FCC CFR47 PART 22H AND 24E
CERTIFICATION TEST REPORT

FOR

850/1900 GSM/GPRS, 850 WCDMA PHONE WITH BLUETOOTH 3.0 AND EDR, HOTSPOTS, VOIP AND WLAN TRANSCEIVER

MODEL NUMBER: GT-S5360B

FCC ID: A3LGTS5360B

REPORT NUMBER: 11I13975-1, REVISION A

ISSUE DATE: SEPTEMBER 07, 2011

Prepared for

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

Prepared by

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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
---	08/16/11	Initial Issue	T. Chan
A	09/07/11	Updated Edge Portion for RX Mode Only	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:	850/1900 GSM/GPRS, 850 WCDMA PHONE WITH BLUETOOTH 3.0 AND EDR, HOTSPOTS, VOIP AND WLAN TRANSCEIVER
MODEL:	GT-S5360B
SERIAL NUMBER:	F1 191 D (CONDUCTED) AND F1 191 B (RADIATED)
DATE TESTED:	AUGUST 06 TO 28, 2011

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

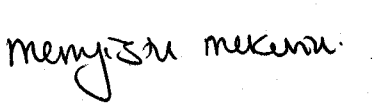
Compliance Certification Services (UL CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties 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:

THU CHAN
ENGINEERING MANAGER
UL CCS

Tested By:



MENGISTU MEKURIA
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

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4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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

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

4.3. MEASUREMENT UNCERTAINTY

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

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

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 850/1900 GSM/GPRS, 850 WCDMA phone with Bluetooth 3.0 and EDR, Hotspots, VOIP and WLAN transceiver.

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	32.42	1745.8	32.32	1706.1
824.2 – 848.8	EGPRS	RX Only			
826.4 – 846.6	UMTS, Rel 99	23.88	244.3	20.31	107.4
826.4 – 846.6	HSDPA, Rel 5	24.40	275.4	21.59	144.2

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2-1909.8	GPRS	29.26	843.3	32.48	1770.1
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 without 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	ETADU10BBB	SC2Z42718/7-E	DoC
Earphone	Samsung	NA	F1 191 B	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	US 115V	Un-shielded	2.0 m	NA
2	RF	1	SMA	Shielded	0.6 m	NA
3	RF	1	EUT	Un-shielded	0.2 m	NA

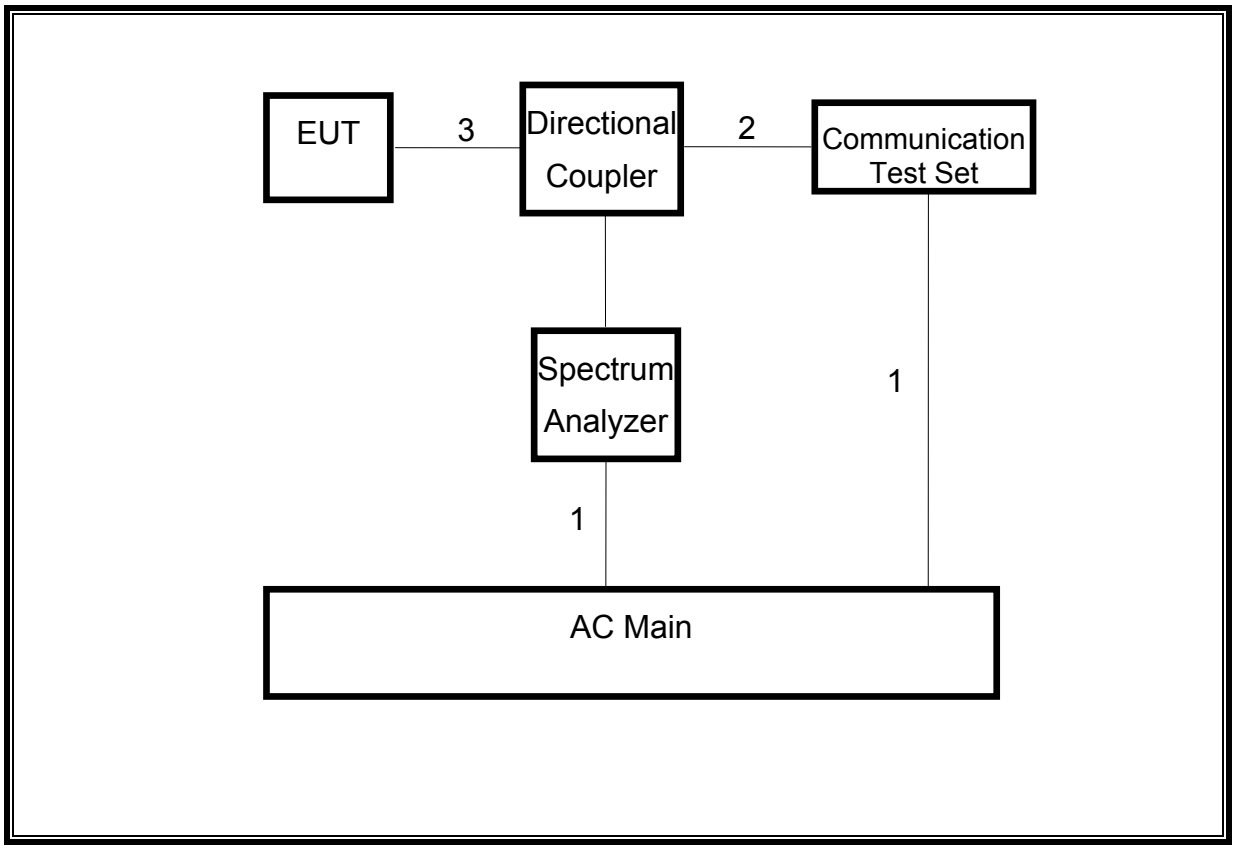
I/O CABLES (RADIATED SETUP)

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

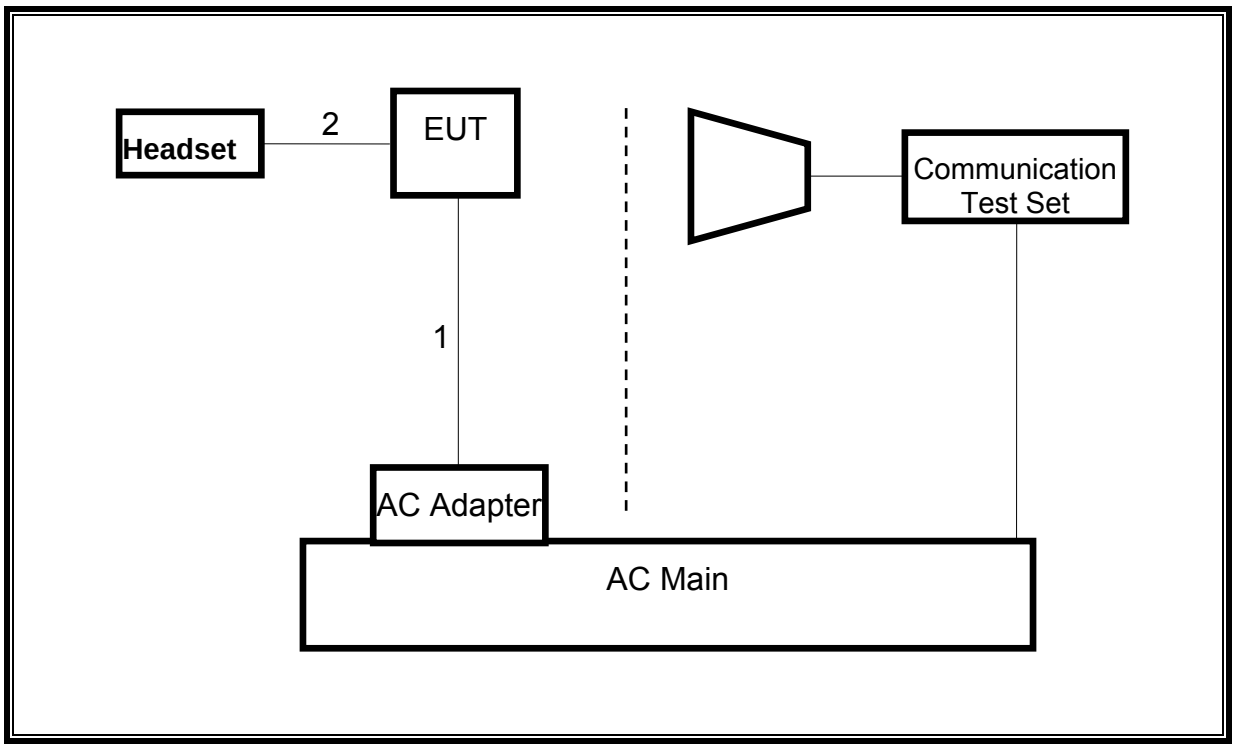
TEST SETUP

The EUT is connected to Bluetooth tester via a directional coupler during the tests.

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	Sunol 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, 44 GHz	Agilent / HP	E4446A	C00996	05/04/12
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01176	08/04/12
Communication Test Set	R & S	CMU 200	C00944	02/16/12
Communications Test Set	Agilent / HP	E5515C	C01086	09/17/11
DC Power Supply				
Signal Generator, 20 GHz	Agilent / HP	83732B	C00774	07/14/12
Power Meter	Agilent / HP	437B	N/A	02/08/12
Power Sensor, 18 GHz	Agilent / HP	8481A	N/A	02/08/12
Peak Power Meter	Agilent / HP	E9327A	C00964	12/04/11
Peak Power Sensor	Agilent / HP	E4416A	C00963	12/04/11
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

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: MC4

Band	Ch	Frequency	Conducted Peak output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GPRS850	128	824.2	**32.42**	30.68	28.67	26.66
	190	836.6	32.29	30.53	28.54	26.54
	251	848.8	32.26	30.54	28.52	26.52
GPRS1900	512	1850.2	29.20	27.66	25.64	23.63
	661	1880.0	29.10	27.69	25.67	23.67
	810	1909.8	**29.26**	27.74	25.72	23.73

7.2. RF POWER OUTPUT FOR UMTS REL99

TEST PROCEDURE

The following summary of these settings are illustrated below:

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

RESULTS

Cell Band 850MHz REL 99

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
				Peak
UMTS 850	4132	4357	826.4	**23.88**
	4182	4407	836.4	23.34
	4233	4458	846.6	23.60

7.3. RF POWER OUTPUT FOR HSDPA REL 5

The following 4 Sub-tests were completed according to Release 5 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			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	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			
	Ahs =βhs/βc	30/15			

Results

Rel 5 HSDPA

Band	Mode	UL Ch No.	f (MHz)	Peak Tx Pwr (dBm)
UMTS850 (Band V)	Subtest 1	4132	826.4	23.87
		4182	836.4	23.87
		4233	846.6	24.08
	Subtest 2	4132	826.4	24.08
		4182	836.4	24.28
		4233	846.6	24.40
	Subtest 3	4132	826.4	23.94
		4182	836.4	23.97
		4233	846.6	23.99
	Subtest 4	4132	826.4	23.70
		4182	836.4	23.79
		4233	846.6	23.84

Note:

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. 5

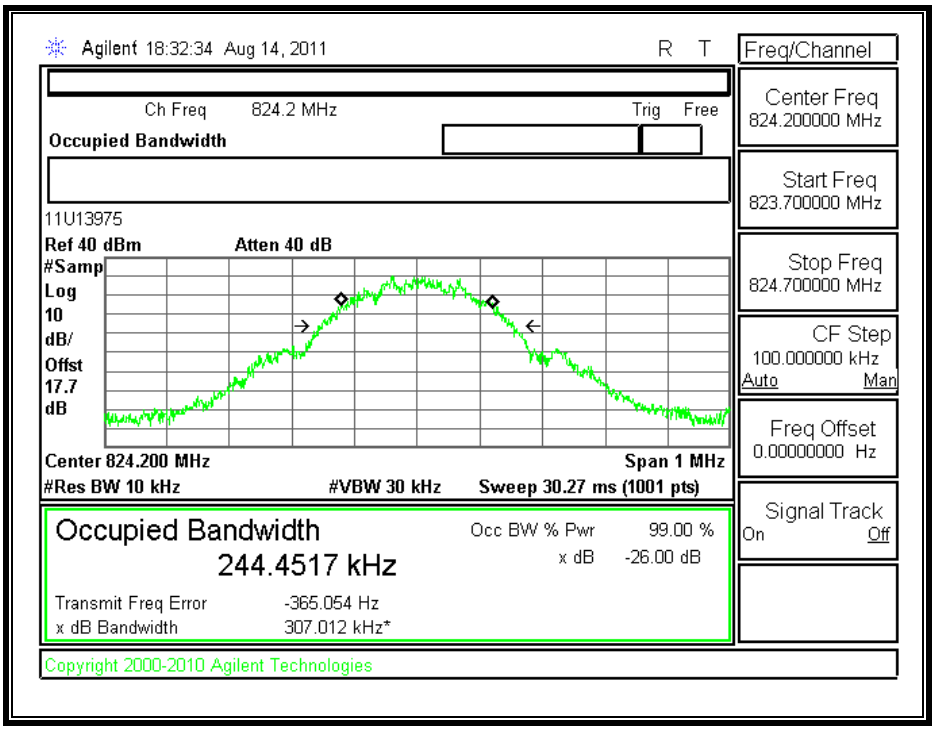
RESULTS

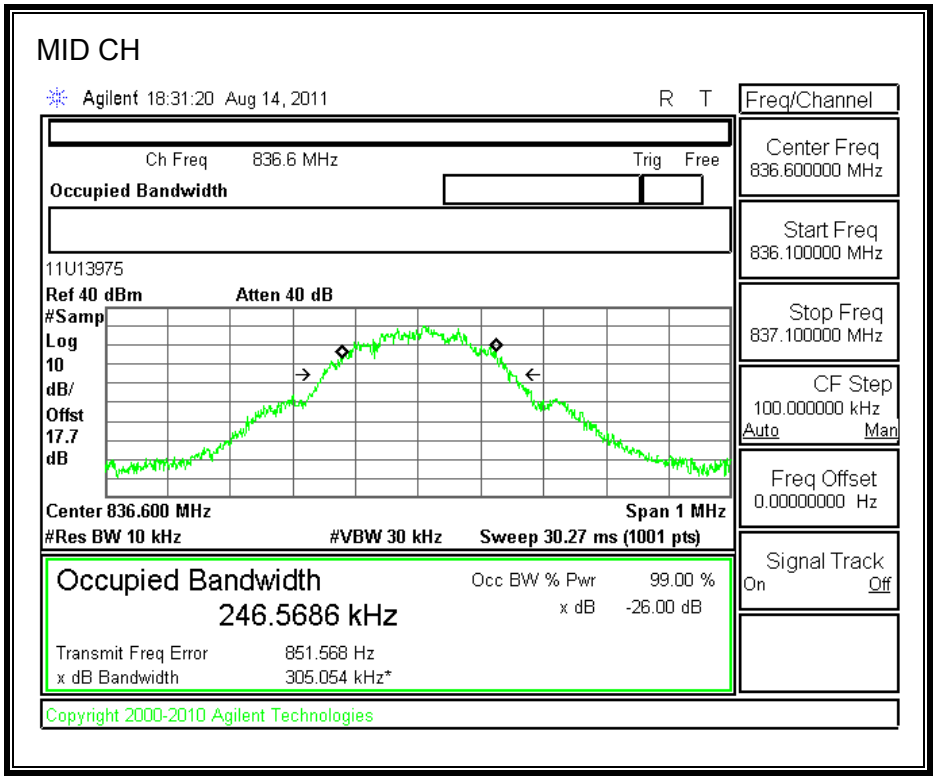
Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.2	244.4517	307.012
		190	836.6	246.5686	305.054
		251	848.8	248.8319	309.088
PCS	GPRS	512	1850.2	256.1569	317.896
		661	1880.0	245.5675	309.053
		810	1909.8	245.6231	307.487

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Cellular	UMTS, REL 99	4357	826.4	4.1632	4.614
		4405	836.6	4.1923	4.682
		4455	846.6	4.1641	4.626
	HSDPA, REL 99	4357	826.4	4.1647	4.660
		4405	836.6	4.1730	4.624
		4455	846.6	4.1789	4.701

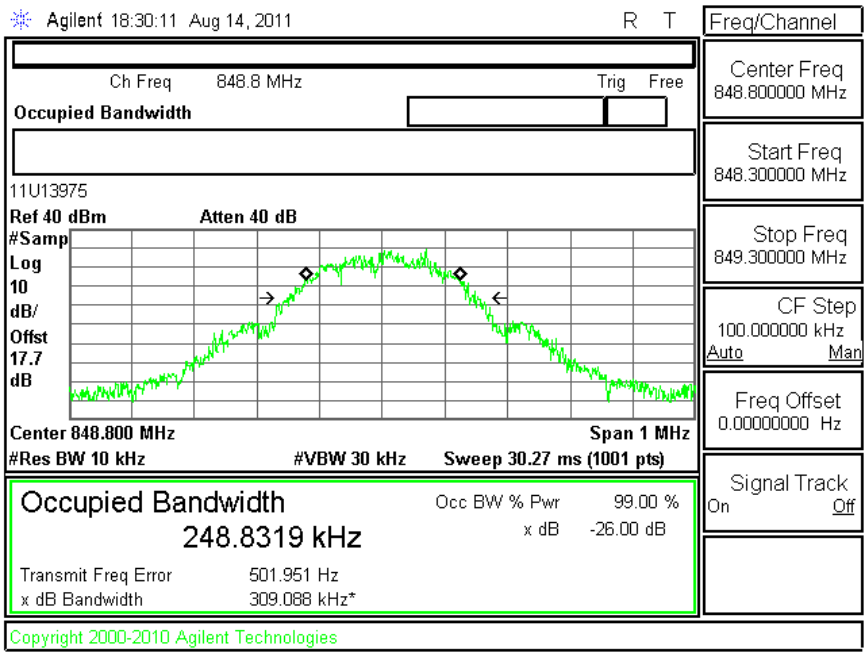
99% and 26dB BANDWIDTH

GPRS850 BAND



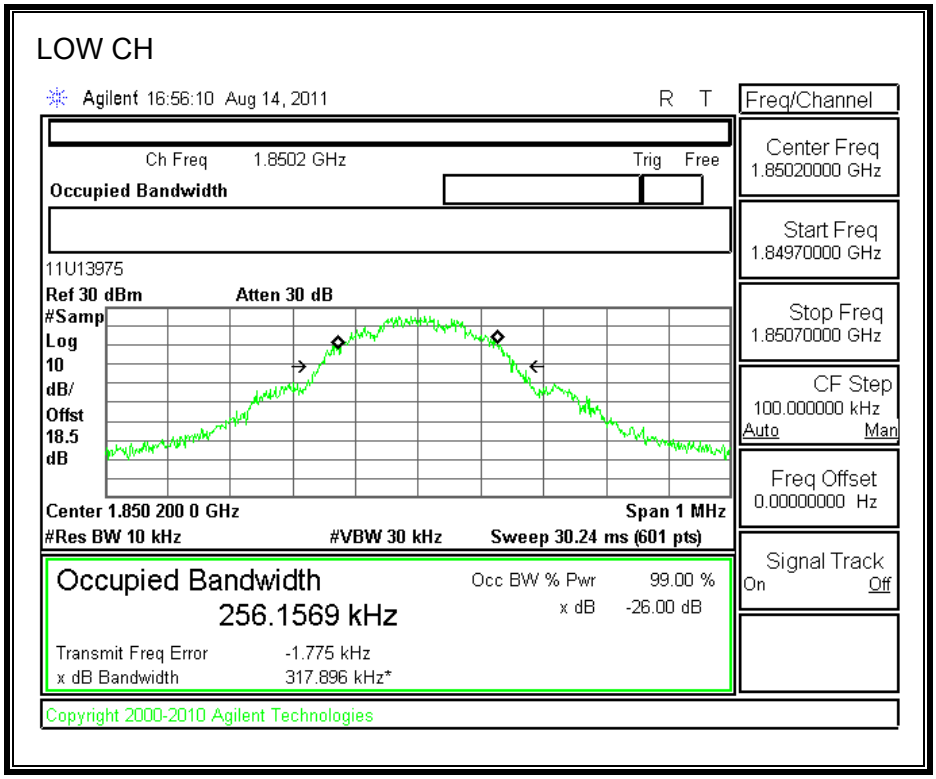


HIGH CH

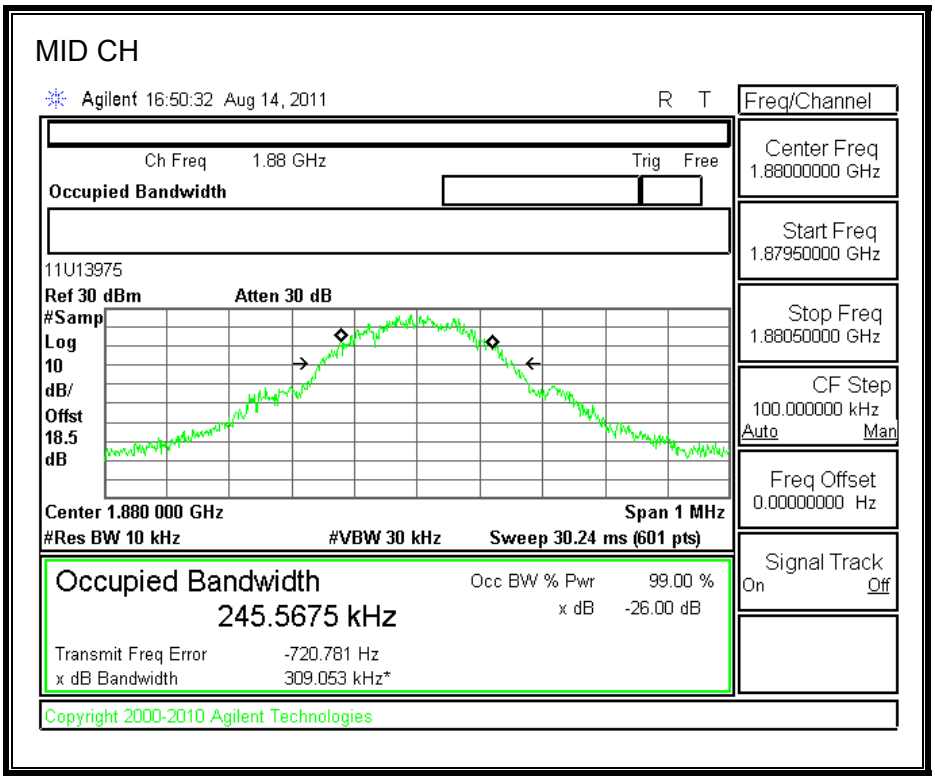


GPRS1900 BAND

LOW CH



MID CH



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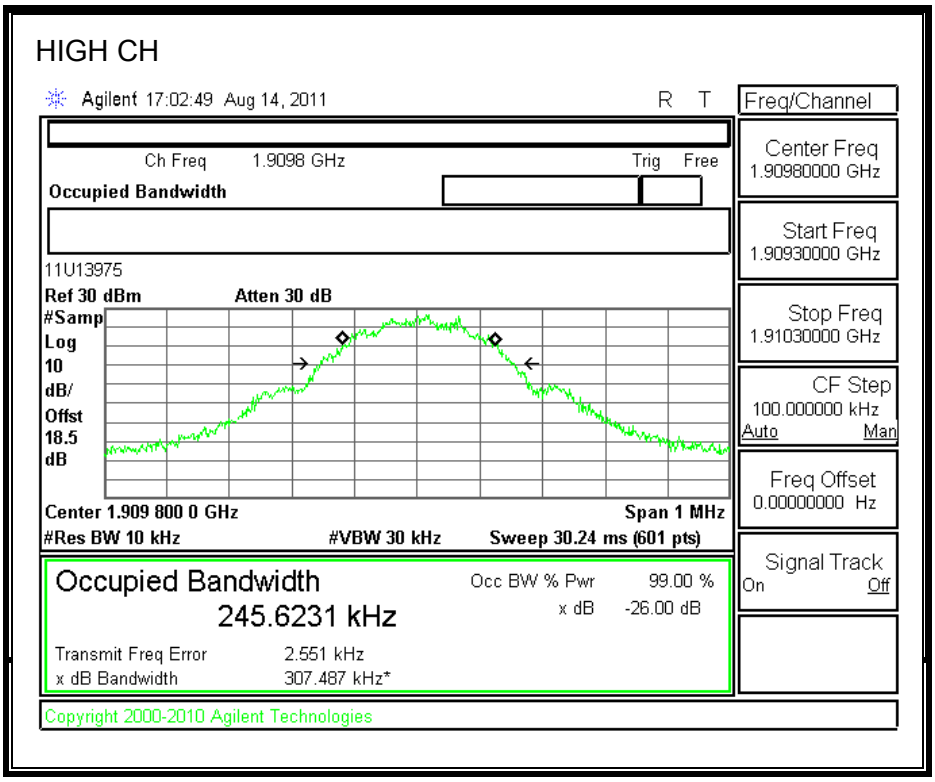
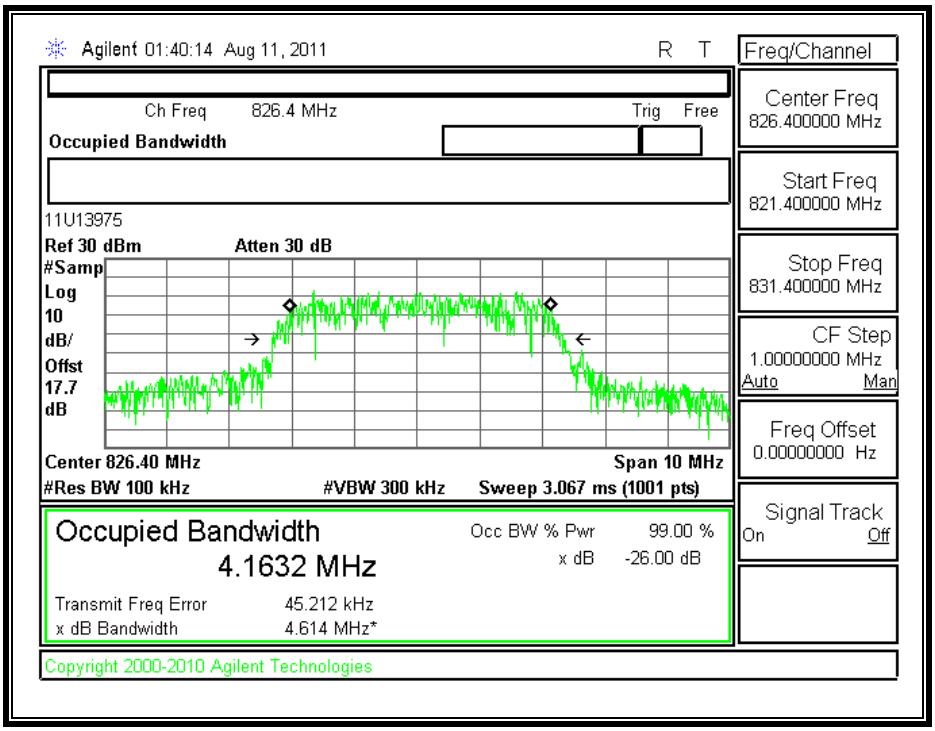
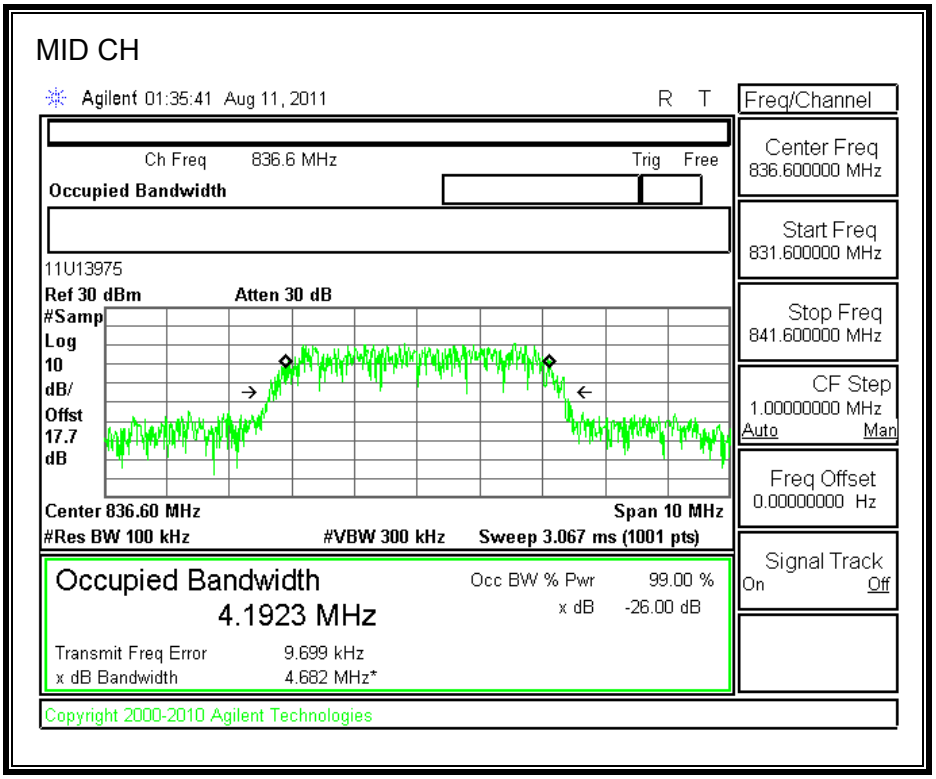


UMTS REL 99, CELL BAND

LOW CH





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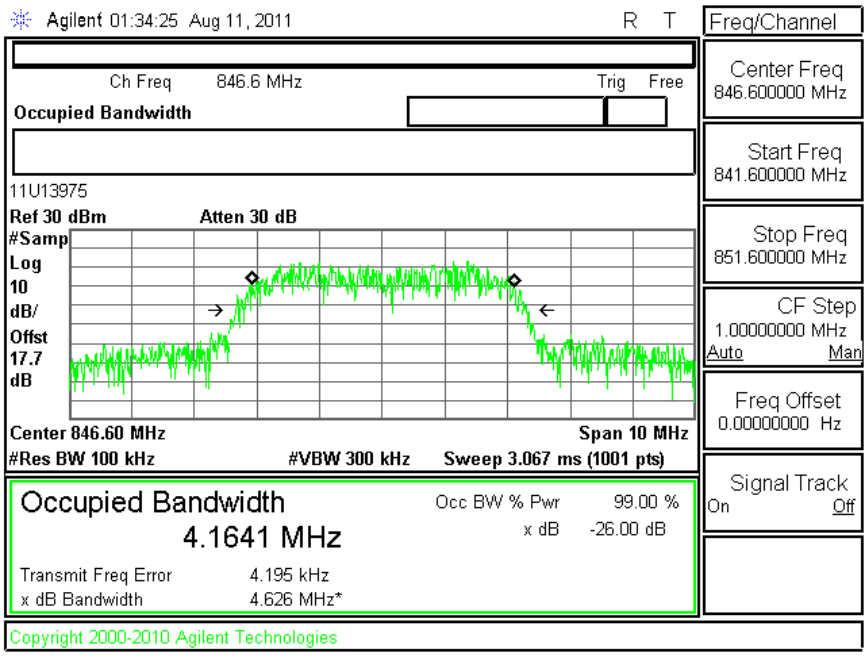
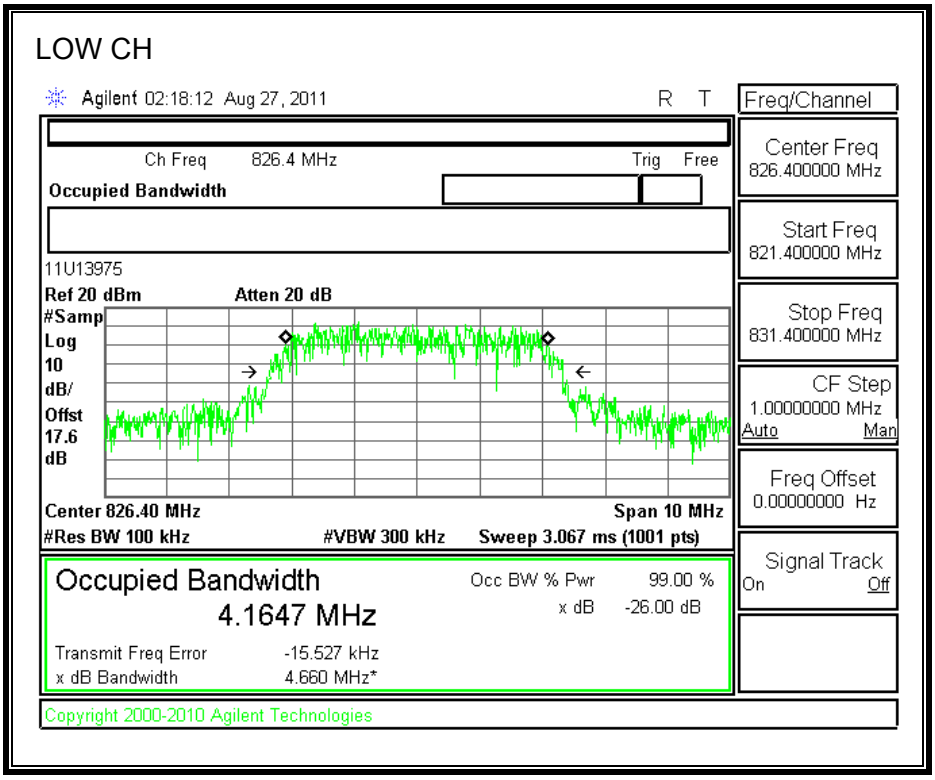


HSDPA REL 5, CELL BAND

LOW CH



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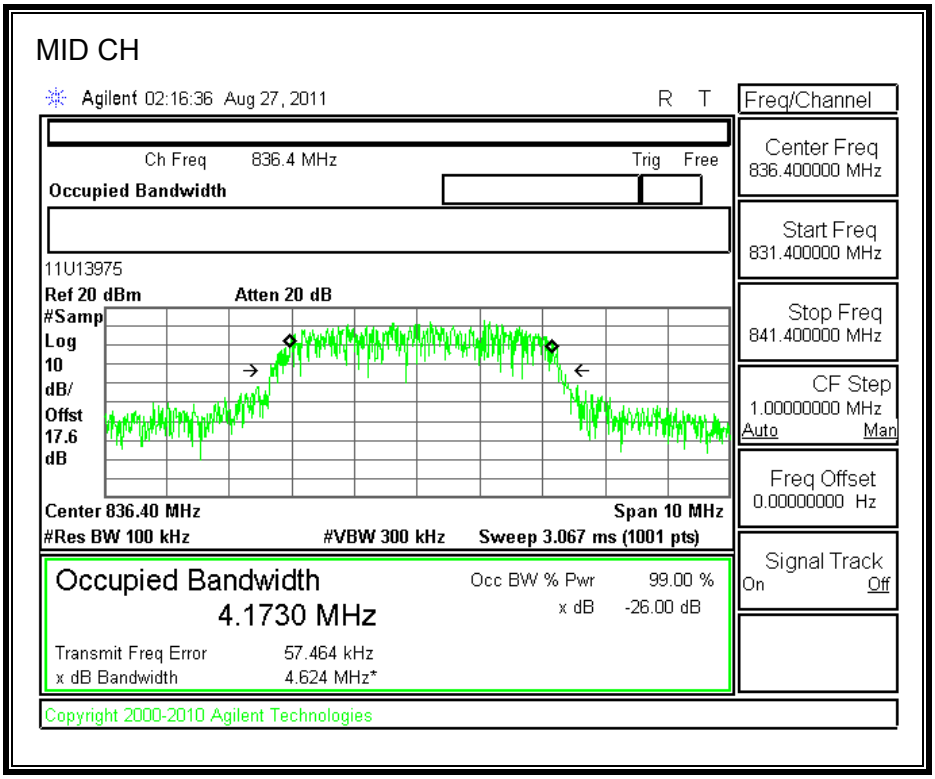
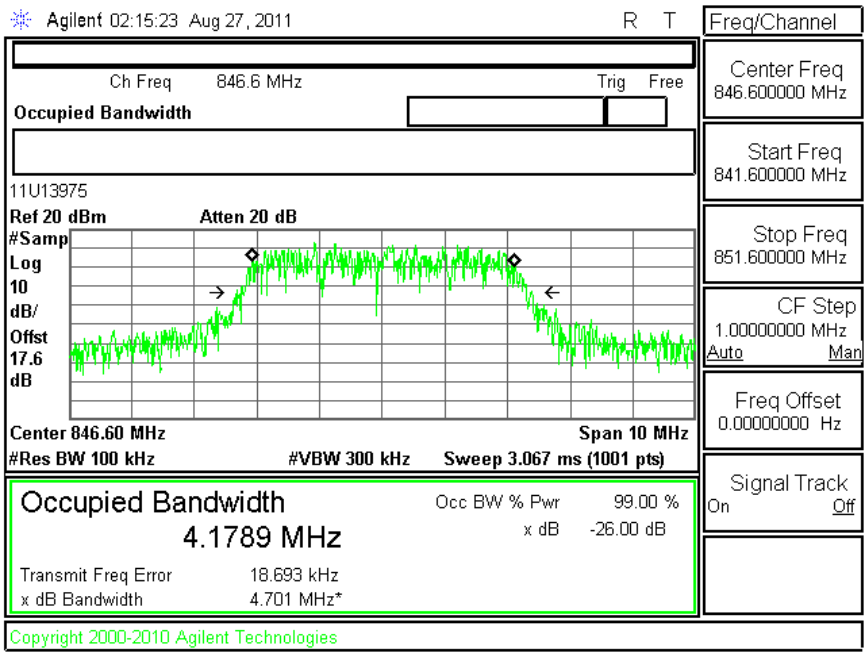


HIGH CH



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 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.

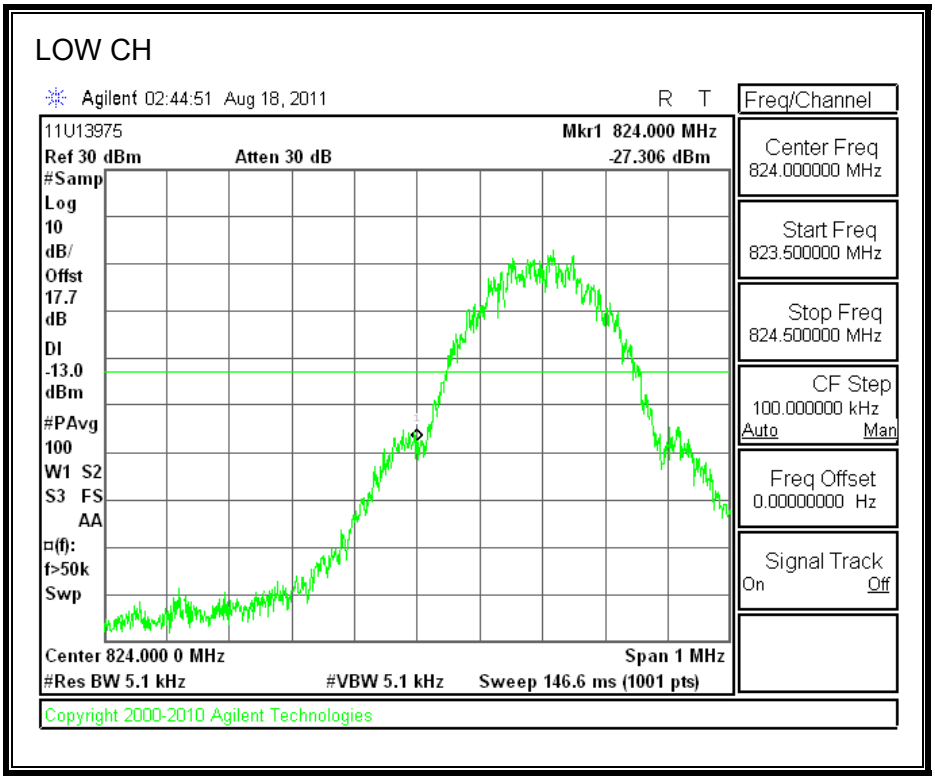
MODES TESTED

- GPRS
- UMTS REL. 99
- HSDPA REL. 5

RESULTS

BANDEDGE

GPRS850 BAND



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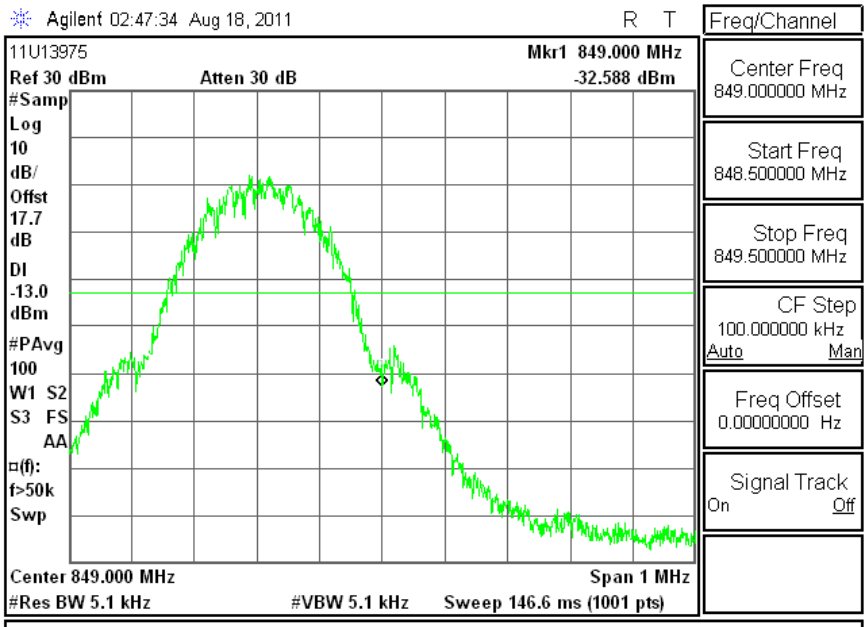
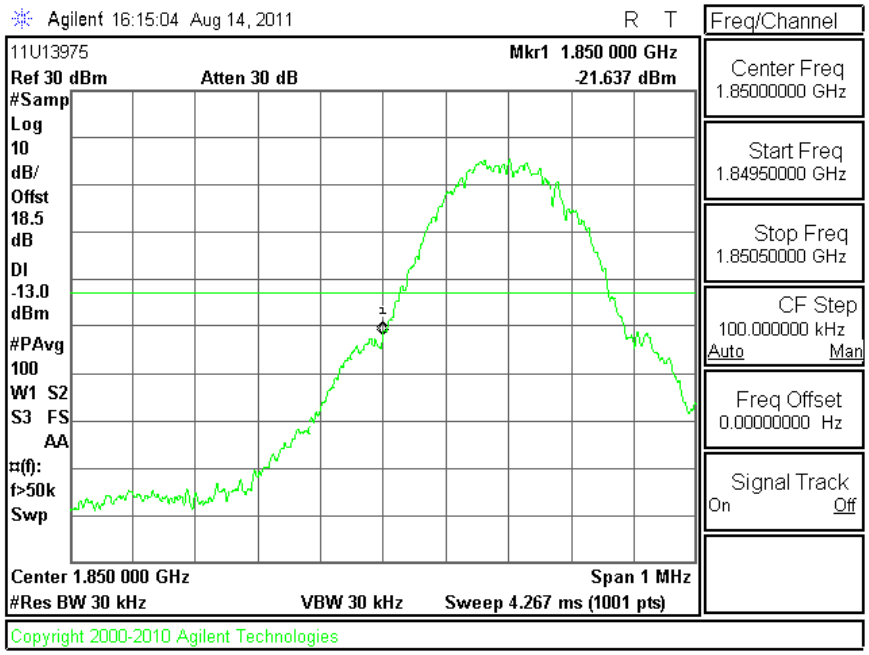


GPRS1900 BAND

LOW CH



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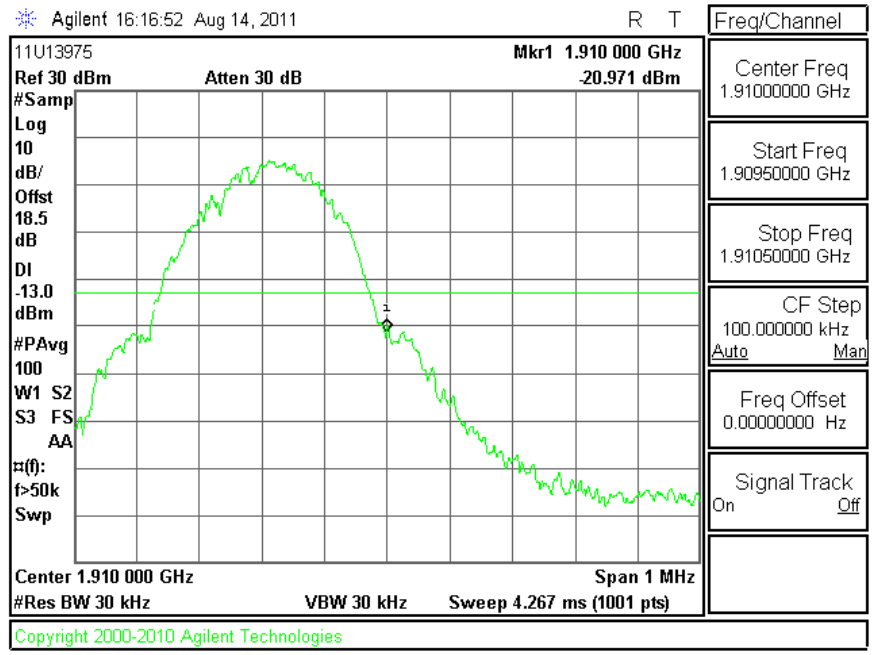
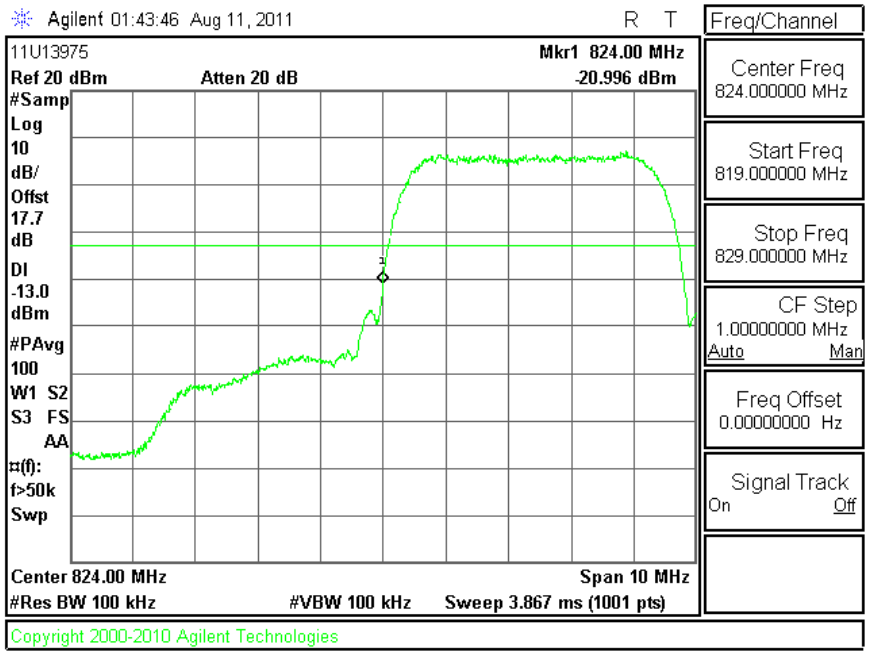


UMTS REL 99 CELL BAND

LOW CH



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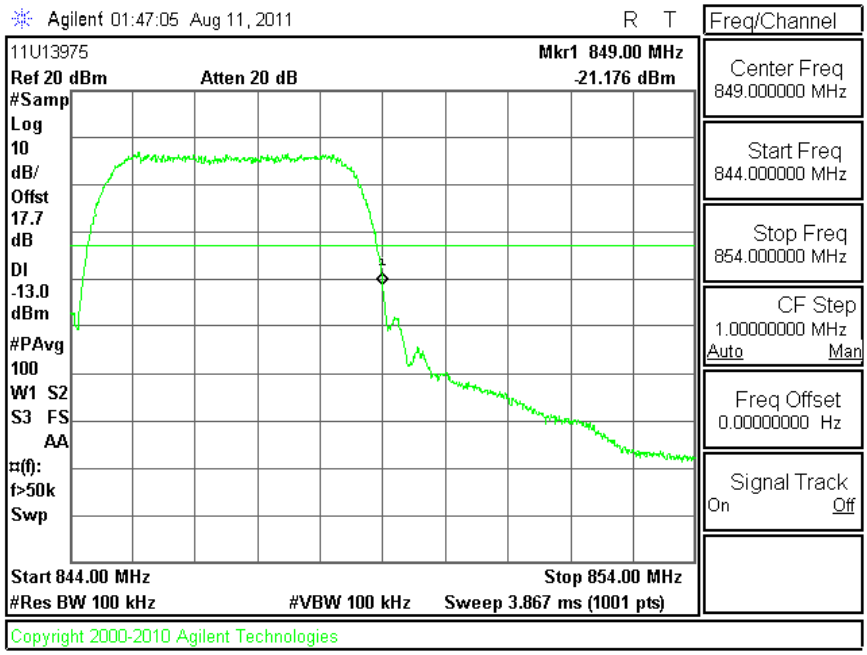
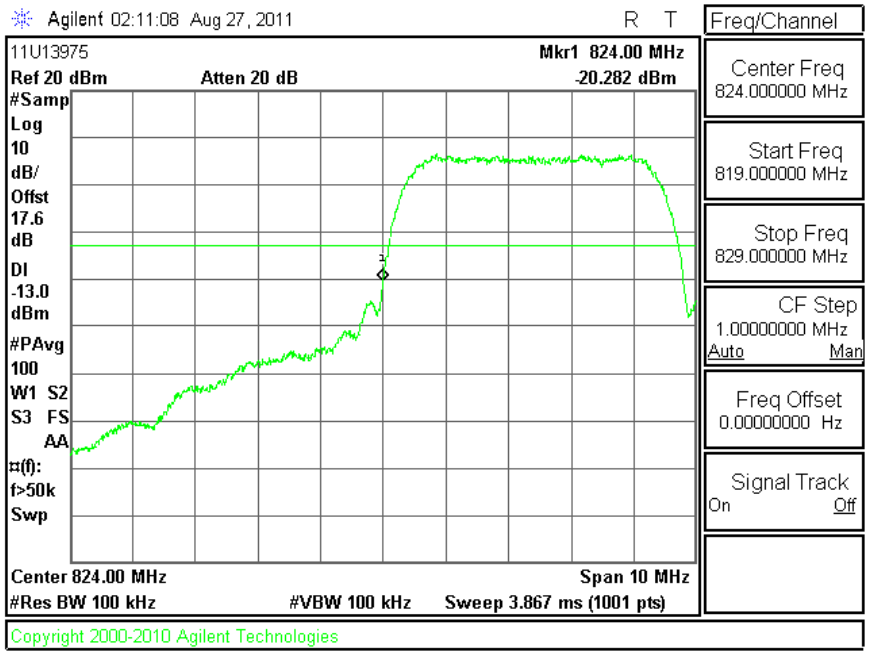


HSDPA REL 5 CELL BAND

LOW CH



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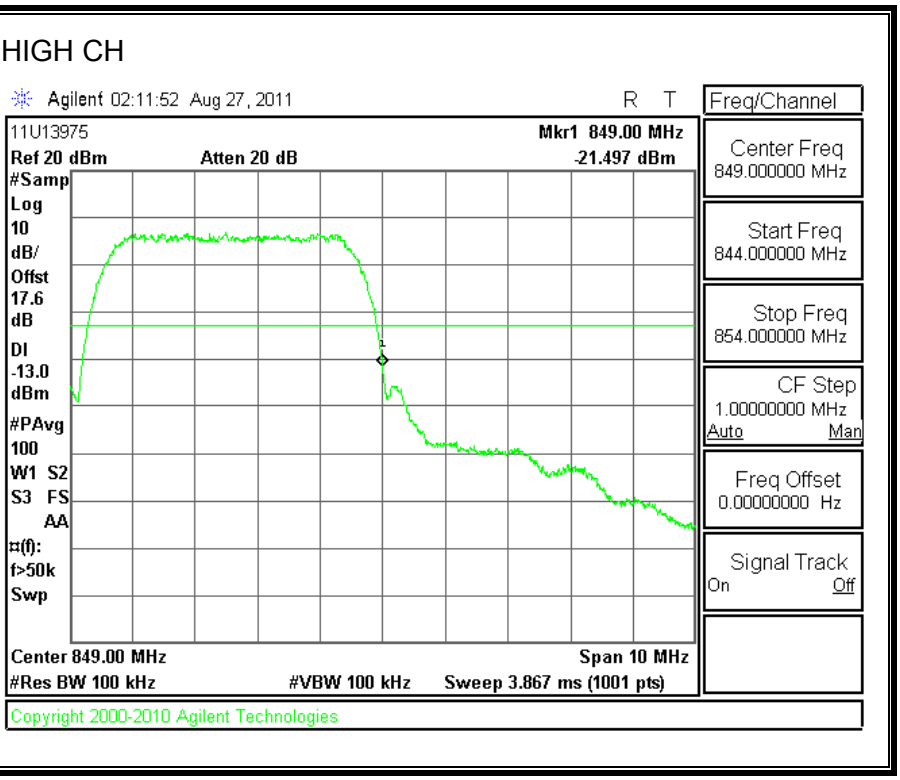


8.1.3. OUT OF BAND EMISSIONS

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.

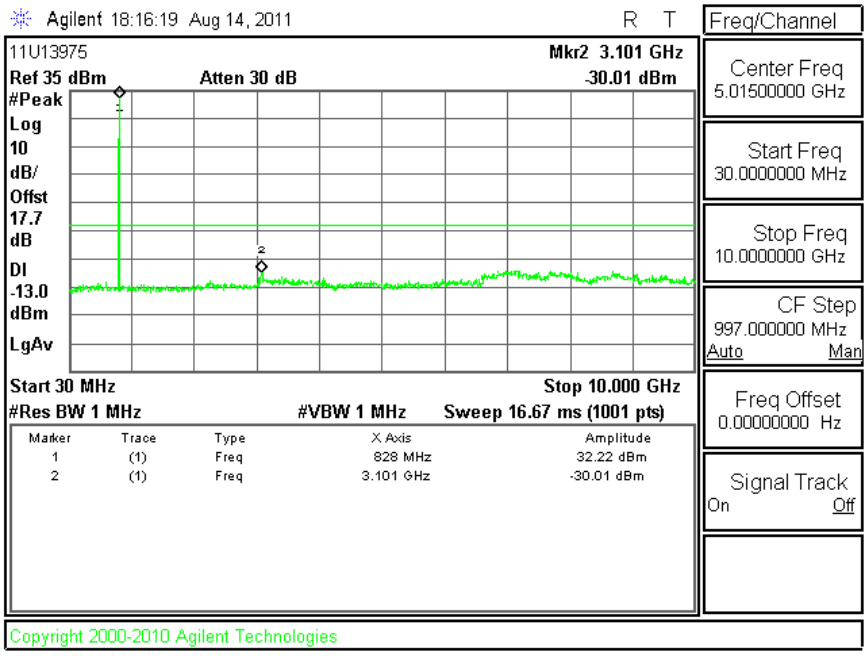
MODES TESTED

- GPRS
- UMTS REL. 99
- HSDPA REL. 5

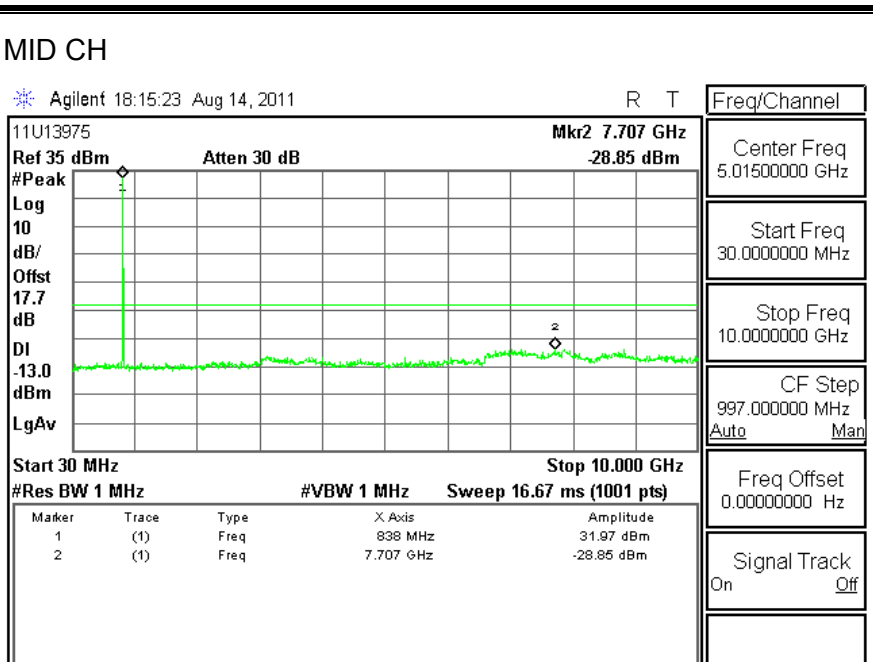
RESULTS

GPRS850 BAND

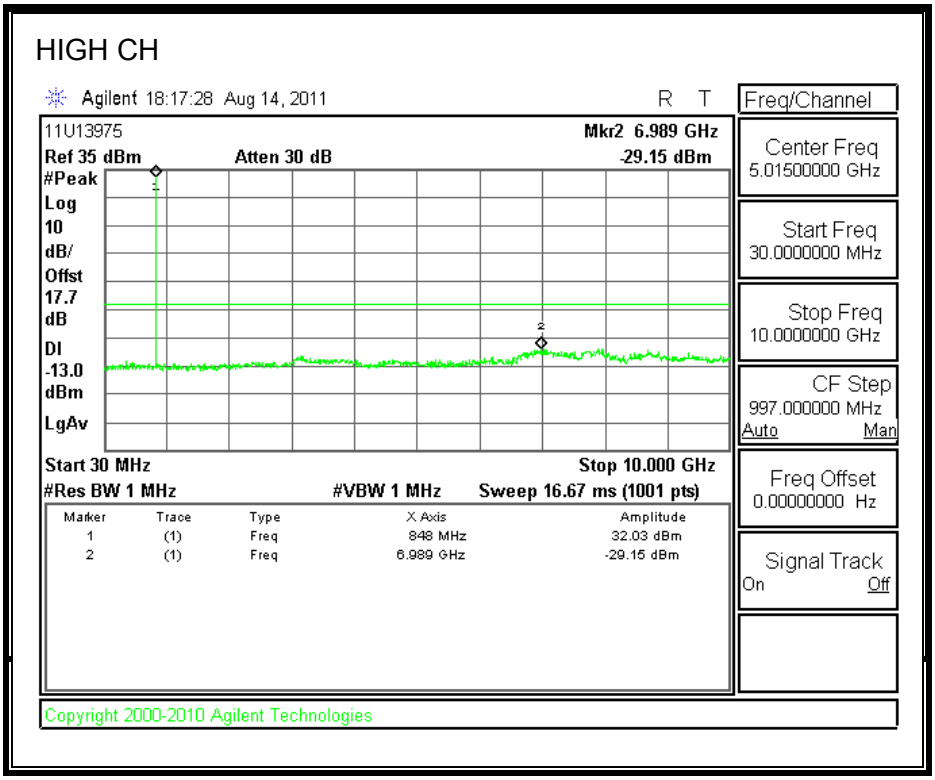
LOW CH



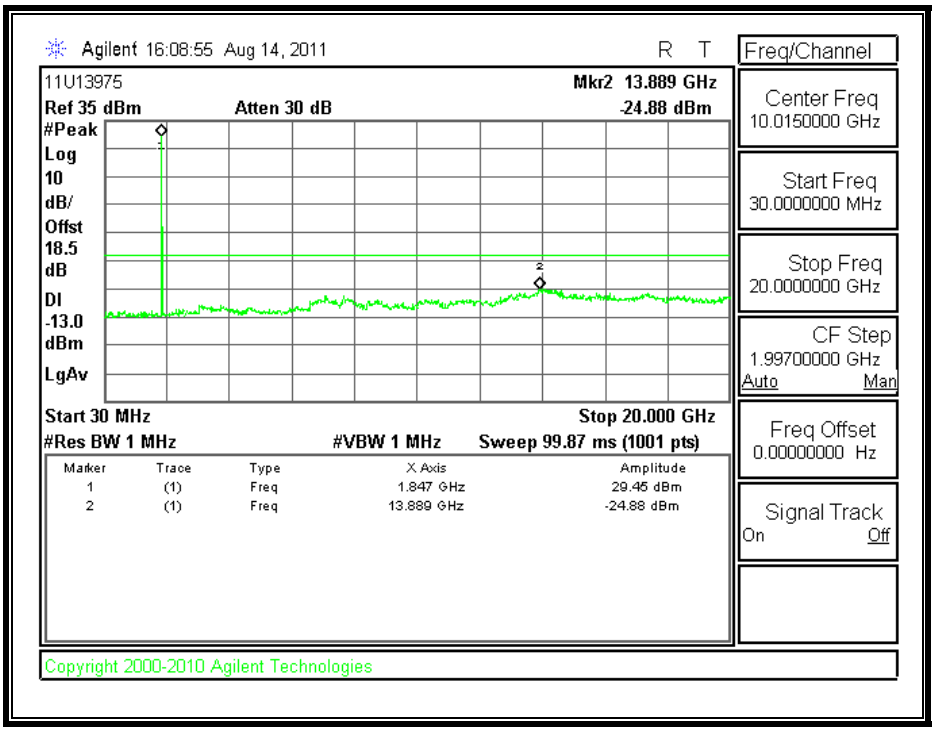
MID CH

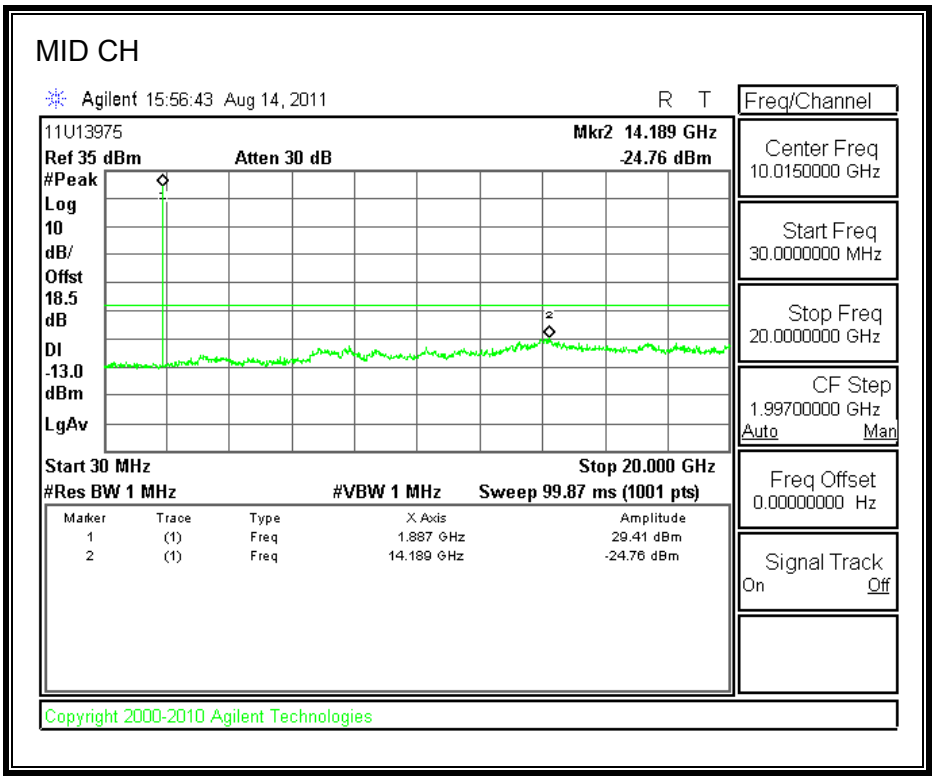


HIGH CH

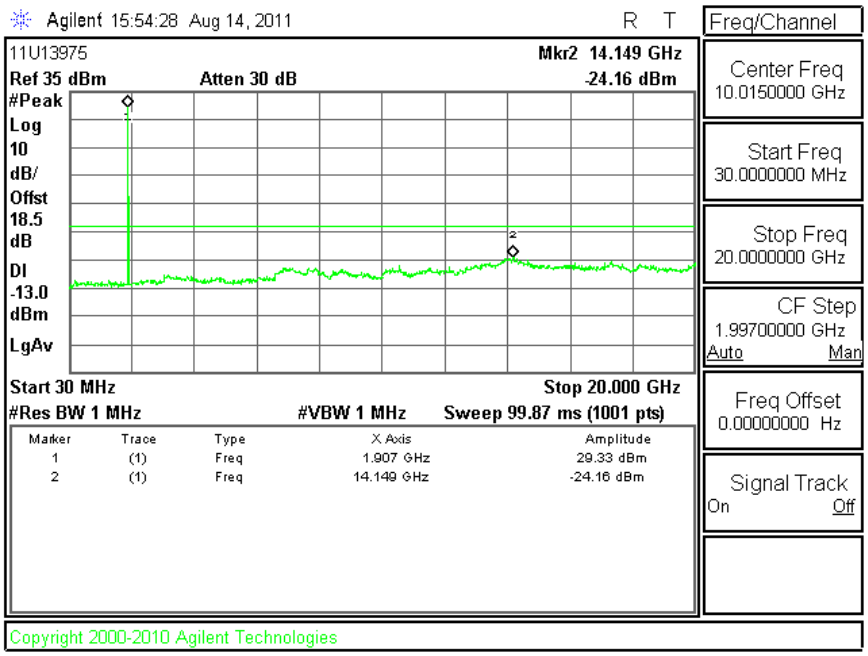


GPRS1900 BAND



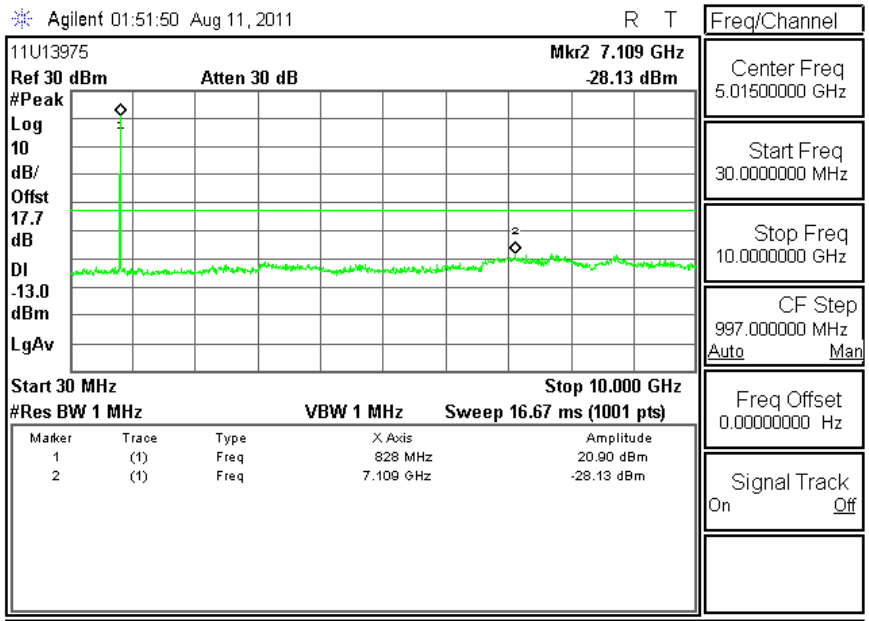


HIGH CH

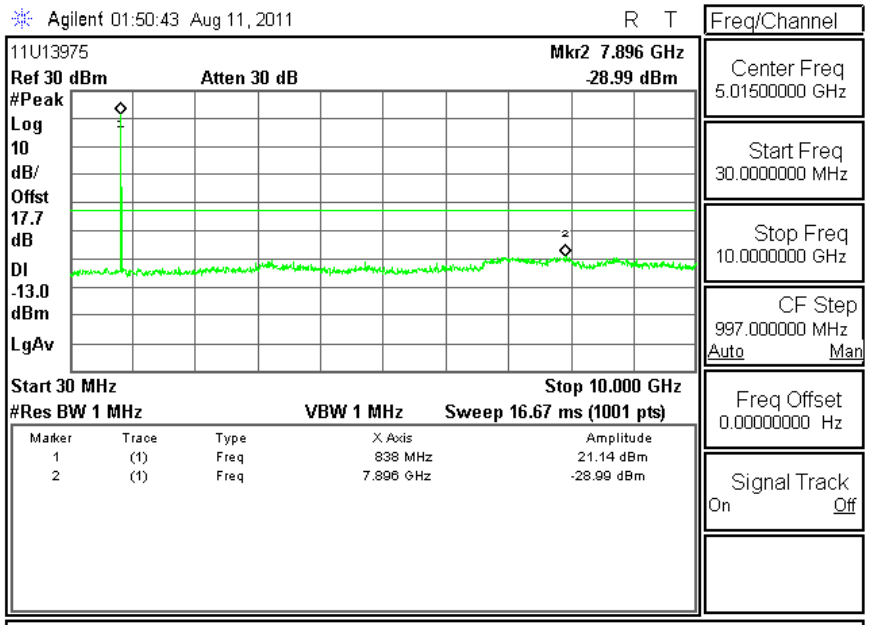


UMTS REL 99. Cell Band

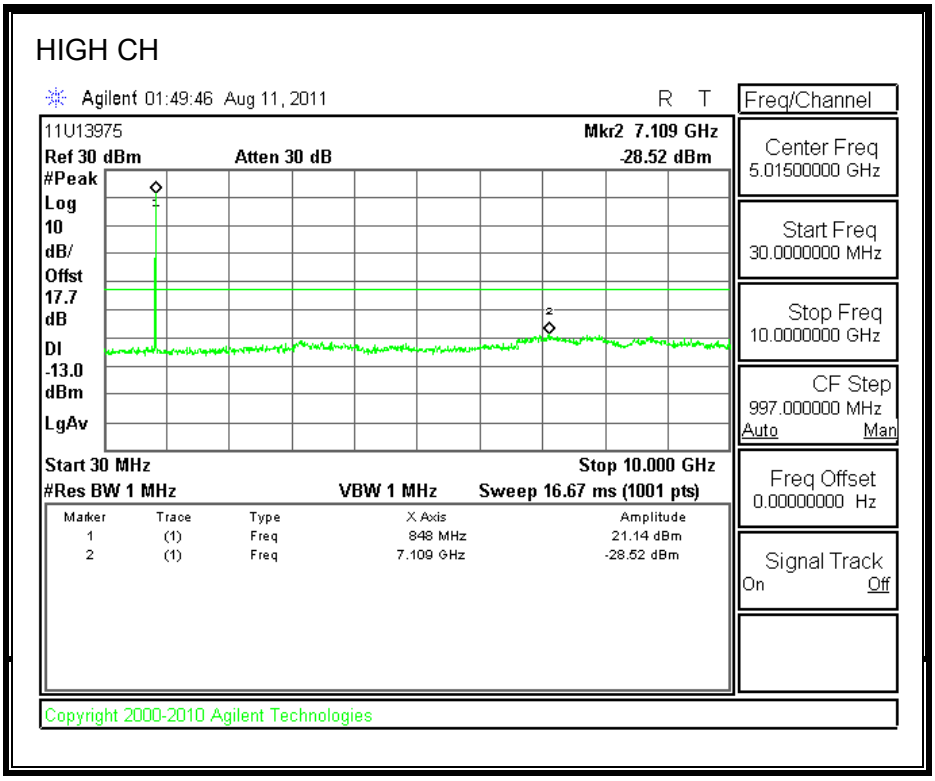
LOW CH



MID CH

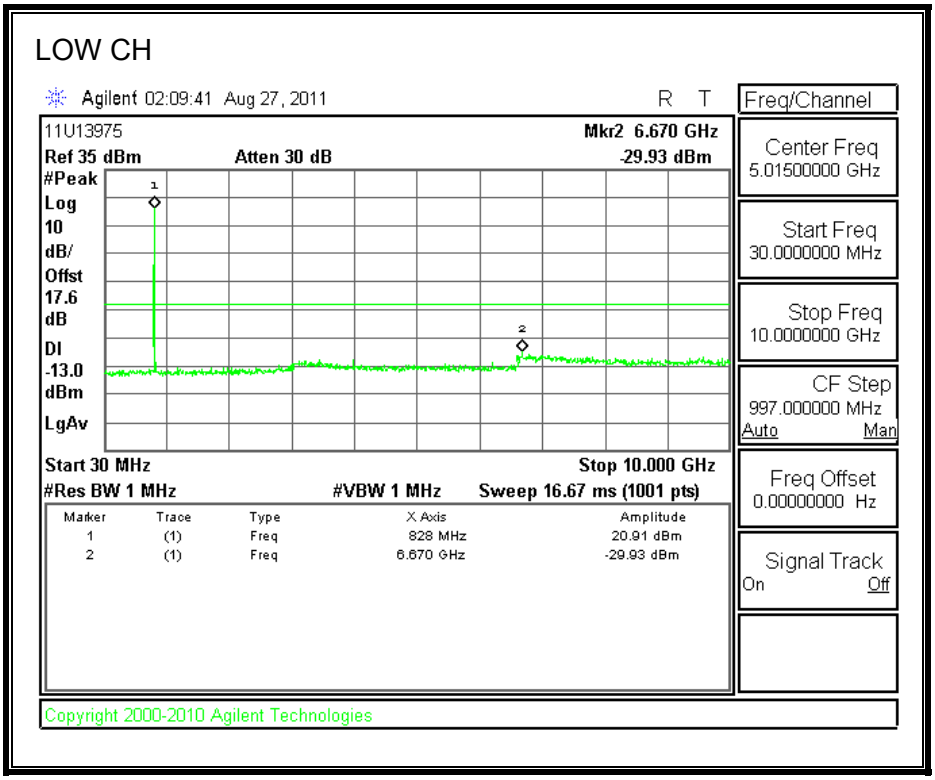


HIGH CH

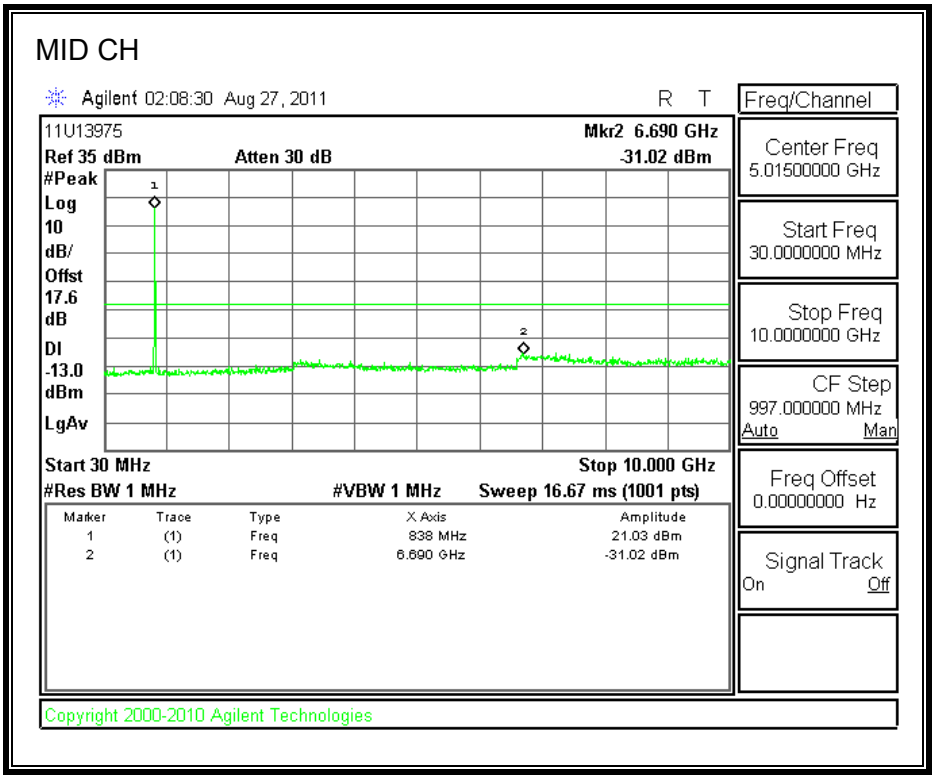


HSDPA REL 5. Cell Band

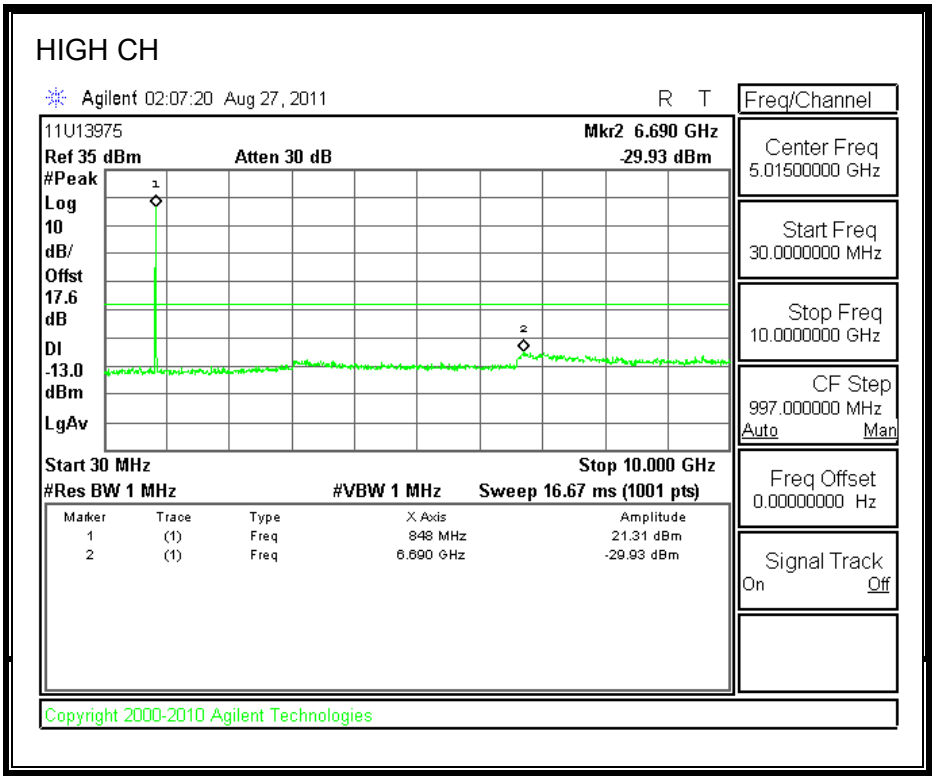
LOW CH



MID CH



HIGH CH



8.1.1. 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 place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached. Reference power supply voltage for these tests is 4.1 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 5

RESULTS

See the following pages.

CELL, GSM MODULATION – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.5999823MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.500 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
4.20	50	836.5999879	-0.007	2.5
4.20	40	836.5999856	-0.004	2.5
4.20	30	836.5999837	-0.002	2.5
4.20	***20***	***836.5999823***	***0***	2.5
4.20	10	836.5999823	0.000	2.5
4.20	0	836.5999822	0.000	2.5
4.20	-10	836.5999787	0.004	2.5
4.20	-20	836.5999742	0.010	2.5
4.20	-30	836.5999753	0.008	2.5
Reference Frequency: Cellular Mid Channel 835.837000MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.500 Hz				
Power Supply	**Environment**	**Frequency Deviation Measureed with Time Elapse**		
(Vdc)	**Temperature (°C)**	**(MHz)**	**Delta (ppm)**	**Limit (ppm)**
100%	***20***	***836.5999823***	***0***	***2.5***
85%	20	836.5999802	*0.003*	2.5
115%	20	836.5999833	*-0.001*	2.5

PCS, GSM MODULATION – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.9999661MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
4.20	50	1879.9999809	-0.008	2.5
4.20	40	1879.9999756	-0.005	2.5
4.20	30	1879.9999715	-0.003	2.5
4.20	***20***	***1879.9999661***	***0***	***2.5***
4.20	10	1879.9999707	-0.002	2.5
4.20	0	1879.9999748	-0.005	2.5
4.20	-10	1879.9999750	-0.005	2.5
4.20	-20	1879.9999760	-0.005	2.5
4.20	-30	1879.9999762	-0.005	2.5

Reference Frequency: PCS Mid Channel 1880.00007MHz @ 20ºC Limit: within the authorized block or +- 2.5 ppm = 4700.000 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (*C)	(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***1879.9999661***	***0***	***2.5***
85%	20	1879.9999707	*-0.002*	2.5
115%	20	1879.9999699	*-0.002*	2.5

CELL WCDMA – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.3999800MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
4.20	50	836.3999730	0.008	2.5
4.20	40	836.3999748	0.006	2.5
4.20	30	836.3999770	0.004	2.5
4.20	***20***	***836.3999800***	***0***	2.5
4.20	10	836.3999754	0.005	2.5
4.20	0	836.3999720	0.010	2.5
4.20	-10	836.3999720	0.010	2.5
4.20	-20	836.3999720	0.010	2.5
4.20	-30	836.3999697	0.012	2.5

Reference Frequency: Cellular Mid Channel 836.000004MHz @ 20°C Limit: to stay +- 2.5 ppm = 2091.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
100%	***20***	***836.3999800***	***0***	***2.5***
85%	20	836.3999798	*0.000*	2.5
115%	20	836.3999795	*0.001*	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 5

RESULTS

CELLULAR BAND (ERP)

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	32.32	1706.08
	192	836.60	31.49	1409.29
	251	848.80	30.74	1185.77
UMTS, Rel 99	4357	826.40	20.31	107.40
	4407	836.60	20.17	103.99
	4458	846.60	19.83	96.16
HSDPA, Rel 5	4357	826.40	21.05	127.35
	4407	836.60	21.59	144.21
	4458	846.60	20.25	105.93

PCS BAND (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	32.31	1702.16
	661	1880.00	32.48	1770.11
	810	1909.80	30.41	1099.01

GPRS850 BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 11U13867
Date: 08/06/11
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	32.82	V	0.5	0.0	32.32	38.5	-6.1	
824.20	19.35	H	0.5	0.0	18.85	38.5	-19.6	
836.60	31.99	V	0.5	0.0	31.49	38.5	-7.0	
836.60	19.20	H	0.5	0.0	18.70	38.5	-19.8	
848.80	31.24	V	0.5	0.0	30.74	38.5	-7.7	
848.80	18.77	H	0.5	0.0	18.27	38.5	-20.2	

Rev. 3.17.11

UMTS REL 99, 850MHz BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company:	SAMSUNG ELECTRONICS
Project #:	11U13975
Date:	08/15/11
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT ALONE
Mode:	TX, CELL BAND WCDMA MODE

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
826.40	20.81	V	0.5	0.0	20.31	38.5	-18.1	
826.40	4.36	H	0.5	0.0	3.86	38.5	-34.6	
836.60	20.67	V	0.5	0.0	20.17	38.5	-18.3	
836.60	4.33	H	0.5	0.0	3.83	38.5	-34.6	
846.60	20.33	V	0.5	0.0	19.83	38.5	-18.6	
846.60	3.97	H	0.5	0.0	3.47	38.5	-35.0	

Rev. 3.17.11

ERP HSDPA REL 5, 850MHz BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 11U13975
Date: 08/26/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, CELL BAND HSDPA MODE

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

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
826.40	21.55	V	0.5	0.0	21.05	38.5	-17.4	
826.40	3.79	H	0.5	0.0	3.29	38.5	-35.2	
836.40	22.09	V	0.5	0.0	21.59	38.5	-16.9	
836.60	4.23	H	0.5	0.0	3.73	38.5	-34.7	
846.60	20.75	V	0.5	0.0	20.25	38.5	-18.2	
846.60	4.28	H	0.5	0.0	3.78	38.5	-34.7	

Rev. 3.17.11

GPRS1900 BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: Samsung
Project #: 11I13975
Date: 08/06/11
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
1.851	25.2	V	0.85	8.01	32.31	33.0	-0.7	
1.851	16.2	H	0.85	8.01	23.36	33.0	-9.6	
1.880	25.2	V	0.85	8.13	32.48	33.0	-0.5	
1.880	16.8	H	0.85	8.13	24.08	33.0	-8.9	
1.909	23.1	V	0.85	8.13	30.41	33.0	-2.6	
1.909	14.3	H	0.85	8.13	21.58	33.0	-11.4	

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 5

RESULTS

GPRS850 BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 11I13975
Date: 08/06/11
Test Engineer: Chin Pang
Configuration: EUT only
Mode: TX, CELL BAND GPRS MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-8.7	V	3.0	35.5	1.0	-43.3	-13.0	-30.3	
4.121	-5.7	V	3.0	35.2	1.0	-39.9	-13.0	-26.9	
4.945	-11.8	V	3.0	35.3	1.0	-46.1	-13.0	-33.1	
1.648	-10.3	H	3.0	35.5	1.0	-44.8	-13.0	-31.8	
4.121	-7.4	H	3.0	35.2	1.0	-41.7	-13.0	-28.7	
4.945	-9.8	H	3.0	35.3	1.0	-44.2	-13.0	-31.2	
Mid Ch, (836.6MHz)									
1.673	-9.1	V	3.0	35.5	1.0	-43.6	-13.0	-30.6	
3.346	-13.7	V	3.0	35.5	1.0	-48.3	-13.0	-35.3	
4.183	-8.4	V	3.0	35.2	1.0	-42.6	-13.0	-29.6	
1.673	-8.3	H	3.0	35.5	1.0	-42.9	-13.0	-29.9	
2.510	-18.1	H	3.0	35.4	1.0	-52.5	-13.0	-39.5	
4.183	-9.2	H	3.0	35.2	1.0	-43.4	-13.0	-30.4	
High Ch, (848.8MHz)									
1.698	-9.6	V	3.0	35.5	1.0	-44.1	-13.0	-31.1	
3.395	-9.9	V	3.0	35.5	1.0	-44.4	-13.0	-31.4	
4.244	-6.1	V	3.0	35.2	1.0	-40.4	-13.0	-27.4	
1.698	-8.1	H	3.0	35.5	1.0	-42.6	-13.0	-29.6	
3.395	-14.1	H	3.0	35.5	1.0	-48.6	-13.0	-35.6	
4.244	-6.7	H	3.0	35.2	1.0	-41.0	-13.0	-28.0	

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 #: 11U13875
Date: 08/15/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, CELL BAND WCDMA MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (826.4MHz)									
1.653	-20.4	V	3.0	35.5	1.0	-54.9	-13.0	-41.9	
2.479	-20.8	V	3.0	35.4	1.0	-55.2	-13.0	-42.2	
3.306	-16.2	V	3.0	35.5	1.0	-50.8	-13.0	-37.8	
4.132	-17.7	V	3.0	35.2	1.0	-51.9	-13.0	-38.9	
1.653	-18.7	H	3.0	35.5	1.0	-53.2	-13.0	-40.2	
2.479	-24.7	H	3.0	35.4	1.0	-59.1	-13.0	-46.1	
3.306	-15.1	H	3.0	35.5	1.0	-49.6	-13.0	-36.6	
4.132	-18.0	H	3.0	35.2	1.0	-52.2	-13.0	-39.2	
Mid Channel (836.6MHz)									
1.673	-20.0	V	3.0	35.5	1.0	-54.5	-13.0	-41.5	
2.510	-20.5	V	3.0	35.4	1.0	-54.9	-13.0	-41.9	
3.346	-16.5	V	3.0	35.5	1.0	-51.0	-13.0	-38.0	
4.183	-17.6	V	3.0	35.2	1.0	-51.8	-13.0	-38.8	
1.673	-19.5	H	3.0	35.5	1.0	-54.0	-13.0	-41.0	
2.510	-21.1	H	3.0	35.4	1.0	-55.5	-13.0	-42.5	
3.346	-14.8	H	3.0	35.5	1.0	-49.3	-13.0	-36.3	
4.183	-18.7	H	3.0	35.2	1.0	-52.9	-13.0	-39.9	
High Channel (846.6MHz)									
1.693	-21.7	V	3.0	35.5	1.0	-56.2	-13.0	-43.2	
2.540	-21.0	V	3.0	35.4	1.0	-55.4	-13.0	-42.4	
3.386	-14.9	V	3.0	35.5	1.0	-49.4	-13.0	-36.4	
4.233	-18.0	V	3.0	35.2	1.0	-52.3	-13.0	-39.3	
1.693	-17.8	H	3.0	35.5	1.0	-52.4	-13.0	-39.4	
2.540	-21.3	H	3.0	35.4	1.0	-55.7	-13.0	-42.7	
3.386	-10.3	H	3.0	35.5	1.0	-44.8	-13.0	-31.8	

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

ERP HSDPA REL 5, CELL BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SAMSUNG ELECTRONICS
Project #: 11U13875
Date: 08/28/11
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, CELL BAND HSDPA MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Channel (826.4MHz)									
1.653	-18.5	V	3.0	35.5	1.0	-53.1	-13.0	-40.1	
2.479	-22.0	V	3.0	35.4	1.0	-56.4	-13.0	-43.4	
3.306	-19.7	V	3.0	35.5	1.0	-54.2	-13.0	-41.2	
4.132	-12.7	V	3.0	35.2	1.0	-46.9	-13.0	-33.9	
4.958	-18.3	V	3.0	35.3	1.0	-52.6	-13.0	-39.6	
1.653	-21.8	H	3.0	35.5	1.0	-56.3	-13.0	-43.3	
2.479	-22.7	H	3.0	35.4	1.0	-57.1	-13.0	-44.1	
3.306	-18.0	H	3.0	35.5	1.0	-52.5	-13.0	-39.5	
4.132	-12.3	H	3.0	35.2	1.0	-46.5	-13.0	-33.5	
4.958	-17.6	H	3.0	35.3	1.0	-51.9	-13.0	-38.9	
Mid Channel (836.6MHz)									
1.673	-20.3	V	3.0	35.5	1.0	-54.9	-13.0	-41.9	
2.510	-20.0	V	3.0	35.4	1.0	-54.4	-13.0	-41.4	
3.346	-19.0	V	3.0	35.5	1.0	-53.6	-13.0	-40.6	
4.183	-13.6	H	3.0	35.2	1.0	-47.9	-13.0	-34.9	
5.020	-17.5	H	3.0	35.3	1.0	-51.8	-13.0	-38.8	
1.673	-22.4	H	3.0	35.5	1.0	-56.9	-13.0	-43.9	
2.510	-22.1	H	3.0	35.4	1.0	-56.5	-13.0	-43.5	
3.346	-16.2	H	3.0	35.5	1.0	-50.7	-13.0	-37.7	
4.183	-12.6	H	3.0	35.2	1.0	-46.9	-13.0	-33.9	
5.020	-17.4	H	3.0	35.3	1.0	-51.8	-13.0	-38.8	
High Channel (846.6MHz)									
1.693	-20.6	V	3.0	35.5	1.0	-55.1	-13.0	-42.1	
2.540	-18.7	V	3.0	35.4	1.0	-53.1	-13.0	-40.1	
3.386	-10.9	V	3.0	35.5	1.0	-45.4	-13.0	-32.4	
4.233	-13.9	V	3.0	35.2	1.0	-48.2	-13.0	-35.2	
5.080	-18.8	V	3.0	35.3	1.0	-53.1	-13.0	-40.1	
1.693	-20.5	H	3.0	35.5	1.0	-55.0	-13.0	-42.0	
2.540	-20.6	H	3.0	35.4	1.0	-55.0	-13.0	-42.0	
3.386	-13.0	H	3.0	35.5	1.0	-47.5	-13.0	-34.5	
4.233	-12.2	H	3.0	35.2	1.0	-46.4	-13.0	-33.4	
5.080	-17.0	H	3.0	35.3	1.0	-51.3	-13.0	-38.3	

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 #:	11I13975
Date:	08/06/11
Test Engineer:	Chin Pang
Configuration:	EUT ALONE
Mode:	TX, PCS BAND GPRS MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (1851.25MHz)									
3.700	-10.9	V	3.0	35.4	1.0	-45.2	-13.0	-32.2	
5.551	-6.2	V	3.0	35.4	1.0	-40.6	-13.0	-27.6	
7.401	-6.5	V	3.0	35.7	1.0	-41.2	-13.0	-28.2	
3.700	-11.2	H	3.0	35.4	1.0	-45.5	-13.0	-32.5	
5.551	-3.7	H	3.0	35.4	1.0	-38.1	-13.0	-25.1	
7.401	-0.2	H	3.0	35.7	1.0	-34.9	-13.0	-21.9	
		H							
Mid Ch, (1880.0MHz)									
3.760	-8.2	V	3.0	35.3	1.0	-42.6	-13.0	-29.6	
5.640	-6.4	V	3.0	35.4	1.0	-40.8	-13.0	-27.8	
7.520	-3.0	V	3.0	35.7	1.0	-37.7	-13.0	-24.7	
3.760	-11.5	H	3.0	35.3	1.0	-45.8	-13.0	-32.8	
5.640	-4.5	H	3.0	35.4	1.0	-39.0	-13.0	-26.0	
7.520	-0.2	H	3.0	35.7	1.0	-34.9	-13.0	-21.9	
High Ch, (1908.75MHz)									
3.820	-4.3	V	3.0	35.3	1.0	-38.6	-13.0	-25.6	
5.729	-3.7	V	3.0	35.4	1.0	-38.2	-13.0	-25.2	
7.639	-5.1	V	3.0	35.7	1.0	-39.8	-13.0	-26.8	
3.820	-9.7	H	3.0	35.3	1.0	-44.0	-13.0	-31.0	
5.729	-5.0	H	3.0	35.4	1.0	-39.4	-13.0	-26.4	
7.639	1.5	H	3.0	35.7	1.0	-33.2	-13.0	-20.2	

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