FCC CFR47 PART 22H AND 24E
&
INDUSTRY CANADA RSS-132 AND RSS-133

CERTIFICATION TEST REPORTFOR

FOR

802.11BG, BT, WWAN COMBO MODULE

MODEL NUMBER: FENWAY-2

FCC ID: J9CFENWAY-2

IC: 2723A-FENWAY2

REPORT NUMBER: 10U13243-3

ISSUE DATE: JUNE 02, 2010

Prepared for

QUALCOMM

5775 MOREHOUSE DRIVE
SAN DIEGO, CA. 92121, UNITED STATES

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	06/02/10	Initial Issue	--

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	QUALCOMM CORPORATE 5775 MOREHOUSE DRIVE SAN DIEGO, CA. 92121, UNITED STATES.
EUT DESCRIPTION:	802.11bg, BT, WWAN Combo Module
MODEL:	FENWAY-2
SERIAL NUMBER:	HCR1JJW
DATE TESTED:	NOVEMBER 06-15, 2008

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22 SUBPART H	Pass
IC RSS-132 ISSUE 2 and RSS-133 ISSUE 5	Pass

Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For CCS By:

SUNNY SHIH
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with RSS-GEN, RSS-132, RSS-133, ANSI/TIA 603C-2004, FCC CFR 47 Part 2, and FCC CFR 47 Part 22 and 24.

3. FACILITIES AND ACCREDITATION

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

CCS 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. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11bg, BT, WWAN Combo Module.

Fenway is a ruggedized Win Mobile PDA device for the Vertical and Enterprise markets. Fenway will deliver WWAN connectivity solutions for the UMTS HSDPA and HSUPA, and GSM/GPRS/EDGE protocols in one hardware configuration.

In the US and Canada, only 850 MHz (Cellular), 1700 MHz (AWS) and 1900 MHz (PCS) bands are used for WCDMA and GSM operation. The EUT was only tested in those three bands for FCC application.

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Magnetic Mount triple-frequency Mobile antenna with a maximum gain of 0 dBi.

5.3. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop	HP	Compaq6910p	CND8153FTV	DoC
AC Adapter	HP	PA-1131-08HC	7500329102	DoC
DC Power Supply	XANTREX	XHR60-18	1064	NA
Horn	EMCO	3115	6717	NA
AC Adapter	QUALCOMM	GWC-1700	CV90-C6024	DoC
Qualcomm Miniposer	QUALCOMM	NA	NA	NA

I/O CABLES (CONDUCTED TEST)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	3	US 115V	Un-shielded	2m	No
2	DC	3	DC	Un-shielded	2m	No
3	USB	1	USB	Un-shielded	2m	Yes
4	RF In/Out	1	SMA	Un-shielded	1m	Yes

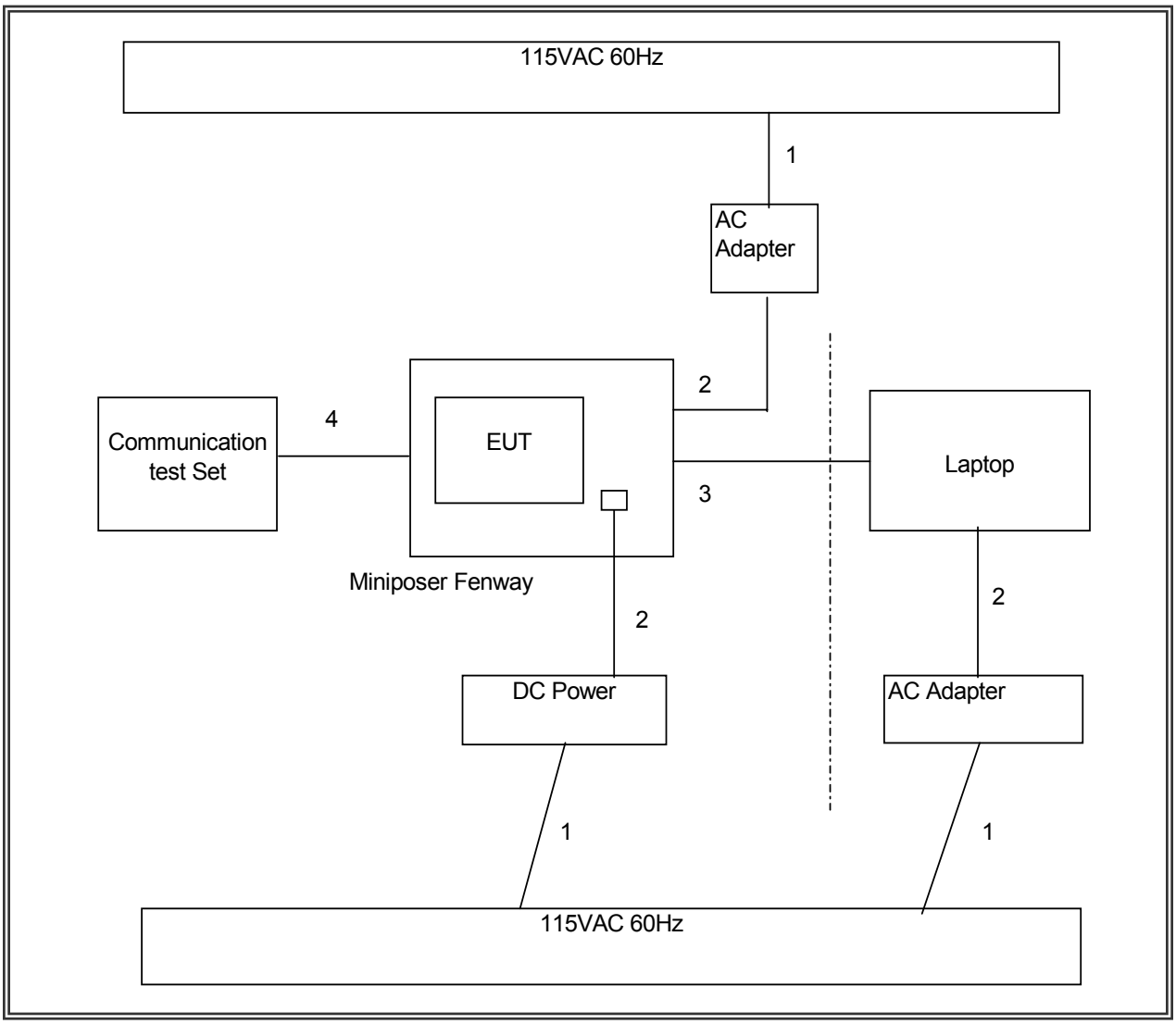
I/O CABLES (RADIATED TEST)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	3	US 115V	Un-shielded	2m	No
2	DC	3	DC	Un-shielded	2m	No
3	USB	1	USB	Un-shielded	2m	Yes
4	RF In/Out	1	Horn	Un-shielded	1m	Yes

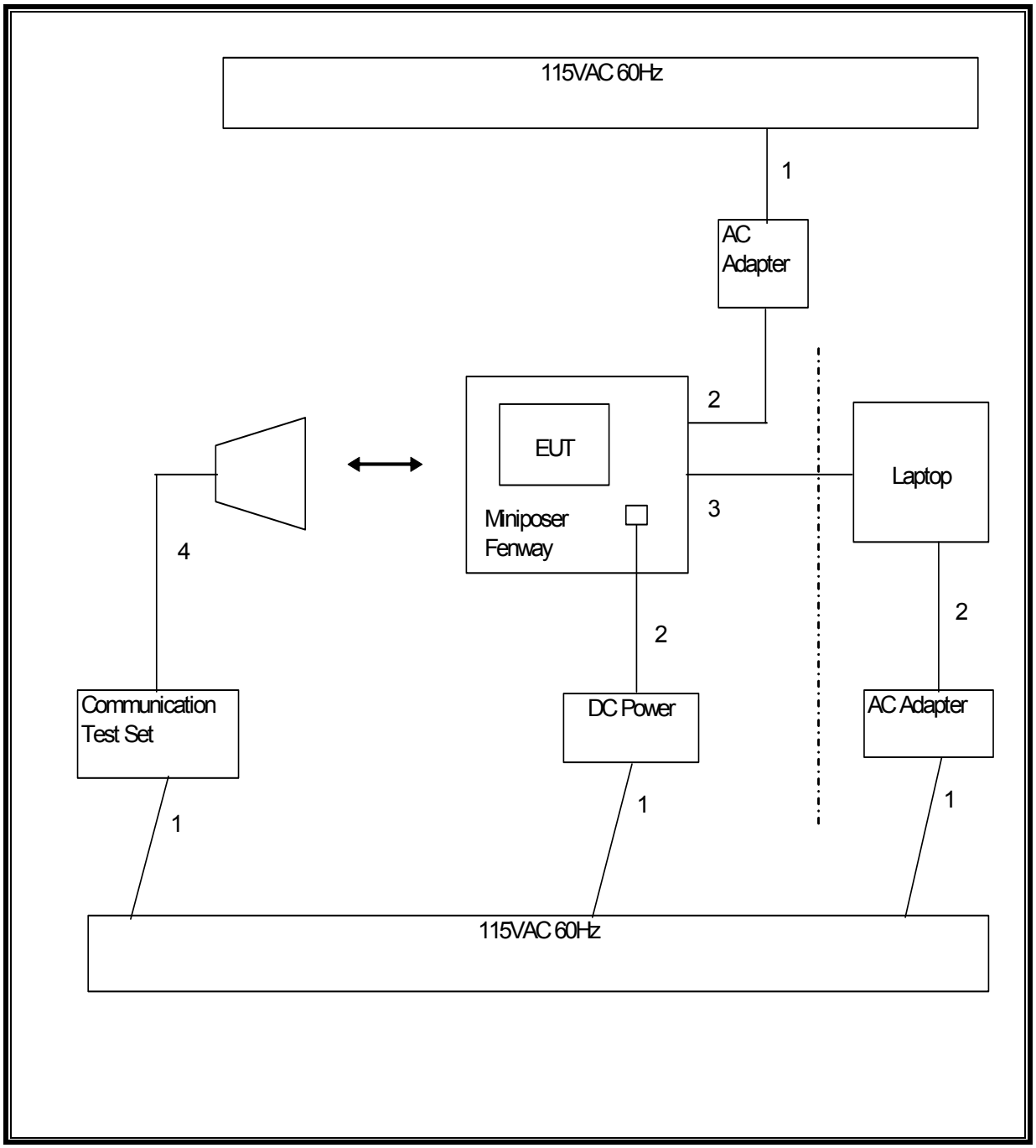
TEST SETUP

The EUT is installed in a test fixture during the tests. A link is established between the EUT and the Agilent 8960 communications test set.

SETUP DIAGRAM FOR CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**Asset**	**Cal Date**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	12/03/07	03/03/09
Temperature / Humidity	Thermotron	SE 600-10-10	C00930	05/13/08	05/13/09
Antenna, Horn, 18 GHz	ETS	3117	C01006	04/22/08	04/22/09
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	09/27/07	08/05/09
EMI Receiver, 2.9 GHz	Agilent / HP	8542E	C00957	06/19/08	09/19/09
RF Filter Section, 2.9 GHz	Agilent / HP	85420E	C00958	06/19/08	09/19/09
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	02/06/08	08/06/09
Communications Test Set	Agilent / HP	E5515C	C01086	06/16/08	06/16/09
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	02/11/08	02/11/09
Preamplifier, 1300 MHz	Agilent / HP	8447D	C01064	05/09/07	03/31/09
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	09/15/06	10/29/09

7. TEST SUMMARY

Description of test	Rule part		Results
	FCC	IC	
1. RF Power Output	§2.1046	RSS-132, 4.4; RSS-133, 6.4;	Complies
2. Occupied Bandwidth	§2.1049	RSS-Gen, 4.6	Complies
3. Block Edge (Band Edge)	§22.359, §24.238	RSS-132, 4.5; RSS-133, 6.5	Complies
4. Out of Band Emissions	§2.1051, §22.917, §24.238	RSS-132, 4.5; RSS-133, 6.5	Complies
5. Frequency Stability	§2.1055, §22.355, §24.235	RSS-132, 4.3; RSS-133, 6.3	Complies
6. Radiated Power (ERP & EIRP)	§2.1046, §22.913, §24.232	RSS-132; 4.4, RSS-133, 6.4	Complies
7. Field Strength of Spurious Radiation	§2.1053, §22.917, §24.238	RSS-132, 4.5; RSS-133, 6.5	Complies
8. Receiver Spurious Emissions (IC only)	n/a	RSS-132, 4.6; RSS-133, 6.6, RSS-Gen	Complies

8. MAXIMUM OUTPUT POWER

The transmitter has a maximum output power as follows:

Part 22 Cellular Band

Frequency range (MHz)	Modulation	Peak Conducted Power		ERP	
		dBm	mW	dBm	mW
824.2 – 848.8	GMSK (GSM)	32.71	1866.4	30.3	1071.5
	8PSK (EGPRS)	30.33	1078.9	27.7	588.8
826.4 – 846.6	UMTS - Rel 99	28.17	656.1	27.6	575.4
	UMTS - HSDPA	28.75	749.9	27.2	524.8

Part 24 PCS Band

Frequency range (MHz)	Modulation	Peak Conducted Power		EIRP	
		dBm	mW	dBm	mW
1850.2 – 1909.8	GMSK (GSM)	29.6	905.7	29.2	831.8
	8PSK (EGPRS)	29.3	841.4	26.9	489.8
1852.4 – 1907.6	UMTS - Rel 99	25.0	316.2	26.1	407.4
	UMTS - HSDPA	30.0	988.6	26.9	489.8

9. RF POWER OUTPUT VERIFICATION

RULE PART(S)

FCC: §2.1046
IC: RSS-132, 4.4; RSS-133, 6.4

LIMITS

For reporting purposes only

TEST PROCEDURE

The transmitter output was connected to an Agilent 8960Test Set and configured to operate at maximum power in a call. The peak power was measured using the spectrum analyzer at three equally spaced operating frequencies for each band. The RBW was set to 300 KHz for the GSM and EDGE measurements and 5 MHz for the UMTS (WCDMA) measurements.

MODES TESTED

- GSM – GSM/GPRS (GSMK) & EGPRS (8PSK) modes.
- UMTS (W-CDMA) - Rel 99, Rel 6 HSDPA and HSPA (HSDPA & HSUPA)

RESULTS

See Section 9.1 to 9.4

9.1. RF POWER OUTPUT FOR GSM MODE

GSM (GMSK)

Band	Ch	Frequency	Conducted output power (dBm)	
			Average	Peak
GSM850	128	824.2	32.28	32.40
	190	836.6	32.47	32.64
	251	848.8	32.44	32.71*
GSM1900	512	1850.2	28.94	29.47
	661	1880	28.95	29.54*
	810	1909.8	28.85	29.43

GPRS (GMSK) - Coding scheme: MCS4

Band	Ch	Frequency	Conducted output power (dBm)			
			Average		Peak	
			1 slot	2 slot	1 slot	2 slot
GSM850	128	824.2	32.28	32.14	32.40	32.22
	190	836.6	32.45	32.33	32.63	32.50
	251	848.8	32.42	32.34	32.67	32.61
GSM1900	512	1850.2	29.02	28.80	29.57	29.32
	661	1880	28.92	28.75	29.49	29.31
	810	1909.8	28.89	28.78	29.49	29.38

EGPRS (8PSK) - Coding scheme: MCS9

Band	Ch	Frequency	Conducted output power (dBm)			
			Average		Peak	
			1 slot	2 slot	1 slot	2 slot
GSM850	128	824.2	27.00	26.90	30.06	29.96
	190	836.6	27.00	27.00	30.29	30.22
	251	848.8	27.10	27.00	30.40	30.33
GSM1900	512	1850.2	25.50	25.42	29.25	29.08
	661	1880	25.42	25.37	29.19	29.12
	810	1909.8	25.40	25.30	29.17	29.07

9.2. RF POWER OUTPUT FOR UMTS REL99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V7.5.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7) 12.2kps RMC is used for this testing. Power control set to All bits up. A summary of these settings are illustrated below:

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

REL 99

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Average	Peak
UMTS850 (Band V)	4132	4357	826.4	24.90	28.17
	4180	4405	836.0	24.80	28.09
	4230	4455	846.0	24.85	28.05
UMTS1900 (Band II)	9262	9662	1852.4	25.00	29.32
	9400	9800	1880	24.76	29.06
	9538	9938	1907.6	24.80	28.79

9.3. RF POWER OUTPUT FOR UMTS Rel 6 HSDPA

The following Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V7.5.0 specification. All TX RMS and Peak power requirements for Power Class 3 were met according to table 5.2AA.5 and achieved through the outlined test procedure in section 5.2AA.4.2. A summary of these settings are illustrated below:

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

Result

REL 6 HSDPA

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Average	Peak
UMTS850 (Band V)	1	4132	4357	826.4	24.80	28.49
		4180	4405	836.0	24.60	28.52
		4230	4455	846.0	24.60	28.35
	2*	4132	4357	826.4	24.60	28.39
		4180	4405	836.0	24.80	**28.75***
		4230	4455	846.0	24.62	28.60
	3	4132	4357	826.4	23.76	27.92
		4180	4405	836.0	23.70	27.89
		4230	4455	846.0	23.80	27.74
	4	4132	4357	826.4	23.82	28.01
		4180	4405	836.0	23.80	27.90
		4230	4455	846.0	23.70	27.91
UMTS1900 (Band II)	1	9262	9662	1852.4	24.58	29.00
		9400	9800	1880.0	24.53	28.59
		9538	9938	1907.6	24.48	28.76
	2*	9262	9662	1852.4	24.60	29.20
		9400	9800	1880.0	24.20	29.16
		9538	9938	1907.6	24.66	**29.35***
	3	9262	9662	1852.4	24.50	28.87
		9400	9800	1880.0	24.20	29.04
		9538	9938	1907.6	24.30	29.07
	4	9262	9662	1852.4	24.40	29.14
		9400	9800	1880.0	24.50	28.51
		9538	9938	1907.6	24.50	29.14

9.4. RF POWER OUTPUT UMTS Rel 6 HSPA (HSDPA & HSUPA)

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2B of the 3GPP TS34.121-1 V7.5.0 specification. All TX RMS and Peak power requirements were met according to table 5.2B.5 and achieved through the outlined test procedure in section 5.2B.4.2. A summary of these settings are illustrated below:

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	15/15
	βec	209/225	12/15	30/15	2/15	24/15
	βc/βd	11/15	6/15	15/9	2/15	15/15
	βhs	22/15	12/15	30/15	4/15	30/15
	βed	1309/225	94/75	47/15 47/15	56/75	134/15
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

REL 6 HSPA (HSDPA & HSUPA)

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Average	Peak
UMTS850 (Band V)	1	4132	4357	826.4	24.20	28.18
		4180	4405	836.0	24.50	28.46
		4230	4455	846.0	24.50	28.29
	2	4132	4357	826.4	22.50	28.12
		4180	4405	836.0	22.60	28.13
		4230	4455	846.0	22.60	28.11
	3	4132	4357	826.4	23.30	28.65
		4180	4405	836.0	23.15	28.64
		4230	4455	846.0	23.20	28.55
	4	4132	4357	826.4	23.20	28.22
		4180	4405	836.0	23.20	28.30
		4230	4455	846.0	23.60	28.34
	5	4132	4357	826.4	24.20	28.50
		4180	4405	836.0	24.50	28.44
		4230	4455	846.0	24.15	28.60
UMTS1900 (Band II)	1	9262	9662	1852.4	24.32	29.08
		9400	9800	1880.0	24.25	29.27
		9538	9938	1907.6	24.00	29.29
	2	9262	9662	1852.4	22.48	28.43
		9400	9800	1880.0	22.10	28.93
		9538	9938	1907.6	22.20	28.83
	3	9262	9662	1852.4	23.80	29.08
		9400	9800	1880.0	23.70	29.02
		9538	9938	1907.6	23.30	29.12
	4	9262	9662	1852.4	23.10	28.78
		9400	9800	1880.0	22.60	28.65
		9538	9938	1907.6	22.70	29.14
	5	9262	9662	1852.4	24.30	29.02
		9400	9800	1880.0	24.00	28.93.
		9538	9938	1907.6	24.20	29.27

10. WORST-CASE CONFIGURATION AND MODE

Based on the following investigation results, see Section 6. RF POWER OUTPUT VERIFCATION. The highest peak power and enhanced data rate is the worst-case scenario for all measurements.

Worst case modes:

- Cellular & PCS bands for GSM
  - GSM (GSMK)
  - EGPRS (8PSK)
- Band V & Band II for UMTS (WCDMA)
  - Rel 99
  - Rel 6 HSDPA Subtest 2

11. CONDUCTED TEST RESULTS

11.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049
IC: RSS-Gen, 4.6

LIMITS

For reporting purposes only

TEST PROCEDURE

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

MODES TESTED

- GSM - GSM (GSMK) & EGPRS (8PSK),
- UMTS (W-CDMA) - Rel 99, Rel 6 HSDPA Subtest 2

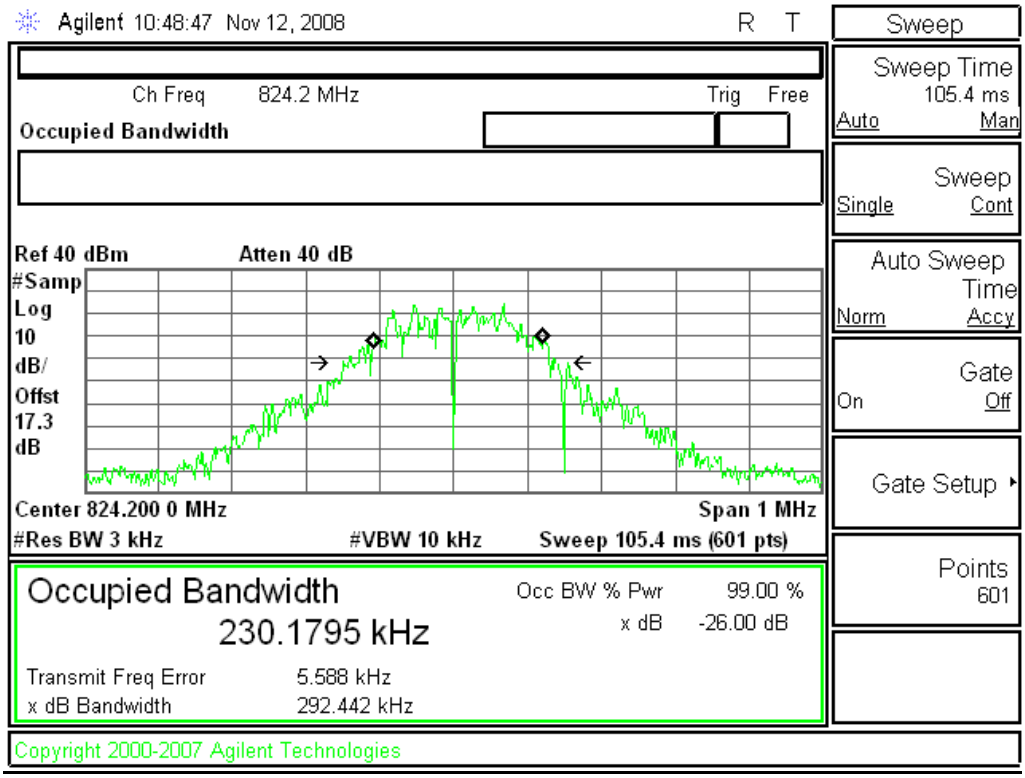
RESULTS

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GSM (GMSK)	128	824.2	230.1795	292.442
		190	836.6	243.1652	308.637
		251	848.8	243.7389	306.056
	EGPRS (8PSK)	128	824.2	238.2143	292.889
		190	836.6	240.1634	295.889
		251	848.8	247.8720	304.798
PCS	GSM (GMSK)	512	1850.2	245.621	306.094
		661	1880.0	243.189	316.668
		810	1909.8	246.024	309.244
	EGPRS (8PSK)	512	1850.2	239.092	300.341
		661	1880.0	245.914	304.024
		810	1909.8	241.190	302.521

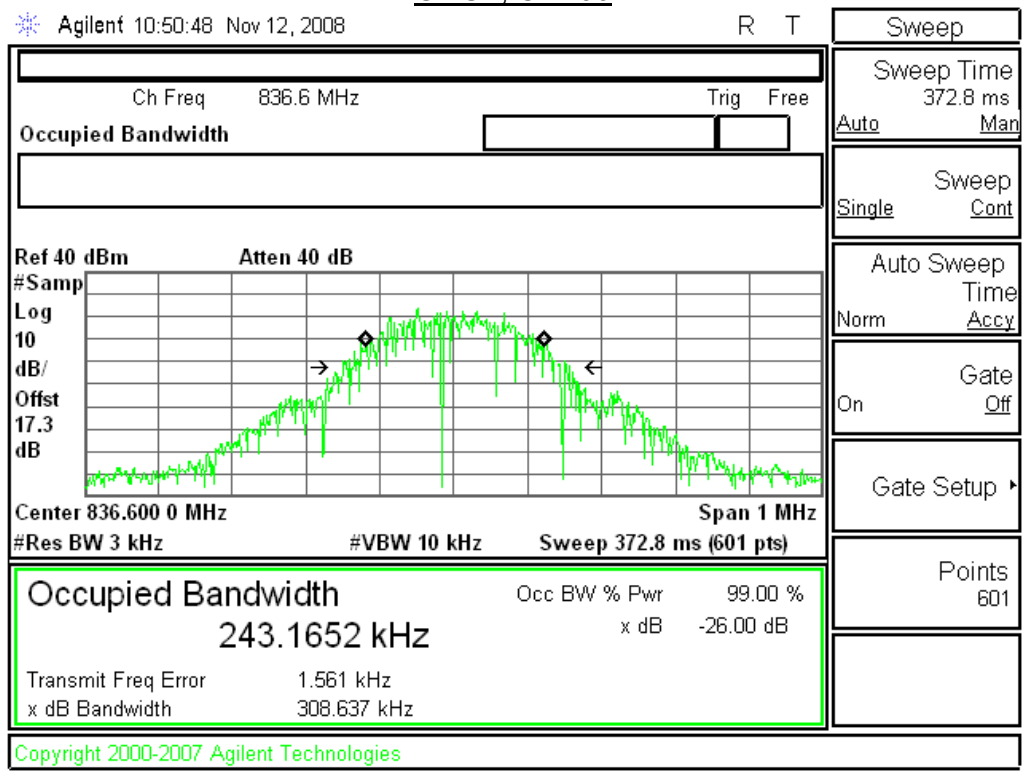
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
UMTS Band V	Rel 99	4132	826.4	4.190	4.622
		4180	836.0	4.188	4.675
		4230	846.0	4.185	4.681
	HSDPA Rel 6 Subtest 2	4132	826.4	4.1811	4.664
		4180	836.0	4.1772	4.629
		4230	846.0	4.1534	4.669
UMTS Band II	Rel 99	9262	1852.4	4.1783	4.6500
		9400	1880.0	4.1788	4.6440
		9538	1907.6	4.170	4.6760
	HSDPA Rel 6 Subtest 2	9262	1852.4	4.1457	4.6390
		9400	1880.0	4.1950	4.6660
		9538	1907.6	4.1722	4.6560

Plots for GMSK Mode (Cellular Band)

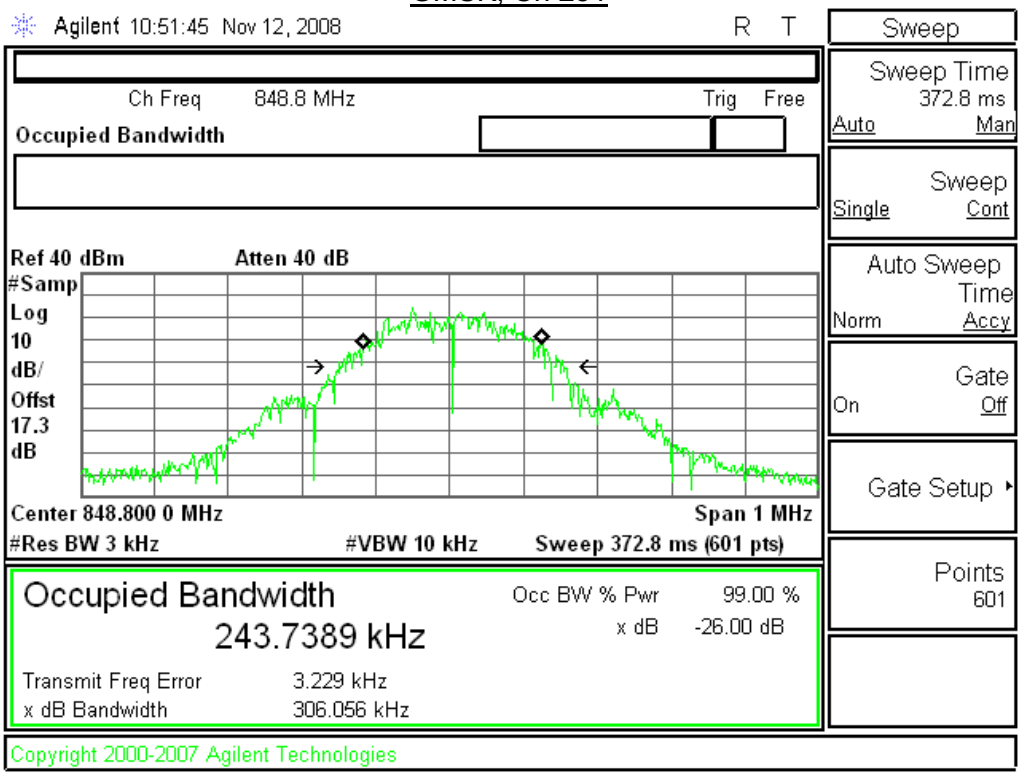
GMSK, Ch 128



GMSK, Ch 190

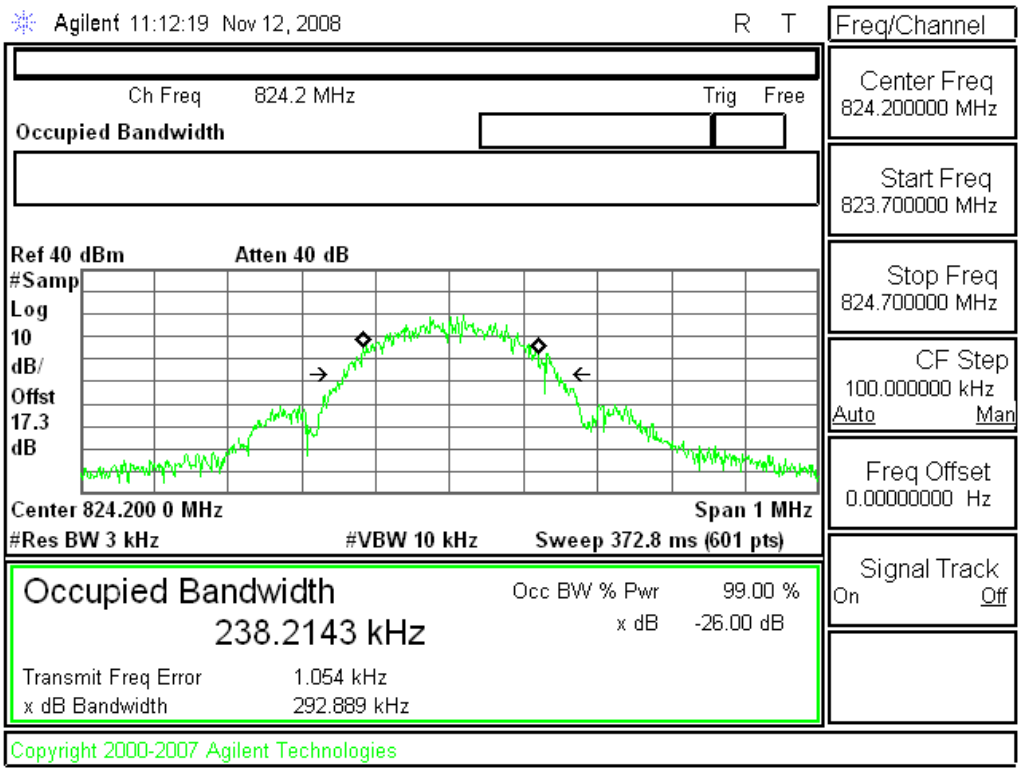


GMSK, Ch 251

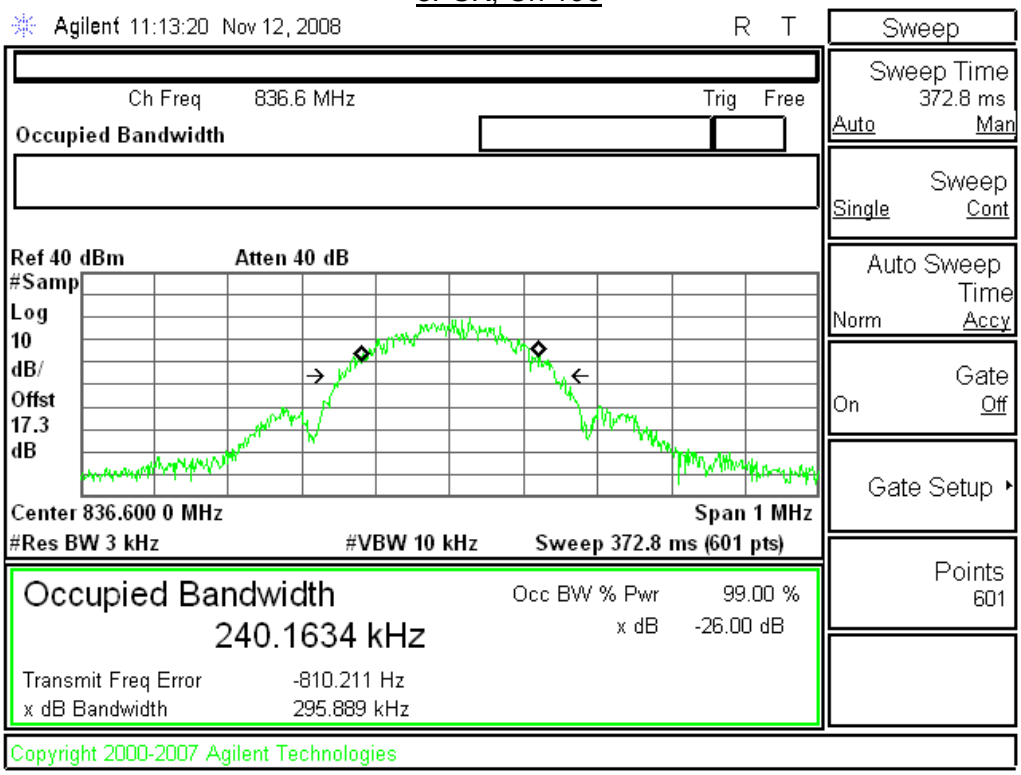


Plots for 8PSK Mode (Cellular Band)

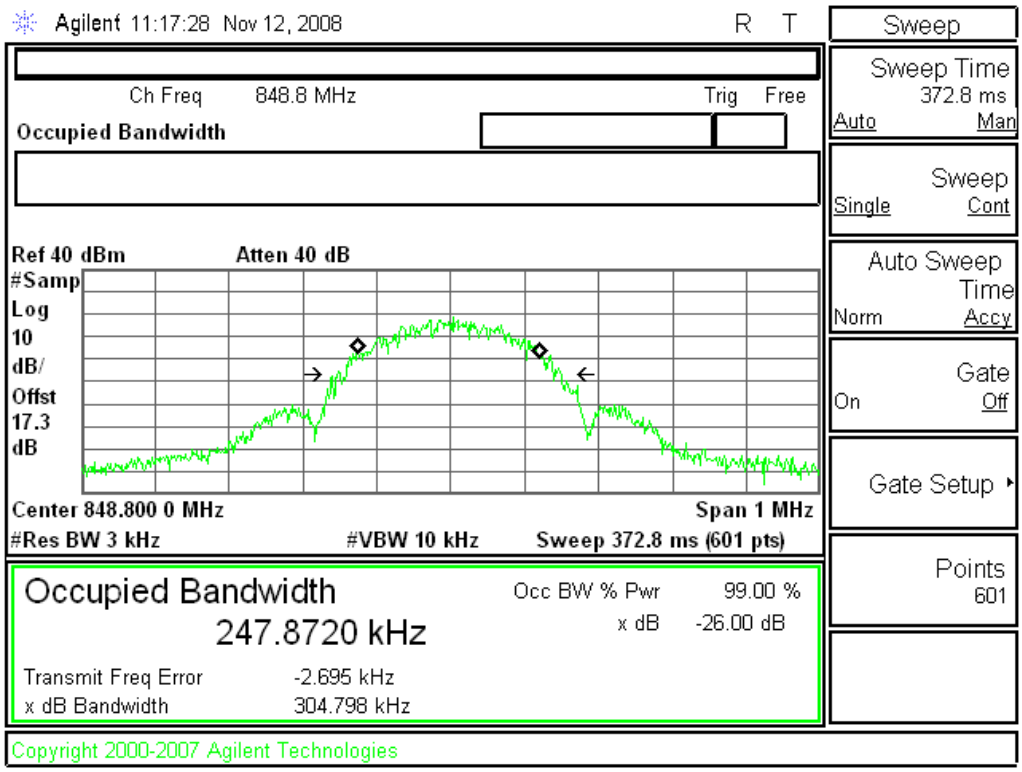
8PSK, Ch 128



8PSK, Ch 190

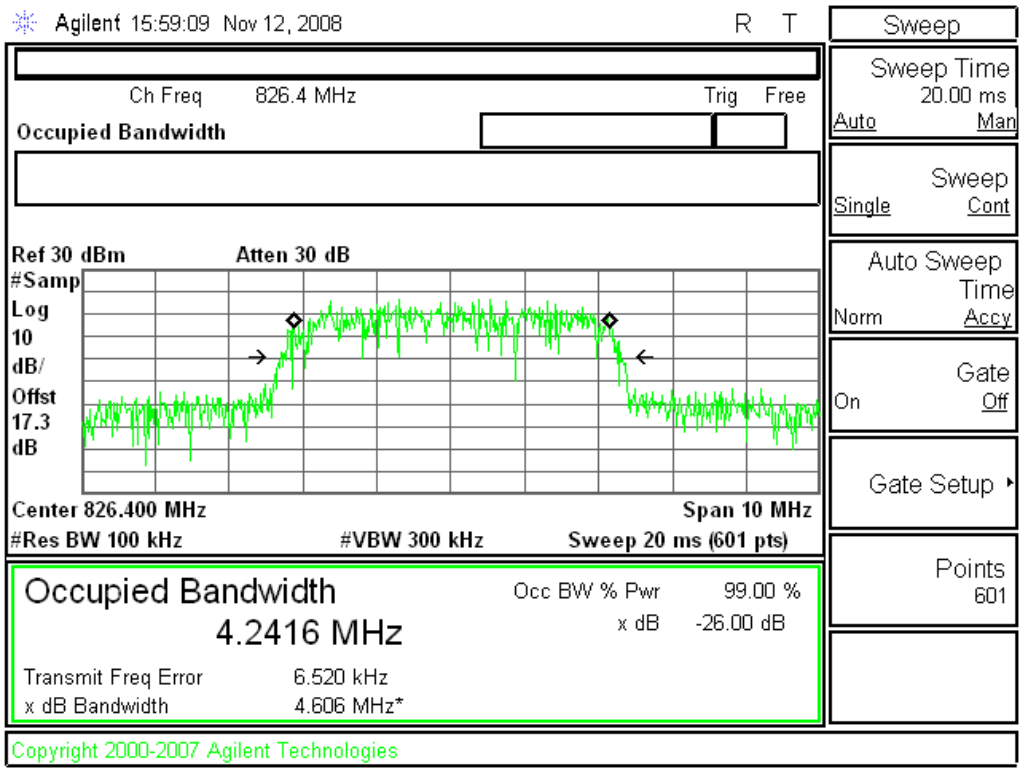


8PSK, Ch 251

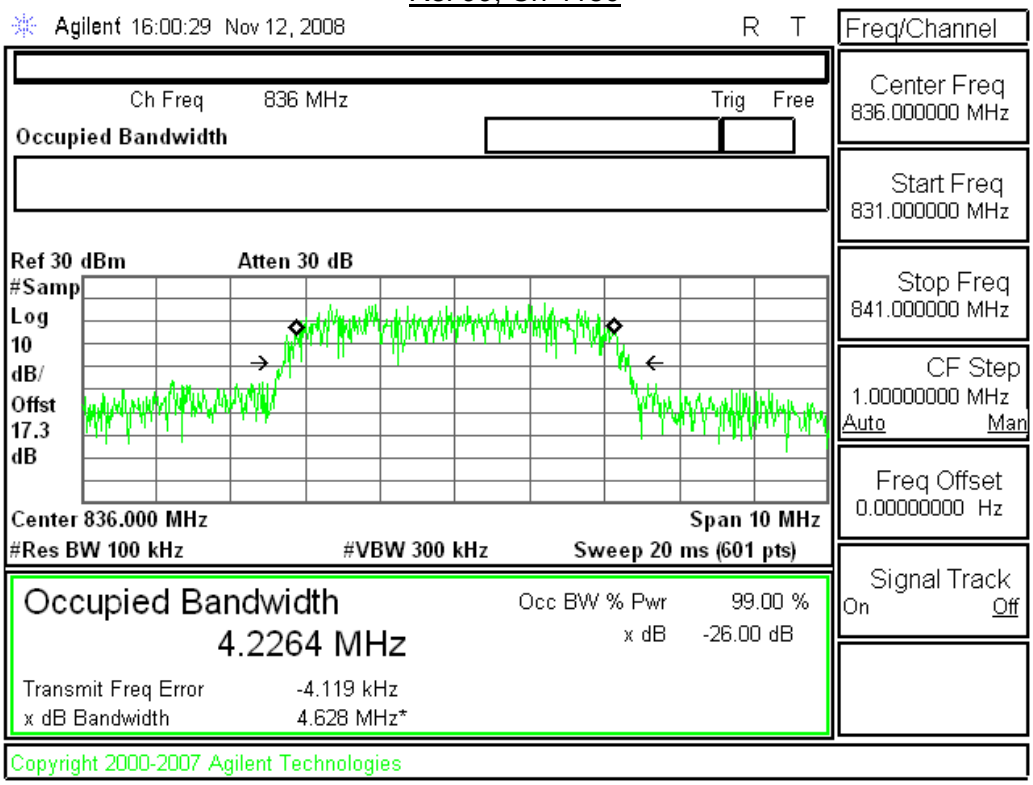


Plots for UMTS Rel 99 Mode (Cellular Band)

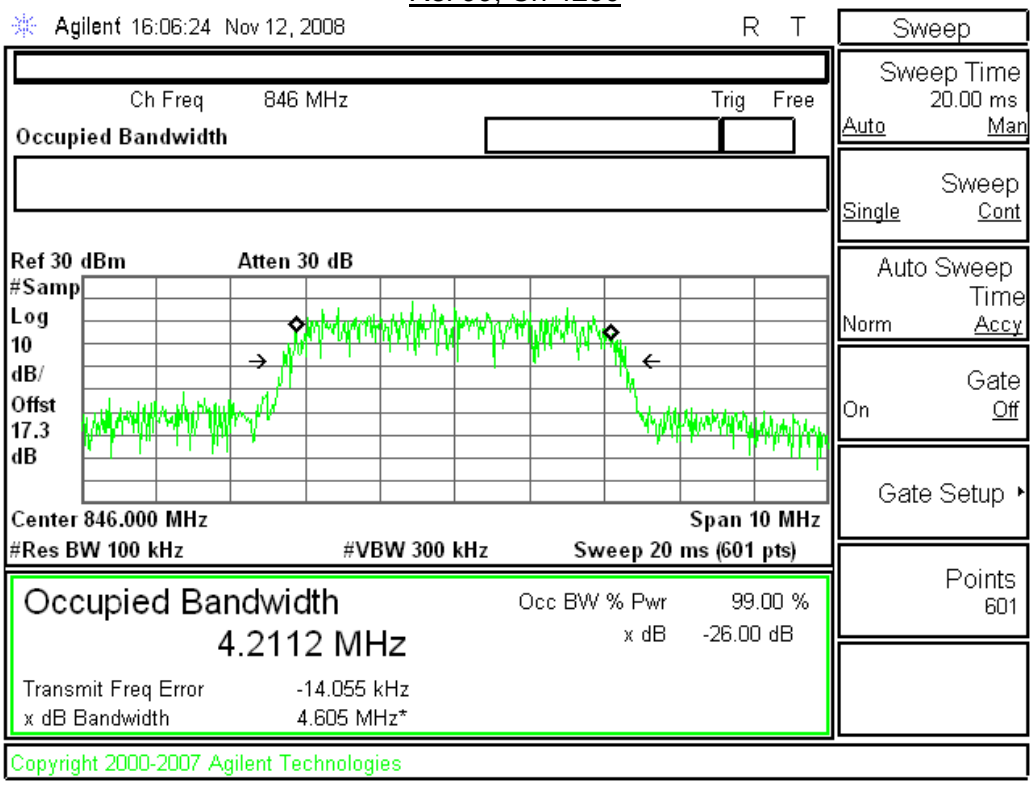
Rel 99, Ch 4132



Rel 99, Ch 4180

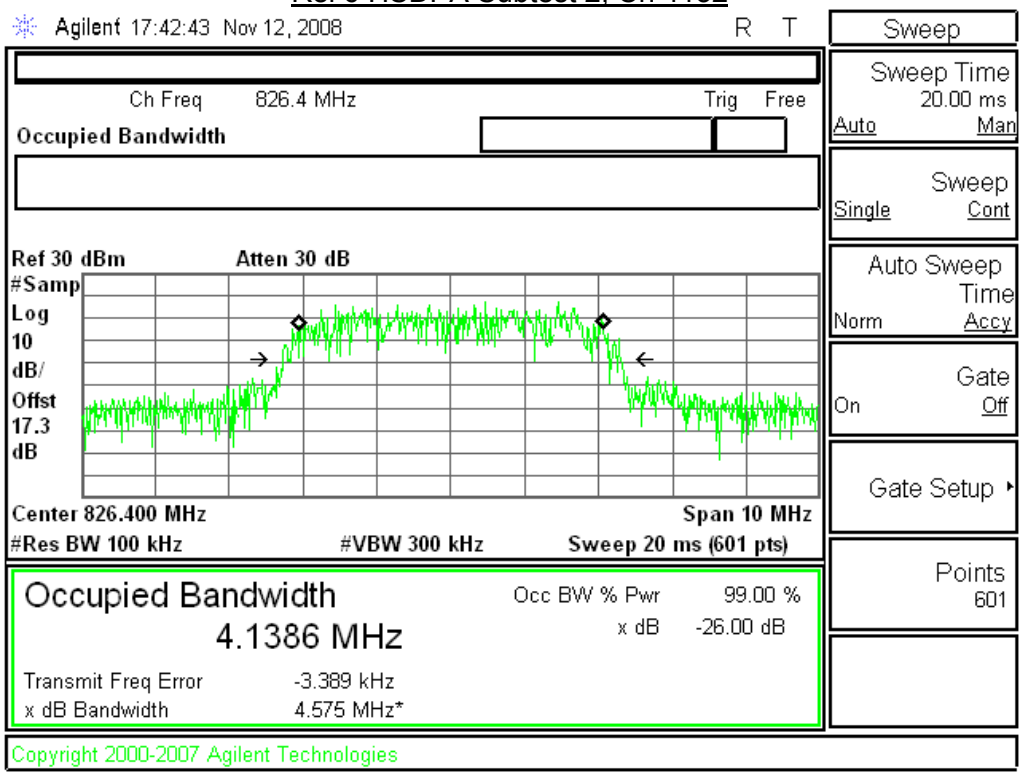


Rel 99, Ch 4230

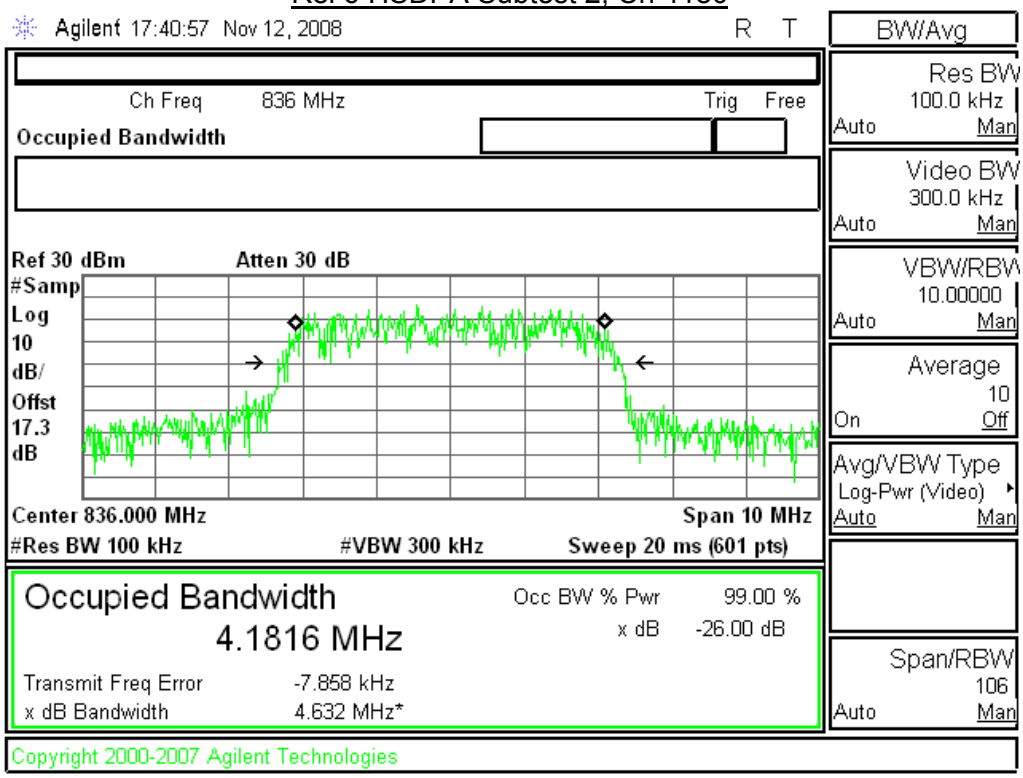


Plots for UMTS Rel 6 HSDPA Subtest 2 Mode (Cellular Band)

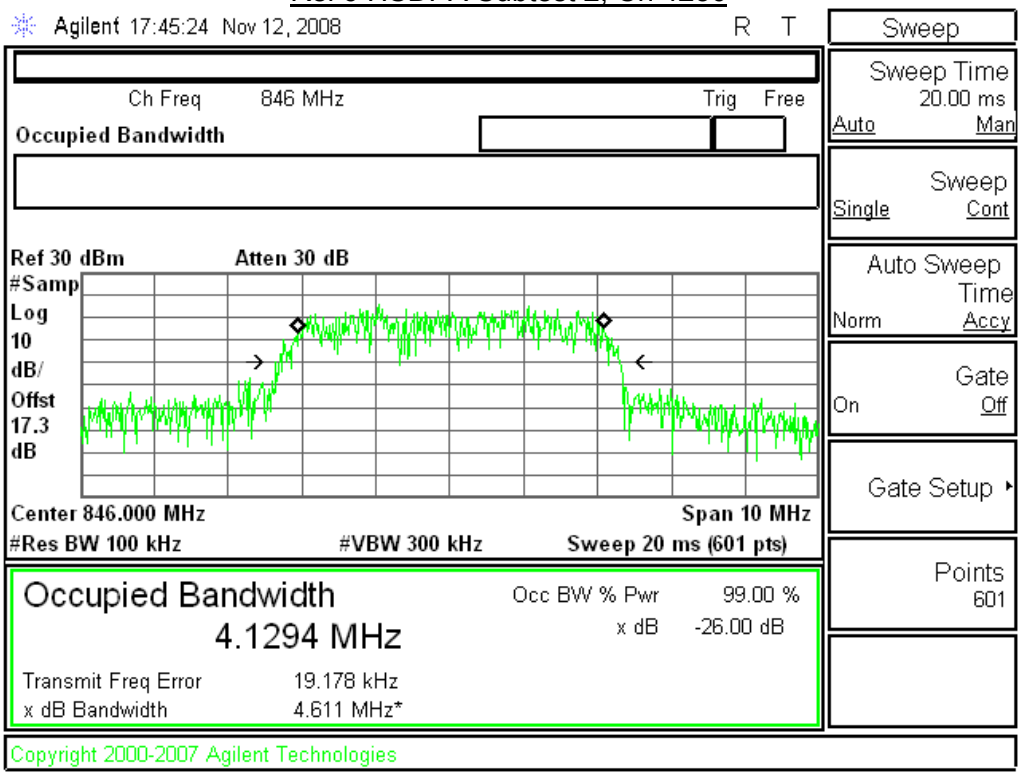
Rel 6 HSDPA Subtest 2, Ch 4132



Rel 6 HSDPA Subtest 2, Ch 4180

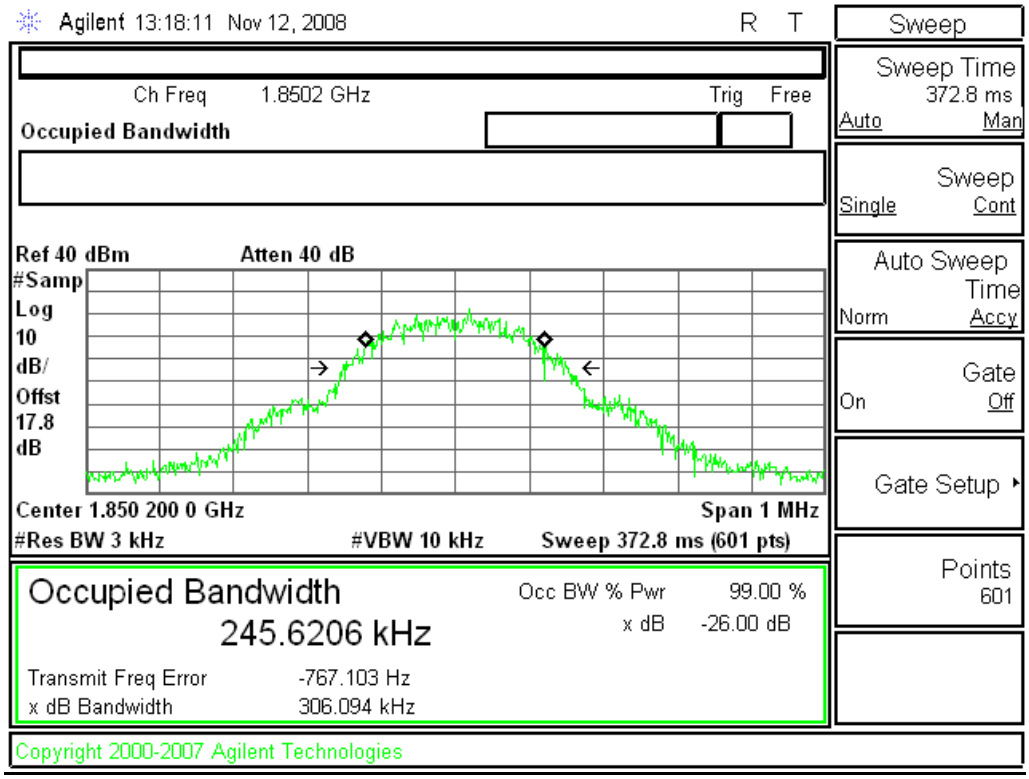


Rel 6 HSDPA Subtest 2, Ch 4230

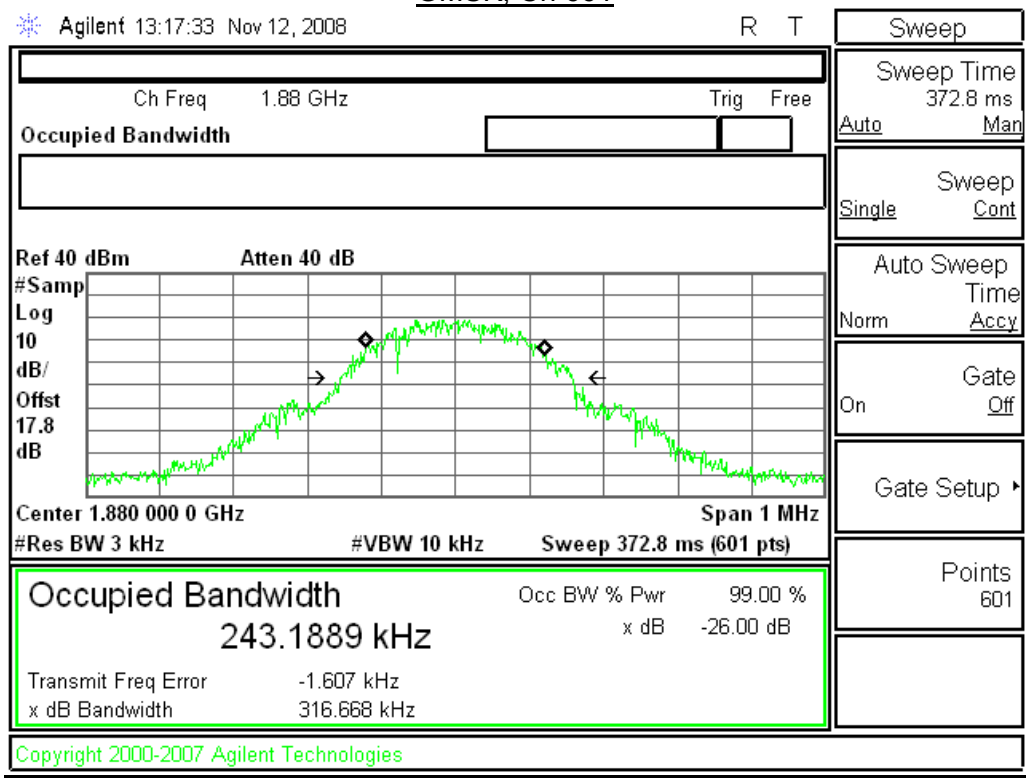


Plots for GMSK Mode (PCS Band)

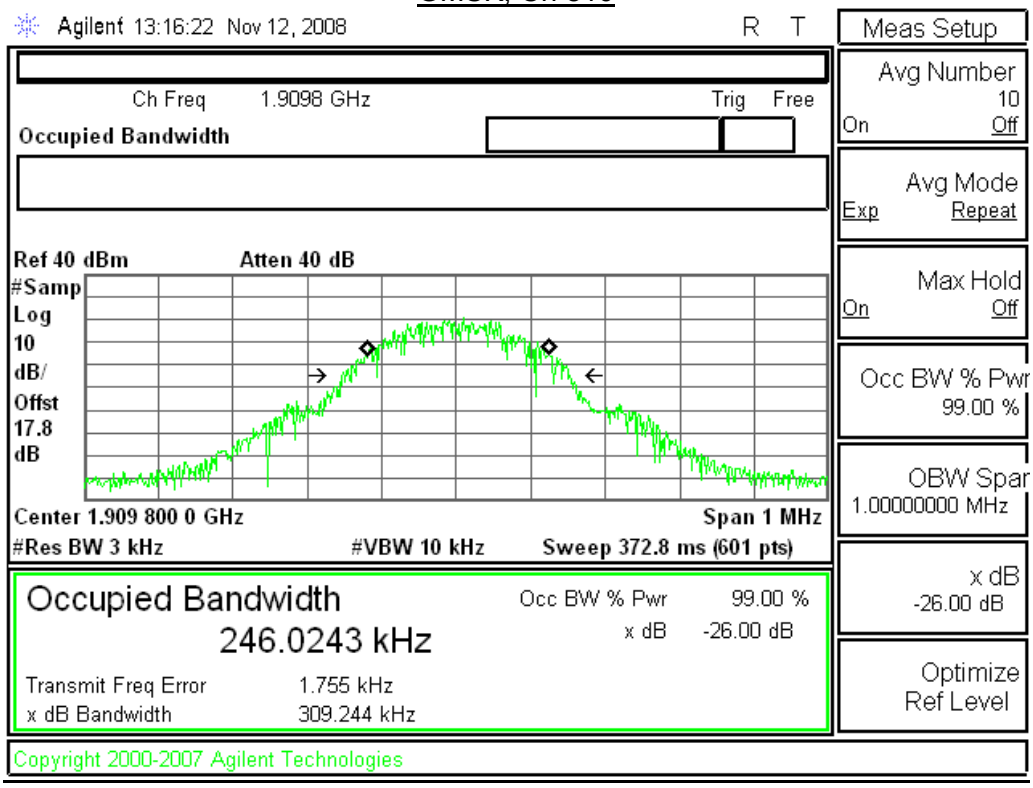
GMSK, Ch 512



GMSK, Ch 661

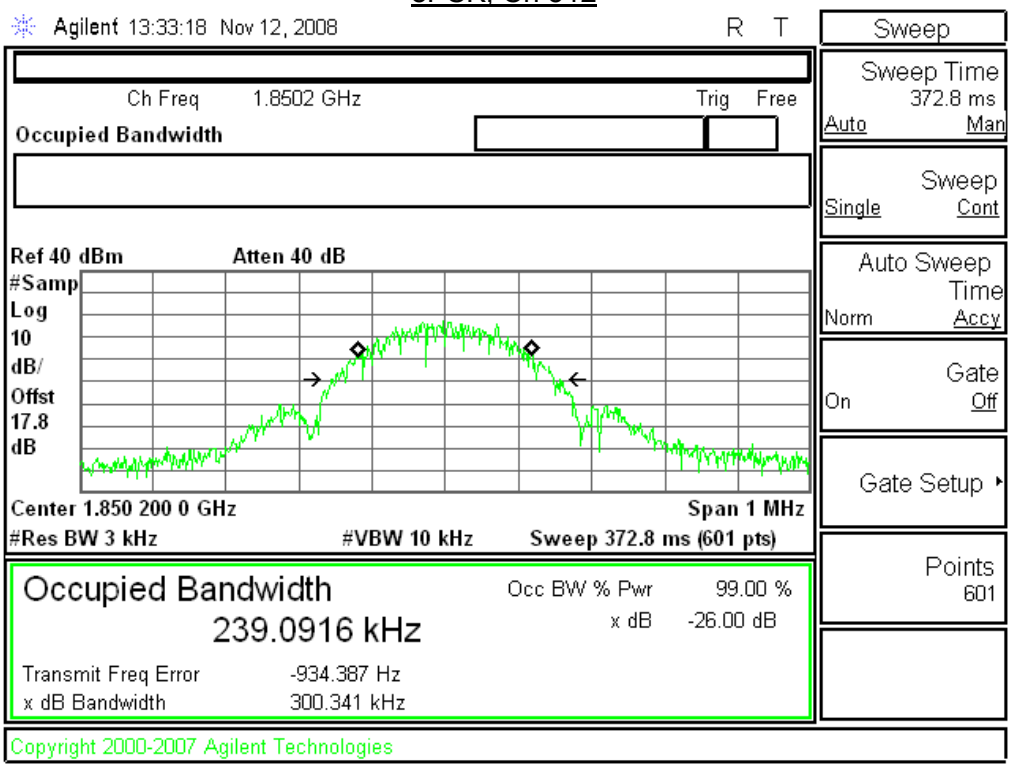


GMSK, Ch 810

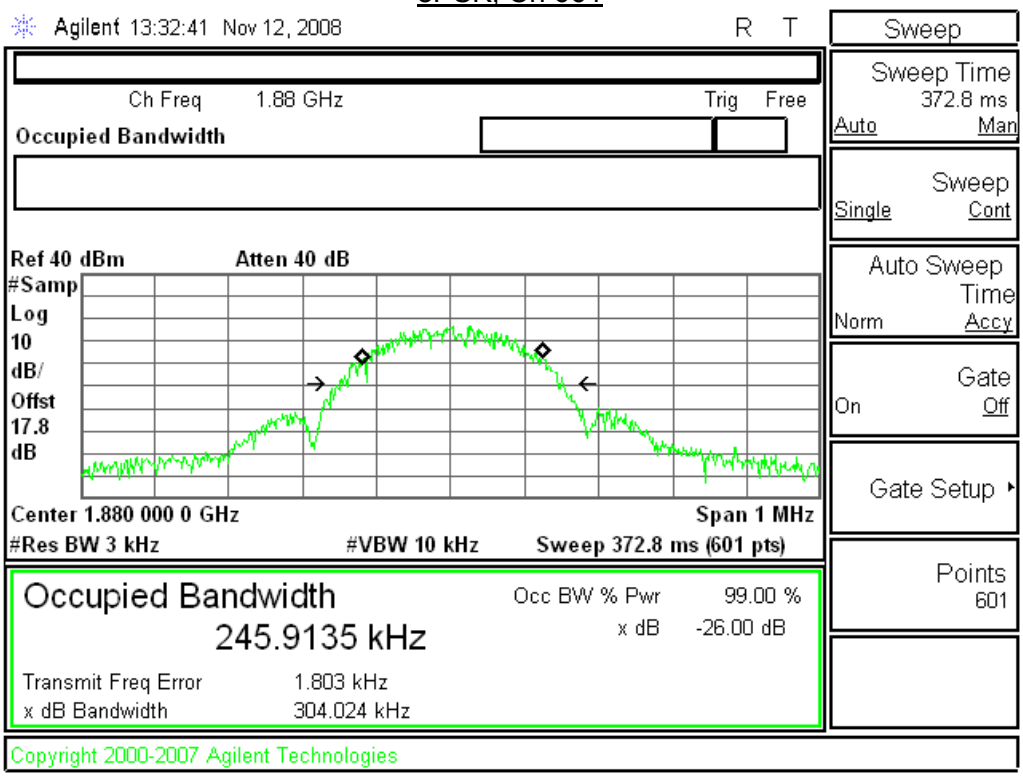


Plots for 8PSK Mode (PCS Band)

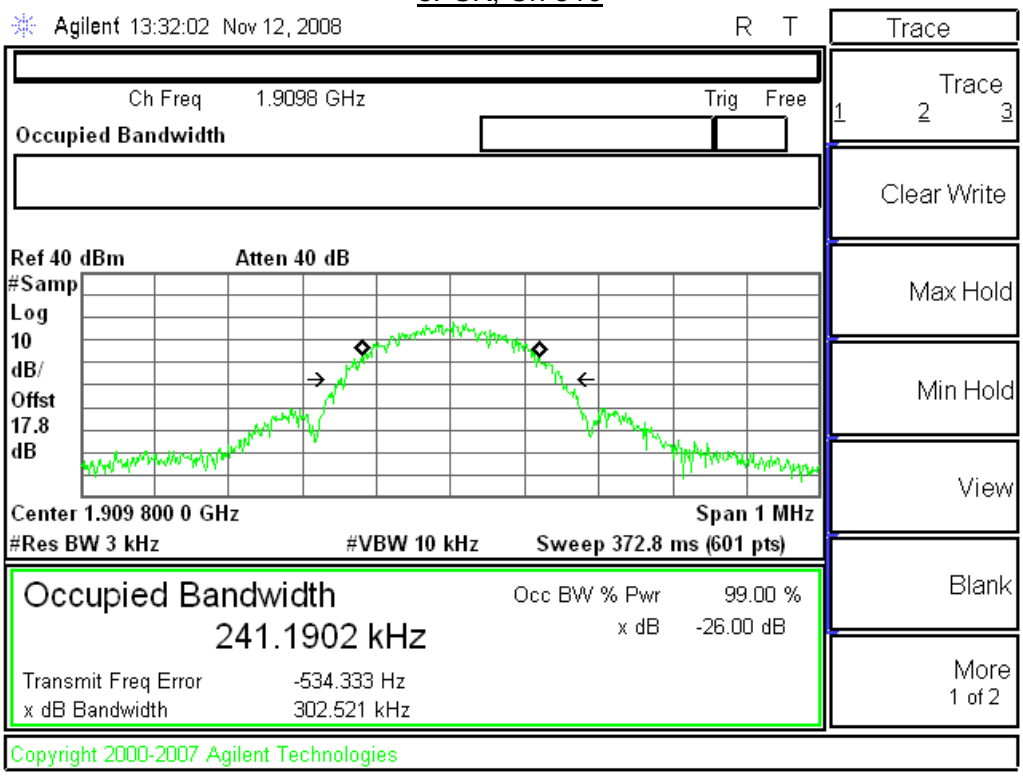
8PSK, Ch 512



8PSK, Ch 661

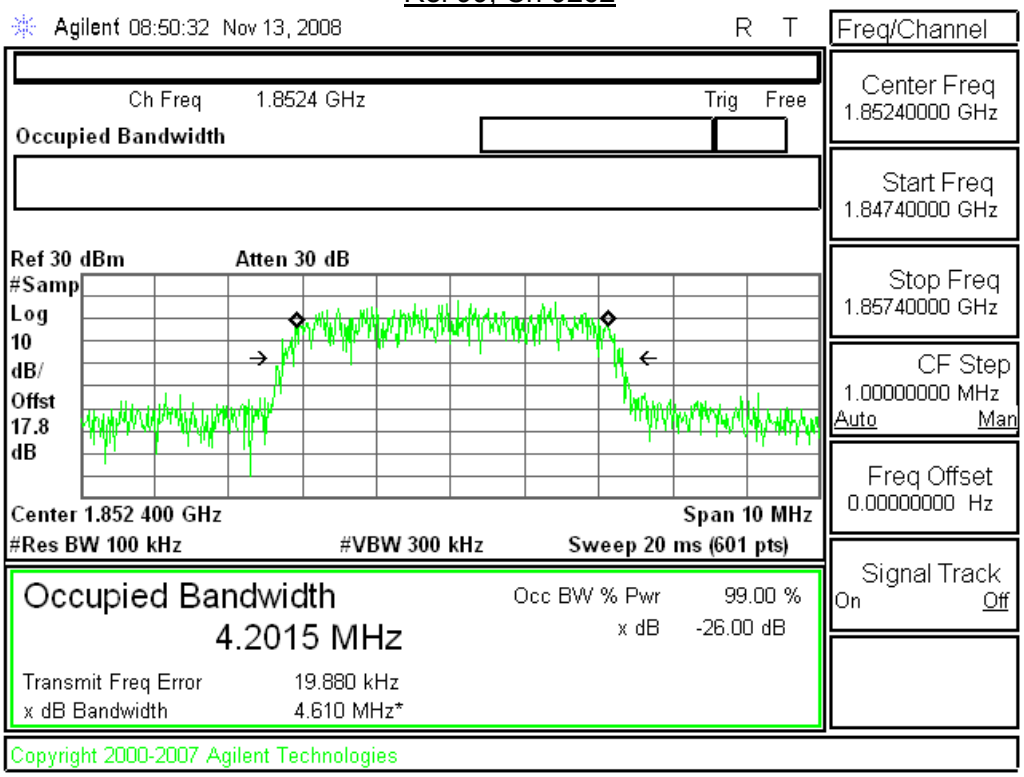


8PSK, Ch 810

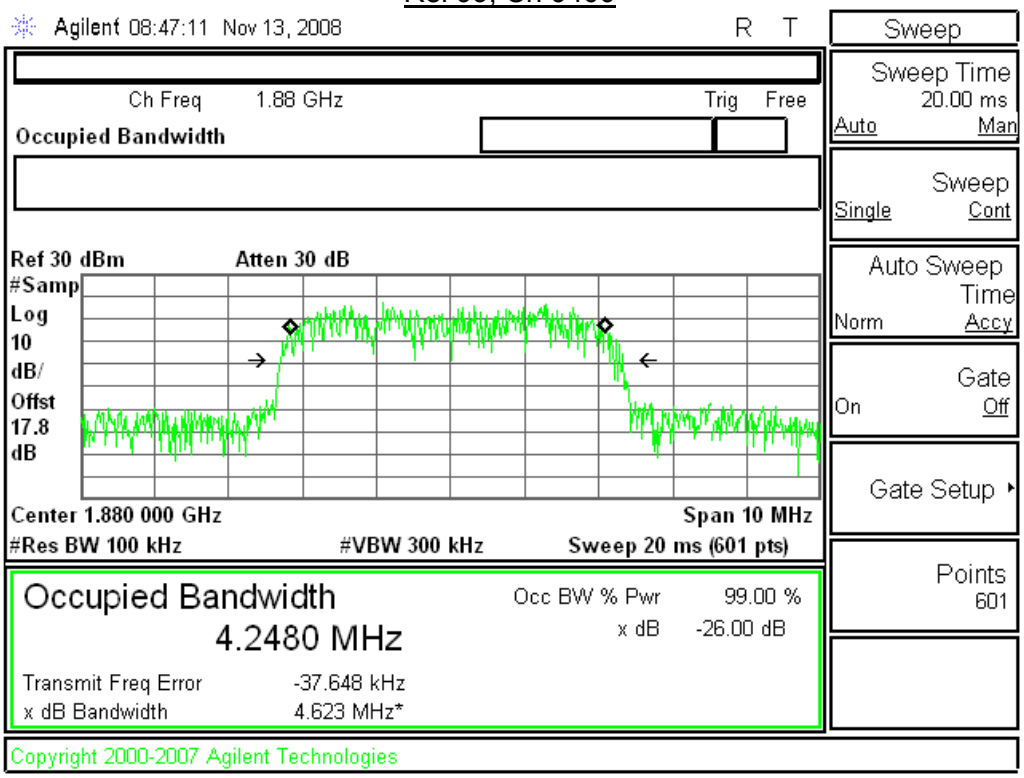


Plots for UMTS Rel 99 Mode (PCS Band)

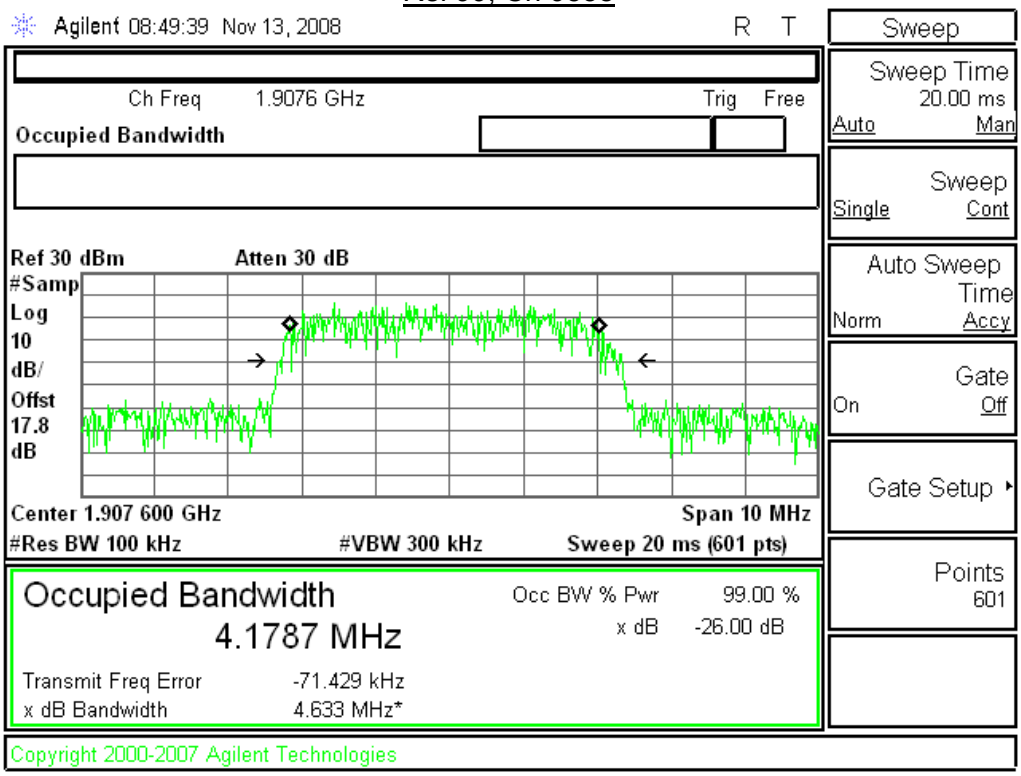
Rel 99, Ch 9262



Rel 99, Ch 9400

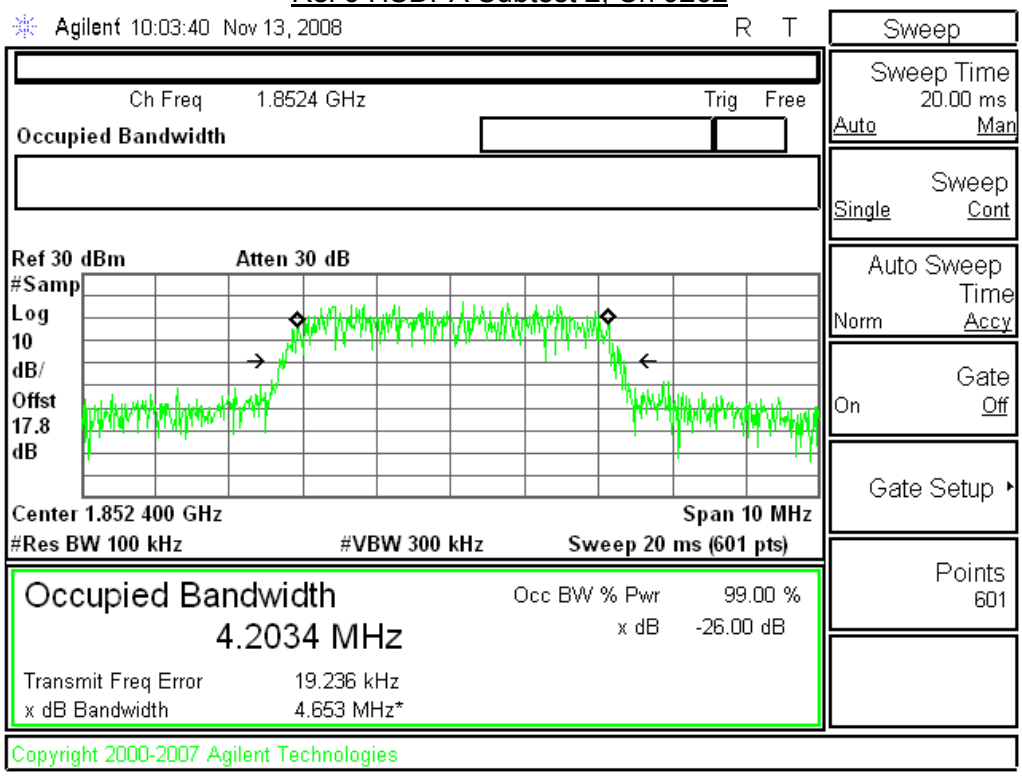


Rel 99, Ch 9538

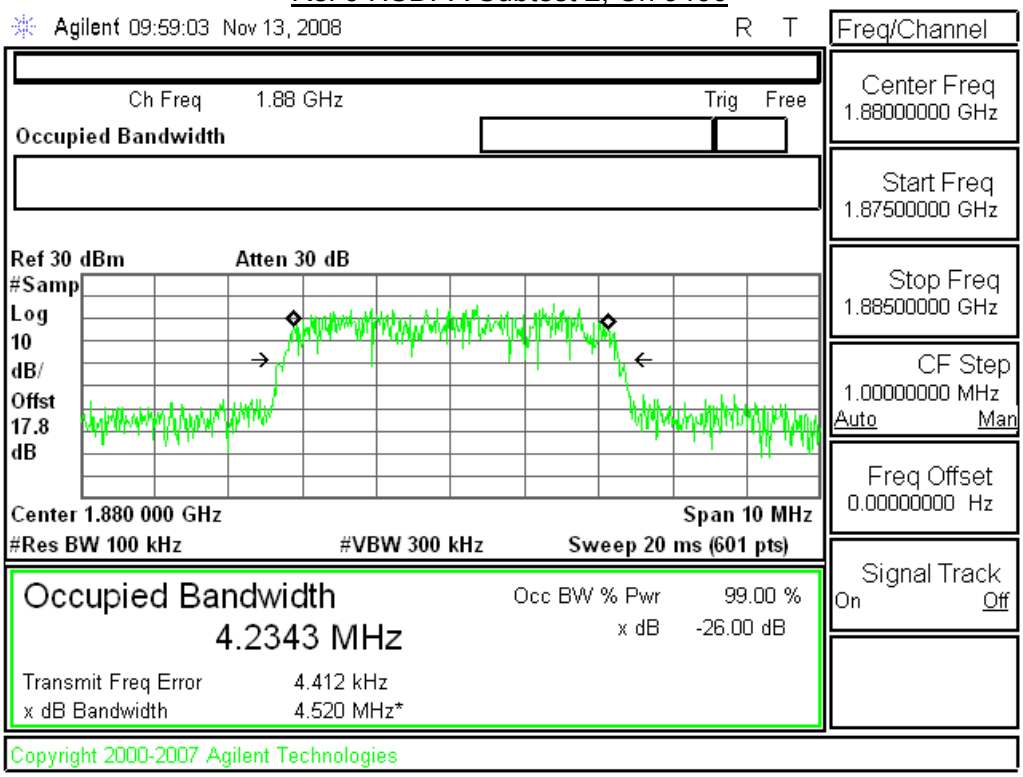


Plots for UMTS Rel 6 HSDPA Subtest 2 Mode (PCS Band)

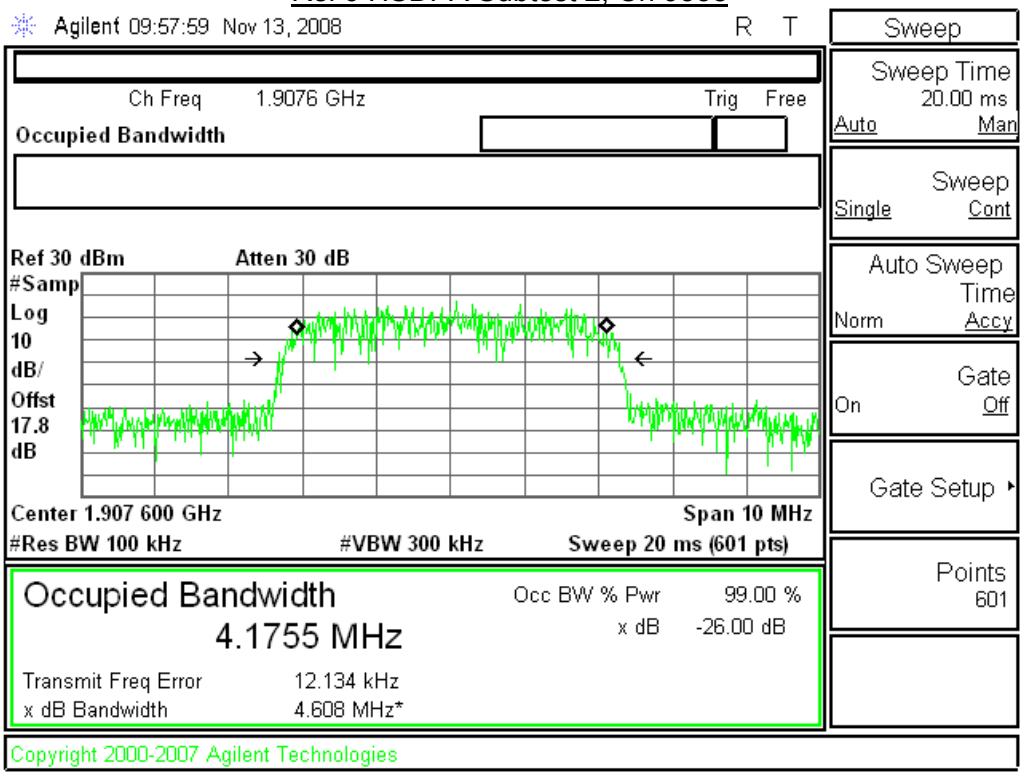
Rel 6 HSDPA Subtest 2, Ch 9262



Rel 6 HSDPA Subtest 2, Ch 9400



Rel 6 HSDPA Subtest 2, Ch 9538



11.2. BAND EDGE

RULE PART(S)

FCC: §22.359, 24.238
IC: RSS-132, 4.5; RSS-133, 6.5

LIMITS

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

TEST PROCEDURE

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

- Set the spectrum analyzer span to include the block edge frequency (824, 848, 1850, 1910MHz)
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

MODES TESTED

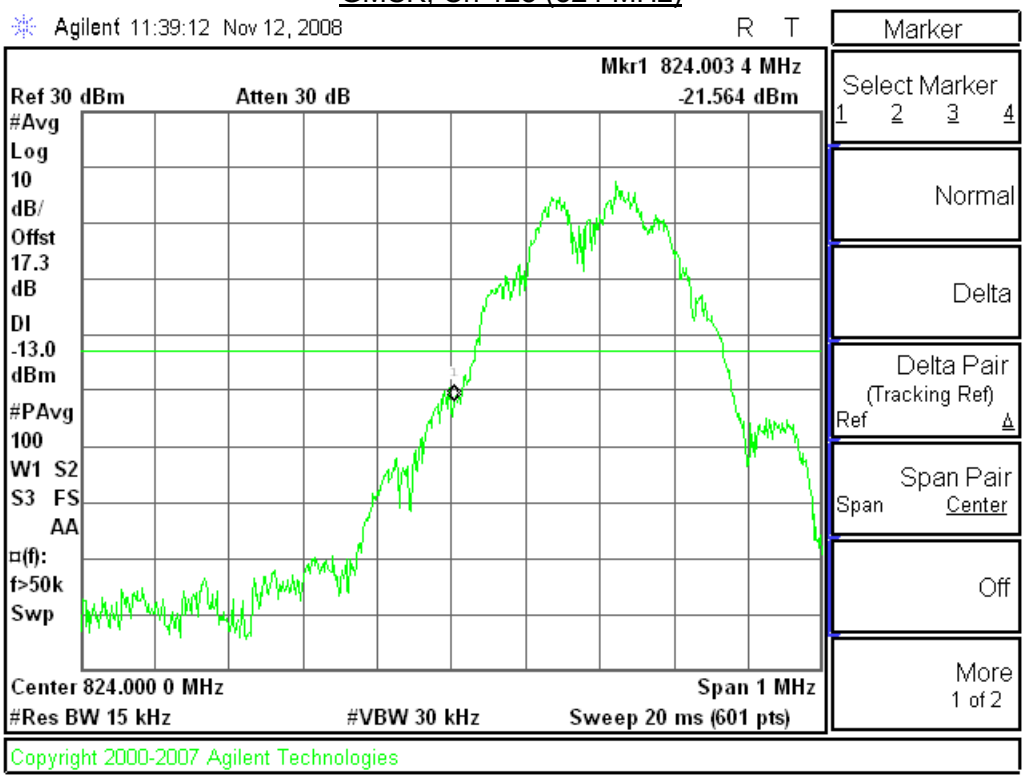
- GSM - GSM (GSMK) & EGPRS (8PSK),
- UMTS (W-CDMA) - Rel 99, Rel 6 HSDPA Subtest 2

RESULTS

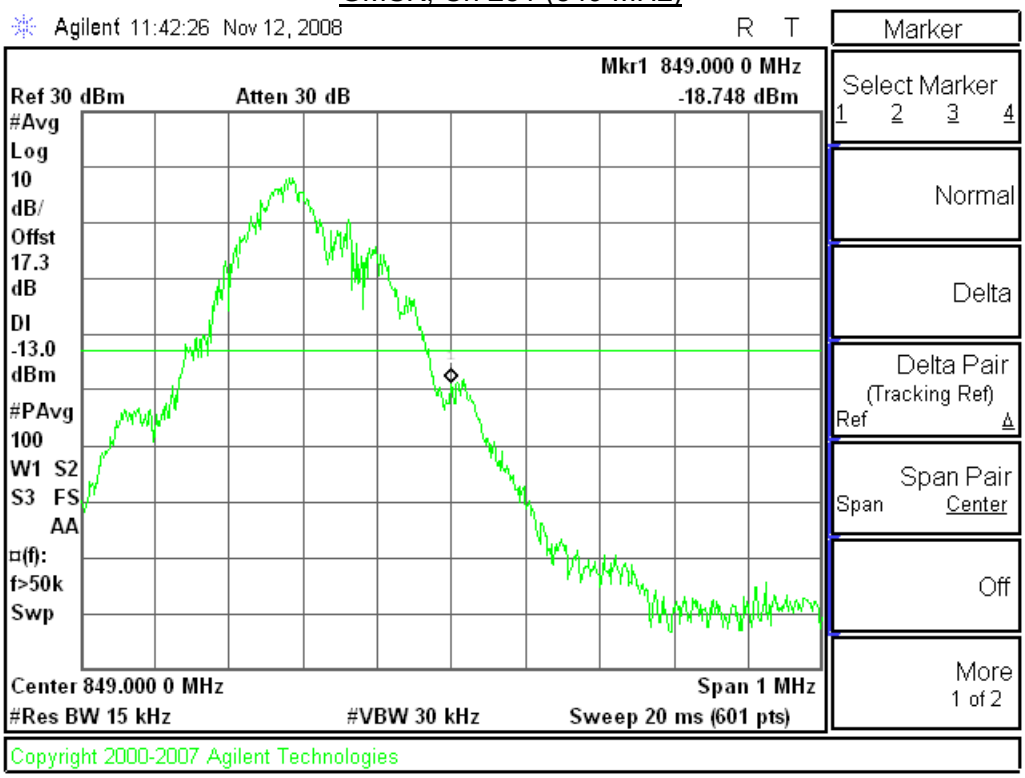
See the following pages.

Plots for GMSK mode (Cellular Band)

GMSK, Ch 128 (824 MHz)

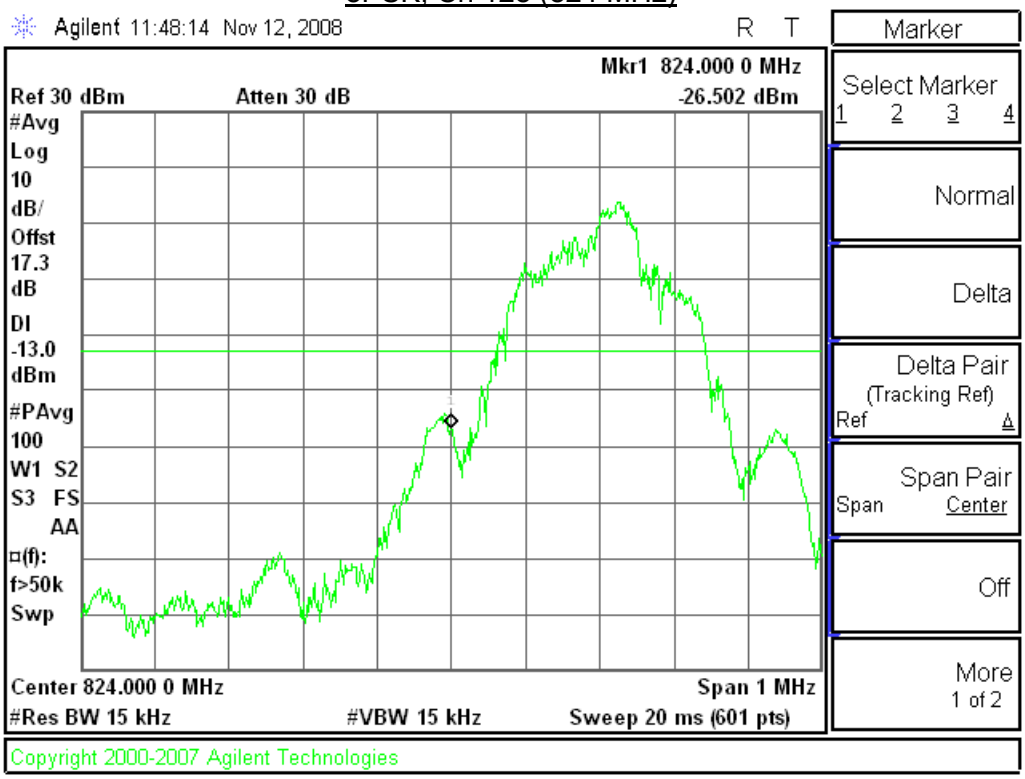


GMSK, Ch 251 (849 MHz)

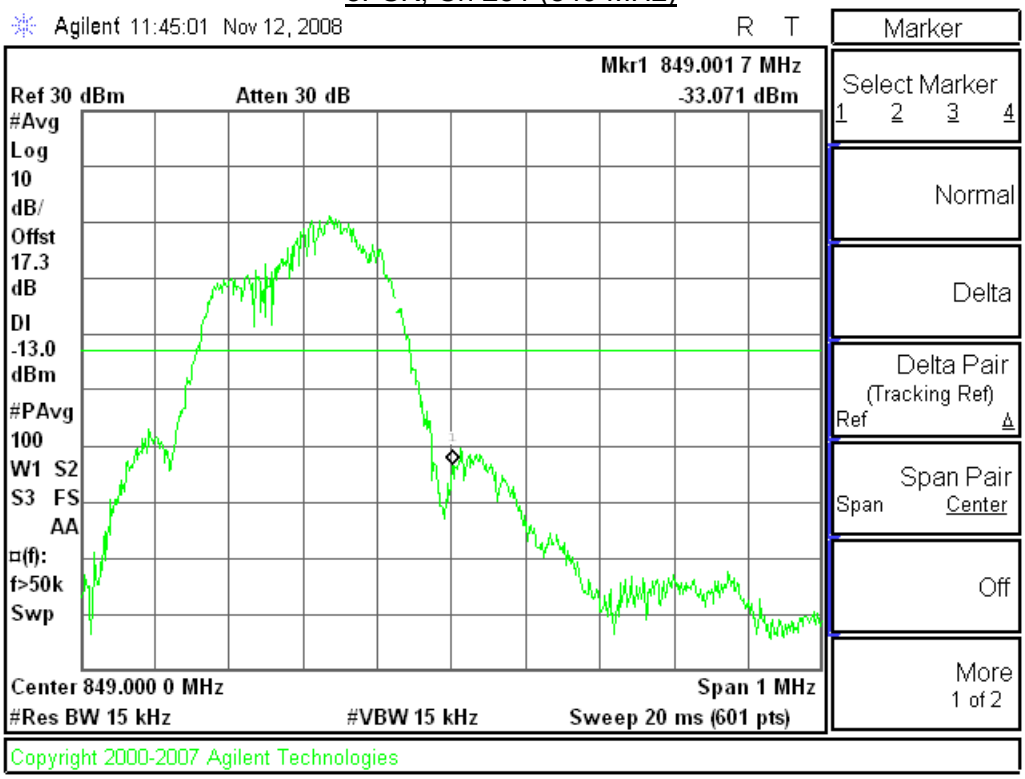


Plots for 8PSK mode (Cellular Band)

8PSK, Ch 128 (824 MHz)

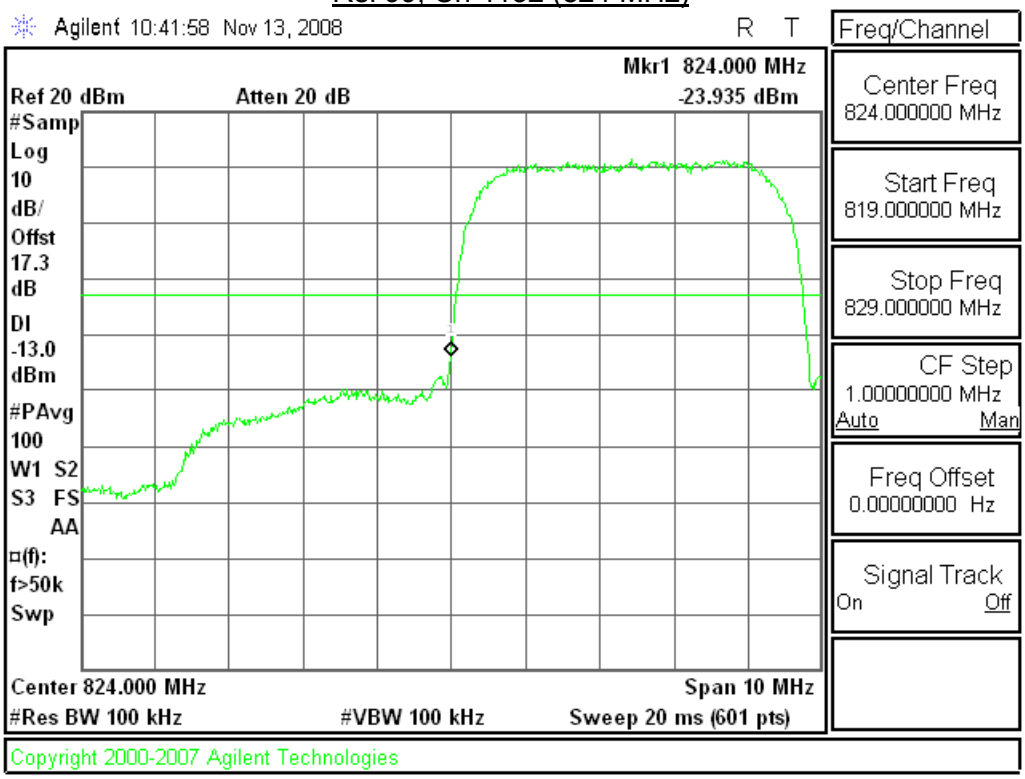


8PSK, Ch 251 (849 MHz)

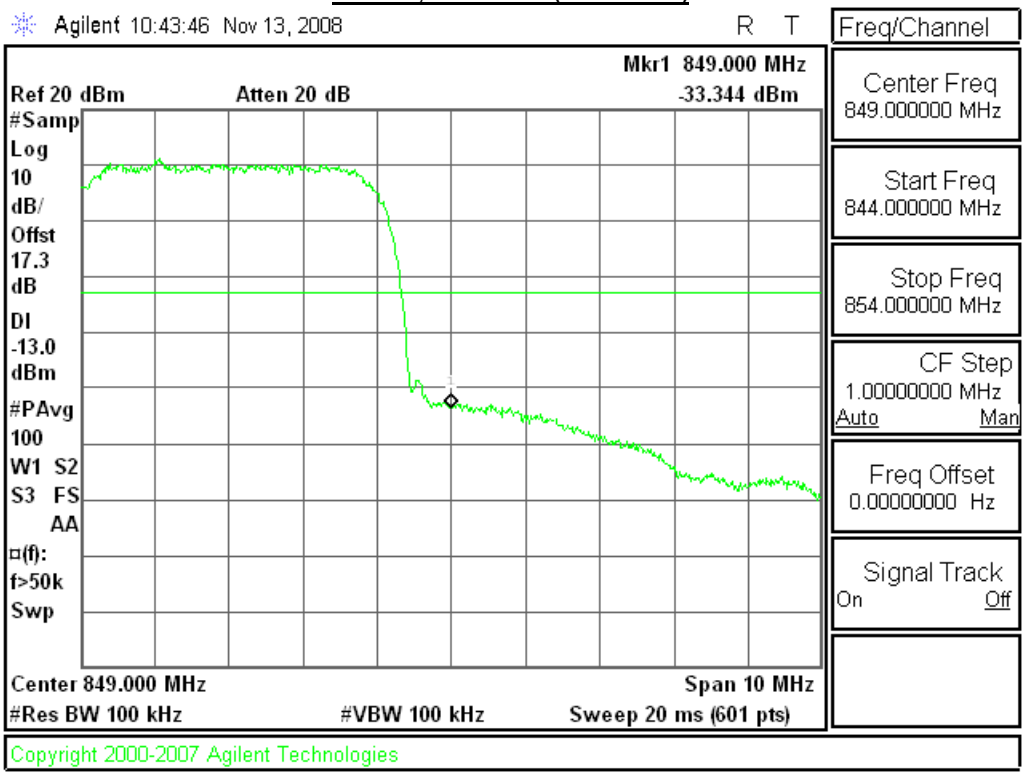


Plots for UMTS Rel 99 mode (Cellular Band)

Rel 99, Ch 4132 (824 MHz)

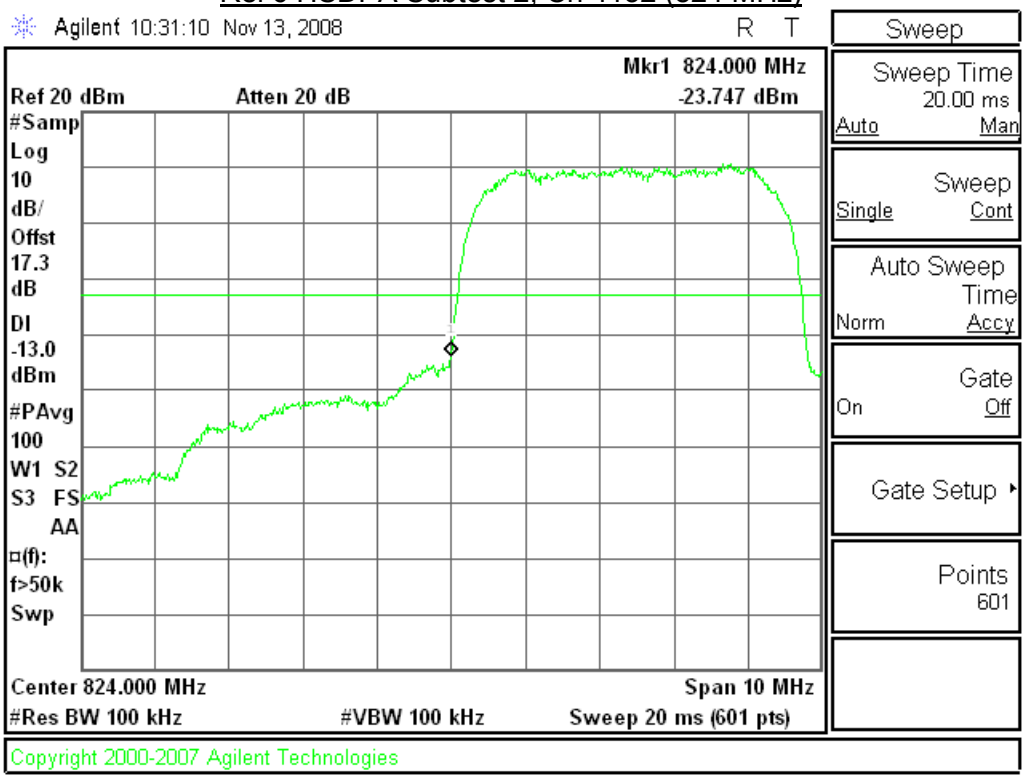


Rel 99, Ch 4230 (849 MHz)

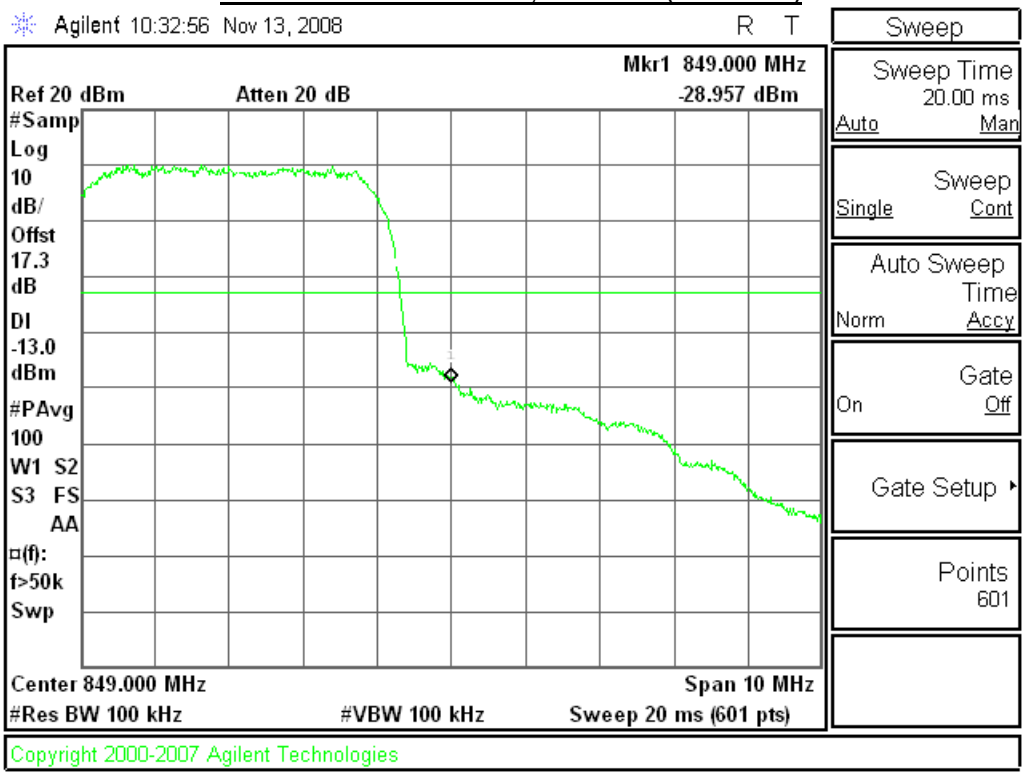


Plots for UMTS Rel 6 HSDPA mode (Cellular Band)

Rel 6 HSDPA Subtest 2, Ch 4132 (824 MHz)

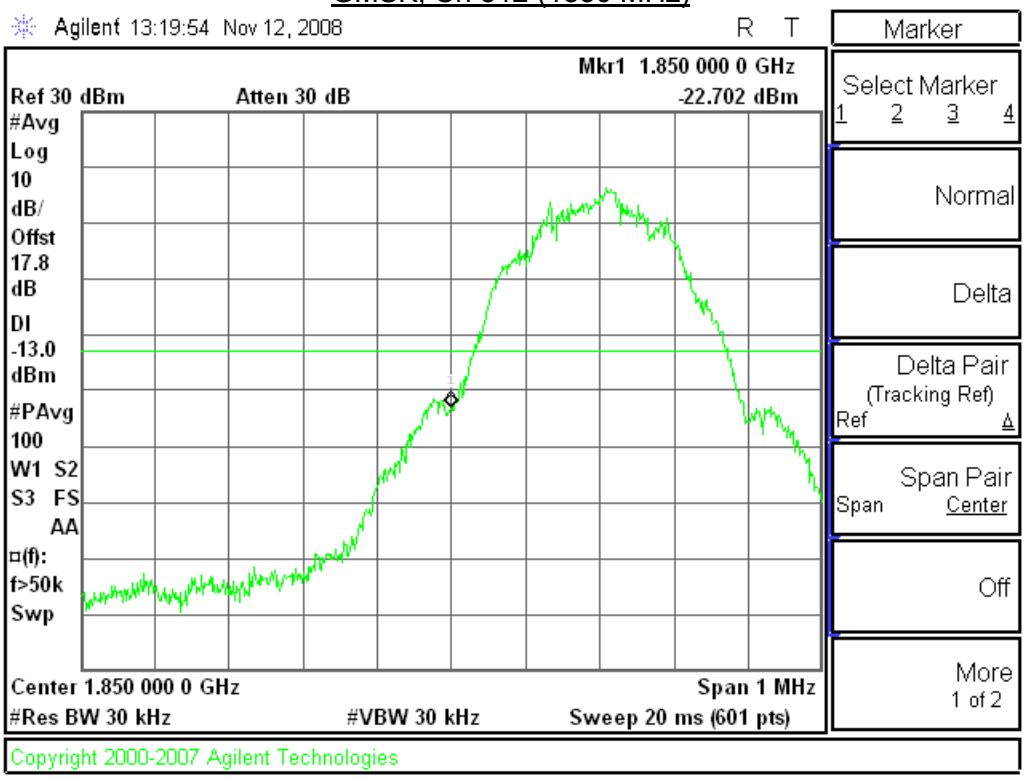


Rel 6 HSDPA Subtest 2, Ch 4230 (849 MHz)

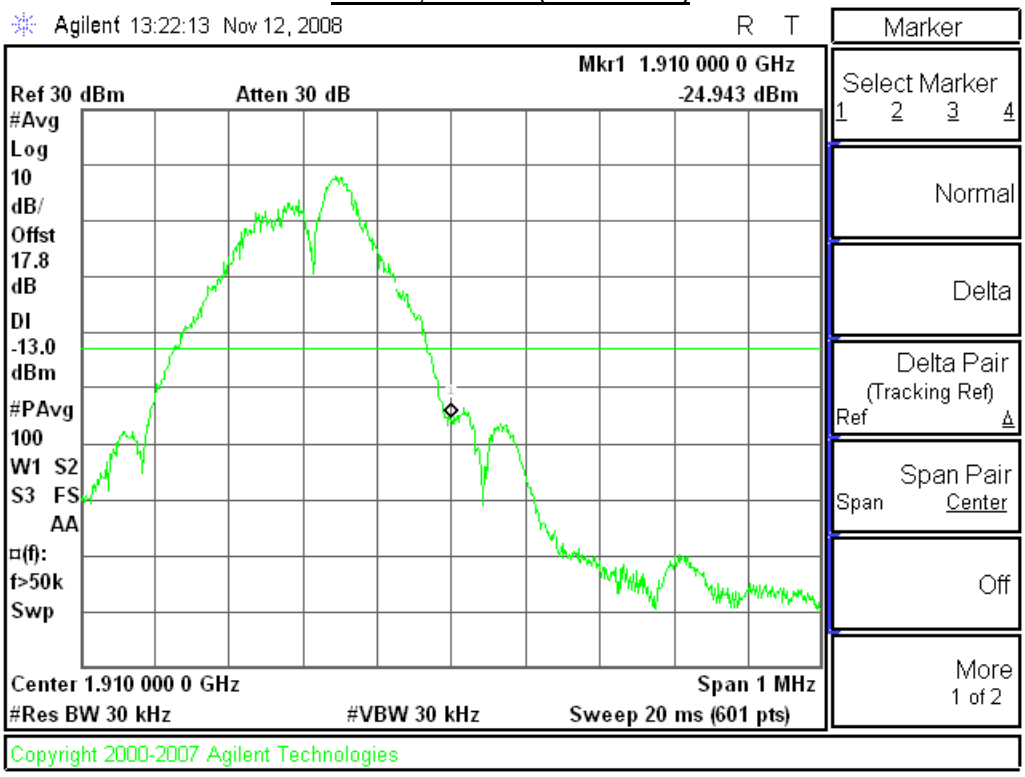


Plots for GMSK mode (PCS Band)

GMSK, Ch 512 (1850 MHz)

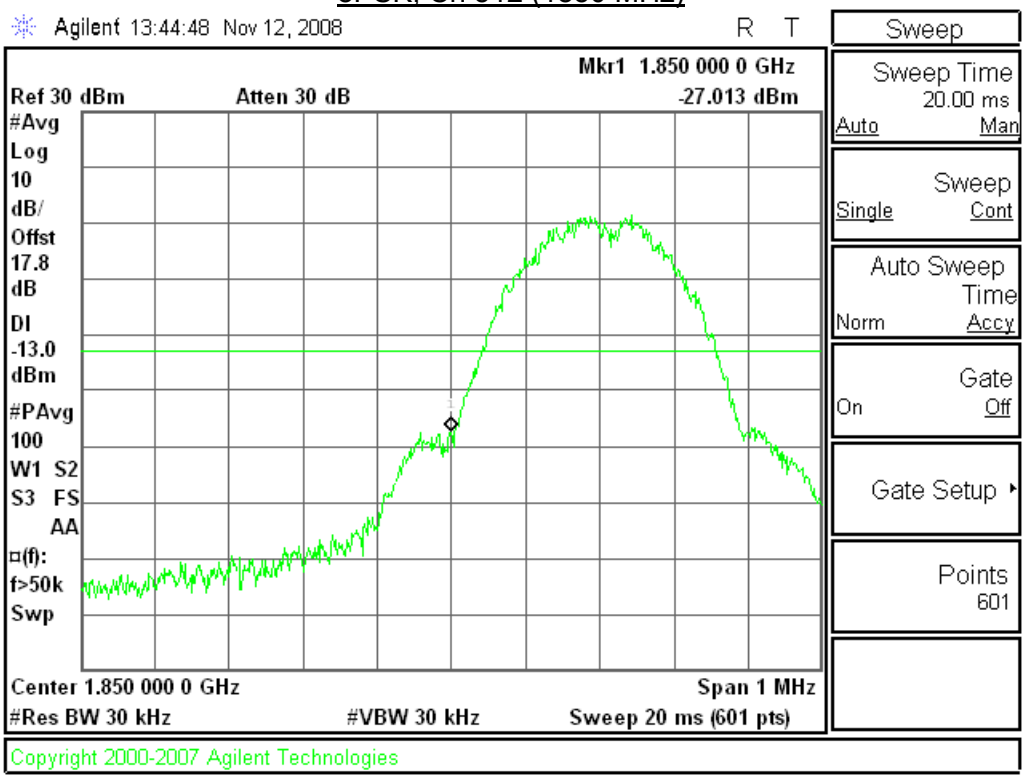


GMSK, Ch 810 (1910 MHz)

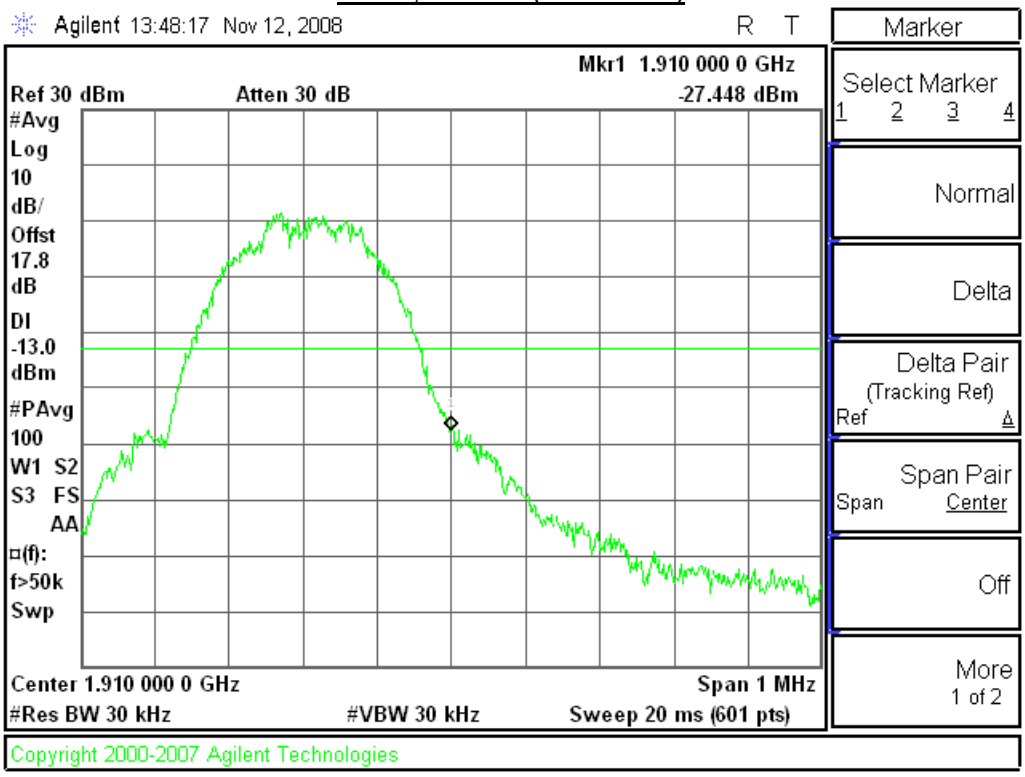


Plots for 8PSK mode (PCS Band)

8PSK, Ch 512 (1850 MHz)

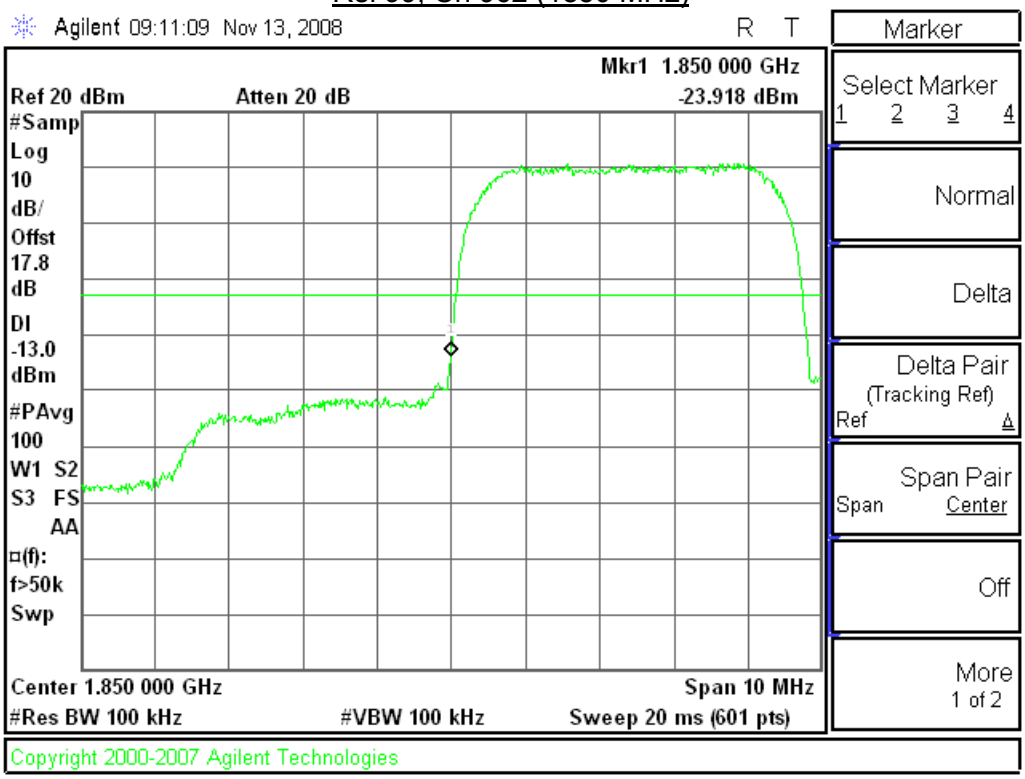


8PSK, Ch 810 (1910 MHz)

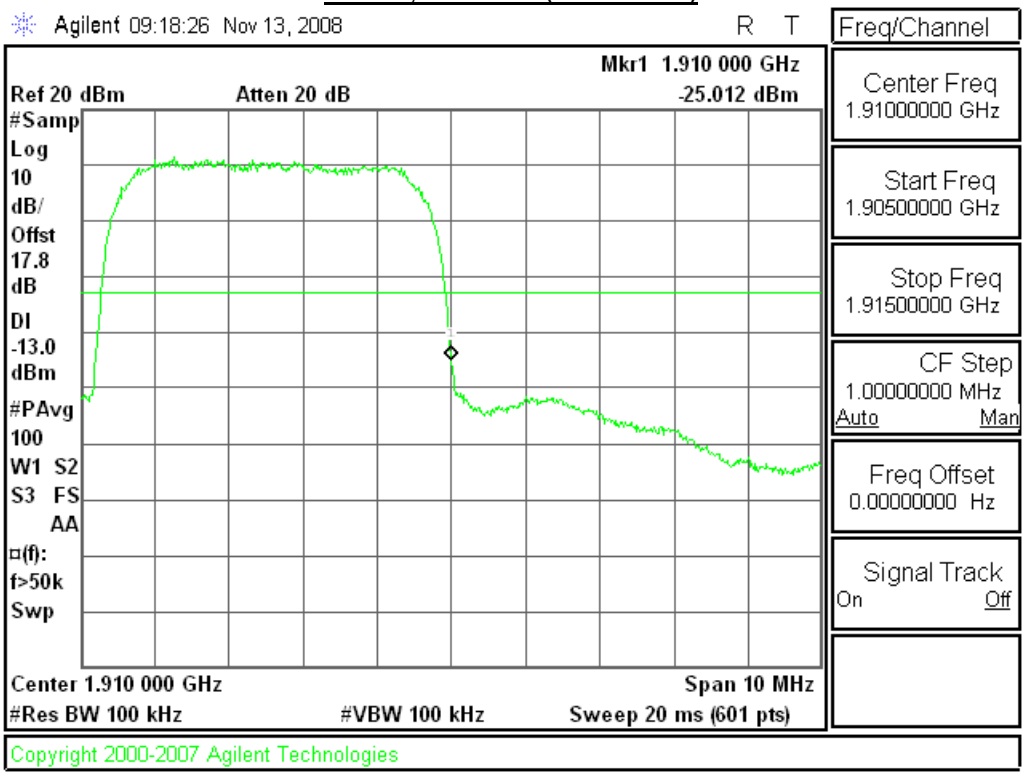


Plots for UMTS Rel 99 mode (PCS Band)

Rel 99, Ch 962 (1850 MHz)

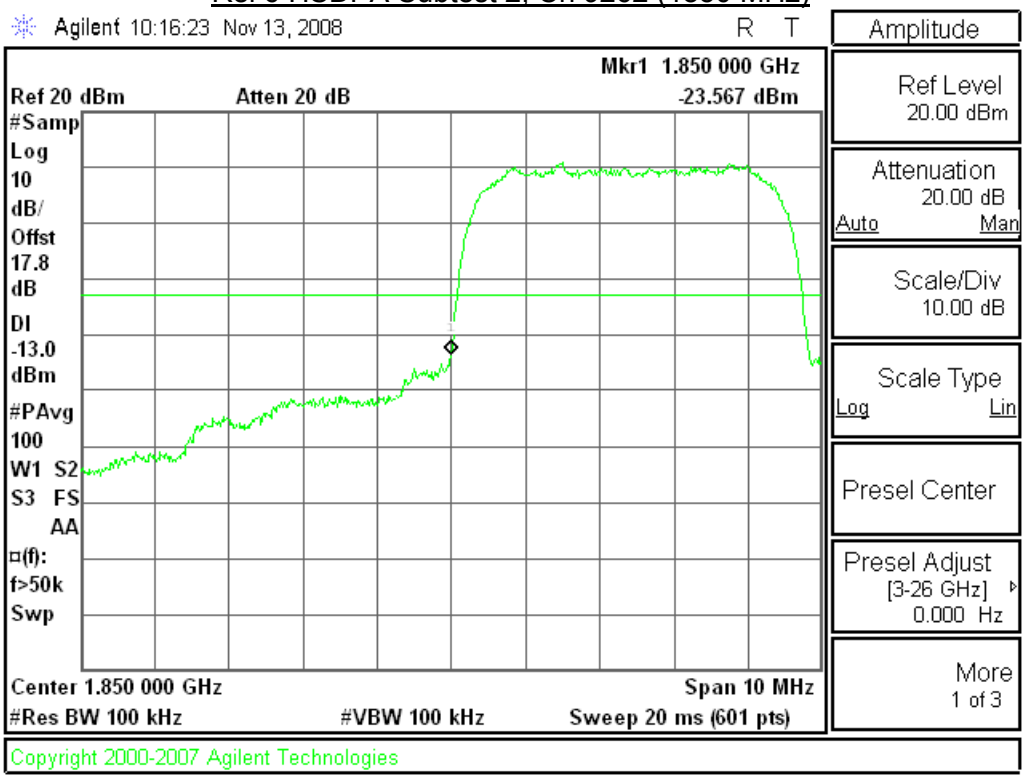


Rel 99, Ch 9538 (1910 MHz)

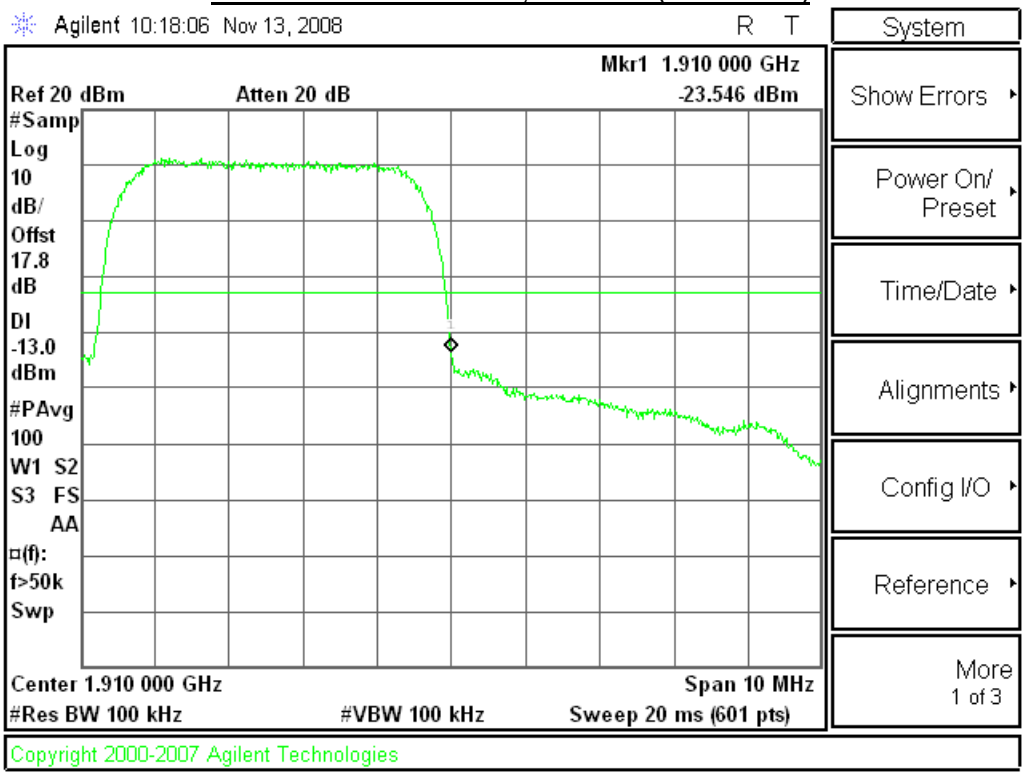


Plots for UMTS Rel 6 HSDPA mode (PCS Band)

Rel 6 HSDPA Subtest 2, Ch 9262 (1850 MHz)



Rel 6 HSDPA Subtest 2, Ch 9538 (1910 MHz)



11.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238
IC: RSS-132, 4.5; RSS-133, 6.5

LIMITS

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

TEST PROCEDURE

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

For each out of band emissions measurement:

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

MODES TESTED

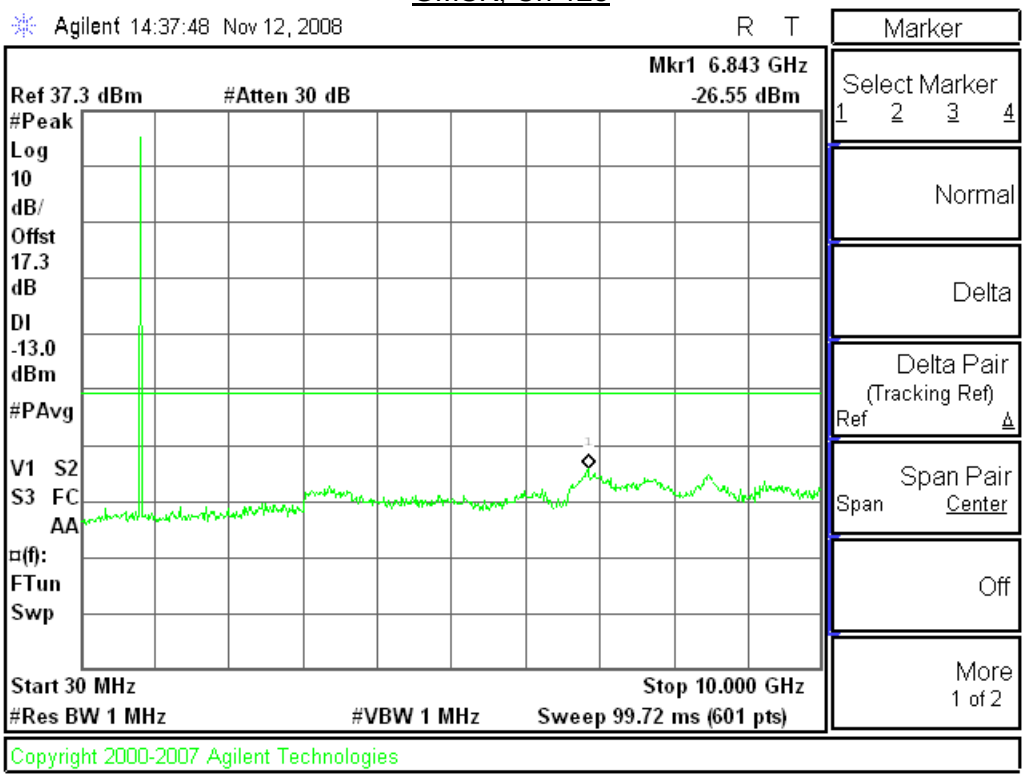
- GSM - GSM (GSMK) & EGPRS (8PSK),
- UMTS (W-CDMA) - Rel 99, Rel 6 HSDPA Subtest 2

RESULTS

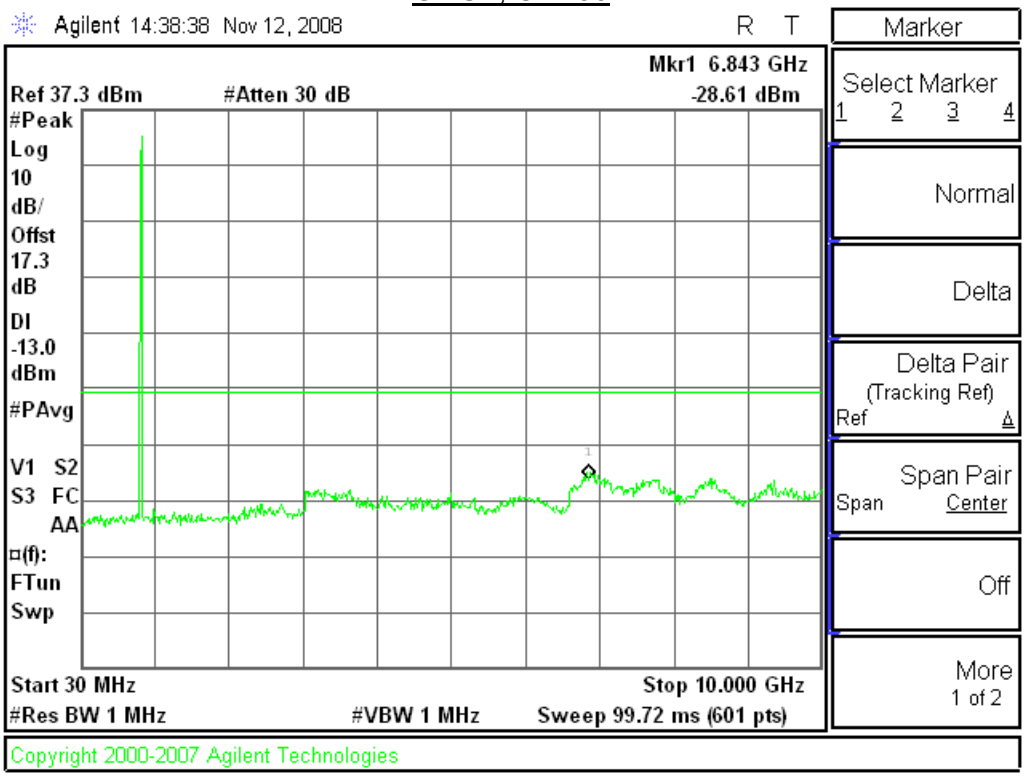
See the following pages.

Plots for GMSK Mode (Cellular Band)

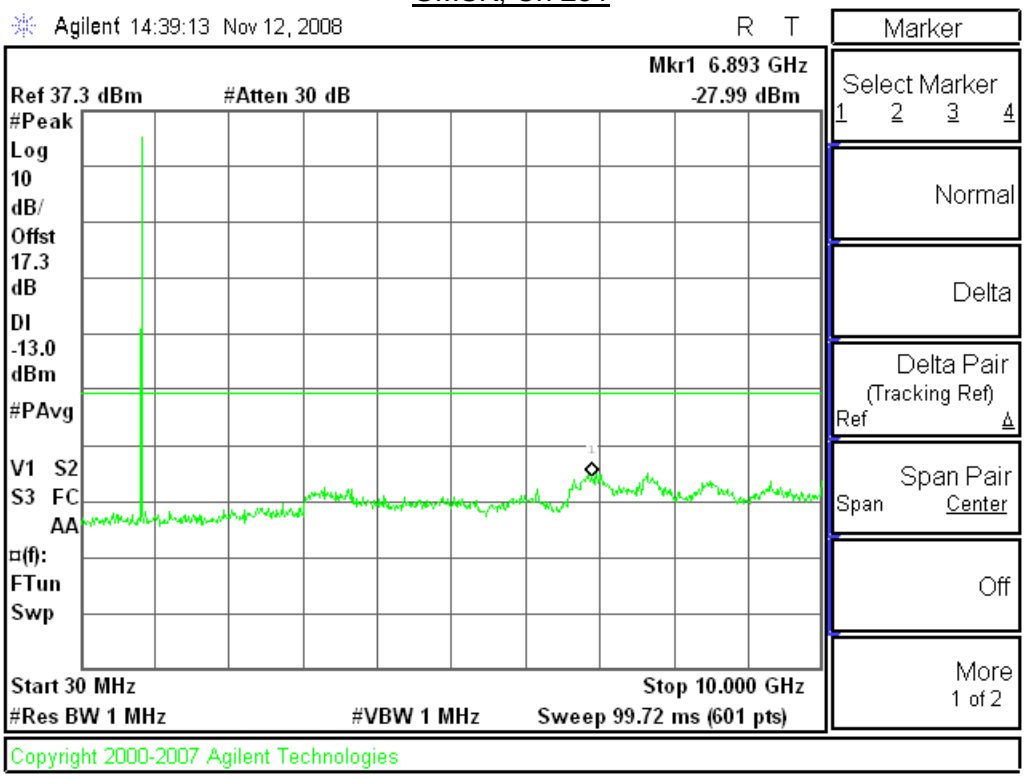
GMSK, Ch 128



GMSK, Ch 190

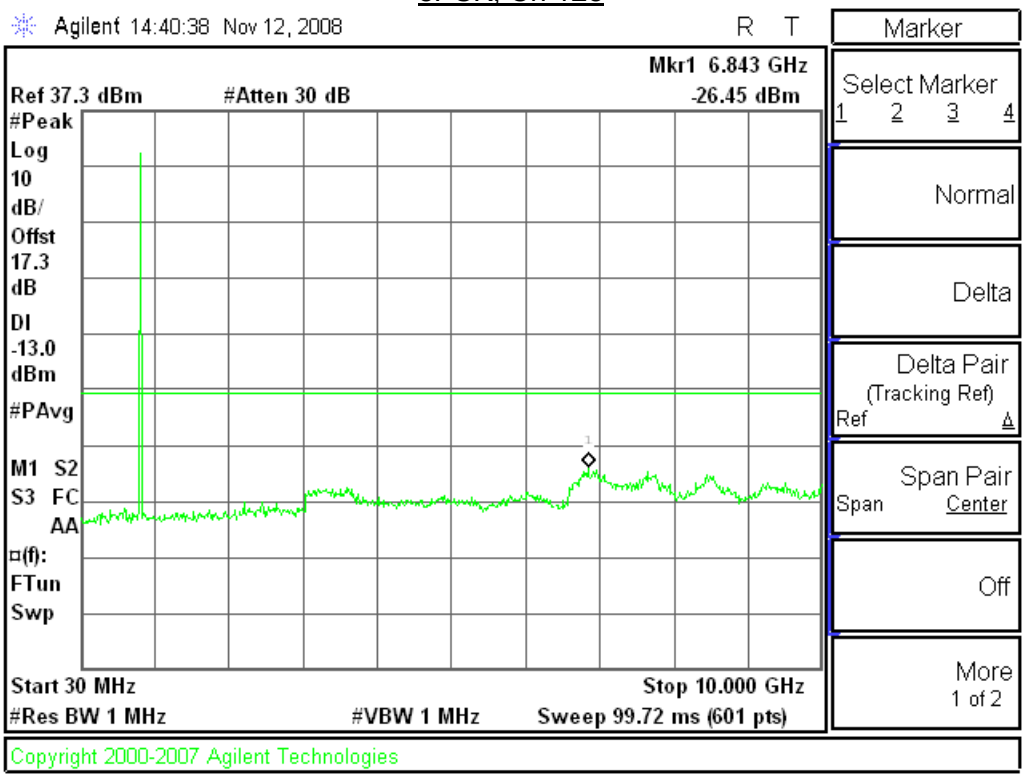


GMSK, Ch 251

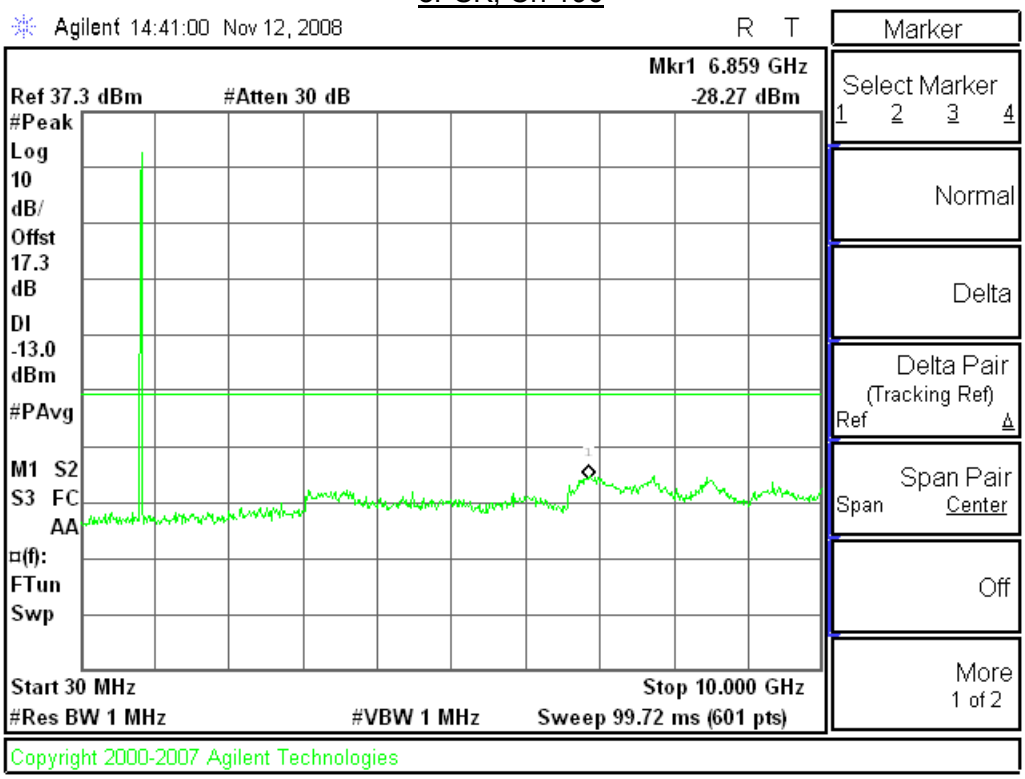


Plots for 8PSK Mode (Cellular Band)

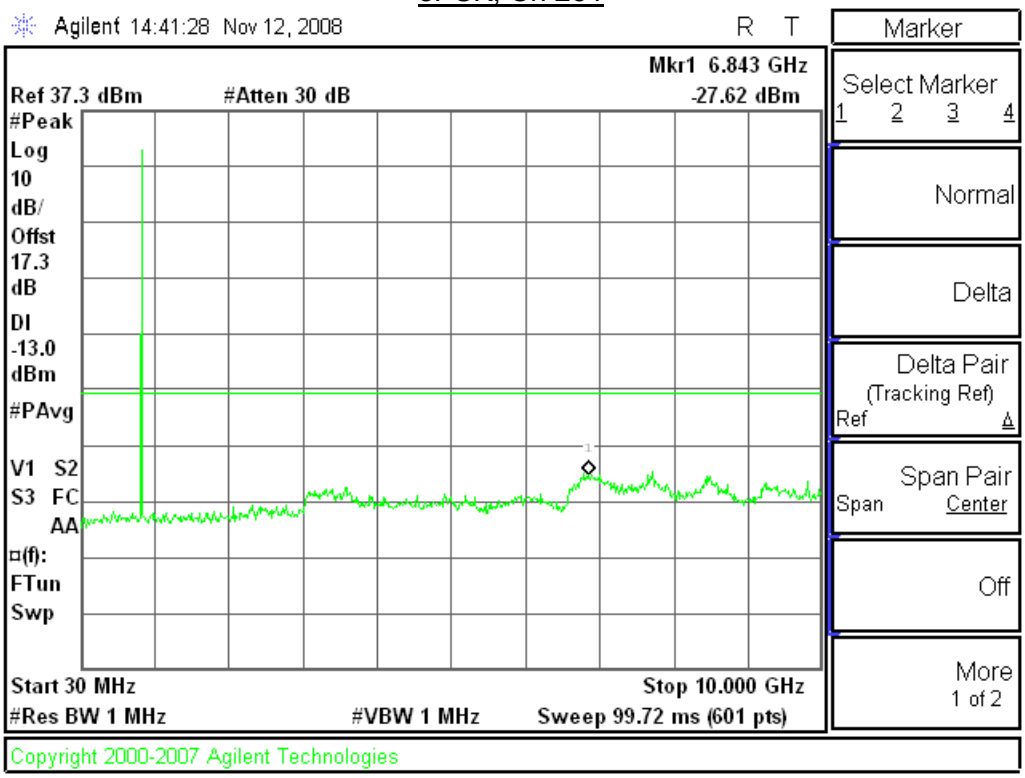
8PSK, Ch 128



8PSK, Ch 190

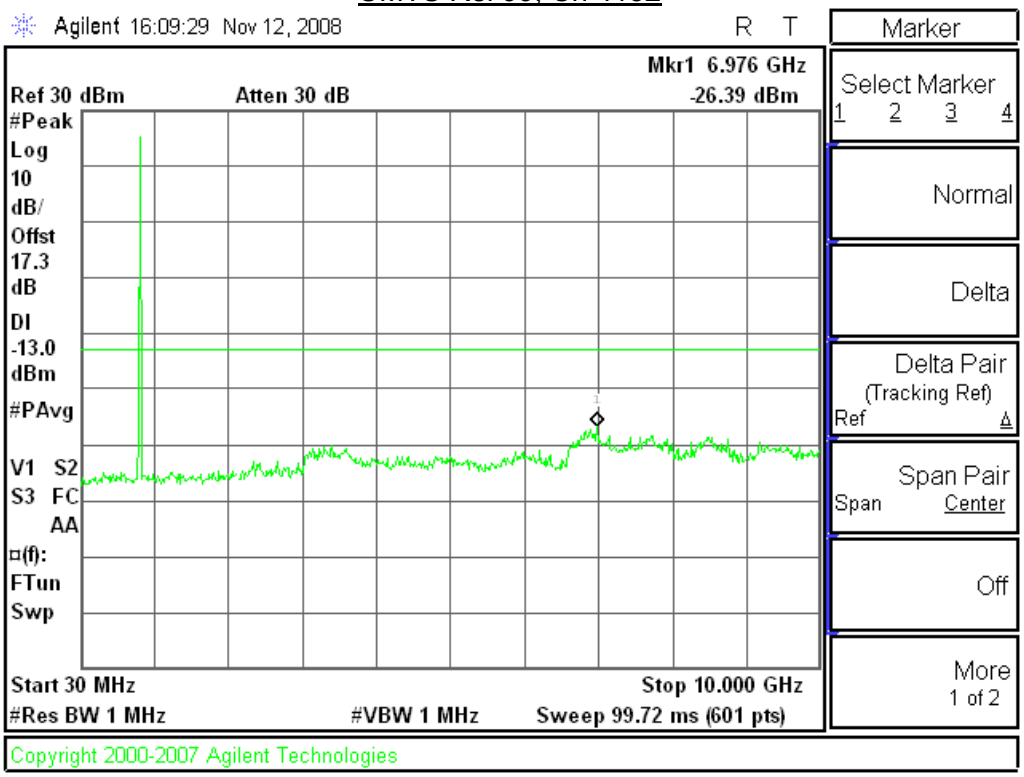


8PSK, Ch 251

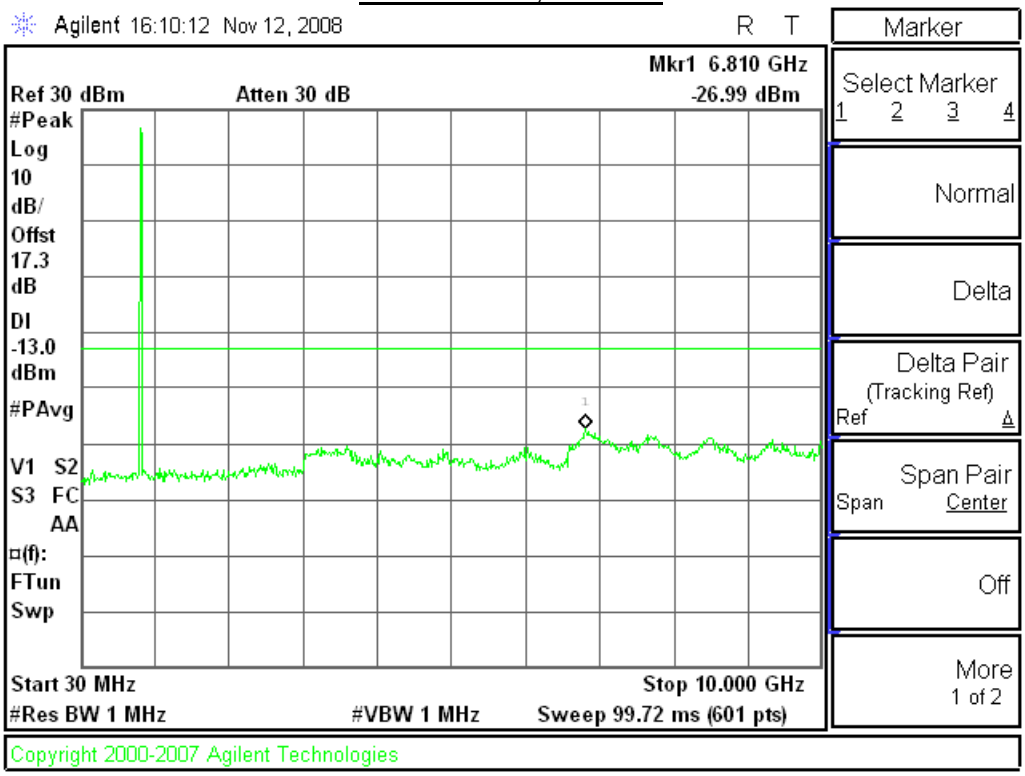


Plots for UMTS Rel 99 Mode (Cellular Band)

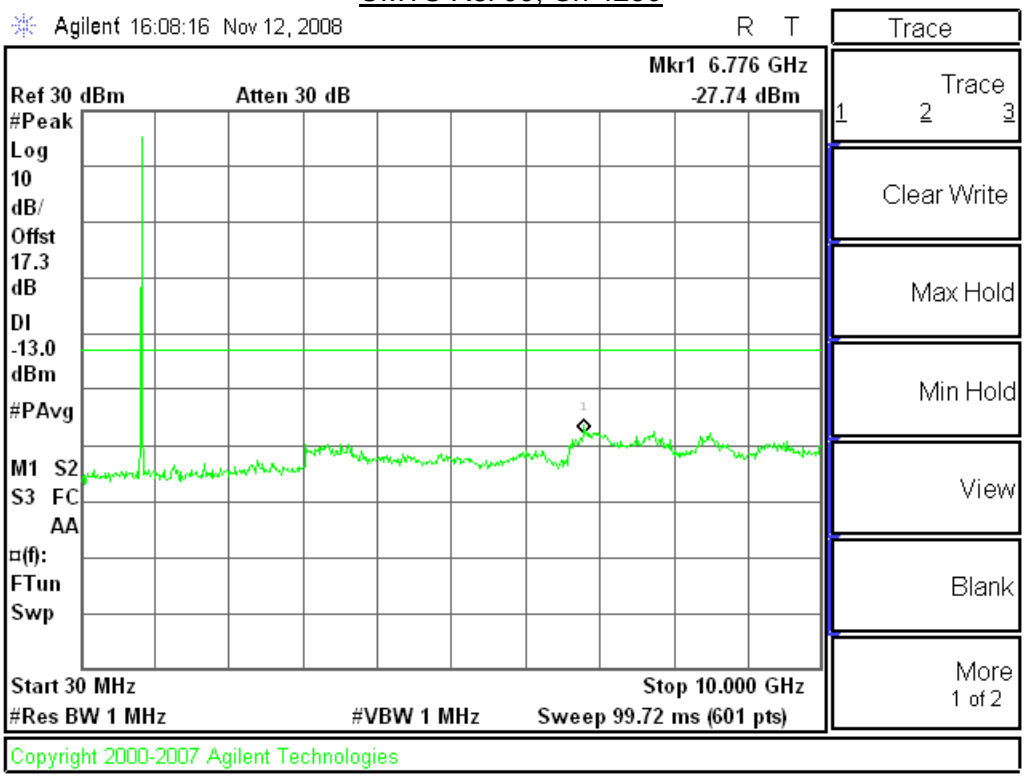
UMTS Rel 99, Ch 4132



UMTS Rel 99, Ch 4180

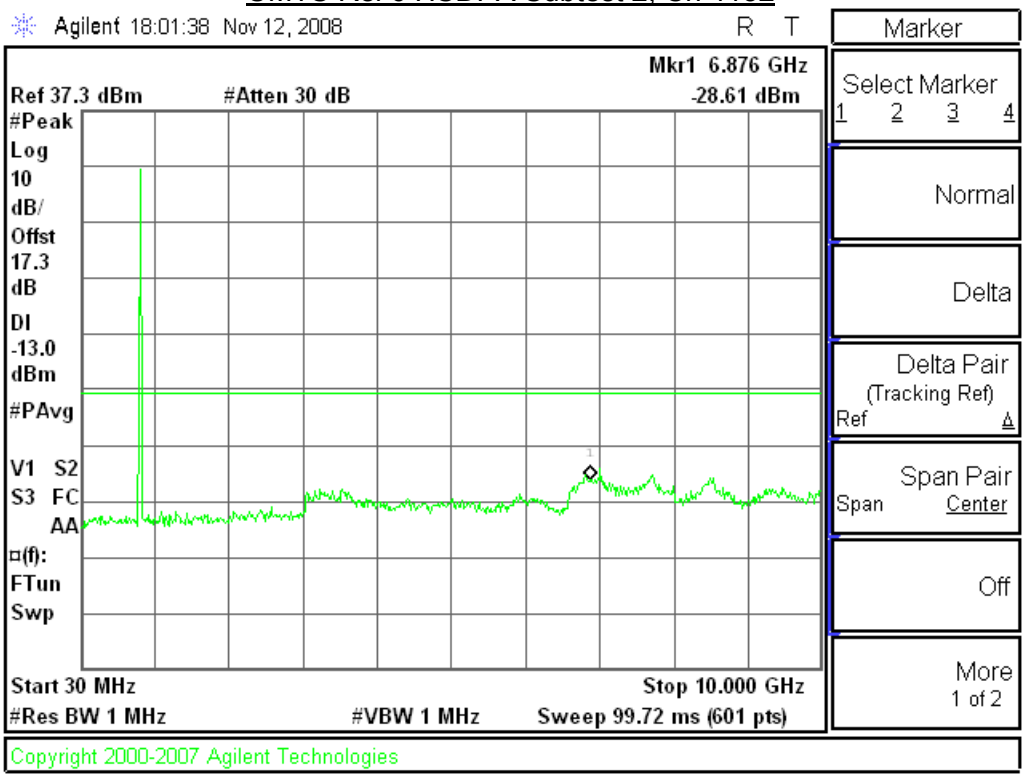


UMTS Rel 99, Ch 4230

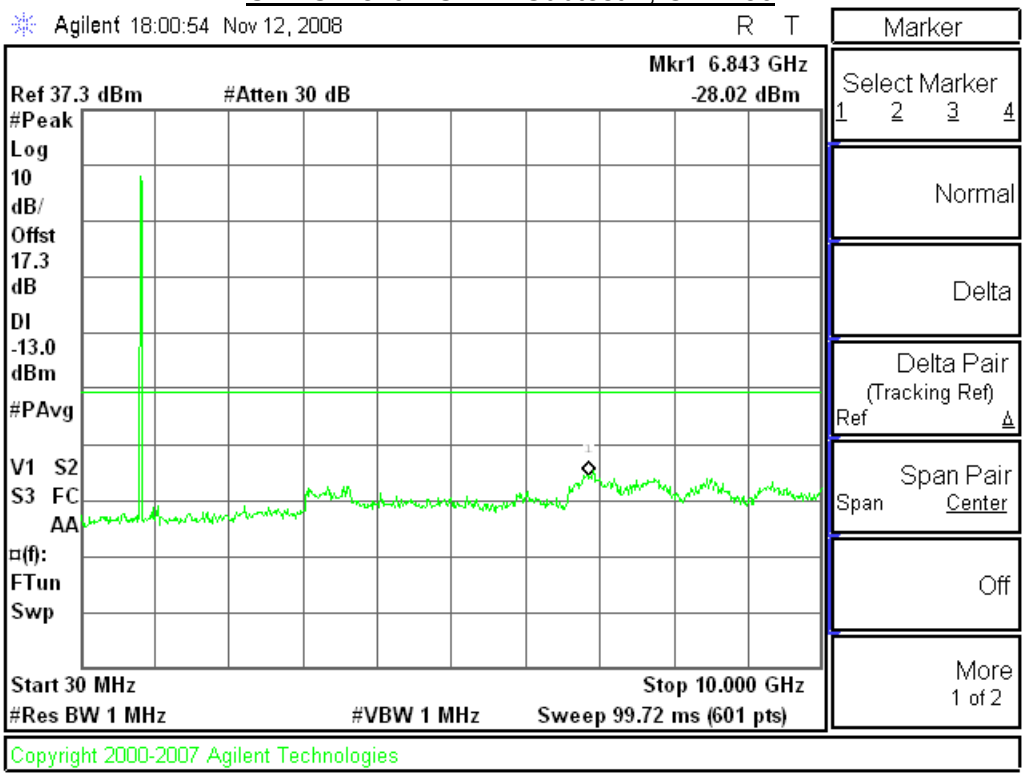


Plots for UMTS Rel 6 HSDPA Subtest 2 Mode (Cellular Band)

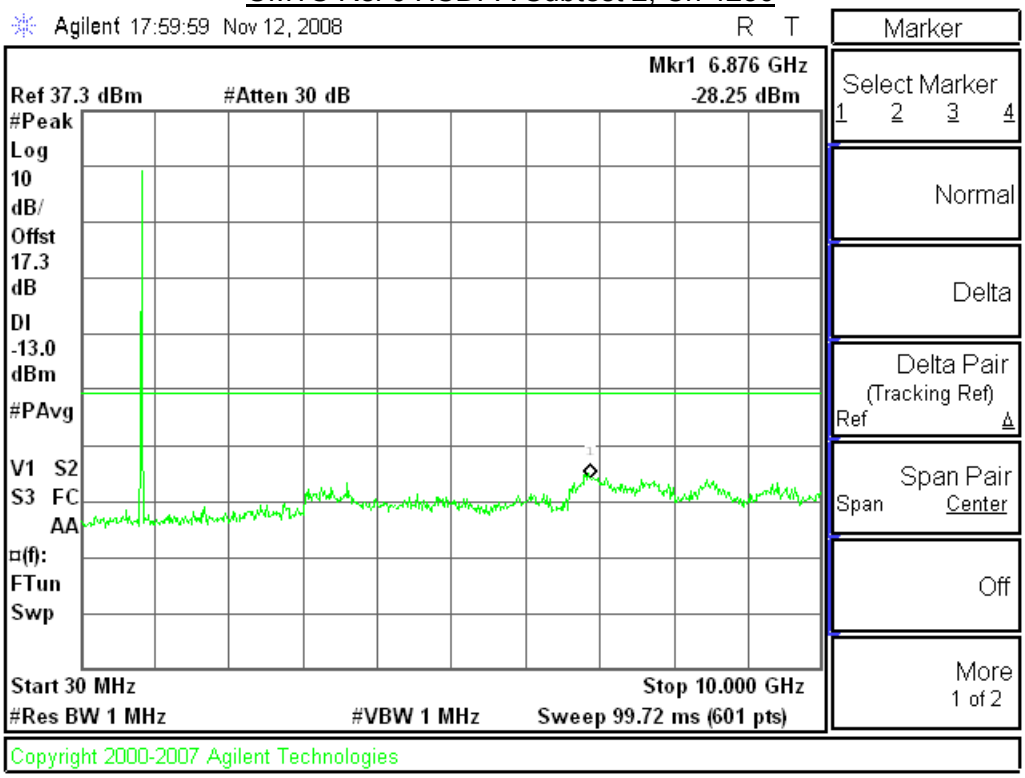
UMTS Rel 6 HSDPA Subtest 2, Ch 4132



UMTS Rel 6 HSDPA Subtest 2, Ch 4180

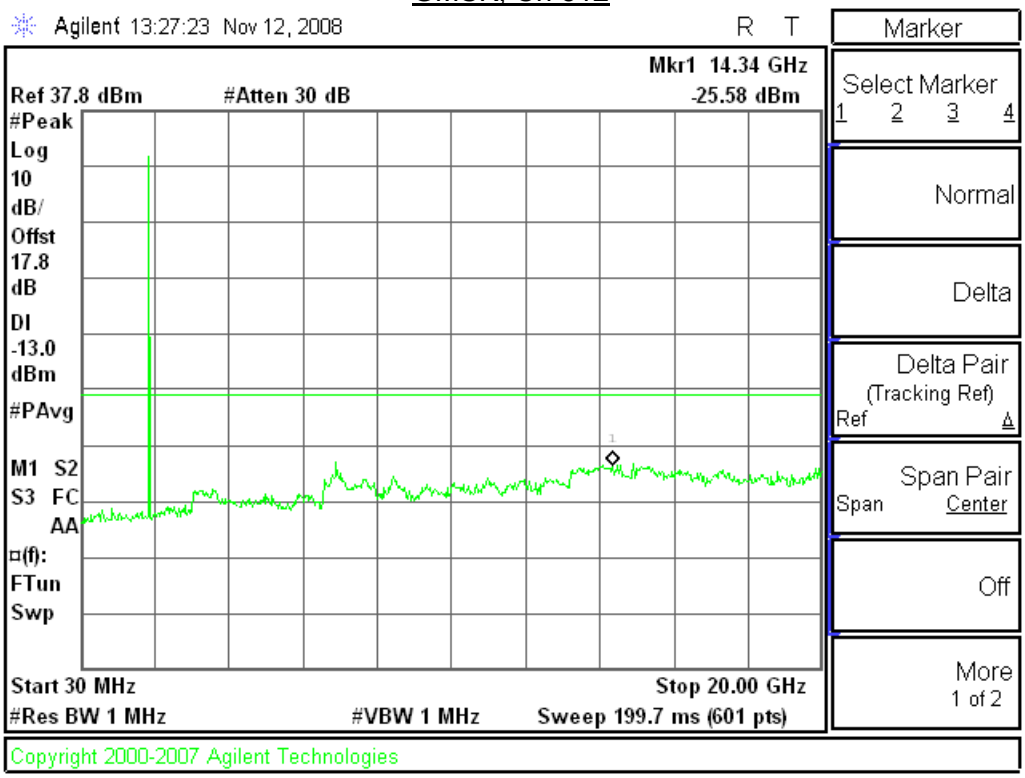


UMTS Rel 6 HSDPA Subtest 2, Ch 4230

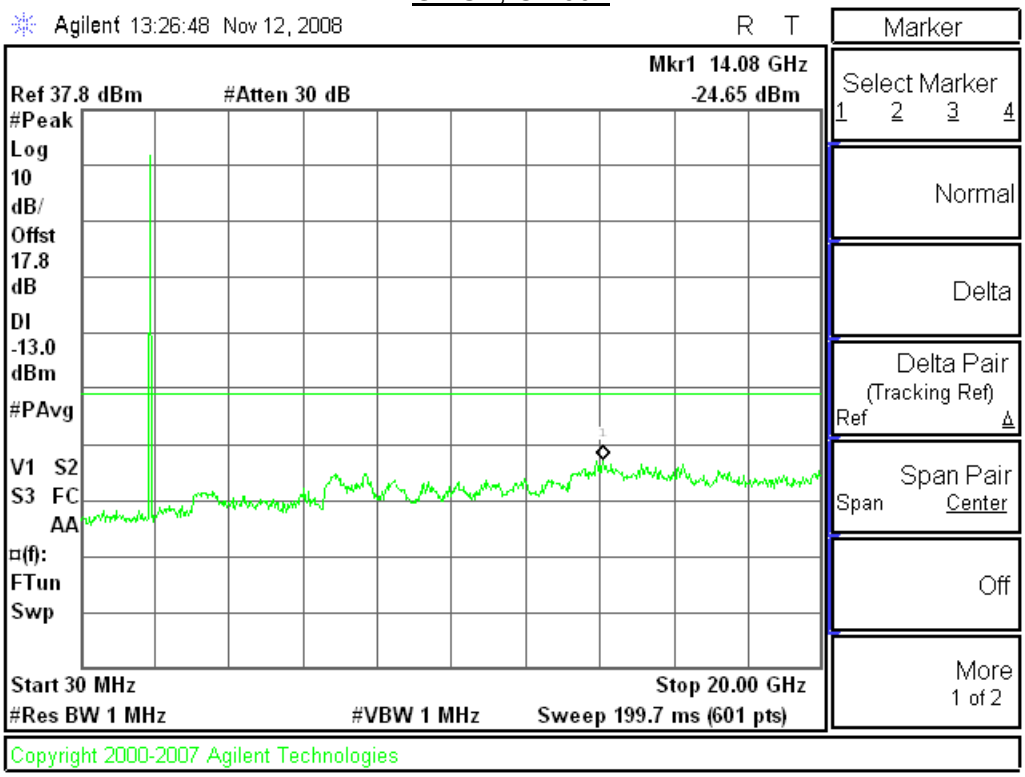


Plots for GMSK Mode (PCS Band)

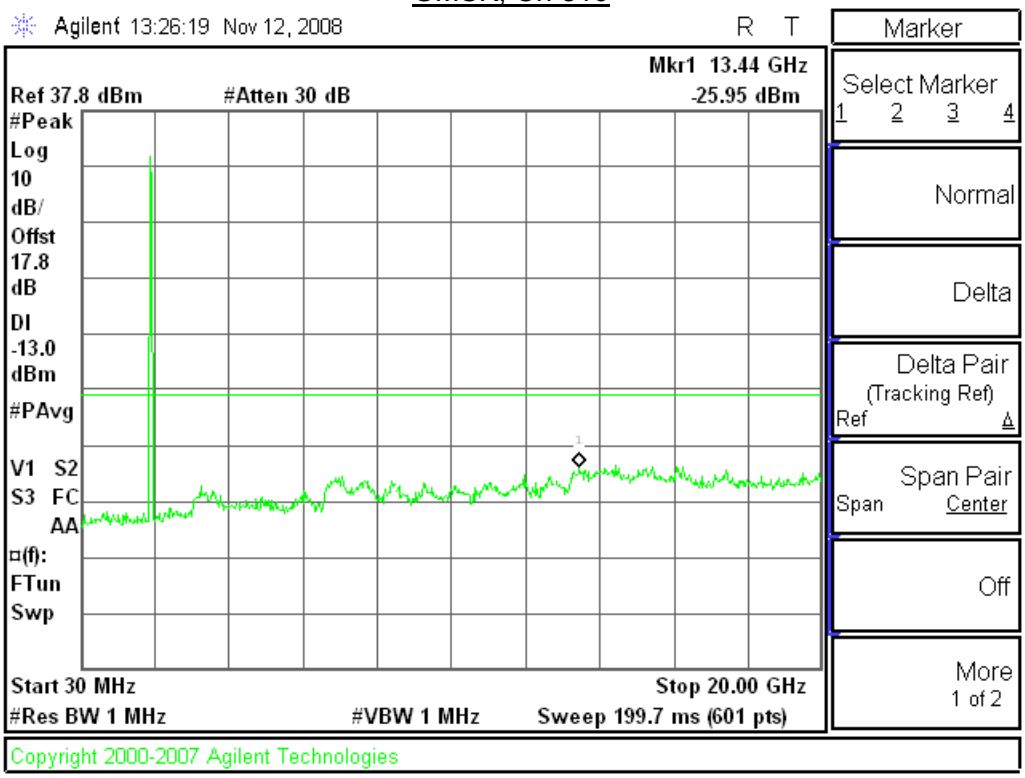
GMSK, Ch 512



GMSK, Ch 661

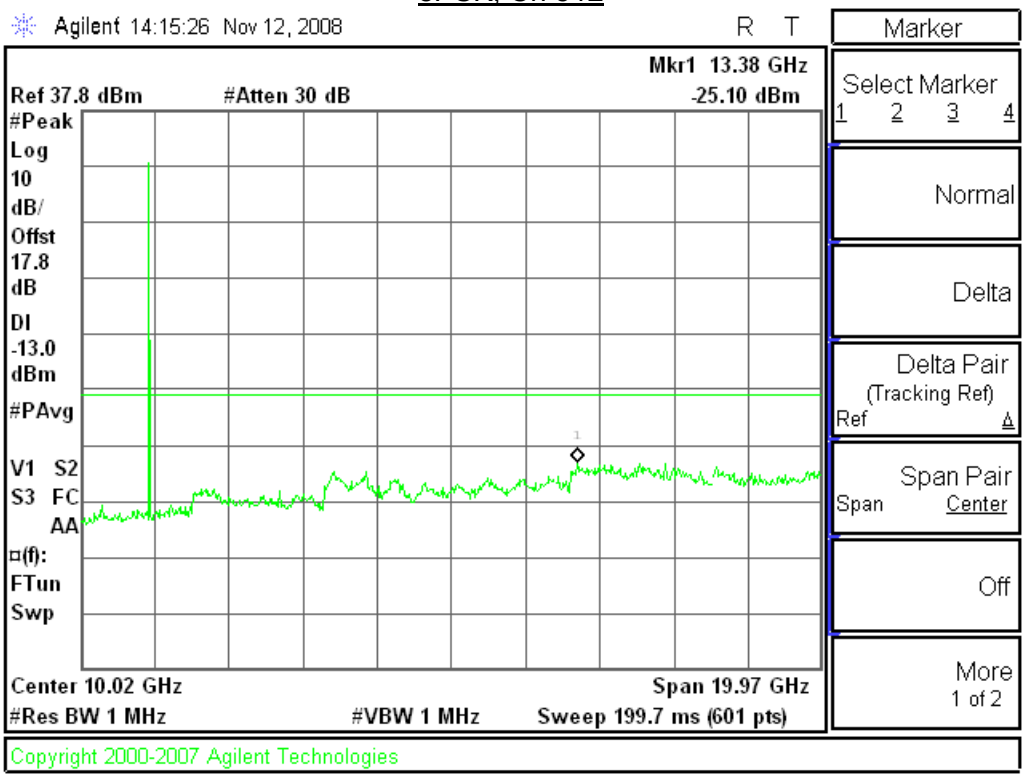


GMSK, Ch 810

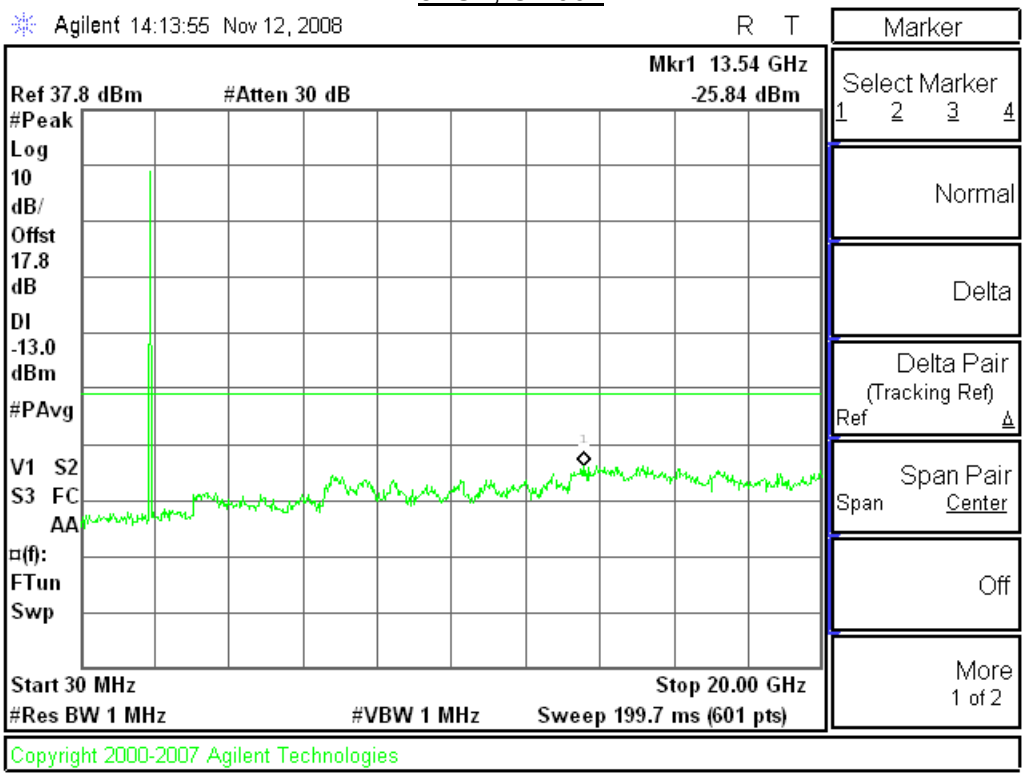


Plots for 8PSK Mode (PCS Band)

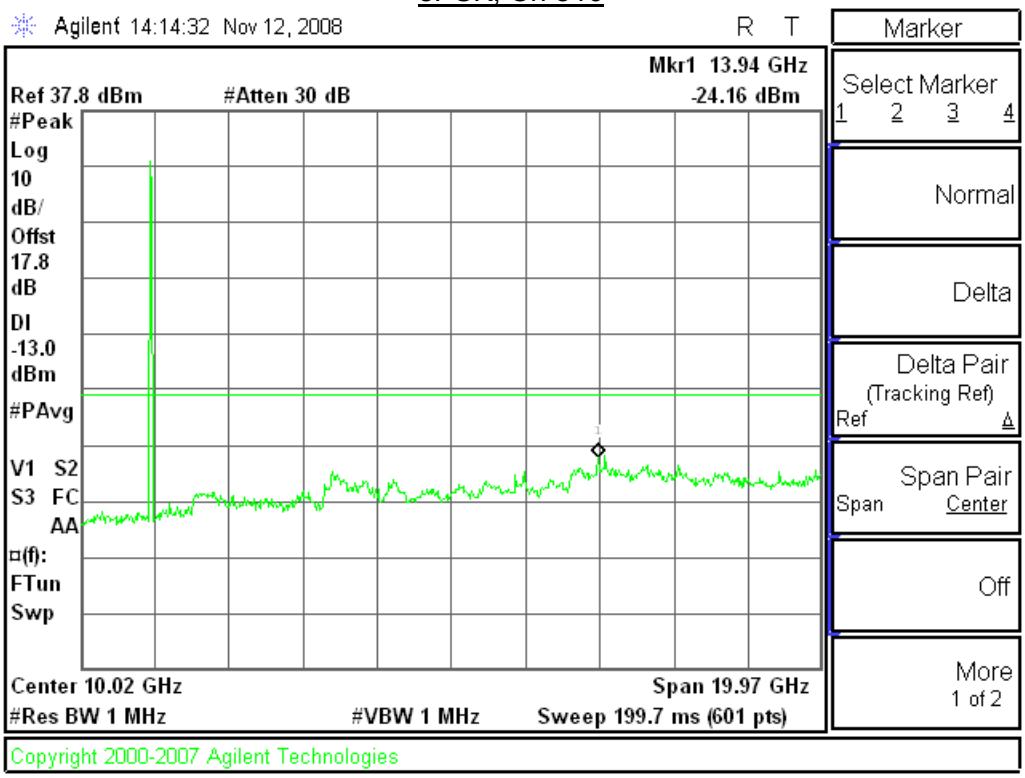
8PSK, Ch 512



8PSK, Ch 661

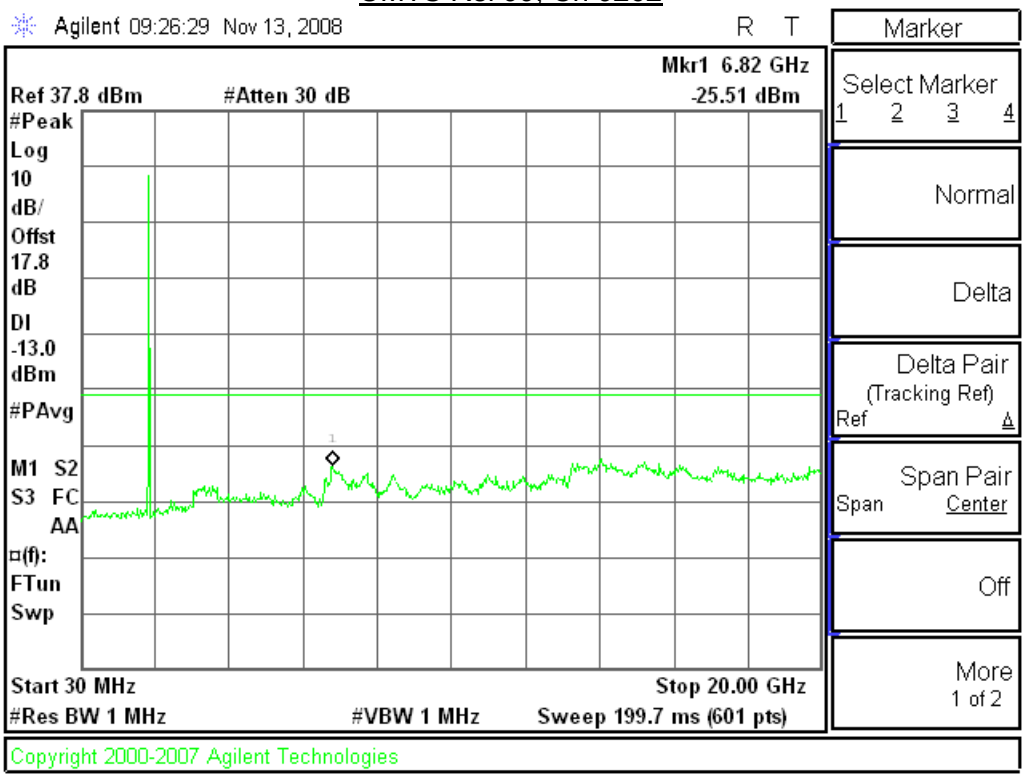


8PSK, Ch 810

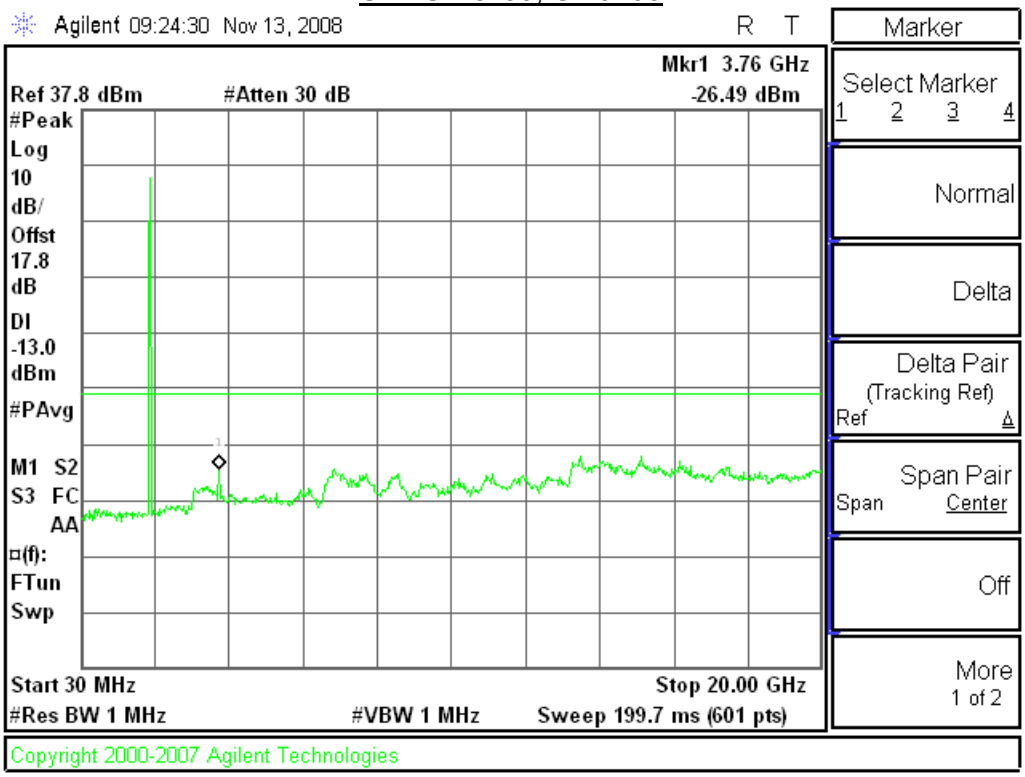


Plots for UMTS Rel 99 Mode (PCS Band)

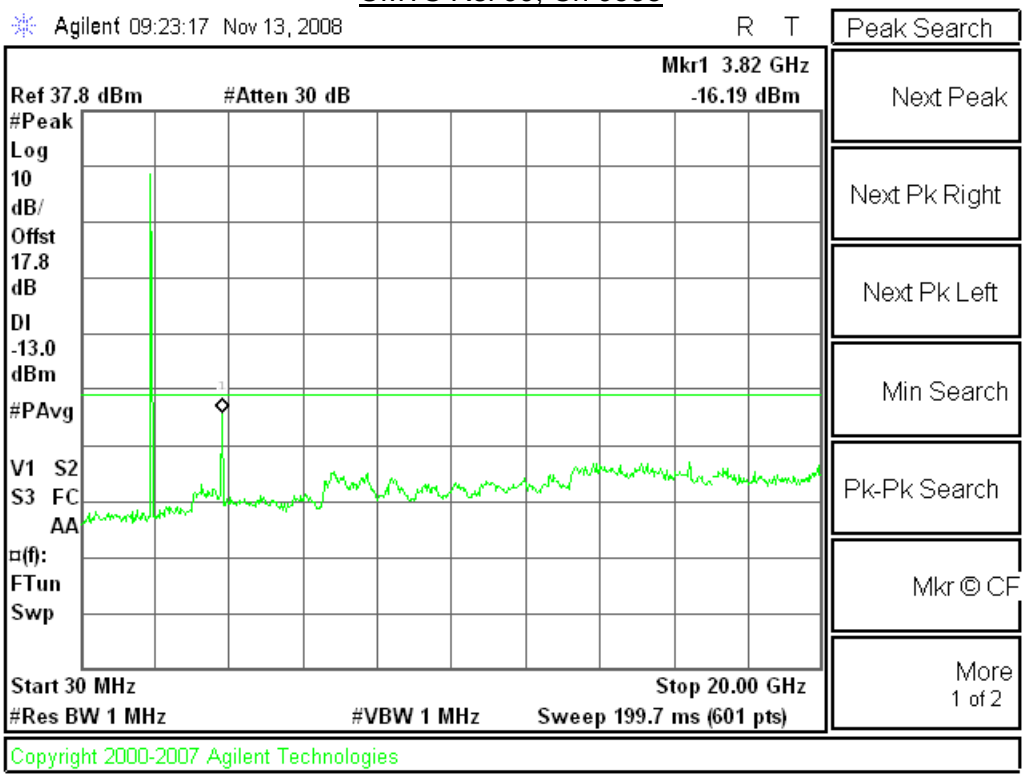
UMTS Rel 99, Ch 9262



UMTS Rel 99, Ch 9400

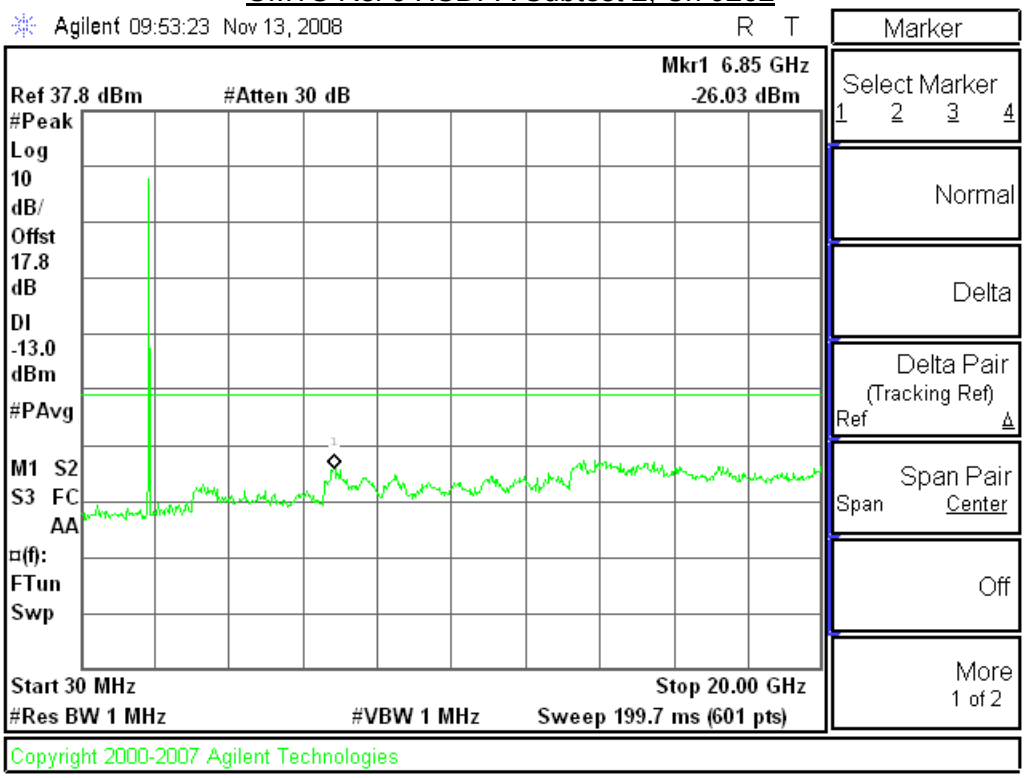


UMTS Rel 99, Ch 9538

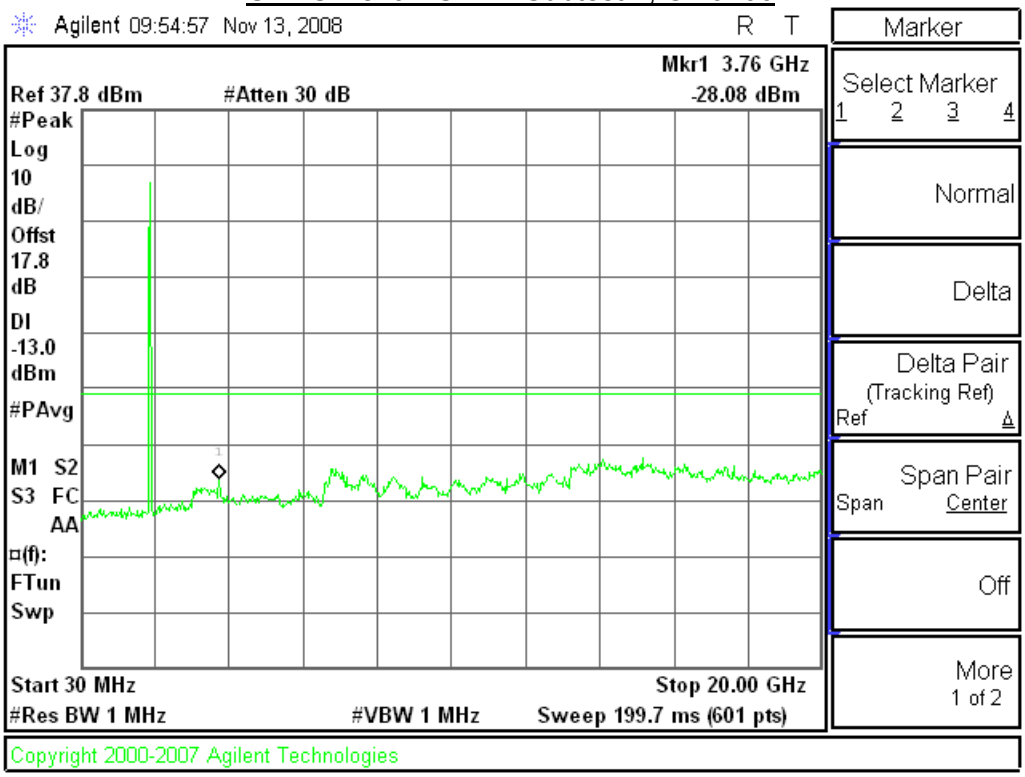


Plots for UMTS Rel 6 HSDPA Subtest 2 Mode (PCS Band)

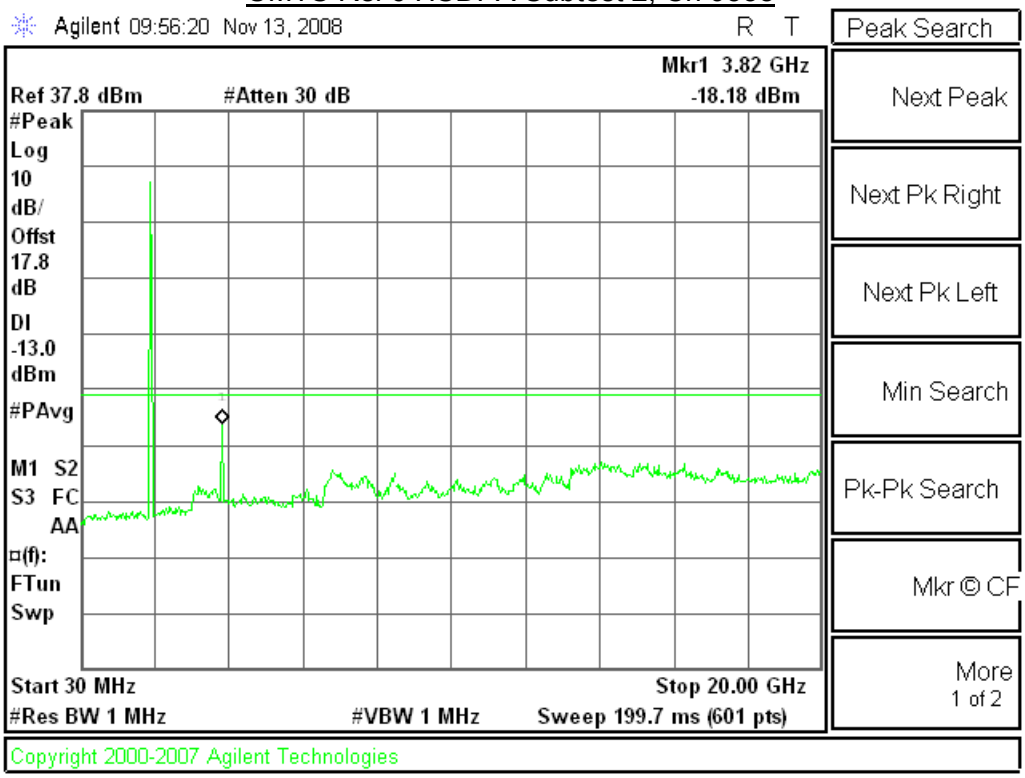
UMTS Rel 6 HSDPA Subtest 2, Ch 9262



UMTS Rel 6 HSDPA Subtest 2, Ch 9400



UMTS Rel 6 HSDPA Subtest 2, Ch 9538



11.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235
IC: RSS-132, 4.3; RSS-133, 6.3

LIMITS

§22.355 & RSS-132 4.3 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.
RSS-133 6.3 - The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.
§24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use Agilent 8960 with Frequency Error measurement capability.

- Temp. = −20° to +50°C
- Voltage = 3.3 Vdc
- 3.0 – 3.6 Vdc (85% - 115%)

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached. Reference power supply voltage for these tests is 3.3 Vdc.
Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case). The test voltages are 3.0 to 3.6 Vdc.

MODES TESTED

- GSM - GSM (GSMK) & EGPRS (8PSK),
- UMTS (W-CDMA) - Rel 99

RESULTS

See the following pages.

GMSK Mode (Cellular Band)

Reference Frequency: Cellular Mid Channel 836.46324MHz @ 20*C Limit: to stay +- 2.5 ppm = 2091.158 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
4.20	50	836.462740	0.598	2.5
4.20	40	836.462840	0.478	2.5
4.20	30	836.462960	0.335	2.5
4.20	***20***	***836.463240***	***0***	2.5
4.20	10	836.462920	0.383	2.5
4.20	0	836.463100	0.167	2.5
4.20	-10	836.463040	0.239	2.5
4.20	-20	836.463200	0.048	2.5
4.20	-30	836.463800	-0.669	2.5

Reference Frequency: Cellular Mid Channel 836.46324MHz @ 20*C Limit: to stay +- 2.5 ppm = 2091.158 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***836.463240***	***0***	***2.5***
85%	20	836.462860	*0.454*	2.5
115%	20	836.462830	*0.490*	2.5

8PSK Mode (Cellular Band)

Reference Frequency: Cellular Mid Channel 836.467325MHz @ 20*C Limit: to stay +- 2.5 ppm = 2091.168 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
4.20	50	836.467298	0.032	2.5
4.20	40	836.467304	0.025	2.5
4.20	30	836.467306	0.023	2.5
4.20	***20***	***836.467325***	***0***	2.5
4.20	10	836.467322	0.004	2.5
4.20	0	836.467316	0.011	2.5
4.20	-10	836.467338	-0.016	2.5
4.20	-20	836.467334	-0.011	2.5
4.20	-30	836.467345	-0.024	2.5

Reference Frequency: Cellular Mid Channel 836.467325MHz @ 20*C Limit: to stay +- 2.5 ppm = 2091.168 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse (MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***836.467325***	***0***	***2.5***
85%	20	836.467336	*-0.013*	2.5
115%	20	836.467339	*-0.017*	2.5

UMTS Rel 99 Mode (Cellular Band)

Reference Frequency: Cellular Mid Channel 833.726268MHz @ 20*C Limit: to stay +- 2.5 ppm = 2084.316 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.20	50	833.726278	-0.012	2.5
4.20	40	833.726271	-0.004	2.5
4.20	30	833.726272	-0.005	2.5
4.20	***20***	***833.726268***	***0***	2.5
4.20	10	833.726264	0.005	2.5
4.20	0	833.726260	0.010	2.5
4.20	-10	833.726248	0.024	2.5
4.20	-20	833.726233	0.042	2.5
4.20	-30	833.726230	0.046	2.5

Reference Frequency: Cellular Mid Channel 833.726430MHz @ 20*C Limit: to stay +- 2.5 ppm = 2084.316 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***833.726268***	***0***	***2.5***
85%	20	833.726278	*-0.012*	2.5
115%	20	833.726260	*0.010*	2.5

GMSK Mode (PCS Band)

Reference Frequency: PCS Mid Channel 1880.01512MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.038 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.20	50	1880.01530	-0.096	2.5
4.20	40	1880.01521	-0.048	2.5
4.20	30	1880.01527	-0.080	2.5
4.20	***20***	***1880.01512***	***0***	***2.5***
4.20	10	1880.01573	-0.324	2.5
4.20	0	1880.01594	-0.436	2.5
4.20	-10	1880.01615	-0.548	2.5
4.20	-20	1880.01600	-0.468	2.5
4.20	-30	1880.01602	-0.479	2.5

Reference Frequency: PCS Mid Channel 1880.01512MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.038 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1880.01512***	***0***	***2.5***
85%	20	***1880.01498***	*0.074*	2.5
115%	20	1880.01495	*0.090*	2.5

8PSK Mode (PCS Band)

Reference Frequency: PCS Mid Channel 1879.51415MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4698.785 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.20	50	1879.51404	0.059	2.5
4.20	40	1879.51402	0.072	2.5
4.20	30	1879.51405	0.053	2.5
4.20	***20***	***1879.51415***	***0***	***2.5***
4.20	10	1879.51412	0.016	2.5
4.20	0	1879.51424	-0.048	2.5
4.20	-10	1879.51426	-0.059	2.5
4.20	-20	1879.51432	-0.090	2.5
4.20	-30	1879.51438	-0.122	2.5

Reference Frequency: PCS Mid Channel 1879.51415MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4698.785 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1879.51415***	***0***	***2.5***
85%	20	***1879.51426***	*-0.059*	2.5
115%	20	1879.51428	*-0.069*	2.5

UMTS Rel 99 Mode (PCS Band)

Reference Frequency: PCS Mid Channel 1877.772080MHz @ 20ºC				
Limit: within the authorized block or +- 2.5 ppm = 4694.430 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.20	50	1877.772066	0.007	2.5
4.20	40	1877.772062	0.010	2.5
4.20	30	1877.772070	0.005	2.5
4.20	***20***	***1877.772080***	***0***	***2.5***
4.20	10	1877.772070	0.005	2.5
4.20	0	1877.772116	-0.019	2.5
4.20	-10	1877.772083	-0.002	2.5
4.20	-20	1877.772086	-0.003	2.5
4.20	-30	1877.772090	-0.005	2.5

Reference Frequency: PCS Mid Channel 1877.772080MHz @ 20ºC				
Limit: within the authorized block or +- 2.5 ppm = 4694.430 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1877.772080***	***0***	***2.5***
85%	20	***1877.772072***	*0.004*	2.5
115%	20	1877.772086	*-0.003*	2.5

12. RADIATED TEST RESULTS

12.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232
IC: RSS-132; 4.4, RSS-133, 6.4

LIMITS

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

24.232(c) & RSS-133 § 6.4 - 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.

RSS-132 4.4, SRSP503 5.1.3 - The maximum ERP shall be 11.5 Watts for mobile stations.

TEST PROCEDURE

ANSI / TIA / EIA 603C
RSS-132; RSS-133

MODES TESTED

- GSM - GSM (GSMK) & EGPRS (8PSK),
- UMTS (W-CDMA) - Rel 99, Rel 6 HSDPA Subtest 2

RESULTS for Cellular Band (ERP)

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GMSK	128	824.20	28.10	645.65
	190	836.60	30.30	1071.52
	251	848.80	30.00	1000.00
8PSK	128	824.20	26.40	436.52
	190	836.60	27.70	588.84
	251	848.80	27.30	537.03

Mode	Channel	f (MHz)	ERP	
			dBm	mW
Rel 99	4132	826.40	25.40	346.74
	4180	836.00	26.30	426.58
	4230	846.00	27.60	575.44
HSDPA (Subtest 2)	4132	826.40	25.50	354.81
	4180	836.00	26.40	436.52
	4230	846.00	27.20	524.81

RESULTS for PCS Band (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GMSK	512	1850.20	29.00	794.33
	661	1880.00	29.10	812.83
	810	1909.80	29.20	831.76
8PSK	512	1850.20	26.60	457.09
	661	1880.00	26.90	489.78
	810	1909.80	26.20	416.87

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
Rel 99	9262	1852.40	25.20	331.13
	9400	1880.00	26.00	398.11
	9538	1907.60	26.10	407.38
HSDPA (Subtest 2)	9262	1852.40	26.40	436.52
	9400	1880.00	26.40	436.52
	9538	1907.60	26.90	489.78

ERP for GMSK Mode (Cellular Band)

Cellular Fundamental Substitution Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11/15/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: GSM 850, GSM

Test Equipment:
Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002, Thanh cable

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	104.1	V	28.6	0.5	0.0	28.1	38.5	-10.3	
824.20	96.8	H	20.5	0.5	0.0	20.0	38.5	-18.4	
836.60	106.0	V	30.8	0.5	0.0	30.3	38.5	-8.2	
836.60	98.3	H	21.7	0.5	0.0	21.2	38.5	-17.2	
848.80	105.1	V	30.5	0.5	0.0	30.0	38.5	-8.4	
848.80	97.0	H	21.5	0.5	0.0	21.0	38.5	-17.4	

Rev. 1.24.7

ERP for 8PSK Mode (Cellular Band)

Cellular Fundamental Substitution Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11/15/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: GSM 850, EGPRS

Test Equipment:
Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002, Thanh cable

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	102.4	V	26.9	0.5	0.0	26.4	38.5	-12.0	
824.20	93.0	H	16.7	0.5	0.0	16.2	38.5	-22.2	
836.60	103.4	V	28.2	0.5	0.0	27.7	38.5	-10.7	
836.60	93.4	H	16.8	0.5	0.0	16.3	38.5	-22.1	
848.80	102.4	V	27.8	0.5	0.0	27.3	38.5	-11.1	
848.80	93.8	H	18.3	0.5	0.0	17.8	38.5	-20.6	

Rev. 1.24.7

ERP for UMTS Rel 99 Mode (Cellular Band)

Cellular Fundamental Substitution Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11/18/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: UMTS 850, WCDMA Rel 99

Test Equipment:
Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002, Thanh cable

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
826.40	101.4	V	25.9	0.5	0.0	25.4	38.5	-13.0	
826.40	93.0	H	16.7	0.5	0.0	16.2	38.5	-22.2	
836.00	101.5	V	26.8	0.5	0.0	26.3	38.5	-12.1	
836.00	94.5	H	17.9	0.5	0.0	17.4	38.5	-21.0	
846.00	101.7	V	28.1	0.5	0.0	27.6	38.5	-10.8	
846.00	94.3	H	18.8	0.5	0.0	18.3	38.5	-20.2	

Rev. 1.24.7

ERP for UMTS Rel 6 HSDPA Mode (Cellular Band)

Cellular Fundamental Substitution Measurement
Compliance Certification Services, Fremont 5m Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11/18/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: UMTS 850, WCDMA+HSDPA

Test Equipment:
Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002, Thanh cable

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	101.5	V	26.0	0.5	0.0	25.5	38.5	-12.9	
824.20	93.2	H	16.9	0.5	0.0	16.4	38.5	-22.0	
836.60	101.6	V	26.9	0.5	0.0	26.4	38.5	-12.0	
836.60	93.5	H	16.9	0.5	0.0	16.4	38.5	-22.0	
848.80	101.3	V	27.7	0.5	0.0	27.2	38.5	-11.2	
848.80	94.2	H	18.7	0.5	0.0	18.2	38.5	-20.3	

Rev. 1.24.7

EIRP for GMSK Mode (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services, Fremont 5m Chamber Site

Company: Qualcomm
Project #:08U12127
Date: 11/15/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: GSM1900, GSM

Test Equipment:
Receiving: Horn T73, and 20ft S/N: 228076 003
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 187215 001

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch									
1.850	96.6	V	21.3	0.6	8.3	29.0	33.0	-4.0	
1.850	90.0	H	13.9	0.6	8.3	21.6	33.0	-11.4	
Mid Ch									
1.880	97.0	V	21.5	0.7	8.3	29.1	33.0	-3.9	
1.880	90.5	H	14.6	0.7	8.3	22.2	33.0	-10.8	
High Ch									
1.910	96.8	V	21.7	0.8	8.4	29.2	33.0	-3.8	
1.910	91.3	H	15.0	0.8	8.4	22.6	33.0	-10.4	

Rev. 1.24.7

EIRP for 8PSK Mode (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services, Fremont 5m Chamber Site

Company: Qualcomm
Project #:08U12127
Date: 11/15/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: GSM1900, EGPRS

Test Equipment:
Receiving: Horn T73, and 20ft S/N: 228076 003
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 187215 001

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch									
1.850	94.3	V	18.9	0.6	8.3	26.6	33.0	-6.4	
1.850	87.8	H	11.7	0.6	8.3	19.4	33.0	-13.6	
Mid Ch									
1.880	94.8	V	19.3	0.7	8.3	26.9	33.0	-6.1	
1.880	87.5	H	11.6	0.7	8.3	19.2	33.0	-13.8	
High Ch									
1.910	93.8	V	18.7	0.8	8.4	26.2	33.0	-6.8	
1.910	87.9	H	11.6	0.8	8.4	19.2	33.0	-13.8	

Rev. 1.24.7

EIRP for UMTS Rel 99 Mode (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services, Fremont 5m Chamber Site

Company: Qualcomm
Project #:08U12127
Date: 11/18/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: UMTS1900, WCDMA Rel 99

Test Equipment:
Receiving: Horn T73, and 20ft S/N: 228076 003
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 187215 001

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch									
1.852	92.8	V	17.5	0.6	8.3	25.2	33.0	-7.8	
1.852	88.2	H	12.1	0.6	8.3	19.8	33.0	-13.2	
Mid Ch									
1.880	93.9	V	18.4	0.7	8.3	26.0	33.0	-7.0	
1.880	87.6	H	11.7	0.7	8.3	19.3	33.0	-13.7	
High Ch									
1.908	93.7	V	18.6	0.8	8.4	26.1	33.0	-6.9	
1.908	87.9	H	11.6	0.8	8.4	19.2	33.0	-13.8	

Rev. 1.24.7

EIRP for UMTS Rel 6 HSDPA Mode (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services, Fremont 5m Chamber Site

Company: Qualcomm
Project #:08U12127
Date: 11/18/2008
Test Engineer: Chin Pang
Configuration: EUT with Mobile Antenna
Mode: UMTS1900, WCDMA+HSDPA

Test Equipment:
Receiving: Horn T73, and 20ft S/N: 228076 003
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 187215 001

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch									
1.852	94.0	V	18.7	0.6	8.3	26.4	33.0	-6.6	
1.852	87.5	H	11.4	0.6	8.3	19.1	33.0	-13.9	
Mid Ch									
1.880	94.3	V	18.8	0.7	8.3	26.4	33.0	-6.6	
1.880	87.0	H	11.1	0.7	8.3	18.7	33.0	-14.3	
High Ch									
1.908	94.5	V	19.4	0.8	8.4	26.9	33.0	-6.1	
1.908	88.5	H	12.2	0.8	8.4	19.8	33.0	-13.2	

Rev. 1.24.7

12.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238
IC: RSS-132, 4.5; RSS-233, 6.5

LIMIT

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

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

MODES TESTED

- GSM - GSM (GSMK) & EGPRS (8PSK),
- UMTS (W-CDMA) - Rel 99, Rel 6 HSDPA Subtest 2

RESULTS

See the following pages.

GMSK Mode (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 3m C-Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11/19/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: GSM850, GSM

Test Equipment:

EMCO Horn 1-18 GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: FCC 22
High Pass Filter: ☑
Hi Frequency Cables: ☐ (2' Chin 17707903) ☐ (2 ~ 3', Thanh 187213003) ☑ (12' S/N: 208946002)
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 824.2MHz										
1.648	57.6	H	-50.7	2.3	7.1	4.9	-48.1	-13.0	-35.1	
2.473	48.5	H	-59.4	2.3	9.3	7.1	-54.6	-13.0	-41.6	
3.297	48.0	H	-57.2	2.4	9.4	7.3	-52.3	-13.0	-39.3	
1.648	65.5	V	-43.5	2.3	7.1	4.9	-40.9	-13.0	-27.9	
2.473	53.0	V	-55.1	2.3	9.3	7.1	-50.3	-13.0	-37.3	
3.297	47.5	V	-57.8	2.4	9.4	7.3	-52.9	-13.0	-39.9	
Mid Ch, 836.6MHz										
1.673	59.0	H	-49.3	2.3	7.2	5.0	-46.6	-13.0	-33.6	
2.510	50.0	H	-57.8	2.3	9.3	7.1	-53.0	-13.0	-40.0	
3.346	46.8	H	-58.3	2.4	9.5	7.3	-53.4	-13.0	-40.4	
1.673	67.6	V	-41.4	2.3	7.2	5.0	-38.7	-13.0	-25.7	
2.510	53.5	V	-54.5	2.3	9.3	7.1	-49.7	-13.0	-36.7	
3.346	48.0	V	-57.2	2.4	9.5	7.3	-52.3	-13.0	-39.3	
High Ch, 848.8MHz										
1.698	60.0	H	-48.3	2.3	7.2	5.1	-45.5	-13.0	-32.5	
2.546	50.4	H	-57.2	2.3	9.3	7.1	-52.5	-13.0	-39.5	
3.395	48.2	H	-56.8	2.4	9.5	7.3	-51.8	-13.0	-38.8	
1.698	68.8	V	-40.2	2.3	7.2	5.1	-37.4	-13.0	-24.4	
2.546	56.0	V	-51.8	2.3	9.3	7.1	-47.1	-13.0	-34.1	
3.395	46.4	V	-58.7	2.4	9.5	7.3	-53.7	-13.0	-40.7	

Rev. 8.19.8

8PSK Mode (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 3m C-Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11/19/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: GSM850, EGPRS

Test Equipment:

EMCO Horn 1-18 GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: FCC 22
High Pass Filter: ☑
Hi Frequency Cables: ☐ (2' Chin 17707903) ☐ (2 ~ 3', Thanh 187213003) ☑ (12' S/N: 208946002)
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 824.2MHz										
1.648	54.0	H	-54.3	2.3	7.1	4.9	-51.7	-13.0	-38.7	
2.473	47.0	H	-60.9	2.3	9.3	7.1	-56.1	-13.0	-43.1	
3.297	44.0	H	-61.2	2.4	9.4	7.3	-56.3	-13.0	-43.3	
1.648	58.4	V	-50.6	2.3	7.1	4.9	-48.0	-13.0	-35.0	
2.473	49.4	V	-58.7	2.3	9.3	7.1	-53.9	-13.0	-40.9	
3.297	46.0	V	-59.3	2.4	9.4	7.3	-54.4	-13.0	-41.4	
Mid Ch, 836.6MHz										
1.673	55.3	H	-53.0	2.3	7.2	5.0	-50.3	-13.0	-37.3	
2.510	47.5	H	-60.3	2.3	9.3	7.1	-55.5	-13.0	-42.5	
3.346	45.6	H	-59.5	2.4	9.5	7.3	-54.6	-13.0	-41.6	
1.673	61.8	V	-47.2	2.3	7.2	5.0	-44.5	-13.0	-31.5	
2.510	52.0	V	-56.0	2.3	9.3	7.1	-51.2	-13.0	-38.2	
3.346	43.0	V	-62.2	2.4	9.5	7.3	-57.3	-13.0	-44.3	
High Ch, 848.8MHz										
1.698	56.8	H	-51.5	2.3	7.2	5.1	-48.7	-13.0	-35.7	
2.546	48.5	H	-59.1	2.3	9.3	7.1	-54.4	-13.0	-41.4	
3.395	47.0	H	-58.0	2.4	9.5	7.3	-53.0	-13.0	-40.0	
1.698	63.8	V	-45.2	2.3	7.2	5.1	-42.4	-13.0	-29.4	
2.546	53.4	V	-54.4	2.3	9.3	7.1	-49.7	-13.0	-36.7	
3.395	45.6	V	-59.5	2.4	9.5	7.3	-54.5	-13.0	-41.5	

Rev. 8.19.8

UMTS REL 99 Mode (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 3m C-Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11/19/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: UMTS850, REL99, WCDMA

Test Equipment:

EMCO Horn 1-18 GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: FCC 22
High Pass Filter: ☑
Hi Frequency Cables: ☐ (2' Chin 17707903) ☐ (2 ~ 3', Thanh 187213003) ☑ (12' S/N: 208946002)
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 826.4MHz										
1.653	56.8	H	-51.5	2.3	7.1	4.9	-48.8	-13.0	-35.8	
2.479	45.0	H	-62.9	2.3	9.3	7.1	-58.1	-13.0	-45.1	
1.653	62.0	V	-47.0	2.3	7.1	4.9	-44.4	-13.0	-31.4	
2.479	46.5	V	-61.6	2.3	9.3	7.1	-56.8	-13.0	-43.8	
Mid Ch, 836MHz										
1.672	50.0	H	-58.3	2.3	7.1	5.0	-55.6	-13.0	-42.6	
2.508	44.0	H	-63.8	2.3	9.3	7.1	-59.0	-13.0	-46.0	
1.672	55.2	V	-53.8	2.3	7.1	5.0	-51.1	-13.0	-38.1	
2.508	45.5	V	-62.5	2.3	9.3	7.1	-57.7	-13.0	-44.7	
High Ch, 846MHz										
1.692	56.0	H	-52.3	2.3	7.2	5.1	-49.5	-13.0	-36.5	
2.538	42.0	H	-65.7	2.3	9.3	7.1	-60.9	-13.0	-47.9	
1.692	63.0	V	-46.0	2.3	7.2	5.1	-43.2	-13.0	-30.2	
2.538	45.0	V	-62.9	2.3	9.3	7.1	-58.1	-13.0	-45.1	

Rev. 8.19.8

UMTS REL 6 HSDPA Subtest 2 Mode (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 3m C-Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11/19/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: UMTS850, WCDMA+HSDPA

Test Equipment:

EMCO Horn 1-18 GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: FCC 22
High Pass Filter: ☑
Hi Frequency Cables: ☐ (2' Chin 17707903) ☐ (2 ~ 3', Thanh 187213003) ☑ (12' S/N: 208946002)
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 826.4MHz										
1.653	55.5	H	-52.8	2.3	7.1	4.9	-50.1	-13.0	-37.1	
2.479	43.5	H	-64.4	2.3	9.3	7.1	-59.6	-13.0	-46.6	
1.653	60.0	V	-49.0	2.3	7.1	4.9	-46.4	-13.0	-33.4	
2.479	45.6	V	-62.5	2.3	9.3	7.1	-57.7	-13.0	-44.7	
Mid Ch, 836MHz										
1.672	53.6	H	-54.7	2.3	7.1	5.0	-52.0	-13.0	-39.0	
2.508	43.0	H	-64.8	2.3	9.3	7.1	-60.0	-13.0	-47.0	
1.672	58.6	V	-50.4	2.3	7.1	5.0	-47.7	-13.0	-34.7	
2.508	45.0	V	-63.0	2.3	9.3	7.1	-58.2	-13.0	-45.2	
High Ch, 846MHz										
1.692	54.6	H	-53.7	2.3	7.2	5.1	-50.9	-13.0	-37.9	
2.538	43.2	H	-64.5	2.3	9.3	7.1	-59.7	-13.0	-46.7	
1.692	63.2	V	-45.8	2.3	7.2	5.1	-43.0	-13.0	-30.0	
2.538	46.1	V	-61.8	2.3	9.3	7.1	-57.0	-13.0	-44.0	

Rev. 8.19.8

GMSK Mode (PCS Band)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 5m B-Chamber

Company: Qualcomm
Project #: 08U12127
Date: 11-18-2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: GSM 1900, GSM

Test Equipment:

EMCO Horn 1-18GHz: T73; S/N: 6717 @3m
Horn > 18GHz:
Limit: FCC 24
High Pass Filter: ☑
Hi Frequency Cables: ☐ (2 ft) ☑ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T145 Agilent 3008A
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 1850.2MHz										
3.700	45.3	H	-50.8	6.4	9.7	7.6	-47.5	-13.0	-34.5	
5.551	45.8	H	-44.4	8.0	11.3	9.1	-41.2	-13.0	-28.2	
9.251	52.0	H	-34.7	10.1	13.0	10.8	-31.8	-13.0	-18.8	
11.101	44.0	H	-36.1	12.2	13.8	11.7	-34.5	-13.0	-21.5	
3.700	49.5	V	-46.7	6.4	9.7	7.6	-43.4	-13.0	-30.4	
5.551	47.0	V	-44.2	8.0	11.3	9.1	-41.0	-13.0	-28.0	
9.251	49.6	V	-37.1	10.1	13.0	10.8	-34.2	-13.0	-21.2	
11.101	45.0	V	-35.7	12.2	13.8	11.7	-34.1	-13.0	-21.1	
Mid Ch, 1880MHz										
3.760	47.6	H	-48.2	6.4	9.7	7.6	-44.9	-13.0	-31.9	
5.640	46.0	H	-44.4	8.1	11.5	9.3	-41.0	-13.0	-28.0	
9.400	52.5	H	-33.9	10.3	13.0	10.9	-31.2	-13.0	-18.2	
11.200	45.0	H	-34.8	12.3	13.9	11.7	-33.3	-13.0	-20.3	
3.760	50.8	V	-45.1	6.4	9.7	7.6	-41.8	-13.0	-28.8	
5.640	48.2	V	-43.2	8.1	11.5	9.3	-39.8	-13.0	-26.8	
9.400	50.6	V	-35.8	10.3	13.0	10.9	-33.1	-13.0	-20.1	
11.200	47.2	V	-33.2	12.3	13.9	11.7	-31.7	-13.0	-18.7	
High Ch, 1909.8MHz										
3.820	48.9	H	-46.6	6.5	9.7	7.5	-43.4	-13.0	-30.4	
5.729	46.8	H	-43.8	8.1	11.7	9.5	-40.3	-13.0	-27.3	
9.549	45.5	H	-40.6	10.5	13.1	11.0	-38.0	-13.0	-25.0	
11.459	45.3	H	-33.5	12.6	13.9	11.8	-32.2	-13.0	-19.2	
3.820	47.3	V	-48.3	6.5	9.7	7.5	-45.1	-13.0	-32.1	
5.729	46.6	V	-45.0	8.1	11.7	9.5	-41.5	-13.0	-28.5	
9.549	48.6	V	-37.5	10.5	13.1	11.0	-34.9	-13.0	-21.9	
11.459	46.0	V	-33.4	12.6	13.9	11.8	-32.1	-13.0	-19.1	

Rev. 4.12.7

8PSK Mode (PCS Band)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 5m B-Chamber

Company: Qualcomm
Project #:08U12127
Date: 11-18-2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: GSM 1900, EGPRS

Test Equipment:

EMCO Horn 1-18GHz: T73; S/N: 6717 @3m
Horn > 18GHz:
Limit: FCC 24
☑ High Pass Filter
Hi Frequency Cables: ☐ (2 ft) ☑ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T145 Agilent 3008A
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 1850.2MHz										
3.700	46.8	H	-49.3	6.4	9.7	7.6	-46.0	-13.0	-33.0	
5.551	45.0	H	-45.2	8.0	11.3	9.1	-42.0	-13.0	-29.0	
9.251	47.2	H	-39.5	10.1	13.0	10.8	-36.6	-13.0	-23.6	
3.700	46.0	V	-50.2	6.4	9.7	7.6	-46.9	-13.0	-33.9	
5.551	48.0	V	-43.2	8.0	11.3	9.1	-40.0	-13.0	-27.0	
9.251	48.5	V	-38.2	10.1	13.0	10.8	-35.3	-13.0	-22.3	
11.101	44.0	V	-36.7	12.2	13.8	11.7	-35.1	-13.0	-22.1	
Mid Ch, 1880MHz										
3.760	47.0	H	-48.8	6.4	9.7	7.6	-45.5	-13.0	-32.5	
5.640	47.2	H	-43.2	8.1	11.5	9.3	-39.8	-13.0	-26.8	
9.400	46.0	H	-40.4	10.3	13.0	10.9	-37.7	-13.0	-24.7	
3.760	49.0	V	-46.9	6.4	9.7	7.6	-43.6	-13.0	-30.6	
5.640	45.0	V	-46.4	8.1	11.5	9.3	-43.0	-13.0	-30.0	
9.400	47.5	V	-38.9	10.3	13.0	10.9	-36.2	-13.0	-23.2	
11.200	46.1	V	-34.3	12.3	13.9	11.7	-32.8	-13.0	-19.8	
High Ch, 1909.8MHz										
3.820	49.5	H	-46.0	6.5	9.7	7.5	-42.8	-13.0	-29.8	
5.729	46.0	H	-44.6	8.1	11.7	9.5	-41.1	-13.0	-28.1	
9.549	45.0	H	-41.1	10.5	13.1	11.0	-38.5	-13.0	-25.5	
3.820	47.8	V	-47.8	6.5	9.7	7.5	-44.6	-13.0	-31.6	
5.729	46.5	V	-45.1	8.1	11.7	9.5	-41.6	-13.0	-28.6	
9.549	45.3	V	-40.8	10.5	13.1	11.0	-38.2	-13.0	-25.2	
11.459	47.3	V	-32.1	12.6	13.9	11.8	-30.8	-13.0	-17.8	

Rev. 4.12.7

UMTS REL 99 Mode (PCS Band)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 3m C-Chamber

Company: Qualcomm
Project #:08U12127
Date: 11/19/2008
Test Engineer: Chin Pang
Configuration: EUT with Magnetic Mount triple-frequency mobile antenna
Mode: UMTS1900, WCDMA Rel 99

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: FCC 24
High Pass Filter
Hi Frequency Cables: (2' Chin 17707903); (2 ~ 3', Thanh 187215003); (12' S/N: 208946002)
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 1852.4MHz										
3.705	46.2	H	-56.7	3.1	9.7	7.5	-50.1	-13.0	-37.1	
9.262	47.5	H	-50.7	3.9	12.7	10.6	-42.0	-13.0	-29.0	
3.705	48.6	V	-54.4	3.1	9.7	7.5	-47.8	-13.0	-34.8	
9.262	48.0	V	-50.2	3.9	12.7	10.6	-41.5	-13.0	-28.5	
Mid Ch, 1880MHz										
3.760	50.0	H	-52.8	3.1	9.7	7.5	-46.2	-13.0	-33.2	
9.400	45.8	H	-51.9	4.0	12.7	10.6	-43.2	-13.0	-30.2	
3.760	53.9	V	-49.0	3.1	9.7	7.5	-42.4	-13.0	-29.4	
9.400	43.5	V	-54.2	4.0	12.7	10.6	-45.5	-13.0	-32.5	
High Ch, 1907.6MHz										
3.815	61.2	H	-41.4	3.1	9.7	7.6	-34.8	-13.0	-21.8	
9.538	40.6	H	-56.6	4.0	12.7	10.6	-47.9	-13.0	-34.9	
3.815	66.3	V	-36.4	3.1	9.7	7.6	-29.8	-13.0	-16.8	
9.538	42.0	V	-55.2	4.0	12.7	10.6	-46.5	-13.0	-33.5	

Rev. 8.19.8

UMTS REL 6 HSDPA Subtest 2 Mode (PCS Band)

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 3m C-Chamber

Company: Qualcomm
Project #:08U12127
Date:11/19/2008
Test Engineer: Chin Pang
Configuration:EUT with Magnetic Mount triple-frequency mobile antenna
Mode: UMTS1900, HSDPA

Test Equipment:

EMCO Horn 1-18GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: FCC 24
High Pass Filter
Hi Frequency Cables: (2' Chin 17707903); (2 ~ 3', Thanh 187215003); (12' S/N: 208946002)
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:

f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch, 1852.4MHz										
3.705	46.6	H	-56.3	3.1	9.7	7.5	-49.7	-13.0	-36.7	
9.262	42.7	H	-55.5	3.9	12.7	10.6	-46.8	-13.0	-33.8	
3.705	48.5	V	-54.5	3.1	9.7	7.5	-47.9	-13.0	-34.9	
9.262	43.0	V	-55.2	3.9	12.7	10.6	-46.5	-13.0	-33.5	
Mid Ch, 1880MHz										
3.760	48.8	H	-54.0	3.1	9.7	7.5	-47.4	-13.0	-34.4	
9.400	43.3	H	-54.4	4.0	12.7	10.6	-45.7	-13.0	-32.7	
3.760	52.0	V	-50.9	3.1	9.7	7.5	-44.3	-13.0	-31.3	
9.400	45.6	V	-52.1	4.0	12.7	10.6	-43.4	-13.0	-30.4	
High Ch, 1907.6MHz										
3.815	64.6	H	-38.0	3.1	9.7	7.6	-31.4	-13.0	-18.4	
9.538	42.0	H	-55.2	4.0	12.7	10.6	-46.5	-13.0	-33.5	
3.815	65.5	V	-37.2	3.1	9.7	7.6	-30.6	-13.0	-17.6	
9.538	43.5	V	-53.7	4.0	12.7	10.6	-45.0	-13.0	-32.0	

Rev. 8.19.8

12.3. RECEIVER SPURIOUS EMISSIONS

RULE PART(S)

FCC: N/A
IC: RSS-132, 4.6; RSS-133, 6.6, RSS-Gen

LIMIT

RSS-Gen 6 (a) - If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

Table 1 - Spurious Emission Limits for Receivers:

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

TEST PROCEDURE

RSS-Gen 4.10 - The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

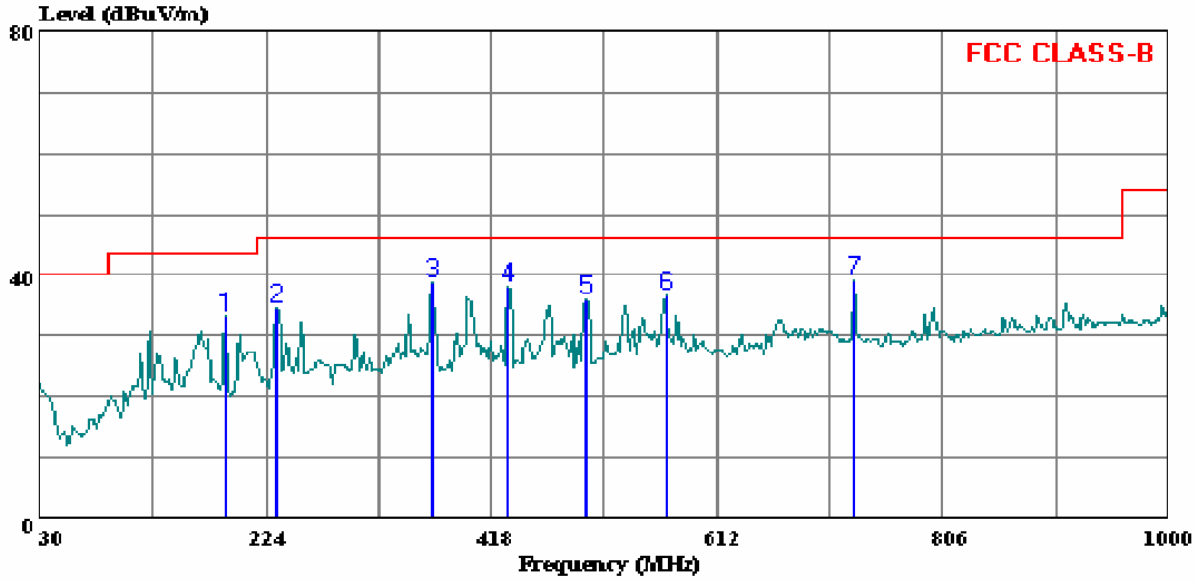
RESULTS

See the following pages.

RECEIVER SPURIOUS EMISSIONS FOR 30 TO 1000 MHz, HORIZONTAL

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 30 File#: 08u12127.emi Date: 11-26-2008 Time: 08:58:51



Trace: 19 Ref Trace:

Condition: FCC CLASS-B HORIZONTAL
Test Operator:: Chin Pang
Project #: : 08U12127
Company: : Qualcomm
Configuration:: EUT and antenna
Mode : : RX
Target: : FCC Class B

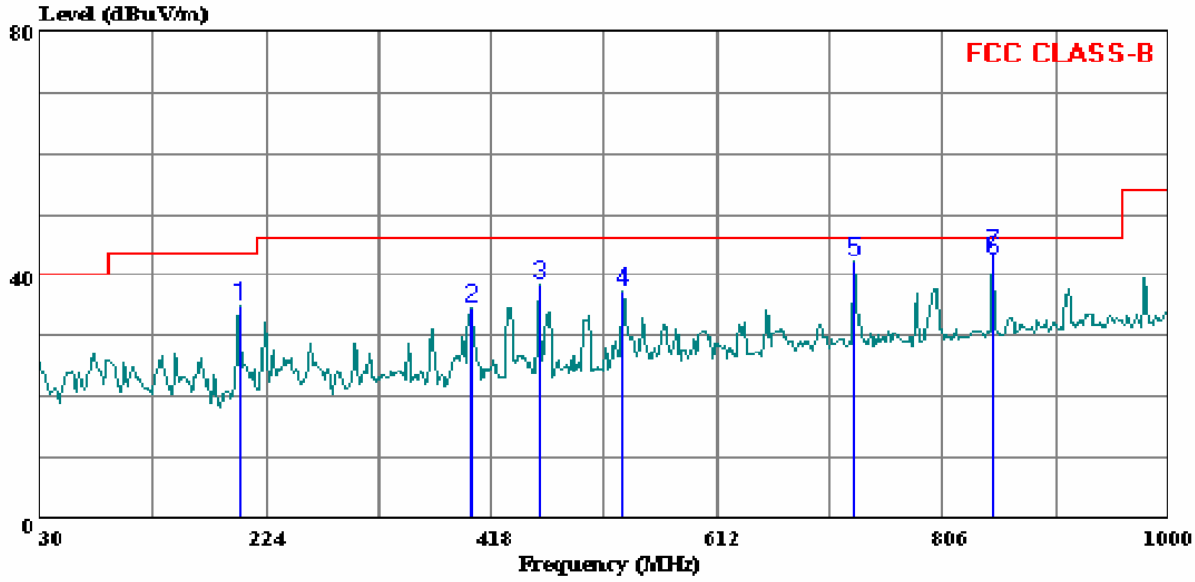
Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	189.080	47.19	-13.89	33.30	43.50	-10.20	Peak
2	232.730	47.64	-13.15	34.49	46.00	-11.51	Peak
3	366.590	47.91	-9.16	38.75	46.00	-7.25	Peak
4	431.580	45.31	-7.11	38.20	46.00	-7.80	Peak
5	499.480	40.94	-4.79	36.15	46.00	-9.85	Peak
6	567.380	40.14	-3.48	36.66	46.00	-9.34	Peak
7	730.340	39.29	-0.04	39.25	46.00	-6.75	Peak

RECEIVER SPURIOUS EMISSIONS FOR 30 TO 1000 MHz, VERTICAL

Compliance Certification Services
47173 Benicia Street
Fremont, CA 94538
Tel: (510) 771-1000
Fax: (510) 661-0888

Data#: 29 File#: 08u12127.emi Date: 11-26-2008 Time: 08:44:50



Trace: 11 Ref Trace:

Condition: FCC CLASS-B VERTICAL
Test Operator:: Chin Pang
Project #: : 08U12127
Company: : Qualcomm
Configuration:: EUT and antenna
Mode : : RX
Target: : FCC class B

Page: 1

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	
1	201.690	47.97	-12.98	34.99	43.50	-8.51	Peak
2	400.540	42.70	-8.18	34.52	46.00	-11.48	Peak
3	458.740	44.46	-6.18	38.28	46.00	-7.72	Peak
4	531.490	41.54	-4.18	37.36	46.00	-8.64	Peak
5	730.340	42.16	-0.04	42.12	46.00	-3.88	Peak
6	848.680	40.68	1.74	42.42	46.00	-3.58	QP
7	848.680	41.78	1.74	43.52	46.00	-2.48	Peak

13. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f^2)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500			f/1500	30
1500–100,000			1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

CALCULATIONS

Given

$E = \sqrt{(30 * P * G)} / d$

and

$S = E ^ 2 / 3770$

where

E = Field Strength in Volts/meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

$d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P (mW) = P (W) / 1000 and
d (cm) =100 * d (m)

yields

$d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$
$d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

P (mW) = 10 ^ (P (dBm) / 10) and
G (numeric) = 10 ^ (G (dBi) / 10)

yields

$d = 0.282 * 10 ^ ((P + G) / 20) / \sqrt{S}$ Equation (1)

where

d = MPE distance in cm
P = Power in dBm
G = Antenna Gain in dBi
S = Power Density Limit in mW/cm^2

Equation (1) and the measured peak power is used to calculate the MPE distance.

LIMITS

From §1.1310 Table 1 (B), S = 0.549 mW/cm^2 (Cell) and 1.0 mW/cm^2 (PCS)

RESULTS

No non-compliance noted: (MPE distance equals 20 cm)

Cellular Band

Modulation	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)	FCC MPE Limit (mW/cm^2)
GMSK (GSM)	20.0	32.71	0.00	0.371	0.549
8PSK (EGPRS)	20.0	30.33	0.00	0.214	0.549
UMTS - Rel 99	20.0	28.17	0.00	0.130	0.549
UMTS - HSDPA	20.0	28.75	0.00	0.149	0.549

PCS Band

Modulation	MPE Distance (cm)	Output Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm^2)	FCC MPE Limit (mW/cm^2)
GMSK (GSM)	20.0	29.6	0.00	0.180	1.0
8PSK (EGPRS)	20.0	29.3	0.00	0.167	1.0
UMTS - Rel 99	20.0	25.0	0.00	0.063	1.0
UMTS - HSDPA	20.0	30.0	0.00	0.196	1.0

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.