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

FOR

DUAL BANDS GSM/GPRS/EDGE/WCDMA PHONE WITH BT3.0 AND WIFI

MODEL NUMBER: GT-S6012B

FCC ID: A3LGTS6012B

REPORT NUMBER: 12I14597-3

ISSUE DATE: SEPTEMBER 10, 2012

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

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1. ATTESTATION OF TEST RESULTS

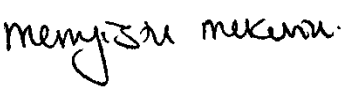
COMPANY NAME:	SAMSUNG ELECTRONICS CO., LTD. 416, MAETAN 3-DONG, YEONGTONG-GU SUWON-CITY, GYEONGGI-DO 443-742, SOUTH KOREA
EUT DESCRIPTION:	DUAL BANDS GSM/GPRS/EDGE/WCDMA PHONE, 802.11bgn, BT3.0
MODEL:	GT-S6012B
SERIAL NUMBER:	FJ-223-B
DATE TESTED:	AUGUST 31 TO SEPTEMBER 9, 2012

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

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

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 Dual Bands GSM/GPRS/EDGE/WCDMA phone with 802.11BGN and BT3.0 feature. Test was performed on EUT with FCC ID A3LGTS6010L, which is identical to this device except that for FCC ID A3LZGTS6012B, the WCDMA 1900MHz band is disabled at the factory. (Reference to report number 12I14598-3).

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak 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	32.75	1883.6	30.62	1153.5
826.4 – 846.6	UMTS, WCDMA	25.56	359.7	23.07	202.8
	UMTS, HSUPA	27.90	616.6	24.89	308.3

Part 24 PCS Band

Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2 – 1909.8	GPRS	29.87	970.5	26.56	452.9

5.3. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent 8960/Anritsu Wireless Communication Test Set.

5.4. WORST-CASE CONFIGURATION AND MODE

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

Worst-case modes: GPRS, UMTS WCDMA and UMTS HSUPA Sub-test 3.

Since the EUT is a portable device, to determine the worst/highest emissions, the X, Y, and Z orientations of the EUT with respect to the turntable and the worst among them with headset and an AC adapter were investigated. After the investigations Z-Orientation without headset and an AC Adapter and Y-orientation with headset and an AC adapter was turned out to be the worst case for cell and PCS bands respectively.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
USB Travel Adapter	Samsung	ETAOU10EBE	SC3BB03HS/7E FJ-223-B	DoC
Headset	Samsung	EHS61ASFWE	--	N/A

I/O CABLES (CONDUCTED)

I/O Cable List						
Cable No	**Port**	**# of identical ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	RF	1	Antenna Port	Shielded	1.0m	NA
2	RF	1	SMA	Shielded	0.7m	NA

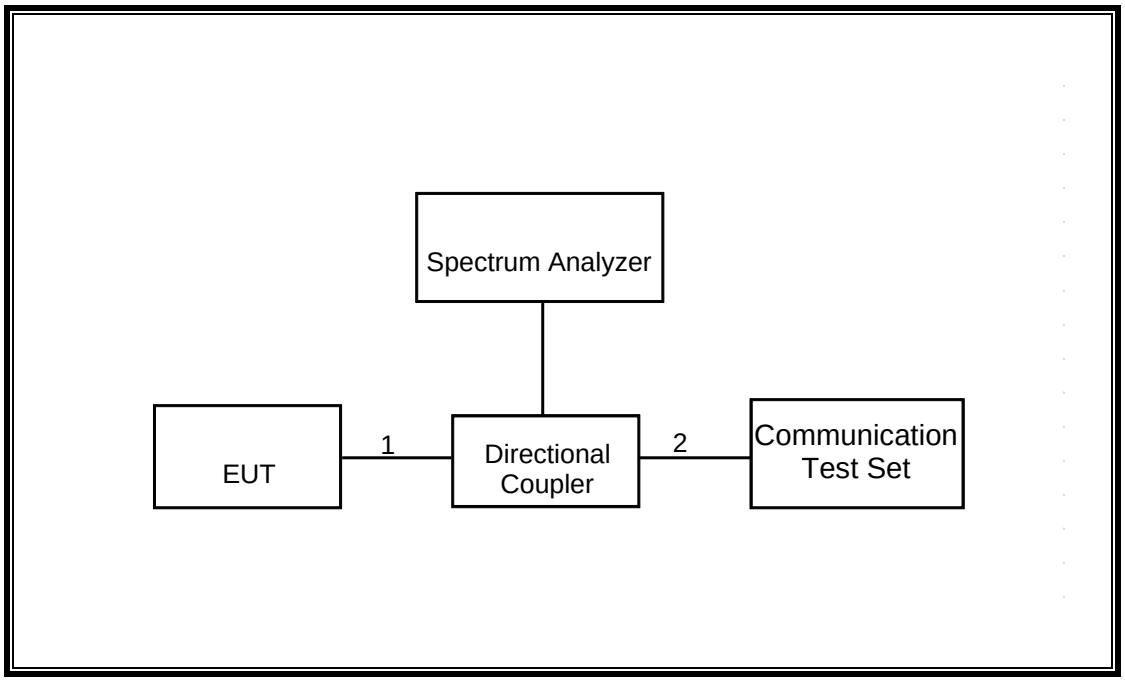
I/O CABLES (RADIATED)

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	DC Power	1	Mini-USB	Shielded	1.2 m	NA
2	Audio	1	Mini-Jack	Shielded	1.5 m	NA

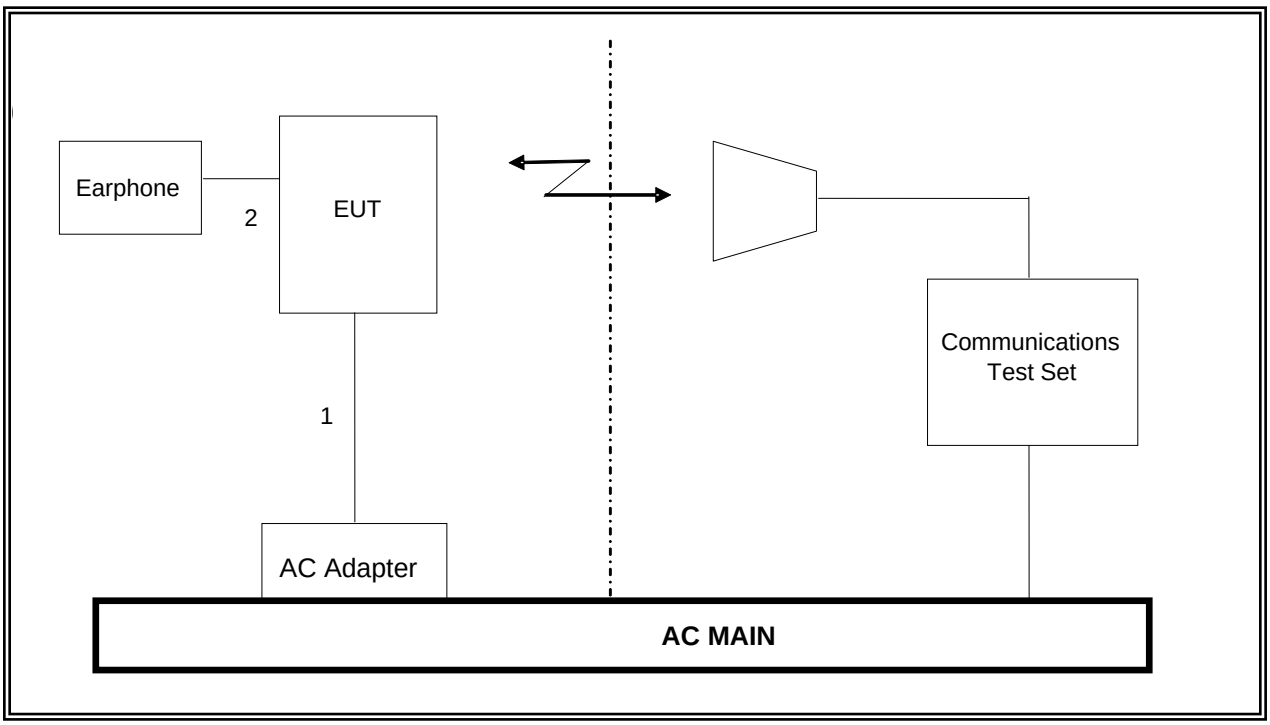
TEST SETUP

The EUT is a stand-alone device. A link is established between the EUT and the Agilent/Anritsu 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	C00986	03/22/13
Antenna, Horn, 18 GHz	EMCO	3115	C00945	10/06/12
Antenna, Horn, 18 GHz	EMCO	3115	C00943	CNR
Antenna, Horn, 18 GHz	EMCO	3115	C00783	10/18/12
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1		02/07/13
Preamplifier, 26.5 GHz	Agilent / HP	8449B	C01063	11/07/12
41468	41468	41468	41468	07/13/13
Communications Test Set	Agilent / HP	E5515C	C01086	06/20/13
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	10/20/12
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
Vector signal generator, 20 GHz	Agilent / HP	E8267C	C01066	11/17/12
Antenna, Tuned Dipole 400~1000 MHz	ETS	3121C DB4	C00993	10/16/12

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 Peak (dBm)	2 time slots Peak (dBm)	3 time slots Peak (dBm)	4 time slots Peak (dBm)
GPRS	128	824.2	**32.75**	29.88	27.99	26.83
	190	836.6	32.74	29.66	27.98	26.85
	251	848.8	32.67	29.84	27.95	26.8
GPRS	512	1850.2	**29.87**	27.01	25.15	24.02
	661	1880.0	29.77	26.91	25.04	32.93
	810	1909.8	29.74	26.85	25.00	23.84

7.2. RF POWER OUTPUT FOR UMTS WCDMA

TEST PROCEDURE

The following summary of these settings are illustrated below:

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

RESULTS

Band	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
				Peak
UMTS 850	4132	4357	826.4	**25.56**
	4183	4408	836.6	25.34
	4233	4458	846.6	25.34

7.3. RF POWER OUTPUT FOR UMTS 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			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βec	-	-	-	-
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	βed	Not Applicable			
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs = βhs/βc	30/15			

RESULT

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS850 (Band IV)	1	4132	4357	826.4	25.35
		4183	4408	836.6	26.27
		4233	4458	846.6	26.06
	2	4132	4357	826.4	26.58
		4183	4408	836.6	26.56
		4233	4458	846.6	26.48
	3	4132	4357	826.4	**27.43**
		4183	4408	836.6	27.35
		4233	4458	846.6	27.11
	4	4132	4357	826.4	25.06
		4183	4408	836.6	24.90
		4233	4458	846.6	25.51

7.4. RF POWER OUTPUT UMTS HSPA (HSDPA & HSUPA)

TEST PROCEDURE

The following summary of these settings are illustrated below:

	Mode	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA	Rel6 HSUPA
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	1309/225	94/75	47/15 47/15	56/75	47/15
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	D E-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_TFCIs	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO 4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO 23 E-TFCI 75 E-TFCI PO 26 E-TFCI 81 E-TFCI PO 27	

RESULTS

Band	Subtest	UL Ch	DL Ch	Frequency	Conducted output power (dBm)
					Peak
UMTS850 (Band IV)	1	4132	4357	826.4	25.67
		4183	4408	836.6	26.82
		4233	4458	846.6	26.58
	2	4132	4357	826.4	26.90
		4183	4408	836.6	27.11
		4233	4458	846.6	27.00
	3	4132	4357	826.4	27.75
		4183	4408	836.6	**27.90**
		4233	4458	846.6	27.63
	4	4132	4357	826.4	25.38
		4183	4408	836.6	25.45
		4233	4458	846.6	26.03
	5	4132	4357	826.4	26.78
		4183	4408	836.6	26.78
		4233	4458	846.6	26.82

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, WCDMA and HSUPA

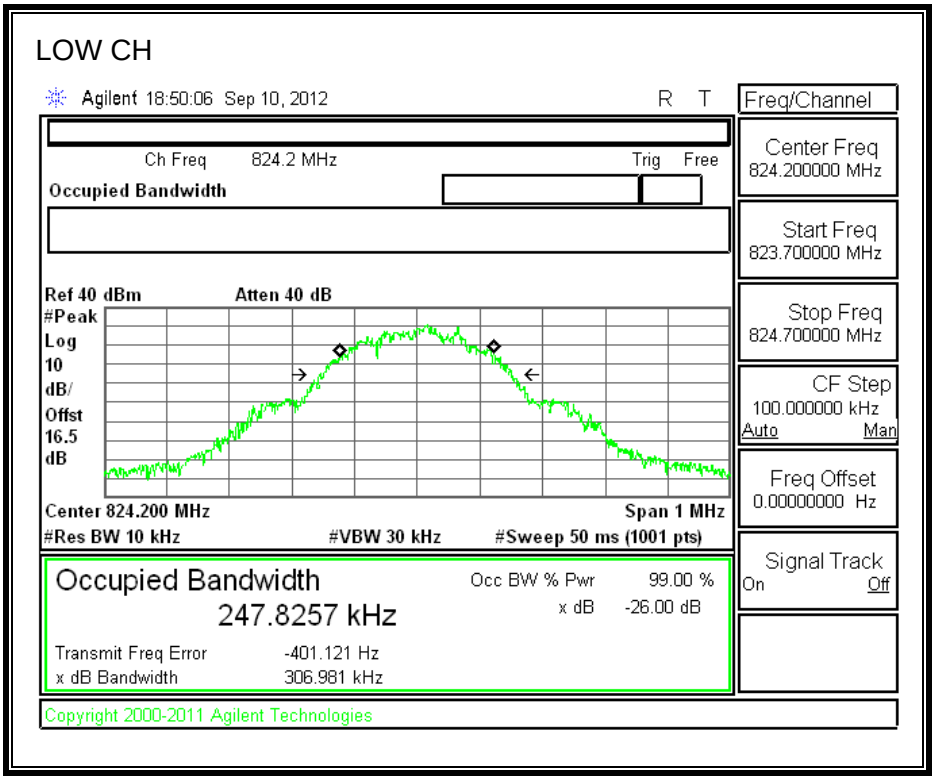
RESULTS

Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.20	247.8257	306.981
		190	836.60	247.3542	305.671
		251	848.80	246.6554	306.688
PCS		512	1850.2	245.6779	303.903
		661	1880.0	249.0212	307.061
		810	1909.8	249.6939	313.101

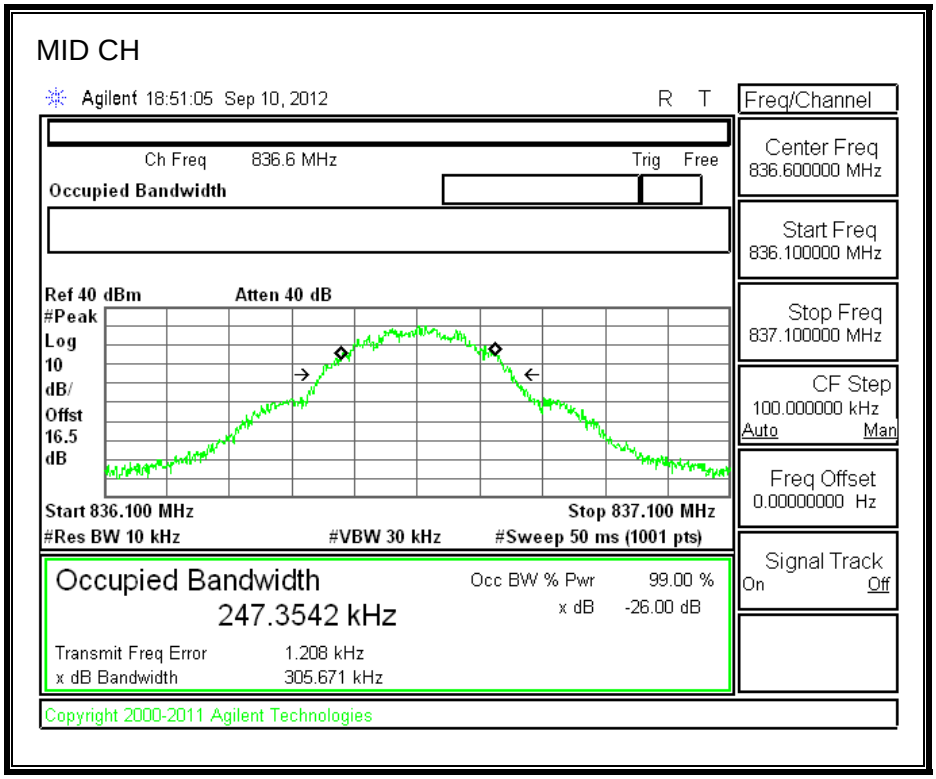
Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
CELL	UMTS, WCDMA	4357	826.4	4.1228	4.700
		4408	836.6	4.1878	4.685
		4458	846.6	4.2293	4.613
	UMTS, HSUPA	4357	826.4	4.1932	4.630
		4408	836.6	4.1610	4.628
		4458	846.6	4.1733	4.658

GPRS Mode (Cellular Band)

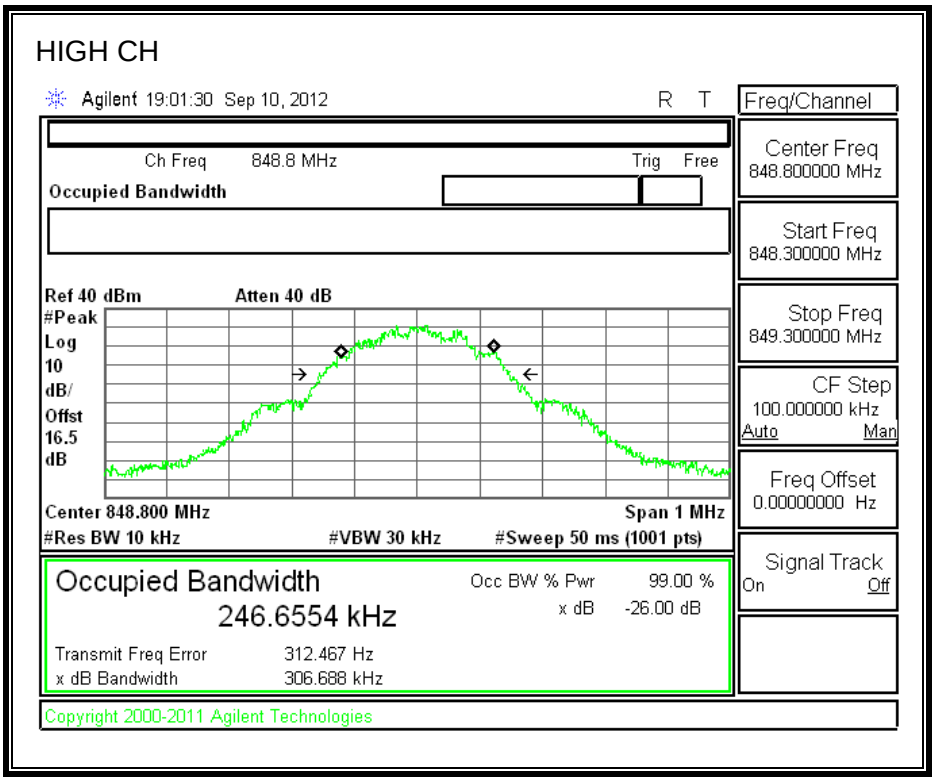
LOW CH



MID CH

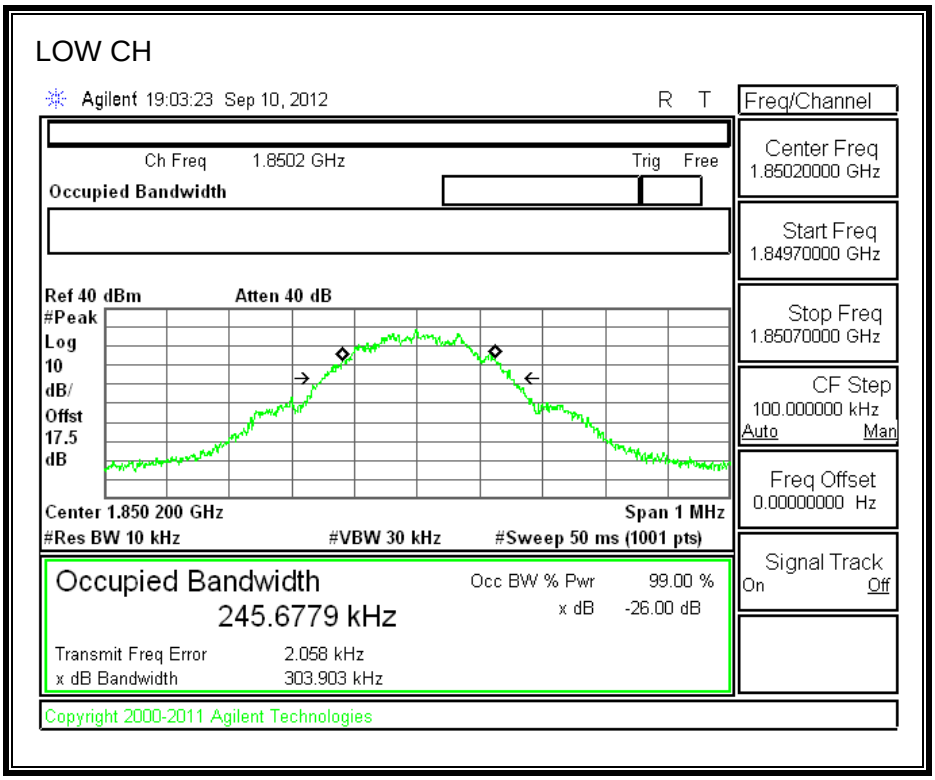


HIGH CH

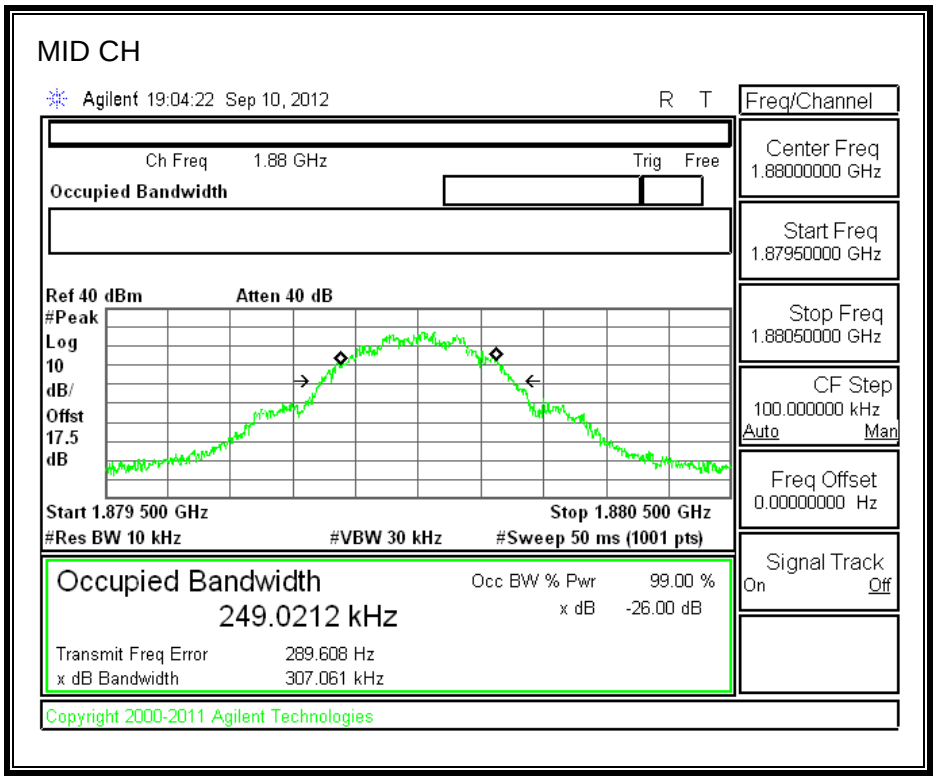


GPRS Mode (PCS Band)

LOW CH



MID CH



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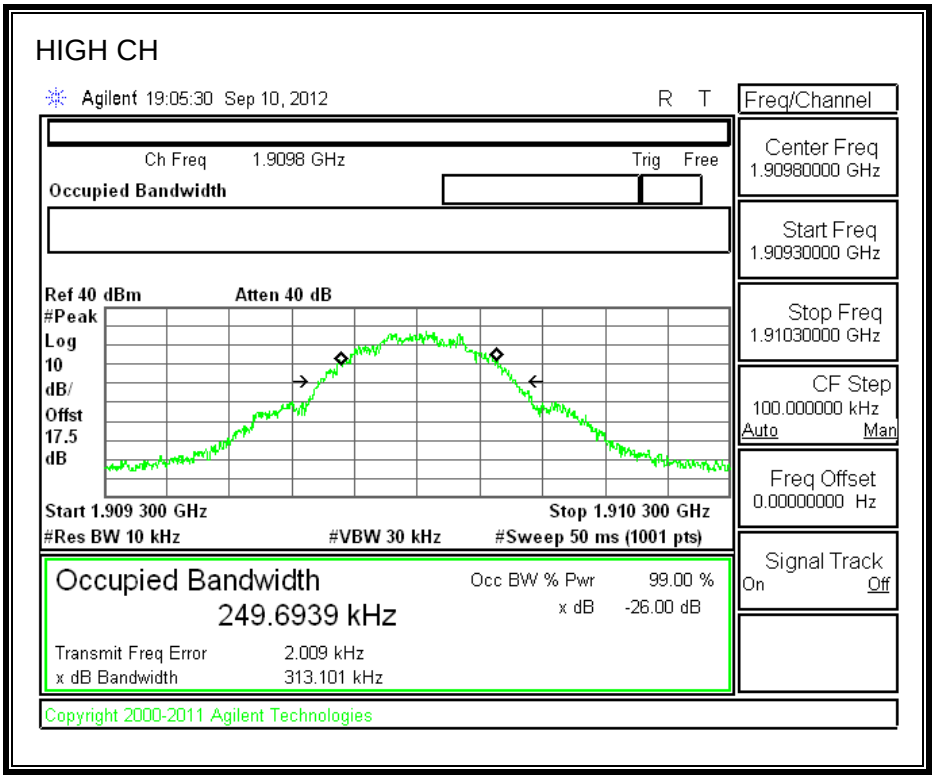
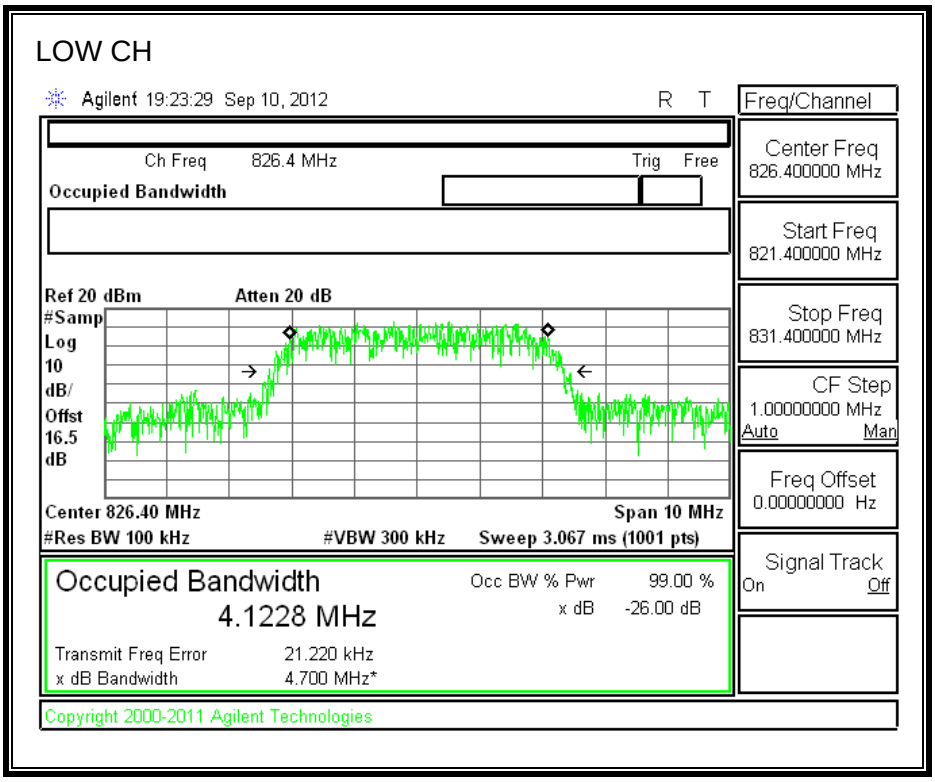


UMTS WCDMA850 (Cellular Band)

LOW CH



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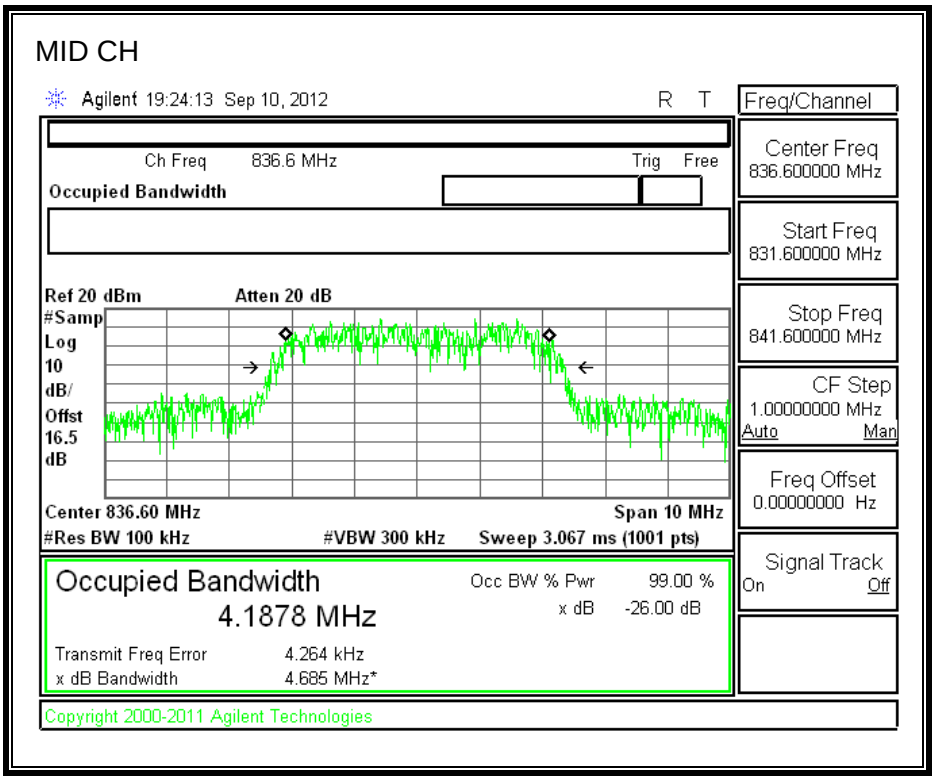
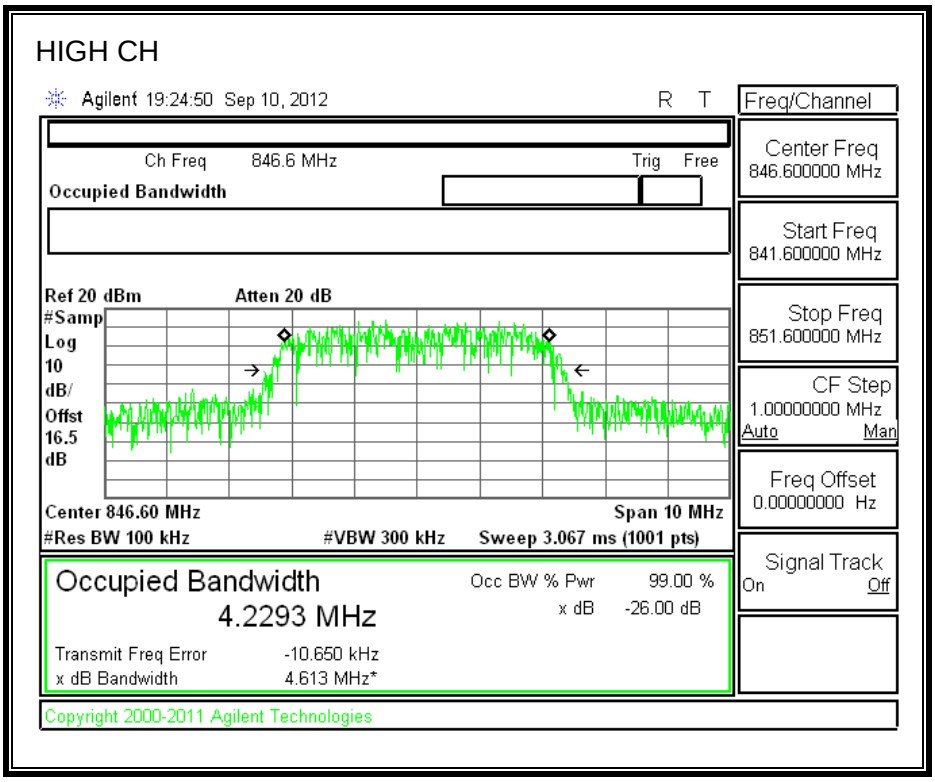
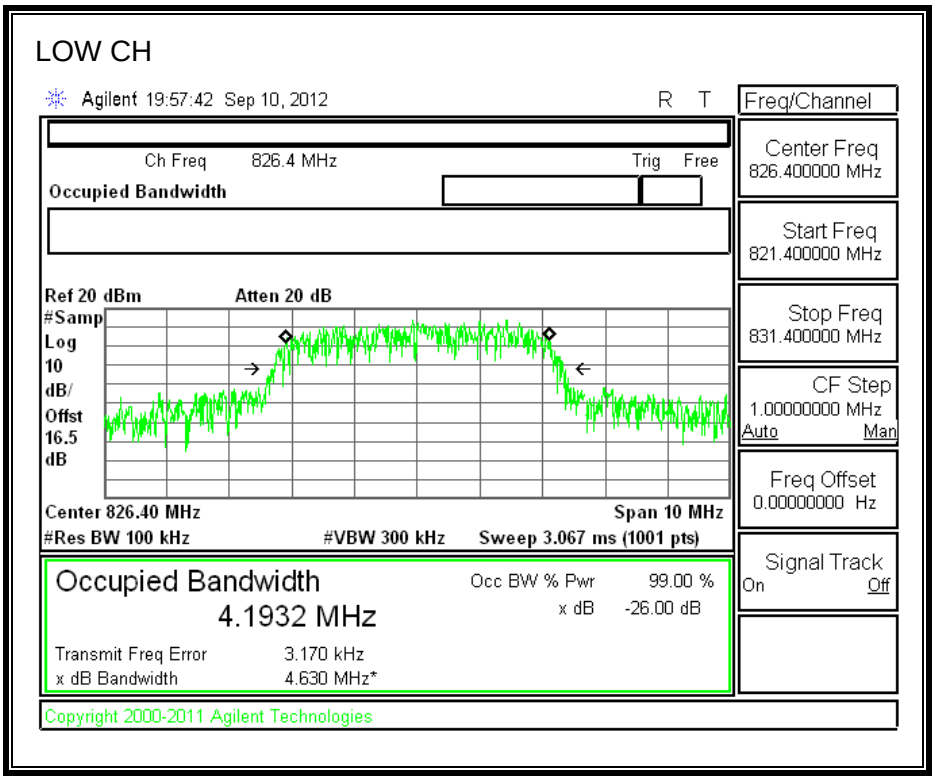


HIGH CH

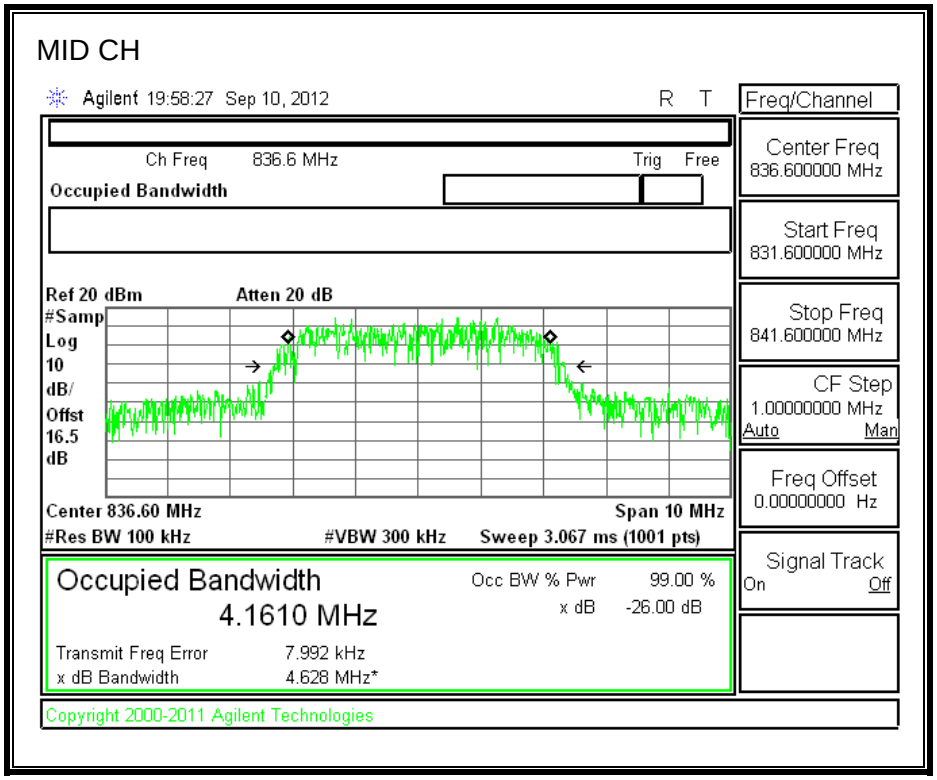


UMTS HSUPA850 (Cellular Band)

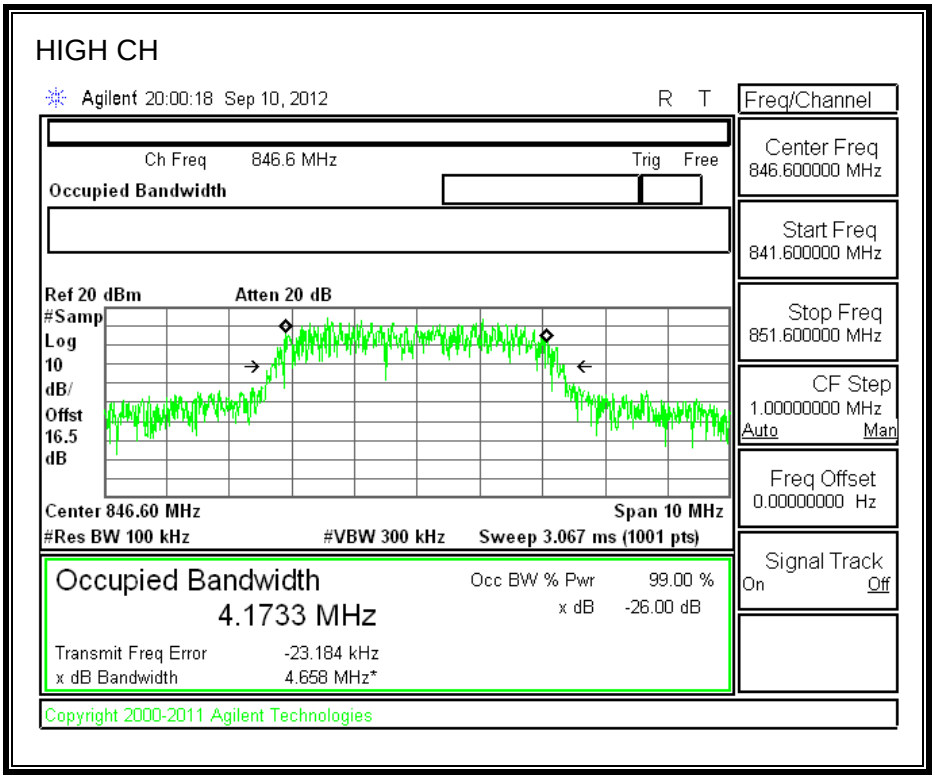
LOW CH



MID CH



HIGH CH



8.2. BAND EDGE

RULE PART(S)

FCC: §22.359, 24.238

LIMITS

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

TEST PROCEDURE

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

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

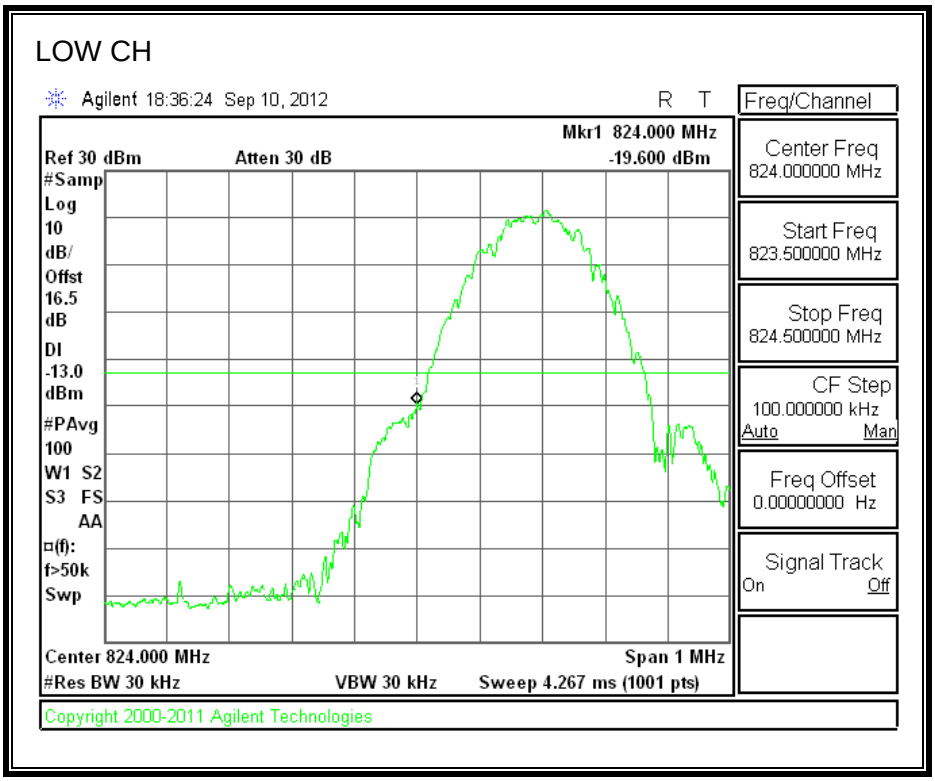
MODES TESTED

- GPRS
- UMTS, WCDMA and HSUPA

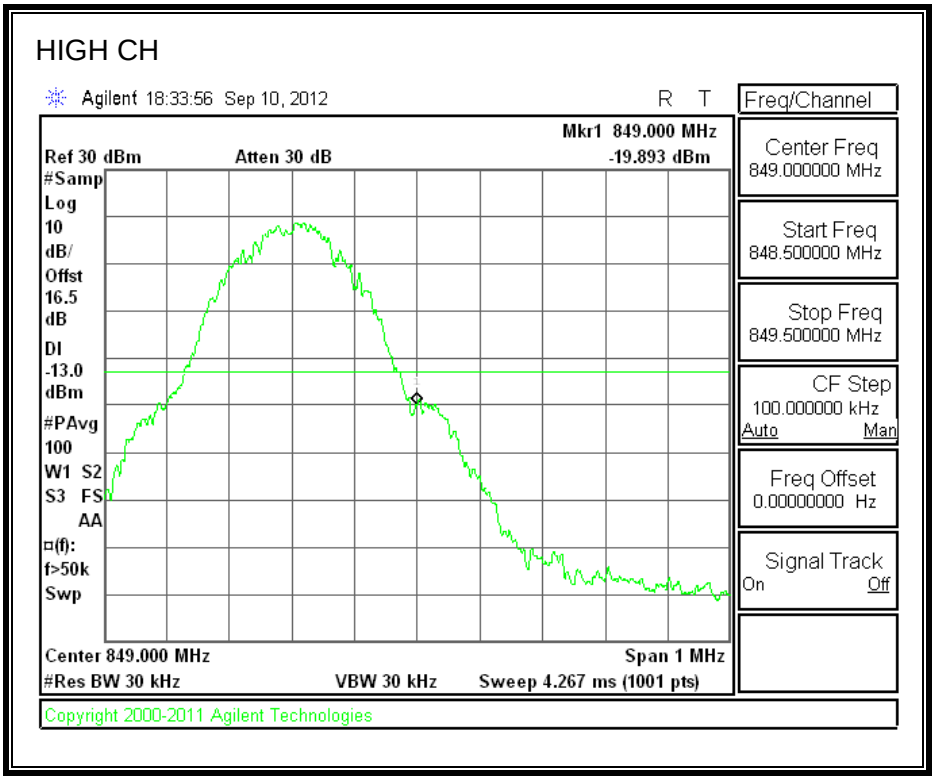
RESULTS

GPRS Mode (Cellular Band)

Low Channel Band Edge

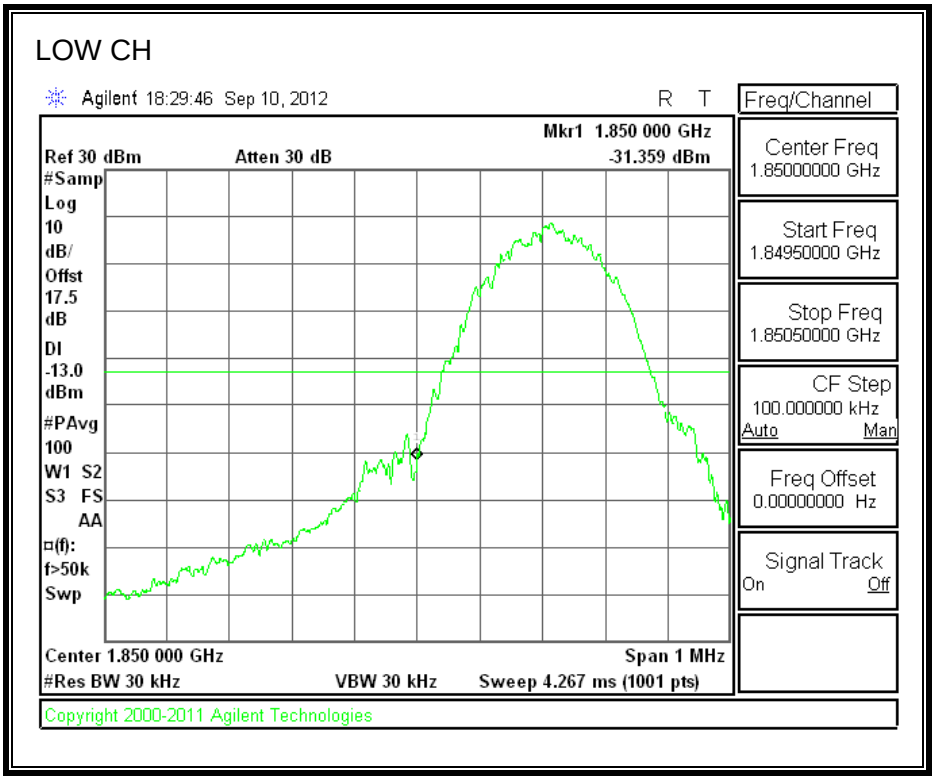


High Channel Band Edge

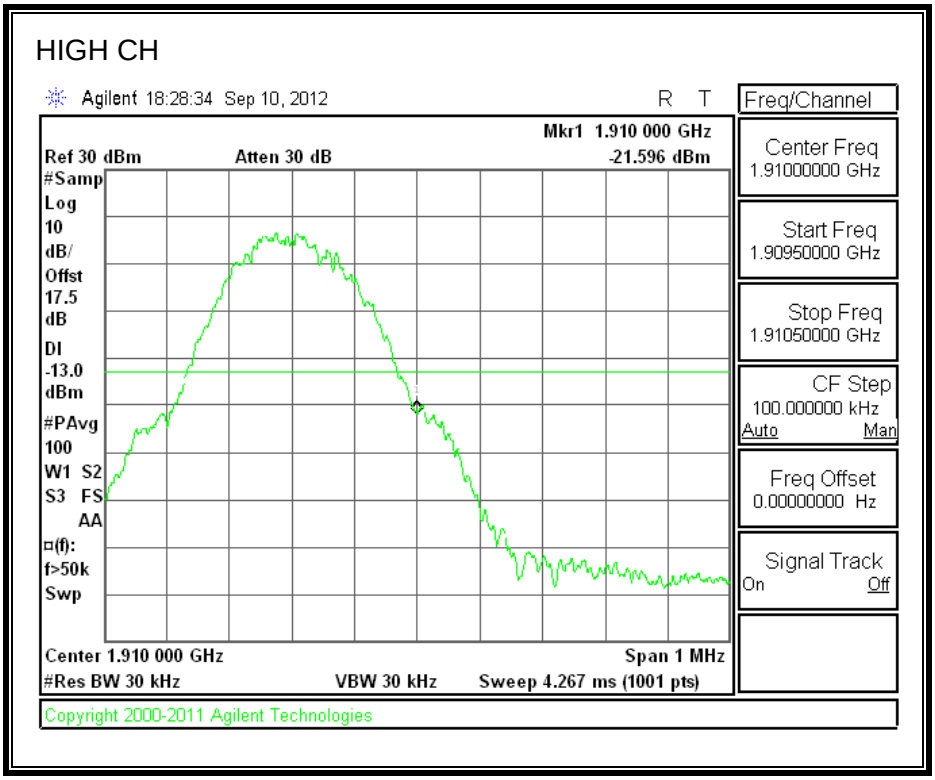


GPRS Mode (PCS Band)

Low Channel Band Edge

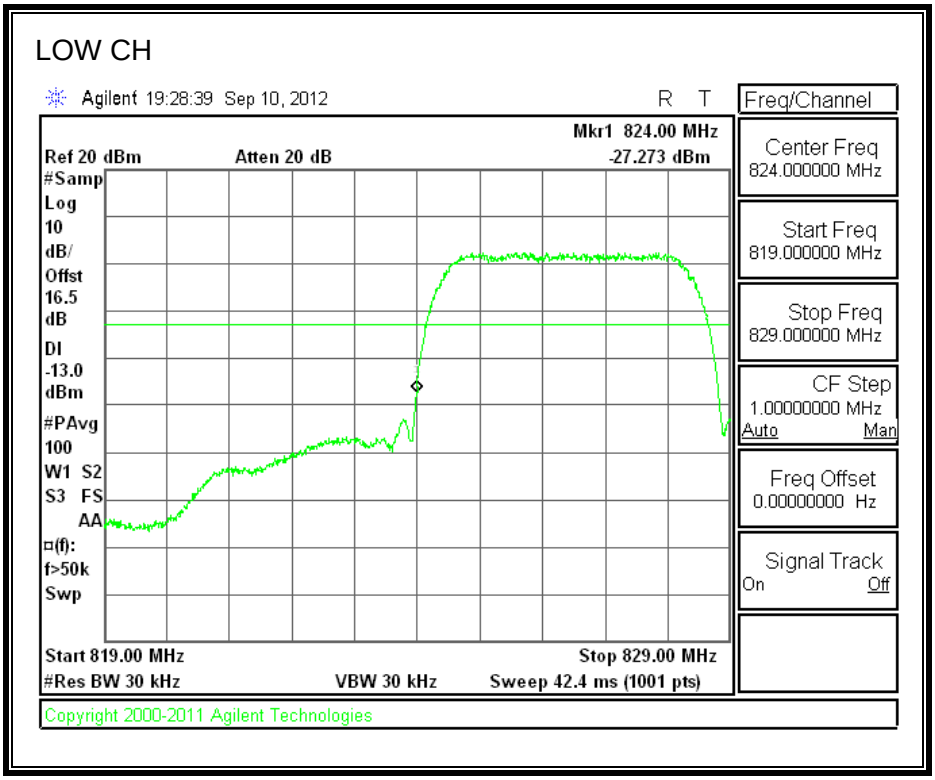


High Channel Band Edge

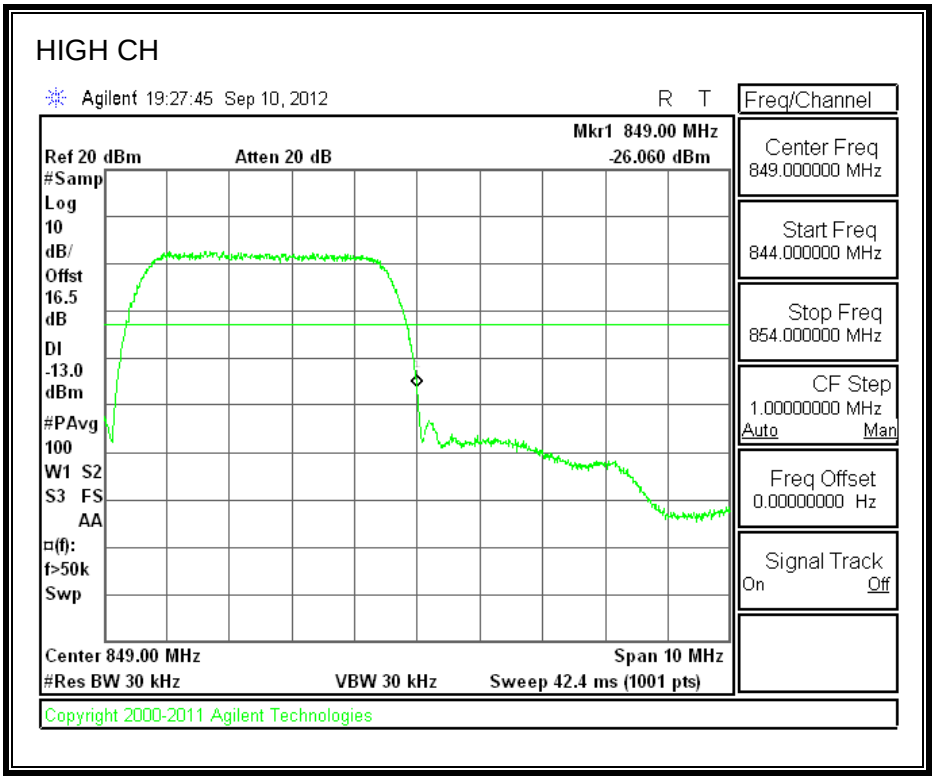


UMTS WCDMA850 (Cellular Band)

Low Channel Band Edge

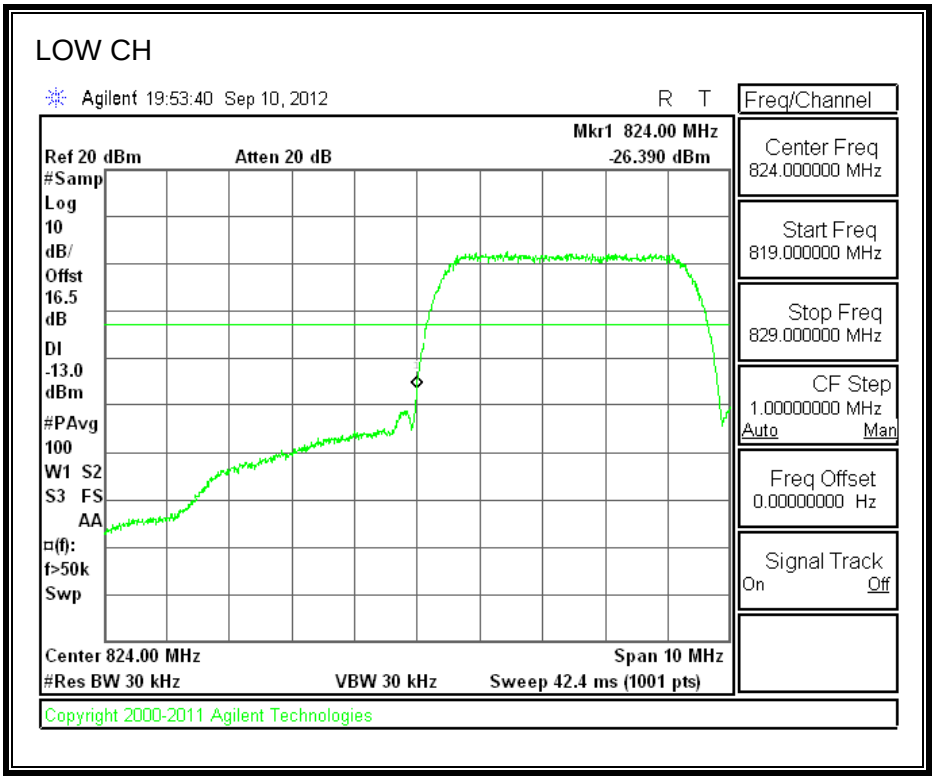


High Channel Band Edge

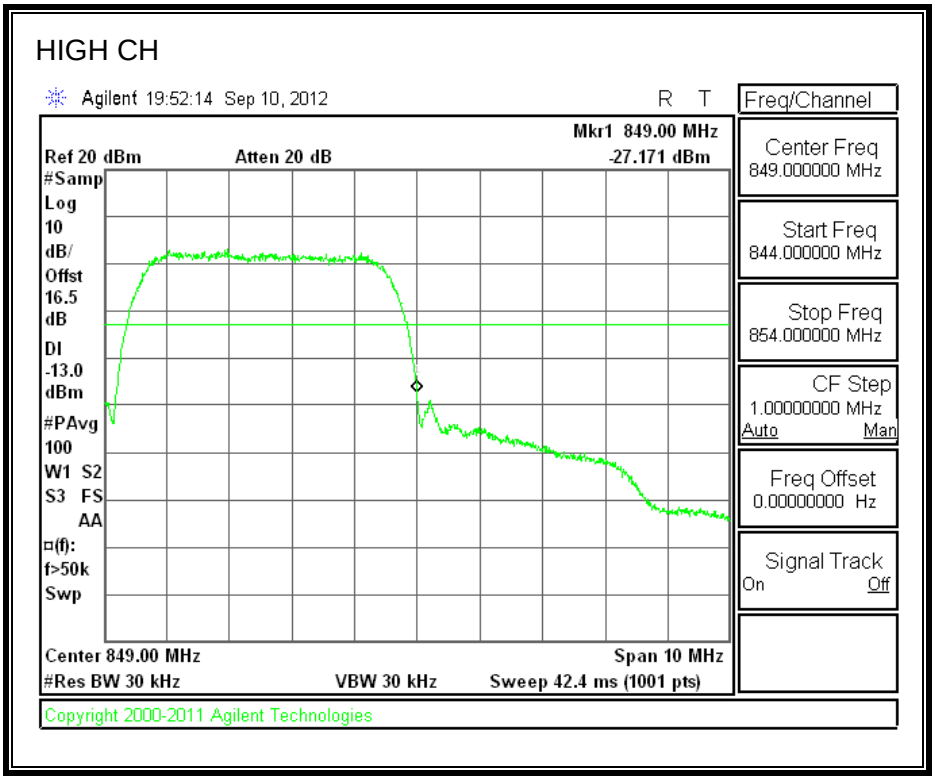


UMTS HSUPA850 (Cellular Band)

Low Channel Band Edge



High Channel Band Edge



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.

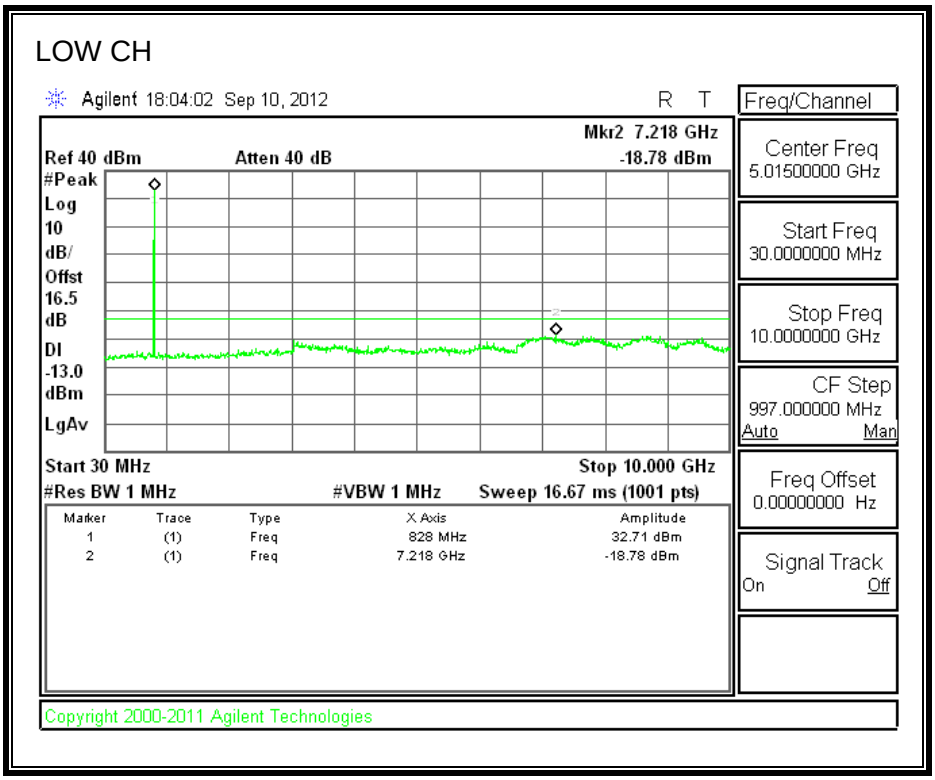
MODES TESTED

- GPRS
- UMTS, WCDMA and HSUPA

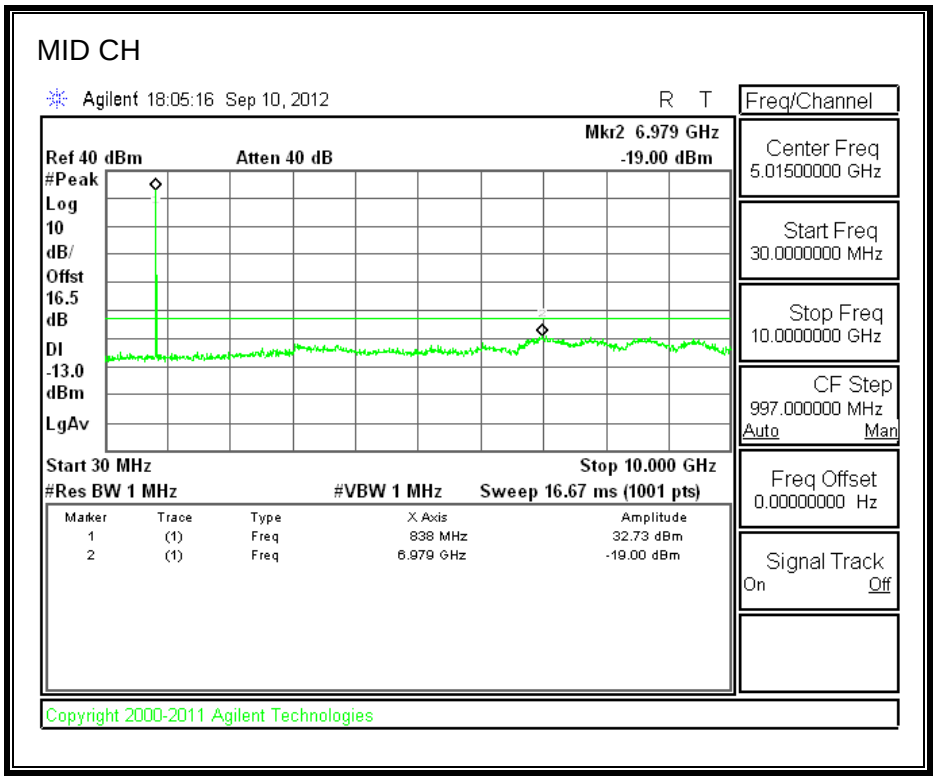
RESULTS

GPRS Mode (Cellular Band)

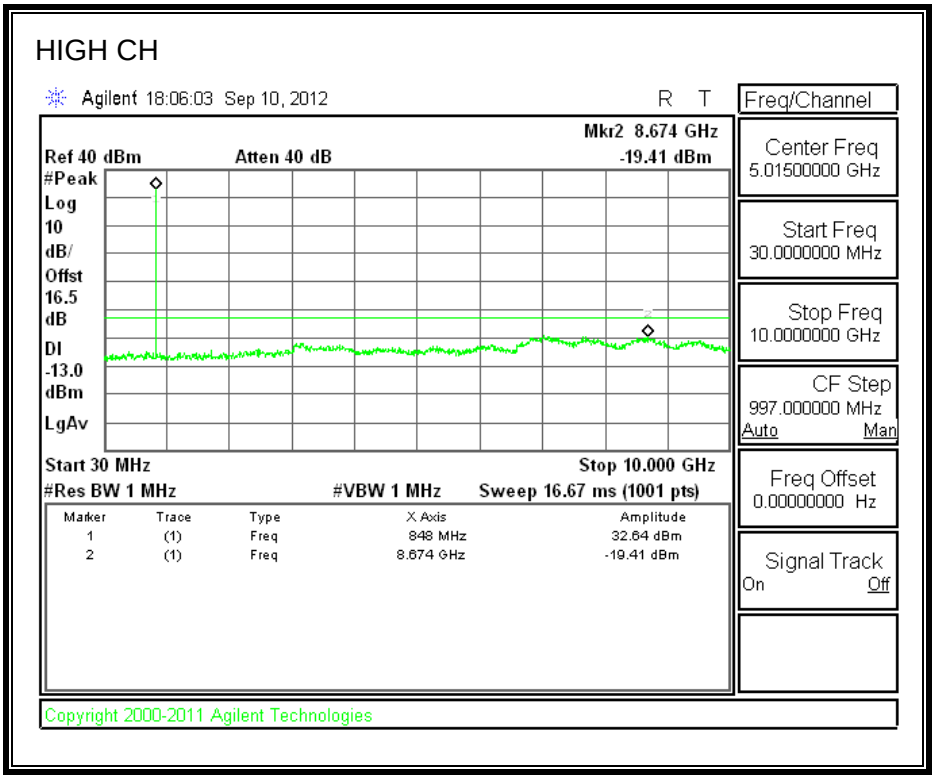
LOW CH



MID CH

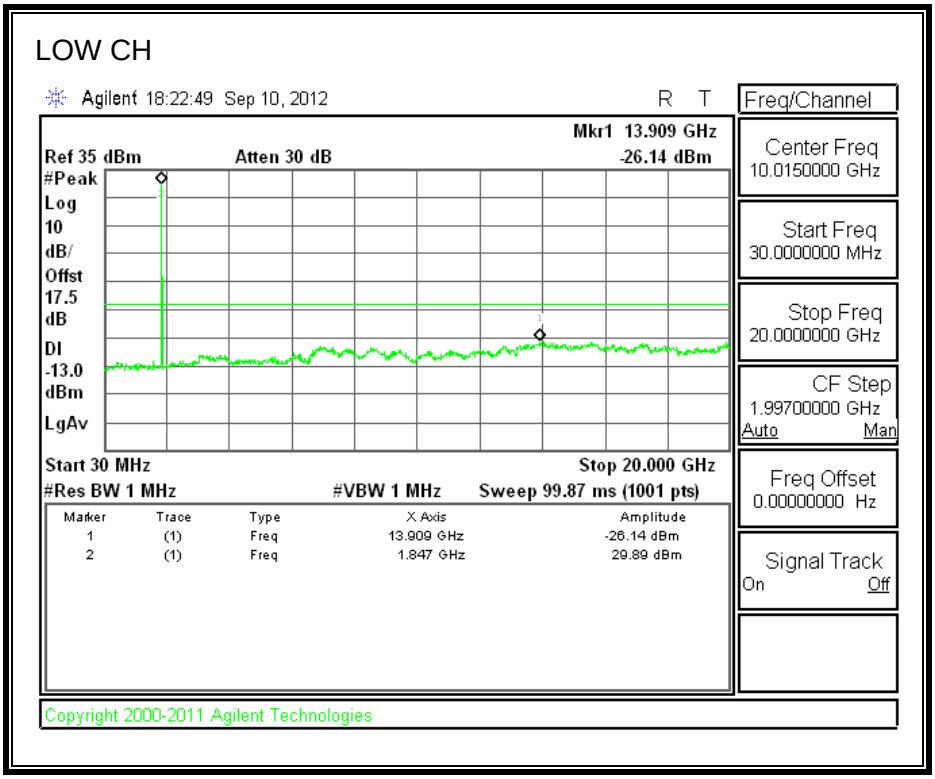


HIGH CH

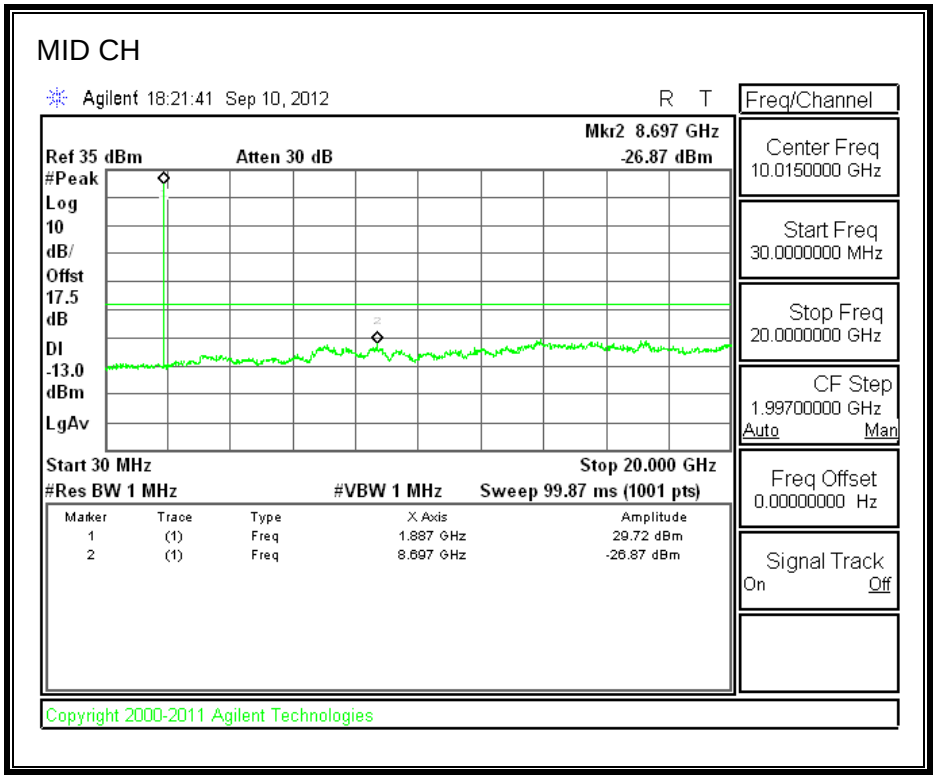


GPRS Mode (PCS Band)

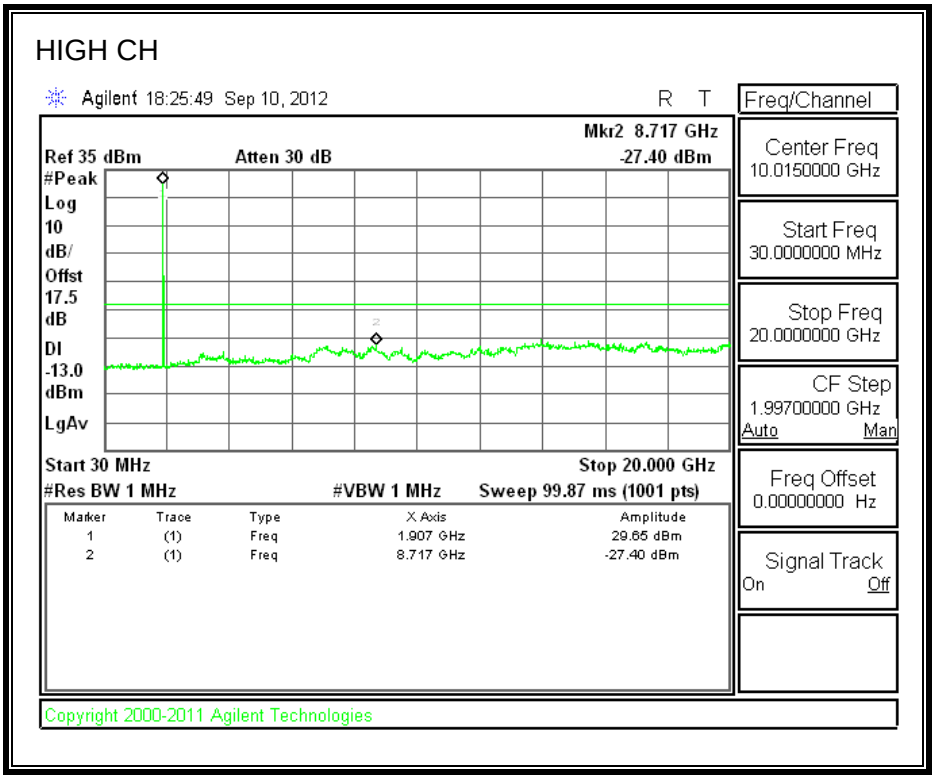
LOW CH



MID CH

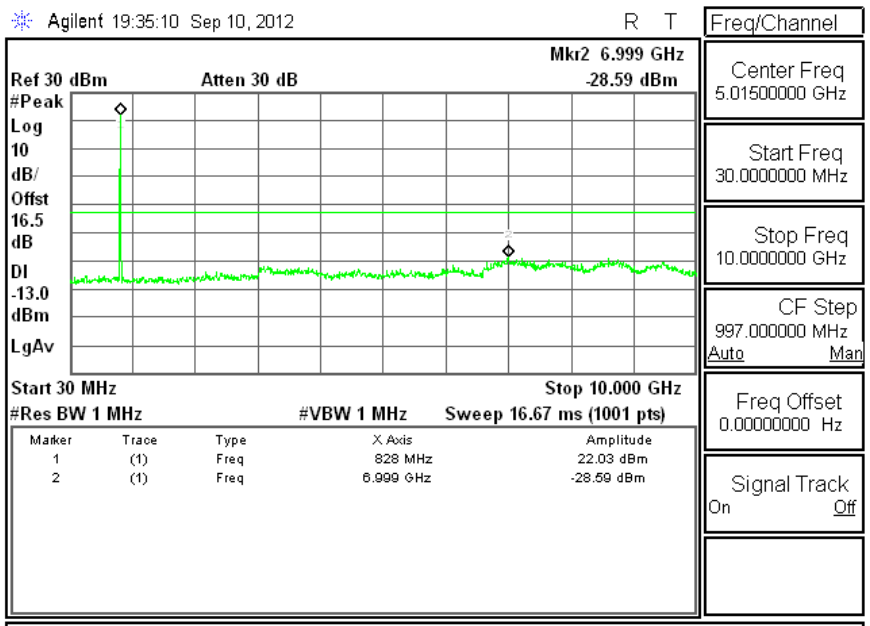


HIGH CH

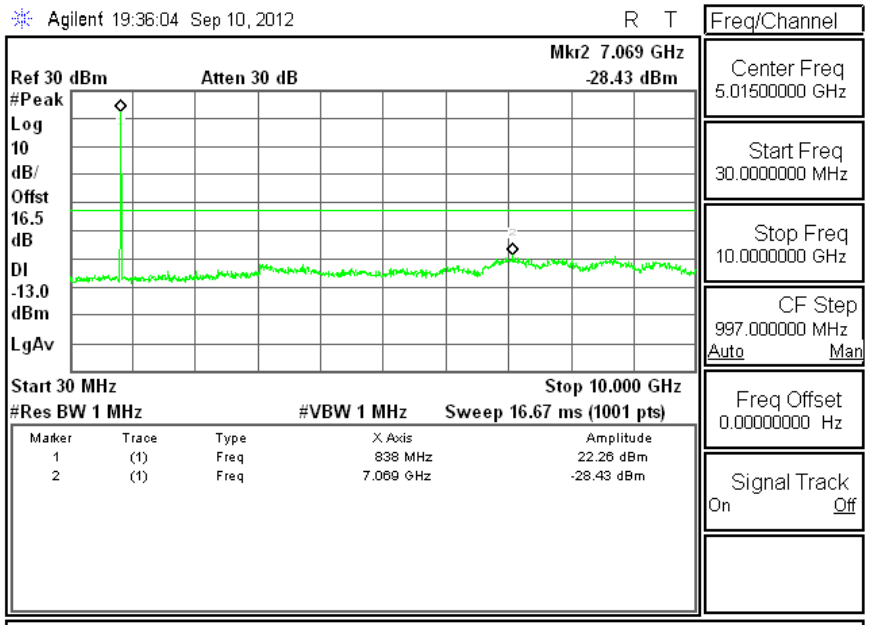


UMTS WCDMA850 (Cellular Band)

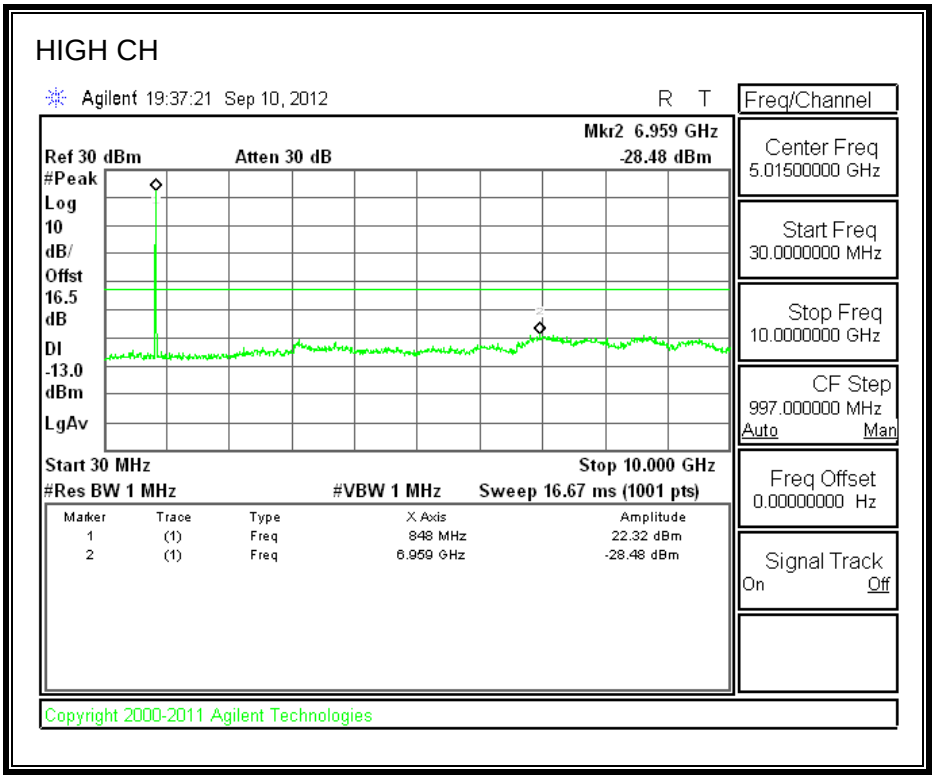
LOW CH



MID CH

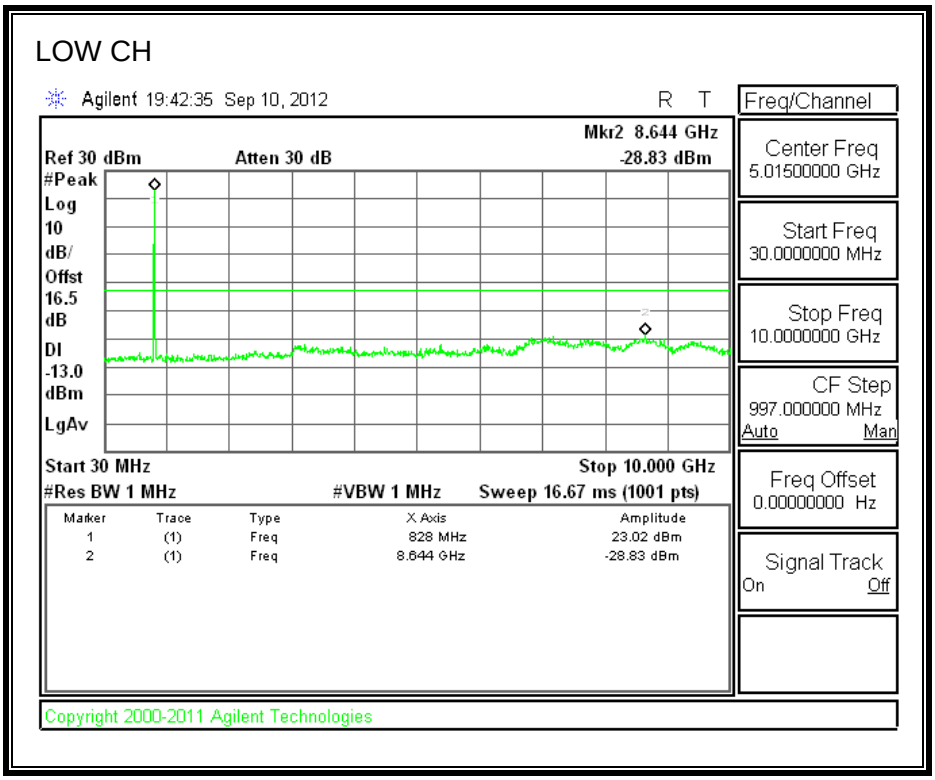


HIGH CH

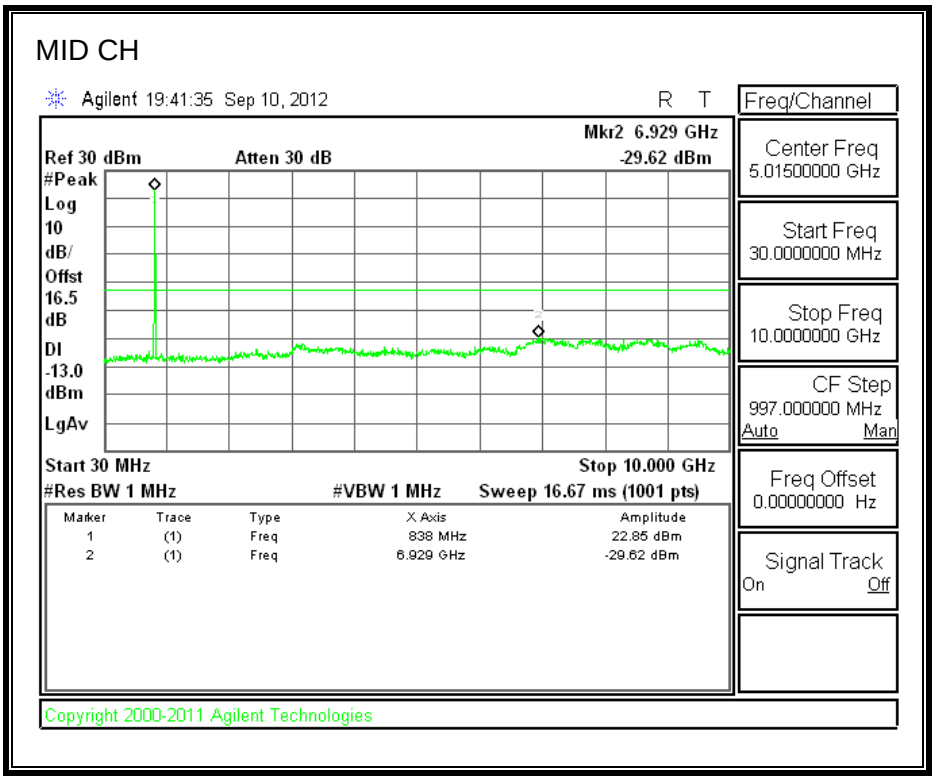


UMTS HSUPA850 (Cellular Band)

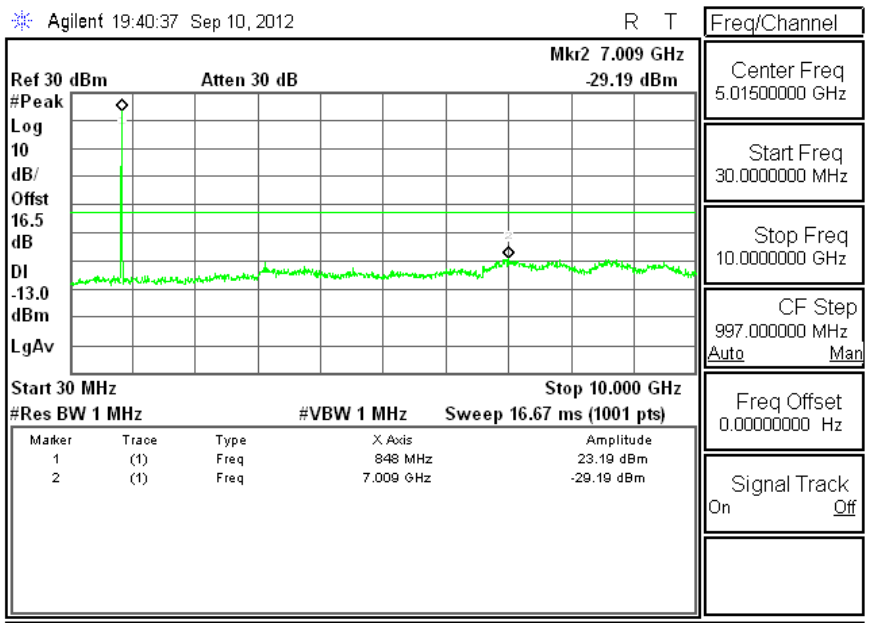
LOW CH



MID CH



HIGH CH



8.3. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235

LIMITS

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

- §24.235 - The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Use Agilent 8960 with Frequency Error measurement capability.

- Temp. = −30° to +50°C
- Voltage = 3.70 Vdc (85% - 115%)

Frequency Stability vs Temperature:

The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:

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

MODES TESTED

- GPRS
- UMTS, WCDMA and HSUPA

RESULTS

See the following pages

CELL, GSM MODULATION – MID CHANNEL

Reference Frequency: Cellular Mid Channel 836.600026MHz @ 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)
3.70	50	836.600015	0.013	2.5
3.70	40	836.600018	0.010	2.5
3.70	30	836.600022	0.005	2.5
3.70	***20***	***836.600026***	***0***	2.5
3.70	10	836.600027	-0.001	2.5
3.70	0	836.600027	-0.001	2.5
3.70	-10	836.600029	-0.004	2.5
3.70	-20	836.600030	-0.005	2.5
3.70	-30	836.600012	0.017	2.5

Reference Frequency: Cellular Mid Channel 836.600026MHz @ 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)
3.70	***20***	***836.600026***	***0***	***2.5***
3.40	20	836.600027	*-0.001*	2.5
4.26	20	836.600011	*0.018*	2.5

PCS, GSM MODULATION – MID CHANNEL

Reference Frequency: PCS Mid Channel 1880.000021MHz @ 20°C 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)
3.70	50	1880.000015	0.003	2.5
3.70	40	1880.000017	0.002	2.5
3.70	30	1880.000018	0.002	2.5
3.70	***20***	***1880.000021***	***0***	***2.5***
3.70	10	1880.000019	0.001	2.5
3.70	0	1880.000017	0.002	2.5
3.70	-10	1880.000015	0.003	2.5
3.70	-20	1880.000013	0.004	2.5
3.70	-30	1880.000012	0.005	2.5

Reference Frequency: PCS Mid Channel 1880.000021MHz @ 20°C 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)
3.70	***20***	***1880.000021***	***0***	***2.5***
3.40	20	1880.000022	*-0.001*	2.5
4.26	20	1880.000021	*0.000*	2.5

CELL UMTS – MID CHANNEL

Reference Frequency: PCS Mid Channel 1879.999596MHz @ 20ºC Limit: to stay +- 2.5 ppm = 4699.999 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1879.999574	0.012	2.5
3.70	40	1879.999579	0.009	2.5
3.70	30	1879.999584	0.006	2.5
3.70	***20***	***1879.999596***	***0***	2.5
3.70	10	1880.000063	-0.248	2.5
3.70	0	1880.000476	-0.468	2.5
3.70	-10	1880.000539	-0.502	2.5
3.70	-20	1880.000093	-0.264	2.5
3.70	-30	1879.999566	0.016	2.5

Reference Frequency: PCS Mid Channel 1879.999596MHz @ 20ºC Limit: to stay +- 2.5 ppm = 4699.999 Hz				
Power Supply	Environment	Frequency Deviation Measureed with Time Elapse		
(Vdc)	Temperature (°C)	(MHz)	Delta (ppm)	Limit (ppm)
3.70	***20***	***1879.999596***	***0***	***2.5***
3.40	20	1879.999626	*-0.016*	2.5
4.26	20	1879.999609	*-0.007*	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, WCDMA and HSUPA

RESULTS

CELLULAR BAND (ERP)

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	27.32	539.51
	192	836.60	28.29	674.53
	251	848.80	**30.62**	1153.45
UMTS WCDMA	4357	826.40	18.16	65.46
	4408	836.60	**23.07**	202.77
	4458	846.60	22.22	166.72
UMTS HSUPA	4357	826.40	19.80	95.50
	4408	836.60	**24.89**	308.32
	4458	846.60	24.18	261.82

PCS BAND (EIRP)

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	25.30	338.84
	661	1880.00	26.11	408.32
	810	1909.80	**26.56**	452.90

ERP GPRS850 BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14597
Date: 09/03/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 850 MHz BAND, GPRS MODE

Test Equipment:
Receiving: Sunol T122, and 3m Chamber N-type Cable (Setup this one for testing EUT)
Substitution: Dipole S/N: 1629, 4ft SMA Cable (245182002) 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	27.82	V	0.5	0.0	27.32	38.5	-11.1	
824.20	15.55	H	0.5	0.0	15.05	38.5	-23.4	
836.60	28.79	V	0.5	0.0	28.29	38.5	-10.2	
836.60	15.04	H	0.5	0.0	14.54	38.5	-23.9	
848.80	31.12	V	0.5	0.0	30.62	38.5	-7.8	
848.80	16.09	H	0.5	0.0	15.59	38.5	-22.9	

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ERP UMTS WCDMA, 850MHz BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: SAMSUNG ELECTRONICS
Project #: 12I14597
Date: 09/03/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 850 MHz BAND, WCDMA MODE

Test Equipment:
Receiving: Sunol T243, and Chamber A 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	18.66	V	0.5	0.0	18.16	38.5	-20.3	
826.40	6.13	H	0.5	0.0	5.63	38.5	-32.8	
836.60	23.57	V	0.5	0.0	23.07	38.5	-15.4	
836.60	6.53	H	0.5	0.0	6.03	38.5	-32.4	
846.60	22.72	V	0.5	0.0	22.22	38.5	-16.2	
846.60	8.41	H	0.5	0.0	7.91	38.5	-30.5	

Rev. 3.17.11

ERP UMTS HSUPA, 850MHz BAND

High Frequency Substitution Measurement
Compliance Certification Services Chamber A

Company: SAMSUNG ELECTRONICS
Project #: 12I14597
Date: 09/03/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT ALONE
Mode: TX, 850 MHz BAND, HSUPA MODE

Test Equipment:
Receiving: Sunol T243, and Chamber A 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	20.30	V	0.5	0.0	19.80	38.5	-18.6	
826.40	7.70	H	0.5	0.0	7.20	38.5	-31.2	
836.60	25.39	V	0.5	0.0	24.89	38.5	-13.6	
836.60	8.89	H	0.5	0.0	8.39	38.5	-30.1	
846.60	24.68	V	0.5	0.0	24.18	38.5	-14.3	
846.60	9.91	H	0.5	0.0	9.41	38.5	-29.0	

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EIRP GPRS1900 BAND

High Frequency Fundamental Measurement
Compliance Certification Services Chamber B

Company: SAMSUNG ELECTRONICS
Project #: 12I14597
Date: 09/03/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH HEADSET AND AC ADAPTER
Mode: TX, 1900 MHz BAND, GPRS MODE

Test Equipment:
Receiving: Horn T59, and Camber B SMA Cables
Substitution: Horn T217 Substitution, 4ft SMA Cable (245182002) 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	17.5	V	0.85	8.62	25.30	33.0	-7.7	
1.850	8.2	H	0.85	8.47	15.86	33.0	-17.1	
1.880	18.5	V	0.85	8.46	26.11	33.0	-6.9	
1.880	9.1	H	0.85	8.36	16.64	33.0	-16.4	
1.910	19.1	V	0.85	8.30	26.56	33.0	-6.4	
1.910	9.0	H	0.85	8.25	16.38	33.0	-16.6	

Rev. 3.17.11

9.2. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

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

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, WCDMA and HSUPA

RESULTS

ERP GPRS850MHz BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SAMSUNG ELECTRONICS
Project #: 12U14597
Date: 08/31/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT with AC Adapter and Earphone
Mode: TX, 850MHz BAND GPRS MODE

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

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	ERP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, (824.2MHz)									
1.648	-2.3	V	3.0	35.5	1.0	-36.8	-13.0	-23.8	
5.769	-12.7	V	3.0	35.5	1.0	-47.1	-13.0	-34.1	
8.242	-8.2	V	3.0	35.6	1.0	-42.9	-13.0	-29.9	
9.066	-9.2	V	3.0	35.6	1.0	-43.8	-13.0	-30.8	
9.890	-5.2	V	3.0	35.5	1.0	-39.7	-13.0	-26.7	
1.648	-6.9	H	3.0	35.5	1.0	-41.4	-13.0	-28.4	
5.769	-10.1	H	3.0	35.5	1.0	-44.5	-13.0	-31.5	
8.242	-8.0	H	3.0	35.6	1.0	-42.7	-13.0	-29.7	
9.066	-4.6	H	3.0	35.6	1.0	-39.2	-13.0	-26.2	
9.890	-2.7	H	3.0	35.5	1.0	-37.2	-13.0	-24.2	
Mid Ch, (836.6MHz)									
1.673	-6.0	V	3.0	35.5	1.0	-40.6	-13.0	-27.6	
5.020	-12.8	V	3.0	35.3	1.0	-47.1	-13.0	-34.1	
8.366	-10.3	V	3.0	35.6	1.0	-44.9	-13.0	-31.9	
9.203	-9.1	V	3.0	35.6	1.0	-43.6	-13.0	-30.6	
10.039	-5.4	V	3.0	35.5	1.0	-39.9	-13.0	-26.9	
1.673	-10.0	H	3.0	35.5	1.0	-44.5	-13.0	-31.5	
5.856	-9.6	H	3.0	35.5	1.0	-44.1	-13.0	-31.1	
7.529	-12.9	H	3.0	35.7	1.0	-47.6	-13.0	-34.6	
8.366	-7.8	H	3.0	35.6	1.0	-42.4	-13.0	-29.4	
9.203	-6.8	H	3.0	35.6	1.0	-41.3	-13.0	-28.3	
10.039	-3.2	H	3.0	35.5	1.0	-37.7	-13.0	-24.7	
High Ch, (848.8MHz)									
1.698	-13.8	V	3.0	35.5	1.0	-48.3	-13.0	-35.3	
5.093	-13.5	V	3.0	35.3	1.0	-47.8	-13.0	-34.8	
5.942	-11.2	V	3.0	35.5	1.0	-45.7	-13.0	-32.7	
8.488	-13.5	V	3.0	35.6	1.0	-48.1	-13.0	-35.1	
9.337	-7.1	V	3.0	35.6	1.0	-41.7	-13.0	-28.7	
10.186	-6.1	V	3.0	35.4	1.0	-40.5	-13.0	-27.5	
5.942	-12.1	H	3.0	35.5	1.0	-46.6	-13.0	-33.6	
7.639	-11.8	H	3.0	35.7	1.0	-46.5	-13.0	-33.5	
8.488	-9.1	H	3.0	35.6	1.0	-43.8	-13.0	-30.8	
9.337	-4.2	H	3.0	35.6	1.0	-38.8	-13.0	-25.8	
10.186	-3.1	H	3.0	35.4	1.0	-37.5	-13.0	-24.5	

Rev. 03.03.09
Note: No other emissions within 35 dB marrgine to the limit line detected.

ERP UMTS WCDMA, 850MHz BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SAMSUNG ELECTRONICS
Project #: 12I14597
Date: 09/06/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH AC ADAPTER AND HEADSET
Mode: TX, 850MHz BAND WCDMA 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, (826.4MHz)									
1.653	-3.1	V	3.0	35.5	1.0	-37.6	-13.0	-24.6	
2.479	-21.2	V	3.0	35.4	1.0	-55.6	-13.0	-42.6	
1.653	-7.0	H	3.0	35.5	1.0	-41.5	-13.0	-28.5	
2.479	-23.9	H	3.0	35.4	1.0	-58.3	-13.0	-45.3	
Mid Ch, (836.6MHz)									
1.673	-4.0	V	3.0	35.5	1.0	-38.6	-13.0	-25.6	
2.510	-21.7	V	3.0	35.4	1.0	-56.1	-13.0	-43.1	
1.673	-7.9	H	3.0	35.5	1.0	-42.4	-13.0	-29.4	
2.510	-23.6	H	3.0	35.4	1.0	-58.0	-13.0	-45.0	
High Ch, (846.6MHz)									
1.693	-1.9	V	3.0	35.5	1.0	-36.4	-13.0	-23.4	
2.540	-21.1	V	3.0	35.4	1.0	-55.5	-13.0	-42.5	
1.693	-6.3	H	3.0	35.5	1.0	-40.8	-13.0	-27.8	
2.540	-22.1	H	3.0	35.4	1.0	-56.5	-13.0	-43.5	

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

ERP UMTS HSUPA, 850MHz BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company: SAMSUNG ELECTRONICS
Project #: 12I14597
Date: 09/06/12
Test Engineer: MENGISTU MEKURIA
Configuration: EUT WITH AC ADAPTER AND HEADSET
Mode: TX, 850MHz BAND HSUPA 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, (826.4MHz)									
1.653	-2.6	V	3.0	35.5	1.0	-37.1	-13.0	-24.1	
2.479	-20.6	V	3.0	35.4	1.0	-55.0	-13.0	-42.0	
1.653	-4.6	H	3.0	35.5	1.0	-39.1	-13.0	-26.1	
2.479	-23.2	H	3.0	35.4	1.0	-57.6	-13.0	-44.6	
Mid Ch, (836.6MHz)									
1.673	-3.5	V	3.0	35.5	1.0	-38.0	-13.0	-25.0	
2.510	-21.1	V	3.0	35.4	1.0	-55.5	-13.0	-42.5	
1.673	-5.5	H	3.0	35.5	1.0	-40.0	-13.0	-27.0	
2.510	-22.9	H	3.0	35.4	1.0	-57.3	-13.0	-44.3	
High Ch, (846.6MHz)									
1.693	-1.3	V	3.0	35.5	1.0	-35.9	-13.0	-22.9	
2.540	-20.5	V	3.0	35.4	1.0	-54.9	-13.0	-41.9	
1.693	-3.9	H	3.0	35.5	1.0	-38.4	-13.0	-25.4	
2.540	-21.4	H	3.0	35.4	1.0	-55.8	-13.0	-42.8	

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

EIRP GPRS1900MHz BAND

Compliance Certification Services
Above 1GHz High Frequency Substitution Measurement

Company:	SAMSUNG ELECTRONICS
Project #:	12U14597
Date:	08/31/12
Test Engineer:	MENGISTU MEKURIA
Configuration:	EUT WITH AC ADAPTER AND HEAD SET
Mode:	TX, 1900MHz 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, (1850.20MHz)									
3.705	-10.0	V	3.0	35.4	1.0	-44.3	-13.0	-31.3	
5.557	-12.2	V	3.0	35.4	1.0	-46.6	-13.0	-33.6	
7.410	-13.0	V	3.0	35.7	1.0	-47.7	-13.0	-34.7	
9.262	2.8	V	3.0	35.6	1.0	-31.7	-13.0	-18.7	
11.114	-7.6	V	3.0	34.8	1.0	-41.3	-13.0	-28.3	
12.967	-8.9	V	3.0	34.0	1.0	-41.9	-13.0	-28.9	
3.705	-7.3	H	3.0	35.4	1.0	-41.7	-13.0	-28.7	
5.557	-7.9	H	3.0	35.4	1.0	-42.3	-13.0	-29.3	
7.410	-12.9	H	3.0	35.7	1.0	-47.6	-13.0	-34.6	
9.262	8.3	H	3.0	35.6	1.0	-26.3	-13.0	-13.3	
11.114	-7.2	H	3.0	34.8	1.0	-41.0	-13.0	-28.0	
12.967	-5.4	H	3.0	34.0	1.0	-38.4	-13.0	-25.4	
Mid Ch, (1880.00MHz)									
3.760	-9.7	V	3.0	35.3	1.0	-44.0	-13.0	-31.0	
5.640	-12.3	V	3.0	35.4	1.0	-46.7	-13.0	-33.7	
7.520	-11.6	V	3.0	35.7	1.0	-46.3	-13.0	-33.3	
9.400	51.2	V	3.0	35.6	1.0	16.7	-13.0	29.7	
11.280	-2.1	V	3.0	34.7	1.0	-35.8	-13.0	-22.8	
13.160	-5.3	V	3.0	34.0	1.0	-38.3	-13.0	-25.3	
3.760	-8.2	H	3.0	35.3	1.0	-42.5	-13.0	-29.5	
5.640	-12.1	H	3.0	35.4	1.0	-46.5	-13.0	-33.5	
7.520	-11.7	H	3.0	35.7	1.0	-46.4	-13.0	-33.4	
9.400	5.3	H	3.0	35.6	1.0	-29.2	-13.0	-16.2	
11.280	-5.1	H	3.0	34.7	1.0	-38.7	-13.0	-25.7	
13.160	-4.1	H	3.0	34.0	1.0	-37.0	-13.0	-24.0	
High Ch, (1909.80MHz)									
3.815	-13.2	V	3.0	35.3	1.0	-47.5	-13.0	-34.5	
5.723	-11.5	V	3.0	35.4	1.0	-46.0	-13.0	-33.0	
7.630	-9.8	V	3.0	35.7	1.0	-44.5	-13.0	-31.5	
9.538	0.1	V	3.0	35.6	1.0	-34.4	-13.0	-21.4	
11.446	-8.0	V	3.0	34.6	1.0	-41.6	-13.0	-28.6	
13.353	-1.1	V	3.0	33.9	1.0	-34.0	-13.0	-21.0	
15.261	-3.1	V	3.0	33.4	1.0	-35.5	-13.0	-22.5	
3.815	-8.0	H	3.0	35.3	1.0	-42.3	-13.0	-29.3	
5.723	-12.8	H	3.0	35.4	1.0	-47.2	-13.0	-34.2	
7.630	-7.8	H	3.0	35.7	1.0	-42.5	-13.0	-29.5	
9.538	3.2	H	3.0	35.6	1.0	-31.4	-13.0	-18.4	
11.446	-7.4	H	3.0	34.6	1.0	-41.0	-13.0	-28.0	
13.353	-1.9	H	3.0	33.9	1.0	-34.8	-13.0	-21.8	
15.261	-5.9	H	3.0	33.4	1.0	-38.3	-13.0	-25.3	

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