



**FCC CFR47 PART 22 SUBPART H  
FCC CFR47 PART 24 SUBPART E  
INDUSTRY CANADA RSS-132 ISSUE 2  
INDUSTRY CANADA RSS-133 ISSUE 5**

**CERTIFICATION TEST REPORT  
FOR  
PC EXPRESS CARD**

**MODEL NUMBER: E351  
FCC ID: PKRNVWE351  
IC: 3229A-E351**

**REPORT NUMBER: 11U13890-1  
ISSUE DATE: JULY 13, 2011**

*Prepared for*

**NOVATEL WIRELESS  
4122 SORRENTO VALLEY BLVD #104  
SAN DIEGO, CA 92121, U.S.A.**

*Prepared by*

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**NVLAP LAB CODE 200065-0**

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
---	07/13/11	Initial Issue	T. Chan

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS</b> .....	<b>4</b>
<b>2. TEST METHODOLOGY</b> .....	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION</b> .....	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY</b> .....	<b>5</b>
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i> .....	5
4.2. <i>SAMPLE CALCULATION</i> .....	5
4.3. <i>MEASUREMENT UNCERTAINTY</i> .....	5
<b>5. EQUIPMENT UNDER TEST</b> .....	<b>6</b>
5.1. <i>DESCRIPTION OF EUT</i> .....	6
5.2. <i>MAXIMUM OUTPUT POWER</i> .....	6
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS</i> .....	7
5.4. <i>SOFTWARE AND FIRMWARE</i> .....	7
5.5. <i>WORST-CASE CONFIGURATION AND MODE</i> .....	7
5.6. <i>DESCRIPTION OF TEST SETUP</i> .....	8
<b>6. TEST AND MEASUREMENT EQUIPMENT</b> .....	<b>11</b>
<b>7. RF POWER OUTPUT VERIFICATION</b> .....	<b>12</b>
7.1. <i>RF POWER OUTPUT FOR 1xRTT</i> .....	12
7.2. <i>RF POWER OUTPUT FOR CDMA2000 1xEV-DO Release 0 (Rel. 0)</i> .....	15
7.3. <i>RF POWER OUTPUT FOR CDMA2000 1xEV-DO Revision A (Rev. A)</i> .....	16
<b>8. CONDUCTED TEST RESULTS</b> .....	<b>17</b>
8.1. <i>OCCUPIED BANDWIDTH</i> .....	17
8.2. <i>BAND EDGE</i> .....	26
8.3. <i>OUT OF BAND EMISSIONS</i> .....	35
8.4. <i>FREQUENCY STABILITY</i> .....	48
<b>9. RADIATED TEST RESULTS</b> .....	<b>51</b>
9.1. <i>RADIATED POWER (ERP &amp; EIRP)</i> .....	51
9.2. <i>FIELD STRENGTH OF SPURIOUS RADIATION</i> .....	54
9.3. <i>RECEIVER SPURIOUS EMISSIONS</i> .....	59
9.4. <i>POWER LINE CONDUCTED EMISSION</i> .....	64
<b>10. SETUP PHOTOS</b> .....	<b>68</b>

# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** NOVATEL WIRELESS  
4122 SORRENTO VALLEY BLVD #104  
SAN DIEGO, CA 92121, U.S.A.

**EUT DESCRIPTION:** PC EXPRESS CARD

**MODEL:** E351

**SERIAL NUMBER:** 170192241

**DATE TESTED:** JULY 11-16, 2011

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 H AND 24 E	Pass
IC RSS132 AND IC RSS133	Pass

Compliance Certification Services (UL CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. 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 UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



THU CHAN  
ENGINEERING MANAGER  
UL CCS

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EMC ENGINEER  
UL CCS

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with RSS-132, RSS-133, TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22H, FCC CFR Part 24E, and FCC Part 27C.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL 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. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

### 4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

EUT is a PCI Mini Card operates on dual band CDMA2000, 1xRTT and EvDO and LTE band 13.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted and ERP / EIRP output powers as follows:

#### Part 22 Cellular Band

Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.7 – 848.31	1xRTT (RC1, SO55)	28.82	762.1	30.76	1191.2
824.7 – 848.31	EV-DO - REV A	28.49	706.3	31.16	1306.2

#### Part 24 PCS Band

Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1851.25 – 1908.8	1xRTT (RC1, SO55)	27.36	544.5	28.62	727.8
1851.25 – 1908.8	EV-DO - REV A	29.14	820.4	29.22	835.6

### **5.3. DESCRIPTION OF AVAILABLE ANTENNAS**

The radio utilizes a dipole antenna for the 850MHz and 1900MHz bands with a maximum peak gain of 2dBi for cell band and PCS band.

### **5.4. SOFTWARE AND FIRMWARE**

The firmware installed in the EUT during testing was

The EUT software installed during testing was

The EUT is linked with Agilent 8960 Communication and CMU500Test Set

### **5.5. WORST-CASE CONFIGURATION AND MODE**

The worst-case channel for RF radiated emissions below 1GHz and AC conducted emissions are determined as the channel with the AC Power Adapter Source

Based on the investigation results, the highest peak power and enhanced data rate is the worst-case scenario for all measurements.

Worst-case modes:

- For Cellular and PCS band: 1xRTT (RC1 SO55)
- For Cellular and PCS band: CDMA2000 1xEV-DO Revision A (Rev. A)

The worst-case configuration has been evaluated on EUT with dipole antenna at Y-position for 700MHz, 850MHz, and 1900MHz bands.

## 5.6. DESCRIPTION OF TEST SETUP

### I/O CABLES (RF CONDUCTED TEST)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	3	US 115V	Un-shielded	2m	NA
2	DC	2	DC	Un-shielded	1m	NA
3	RFOut	1	Directional Coupler	Un-shielded	None	NA
4	RF In/Out	1	Directional Coupler	Un-shielded	1.2 m	NA
5	RF In/Out	1	EUT	Un-shielded	0.2m	NA
6	USB	1	USB	Un-shielded	0.8m	NA

### I/O CABLES (RF RADIATED TEST)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	3	US 115V	Un-shielded	2m	No
2	DC	2	US 115V	Un-shielded	2m	No
3	USB	1	Test Jig Card	Un-shielded	1m	Yes
4	RF	1	Dipole Antenna	Un-shielded	none	Yes
5	RF In/Out	1	Horn	Un-shielded	2m	Yes

### SUPPORT EQUIPMENT

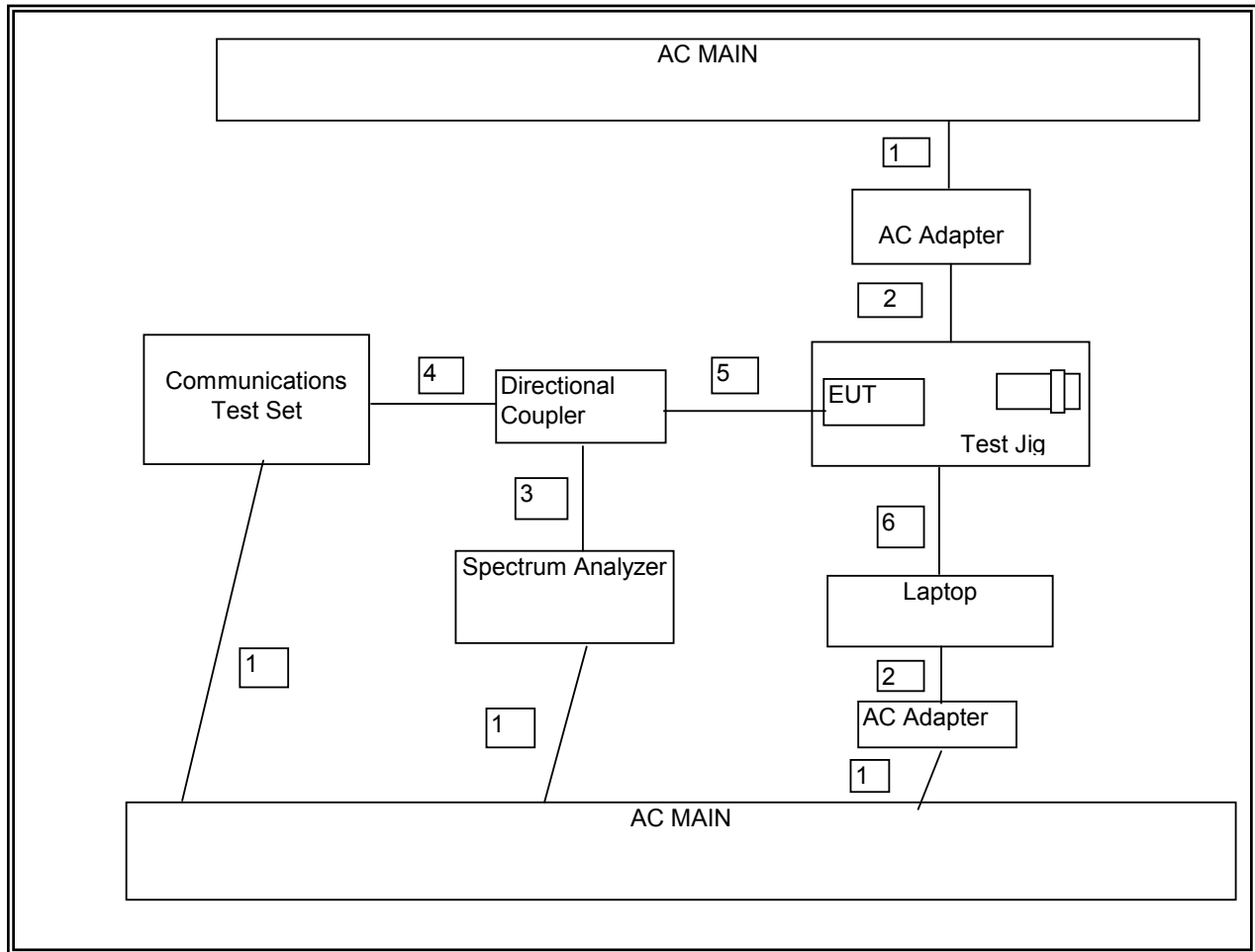
PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop AC Adapter	Dell	LA90PS-00	CN-ODF2667161571K5BFF	DoC
Jig card	Novatel	NA	NA	NA
Jig Card AC Adapter	V-Infinity	3A-211DN05	ETS050400UTC-P5P-5C	DoC

### TEST SETUP

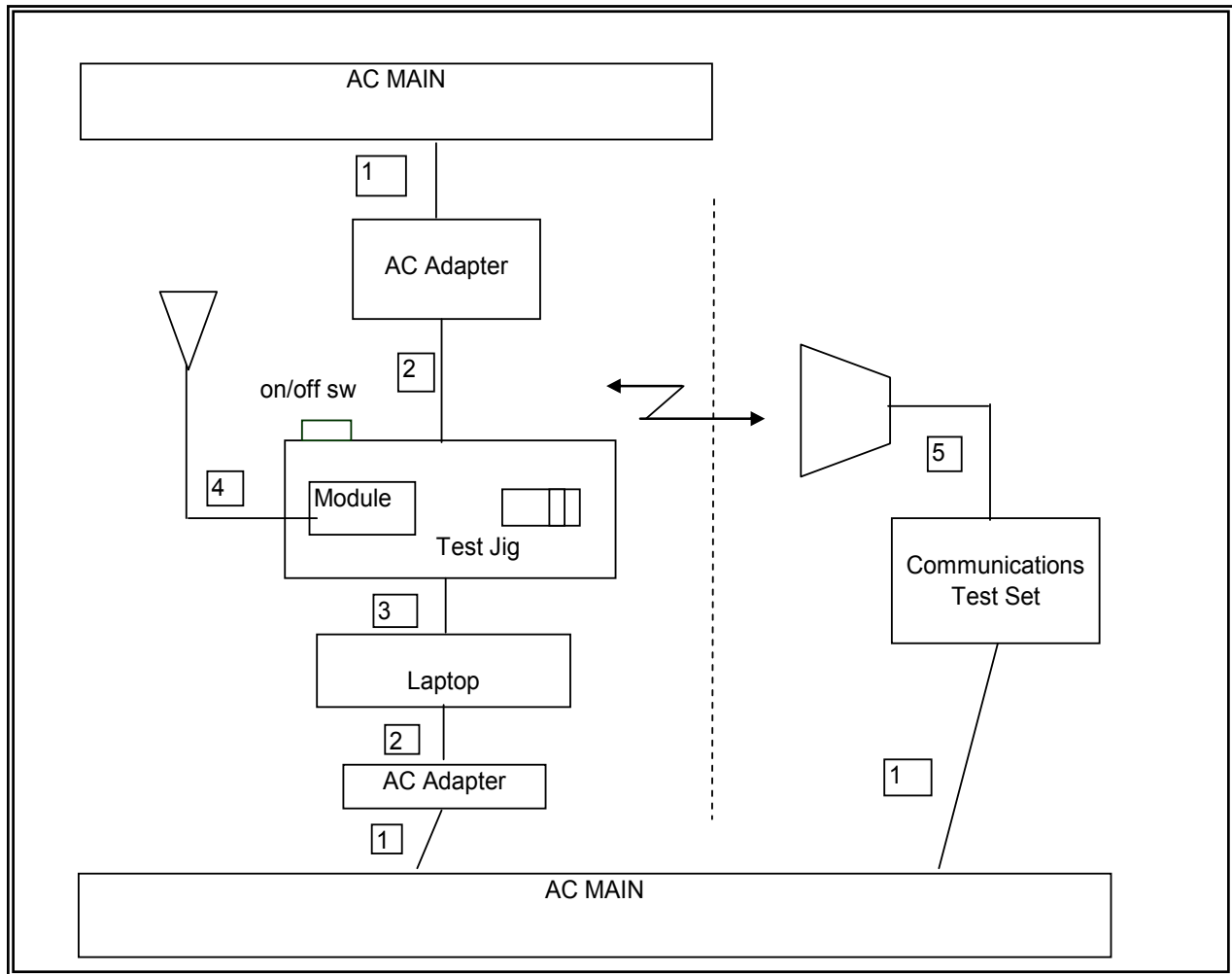
The EUT is a stand-alone device. The Wireless Communication test set exercised the EUT.



**SETUP DIAGRAM FOR RF CONDUCTED TESTS**



**SETUP DIAGRAM FOR RADIATED 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	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	06-08-12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	06-30-12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07-16-12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01-27-12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07-12-12
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	None	07-06-12
Communication Test Set	Agilent / HP	E5515C	C01086	09-27-12
Wideband Communication Test Set	R & S	CMW 500	None	04-20-12
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11-10-11
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	04-20-12
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Directional Coupler, 4.2 GHz, 40 dB	A-R	DC7144A	C00983	CNR
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07-14-12
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00993	07-16-12

## 7. RF POWER OUTPUT VERIFICATION

### 7.1. RF POWER OUTPUT FOR 1xRTT

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

<u>Application</u>	<u>Rev, License</u>
CDMA2000 Mobile Test	B.13.08, L

- Call Setup > Shift & Preset
- Cell Info > Cell Parameters > System ID (SID) > 18  
> Network ID (NID) > 65535
- Protocol Rev > 6 (IS-2000-0)
- Radio Config (RC) > Please see following table or details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps  
> R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > Active bits
  - Rvs Power Ctrl > All Up bits (Maximum TxPout)

**RF Power Output Results for 1XRTT**

**RF Output Power for Cellular Band**

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)		
		Ch. 1013 / 824.7 MHz	Ch. 384 / 836.52 MHz	Ch. 777 / 848.31 MHz
		Peak	Peak	Peak
RC1	2 (Loopback)	28.45	27.80	28.70
	55 (Loopback)	28.51	27.81	<b>28.82</b>
RC2	9 (Loopback)	28.43	27.77	28.75
	55 (Loopback)	28.50	27.74	28.79
RC3	2 (Loopback)	28.15	27.51	28.58
	55 (Loopback)	28.27	27.51	28.50
	32 (+ F-SCH)	28.10	27.44	28.57
	32 (+ SCH)	28.19	27.53	28.57
RC4	2 (Loopback)	28.26	27.51	28.54
	55 (Loopback)	28.31	27.54	28.51
	32 (+ F-SCH)	28.25	27.47	28.50
	32 (+ SCH)	28.19	27.49	28.49
RC5	9 (Loopback)	28.17	27.49	28.37
	55 (Loopback)	28.19	27.56	28.55

**RF Power Output Results for 1XRTT**

**RF Output Power for PCS Band**

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)		
		Ch. 25 / 1851.25 MHz	Ch. 600 / 1880 MHz	Ch. 1175 / 1908.75 MHz
		Peak	Peak	Peak
RC1	2 (Loopback)	27.19	27.10	27.18
	55 (Loopback)	27.27	<b>27.39</b>	27.04
RC2	9 (Loopback)	27.23	27.04	26.97
	55 (Loopback)	27.06	27.04	26.92
RC3	2 (Loopback)	26.55	26.47	26.71
	55 (Loopback)	26.72	26.59	26.73
	32 (+ F-SCH)	26.68	26.60	26.69
	32 (+ SCH)	26.70	26.51	26.48
RC4	2 (Loopback)	26.70	26.46	26.71
	55 (Loopback)	26.69	26.49	26.59
	32 (+ F-SCH)	26.72	26.50	26.70
	32 (+ SCH)	26.69	26.49	26.52
RC5	9 (Loopback)	26.56	26.56	26.48
	55 (Loopback)	26.90	26.45	26.43

## 7.2. RF POWER OUTPUT FOR CDMA2000 1xEV-DO Release 0 (Rel. 0)

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

<u>Application</u>	<u>Rev. License</u>
1xEV-DO Terminal Test	A.09.13

### EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press "Start Data Connection" when "Session Open" appear in "Active Cell"
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

### EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press "Start Data Connection" when "Session Open" appear in "Active Cell"
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

### **RF Power Output for CDMA2000 1xEV-DO Release 0 (Rel. 0)**

#### Cell Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)	
				Average	Peak
307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	24.22	27.77
		384	836.52	24.17	<b>28.32</b>
		777	848.31	23.92	28.16

#### PCS Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)	
				Average	Peak
307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	23.70	28.38
		600	1880.00	23.74	<b>28.85</b>
		1175	1908.75	23.55	28.77

### 7.3. RF POWER OUTPUT FOR CDMA2000 1xEV-DO Revision A (Rev. A)

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

Application	Rev. License
1xEV-DO Terminal Test	A.09.13

#### EVDO Release A – RETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

#### EVDO Release A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000 > Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots > ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

#### RF Power Output Results for CDMA2000 1xEV-DO Revision A (Rev. A)

##### Cell Band

FETAP-Traffic Format	RETAP-Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
				Average	Peak
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	24.23	27.92
		384	836.52	24.20	<b>28.49</b>
		777	848.31	23.95	28.18

##### PCS Band

FETAP-Traffic Format	RETAP-Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
				Average	Peak
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	23.70	28.58
		600	1880.00	24.00	<b>29.14</b>
		1175	1908.75	23.84	28.84



## 8. CONDUCTED TEST RESULTS

### 8.1. OCCUPIED BANDWIDTH

**RULE PART(S)**

FCC: §2.1049

**LIMITS**

For reporting purposes only

**TEST PROCEDURE**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The -26dB bandwidth was also measured and recorded.

**MODES TESTED**

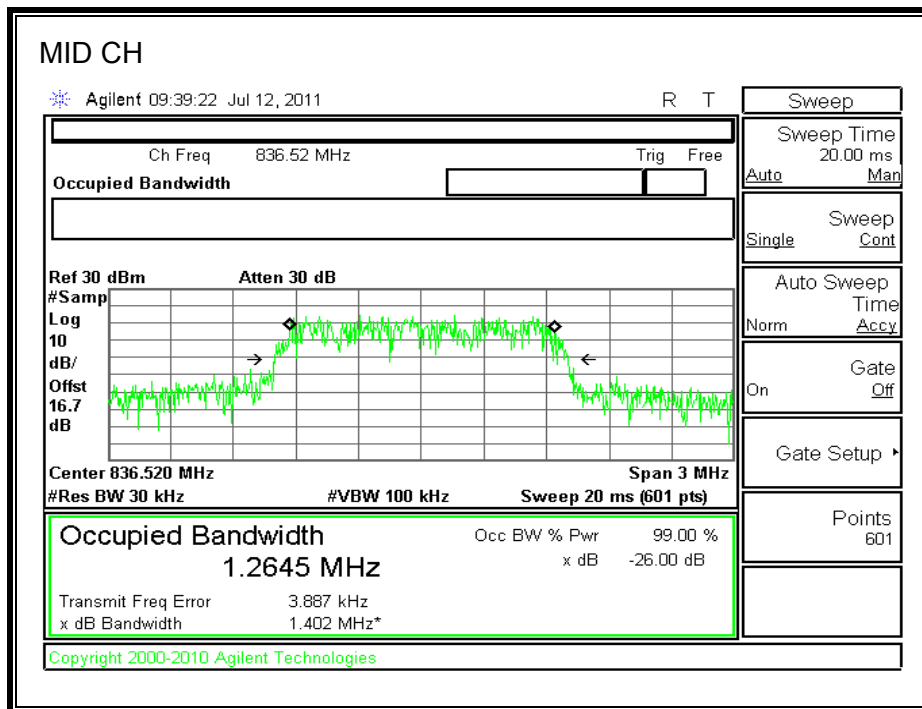
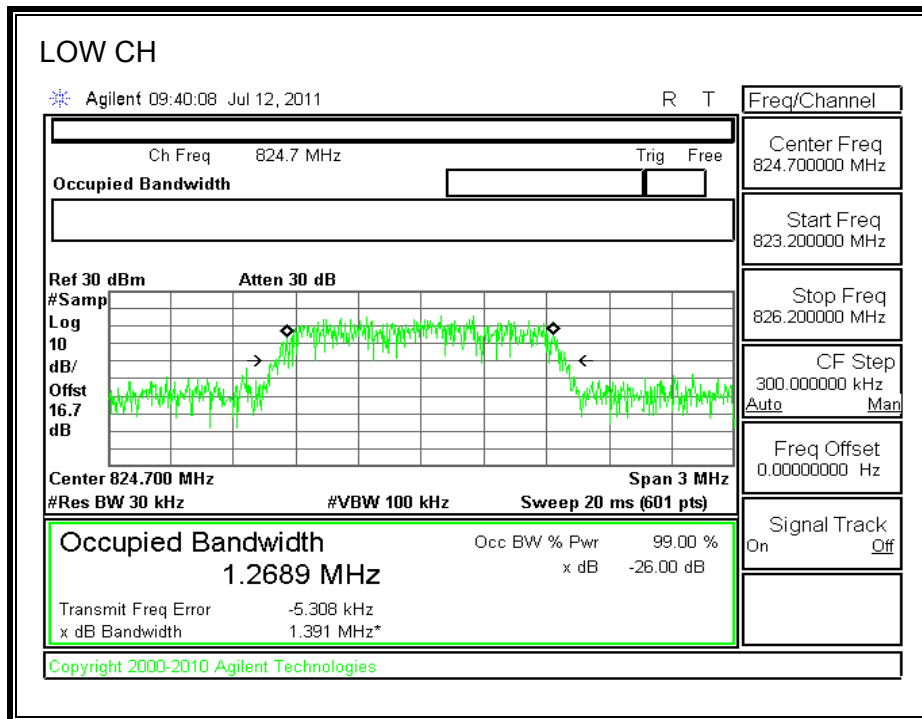
- 1xRTT – RC1, SO55
- CDMA2000 1xEV-DO Revision A (Rev. A)

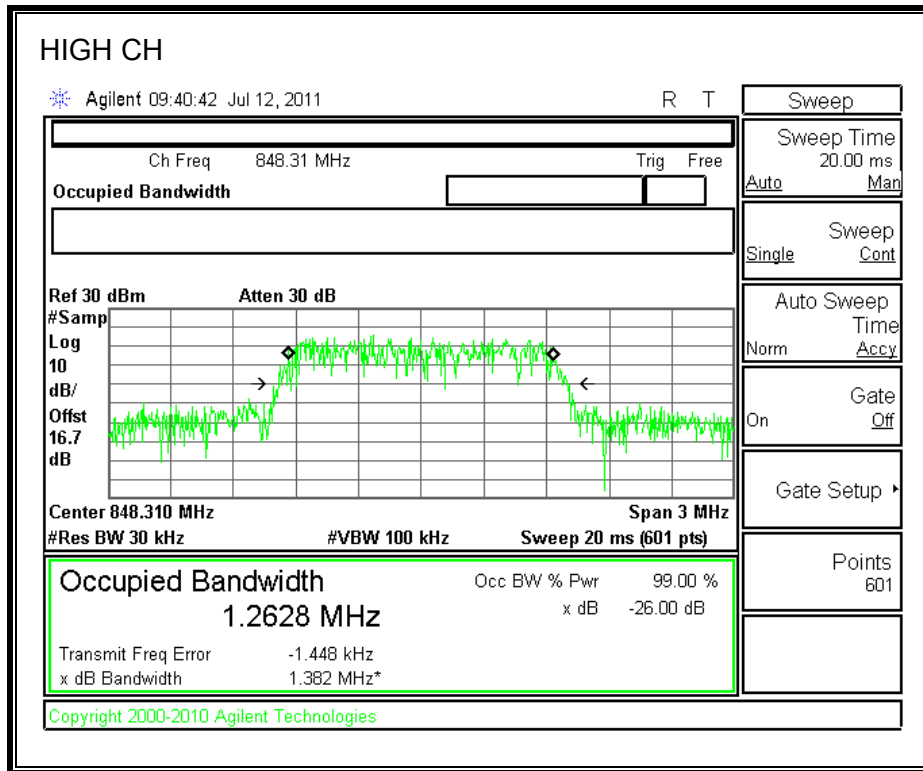
**RESULTS**

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW MHz)
Cellular	1xRTT	1013	824.70	1.2689	1.391
		384	836.52	1.2645	1.402
		777	848.31	1.2628	1.382
	CDMA2000 1xEV-DO Revision A (Rev. A)	1013	824.70	1.2646	1.412
		384	836.52	1.2651	1.408
		777	848.31	1.2680	1.413
PCS	1xRTT	25	1851.25	1.2727	1.396
		600	1880.0	1.2645	1.402
		1175	1908.75	1.2628	1.382
	CDMA2000 1xEV-DO Revision A (Rev. A)	25	1851.25	1.2748	1.402
		600	1880.0	1.2791	1.388
		1175	1908.75	1.2712	1.413

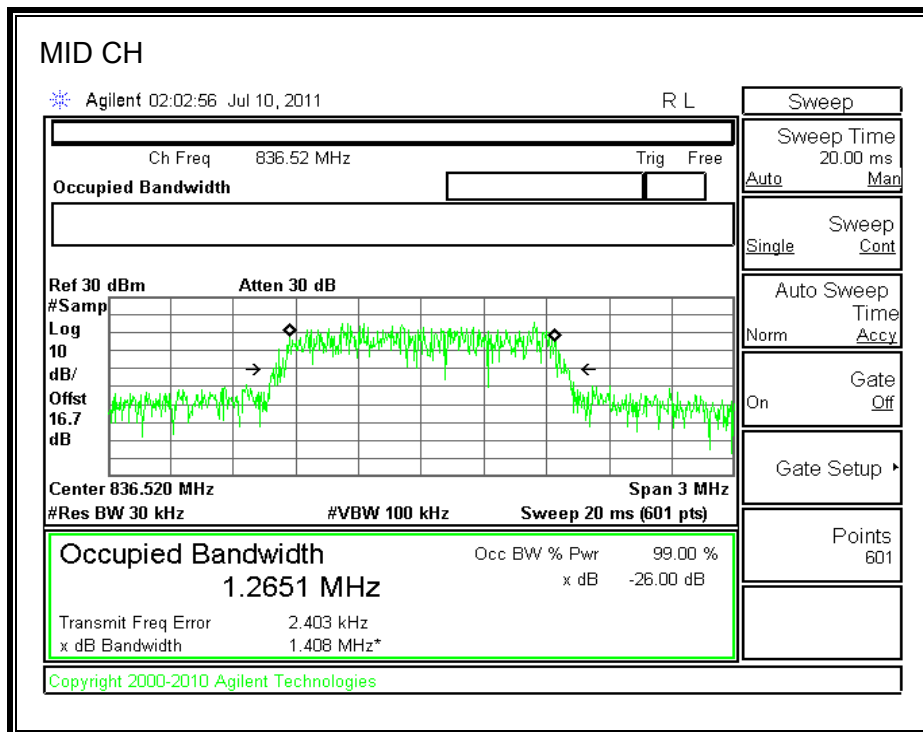
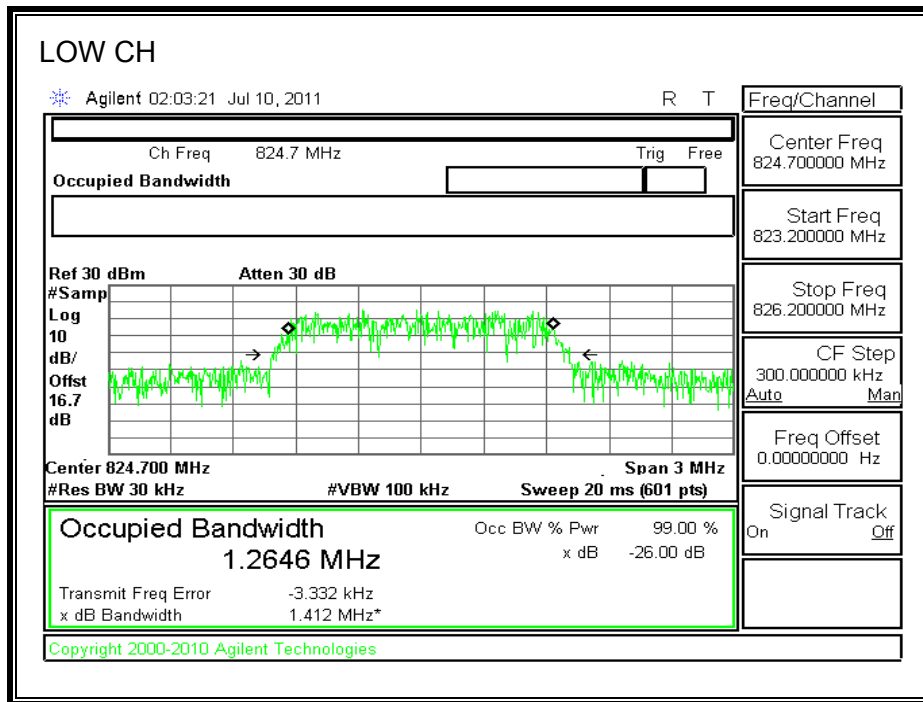
**CDMA2000 1xRTT Mode (Cellular Band)**

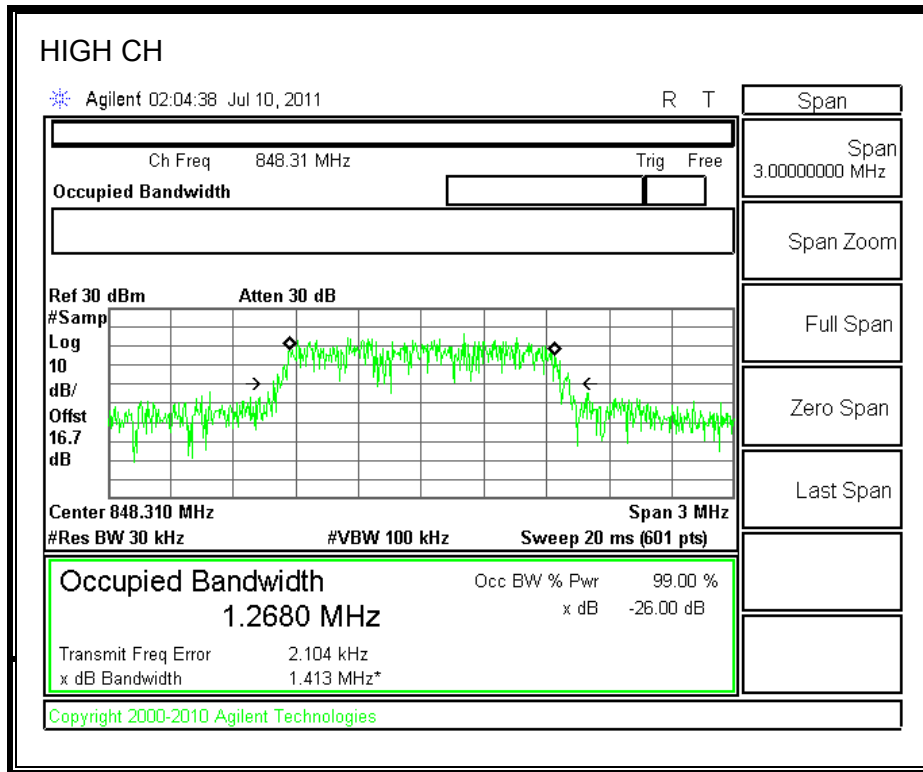
**99% BANDWIDTH and 26dB**



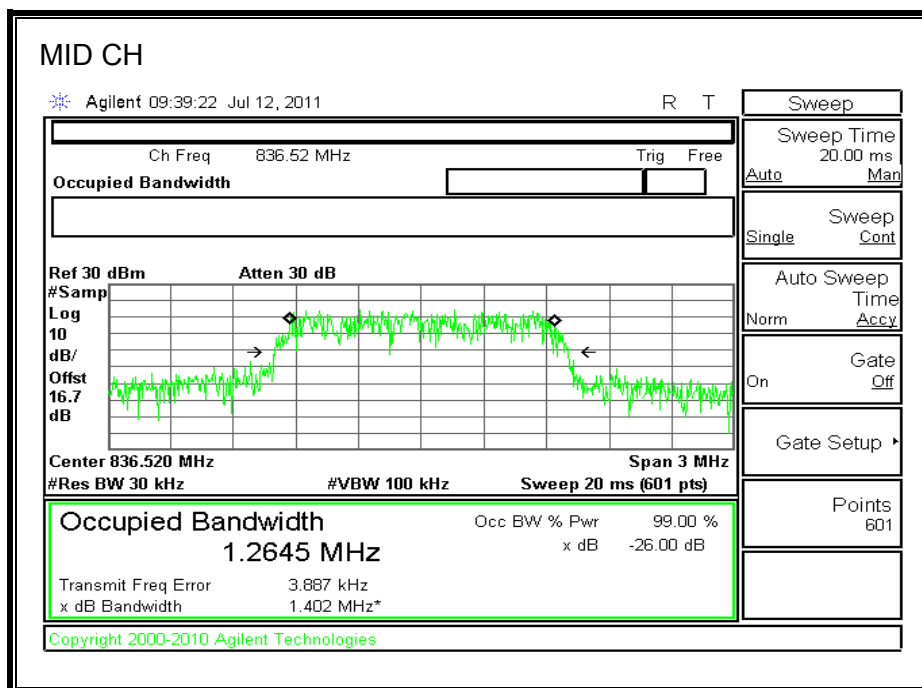
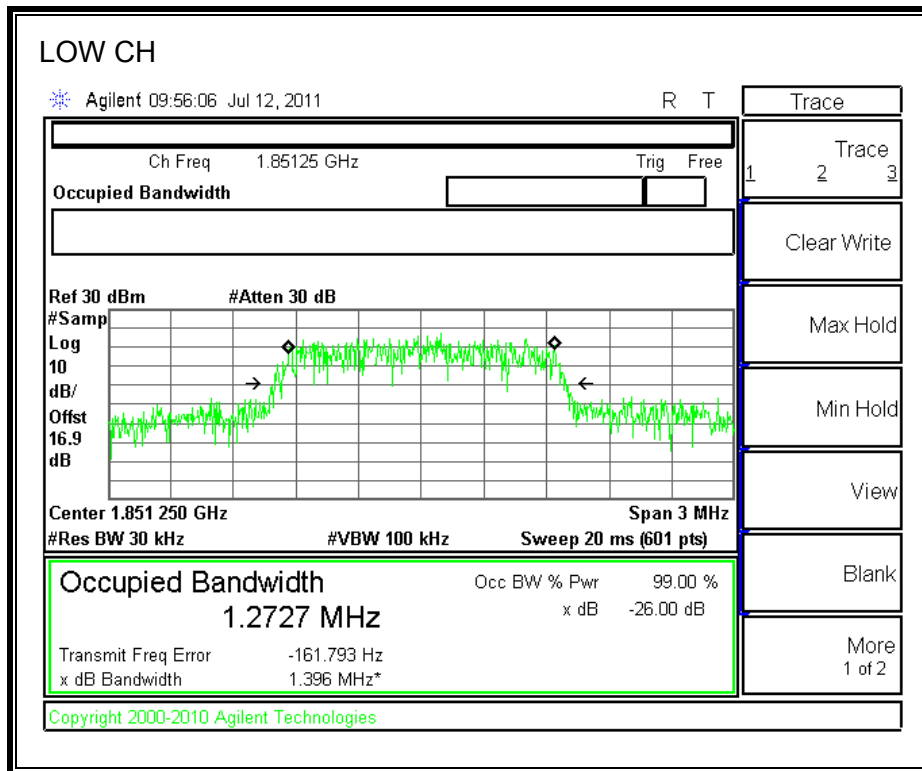


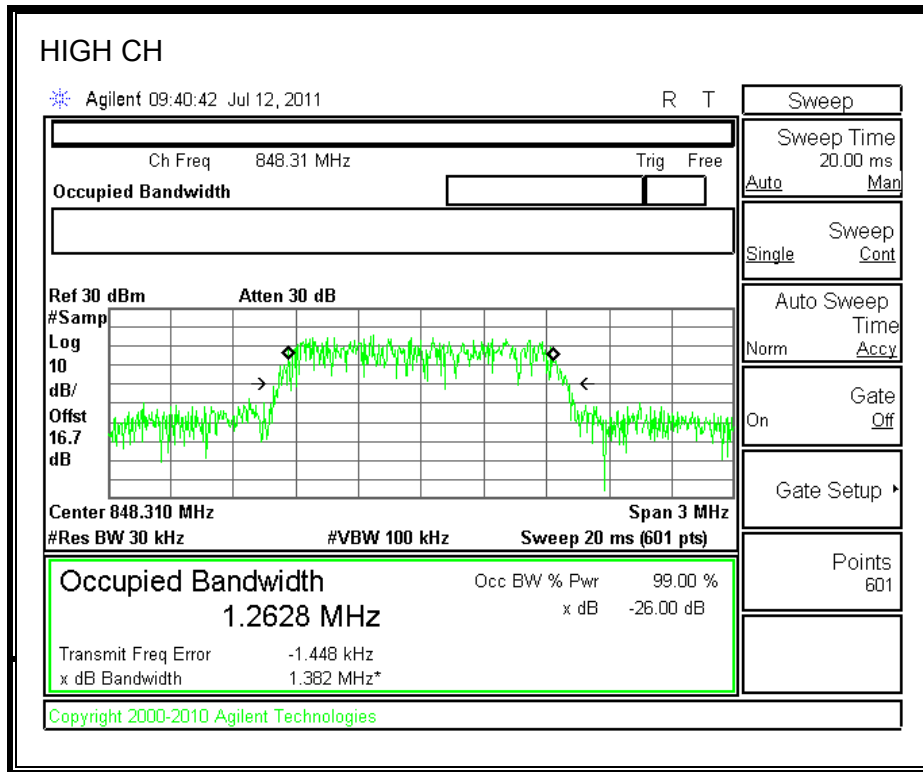
**CDMA2000 1xEV-DO Revision A (Rev. A) Cellular Band**



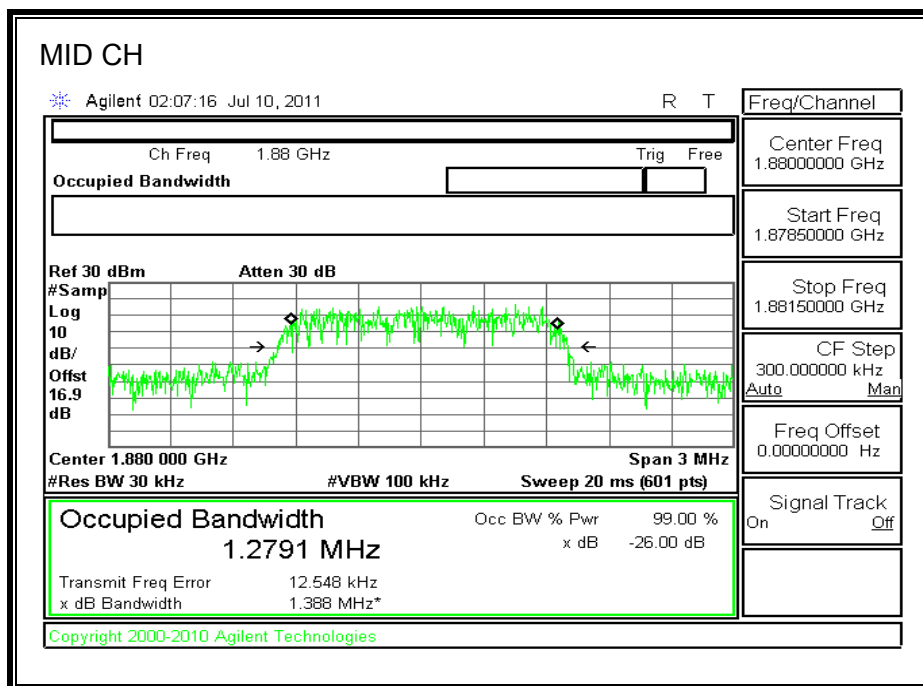
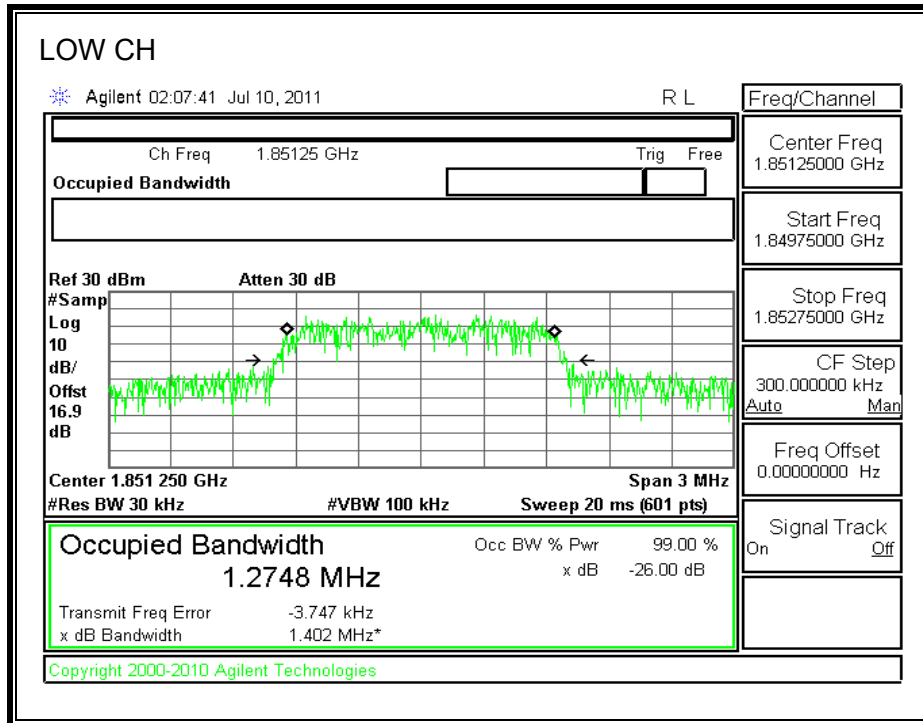


**CDMA2000 1xRTT Mode (PCS Band)**

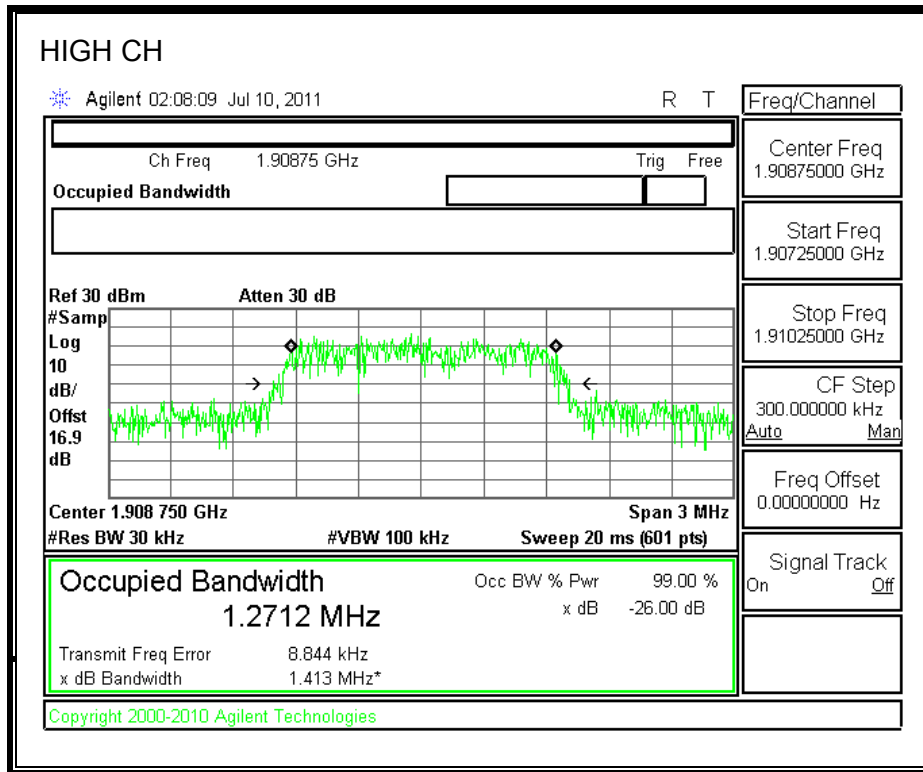




**CDMA2000 1xEV-DO Revision A (Rev. A) Mode (PCS Band)**







## **8.2. BAND EDGE**

### **RULE PART(S)**

FCC: §22.359, 24.238, and 27.53(c)(2)

### **LIMITS**

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**

The transmitter output was connected to a Agilent 8960 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

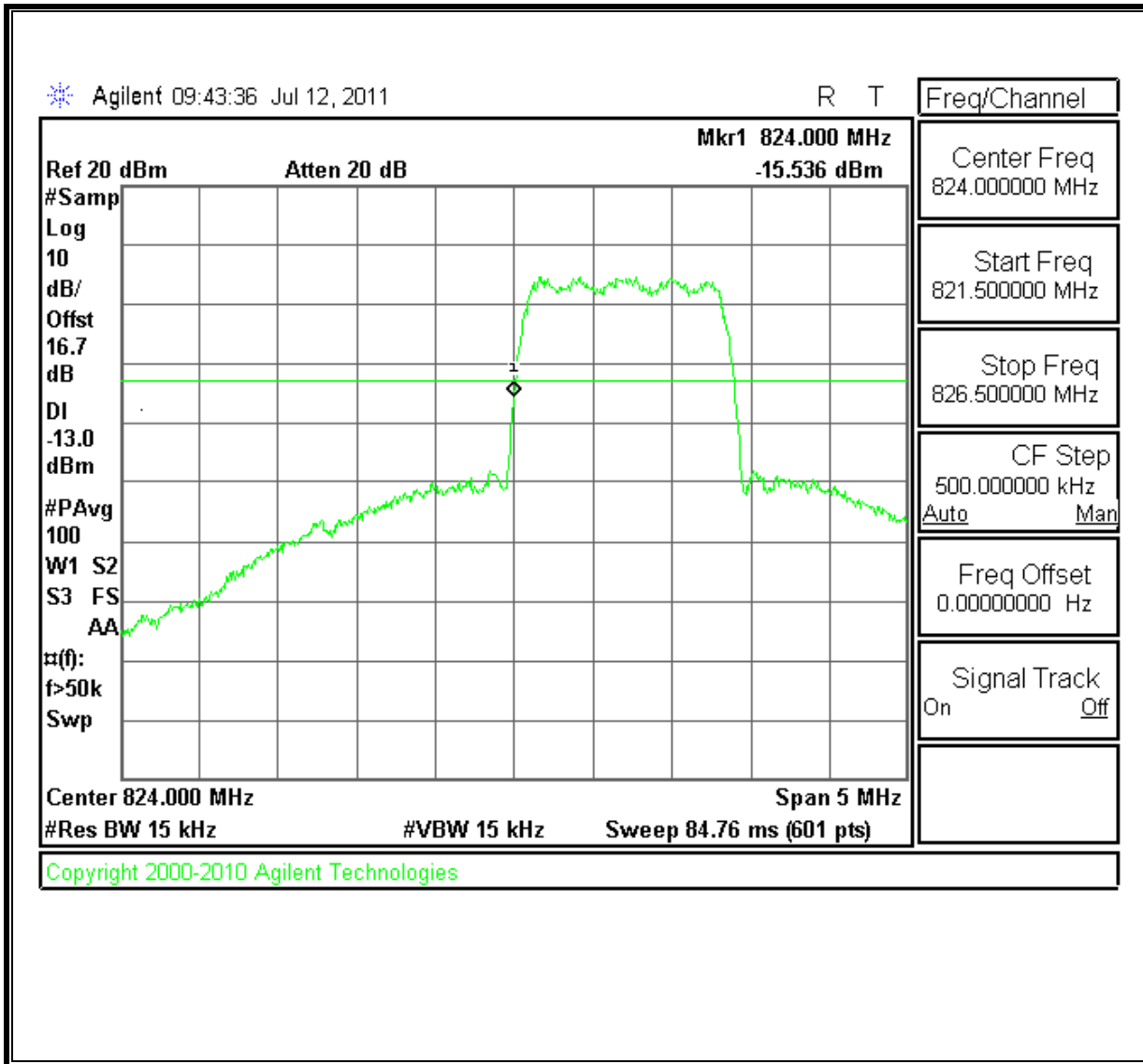
### **MODES TESTED**

- 1xRTT – RC1 SO55
- CDMA2000 1xEV-DO Revision A (Rev. A)

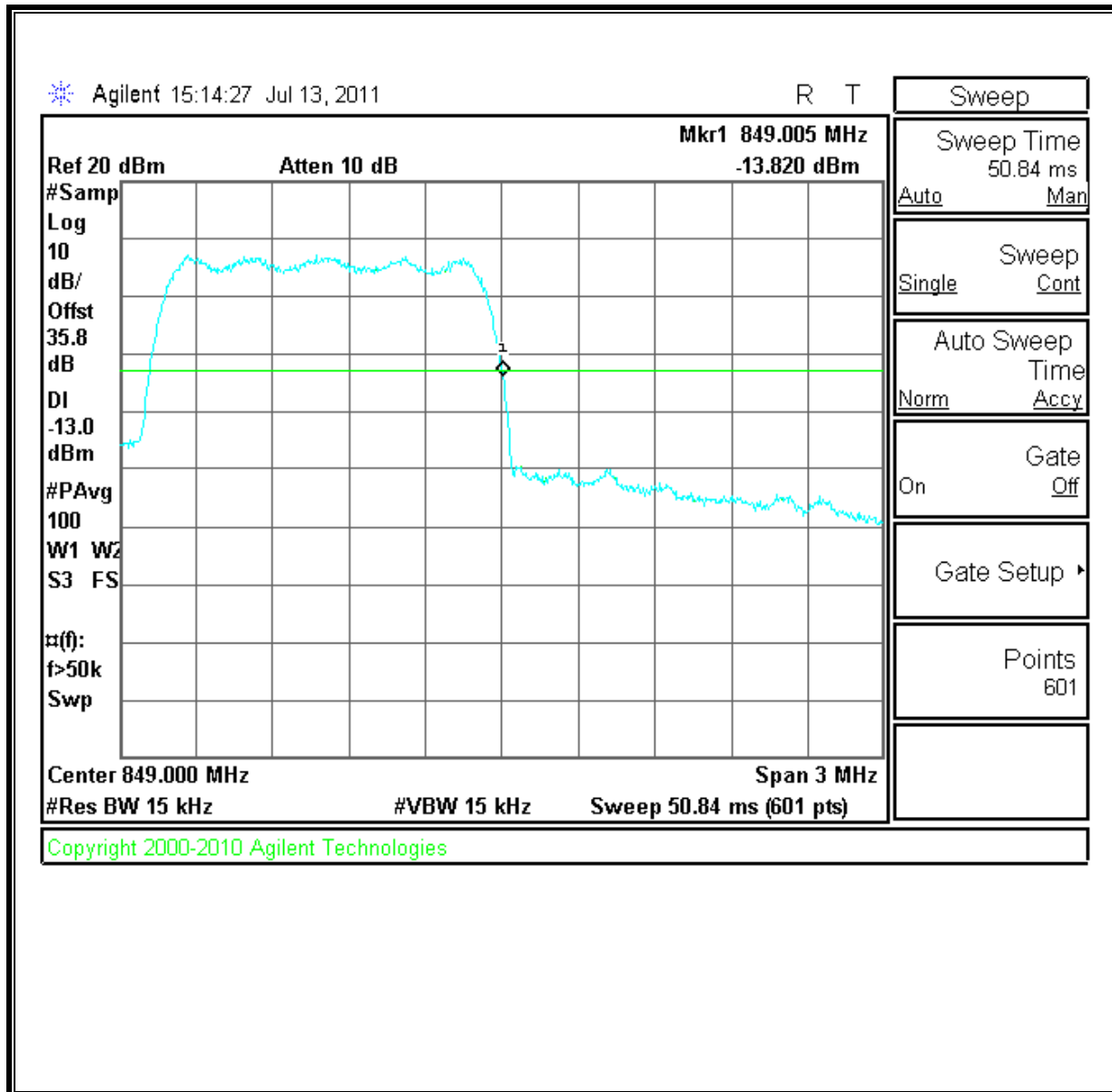
### **RESULTS**

**CDMA2000 1xRTT mode (Cellular Band)**

**Low Channel Band Edge**

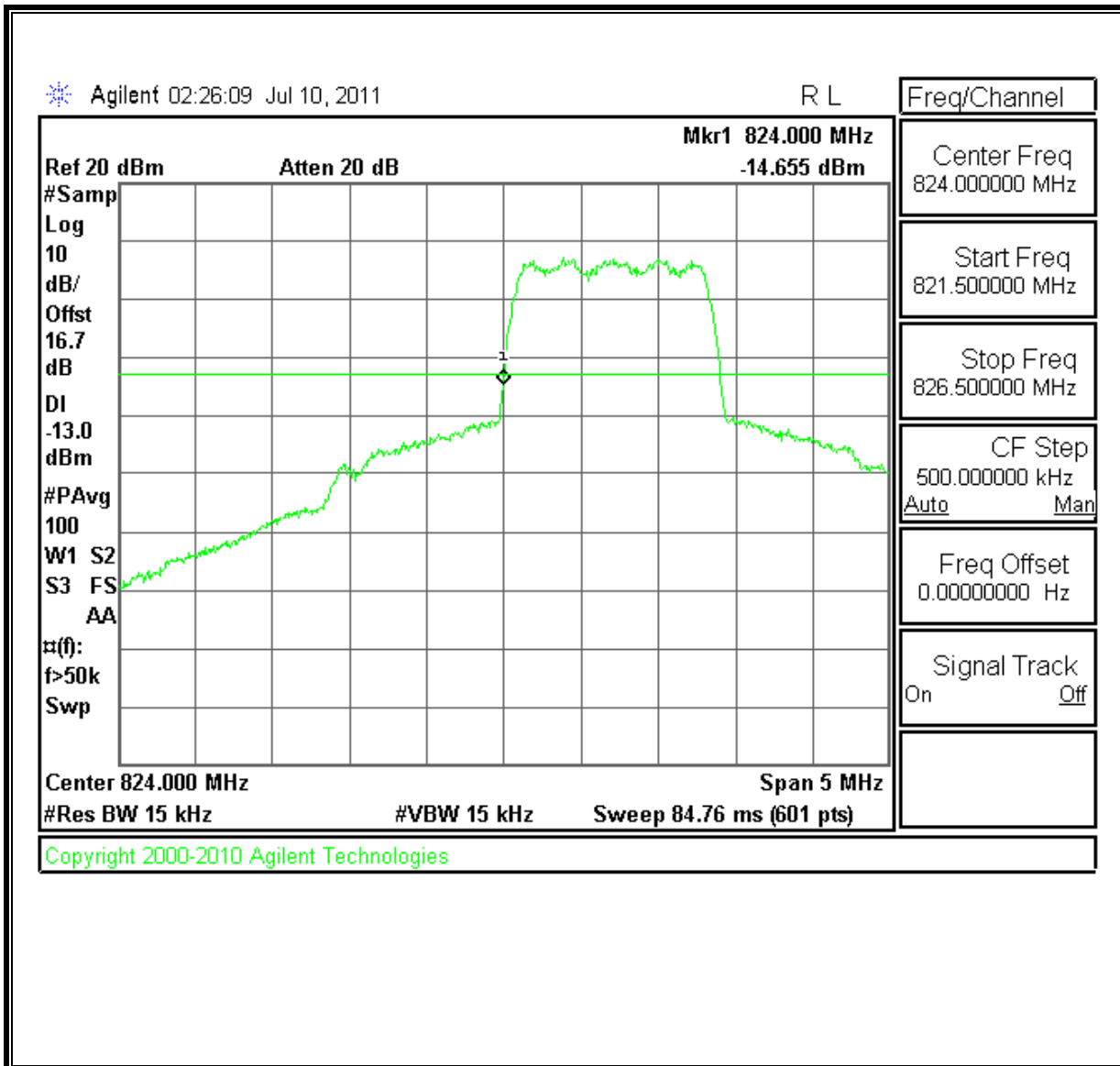


**High Channel Band Edge**

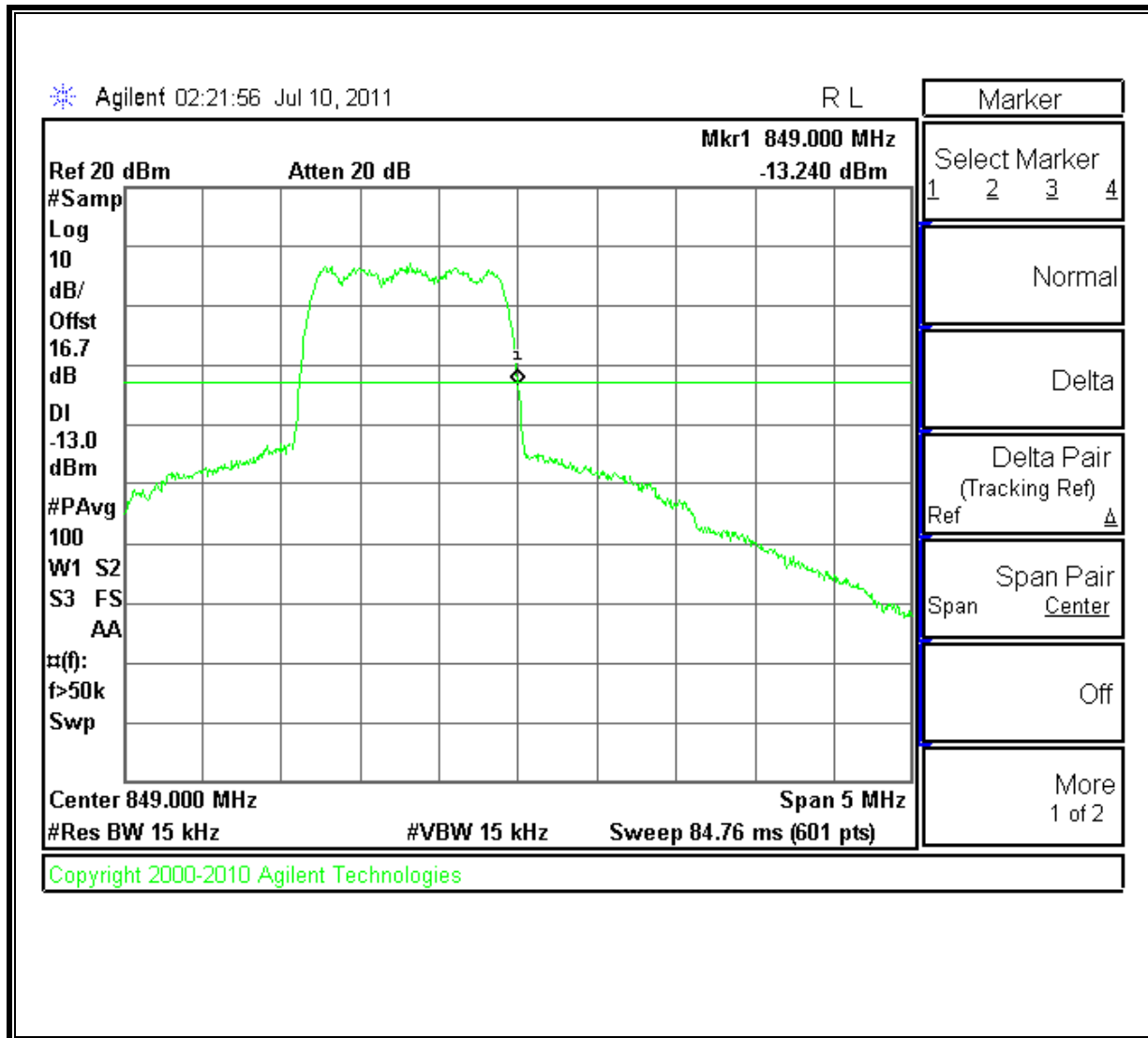


**CDMA2000 1xEV-DO Revision A (Rev. A) mode (Cellular Band)**

**Low Channel Band Edge**

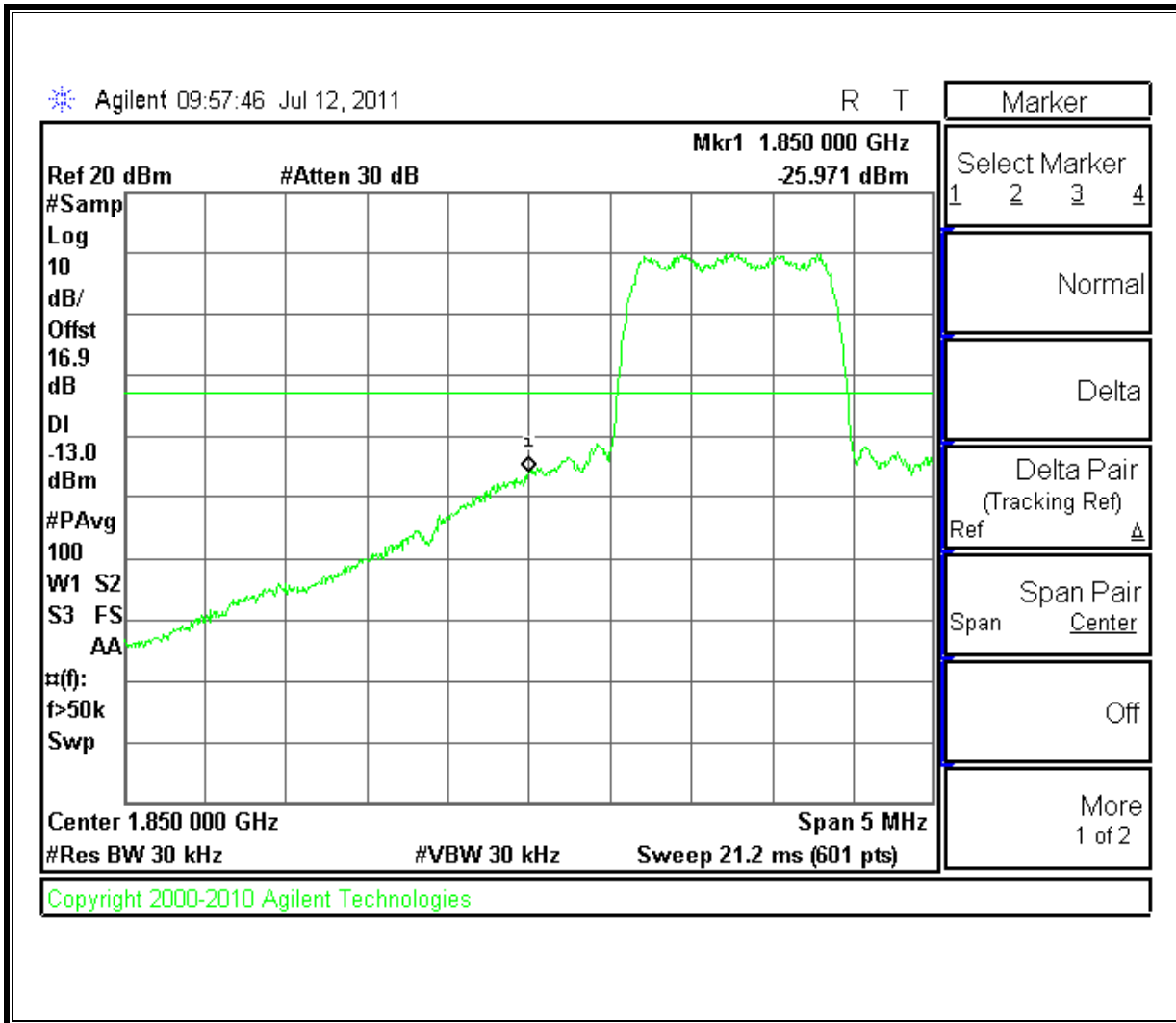


**High Channel Band Edge**

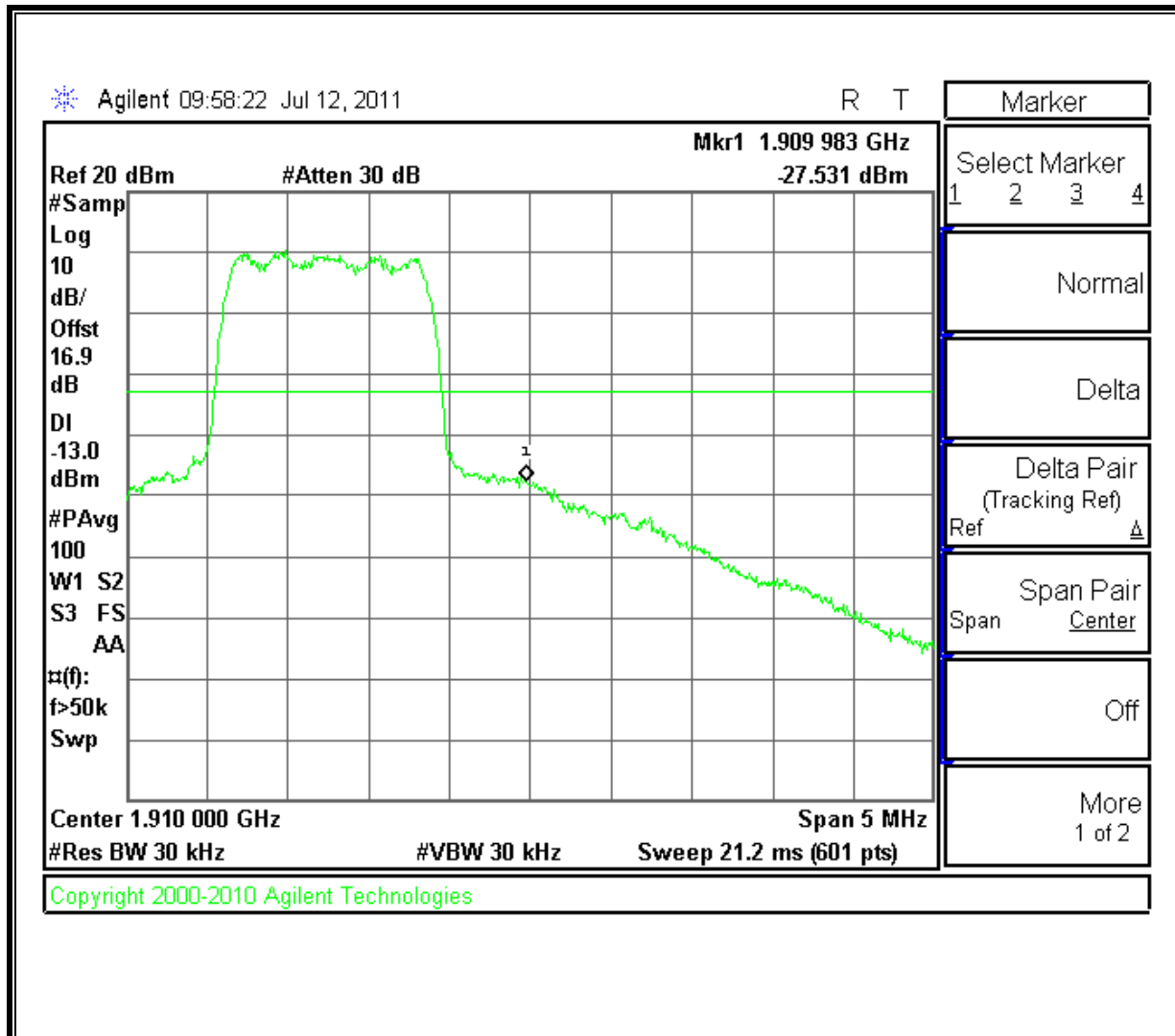


**CDMA2000 1xRTT mode (PCS Band)**

**Low Channel Band Edge**



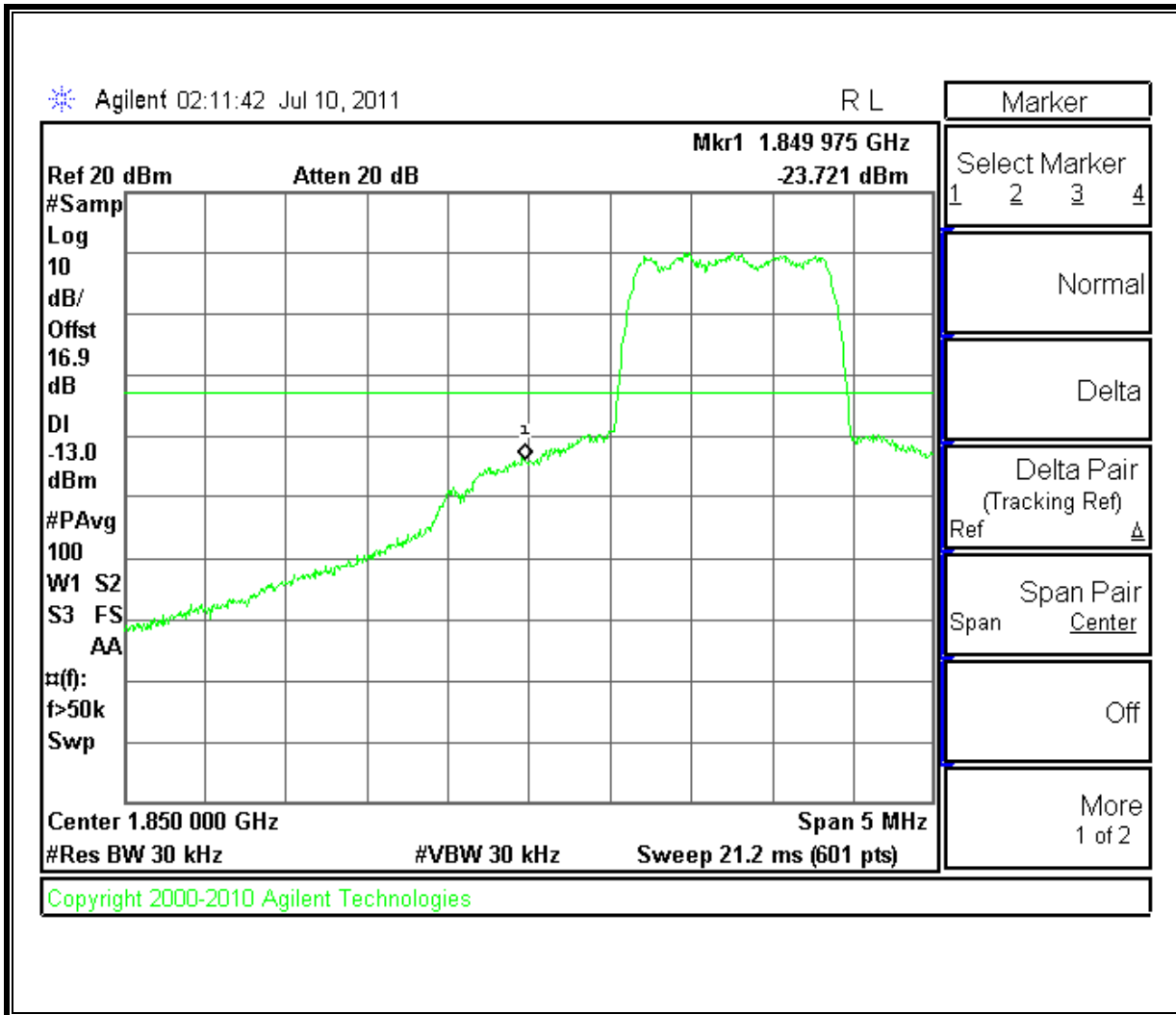
**High Channel Band Edge**



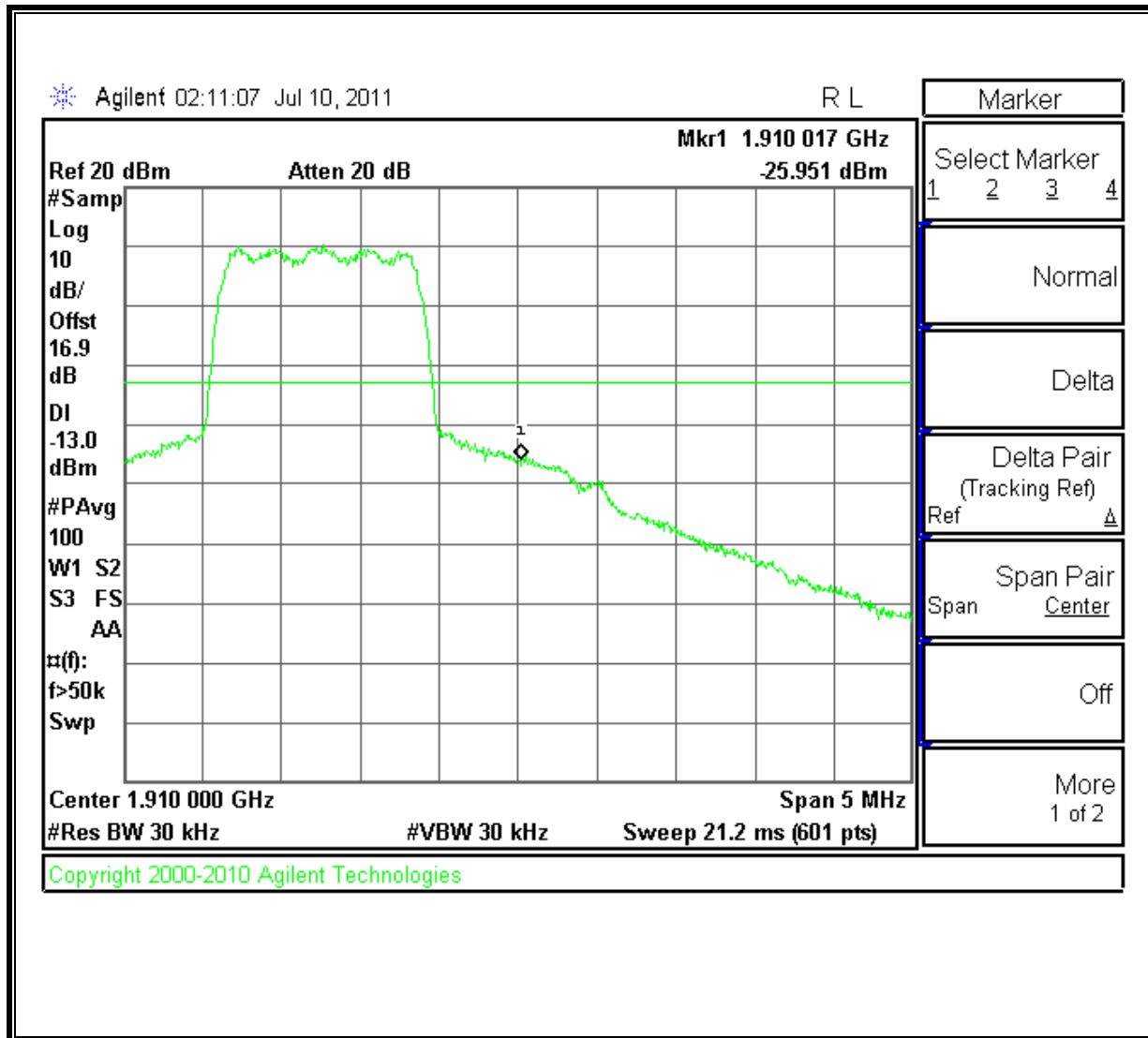


**CDMA2000 1xEV-DO Revision A (Rev. A) mode (PCS Band)**

**Low Channel Band Edge**



**High Channel Band Edge**



### **8.3. OUT OF BAND EMISSIONS**

#### **RULE PART(S)**

FCC: §2.1053, §22.917, §24.238, §27.53  
IC: RSS-132, 4.5; RSS-133, 6.5

#### **LIMITS**

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**

The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

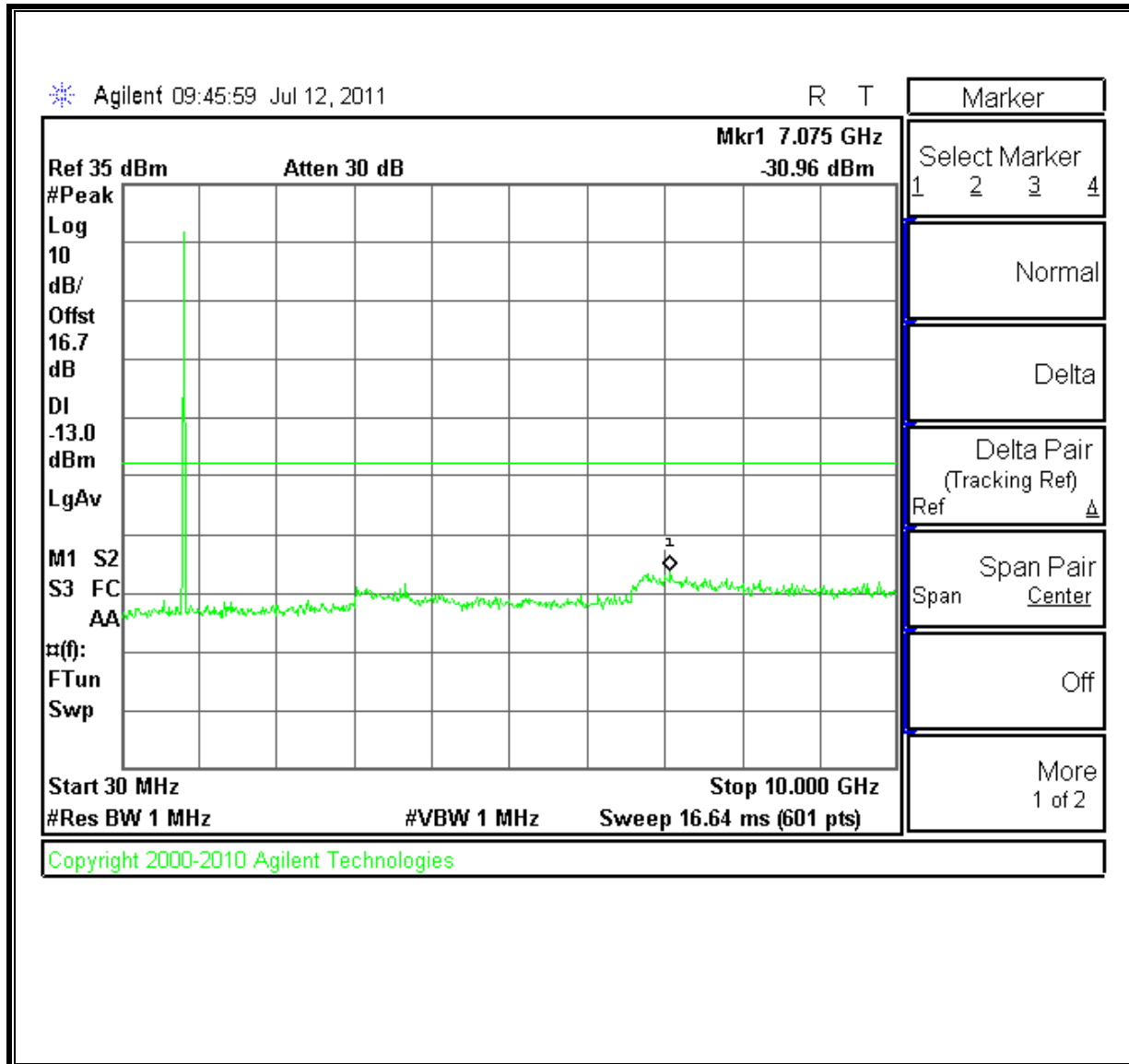
#### **MODES TESTED**

- 1xRTT – RC1 SO55
- CDMA2000 1xEV-DO Revision A (Rev. A)

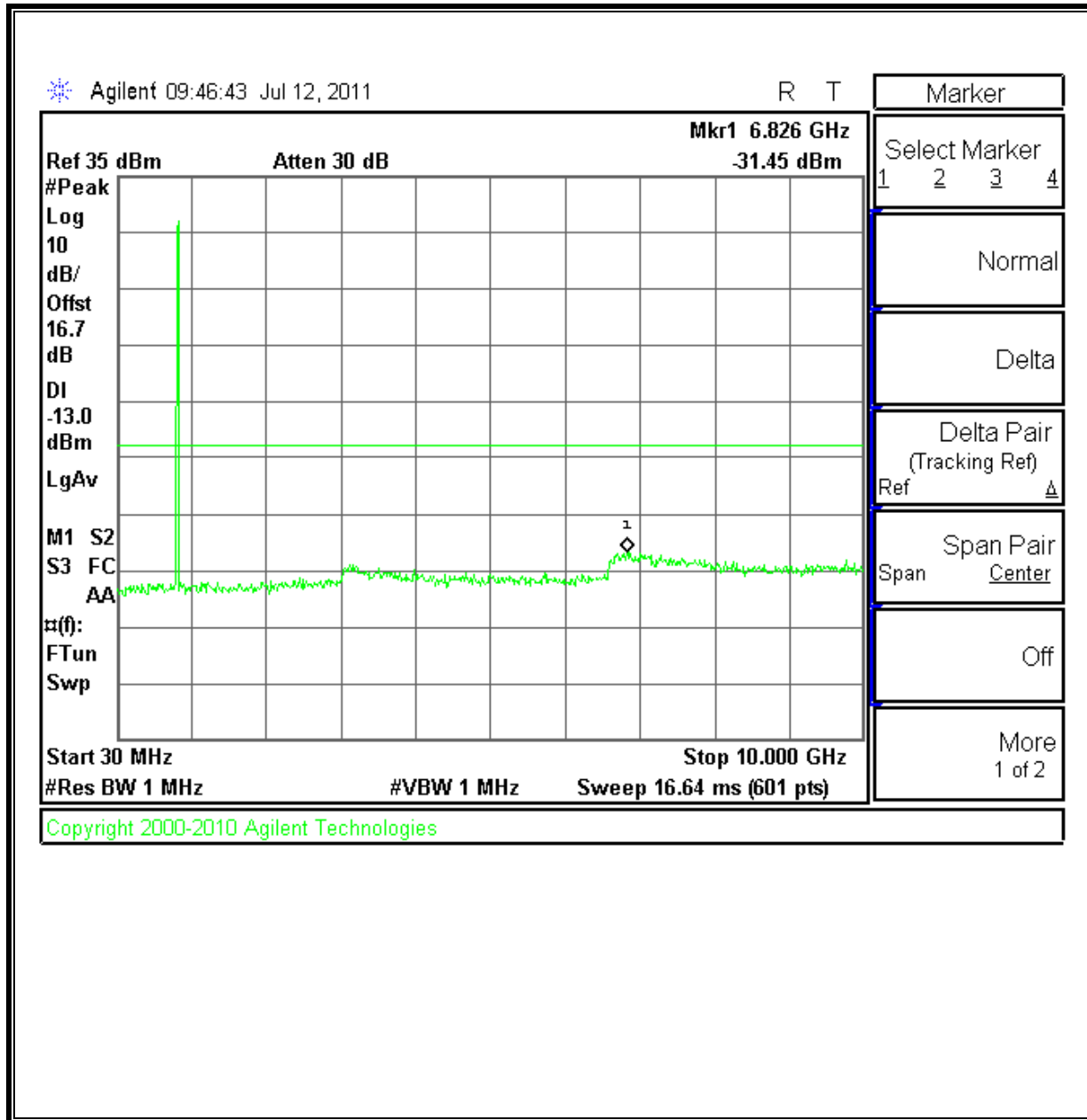
#### **RESULTS**

**1xRTT Mode (Cellular Band)**

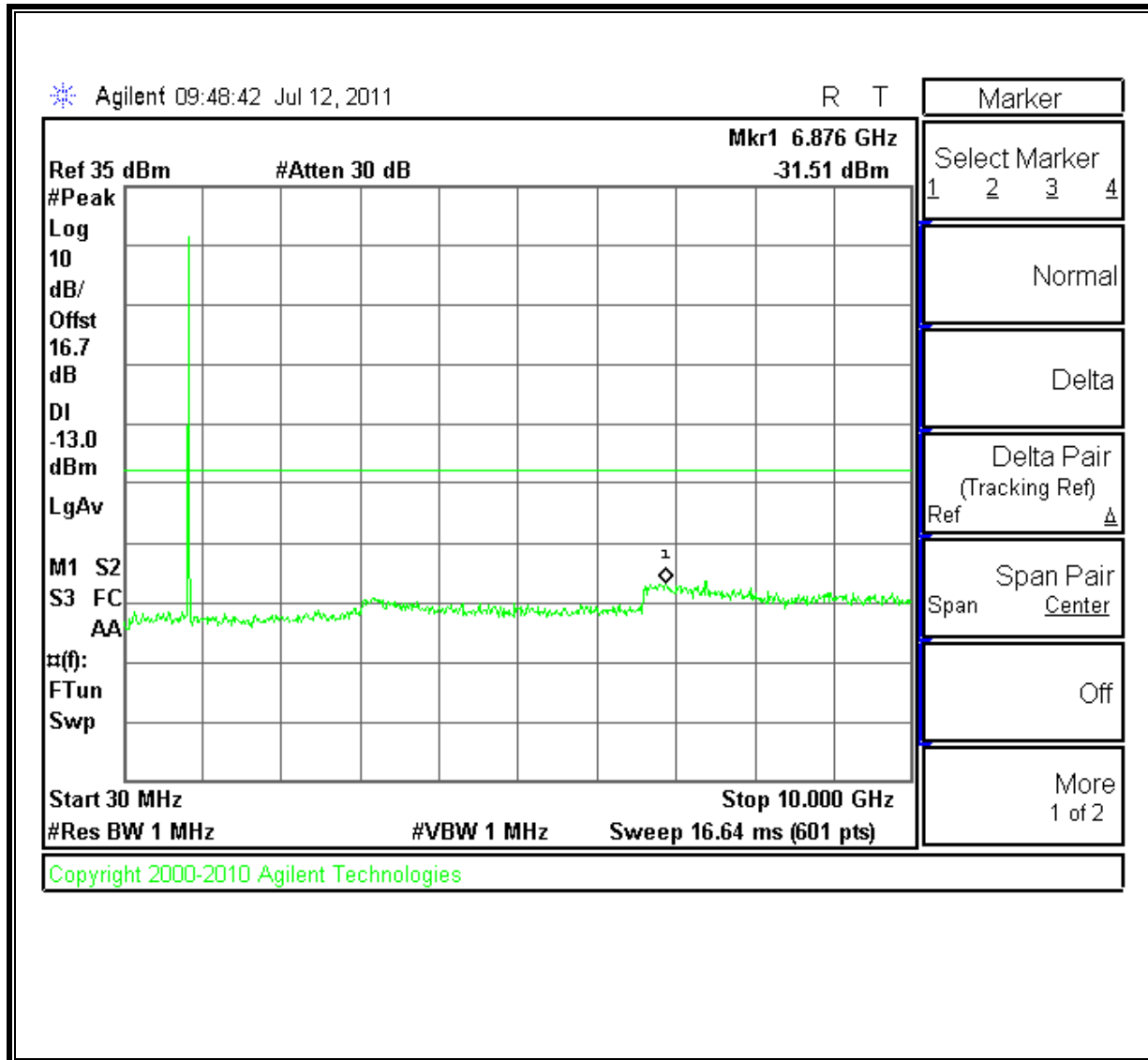
**LOW CHANNEL**



**MID CHANNEL**

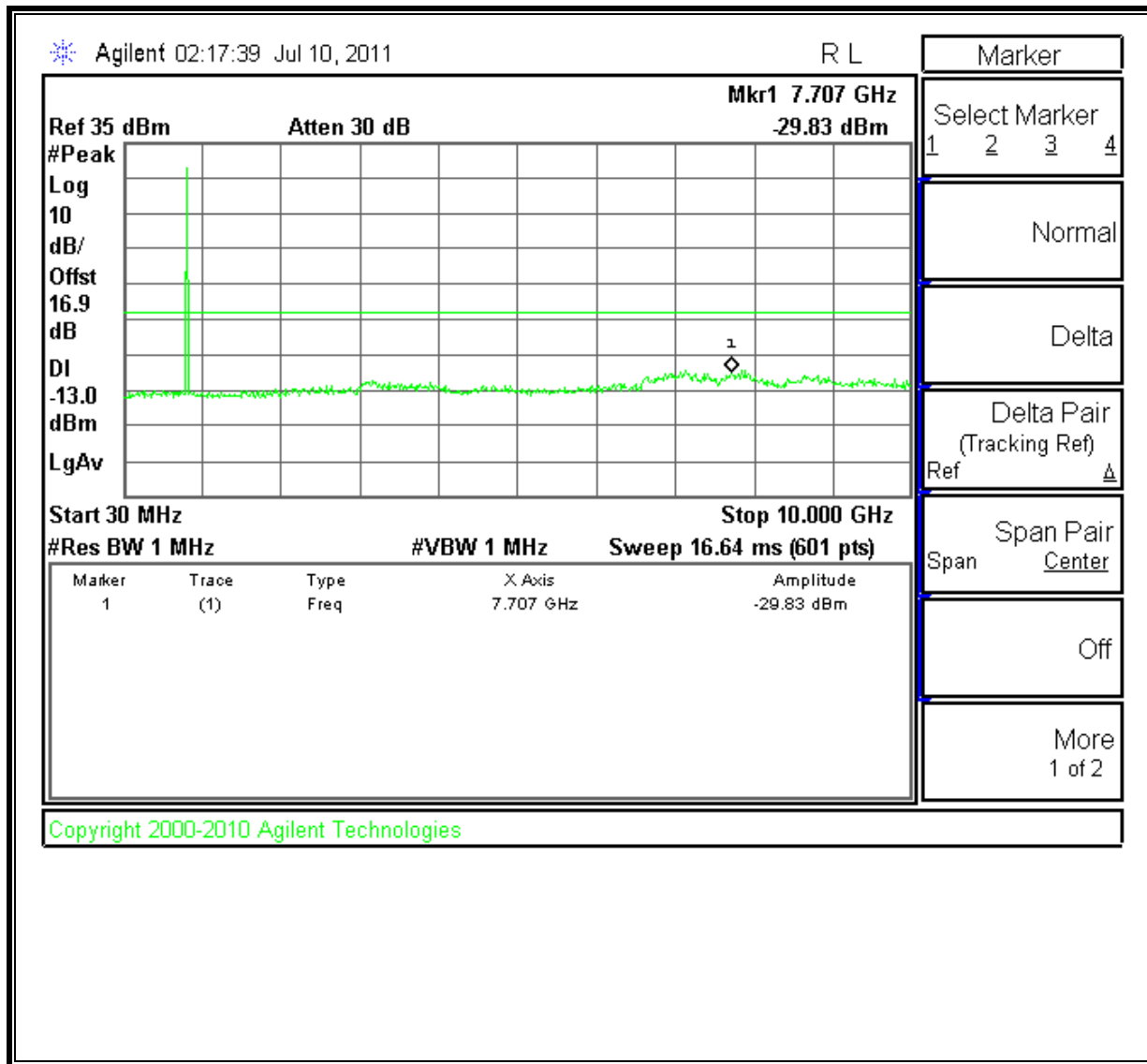


**High Channel**

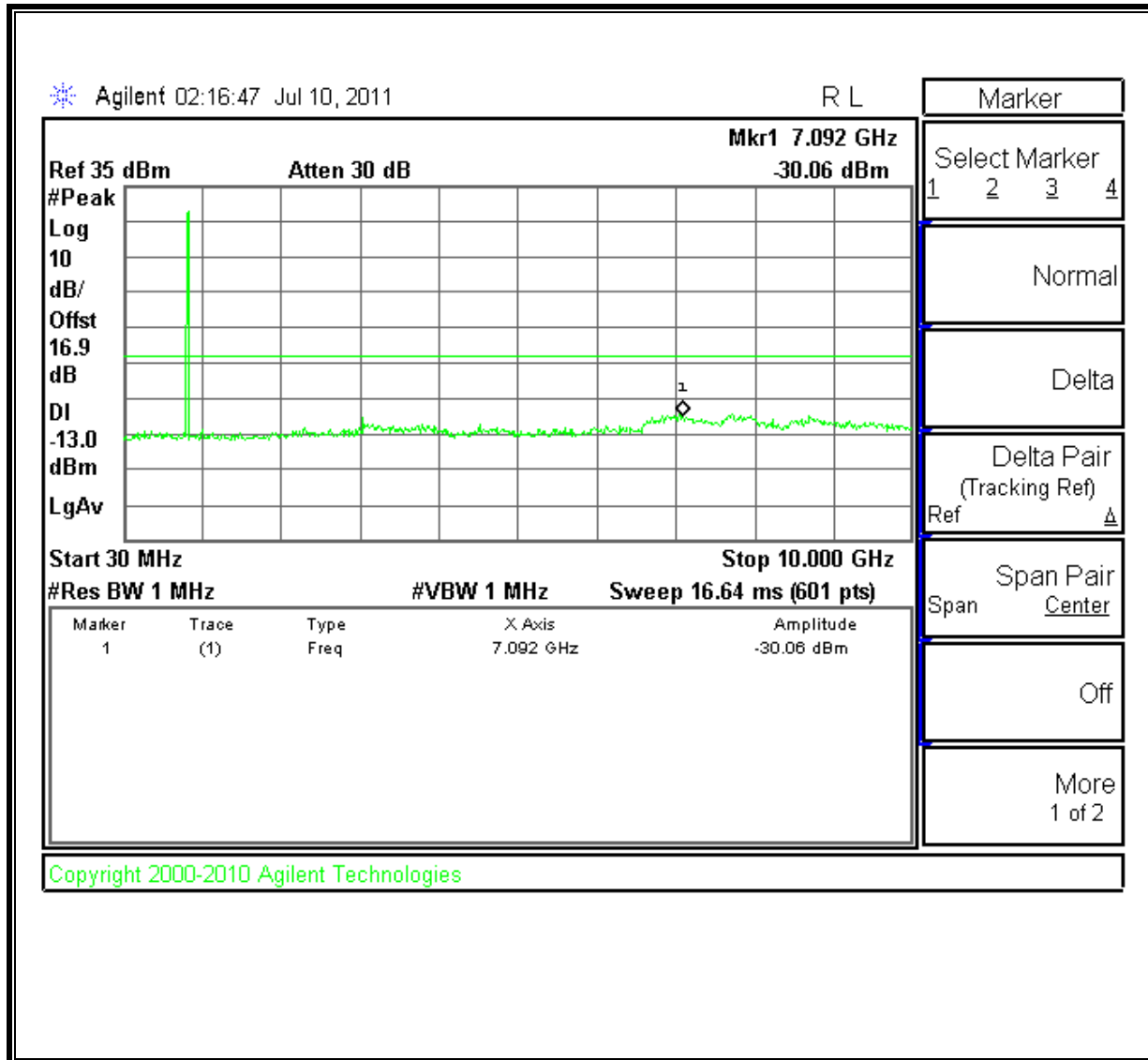


**CDMA2000 1xEV-DO Revision A (Rev. A) Mode (Cellular Band)**

**LOW CHANNEL**

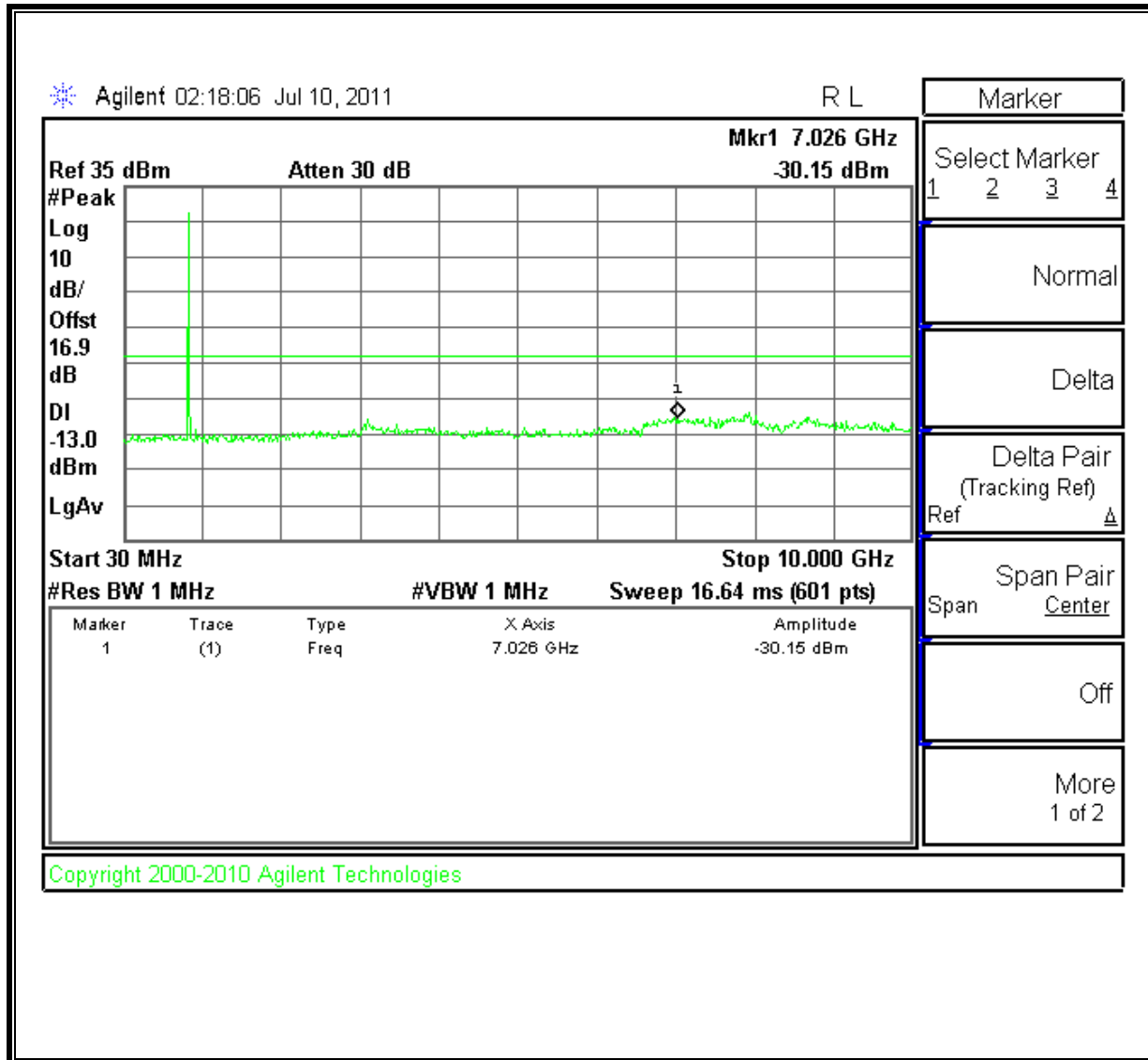


**MID CHANNEL**



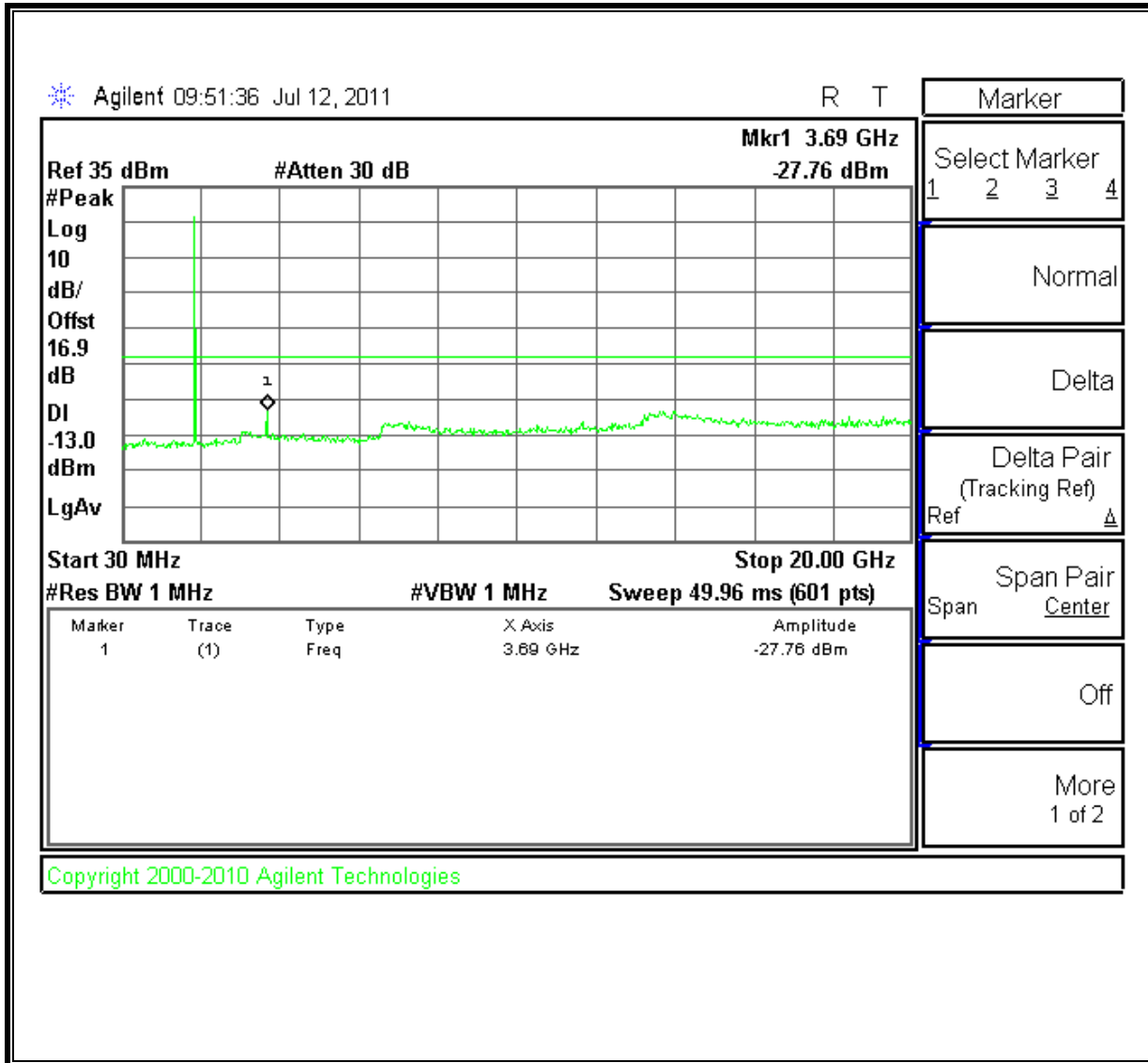


**HIGH CHANNEL**

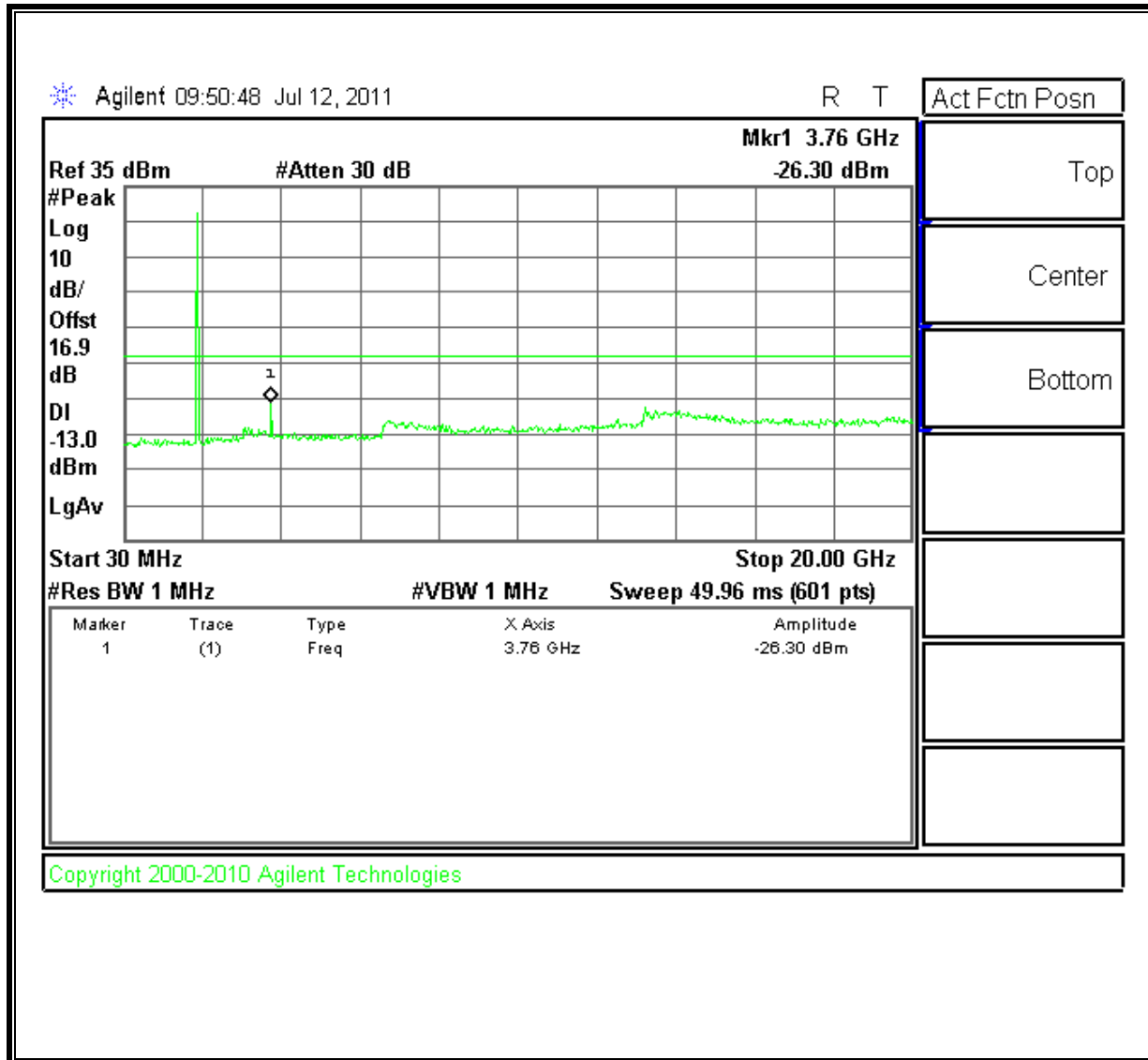


**1xRTT Mode (PCS Band)**

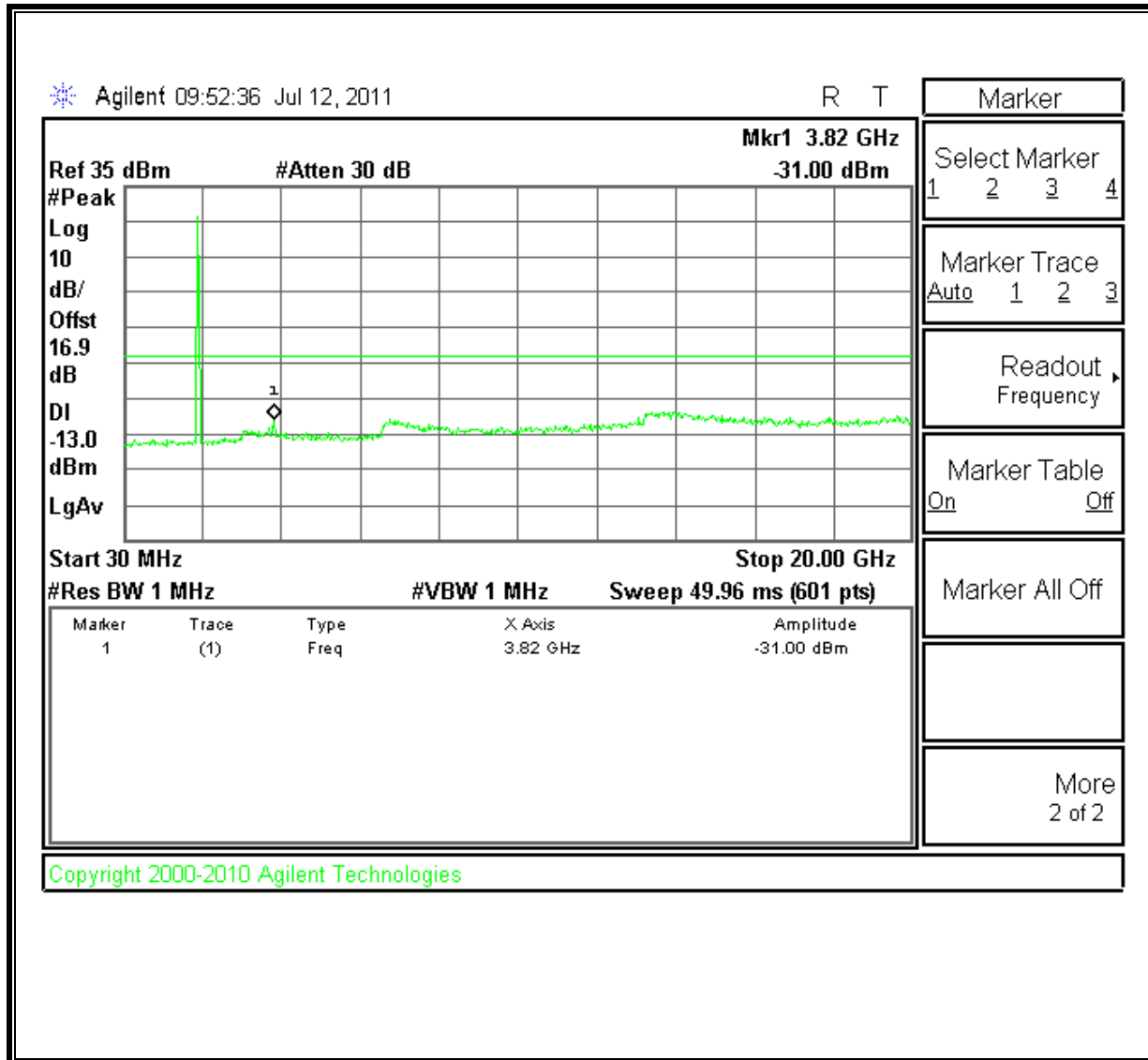
**LOW CHANNEL**



**MID CHANNEL**

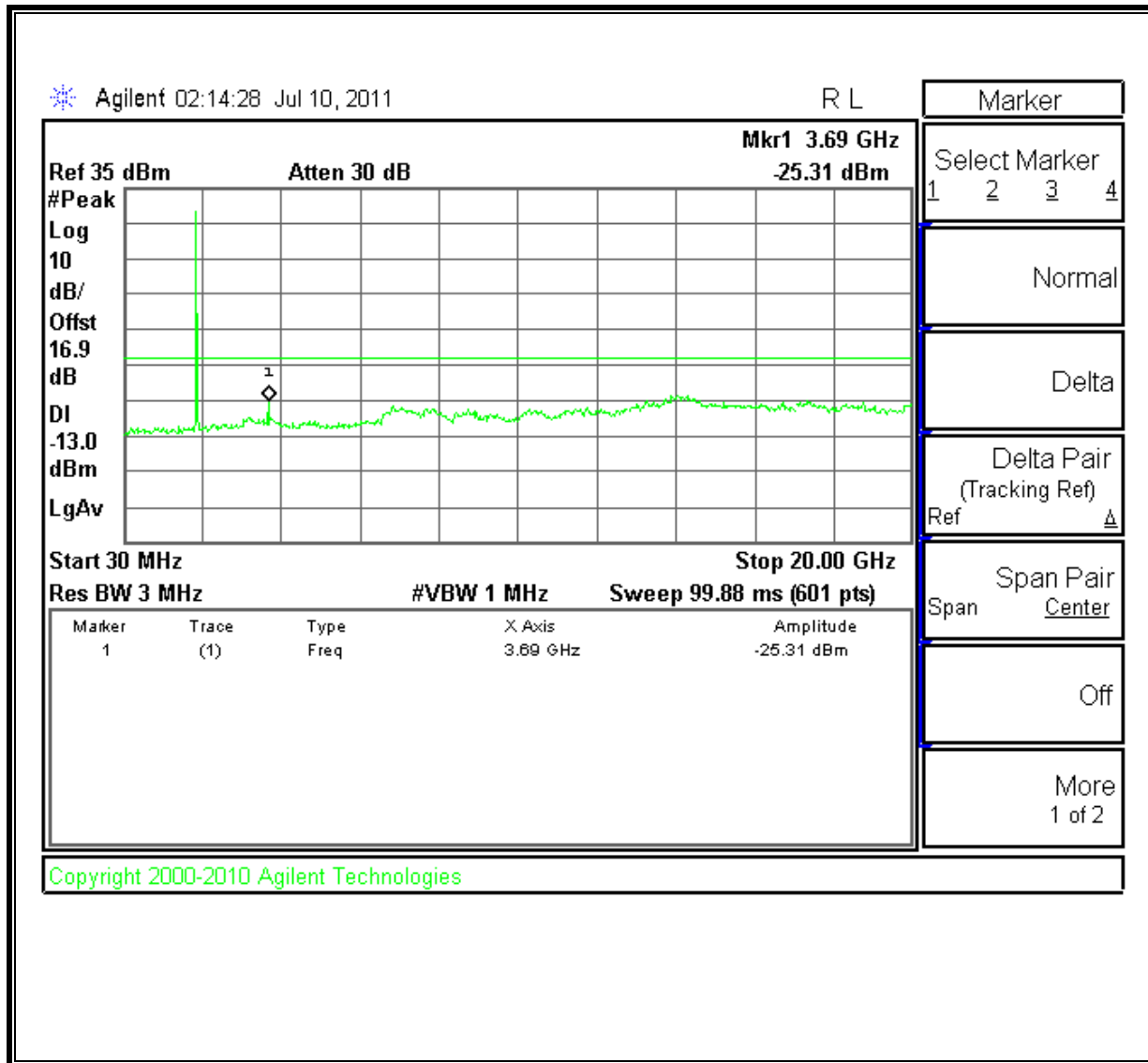


**HIGH CHANNEL**

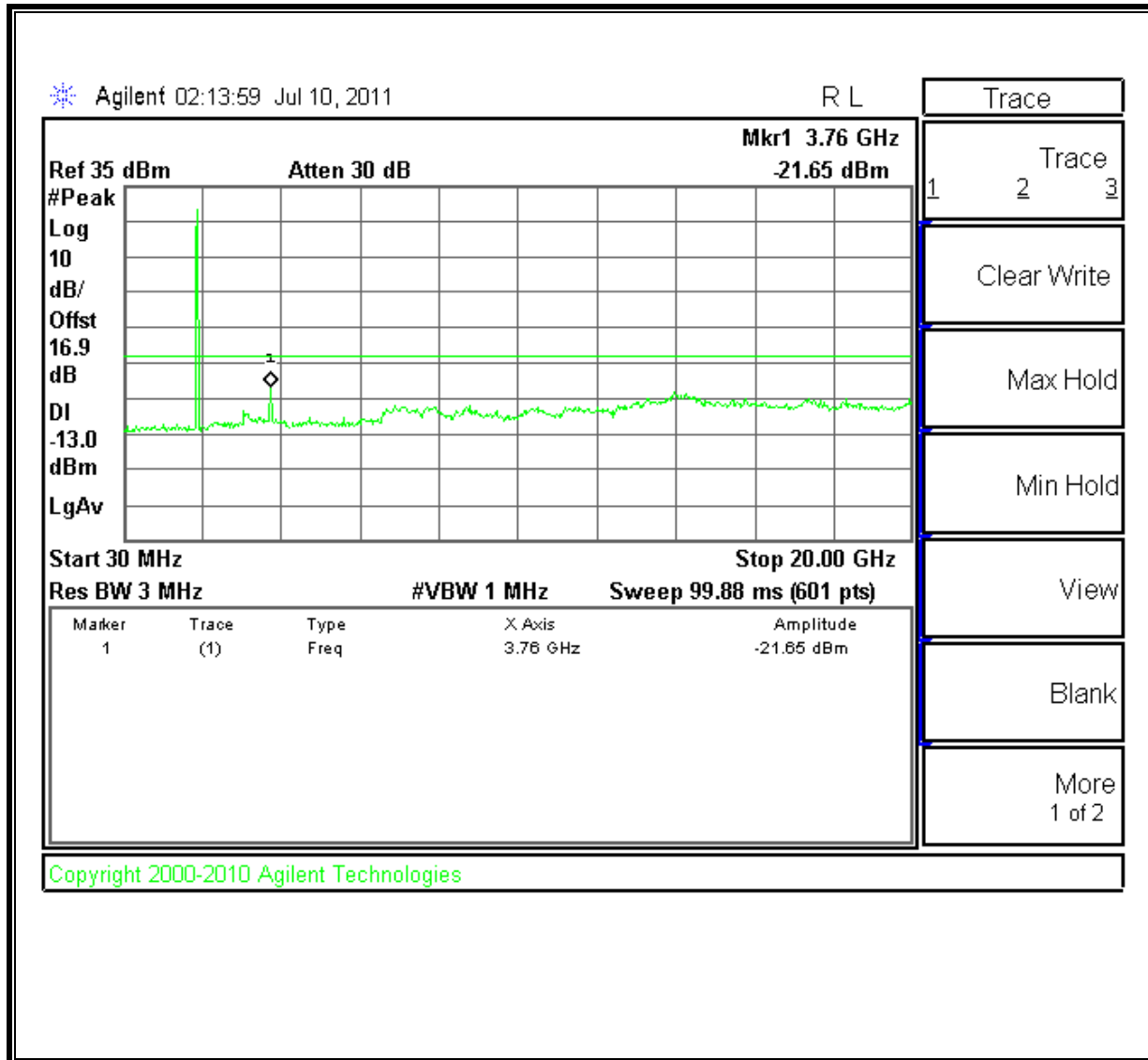


**CDMA2000 1xEV-DO Revision A (Rev. A) Mode (PCS Band)**

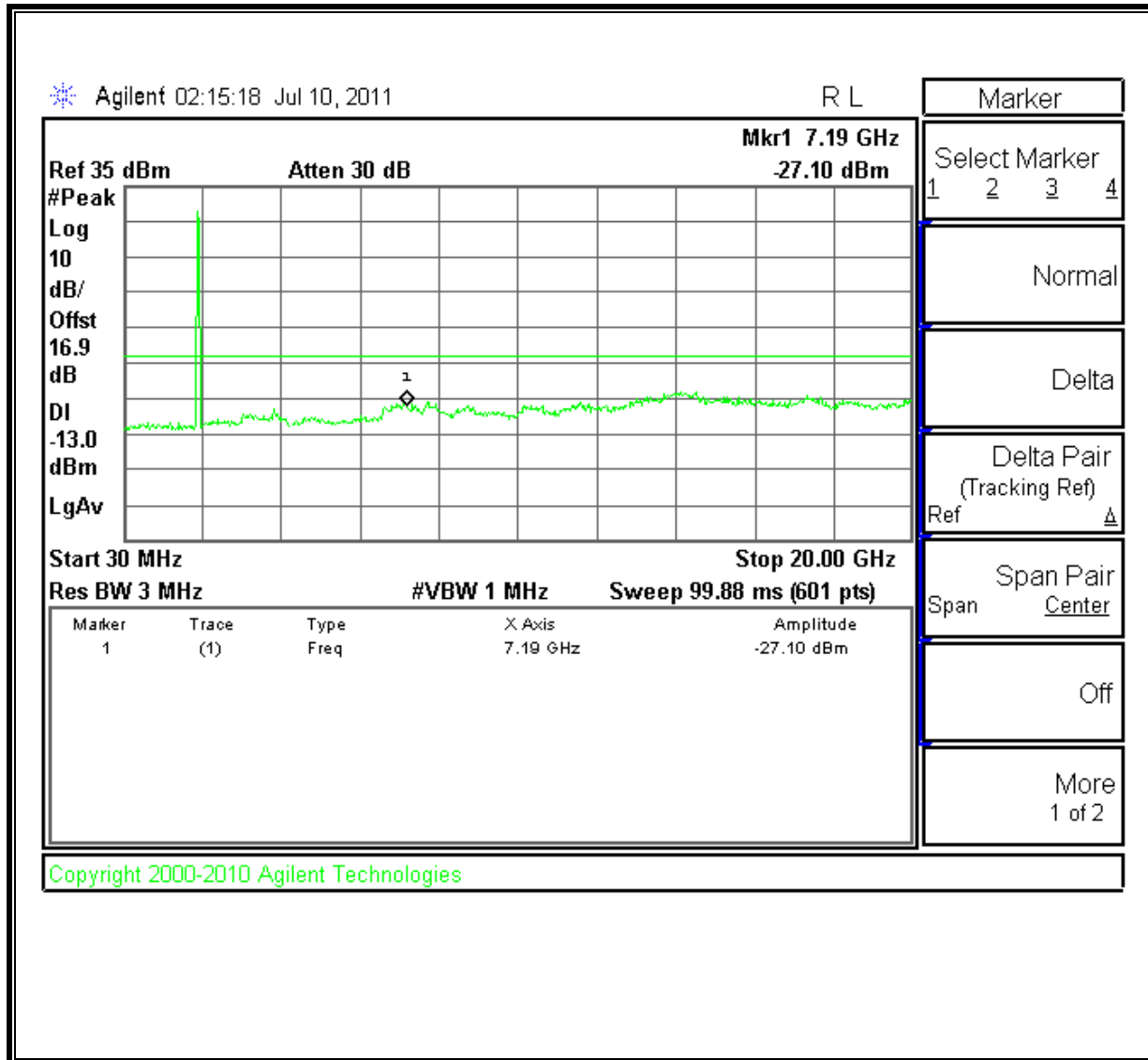
**LOW CHANNEL**



**MID CHANNEL**



**HIGH CHANNEL**



## 8.4. FREQUENCY STABILITY

### RULE PART(S)

FCC: §2.1055, §22.355, §24.235, RSS132 & RSS133

### LIMITS

- §22.355 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.
- §24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.
- RSS-132 & 133 6.3 - The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations

### TEST PROCEDURE

Use Agilent 8960 with Frequency Error measurement capability.

- Temp. =  $-20^{\circ}$  to  $+50^{\circ}\text{C}$
- Voltage = 3.00-3.6VDC

#### **Frequency Stability vs Temperature:**

The EUT is placed inside a temperature chamber. The temperature is set to  $20^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

#### **Frequency Stability vs Voltage:**

The peak frequency error is recorded (worst-case).

### MODES TESTED

- CDMA2000 1xEV-DO Revision A (Rev. A)

### RESULTS

See the following pages.



**CELL CDMA2000 1xEV-DO Revision A (Rev. A) – MID CHANNEL**

Reference Frequency: Cellular Mid Channel 836.519985Hz @ 20°C Limit: to stay +/- 2.5 ppm = 2091.300 Hz				
DC Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	836.519972	0.017	2.5
3.30	40	836.519980	0.007	2.5
3.30	30	836.519982	0.005	2.5
3.30	<b>20</b>	<b>836.519986</b>	<b>0</b>	2.5
3.30	10	836.520000	-0.016	2.5
3.30	0	836.520022	-0.043	2.5
3.30	-10	836.519990	-0.005	2.5
3.30	-20	836.519988	-0.002	2.5
3.30	-30	836.520012	-0.031	2.5
Reference Frequency: Cellular Mid Channel 836.519986MHz @ 20°C Limit: to stay +/- 2.5 ppm = 2091.300 Hz				
DC Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.30</b>	20	836.519996	<b>0.000</b>	2.5
3.60	20	836.520018	-0.026	2.5
3.00	20	836.520008	-0.014	2.5
2.65(end voltage)	20	836.519961	0.042	2.5

**PCS, CDMA2000 1xEV-DO Revision A (Rev. A) – MID CHANNEL**

Reference Frequency: PCS Mid Channel 1879.999992MHz @ 20°C				
Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	50	1879.999996	-0.002	2.5
3.30	40	1880.000012	-0.011	2.5
3.30	30	1879.999985	0.004	2.5
3.30	<b>20</b>	<b>1879.999992</b>	<b>0</b>	<b>2.5</b>
3.30	10	1880.000014	-0.012	2.5
3.30	0	1880.000023	-0.016	2.5
3.30	-10	1879.999991	0.001	2.5
3.30	-20	1879.999982	0.005	2.5
3.30	-30	1879.999978	0.007	2.5
Reference Frequency: PCS Mid Channel 1879.999992MHz @ 20°C				
Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.30	<b>20</b>	<b>1879.999992</b>	<b>0</b>	<b>2.5</b>
3.60	20	1880.000025	-0.018	2.5
3.00	20	1879.999979	0.007	2.5
2.65(end voltage)	20	1879.999867	0.066	2.5

## 9. RADIATED TEST RESULTS

### 9.1. RADIATED POWER (ERP & EIRP)

#### RULE PART(S)

FCC: §2.1046, §22.913, §24.232  
 RSS132 & RSS133

#### LIMITS

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

24.232(c) - 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 603C

#### MODES TESTED

- 1xRTT – RC1, SO55
- CDMA2000 1xEV-DO Revision A (Rev. A)

#### RESULTS for Cellular Band (ERP)

Mode	Channel	f (MHz)	ERP	
			dBm	mW
1xRTT (RC1, SO55)	1013	824.70	30.76	1191.24
	384	836.52	29.53	897.43
	777	848.31	29.74	941.89
EVDO-REV A	1013	824.70	31.16	1306.17
	384	836.52	30.53	1129.80
	777	848.31	29.54	899.50

#### RESULTS for PCS Band (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
1xRTT (RC1, SO55)	25	1851.25	28.26	669.88
	600	1880.00	28.62	727.78
	1175	1908.75	28.28	672.98
EVDO-REV A	25	1851.25	28.16	654.64
	600	1880.00	29.22	835.60
	1175	1908.75	28.48	704.69

**ERP for 1xRTT Mode (Cellular Band)**

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		Novatel						
<b>Project #:</b>		11U13890						
<b>Date:</b>		07/12/11						
<b>Test Engineer:</b>		Chin Pang						
<b>Configuration:</b>		EUT with Test jig Card						
<b>Mode:</b>		Cell Band 1xRTT						
<b>Test Equipment:</b>								
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)								
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.70	31.26	V	0.5	0.0	30.76	38.5	-7.7	
824.70	20.55	H	0.5	0.0	20.05	38.5	-18.4	
836.52	30.03	V	0.5	0.0	29.53	38.5	-8.9	
836.52	20.15	H	0.5	0.0	19.65	38.5	-18.8	
848.31	30.24	V	0.5	0.0	29.74	38.5	-8.7	
848.31	21.47	H	0.5	0.0	20.97	38.5	-17.5	
Rev. 1.24.7								

**ERP for CDMA2000 1xEV-DO Revision A (Cellular Band)**

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		Novatel						
<b>Project #:</b>		11U13890						
<b>Date:</b>		07-12-11						
<b>Test Engineer:</b>		Chin Pang						
<b>Configuration:</b>		EUT with Dipole Antenna						
<b>Mode:</b>		Cell Band EvDO, Rev A						
<b>Test Equipment:</b>								
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)								
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.								
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.70	31.66	V	0.5	0.0	31.16	38.5	-7.3	
824.70	20.35	H	0.5	0.0	19.85	38.5	-18.6	
836.52	31.03	V	0.5	0.0	30.53	38.5	-7.9	
836.52	20.60	H	0.5	0.0	20.10	38.5	-18.4	
848.31	30.04	V	0.5	0.0	29.54	38.5	-8.9	
848.31	21.67	H	0.5	0.0	21.17	38.5	-17.3	
Rev. 1.24.7								

EIRP for 1xRTT Mode (PCS Band)

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		Novatel						
<b>Project #:</b>		11U13890						
<b>Date:</b>		07-12-11						
<b>Test Engineer:</b>		Chin Pang						
<b>Configuration:</b>		EUT with Dipole Antenna						
<b>Mode:</b>		TX PCS CDMA2000, 1xRTT						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.851	21.1	V	0.85	8.01	28.26	33.0	-4.7	
1.851	14.4	H	0.85	8.01	21.56	33.0	-11.4	
1.880	21.4	V	0.85	8.07	28.62	33.0	-4.4	
1.880	14.6	H	0.85	8.07	21.82	33.0	-11.2	
1.909	21.0	V	0.85	8.13	28.28	33.0	-4.7	
1.909	13.8	H	0.85	8.13	21.08	33.0	-11.9	
Rev. 1.24.7								

EIRP for CDMA2000 1xEV-DO Revision A (PCS Band)

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		Novatel						
<b>Project #:</b>		11U13890						
<b>Date:</b>		07-12-11						
<b>Test Engineer:</b>		Chin Pang						
<b>Configuration:</b>		EUT with Dipole Antenna						
<b>Mode:</b>		TX PCS, EvDO Rev A						
<b>Test Equipment:</b>								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.851	21.0	V	0.85	8.01	28.16	33.0	-4.8	
1.851	13.9	H	0.85	8.01	21.06	33.0	-11.9	
1.880	22.0	V	0.85	8.07	29.22	33.0	-3.8	
1.880	14.6	H	0.85	8.07	21.82	33.0	-11.2	
1.909	21.2	V	0.85	8.13	28.48	33.0	-4.5	
1.909	14.0	H	0.85	8.13	21.28	33.0	-11.7	
Rev. 1.24.7								

## 9.2. FIELD STRENGTH OF SPURIOUS RADIATION

### RULE PART(S)

FCC: §2.1053, §22.917, §24.238  
IC: RSS-132, 4.5; RSS-133, 6.5

### LIMIT

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

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 100 kHz or 1 percent of emission bandwidth, as specified). 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 emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth ( i.e. 1 MHz or 1 percent of emission bandwidth, as specified). 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 emissions are attenuated at least 26 dB below the transmitter power.

### MODES TESTED

- 1xRTT – RC1, SO55
- CDMA2000 1xEV-DO Revision A (Rev. A)

### RESULTS

**1xRTT Mode (Cellular Band)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** Novatel  
**Project #:** 11U13890  
**Date:** 07-13-11  
**Test Engineer:** Chin Pang  
**Configuration:** EUT with Dipole Antenna  
**Mode:** TX, Cell BAND CDMA 1xRTT

Chamber

Pre-amplifier

Filter

Limit

5m Chamber B

T145 8449B

Filter 1

FCC Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Channel (824.7MHz)</b>									
1.649	-13.2	V	3.0	35.5	1.0	-47.7	-13.0	-34.7	
2.474	-10.8	V	3.0	35.4	1.0	-45.2	-13.0	-32.2	
1.649	-15.8	H	3.0	35.5	1.0	-50.3	-13.0	-37.3	
2.474	-15.0	H	3.0	35.4	1.0	-49.4	-13.0	-36.4	
<b>Mid Channel (836.52MHz)</b>									
1.673	-10.7	V	3.0	35.5	1.0	-45.2	-13.0	-32.2	
2.510	-11.0	V	3.0	35.4	1.0	-45.4	-13.0	-32.4	
1.673	-13.7	H	3.0	35.5	1.0	-48.3	-13.0	-35.3	
2.510	-13.8	H	3.0	35.4	1.0	-48.2	-13.0	-35.2	
<b>High Channel (848.31MHz)</b>									
1.697	-4.7	V	3.0	35.5	1.0	-39.2	-13.0	-26.2	
2.545	-11.0	V	3.0	35.4	1.0	-45.5	-13.0	-32.5	
1.697	-8.2	H	3.0	35.5	1.0	-42.7	-13.0	-29.7	
2.545	-14.6	H	3.0	35.4	1.0	-49.0	-13.0	-36.0	

Rev: 03.03.09  
 Note: No other emissions were detected above the system noise floor.

**CDMA2000 1xEV-DO Revision A (Rev. A) Mode (Cellular Band)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Novatel							
<b>Project #:</b>		11U13890							
<b>Date:</b>		07-13-11							
<b>Test Engineer:</b>		Chin Pang							
<b>Configuration:</b>		EUT with Dipole Antenna							
<b>Mode:</b>		TX, Cell BAND CDMA EvDO, Rev A							
<b>Chamber</b>		<b>Pre-amplifier</b>			<b>Filter</b>		<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1		FCC Part 22		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Channel (824.7MHz)</b>									
1.649	-11.5	V	3.0	35.5	1.0	-46.0	-13.0	-33.0	
2.474	-11.0	V	3.0	35.4	1.0	-45.4	-13.0	-32.4	
1.649	-13.6	H	3.0	35.5	1.0	-48.1	-13.0	-35.1	
2.474	-14.2	H	3.0	35.4	1.0	-48.6	-13.0	-35.6	
<b>Mid Channel (836.52MHz)</b>									
1.673	-13.5	V	3.0	35.5	1.0	-48.0	-13.0	-35.0	
2.510	-10.8	V	3.0	35.4	1.0	-45.2	-13.0	-32.2	
1.673	-14.5	H	3.0	35.5	1.0	-49.1	-13.0	-36.1	
2.510	-16.1	H	3.0	35.4	1.0	-50.5	-13.0	-37.5	
<b>High Channel (848.31MHz)</b>									
1.697	-3.4	V	3.0	35.5	1.0	-37.9	-13.0	-24.9	
2.545	-10.0	V	3.0	35.4	1.0	-44.5	-13.0	-31.5	
1.697	-7.8	H	3.0	35.5	1.0	-42.3	-13.0	-29.3	
2.545	-16.1	H	3.0	35.4	1.0	-50.5	-13.0	-37.5	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									



**1xRTT Mode (PCS Band)**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		Novatel							
<b>Project #:</b>		11U13890							
<b>Date:</b>		07-13-11							
<b>Test Engineer:</b>		Chin Pang							
<b>Configuration:</b>		EUT with Dipole Antenna							
<b>Mode:</b>		TX, PCS BAND CDMA2000, 1xRTT							
<b>Chamber</b>		<b>Pre-amplifier</b>			<b>Filter</b>		<b>Limit</b>		
5m Chamber B		T145 8449B			Filter 1		Part 24		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. (1851.25MHz)</b>									
3.703	-1.9	V	3.0	35.4	1.0	-36.2	-13.0	-23.2	
5.554	-7.1	V	3.0	35.4	1.0	-41.5	-13.0	-28.5	
3.703	-7.8	H	3.0	35.4	1.0	-42.1	-13.0	-29.1	
5.554	-10.7	H	3.0	35.4	1.0	-45.1	-13.0	-32.1	
<b>Mid Ch. (1880.0MHz)</b>									
3.759	4.6	V	3.0	35.3	1.0	-29.8	-13.0	-16.8	
5.640	-10.8	V	3.0	35.4	1.0	-45.2	-13.0	-32.2	
3.760	-4.5	H	3.0	35.3	1.0	-38.8	-13.0	-25.8	
5.640	-0.1	H	3.0	35.4	1.0	-34.6	-13.0	-21.6	
<b>High Ch. (1908.75MHz)</b>									
3.818	-1.7	V	3.0	35.3	1.0	-36.0	-13.0	-23.0	
5.726	-7.9	V	3.0	35.4	1.0	-42.4	-13.0	-29.4	
3.818	-9.1	H	3.0	35.3	1.0	-43.4	-13.0	-30.4	
5.726	-6.9	H	3.0	35.4	1.0	-41.3	-13.0	-28.3	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

**CDMA2000 1xEV-DO Revision A (Rev. A) Mode (PCS Band)**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** Novatel  
**Project #:** 11U13890  
**Date:** 07-13-11  
**Test Engineer:** Chin Pang  
**Configuration:** EUT with Dipole Antenna  
**Mode:** TX, PCS BAND CDMA2000, EvDO, Rev A

Chamber

Pre-amplifier

Filter

Limit

5m Chamber B

T145 8449B

Filter 1

Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. (1851.25MHz)</b>									
3.703	2.7	V	3.0	35.4	1.0	-31.6	-13.0	-18.6	
5.554	-7.0	V	3.0	35.4	1.0	-41.4	-13.0	-28.4	
3.703	-7.2	H	3.0	35.4	1.0	-41.5	-13.0	-28.5	
5.554	-7.7	H	3.0	35.4	1.0	-42.1	-13.0	-29.1	
<b>Mid Ch. (1880.0MHz)</b>									
3.759	7.5	V	3.0	35.3	1.0	-26.9	-13.0	-13.9	
5.640	-5.5	V	3.0	35.4	1.0	-39.9	-13.0	-26.9	
3.760	2.0	H	3.0	35.3	1.0	-32.3	-13.0	-19.3	
5.640	-7.4	H	3.0	35.4	1.0	-41.9	-13.0	-28.9	
<b>High Ch. (1908.75MHz)</b>									
3.818	0.7	V	3.0	35.3	1.0	-33.6	-13.0	-20.6	
5.726	-7.8	V	3.0	35.4	1.0	-42.3	-13.0	-29.3	
3.818	-6.4	H	3.0	35.3	1.0	-40.7	-13.0	-27.7	
5.726	-8.3	H	3.0	35.4	1.0	-42.7	-13.0	-29.7	

Rev. 03.03.09  
 Note: No other emissions were detected above the system noise floor.

### 9.3. RECEIVER SPURIOUS EMISSIONS

#### LIMIT

RSS-Gen 7.2.2

Spurious Emission Limits for Receivers:

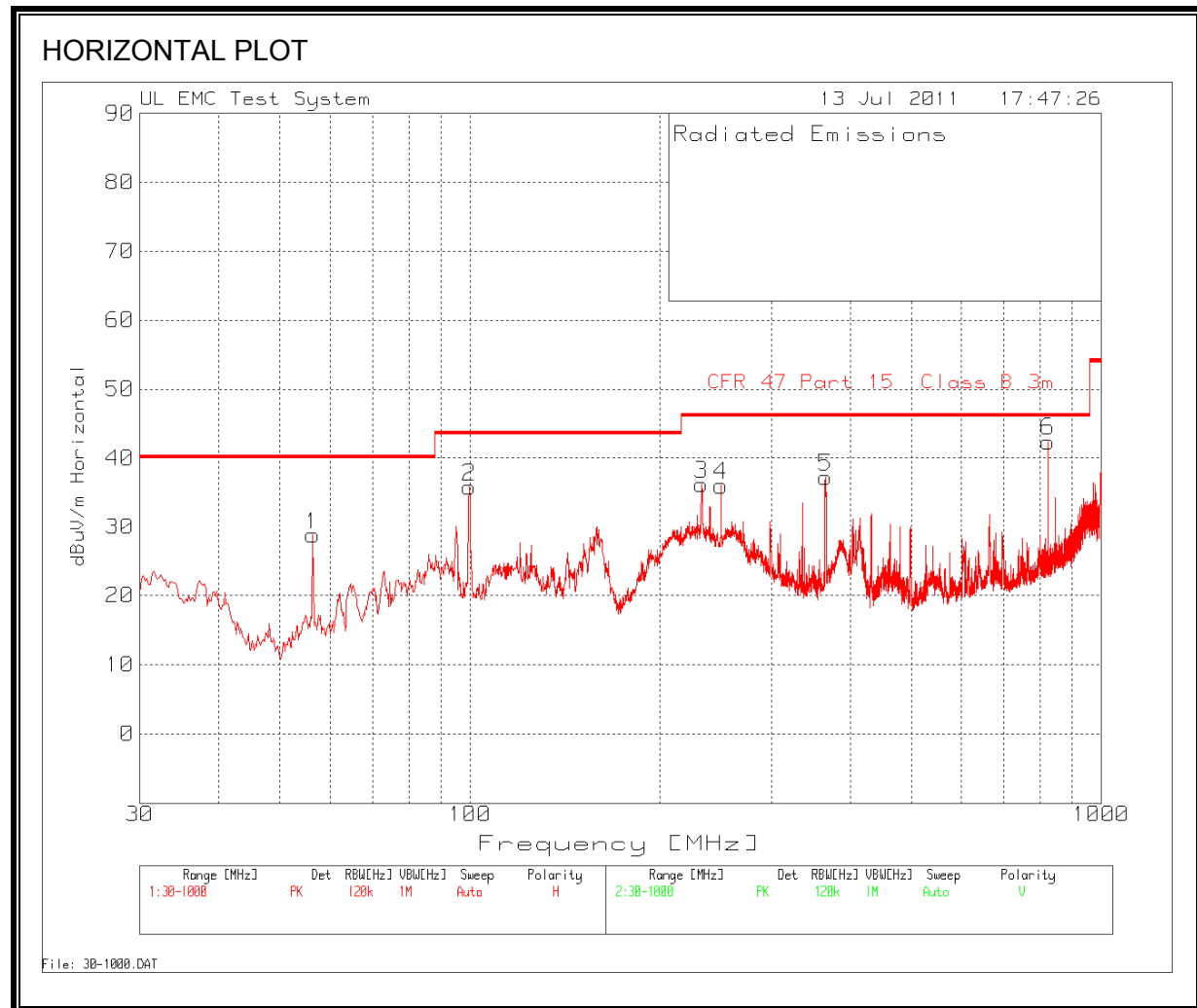
Spurious Frequency (MHz)	Field Strength (microvolts/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960	500

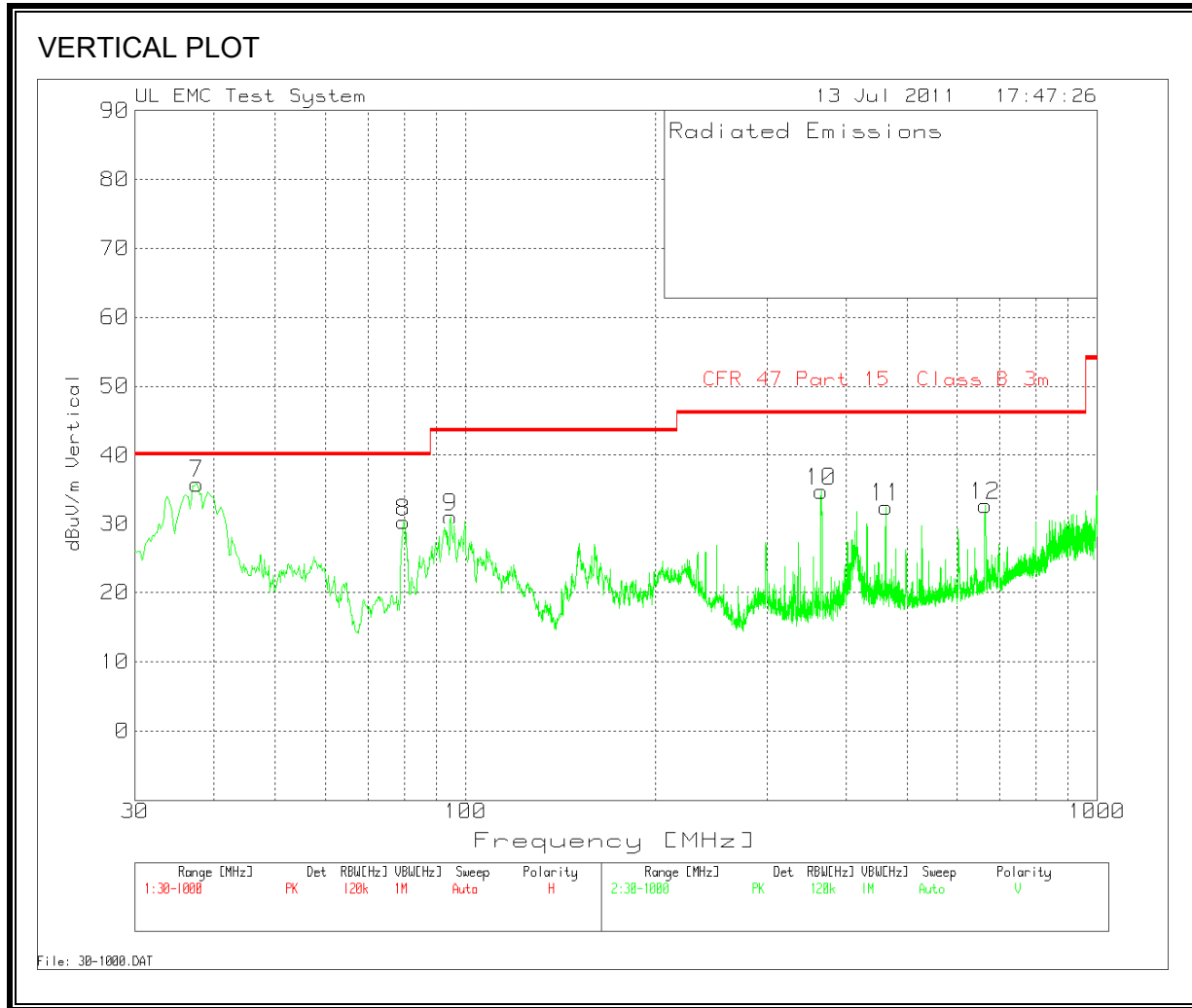
#### TEST PROCEDURE

The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (local oscillator frequency, intermediate frequency or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tunable and local oscillator frequencies.

#### RESULTS

**SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)**





**HORIZONTAL AND VERTICAL DATA**

Range 1 30 - 1000MHz									
Frequency	Reading	Detector	Cable. [dB]	PreAmp[dB]	Bilog Factors[dB]	dBuV/m	Part 15B 3m	Margin	Polarity
56.3629	49.18	PK	1.1	-29.4	7.9	28.78	40	-11.22	Horz
99.5903	53.69	PK	1.4	-29.3	10	35.79	43.5	-7.71	Horz
232.5679	50.99	PK	2.1	-28.8	11.9	36.19	46	-9.81	Horz
250.014	50.7	PK	2.2	-28.7	11.8	36	46	-10	Horz
366.3209	48.92	PK	2.7	-28.8	14.4	37.22	46	-8.78	Horz
824.5703	46.12	PK	4	-28.8	21.1	42.42	46	-3.58	Horz
2 30 - 1000MHz									
Frequency	Reading	Detector	Cable. [dB]	PreAmp[dB]	Bilog Factors[dB]	dBuV/m	Part 15B 3m	Margin	Polarity
37.56	48.47	PK	0.9	-29.5	16	35.87	40	-4.13	Vert
79.9151	50.81	PK	1.3	-29.4	7.6	30.31	40	-9.69	Vert
94.7442	50.29	PK	1.4	-29.3	8.7	31.09	43.5	-12.41	Vert
366.1271	46.44	PK	2.7	-28.8	14.4	34.74	46	-11.26	Vert
463.8249	42.62	PK	3	-29.3	16.2	32.52	46	-13.48	Vert
666.199	39.49	PK	3.6	-29.3	18.9	32.69	46	-13.31	Vert

**SPURIOUS EMISSIONS ABOVE 1000 MHz (WORST-CASE CONFIGURATION)**

Note: No emissions were detected above the system noise floor.

## 9.4. POWER LINE CONDUCTED EMISSION

### LIMIT

RSS-Gen 7.2.2

Except when the requirements applicable to a given device state otherwise, for any licence-exempt radio communication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in Table 2. The tighter limit applies at the frequency range boundaries.

Table 2 – AC Power Lines Conducted Emission Limits

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

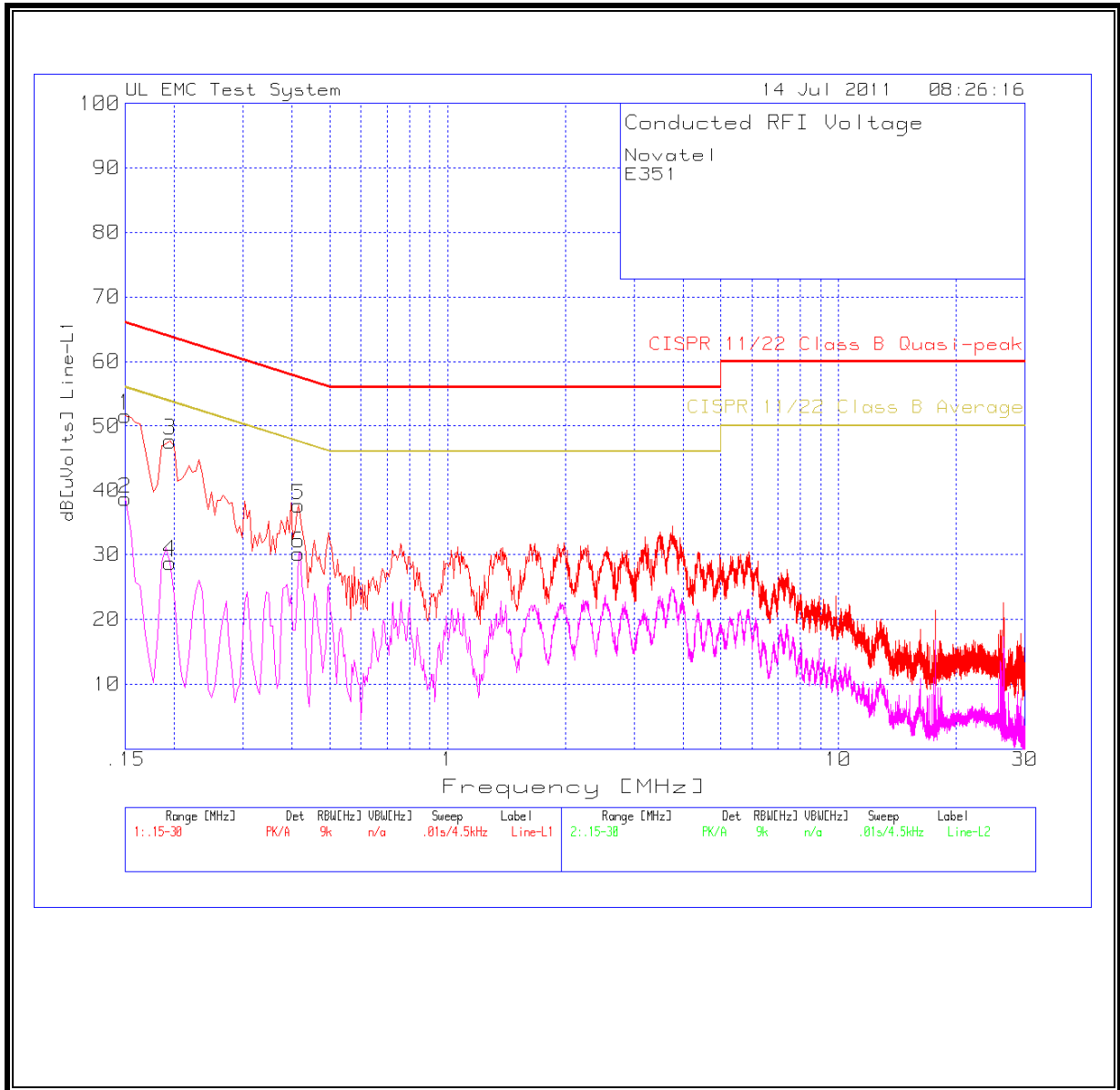
### RESULTS



**6 WORST EMISSIONS**

Line-L1 .15 - 30MHz							
Frequency	Reading	Detector	dB[uVolts]	CISPR 22 B QP	Margin	CISPR 22 B Average	Margin
0.15	51.62	PK	51.62	66	-14.38	56	-4.38
0.15	38.61	Av	38.61	-	-	56	-17.39
0.195	47.67	PK	47.67	63.8	-16.13	53.8	-6.13
0.195	28.78	Av	28.78	-	-	53.8	-25.02
0.4155	37.57	PK	37.57	57.5	-19.93	47.5	-9.93
0.4155	30.14	Av	30.14	-	-	47.5	-17.36
Line-L2 .15 - 30MHz							
Frequency	Reading	Detector	dB[uVolts]	CISPR 22 B QP	Margin	CISPR 22 B Average	Margin
0.1545	52.29	PK	52.29	65.8	-13.51	55.8	-3.51
0.1545	32.08	Av	32.08	-	-	55.8	-23.72
0.195	47.51	PK	47.51	63.8	-16.29	53.8	-6.29
0.195	28.48	Av	28.48	-	-	53.8	-25.32
0.4065	38.73	PK	38.73	57.7	-18.97	47.7	-8.97
0.4065	23.58	Av	23.58	-	-	47.7	-24.12

**LINE 1 RESULTS**



**LINE 2 RESULTS**

