FCC CFR47 PART 22 SUBPART H
CLASS II PERMISSIVE CHANGE CERTIFICATION
TEST REPORT

FOR

800/1900MHZ DUAL BAND CDMA DATA MODEM MODULE

MODEL NUMBER: EM3420

FCC ID: N7N-EM3420P

REPORT NUMBER: 06U10536-1

ISSUE DATE: SEPTEMBER 20, 2006

Prepared for
SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92009, USA

Prepared by
COMPLIANCE CERTIFICATION SERVICES
561F MONTEREY ROAD
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LAB CODE:200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	9/20/06	Initial Issue	Thu C.

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SIERRA WIRELESS
2290 COSMOS CT.
CARLSBAD, CA 92009, USA

EUT DESCRIPTION: 800/1900 MHz DUAL BAND CDMA DATA MODEM MODULE

MODEL: EM3420

SERIAL NUMBER: 01798

DATE TESTED: AUGUST 28, 2006

APPLICABLE STANDARDS	
STANDARD	**STANDARD**
FCC PART 22 SUBPART H	FCC PART 22 SUBPART H
FCC PART 24 SUBPART E	FCC PART 24 SUBPART E

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC CFR 47 Part 22H and 24E.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a dual-band CDMA phone.

The radio module is manufactured by Sierra Wireless Inc.

5.2. CLASS II PERMISSIVE CHANGE DESCRIPTION

The changes filed under this application include the following:

1. TX SAW filter changed from Fujitsu FAR-G6CR-1G8950-L24A to Agilent part number ACPF-7003;

2. Stacked Memory changed from NANOAMP N08C1630E3AM-7TI, to SPANSION S71PL032J80BFWQ70;

3. NJR RF switch is eliminated from the design since the new TX SAW (Item 1) covers the entire PCS band.

5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

800 MHz Cellular Band

Frequency Range (MHz)	Modulation	Output Power (dBm)	Output Power (mW)
824.7 - 848.3	CDMA	29.48	887.16

1900 MHz PCS Band

Frequency Range (MHz)	Modulation	Output Power (dBm)	Output Power (mW)
1851.25 - 1908.75	CDMA	28.33	680.77

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes the same antenna as the original filing.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was DirestedTest.exe

The test utility software used during testing was DirestedTest.

5.6. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at 824.7MHz.for CELL Band and 1851.31MHz for PCS Band

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
Laptop	IBM	Thinkpad T20	78-PRT68	DoC
AC Adapter	IBM	02K6665	11S02K6665Z1Z0ZX0910HC	DoC
AC Adapter	Elpac Power System	FW1805F	13166	DoC
Test Kit	Sierra Wireless	NA	CCA-000051-0001	NA

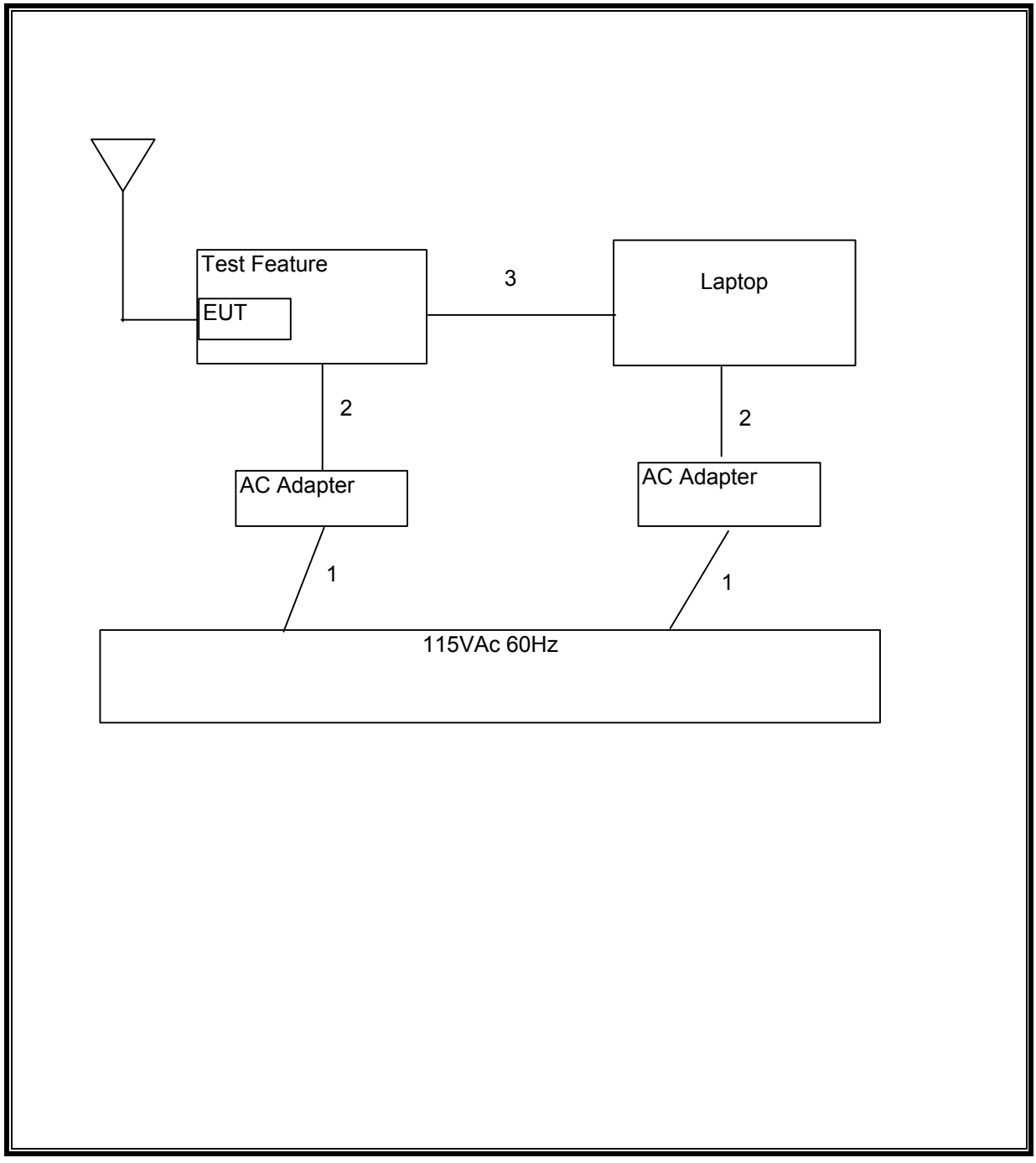
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	AC	2	US 115V	Un-shielded	2m	N/A
2	DC	1	DC	Un-shielded	2m	N/A
3	Serial	1	DB9	Shielded	1m	Connected from test feature to Laptop

TEST SETUP

The EUT is installed in a Test Kit via a serial cable to a Laptop during the tests. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	MY45300064	12/19/2006
Peak / Average Power Sensor	Agilent	E9327A	US40440755	12/2/07
Peak Power Meter	Agilent / HP	E4416A	GB41291160	12/2/07
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	12/3/06
Preamplifier, 1300 MHz	HP	8447D	1937A02062	1/7/07
EMI Test Receiver	R & S	ESHS 20	827129/006	12/3/06
Dipole	EMCO	3121C-DB2	22435	3/25/07
Signal Generator, 1024 MHz	R & S	SMY01	DE 12311	04/11/07
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/22/07
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	04/22/07
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00369	8/17/07

7. LIMITS AND RESULTS

7.1. OCCUPIED BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the –26 dB bandwidth. The VBW is set to >=3 times the RBW. The sweep time is coupled. The spectrum analyzer internal –26 dB bandwidth function is utilized.

RESULTS

No non-compliance noted:

CELL Modulation

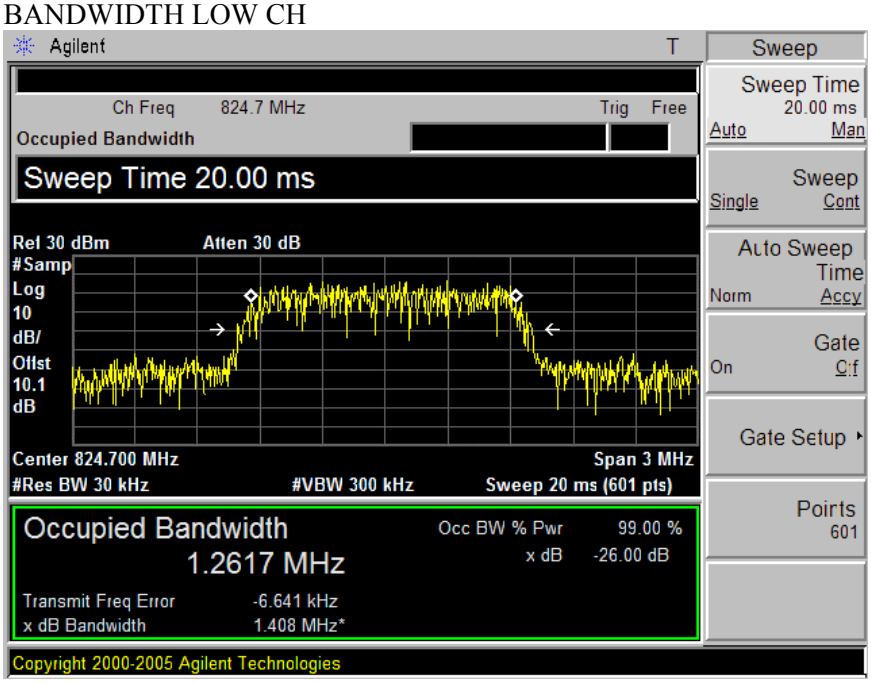
Channel	Frequency (MHz)	Bandwidth (MHz)
Low	824.7	1.408
Middle	836.5	1.39
High	848.31	1.419

PCS Modulation

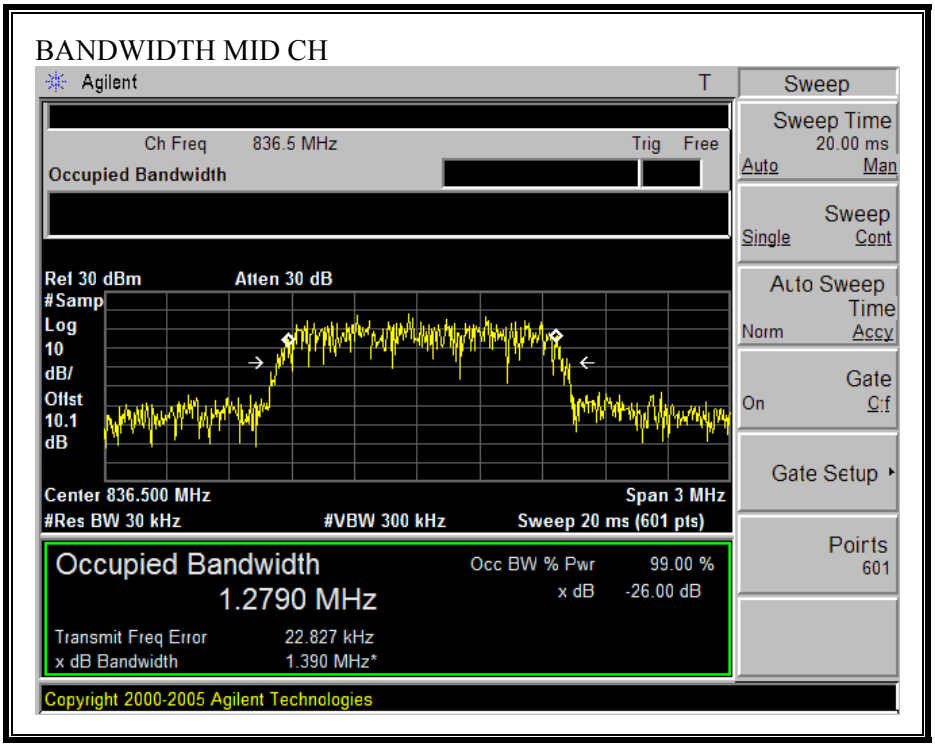
Channel	Frequency (MHz)	Bandwidth (MHz)
Low	1851.25	1.399
Middle	1880	1.395
High	1908.75	1.402

800MHz CELLULAR 26 dB BANDWIDTH

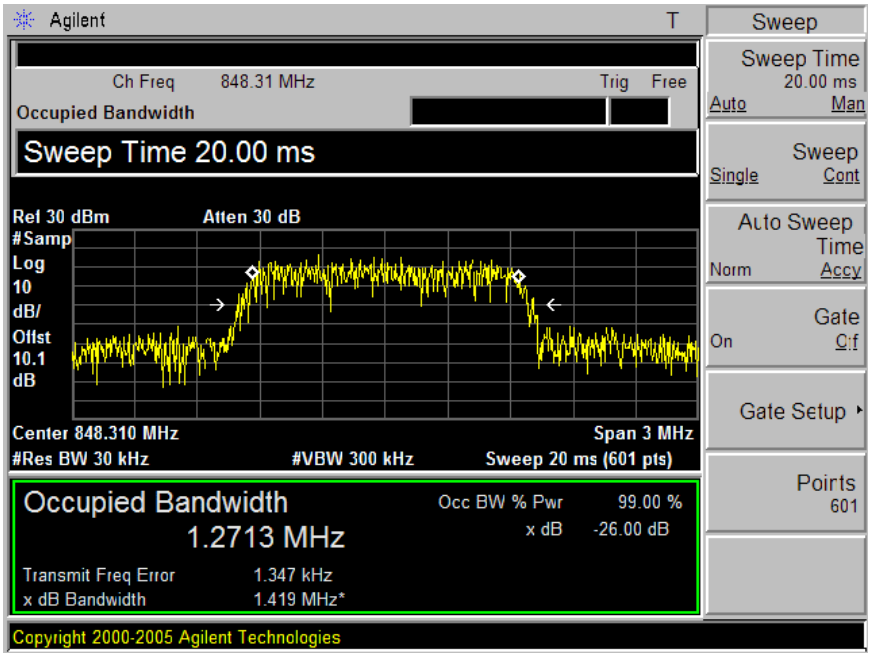
BANDWIDTH LOW CH



BANDWIDTH MID CH

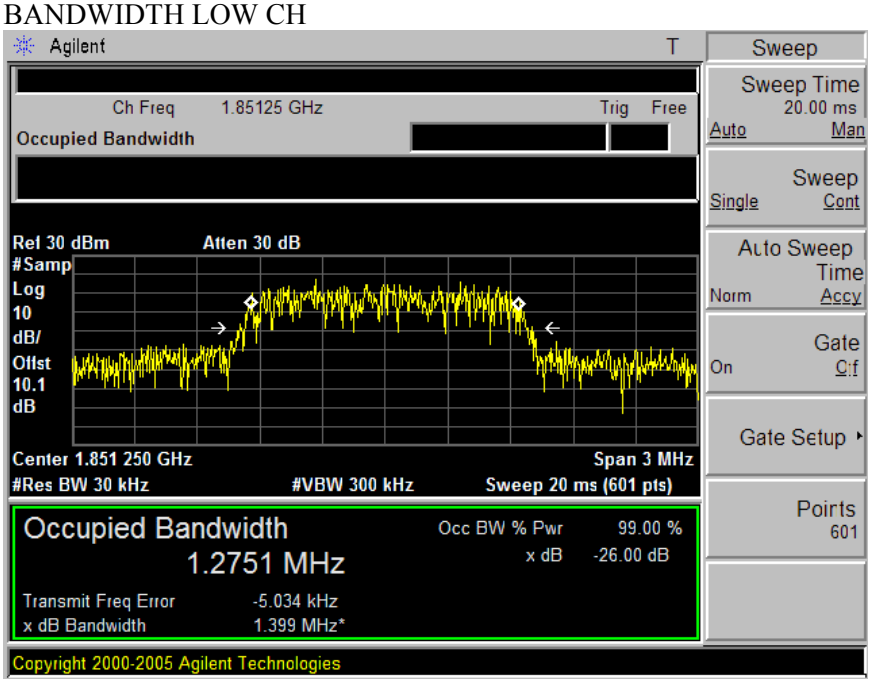


BANDWIDTH HIGH CH

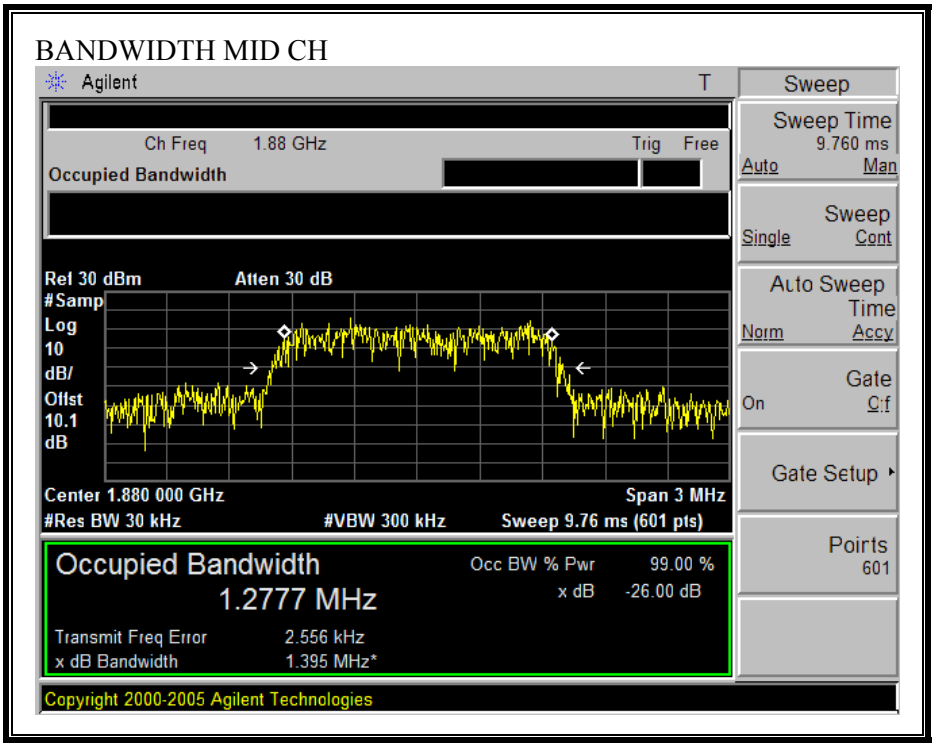


1900MHz PCS 26 dB BANDWIDTH

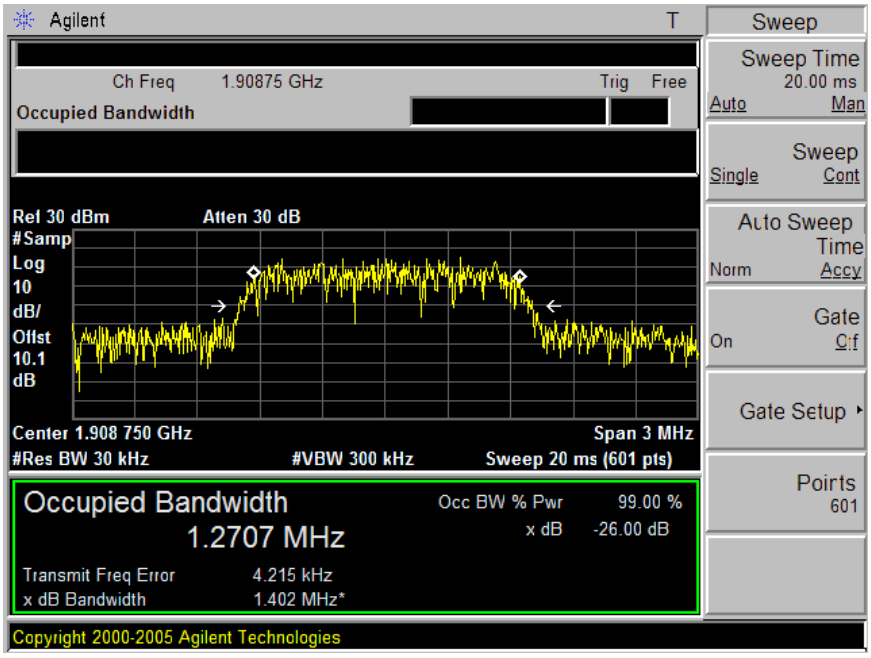
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



7.2. RF POWER OUTPUT

LIMIT

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

24.232(b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

RESULTS

No non-compliance noted.

800MHz CELL CDMA Modulation

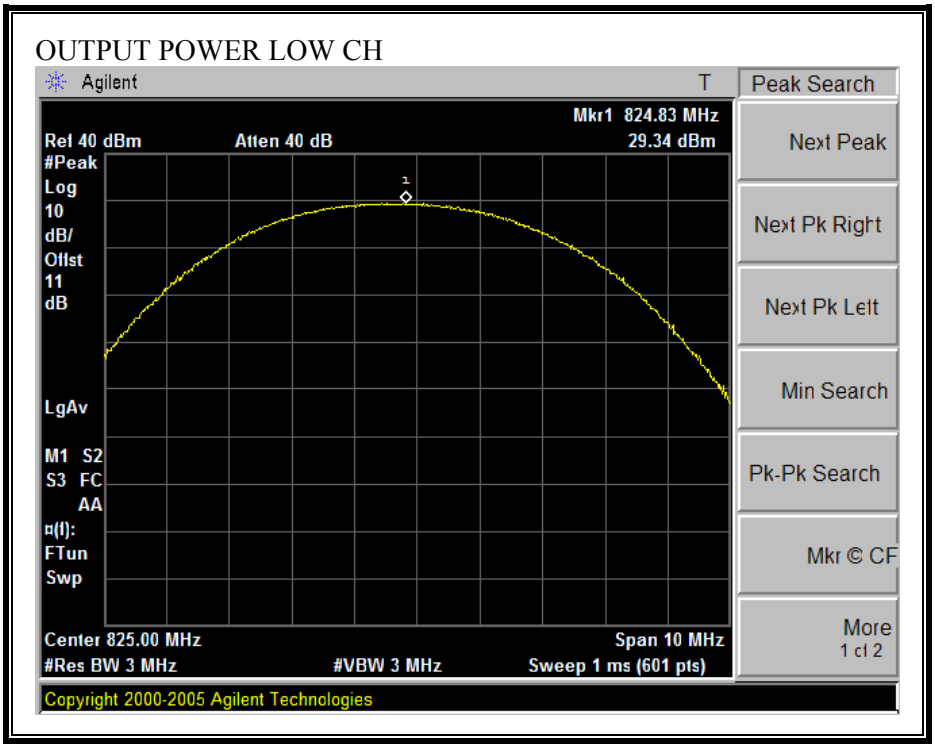
Channel	Frequency (MHz)	Conducted Average Power (dBm)	Conducted Average Power (mW)	Conducted Peak Power (dBm)	Conducted Peak Power (mW)
Low	824.7	24.4	277.33	29.34	859.01
Middle	836.5	24.5	279.25	29.48	887.16
High	848.3	24.4	274.16	29.02	797.99

1900MHz PCS CDMA Modulation

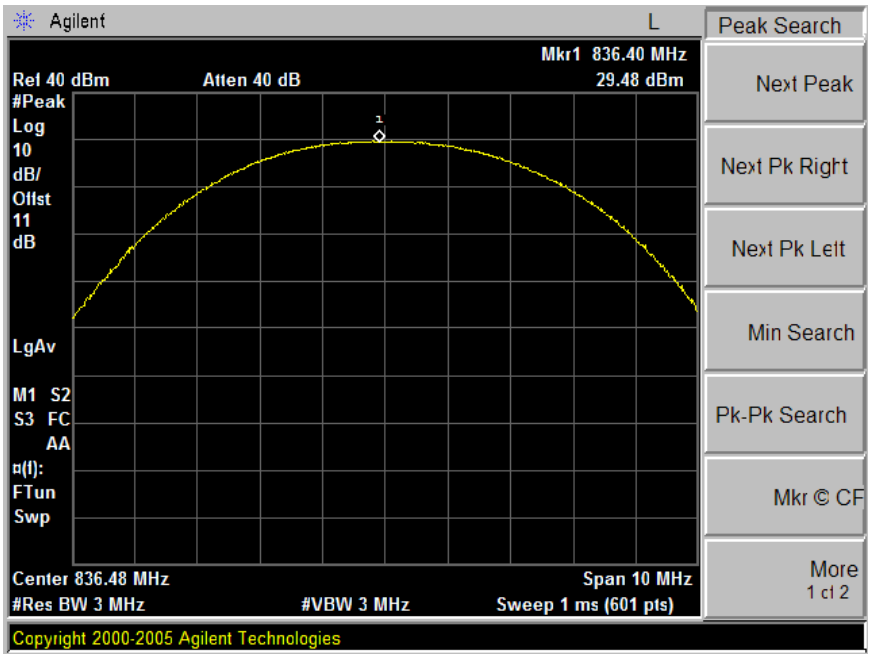
Channel	Frequency (MHz)	Conducted Average Power (dBm)	Conducted Average Power (mW)	Conducted Peak Power (dBm)	Conducted Peak Power (mW)
Low	1851.25	24.30	269.15	28.33	680.77
Middle	1880.00	23.61	229.61	27.45	555.90
High	1908.75	23.50	223.87	27.00	501.19

800MHz CELLULAR (RF CONDUCTED OUTPUT POWER)

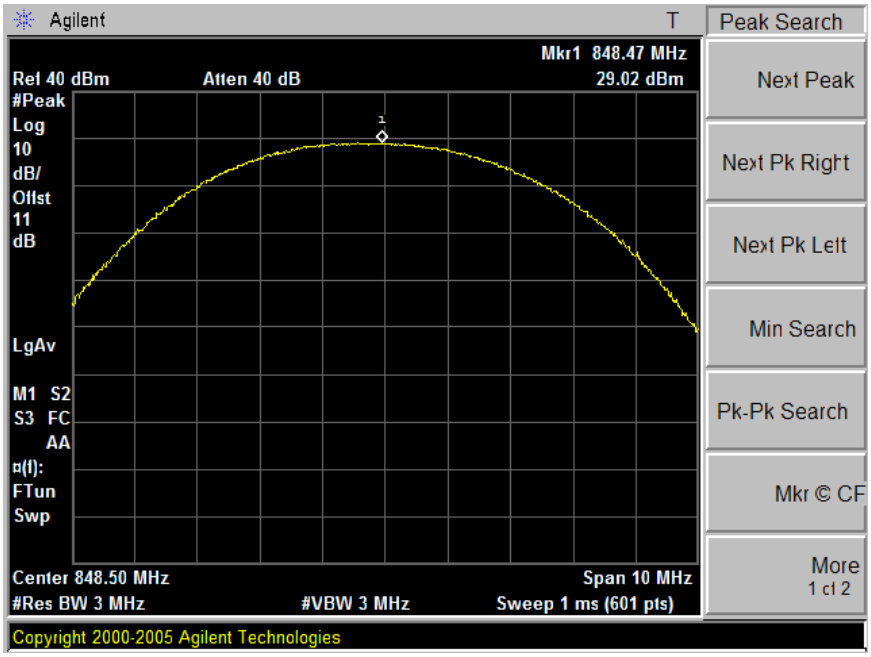
OUTPUT POWER LOW CH



OUTPUT POWER MID CH

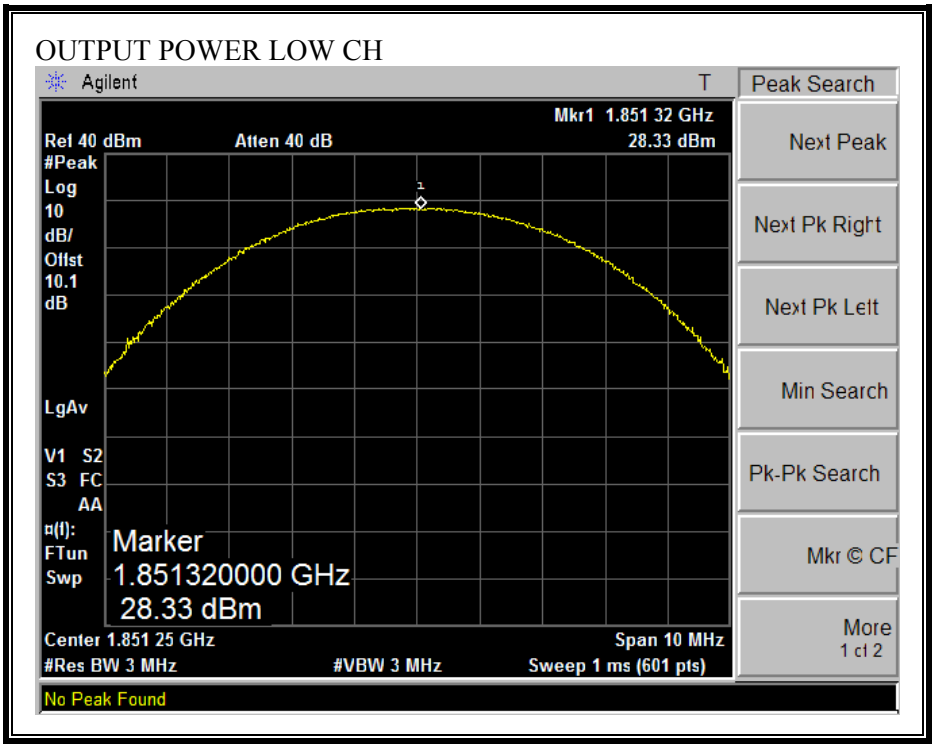


OUTPUT POWER HIGH CH

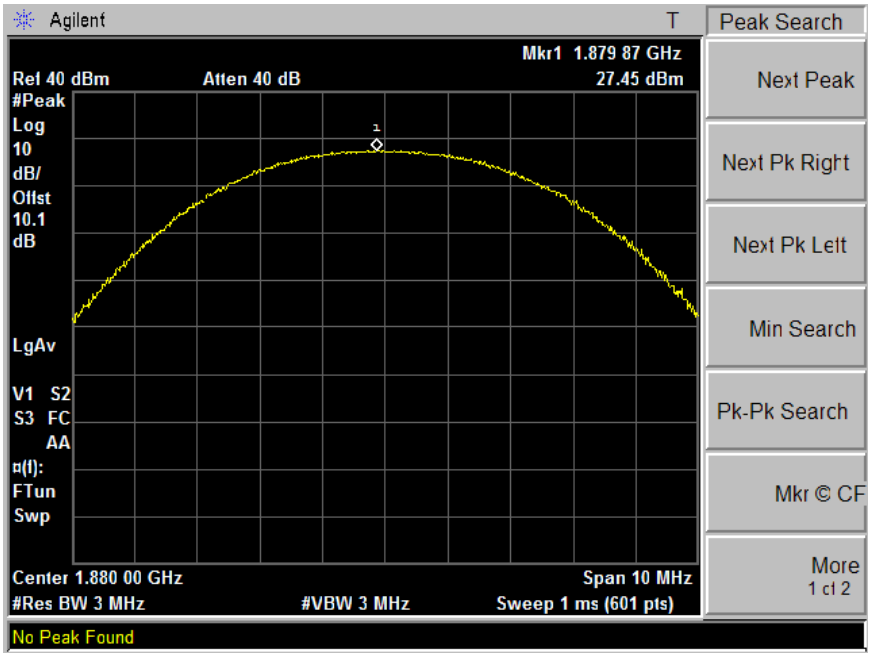


1900MHz PCS (RF CONDUCTED OUTPUT POWER)

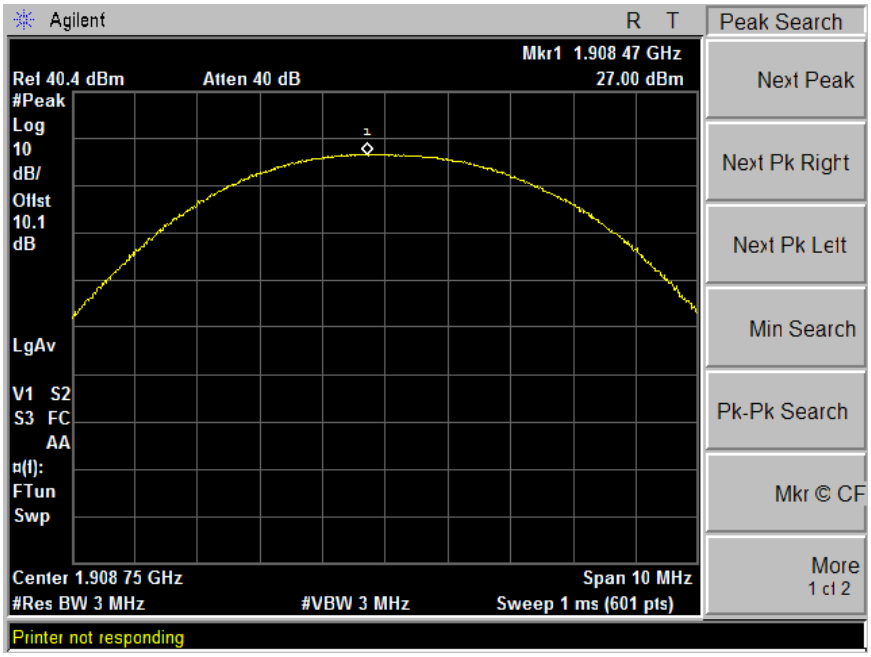
OUTPUT POWER LOW CH



OUTPUT POWER MID CH



OUTPUT POWER HIGH CH



7.3. SPURIOUS EMISSION AT ANTENNA TERMINAL

LIMIT

§22.917 (e) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
§24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

TEST PROCEDURE

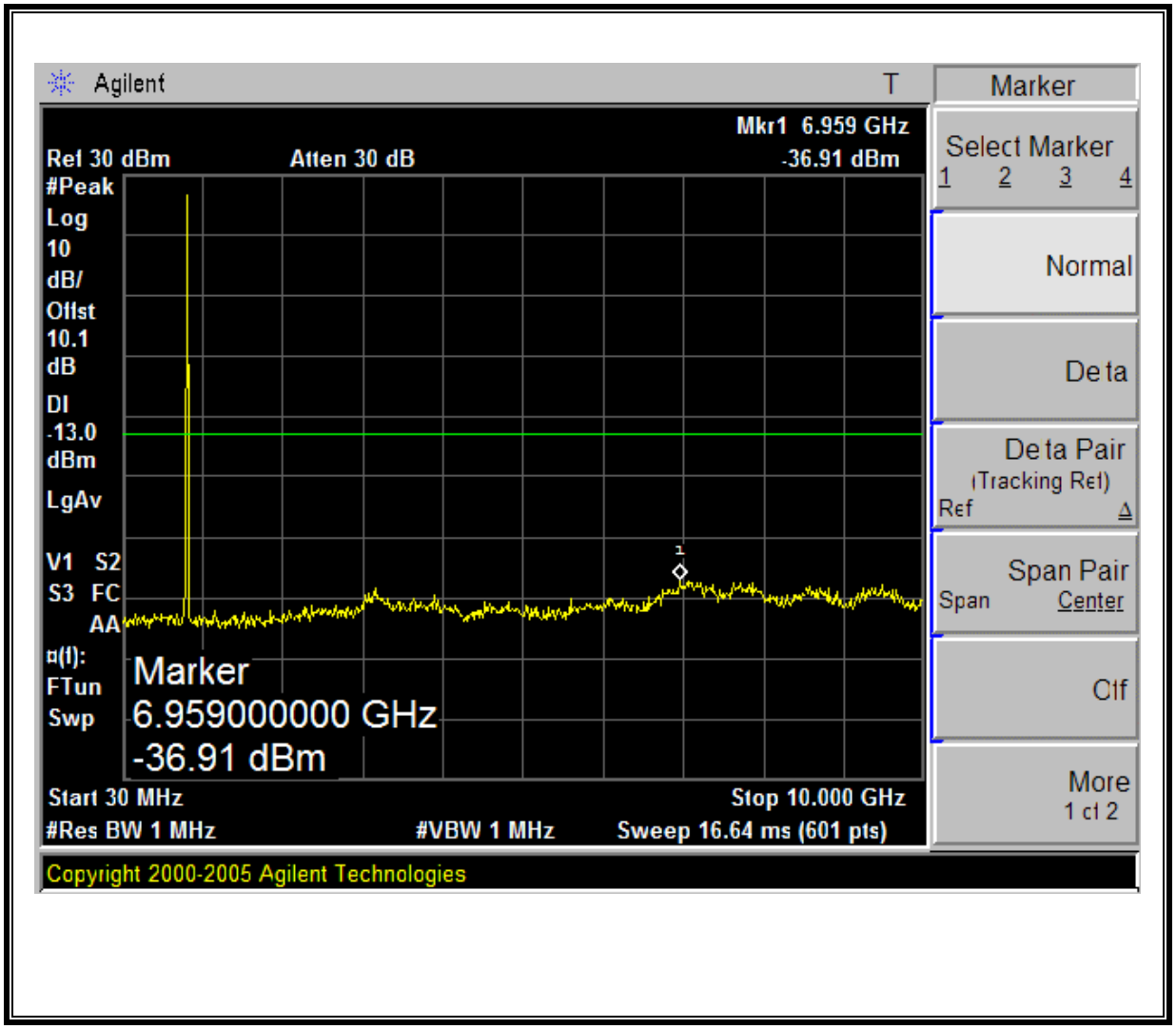
ANSI / TIA / EIA 603 Clause 3.2.13 & FCC 22.917 (h)
ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 24.238 (b)

RESULTS

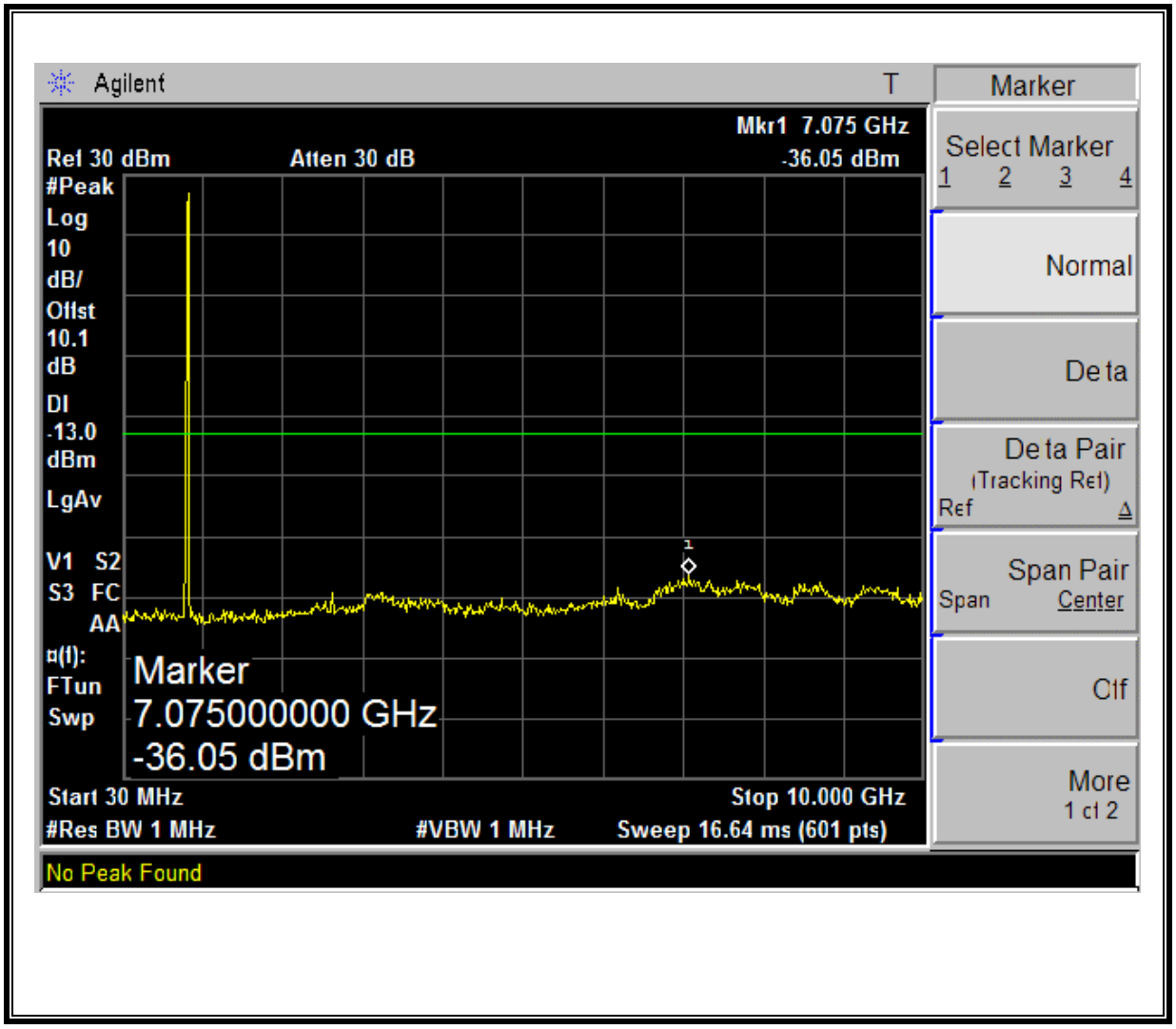
No non-compliance noted.

800MHz CELLULAR

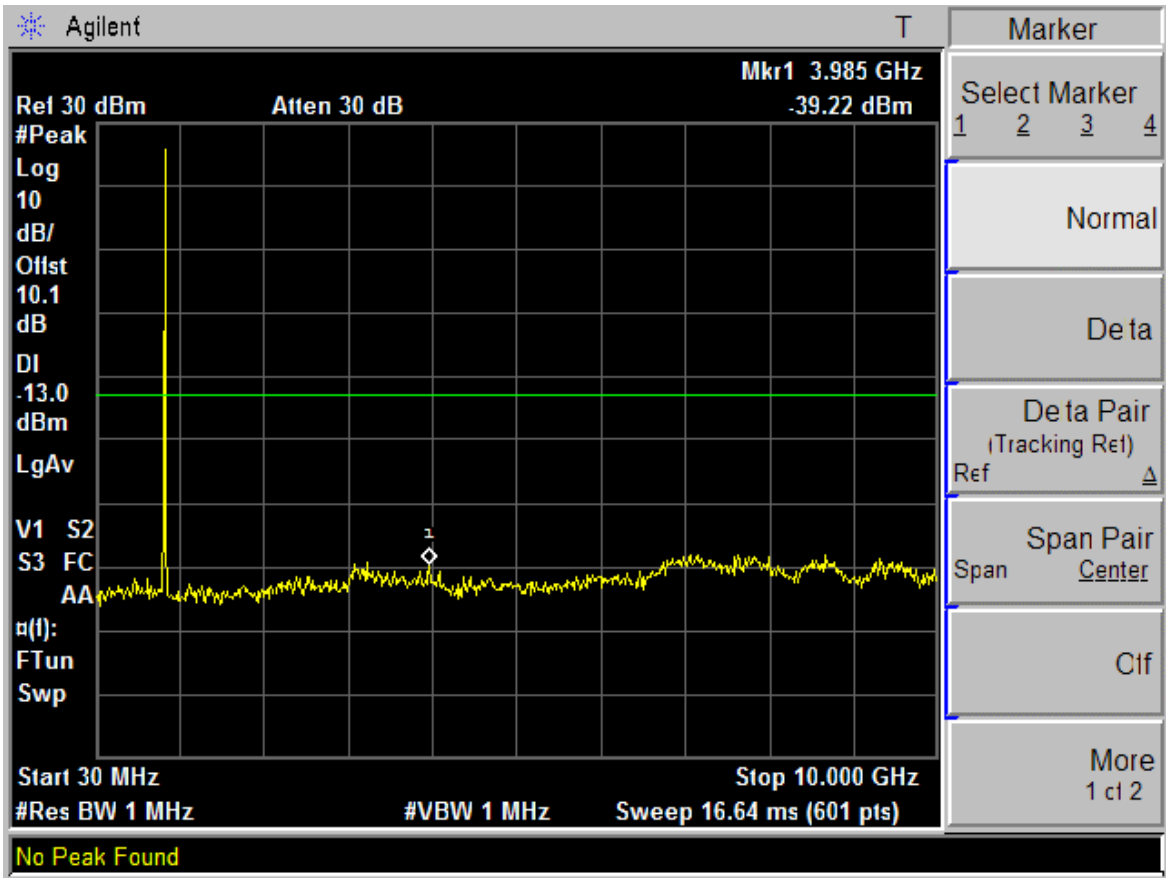
CDMA Modulation: Low Channel, Out-Of-Band Emissions



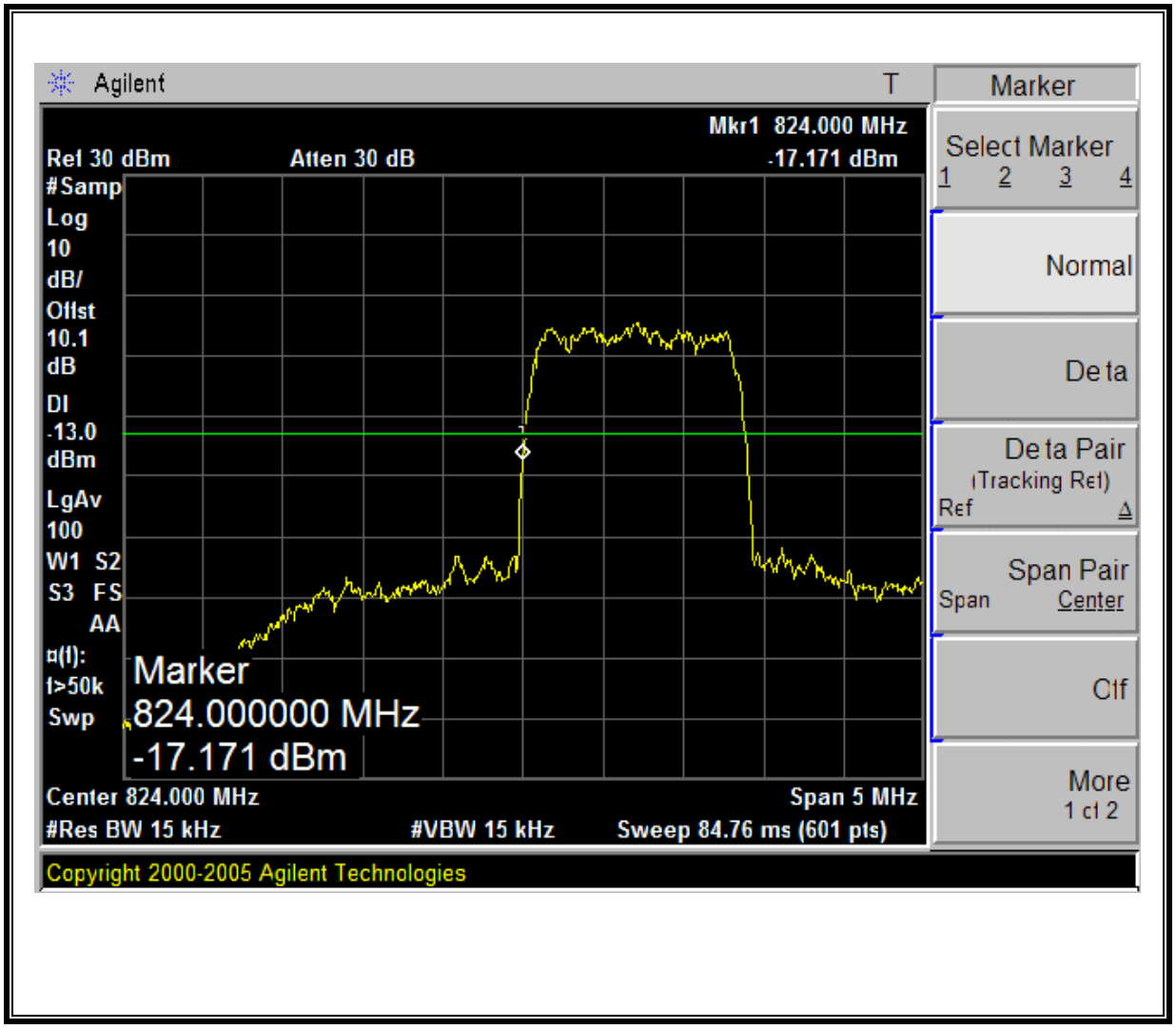
CELL Modulation: Mid Channel, Out-Of-Band Emissions



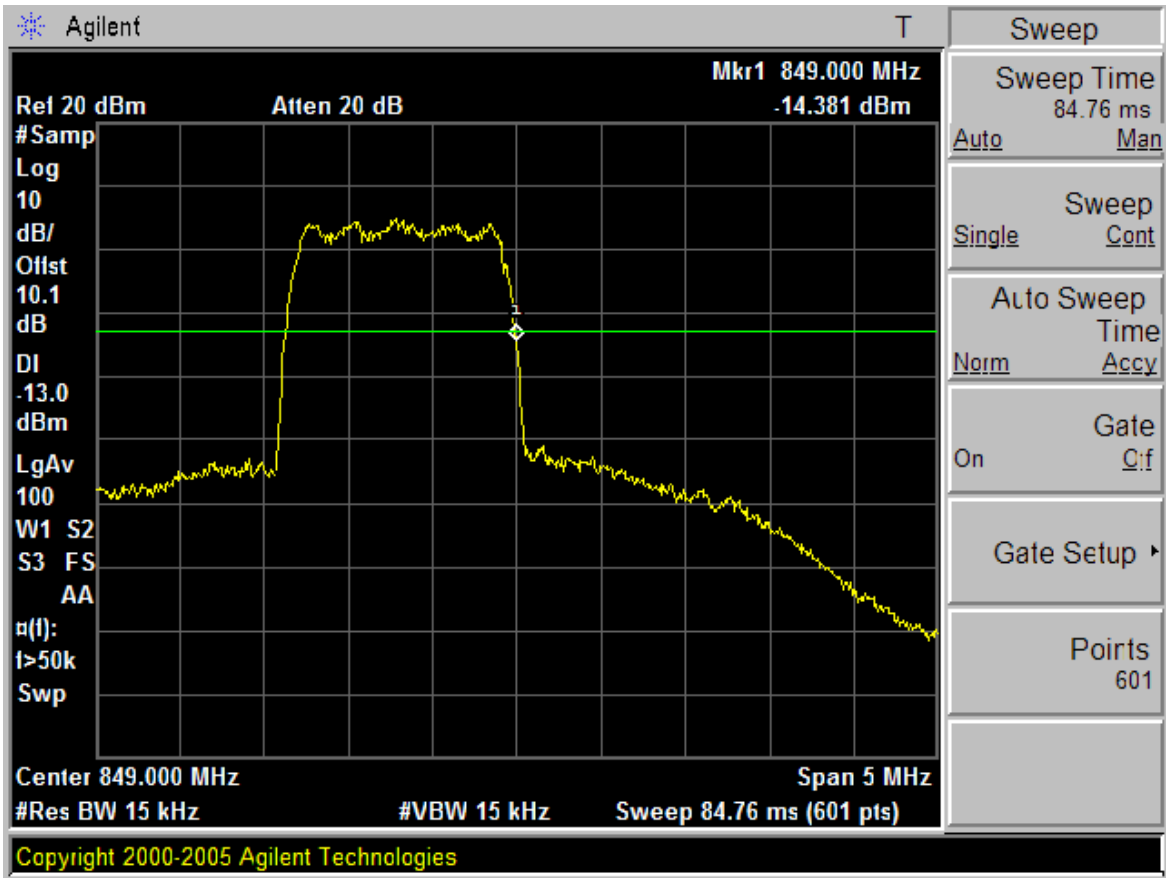
CELL Modulation: High Channel, Out-Of-Band Emissions



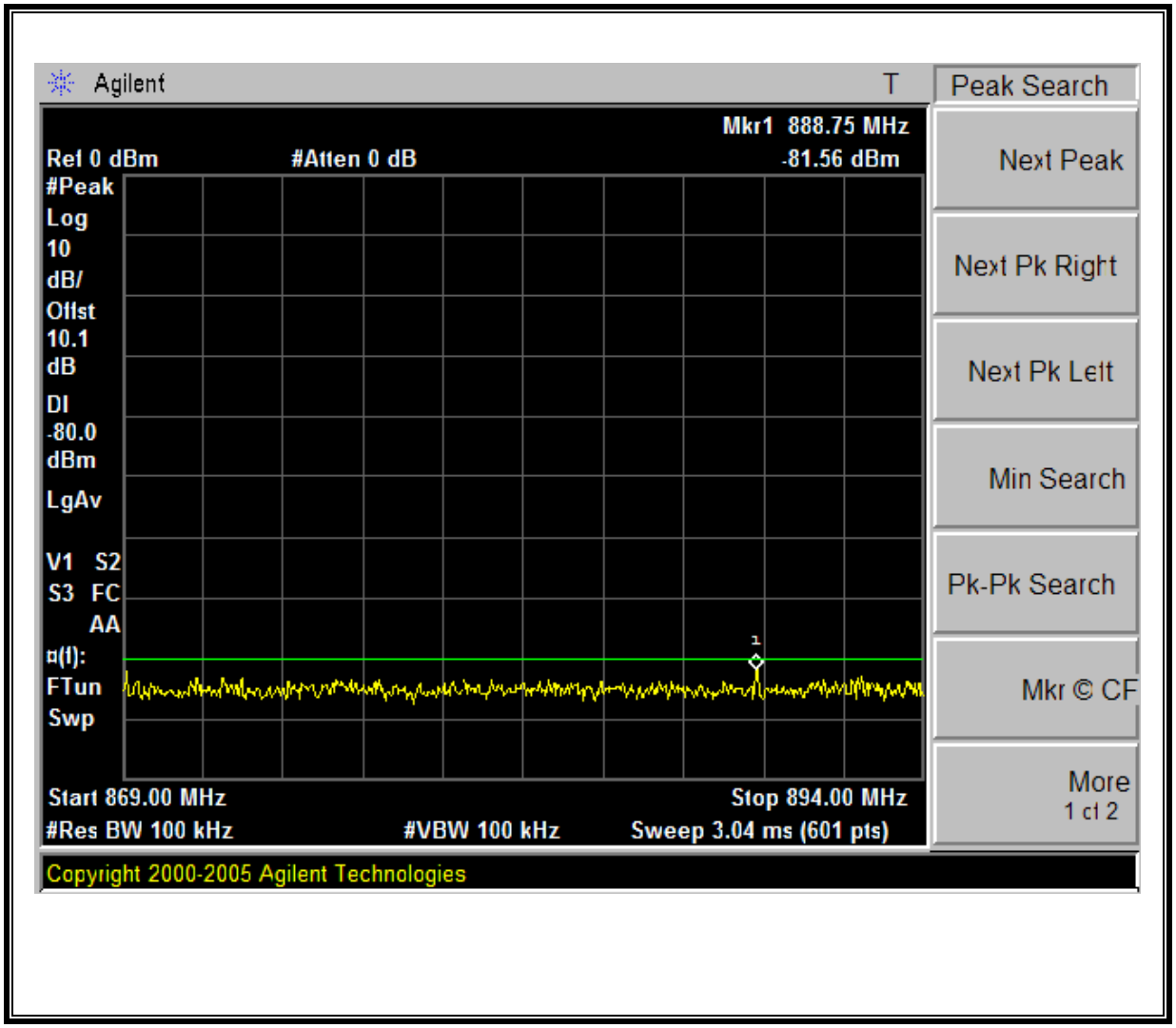
CELL Modulation: Low Channel Band Edge



CELL Modulation: High Channel Band Edge

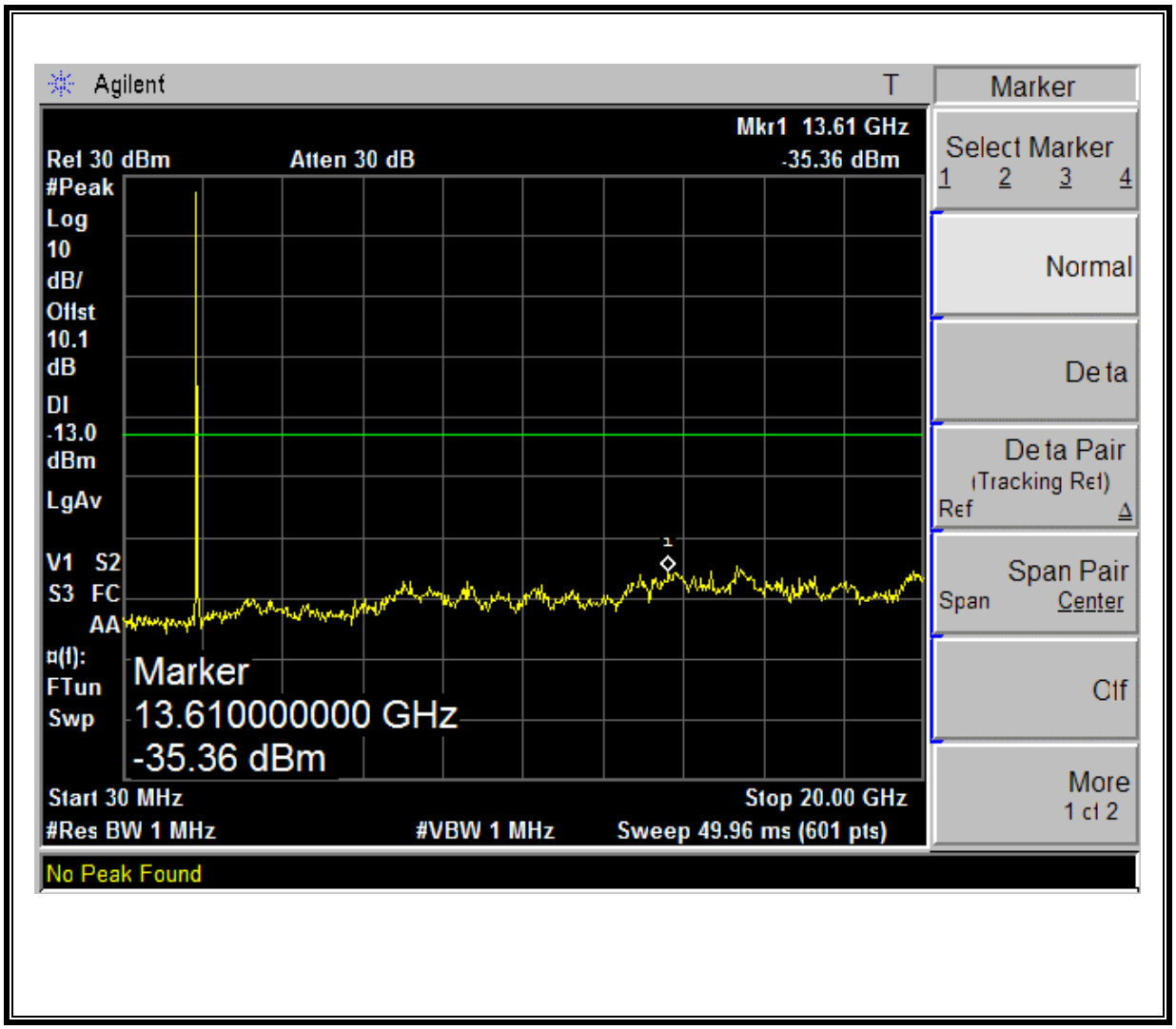


CELL Mobile Emissions in Base Frequency Range

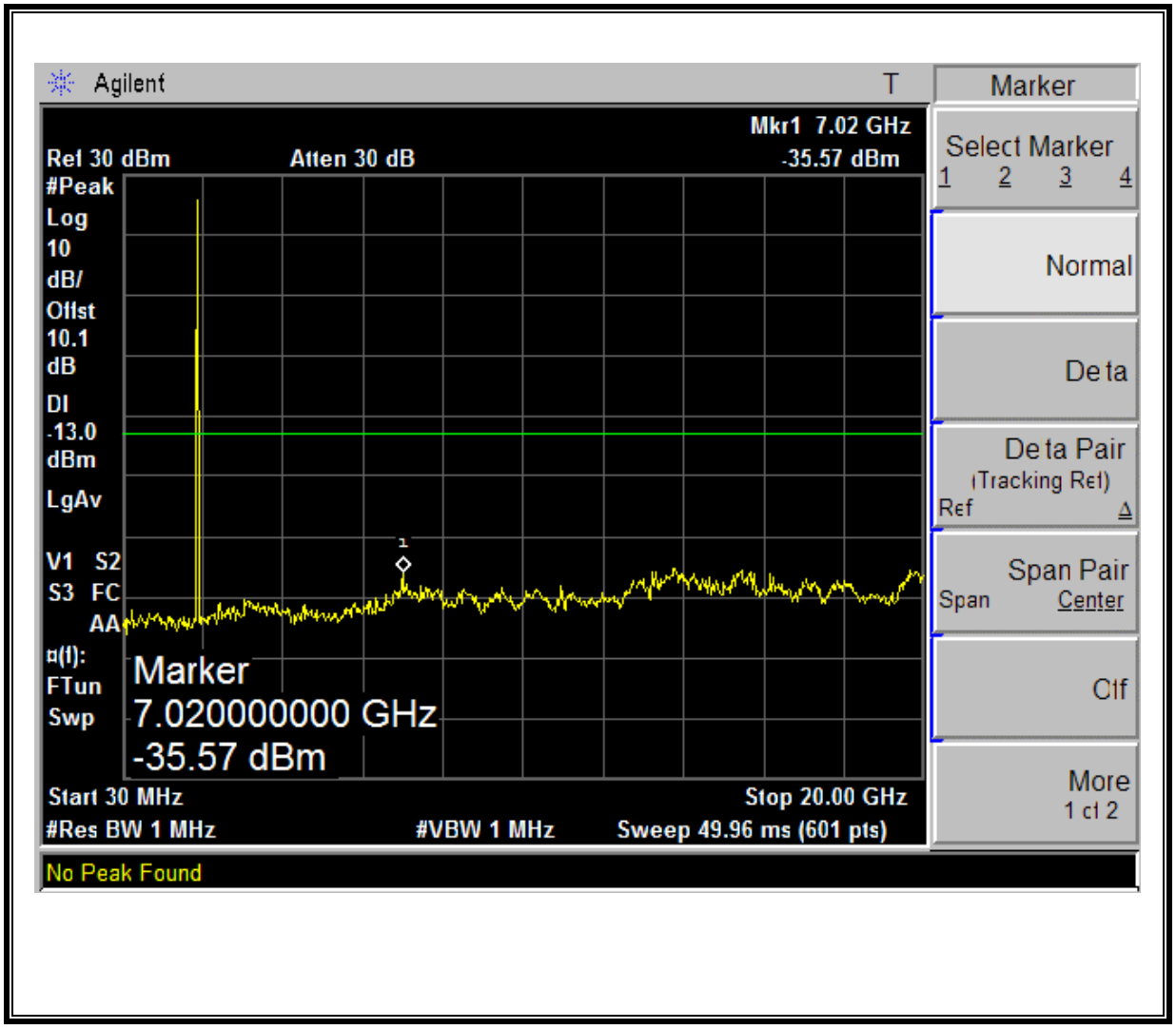


1900MHZ PCS

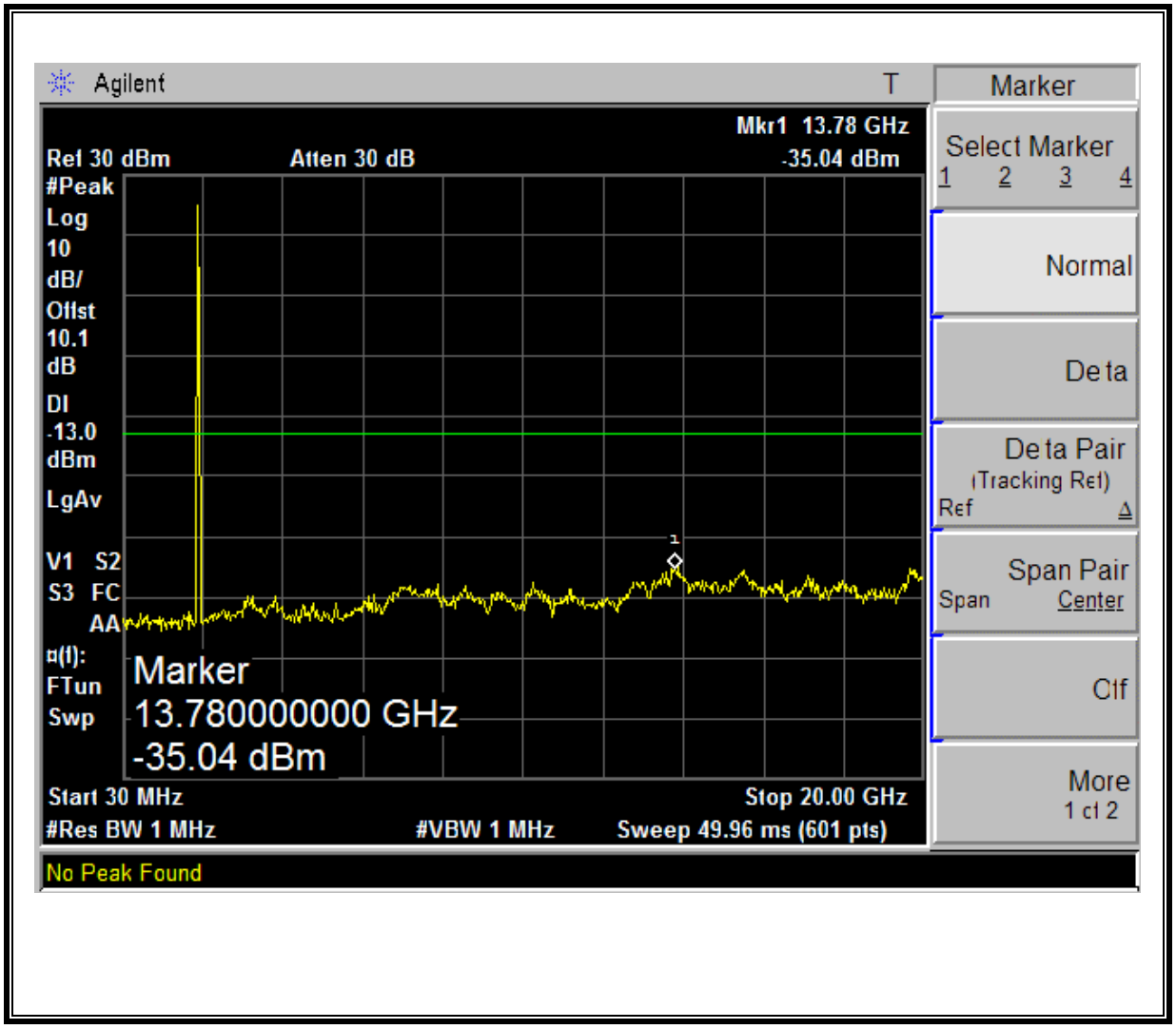
PCS CDMA Modulation: Low Channel Out-Of-Band Emissions



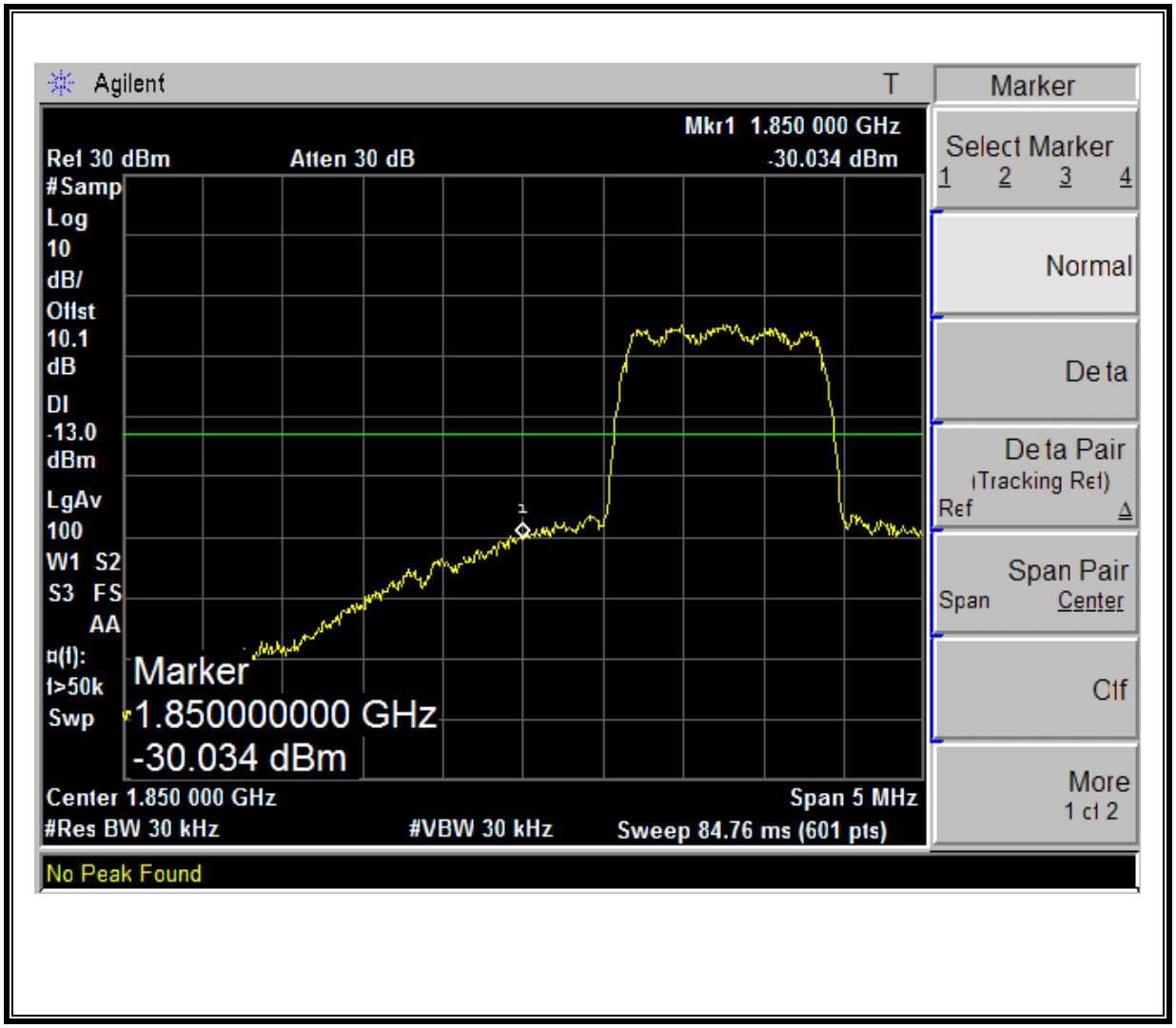
CDMA Modulation: Mid Channel Out-Of-Band Emissions



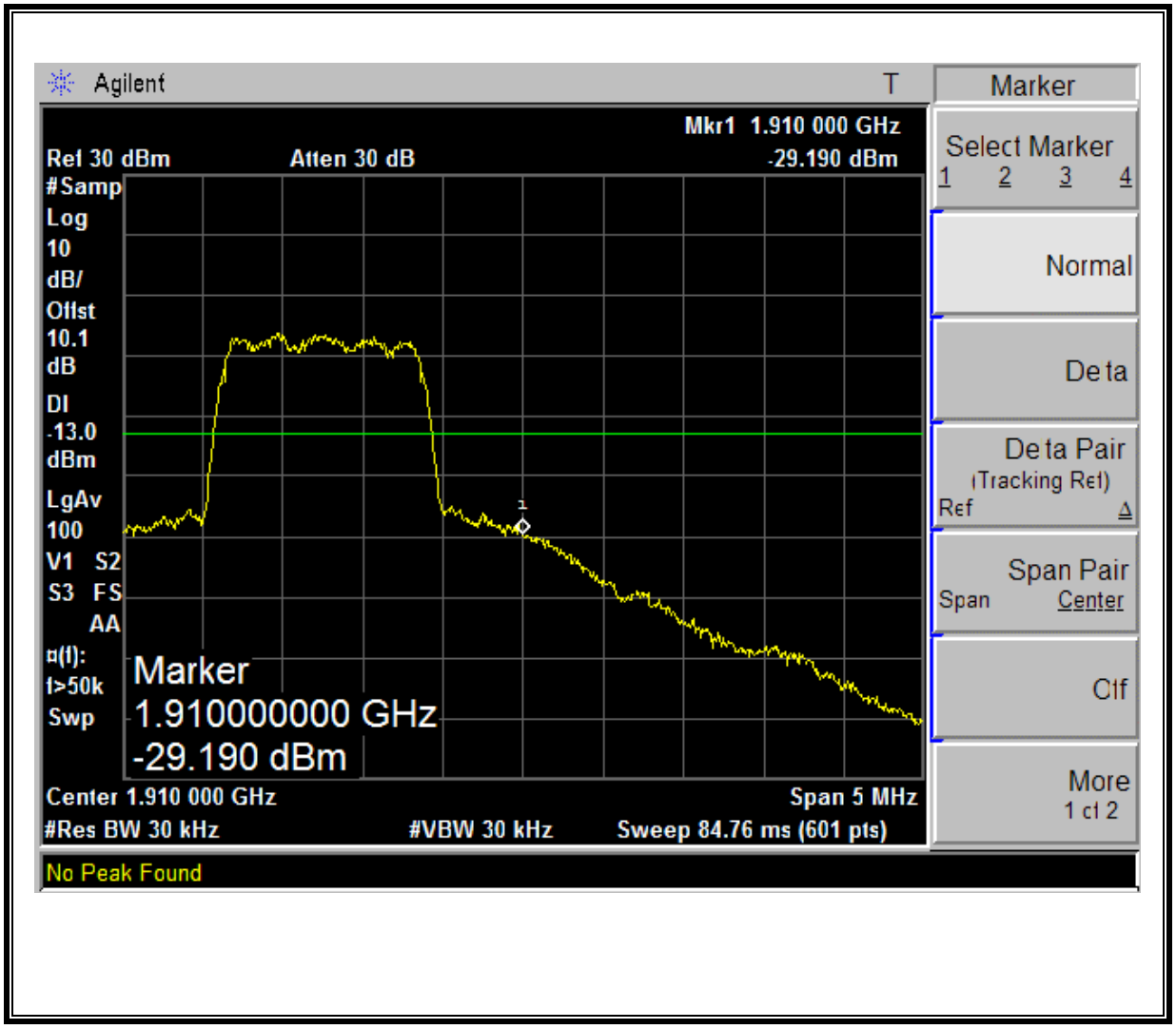
CDMA Modulation: High Channel Out-Of-Band Emissions



CDMA Modulation: Low Channel Band Edge



CDMA Modulation: High Channel Band Edge



7.4. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

§22.917 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

§24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 22.917 (b)
ANSI / TIA / EIA 603 Clause 3.2.12 & FCC 24.238 (b)

RESULTS

No non-compliance noted.

Cell Spurious & Harmonic (ERP)

Cellular Harmonic Substitution Measurement
Compliance Certification Services, Morgan Hill Immunity Chamber

Company: SIERRA WIRELESS
Project #: 06U10536
Date: 09/08/2006
Test Engineer: Thanh Nguyen
Configuration: EUT Connects to Support Laptop.
Mode:Transmit.

Test Equipment:
Receiving: Horn T59, Pre-amp T34, Chin SMA Cables 2 & 12 ft (Setup this one for testing EUT)
Substitution: Horn T60, 6ft SMA Cable Warehouse S/N: 208947 002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (824.7MHz)									
1.649	61.4	V	-51.9	0.8	4.9	-47.8	-13.0	-34.8	
2.474	55.4	V	-55.0	1.0	7.1	-48.8	-13.0	-35.8	
3.299	46.5	V	-59.0	1.2	7.3	-52.9	-13.0	-39.9	
4.124	43.8	V	-61.7	1.3	7.8	-55.2	-13.0	-42.2	
4.948	47.5	V	-56.5	1.5	8.8	-49.2	-13.0	-36.2	
1.649	57.1	H	-57.2	0.8	4.9	-53.1	-13.0	-40.1	
2.474	53.2	H	-57.5	1.0	7.1	-51.3	-13.0	-38.3	
3.299	51.3	H	-56.1	1.2	7.3	-50.0	-13.0	-37.0	
4.124	42.0	H	-63.7	1.3	7.8	-57.3	-13.0	-44.3	
4.948	49.3	H	-53.6	1.5	8.8	-46.3	-13.0	-33.3	
Mid Channel (836.52MHz)									
1.673	58.9	V	-54.2	0.8	5.0	-50.0	-13.0	-37.0	
2.510	52.9	V	-56.5	1.0	7.1	-50.4	-13.0	-37.4	
3.346	49.8	V	-57.0	1.2	7.3	-50.8	-13.0	-37.8	
4.183	43.6	V	-61.9	1.4	7.9	-55.3	-13.0	-42.3	
5.019	50.2	V	-53.3	1.5	8.9	-45.9	-13.0	-32.9	
1.673	57.8	H	-56.4	0.8	5.0	-52.2	-13.0	-39.2	
2.510	52.1	H	-58.9	1.0	7.1	-52.8	-13.0	-39.8	
3.346	50.0	H	-57.6	1.2	7.3	-51.4	-13.0	-38.4	
4.183	41.6	H	-63.9	1.4	7.9	-57.4	-13.0	-44.4	
5.019	46.2	H	-56.3	1.5	8.9	-48.9	-13.0	-35.9	
High Channel (848.31MHz)									
1.697	62.4	V	-50.5	0.8	5.1	-46.3	-13.0	-33.3	
2.545	59.5	V	-49.3	1.0	7.1	-43.1	-13.0	-30.1	
3.393	49.2	V	-57.3	1.2	7.4	-51.1	-13.0	-38.1	
4.242	46.4	V	-59.5	1.4	8.0	-52.9	-13.0	-39.9	
5.090	51.1	V	-51.8	1.5	8.9	-44.5	-13.0	-31.5	
1.697	58.6	H	-55.1	0.8	5.1	-50.8	-13.0	-37.8	
2.545	57.5	H	-53.8	1.0	7.1	-47.7	-13.0	-34.7	
3.393	47.6	H	-60.0	1.2	7.4	-53.8	-13.0	-40.8	
4.242	48.4	H	-56.9	1.4	8.0	-50.3	-13.0	-37.3	
5.090	48.7	H	-54.1	1.5	8.9	-46.7	-13.0	-33.7	

PCS Spurious & Harmonic (ERP)

PCS Harmonic Substitution Measurement
Compliance Certification Services, Morgan Hill Immunity Chamber

Company: SIERRA WIRELESS
Project #: 06U10536
Date: 09/08/2006
Test Engineer: Thanh Nguyen
Configuration: EUT Connects to Support Laptop.
Mode:Transmit.

Test Equipment:
Receiving: Horn T59, Pre-amp T34, and Chin SMA Cables 2 & 12 ft (Setup this one for testing EUT)
Substitution: Horn T60, and 6ft SMA Cable Warehouse S/N: 208947 002

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (1851.25MHz)									
3.703	71.9	V	-33.1	1.2	9.7	-24.7	-13.0	-11.7	
5.554	77.0	V	-25.5	1.6	11.0	-16.1	-13.0	-3.1	
7.405	54.0	V	-45.6	1.9	12.0	-35.5	-13.0	-22.5	
9.256	45.9	V	-51.9	2.1	12.7	-41.3	-13.0	-28.3	
11.108	48.5	V	-48.2	2.3	13.8	-36.7	-13.0	-23.7	
3.703	67.3	H	-39.2	1.2	9.7	-30.8	-13.0	-17.8	
5.554	68.4	H	-33.6	1.6	11.0	-24.2	-13.0	-11.2	
7.405	51.1	H	-47.6	1.9	12.0	-37.5	-13.0	-24.5	
9.256	52.2	H	-44.5	2.1	12.7	-33.9	-13.0	-20.9	
Mid Channel (1880MHz)									
3.760	77.7	V	-26.8	1.3	9.7	-18.4	-13.0	-5.4	
5.640	67.4	V	-35.4	1.7	11.2	-25.9	-13.0	-12.9	
7.520	50.4	V	-50.0	1.9	12.0	-39.9	-13.0	-26.9	
9.400	56.4	V	-40.1	2.1	12.7	-29.5	-13.0	-16.5	
11.280	48.3	V	-47.5	2.3	13.9	-36.0	-13.0	-23.0	
3.760	72.5	H	-33.6	1.3	9.7	-25.1	-13.0	-12.1	
5.640	65.7	H	-36.2	1.7	11.2	-26.7	-13.0	-13.7	
7.520	50.1	H	-49.0	1.9	12.0	-38.9	-13.0	-25.9	
9.400	53.0	H	-42.8	2.1	12.7	-32.1	-13.0	-19.1	
11.280	47.3	H	-48.4	2.3	13.9	-36.8	-13.0	-23.8	
High Channel (1908.75MHz)									
3.818	79.4	V	-24.8	1.3	9.7	-16.4	-13.0	-3.4	
5.726	59.9	V	-42.6	1.7	11.3	-33.0	-13.0	-20.0	
7.635	49.8	V	-50.2	1.9	12.0	-40.1	-13.0	-27.1	
9.544	50.2	V	-45.4	2.1	12.7	-34.8	-13.0	-21.8	
11.453	43.8	V	-51.4	2.4	14.0	-39.8	-13.0	-26.8	
13.361	47.5	V	-47.4	2.6	15.3	-34.7	-13.0	-21.7	
3.818	79.9	H	-25.5	1.3	9.7	-17.0	-13.0	-4.0	
5.726	63.3	H	-38.9	1.7	11.3	-29.3	-13.0	-16.3	
7.635	44.9	H	-54.0	1.9	12.0	-43.9	-13.0	-30.9	
9.544	48.8	H	-46.8	2.1	12.7	-36.2	-13.0	-23.2	
11.453	53.2	H	-42.3	2.4	14.0	-30.7	-13.0	-17.7	