FCC CFR47 PART 22H, 24E, AND 90S
CERTIFICATION TEST REPORT

FOR

iPhone With GSM/WCDMA/HSPA+/DC-HSDPA/LTE, 1xRTT/CDMA 1xEVDO Rev. A, Rev. B/Advanced Bluetooth EDR 2.1, and WiFi 802.11 a/b/g/n

MODEL NUMBER: A1428 and A1429

FCC ID: BCG-E2599A

REPORT NUMBER: 11U14316-8, Revision B

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Prepared for

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Revision History

Rev.	Issue Date	Revisions	Revised By
---	08/01/12	Initial issue	T. Chan
A	08/13/12	Revised section 5.2 and radiated harmonics data	C. Pang
B	08/27/12	Add CDMA2000 EVDO REV B 99% BW, 26dB BW, ERP Fundamental and Spurious Emissions	C. Pang

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

EUT DESCRIPTION: iPhone With GSM/WCDMA/HSPA+/DC-HSDPA/LTE, 1xRTT/CDMA 1xEVDO Rev. A, Rev. B/Advanced Bluetooth EDR 2.1, and WiFi 802.11 a/b/g/n

MODEL: A1428 and A1429

SERIAL NUMBER: A1428 (C39HL00PF4KW)-EVT3: A1429 (C39HL001F4LF)-EVT3

DATE TESTED: MAY 15 - JULY 30 and AUGUST 25, 2012

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22H, 24E and 90S	Pass

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.

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Tested By:

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, FCC CFR 47 Part 22, FCC CFR Part 24 and FCC part 90.

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:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 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%.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT, Model A1428 is a mobile phone with multimedia functions (music, application support, and video), cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/LTE radio, IEEE 802.11a/b/g/n and Bluetooth radio. The rechargeable battery is not user accessible.

The EUT, Model A1429 is a mobile phone with multimedia functions (music, application support, and video), cellular GSM/GPRS/EGPRS/WCDMA/HSPA+/DC-HSDPA/ CDMA1xRTT/EVDO Rev 0, A, B/1xAdvance/ LTE radio, IEEE 802.11a/b/g/n and Bluetooth radio. The rechargeable battery is not user accessible

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted and ERP / EIRP output powers; average detector is used for UMTS/CDMA mode of Cellular band, while peak detector is used for GSM mode of Cellular and all GSM/CDMA/UMTS PCS bands as follows:

A1428

LAT (PORT A) / PRIMARY

Part 22 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.2 - 848.8	GPRS	33.60	2290.9	32.60	1819.7
824.2 - 848.8	EGPRS	32.50	1778.3	31.74	1492.8
826.4 - 846.0	Rel 99	24.50	281.8	24.50	281.8
826.4 - 846.0	HSDPA	23.60	229.1	23.41	219.3

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2 - 1909.8	GPRS	31.10	1288.2	32.84	1923.1
1850.2 - 1909.8	EGPRS	30.70	1174.9	30.66	1164.1
1852.4 - 1907.6	Rel 99	25.80	380.2	26.76	474.2
1852.4 - 1907.6	HSDPA	25.65	367.3	26.66	463.4

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UAT (PORT B) / SECONDARY

Part 22 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.2 - 848.8	GPRS	33.20	2089.3	26.95	495.5
824.2 - 848.8	EGPRS	32.40	1737.8	22.41	174.2
826.4 - 846.0	Rel 99	24.00	251.2	18.61	72.6
826.4 - 846.0	HSDPA	23.15	206.5	19.80	95.5

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2 - 1909.8	GPRS	30.60	1148.2	27.20	524.8
1850.2 - 1909.8	EGPRS	30.50	1122.0	26.90	489.8
1852.4 - 1907.6	Rel 99	25.12	325.1	21.26	133.7
1852.4 - 1907.6	HSDPA	25.10	323.6	22.00	158.5

A1429

LAT (PORT A) / PRIMARY

Part 90 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
817.9 - 823.1	BC10, 1xRTT	24.50	281.8	22.20	166.0
817.9 - 823.1	BC10, EVDO	24.45	278.6	22.00	158.5

Part 22 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.7 - 848.31	CDMA, 1xRTT	25.00	316.2	24.61	289.1
824.7 - 848.31	EVDO, Rev A	25.00	316.2	22.81	191.0
824.7 - 848.31	EVDO Rev B, Two Carrier Min Sep	21.40	138.0	22.34	171.4
824.7 - 848.31	EVDO Rev B, Two Carrier Max Sep	21.40	138.0	21.34	136.1
824.7 - 848.31	EVDO Rev B, Three Carrier Min Sep	20.90	123.0	21.94	156.3

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Part 22 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.2 - 848.8	GPRS	33.60	2290.9	32.25	1678.8
824.2 - 848.8	EGPRS	32.50	1778.3	31.01	1261.8
826.4 - 846.0	UMTS, REL 99	24.45	278.6	24.24	265.5
826.4 - 846.0	UMTS, HSDPA	23.56	227.0	23.44	220.8
Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1851.25-1908.75	BC1, 1xRTT	27.50	562.3	27.20	524.8
1851.25-1908.75	BC1, EVDO	28.30	676.1	28.40	691.8
1850.2-1909.85	GPRS	31.10	1288.2	31.27	1339.7
1850.2-1909.85	EGPRS	30.80	1202.3	31.16	1306.2
1852.2-1907.6	UMTS, REL 99	25.75	375.8	25.76	376.7
1852.2-1907.6	UMTS, HSDPA	25.67	369.0	26.56	452.9

UAT (PORT B) / SECONDARY

Part 90 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
817.9 - 823.1	BC10, 1xRTT	24.00	251.2	17.00	50.1
817.9 - 823.1	BC10, EVDO	24.00	251.2	17.01	50.2

Part 22 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.7 - 848.31	CDMA, 1xRTT	24.48	280.5	17.11	51.4
824.7 - 848.31	EVDO, Rev A	24.47	279.9	18.57	71.9
824.7 - 848.31	EVDO Rev B, Two Carrier Min Sep	21.20	131.8	19.14	82.0
824.7 - 848.31	EVDO Rev B, Two Carrier Max Sep	21.30	134.9	20.14	103.3
824.7 - 848.31	EVDO Rev B, Three Carrier Min Sep	20.78	119.7	19.97	99.3

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Part 22 Cellular Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.2 - 848.8	GPRS	33.20	2089.3	26.00	398.1
824.2 - 848.8	EGPRS	32.38	1729.8	25.11	324.3
826.4 - 846.0	UMTS, REL 99	23.95	248.3	18.11	64.7
826.4 - 846.0	UMTS, HSDPA	23.18	208.0	17.54	56.8

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
1851.25 - 1908.75	BC1, 1xRTT	26.49	445.7	23.40	218.8
1851.25 - 1908.75	BC1, EVDO	27.64	580.8	24.61	289.1
1850.2 - 1909.85	GPRS	30.60	1148.2	27.50	562.3
1850.2 - 1909.85	EGPRS	30.50	1122.0	27.36	544.5
1852.2 - 1907.6	UMTS, REL 99	25.25	335.0	22.36	172.2
1852.2 - 1907.6	UMTS, HSDPA	25.05	319.9	21.50	141.3

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5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a band gap type integral antenna for the 850MHz and 1900MHz bands with a maximum peak gain as follow: LAT: Port A, UAT: Port B.

Frequency (MHz)	Gain (dBi) LAT A1428	Gain (dBi) LAT A1429	Gain (dBi) UAT A1428 & A1429
BC10, 817 - 824	NA	-1.73	-5.47
Cell, 824 - 849	-1.25	-0.86	-4.33
PCS, 1850 - 1910	0.66	1.04	-2.9

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was 0.11.04_DEBUG

The EUT software installed during testing was 10A341A

The EUT is linked with Agilent 8960 Communication, CMU200 and CMW500 Test 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 below:

- For Cellular and PCS band: 1xRTT (RC2 SO9)
- For Cellular and PCS band: CDMA2000 1xEV-DO Rev. A and Rev B
- For Cellular and PCS band: GPRS and EGPRS
- For Cellular and PCS band: UMTS, REL 99 and HSDPA

Both A1428 and A1429 devices have two ports of port A (LAT) and Port B (UAT). Port A has a most higher of output power than Port B from the result measurement.

For the A1428 and A1429 devices, all tests were performed as below,
_Port A: Both conducted and radiated emissions measurement with all bands.
_Port B: All conducted power, band edge measurement and only ERP/EIRP radiated emissions on all bands.

The EUT has been investigated on X, Y and Z position, the worst-case was determined on Y-position for CELL and Z position for PCS band by comparing the fundamental ERP / EIRP output power.

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5.6. DESCRIPTION OF TEST SETUP

I/O CABLES (RF CONDUCTED TEST)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US 115V	Un-shielded	2m	N/A
2	DC	1	DC	Un-shielded	2m	N/A
3	RF In/Out	1	EUT	Un-shielded	1m	N/A
4	RF In/Out	1	Spectrum Analyzer	Un-shielded	1m	N/A
5	RF In/Out	1	Communication Test Set	Un-shielded	None	N/A

I/O CABLES (RF RADIATED TEST)

I/O Cable List						
Cable No	Port	# of identical	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	2	US 115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	1m	NA
3	Jack	1	Earphone	Un-shielded	0.5m	NA
4	RF In/Out	1	Horn	Un-shielded	2m	NA

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Apple	A1385	D292066H2T2DHLHAC	DoC
DC Power Supply	Xantrex	XHR-60-18	27519	NA

TEST SETUP

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

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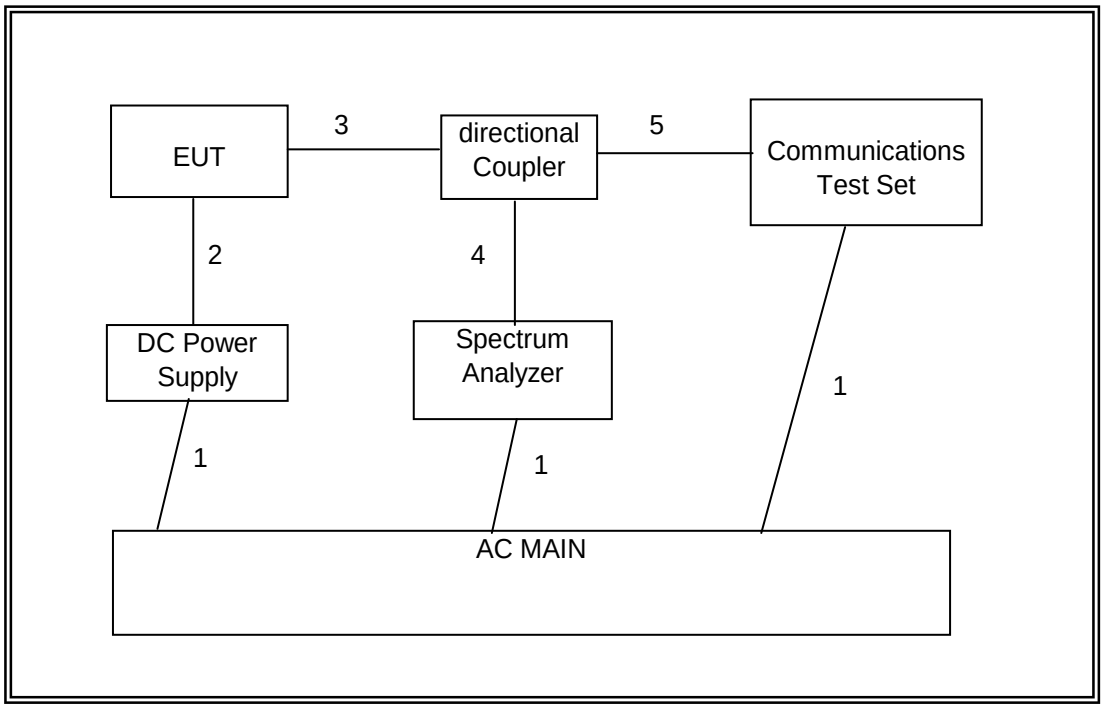
SETUP DIAGRAM FOR RF CONDUCTED TESTS



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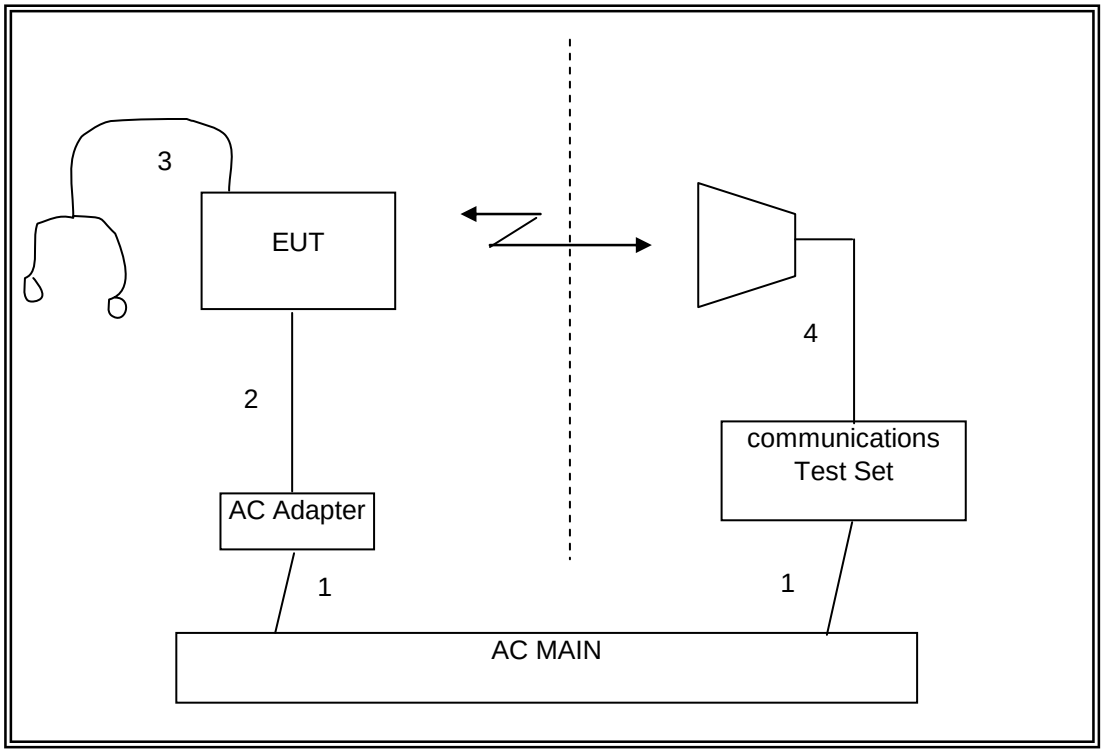
SETUP DIAGRAM FOR RF RADIATED TESTS



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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	C01159	04/09/13
Antenna, Horn, 18 GHz	EMCO	3115	C00872	09/20/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	02/07/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	11/11/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	11/11/12
Communications Test Set	Agilent / HP	E5515C	1000732	09/27/12
Communication Test Set	R & S	CMU 200	None	06/06/13
Wideband Communication Test Set	R & S	CMW 500	None	12/16/12
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689`	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Temperature / Humidity Chamber	WATLOW Controls	SK-3102	None	CNR
Dual Channel Thermometer	Tektronix	DTM920	CCS-0048	05/21/13
Directional Coupler	Krytar	1817	N02656	CNR
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	07/06/13

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7. RF POWER OUTPUT VERIFICATION

7.1. A1428 GSM

TEST PROCEDURE

GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press Connection control to choose the different menus

Press RESET > choose all to reset all settings

Connection Press Signal Off to turn off the signal and change settings

Network Support > GSM+GPRS or GSM+EGPRS

Main Service > Packet Data

Service selection > Test Mode A – Auto Slot Config. off

MS Signal Press Slot Config bottom on the right twice to select and change the number of time slots and power setting

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850/900

> 27 dBm for EGPRS 850/900

> 30 dBm for GPRS1800/1900

> 26 dBm for EGPRS1800/1900

BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

BCCH Level > -85 dBm (May need to adjust if link is not stable)

BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off

P0> 4 dB

Slot Config > Unchanged (if already set under MS Signal)

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3 (Default)

Network Coding Scheme > CS4 (GPRS) and MCS9 (EGPRS)

Bit Stream > 2E9-1PSR Bit Pattern

AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input

Connection Press Signal On to turn on the signal and change settings

RESULTS

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LAT (PORT A) / PRIMARY

GPRS

Ch.	f (MHz)	1 time slots		2 time slots	
		Peak	Average	Peak	Average
128	824.2	33.60	**33.40**	31.50	31.40
190	836.6	**33.60**	**33.50**	31.30	31.20
251	848.8	33.40	**33.20**	31.30	31.20
512	1850.2	**31.00**	30.80	30.30	30.00
661	1880.0	**31.00**	30.80	29.90	29.80
810	1909.8	**31.00**	30.90	30.00	29.80

EGPRS

Ch.	f (MHz)	1 time slots		2 time slots	
		Peak	Average	Peak	Average
128	824.2	32.49	**28.98**	32.05	28.49
190	836.6	**32.50**	**29.00**	32.07	28.50
251	848.8	32.50	**29.00**	32.10	28.50
512	1850.2	**30.70**	27.90	30.60	27.70
661	1880.0	**30.70**	27.90	30.60	27.80
810	1909.8	**30.70**	27.90	30.50	27.80

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UAT (PORT B) / SECONDARY

GPRS

Ch.	f (MHz)	1 time slots		2 time slots	
		Peak	Average	Peak	Average
128	824.2	**33.20**	33.00	32.60	32.40
190	836.6	33.10	32.80	32.60	32.40
251	848.8	33.00	32.90	32.50	32.30
512	1850.2	**30.60**	30.40	30.60	30.30
661	1880.0	30.60	30.40	30.40	30.20
810	1909.8	30.60	30.40	30.40	30.20

EGPRS

Ch.	f (MHz)	1 time slots		2 time slots	
		Peak	Average	Peak	Average
128	824.2	**32.40**	28.50	31.90	28.47
190	836.6	32.30	28.50	31.90	28.40
251	848.8	32.30	28.50	31.90	28.39
512	1850.2	30.49	27.00	30.45	26.90
661	1880.0	30.45	27.00	30.40	26.95
810	1909.8	**30.50**	27.00	30.40	26.90

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7.2. A1428 UMTS REL99

TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel99
	Subtest	-
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	βc	Not Applicable
	βd	Not Applicable
	βec	Not Applicable
	βc/βd	8/15
	βhs	Not Applicable
	βed	Not Applicable

RESULTS

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LAT (PORT A) / PRIMARY

UMTS REL99

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 850	4132	4357	826.4	27.78	**24.50**
	4180	4405	836.0	27.50	**24.45**
	4230	4455	846.0	27.60	**24.41**

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 1900	9262	9662	1852.4	**25.80**	22.50
	9400	9800	1880.0	**25.60**	22.45
	9538	9938	1907.6	**25.60**	22.46

UAT (PORT B) / SECONDARY

UMTS REL99

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 850	4132	4357	826.4	27.48	**23.90**
	4180	4405	836.0	27.60	**24.00**
	4230	4455	846.0	27.40	**23.97**

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 1900	9262	9662	1852.4	**25.05**	21.24
	9400	9800	1880.0	**24.89**	21.20
	9538	9938	1907.6	**25.12**	21.28

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7.3. A1428 UMTS Rel 5 HSDPA

TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel5 HSDPA	Rel5 HSDPA	Rel5 HSDPA	Rel5 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	HSUPA Test	Not Applicable			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βec	-	-	-	-
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	βed	Not Applicable			
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs = βhs/βc	30/15			

RESULT

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LAT (PORT A) / PRIMARY

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	Conducted output power (dBm)
					Peak	Average
UMTS850 (Band V)	1	4132	4357	826.4	27.10	23.60
		4180	4405	836.0	26.90	23.50
		4230	4455	846.0	27.08	23.50
	2*	4132	4357	826.4	**27.65**	**23.60**
		4180	4405	836.0	27.30	23.50
		4230	4455	846.0	27.50	23.48
	3	4132	4357	826.4	27.60	23.20
		4180	4405	836.0	27.19	23.00
		4230	4455	846.0	27.47	23.00
	4	4132	4357	826.4	27.50	23.20
		4180	4405	836.0	27.30	23.00
		4230	4455	846.0	27.40	23.10
UMTS1900 (Band II)	1	9262	9662	1852.4	24.70	21.50
		9400	9800	1880.0	24.77	21.40
		9538	9938	1907.6	24.70	21.40
	2*	9262	9662	1852.4	**25.65**	21.50
		9400	9800	1880.0	25.48	21.50
		9538	9938	1907.6	25.60	21.50
	3	9262	9662	1852.4	25.40	21.10
		9400	9800	1880.0	25.20	21.00
		9538	9938	1907.6	25.30	21.03
	4	9262	9662	1852.4	25.35	21.00
		9400	9800	1880.0	25.25	21.00
		9538	9938	1907.6	25.30	21.00

UAT (PORT B) / SECONDARY (WORST CASE ONLY ON SUB TEST 2)

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 850 Band V	2	4132	4357	826.4	27.10	**23.15**
		4180	4405	836.0	27.02	**23.10**
		4230	4455	846.0	27.07	**23.05**

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 1900 Band II	2	9262	9662	1852.4	**24.95**	20.70
		9400	9800	1880.0	**24.90**	20.60
		9538	9938	1907.6	**25.10**	20.80

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7.4. A1428 UMTS DUAL CARRIER HSDPA

RESULT

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS850 (Band V)	1*	4132	4357	826.4	27.28	23.40
		4180	4405	836.0	27.27	23.40
		4230	4455	846.0	27.35	23.42
	2	4132	4357	826.4	27.29	23.33
		4180	4405	836.0	27.21	23.30
		4230	4455	846.0	27.25	23.39
	3	4132	4357	826.4	27.27	23.38
		4180	4405	836.0	27.25	23.35
		4230	4455	846.0	27.27	23.35
	4	4132	4357	826.4	27.30	23.34
		4180	4405	836.0	27.25	23.33
		4230	4455	846.0	27.30	23.35
UMTS1900 (Band II)	1*	9262	9662	1852.4	25.49	21.30
		9400	9800	1880.0	25.56	21.37
		9538	9938	1907.6	25.40	21.34
	2	9262	9662	1852.4	25.49	21.20
		9400	9800	1880.0	25.53	21.20
		9538	9938	1907.6	25.50	21.24
	3	9262	9662	1852.4	25.55	21.20
		9400	9800	1880.0	25.57	21.41
		9538	9938	1907.6	25.40	21.10
	4	9262	9662	1852.4	25.50	21.20
		9400	9800	1880.0	25.56	21.34
		9538	9938	1907.6	25.44	21.15

UAT (PORT B) / SECONDARY (WORST CASE ONLY ON SUB TEST 2)

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 850 Band V	1	4132	4357	826.4	27.15	23.10
		4180	4405	836.0	27.25	23.12
		4230	4455	846.0	27.10	23.09

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 1900 Band II	1	9262	9662	1852.4	24.90	20.75
		9400	9800	1880.0	25.00	20.75
		9538	9938	1907.6	24.90	20.73

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7.5. A1428 UMTS Rel 6 HSPA (HSDPA & HSUPA)

TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	1309/225	94/75	47/15 47/15	56/75	47/15
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

RESULTS

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LAT (PORT A) / PRIMARY

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS850 (Band V)	1*	4132	4357	826.4	27.30	**23.50**
		4180	4405	836.0	27.25	23.50
		4230	4455	846.0	27.10	23.30
	2	4132	4357	826.4	27.00	21.70
		4180	4405	836.0	27.00	21.60
		4230	4455	846.0	26.90	21.60
	3	4132	4357	826.4	2710	22.70
		4180	4405	836.0	27.00	22.60
		4230	4455	846.0	27.10	22.60
	4	4132	4357	826.4	27.00	21.70
		4180	4405	836.0	26.85	21.60
		4230	4455	846.0	26.90	21.60
	5	4132	4357	826.4	27.20	23.50
		4180	4405	836.0	27.15	23.40
		4230	4455	846.0	27.20	23.40
UMTS1900 (Band II)	1*	9262	9662	1852.4	26.30	21.50
		9400	9800	1880.0	26.20	21.40
		9538	9938	1907.6	**26.40**	21.50
	2	9262	9662	1852.4	25.70	19.52
		9400	9800	1880.0	25.60	19.51
		9538	9938	1907.6	25.70	19.62
	3	9262	9662	1852.4	26.20	20.60
		9400	9800	1880.0	26.10	20.50
		9538	9938	1907.6	26.20	20.60
	4	9262	9662	1852.4	25.60	19.50
		9400	9800	1880.0	25.50	19.50
		9538	9938	1907.6	25.60	19.60
	5	9262	9662	1852.4	25.10	21.40
		9400	9800	1880.0	25.20	21.40
		9538	9938	1907.6	25.30	21.50

UAT (PORT B) / SECONDARY (WORST CASE ONLY ON SUB TEST 1)

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 850 Band V	1	4132	4357	826.4	27.20	**23.00**
		4180	4405	836.0	2715	22.90
		4230	4455	846.0	27.10	22.90

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 1900 Band II	1	9262	9662	1852.4	25.52	20.60
		9400	9800	1880.0	25.50	20.50
		9538	9938	1907.6	**25.55**	20.60

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7.6. A1429 1xRTT

TEST PROCEDURE

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

Application	Rev, License
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)

RESULT

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LAT (PORT A) / PRIMARY

1xRTT, BC10

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		Ch.476 / 817.9 MHz		Ch.526 / 819.15 MHz		Ch. 684 /823.1 MHz	
		Peak	Average	Peak	Average	Peak	Average
RC1	2 (Loopback)	28.89	24.41	28.95	24.40	28.92	24.50
	55 (Loopback)	28.94	24.42	28.94	24.40	28.91	24.49
RC2	9 (Loopback)	28.97	24.40	28.98	24.39	29.09	**24.50**
	55 (Loopback)	28.93	24.41	28.90	24.37	28.88	24.48
RC3	2 (Loopback)	28.59	24.39	28.53	24.35	28.66	24.45
	55 (Loopback)	28.37	24.40	28.51	24.37	28.75	24.46
	32 (+ F-SCH)	28.74	24.29	28.61	24.28	28.57	24.45
	32 (+ SCH)	28.61	24.33	28.35	24.25	28.60	24.45
RC4	2 (Loopback)	28.35	24.39	28.70	24.42	28.62	24.46
	55 (Loopback)	28.50	24.37	28.59	24.38	28.66	24.46
	32 (+ F-SCH)	28.53	24.31	28.40	24.28	28.75	24.46
	32 (+ SCH)	28.52	24.30	28.55	24.23	28.69	24.47
RC5	9 (Loopback)	28.47	24.38	28.60	24.40	28.72	24.48
	55 (Loopback)	28.41	24.39	28.62	24.40	28.57	24.45
RC11	2 (Loopback)	28.40	24.30	28.60	24.38	28.60	24.42
	75 (Loopback)	28.50	24.35	28.59	24.40	28.62	24.40
	32 (+ F-SCH)	28.65	24.34	28.56	24.25	28.66	24.43
	32 (+ SCH)	28.60	24.32	28.55	24.23	28.65	24.45

1xRTT, BC0, CELL BAND

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		Ch.1013/824.7 MHz		Ch384/836.52 MHz		Ch.777/848.31 MHz	
		Peak	Average	Peak	Average	Peak	Average
RC1	2 (Loopback)	29.37	24.99	29.36	24.97	29.10	24.97
	55 (Loopback)	29.32	24.96	29.43	24.97	29.05	24.96
RC2	9 (Loopback)	29.37	25.00	29.46	**25.00**	29.02	24.98
	55 (Loopback)	29.42	24.98	29.32	24.98	29.03	24.98
RC3	2 (Loopback)	29.16	24.93	29.32	24.98	29.11	24.97
	55 (Loopback)	29.15	24.94	29.12	24.98	29.07	24.98
	32 (+ F-SCH)	29.03	24.95	29.18	24.97	29.17	24.97
	32 (+ SCH)	29.20	24.94	29.22	24.95	29.20	24.97
RC4	2 (Loopback)	28.99	24.95	29.14	24.96	29.16	24.96
	55 (Loopback)	29.17	24.96	29.27	24.96	29.13	24.95
	32 (+ F-SCH)	29.17	24.95	29.16	24.95	29.10	24.96
	32 (+ SCH)	29.10	24.95	29.06	24.96	29.14	24.95
RC5	9 (Loopback)	29.09	24.96	29.21	24.96	29.17	24.96
	55 (Loopback)	29.02	24.96	29.15	24.85	29.10	24.95
RC11	2 (Loopback)	28.85	24.92	28.85	24.90	29.00	24.92
	75 (Loopback)	28.90	24.94	28.90	24.90	28.97	24.90
	32 (+ F-SCH)	29.04	24.93	29.02	24.88	29.00	24.88
	32 (+ SCH)	29.00	24.92	28.96	24.85	28.96	24.85

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LAT (PORT A) / PRIMARY

BC1, 1xRTT 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	Average	Peak	Average	Peak	Average
RC1	2 (Loopback)	27.45	22.40	27.48	22.45	27.23	22.30
	55 (Loopback)	27.22	22.40	27.33	22.43	27.17	22.33
RC2	9 (Loopback)	27.45	22.45	**27.50**	22.43	27.32	22.30
	55 (Loopback)	27.46	22.43	27.41	22.46	27.37	22.30
RC3	2 (Loopback)	26.55	22.35	27.02	22.44	26.94	22.31
	55 (Loopback)	26.57	22.34	27.12	22.46	26.97	22.30
	32 (+ F-SCH)	26.80	22.40	27.10	22.40	26.91	22.20
	32 (+ SCH)	26.85	22.43	27.15	22.42	26.88	22.20
RC4	2 (Loopback)	26.83	22.28	26.99	22.43	27.08	22.14
	55 (Loopback)	26.93	22.27	27.06	22.43	26.91	22.15
	32 (+ F-SCH)	27.00	22.30	27.12	22.40	26.86	22.38
	32 (+ SCH)	26.77	22.26	27.15	22.43	26.80	22.40
RC5	9 (Loopback)	26.52	22.30	27.16	22.46	26.85	22.17
	55 (Loopback)	26.80	22.29	27.07	22.45	26.82	22.20
RC11	2 (Loopback)	26.75	22.32	26.98	22.44	26.64	22.21
	75 (Loopback)	26.99	22.34	27.00	22.46	26.97	22.17
	32 (+F-SCH)	26.95	22.38	26.98	22.40	27.02	22.20
	32 (+SCH)	27.10	22.40	27.05	22.43	27.05	22.23

UAT (PORT B) / SECONDARY BC10, 1xRTT (Worst Case)

Radio Configuration	Service Option	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
BC10	RC2-S09	476	817.90	28.40	23.88
		526	819.15	28.57	23.90
		684	823.10	28.67	24.00

UAT (PORT B) / SECONDARY

BC0, 1xRTT

RF Power Output for 1xRTT - Cell Band							
Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		Ch. 1013/824.7MHz		Ch. 384/836.52MHz		Ch. 779/848.32MHz	
		Peak	Average	Peak	Average	Peak	Average
	RC2 S09	29.09	**24.48**	28.56	24.45	28.56	24.38
	32 (+ F-SCH)	27.83	24.18	28.40	24.20	28.51	24.24
	32 (+ SCH)	27.75	24.42	28.38	24.18	28.40	24.22

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UAT (PORT B) / SECONDARY

BC1, 1xRTT

RF Power Output for 1xRTT - PCS Band							
Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		Ch. 25/1851.25MHz		Ch. 600/1880MHz		Ch. 1175/1908.75 MHz	
		Peak	Average	Peak	Average	Peak	Average
	RC2 SO9	26.01	21.45	**26.49**	21.50	26.33	21.48
	32 (+ F-SCH)	25.25	21.40	25.46	21.46	25.94	21.48
	32 (+ SCH)	25.84	21.43	25.38	21.43	25.77	21.42

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7.7. A1429 CDMA2000 1xEV-DO Rel. 0

TEST PROCEDURE

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 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 Parms:
  - 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 Parms:
  - 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)

RESULTS

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LAT (PORT A) / PRIMARY

EV-DO REV 0

Radio Configuration	Service Option	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
BC10	EVDO REV 0 (4096)	476	817.90	29.34	24.30
		526	819.15	29.26	24.28
		684	823.10	29.30	24.40

Cell Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	29.35	**24.50**
		384	836.52	29.30	24.46
		777	848.31	29.33	24.49

PCS Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	27.73	22.35
		600	1880.00	**28.05**	22.40
		1175	1908.75	27.64	22.20

UAT (PORT B) / SECONDARY

EV-DO REV 0

Radio Configuration	Service Option	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
BC10	EVDO REV 0 (4096)	476	817.90	28.50	23.80
		526	819.15	28.55	23.82
		684	823.10	28.65	23.85

Cell Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
307.2 kbps (2 slot, QPSK)	153.6 kbps	1013	824.70	28.75	24.40
		384	836.52	28.80	**24.45**
		777	848.31	28.25	24.40

PCS Band

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted power (dBm) FTAP	
				Peak	Average
307.2 kbps (2 slot, QPSK)	153.6 kbps	25	1851.25	27.02	21.42
		600	1880.00	27.26	21.40
		1175	1908.75	**27.50**	21.43

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7.8. A1429, RF POWER OUTPUT FOR CDMA2000 1xEV-DO Rev. A

TEST PROCEDURE

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)

RESULTS

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LAT (PORT A) / PRIMARY

EV-DO Rev A

Radio Configuration	Service Option	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
BC10	EVDO REV A (4096)	476	817.90	29.38	24.42
		526	819.15	29.32	24.40
		684	823.10	29.37	24.45

Cell Band

FETAP-Traffic Format	RETAP-Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	29.80	24.98
		384	836.52	29.86	**25.00**
		777	848.31	29.50	24.96

PCS Band

FETAP-Traffic Format	RETAP-Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	28.11	22.45
		600	1880.00	**28.30**	22.49
		1175	1908.75	27.91	22.25

UAT (PORT B) / SECONDARY

EV-DO Rev A

Radio Configuration	Service Option	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
BC10	EVDO REV A (4096)	476	817.90	28.64	23.90
		526	819.15	28.68	23.92
		684	823.10	28.76	**24.00**

Cell Band

FETAP-Traffic Format	RETAP-Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	29.02	24.43
		384	836.52	28.97	**24.47**
		777	848.31	28.47	24.40

PCS Band

FETAP-Traffic Format	RETAP-Data Payload Size	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
307.2k, QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	27.10	21.40
		600	1880.00	27.57	21.44
		1175	1908.75	**27.64**	21.50

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7.9. A1429, RF POWER OUTPUT FOR CDMA2000 1xEV-DO Rev. B

TEST PROCEDURE

This procedure assumes the Rohde & Schwarz CMW 500 CDMA Rev. B Test Set has the following applications installed and with valid license.

Application	Rev, License
1xEV-DO Terminal Test	V.2.1.25

1xEV-DO Release B –

- CMW 500 Signal Generator > 1xEV-DO Taskbar Enable
- CMW 500 1xEV-DO Signaling Configuration Window >
- 1xEV-DO Signaling On Window:
  Under Access Network Control:
  Band Class: BC0: US Cellular
  RF Channel: 31
  1xEV-DP Power: -70 dBm
  Release B

- 1xEV-DO Signaling Configuration Window

  Under RF Frequency Band / Channel: Enter Ch. Frequency
  - Under Carrier Configuration: RF Frequency

  For Two Carriers: Low Channel (1013)

	RF Channel	RF Channel Offset
Carrier [0]	31	0
Carrier [1]	1013	982

  - Under Carrier Configuration: RF Pilot

	Carrier Sector	Active on AN	Assigned to AT
Pilot [0]	C0/S0	□	□
	CA/S1	□	□

  For Three Carriers: Low Channel (1013)

	RF Channel	RF Channel Offset
Carrier [0]	72	0
Carrier [1]	31	-41
Carrier [2]	1013	941

  - Under Carrier Configuration: RF Pilot

	Carrier Sector	Active on AN	Assigned to AT
Pilot [0]	C0/S0	□	□
Pilot [1]	C1/S1	□	□
Pilot [2]	C2/S2	□	□

- Rvs Power Ctrl > All Up bits (to get the maximum power)

RESULTS

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LAT (PORT A) / PRIMARY

EVDO REV B

Two Carrier Mini Separation

	MODE	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
Rev B	CDMA	1013+31	824.70+825.93	27.00	21.30
		384+425	836.52+837.75	27.33	**21.40**
		736+777	847.08+848.31	27.91	21.30

Two Carrier Max Separation

	Mode	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
Rev B	CDMA	1013+156	824.70+829.68	25.29	21.20
		384+550	836.52+841.50	25.36	**21.40**
		611+777	843.33+848.31	25.54	21.30

Three Carrier Min Separation

	Mode	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
Rev B	CDMA	1013+31+72	824.70+825.93+827.16	25.61	20.80
		384+425+466	836.52+837.75+838.98	25.38	**20.90**
		695+736+777	845.85+847.08+848.31	25.60	20.70

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UAT (PORT B) / SECONDARY

EVDO REV B

Two Carrier Mini Separation

	MODE	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
Rev B	CDMA	1013+31	824.70+825.93	27.12	21.10
		384+425	836.52+837.75	27.35	21.10
		736+777	847.08+848.31	27.75	**21.20**

Two Carrier Max Separation

	Mode	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
Rev B	CDMA	1013+156	824.70+829.68	25.25	21.15
		384+550	836.52+841.50	25.49	**21.30**
		611+777	843.33+848.31	25.40	21.20

Three Carrier Min Separation

	Mode	Channel	f (MHz)	Conducted power (dBm)	
				Peak	Average
Rev B	CDMA	1013+31+72	824.70+825.93+827.16	25.55	20.70
		384+425+466	836.52+837.75+838.98	25.35	**20.78**
		695+736+777	845.85+847.08+848.31	25.60	20.70

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7.10. A1429 GSM

TEST PROCEDURE

GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900
Press Connection control to choose the different menus
Press RESET > choose all to reset all settings
Connection Press Signal Off to turn off the signal and change settings
Network Support > GSM+GPRS or GSM+EGPRS
Main Service > Packet Data
Service selection > Test Mode A – Auto Slot Config. off
MS Signal Press Slot Config bottom on the right twice to select and change the number of time slots and power setting
> Slot configuration > Uplink/Gamma
> 33 dBm for GPRS 850/900
> 27 dBm for EGPRS 850/900
> 30 dBm for GPRS1800/1900
> 26 dBm for EGPRS1800/1900
BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel
Frequency Offset > + 0 Hz
Mode > BCCH and TCH
BCCH Level > -85 dBm (May need to adjust if link is not stable)
BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]
Channel Type > Off
P0> 4 dB
Slot Config > Unchanged (if already set under MS Signal)
TCH > choose desired test channel
Hopping > Off
Main Timeslot > 3 (Default)
Network Coding Scheme > CS4 (GPRS) and MCS9 (EGPRS)
Bit Stream > 2E9-1PSR Bit Pattern
AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
Connection Press Signal On to turn on the signal and change settings

RESULTS

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LAT (PORT A) / PRIMARY

GPRS

Ch.	f (MHz)	1 time slots		2 time slots	
		Peak	Average	Peak	Average
128	824.2	33.60	33.40	31.50	31.30
190	836.6	**33.60**	33.40	31.50	31.30
251	848.8	33.50	33.30	31.30	31.20
512	1850.2	31.00	30.80	30.30	29.80
661	1880.0	31.00	30.80	30.20	30.00
810	1909.8	**31.10**	30.90	30.00	29.80

EGPRS

Ch.	f (MHz)	1 time slots		2 time slots	
		Peak	Average	Peak	Average
128	824.2	32.48	29.00	32.09	28.45
190	836.6	**32.50**	28.95	32.05	28.47
251	848.8	32.50	28.91	32.10	28.50
512	1850.2	30.70	27.95	30.60	27.80
661	1880.0	30.75	28.00	30.50	27.70
810	1909.8	**30.80**	28.00	30.50	27.80

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UAT (PORT B)

GPRS

Ch.	f (MHz)	1 time slots		2 time slots	
		Peak	Average	Peak	Average
128	824.2	**33.20**	33.00	32.60	32.40
190	836.6	33.10	32.80	32.70	32.50
251	848.8	33.00	32.90	32.50	32.30
512	1850.2	30.60	30.40	30.60	30.30
661	1880.0	**30.60**	30.40	30.40	30.20
810	1909.8	30.60	30.40	30.40	30.20

EGPRS

Ch.	f (MHz)	1 time slots		2 time slots	
		Peak	Average	Peak	Average
128	824.2	**32.38**	28.45	31.85	28.35
190	836.6	32.36	28.37	31.88	28.30
251	848.8	32.25	28.40	31.90	28.35
512	1850.2	**30.50**	26.95	30.40	26.90
661	1880.0	30.46	26.90	30.40	26.85
810	1909.8	30.45	27.00	30.40	26.95

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7.11. A1429 UMTS REL99

TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel99
	Subtest	-
WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	βc	Not Applicable
	βd	Not Applicable
	βec	Not Applicable
	βc/βd	8/15
	βhs	Not Applicable
	βed	Not Applicable

RESULTS

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LAT (PORT A) / PRIMARY

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 850	4132	4357	826.4	28.45	24.48
	4180	4405	836.4	28.47	24.50
	4230	4455	846.6	28.45	**24.45**

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 1900	9262	9662	1852.4	**25.75**	22.50
	9400	9800	1880.0	25.65	22.40
	9538	9938	1907.6	25.65	22.45

UAT (PORT B)

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 850	4132	4357	826.4	27.45	23.90
	4180	4405	836.0	27.60	**23.95**
	4230	4455	846.0	27.50	23.95

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Peak	Average
UMTS 1900	9262	9662	1852.4	25.10	21.30
	9400	9800	1880.0	25.05	21.25
	9538	9938	1907.6	**25.25**	21.30

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7.12. A1429 UMTS Rel 6 HSDPA

TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA	Rel6 HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	HSUPA Test	Not Applicable			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βec	-	-	-	-
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	βed	Not Applicable			
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs = βhs/βc	30/15			

RESULT

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LAT (PORT A) / PRIMARY

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS850 (Band V)	1	4132	4357	826.4	27.15	23.48
		4180	4405	836.0	26.95	23.50
		4230	4455	846.0	27.15	23.50
	2*	4132	4357	826.4	27.68	**23.56**
		4180	4405	836.0	27.35	23.50
		4230	4455	846.0	27.54	23.45
	3	4132	4357	826.4	27.60	23.25
		4180	4405	836.0	27.23	23.05
		4230	4455	846.0	27.45	23.00
	4	4132	4357	826.4	27.50	23.10
		4180	4405	836.0	27.33	23.00
		4230	4455	846.0	27.45	23.00
UMTS1900 (Band II)	1	9262	9662	1852.4	24.76	21.48
		9400	9800	1880.0	24.77	21.43
		9538	9938	1907.6	24.73	21.40
	2*	9262	9662	1852.4	**25.67**	21.52
		9400	9800	1880.0	25.48	21.50
		9538	9938	1907.6	25.63	21.55
	3	9262	9662	1852.4	25.45	21.15
		9400	9800	1880.0	25.25	21.10
		9538	9938	1907.6	25.32	21.06
	4	9262	9662	1852.4	25.38	21.04
		9400	9800	1880.0	25.27	21.05
		9538	9938	1907.6	25.32	21.00

UAT (PORT B) (WORST CASE ONLY ON SUB TEST 2)

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 850 Band V	2	4132	4357	826.4	27.15	**23.18**
		4180	4405	836.0	27.12	23.15
		4230	4455	846.0	27.05	23.09

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 1900 Band II	2	9262	9662	1852.4	24.85	20.75
		9400	9800	1880.0	24.67	20.65
		9538	9938	1907.6	**25.05**	20.80

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7.13. A1429 UMTS DUAL CARRIER HSDPA

TEST PROCEDURE

The following summary of these settings are illustrated below:

RESULT

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS850 (Band V)	1*	4132	4357	826.4	27.25	23.40
		4180	4405	836.0	27.30	23.43
		4230	4455	846.0	27.37	23.44
	2	4132	4357	826.4	27.30	23.30
		4180	4405	836.0	27.25	23.32
		4230	4455	846.0	27.25	23.30
	3	4132	4357	826.4	27.28	23.32
		4180	4405	836.0	27.30	23.32
		4230	4455	846.0	27.27	23.30
	4	4132	4357	826.4	27.33	23.30
		4180	4405	836.0	27.27	23.32
		4230	4455	846.0	27.30	23.30
UMTS1900 (Band II)	1*	9262	9662	1852.4	25.45	21.32
		9400	9800	1880.0	25.60	21.35
		9538	9938	1907.6	25.55	21.35
	2	9262	9662	1852.4	25.49	21.22
		9400	9800	1880.0	25.54	21.23
		9538	9938	1907.6	25.50	21.20
	3	9262	9662	1852.4	25.56	21.22
		9400	9800	1880.0	25.52	21.40
		9538	9938	1907.6	25.45	21.12
	4	9262	9662	1852.4	25.53	21.21
		9400	9800	1880.0	25.56	21.32
		9538	9938	1907.6	25.48	21.17

UAT (PORT B) / SECONDARY (WORST CASE ONLY ON SUB TEST 2)

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 850 Band V	1	4132	4357	826.4	27.30	23.06
		4180	4405	836.0	27.38	23.10
		4230	4455	846.0	27.40	23.12

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 1900 Band II	1	9262	9662	1852.4	25.02	20.75
		9400	9800	1880.0	25.05	20.75
		9538	9938	1907.6	25.00	20.70

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7.14. A1429 UMTS Rel 6 HSPA (HSDPA & HSUPA)

RESULTS:

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	1309/225	94/75	47/15 47/15	56/75	47/15
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

RESULTS

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LAT (PORT A) / PRIMARY

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS850 (Band V)	1*	4132	4357	826.4	27.35	**23.45**
		4180	4405	836.0	27.30	23.45
		4230	4455	846.0	27.10	23.32
	2	4132	4357	826.4	26.90	21.70
		4180	4405	836.0	26.72	21.62
		4230	4455	846.0	26.70	21.62
	3	4132	4357	826.4	27.12	22.70
		4180	4405	836.0	27.10	22.62
		4230	4455	846.0	27.12	22.62
	4	4132	4357	826.4	27.04	21.70
		4180	4405	836.0	27.08	21.60
		4230	4455	846.0	27.03	21.62
	5	4132	4357	826.4	27.30	23.50
		4180	4405	836.0	27.15	23.45
		4230	4455	846.0	27.20	23.43
UMTS1900 (Band II)	1*	9262	9662	1852.4	26.35	21.50
		9400	9800	1880.0	26.20	21.45
		9538	9938	1907.6	**26.43**	21.50
	2	9262	9662	1852.4	25.75	19.50
		9400	9800	1880.0	25.65	19.52
		9538	9938	1907.6	25.70	19.60
	3	9262	9662	1852.4	26.25	20.62
		9400	9800	1880.0	26.15	20.55
		9538	9938	1907.6	26.23	20.60
	4	9262	9662	1852.4	25.62	19.50
		9400	9800	1880.0	25.50	19.53
		9538	9938	1907.6	25.60	19.60
	5	9262	9662	1852.4	25.15	21.42
		9400	9800	1880.0	25.25	21.45
		9538	9938	1907.6	25.30	21.50

UAT (PORT B) / SECONDARY (WORST CASE ONLY ON SUB TEST 1)

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 850 Band V	1*	4132	4357	826.4	27.05	**22.95**
		4180	4405	836.0	26.90	22.90
		4230	4455	846.0	27.00	22.92

	SUB Test	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Peak	Average
UMTS 1900 Band II	1*	9262	9662	1852.4	24.95	20.55
		9400	9800	1880.0	24.90	20.50
		9538	9938	1907.6	**25.00**	20.60

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8. CONDUCTED TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049
IC: RSS-132, 4.5; RSS-133, 6.5

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

- GPRS and EGPRS
- UMTS, REL 99 and HSDPA

RESULTS

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
Cellular	GPRS	128	824.20	250.1509	280.588
		190	836.60	253.6995	277.046
		251	848.80	254.1607	316.111
	EGPRS	128	824.20	254.9317	291.103
		190	836.60	252.7668	303.596
		251	848.80	255.9691	284.654

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Cellular	UMTS, REL 99	4357	826.4	4.2025	4.590
		4405	836.0	4.2066	4.660
		4455	846.0	4.2123	4.606
	UMTS, HSDPA	4357	826.4	4.2061	4.577
		4405	836.0	4.1942	4.623
		4455	846.0	4.2100	4.599

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Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
PCS	GPRS	512	1850.2	255.7435	293.824
		661	1880.0	252.1679	273.157
		810	1909.8	249.9440	309.698
	EGPRS	512	1850.2	248.1301	310.418
		661	1880.0	251.9354	309.408
		810	1909.8	253.6540	294.917

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
PCS	UMTS, REL 99	9662	1852.4	4.2178	4.625
		9800	1880.0	4.2164	4.643
		9938	1907.6	4.2110	4.601
	UMTS, HSDPA	9662	1852.4	4.2225	4.617
		9800	1880.0	4.2108	4.588
		9938	1907.6	4.2193	4.619

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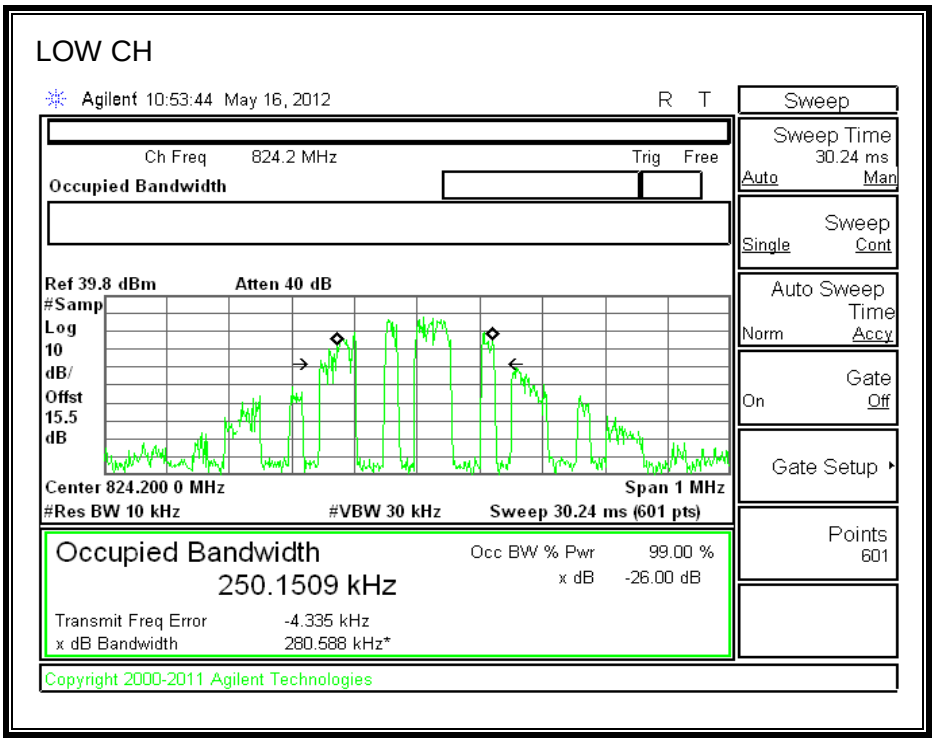
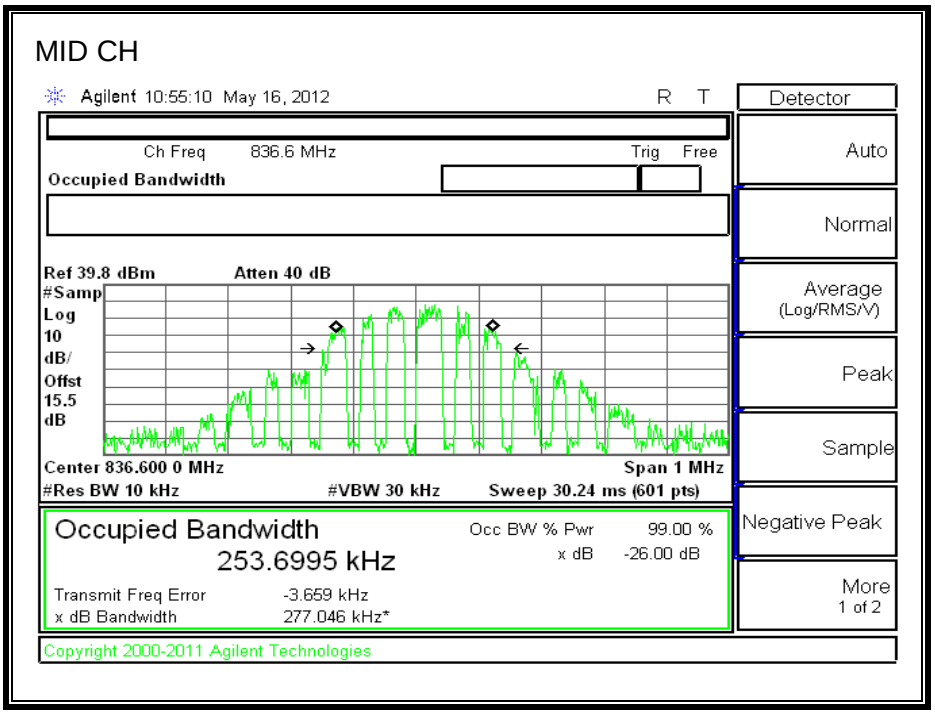
8.1.1. A1428

GPRS Mode (Cellular Band)





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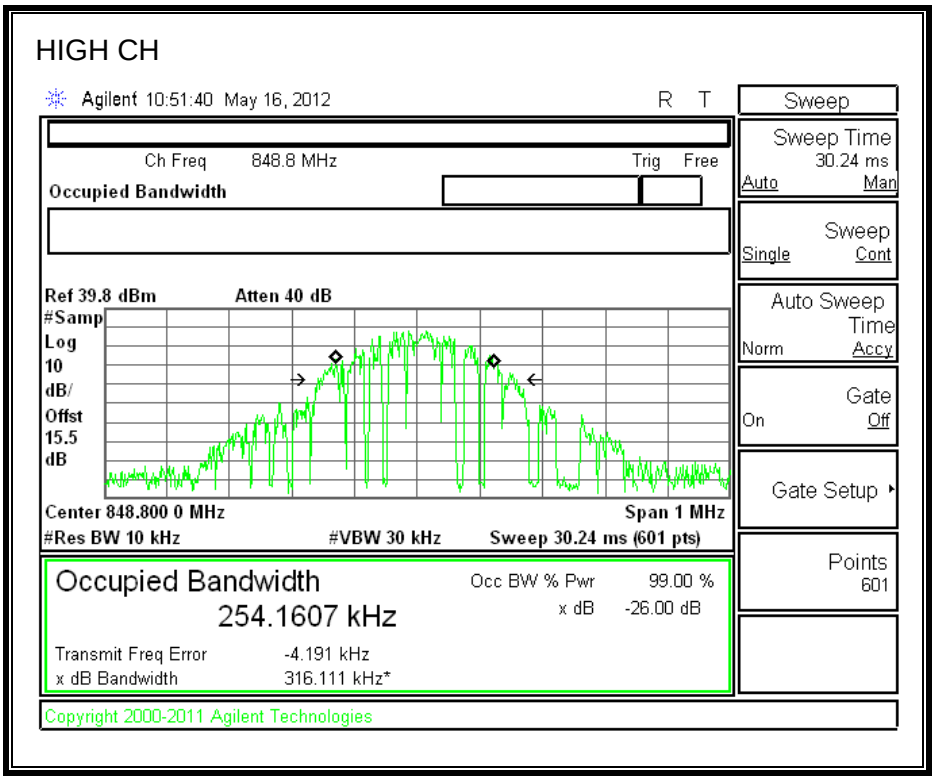
HIGH CH



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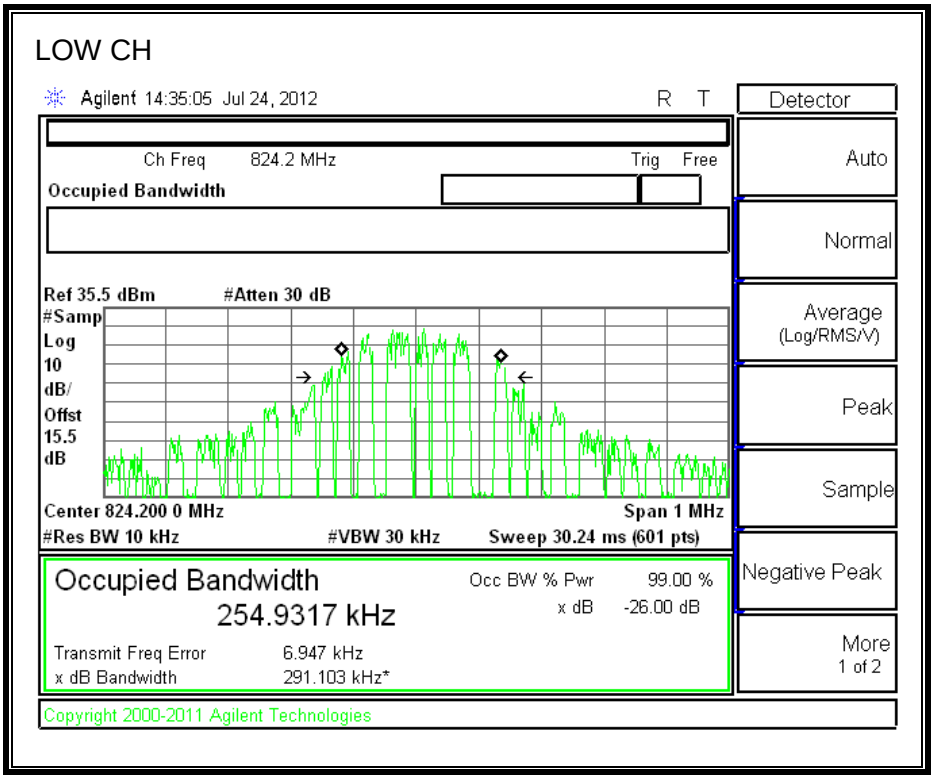
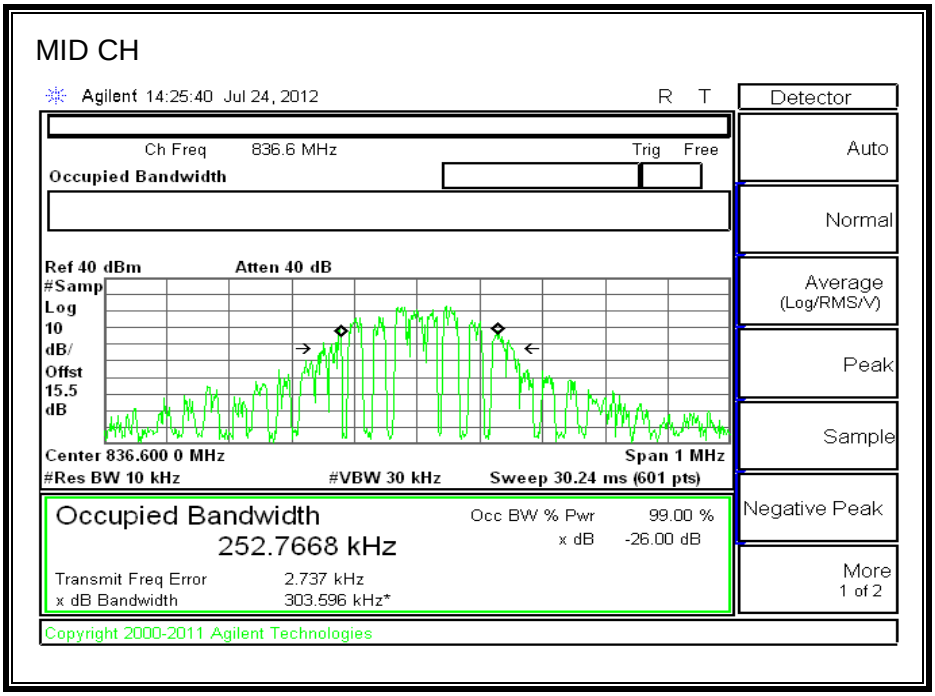
EGPRS Cellular Band





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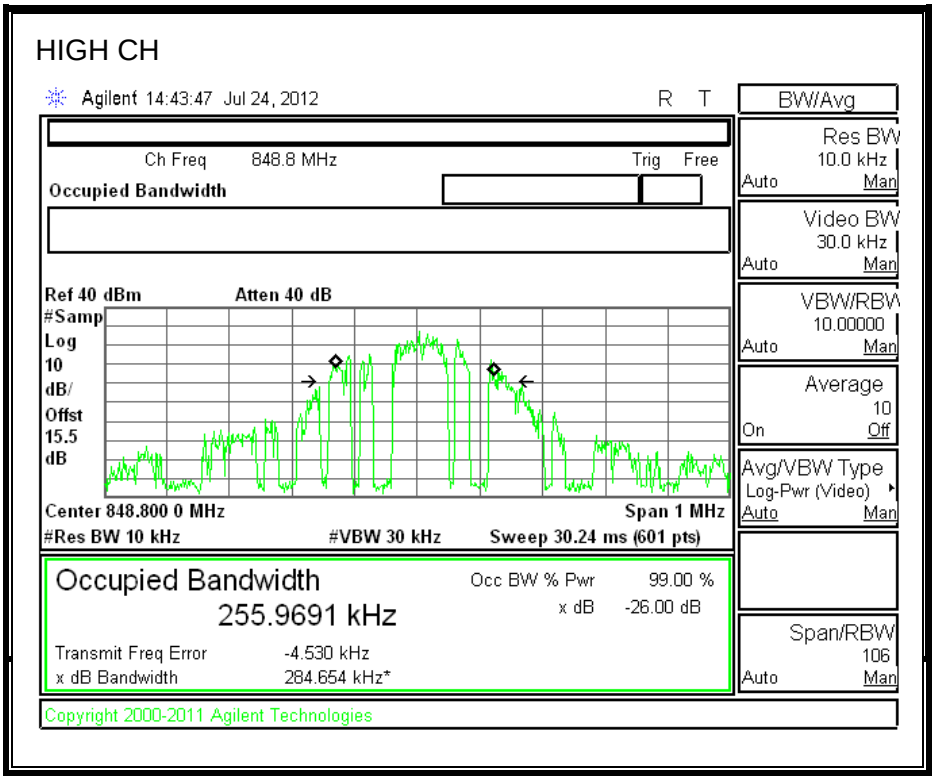

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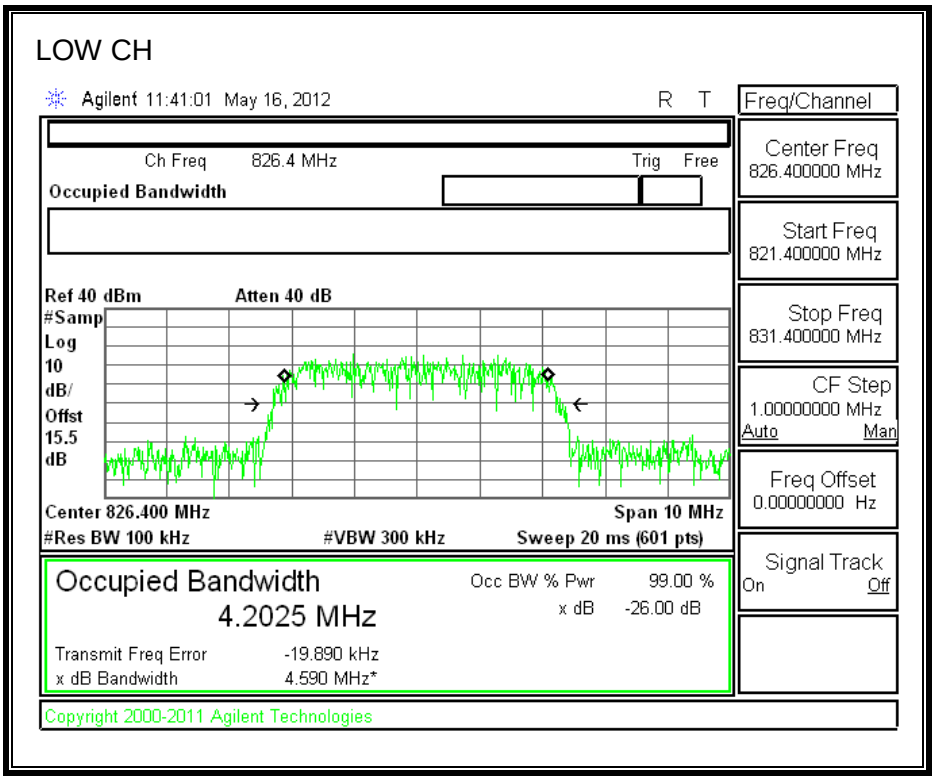
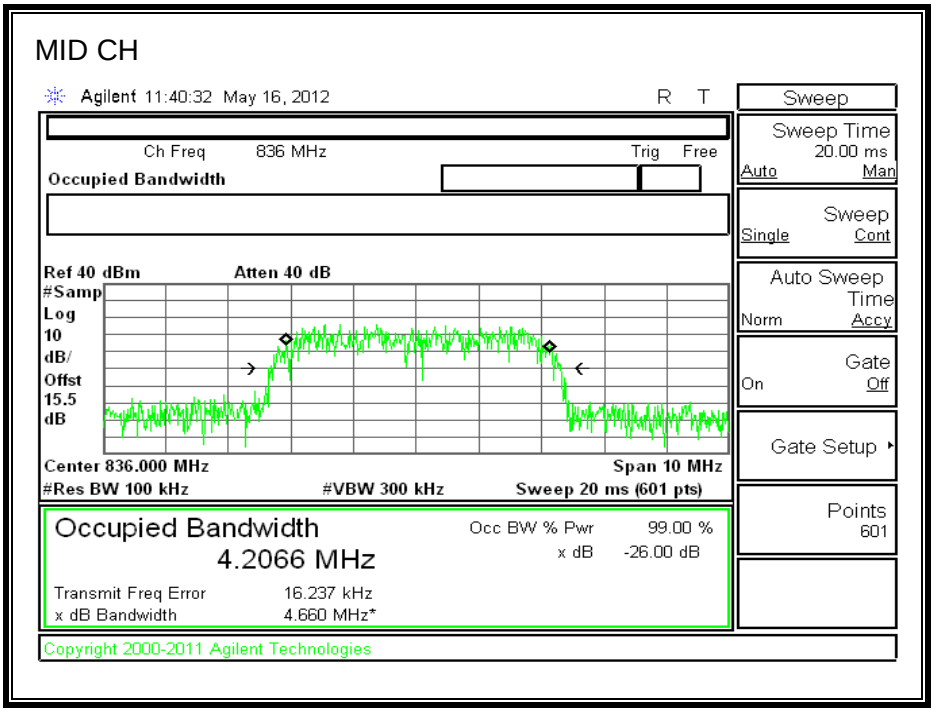
WCDMA Rel 99 (Cellular Band)





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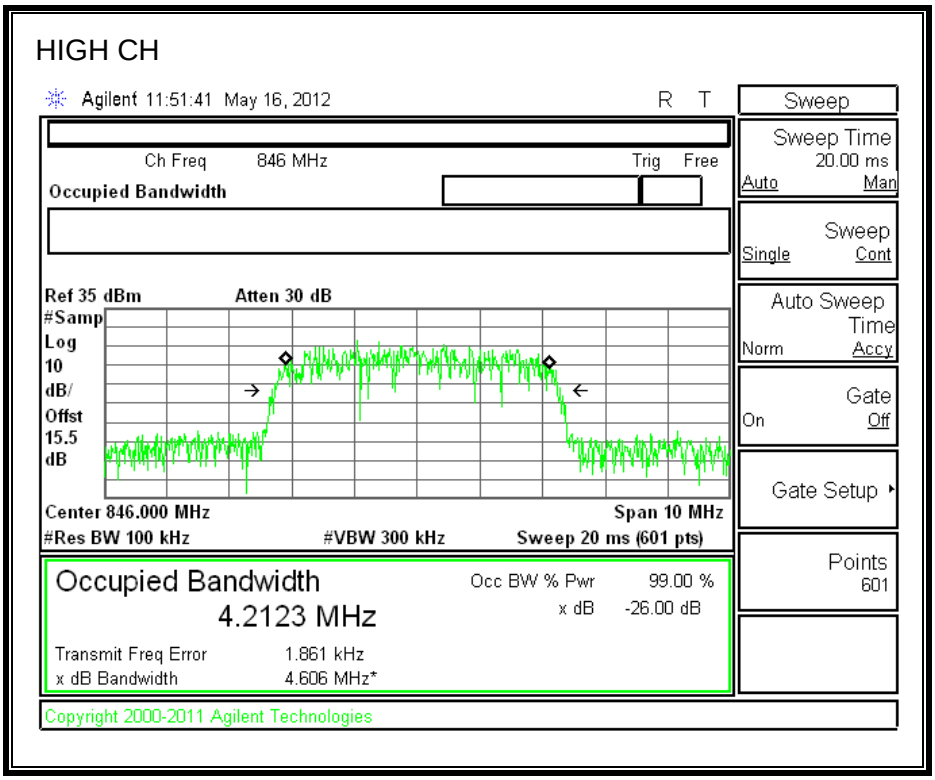
HIGH CH



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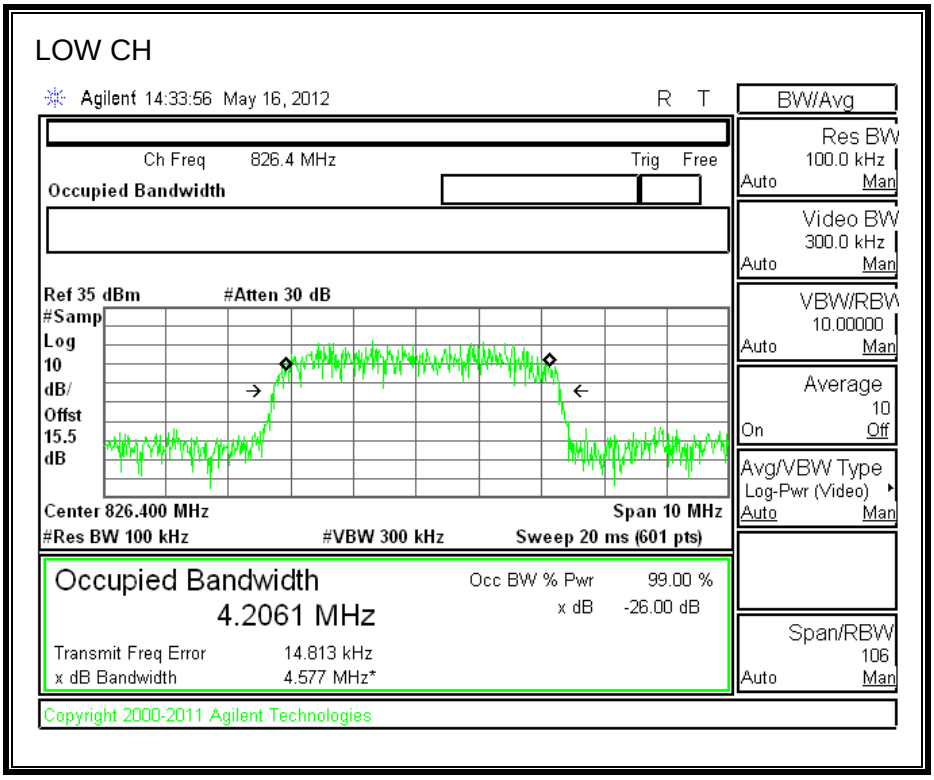
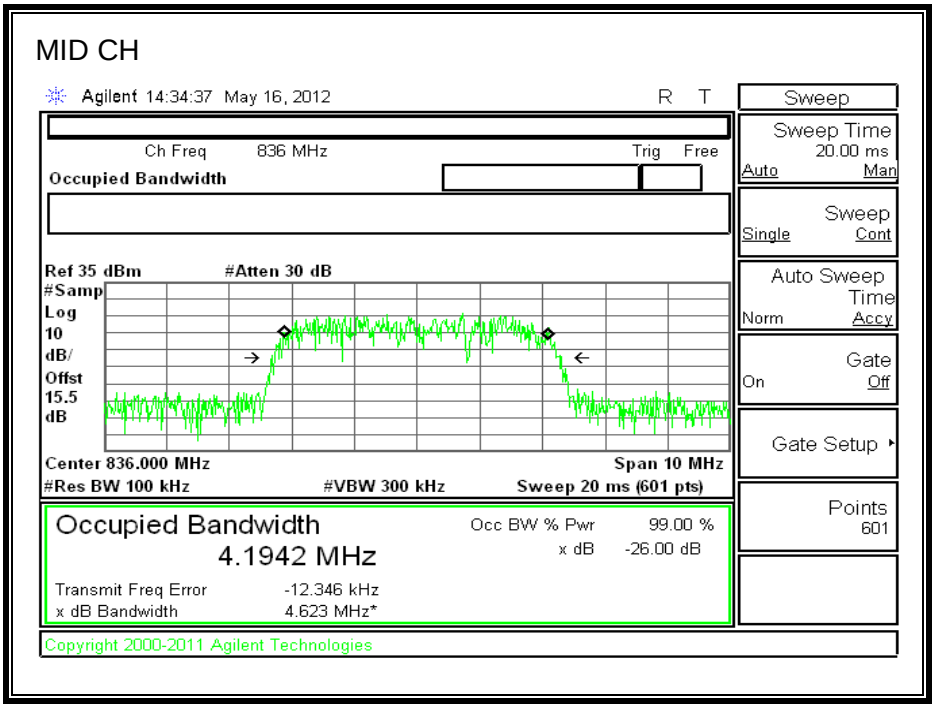
WCDMA HSDPA (Cellular Band)





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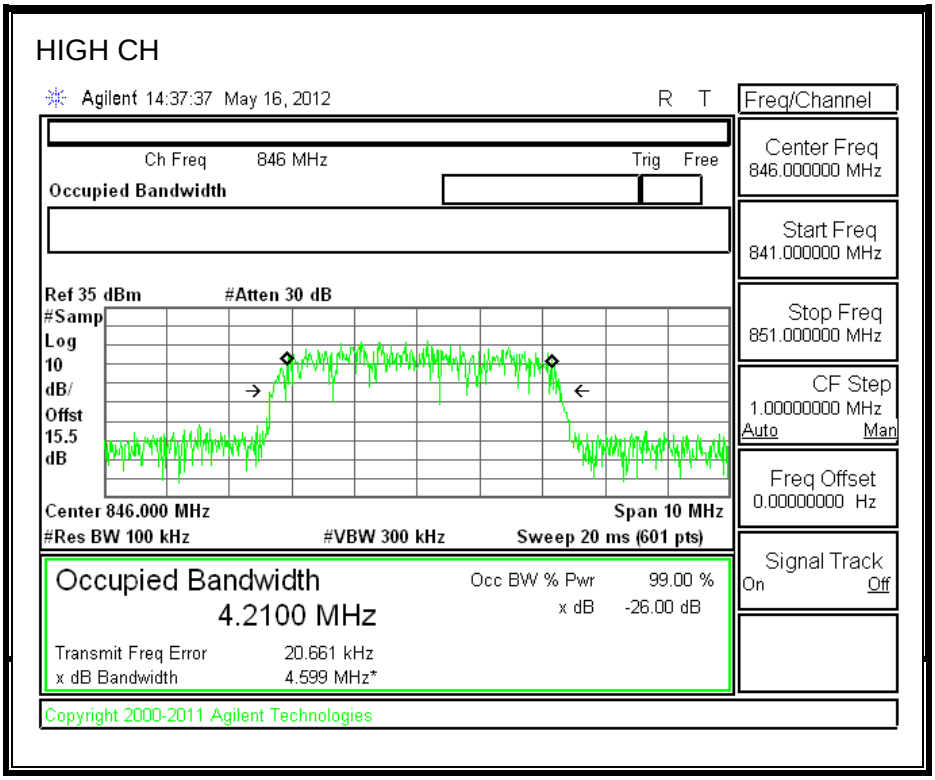
HIGH CH



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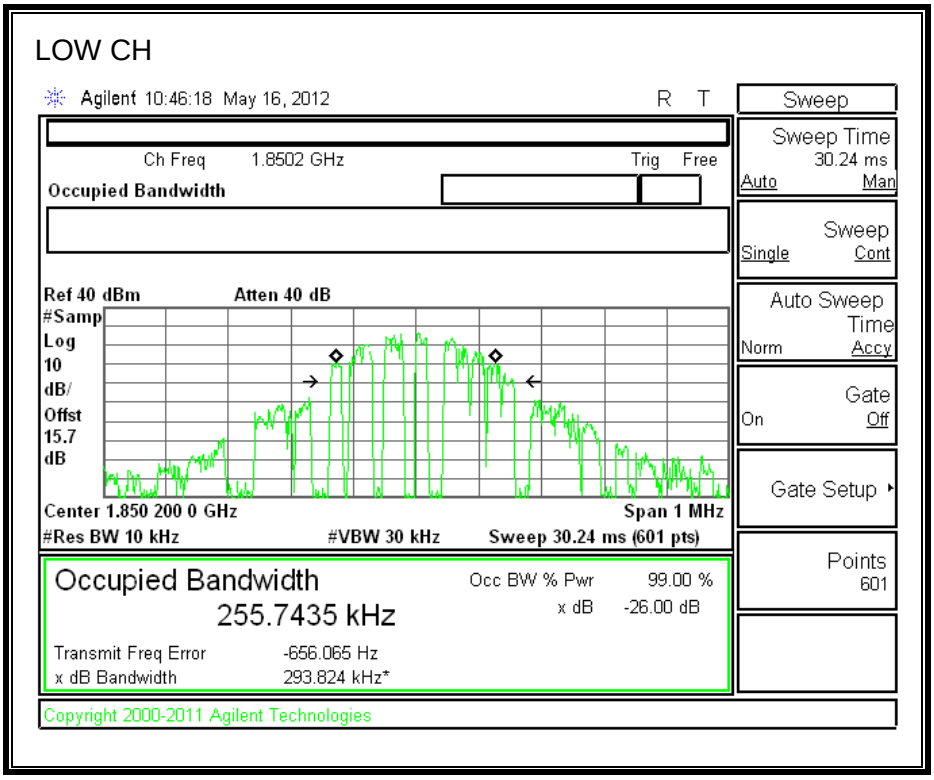
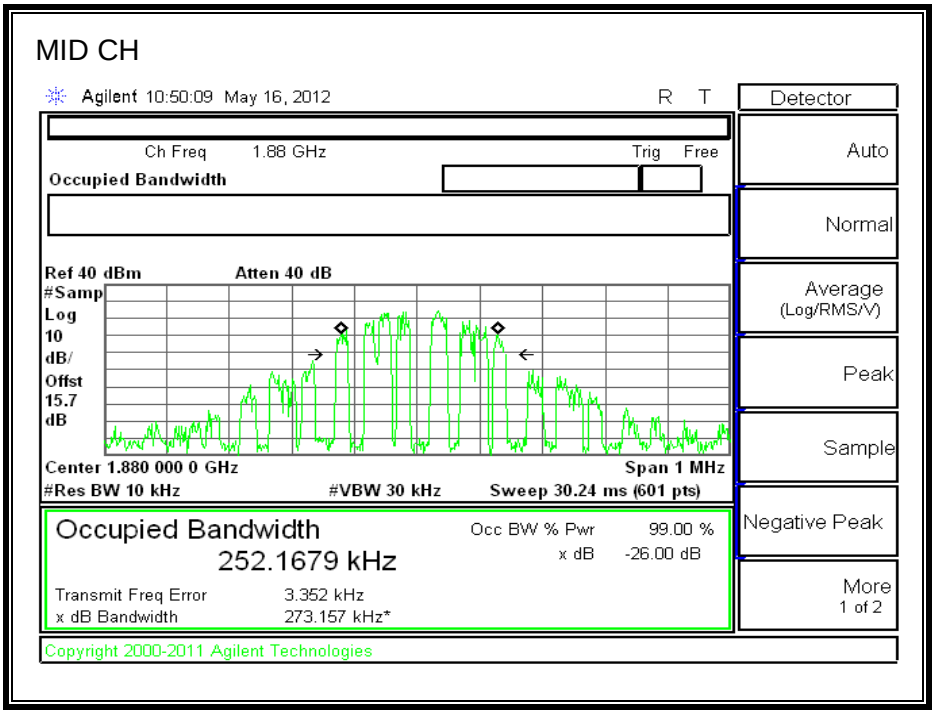
GPRS 1900 Mode (PCS Band)





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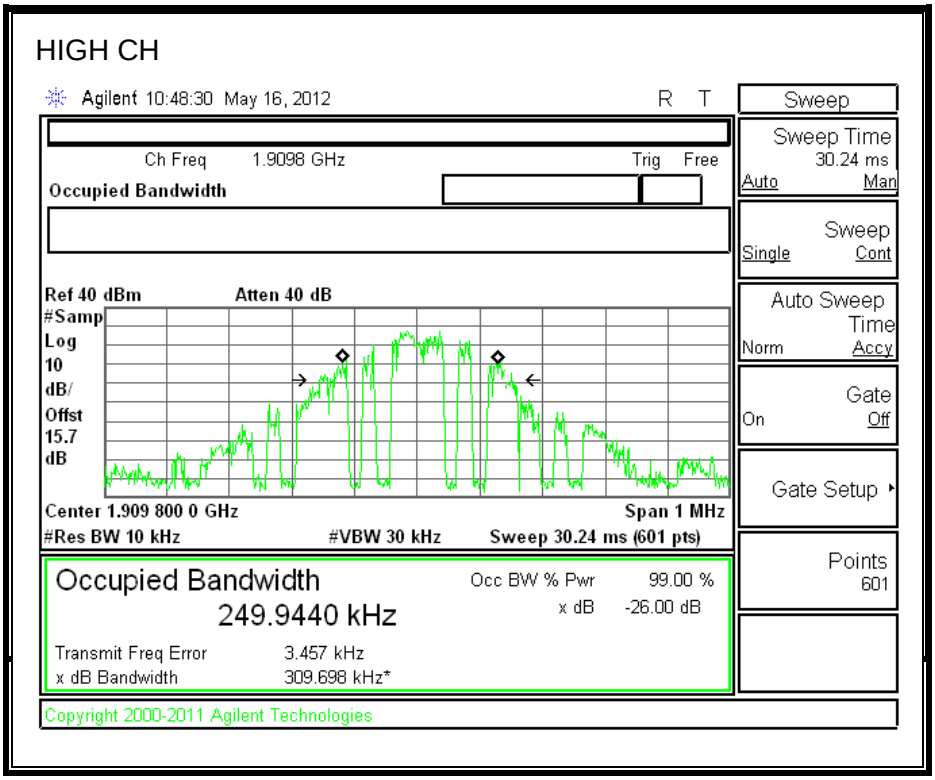
HIGH CH



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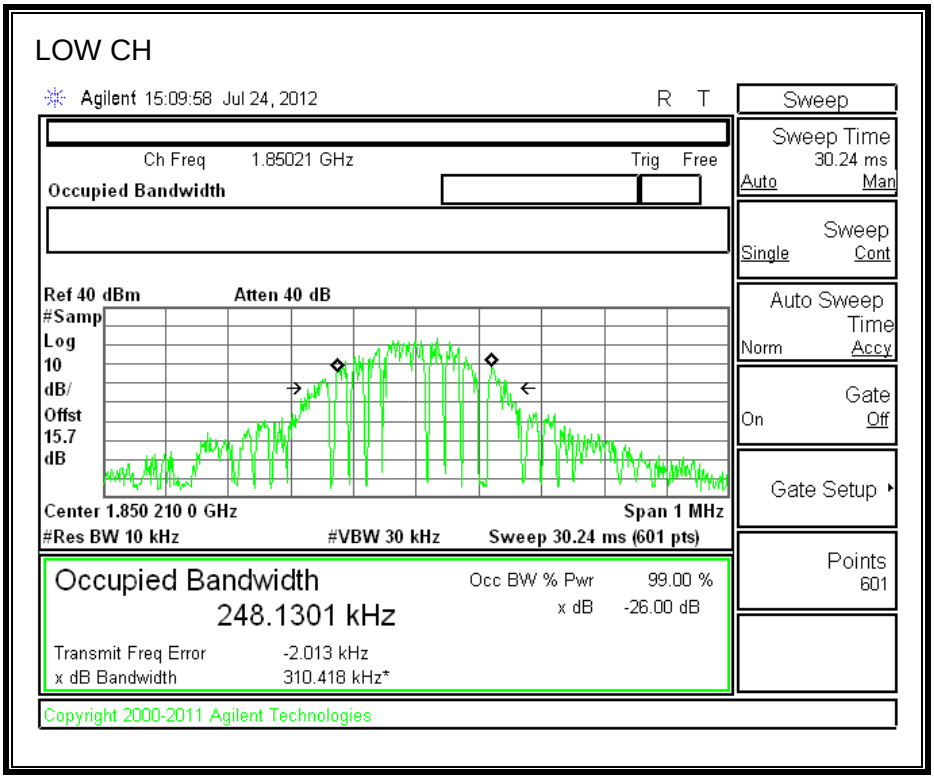
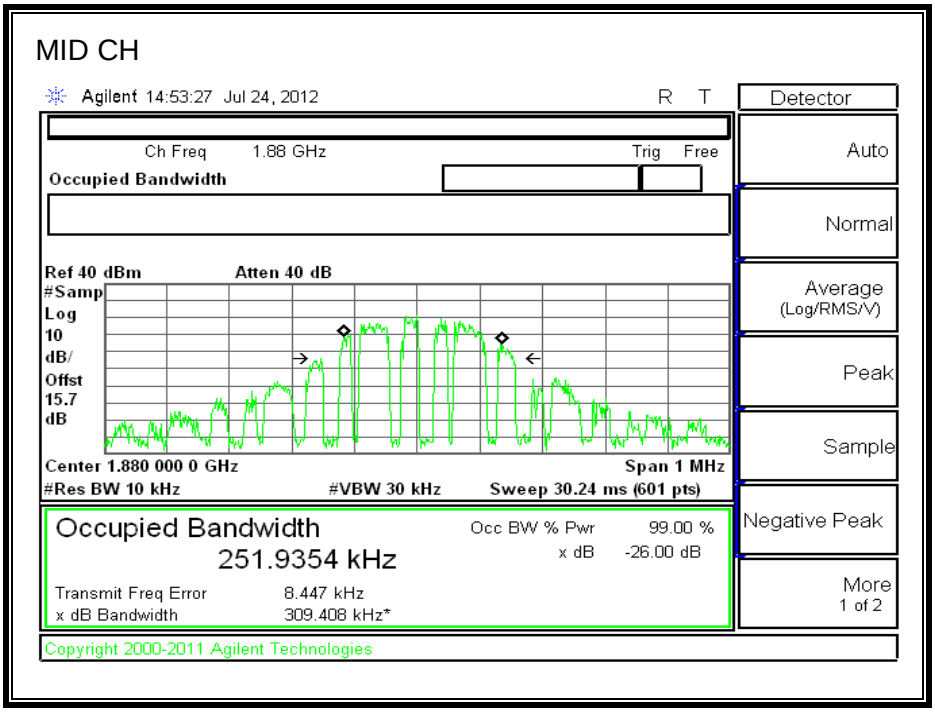
EGPRS 1900 Mode (PCS Band)





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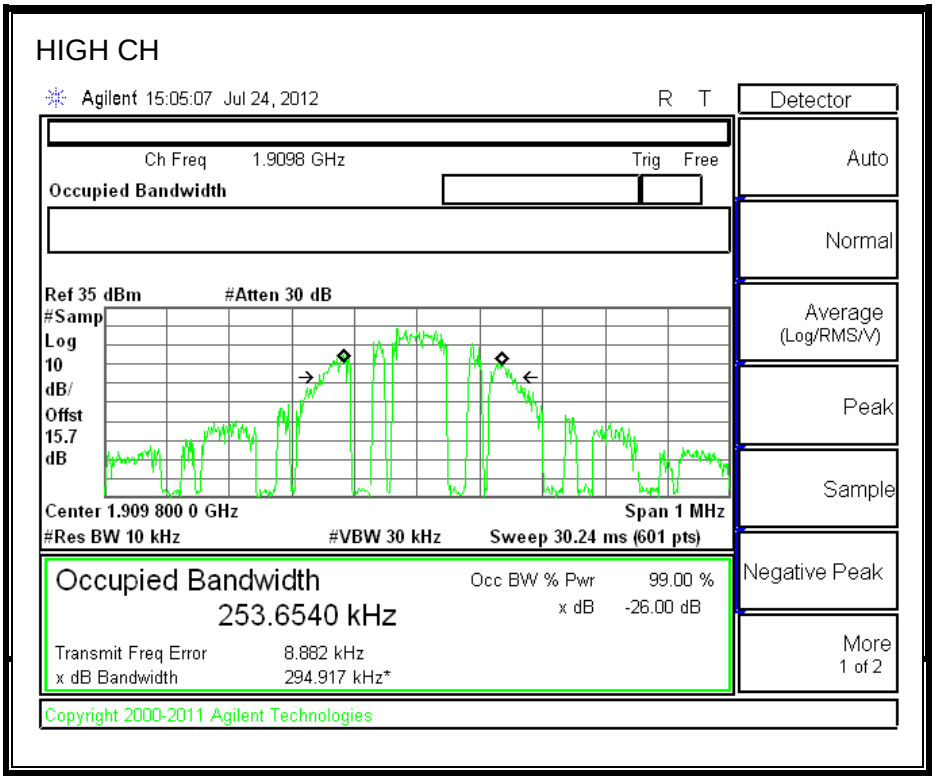
HIGH CH



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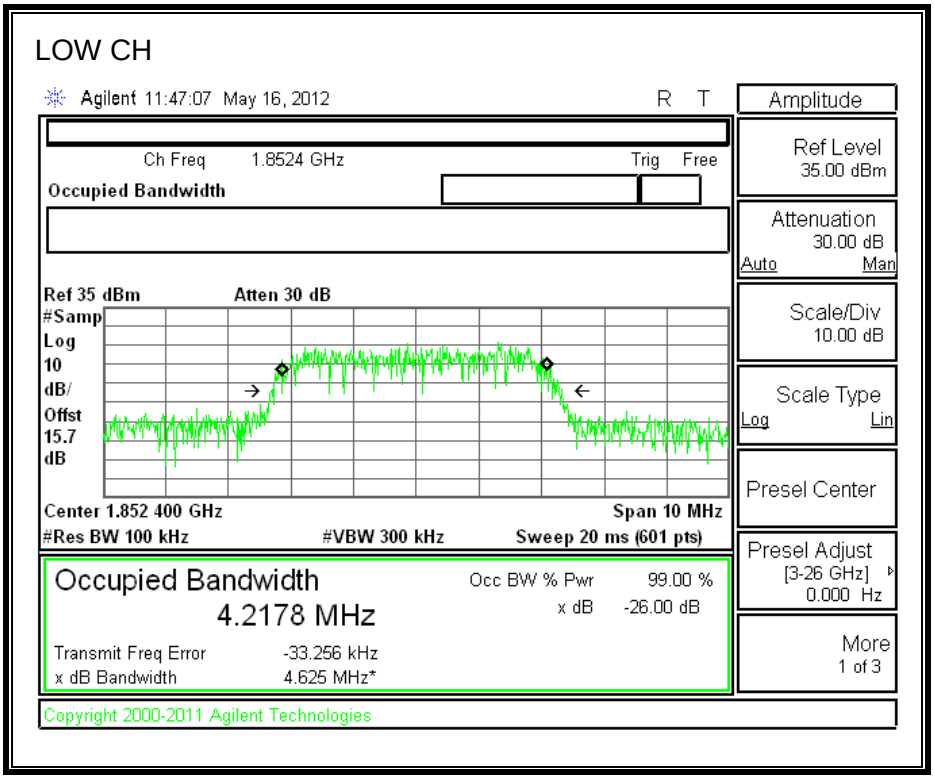
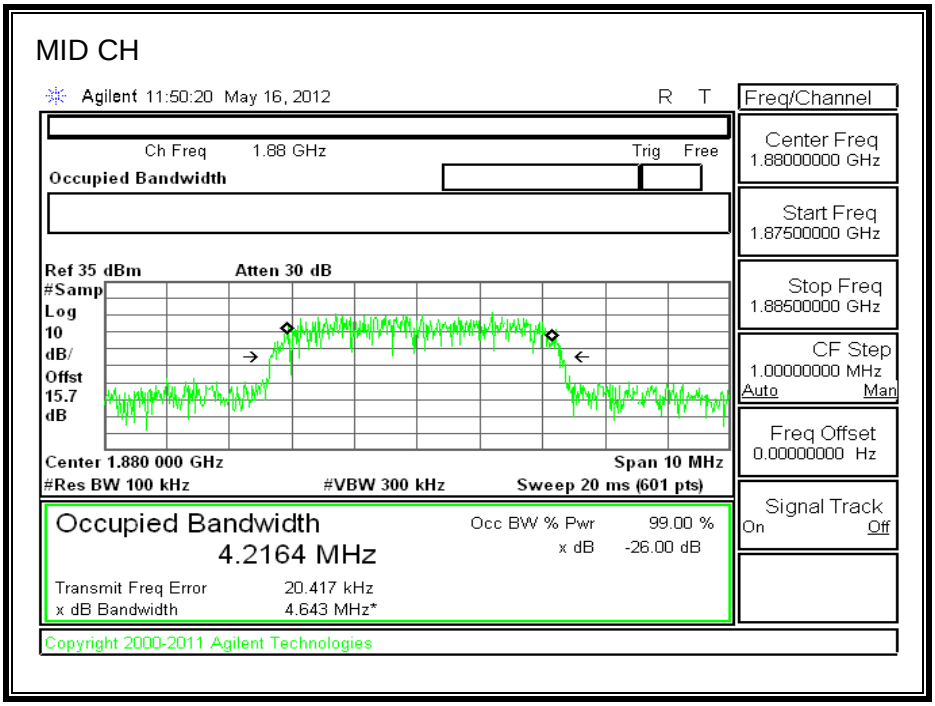
WCDMA REL 99 Mode (PCS Band)





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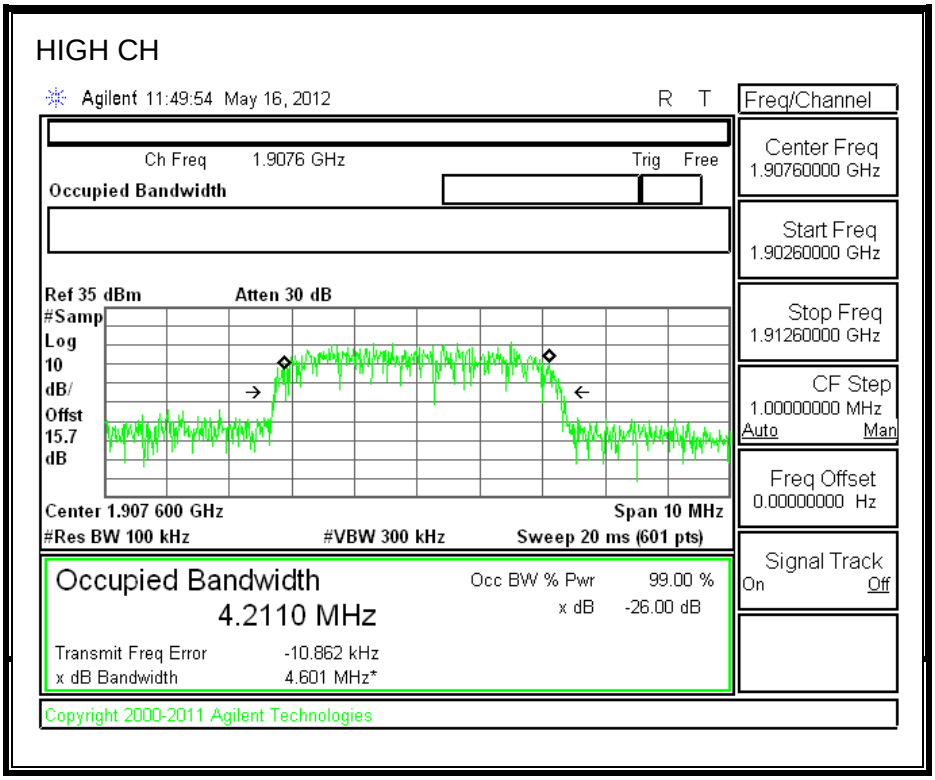
HIGH CH



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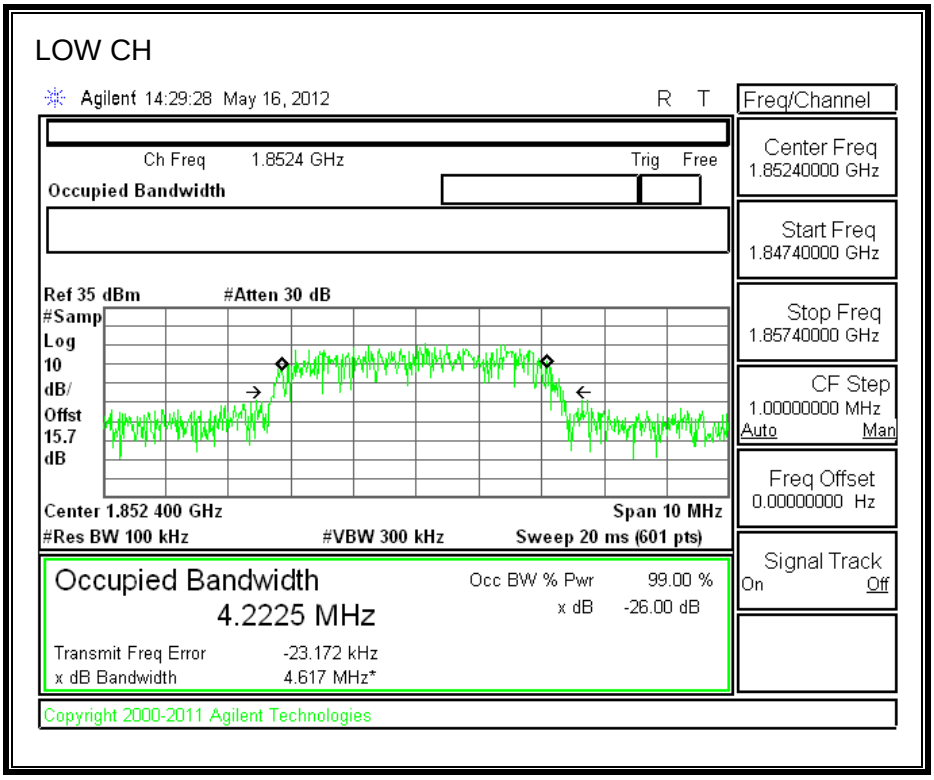
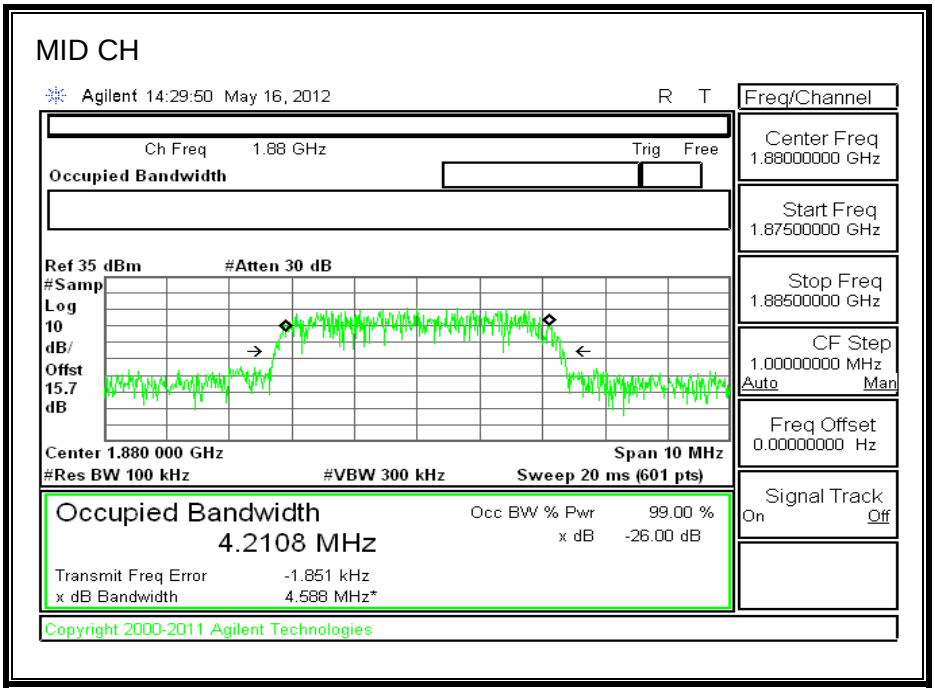
WCDMA HSDPA Mode (PCS Band)





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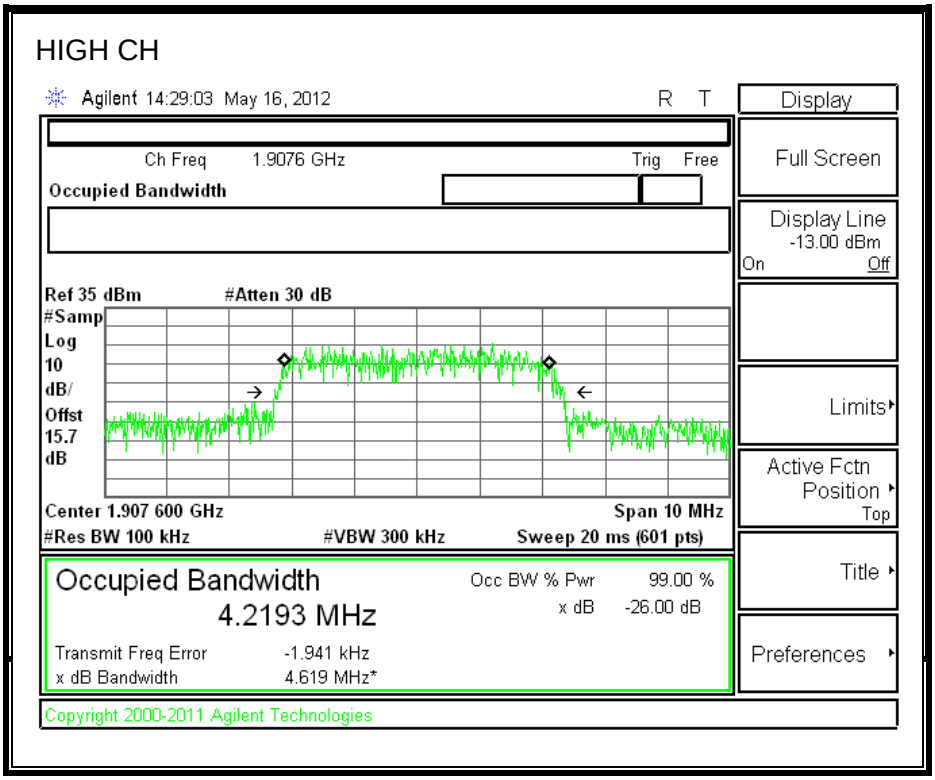
HIGH CH



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8.1.2. A1429

RESULTS

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Cellular	1xRTT	1013	824.70	1.2719	1.384
		384	836.52	1.2764	1.418
		777	848.31	1.2789	1.410
	CDMA2000 1xEV-DO (Rev. A)	1013	824.70	1.2784	1.389
		384	836.52	1.2783	1.399
		777	848.31	1.2775	1.400

Band	Mode	Two Carriers Minimum Separation	f (MHz)	99% BW (MHz)	-26dB BW MHz)
Cellular	EVDO REV B	1013+31	824.70+825.93	2.4478	2.697
		384+425	836.52+837.75	2.4664	2.651
		736+777	847.08+848.31	2.4824	2.651

Band	Mode	Two Carriers Maximum Separation	f (MHz)	99% BW (MHz)	-26dB BW MHz)
Cellular	EVDO REV B	1013+156	824.70+829.68	6.3825	6.641
		384+550	836.52+841.50	6.3574	6.692
		611+777	843.33+848.31	6.3322	6.620

Band	Mode	Three Carriers Minimum Separation	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Cellular	EVDO REV B	1013+31+72	824.70+825.93+827.16	3.7261	3.948
		384+425+466	836.52+837.75+838.98	3.6735	3.915
		695+736+777	845.85+847.08+848.31	3.7263	3.913

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
BC10	1xRTT	476	817.9	1.2749	1.414
		526	819.15	1.2854	1.414
		684	823.1	1.2730	1.396
BC10	EVDO	476	817.9	1.2774	1.390
		526	819.15	1.2718	1.417
		684	823.1	1.2727	1.397

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Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
PCS	1xRTT	25	1851.25	1.2807	1.399
		600	1880.0	1.2862	1.387
		1175	1908.75	1.2797	1.387
	CDMA2000 1xEV-DO (Rev. A)	25	1851.25	1.2762	1.413
		600	1880.0	1.2718	1.421
		1175	1908.75	1.2748	1.406

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.2	251.0488	303.788
		190	836.6	244.6309	307.529
		251	848.8	253.8623	310.277
	EGPRS	128	824.2	249.5882	314.628
		190	836.6	241.9351	306.768
		251	848.8	248.0590	316.762
PCS	GPRS	512	1850.2	249.1318	314.814
		661	1880.0	246.3538	272.715
		810	1909.8	248.5029	298.895
	EGPRS	512	1850.2	250.7722	266.904
		661	1880.0	243.1239	273.397
		810	1909.8	251.1885	327.073

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Cell	WCDMA, REL 99	4357	826.4	4.2091	4.575
		4405	836.0	4.1709	4.600
		4455	846.0	4.2210	4.540
	HSDPA REL 6	4357	826.4	4.1444	4.636
		4405	836.0	4.1245	4.719
		4455	846.0	4.2223	4.579
PCS	WCDMA, REL 99	9662	1852.4	4.1960	4.630
		9800	1880.0	4.1947	4.630
		9938	1907.6	4.2179	4.655
	HSDPA REL 6	9662	1852.4	4.2472	4.608
		9800	1880.0	4.2334	4.628
		9938	1907.6	4.1562	4.506

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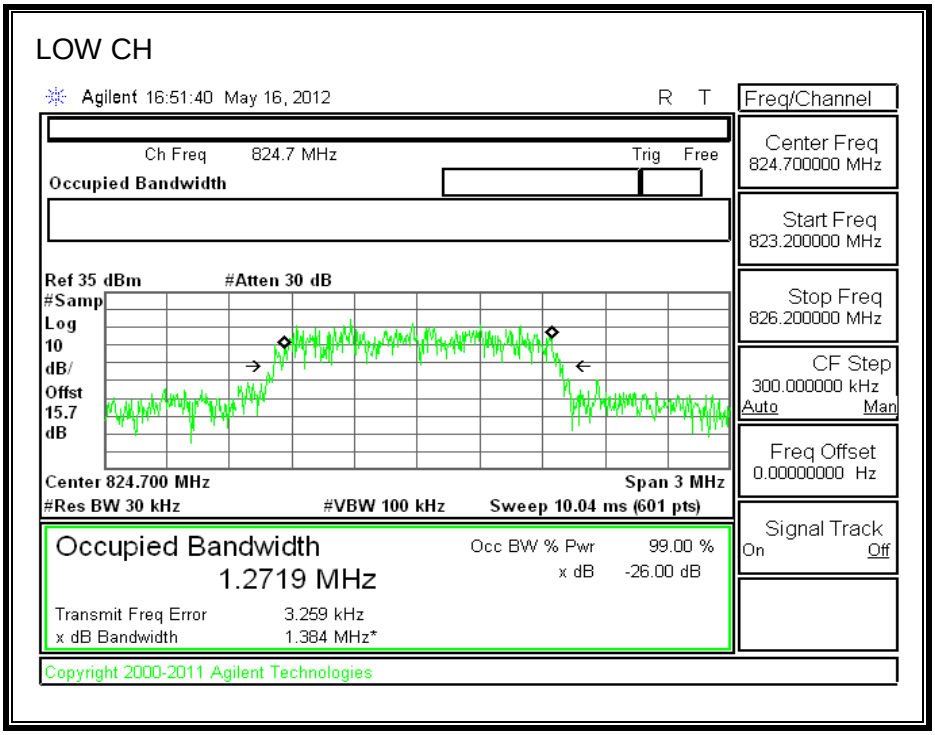
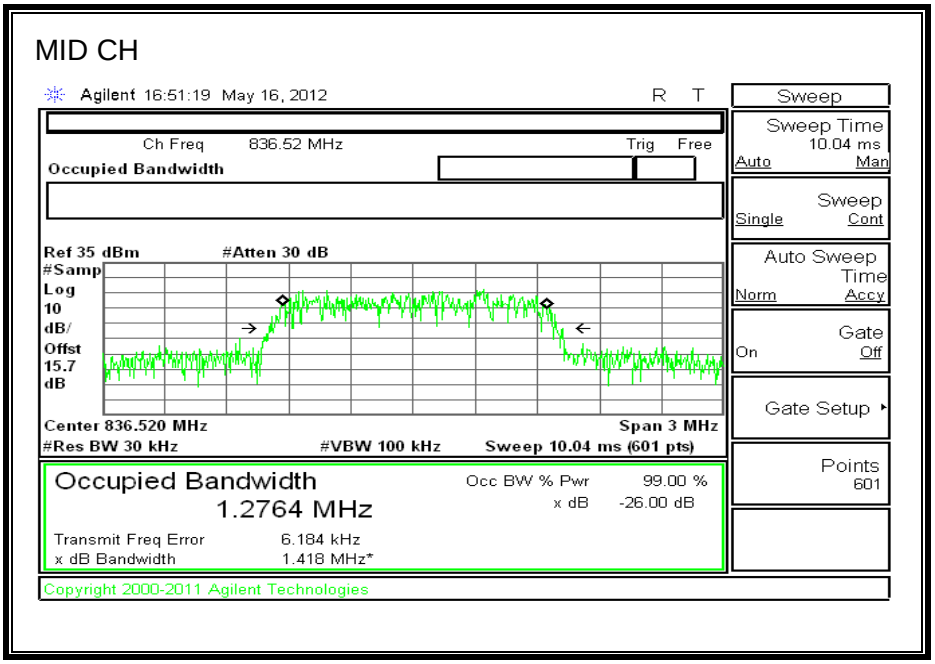
CDMA2000 1xRTT Mode (Cellular Band)

LOW CH



MID CH



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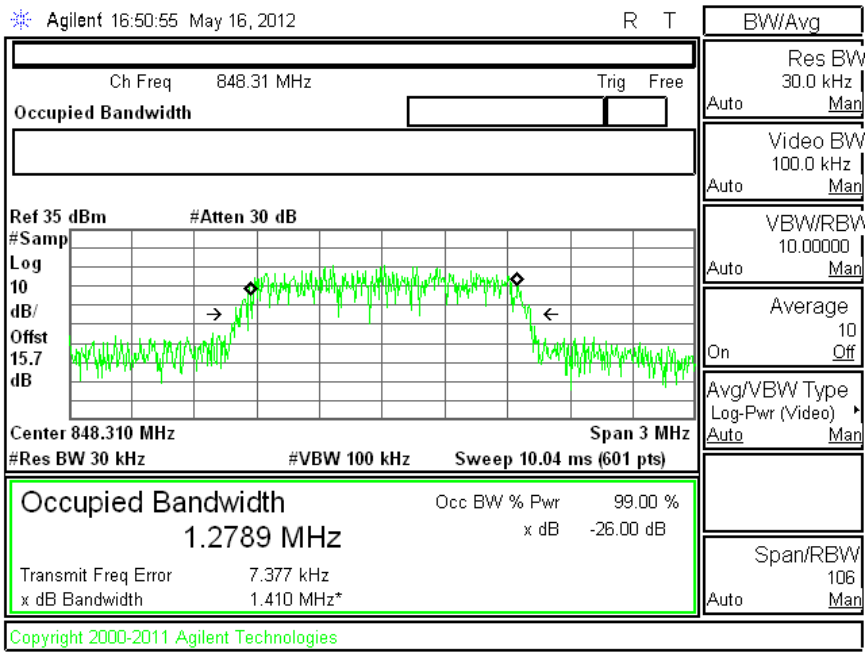
HIGH CH



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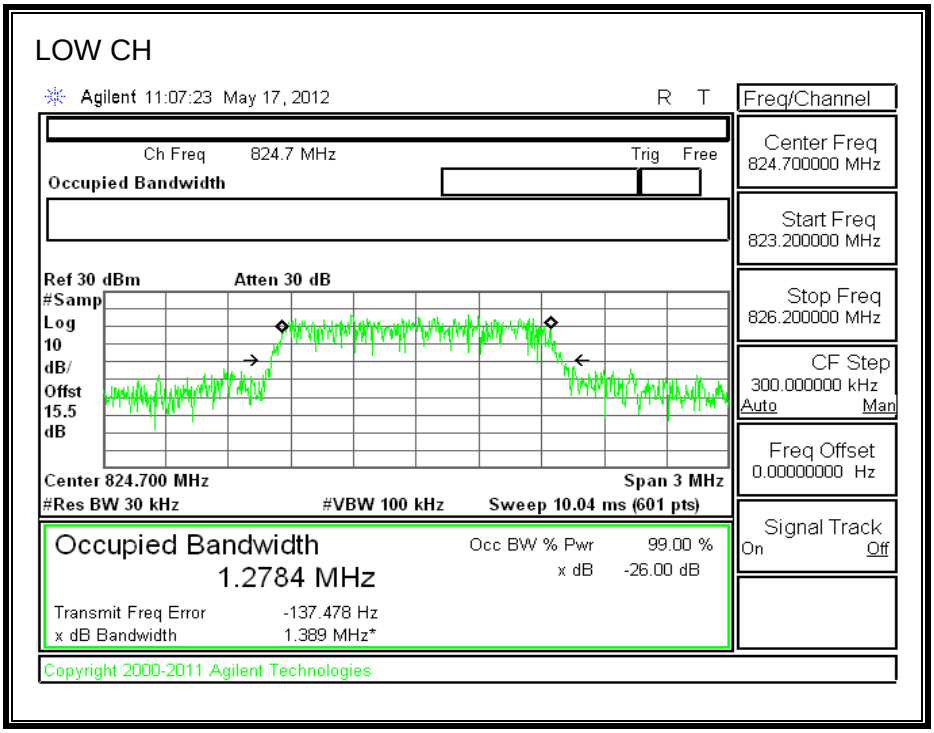
CDMA2000 1xEV-DO Revision A (Rev. A) Cellular Band

LOW CH



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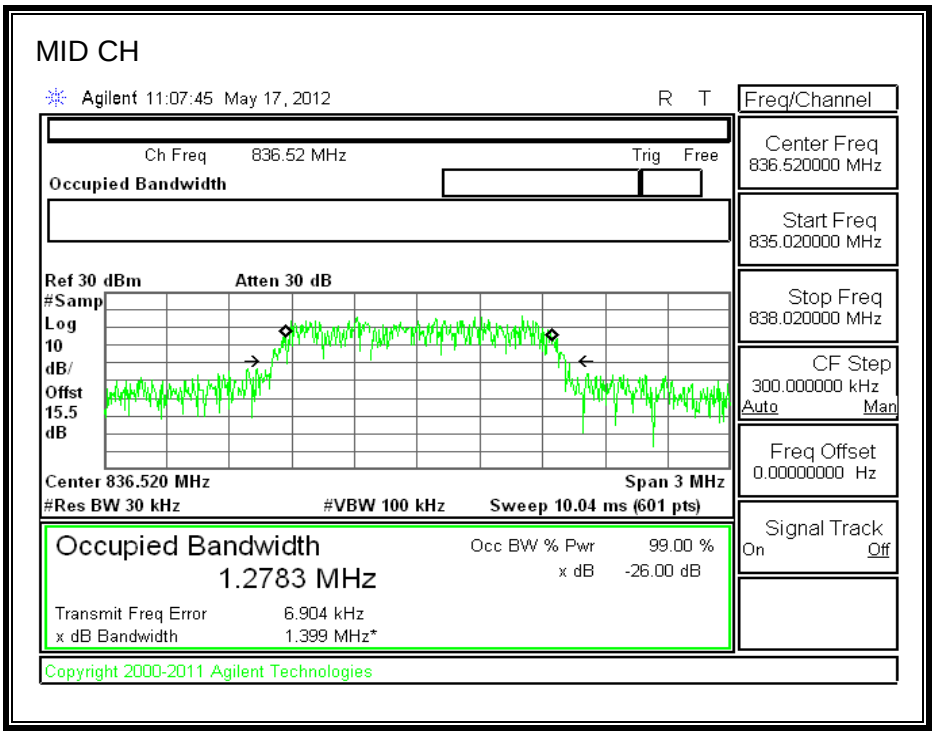

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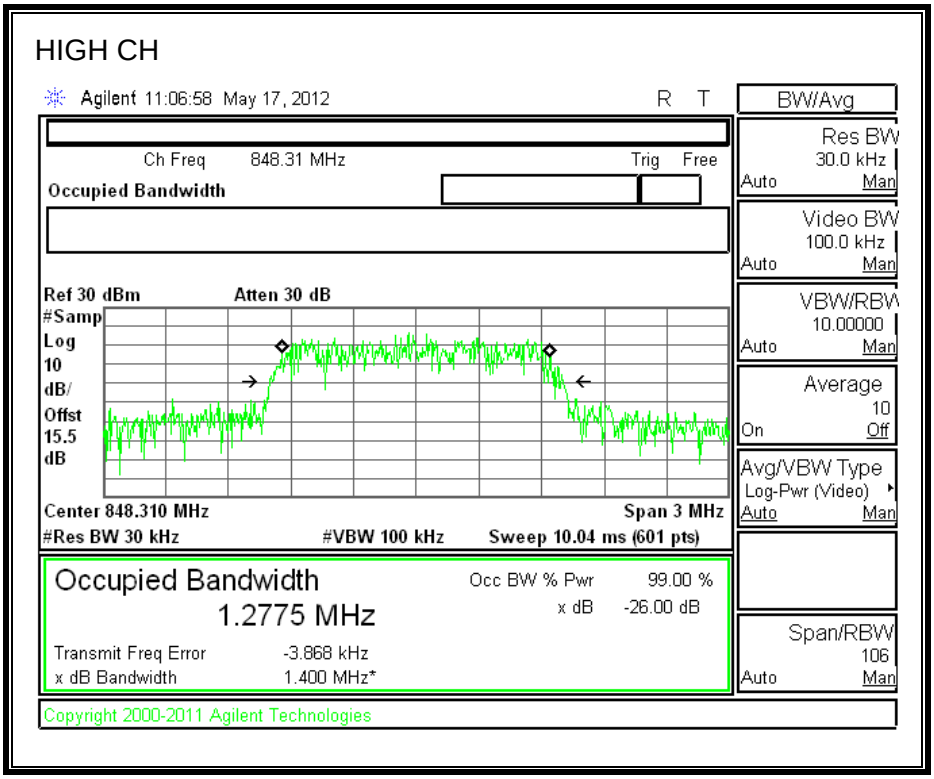
HIGH CH



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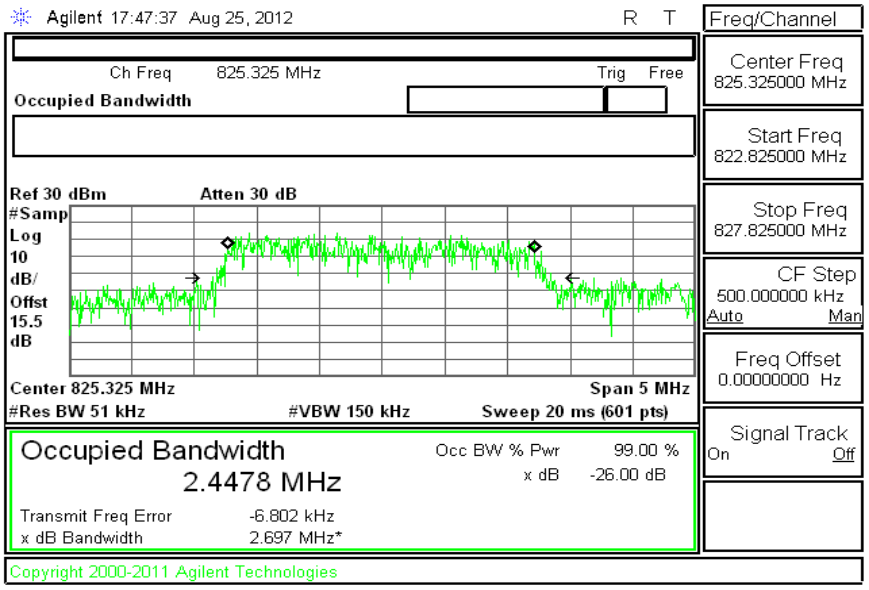
CDMA2000 1XEV-DO REV B CELLULAR BAND

Two Carriers Minimum Separation

LOW CH



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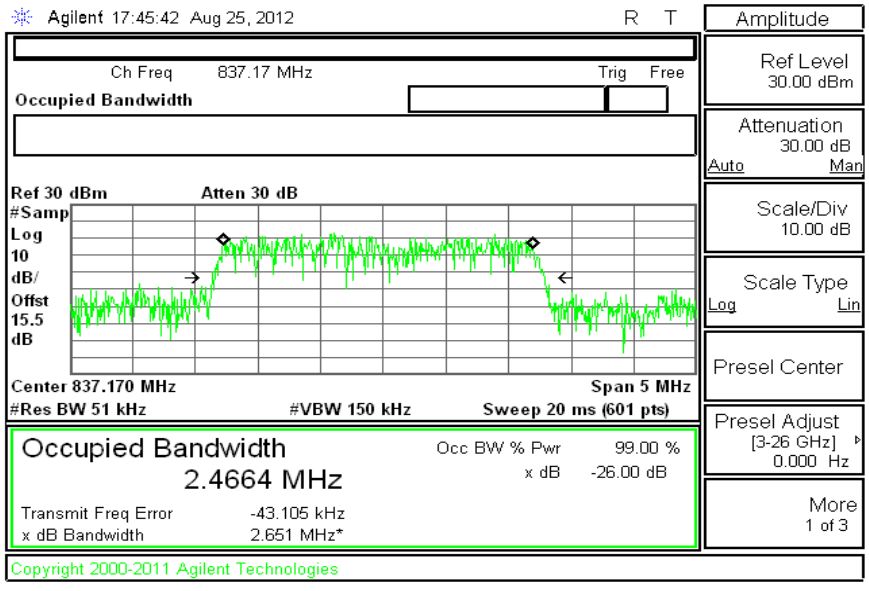

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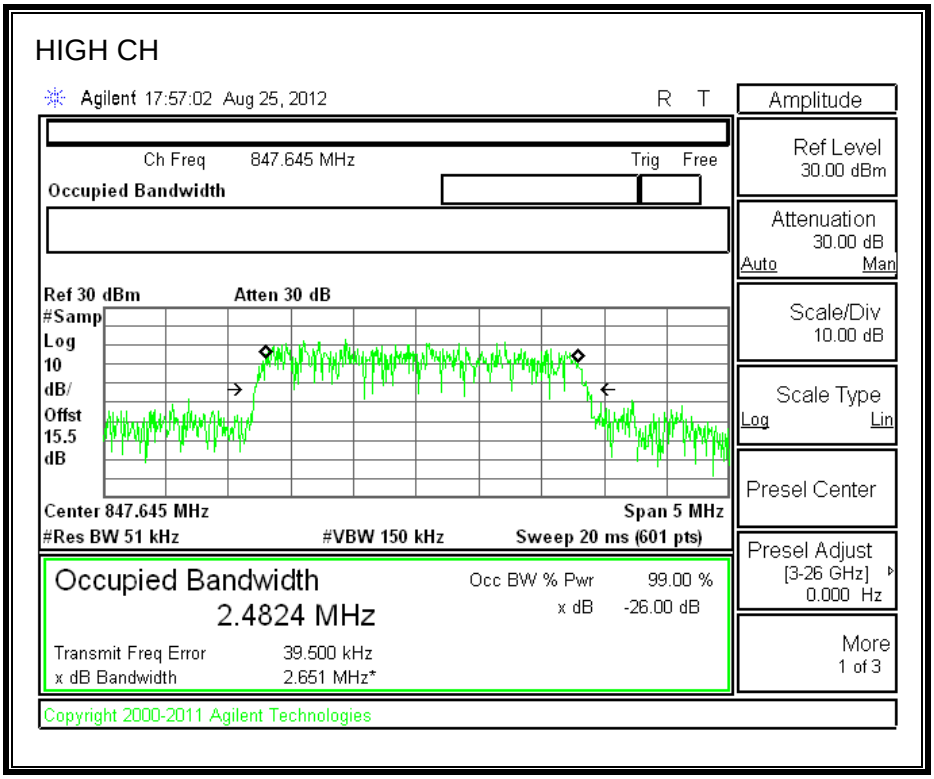
HIGH CH



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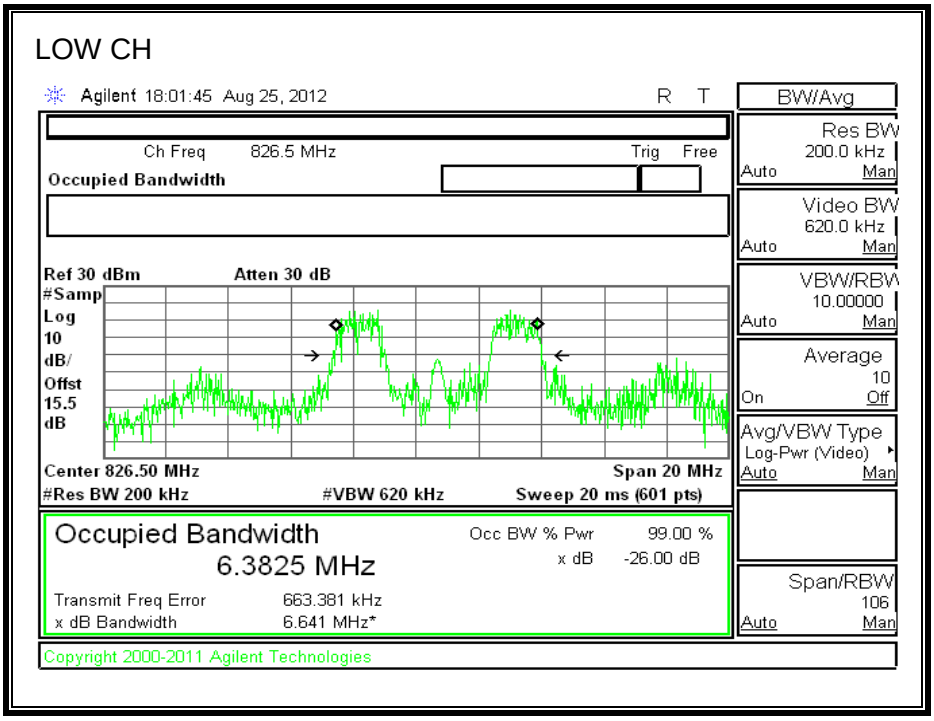
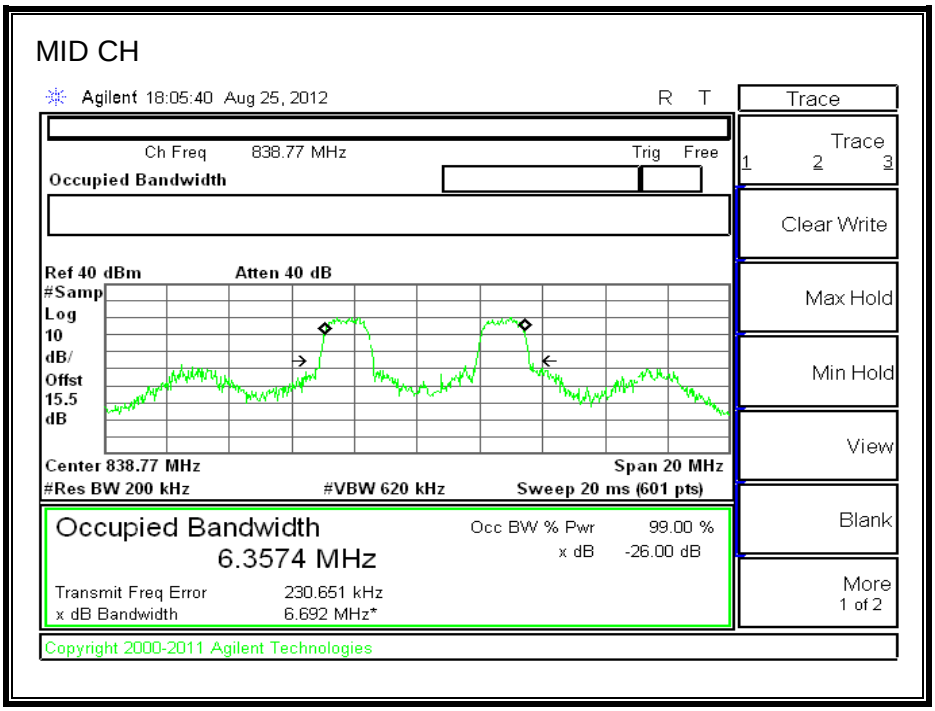
CDMA2000 1XEV-DO REV B CELLULAR BAND

Two Carriers Maximum Separation





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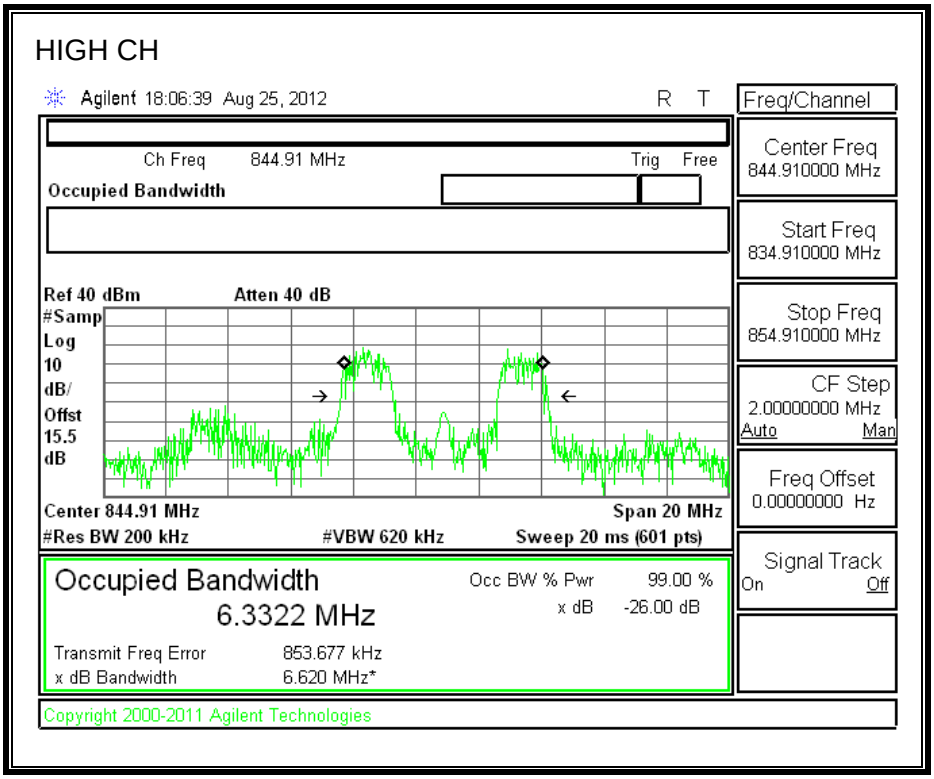
HIGH CH



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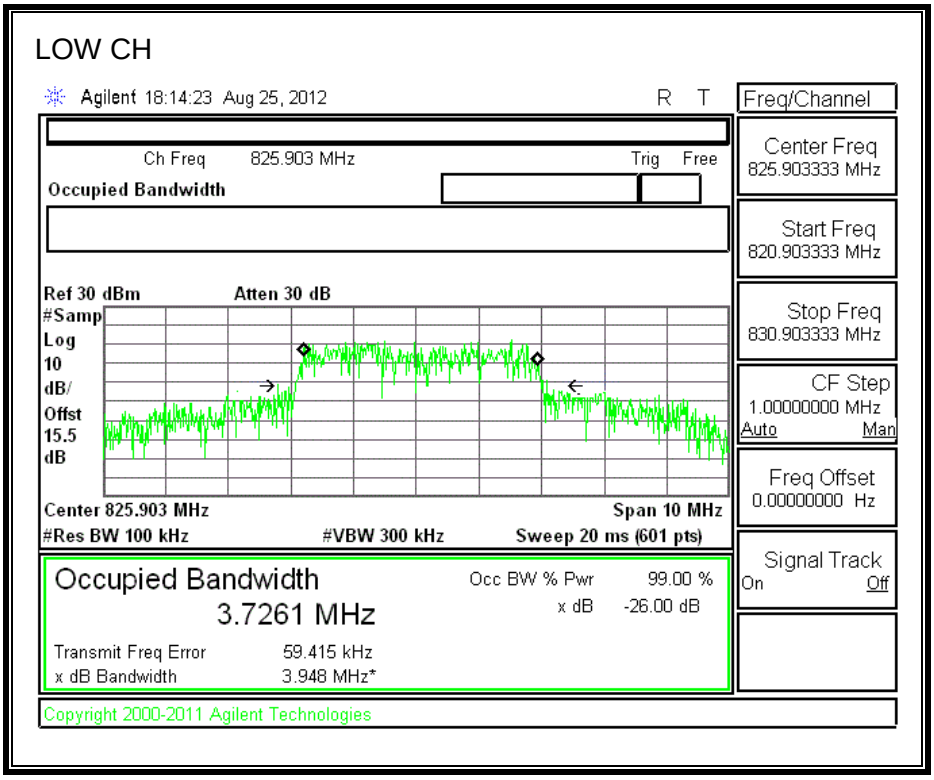
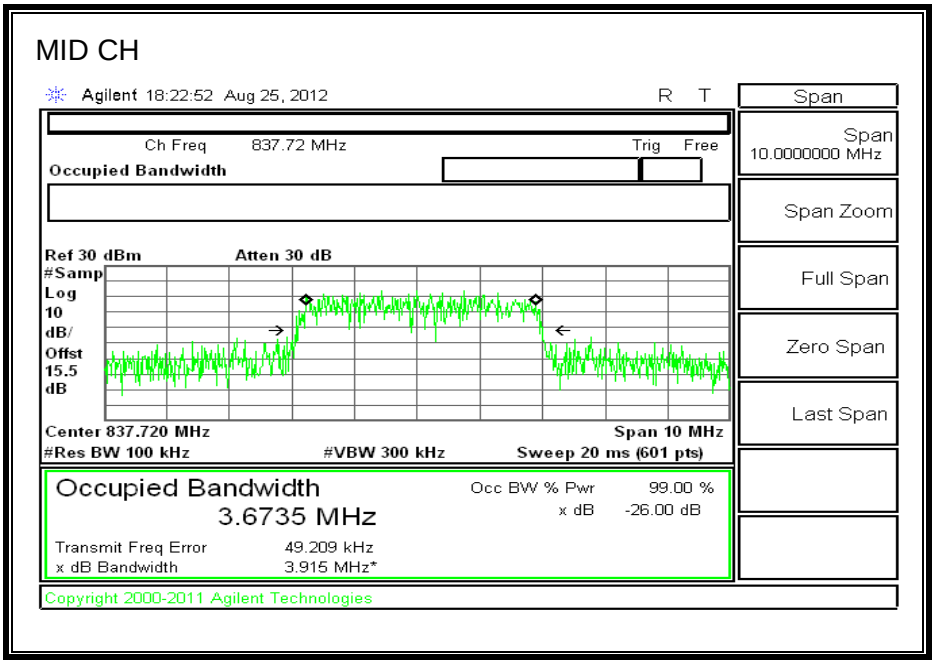
CDMA2000 1XEV-DO REV B CELLULAR BAND

Three Carriers Minimum Separation





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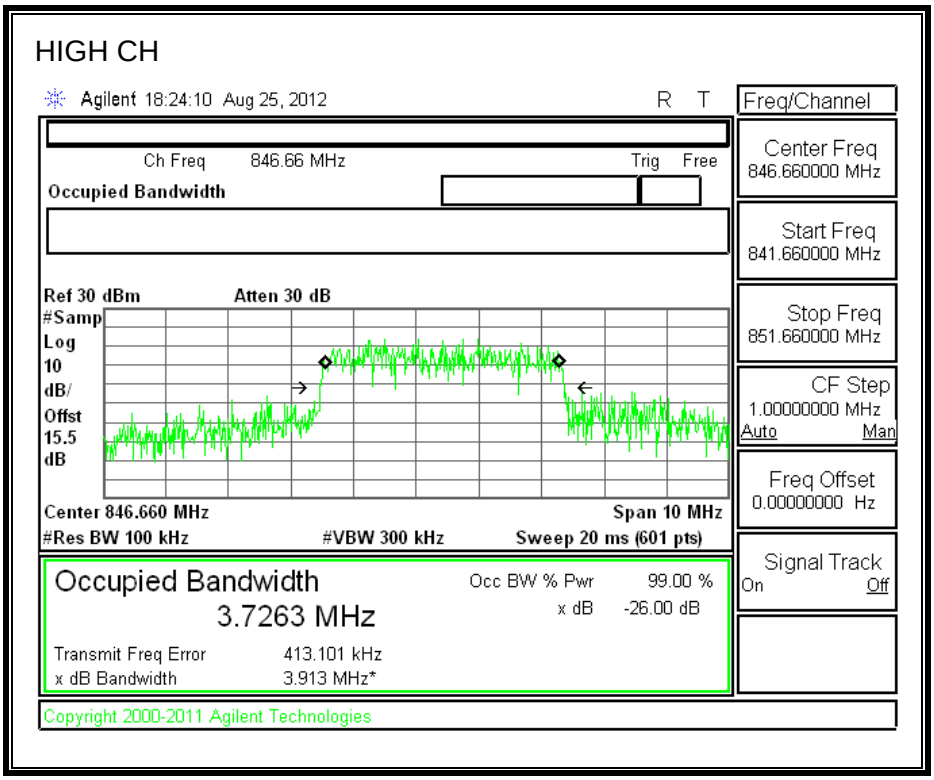
HIGH CH



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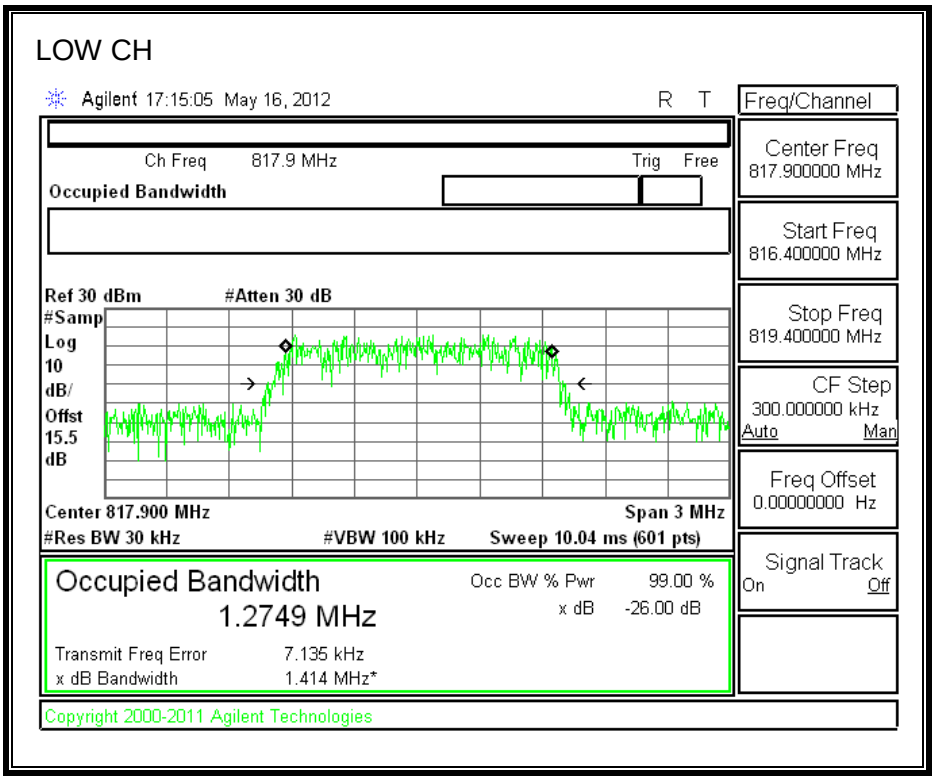
CDMA2000 1xRTT BC10

LOW CH



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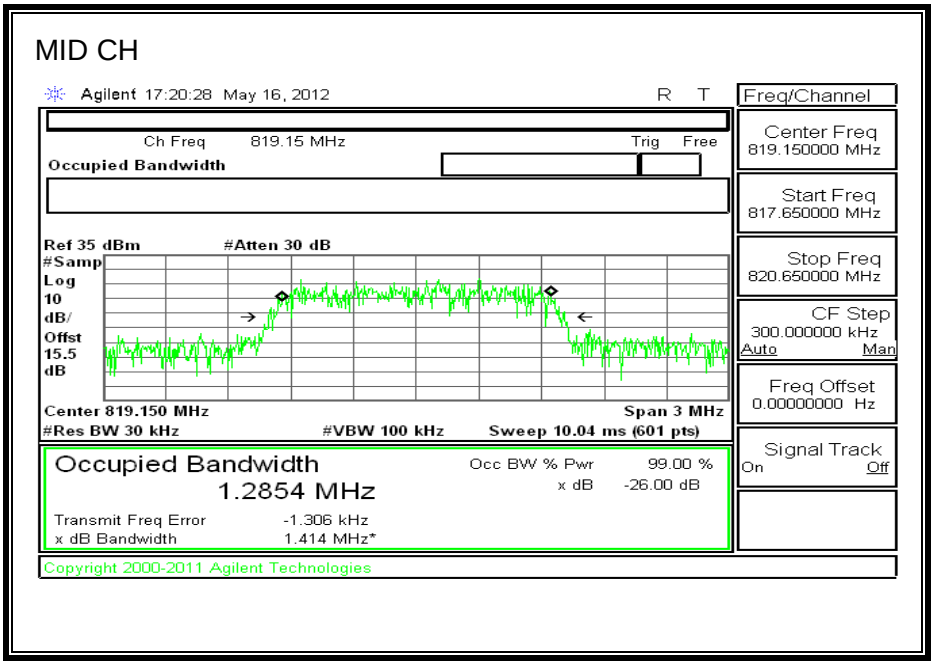

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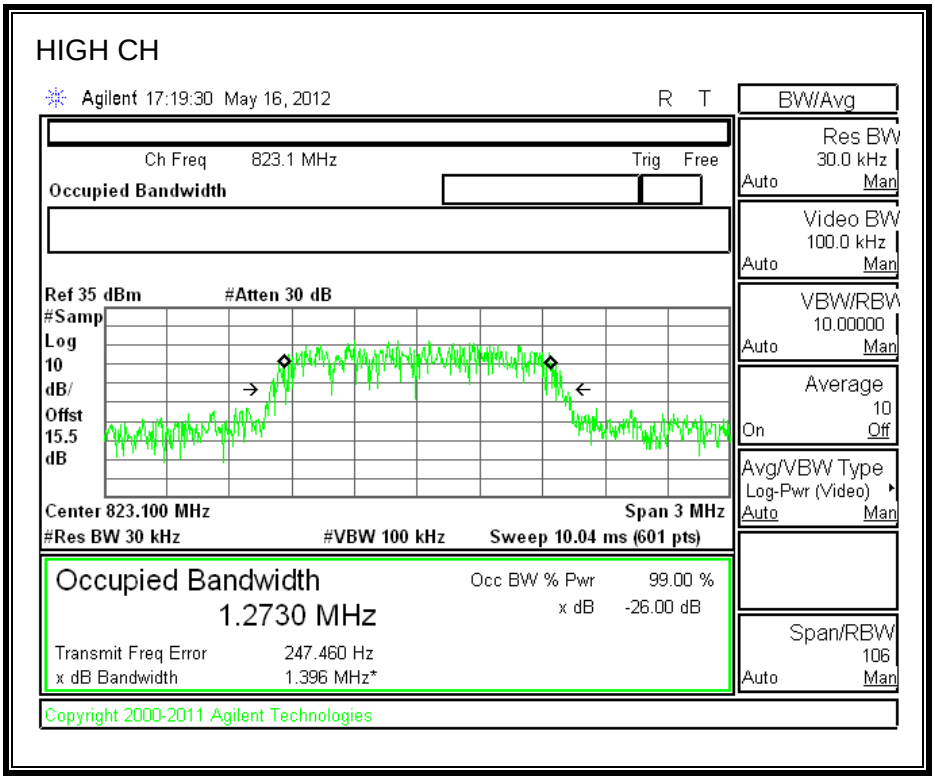

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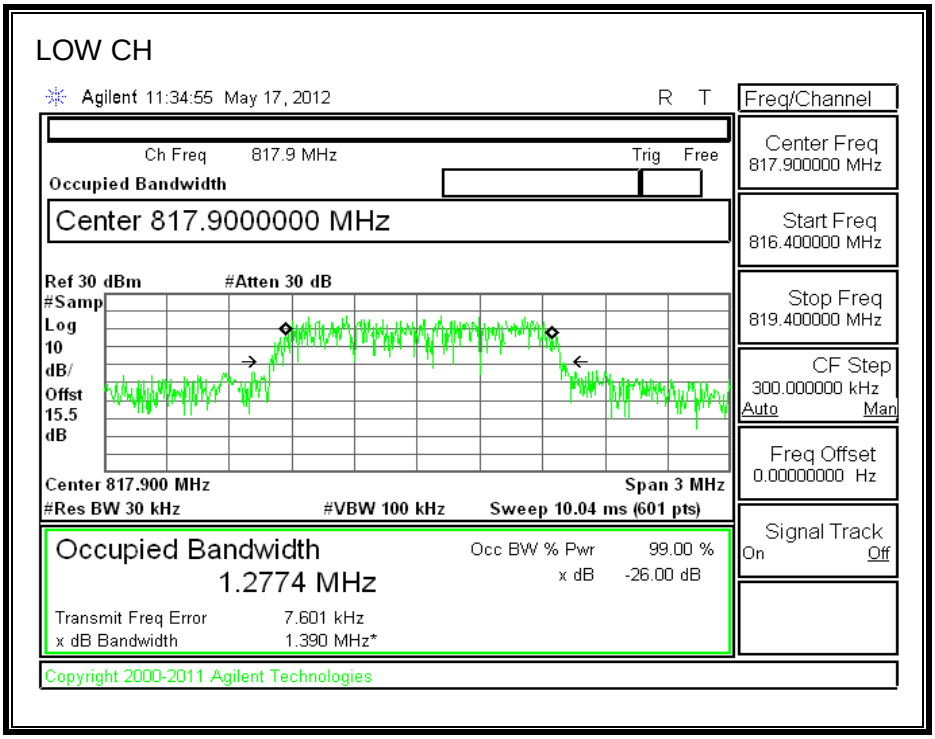
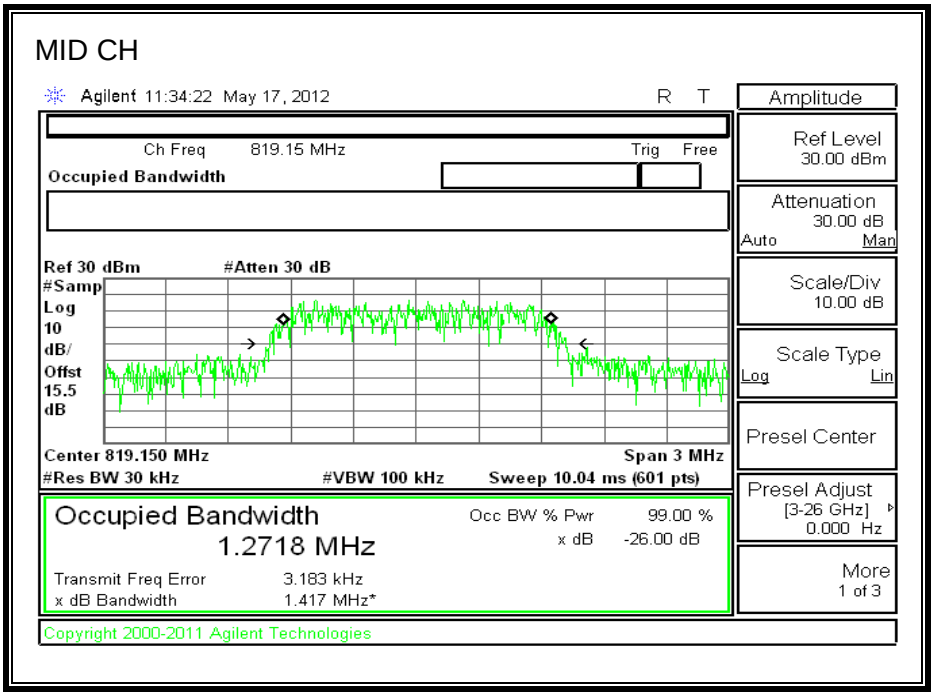
CDMA2000 EVDO, BC10





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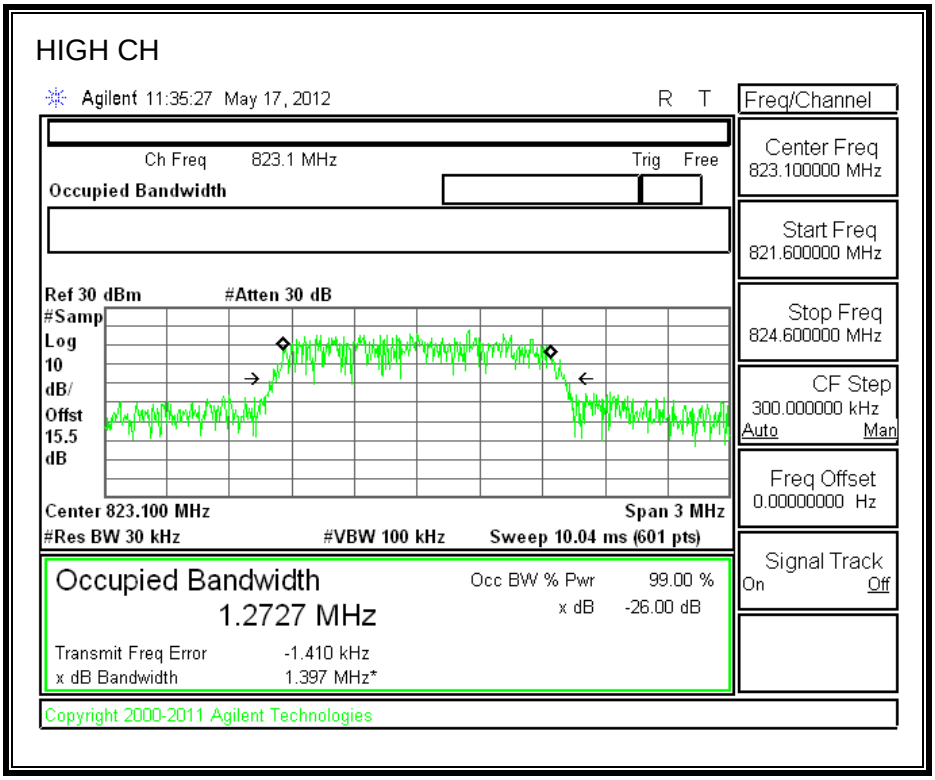
HIGH CH



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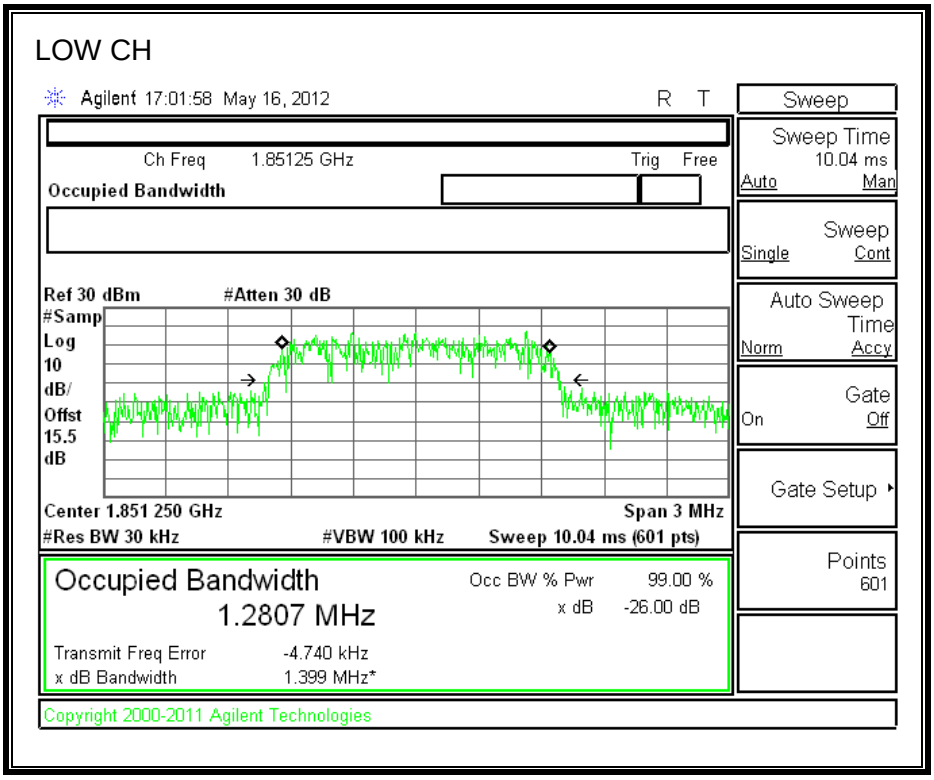
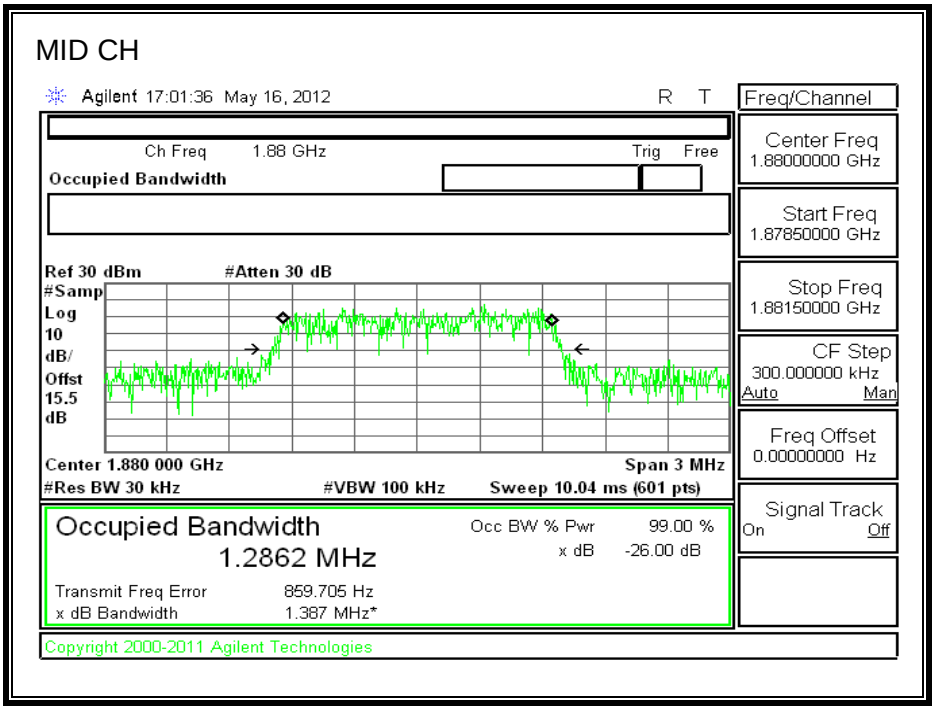
CDMA2000 1xRTT Mode (PCS Band)

LOW CH



MID CH



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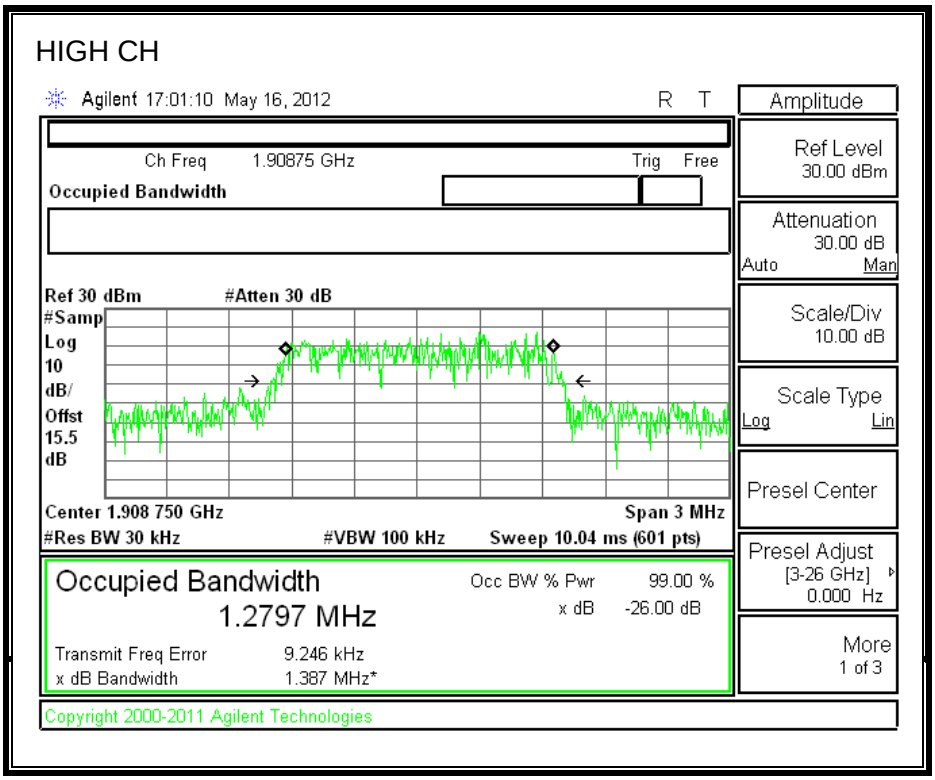

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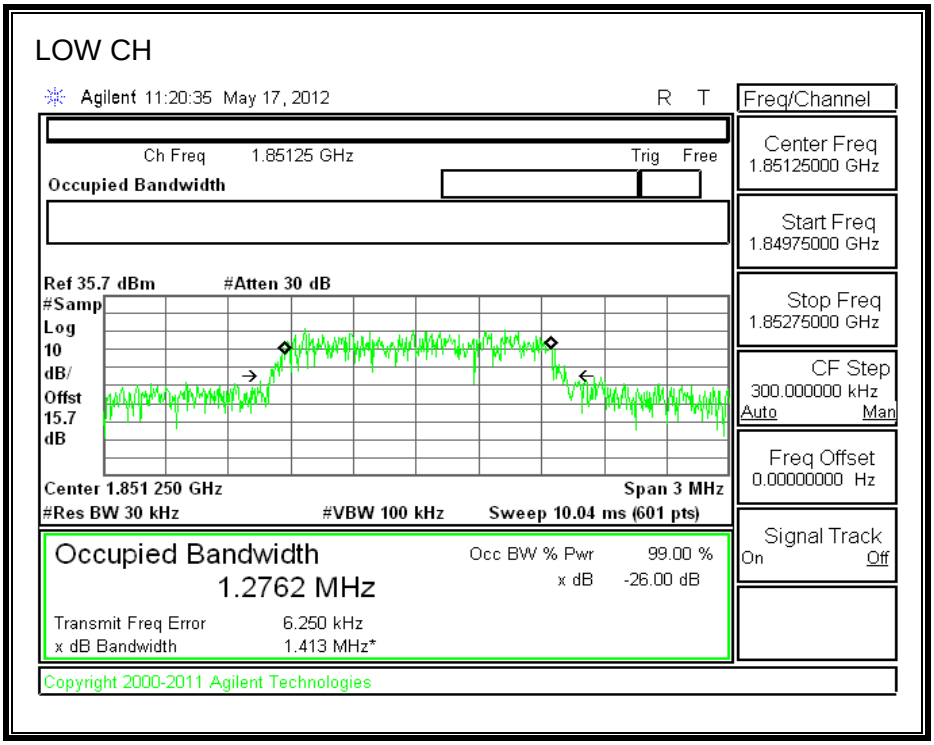
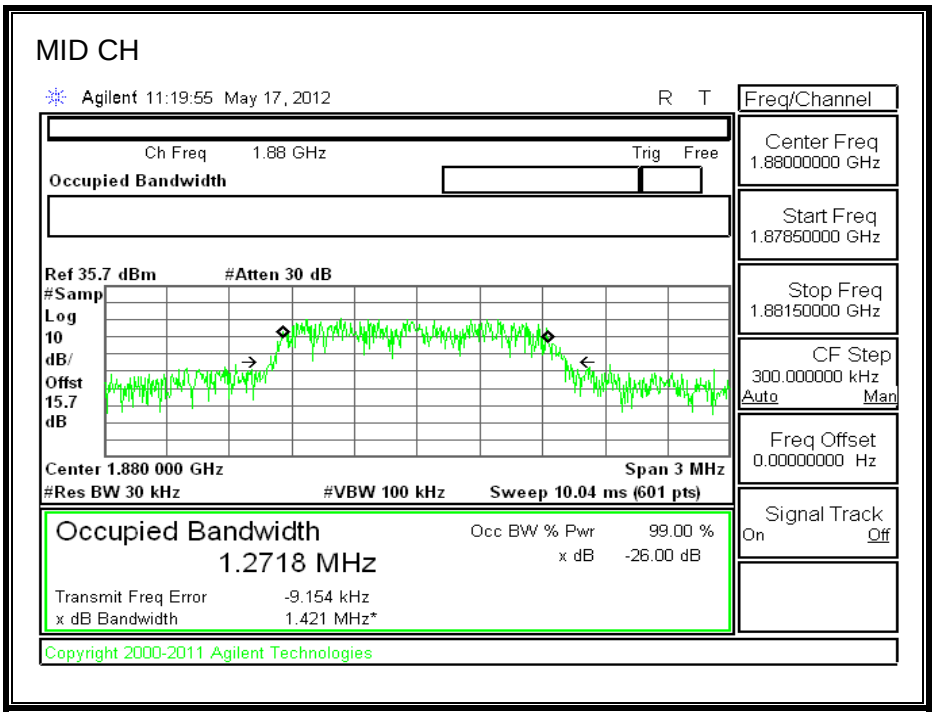
CDMA2000 1xEV-DO Revision A (Rev. A) Mode (PCS Band)

LOW CH



MID CH



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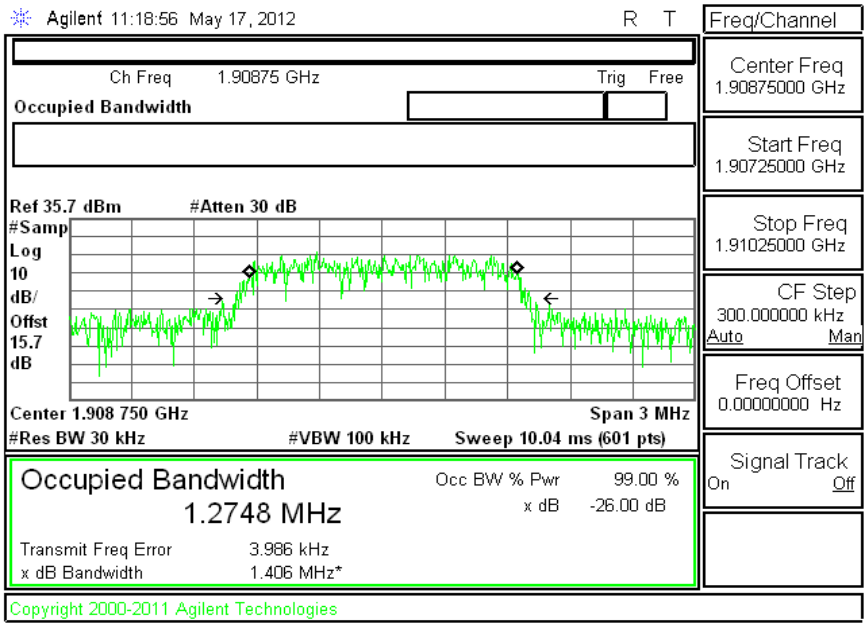
HIGH CH



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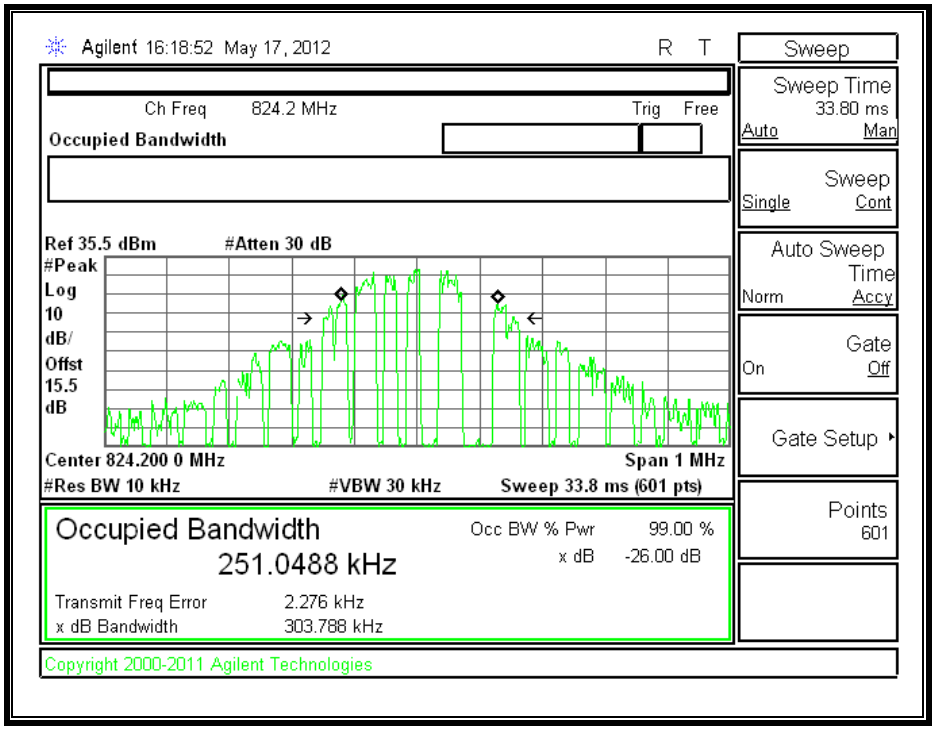
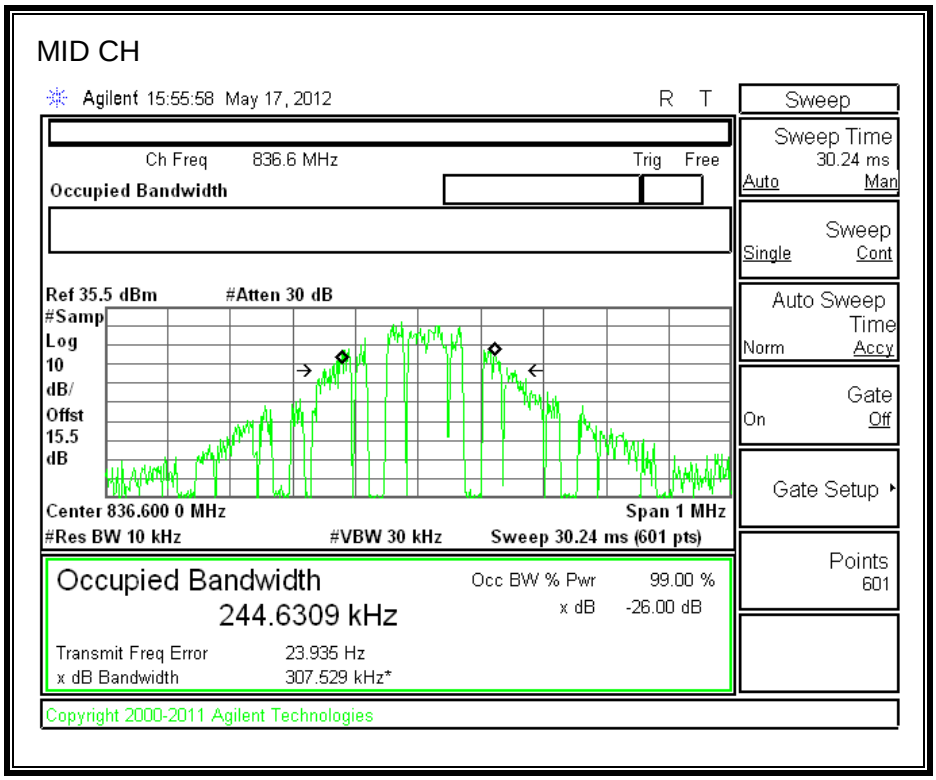
GPRS850 BAND





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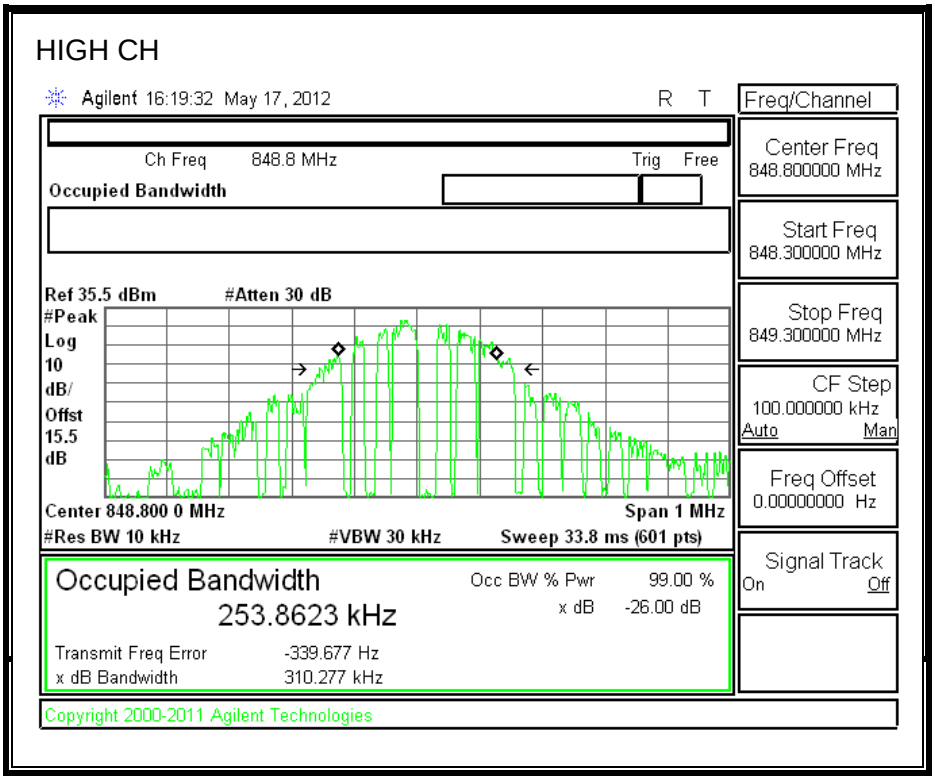
HIGH CH



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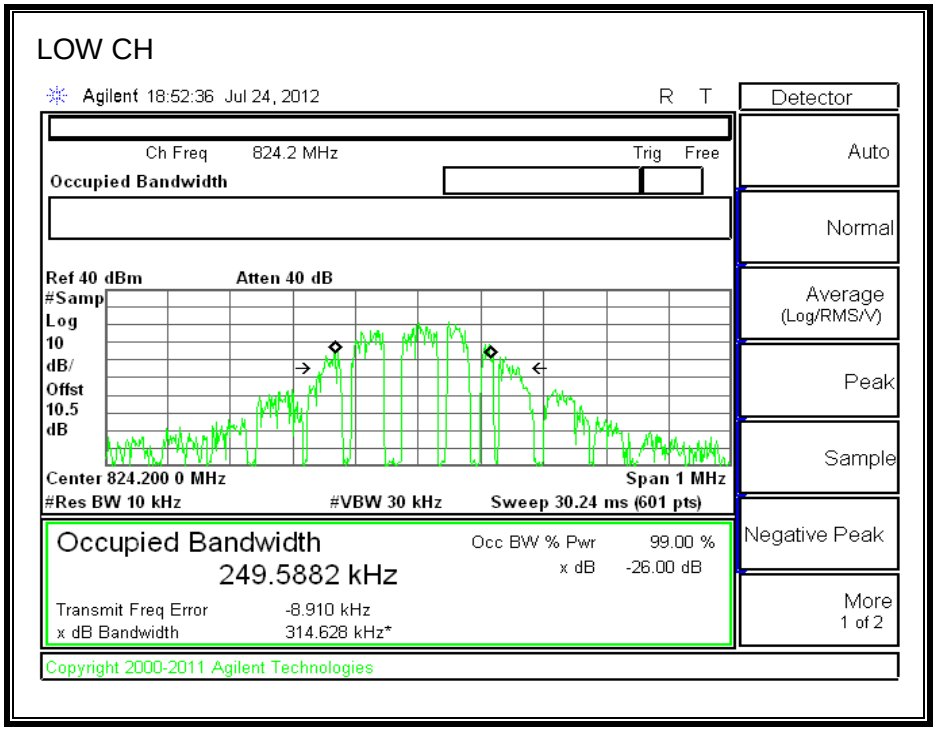
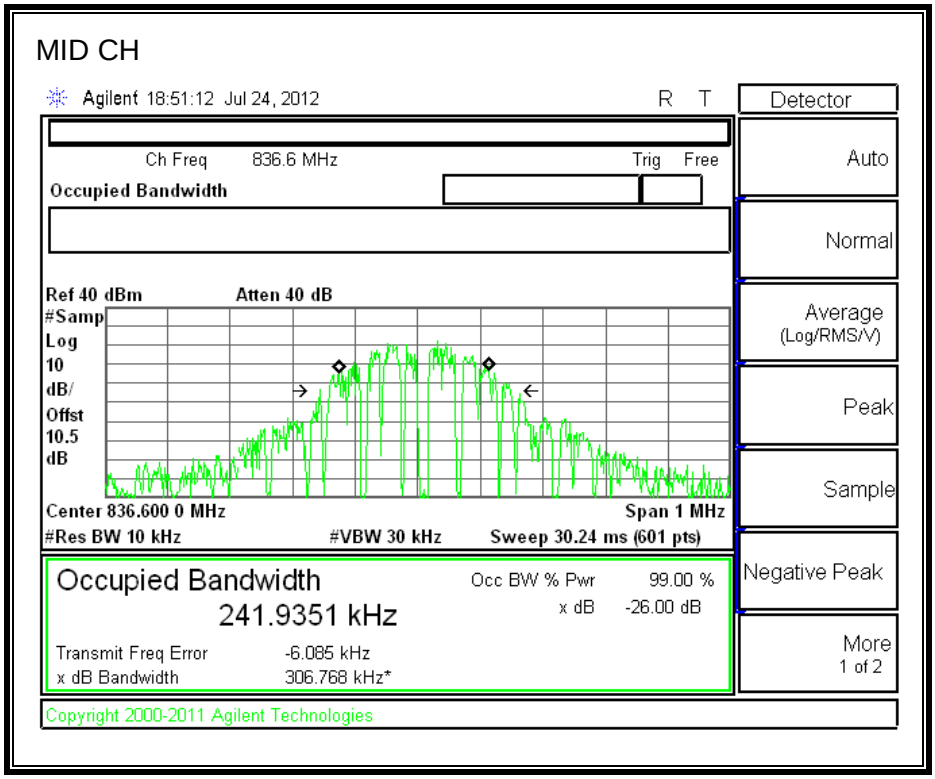
EGPRS850 BAND

LOW CH



MID CH



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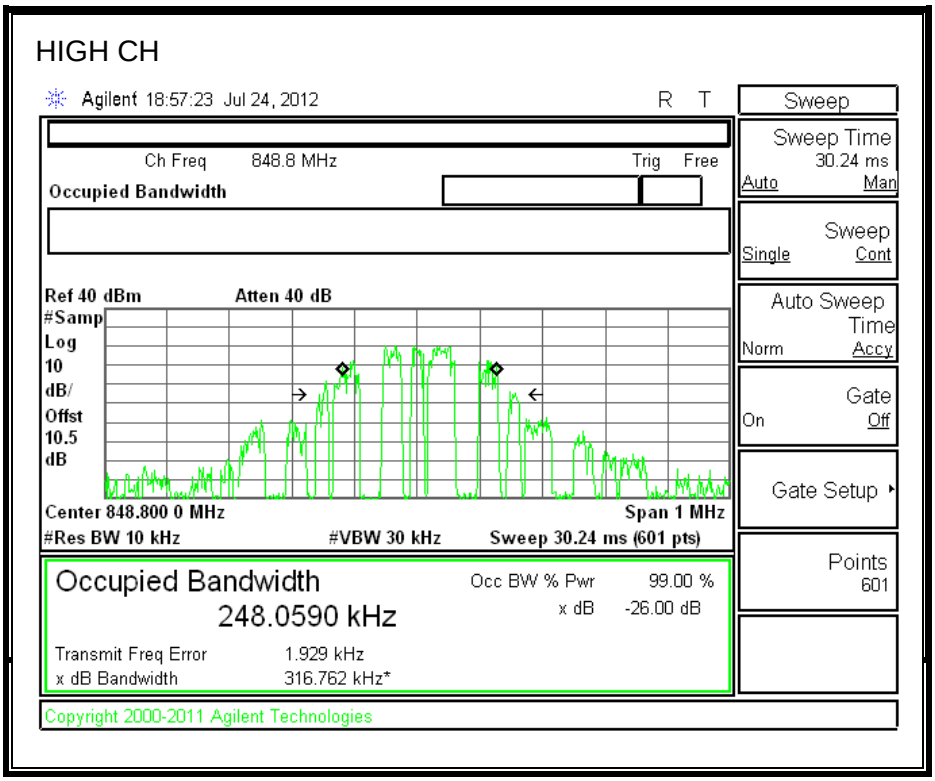
HIGH CH



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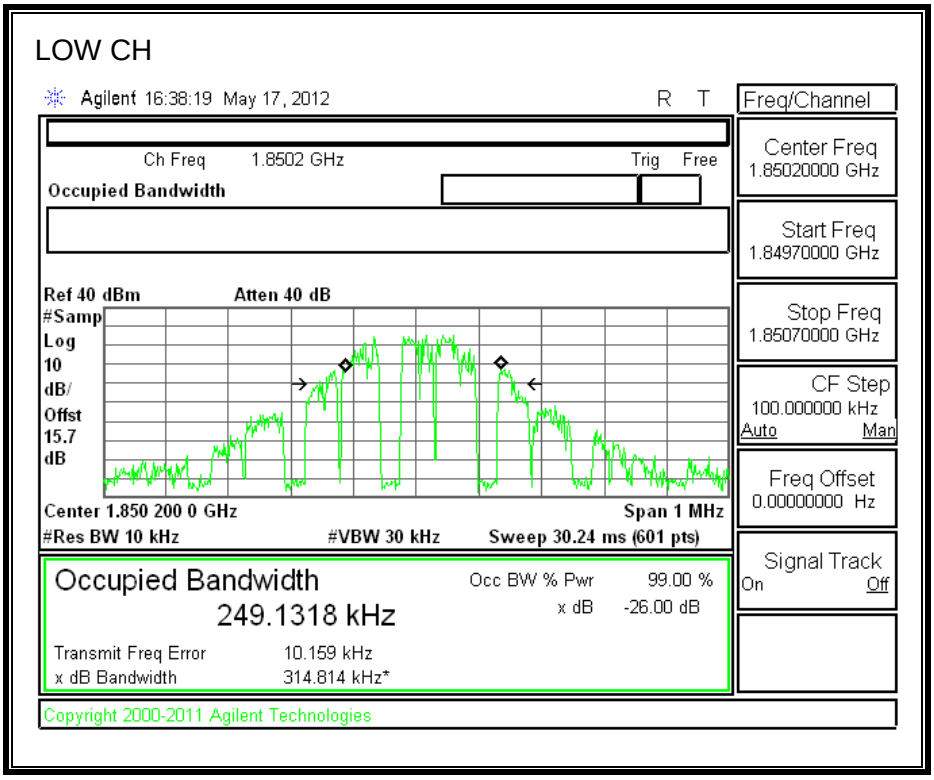
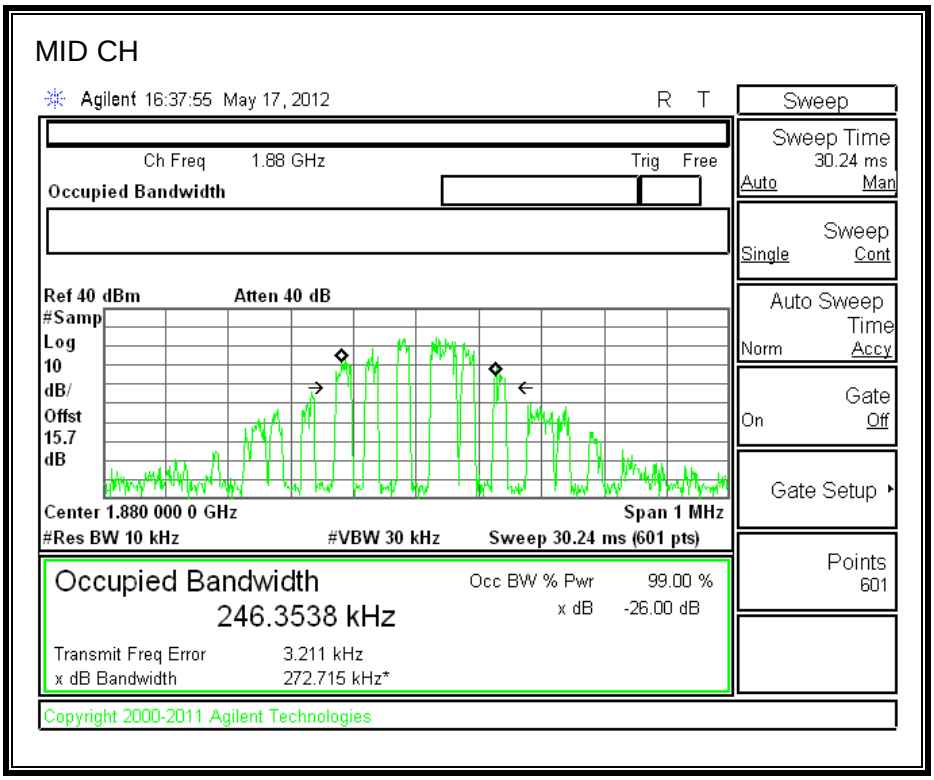
GPRS1900 BAND





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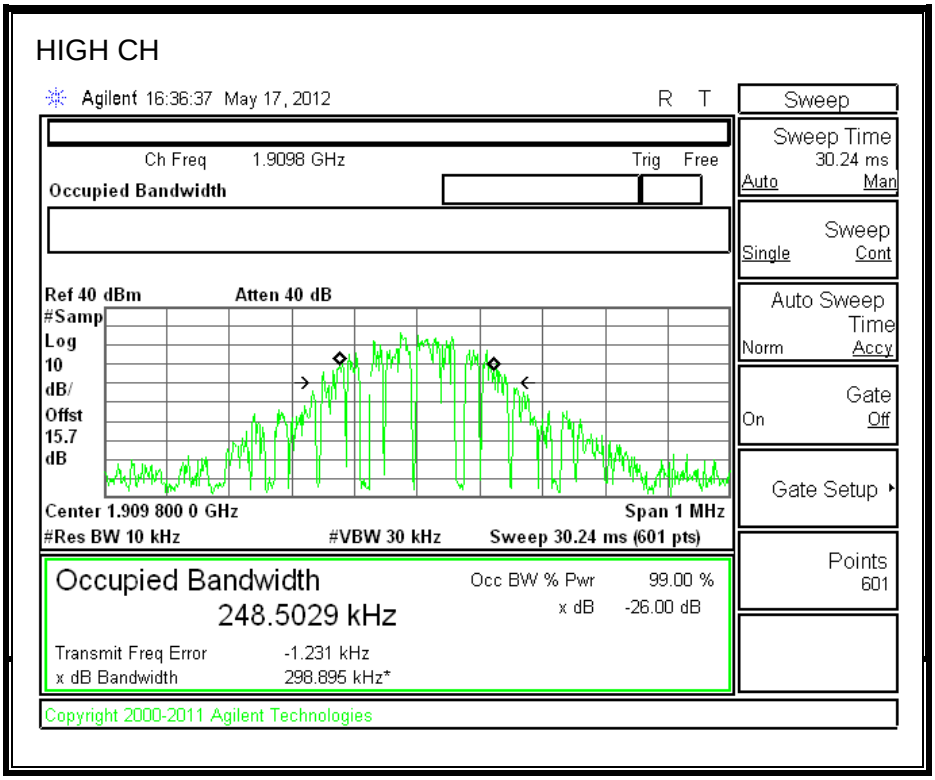
HIGH CH



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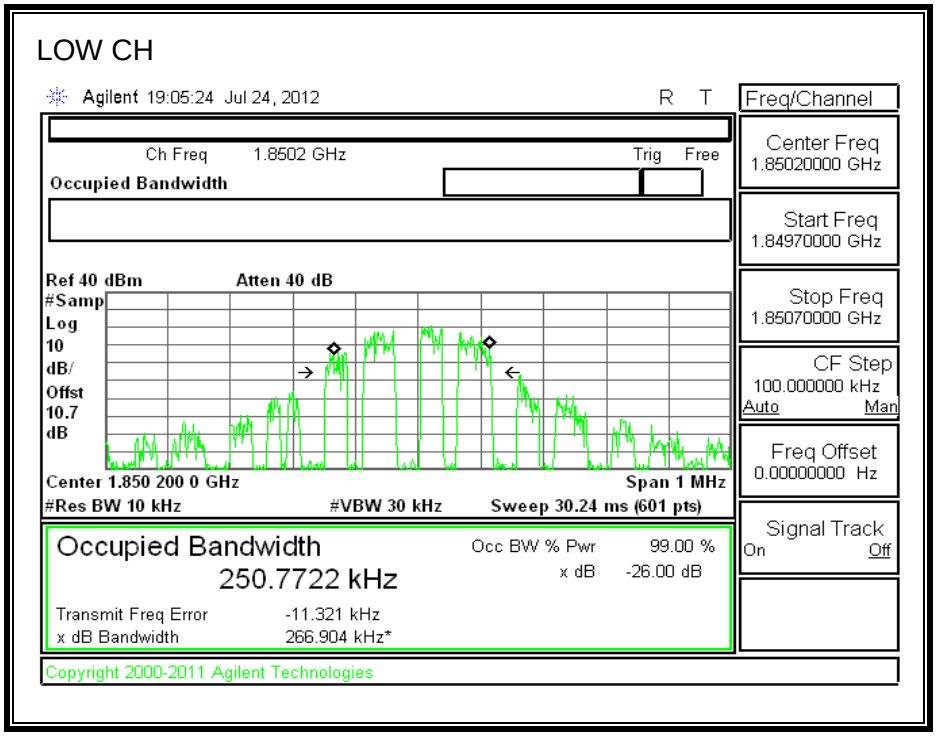
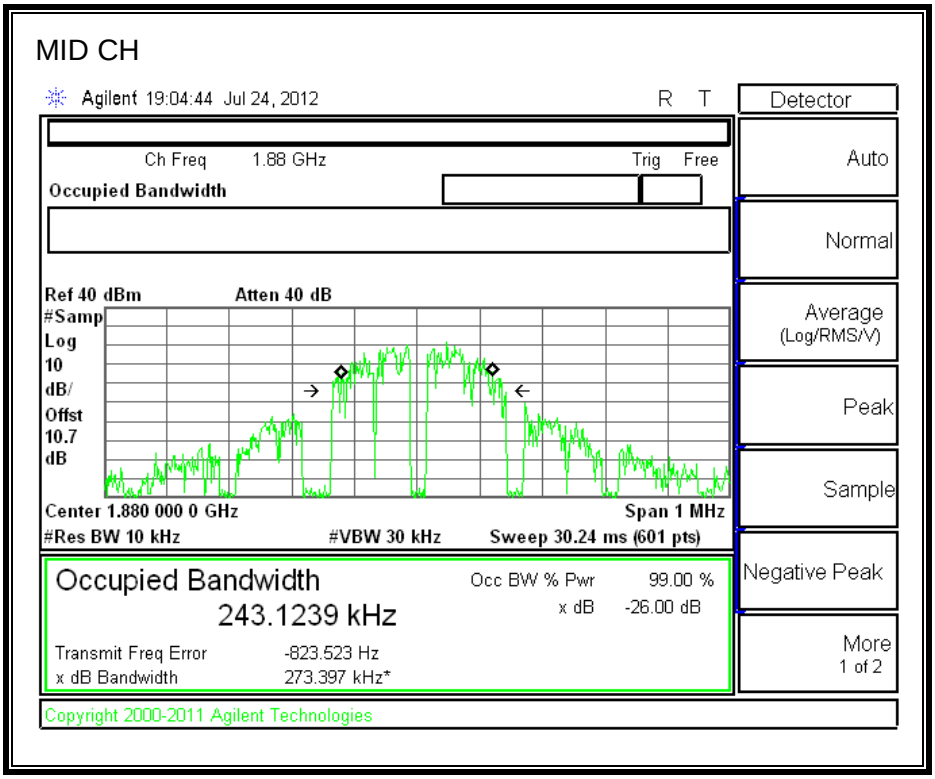
EGPRS1900 BAND

LOW CH



MID CH



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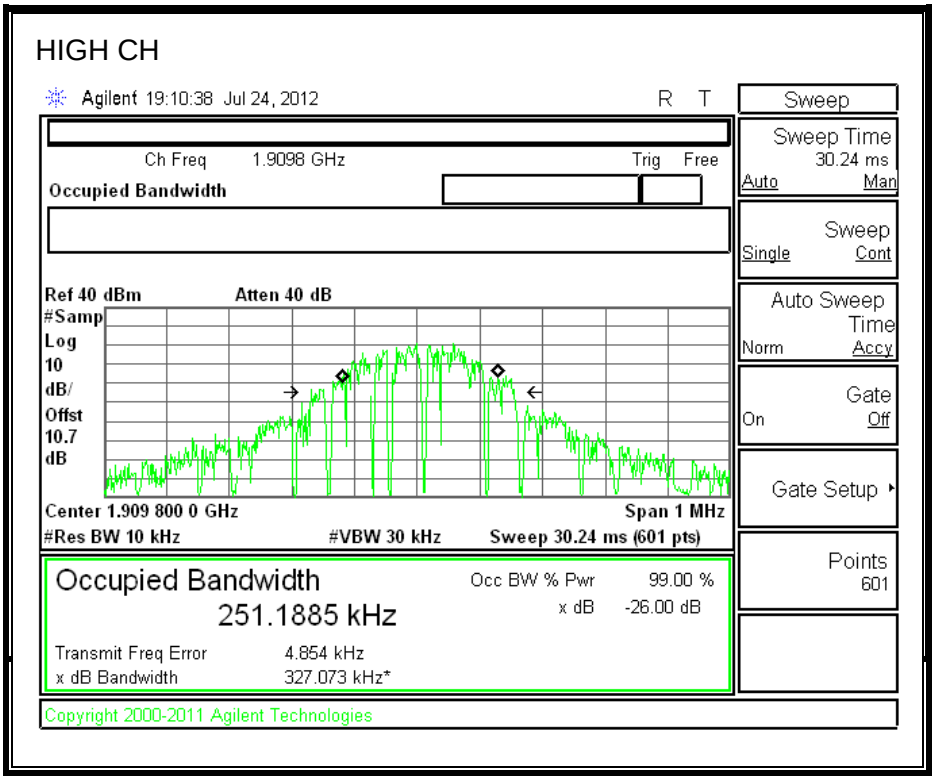
HIGH CH



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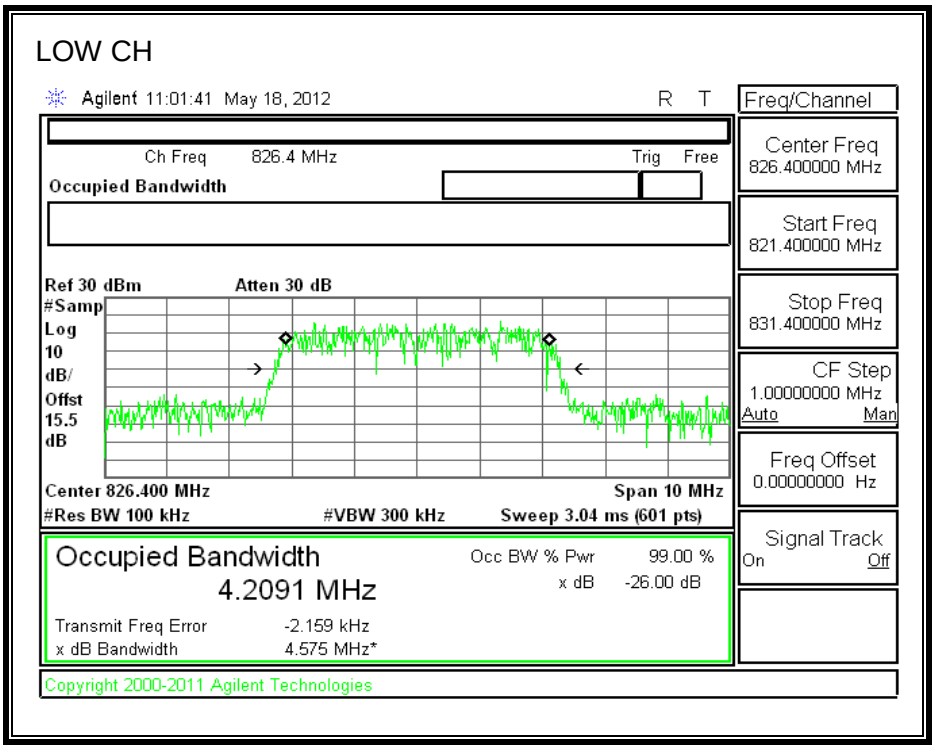
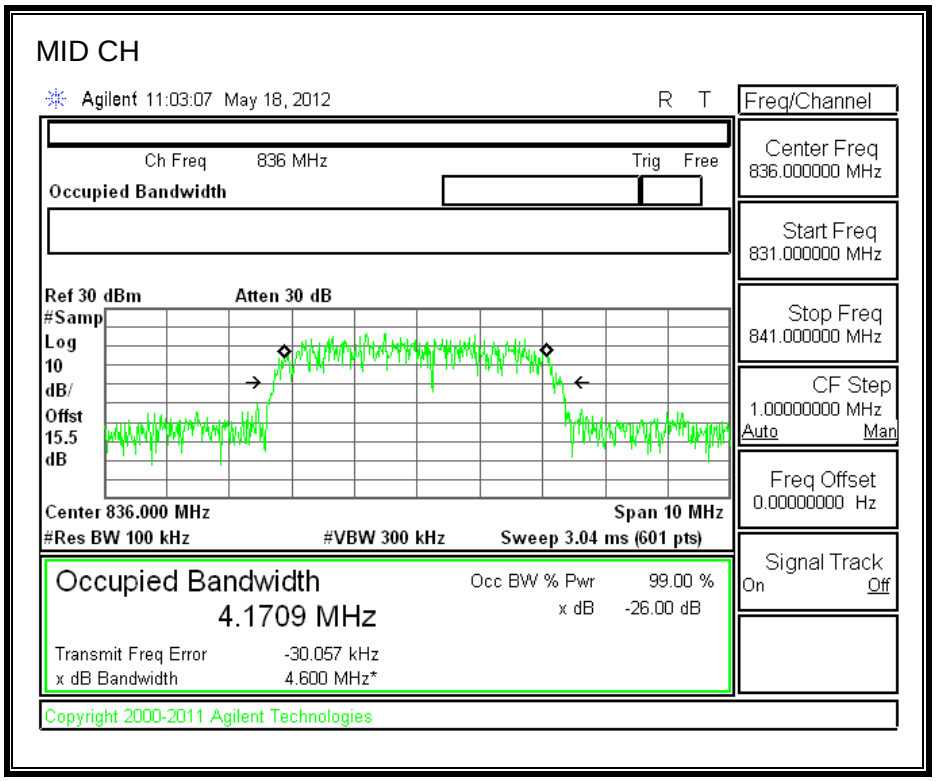
UMTS WCDMA Rel 99, Cell BAND

LOW CH



MID CH



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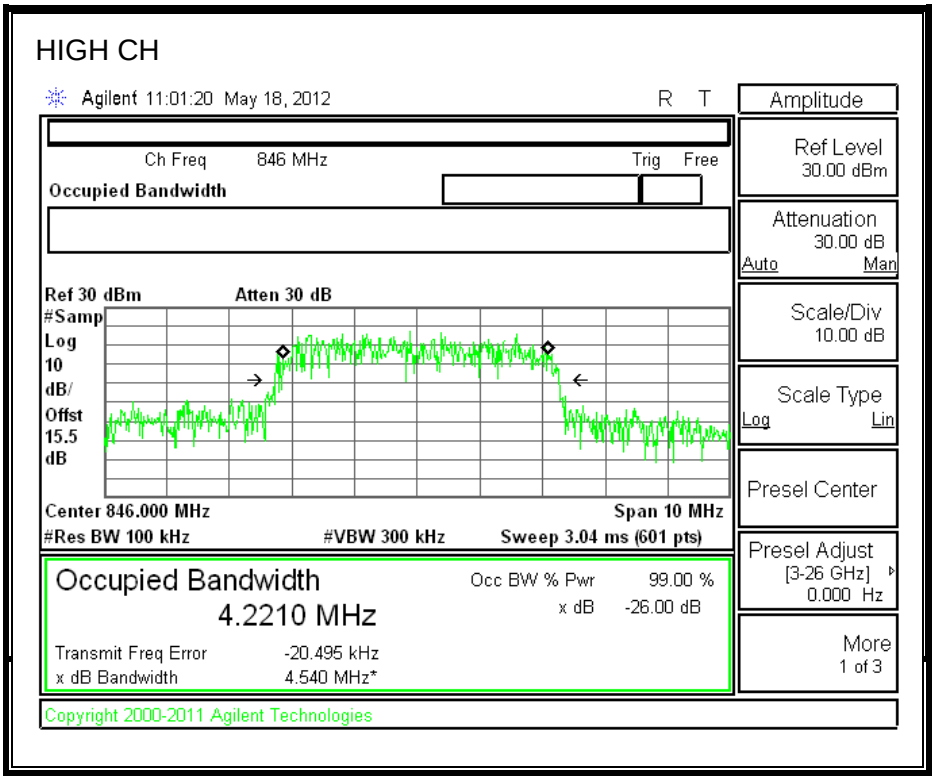
HIGH CH



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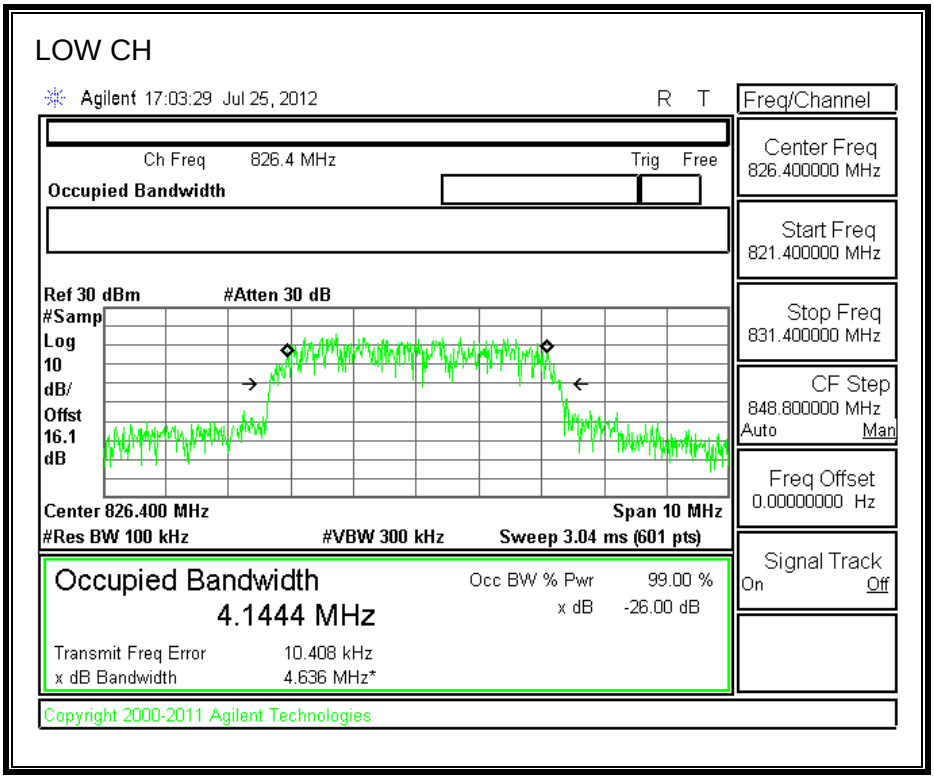
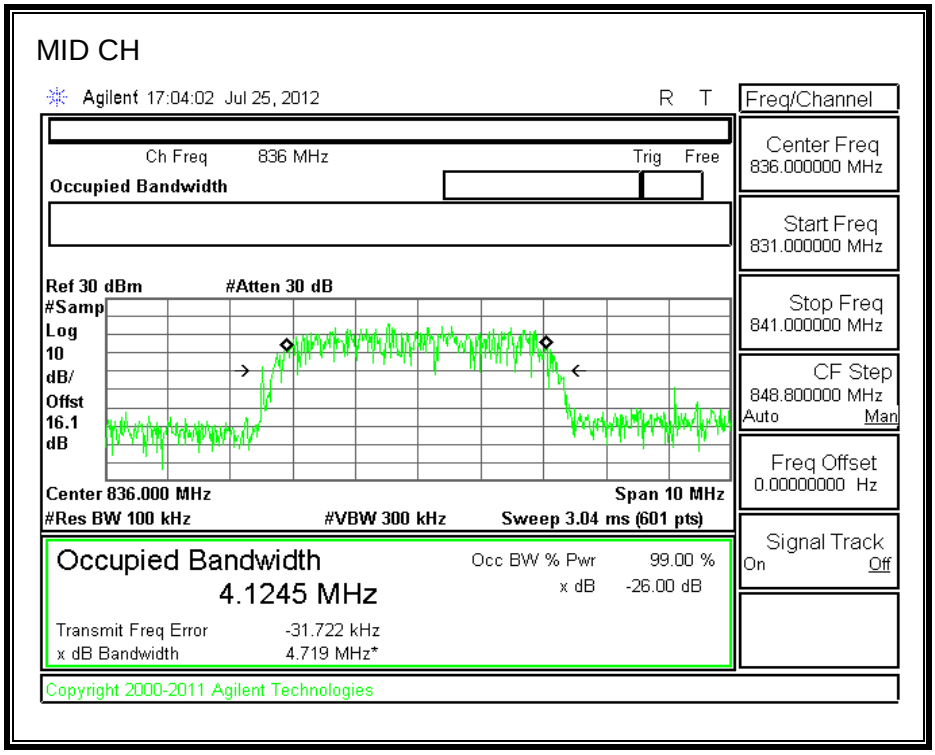
UMTS HSDPA, Cell BAND

LOW CH



MID CH



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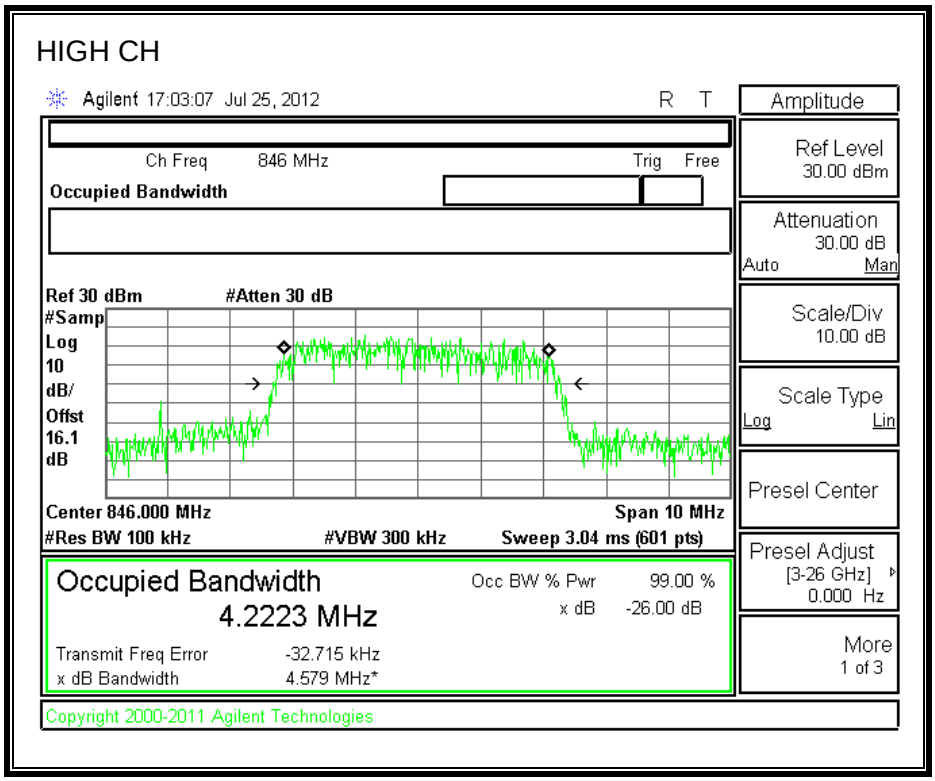

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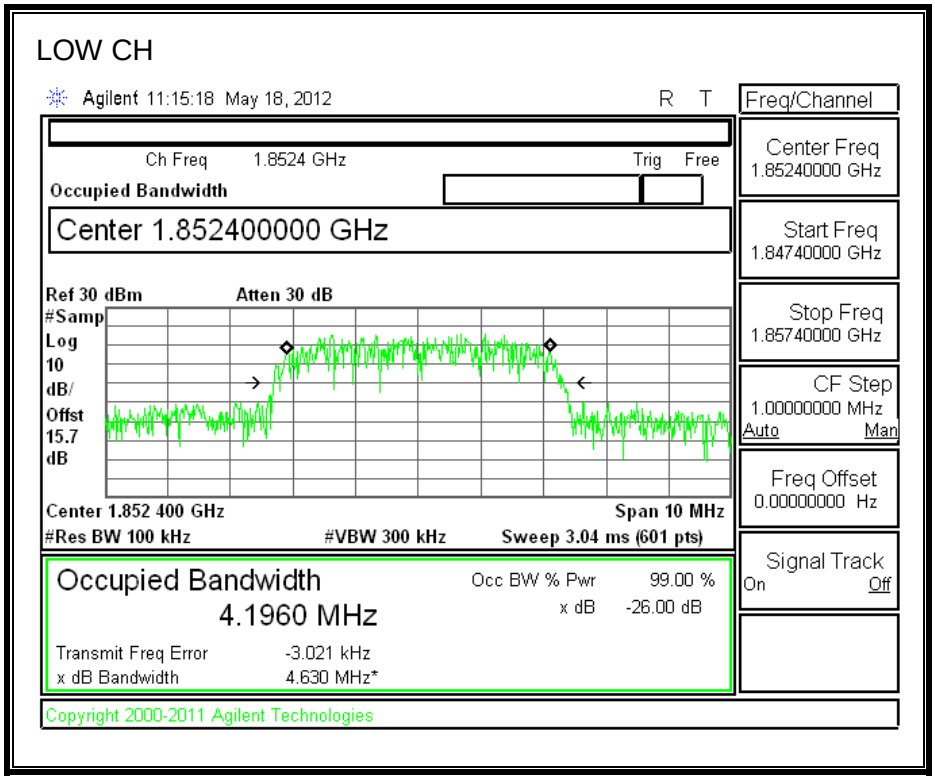
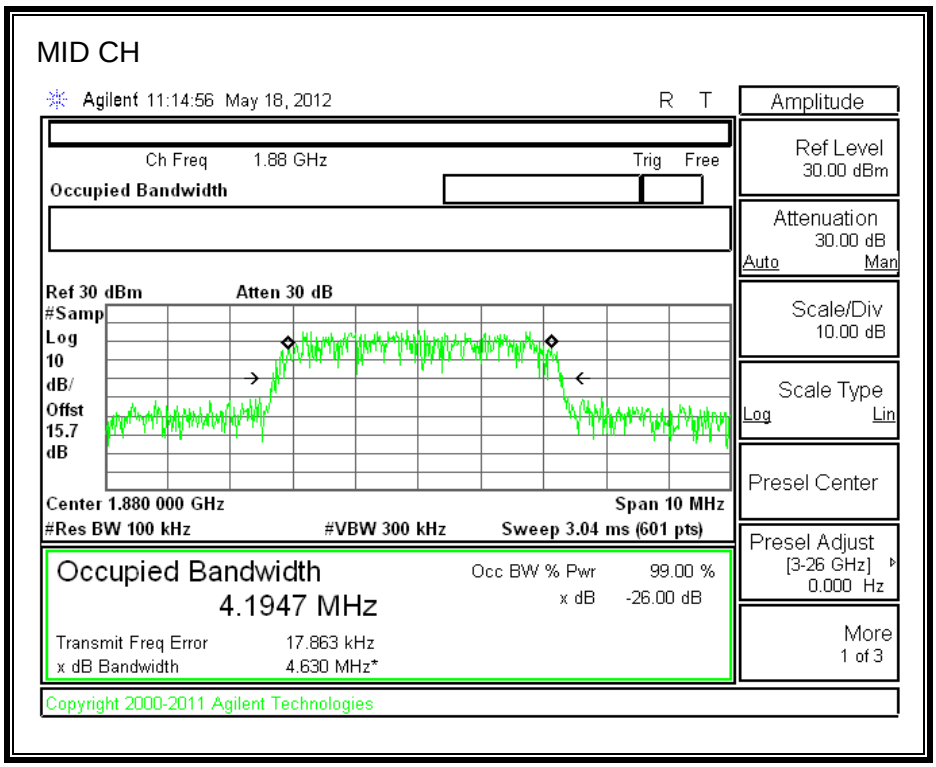
UMTS WCDMA REL 99. PCS Band

LOW CH

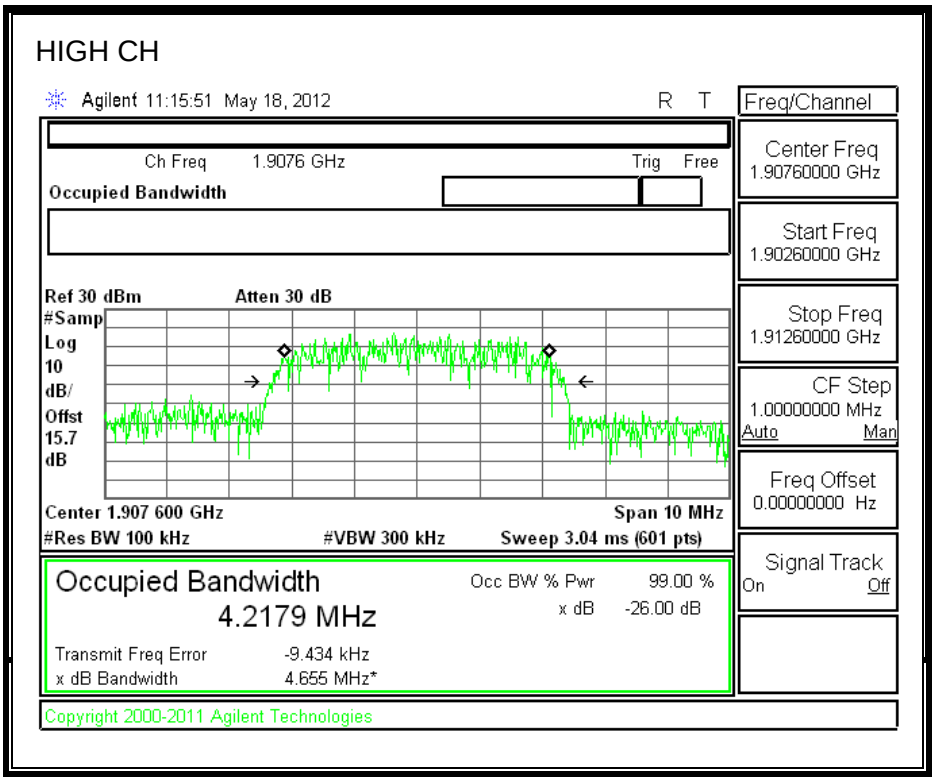


MID CH



This report shall not be reproduced except in full, without the written approval of UL.CCS.

HIGH CH



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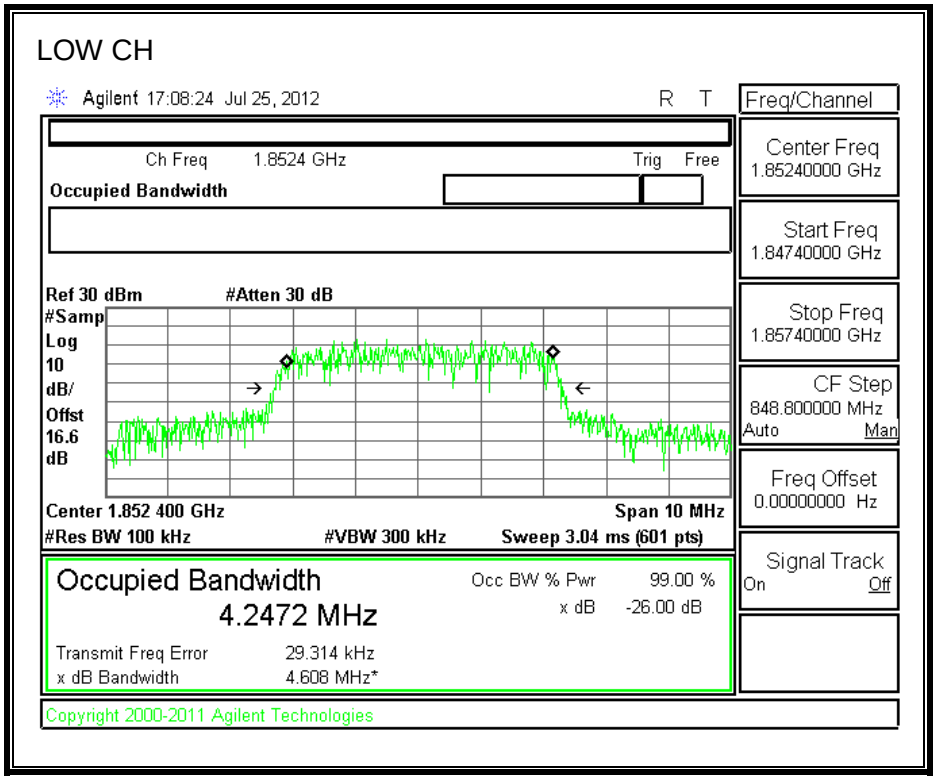
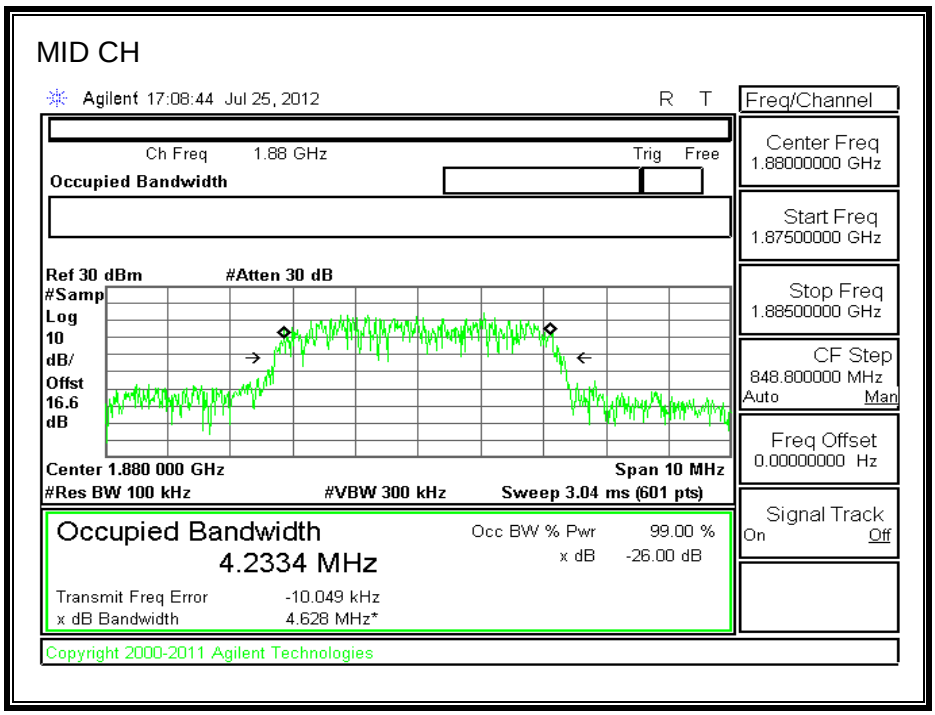
UMTS HSDPA. PCS Band





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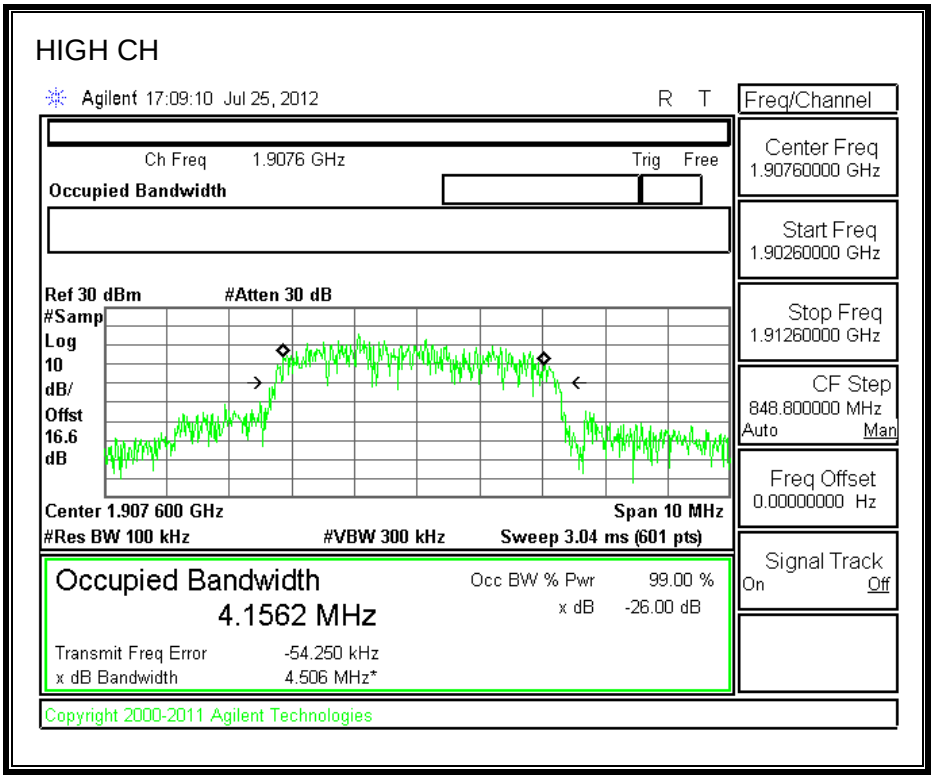
HIGH CH



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8.2. BAND EDGE

RULE PART(S)

FCC: §22.359, 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 (824, 848, 1850, 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

- GPRS and EGPRS
- UMTS, REL 99 and HSDPA

RESULTS

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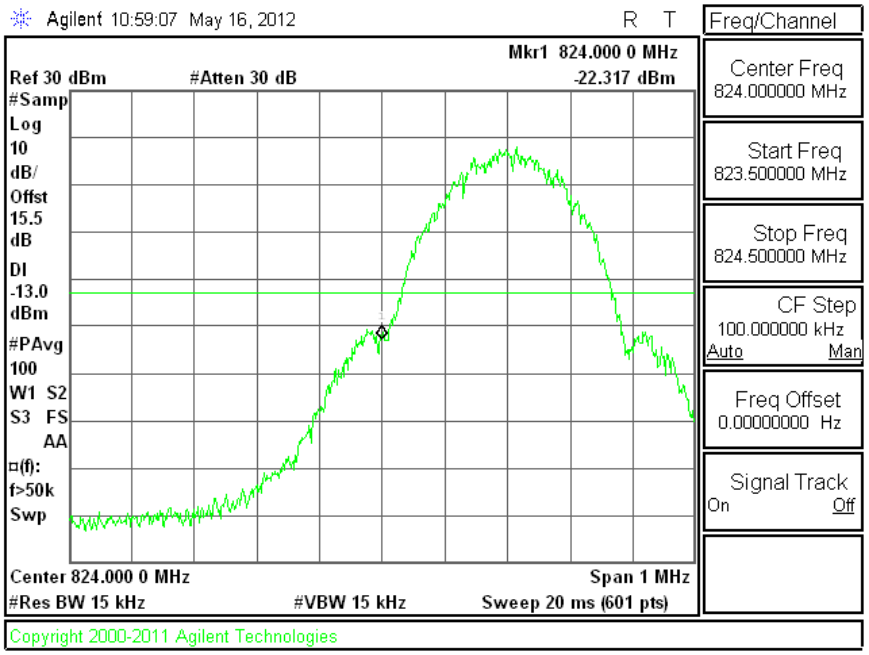
8.2.1. A1428

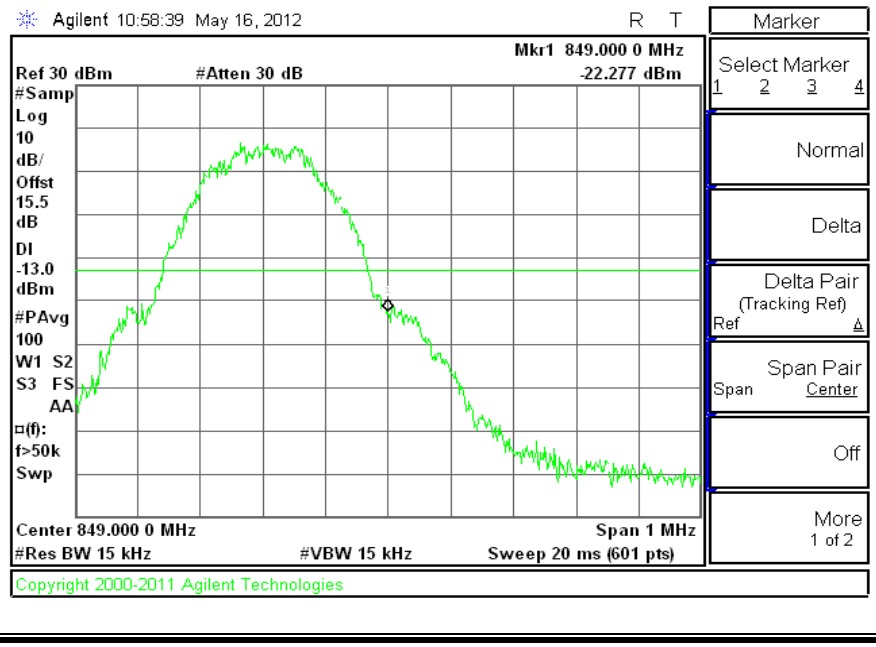
LAT (PORT A) / PRIMARY

GPRS mode (Cellular Band)

LOW CH



HIGH CH



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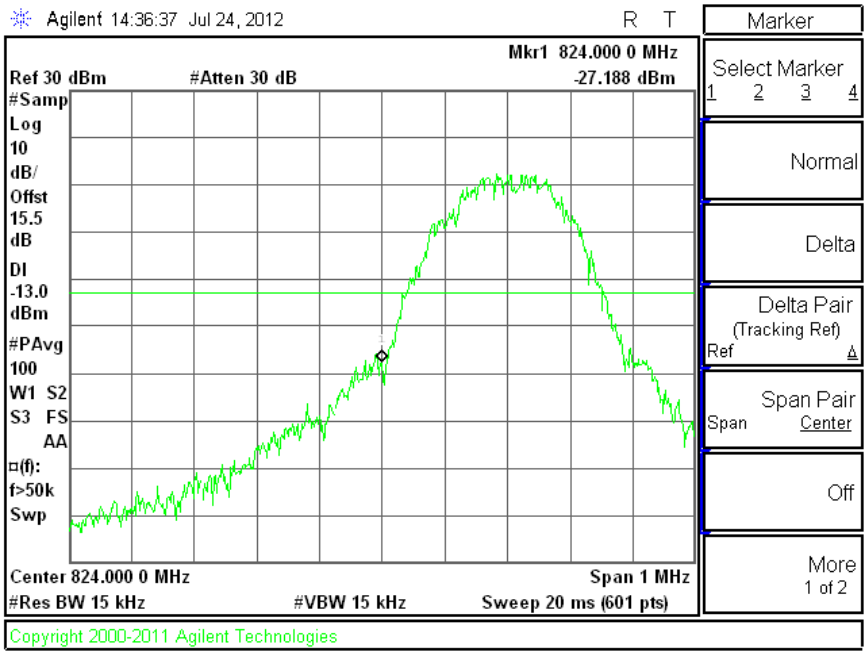
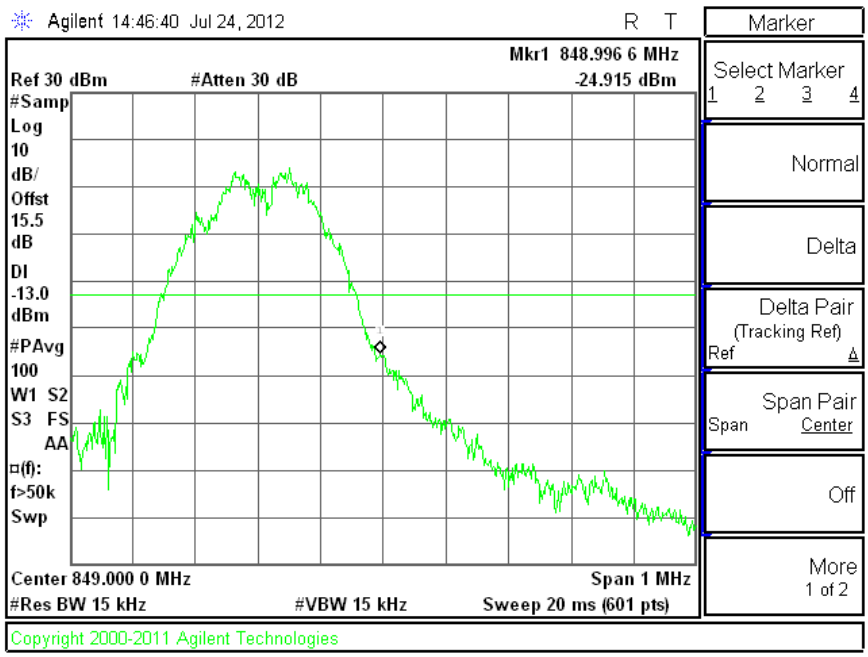
EGPRS850

LOW CH



HIGH CH



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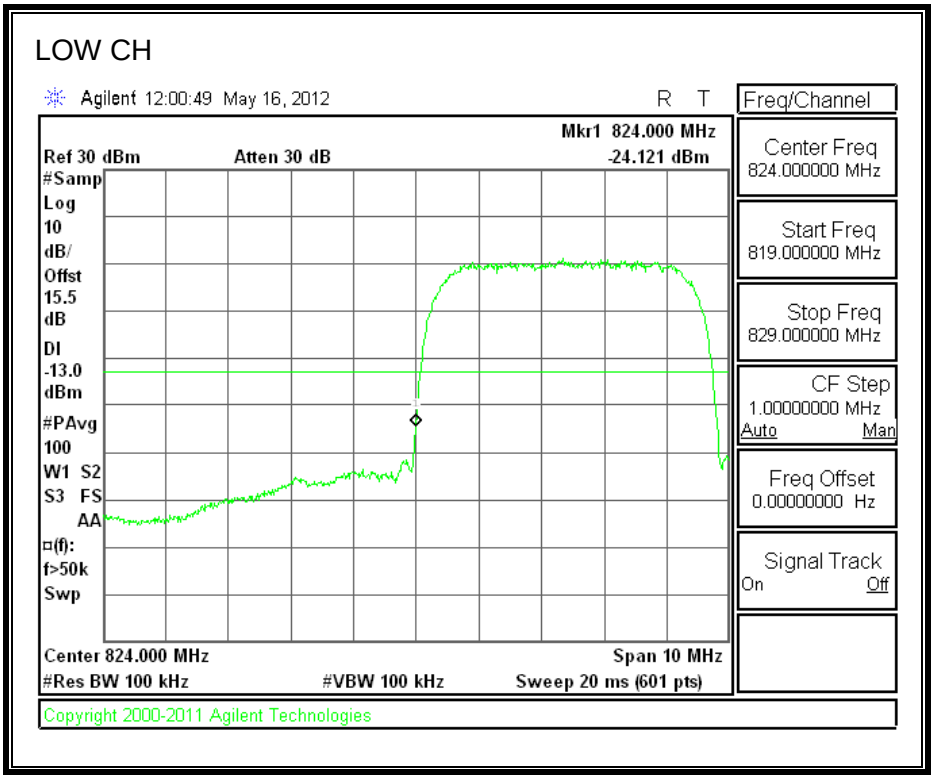
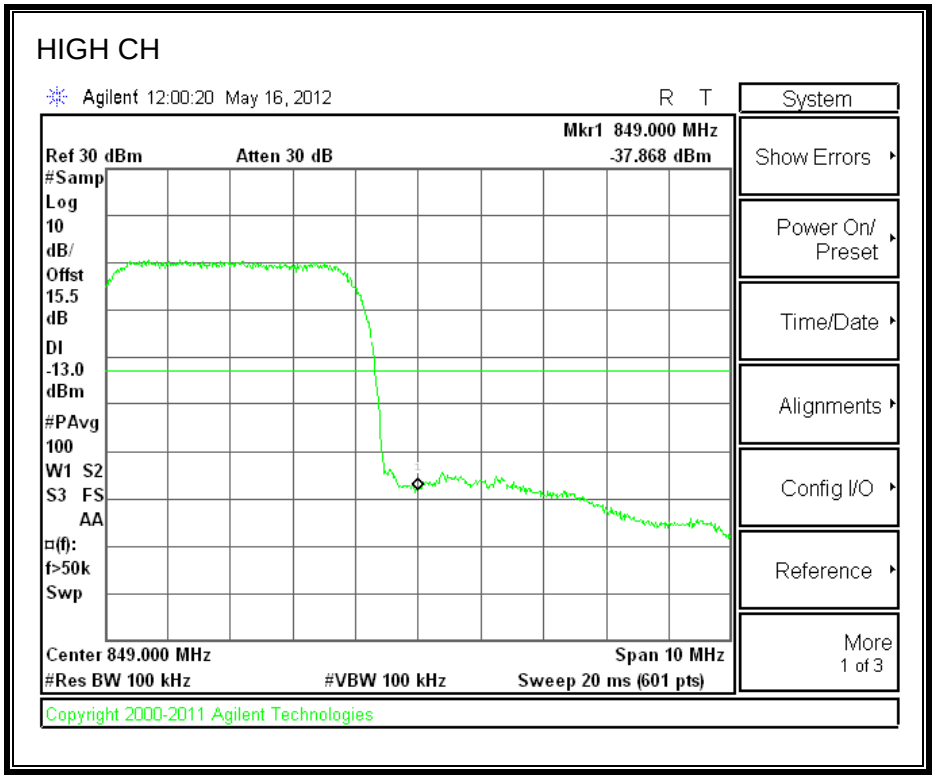
UMTS850, REL99

LOW CH



HIGH CH



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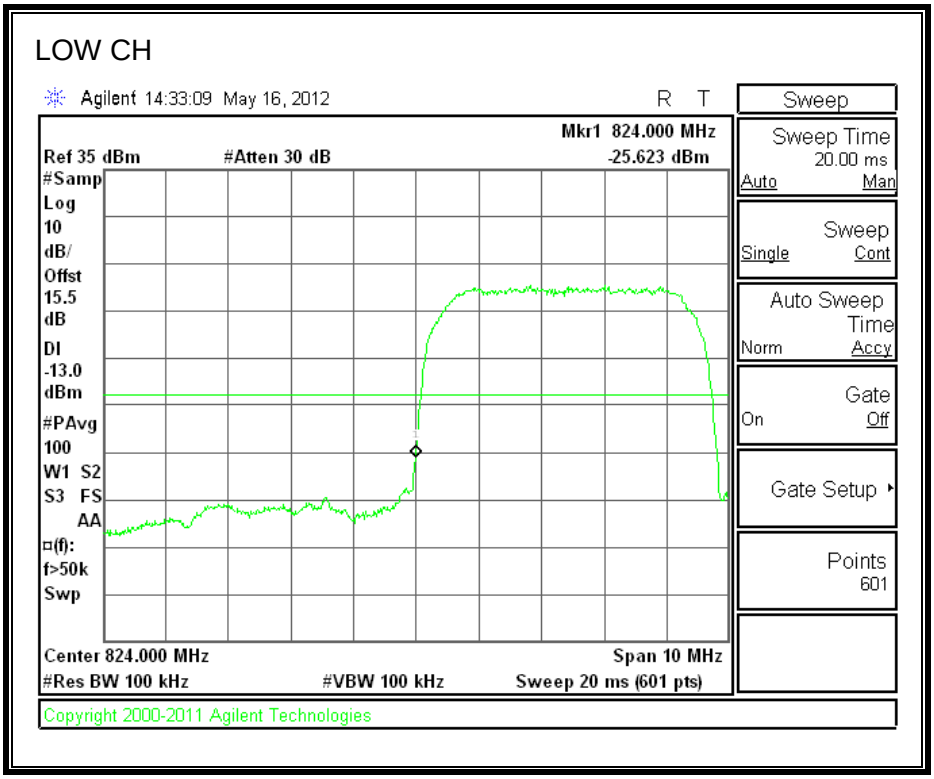
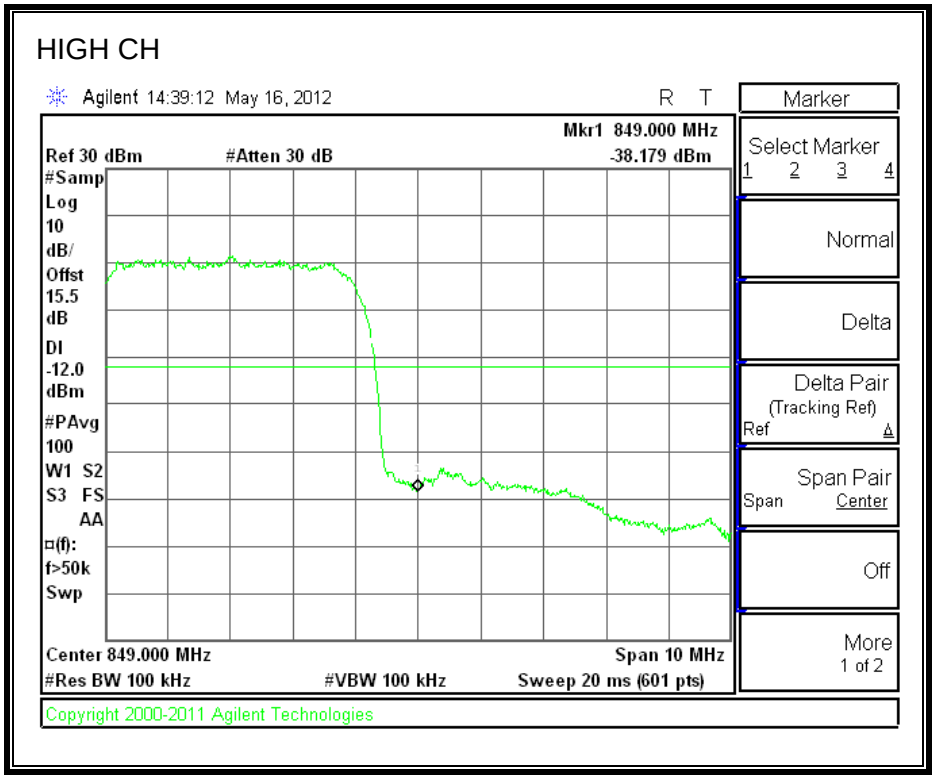
UMTS850, HSDPA

LOW CH



HIGH CH



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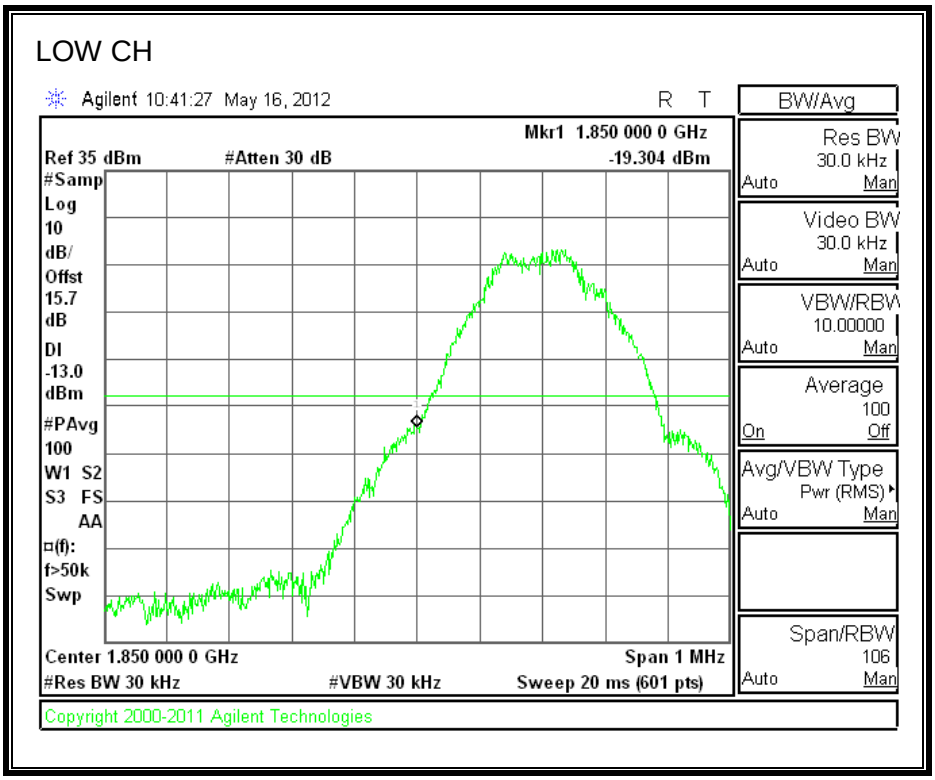
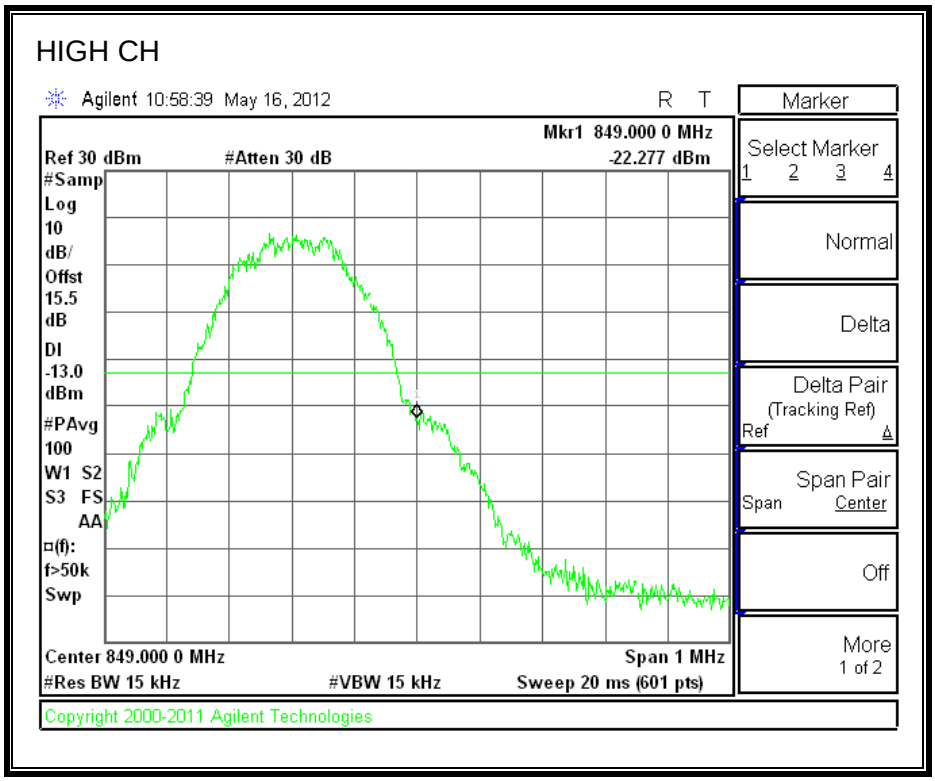
GPRS1900

LOW CH



HIGH CH



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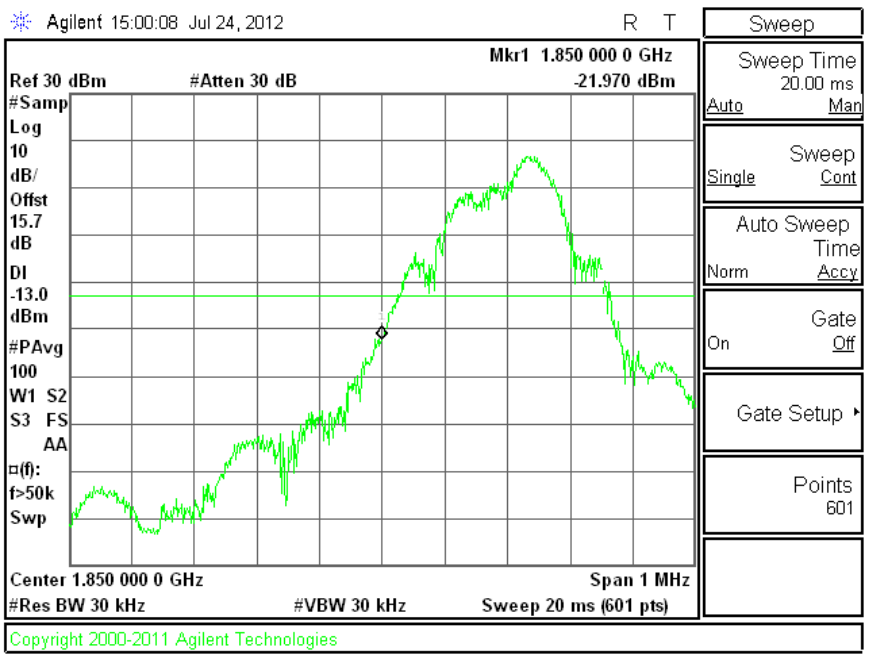
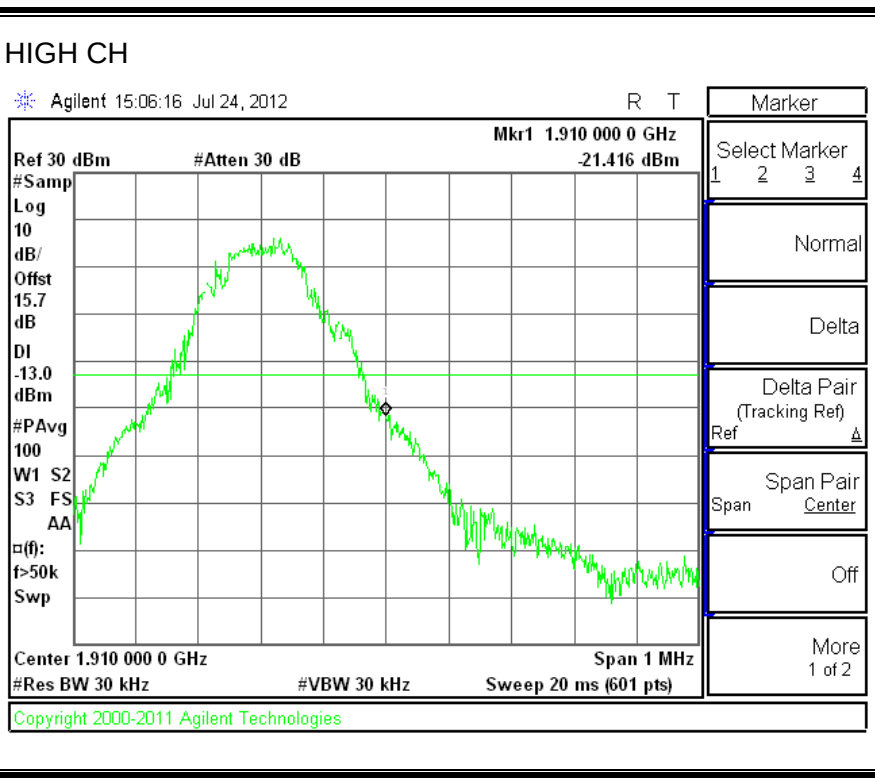
EGPRS1900 BAND

LOW CH



HIGH CH



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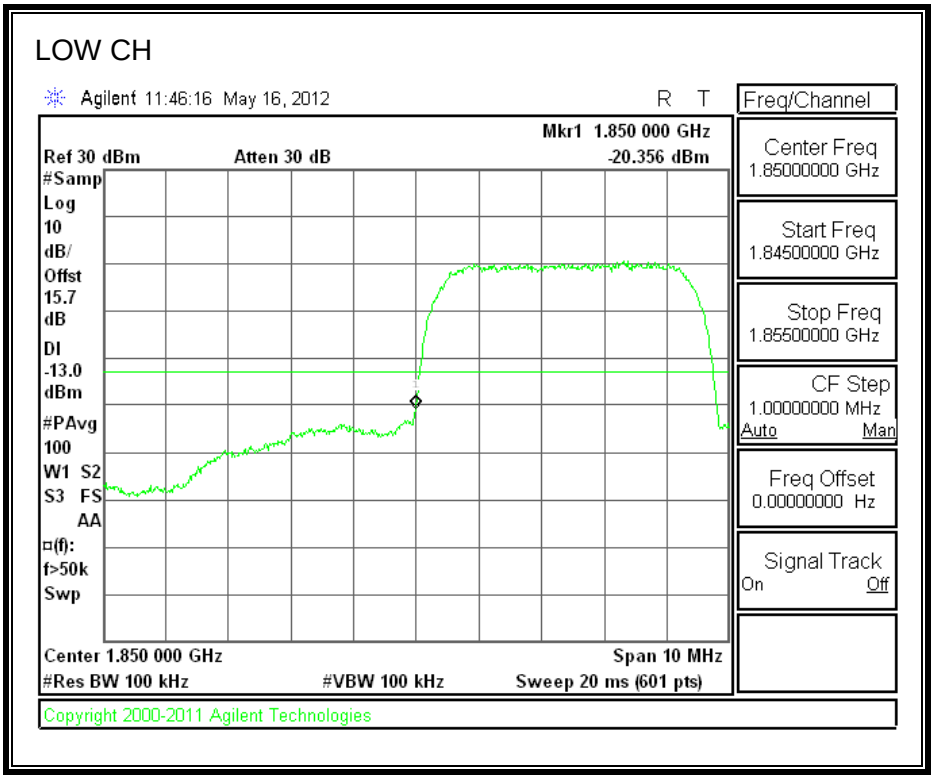
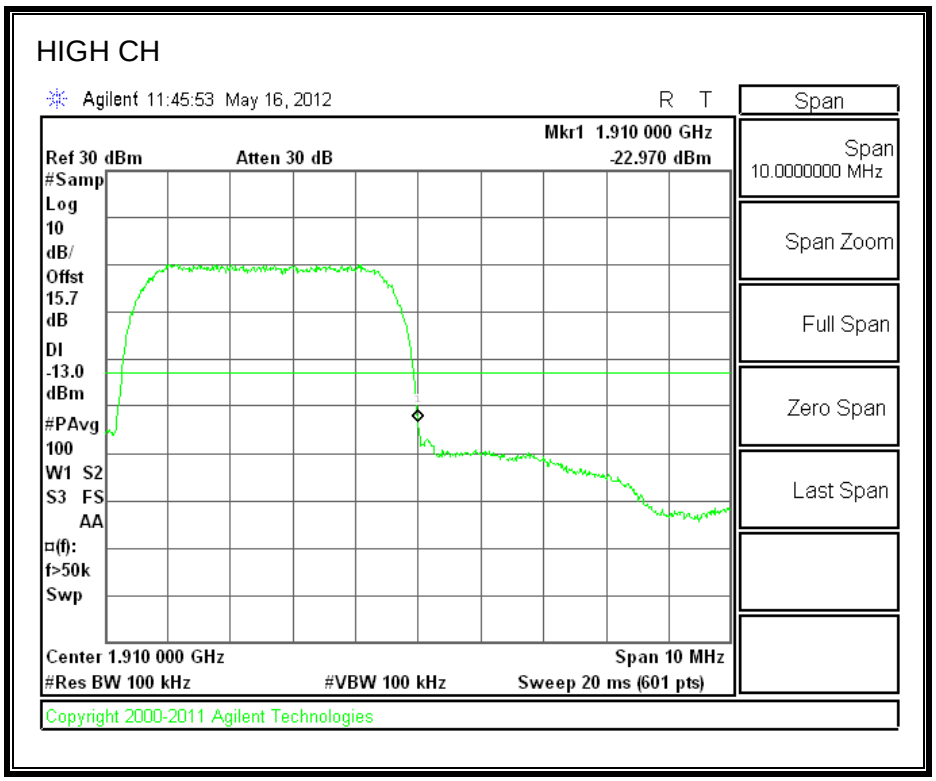
UMTS1900, REL99

LOW CH



HIGH CH



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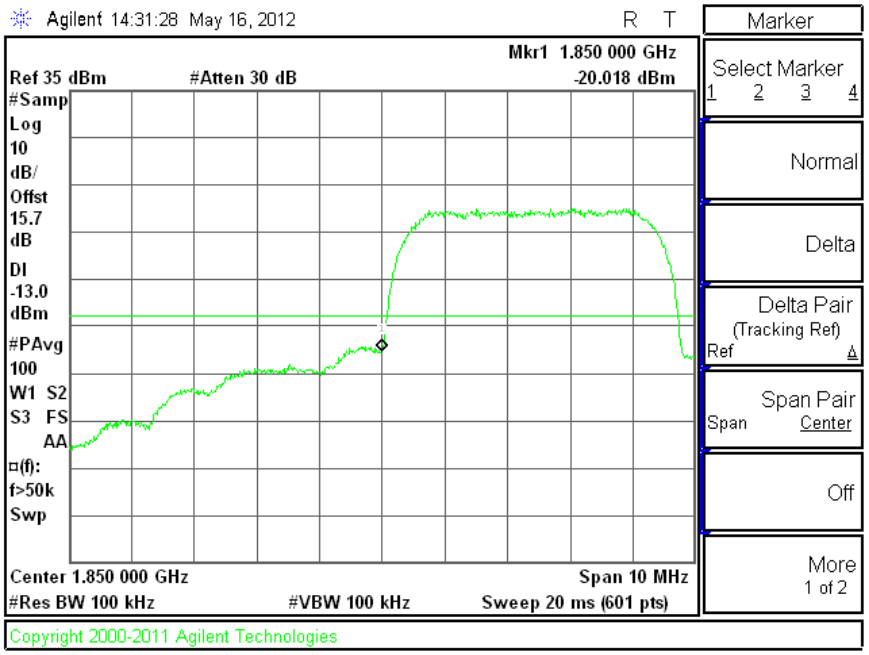
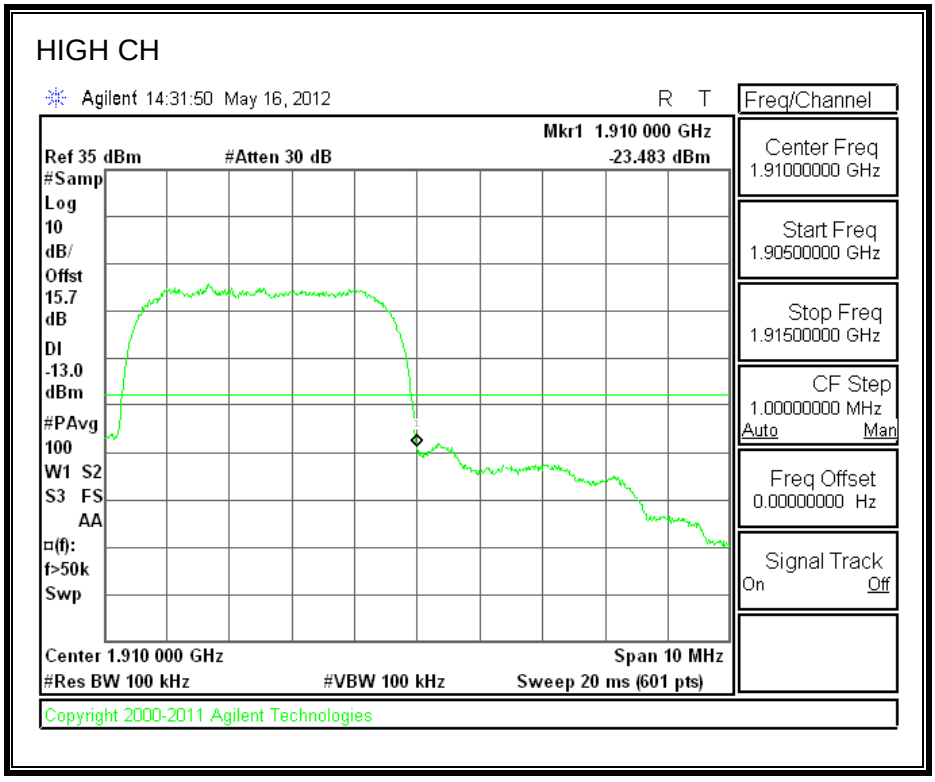
UMTS1900, HSDPA

LOW CH



HIGH CH



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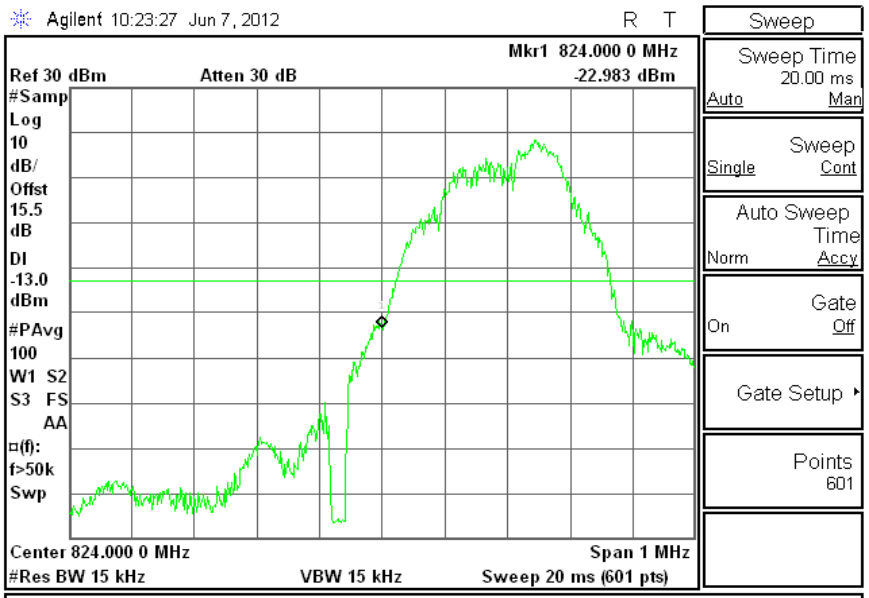
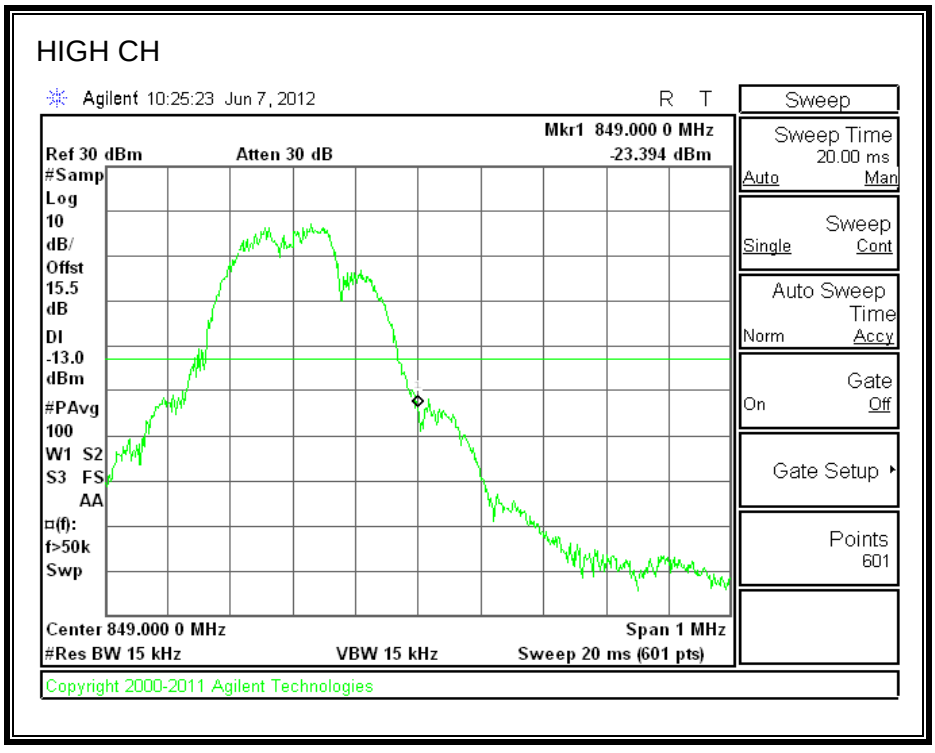
UAT (PORT B) / SECONDARY

GPRS mode (Cellular Band)

LOW CH



HIGH CH



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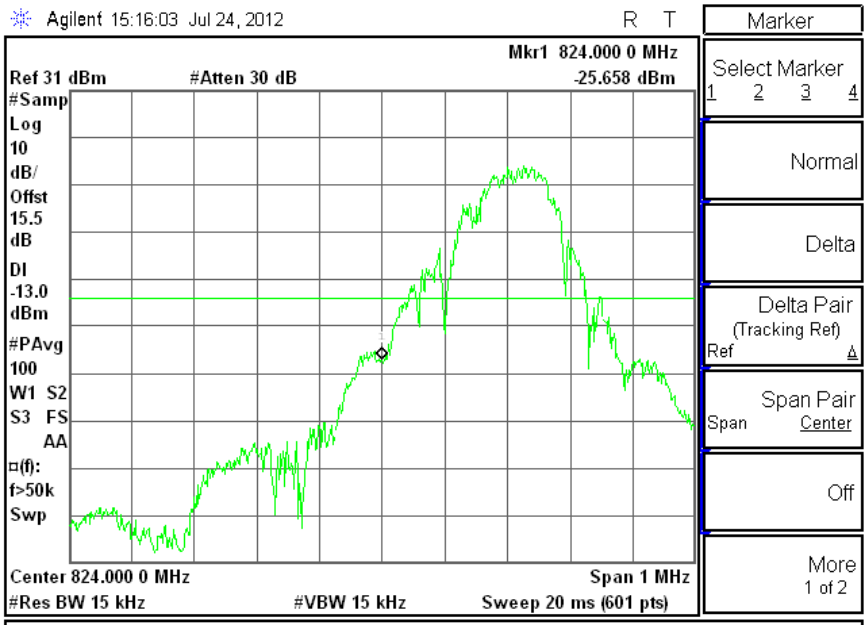
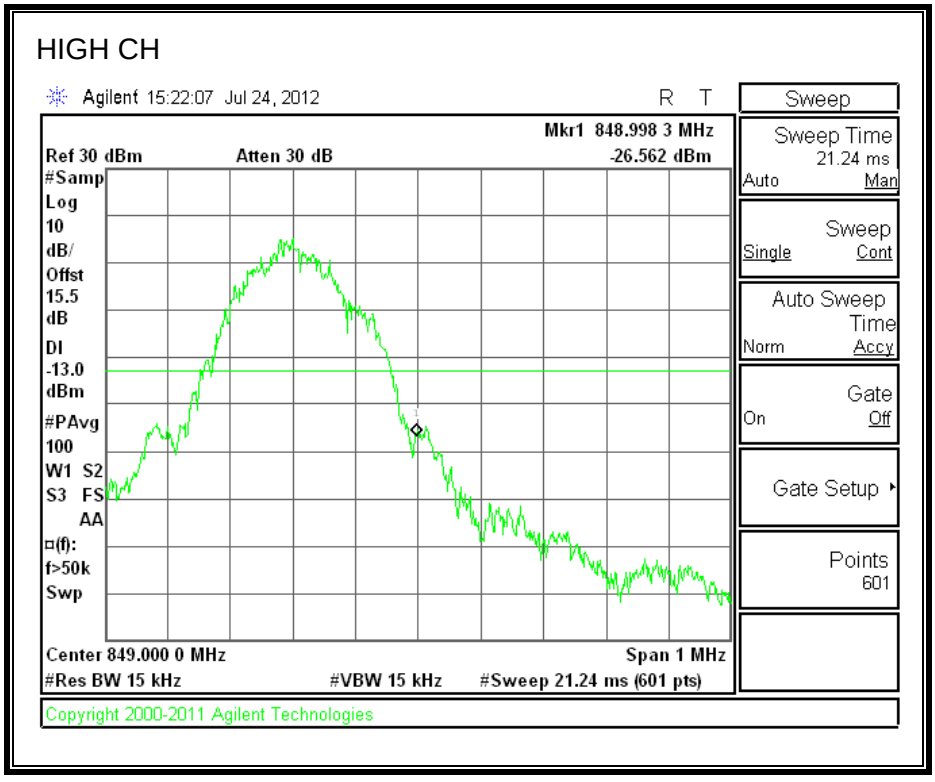
EGPRS850

LOW CH



HIGH CH



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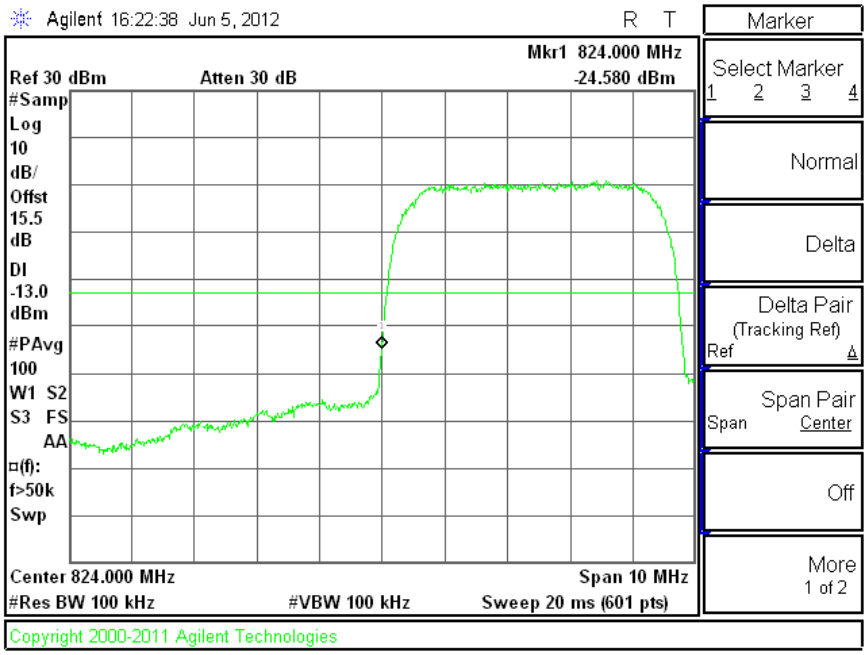
UMTS850, REL99

LOW CH



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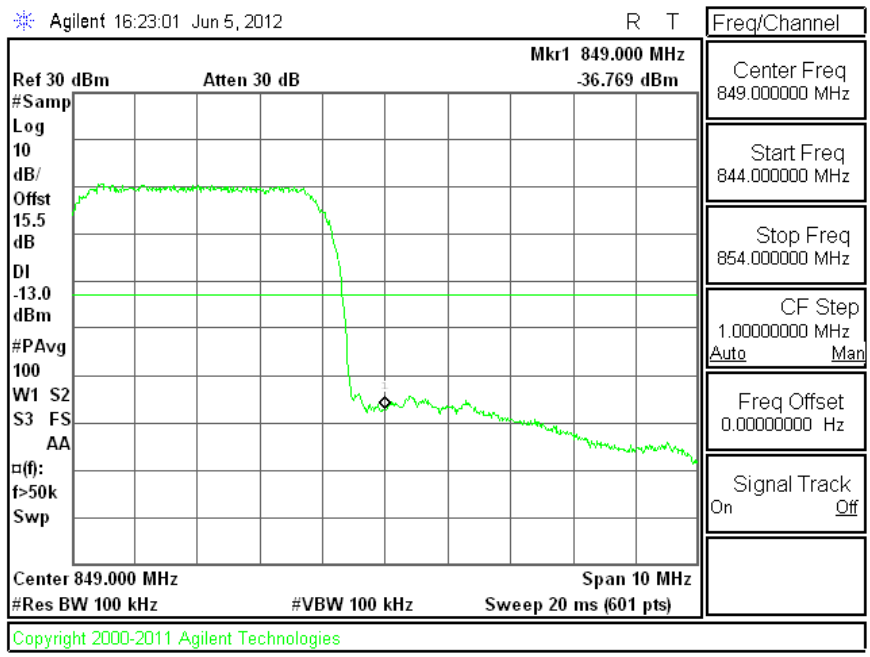

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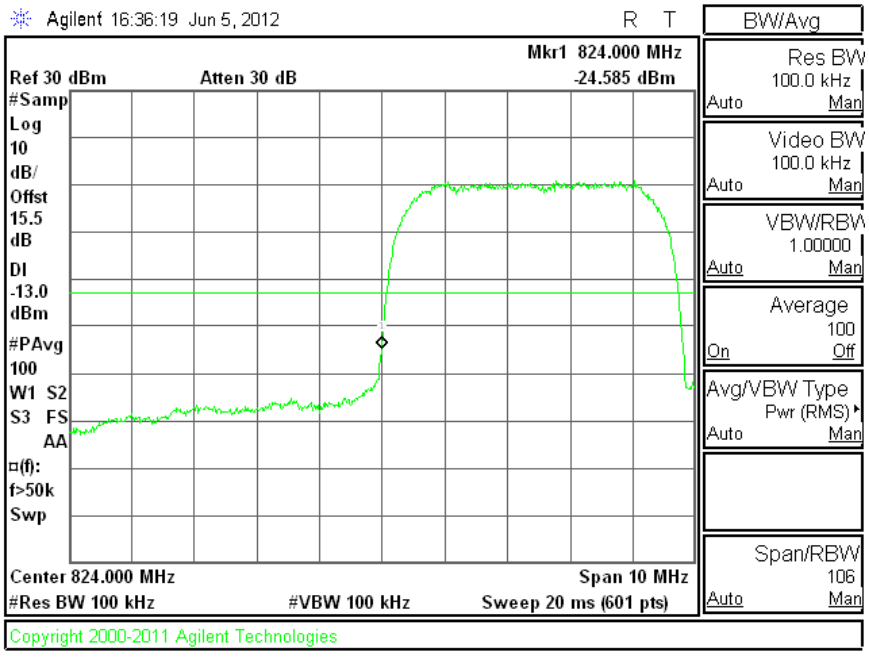
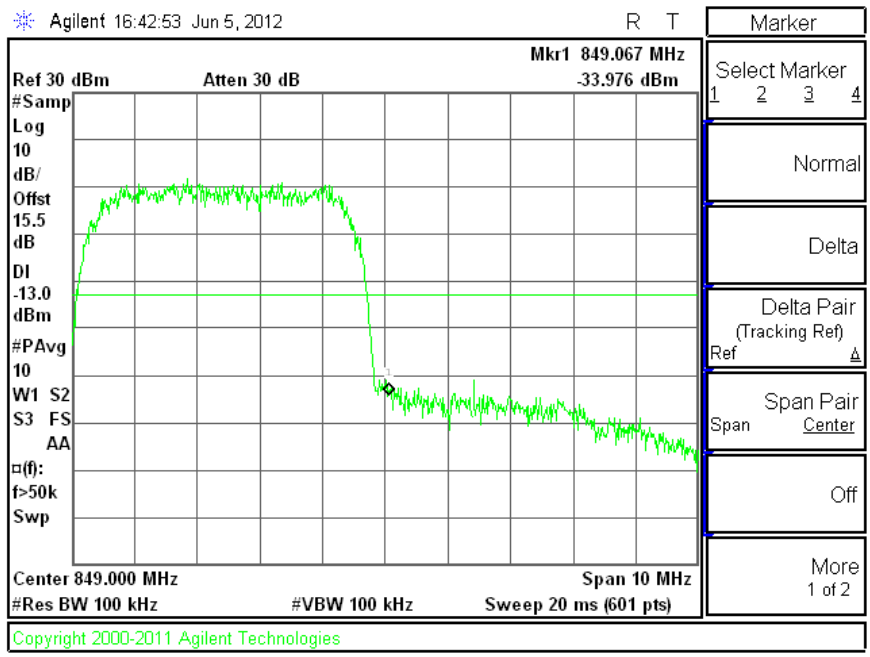
UMTS850, HSDPA

LOW CH



HIGH CH



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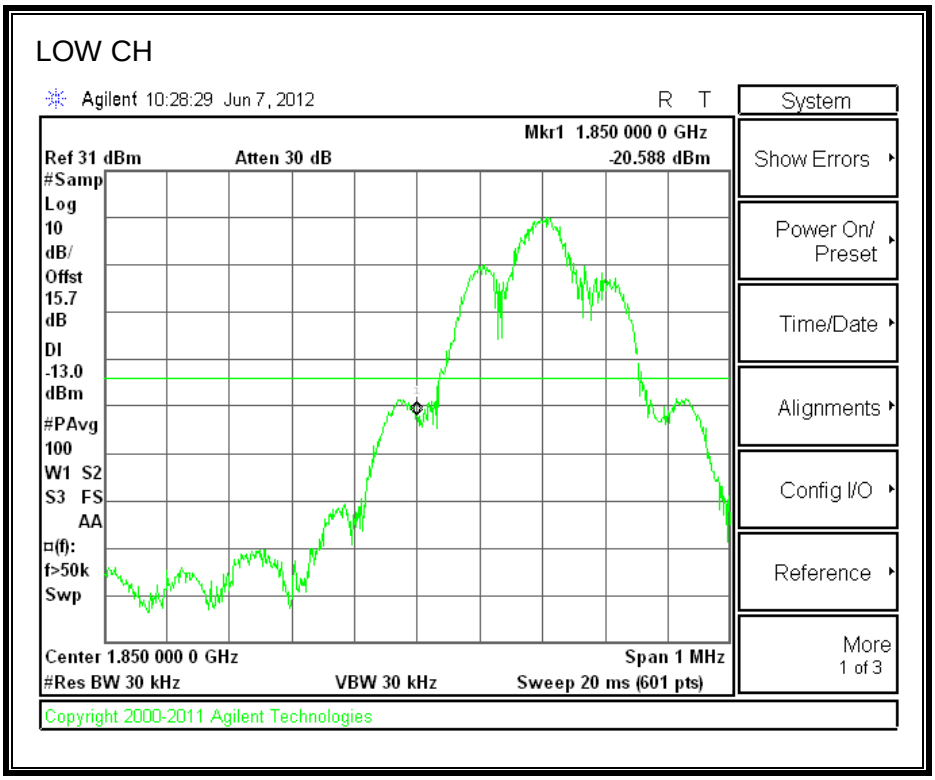
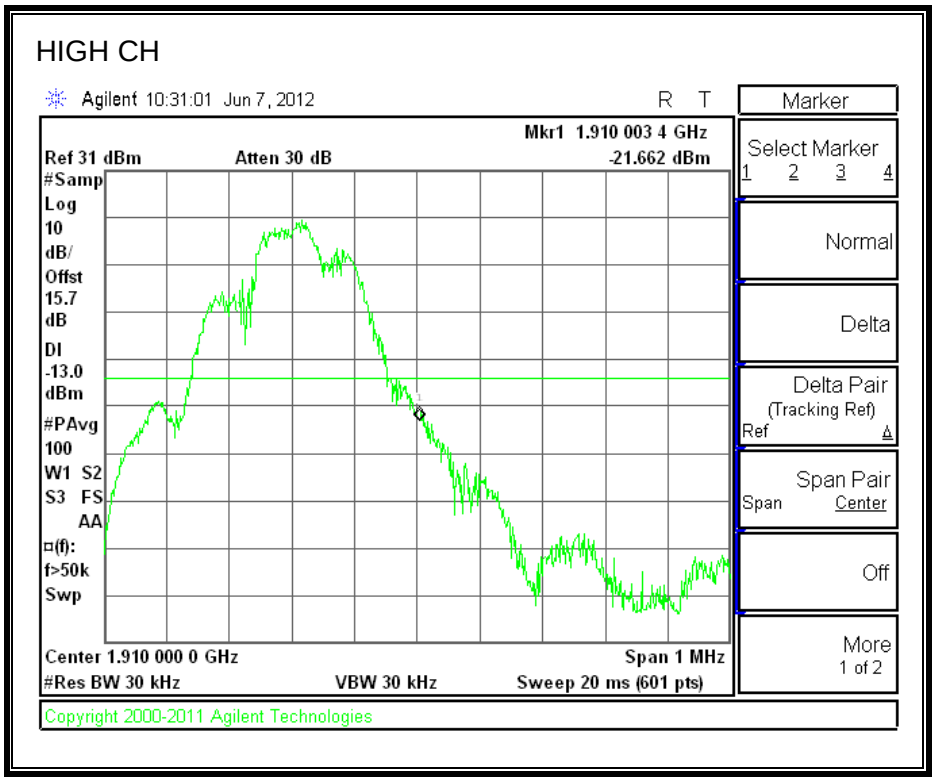
GPRS1900

LOW CH



HIGH CH



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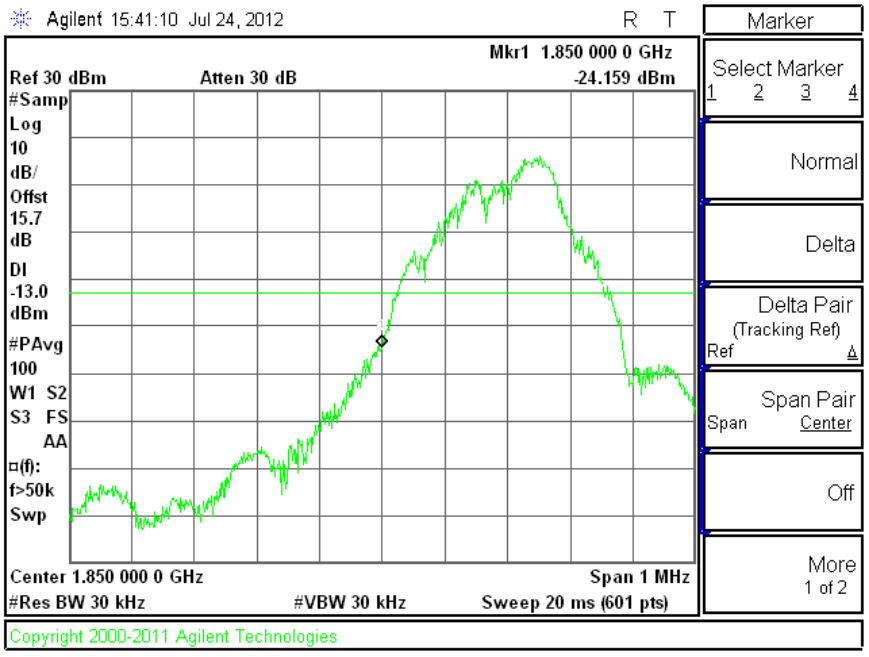
EGPRS1900 BAND

LOW CH



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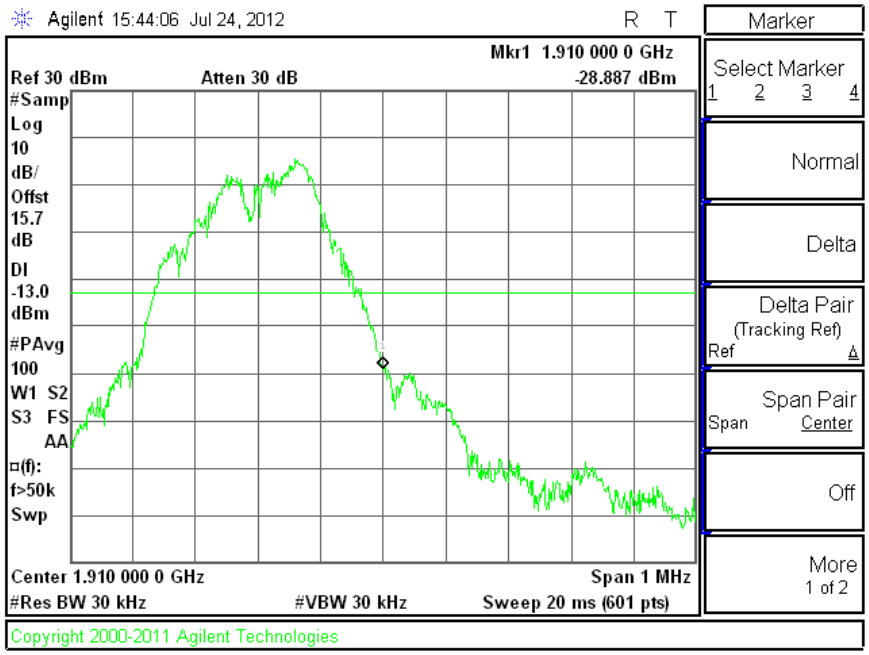

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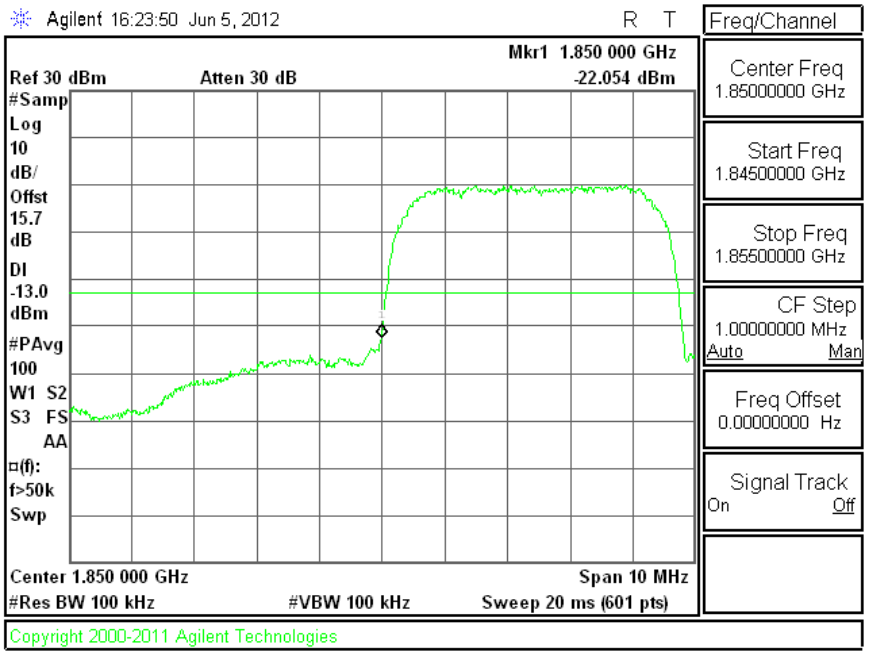
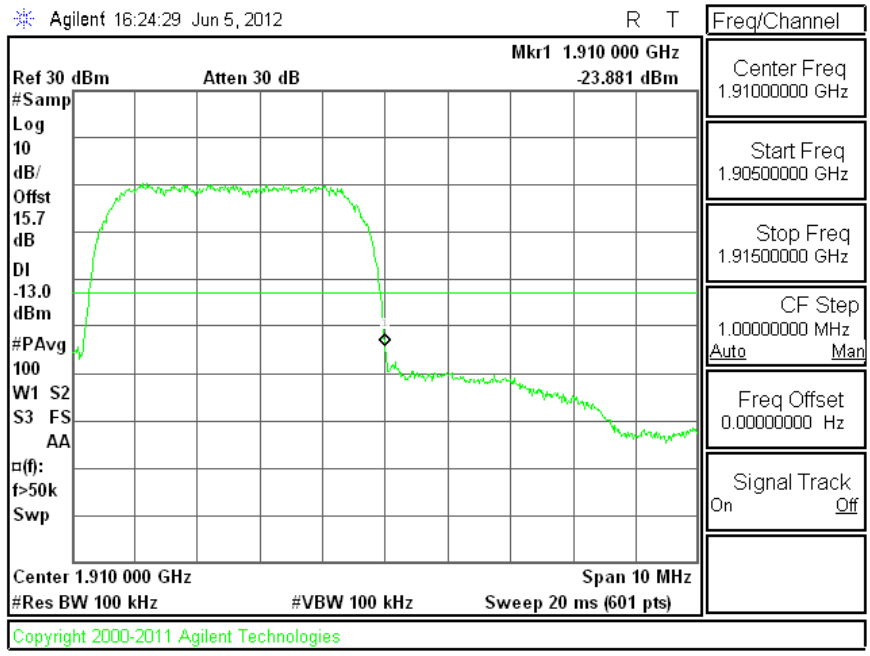
UMTS1900, REL99

LOW CH



HIGH CH



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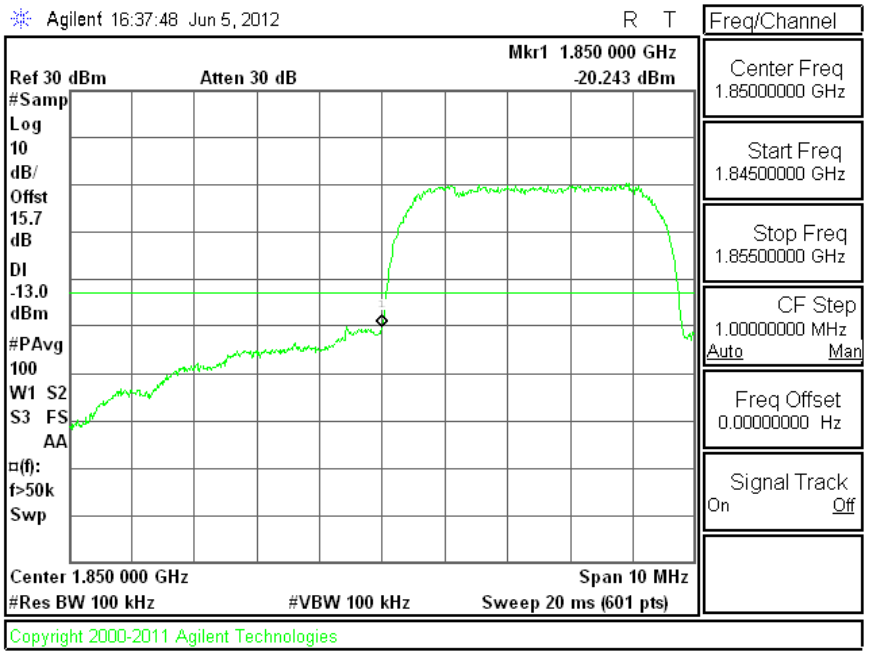
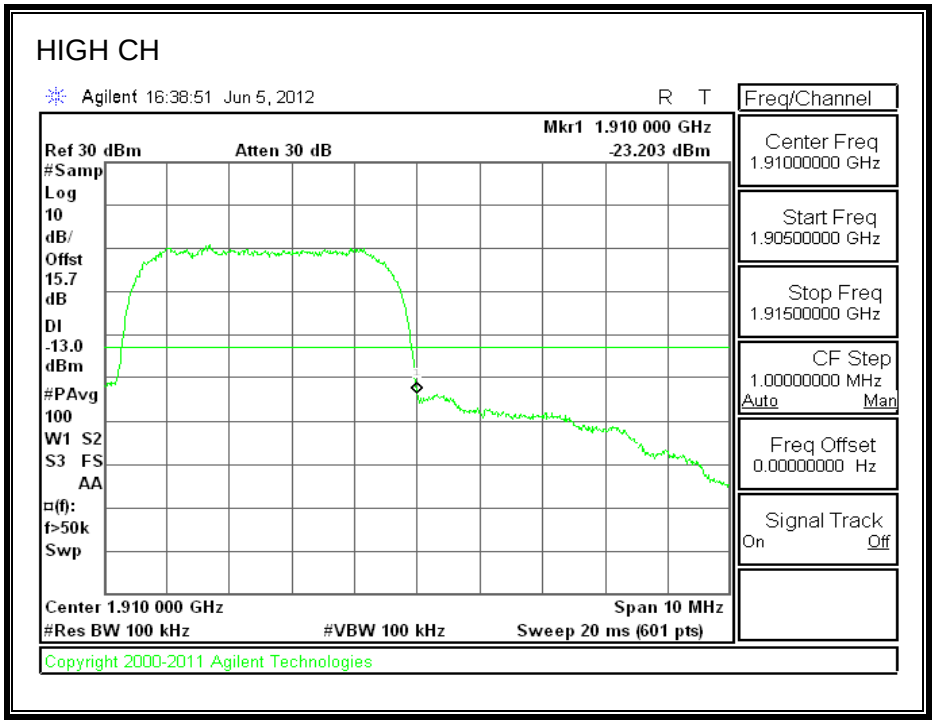
UMTS1900, HSDPA

LOW CH



HIGH CH



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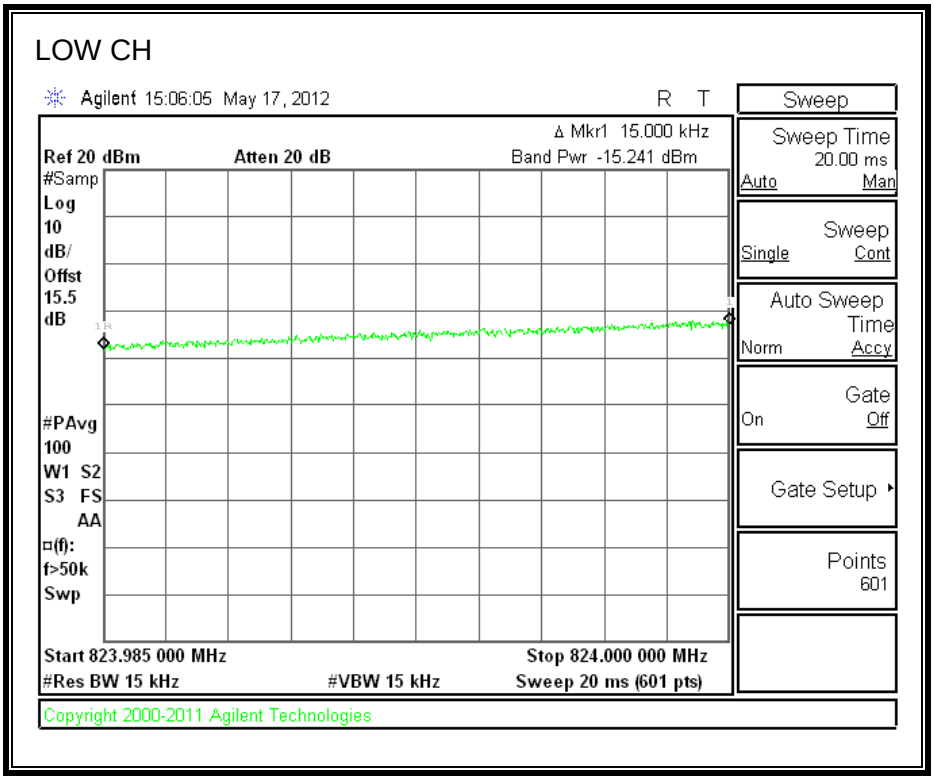
8.2.2. A1429

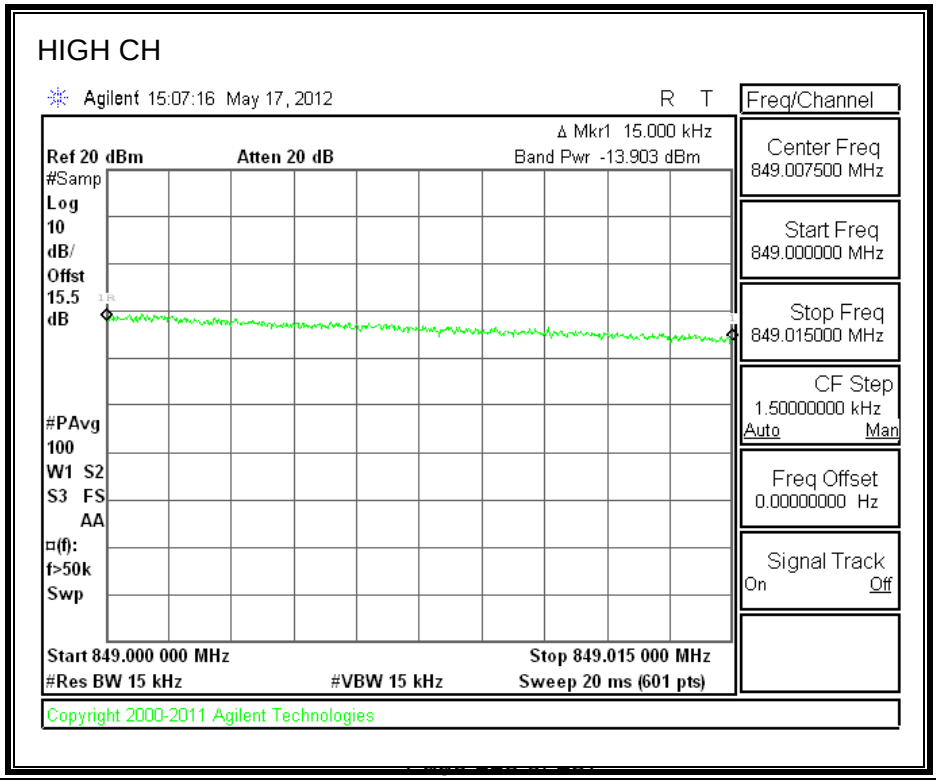
LAT (PORT A) / PRIMARY

CDMA2000 1xRTT mode (Cellular Band)

LOW CH



HIGH CH



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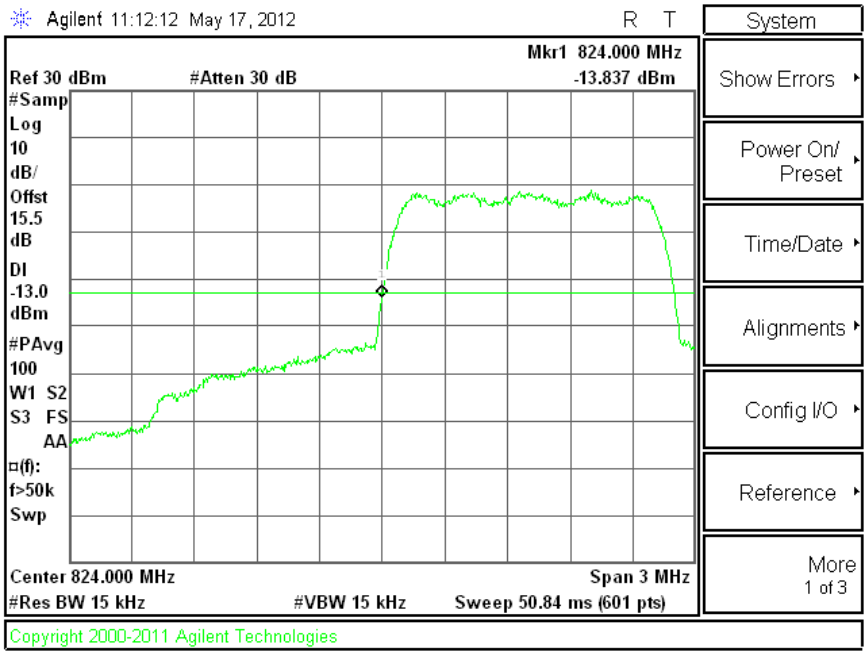
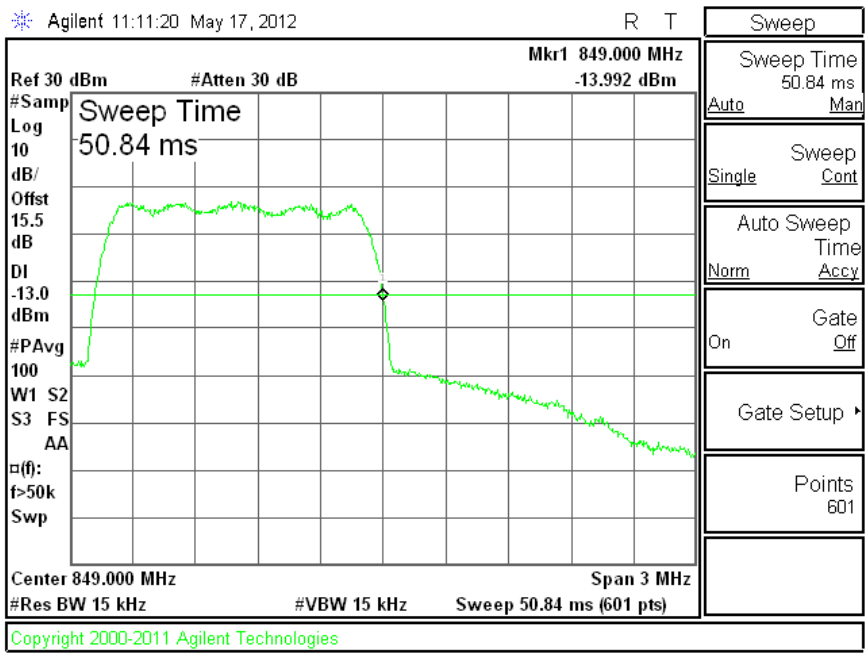
CDMA2000 EVDO Rev A mode (Cellular Band)

LOW CH



HIGH CH



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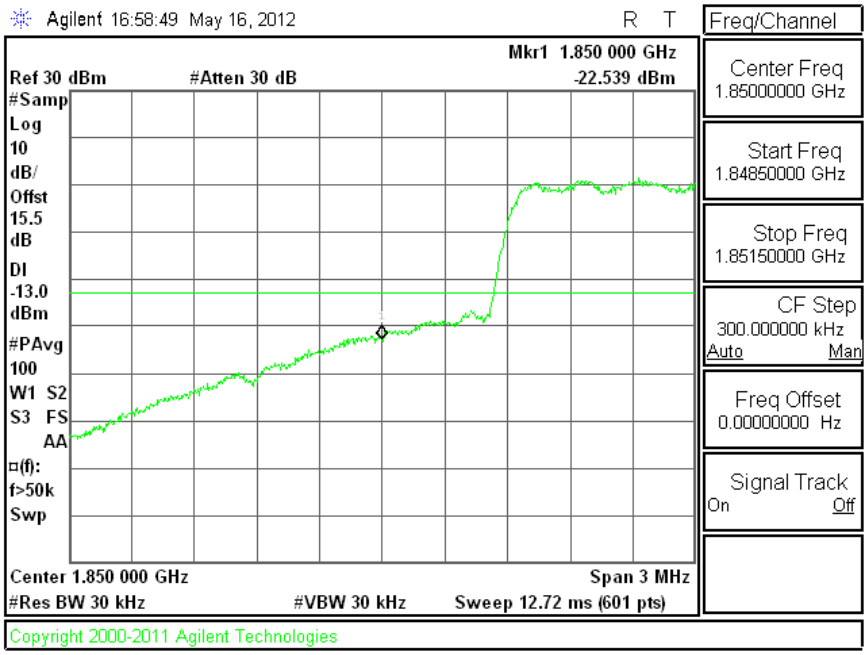
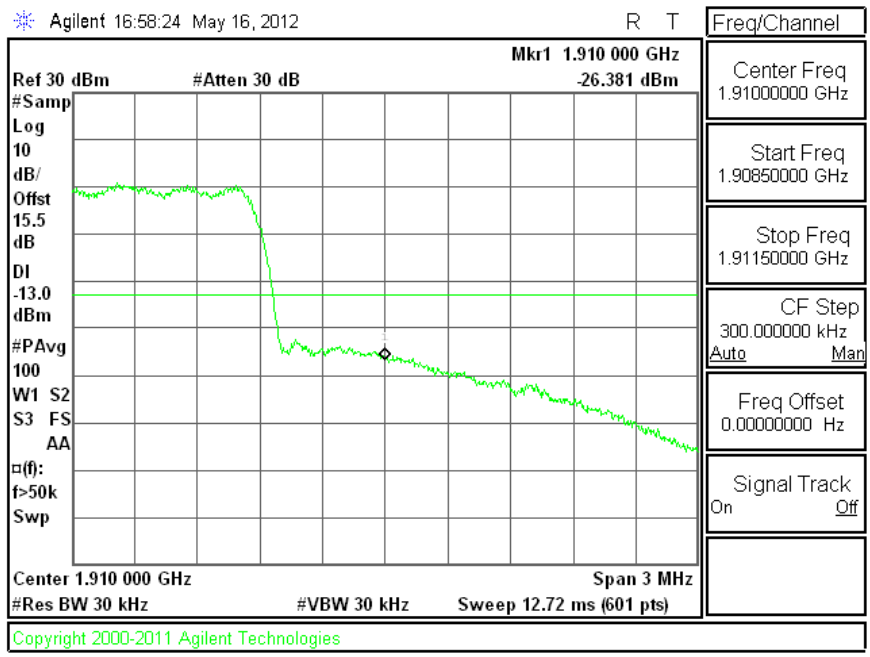
CDMA2000 1xRTT mode (PCS Band)

LOW CH



HIGH CH



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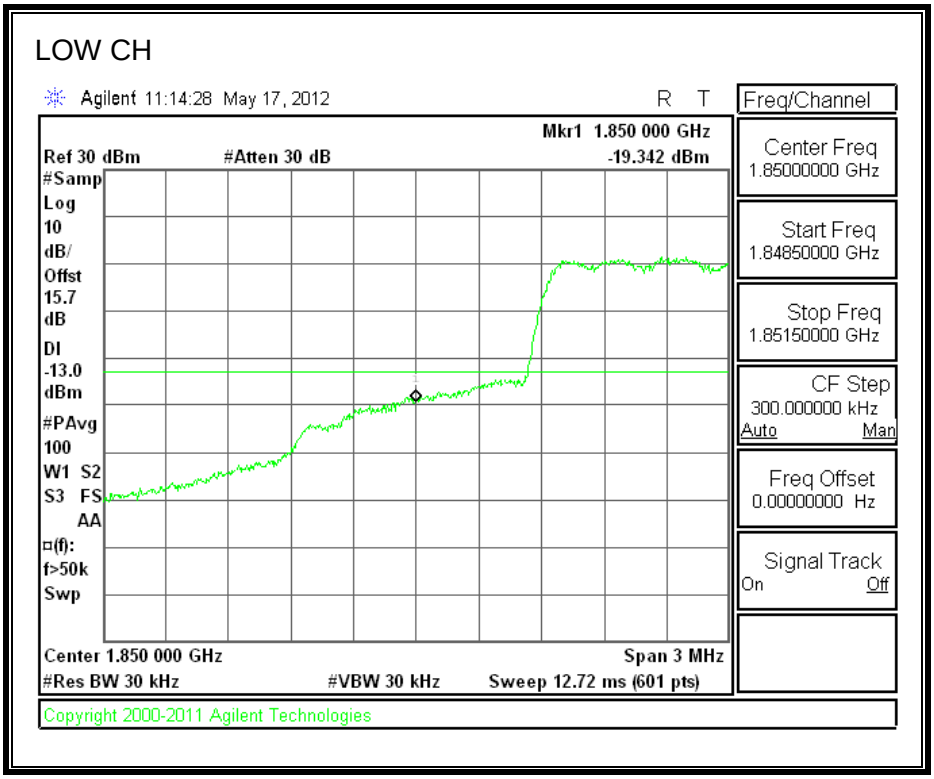
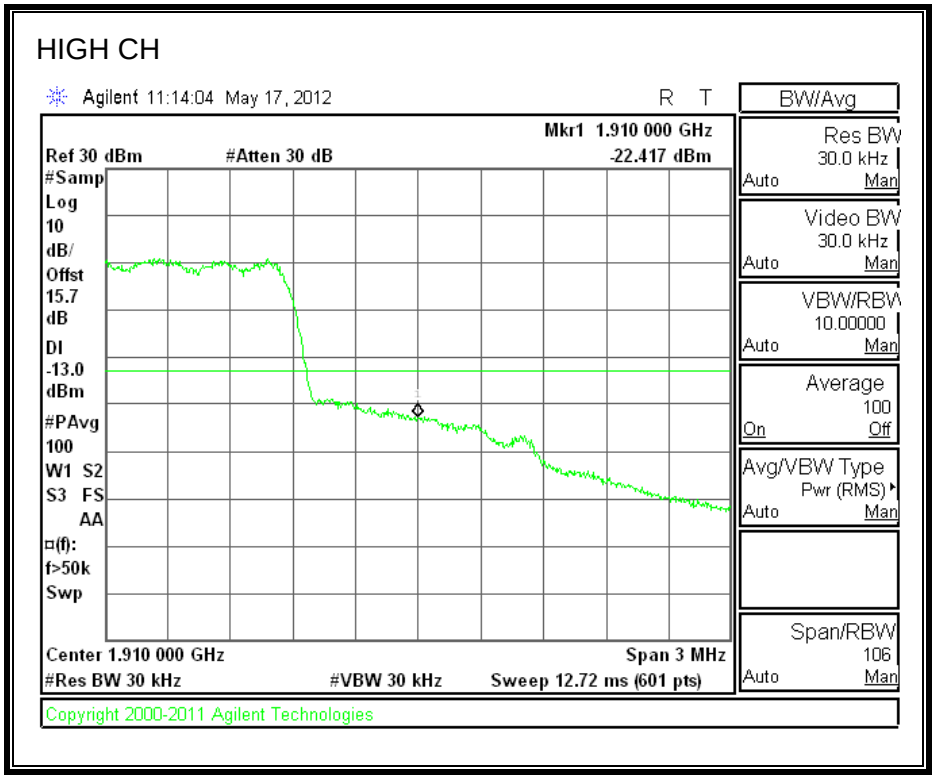
CDMA2000 EVDO Rev A mode (PCS Band)

LOW CH



HIGH CH



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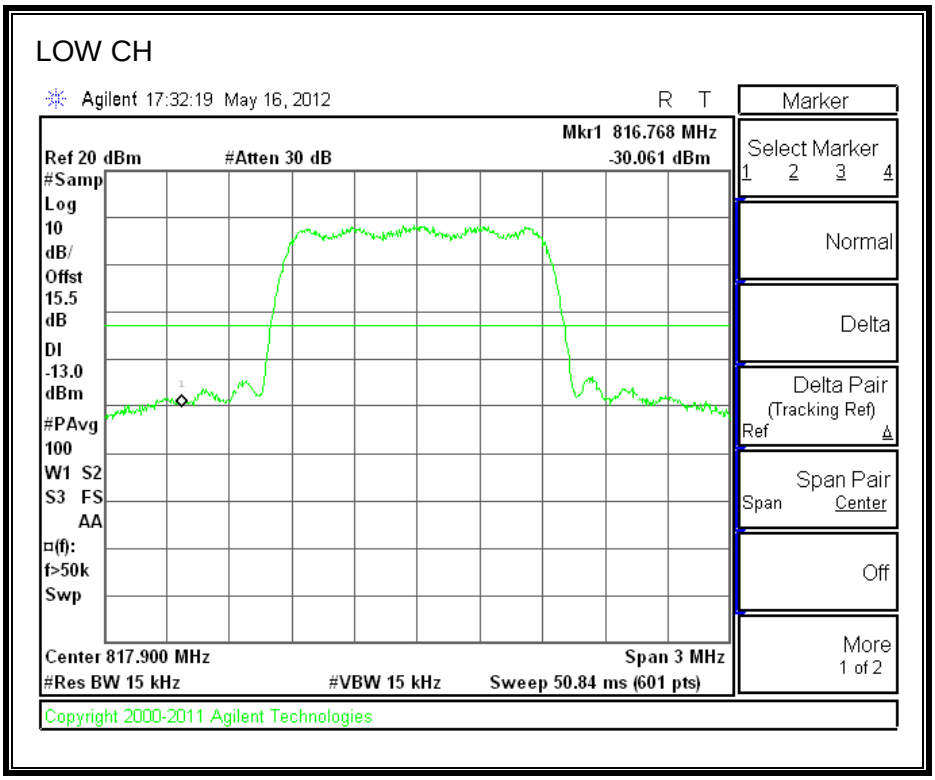
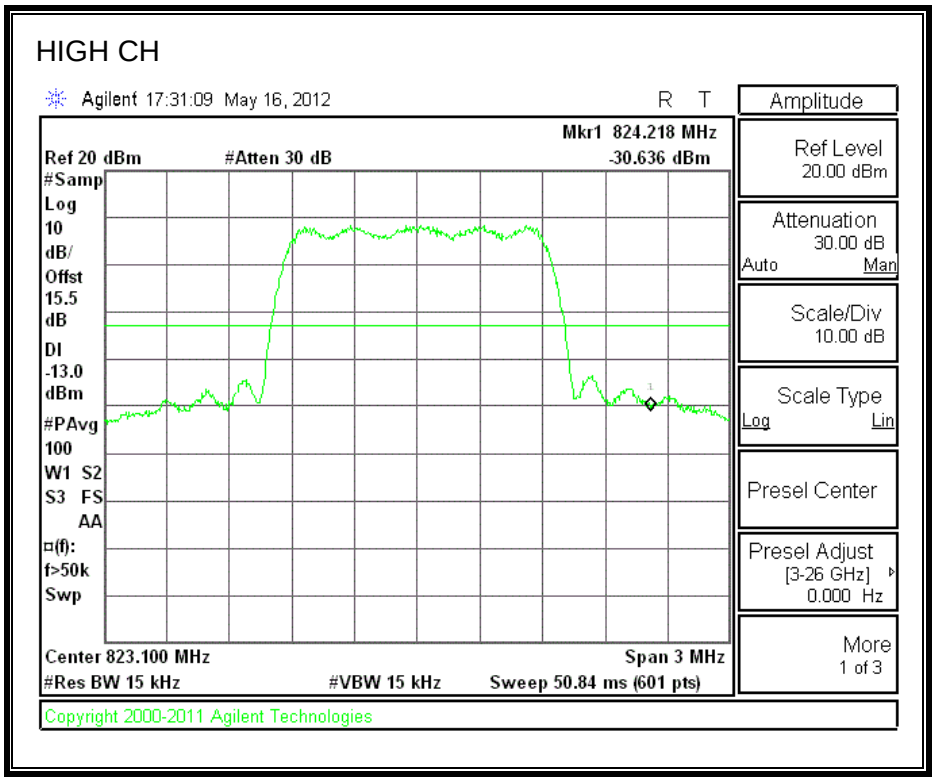
BC10, 1xRTT

LOW CH



HIGH CH



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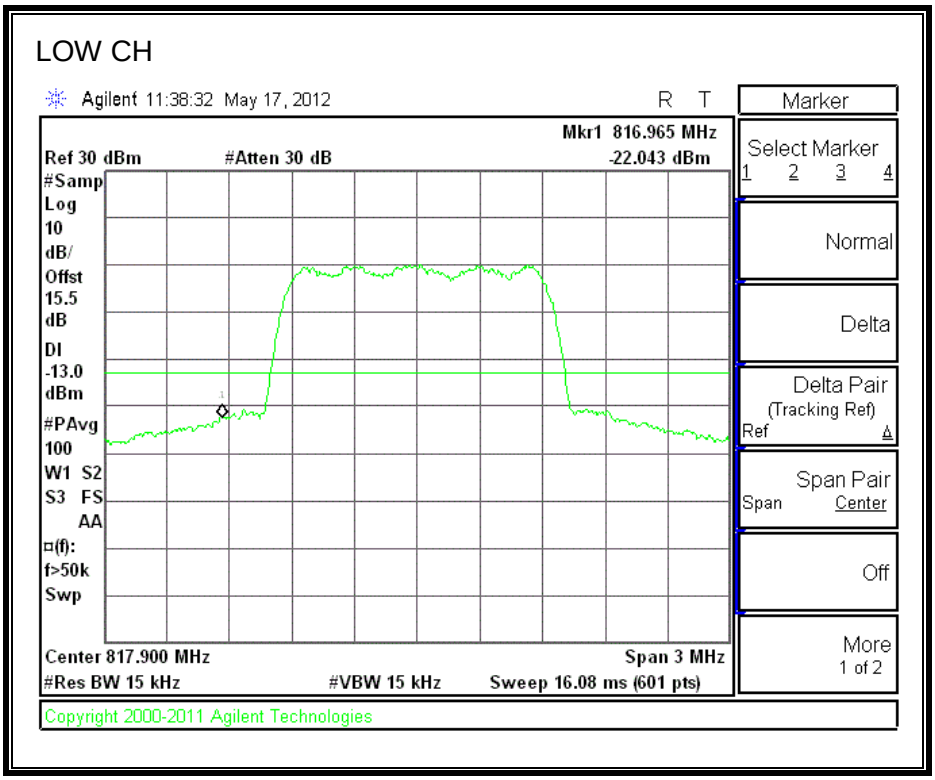
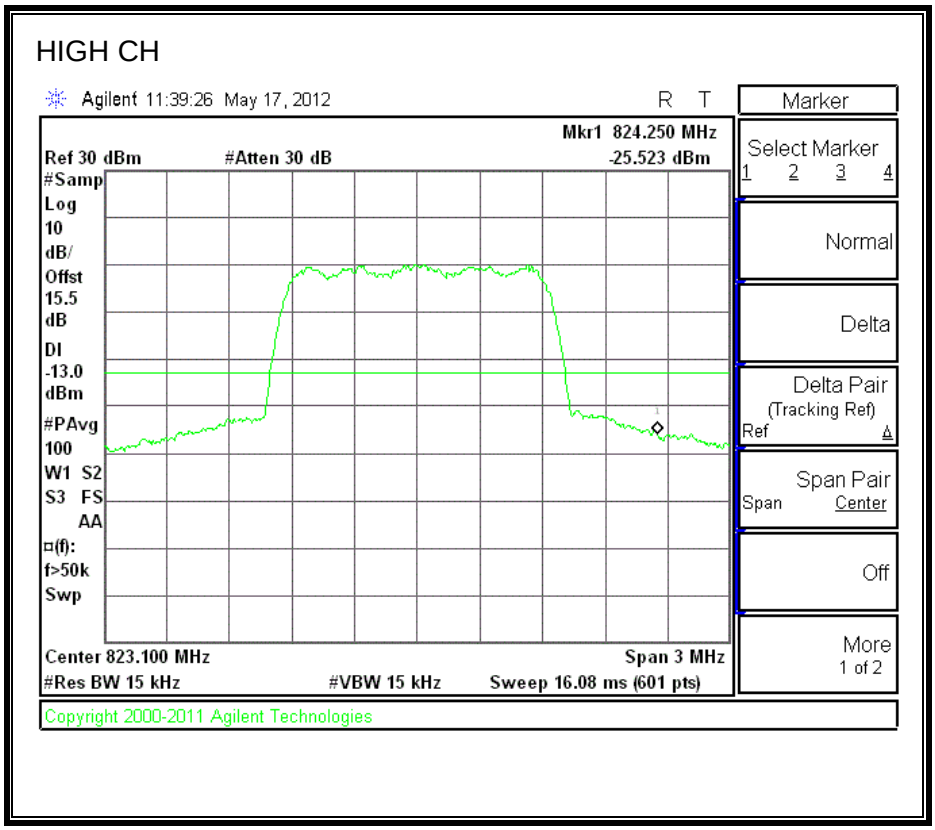
BC10, EVDO

LOW CH



HIGH CH



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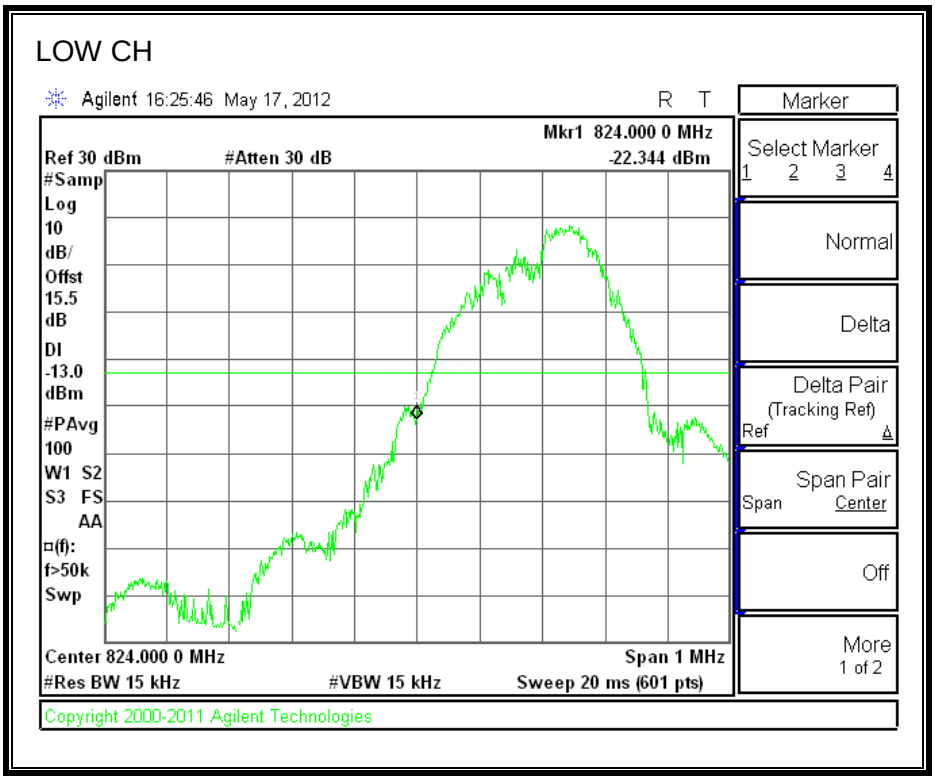
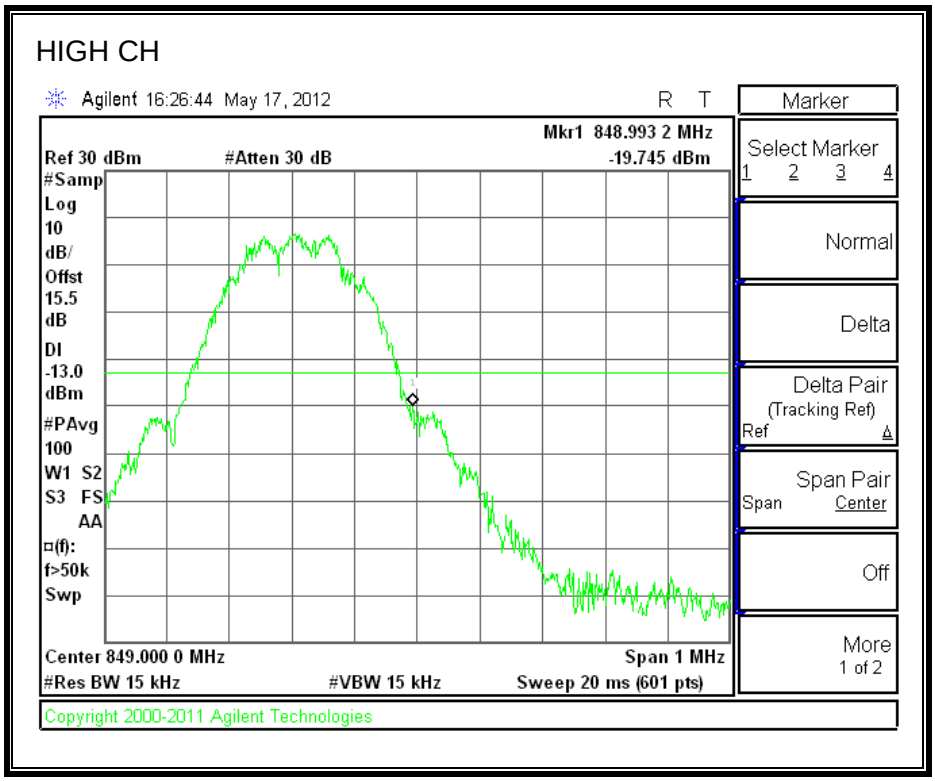
GPRS850 BAND

LOW CH



HIGH CH



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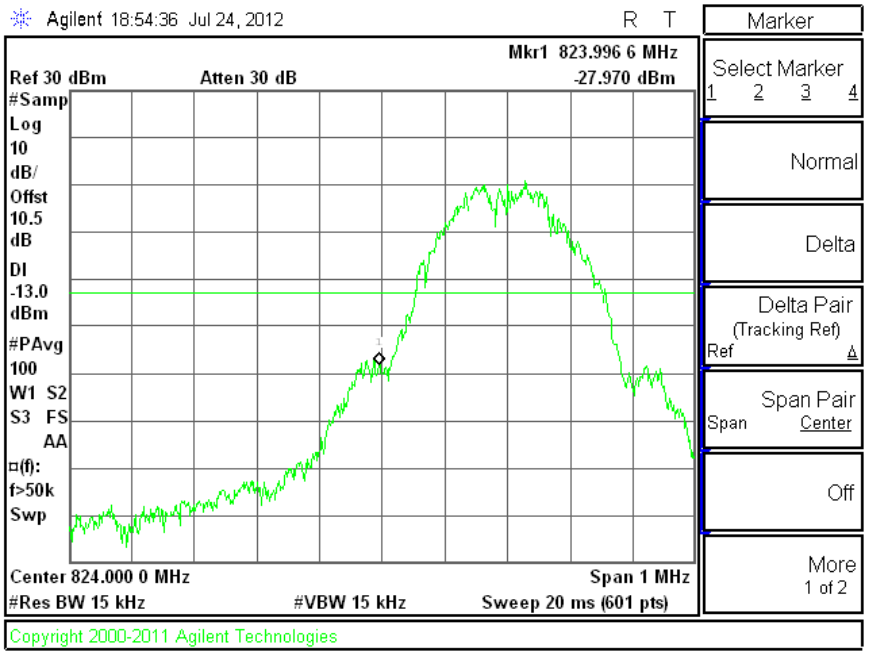
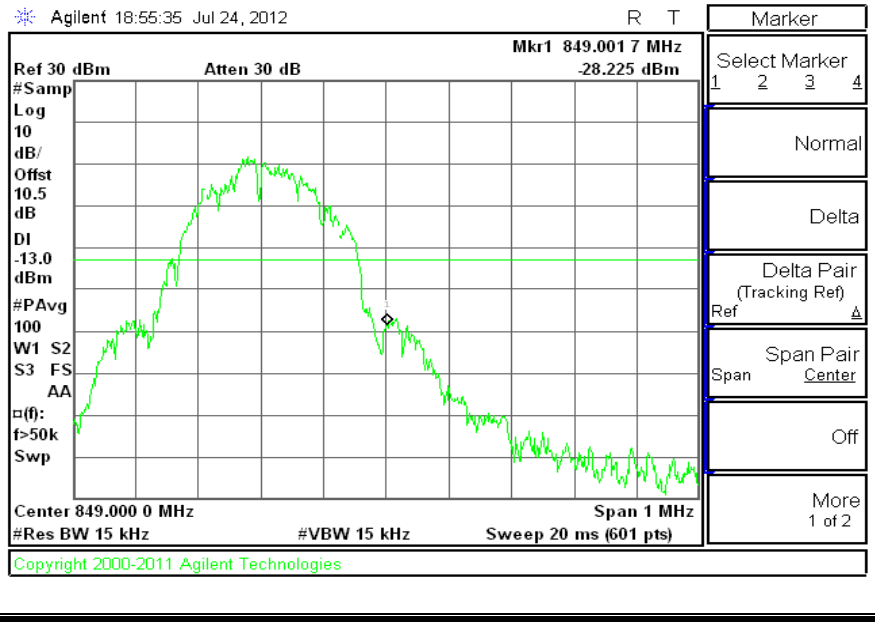
EGPRS850 BAND

LOW CH



HIGH CH



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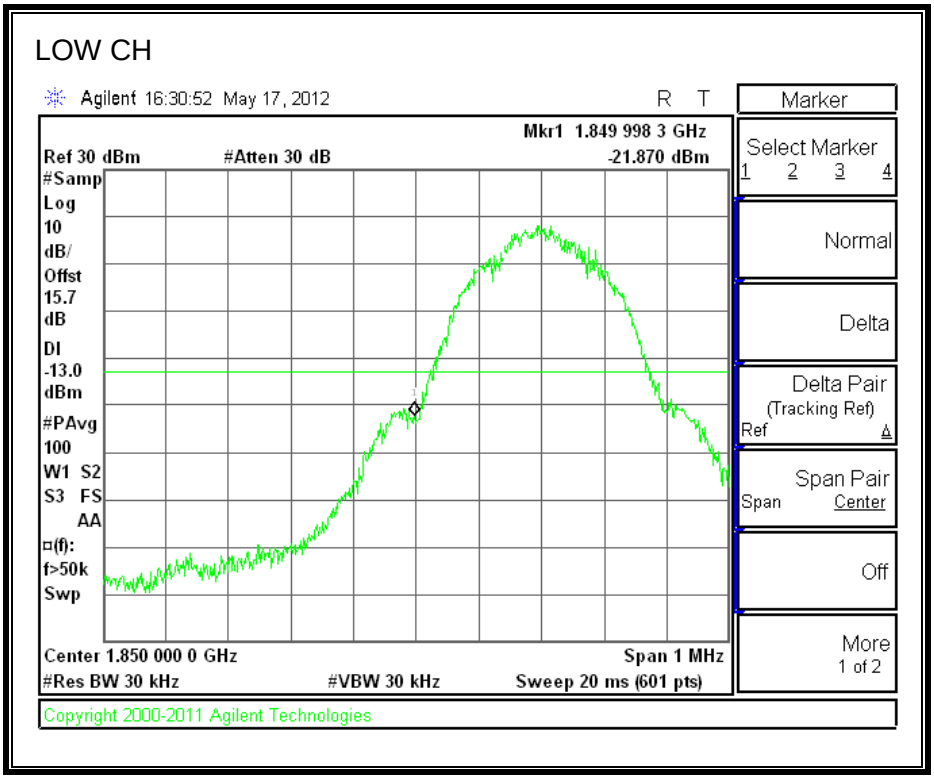
GPRS1900 BAND

LOW CH



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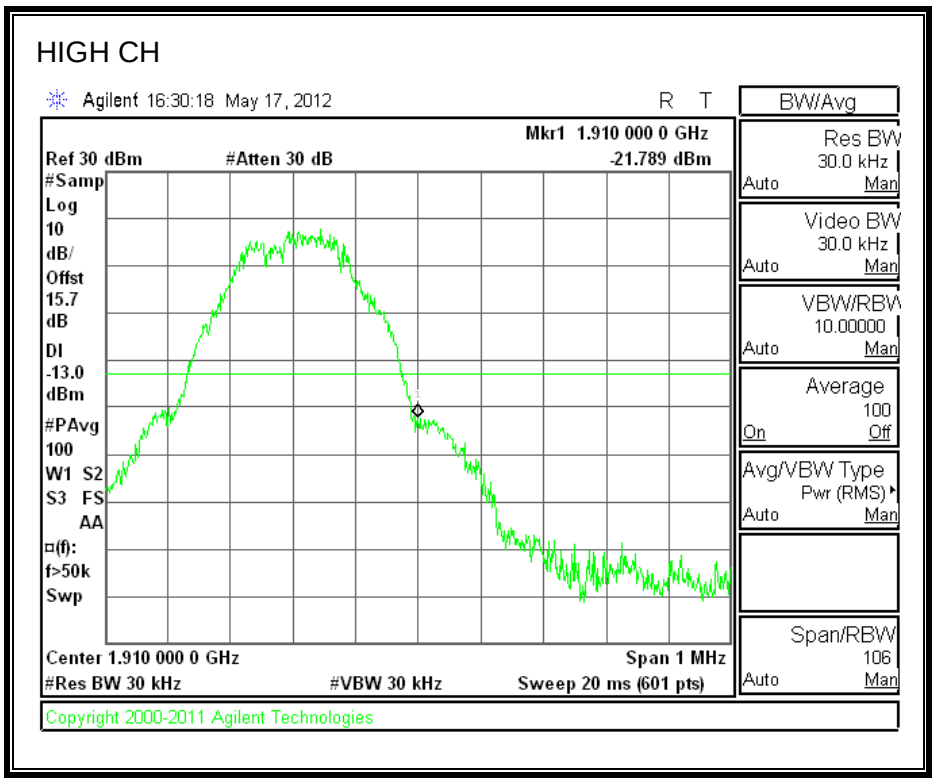

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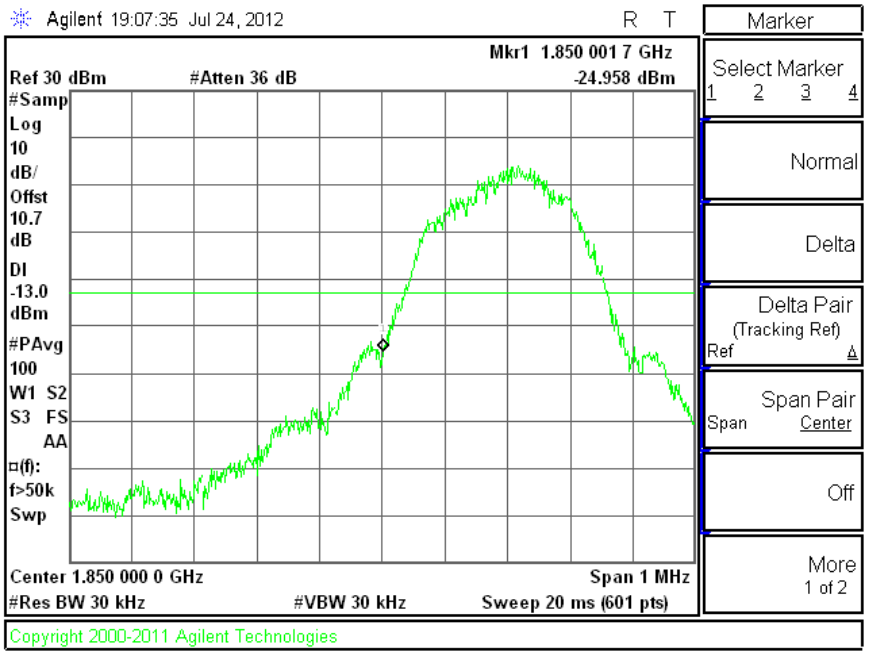
EGPRS1900 BAND

LOW CH



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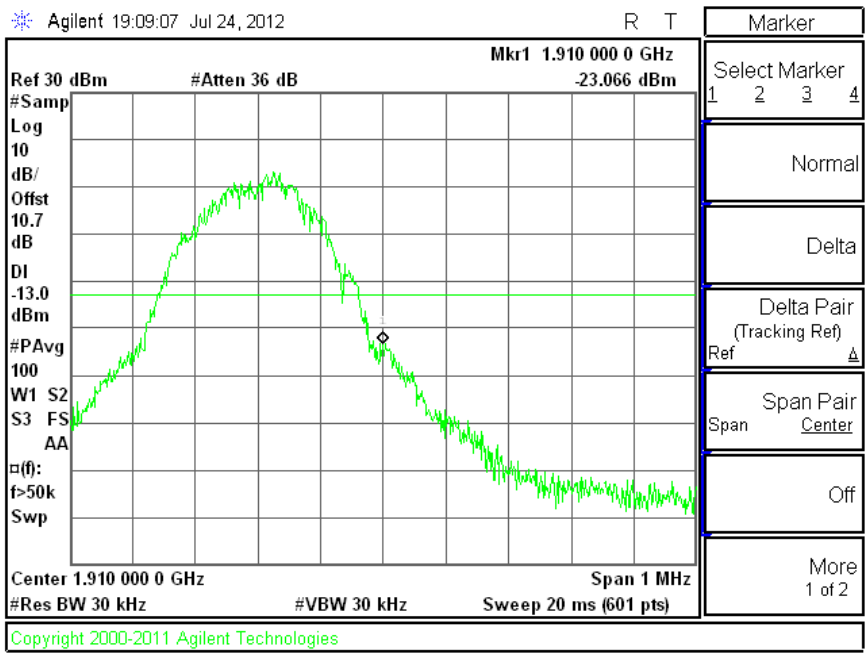

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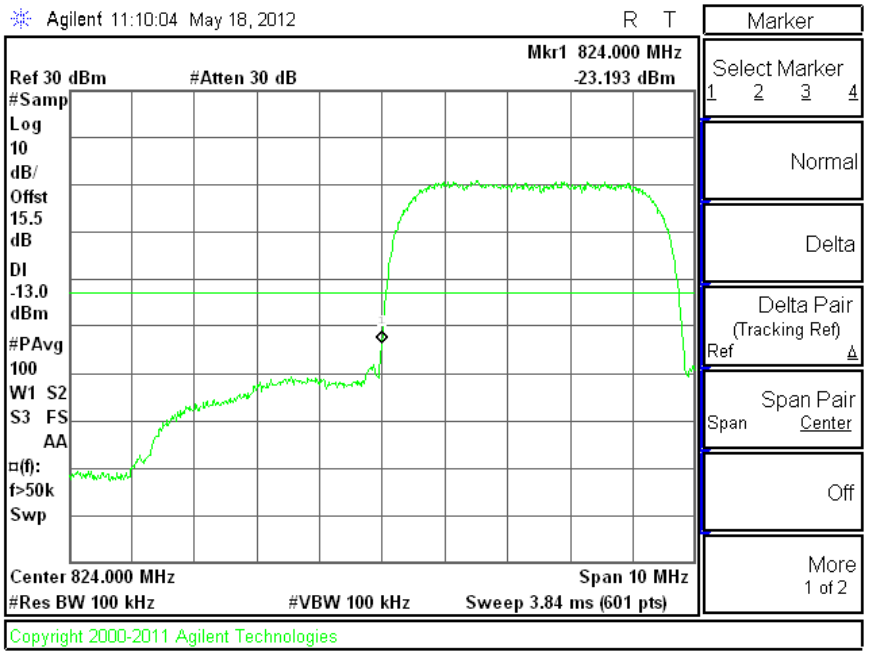
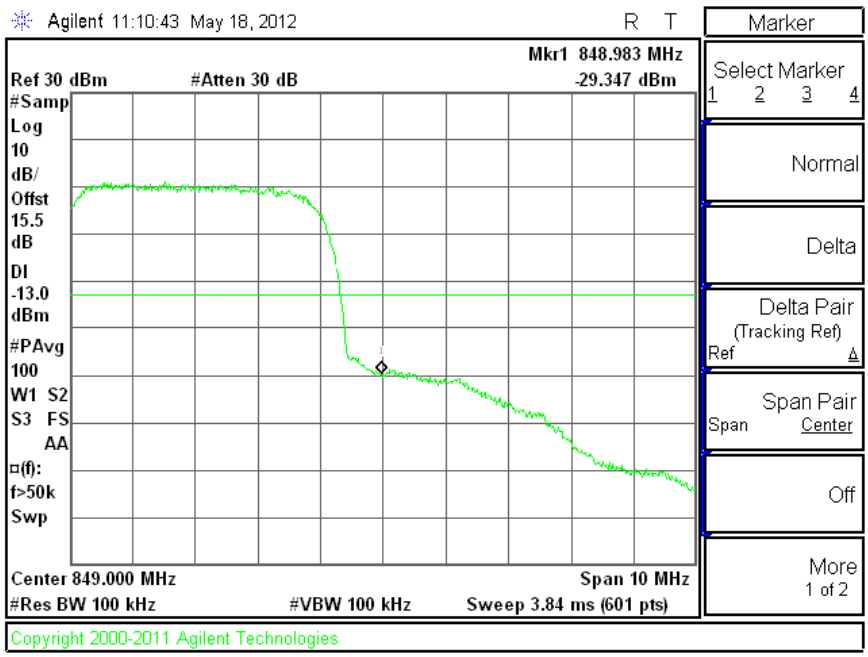
UMTS HSDPA REL 6 CELL BAND

LOW CH



HIGH CH



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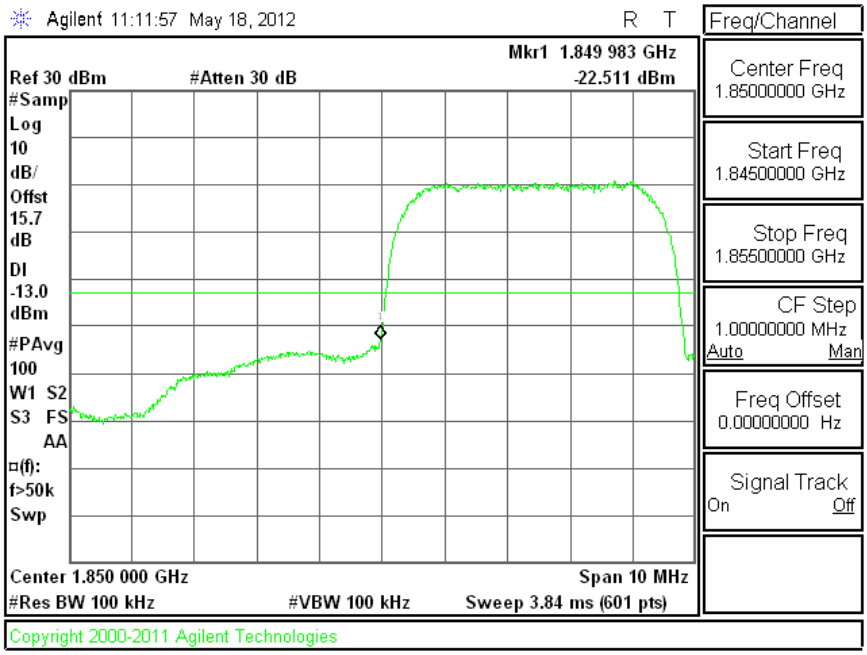
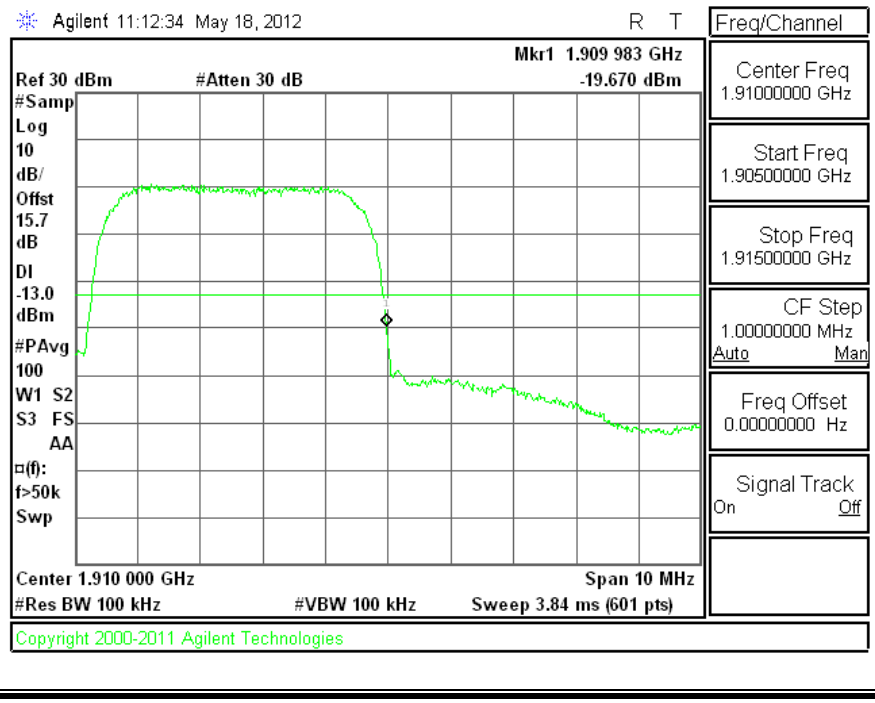
UMTS WCDMA REL 99 PCS Band

LOW CH



HIGH CH



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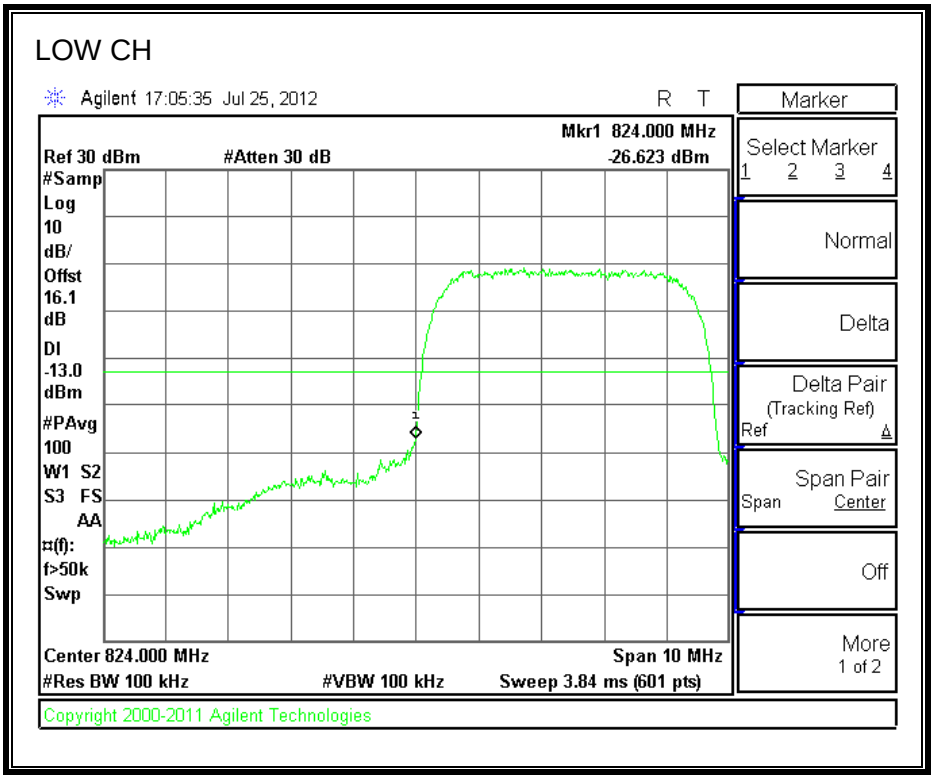
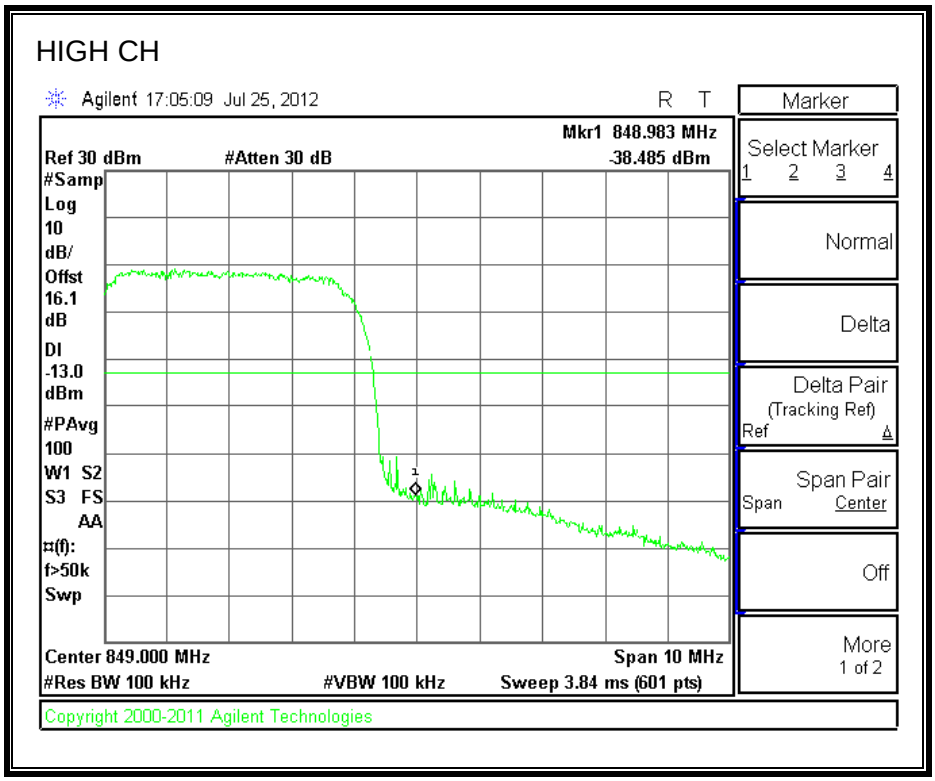
UMTS HSDPA CELL BAND

LOW CH



HIGH CH



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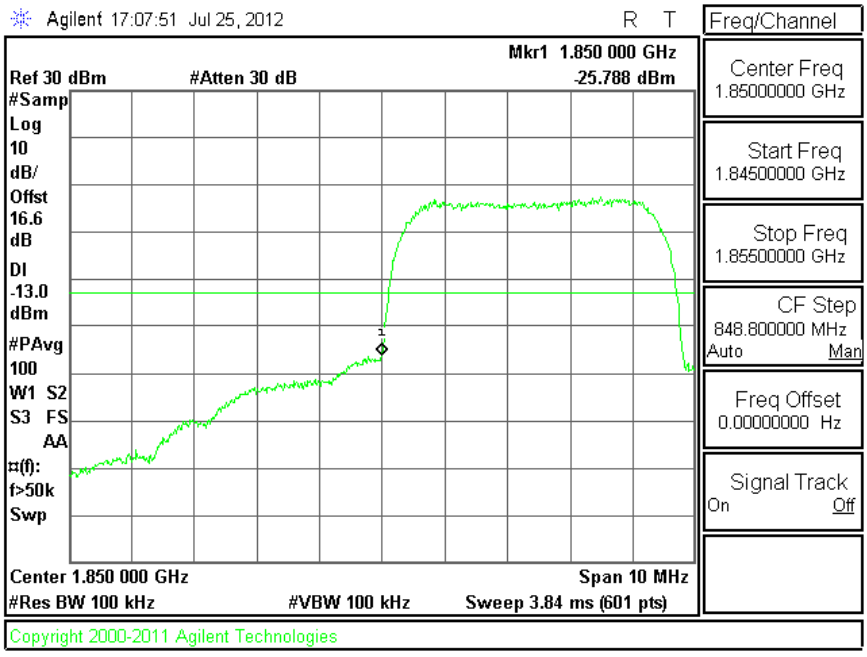
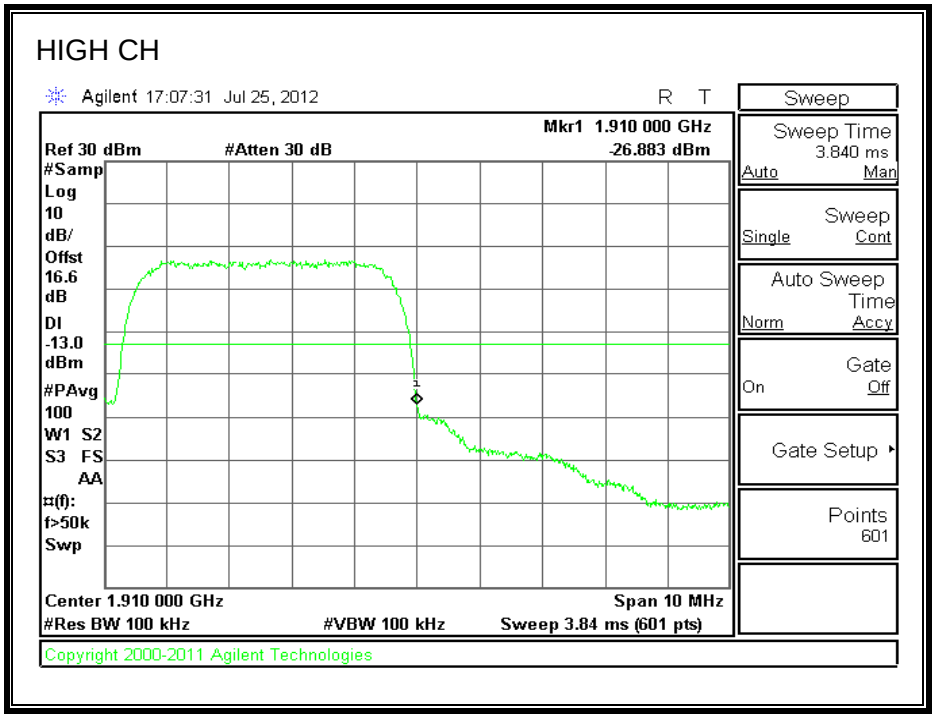
UMTS HSDPA PCS Band

LOW CH



HIGH CH



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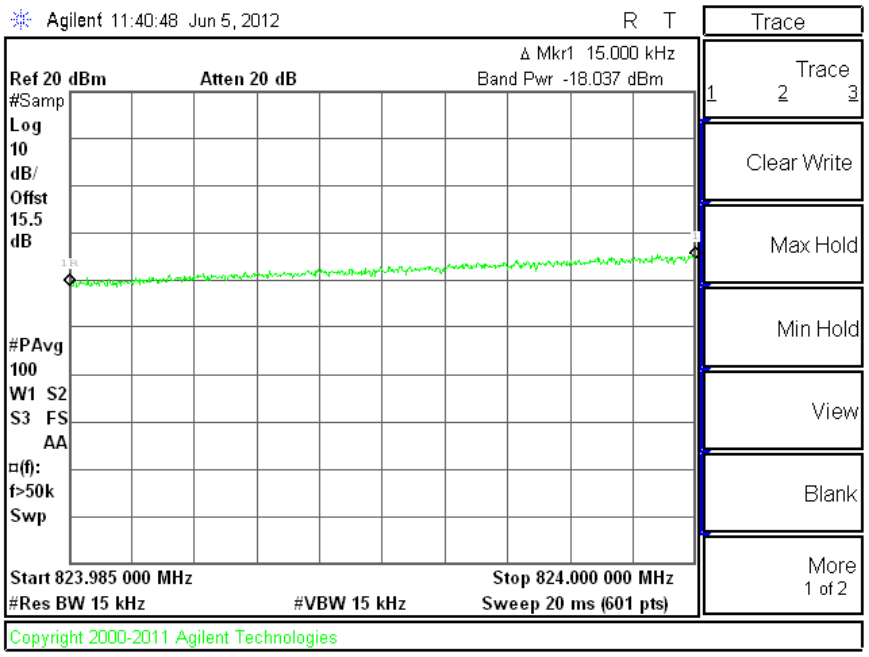
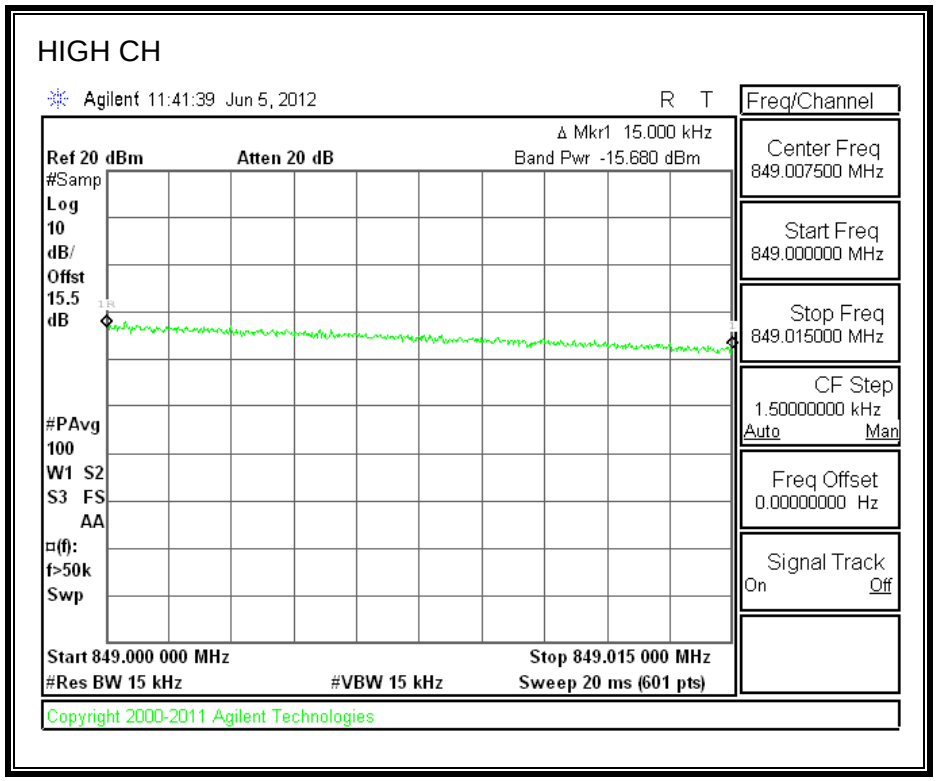
UAT (PORT B) / SECONDARY

CDMA2000 1xRTT mode (Cellular Band)

LOW CH



HIGH CH



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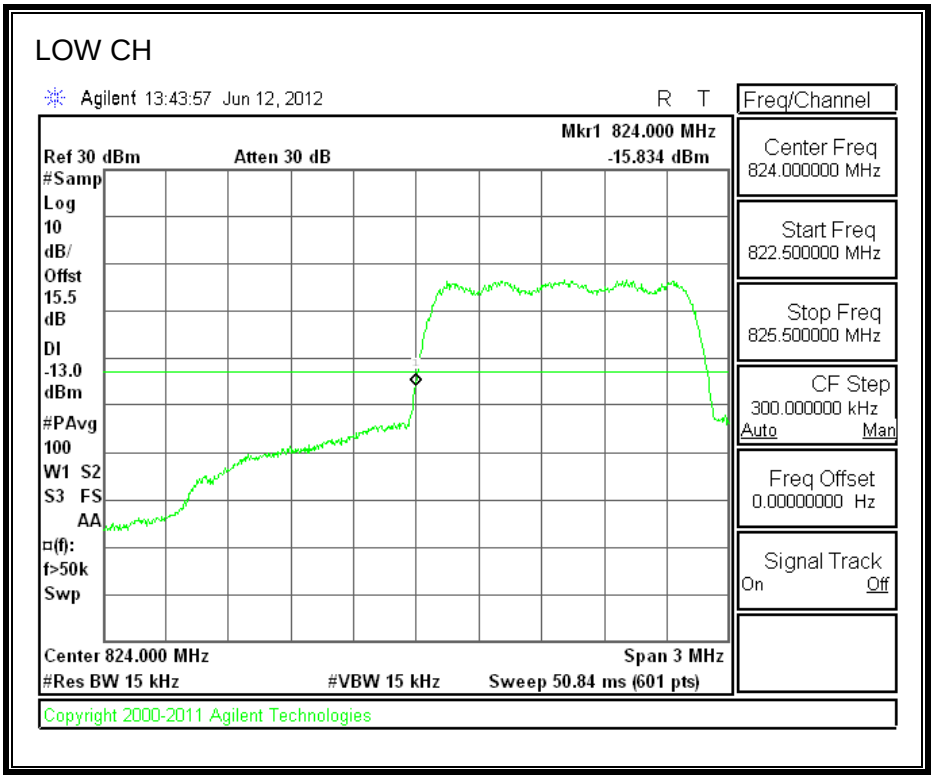
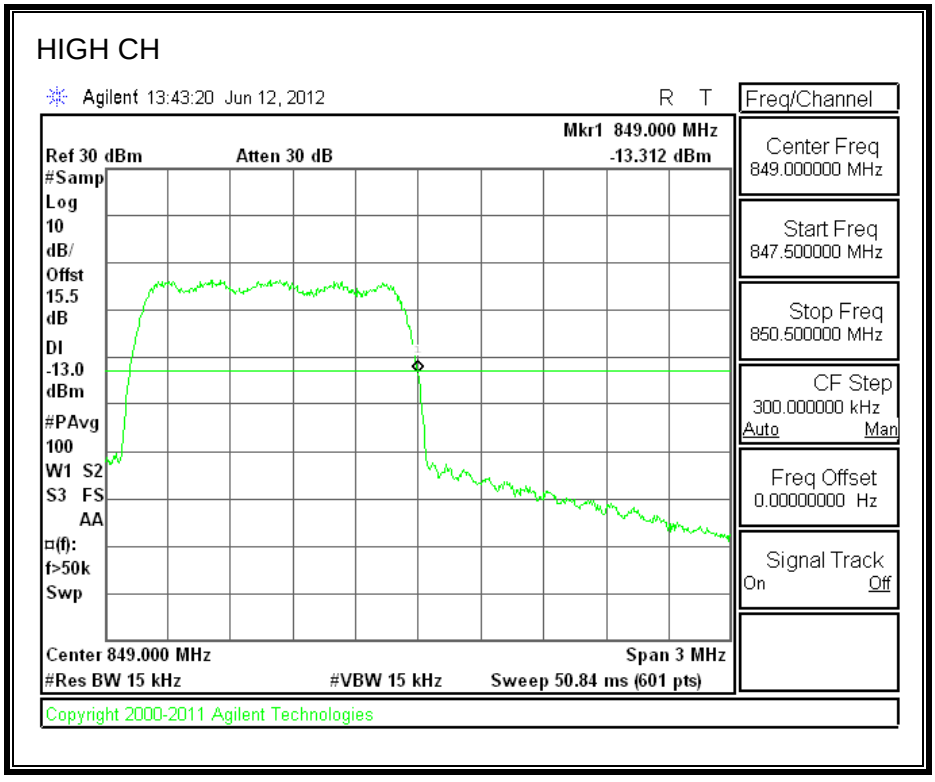
CDMA2000 EVDO Rev A mode (Cellular Band)

LOW CH



HIGH CH



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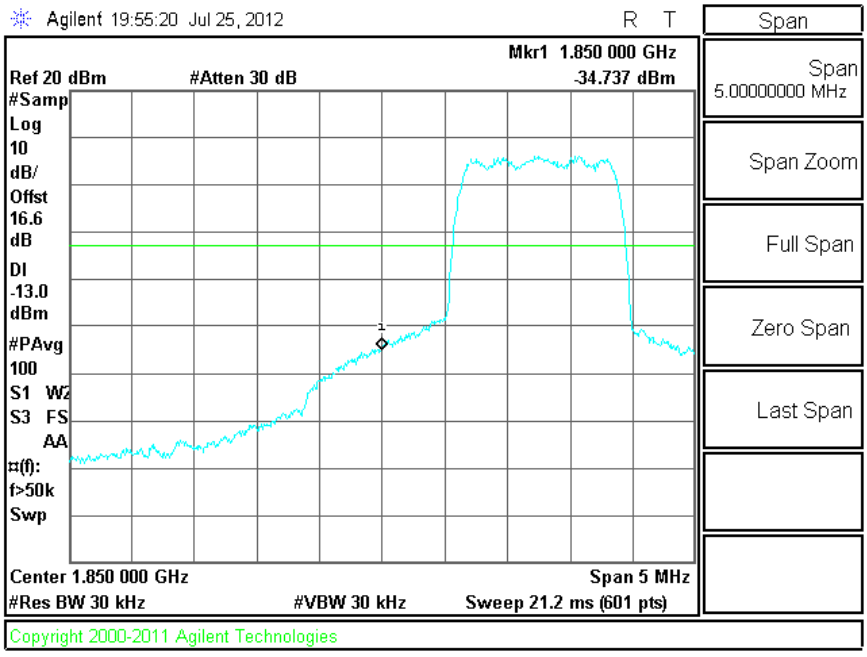
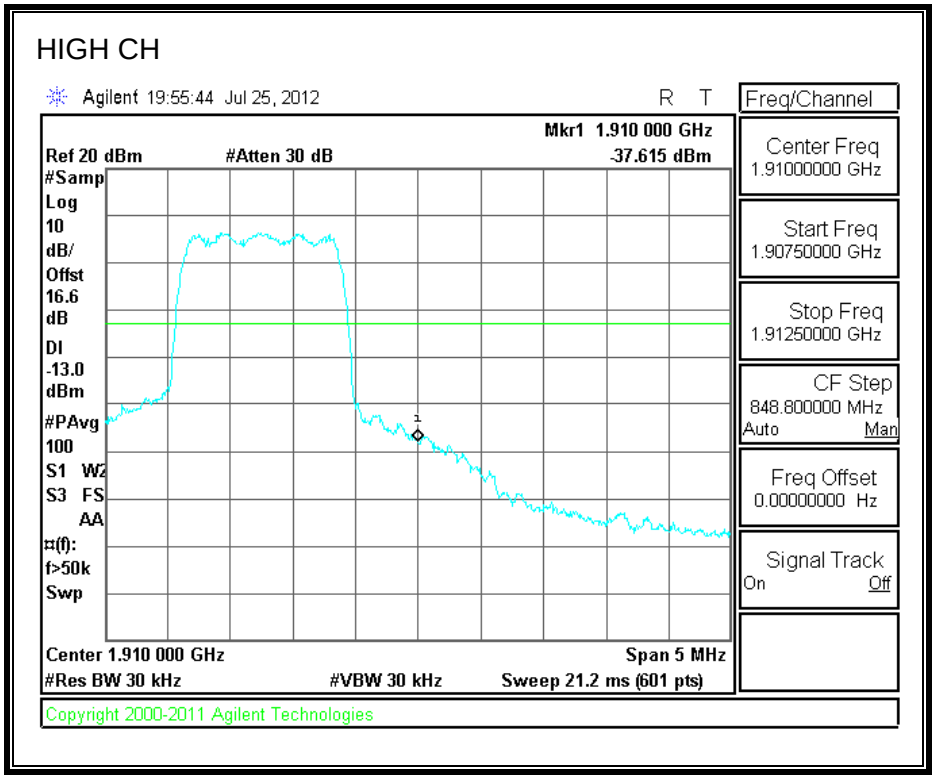
CDMA2000 1xRTT mode (PCS Band)

LOW CH



HIGH CH



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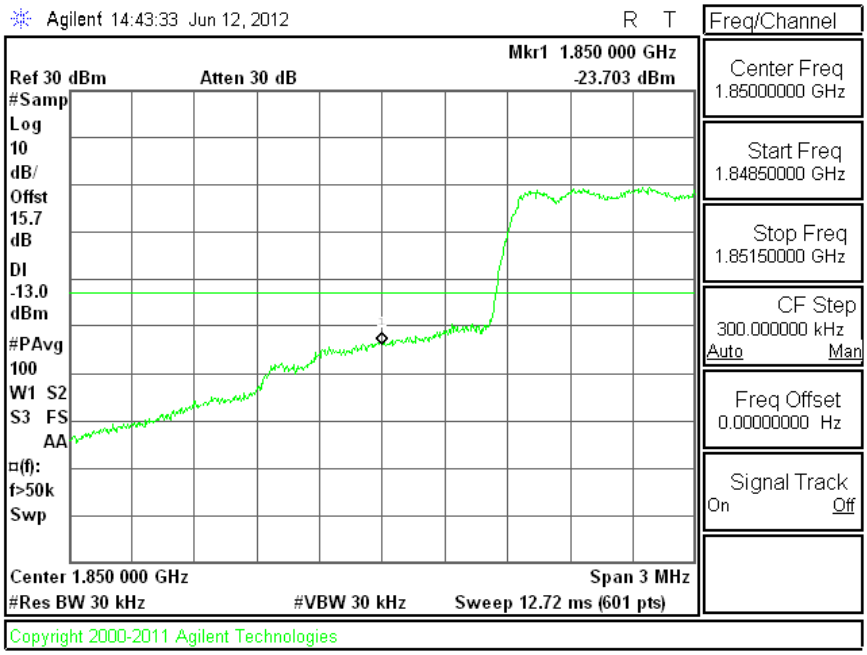
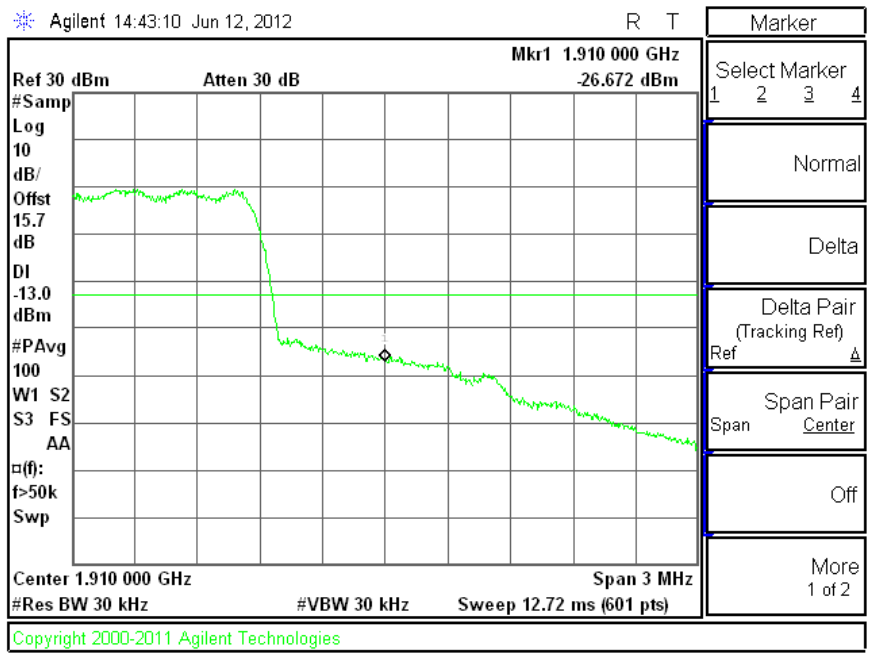
CDMA2000 EVDO Rev A mode (PCS Band)

LOW CH



HIGH CH



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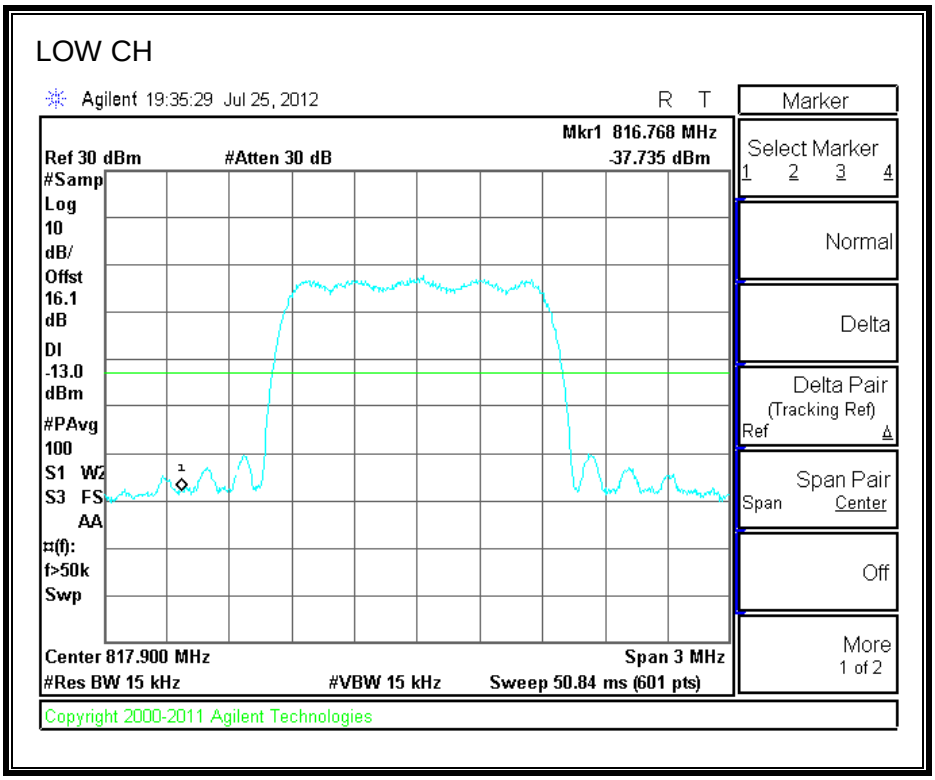
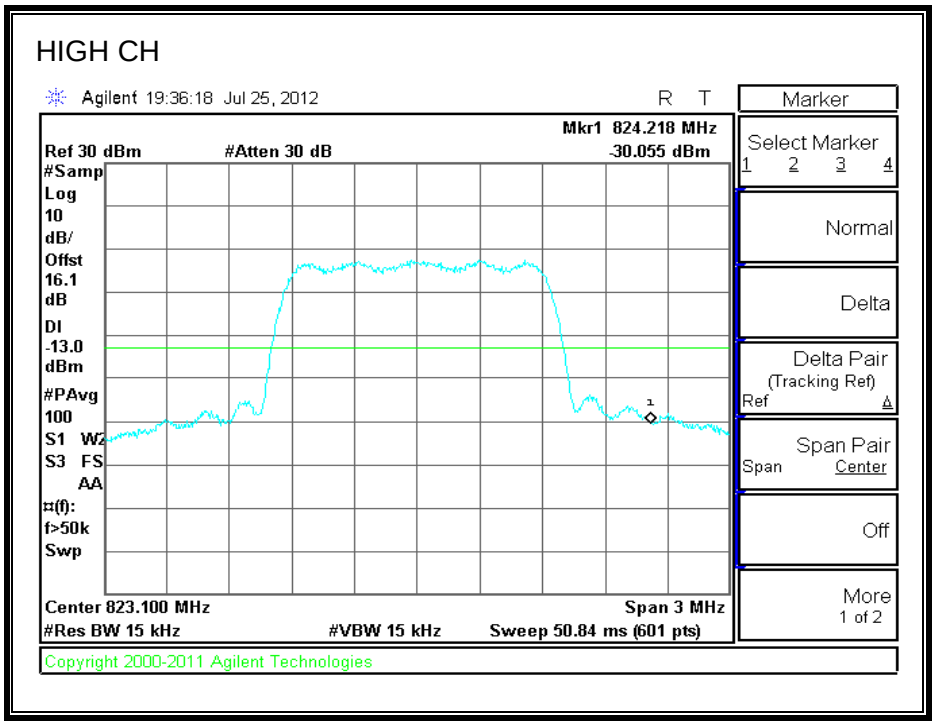
BC10, 1xRTT

LOW CH



HIGH CH



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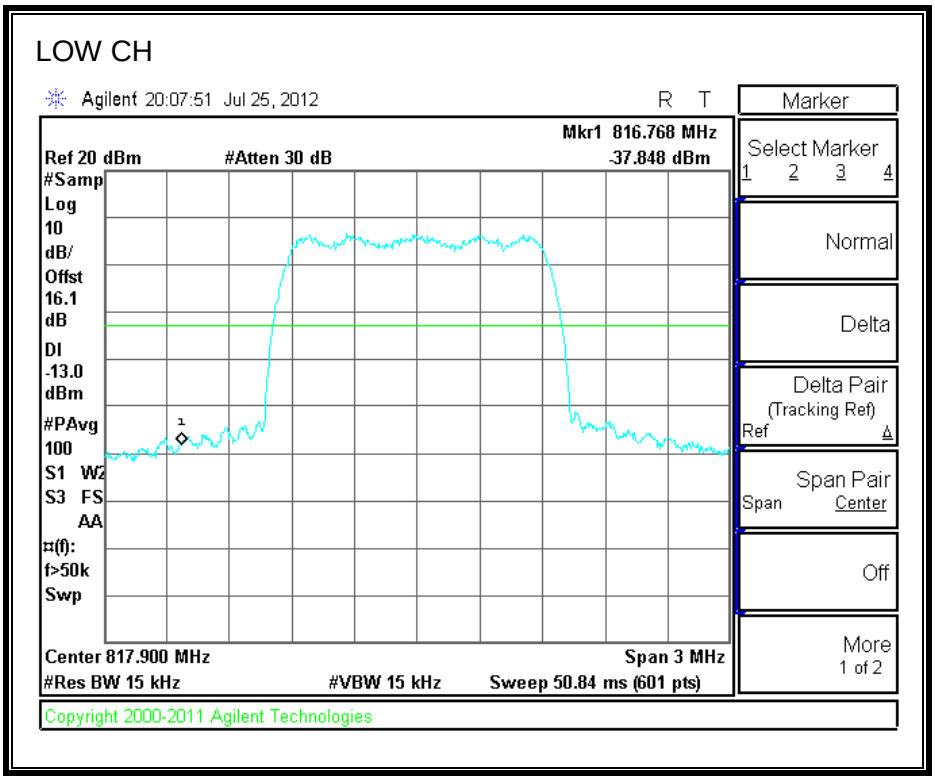
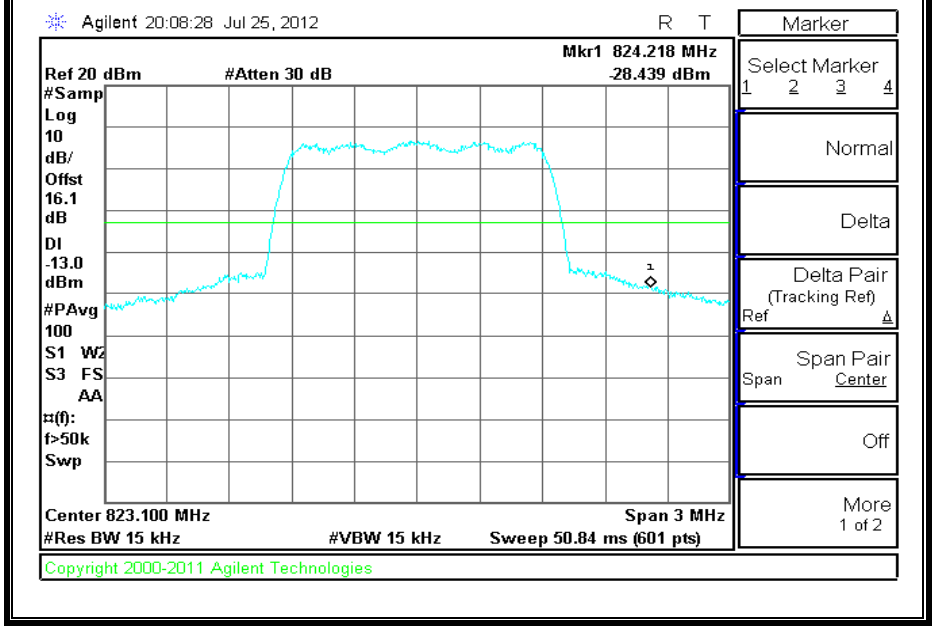
BC10, EVDO

LOW CH



HIGH CH



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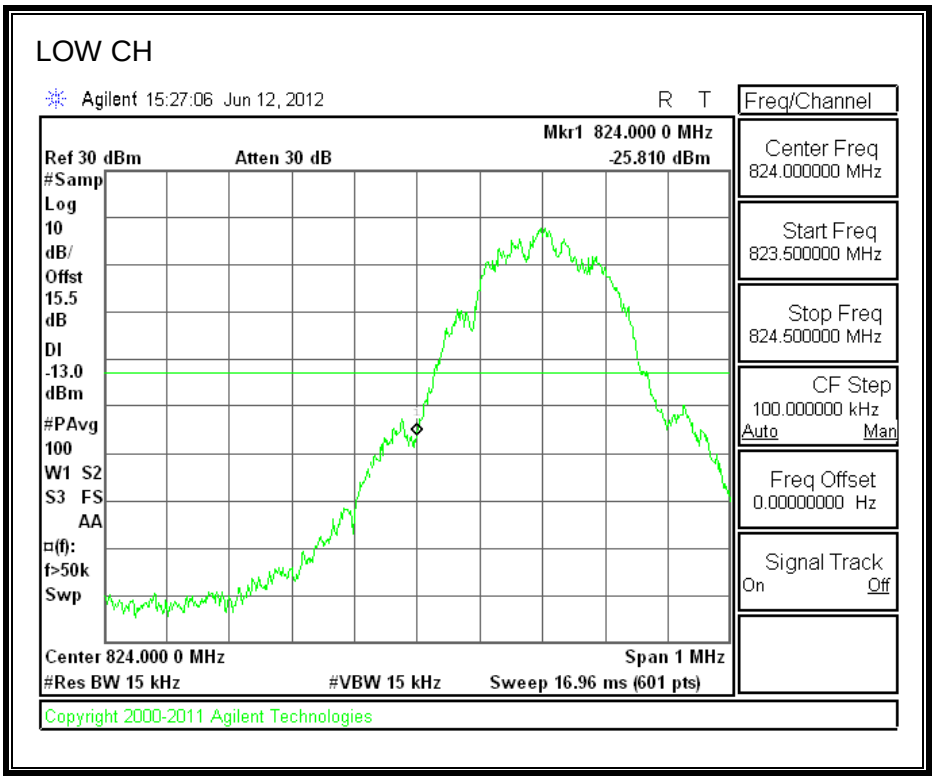
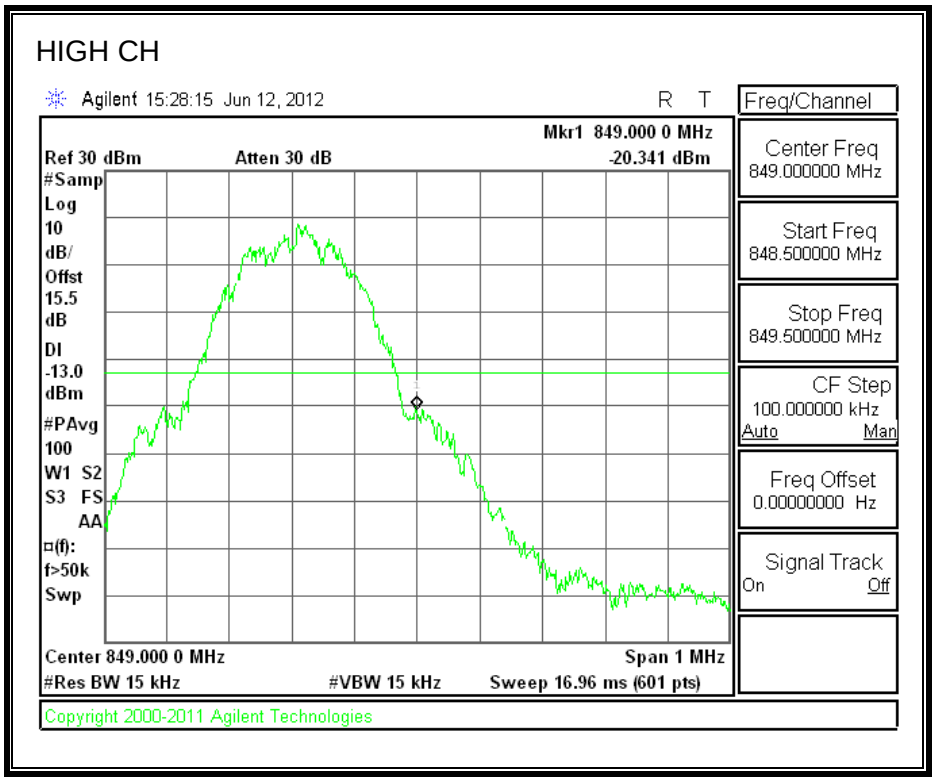
GPRS850 BAND

LOW CH



HIGH CH



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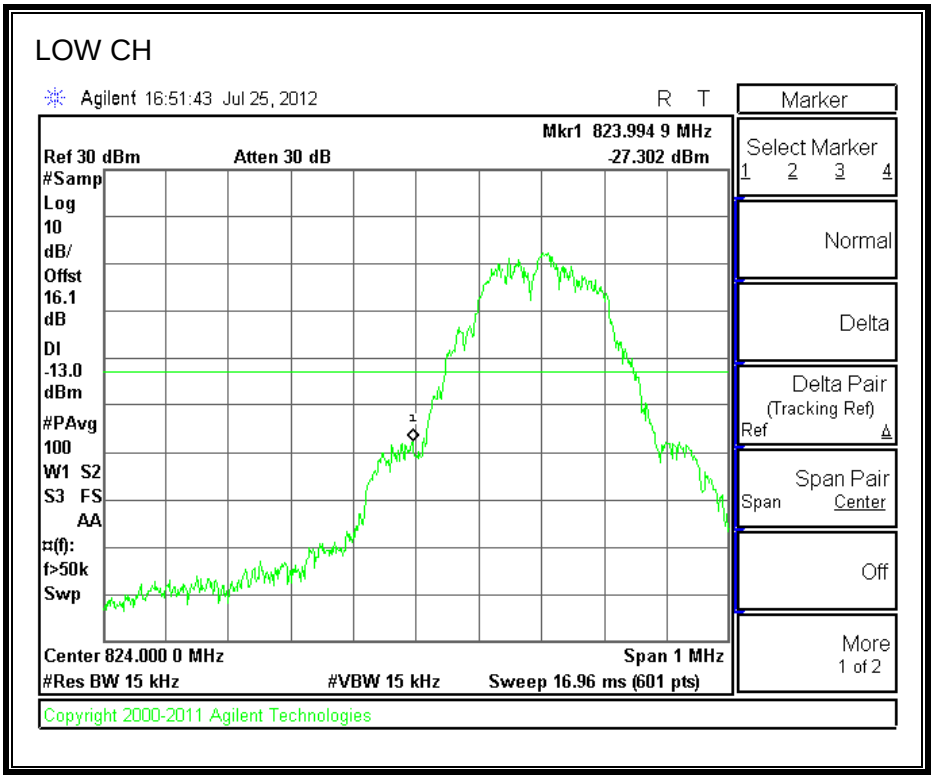
EGPRS850 BAND

LOW CH



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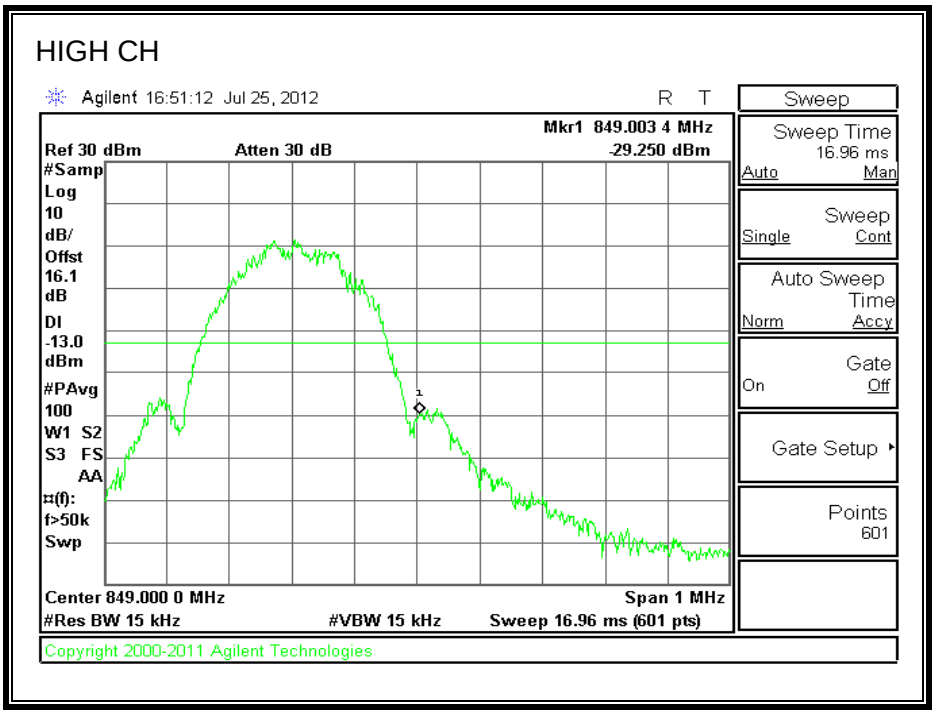

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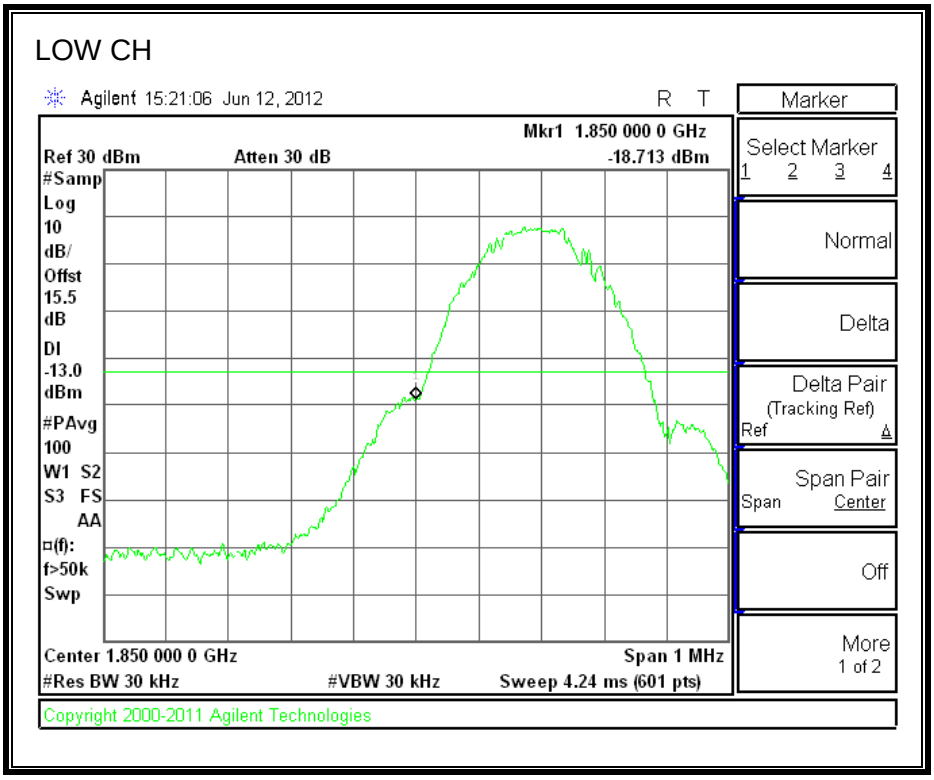
GPRS1900 BAND

LOW CH



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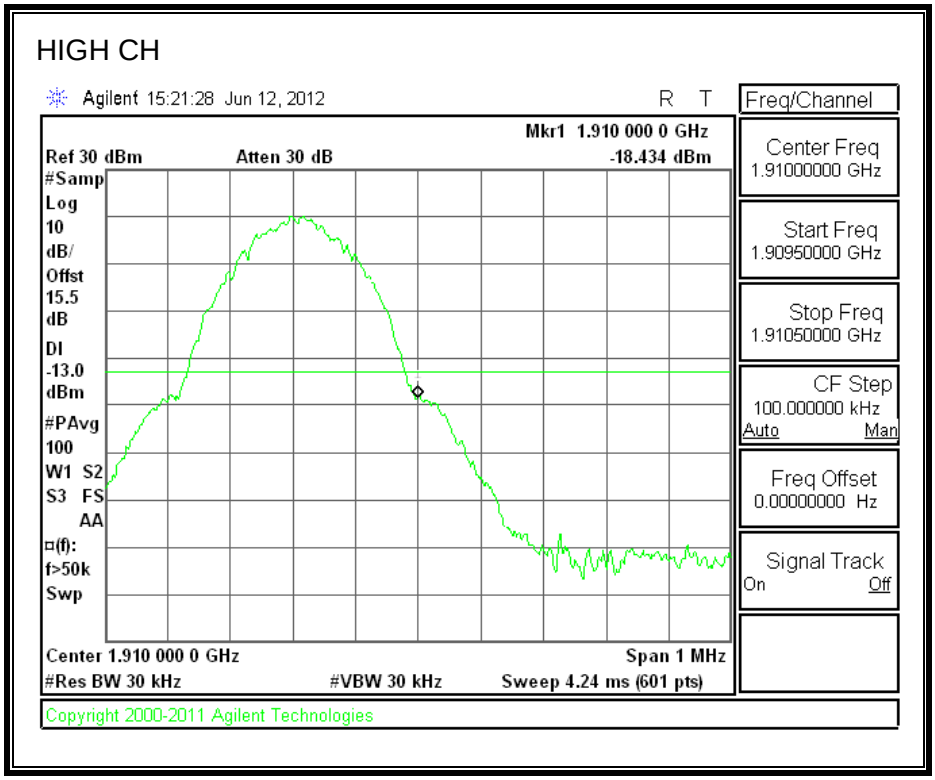

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EGPRS1900 BAND

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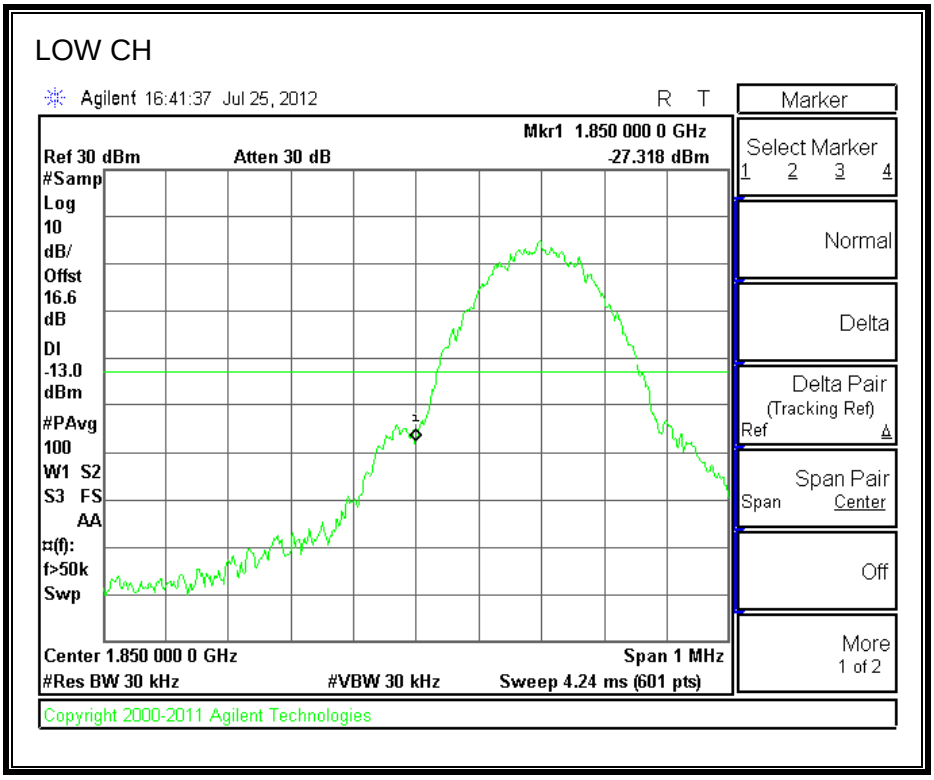

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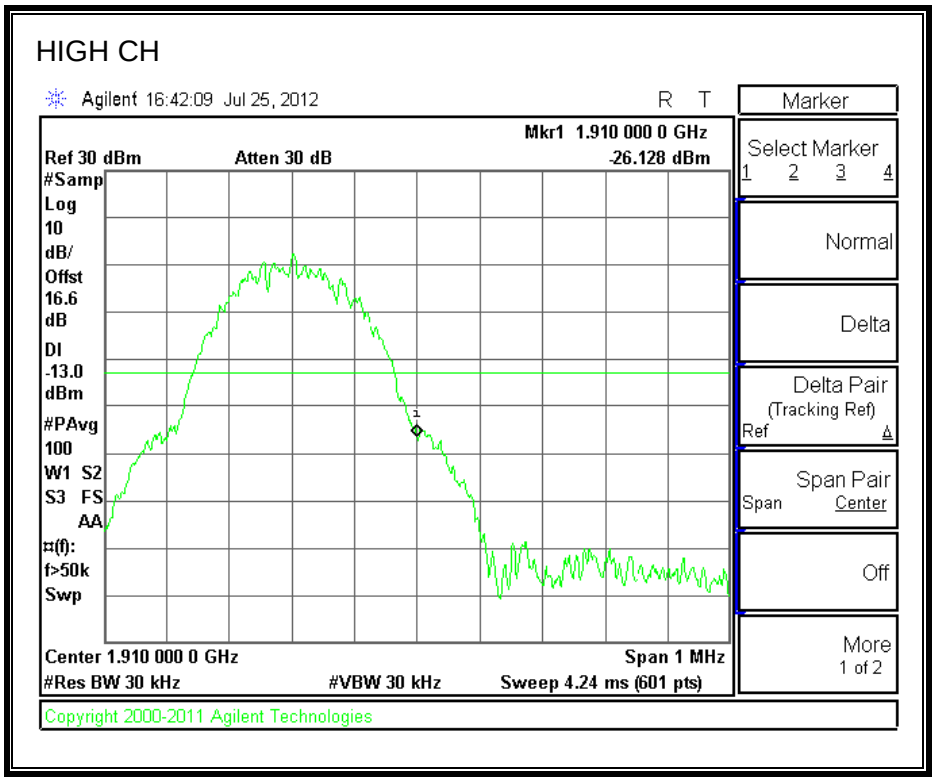

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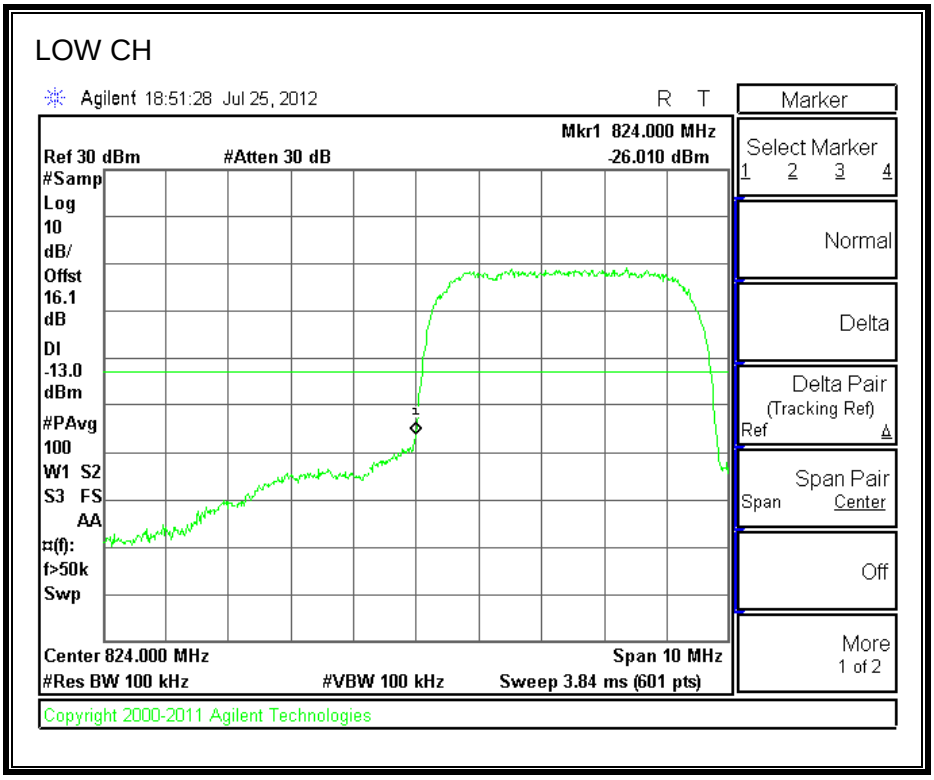
UMTS HSDPA CELL BAND

LOW CH



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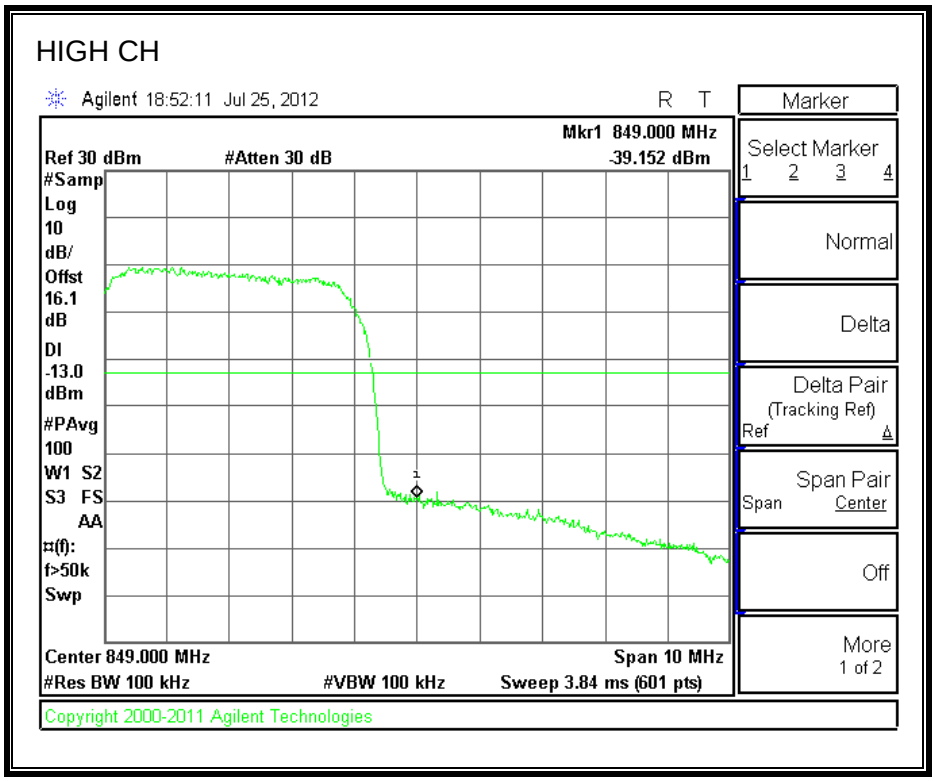

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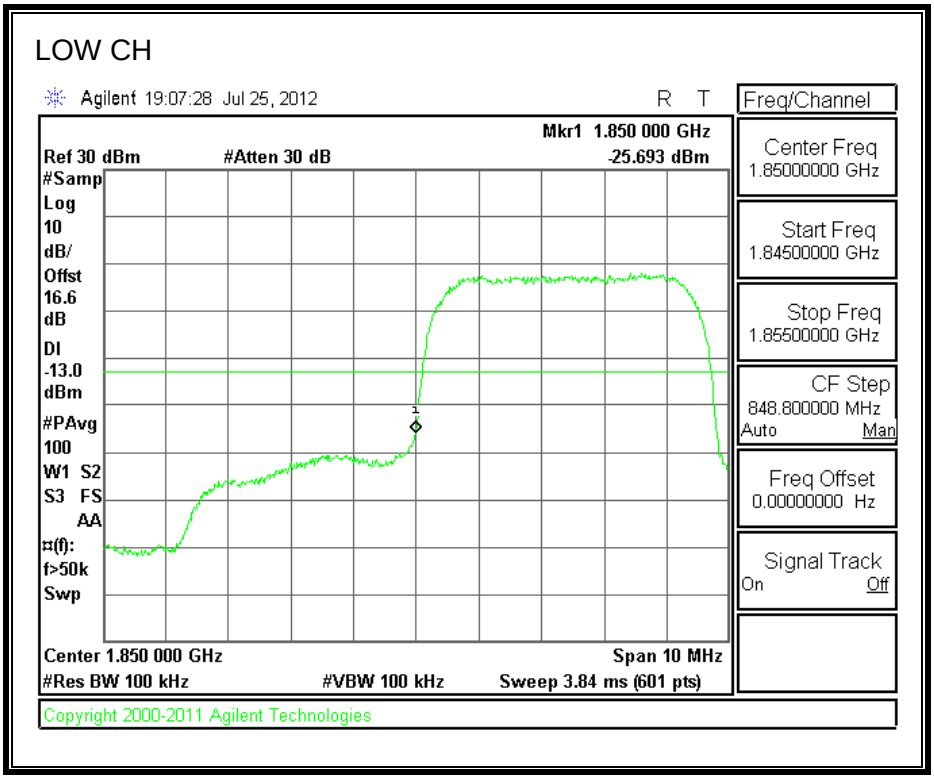
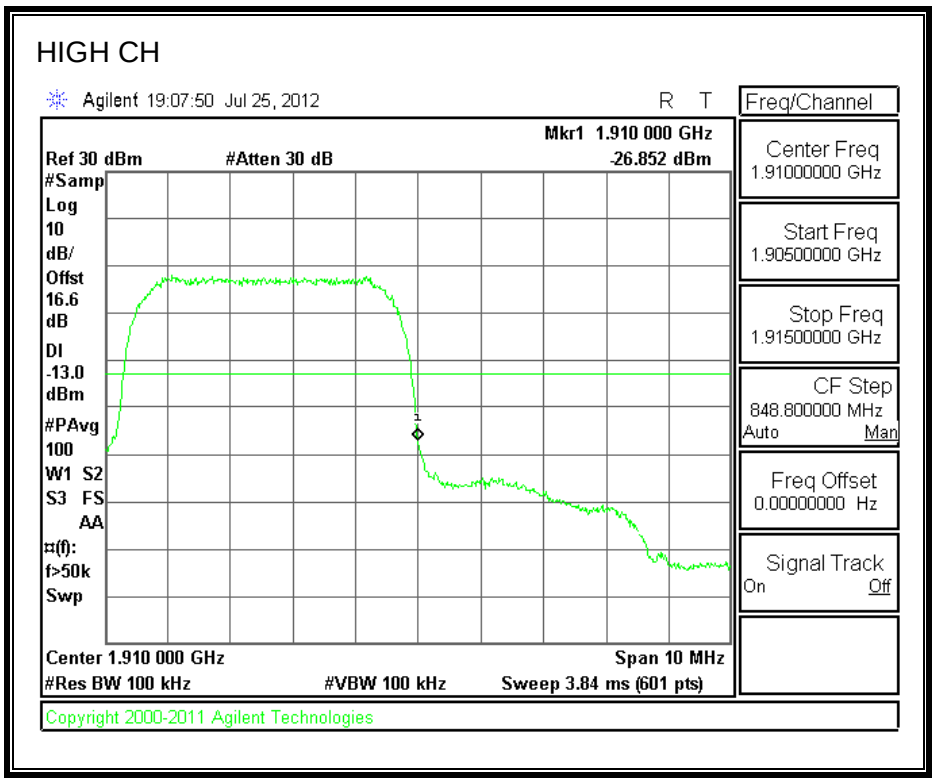
UMTS WCDMA REL 99 PCS Band

LOW CH



HIGH CH



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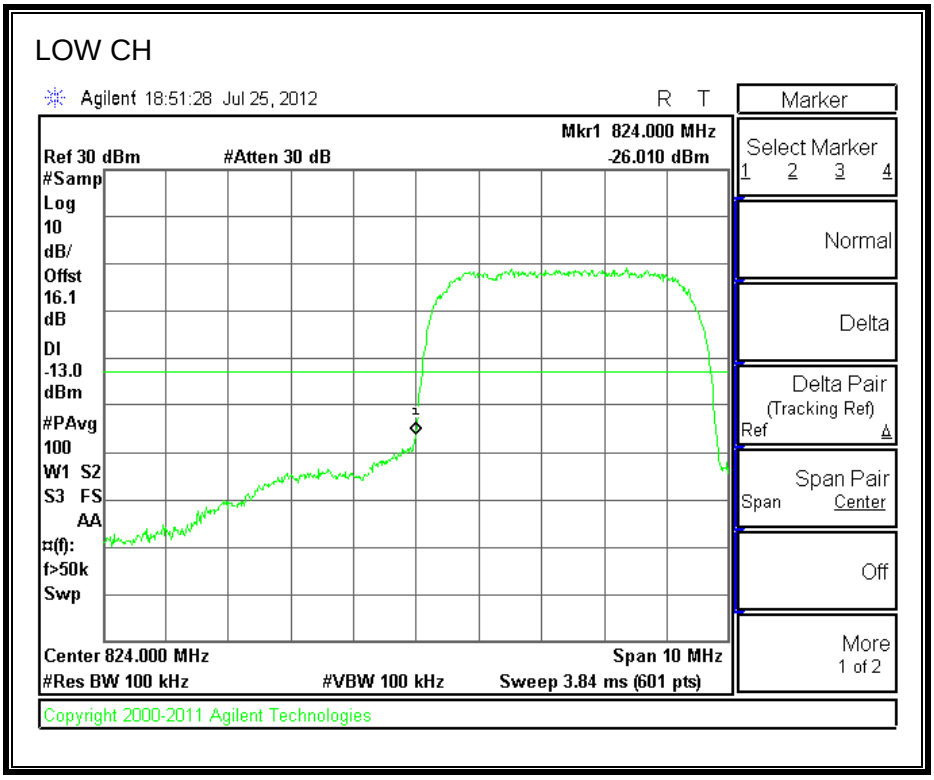
UMTS HSDPA CELL BAND

LOW CH



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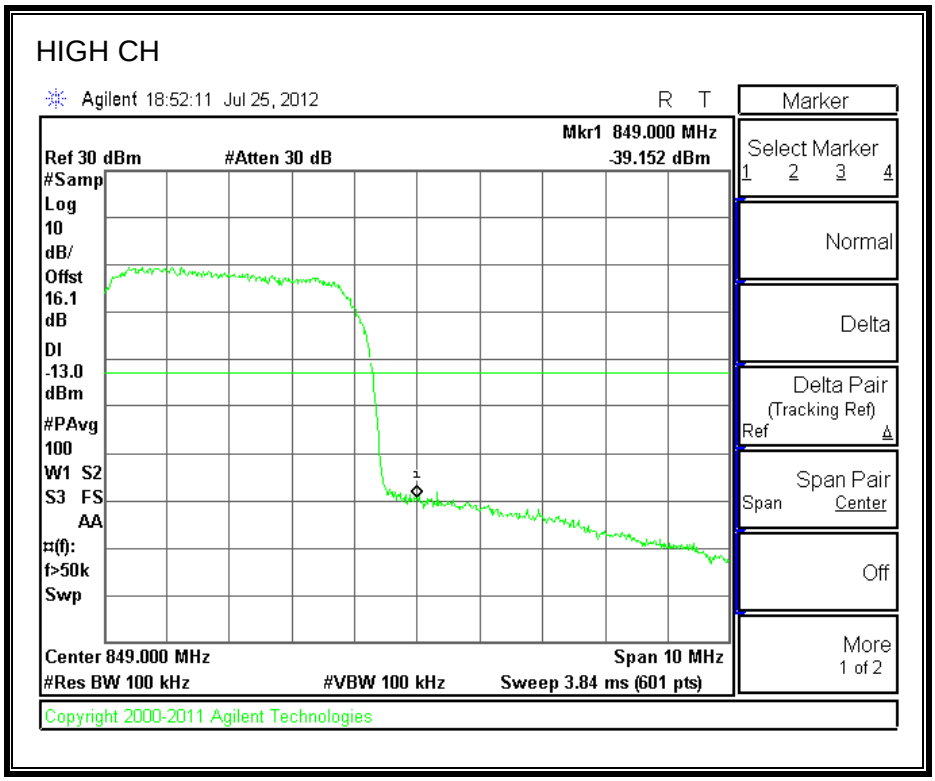

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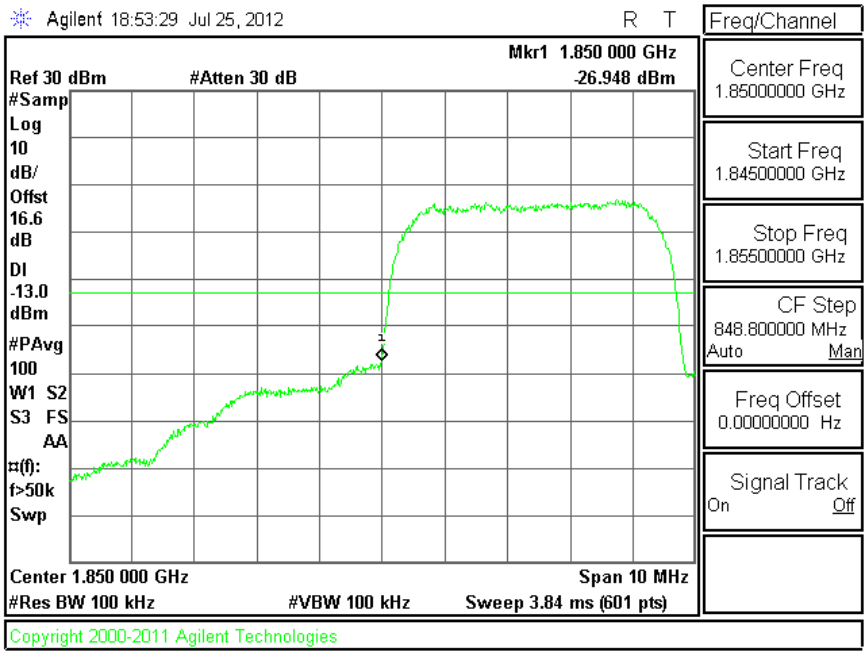
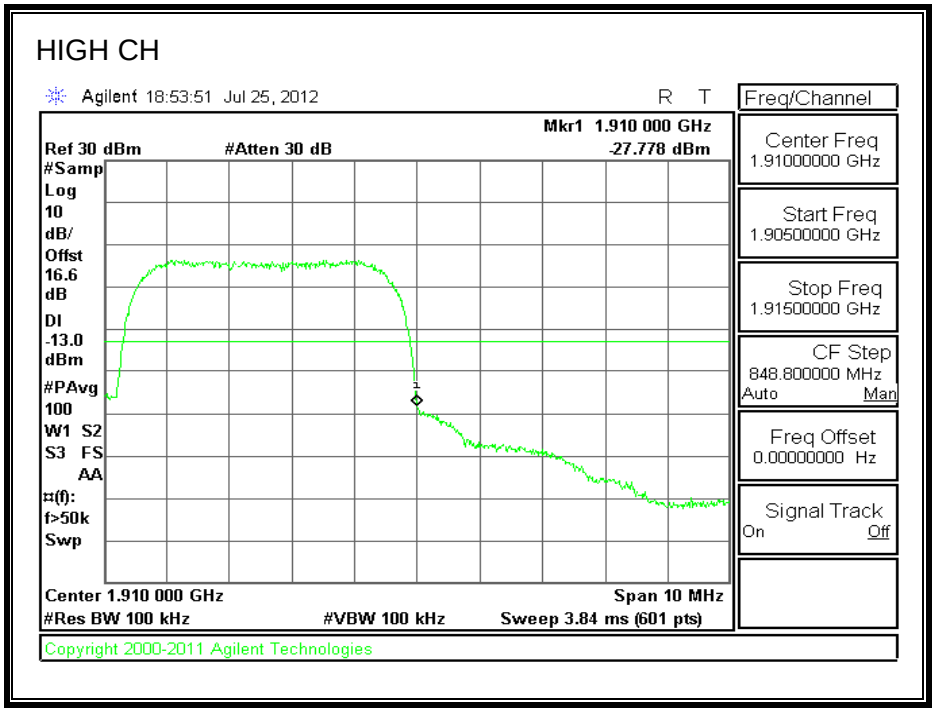
UMTS HSDPA PCS Band

LOW CH



HIGH CH



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8.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §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

- GPRS and EGPRS
- UMTS, REL 99 and HSDPA
- BC10
- CDMA2000

RESULTS

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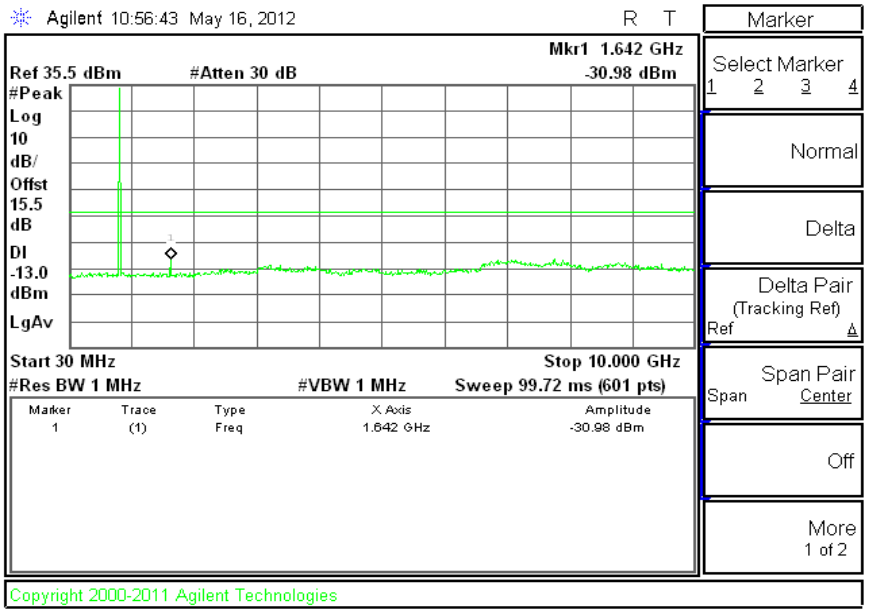
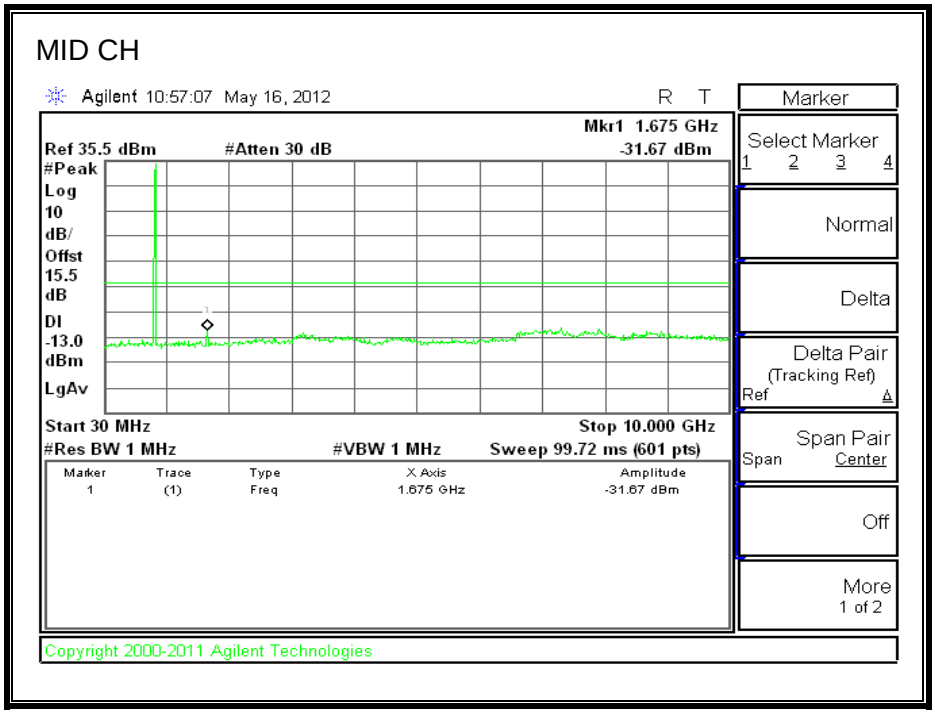
8.3.1. A1428

GPRS Mode (Cellular Band)

LOW CH



MID CH



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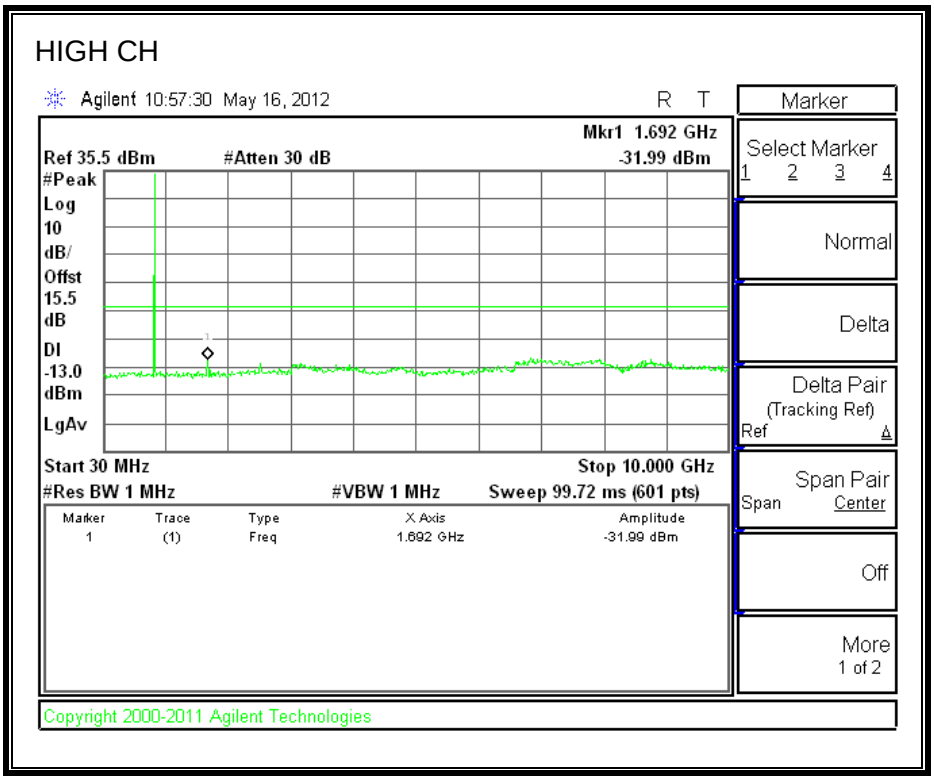
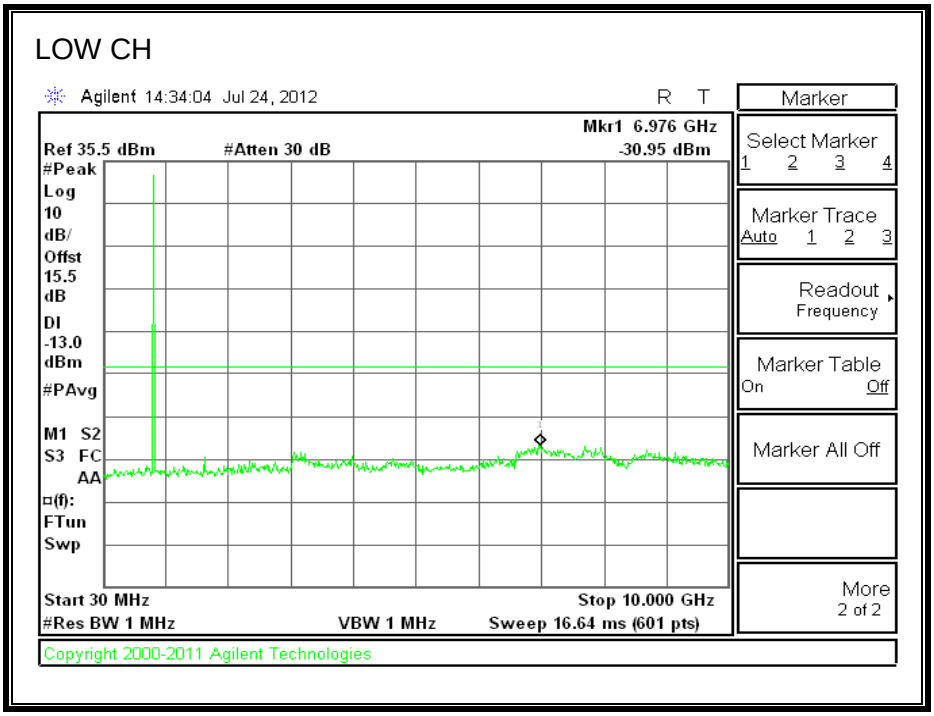


EGPRS Mode (Cellular Band)



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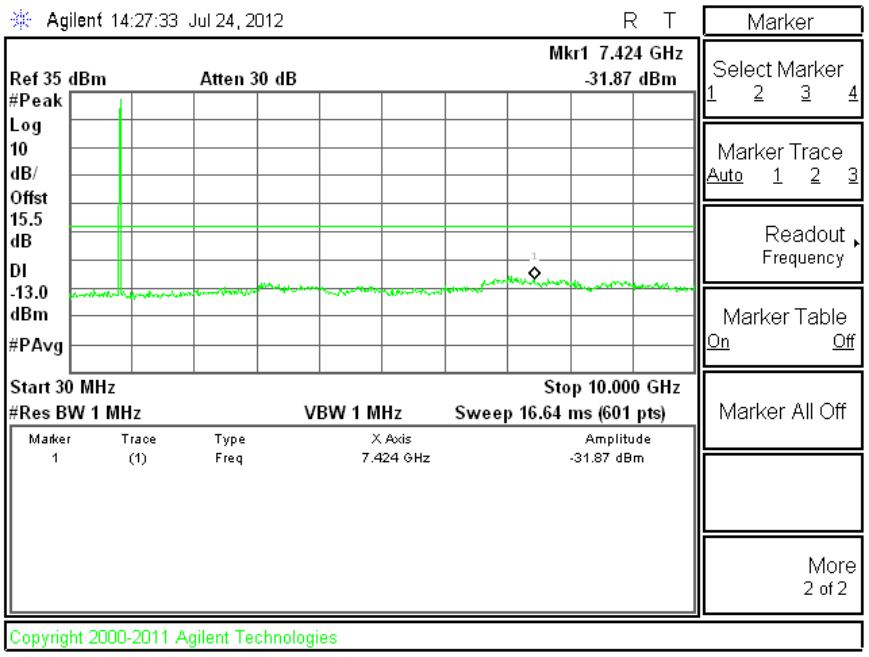
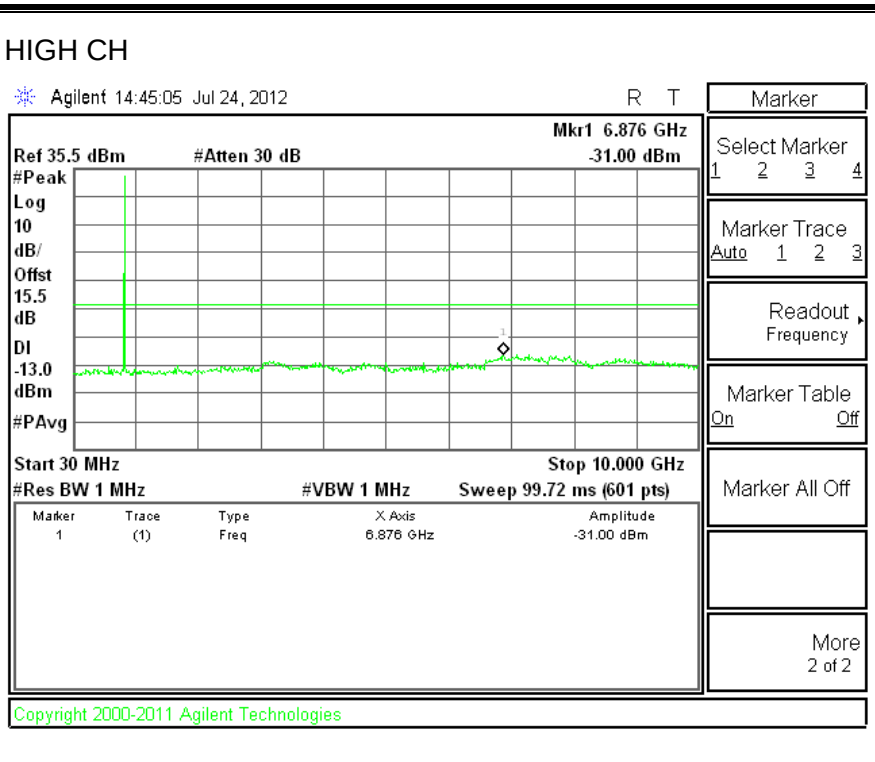
MID CH



HIGH CH



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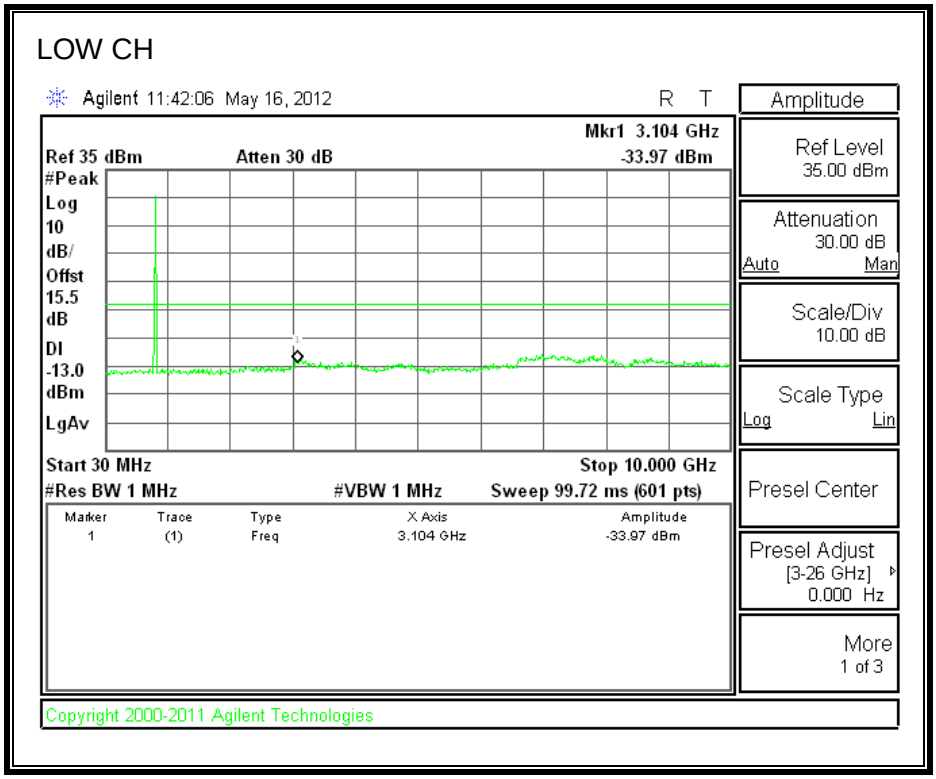
UMTS CELL BAND, REL 99

LOW CH



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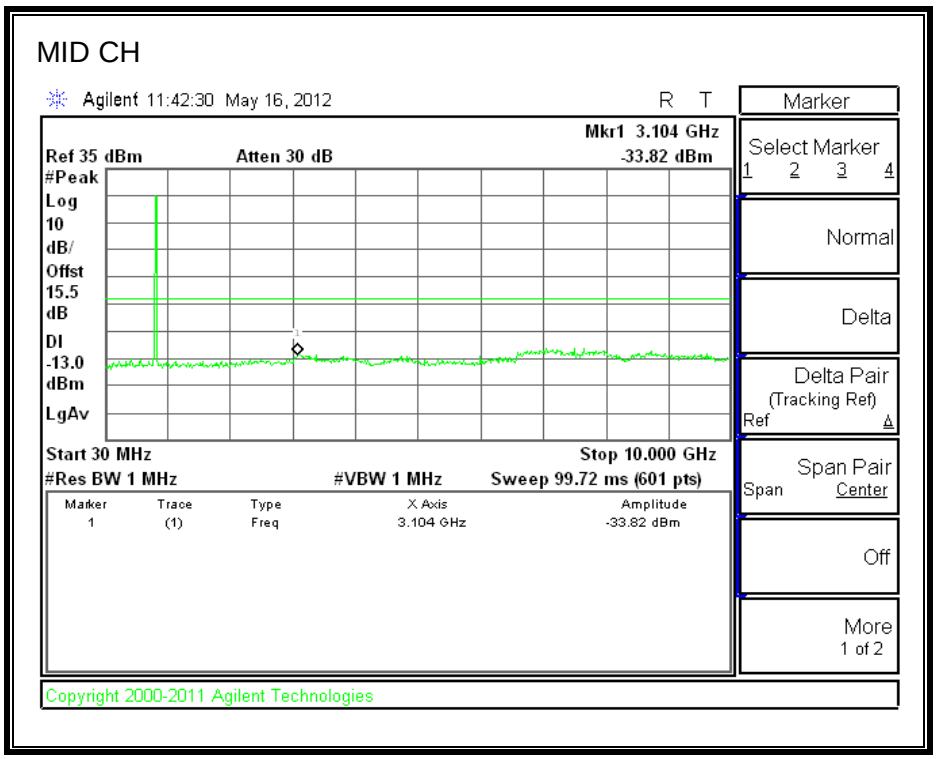

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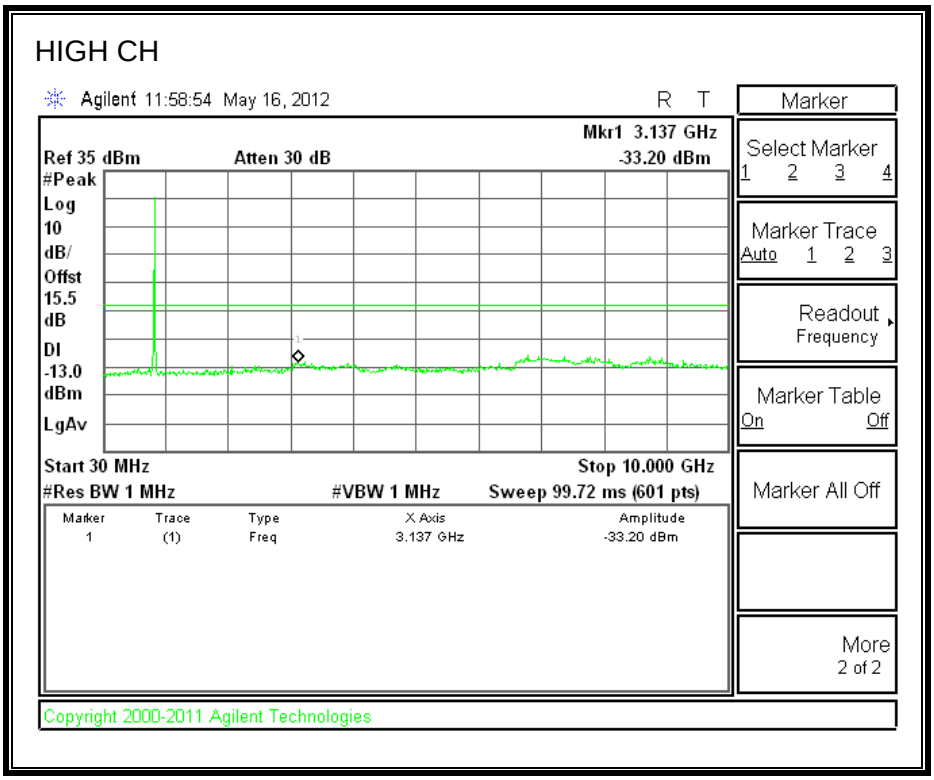

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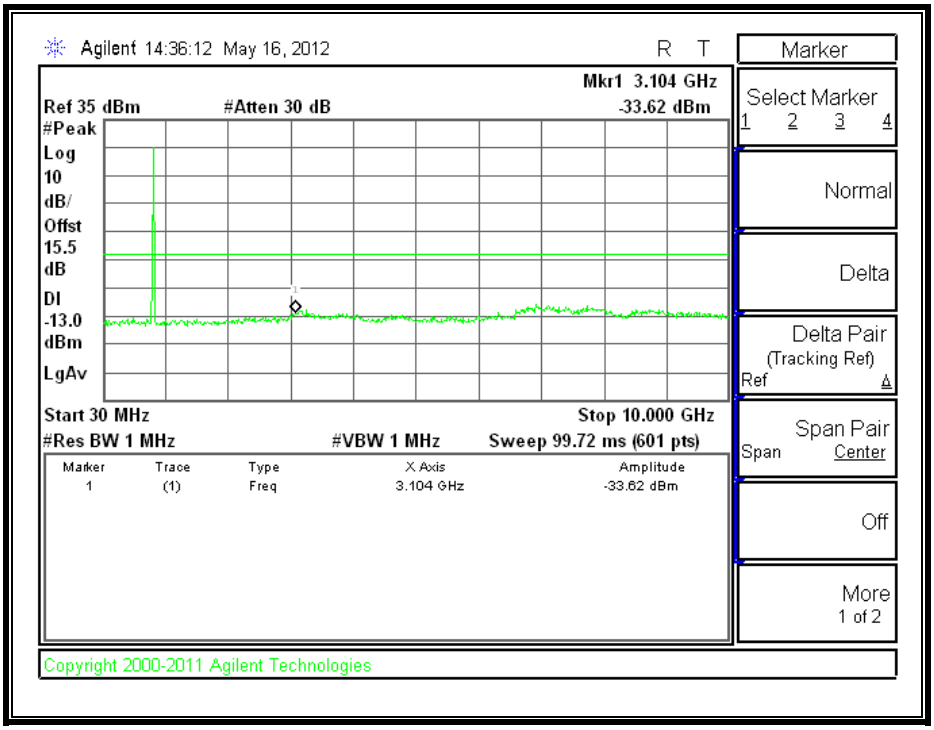
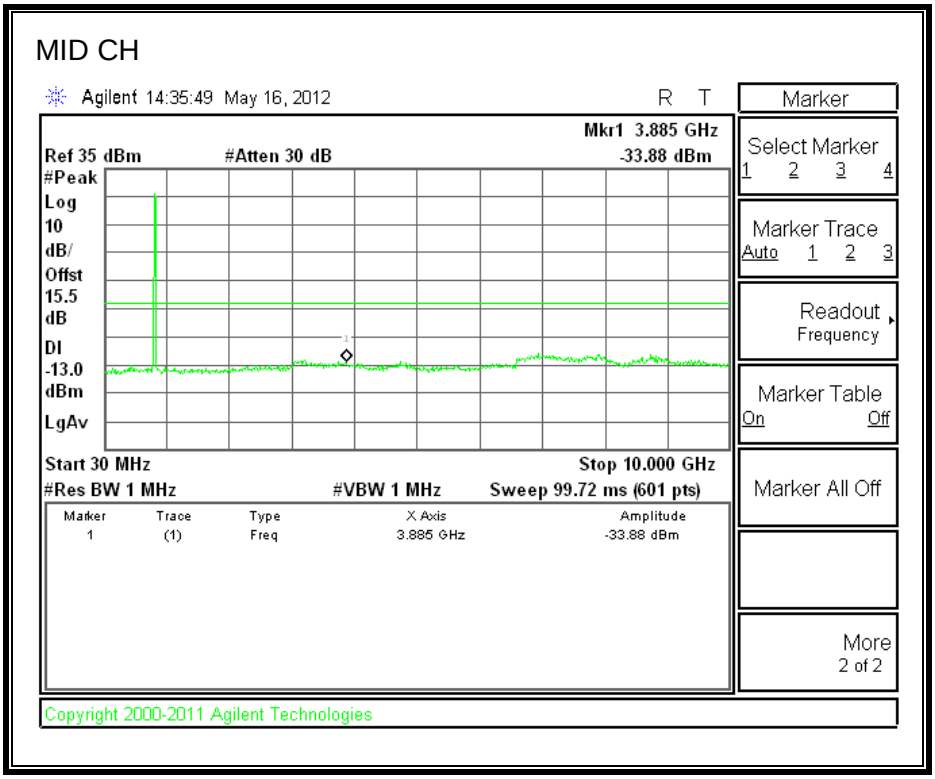
UMTS CELL BAND, HSDPA,





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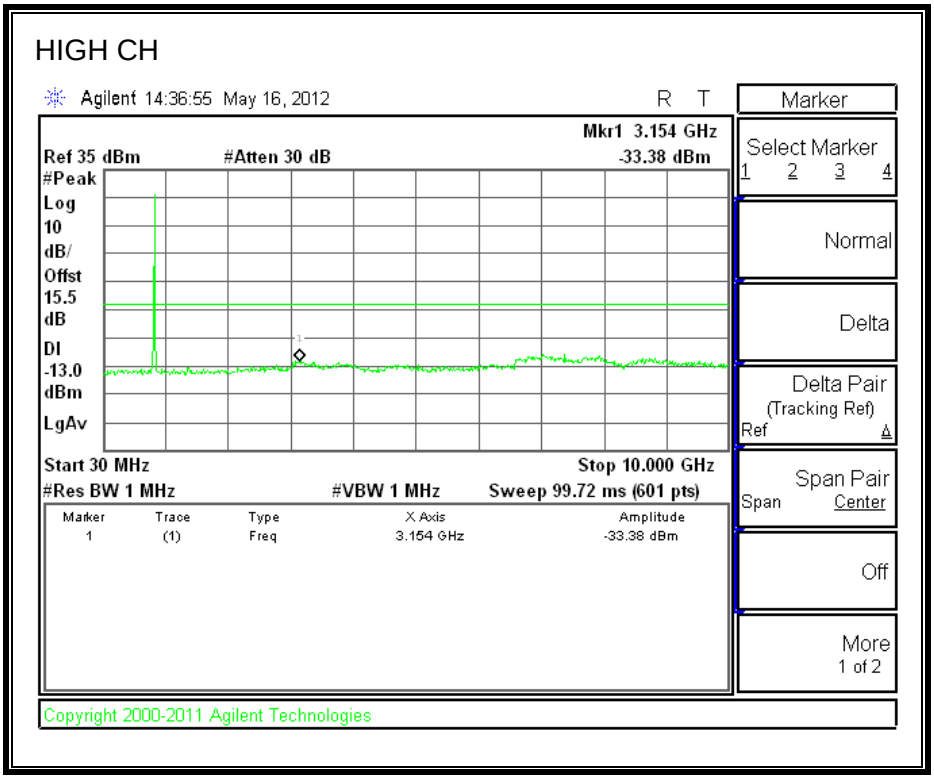
HIGH CH



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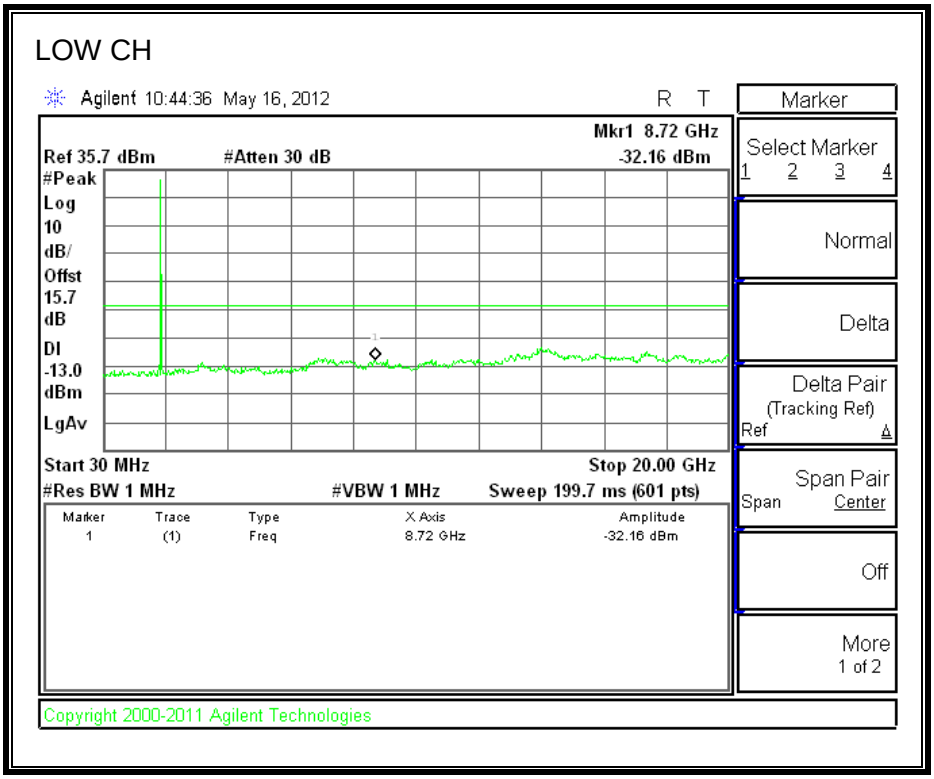
GPRS PCS BAND

LOW CH



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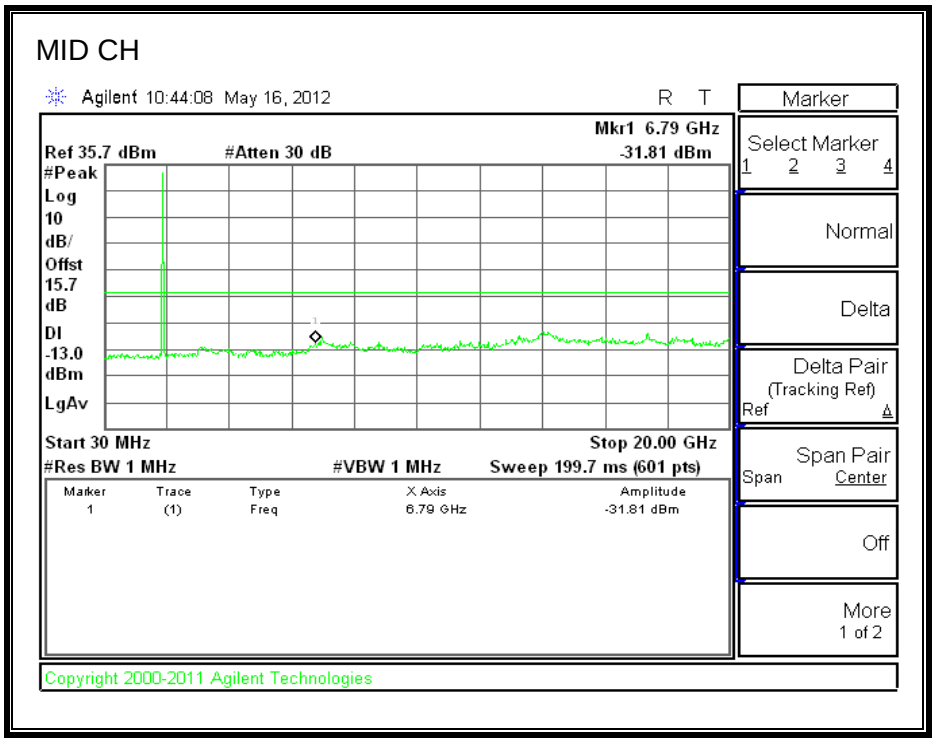

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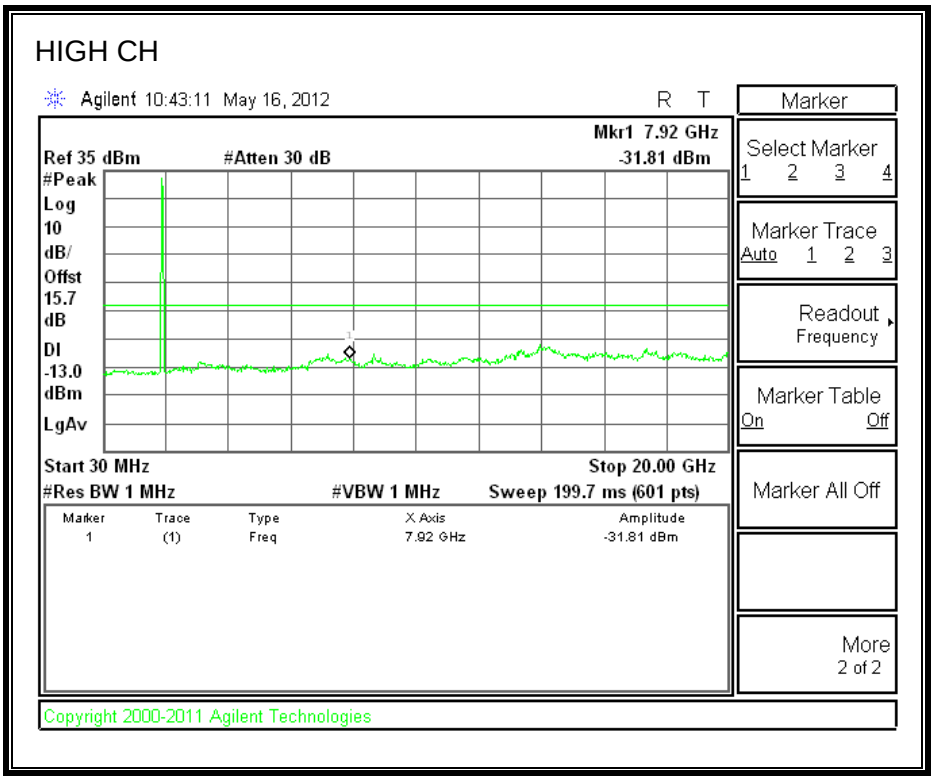
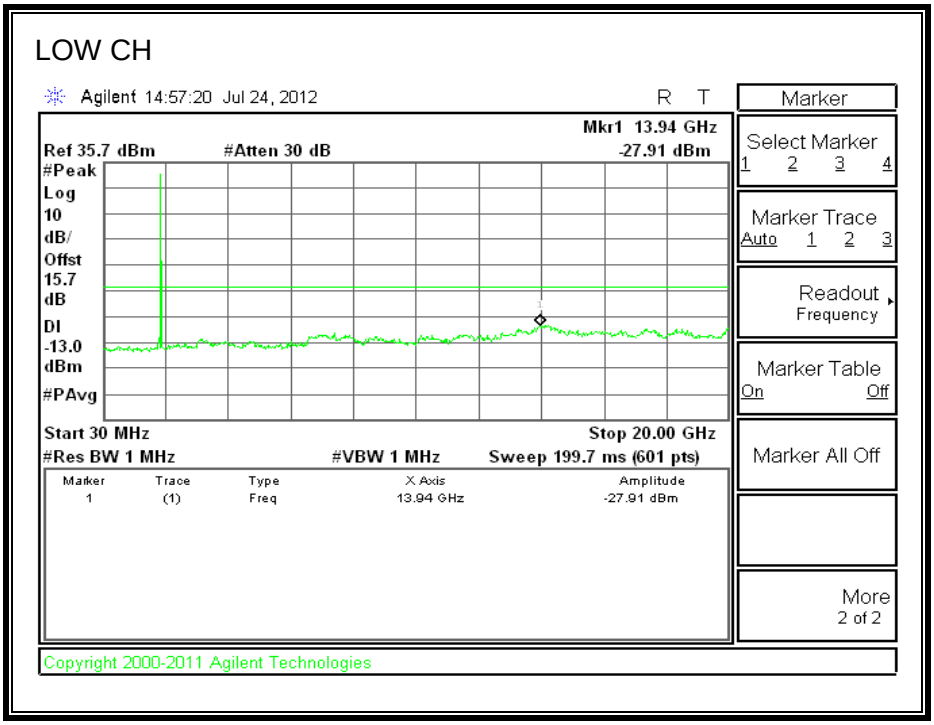


EGPRS PCS Band



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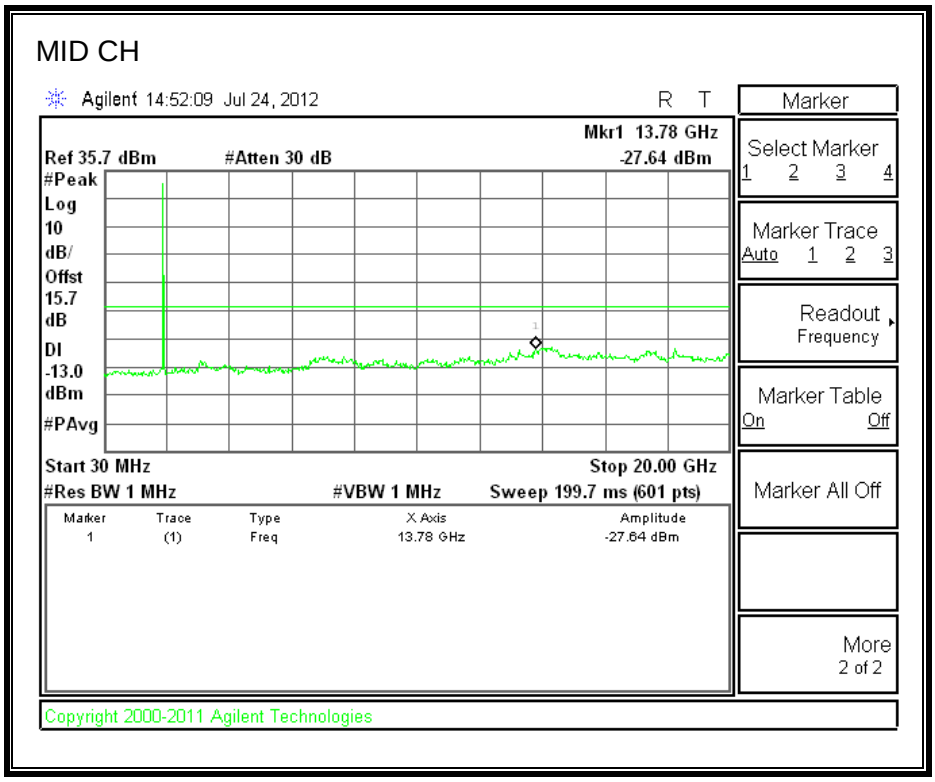
MID CH



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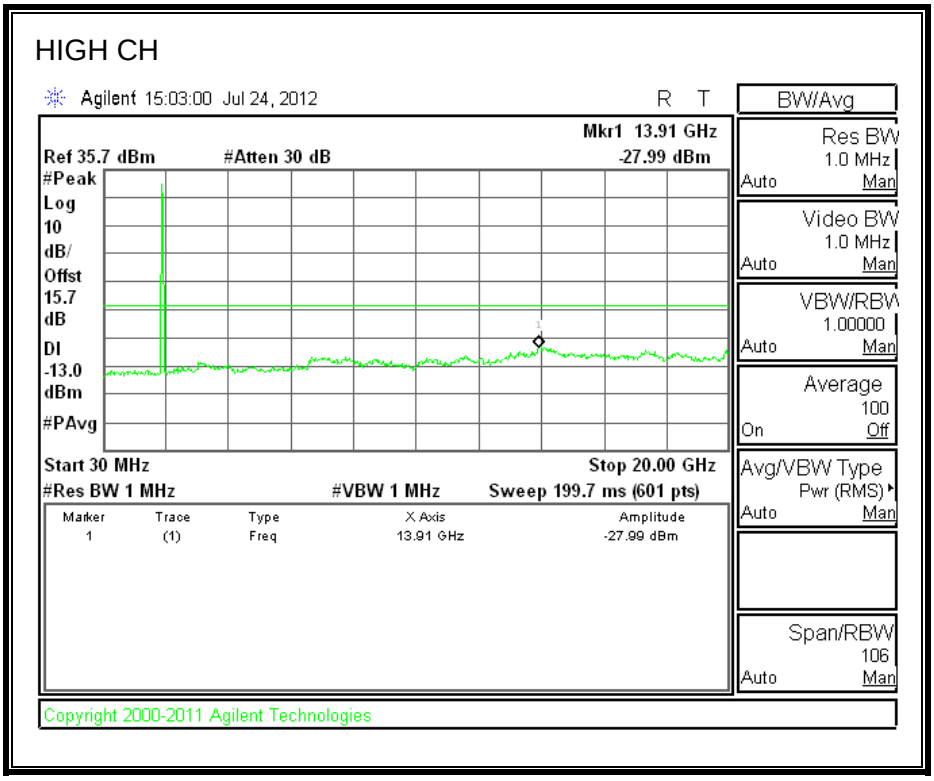

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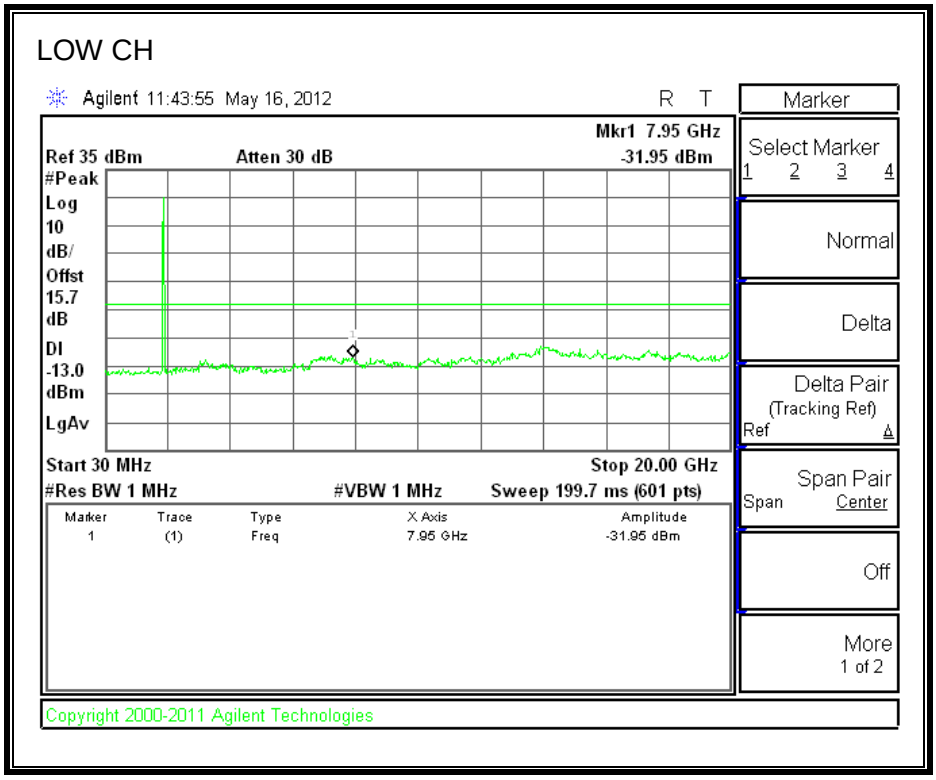
UMTS PCS BAND, REL 99

LOW CH



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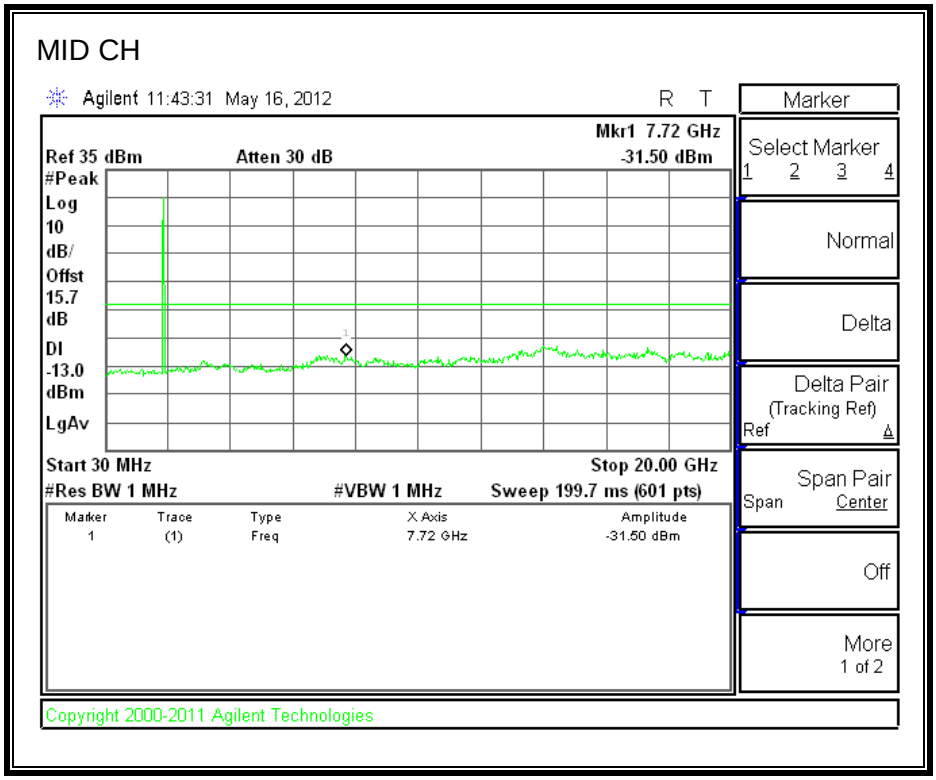

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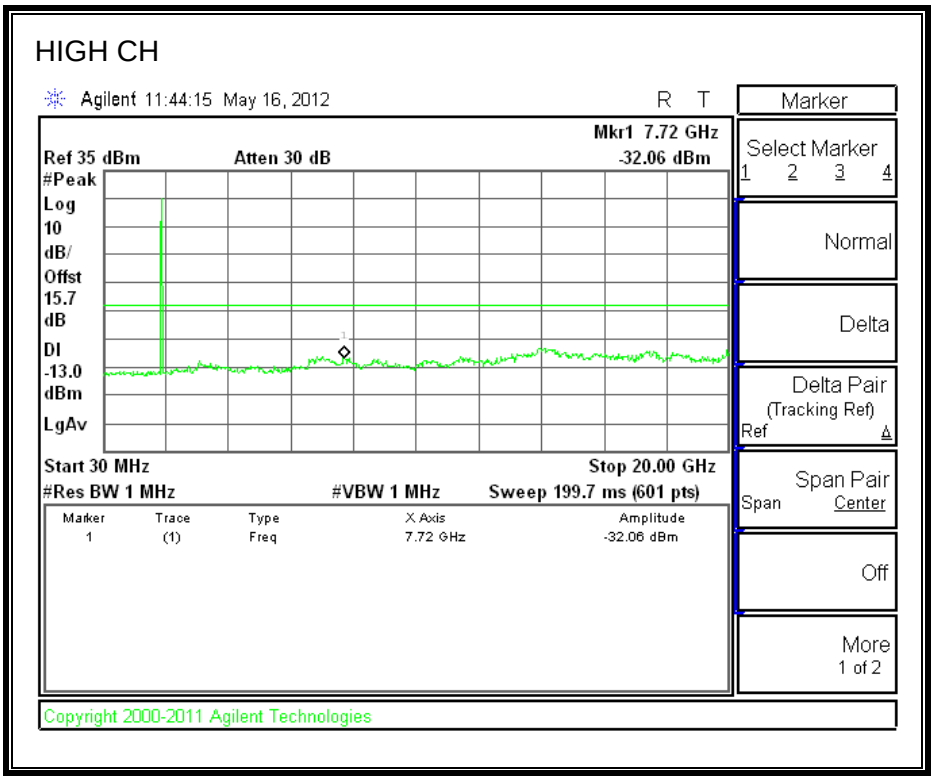
HIGH CH



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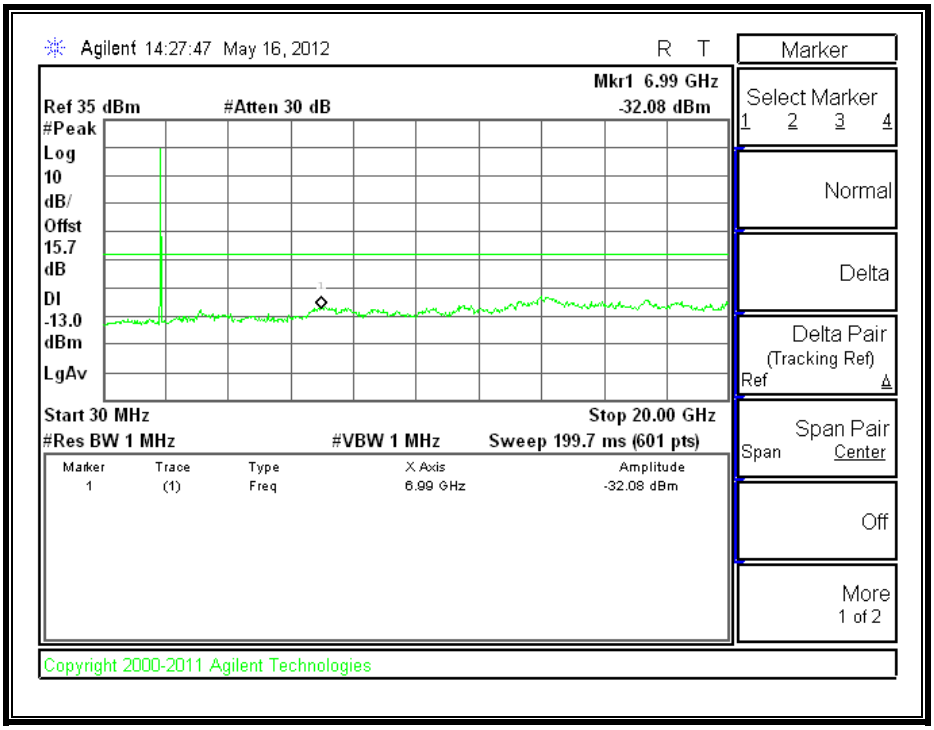
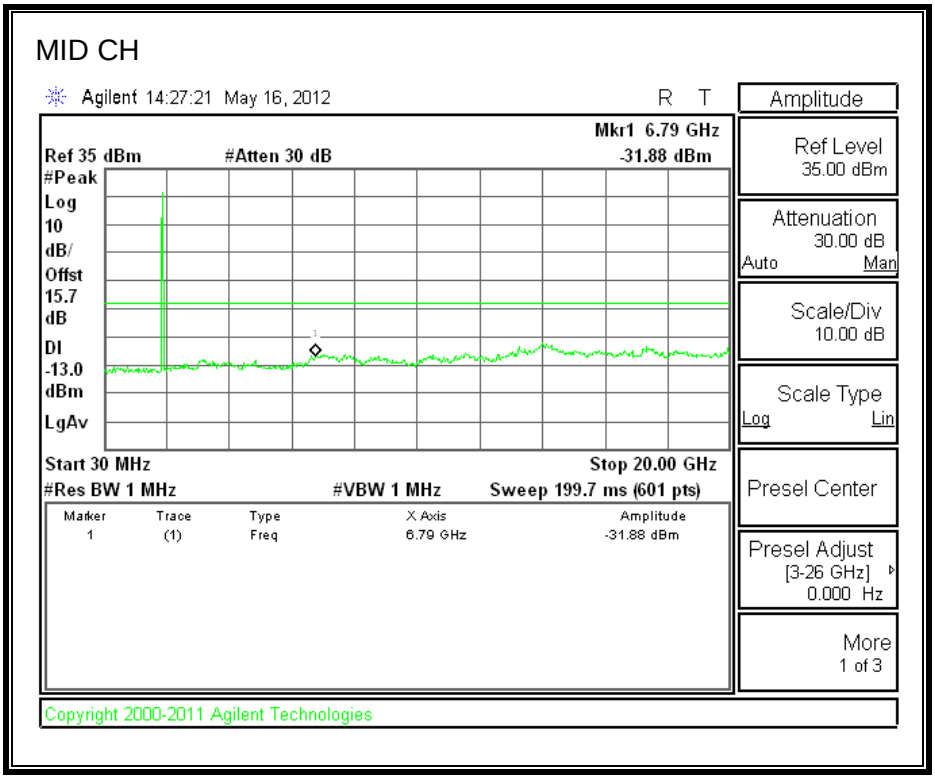
UMTS PCS BAND, HSDPA,





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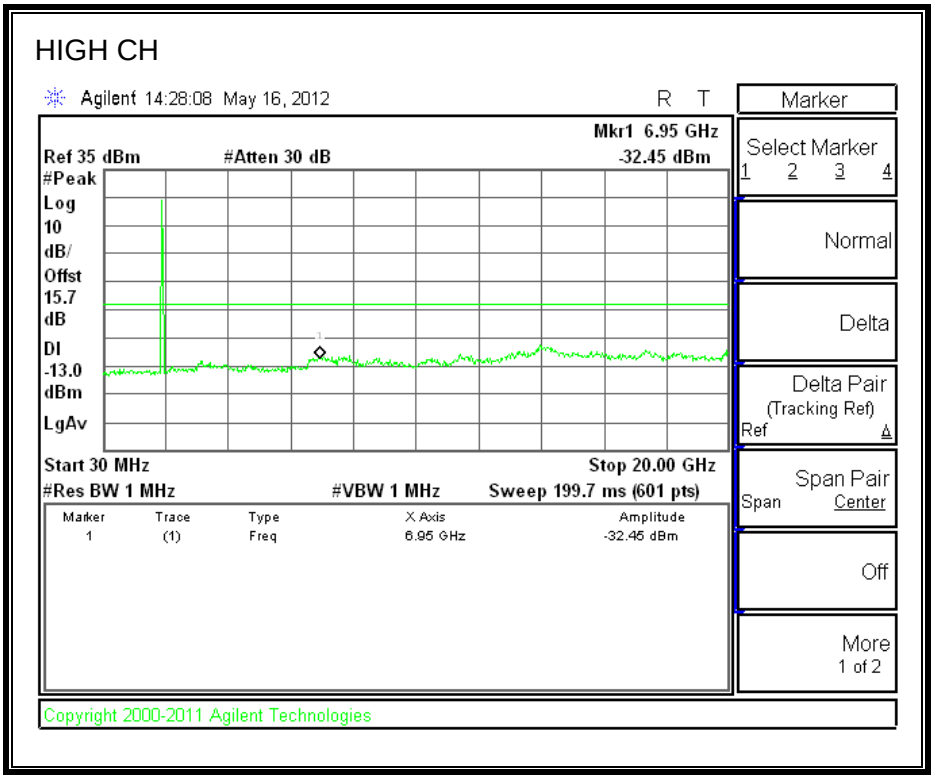
HIGH CH



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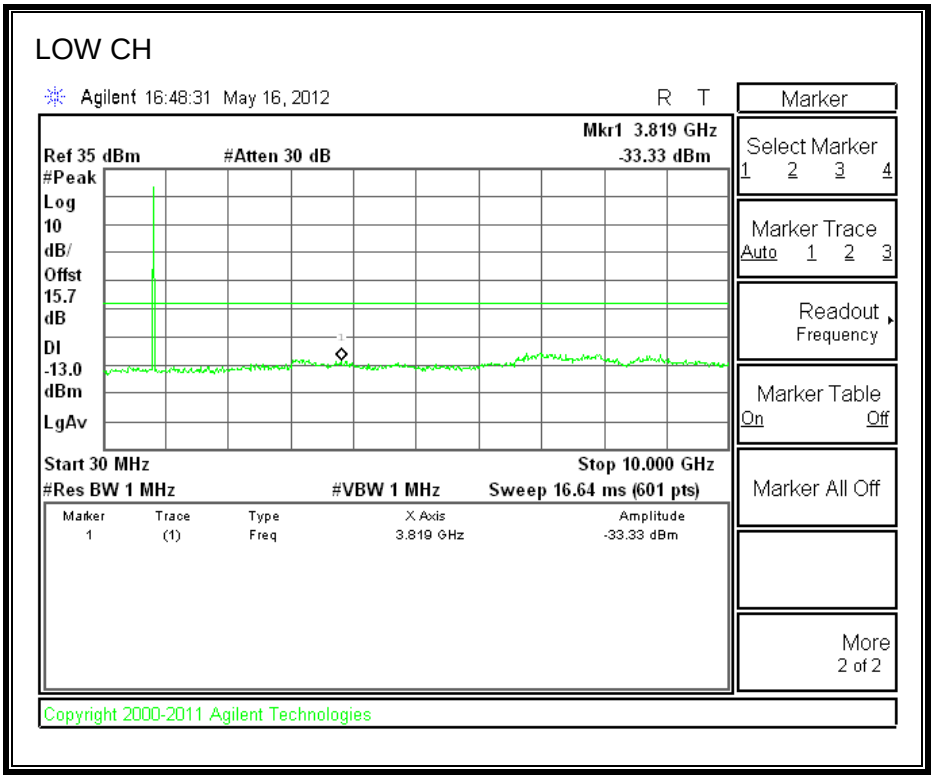
8.3.2. A1429

CDMA2000 CELL BAND, 1xRTT

LOW CH



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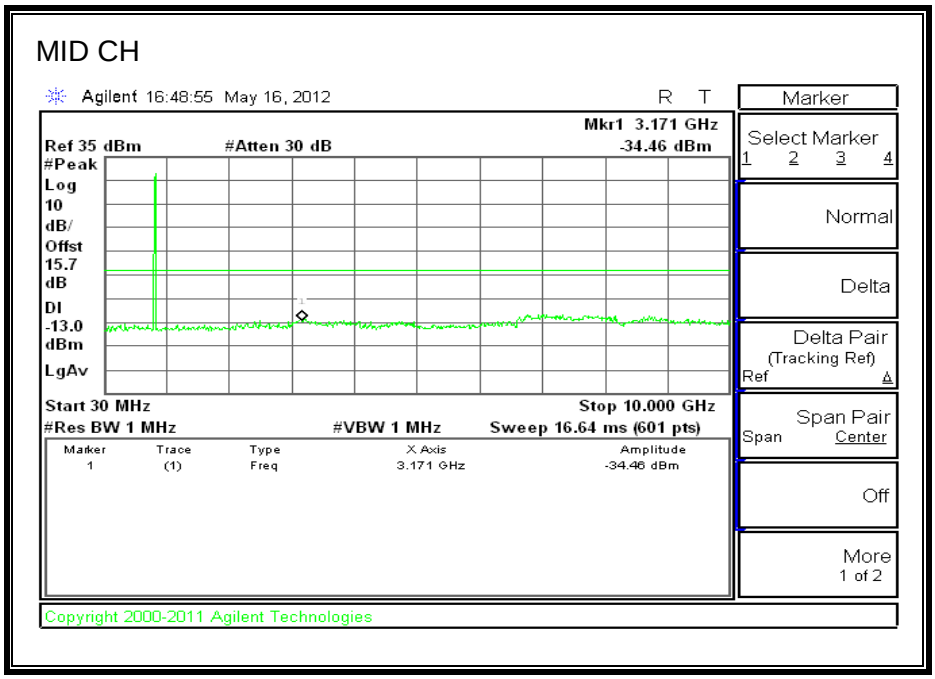

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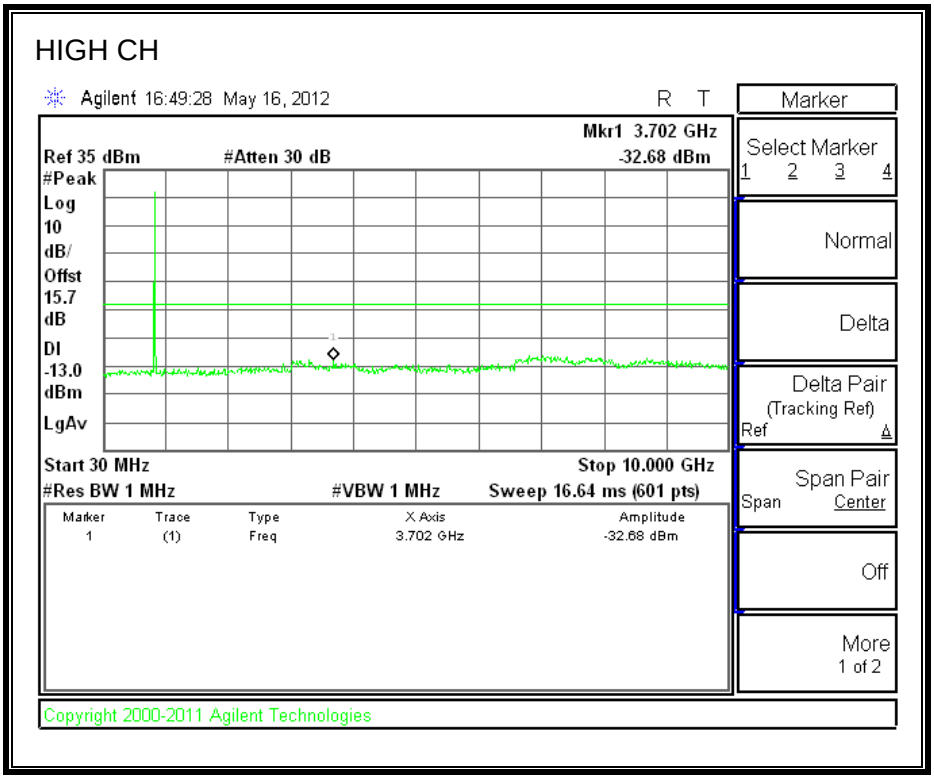
HIGH CH



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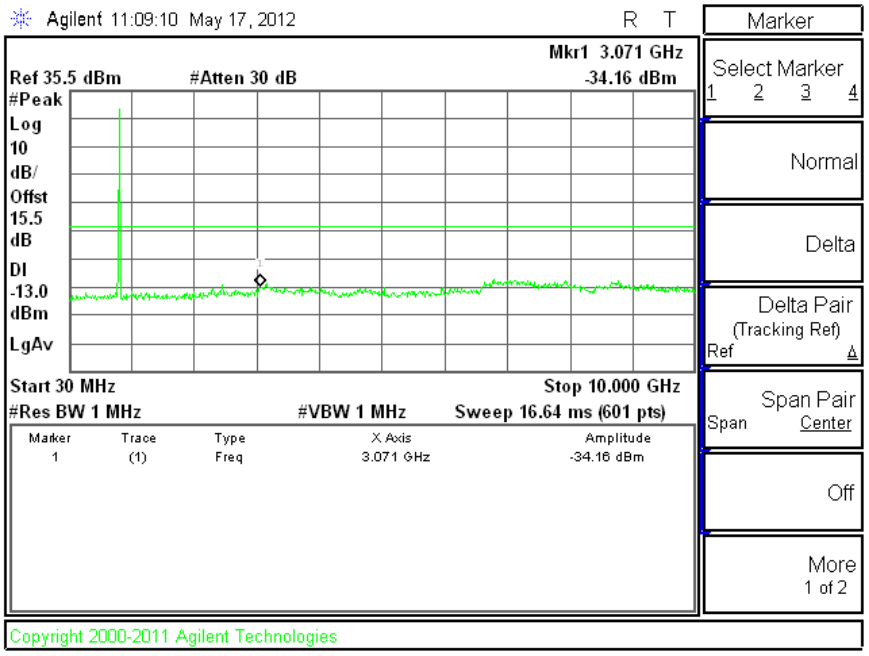
CDMA2000, Cell BAND, EVDO, Rev A

LOW CH



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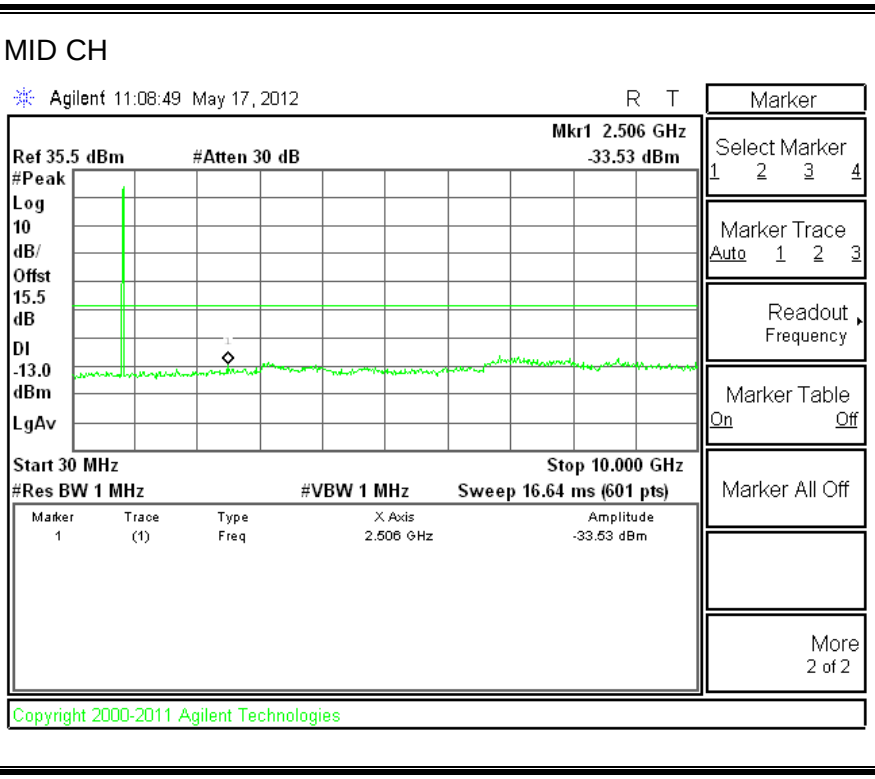

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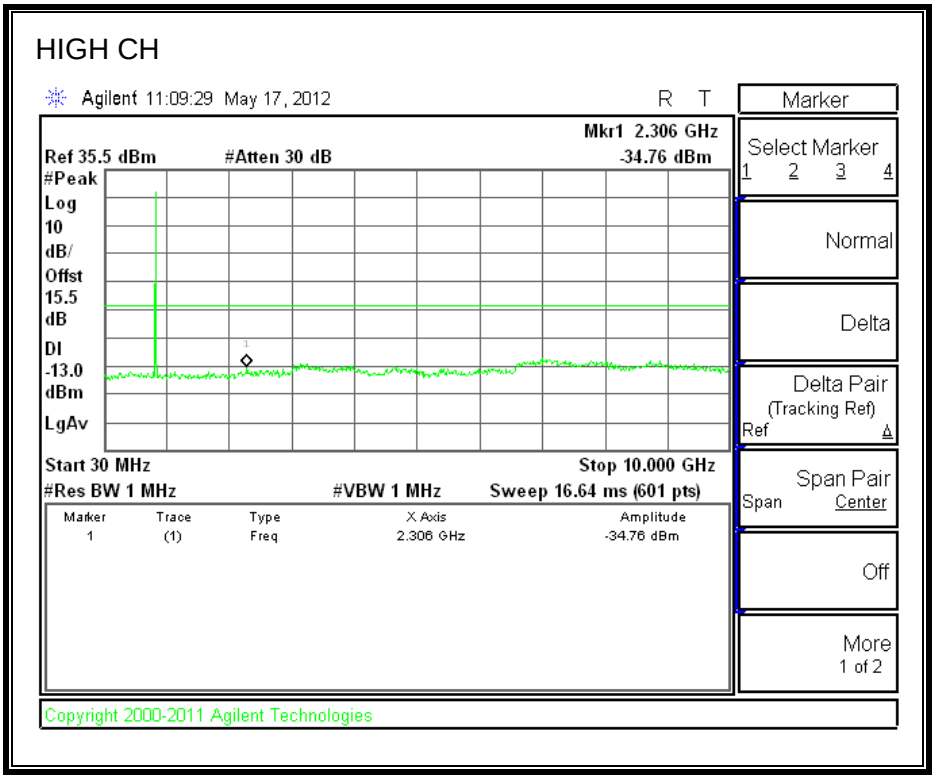

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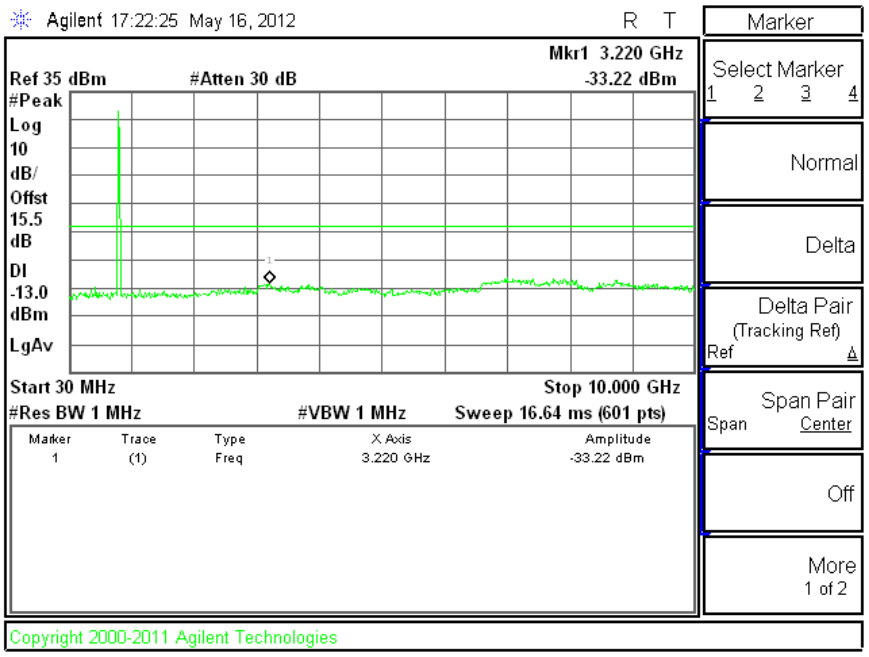
BC10, 1xRTT

LOW CH



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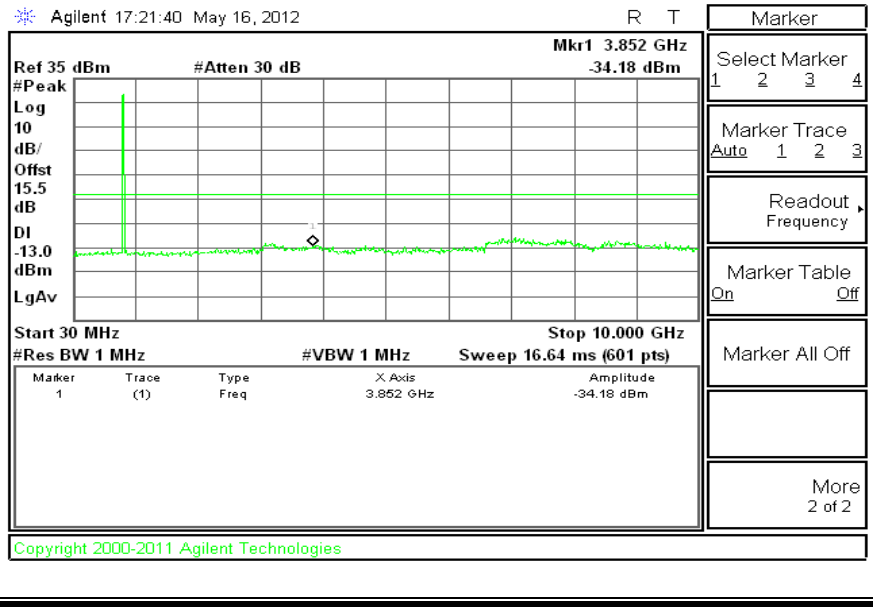

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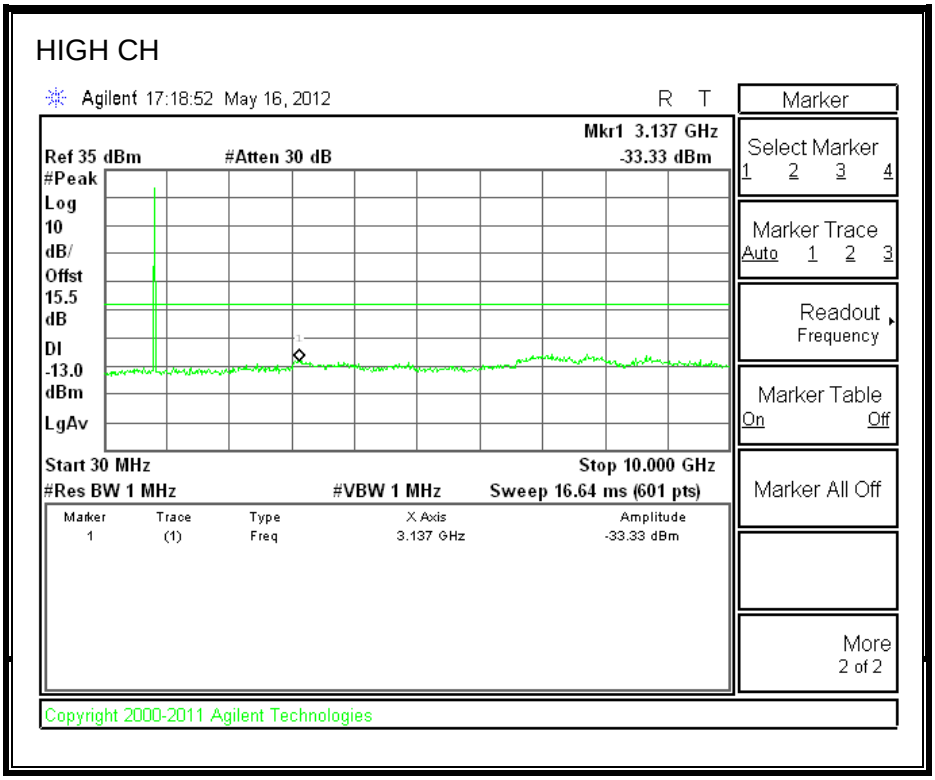
HIGH CH



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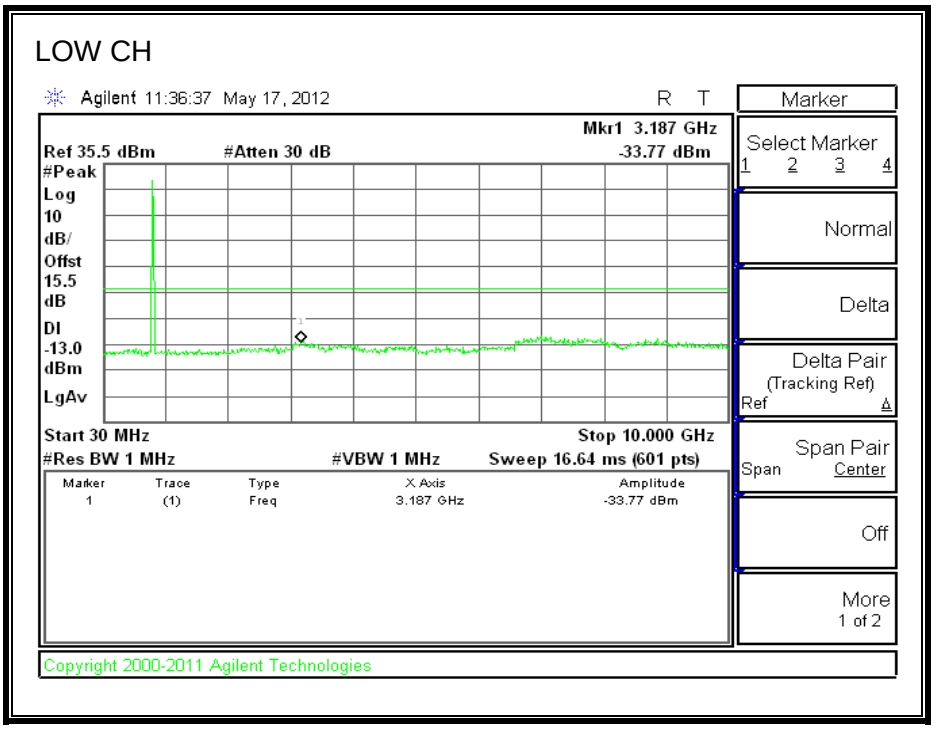
BC10, EVDO

LOW CH



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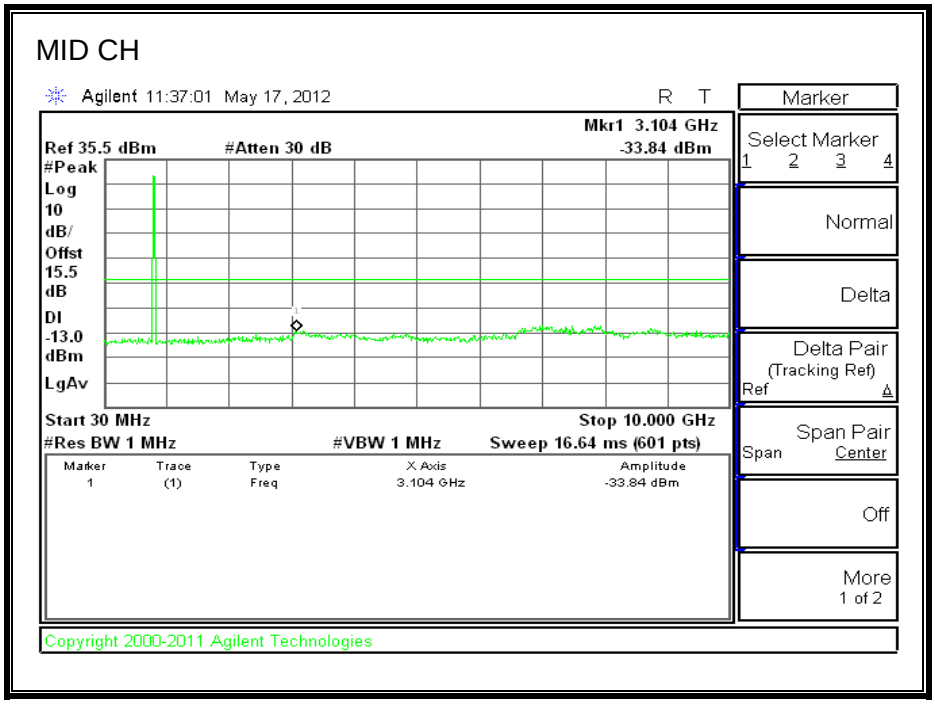

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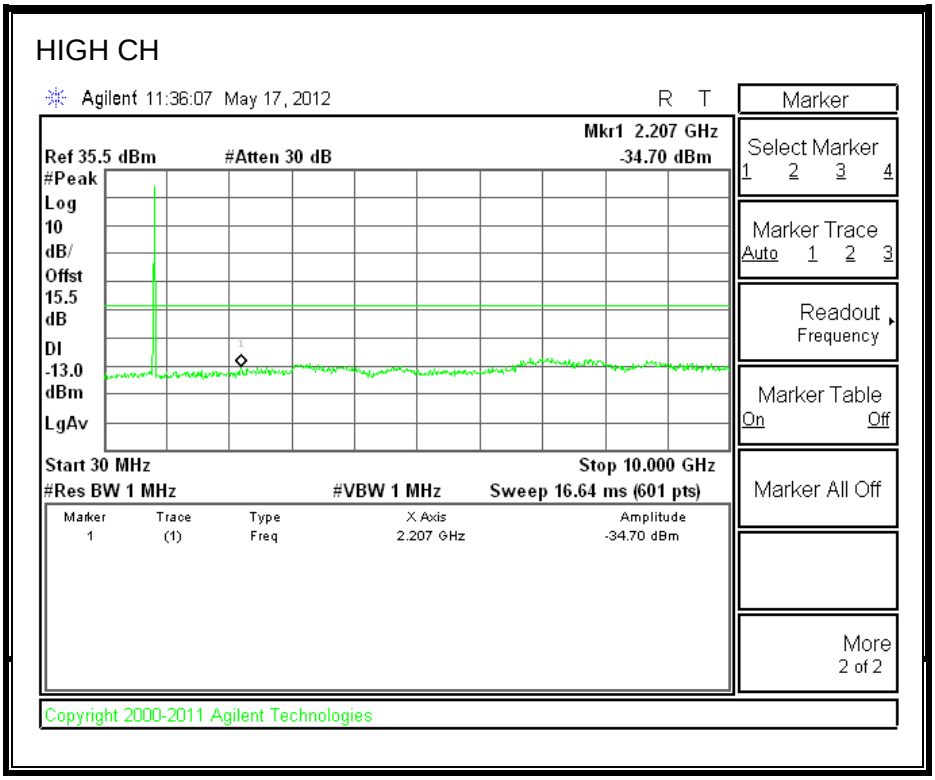
HIGH CH



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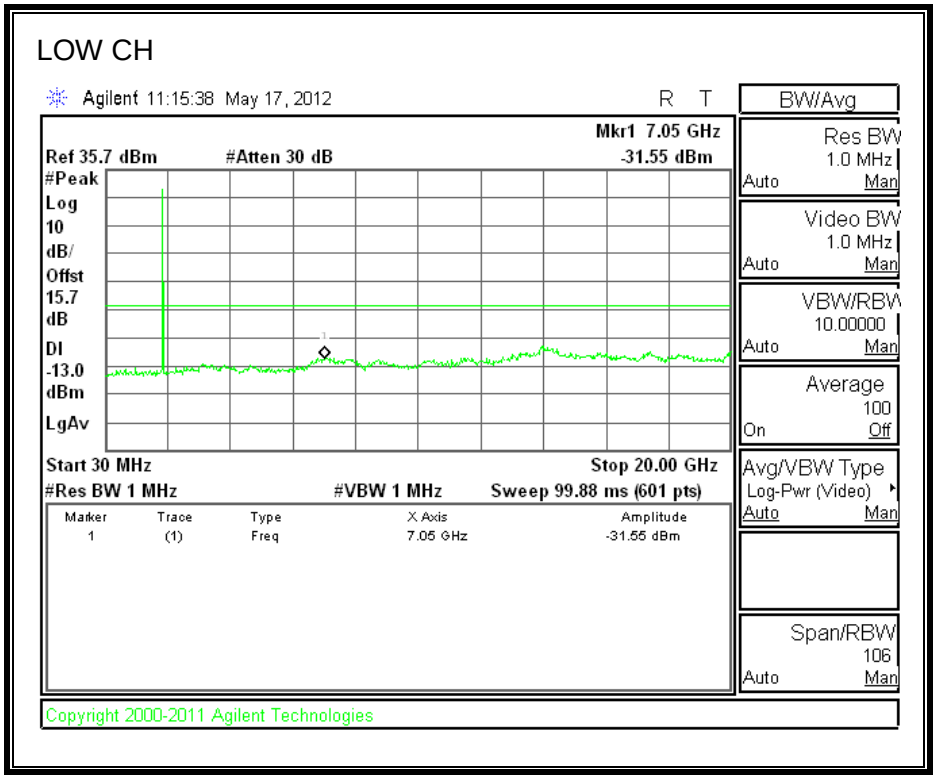
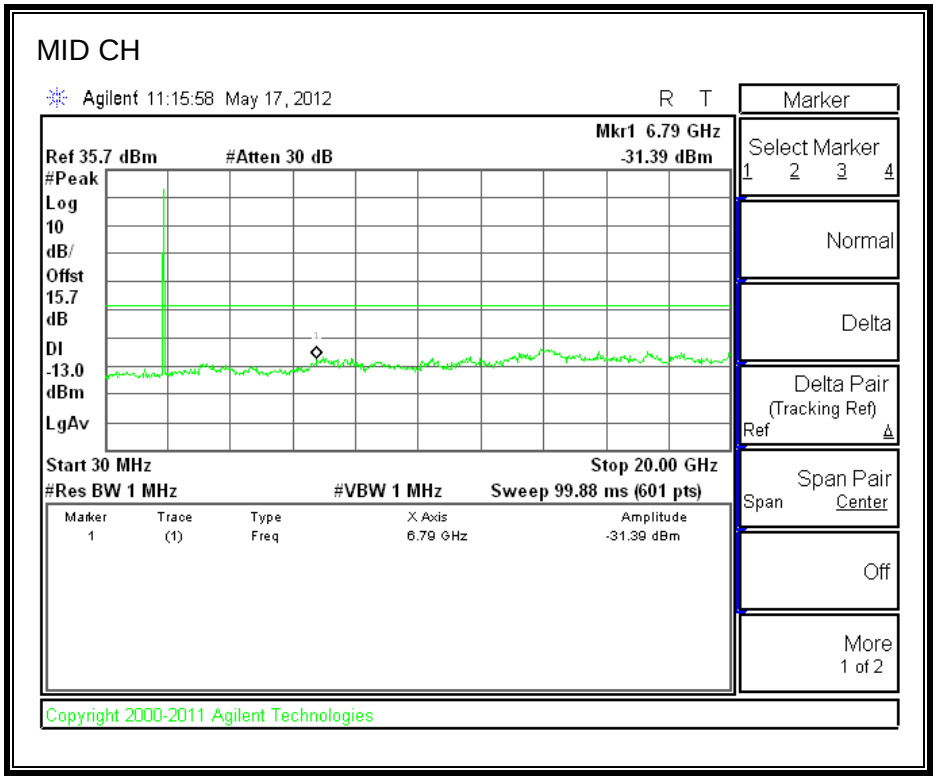
CDMA2000 PCS BAND, EVDO Rev A

LOW CH



MID CH



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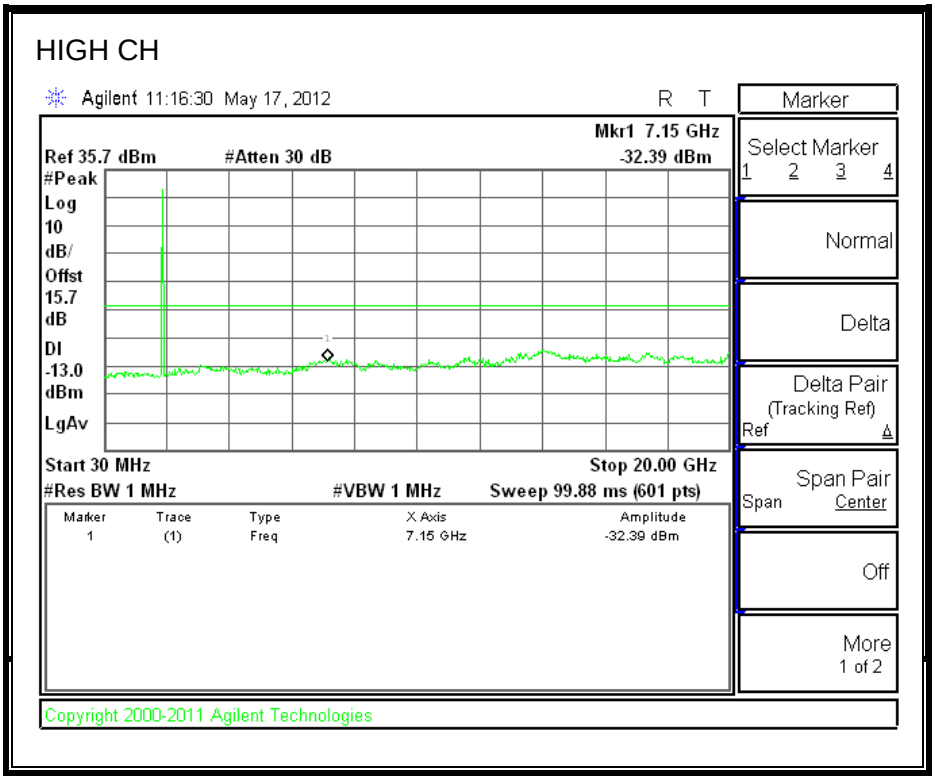
HIGH CH



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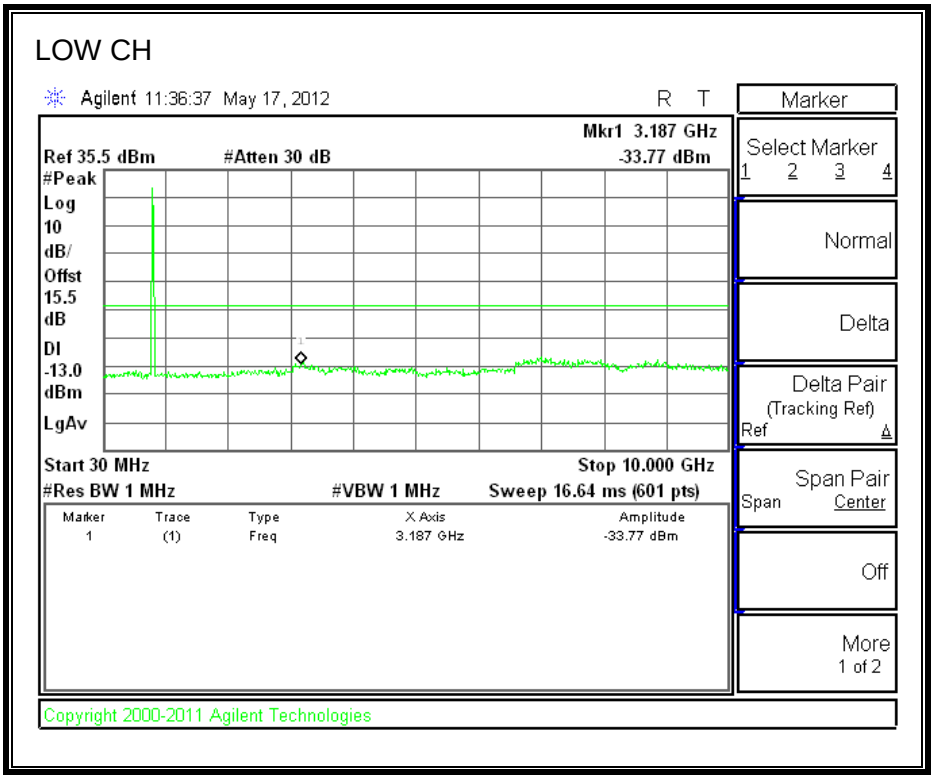
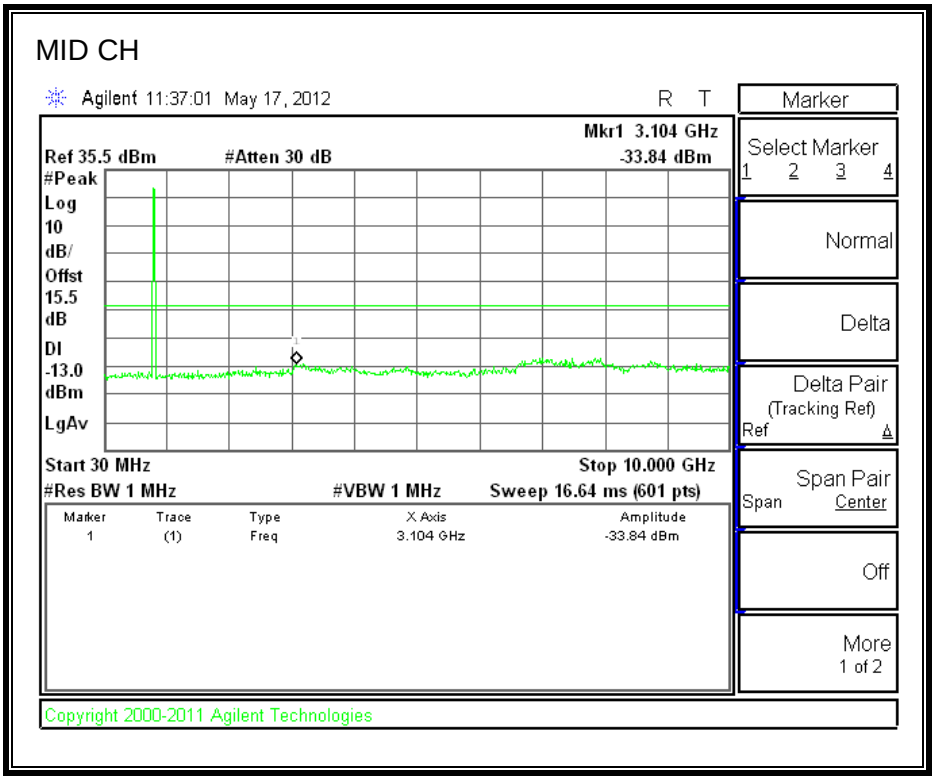
BC10





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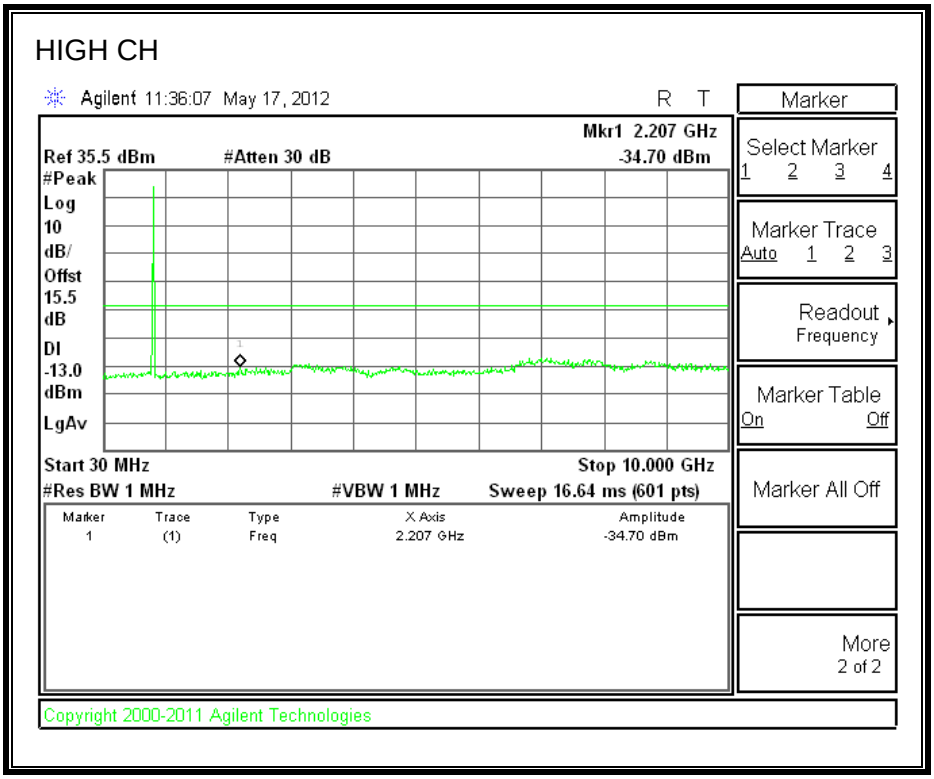

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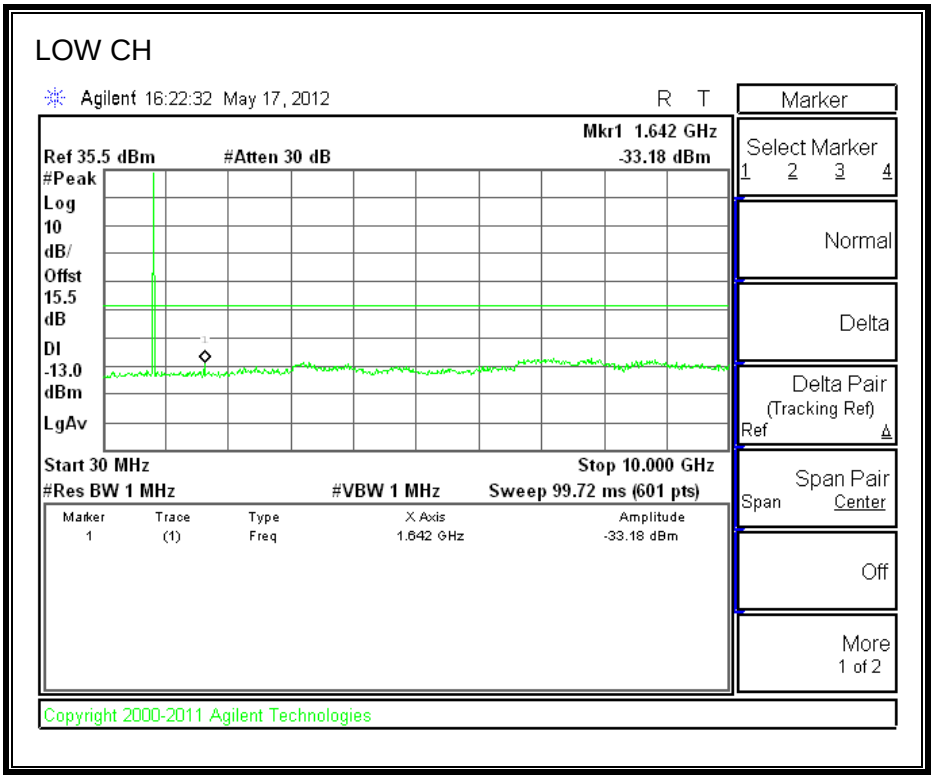
GPRS850 BAND

LOW CH



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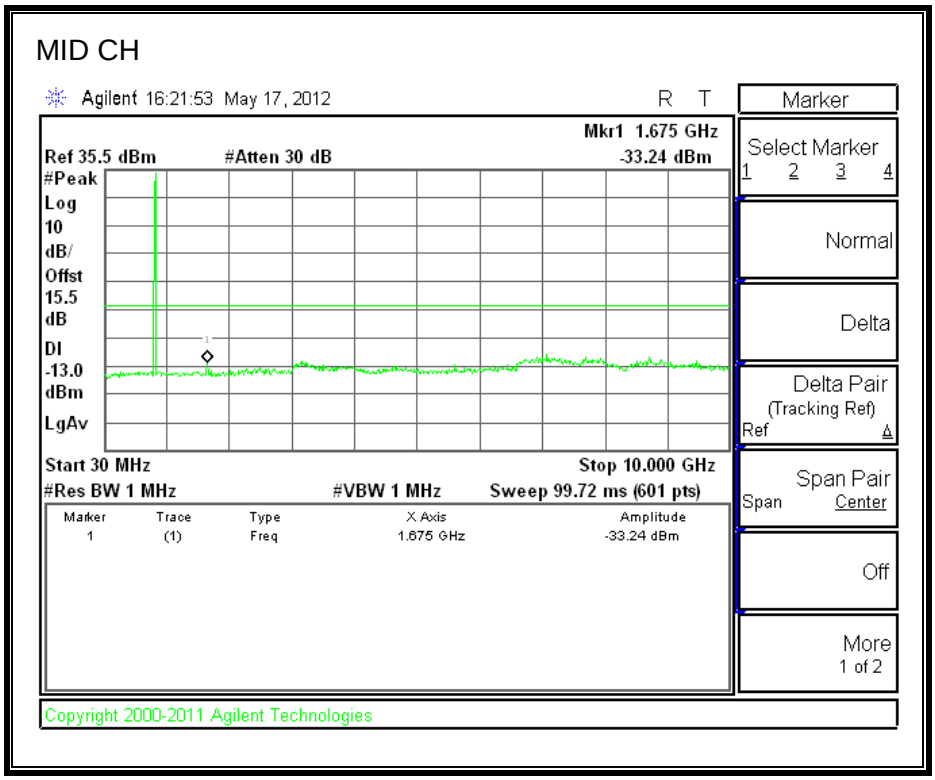

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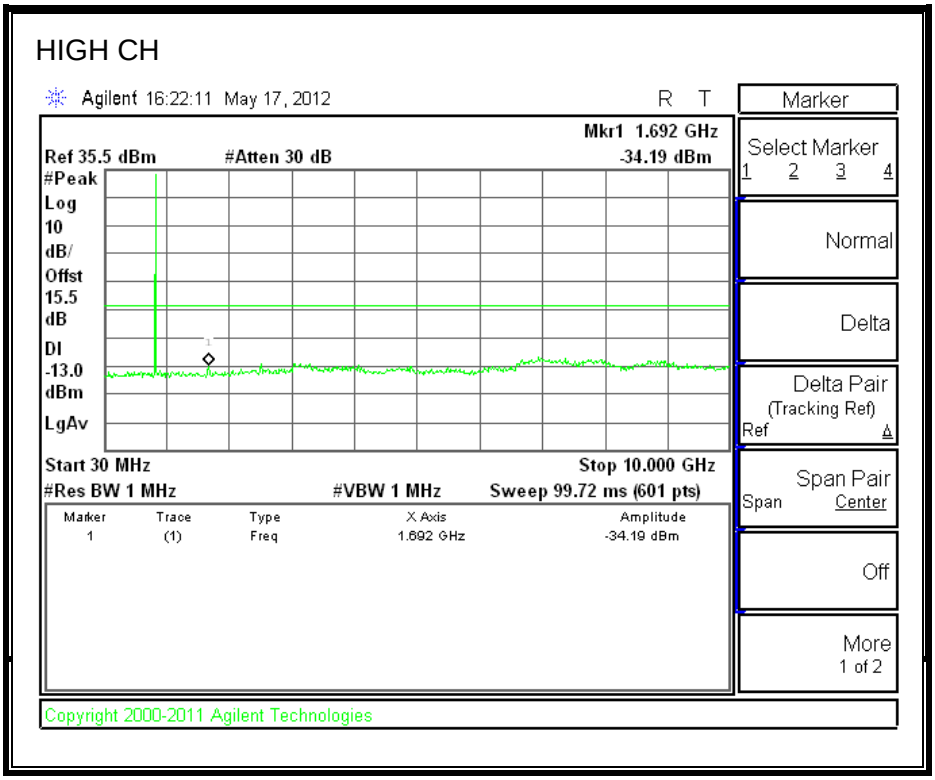

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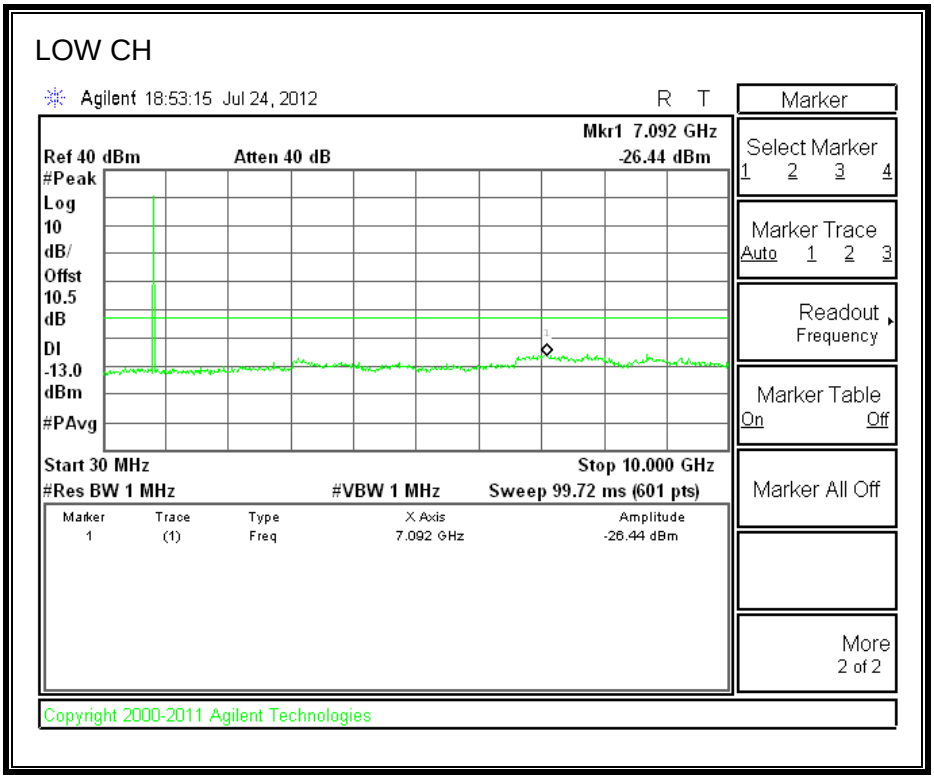
EGPRS850 BAND

LOW CH



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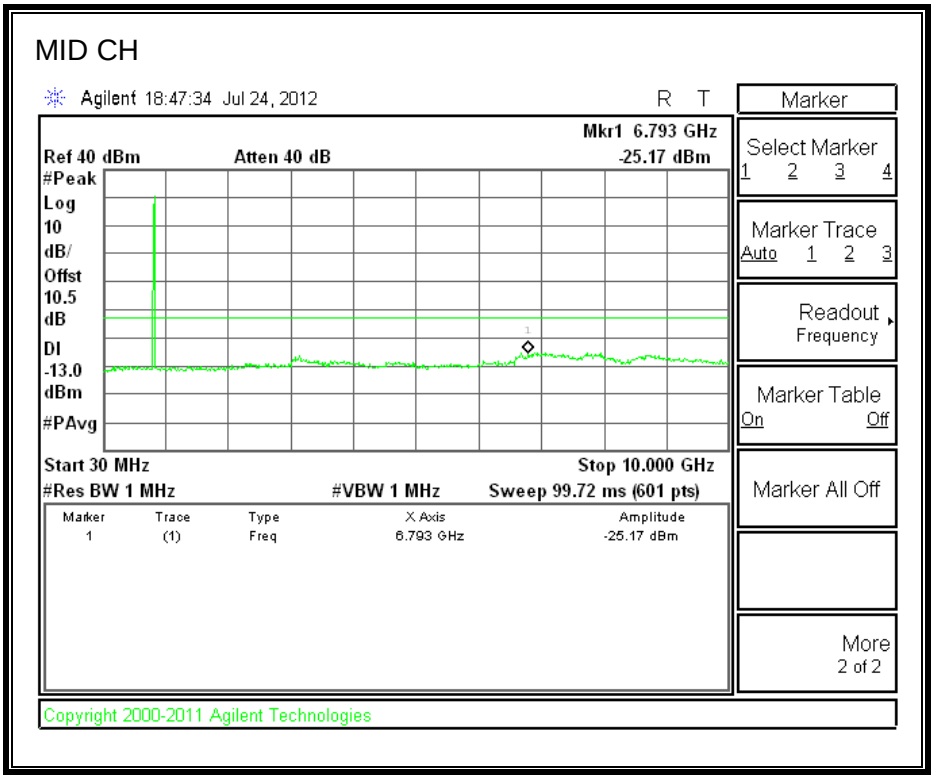

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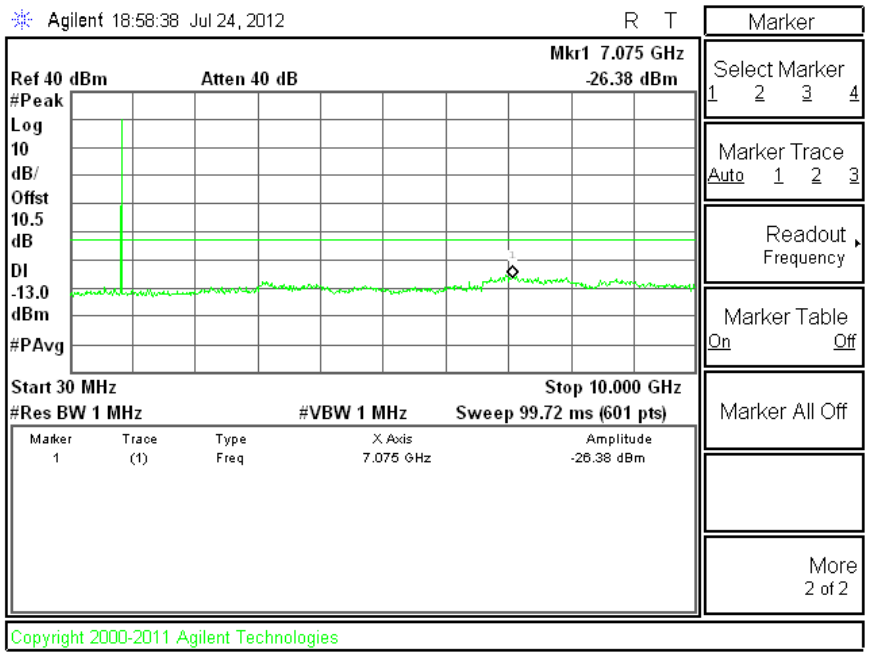
HIGH CH



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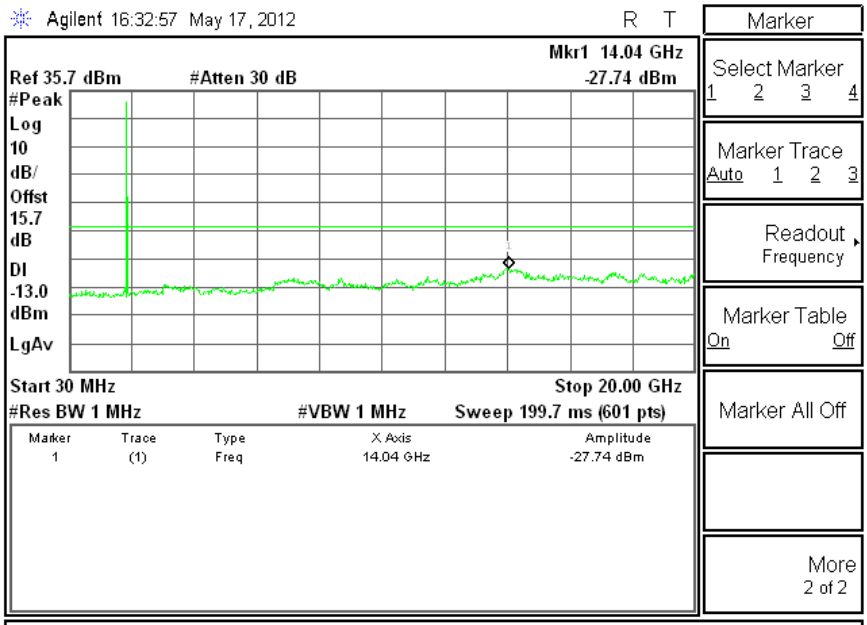
GPRS1900 BAND

LOW CH



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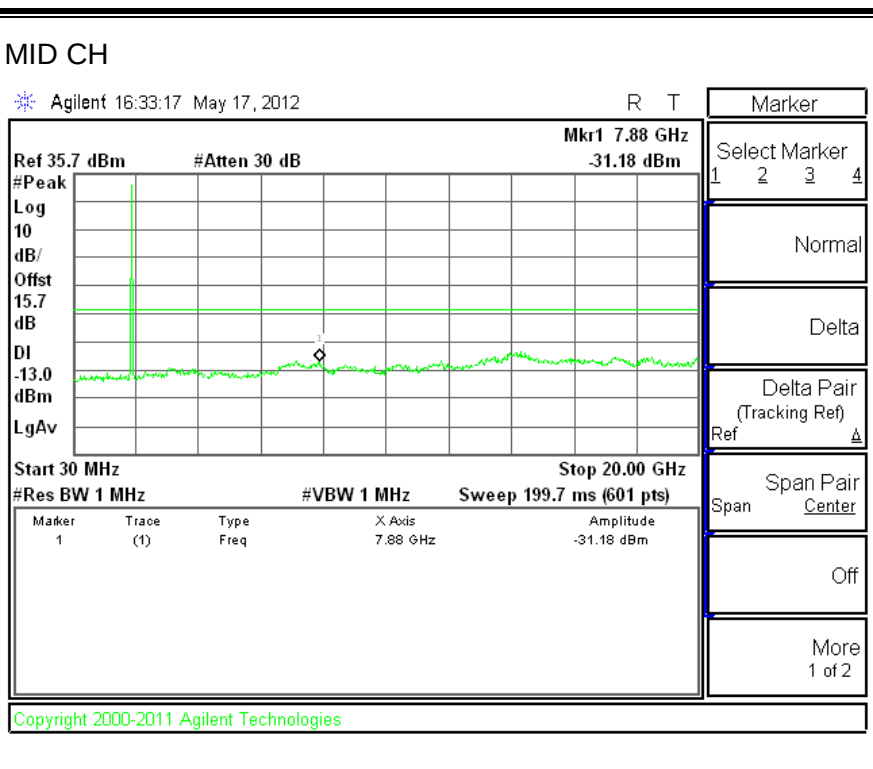

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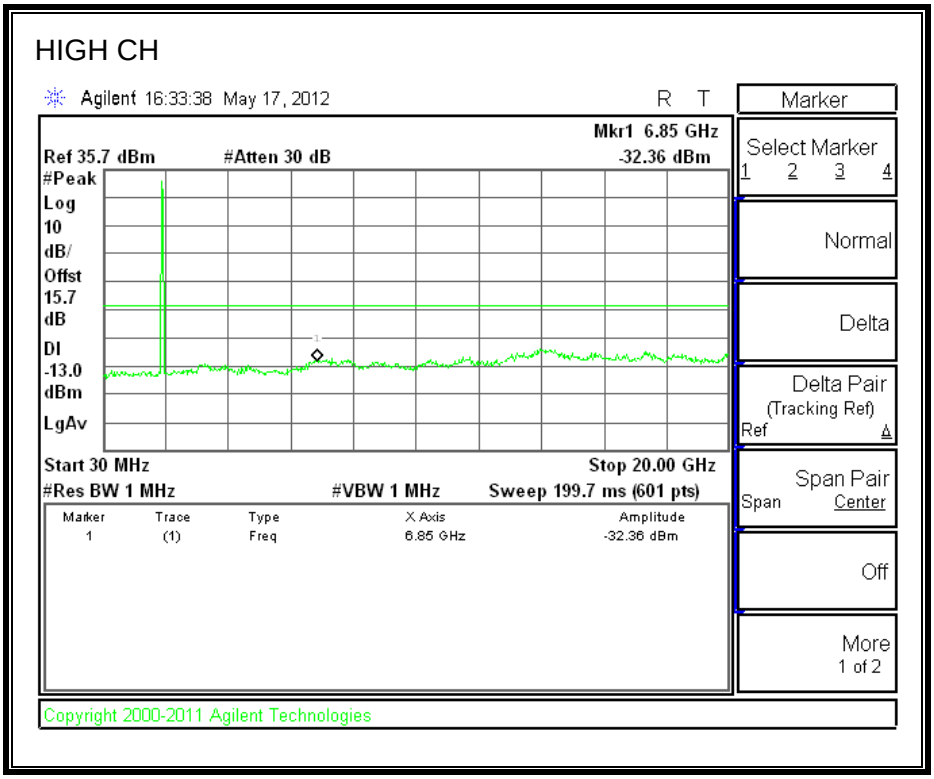
HIGH CH



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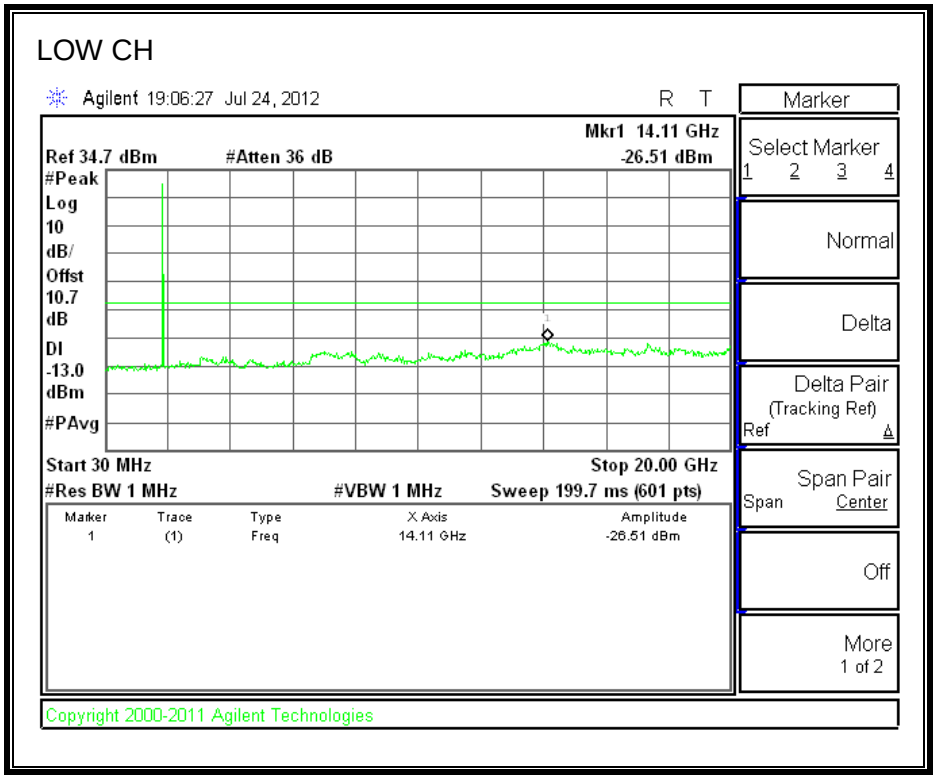
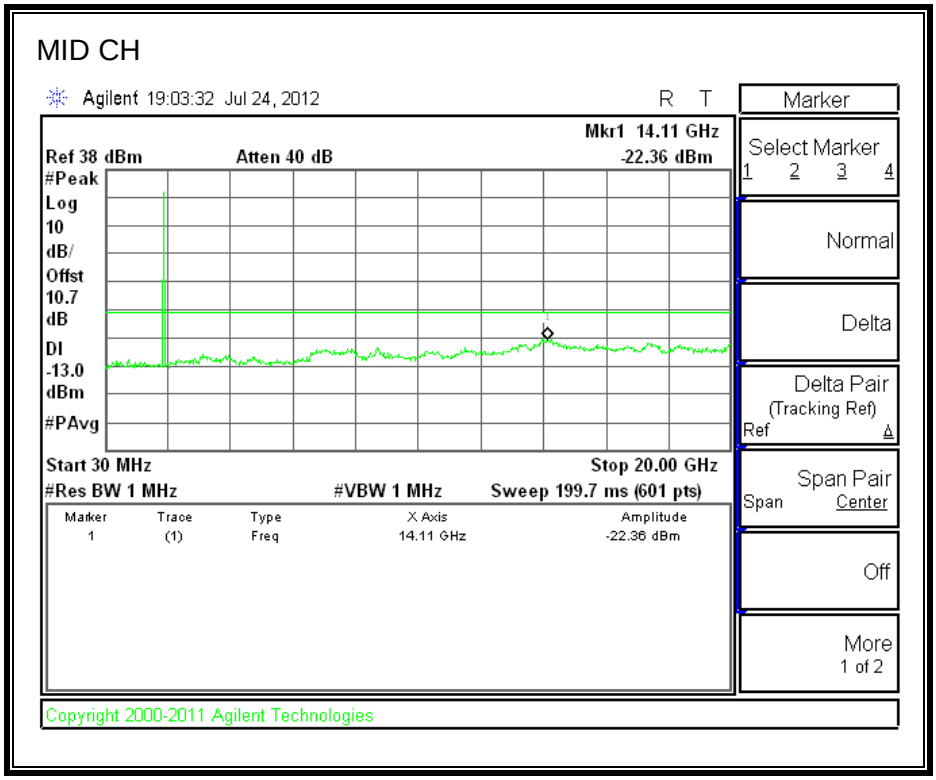
EGPRS1900 BAND

LOW CH



MID CH



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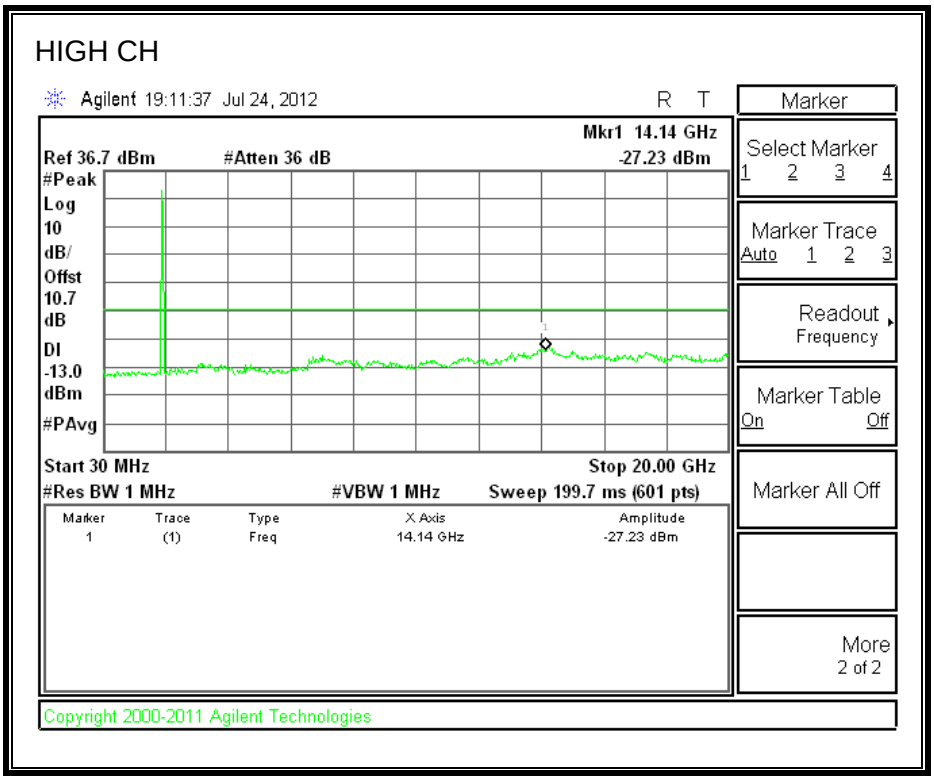

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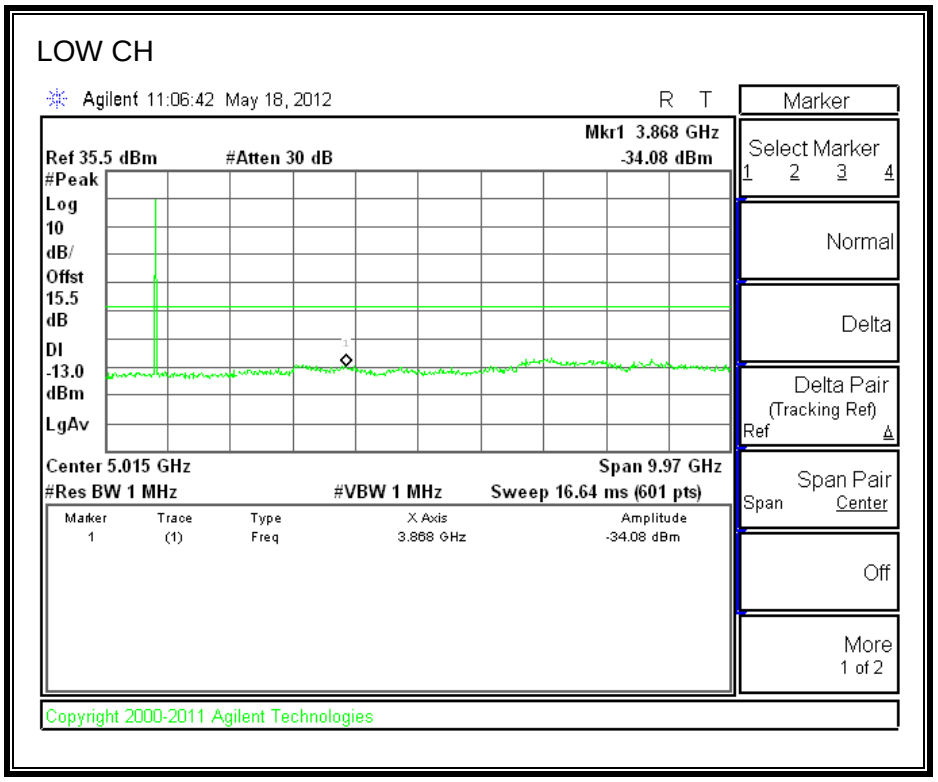
UMTS WCDMA REL 99, Cell Band

LOW CH



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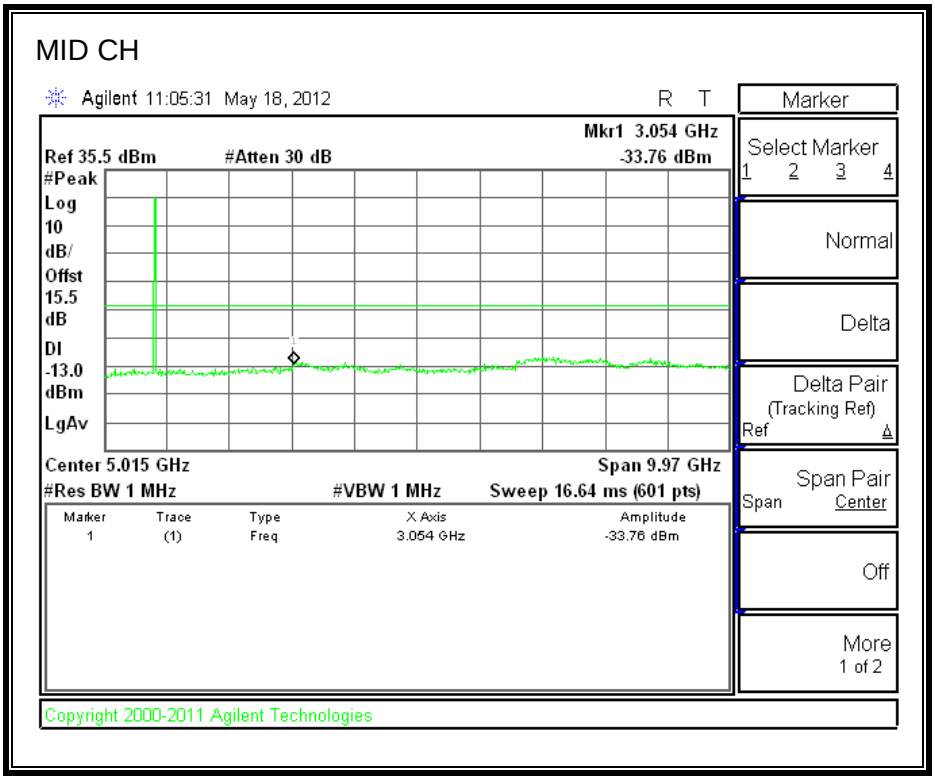

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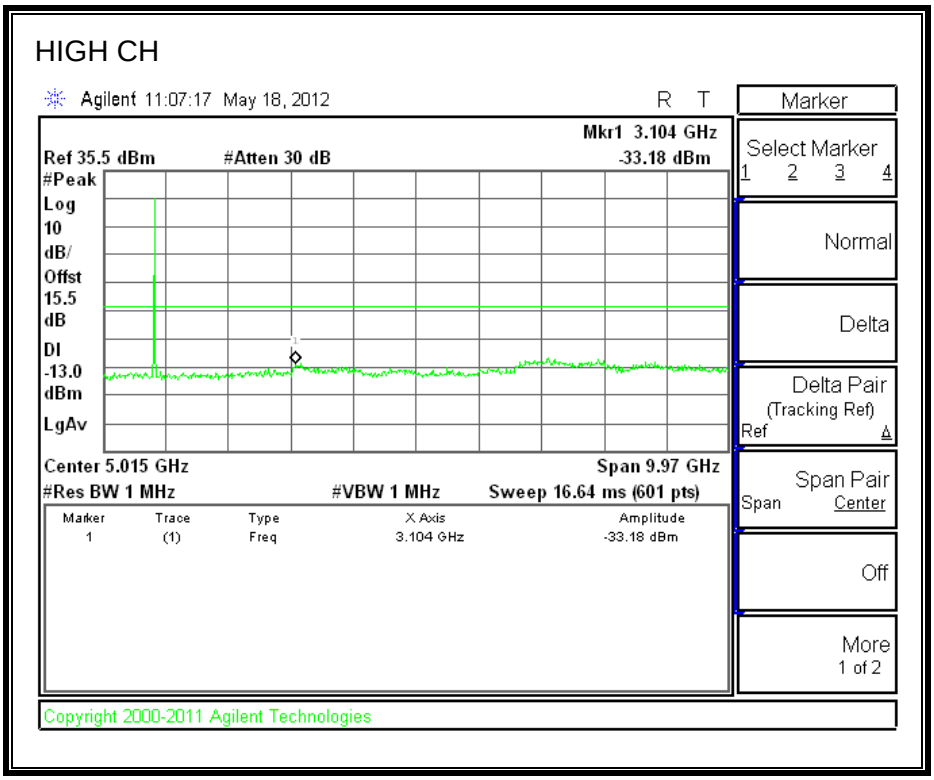
HIGH CH



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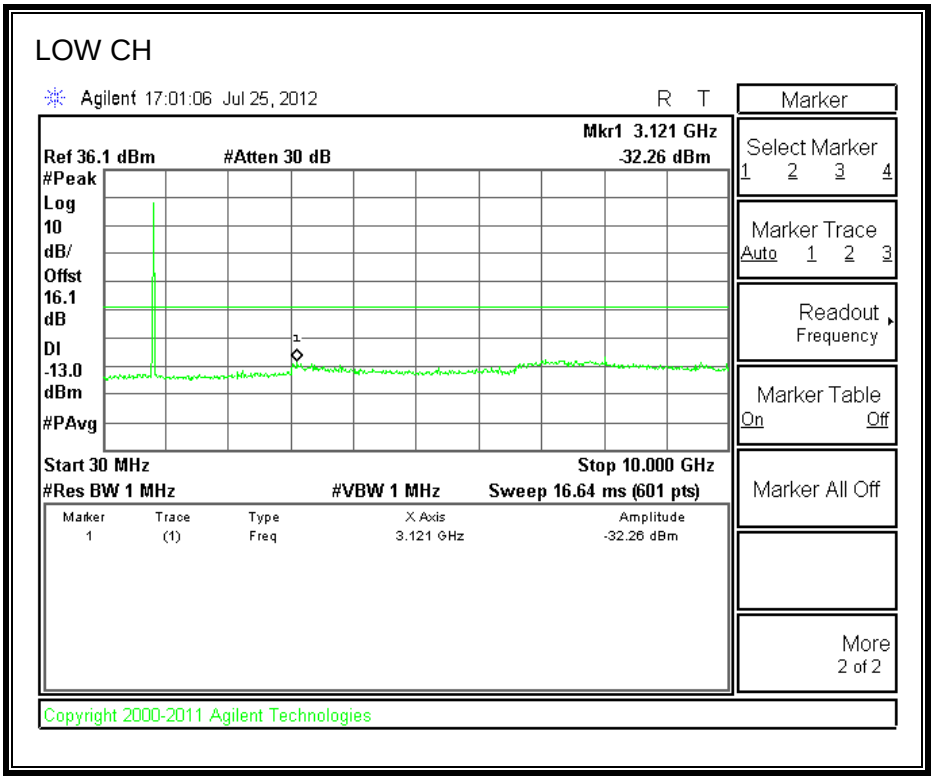
UMTS HSDPA, Cell Band

LOW CH



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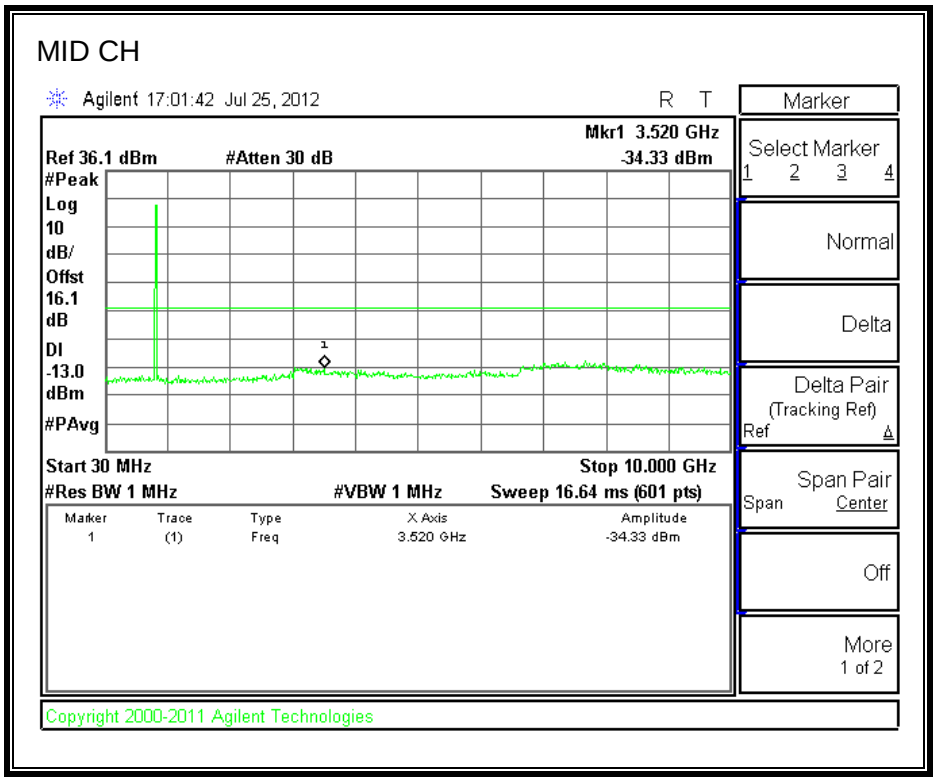

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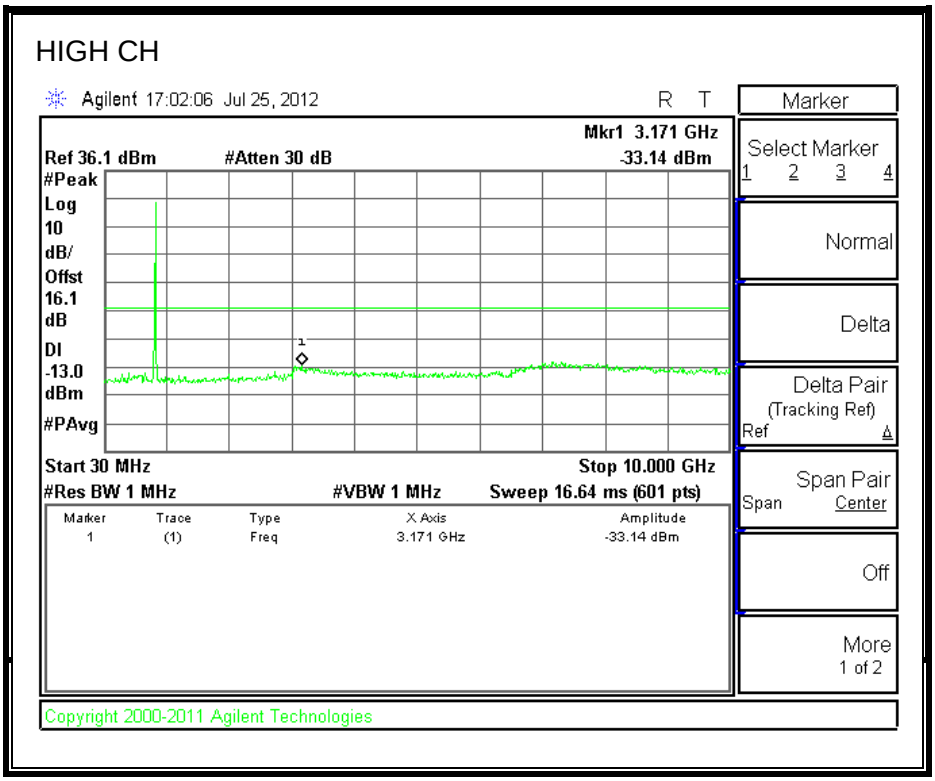
HIGH CH



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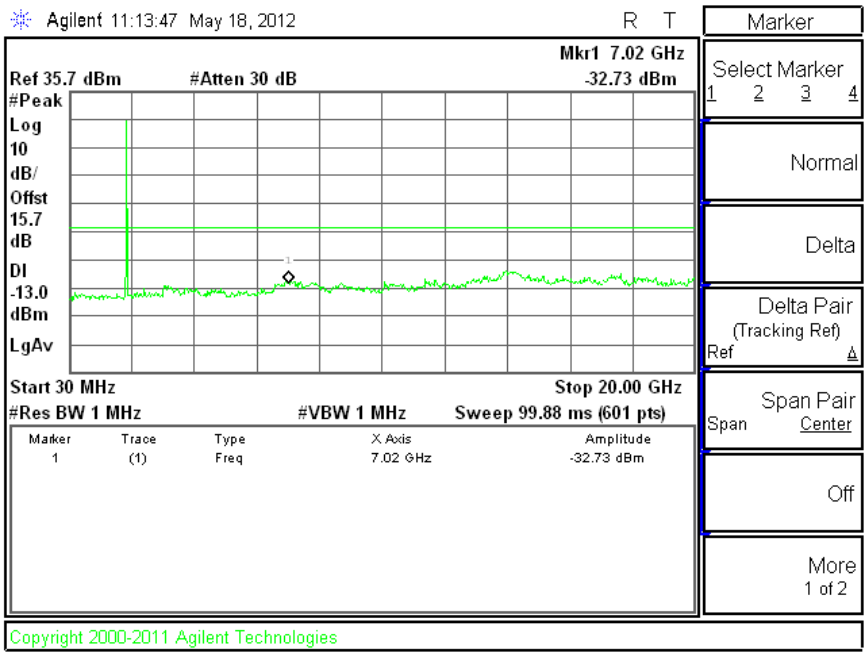
UMTS WCDMA REL 99, PCS Band

LOW CH



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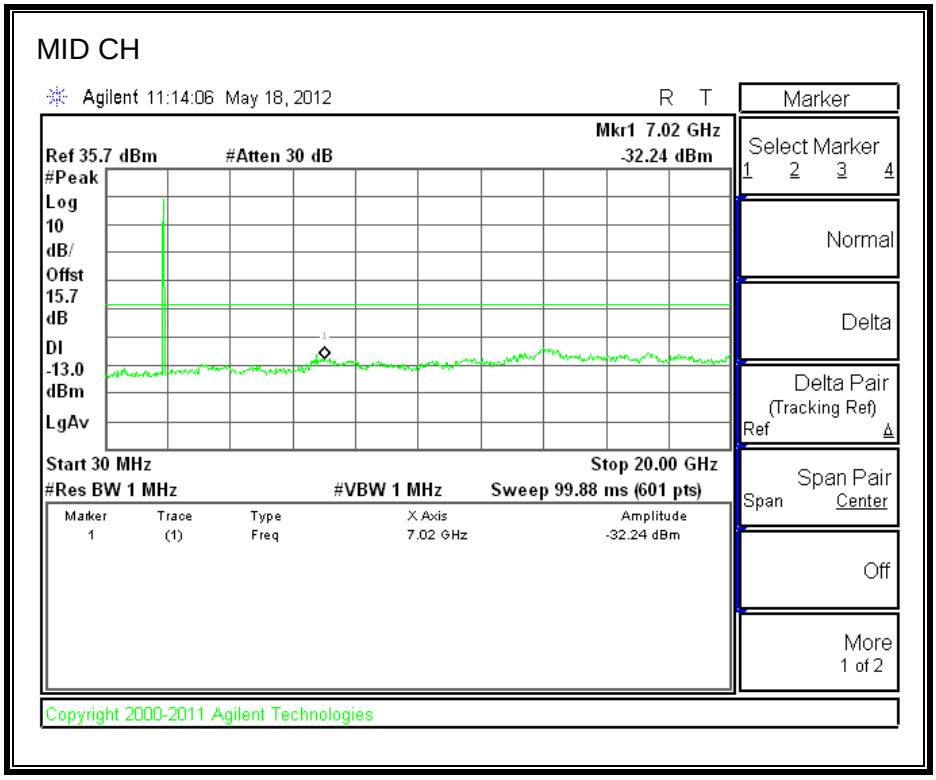

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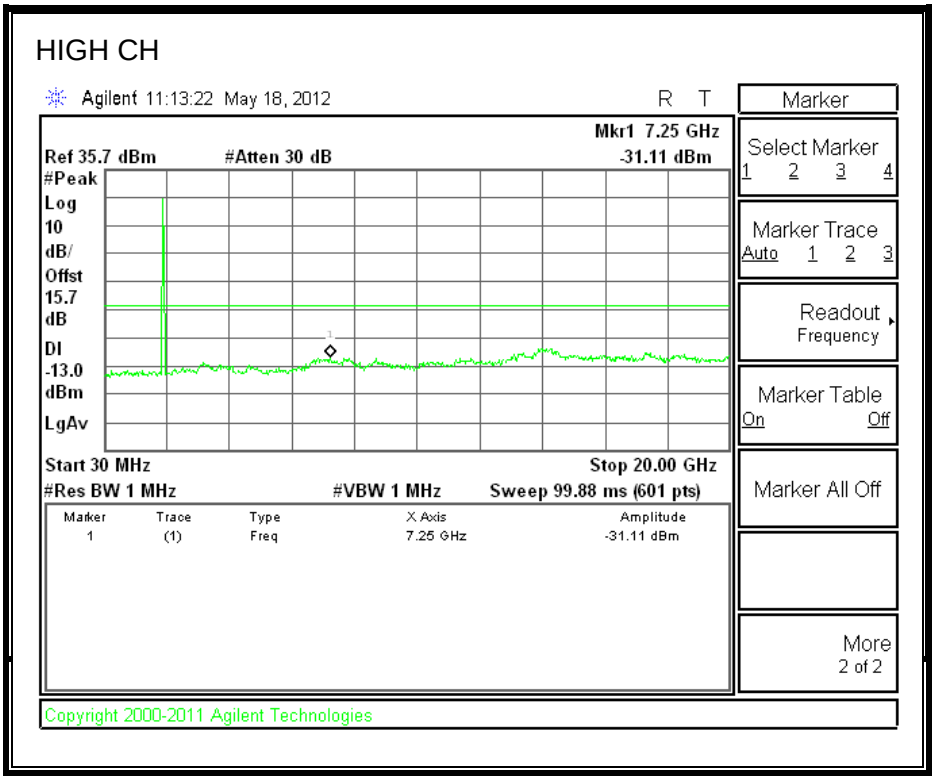
HIGH CH



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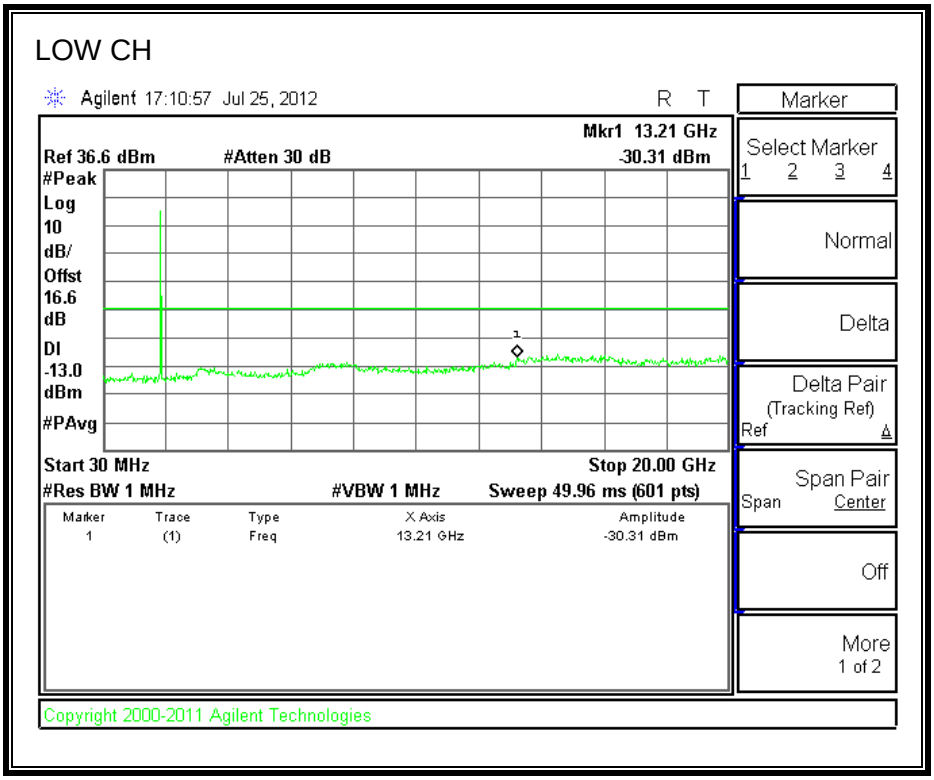
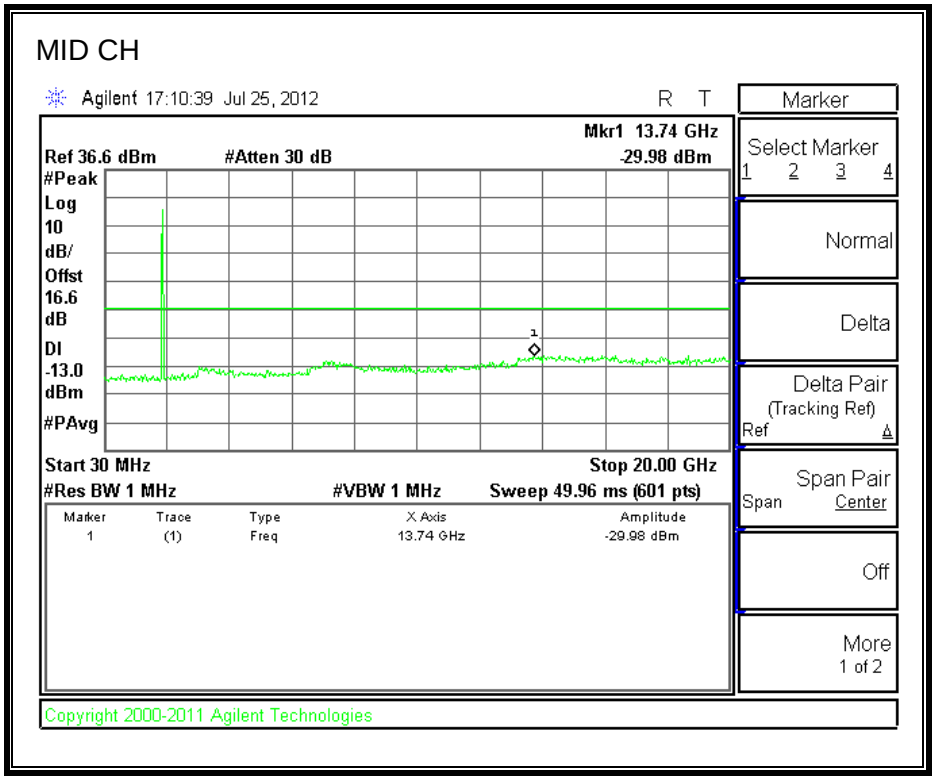
UMTS HSDPA, PCS Band

LOW CH



MID CH



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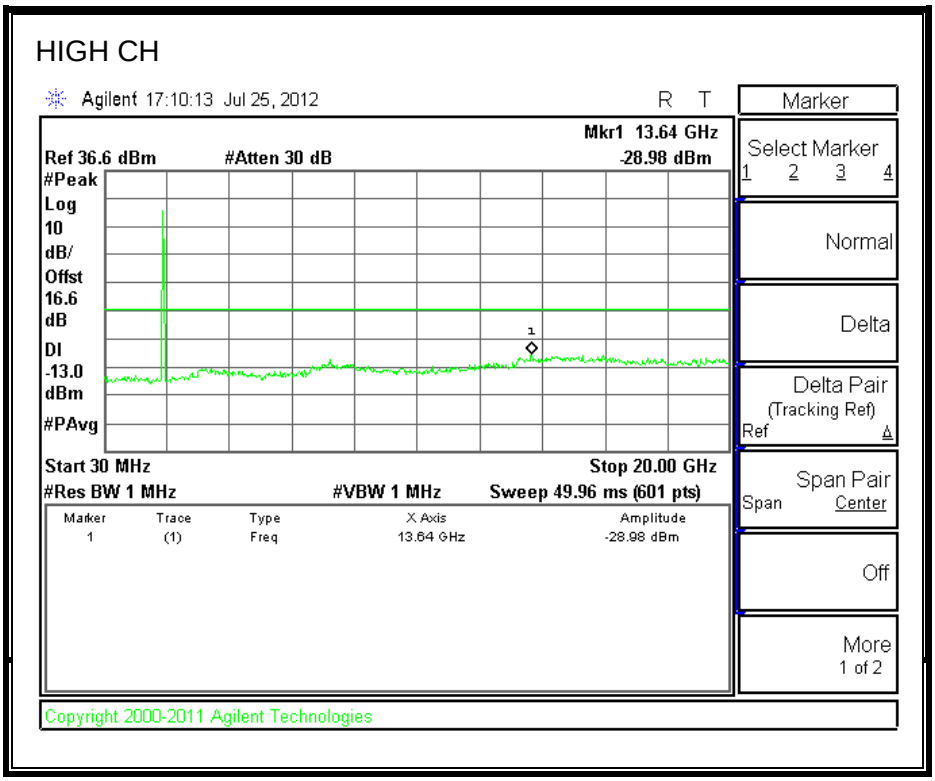
HIGH CH



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8.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235

LIMITS

- §22.355 - 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 with Frequency Error measurement capability.

- Temp. = −30° to +50℃
- Voltage =Low, 3.4VDC, Normal, 3.8VDC and High, 4.3VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC 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 +50ºC is reached.
Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

MODES TESTED

- GPRS, EGPRS
- UMTS, HSDPA
- EVDO, Rev A
- BC10

RESULTS

See the following pages.

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800 MHz SECONDARY, 1xRTT MODULATION – MID CHANNEL

Reference Frequency: 800MHz Secondary Mid Channel 819.149991MHz @ 20℃ Limit: to stay +- 2.5 ppm = 2047.875 Hz				
Power Supply (Vdc)	Environment Temperature (℃)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	819.149973	0.022	2.5
3.80	40	819.149973	0.022	2.5
3.80	30	819.149976	0.018	2.5
3.80	***20***	***819.149991***	***0***	2.5
3.80	10	819.149980	0.013	2.5
3.80	0	819.149986	0.006	2.5
3.80	-10	819.150011	-0.024	2.5
3.80	-20	819.150013	-0.027	2.5
3.80	-30	819.1500160	-0.031	2.5

Reference Frequency: 800MHz Secondary Mid Channel 819.149991MHz @ 20℃ Limit: to stay +- 2.5 ppm = 2047.875 Hz				
Power Supply (Vdc)	Environment Temperature (℃)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	***819.149991***	***0***	***2.5***
4.20	20	819.149985	*0.007*	2.5
3.30	20	819.149982	*0.011*	2.5
End Voltage (3.1V)	20	819.149975	*0.020*	2.5

CELL, 1xRTT MODULATION – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.519996MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2091.300 Hz				
DC Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.519995	0.001	2.5
3.80	40	836.519994	0.002	2.5
3.80	30	836.519996	0.000	2.5
3.80	***20***	***836.519996***	***0***	2.5
3.80	10	836.520004	-0.010	2.5
3.80	0	836.520003	-0.008	2.5
3.80	-10	836.520004	-0.010	2.5
3.80	-20	836.519996	0.000	2.5
3.80	-30	836.519995	0.001	2.5

Reference Frequency: Cellular Mid Channel 836.519996MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2091.300 Hz				
DC Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	20	836.519996	***0.000***	2.5
4.20	20	836.519997	-0.001	2.5
3.30	20	836.520003	-0.008	2.5
End Volt (3.1)	20	836.519994	0.002	2.5

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PCS, 1xRTT MODULATION – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.999987MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1879.999963	0.013	2.5
3.80	40	1879.999968	0.010	2.5
3.80	30	1879.999984	0.002	2.5
3.80	***20***	1879.999987	***0***	***2.5***
3.80	10	1880.000006	-0.010	2.5
3.80	0	1880.000009	-0.012	2.5
3.80	-10	1880.000014	-0.014	2.5
3.80	-20	1879.999993	-0.003	2.5
3.80	-30	1879.999980	0.004	2.5

Reference Frequency: PCS Mid Channel 1879.999987MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	1879.999987	***0***	***2.5***
4.20	20	1880.000007	-0.011	2.5
3.30	20	1879.999994	-0.004	2.5
End Volt(3.1)	20	1879.999992	-0.003	2.5

CELL, GPRS MODULATION – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.599965MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2091.500 Hz				
DC Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.599982	-0.020	2.5
3.80	40	836.599975	-0.012	2.5
3.80	30	836.599973	-0.010	2.5
3.80	***20***	***836.599965***	***0***	2.5
3.80	10	836.600035	-0.084	2.5
3.80	0	836.600030	-0.078	2.5
3.80	-10	836.600039	-0.088	2.5
3.80	-20	836.599990	-0.030	2.5
3.80	-30	836.599978	-0.016	2.5

Reference Frequency: Cellular Mid Channel 836.599965MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2091.500 Hz				
DC Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	836.599965	***0.000***	2.5
4.20	20	836.600014	-0.059	2.5
3.30	20	836.600033	-0.081	2.5
End Volt (3.1)	20	836.599985	-0.024	2.5

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PCS, GPRS MODULATION – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.999989MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1879.999960	0.015	2.5
3.80	40	1879.999968	0.011	2.5
3.80	30	1879.999973	0.009	2.5
3.80	***20***	1879.999989	***0***	***2.5***
3.80	10	1880.000090	-0.054	2.5
3.80	0	1880.000105	-0.062	2.5
3.80	-10	1880.000090	-0.054	2.5
3.80	-20	1880.000062	-0.039	2.5
3.80	-30	1880.000067	-0.041	2.5

Reference Frequency: PCS Mid Channel 1879.999989MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	1879.999989	***0***	***2.5***
4.20	20	1879.999993	-0.002	2.5
3.30	20	1879.999975	0.007	2.5
End Volt(3.1)	20	1879.999973	0.009	2.5

CELL, EGPRS MODULATION – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.599974MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2091.500 Hz				
DC Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	50	836.599950	0.029	2.5
3.80	40	836.599954	0.024	2.5
3.80	30	836.599965	0.011	2.5
3.80	***20***	***836.599974***	***0***	2.5
3.80	10	836.600024	-0.060	2.5
3.80	0	836.600021	-0.056	2.5
3.80	-10	836.600028	-0.065	2.5
3.80	-20	836.599982	-0.010	2.5
3.80	-30	836.599977	-0.004	2.5

Reference Frequency: Cellular Mid Channel 836.599974MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2091.500 Hz				
DC Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
3.80	20	836.599974	***0.000***	2.5
4.20	20	836.600028	-0.065	2.5
3.30	20	836.600044	-0.084	2.5
End Volt (3.1)	20	836.599995	-0.025	2.5

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PCS, EGPRS MODULATION – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.999981MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1879.999910	0.038	2.5
3.80	40	1879.999972	0.005	2.5
3.80	30	1879.999976	0.003	2.5
3.80	***20***	1879.999981	***0***	***2.5***
3.80	10	1880.000053	-0.038	2.5
3.80	0	1880.000055	-0.039	2.5
3.80	-10	1880.000071	-0.048	2.5
3.80	-20	1880.000082	-0.054	2.5
3.80	-30	1880.000021	-0.021	2.5

Reference Frequency: PCS Mid Channel 1879.999981MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	1879.999981	***0***	***2.5***
4.20	20	1880.000015	-0.018	2.5
3.30	20	1880.000011	-0.016	2.5
End Volt(3.1)	20	1879.999973	0.004	2.5

CELL WCDMA – MID CHANNEL

Reference Frequency: Cellular Mid Channel 835.999996MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2090.000 Hz				
DC Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	835.999996	0.000	2.5
3.80	40	835.999993	0.004	2.5
3.80	30	835.999997	-0.001	2.5
3.80	***20***	***835.999996***	***0***	2.5
3.80	10	836.000004	-0.010	2.5
3.80	0	836.000003	-0.008	2.5
3.80	-10	835.999997	-0.001	2.5
3.80	-20	835.999997	-0.001	2.5
3.80	-30	835.999996	0.000	2.5

Reference Frequency: Cellular Mid Channel 835.999996MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2090.000 Hz				
DC Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	20	835.999996	***0.000***	2.5
4.20	20	835.999997	-0.001	2.5
3.30	20	835.999996	0.000	2.5
End Volt (3.1)	20	835.999982	0.017	2.5

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PCS, WCDMA – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.999995MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	1879.999950	0.024	2.5
3.80	40	1879.999994	0.001	2.5
3.80	30	1879.999994	0.001	2.5
3.80	***20***	1879.999995	***0***	***2.5***
3.80	10	1880.000006	-0.006	2.5
3.80	0	1880.000004	-0.005	2.5
3.80	-10	1880.000005	-0.005	2.5
3.80	-20	1880.000005	-0.005	2.5
3.80	-30	1880.000006	-0.006	2.5

Reference Frequency: PCS Mid Channel 1879.999995MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (ºC)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	***20***	1879.999995	***0***	***2.5***
4.20	20	1880.000006	-0.006	2.5
3.30	20	1880.000005	-0.005	2.5
End Volt(3.1)	20	1879.999998	-0.002	2.5

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9. RADIATED TEST RESULTS

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, § 90.635.

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.

§ 90.635 Limitations on power and antenna height.

(a) The effective radiated power and antenna height for base stations may not exceed 1 kilowatt (30 dBw) and 304 m. (1,000 ft.) above average terrain (AAT), respectively, or the equivalent thereof as determined from the Table. These are maximum values, and applicants will be required to justify power levels and antenna heights requested.

(b) The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

Table—Equivalent Power and Antenna Heights for Base Stations in the 851–869 MHz and 935–940 MHz Bands Which Have a Requirement for a 32 km (20 mi) Service Area Radius

Antenna height (ATT) meters (feet)	Effective radiated power (watts)[1,2,4]
Above 1,372 (4,500)	65
Above 1,220 (4,000) to 1,372 (4,500)	70
Above 1,067 (3,500) to 1,220 (4,000)	75
Above 915 (3,000) to 1,067 (3,500)	100
Above 763 (2,500) to 915 (3,000)	140
Above 610 (2,000) to 763 (2,500)	200
Above 458 (1,500) to 610 (2,000)	350
Above 305 (1,000) to 458 (1,500)	600
Up to 305 (1,000)	31,000

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1Power is given in terms of effective radiated power (ERP).

2Applicants 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.

3Stations with antennas below 305 m (1,000 ft) (AAT) will be restricted to a maximum power of 1 kw (ERP).

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17

MODES TESTED

A1428 and A1429

- GPRS and EGPRS
- UMTS, REL 99 and HSDPA
- CDMA2000, 1xRTT and EVDO, Rev A
- BC10

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9.1.1. A1428

LAT (PORT A) / PRIMARY

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	32.60	1819.70
	190	836.60	32.40	1737.80
	251	848.80	32.54	1794.73
EGPRS	128	824.20	30.60	1148.15
	190	836.60	31.74	1492.79
	251	848.80	30.22	1051.96

Mode	Channel	f (MHz)	ERP	
			dBm	mW
UMTS,REL 99	4357	826.40	23.90	245.47
	4405	836.00	24.50	281.84
	4455	846.00	24.31	269.77
UMTS, HSDPA	4357	826.40	22.70	186.21
	4405	836.00	23.30	213.80
	4455	846.00	23.41	219.28

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	32.12	1629.30
	661	1880.00	32.84	1923.09
	810	1909.80	31.90	1548.82
EGPRS	512	1850.20	29.92	981.75
	661	1880.00	30.66	1164.13
	810	1909.80	30.40	1096.48

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS, REL 99	9662	1852.40	26.12	409.26
	9800	1880.00	26.76	474.24
	9938	1907.60	26.20	416.87
UMTS, HSDPA	9662	1852.40	26.02	399.94
	9800	1880.00	26.66	463.45
	9938	1907.60	26.30	426.58

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UAT (PORT B) / SECONDARY

Mode	Channel	f (MHz)	ERP / EIRP	
			dBm	mW
GPRS850	128	824.20	26.10	407.38
	190	836.60	26.00	398.11
	251	848.80	26.95	495.45
GPRS1900	512	1850.20	25.02	317.69
	661	1880.00	26.46	442.59
	810	1909.80	27.20	524.81

Mode	Channel	f (MHz)	ERP / EIRP	
			dBm	mW
EGPRS850	128	824.20	22.00	158.49
	190	836.60	22.30	169.82
	251	848.80	22.41	174.18
EGPRS1900	512	1850.20	25.72	373.25
	661	1880.00	26.66	463.45
	810	1909.80	26.90	489.78

Mode	Channel	f (MHz)	ERP	
			dBm	mW
UMTS850, REL 99	4357	826.40	18.20	66.07
	4405	836.00	18.60	72.44
	4455	846.00	18.61	72.61
UMTS850, HSDPA	4357	826.40	18.80	75.86
	4405	836.00	19.80	95.50
	4455	846.00	19.71	93.54

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS1900, REL 99	9662	1852.40	20.12	102.80
	9800	1880.00	21.26	133.66
	9938	1907.60	21.20	131.83
UMTS1900, HSDPA	9662	1852.40	21.72	148.59
	9800	1880.00	21.86	153.46
	9938	1907.60	22.00	158.49

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LAT (PORT A) / PRIMARY

GPRS (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 06/26/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND GPRS MODE
Peak

Test Equipment:
Receiving: Sunol T243 and Chamber A 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
824.20	33.10	V	0.5	0.0	32.60	38.5	-5.8	
824.20	14.50	H	0.5	0.0	14.00	38.5	-24.4	
836.60	32.90	V	0.5	0.0	32.40	38.5	-6.0	
836.60	14.75	H	0.5	0.0	14.25	38.5	-24.2	
848.80	33.04	V	0.5	0.0	32.54	38.5	-5.9	
848.80	14.43	H	0.5	0.0	13.93	38.5	-24.5	

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EGPRS (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14236
Date: 07/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND EGPRS MODE
Peak

Test Equipment:
Receiving: Sunol T243 and Chamber A 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
824.20	32.10	V	0.5	0.0	31.60	38.5	-6.8	
824.20	13.90	H	0.5	0.0	13.40	38.5	-25.0	
836.60	32.24	V	0.5	0.0	31.74	38.5	-6.7	
836.60	13.40	H	0.5	0.0	12.90	38.5	-25.6	
848.80	31.71	V	0.5	0.0	31.21	38.5	-7.2	
848.80	13.50	H	0.5	0.0	13.00	38.5	-25.4	

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UMTS REL 99 (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 06/27/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND WCDMA REL 99
Port A, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
826.40	24.40	V	0.5	0.0	23.90	38.5	-14.5	
826.40	8.00	H	0.5	0.0	7.50	38.5	-30.9	
836.00	25.00	V	0.5	0.0	24.50	38.5	-13.9	
836.00	8.10	H	0.5	0.0	7.60	38.5	-30.8	
846.00	24.81	V	0.5	0.0	24.31	38.5	-14.1	
846.00	7.60	H	0.5	0.0	7.10	38.5	-31.3	

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UMTS HSDPA (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 06/27/12
Test Engineer: Chin Pang
Configuration: EUTonly
Mode: TX, 850MHz BAND WCDMA HSDPA
Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
826.40	23.20	V	0.5	0.0	22.70	38.5	-15.7	
826.40	7.70	H	0.5	0.0	7.20	38.5	-31.2	
836.00	23.80	V	0.5	0.0	23.30	38.5	-15.1	
836.00	8.40	H	0.5	0.0	7.90	38.5	-30.5	
846.00	23.91	V	0.5	0.0	23.41	38.5	-15.0	
846.00	8.50	H	0.5	0.0	8.00	38.5	-30.4	

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GPRS (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 06/11/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, GPRS1900

Test Equipment:
Receiving: Horn T73 and Chamber A 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	21.2	V	0.85	8.62	28.97	33.0	-4.0	
1.850	24.5	H	0.85	8.47	32.12	33.0	-0.9	
1.880	21.3	V	0.85	8.46	28.95	33.0	-4.1	
1.880	25.3	H	0.85	8.36	32.84	33.0	-0.2	
1.910	19.3	V	0.85	8.30	26.75	33.0	-6.3	
1.910	24.5	H	0.85	8.25	31.90	33.0	-1.1	

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EGPRS (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, EGPRS1900
Peak

Test Equipment:
Receiving: Horn T73 and Chamber A 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	16.2	V	0.85	8.62	23.97	33.0	-9.0	
1.850	22.3	H	0.85	8.47	29.92	33.0	-3.1	
1.880	16.5	V	0.85	8.46	24.11	33.0	-8.9	
1.880	23.2	H	0.85	8.36	30.66	33.0	-2.3	
1.910	16.1	V	0.85	8.30	23.55	33.0	-9.5	
1.910	23.0	H	0.85	8.25	30.40	33.0	-2.6	

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UMTS REL 99 (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, UMTS, PCS band, Rel 99
Port A, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.852	15.6	V	0.85	8.62	23.37	33.0	-9.6	
1.852	18.5	H	0.85	8.47	26.12	33.0	-6.9	
1.880	15.8	V	0.85	8.46	23.41	33.0	-9.6	
1.880	19.3	H	0.85	8.36	26.76	33.0	-6.2	
1.908	15.5	V	0.85	8.30	22.95	33.0	-10.1	
1.908	18.8	H	0.85	8.25	26.20	33.0	-6.8	

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UMTS HSDPA (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company:	Apple
Project #:	11U14136
Date:	07/03/12
Test Engineer:	Chin Pang
Configuration:	EUT only
Mode:	TX, UMTS, PCS band, HSDPA
	Port A, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.852	15.9	V	0.85	8.62	23.67	33.0	-9.3	
1.852	18.4	H	0.85	8.47	26.02	33.0	-7.0	
1.880	16.5	V	0.85	8.46	24.11	33.0	-8.9	
1.880	19.2	H	0.85	8.36	26.66	33.0	-6.3	
1.908	10.3	V	0.85	8.30	17.75	33.0	-15.3	
1.908	18.9	H	0.85	8.25	26.30	33.0	-6.7	

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UAT (PORT B) / SECONDARY

GSM (Cellular Band):

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14236
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND GPRS MODE
Port B, GPRS

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
824.20	26.60	V	0.5	0.0	26.10	38.5	-12.3	
824.20	10.50	H	0.5	0.0	10.00	38.5	-28.4	
836.60	26.50	V	0.5	0.0	26.00	38.5	-12.4	
836.60	9.95	H	0.5	0.0	9.45	38.5	-29.0	
848.80	27.45	V	0.5	0.0	26.95	38.5	-11.5	
848.80	9.93	H	0.5	0.0	9.43	38.5	-29.0	

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GSM (PCS Band):

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, GSM1900
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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	15.2	V	0.85	8.62	22.97	33.0	-10.0	
1.850	17.4	H	0.85	8.47	25.02	33.0	-8.0	
1.880	15.5	V	0.85	8.46	23.11	33.0	-9.9	
1.880	19.0	H	0.85	8.36	26.46	33.0	-6.5	
1.910	15.1	V	0.85	8.30	22.55	33.0	-10.5	
1.910	19.8	H	0.85	8.25	27.20	33.0	-5.8	

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PORT B, EGPRS (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14236
Date: 07/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND EGPRS MODE
Port B, Peak

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
824.20	22.50	V	0.5	0.0	22.00	38.5	-16.4	
824.20	10.50	H	0.5	0.0	10.00	38.5	-28.4	
836.60	22.80	V	0.5	0.0	22.30	38.5	-16.1	
836.60	9.95	H	0.5	0.0	9.45	38.5	-29.0	
848.80	22.91	V	0.5	0.0	22.41	38.5	-16.0	
848.80	9.93	H	0.5	0.0	9.43	38.5	-29.0	

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PORT B, EGPRS (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, EGPRS1900
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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	15.2	V	0.85	8.62	22.97	33.0	-10.0	
1.850	18.1	H	0.85	8.47	25.72	33.0	-7.3	
1.880	15.7	V	0.85	8.46	23.31	33.0	-9.7	
1.880	19.2	H	0.85	8.36	26.66	33.0	-6.3	
1.910	15.7	V	0.85	8.30	23.15	33.0	-9.9	
1.910	19.5	H	0.85	8.25	26.90	33.0	-6.1	

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UMTS, REL 99 (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND WCDMA Rel 99
Port B, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
826.40	18.70	V	0.5	0.0	18.20	38.5	-20.2	
826.40	4.20	H	0.5	0.0	3.70	38.5	-34.7	
836.00	19.10	V	0.5	0.0	18.60	38.5	-19.8	
836.00	4.10	H	0.5	0.0	3.60	38.5	-34.8	
846.00	19.11	V	0.5	0.0	18.61	38.5	-19.8	
846.00	3.90	H	0.5	0.0	3.40	38.5	-35.0	

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UMTS, HSDPA (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, 850MHz BAND WCDMA HSDPA
Port B, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
826.40	17.30	V	0.5	0.0	16.80	38.5	-21.6	
826.40	4.40	H	0.5	0.0	3.90	38.5	-34.5	
836.00	18.30	V	0.5	0.0	17.80	38.5	-20.6	
836.00	4.40	H	0.5	0.0	3.90	38.5	-34.5	
846.00	18.21	V	0.5	0.0	17.71	38.5	-20.7	
846.00	4.30	H	0.5	0.0	3.80	38.5	-34.6	

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UMTS, REL 99 (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, UMTS, PCS band, Rel 99
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Camber A 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
1.852	8.4	V	0.85	8.62	16.17	33.0	-16.8	
1.852	13.5	H	0.85	8.47	21.12	33.0	-11.9	
1.880	8.8	V	0.85	8.46	16.41	33.0	-16.6	
1.880	14.8	H	0.85	8.36	22.26	33.0	-10.7	
1.908	8.3	V	0.85	8.30	15.75	33.0	-17.3	
1.908	14.8	H	0.85	8.25	22.20	33.0	-10.8	

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UMTS, HSDPA (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, UMTS, PCS band, HSDPA
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Camber A 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
1.852	8.2	V	0.85	8.62	15.97	33.0	-17.0	
1.852	14.1	H	0.85	8.47	21.72	33.0	-11.3	
1.880	8.9	V	0.85	8.46	16.51	33.0	-16.5	
1.880	14.4	H	0.85	8.36	21.86	33.0	-11.1	
1.908	8.5	V	0.85	8.30	15.95	33.0	-17.1	
1.908	14.6	H	0.85	8.25	22.00	33.0	-11.0	

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9.1.2. A1429

LAT (PORT A) / PRIMARY

CELLULAR BAND (ERP)

Mode	Channel	f (MHz)	ERP	
			dBm	mW
BC10, 1xRTT	476	817.90	21.17	130.92
	526	819.15	21.20	131.83
	684	823.10	22.20	165.96
BC10, EVDO	476	817.90	21.77	150.31
	526	819.15	21.70	147.91
	684	823.10	22.00	158.49

Mode	Channel	f (MHz)	ERP	
			dBm	mW
CDMA 1xRTT	1013	824.70	23.97	249.46
	384	836.52	24.38	274.16
	777	848.31	24.61	289.07
CDMA EVDO Rev A	1013	824.70	22.37	172.58
	384	836.52	22.24	274.16
	777	848.31	22.81	289.07
EVDO Rev B Two Carriers Min.	1013+31	824.70+825.93	21.87	172.58
	384+425	836.52+837.75	22.34	167.49
	736+777	847.08+848.31	22.11	190.99
EVDO Rev B Two Carriers Max	1013+156	824.829.68	20.97	153.82
	384+550	836.52+841.50	21.34	171.40
	611+777	843.33+848.31	21.31	162.55
EVDO Rev B Three Carriers Min.	1013+31+72	824.70+825.93+827.16	21.17	125.03
	384+425+466	836.52+837.75+838.98	21.94	136.14
	695+736+777	845.85+847.08+848.31	21.61	135.21

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	31.27	1339.68
	192	836.60	32.25	1678.80
	251	848.80	32.00	1584.89
EGPRS	128	824.20	30.77	1193.99
	192	836.60	31.01	1261.83
	251	848.80	30.50	1122.02
WCDMA, Rel 99	4357	826.40	28.80	758.58
	4405	836.00	24.24	265.46
	4455	846.00	23.81	240.44
WCDMA, HSDPA	4357	826.40	22.70	186.21
	4405	836.00	23.44	220.80
	4455	846.00	23.31	214.29

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PCS BAND (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
CDMA 1xRTT	25	1851.25	26.72	469.89
	600	1880.00	26.81	479.73
	1175	1908.75	27.20	524.81
CDMA EVDO, REV A	25	1851.25	27.82	605.34
	600	1880.00	28.21	662.22
	1175	1908.75	28.40	691.83
GPRS	512	1850.20	30.77	1193.99
	661	1880.00	31.27	1339.68
	810	1909.80	30.70	1174.90
EGPRS	512	1850.20	31.02	1264.74
	661	1880.00	31.16	1306.17
	810	1909.80	30.90	1230.27
WCDMA,REL 99	9626	1852.40	24.72	296.48
	9800	1880.00	25.76	376.70
	9938	1907.60	25.30	338.84
WCDMA, HSDPA	9662	1852.40	25.82	381.94
	9800	1880.00	26.56	452.90
	9938	1907.60	25.90	389.05

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UAT (PORT B) / SECONDARY

CELLULAR BAND (ERP)

Mode	Channel	f (MHz)	ERP	
			dBm	mW
BC10, 1xRTT	476	817.90	15.97	39.54
	526	819.15	16.10	40.74
	684	823.10	17.00	50.12
BC10, EVDO	476	817.90	16.97	49.77
	526	819.15	16.70	46.77
	684	823.10	17.01	50.23

Mode	Channel	f (MHz)	ERP	
			dBm	mW
CDMA 1xRTT	1013	824.70	16.87	48.64
	384	836.52	16.94	49.43
	777	848.31	17.11	51.40
CDMA EVDO Rev A	1013	824.70	18.57	71.94
	384	836.52	17.94	62.23
	777	848.31	18.41	69.34
EVDO Rev B Two Carriers Min.	1013+31	824.70+825.93	18.47	70.31
	384+425	836.52+837.75	19.14	82.04
	736+777	847.08+848.31	18.71	74.30
EVDO Rev B Two Carriers Max	1013+156	824.829.68	19.47	88.51
	384+550	836.52+841.50	20.14	103.28
	611+777	843.33+848.31	18.11	64.71
EVDO Rev B Three Carriers Min.	1013+31+72	824.70+825.93+827.16	19.97	99.31
	384+425+466	836.52+837.75+838.98	19.84	96.38
	695+736+777	845.85+847.08+848.31	19.11	81.47

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	25.28	337.29
	192	836.60	25.44	349.95
	251	848.80	26.00	398.11
EGPRS	128	824.20	25.00	316.23
	192	836.60	24.60	288.40
	251	848.80	25.11	324.34
WCDMA, Rel 99	4357	826.40	17.50	56.23
	4405	836.00	17.84	60.81
	4455	846.00	18.11	64.71
WCDMA, HSDPA	4357	826.40	17.30	53.70
	4405	836.00	17.54	56.75
	4455	846.00	16.91	49.09

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PCS BAND (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
CDMA 1xRTT	25	1851.25	22.72	187.07
	600	1880.00	23.11	204.64
	1175	1908.75	23.40	218.78
CDMA EVDO, REV A	25	1851.25	22.72	187.07
	600	1880.00	24.61	289.07
	1175	1908.75	24.10	257.04
GPRS	512	1850.20	26.72	469.89
	661	1880.00	27.36	544.50
	810	1909.80	27.50	562.34
EGPRS	512	1850.20	26.12	409.26
	661	1880.00	27.36	544.50
	810	1909.80	27.00	501.19
WCDMA,REL 99	9626	1852.40	20.72	118.03
	9800	1880.00	22.36	172.19
	9938	1907.60	21.90	154.88
WCDMA, HSDPA	9662	1852.40	20.42	110.15
	9800	1880.00	21.36	136.77
	9938	1907.60	21.50	141.25

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LAT (PORT A) / PRIMARY

CDMA2000 BC10, 1xRTT

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/06/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, BC10 BAND, CDMA 1xRTT
Port A, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
817.90	21.67	V	0.5	0.0	21.17	38.5	-17.3	
817.90	6.70	H	0.5	0.0	6.20	38.5	-32.2	
Mid Ch								
819.15	21.70	V	0.5	0.0	21.20	38.5	-17.2	
819.15	5.80	H	0.5	0.0	5.30	38.5	-33.2	
High Ch								
823.10	22.70	V	0.5	0.0	22.20	38.5	-16.2	
823.10	6.50	H	0.5	0.0	6.00	38.5	-32.4	

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CDMA2000 BC10, EVDO REV A

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, BC10 BAND, CDMA EVDO, Rev A MODE
Average

Test Equipment:
Receiving: Sunol T243, and Chamber AN-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
Low Ch								
817.90	22.27	V	0.5	0.0	21.77	38.5	-16.7	
817.90	6.90	H	0.5	0.0	6.40	38.5	-32.0	
Mid Ch								
819.15	22.20	V	0.5	0.0	21.70	38.5	-16.7	
819.15	6.00	H	0.5	0.0	5.50	38.5	-33.0	
High Ch								
823.10	22.50	V	0.5	0.0	22.00	38.5	-16.4	
823.10	6.80	H	0.5	0.0	6.30	38.5	-32.1	

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CDMA2000 CELL BAND, 1xRTT

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA 1xRTT MODE
Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	24.47	V	0.5	0.0	23.97	38.5	-14.5	
824.70	8.70	H	0.5	0.0	8.20	38.5	-30.2	
Mid Ch								
836.52	24.88	V	0.5	0.0	24.38	38.5	-14.1	
836.52	7.60	H	0.5	0.0	7.10	38.5	-31.4	
High Ch								
848.31	25.11	V	0.5	0.0	24.61	38.5	-13.8	
848.31	8.00	H	0.5	0.0	7.50	38.5	-30.9	

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CDMA2000 CELL BAND, EVDO REV A

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA EVDO Rev A MODE
Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	22.87	V	0.5	0.0	22.37	38.5	-16.1	
824.70	4.90	H	0.5	0.0	4.40	38.5	-34.0	
Mid Ch								
836.52	22.74	V	0.5	0.0	22.24	38.5	-16.2	
836.52	4.00	H	0.5	0.0	3.50	38.5	-35.0	
High Ch								
848.31	23.31	V	0.5	0.0	22.81	38.5	-15.6	
848.31	4.70	H	0.5	0.0	4.20	38.5	-34.2	

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CDMA2000 CELL BAND, EVDO REV B

Two Carriers Minimum Separation

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 08/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA Rev B
A21, Average
Two Carrier Min Separation

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	22.37	V	0.5	0.0	21.87	38.5	-16.6	
824.70	8.50	H	0.5	0.0	8.00	38.5	-30.4	
Mid Ch								
836.52	22.84	V	0.5	0.0	22.34	38.5	-16.1	
836.52	7.40	H	0.5	0.0	6.90	38.5	-31.6	
High Ch								
848.31	22.61	V	0.5	0.0	22.11	38.5	-16.3	
848.31	7.50	H	0.5	0.0	7.00	38.5	-31.4	

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CDMA2000 CELL BAND, EVDO REV B

Two Carriers Maximum Separation

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 08/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA Rev B
A21, Average
Two Carrier Max Separation

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	21.47	V	0.5	0.0	20.97	38.5	-17.5	
824.70	7.90	H	0.5	0.0	7.40	38.5	-31.0	
Mid Ch								
836.52	21.84	V	0.5	0.0	21.34	38.5	-17.1	
836.52	7.20	H	0.5	0.0	6.70	38.5	-31.8	
High Ch								
848.31	21.81	V	0.5	0.0	21.31	38.5	-17.1	
848.31	7.50	H	0.5	0.0	7.00	38.5	-31.4	

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CDMA2000 CELL BAND, EVDO REV B

Three Carriers Minimum Separation

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 08/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA Rev B
A21, Average
Three Carrier Min Separation

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	21.67	V	0.5	0.0	21.17	38.5	-17.3	
824.70	8.10	H	0.5	0.0	7.60	38.5	-30.8	
Mid Ch								
836.52	22.44	V	0.5	0.0	21.94	38.5	-16.5	
836.52	7.50	H	0.5	0.0	7.00	38.5	-31.5	
High Ch								
848.31	22.11	V	0.5	0.0	21.61	38.5	-16.8	
848.31	7.70	H	0.5	0.0	7.20	38.5	-31.2	

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GPRS850, CELL Band

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, GPRS850
Port A, Peak

Test Equipment:
Receiving: Sunol T243 and Chamber A 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
Low Ch								
824.20	31.77	V	0.5	0.0	31.27	38.5	-7.2	
824.20	9.40	H	0.5	0.0	8.90	38.5	-29.5	
Mid Ch								
836.60	32.75	V	0.5	0.0	32.25	38.5	-6.2	
836.60	8.00	H	0.5	0.0	7.50	38.5	-31.0	
High Ch								
848.80	32.50	V	0.5	0.0	32.00	38.5	-6.4	
848.80	8.50	H	0.5	0.0	8.00	38.5	-30.4	

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EGPRS850, CELL Band

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, EGPRS850
Port A, Peak

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.20	31.27	V	0.5	0.0	30.77	38.5	-7.7	
824.20	15.40	H	0.5	0.0	14.90	38.5	-23.5	
Mid Ch								
836.60	31.51	V	0.5	0.0	31.01	38.5	-7.4	
836.60	15.50	H	0.5	0.0	15.00	38.5	-23.5	
High Ch								
848.80	31.00	V	0.5	0.0	30.50	38.5	-7.9	
848.80	15.20	H	0.5	0.0	14.70	38.5	-23.7	

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WCDMA, REL99, CELL Band

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND WCDMA Rel 99
Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
826.40	23.90	V	0.5	0.0	23.40	38.5	-15.0	
826.40	5.90	H	0.5	0.0	5.40	38.5	-33.0	
836.00	24.74	V	0.5	0.0	24.24	38.5	-14.2	
836.00	6.50	H	0.5	0.0	6.00	38.5	-32.5	
846.00	24.31	V	0.5	0.0	23.81	38.5	-14.6	
846.00	6.00	H	0.5	0.0	5.50	38.5	-32.9	

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WCDMA, HSDPA, CELL Band

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND WCDMA HSDPA
Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
826.40	23.20	V	0.5	0.0	22.70	38.5	-15.7	
826.40	6.70	H	0.5	0.0	6.20	38.5	-32.2	
836.00	23.94	V	0.5	0.0	23.44	38.5	-15.0	
836.00	7.00	H	0.5	0.0	6.50	38.5	-32.0	
846.00	23.81	V	0.5	0.0	23.31	38.5	-15.1	
846.00	6.10	H	0.5	0.0	5.60	38.5	-32.8	

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CDMA2000 PCS BAND, 1xRTT

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, CDMA2000, 1xRTT
Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.851	10.2	V	0.85	8.62	17.97	33.0	-15.0	
1.850	19.1	H	0.85	8.47	26.72	33.0	-6.3	
1.880	10.5	V	0.85	8.46	18.11	33.0	-14.9	
1.880	19.3	H	0.85	8.36	26.81	33.0	-6.2	
1.909	10.1	V	0.85	8.30	17.55	33.0	-15.5	
1.909	19.8	H	0.85	8.25	27.20	33.0	-5.8	

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CDMA2000 PCS BAND, EVDO, Rev A

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, CDMA2000, EVDO, Rev A
Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.851	11.2	V	0.85	8.62	18.97	33.0	-14.0	
1.851	20.2	H	0.85	8.47	27.82	33.0	-5.2	
1.880	11.5	V	0.85	8.46	19.11	33.0	-13.9	
1.880	20.7	H	0.85	8.36	28.21	33.0	-4.8	
1.909	11.3	V	0.85	8.30	18.75	33.0	-14.3	
1.909	21.0	H	0.85	8.25	28.40	33.0	-4.6	

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EIRP GPRS1900 BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, GPRS1900

Test Equipment:
Receiving: Horn T73, and Chamber A 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	20.2	V	0.85	8.62	27.97	33.0	-5.0	
1.850	23.2	H	0.85	8.47	30.77	33.0	-2.2	
1.880	20.6	V	0.85	8.46	28.21	33.0	-4.8	
1.880	23.8	H	0.85	8.36	31.27	33.0	-1.7	
1.910	20.3	V	0.85	8.30	27.75	33.0	-5.3	
1.910	23.3	H	0.85	8.25	30.70	33.0	-2.3	

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EIRP EGPRS1900 BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/25/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, EGPRS1900
Port A, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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	18.9	V	0.85	8.62	26.67	33.0	-6.3	
1.850	23.4	H	0.85	8.47	31.02	33.0	-2.0	
1.880	19.4	V	0.85	8.46	27.01	33.0	-6.0	
1.880	23.7	H	0.85	8.36	31.16	33.0	-1.8	
1.910	19.3	V	0.85	8.30	26.75	33.0	-6.3	
1.910	23.5	H	0.85	8.25	30.90	33.0	-2.1	

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EIRP WCDMA REL. 99 PCS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company:	Apple
Project #:	11U14136
Date:	07/02/12
Test Engineer:	Chin Pang
Configuration:	EUT only
Mode:	TX, UMTS, PCS band, Rel 99
	Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.852	14.9	V	0.85	8.62	22.67	33.0	-10.3	
1.852	17.1	H	0.85	8.47	24.72	33.0	-8.3	
1.880	15.3	V	0.85	8.46	22.91	33.0	-10.1	
1.880	18.3	H	0.85	8.36	25.76	33.0	-7.2	
1.908	15.3	V	0.85	8.30	22.75	33.0	-10.3	
1.908	17.9	H	0.85	8.25	25.30	33.0	-7.7	

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EIRP WCDMA HSDPA, PCS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, UMTS, PCS band, HSDPA

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.852	15.4	V	0.85	8.62	23.17	33.0	-9.8	
1.852	18.2	H	0.85	8.47	25.82	33.0	-7.2	
1.880	15.7	V	0.85	8.46	23.31	33.0	-9.7	
1.880	19.1	H	0.85	8.36	26.56	33.0	-6.4	
1.908	15.3	V	0.85	8.30	22.75	33.0	-10.3	
1.908	18.5	H	0.85	8.25	25.90	33.0	-7.1	

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UAT (PORT B) / SECONDARY

CDMA2000 1xRTT, BC10

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, BC10 BAND, CDMA 1xRTT
Port B, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
817.90	16.47	V	0.5	0.0	15.97	38.5	-22.5	
817.90	3.90	H	0.5	0.0	3.40	38.5	-35.0	
Mid Ch								
819.15	16.60	V	0.5	0.0	16.10	38.5	-22.3	
819.15	3.50	H	0.5	0.0	3.00	38.5	-35.5	
High Ch								
823.10	17.50	V	0.5	0.0	17.00	38.5	-21.4	
823.10	4.00	H	0.5	0.0	3.50	38.5	-34.9	

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CDMA2000 BC10, EVDO REV A

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, BC10 BAND, CDMA EVDO, Rev A MODE
Port B, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
817.90	17.47	V	0.5	0.0	16.97	38.5	-21.5	
817.90	3.90	H	0.5	0.0	3.40	38.5	-35.0	
Mid Ch								
819.15	17.20	V	0.5	0.0	16.70	38.5	-21.7	
819.15	4.00	H	0.5	0.0	3.50	38.5	-35.0	
High Ch								
823.10	17.51	V	0.5	0.0	17.01	38.5	-21.4	
823.10	3.80	H	0.5	0.0	3.30	38.5	-35.1	

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CDMA2000 CELL BAND, 1xRTT

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA 1xRTT
Port B, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	17.37	V	0.5	0.0	16.87	38.5	-21.6	
824.70	4.20	H	0.5	0.0	3.70	38.5	-34.7	
Mid Ch								
836.52	17.44	V	0.5	0.0	16.94	38.5	-21.5	
836.52	3.80	H	0.5	0.0	3.30	38.5	-35.2	
High Ch								
848.31	17.61	V	0.5	0.0	17.11	38.5	-21.3	
848.31	3.70	H	0.5	0.0	3.20	38.5	-35.2	

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CDMA2000 CELL BAND, EVDO, REV A

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA EVDO Rev A
A21, Port B, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	19.07	V	0.5	0.0	18.57	38.5	-19.9	
824.70	4.20	H	0.5	0.0	3.70	38.5	-34.7	
Mid Ch								
836.52	18.44	V	0.5	0.0	17.94	38.5	-20.5	
836.52	3.70	H	0.5	0.0	3.20	38.5	-35.3	
High Ch								
848.31	18.91	V	0.5	0.0	18.41	38.5	-20.0	
848.31	4.10	H	0.5	0.0	3.60	38.5	-34.8	

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CDMA2000 CELL BAND, EVDO, REV B

TWO CARRIERS MINIMUM SEPARATION

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 08/28/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA Rev B Port B
A21, Average
Two Carrier Min Separation

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	18.97	V	0.5	0.0	18.47	38.5	-20.0	
824.70	8.10	H	0.5	0.0	7.60	38.5	-30.8	
Mid Ch								
836.52	19.64	V	0.5	0.0	19.14	38.5	-19.3	
836.52	7.30	H	0.5	0.0	6.80	38.5	-31.7	
High Ch								
848.31	19.21	V	0.5	0.0	18.71	38.5	-19.7	
848.31	7.40	H	0.5	0.0	6.90	38.5	-31.5	

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CDMA2000 CELL BAND, EVDO, REV B

TWO CARRIERS MAXIMUM SEPARATION

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 08/28/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA Rev B, Port B
A21, Average
Two Carrier Max Separation

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	19.97	V	0.5	0.0	19.47	38.5	-19.0	
824.70	7.80	H	0.5	0.0	7.30	38.5	-31.1	
Mid Ch								
836.52	20.64	V	0.5	0.0	20.14	38.5	-18.3	
836.52	7.00	H	0.5	0.0	6.50	38.5	-32.0	
High Ch								
848.31	18.61	V	0.5	0.0	18.11	38.5	-20.3	
848.31	7.50	H	0.5	0.0	7.00	38.5	-31.4	

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CDMA2000 CELL BAND, EVDO, REV B

THREE CARRIERS MNIMUM SEPARATION

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 08/28/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850 MHz BAND, CDMA Rev B, Port B
A21, Average
Three Carrier Min Separation

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.70	20.47	V	0.5	0.0	19.97	38.5	-18.5	
824.70	7.90	H	0.5	0.0	7.40	38.5	-31.0	
Mid Ch								
836.52	20.34	V	0.5	0.0	19.84	38.5	-18.6	
836.52	7.20	H	0.5	0.0	6.70	38.5	-31.8	
High Ch								
848.31	19.61	V	0.5	0.0	19.11	38.5	-19.3	
848.31	7.50	H	0.5	0.0	7.00	38.5	-31.4	

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EIRP GPRS850 BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, GPRS850
Port B, Peak

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
Low Ch								
824.20	25.78	V	0.5	0.0	25.28	38.5	-13.2	
824.20	6.50	H	0.5	0.0	6.00	38.5	-32.4	
Mid Ch								
836.60	25.94	V	0.5	0.0	25.44	38.5	-13.0	
836.60	7.00	H	0.5	0.0	6.50	38.5	-32.0	
High Ch								
848.80	26.50	V	0.5	0.0	26.00	38.5	-12.4	
848.80	6.20	H	0.5	0.0	5.70	38.5	-32.7	

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EIRP EGPRS850 BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14236
Date: 07/26/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND EGPRS MODE
Port B, Peak

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
824.20	25.50	V	0.5	0.0	25.00	38.5	-13.4	
824.20	11.20	H	0.5	0.0	10.70	38.5	-27.7	
836.60	25.10	V	0.5	0.0	24.60	38.5	-13.8	
836.60	10.75	H	0.5	0.0	10.25	38.5	-28.2	
848.80	25.61	V	0.5	0.0	25.11	38.5	-13.3	
848.80	10.73	H	0.5	0.0	10.23	38.5	-28.2	

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EIRP WCDMA850 BAND, REL 99

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company:	Apple
Project #:	11U14136
Date:	07/02/12
Test Engineer:	Chin Pang
Configuration:	EUT only
Mode:	TX, 850MHz BAND WCDMA Rel 99
	A21, Port B, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
826.40	18.00	V	0.5	0.0	17.50	38.5	-20.9	
826.40	3.90	H	0.5	0.0	3.40	38.5	-35.0	
836.00	18.34	V	0.5	0.0	17.84	38.5	-20.6	
836.00	4.00	H	0.5	0.0	3.50	38.5	-35.0	
846.00	18.61	V	0.5	0.0	18.11	38.5	-20.3	
846.00	3.50	H	0.5	0.0	3.00	38.5	-35.4	

Rev. 3.17.11

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EIRP WCDMA850 BAND, HSDPA

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, 850MHz BAND WCDMA HSDPA
Port B, Average

Test Equipment:
Receiving: Sunol T243, and Chamber A 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
826.40	17.80	V	0.5	0.0	17.30	38.5	-21.1	
826.40	6.10	H	0.5	0.0	5.60	38.5	-32.8	
836.00	18.04	V	0.5	0.0	17.54	38.5	-20.9	
836.00	6.30	H	0.5	0.0	5.80	38.5	-32.7	
846.00	17.41	V	0.5	0.0	16.91	38.5	-21.5	
846.00	5.50	H	0.5	0.0	5.00	38.5	-33.4	

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CDMA2000 PCS BAND, 1xRTT

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, CDMA2000, 1xRTT
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.851	10.2	V	0.85	8.62	17.97	33.0	-15.0	
1.851	13.6	H	0.85	8.47	21.22	33.0	-11.8	
1.880	10.5	V	0.85	8.46	18.11	33.0	-14.9	
1.880	14.2	H	0.85	8.36	21.71	33.0	-11.3	
1.909	10.6	V	0.85	8.30	18.05	33.0	-15.0	
1.909	14.6	H	0.85	8.25	22.00	33.0	-11.0	

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CDMA2000 PCS BAND, EVDO REV A

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, CDMA2000, EVDO, Rev A
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.851	10.7	V	0.85	8.62	18.47	33.0	-14.5	
1.851	14.1	H	0.85	8.47	21.72	33.0	-11.3	
1.880	11.1	V	0.85	8.46	18.71	33.0	-14.3	
1.880	16.1	H	0.85	8.36	23.61	33.0	-9.4	
1.909	11.0	V	0.85	8.30	18.45	33.0	-14.6	
1.909	15.7	H	0.85	8.25	23.10	33.0	-9.9	

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EIRP GPRS1900, PCS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, GPRS1900
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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	14.9	V	0.85	8.62	22.67	33.0	-10.3	
1.850	18.1	H	0.85	8.47	25.72	33.0	-7.3	
1.880	15.5	V	0.85	8.46	23.11	33.0	-9.9	
1.880	19.1	H	0.85	8.36	26.56	33.0	-6.4	
1.910	15.3	V	0.85	8.30	22.75	33.0	-10.3	
1.910	19.5	H	0.85	8.25	26.90	33.0	-6.1	

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EIRP EGPRS1900, PCS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/26/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, EGPRS1900
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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	14.9	V	0.85	8.62	22.67	33.0	-10.3	
1.850	17.5	H	0.85	8.47	25.12	33.0	-7.9	
1.880	15.7	V	0.85	8.46	23.31	33.0	-9.7	
1.880	18.9	H	0.85	8.36	26.36	33.0	-6.6	
1.910	15.7	V	0.85	8.30	23.15	33.0	-9.9	
1.910	18.6	H	0.85	8.25	26.00	33.0	-7.0	

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EIRP WCDMA REL. 99 PCS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/02/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, UMTS, PCS band, Rel 99
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.852	10.2	V	0.85	8.62	17.97	33.0	-15.0	
1.852	13.1	H	0.85	8.47	20.72	33.0	-12.3	
1.880	10.8	V	0.85	8.46	18.41	33.0	-14.6	
1.880	14.9	H	0.85	8.36	22.36	33.0	-10.6	
1.908	10.3	V	0.85	8.30	17.75	33.0	-15.3	
1.908	14.5	H	0.85	8.25	21.90	33.0	-11.1	

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EIRP WCDMA HSDPA, PCS BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber A

Company: Apple
Project #: 11U14136
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, UMTS, PCS band, HSDPA
Port B, Peak

Test Equipment:
Receiving: Horn T73, and Chamber A 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
1.852	9.8	V	0.85	8.62	17.57	33.0	-15.4	
1.852	12.8	H	0.85	8.47	20.42	33.0	-12.6	
1.880	10.0	V	0.85	8.46	17.61	33.0	-15.4	
1.880	13.9	H	0.85	8.36	21.36	33.0	-11.6	
1.908	9.8	V	0.85	8.30	17.25	33.0	-15.8	
1.908	14.1	H	0.85	8.25	21.50	33.0	-11.5	

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9.2. PEAK-TO-AVERAGE RATIO

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

A1428

Peak-To-Average Ratio:

Mode	Channel Band-width (KHZ)	Modulation	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
			*Peak	Average	
UMTS	5	REL99	28.32	24.93	3.39

Mode	Channel Band-width (MHZ)	Ch. No.	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
			*Peak	Average	
UMTS	5	HSDPA	29.01	22.52	6.49

*Peak Reading = Average Reading + Peak-to-Average Ratio

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A1429

Peak-To-Average Ratio:

Mode	Channel Band-width (KHZ)	Modulation	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
			*Peak	Average	
BC10	250	1xRTT	29.02	24.26	4.76

Mode	Channel Band-width (KHZ)	Modulation	Couducted Power (dBm)		Peak-to-Average Ratio
			*Peak	Average	
BC10	250	EVDO	29.79	24.14	5.65

Mode	Channel Band-width (KHZ)	Modulation	Couducted Power (dBm)		Peak-to-Average Ratio
			*Peak	Average	
BC0	250	1xRTT	29.02	24.26	4.76

Mode	Channel Band-width (KHZ)	Ch. No.	Couducted Power (dBm)		Peak-to-Average Ratio
			*Peak	Average	
BC0	5	EVDO	29.74	24.31	5.43

*Peak Reading = Average Reading + Peak-to-Average Ratio

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Peak-To-Average Ratio:

Mode	Channel Band-width (MHZ)	Modulation	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
			*Peak	Average	
UMTS	5	REL99	27.75	24.37	3.38

Mode	Channel Band-width (MHZ)	Ch. No.	Couducted Power (dBm)		Peak-to-Average Ratio (PAR)
			*Peak	Average	
UMTS	5	HSDPA	27.79	23.43	4.36

*Peak Reading = Average Reading + Peak-to-Average Ratio

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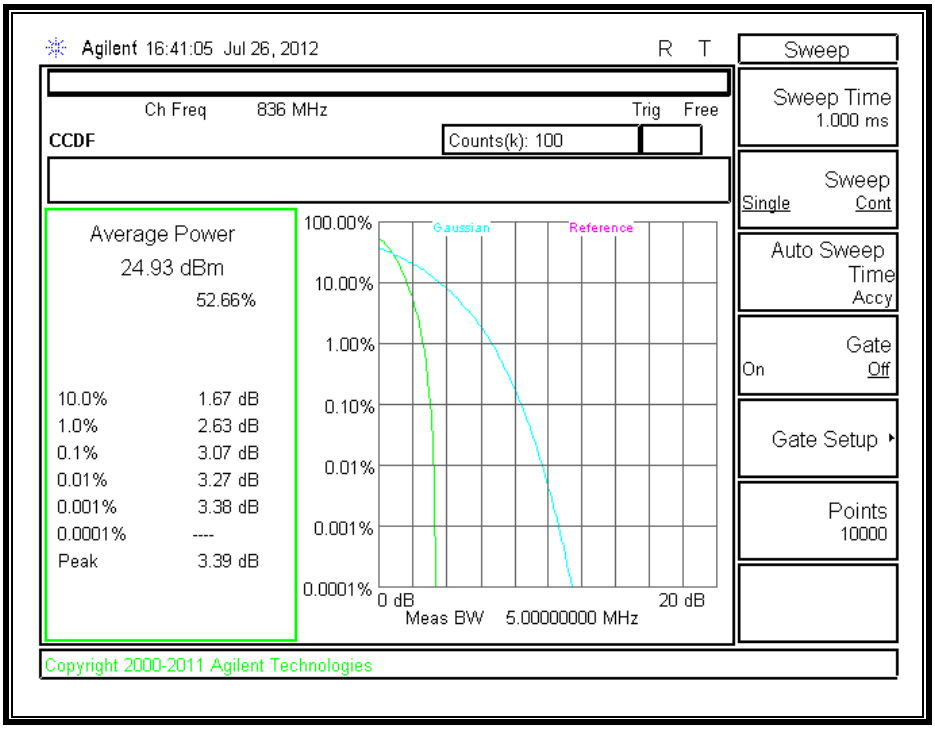
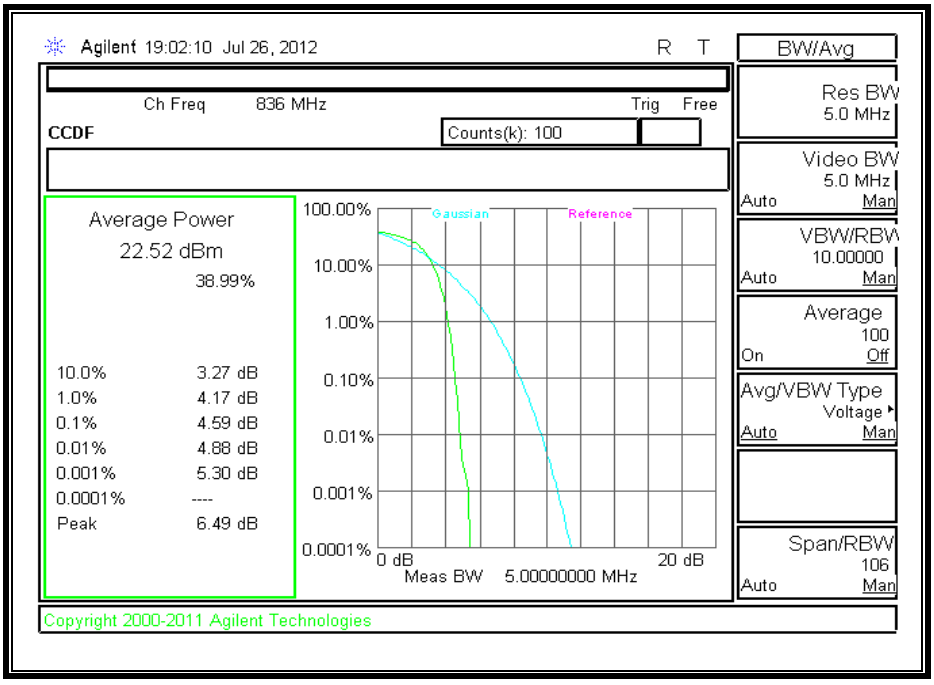
A1428

UMTS850, REL 99



UMTS850, HSDPA



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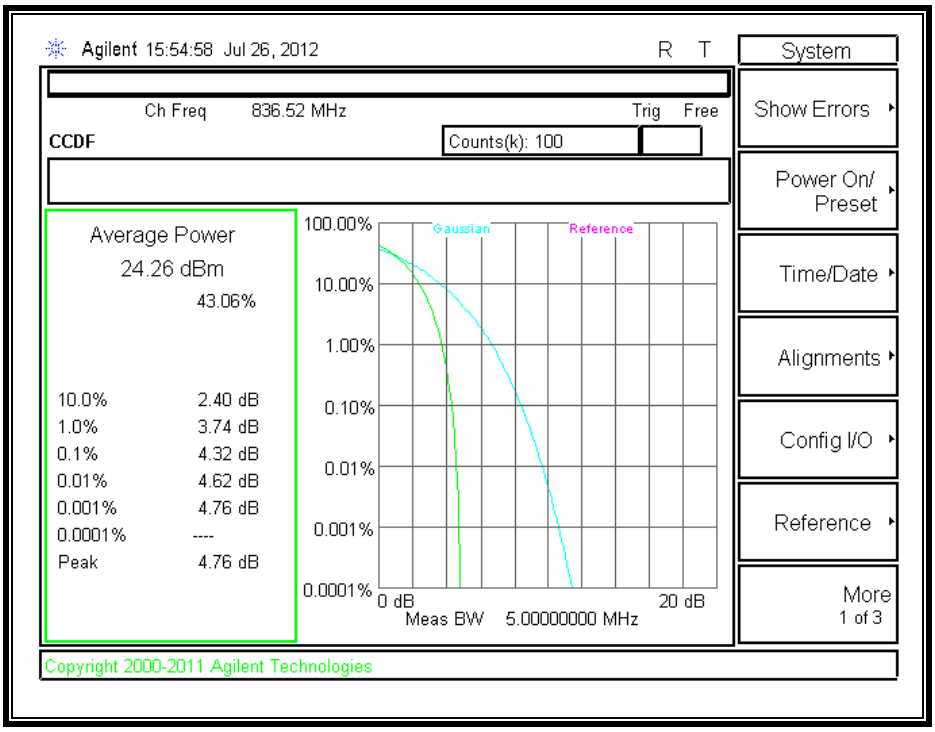
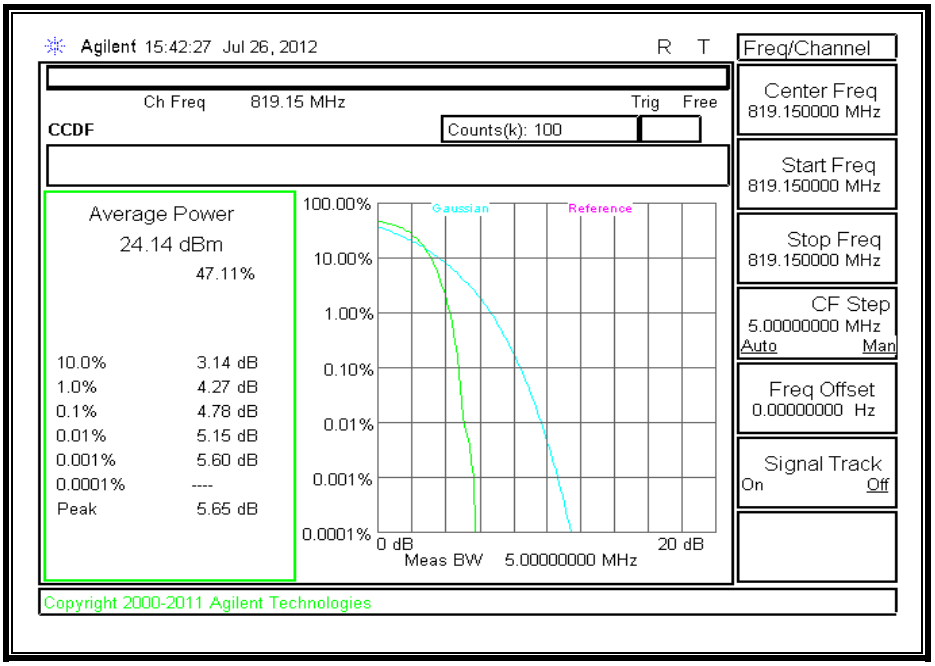
A1429

BC10, 1xRTT



BC10, EVDO



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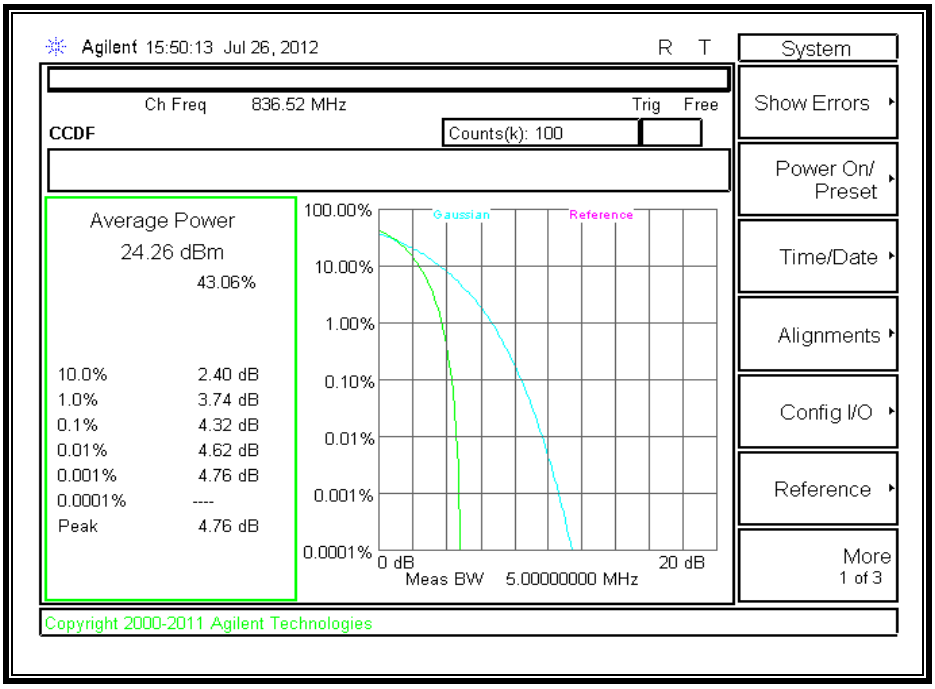
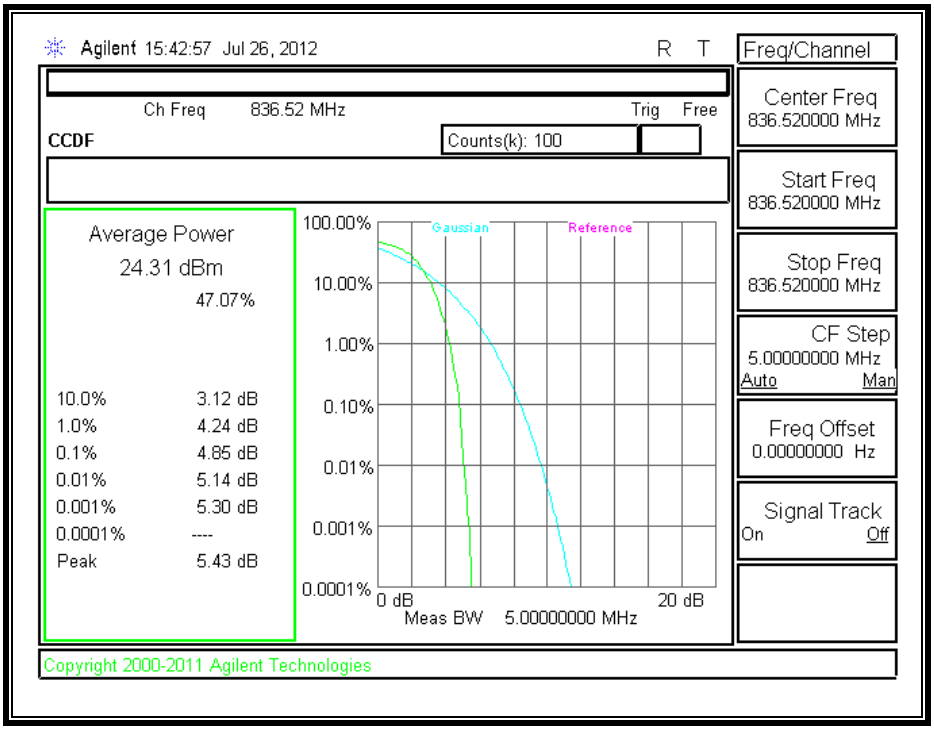
BC0, 1xRTT



BC0, EVDO



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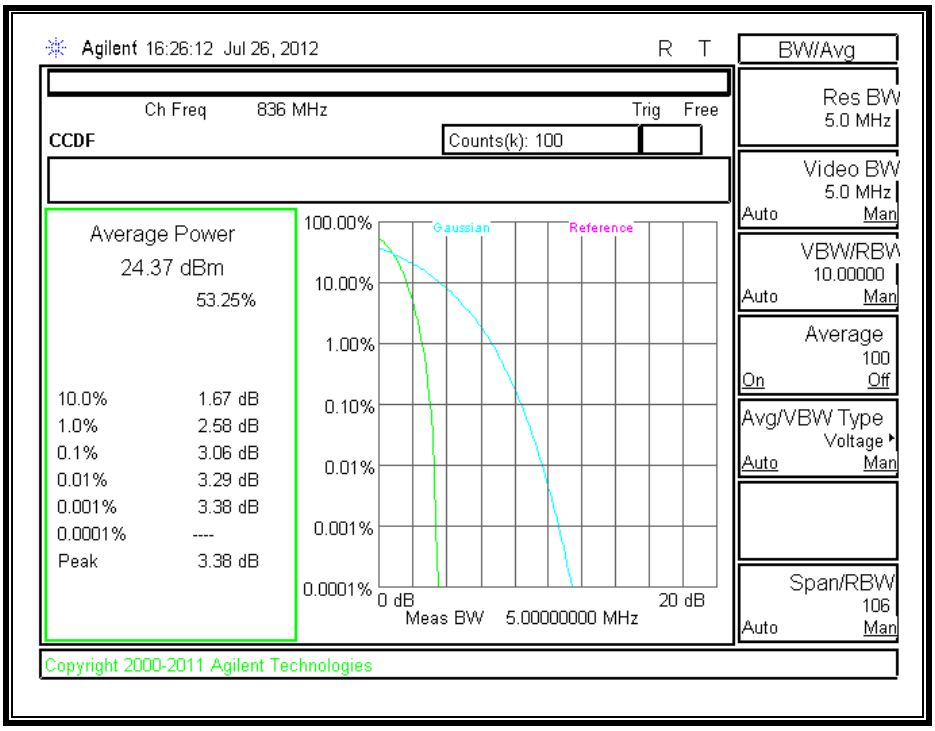
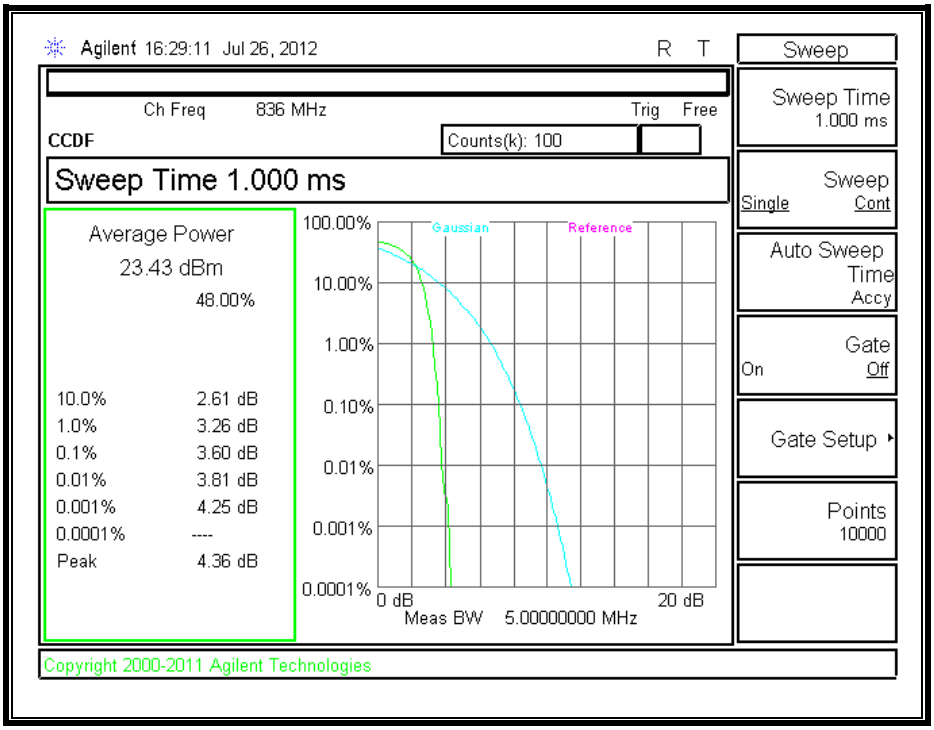
UMTS850, REL99



UMTS850, HSDPA



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9.3. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238 & § 90.691

LIMIT

§22.917 (e) and §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.

§ 90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10 (f/6.1) decibels or 50 + 10 Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10 (P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

(b) When an emission outside of the authorized bandwidth causes harmful interference, the Commission may, at its discretion, require greater attenuation than specified in this section.

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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:

A1428 and A1429, LAT PORT and UAT PORT

- CDMA2000
- GPRS and EGPRS
- UMTS, REL 99 and HSDPA

RESULTS

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9.3.1. A1428

GPRS (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 11U14136
Date: 06/27/12
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, CELL BAND GPRS MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-8.2	V	3.0	38.2	1.0	-45.3	-13.0	-32.3	
2.473	-13.3	V	3.0	37.5	1.0	-49.8	-13.0	-36.8	
1.648	-17.5	H	3.0	38.2	1.0	-54.6	-13.0	-41.6	
2.473	-19.0	H	3.0	37.5	1.0	-55.5	-13.0	-42.5	
Mid Ch, (836.6MHz)									
1.673	-2.9	V	3.0	38.1	1.0	-40.0	-13.0	-27.0	
2.510	-12.1	V	3.0	37.5	1.0	-48.6	-13.0	-35.6	
1.673	-16.2	H	3.0	38.1	1.0	-53.3	-13.0	-40.3	
2.510	-18.9	H	3.0	37.5	1.0	-55.3	-13.0	-42.3	
High Ch, (848.8MHz)									
1.698	-7.6	V	3.0	38.1	1.0	-44.7	-13.0	-31.7	
2.546	-15.0	V	3.0	37.5	1.0	-51.5	-13.0	-38.5	
1.698	-18.0	H	3.0	38.1	1.0	-55.1	-13.0	-42.1	
2.546	-15.6	H	3.0	37.5	1.0	-52.1	-13.0	-39.1	

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

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EGPRS (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/25/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, CELL BAND EGPRS MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-18.2	V	3.0	38.2	1.0	-55.3	-13.0	-42.3	
2.473	-18.3	V	3.0	37.5	1.0	-54.8	-13.0	-41.8	
1.648	-21.5	H	3.0	38.2	1.0	-58.6	-13.0	-45.6	
2.473	-22.0	H	3.0	37.5	1.0	-58.5	-13.0	-45.5	
Mid Ch, (836.6MHz)									
1.673	-19.9	V	3.0	38.1	1.0	-57.0	-13.0	-44.0	
2.510	-18.1	V	3.0	37.5	1.0	-54.6	-13.0	-41.6	
1.673	-17.2	H	3.0	38.1	1.0	-54.3	-13.0	-41.3	
2.510	-20.9	H	3.0	37.5	1.0	-57.3	-13.0	-44.3	
High Ch, (848.8MHz)									
1.698	-16.6	V	3.0	38.1	1.0	-53.7	-13.0	-40.7	
2.546	-17.0	V	3.0	37.5	1.0	-53.5	-13.0	-40.5	
1.698	-19.0	H	3.0	38.1	1.0	-56.1	-13.0	-43.1	
2.546	-19.6	H	3.0	37.5	1.0	-56.1	-13.0	-43.1	

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

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UMTS REL 99 (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	06/27/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, WCDMA 850MHz, Rel 99

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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
Low Channel (826.4MHz)									
1.653	-19.1	V	3.0	38.1	1.0	-56.3	-13.0	-43.3	
2.479	-22.3	V	3.0	37.5	1.0	-58.7	-13.0	-45.7	
1.653	-14.4	H	3.0	38.1	1.0	-51.6	-13.0	-38.6	
2.479	-23.0	H	3.0	37.5	1.0	-59.5	-13.0	-46.5	
Mid Channel (836MHz)									
1.672	-18.9	V	3.0	38.1	1.0	-56.0	-13.0	-43.0	
2.508	-21.2	V	3.0	37.5	1.0	-57.6	-13.0	-44.6	
1.672	-16.2	H	3.0	38.1	1.0	-53.3	-13.0	-40.3	
2.508	-22.9	H	3.0	37.5	1.0	-59.3	-13.0	-46.3	
High Channel (846MHz)									
1.692	-16.7	V	3.0	38.1	1.0	-53.8	-13.0	-40.8	
3.384	-19.8	V	3.0	37.1	1.0	-55.9	-13.0	-42.9	
1.692	-15.0	H	3.0	38.1	1.0	-52.1	-13.0	-39.1	
3.384	-19.9	H	3.0	37.1	1.0	-56.0	-13.0	-43.0	

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

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UMTS HSDPA (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	06/27/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, WCDMA 850MHz, HSDPA

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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
Low Channel (826.4MHz)									
1.653	-14.8	V	3.0	38.1	1.0	-52.0	-13.0	-39.0	
2.479	-22.3	V	3.0	37.5	1.0	-58.7	-13.0	-45.7	
1.653	-14.4	H	3.0	38.1	1.0	-51.6	-13.0	-38.6	
2.479	-24.0	H	3.0	37.5	1.0	-60.5	-13.0	-47.5	
Mid Channel (836MHz)									
1.672	-17.9	V	3.0	38.1	1.0	-55.0	-13.0	-42.0	
2.508	-21.2	V	3.0	37.5	1.0	-57.6	-13.0	-44.6	
1.672	-17.2	H	3.0	38.1	1.0	-54.3	-13.0	-41.3	
2.508	-23.9	H	3.0	37.5	1.0	-60.3	-13.0	-47.3	
High Channel (846MHz)									
1.692	-14.7	V	3.0	38.1	1.0	-51.8	-13.0	-38.8	
2.538	-21.1	V	3.0	37.5	1.0	-57.5	-13.0	-44.5	
1.692	-17.0	H	3.0	38.1	1.0	-54.1	-13.0	-41.1	
2.538	-23.7	H	3.0	37.5	1.0	-60.2	-13.0	-47.2	

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

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GPRS (PCS Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 11U14136
Date: 06/27/12
Test Engineer: Chin Pang
Configuration: EUTand Earphone
Mode: TX, PCS BAND GPRS

Chamber	Pre-amplifer	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, (1850.2MHz)									
5.551	-9.7	V	3.0	36.3	1.0	-45.0	-13.0	-32.0	
7.400	-14.2	V	3.0	36.6	1.0	-49.7	-13.0	-36.7	
5.551	-14.1	H	3.0	36.3	1.0	-49.4	-13.0	-36.4	
7.400	-13.1	H	3.0	36.6	1.0	-48.7	-13.0	-35.7	
Mid Ch, (1880.0MHz)									
5.640	-10.6	V	3.0	36.3	1.0	-45.9	-13.0	-32.9	
7.520	-14.0	V	3.0	36.6	1.0	-49.6	-13.0	-36.6	
3.760	-14.8	H	3.0	36.8	1.0	-50.6	-13.0	-37.6	
5.640	-14.9	H	3.0	36.3	1.0	-50.2	-13.0	-37.2	
7.520		H	3.0	36.6	1.0	-35.6	-13.0	-22.6	
High Ch, (1909.8MHz)									
5.729	-9.5	V	3.0	36.3	1.0	-44.8	-13.0	-31.8	
7.639	-12.9	V	3.0	36.6	1.0	-48.5	-13.0	-35.5	
5.729	-11.8	H	3.0	36.3	1.0	-47.1	-13.0	-34.1	
7.639	-12.8	H	3.0	36.6	1.0	-48.4	-13.0	-35.4	

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

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EGPRS (PCS Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/25/12
Test Engineer:	Chin Pang
Configuration:	EUTand Earphone
Mode:	TX, PCS BAND EGPRS

Chamber	Pre-amplifer	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, (1850.2MHz)									
5.551	-8.5	V	3.0	36.3	1.0	-43.8	-13.0	-30.8	
7.400	-13.2	V	3.0	36.6	1.0	-48.7	-13.0	-35.7	
5.551	1.3	H	3.0	36.3	1.0	-34.0	-13.0	-21.0	
7.400	-4.6	H	3.0	36.6	1.0	-40.2	-13.0	-27.2	
Mid Ch, (1880.0MHz)									
3.760	-10.9	V	3.0	36.8	1.0	-46.7	-13.0	-33.7	
5.640	-13.6	V	3.0	36.3	1.0	-48.9	-13.0	-35.9	
7.520	-12.0	V	3.0	36.6	1.0	-47.6	-13.0	-34.6	
3.760	-5.8	H	3.0	36.8	1.0	-41.6	-13.0	-28.6	
5.640	-9.9	H	3.0	36.3	1.0	-45.2	-13.0	-32.2	
7.520	-8.9	H	3.0	36.6	1.0	-44.5	-13.0	-31.5	
High Ch, (1909.8MHz)									
3.820	-5.9	V	3.0	36.7	1.0	-41.6	-13.0	-28.6	
5.729	-12.5	V	3.0	36.3	1.0	-47.8	-13.0	-34.8	
7.639	-9.9	V	3.0	36.6	1.0	-45.5	-13.0	-32.5	
3.820	-7.7	H	3.0	36.7	1.0	-43.4	-13.0	-30.4	
5.729	-11.8	H	3.0	36.3	1.0	-47.1	-13.0	-34.1	
7.639	-9.8	H	3.0	36.6	1.0	-45.4	-13.0	-32.4	

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

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UMTS REL 99 (PCS Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	06/27/11
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, PCS BAND WCDMA, Rel 99

Chamber	Pre-amplifer	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, 1852.4MHz									
3.704	-18.1	V	3.0	36.8	1.0	-53.9	-13.0	-40.9	
5.557	-16.7	V	3.0	36.3	1.0	-52.0	-13.0	-39.0	
3.704	-17.0	H	3.0	36.8	1.0	-52.8	-13.0	-39.8	
5.557	-15.0	H	3.0	36.3	1.0	-50.3	-13.0	-37.3	
Mid Ch, 1880.0MHz									
3.760	-19.9	V	3.0	36.8	1.0	-55.7	-13.0	-42.7	
5.640	-17.6	V	3.0	36.3	1.0	-52.9	-13.0	-39.9	
3.760	-18.8	H	3.0	36.8	1.0	-54.6	-13.0	-41.6	
5.640	-15.9	H	3.0	36.3	1.0	-51.2	-13.0	-38.2	
High Ch, 1907.6MHz									
3.815	-17.8	V	3.0	36.7	1.0	-53.6	-13.0	-40.6	
5.723	-14.5	V	3.0	36.3	1.0	-49.8	-13.0	-36.8	
3.815	-19.7	H	3.0	36.7	1.0	-55.4	-13.0	-42.4	
5.723	-16.8	H	3.0	36.3	1.0	-52.1	-13.0	-39.1	

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

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UMTS HSDPA (PCS Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	06/27/11
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, PCS BAND WCDMA, HSDPA

Chamber	Pre-amplifer	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, 1852.4MHz									
3.704	-15.1	V	3.0	36.8	1.0	-50.9	-13.0	-37.9	
5.557	-15.7	V	3.0	36.3	1.0	-51.0	-13.0	-38.0	
3.704	-15.0	H	3.0	36.8	1.0	-50.8	-13.0	-37.8	
5.557	-15.0	H	3.0	36.3	1.0	-50.3	-13.0	-37.3	
Mid Ch, 1880.0MHz									
3.760	-16.9	V	3.0	36.8	1.0	-52.7	-13.0	-39.7	
5.640	-15.6	V	3.0	36.3	1.0	-50.9	-13.0	-37.9	
3.760	-15.8	H	3.0	36.8	1.0	-51.6	-13.0	-38.6	
5.640	-13.9	H	3.0	36.3	1.0	-49.2	-13.0	-36.2	
High Ch, 1907.6MHz									
3.815	-17.8	V	3.0	36.7	1.0	-53.6	-13.0	-40.6	
5.723	-15.5	V	3.0	36.3	1.0	-50.8	-13.0	-37.8	
3.815	-17.7	H	3.0	36.7	1.0	-53.4	-13.0	-40.4	
5.723	-15.8	H	3.0	36.3	1.0	-51.1	-13.0	-38.1	

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

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9.3.2. A1429

BC10, 1xRTT

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	06/28/12
Test Engineer:	Chin Pang
Configuration:	EUT and earphone
Mode:	TX, BC10, 1xRTT

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (817.90MHz)									
1.636	-10.3	V	3.0	38.2	1.0	-47.5	-13.0	-34.5	
2.454	-18.4	V	3.0	37.5	1.0	-54.9	-13.0	-41.9	
3.272	-13.1	V	3.0	37.1	1.0	-49.2	-13.0	-36.2	
1.636	-3.6	H	3.0	38.2	1.0	-40.7	-13.0	-27.7	
2.454	-15.1	H	3.0	37.5	1.0	-51.6	-13.0	-38.6	
3.272	-14.2	H	3.0	37.1	1.0	-50.4	-13.0	-37.4	
Mid Ch, (819.15MHz)									
1.638	-10.3	V	3.0	38.2	1.0	-47.5	-13.0	-34.5	
2.458	-15.4	V	3.0	37.5	1.0	-51.9	-13.0	-38.9	
3.277	-14.0	V	3.0	37.1	1.0	-50.2	-13.0	-37.2	
1.638	-6.6	H	3.0	38.2	1.0	-43.7	-13.0	-30.7	
2.458	-14.1	H	3.0	37.5	1.0	-50.6	-13.0	-37.6	
3.277	-16.2	H	3.0	37.1	1.0	-52.3	-13.0	-39.3	
High Ch, (823.11MHz)									
1.647	-14.2	V	3.0	38.2	1.0	-51.4	-13.0	-38.4	
2.470	-18.3	V	3.0	37.5	1.0	-54.8	-13.0	-41.8	
3.293	-17.0	V	3.0	37.1	1.0	-53.1	-13.0	-40.1	
1.647	-10.5	H	3.0	38.2	1.0	-47.6	-13.0	-34.6	
2.470	-20.0	H	3.0	37.5	1.0	-56.5	-13.0	-43.5	
3.293	-18.2	H	3.0	37.1	1.0	-54.3	-13.0	-41.3	

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

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BC10, EVDO REV A

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 11U14136
Date: 07/05/12
Test Engineer: Chin Pang
Configuration: EUT and earphone
Mode: TX, BC10, EVDO, Rev A

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (817.90MHz)									
1.636	-7.3	V	3.0	38.2	1.0	-44.5	-13.0	-31.5	
2.454	-12.4	V	3.0	37.5	1.0	-48.9	-13.0	-35.9	
3.272	-16.1	V	3.0	37.1	1.0	-52.2	-13.0	-39.2	
1.636	0.4	H	3.0	38.2	1.0	-36.7	-13.0	-23.7	
2.454	-14.1	H	3.0	37.5	1.0	-50.6	-13.0	-37.6	
3.272	-16.2	H	3.0	37.1	1.0	-52.4	-13.0	-39.4	
Mid Ch, (819.15MHz)									
1.638	-9.8	V	3.0	38.2	1.0	-47.0	-13.0	-34.0	
2.458	-13.4	V	3.0	37.5	1.0	-49.9	-13.0	-36.9	
3.277	-16.0	V	3.0	37.1	1.0	-52.2	-13.0	-39.2	
1.638	-3.6	H	3.0	38.2	1.0	-40.7	-13.0	-27.7	
2.458	-12.1	H	3.0	37.5	1.0	-48.6	-13.0	-35.6	
3.277	-15.2	H	3.0	37.1	1.0	-51.3	-13.0	-38.3	
High Ch, (823.11MHz)									
1.647	-15.2	V	3.0	38.2	1.0	-52.4	-13.0	-39.4	
2.470	-14.3	V	3.0	37.5	1.0	-50.8	-13.0	-37.8	
3.293	-16.0	V	3.0	37.1	1.0	-52.1	-13.0	-39.1	
1.647	-9.5	H	3.0	38.2	1.0	-46.6	-13.0	-33.6	
2.470	-17.0	H	3.0	37.5	1.0	-53.5	-13.0	-40.5	
3.293	-18.2	H	3.0	37.1	1.0	-54.3	-13.0	-41.3	

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

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CDMA2000, CELL Band, 1xRTT

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	06/27/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, CELL Band CDMA 1xRTT
	Port A

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.70MHz									
1.672	-8.9	V	3.0	38.1	1.0	-46.0	-13.0	-33.0	
2.510	-14.2	V	3.0	37.5	1.0	-50.6	-13.0	-37.6	
4.124	-15.1	V	3.0	36.5	1.0	-50.6	-13.0	-37.6	
1.672	-9.2	H	3.0	38.1	1.0	-46.3	-13.0	-33.3	
2.510	-16.9	H	3.0	37.5	1.0	-53.3	-13.0	-40.3	
4.124	-15.8	H	3.0	36.5	1.0	-51.3	-13.0	-38.3	
Mid Ch, 836.52MHz									
1.672	-6.9	V	3.0	38.1	1.0	-44.0	-13.0	-31.0	
2.510	-11.2	V	3.0	37.5	1.0	-47.6	-13.0	-34.6	
3.347	-15.9	V	3.0	37.1	1.0	-52.0	-13.0	-39.0	
1.672	-7.2	H	3.0	38.1	1.0	-44.3	-13.0	-31.3	
2.510	-12.9	H	3.0	37.5	1.0	-49.3	-13.0	-36.3	
3.347	-16.0	H	3.0	37.1	1.0	-52.1	-13.0	-39.1	
High Ch, 848.31MHz									
1.697	-5.1	V	3.0	38.1	1.0	-42.2	-13.0	-29.2	
2.545	-14.0	V	3.0	37.5	1.0	-50.5	-13.0	-37.5	
3.393	-14.8	V	3.0	37.1	1.0	-50.8	-13.0	-37.8	
1.697	-9.0	H	3.0	38.1	1.0	-46.1	-13.0	-33.1	
2.545	-15.7	H	3.0	37.5	1.0	-52.1	-13.0	-39.1	
3.393	-17.9	H	3.0	37.1	1.0	-53.9	-13.0	-40.9	

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

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CDMA2000, CELL BAND, EVDO REV A

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/05/12
Test Engineer:	Chin Pang
Configuration:	EUT and earphone
Mode:	TX, PCS Band CDMA EVDO Rev A Mode
	Port A

Chamber	Pre-amplifer	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	-17.1	V	3.0	36.8	1.0	-52.9	-13.0	-39.9	
5.554	-14.7	V	3.0	36.3	1.0	-50.0	-13.0	-37.0	
3.703	-19.0	H	3.0	36.8	1.0	-54.8	-13.0	-41.8	
5.554	-16.1	H	3.0	36.3	1.0	-51.3	-13.0	-38.3	
Mid Ch, 1880.00MHz									
3.760	-16.9	V	3.0	36.8	1.0	-52.7	-13.0	-39.7	
5.640	-12.6	V	3.0	36.3	1.0	-47.9	-13.0	-34.9	
3.760	-17.8	H	3.0	36.8	1.0	-53.6	-13.0	-40.6	
5.640	-13.9	H	3.0	36.3	1.0	-49.2	-13.0	-36.2	
High Ch, 1908.75MHz									
3.818	-17.8	V	3.0	36.7	1.0	-53.5	-13.0	-40.5	
5.726	-15.5	V	3.0	36.3	1.0	-50.8	-13.0	-37.8	
3.818	-17.7	H	3.0	36.7	1.0	-53.4	-13.0	-40.4	
5.726	-14.8	H	3.0	36.3	1.0	-50.1	-13.0	-37.1	

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

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CDMA2000, CELL BAND, EVDO REV B

Two Carriers Minimum Separation

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 11U14136
Date: 08/25/12
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, CELL Band CDMA EVDO Rev B, Two Carrier Min Separation
A21, Port A

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch									
1.650	-18.2	V	3.0	35.5	1.0	-52.7	-13.0	-39.7	
2.475	-12.3	V	3.0	35.4	1.0	-46.7	-13.0	-33.7	
3.300	-15.9	V	3.0	35.5	1.0	-50.4	-13.0	-37.4	
1.650	-12.8	H	3.0	35.5	1.0	-47.3	-13.0	-34.3	
2.475	-12.2	H	3.0	35.4	1.0	-46.6	-13.0	-33.6	
3.300	-14.0	H	3.0	35.5	1.0	-48.6	-13.0	-35.6	
Mid Ch									
1.674	-17.9	V	3.0	35.5	1.0	-52.4	-13.0	-39.4	
2.511	-15.2	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
3.348	-15.7	V	3.0	35.5	1.0	-50.3	-13.0	-37.3	
1.674	-7.5	H	3.0	35.5	1.0	-42.1	-13.0	-29.1	
2.511	-12.1	H	3.0	35.4	1.0	-46.5	-13.0	-33.5	
3.348	-13.9	H	3.0	35.5	1.0	-48.4	-13.0	-35.4	
High Ch									
1.695	-14.6	V	3.0	35.5	1.0	-49.1	-13.0	-36.1	
2.543	-15.1	V	3.0	35.4	1.0	-49.5	-13.0	-36.5	
3.393	-15.6	V	3.0	35.5	1.0	-50.1	-13.0	-37.1	
1.697	-10.3	H	3.0	35.5	1.0	-44.8	-13.0	-31.8	
2.545	-10.9	H	3.0	35.4	1.0	-45.3	-13.0	-32.3	
3.393	-13.7	H	3.0	35.5	1.0	-48.2	-13.0	-35.2	

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

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CDMA2000, CELL BAND, EVDO REV B

Two Carriers Maximum Separation

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	08/25/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, CELL Band CDMA EVDO Rev B, Two Carrier Max Separation A21, Port A

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch									
1.654	-18.1	V	3.0	35.5	1.0	-52.7	-13.0	-39.7	
2.482	-16.3	V	3.0	35.4	1.0	-50.7	-13.0	-37.7	
3.309	-15.8	V	3.0	35.5	1.0	-50.4	-13.0	-37.4	
1.654	-4.7	H	3.0	35.5	1.0	-39.3	-13.0	-26.3	
2.482	-16.2	H	3.0	35.4	1.0	-50.6	-13.0	-37.6	
3.309	-15.0	H	3.0	35.5	1.0	-49.5	-13.0	-36.5	
Mid Ch									
1.677	-7.8	V	3.0	35.5	1.0	-42.4	-13.0	-29.4	
2.516	-16.1	V	3.0	35.4	1.0	-50.6	-13.0	-37.6	
3.355	-13.7	V	3.0	35.5	1.0	-48.2	-13.0	-35.2	
1.677	-5.5	H	3.0	35.5	1.0	-40.0	-13.0	-27.0	
2.516	-13.1	H	3.0	35.4	1.0	-47.5	-13.0	-34.5	
3.355	-12.9	H	3.0	35.5	1.0	-47.4	-13.0	-34.4	
High Ch									
1.692	-13.6	V	3.0	35.5	1.0	-48.1	-13.0	-35.1	
2.538	-14.1	V	3.0	35.4	1.0	-48.5	-13.0	-35.5	
3.382	-14.7	V	3.0	35.5	1.0	-49.2	-13.0	-36.2	
1.692	-4.4	H	3.0	35.5	1.0	-38.9	-13.0	-25.9	
2.538	-13.9	H	3.0	35.4	1.0	-48.4	-13.0	-35.4	
3.382	-12.8	H	3.0	35.5	1.0	-47.3	-13.0	-34.3	

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

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CDMA2000, CELL BAND, EVDO REV B

Three Carriers Minimum Separation

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 11U14136
Date: 08/25/12
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, CELL Band CDMA EVDO Rev B, Three Carrier Min Separation
A21, Port A

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch									
1.652	-16.2	V	3.0	35.5	1.0	-50.7	-13.0	-37.7	
2.478	-16.3	V	3.0	35.4	1.0	-50.7	-13.0	-37.7	
3.304	-15.8	V	3.0	35.5	1.0	-50.4	-13.0	-37.4	
1.652	-5.7	H	3.0	35.5	1.0	-40.3	-13.0	-27.3	
2.478	-18.2	H	3.0	35.4	1.0	-52.6	-13.0	-39.6	
3.304	-15.0	H	3.0	35.5	1.0	-49.6	-13.0	-36.6	
Mid Ch									
1.676	-16.8	V	3.0	35.5	1.0	-51.4	-13.0	-38.4	
2.513	-15.1	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
3.351	-15.7	V	3.0	35.5	1.0	-50.2	-13.0	-37.2	
1.676	-6.5	H	3.0	35.5	1.0	-41.0	-13.0	-28.0	
2.513	-14.1	H	3.0	35.4	1.0	-48.5	-13.0	-35.5	
3.351	-12.9	H	3.0	35.5	1.0	-47.4	-13.0	-34.4	
High Ch									
1.692	-14.6	V	3.0	35.5	1.0	-49.1	-13.0	-36.1	
2.540	-14.1	V	3.0	35.4	1.0	-48.5	-13.0	-35.5	
3.387	-15.6	V	3.0	35.5	1.0	-50.1	-13.0	-37.1	
1.692	-7.4	H	3.0	35.5	1.0	-41.9	-13.0	-28.9	
2.540	-16.9	H	3.0	35.4	1.0	-51.3	-13.0	-38.3	
3.387	-12.7	H	3.0	35.5	1.0	-47.2	-13.0	-34.2	

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

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ERP GPRS850 BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/02/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, CELL BAND GPRS MODE
	Port A

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 8449B	Filter 1	Part 22

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-21.2	V	3.0	38.2	1.0	-58.3	-13.0	-45.3	
2.473	-18.3	V	3.0	37.5	1.0	-54.8	-13.0	-41.8	
1.648	-22.5	H	3.0	38.2	1.0	-59.6	-13.0	-46.6	
2.473	-20.0	H	3.0	37.5	1.0	-56.5	-13.0	-43.5	
Mid Ch, (836.6MHz)									
1.673	-22.9	V	3.0	38.1	1.0	-60.0	-13.0	-47.0	
2.510	-17.1	V	3.0	37.5	1.0	-53.6	-13.0	-40.6	
1.673	-23.2	H	3.0	38.1	1.0	-60.3	-13.0	-47.3	
2.510	-21.9	H	3.0	37.5	1.0	-58.3	-13.0	-45.3	
High Ch, (848.8MHz)									
1.698	-21.6	V	3.0	38.1	1.0	-58.7	-13.0	-45.7	
2.546	-19.0	V	3.0	37.5	1.0	-55.5	-13.0	-42.5	
1.698	-24.0	H	3.0	38.1	1.0	-61.1	-13.0	-48.1	
2.546	-21.6	H	3.0	37.5	1.0	-58.1	-13.0	-45.1	

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

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ERP WCDMA Rel 99, CELL BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/02/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, WCDMA 850MHz, Rel 99
	Port A

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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
Low Channel (826.4MHz)									
1.653	-13.1	V	3.0	38.1	1.0	-50.3	-13.0	-37.3	
2.479	-16.3	V	3.0	37.5	1.0	-52.7	-13.0	-39.7	
1.653	-7.4	H	3.0	38.1	1.0	-44.6	-13.0	-31.6	
2.479	-19.0	H	3.0	37.5	1.0	-55.5	-13.0	-42.5	
Mid Channel (836MHz)									
1.672	-9.9	V	3.0	38.1	1.0	-47.0	-13.0	-34.0	
2.508	-17.2	V	3.0	37.5	1.0	-53.6	-13.0	-40.6	
1.672	-3.2	H	3.0	38.1	1.0	-40.3	-13.0	-27.3	
2.508	-17.9	H	3.0	37.5	1.0	-54.3	-13.0	-41.3	
High Channel (846MHz)									
1.692	-10.7	V	3.0	38.1	1.0	-47.8	-13.0	-34.8	
3.384	-14.8	V	3.0	37.1	1.0	-50.9	-13.0	-37.9	
1.692	-9.0	H	3.0	38.1	1.0	-46.1	-13.0	-33.1	
3.384	-14.9	H	3.0	37.1	1.0	-51.0	-13.0	-38.0	

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

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ERP HSDPA Rel 6, CELL BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Apple
Project #: 11U14136
Date: 07/03/12
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, WCDMA 850MHz, HSDPA
Port A

Chamber	Pre-amplifer	Filter	Limit
5m Chamber A	T144 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
Low Channel (826.4MHz)									
1.653	-14.1	V	3.0	38.1	1.0	-51.3	-13.0	-38.3	
2.479	-20.3	V	3.0	37.5	1.0	-56.7	-13.0	-43.7	
1.653	-10.4	H	3.0	38.1	1.0	-47.6	-13.0	-34.6	
2.479	-22.0	H	3.0	37.5	1.0	-58.5	-13.0	-45.5	
Mid Channel (836MHz)									
1.672	-10.9	V	3.0	38.1	1.0	-48.0	-13.0	-35.0	
2.508	-18.2	V	3.0	37.5	1.0	-54.6	-13.0	-41.6	
1.672	-13.2	H	3.0	38.1	1.0	-50.3	-13.0	-37.3	
2.508	-18.9	H	3.0	37.5	1.0	-55.3	-13.0	-42.3	
High Channel (846MHz)									
1.692	-12.7	V	3.0	38.1	1.0	-49.8	-13.0	-36.8	
3.384	-15.8	V	3.0	37.1	1.0	-51.9	-13.0	-38.9	
1.692	-9.2	H	3.0	38.1	1.0	-46.3	-13.0	-33.3	
3.384	-15.9	H	3.0	37.1	1.0	-52.0	-13.0	-39.0	

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

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EIRP CDMA2000, 1xRTT PCS Band

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	06/27/12
Test Engineer:	Chin Pang
Configuration:	EUT and earphone
Mode:	TX, PCS Band CDMA 1xRTT Mode
	Port A

Chamber	Pre-amplifer	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	-18.1	V	3.0	36.8	1.0	-53.9	-13.0	-40.9	
5.554	-17.7	V	3.0	36.3	1.0	-53.0	-13.0	-40.0	
3.703	-20.0	H	3.0	36.8	1.0	-55.8	-13.0	-42.8	
5.554	-17.1	H	3.0	36.3	1.0	-52.3	-13.0	-39.3	
Mid Ch, 1880.00MHz									
3.760	-18.9	V	3.0	36.8	1.0	-54.7	-13.0	-41.7	
5.640	-15.6	V	3.0	36.3	1.0	-50.9	-13.0	-37.9	
3.760	-19.8	H	3.0	36.8	1.0	-55.6	-13.0	-42.6	
5.640	-15.9	H	3.0	36.3	1.0	-51.2	-13.0	-38.2	
High Ch, 1908.75MHz									
3.818	-18.8	V	3.0	36.7	1.0	-54.5	-13.0	-41.5	
5.726	-16.5	V	3.0	36.3	1.0	-51.8	-13.0	-38.8	
3.818	-18.7	H	3.0	36.7	1.0	-54.4	-13.0	-41.4	
5.726	-15.8	H	3.0	36.3	1.0	-51.1	-13.0	-38.1	

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

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EIRP CDMA2000, EVDO

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/05/12
Test Engineer:	Chin Pang
Configuration:	EUT and earphone
Mode:	TX, PCS Band CDMA EVDO Rev A Mode
	Port A

Chamber	Pre-amplifer	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	-17.1	V	3.0	36.8	1.0	-52.9	-13.0	-39.9	
5.554	-14.7	V	3.0	36.3	1.0	-50.0	-13.0	-37.0	
3.703	-19.0	H	3.0	36.8	1.0	-54.8	-13.0	-41.8	
5.554	-16.1	H	3.0	36.3	1.0	-51.3	-13.0	-38.3	
Mid Ch, 1880.00MHz									
3.760	-16.9	V	3.0	36.8	1.0	-52.7	-13.0	-39.7	
5.640	-12.6	V	3.0	36.3	1.0	-47.9	-13.0	-34.9	
3.760	-17.8	H	3.0	36.8	1.0	-53.6	-13.0	-40.6	
5.640	-13.9	H	3.0	36.3	1.0	-49.2	-13.0	-36.2	
High Ch, 1908.75MHz									
3.818	-17.8	V	3.0	36.7	1.0	-53.5	-13.0	-40.5	
5.726	-15.5	V	3.0	36.3	1.0	-50.8	-13.0	-37.8	
3.818	-17.7	H	3.0	36.7	1.0	-53.4	-13.0	-40.4	
5.726	-14.8	H	3.0	36.3	1.0	-50.1	-13.0	-37.1	

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

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EIRP GPRS1900 BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/02/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, PCS BAND GPRS
	Port A

Chamber	Pre-amplifer	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, (1850.2MHz)									
5.551	-16.7	V	3.0	36.3	1.0	-52.0	-13.0	-39.0	
7.400	-14.2	V	3.0	36.6	1.0	-49.7	-13.0	-36.7	
3.700	-19.0	H	3.0	36.8	1.0	-54.8	-13.0	-41.8	
5.551	-16.1	H	3.0	36.3	1.0	-51.4	-13.0	-38.4	
Mid Ch, (1880.0MHz)									
5.640	-8.6	V	3.0	36.3	1.0	-43.9	-13.0	-30.9	
7.520	-13.0	V	3.0	36.6	1.0	-48.6	-13.0	-35.6	
3.760	-15.8	H	3.0	36.8	1.0	-51.6	-13.0	-38.6	
7.520	-12.4	H	3.0	36.6	1.0	-48.0	-13.0	-35.0	
High Ch, (1909.8MHz)									
3.820	-14.8	V	3.0	36.7	1.0	-50.5	-13.0	-37.5	
5.729	-13.5	V	3.0	36.3	1.0	-48.8	-13.0	-35.8	
3.820	-16.7	H	3.0	36.7	1.0	-52.4	-13.0	-39.4	
5.729	-15.8	H	3.0	36.3	1.0	-51.1	-13.0	-38.1	

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

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EIRP WCDMA Rel 99, PCS BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/02/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, PCS BAND WCDMA, Rel 99

Chamber	Pre-amplifer	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, (1852.4MHz)									
5.557	-13.7	V	3.0	36.3	1.0	-49.0	-13.0	-36.0	
7.410	-14.2	V	3.0	36.6	1.0	-49.7	-13.0	-36.7	
5.557	-15.0	H	3.0	36.3	1.0	-50.3	-13.0	-37.3	
7.410	-14.1	H	3.0	36.6	1.0	-49.7	-13.0	-36.7	
Mid Ch, (1880.0MHz)									
5.640	-12.6	V	3.0	36.3	1.0	-47.9	-13.0	-34.9	
7.520	-15.0	V	3.0	36.6	1.0	-50.6	-13.0	-37.6	
5.640	-9.9	H	3.0	36.3	1.0	-45.2	-13.0	-32.2	
7.520	-12.9	H	3.0	36.6	1.0	-48.5	-13.0	-35.5	
High Ch, (1909.8MHz)									
5.729	-13.5	V	3.0	36.3	1.0	-48.8	-13.0	-35.8	
7.639	-13.9	V	3.0	36.6	1.0	-49.5	-13.0	-36.5	
5.723	-12.8	H	3.0	36.3	1.0	-48.1	-13.0	-35.1	
7.639	-13.8	H	3.0	36.6	1.0	-49.4	-13.0	-36.4	

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

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EIRP HSDPA Rel 5; PCS BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Apple
Project #:	11U14136
Date:	07/03/12
Test Engineer:	Chin Pang
Configuration:	EUT and Earphone
Mode:	TX, PCS BAND WCDMA, HSDPA

Chamber	Pre-amplifer	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, (1852.4MHz)									
5.557	-14.7	V	3.0	36.3	1.0	-50.0	-13.0	-37.0	
7.410	-13.2	V	3.0	36.6	1.0	-48.7	-13.0	-35.7	
5.557	-14.0	H	3.0	36.3	1.0	-49.3	-13.0	-36.3	
7.410	-11.1	H	3.0	36.6	1.0	-46.7	-13.0	-33.7	
Mid Ch, (1880.0MHz)									
5.640	-12.6	V	3.0	36.3	1.0	-47.9	-13.0	-34.9	
7.520	-13.0	V	3.0	36.6	1.0	-48.6	-13.0	-35.6	
5.640	-12.9	H	3.0	36.3	1.0	-48.2	-13.0	-35.2	
7.520	-9.9	H	3.0	36.6	1.0	-45.5	-13.0	-32.5	
High Ch, (1907.6MHz)									
5.729	-12.5	V	3.0	36.3	1.0	-47.8	-13.0	-34.8	
7.639	-10.9	V	3.0	36.6	1.0	-46.5	-13.0	-33.5	
5.723	-13.8	H	3.0	36.3	1.0	-49.1	-13.0	-36.1	
7.639	-9.8	H	3.0	36.6	1.0	-45.4	-13.0	-32.4	

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

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