



**FCC 47 CFR PART 22H, 24E, 27L AND 90S
CERTIFICATION TEST REPORT**

FOR

TABLET DEVICE

MODEL NUMBER: A1567

FCC ID: BCGA1567

REPORT NUMBER: 14U18207-E14, Revision B

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Prepared for

APPLE, INC.

1 INFINITE LOOP

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	08/28/14	Initial Review	C. Pang
A	09/05/14	Update EUT description	D. Garcia
B	09/14/14	Address TCB's Questions	

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	6
4.1. MEASURING INSTRUMENT CALIBRATION	6
4.2. SAMPLE CALCULATION	6
4.3. MEASUREMENT UNCERTAINTY	6
5. EQUIPMENT UNDER TEST	7
5.1. DESCRIPTION OF EUT	7
5.2. MAXIMUM OUTPUT POWER.....	7
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	9
5.4. SOFTWARE AND FIRMWARE.....	9
5.5. WORST-CASE CONFIGURATION AND MODE.....	9
5.6. DESCRIPTION OF TEST SETUP.....	10
6. TEST AND MEASUREMENT EQUIPMENT	12
7. RF POWER OUTPUT VERIFICATION	13
7.1. GPRS/EGPRS MODE	15
7.2. UMTS REL99.....	16
7.3. HSDPA REL 5	18
7.4. HSPA REL 6 (HSDPA & HSUPA).....	21
7.5. DUAL CARRIER HSDPA.....	24
7.6. CDMA2000 1xRTT.....	28
7.7. CDMA2000 1xEV-DO - Release 0 (Rel. 0)	33
7.8. CDMA2000 1xEV-DO - Revision A (Rev. A).....	35
7.9. CDMA2000 1xEV-DO - Revision B (Rev. B)	37
8. CONDUCTED TEST RESULTS	39
8.1. OCCUPIED BANDWIDTH	39
8.1.1. GSM-GPRS	43
8.1.2. GSM-EGPRS.....	46
8.1.3. UMTS Rel. 99	49
8.1.4. UMTS HSDPA	54
8.1.5. CDMA2000 1xRTT.....	59
8.1.6. CDMA2000 EVDO Rev. A.....	65
8.1.7. CDMA2000 EVDO Rev. B.....	71
8.2. BAND EDGE.....	76

8.2.1.	GSM-GPRS	78
8.2.2.	GSM-EGPRS.....	80
8.2.3.	UMTS Rel. 99	82
8.2.4.	UMTS HSDPA	85
8.2.5.	CDMA2000 1xRTT.....	88
8.2.6.	CDMA2000 1xRTT BC10 MASK.....	93
8.2.7.	CDMA2000 EVDO Rev. A.....	95
8.2.8.	CDMA2000 EVDO REVA BC10 MASK.....	100
8.3.	<i>OUT OF BAND EMISSIONS.....</i>	<i>102</i>
8.3.1.	GSM-GPRS	103
8.3.2.	GSM-EGPRS.....	106
8.3.3.	UMTS Rel. 99	109
8.3.4.	UMTS HSDPA	114
8.3.5.	CDMA2000 1xRTT.....	119
8.3.6.	CDMA2000 EVDO Rev. A.....	125
9.	FREQUENCY STABILITY	131
10.	RADIATED TEST RESULTS	138
10.1.	<i>RADIATED POWER (ERP & EIRP).....</i>	<i>138</i>
10.1.1.	GSM.....	143
10.1.2.	WCDMA	147
10.1.3.	CDMA2000.....	153
10.2.	<i>PEAK-TO-AVERAGE RATIO</i>	<i>164</i>
10.3.	<i>FIELD STRENGTH OF SPURIOUS RADIATION</i>	<i>176</i>
10.3.1.	GSM.....	178
10.3.2.	WCDMA	182
10.3.3.	CDMA2000.....	188
11.	SETUP PHOTOS	196

1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: TABLET DEVICE

MODEL: A1567

SERIAL NUMBER: DLX42350087FV2M0N631(Conducted) & DLXN100PG4MF
(Radiated)

DATE TESTED: JULY 09 – AUGUST 26, 2014

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22H, 24E, 27L and 90S	Pass

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:

Tested By:



Chin Pang
Senior Engineer
UL Verification Services Inc.



Mona Hua
Lab Engineer
UL Verification Services Inc.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA-603-C, FCC CFR 47 Part 2, Part 22, Part 24, Part 27, and Part 90.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
☐ Chamber A	☒ Chamber D
☐ Chamber B	☒ Chamber E
☐ Chamber C	☒ Chamber F
	☐ Chamber G
	☐ Chamber H

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a tablet with multimedia functions (music, application support, and video), Cellular GSM/GPRS/EGPRS/CDMA2000 1xRTT/1x Advanced/EVDO Rev.A/EVDO Rev.B /WCDMA /HSPA+/DC-HSDPA/LTE FDD & Carrier Aggregation/TDD/TD-SCDMA radio, IEEE 802.11a/b/g/n/ac radio, and Bluetooth radio. The rechargeable battery is not user accessible.

5.2. MAXIMUM OUTPUT POWER

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

GSM MODES

Part 22 850MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		ERP (Average)	
		dBm	mW	dBm	mW
824-849	GPRS	33.30	2138.0	31.85	1531.1
	EGPRS	29.00	794.3	27.12	515.2

Part 24 1900MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		EIRP (Average)	
		dBm	mW	dBm	mW
1850-1910	GPRS	30.50	1122.0	31.54	1425.6
	EGPRS	27.97	626.6	29.44	879.0

WCDMA MODES

Part 22 850MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		ERP(Average)	
		dBm	mW	dBm	mW
826.40 – 846.60	REL 99	24.96	313.3	23.30	213.8
	HSDPA	24.16	260.6	22.40	173.8

Part 24 1900MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		EIRP(Average)	
		dBm	mW	dBm	mW
1852.40 – 1907.60	REL 99	23.50	223.9	24.81	302.7
	HSDPA	22.48	177.0	23.32	214.8

Part 27 1700MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		EIRP(Average)	
		dBm	mW	dBm	mW
1712.40 – 1752.60	REL 99	23.49	223.4	24.58	287.1
	HSDPA	22.49	177.4	23.29	213.3

CDMA2000 MODES

Part 22 850MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		ERP(Average)	
		dBm	mW	dBm	mW
824.70 – 848.31	CDMA 2000 1xRTT	24.50	281.8	22.82	191.4
	CDMA 2000 EVDO-Rev A	24.50	281.8	22.77	189.2

Part 24 1900MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		EIRP(Average)	
		dBm	mW	dBm	mW
1851.25 – 1908.75	CDMA 2000 1xRTT	23.50	223.9	24.74	297.9
	CDMA 2000 EVDO-Rev A	23.50	223.9	24.54	284.4

Part 27 1700MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		EIRP(Average)	
		dBm	mW	dBm	mW
1711.25 – 1753.75	CDMA 2000 1xRTT	23.50	223.9	24.41	276.1
	CDMA 2000 EVDO-Rev A	23.50	223.9	24.31	269.8

Part 90 800MHz SECONDARY Band					
Frequency range (MHz)	Modulation	Conducted (Average)		ERP(Average)	
		dBm	mW	dBm	mW
817.90 – 823.10	CDMA 2000 1xRTT	24.90	309.0	23.22	209.9
	CDMA 2000 EVDO-Rev A	25.00	316.2	23.28	212.8

Part 22 850MHz Band					
Frequency range (MHz)	Modulation	Conducted (Average)		ERP (Average)	
		dBm	mW	dBm	mW
2 CARRIER MIN	CDMA 2000 EVDO-Rev B	21.96	157.0	18.22	66.4
2 CARRIER MAX	CDMA 2000 EVDO-Rev B	22.00	158.5	18.32	67.9
3 CARRIER MIN	CDMA 2000 EVDO-Rev B	21.97	157.4	18.27	67.1

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a band gap type integral antenna for the following bands with a maximum peak gain as follow:

Frequency (MHz)	Gain (dBi)
BC10, 817 - 824	0.5
BC0 Cell, 824 - 849	0.5
BC1 PCS, 1850 - 1910	1.5
BC15 AWS, 1710 - 1754	1.1

5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was version 12B331 Baseband 0.25.00.

The EUT is linked with Agilent 8960, Anritsu MT8820C, and CMW500 Communication Test Sets.

5.5. WORST-CASE CONFIGURATION AND MODE

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

For the device, all tests were performed as below,
Both conducted and radiated emissions measurement with all bands.

Z-position (Landscape) is the worst-case for all modes below:

- For Cellular and PCS band: CDMA2000, 1xRTT (SO55)
- For Cellular and PCS band: CDMA2000, 1xEV-DO Rev. A.
- For Cellular and PCS band: GSM, GPRS and EGPRS
- For Cellular and PCS band: UMTS, REL 99 and HSDPA

For the fundamental investigation, since the EUT is a portable device that has three orientations; an X, Y and Z orientations and the worst among X, Y, and Z with AC/DC adapter and headset have been investigated. The worst case was found to be at Z-position (Landscape) without AC/DC adapter and headset for all cell and pcs bands

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List			
Description	Manufacturer	Model	Serial Number
AC Adapter	Dell	Latitude 3540	N/A
DC Power Supply	Dell	H65NM130	426-03P6-A00
EUT AC Adapter	Apple	A1385	D292365COYADHLHC3

I/O CABLES (RF Conducted Test)

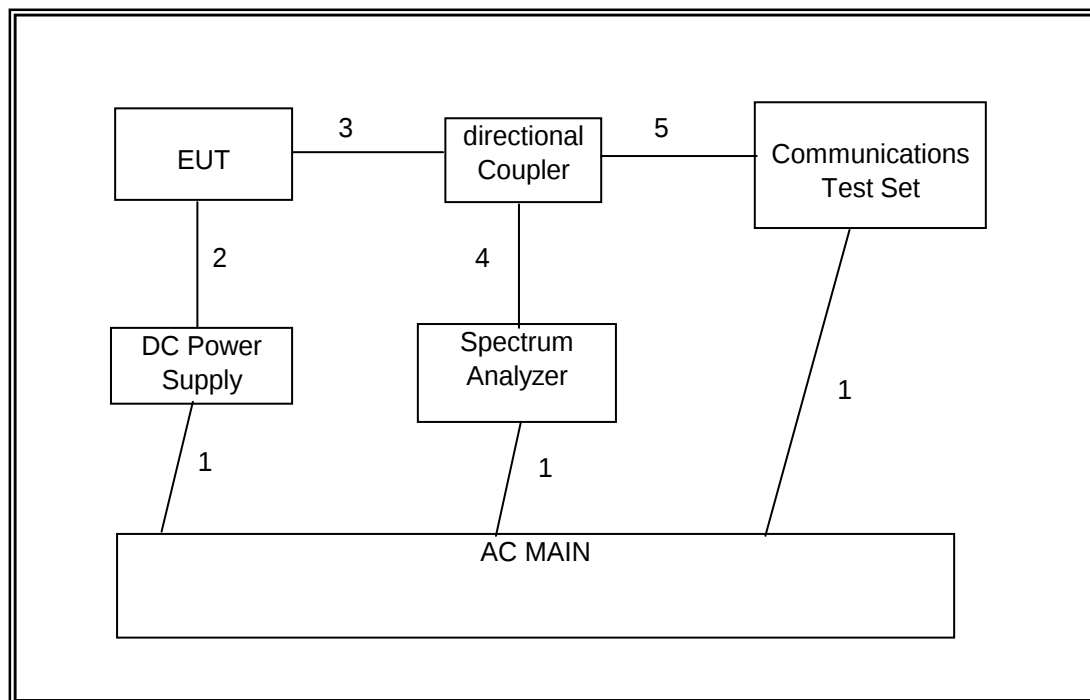
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	AC	1	US 115V	Un-shielded	2m	N/A
2	DC	1	DC	Un-shielded	2m	N/A
3	RF In/Out	1	EUT	Un-shielded	1m	N/A
4	RF In/Out	1	Spectrum Analyzer	Un-shielded	1m	N/A
5	RF In/Out	1	Communication Test Set	Un-shielded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

I/O CABLES (RF Radiated Test)

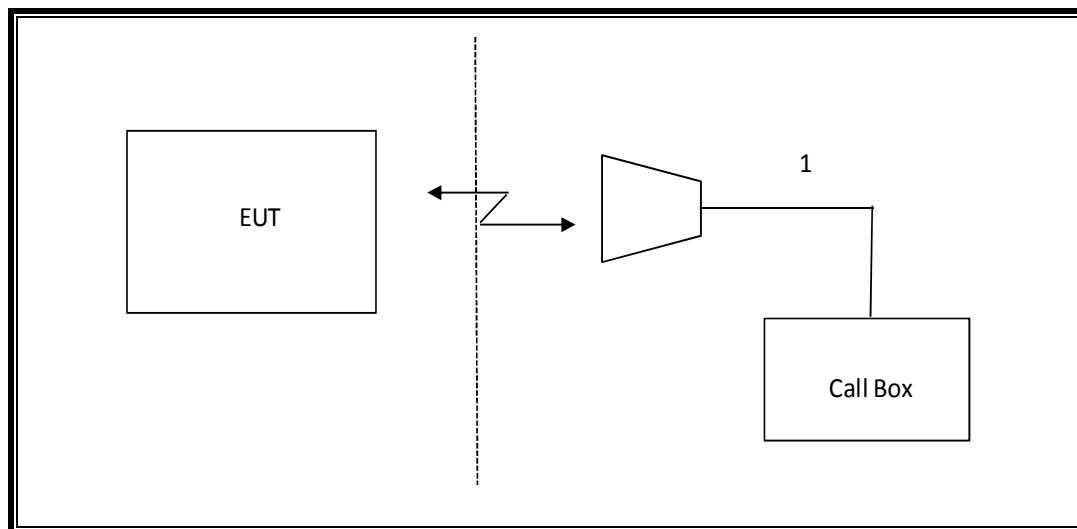
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	RF In/Out	1	Antenna	Un-shielded	5m	NA

TEST SETUP

CONDUCTED SETUP



RADIATED SETUP



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
Directional Coupler	Krytar	Directional Coupler	None	CNR
8960 series 10 wireless	Agilent	E5515E	F00362	09/11/14
Spectrum Analyzer, PXA, 44GHz	Agilent	N9030A	None	05/17/15
Wideband Radio Communication	R & S	CMW500	None	05/29/15
Temperature / Humidity Chamber	CSZ	ZPHS-8-3.5-SCT/WC	None	10/14/14
Signal Generator, 100KHz - 6GHz	Agilent	8665B	F00124	03/12/15
Antenna, Tuned Dipole 400~1000	ETS Lindgren	3121C DB4	C00993	01/23/15
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02686	CNR
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02688	CNR
HighPass Filter 1GHz	Micro-Tronics	HPM18129	None	CNR
Power Meter	Agilent	N1911A	F00022	4/9/2015
Power Sensor	Agilent	E9323A	F00153	03/06/15
Antenna, Horn 1-18GHz	ETS Lindgren	3117	None	04/14/15
Antenna, Horn, 18 GHz	EMCO	3115	C00872	01/06/15
Amplifier, 1 to 18GHz	Miteq	AMF-5D-01001800-40-20P	F00394	11/27/14
Amplifier	Sonoma	310	F00008	05/28/15
Antenna, Biconolog, 30MHz-1	Sunol Sciences	JB3	F00027	05/05/15

7. RF POWER OUTPUT VERIFICATION

TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with $VBW \geq RBW \geq 26\text{dB BW}$, typically 5MHz.
- Set a marker to point the corresponding peak value.

Using CMU200 Communication Test Set

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 > CS 4 (GPRS) and MCS5-9 (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

Using Agilent 8960A Communication Test Set

System Config: GSM/GPRS Mobile Test
E1968A A.06.31

Call Params: BCH → Cell Band: GSM850/PCS
TCH → Traffic Band: GSM850/PCS
Traffic Channel: 128/192/251 or 512/661/810
MS Tx Level: 0
PDTCH → Traffic Band: GSM850/PCS
Traffic Channel: 128/192/251 512/661/810
MS Tx Level: 0
Coding Scheme: CS-4 (GPRS)
Coding Scheme: MCS-5 to 9 (EGPRS)
MultiSlot Config: 1up, 1 down (Assuming that the highest
conducted power)

Control: Active Cell → GSM/GPRS

7.1. GPRS/EGPRS MODE

Part 22/24

Mode	Ch.	f (MHz)	1 Slot	2 Slot
			Average (dBm)	Average (dBm)
GPRS	128	824.2	33.30	32.39
	190	836.6	33.28	32.30
	251	848.8	33.24	32.41
EGPRS	128	824.2	29.00	28.92
	190	836.6	28.89	28.90
	251	848.8	28.87	28.86
GPRS	512	1850.2	30.47	29.37
	661	1880.0	30.42	29.34
	810	1909.8	30.50	29.44
EGPRS	512	1850.2	27.97	27.76
	661	1880.0	27.81	27.72
	810	1909.8	27.83	27.71

7.2. UMTS REL99

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
	β_c	Not Applicable
	β_d	Not Applicable
	β_{ec}	Not Applicable
	β_c/β_d	8/15
	β_{hs}	Not Applicable
	β_{ed}	Not Applicable

RESULTS

Part 22 850MHz Band

Bands	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
				Peak	Average
UMTS850 (Band 5)	4132	4357	826.4	29.11	24.86
	4180	4405	836.0	29.13	24.96
	4230	4455	846.0	29.02	24.91

Part 24 1900MHz Band

Bands	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
				Peak	Average
UMTS1900 (Band 2)	9262	9662	1852.4	26.52	23.50
	9400	9800	1880.0	26.53	23.41
	9538	9938	1907.6	26.65	23.47

Part 27 1700MHz Band

Bands	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
				Peak	Average
UMTS1700 (Band 4)	1312	1537	1712.4	26.68	23.49
	1413	1638	1732.6	26.60	23.46
	1513	1738	1752.6	26.60	23.38

7.3. HSDPA REL 5

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Summary of settings are illustrated below:

	Mode	Rel5 HSDPA			
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm 2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
HSDPA Specific Settings	MPR (dB)	0	0	0.5	0.5
	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

Result

Part 22 850MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS850 (Band 5)	1	4132	4357	826.4	28.45	24.16
		4180	4405	836.0	28.18	23.91
		4230	4455	846.0	27.97	23.36
	2	4132	4357	826.4	28.07	24.10
		4180	4405	836.0	28.29	23.95
		4230	4455	846.0	28.01	23.84
	3	4132	4357	826.4	28.14	23.57
		4180	4405	836.0	28.27	23.85
		4230	4455	846.0	28.04	23.38
	4	4132	4357	826.4	28.32	23.57
		4180	4405	836.0	28.38	23.46
		4230	4455	846.0	28.14	23.37

Part 24 1900MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS1900 (Band 2)	1	9262	9662	1852.4	25.45	22.39
		9400	9800	1880.0	25.53	22.48
		9538	9938	1907.6	26.00	22.46
	2	9262	9662	1852.4	25.90	22.40
		9400	9800	1880.0	25.95	21.95
		9538	9938	1907.6	25.89	22.16
	3	9262	9662	1852.4	25.35	22.00
		9400	9800	1880.0	25.10	21.92
		9538	9938	1907.6	25.27	22.10
	4	9262	9662	1852.4	25.23	21.95
		9400	9800	1880.0	25.20	21.94
		9538	9938	1907.6	25.23	21.99

Part 27 1700MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS1700 (Band 4)	1	1312	1537	1712.4	25.71	22.47
		1413	1638	1732.6	25.63	22.41
		1513	1738	1752.6	25.78	22.45
	2	1312	1537	1712.4	26.95	22.49
		1413	1638	1732.6	26.46	22.42
		1513	1738	1752.6	26.35	22.36
	3	1312	1537	1712.4	26.57	22.00
		1413	1638	1732.6	26.74	21.93
		1513	1738	1752.6	26.89	21.86
	4	1312	1537	1712.4	26.91	22.04
		1413	1638	1732.6	26.80	21.97
		1513	1738	1752.6	26.55	21.94

7.4. HSPA REL 6 (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				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	22/15	12/15	30/15	4/15	5/15
HSDPA Specific Settings	β_{ed}	1309/225	94/75	47/15 47/15	56/75	47/15
	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				
HSUPA Specific Settings	$A_{hs} = \beta_{hs}/\beta_c$	30/15				
	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 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 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 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

Part 22 850MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS HSUPA 850MHz (Band 5)	1	4132	4357	826.4	28.39	24.11
		4180	4405	836.0	28.00	24.02
		4230	4455	846.0	28.04	24.08
	2	4132	4357	826.4	28.07	23.53
		4180	4405	836.0	28.29	23.51
		4230	4455	846.0	28.15	23.48
	3	4132	4357	826.4	28.05	22.80
		4180	4405	836.0	28.20	22.78
		4230	4455	846.0	28.14	22.76
	4	4132	4357	826.4	28.20	24.00
		4180	4405	836.0	28.08	24.00
		4230	4455	846.0	27.96	23.97
	5	4132	4357	826.4	28.30	24.10
		4180	4405	836.0	28.17	24.08
		4230	4455	846.0	28.16	24.03

Part 24 1900MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS HSUPA 1900MHz (Band 2)	1	9262	9662	1852.4	25.40	22.18
		9400	9800	1880.0	25.76	22.15
		9538	9938	1907.6	25.64	22.32
	2	9262	9662	1852.4	25.90	21.59
		9400	9800	1880.0	25.54	21.64
		9538	9938	1907.6	25.95	22.40
	3	9262	9662	1852.4	25.60	20.87
		9400	9800	1880.0	25.40	20.93
		9538	9938	1907.6	25.63	21.73
	4	9262	9662	1852.4	25.23	22.05
		9400	9800	1880.0	25.40	22.17
		9538	9938	1907.6	25.94	22.33
	5	9262	9662	1852.4	25.93	22.23
		9400	9800	1880.0	25.40	22.23
		9538	9938	1907.6	25.75	22.30

Part 27 1700MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS HSUPA 1700MHz (Band 4)	1	1312	1537	1712.4	26.90	22.12
		1413	1638	1732.6	26.44	22.14
		1513	1738	1752.6	26.70	22.30
	2	1312	1537	1712.4	26.81	21.70
		1413	1638	1732.6	26.14	21.63
		1513	1738	1752.6	26.42	21.58
	3	1312	1537	1712.4	26.41	21.03
		1413	1638	1732.6	26.60	20.80
		1513	1738	1752.6	26.44	20.86
	4	1312	1537	1712.4	26.80	22.23
		1413	1638	1732.6	26.65	22.06
		1513	1738	1752.6	26.54	22.10
	5	1312	1537	1712.4	26.77	22.25
		1413	1638	1732.6	26.86	22.13
		1513	1738	1752.6	26.68	22.25

7.5. DUAL CARRIER HSDPA

DC-HSDPA (Rel 8, CAT 24)

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH_Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

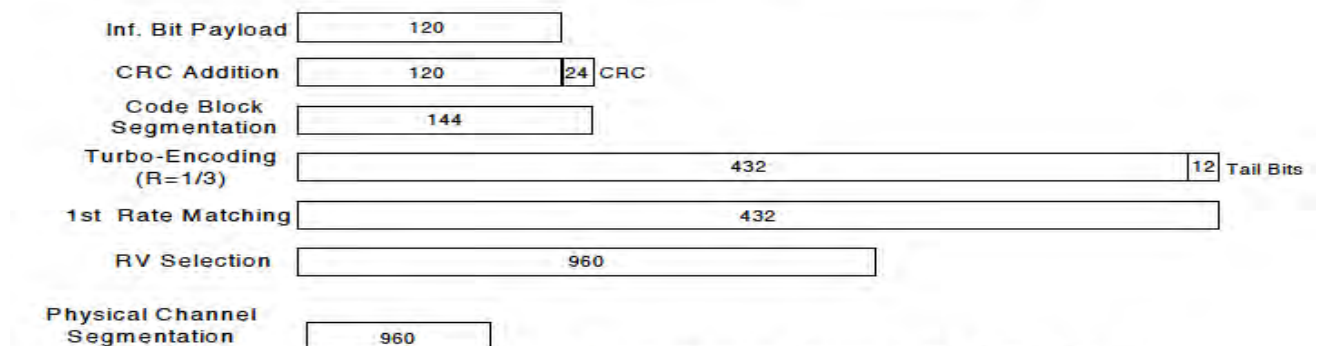


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of subtest 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			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	MPR	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs} / \beta_c$	30/15			

RESULT

Part 22 850MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS850 (Band 5)	1	4132	4357	826.4	27.65	24.00
		4180	4405	836.0	27.51	23.95
		4230	4455	846.0	27.40	23.99
	2	4132	4357	826.4	27.58	23.94
		4180	4405	836.0	27.45	23.93
		4230	4455	846.0	27.53	23.90
	3	4132	4357	826.4	27.33	23.48
		4180	4405	836.0	27.27	23.54
		4230	4455	846.0	27.14	23.52
	4	4132	4357	826.4	27.26	23.53
		4180	4405	836.0	27.63	23.55
		4230	4455	846.0	27.48	23.42

Part 24 1900MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS1900 (Band 2)	1	9262	9662	1852.4	25.78	22.38
		9400	9800	1880.0	25.97	22.37
		9538	9938	1907.6	26.00	22.41
	2	9262	9662	1852.4	25.72	22.32
		9400	9800	1880.0	25.91	22.38
		9538	9938	1907.6	26.02	22.45
	3	9262	9662	1852.4	25.49	21.83
		9400	9800	1880.0	25.51	21.88
		9538	9938	1907.6	25.89	22.05
	4	9262	9662	1852.4	25.41	21.82
		9400	9800	1880.0	25.64	21.88
		9538	9938	1907.6	25.82	22.10

Part 27 1700MHz Band

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted Output Power (dBm)	
					Peak	Average
UMTS1700 (Band 4)	1	1312	1537	1712.4	26.01	22.47
		1413	1638	1732.6	25.74	22.35
		1513	1738	1752.6	25.86	22.34
	2	1312	1537	1712.4	25.93	22.45
		1413	1638	1732.6	25.92	22.36
		1513	1738	1752.6	25.79	22.42
	3	1312	1537	1712.4	25.58	21.94
		1413	1638	1732.6	25.52	21.85
		1513	1738	1752.6	25.51	21.95
	4	1312	1537	1712.4	25.55	21.93
		1413	1638	1732.6	25.47	21.85
		1513	1738	1752.6	25.53	21.88

7.6. CDMA2000 1xRTT

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

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

<u>Application</u>	<u>Rev, License</u>
CDMA2000 Mobile Test	B.15.18, L

- Protocol Rev > 6 (IS-2000-0)
- System ID: 7; NID: 65535, Reg. Ch. #: 610 for Cell, 600 for PCS & 450 for AWS
- Radio Config (RC) > RC1 or RC3
- Service Option (SO) Setup > SO55 or SO32
- Traffic Data Rate > Full
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

*Note: RC11 represent 1x Advanced functionality

RESULT

CDMA 1xRTT, BC0, CELL BAND

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		CH 1013 - 824.7MHz		CH 384 - 836.52MHz		CH 777 - 848.31MHz	
		Peak	Average	Peak	Average	Peak	Average
RC1	2 (Loopback)	29.72	24.42	29.48	24.46	29.50	24.48
	55 (Loopback)	29.55	24.43	29.85	24.48	29.54	24.49
RC2	9 (Loopback)	29.50	24.43	29.66	24.47	29.51	24.48
	55 (Loopback)	29.73	24.42	30.00	24.50	29.53	24.47
RC3	2 (Loopback)	29.31	24.41	29.35	24.46	29.20	24.48
	55 (Loopback)	29.26	24.40	29.21	24.45	29.11	24.49
	32 (+ F-SCH)	29.22	24.40	29.20	24.44	29.23	24.49
	32 (+ SCH)	29.37	24.43	29.31	24.46	29.10	24.48
RC4	2 (Loopback)	29.18	24.41	29.32	24.46	29.15	24.49
	55 (Loopback)	29.30	24.40	29.25	24.45	29.10	24.48
	32 (+ F-SCH)	29.35	24.41	29.22	24.46	29.16	24.48
	32 (+ SCH)	29.18	24.40	29.38	24.44	29.24	24.49
RC5	9 (Loopback)	29.30	24.40	29.39	24.45	29.10	24.49
	55 (Loopback)	29.23	24.41	29.31	24.46	29.18	24.48
*RC11	2 (Loopback)	29.36	24.43	29.24	24.48	29.34	24.49
	75 (Loopback)	29.21	24.44	29.30	24.49	29.14	24.46
	32 (+ F-SCH)	29.17	24.46	29.39	24.47	29.11	24.49
	32 (+ SCH)	29.16	24.45	29.21	24.43	29.10	24.49

CDMA2000 1xRTT, BC1, PCS BAND

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		CH 25 - 1851.25MHz		CH 600 - 1880MHz		CH 1175 - 1908.75MHz	
		Peak	Average	Peak	Average	Peak	Average
RC1	2 (Loopback)	28.68	23.49	28.78	23.49	28.76	23.49
	55 (Loopback)	28.65	23.48	28.82	23.48	28.77	23.49
RC2	9 (Loopback)	28.75	23.48	28.69	23.49	28.59	23.47
	55 (Loopback)	28.79	23.47	28.66	23.50	28.85	23.49
RC3	2 (Loopback)	28.21	23.49	28.10	23.46	28.06	23.48
	55 (Loopback)	28.36	23.48	28.20	23.48	28.03	23.49
	32 (+ F-SCH)	28.29	23.49	28.15	23.49	28.05	23.47
	32 (+ SCH)	28.35	23.48	28.27	23.48	28.15	23.48
RC4	2 (Loopback)	28.25	23.49	28.14	23.48	28.11	23.48
	55 (Loopback)	28.18	23.49	28.29	23.47	28.00	23.48
	32 (+ F-SCH)	28.22	23.48	28.26	23.49	28.12	23.49
	32 (+ SCH)	28.29	23.49	28.27	23.49	28.20	23.48
RC5	9 (Loopback)	28.25	23.49	28.18	23.46	28.10	23.47
	55 (Loopback)	28.19	23.47	28.14	23.48	28.04	23.49
*RC11	2 (Loopback)	28.21	23.48	28.17	23.49	28.06	23.48
	75 (Loopback)	28.22	23.49	28.18	23.49	28.10	23.49
	32 (+ F-SCH)	28.27	23.49	28.26	23.49	28.14	23.49
	32 (+ SCH)	28.24	23.47	28.24	23.48	28.11	23.47

CDMA2000 1xRTT, BC15, AWS BAND

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		CH 25 - 1711.25MHz		CH 450 - 1732.5MHz		CH 875 - 1753.75MHz	
		Peak	Average	Peak	Average	Peak	Average
RC1	2 (Loopback)	28.70	23.48	28.17	23.47	28.10	23.48
	55 (Loopback)	28.74	23.49	28.80	23.46	28.70	23.43
RC2	9 (Loopback)	28.70	23.45	28.80	23.46	28.61	23.44
	55 (Loopback)	28.75	23.50	29.00	23.45	28.70	23.42
RC3	2 (Loopback)	28.20	23.49	28.30	23.44	28.10	23.43
	55 (Loopback)	28.31	23.49	28.18	23.45	28.21	23.44
	32 (+ F-SCH)	28.27	23.47	28.18	23.44	28.21	23.44
	32 (+ SCH)	28.25	23.48	28.15	23.44	28.20	23.42
RC4	2 (Loopback)	28.46	23.49	28.24	23.45	28.15	23.45
	55 (Loopback)	28.41	23.48	28.13	23.47	28.16	23.45
	32 (+ F-SCH)	28.34	23.47	28.13	23.45	28.14	23.44
	32 (+ SCH)	28.35	23.48	28.12	23.44	28.15	23.44
RC5	9 (Loopback)	28.17	23.49	28.32	23.44	28.11	23.43
	55 (Loopback)	28.31	23.48	28.15	23.43	28.12	23.44
*RC11	2 (Loopback)	28.27	23.48	28.22	23.44	28.10	23.45
	75 (Loopback)	28.39	23.49	28.16	23.46	28.12	23.45
	32 (+ F-SCH)	28.44	23.49	28.29	23.48	28.10	23.44
	32 (+ SCH)	28.35	23.47	28.27	23.46	28.05	23.44

CDMA 1xRTT, BC10, SECONDARY 800

Radio Configuration (RC)	Service Option (SO)	Conducted Output Power (dBm)					
		CH 450 - 817.25MHz		CH 560 - 820MHz		CH 670 - 822.75MHz	
		Peak	Average	Peak	Average	Peak	Average
RC1	2 (Loopback)	29.73	24.88	29.73	24.87	29.80	24.86
	55 (Loopback)	29.74	24.87	29.72	24.86	29.93	24.90
RC2	9 (Loopback)	29.73	24.87	29.72	24.87	29.80	24.84
	55 (Loopback)	29.75	24.88	29.73	24.87	29.90	24.85
RC3	2 (Loopback)	29.38	24.83	29.39	24.83	29.43	24.83
	55 (Loopback)	29.53	24.87	29.66	24.82	29.65	24.86
	32 (+ F-SCH)	29.61	24.86	29.52	24.84	29.58	24.84
	32 (+ SCH)	29.69	24.85	29.51	24.85	29.56	24.83
RC4	2 (Loopback)	29.52	24.84	29.50	24.84	29.39	24.84
	55 (Loopback)	29.62	24.85	29.57	24.83	29.46	24.84
	32 (+ F-SCH)	29.58	24.87	29.57	24.83	29.45	24.82
	32 (+ SCH)	29.56	24.83	29.53	24.84	29.50	24.83
RC5	9 (Loopback)	29.56	24.84	29.33	24.84	29.50	24.82
	55 (Loopback)	29.64	24.82	29.45	24.86	29.57	24.82
RC11	2 (Loopback)	29.63	24.80	29.59	24.87	29.53	24.86
	75 (Loopback)	29.53	24.89	29.58	24.86	29.44	24.85
	32 (+ F-SCH)	29.55	24.88	29.60	24.87	29.70	24.86
	32 (+ SCH)	29.49	24.89	29.62	24.87	29.51	24.84

7.7. CDMA2000 1xEV-DO - Release 0 (Rel. 0)

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

EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
 - o Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
 - o Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
 - o Cell Power > -105.5 dBm/1.23 MHz
 - o Channel > (Enter channel number)
 - o Application Config > Enhanced Test Application Protocol > RTAP
 - o RTAP Rate > 153.6 kbps
 - o Rvs Power Ctrl > Active bits
 - o 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:
 - o Access Network Info > Cell Parameters > Sector ID > 00000000 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
 - o Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
 - o Cell Power > -105.5 dBm/1.23 MHz
 - o Cell Band > (Select US Cellular or US PCS)
 - o Channel > (Enter channel number)
 - o Application Config > Enhanced Test Application Protocol > FTAP (default)
 - o FTAP Rate > 307.2 kbps (2 Slot, QPSK)
 - o Rvs Power Ctrl > Active bits
 - o 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

CDMA2000 EVDO REV. 0 850MHz BAND

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
307.2 kbps (2 Slot QPSK)	153.6 kbps	1013	824.70	29.99	24.48
		384	836.52	29.92	24.46
		777	848.31	29.63	24.47

CDMA2000 EVDO REV. 0 1900MHz BAND

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
307.2 kbps (2 Slot QPSK)	153.6 kbps	25	1851.25	28.73	23.48
		600	1880.00	28.56	23.44
		1175	1908.75	28.78	23.33

CDMA2000 EVDO REV. 0 1700MHz BAND

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
307.2 kbps (2 Slot QPSK)	153.6 kbps	25	1711.25	28.84	23.49
		450	1732.50	28.70	23.47
		875	1753.75	28.81	23.46

CDMA2000 EVDO REV. 0 800MHz SECONDARY BAND

FTAP Rate	RTAP Rate	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
307.2 kbps (2 Slot QPSK)	153.6 kbps	450	817.25	29.76	24.95
		560	820.00	29.92	24.94
		670	822.75	30.17	24.96

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

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

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

EVDO Rev. A – RETAP

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

EVDO Rev. A - FETAP

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

RESULTS

CDMA2000 EVDO REV A 850MHz BAND

FETAP - Traffic Format	RETAP - Data Payload Size	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
307.2k QPSK/ ACK channel is transmitted at all the slots	4096	1013	824.70	29.84	24.50
		384	836.52	30.50	24.49
		777	848.31	29.70	24.48

CDMA2000 EVDO REV A 1900MHz BAND

FETAP - Traffic Format	RETAP - Data Payload Size	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
307.2k QPSK/ ACK channel is transmitted at all the slots	4096	25	1851.25	28.74	23.50
		600	1880.00	29.10	23.49
		1175	1908.75	28.98	23.33

CDMA2000 EVDO REV A 1700MHz BAND

FETAP - Traffic Format	RETAP - Data Payload Size	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
307.2k QPSK/ ACK channel is transmitted at all the slots	4096	25	1711.25	28.89	23.50
		450	1732.50	28.94	23.46
		875	1753.75	29.00	23.42

CDMA2000 EVDO REV A 800MHz SECONDARY BAND

FETAP - Traffic Format	RETAP - Data Payload Size	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
307.2k QPSK/ ACK channel is transmitted at all the slots	4096	450	817.25	29.78	24.97
		560	820.00	29.80	25.00
		670	822.75	30.18	24.98

7.9. CDMA2000 1xEV-DO - Revision B (Rev. B)

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: -70dBm
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

Two Carrier Min Separations

	Mode	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
Rev B	CDMA	1013+31	824.70+825.93	28.50	21.96
		384+425	836.52+837.75	28.40	21.90
		736+777	847.08+848.31	28.35	21.87

Two Carrier Max Separations

	Mode	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
Rev B	CDMA	1013+156	824.70+829.68	28.45	21.96
		384+550	836.52+841.50	28.43	22.00
		611+777	843.33+848.31	28.36	21.97

Three Carrier Min Separations

	Mode	Channel	f (MHz)	Conducted Output Power (dBm)	
				Peak	Average
Rev B	CDMA	1013+31+72	824.70+825.93+827.16	28.78	21.97
		384+425+466	836.52+837.75+838.98	28.80	21.91
		695+736+777	845.85+847.08+848.31	28.72	21.92

8. CONDUCTED TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99 and HSDPA
- CDMA2000, BC0, BC1, BC10 and BC15

RESULTS

GPRS MODE

Part 22 850MHz Band

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
CELL	GPRS	128	824.2	251.0122	316.443
		190	836.6	249.7975	311.106
		251	848.8	241.8161	307.381

Part 24 1900MHz Band

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
PCS	GPRS	512	1850.2	246.7129	314.656
		661	1880.0	245.7737	316.347
		810	1909.8	249.6959	313.915

EGPRS MODE

Part 22 850MHz Band

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
CELL	EGPRS	128	824.2	247.9548	321.282
		190	836.6	252.5691	302.589
		251	848.8	254.3688	310.404

Part 24 1900MHz Band

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
PCS	EGPRS	512	1850.2	256.2555	312.580
		661	1880.0	254.5981	328.308
		810	1909.8	247.4547	310.251

WCDMA PART 22, 24, AND 27

Band	Mode	DL Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
850MHz	UMTS Rel. 99	4357	826.40	4.1834	4.577
		4408	836.00	4.1928	4.581
		4458	846.60	4.2520	4.557
1900MHz		9662	1852.40	4.1490	4.577
		9800	1880.00	4.1966	4.550
		9938	1907.60	4.1343	4.589
1700MHz		1537	1712.40	4.1293	4.555
		1638	1732.00	4.1516	4.649
		1738	1752.60	4.1858	4.589

WCDMA PART 22, 24, AND 27

Band	Mode	DL Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
850MHz	UMTS HSDPA	4357	826.40	4.1664	4.511
		4408	836.00	4.1498	4.541
		4458	846.60	4.1996	4.603
1900MHz		9662	1852.40	4.0662	4.433
		9800	1880.00	4.1931	4.551
		9938	1907.60	4.1668	4.475
1700MHz		1537	1712.40	4.1789	4.572
		1638	1732.00	4.1122	4.637
		1738	1752.60	4.0762	4.554

CDMA2000 PART 22, 24, 27 AND 90

Band	Mode	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
CELL	CDMA 2000 1xRTT	1013	824.70	1.2798	1.390
		384	836.52	1.2607	1.391
		777	848.31	1.2862	1.406
PCS		25	1851.25	1.2659	1.415
		600	1880.00	1.2706	1.413
		1175	1908.75	1.2725	1.404
AWS		25	1711.25	1.2505	1.399
		450	1732.50	1.2637	1.394
		875	1753.75	1.2639	1.384
800 MHz Secondary		476	817.90	1.2730	1.409
		580	820.50	1.2720	1.401
		684	823.10	1.2710	1.411

CDMA2000 PART 22, 24, 27 AND 90

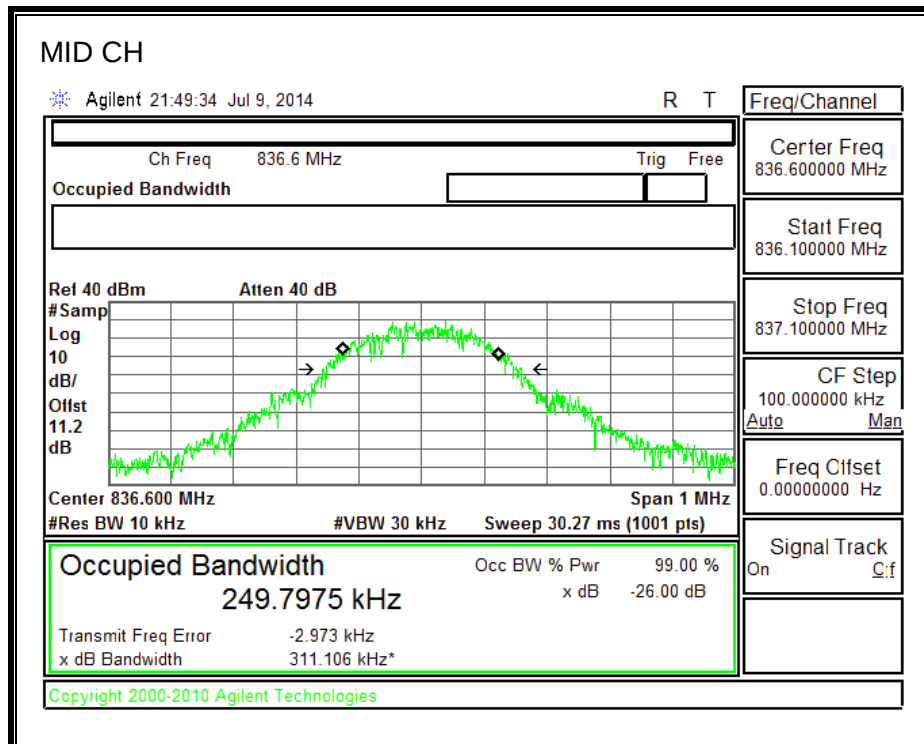
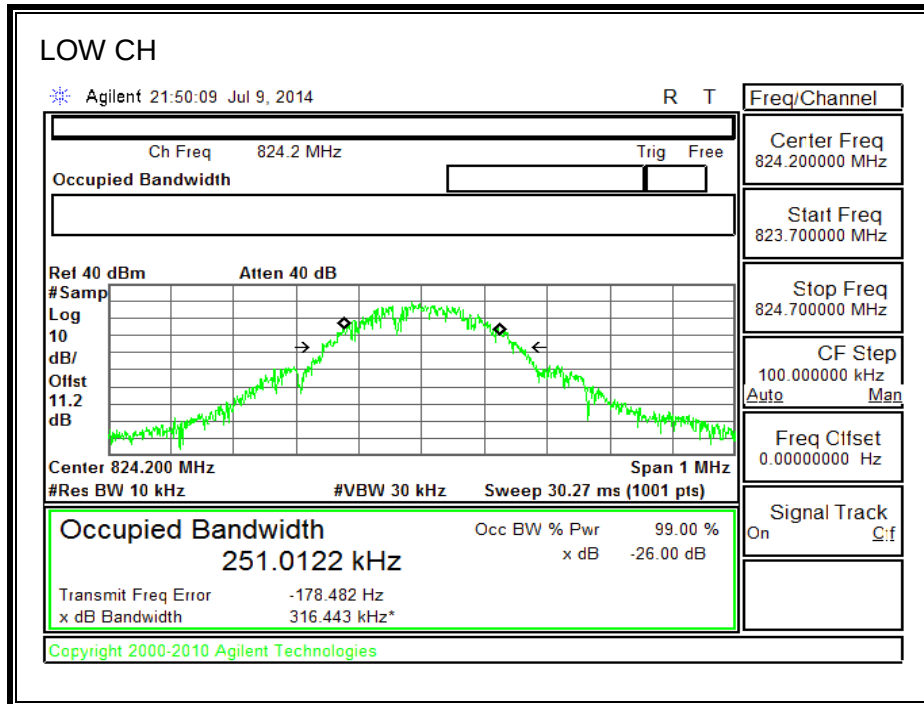
Band	Mode	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
CELL	CDMA 2000 EVDO Rev. A	1013	824.70	1.2690	1.412
		384	836.52	1.2890	1.396
		777	848.31	1.2783	1.395
PCS		25	1851.25	1.2827	1.411
		600	1880.00	1.2663	1.394
		1175	1908.75	1.2723	1.409
AWS		25	1711.25	1.2730	1.433
		450	1732.50	1.2569	1.381
		875	1753.75	1.2735	1.395
800 MHz Secondary		476	817.90	1.2845	1.406
		580	820.50	1.2633	1.377
		684	823.10	1.2553	1.392

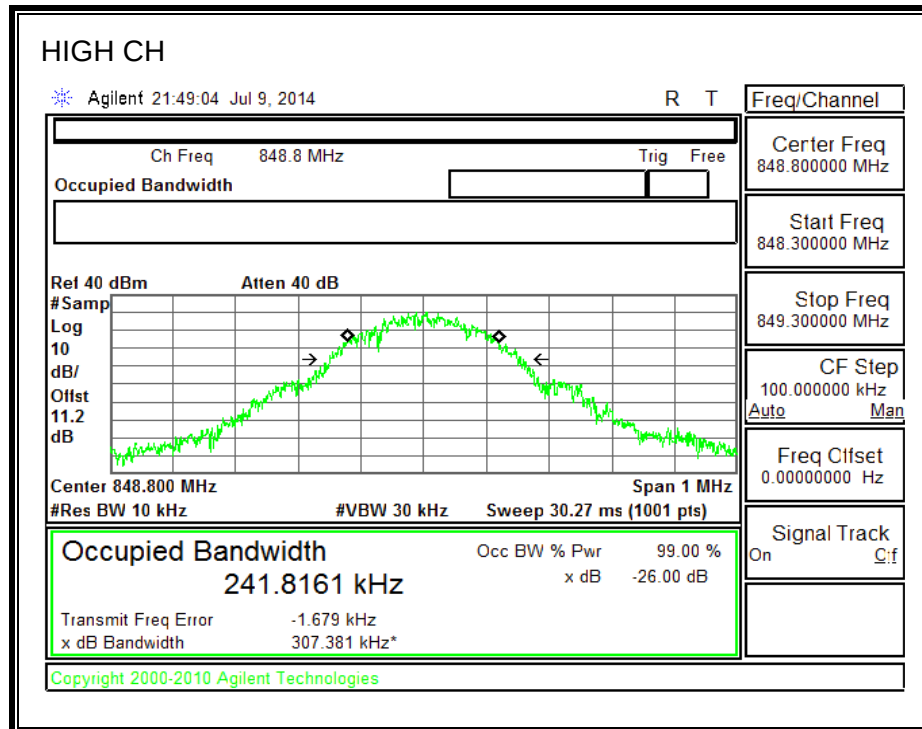
CDMA2000 REV B, PART 22

Band	Mode	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
CELL	CDMA 2000 EVDO Rev. B	1013+31	824.70+825.93	2.4786	2.655
		384+425	836.52+837.75	2.4714	2.663
		736+777	847.08+848.31	2.4486	2.612
		1013+156	824.70+829.68	3.3400	6.661
		384+550	836.52+841.50	3.1700	6.535
		611+777	843.33+848.31	3.3000	6.606
		1013+31+72	824.70+825.93+827.16	3.6690	3.920
		384+425+466	836.52+837.75+838.98	3.7237	3.925
		695+736+777	845.85+847.08+848.31	3.7410	5.785

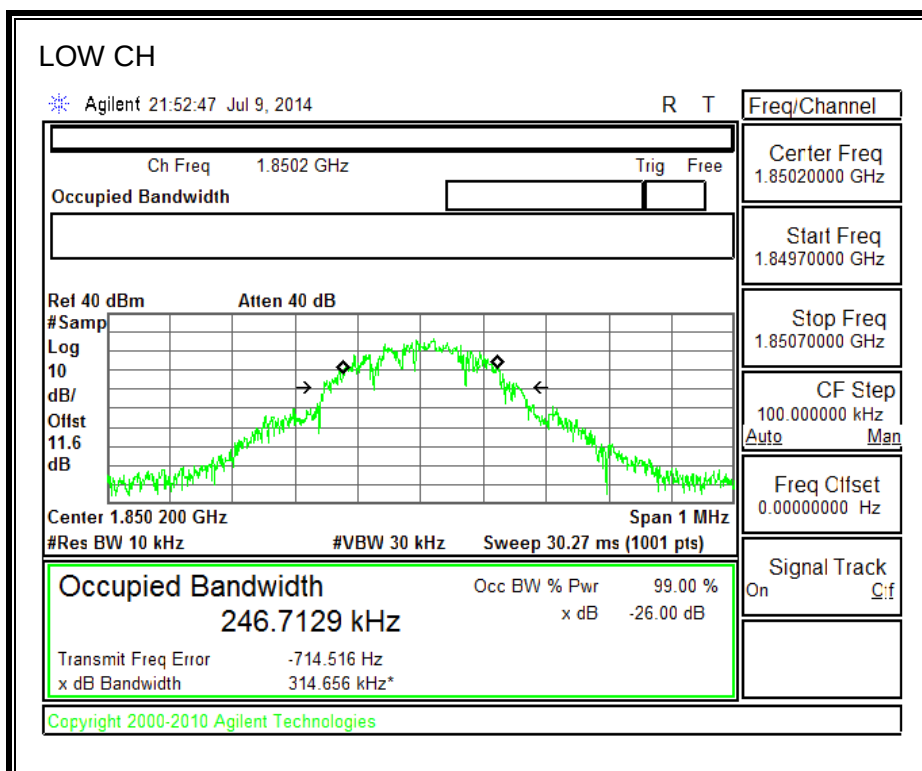
8.1.1. GSM-GPRS

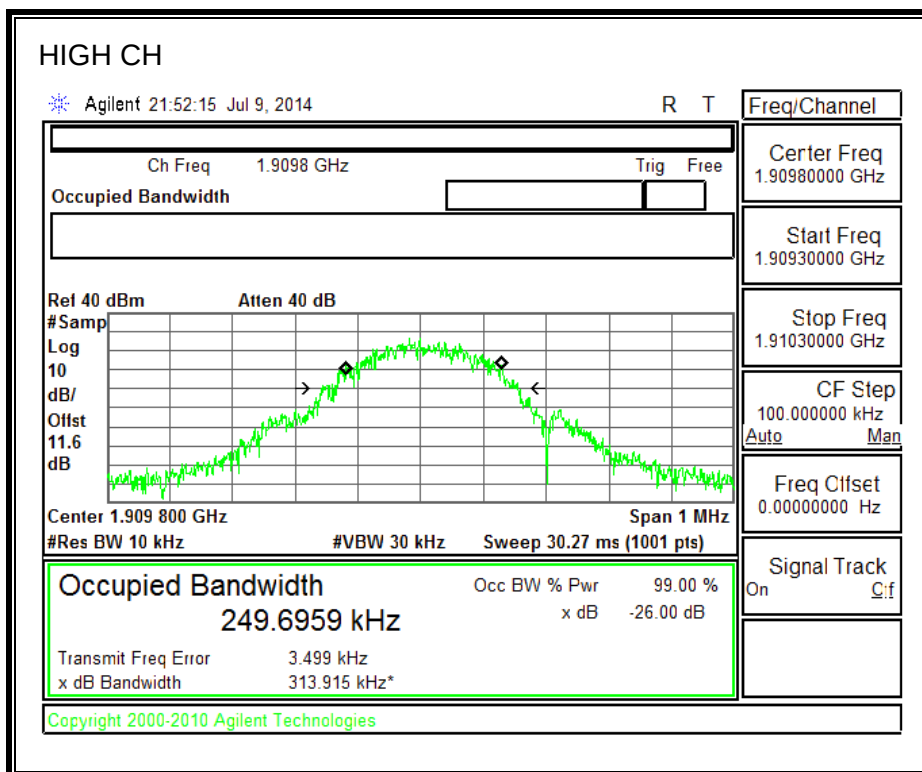
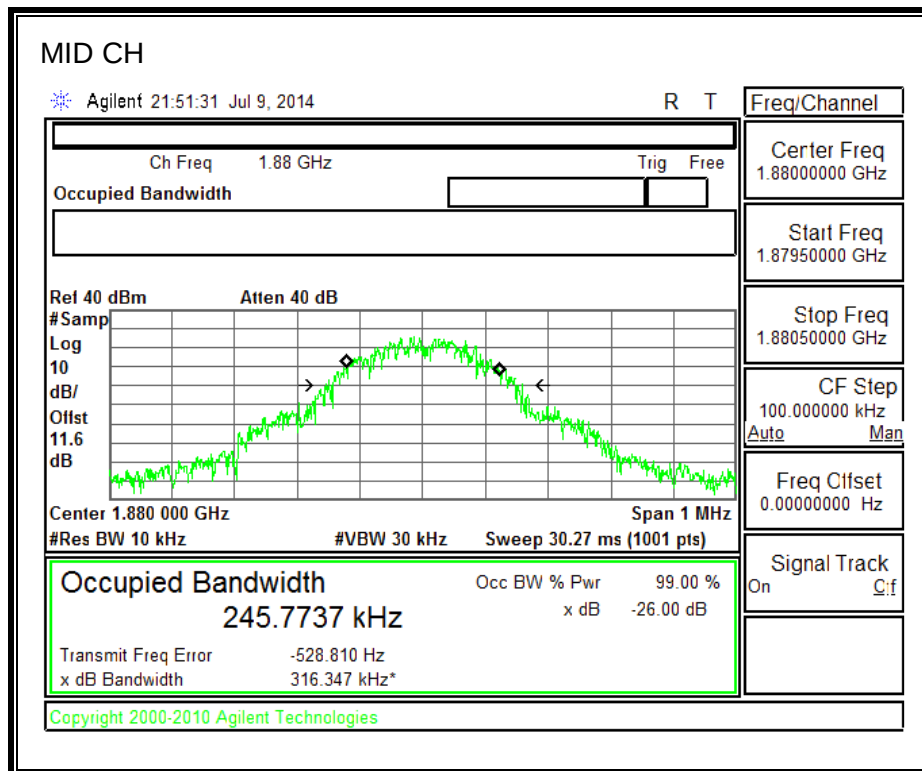
850MHz BAND





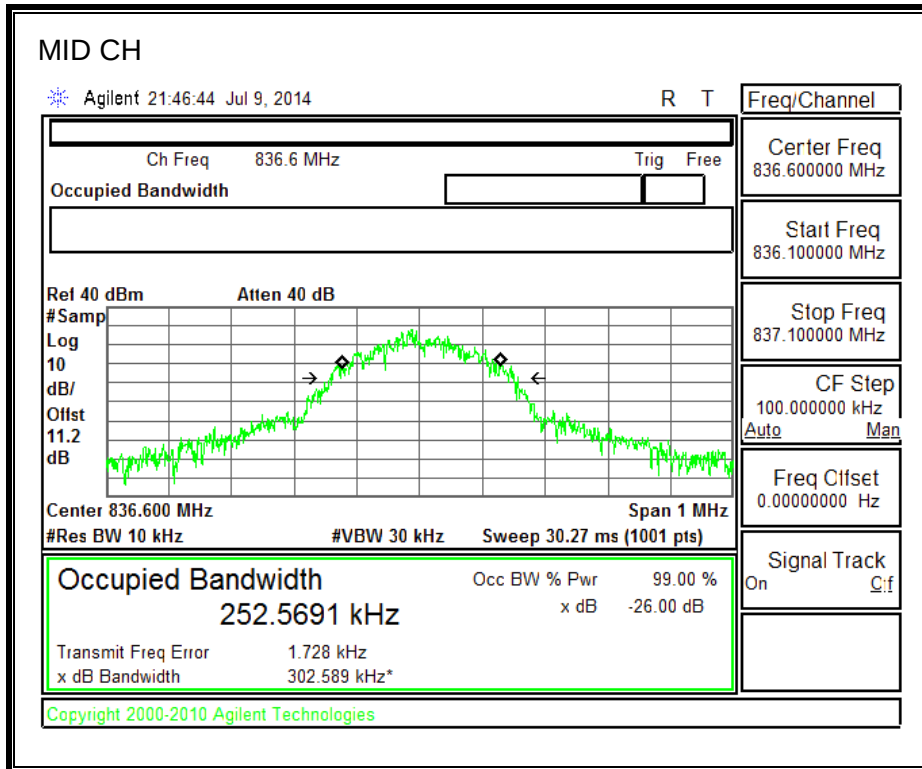
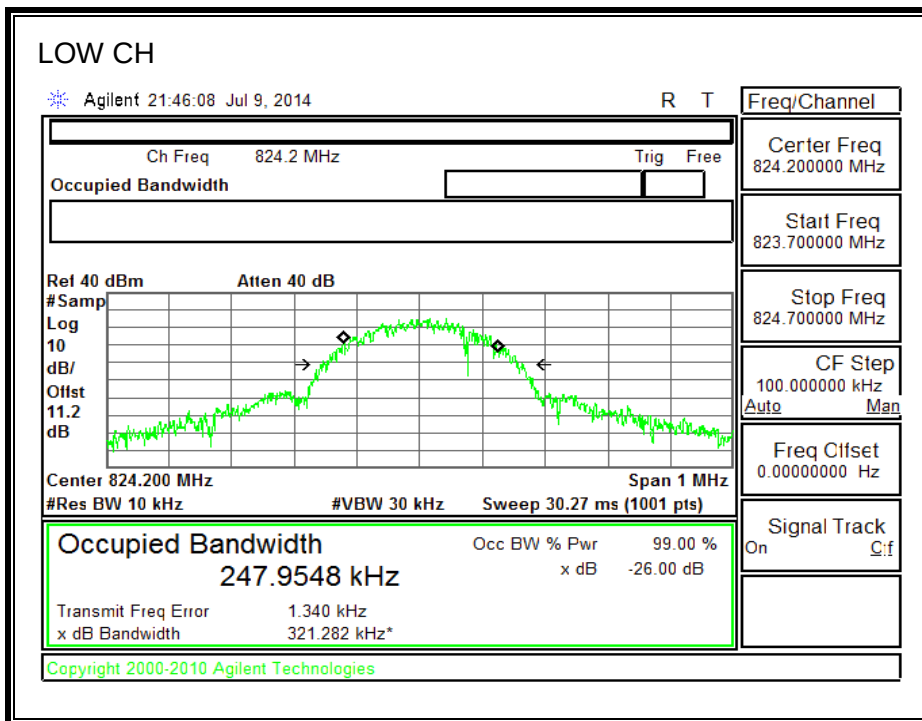
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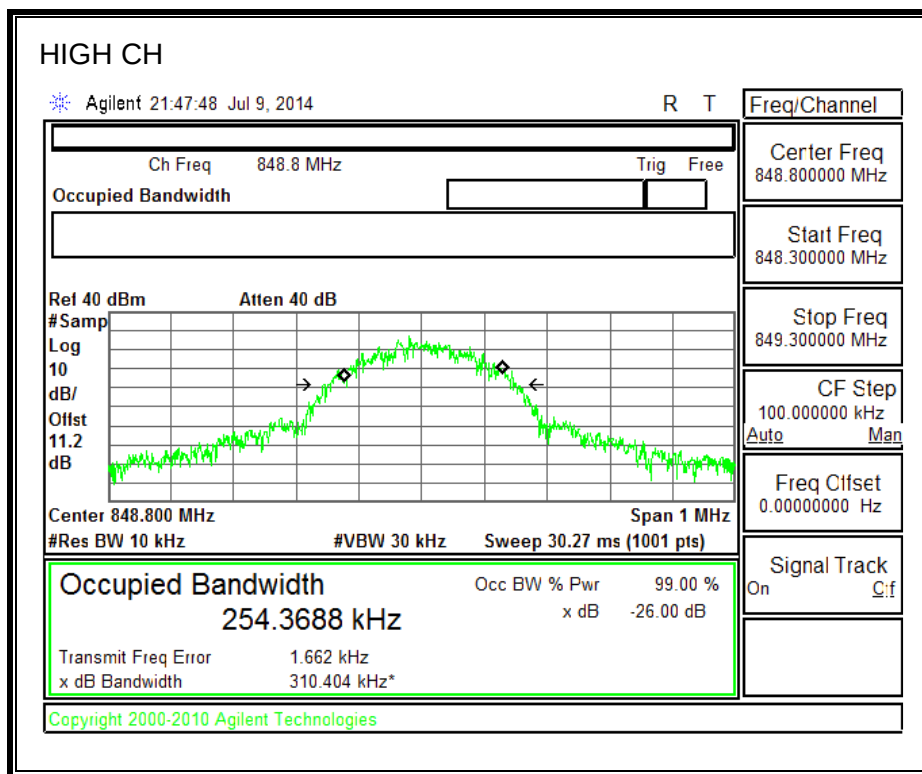




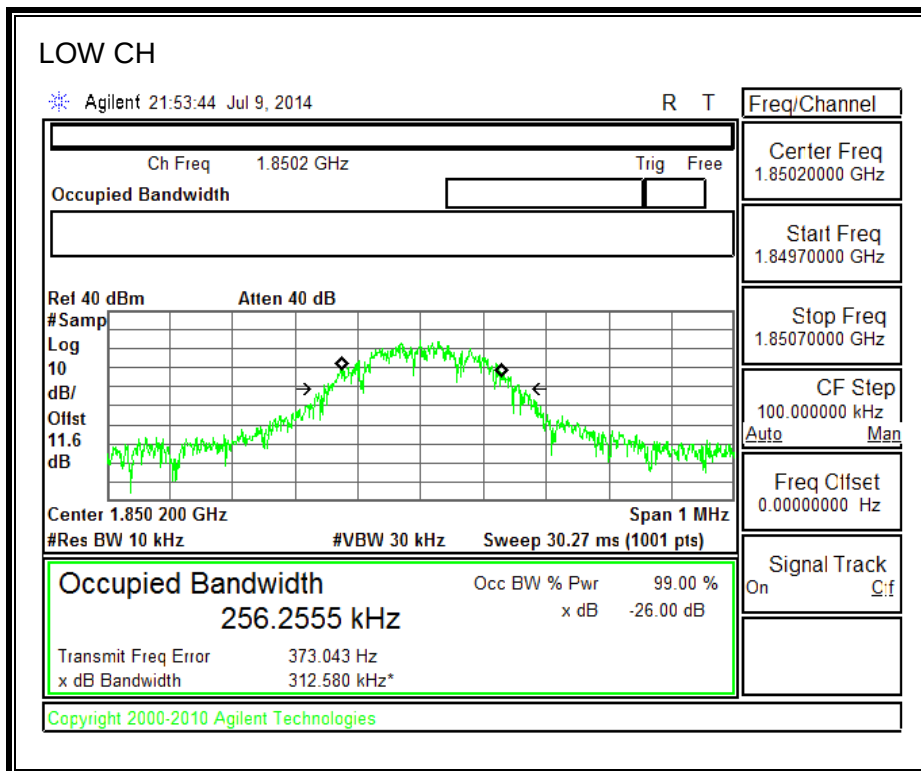
8.1.2. GSM-EGPRS

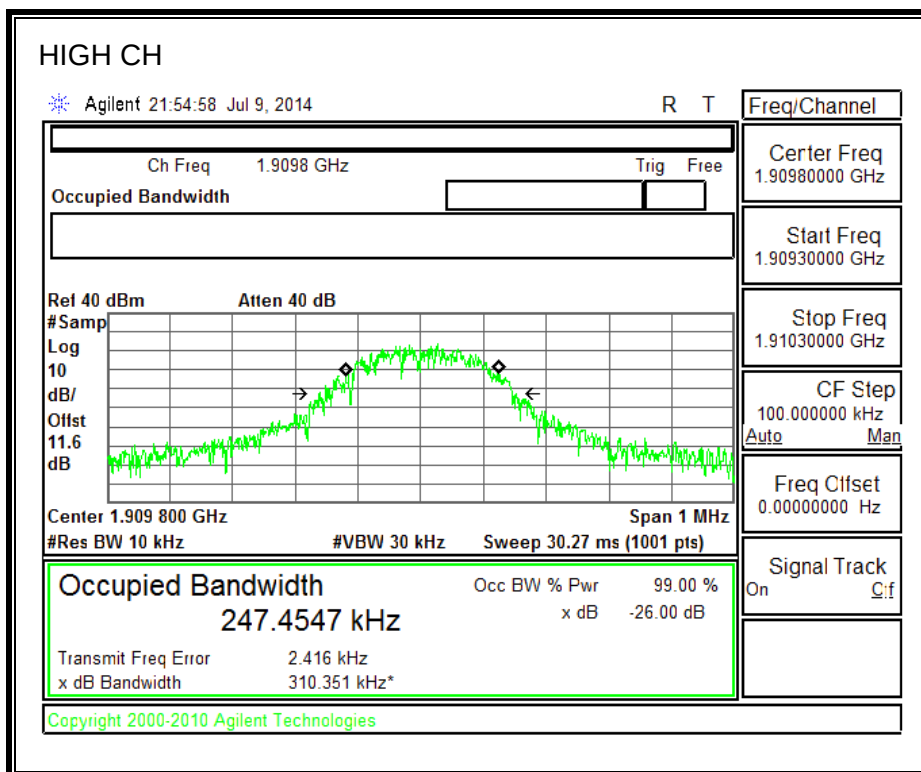
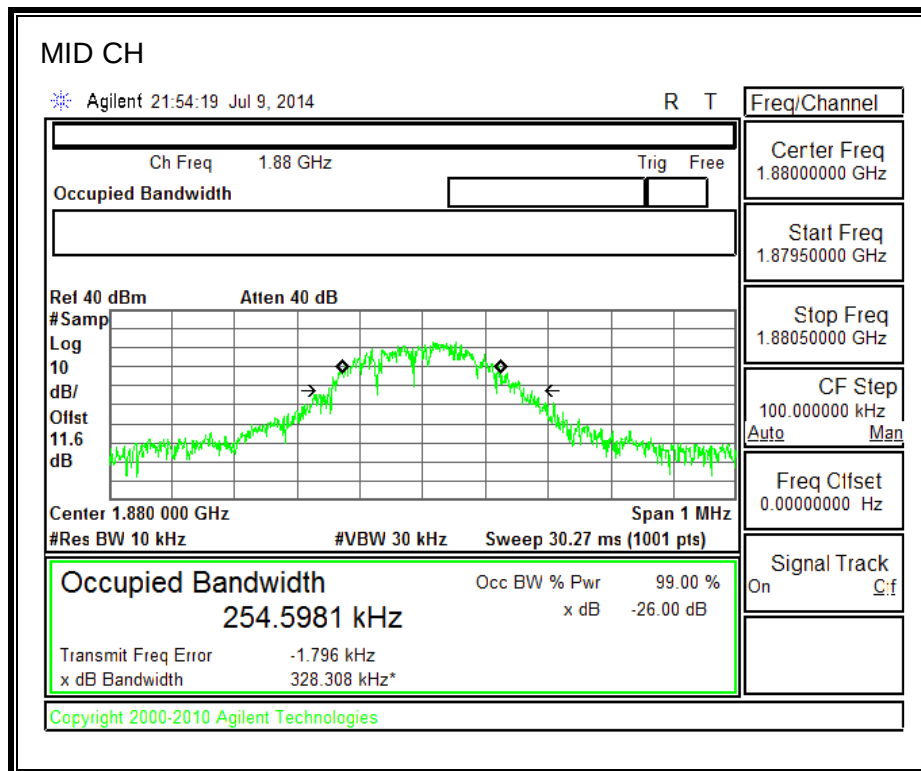
850MHz BAND





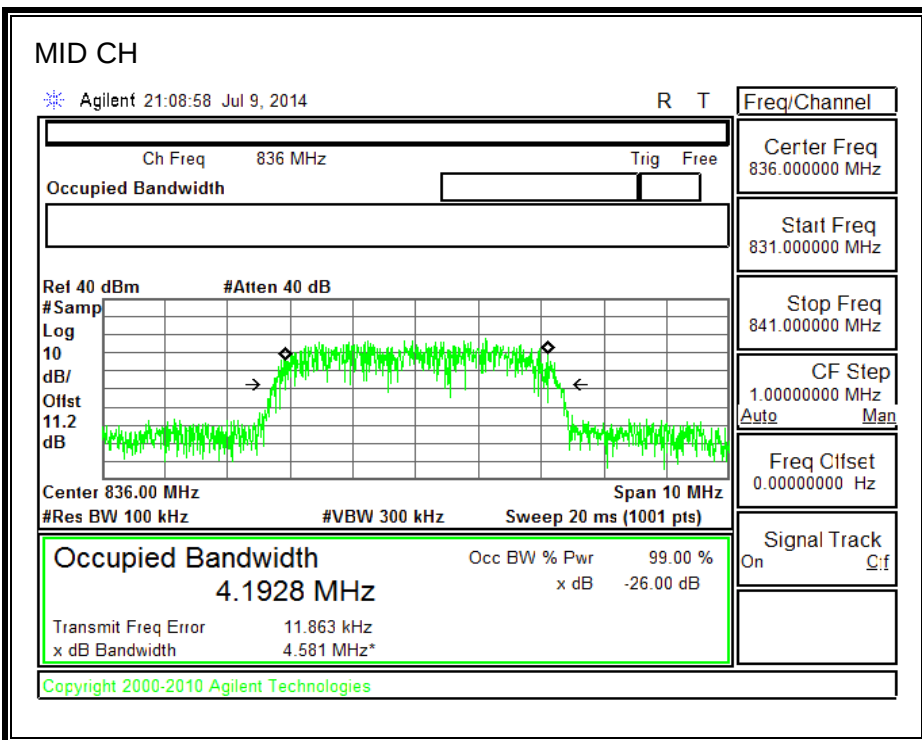
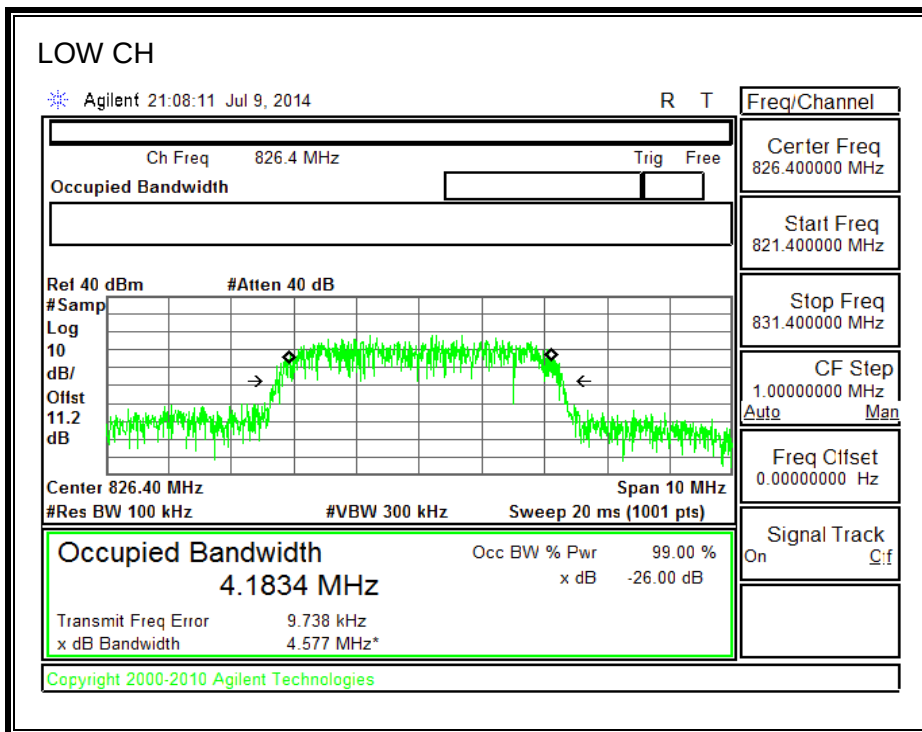
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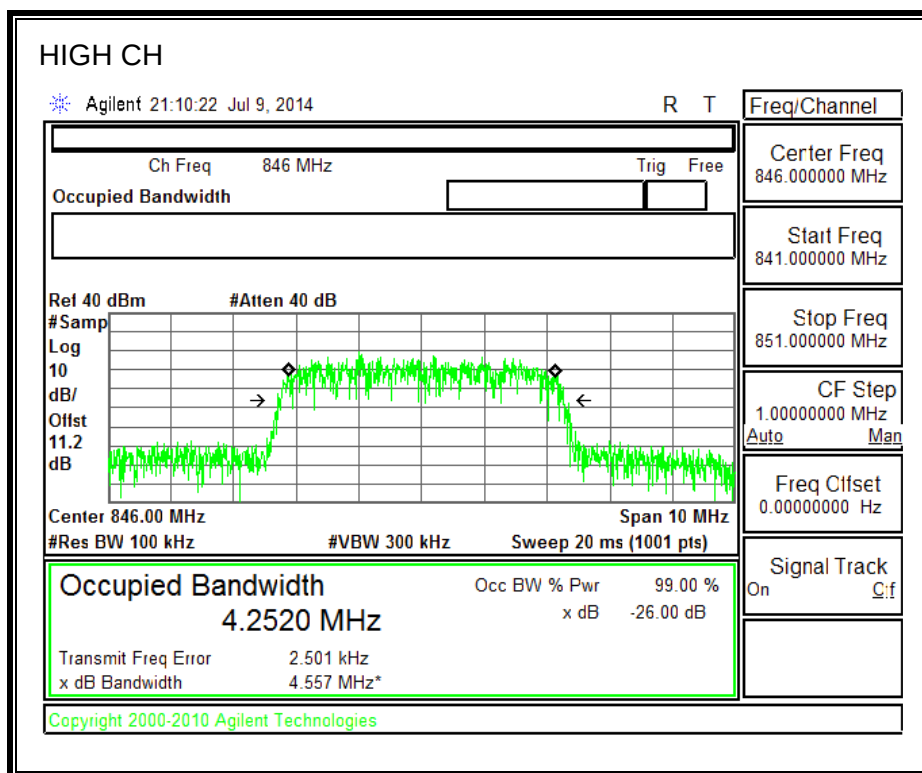




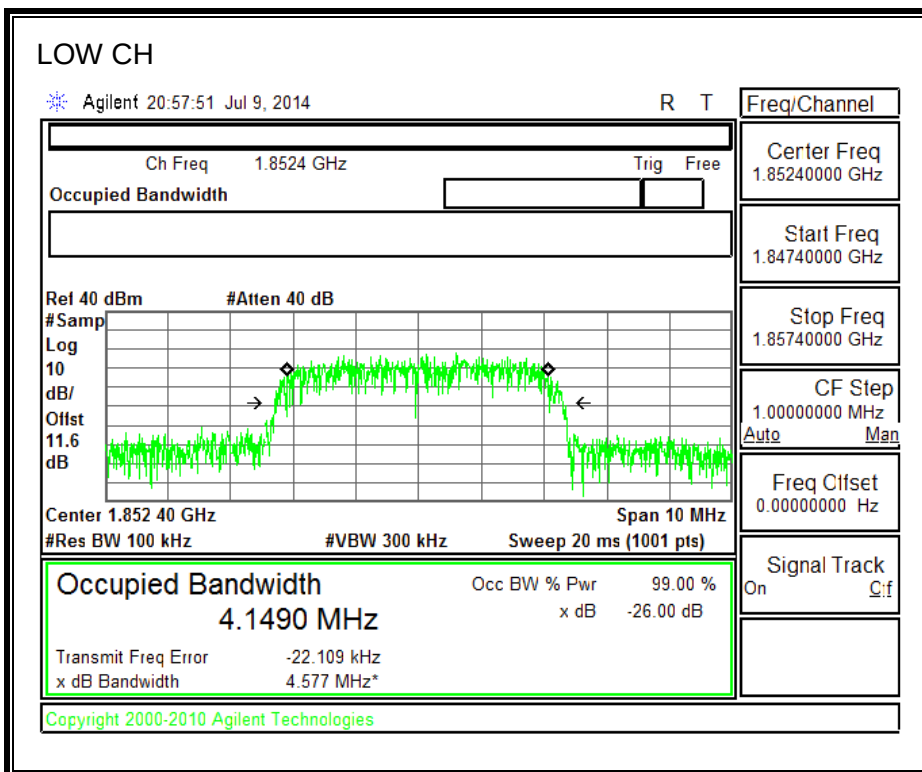
8.1.3. UMTS Rel. 99

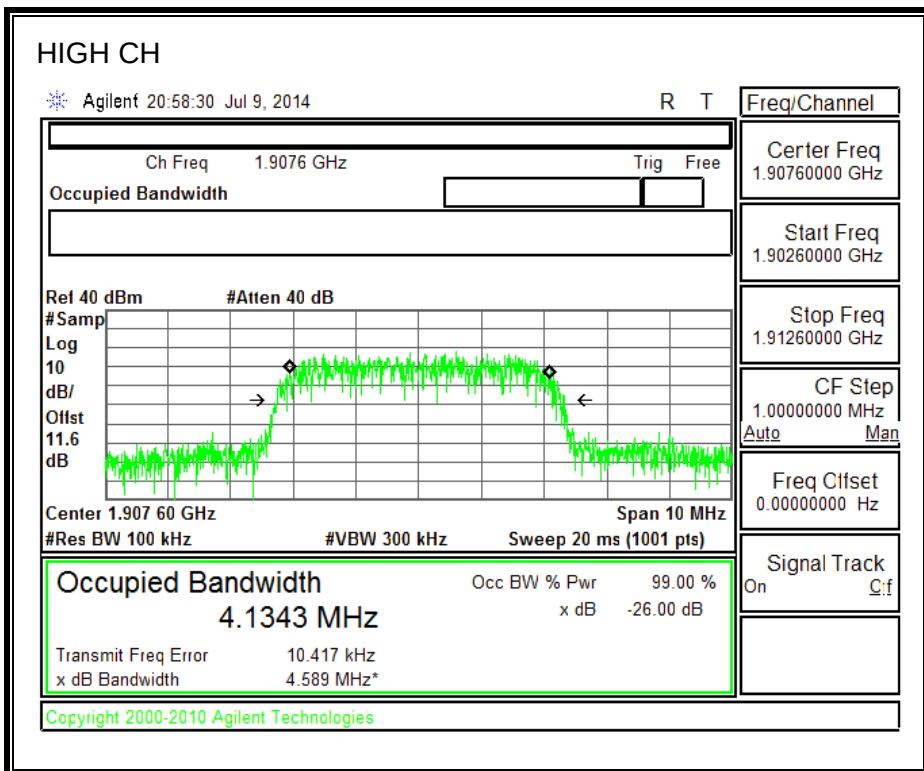
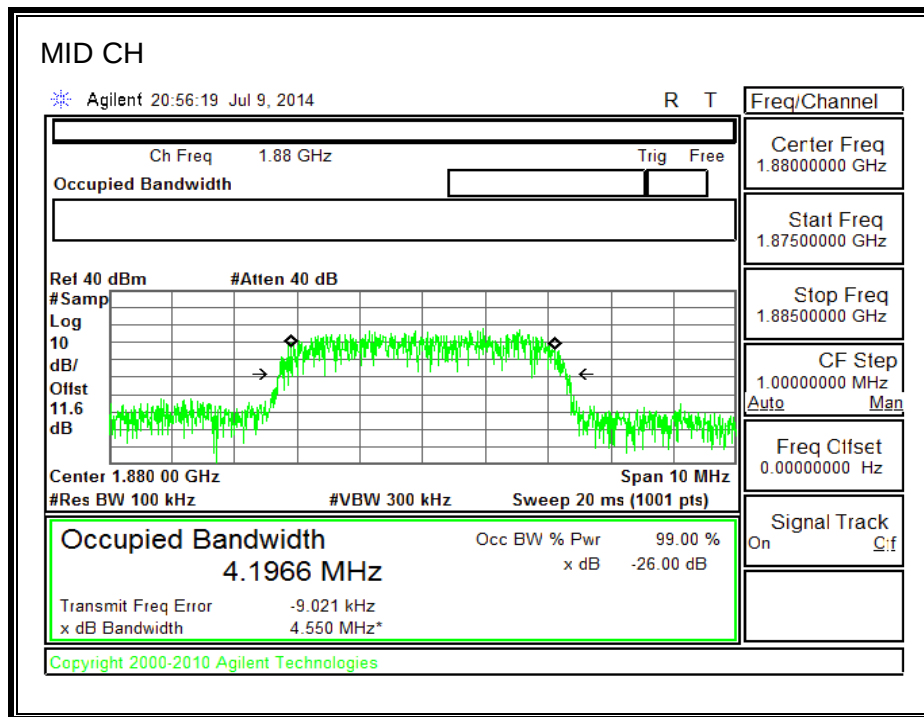
850MHz BAND



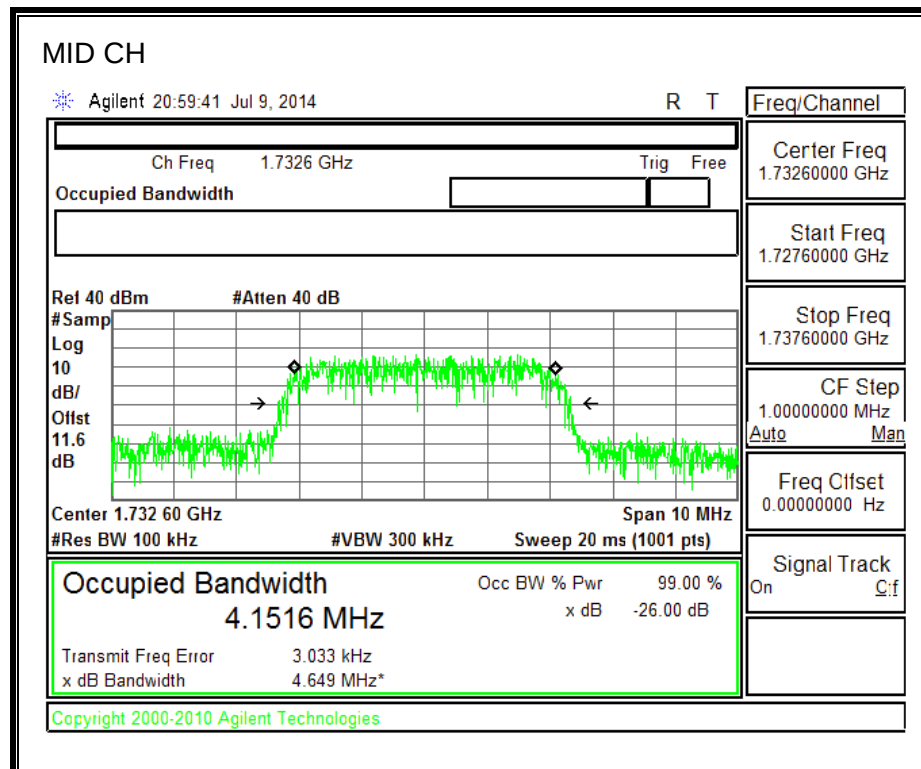
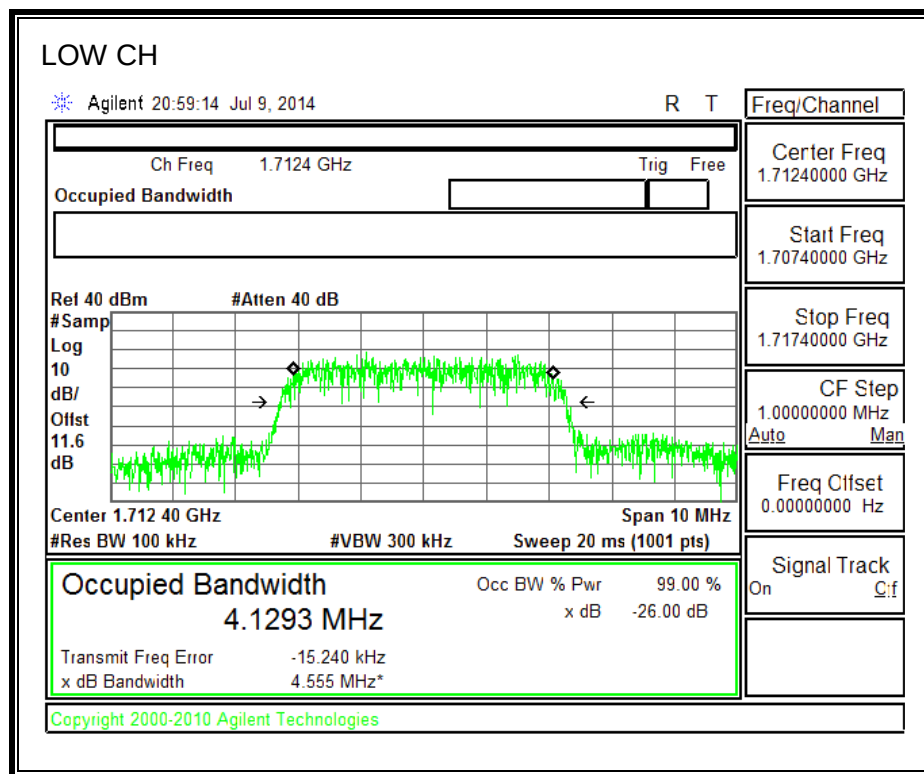


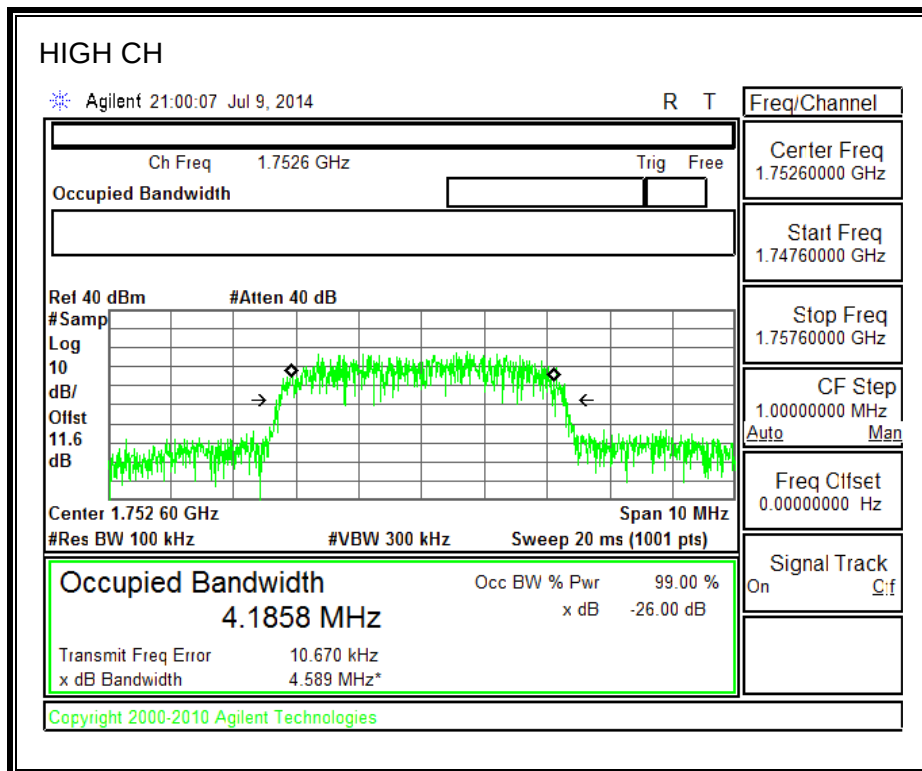
1900MHz BAND





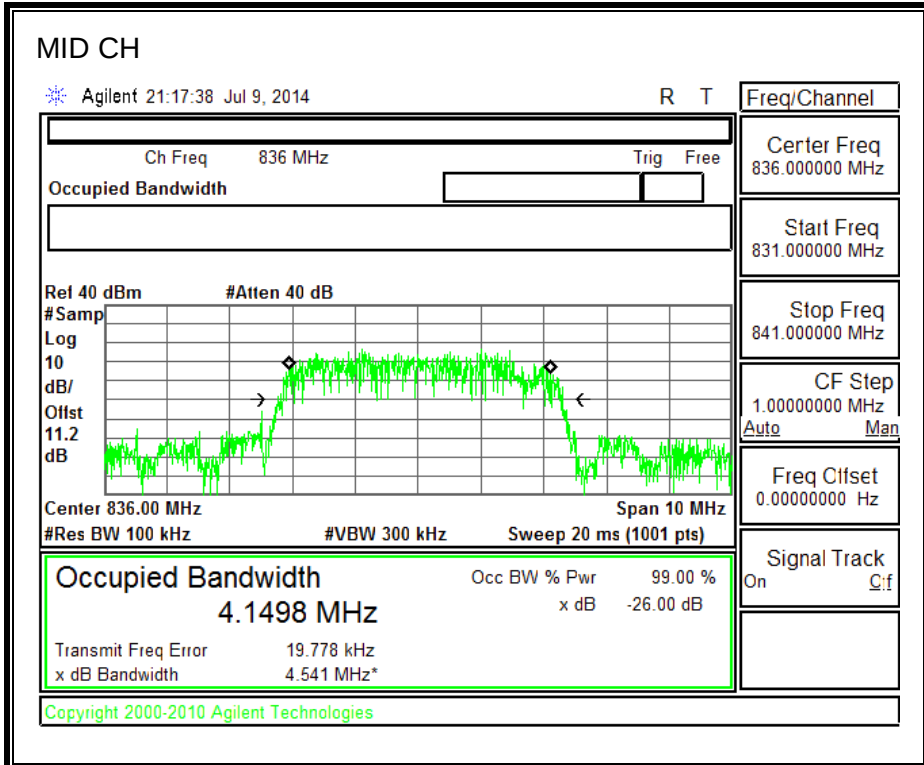
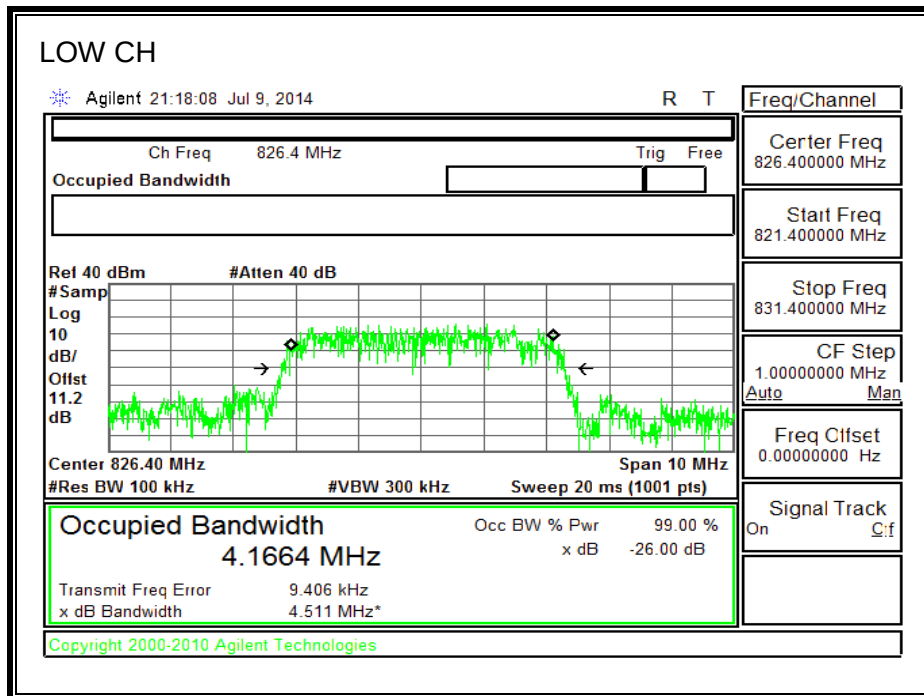
1700MHz BAND

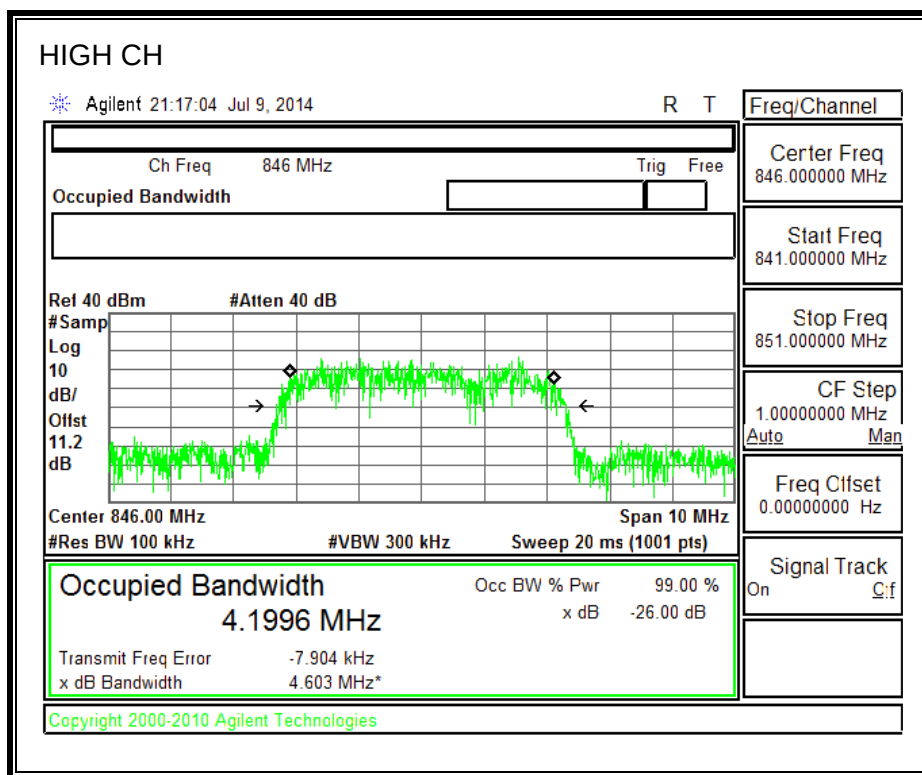




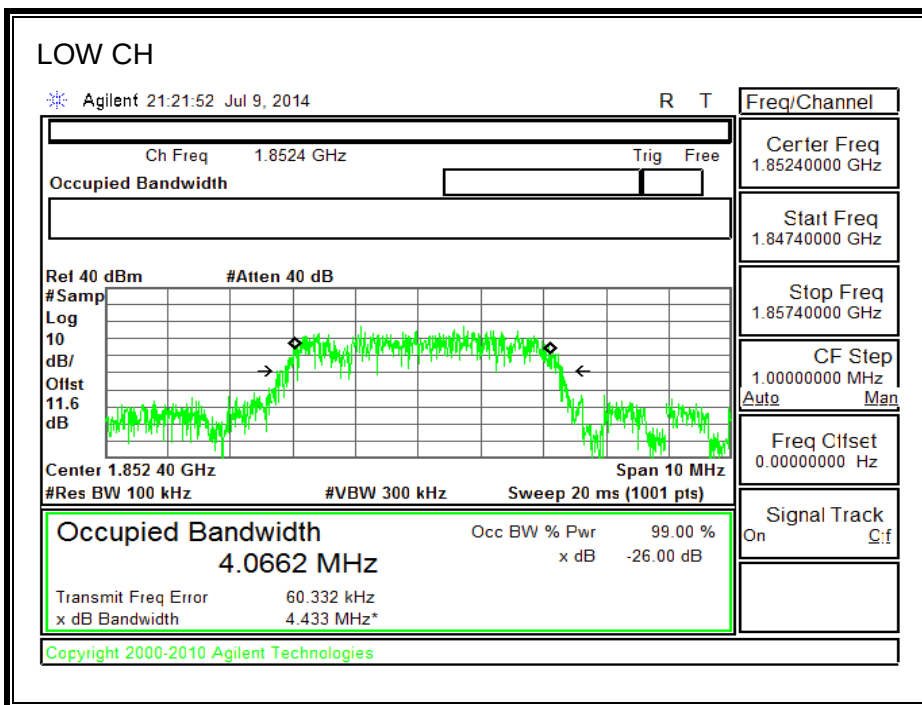
8.1.4. UMTS HSDPA

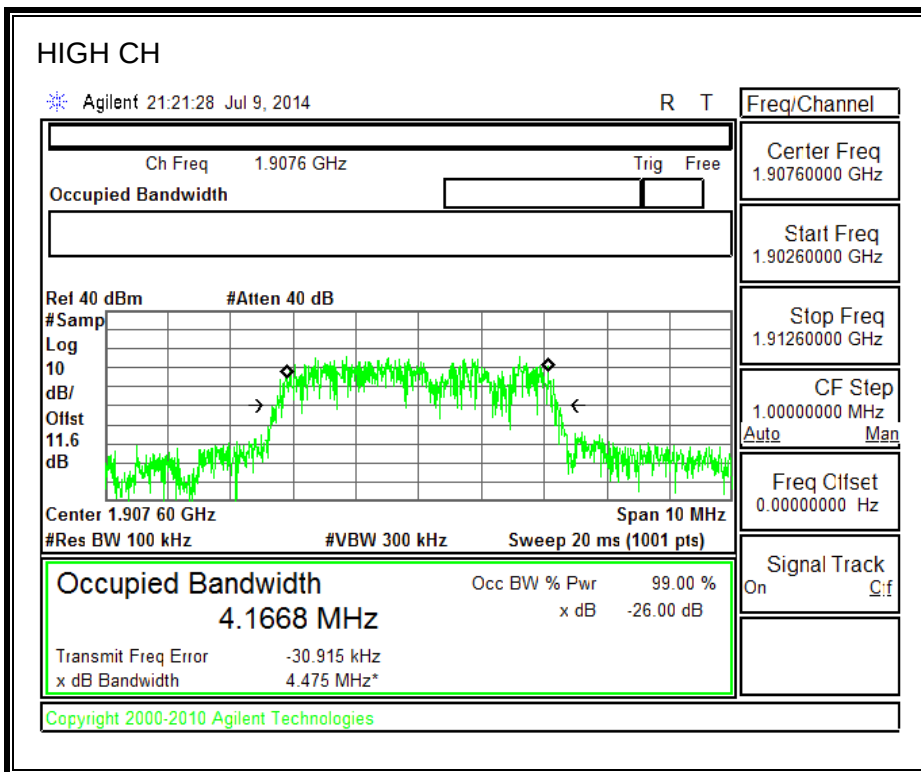
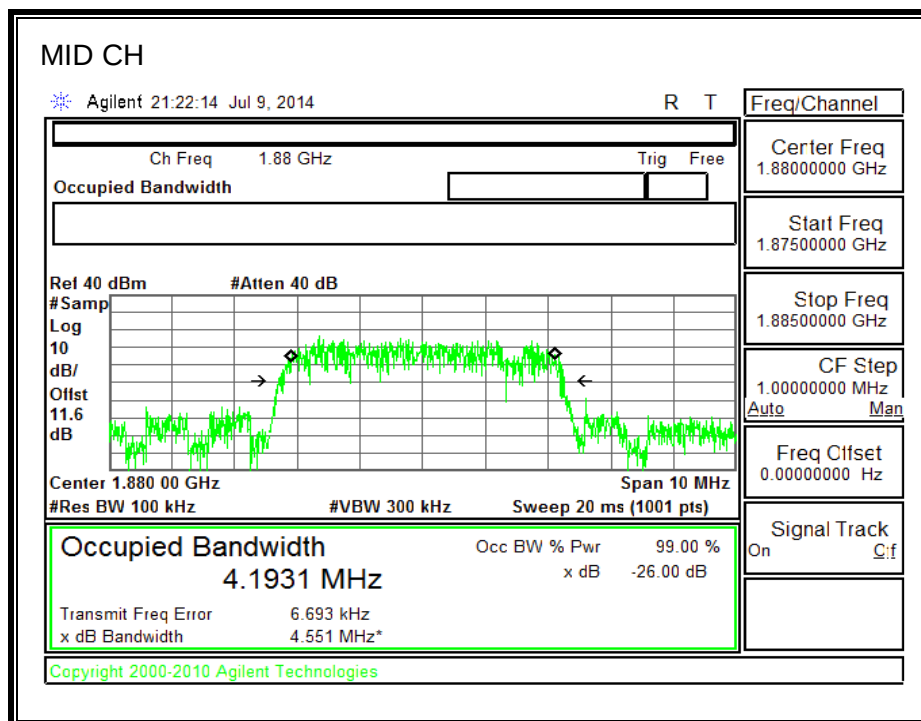
850MHz BAND



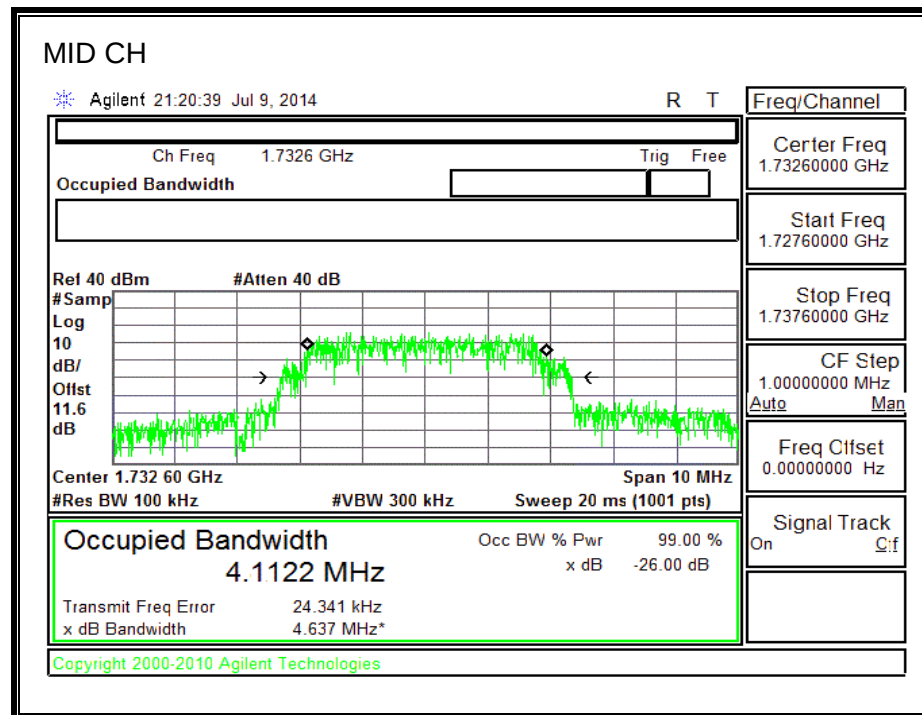
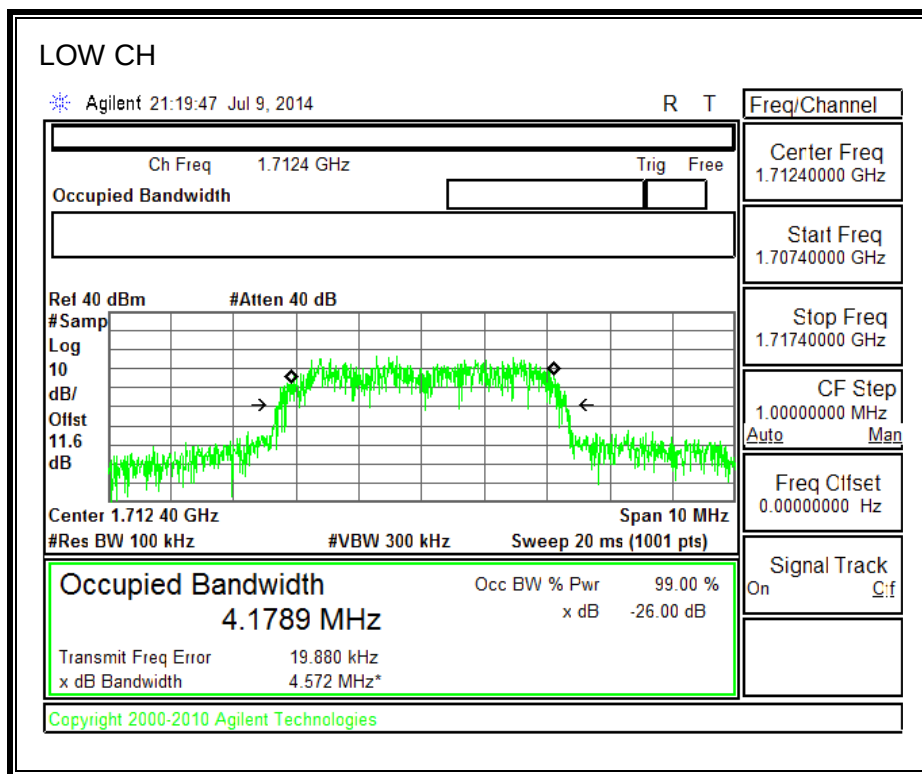


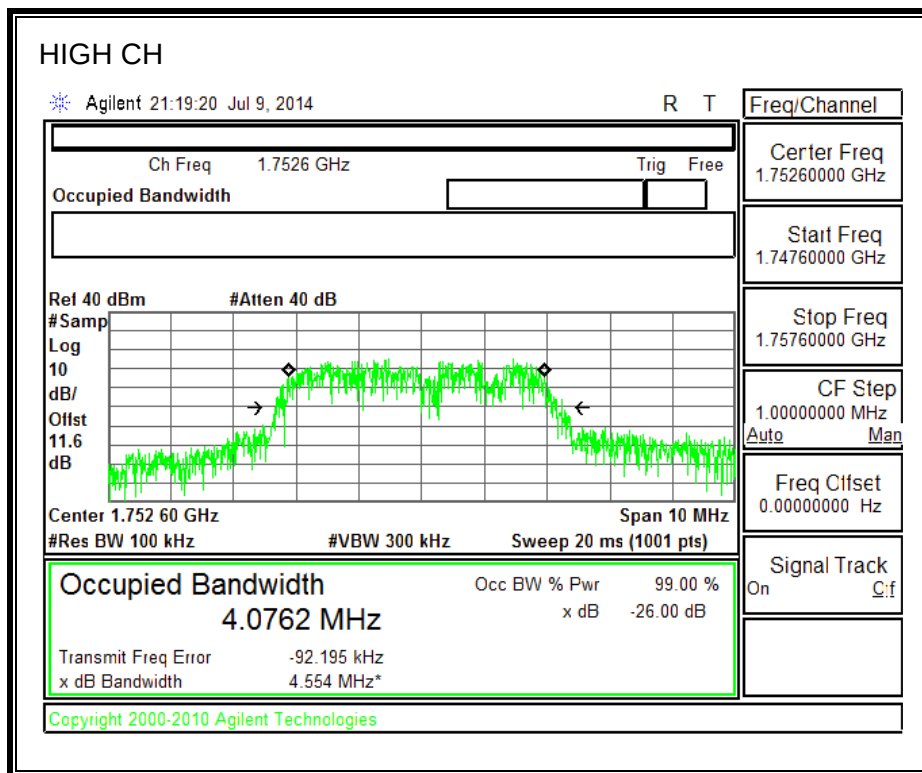
1900MHz BAND





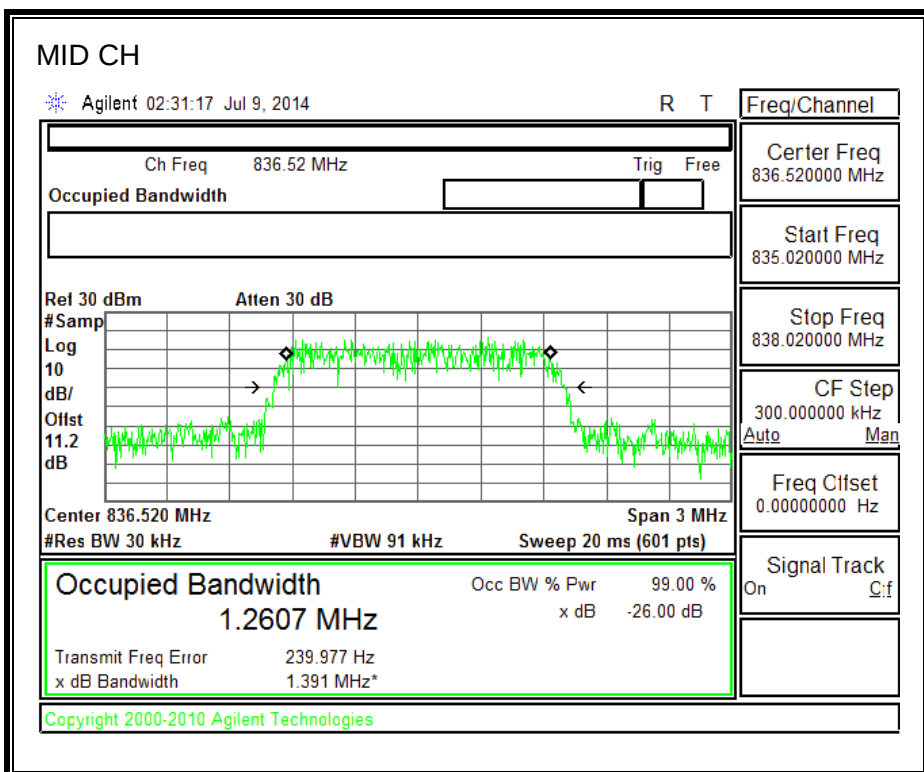
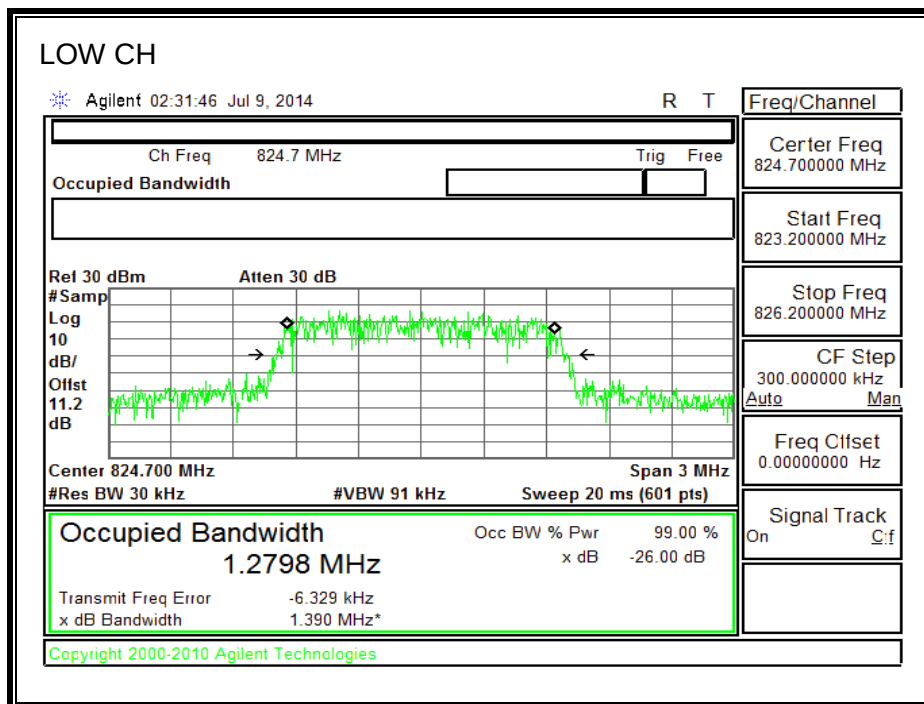
1700MHz BAND

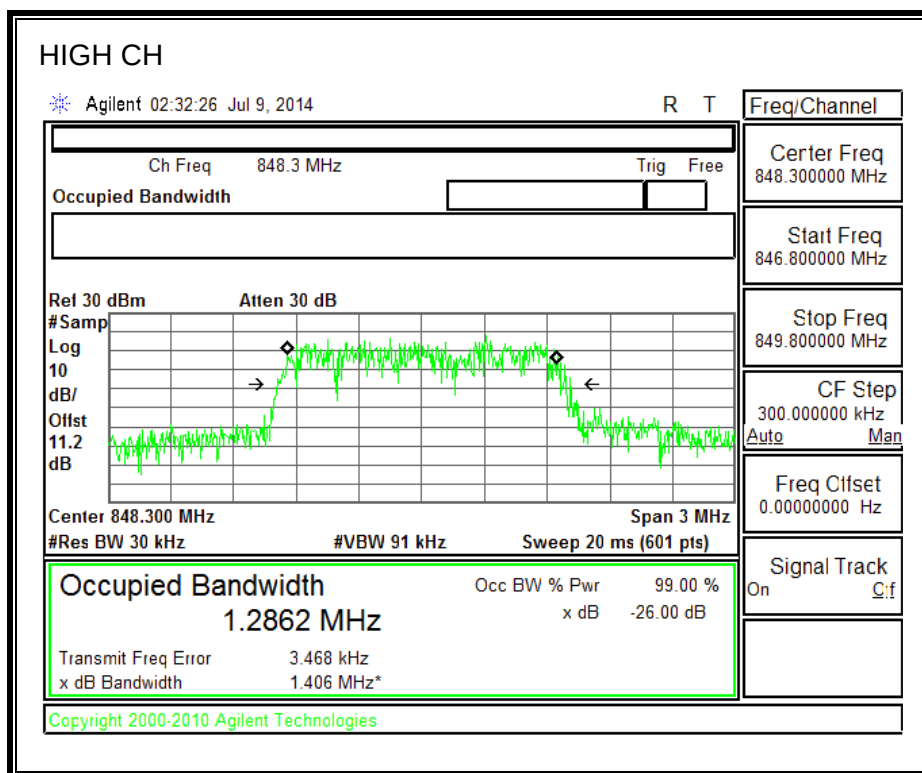




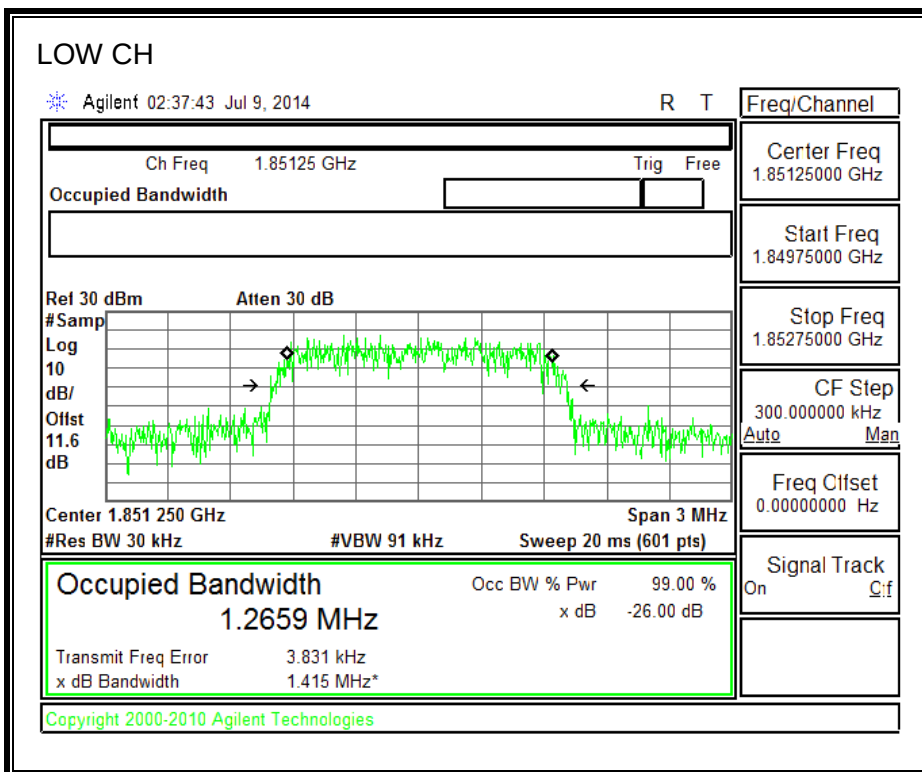
8.1.5. CDMA2000 1xRTT

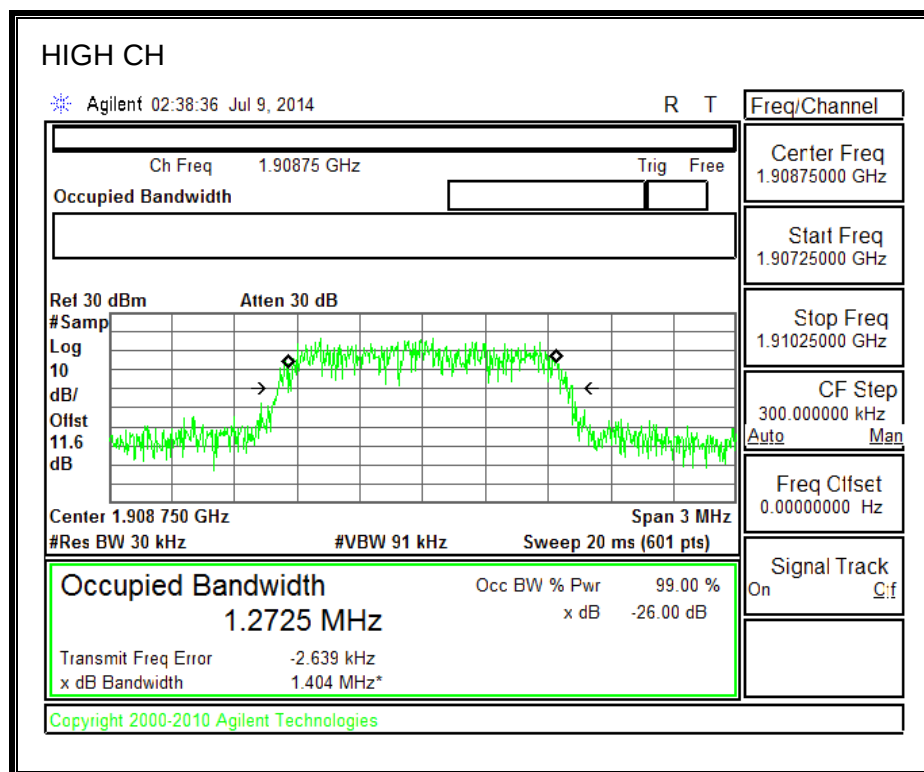
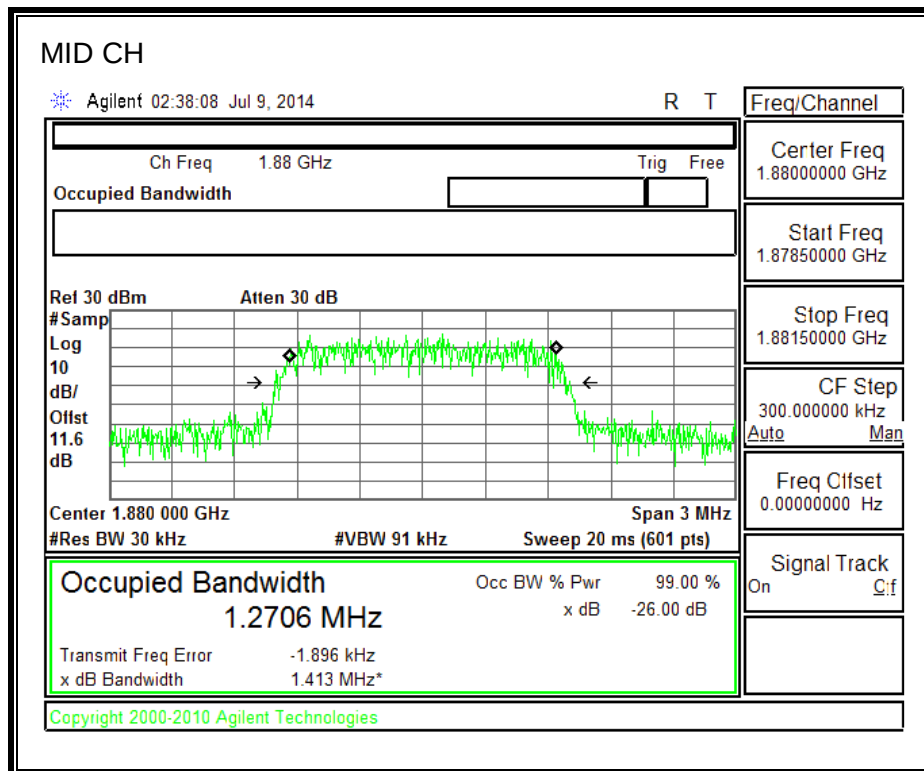
850MHz BAND



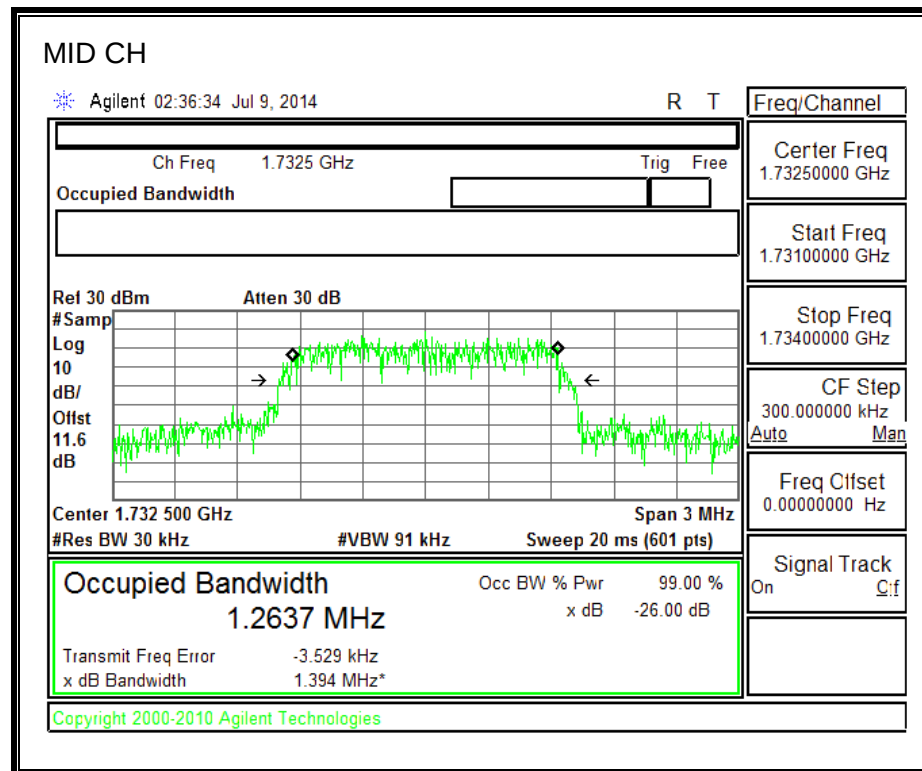
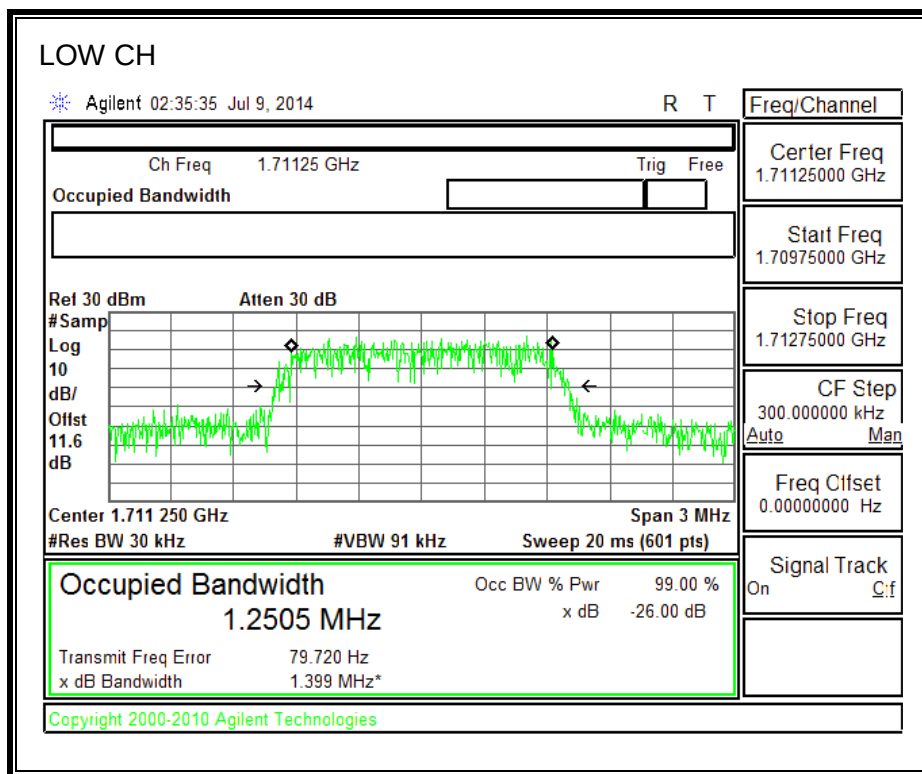


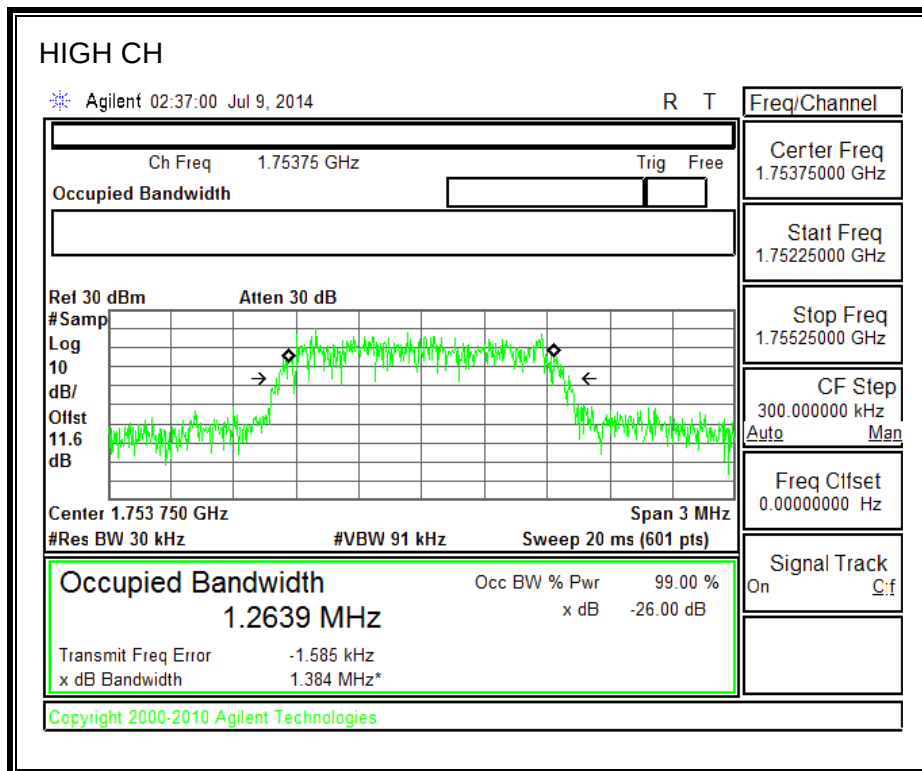
1900MHz BAND



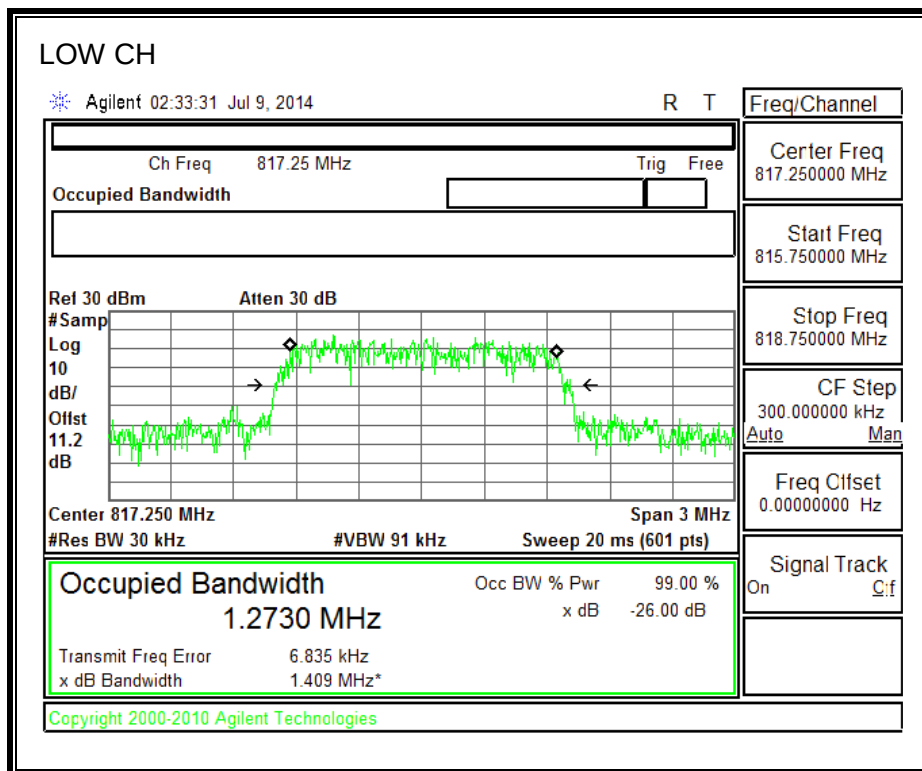


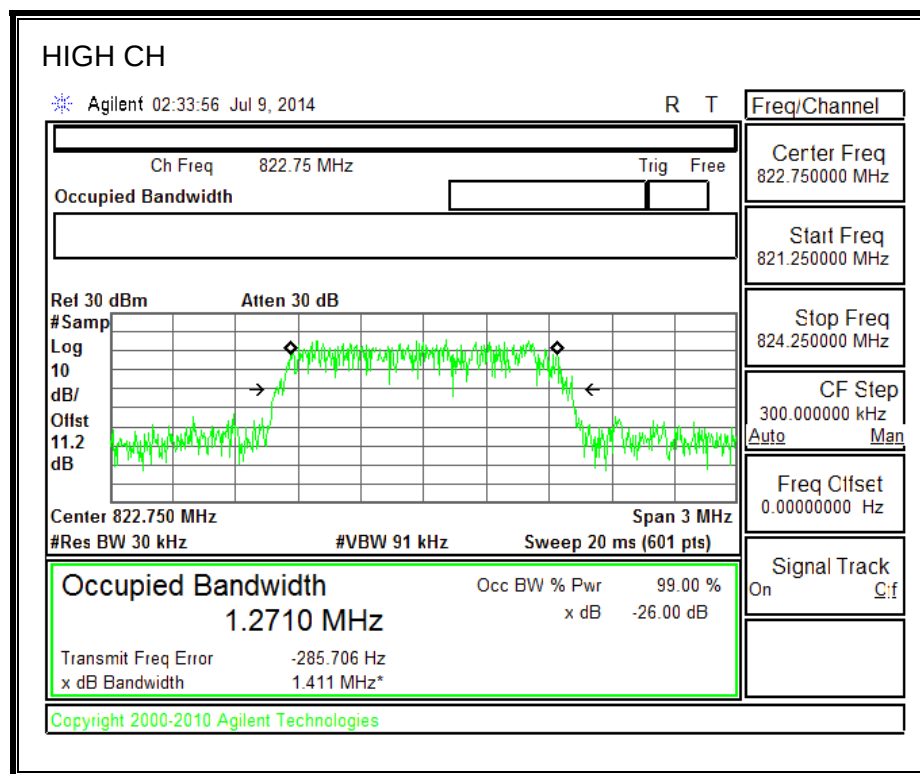
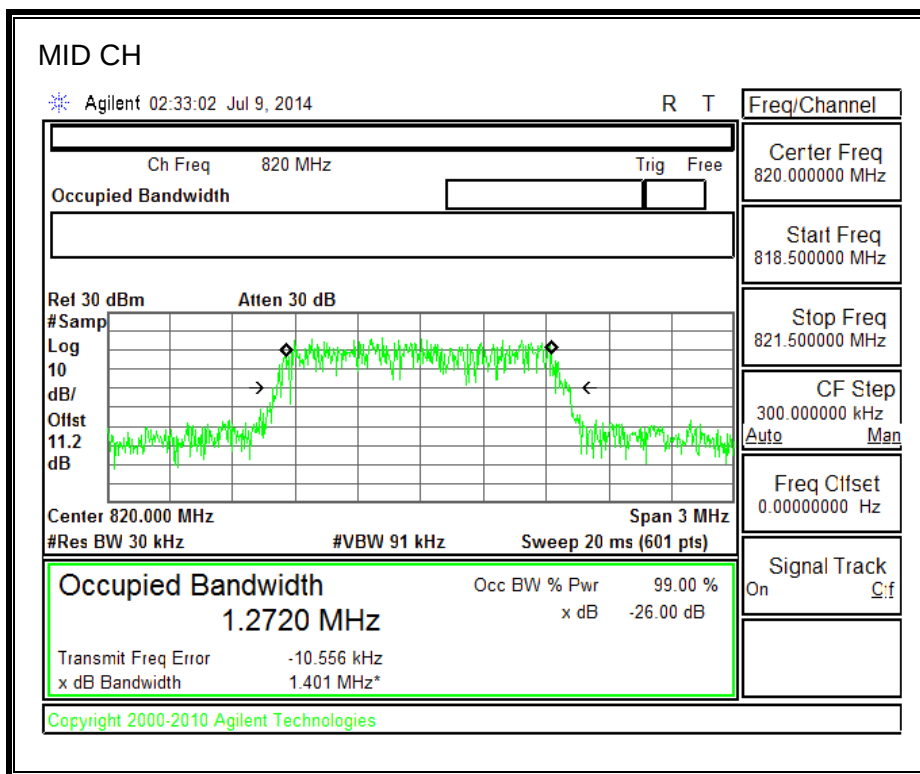
1700MHz BAND





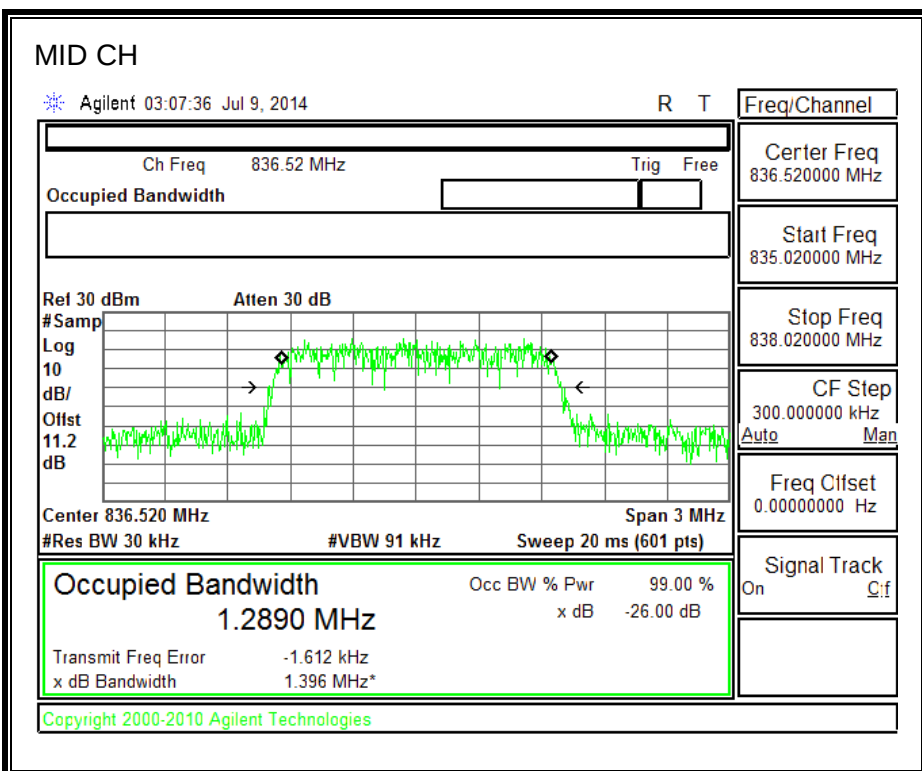
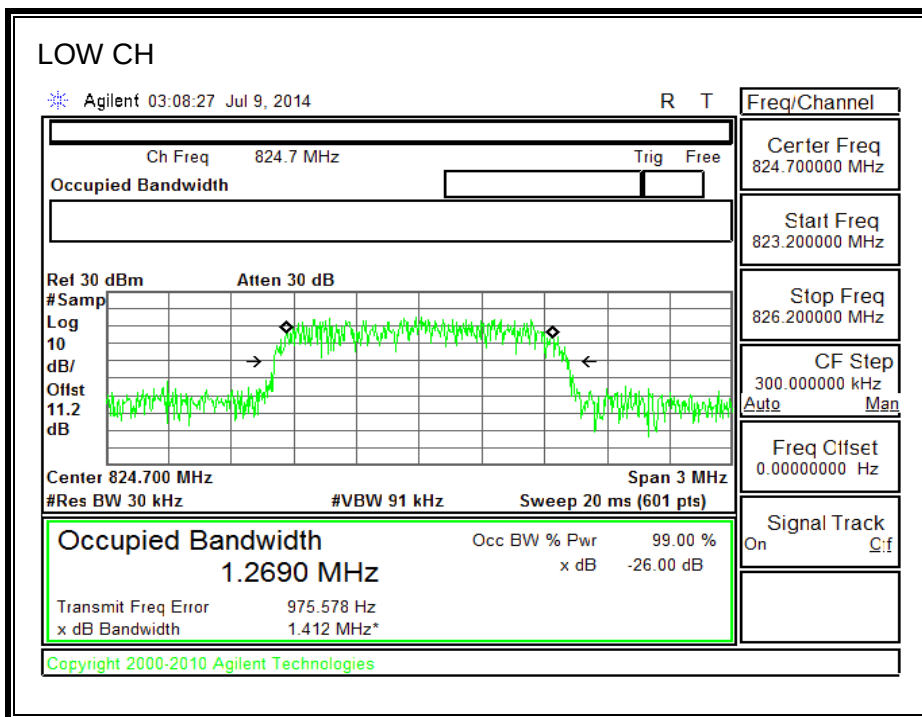
800MHz SECONDARY BAND

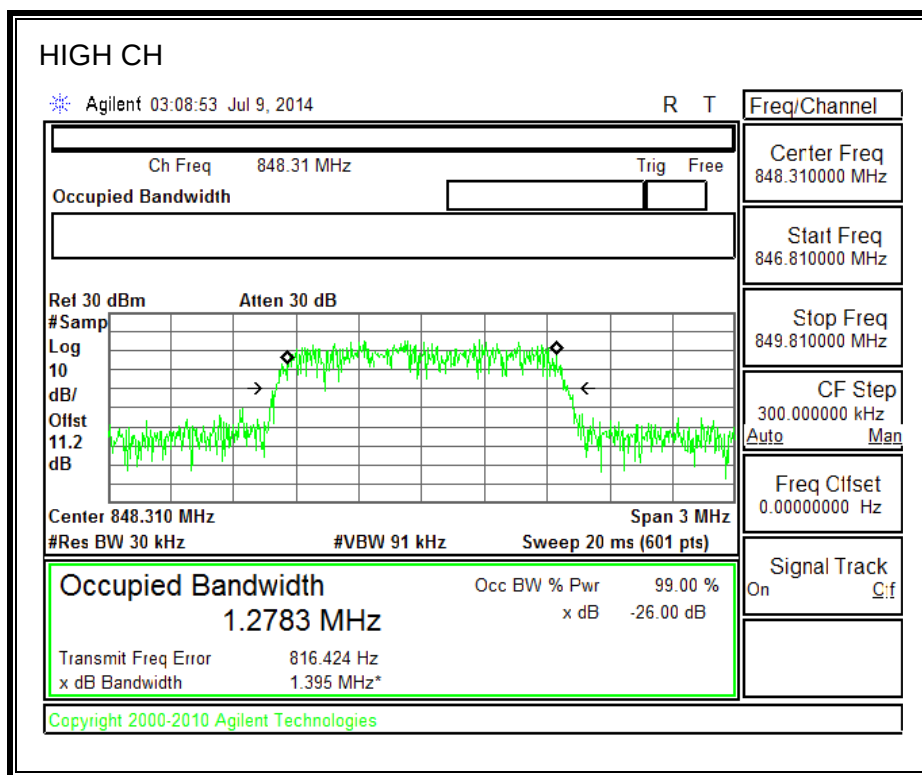




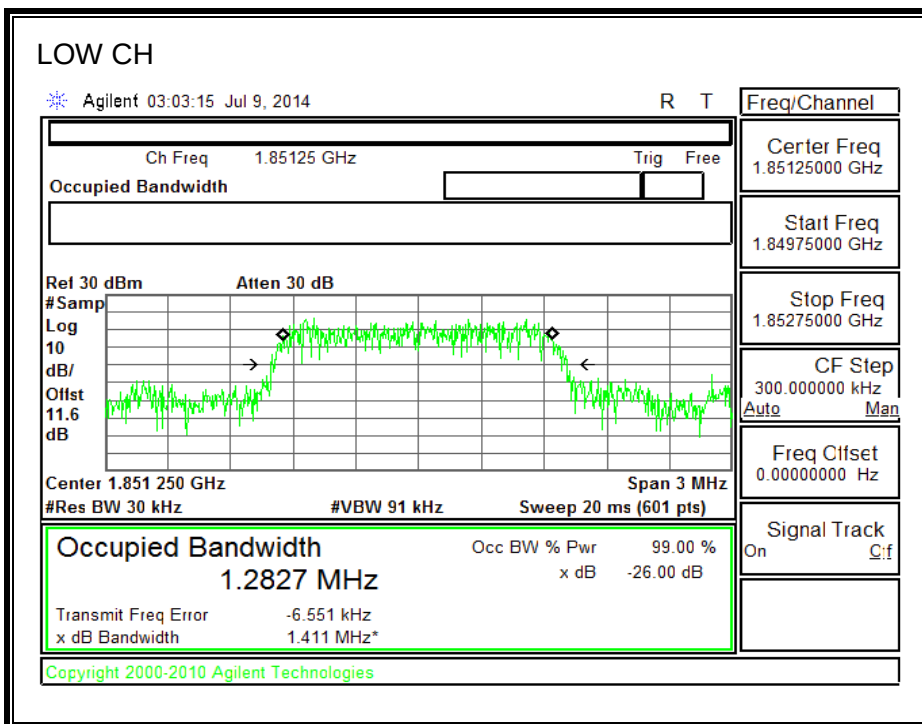
8.1.6. CDMA2000 EVDO Rev. A

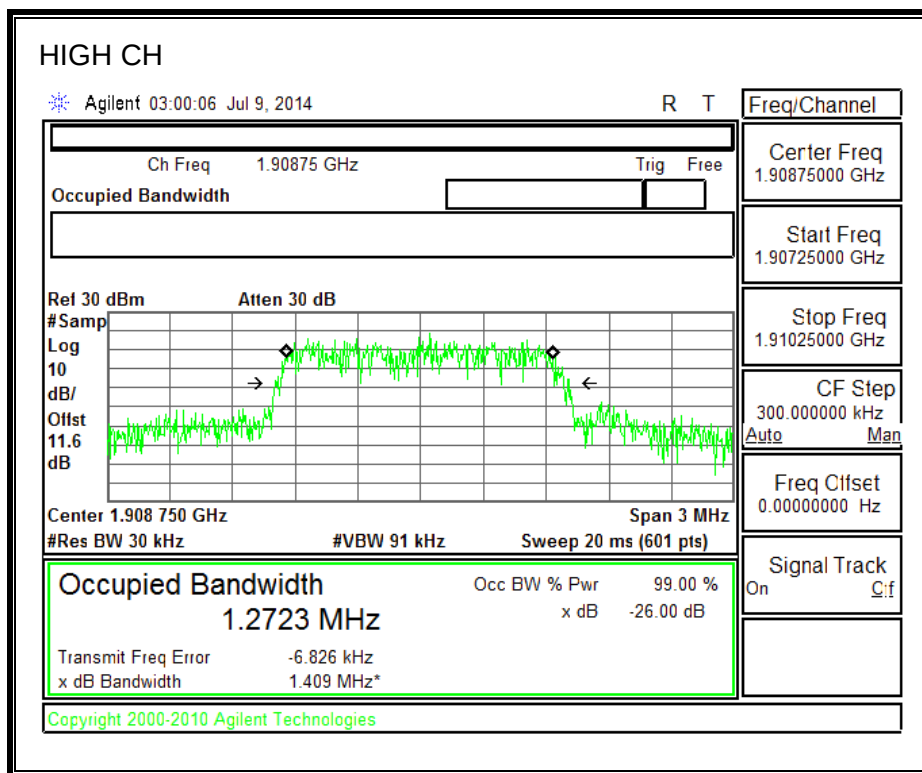
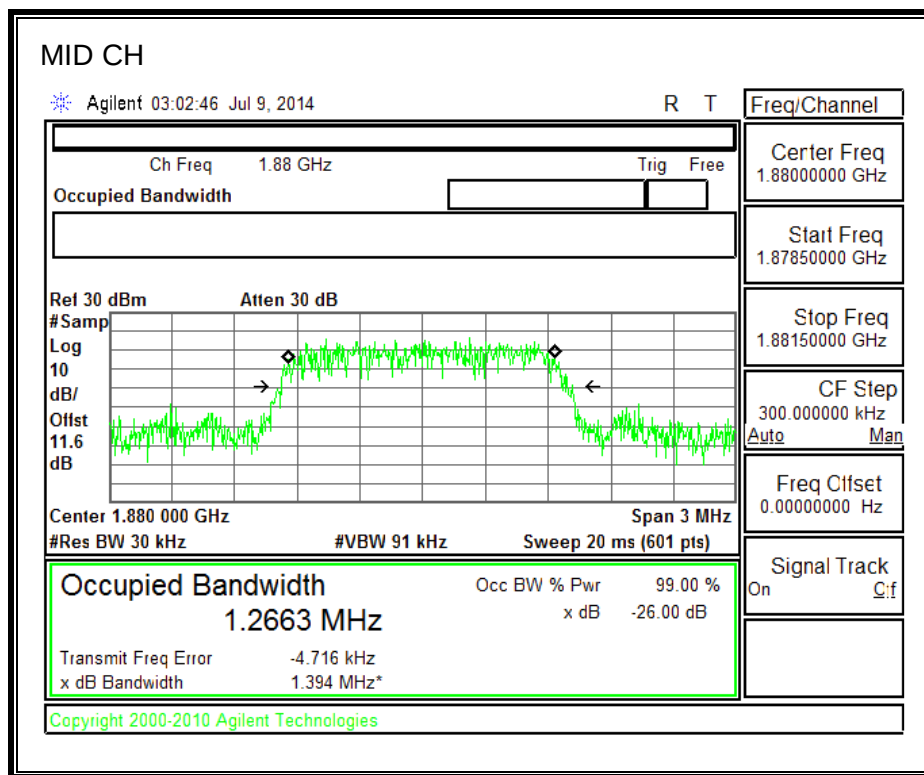
850MHz BAND



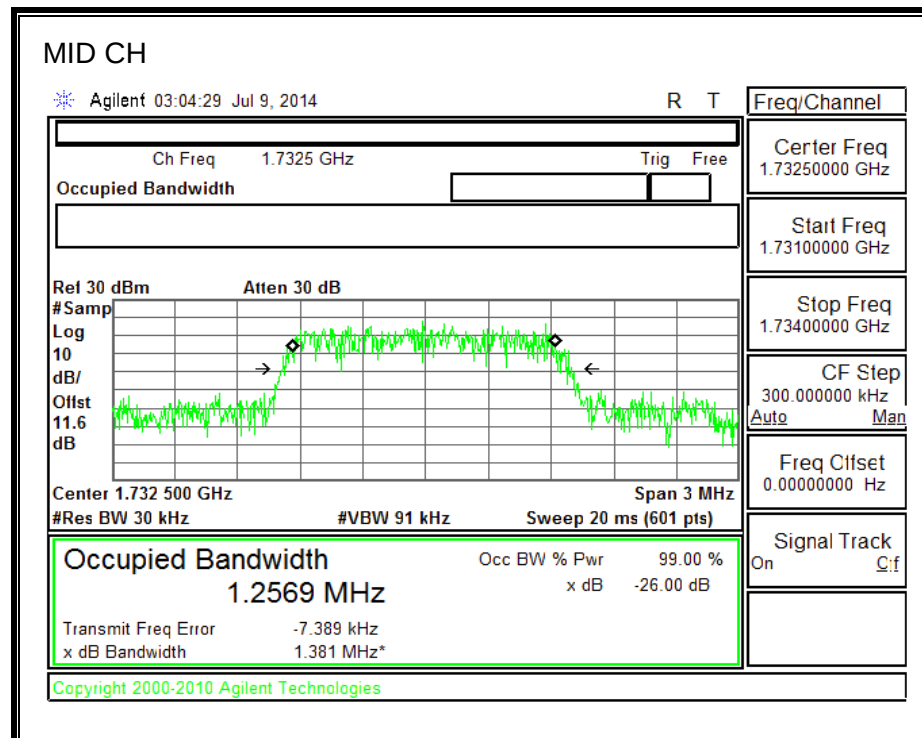
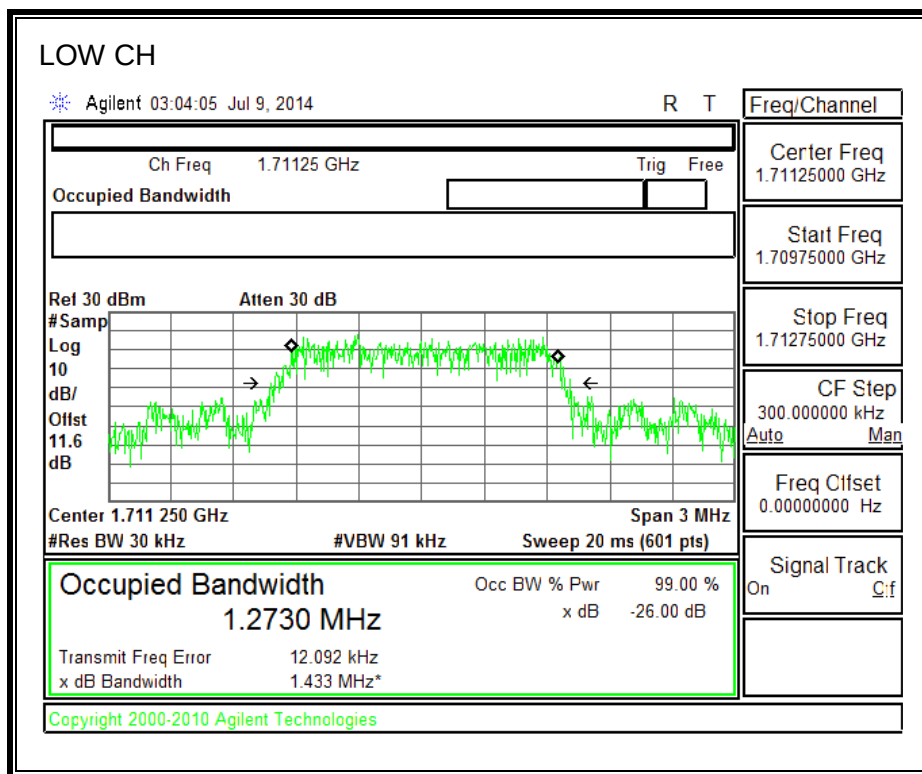


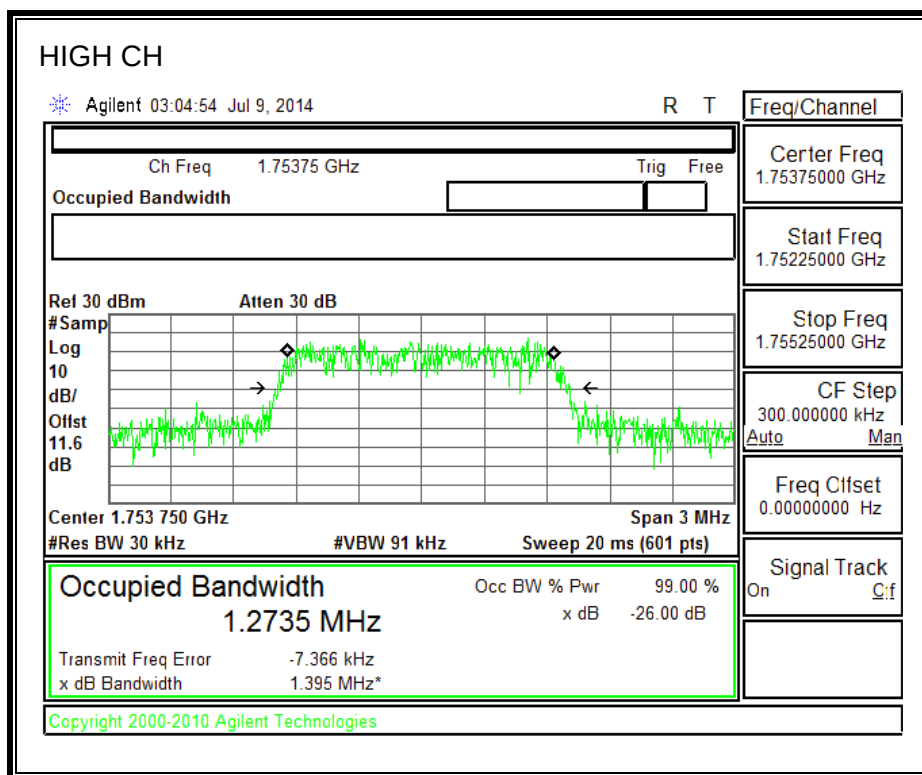
1900MHz BAND



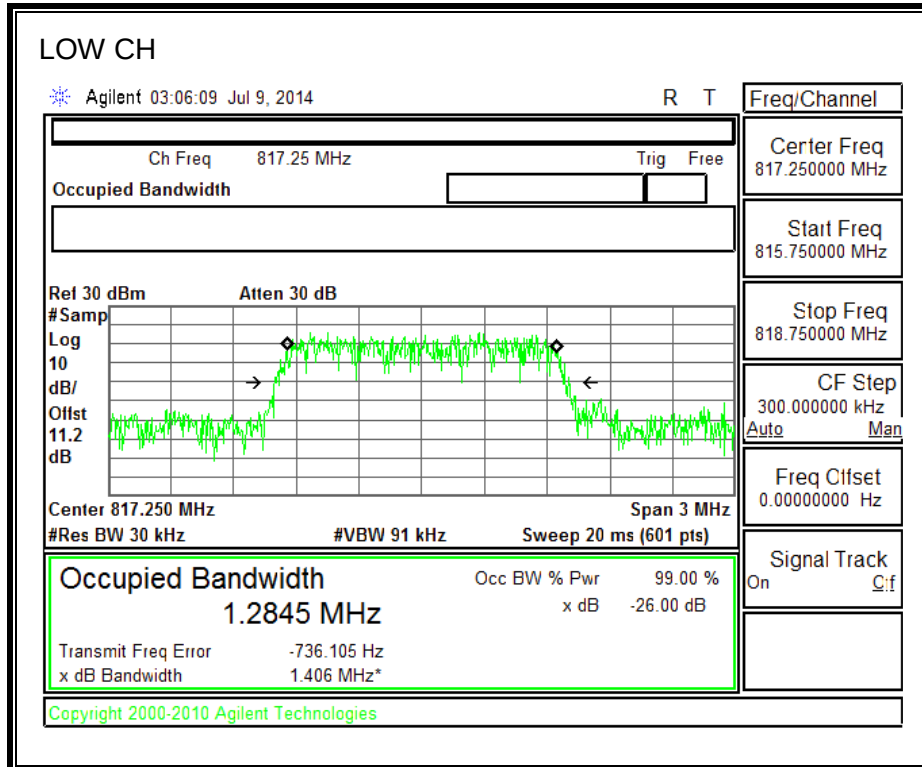


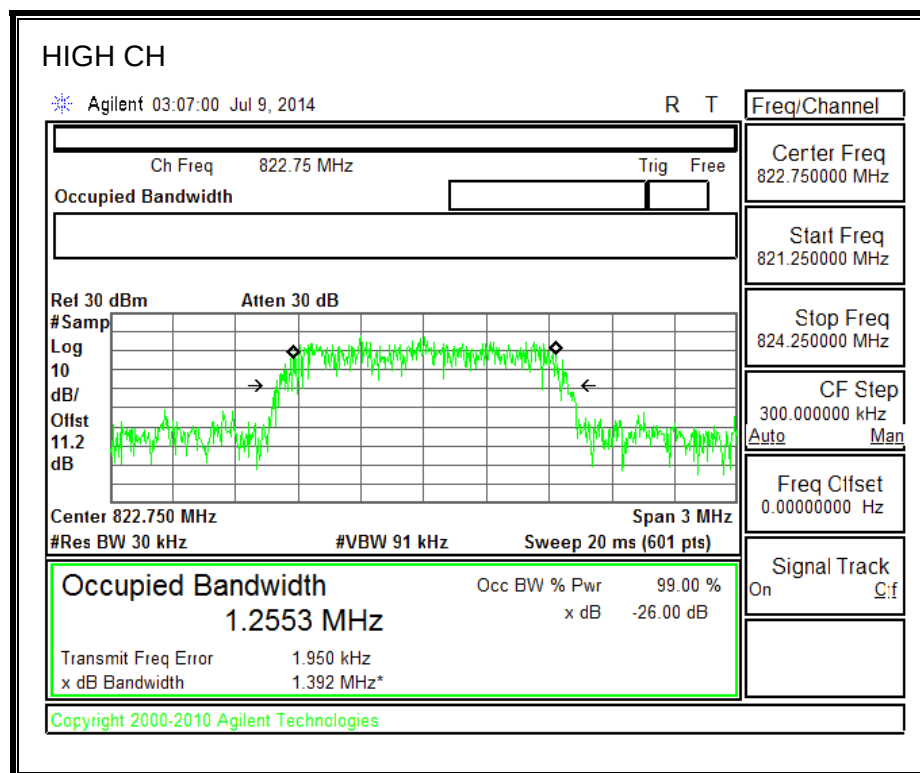
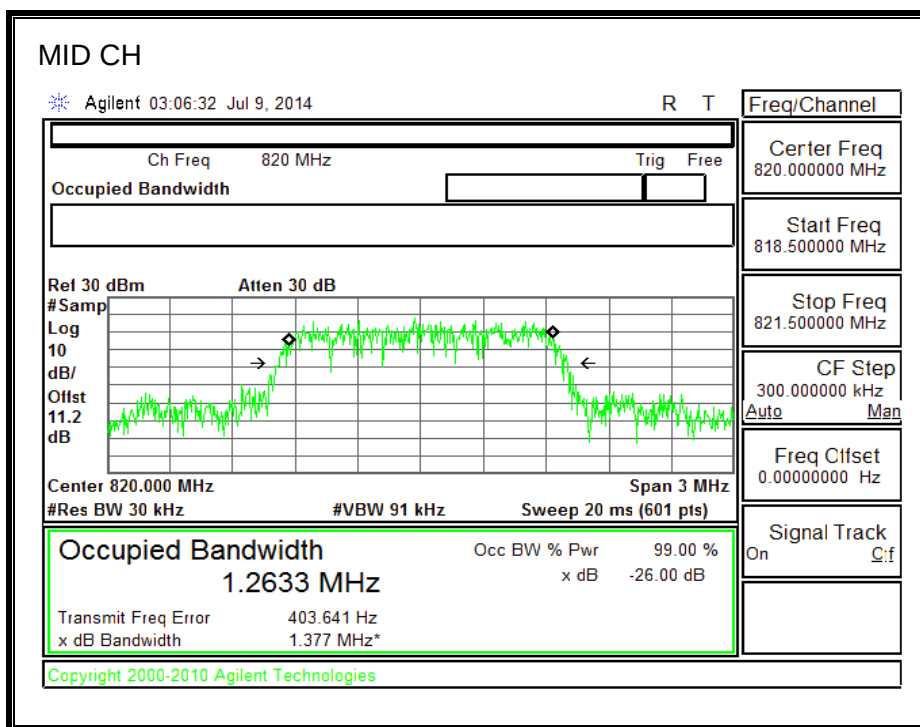
1700MHz BAND





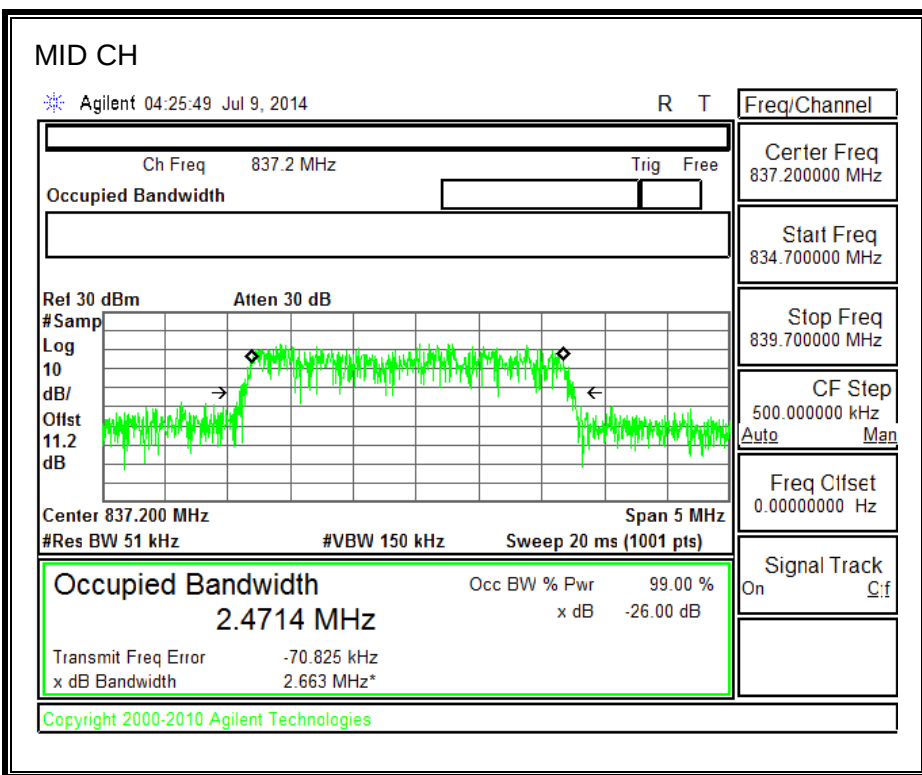
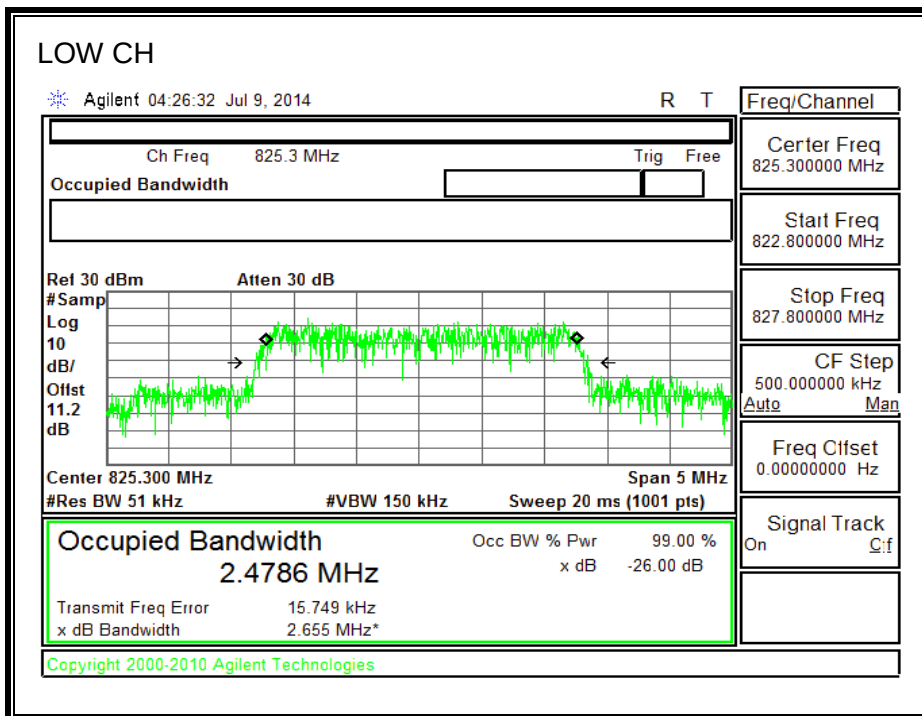
800MHz SECONDARY BAND

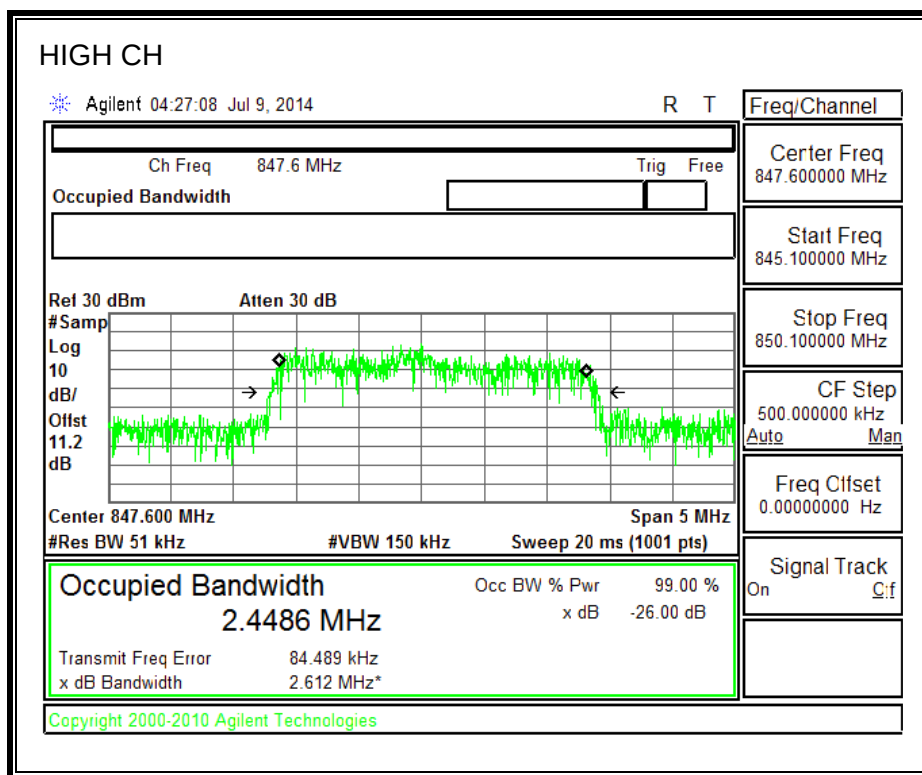




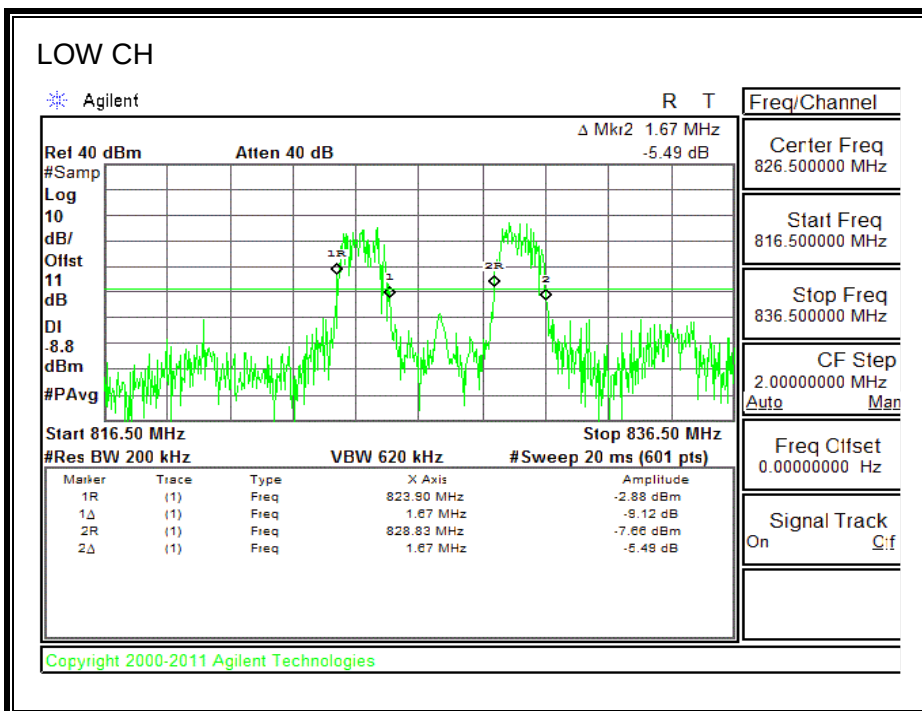
8.1.7. CDMA2000 EVDO Rev. B

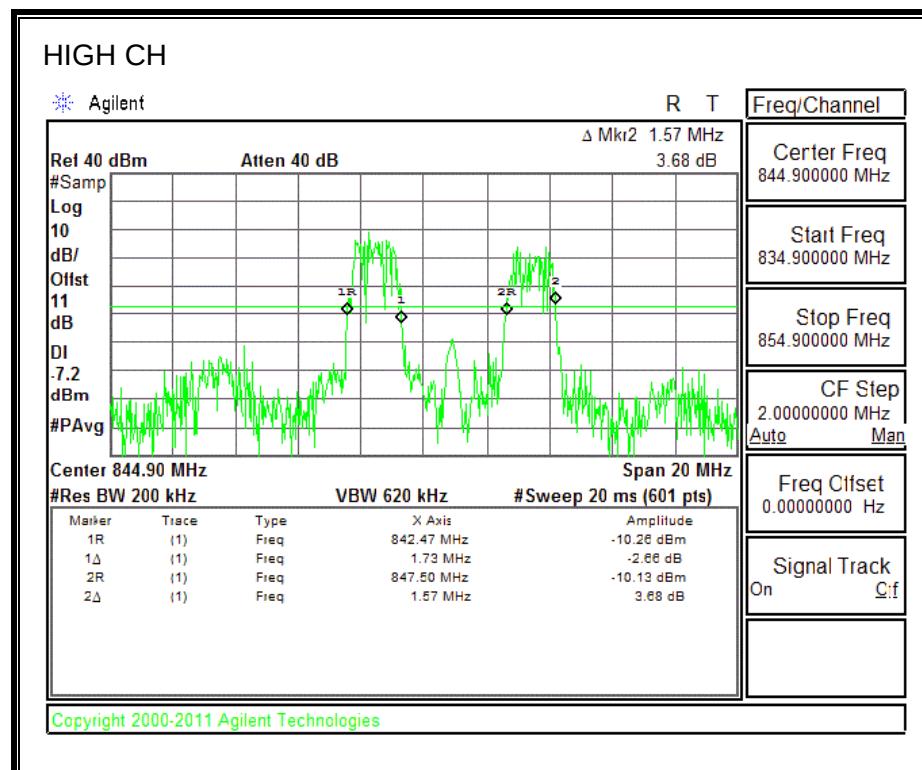
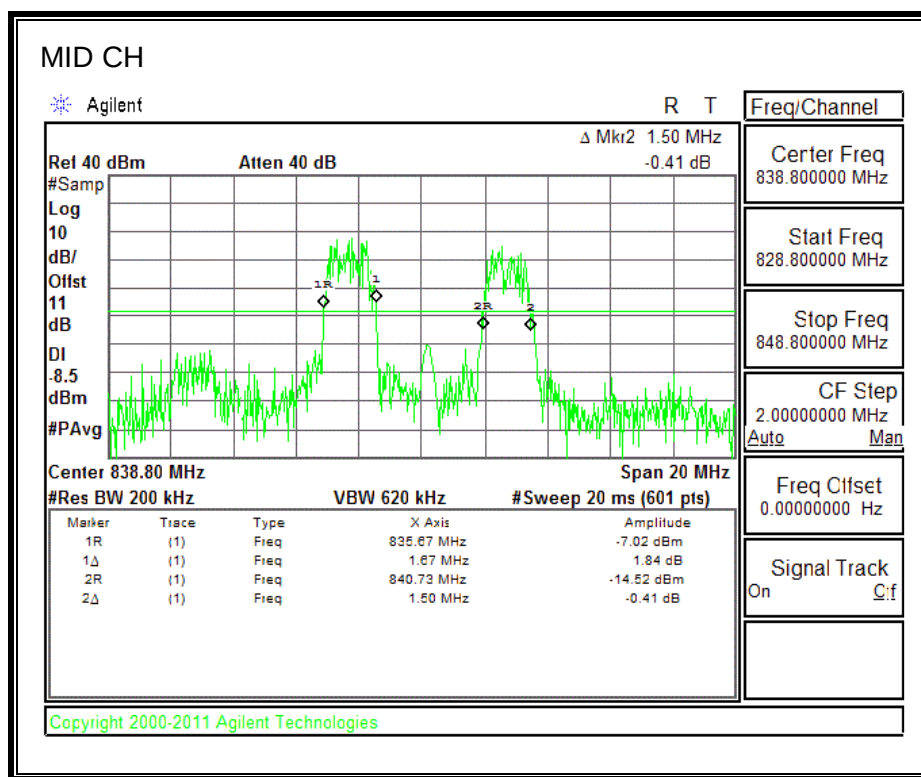
2 CARRIER MIN



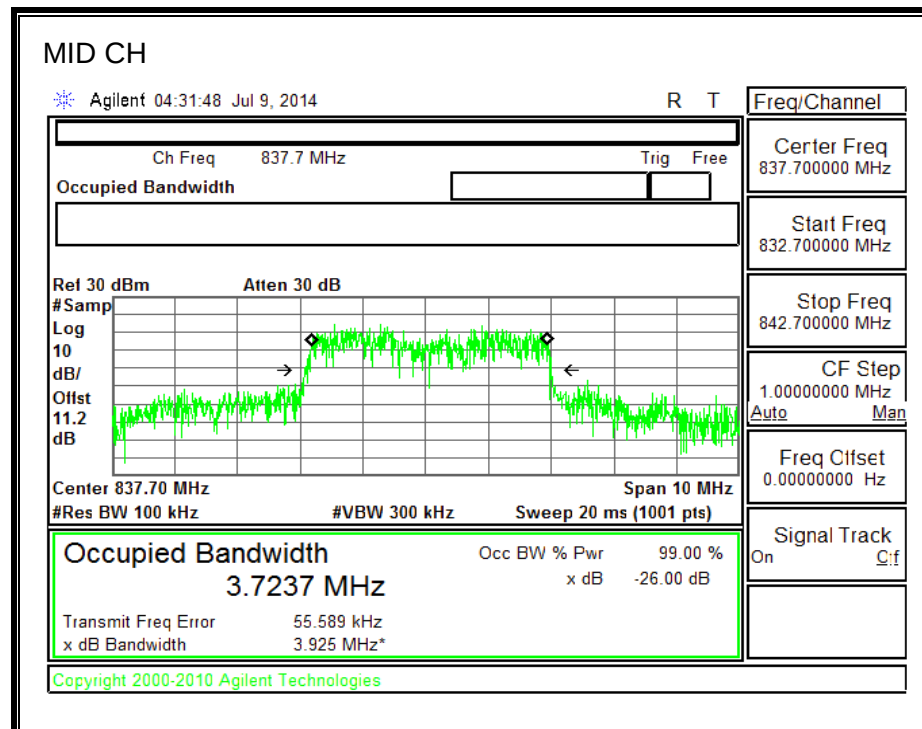
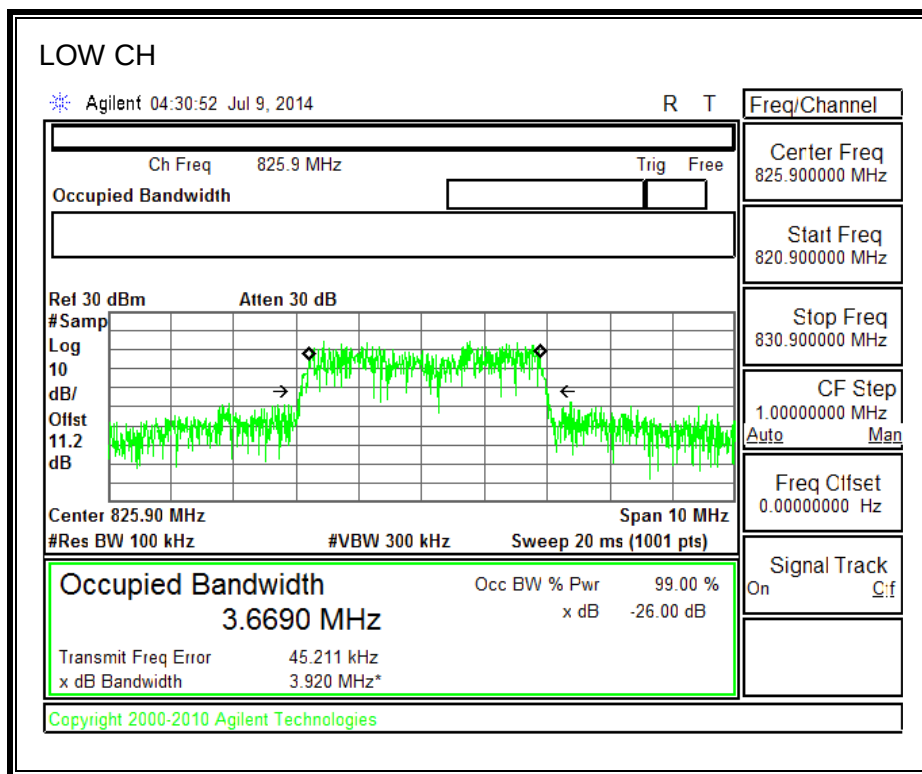


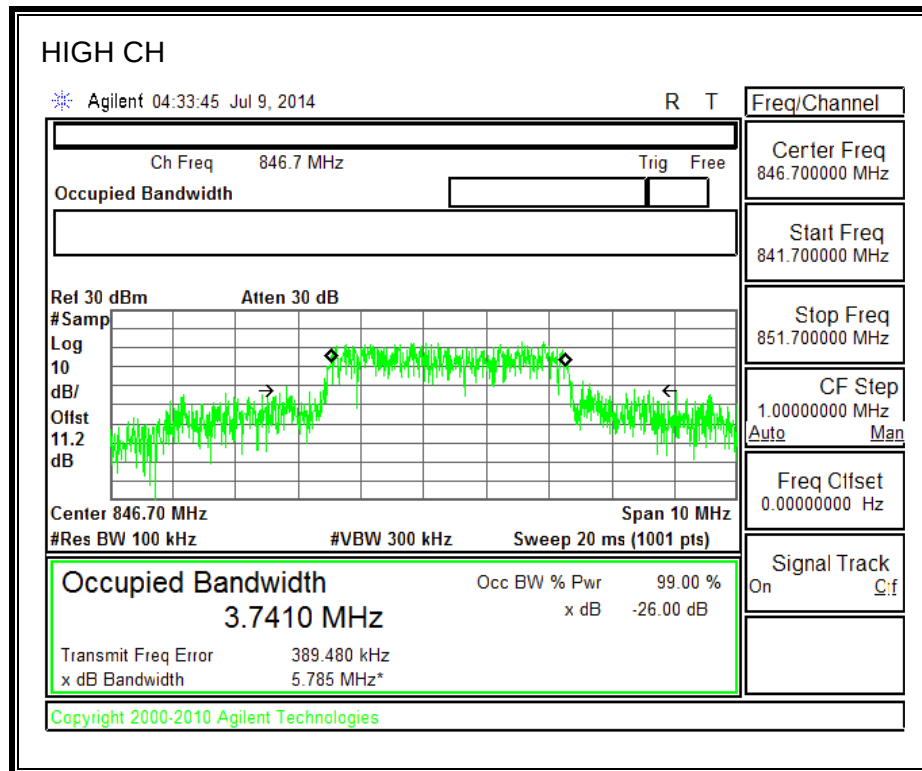
2 CARRIER MAX





3 CARRIER MIN





8.2. BAND EDGE

RULE PART(S)

FCC: §22.359, 24.238 §27.53, § 90.691.

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.

On any frequency outside the 776–788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.

Compliance with the provisions of paragraphs above of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

RULE PART(S) for Emission Mask

FCC: §90.210, and §90.691

(a)(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 $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ 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.

(a)(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 $43 + 10 \log_{10}(P)$ 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. {NOTE: Use 100 kHz reference bandwidth}

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, 849, 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.

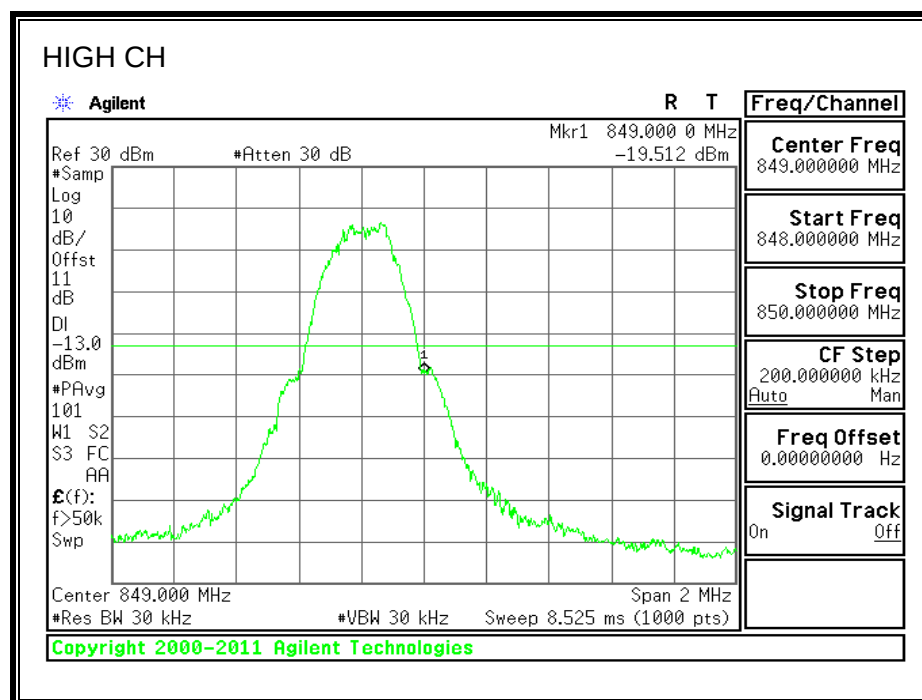
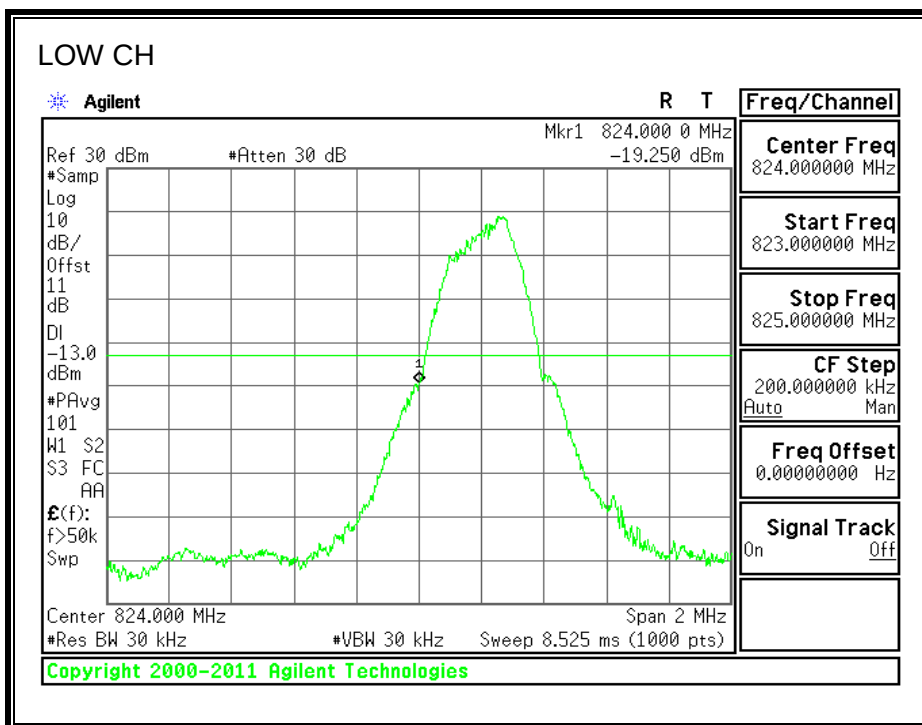
MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99 and HSDPA
- CDMA2000, BC0, BC1, BC10 and BC15

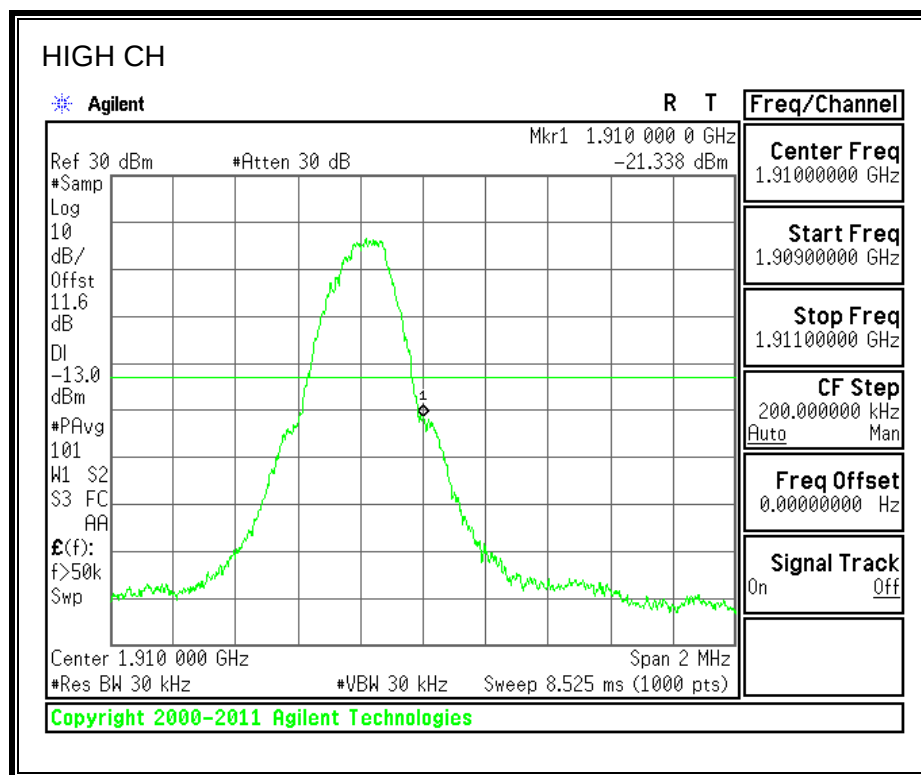
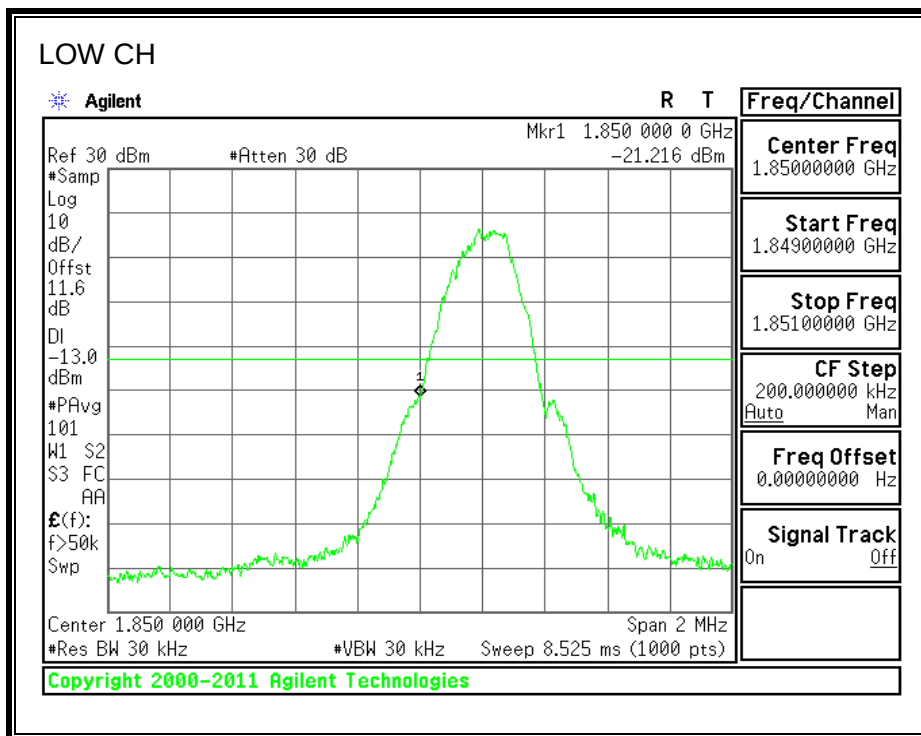
RESULTS

8.2.1. GSM-GPRS

850MHz BAND

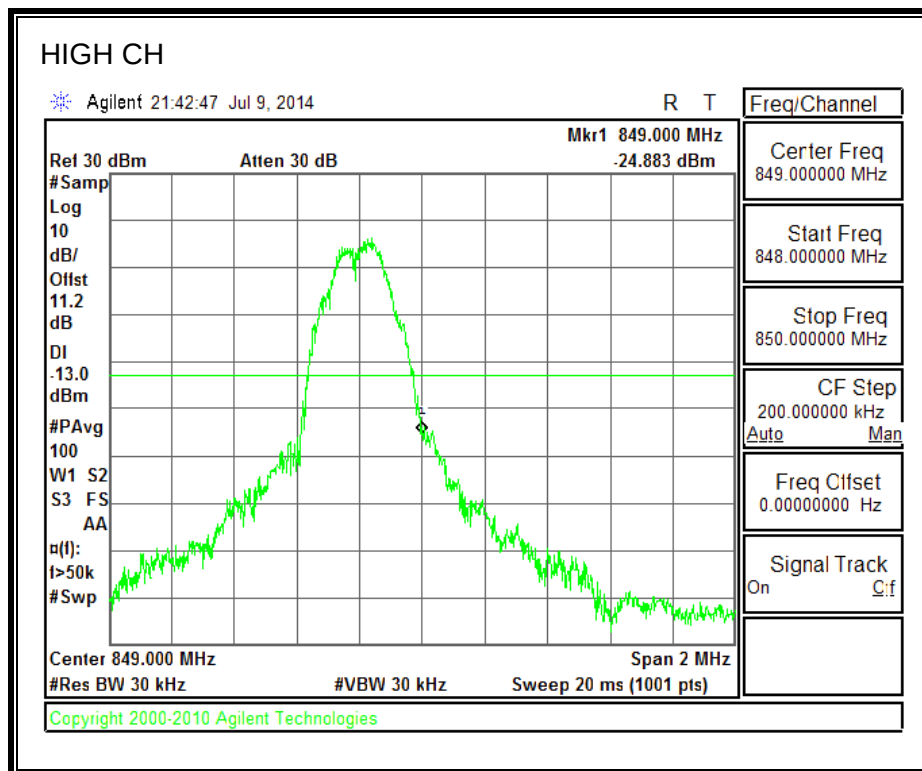
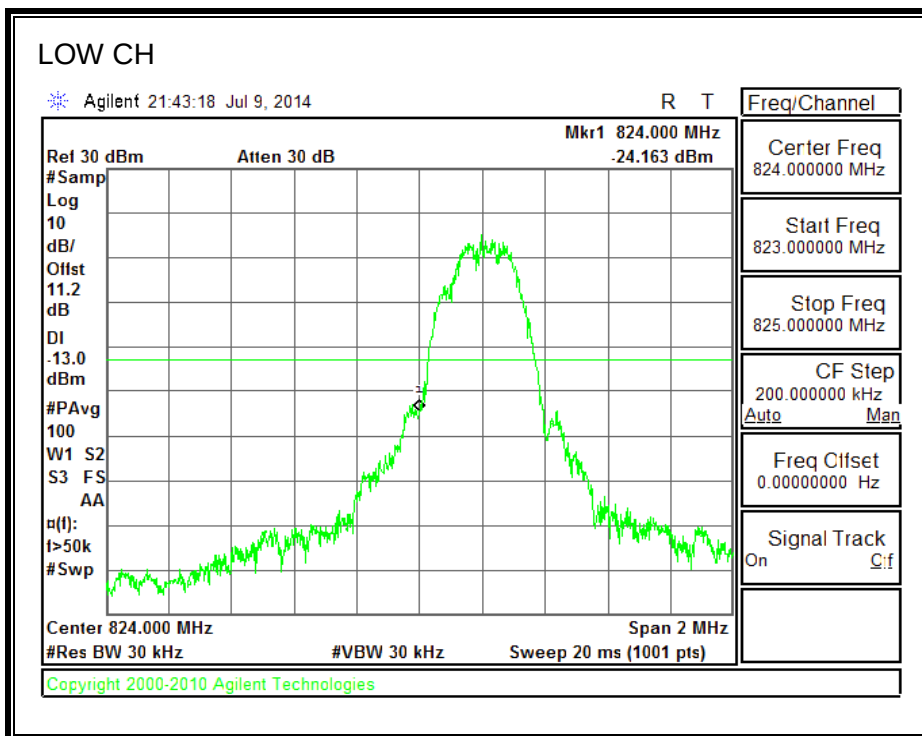


1900MHz BAND

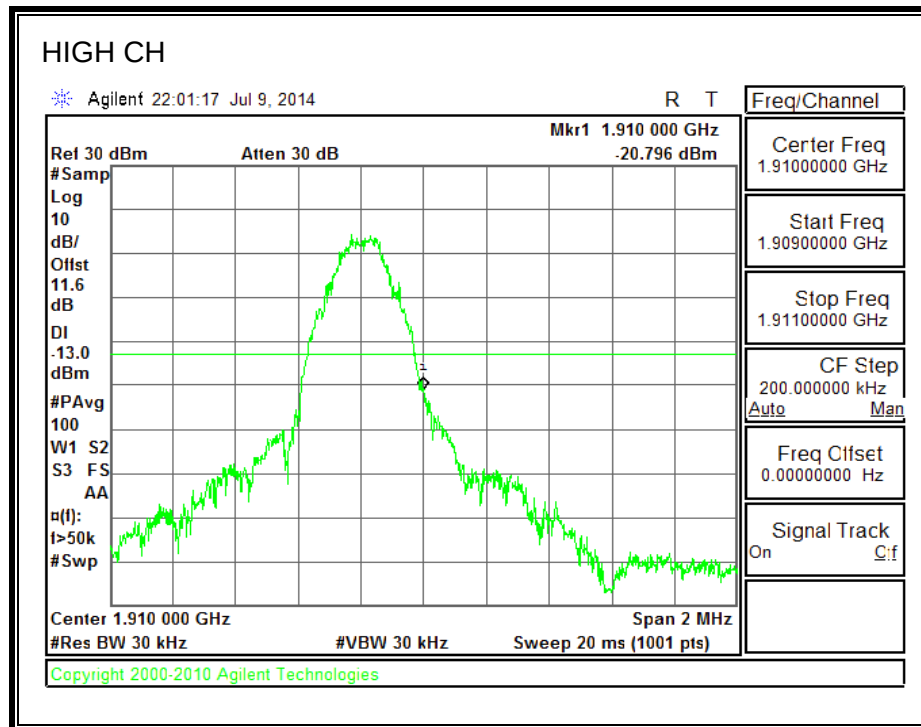
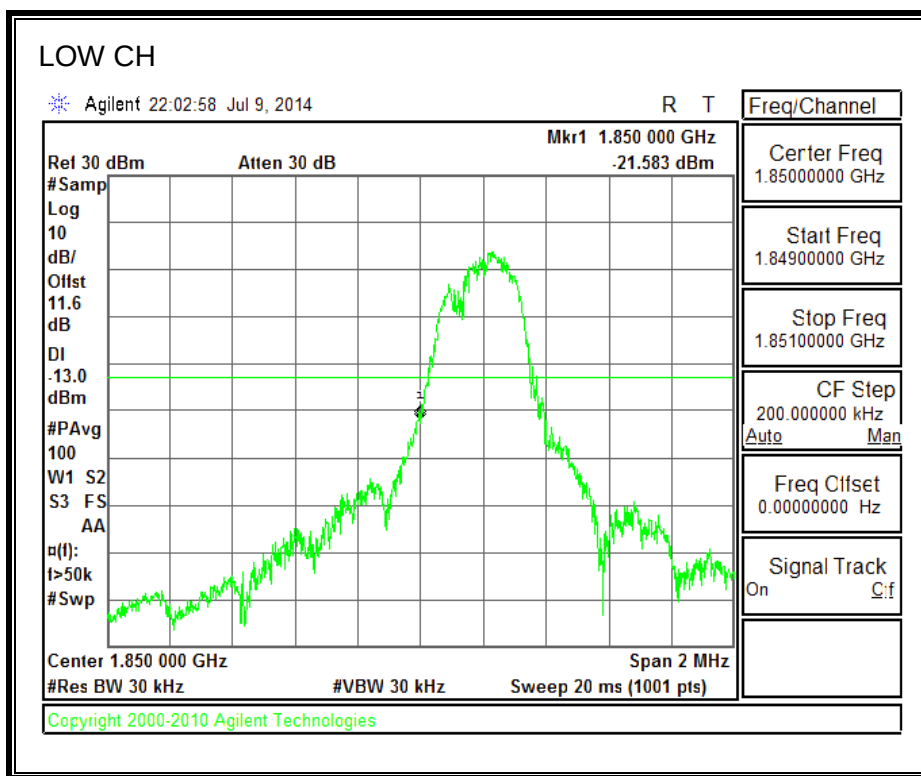


8.2.2. GSM-EGPRS

850MHz BAND

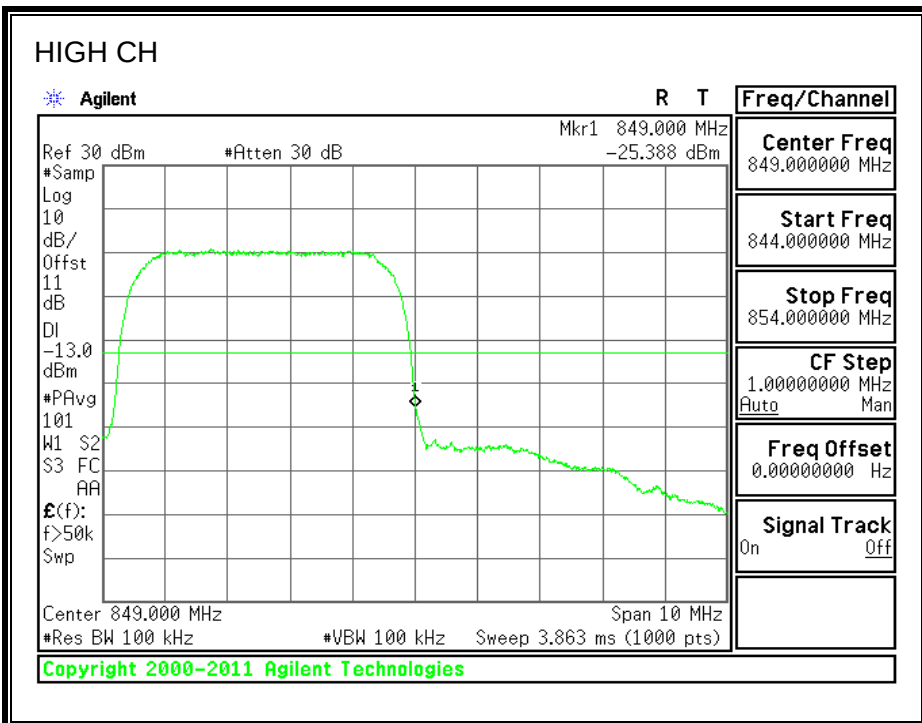
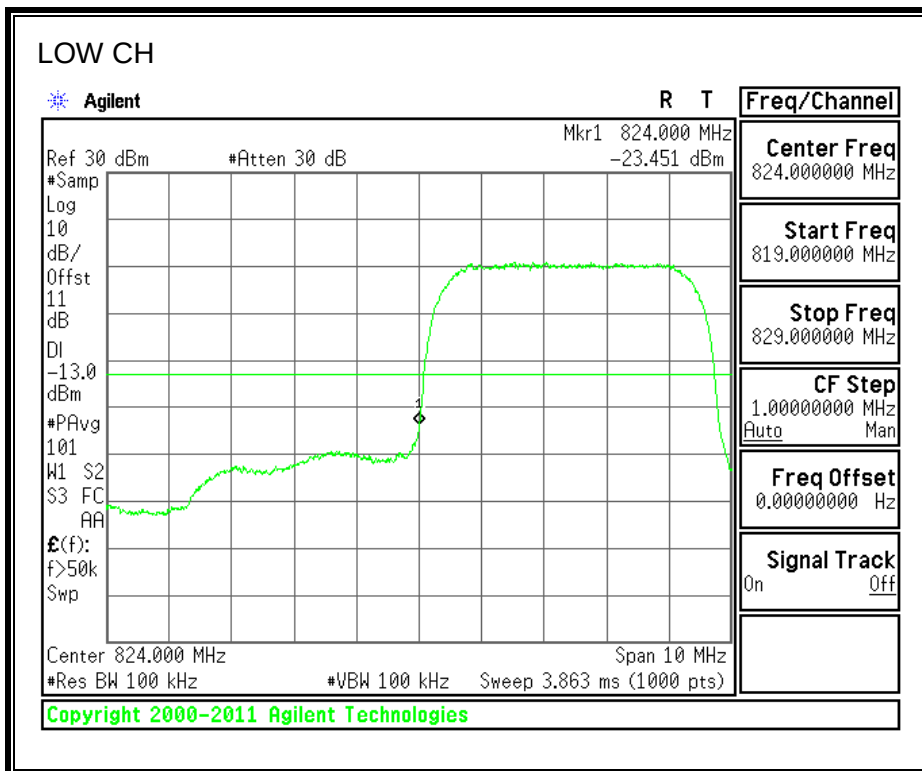


1900MHz BAND

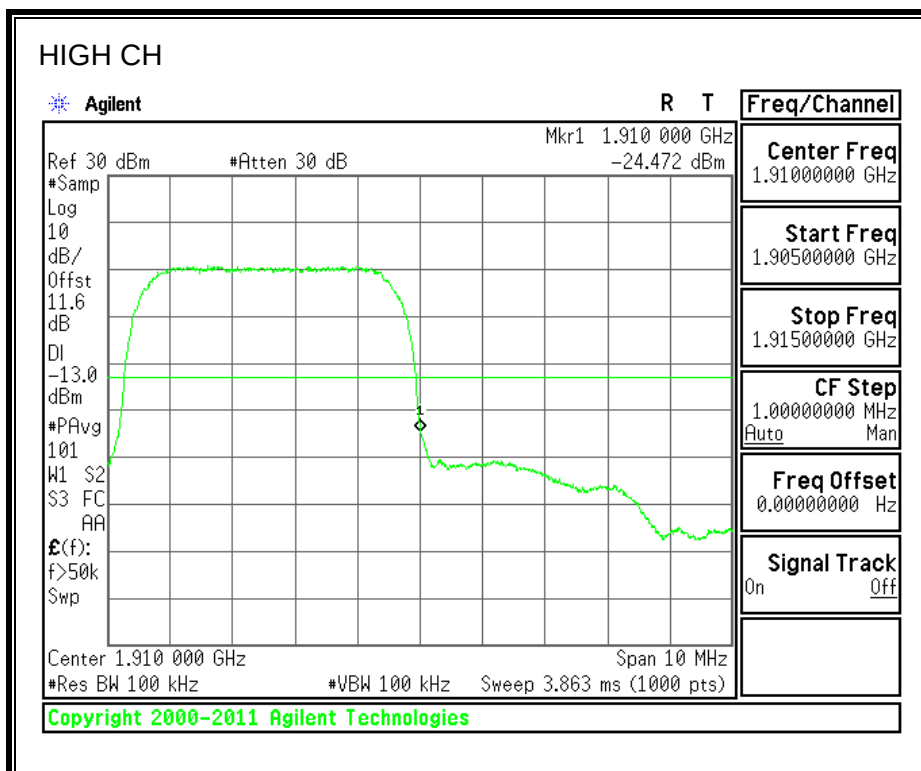
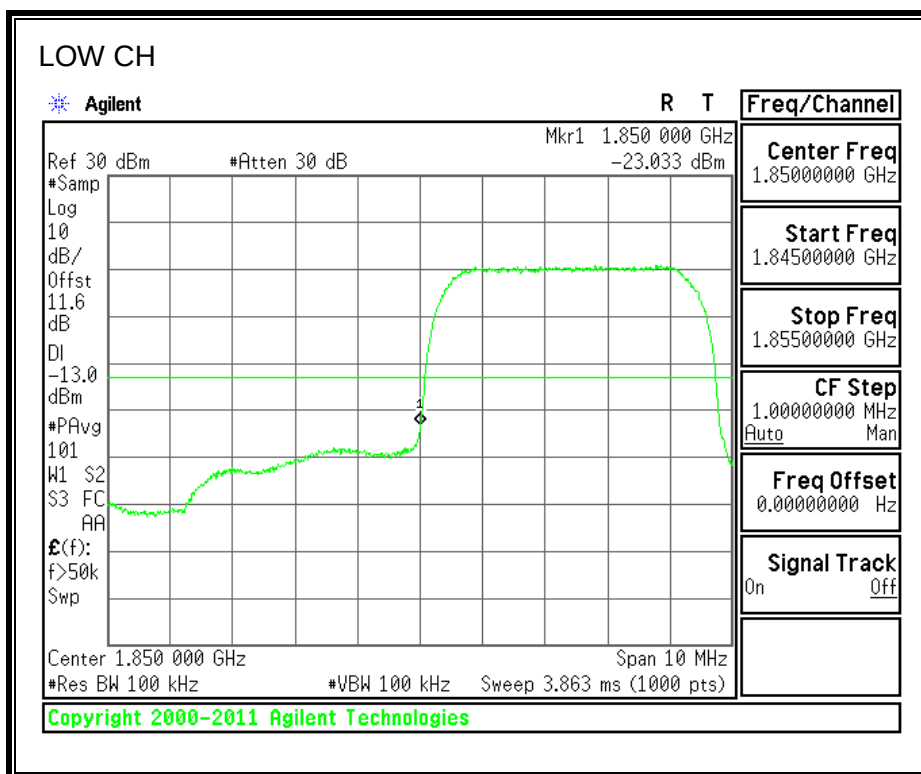


8.2.3. UMTS Rel. 99

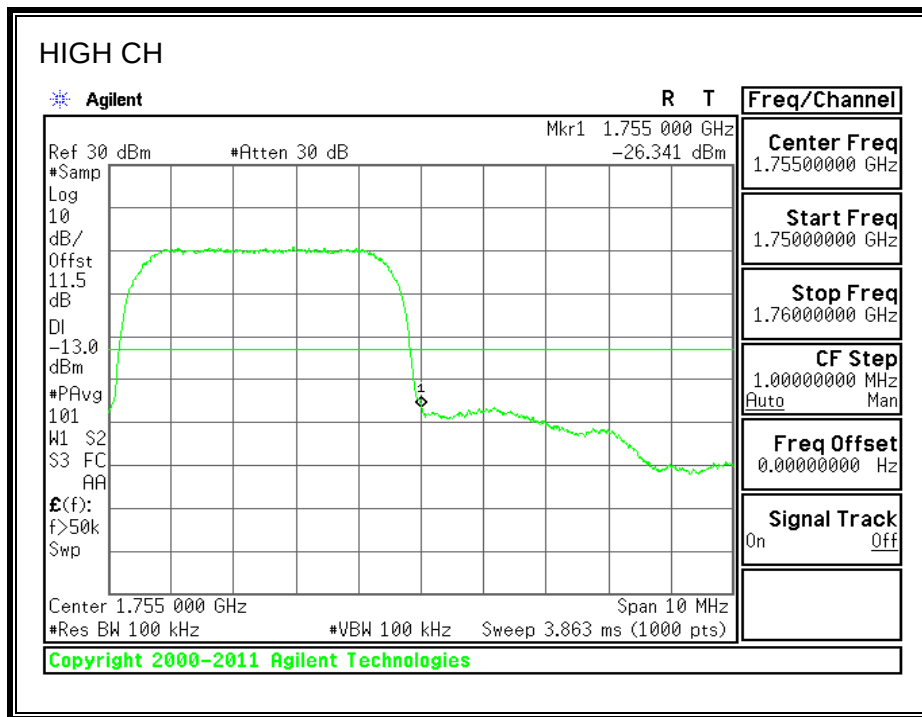
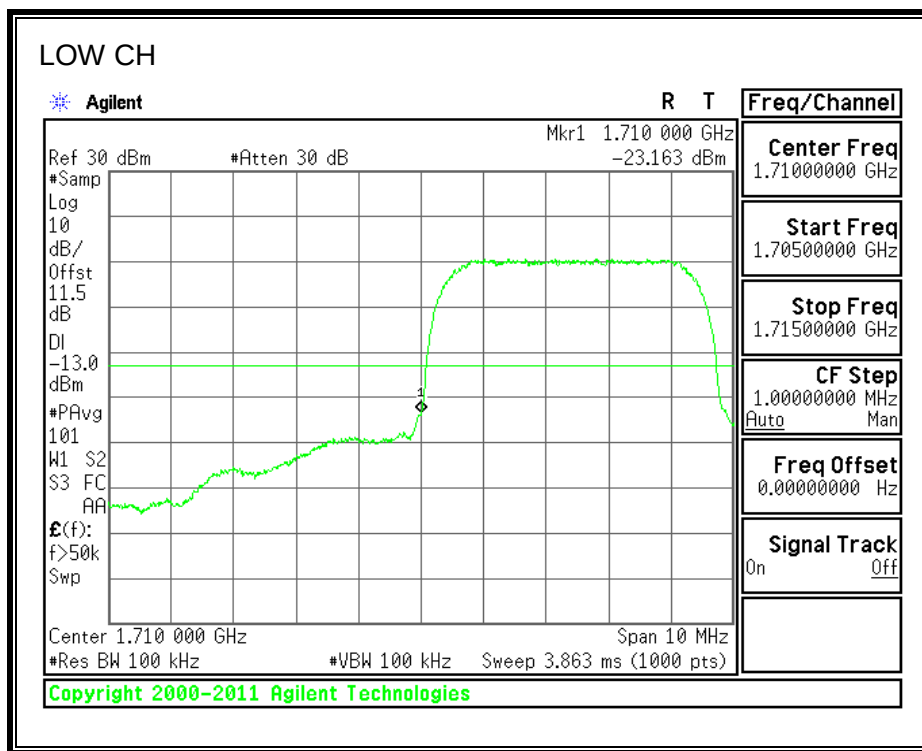
850MHz BAND



1900MHz BAND

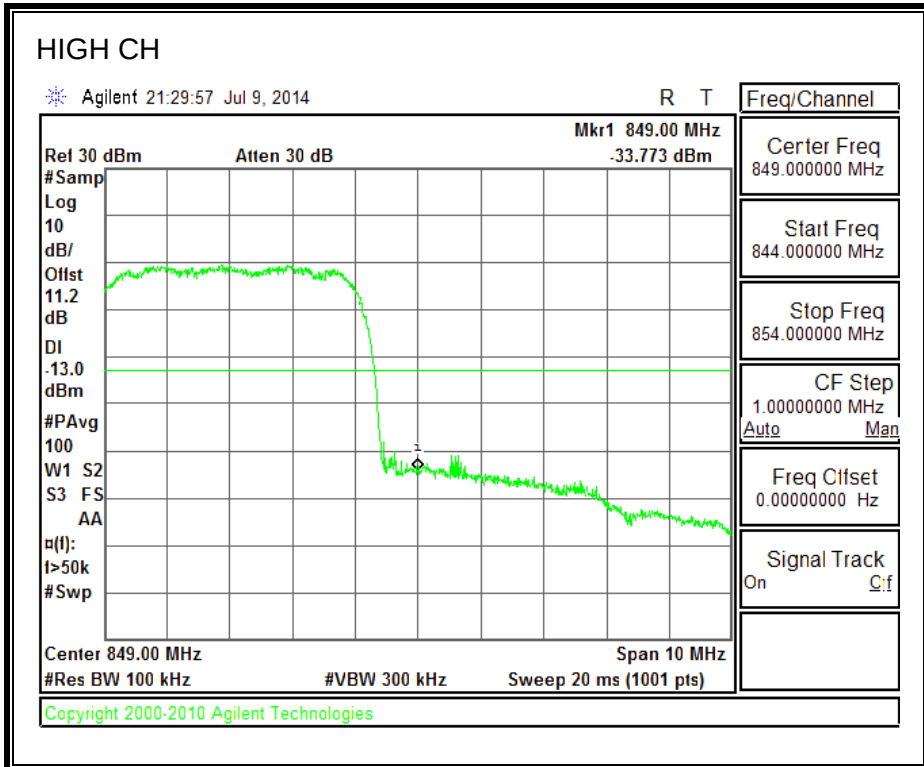
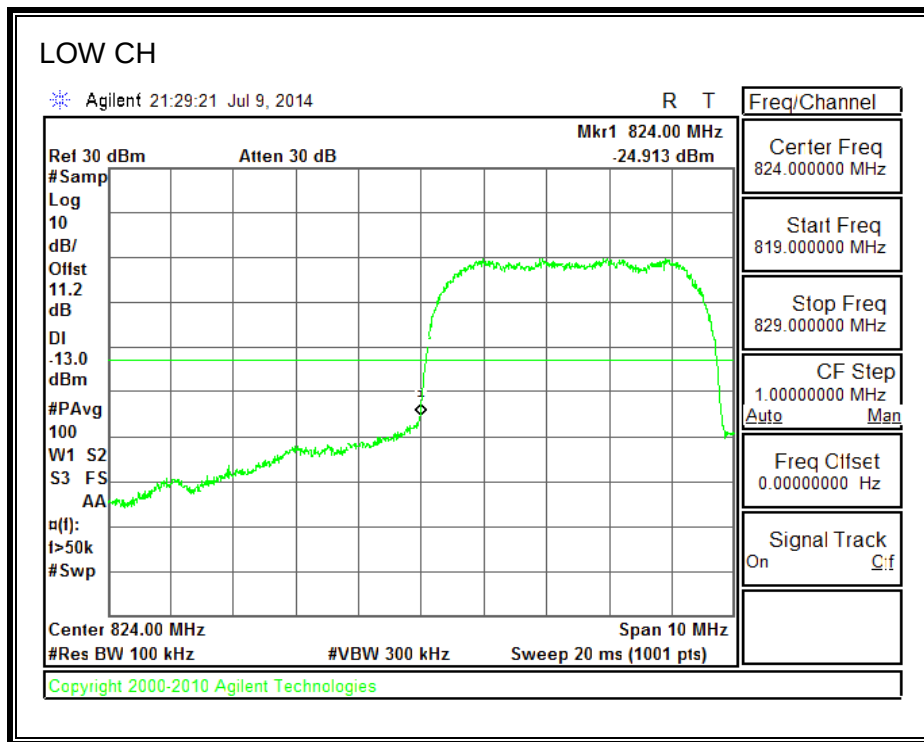


1700MHz BAND

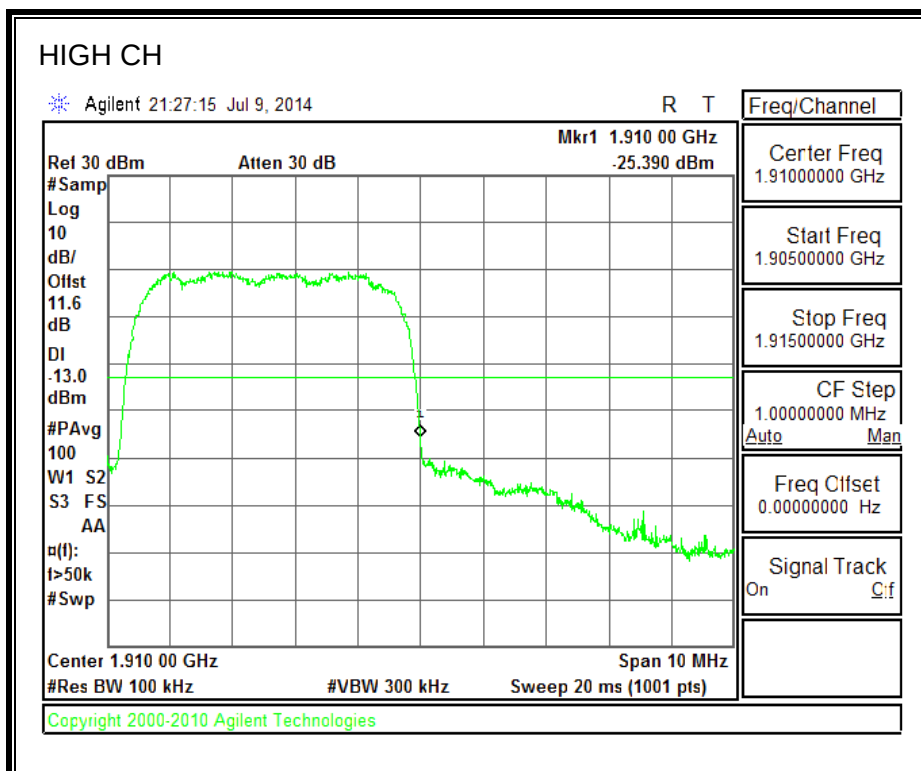
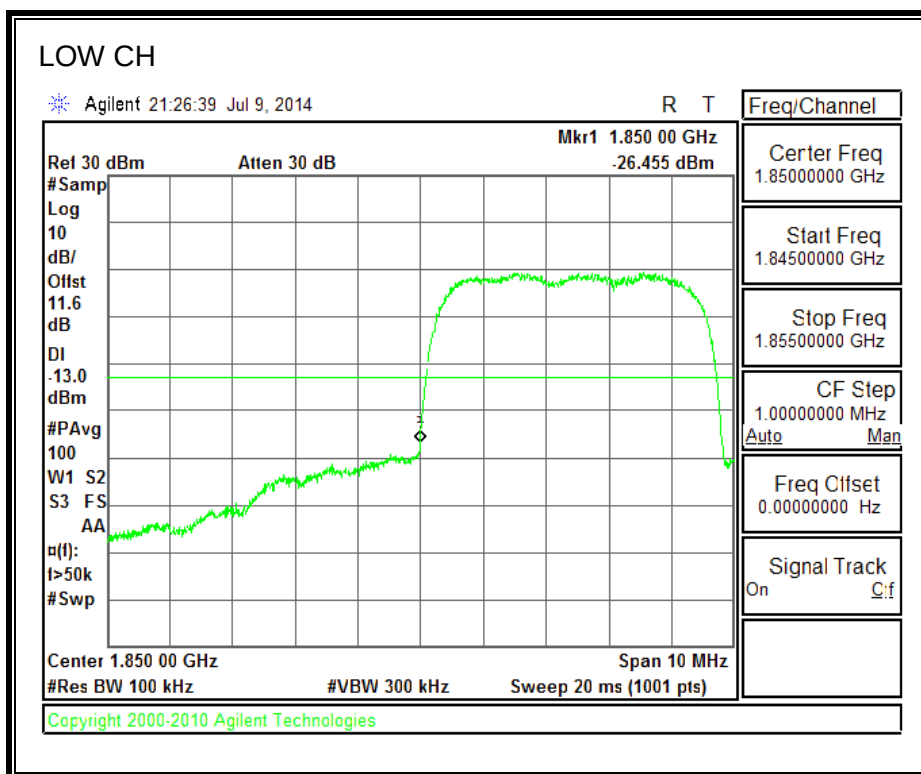


8.2.4. UMTS HSDPA

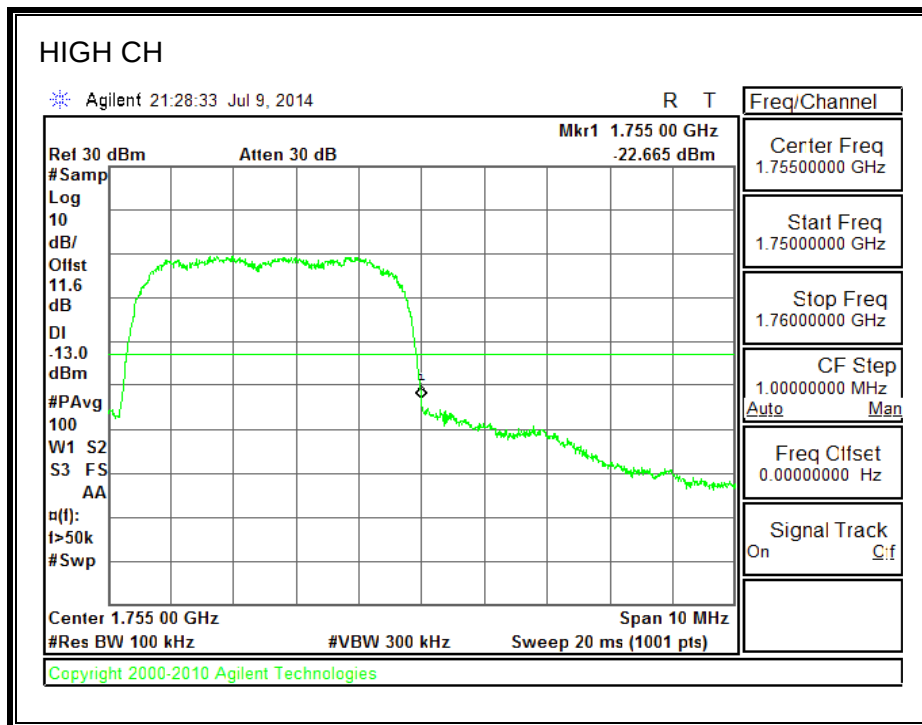
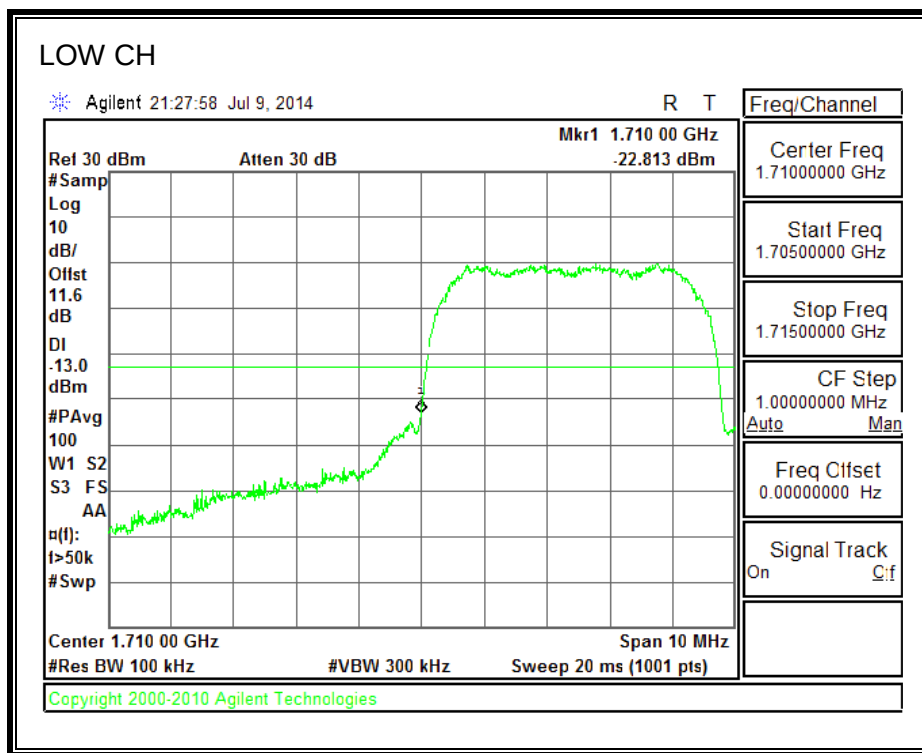
850MHz BAND



1900MHz BAND

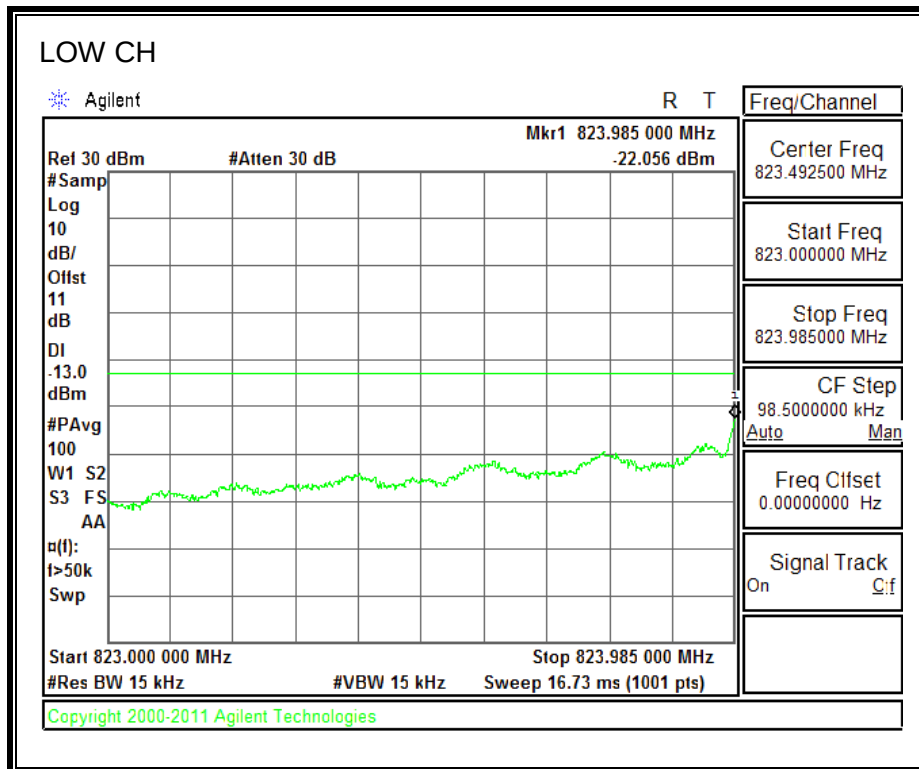
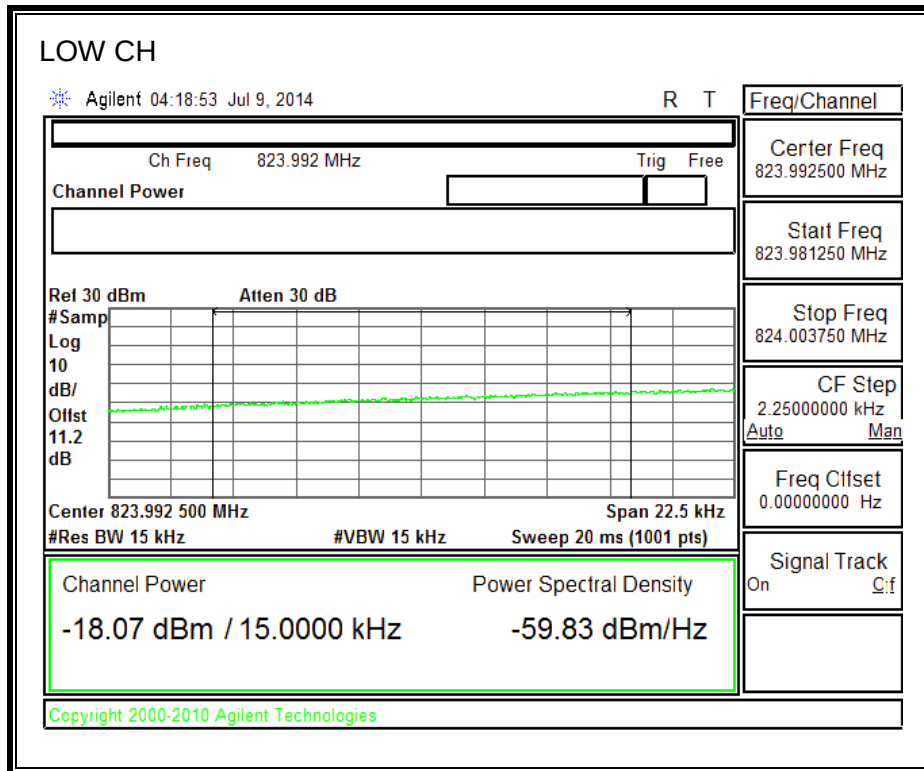


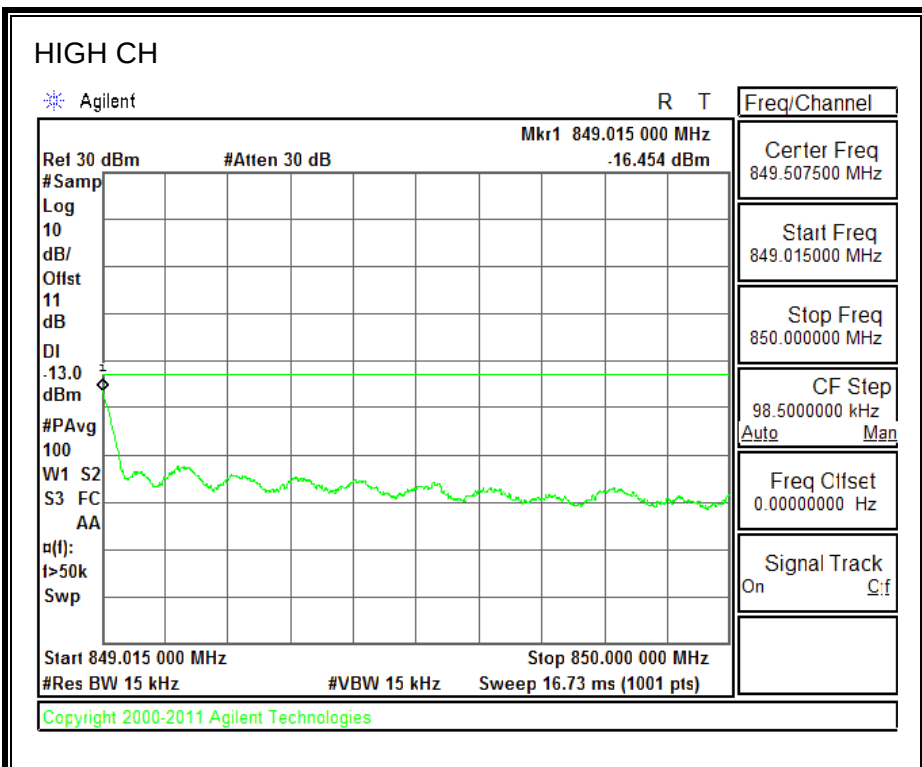
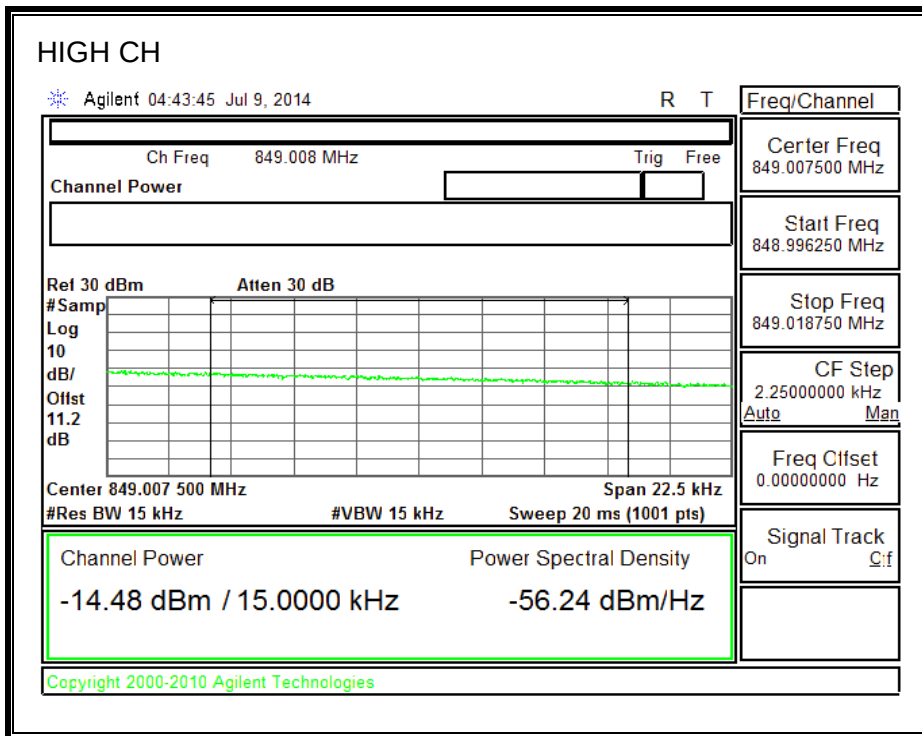
1700MHz BAND



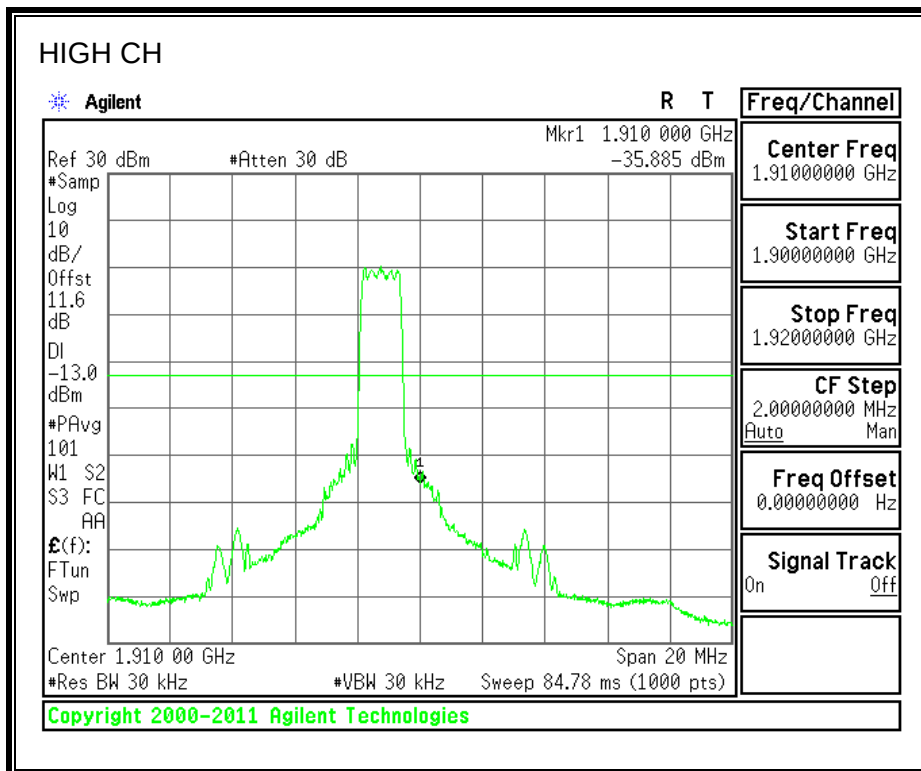
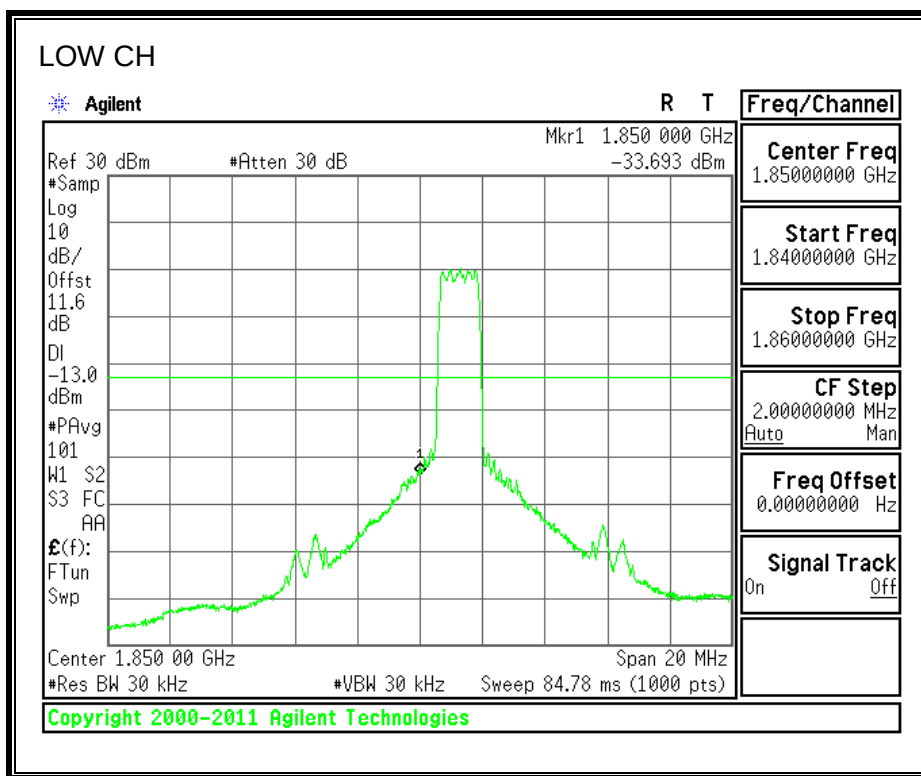
8.2.5. CDMA2000 1xRTT

850MHz BAND

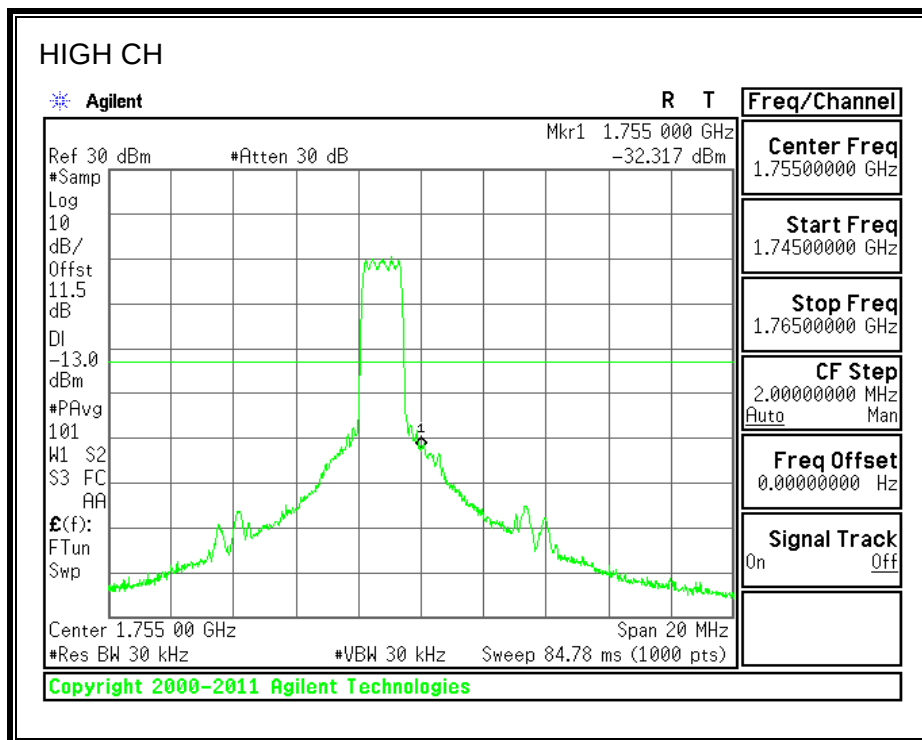
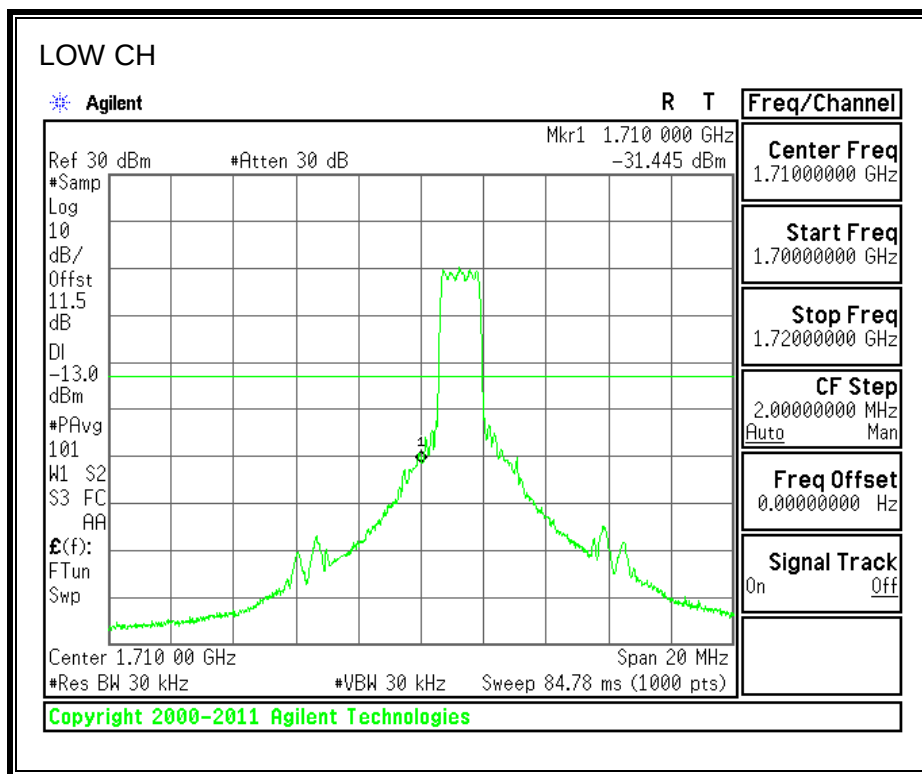




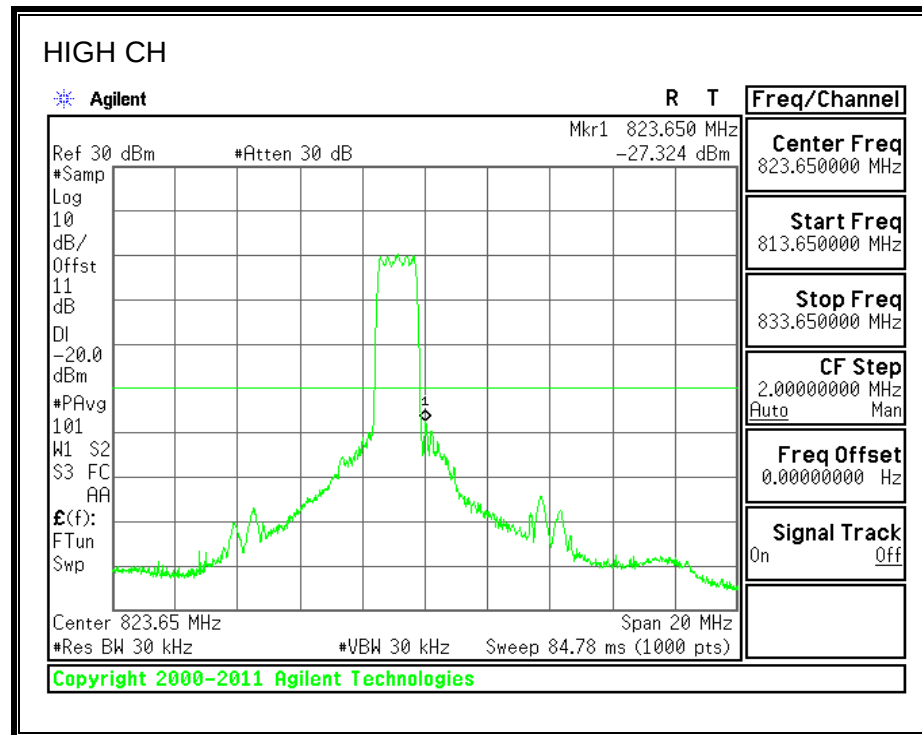
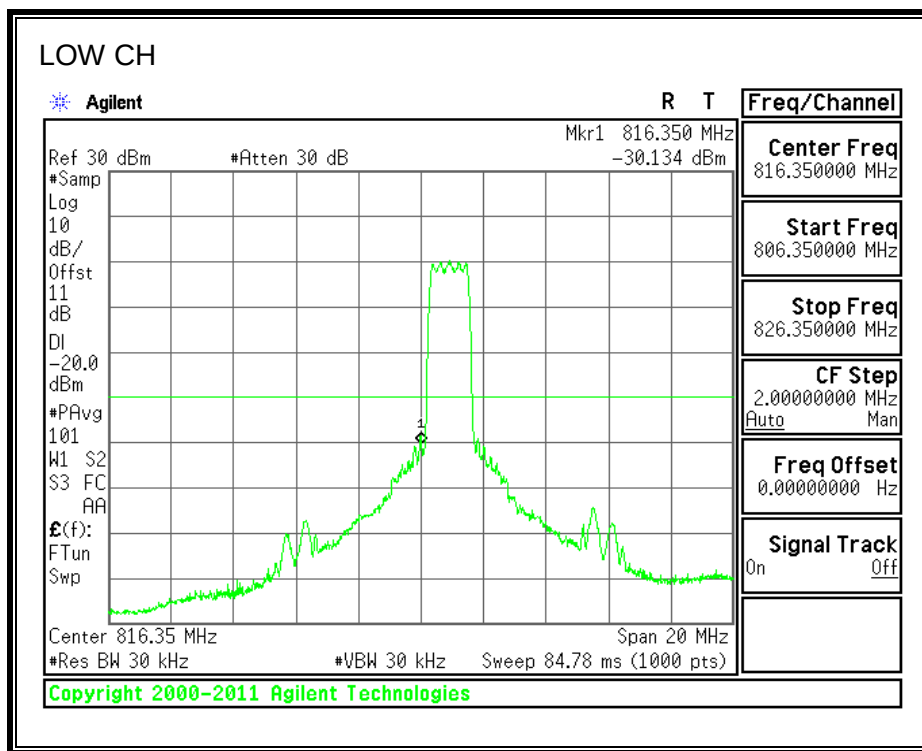
1900MHz BAND



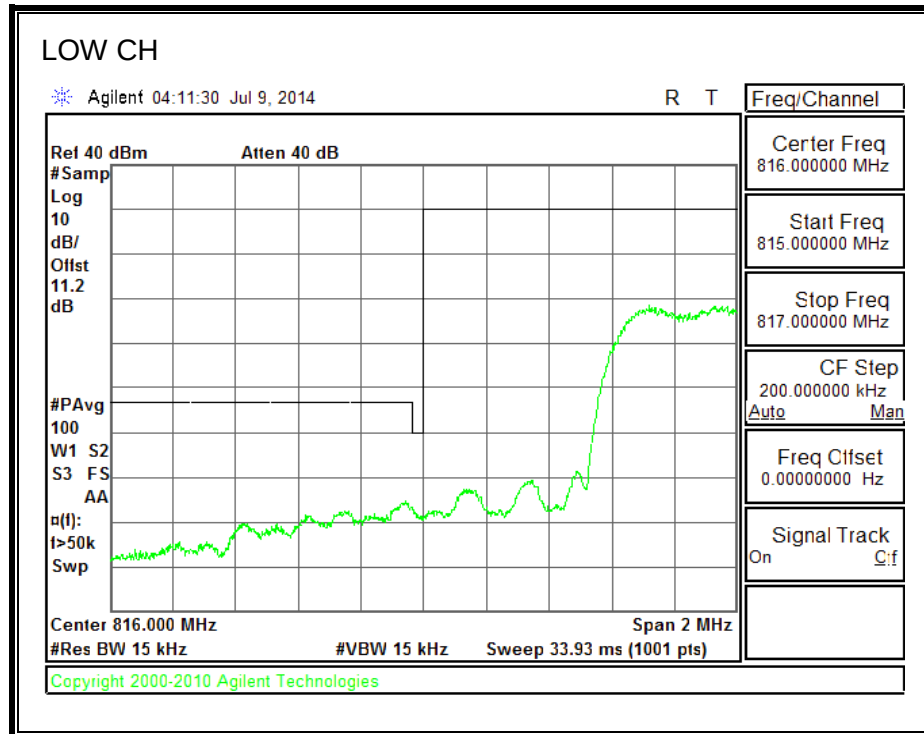
1700MHz BAND



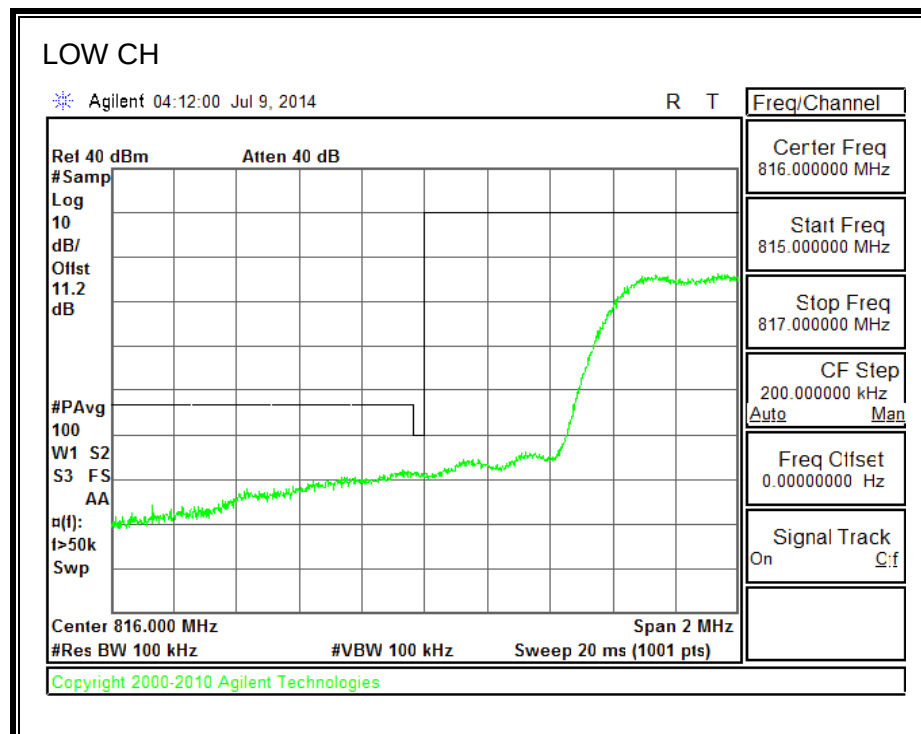
800MHz SECONDARY BAND



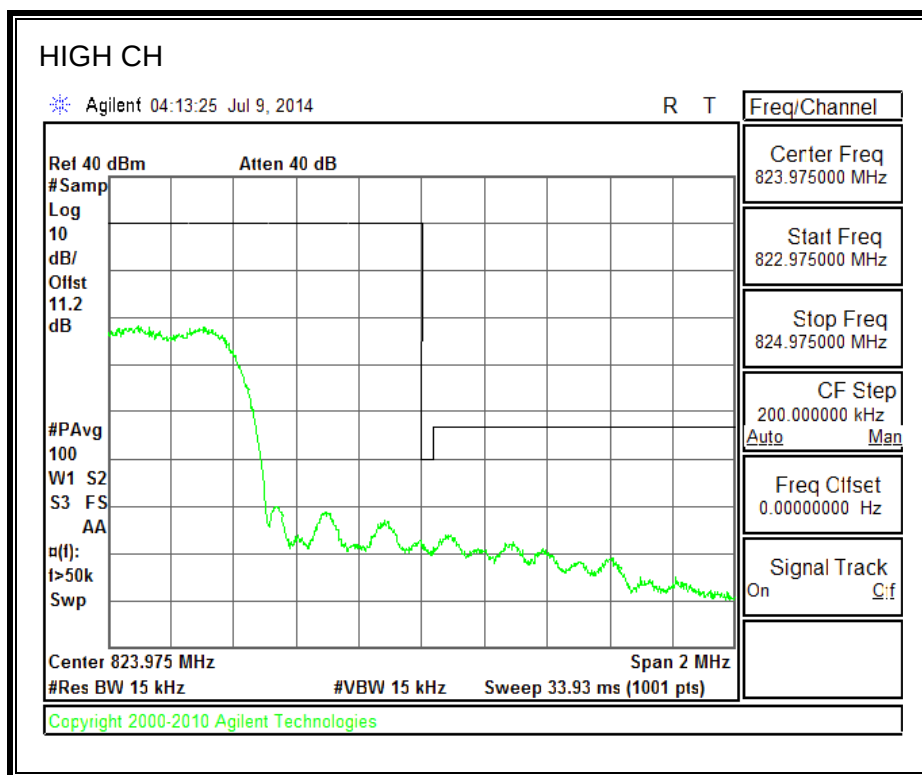
8.2.6. CDMA2000 1xRTT BC10 MASK



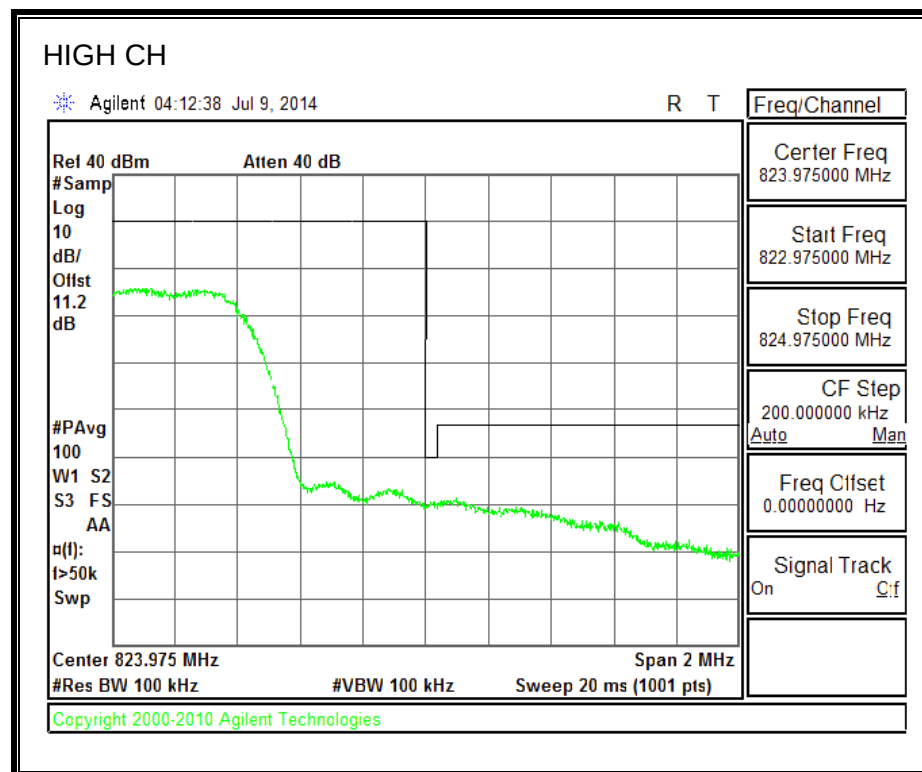
Note: RBW=1% of EBW



Note: RBW of 1% of 37.5KHz of outer channel frequency block



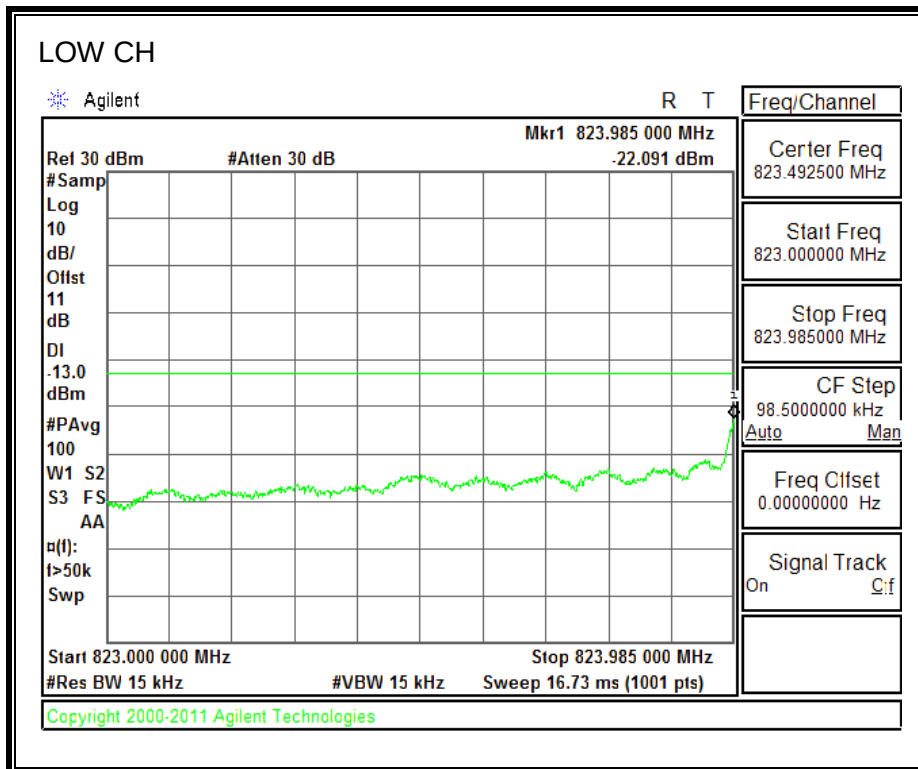
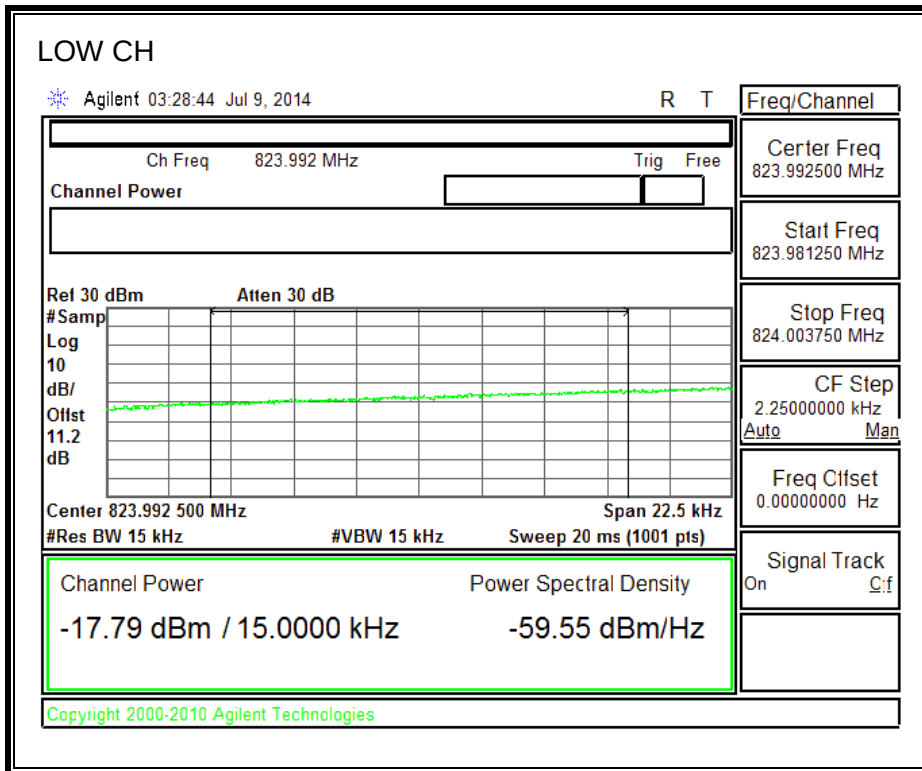
Note: RBW=1% of EBW



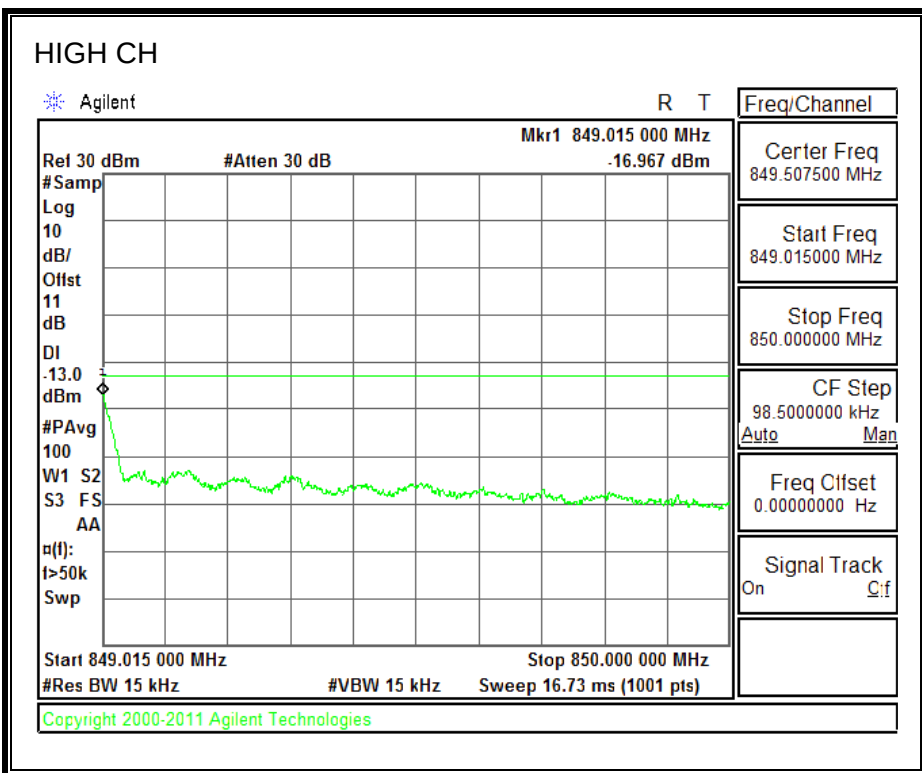
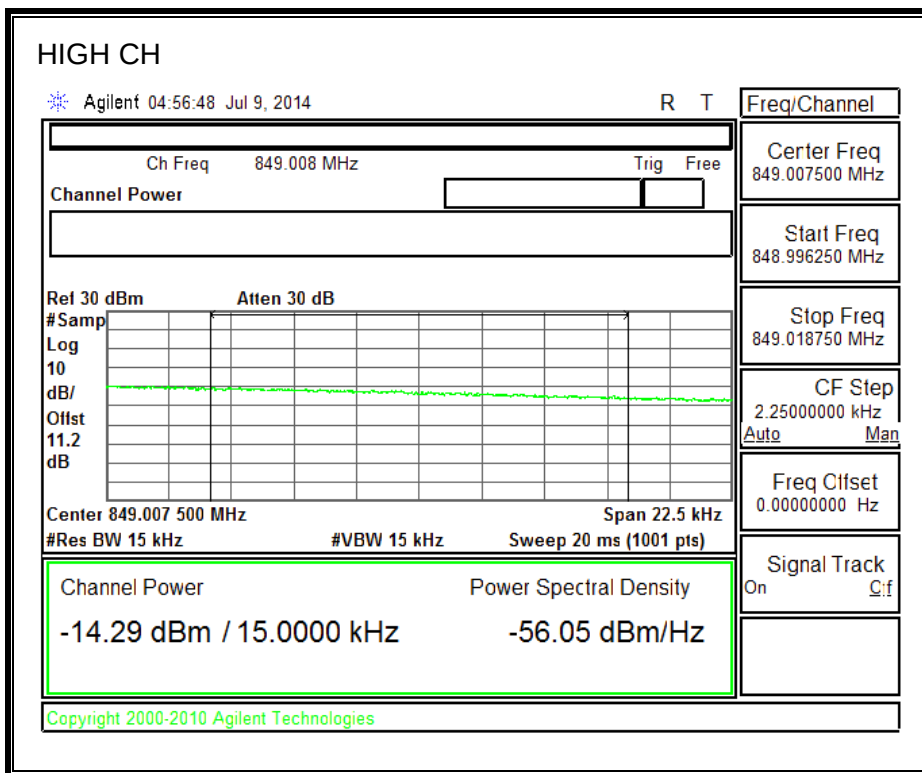
Note: RBW of 1% of 37.5KHz of outer channel frequency block

8.2.7. CDMA2000 EVDO Rev. A

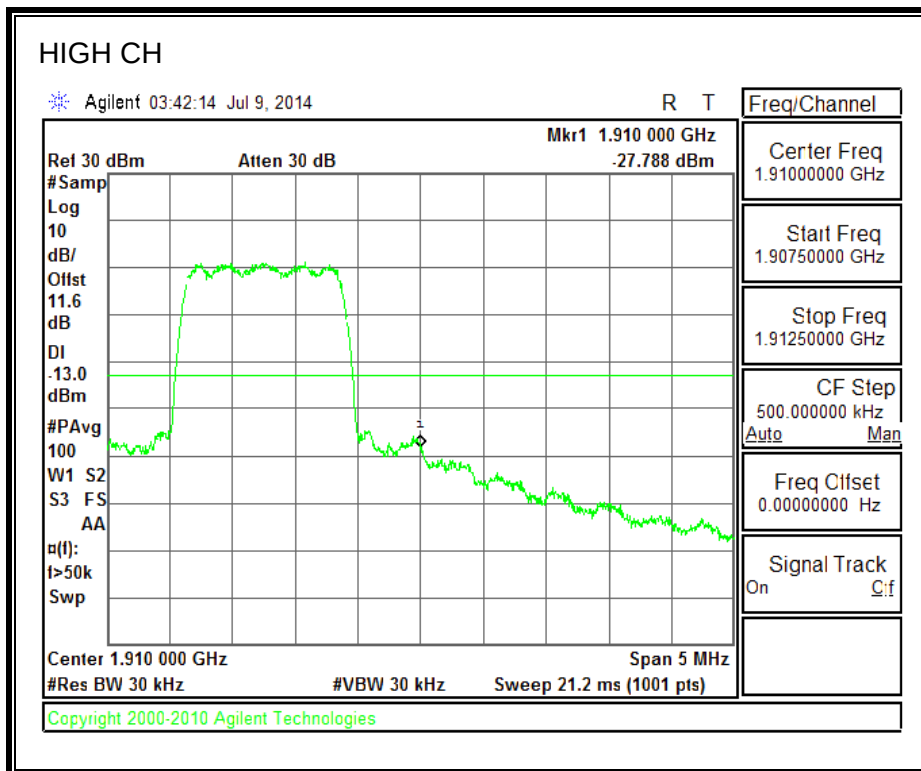
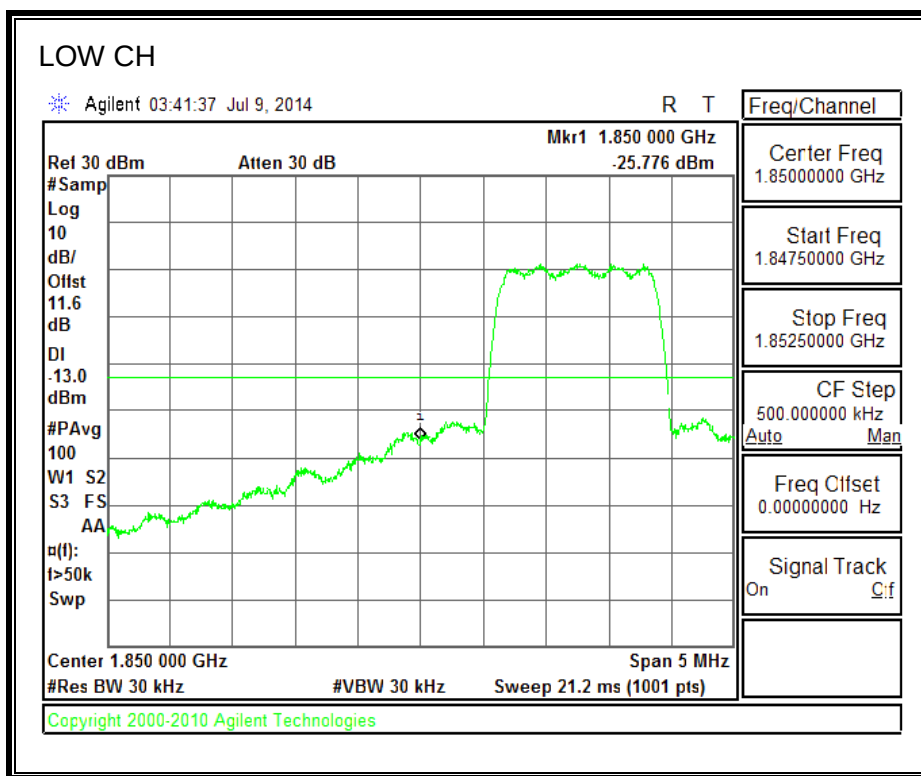
850MHz BAND



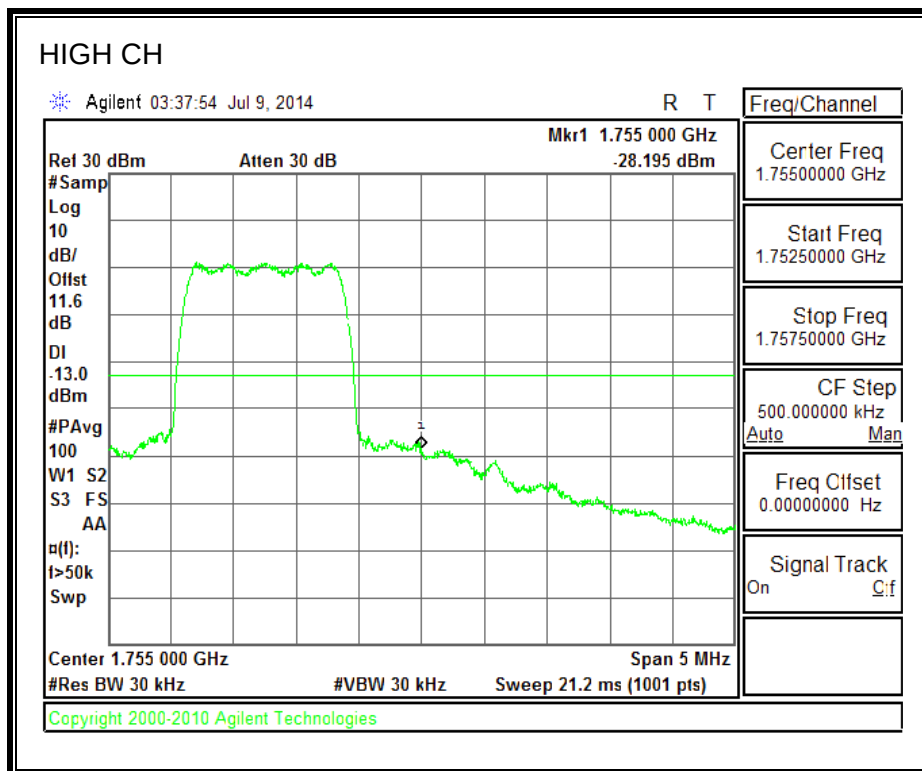
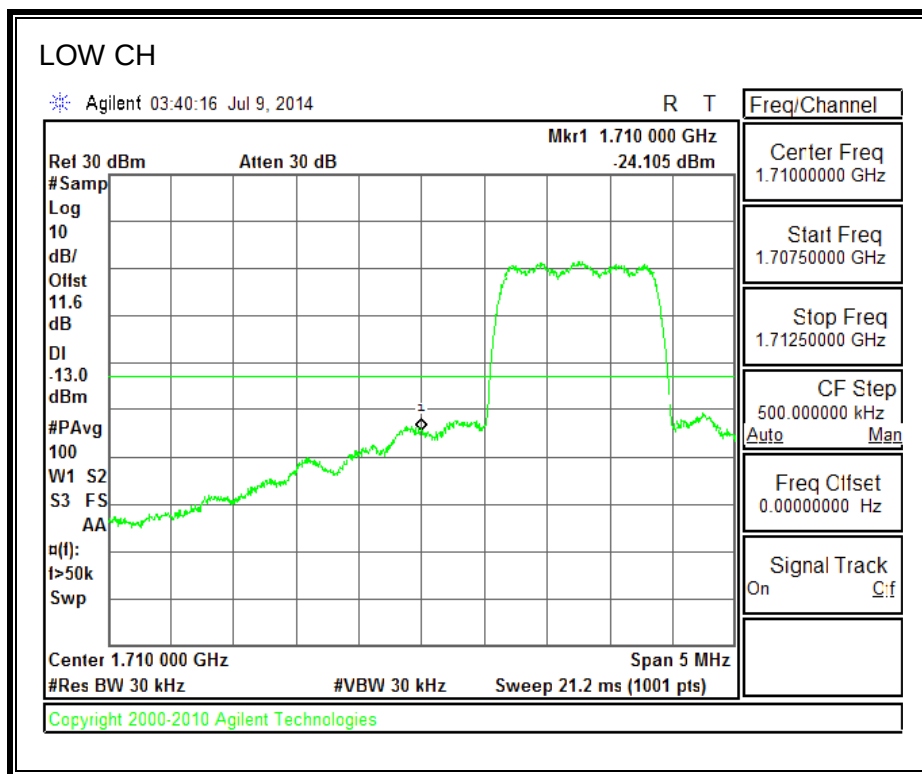
850MHz BAND



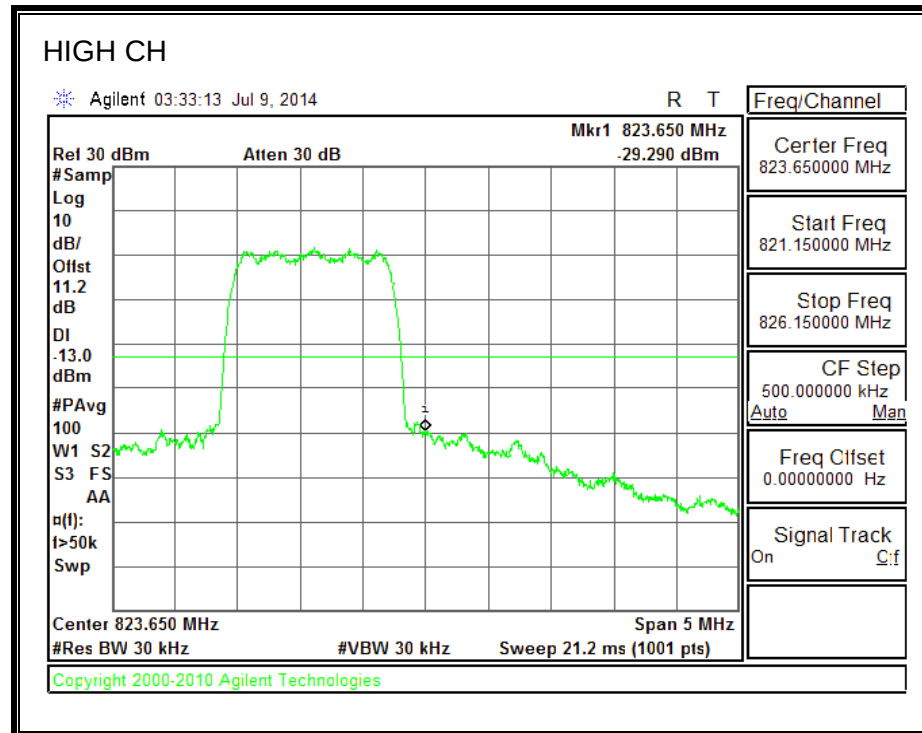
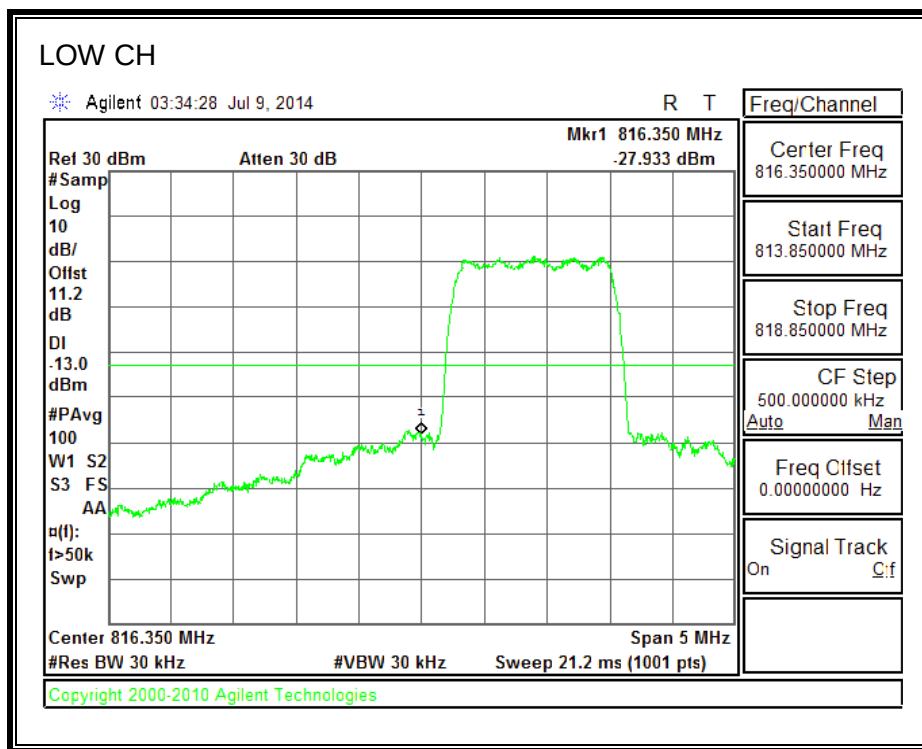
1900MHz BAND



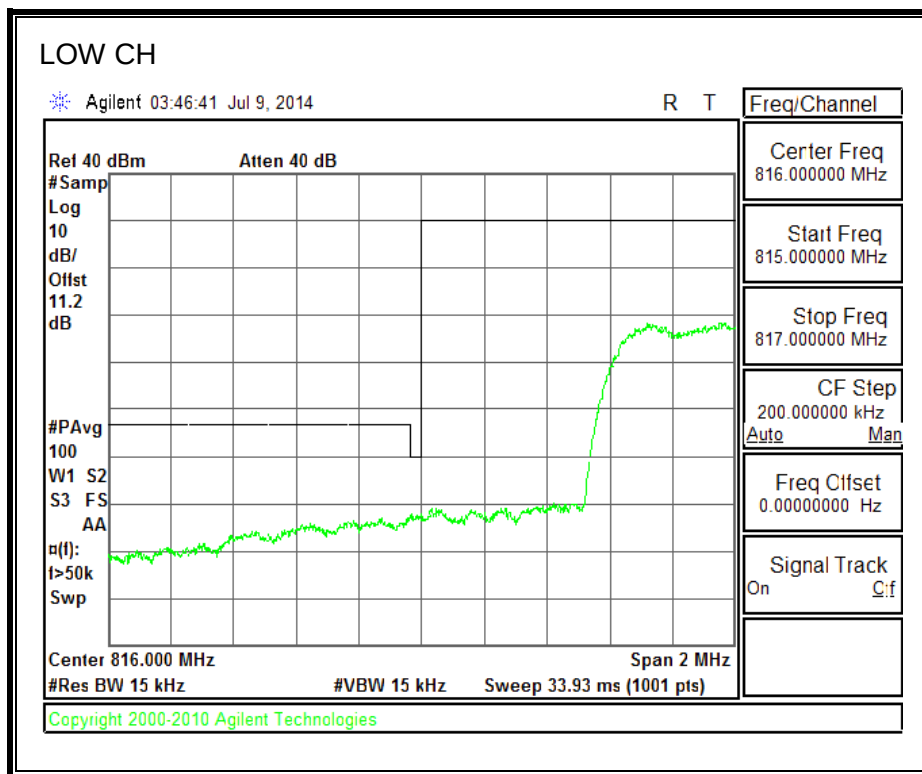
1700MHz BAND



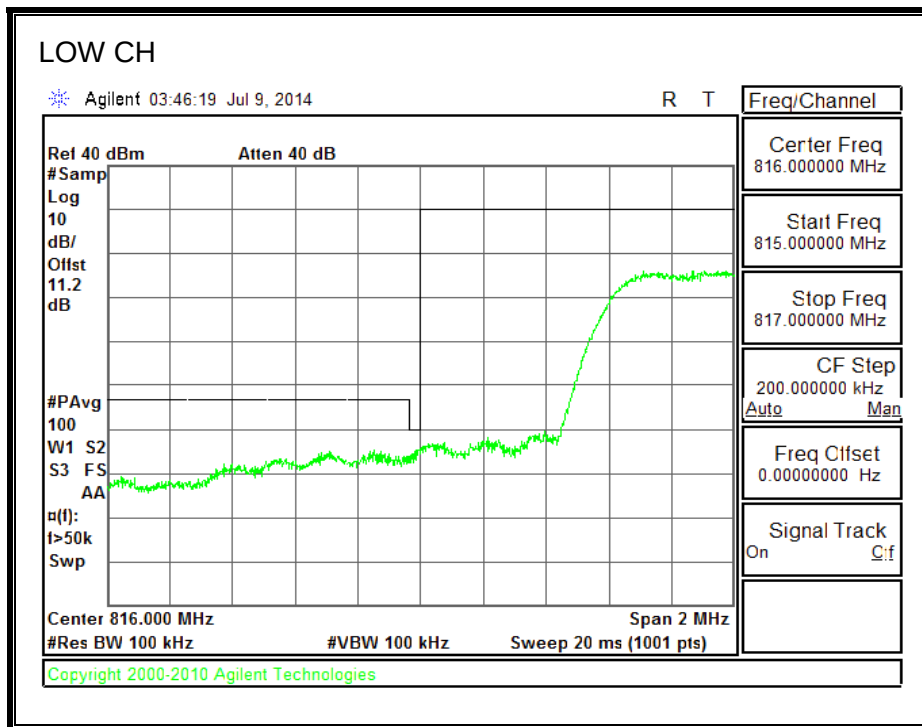
800MHz SECONDARY BAND



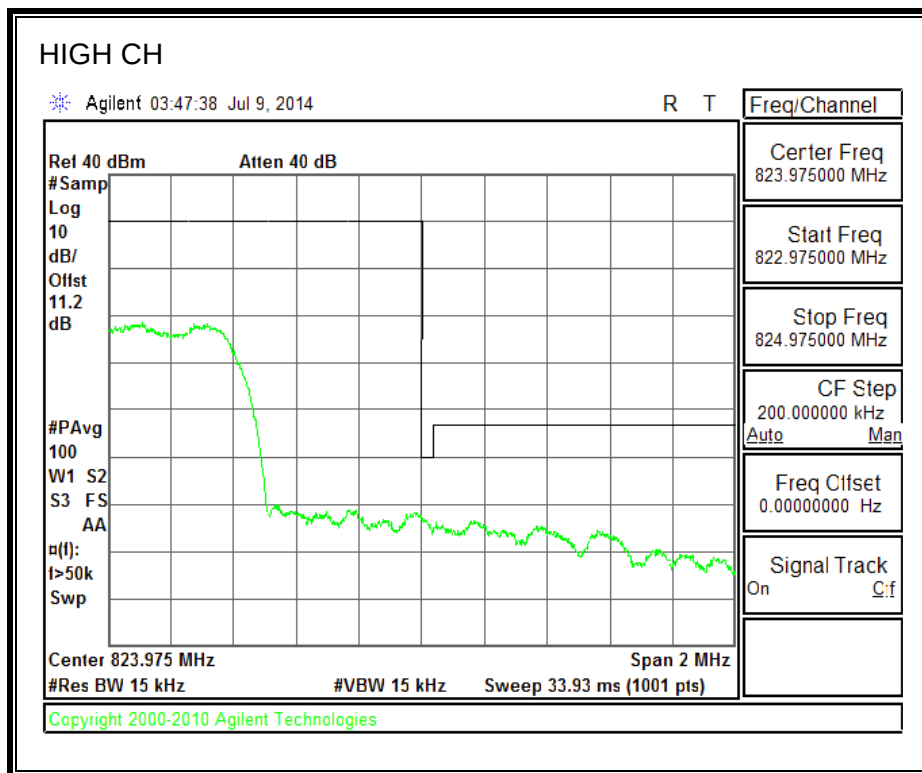
8.2.8. CDMA2000 EVDO REVA BC10 MASK



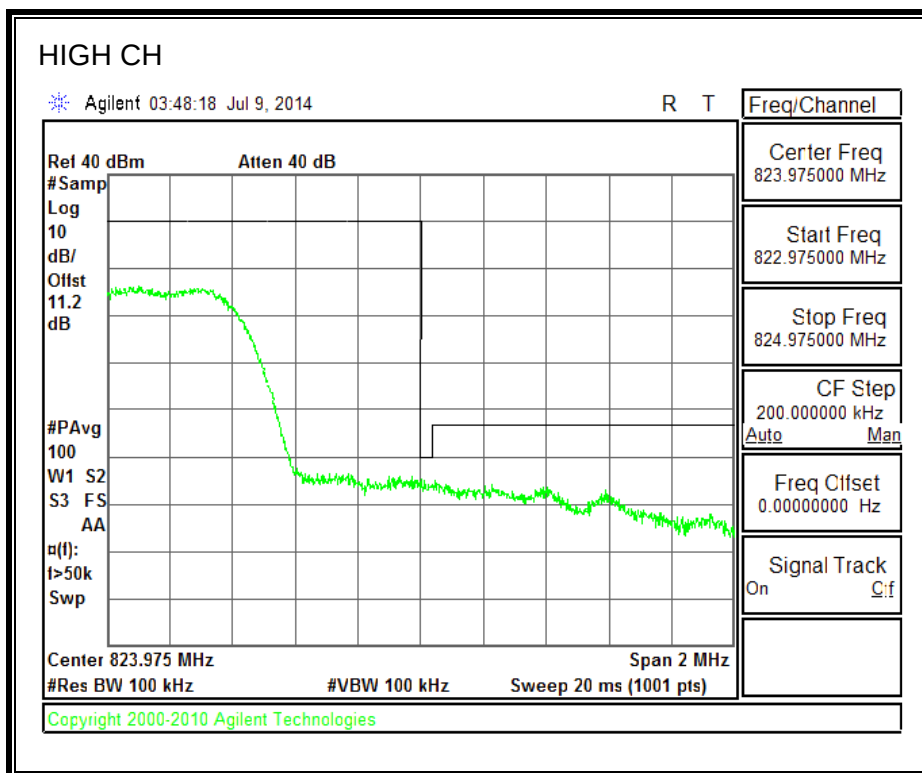
Note: RBW=1% of EBW



Note: RBW of 1% of 37.5KHz of outer channel frequency block



Note: RBW=1% of EBW



Note: RBW of 1% of 37.5KHz of outer channel frequency block

8.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238, §27.53 §90.691

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.
-

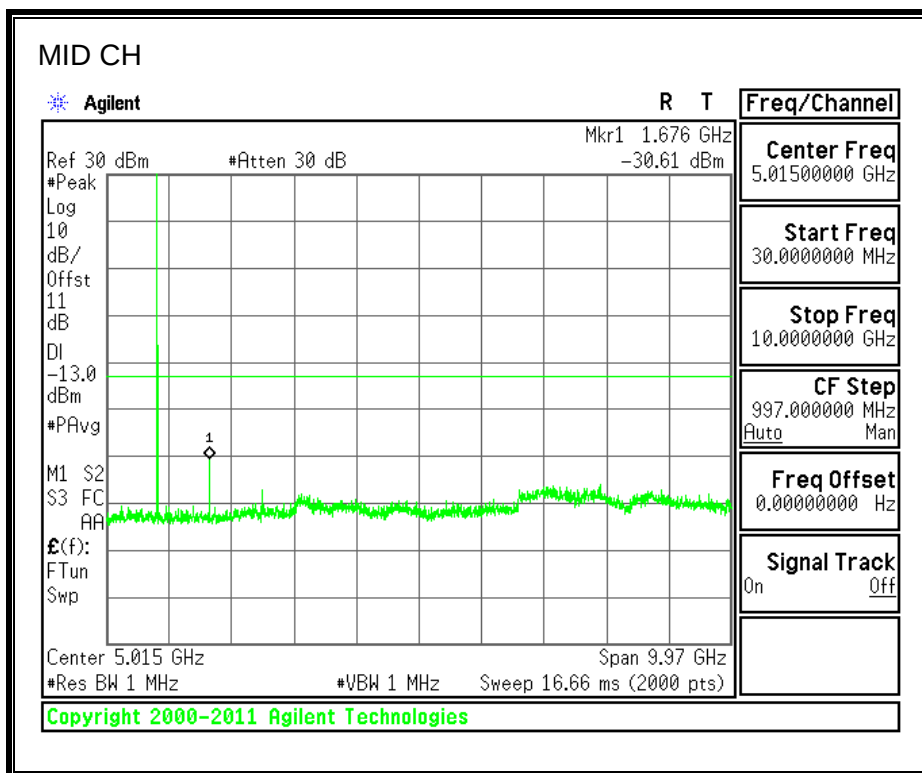
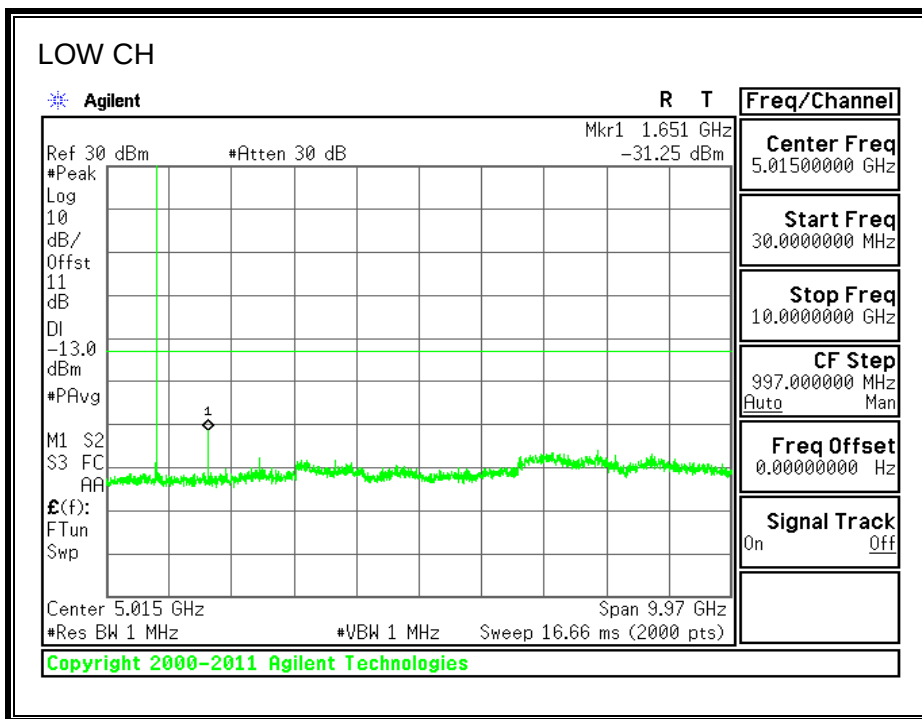
MODES TESTED

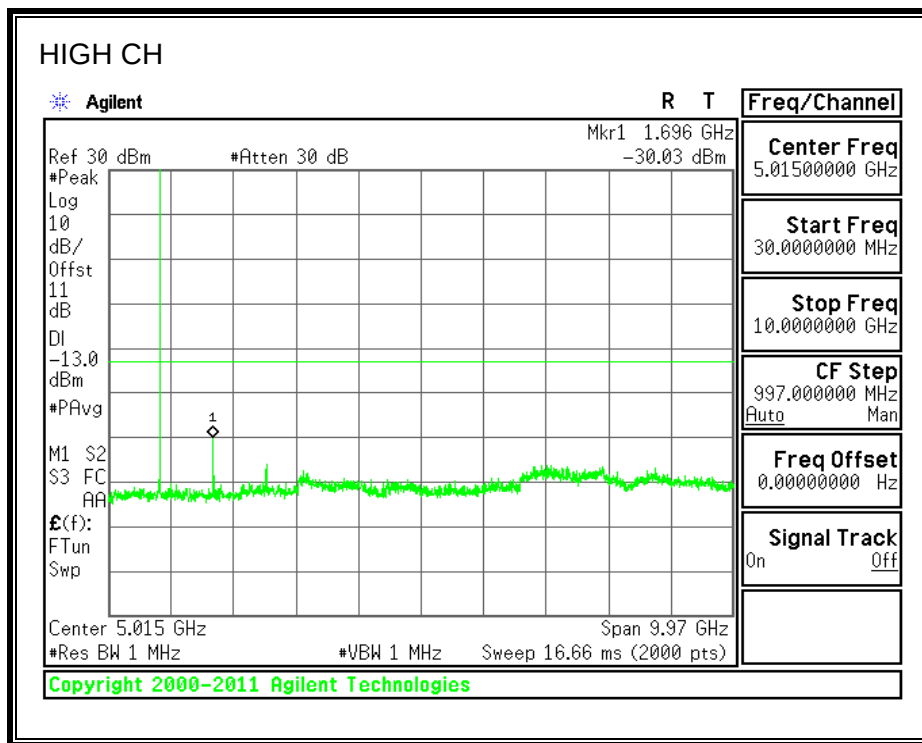
- GPRS and EGPRS
- UMTS, REL 99 and HSDPA
- CDMA2000, BC0, BC1 BC10 and BC15

RESULTS

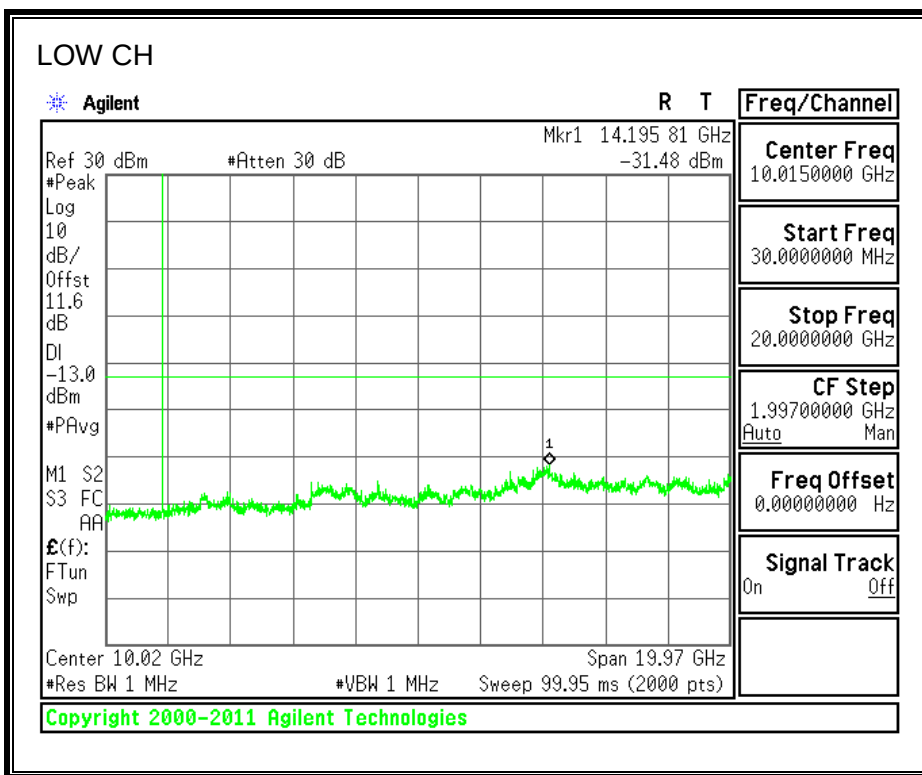
8.3.1. GSM-GPRS

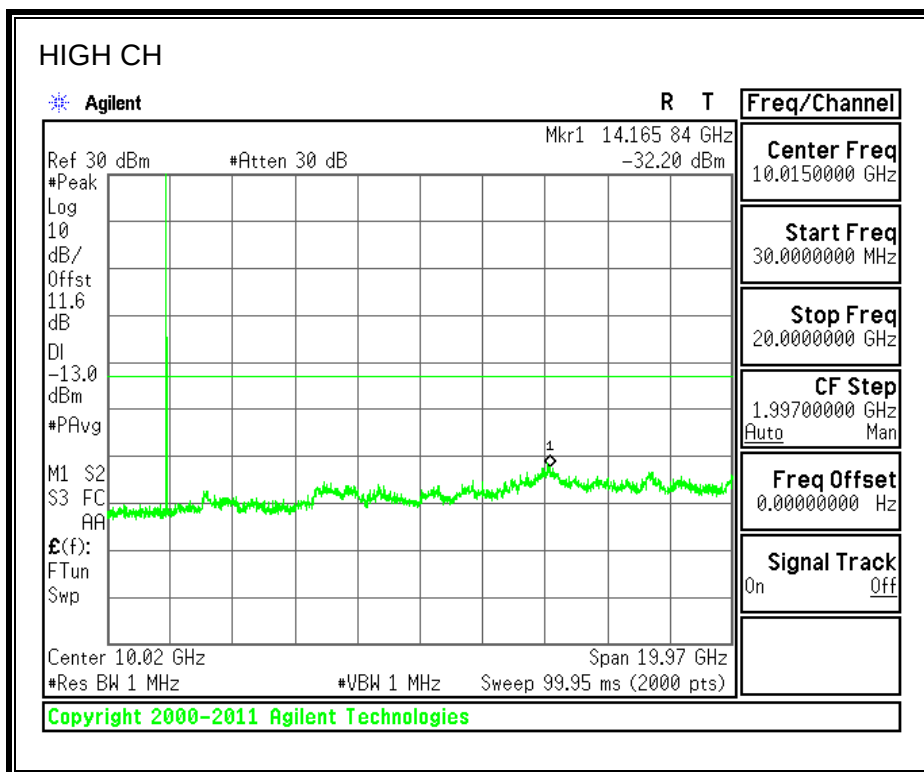
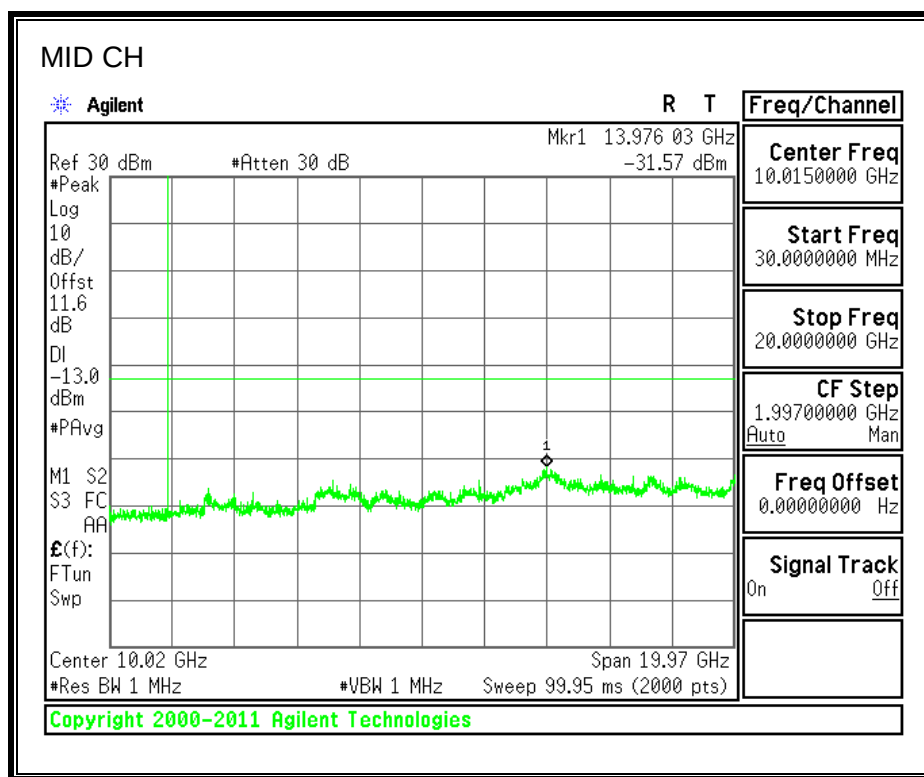
850MHz BAND





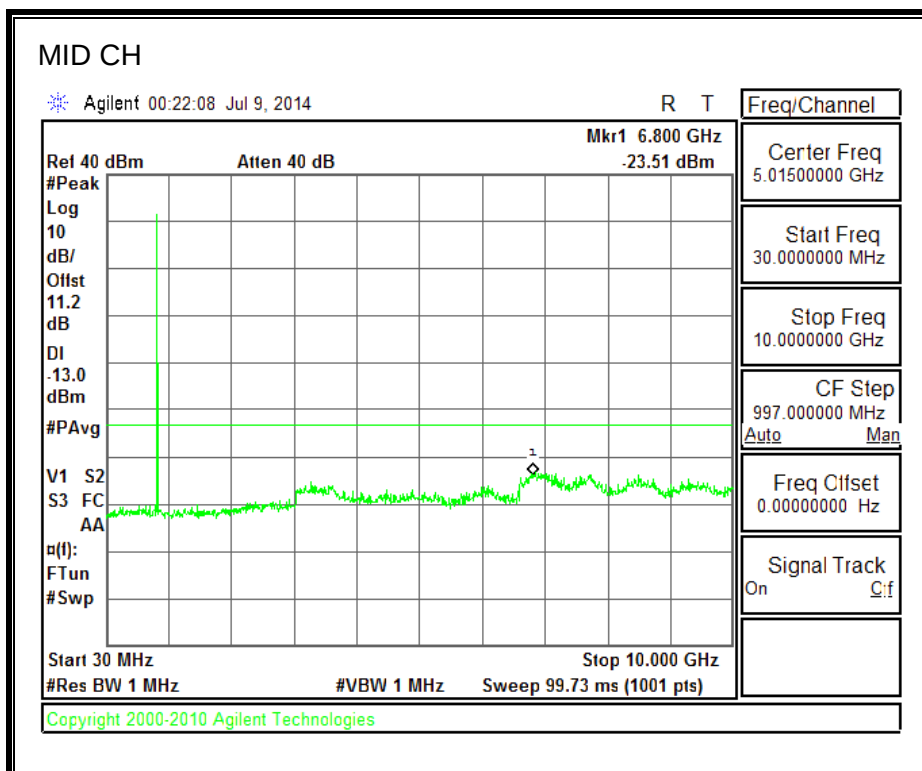
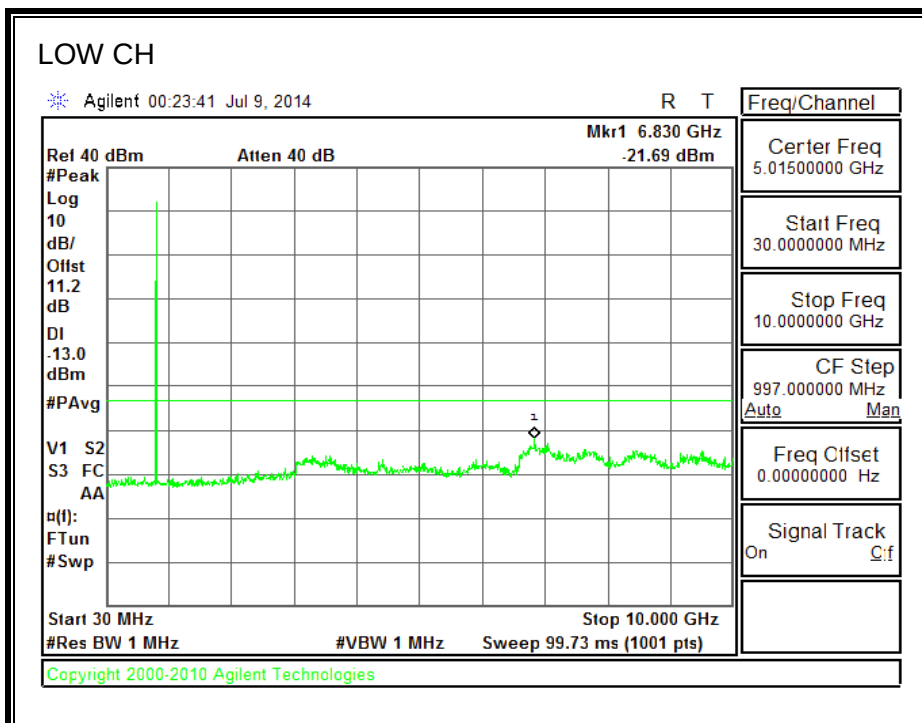
1900MHz BAND

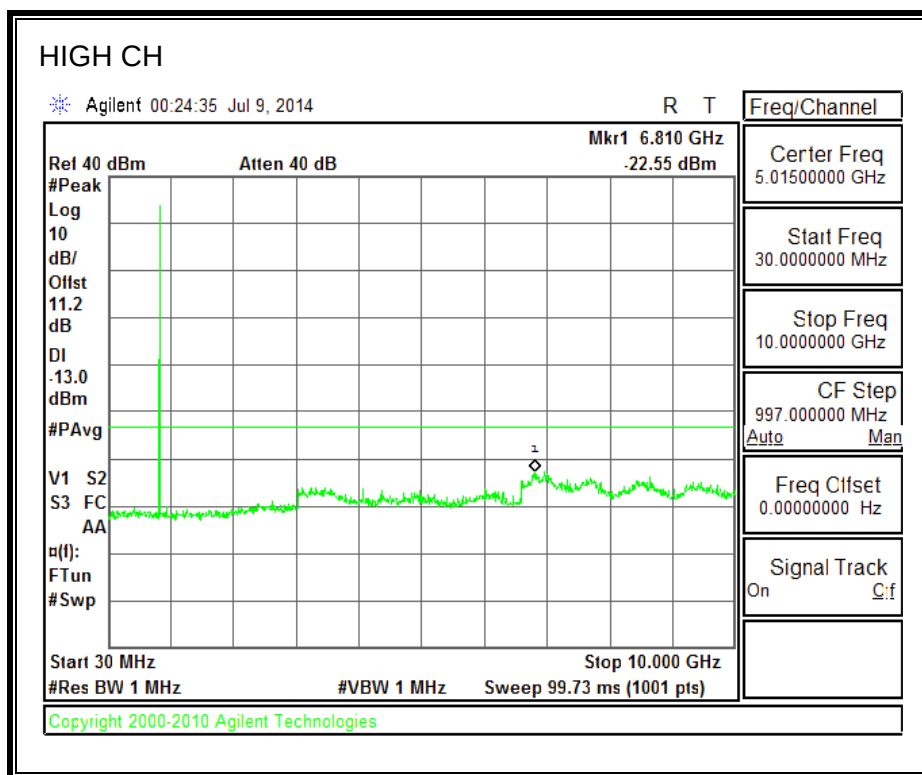




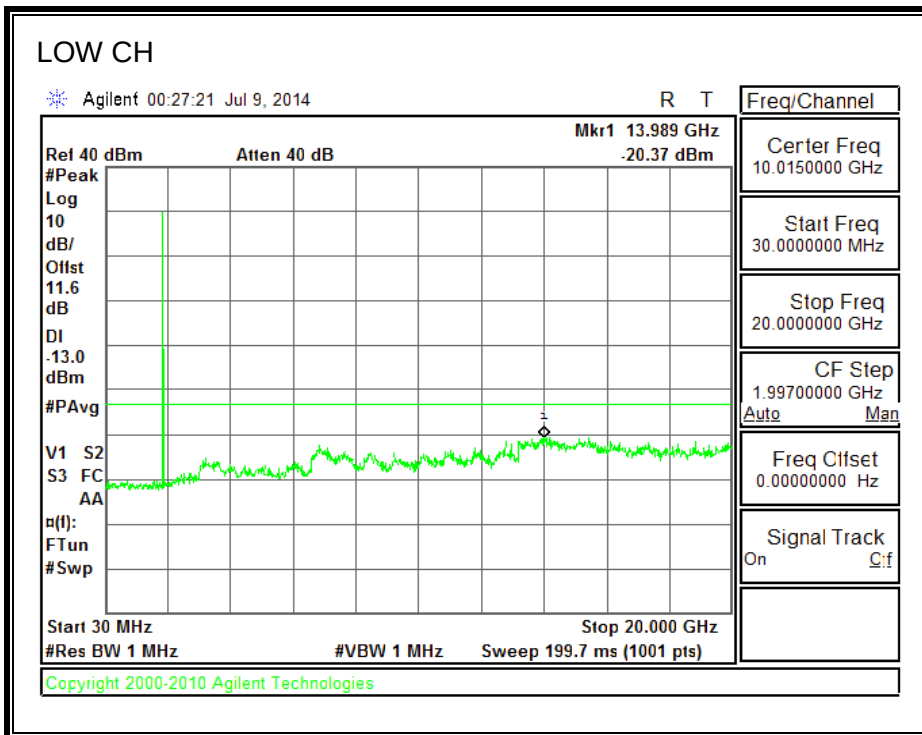
8.3.2. GSM-EGPRS

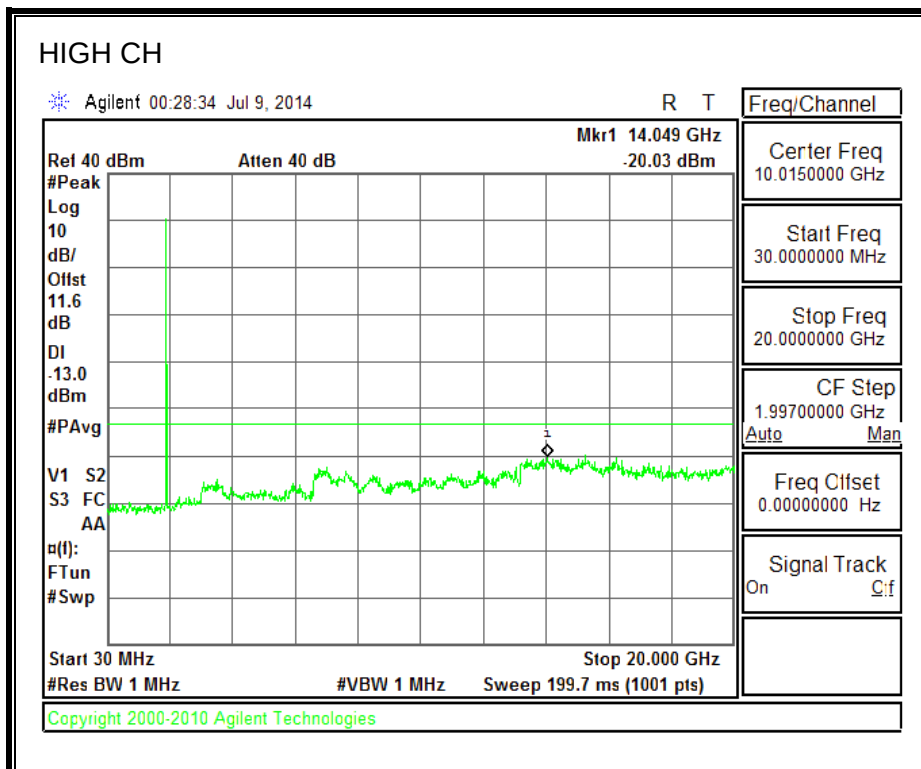
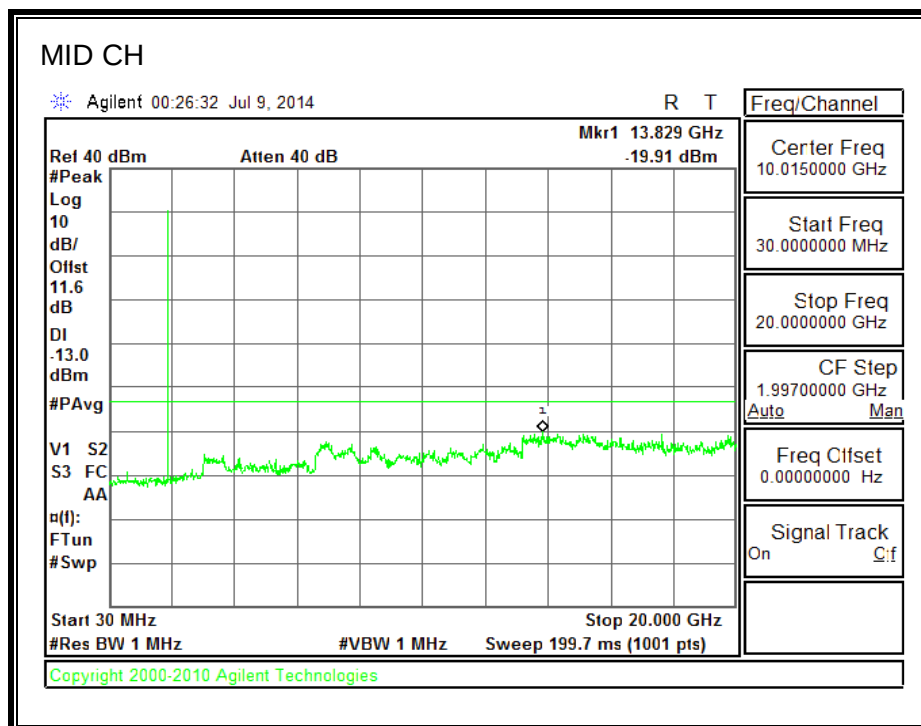
850MHz BAND





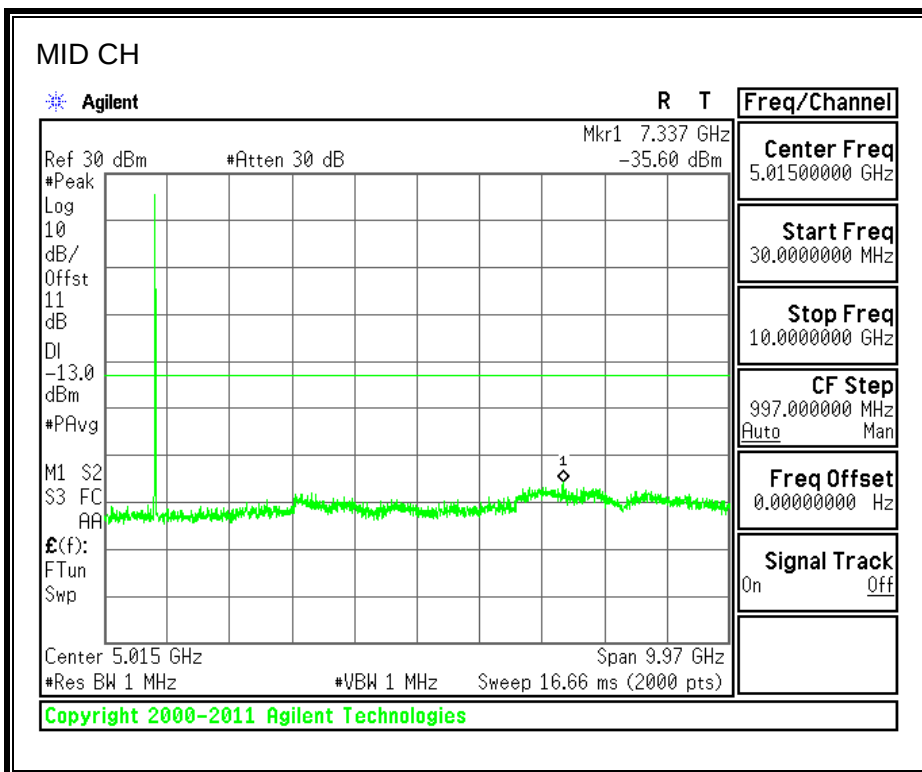
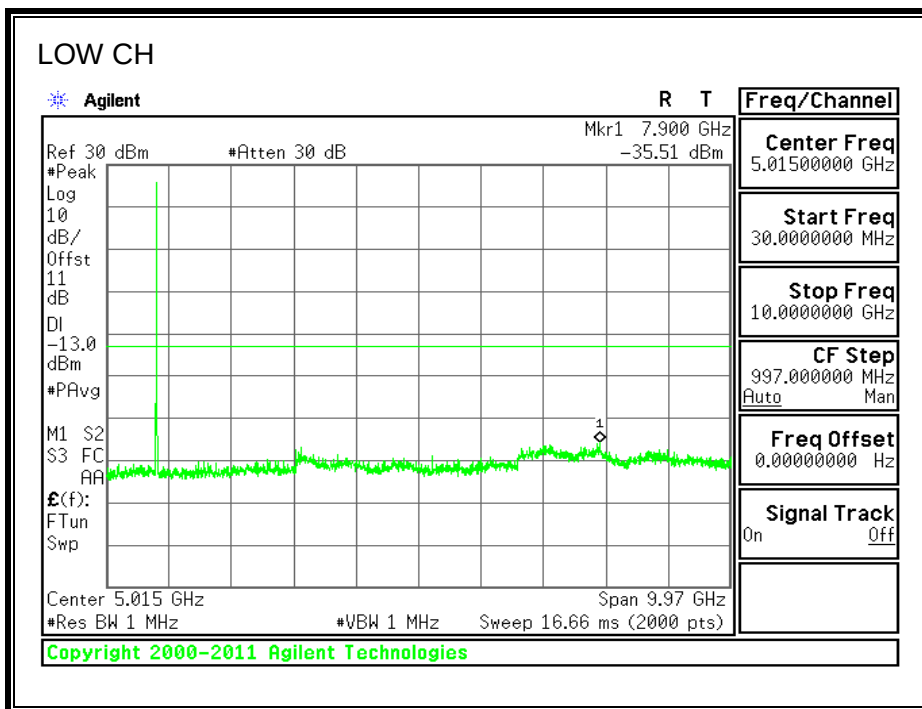
1900MHz BAND

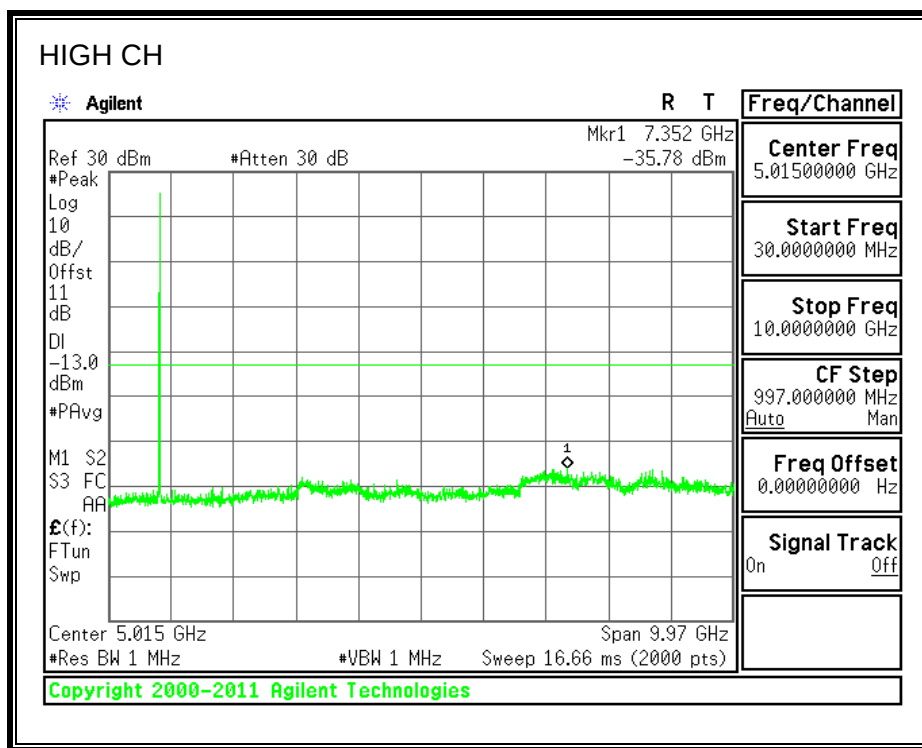




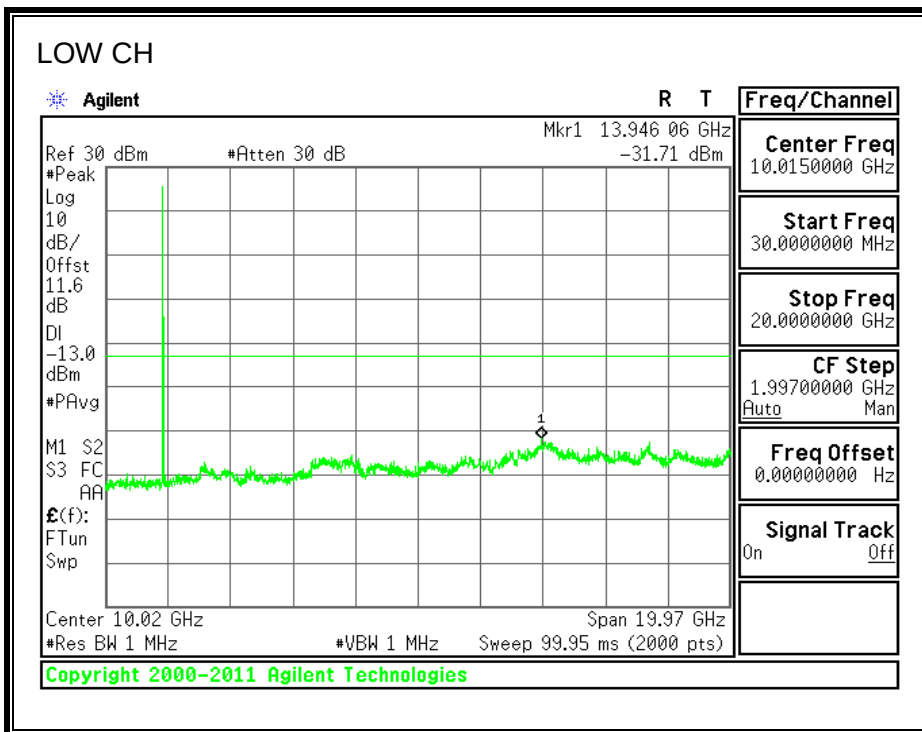
8.3.3. UMTS Rel. 99

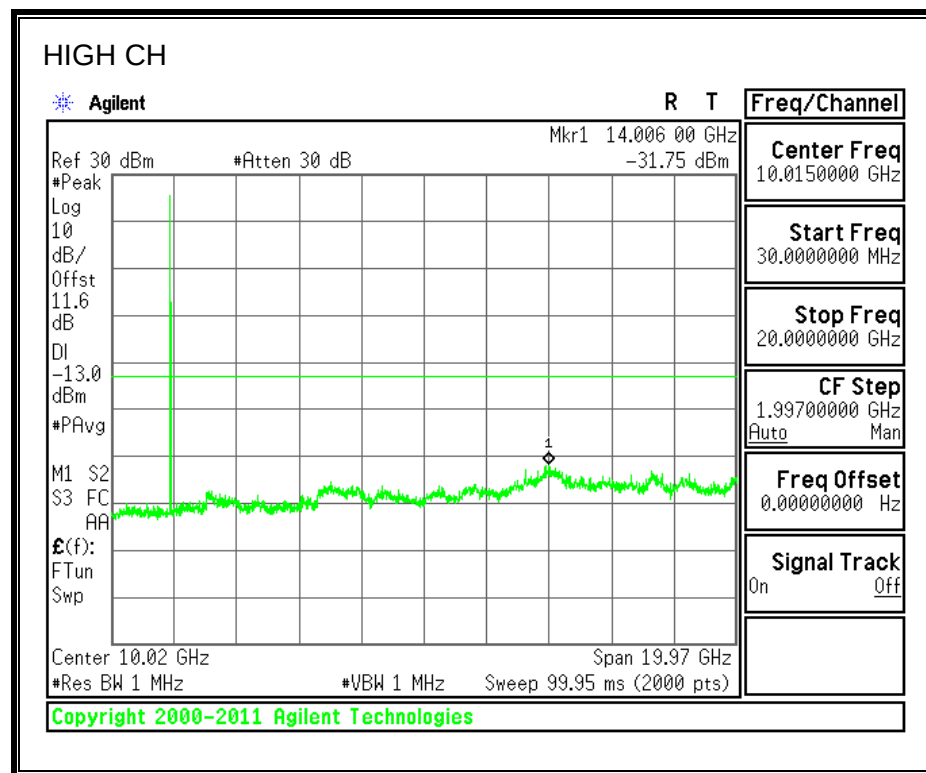
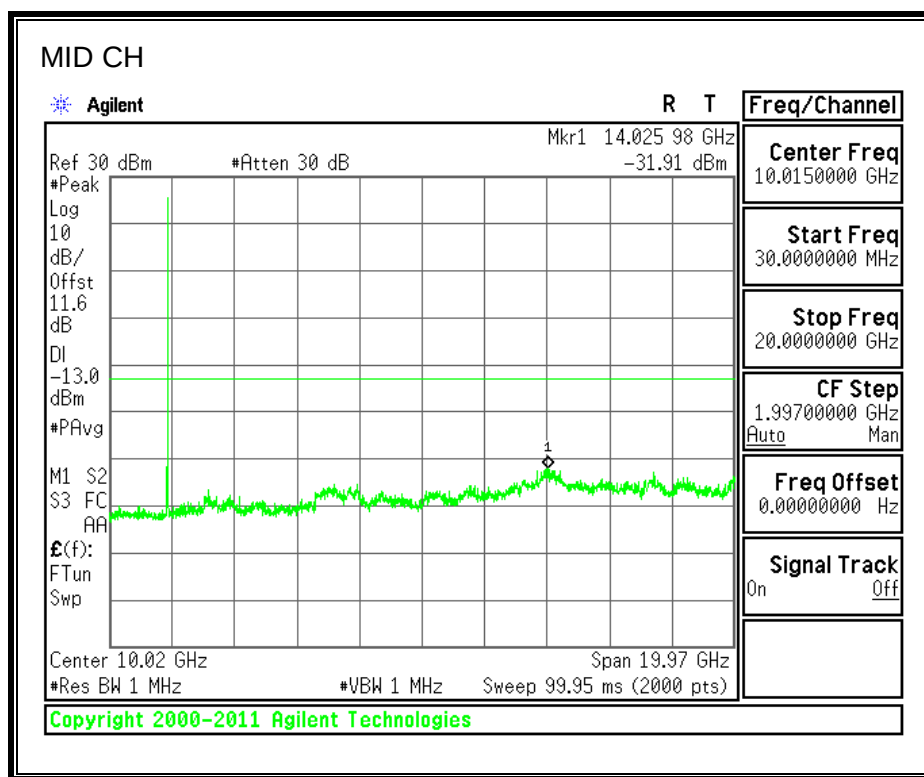
850MHz BAND



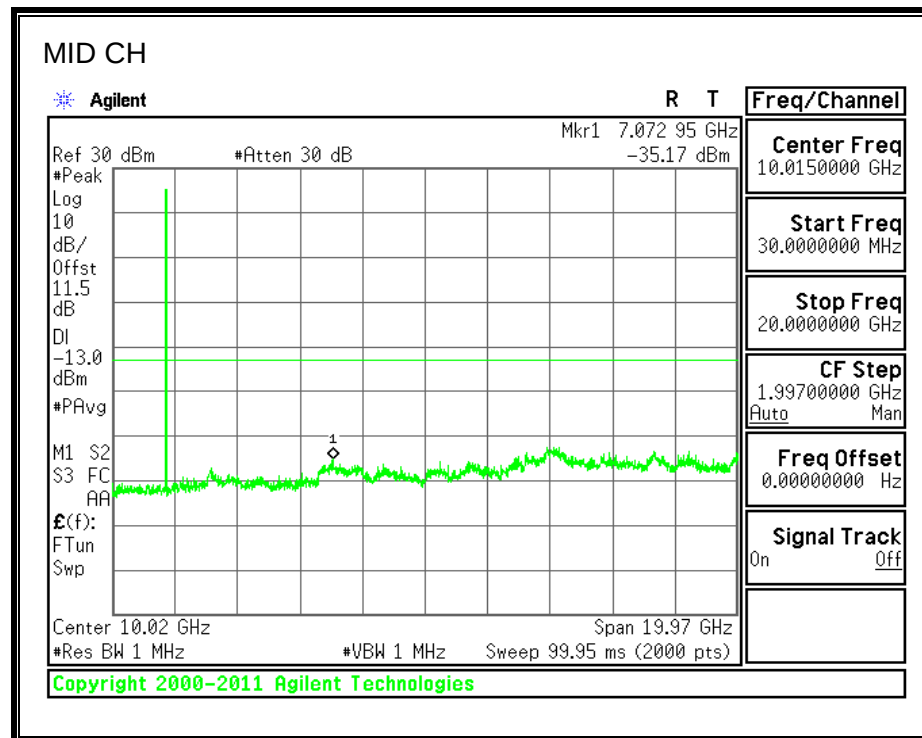
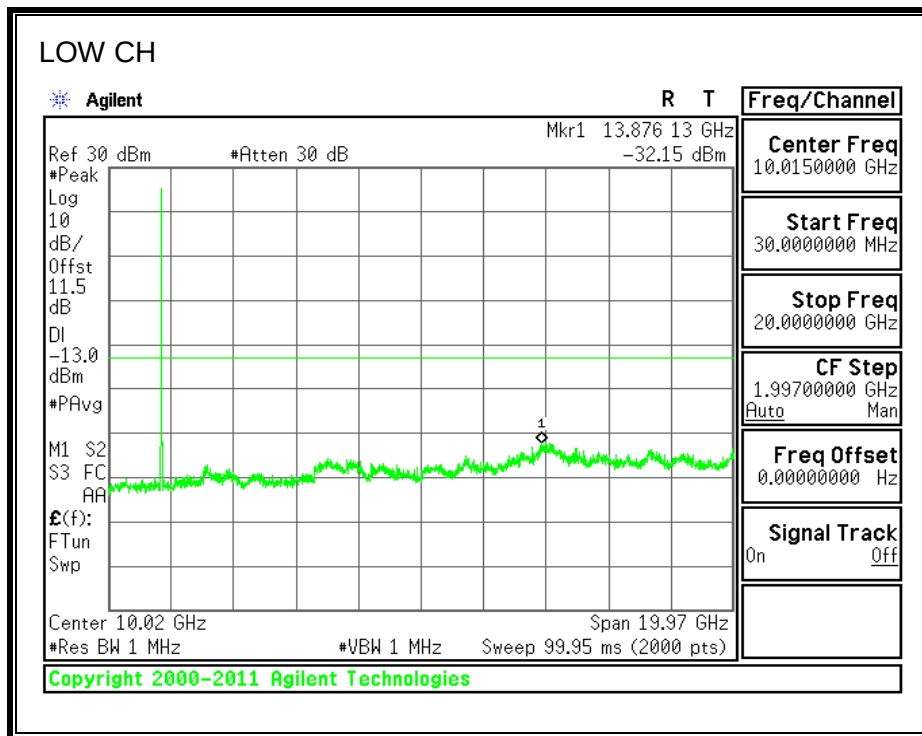


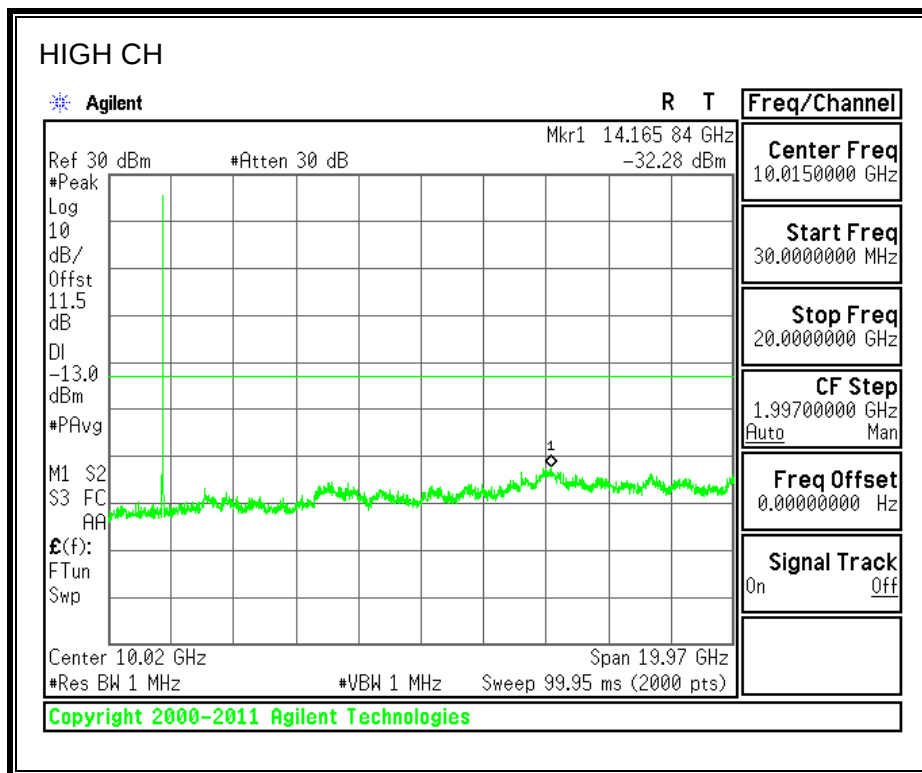
1900MHz BAND





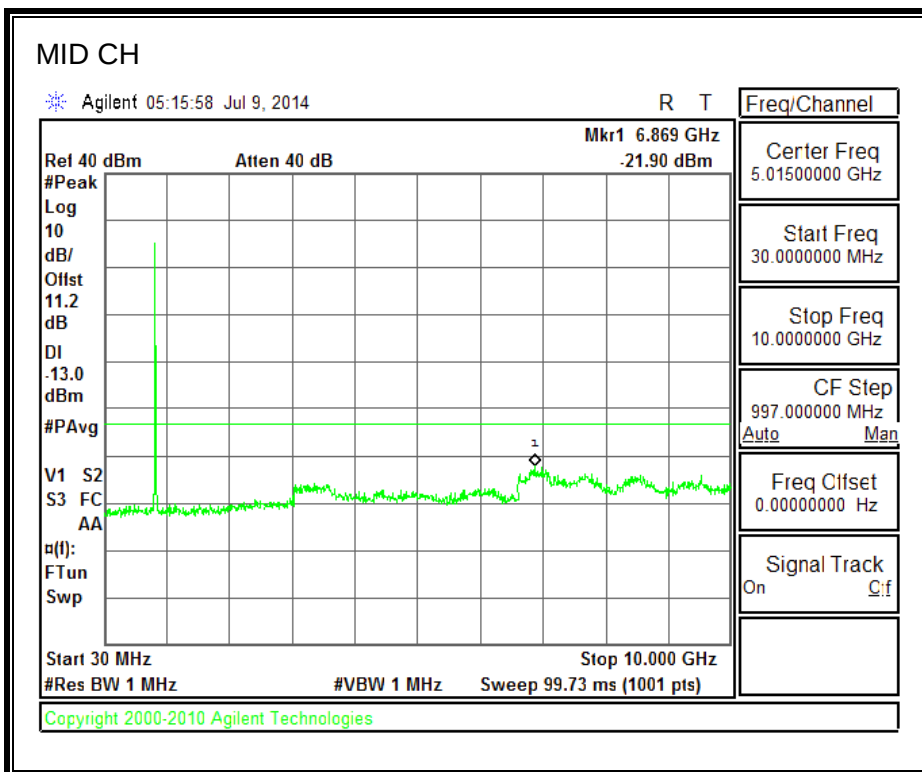
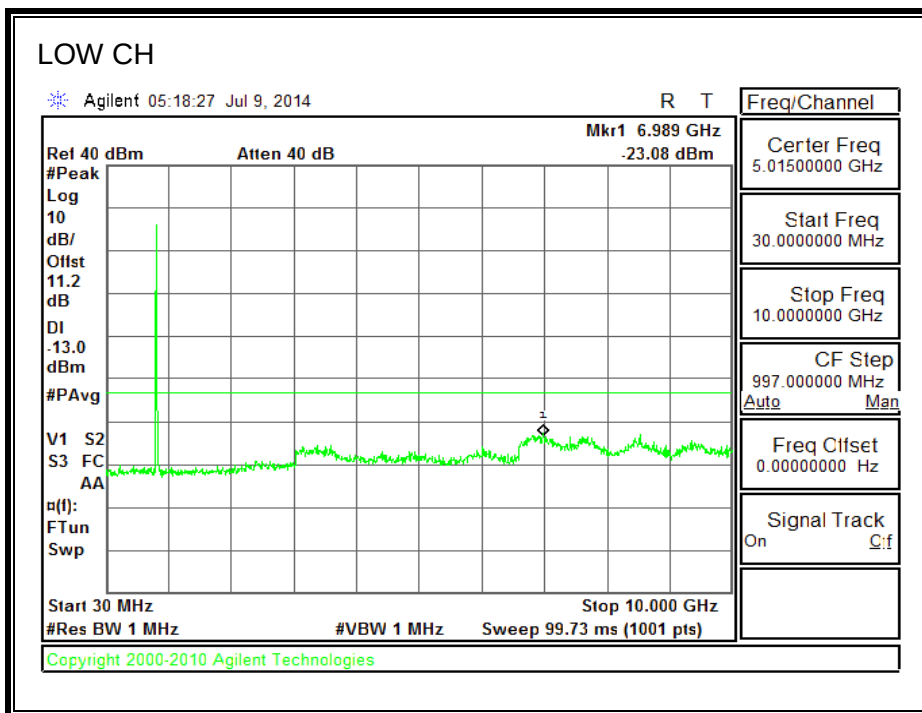
1700MHz BAND

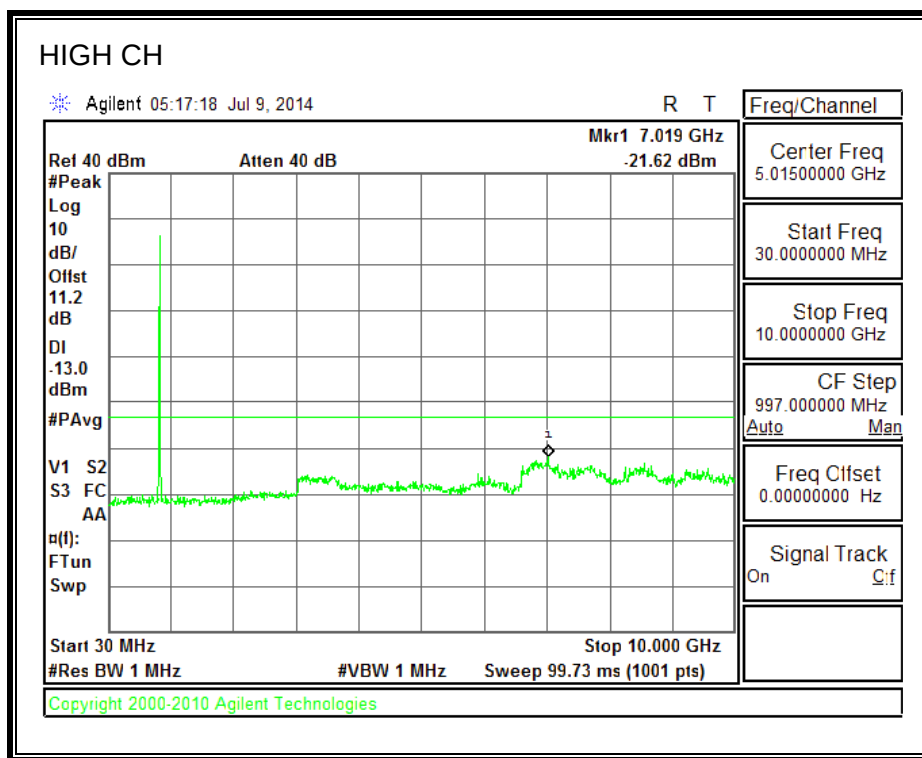




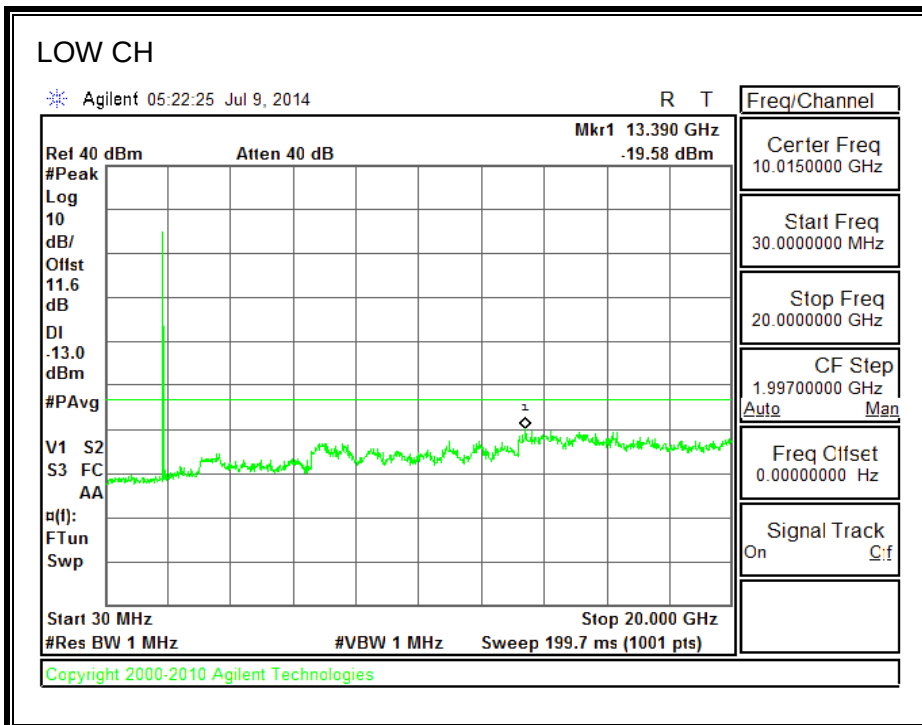
8.3.4. UMTS HSDPA

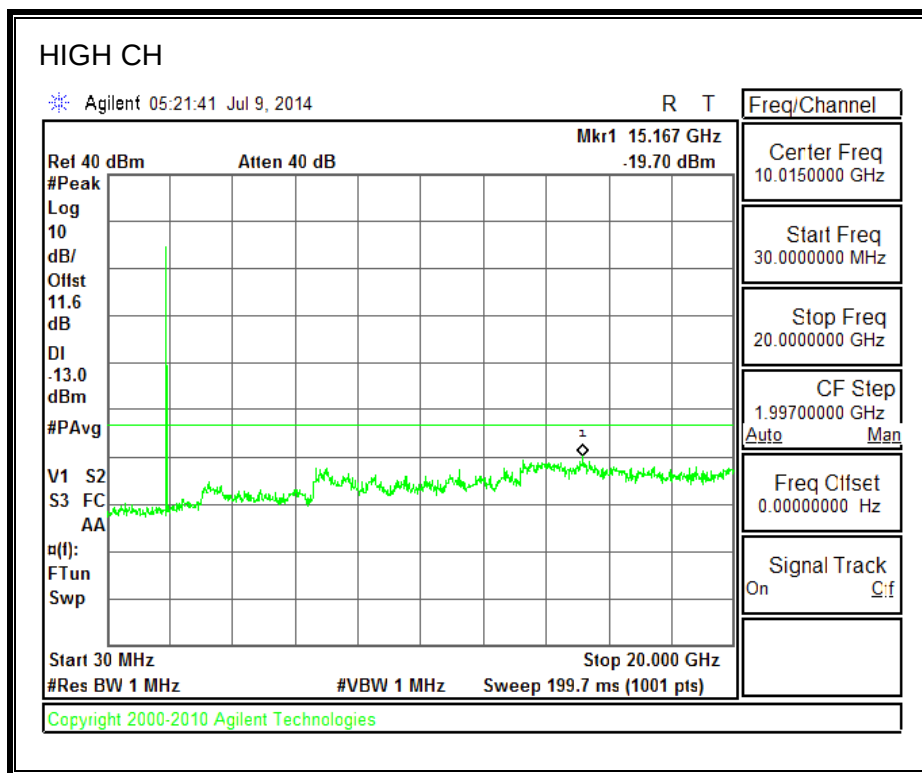
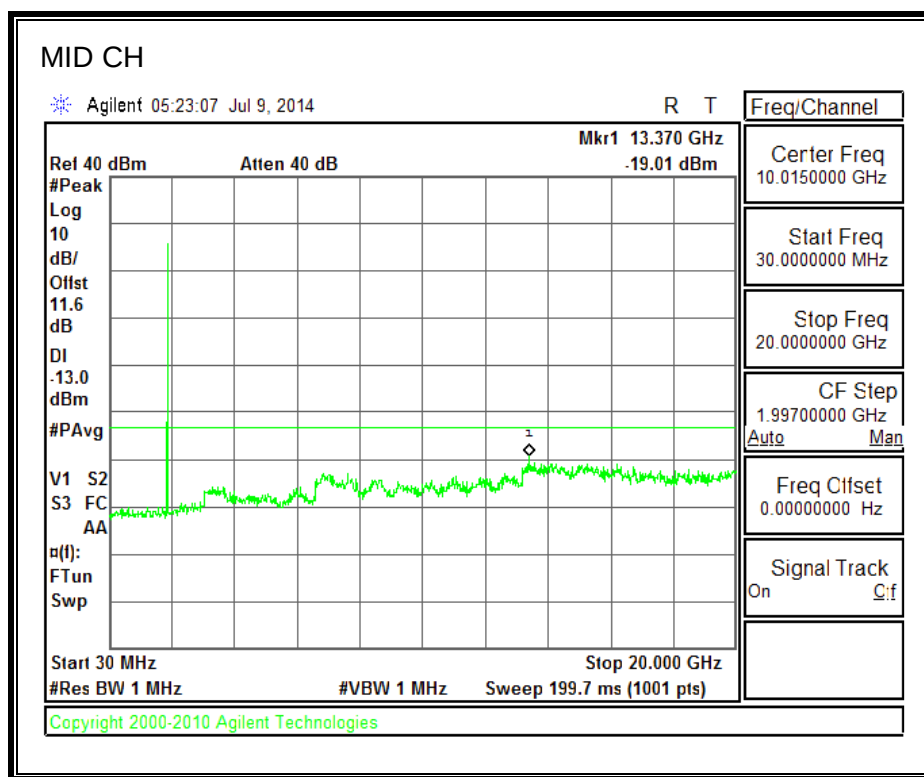
850MHz BAND



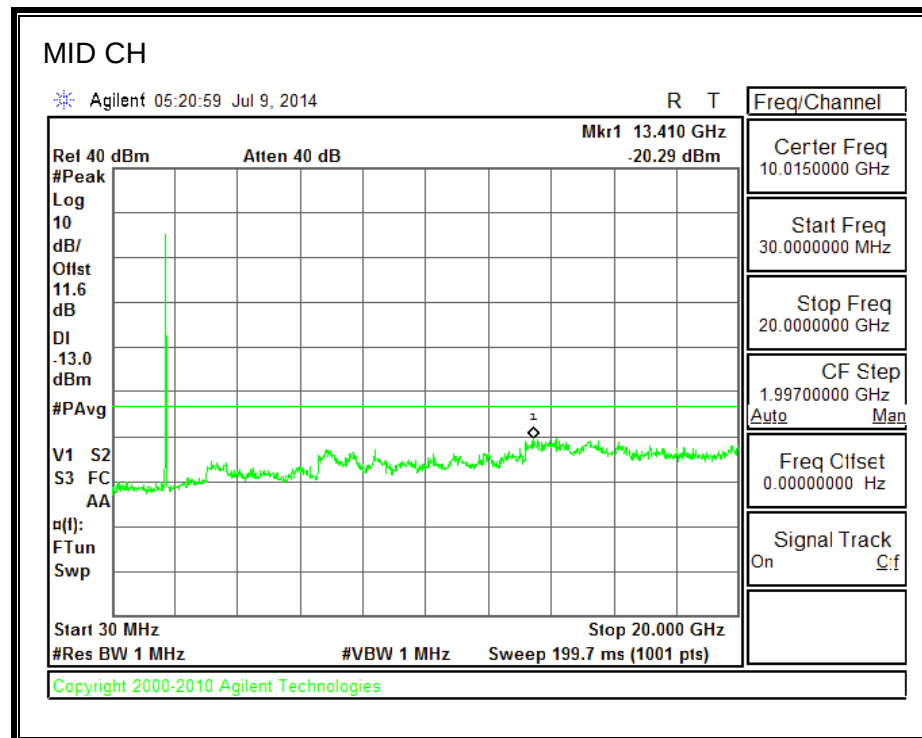
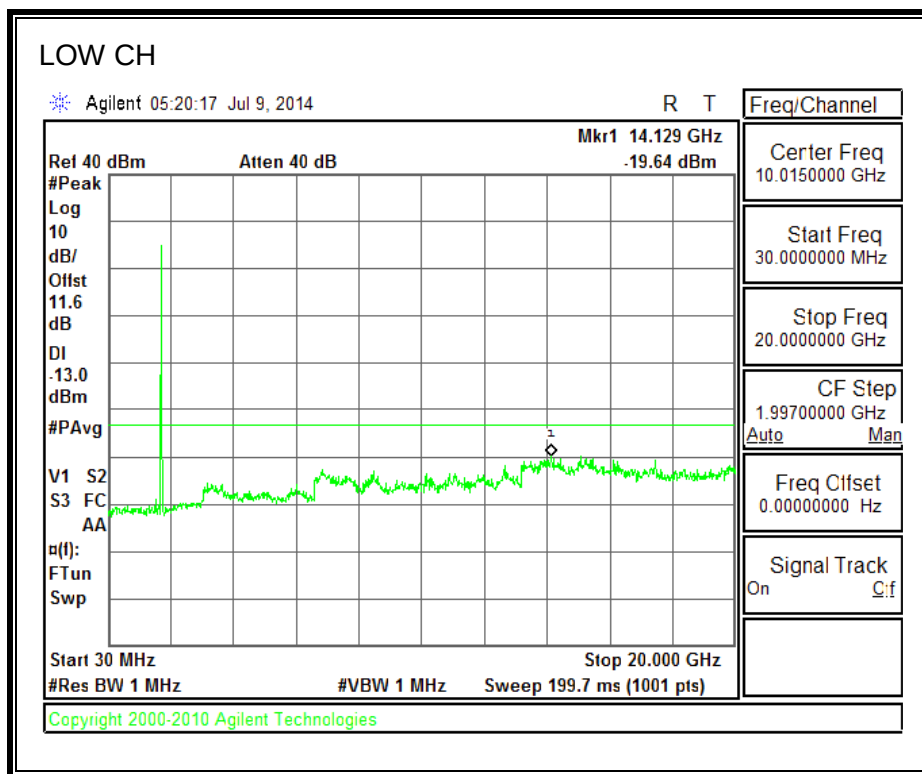


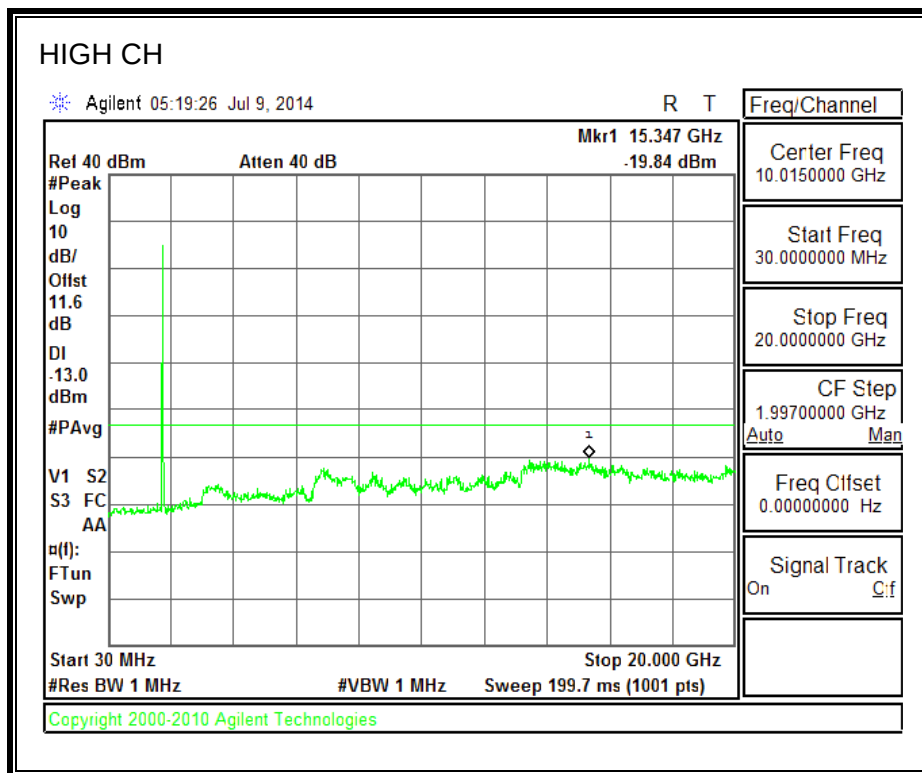
1900MHz BAND





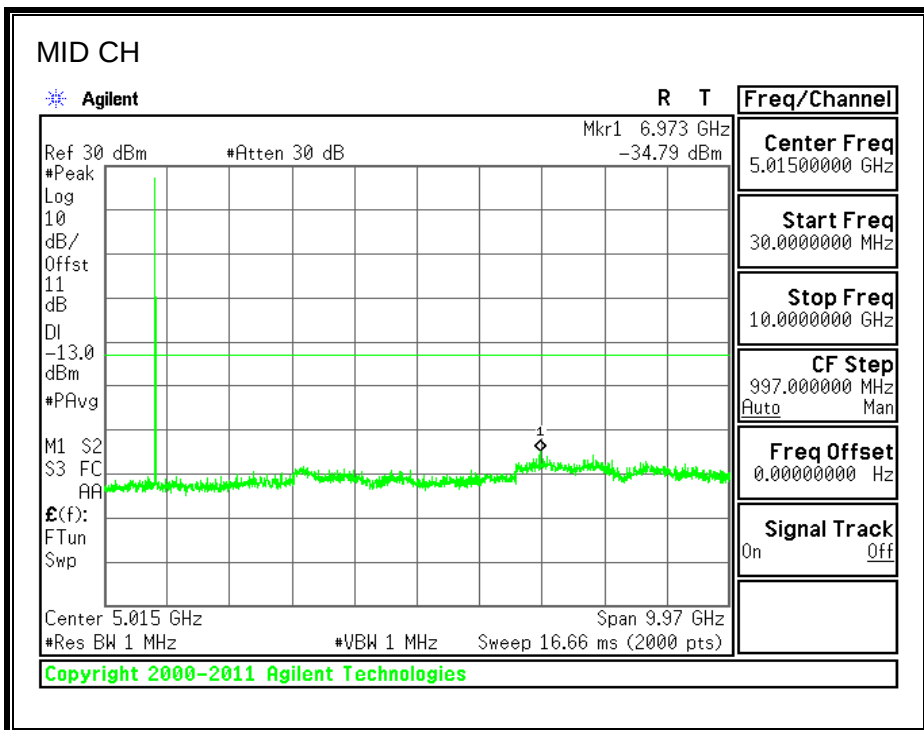
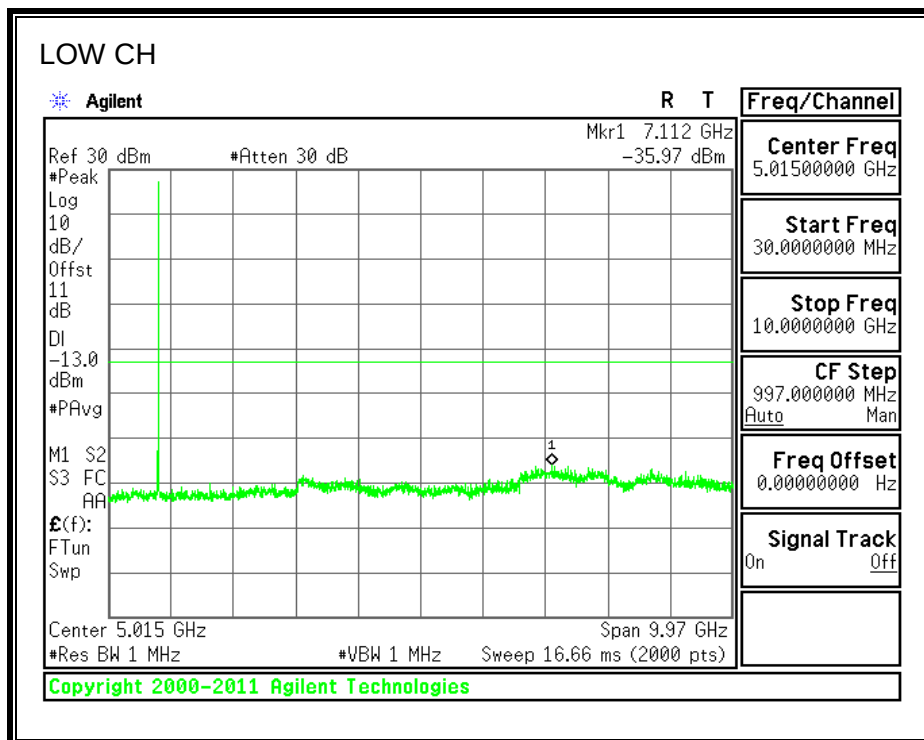
1700MHz BAND

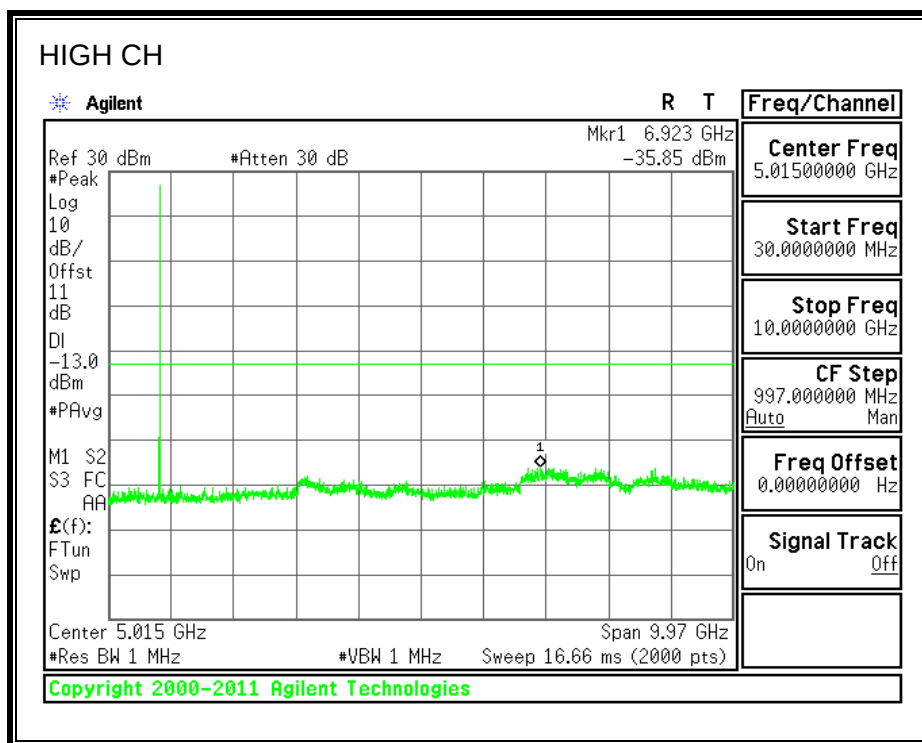




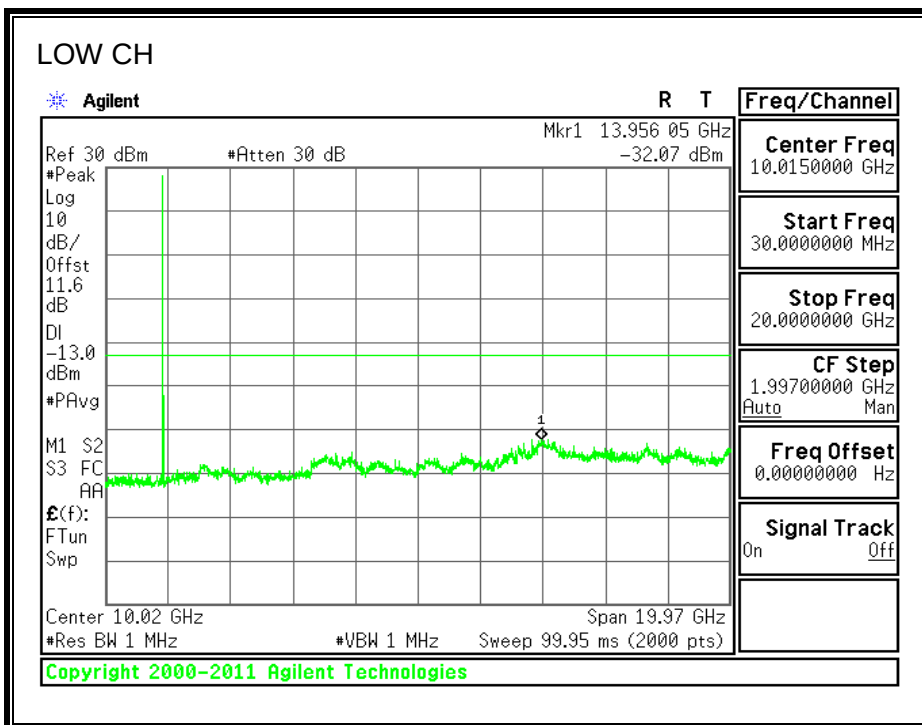
8.3.5. CDMA2000 1xRTT

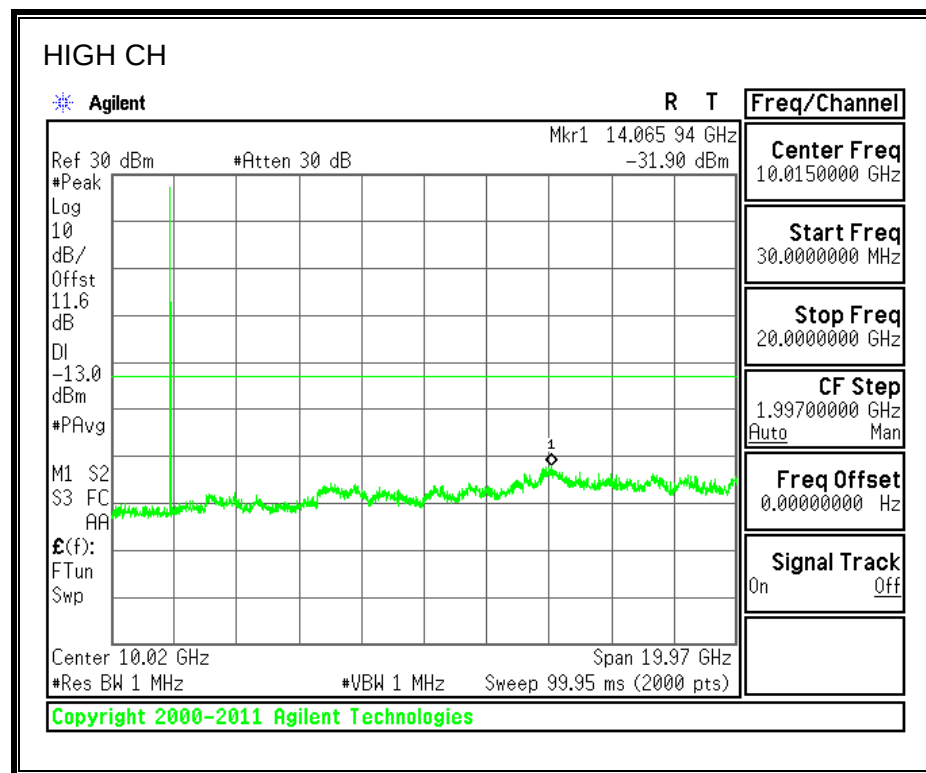
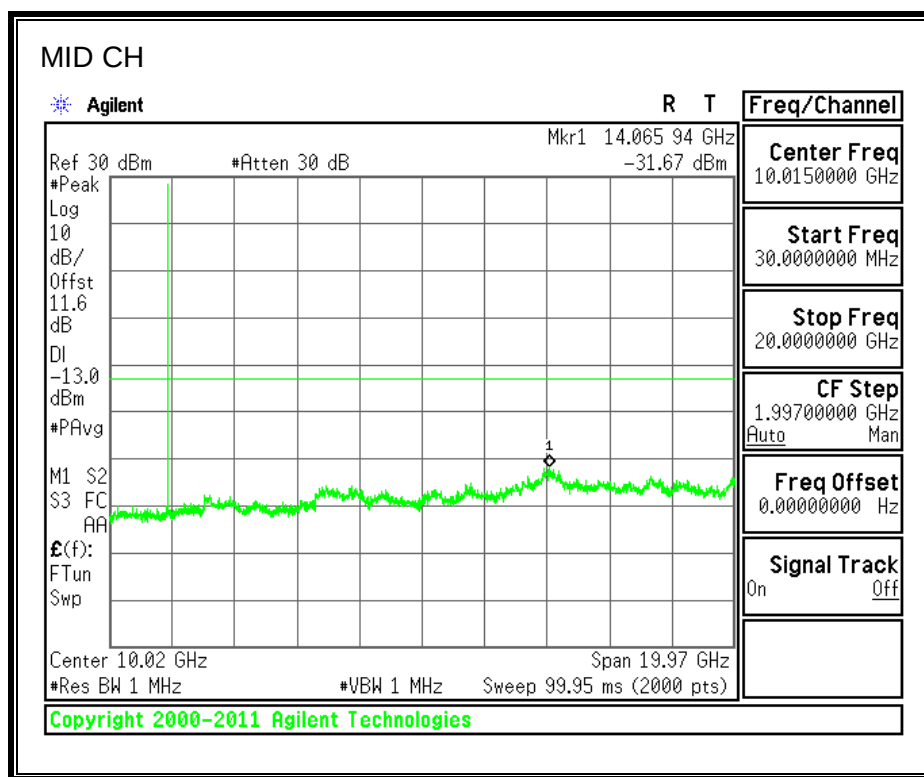
850MHz BAND



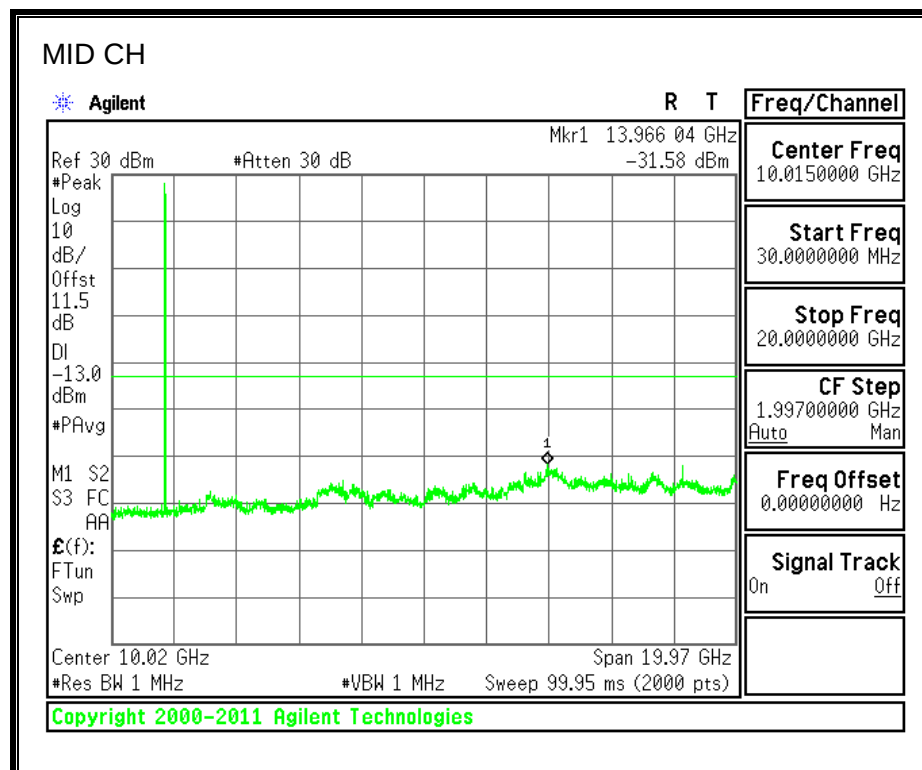
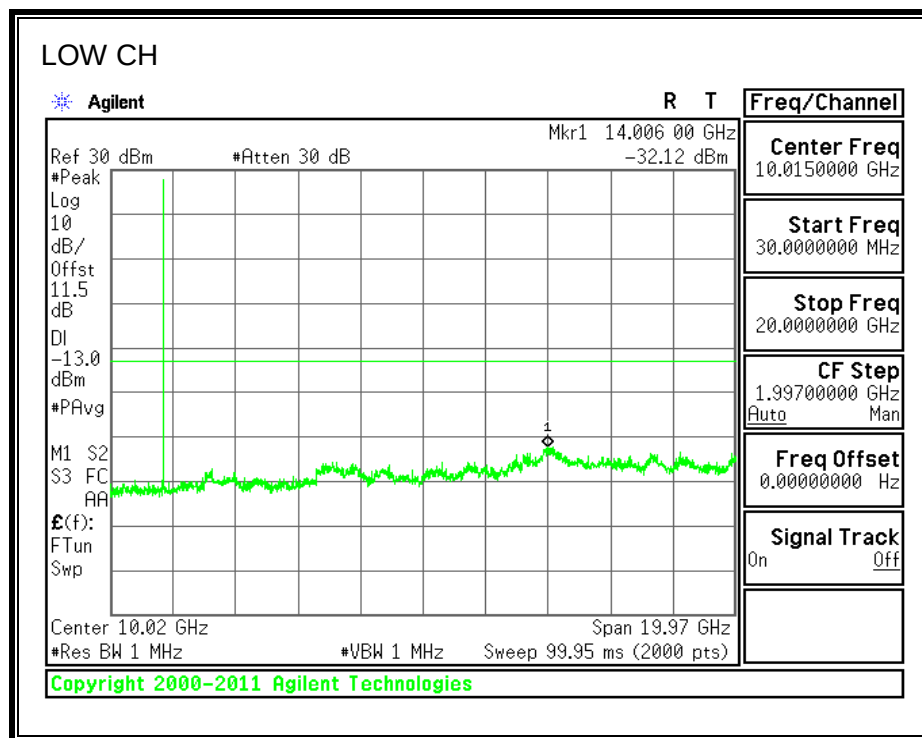


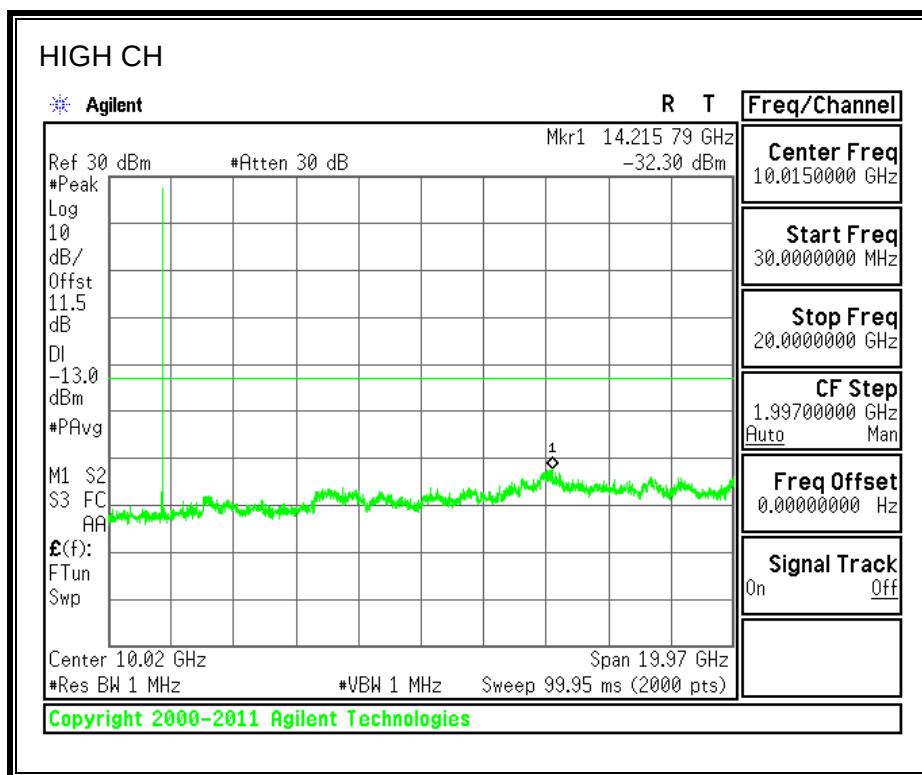
1900MHz BAND



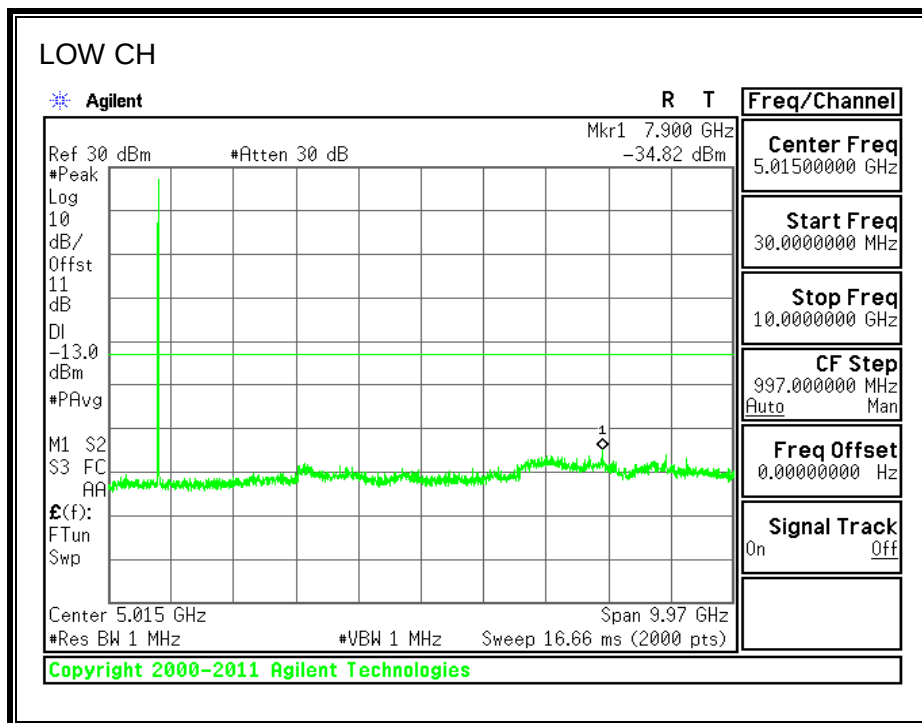


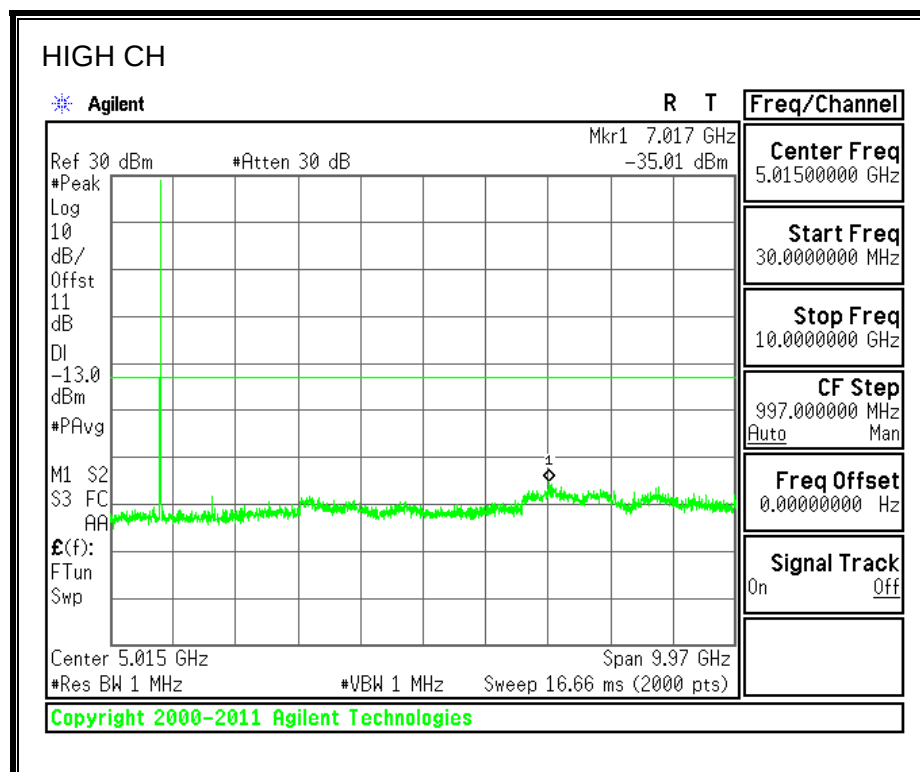
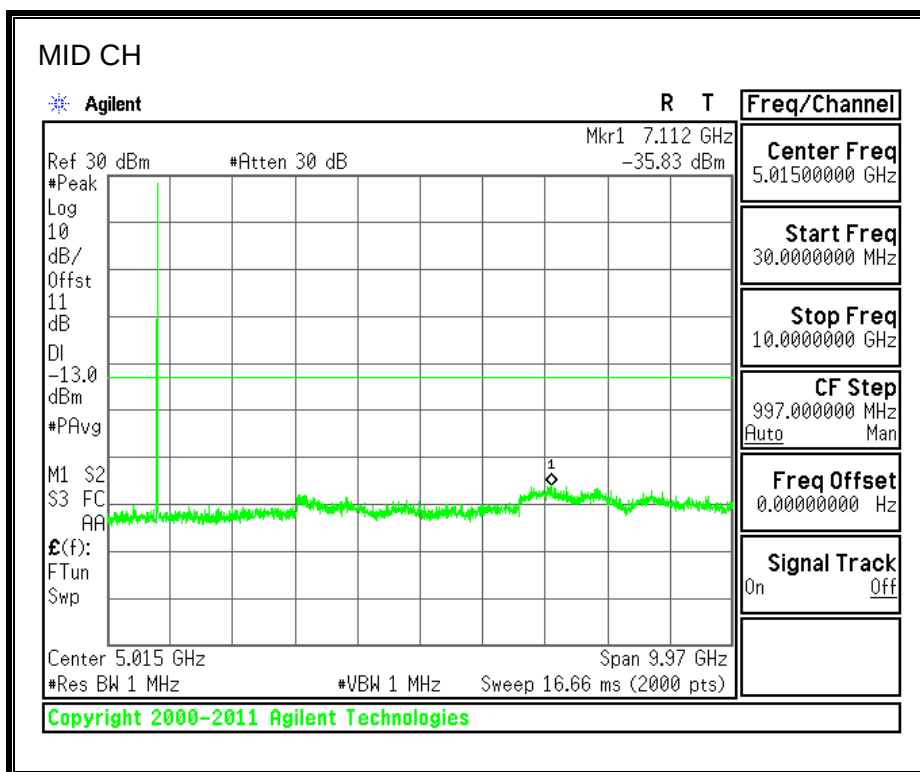
1700MHz BAND





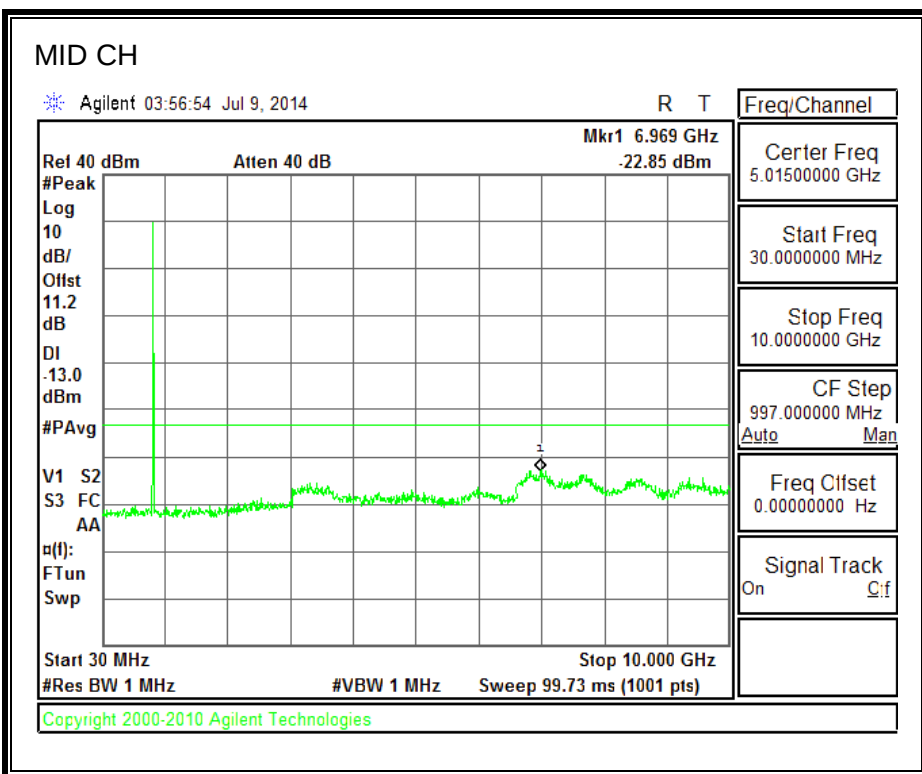
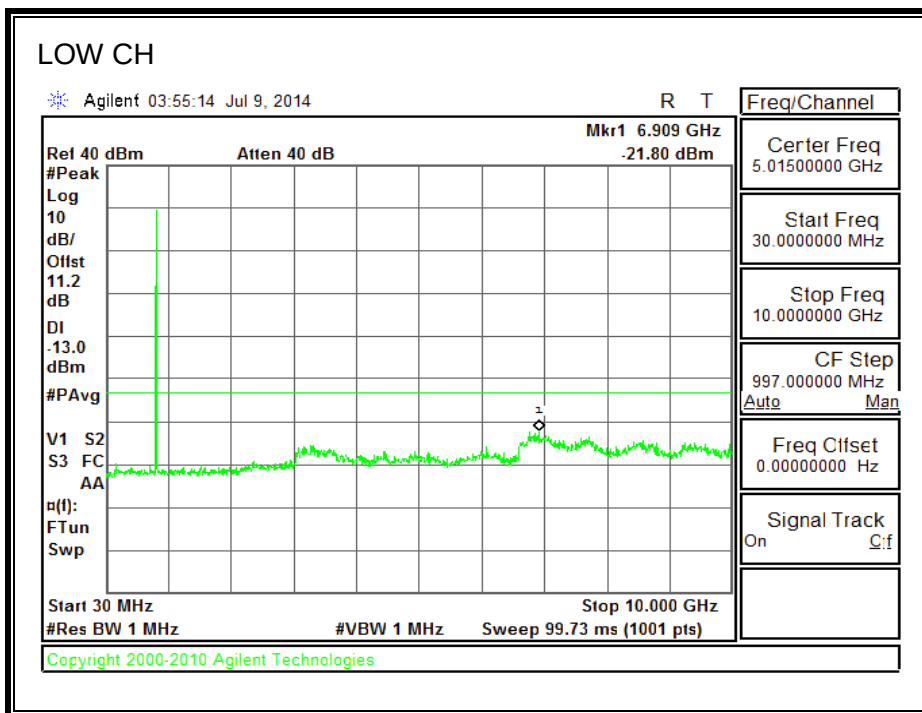
800MHz SECONDARY BAND

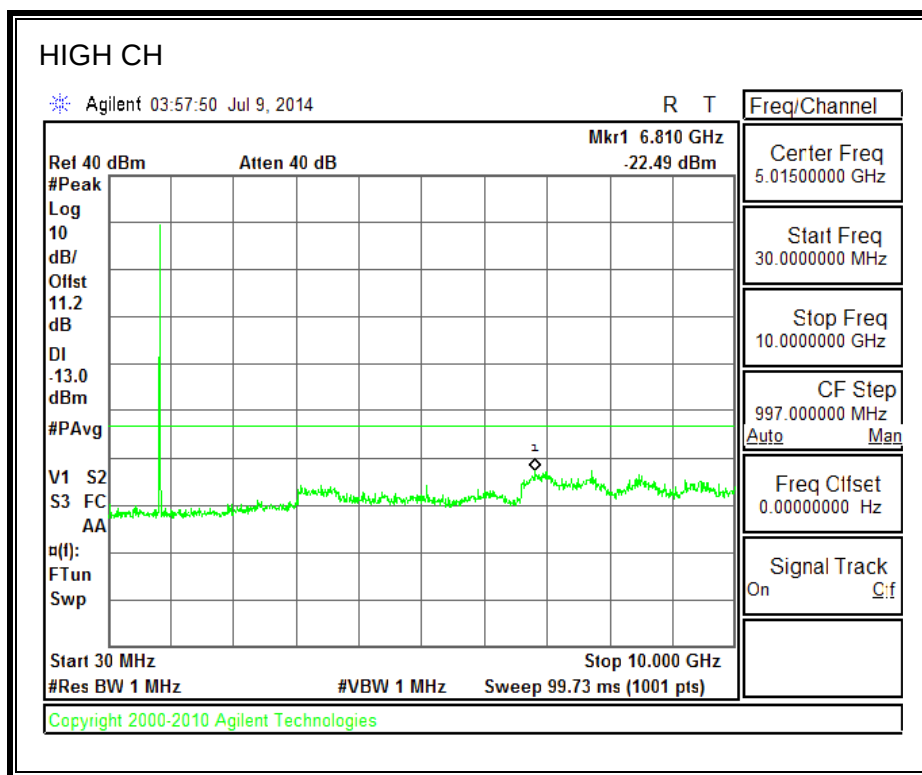




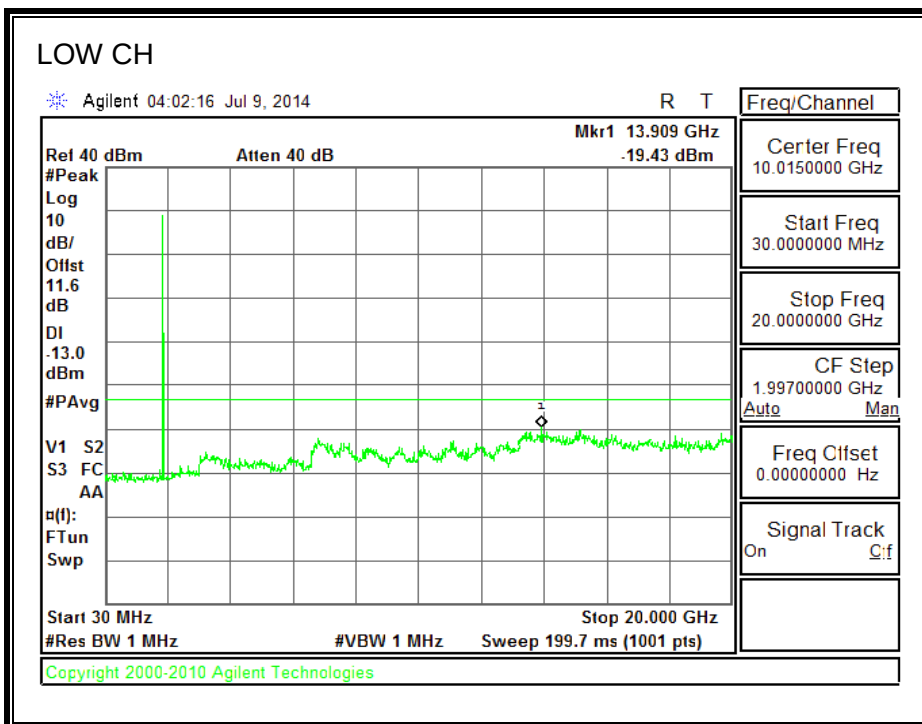
8.3.6. CDMA2000 EVDO Rev. A

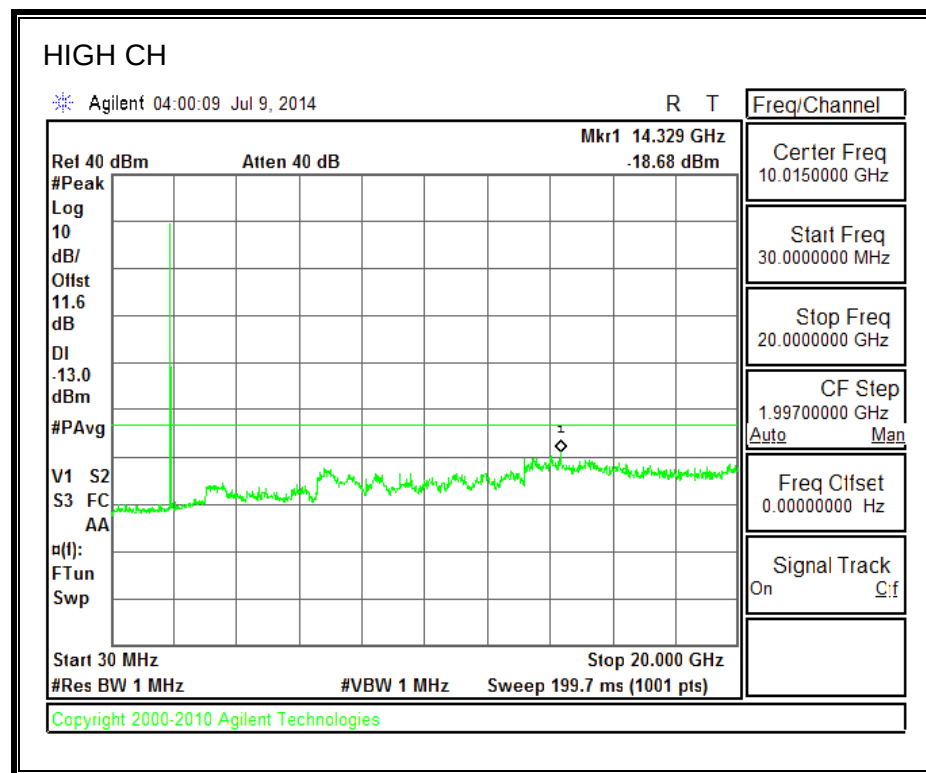
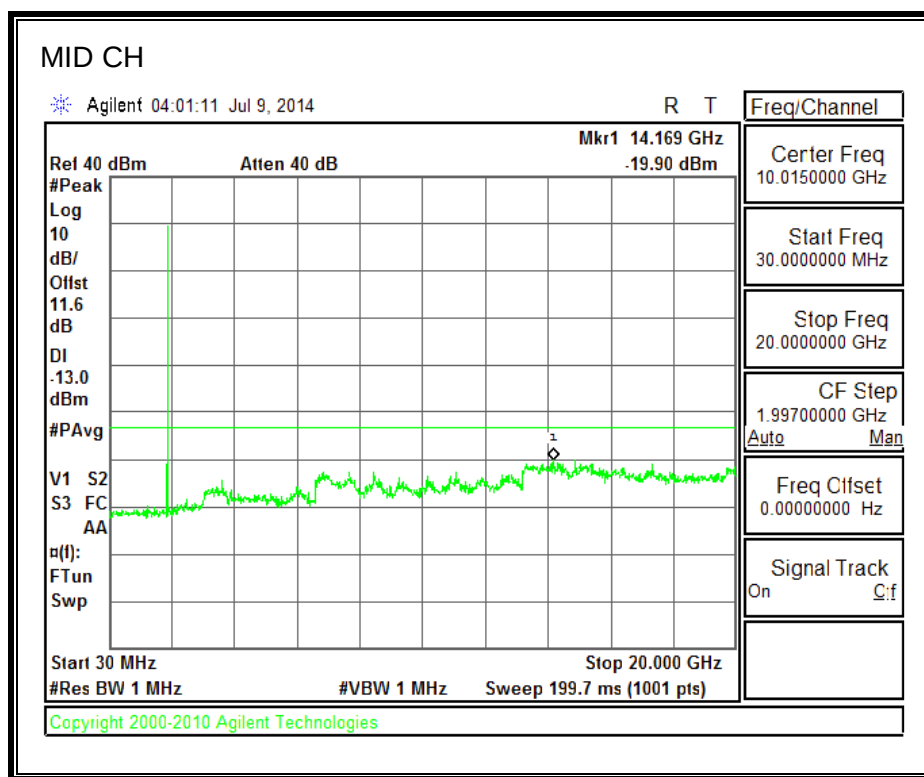
850MHz BAND



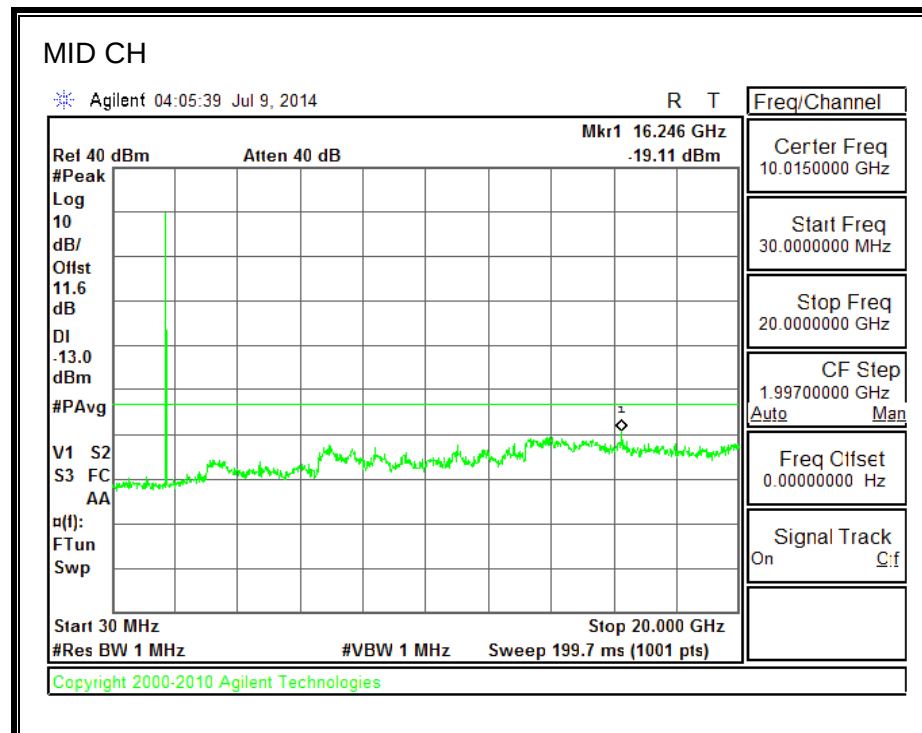
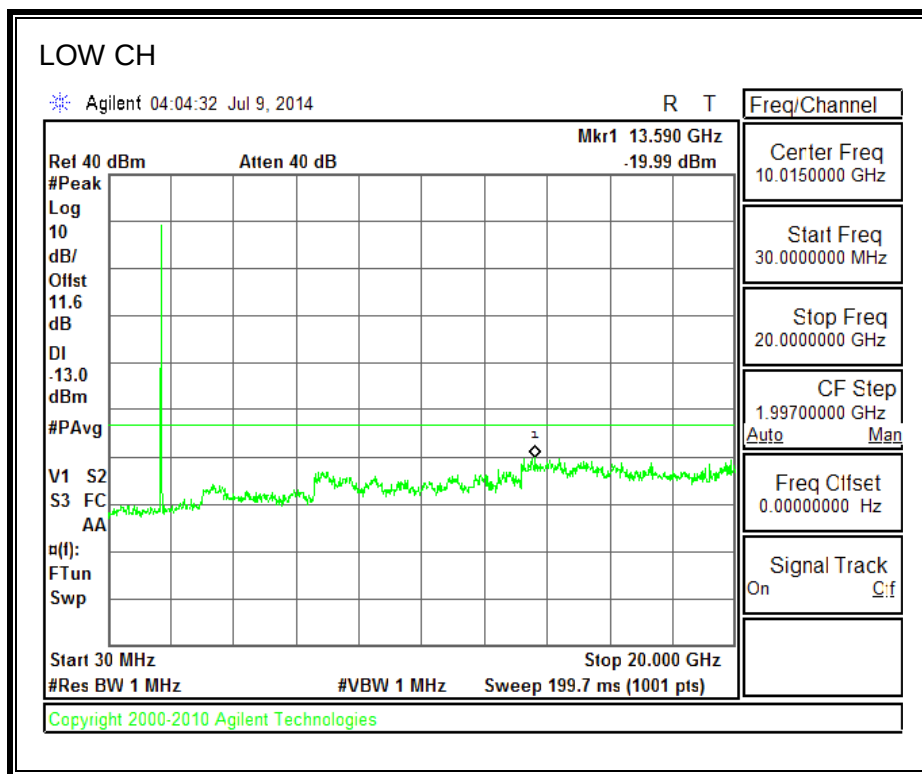


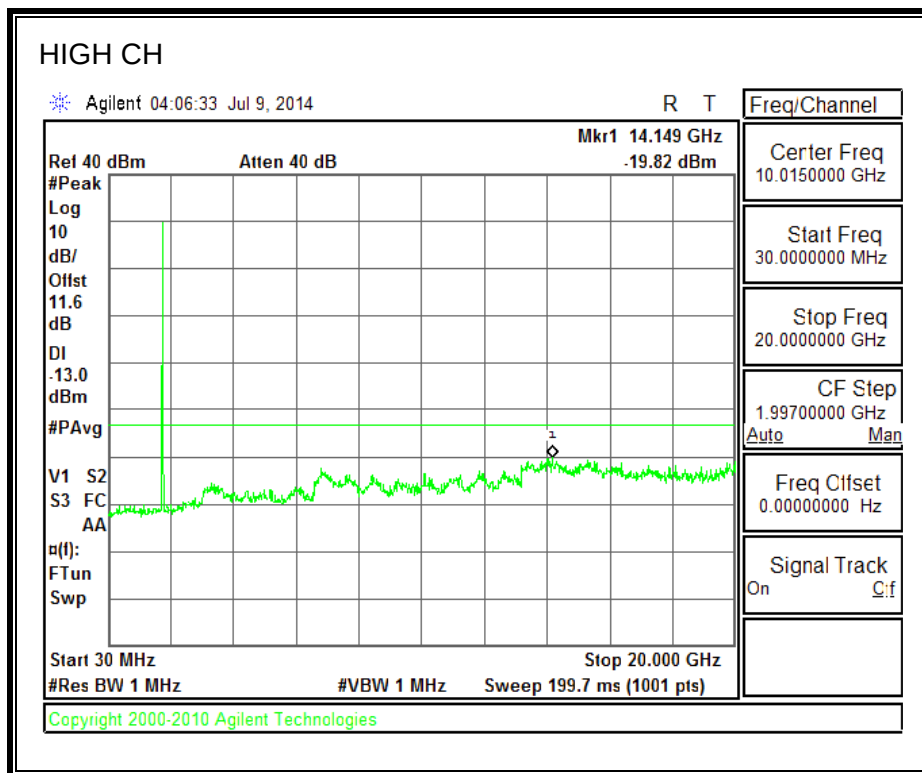
1900MHz BAND



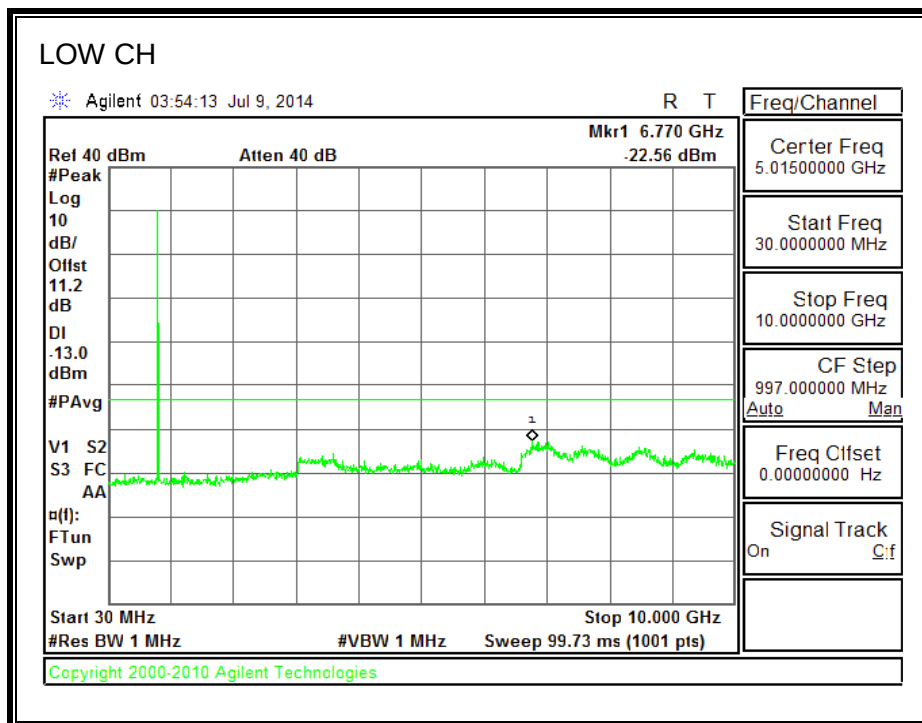


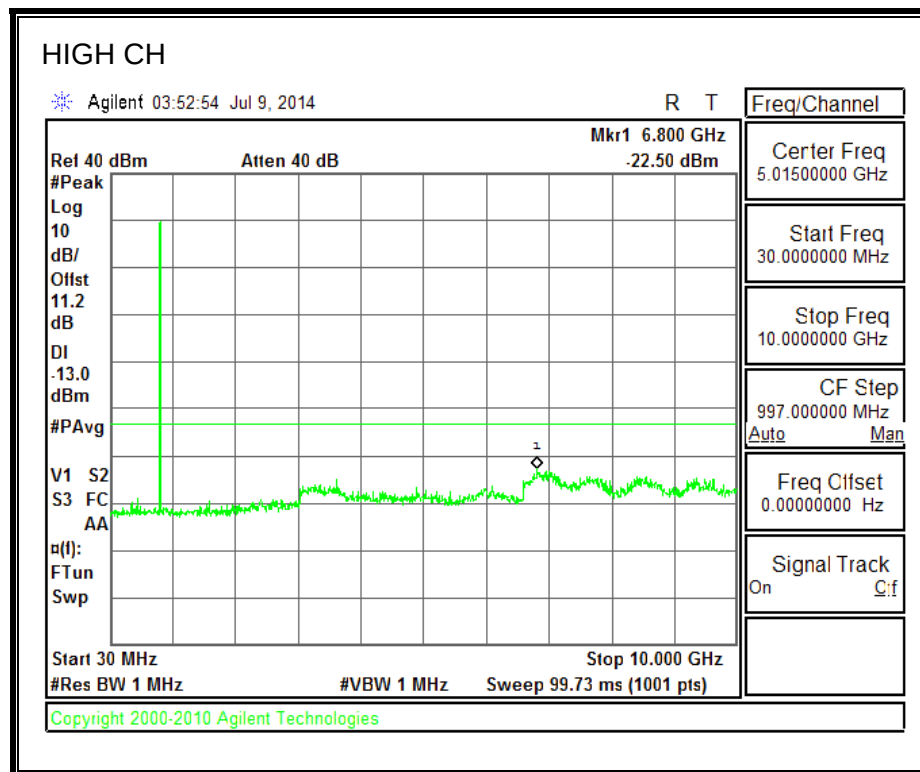
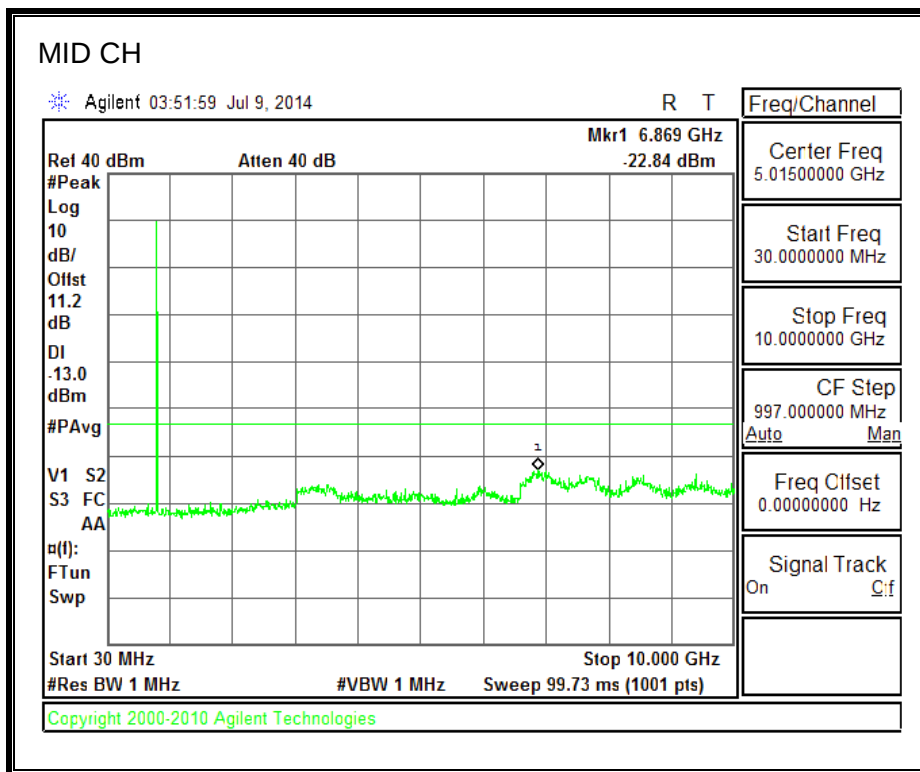
1700MHz BAND





800MHz SECONDARY BAND





9. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54. §90.213

LIMITS

§22.355 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

§24.235 & §27.54 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

90.213 - The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

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

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

- GSM850 and GSM1900 GPRS and EGPRS
- UMTS REL 99 BAND2, BAND4, BAND5
- CDMA2000 1xRTT BC0, BC1, BC10 and BC15

RESULTS

See the following pages.

GPRS 850

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	824.0200	848.9802		
Extreme (50C)		824.0201	848.9802	33.1	0.04
Extreme (40C)		824.0201	848.9802	29.6	0.04
Extreme (30C)		824.0200	848.9802	20.7	0.02
Extreme (10C)		824.0200	848.9802	13.4	0.02
Extreme (0C)		824.0200	848.9802	18.4	0.02
Extreme (-10C)		824.0200	848.9802	22.6	0.03
Extreme (-20C)		824.0200	848.9802	21.6	0.03
Extreme (-30C)		824.0200	848.9802	15.0	0.02
25C	10%	824.0200	848.9802	12.4	0.01
	-10%	824.0200	848.9802	-13.8	-0.02
	End Point	824.0200	848.9802	14.6	0.02

EGPRS 850

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	824.0361	848.9709		
Extreme (50C)		824.0362	848.9710	20.2	0.02
Extreme (40C)		824.0362	848.9710	19.6	0.02
Extreme (30C)		824.0362	848.9710	18.1	0.02
Extreme (10C)		824.0362	848.9710	17.8	0.02
Extreme (0C)		824.0362	848.9710	19.8	0.02
Extreme (-10C)		824.0362	848.9710	22.7	0.03
Extreme (-20C)		824.0362	848.9710	19.2	0.02
Extreme (-30C)		824.0362	848.9710	20.3	0.02
25C	10%	824.0362	848.9710	24.6	0.03
	-10%	824.0362	848.9710	22.7	0.03
	End Point	824.0362	848.9710	23.0	0.03

GPRS 1900

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	1850.0287	1909.9746		
Extreme (50C)		1850.0288	1909.9747	71.5	0.04
Extreme (40C)		1850.0288	1909.9747	67.3	0.04
Extreme (30C)		1850.0287	1909.9747	65.7	0.03
Extreme (10C)		1850.0287	1909.9747	65.4	0.03
Extreme (0C)		1850.0288	1909.9747	69.8	0.04
Extreme (-10C)		1850.0288	1909.9747	70.9	0.04
Extreme (-20C)		1850.0287	1909.9747	64.5	0.03
Extreme (-30C)		1850.0287	1909.9747	63.4	0.03
25C	10%	1850.0287	1909.9747	52.9	0.03
	-10%	1850.0287	1909.9747	55.6	0.03
	End Point	1850.0287	1909.9747	63.9	0.03

EGPRS 1900

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	1850.0296	1909.9692		
Extreme (50C)				58.6	0.03
Extreme (40C)		1850.0296	1909.9693	61.8	0.03
Extreme (30C)		1850.0296	1909.9693	68.9	0.04
Extreme (10C)		1850.0296	1909.9693	59.2	0.03
Extreme (0C)		1850.0296	1909.9693	66.7	0.04
Extreme (-10C)		1850.0296	1909.9693	69.0	0.04
Extreme (-20C)		1850.0296	1909.9693	66.4	0.04
Extreme (-30C)		1850.0296	1909.9693	58.8	0.03
25C	10%	1850.0296	1909.9693	68.0	0.04
	-10%	1850.0296	1909.9693	66.7	0.04
	End Point	1850.0296	1909.9693	69.2	0.04

WCDMA REL99 BAND 2

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	1850.1259	1909.8708		
Extreme (50C)		1850.1259	1909.8708	12.0	0.01
Extreme (40C)		1850.1259	1909.8708	9.5	0.01
Extreme (30C)		1850.1259	1909.8708	10.4	0.01
Extreme (10C)		1850.1259	1909.8708	11.6	0.01
Extreme (0C)		1850.1259	1909.8708	11.8	0.01
Extreme (-10C)		1850.1259	1909.8708	10.2	0.01
Extreme (-20C)		1850.1259	1909.8708	11.9	0.01
Extreme (-30C)		1850.1259	1909.8708	12.8	0.01
25C	10%	1850.1259	1909.8708	11.0	0.01
	-10%	1850.1259	1909.8708	12.2	0.01
	End Point	1850.1259	1909.8708	13.9	0.01

WCDMA REL99 BAND 4

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	1710.1295	1754.8768		
Extreme (50C)		1710.1295	1754.8768	14.1	0.01
Extreme (40C)		1710.1295	1754.8768	14.3	0.01
Extreme (30C)		1710.1295	1754.8768	15.0	0.01
Extreme (10C)		1710.1295	1754.8768	-14.0	-0.01
Extreme (0C)		1710.1295	1754.8768	-13.1	-0.01
Extreme (-10C)		1710.1295	1754.8768	-14.5	-0.01
Extreme (-20C)		1710.1295	1754.8768	12.7	0.01
Extreme (-30C)		1710.1295	1754.8768	-12.5	-0.01
25C	10%	1710.1295	1754.8768	18.5	0.01
	-10%	1710.1295	1754.8768	16.5	0.01
	End Point	1710.1295	1754.8768	18.4	0.01

WCDMA REL99 BAND 5

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	824.1258	848.8750		
Extreme (50C)		824.1258	848.8750	-9.4	-0.01
Extreme (40C)		824.1258	848.8750	-4.0	0.00
Extreme (30C)		824.1258	848.8750	-4.1	0.00
Extreme (10C)		824.1258	848.8750	-4.1	0.00
Extreme (0C)		824.1258	848.8750	-5.4	-0.01
Extreme (-10C)		824.1258	848.8750	-4.2	-0.01
Extreme (-20C)		824.1258	848.8750	-6.4	-0.01
Extreme (-30C)		824.1258	848.8750	-5.5	-0.01
25C	10%	824.1258	848.8750	-4.4	-0.01
	-10%	824.1258	848.8750	-4.3	-0.01
	End Point	824.1258	848.8750	-4.3	-0.01

CDMA 1xRTT BC0

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	824.0047	848.9982		
Extreme (50C)		824.0046	848.9982	-34.4	-0.04
Extreme (40C)		824.0047	848.9982	13.9	0.02
Extreme (30C)		824.0046	848.9982	-14.7	-0.02
Extreme (10C)		824.0046	848.9982	-21.7	-0.03
Extreme (0C)		824.0047	848.9982	8.6	0.01
Extreme (-10C)		824.0046	848.9982	-12.2	-0.01
Extreme (-20C)		824.0046	848.9982	-14.8	-0.02
Extreme (-30C)		824.0047	848.9982	7.6	0.01
25C	10%	824.0046	848.9982	-17.0	-0.02
	-10%	824.0046	848.9982	-16.4	-0.02
	End Point	824.0046	848.9982	-19.0	-0.02

CDMA 1x RTT BC1

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	1850.5516	1909.4452		
Extreme (50C)		1850.5516	1909.4451	-54.9	-0.03
Extreme (40C)		1850.5515	1909.4451	-58.3	-0.03
Extreme (30C)		1850.5515	1909.4451	-70.6	-0.04
Extreme (10C)		1850.5515	1909.4451	-72.3	-0.04
Extreme (0C)		1850.5515	1909.4451	-79.3	-0.04
Extreme (-10C)		1850.5515	1909.4451	-77.6	-0.04
Extreme (-20C)		1850.5515	1909.4451	-71.0	-0.04
Extreme (-30C)		1850.5515	1909.4451	-72.1	-0.04
25C	10%	1850.5515	1909.4451	-67.4	-0.04
	-10%	1850.5515	1909.4451	-69.0	-0.04
	End Point	1850.5515	1909.4451	-70.1	-0.04

CDMA 1xRTT BC10

Limit		816.35	823.65	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	816.5616	823.4445		
Extreme (50C)		816.5616	823.4445	22.6	0.03
Extreme (40C)		816.5616	823.4445	28.3	0.03
Extreme (30C)		816.5616	823.4445	-27.2	-0.03
Extreme (10C)		816.5616	823.4445	18.3	0.02
Extreme (0C)		816.5616	823.4445	-14.4	-0.02
Extreme (-10C)		816.5616	823.4445	6.4	0.01
Extreme (-20C)		816.5616	823.4445	16.0	0.02
Extreme (-30C)		816.5616	823.4445	-9.4	-0.01
25C	10%	816.5616	823.4445	-22.3	-0.03
	-10%	816.5616	823.4445	-25.3	-0.03
	End Point	816.5616	823.4445	-23.7	-0.03

CDMA 1xRTT BC15

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm (MHz)	F high @ -13dBm (MHz)		
Temperature	Voltage				
Normal (25C)	Normal	1710.5556	1754.4442		
Extreme (50C)		1710.5556	1754.4442	-32.6	-0.02
Extreme (40C)		1710.5556	1754.4442	-36.4	-0.02
Extreme (30C)		1710.5556	1754.4442	-43.4	-0.03
Extreme (10C)		1710.5556	1754.4441	-66.9	-0.04
Extreme (0C)		1710.5556	1754.4442	-56.4	-0.03
Extreme (-10C)		1710.5556	1754.4442	-61.2	-0.04
Extreme (-20C)		1710.5556	1754.4441	-75.7	-0.04
Extreme (-30C)		1710.5556	1754.4441	-80.3	-0.05
25C	10%	1710.5556	1754.4442	-46.7	-0.03
	-10%	1710.5556	1754.4442	-45.3	-0.03
	End Point	1710.5556	1754.4442	-43.1	-0.02

10. RADIATED TEST RESULTS

10.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50 and § 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.

§27.50(d) (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band are limited to 1 watt EIRP. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in this band must employ a means for limiting 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

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

2, Applicants in the Los Angeles, CA, area who demonstrate a need to serve both the downtown and fringe areas will be permitted to utilize an ERP of 1 kw at the following mountaintop sites: Santiago Park, Sierra Peak, Mount Lukens, and Mount Wilson.

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

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

KDB 971168 v02r01 RF Power output using broadband peak and average power meter method

MODES TESTED

- GSM GPRS/EGPRS.
- UMTS, REL 99 and HSDPA
- CDMA2000, 1xRTT and EVDO, Rev A, BC0, BC1
- BC10, BC15

RESULTS

Part 22 850MHz Band					
Band	Mode	Channel	f (MHz)	ERP (Average)	
				dBm	mW
CELL	GPRS	128	824.2	31.79	1510.08
		190	836.6	31.80	1513.56
		251	848.8	31.85	1531.09
	EGPRS	128	824.2	27.02	503.50
		190	836.6	27.03	504.66
		251	848.8	27.12	515.23

Part 24 1900MHz Band					
Band	Mode	Channel	f (MHz)	EIRP (Average)	
				dBm	mW
PCS	GPRS	512	1850.2	30.74	1185.77
		661	1880.0	31.03	1267.65
		810	1909.8	31.54	1425.61
	EGPRS	512	1850.2	28.94	783.43
		661	1880.0	29.13	818.46
		810	1909.8	29.44	879.02

Part 22 850MHz Band					
Band	Mode	Channel	f (MHz)	ERP (Average)	
				dBm	mW
CELL	UMTS,REL 99	4357	826.4	23.30	213.80
		4405	836.0	23.23	210.38
		4455	846.0	23.12	205.12
	UMTS, HSDPA	4357	826.4	22.37	172.58
		4405	836.0	22.13	163.31
		4455	846.0	22.40	173.78

Part 24 1900MHz Band					
Band	Mode	Channel	f (MHz)	EIRP (Average)	
				dBm	mW
PCS	UMTS,REL 99	9662	1852.4	24.81	302.69
		9800	1880.0	24.63	290.40
		9938	1907.6	24.58	287.08
	UMTS, HSDPA	9662	1852.4	23.32	214.78
		9800	1880.0	23.11	204.64
		9938	1907.6	23.14	206.06

Part 27 1700MHz Band					
Band	Mode	Channel	f (MHz)	EIRP (Average)	
				dBm	mW
PCS	UMTS,REL 99	1537	1712.4	24.09	256.45
		1638	1732.6	24.58	287.08
		1738	1752.5	24.16	260.62
	UMTS, HSDPA	1537	1712.4	23.05	201.84
		1638	1732.6	23.23	210.38
		1738	1752.5	23.29	213.30

Part 22 850MHz Band					
Band	Mode	Channel	f (MHz)	ERP (Average)	
				dBm	mW
CELL	BC 0, 1xRTT	1013	824.7	22.80	190.55
		384	836.5	22.60	181.97
		777	848.3	22.82	191.43
	BC 0, EVDO Rev A	1013	824.7	22.77	189.23
		384	836.5	22.74	187.93
		777	848.3	22.69	185.78

Part 24 1900MHz Band					
Band	Mode	Channel	f (MHz)	EIRP (Average)	
				dBm	mW
PCS	BC1, 1xRTT	25	1851.3	24.14	259.42
		600	1880.0	24.53	283.79
		1175	1908.8	24.74	297.85
	BC1, EVDO REV A	25	1851.3	24.04	253.51
		600	1880.0	24.23	264.85
		1175	1908.8	24.54	284.45

Part 27 1700MHz Band					
Band	Mode	Channel	f (MHz)	EIRP (Average)	
				dBm	mW
PCS	BC15, 1xRTT	25	1711.3	24.41	276.06
		450	1732.5	23.93	247.17
		875	1753.8	23.65	231.74
	BC15, EVDO, REV A	25	1711.3	24.31	269.77
		450	1732.5	23.73	236.05
		875	1753.8	23.55	226.46

Part 90 800MHz Band					
Band	Mode	Channel	f (MHz)	ERP (Average)	
				dBm	mW
CELL	BC10, 1xRTT	476	817.9	23.16	207.01
		526	819.2	23.08	203.24
		684	823.1	23.22	209.89
	BC10, EVDO A	476	817.9	23.28	212.81
		526	819.2	23.24	210.86
		684	823.1	23.12	205.12

CDMA2000 REV B				
Mode	Channel	f (MHz)	ERP (Average)	
			dBm	mW
EVDO Rev B Two Carriers Min.	1013+31	825.3	18.12	64.86
	384+425	837.2	18.03	63.53
	736+777	847.6	18.22	66.37
EVDO Rev B Two Carriers Max	1013+156	826.5	18.32	67.92
	384+550	838.8	18.23	66.53
	611+777	844.9	18.12	64.86
EVDO Rev B Three Carriers Min.	1013+31+72	825.9	18.27	67.14
	384+425+466	837.7	18.13	65.01
	695+736+777	846.7	18.12	64.86

10.1.1. GSM

GPRS, 850MHz BAND 5

High Frequency Substitution Measurement UL Fremont Radiated Chamber E										
Project #:		14U18207								
Date:		7/24/2014								
Test Engineer:		Ali poushnejad								
Configuration:		EUT only								
Mode:		GSM GPRS 850MHz								
Test Equipment:										
Receiving: Sunol T408, and Chamber E Cable										
Substitution: Dipole S/N: 00022117, 8ft SMA Cable										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
824.20	32.4	V	0.6	0.0	31.79	33.94	38.45	40.60	-6.7	
824.20	28.5	H	0.6	0.0	27.87	30.02	38.45	40.60	-10.6	
Mid Ch										
836.60	32.4	V	0.6	0.0	31.80	33.95	38.45	40.60	-6.7	
836.60	26.5	H	0.6	0.0	25.85	28.00	38.45	40.60	-12.6	
High Ch										
848.80	32.5	V	0.6	0.0	31.85	34.00	38.45	40.60	-6.6	
848.80	26.2	H	0.6	0.0	25.60	27.75	38.45	40.60	-12.9	
Rev. 06.19.14										

EGPRS, 850MHz BAND 5

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Project #: 14U18207
Date: 7/24/2014
Test Engineer: Ali poushnejad
Configuration: EUT only
Mode: GSM EGPRS 850MHz

Test Equipment:

Receiving: Sunol T408, and Chamber E Cable
 Substitution: Dipole S/N: 00022117, 8ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
824.20	27.6	V	0.6	0.0	27.02	29.17	38.45	40.60	-11.4	
824.20	24.6	H	0.6	0.0	23.99	26.14	38.45	40.60	-14.5	
Mid Ch										
836.60	27.6	V	0.6	0.0	27.03	29.18	38.45	40.60	-11.4	
836.60	24.1	H	0.6	0.0	23.53	25.68	38.45	40.60	-14.9	
High Ch										
848.80	27.7	V	0.6	0.0	27.12	29.27	38.45	40.60	-11.3	
848.80	23.9	H	0.6	0.0	23.25	25.40	38.45	40.60	-15.2	

Rev. 06.19.14

GPRS, 1900MHz BAND 2**High Frequency Substitution Measurement
UL Fremont Radiated Chamber E**

Project #: 14U18207
Date: 7/25/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: GSM 1900MHz GPRS

Test Equipment:

Receiving: Horn T346 and Chamber E SMA Cables

Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.851	23.8	V	0.98	7.88	30.74	33.0	-2.3	
1.851	18.7	H	0.98	7.88	25.61	33.0	-7.4	
Mid Ch								
1.880	24.2	V	0.98	7.86	31.03	33.0	-2.0	
1.880	18.9	H	0.98	7.86	25.81	33.0	-7.2	
High Ch								
1.910	24.7	V	0.98	7.84	31.54	33.0	-1.5	
1.910	19.3	H	0.98	7.84	26.12	33.0	-6.9	

Rev. 06.19.14

EGPRS, 1900MHz BAND 2**High Frequency Substitution Measurement
UL Fremont Radiated Chamber E**

Project #: 14U18207
Date: 7/24/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: GSM 1900MHz EGPRS

Test Equipment:

Receiving: Horn T346 and Chamber E SMA Cables

Substitution: Horn T69 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.851	22.0	V	0.98	7.88	28.94	33.0	-4.1	
1.851	17.3	H	0.98	7.88	24.21	33.0	-8.8	
Mid Ch								
1.880	22.3	V	0.98	7.86	29.13	33.0	-3.9	
1.880	17.5	H	0.98	7.86	24.41	33.0	-8.6	
High Ch								
1.910	22.6	V	0.98	7.84	29.44	33.0	-3.6	
1.910	17.9	H	0.98	7.84	24.72	33.0	-8.3	

Rev. 06.19.14

10.1.2. WCDMA

UMTS REL 99, 850MHz BAND 5

High Frequency Substitution Measurement UL Fremont Radiated Chamber E										
Project #:		14U18207								
Date:		7/25/2014								
Test Engineer:		T Wang								
Configuration:		EUT only								
Mode:		WCDMA Rel 99 850MHz								
Test Equipment:										
Receiving: Sunol T408, and Chamber E Cable										
Substitution: Dipole S/N: 00022117, 8ft SMA Cable										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
826.40	23.9	V	0.6	0.0	23.30	25.45	38.45	40.60	-15.1	
826.40	16.7	H	0.6	0.0	16.09	18.24	38.45	40.60	-22.4	
Mid Ch										
836.00	23.8	V	0.6	0.0	23.23	25.38	38.45	40.60	-15.2	
836.00	16.2	H	0.6	0.0	15.63	17.78	38.45	40.60	-22.8	
High Ch										
846.00	23.7	V	0.6	0.0	23.12	25.27	38.45	40.60	-15.3	
846.00	16.5	H	0.6	0.0	15.85	18.00	38.45	40.60	-22.6	
Rev. 06.19.14										

UMTS HSDPA, 850MHz BAND 5

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Project #: 14U18207
Date: 7/25/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: WCDMA HSDPA 850MHz

Test Equipment:

Receiving: Sunol T408, and Chamber E Cable

Substitution: Dipole S/N: 00022117, 8ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
826.40	23.0	V	0.6	0.0	22.37	24.52	38.45	40.60	-16.1	
826.40	11.6	H	0.6	0.0	10.99	13.14	38.45	40.60	-27.5	
Mid Ch										
836.00	22.7	V	0.6	0.0	22.13	24.28	38.45	40.60	-16.3	
836.00	11.4	H	0.6	0.0	10.83	12.98	38.45	40.60	-27.6	
High Ch										
846.00	23.0	V	0.6	0.0	22.40	24.55	38.45	40.60	-16.1	
846.00	11.5	H	0.6	0.0	10.85	13.00	38.45	40.60	-27.6	

Rev. 06.19.14

UMTS REL 99, 1900MHz BAND 2

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Project #: 14U18207
Date: 7/30/2014
Test Engineer: R.Z
Configuration: EUT only
Mode: WCDMA Rel 99 1900MHz

Test Equipment:

Receiving: Horn T346 and Chamber E SMA Cables

Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.852	17.9	V	0.98	7.88	24.81	33.0	-8.2	
1.852	11.0	H	0.98	7.88	17.89	33.0	-15.1	
Mid Ch								
1.880	17.8	V	0.98	7.86	24.63	33.0	-8.4	
1.880	10.8	H	0.98	7.86	17.68	33.0	-15.3	
High Ch								
1.908	17.7	V	0.98	7.84	24.58	33.0	-8.4	
1.908	10.4	H	0.98	7.84	17.22	33.0	-15.8	

Rev. 06.19.14

UMTS HSDPA, 1900MHz BAND 2**High Frequency Substitution Measurement
UL Fremont Radiated Chamber E**

Project #: 14U18207
Date: 7/31/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: WCDMA HSDPA 1900MHz

Test Equipment:

Receiving: Horn T346 and Chamber E SMA Cables

Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.852	16.4	V	0.98	7.88	23.32	33.0	-9.7	
1.852	10.1	H	0.98	7.88	17.01	33.0	-16.0	
Mid Ch								
1.880	16.2	V	0.98	7.86	23.11	33.0	-9.9	
1.880	10.2	H	0.98	7.86	17.07	33.0	-15.9	
High Ch								
1.908	16.3	V	0.98	7.84	23.14	33.0	-9.9	
1.908	9.8	H	0.98	7.84	16.63	33.0	-16.4	

Rev. 06.19.14

UMTS REL 99, 1700MHz BAND 4

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Project #: 14U18207
Date: 7/30/2014
Test Engineer: R.Z
Configuration: EUT only
Mode: WCDMA Rel 99 1700MHz

Test Equipment:

Receiving: Horn T346 and Chamber E SMA Cables

Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.712	16.8	V	0.95	8.25	24.09	30.0	-5.9	
1.712	13.1	H	0.95	8.25	20.44	30.0	-9.6	
Mid Ch								
1.733	17.4	V	0.95	8.17	24.58	30.0	-5.4	
1.733	12.7	H	0.95	8.17	19.96	30.0	-10.0	
High Ch								
1.753	17.0	V	0.95	8.09	24.16	30.0	-5.8	
1.753	11.9	H	0.95	8.09	19.07	30.0	-10.9	

Rev. 06.19.14

UMTS HSDPA, 1700MHz BAND 4

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Project #: 14U18207
Date: 7/31/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: WCDMA HSDPA 1700MHz

Test Equipment:

Receiving: Horn T346 and Chamber E SMA Cables

Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.712	15.7	V	0.95	8.25	23.05	30.0	-7.0	
1.712	11.9	H	0.95	8.25	19.22	30.0	-10.8	
Mid Ch								
1.733	16.0	V	0.95	8.17	23.23	30.0	-6.8	
1.733	11.8	H	0.95	8.17	19.00	30.0	-11.0	
High Ch								
1.753	16.2	V	0.95	8.09	23.29	30.0	-6.7	
1.753	11.4	H	0.95	8.09	18.57	30.0	-11.4	

Rev. 06.19.14

10.1.3. CDMA2000

CDMA2000 1xRTT, 850MHz BC0

High Frequency Substitution Measurement UL Fremont Radiated Chamber E										
Project #:		14U18207								
Date:		07/25/14								
Test Engineer:		T Wang								
Configuration:		EUT only								
Mode:		CDMA 1XRTT 850MHz								
<u>Test Equipment:</u>										
Receiving: Sunol T408, and Chamber E Cable										
Substitution: Dipole S/N: 00022117, 8ft SMA Cable										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
824.70	23.42	V	0.6	0.0	22.80	24.95	38.45	40.60	-15.6	
824.70	15.21	H	0.6	0.0	14.59	16.74	38.45	40.60	-23.9	
Mid Ch										
836.52	23.22	V	0.6	0.0	22.60	24.75	38.45	40.60	-15.9	
836.52	15.35	H	0.6	0.0	14.73	16.88	38.45	40.60	-23.7	
High Ch										
848.31	23.44	V	0.6	0.0	22.82	24.97	38.45	40.60	-15.6	
848.31	15.87	H	0.6	0.0	15.25	17.40	38.45	40.60	-23.2	
Rev. 06.19.14										

EVDO-Rev A, 850MHz BC0

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Project #: 14U18207
Date: 7/25/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: CDMA Rev A 850MHz

Test Equipment:

Receiving: Sunol T408, and Chamber E Cable
Substitution: Dipole S/N: 00022117, 8ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
824.70	23.39	V	0.6	0.0	22.77	24.92	38.45	40.60	-15.7	
824.70	15.32	H	0.6	0.0	14.70	16.85	38.45	40.60	-23.8	
Mid Ch										
836.52	23.36	V	0.6	0.0	22.74	24.89	38.45	40.60	-15.7	
836.52	15.39	H	0.6	0.0	14.77	16.92	38.45	40.60	-23.7	
High Ch										
848.31	23.31	V	0.6	0.0	22.69	24.84	38.45	40.60	-15.8	
848.31	15.91	H	0.6	0.0	15.29	17.44	38.45	40.60	-23.2	

Rev. 06.19.14

CDMA2000 1xRTT, 1900MHz BC1

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Company:
Project #: 14U18207
Date: 7/31/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: CDMA 1XRTT 1900MHz

Test Equipment:

Receiving: Horn T346 and Chamber E SMA Cables
Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.851	17.2	V	0.98	7.88	24.14	33.0	-8.9	
1.851	11.8	H	0.98	7.88	18.71	33.0	-14.3	
Mid Ch								
1.880	17.7	V	0.98	7.86	24.53	33.0	-8.5	
1.880	11.8	H	0.98	7.86	18.71	33.0	-14.3	
High Ch								
1.910	17.9	V	0.98	7.84	24.74	33.0	-8.3	
1.910	11.6	H	0.98	7.84	18.42	33.0	-14.6	

Rev: 06.19.14

EVDO-Rev A, 1900MHz BC1

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Company:**Project #:** 14U18207**Date:** 7/31/2014**Test Engineer:** T Wang**Configuration:** EUT only**Mode:** CDMA Rev 0/A 1900MHz**Test Equipment:****Receiving:** Horn T346 and Chamber E SMA Cables**Substitution:** Horn T69 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.851	17.1	V	0.98	7.88	24.04	33.0	-9.0	
1.851	9.0	H	0.98	7.88	15.91	33.0	-17.1	
Mid Ch								
1.880	17.4	V	0.98	7.86	24.23	33.0	-8.8	
1.880	9.6	H	0.98	7.86	16.51	33.0	-16.5	
High Ch								
1.910	17.7	V	0.98	7.84	24.54	33.0	-8.5	
1.910	9.9	H	0.98	7.84	16.72	33.0	-16.3	

Rev. 06.19.14

CDMA2000 1xRTT, 1700MHz BC15

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Company:
Project #: 14U18207
Date: 7/31/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: CDMA 1XRTT 1700MHz

Test Equipment:

Receiving: Horn T346 and Chamber E SMA Cables

Substitution: Horn T59 Substitution, and 8ft SMA Cable

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.711	17.1	V	0.95	8.25	24.41	30.0	-5.6	
1.711	12.3	H	0.95	8.25	19.64	30.0	-10.4	
Mid Ch								
1.733	16.7	V	0.95	8.17	23.93	30.0	-6.1	
1.733	12.0	H	0.95	8.17	19.21	30.0	-10.8	
High Ch								
1.754	16.5	V	0.95	8.09	23.65	30.0	-6.3	
1.754	12.8	H	0.95	8.09	19.97	30.0	-10.0	

Rev. 06.19.14

EVDO-Rev A, 1700MHz BC15

High Frequency Substitution Measurement UL Fremont Radiated Chamber E								
Company:								
Project #:		14U18207						
Date:		7/31/2014						
Test Engineer:		T Wang						
Configuration:		EUT only						
Mode:		CDMA Rev 0/A 1700MHz						
Test Equipment:								
Receiving: Horn T346 and Chamber E SMA Cables								
Substitution: Horn T59 Substitution, and 8ft SMA Cable								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
1.711	17.0	V	0.95	8.25	24.31	30.0	-5.7	
1.711	11.7	H	0.95	8.25	19.04	30.0	-11.0	
Mid Ch								
1.733	16.5	V	0.95	8.17	23.73	30.0	-6.3	
1.733	9.4	H	0.95	8.17	16.61	30.0	-13.4	
High Ch								
1.754	16.4	V	0.95	8.09	23.55	30.0	-6.4	
1.754	11.6	H	0.95	8.09	18.77	30.0	-11.2	
Rev. 06.19.14								

CDMA2000 1xRTT, 800MHz BC10

High Frequency Substitution Measurement UL Fremont Radiated Chamber E

Project #: 14U18207
Date: 7/25/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: CDMA 1XRTT 800MHz

Test Equipment:

Receiving: Sunol T408, and Chamber E Cable
 Substitution: Dipole S/N: 00022117, 8ft SMA Cable

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
817.25	23.78	V	0.6	0.0	23.16	25.31	38.45	40.60	-15.3	
817.25	16.33	H	0.6	0.0	15.71	17.86	38.45	40.60	-22.7	
Mid Ch										
820.00	23.70	V	0.6	0.0	23.08	25.23	38.45	40.60	-15.4	
820.00	16.09	H	0.6	0.0	15.47	17.62	38.45	40.60	-23.0	
High Ch										
822.75	23.84	V	0.6	0.0	23.22	25.37	38.45	40.60	-15.2	
822.75	15.71	H	0.6	0.0	15.09	17.24	38.45	40.60	-23.4	

Rev. 06.19.14

EVDO-Rev A, 800MHz BC10

High Frequency Substitution Measurement UL Fremont Radiated Chamber E										
Project #:		14U18207								
Date:		7/25/2014								
Test Engineer:		O Su								
Configuration:		EUT only								
Mode:		CDMA Rev A 800MHz								
Test Equipment:										
Receiving: Sunol T408, and Chamber E Cable										
Substitution: Dipole S/N: 00022117, 8ft SMA Cable										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
817.25	23.90	V	0.6	0.0	23.28	25.43	38.45	40.60	-15.2	
817.25	16.83	H	0.6	0.0	16.21	18.36	38.45	40.60	-22.2	
Mid Ch										
820.00	23.86	V	0.6	0.0	23.24	25.39	38.45	40.60	-15.2	
820.00	16.49	H	0.6	0.0	15.87	18.02	38.45	40.60	-22.6	
High Ch										
822.75	23.74	V	0.6	0.0	23.12	25.27	38.45	40.60	-15.3	
822.75	16.41	H	0.6	0.0	15.79	17.94	38.45	40.60	-22.7	
Rev. 06.19.14										

CDMA2000, REV B

Two Carriers Min Separation

High Frequency Substitution Measurement UL Fremont Radiated Chamber E										
Project #:		14U18207								
Date:		8/1/2014								
Test Engineer:		T Wang								
Configuration:		EUT only								
Mode:		CDMA Rev B 2C Min Sep 850MHz								
Test Equipment:										
Receiving: Sunoi T408, and Chamber E Cable										
Substitution: Dipole S/N: 00022117, 8ft SMA Cable										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
825.3MHz (824.7 + 825.93MHz)	18.7	V	0.6	0.0	18.12	20.27	38.45	40.60	-20.3	
825.3MHz (824.7 + 825.93MHz)	6.5	H	0.6	0.0	5.89	8.04	38.45	40.60	-32.6	
Mid Ch										
837.2MHz (836.52+837.75MHz)	18.6	V	0.6	0.0	18.03	20.18	38.45	40.60	-20.4	
837.2MHz (836.52+837.75MHz)	5.8	H	0.6	0.0	5.23	7.38	38.45	40.60	-33.2	
High Ch										
847.6MHz (847.08+848.31MHz)	18.8	V	0.6	0.0	18.22	20.37	38.45	40.60	-20.2	
847.6MHz (847.08+848.31MHz)	7.0	H	0.6	0.0	6.35	8.50	38.45	40.60	-32.1	
Rev. 06.19.14										

CDMA2000, REV B

Two Carriers Max Separation

High Frequency Substitution Measurement UL Fremont Radiated Chamber E										
Project #:		14U18207								
Date:		8/1/2014								
Test Engineer:		T Wang								
Configuration:		EUT only								
Mode:		CDMA Rev B 2C Max Sep 850MHz								
Test Equipment:										
Receiving: Sunol T408, and Chamber E Cable										
Substitution: Dipole S/N: 00022117, 8ft SMA Cable										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
826.5MHz (824.7 + 829.68MHz)	18.9	V	0.6	0.0	18.32	20.47	38.45	40.60	-20.1	
826.5MHz (824.7 + 829.68MHz)	11.7	H	0.6	0.0	11.09	13.24	38.45	40.60	-27.4	
Mid Ch										
838.8MHz (836.52+841.50MHz)	18.8	V	0.6	0.0	18.23	20.38	38.45	40.60	-20.2	
838.8MHz (836.52+841.50MHz)	12.0	H	0.6	0.0	11.43	13.58	38.45	40.60	-27.0	
High Ch										
844.9MHz (843.33+848.31MHz)	18.7	V	0.6	0.0	18.12	20.27	38.45	40.60	-20.3	
844.9MHz (843.33+848.31MHz)	11.9	H	0.6	0.0	11.25	13.40	38.45	40.60	-27.2	
Rev. 06 19 14										

CDMA2000, REV B**Three Carriers Min Separation**

High Frequency Substitution Measurement UL Fremont Radiated Chamber E										
Project #:		14U18207								
Date:		8/1/2014								
Test Engineer:		O. Su								
Configuration:		EUT only								
Mode:		CDMA Rev B 3C Min Sep 850MHz								
Test Equipment										
Receiving: Sunol T408, and Chamber E Cable										
Substitution: Dipole S/N: 00022117, 8ft SMA Cable										
f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	EIRP (dBm)	ERP Limit (dBm)	EIRP Limit (dBm)	Margin (dB)	Notes
Low Ch										
825.9MHz	18.9	V	0.6	0.0	18.27	20.42	38.45	40.60	-20.2	
(824.7+825.93+827.16MHz)										
825.9MHz	13.4	H	0.6	0.0	12.79	14.94	38.45	40.60	-25.7	
(824.7+825.93+827.16MHz)										
Mid Ch										
837.7MHz	18.7	V	0.6	0.0	18.13	20.28	38.45	40.60	-20.3	
(836.52+837.75+838.98MHz)										
837.7MHz	13.7	H	0.6	0.0	13.13	15.28	38.45	40.60	-25.3	
(836.52+837.75+838.98MHz)										
High Ch										
846.7MHz	18.7	V	0.6	0.0	18.12	20.27	38.45	40.60	-20.3	
(845.85+847.08+848.31MHz)										
846.7MHz	13.6	H	0.6	0.0	12.98	15.13	38.45	40.60	-25.5	
(845.85+847.08+848.31MHz)										
Rev. 06.19.14										

10.2. 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.

Peak-To-Average Ratio:

Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
GSM850	GPRS	33.56	33.27	0.29
	EGPRS	31.69	28.83	2.86
*Peak Reading = Average Reading + Peak-to-Average Ratio				

Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
GSM1900	GPRS	30.48	30.27	0.21
	EGPRS	30.42	27.84	2.58
*Peak Reading = Average Reading + Peak-to-Average Ratio				

Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
UMTS Band II	Rel 99	26.44	23.37	3.07
	HSDPA	25.48	22.28	3.20
*Peak Reading = Average Reading + Peak-to-Average Ratio				

Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
UMTS Band IV	Rel 99	26.61	23.49	3.12
	HSDPA	25.52	22.32	3.2
*Peak Reading = Average Reading + Peak-to-Average Ratio				

Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
UMTS Band V	Rel 99	28.14	24.95	3.19
	HSDPA	28.07	24.03	4.04
*Peak Reading = Average Reading + Peak-to-Average Ratio				

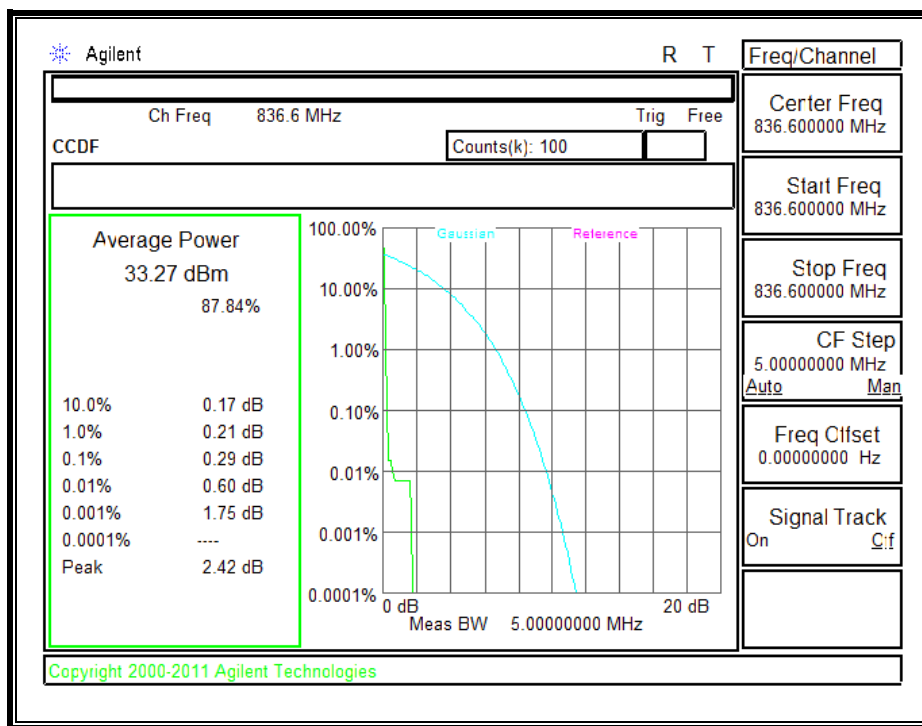
Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
CDMA2000 BC0	1xRTT	29.16	24.51	4.65
	EVDO Rev A	30.13	24.49	5.64
*Peak Reading = Average Reading + Peak-to-Average Ratio				

Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
CDMA2000 BC10	1xRTT	29.58	25.06	4.52
	EVDO Rev A	31.81	24.96	6.85
*Peak Reading = Average Reading + Peak-to-Average Ratio				

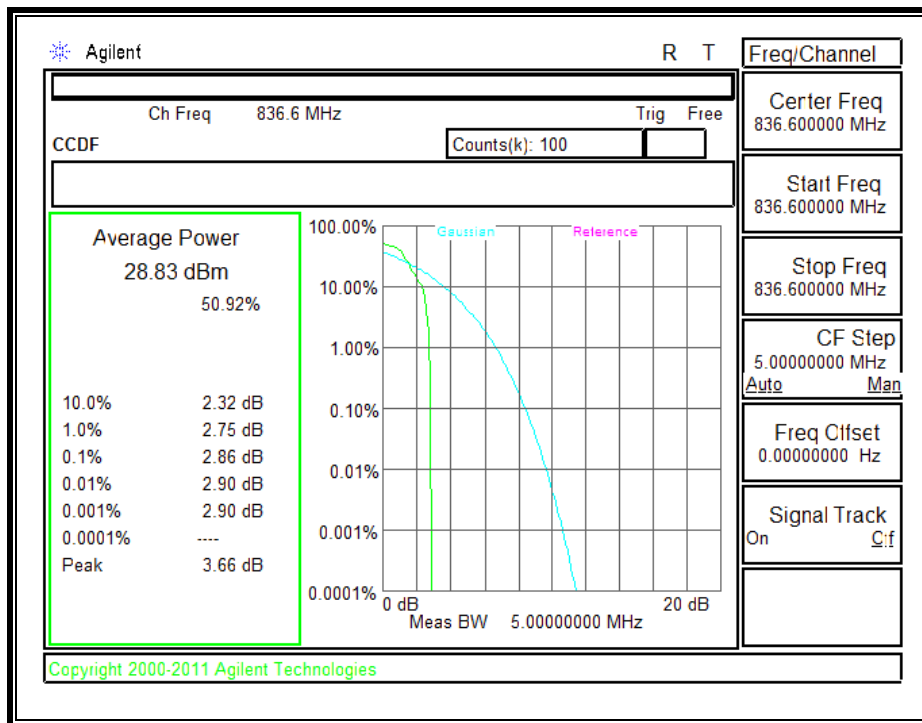
Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
CDMA2000 BC1	1xRTT	28.14	23.47	4.67
	EVDO Rev A	29.21	23.45	5.76
*Peak Reading = Average Reading + Peak-to-Average Ratio				

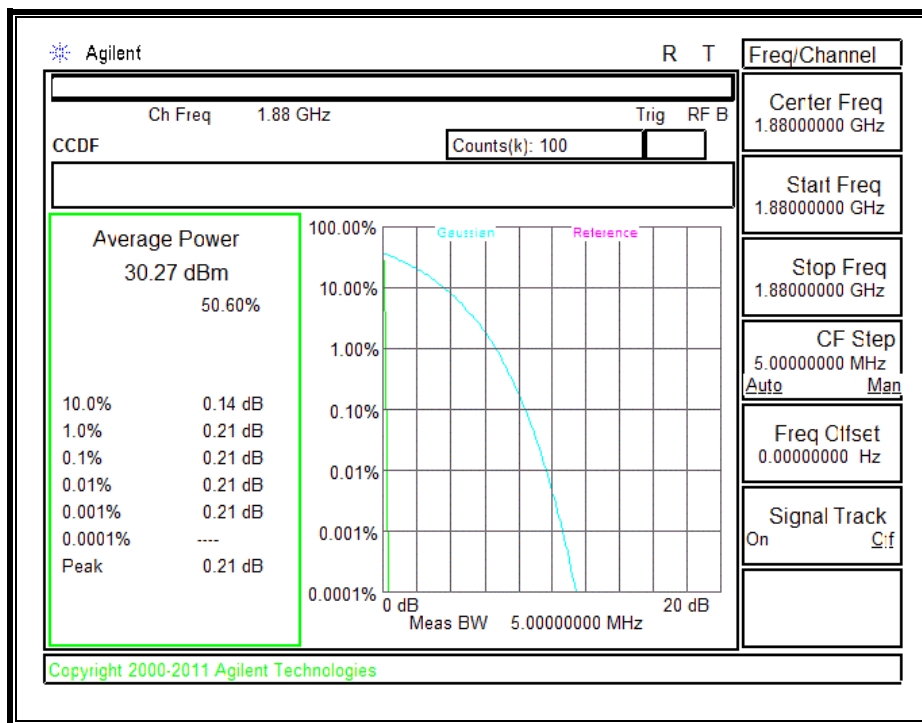
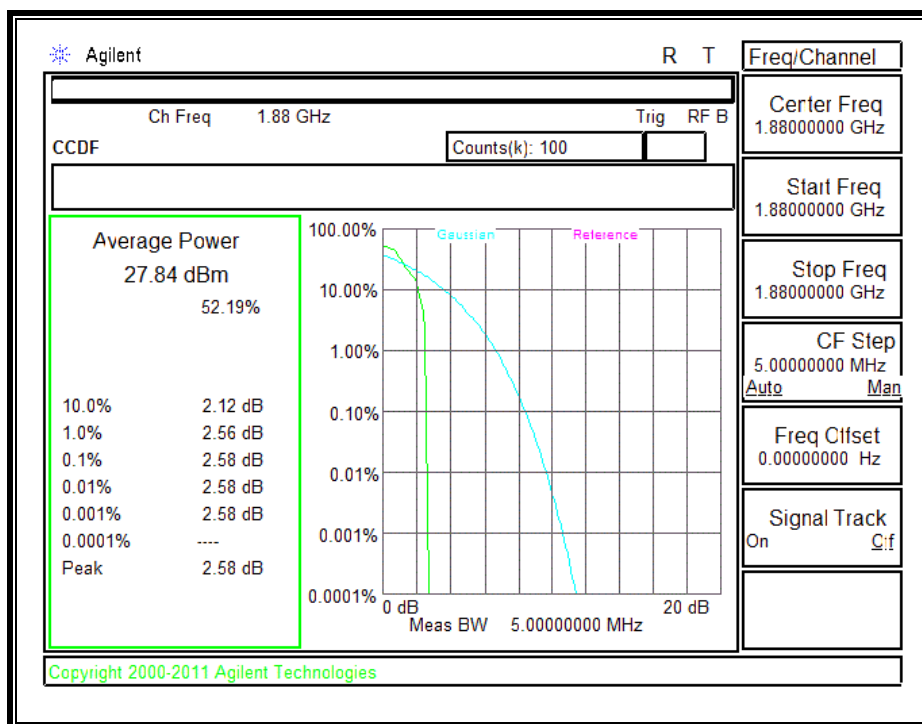
Mode	Modulation	Conducted Power (dBm)		Peak-to-Average Ratio (PAR)
		*Peak	Average	
CDMA2000 BC15	1xRTT	28.17	23.45	4.72
	EVDO Rev A	29.28	23.48	5.80
*Peak Reading = Average Reading + Peak-to-Average Ratio				

GSM850, GPRS

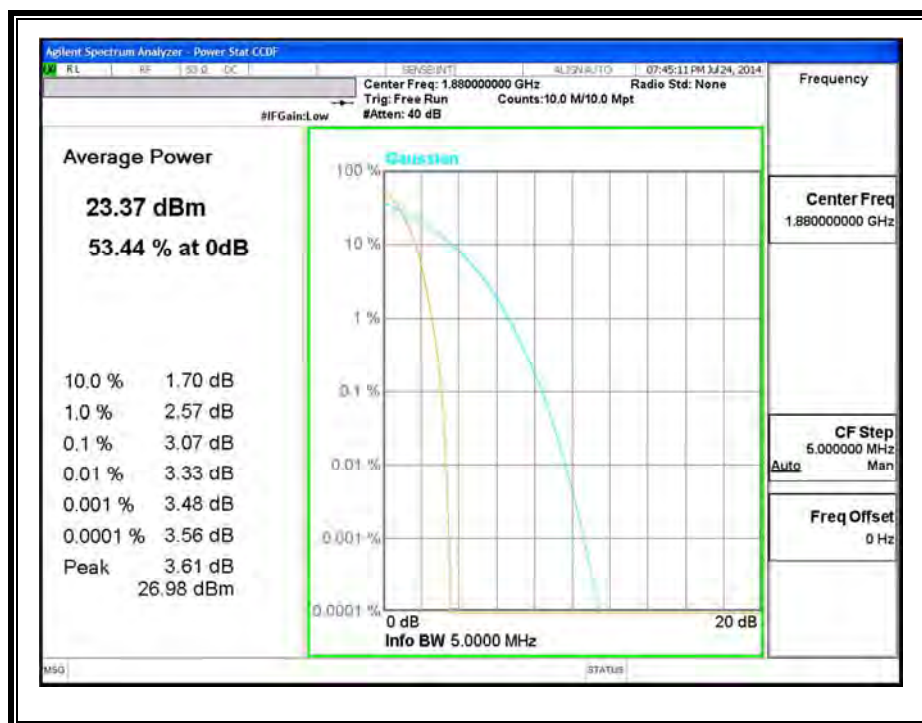


GSM850, EGPRS

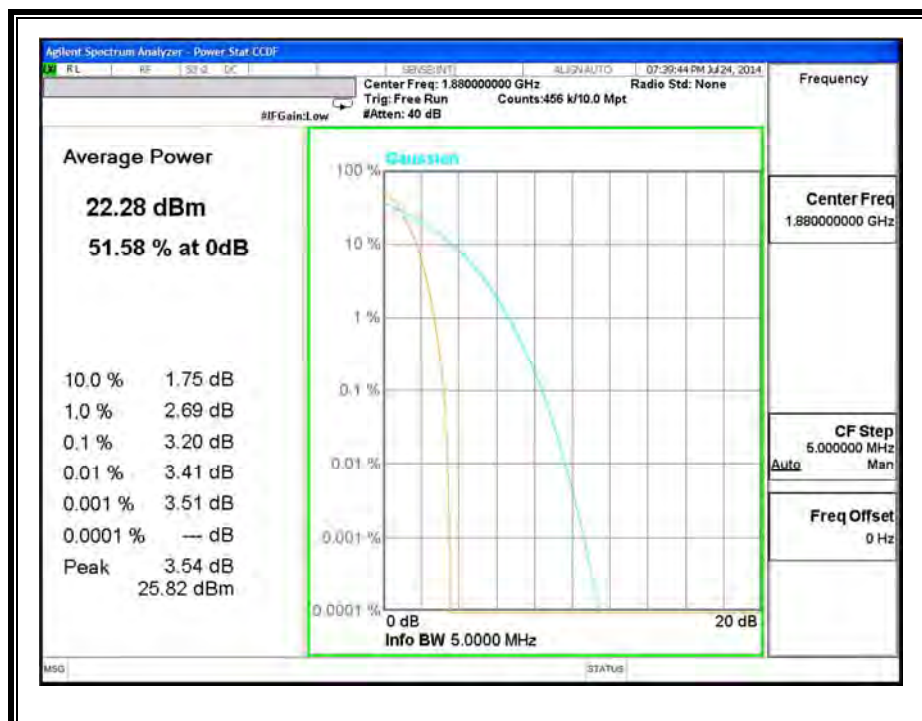


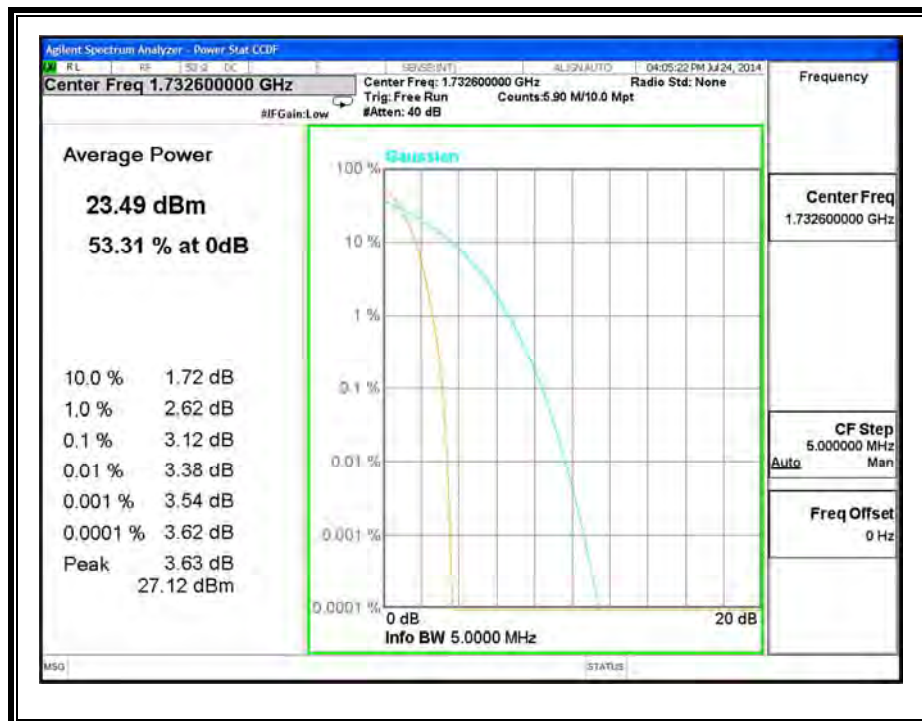
GSM1900, GPRS**GSM1900, EGPRS**

UMTS 1900, REL99 BAND 2

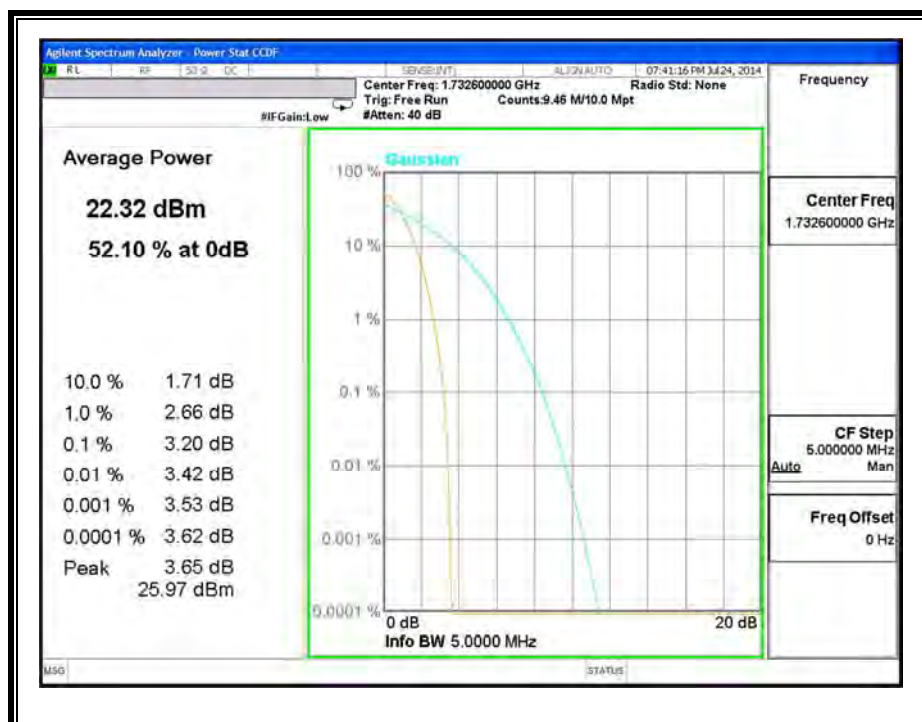


UMTS 1900, HSDPA BAND 2

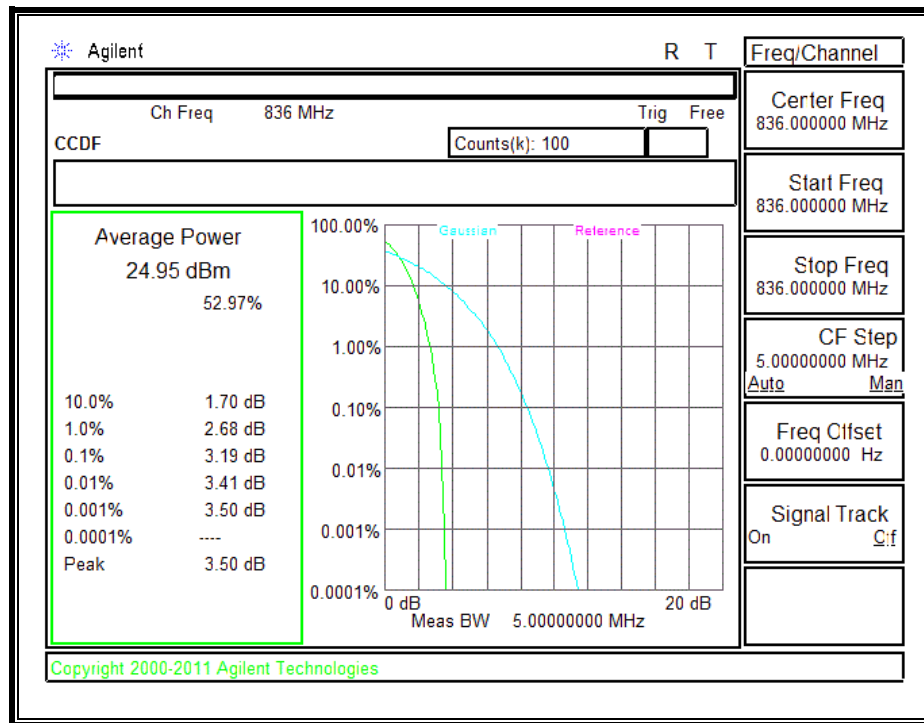




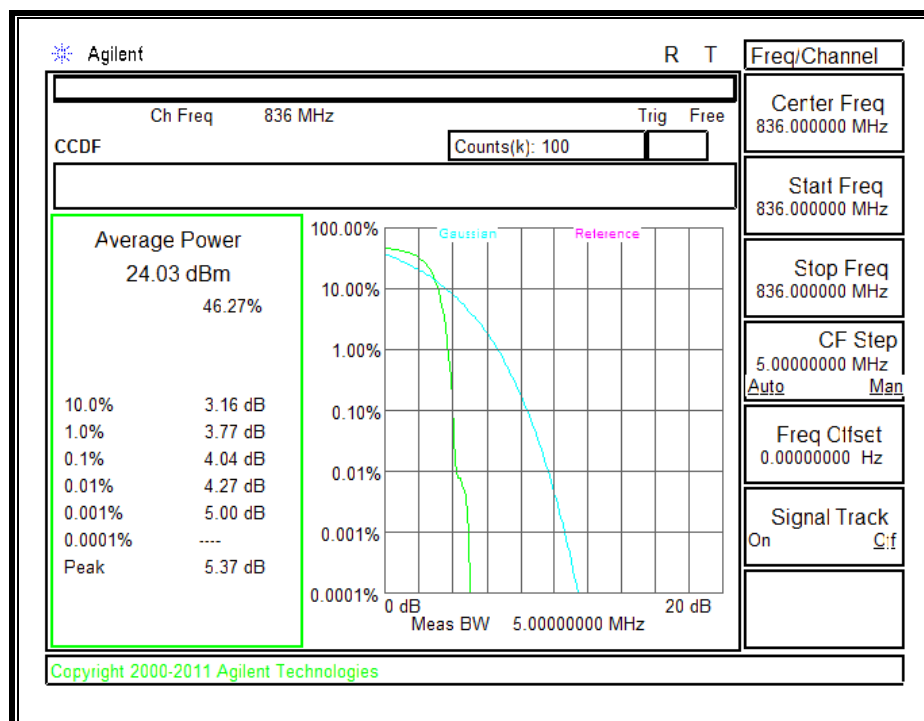
UMTS 1700, HSDPA BAND 4

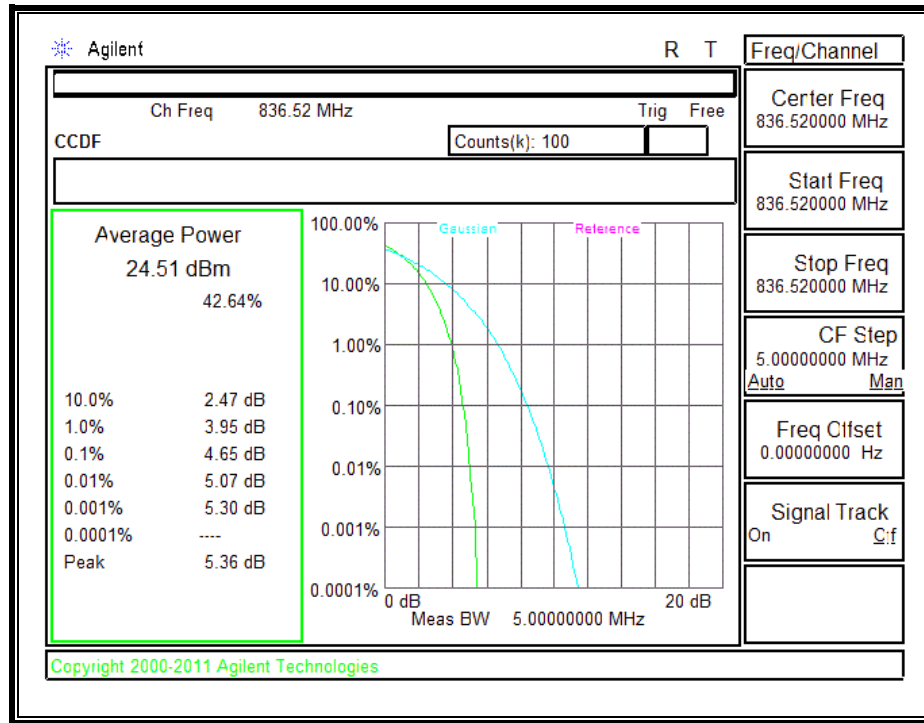


UMTS850, REL 99 BAND 5

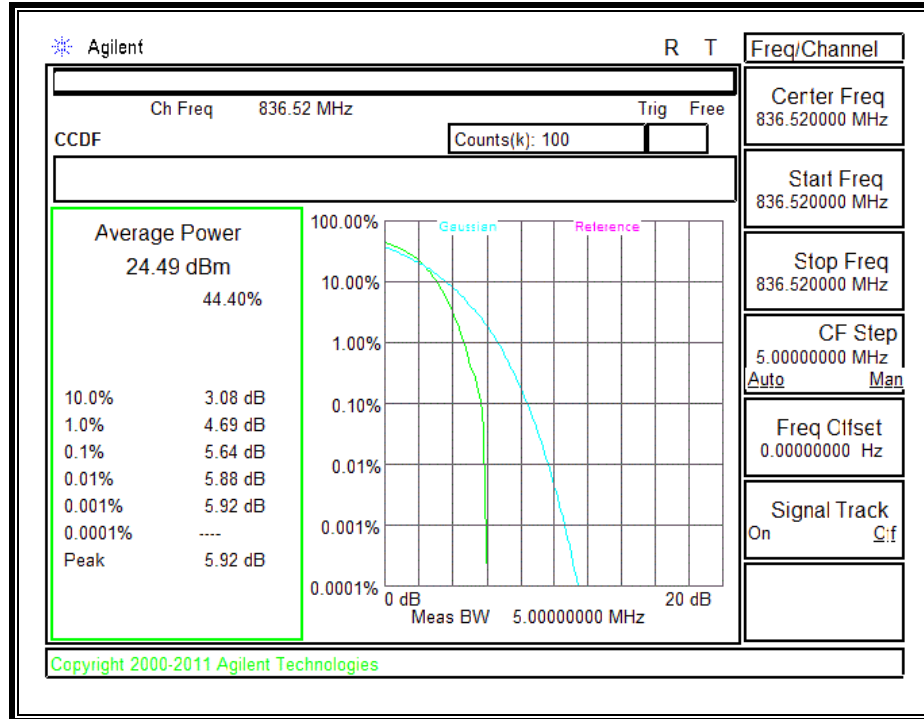


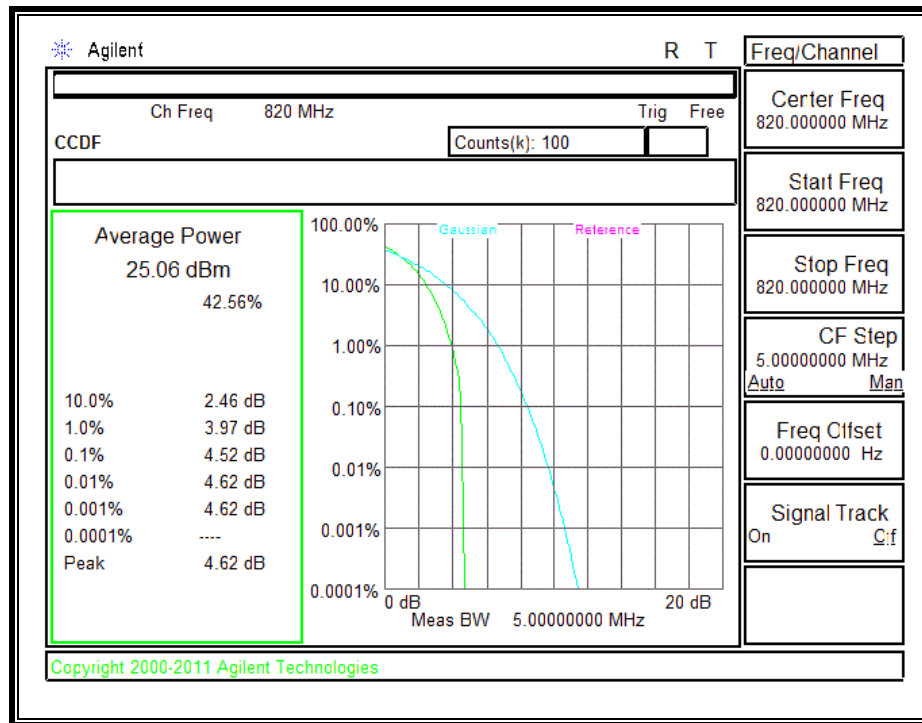
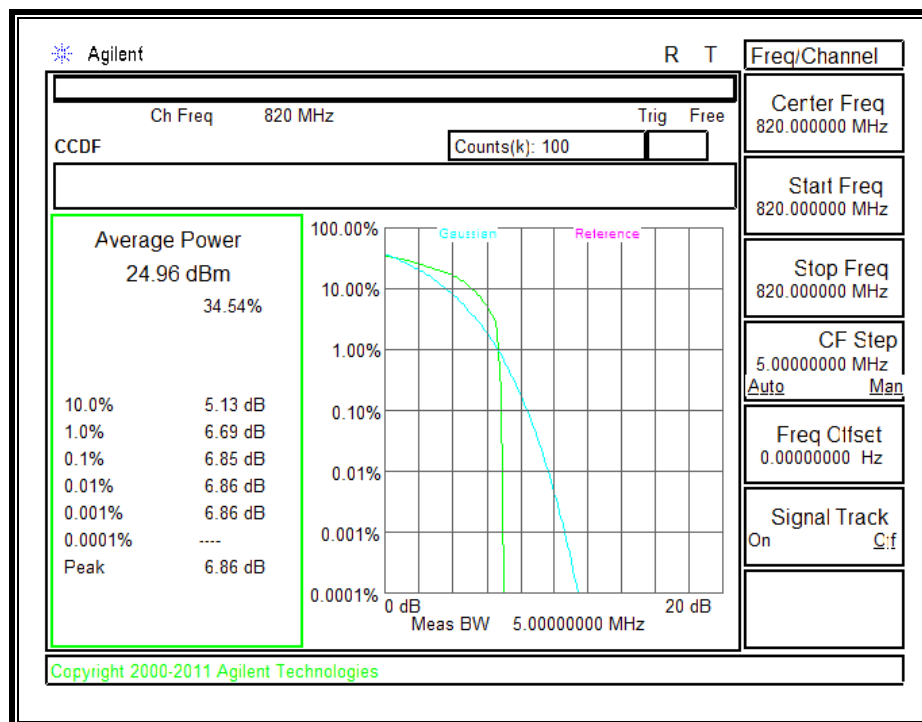
UMTS850, HSDPA BAND 5



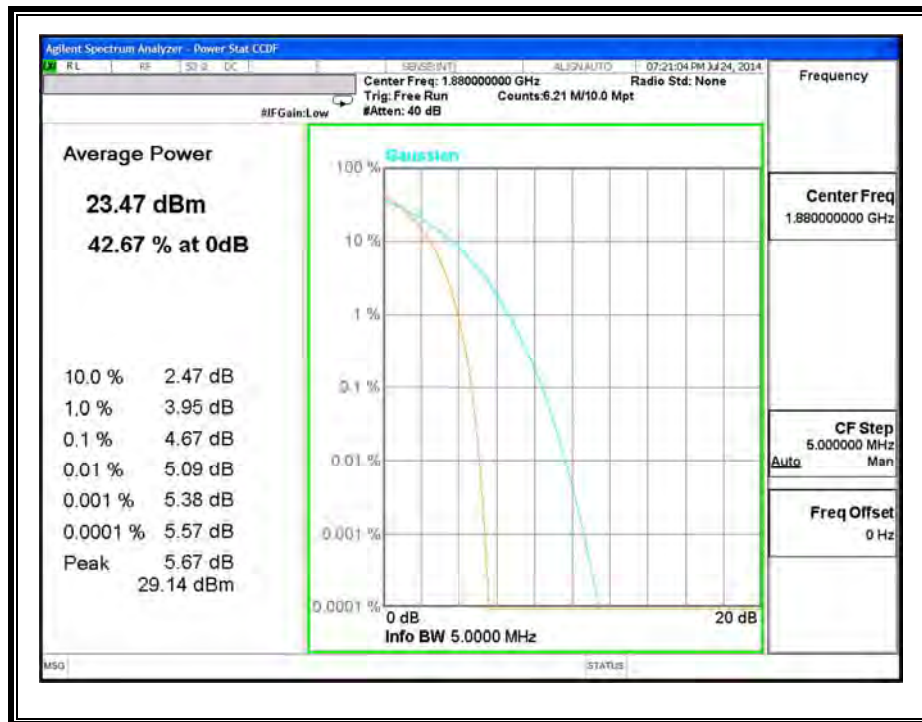


BC 0, EVDO A

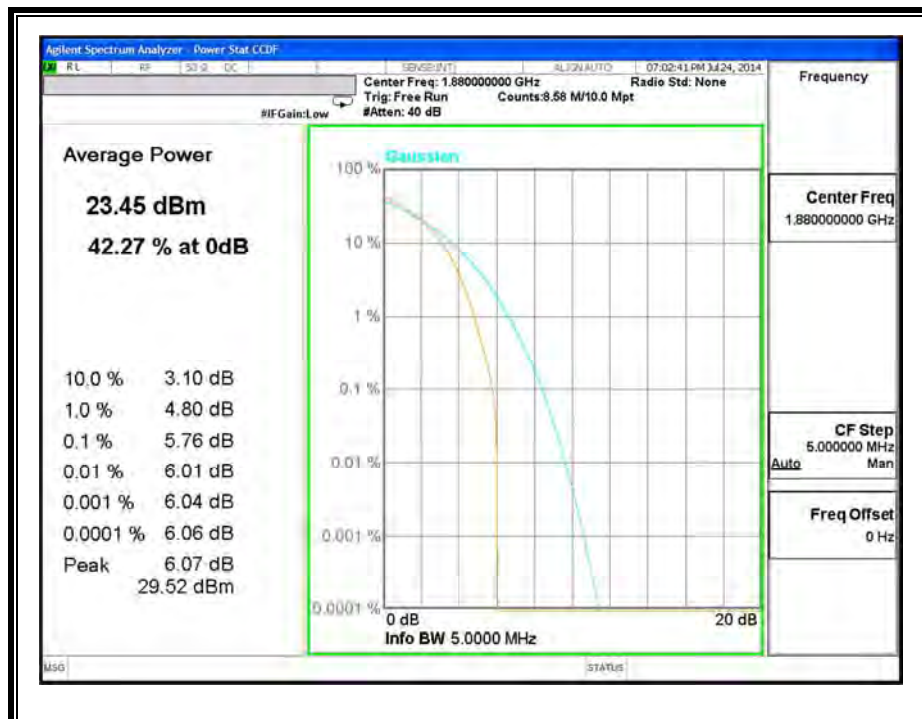


BC10, 1xRTT**BC10, EVDO A**

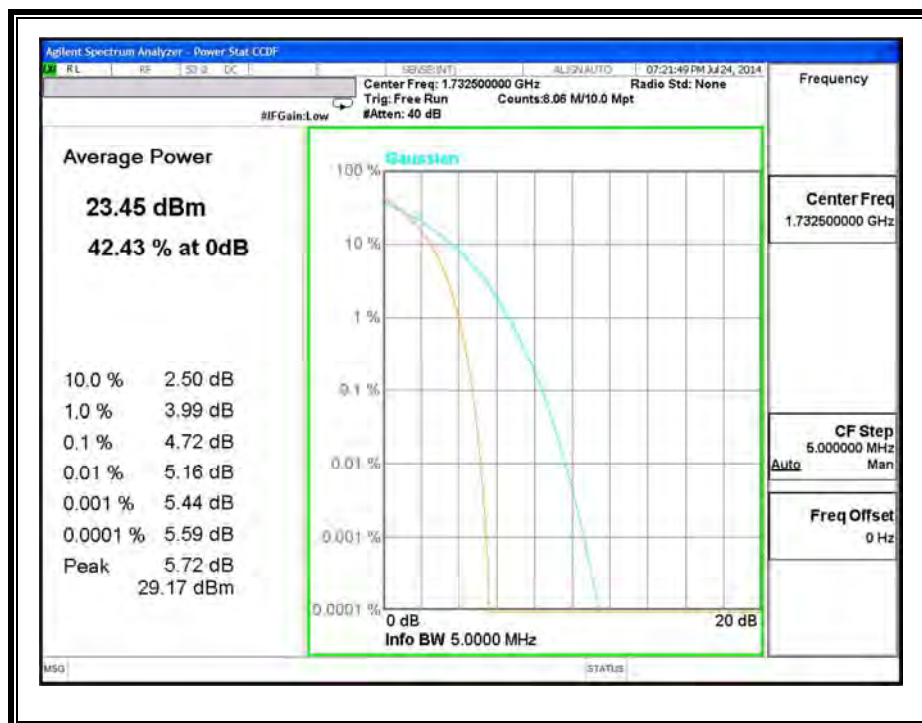
BC 1, 1xRTT



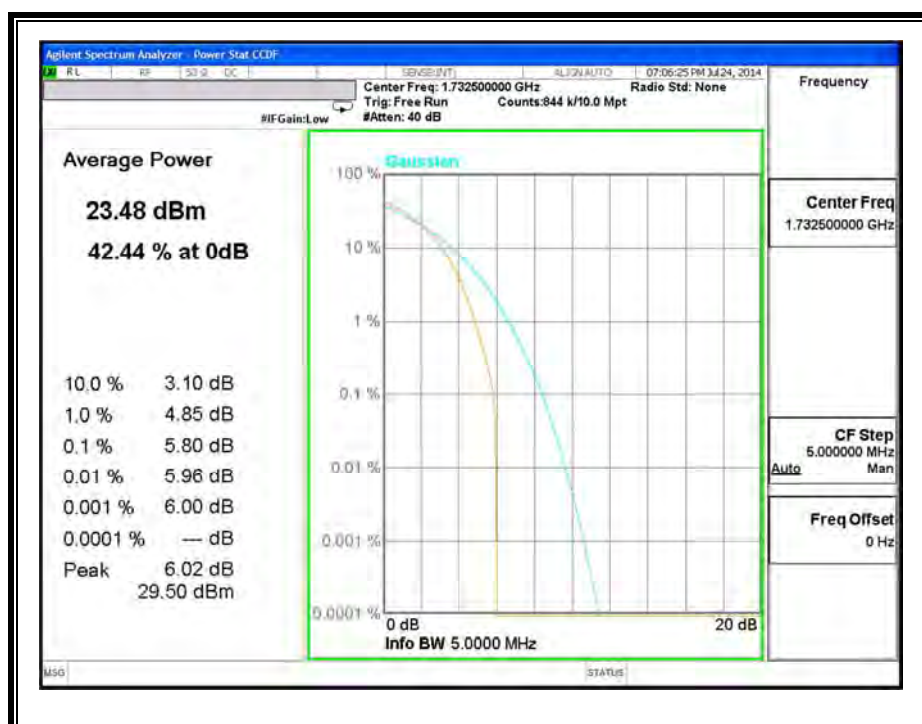
BC 1, EVDO A



BC 15, 1xRTT



BC 15, EVDO A



10.3. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, §27.53 and § 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.

§27.53 (h) For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ 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 $116 \log_{10} (f/6.1)$ decibels or $50 + 10 \log_{10} (P)$ 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 $43 + 10 \log_{10} (P)$ 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.

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

- GPRS/EGPRS.
- UMTS, REL 99 and HSDPA
- CDMA2000, BC0, BC1, BC10 and BC15

RESULTS

10.3.1. GSM

GPRS, 850MHz BAND 5

**3m Radiated Emissions Chamber
 Above 1GHz Substitution Measurement**

Project #: 14U18207
Date: 07/08/14
Test Engineer: T Wang
Configuration: EUT only
Mode: GPRS 850MHz

Test Equipment:
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber
 3m Chamber F

Pre-amplifier
 3m Chamber F

Filter
 (Empty)

Limit
 Part 22

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (824.2MHz)									
1.648	-18.6	H	3.0	34.9	1.0	-52.5	-13.0	-39.5	
2.472	-12.1	H	3.0	35.4	1.0	-46.5	-13.0	-33.5	
1.648	-14.2	V	3.0	34.9	1.0	-48.1	-13.0	-35.1	
2.472	-9.9	V	3.0	35.4	1.0	-44.3	-13.0	-31.3	
Mid Channel (836.6MHz)									
1.673	-18.2	H	3.0	34.9	1.0	-52.1	-13.0	-39.1	
2.510	-12.7	H	3.0	35.3	1.0	-47.0	-13.0	-34.0	
1.673	-15.1	V	3.0	34.9	1.0	-49.0	-13.0	-36.0	
2.510	-10.6	V	3.0	35.3	1.0	-44.9	-13.0	-31.9	
High Channel (848.8MHz)									
1.698	-17.9	H	3.0	34.9	1.0	-51.7	-13.0	-38.7	
2.546	-11.7	H	3.0	35.4	1.0	-46.1	-13.0	-33.1	
1.698	-13.9	V	3.0	34.9	1.0	-47.7	-13.0	-34.7	
2.546	-10.2	V	3.0	35.4	1.0	-44.6	-13.0	-31.6	

Rev. 03.03.14

EGPRS, 850MHz BAND 5

**3m Radiated Emissions Chamber
 Above 1GHz Substitution Measurement**

Project #: 14U18207
Date: 07/11/14
Test Engineer: E.Yu
Configuration: EUT only
Mode: EGPRS 850MHz

Test Equipment:
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber
 3m Chamber F

Pre-amplifier
 3m Chamber F

Filter
 [Empty]

Limit
 Part 22

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (824.2MHz)									
1.648	-18.4	H	3.0	34.9	1.0	-52.3	-13.0	-39.3	
2.462	-12.9	H	3.0	35.4	1.0	-47.3	-13.0	-34.3	
3.302	-12.5	H	3.0	36.4	1.0	-47.9	-13.0	-34.9	
1.648	-11.1	V	3.0	34.9	1.0	-45.0	-13.0	-32.0	
2.472	-13.8	V	3.0	35.4	1.0	-48.2	-13.0	-35.2	
3.297	-11.0	V	3.0	36.4	1.0	-46.4	-13.0	-33.4	
Mid Channel (836.6MHz)									
1.673	-19.3	H	3.0	34.9	1.0	-53.2	-13.0	-40.2	
2.511	-12.5	H	3.0	35.3	1.0	-46.8	-13.0	-33.8	
3.346	-11.4	H	3.0	36.4	1.0	-46.8	-13.0	-33.8	
1.673	-13.5	V	3.0	34.9	1.0	-47.4	-13.0	-34.4	
2.511	-14.2	V	3.0	35.3	1.0	-48.5	-13.0	-35.5	
3.346	-10.6	V	3.0	36.4	1.0	-46.0	-13.0	-33.0	
High Channel (848.8MHz)									
1.698	-17.2	H	3.0	34.9	1.0	-51.1	-13.0	-38.1	
2.546	-12.1	H	3.0	35.4	1.0	-46.5	-13.0	-33.5	
3.395	-12.6	H	3.0	36.4	1.0	-48.0	-13.0	-35.0	
1.698	-14.3	V	3.0	34.9	1.0	-48.2	-13.0	-35.2	
2.546	-13.8	V	3.0	35.4	1.0	-48.2	-13.0	-35.2	
3.395	-11.2	V	3.0	36.4	1.0	-46.6	-13.0	-33.6	

Rev. 03.03.14

GPRS, 1900MHz BAND 2

**3m Radiated Emissions Chamber
 Above 1GHz Substitution Measurement**

Project #: 14U18207
Date: 07/11/14
Test Engineer: T Wang
Configuration: EUT only
Mode: GPRS 1900MHz

Test Equipment:
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber
 3m Chamber F

Pre-amplifier
 3m Chamber F

Filter
 [Empty]

Limit
 Part 24

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1850.2MHz)									
3.700	-11.0	H	3.0	36.3	1.0	-46.3	-13.0	-33.3	
5.551	-10.6	H	3.0	35.6	1.0	-45.1	-13.0	-32.1	
3.700	-10.9	V	3.0	36.3	1.0	-46.2	-13.0	-33.2	
5.551	-10.0	V	3.0	35.6	1.0	-44.5	-13.0	-31.5	
Mid Channel (1880.0)									
3.760	-10.6	H	3.0	36.3	1.0	-45.9	-13.0	-32.9	
5.640	-8.6	H	3.0	35.6	1.0	-43.2	-13.0	-30.2	
3.760	-9.7	V	3.0	36.3	1.0	-45.0	-13.0	-32.0	
5.640	-10.1	V	3.0	35.6	1.0	-44.7	-13.0	-31.7	
High Channel (1909.8MHz)									
3.820	-10.0	H	3.0	36.3	1.0	-45.3	-13.0	-32.3	
5.729	-9.3	H	3.0	35.6	1.0	-43.9	-13.0	-30.9	
3.820	-10.1	V	3.0	36.3	1.0	-45.4	-13.0	-32.4	
5.729	-9.7	V	3.0	35.6	1.0	-44.3	-13.0	-31.3	

Rev. 03.03.14

EGPRS, 1900MHz BAND 2

3m Radiated Emissions Chamber
Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 07/11/14
Test Engineer: T Wang
Configuration: EUT only
Mode: EGPRS 1900MHz

Test Equipment:
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber
 3m Chamber F

Pre-amplifier
 3m Chamber F

Filter
 [Empty]

Limit
 Part 24

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamplifier	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1850.2MHz)									
3.700	-11.2	H	3.0	36.3	1.0	-46.5	-13.0	-33.5	
5.551	-9.6	H	3.0	35.6	1.0	-44.1	-13.0	-31.1	
3.700	-10.6	V	3.0	36.3	1.0	-45.9	-13.0	-32.9	
5.551	-9.9	V	3.0	35.6	1.0	-44.4	-13.0	-31.4	
Mid Channel (1880.0)									
3.760	-10.9	H	3.0	36.3	1.0	-46.2	-13.0	-33.2	
5.640	-10.0	H	3.0	35.6	1.0	-44.6	-13.0	-31.6	
3.760	-9.8	V	3.0	36.3	1.0	-45.1	-13.0	-32.1	
5.640	-9.4	V	3.0	35.6	1.0	-44.0	-13.0	-31.0	
High Channel (1909.8MHz)									
3.820	-10.0	H	3.0	36.3	1.0	-45.3	-13.0	-32.3	
5.729	-9.7	H	3.0	35.6	1.0	-44.3	-13.0	-31.3	
3.820	-9.7	V	3.0	36.3	1.0	-45.0	-13.0	-32.0	
5.729	-9.5	V	3.0	35.6	1.0	-44.1	-13.0	-31.1	

Rev. 03.03.14

10.3.2. WCDMA

UMTS REL 99, 850MHz BAND 5

3m Radiated Emissions Chamber
Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 07/10/14
Test Engineer: E. Yu
Configuration: EUT Only
Mode: Band 5 REL 99, 850MHz

Test Equipment:
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber
 3m Chamber E

Pre-amplifier
 3m Chamber E

Filter
 [Empty]

Limit
 Part 22

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (826.4MHz)									
1.653	-19.2	H	3.0	37.6	1.0	-55.8	-13.0	-42.8	
2.479	-15.2	H	3.0	38.0	1.0	-52.2	-13.0	-39.2	
1.653	-17.7	V	3.0	37.6	1.0	-54.3	-13.0	-41.3	
2.479	-15.6	V	3.0	38.0	1.0	-52.6	-13.0	-39.6	
Mid Channel (836MHz)									
1.672	-19.0	H	3.0	37.6	1.0	-55.6	-13.0	-42.6	
2.508	-17.5	H	3.0	37.9	1.0	-54.4	-13.0	-41.4	
1.672	-18.9	V	3.0	37.6	1.0	-55.5	-13.0	-42.5	
2.508	-18.0	V	3.0	37.9	1.0	-54.9	-13.0	-41.9	
High Channel (846.6MHz)									
1.693	-19.4	H	3.0	37.6	1.0	-56.0	-13.0	-43.0	
2.540	-13.4	H	3.0	38.0	1.0	-50.4	-13.0	-37.4	
1.693	-19.1	V	3.0	37.6	1.0	-55.7	-13.0	-42.7	
2.540	-15.5	V	3.0	38.0	1.0	-52.5	-13.0	-39.5	

Rev. 03.03.14

UMTS HSDPA, 850MHz BAND 5**3m Radiated Emissions Chamber
Above 1GHz Substitution Measurement**

Project #: 14U18207
Date: 07/11/14
Test Engineer: E. Yu
Configuration: EUT only
Mode: Band 5 HSDPA, 850MHz

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifier	Filter	Limit
3m Chamber F	3m Chamber F		Part 22

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (826.4MHz)									
1.653	-18.7	H	3.0	34.9	1.0	-52.6	-13.0	-39.6	
2.479	-15.4	H	3.0	35.4	1.0	-49.8	-13.0	-36.8	
1.653	-15.7	V	3.0	34.9	1.0	-49.6	-13.0	-36.6	
2.479	-11.5	V	3.0	35.4	1.0	-45.9	-13.0	-32.9	
Mid Channel (836MHz)									
1.672	-20.9	H	3.0	34.9	1.0	-54.8	-13.0	-41.8	
2.508	-16.4	H	3.0	35.3	1.0	-50.7	-13.0	-37.7	
1.672	-18.7	V	3.0	34.9	1.0	-52.6	-13.0	-39.6	
2.508	-13.6	V	3.0	35.3	1.0	-47.9	-13.0	-34.9	
High Channel (846.6MHz)									
1.693	-19.9	H	3.0	34.9	1.0	-53.8	-13.0	-40.8	
2.540	-15.1	H	3.0	35.4	1.0	-49.4	-13.0	-36.4	
1.693	-20.2	V	3.0	34.9	1.0	-54.1	-13.0	-41.1	
2.540	-15.8	V	3.0	35.4	1.0	-50.2	-13.0	-37.2	

Rev. 03.03.14

UMTS REL 99, 1900MHz BAND 2

3m Radiated Emissions Chamber Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 7/11/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: Band 2 REL 99, 1900MHz

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber		Pre-amplifier		Filter		Limit	
3m Chamber F		3m Chamber F				Part 24	

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1852.4MHz)									
3.705	-10.7	H	3.0	36.3	1.0	-46.0	-13.0	-33.0	
5.557	-10.2	H	3.0	35.6	1.0	-44.8	-13.0	-31.8	
3.705	-10.5	V	3.0	36.3	1.0	-45.8	-13.0	-32.8	
5.557	-9.7	V	3.0	35.6	1.0	-44.3	-13.0	-31.3	
Mid Channel (1880MHz)									
3.760	-10.0	H	3.0	36.3	1.0	-45.3	-13.0	-32.3	
5.640	-9.4	H	3.0	35.6	1.0	-44.0	-13.0	-31.0	
3.760	-9.8	V	3.0	36.3	1.0	-45.1	-13.0	-32.1	
5.640	-9.8	V	3.0	35.6	1.0	-44.4	-13.0	-31.4	
High Channel (1907.6MHz)									
3.815	-10.0	H	3.0	36.3	1.0	-45.3	-13.0	-32.3	
5.723	-9.5	H	3.0	35.6	1.0	-44.1	-13.0	-31.1	
3.815	-8.8	V	3.0	36.3	1.0	-44.1	-13.0	-31.1	
5.723	-9.5	V	3.0	35.6	1.0	-44.1	-13.0	-31.1	

Rev. 03.03.14

UMTS HSDPA, 1900MHz BAND 2

3m Radiated Emissions Chamber Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 7/11/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: Band 2 HSDPA, 1900MHz

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifier	Filter	Limit
3m Chamber F	3m Chamber F		Part 24

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1852.4MHz)									
3.705	-10.2	H	3.0	36.3	1.0	-45.5	-13.0	-32.5	
5.557	-10.0	H	3.0	35.6	1.0	-44.6	-13.0	-31.6	
3.705	-10.3	V	3.0	36.3	1.0	-45.6	-13.0	-32.6	
5.557	-9.3	V	3.0	35.6	1.0	-43.9	-13.0	-30.9	
Mid Channel (1880MHz)									
3.760	-9.9	H	3.0	36.3	1.0	-45.2	-13.0	-32.2	
5.640	-9.7	H	3.0	35.6	1.0	-44.3	-13.0	-31.3	
3.760	-8.4	V	3.0	36.3	1.0	-43.7	-13.0	-30.7	
5.640	-9.6	V	3.0	35.6	1.0	-44.2	-13.0	-31.2	
High Channel (1907.6MHz)									
3.815	-10.2	H	3.0	36.3	1.0	-45.5	-13.0	-32.5	
5.723	-9.6	H	3.0	35.6	1.0	-44.2	-13.0	-31.2	
3.815	-9.6	V	3.0	36.3	1.0	-44.9	-13.0	-31.9	
5.723	-9.5	V	3.0	35.6	1.0	-44.1	-13.0	-31.1	

Rev. 03.03.14

UMTS REL 99, 1700MHz BAND 4

3m Radiated Emissions Chamber Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 7/11/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: Band 4 Rel 99, 1700MHz

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifier	Filter	Limit
3m Chamber F	3m Chamber F		Part 27

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1712.4MHz)									
3.425	-10.8	H	3.0	36.4	1.0	-46.2	-13.0	-33.2	
5.137	-9.9	H	3.0	35.5	1.0	-44.5	-13.0	-31.5	
3.425	-10.6	V	3.0	36.4	1.0	-46.0	-13.0	-33.0	
5.137	-9.8	V	3.0	35.5	1.0	-44.3	-13.0	-31.3	
Mid Channel (1732.6MHz)									
3.465	-11.1	H	3.0	36.4	1.0	-46.4	-13.0	-33.4	
5.198	-10.2	H	3.0	35.5	1.0	-44.7	-13.0	-31.7	
3.465	-9.8	V	3.0	36.4	1.0	-45.2	-13.0	-32.2	
5.198	-9.4	V	3.0	35.5	1.0	-43.9	-13.0	-30.9	
High Channel (1752.6MHz)									
3.505	-10.9	H	3.0	36.4	1.0	-46.3	-13.0	-33.3	
5.258	-9.8	H	3.0	35.5	1.0	-44.3	-13.0	-31.3	
3.505	-10.7	V	3.0	36.4	1.0	-46.1	-13.0	-33.1	
5.258	-10.3	V	3.0	35.5	1.0	-44.8	-13.0	-31.8	

Rev. 03.03.14

UMTS HSDPA, 1700MHz BAND 4

3m Radiated Emissions Chamber Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 7/11/2014
Test Engineer: T Wang
Configuration: EUT only
Mode: Band 4 HSDPA, 1700MHz

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber		Pre-amplifier		Filter		Limit	
3m Chamber F		3m Chamber F				Part 27	

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1712.4MHz)									
3.425	-11.8	H	3.0	36.4	1.0	-47.2	-13.0	-34.2	
5.137	-10.4	H	3.0	35.5	1.0	-45.0	-13.0	-32.0	
3.425	-11.3	V	3.0	36.4	1.0	-46.7	-13.0	-33.7	
5.137	-9.6	V	3.0	35.5	1.0	-44.1	-13.0	-31.1	
Mid Channel (1732.6MHz)									
3.465	-11.5	H	3.0	36.4	1.0	-46.8	-13.0	-33.8	
5.198	-10.2	H	3.0	35.5	1.0	-44.7	-13.0	-31.7	
3.465	-11.1	V	3.0	36.4	1.0	-46.5	-13.0	-33.5	
5.198	-9.1	V	3.0	35.5	1.0	-43.6	-13.0	-30.6	
High Channel (1752.6MHz)									
3.505	-11.2	H	3.0	36.4	1.0	-46.6	-13.0	-33.6	
5.258	-10.2	H	3.0	35.5	1.0	-44.7	-13.0	-31.7	
3.505	-11.3	V	3.0	36.4	1.0	-46.7	-13.0	-33.7	
5.258	-10.0	V	3.0	35.5	1.0	-44.5	-13.0	-31.5	

Rev. 03.03.14

10.3.3. CDMA2000

CDMA2000 1xRTT, 850MHz BC0

3m Radiated Emissions Chamber
Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 07/11/14
Test Engineer: Ali. Poushnejad
Configuration: EUT Only
Mode: CDMA2000, 1xRTT BC0

Test Equipment:
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber
 3m Chamber F

Pre-amplifier
 3m Chamber F

Filter
 [Empty]

Limit
 Part 22

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (824.7MHz)									
1.649	-19.5	H	3.0	34.9	1.0	-53.4	-13.0	-40.4	
2.474	-16.9	H	3.0	35.4	1.0	-51.3	-13.0	-38.3	
2.474	-10.4	V	3.0	35.4	1.0	-44.8	-13.0	-31.8	
3.298	-14.6	V	3.0	36.4	1.0	-50.0	-13.0	-37.0	
Mid Channel (836.52MHz)									
1.673	-21.7	H	3.0	34.9	1.0	-55.6	-13.0	-42.6	
2.510	-17.6	H	3.0	35.3	1.0	-51.9	-13.0	-38.9	
1.673	-18.9	V	3.0	34.9	1.0	-52.7	-13.0	-39.7	
2.510	-16.9	V	3.0	35.3	1.0	-51.2	-13.0	-38.2	
High Channel (848.31MHz)									
1.687	-21.6	H	3.0	34.9	1.0	-55.4	-13.0	-42.4	
2.530	-17.5	H	3.0	35.4	1.0	-51.8	-13.0	-38.8	
1.687	-17.7	V	3.0	34.9	1.0	-51.5	-13.0	-38.5	
2.530	-16.7	V	3.0	35.4	1.0	-51.0	-13.0	-38.0	

Rev. 03.03.14

EVDO-Rev A, 850MHz BC0

3m Radiated Emissions Chamber Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 07/15/14
Test Engineer: E. Yu
Configuration: EUT Only
Mode: CDMA2000, EVDO_A BC0

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifier	Filter	Limit
3m Chamber F	3m Chamber F		Part 22

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (824.7MHz)									
1.649	-19.9	H	3.0	34.9	1.0	-53.8	-13.0	-40.8	
2.479	-17.9	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
1.649	-14.5	V	3.0	34.9	1.0	-48.4	-13.0	-35.4	
2.471	-21.5	V	3.0	35.4	1.0	-55.9	-13.0	-42.9	
Mid Channel (836.52MHz)									
1.673	-20.8	H	3.0	34.9	1.0	-54.7	-13.0	-41.7	
2.510	-17.3	H	3.0	35.3	1.0	-51.6	-13.0	-38.6	
1.673	-19.6	V	3.0	34.9	1.0	-53.5	-13.0	-40.5	
2.510	-16.6	V	3.0	35.3	1.0	-50.9	-13.0	-37.9	
High Channel (848.31MHz)									
1.697	-22.4	H	3.0	34.9	1.0	-56.2	-13.0	-43.2	
2.545	-17.9	H	3.0	35.4	1.0	-52.3	-13.0	-39.3	
1.697	-19.8	V	3.0	34.9	1.0	-53.6	-13.0	-40.6	
2.545	-17.1	V	3.0	35.4	1.0	-51.5	-13.0	-38.5	

Rev. 03.03.14

CDMA2000 1xRTT, 1900MHz BC1**Above 1GHz Substitution Measurement**

Project #: 14U18207
Date: 07/11/14
Test Engineer: T Wang
Configuration: EUT Only
Mode: CDMA2000, 1xRTT BC1

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber		Pre-amplifier		Filter		Limit			
3m Chamber F		3m Chamber F				Part 24			
Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1851.25MHz)									
3.703	-10.9	H	3.0	36.3	1.0	-46.2	-13.0	-33.2	
5.554	-10.0	H	3.0	35.6	1.0	-44.5	-13.0	-31.5	
3.703	-10.3	V	3.0	36.3	1.0	-45.6	-13.0	-32.6	
5.554	-9.1	V	3.0	35.6	1.0	-43.7	-13.0	-30.7	
Mid Channel (1880MHz)									
3.760	-10.5	H	3.0	36.3	1.0	-45.8	-13.0	-32.8	
5.640	-9.7	H	3.0	35.6	1.0	-44.3	-13.0	-31.3	
3.760	-10.0	V	3.0	36.3	1.0	-45.3	-13.0	-32.3	
5.640	-9.3	V	3.0	35.6	1.0	-43.9	-13.0	-30.9	
High Channel (1908.75MHz)									
3.818	-10.2	H	3.0	36.3	1.0	-45.5	-13.0	-32.5	
5.726	-9.2	H	3.0	35.6	1.0	-43.7	-13.0	-30.7	
3.818	-9.6	V	3.0	36.3	1.0	-44.9	-13.0	-31.9	
5.726	-9.1	V	3.0	35.6	1.0	-43.7	-13.0	-30.7	

Rev. 03.03.14

EVDO-Rev A, 1900MHz BC1

3m Radiated Emissions Chamber
Above 1GHz Substitution Measurement

Project #: 14U18207
 Date: 07/15/14
 Test Engineer: T Wang
 Configuration: EUT Only
 Mode: CDMA EV DO_A BC 1

Test Equipment:
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber

Pre-amplifier

Filter

Limit

3m Chamber F

3m Chamber F

Part 24

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1851.25MHz)									
3.703	-16.0	H	3.0	36.3	1.0	-51.3	-13.0	-38.3	
5.554	-14.6	H	3.0	35.6	1.0	-49.1	-13.0	-36.1	
3.703	-15.1	V	3.0	36.3	1.0	-50.4	-13.0	-37.4	
5.554	-13.6	V	3.0	35.6	1.0	-48.2	-13.0	-35.2	
Mid Channel (1880.0)									
3.760	-15.5	H	3.0	36.3	1.0	-50.8	-13.0	-37.8	
5.640	-4.8	H	3.0	35.6	1.0	-39.4	-13.0	-26.4	
3.760	-15.0	V	3.0	36.3	1.0	-50.3	-13.0	-37.3	
5.640	-9.7	V	3.0	35.6	1.0	-44.3	-13.0	-31.3	
High Channel (1908.75MHz)									
3.818	-15.1	H	3.0	36.3	1.0	-50.4	-13.0	-37.4	
5.726	-14.1	H	3.0	35.6	1.0	-48.6	-13.0	-35.6	
3.818	-14.4	V	3.0	36.3	1.0	-49.7	-13.0	-36.7	
5.726	-14.0	V	3.0	35.6	1.0	-48.6	-13.0	-35.6	

Rev. 03.03.14

CDMA2000 1xRTT, 1700MHz BC15**3m Radiated Emissions Chamber
Above 1GHz Substitution Measurement**

Project #: 14U18207
 Date: 07/11/14
 Test Engineer: Ali. Poushnejad
 Configuration: EUT Only
 Mode: CDMA2000, 1xRTT BC15

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifier	Filter	Limit
3m Chamber F	3m Chamber F		Part 27

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1711.25MHz)									
3.423	-15.6	H	3.0	36.4	1.0	-51.0	-13.0	-38.0	
5.114	-16.8	H	3.0	35.5	1.0	-51.4	-13.0	-38.4	
3.423	-16.4	V	3.0	36.4	1.0	-51.8	-13.0	-38.8	
5.114	-16.9	V	3.0	35.5	1.0	-51.4	-13.0	-38.4	
Mid Channel (1732.5MHz)									
3.465	-13.3	H	3.0	36.4	1.0	-48.7	-13.0	-35.7	
5.198	-16.8	H	3.0	35.5	1.0	-51.3	-13.0	-38.3	
3.465	-11.2	V	3.0	36.4	1.0	-46.5	-13.0	-33.5	
5.198	-16.6	V	3.0	35.5	1.0	-51.1	-13.0	-38.1	
High Channel (1753.75MHz)									
3.508	-15.8	H	3.0	36.4	1.0	-51.1	-13.0	-38.1	
5.261	-16.0	H	3.0	35.5	1.0	-50.5	-13.0	-37.5	
3.508	-16.1	V	3.0	36.4	1.0	-51.4	-13.0	-38.4	
5.261	-15.6	V	3.0	35.5	1.0	-50.1	-13.0	-37.1	

Rev. 03.03.14

EVDO-Rev A, 1700MHz BC15

**3m Radiated Emissions Chamber
 Above 1GHz Substitution Measurement**

Company:
Project #: 14U18207
Date: 7/15/2014
Test Engineer: T Wang
Configuration: EUT Only
Mode: CDMA EVDO_A BC15

Test Equipment:
 Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber
 3m Chamber F

Pre-amplifier
 3m Chamber F

Filter
 [Empty]

Limit
 Part 27

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (1711.25MHz)									
3.423	-15.9	H	3.0	36.4	1.0	-51.3	-13.0	-38.3	
5.134	-14.7	H	3.0	35.5	1.0	-49.3	-13.0	-36.3	
3.423	-15.0	V	3.0	36.4	1.0	-50.4	-13.0	-37.4	
5.134	-14.3	V	3.0	35.5	1.0	-48.8	-13.0	-35.8	
Mid Channel (1732.5MHz)									
3.465	-14.3	H	3.0	36.4	1.0	-49.6	-13.0	-36.6	
5.198	-14.5	H	3.0	35.5	1.0	-49.0	-13.0	-36.0	
3.465	-15.3	V	3.0	36.4	1.0	-50.7	-13.0	-37.7	
5.198	-14.6	V	3.0	35.5	1.0	-49.1	-13.0	-36.1	
High Channel (1753.75MHz)									
3.508	-15.1	H	3.0	36.4	1.0	-50.5	-13.0	-37.5	
5.261	-15.3	H	3.0	35.5	1.0	-49.8	-13.0	-36.8	
3.508	-14.5	V	3.0	36.4	1.0	-49.9	-13.0	-36.9	
5.261	-14.2	V	3.0	35.5	1.0	-48.7	-13.0	-35.7	

Rev. 03.03.14

CDMA2000 1xRTT, 800MHz BC10**3m Radiated Emissions Chamber
Above 1GHz Substitution Measurement**

Project #: 14U18207
 Date: 07/11/14
 Test Engineer: Ali. Poushnejad
 Configuration: EUT Only
 Mode: CDMA2000, 1xRTT BC10

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifier	Filter	Limit
3m Chamber F	3m Chamber F		Part 90

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (817.90MHz)									
1.636	-19.6	H	3.0	34.9	1.0	-53.5	-13.0	-40.5	
2.454	-17.7	H	3.0	35.5	1.0	-52.1	-13.0	-39.1	
1.636	-15.2	V	3.0	34.9	1.0	-49.1	-13.0	-36.1	
2.454	-16.0	V	3.0	35.5	1.0	-50.5	-13.0	-37.5	
Mid Channel (820.5MHz)									
1.641	-21.6	H	3.0	34.9	1.0	-55.5	-13.0	-42.5	
2.462	-17.4	H	3.0	35.4	1.0	-51.9	-13.0	-38.9	
1.641	-16.9	V	3.0	34.9	1.0	-50.8	-13.0	-37.8	
2.462	-16.8	V	3.0	35.4	1.0	-51.2	-13.0	-38.2	
High Channel (823.10MHz)									
1.646	-20.4	H	3.0	34.9	1.0	-54.4	-13.0	-41.4	
2.469	-17.6	H	3.0	35.4	1.0	-52.0	-13.0	-39.0	
1.646	-16.6	V	3.0	34.9	1.0	-50.5	-13.0	-37.5	
2.469	-16.5	V	3.0	35.4	1.0	-50.9	-13.0	-37.9	

Rev. 03.03.14

EVDO-Rev A, 800MHz BC10

3m Radiated Emissions Chamber Above 1GHz Substitution Measurement

Project #: 14U18207
Date: 07/15/14
Test Engineer: E.Yu
Configuration: EUT Only
Mode: CDMA2000, EV DO_A BC10

Test Equipment:

Substitution: Horn T59 Substitution, and 8ft SMA Cable

Chamber	Pre-amplifier	Filter	Limit
3m Chamber F	3m Chamber F		Part 90

Frequency (GHz)	SG reading (dBm)	Ant. Pol. (H/V)	Distance	Preamp	Attenuator	EIRP	Limit	Delta	Notes
Low Channel (817.25MHz)									
1.635	-19.4	H	3.0	34.9	1.0	-53.3	-13.0	-40.3	
2.437	-16.1	H	3.0	35.5	1.0	-50.6	-13.0	-37.6	
1.635	-14.0	V	3.0	34.9	1.0	-47.9	-13.0	-34.9	
2.439	-13.3	V	3.0	35.5	1.0	-47.8	-13.0	-34.8	
Mid Channel (820.0MHz)									
1.640	-19.7	H	3.0	34.9	1.0	-53.6	-13.0	-40.6	
2.460	-15.0	H	3.0	35.4	1.0	-49.5	-13.0	-36.5	
1.640	-16.1	V	3.0	34.9	1.0	-50.0	-13.0	-37.0	
2.460	-15.2	V	3.0	35.4	1.0	-49.6	-13.0	-36.6	
High Channel (822.75MHz)									
1.646	-20.9	H	3.0	34.9	1.0	-54.8	-13.0	-41.8	
2.437	-18.2	H	3.0	35.5	1.0	-52.8	-13.0	-39.8	
1.646	-16.0	V	3.0	34.9	1.0	-49.9	-13.0	-36.9	
2.439	-16.6	V	3.0	35.5	1.0	-51.2	-13.0	-38.2	

Rev. 03.03.14