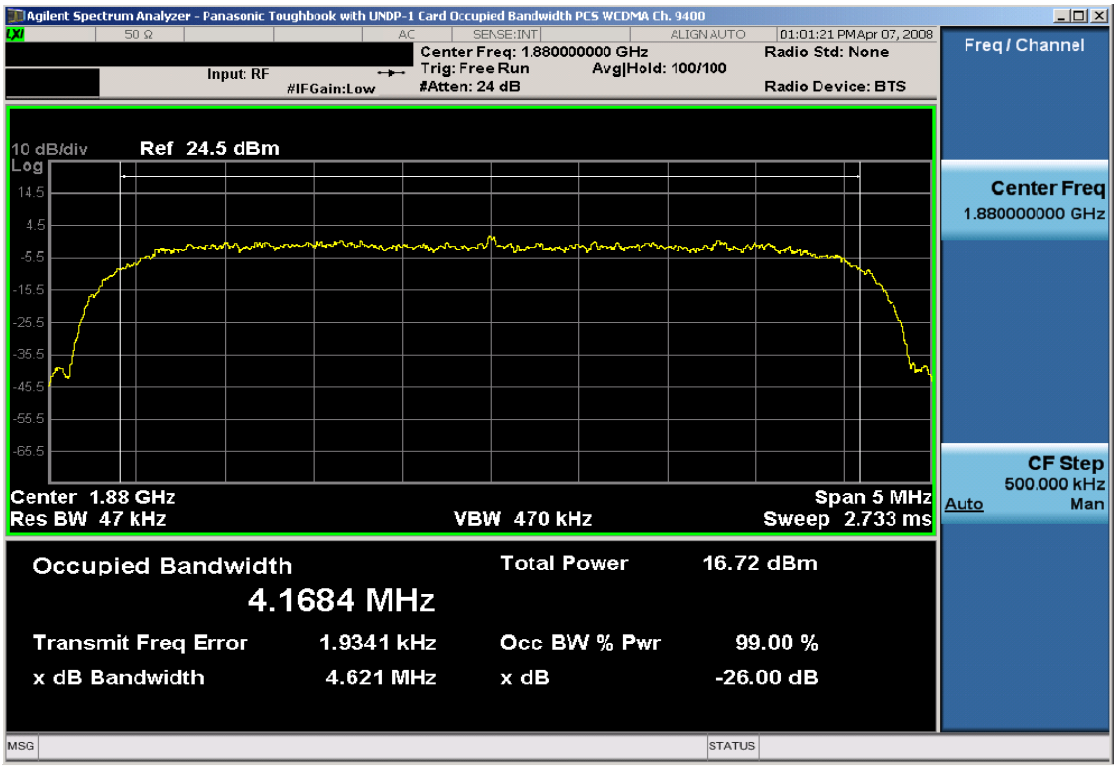


Plot 7-39. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9400)



Plot 7-40. Occupied Bandwidth Plot (PCS WCDMA Mode – Ch. 9400)

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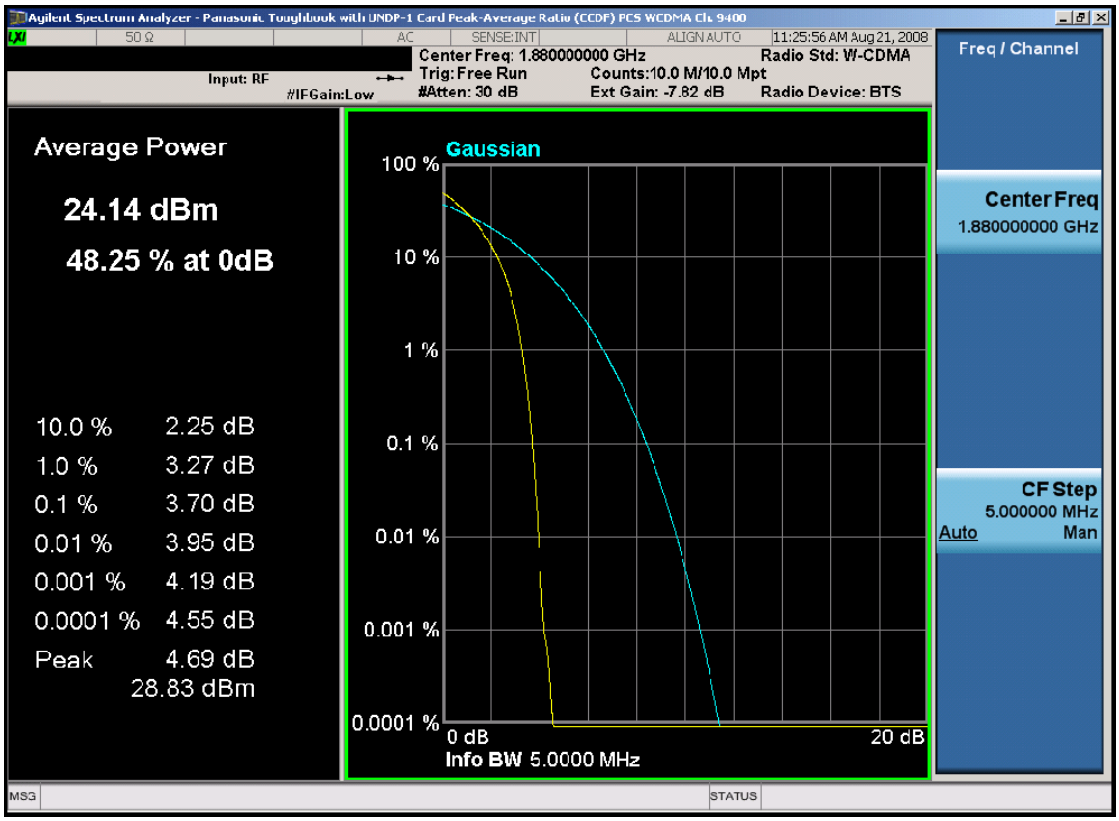
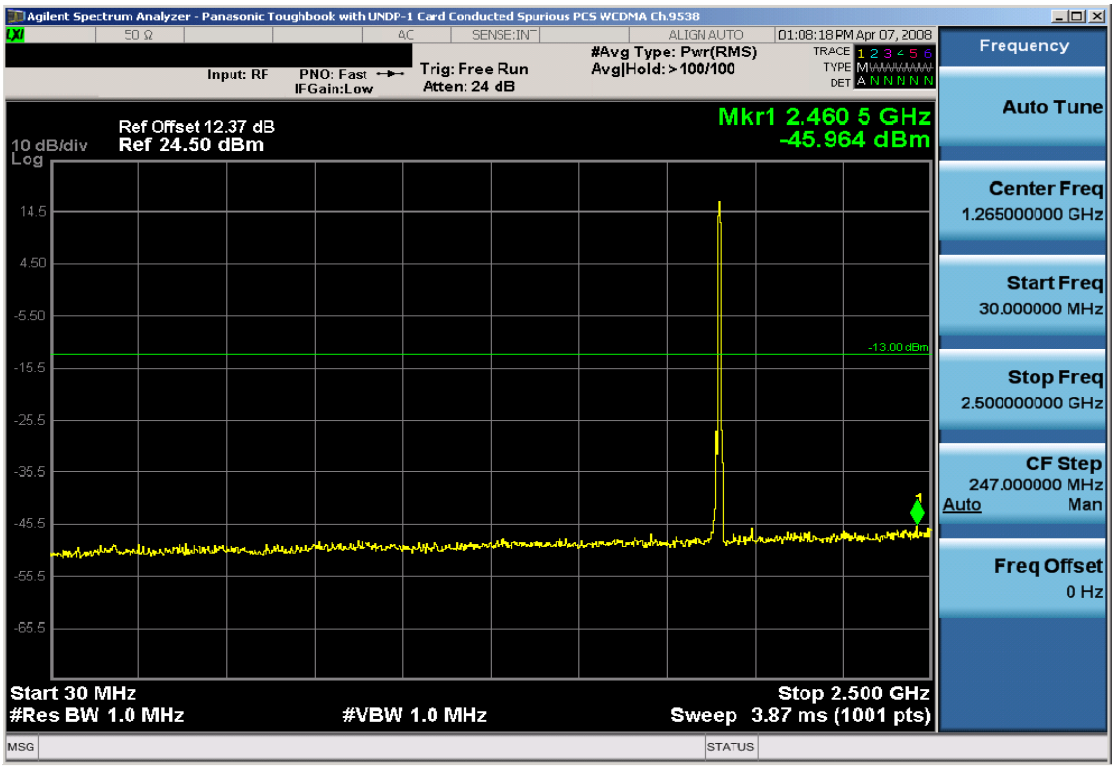


Plot 7-41. Peak-Average Ratio Plot (PCS WCDMA Mode – Ch. 9400)



Plot 7-42. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)

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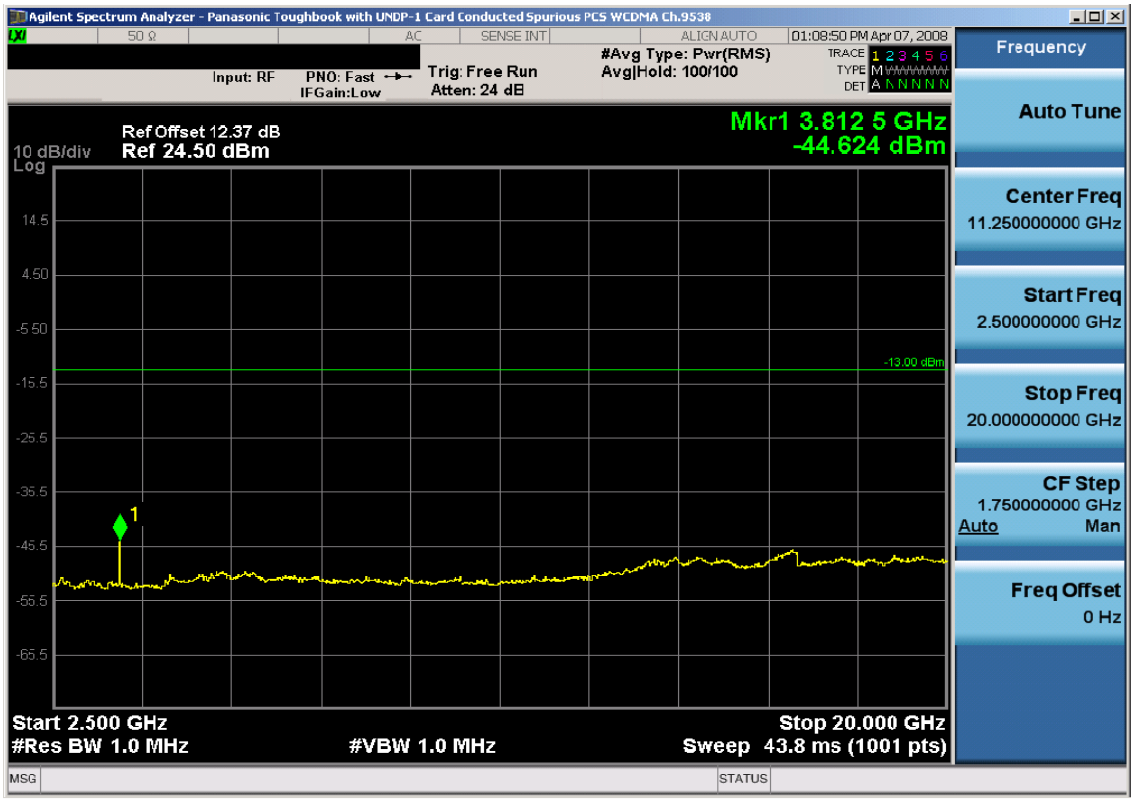
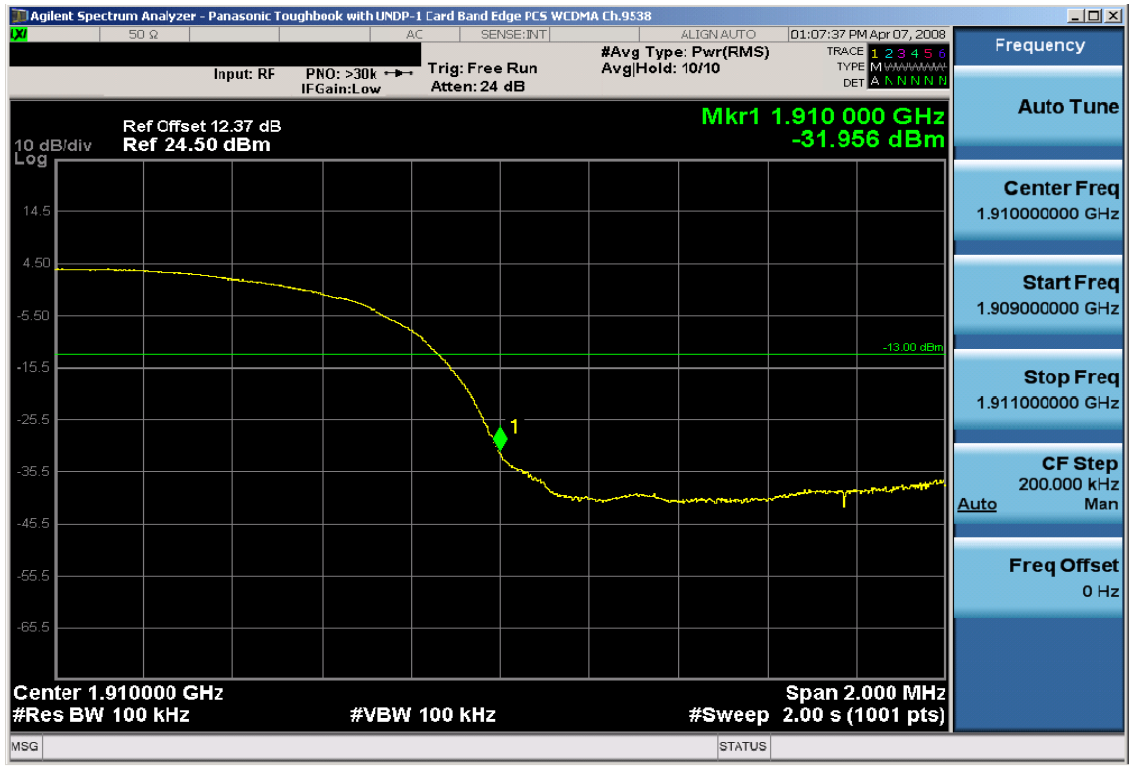


Plot 7-43. Conducted Spurious Plot (PCS WCDMA Mode – Ch. 9538)



Plot 7-44. Band Edge Plot (PCS WCDMA Mode – Ch. 9538)

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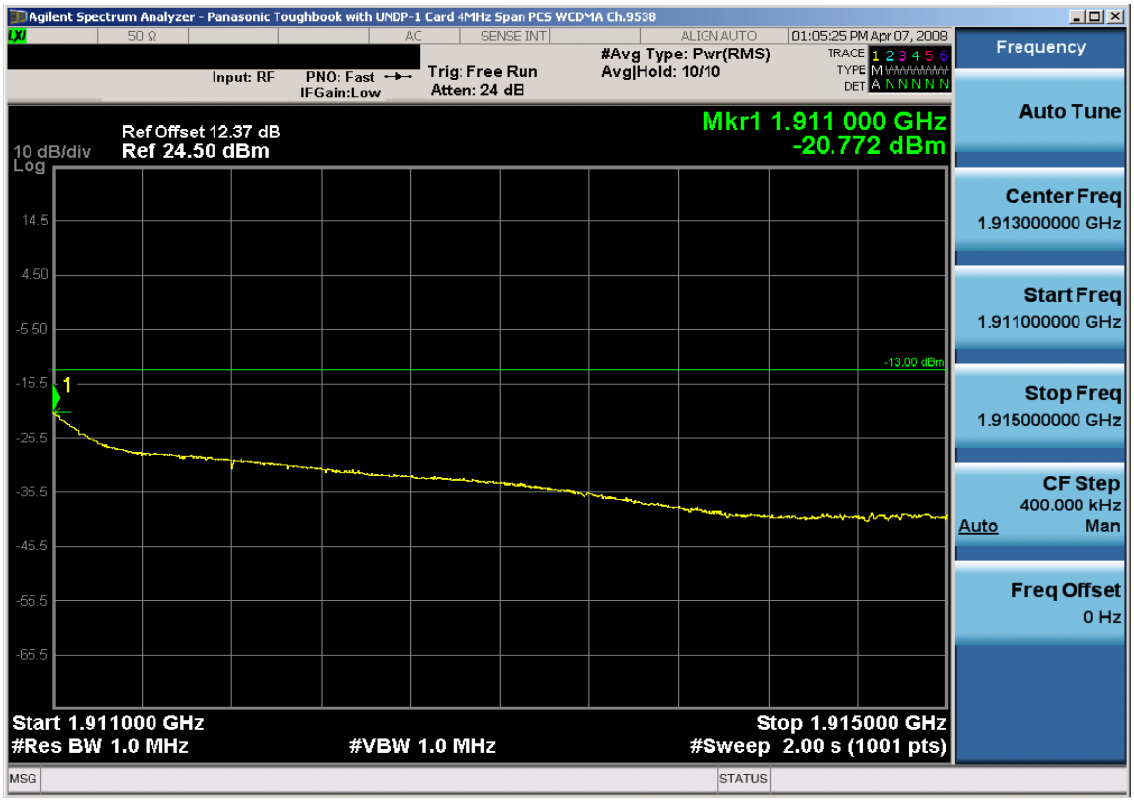
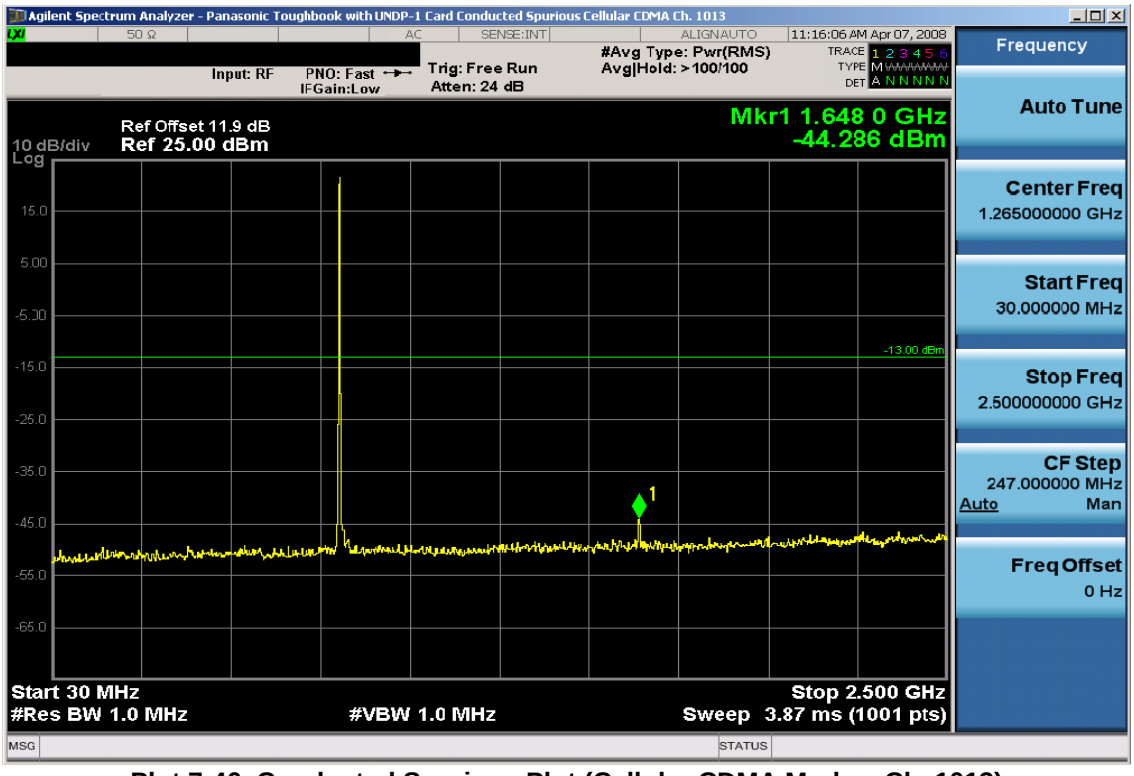


Plot 7-45. 4MHz Span Plot (PCS WCDMA Mode – Ch. 9538)



Plot 7-46. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 1013)

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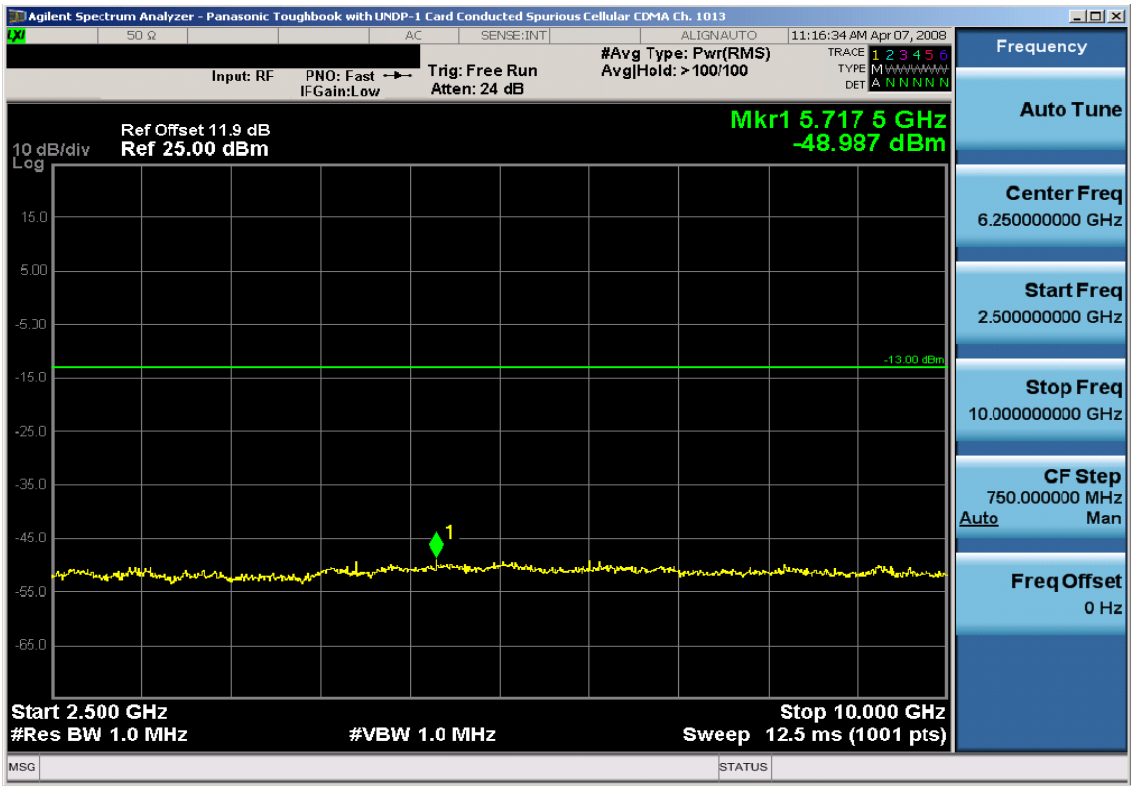
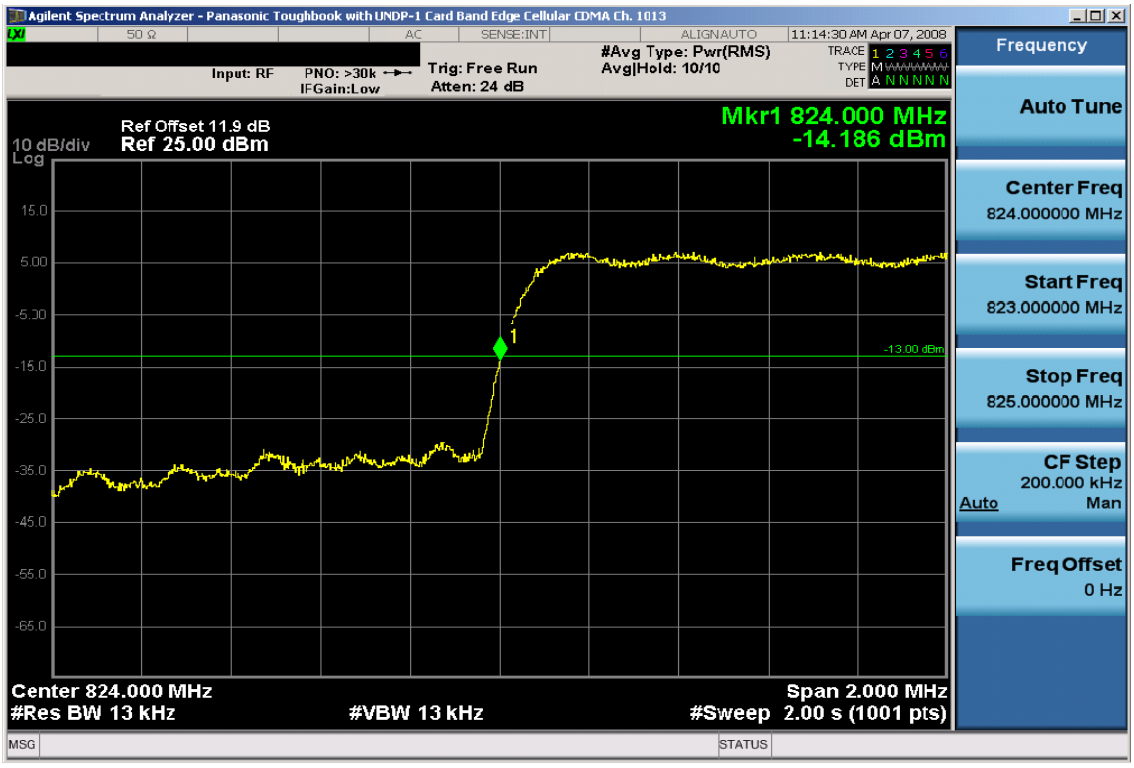


Plot 7-47. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 1013)



Plot 7-48. Band Edge Plot (Cellular CDMA Mode – Ch. 1013)

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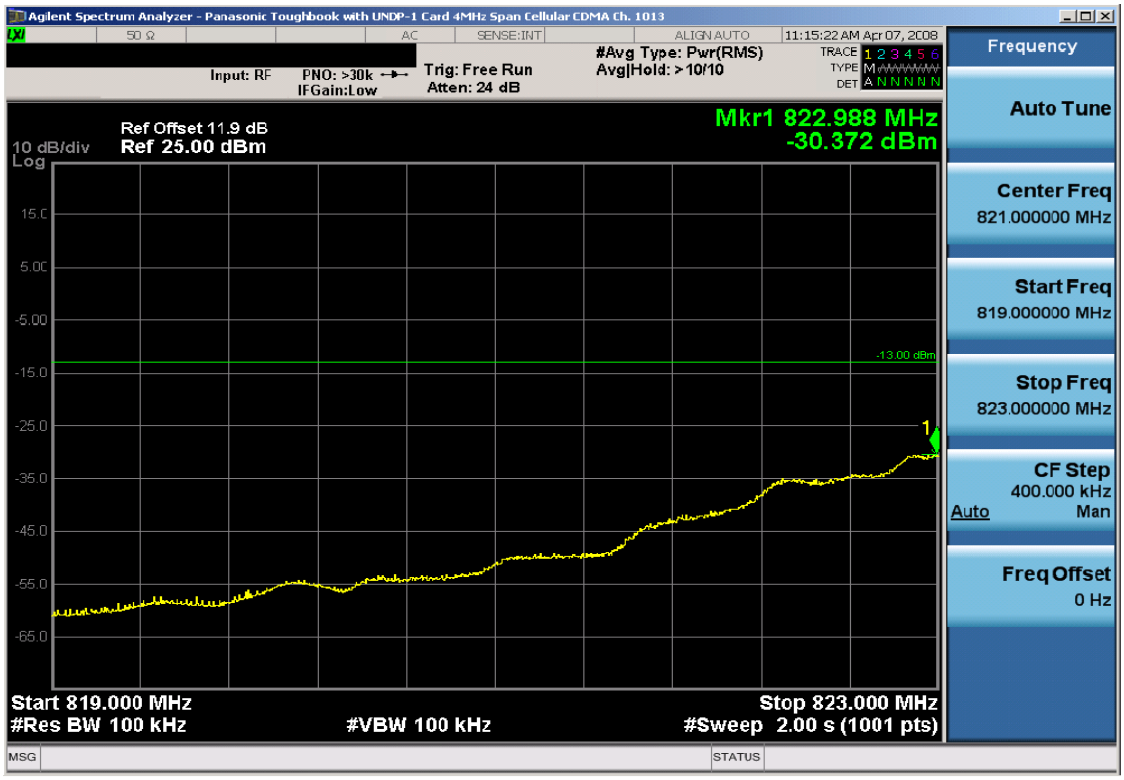
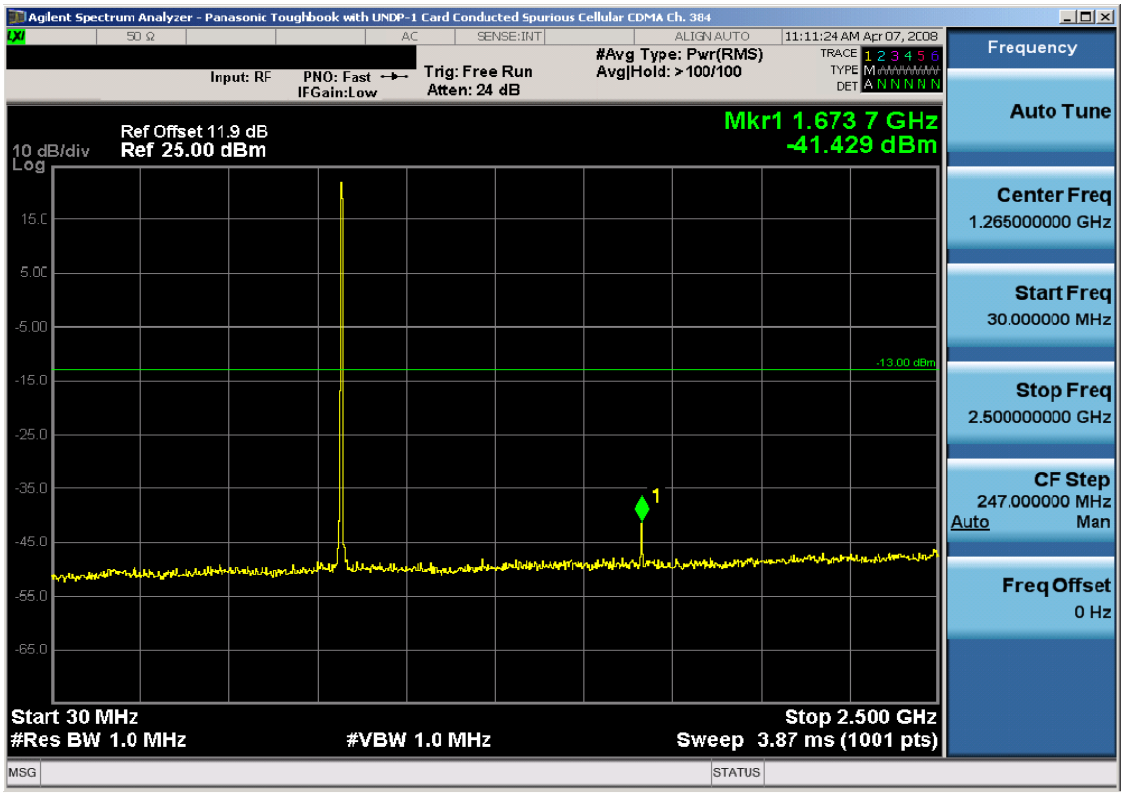


Plot 7-49. 4MHz Span Plot (Cellular CDMA Mode – Ch. 1013)



Plot 7-50. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 384)

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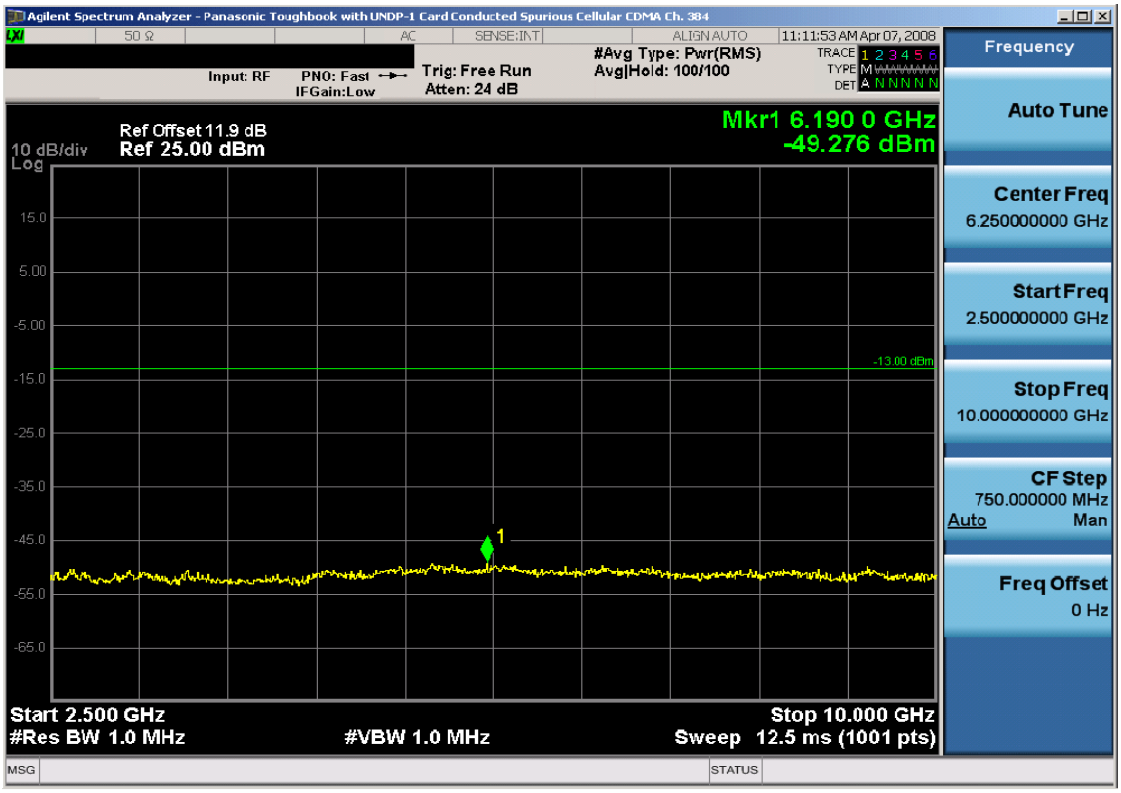
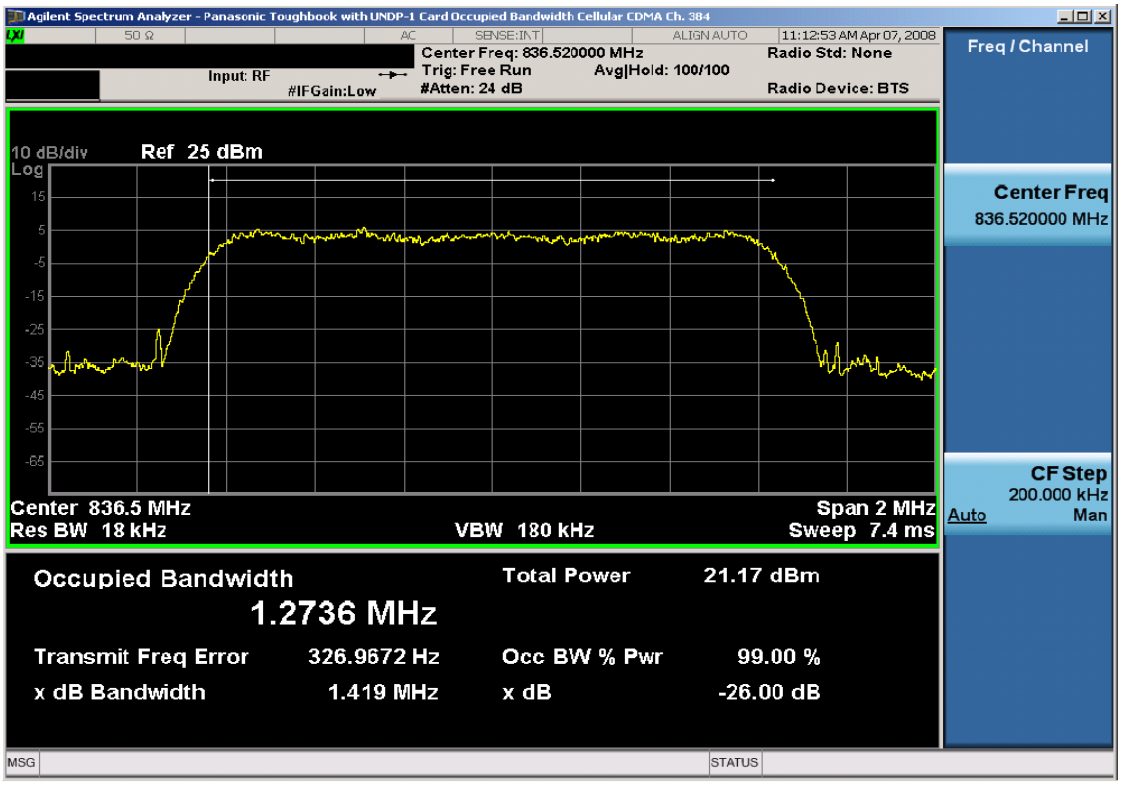


Plot 7-51. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 384)



Plot 7-52. Occupied Bandwidth Plot (Cellular CDMA Mode – Ch. 1013)

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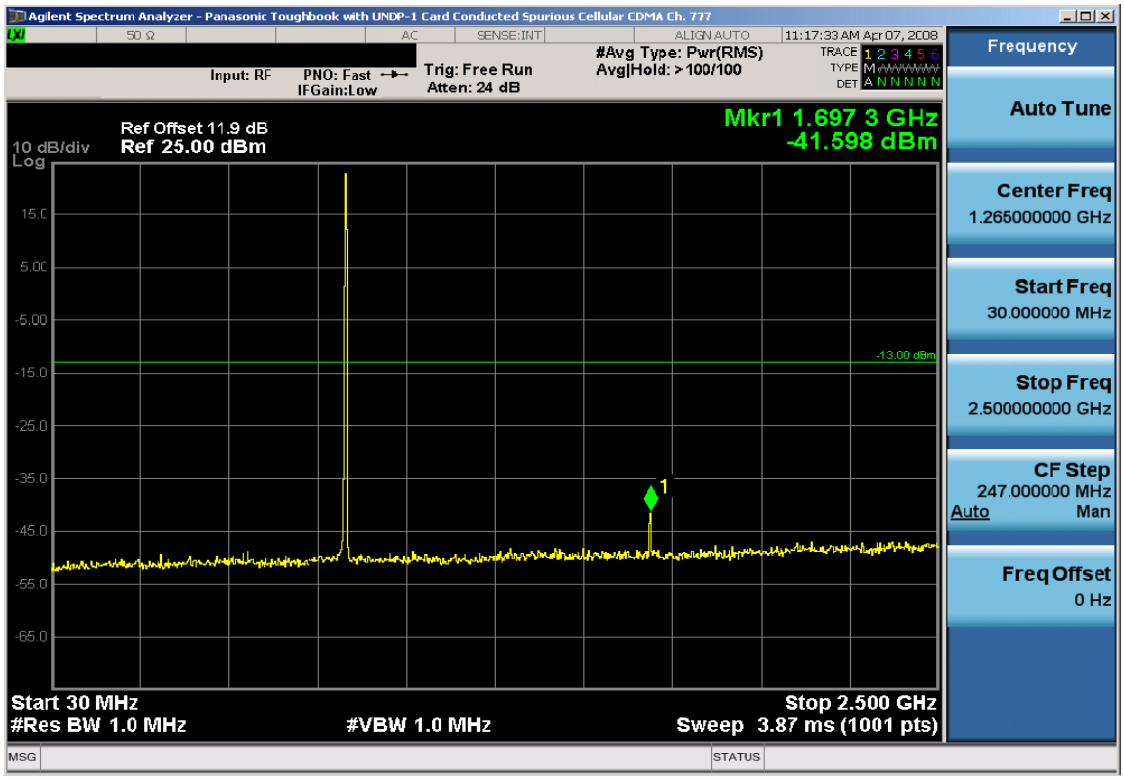
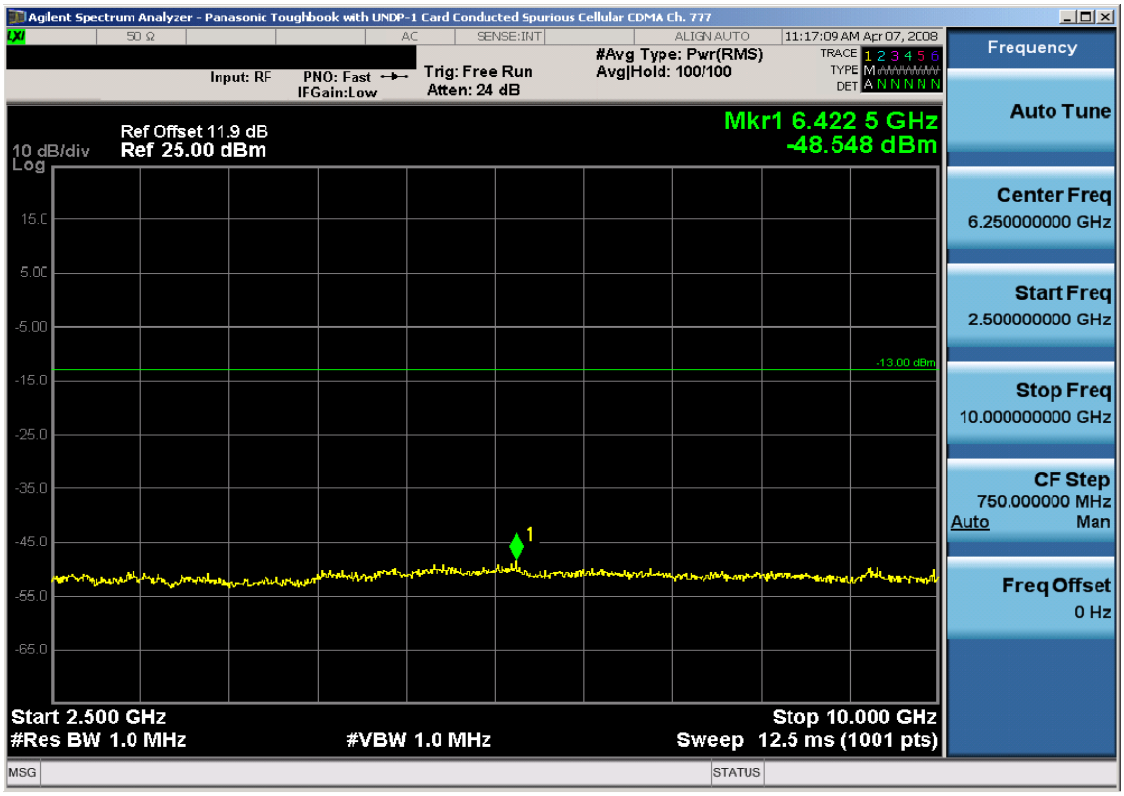


Plot 7-53. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)



Plot 7-54. Conducted Spurious Plot (Cellular CDMA Mode – Ch. 777)

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Plot 7-55. Band Edge Plot (Cellular CDMA Mode – Ch. 777)

Plot 7-56. 4MHz Span Plot (Cellular CDMA Mode – Ch. 777)

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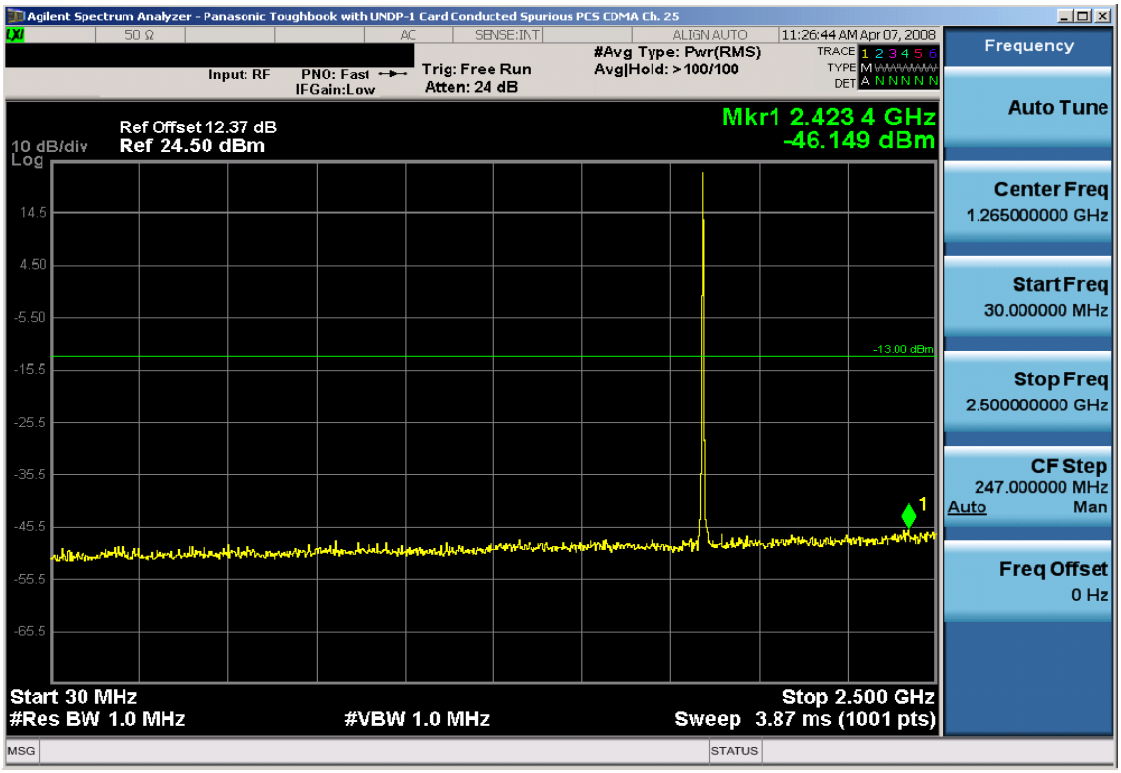

Plot 7-57. Conducted Spurious Plot (PCS CDMA Mode – Ch. 25)

Plot 7-58. Conducted Spurious Plot (PCS CDMA Mode – Ch. 25)

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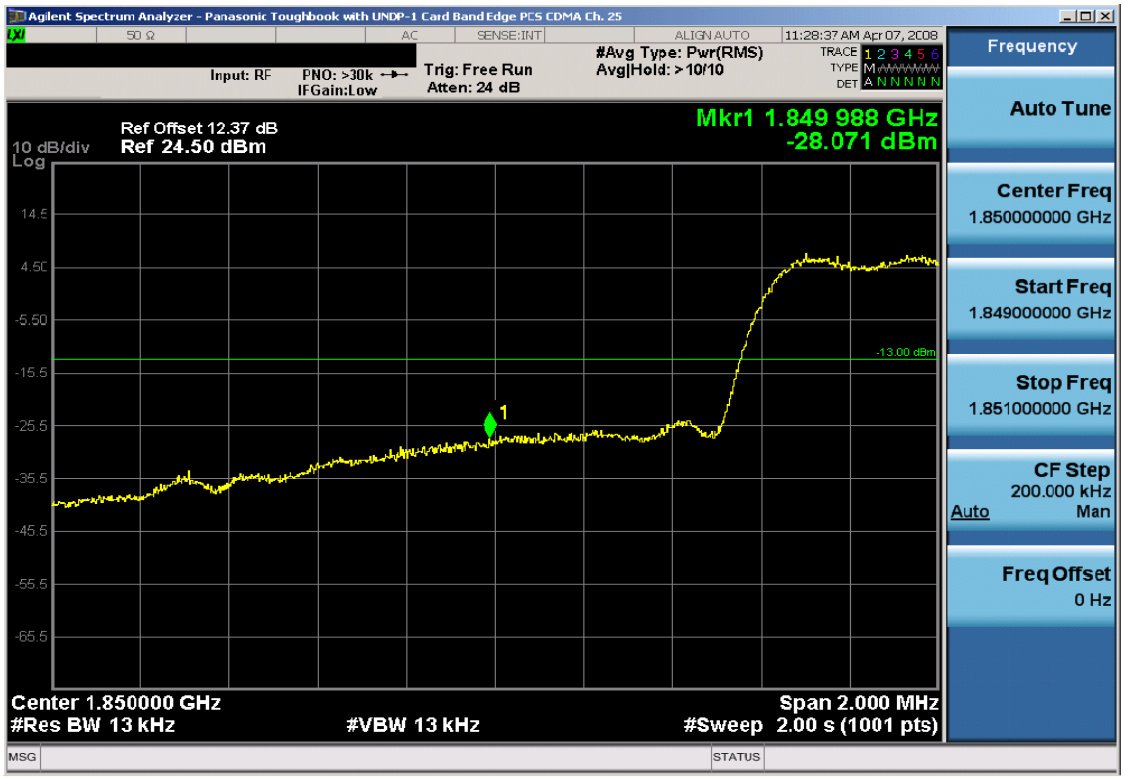
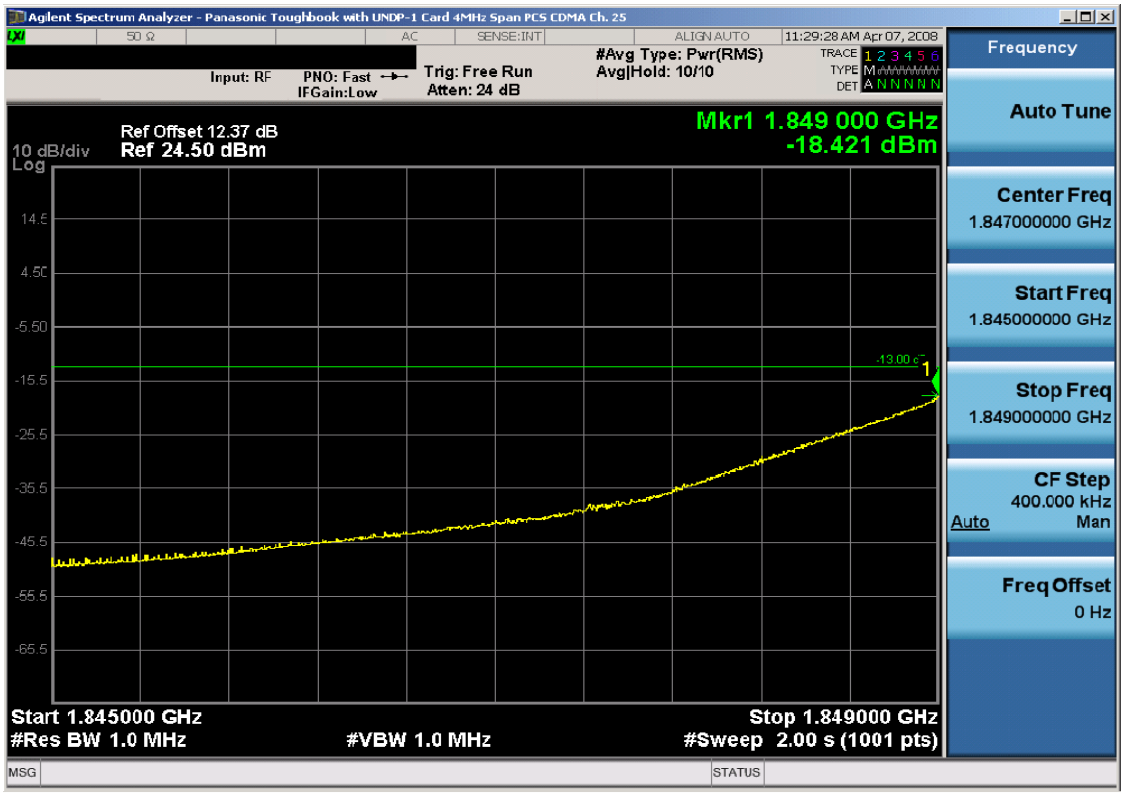


Plot 7-59. Band Edge Plot (PCS CDMA Mode – Ch. 25)



Plot 7-60. 4MHz Span Plot (PCS CDMA Mode – Ch. 25)

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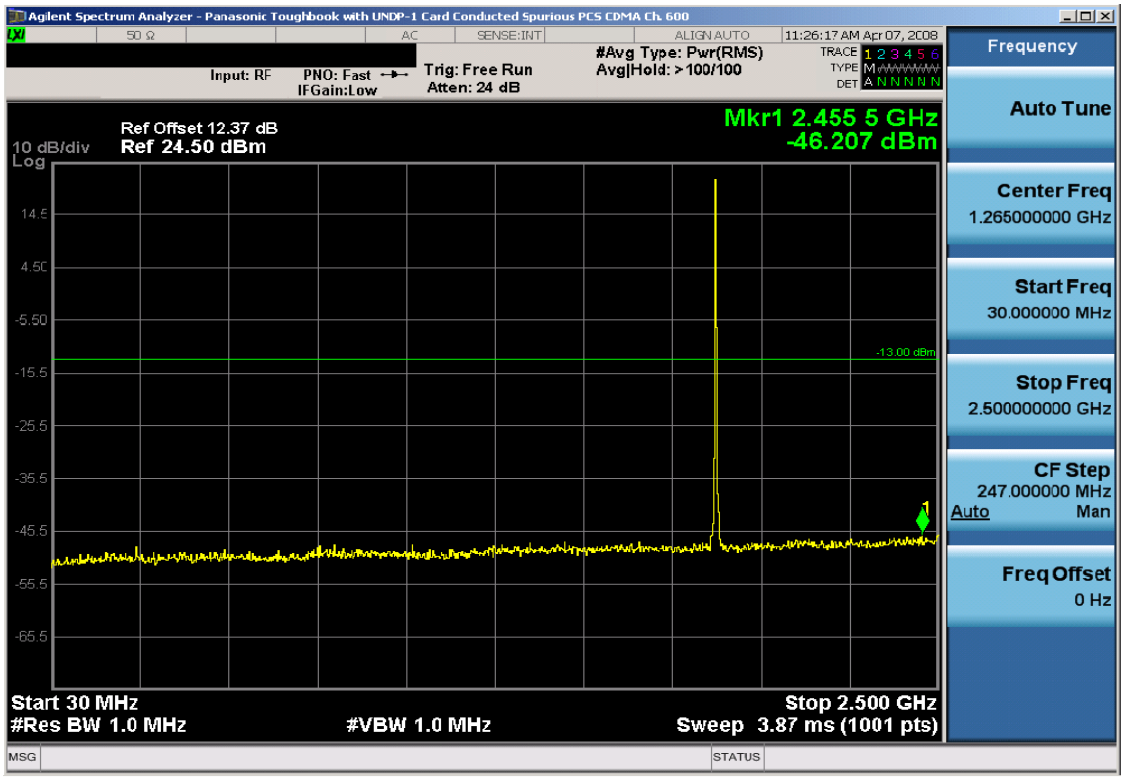
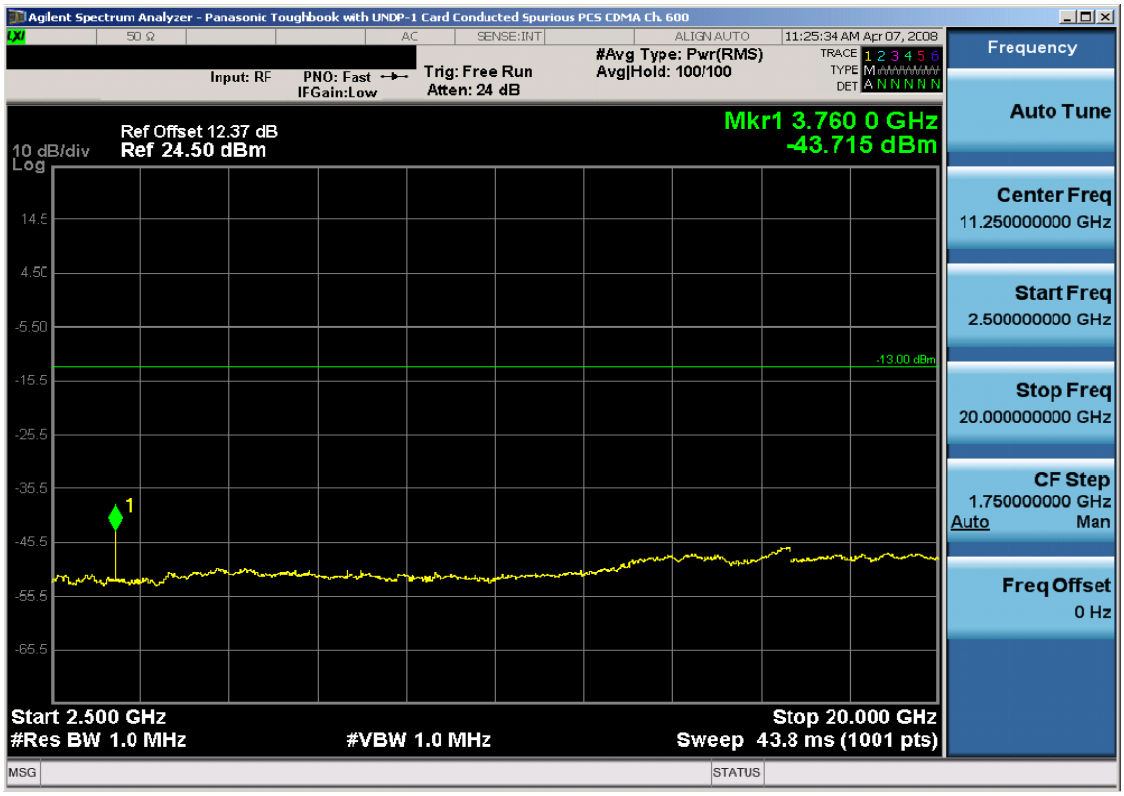


Plot 7-61. Conducted Spurious Plot (PCS CDMA Mode – Ch. 600)



Plot 7-62. Conducted Spurious Plot (PCS CDMA Mode – Ch. 600)

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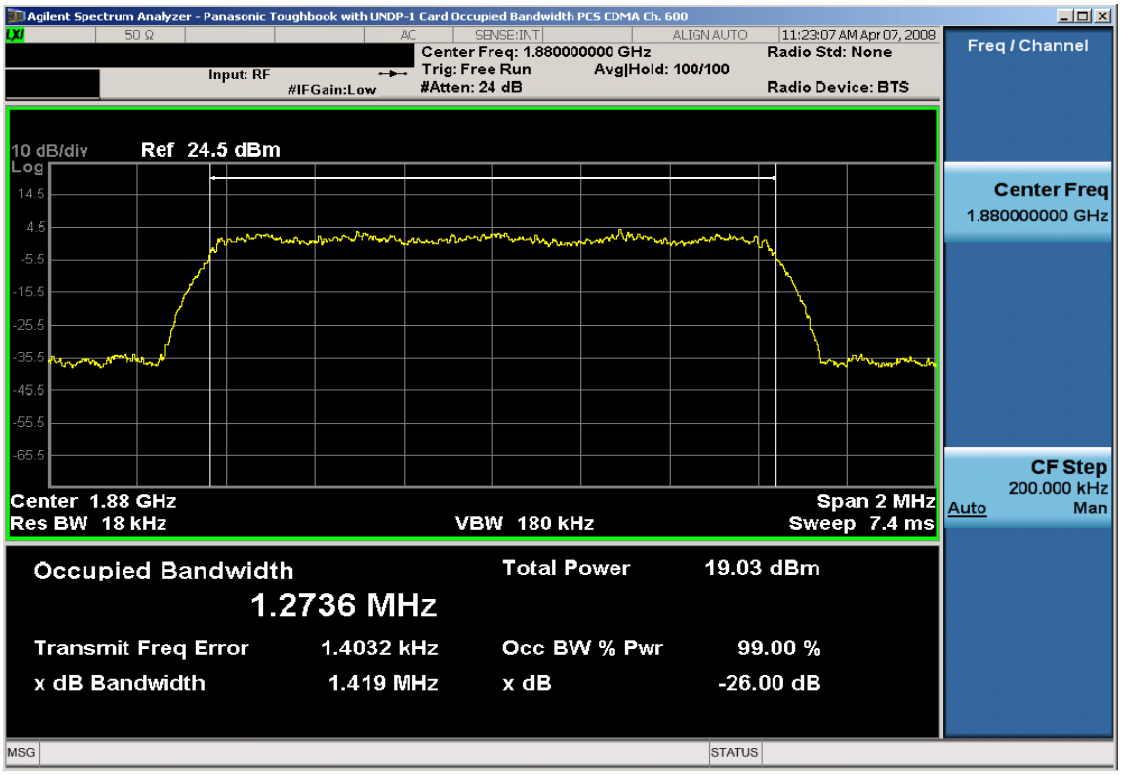
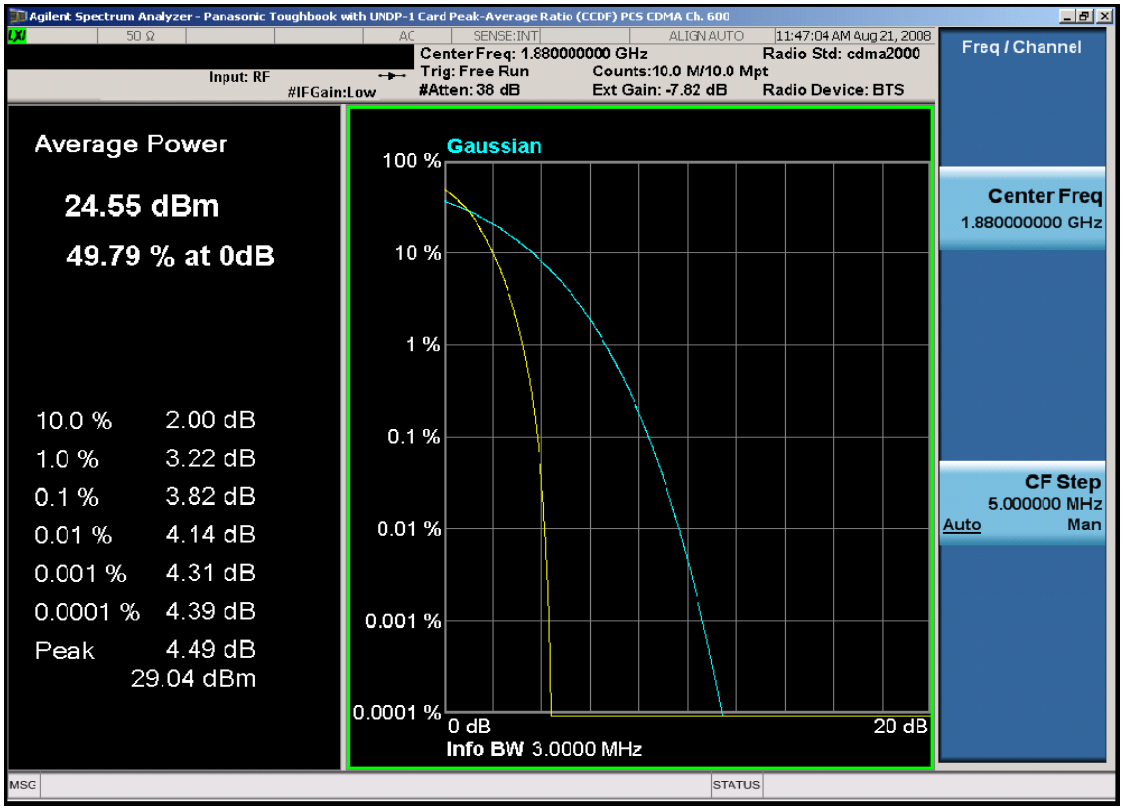


Plot 7-63. Occupied Bandwidth Plot (PCS CDMA Mode – Ch. 600)



Plot 7-64. Peak-Average Ratio Plot (PCS CDMA Mode – Ch. 600)

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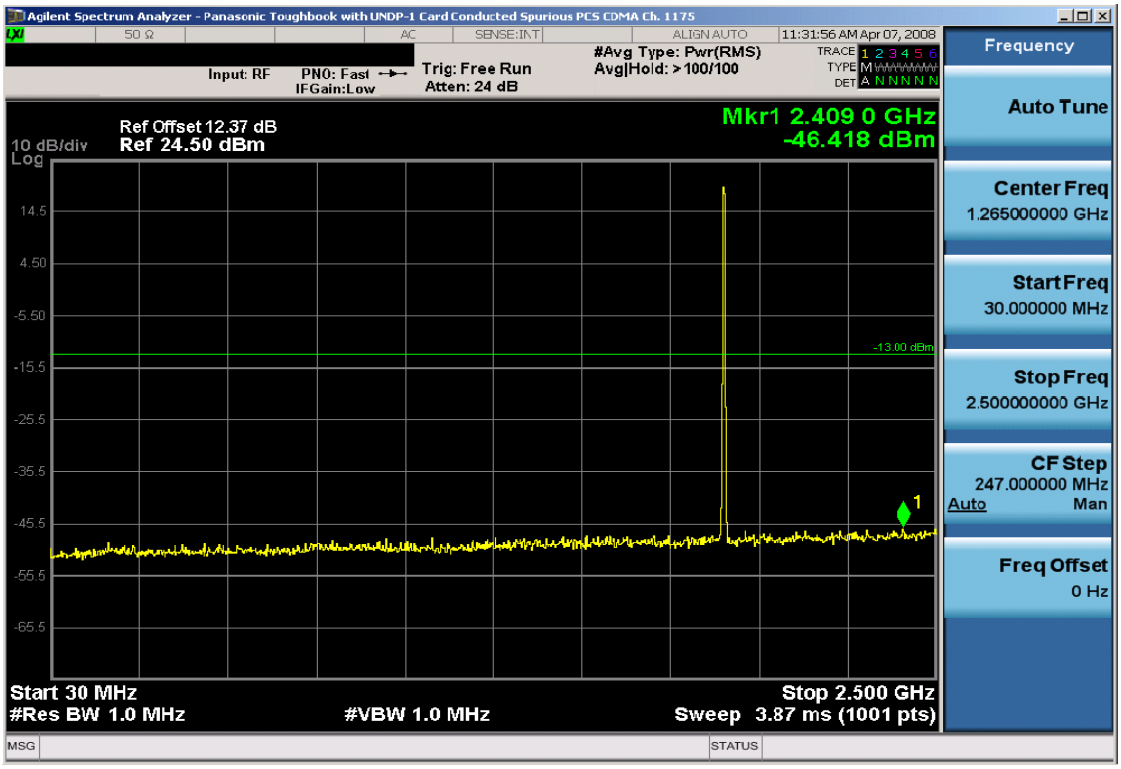
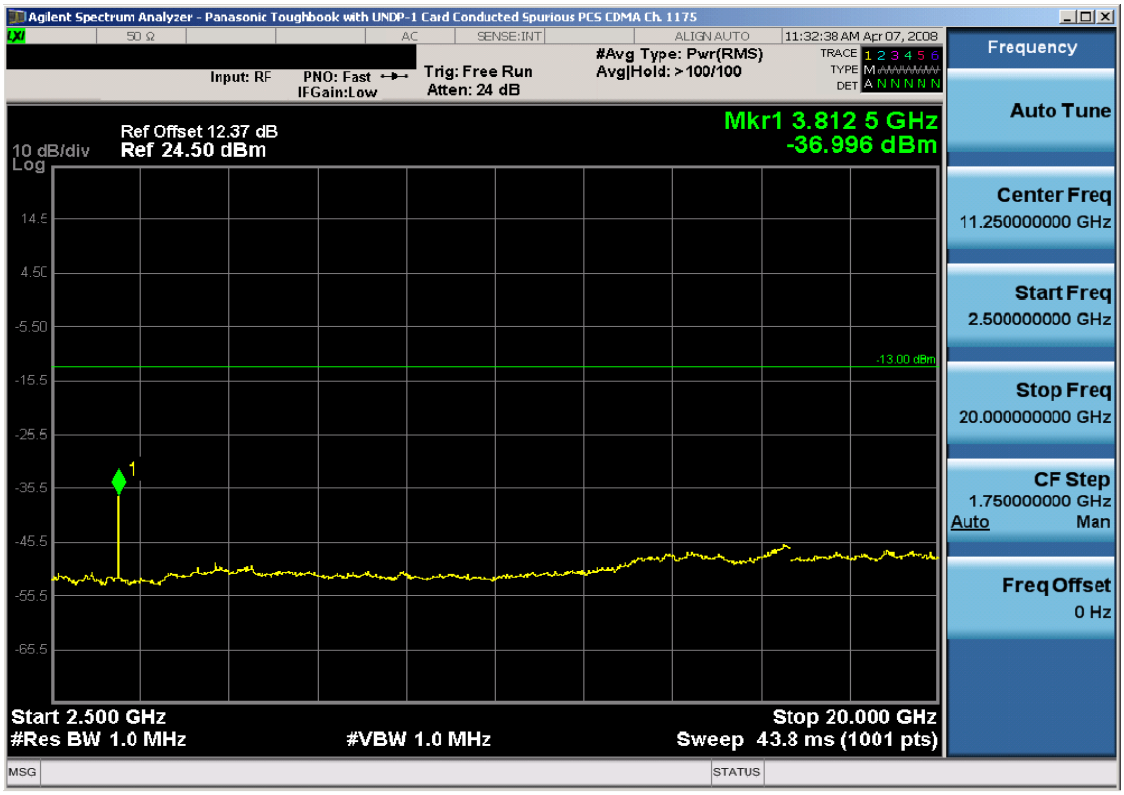


Plot 7-65. Conducted Spurious Plot (PCS CDMA Mode – Ch. 1175)



Plot 7-66. Conducted Spurious Plot (PCS CDMA Mode – Ch. 1175)

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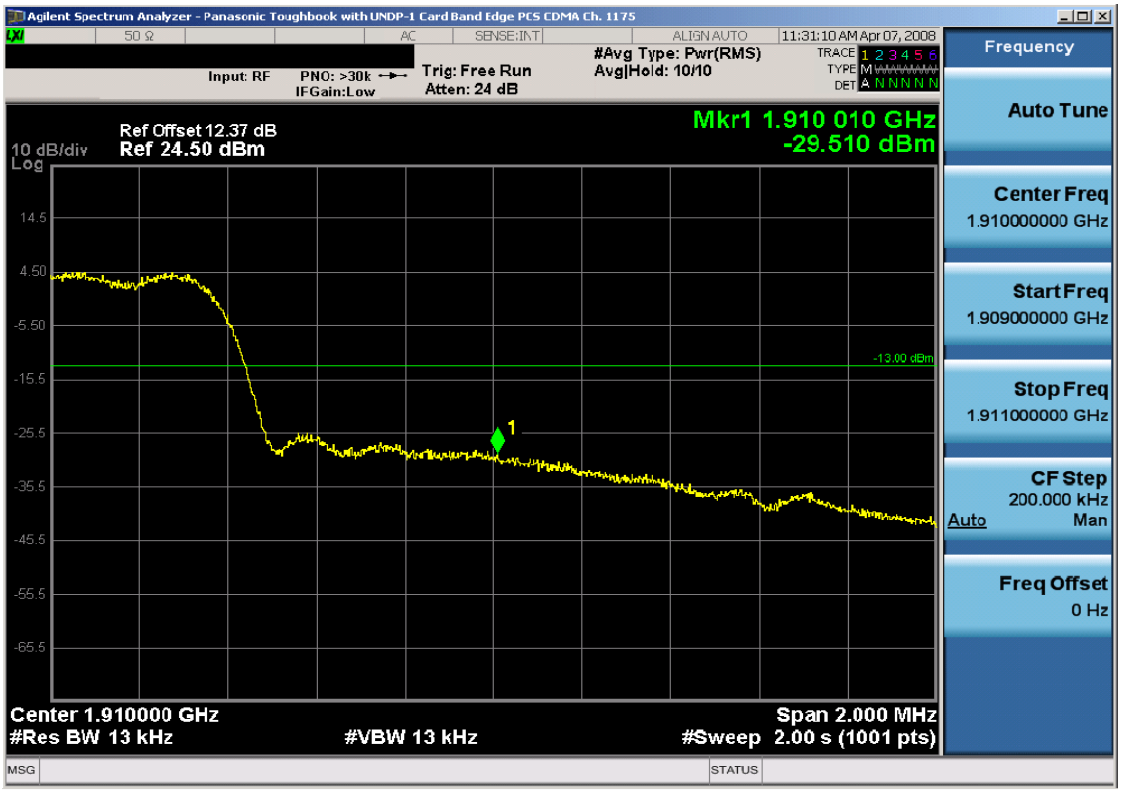
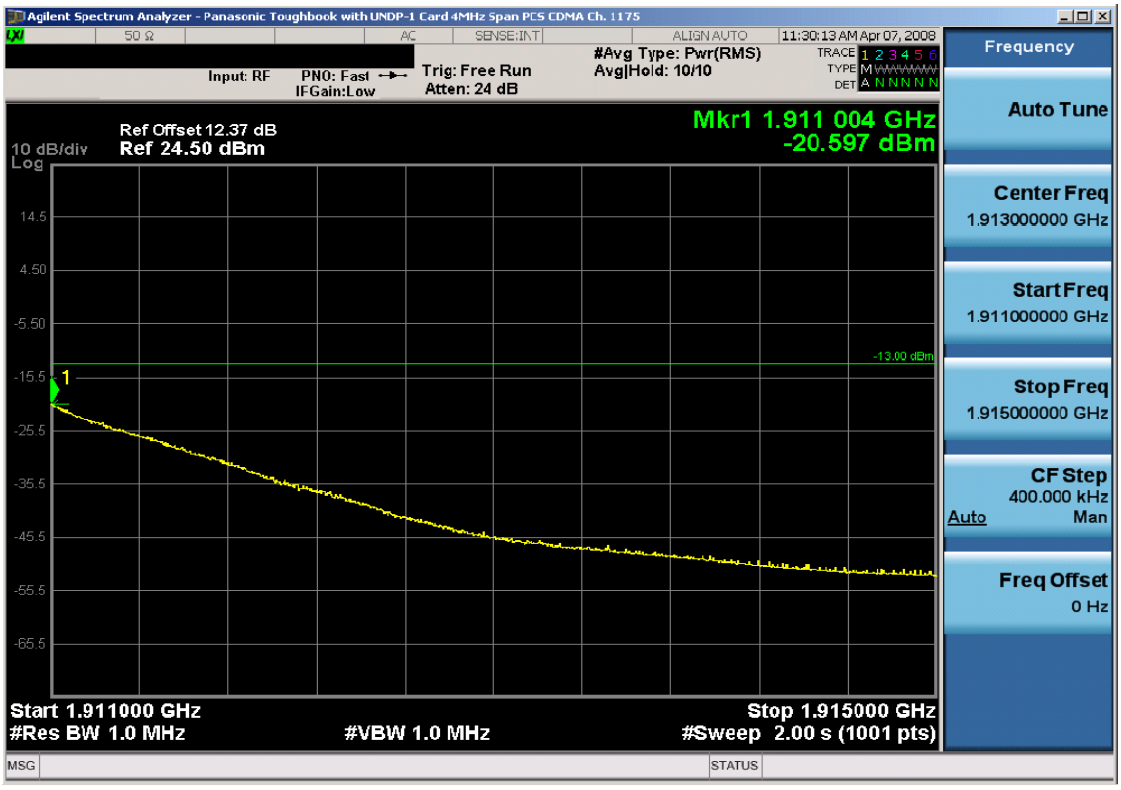


Plot 7-67. Band Edge Plot (PCS CDMA Mode – Ch. 1175)



Plot 7-68. 4MHz Span Plot (PCS CDMA Mode – Ch. 1175)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Panasonic Toughbook Model: CF-U1 FCC ID: ACJ9TGCF-U13** complies with all the requirements of Parts 2, 22, and 24 of the FCC rules.

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