



**FCC CFR47 PART 24E
CERTIFICATION TEST REPORT
FOR**

CDMA, LTE, WIMAX, AND WIFI MOBILE HOT SPOT

MODEL NUMBER: AC803S

FCC ID: N7NAC803S

REPORT NUMBER: 11U14068-1

ISSUE DATE: MARCH 05, 2012

Prepared for
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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>
---	03/05/12	Initial Issue	T. Chan

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SIERRA WIRELESS INC.
2200 FARADAY AVE. SUITE 150
CARLSBAD, CA 92008, U.S.A.

EUT DESCRIPTION: CDMA, LTE, WIMAX, AND WIFI MOBILE HOT SPOT

MODEL: AC803S

SERIAL NUMBER: N7NAC803

DATE TESTED: DECEMBER 5 TO 21, 2011

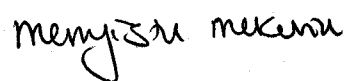
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 24E	Pass

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

MENGISTU MEKURIA
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, and FCC CFR Part 24.

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:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

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

The EUT is a Mobile hotspot that features with CDMA, LTE, WIMAX, and WIFI transceiver that is manufacture by Sierra Wireless Inc.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average conducted and EIRP output powers as follows:

Frequency range (MHz)	Modulation	Conducted		EIRP (EUT Only)		EIRP (EUT WITH CRADLE)	
		dBm	mW	dBm	mW	dBm	mW
1851.25-1908.75	1xRTT	24.14	259.4	28.55	716.1	27.77	598.4
	EVDO REV. A	24.30	269.2	28.33	680.8	27.22	527.2

5.3. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent 8960 Communication Test Set.

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case is EUT on the highest power. Based on Peak Power measurement investigations, the following modes should be considered as worst-case scenario for all other measurements.

Worst-case modes:

- CDMA 2000 1xRTT
- CDMA 2000 EVDO REV. A

Since the EUT is a portable device, for the fundamental tests the X, Y and Z orientations have been investigated on, and after the investigations the X position turned out to be the worst case.

5.5. DESCRIPTION OF TEST SETUP

RADIATED TESTS SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	Manufacturer	Model	Serial Number
AC ADAPTER	Sierra Wireless	SSW-2013	201034
CRADLE	Sierra Wireless	N/A	1145-0003

I/O CABLES (RF Conducted Test)

I/O CABLE LIST						
Cable No.	Port	# of Identic Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	MINI USB	UN-SHELDED	1.0m	N/A
2	RF	1	RF	SHELDED	0.1m	N/A
3	RF	1	SMA	SHELDED	0.6 m	N/A

CONFIGURATION 1: I/O CABLES (RF Radiated Test)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	MINI USB	UN-SHELDDED	1.0m	N/A

CONFIGURATION 2: I/O CABLES (RF Radiated Test)

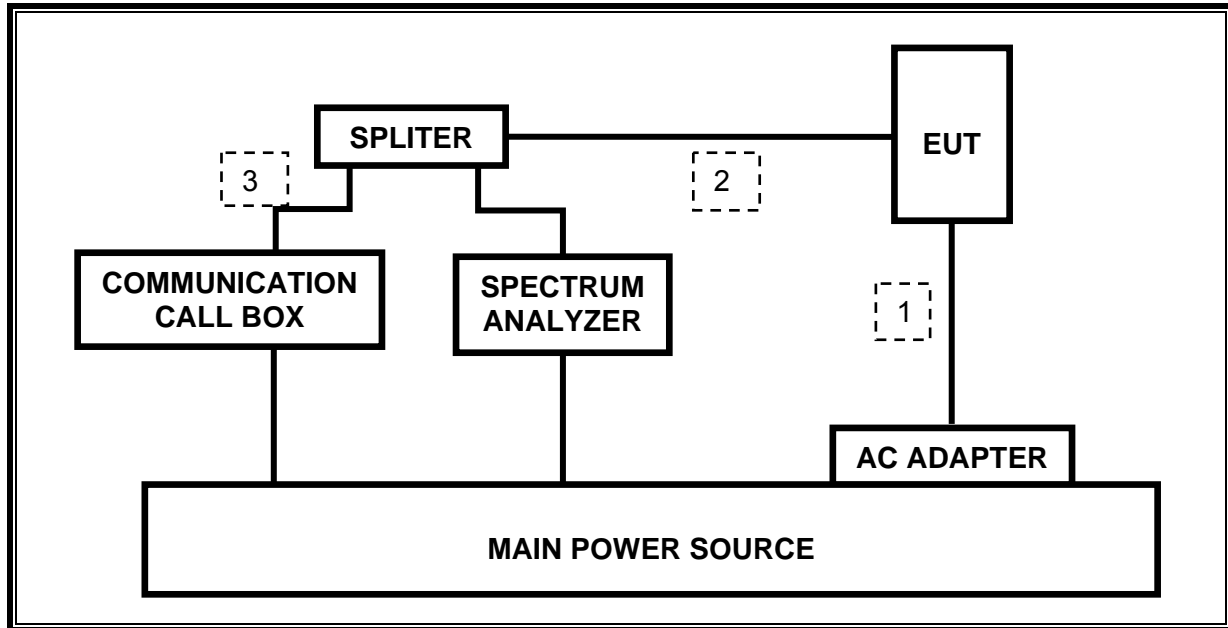
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	Built-in	UN-SHELDDED	2.0m	Ferrite core at one end (Cradle Unit)

TEST SETUP

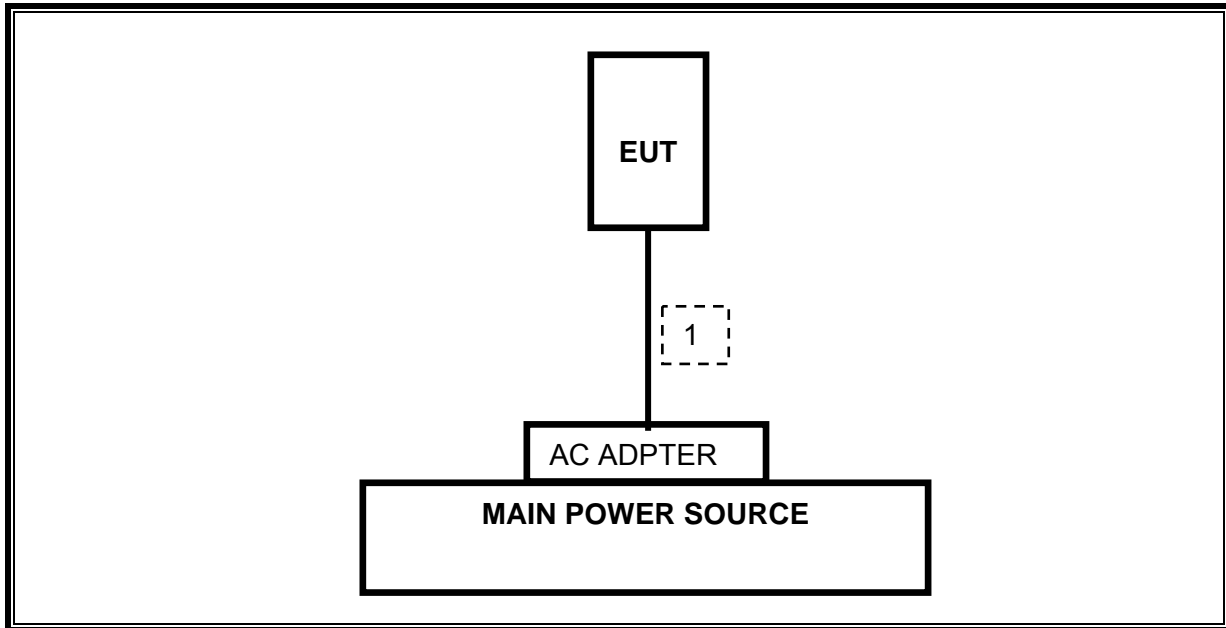
Configuration 1: The EUT is a stand-alone device and was tested with AC/USB Adapter.

Configuration 2: The EUT sat on the cradle unit that was connected with DC Adapter

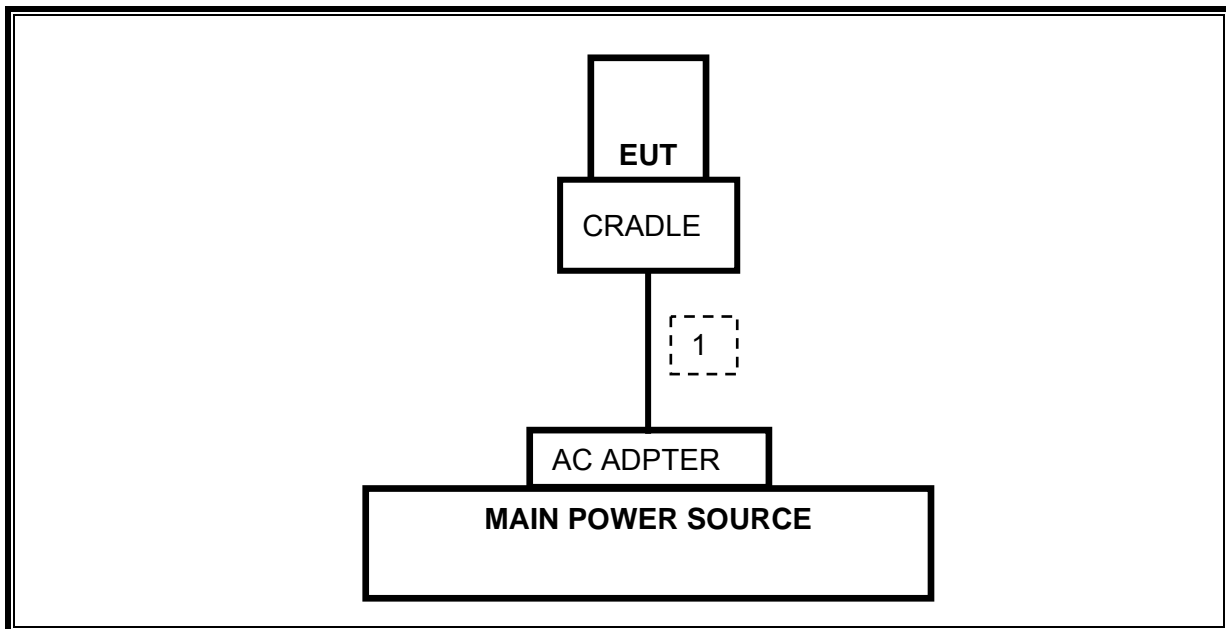
CONDUCTED SETUP DIAGRAM FOR TESTS



CONFIGURATION 1: RADIATED SETUP DIAGRAM FOR TESTS



CONFIGURATION 2: RADIATED 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	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	04/07/12
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01178	08/30/12
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/12
Antenna, Horn, 18 GHz	EMCO	3115	C00945	06/29/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/16/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01052	07/12/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	01/27/12
Communications Test Set	Agilent / HP	E5515C	C01086	06/17/12
Radio Communication Analyzer	Anritsu	MT8820C	N/A	05/17/12
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	10/20/12
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Directional Coupler	RF-Lambda	RFDC5M06G15	N/A	CNR
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/14/12
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00993	07/10/12

7. RF POWER OUTPUT VERIFICATION

Maximum output power is verified on the Low, Middle and High channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E for 1xRTT, section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rel. 0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev. A

CDMA2000 1xRTT

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

Application Rev, License
 CDMA2000 Mobile Test B.15.18, L

- Protocol Rev > 6 (IS-2000-0)
- System ID: 8; NID: 65535, Reg. Ch. #. 600 for PCS
- Radio Config (RC) > RC1 or RC3
- Service Option (SO) Setup > SO02 or SO55
- Traffic Data Rate > Full
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

RF Output Power for PCS Band				
Radio Configuration (RC)	Service Option (SO)	RF Pwr (dBm)		
		Ch. 25/1851.25 MHz	Ch.600/1880 MHz	Ch.1175/1908.75 MHz
		Peak	Peak	Peak
RC1	2 (Loopback)	24.00	23.95	23.65
	55 (Loopback)	24.03	23.96	23.83
RC2	9 (Loopback)	24.05	23.90	23.68
	55 (Loopback)	24.04	23.92	23.73
RC3	2 (Loopback)	24.14	23.98	23.68
	55 (Loopback)	24.11	24.00	23.80
	32 (+F-SCH)	24.08	23.90	23.69
	32 (+SCH)	24.04	23.90	23.69
RC4	2 (Loopback)	24.11	23.98	23.68
	55 (Loopback)	24.13	23.99	23.68
	32 (+F-SCH)	24.04	23.89	23.67
	32 (+SCH)	24.07	23.92	23.67
RC5	9 (Loopback)	24.04	23.90	23.66
	55 (Loopback)	24.07	23.89	23.65

1xEV-Do - Release 0 (Rel. 0)

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

EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
 - Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
 - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parm:
 - Cell Power > -105.5 dBm/1.23 MHz
 - 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 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
 - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Parm:
 - 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)

PCS Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	RF Pwr (dBm)
				Average
307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	24.12
		600	1880.00	23.94
		1175	1908.75	23.86

1xEV-Do - Revision A (Rev. A)

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 Rev. 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: 00000000: 00000000: 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)

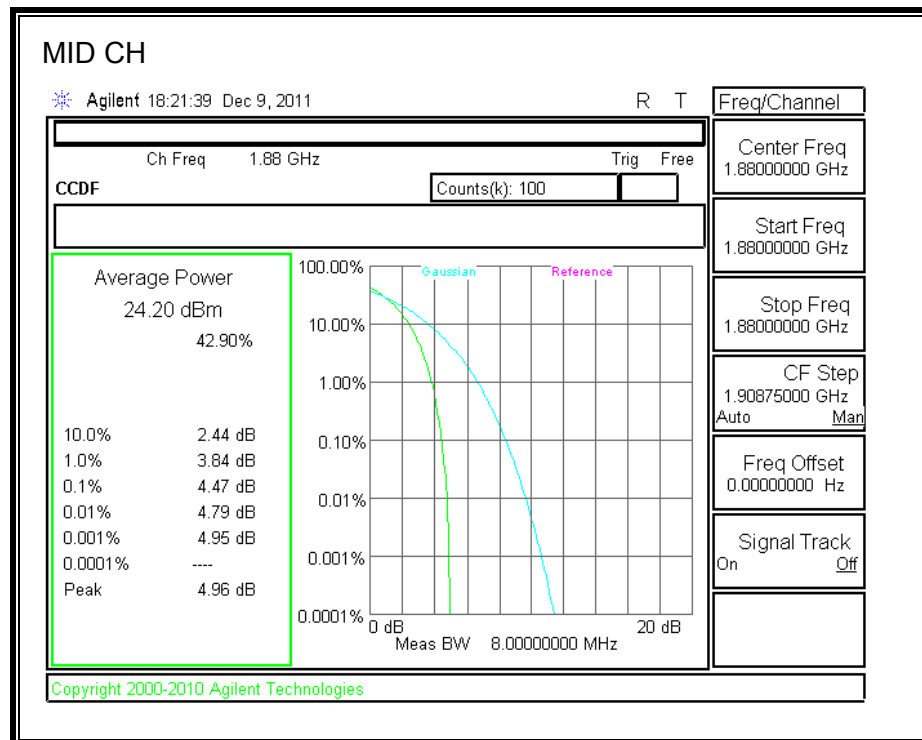
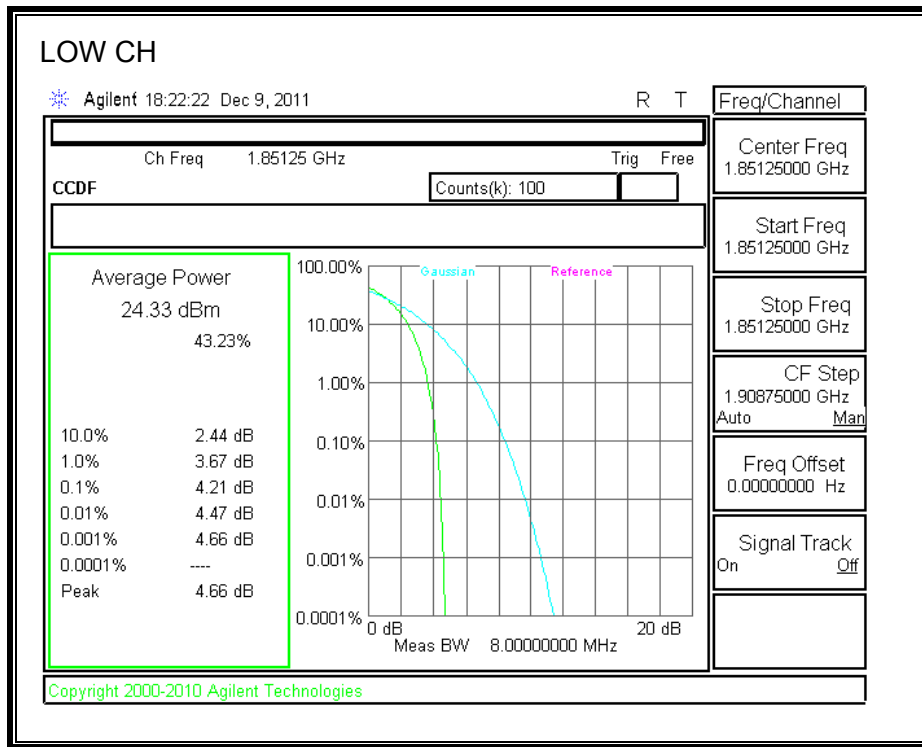
EVDO Rev. A - FETAP

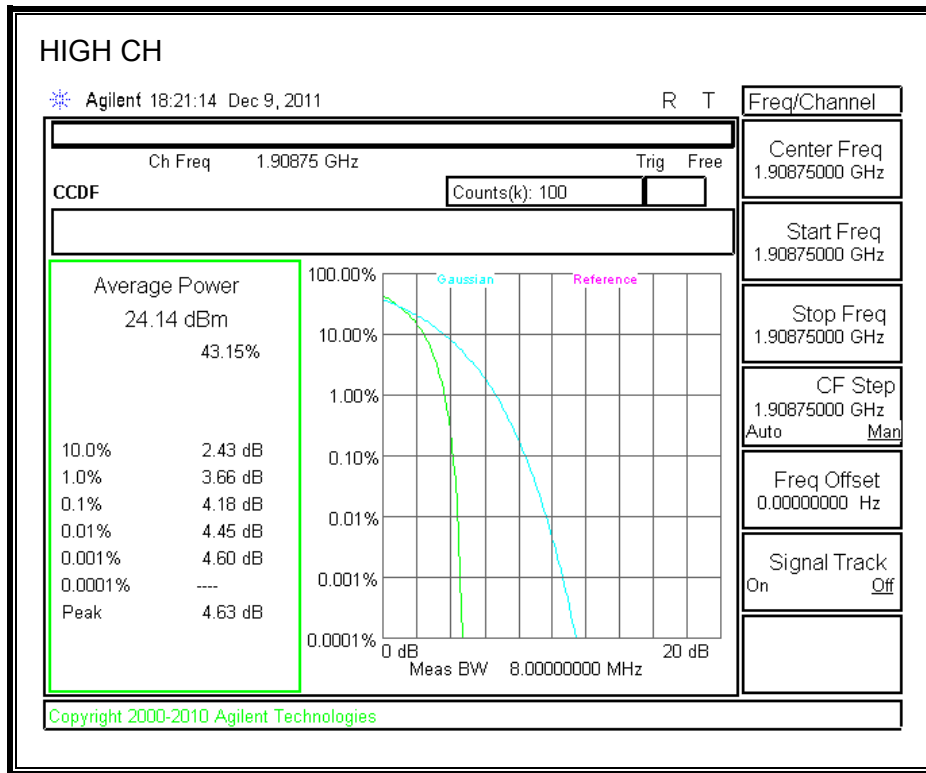
- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00000000: 00000000: 00000000: 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)

PCS Band

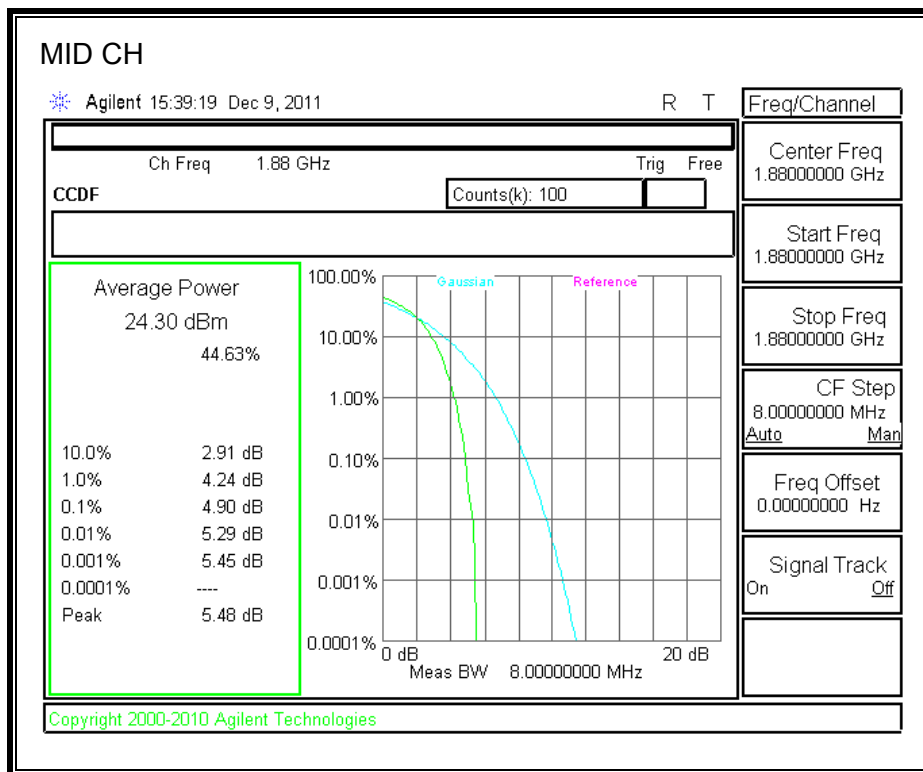
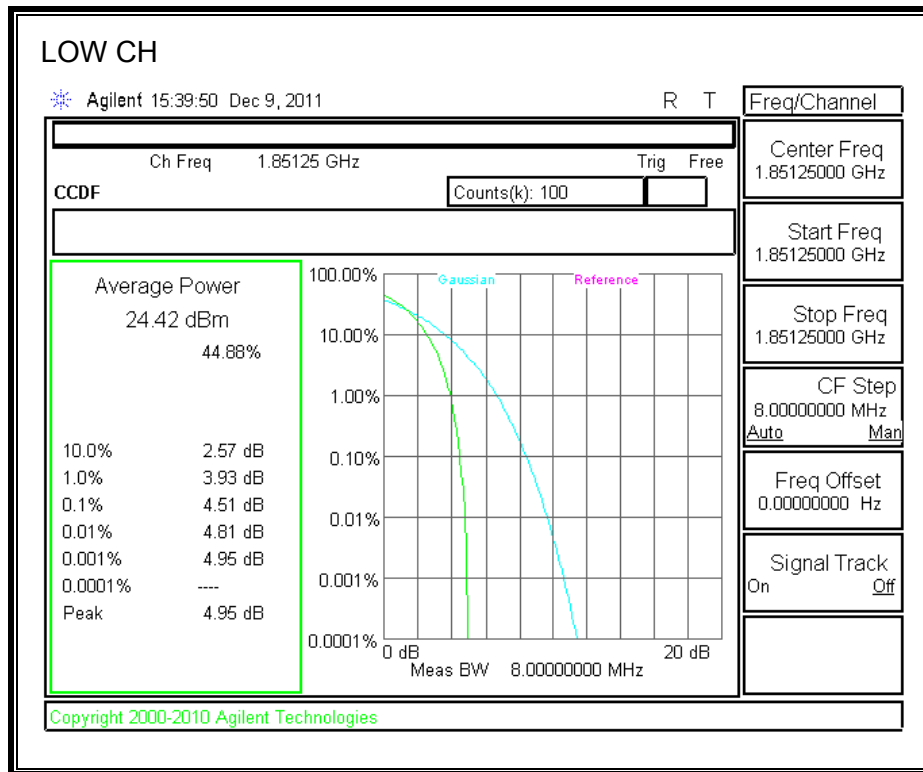
FETAP Traffic Format	RETAP Data Payload Size	Channel	f (MHz)	RF Pwr (dBm)
				Average
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	24.30
		600	1880.00	24.14
		1175	1908.75	23.91

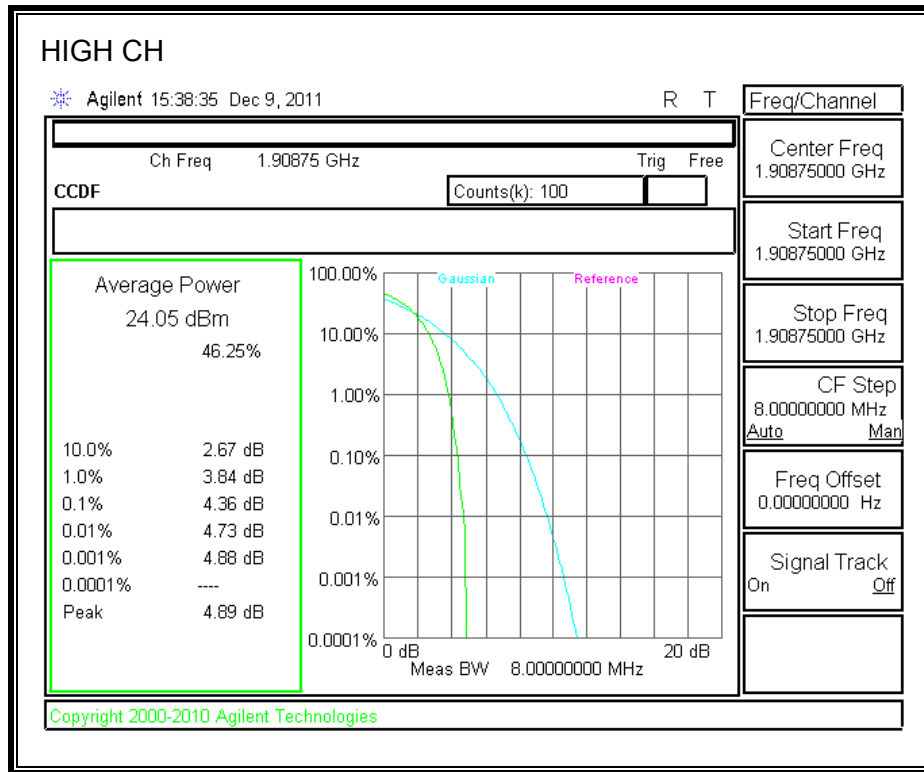
PEAK TO AVERAGE RATIO
1xRTT 1900 BAND





EVDO REV A 1900 BAND





PEAK-TO-AVERAGE RATIO 1xRTT 1900 BAND:

Mode	Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PARA)
			*Peak	Average	
CDMA2000 1xRTT	25	1851.25	28.99	24.33	4.66
	Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
	*Peak	Average			
	600	1880	29.16	24.2	4.96
Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)	
*Peak	Average				
1175	1908.75	28.77	24.14	4.63	
*Peak Reading = Average Reading + Peak-to-Average Ratio					

PEAK-TO-AVERAGE RATIO EVDO A 1900 BAND:

Mode	Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PARA)
			*Peak	Average	
CDMA2000 EVDO REV A	25	1851.25	29.37	24.42	4.95
	Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
	*Peak	Average			
	600	1880	29.78	24.30	5.48
Ch. No.	f (MHz)	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)	
*Peak	Average				
1175	1908.75	28.94	24.05	4.89	
*Peak Reading = Average Reading + Peak-to-Average Ratio					

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.

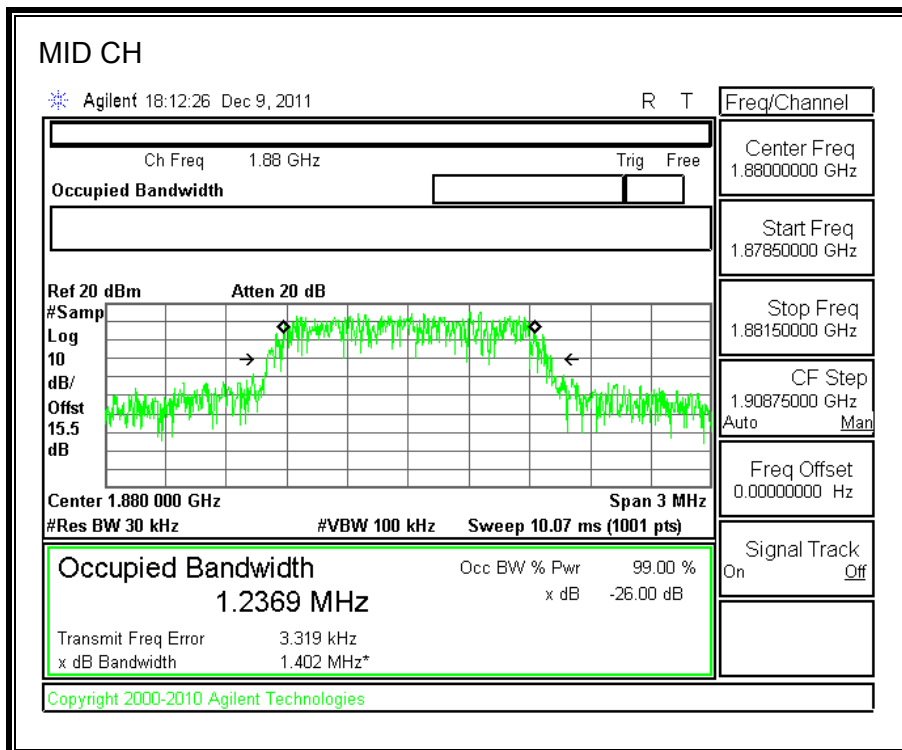
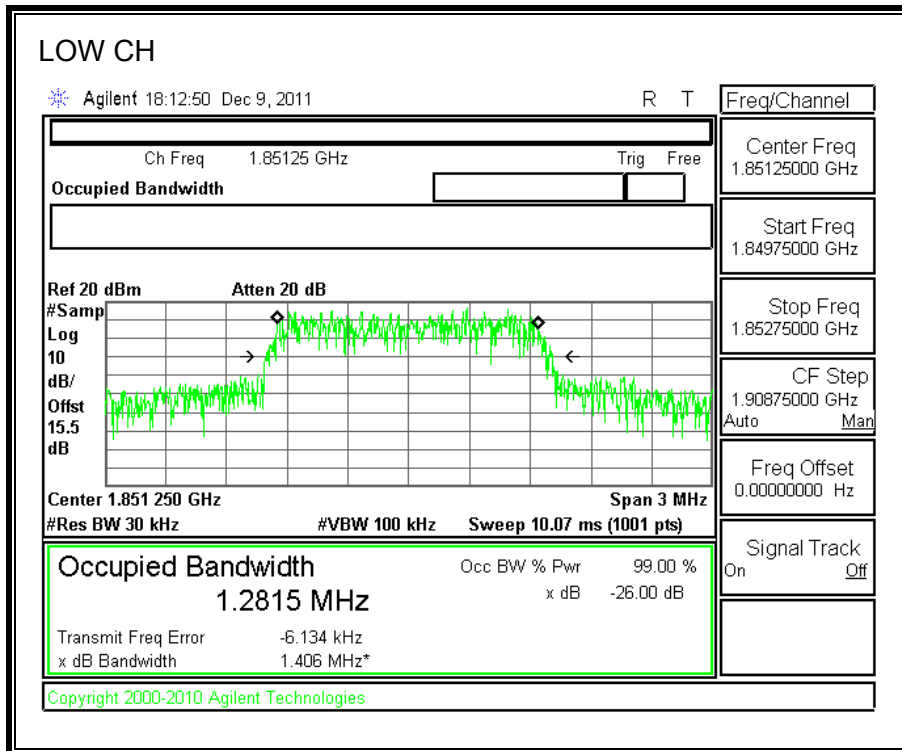
MODES TESTED

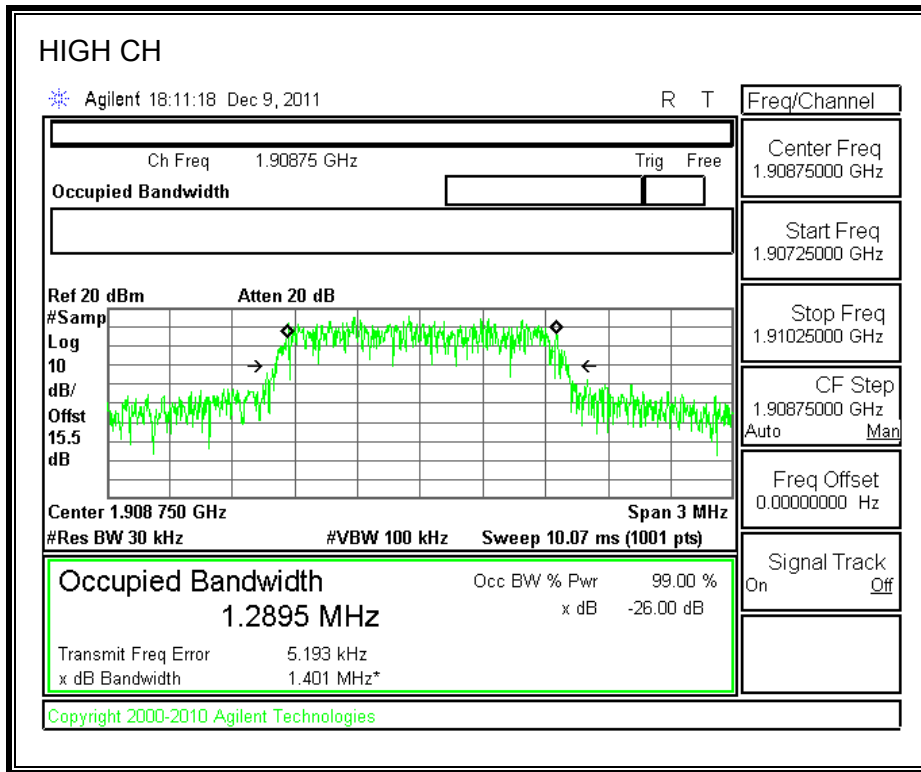
- CDMA 2000 1xRTT
- CDMA 2000 EVDO REV. A

RESULTS

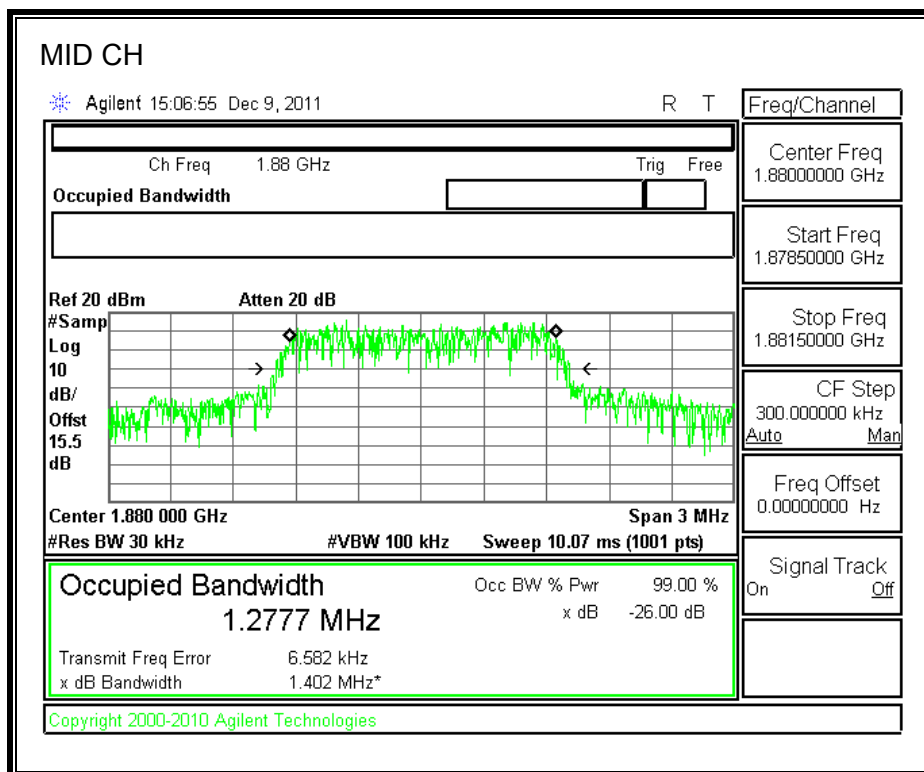
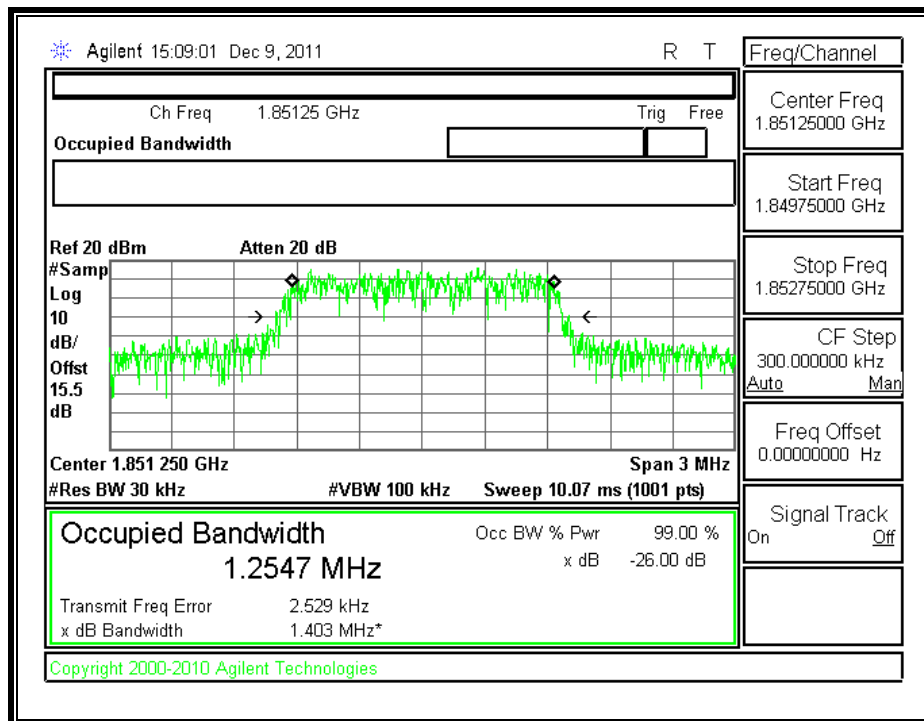
Mode	Band	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
CDMA 2000 1xRTT	PCS	25	1851.25	1.2815	1.406
		600	1880.00	1.2369	1.402
		1175	1908.75	1.2895	1.401
25		1851.25	1.2547	1.403	
CDMA 2000 EVDO REV.A		600	1880.00	1.2777	1.402
		1175	1908.75	1.3053	1.416

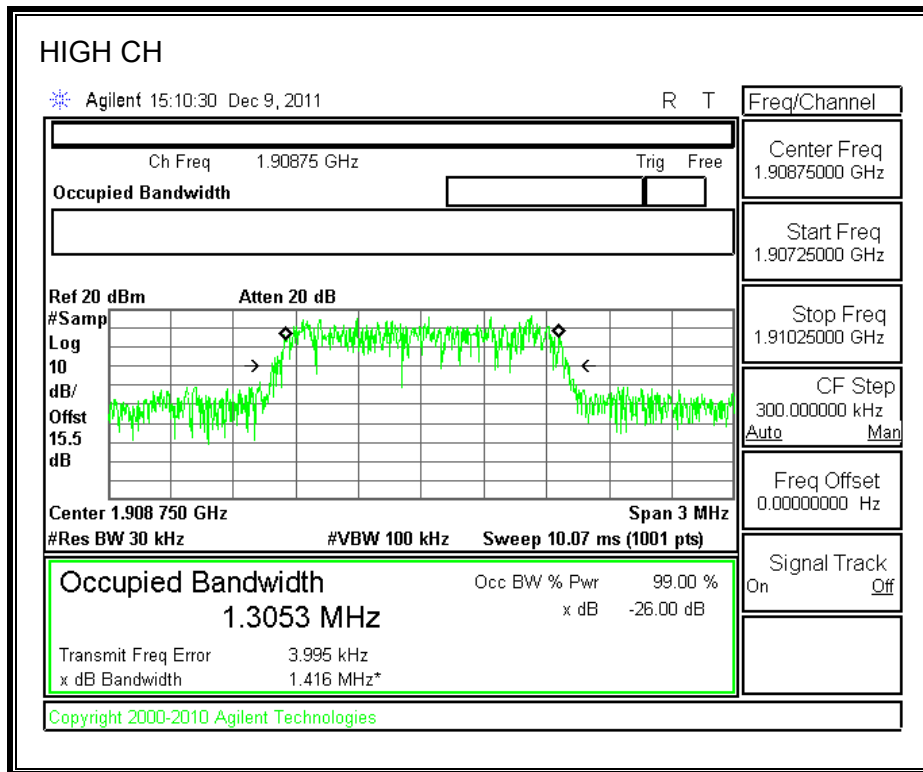
99% BANDWIDTH and 26dB
1xRTT 1900 BAND





EVDO REV A 1900 BAND





8.2. BAND EDGE

RULE PART(S)

FCC: §24.238

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:

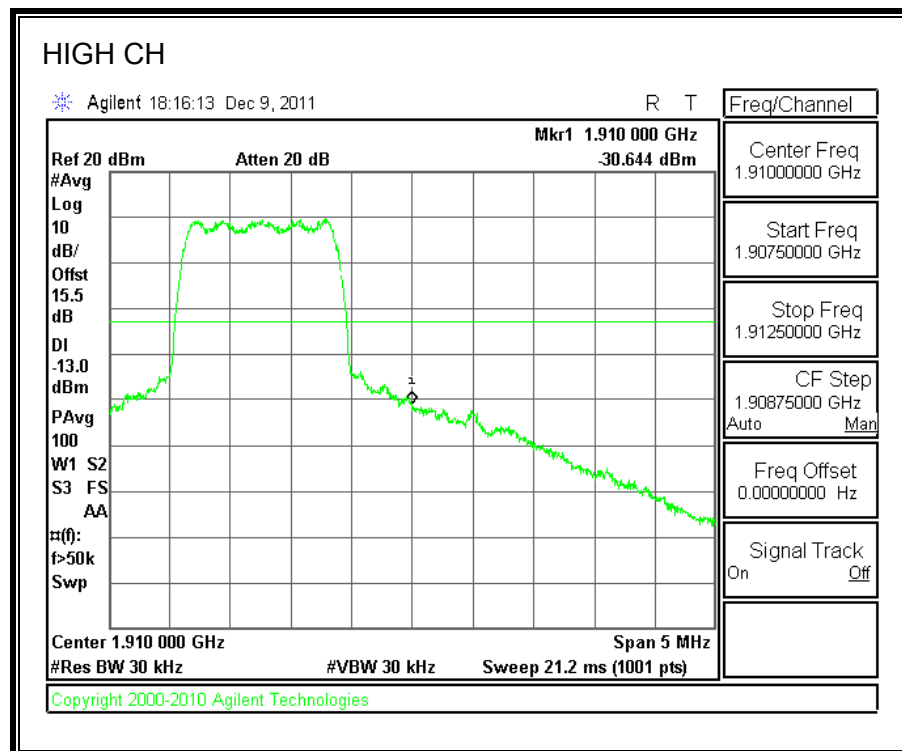
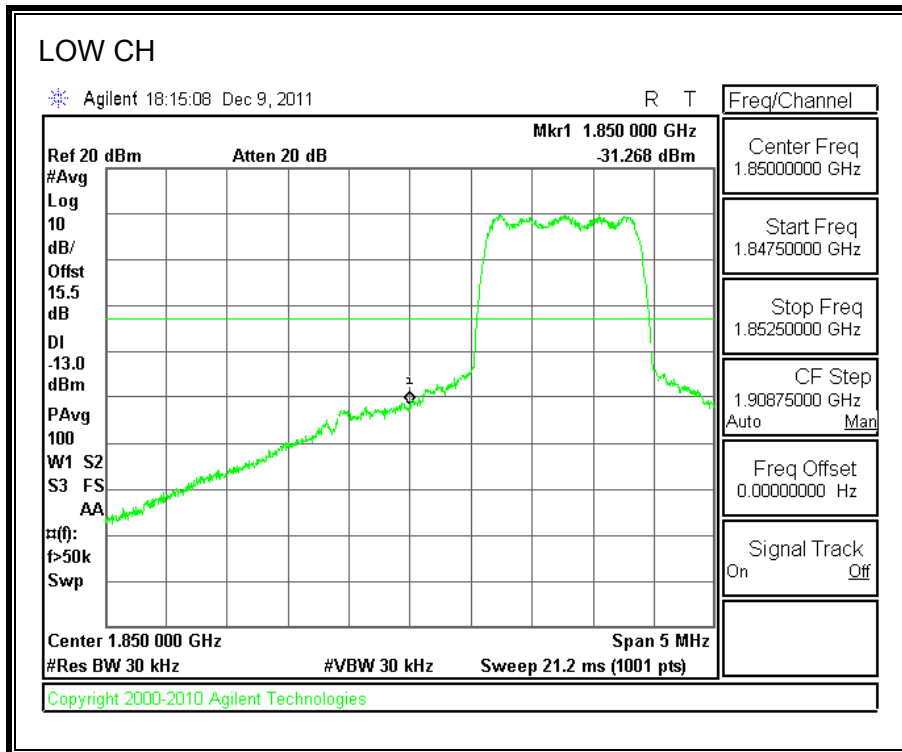
- Set the spectrum analyzer span to include the block edge frequency (1850 and 1910MHz)
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

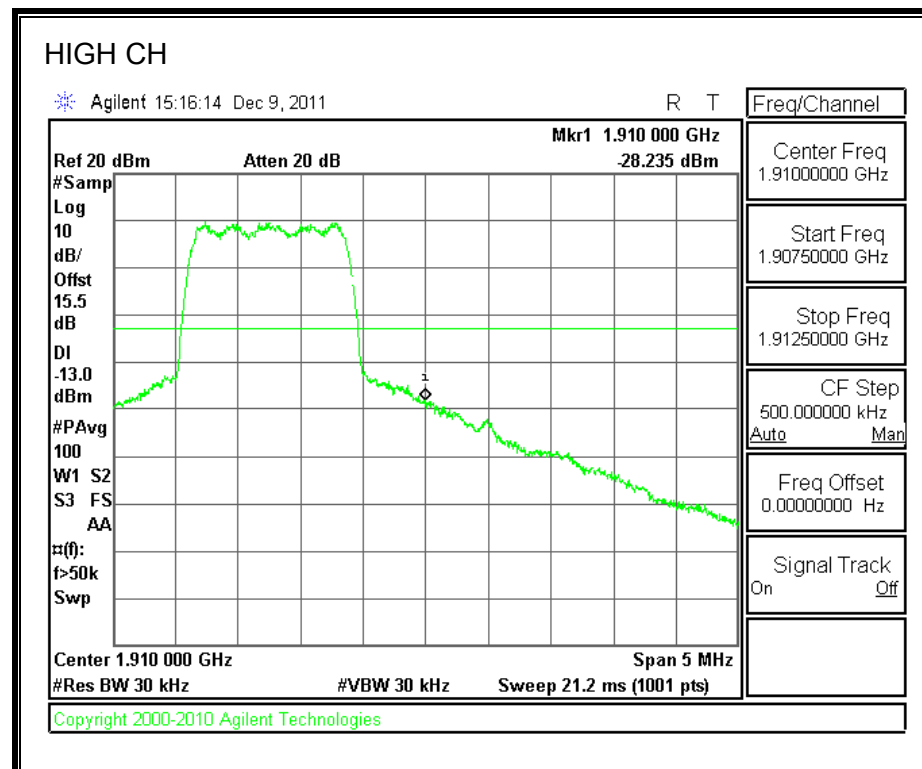
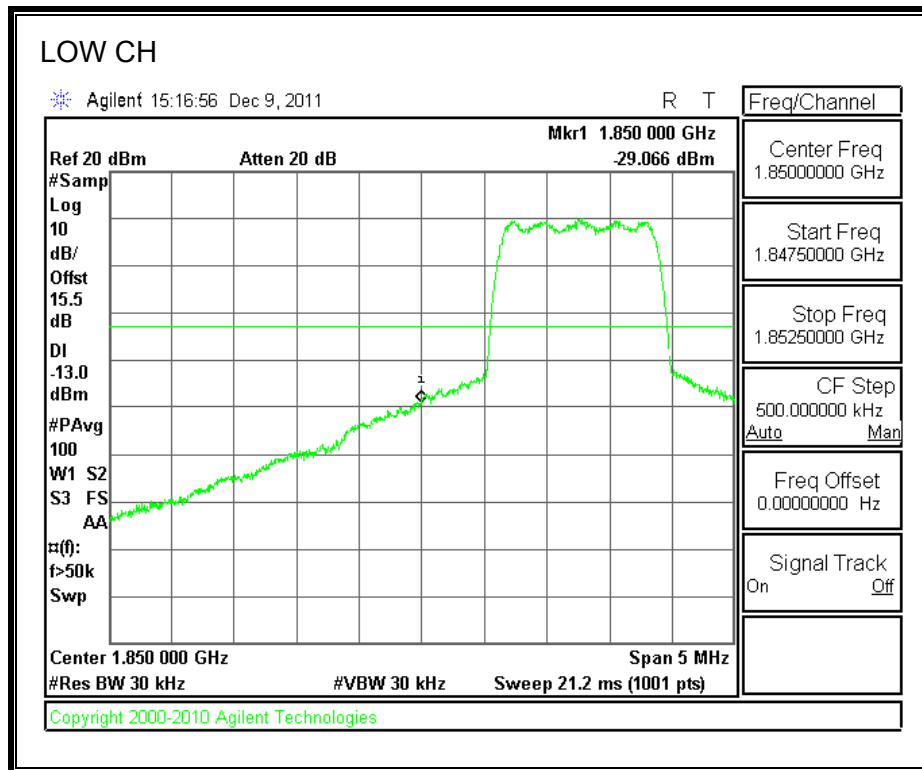
- CDMA 2000 1xRTT
- CDMA 2000 EVDO REV. A

RESULTS

1xRTT 1900 BAND



EVDO REV A 1900 BAND



8.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §24.238

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:

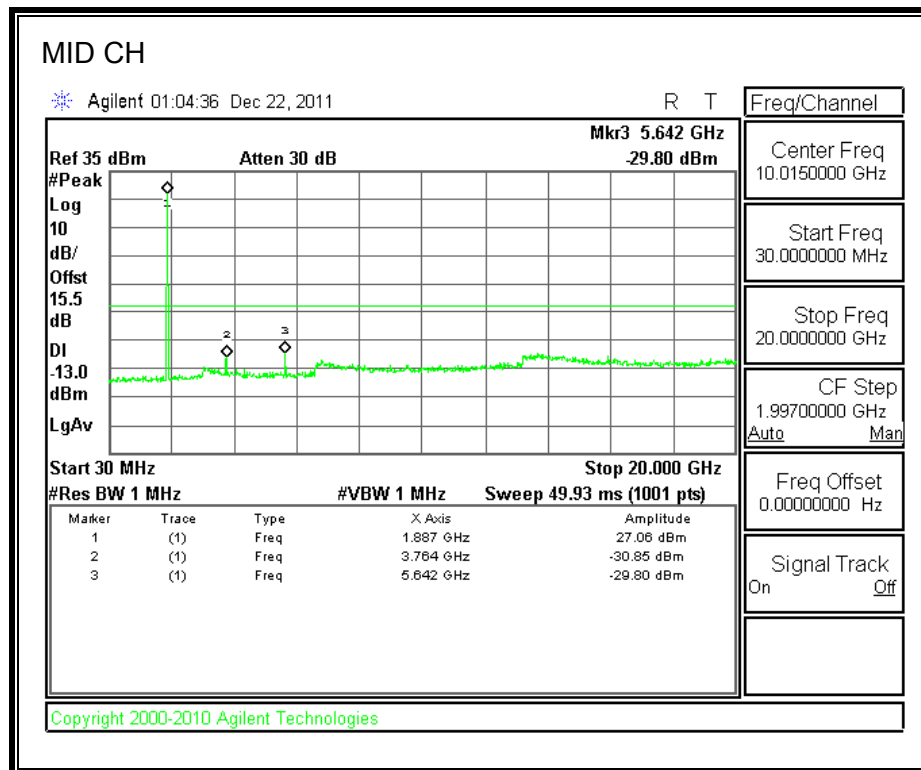
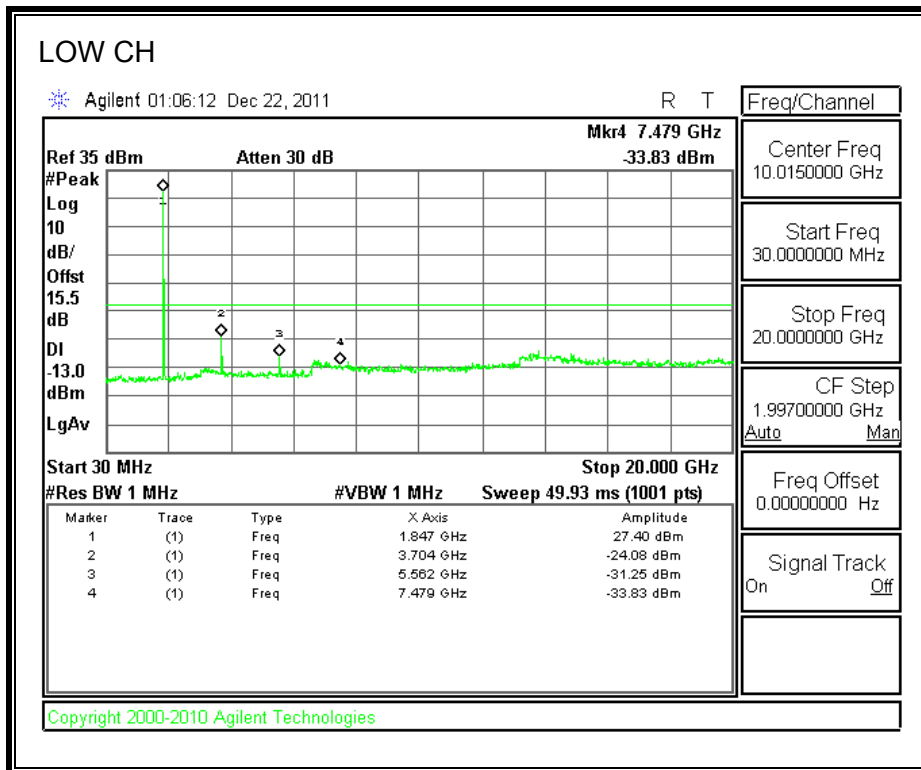
- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

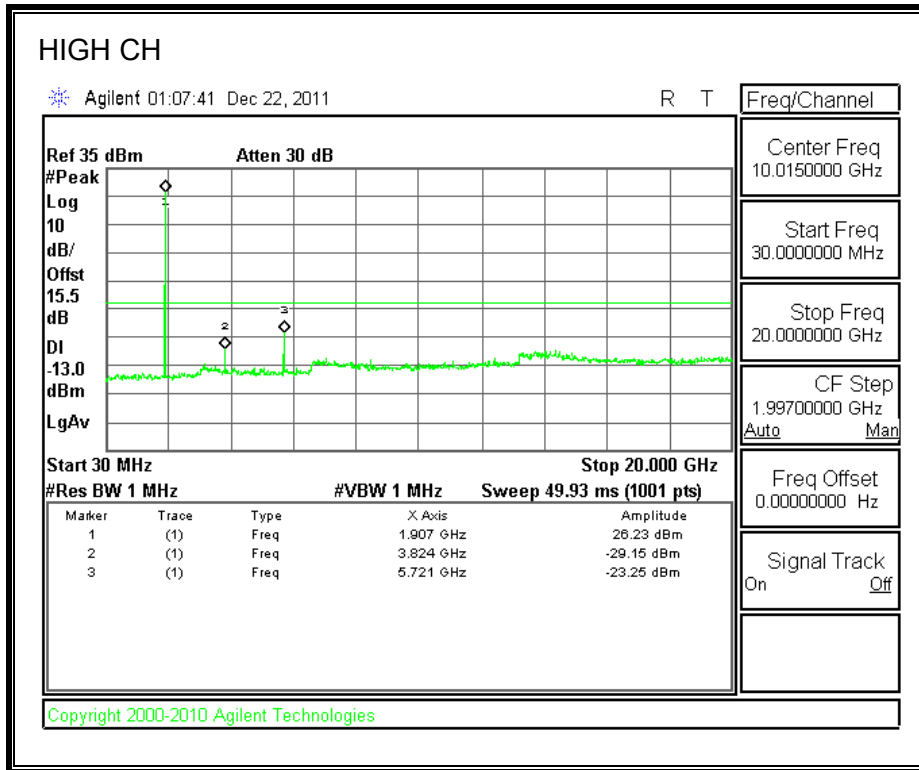
MODES TESTED

- CDMA 2000 1xRTT
- CDMA 2000 EVDO REV. A

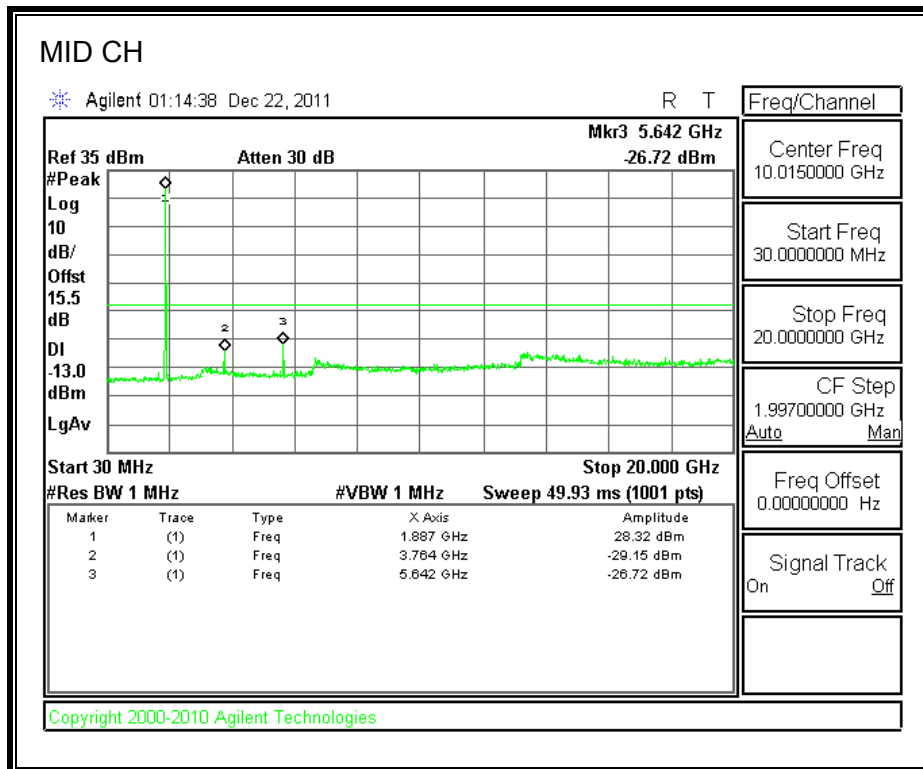
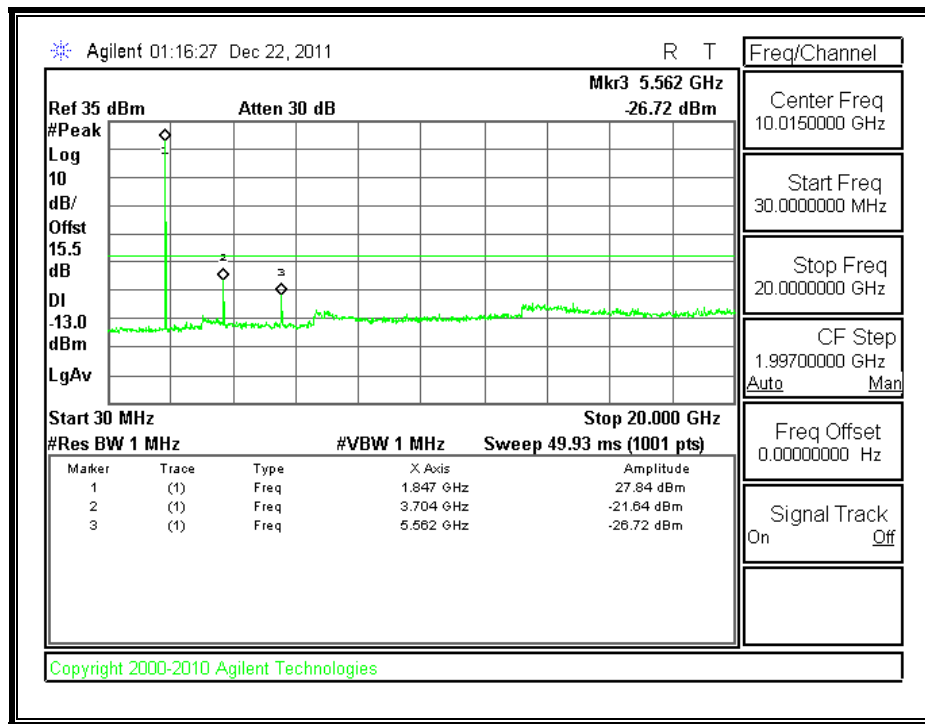
RESULTS

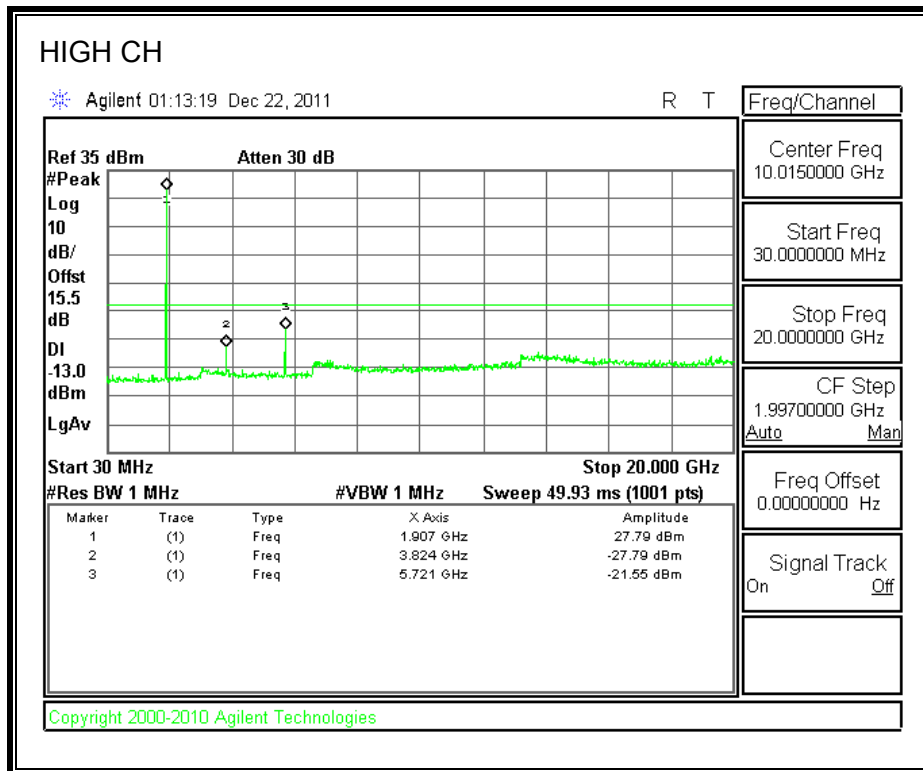
1xRTT 1900 BAND





EVDO REV A 1900 BAND





8.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §24.235.

LIMITS

RSS-133 6.3 - The carrier frequency shall not depart from the reference frequency in excess of ± 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.

TEST PROCEDURE

Use Agilent 8960 and CMW 500 with Frequency Error measurement capability.

- Temp. = -30° to $+50^{\circ}\text{C}$
- Voltage = 4.2Vdc (85% - 115%)

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°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

- CDMA 2000 1xRTT
- CDMA 2000 EVDO REV. A

RESULTS

See the following pages.

PCS, 1xRTT – MID CHANNEL

Reference Frequency: PCS Mid Channel 1880.999999MHz @ 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)
4.20	50	1879.999998	0.001	2.5
4.20	40	1879.999998	0.001	2.5
4.20	30	1879.999999	0.000	2.5
4.2	20	1879.999999	0	2.5
4.20	10	1880.000000	-0.001	2.5
4.20	0	1880.000002	-0.002	2.5
4.20	-10	1880.000000	-0.001	2.5
4.20	-20	1879.999999	0.000	2.5
4.20	-30	1879.999998	0.001	2.5

Reference Frequency: PCS Mid Channel 1880.999999MHz @ 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)
4.20	20	1879.999999	0	2.5
3.57	20	1879.999998	0.001	2.5
4.83	20	1879.999999	0.000	2.5

PCS, EVDO REV. A - MID CHANNEL

Reference Frequency: PCS Mid Channel 1880.000003MHz @ 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)
4.20	50	1880.000004	-0.001	2.5
4.20	40	1880.000002	0.001	2.5
4.20	30	1880.000002	0.001	2.5
4.2	20	1880.000003	0	2.5
4.20	10	1880.000003	0.000	2.5
4.20	0	1879.999997	0.003	2.5
4.20	-10	1880.000000	0.002	2.5
4.20	-20	1880.000001	0.001	2.5
4.20	-30	1880.000002	0.001	2.5

Reference Frequency: PCS Mid Channel 1880.000003MHz @ 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)
4.20	20	1880.000003	0	2.5
3.57	20	1880.000002	0.001	2.5
4.83	20	1880.000003	0.000	2.5

9. RADIATED TEST RESULTS

9.1. RADIATED POWER (EIRP)

RULE PART(S)

FCC: §2.1046, §24.232.

LIMITS

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.

1. Power is given in terms of effective radiated power (ERP).
2. Applicants in the Los Angeles, CA, area who demonstrate a need to serve both the downtown and fringe areas will be permitted to utilize an ERP of 1 kw at the following mountaintop sites: Santiago Park, Sierra Peak, Mount Lukens, and Mount Wilson.
3. Stations with antennas below 305 m (1,000 ft) (AAT) will be restricted to a maximum power of 1 kw (ERP).

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17

KDB 971168 D01 Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems.

MODES TESTED

- CDMA 2000 1xRTT
- CDMA 2000 EVDO REV. A

RESULTS

PCS BAND (EIRP)

Mode	Channel	f (MHz)	EIRP (EUT)		EIRP (EUT WITH CRADLE)	
			dBm	mW	dBm	mW
1xRTT	25	1851.25	28.55	716.14	25.02	317.69
	600	1880.00	28.35	683.91	25.44	349.95
	1175	1908.75	28.33	680.77	27.77	598.41
EVDO REV. A	25	1851.25	27.62	578.10	24.51	282.49
	600	1880.00	28.17	656.15	25.24	334.20
	1175	1908.75	28.33	680.77	27.22	527.23

EUT ALONE

EIRP 1xRTT 1900 BAND

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:		SIERRA WIRELESS						
Project #:		11U14068						
Date:		12/21/11						
Test Engineer:		MENGISTU MEKURIA						
Configuration:		EUT ALONE						
Mode:		TX, PCS BAND CDMA 2000, 1xRTT						
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	14.2	V	0.53	8.10	21.73	33.0	-11.3	
1.850	20.9	H	0.53	8.14	28.55	33.0	-4.5	
1.880	14.0	V	0.53	8.10	21.55	33.0	-11.4	
1.880	20.7	H	0.53	8.14	28.35	33.0	-4.7	
1.910	13.9	V	0.53	8.10	21.45	33.0	-11.5	
1.910	20.7	H	0.53	8.14	28.33	33.0	-4.7	
Rev. 3.17.11								

EIRP EVDO REV A 1900 BAND

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:		SIERRA WIRELESS						
Project #:		11U14068						
Date:		12/21/11						
Test Engineer:		MENGISTU MEKURIA						
Configuration:		EUT ALONE						
Mode:		TX, PCS BAND CDMA 2000, EVDO REV A. MODE						
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	14.7	V	0.53	8.10	22.26	33.0	-10.7	
1.850	20.0	H	0.53	8.14	27.62	33.0	-5.4	
1.880	13.6	V	0.53	8.10	21.13	33.0	-11.9	
1.880	20.6	H	0.53	8.14	28.17	33.0	-4.8	
1.910	15.0	V	0.53	8.10	22.57	33.0	-10.4	
1.910	20.7	H	0.53	8.14	28.33	33.0	-4.7	
Rev. 3.17.11								

EUT WITH CRADLE

EIRP 1xRTT 1900 BAND

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:		SIERRA WIRELESS						
Project #:		11U14068						
Date:		01/05/11						
Test Engineer:		MENGISTU MEKURIA						
Configuration:		EUT WITH CRADLE AND AC ADAPTER						
Mode:		TX, PCS BAND CDMA 2000, 1xRTT MODE						
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	10.8	V	0.53	8.10	18.32	33.0	-14.7	
1.850	17.4	H	0.53	8.14	25.02	33.0	-8.0	
1.880	10.5	V	0.53	8.10	18.11	33.0	-14.9	
1.880	17.8	H	0.53	8.14	25.44	33.0	-7.6	
1.910	12.3	V	0.53	8.10	19.82	33.0	-13.2	
1.910	20.2	H	0.53	8.14	27.77	33.0	-5.2	
Rev. 3.17.11								

EIRP EVDO REV A 1900 BAND

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:		SIERRA WIRELESS						
Project #:		11U14068						
Date:		01/05/11						
Test Engineer:		MENGISTU MEKURIA						
Configuration:		EUT WITH CRADLE AND AC ADAPTER						
Mode:		TX, PCS BAND CDMA 2000, EVDO REV. A. MODE						
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	10.5	V	0.53	8.10	18.04	33.0	-15.0	
1.850	16.9	H	0.53	8.14	24.51	33.0	-8.5	
1.880	10.4	V	0.53	8.10	17.97	33.0	-15.0	
1.880	17.6	H	0.53	8.14	25.24	33.0	-7.8	
1.910	12.1	V	0.53	8.10	19.68	33.0	-13.3	
1.910	19.6	H	0.53	8.14	27.22	33.0	-5.8	
Rev. 3.17.11								

9.1. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §24.238

LIMIT

§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

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

- CDMA 2000 1xRTT
- CDMA 2000 EVDO REV. A

RESULTS

EUT ALONE

EIRP 1xRTT 1900 BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SIERRA WIRELESS
 Project #: 11U14068
 Date: 12/21/11
 Test Engineer: MENGISTU MEKURIA
 Configuration: EUT ALONE
 Mode: TX, PCS BAND CDMA 1xRTT MODE

Chamber

5m Chamber A

Pre-amplifier

T144 8449B

Filter

Filter 1

Limit

Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1851.25MHz									
3.703	-7.9	V	3.0	36.8	1.0	-43.8	-13.0	-30.8	
5.554	3.2	V	3.0	36.3	1.0	-32.1	-13.0	-19.1	
7.405	-6.8	V	3.0	36.6	1.0	-42.4	-13.0	-29.4	
3.703	-3.3	H	3.0	36.8	1.0	-39.1	-13.0	-26.1	
5.554	4.4	H	3.0	36.3	1.0	-30.9	-13.0	-17.9	
7.405	-6.8	H	3.0	36.6	1.0	-42.4	-13.0	-29.4	
Mid Ch, 1880.00MHz									
3.760	-8.5	V	3.0	36.8	1.0	-44.3	-13.0	-31.3	
5.640	4.7	V	3.0	36.3	1.0	-30.6	-13.0	-17.6	
7.520	-10.8	V	3.0	36.6	1.0	-46.4	-13.0	-33.4	
3.760	-11.5	H	3.0	36.8	1.0	-47.3	-13.0	-34.3	
5.640	6.2	H	3.0	36.3	1.0	-29.1	-13.0	-16.1	
7.520	-9.3	H	3.0	36.6	1.0	-44.9	-13.0	-31.9	
High Ch, 1908.75MHz									
3.818	-5.4	V	3.0	36.7	1.0	-41.1	-13.0	-28.1	
5.726	6.8	V	3.0	36.3	1.0	-28.5	-13.0	-15.5	
7.635	-13.9	V	3.0	36.6	1.0	-49.5	-13.0	-36.5	
3.818	-7.0	H	3.0	36.7	1.0	-42.7	-13.0	-29.7	
5.726	7.5	H	3.0	36.3	1.0	-27.8	-13.0	-14.8	
7.635	-12.4	H	3.0	36.6	1.0	-48.1	-13.0	-35.1	

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

EIRP EVDO REV. A 1900 BAND

Compliance Certification Services									
Above 1GHz High Frequency Substitution Measurement									
Company:		SIERRA WIRELESS							
Project #:		11U14068							
Date:		12/21/11							
Test Engineer:		MENGISTU MEKURIA							
Configuration:		EUT ALONE							
Mode:		TX, PCS BAND CDMA EVDO REV A. MODE							
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
Low Ch, 1851.25MHz									
3.703	-8.4	V	3.0	35.4	1.0	-42.7	-13.0	-29.7	
5.554	4.0	V	3.0	35.4	1.0	-30.4	-13.0	-17.4	
7.405	-7.5	V	3.0	35.7	1.0	-42.2	-13.0	-29.2	
3.703	-6.1	H	3.0	35.4	1.0	-40.4	-13.0	-27.4	
5.554	4.9	H	3.0	35.4	1.0	-29.6	-13.0	-16.6	
7.405	-8.2	H	3.0	35.7	1.0	-43.0	-13.0	-30.0	
Mid Ch, 1880.00MHz									
3.760	-13.3	V	3.0	35.3	1.0	-47.7	-13.0	-34.7	
5.640	7.2	V	3.0	35.4	1.0	-27.2	-13.0	-14.2	
7.520	-11.3	V	3.0	35.7	1.0	-46.0	-13.0	-33.0	
3.760	-4.5	H	3.0	35.3	1.0	-38.9	-13.0	-25.9	
5.640	12.6	H	3.0	35.4	1.0	-21.9	-13.0	-8.9	
7.520	-6.6	H	3.0	35.7	1.0	-41.3	-13.0	-28.3	
High Ch, 1908.75MHz									
3.818	-3.9	V	3.0	35.3	1.0	-38.2	-13.0	-25.2	
5.726	7.9	V	3.0	35.4	1.0	-26.6	-13.0	-13.6	
7.635	-16.2	V	3.0	35.7	1.0	-50.9	-13.0	-37.9	
3.818	4.1	H	3.0	35.3	1.0	-30.2	-13.0	-17.2	
5.726	14.1	H	3.0	35.4	1.0	-20.4	-13.0	-7.4	
7.635	-12.5	H	3.0	35.7	1.0	-47.2	-13.0	-34.2	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

EUT WITH CRADLE

EIRP 1xRTT 1900 BAND

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		SIERRA WIRELESS							
Project #:		11U14068							
Date:		01/09/11							
Test Engineer:		MENGISTU MEKURIA							
Configuration:		EUT WITH CRADLE AND AC ADAPTER							
Mode:		TX, PCS BAND CDMA 1xRTT. MODE							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 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
Low Ch, 1851.25MHz									
3.703	5.0	V	3.0	36.8	1.0	-30.8	-13.0	-17.8	
5.554	1.8	V	3.0	36.3	1.0	-33.5	-13.0	-20.5	
7.405	-10.1	V	3.0	36.6	1.0	-45.7	-13.0	-32.7	
3.703	8.0	H	3.0	36.8	1.0	-27.8	-13.0	-14.8	
5.554	3.3	H	3.0	36.3	1.0	-32.0	-13.0	-19.0	
7.405	-6.6	H	3.0	36.6	1.0	-42.2	-13.0	-29.2	
Mid Ch, 1880.00MHz									
3.760	-5.1	V	3.0	36.8	1.0	-40.9	-13.0	-27.9	
5.640	8.7	V	3.0	36.3	1.0	-26.6	-13.0	-13.6	
7.520	-13.5	V	3.0	36.6	1.0	-49.1	-13.0	-36.1	
3.760	-0.1	H	3.0	36.8	1.0	-35.9	-13.0	-22.9	
5.640	9.6	H	3.0	36.3	1.0	-25.7	-13.0	-12.7	
7.520	-10.5	H	3.0	36.6	1.0	-46.1	-13.0	-33.1	
High Ch, 1908.75MHz									
3.818	6.4	V	3.0	36.7	1.0	-29.3	-13.0	-16.3	
5.726	10.0	V	3.0	36.3	1.0	-25.3	-13.0	-12.3	
7.635	-15.3	V	3.0	36.6	1.0	-51.0	-13.0	-38.0	
3.818	11.7	H	3.0	36.7	1.0	-24.0	-13.0	-11.0	
5.726	10.6	H	3.0	36.3	1.0	-24.7	-13.0	-11.7	
7.635	-13.5	H	3.0	36.6	1.0	-49.1	-13.0	-36.1	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

EIRP EVDO REV. A 1900 BAND

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		SIERRA WIRELESS							
Project #:		11U14068							
Date:		01/09/11							
Test Engineer:		MENGISTU MEKURIA							
Configuration:		EUT WITH CRADLE AND AC ADAPTER							
Mode:		TX, PCS BAND CDMA EVDO REV. A. MODE							
Chamber		Pre-amplifier			Filter		Limit		
5m Chamber A		T144 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
Low Ch, 1851.25MHz									
3.703	5.7	V	3.0	36.8	1.0	-30.1	-13.0	-17.1	
5.554	5.9	V	3.0	36.3	1.0	-29.4	-13.0	-16.4	
7.405	-9.1	V	3.0	36.6	1.0	-44.7	-13.0	-31.7	
3.703	8.2	H	3.0	36.8	1.0	-27.6	-13.0	-14.6	
5.554	6.5	H	3.0	36.3	1.0	-28.8	-13.0	-15.8	
7.405	-6.0	H	3.0	36.6	1.0	-41.6	-13.0	-28.6	
Mid Ch, 1880.00MHz									
3.760	0.6	V	3.0	36.8	1.0	-35.1	-13.0	-22.1	
5.640	13.1	V	3.0	36.3	1.0	-22.2	-13.0	-9.2	
7.520	-11.0	V	3.0	36.6	1.0	-46.6	-13.0	-33.6	
3.760	0.8	H	3.0	36.8	1.0	-35.0	-13.0	-22.0	
5.640	10.8	H	3.0	36.3	1.0	-24.5	-13.0	-11.5	
7.520	-11.5	H	3.0	36.6	1.0	-47.1	-13.0	-34.1	
High Ch, 1908.75MHz									
3.818	8.7	V	3.0	36.7	1.0	-27.0	-13.0	-14.0	
5.726	13.2	V	3.0	36.3	1.0	-22.1	-13.0	-9.1	
7.635	-13.7	V	3.0	36.6	1.0	-49.3	-13.0	-36.3	
3.818	13.1	H	3.0	36.7	1.0	-22.6	-13.0	-9.6	
5.726	12.0	H	3.0	36.3	1.0	-23.3	-13.0	-10.3	
7.635	-11.8	H	3.0	36.6	1.0	-47.5	-13.0	-34.5	
Rev. 03.03.09									