FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E
CERTIFICATION TEST REPORT

FOR

TABLET with GSM/GPRS/EDGE/WCDMA, 802.11bgn, BT3.0

MODEL NUMBER: GT-P3100

FCC ID: A3LGTP3100

REPORT NUMBER: 12I14206-1

ISSUE DATE: FEBRUARY 17, 2012

Prepared for

SAMSUNG ELECTRONICS CO., LTD.
416, MAETAN 3-DONG, YEONGTONG-GU
SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA

Prepared by

COMPLIANCE CERTIFICATION SERVICES (UL CCS)
47173 BENICIA STREET
FREMONT, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	02/17/12	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

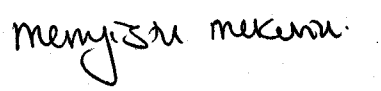
COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD. 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA
EUT DESCRIPTION:	TABLET with GSM/GPRS/EDGE/WCDMA, 802.11bgn, BT3.0
MODEL:	GT-P3100
SERIAL NUMBER:	03004
DATE TESTED:	FEBRUARY 02 TO 16, 2012

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 22H AND 24E	Pass

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

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

Approved & Released For UL CCS By: Tested By:



THU CHAN
ENGINEERING MANAGER
UL CCS

MENGISTU MEKURIA
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

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

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Tablet With GSM/GPRS/EDGE/WCDMA,802.11BGN,BT3.0.

5.2. MAXIMUM OUTPUT POWER

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

Part 22 Cellular Band

Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
824.2 – 848.8	GPRS	32.42	1745.8	27.78	599.8
	EGPRS	29.70	933.3	25.03	318.4
826.4 – 846.6	UMTS, REL 99	25.65	367.3	20.83	121.1
	UMTS, REL 5	27.19	523.6	24.42	276.7

Part 24 PCS Band

Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2 – 1909.8	GPRS	29.73	939.7	32.87	1936.4
	EGPRS	28.68	737.9	31.69	1475.7
1852.4 – 1907.6	UMTS, REL 99	25.34	342.0	30.42	1101.5
	UMTS, REL 5	26.58	455.0	31.03	1267.7

5.3. SOFTWARE AND FIRMWARE

Bluetooth firmware - BCM4330B1_002.001.003.0634.0678.hcd

Wi-Fi Firmware Rev 5.90.125.1191

EUT driver software version: P3100.001

5.4. WORST-CASE CONFIGURATION AND MODE

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

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

Worst-case modes: GPRS, EGPRS, UMTS REL 99 and HSUPA Sub-set 5.

Since the EUT is a portable device, to determine the worst/highest emissions, the X, Y, and Z orientations of the EUT with respect to the turntable and the worst among them with headset and an AC adapter were investigated. After the investigations the Y-orientation with headset and Y-orientation with headset and an AC adapter was turned out to be the worst case for cell and PCS bands respectively.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	ETA-P11X	3046	DoC
Headset	Samsung	EHS64AVFWE	3040	NA

I/O CABLES (CONDUCTED)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	115VAC	Un-shielded	1.5m	N/A
2	DC	1	Flat DC Connector	Un-shielded	1.0m	USB other End
3	Antenna Port	1	BNC	Un-shielded	1.7m	N/A
4	RF In/Out	1	SMA	Shielded	0.6m	N/A

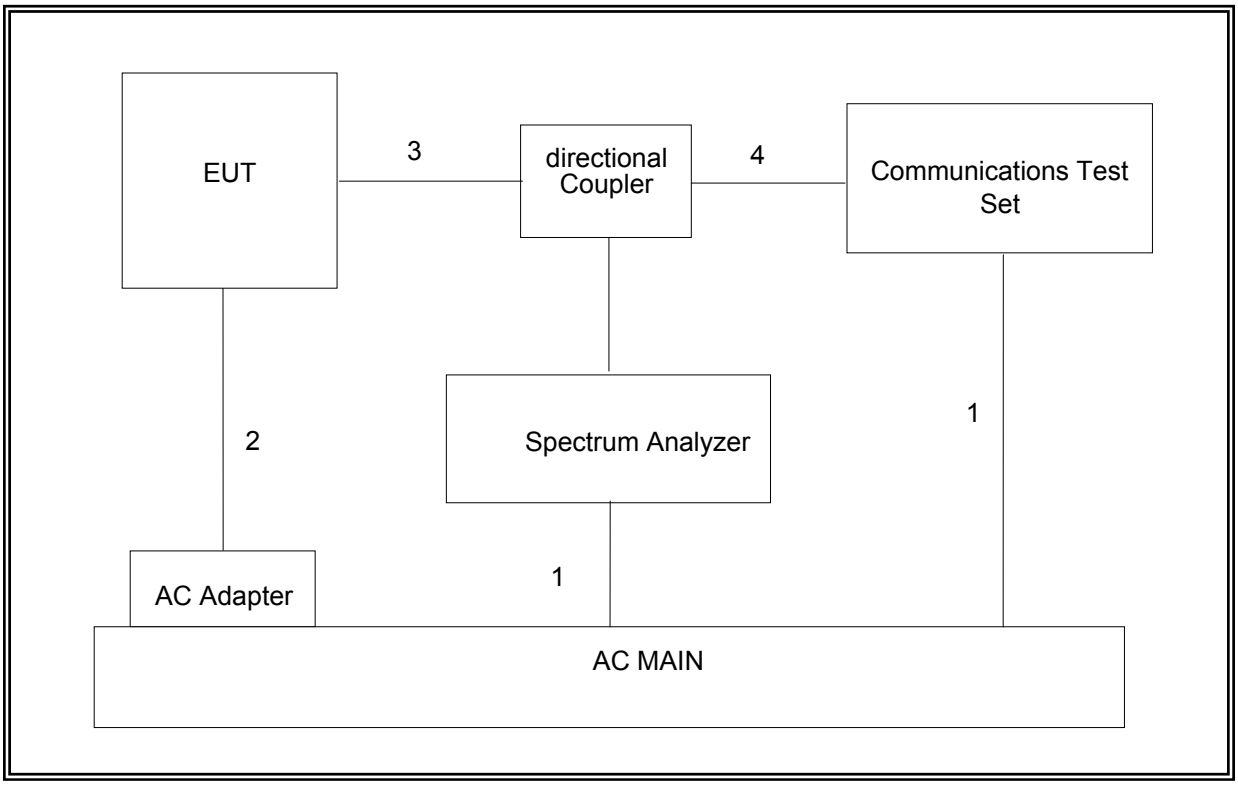
I/O CABLES (RADIATED)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	Jack	1	Earphone	Un-shielded	1.5m	Volume Control on Cable
2	DC	1	Flat DC	Un-shielded	1.0m	USB other End

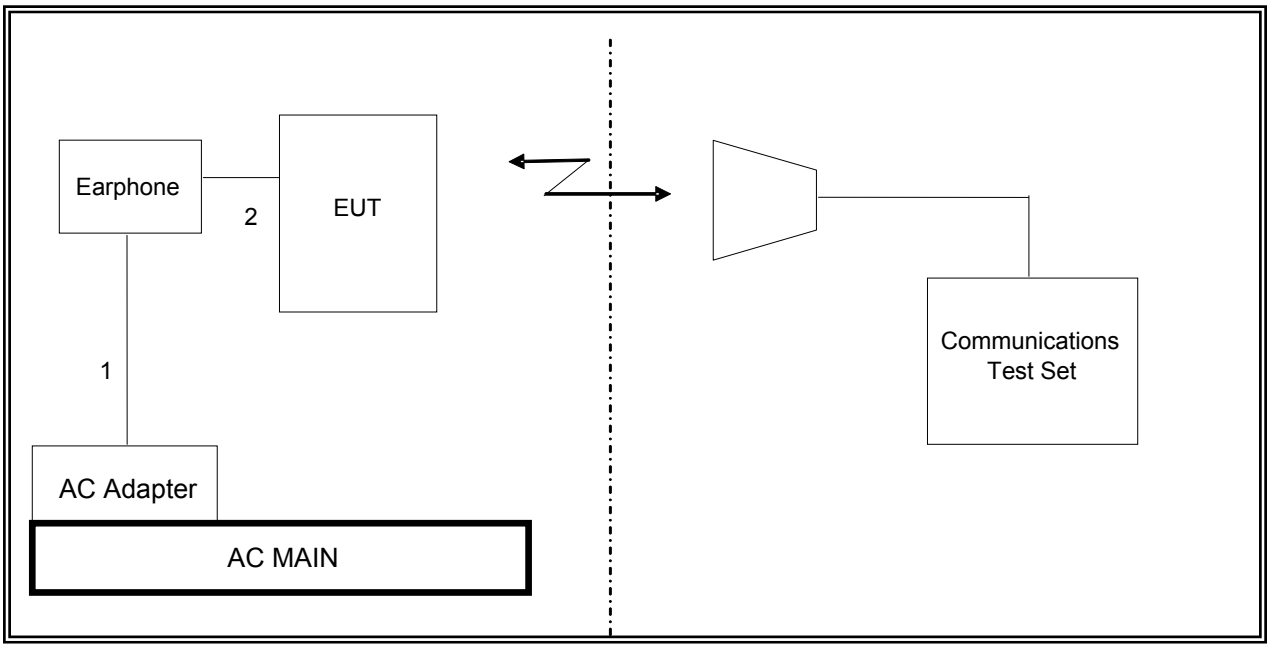
TEST SETUP

The EUT is a stand-alone device. A link is established between the EUT and the Agilent communications test set.

SETUP DIAGRAM FOR RF CONDUCTED TESTS



SETUP DIAGRAM FOR RF RADIATED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	05/11/12
Antenna, Horn, 18 GHz	EMCO	3115	C00872	06/29/12
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	07/16/12
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	11/11/12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/12/12
Communication Test Set	Agilent / HP	E5515C	C01086	06/17/12
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	04/20/12
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689`	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Directional Coupler	Krytar	1817	N02656	CNR
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/14/12
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00993	07/16/12

7. RF POWER OUTPUT VERIFICATION

7.1. RF POWER OUTPUT FOR GSM MODE

TEST PROCEDURE

GPRS/EGPRS

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

Press Connection control to choose the different menus

Press RESET > choose all to reset all settings

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

Network Support > GSM+GPRS or GSM+EGPRS

Main Service > Packet Data

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

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

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850/900

> 27 dBm for EGPRS 850/900

> 30 dBm for GPRS1800/1900

> 26 dBm for EGPRS1800/1900

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

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

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

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

Channel Type > Off

P0> 4 dB

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

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3 (Default)

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

Bit Stream > 2E9-1PSR Bit Pattern

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

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

RESULTS

GPRS for Cell and PCS Band

Mode	Ch.	f (MHz)	1 time slot Peak (dBm)	2 time slots Peak (dBm)	3 time slots Peak (dBm)	4 time slots Peak (dBm)
GPRS	128	824.2	32.41	30.04	28.56	27.12
	190	836.6	**32.42**	30.01	28.54	27.12
	251	848.8	32.40	29.98	28.51	27.06
GPRS	512	1850.2	29.66	27.17	25.71	24.26
	661	1880.0	29.72	27.24	25.75	24.3
	810	1909.8	**29.73**	27.25	25.78	24.32

EGPRS for Cell and PCS Band

Mode	Ch.	f (MHz)	1 time slot Peak (dBm)	2 time slots Peak (dBm)	3 time slots Peak (dBm)	4 time slots Peak (dBm)
EGPRS	128	824.2	29.59	29.68	**29.70**	26.75
	190	836.6	29.56	29.65	29.66	26.73
	251	848.8	29.53	29.63	29.63	26.71
EGPRS	512	1850.2	28.53	28.62	27.65	25.67
	661	1880.0	28.57	28.67	27.68	25.67
	810	1909.8	28.57	**28.68**	27.68	25.68

7.2. RF POWER OUTPUT FOR UMTS REL99

TEST PROCEDURE

The following summary of these settings are illustrated below:

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

RESULTS

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
				Peak
UMTS 850	4132	4357	826.4	**25.65**
	4183	4408	836.6	25.41
	4233	4458	846.6	25.49

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
				Peak
UMTS 1900	9262	9662	1852.4	24.89
	9400	9800	1880.0	**25.34**
	9538	9938	1907.6	25.23

7.3. RF POWER OUTPUT FOR UMTS Rel 6 HSDPA

TEST PROCEDURE

The following summary of these settings are illustrated below:

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

RESULT

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS850 (Band IV)	1	4132	4357	826.4	25.83
		4183	4408	836.6	25.73
		4233	4458	846.6	25.67
	2	4132	4357	826.4	26.73
		4183	4408	836.6	26.50
		4233	4458	846.6	26.73
	3	4132	4357	826.4	26.96
		4183	4408	836.6	26.82
		4233	4458	846.6	26.84
	4	4132	4357	826.4	26.83
		4183	4408	836.6	26.65
		4233	4458	846.6	26.69

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS1900 (Band II)	1	9262	9662	1852.4	25.03
		9400	9800	1880.0	25.53
		9538	9938	1907.6	25.57
	2	9262	9662	1852.4	25.88
		9400	9800	1880.0	26.33
		9538	9938	1907.6	26.37
	3	9262	9662	1852.4	25.88
		9400	9800	1880.0	26.29
		9538	9938	1907.6	26.42
	4	9262	9662	1852.4	25.79
		9400	9800	1880.0	26.03
		9538	9938	1907.6	26.23

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

TEST PROCEDURE

The following summary of these settings are illustrated below:

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

RESULTS

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS850 (Band IV)	1	4132	4357	826.4	26.74
		4183	4408	836.6	26.51
		4233	4458	846.6	26.49
	2	4132	4357	826.4	26.24
		4183	4408	836.6	25.97
		4233	4458	846.6	26.41
	3	4132	4357	826.4	26.95
		4183	4408	836.6	26.85
		4233	4458	846.6	26.78
	4	4132	4357	826.4	25.78
		4183	4408	836.6	25.65
		4233	4458	846.6	25.63
	5	4132	4357	826.4	27.19
		4183	4408	836.6	26.82
		4233	4458	846.6	26.90

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS1900 (Band II)	1	9262	9662	1852.4	25.90
		9400	9800	1880.0	26.31
		9538	9938	1907.6	26.45
	2	9262	9662	1852.4	25.29
		9400	9800	1880.0	25.83
		9538	9938	1907.6	26.04
	3	9262	9662	1852.4	25.76
		9400	9800	1880.0	26.12
		9538	9938	1907.6	26.25
	4	9262	9662	1852.4	24.98
		9400	9800	1880.0	25.44
		9538	9938	1907.6	25.49
	5	9262	9662	1852.4	26.10
		9400	9800	1880.0	26.36
		9538	9938	1907.6	26.58

8. CONDUCTED TEST RESULTS

8.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049

LIMITS

For reporting purposes only

TEST PROCEDURE

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

MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99 and HSUPA

RESULTS

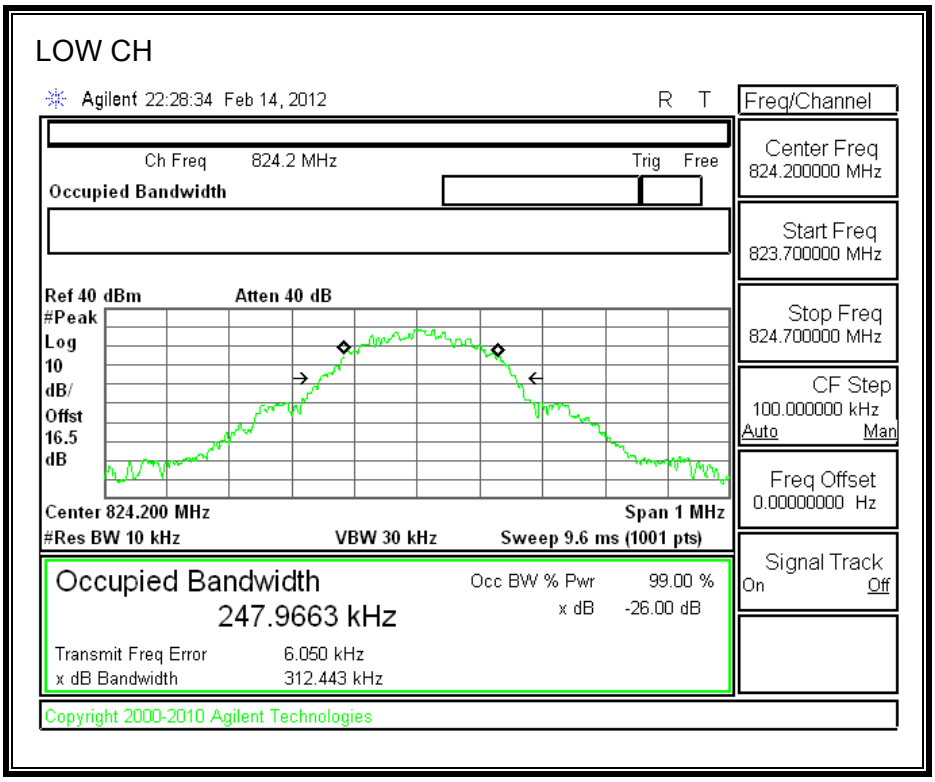
Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.20	247.9663	312.443
		190	836.60	248.1574	310.629
		251	848.80	246.9160	311.943
Cellular	EGPRS	128	824.20	245.6064	301.054
		190	836.60	242.3838	312.460
		251	848.80	239.652	307.609

Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
PCS	GPRS	512	1850.2	254.1285	312.886
		661	1880.0	246.9097	316.745
		810	1909.8	247.8673	311.595
PCS	EGPRS	512	1850,2	248.2529	306.023
		661	1880.0	250.9222	316.525
		810	1909.8	239.6520	307.609

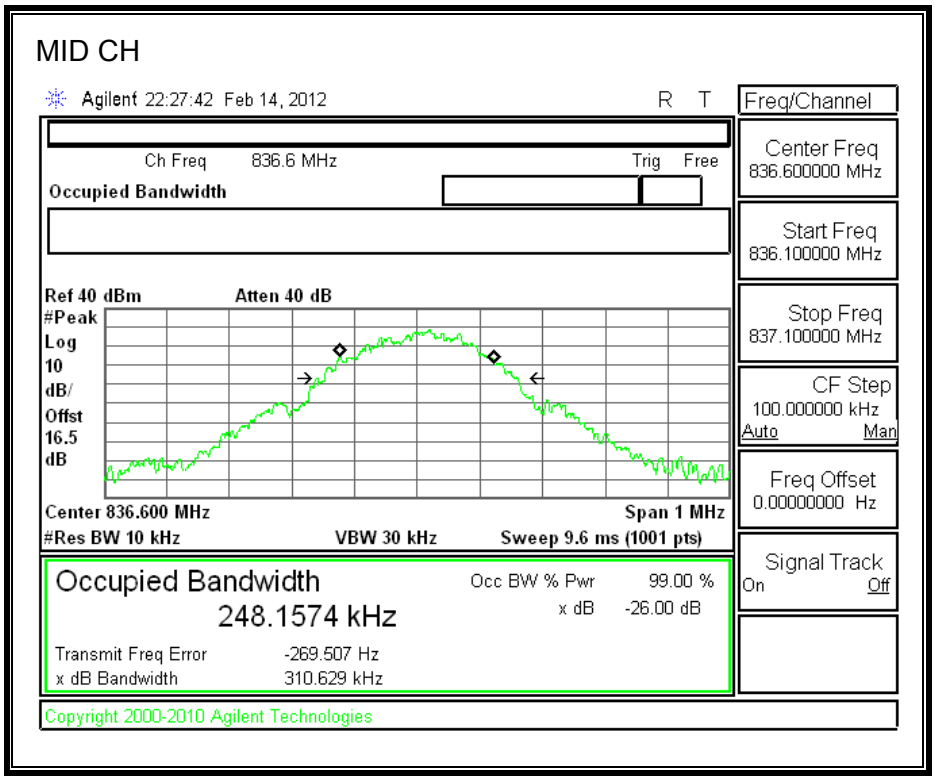
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
CELL	UMTS, REL 99	4357	826.4	4.1239	4.563
		4408	836.6	4.1208	4.612
		4458	846.6	4.1650	4.630
	UMTS, HSUPA	4357	826.4	4.1160	4.443
		4408	836.6	4.0904	4.438
		4458	846.6	4.0892	4.535
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
PCS	UMTS, REL 99	9662	1852.4	4.1161	4.533
		9800	1880.0	4.1116	4.626
		9938	1907.6	4.1161	4.591
	UMTS, HSUPA	9662	1852.4	4.0837	4.552
		9800	1880.0	4.1305	4.465
		9938	1907.6	3.9954	4.555

GPRS Mode (Cellular Band)

LOW CH



MID CH



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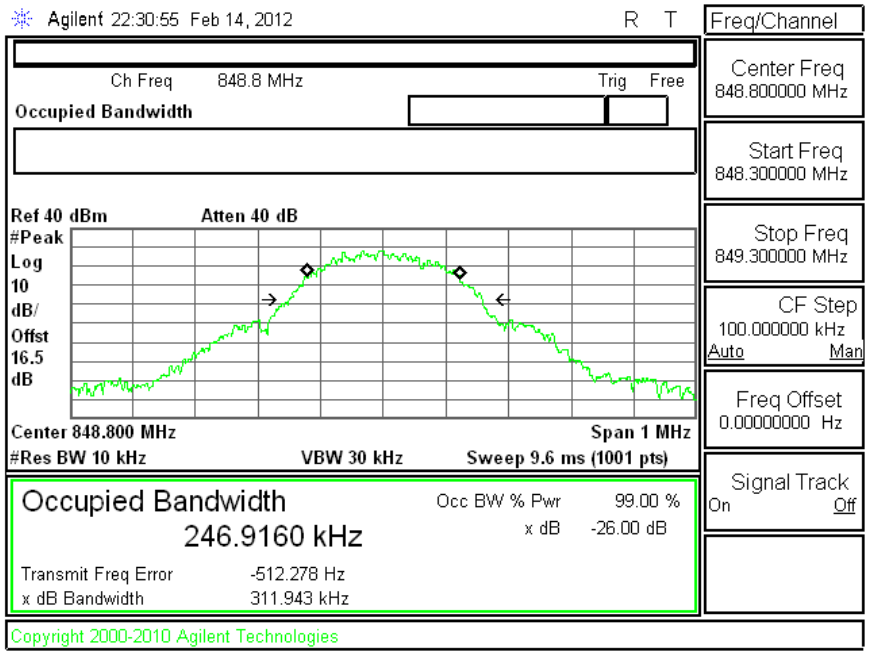
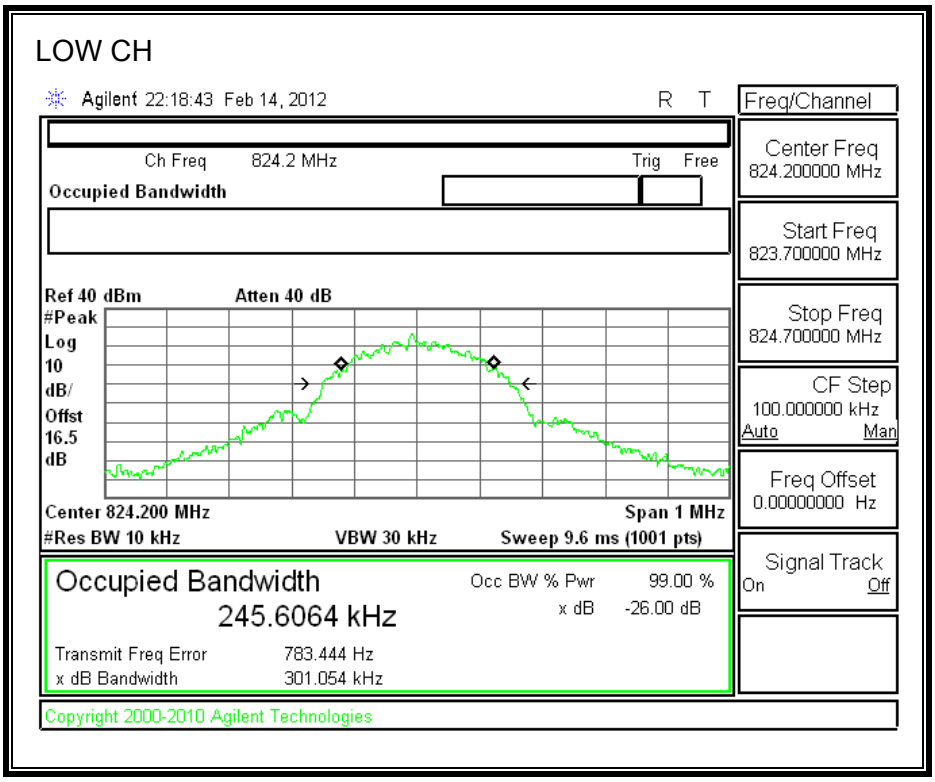


EGPRS Mode (Cellular Band)

LOW CH



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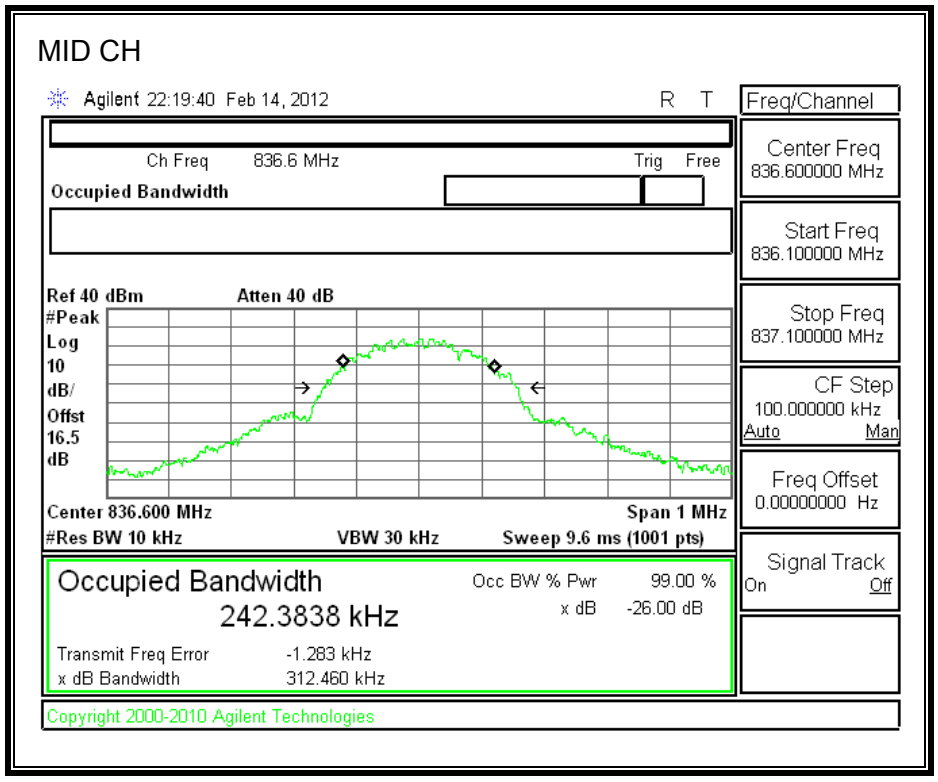
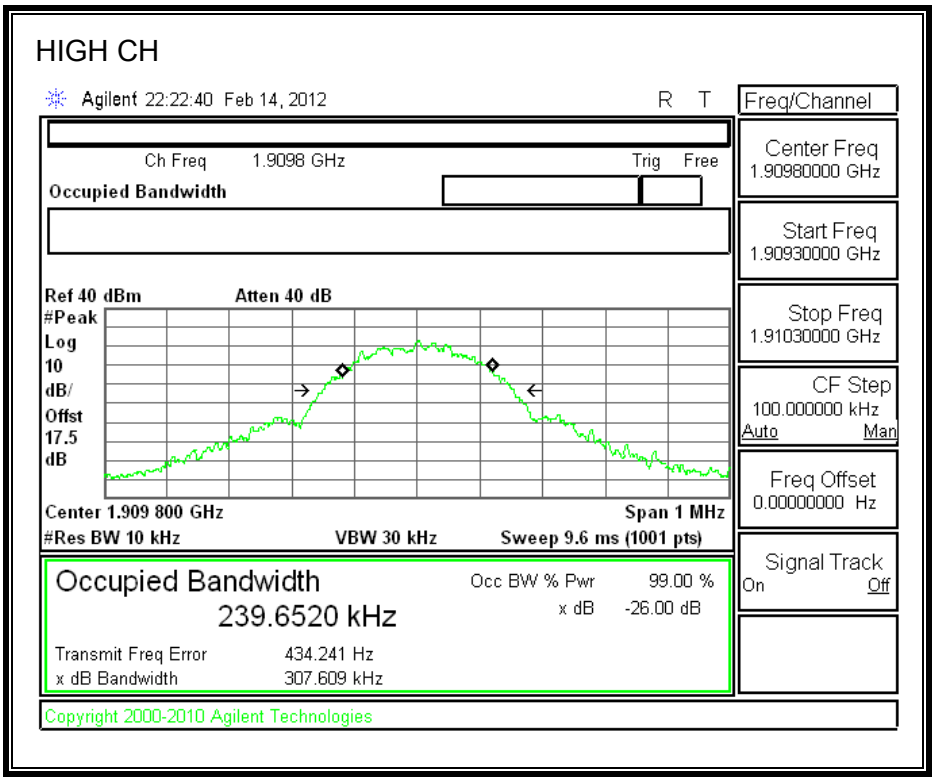
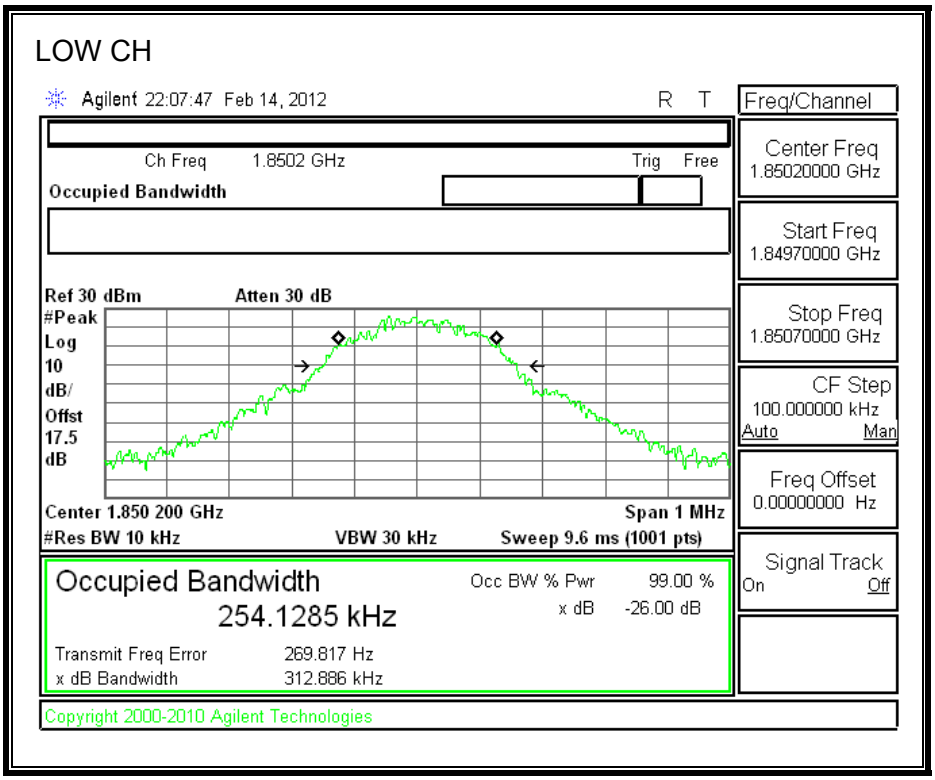


HIGH CH

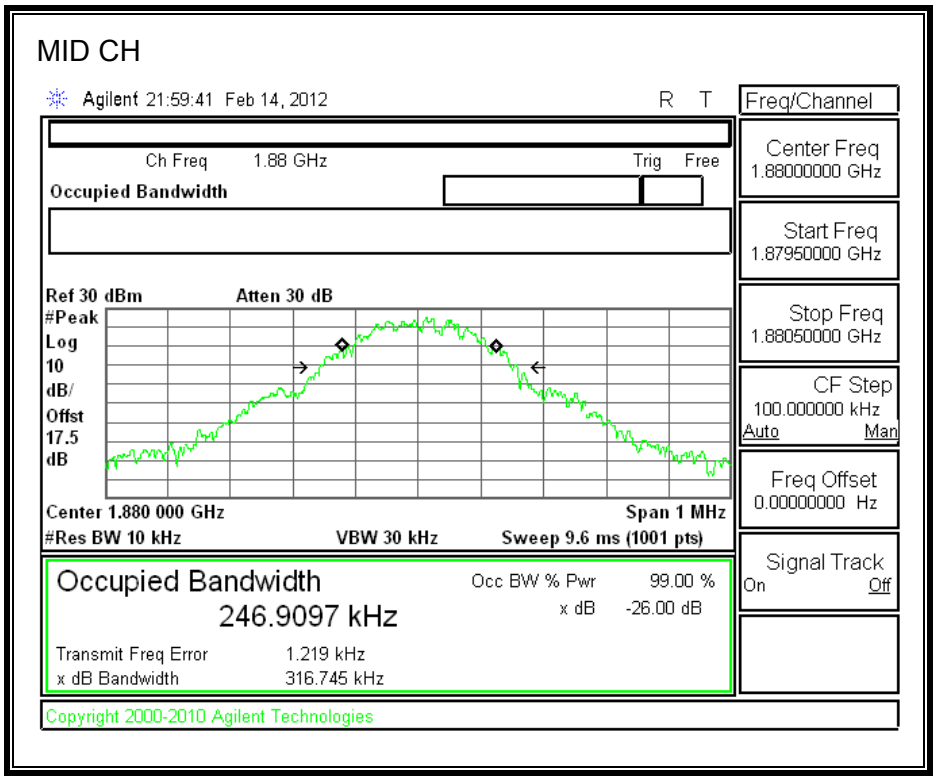


GPRS Mode (PCS Band)

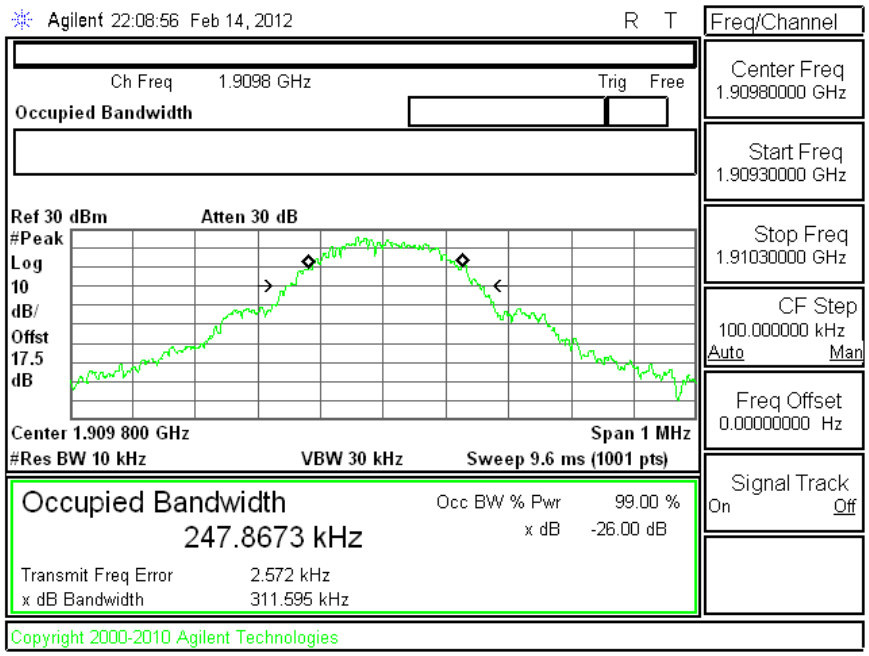
LOW CH



MID CH

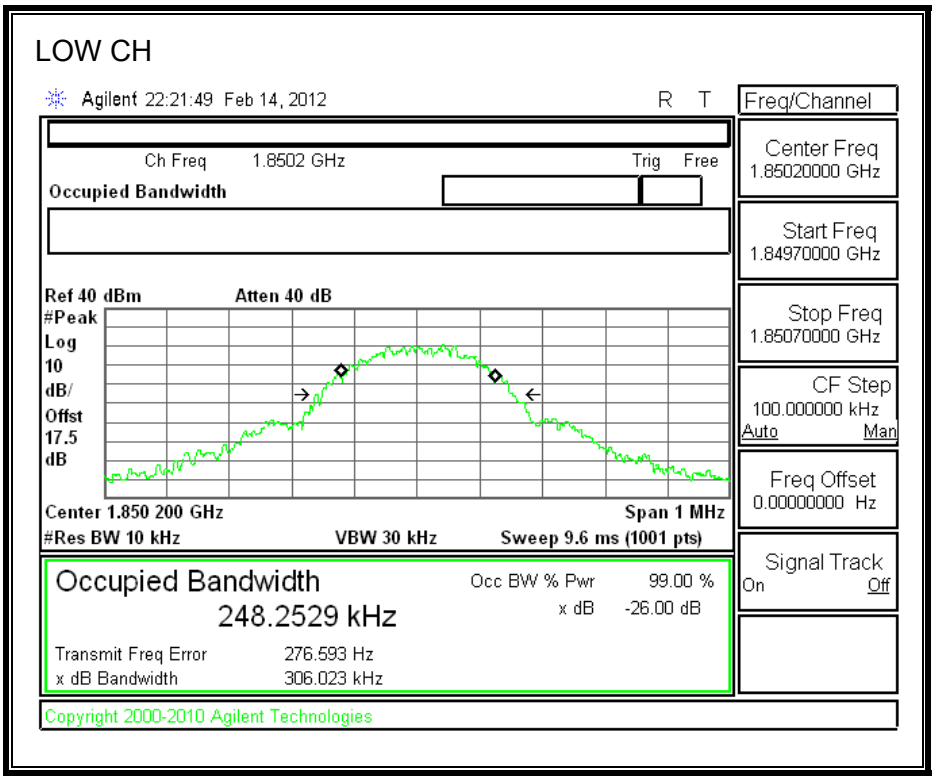


HIGH CH

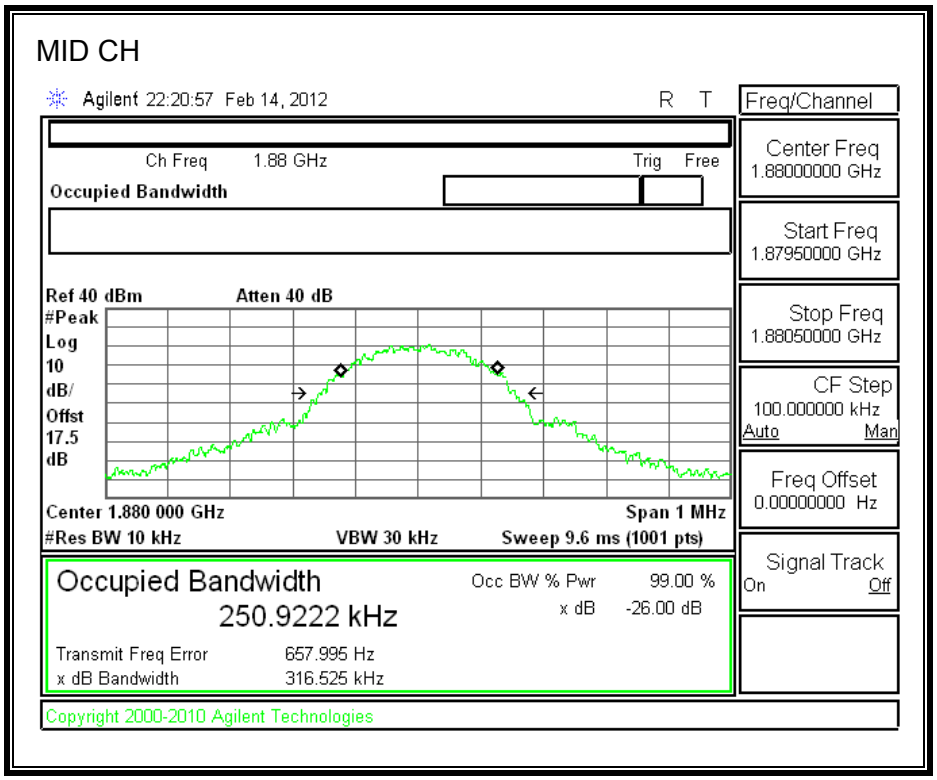


EGPRS Mode (PCS Band)

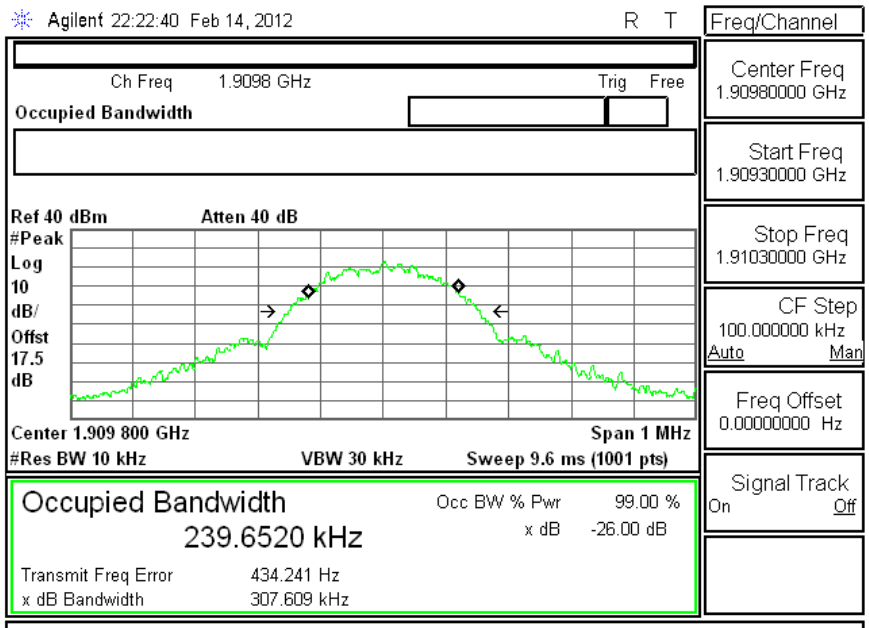
LOW CH



MID CH

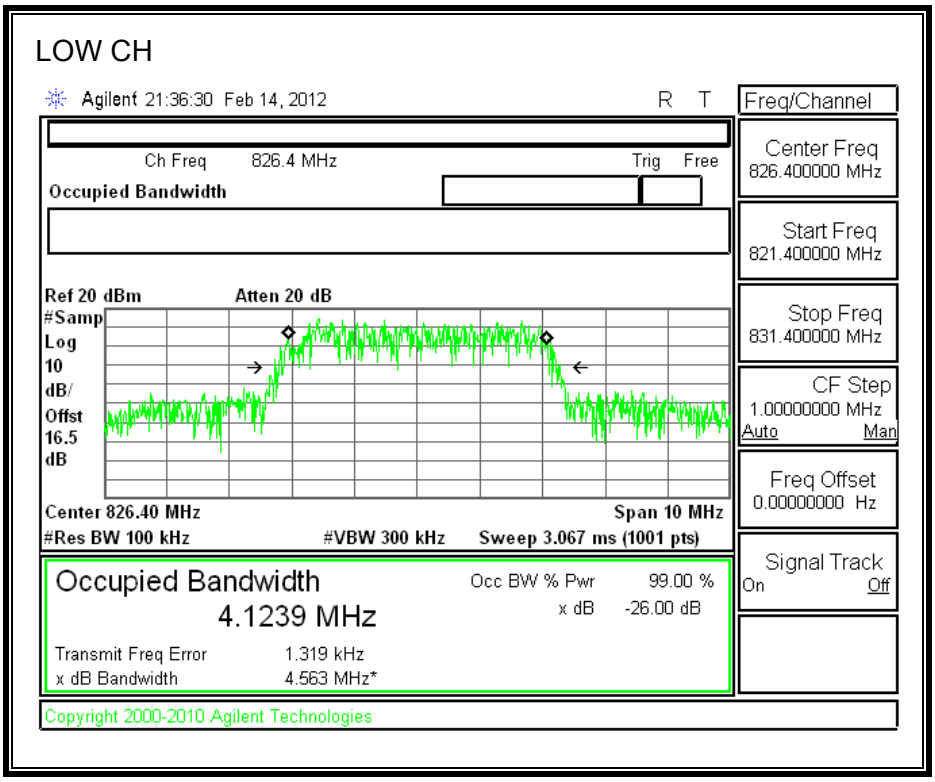


HIGH CH

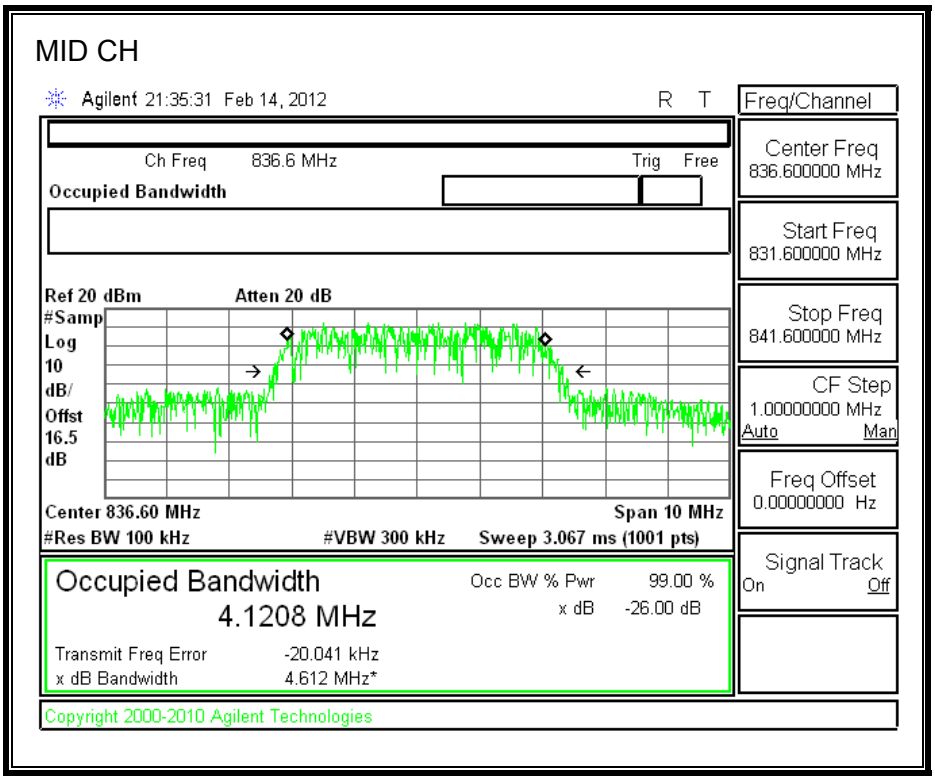


WCDMA850 REL 99 (Cellular Band)

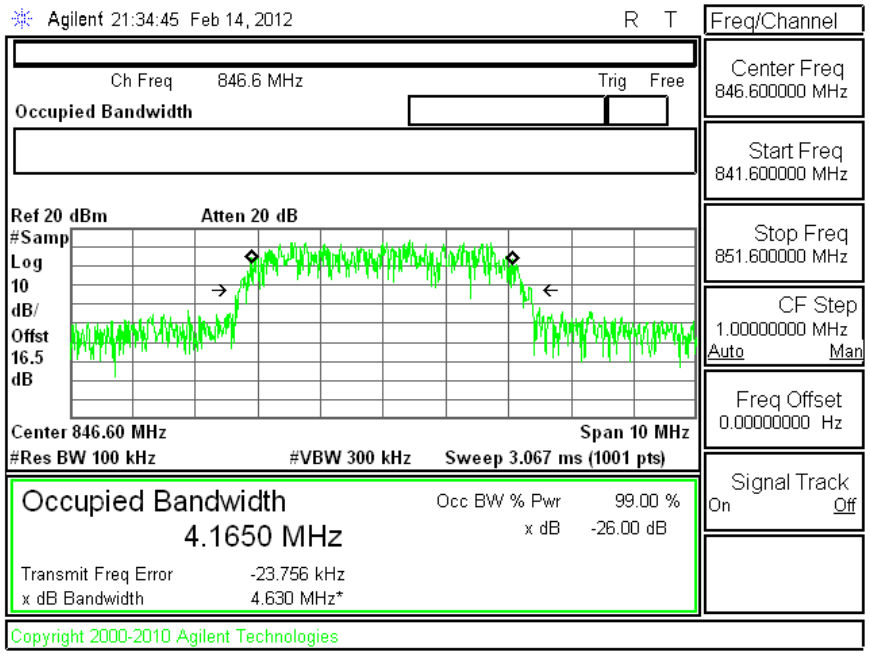
LOW CH



MID CH

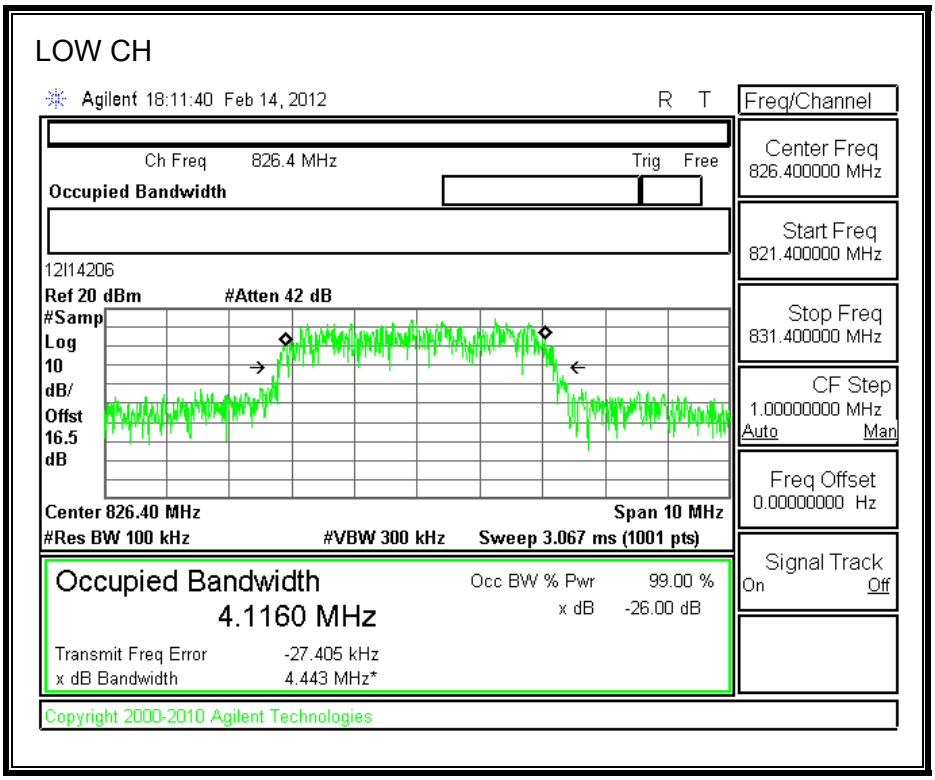


HIGH CH

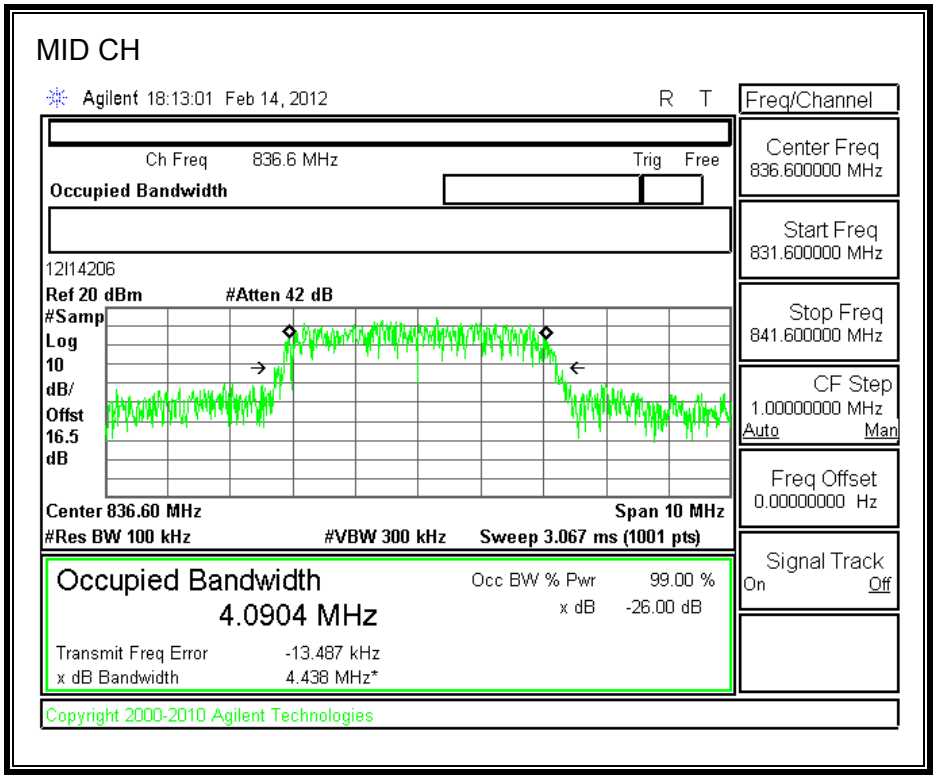


WCDMA850 HSUPA (Cellular Band)

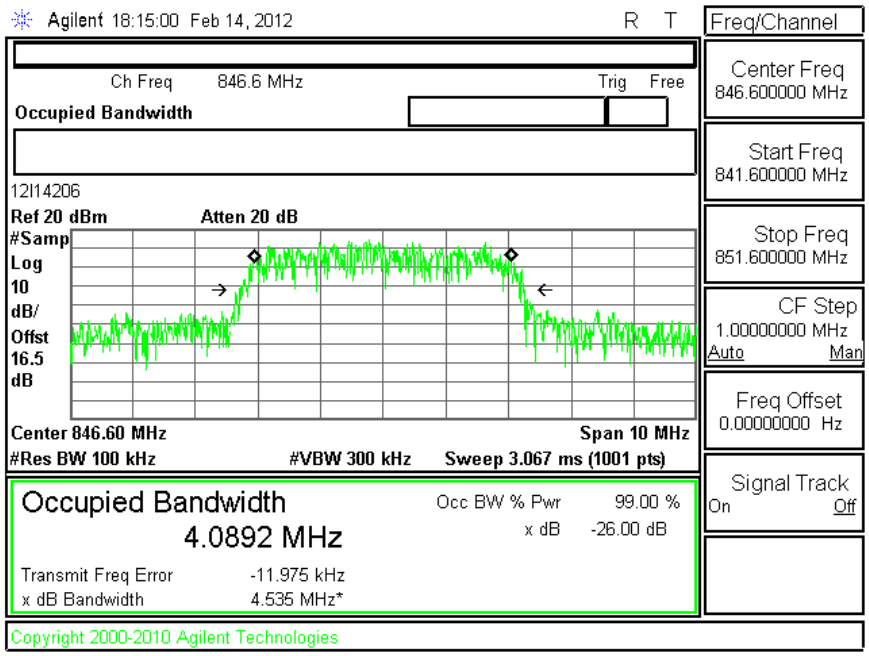
LOW CH



MID CH

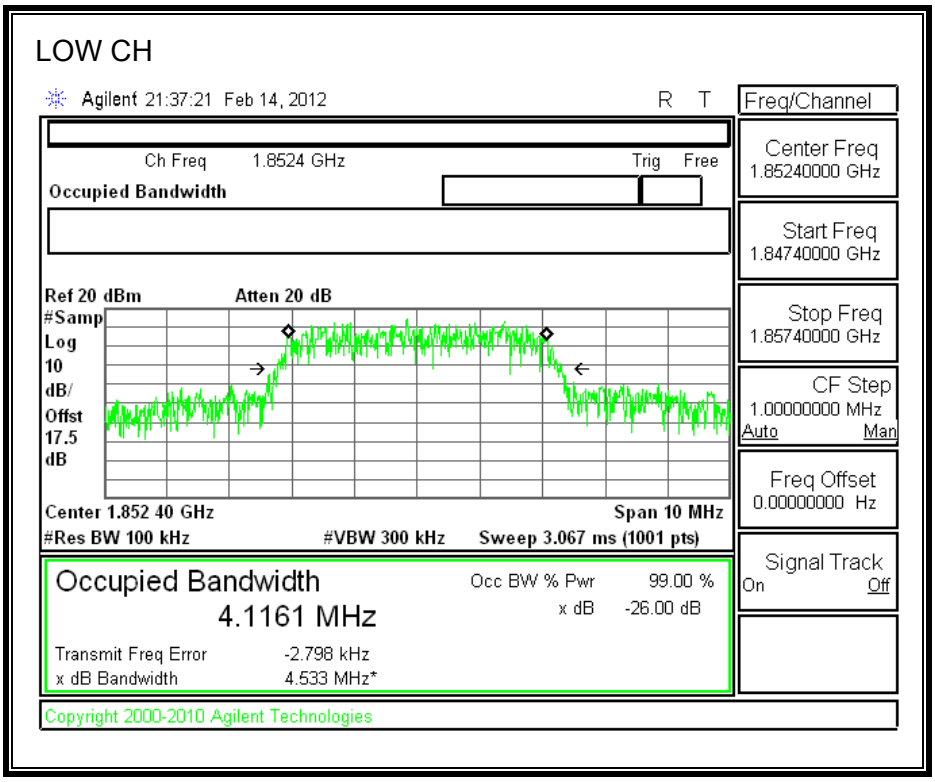


HIGH CH

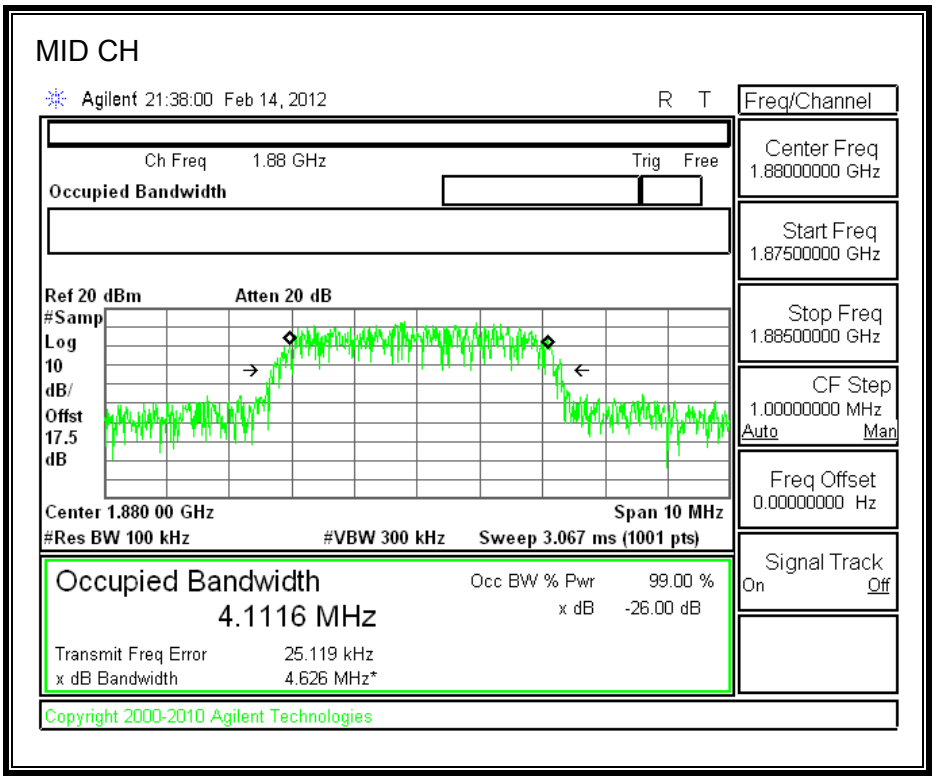


WCDMA1900 REL 99 (PCS Band)

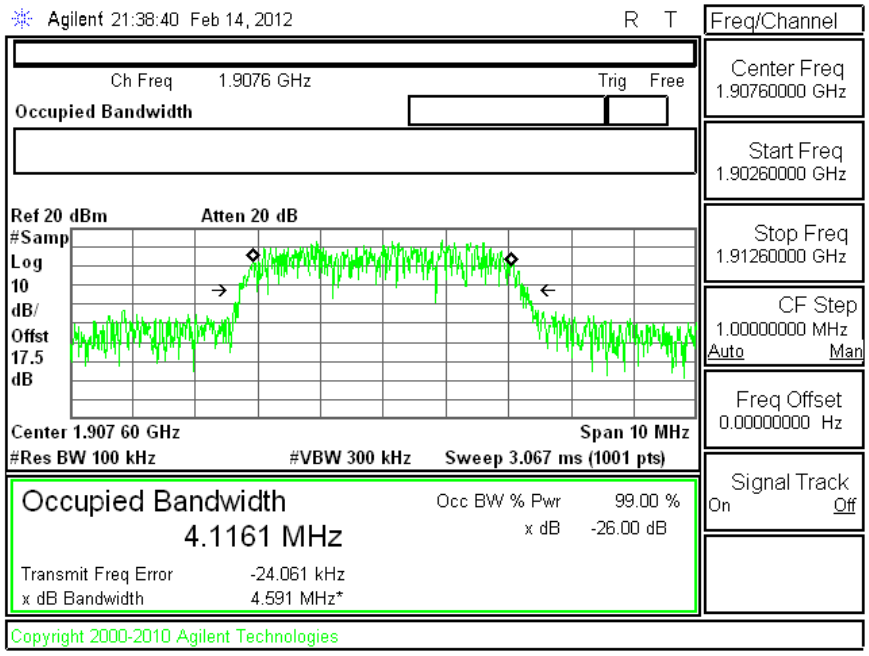
LOW CH



MID CH

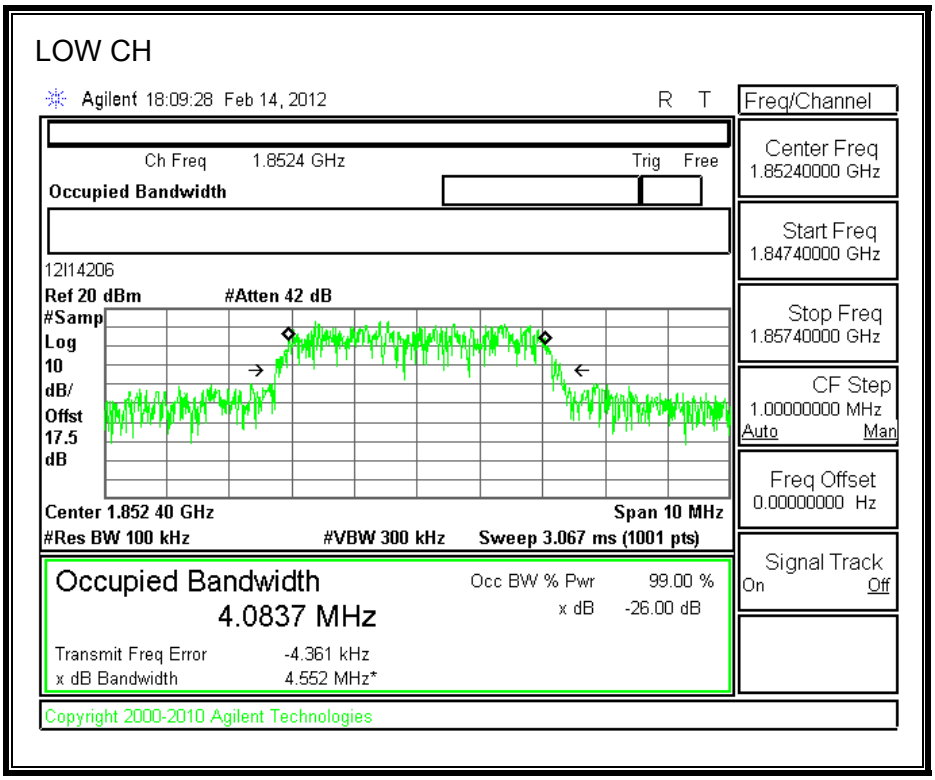


HIGH CH

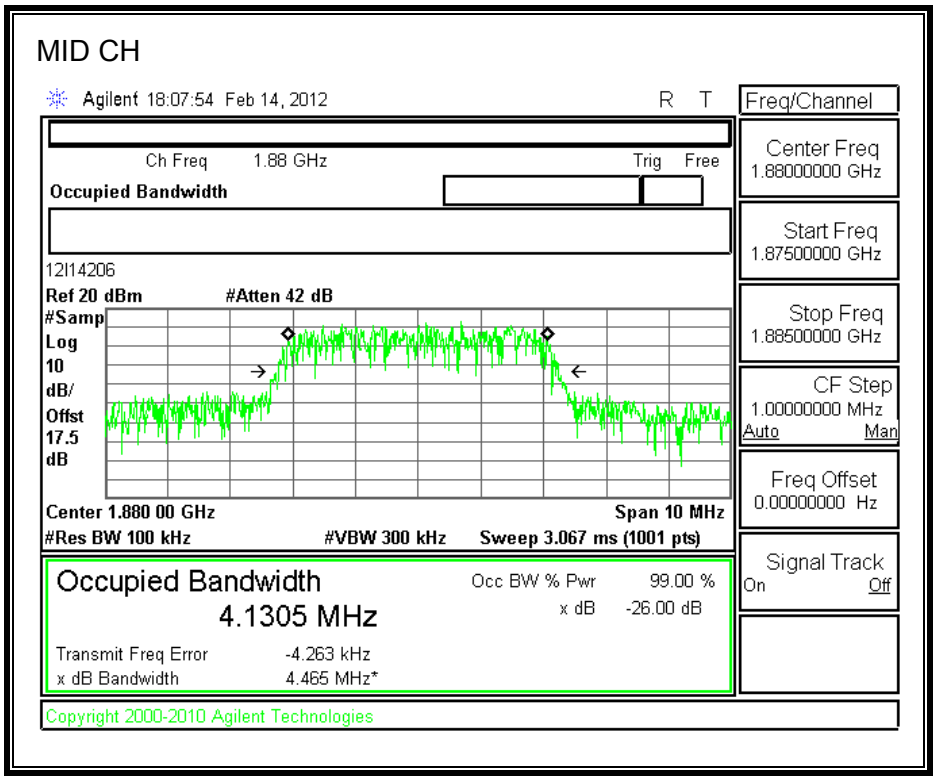


WCDMA1900 HSUPA (PCS Band)

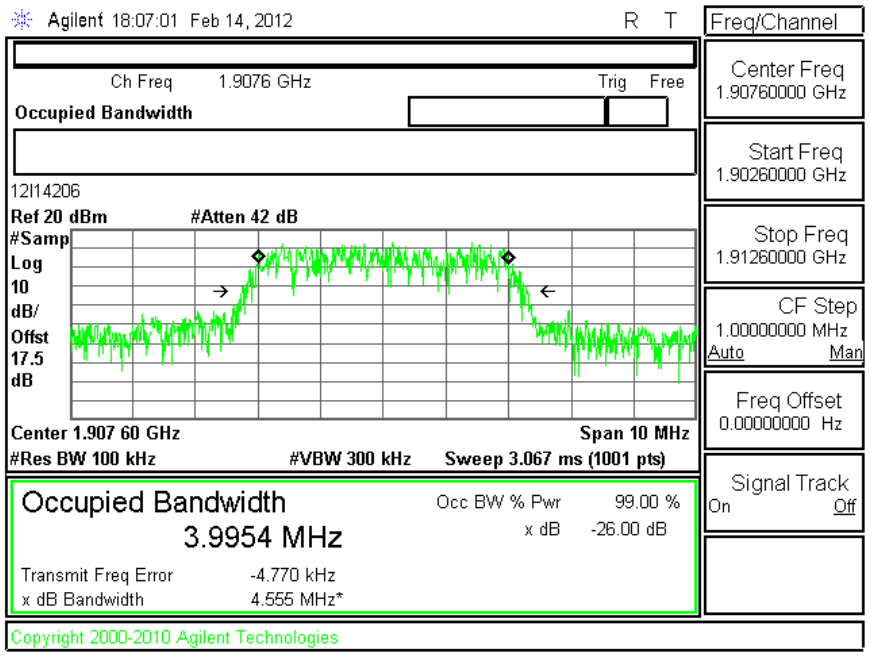
LOW CH



MID CH



HIGH CH



8.2. BAND EDGE

RULE PART(S)

FCC: §22.359, 24.238

LIMITS

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

TEST PROCEDURE

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

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

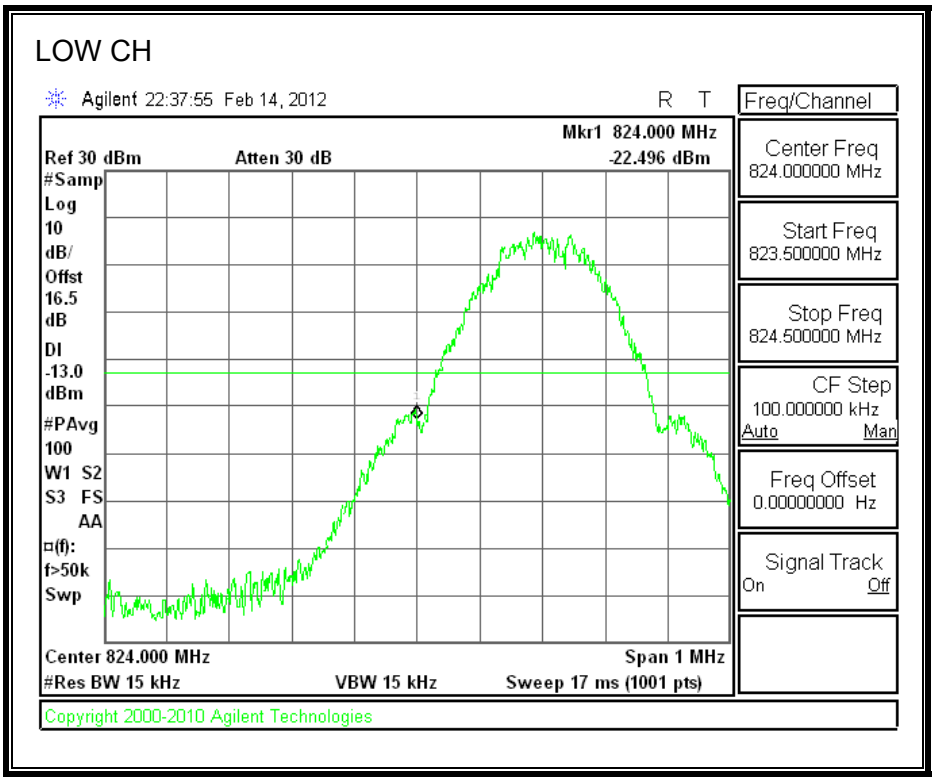
MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99 and HSUPA

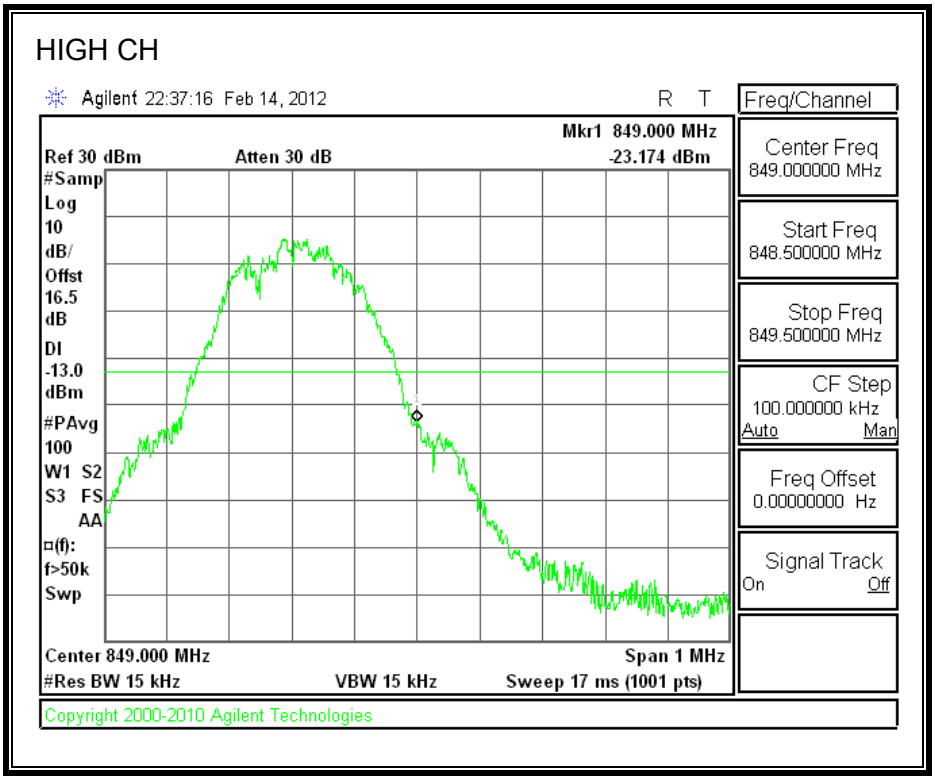
RESULTS

GPRS Mode (Cellular Band)

Low Channel Band Edge

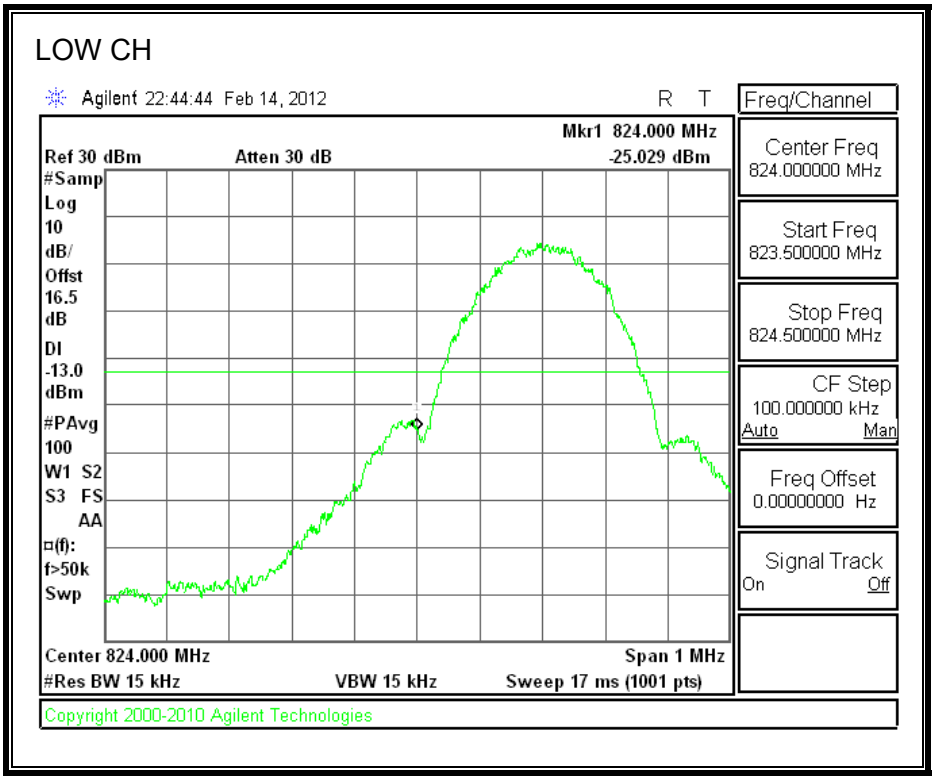


High Channel Band Edge

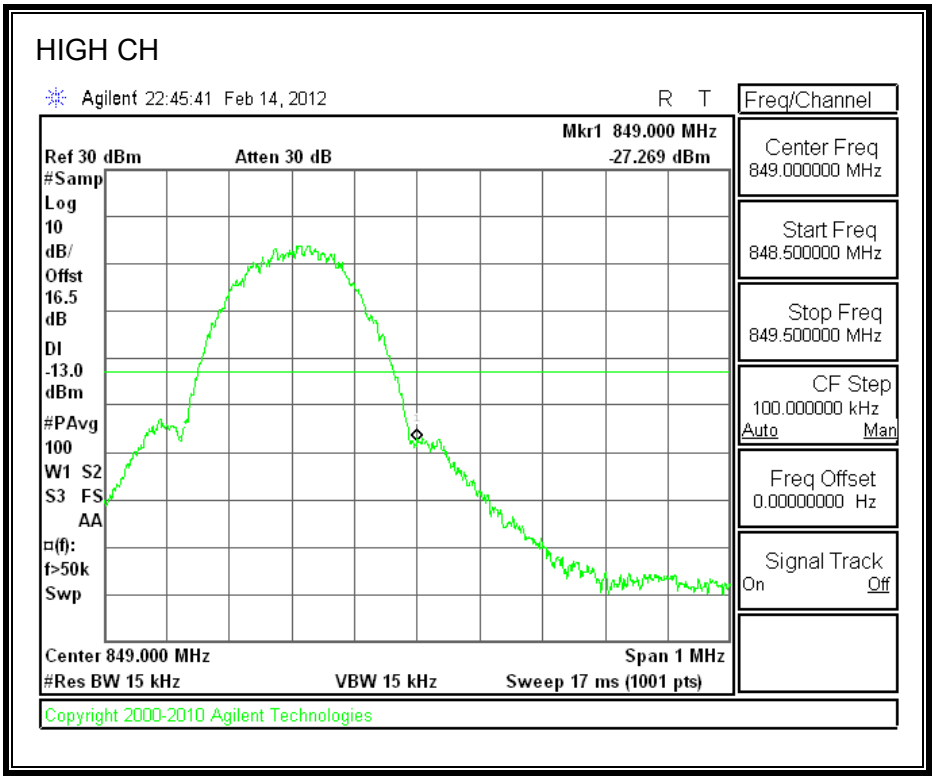


EGPRS Mode (Cellular Band)

Low Channel Band Edge

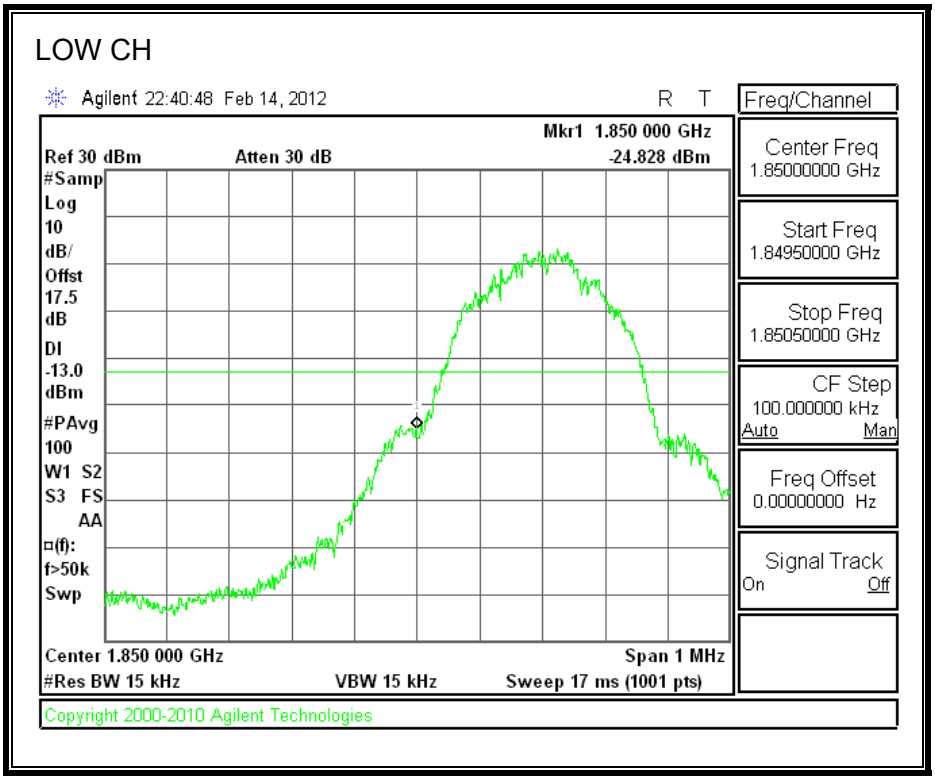


High Channel Band Edge

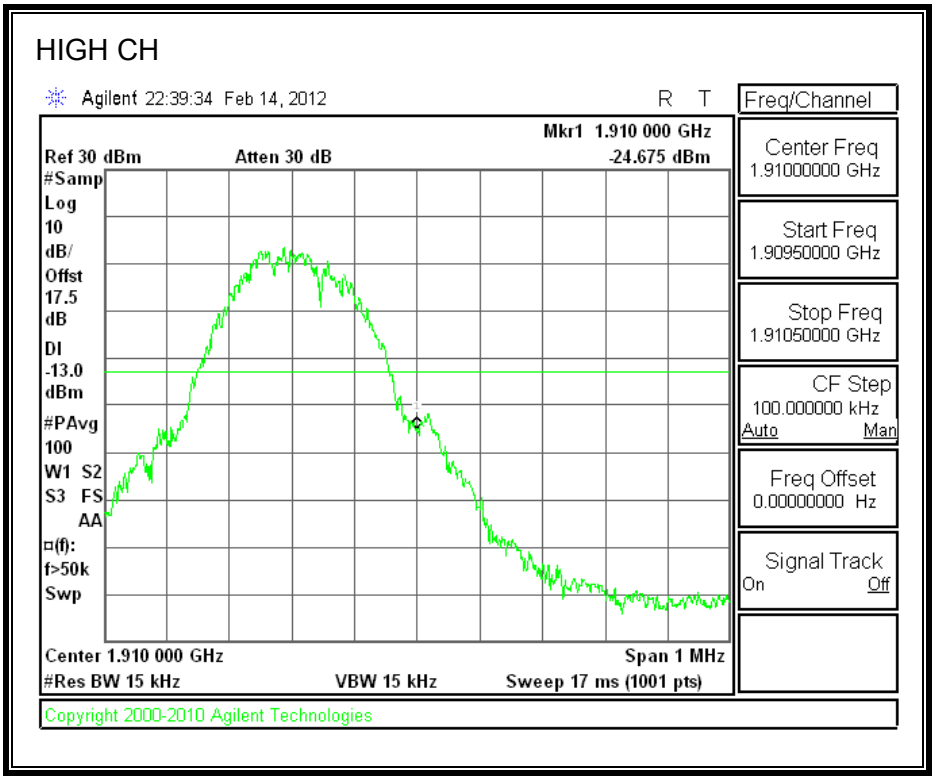


GPRS Mode (PCS Band)

Low Channel Band Edge

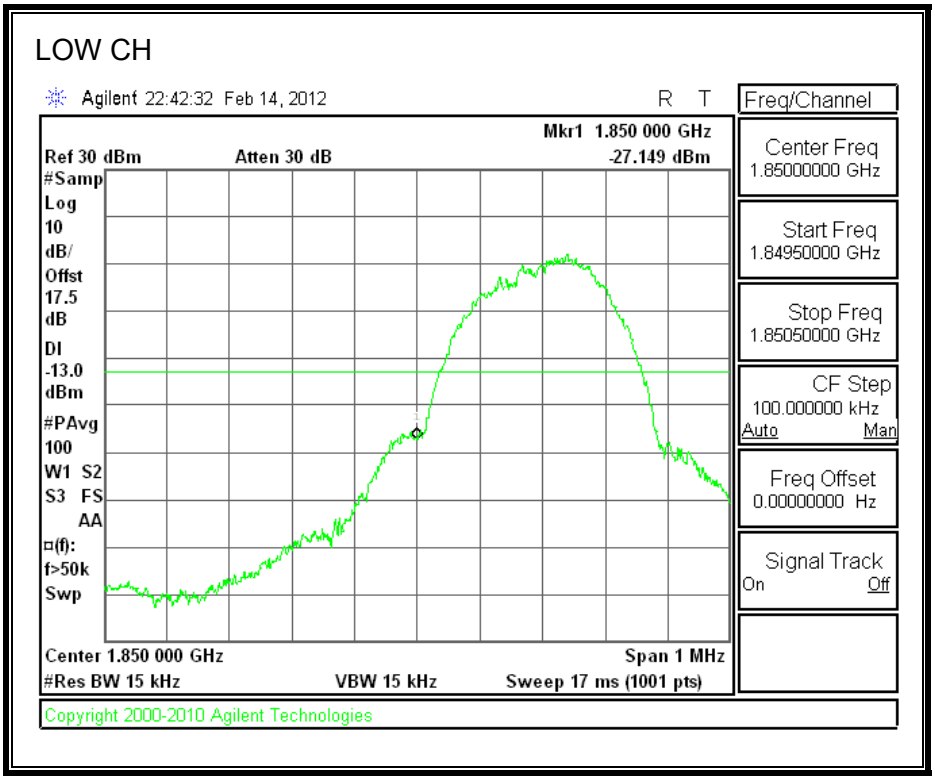


High Channel Band Edge

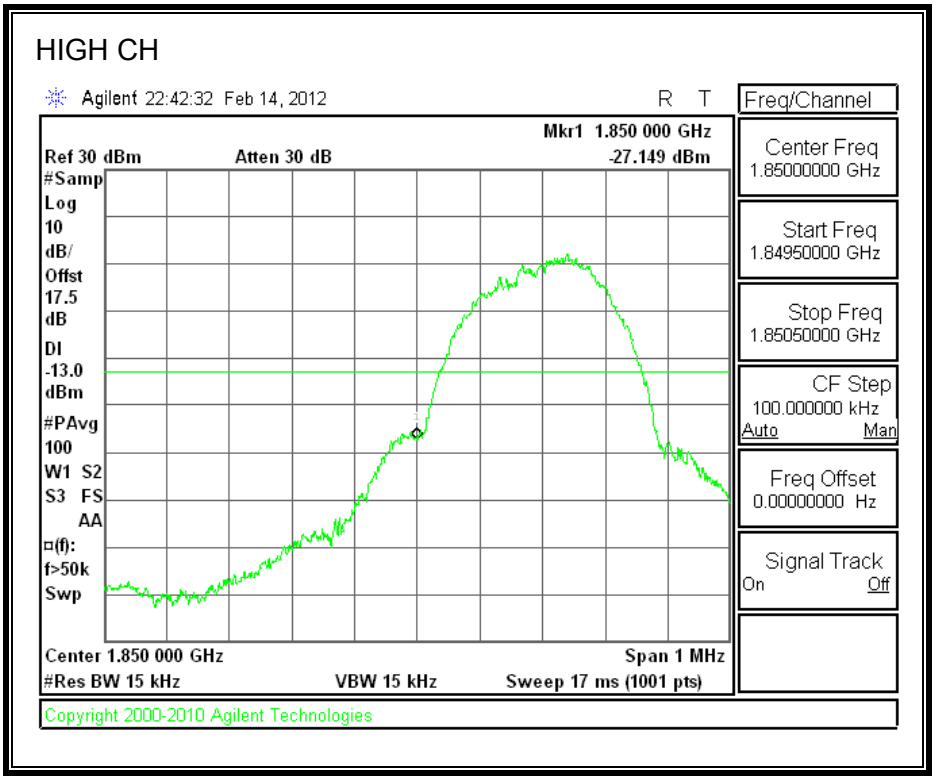


EGPRS Mode (PCS Band)

Low Channel Band Edge

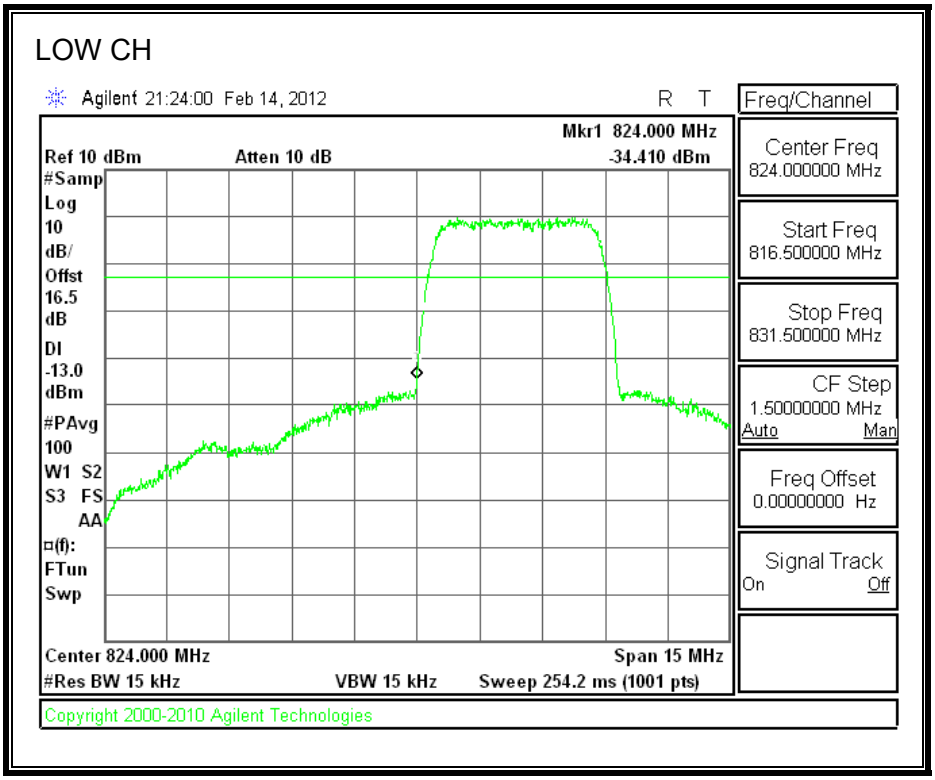


High Channel Band Edge

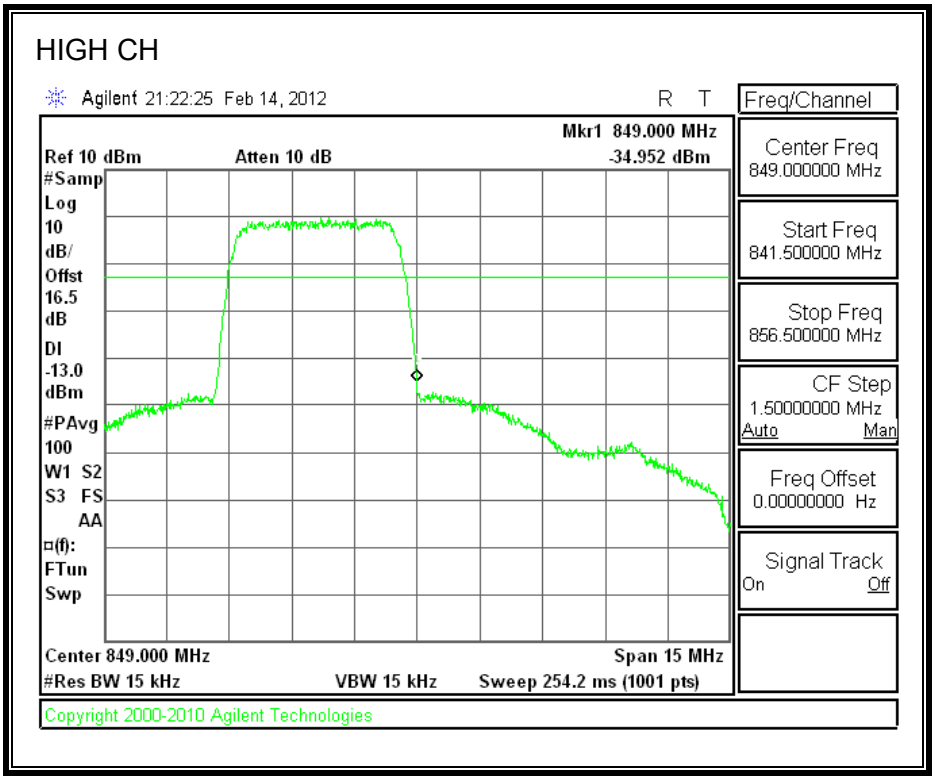


WCDMA 850 REL 99 (Cell Band)

Low Channel Band Edge

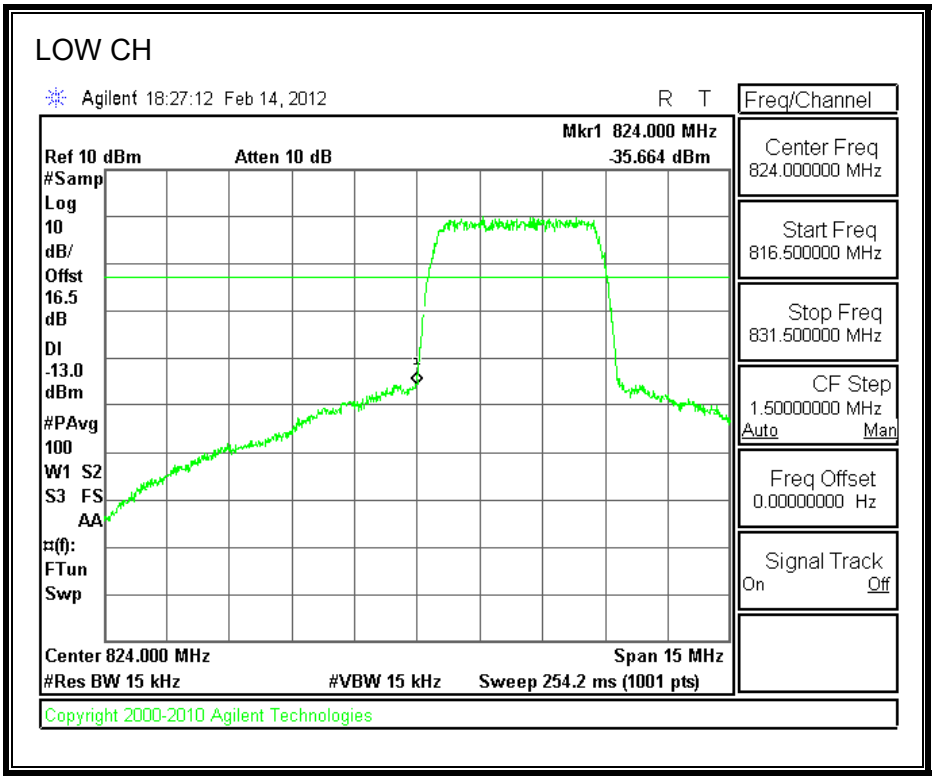


High Channel Band Edge

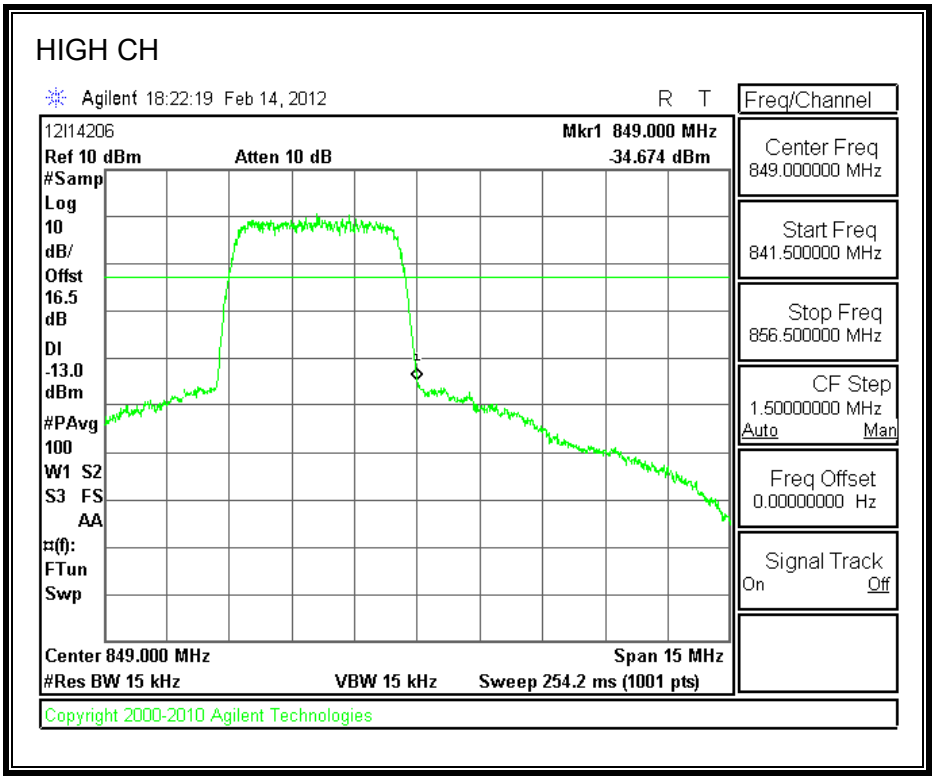


WCDMA 850 HSUPA (Cell Band)

Low Channel Band Edge

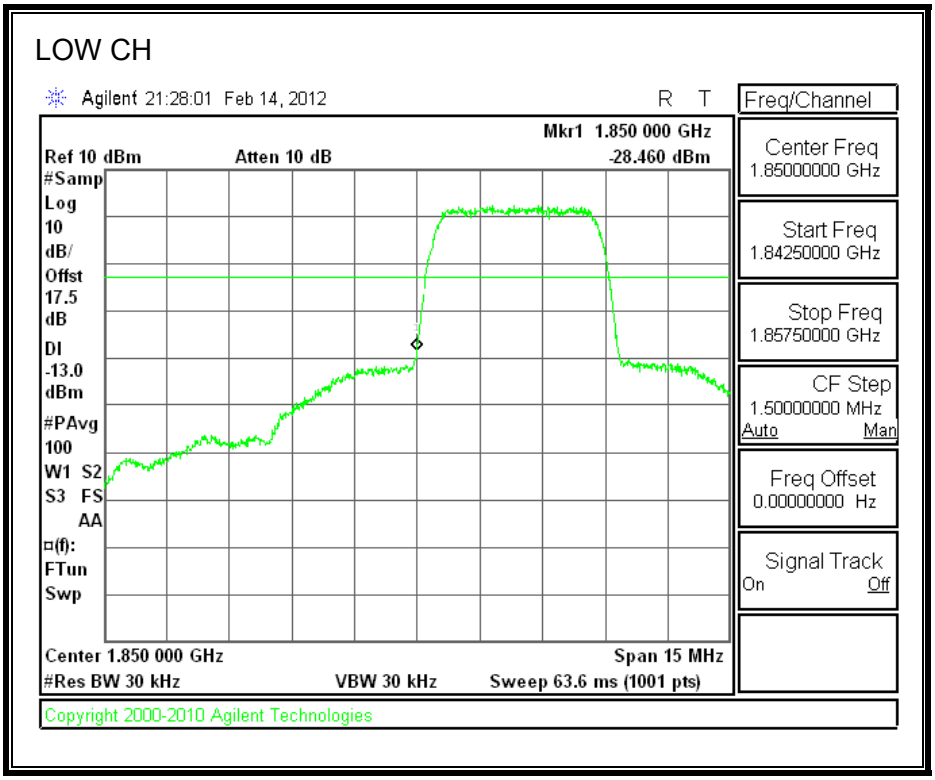


High Channel Band Edge

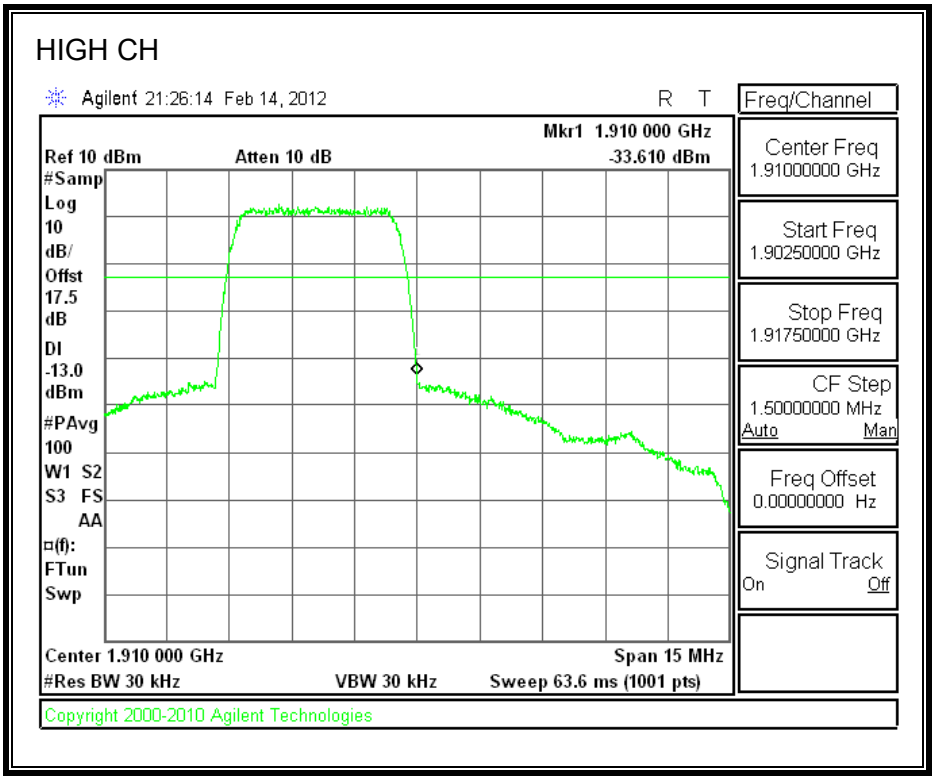


WCDMA 1900 REL 99 (PCS Band)

Low Channel Band Edge

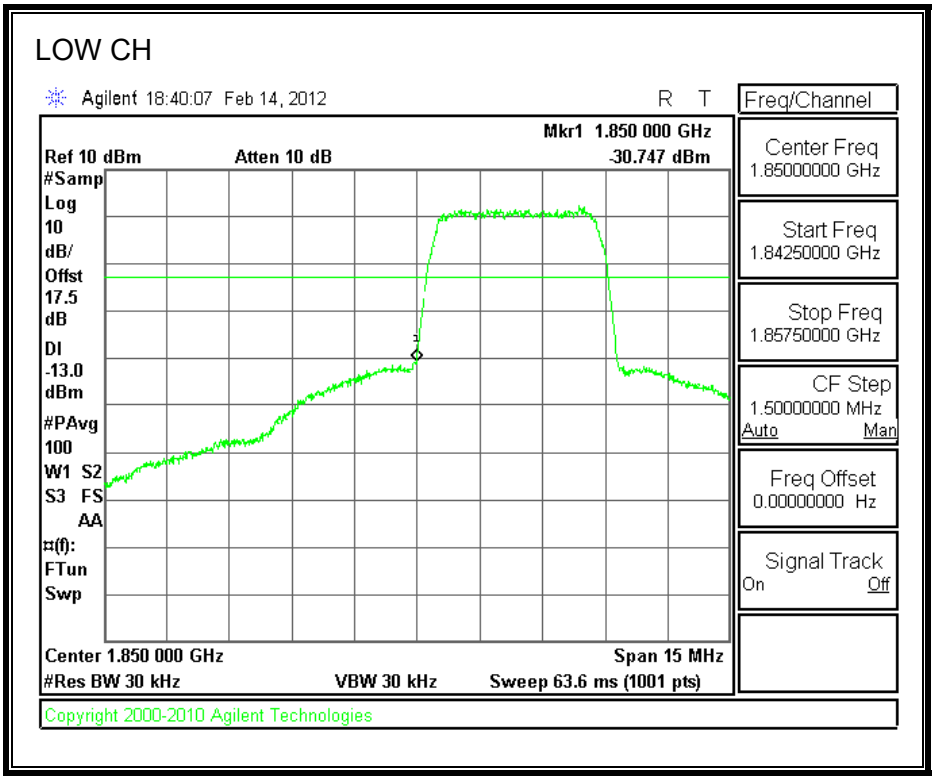


High Channel Band Edge

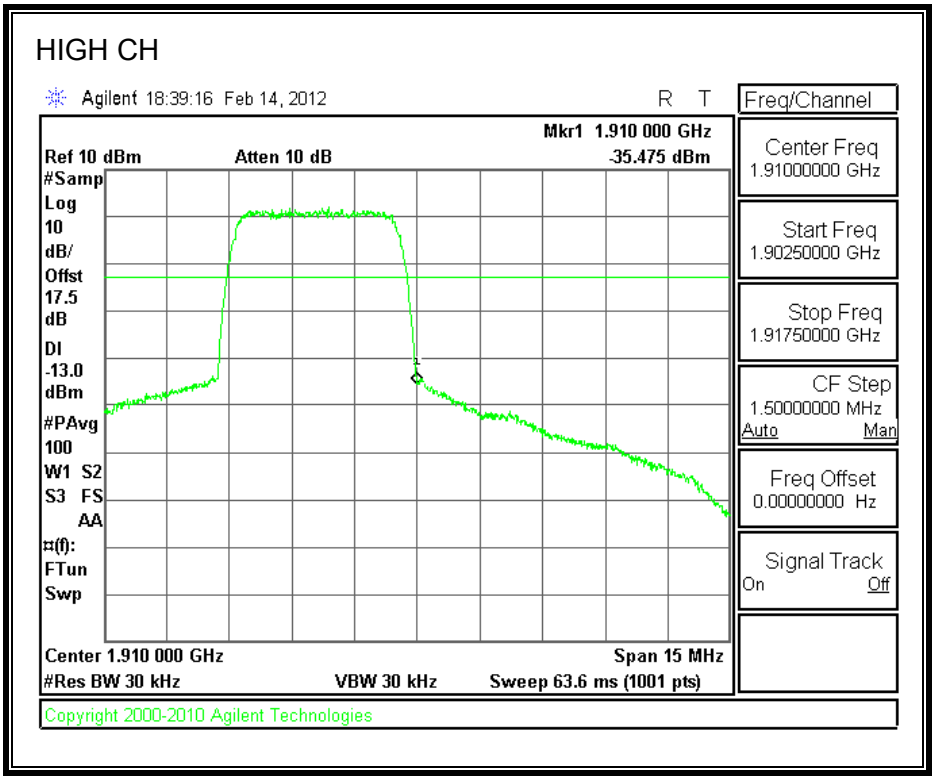


WCDMA 1900 HSUPA (PCS Band)

Low Channel Band Edge



High Channel Band Edge



8.3. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

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

For each out of band emissions measurement:

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

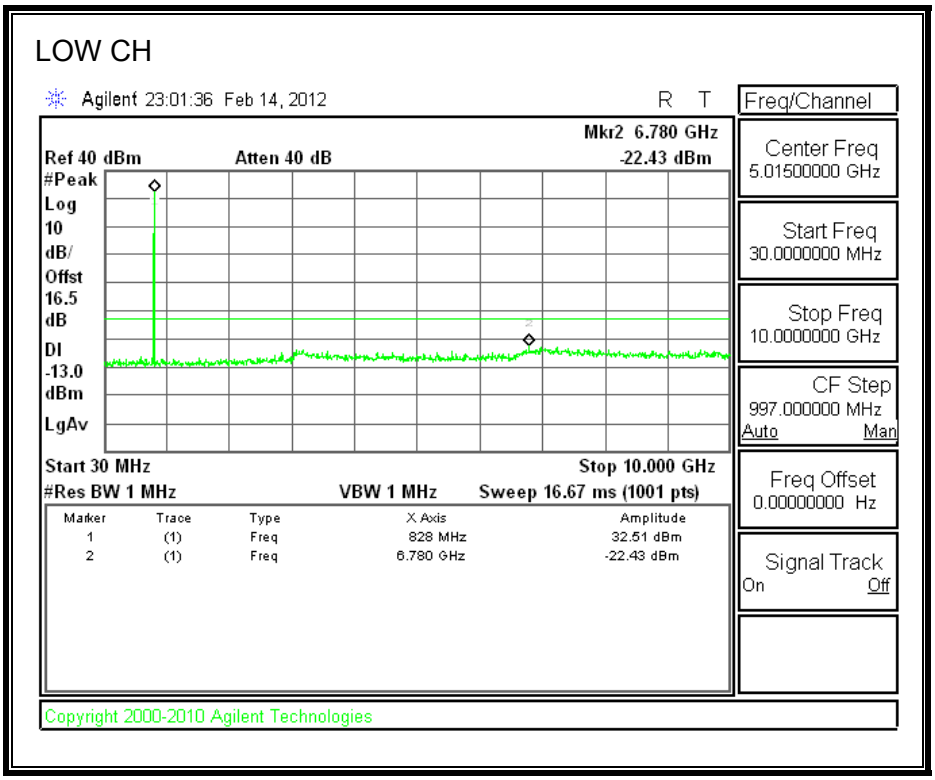
MODES TESTED

- GPRS and EGPRS
- UMTS, REL99 and HSUPA

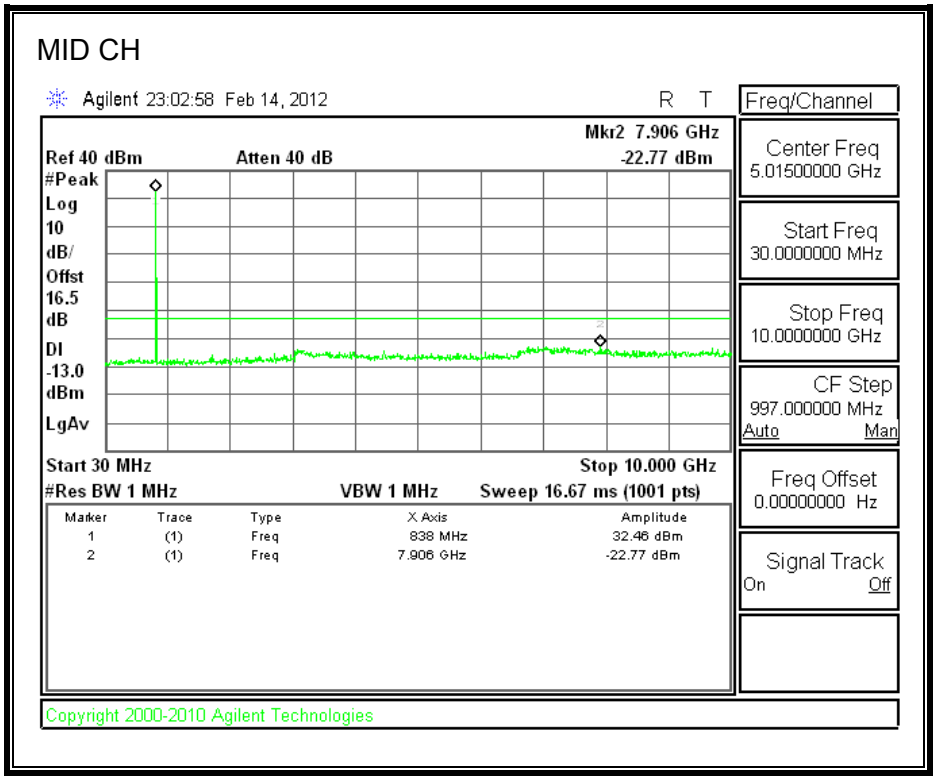
RESULTS

GPRS Mode (Cellular Band)

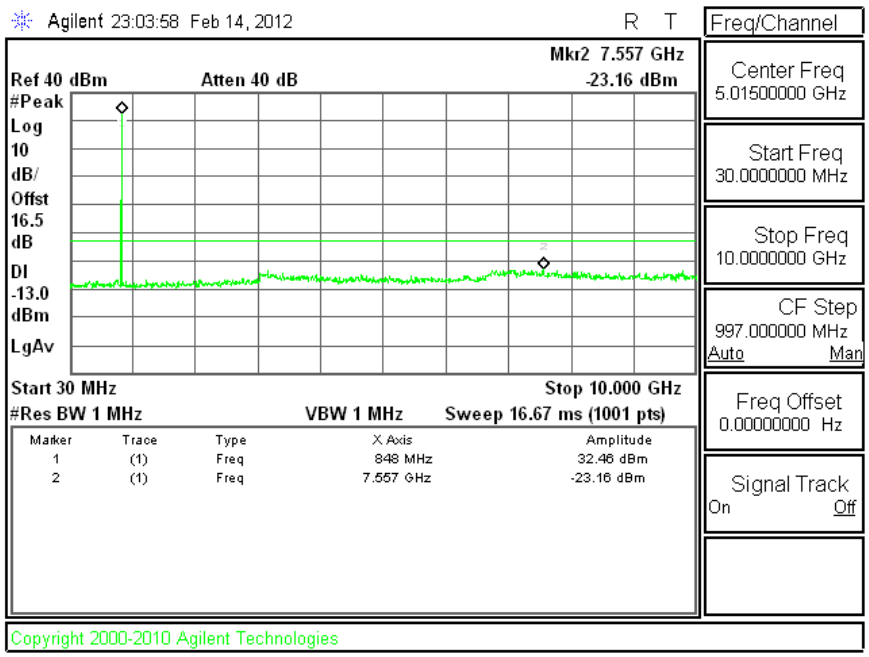
LOW CH



MID CH

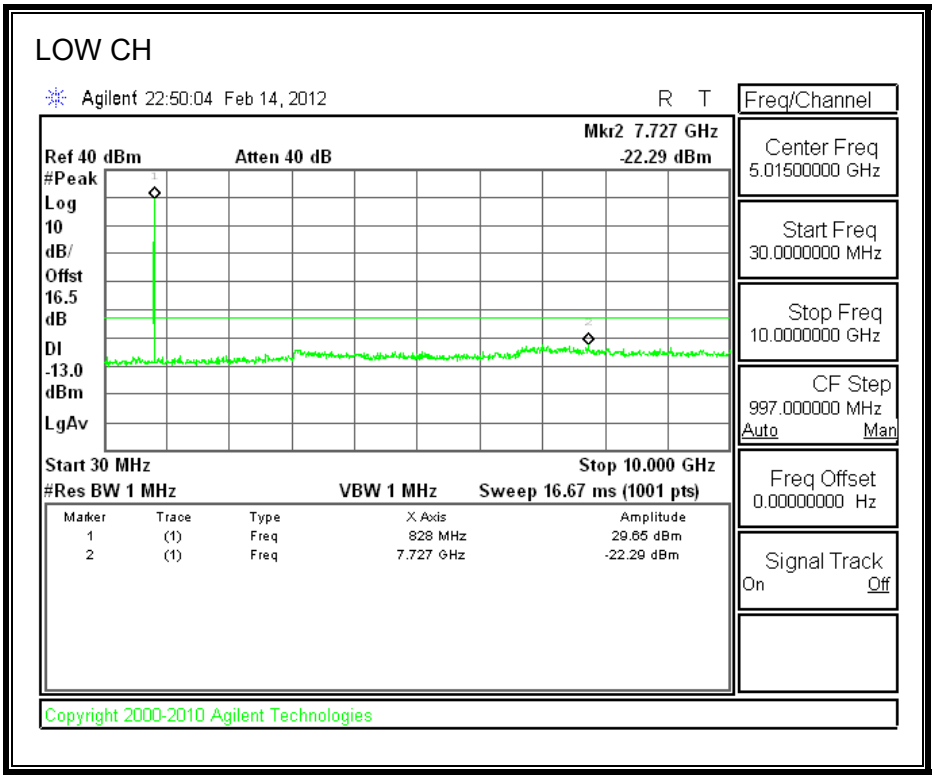


HIGH CH

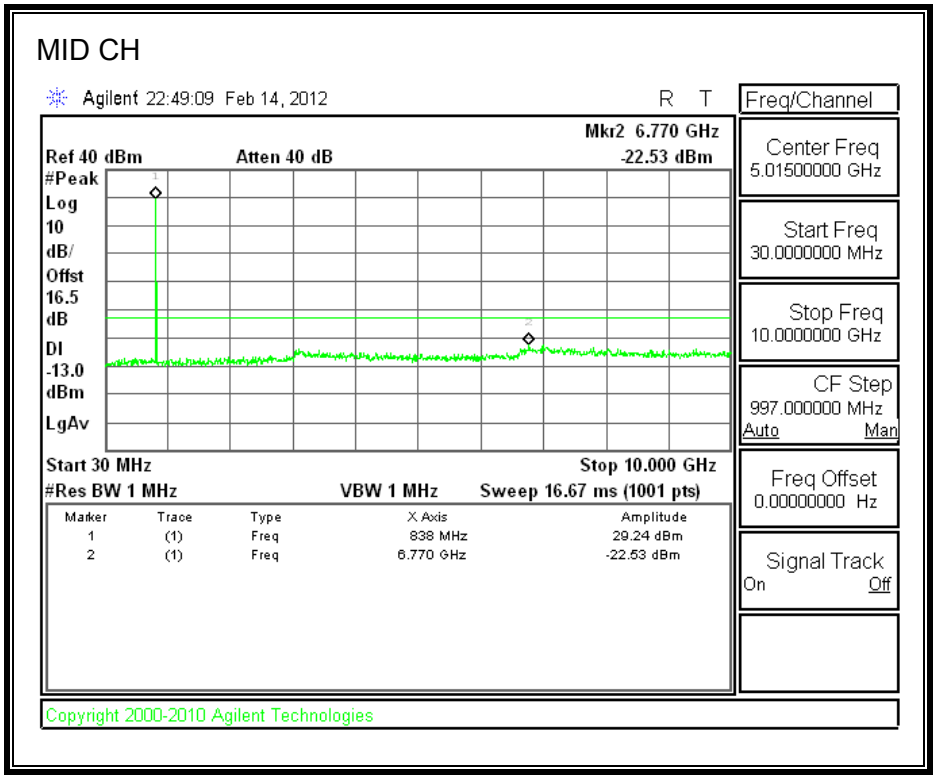


EGPRS (Cellular Band)

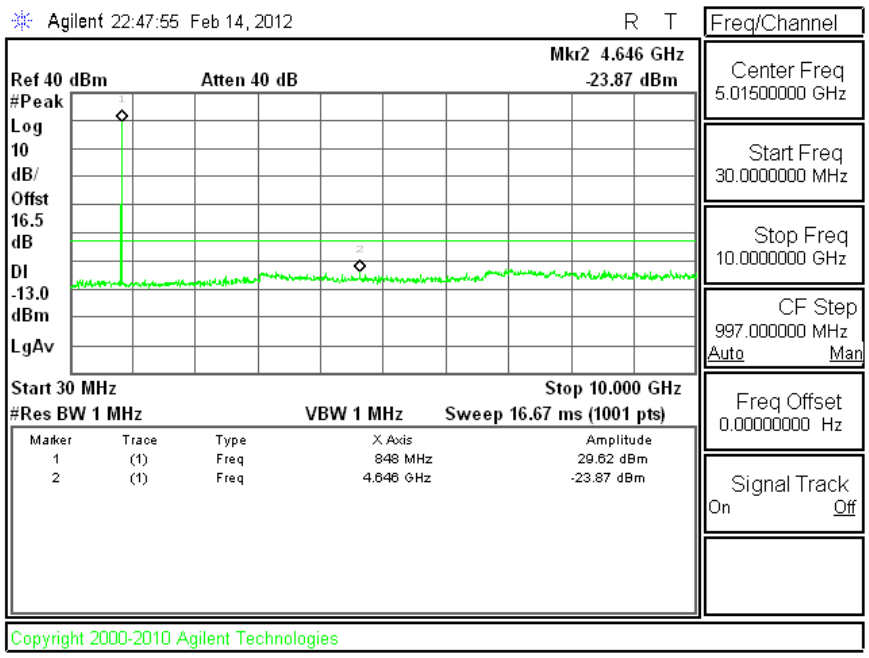
LOW CH



MID CH

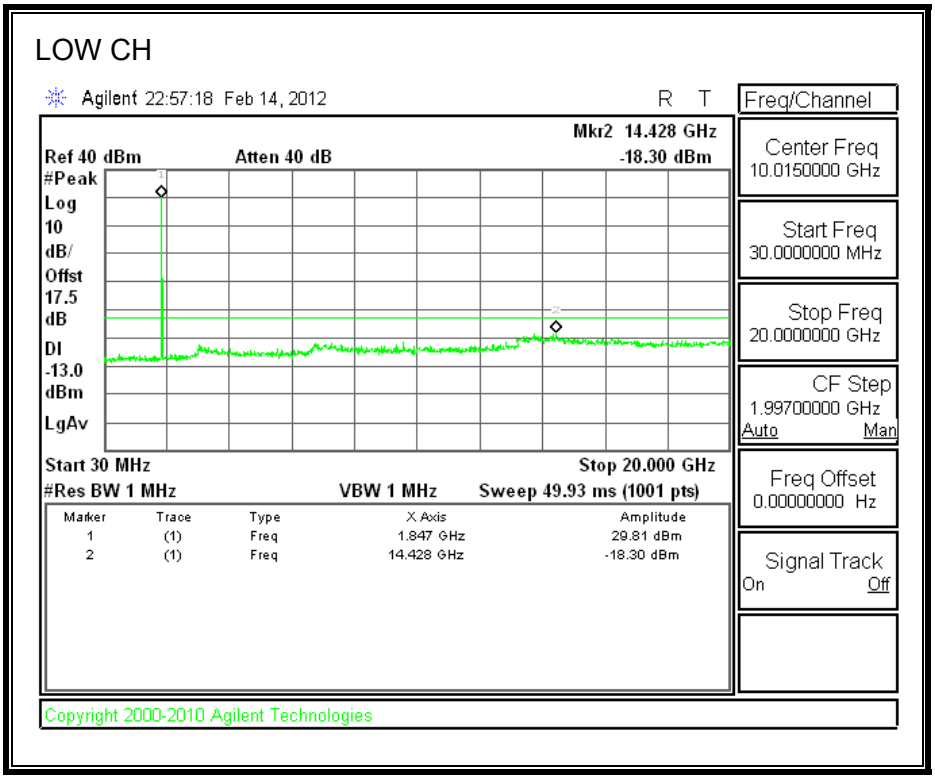


HIGH CH

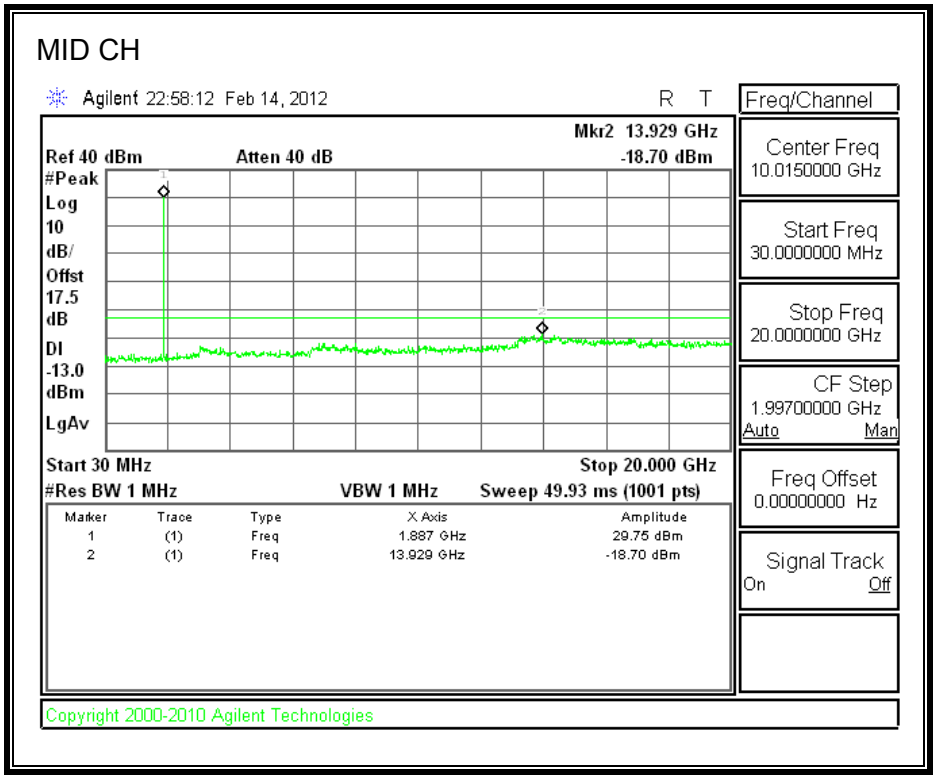


GPRS Mode (PCS Band)

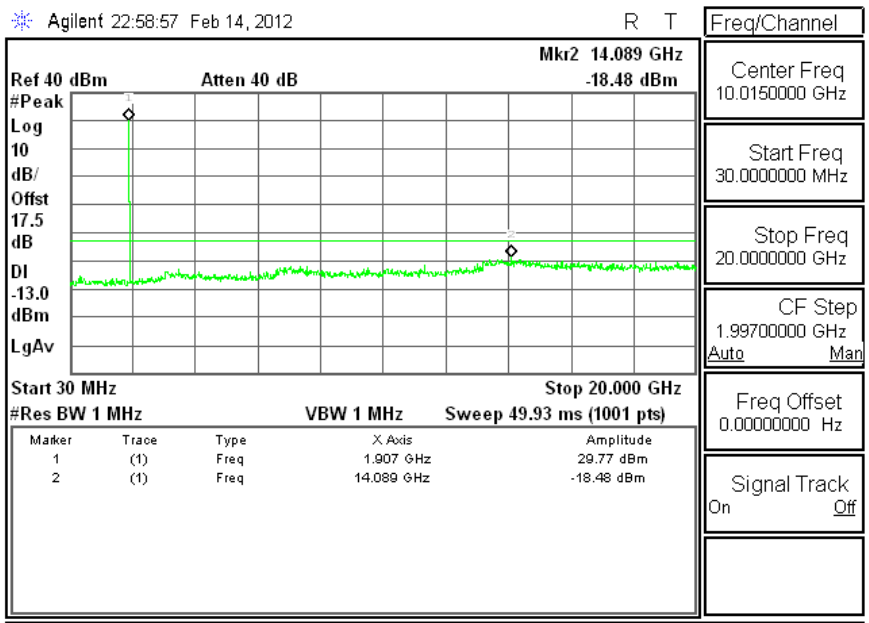
LOW CH



MID CH

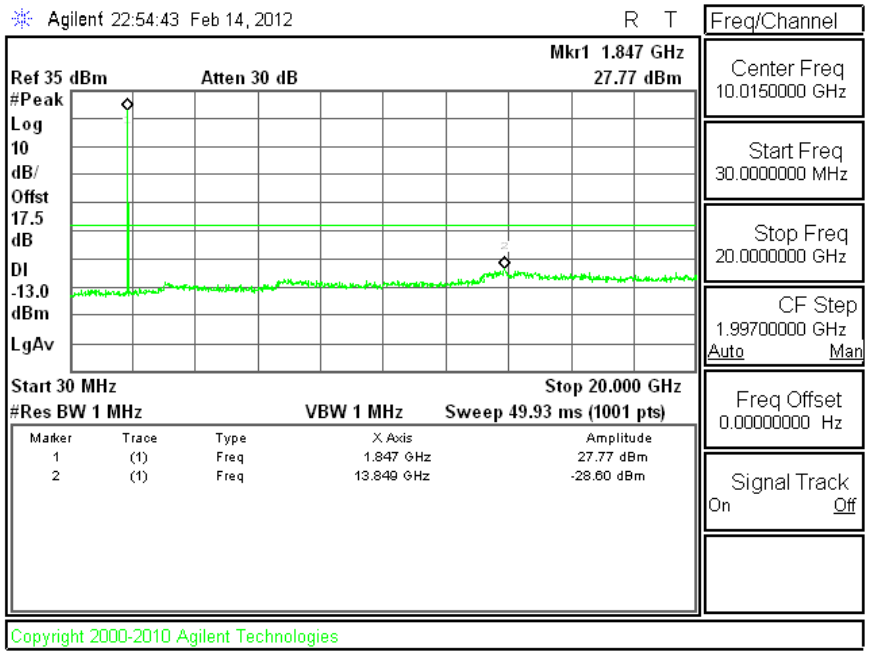


HIGH CH

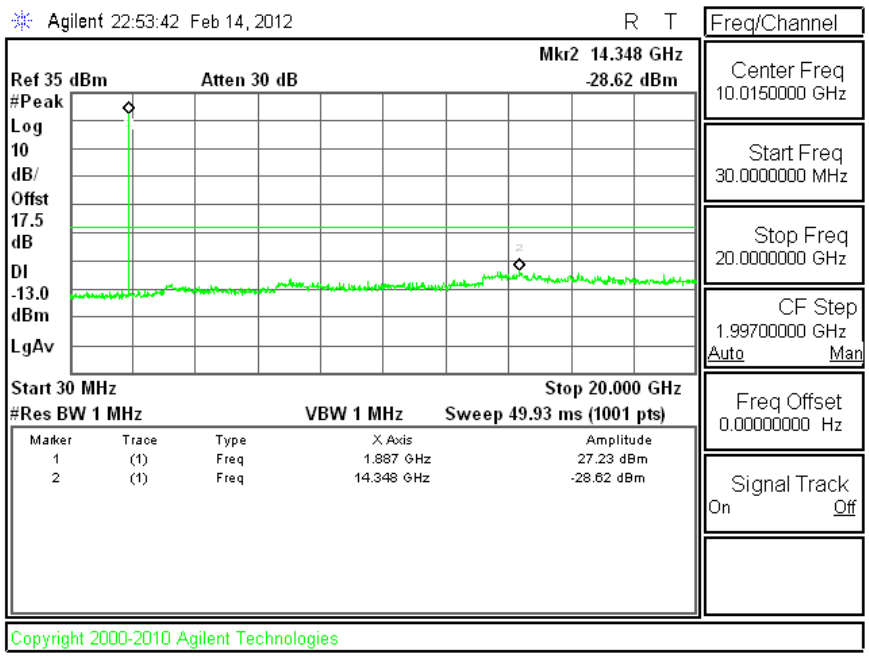


EGPRS Mode (PCS Band)

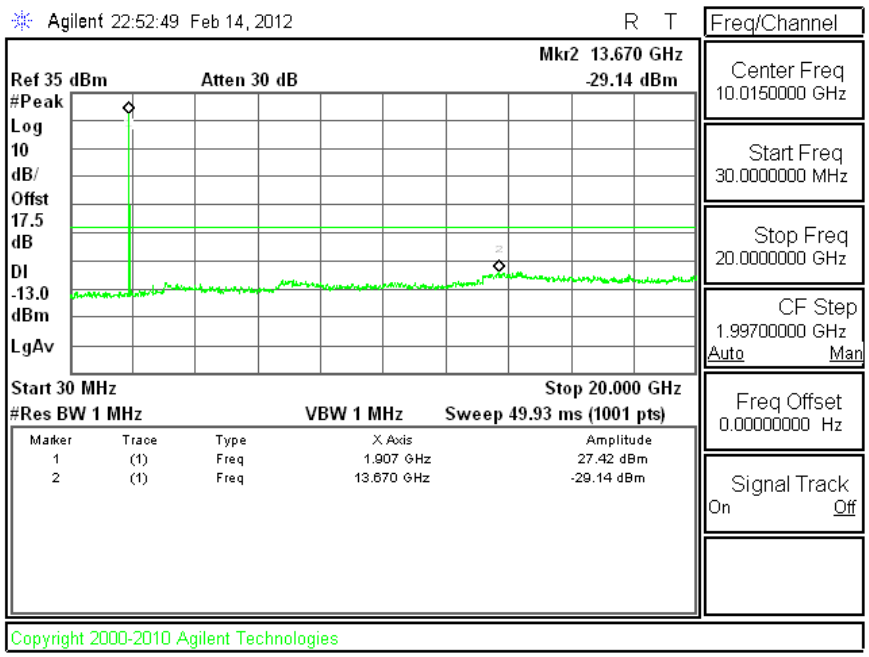
LOW CH



MID CH

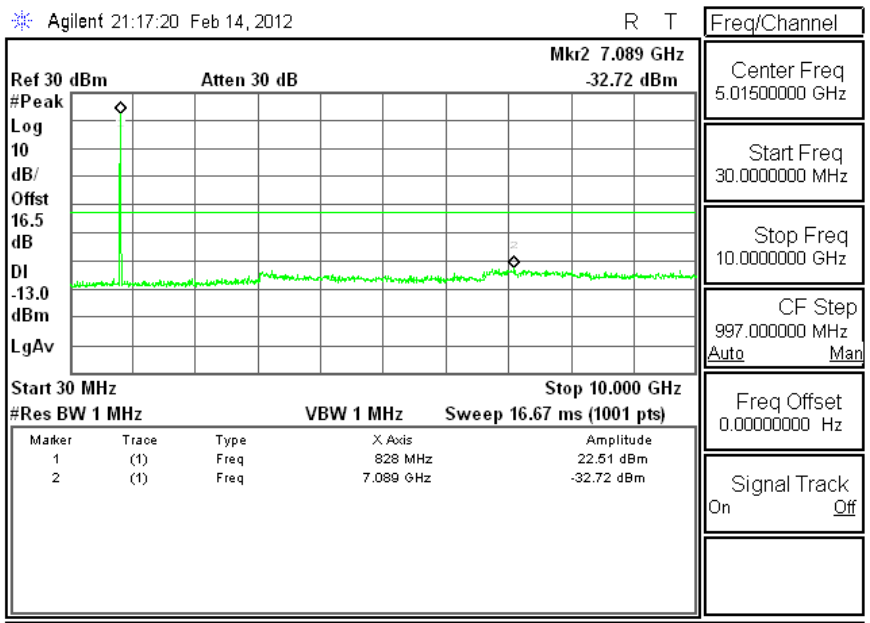


HIGH CH

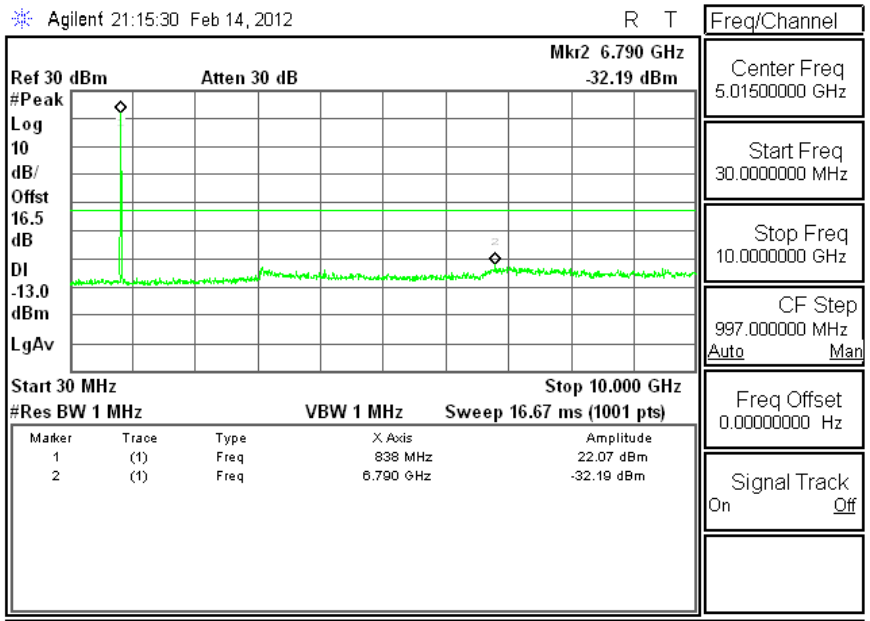


WCDMA 850 REL 99 (Cell Band)

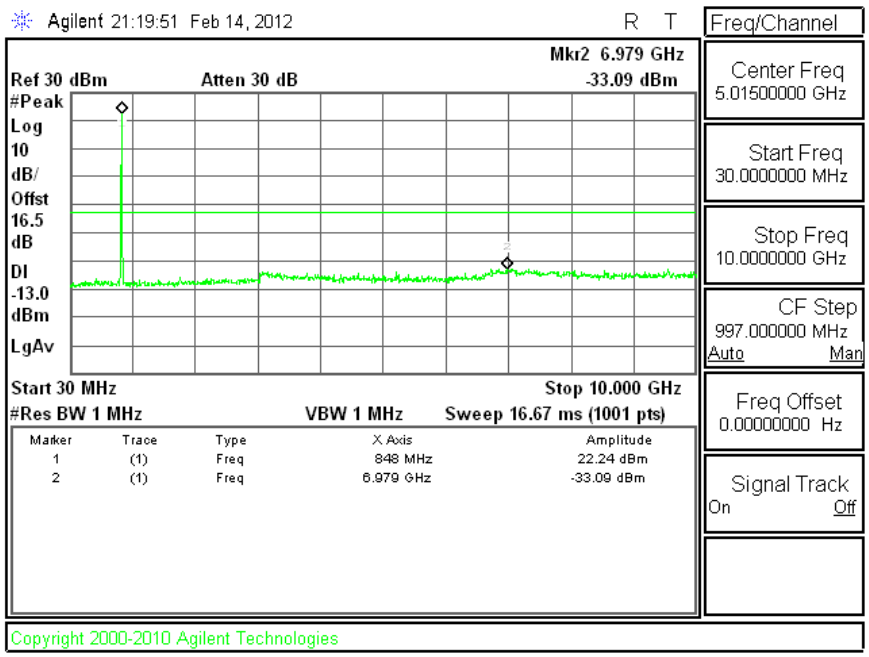
LOW CH



MID CH

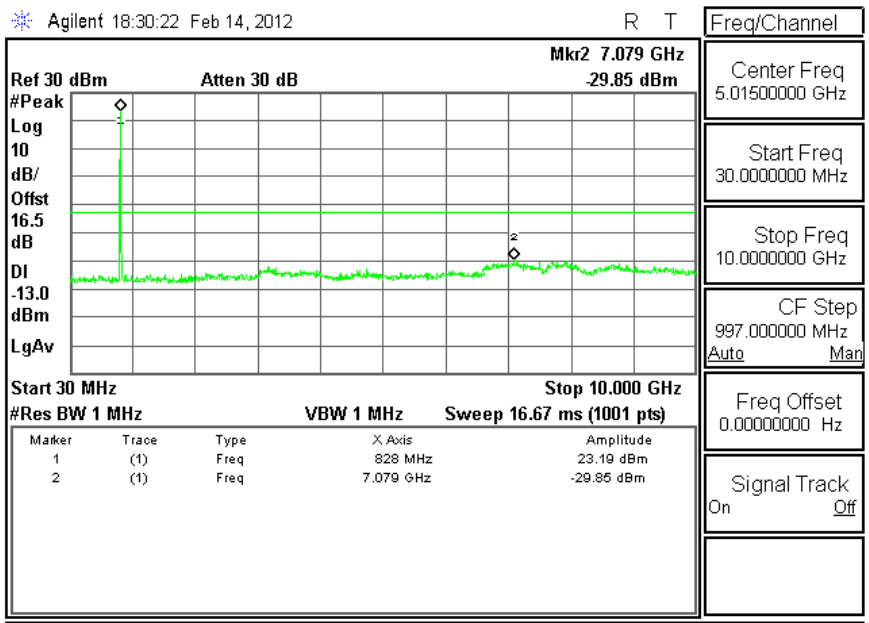


HIGH CH

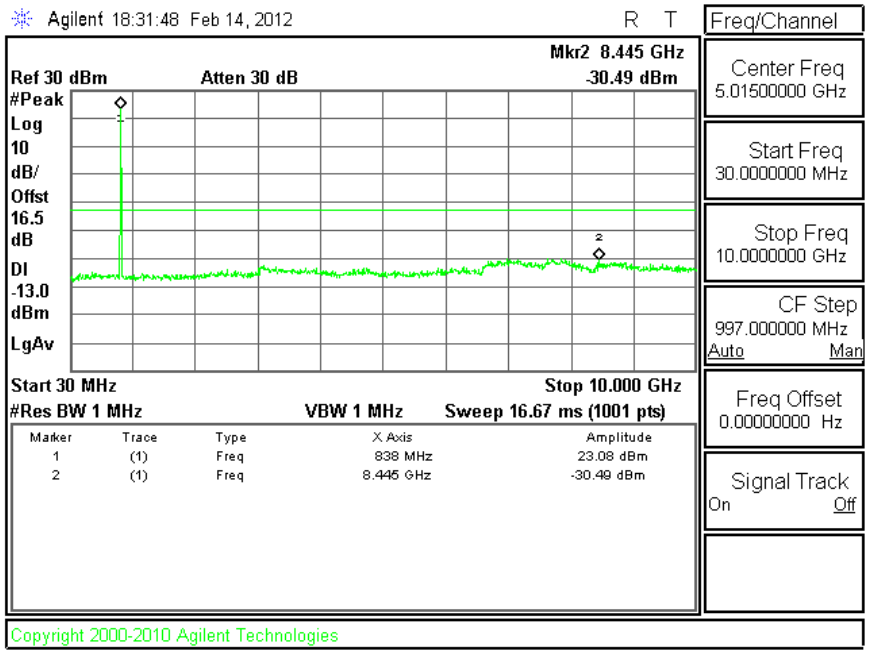


WCDMA 850 HSUPA (Cell Band)

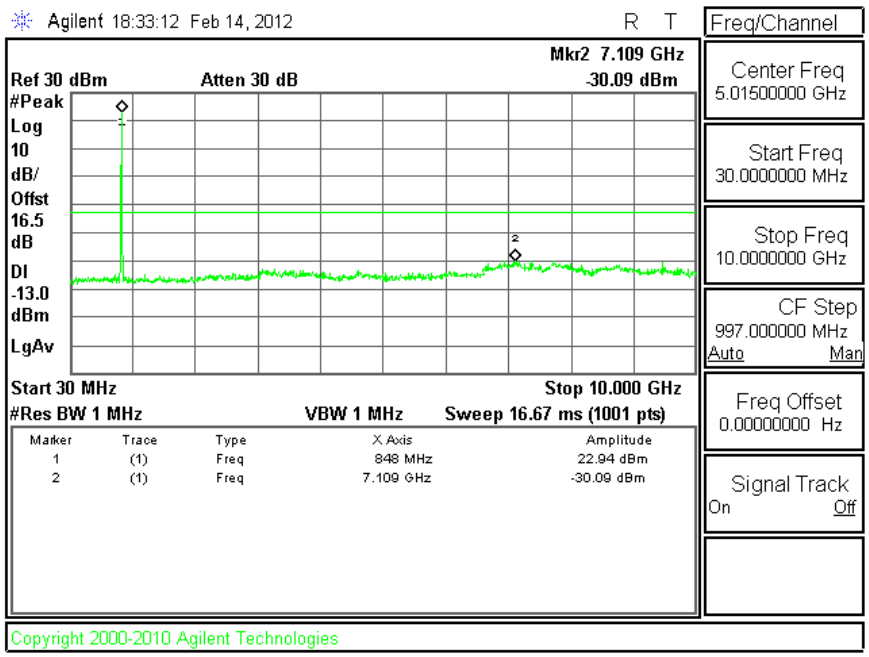
LOW CH



MID CH

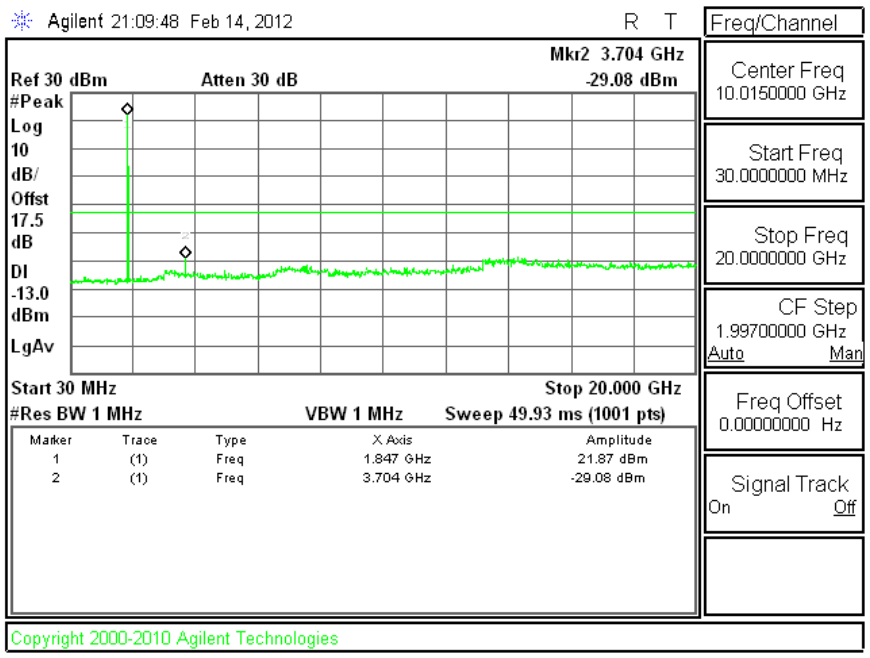


HIGH CH

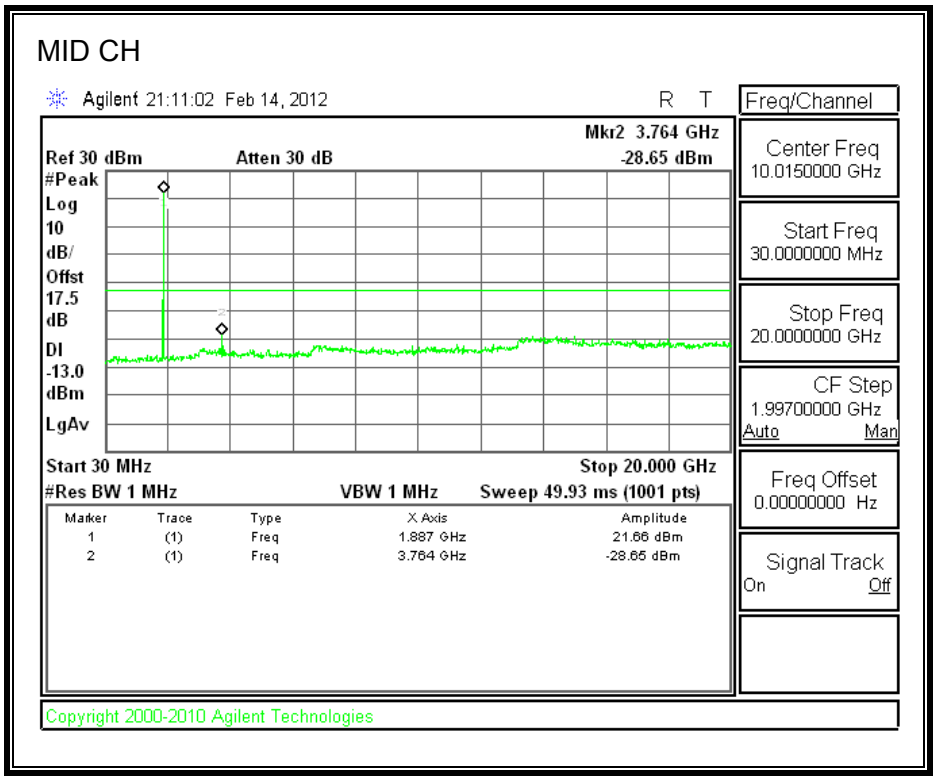


WCDMA 1900 REL 99 (PCS Band)

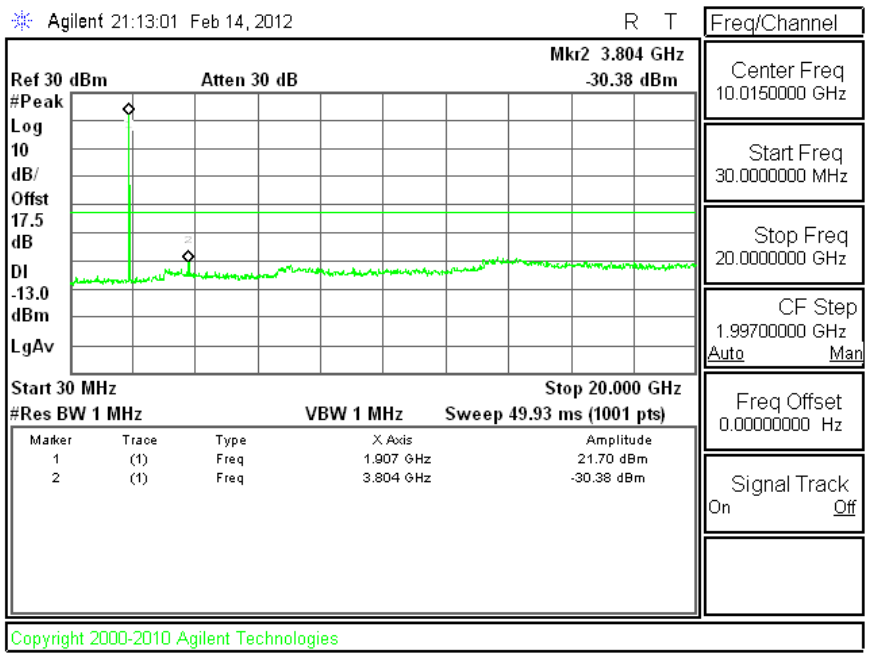
LOW CH



MID CH

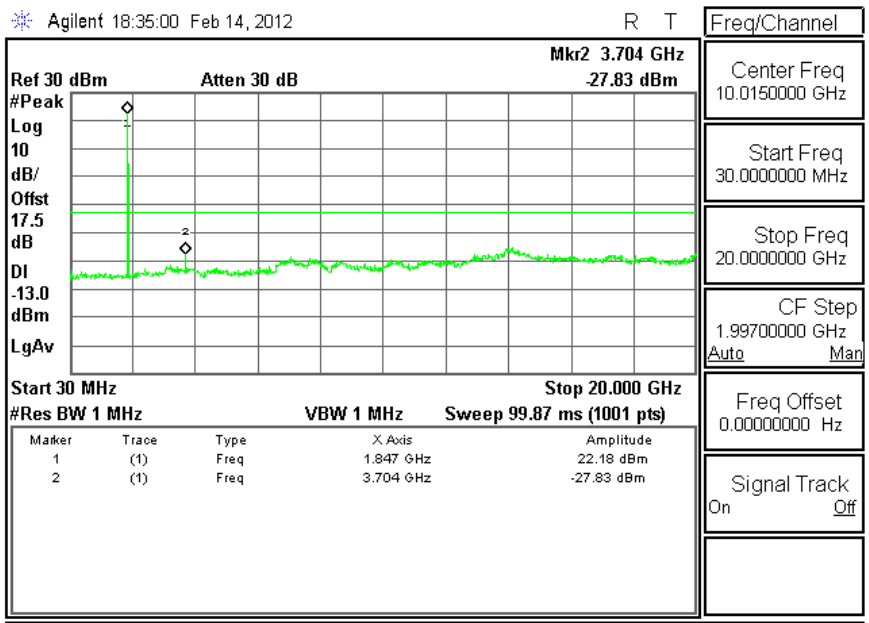


HIGH CH

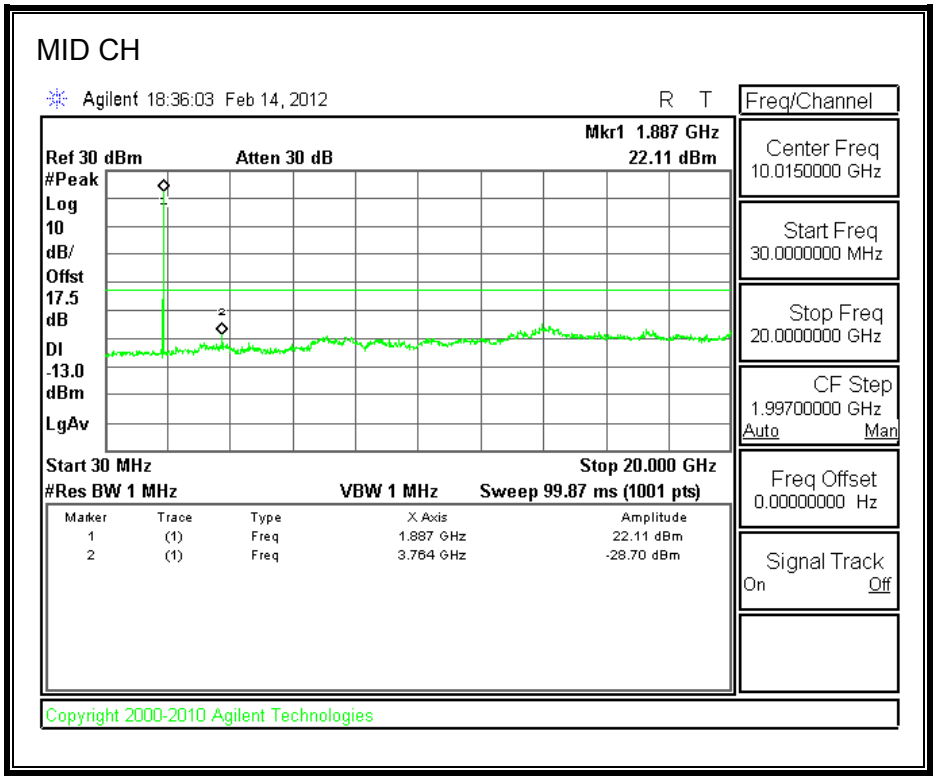


WCDMA 1900 HSUPA (PCS Band)

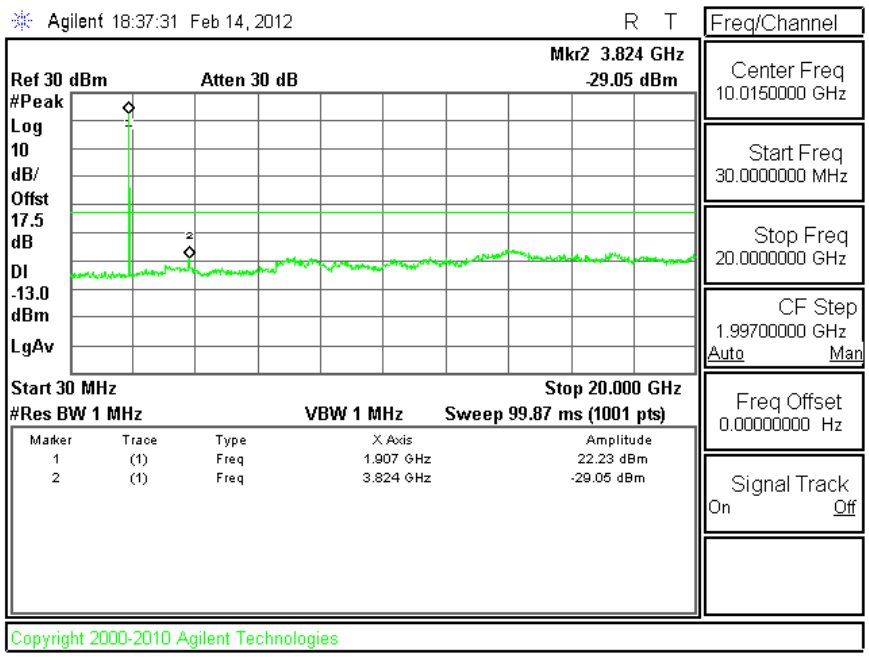
LOW CH



MID CH



HIGH CH



8.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235

LIMITS

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

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

TEST PROCEDURE

Use Agilent 8960 with Frequency Error measurement capability.

- Temp. = −30° to +50°C
- Voltage = 3.70 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.

Frequency Stability vs Voltage:

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

MODES TESTED

- GPRS and EGPRS
- UMTS, HSUPA

RESULTS

See the following pages

CELL GSM – MID CHANNEL (GPRS)

Reference Frequency: CELL Mid Channel 836.6000273MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
3.90	50	836.6000146	0.0151	2.5
3.90	40	836.6000193	0.0096	2.5
3.90	30	836.6000230	0.0052	2.5
3.90	***20***	***836.6000273***	***0.0000***	***2.5***
3.90	10	836.6000149	0.0148	2.5
3.90	0	836.6000131	0.0170	2.5
3.90	-10	836.6000192	0.0097	2.5
3.90	-20	836.6000240	0.0040	2.5
3.90	-30	836.6000290	-0.0021	2.5

Reference Frequency: CELL Mid Channel 836.6000273MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***836.6000273***	***0.0000***	***2.5***
85% (3.315)	20	*836.6000293*	*-0.0025*	2.5
115% (4.485)	20	*836.6000271*	*0.0002*	2.5

PCS, GSM – MID CHANNEL (GPRS)

Reference Frequency: PCS Mid Channel 1880.0000270MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
3.90	50	1880.0000183	0.0046	2.5
3.90	40	1880.0000216	0.0029	2.5
3.90	30	1880.0000240	0.0016	2.5
3.90	***20***	***1880.0000270***	***0.0000***	***2.5***
3.90	10	1880.0000160	0.0059	2.5
3.90	0	1880.0000136	0.0071	2.5
3.90	-10	1880.0000183	0.0046	2.5
3.90	-20	1880.0000192	0.0042	2.5
3.90	-30	1880.0000216	0.0028	2.5

Reference Frequency: PCS Mid Channel 1880.0000270Hz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1880.000027***	***0.0000***	***2.5***
85% (3.315)	20	1879.9999731	*0.0287*	2.5
115% (4.485)	20	1880.0000268	*0.0001*	2.5

CELL GSM – MID CHANNEL (EGPRS)

Reference Frequency: CELL Mid Channel 836.6000116MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
3.90	50	836.6000150	-0.0041	2.5
3.90	40	836.6000140	-0.0028	2.5
3.90	30	836.6000131	-0.0017	2.5
3.90	***20***	***836.6000116***	***0.0000***	***2.5***
3.90	10	836.6000027	0.0107	2.5
3.90	0	836.6000028	0.0105	2.5
3.90	-10	836.6000130	-0.0017	2.5
3.90	-20	836.6000229	-0.0135	2.5
3.90	-30	836.6000312	-0.0234	2.5

Reference Frequency: CELL Mid Channel 836.6000116MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***836.6000116***	***0.0000***	***2.5***
85% (3.315)	20	*836.6000207*	*-0.0108*	2.5
115% (4.485)	20	*836.6000228*	*-0.0134*	2.5

PCS, GSM – MID CHANNEL (EGPRS)

Reference Frequency: PCS Mid Channel 1880.0000249MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
3.90	50	1880.0000192	0.0030	2.5
3.90	40	1880.0000209	0.0021	2.5
3.90	30	1880.0000227	0.0012	2.5
3.90	***20***	***1880.0000249***	***0.0000***	***2.5***
3.90	10	1880.0000159	0.0048	2.5
3.90	0	1880.0000160	0.0047	2.5
3.90	-10	1880.0000160	0.0047	2.5
3.90	-20	1880.0000166	0.0044	2.5
3.90	-30	1880.0000188	0.0032	2.5

Reference Frequency: PCS Mid Channel 1880.0000249Hz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1880.0000249***	***0.0000***	***2.5***
85% (3.315)	20	1879.9999701	*0.0291*	2.5
115% (4.485)	20	1880.0000286	*-0.0020*	2.5

CELL UMTS– MID CHANNEL (EGPRS)

Reference Frequency: CELL Mid Channel 836.61926920MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 2091.548 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
3.90	50	836.6192340	0.0418	2.5
3.90	40	836.6192330	0.0430	2.5
3.90	30	836.6192260	0.0514	2.5
3.90	***20***	***836.6192690***	***0.0000***	***2.5***
3.90	10	836.6195340	-0.3168	2.5
3.90	0	836.6190450	0.2677	2.5
3.90	-10	836.6193160	-0.0562	2.5
3.90	-20	836.6194400	-0.2044	2.5
3.90	-30	836.6195140	-0.2928	2.5

Reference Frequency: CELL Mid Channel 836.61926920MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 2091.548 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***836.619269***	***0.0000***	***2.5***
85% (3.315)	20	*836.6192810*	*-0.0143*	2.5
115% (4.485)	20	*836.6192580*	*0.0131*	2.5

PCS, UMTS – MID CHANNEL

Reference Frequency: PCS Mid Channel 1880.0189130MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.047 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
3.90	50	1880.0186420	0.14415	2.5
3.90	40	1880.0189730	-0.03191	2.5
3.90	30	1880.0189430	-0.01596	2.5
3.90	***20***	***1880.0189130***	***0.00000***	***2.5***
3.90	10	1880.0182180	0.36968	2.5
3.90	0	1880.0182200	0.36861	2.5
3.90	-10	1880.0187640	0.07925	2.5
3.90	-20	1880.0187030	0.11170	2.5
3.90	-30	1880.0190190	-0.05638	2.5

Reference Frequency: PCS Mid Channel 1880.0189130Hz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.047 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1880.018913***	***0.00000***	***2.5***
85% (3.315)	20	1880.018941	*-0.01489*	2.5
115% (4.485)	20	1880.018961	*-0.02553*	2.5

9. RADIATED TEST RESULTS

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232

LIMITS

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

24.232(c) - Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

TEST PROCEDURE

ANSI / TIA / EIA 603C

MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99 and HSUPA

RESULTS

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	26.71	468.81
	190	836.60	27.53	566.24
	251	848.80	**27.78**	599.79
EGPRS	128	824.20	23.85	242.66
	190	836.60	24.58	287.08
	251	848.80	**25.03**	318.42

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	32.83	1918.67
	661	1880.00	32.46	1761.98
	810	1909.80	**32.87**	1936.42
EGPRS	512	1850.20	**31.69**	1475.71
	661	1880.00	30.73	1183.04
	810	1909.80	31.06	1276.44

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS,REL 99	4357	826.40	19.60	91.20
	4408	836.60	**20.83**	121.06
	4458	846.60	19.93	98.40
UMTS, HSDPA	4357	826.40	22.86	193.20
	4408	836.60	**24.42**	276.69
	4458	846.60	23.35	216.27

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS,REL 99	9662	1852.40	29.73	939.72
	9800	1880.00	**30.42**	1101.54
	9938	1907.60	29.52	895.36
UMTS, HSDPA	9662	1852.40	**31.03**	1267.65
	9800	1880.00	30.07	1016.25
	9938	1907.60	29.82	959.40

GPRS (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/08/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX , CELL GPRS MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	27.21	V	0.5	0.0	26.71	38.5	-11.7	
824.20	21.22	H	0.5	0.0	20.72	38.5	-17.7	
836.60	28.03	V	0.5	0.0	27.53	38.5	-10.9	
836.60	20.79	H	0.5	0.0	20.29	38.5	-18.2	
848.80	28.28	V	0.5	0.0	27.78	38.5	-10.7	
848.80	21.94	H	0.5	0.0	21.44	38.5	-17.0	

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EGPRS (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/08/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX , CELL EGPRS MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	24.35	V	0.5	0.0	23.85	38.5	-14.6	
824.20	18.54	H	0.5	0.0	18.04	38.5	-20.4	
836.60	25.08	V	0.5	0.0	24.58	38.5	-13.9	
836.60	18.01	H	0.5	0.0	17.51	38.5	-20.9	
848.80	25.53	V	0.5	0.0	25.03	38.5	-13.4	
848.80	19.10	H	0.5	0.0	18.60	38.5	-19.8	

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GPRS (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/08/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX , PCS GPRS MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	17.9	V	0.53	8.10	25.49	33.0	-7.5	
1.850	25.2	H	0.53	8.14	32.83	33.0	-0.2	
1.880	17.2	V	0.53	8.10	24.73	33.0	-8.3	
1.880	24.9	H	0.53	8.14	32.46	33.0	-0.5	
1.910	16.7	V	0.53	8.10	24.25	33.0	-8.7	
1.910	25.3	H	0.53	8.14	32.87	33.0	-0.1	

Rev. 3.17.11

EGPRS (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/08/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX , PCS EGPRS MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	15.4	V	0.53	8.10	22.98	33.0	-10.0	
1.850	24.1	H	0.53	8.14	31.69	33.0	-1.3	
1.880	15.2	V	0.53	8.10	22.74	33.0	-10.3	
1.880	23.1	H	0.53	8.14	30.73	33.0	-2.3	
1.910	14.8	V	0.53	8.10	22.38	33.0	-10.6	
1.910	23.5	H	0.53	8.14	31.06	33.0	-1.9	

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UMTS850 REL 99(Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/08/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX , CELL WCDMA REL 99 MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
826.40	20.10	V	0.5	0.0	19.60	38.5	-18.8	
826.40	17.10	H	0.5	0.0	16.60	38.5	-21.8	
836.60	21.33	V	0.5	0.0	20.83	38.5	-17.6	
836.60	16.04	H	0.5	0.0	15.54	38.5	-22.9	
846.60	20.43	V	0.5	0.0	19.93	38.5	-18.5	
846.60	15.91	H	0.5	0.0	15.41	38.5	-23.0	

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UMTS850 HSUPA(Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/08/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX , CELL HSUPA MODE

Test Equipment:
Receiving: Sunol T130, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 6ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
826.40	23.36	V	0.5	0.0	22.86	38.5	-15.6	
826.40	21.29	H	0.5	0.0	20.79	38.5	-17.7	
836.60	24.92	V	0.5	0.0	24.42	38.5	-14.0	
836.60	20.27	H	0.5	0.0	19.77	38.5	-18.7	
848.60	23.88	V	0.5	0.0	23.38	38.5	-15.1	
848.80	19.91	H	0.5	0.0	19.41	38.5	-19.0	

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UMTS1900 REL 99(PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/08/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX , PCS WCDMA REL 99 MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.852	22.2	V	0.53	8.10	29.73	33.0	-3.3	
1.852	13.9	H	0.53	8.14	21.47	33.0	-11.5	
1.880	22.9	V	0.53	8.10	30.42	33.0	-2.6	
1.880	14.5	H	0.53	8.14	22.15	33.0	-10.9	
1.908	22.0	V	0.53	8.10	29.52	33.0	-3.5	
1.908	16.7	H	0.53	8.14	24.26	33.0	-8.7	

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UMTS1900 HSUPA(PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/08/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX , PCS HSUPA MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T217 Substitution, 4ft SMA Cable (244639001) Warehouse

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.852	23.5	V	0.53	8.10	31.03	33.0	-2.0	
1.852	15.7	H	0.53	8.14	23.35	33.0	-9.7	
1.880	22.5	V	0.53	8.10	30.07	33.0	-2.9	
1.880	16.3	H	0.53	8.14	23.94	33.0	-9.1	
1.908	22.3	V	0.53	8.10	29.82	33.0	-3.2	
1.908	17.8	H	0.53	8.14	25.40	33.0	-7.6	

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9.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238

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

- GPRS and EGPRS
- UMTS, REL 99 and HSUPA

RESULTS

GPRS (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/17/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH HEADSET AND AC ADAPTER
Mode: TX, CELL GPRS MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LOW CHANNE (824.2MHz)									
1.648	-14.9	V	3.0	38.2	1.0	-52.0	-13.0	-39.0	
2.473	-15.0	V	3.0	37.5	1.0	-51.5	-13.0	-38.5	
1.648	-13.5	H	3.0	38.2	1.0	-50.6	-13.0	-37.6	
2.473	-19.4	H	3.0	37.5	1.0	-55.9	-13.0	-42.9	
MID CHANNEL (836.6 MHz)									
1.673	-17.2	V	3.0	38.1	1.0	-54.3	-13.0	-41.3	
2.510	-12.4	V	3.0	37.5	1.0	-48.9	-13.0	-35.9	
1.673	-16.1	H	3.0	38.1	1.0	-53.2	-13.0	-40.2	
2.510	-16.9	H	3.0	37.5	1.0	-53.3	-13.0	-40.3	
HIGH CHANNEL (848.8 MHz)									
1.698	-5.8	V	3.0	38.1	1.0	-42.9	-13.0	-29.9	
2.546	-13.0	V	3.0	37.5	1.0	-49.4	-13.0	-36.4	
1.698	-7.4	H	3.0	38.1	1.0	-44.5	-13.0	-31.5	
2.546	-15.5	H	3.0	37.5	1.0	-51.9	-13.0	-38.9	

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

EGPRS (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	SAMSUNG ELECTRONICS
Project #:	12I14206
Date:	02/17/12
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH HEADSET AND AC ADAPTER
Mode:	TX, PCS EGPRS MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LOW CHANNE (824.2MHz)									
1.648	-20.6	V	3.0	38.2	1.0	-57.8	-13.0	-44.8	
2.473	-19.5	V	3.0	37.5	1.0	-56.0	-13.0	-43.0	
1.648	-19.2	H	3.0	38.2	1.0	-56.4	-13.0	-43.4	
2.473	-23.2	H	3.0	37.5	1.0	-59.7	-13.0	-46.7	
MID CHANNEL (836.6 MHz)									
1.673	-17.6	V	3.0	38.1	1.0	-54.7	-13.0	-41.7	
2.510	-18.6	V	3.0	37.5	1.0	-55.1	-13.0	-42.1	
1.673	-17.0	H	3.0	38.1	1.0	-54.1	-13.0	-41.1	
2.510	-23.1	H	3.0	37.5	1.0	-59.5	-13.0	-46.5	
HIGH CHANNEL (848.8 MHz)									
1.698	-11.4	V	3.0	38.1	1.0	-48.5	-13.0	-35.5	
2.546	-19.2	V	3.0	37.5	1.0	-55.6	-13.0	-42.6	
1.698	-12.1	H	3.0	38.1	1.0	-49.2	-13.0	-36.2	
2.546	-21.3	H	3.0	37.5	1.0	-57.7	-13.0	-44.7	

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

GPRS (PCS Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SAMSUNG ELECTRONICS
Project #: 12I14206
Date: 02/17/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH HEADSET AND AC ADAPTER
Mode: TX, PCS GPRS MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T144 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LOW CHANNE (1850.2MHz)									
3.700	-12.7	V	3.0	36.8	1.0	-48.6	-13.0	-35.6	
5.551	-15.8	V	3.0	36.3	1.0	-51.1	-13.0	-38.1	
9.251	-8.5	V	3.0	37.0	1.0	-44.5	-13.0	-31.5	
3.700	-20.5	H	3.0	36.8	1.0	-56.3	-13.0	-43.3	
5.551	-18.3	H	3.0	36.3	1.0	-53.5	-13.0	-40.5	
9.251	-12.9	H	3.0	37.0	1.0	-48.9	-13.0	-35.9	
MID CHANNEL (1880.0 MHz)									
3.760	-14.5	V	3.0	36.8	1.0	-50.2	-13.0	-37.2	
5.640	47.7	V	3.0	36.3	1.0	12.4	-13.0	25.4	
9.400	-6.7	V	3.0	37.0	1.0	-42.8	-13.0	-29.8	
3.760	-16.8	H	3.0	36.8	1.0	-52.6	-13.0	-39.6	
5.640	-12.5	H	3.0	36.3	1.0	-47.8	-13.0	-34.8	
9.400	-14.6	H	3.0	37.0	1.0	-50.7	-13.0	-37.7	
HIGH CHANNEL (1909.8 MHz)									
3.820	-11.5	V	3.0	36.7	1.0	-47.3	-13.0	-34.3	
5.729	-16.3	V	3.0	36.3	1.0	-51.6	-13.0	-38.6	
9.549	-9.1	H	3.0	37.1	1.0	-45.2	-13.0	-32.2	
3.820	-16.1	H	3.0	36.7	1.0	-51.8	-13.0	-38.8	
5.729	-11.2	H	3.0	36.3	1.0	-46.5	-13.0	-33.5	
9.549	-15.2	V	3.0	37.1	1.0	-51.3	-13.0	-38.3	

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

EGPRS (PCS Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	SAMSUNG ELECTRONICS
Project #:	12I14206
Date:	02/17/12
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH HEADSET AND AC ADAPTER
Mode:	TX, PCS EGPRS MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T144 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LOW CHANNE (1850.2MHz)									
3.700	-18.4	V	3.0	36.8	1.0	-54.3	-13.0	-41.3	
5.551	-22.4	V	3.0	36.3	1.0	-57.7	-13.0	-44.7	
3.700	-22.5	H	3.0	36.8	1.0	-58.3	-13.0	-45.3	
5.551	-16.3	H	3.0	36.3	1.0	-51.6	-13.0	-38.6	
MID CHANNEL (1880.0 MHz)									
3.760	-18.7	V	3.0	36.8	1.0	-54.5	-13.0	-41.5	
5.640	-17.9	V	3.0	36.3	1.0	-53.2	-13.0	-40.2	
3.760	-21.0	H	3.0	36.8	1.0	-56.8	-13.0	-43.8	
5.640	-12.8	H	3.0	36.3	1.0	-48.1	-13.0	-35.1	
HIGH CHANNEL (1909.8 MHz)									
3.820	-14.5	V	3.0	36.7	1.0	-50.2	-13.0	-37.2	
5.729	-21.8	V	3.0	36.3	1.0	-57.1	-13.0	-44.1	
3.820	-22.2	H	3.0	36.7	1.0	-58.0	-13.0	-45.0	
5.729	-20.2	H	3.0	36.3	1.0	-55.5	-13.0	-42.5	

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

WCDMA REL 99 (Cellula Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	SAMSUNG ELECTRONICS
Project #:	12I14206
Date:	02/17/12
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH HEADSET AND AC ADAPTER
Mode:	TX, CELL WCDMA REL. 99 MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LOW CHANNE (826.4MHz)									
1.653	-14.3	V	3.0	38.1	1.0	-51.5	-13.0	-38.5	
2.479	-21.0	V	3.0	37.5	1.0	-57.4	-13.0	-44.4	
1.653	-15.7	H	3.0	38.1	1.0	-52.9	-13.0	-39.9	
2.479	-22.6	H	3.0	37.5	1.0	-59.1	-13.0	-46.1	
MID CHANNEL (836.6 MHz)									
1.673	-9.9	V	3.0	38.1	1.0	-47.0	-13.0	-34.0	
2.510	-20.4	V	3.0	37.5	1.0	-56.9	-13.0	-43.9	
2.510	-10.2	H	3.0	37.5	1.0	-46.7	-13.0	-33.7	
3.346	-18.1	H	3.0	37.1	1.0	-54.2	-13.0	-41.2	
HIGH CHANNEL (846.6 MHz)									
1.693	-11.8	V	3.0	38.1	1.0	-48.9	-13.0	-35.9	
2.540	-22.5	V	3.0	37.5	1.0	-58.9	-13.0	-45.9	
1.693	-14.1	H	3.0	38.1	1.0	-51.2	-13.0	-38.2	
2.540	-23.2	H	3.0	37.5	1.0	-59.6	-13.0	-46.6	

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

WCDMA HSDPA (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	SAMSUNG ELECTRONICS
Project #:	12I14206
Date:	02/17/12
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH HEADSET AND AC ADAPTER
Mode:	TX, CELL HSUPA REL. 5 MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LOW CHANNE (826.4MHz)									
1.653	-11.6	V	3.0	35.5	1.0	-46.1	-13.0	-33.1	
2.479	-21.6	V	3.0	35.4	1.0	-56.0	-13.0	-43.0	
1.653	-14.6	H	3.0	35.5	1.0	-49.2	-13.0	-36.2	
2.479	-23.3	H	3.0	35.4	1.0	-57.7	-13.0	-44.7	
MID CHANNEL (836.6 MHz)									
1.673	-8.9	V	3.0	35.5	1.0	-43.5	-13.0	-30.5	
2.510	-20.7	V	3.0	35.4	1.0	-55.1	-13.0	-42.1	
1.673	-10.8	H	3.0	35.5	1.0	-45.3	-13.0	-32.3	
2.510	-22.1	H	3.0	35.4	1.0	-56.5	-13.0	-43.5	
HIGH CHANNEL (846.6 MHz)									
1.693	-11.1	V	3.0	35.5	1.0	-45.6	-13.0	-32.6	
2.540	-21.2	V	3.0	35.4	1.0	-55.6	-13.0	-42.6	
1.693	94.6	H	3.0	35.5	1.0	60.1	-13.0	73.1	
2.540	-23.1	H	3.0	35.4	1.0	-57.6	-13.0	-44.6	

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

WCDMA REL 99 (PCS Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	SAMSUNG ELECTRONICS
Project #:	12I14206
Date:	02/17/12
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH HEADSET AND AC ADAPTER
Mode:	TX, PCS WCDMA REL. 99 MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T145 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LOW CHANNE (1852.4MHz)									
3.705	-14.8	V	3.0	35.4	1.0	-49.2	-13.0	-36.2	
5.557	-10.6	V	3.0	35.4	1.0	-45.0	-13.0	-32.0	
7.410	-11.9	V	3.0	35.7	1.0	-46.6	-13.0	-33.6	
3.705	-17.8	H	3.0	35.4	1.0	-52.2	-13.0	-39.2	
5.557	-15.2	H	3.0	35.4	1.0	-49.6	-13.0	-36.6	
7.410	-11.8	H	3.0	35.7	1.0	-46.5	-13.0	-33.5	
MID CHANNEL (1880.0 MHz)									
3.760	-14.4	V	3.0	35.3	1.0	-48.7	-13.0	-35.7	
5.640	-7.5	V	3.0	35.4	1.0	-41.9	-13.0	-28.9	
7.520	-11.2	V	3.0	35.7	1.0	-45.9	-13.0	-32.9	
3.760	-16.4	H	3.0	35.3	1.0	-50.7	-13.0	-37.7	
5.640	-14.7	H	3.0	35.4	1.0	-49.1	-13.0	-36.1	
7.520	-11.7	H	3.0	35.7	1.0	-46.4	-13.0	-33.4	
HIGH CHANNEL (1907.6 MHz)									
3.815	-16.8	V	3.0	35.3	1.0	-51.1	-13.0	-38.1	
5.723	-9.1	V	3.0	35.4	1.0	-43.5	-13.0	-30.5	
7.630	-9.7	V	3.0	35.7	1.0	-44.4	-13.0	-31.4	
3.815	-16.0	H	3.0	35.3	1.0	-50.3	-13.0	-37.3	
5.723	-13.6	H	3.0	35.4	1.0	-48.0	-13.0	-35.0	
7.630	-10.5	H	3.0	35.7	1.0	-45.2	-13.0	-32.2	

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

WCDMA HSUPA (PCS Band)

Company:	SAMSUNG ELECTRONICS
Project #:	12I14206
Date:	02/17/12
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH HEADSET AND AC ADAPTER
Mode:	TX, WCDMA1900, HSUPA MODE

Chamber	Pre-amplifer	Filter	Limit
5m Chamber B	T144 8449B	Filter 1	Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
LOW CHANNE (1852.4MHz)									
3.705	-17.3	V	3.0	36.8	1.0	-53.1	-13.0	-40.1	
5.557	-16.9	V	3.0	36.3	1.0	-52.2	-13.0	-39.2	
7.410	-12.1	V	3.0	36.6	1.0	-47.6	-13.0	-34.6	
3.705	-18.8	H	3.0	36.8	1.0	-54.6	-13.0	-41.6	
5.557	-16.0	H	3.0	36.3	1.0	-51.3	-13.0	-38.3	
7.410	-8.4	H	3.0	36.6	1.0	-43.9	-13.0	-30.9	
MID CHANNEL (1880.0 MHz)									
3.760	-16.9	V	3.0	36.8	1.0	-52.6	-13.0	-39.6	
5.640	-9.4	V	3.0	36.3	1.0	-44.7	-13.0	-31.7	
7.520	-11.2	V	3.0	36.6	1.0	-46.8	-13.0	-33.8	
3.760	-18.9	H	3.0	36.8	1.0	-54.7	-13.0	-41.7	
5.640	-17.3	H	3.0	36.3	1.0	-52.6	-13.0	-39.6	
7.520	-12.4	H	3.0	36.6	1.0	-48.0	-13.0	-35.0	
HIGH CHANNEL (1907.6 MHz)									
3.815	-14.2	V	3.0	36.7	1.0	-50.0	-13.0	-37.0	
5.723	-16.0	V	3.0	36.3	1.0	-51.3	-13.0	-38.3	
7.630	-11.1	H	3.0	36.6	1.0	-46.7	-13.0	-33.7	
3.815	-16.0	H	3.0	36.7	1.0	-51.7	-13.0	-38.7	
5.723	-13.7	H	3.0	36.3	1.0	-49.0	-13.0	-36.0	
7.630	-11.2	V	3.0	36.6	1.0	-46.8	-13.0	-33.8	
		H							

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