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

FOR

802.11 B/G/N 1X1 HT20, + BT4.0 +BASIC RATES + GSM850/1900 & WCDMA850/1900MHZ BAR PHONE

MODEL NUMBER: GT-S7710L

FCC ID: A3LGTS7710L

REPORT NUMBER: 12I14777- 4

ISSUE DATE: JANUARY 31, 2013

Prepared for

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

Prepared by

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
---	01/31/13	Initial Issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

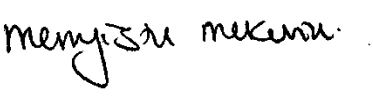
COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD. 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA
EUT DESCRIPTION:	802.11 B/G/N 1X1 HT20, + BT4.0 +BASIC RATES + GSM850/1900 & WCDMA850/1900MHZ BAR PHONE
MODEL:	GT-S7710L
SERIAL NUMBER:	FJ-334-F
DATE TESTED:	JANUARY 16 - 30, 2012

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

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

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

Approved & Released For UL CCS By: Tested By:



THU CHAN
WISE OPERATIONS MANAGER
UL CCS

ROY ZHENG
WISE LAB TECHNICIAN
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 an 802.11 b/g/n 1x1 HT20, + BT4.0 +basic rates + GSM850/1900 & WCDMA850/1900MHz Bar phone.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak of both 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	32.86	1932.0	28.10	645.7
824.2 - 848.8	EGPRS	29.43	877.0	24.89	308.3

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2 - 1909.8	GPRS	29.51	893.3	29.36	863.0
1850.2 - 1909.8	EGPRS	29.42	875.0	28.86	769.1

Part 22/24 Band					
Frequency range (MHz)	Modulation	Conducted		ERP/EIRP	
		dBm	mW	dBm	mW
826.4 - 846	REL 99	25.73	374.1	20.89	122.7
1852.4 - 1907.6		25.60	363.1	25.25	335.0

Part 22/24 Band					
Frequency range (MHz)	Modulation	Conducted		ERP/EIRP	
		dBm	mW	dBm	mW
826.4 - 846	HSUPA	26.32	428.5	22.02	159.2
1852.4 - 1907.6		26.72	469.9	26.67	464.5

5.3. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent 8960 Communication Test Set.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral antenna with a maximum peak gain as follow:

Frequency (MHz)	Gain (dBi)
850MHz	-2.45
1900MHz	-0.50

5.5. WORST-CASE CONFIGURATION AND MODE

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

Worst-case modes: GPRS, UMTS WCDMA and UMTS HSDPA Sub-test 1

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, Y-Orientation with headset was turned out to be the worst case for cell and PCS bands.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	NA	SC1C401VS	DoC
Headset	Samsung	NA	3040	NA

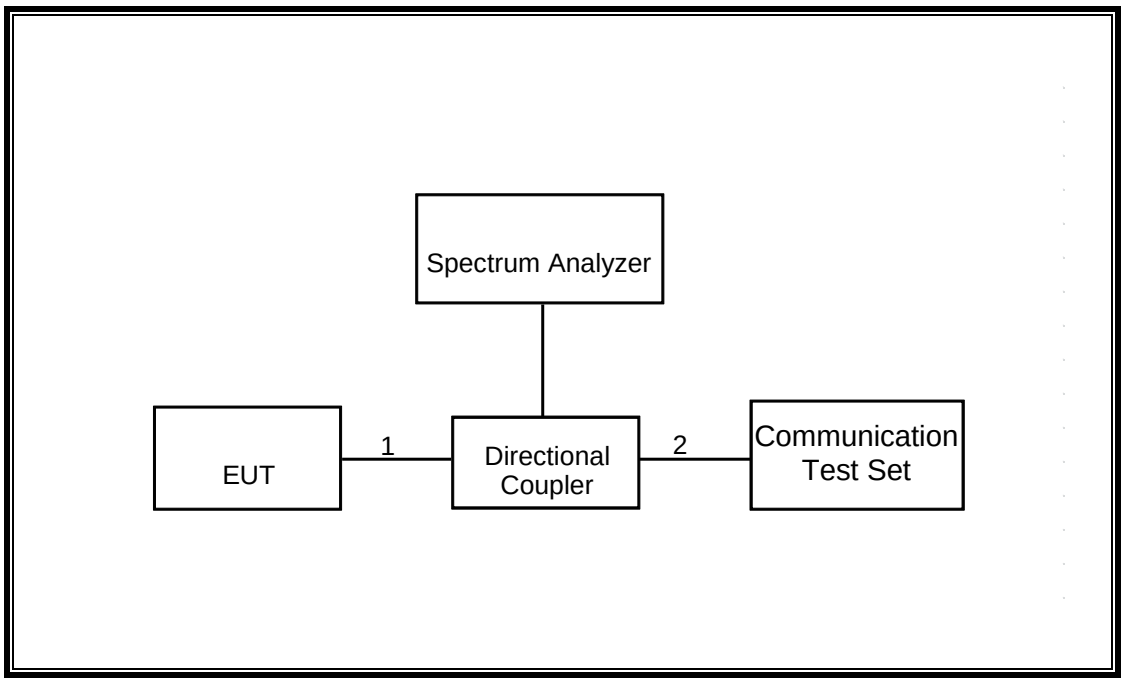
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC	1	DC	Un-shielded	1m	NA
2	Jack	1	Earphone	Un-shielded	1.2m	NA

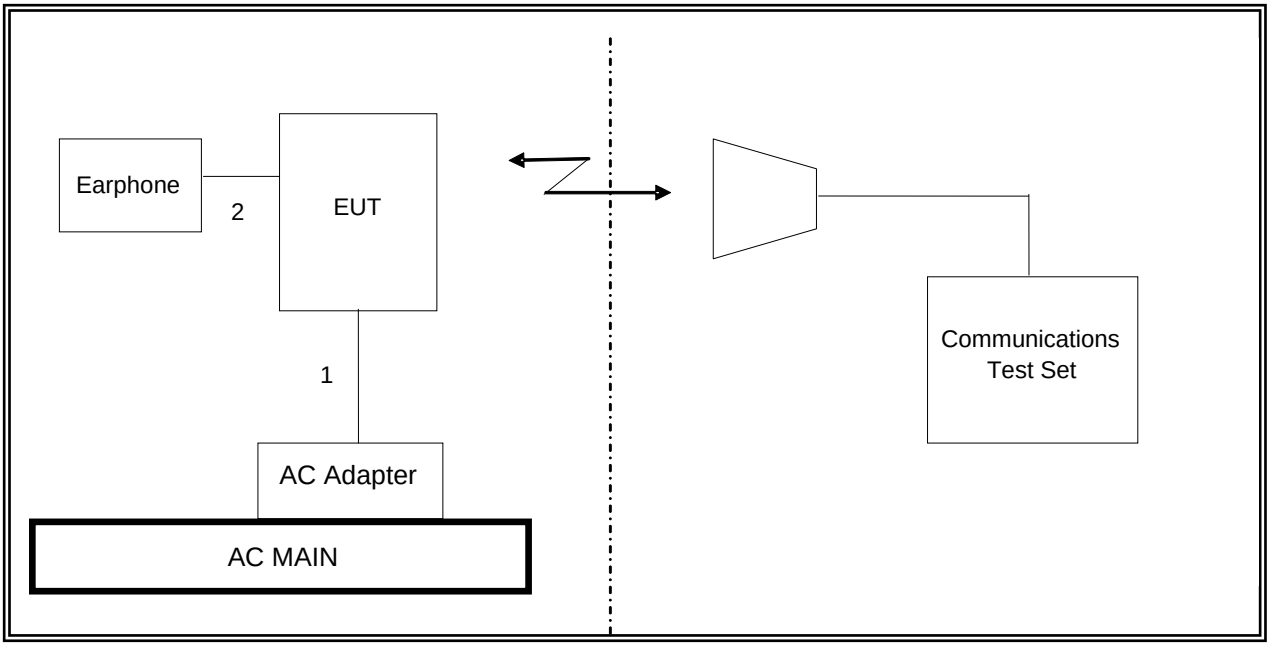
TEST SETUP

The EUT is a stand-alone device. A link is established between the EUT and the 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**
Antenna, Horn, 18 GHz	EMCO	3115	C00872	10/25/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00885	12/11/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	03/22/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	10/22/13
Communication Test Set	Agilent / HP	E5515C	C01086	06/20/13
Communication Test Set	Anritsu	MT8820C	1100481	07/13/13
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02689	CNR
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02687	CNR
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01011	03/23/13
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	07/06/13

7. RF POWER OUTPUT VERIFICATION

7.1. GPRS / EGPRS MODES

TEST PROCEDURE

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

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

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW ≥ RBW.≥ 26dB BW, typically 3MHz.
- Set a marker to point the corresponding peak value.

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 >	CS1 (GPRS) and MCS5 (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

CELL

	Ch.	f (MHz)	1 time slots	2 time slots	3 time slots	4 time slots
			Peak	Peak	Peak	Peak
GPRS	128	824.2	32.78	31.73	30.39	28.43
	190	836.6	**32.86**	31.84	30.40	28.47
	251	848.8	32.84	31.83	30.36	28.44
EGPRS	128	824.2	29.43	28.71	27.45	26.58
	190	836.6	**29.43**	28.72	27.44	26.58
	251	848.8	29.37	28.66	27.40	26.49

PCS

	Ch.	f (MHz)	1 time slots	2 time slots	3 time slots	4 time slots
			Peak	Peak	Peak	Peak
GPRS	512	1850.2	**29.51**	28.63	27.21	25.24
	661	1880.0	29.39	28.51	27.09	25.09
	810	1909.8	29.38	28.48	27.09	25.11
EGPRS	512	1850.2	29.03	27.85	26.65	25.67
	661	1880.0	29.41	28.25	26.91	25.99
	810	1909.8	**29.42**	28.38	27.09	26.24

7.2. UMTS REL 99 MODE

TEST PROCEDURE

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

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

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

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	Peak Conducted output power (dBm)
UMTS 850	4132	4357	826.4	25.59
	4180	4405	836.0	**25.73**
	4230	4455	846.0	25.45

Band	UL Ch	DL Ch	Frequency	Peak Conducted output power (dBm)
UMTS 1900	9262	9662	1852.4	25.55
	9400	9800	1880.0	**25.60**
	9538	9938	1907.6	25.40

7.3. UMTS HSDPA MODE

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	Peak Conducted output power (dBm)
UMTS850 (Band V)	1	4132	4357	826.4	25.75
		4180	4405	836.0	26.05
		4230	4455	846.0	25.92
	2	4132	4357	826.4	25.81
		4180	4405	836.0	25.72
		4230	4455	846.0	26.08
	3	4132	4357	826.4	25.99
		4180	4405	836.0	26.04
		4230	4455	846.0	25.90
	4	4132	4357	826.4	26.07
		4180	4405	836.0	25.67
		4230	4455	846.0	**26.12**
UMTS1900 (Band II)	1	9262	9662	1852.4	26.07
		9400	9800	1880.0	26.27
		9538	9938	1907.6	25.98
	2	9262	9662	1852.4	26.06
		9400	9800	1880.0	26.39
		9538	9938	1907.6	25.95
	3	9262	9662	1852.4	26.18
		9400	9800	1880.0	26.56
		9538	9938	1907.6	25.88
	4	9262	9662	1852.4	26.12
		9400	9800	1880.0	**26.60**
		9538	9938	1907.6	26.14

Note 1: Maximum output power levels that are possible for all subtests reported.

7.4. UMTS HSUPA MODE

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	Peak Conducted output power (dBm)
UMTS850 (Band V)	1	4132	4357	826.4	26.16
		4180	4405	836.0	**26.32**
		4230	4455	846.0	26.26
	2	4132	4357	826.4	25.72
		4180	4405	836.0	25.83
		4230	4455	846.0	26.10
	3	4132	4357	826.4	26.02
		4180	4405	836.0	25.66
		4230	4455	846.0	25.91
	4	4132	4357	826.4	25.79
		4180	4405	836.0	25.88
		4230	4455	846.0	25.92
	5	4132	4357	826.4	25.64
		4180	4405	836.0	25.95
		4230	4455	846.0	25.90
UMTS1900 (Band II)	1	9262	9662	1852.4	26.55
		9400	9800	1880.0	26.51
		9538	9938	1907.6	26.53
	2	9262	9662	1852.4	26.59
		9400	9800	1880.0	26.56
		9538	9938	1907.6	**26.72**
	3	9262	9662	1852.4	26.67
		9400	9800	1880.0	26.63
		9538	9938	1907.6	26.66
	4	9262	9662	1852.4	26.35
		9400	9800	1880.0	26.57
		9538	9938	1907.6	26.49
	5	9262	9662	1852.4	26.28
		9400	9800	1880.0	26.60
		9538	9938	1907.6	26.71

Note 1: Maximum output power levels that are possible for all subtests reported.

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
- UMTS REL 99 and HSUPA

RESULTS

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.20	244.7534	306.850
		190	836.60	247.6640	322.069
		251	848.80	247.7476	303.813
PCS		512	1850.2	241.4994	305.421
		661	1880.0	246.2467	303.838
		810	1909.8	246.3514	292.296

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	EGPRS	128	824.20	245.4253	308.969
		190	836.60	246.7640	306.247
		251	848.80	243.3898	315.133
PCS		512	1850.2	233.9079	306.494
		661	1880.0	249.6136	302.068
		810	1909.8	239.6417	320.916

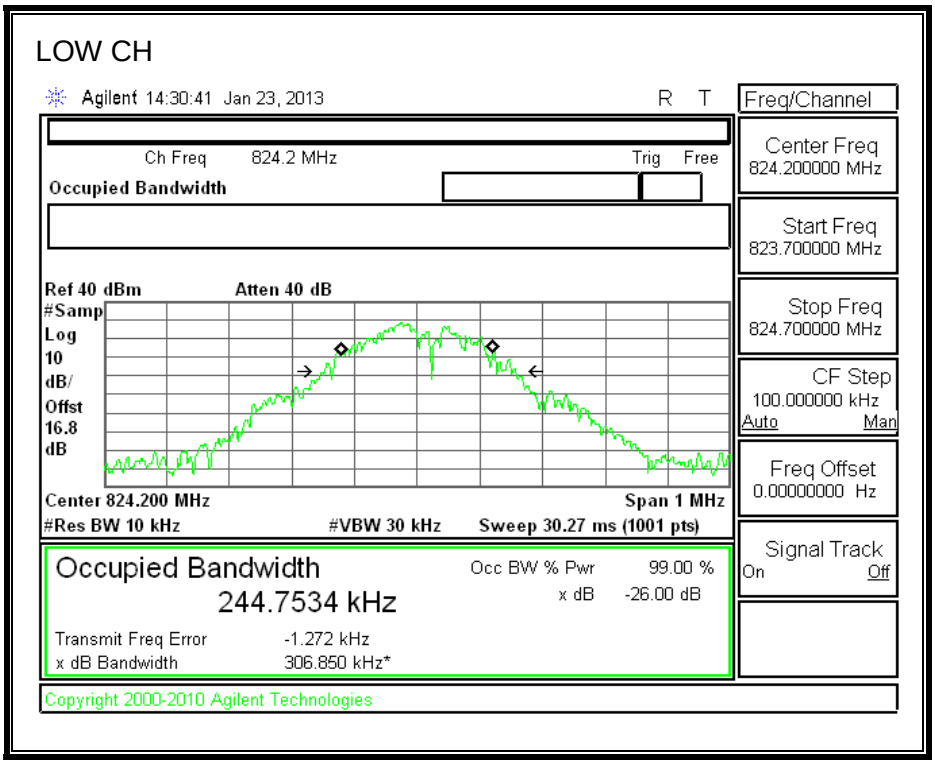
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
REL 99	Cell	4357	826.4	4.1855	4.712
		4408	836.6	4.2193	4.645
		4458	846.6	4.1914	4.710
	PCS	9662	1852.4	4.0586	4.633
		9880	1880.0	4.1359	4.696
		9938	1907.6	4.1798	4.678

HSUPA	CELL	4357	826.4	4.0933	4.600
		4408	836.6	4.1012	4.745
		4458	846.6	4.1751	4.599
	PCS	9662	1852.4	4.1156	4.566
		9880	1880.0	4.1449	4.697
		9938	1907.6	4.2207	4.708

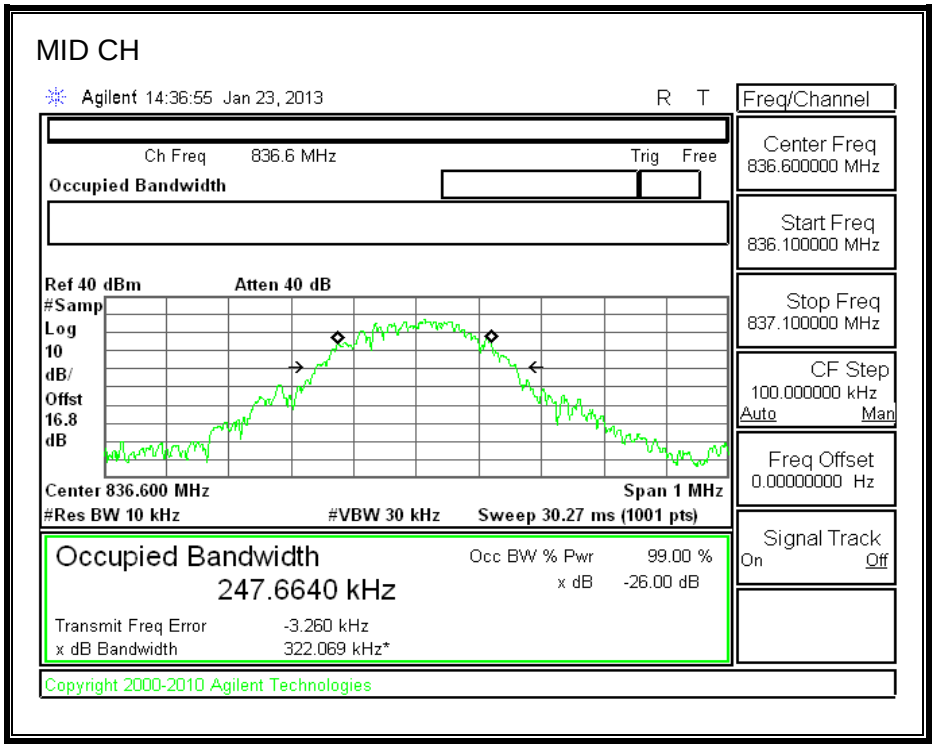
8.1.1. GPRS MODE

CELL BAND

LOW CH



MID CH



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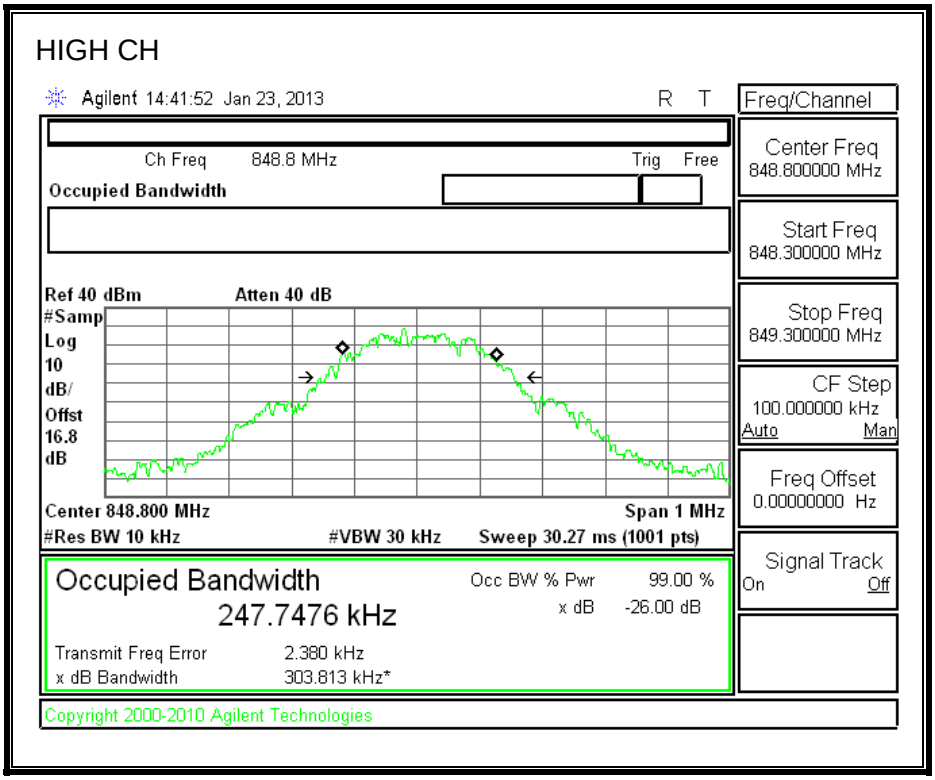
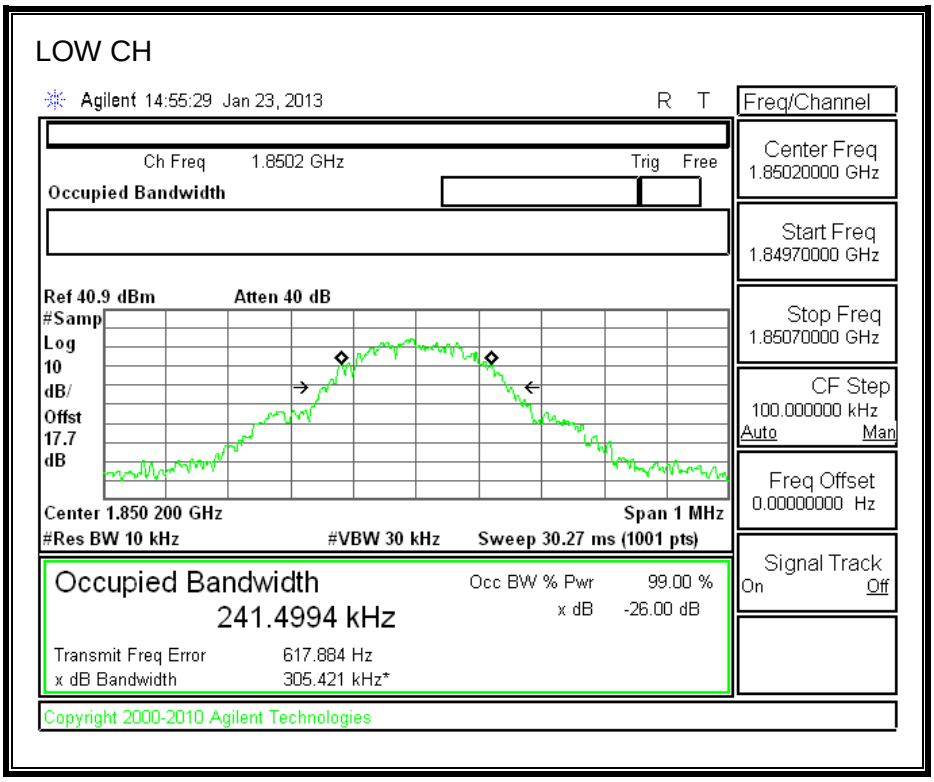


PCS Band

LOW CH



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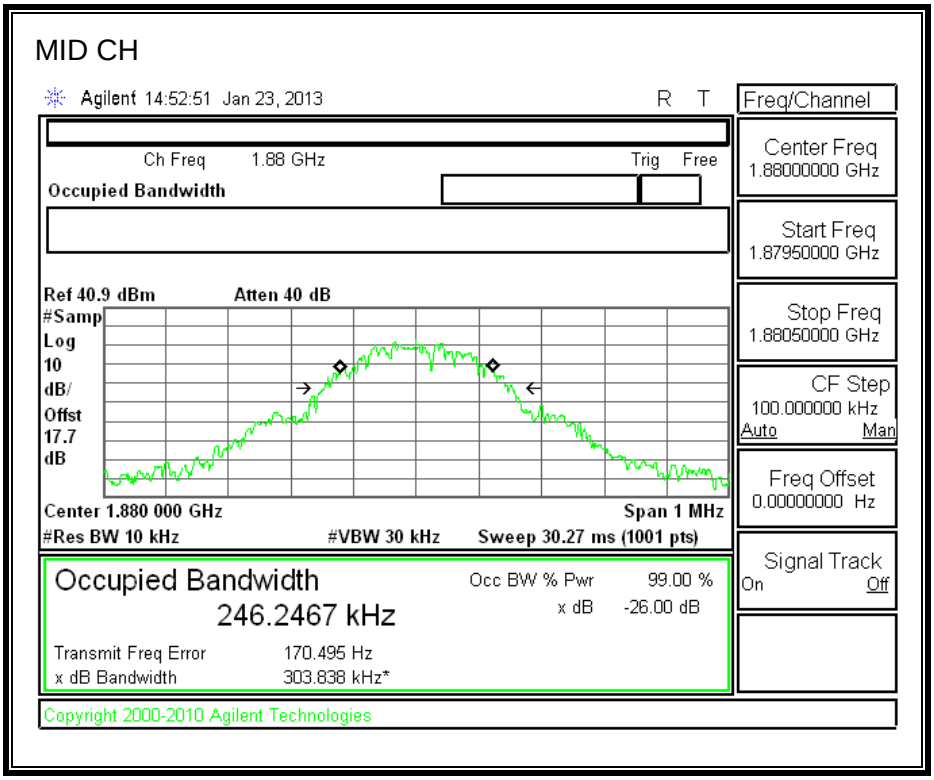
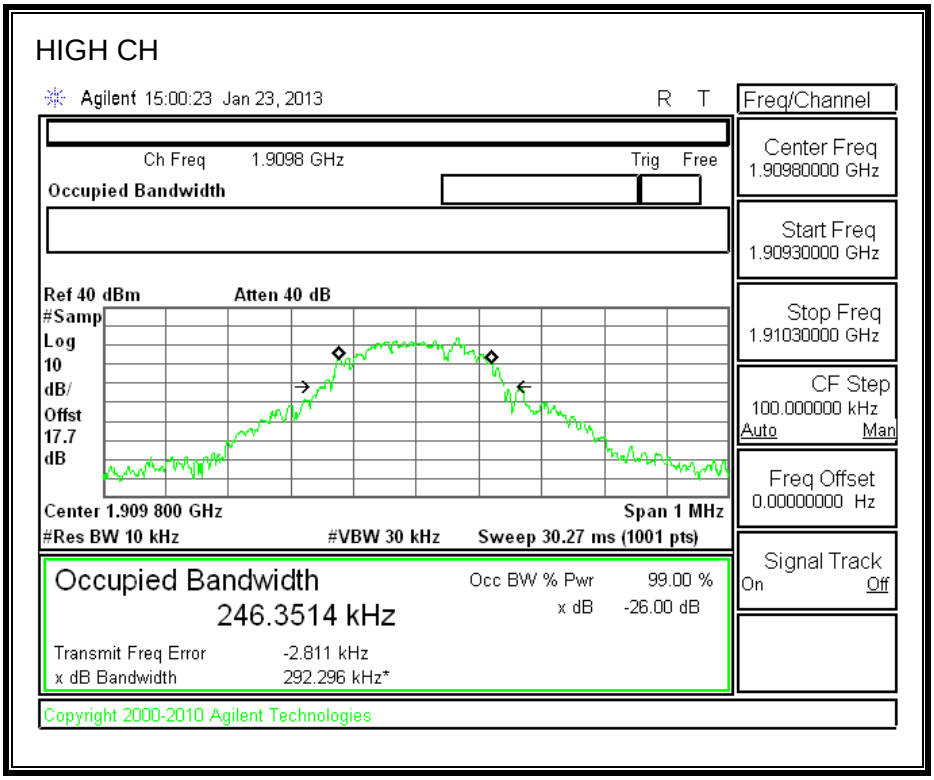


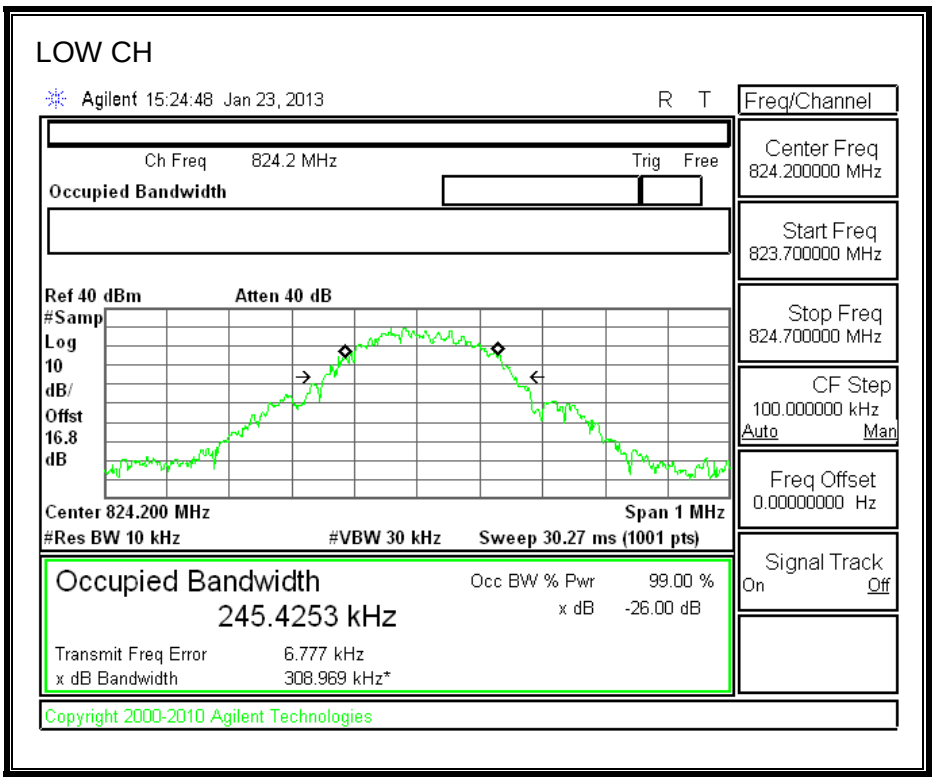
HIGH CH



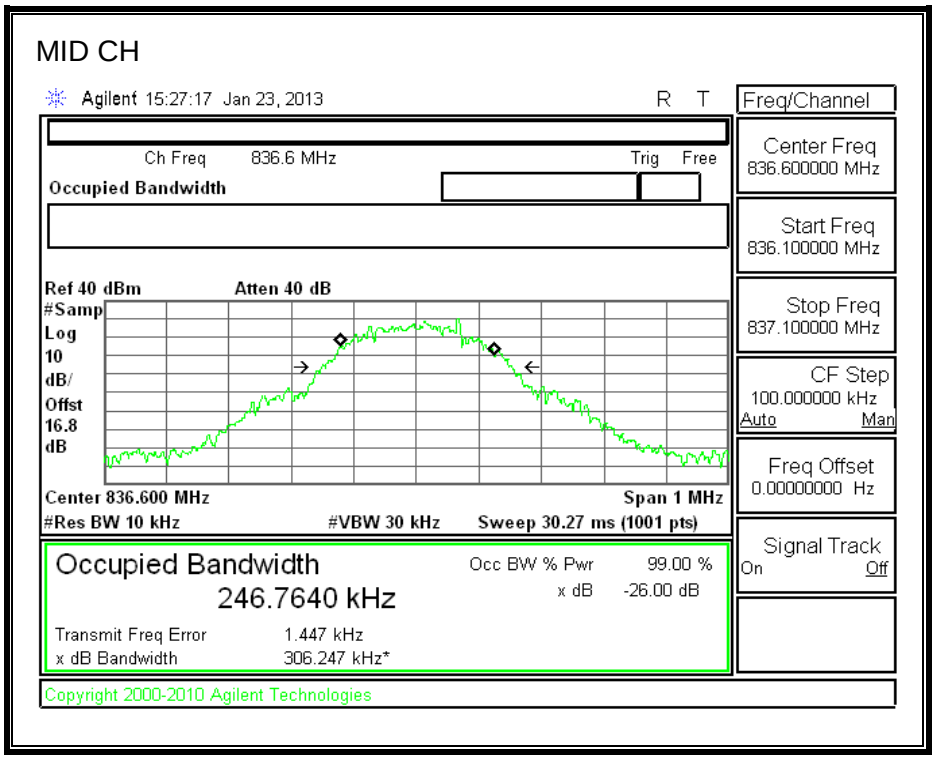
8.1.2. EGPRS MODE

CELL BAND

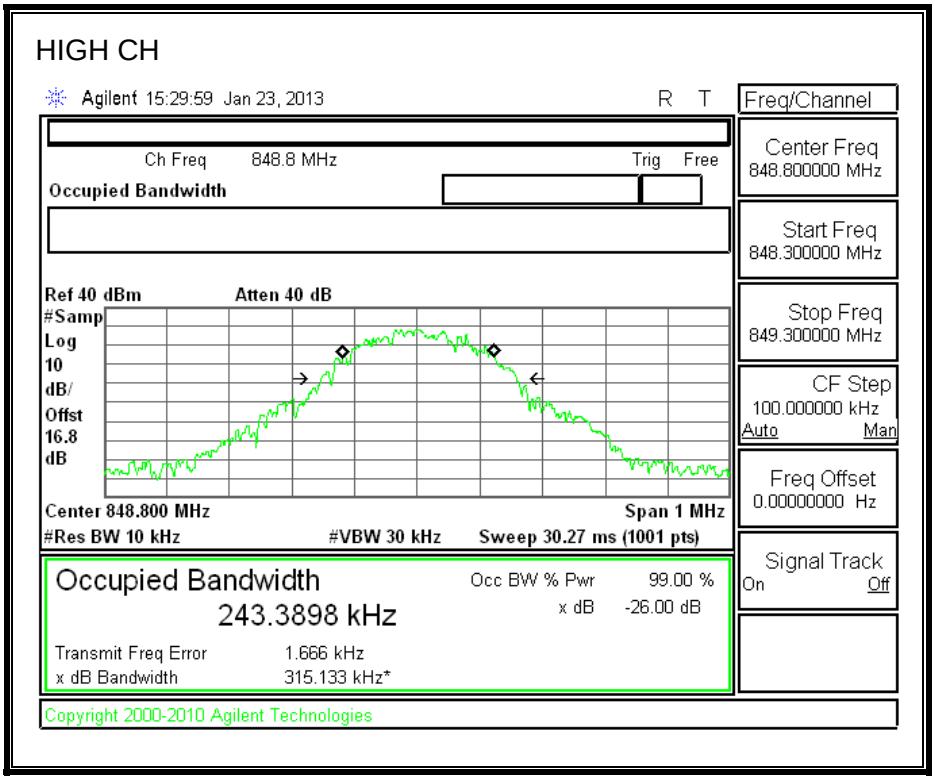
LOW CH



MID CH

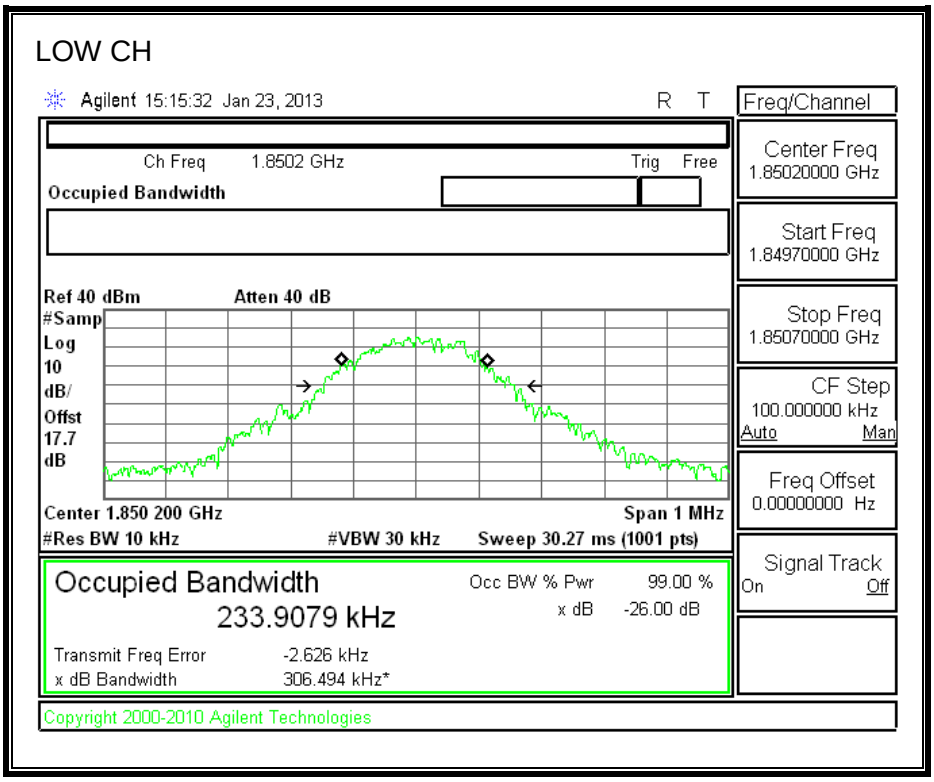


HIGH CH

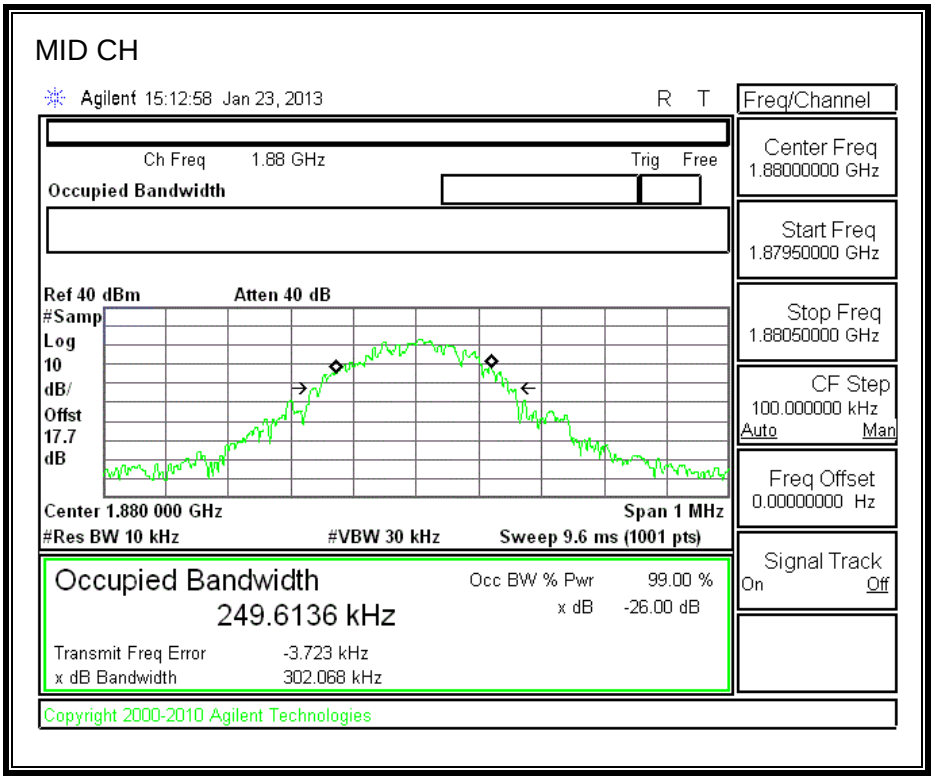


PCS Band

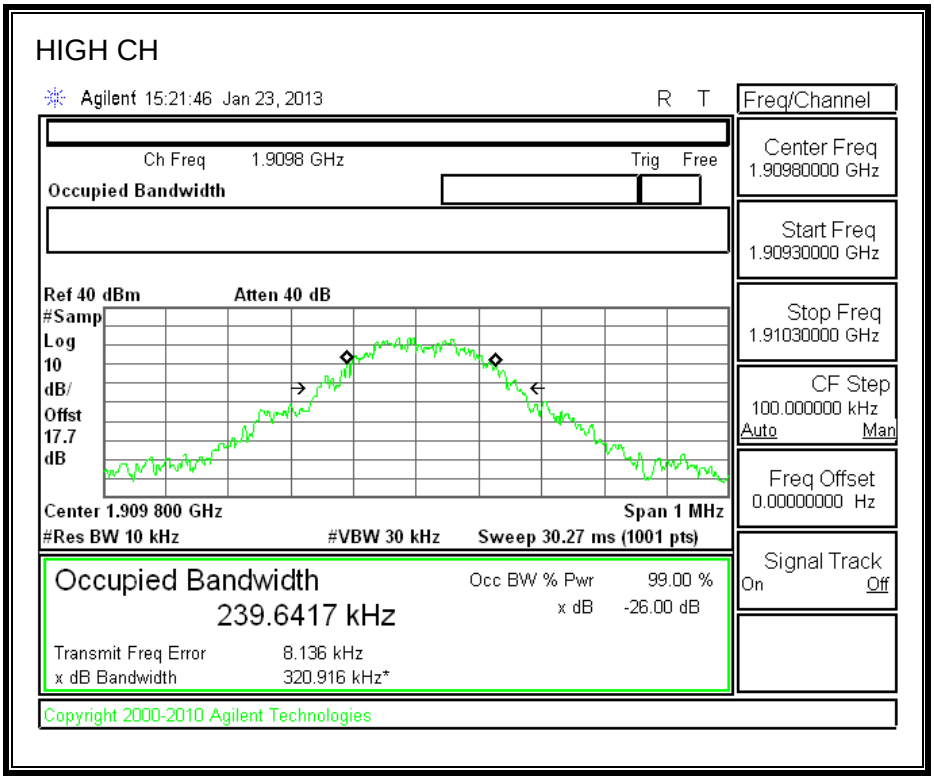
LOW CH



MID CH



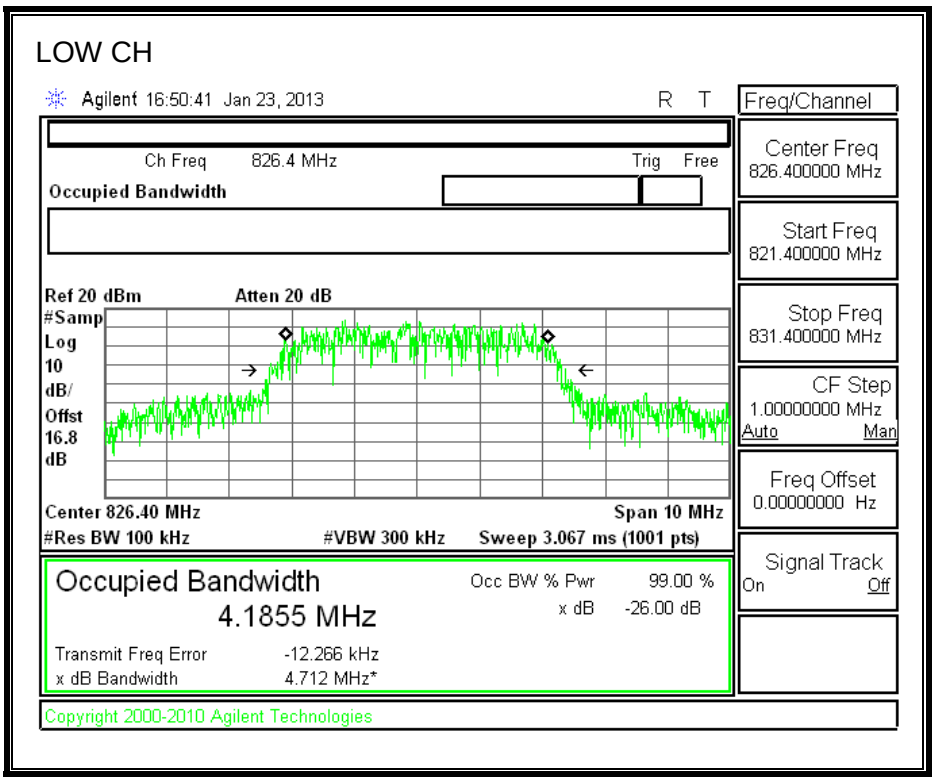
HIGH CH



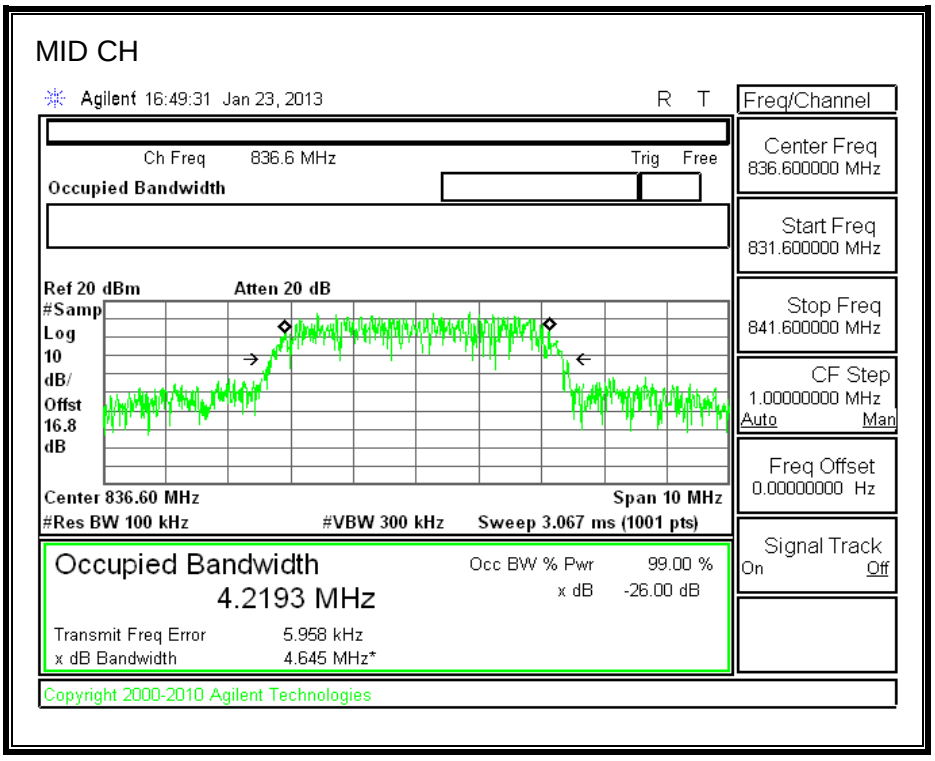
8.1.3. UMTS REL 99 MODE

CELL BAND

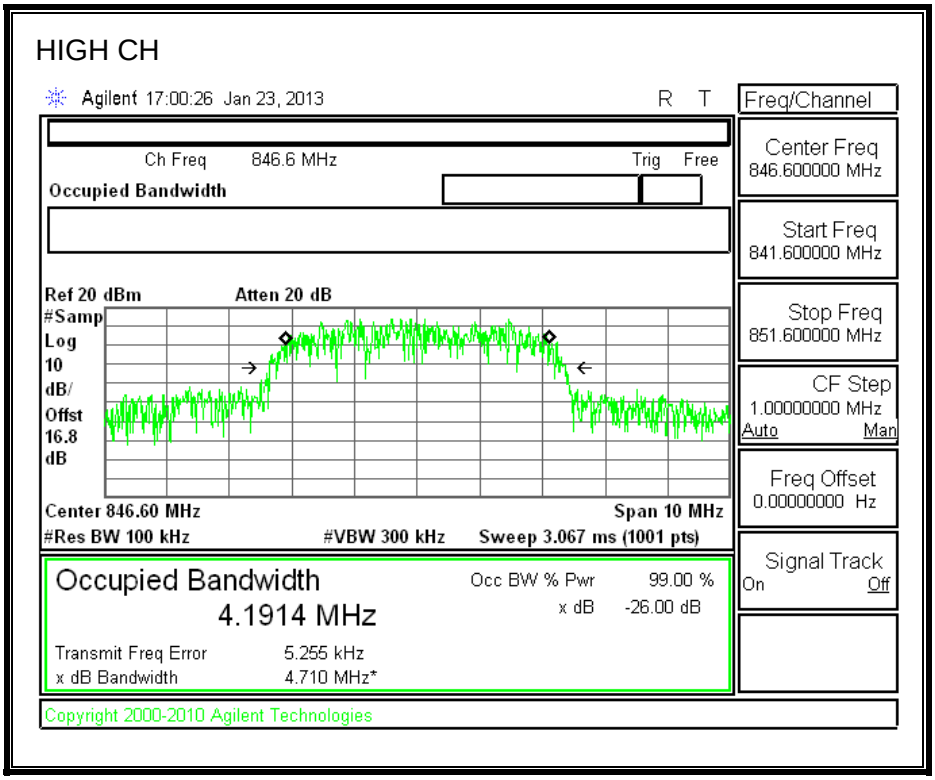
LOW CH



MID CH

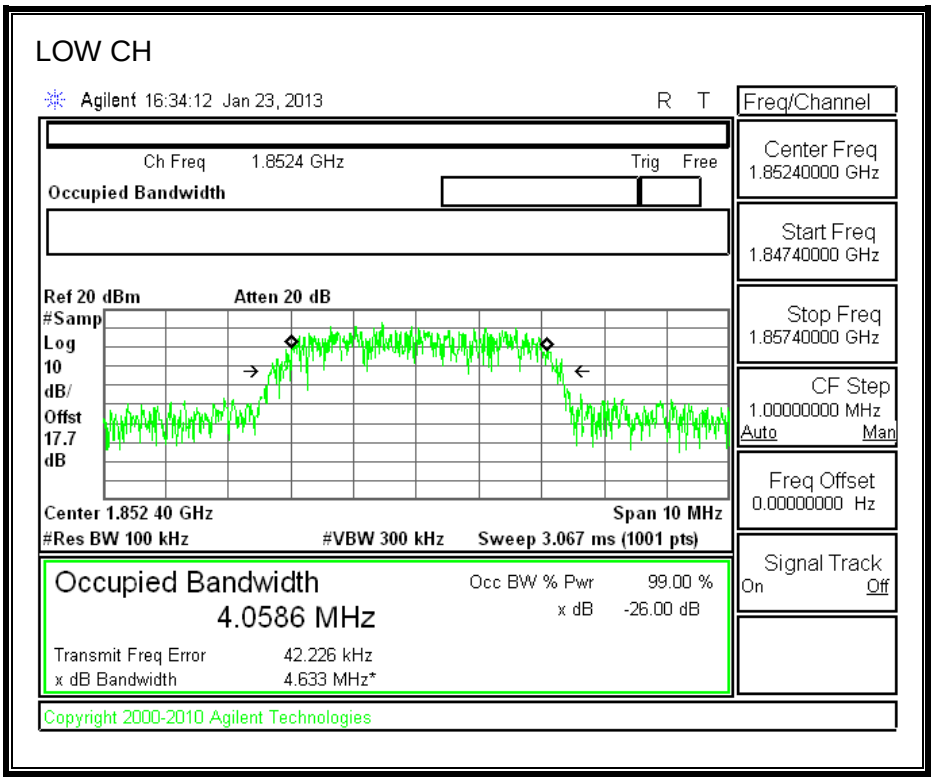


HIGH CH

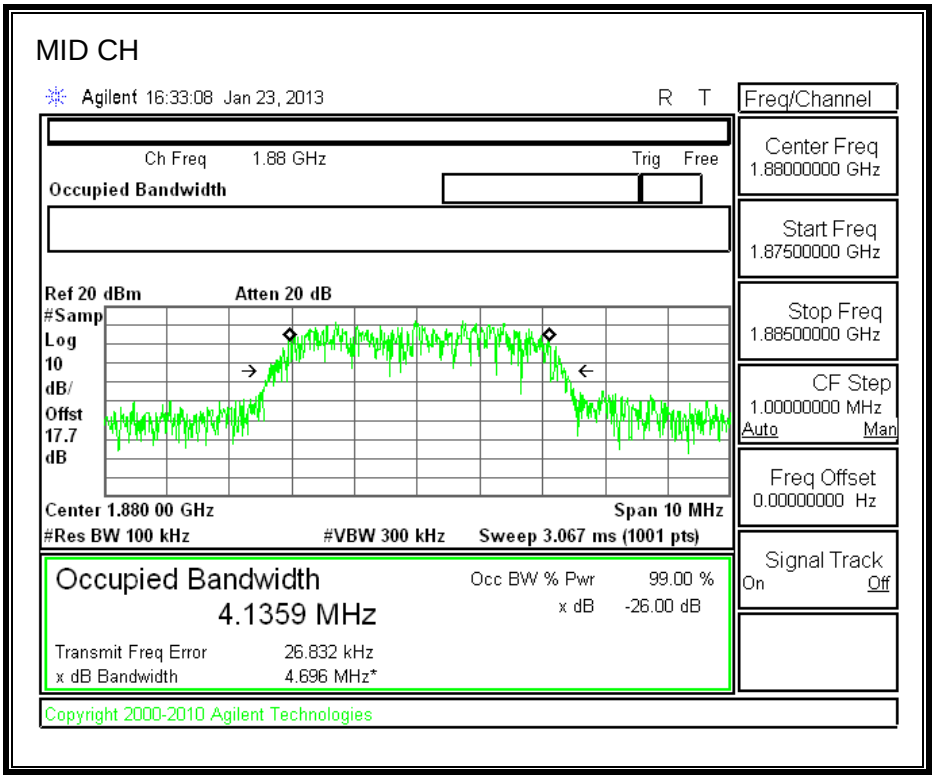


PCS Band

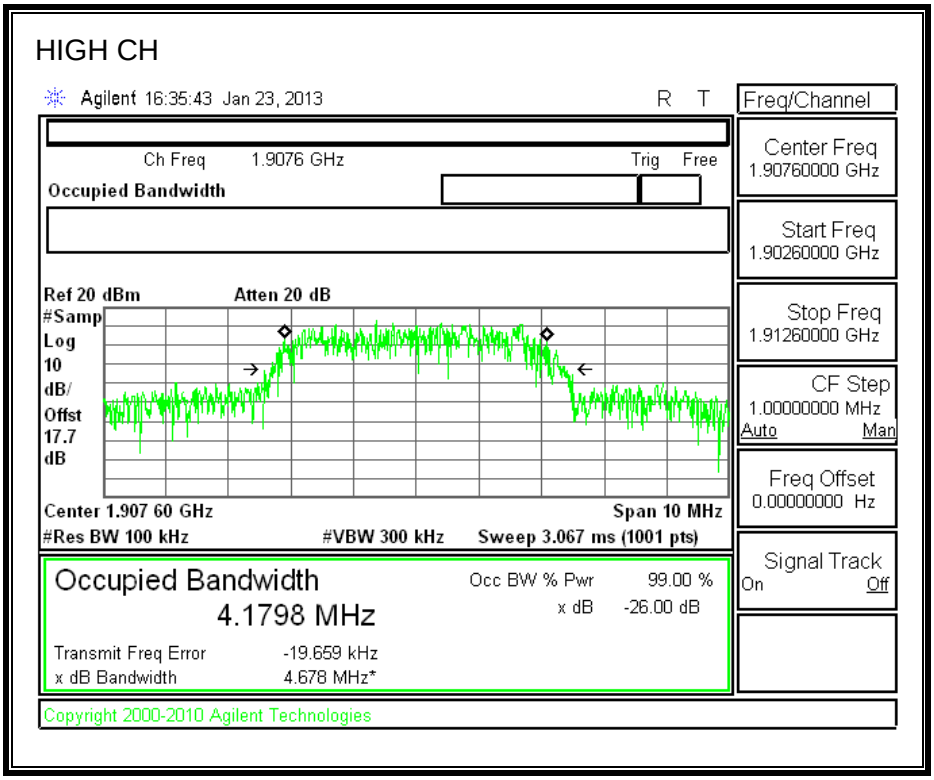
LOW CH



MID CH



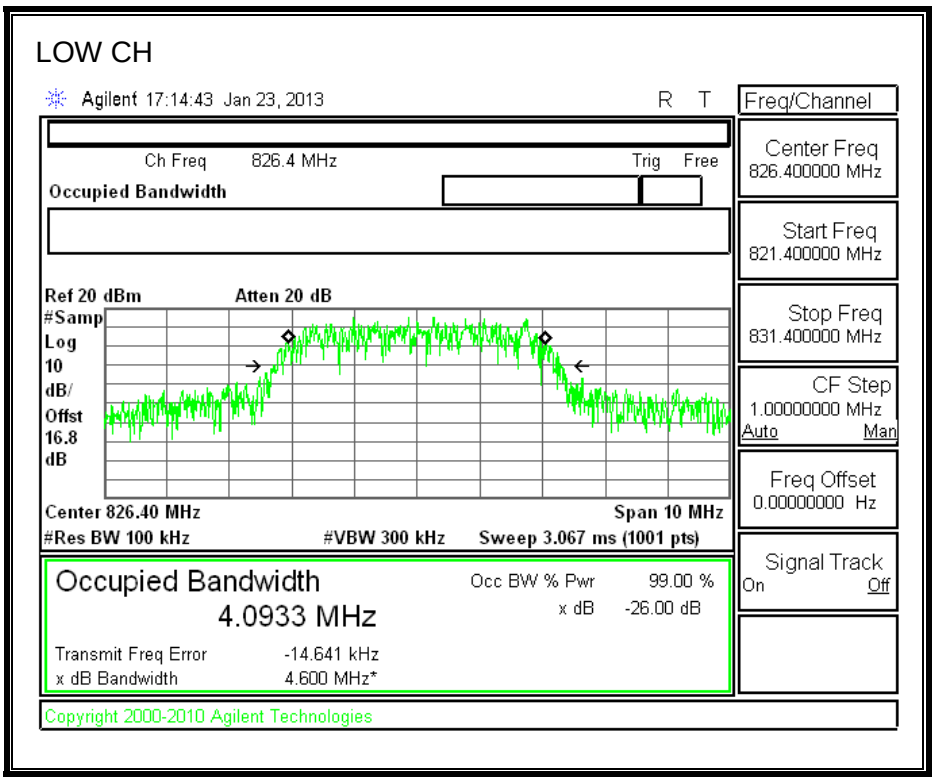
HIGH CH



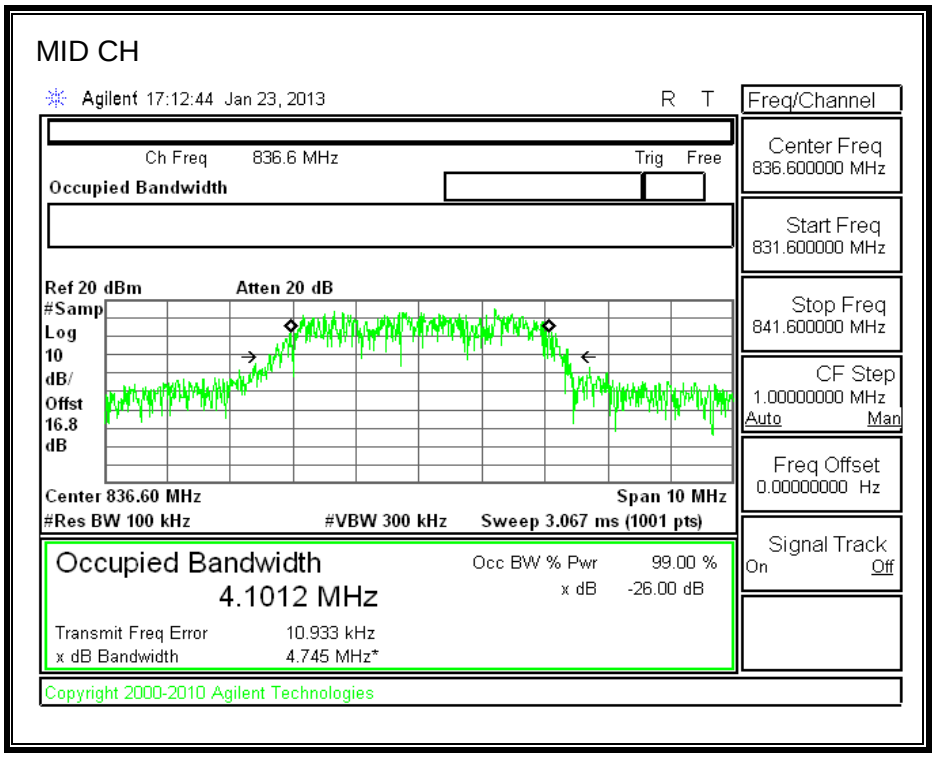
8.1.4. UMTS HSUPA MODE

CELL Band

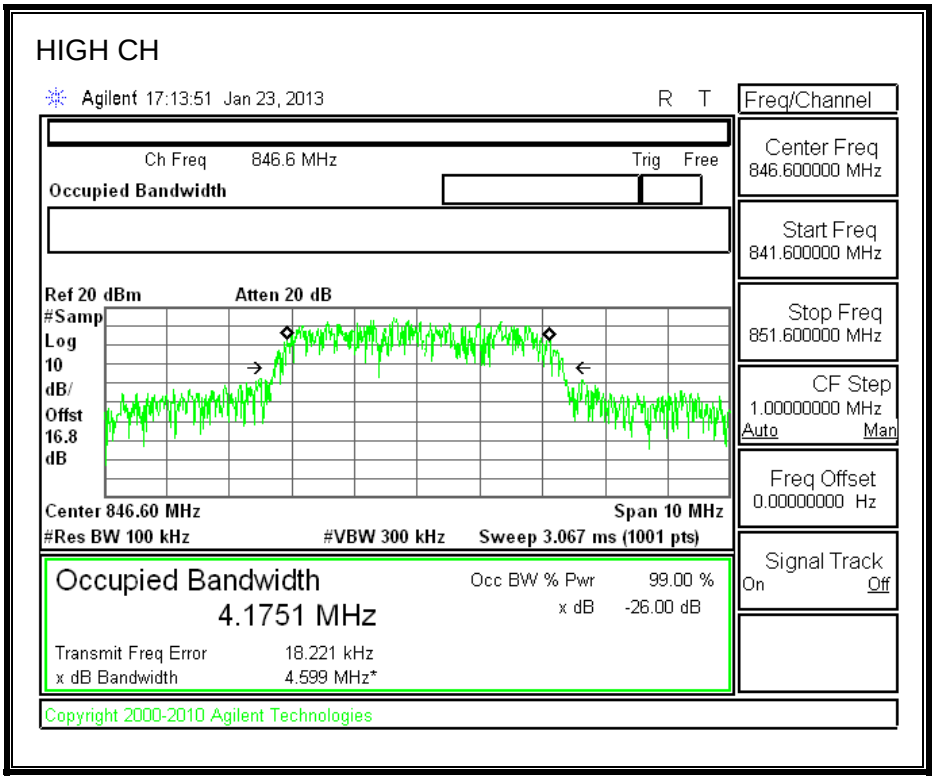
LOW CH



MID CH

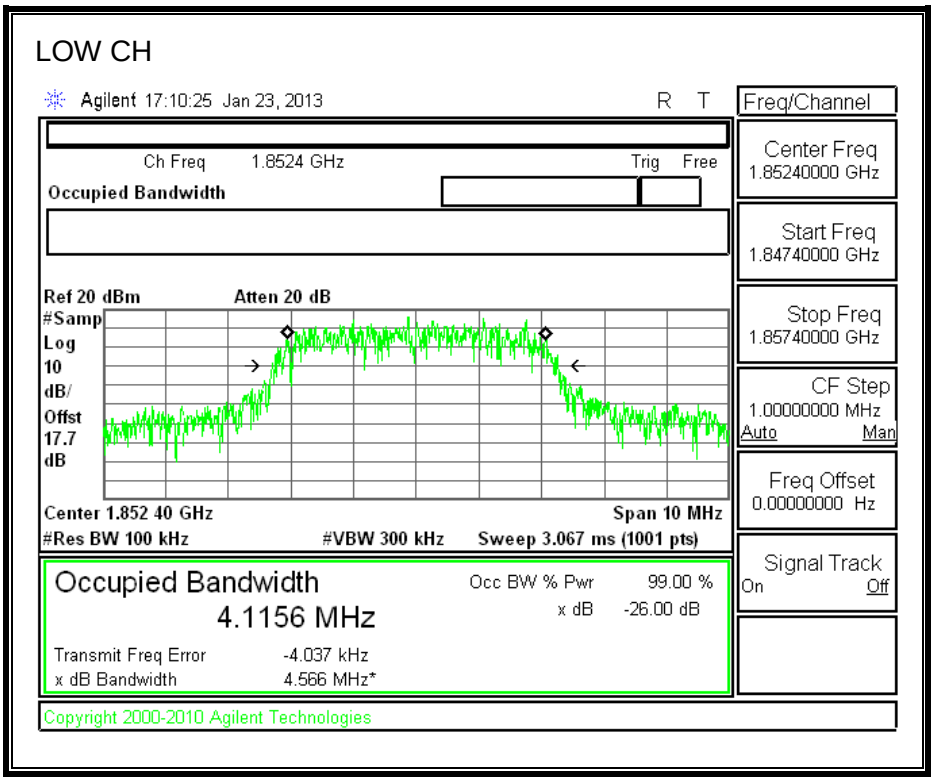


HIGH CH

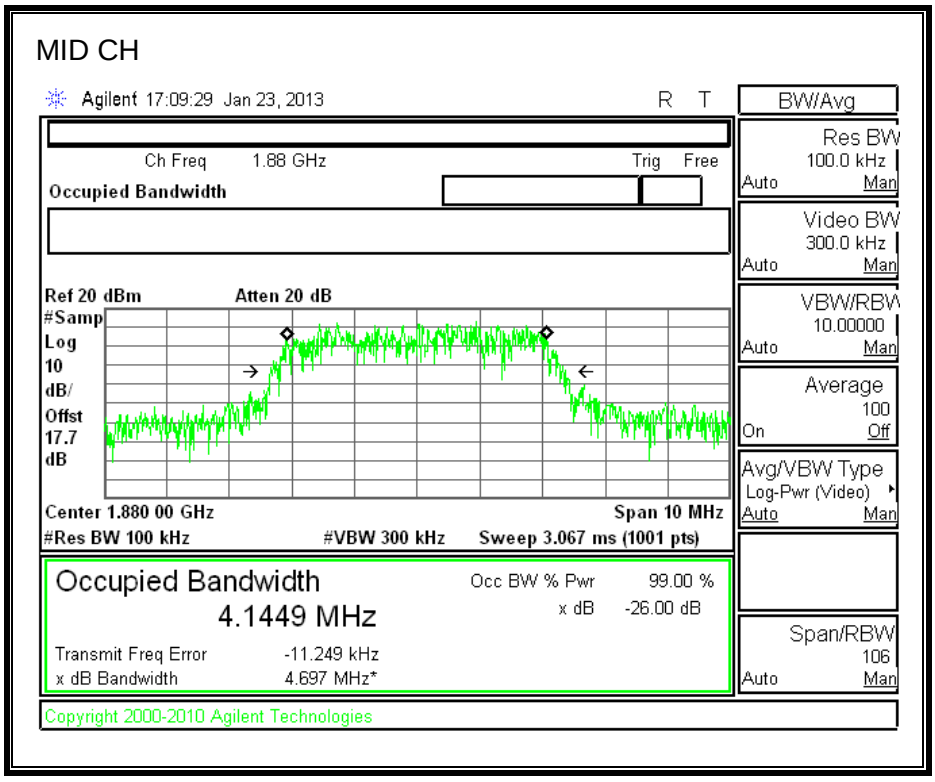


PCS BAND

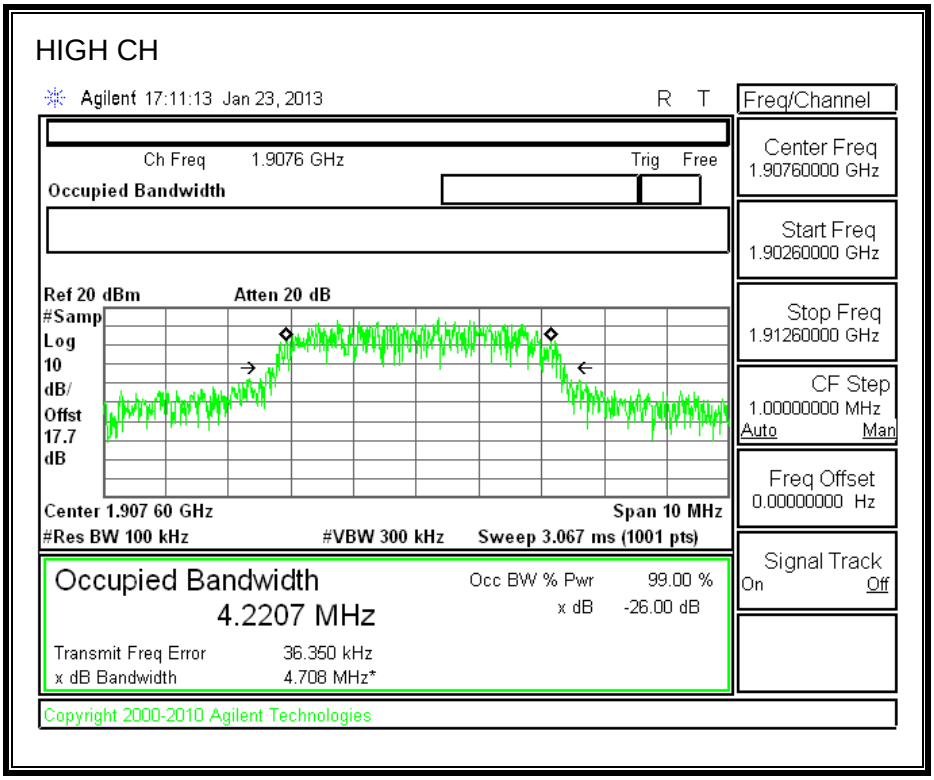
LOW CH



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

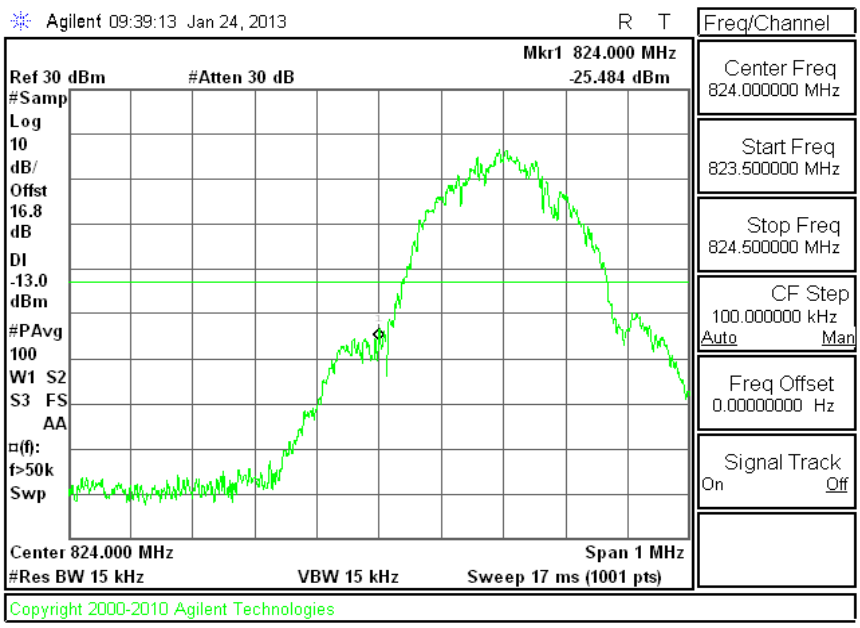
- GPRS and EGPRS
- UMTS, REL 99 and HSDPA

RESULTS

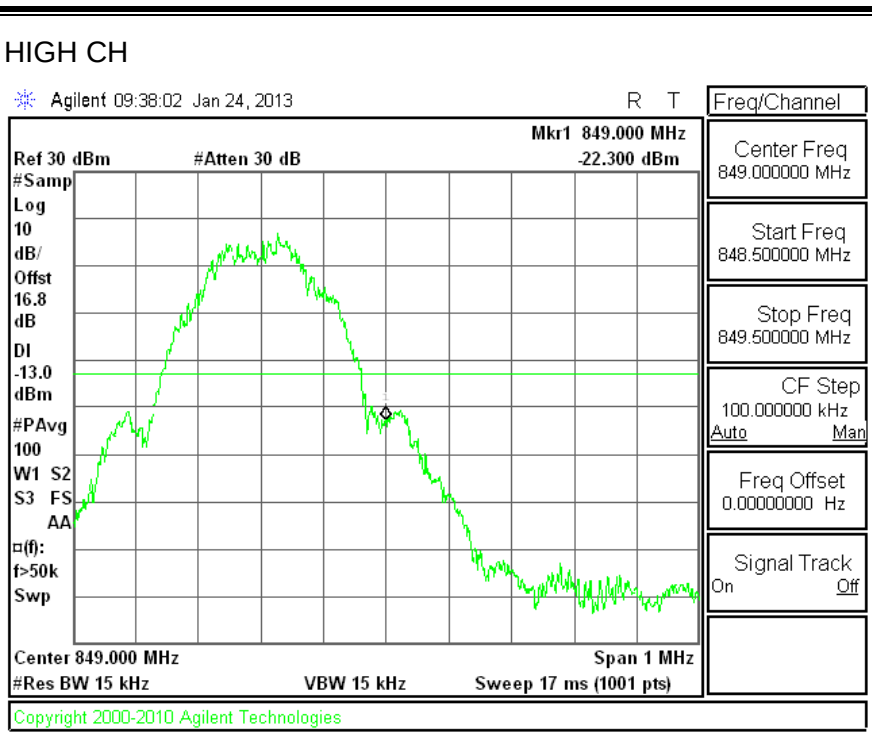
8.2.1. GPRS MODE

CELL BAND

LOW CH

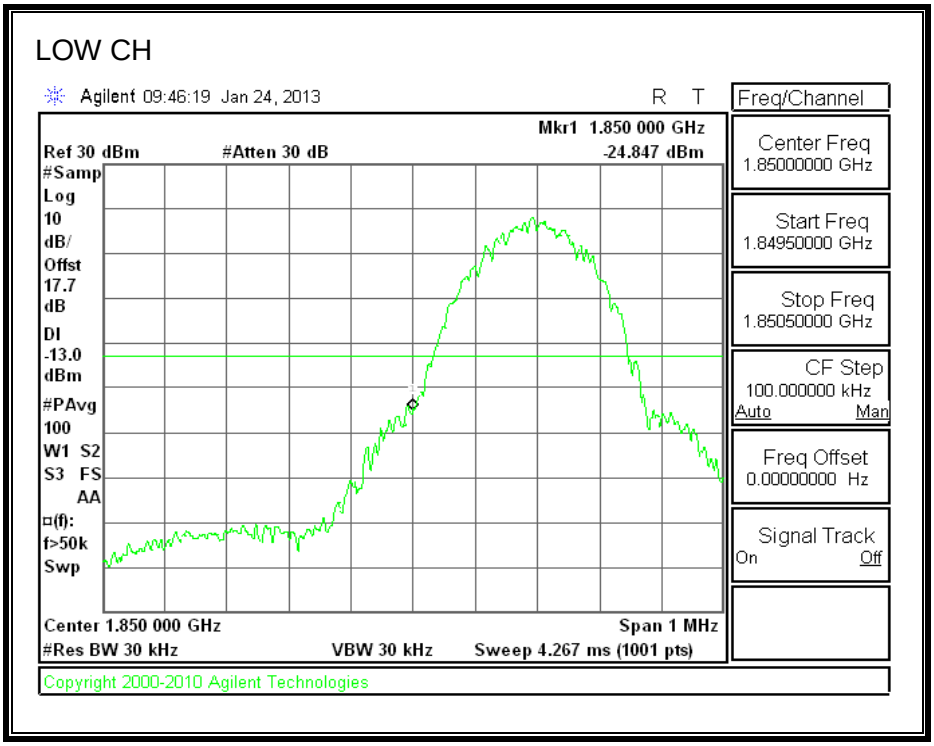


HIGH CH

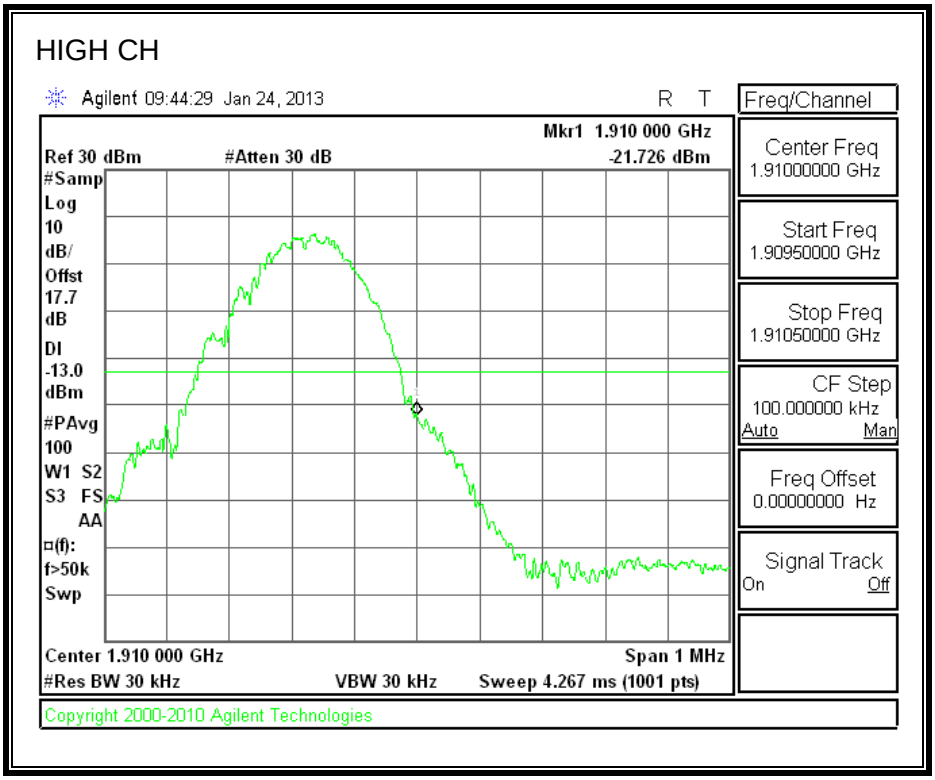


PCS BAND

LOW CH



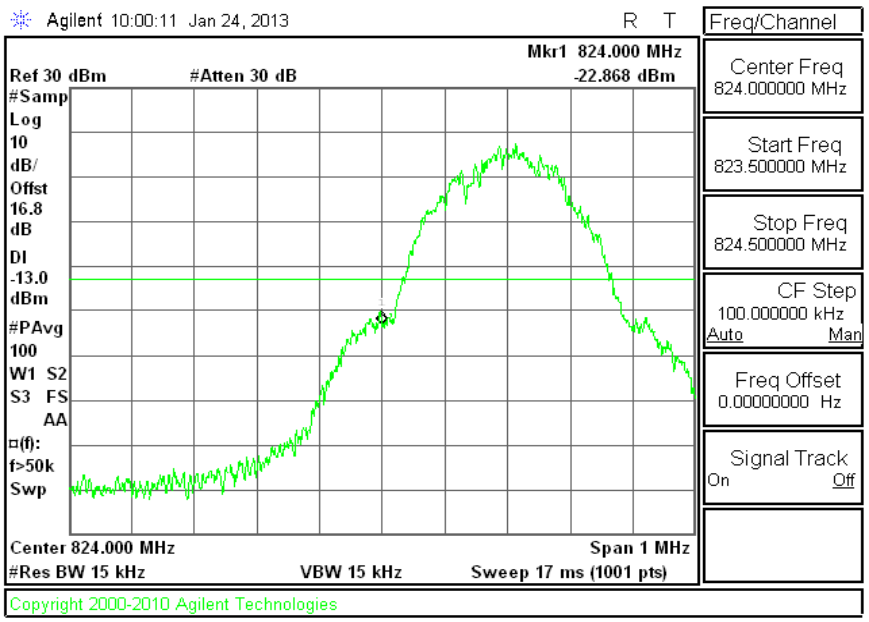
HIGH CH



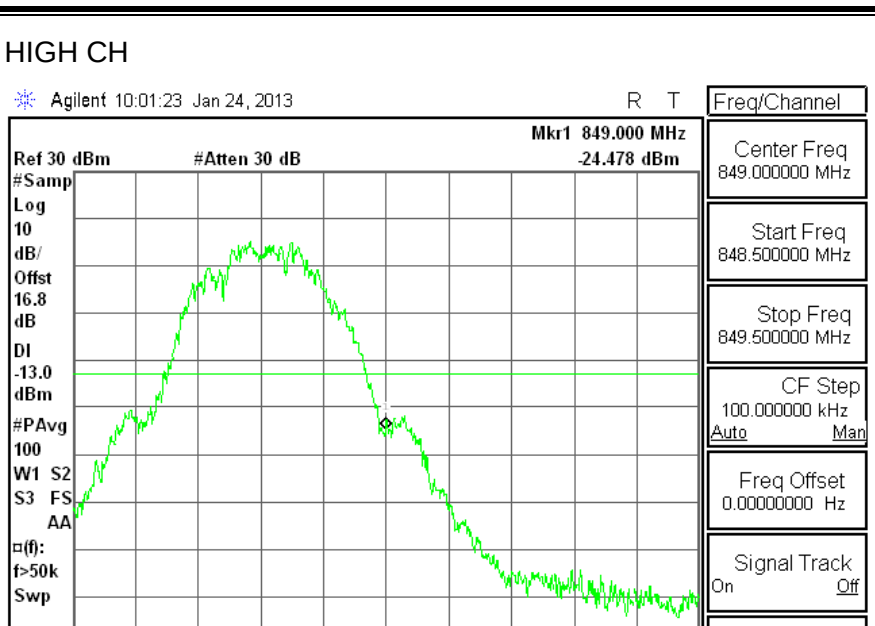
8.2.2. EGPRS MODE

CELL BAND

LOW CH

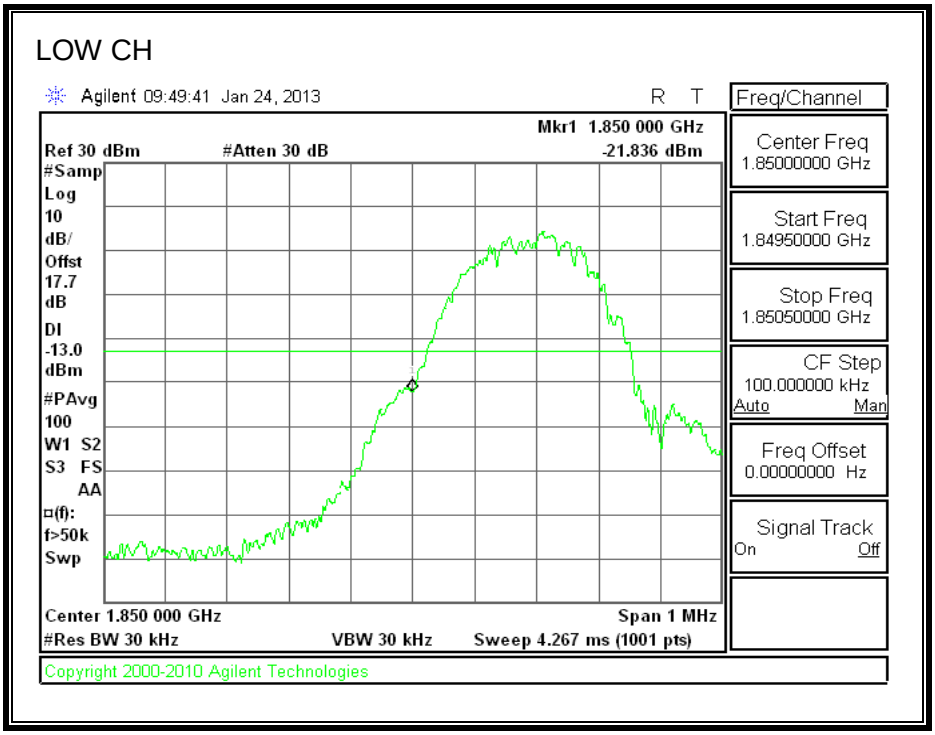


HIGH CH

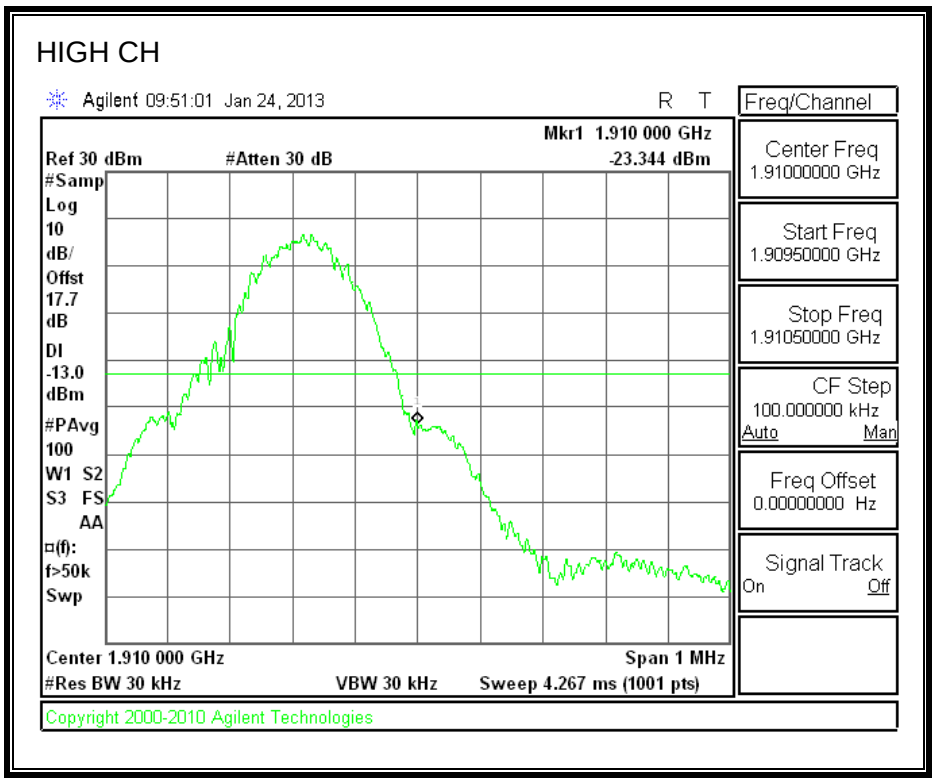


PCS BAND

LOW CH



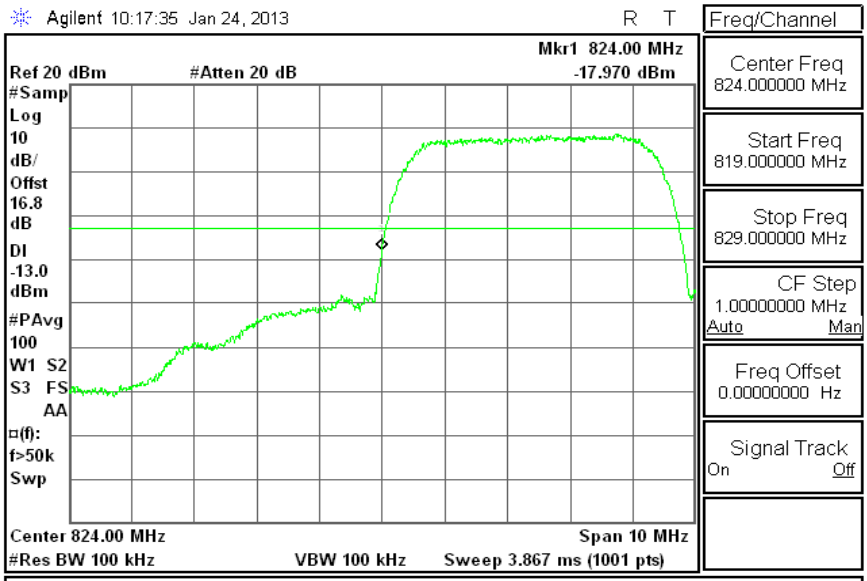
HIGH CH



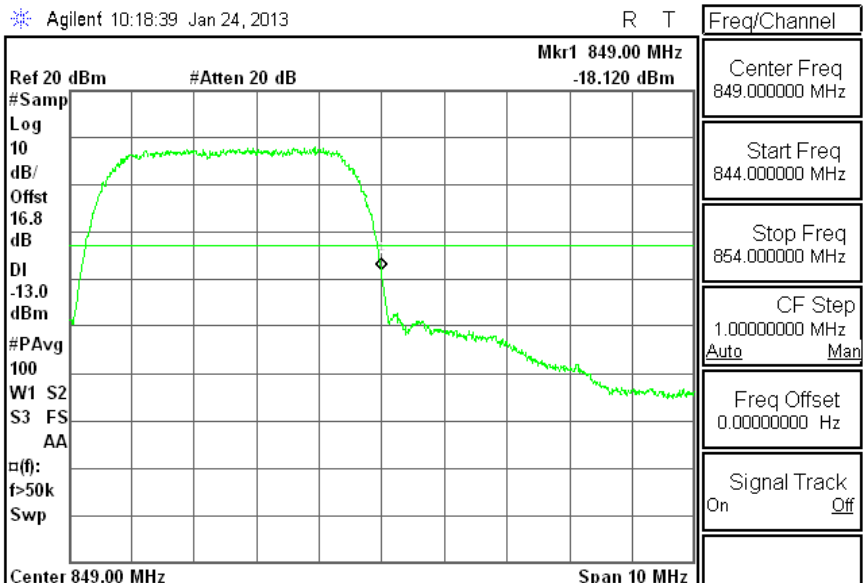
8.2.3. UMTS REL 99 MODE CDMA

CELL BAND

LOW CH

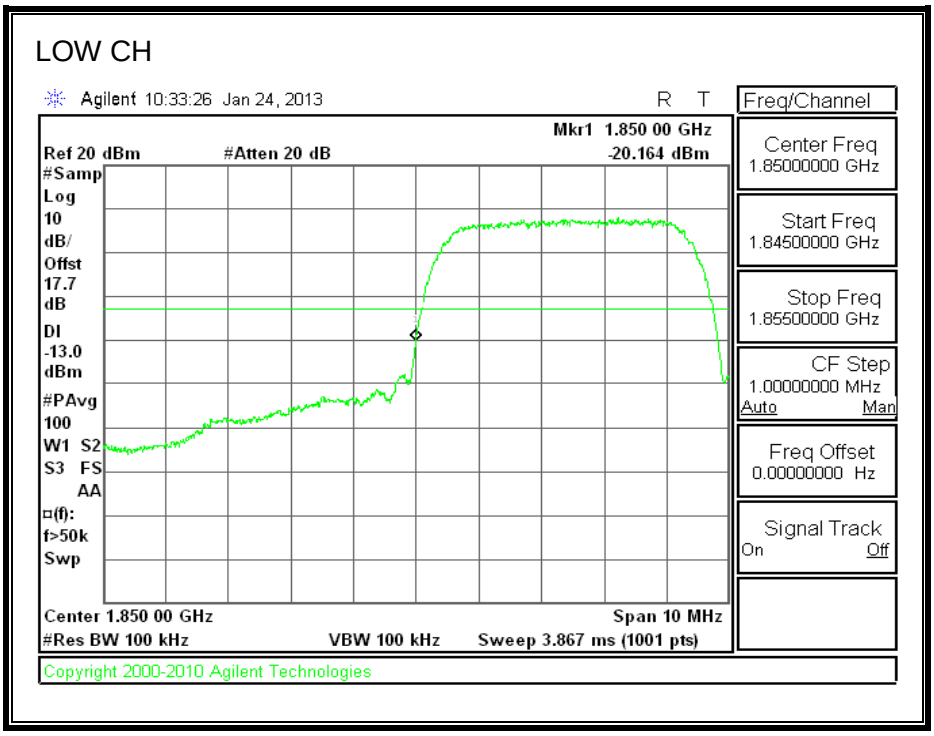


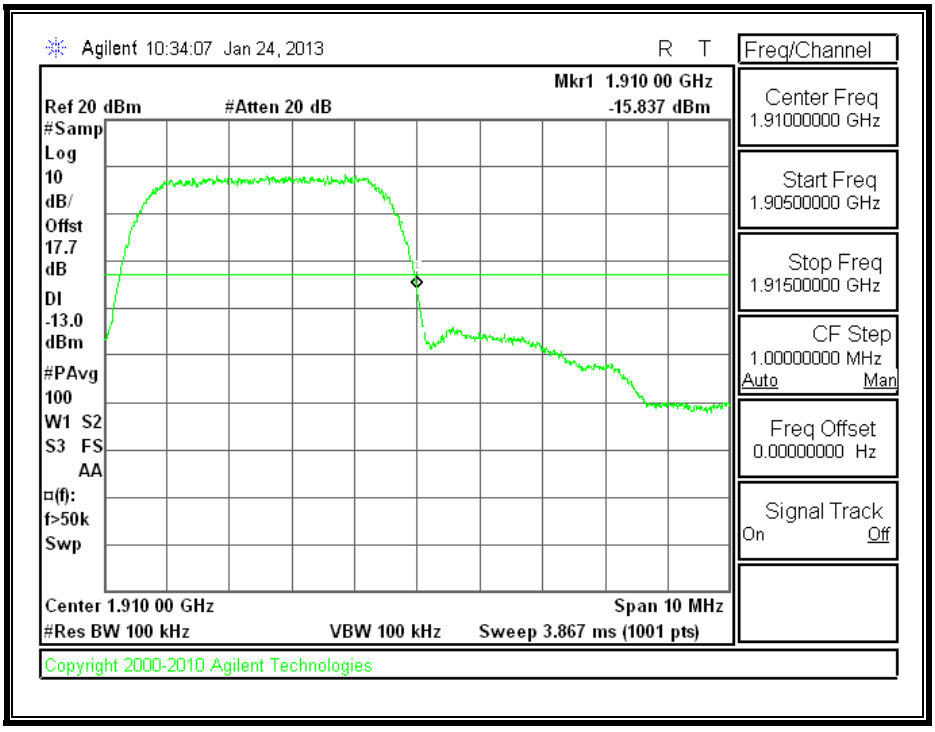
HIGH CH



PCS BAND

LOW CH

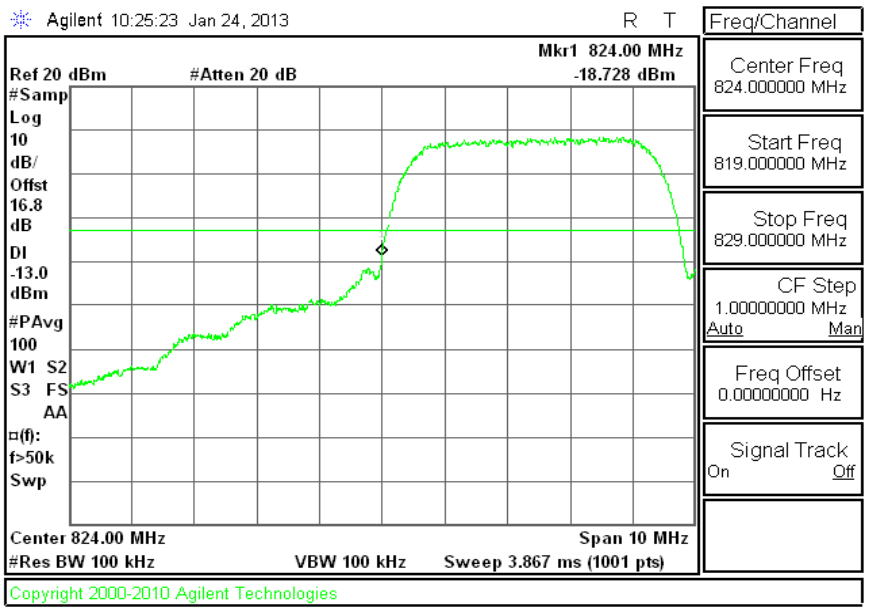




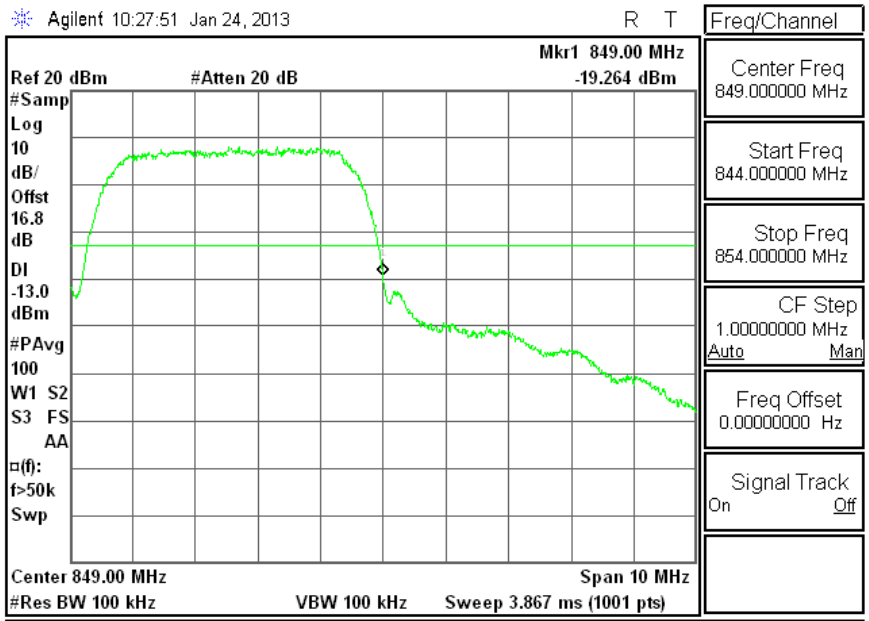
8.2.4. UMTS HSUPA MODE

CELL BAND

LOW CH

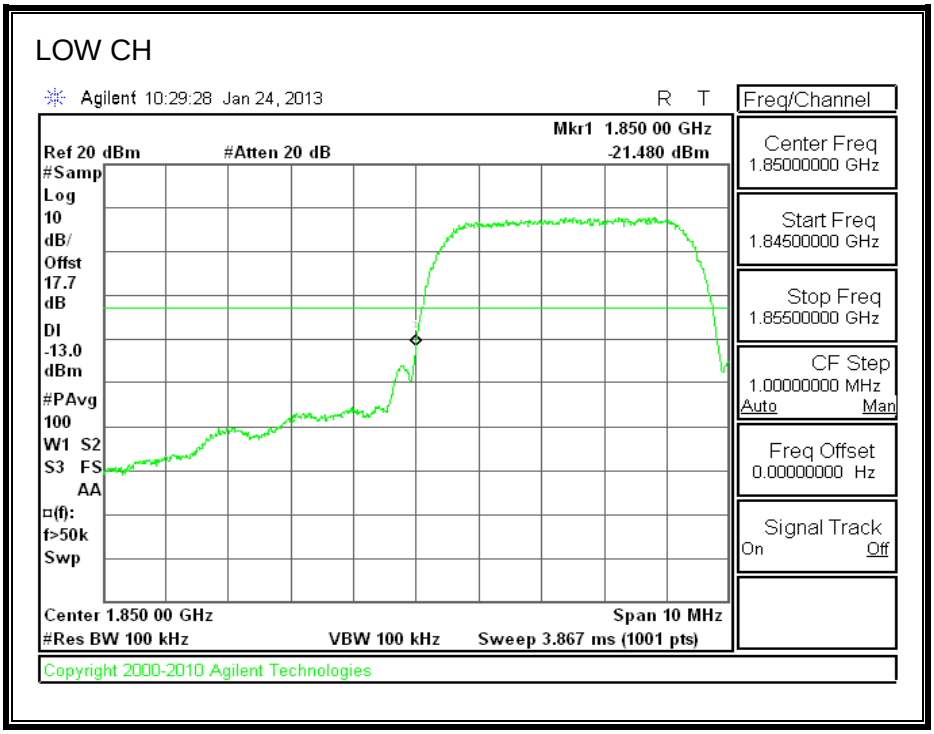


HIGH CH

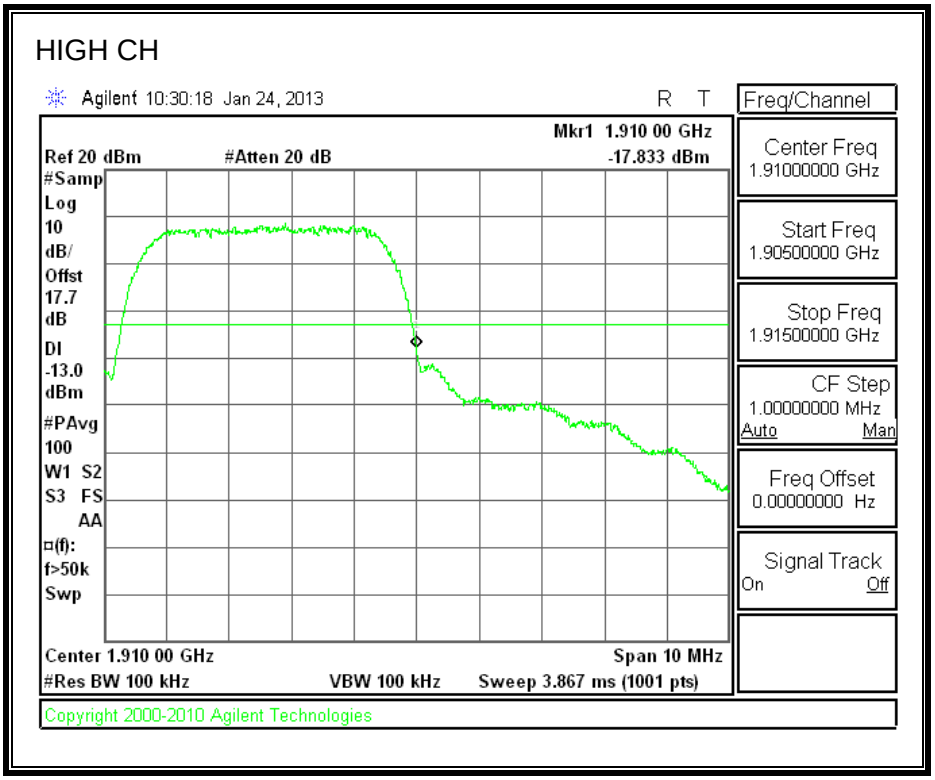


PCS BAND

LOW CH



HIGH CH



8.3. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

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

For each out of band emissions measurement:

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

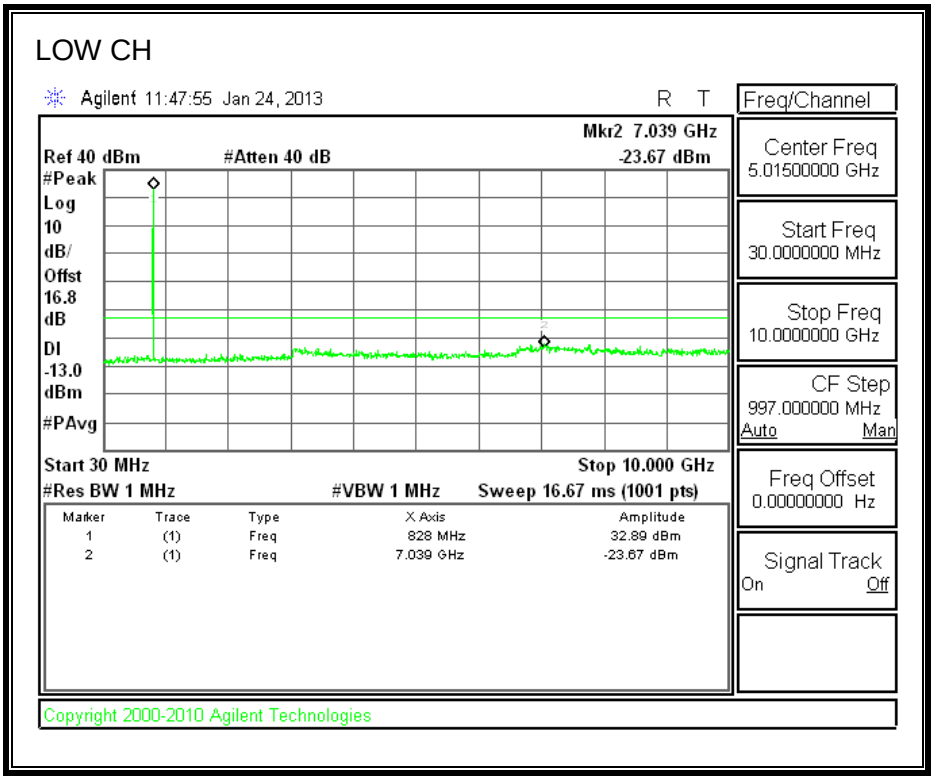
MODES TESTED

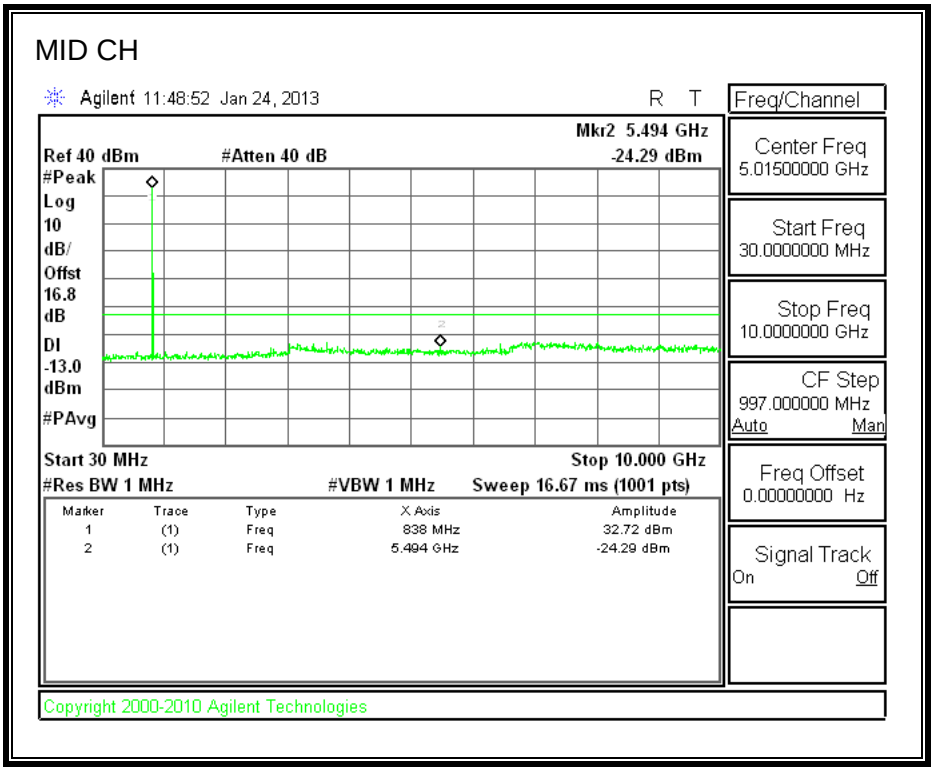
- GPRS and EGPRS
- UMTS, REL 99 and HSDPA

RESULTS

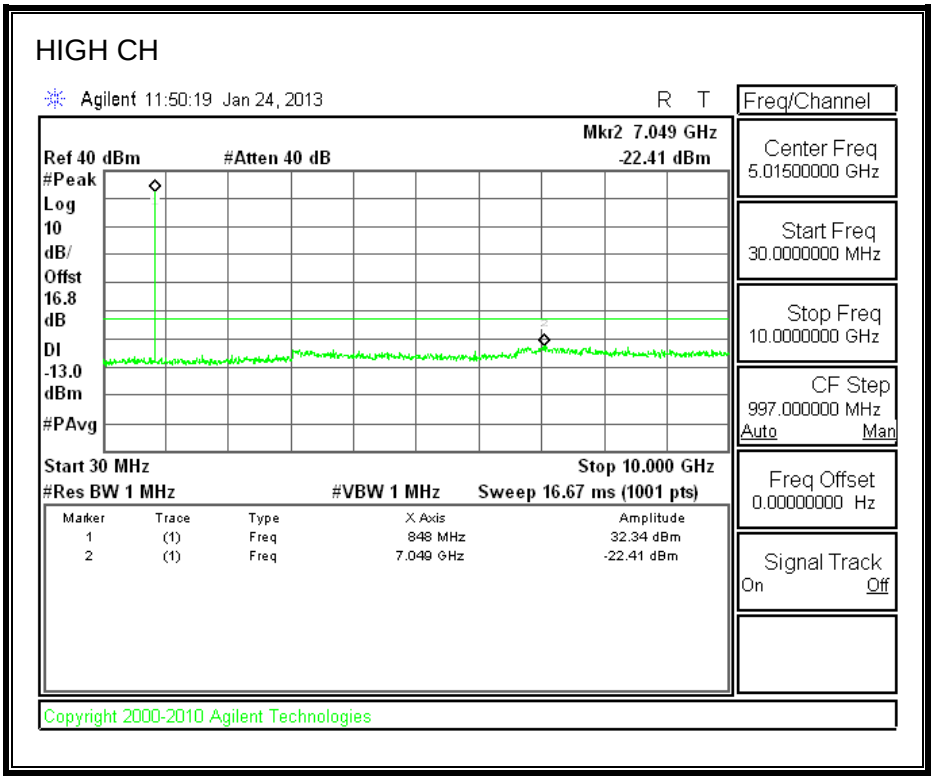
8.3.1. GPRS MODE

CELL BAND



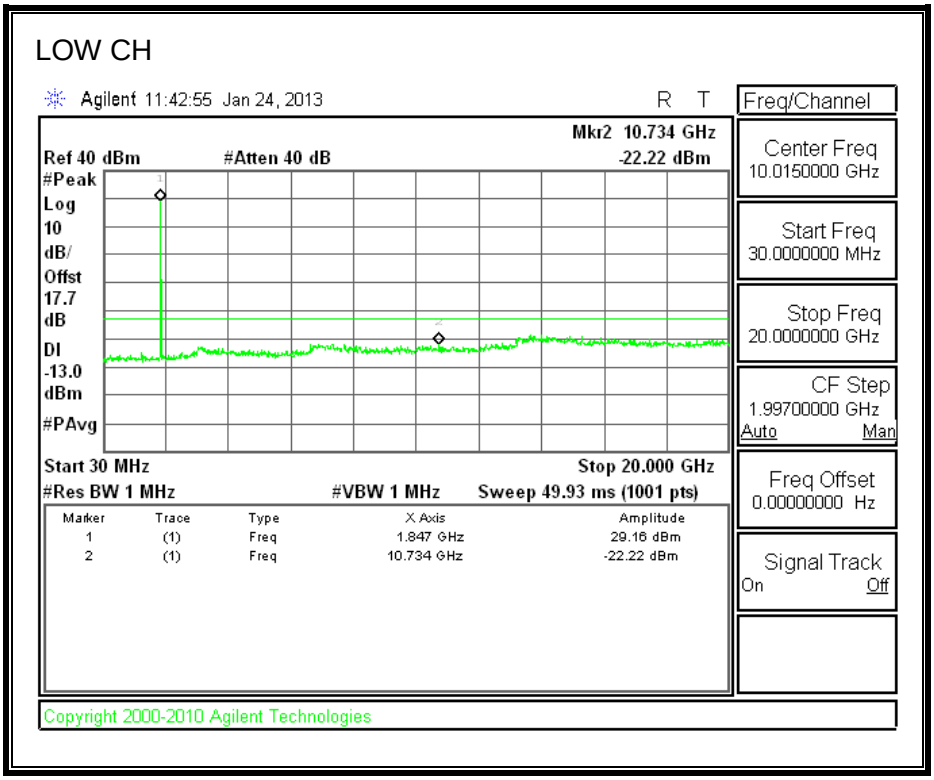


HIGH CH

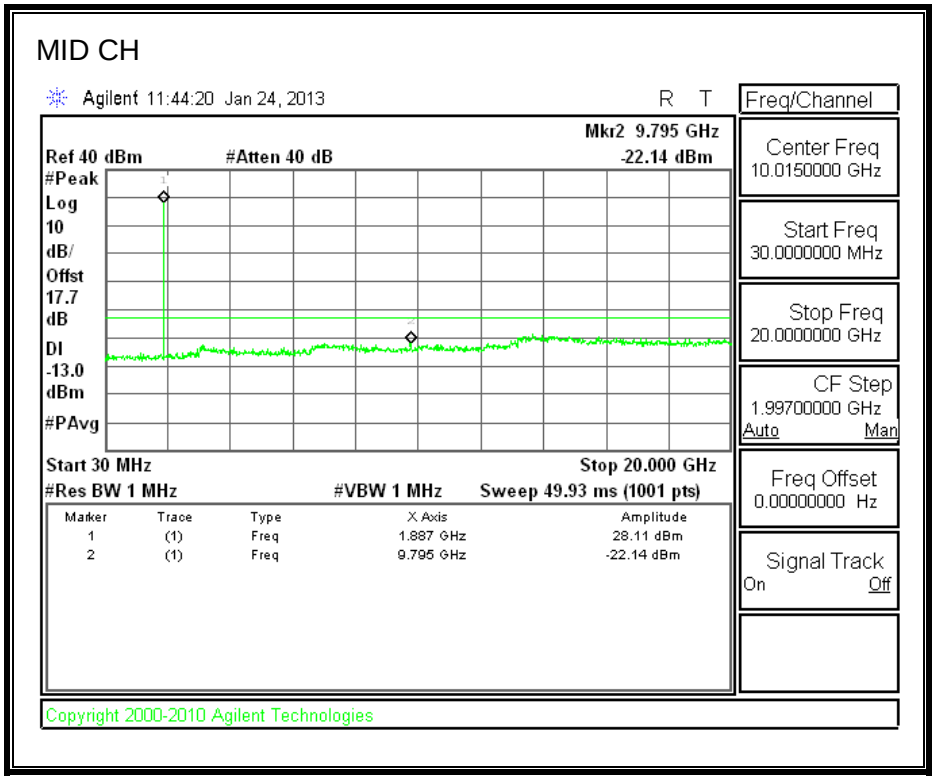


PCS BAND

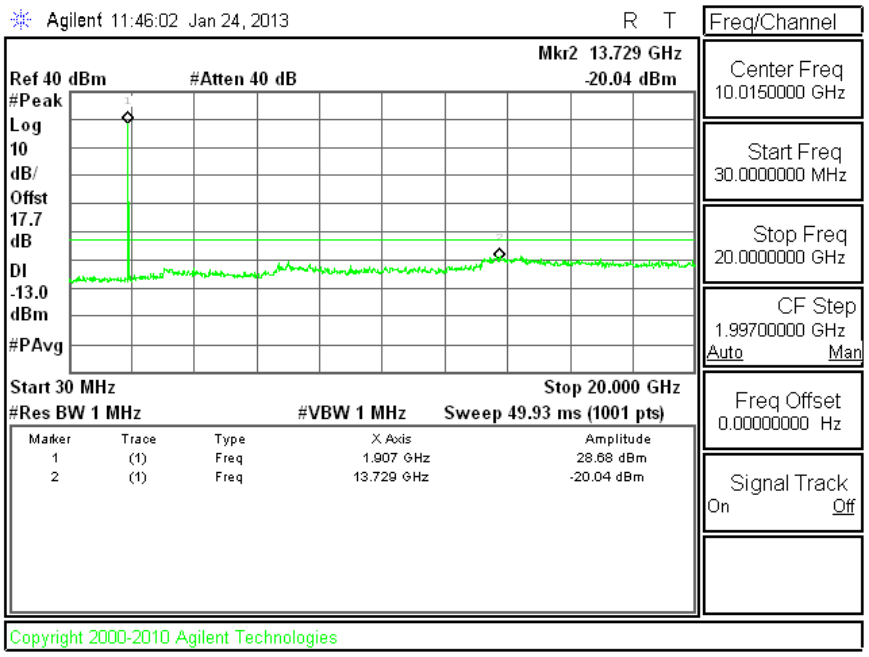
LOW CH



MID CH



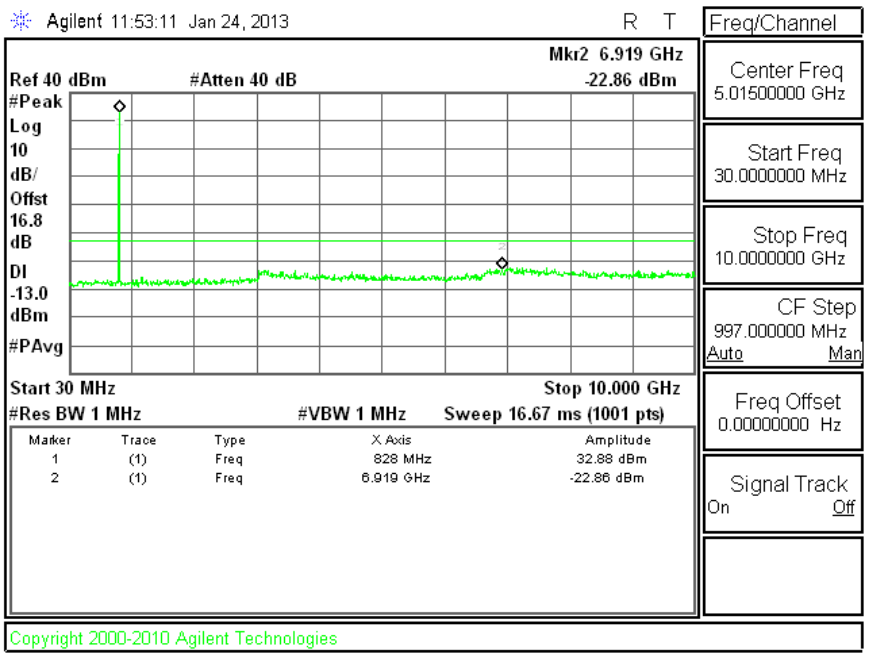
HIGH CH



8.3.2. EGPRS MODE

CELL BAND

LOW CH



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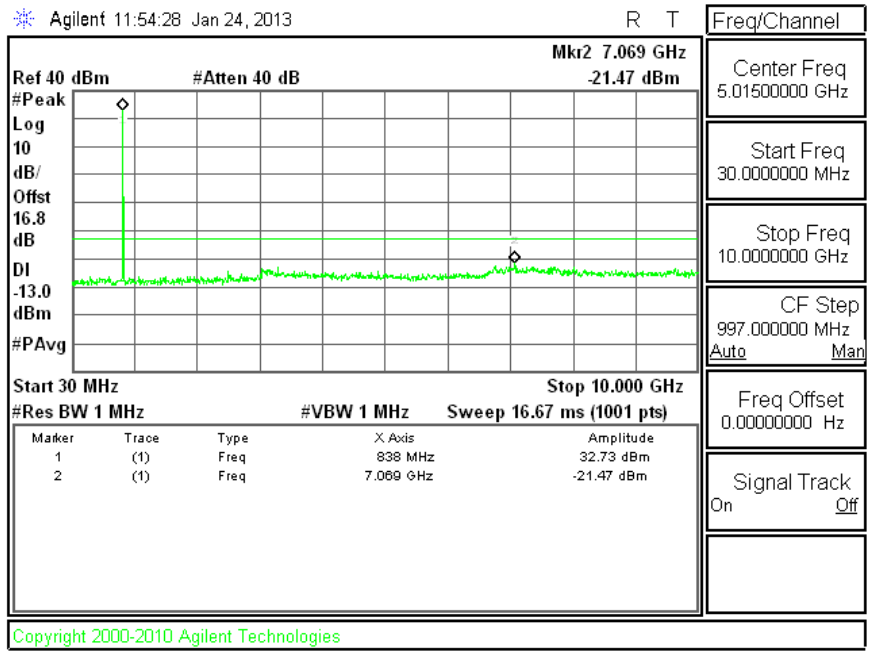

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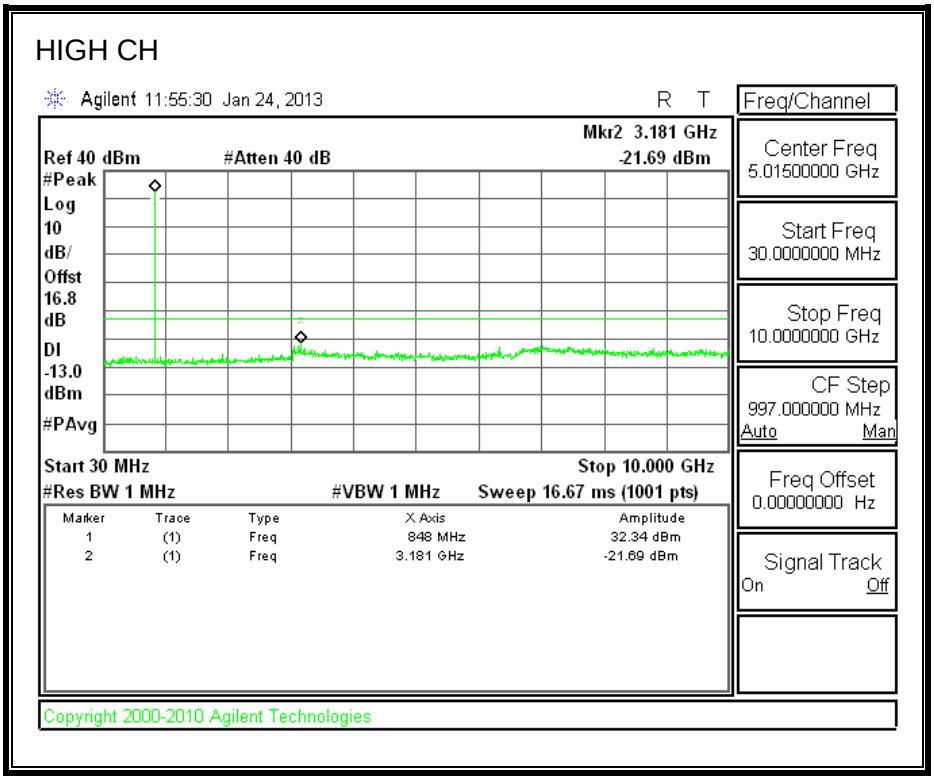
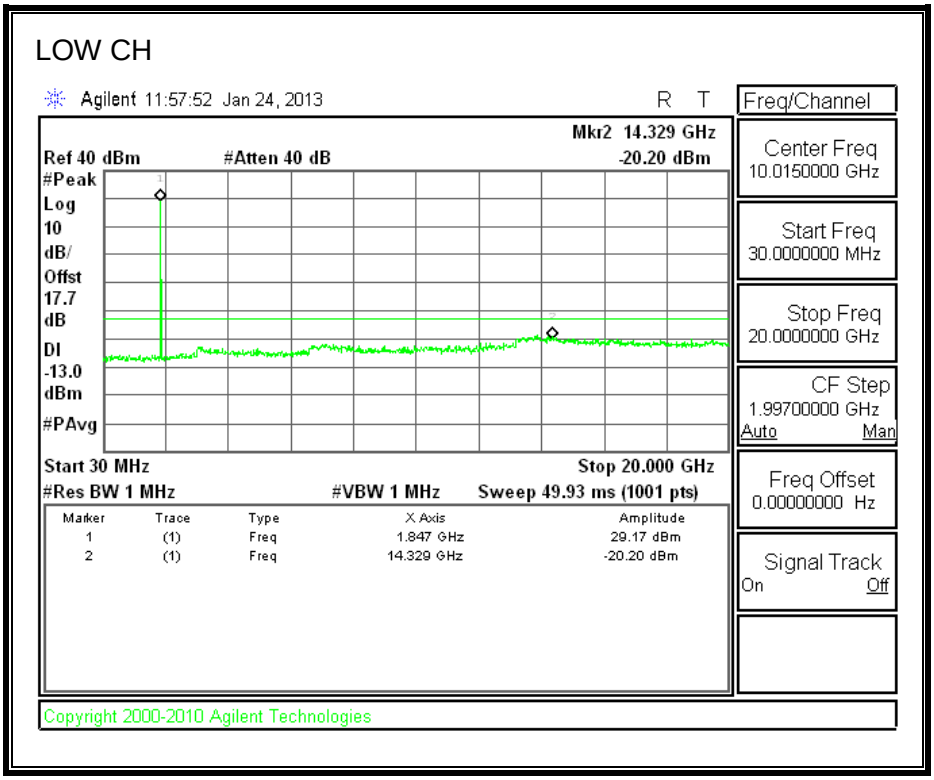


PCS BAND

LOW CH



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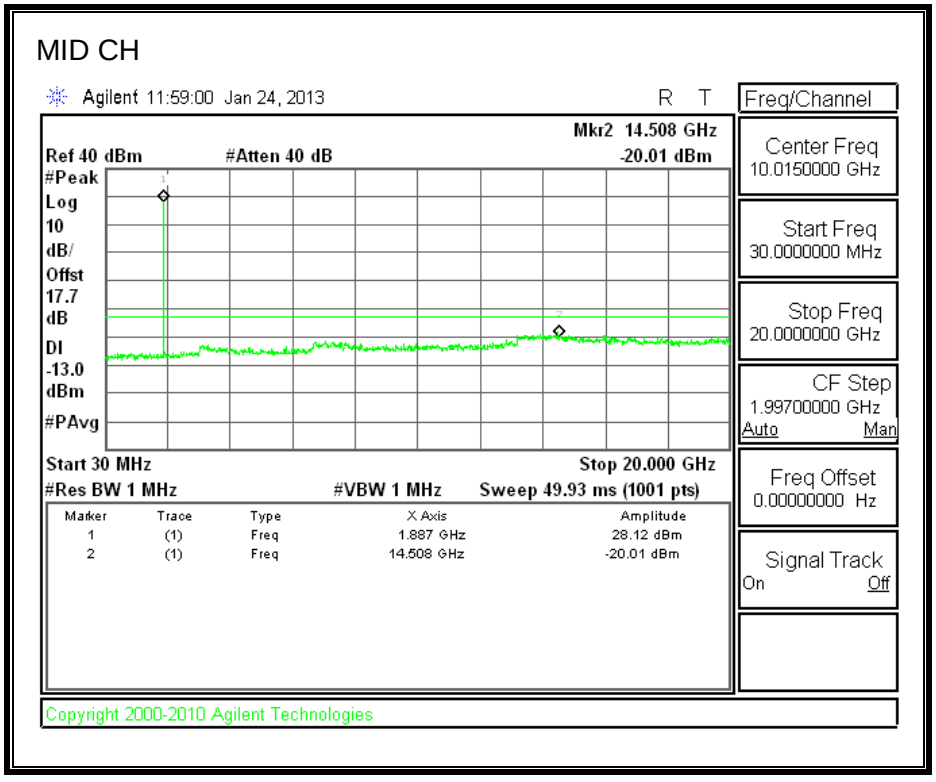
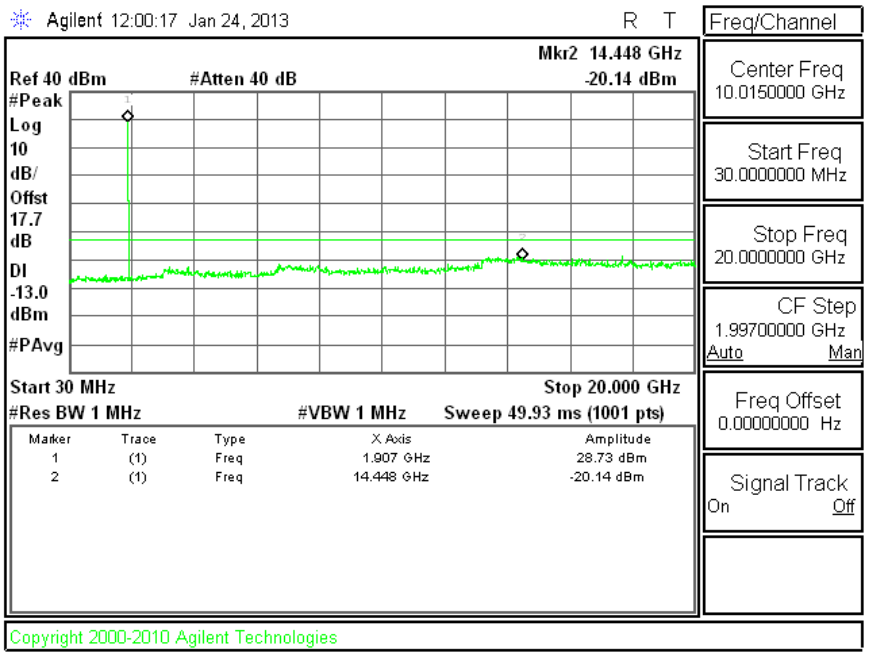


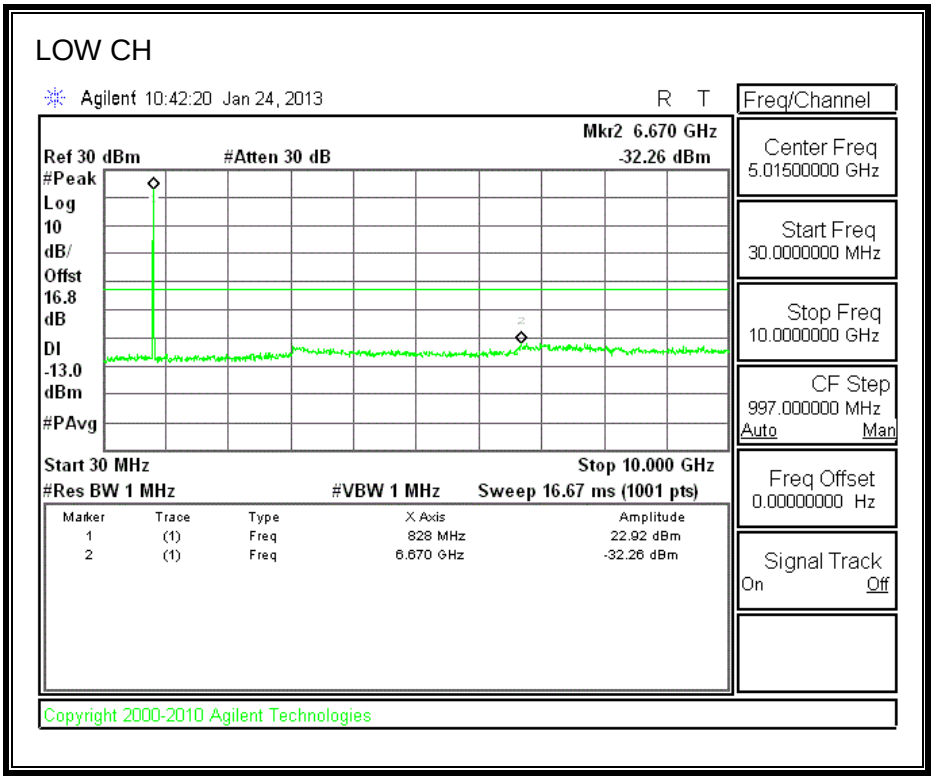
HIGH CH



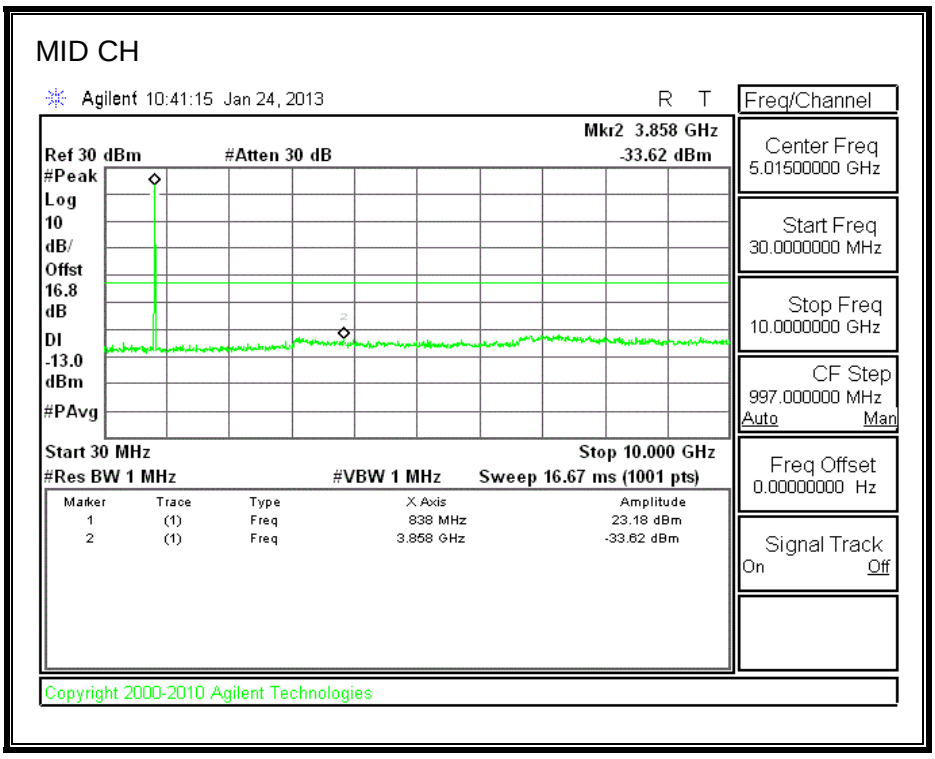
8.3.3. UMTS REL 99 MODE

CELL BAND

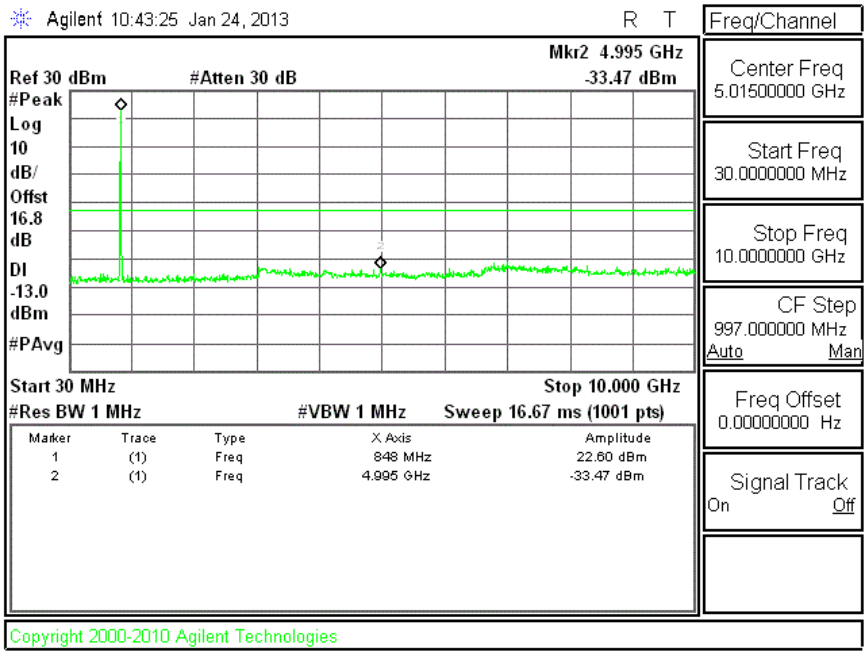
LOW CH



MID CH

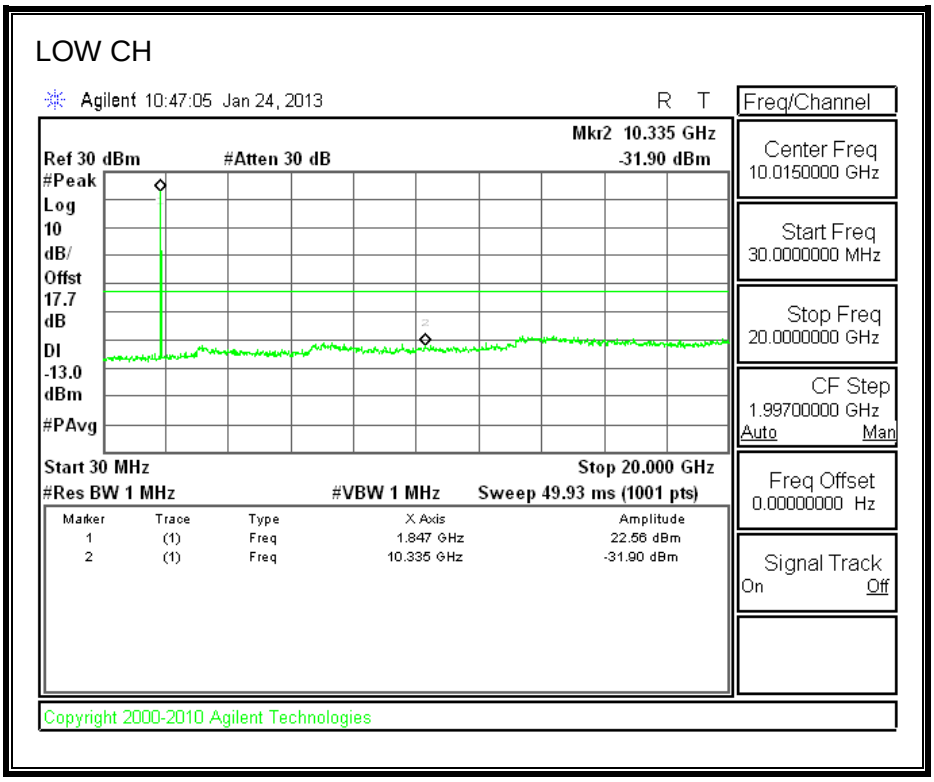


HIGH CH

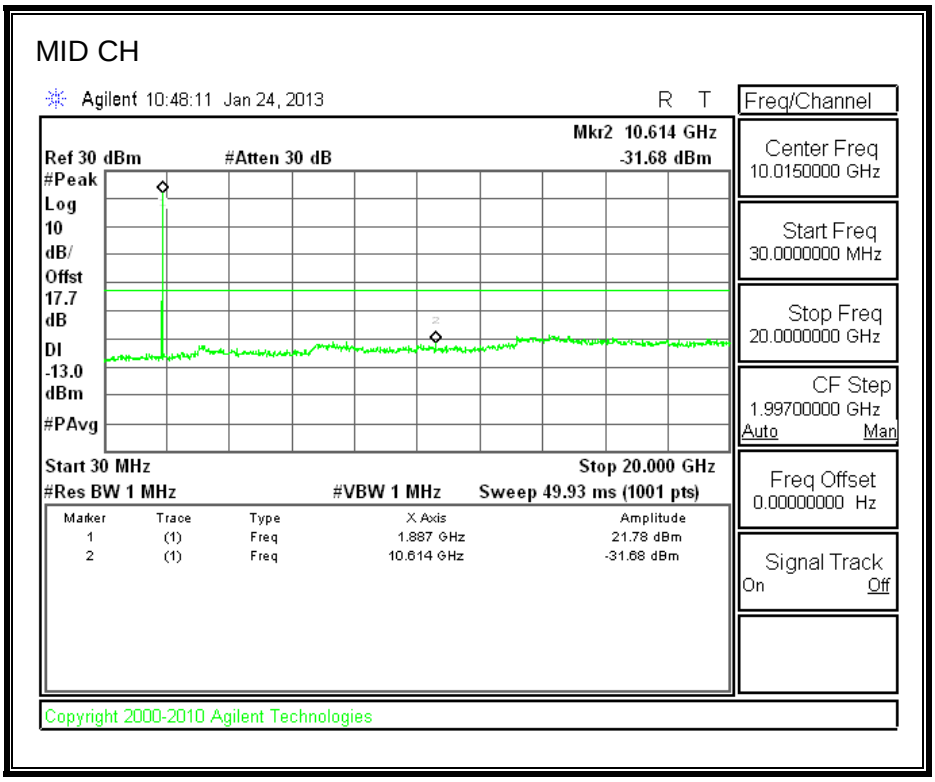


PCS BAND

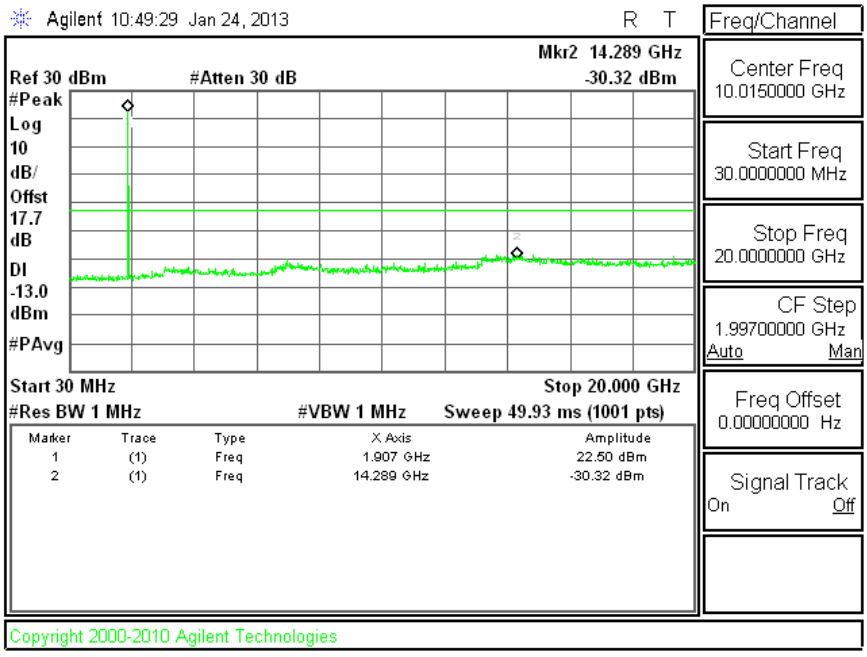
LOW CH



MID CH



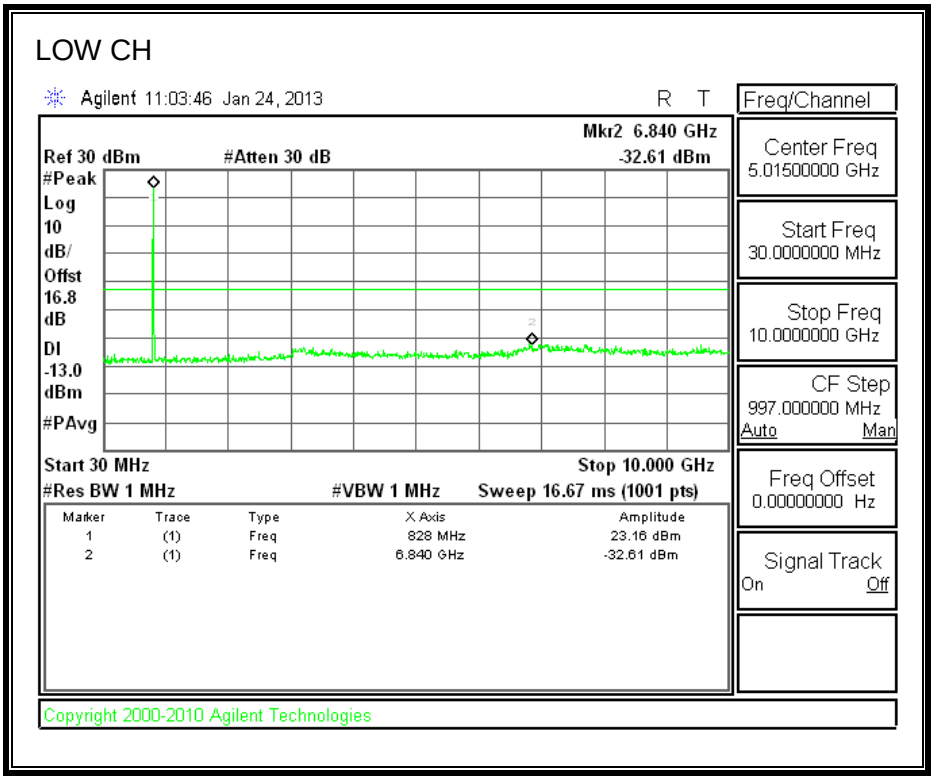
HIGH CH



8.3.4. UMTS HSUPA MODE

CELL BAND

LOW CH



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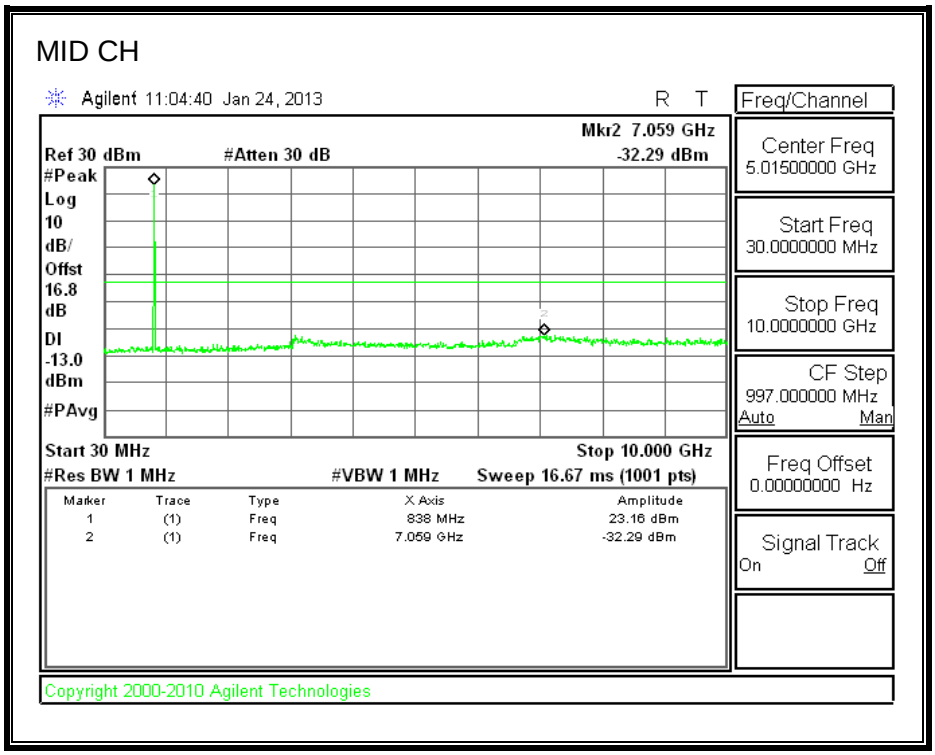
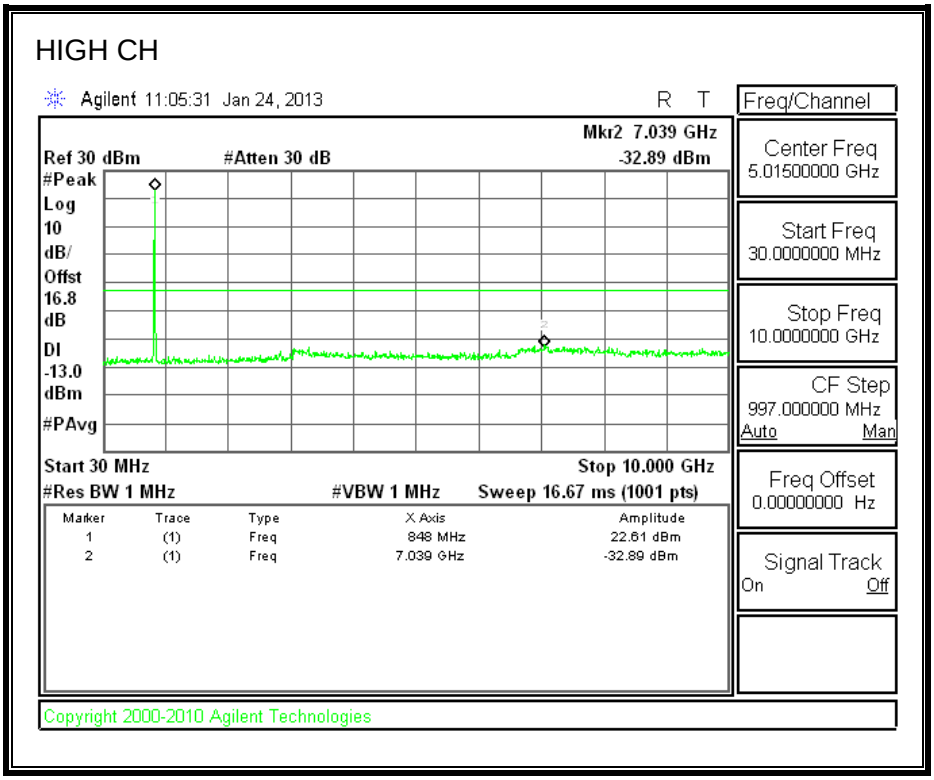
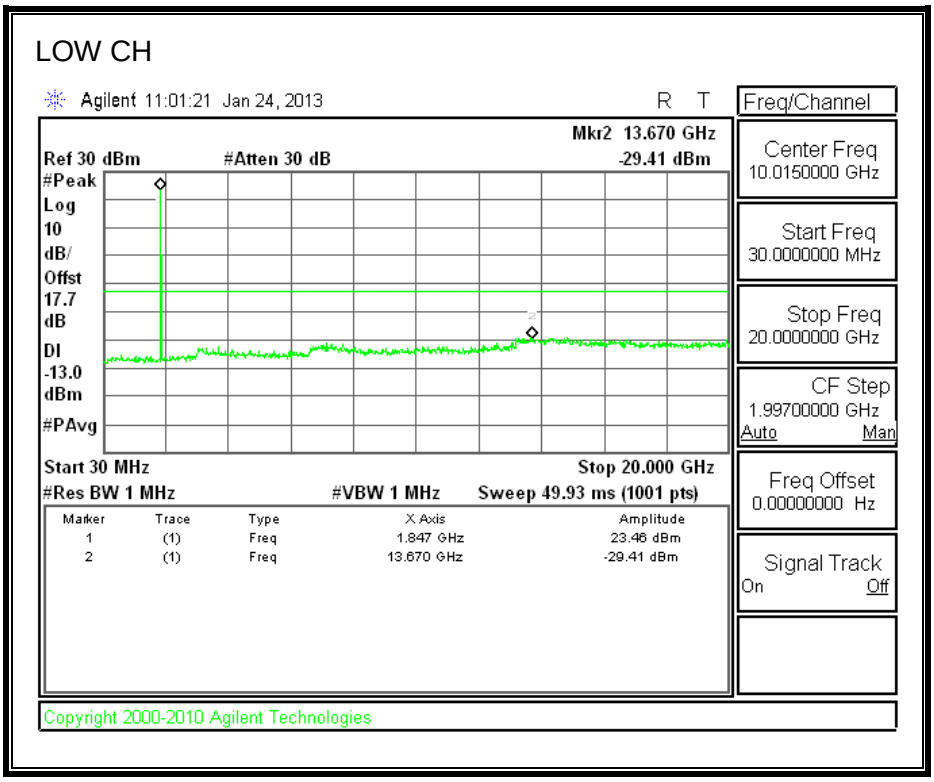


HIGH CH

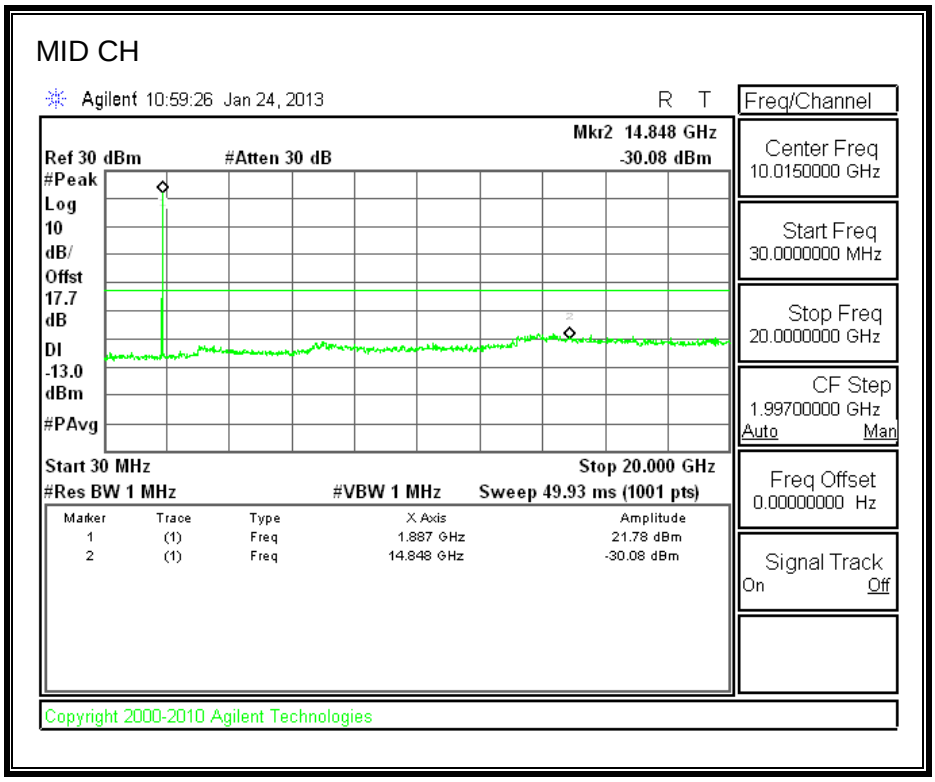


PCS Band

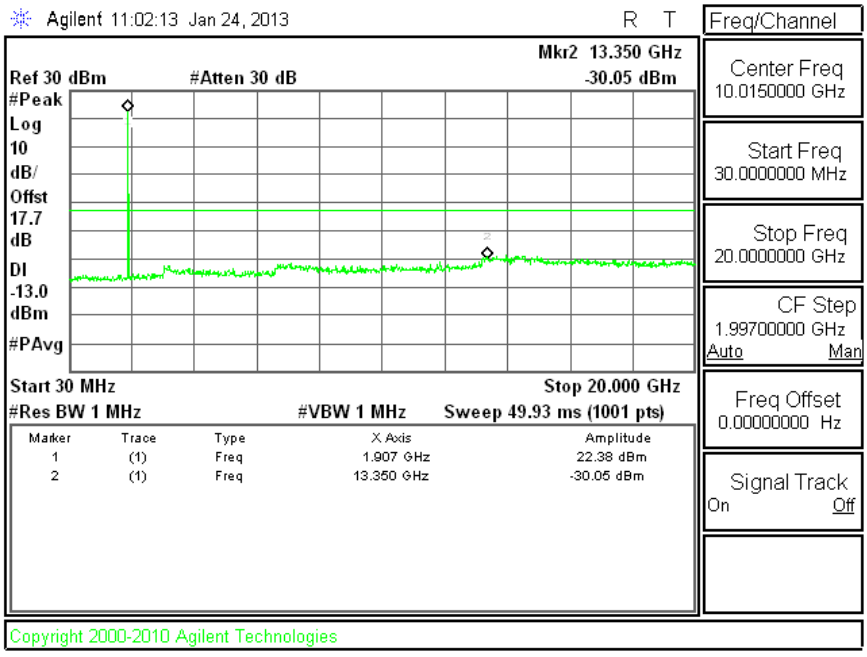
LOW CH



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 = 4.0 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
- UMTS

RESULTS

See the following pages

CELL, GSM MODULATION – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.599981MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
4.00	50	836.599964	0.020	2.5
4.00	40	836.599957	0.029	2.5
4.00	30	836.599961	0.024	2.5
4.00	***20***	***836.599981***	***0***	2.5
4.00	10	836.600004	-0.027	2.5
4.00	0	836.599960	0.025	2.5
4.00	-10	836.599957	0.029	2.5
4.00	-20	836.599957	0.029	2.5
4.00	-30	836.600002	-0.025	2.5
Reference Frequency: Cellular Mid Channel 836.599981MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.500 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
(Vdc)	**Temperature (°C)**	**(MHz)**	**Delta (ppm)**	**Limit (ppm)**
4.00	***20***	***836.599981***	***0***	***2.5***
4.60	20	836.599966	0.018	2.5
3.40	20	836.599961	0.024	2.5
End Voltage(3.1V)	20	836.599995	-0.017	2.5

PCS, GSM MODULATION – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.999980MHz @ 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)
4.00	50	1879.999956	0.013	2.5
4.00	40	1879.999962	0.010	2.5
4.00	30	1879.999954	0.014	2.5
4.00	***20***	**1879.999980**	***0***	***2.5***
4.00	10	1879.999994	-0.007	2.5
4.00	0	1879.999963	0.009	2.5
4.00	-10	1879.999961	0.010	2.5
4.00	-20	1879.999964	0.009	2.5
4.00	-30	1880.000001	-0.011	2.5

Reference Frequency: PCS Mid Channel 1879.999980MHz @ 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)
4.00	***20***	***1879.999980***	***0***	***2.5***
4.60	20	1879.999999	-0.010	2.5
3.40	20	1879.999964	0.009	2.5
End Voltage(3.1)	20	1880.000002	-0.012	2.5

CELL WCDMA – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.600005MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2091.500 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.00	50	836.600012	-0.008	2.5
4.00	40	836.600010	-0.006	2.5
4.00	30	836.600012	-0.008	2.5
4.00	***20***	***836.600005***	***0***	2.5
4.00	10	836.600011	-0.007	2.5
4.00	0	836.600011	-0.007	2.5
4.00	-10	836.600012	-0.008	2.5
4.00	-20	836.600011	-0.007	2.5
4.00	-30	836.600011	-0.007	2.5

Reference Frequency: Cellular Mid Channel 836.600005MHz @ 20ºC Limit: to stay +- 2.5 ppm = 2091.500 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.00	***20***	***836.600005***	***0***	***2.5***
4.60	20	836.600010	-0.006	2.5
3.40	20	836.600011	-0.007	2.5
3.1 (End Point)	20	836.600009	-0.005	2.5

PCS WCDMA – MID CHANNEL

Reference Frequency: Cellular Mid Channel 1880.000013MHz @ 20ºC Limit: to stay +- 2.5 ppm = 4700.000 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.00	50	1880.000031	-0.010	2.5
4.00	40	1880.000024	-0.006	2.5
4.00	30	1880.000028	-0.008	2.5
4.00	***20***	***1880.000013***	***0***	2.5
4.00	10	1880.000031	-0.010	2.5
4.00	0	1880.000027	-0.007	2.5
4.00	-10	1880.000029	-0.009	2.5
4.00	-20	1880.000028	-0.008	2.5
4.00	-30	1880.000033	-0.011	2.5

Reference Frequency: Cellular Mid Channel 1880.000013MHz @ 20ºC Limit: to stay +- 2.5 ppm = 4700.000 Hz				
DC Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.00	***20***	***1880.000013***	***0***	***2.5***
4.60	20	1880.000032	-0.010	2.5
3.40	20	1880.000025	-0.006	2.5
3.1 (End Point)	20	1880.000022	-0.005	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 603 Clause 2.2.17

The ERP/EIRP power was measured with the spectrum analyzer which attached with receiver antenna via calibrated cable. The measurements have been taken at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW ≥ RBW.≥ 26dB BW, typically 3MHz.for GSM and 5MHz for WCDMA modes respectively.
- Set a marker to point the corresponding peak value.

MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99 and HSUPA

RESULTS

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	26.13	410.20
	190	836.60	27.20	524.81
	251	848.80	28.10	645.65
EGPRS	128	824.20	23.02	200.45
	190	836.60	23.74	236.59
	251	848.80	24.89	308.32

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	27.04	505.82
	661	1880.00	27.97	626.61
	810	1909.80	29.36	862.98
EGPRS	512	1850.20	26.41	437.52
	661	1880.00	27.36	544.50
	810	1909.80	28.86	769.13

Mode	Channel	f (MHz)	ERP	
			dBm	mW
REL 99	4357	826.40	19.54	89.95
	4408	836.60	19.55	90.16
	4458	846.60	20.89	122.74
	9662	1852.40	24.24	265.46
	9800	1880.00	24.88	307.61
	9938	1907.60	25.25	334.97

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
HSUPA	4357	826.40	20.67	116.68
	4405	836.00	20.68	116.95
	4455	846.00	22.02	159.22
	9662	1852.40	25.78	378.44
	9800	1880.00	26.32	428.55
	9938	1907.60	26.67	464.52

GPRS (Cellular Band)

Company: SAMSUNG ELECTRONICS
Project #: 12I14777
Date: 01/30/2013 01/30/13
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH AC ADAPTER
Mode: TX, 850MHz BAND, GPRS MODE

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.20	26.73	V	0.6	0.0	26.13	38.5	-12.3	
824.20	20.90	H	0.6	0.0	20.30	38.5	-18.1	
836.60	27.80	V	0.6	0.0	27.20	38.5	-11.2	
836.60	21.95	H	0.6	0.0	21.35	38.5	-17.1	
848.80	28.70	V	0.6	0.0	28.10	38.5	-10.3	
848.80	23.44	H	0.6	0.0	22.84	38.5	-15.6	

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EGPRS (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company:	SAMSUNG ELECTRONICS
Project #:	12I14777
Date:	01/30/13
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH AC ADAPTER
Mode:	TX, 850MHz BAND, EGPRS MODE

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft 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	23.62	V	0.6	0.0	23.02	38.5	-15.4	
824.20	15.67	H	0.6	0.0	15.07	38.5	-23.4	
836.60	24.34	V	0.6	0.0	23.74	38.5	-14.7	
836.60	17.35	H	0.6	0.0	16.75	38.5	-21.7	
848.80	25.49	V	0.6	0.0	24.89	38.5	-13.6	
848.80	18.63	H	0.6	0.0	18.03	38.5	-20.4	

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GPRS (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 12I14777
Date: 01/28/2013
Test Engineer: Tony Wang
Configuration: EUT only
Mode: GSM 1900 GPRS

Test Equipment:
Receiving: Horn T59, and Chamber 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
Low ch								
1.855	19.7	V	0.85	8.05	26.90	33.0	-6.1	
1.855	20.0	H	0.85	7.89	27.04	33.0	-6.0	
Mid ch								
1.880	18.5	V	0.85	8.10	25.75	33.0	-7.3	
1.880	20.9	H	0.85	7.88	27.97	33.0	-5.0	
High ch								
1.905	20.0	V	0.85	8.19	27.34	33.0	-5.7	
1.905	22.3	H	0.85	7.95	29.36	33.0	-3.6	

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EGPRS (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 12I14777
Date: 01/28/2013
Test Engineer: Tony Wang
Configuration: EUT only
Mode: GSM 1900 EGPRS

Test Equipment:
Receiving: Horn T59, and Chamber 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
Low ch								
1.855	17.5	V	0.85	8.05	24.74	33.0	-8.3	
1.855	19.4	H	0.85	7.89	26.41	33.0	-6.6	
Mid ch								
1.880	18.5	V	0.85	8.10	25.74	33.0	-7.3	
1.880	20.3	H	0.85	7.88	27.36	33.0	-5.6	
High ch								
1.905	20.8	V	0.85	8.19	28.09	33.0	-4.9	
1.905	21.8	H	0.85	7.95	28.86	33.0	-4.1	

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UMTS850 REL 99 (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company:	SAMSUNG ELECTRONICS
Project #:	12I14777
Date:	01/30/13
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH AC ADAPTER
Mode:	TX, 850MHz BAND, HSUPA MODE

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft SMA Cable (SN # 208947003) Warehouse.

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Ch								
826.40	20.14	V	0.6	0.0	19.54	38.5	-18.9	
826.40	16.40	H	0.6	0.0	15.80	38.5	-22.6	
836.00	20.15	V	0.6	0.0	19.55	38.5	-18.9	
836.00	16.60	H	0.6	0.0	16.00	38.5	-22.4	
846.80	21.49	V	0.6	0.0	20.89	38.5	-17.6	
846.80	17.44	H	0.6	0.0	16.84	38.5	-21.6	

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UMTS1900 REL 99 (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 12I14777
Date: 01/28/2013
Test Engineer: MENGISTU MEKURIA
Configuration: EUT only
Mode: UMTS 1900 REL 99

Test Equipment:
Receiving: Horn T59, and Chamber 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
Low ch								
1.852	15.4	V	0.85	8.05	22.56	33.0	-10.4	
1.852	17.2	H	0.85	7.89	24.24	33.0	-8.8	
Mid ch								
1.880	15.7	V	0.85	8.10	22.91	33.0	-10.1	
1.880	17.9	H	0.85	7.88	24.88	33.0	-8.1	
High ch								
1.908	16.5	V	0.85	8.19	23.83	33.0	-9.2	
1.908	18.2	H	0.85	7.95	25.25	33.0	-7.8	

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UMTS850 HSUPA (Cellular Band)

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company:	SAMSUNG ELECTRONICS
Project #:	12I14777
Date:	01/30/13
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH AC ADAPTER
Mode:	TX, 850MHz BAND, HSUPA MODE

Test Equipment:
Receiving: Sunol T243, and Chamber B N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 00022117, 4ft 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	21.27	V	0.6	0.0	20.67	38.5	-17.8	
826.40	16.70	H	0.6	0.0	16.10	38.5	-22.3	
836.00	21.28	V	0.6	0.0	20.68	38.5	-17.8	
836.00	16.90	H	0.6	0.0	16.30	38.5	-22.1	
846.80	22.62	V	0.6	0.0	22.02	38.5	-16.4	
846.80	17.74	H	0.6	0.0	17.14	38.5	-21.3	

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UMTS1900 HSUPA (PCS Band)

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 12I14777
Date: 01/28/2013
Test Engineer: MENGISTU MEKURIA
Configuration: EUT only
Mode: UMTS 1900 HSDPA

Test Equipment:
Receiving: Horn T59, and Chamber 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
Low ch								
1.852	16.7	V	0.85	8.05	23.92	33.0	-9.1	
1.852	18.7	H	0.85	7.89	25.78	33.0	-7.2	
Mid ch								
1.880	17.2	V	0.85	8.10	24.47	33.0	-8.5	
1.880	19.3	H	0.85	7.88	26.32	33.0	-6.7	
High ch								
1.908	18.0	V	0.85	8.19	25.32	33.0	-7.7	
1.908	19.6	H	0.85	7.95	26.67	33.0	-6.3	

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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
Project #:	12I14777
Date:	01/28/13
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT and AC Adapter
Mode:	TX, 850MHz BAND GPRS 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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-8.4	V	3.0	35.5	1.0	-42.9	-13.0	-29.9	
2.473	-17.1	V	3.0	35.4	1.0	-51.5	-13.0	-38.5	
6.597	-11.1	V	3.0	35.6	1.0	-45.8	-13.0	-32.8	
1.648	-13.4	H	3.0	35.5	1.0	-47.9	-13.0	-34.9	
2.473	-20.4	H	3.0	35.4	1.0	-54.8	-13.0	-41.8	
3.297	-19.2	H	3.0	35.5	1.0	-53.7	-13.0	-40.7	
Mid Ch, (836.6MHz)									
1.673	-8.3	V	3.0	35.5	1.0	-42.8	-13.0	-29.8	
2.510	-16.3	V	3.0	35.4	1.0	-50.7	-13.0	-37.7	
3.346	-16.6	V	3.0	35.5	1.0	-51.2	-13.0	-38.2	
1.673	-9.9	H	3.0	35.5	1.0	-44.4	-13.0	-31.4	
2.510	-19.9	H	3.0	35.4	1.0	-54.3	-13.0	-41.3	
3.346	-18.7	H	3.0	35.5	1.0	-53.2	-13.0	-40.2	
High Ch, (848.8MHz)									
1.698	-7.3	V	3.0	35.5	1.0	-41.8	-13.0	-28.8	
2.546	-16.8	V	3.0	35.4	1.0	-51.3	-13.0	-38.3	
3.395	-18.8	V	3.0	35.5	1.0	-53.3	-13.0	-40.3	
1.698	-9.4	H	3.0	35.5	1.0	-43.9	-13.0	-30.9	
2.546	-19.1	H	3.0	35.4	1.0	-53.6	-13.0	-40.6	
3.395	-20.5	H	3.0	35.5	1.0	-55.0	-13.0	-42.0	

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
Project #: 12I14777
Date: 01/28/13
Test Engineer: MENGISTU MEKURIA
Configuration: EUT and AC Adapter
Mode: TX, 850MHz BAND EGPRS 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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-28.2	V	3.0	35.5	1.0	-62.8	-13.0	-49.8	
2.473	-22.8	V	3.0	35.4	1.0	-57.2	-13.0	-44.2	
6.597	-12.8	V	3.0	35.6	1.0	-47.4	-13.0	-34.4	
1.648	-27.2	H	3.0	35.5	1.0	-61.7	-13.0	-48.7	
2.473	-24.5	H	3.0	35.4	1.0	-58.9	-13.0	-45.9	
6.597	-11.2	H	3.0	35.6	1.0	-45.9	-13.0	-32.9	
Mid Ch, (836.6MHz)									
1.673	-25.9	V	3.0	35.5	1.0	-60.4	-13.0	-47.4	
2.510	-22.2	V	3.0	35.4	1.0	-56.6	-13.0	-43.6	
6.693	-9.5	V	3.0	35.7	1.0	-44.2	-13.0	-31.2	
1.673	-27.3	H	3.0	35.5	1.0	-61.9	-13.0	-48.9	
2.510	-24.5	H	3.0	35.4	1.0	-58.9	-13.0	-45.9	
6.693	-8.3	H	3.0	35.7	1.0	-43.0	-13.0	-30.0	
High Ch, (848.8MHz)									
1.698	-27.7	V	3.0	35.5	1.0	-62.2	-13.0	-49.2	
2.546	-22.6	V	3.0	35.4	1.0	-57.0	-13.0	-44.0	
6.790	-9.8	V	3.0	35.7	1.0	-44.5	-13.0	-31.5	
1.698	-27.1	H	3.0	35.5	1.0	-61.6	-13.0	-48.6	
2.546	-24.4	H	3.0	35.4	1.0	-58.8	-13.0	-45.8	
6.790	-8.3	H	3.0	35.7	1.0	-42.9	-13.0	-29.9	

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
Project #:	12I14777
Date:	01/28/13
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT and AC Adapter
Mode:	TX, 1900MHz GPRS 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 Ch, 1850.2MHz									
3.700	-13.1	V	3.0	35.4	1.0	-47.5	-13.0	-34.5	
7.401	-15.2	V	3.0	35.7	1.0	-49.9	-13.0	-36.9	
3.700	-15.4	H	3.0	35.4	1.0	-49.7	-13.0	-36.7	
7.401	-13.2	H	3.0	35.7	1.0	-47.9	-13.0	-34.9	
Mid Ch, 1880MHz									
3.760	-16.4	V	3.0	35.3	1.0	-50.7	-13.0	-37.7	
7.520	-16.2	V	3.0	35.7	1.0	-50.9	-13.0	-37.9	
3.760	-15.1	H	3.0	35.3	1.0	-49.4	-13.0	-36.4	
7.520	-13.2	H	3.0	35.7	1.0	-47.9	-13.0	-34.9	
High Ch, 1909.8MHz									
3.820	-16.7	V	3.0	35.3	1.0	-51.0	-13.0	-38.0	
7.639	-15.0	V	3.0	35.7	1.0	-49.7	-13.0	-36.7	
3.820	-15.5	H	3.0	35.3	1.0	-49.8	-13.0	-36.8	
7.639	-13.4	H	3.0	35.7	1.0	-48.1	-13.0	-35.1	

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
Project #: 12I14777
Date: 01/28/13
Test Engineer: MENGISTU MEKURIA
Configuration: EUT and AC Adapter
Mode: TX, 1900MHz EGPRS 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)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1850.2MHz									
3.700	-17.4	V	3.0	35.4	1.0	-51.7	-13.0	-38.7	
5.551	-14.5	V	3.0	35.4	1.0	-48.9	-13.0	-35.9	
7.401	-9.9	V	3.0	35.7	1.0	-44.6	-13.0	-31.6	
3.700	-16.8	H	3.0	35.4	1.0	-51.2	-13.0	-38.2	
5.551	-13.9	H	3.0	35.4	1.0	-48.3	-13.0	-35.3	
7.401	-8.2	H	3.0	35.7	1.0	-42.9	-13.0	-29.9	
Mid Ch, 1880MHz									
3.760	-17.2	V	3.0	35.3	1.0	-51.5	-13.0	-38.5	
5.640	-14.5	V	3.0	35.4	1.0	-48.9	-13.0	-35.9	
7.520	-10.4	V	3.0	35.7	1.0	-45.1	-13.0	-32.1	
3.760	-17.1	H	3.0	35.3	1.0	-51.4	-13.0	-38.4	
5.640	-13.6	H	3.0	35.4	1.0	-48.0	-13.0	-35.0	
7.520	-8.6	H	3.0	35.7	1.0	-43.3	-13.0	-30.3	
High Ch, 1909.8MHz									
3.820	-17.4	V	3.0	35.3	1.0	-51.7	-13.0	-38.7	
5.729	-14.1	V	3.0	35.4	1.0	-48.6	-13.0	-35.6	
7.639	-10.1	V	3.0	35.7	1.0	-44.8	-13.0	-31.8	
3.820	-17.1	H	3.0	35.3	1.0	-51.4	-13.0	-38.4	
5.729	-13.3	H	3.0	35.4	1.0	-47.7	-13.0	-34.7	
7.639	-8.5	H	3.0	35.7	1.0	-43.2	-13.0	-30.2	

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

WCDMA REL 99 (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	Samsung
Project #:	12I14777
Date:	01/28/13
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT and AC Adapter
Mode:	TX, UMTS 850MHz, Rel 99

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (826.4MHz)									
1.653	-23.4	V	3.0	35.5	1.0	-57.9	-13.0	-44.9	
1.653	-24.6	H	3.0	35.5	1.0	-59.1	-13.0	-46.1	
Mid Channel (836MHz)									
1.672	-22.1	V	3.0	35.5	1.0	-56.6	-13.0	-43.6	
1.672	-22.9	H	3.0	35.5	1.0	-57.5	-13.0	-44.5	
High Channel (846MHz)									
1.693	-16.5	V	3.0	35.5	1.0	-51.0	-13.0	-38.0	
1.693	-16.2	H	3.0	35.5	1.0	-50.7	-13.0	-37.7	

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
Project #:	12I14777
Date:	01/28/13
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT and AC Adapter
Mode:	TX, UMTS 850, HSDPA

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (826.4MHz)									
1.653	-22.7	V	3.0	35.5	1.0	-57.2	-13.0	-44.2	
1.653	-24.5	H	3.0	35.5	1.0	-59.0	-13.0	-46.0	
Mid Channel (836MHz)									
1.672	-21.6	V	3.0	35.5	1.0	-56.1	-13.0	-43.1	
1.672	-23.0	H	3.0	35.5	1.0	-57.5	-13.0	-44.5	
High Channel (846.6MHz)									
1.693	-15.0	V	3.0	35.5	1.0	-49.5	-13.0	-36.5	
1.693	-15.8	H	3.0	35.5	1.0	-50.3	-13.0	-37.3	

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
Project #:	12I14777
Date:	01/28/13
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT and AC Adapter
Mode:	TX, UMTS 1900, REL 99

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 Ch, 1852.4MHz									
3.705	-19.4	V	3.0	35.4	1.0	-53.7	-13.0	-40.7	
3.705	-20.5	H	3.0	35.4	1.0	-54.9	-13.0	-41.9	
Mid Ch, 1880.0MHz									
3.760	-18.9	V	3.0	35.3	1.0	-53.2	-13.0	-40.2	
3.760	-18.4	H	3.0	35.3	1.0	-52.8	-13.0	-39.8	
High Ch, 1907.6MHz									
3.815	-16.9	V	3.0	35.3	1.0	-51.2	-13.0	-38.2	
3.815	-17.2	H	3.0	35.3	1.0	-51.6	-13.0	-38.6	

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

WCDMA HSDPA (PCS Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 12I14777
Date: 01/28/13
Test Engineer: MENGISTU MEKURIA
Configuration: EUT and AC Adapter
Mode: TX, UMTS 1900, HSDPA

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 Ch, 1852.4MHz									
3.705	-20.9	V	3.0	35.4	1.0	-55.2	-13.0	-42.2	
3.705	-22.0	H	3.0	35.4	1.0	-56.3	-13.0	-43.3	
Mid Ch, 1880.0MHz									
3.760	-18.9	V	3.0	35.3	1.0	-53.2	-13.0	-40.2	
3.760	-19.7	H	3.0	35.3	1.0	-54.0	-13.0	-41.0	
High Ch, 1907.6MHz									
3.815	-18.5	V	3.0	35.3	1.0	-52.9	-13.0	-39.9	
3.815	-18.5	H	3.0	35.3	1.0	-52.8	-13.0	-39.8	

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