



**FCC CFR47 PART 22 SUBPART H
FCC CFR47 PART 24 SUBPART E**

**CERTIFICATION TEST REPORT
FOR**

BT3.0+EDR, 802.11 b/g/n 1x1 HT20, GSM850/1900 & WCDMA850 Bar phone

**MODEL NUMBER: GT-B5510B
FCC ID: A3LGTB5510B**

**REPORT NUMBER: 11I13982-1A
ISSUE DATE: OCTOBER 5, 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
---	09/12/11	Initial Issue	T. Chan
A	10/05/11	Update average power, GPRS OBW and spelling typo	C. Pang

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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, EDGE RX ONLY PHONE WITH
BLUETOOTH AND WLAN TRANSCEIVER

MODEL: GT-B5510B

SERIAL NUMBER: F1202C

DATE TESTED: AUGUST 26-30 and OCTOBER 5, 2011

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

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

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

Approved & Released For UL CCS By:

Tested By:



THU CHAN
ENGINEERING MANAGER
UL CCS

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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) – Preamplifier 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 + EDR, 802.11bgn 1x1 HT20 GSM850/1900, WCDMA850MHz Bar phone with hotspots and VOIP supported.

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	32.69	1857.8	29.34	859.0

Part 22 Cellular Band

Frequency range (MHz)	Modulation	Conducted		ERP	
		dBm	mW	dBm	mW
826.4 – 846	UMTS, REL 99	26.24	420.7	24.74	297.9
826.4 – 846	UMTS, HSDPA	27.03	504.7	24.64	291.1

Part 24 PCS Band

Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2 – 1909.8	GPRS	29.42	875.0	30.48	1116.9

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna for the 850MHz with a peak gain of -7.09dBi and -0.47dBi gain for 1900MHz.

5.4. SOFTWARE AND FIRMWARE

The EUT software installed during testing was Samsung galaxy pro

The EUT is linked with Agilent 8960 Communication Test Set.

5.5. 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
- For Cellular and PCS band: UMTS, REL 99 and HSDPA. Sub-set 2

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

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	Samsung	ETAOU10EBE	SC3ZA16MS/7-E	DoC
Headset	Samsung	N/A	GT 032 B	NA

I/O CABLES (Conducted Setup)

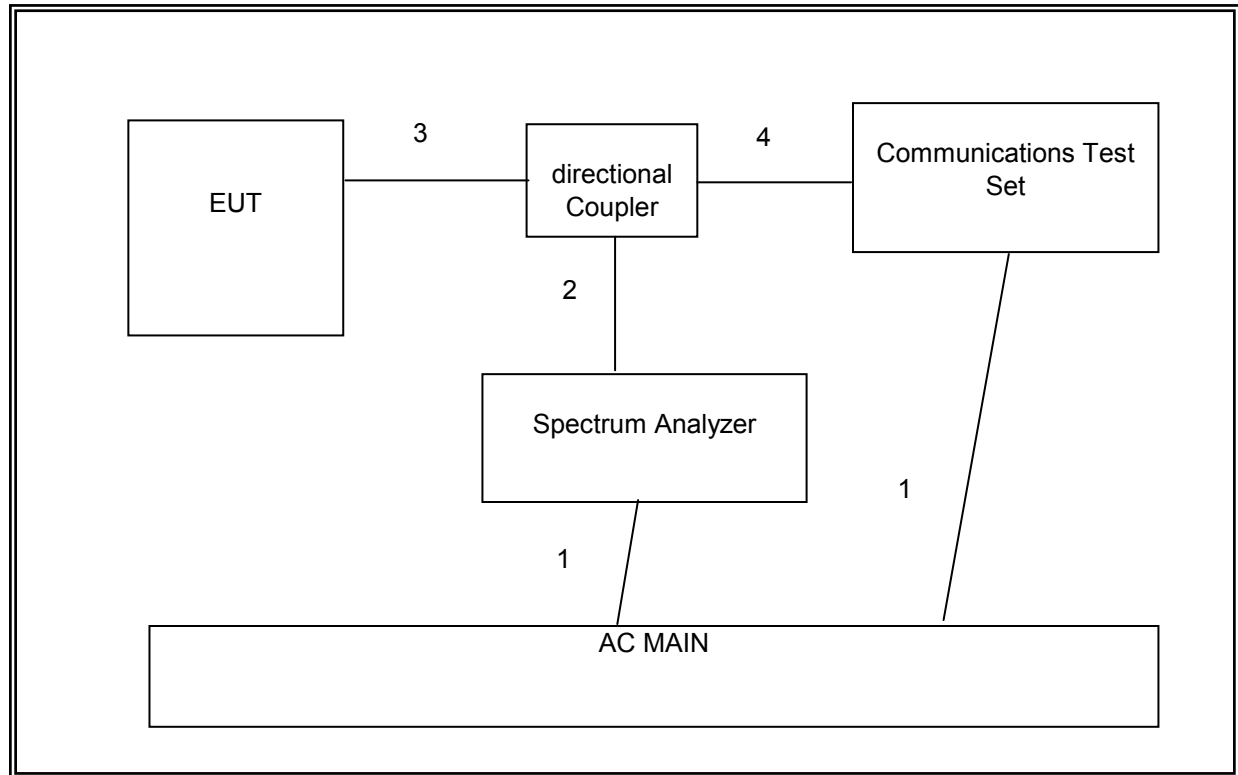
I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	2	115VAC	Un-shielded	1.5m	NA
2	RF In/Out	1	Spectrum Analyzer	Un-shielded	none	
3	Antenna Port	1	Directional Coupler	Un-shielded	1.7m	
4	RF In/Out	1	Test Set	Un-shielded	0.5m	NA

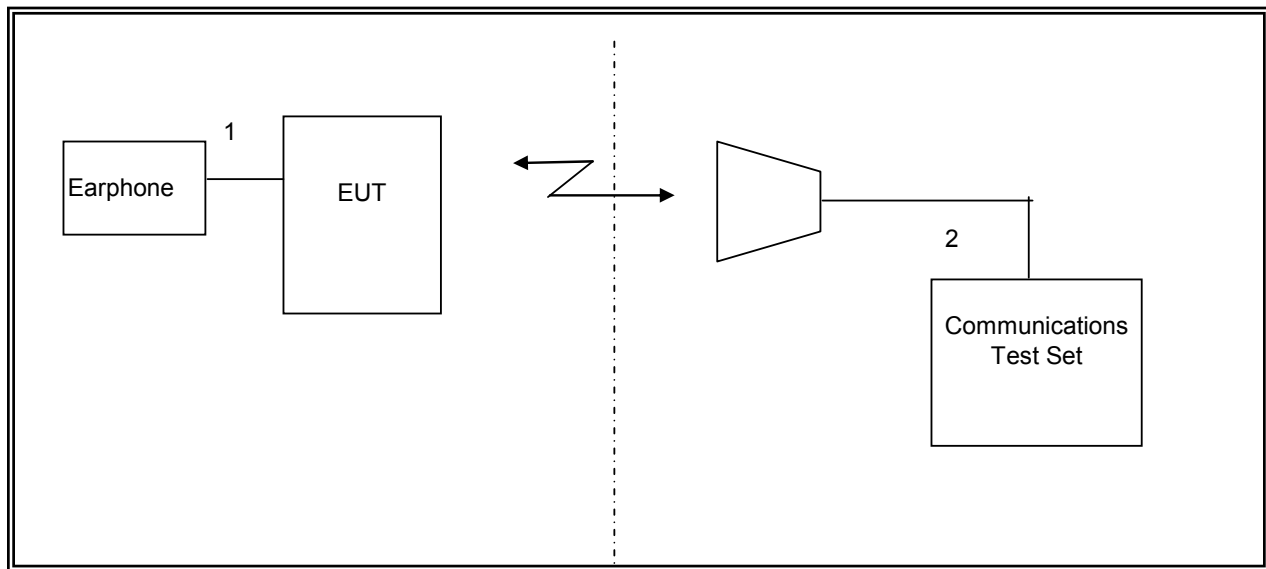
I/O CABLES (Radiated Setup)

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	09/17/12
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

Mode	Ch.	f (MHz)	1 time slot	2 time slots	3 time slots	4 time slots
			Peak	Peak	Peak	Peak
GPRS	128	824.2	32.61	31.22	29.21	27.20
	190	836.6	32.66	31.25	29.24	27.20
	251	848.8	32.69	31.25	29.25	27.20
GPRS	512	1850.2	29.42	27.90	25.70	23.70
	661	1880	29.42	27.80	25.70	23.70
	810	1909.8	29.30	27.80	25.70	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)
				Peak
UMTS 850	4132	4357	826.4	26.20
	4180	4405	836.4	26.20
	4230	4455	846.6	26.24

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			
	Abs = β_{hs}/β_c	30/15			

RESULT

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS850 (Band V)	1	4132	4357	826.4	26.05
		4180	4405	836.0	26.20
		4230	4455	846.0	26.20
	2	4132	4357	826.4	26.80
		4180	4405	836.0	26.86
		4230	4455	846.0	27.03
	3	4132	4357	826.4	26.55
		4180	4405	836.0	26.22
		4230	4455	846.0	26.49
	4	4132	4357	826.4	26.30
		4180	4405	836.0	26.51
		4230	4455	846.0	26.21

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

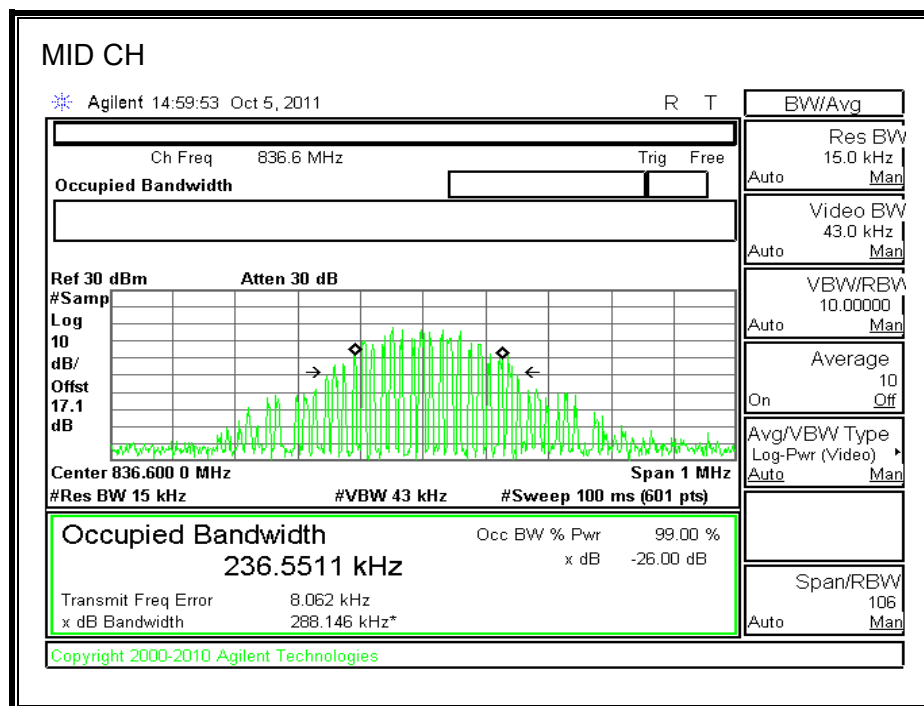
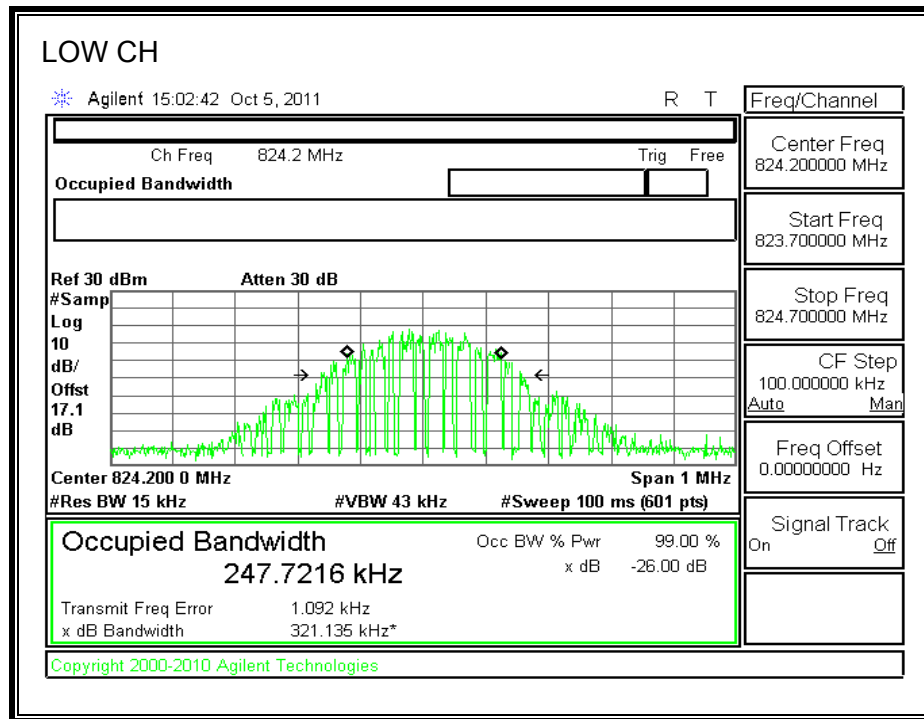
- GPRS
- UMTS, REL 99 and HSDPA

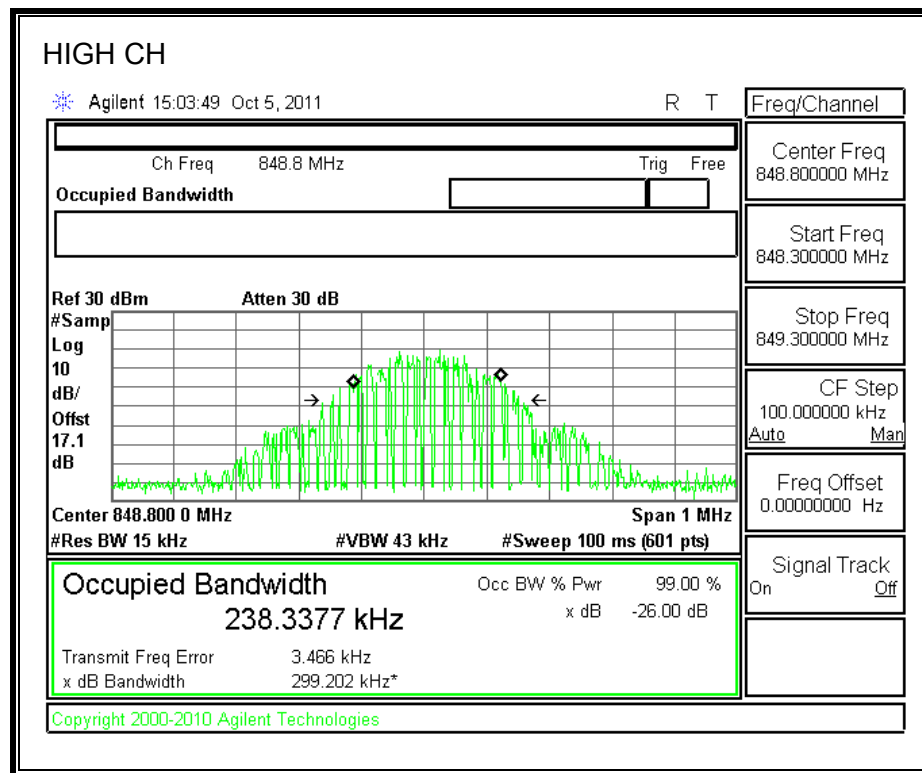
RESULTS

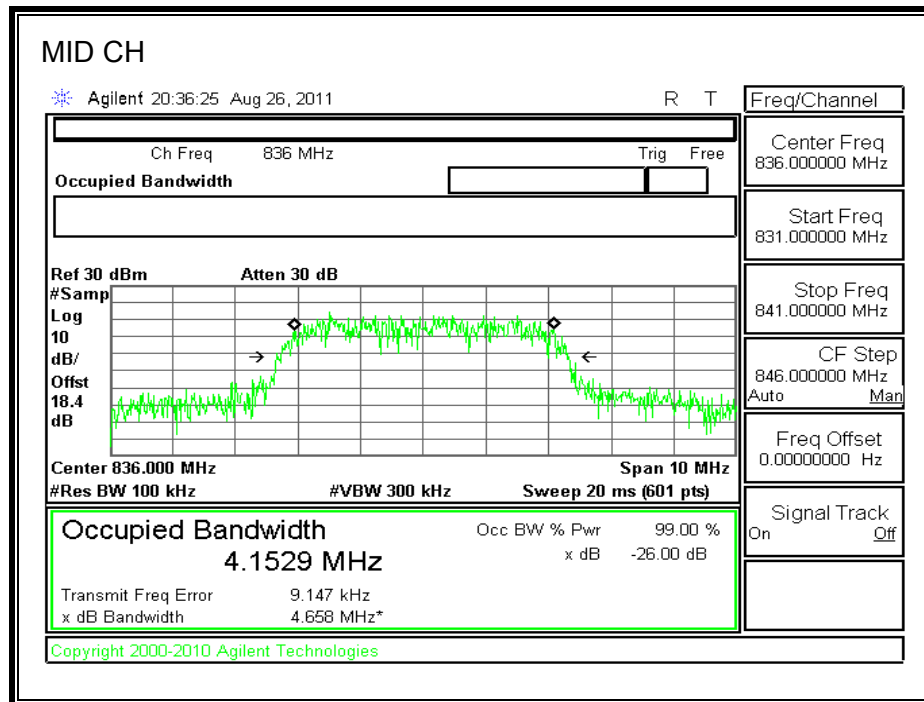
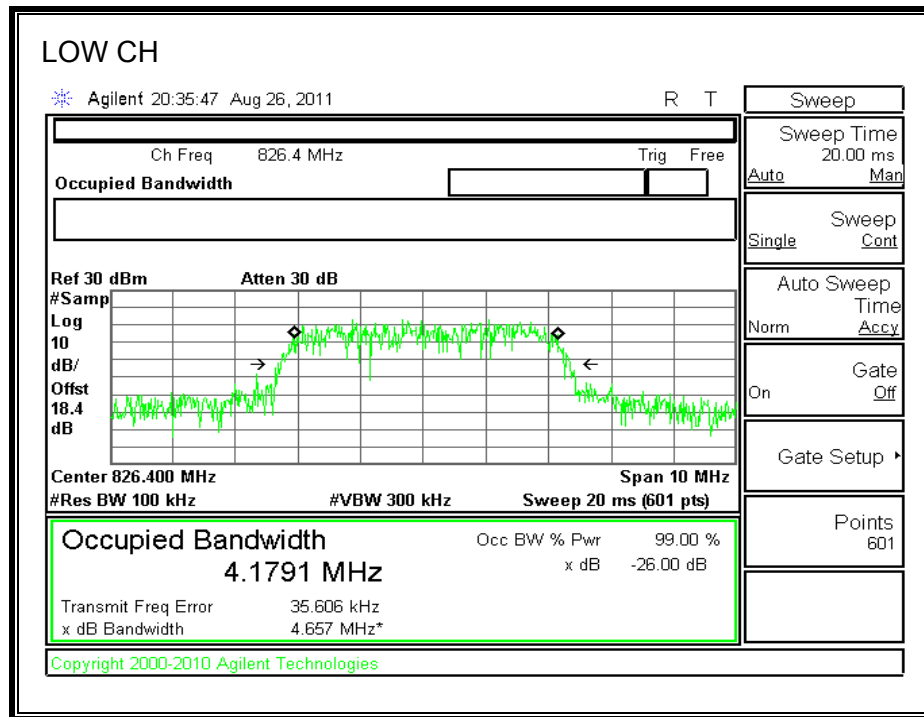
Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
Cellular	GPRS	128	824.20	247.7216	321.135
		190	836.60	236.5511	288.146
		251	848.80	238.3377	299.202

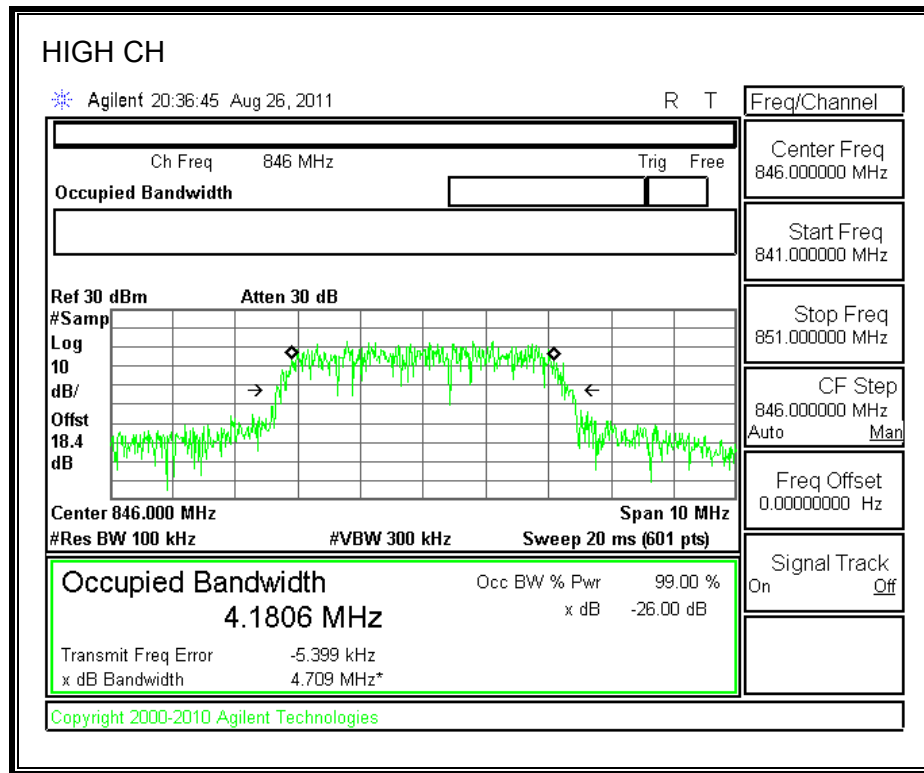
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
Cellular	UMTS, REL 99	4357	826.4	4.1791	4.657
		4405	836.0	4.1529	4.658
		4455	846.0	4.1806	4.709
	UMTS, HSDPA	128	826.4	4.1642	4.679
		190	836.0	4.1727	4.639
		251	846.0	4.1810	4.627

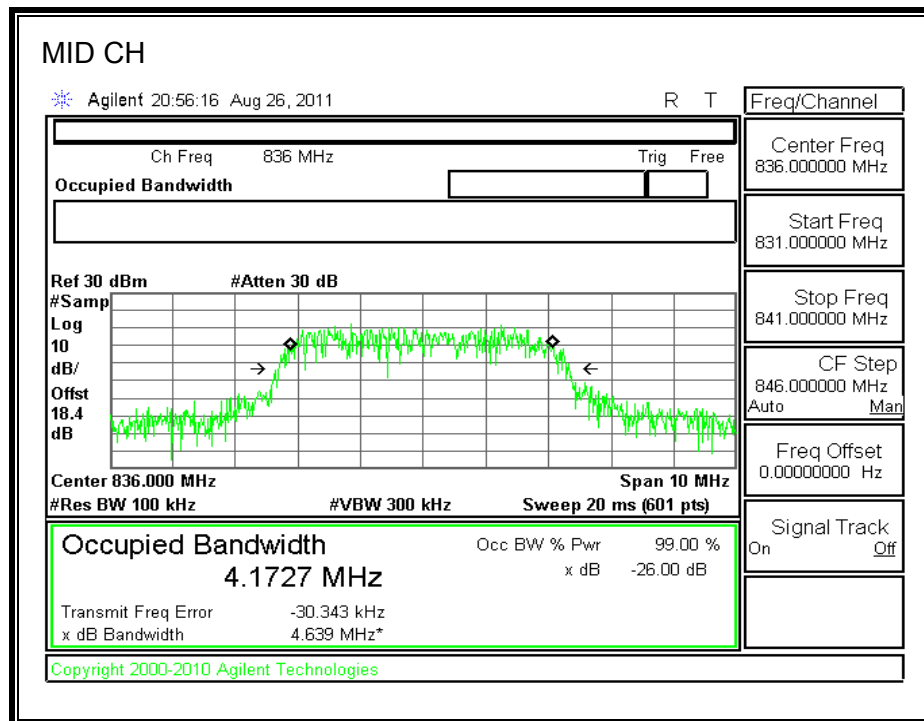
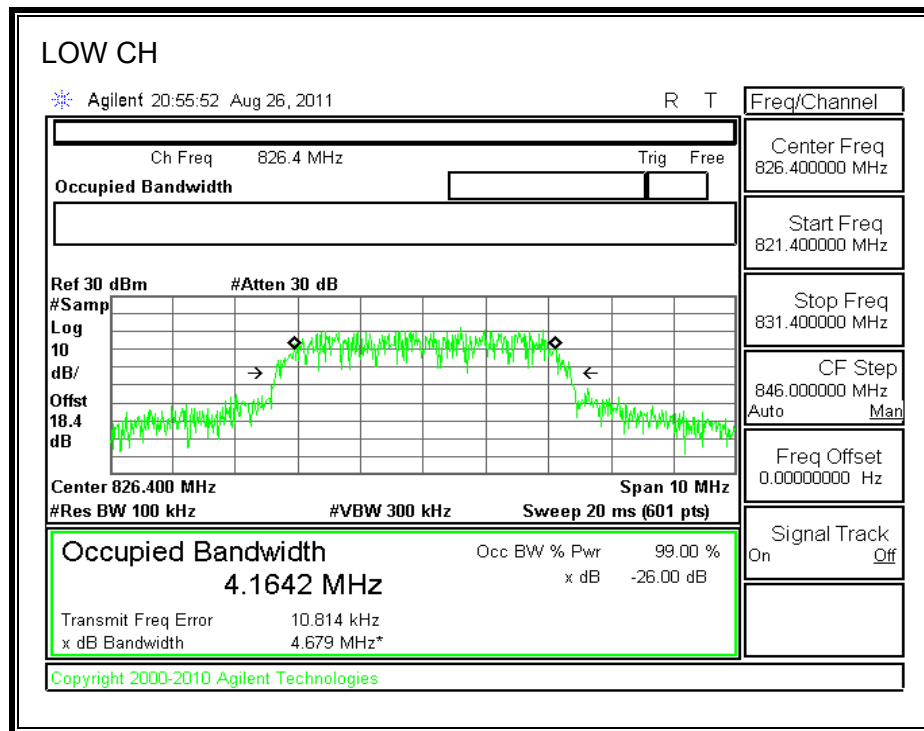
Band	Mode	Channel	f (MHz)	99% BW (KHz)	-26dB BW (KHz)
PCS	GPRS	512	1850.2	250.2056	305.657
		661	1880.0	241.7751	310.818
		810	1909.8	255.1136	283.443

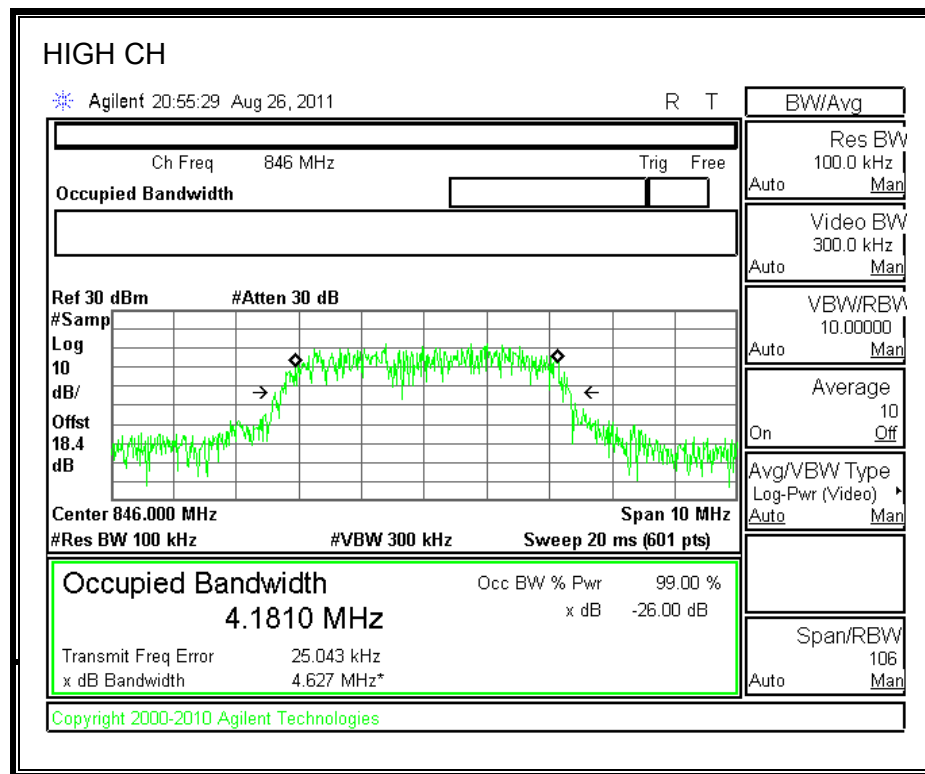
99% AND 26dB BANDWIDTH**GPRS Mode (Cellular Band)**

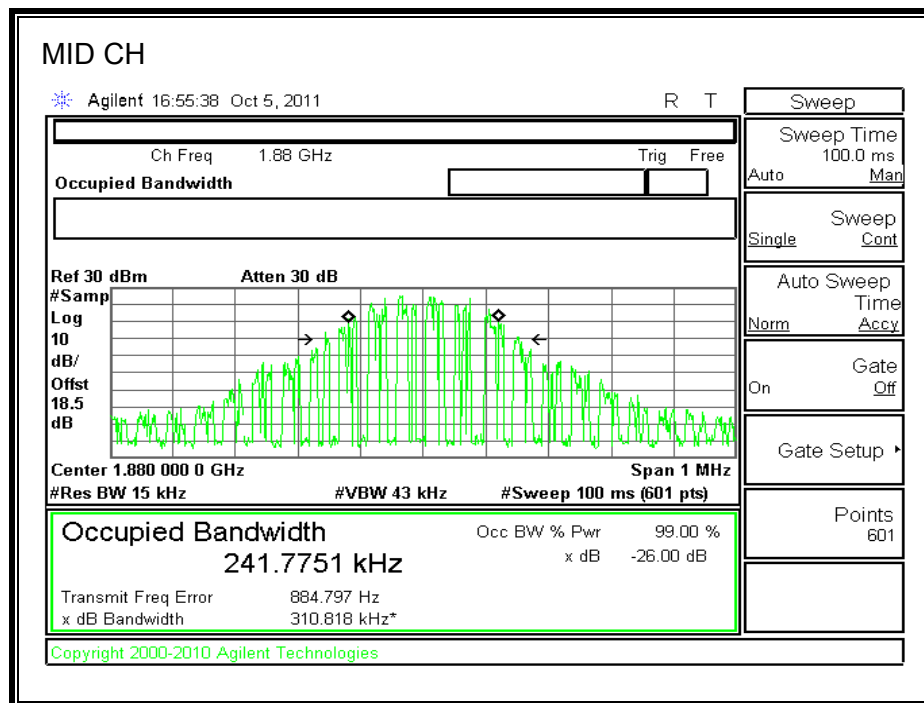
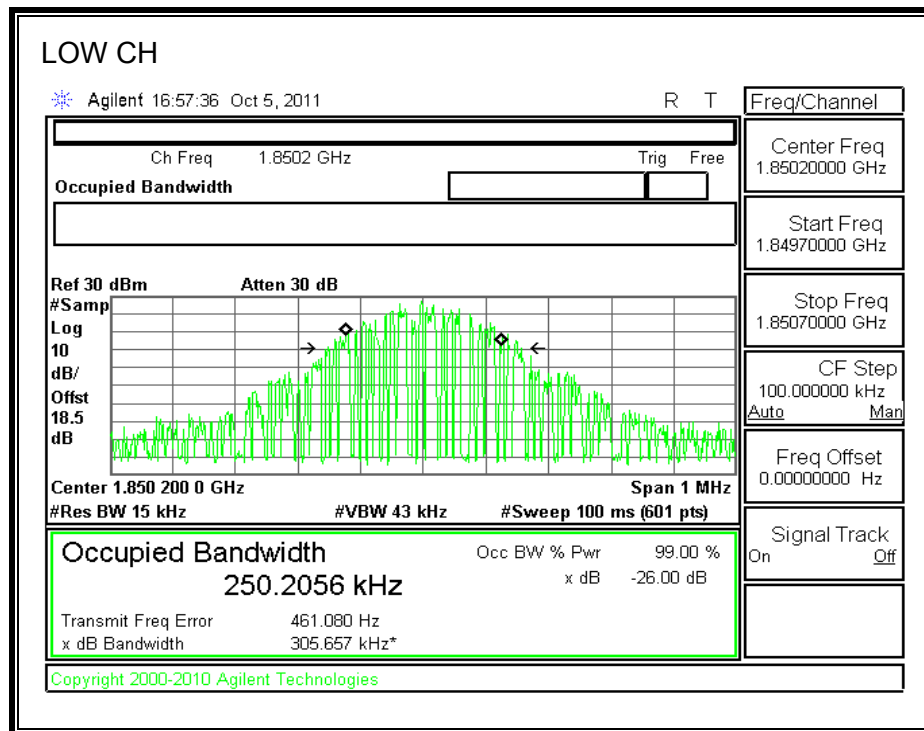


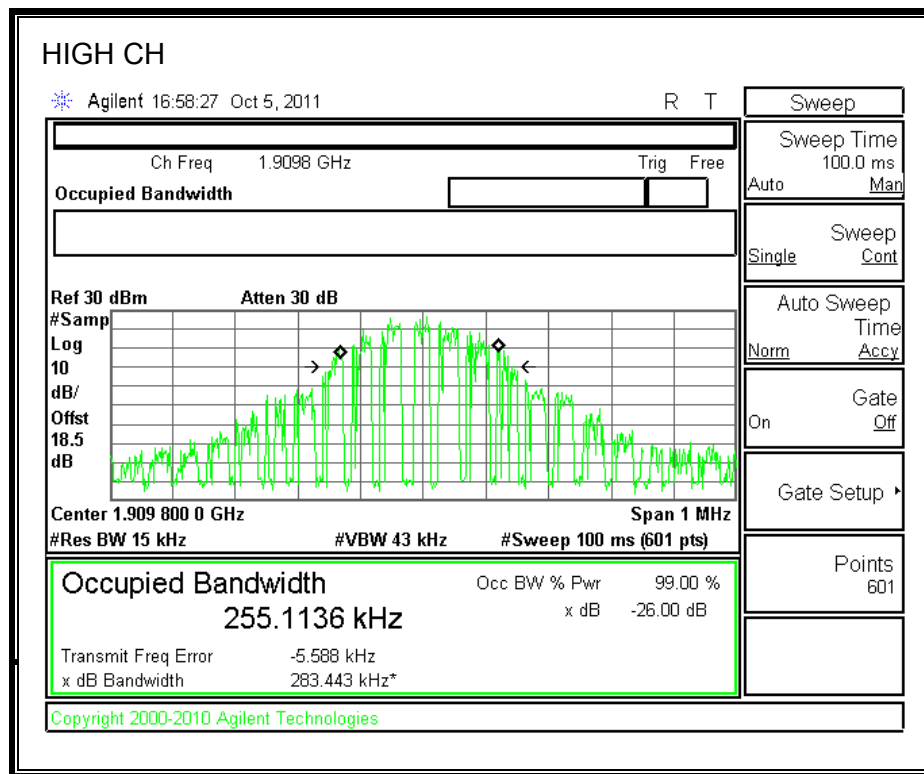
WCDMA REL 99 (Cellular Band)



WCDMA HSDPA (Cellular Band)



GPRS 1900 Mode (PCS Band)



8.2. BAND EDGE

RULE PART(S)

FCC: §22.359, 24.238

LIMITS

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

TEST PROCEDURE

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

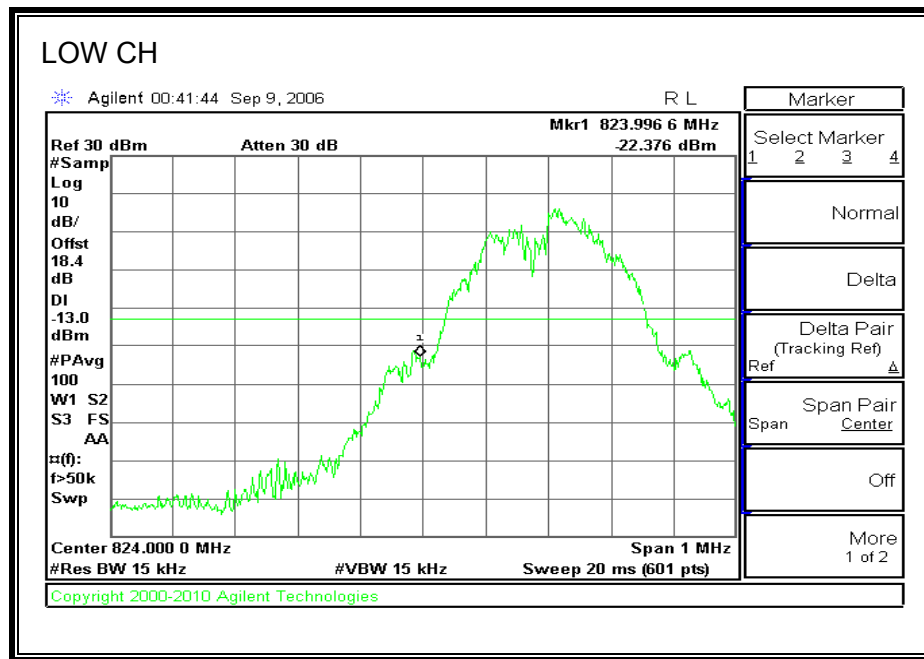
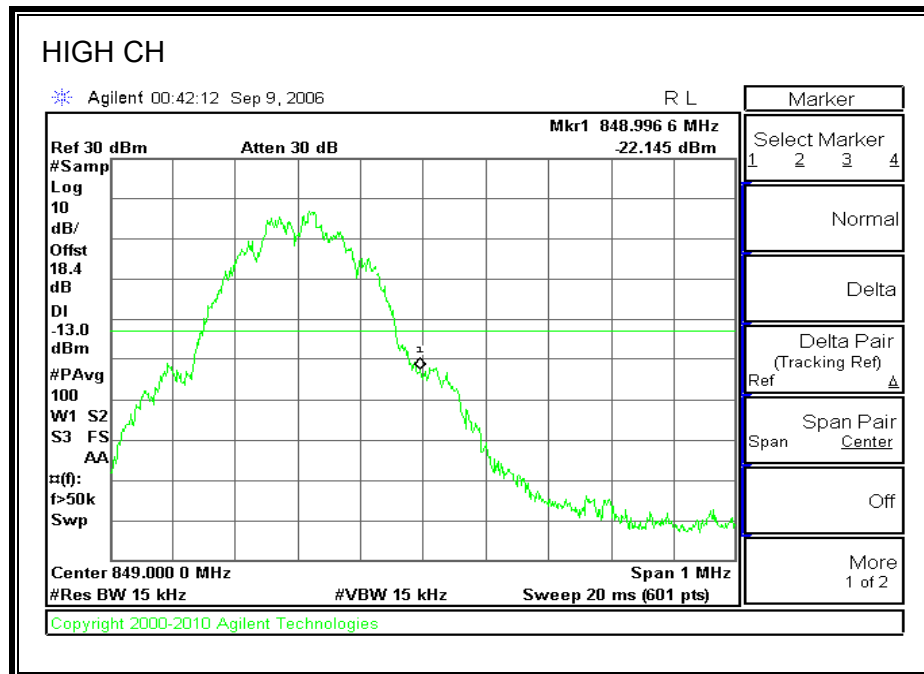
For each band edge measurement:

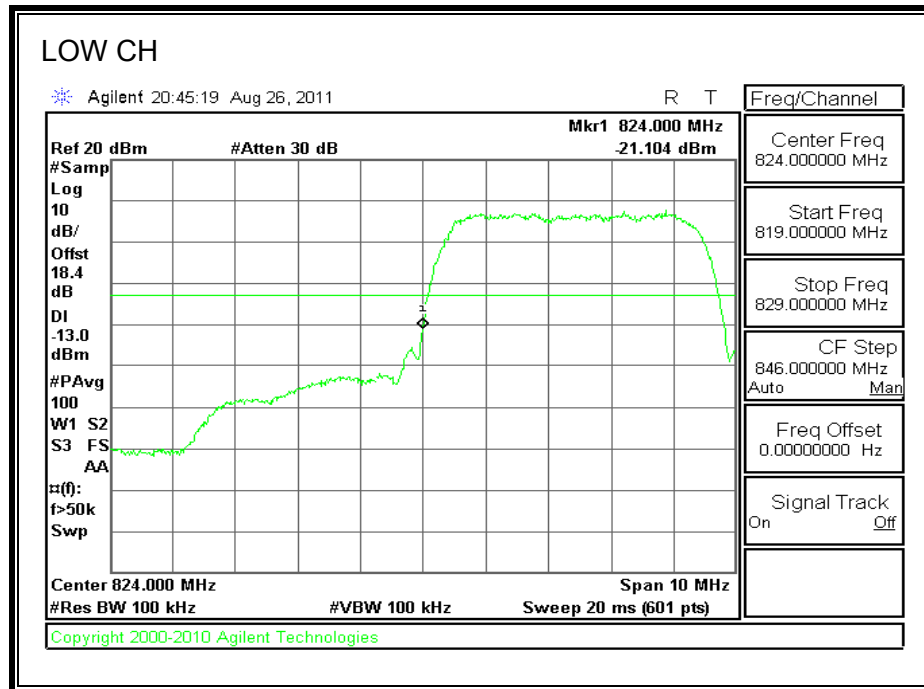
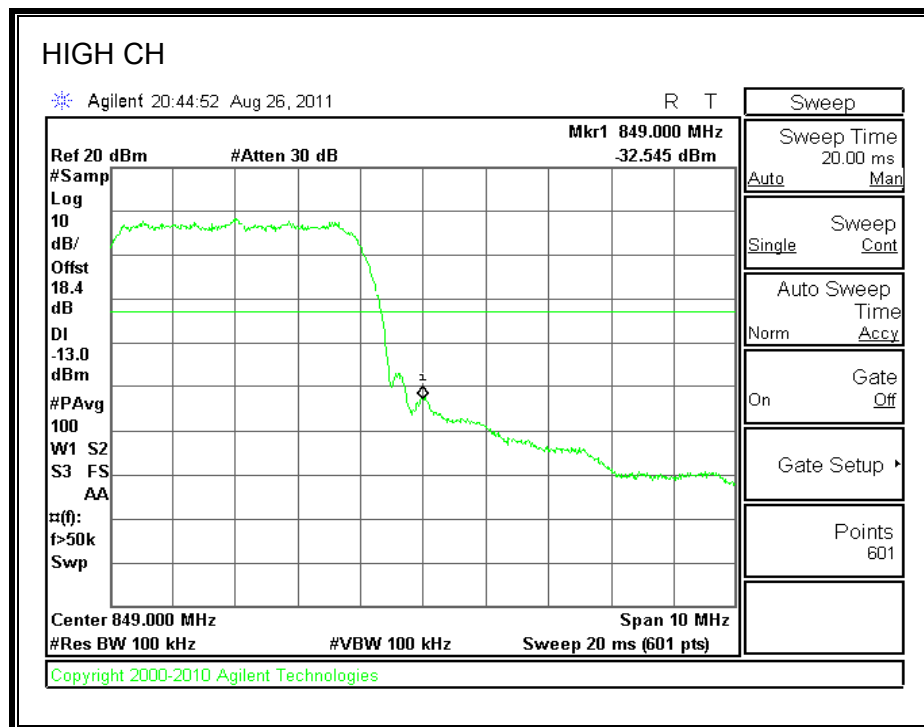
- Set the spectrum analyzer span to include the block edge frequency (824, 848, 1850, 1910MHz)
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

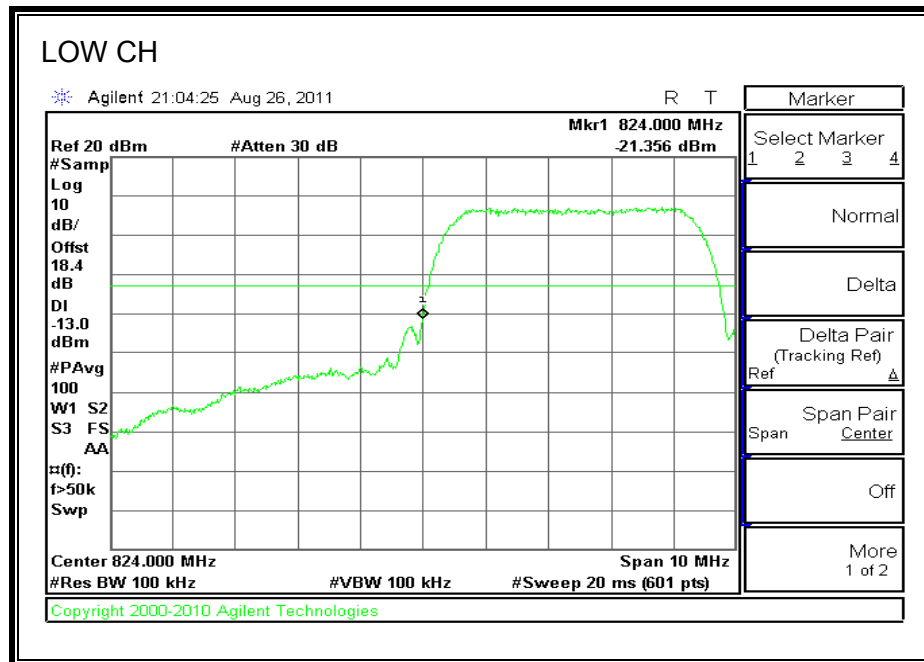
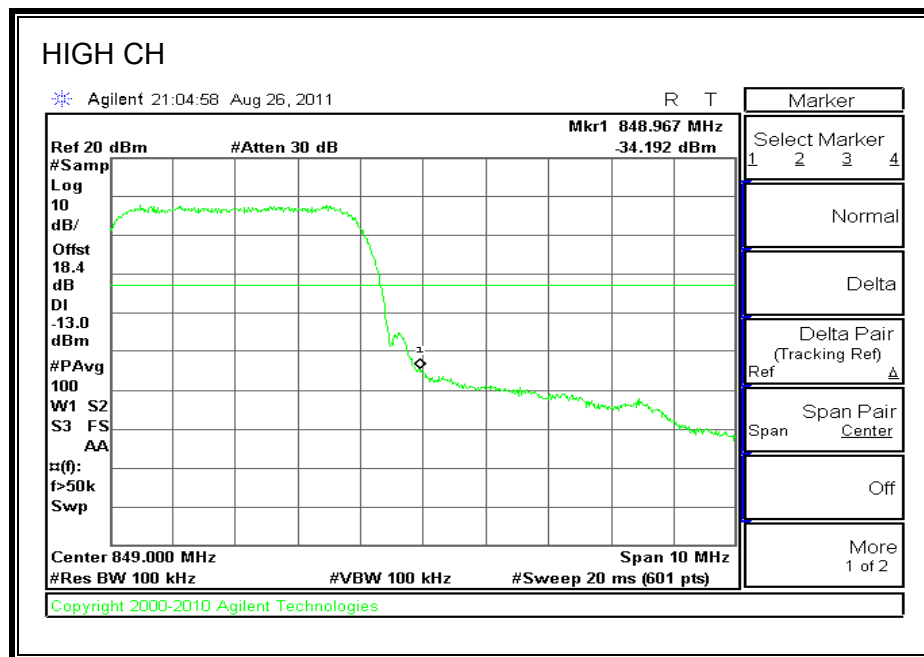
MODES TESTED

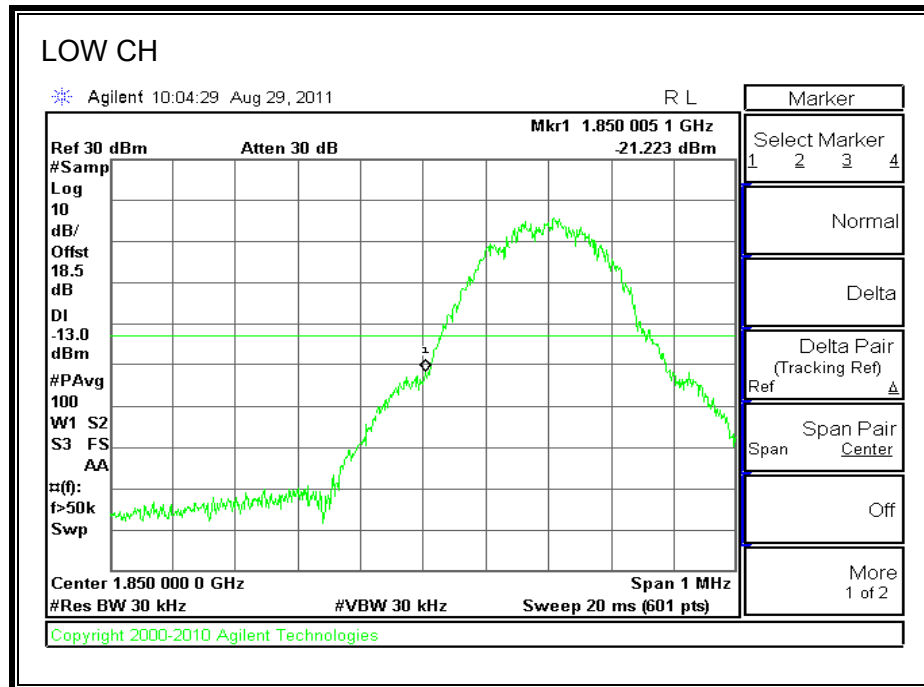
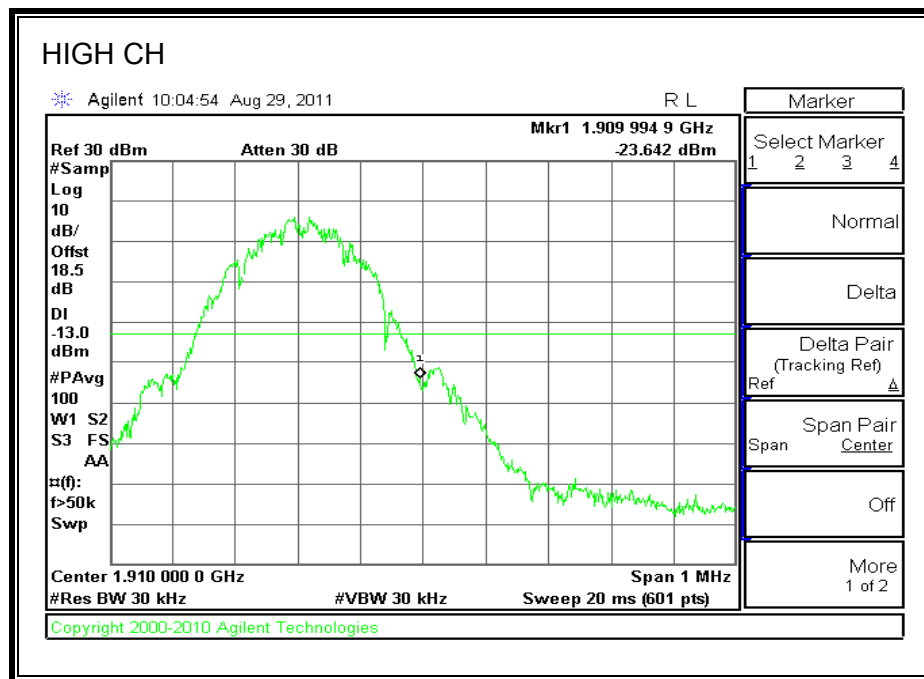
- GPRS
- UMTS, REL 99 and HSDPA

RESULTS

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

UMTS REL 99 mode (Cellular Band)**Low Channel Band Edge****High Channel Band Edge**

UMTS HSDPA mode (Cellular Band)**Low Channel Band Edge****High Channel Band Edge**

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

8.3. OUT OF BAND EMISSIONS

RULE PART(S)

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

LIMITS

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

TEST PROCEDURE

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

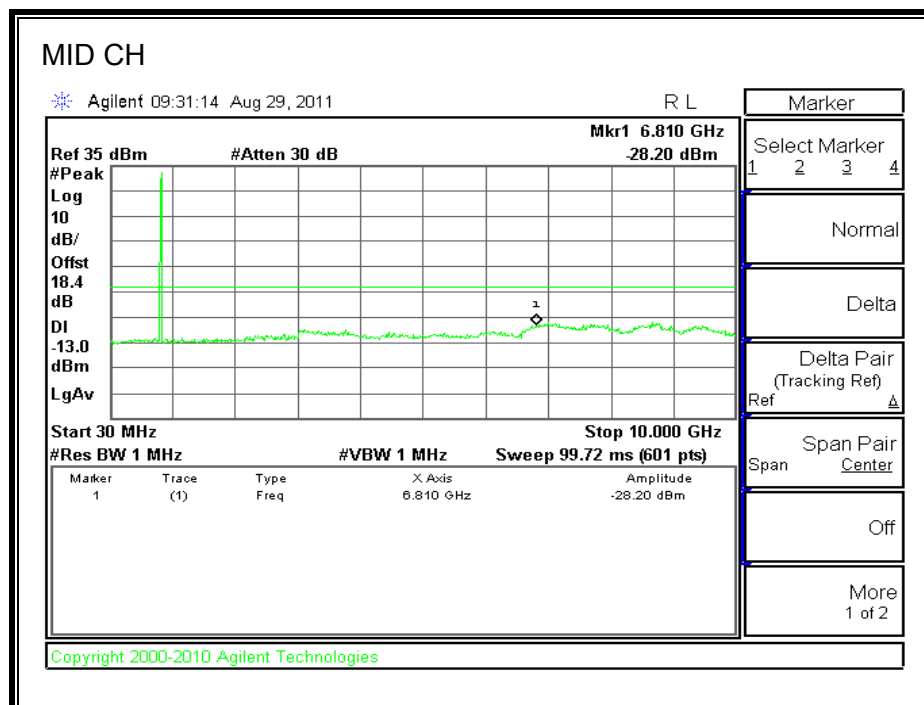
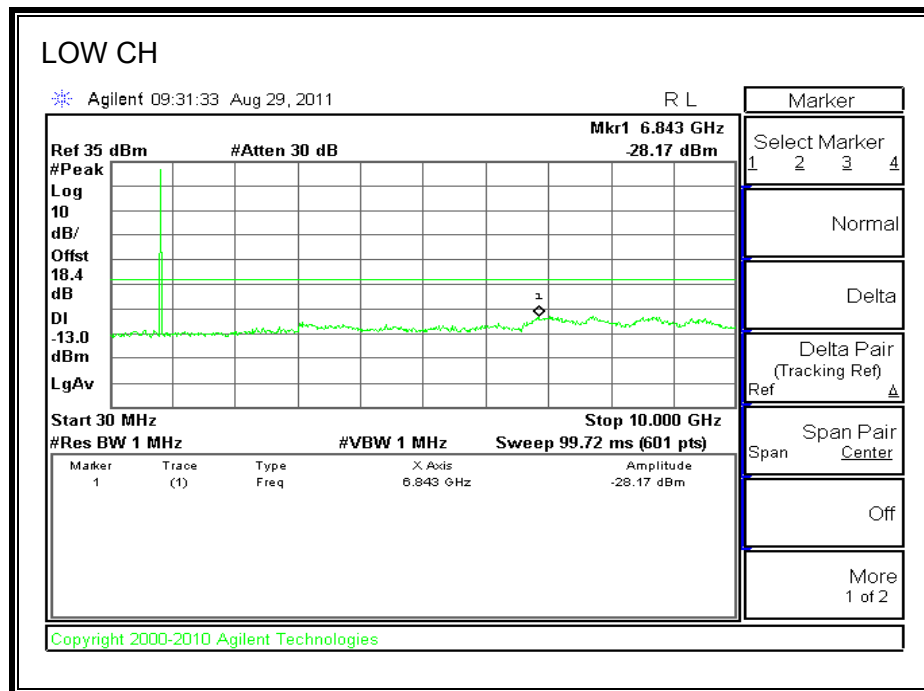
For each out of band emissions measurement:

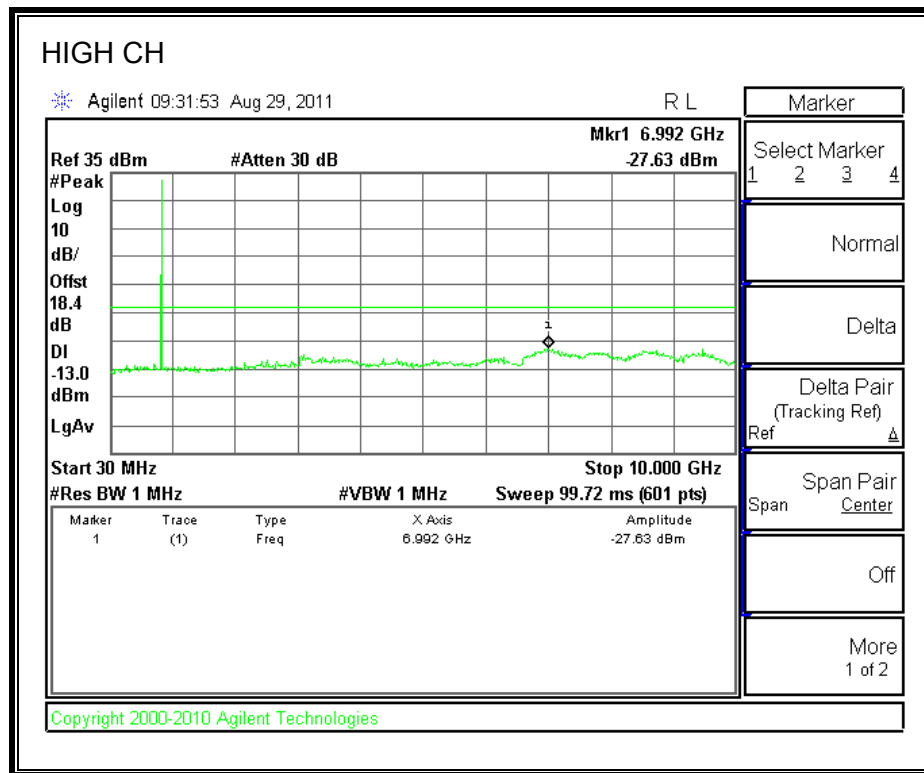
- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

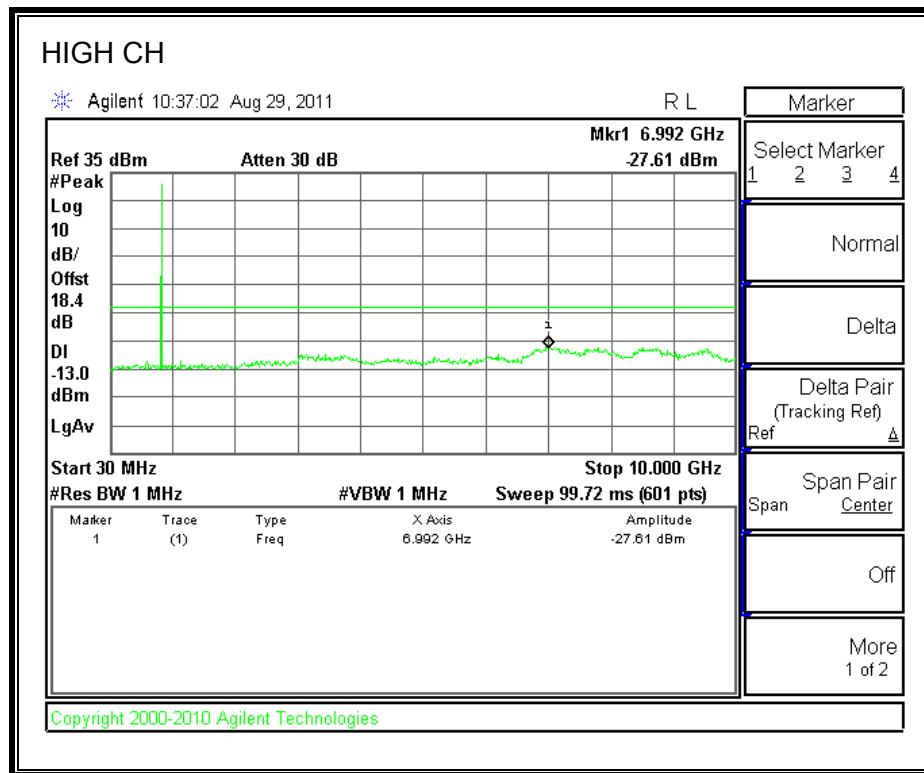
MODES TESTED

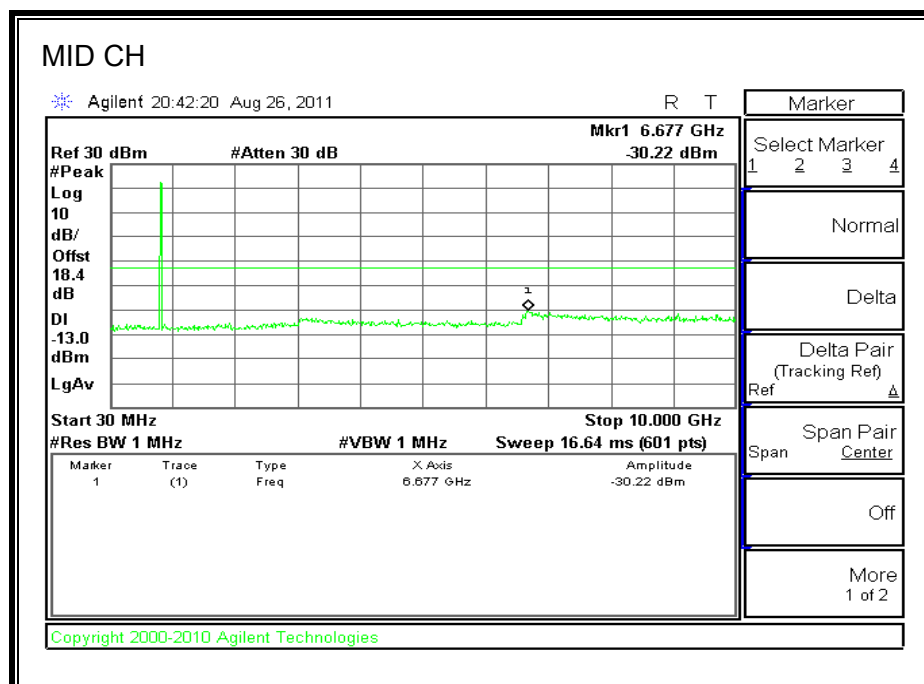
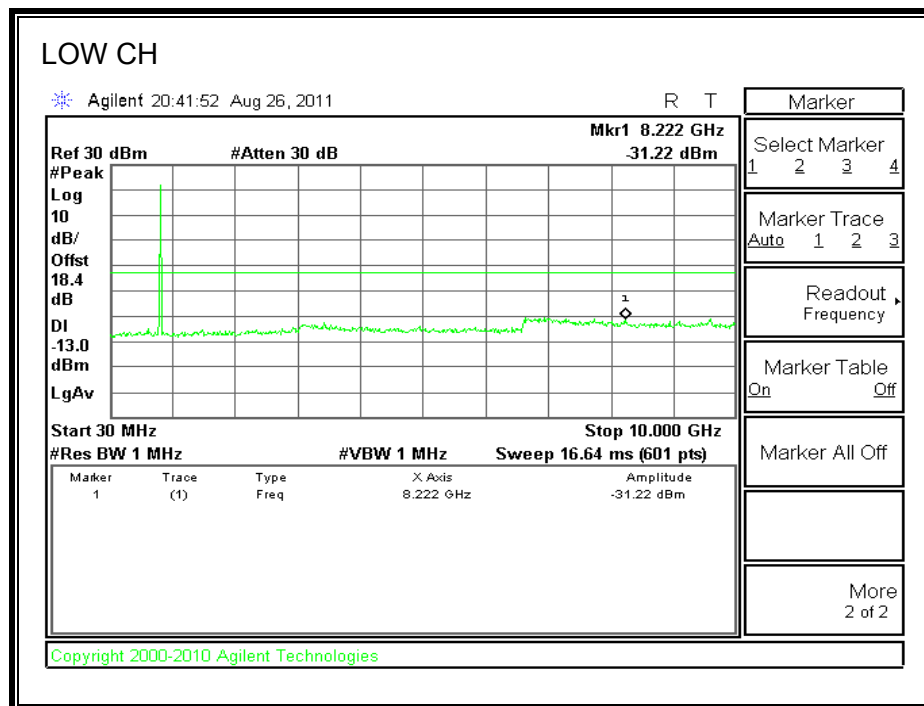
- GPRS
- UMTS, REL99 and HSDPA

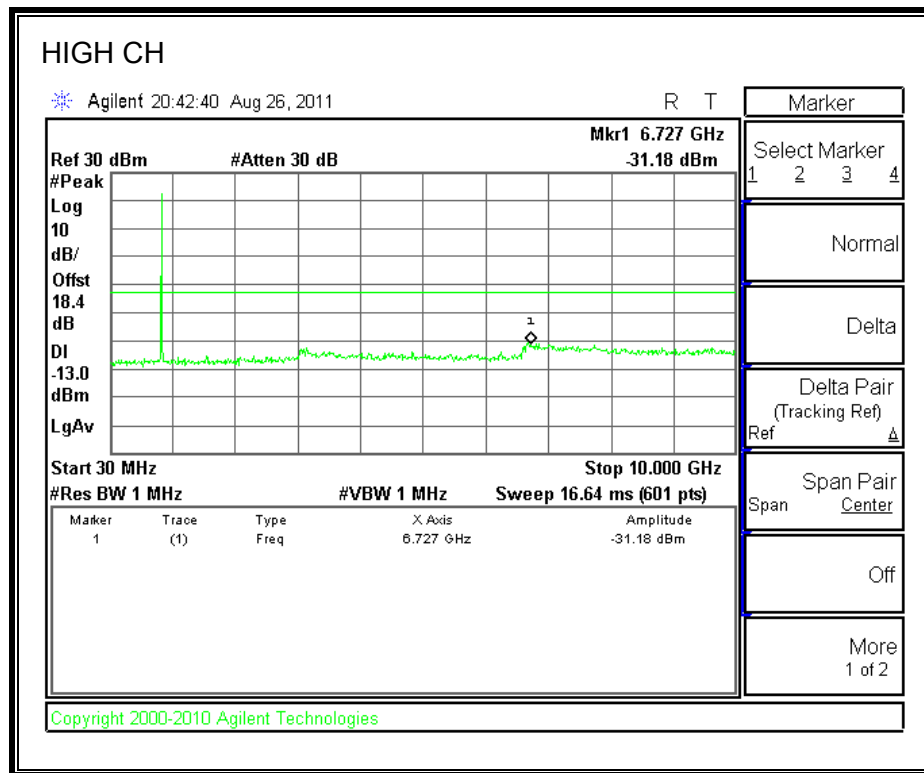
RESULTS

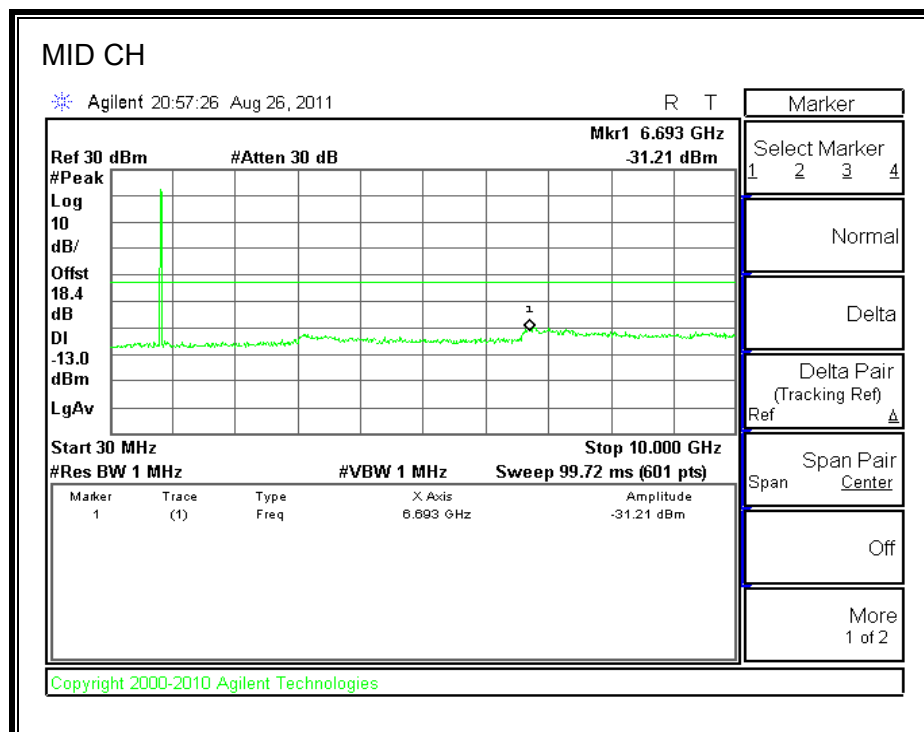
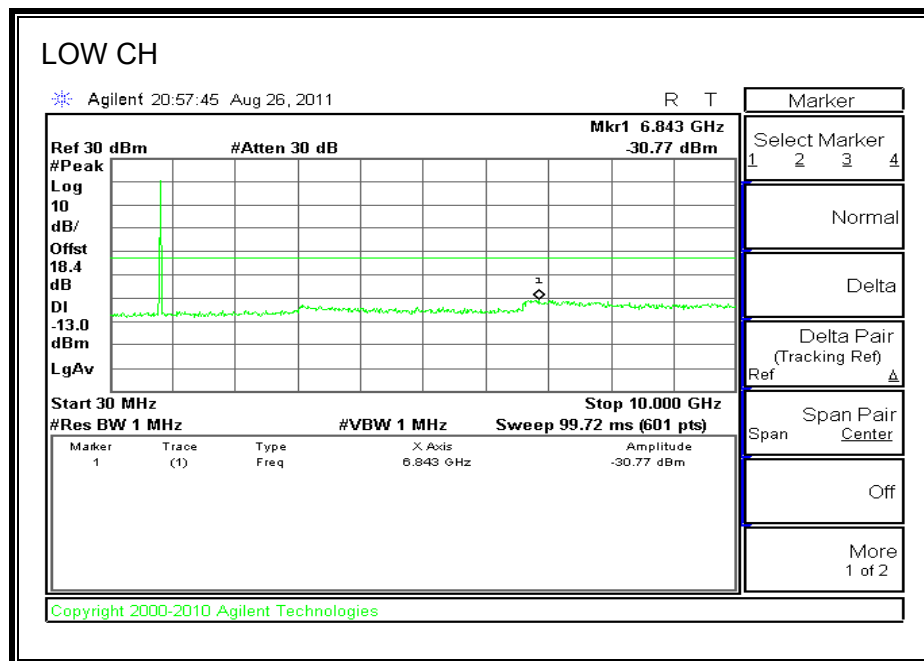
GPRS Mode (Cellular Band)

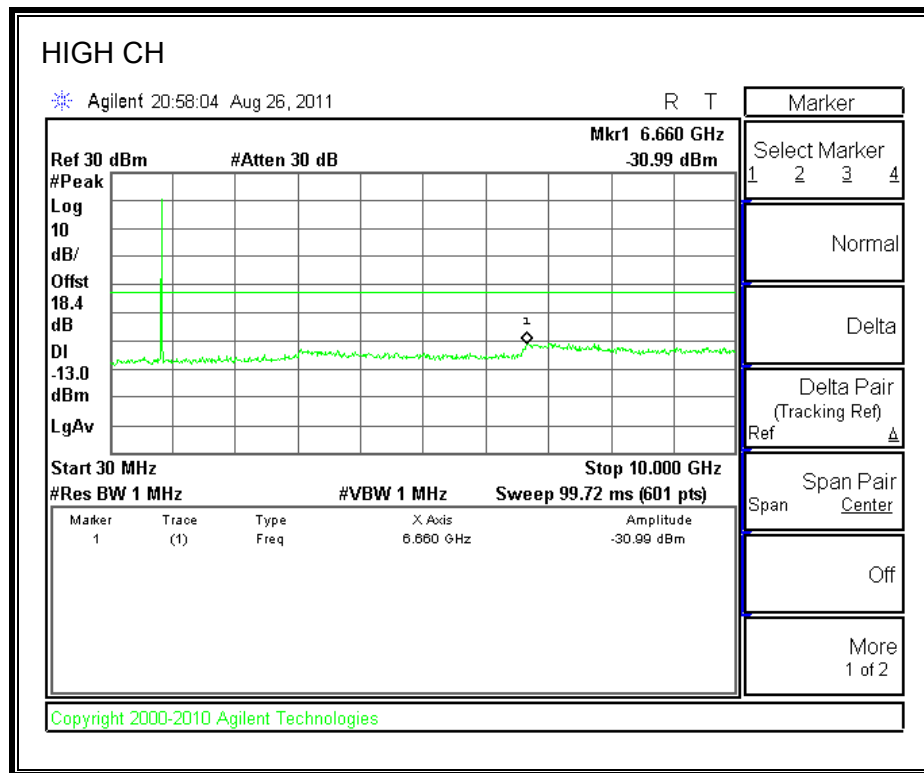


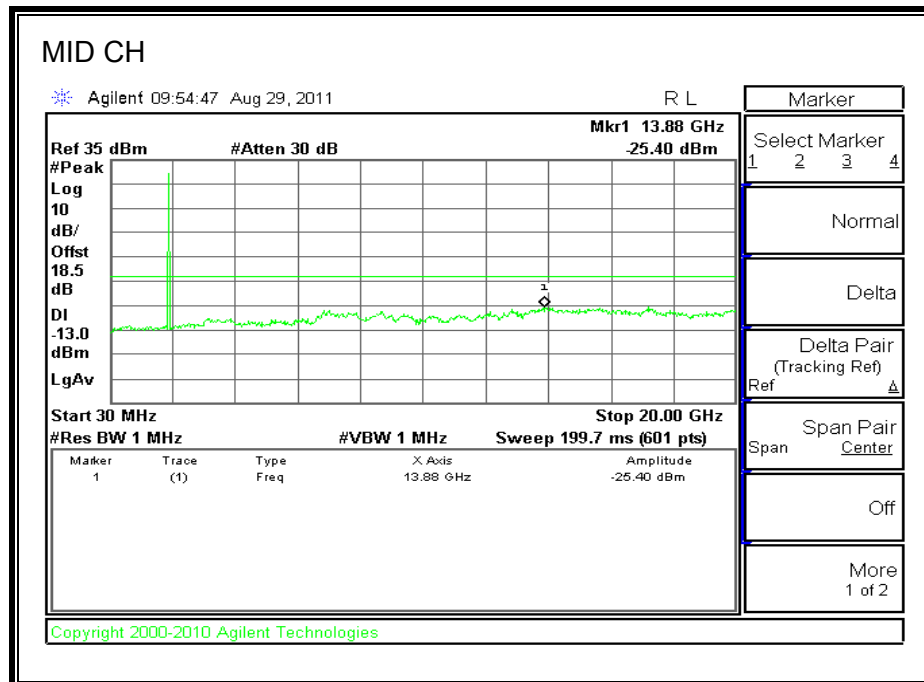
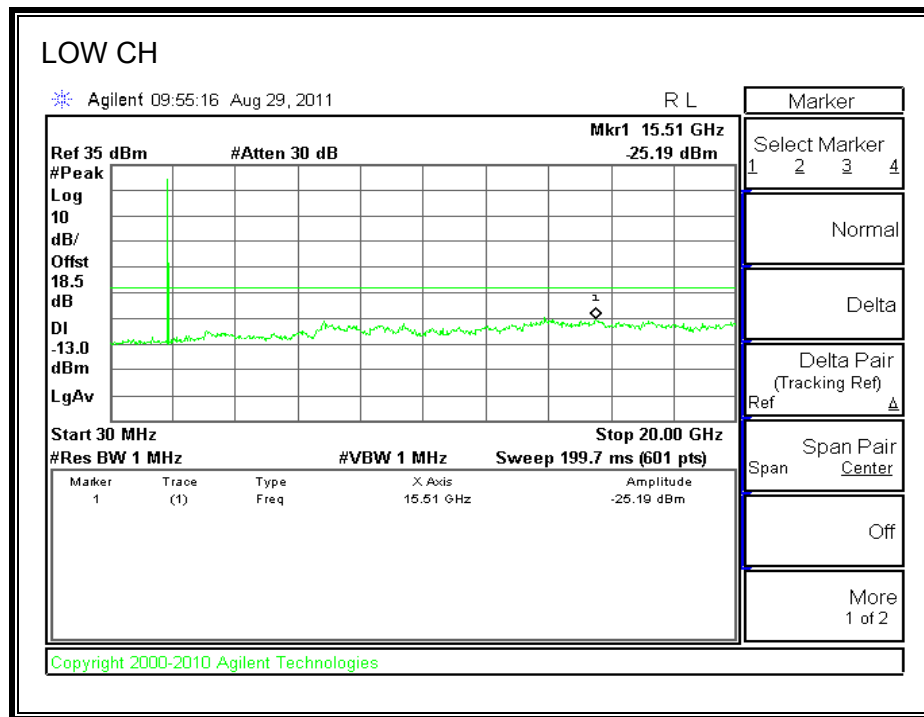


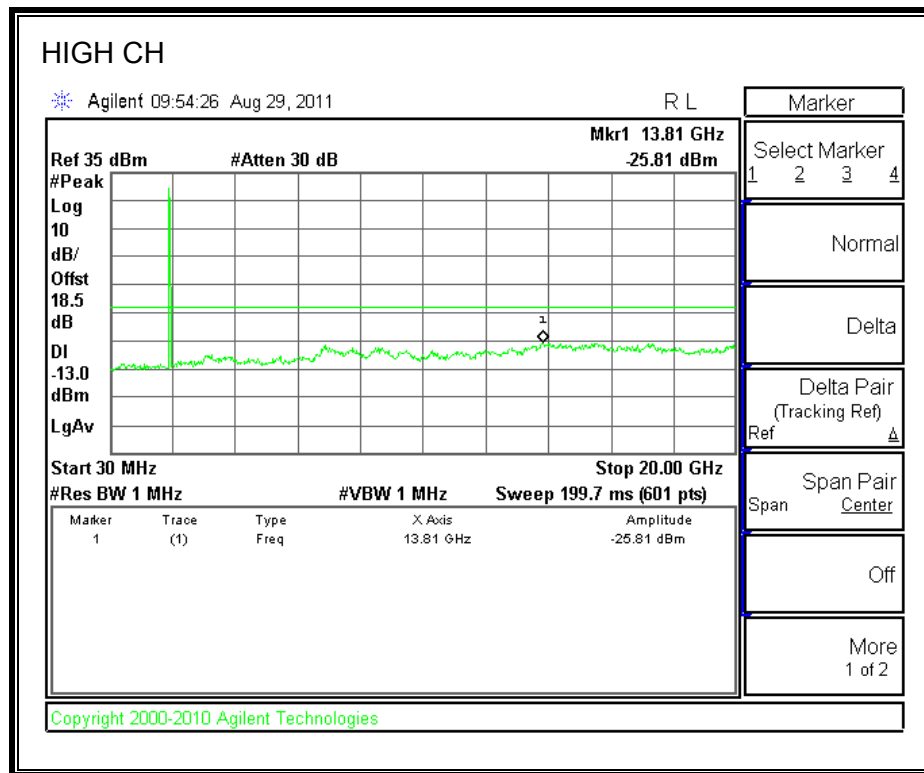
UMTS REL 99 Mode (Cellular Band)



UMTS HSDPA Mode (Cellular Band)



GPRS Mode (PCS Band)



8.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235

LIMITS

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

FCC §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

- GPRS
- UMTS, REL99

RESULTS

See the following pages.

CELL GSM – MID CHANNEL (GPRS)

Reference Frequency: GPRS Mid Channel 836.600024MHz @ 20 ° C				
Limit: ± 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	836.600014	0.000	± 2.5
3.70	40	836.600012	0.002	± 2.5
3.70	30	836.600010	0.005	± 2.5
3.70	20	836.600014	0	± 2.5
3.70	10	836.600028	-0.017	± 2.5
3.70	0	836.600029	-0.018	± 2.5
3.70	-10	836.600027	-0.016	± 2.5
3.70	-20	836.599988	0.031	± 2.5
3.70	-30	836.599969	0.054	± 2.5
100%	25	836.600014	0.000	± 2.5
115%	25	836.600012	0.002	± 2.5
85%	25	836.600026	-0.014	± 2.5
End voltage (3.00)	25	836.600300	-0.342	± 2.5

PCS, GSM – MID CHANNEL (GPRS)

Reference Frequency: PCS Mid Channel 1880.00000MHz @ 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	1879.999981	0.021	2.5
3.70	40	1879.999990	0.016	2.5
3.70	30	1880.000011	0.005	2.5
3.70	20	1880.000021	0	2.5
3.70	10	1880.000390	-0.196	2.5
3.70	0	1880.000033	-0.006	2.5
3.70	-10	1879.999984	0.020	2.5
3.70	-20	1879.999980	0.022	2.5
3.70	-30	1879.999986	0.019	2.5

Reference Frequency: PCS Mid Channel 1880.0000MHz @ 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%	25	1880.000021	0	2.5
85%	25	1880.000034	-0.007	2.5
115%	25	1880.000036	-0.008	2.5
End Voltage (3.00)	25	1879.999988	0.018	2.5

CELL UMTS- MID CHANNEL

Reference Frequency: GPRS Mid Channel 835.999989Hz @ 20°C				
Limit: ± 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	835.999990	-0.001	± 2.5
3.70	40	835.999992	-0.004	± 2.5
3.70	30	835.999993	-0.005	± 2.5
3.70	20	835.999989	0	± 2.5
3.70	10	835.999993	-0.005	± 2.5
3.70	0	835.999991	-0.002	± 2.5
3.70	-10	835.999993	-0.005	± 2.5
3.70	-20	835.999992	-0.004	± 2.5
3.70	-30	835.999990	-0.001	± 2.5
100%	25	835.999989	0.000	± 2.5
115%	25	835.999994	-0.006	± 2.5
85%	25	835.999995	-0.007	± 2.5
End voltage (3.00)	25	835.999990	-0.001	± 2.5

9. RADIATED TEST RESULTS

9.1. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §2.1046, §22.913, §24.232

LIMITS

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

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

TEST PROCEDURE

ANSI / TIA / EIA 603C

MODES TESTED

- GPRS
- UMTS, REL 99 and HSDPA

RESULTS

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	29.32	855.07
	190	836.60	29.24	839.46
	251	848.80	29.34	859.01

Mode	Channel	f (MHz)	ERP	
			dBm	mW
UMTS,REL 99	4357	826.40	23.62	230.14
	4405	836.00	24.74	297.85
	4455	846.00	23.31	214.29
UMTS, HSDPA	4357	826.40	23.72	235.50
	4405	836.00	24.64	291.07
	4455	846.00	23.71	234.96

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	30.41	1099.01
	661	1880.00	30.48	1116.86
	810	1909.80	28.98	790.68

GPRS (Cellular Band)**High Frequency Substitution Measurement
Compliance Certification Services Chamber B**

Company: Samsung
Project #: 11U13982
Date: 08-26-11
Test Engineer: Chin Pang
Configuration: EUT with Earphone
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	29.82	V	0.5	0.0	29.32	38.5	-9.1	
824.20	22.55	H	0.5	0.0	22.05	38.5	-16.4	
836.60	29.74	V	0.5	0.0	29.24	38.5	-9.2	
836.60	22.80	H	0.5	0.0	22.30	38.5	-16.2	
848.80	29.84	V	0.5	0.0	29.34	38.5	-9.1	
848.80	23.51	H	0.5	0.0	23.01	38.5	-15.4	

Rev. 3.17.11

UMTS REL 99 (Cellular Band)

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
Company:	Samsung							
Project #:	11U13982							
Date:	08-26-11							
Test Engineer:	Chin Pang							
Configuration:	EUT and Earphone							
Mode:	TX, CELL BAND WCDMA MODE Rel 99							
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	24.12	V	0.5	0.0	23.62	38.5	-14.8	
826.40	9.75	H	0.5	0.0	9.25	38.5	-29.2	
836.00	25.24	V	0.5	0.0	24.74	38.5	-13.7	
836.00	10.40	H	0.5	0.0	9.90	38.5	-28.6	
846.00	23.81	V	0.5	0.0	23.31	38.5	-15.1	
846.00	9.97	H	0.5	0.0	9.47	38.5	-29.0	
Rev. 3.17.11								

UMTS HSDPA (Cellular Band)

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
Company:	Samsung							
Project #:	11U13982							
Date:	08-26-11							
Test Engineer:	Chin Pang							
Configuration:	EUT and Earphone							
Mode:	TX, CELL BAND WCDMA MODE HSDPA							
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	24.22	V	0.5	0.0	23.72	38.5	-14.7	
826.40	8.85	H	0.5	0.0	8.35	38.5	-30.1	
836.00	25.14	V	0.5	0.0	24.64	38.5	-13.8	
836.00	8.20	H	0.5	0.0	7.70	38.5	-30.8	
846.00	24.21	V	0.5	0.0	23.71	38.5	-14.7	
846.00	8.17	H	0.5	0.0	7.67	38.5	-30.8	
Rev. 3.17.11								

GPRS (PCS Band)

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
Company:		Samsung						
Project #:		11113982						
Date:		08-26-11						
Test Engineer:		Chin Pang						
Configuration:		EUT and Earphone						
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	23.3	V	0.85	8.01	30.41	33.0	-2.6	
1.850	16.6	H	0.85	8.01	23.76	33.0	-9.2	
1.880	23.2	V	0.85	8.13	30.48	33.0	-2.5	
1.880	17.5	H	0.85	8.13	24.78	33.0	-8.2	
1.910	21.7	V	0.85	8.13	28.98	33.0	-4.0	
1.910	16.6	H	0.85	8.13	23.88	33.0	-9.1	
Rev. 3.17.11								

9.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053, §22.917, §24.238

LIMIT

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

TEST PROCEDURE

For Cellular equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

For PCS equipment - Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

MODES TESTED

- GPRS
- UMTS, REL 99 and HSDPA

RESULTS

GPRS (Cellular Band)

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 11113982
Date: 08-26-11
Test Engineer: Chin Pang
Configuration: EUT and Earphone
Mode: TX, CELL BAND GPRS MODE

Chamber	Pre-amplifier	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	-14.2	V	3.0	35.5	1.0	-48.8	-13.0	-35.8	
2.473	-4.9	V	3.0	35.4	1.0	-39.3	-13.0	-26.3	
3.297	-6.3	V	3.0	35.5	1.0	-40.8	-13.0	-27.8	
1.648	-13.4	H	3.0	35.5	1.0	-47.9	-13.0	-34.9	
2.473	-6.7	H	3.0	35.4	1.0	-41.1	-13.0	-28.1	
3.297	-9.6	H	3.0	35.5	1.0	-44.1	-13.0	-31.1	
Mid Ch, (836.6MHz)									
1.673	-14.2	V	3.0	35.5	1.0	-48.7	-13.0	-35.7	
2.510	-5.9	V	3.0	35.4	1.0	-40.3	-13.0	-27.3	
3.346	-14.5	V	3.0	35.5	1.0	-49.1	-13.0	-36.1	
1.673	-15.8	H	3.0	35.5	1.0	-50.4	-13.0	-37.4	
2.510	-9.2	H	3.0	35.4	1.0	-43.6	-13.0	-30.6	
4.183	-12.4	H	3.0	35.2	1.0	-46.6	-13.0	-33.6	
High Ch, (848.8MHz)									
1.698	-15.9	V	3.0	35.5	1.0	-50.4	-13.0	-37.4	
2.546	-6.7	V	3.0	35.4	1.0	-41.2	-13.0	-28.2	
3.395	-15.0	V	3.0	35.5	1.0	-49.5	-13.0	-36.5	
1.698	-18.5	H	3.0	35.5	1.0	-53.0	-13.0	-40.0	
2.546	-12.1	H	3.0	35.4	1.0	-46.5	-13.0	-33.5	
3.395	-15.7	H	3.0	35.5	1.0	-50.2	-13.0	-37.2	

Rev. 03.03.09

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

UMTS REL 99 (Cellular Band)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		11113982							
Date:		08-26-11							
Test Engineer:		Chin Pang							
Configuration:		EUT and Earphone							
Mode:		TX, CELL BAND WCDMA Rel 99							
Chamber		Pre-amplifier		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, (826.4MHz)									
1.653	-21.9	V	3.0	35.5	1.0	-56.4	-13.0	-43.4	
2.479	-20.3	V	3.0	35.4	1.0	-54.7	-13.0	-41.7	
1.653	-22.3	H	3.0	35.5	1.0	-56.9	-13.0	-43.9	
2.479	-23.2	H	3.0	35.4	1.0	-57.6	-13.0	-44.6	
Mid Ch, (836MHz)									
1.673	-20.4	V	3.0	35.5	1.0	-54.9	-13.0	-41.9	
2.508	-18.7	V	3.0	35.4	1.0	-53.1	-13.0	-40.1	
1.672	-19.8	H	3.0	35.5	1.0	-54.4	-13.0	-41.4	
2.508	-20.6	H	3.0	35.4	1.0	-55.0	-13.0	-42.0	
High Ch, (846MHz)									
1.692	-22.4	V	3.0	35.5	1.0	-56.9	-13.0	-43.9	
2.538	-20.1	V	3.0	35.4	1.0	-54.5	-13.0	-41.5	
1.692	-23.7	H	3.0	35.5	1.0	-58.2	-13.0	-45.2	
2.538	-20.8	H	3.0	35.4	1.0	-55.3	-13.0	-42.3	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

UMTS HSDPA (Cellular Band)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		11113982							
Date:		08-26-11							
Test Engineer:		Chin Pang							
Configuration:		EUT and Earphone							
Mode:		TX, CELL BAND WCDMA HSDPA							
Chamber		Pre-amplifier		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, (826.4MHz)									
1.653	-21.3	V	3.0	35.5	1.0	-55.8	-13.0	-42.8	
2.479	-20.3	V	3.0	35.4	1.0	-54.7	-13.0	-41.7	
1.653	-22.2	H	3.0	35.5	1.0	-56.8	-13.0	-43.8	
2.479	-23.4	H	3.0	35.4	1.0	-57.8	-13.0	-44.8	
Mid Ch, (836MHz)									
1.673	-21.4	V	3.0	35.5	1.0	-55.9	-13.0	-42.9	
2.508	-20.0	V	3.0	35.4	1.0	-54.4	-13.0	-41.4	
1.672	-21.9	H	3.0	35.5	1.0	-56.5	-13.0	-43.5	
2.508	-20.4	H	3.0	35.4	1.0	-54.8	-13.0	-41.8	
High Ch, (846MHz)									
1.692	-21.0	V	3.0	35.5	1.0	-55.5	-13.0	-42.5	
2.538	-21.2	V	3.0	35.4	1.0	-55.6	-13.0	-42.6	
1.692	-22.9	H	3.0	35.5	1.0	-57.4	-13.0	-44.4	
2.538	-21.2	H	3.0	35.4	1.0	-55.7	-13.0	-42.7	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									

GPRS (PCS Band)

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		11113982							
Date:		08-26-11							
Test Engineer:		Chin Pang							
Configuration:		EUT and Earphone							
Mode:		TX, PCS BAND GPRS MODE							
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, (1850.2MHz)									
3.700	-13.4	V	3.0	35.4	1.0	-47.7	-13.0	-34.7	
5.551	-11.1	V	3.0	35.4	1.0	-45.5	-13.0	-32.5	
3.700	-15.4	H	3.0	35.4	1.0	-49.7	-13.0	-36.7	
5.551	-11.5	H	3.0	35.4	1.0	-45.9	-13.0	-32.9	
		H							
Mid Ch, (1880.0MHz)									
3.760	-12.3	V	3.0	35.3	1.0	-46.7	-13.0	-33.7	
5.640	-11.0	V	3.0	35.4	1.0	-45.4	-13.0	-32.4	
3.760	-14.5	H	3.0	35.3	1.0	-48.8	-13.0	-35.8	
5.640	-10.2	H	3.0	35.4	1.0	-44.7	-13.0	-31.7	
High Ch, (1909.8MHz)									
3.820	-13.3	V	3.0	35.3	1.0	-47.6	-13.0	-34.6	
5.729	-9.2	V	3.0	35.4	1.0	-43.7	-13.0	-30.7	
3.820	-15.8	H	3.0	35.3	1.0	-50.1	-13.0	-37.1	
5.729	-12.3	H	3.0	35.4	1.0	-46.7	-13.0	-33.7	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									