



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

FOR

**BT3.0+HS, 802.11BGN 1X1 HT20, GSM850/1900 & WCDMA850MHZ BAR PHONE
W/HOTSPOT, EDGE RX ONLY**

MODEL NUMBER: GT-S5300B

**FCC ID: A3LGTS5300B
REPORT NUMBER: 12I14311-1**

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Prepared for

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

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Revision History

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---	03/06/12	Initial issue	T. Chan

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1. ATTESTATION OF TEST RESULTS

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

EUT DESCRIPTION: BT3.0+HS, 802.11BGN 1X1 HT20, GSM850/1900 &
WCDMA850MHZ BAR PHONE W/HOTSPOT, EDGE RX ONLY

MODEL: GT-S5300B

SERIAL NUMBER: FJ-054-A

DATE TESTED: FEBRUARY 28-30, 2012

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 SUBPART H AND 24 SUBPART E	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, and FCC CFR Part 24.

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a BT3.0+HS, 802.11BGN 1X1 HT20, GSM850/1900 & WCDMA850MHZ BAR PHONE W/HOTSPOT, EDGE RX ONLY.

The radio module is manufactured by Samsung Electronics Co., Ltd.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted and radiated 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	32.90	1949.8	32.14	1636.8
824.2 – 848.8	EGPRS	RX Only			
826.4 – 846.6	UMTS, Rel 99	26.35	431.5	22.80	190.5
826.4 – 846.6	HSDPA, Rel 6	26.38	434.5	23.84	242.1

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2-1909.8	GPRS	29.70	933.3	32.05	1603.2
1850.2-1909.8	EGPRS	RX Only			

5.3. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent 8960 Communication Test Set.

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

Since the EUT is a portable device, in addition to the peak power measurements verification data shown below, the EUT also investigated on an X, Y and Z orientations and the worst-orientations among them with AC/DC adapter and headset. After the investigation Y-Orientation with AC Adapter were turned out to be the worst case for both Cell and PCS bands respectively.

5.5. DESCRIPTION OF TEST SETUP**SUPPORT EQUIPMENT**

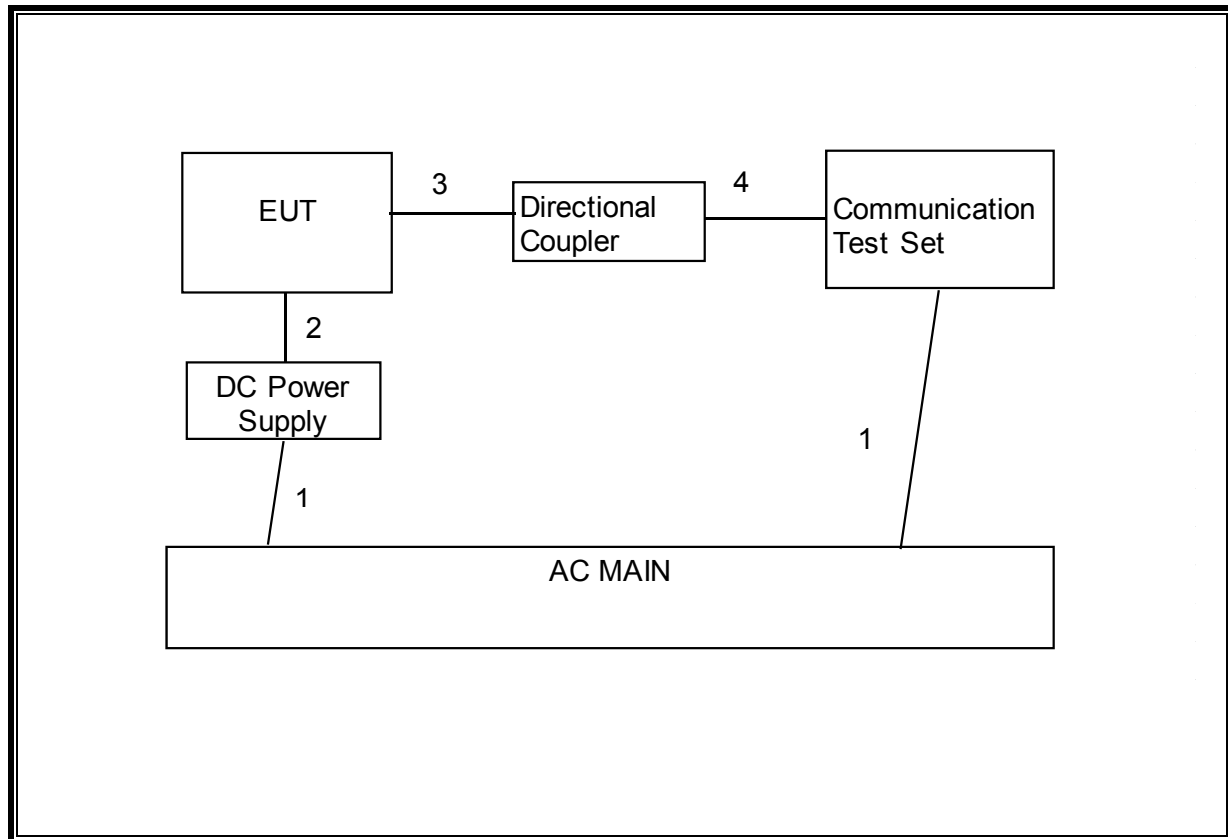
PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	ETAOU10BBB	SC3ZB03LS/7-E	DoC
Earphone	Samsung	NA	NA	NA

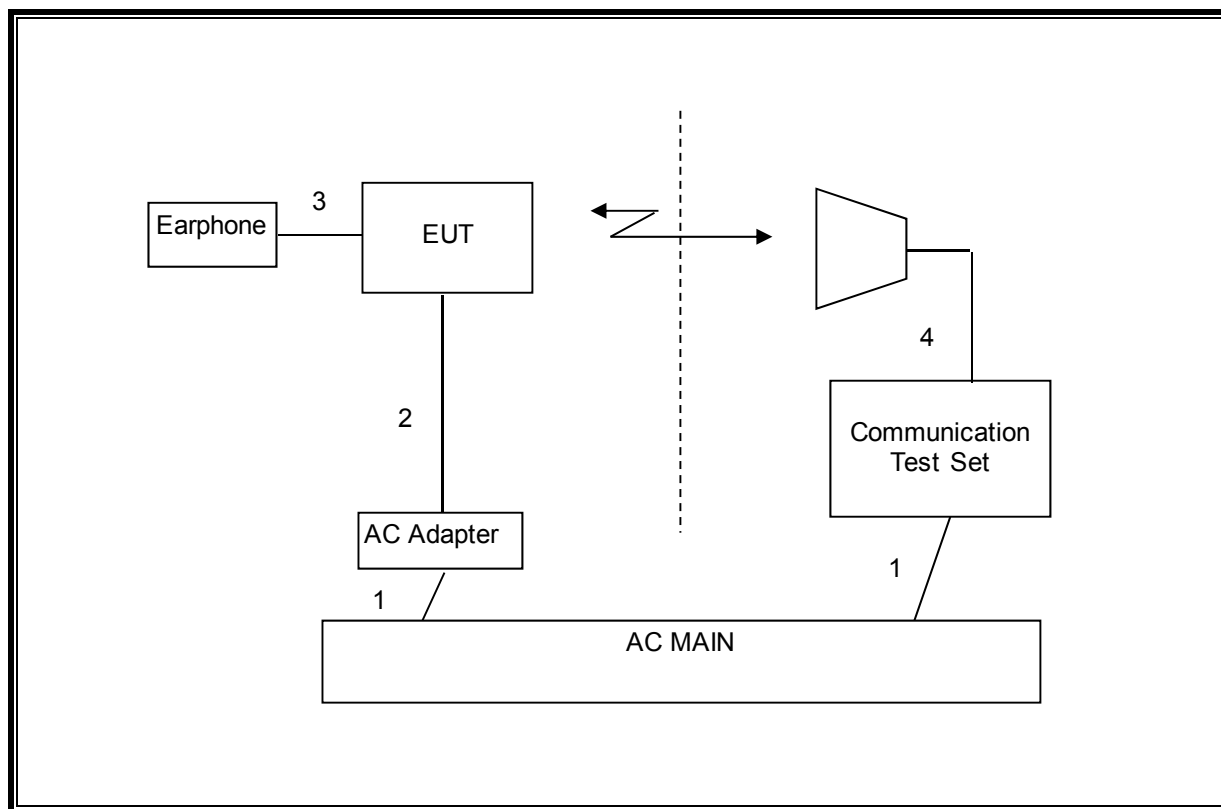
I/O CABLES (CONDUCTED SETUP)

Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	US 115V	Un-shielded	2.0 m	NA
2	DC	1	DC	Un-shielded	1m	NA
3	RF In/Out	1	SMA	Shielded	0.6 m	NA
4	RF In/Out	1	Communication Test Set	Shielded	0.2 m	NA

I/O CABLES (RADIATED SETUP)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	US115V	Un-shielded	2m	NA
2	DC	1	DC	Un-shielded	2m	NA
3	Jack	1	Earphone	Un-shielded	2m	NA
4	RF In/Out	1	Horn	Un-shielded	2m	NA

SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)

SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)

6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	07/12/12
Antenna, Bilog, 2 GHz	Sundt Sciences	JB1	C01016	07/16/12
Antenna, Horn, 18 GHz	EMCO	3115	C00783	06/29/12
Antenna, Horn, 18 GHz	EMCO	3115	C00943	CNR
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	05/11/12
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/04/12
Communications Test Set	Agilent / HP	E5515C	C01086	09/27/12
DC Power Supply	Lambda	LA-300	None	CNR
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/14/12
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	04/20/12
Antenna, Tuned Dipole 400~1000	ETS	3121C DB4	C00993	07/16/12
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02686	CNR
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02688	CNR
Directional Coupler	RF-Lambda	RFDC5M06G15	None	CNR

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
 > 30 dBm for GPRS1800/1900
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 (GMSK) - Coding scheme: CS4

Band	Ch	Frequency	Conducted Peak output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GPRS850	128	824.2	32.90	31.37	29.35	27.30
	190	836.6	32.78	31.32	29.29	27.24
	251	848.8	32.62	31.10	29.08	27.06
GPRS1900	512	1850.2	29.22	27.79	25.74	23.75
	661	1880.0	29.70	28.20	26.13	24.09
	810	1909.8	29.57	28.05	26.02	23.98

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

Cell Band 850MHz REL 99

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
				Peak
UMTS 850	4132	4357	826.4	26.28
	4182	4407	836.4	26.35
	4233	4458	846.6	26.26

7.3. RF POWER OUTPUT FOR HSDPA REL 6

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

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

Results

Rel 6 HSDPA

Band	Mode	UL Ch No.	f (MHz)	Peak Tx Pwr (dBm)
UMTS850 (Band V)	Subtest 1	4132	826.4	26.13
		4182	836.4	26.16
		4233	846.6	25.89
	Subtest 2	4132	826.4	26.38
		4182	836.4	26.35
		4233	846.6	25.92
	Subtest 3	4132	826.4	26.20
		4182	836.4	26.23
		4233	846.6	25.81
	Subtest 4	4132	826.4	26.01
		4182	836.4	25.91
		4233	846.6	25.86

8. LIMITS AND RESULTS

8.1. CONDUCTED TEST RESULTS

8.1.1. 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
- HSDPA REL. 6

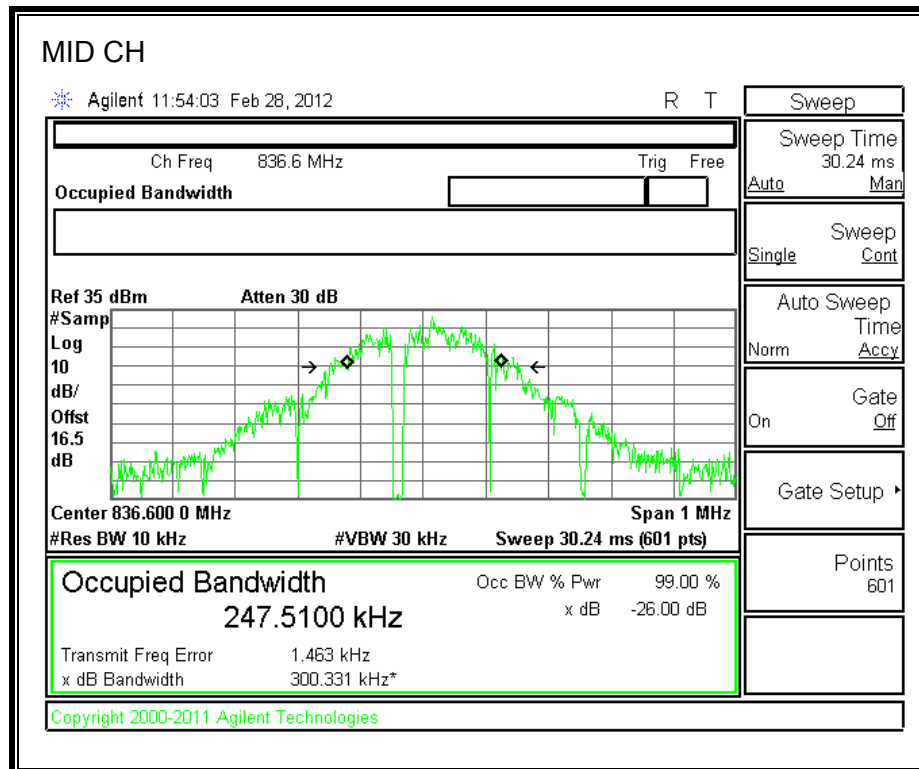
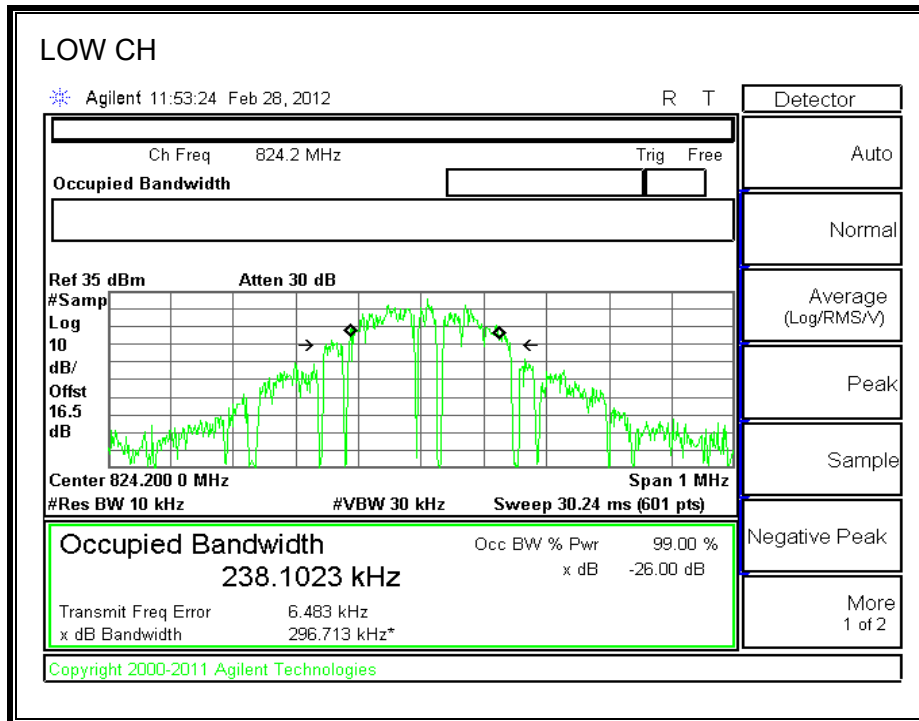
RESULTS

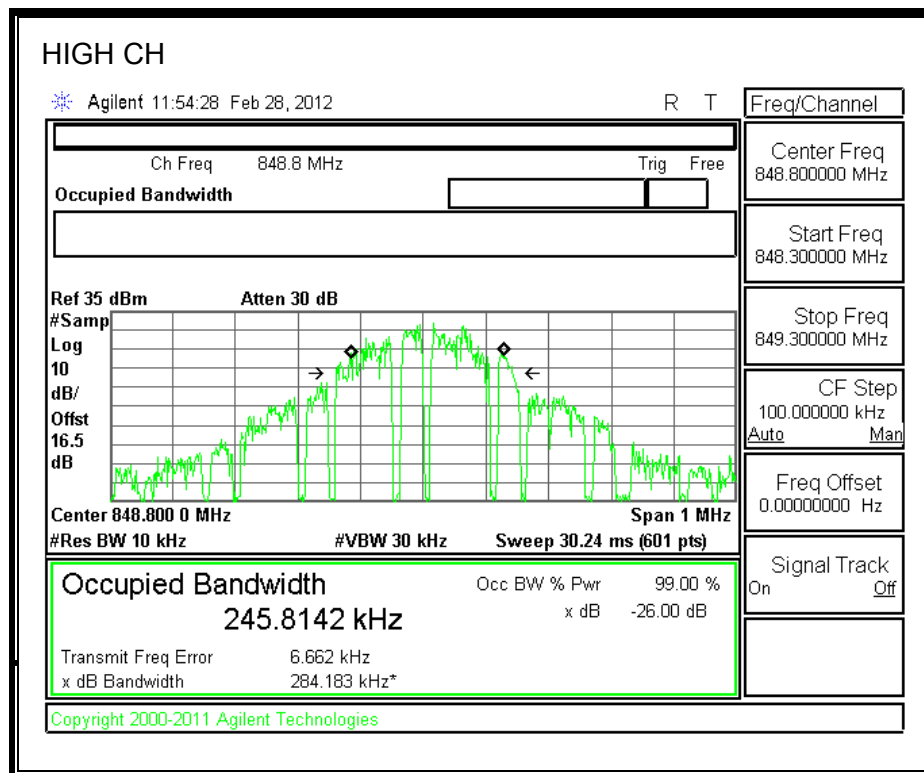
Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.2	238.1023	296.713
		190	836.6	247.5100	300.311
		251	848.8	245.8142	284.183
PCS	GPRS	512	1850.2	240.9682	277.504
		661	1880.0	243.5167	288.605
		810	1909.8	239.1626	299.181

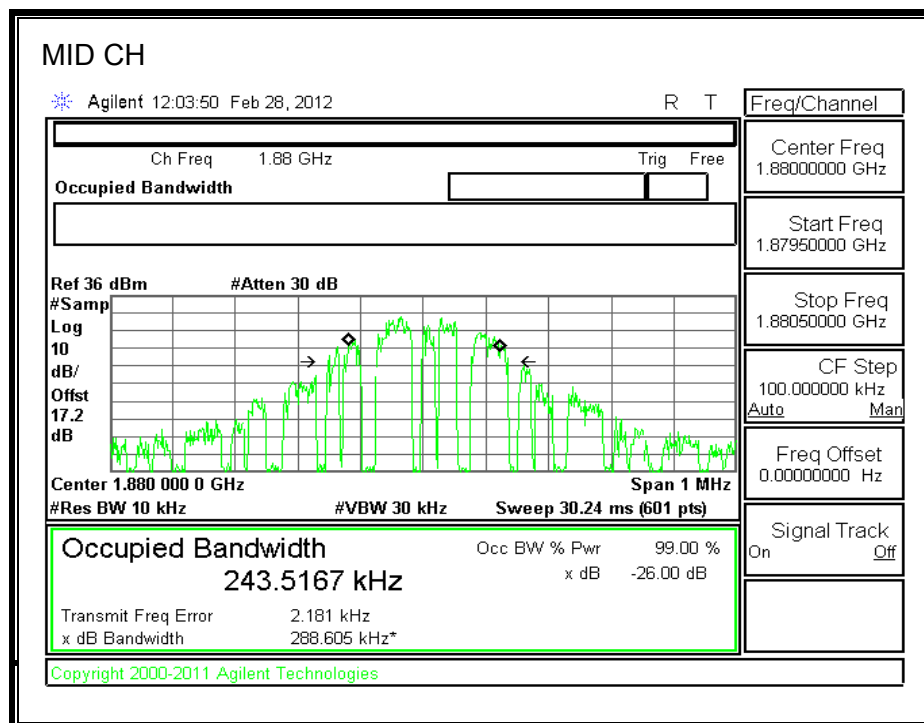
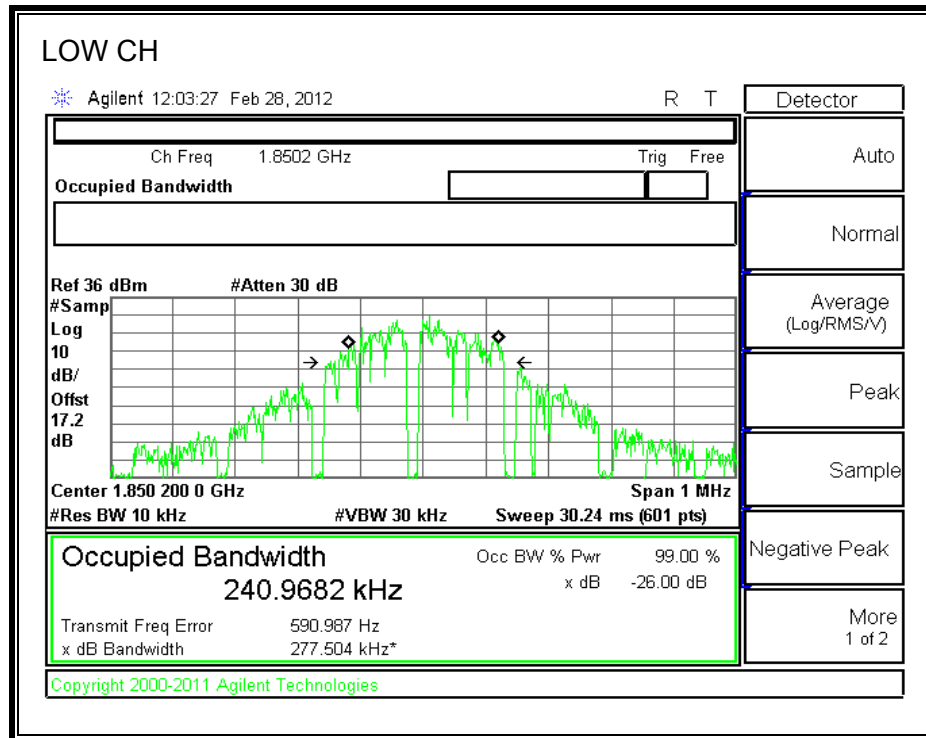
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Cellular	UMTS, REL 99	4357	826.4	4.1862	4.692
		4405	836.6	4.1382	4.587
		4455	846.6	4.1842	4.711
	HSDPA, REL 6	4357	826.4	4.1648	4.580
		4405	836.6	4.1059	4.696
		4455	846.6	4.1409	4.565

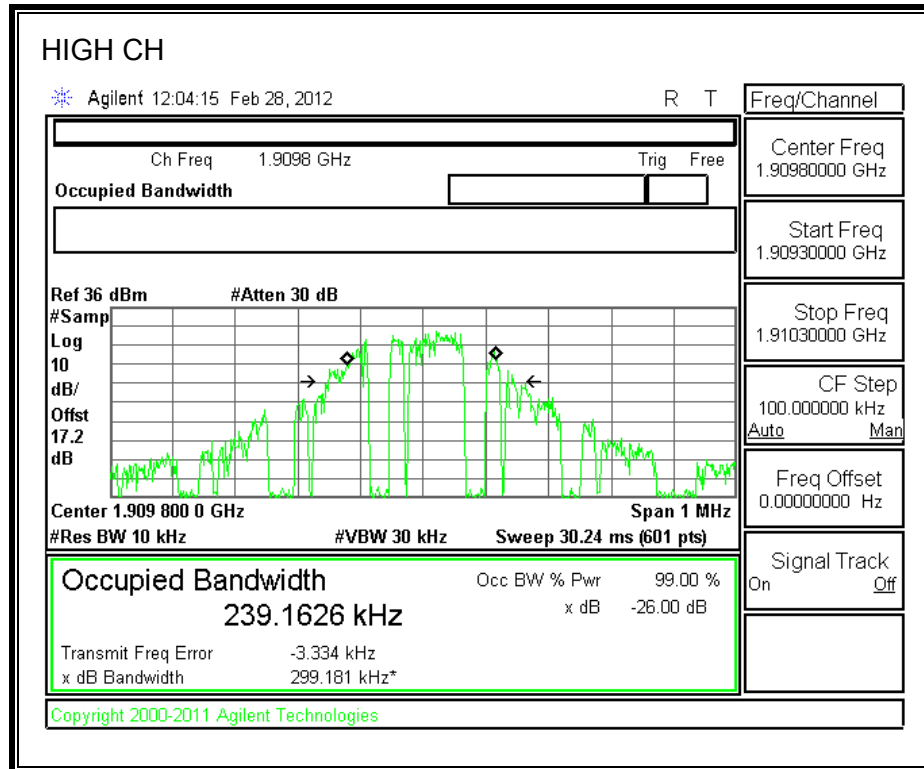
99% and 26dB BANDWIDTH

GPRS850 BAND



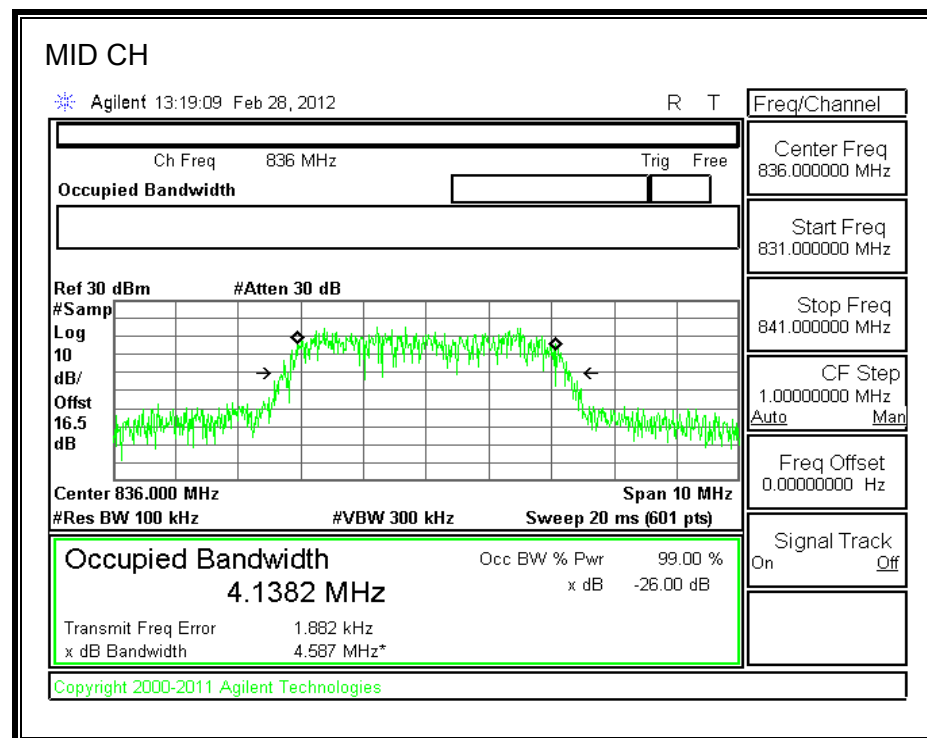
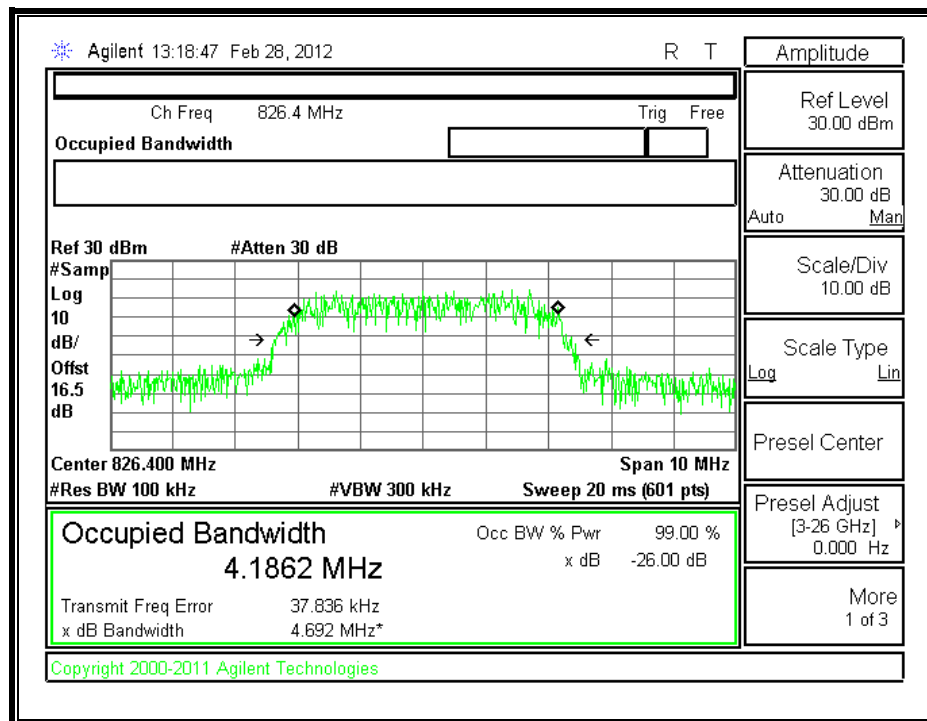


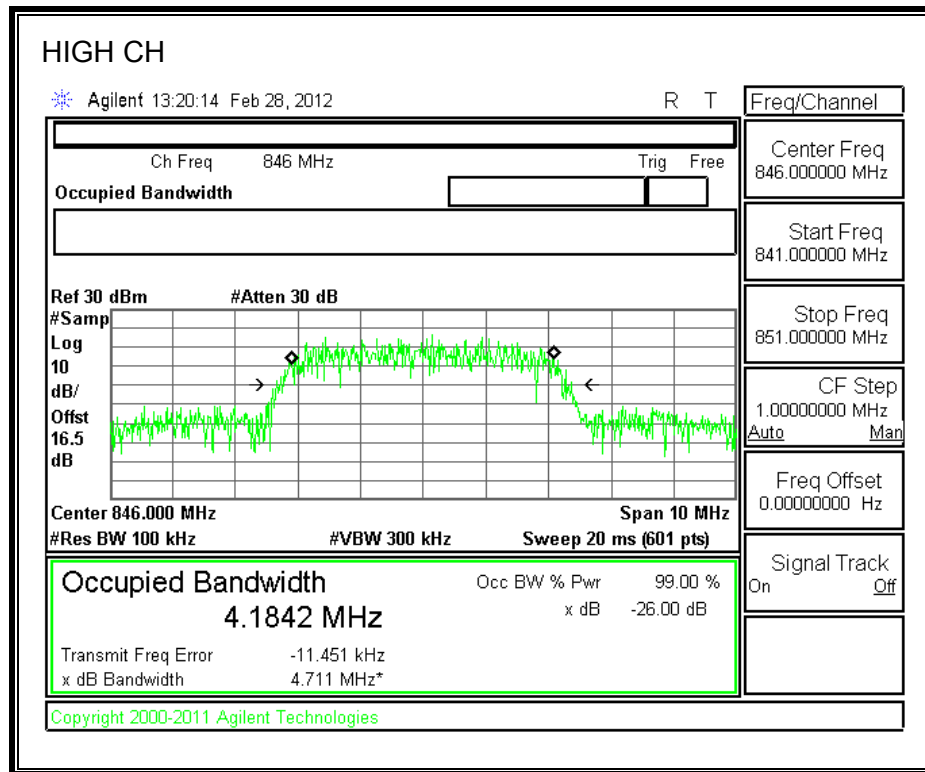
GPRS1900 BAND

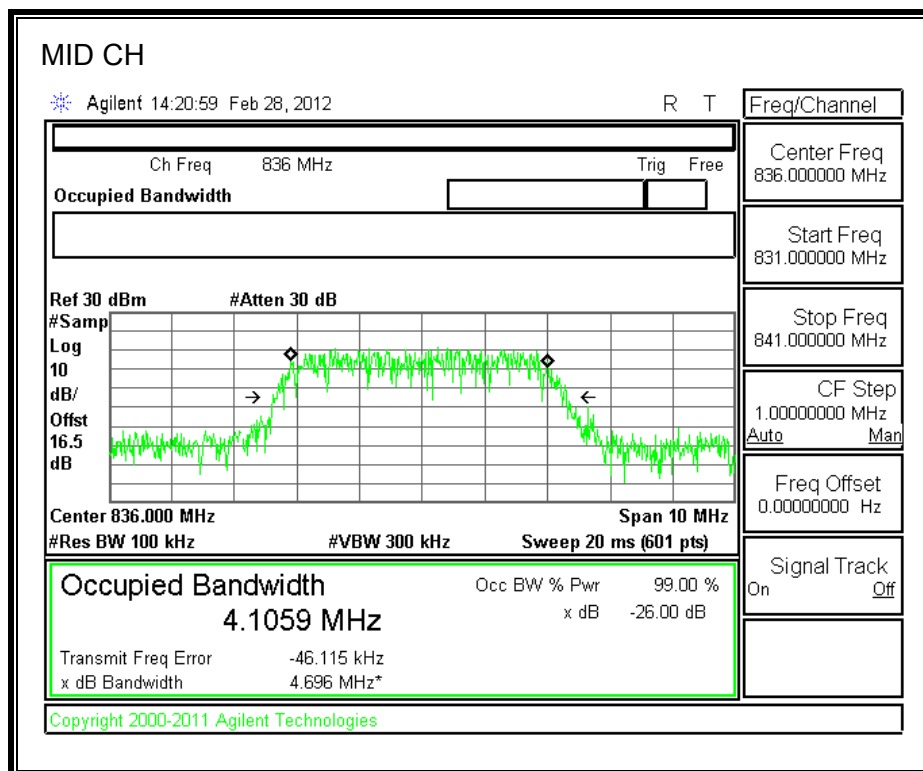
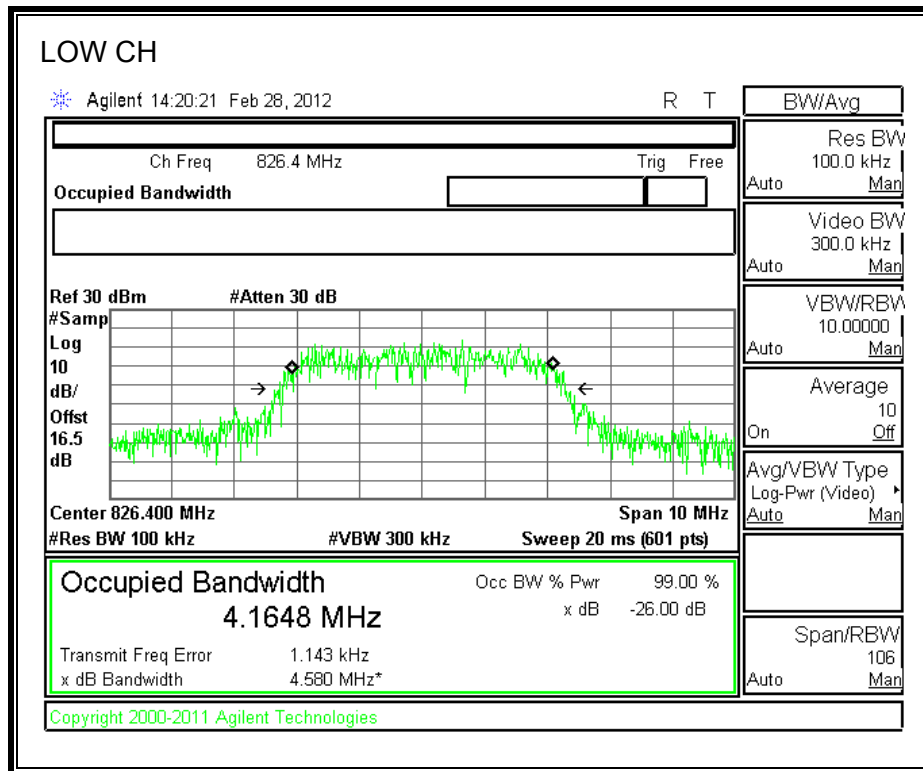


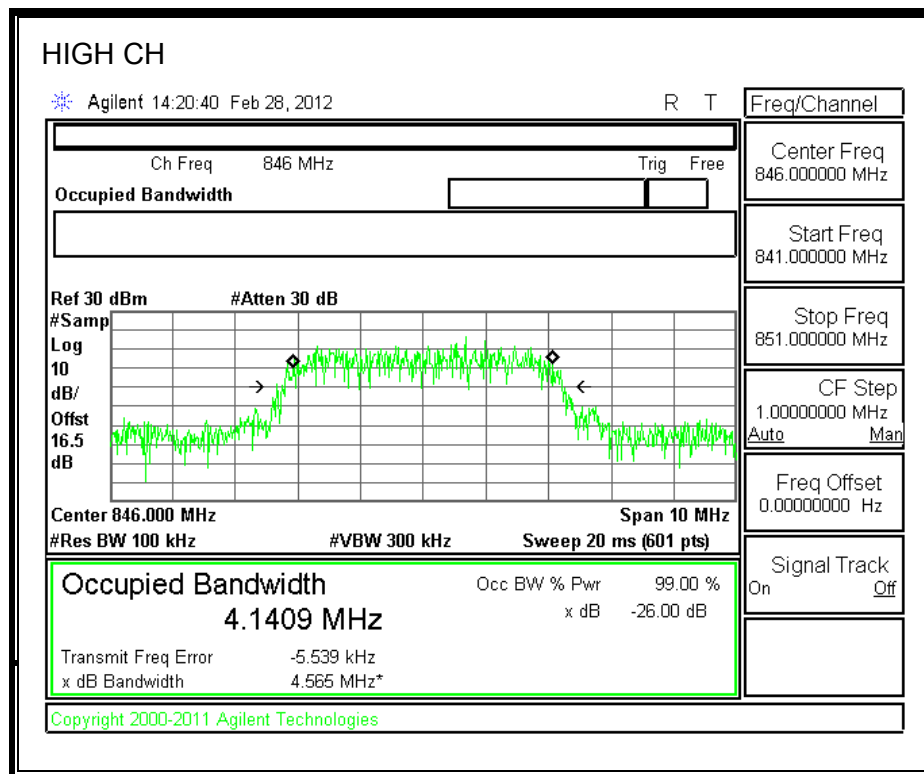
UMTS REL 99, CELL BAND

LOW CH





HSDPA REL 6, CELL BAND



8.1.2. 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 an 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.

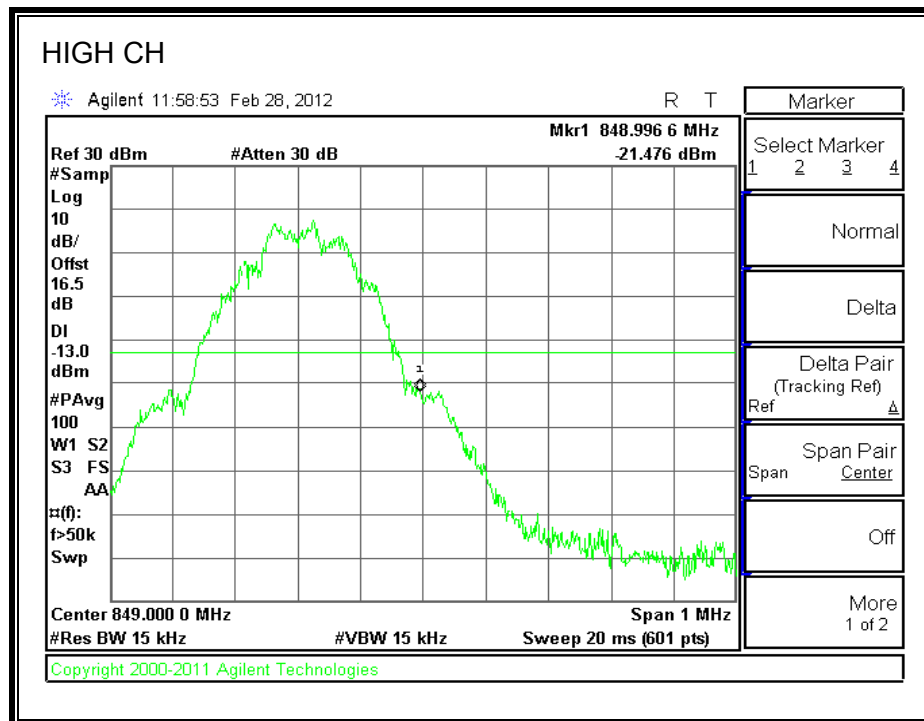
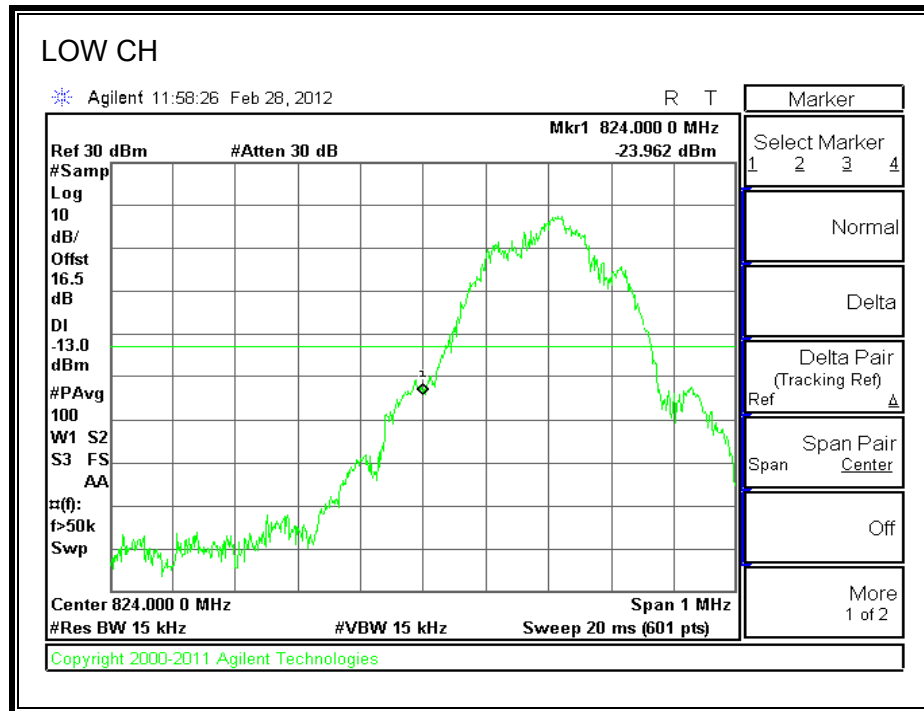
MODES TESTED

- GPRS
- UMTS REL. 99
- HSDPA REL. 6

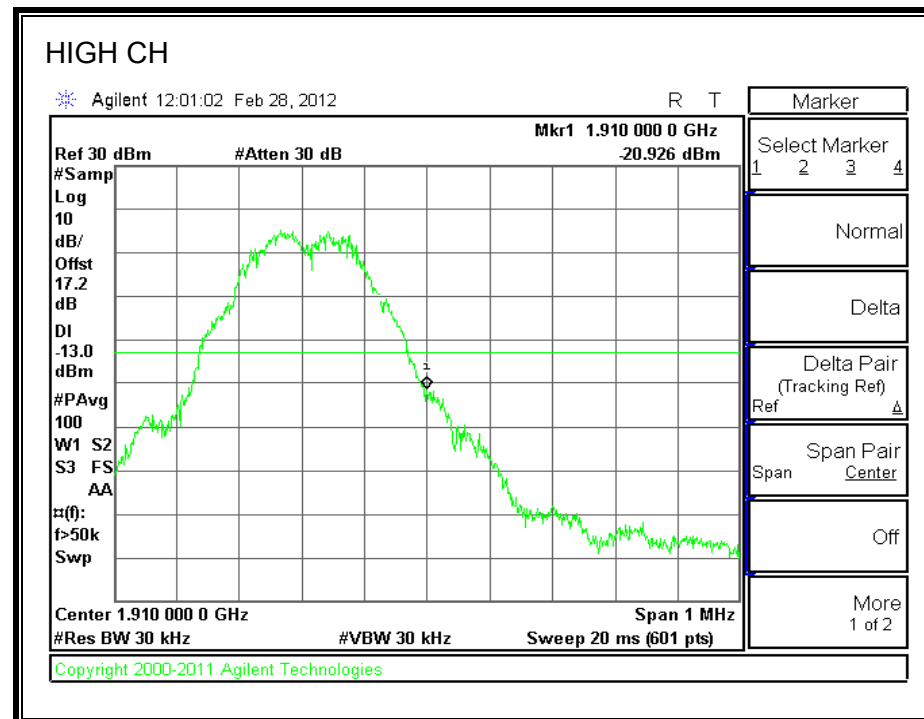
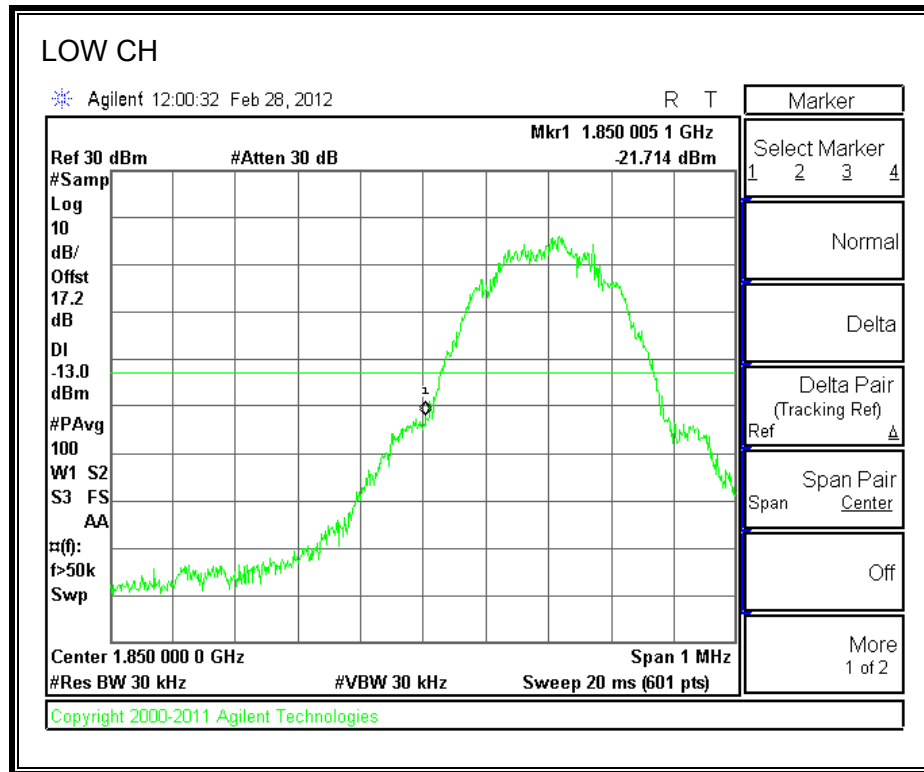
RESULTS

BANDEDGE

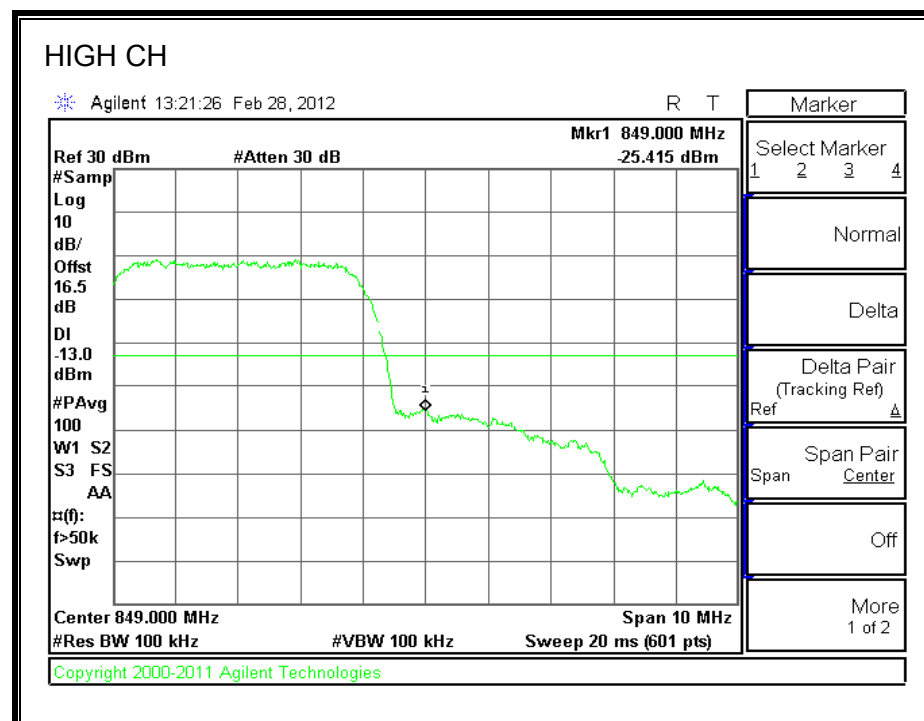
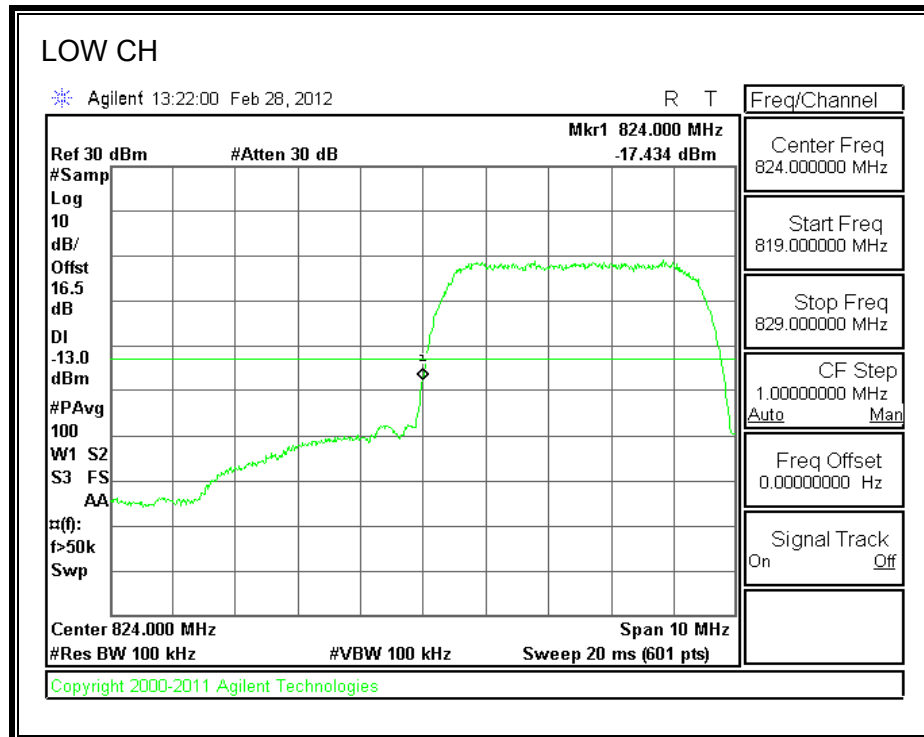
GPRS850 BAND

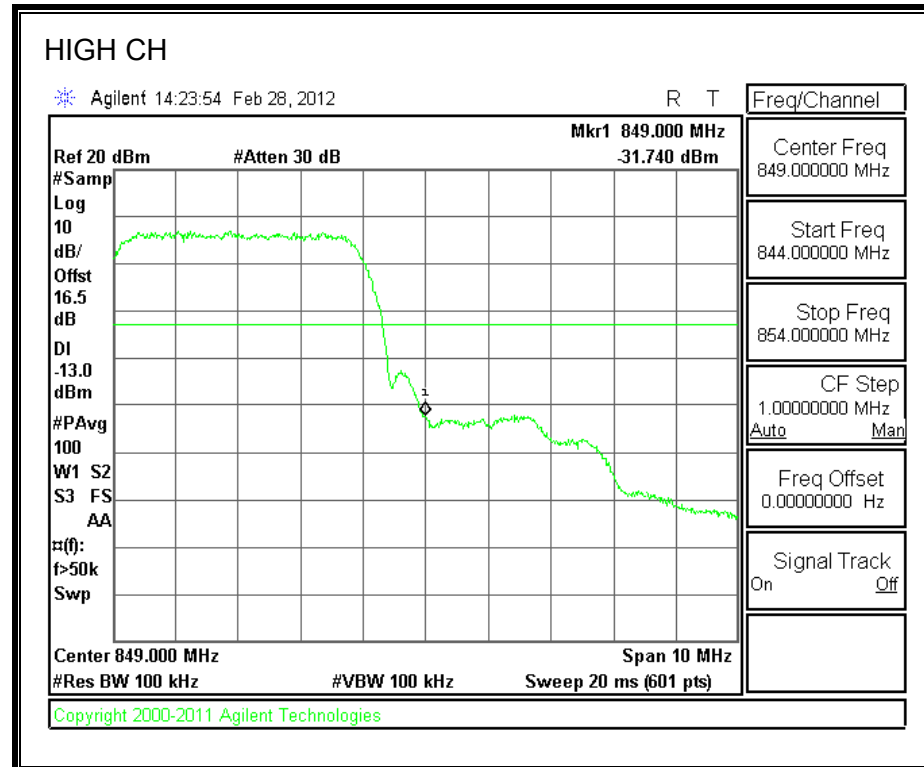
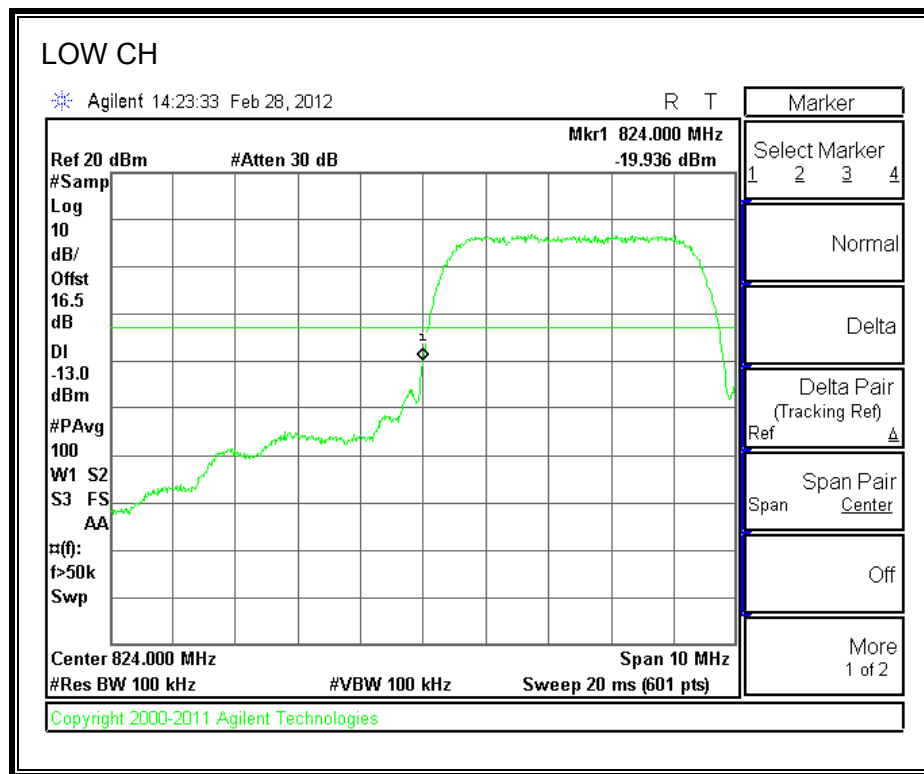


GPRS1900 BAND



UMTS REL 99 CELL BAND



UMTS HSDPA, CELL BAND

8.1.3. 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.

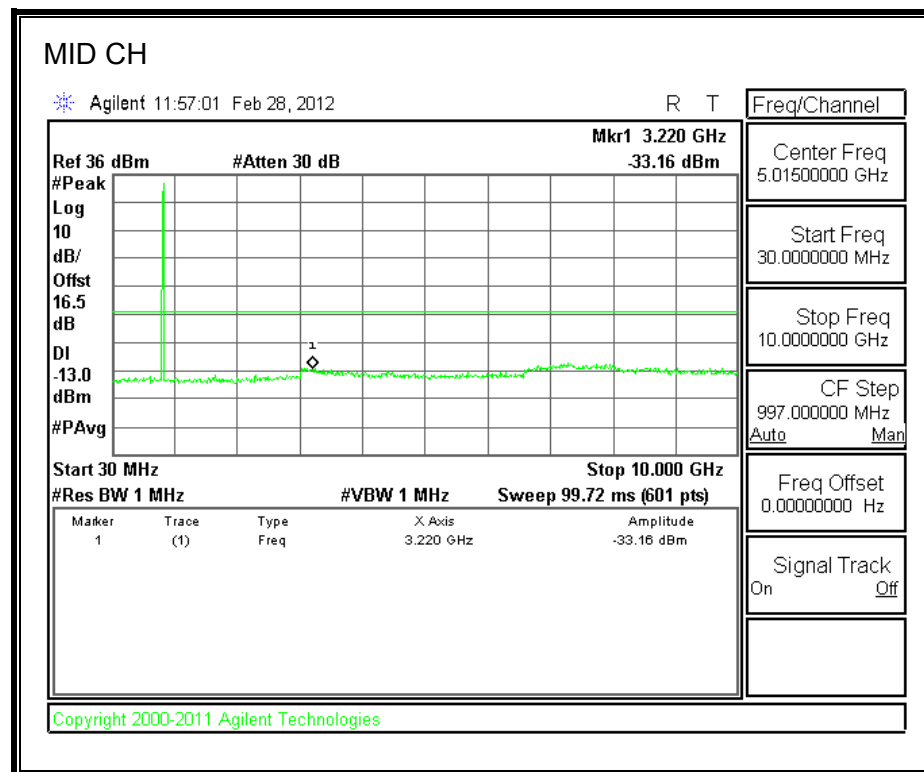
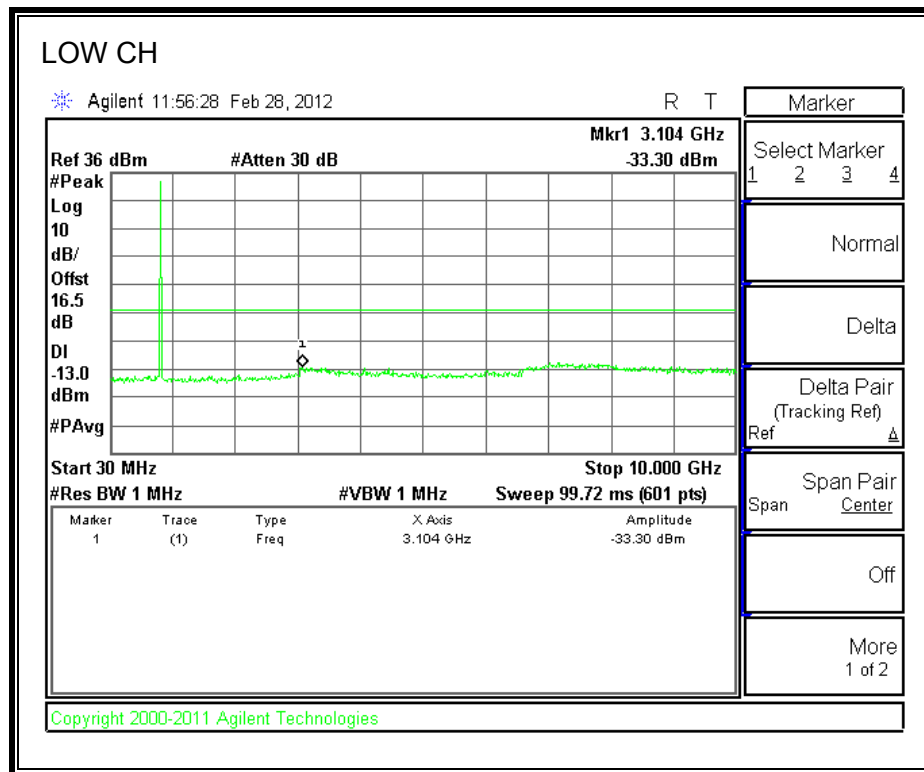
For each out of band emissions measurement:

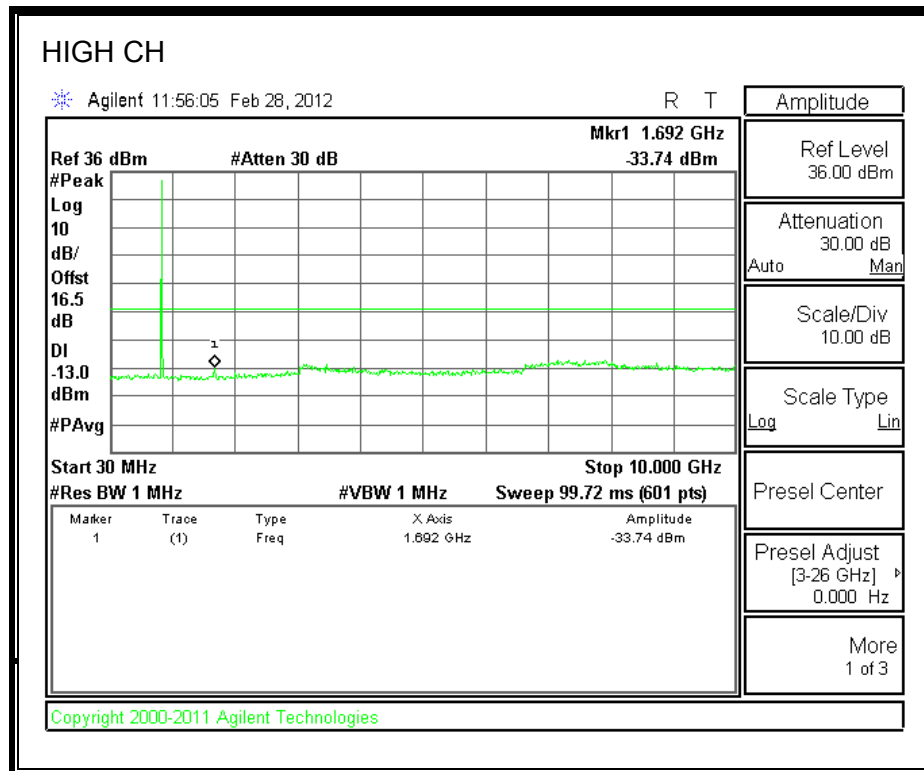
- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

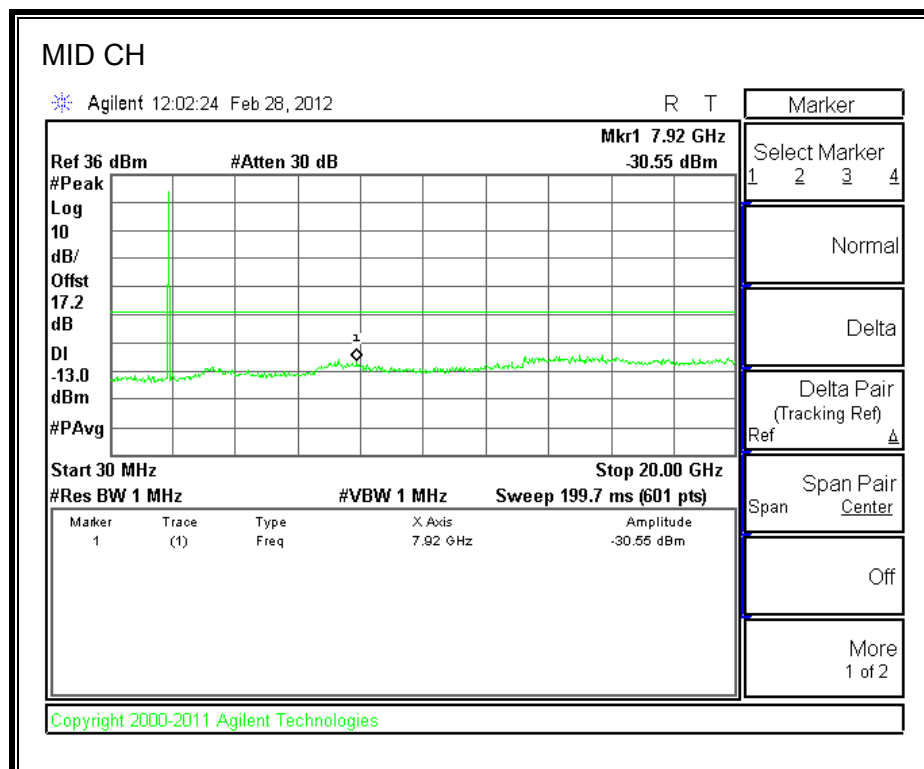
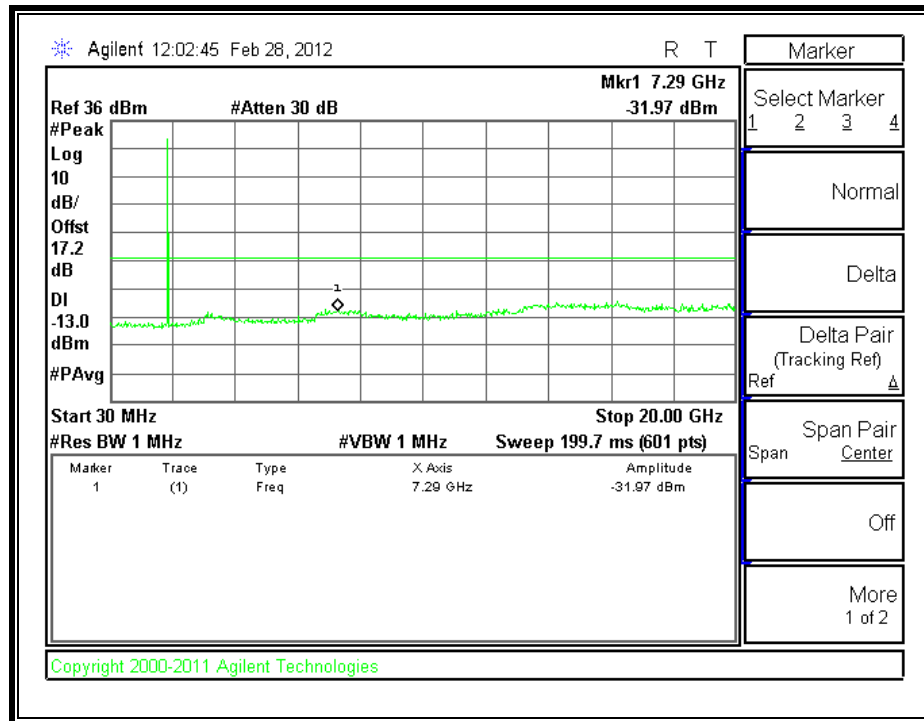
MODES TESTED

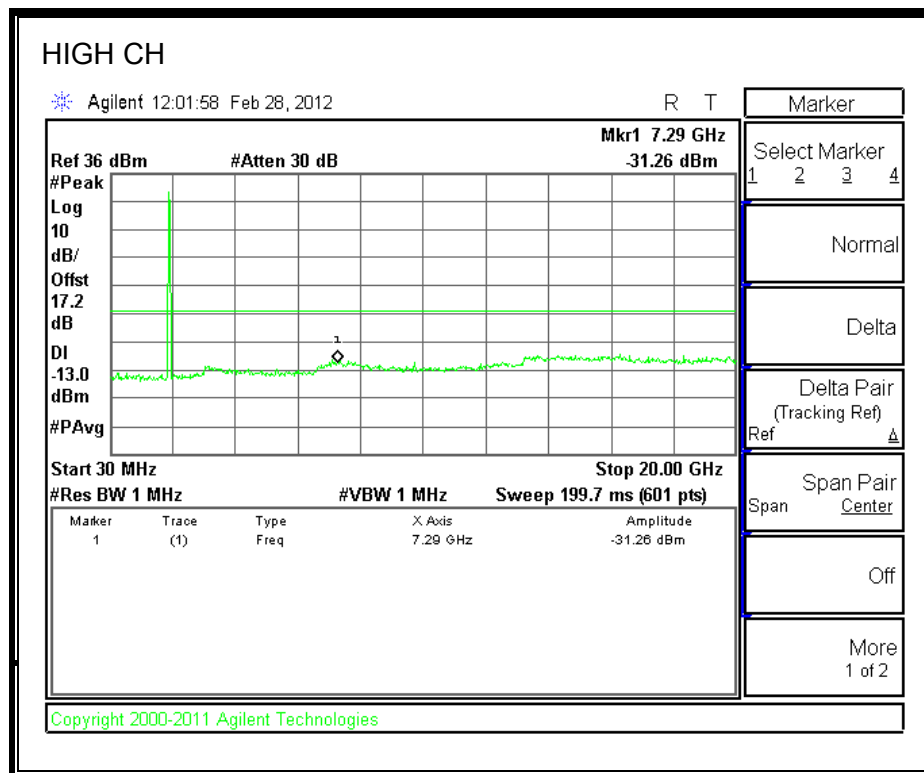
- GPRS
- UMTS REL. 99
- HSDPA REL. 6

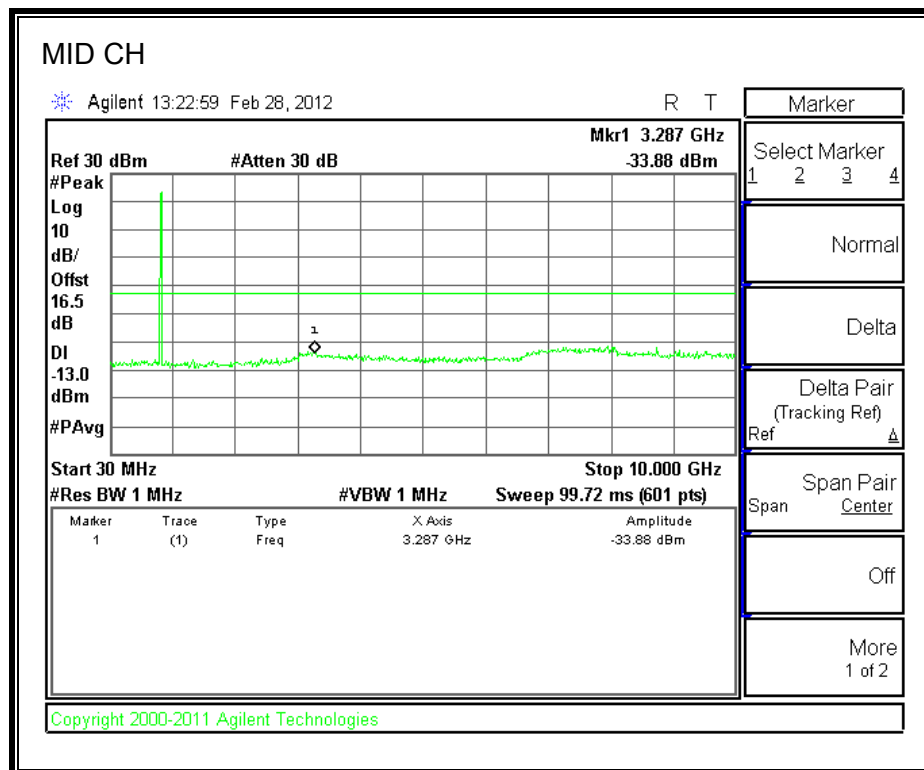
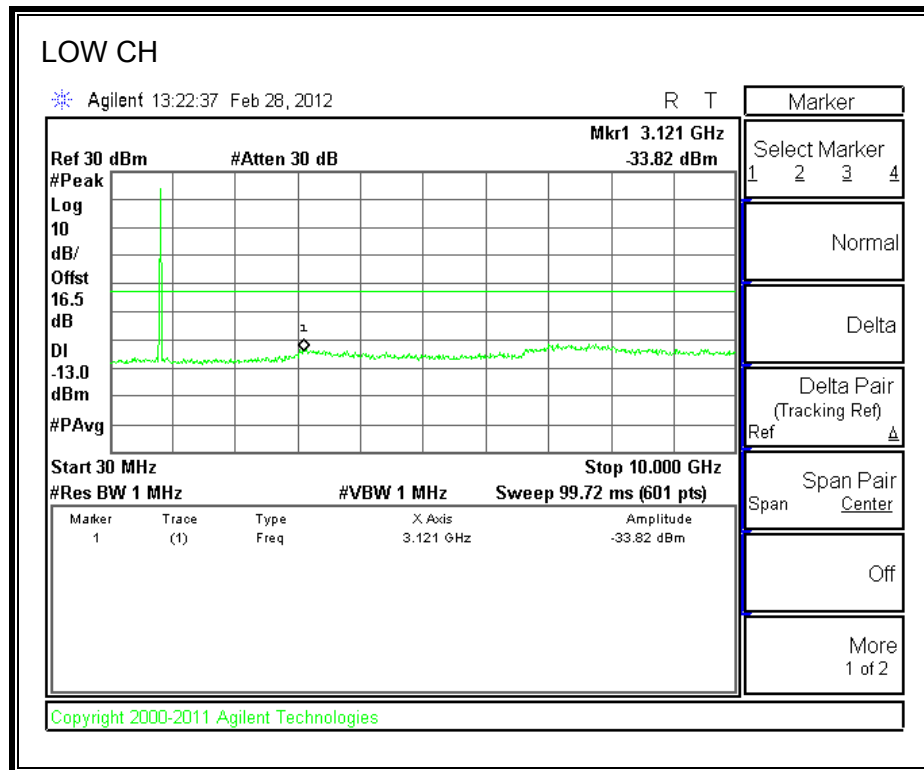
RESULTS

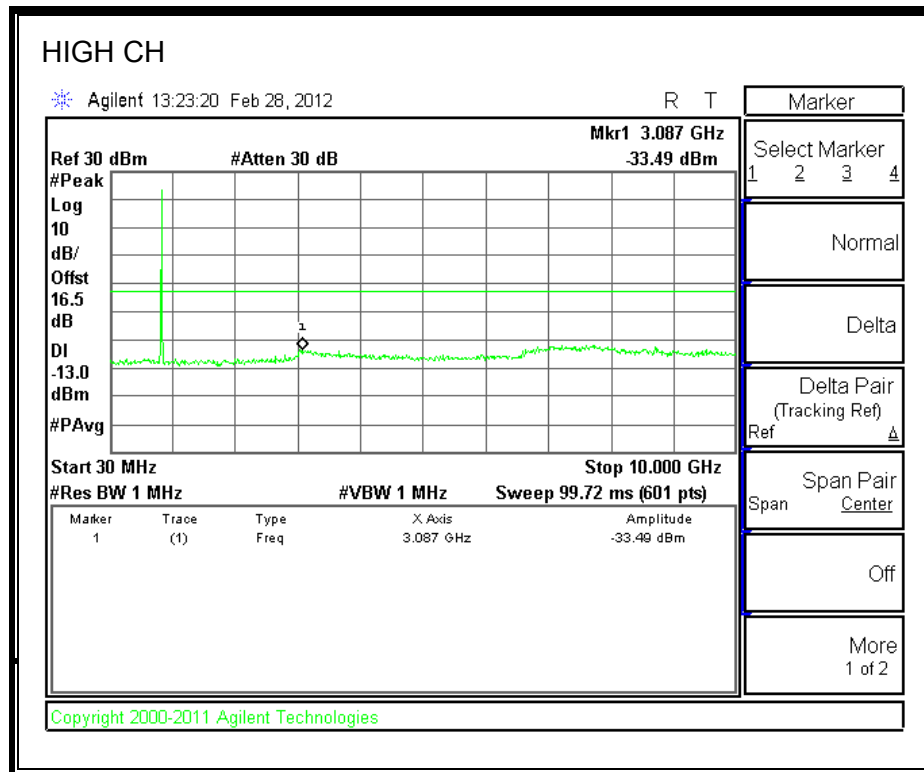
GPRS850 BAND

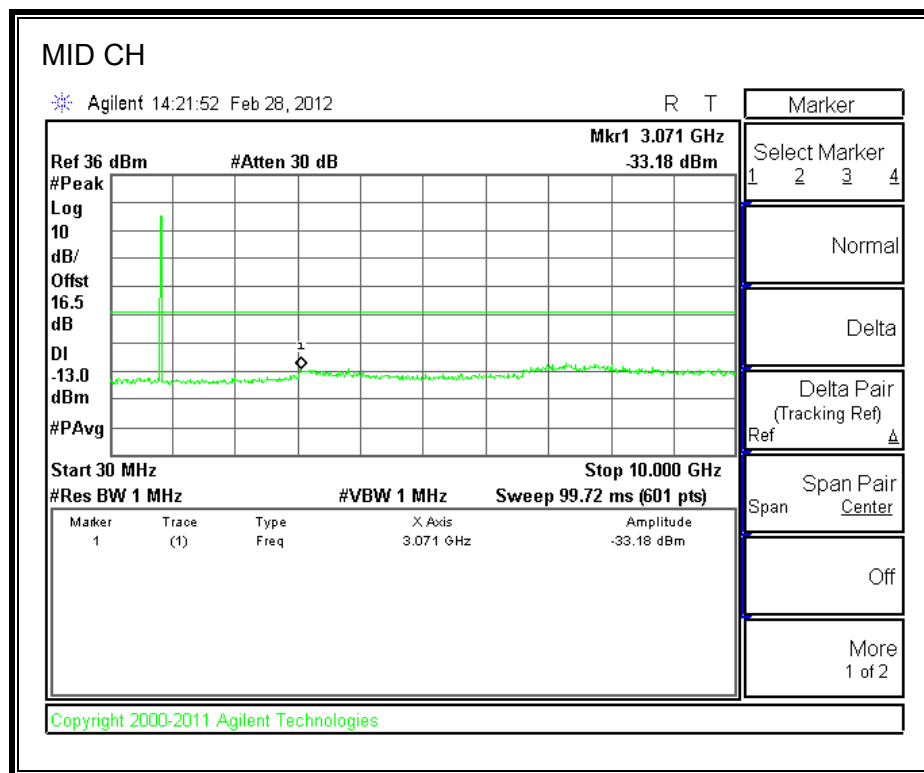
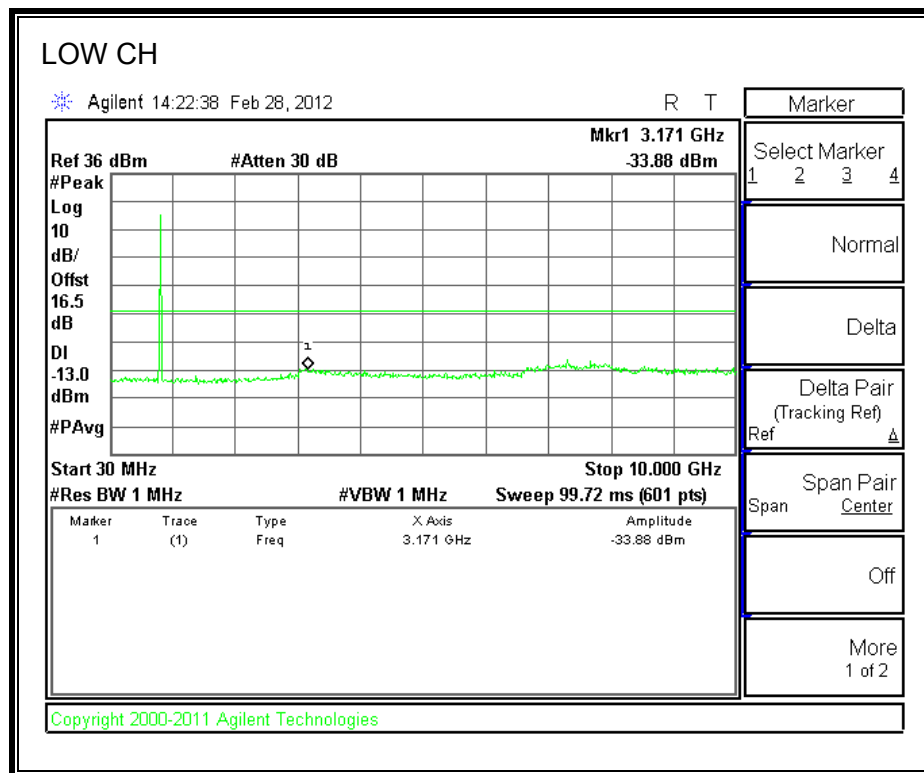


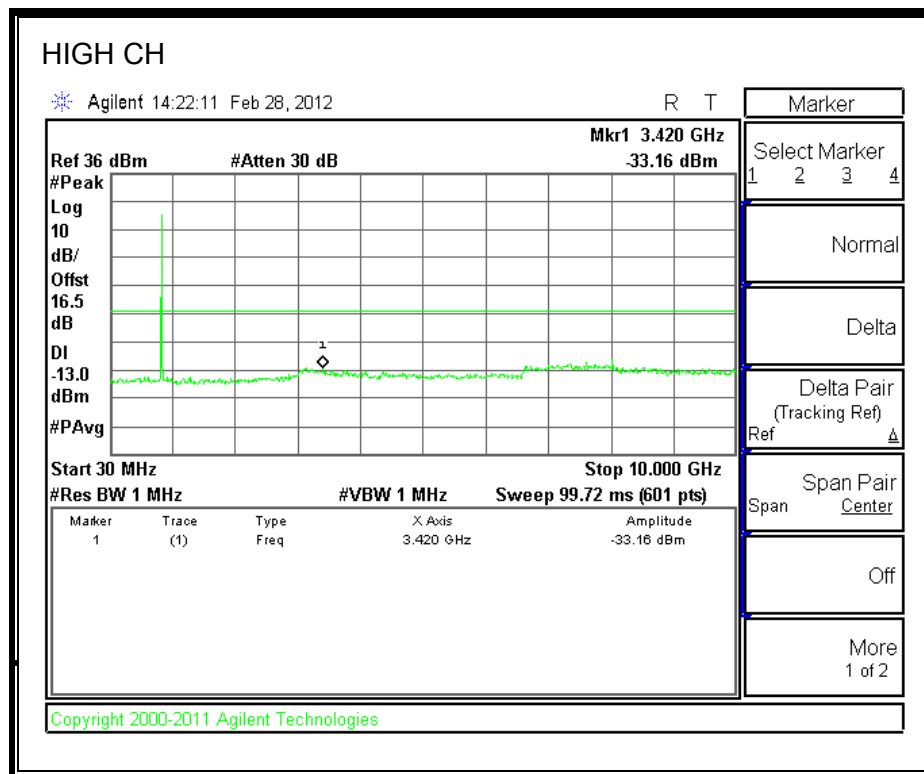
GPRS1900 BAND



UMTS REL 99. Cell Band



HSDPA REL 5. Cell Band



8.1.4. 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

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°C is reached. Reference power supply voltage for these tests is 3.7 Vdc.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case). The test voltage ranges from 3.49 to 4.72 VDC.

MODES TESTED

- GPRS
- UMTS, Rel 99
- HSDPA REL 6

RESULTS

See the following pages.

CELL, GSM MODULATION – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.599980MHz @ 20°C Limit: to stay +/- 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	836.599980	0.000	2.5
3.70	40	836.599986	-0.007	2.5
3.70	30	836.599982	-0.002	2.5
3.70	20	836.599980	0	2.5
3.70	10	836.599992	-0.014	2.5
3.70	0	836.599987	-0.008	2.5
3.70	-10	836.599997	-0.020	2.5
3.70	-20	836.599986	-0.007	2.5
3.70	-30	836.599984	-0.005	2.5
Reference Frequency: Cellular Mid Channel 836.599980MHz @ 20°C Limit: to stay +/- 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	836.599980	0	2.5
85%	20	836.599978	0.002	2.5
115%	20	836.599996	-0.019	2.5

PCS, GSM MODULATION – MID CHANNEL

Reference Frequency: PCS Mid Channel 1880.000026MHz @ 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	1880.000015	0.006	2.5
3.70	40	1880.000018	0.004	2.5
3.70	30	1880.000020	0.003	2.5
3.70	20	1880.000026	0	2.5
3.70	10	1880.000310	-0.151	2.5
3.70	0	1880.000034	-0.004	2.5
3.70	-10	1880.003500	-1.848	2.5
3.70	-20	1880.000210	-0.098	2.5
3.70	-30	1880.000020	0.003	2.5

Reference Frequency: PCS Mid Channel 1880.000026MHz @ 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	1880.000026	0	2.5
85%	20	1880.000025	0.001	2.5
115%	20	1880.000042	-0.009	2.5

CELL WCDMA – MID CHANNEL

Reference Frequency: Cellular Mid Channel 833.999992MHz @ 20°C Limit: to stay +/- 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	835.999993	-0.001	2.5
3.70	40	835.999992	0.000	2.5
3.70	30	835.999995	-0.004	2.5
3.70	20	835.999992	0	2.5
3.70	10	835.999992	0.000	2.5
3.70	0	835.999995	-0.004	2.5
3.70	-10	835.999995	-0.004	2.5
3.70	-20	835.999991	0.001	2.5
3.70	-30	835.999993	-0.001	2.5

Reference Frequency: Cellular Mid Channel 835.999992MHz @ 20°C Limit: to stay +/- 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	835.999992	0	2.5
85%	20	835.999993	-0.001	2.5
115%	20	835.999990	0.002	2.5

8.2. RADIATED TEST RESULTS

8.2.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232

LIMITS

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

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

TEST PROCEDURE

ANSI / TIA / EIA 603C

MODES TESTED

- GPRS
- UMTS, Rel 99
- HSDPA, Rel 6

RESULTS

CELLULAR BAND (ERP)

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	32.14	1636.82
	192	836.60	30.35	1083.93
	251	848.80	29.25	841.40
UMTS, Rel 99	4357	826.40	22.80	190.55
	4407	836.60	22.41	174.18
	4458	846.60	21.80	151.36
HSDPA, Rel 6	4357	826.40	23.84	242.10
	4407	836.60	22.60	181.97
	4458	846.60	22.20	165.96

PCS BAND (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	32.05	1603.25
	661	1880.00	31.30	1348.96
	810	1909.80	31.08	1282.33

GPRS850 BAND**High Frequency Substitution Measurement
Compliance Certification Services Chamber A**

Company: Samsung
Project #: 12114311
Date: 02/29/12
Test Engineer: Chin Pang
Configuration: EUT and AC Adapter
Mode: TX, CELL BAND GPRS
 Y pos

Test Equipment:

Receiving: Sunol T243, 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
Low Ch								
824.20	32.64	V	0.5	0.0	32.14	38.5	-6.3	
824.20	21.20	H	0.5	0.0	20.70	38.5	-17.7	
Mid Ch								
836.60	30.85	V	0.5	0.0	30.35	38.5	-8.1	
836.60	22.03	H	0.5	0.0	21.53	38.5	-16.9	
High Ch								
848.80	29.75	V	0.5	0.0	29.25	38.5	-9.2	
848.80	21.10	H	0.5	0.0	20.60	38.5	-17.8	

Rev. 3.17.11

UMTS REL 99, 850MHz BAND**High Frequency Substitution Measurement
Compliance Certification Services Chamber A**

Company: Samsung
Project #: 12114311
Date: 02/29/12
Test Engineer: Chin Pang
Configuration: EUT and AC Adapter
Mode: TX, WCDMA, 850MHz Rel 99
 Y pos

Test Equipment:

Receiving: Sunol T243, 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
Low Ch								
824.20	23.30	V	0.5	0.0	22.80	38.5	-15.6	
824.20	18.10	H	0.5	0.0	17.60	38.5	-20.8	
Mid Ch								
836.60	22.91	V	0.5	0.0	22.41	38.5	-16.0	
836.60	18.93	H	0.5	0.0	18.43	38.5	-20.0	
High Ch								
848.80	22.30	V	0.5	0.0	21.80	38.5	-16.6	
848.80	19.40	H	0.5	0.0	18.90	38.5	-19.5	

Rev. 3.17.11

ERP HSDPA REL 6, 850MHz BAND**High Frequency Substitution Measurement
Compliance Certification Services Chamber A**

Company: Samsung
Project #: 12I14311
Date: 02/29/12
Test Engineer: Chin Pang
Configuration: EUT and AC Adapter
Mode: TX, WCDMA, 850MHz HSDPA
Y pos

Test Equipment:

Receiving: Sunol T243, 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
Low Ch								
824.20	24.34	V	0.5	0.0	23.84	38.5	-14.6	
824.20	17.70	H	0.5	0.0	17.20	38.5	-21.2	
Mid Ch								
836.60	23.10	V	0.5	0.0	22.60	38.5	-15.8	
836.60	19.10	H	0.5	0.0	18.60	38.5	-19.8	
High Ch								
848.80	22.70	V	0.5	0.0	22.20	38.5	-16.2	
848.80	20.40	H	0.5	0.0	19.90	38.5	-18.5	

Rev. 3.17.11

GPRS1900 BAND**High Frequency Fundamental Measurement
Compliance Certification Services Chamber A**

Company: Samsung
Project #: 12114311
Date: 02/29/12
Test Engineer: Chin Pang
Configuration: EUT and AC Adapter
Mode: TX, GPRS 1900MHz
 Y pos

Test Equipment:

Receiving: Horn T73, and Camber A SMA Cables

Substitution: Horn T60 Substitution, 4ft SMA Cable (SN # 245182002) 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								
1.850	24.9	V	0.85	8.01	32.05	33.0	-1.0	
1.850	14.6	H	0.85	8.01	21.76	33.0	-11.2	
Mid Ch								
1.880	24.0	V	0.85	8.13	31.30	33.0	-1.7	
1.880	13.9	H	0.85	8.13	21.18	33.0	-11.8	
High Ch								
1.910	23.8	V	0.85	8.13	31.08	33.0	-1.9	
1.910	14.5	H	0.85	8.13	21.78	33.0	-11.2	

Rev. 3.17.11

8.2.2. 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
- UMTS, Rel 99
- HSDPA, Rel 6

RESULTS

GPRS850 BAND

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		12114311							
Date:		02/29/12							
Test Engineer:		Chin Pang							
Configuration:		EUT and AC Adapter							
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	-9.1	V	3.0	38.2	1.0	-46.2	-13.0	-33.2	
2.473	-13.3	V	3.0	37.5	1.0	-49.8	-13.0	-36.8	
1.648	-9.7	H	3.0	38.2	1.0	-46.8	-13.0	-33.8	
2.473	-14.0	H	3.0	37.5	1.0	-50.5	-13.0	-37.5	
Mid Ch, (836.6MHz)									
1.673	-10.5	V	3.0	38.1	1.0	-47.6	-13.0	-34.6	
3.346	-15.4	V	3.0	37.1	1.0	-51.5	-13.0	-38.5	
1.673	-15.2	H	3.0	38.1	1.0	-52.3	-13.0	-39.3	
2.510	-15.3	H	3.0	37.5	1.0	-51.7	-13.0	-38.7	
High Ch, (848.8MHz)									
1.698	-9.6	V	3.0	38.1	1.0	-46.7	-13.0	-33.7	
2.546	-16.0	V	3.0	37.5	1.0	-52.5	-13.0	-39.5	
1.698	-17.0	H	3.0	38.1	1.0	-54.1	-13.0	-41.1	
2.546	-19.6	H	3.0	37.5	1.0	-56.1	-13.0	-43.1	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

WCDMA REL 99, CELL BAND

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		SAMSUNG ELECTRONICS							
Project #:		12114311							
Date:		02/29/12							
Test Engineer:		Chin Pang							
Configuration:		EUT and AC Adapter							
Mode:		TX, WCDMA 850MHz, Rel 99							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 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	-20.1	V	3.0	38.1	1.0	-57.3	-13.0	-44.3	
3.306	-16.3	V	3.0	37.1	1.0	-52.4	-13.0	-39.4	
1.653	-21.9	H	3.0	38.1	1.0	-59.0	-13.0	-46.0	
3.306	-15.8	H	3.0	37.1	1.0	-51.9	-13.0	-38.9	
Mid Channel (836.6MHz)									
1.673	-16.9	V	3.0	38.1	1.0	-54.0	-13.0	-41.0	
3.344	-15.9	V	3.0	37.1	1.0	-52.0	-13.0	-39.0	
1.673	-20.7	H	3.0	38.1	1.0	-57.8	-13.0	-44.8	
3.344	-14.0	H	3.0	37.1	1.0	-50.1	-13.0	-37.1	
High Channel (846.6MHz)									
1.692	-13.7	V	3.0	38.1	1.0	-50.8	-13.0	-37.8	
3.384	-12.0	V	3.0	37.1	1.0	-48.1	-13.0	-35.1	
1.692	-18.0	H	3.0	38.1	1.0	-55.1	-13.0	-42.1	
3.384	-13.7	H	3.0	37.1	1.0	-49.8	-13.0	-36.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

ERP HSDPA REL 6, CELL BAND

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		SAMSUNG ELECTRONICS							
Project #:		12114311							
Date:		02/29/12							
Test Engineer:		Chin Pang							
Configuration:		EUT and AC Adapter							
Mode:		TX, WCDMA 850MHz, HSDPA							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 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	-20.4	V	3.0	38.1	1.0	-57.6	-13.0	-44.6	
3.306	-12.0	V	3.0	37.1	1.0	-48.1	-13.0	-35.1	
1.653	-22.4	H	3.0	38.1	1.0	-59.6	-13.0	-46.6	
3.306	-14.9	H	3.0	37.1	1.0	-51.0	-13.0	-38.0	
Mid Channel (836.6MHz)									
1.673	-16.9	V	3.0	38.1	1.0	-54.0	-13.0	-41.0	
3.344	-15.9	V	3.0	37.1	1.0	-52.0	-13.0	-39.0	
1.673	-20.7	H	3.0	38.1	1.0	-57.8	-13.0	-44.8	
3.344	-14.0	H	3.0	37.1	1.0	-50.1	-13.0	-37.1	
High Channel (846.6MHz)									
1.692	-12.7	V	3.0	38.1	1.0	-49.8	-13.0	-36.8	
3.384	-2.8	V	3.0	37.1	1.0	-38.9	-13.0	-25.9	
1.692	-18.0	H	3.0	38.1	1.0	-55.1	-13.0	-42.1	
3.384	-11.3	H	3.0	37.1	1.0	-47.4	-13.0	-34.4	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

GPRS1900 BAND

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		12114311							
Date:		02/29/12							
Test Engineer:		Chin Pang							
Configuration:		EUT and AC Adapter							
Mode:		TX, PCS BAND GPRS							
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	-6.3	V	3.0	36.8	1.0	-42.1	-13.0	-29.1	
5.551	-9.5	V	3.0	36.3	1.0	-44.8	-13.0	-31.8	
9.251	-1.4	V	3.0	37.0	1.0	-37.4	-13.0	-24.4	
3.700	-7.0	H	3.0	36.8	1.0	-42.8	-13.0	-29.8	
5.551	-9.1	H	3.0	36.3	1.0	-44.4	-13.0	-31.4	
9.251	-0.8	H	3.0	37.0	1.0	-36.8	-13.0	-23.8	
Mid Ch, (1880.0MHz)									
3.760	-7.9	V	3.0	36.8	1.0	-43.7	-13.0	-30.7	
5.640	-9.6	V	3.0	36.3	1.0	-44.9	-13.0	-31.9	
9.400	-1.6	V	3.0	37.0	1.0	-37.6	-13.0	-24.6	
3.760	-6.8	H	3.0	36.8	1.0	-42.6	-13.0	-29.6	
5.640	-5.9	H	3.0	36.3	1.0	-41.2	-13.0	-28.2	
9.400	1.4	H	3.0	37.0	1.0	-34.6	-13.0	-21.6	
High Ch, (1909.8MHz)									
3.820	-4.8	V	3.0	36.7	1.0	-40.5	-13.0	-27.5	
5.729	-4.4	V	3.0	36.3	1.0	-39.7	-13.0	-26.7	
9.549	2.6	V	3.0	37.1	1.0	-33.5	-13.0	-20.5	
11.459	0.7	V	3.0	36.8	1.0	-35.1	-13.0	-22.1	
3.820	-9.7	H	3.0	36.7	1.0	-45.4	-13.0	-32.4	
5.729	-7.8	H	3.0	36.3	1.0	-43.1	-13.0	-30.1	
9.549	4.1	H	3.0	37.1	1.0	-32.0	-13.0	-19.0	
11.459	3.7	H	3.0	36.8	1.0	-32.0	-13.0	-19.0	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									