



**FCC CFR47 PART 22H, 24E, AND 27L
CERTIFICATION TEST REPORT**

**CERTIFICATION TEST REPORT
FOR**

Cellular/PCS GPRS/EDGE, AWS/PCS WCDMA Tablet with 802.11abgn, BT3.0

MODEL NUMBER: SGH-T869

FCC ID: A3LSGHT869

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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**



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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: Cellular/PCS GPRS/EDGE, AWS/PCS WCDMA Tablet with
802.11abgn, BT3.0

MODEL: SGH-T869

SERIAL NUMBER: 02047

DATE TESTED: AUGUST 30 - 31 and OCTOBER 05, 2011

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

CHIN PANG
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, FCC CFR Part 24, and FCC CFR Part 27.

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:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

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 Cellular/PCS GPRS/EDGE, AWS/PCS WCDMA Tablet with 802.11abgn, BT3.0

The radio module is manufactured by Samsung.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum 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	32.62	1828.1	27.95	623.7
824.2 – 848.8	EGPRS	30.50	1122.0	26.93	493.2

Part 24 PCS Band

Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2 – 1909.8	GPRS	29.79	952.8	31.32	1355.2
1850.2 – 1909.8	EGPRS	29.05	803.5	29.26	843.3

Part 27 WCDMA1700

Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
1712.4-1752.6	UMTS, REL 99	26.52	448.7	26.18	415.0
1712.4-1752.6	UMTS, HSDPA	26.98	498.9	25.62	364.8

Part 24 WCDMA1900

Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1852.4 – 1907.6	REL 99	26.72	469.9	27.88	613.8
1852.4 – 1907.6	HSDPA	27.27	533.3	27.73	592.9

5.3. SOFTWARE AND FIRMWARE

The EUT software installed during testing was Samsung galaxy pro

The EUT is linked with Agilent 8960 Communication Test Set.

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

- For Cellular and PCS band: GPRS and EGPRS
- For Cellular and PCS band: UMTS, REL 99 and HSDPA. Sub-set 2

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	ETA-P10X	1588-7285	DoC
Headset	Samsung	N/A	NA	NA

I/O CABLES (Conducted Setup)

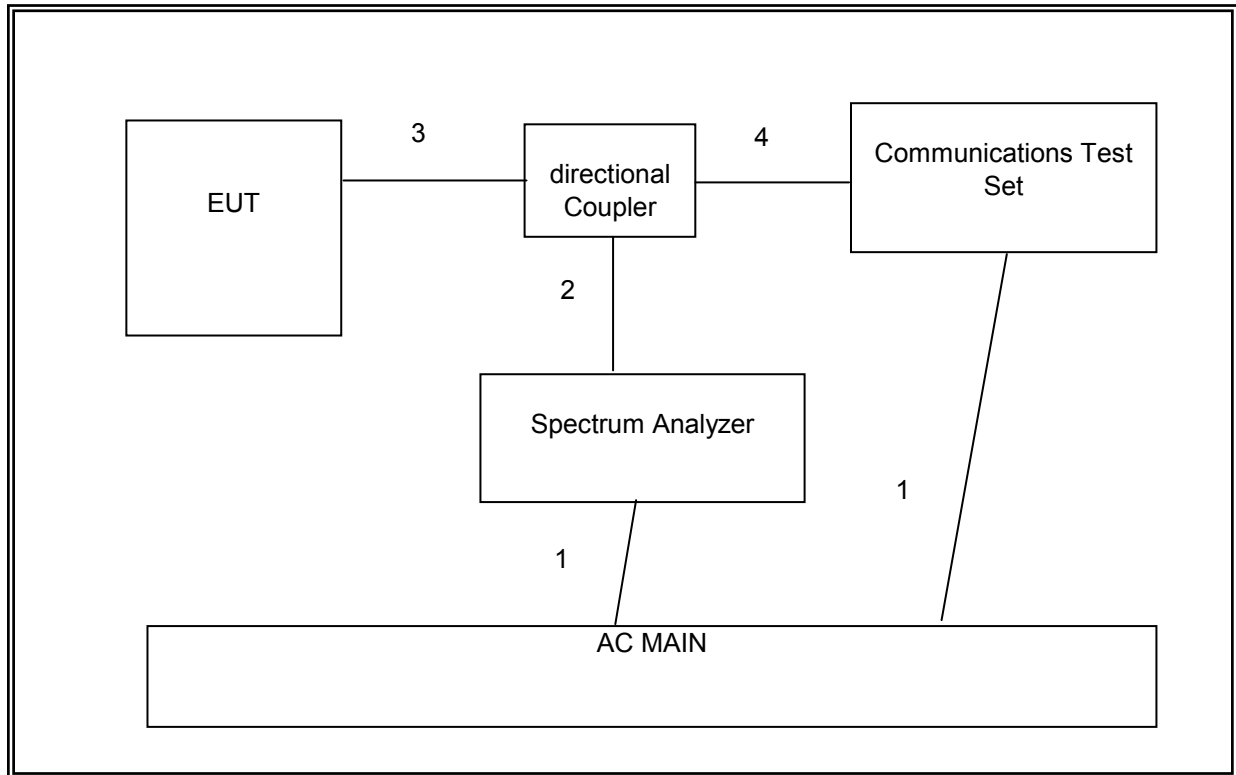
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	115VAC	Un-shielded	1.5m	NA
2	RF In/Out	1	Spectrum Analyzer	Un-shielded	none	NA
3	Antenna Port	1	Directional Coupler	Un-shielded	1.7m	NA
4	RF In/Out	1	Test Set	Un-shielded	0.5m	NA

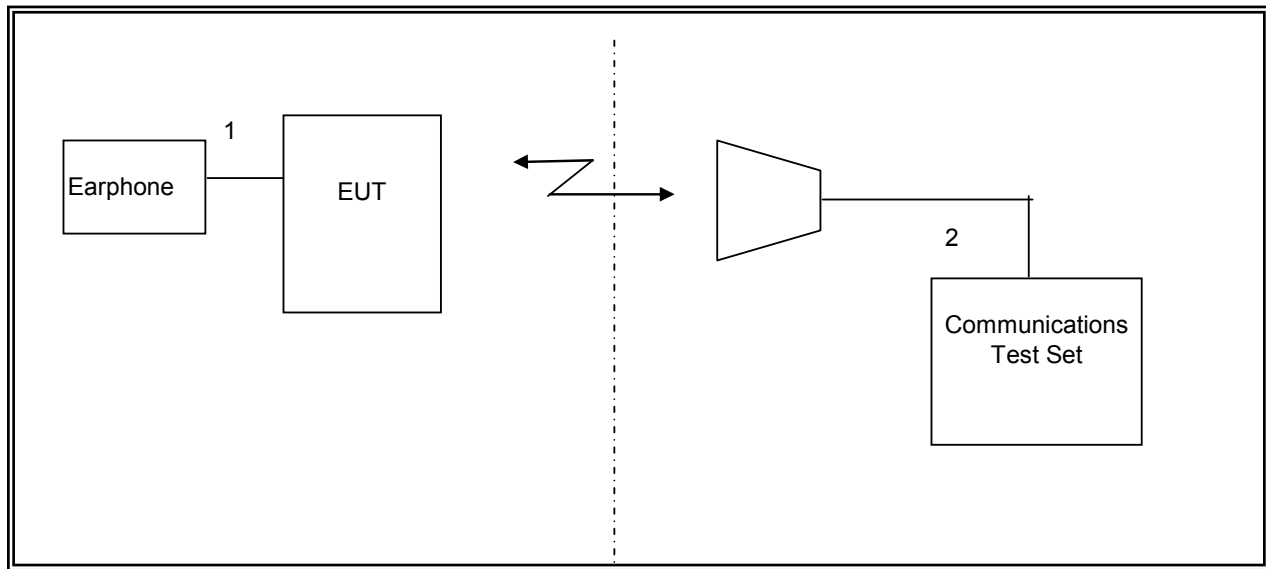
I/O CABLES (Radiated Setup)

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	NA
2	RF In/Out	1	Test Set	Un-shielded	2m	NA

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	01-27-12
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07-12-12
EMI Test Receiver, 9 kHz-7 GHz	R & S	ESCI 7	1000741	07-06-12
Communication Test Set	Agilent / HP	E5515C	C01086	08-17-11
Communication Test Set	R & S	CMU 200	C01131	06-24-12
LISN, 30 MHz	FCC	LISN-50/250-25-2	N02625	11-10-11
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 (MAX Power)

Mode	Ch.	f (MHz)	1 time slot		2 time slots	
			Peak	Average	Peak	Average
GPRS	128	824.2	32.52		31.15	
	190	836.6	32.61		31.24	
	251	848.8	32.62		31.28	
GPRS	512	1850.2	29.76		27.39	
	661	1880	29.79		27.36	
	810	1909.8	29.74		27.36	

EGPRS for Cell and PCS Band

Mode	Ch.	f (MHz)	1 time slot		2 time slots	
			Peak	Average	Peak	Average
EGPRS	128	824.2	30.36	27.00	29.14	25.73
	190	836.6	30.48	27.02	29.20	25.75
	251	848.8	30.50	27.00	29.26	25.75
EGPRS	512	1850.2	29.03	25.90	26.97	23.90
	661	1880	29.04	26.00	27.87	23.80
	810	1909.8	29.05	26.00	26.83	23.80

7.2. RF POWER OUTPUT FOR UMTS REL99

TEST PROCEDURE

The following summary of these settings are illustrated below:

WCDMA General Settings	Mode	Rel99
	Subtest	-
	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	HSDPA FRC	Not Applicable
	HSUPA Test	Not Applicable
	Power Control Algorithm	Algorithm2
	β_c	Not Applicable
	β_d	Not Applicable
	β_{ec}	Not Applicable
	β_c/β_d	8/15
	β_{hs}	Not Applicable
	β_{ed}	Not Applicable

RESULTS

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Average	Peak
UMTS 1700	1312	1537	1712.4		26.52
	1413	1638	1732.6		26.32
	1513	1738	1752.6		26.36

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
				Average	Peak
UMTS 1900	9262	9662	1852.4		26.72
	9400	9800	1880.0		26.62
	9538	9938	1907.6		26.56

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			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_{ec}	-	-	-	-
	β_c/β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
HSDPA Specific Settings	β_{ed}	Not Applicable			
	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			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

RESULT

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Average	Peak
UMTS1700 (Band IV)	1	1312	1537	1712.4		27.35
		1413	1638	1732.6		26.65
		1513	1738	1752.6		26.77
	2*	1312	1537	1712.4		27.06
		1413	1638	1732.6		26.89
		1513	1738	1752.6		26.74
	3	1312	1537	1712.4		26.98
		1413	1638	1732.6		26.51
		1513	1738	1752.6		26.84
	4	1312	1537	1712.4		26.80
		1413	1638	1732.6		26.41
		1513	1738	1752.6		26.79

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Average	Peak
UMTS1900 (Band V)	1	9262	9662	1852.4		27.06
		9400	9800	1880.0		27.07
		9538	9938	1907.6		26.91
	2*	9262	9662	1852.4		27.21
		9400	9800	1880.0		27.06
		9538	9938	1907.6		27.27
	3	9262	9662	1852.4		27.18
		9400	9800	1880.0		27.18
		9538	9938	1907.6		26.93
	4	9262	9662	1852.4		26.78
		9400	9800	1880.0		27.10
		9538	9938	1907.6		27.01

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				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	22/15	12/15	30/15	4/15	5/15
HSDPA Specific Settings	β_{ed}	1309/225	94/75	47/15	56/75	47/15
	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
HSUPA Specific Settings	$A_{hs} = \beta_{hs}/\beta_c$	30/15				
	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 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)	
					Average	Peak
UMTS1700 (Band IV)	1	1312	1537	1712.0		25.75
		1413	1638	1732.6		24.88
		1513	1738	1752.6		25.57
	2	1312	1537	1712.0		26.76
		1413	1638	1732.6		27.00
		1513	1738	1752.6		27.06
	3	1312	1537	1712.0		25.80
		1413	1638	1732.6		26.32
		1513	1738	1752.6		25.91
	4	1312	1537	1712.0		26.05
		1413	1638	1732.6		26.10
		1513	1738	1752.6		26.15
	5	1312	1537	1712.0		25.52
		1413	1638	1732.6		25.40
		1513	1738	1752.6		25.42
UMTS1900 (Band II)	1	9262	9662	1852.4		26.50
		9400	9800	1880.0		26.45
		9538	9938	1907.6		26.70
	2	9262	9662	1852.4		27.00
		9400	9800	1880.0		27.13
		9538	9938	1907.6		27.02
	3	9262	9662	1852.4		26.45
		9400	9800	1880.0		26.27
		9538	9938	1907.6		26.32
	4	9262	9662	1852.4		26.67
		9400	9800	1880.0		26.71
		9538	9938	1907.6		26.56
	5	9262	9662	1852.4		26.00
		9400	9800	1880.0		25.93
		9538	9938	1907.6		26.00

7.1. RF POWER OUTPUT UMTS HSPA EVOLUTION (HSPA +)

TEST PROCEDURE

The following summary of these settings are illustrated the 3GPP TS 34.121 HSPA + (64QAM):

	Mode	HSPA +	HSPA +	HSPA +	HSPA +	HSPA +
	Subtest	1	2	3	4	5
HSPA + Specific Settings	Loopback Mode	Test Mode 1				
	Fixed Reference Channel	For Test TS34.121 6.3B				
	H-Set8(64QAM)	For Test TS34.121 6.3B				
	Integrity Protection	ON				
	Power Control Algorithm	Algorithm2				
	DPCH Timing Offset	6				
	Channel Coding	E-DCH RF EST				
	Output Level	-86				
	HPUPA Throughput	ON				
	HPUPA Throughput-# of Samples	15				
	Absolute Grant Value	14				
	Number of E-TFCIs	3				
	Beta C	8				
	Beta D	15				
	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Reference E_TFCIs	E-TFCI 105 E-TFCI PO 12 E-TFCI 116 E-TFCI PO 14 E-TFCI 127 E-TFCI PO 16				
	Power Control Bit Pattern	Inner Loop Power Control				
	Input Level	16				
	Power Control Bit Pattern	Alternate				
	Power Control Bit Pattern	26				

RESULTS

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)	
					Average	Peak
UMTS1700 (Band IV)	1	1312	1537	1712.0		26.38
		1413	1638	1732.6		25.78
		1513	1738	1752.6		26.81
UMTS1900 (Band II)	1	9262	9662	1852.4		25.60
		9400	9800	1880.0		26.95
		9538	9938	1907.6		25.47

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 HSDPA

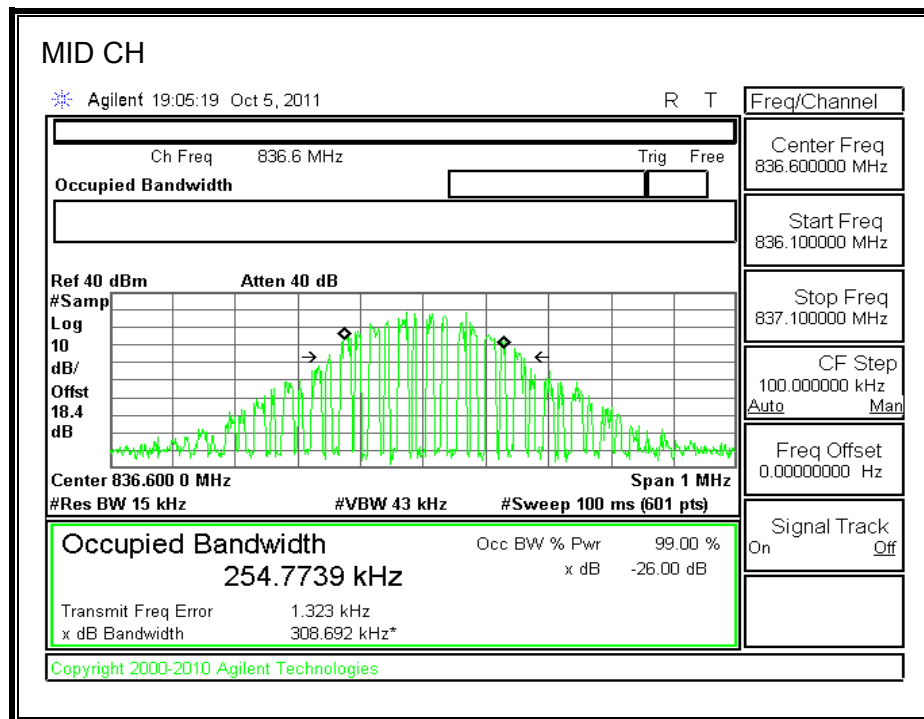
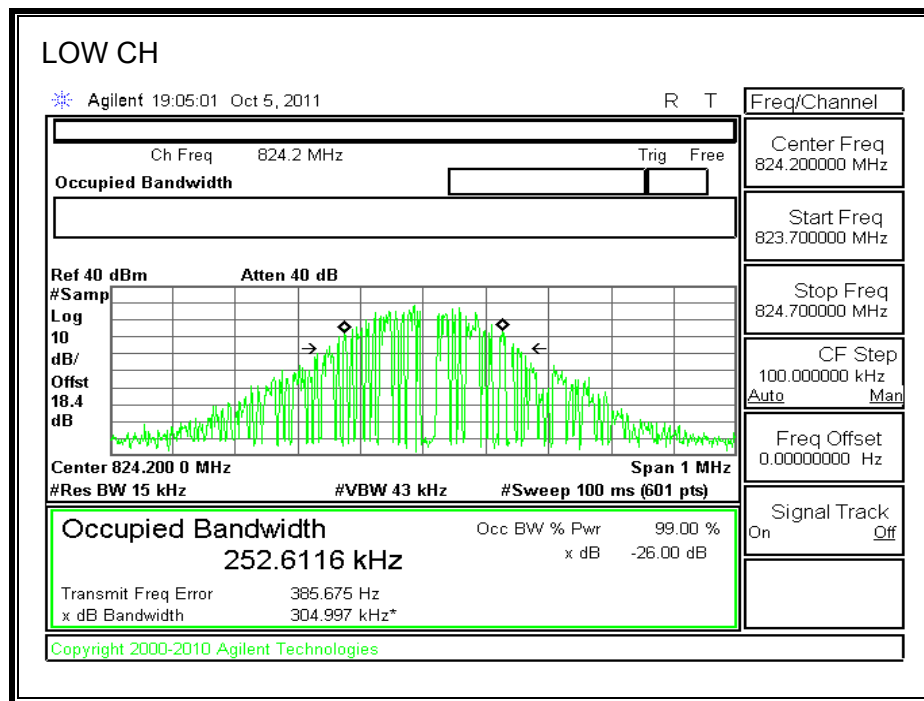
RESULTS

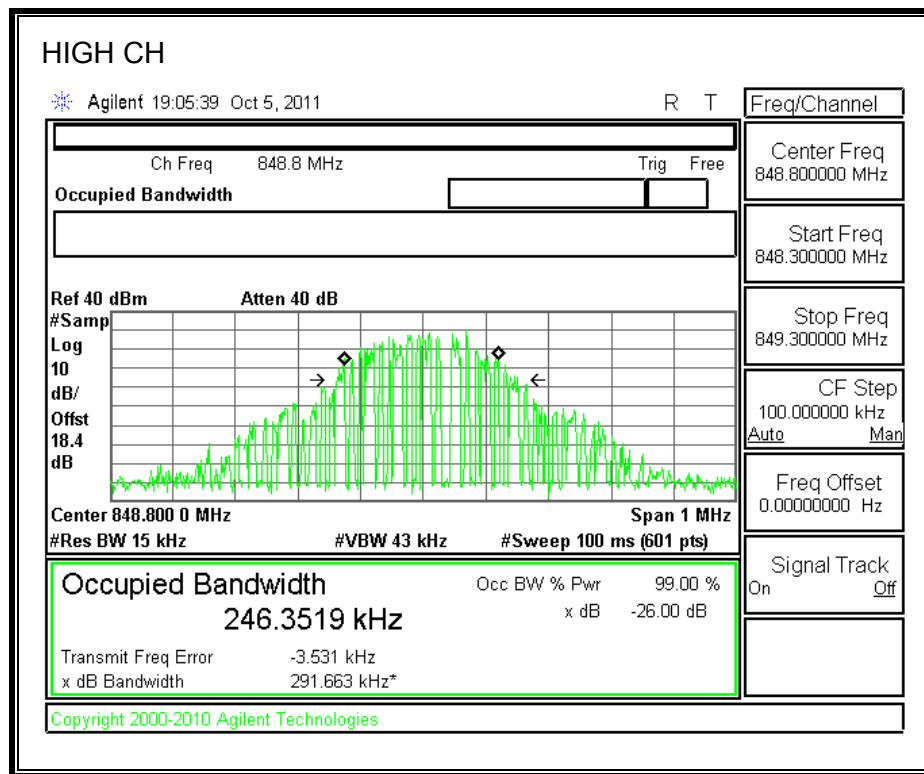
Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
Cellular	GPRS	128	824.20	252.6116	304.997
		190	836.60	254.7739	308.692
		251	848.80	246.3519	291.663
	EGPRS	128	824.20	250.0549	307.671
		190	836.60	241.1498	284.852
		251	848.80	245.7483	283.648

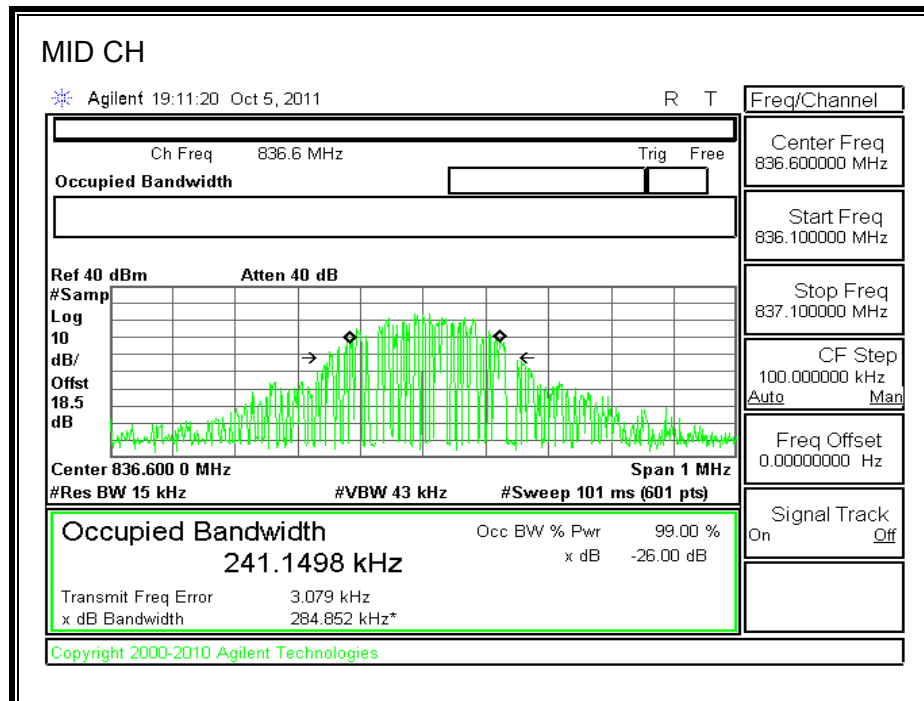
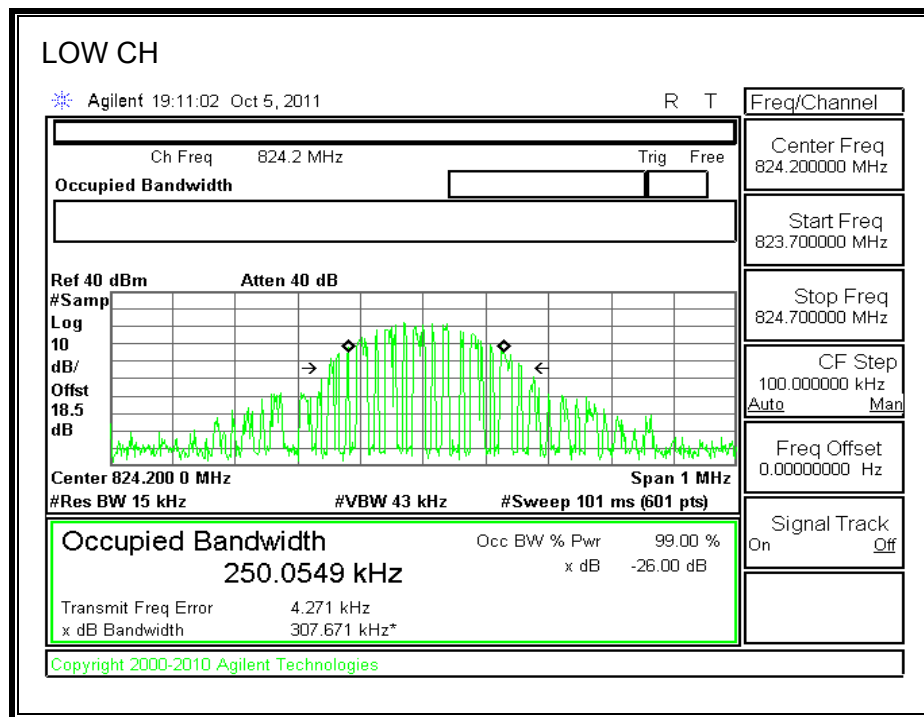
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
PCS	GPRS	512	1850.2	247.5046	302.288
		661	1880.0	251.0131	311.439
		810	1909.8	240.1662	306.876
	EGPRS	512	1850.2	249.0681	303.709
		661	1880.0	251.1482	303.769
		810	1909.8	242.9482	309.564

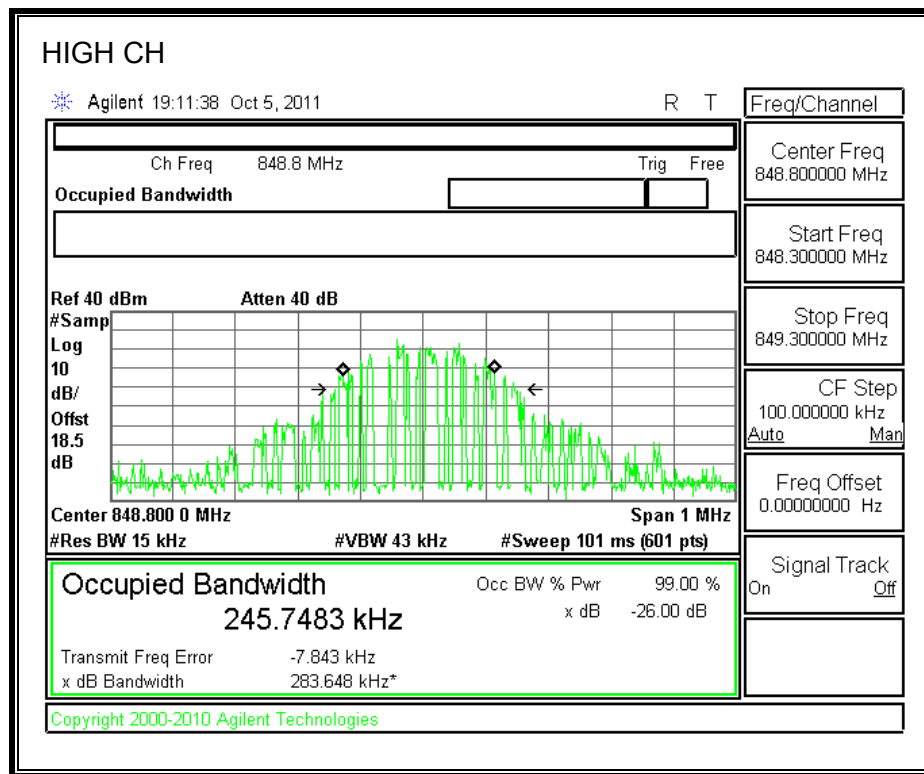
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
WCDMA1700	UMTS, REL 99	1537	1712.4	4.0765	4.441
		1638	1732.6	4.0605	4.486
		1738	1752.6	4.0510	4.493
	UMTS, HSDPA	1537	1712.4	4.0601	4.525
		1638	1732.6	4.0597	4.607
		1738	1752.6	4.0954	4.508

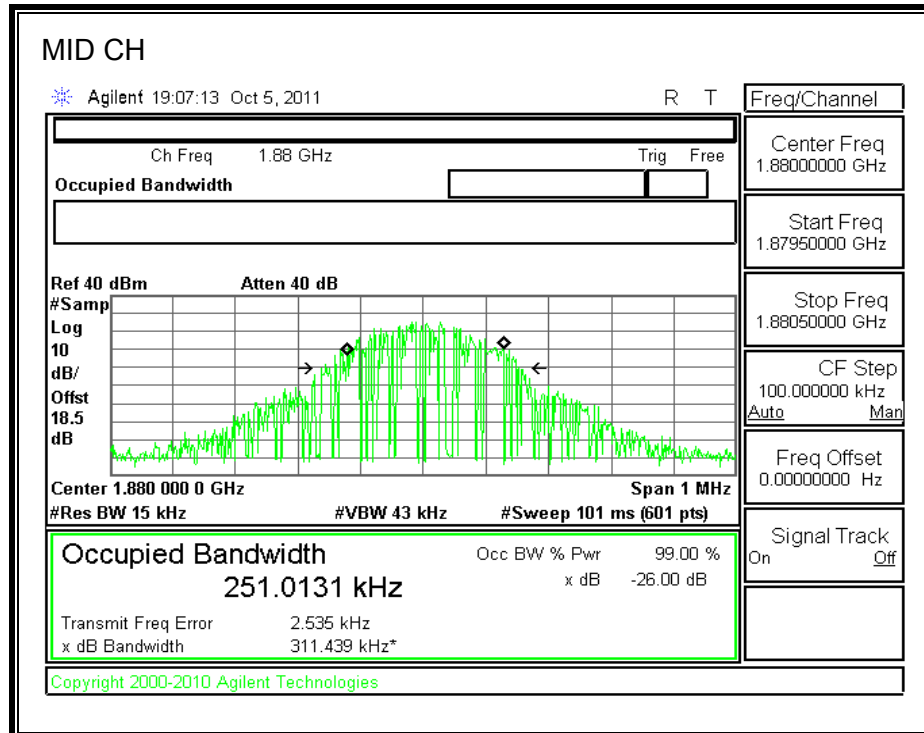
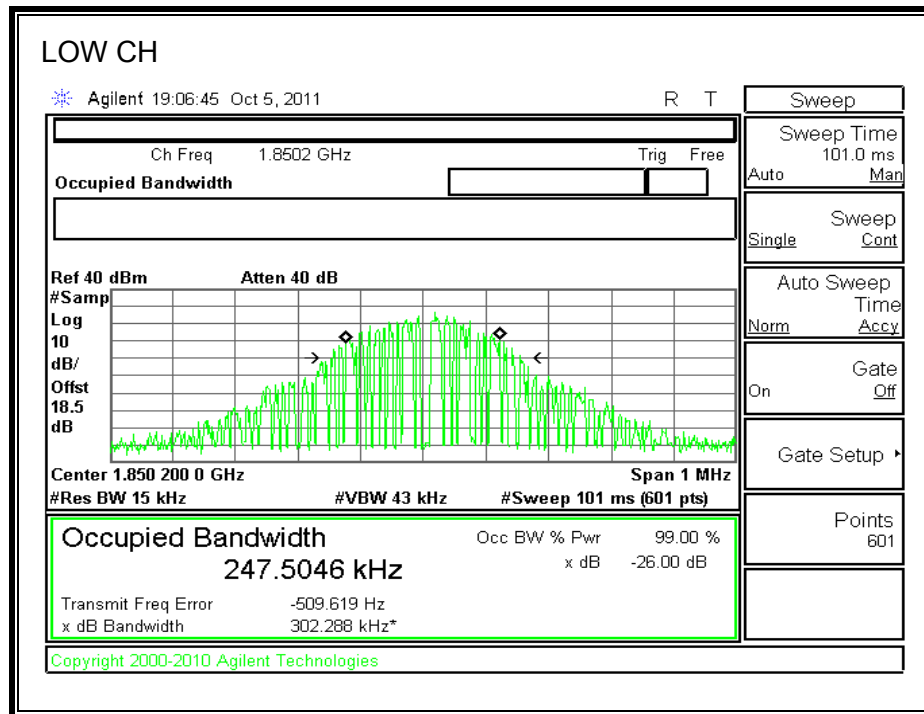
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
WCDMA1900	UMTS, REL 99	9662	1852.4	4.0969	4.467
		9800	1880.0	4.0639	4.496
		9938	1907.6	4.0801	4.393
	UMTS, HSDPA	9662	1852.4	4.0847	4.553
		9800	1880.0	4.0661	4.501
		9938	1907.6	4.0738	4.555

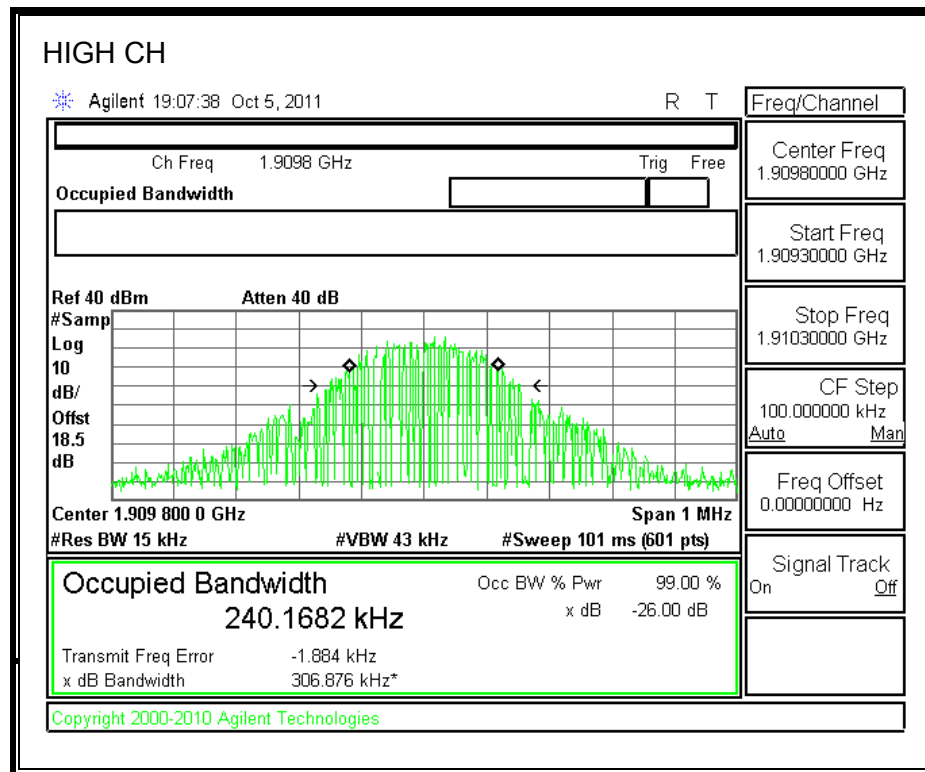
GPRS Mode (Cellular Band)

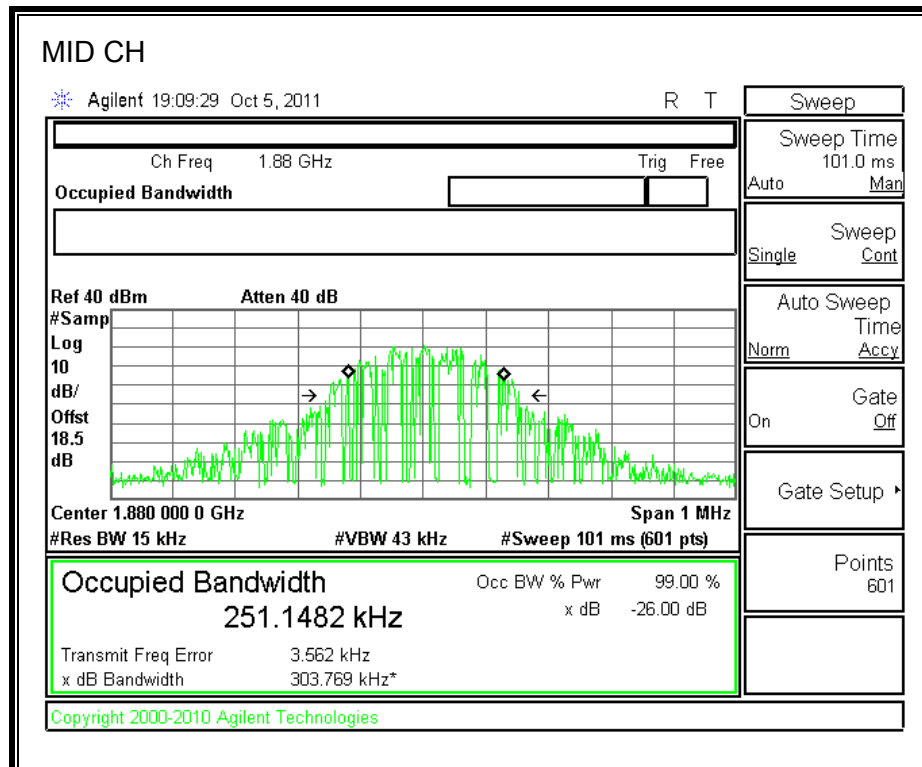
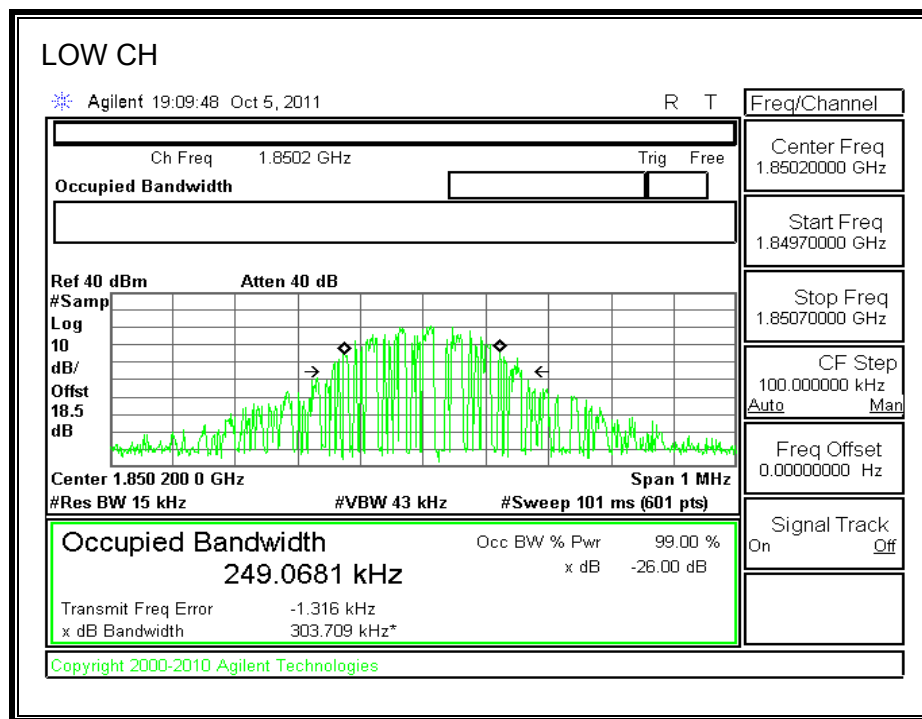


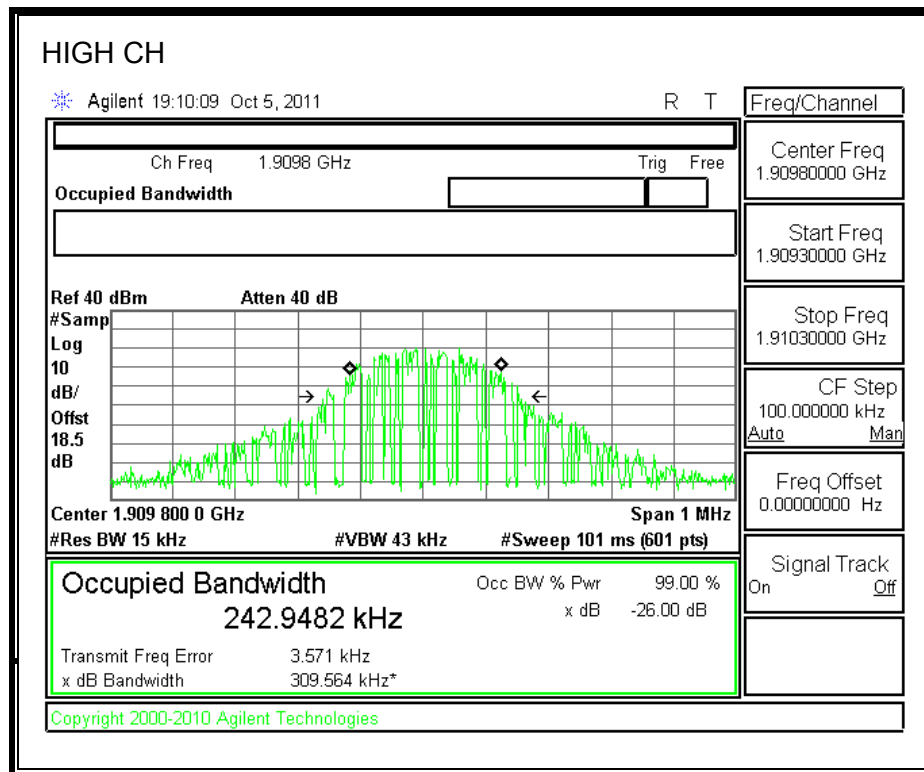
EGPRS Mode (Cellular Band)

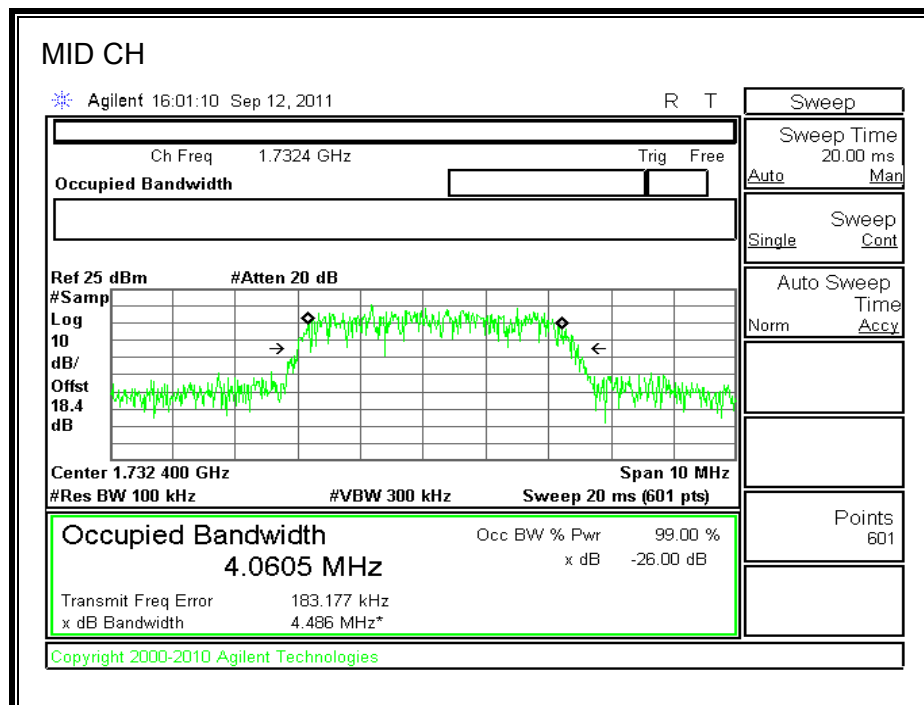
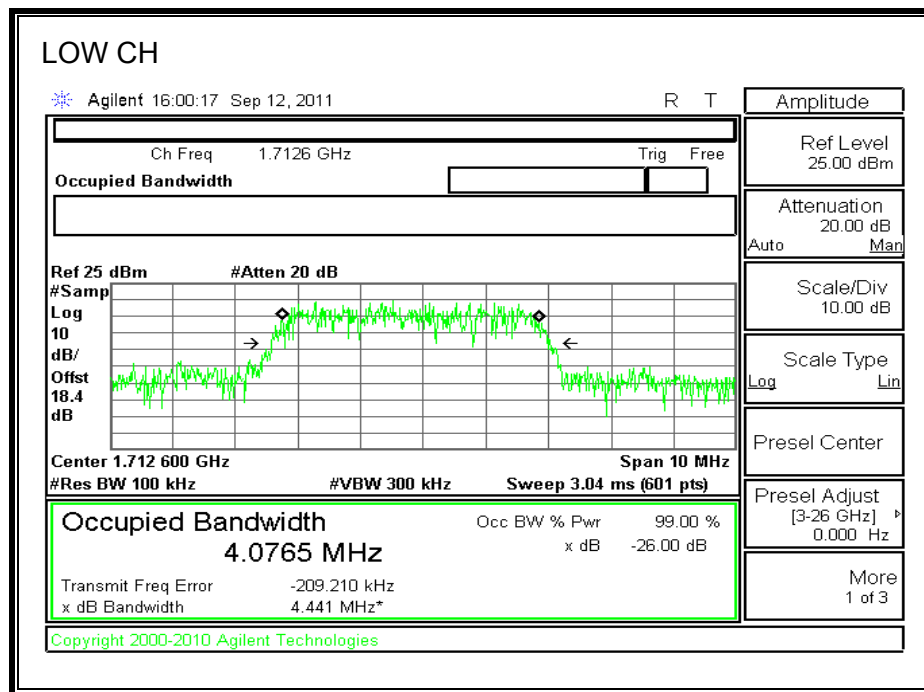


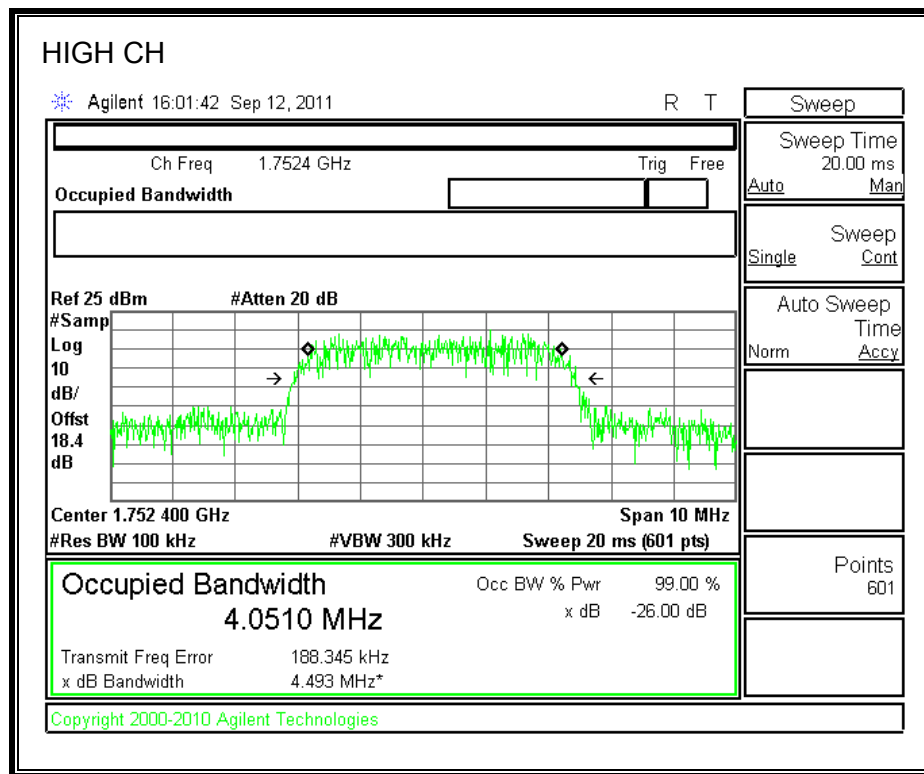
GPRS Mode (PCS Band)

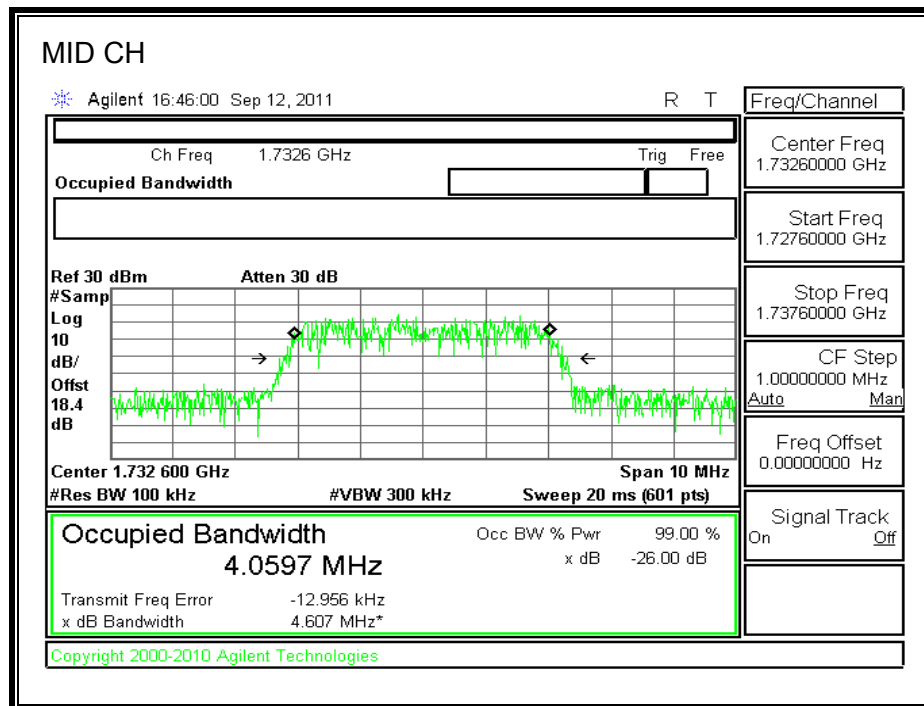
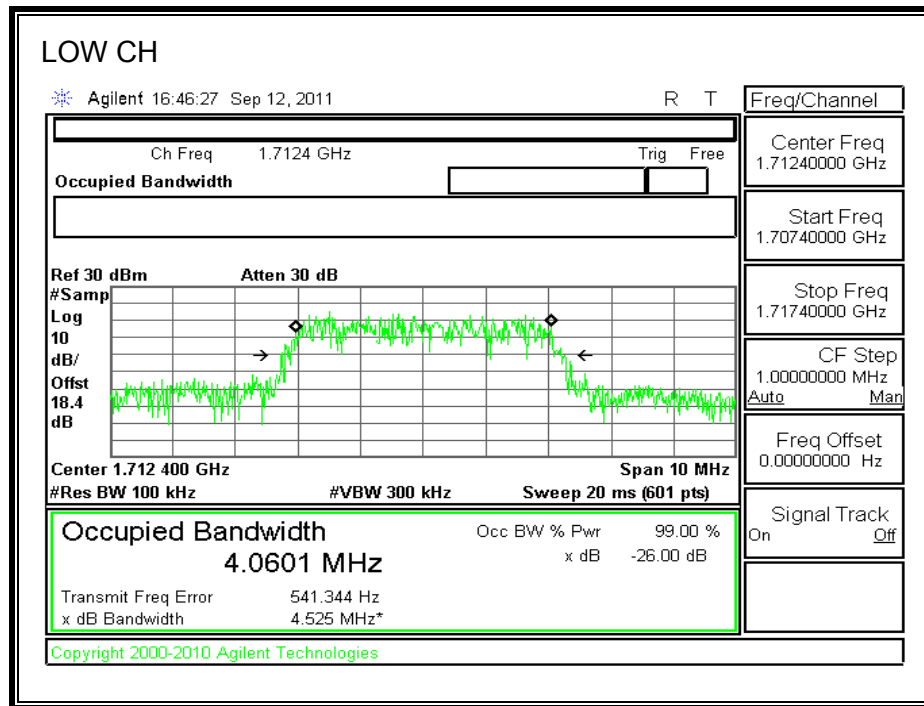


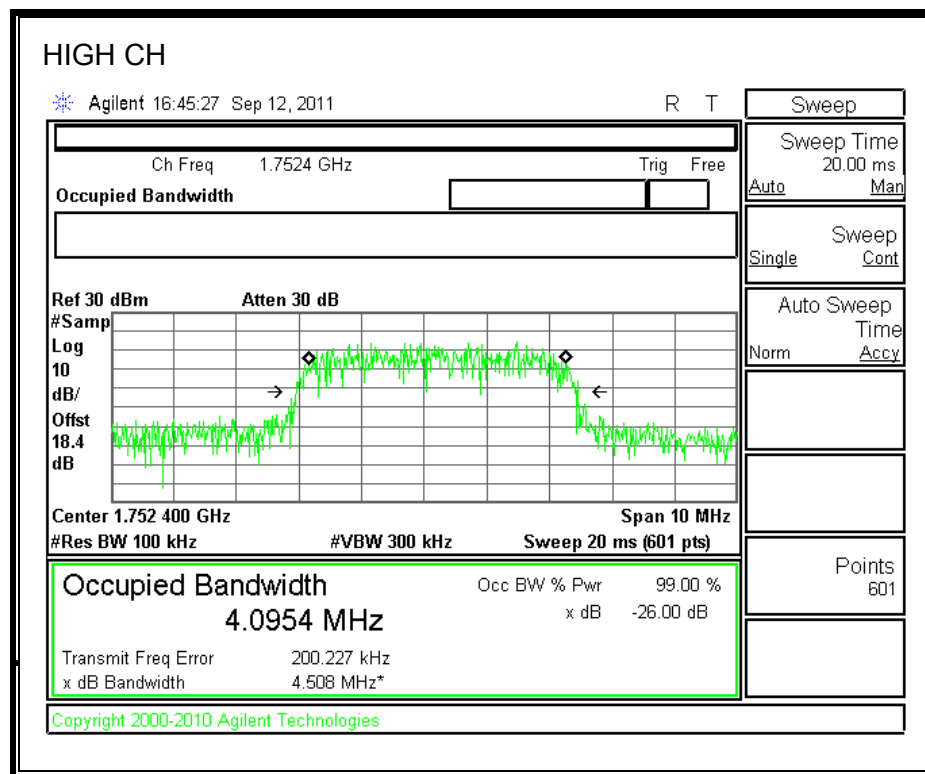
EGPRS Mode (PCS Band)

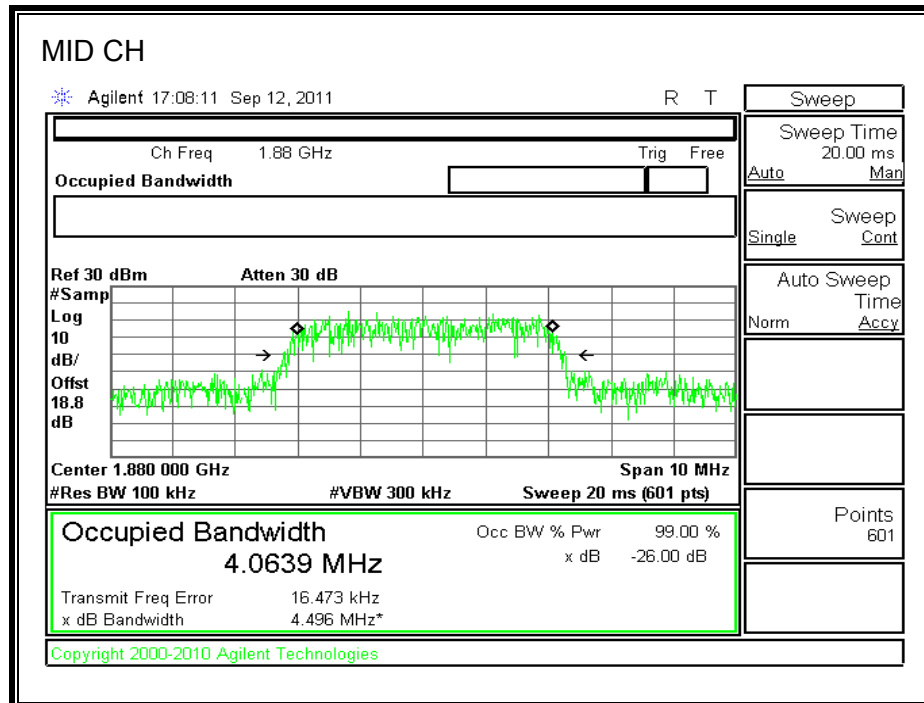
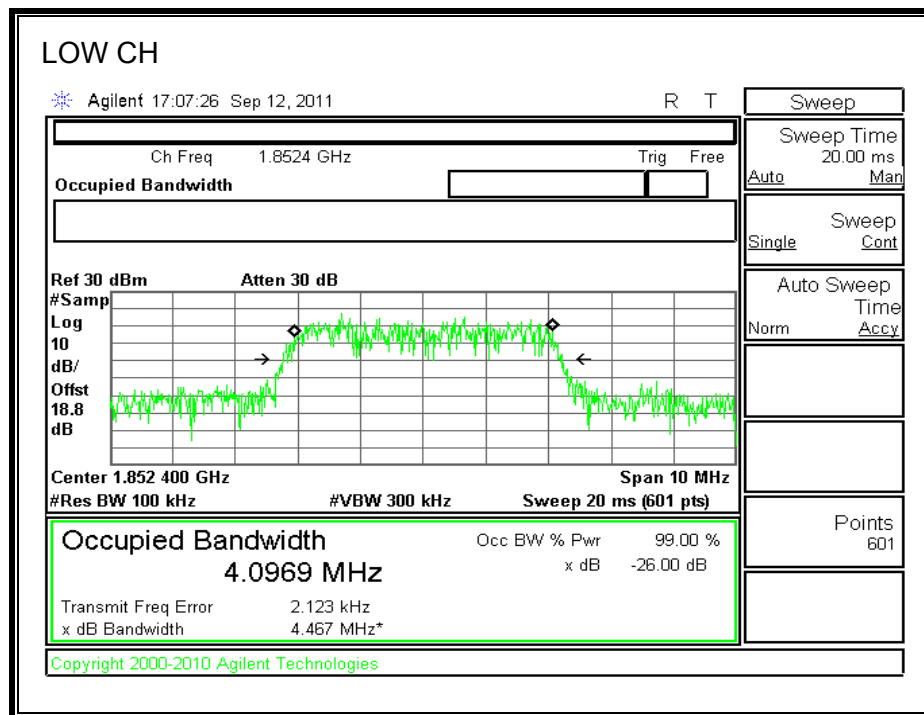


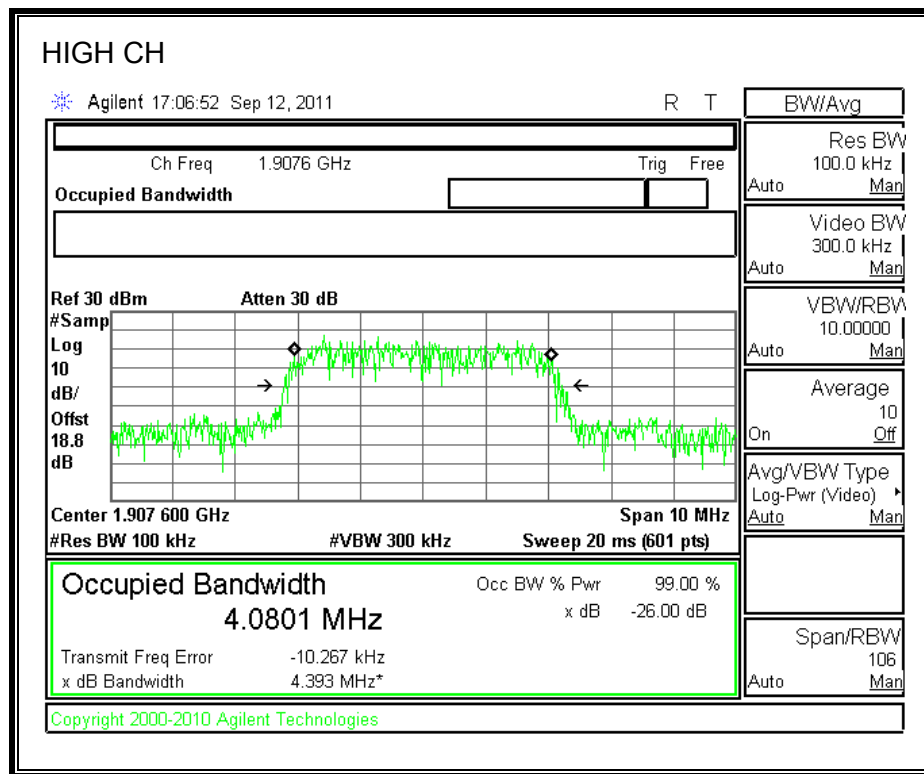
WCDMA 1700 REL 99

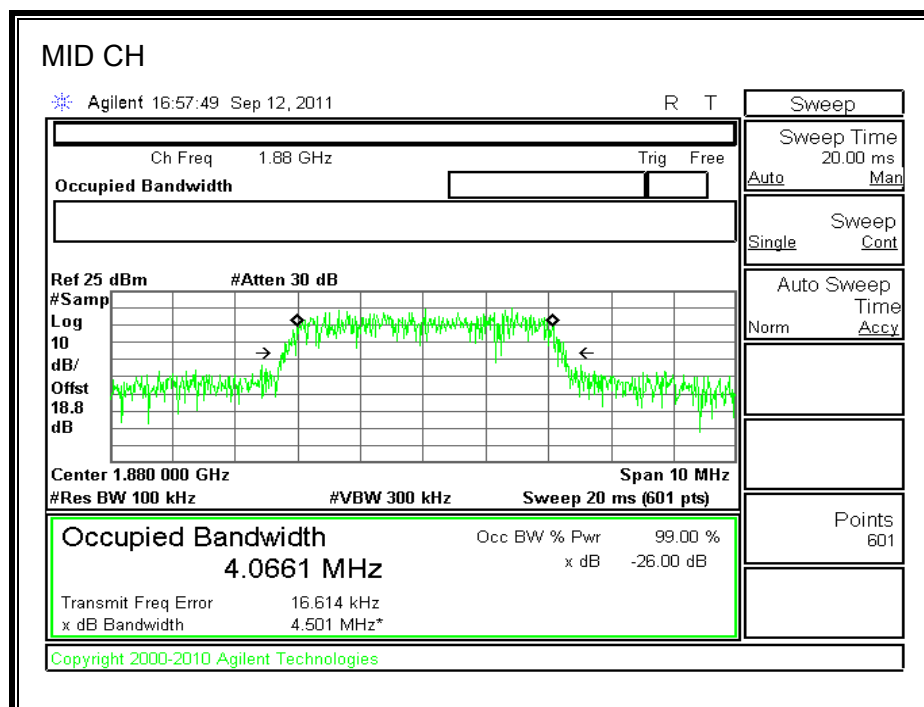
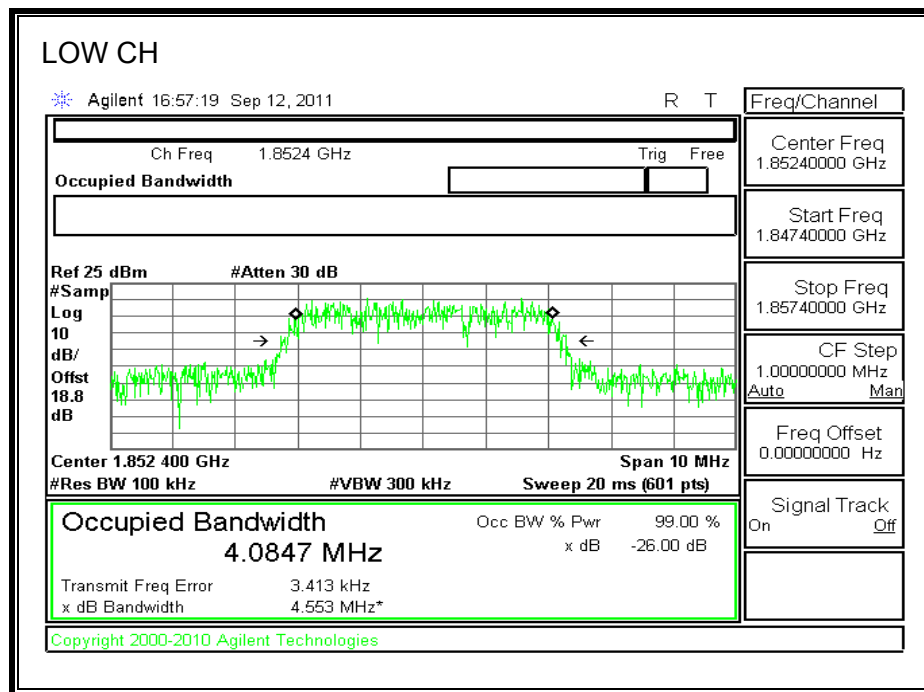


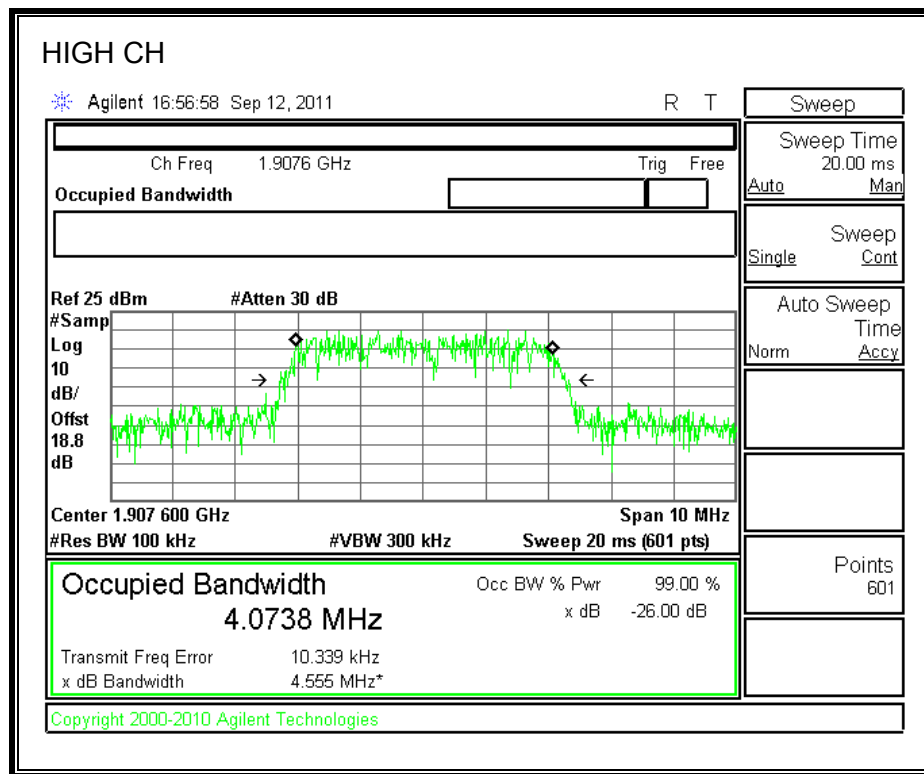
WCDMA 1700 HSDPA



WCDMA 1900 REL 99



WCDMA 1900 HSDPA



8.2. BAND EDGE

RULE PART(S)

FCC: §22.359, 24.238, FCC: §27.53

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.

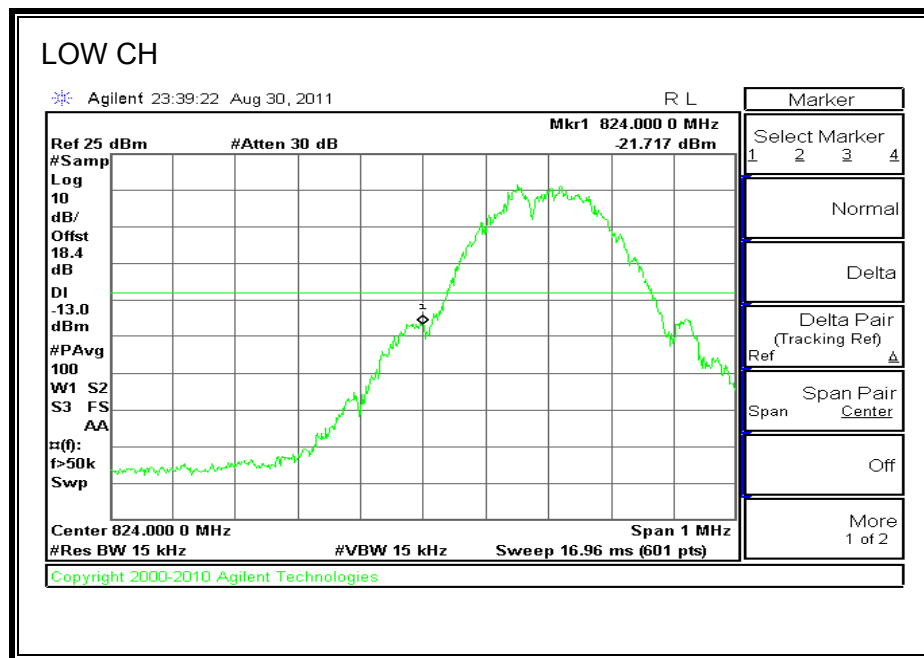
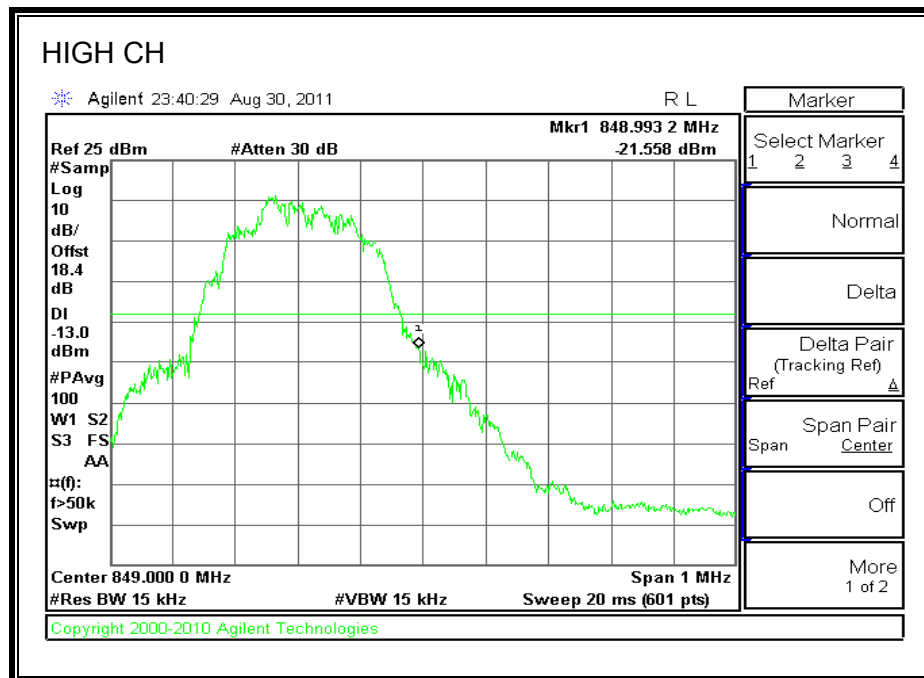
For each band edge measurement:

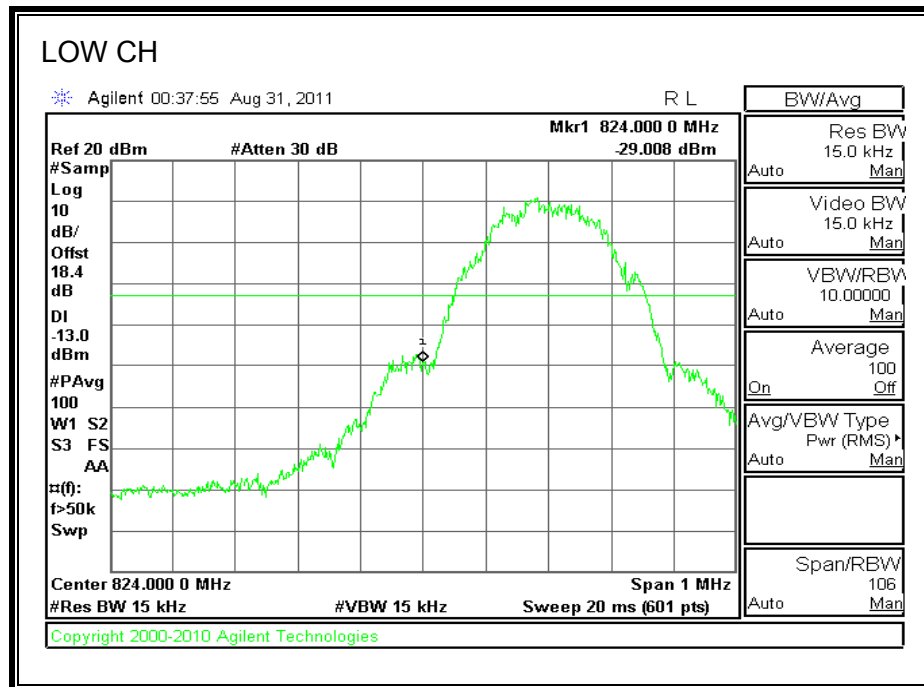
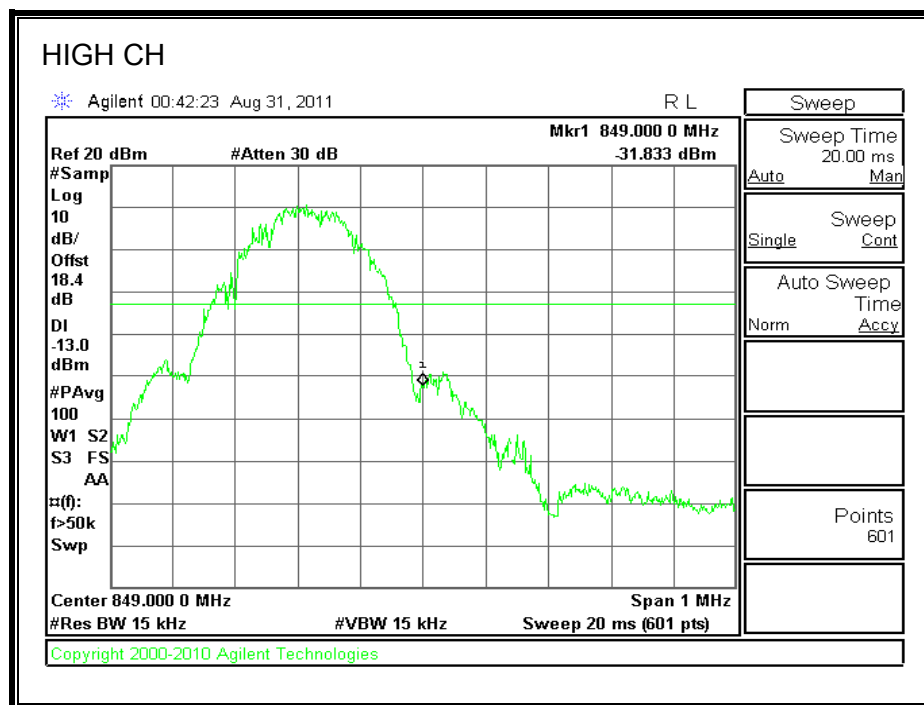
- Set the spectrum analyzer span to include the block edge frequency (824, 848, 1850, 1910MHz)
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

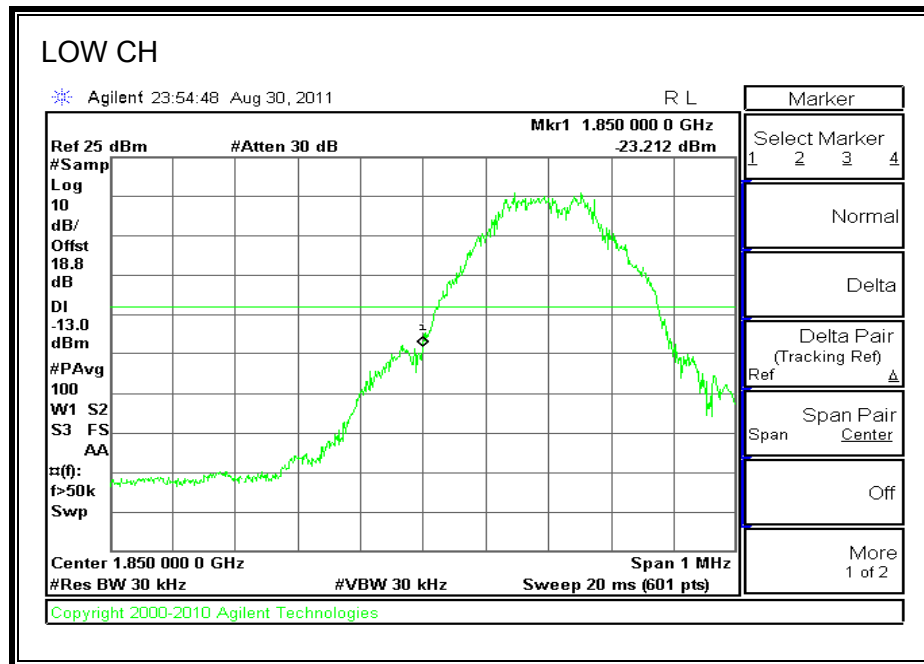
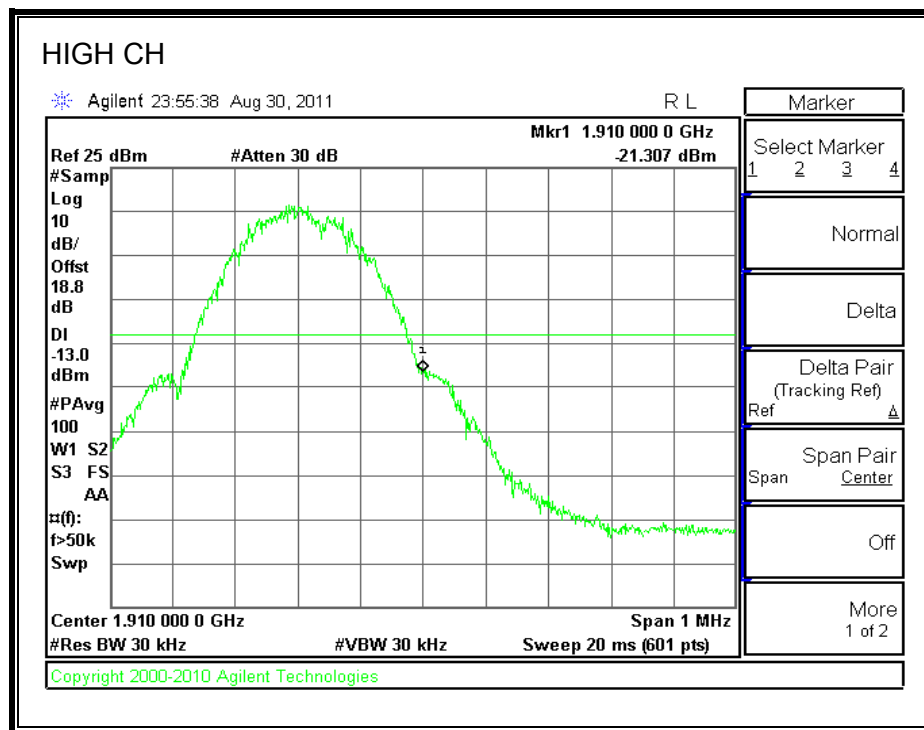
MODES TESTED

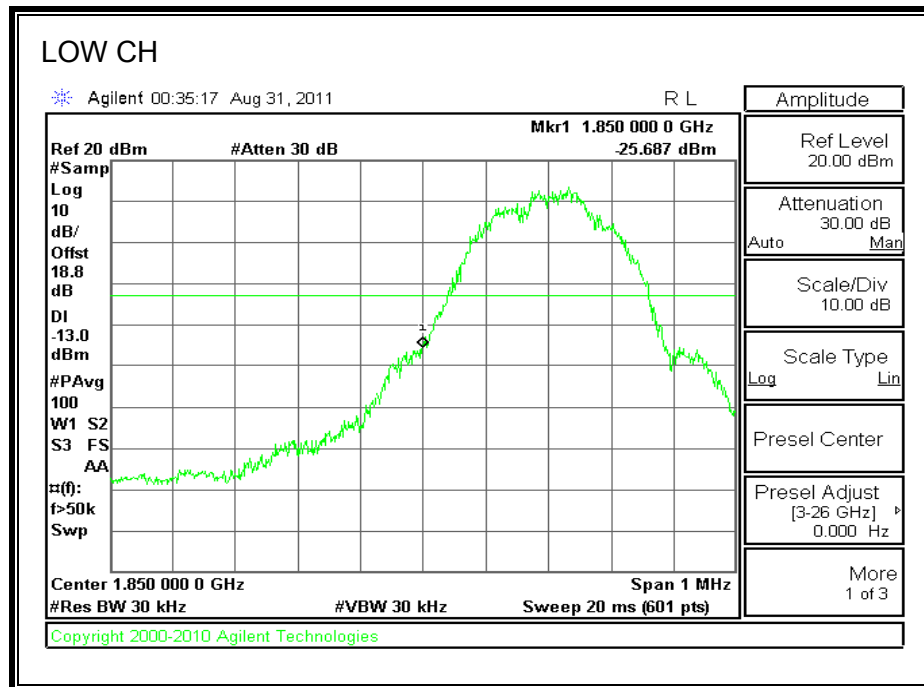
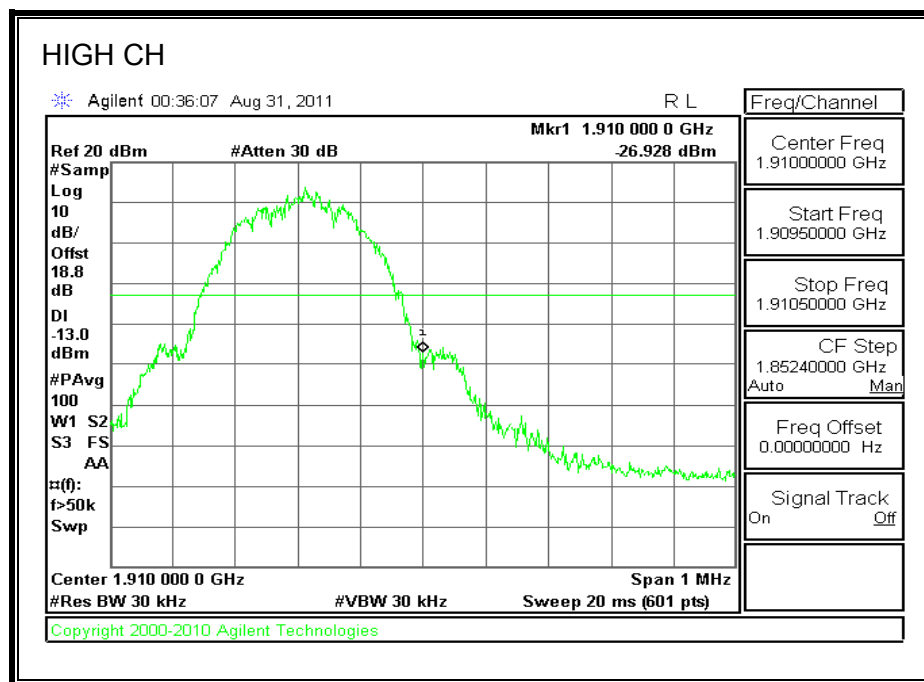
- GPRS, EGPRS
- UMTS, REL 99 and HSDPA

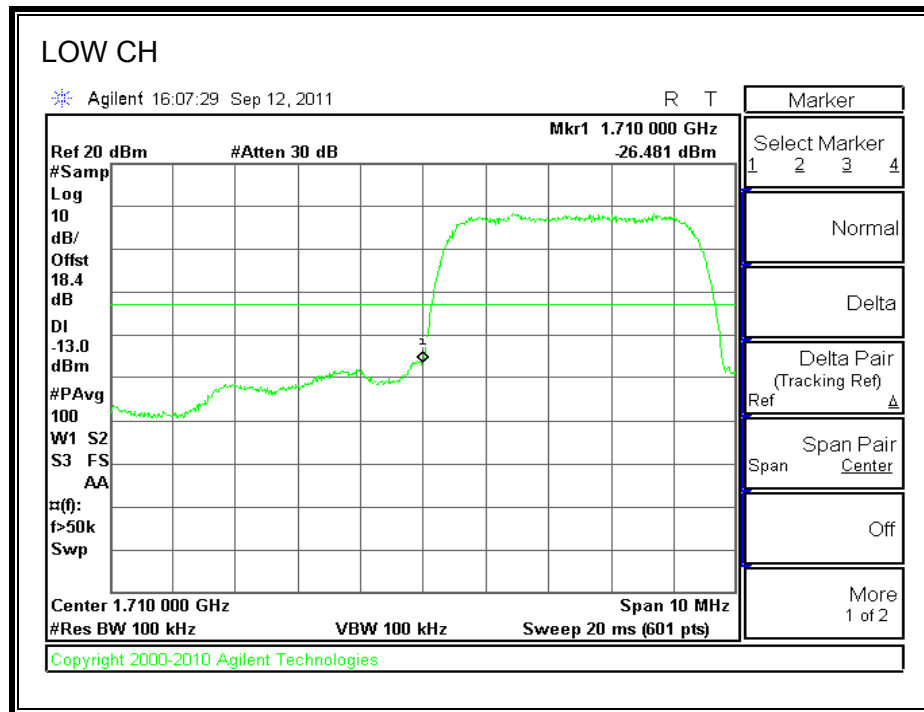
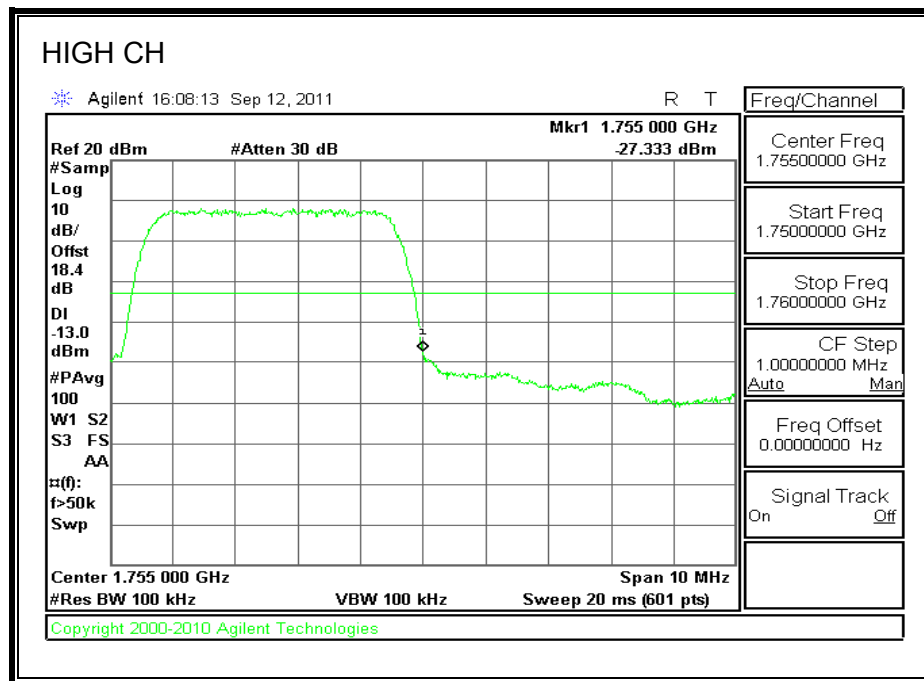
RESULTS

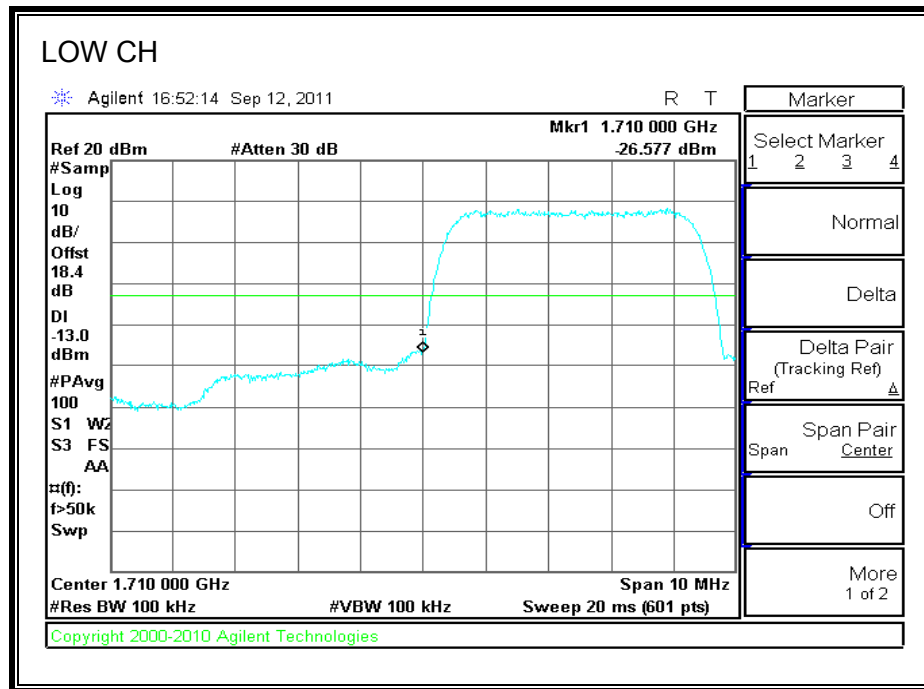
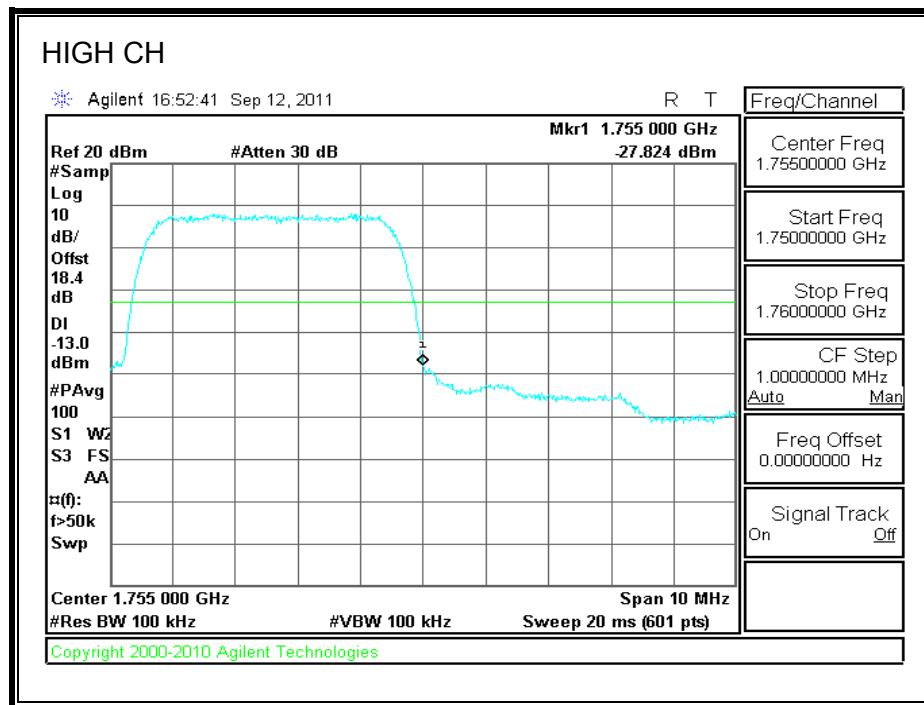
GPRS mode (Cellular Band)**Low Channel Band Edge****High Channel Band Edge**

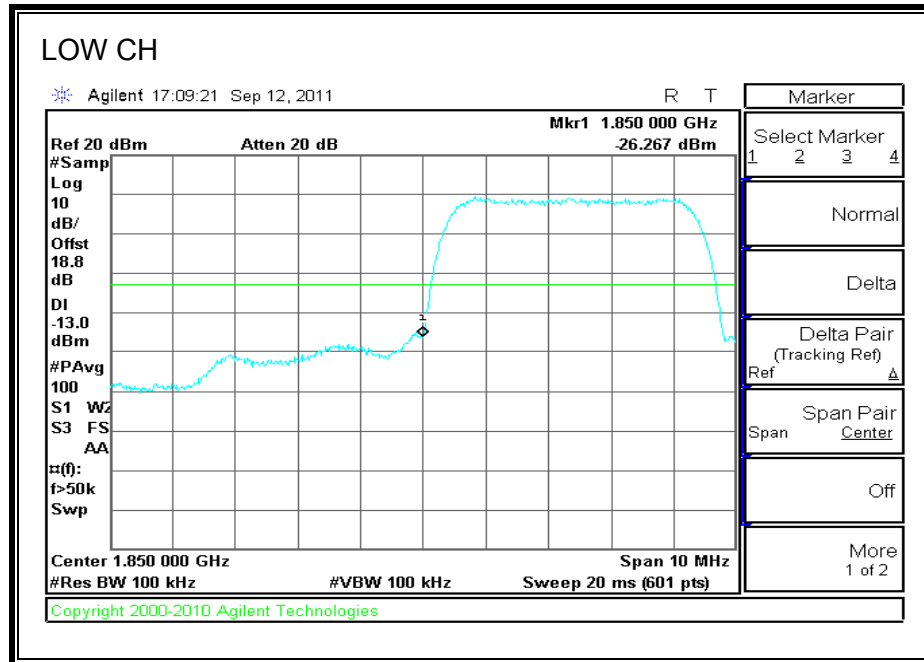
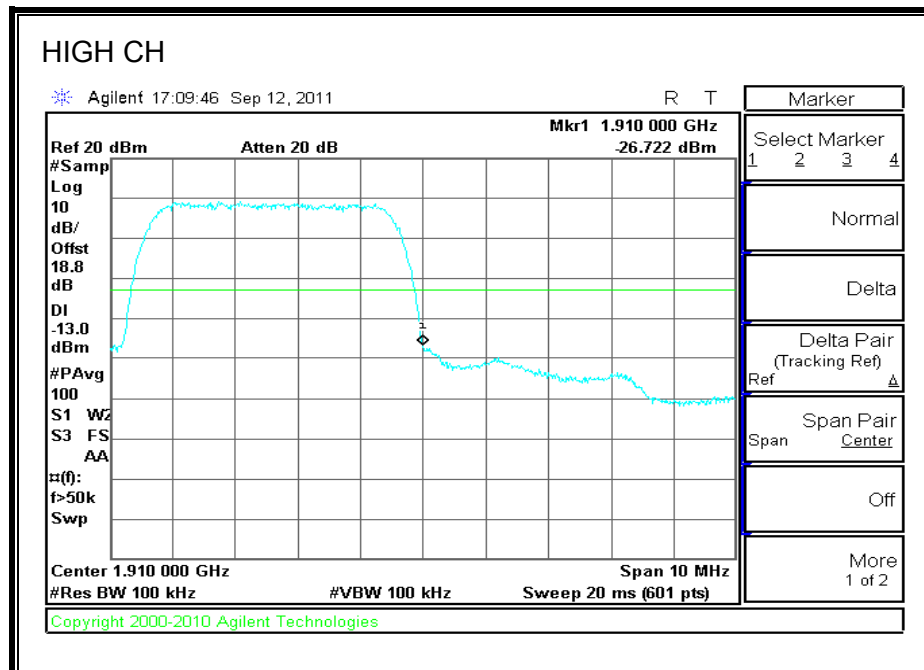
EGPRS mode (Cellular Band)**Low Channel Band Edge****High Channel Band Edge**

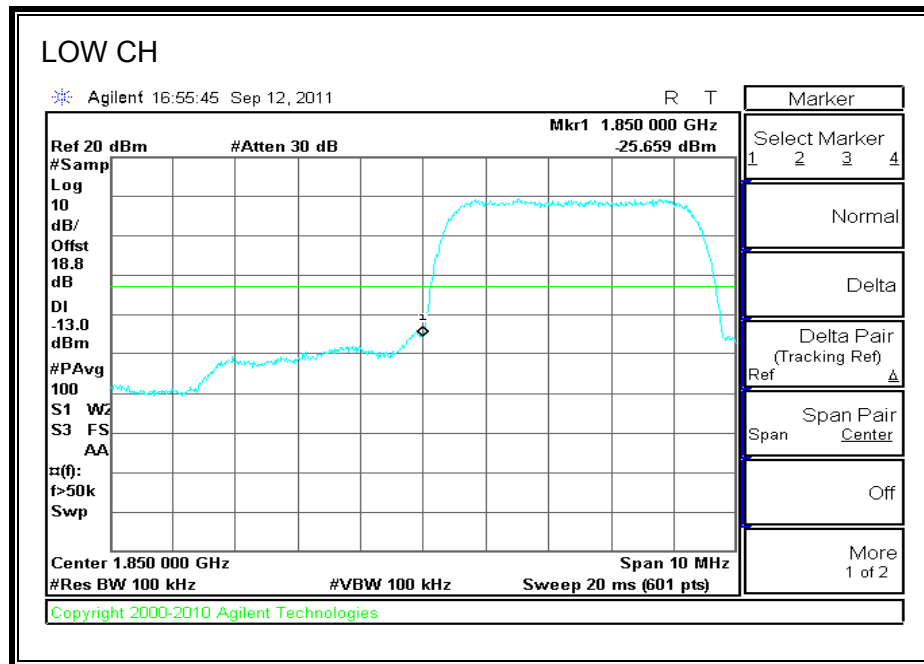
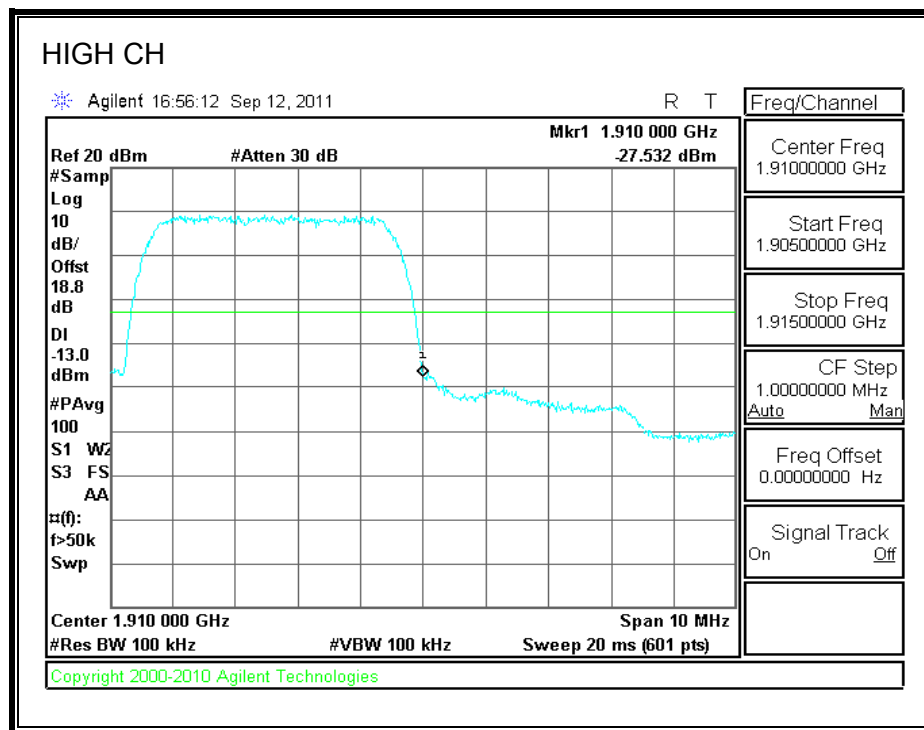
GPRS Mode (PCS Band)**Low Channel Band Edge****High Channel Band Edge**

EGPRS Mode (PCS Band)**Low Channel Band Edge****High Channel Band Edge**

WCDMA 1700 REL 99**Low Channel Band Edge****High Channel Band Edge**

WCDMA 1700 HSDPA**Low Channel Band Edge****High Channel Band Edge**

WCDMA 1900 REL 99**Low Channel Band Edge****High Channel Band Edge**

WCDMA 1900 HSDPA**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, §27.53

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.

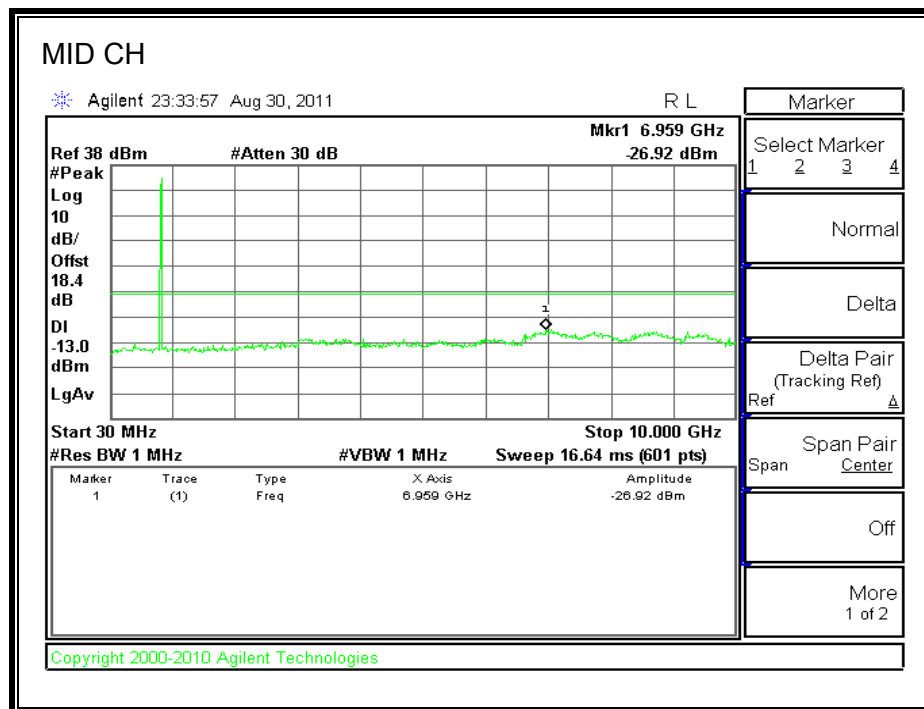
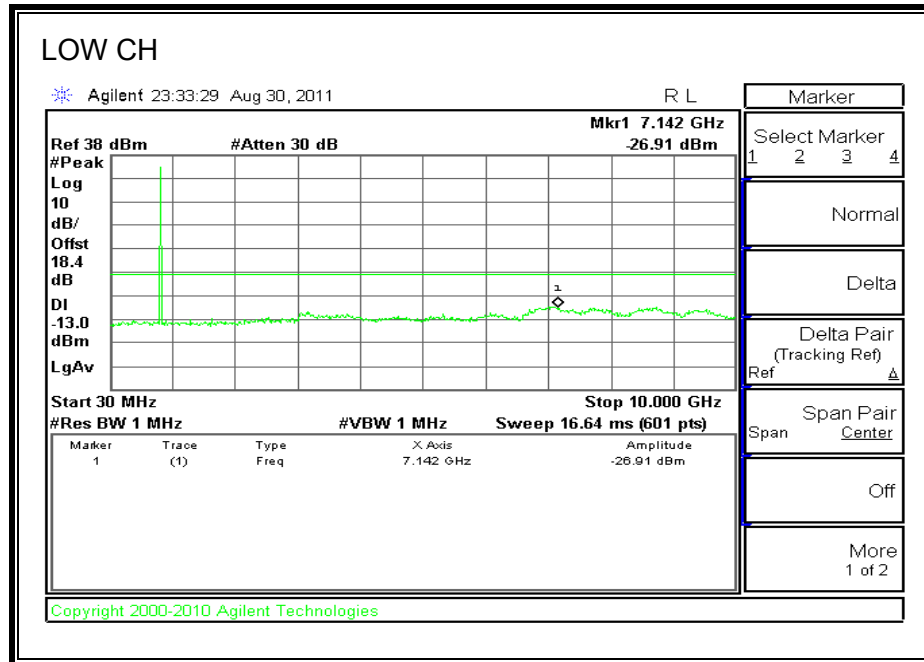
For each out of band emissions measurement:

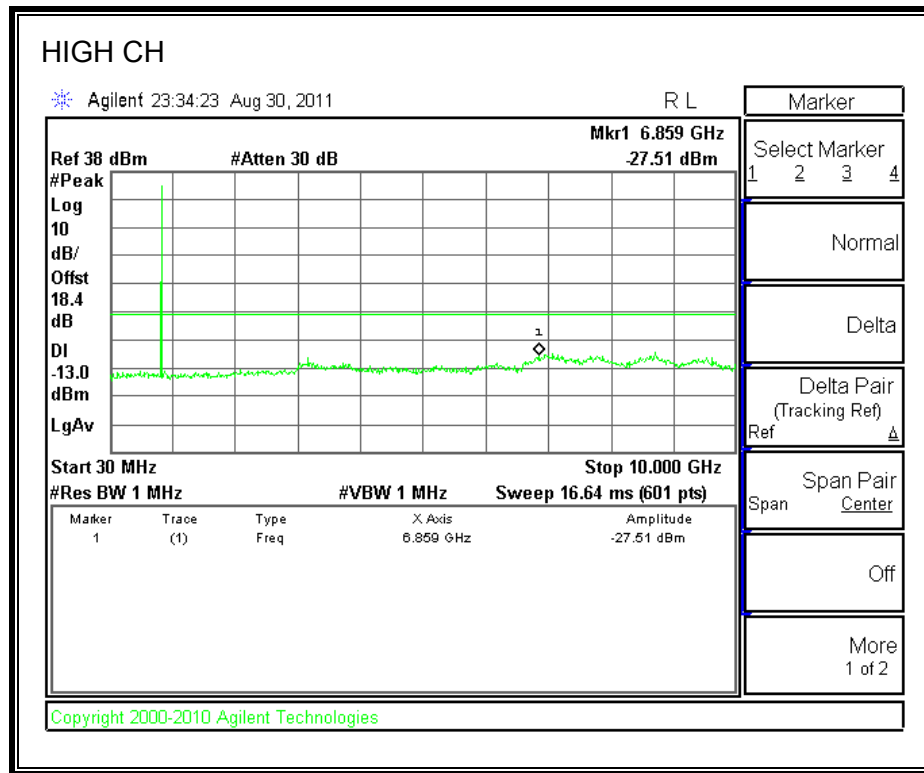
- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

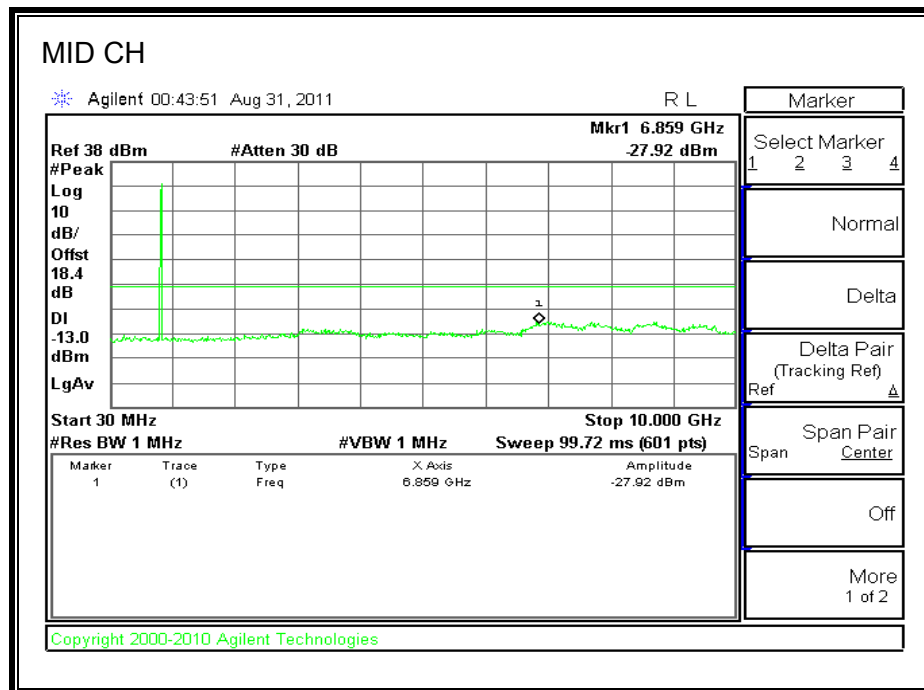
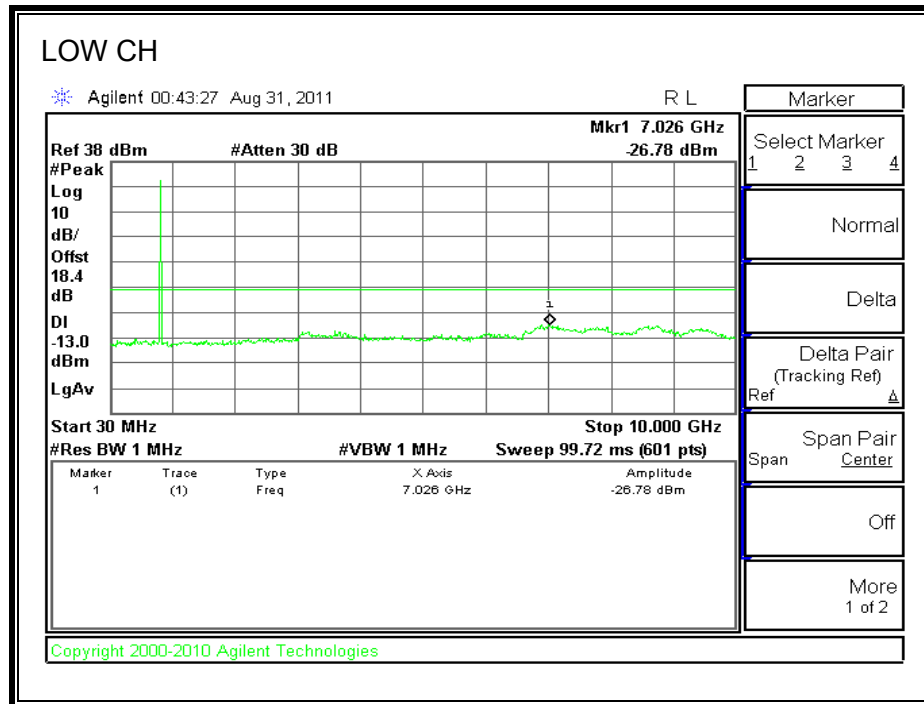
MODES TESTED

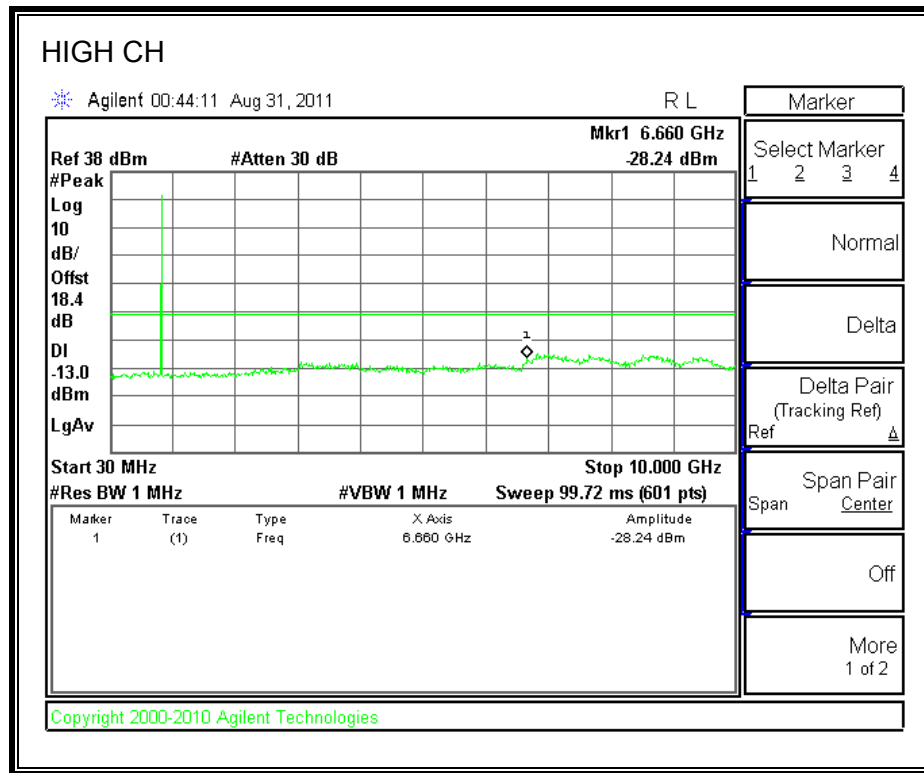
- GPRS , EGPRS
- UMTS, REL99 and HSDPA

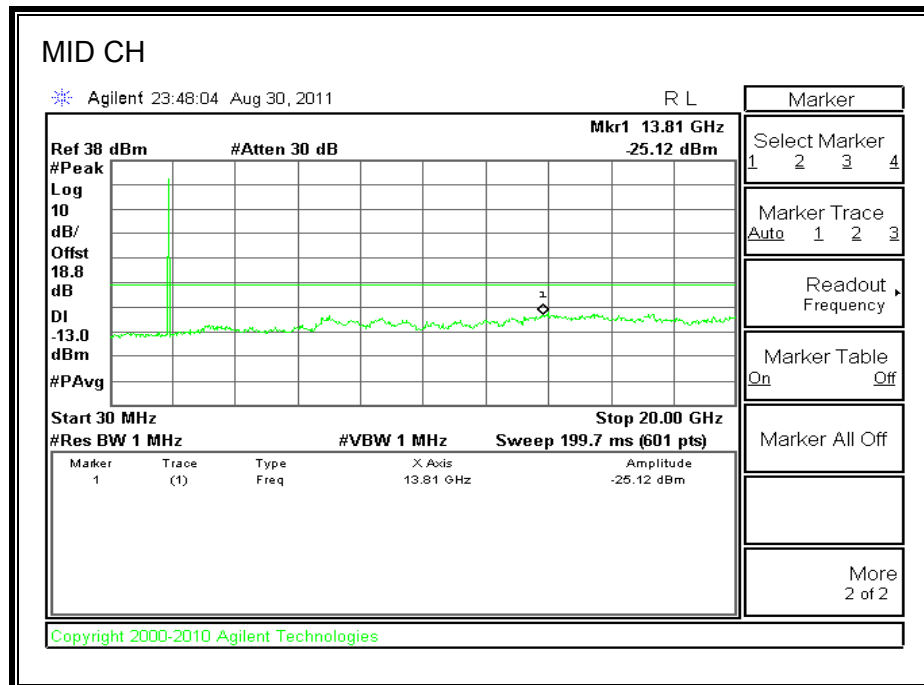
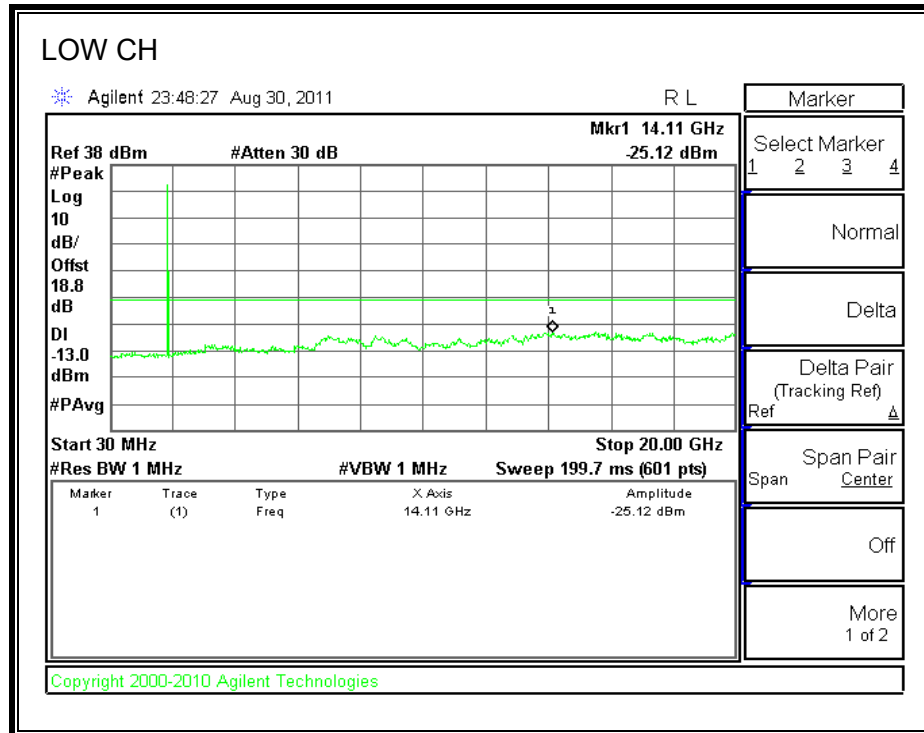
RESULTS

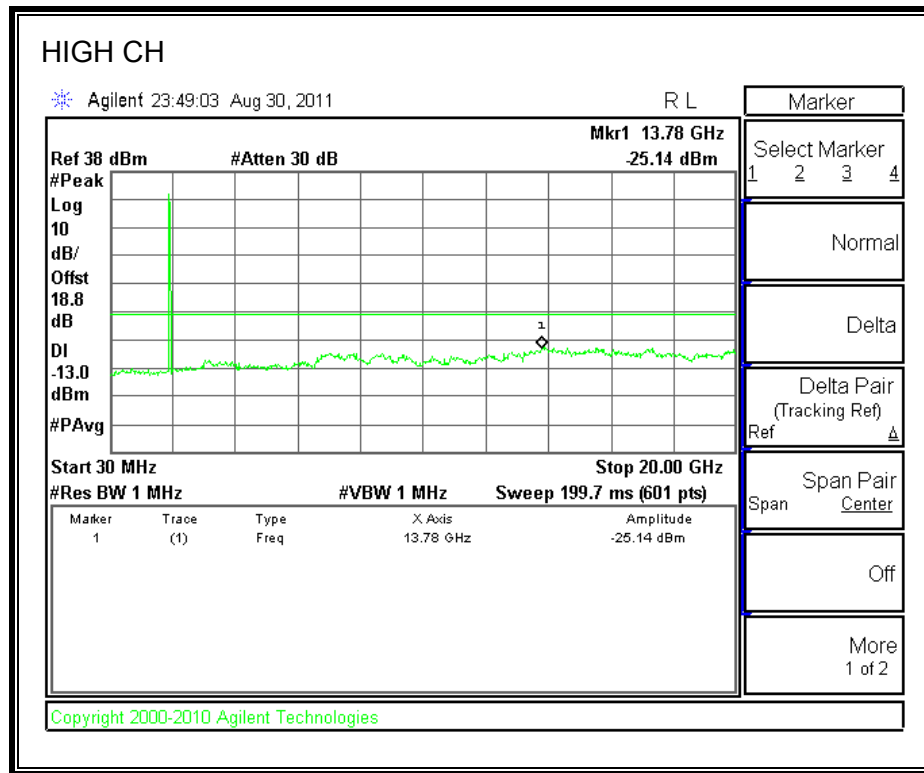
GPRS Mode (Cellular Band)**LOW Channel**

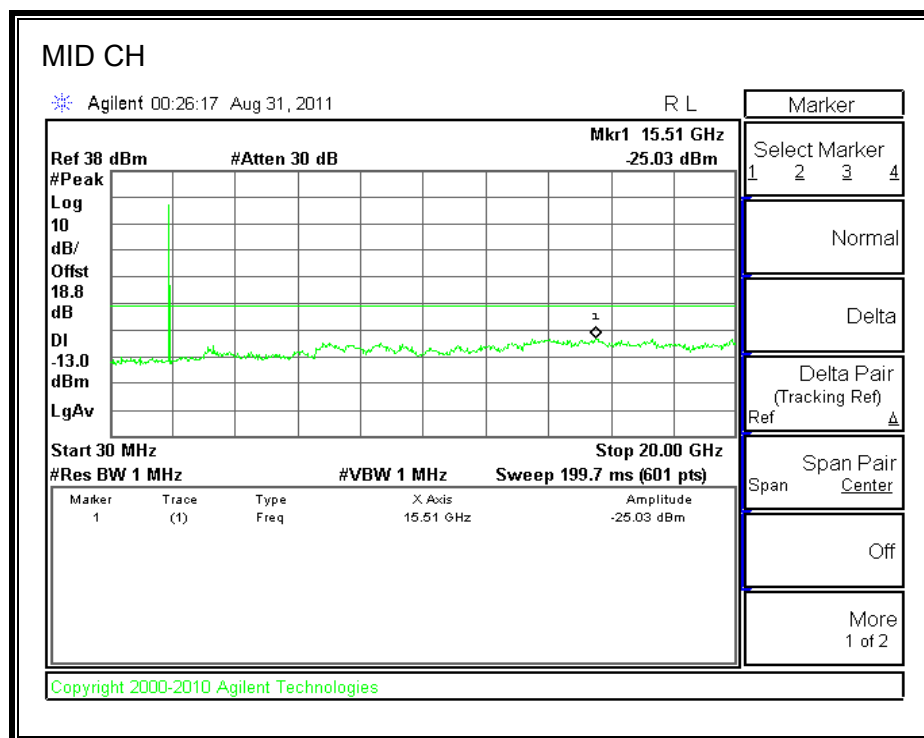
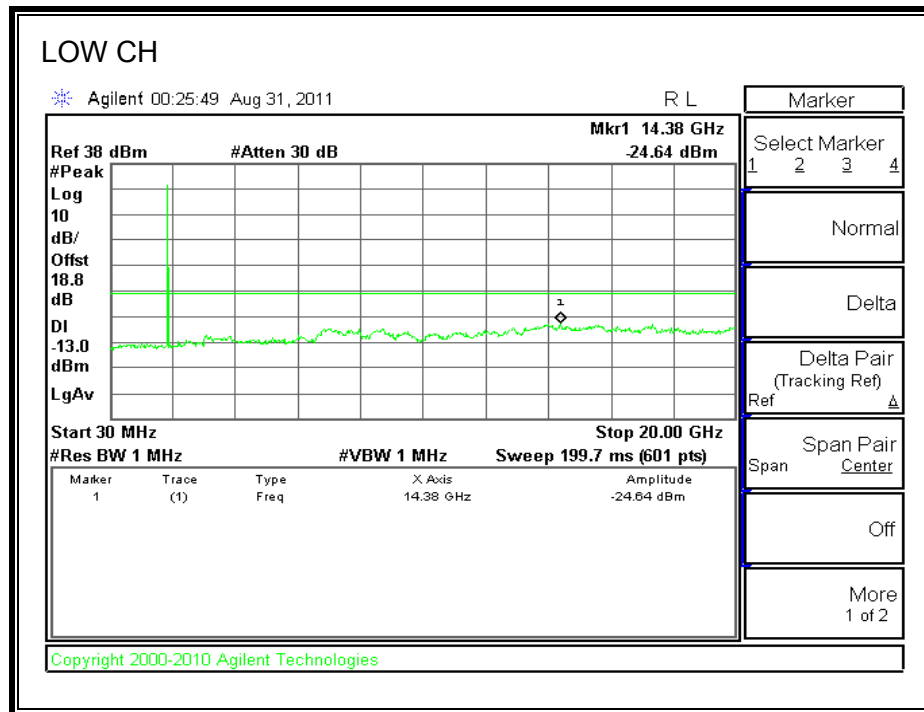


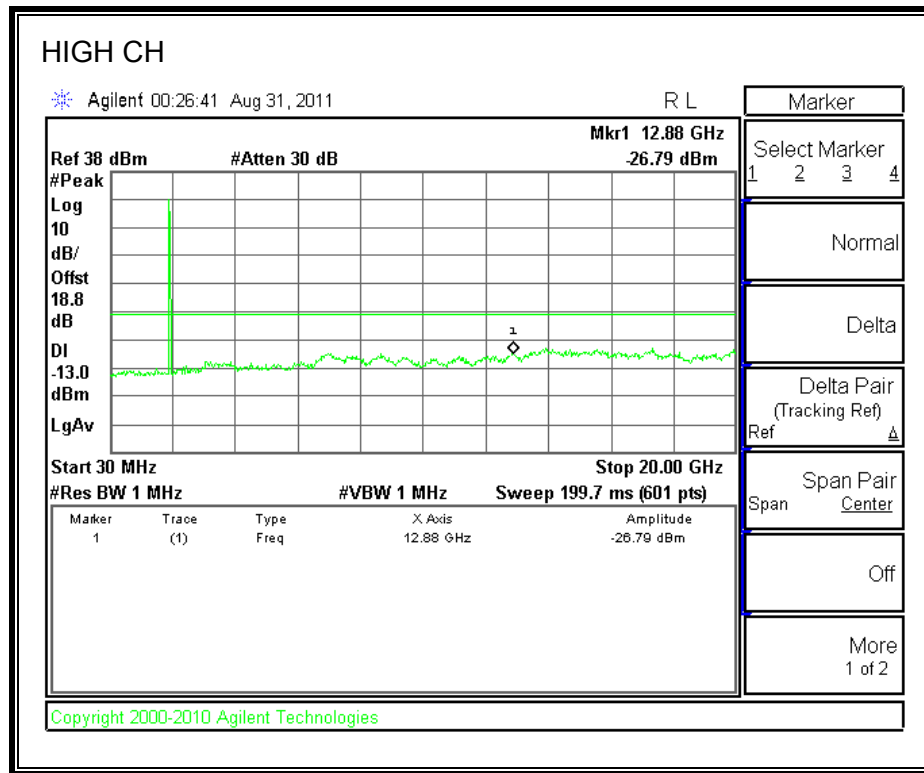
EGPRS Mode (Cellular Band)**LOW Channel**

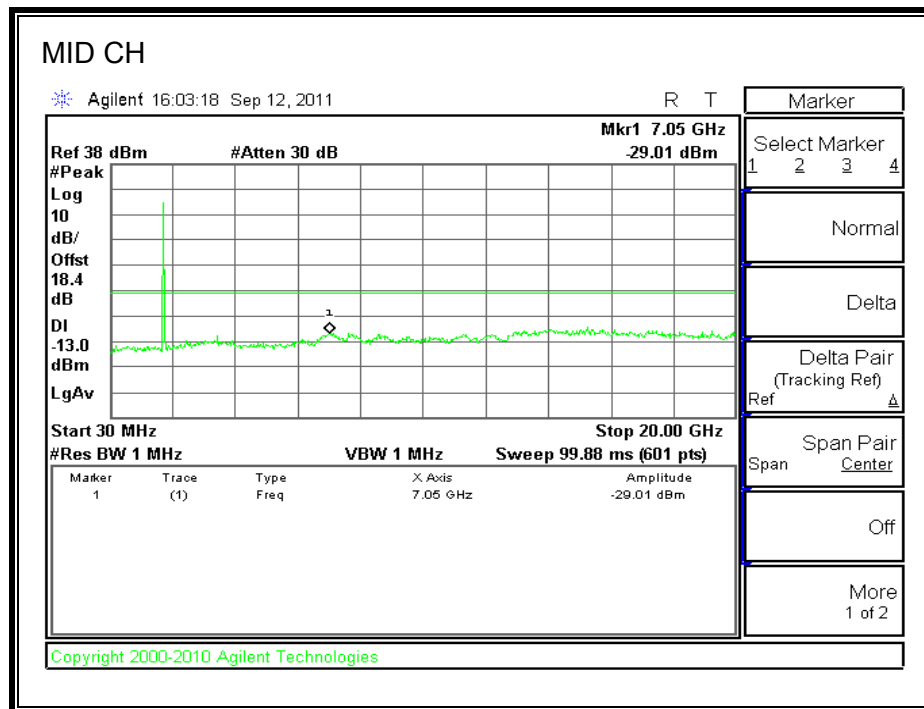
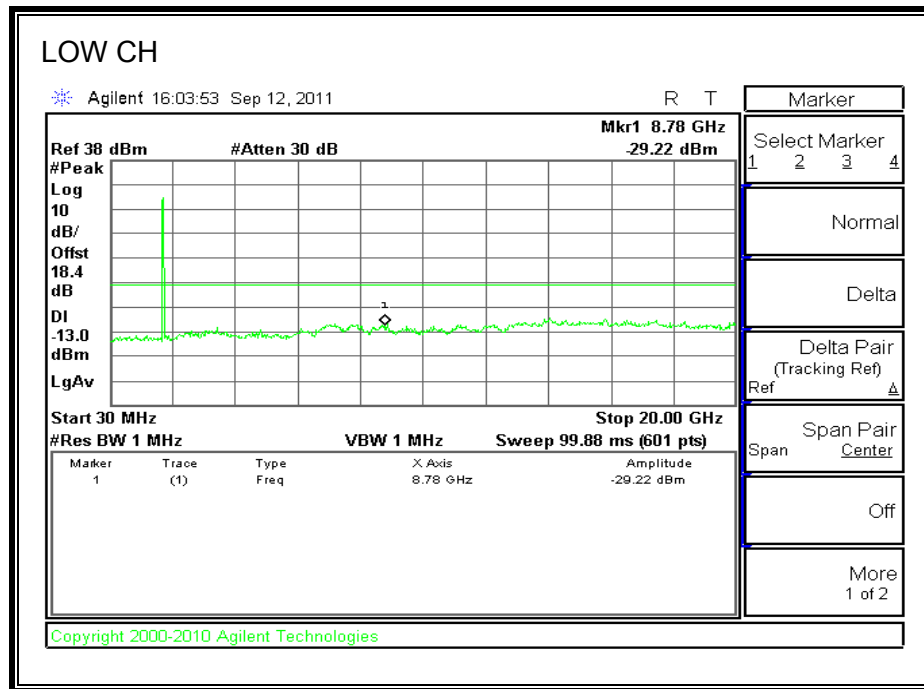


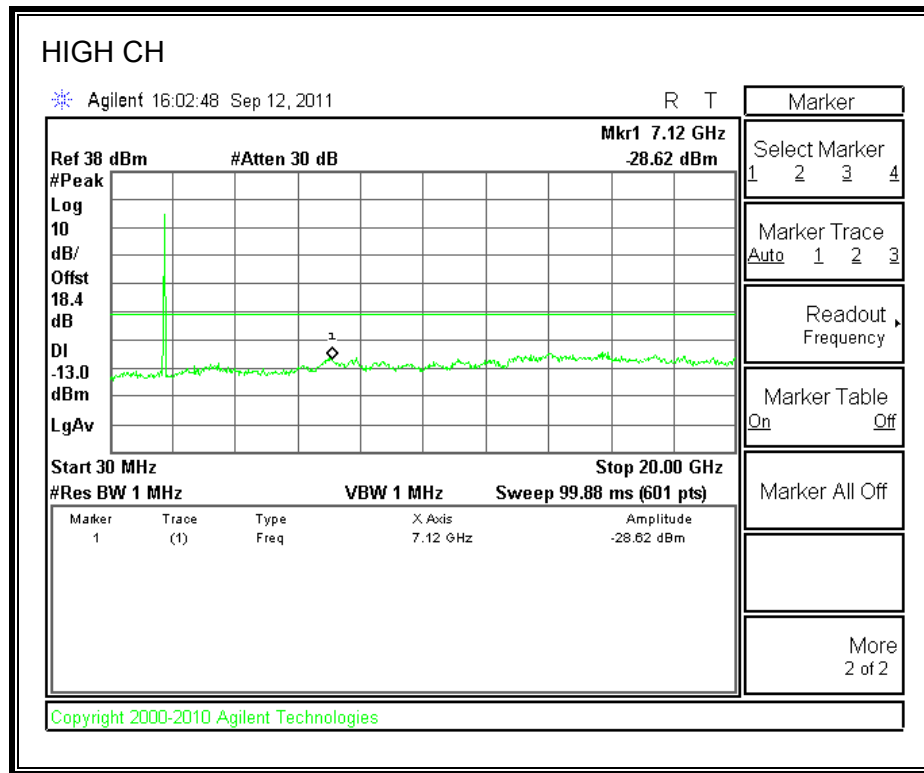
GPRS Mode (PCS Band)**LOW Channel**

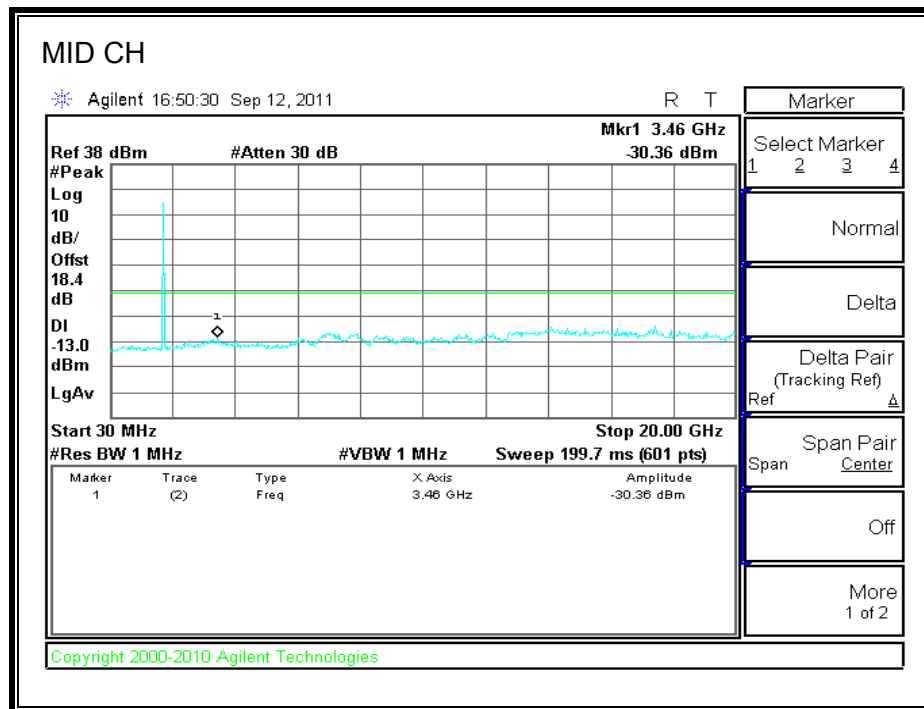
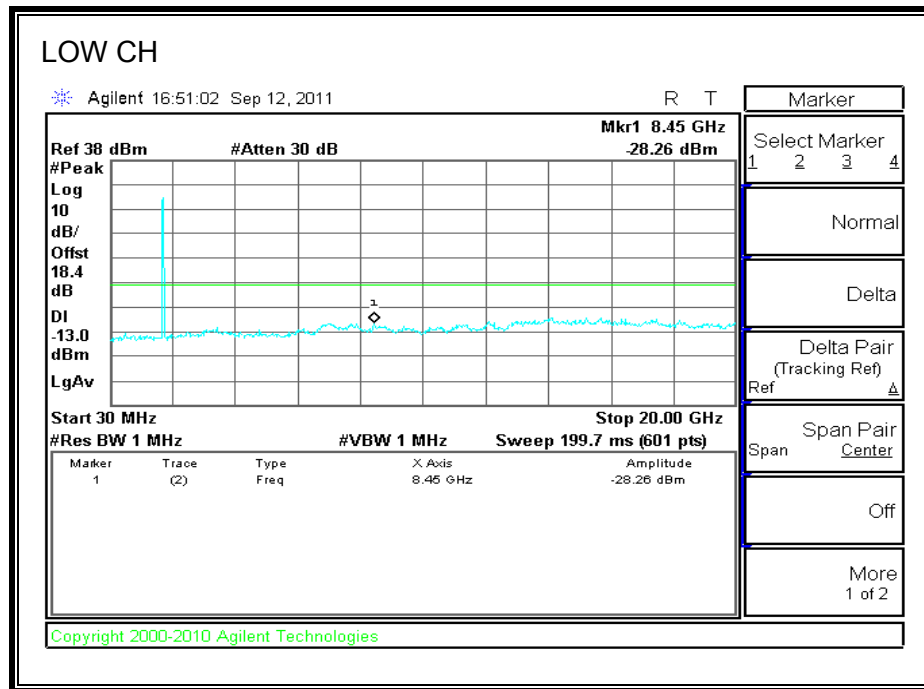


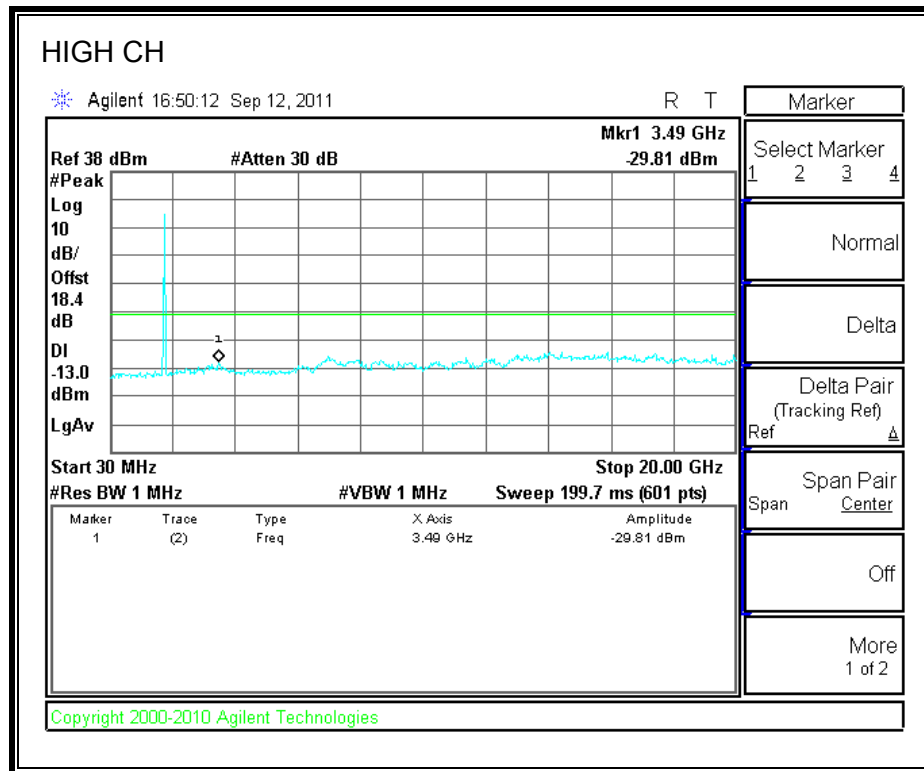
EGPRS Mode (PCS Band)**LOW Channel**

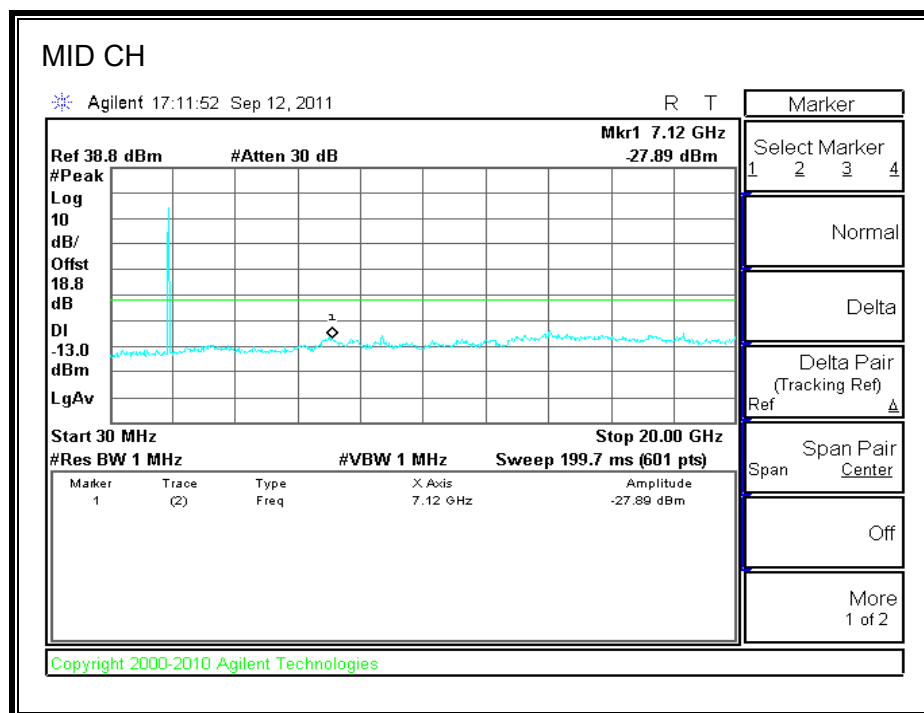
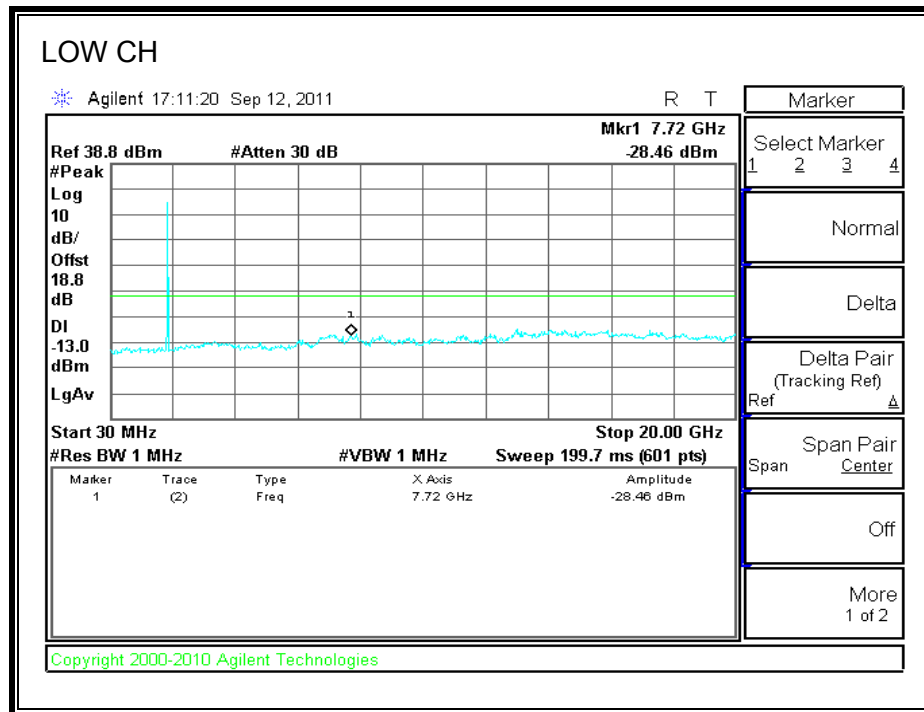


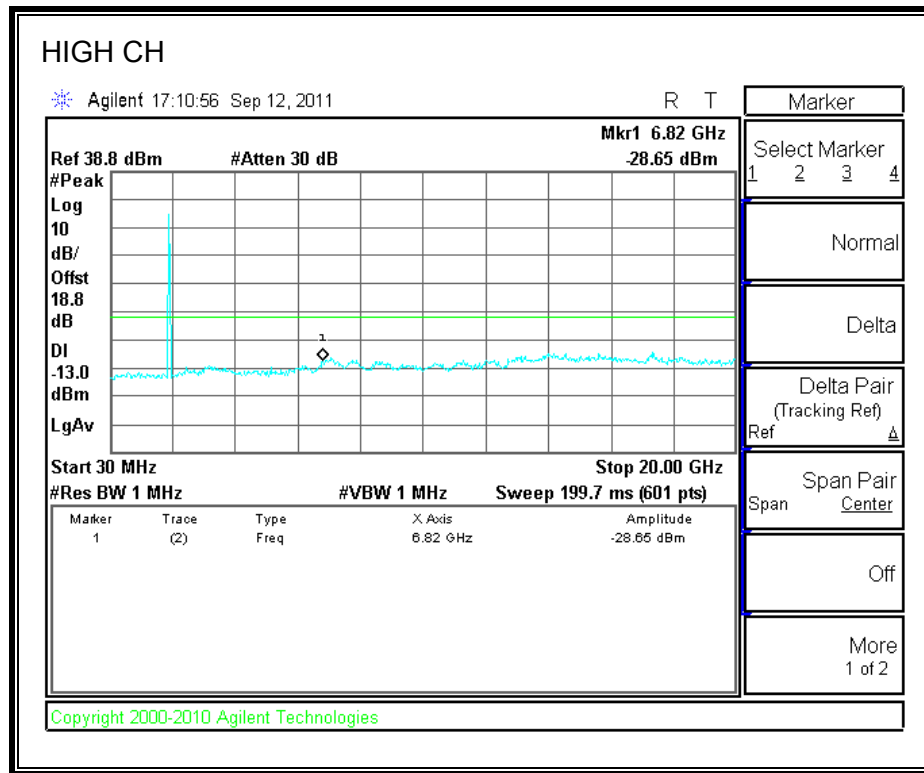
WCDMA 1700 REL 99**LOW Channel**

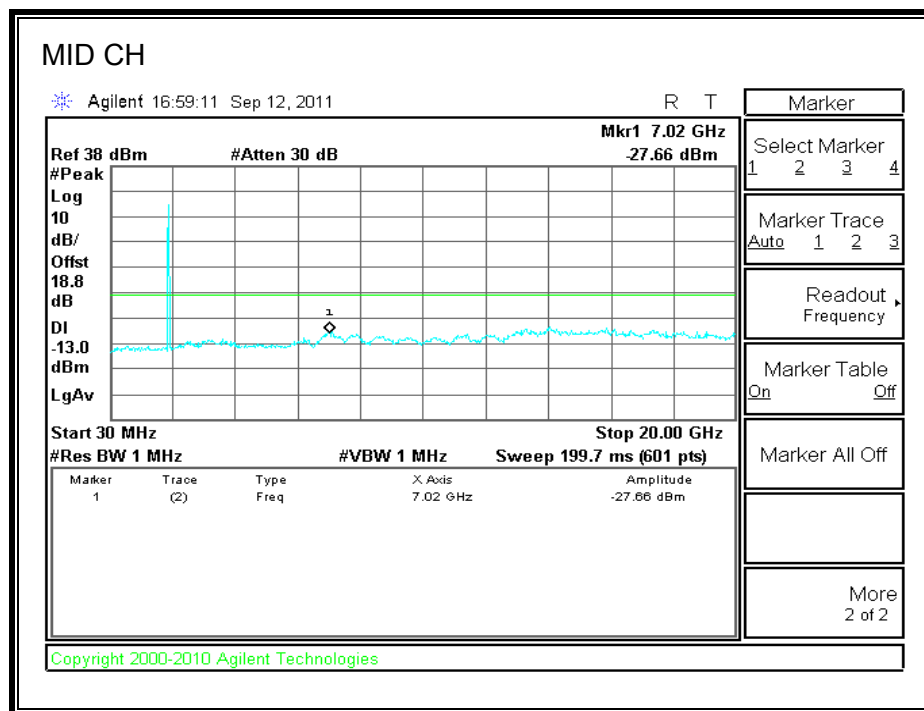
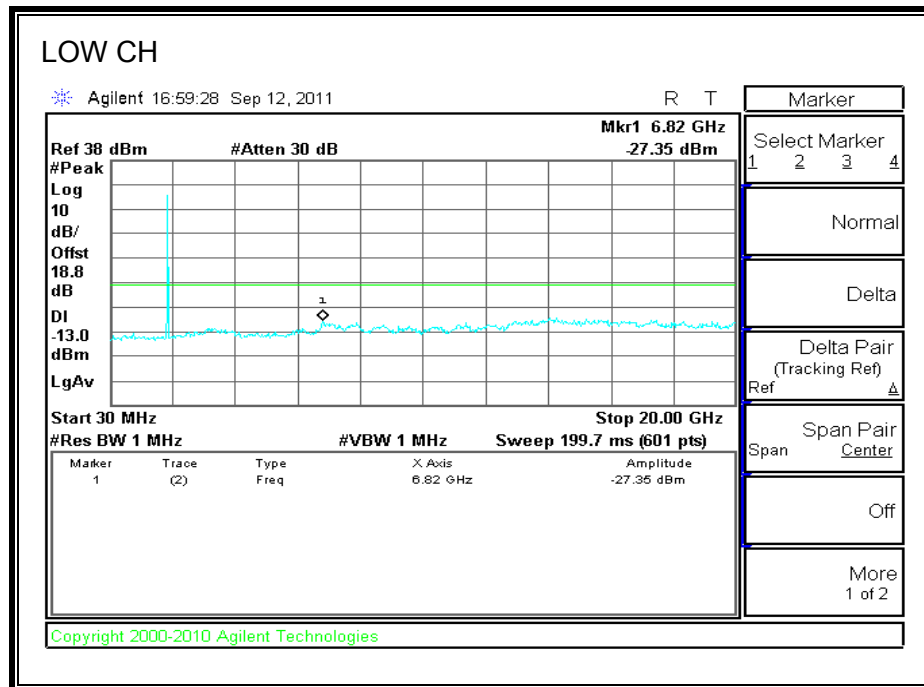


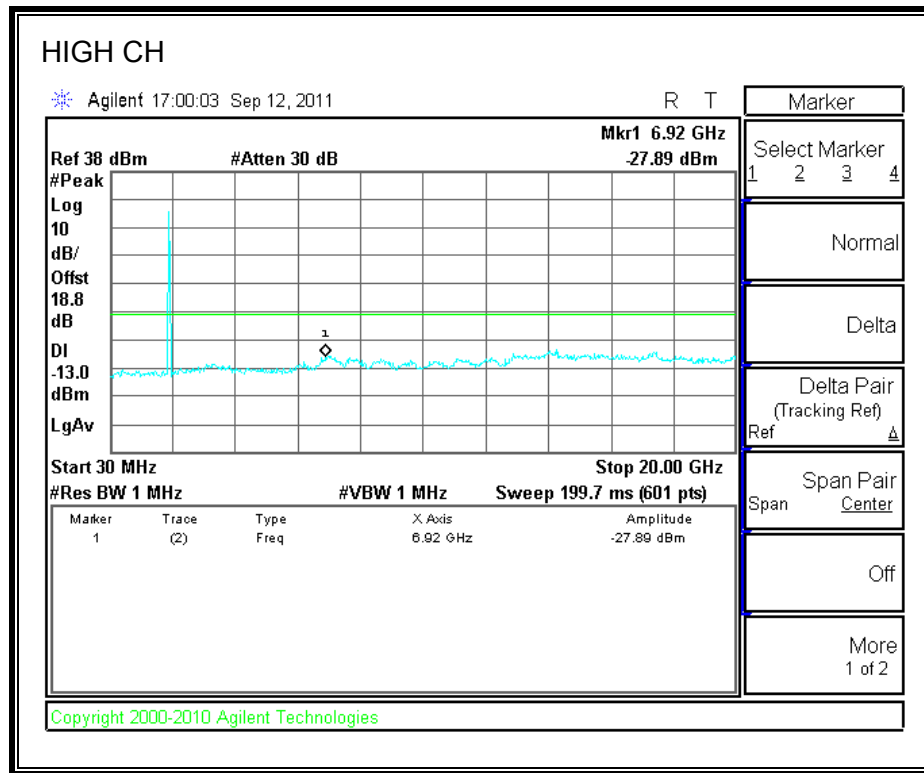
WCDMA 1700 HSDPA**LOW Channel**



WCDMA 1900 REL 99**LOW Channel**



WCDMA 1900 HSDPA**LOW Channel**



8.4. FREQUENCY STABILITY

RULE PART(S)

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

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 $+50^{\circ}\text{C}$
- Voltage = 3.70 Vdc (85% - 115%)
-

Frequency Stability vs Temperature:

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

Frequency Stability vs Voltage:

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

MODES TESTED

- GSM GPRS, EGPRS
- UMTS, HSDPA

RESULTS

See the following pages.

CELL GSM – MID CHANNEL (GPRS)

600019 CELL Mid Channel 836.600016MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	836.600015	0.001	2.5
3.70	40	836.600017	-0.001	2.5
3.70	30	836.600018	-0.002	2.5
3.70	20	836.600016	0	2.5
3.70	10	836.600015	0.001	2.5
3.70	0	836.600020	-0.005	2.5
3.70	-10	836.600018	-0.002	2.5
3.70	-20	836.600019	-0.004	2.5
3.70	-30	836.600022	-0.007	2.5
Reference Frequency: CELL Mid Channel 836.600016MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	20	836.600016	0	2.5
85%	20	836.600025	-0.011	2.5
115%	20	836.600018	-0.002	2.5
End Voltage (3.0)	20	836.599998	0.021	2.5

PCS, GSM – MID CHANNEL (GPRS)

Reference Frequency: PCS Mid Channel 1880.000030MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1880.000014	0.002	2.5
3.70	40	1880.000016	0.001	2.5
3.70	30	1880.000020	-0.001	2.5
3.70	20	1880.000018	0	2.5
3.70	10	1879.999982	0.019	2.5
3.70	0	1879.999980	0.020	2.5
3.70	-10	1879.999978	0.021	2.5
3.70	-20	1879.999977	0.022	2.5
3.70	-30	1879.999980	0.020	2.5
Reference Frequency: PCS Mid Channel 1880.000018Hz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	20	1880.000018	0	2.5
85%	20	1879.999983	0.019	2.5
115%	20	1880.000020	-0.001	2.5
End Voltage (3.0)	20	1879.999952	0.035	2.5

CELL GSM – MID CHANNEL (EGPRS)

600019 CELL Mid Channel 835.599982MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 2090.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	835.999982	0.000	2.5
3.70	40	835.999981	0.001	2.5
3.70	30	835.999984	-0.002	2.5
3.70	20	835.999982	0	2.5
3.70	10	835.999985	-0.004	2.5
3.70	0	835.999980	0.002	2.5
3.70	-10	835.999979	0.004	2.5
3.70	-20	835.999976	0.007	2.5
3.70	-30	835.999975	0.008	2.5
Reference Frequency: CELL Mid Channel 835.999982MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 2090.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	20	835.999982	0	2.5
85%	20	835.999980	0.002	2.5
115%	20	835.999986	-0.005	2.5
End Voltage (3.0)	20	835.999970	0.014	2.5

PCS, GSM – MID CHANNEL (EGPRS)

Reference Frequency: PCS Mid Channel 1979.999977MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4950.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1880.000014	50505.032	2.5
3.70	40	1880.000016	50505.031	2.5
3.70	30	1880.000020	50505.029	2.5
3.70	20	1979.999977	0	2.5
3.70	10	1879.999982	50505.049	2.5
3.70	0	1879.999980	50505.050	2.5
3.70	-10	1879.999978	50505.051	2.5
3.70	-20	1879.999977	50505.051	2.5
3.70	-30	1879.999980	50505.050	2.5
Reference Frequency: PCS Mid Channel 1879.999977Hz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	20	1879.999977	0	2.5
85%	20	1879.999974	0.002	2.5
115%	20	1879.999979	-0.001	2.5
End Voltage (3.0)	20	1879.999970	0.004	2.5

WCDMA1700 – MID CHANNEL

Reference Frequency: WCDMA1700 Mid Channel 1732.599986MHz @ 20°C				
Limit: ± 2.5 ppm = 4331.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1732.599985	0.001	± 2.5
3.70	40	1732.599992	-0.003	± 2.5
3.70	30	1732.599988	-0.001	± 2.5
3.70	20	1732.599986	0	± 2.5
3.70	10	1732.599992	-0.003	± 2.5
3.70	0	1732.599998	-0.007	± 2.5
3.70	-10	1732.599989	-0.002	± 2.5
3.70	-20	1732.599998	-0.007	± 2.5
3.70	-30	1732.600002	-0.009	± 2.5
100%	25	1732.599986	0.000	± 2.5
115%	25	1732.599988	-0.001	± 2.5
85%	25	1732.599985	0.001	± 2.5
End voltage (3.00)	25	1732.599977	0.005	± 2.5

PCS, WCDMA1900 – MID CHANNEL

Reference Frequency: PCS Mid Channel 1880.000030MHz @ 20°C				
Limit: within the authorized block or ± 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1879.999983	-0.002	2.5
3.70	40	1879.999976	0.002	2.5
3.70	30	1879.999978	0.001	2.5
3.70	20	1879.999980	0	2.5
3.70	10	1879.999982	-0.001	2.5
3.70	0	1879.999972	0.004	2.5
3.70	-10	1879.999974	0.003	2.5
3.70	-20	1879.999970	0.005	2.5
3.70	-30	1879.999970	0.005	2.5

Reference Frequency: PCS Mid Channel 1880.000018Hz @ 20°C				
Limit: within the authorized block or ± 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	20	1880.000020	0	2.5
85%	20	1879.999985	0.019	2.5
115%	20	1879.999982	0.020	2.5
End Voltage (3.0)	20	1879.999977	0.023	2.5

9. RADIATED TEST RESULTS

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232, §27.50(d) (2)

LIMITS

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

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

27.50 (c)(10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 758–763 MHz, 776–793 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

27.50 (d)(4) The following power and antenna height requirements apply to stations transmitting in the 1710–1755 MHz and 2110–2155 MHz bands: Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.17

MODES TESTED

- GPRS and EGPRS
- UMTS, REL 99 and HSDPA

RESULTS

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	27.95	623.73
	190	836.60	27.43	553.35
	251	848.80	27.41	550.81
EGPRS	128	824.20	25.36	343.56
	190	836.60	26.93	493.17
	251	848.80	24.90	309.03

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS 1700,REL 99	1537	1712.40	26.18	414.95
	1638	1732.60	26.14	411.15
	1738	1752.60	26.16	413.05
UMTS1700, HSDPA	1537	1712.40	25.49	354.00
	1638	1732.60	25.11	324.34
	1738	1752.60	25.62	364.75

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	31.32	1355.19
	661	1880.00	30.56	1137.63
	810	1909.80	30.81	1205.04
EGPRS	512	1850.20	29.26	843.33
	661	1880.00	28.98	790.68
	810	1909.80	28.50	707.95

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS 1900,REL 99	9662	1852.40	27.86	610.94
	9800	1880.00	27.88	613.76
	9938	1907.60	27.63	579.43
UMTS1900, HSDPA	9662	1852.40	27.70	588.84
	9800	1880.00	27.53	566.24
	9938	1907.60	27.73	592.93

GPRS (Cellular Band)

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
Company:	Samsung							
Project #:	11U14017							
Date:	09-07-11							
Test Engineer:	Chin Pang							
Configuration:	EUT ALONE							
Mode:	TX, CELL BAND 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	28.45	V	0.5	0.0	27.95	38.5	-10.5	
824.20	25.40	H	0.5	0.0	24.90	38.5	-13.5	
836.60	27.93	V	0.5	0.0	27.43	38.5	-11.0	
836.60	27.10	H	0.5	0.0	26.60	38.5	-11.8	
848.80	27.91	V	0.5	0.0	27.41	38.5	-11.0	
848.80	25.54	H	0.5	0.0	25.04	38.5	-13.4	
Rev. 3.17.11								

EGPRS (Cellular Band)

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
Company:	Samsung							
Project #:	11U14017							
Date:	09-07-11							
Test Engineer:	Chin Pang							
Configuration:	EUT ALONE							
Mode:	TX, CELL BAND 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	25.86	V	0.5	0.0	25.36	38.5	-13.1	
824.20	25.36	H	0.5	0.0	24.86	38.5	-13.6	
836.60	25.72	V	0.5	0.0	25.22	38.5	-13.2	
836.60	27.43	H	0.5	0.0	26.93	38.5	-11.5	
848.80	25.40	V	0.5	0.0	24.90	38.5	-13.5	
848.80	24.73	H	0.5	0.0	24.23	38.5	-14.2	
Rev. 3.17.11								

GPRS (PCS Band)

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:	Samsung							
Project #:	11114017							
Date:	09-07-11							
Test Engineer:	Chin Pang							
Configuration:	EUTALONE							
Mode:	TX, PCS BAND GPRS MODE							
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	20.7	V	0.85	8.01	27.89	33.0	-5.1	
1.850	24.2	H	0.85	8.01	31.32	33.0	-1.7	
1.880	17.1	V	0.85	8.13	24.38	33.0	-8.6	
1.880	23.3	H	0.85	8.13	30.56	33.0	-2.4	
1.910	18.8	V	0.85	8.13	26.09	33.0	-6.9	
1.910	23.5	H	0.85	8.13	30.81	33.0	-2.2	
Rev. 3.17.11								

EGPRS (PCS Band)

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:	Samsung							
Project #:	11114017							
Date:	09-07-11							
Test Engineer:	Chin Pang							
Configuration:	EUTALONE							
Mode:	TX, PCS BAND EGPRS MODE							
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.850	21.0	V	0.85	8.01	28.16	33.0	-4.8	
1.850	22.1	H	0.85	8.01	29.26	33.0	-3.7	
1.880	21.1	V	0.85	8.13	28.38	33.0	-4.6	
1.880	21.7	H	0.85	8.13	28.98	33.0	-4.0	
1.910	21.2	V	0.85	8.13	28.50	33.0	-4.5	
1.910	20.8	H	0.85	8.13	28.03	33.0	-5.0	
Rev. 3.17.11								

UMTS 1700 REL 99

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:	Samsung							
Project #:	11114017							
Date:	09-07-11							
Test Engineer:	Chin Pang							
Configuration:	EUTALONE							
Mode:	TX, UMTS band IV , 1700MHz REL 99							
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.712	19.0	V	0.85	8.01	26.18	33.0	-6.8	
1.712	18.8	H	0.85	8.01	25.99	33.0	-7.0	
1.733	18.9	V	0.85	8.13	26.14	33.0	-6.9	
1.733	18.1	H	0.85	8.13	25.41	33.0	-7.6	
1.753	18.9	V	0.85	8.13	26.16	33.0	-6.8	
1.753	18.4	H	0.85	8.13	25.67	33.0	-7.3	
Rev. 3.17.11								

UMTS 1700 HSDPA

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:	Samsung							
Project #:	11114017							
Date:	09-07-11							
Test Engineer:	Chin Pang							
Configuration:	EUTALONE							
Mode:	TX, UMTS band IV , 1700MHz HSDPA							
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) Warehouse								
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
1.712	17.5	V	0.85	8.01	24.68	33.0	-8.3	
1.712	18.3	H	0.85	8.01	25.49	33.0	-7.5	
1.733	16.1	V	0.85	8.13	23.41	33.0	-9.6	
1.733	17.8	H	0.85	8.13	25.11	33.0	-7.9	
1.753	16.3	V	0.85	8.13	23.56	33.0	-9.4	
1.753	18.3	H	0.85	8.13	25.62	33.0	-7.4	
Rev. 3.17.11								

UMTS 1900 REL 99

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:		Samsung						
Project #:		11114017						
Date:		09-07-11						
Test Engineer:		Chin Pang						
Configuration:		EUTALONE						
Mode:		TX, PCS BAND WCDMA Rel 99 MODE						
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) 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	16.2	V	0.85	8.01	23.36	33.0	-9.6	
1.852	20.7	H	0.85	8.01	27.86	33.0	-5.1	
1.880	16.4	V	0.85	8.13	23.68	33.0	-9.3	
1.880	20.6	H	0.85	8.13	27.88	33.0	-5.1	
1.908	16.5	V	0.85	8.13	23.78	33.0	-9.2	
1.908	20.4	H	0.85	8.13	27.63	33.0	-5.4	
Rev. 3.17.11								

UMTS 1900 HSDPA

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:		Samsung						
Project #:		11114017						
Date:		09-07-11						
Test Engineer:		Chin Pang						
Configuration:		EUTALONE						
Mode:		TX, PCS BAND WCDMA HSDPA						
Test Equipment:								
Receiving: Horn T59, and Camber B SMA Cables								
Substitution: Horn T60 Substitution, 6ft SMA Cable (208947003) 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	16.2	V	0.85	8.01	23.36	33.0	-9.6	
1.852	20.5	H	0.85	8.01	27.70	33.0	-5.3	
1.880	16.0	V	0.85	8.13	23.28	33.0	-9.7	
1.880	20.3	H	0.85	8.13	27.53	33.0	-5.5	
1.908	16.5	V	0.85	8.13	23.78	33.0	-9.2	
1.908	20.5	H	0.85	8.13	27.73	33.0	-5.3	
Rev. 3.17.11								

9.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, & §27.53

LIMIT

§22.917 (e) and §24.238 (a): Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log (P)$ dB.

§27.53 (g) For operations in the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB.

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

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 HSDPA

RESULTS

GPRS (Cellular Band)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		11114017							
Date:		09-09-11							
Test Engineer:		Chin Pang							
Configuration:		EUT and Earphone							
Mode:		TX, CELL BAND GPRS MODE							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-5.8	V	3.0	38.2	1.0	-42.9	-13.0	-29.9	
2.473	-9.8	V	3.0	37.5	1.0	-46.3	-13.0	-33.3	
3.297	-13.0	V	3.0	37.1	1.0	-49.1	-13.0	-36.1	
1.648	-4.3	H	3.0	38.2	1.0	-41.4	-13.0	-28.4	
2.473	-9.8	H	3.0	37.5	1.0	-46.3	-13.0	-33.3	
3.297	-9.1	H	3.0	37.1	1.0	-45.3	-13.0	-32.3	
Mid Ch, (836.6MHz)									
1.673	-2.9	V	3.0	38.1	1.0	-40.0	-13.0	-27.0	
2.510	-8.8	V	3.0	37.5	1.0	-45.3	-13.0	-32.3	
3.346	-11.4	V	3.0	37.1	1.0	-47.5	-13.0	-34.5	
1.673	-1.7	H	3.0	38.1	1.0	-38.8	-13.0	-25.8	
2.510	-11.3	H	3.0	37.5	1.0	-47.7	-13.0	-34.7	
3.346	-11.6	H	3.0	37.1	1.0	-47.7	-13.0	-34.7	
High Ch, (848.8MHz)									
1.698	0.4	V	3.0	38.1	1.0	-36.7	-13.0	-23.7	
2.546	-6.2	V	3.0	37.5	1.0	-42.7	-13.0	-29.7	
3.395	-11.8	V	3.0	37.1	1.0	-47.8	-13.0	-34.8	
1.698	-0.8	H	3.0	38.1	1.0	-37.9	-13.0	-24.9	
2.546	-5.2	H	3.0	37.5	1.0	-41.7	-13.0	-28.7	
3.395	-11.1	H	3.0	37.1	1.0	-47.1	-13.0	-34.1	
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 #:		11114017							
Date:		09-09-11							
Test Engineer:		Chin Pang							
Configuration:		EUT and Earphone							
Mode:		TX, CELL BAND EGPRS MODE							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-11.8	V	3.0	38.2	1.0	-48.9	-13.0	-35.9	
2.473	-14.1	V	3.0	37.5	1.0	-50.6	-13.0	-37.6	
1.648	-8.5	H	3.0	38.2	1.0	-45.6	-13.0	-32.6	
2.473	-15.6	H	3.0	37.5	1.0	-52.1	-13.0	-39.1	
Mid Ch, (836.6MHz)									
1.673	-11.1	V	3.0	38.1	1.0	-48.2	-13.0	-35.2	
2.510	-13.8	V	3.0	37.5	1.0	-50.3	-13.0	-37.3	
1.673	-11.2	H	3.0	38.1	1.0	-48.3	-13.0	-35.3	
2.510	-16.2	H	3.0	37.5	1.0	-52.6	-13.0	-39.6	
High Ch, (848.8MHz)									
1.698	-10.1	V	3.0	38.1	1.0	-47.2	-13.0	-34.2	
2.546	-10.7	V	3.0	37.5	1.0	-47.2	-13.0	-34.2	
1.698	-10.0	H	3.0	38.1	1.0	-47.1	-13.0	-34.1	
2.546	-14.3	H	3.0	37.5	1.0	-50.8	-13.0	-37.8	
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 #:		11114017							
Date:		09-09-11							
Test Engineer:		Chin Pang							
Configuration:		EUT and Earphone							
Mode:		TX, PCS BAND GPRS MODE							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.2MHz)									
3.700	-12.6	V	3.0	36.8	1.0	-48.4	-13.0	-35.4	
5.551	-4.2	V	3.0	36.3	1.0	-39.5	-13.0	-26.5	
3.700	-6.6	H	3.0	36.8	1.0	-42.4	-13.0	-29.4	
5.551	-4.3	H	3.0	36.3	1.0	-39.6	-13.0	-26.6	
		H							
Mid Ch, (1880.0MHz)									
3.760	-11.6	V	3.0	36.8	1.0	-47.4	-13.0	-34.4	
5.640	0.4	V	3.0	36.3	1.0	-34.9	-13.0	-21.9	
3.760	-7.1	H	3.0	36.8	1.0	-42.9	-13.0	-29.9	
5.640	-3.9	H	3.0	36.3	1.0	-39.2	-13.0	-26.2	
High Ch, (1909.8MHz)									
3.820	-12.8	V	3.0	36.7	1.0	-48.5	-13.0	-35.5	
5.729	-0.9	V	3.0	36.3	1.0	-36.2	-13.0	-23.2	
3.820	-7.7	H	3.0	36.7	1.0	-43.4	-13.0	-30.4	
5.729	-7.4	H	3.0	36.3	1.0	-42.7	-13.0	-29.7	
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 #: 11114017
Date: 09-09-11
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, PCS BAND EGPRS MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1850.2MHz)									
3.700	-13.9	V	3.0	36.8	1.0	-49.7	-13.0	-36.7	
5.551	-5.3	V	3.0	36.3	1.0	-40.6	-13.0	-27.6	
3.700	-10.8	H	3.0	36.8	1.0	-46.6	-13.0	-33.6	
5.551	-5.3	H	3.0	36.3	1.0	-40.6	-13.0	-27.6	
		H							
Mid Ch, (1880.0MHz)									
3.760	-14.6	V	3.0	36.8	1.0	-50.4	-13.0	-37.4	
5.640	-2.3	V	3.0	36.3	1.0	-37.6	-13.0	-24.6	
3.760	-9.9	H	3.0	36.8	1.0	-45.7	-13.0	-32.7	
5.640	-6.5	H	3.0	36.3	1.0	-41.8	-13.0	-28.8	
High Ch, (1909.8MHz)									
3.820	-14.9	V	3.0	36.7	1.0	-50.6	-13.0	-37.6	
5.729	-1.7	V	3.0	36.3	1.0	-37.0	-13.0	-24.0	
3.820	-11.3	H	3.0	36.7	1.0	-47.0	-13.0	-34.0	
5.729	-6.6	H	3.0	36.3	1.0	-41.9	-13.0	-28.9	

Rev. 03.03.09

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

WCDMA1700 REL99

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 11114017
Date: 09-09-11
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, WCDMA 1700, Rel 99

Chamber	Pre-amplifier	Filter	Limit
5m Chamber B	T144 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4MHz									
3.425	-13.5	V	3.0	37.0	1.0	-49.6	-13.0	-36.6	
5.137	-12.8	V	3.0	36.3	1.0	-48.0	-13.0	-35.0	
3.425	-12.3	H	3.0	37.0	1.0	-48.3	-13.0	-35.3	
5.137	-10.8	H	3.0	36.3	1.0	-46.0	-13.0	-33.0	
Mid Ch, 1732.6MHz									
3.465	-15.5	V	3.0	37.0	1.0	-51.5	-13.0	-38.5	
5.198	-14.1	V	3.0	36.2	1.0	-49.4	-13.0	-36.4	
3.465	-15.3	H	3.0	37.0	1.0	-51.3	-13.0	-38.3	
5.198	-10.6	H	3.0	36.2	1.0	-45.8	-13.0	-32.8	
High Ch, 1752.6MHz									
3.505	-15.2	V	3.0	37.0	1.0	-51.1	-13.0	-38.1	
5.258	-12.1	V	3.0	36.3	1.0	-47.4	-13.0	-34.4	
3.505	-14.6	H	3.0	37.0	1.0	-50.6	-13.0	-37.6	
5.258	-9.5	H	3.0	36.3	1.0	-44.7	-13.0	-31.7	

Rev. 03.03.09

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

WCDMA1700 HSDPA

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 11114017
Date: 09-09-11
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, WCDMA 1700, HSDPA

Chamber	Pre-amplifier	Filter	Limit
5m Chamber B	T144 8449B	Filter 1	Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 1712.4MHz									
3.425	-14.0	V	3.0	37.0	1.0	-50.1	-13.0	-37.1	
5.137	-12.9	V	3.0	36.3	1.0	-48.1	-13.0	-35.1	
3.425	-12.1	H	3.0	37.0	1.0	-48.1	-13.0	-35.1	
5.137	-11.3	H	3.0	36.3	1.0	-46.5	-13.0	-33.5	
Mid Ch, 1732.6MHz									
3.465	-15.9	V	3.0	37.0	1.0	-51.9	-13.0	-38.9	
5.198	-13.8	V	3.0	36.2	1.0	-49.1	-13.0	-36.1	
3.465	-15.8	H	3.0	37.0	1.0	-51.8	-13.0	-38.8	
5.198	-11.6	H	3.0	36.2	1.0	-46.8	-13.0	-33.8	
High Ch, 1752.6MHz									
3.505	-13.7	V	3.0	37.0	1.0	-49.6	-13.0	-36.6	
5.258	-12.4	V	3.0	36.3	1.0	-47.7	-13.0	-34.7	
3.505	-10.9	H	3.0	37.0	1.0	-46.9	-13.0	-33.9	
5.258	-7.6	H	3.0	36.3	1.0	-42.8	-13.0	-29.8	

Rev. 03.03.09

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

WCDMA1900 REL99

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		11I14017							
Date:		09-09-11							
Test Engineer:		Chin Pang							
Configuration:		EUT and Earphone							
Mode:		TX, PCS BAND WCDMA REL 99							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1852.2MHz)									
3.705	-15.1	V	3.0	36.8	1.0	-50.9	-13.0	-37.9	
7.410	-9.2	V	3.0	36.6	1.0	-44.7	-13.0	-31.7	
3.705	-11.5	H	3.0	36.8	1.0	-47.3	-13.0	-34.3	
5.557	-10.7	H	3.0	36.3	1.0	-46.0	-13.0	-33.0	
Mid Ch, (1880.0MHz)									
3.760	-10.6	V	3.0	36.8	1.0	-46.4	-13.0	-33.4	
7.520	-8.3	V	3.0	36.6	1.0	-43.9	-13.0	-30.9	
3.760	-9.6	H	3.0	36.8	1.0	-45.4	-13.0	-32.4	
5.640	-9.8	H	3.0	36.3	1.0	-45.1	-13.0	-32.1	
High Ch, (1907.6MHz)									
3.815	-9.5	V	3.0	36.7	1.0	-45.3	-13.0	-32.3	
7.630	-9.9	V	3.0	36.6	1.0	-45.5	-13.0	-32.5	
3.815	-7.8	H	3.0	36.7	1.0	-43.5	-13.0	-30.5	
5.723	-9.8	H	3.0	36.3	1.0	-45.1	-13.0	-32.1	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

WCDMA1900 HSDPA

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 11114017
Date: 09-09-11
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, PCS BAND WCDMA HSDPA

Chamber	Pre-amplifier	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, (1852.2MHz)									
3.705	-14.9	V	3.0	35.4	1.0	-49.2	-13.0	-36.2	
7.410	-7.8	V	3.0	35.7	1.0	-42.5	-13.0	-29.5	
3.705	-11.8	H	3.0	35.4	1.0	-46.1	-13.0	-33.1	
5.557	-10.4	H	3.0	35.4	1.0	-44.8	-13.0	-31.8	
Mid Ch, (1880.0MHz)									
3.760	-11.3	V	3.0	35.3	1.0	-45.7	-13.0	-32.7	
7.520	-9.2	V	3.0	35.7	1.0	-43.9	-13.0	-30.9	
3.760	-10.0	H	3.0	35.3	1.0	-44.3	-13.0	-31.3	
7.520	-7.1	H	3.0	35.7	1.0	-41.8	-13.0	-28.8	
High Ch, (1907.6MHz)									
3.815	-14.6	V	3.0	35.3	1.0	-48.9	-13.0	-35.9	
7.630	-9.2	V	3.0	35.7	1.0	-43.9	-13.0	-30.9	
3.815	-9.0	H	3.0	35.3	1.0	-43.3	-13.0	-30.3	
7.630	-6.4	H	3.0	35.7	1.0	-41.1	-13.0	-28.1	

Rev. 03.03.09

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