



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

**FOR**

**GSM/WCDMA BAND PHONE WITH BT, WLAN, AND NFC**

**MODEL NUMBER: LG-P880g, LGP880g, P880g, LG-P880G, LGP880G, P880G**

**FCC ID: ZNFP880G**

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*Prepared for*

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**NVLAP LAB CODE 200065-0**

Revision History

Rev.	Issue Date	Revisions	Revised By
---	08/16/12	Initial Issue	T. Chan
A	09/19/12	Updated page 11 and 55 to include instrument settings used for conducted and radiated peak power measurements.	M. Mekuria

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** LG ELECTRONICS MOBILECOMM U.S.A., INC.  
1000 SYLVAN AVENUE  
ENGLEWOOD CLIFFS, NEW JERSEY 07632KOREA

**EUT DESCRIPTION:** GSM/WCDMA TRI-BAND PHONE WITH BT, WLAN, AND NFC

**MODEL:** LG-P880g, LGP880g, P880g, LG-P880G, LGP880G, P880G

**SERIAL NUMBER:** 207KPMZ217107

**DATE TESTED:** AUGUST 03 TO 10, 2012

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

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

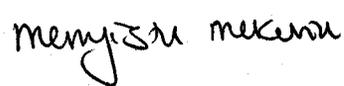
**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of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

Approved & Released For UL CCS By:



THU CHAN  
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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, FCC CFR Part 24, and FCC Part 27.

## 3. FACILITIES AND ACCREDITATION

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

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

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

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

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

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 GSM/WCDMA Tri-Band Phone with BT, WLAN, and NFC capabilities that is manufactured by LG Electronics.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak 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	33.64	2312.1	30.73	1183.0
824.2 – 848.8	EGPRS	29.45	881.0	26.21	417.8

Part 24 PCS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1850.2-1909.8	GPRS	30.70	1174.9	32.88	1940.9
1850.2-1909.8	EGPRS	28.91	778.0	31.23	1327.4

Part 27 AWS Band					
Frequency range (MHz)	Modulation	Conducted		EIRP	
		dBm	mW	dBm	mW
1712.4-1752.5	WCDMA, Rel 99	26.57	453.9	27.96	625.2
1712.4-1752.5	HSUPA, Rel 6	28.36	685.5	29.58	907.8

### 5.3. SOFTWARE AND FIRMWARE

The EUT is linked with Agilent 8960/Anritsu Wireless 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 and headset, X-Orientation without AC adapter and headset, X-Orientation with AC Adapter only were turned out to be the worst case for Cell, PCS, and AWS bands respectively.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG	MCS-01WD	DA260003271	DoC
Headset	LG	N/A	N/A	N/A

### I/O CABLES (CONDUCTED SETUP)

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	RF	1	Antenna Port	Shielded	0.1m	NA
2	RF	1	SMA	Shielded	0.7m	NA

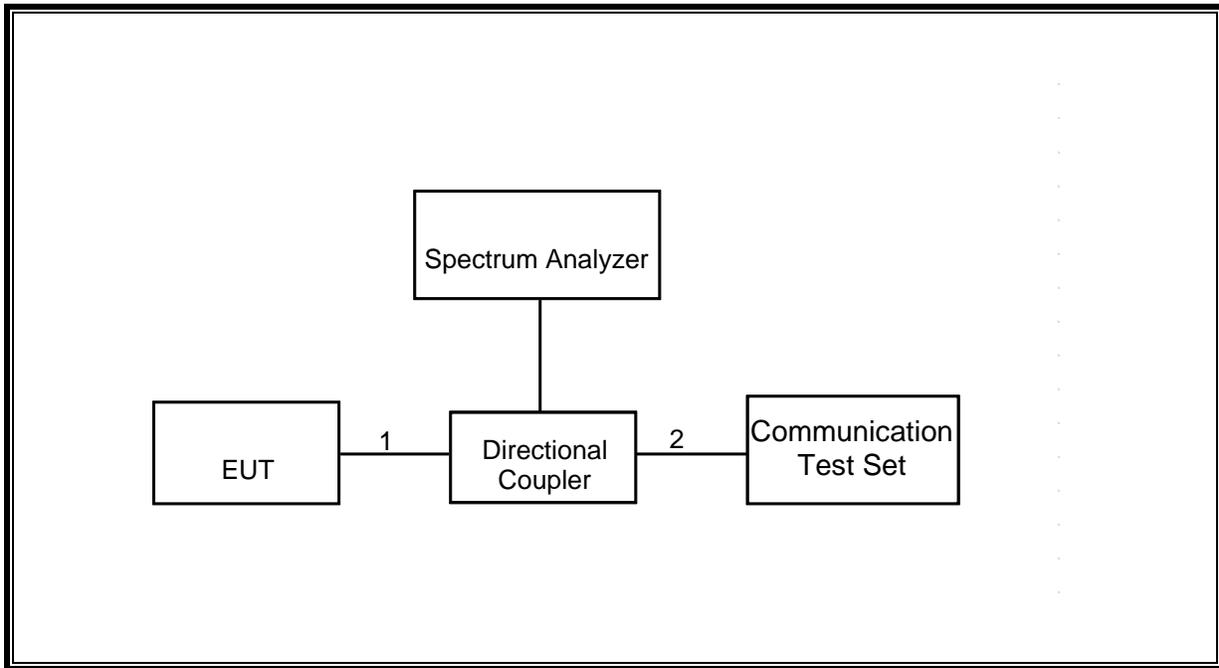
### I/O CABLES (RADIATED SETUP)

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

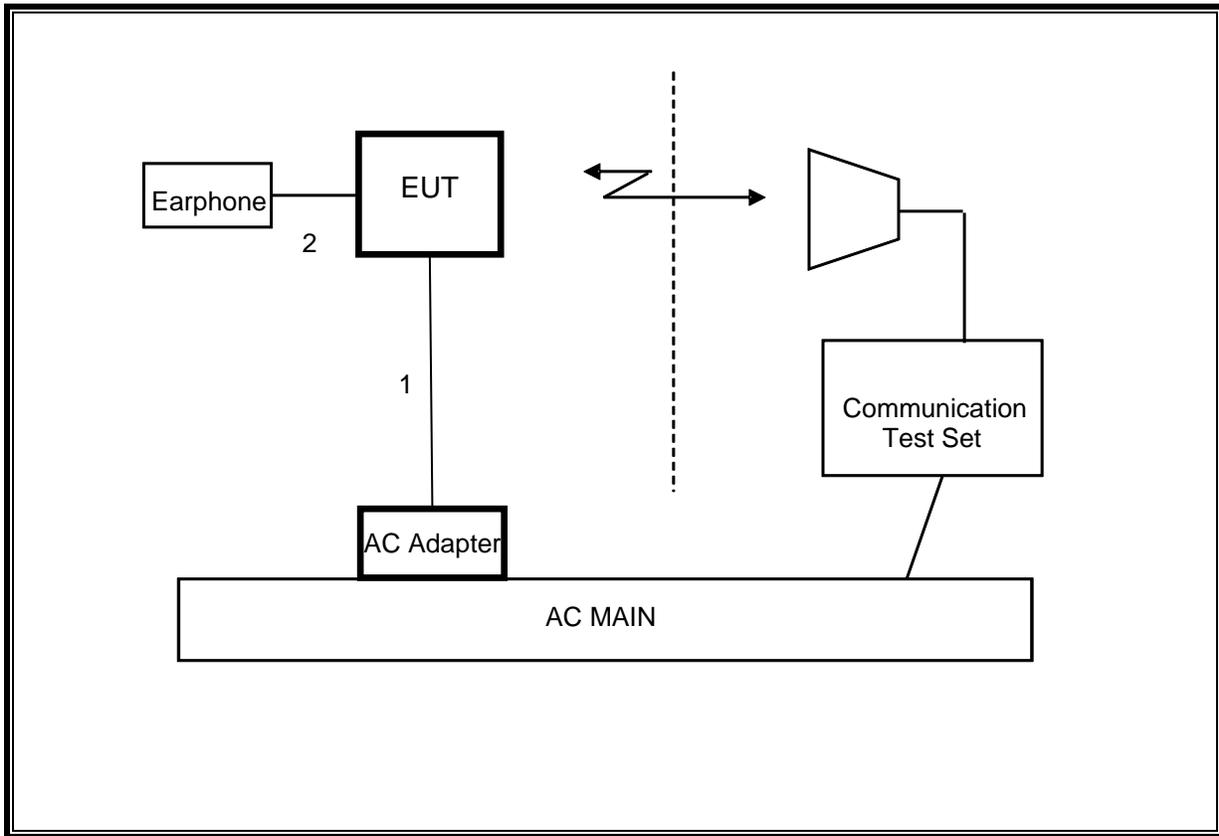
### TEST SETUP

The EUT is continuously communicated to the call box 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	C01052	11/11/12
Antenna, Bilog, 30MHz-1 GHz	Sunol Sciences	JB1	C01011	03/23/13
Antenna, Horn, 18 GHz	EMCO	3115	C00943	CNR
Antenna, Horn, 18 GHz	EMCO	3115	C00783	10/18/12
Antenna, Horn, 18 GHz	EMCO	3115	C00945	10/06/12
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C00986	03/22/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01069	12/15/12
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01161	12/16/12
Radio Communication Analyzer	Anritsu	MT8820C	1100481	07/13/13
Communications Test Set	Agilent / HP	E5515C	C01086	06/20/13
DC power supply, 8 V @ 3 A or 15 V	Agilent / HP	E3610A	None	CNR
Vector signal generator, 6 GHz	Agilent / HP	E4438C	None	07/06/13
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	10/20/12
Antenna, Tuned Dipole 400~1000	ETS	3121C DB4	C00993	08/16/12
Highpass Filter, 2.7 GHz	Micro-Tronics	HPM13194	N02686	CNR
Highpass Filter, 1.5 GHz	Micro-Tronics	HPM13193	N02688	CNR
Directional Coupler	RF-Lambda	RFDC5M06G15	None	CNR

## 7. RF POWER OUTPUT VERIFICATION

### 7.1. RF POWER OUTPUT FOR GSM MODE

#### TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW  $\geq$  RBW.  $\geq$  26dB BW, typically 3MHz.
- Set a marker to point the corresponding peak value.

## **PROCEDURE USED TO ESTABLISH TEST SIGNAL**

### **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

### **MODES TESTED**

- GPRS
- EGPRS
- WCDMA REL. 99
- HSDPA REL 6
- HSUPA REL. 6

### **RESULTS**

**GPRS for Cell and PCS Bands - Coding scheme: CS4**

Band	Ch	Frequency	Conducted Peak output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GPRS850	128	824.2	33.64	30.66	29.17	27.64
	190	836.6	33.62	30.65	29.15	27.65
	251	848.8	33.62	30.59	29.13	27.61
GPRS1900	512	1850.2	30.60	27.63	26.16	25.19
	661	1880.0	30.70	27.74	26.28	25.30
	810	1909.8	30.66	27.73	26.27	25.32

**EGPRS for Cell and PCS Bands - Coding scheme: MCS9**

Band	Ch	Frequency	Conducted Peak output power (dBm)			
			1 slot	2 slot	3 slot	4 slot
GPRS850	128	824.2	29.42	29.42	29.00	28.59
	190	836.6	29.38	29.42	29.02	28.58
	251	848.8	29.39	29.45	29.00	28.57
GPRS1900	512	1850.2	28.78	28.86	28.23	27.82
	661	1880.0	28.85	28.91	28.31	27.92
	810	1909.8	28.86	28.89	28.29	27.92

## 7.2. RF POWER OUTPUT FOR UMTS MODE

### TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW  $\geq$  RBW  $\geq$  26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

### 7.2.1. RF POWER OUTPUT FOR UMTS REL99

Summary of 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
	$\beta_c$	Not Applicable
	$\beta_d$	Not Applicable
	$\beta_{ec}$	Not Applicable
	$\beta_c/\beta_d$	8/15
	$\beta_{hs}$	Not Applicable
$\beta_{ed}$	Not Applicable	

### RESULTS

Band	UL Ch No.	DL Ch No.	f (MHz)	Peak Tx Pwr (dBm)
HSDPA1700 (Band IV)	1537	1312	1712.4	<b>26.57</b>
	1637	1412	1732.4	26.41
	2087	1862	1752.5	26.33

### 7.2.2. RF POWER OUTPUT FOR HSDPA REL 6

The following 4 Sub-tests were completed according to Release 6 procedures in section 5.2 of 3GPP TS34.121.

Summary of 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			
	$\beta_c$	2/15	12/15	15/15	15/15
	$\beta_d$	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	$\beta_c/\beta_d$	2/15	12/15	15/8	15/4
	$\beta_{hs}$	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	$D_{ACK}$	8			
	$D_{NAK}$	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	$A_{hs} = \beta_{hs}/\beta_c$	30/15			

### Results

Band	Mode	UL Ch No.	DL Ch No.	f (MHz)	Peak Tx Pwr (dBm)
HSDPA1700 (Band IV)	Subtest 1	1537	1312	1712.4	27.45
		1637	1412	1732.4	27.29
		2087	1862	1752.5	27.31
	Subtest 2	1537	1312	1712.4	28.24
		1637	1412	1732.4	28.20
		2087	1862	1752.5	<b>28.27</b>
	Subtest 3	1537	1312	1712.4	28.22
		1637	1412	1732.4	28.17
		2087	1862	1752.5	28.23
	Subtest 4	1537	1312	1712.4	28.17
		1637	1412	1732.4	28.09
		2087	1862	1752.5	28.16

### 7.2.3. RF POWER OUTPUT UMTS Rel 6 HSPA (HSDPA & HSUPA)

Summary of 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				
	$\beta_c$	11/15	6/15	15/15	2/15	15/15
	$\beta_d$	15/15	15/15	9/15	15/15	0
	$\beta_{ec}$	209/225	12/15	30/15	2/15	5/15
	$\beta_c/\beta_d$	11/15	6/15	15/9	2/15	-
	$\beta_{hs}$	22/15	12/15	30/15	4/15	5/15
HSDPA Specific Settings	$\beta_{ed}$	1309/225	94/75	47/15	56/75	47/15
	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	$A_{hs} = \beta_{hs}/\beta_c$	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	Mode	UL Ch No.	DL Ch No.	f (MHz)	Peak Tx Pwr (dBm)
HSUPA1700 (Band IV)	Subtest 1	1537	1312	1712.4	28.21
		1637	1412	1732.4	28.10
		2087	1862	1752.5	28.16
	Subtest 2	1537	1312	1712.4	27.77
		1637	1412	1732.4	27.63
		2087	1862	1752.5	27.80
	Subtest 3	1537	1312	1712.4	28.32
		1637	1412	1732.4	28.23
		2087	1862	1752.5	28.29
	Subtest 4	1537	1312	1712.4	27.44
		1637	1412	1732.4	27.24
		2087	1862	1752.5	27.33
	Subtest 5	1537	1312	1712.4	28.34
		1637	1412	1732.4	28.27
		2087	1862	1752.5	<b>28.36</b>

## 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
- EGPRS
- WCDMA REL. 99
- HSUPA REL. 6

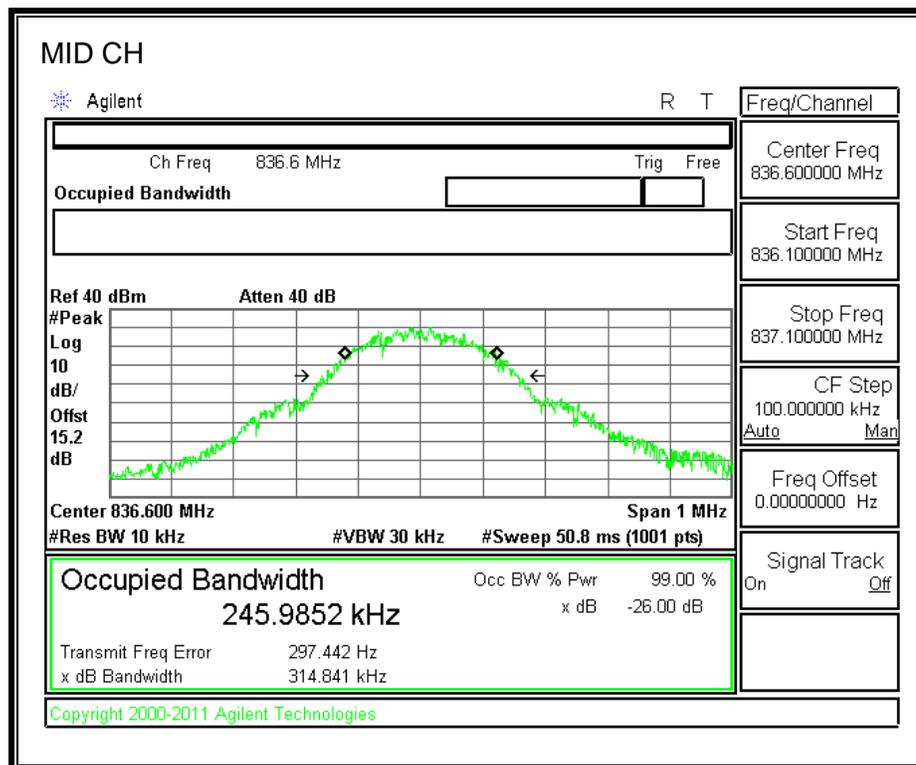
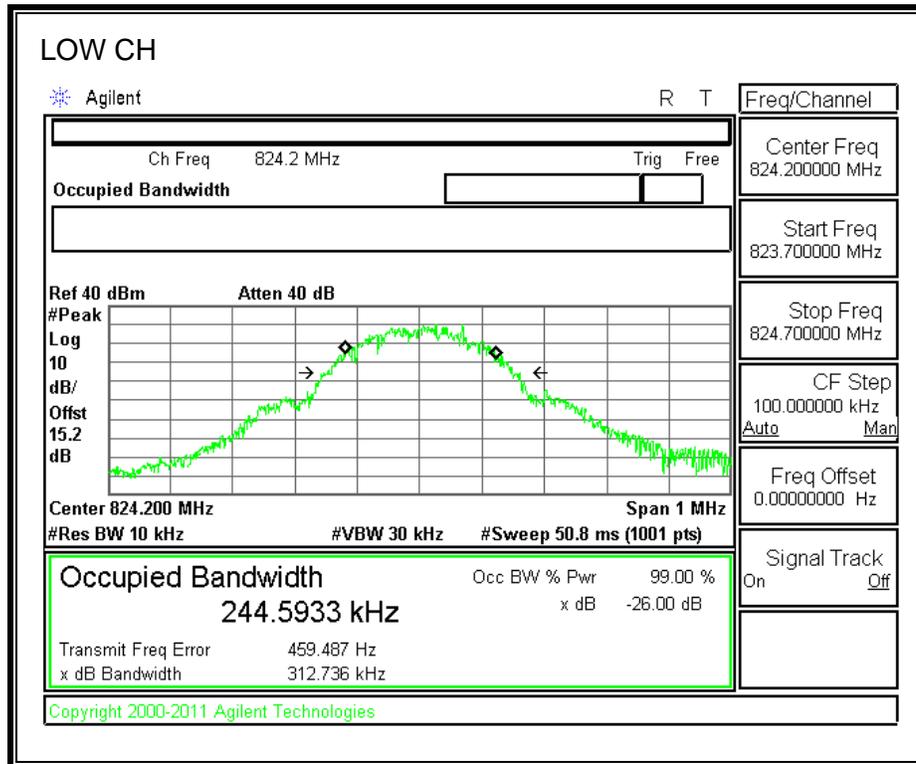
**RESULTS**

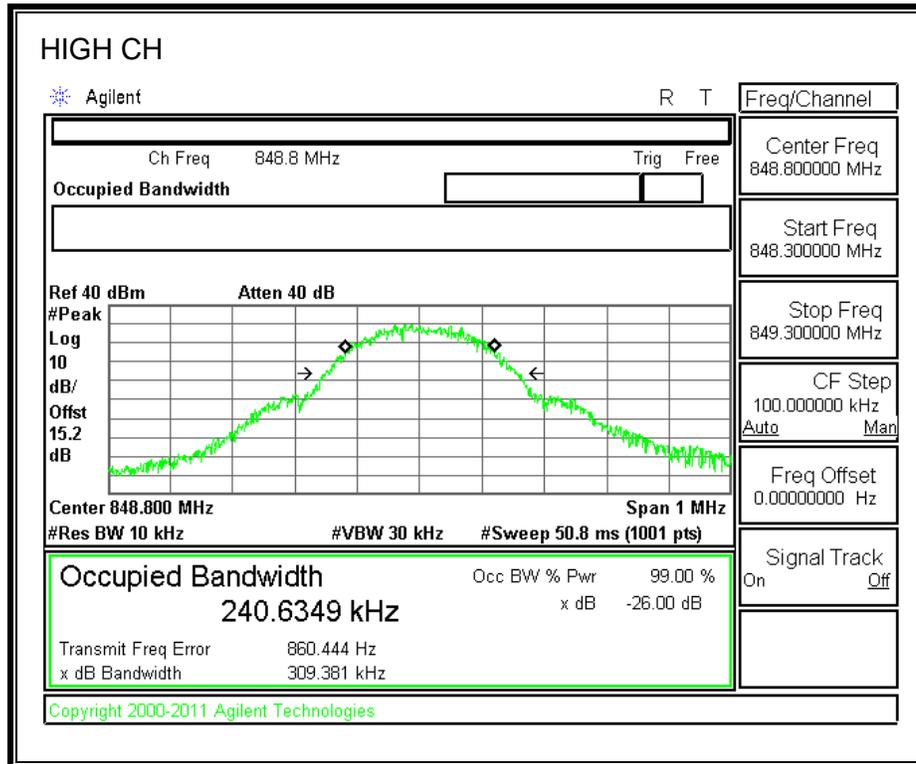
Band	Mode	Channel	f (MHz)	99% BW (kHz)	-26dB BW (kHz)
Cellular	GPRS	128	824.2	244.5933	312.736
		190	836.6	245.9852	314.841
		251	848.8	240.6349	309.381
PCS		512	1850.2	247.5478	308.640
		661	1880.0	242.8015	297.039
		810	1909.8	245.9808	317.999
Cellular	EGPRS	128	824.2	249.7414	307.450
		190	836.6	246.1389	315.783
		251	848.8	246.9155	306.660
PCS		512	1850.2	255.1940	311.411
		661	1880.0	244.1393	317.563
		810	1909.8	242.7071	306.513

Band	Mode	Channel	f (MHz)	99% BW (MHz)	-26dB BW (MHz)
AWS	WCDMA REL 99	1537	1712.4	4.0944	4.417
		1637	1732.4	4.0644	4.527
		2087	1752.5	4.1552	4.545
AWS	HSUPA REL 6	1537	1712.4	4.0714	4.517
		1637	1732.4	4.0468	4.516
		2087	1752.5	4.0865	4.553

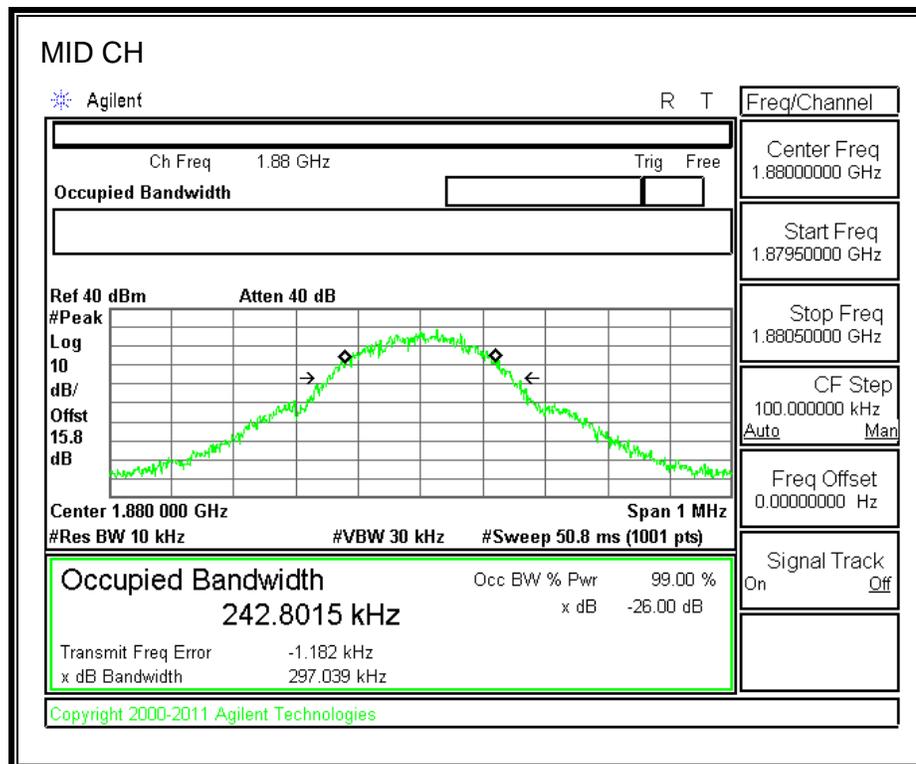
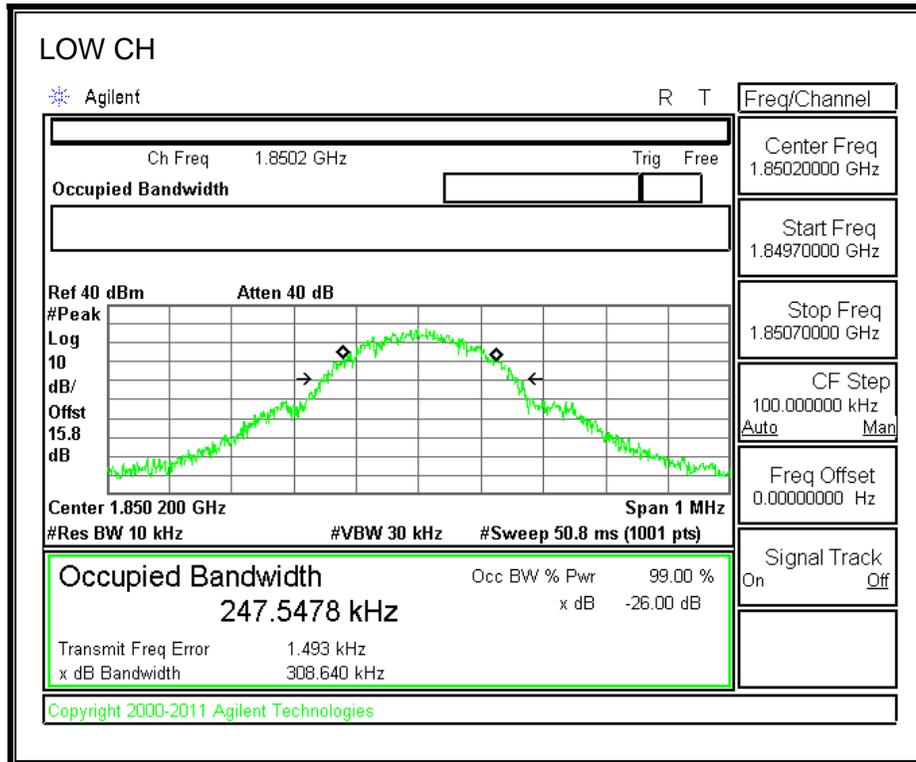
**99% and 26dB Bandwidth**

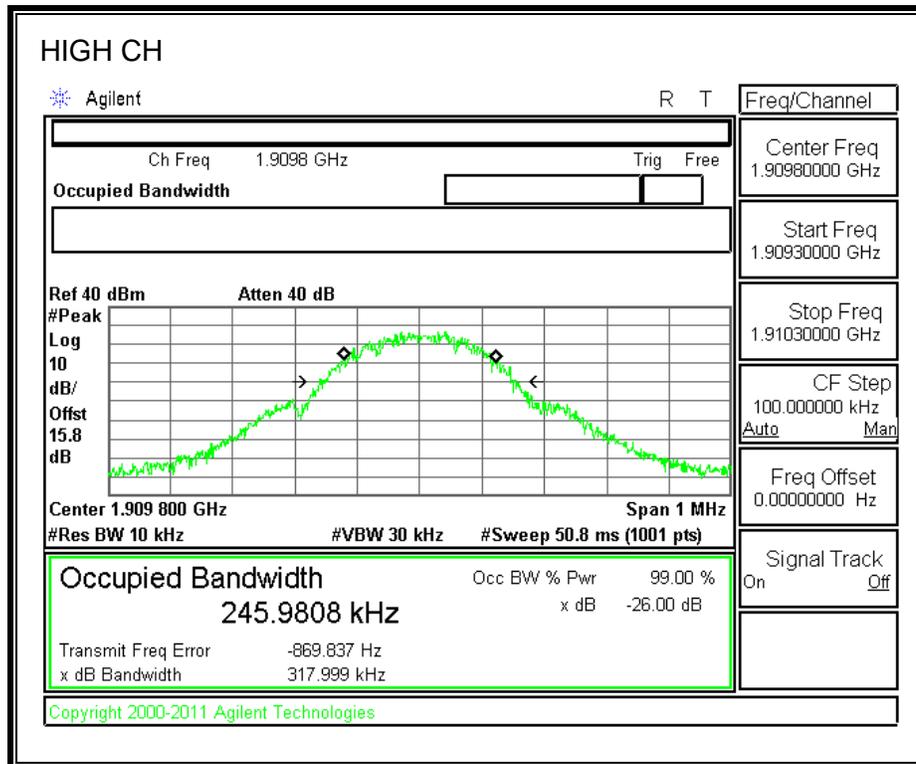
**GPRS850 BAND**



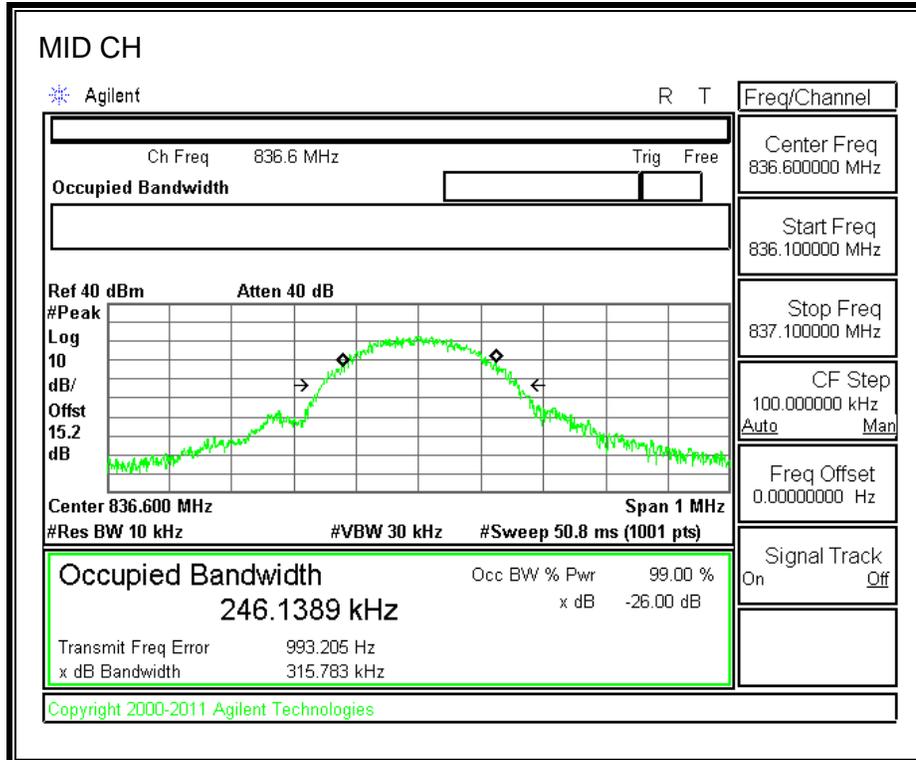
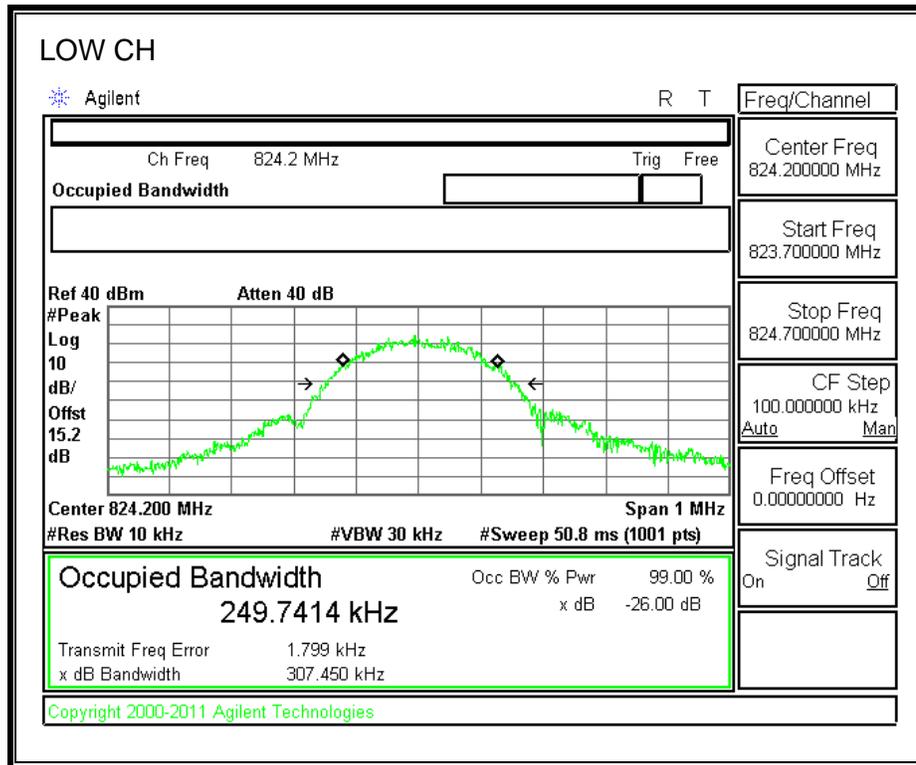


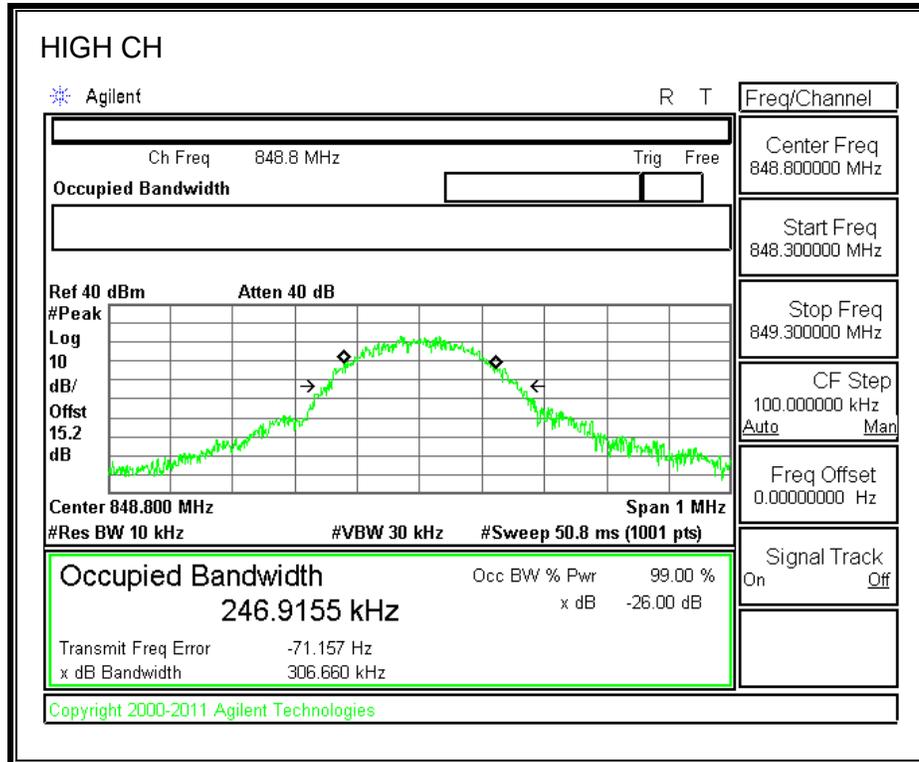
**GPRS1900 BAND**



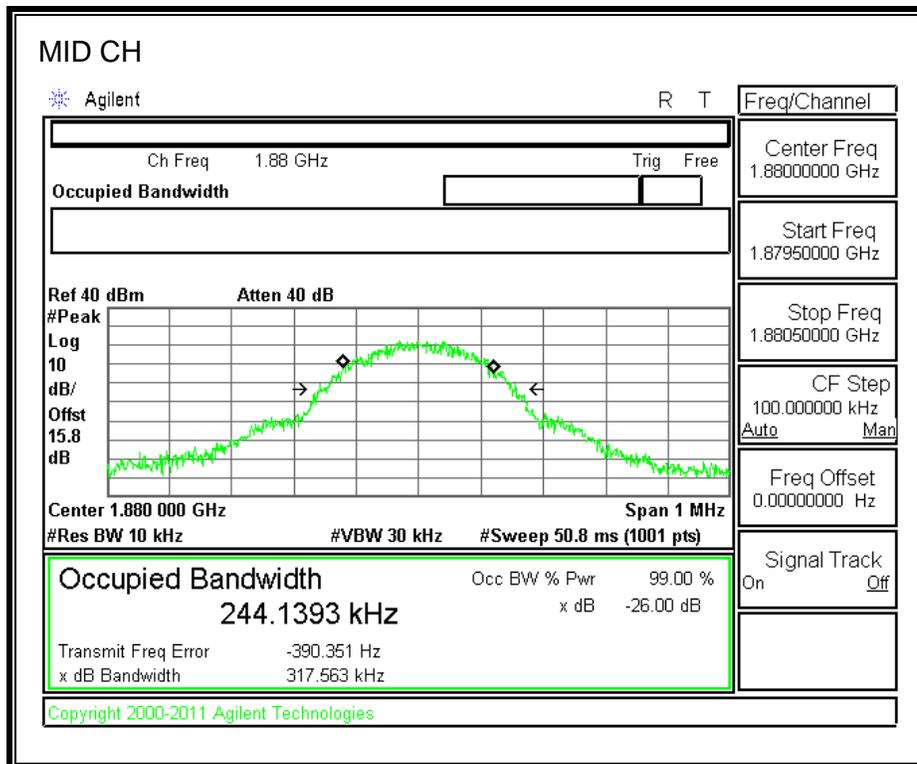
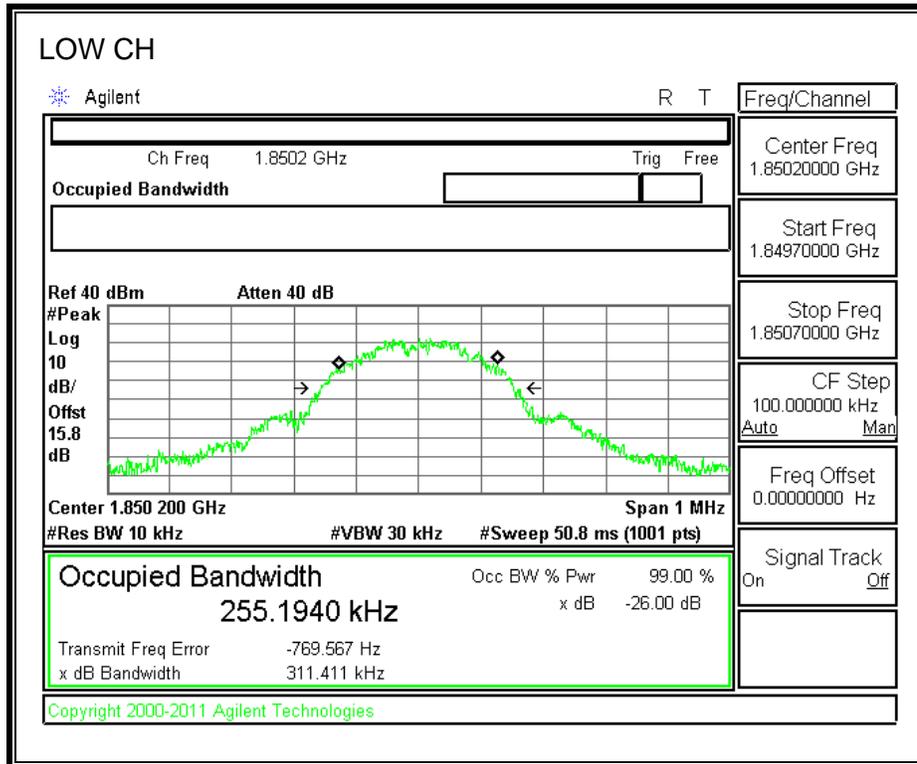


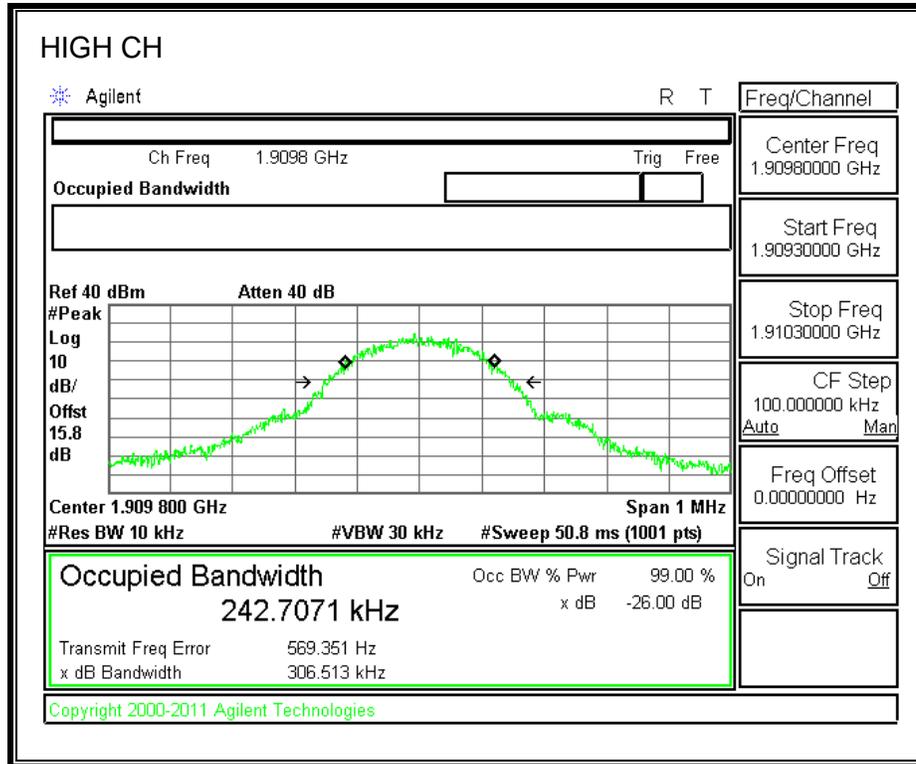
**EGPRS850 BAND**



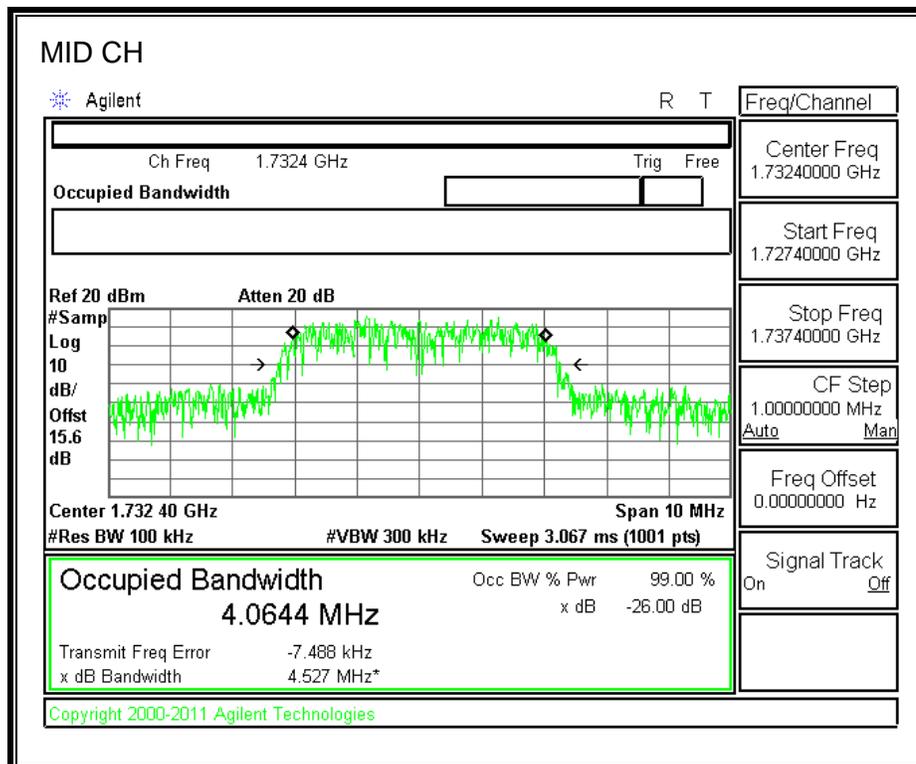
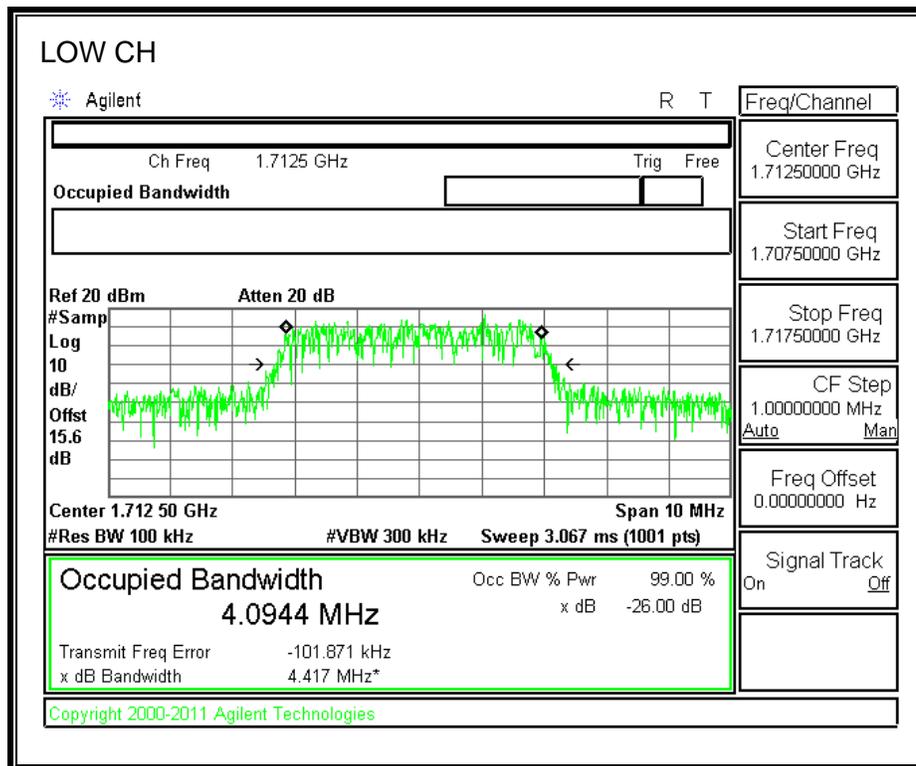


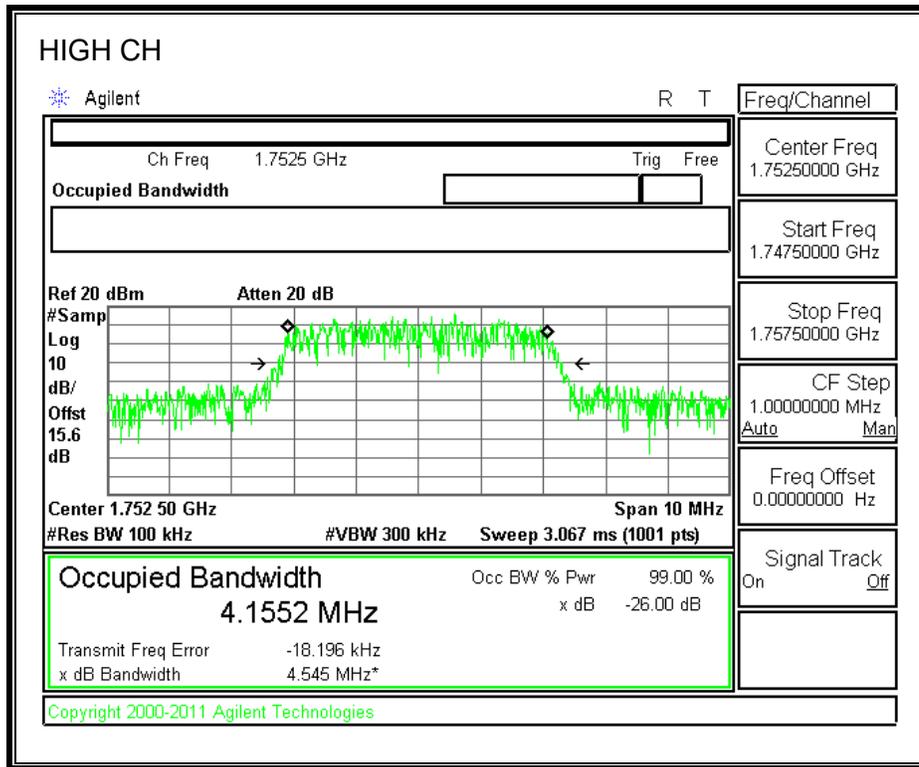
**EGPRS1900 BAND**



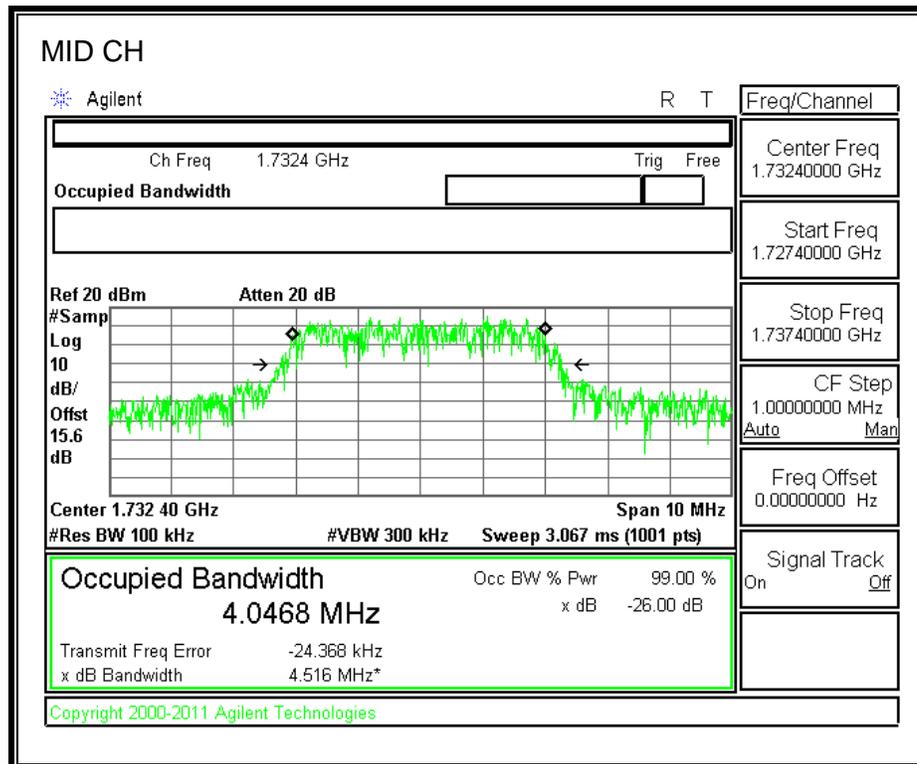
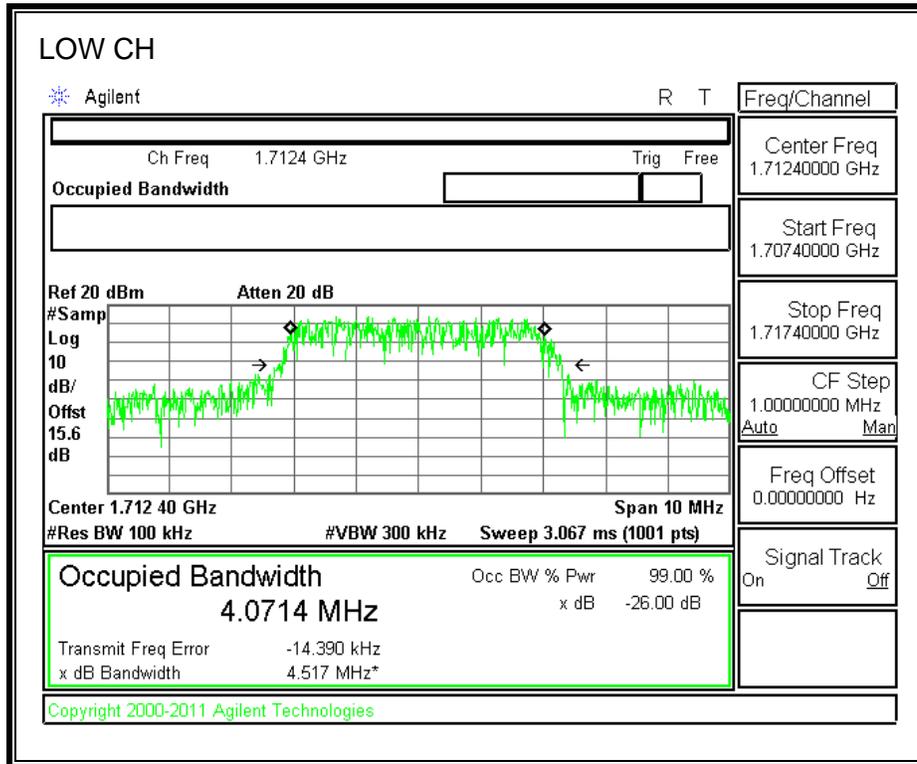


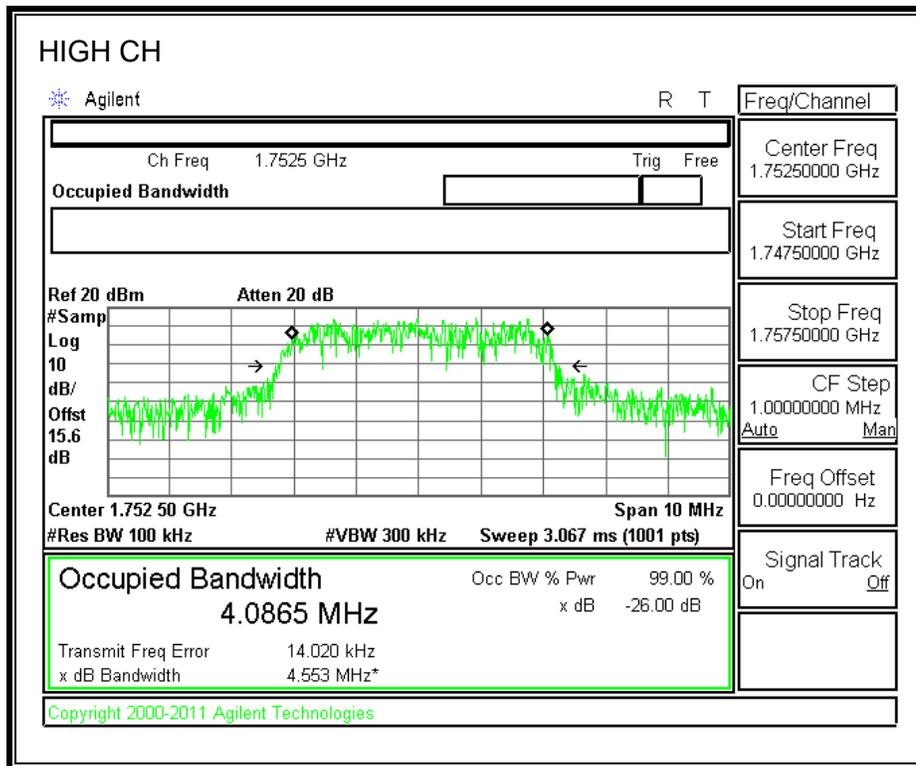
**WCDMA REL 99 AWS BAND**





**HSUPA REL 5, AWS BAND**





## **8.1.2. BAND EDGE**

### **RULE PART(S)**

FCC: §22.359, 24.238, and 27.53

### **LIMITS**

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

### **TEST PROCEDURE**

The transmitter output was connected to an CMU200 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

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

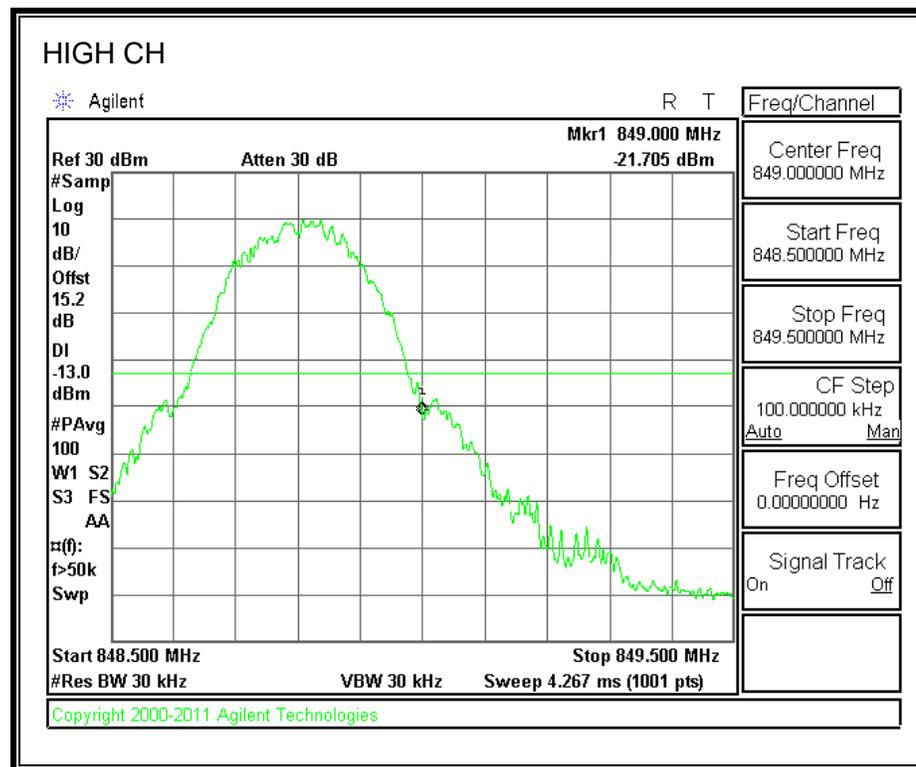
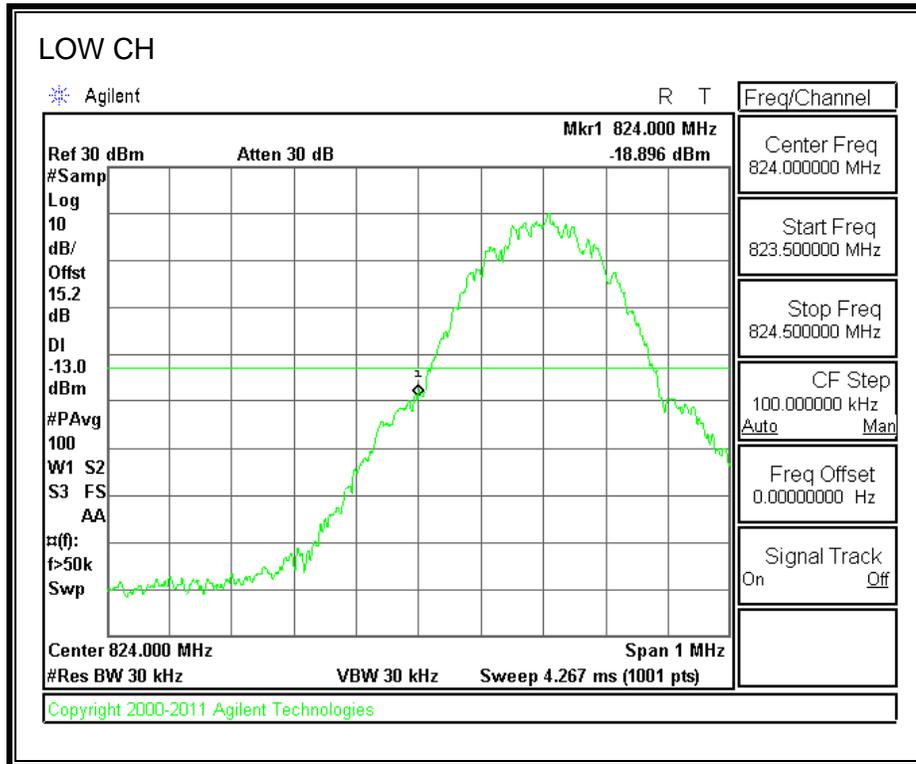
### **MODES TESTED**

- GPRS
- EGPRS
- WCDMA REL. 99
- HSUPA REL. 6

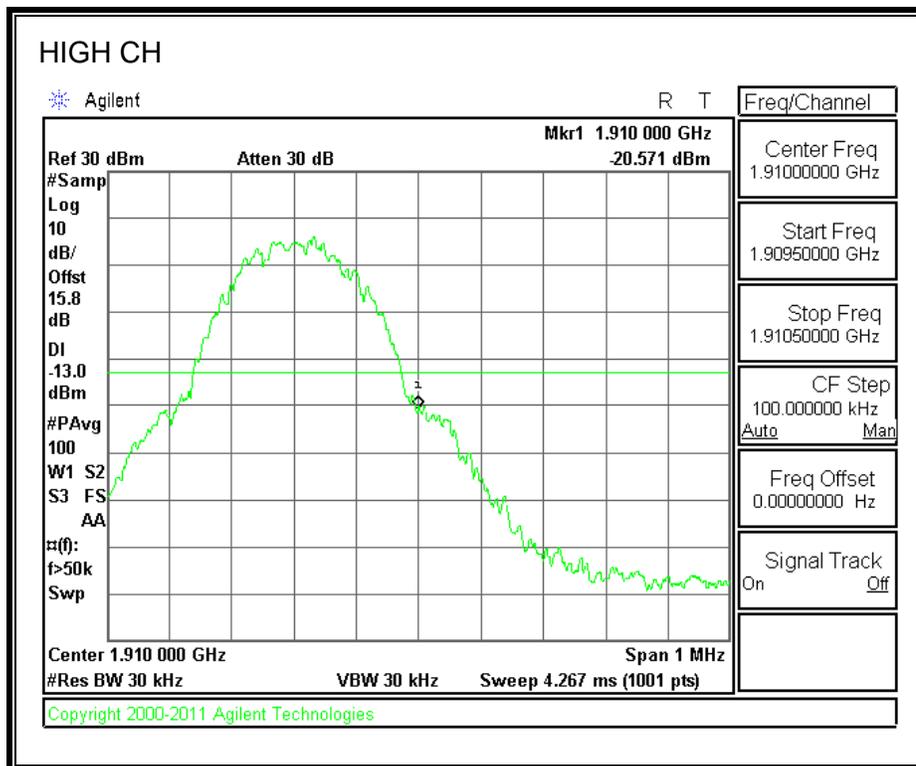
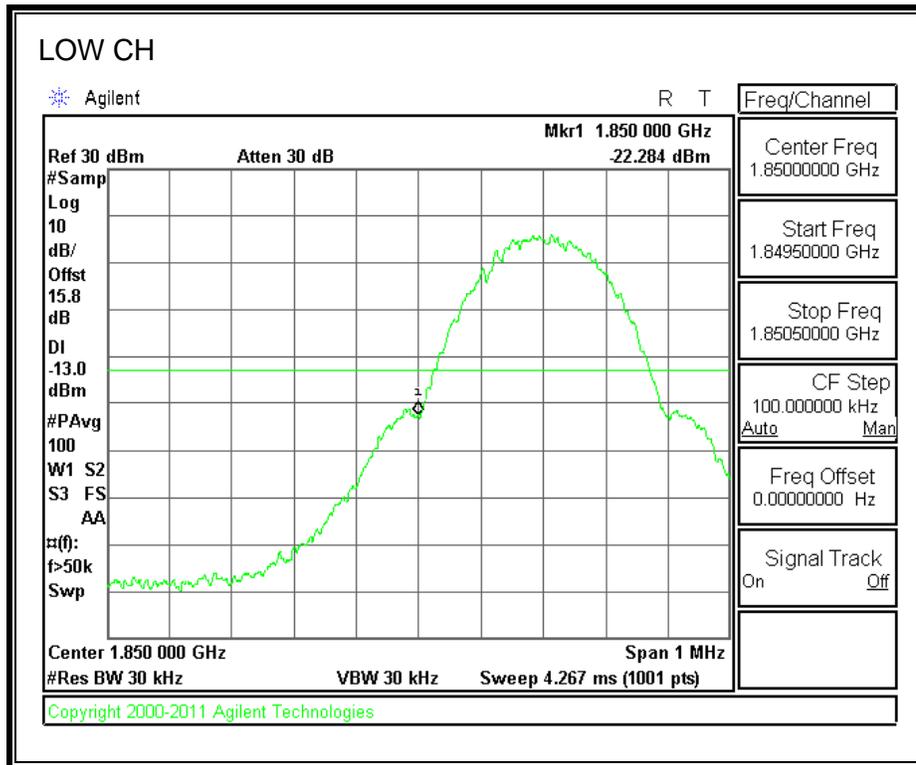
### **RESULTS**

**BANDEDGE**

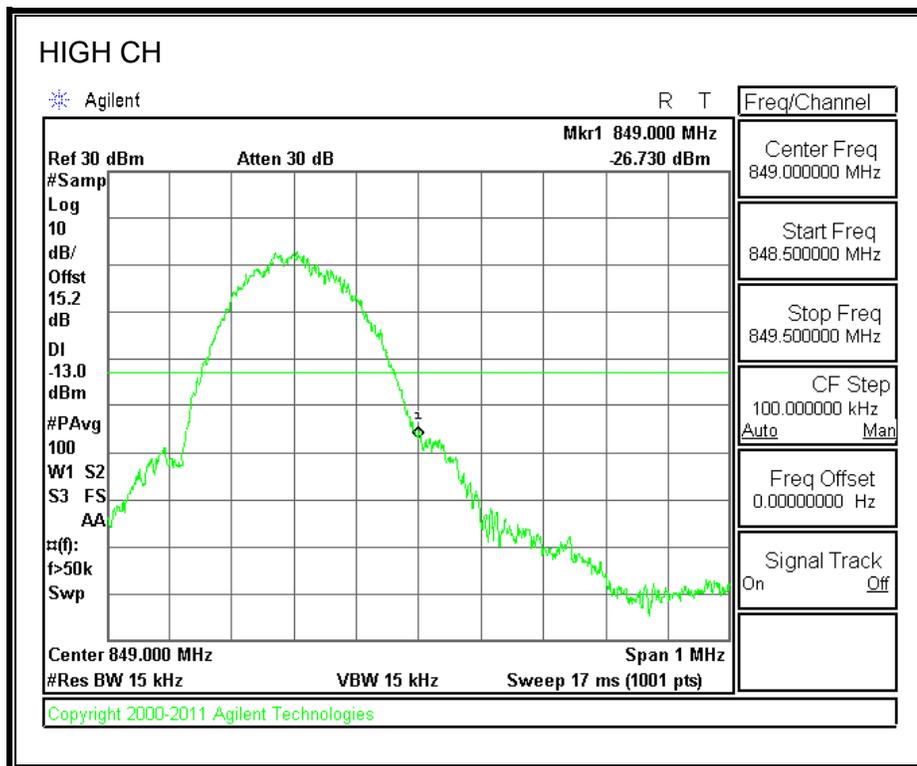
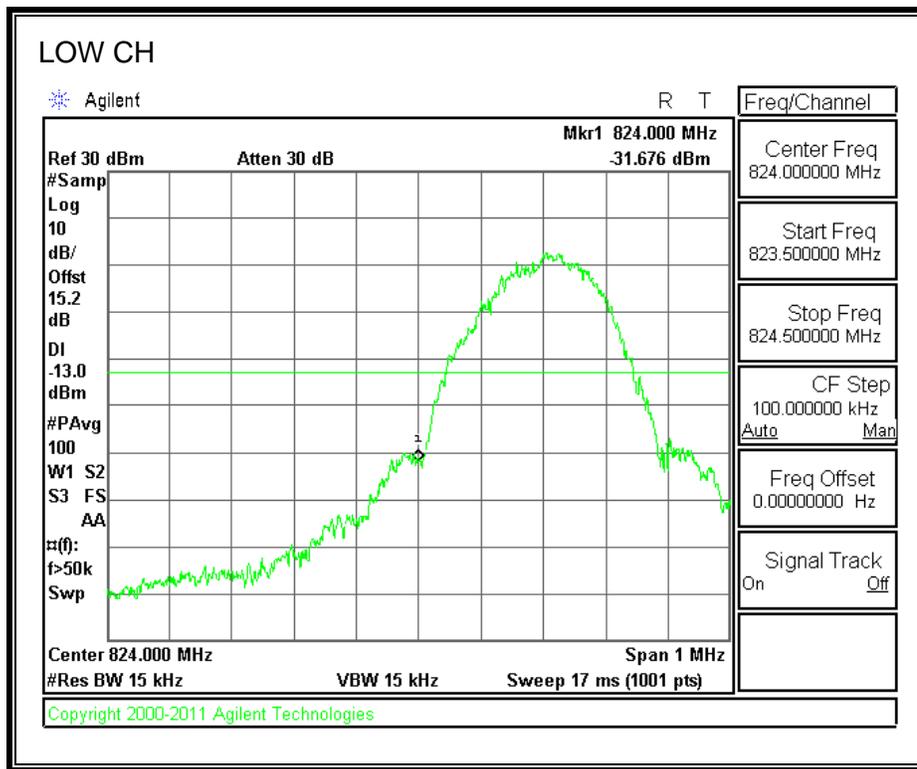
**GPRS850 BAND**



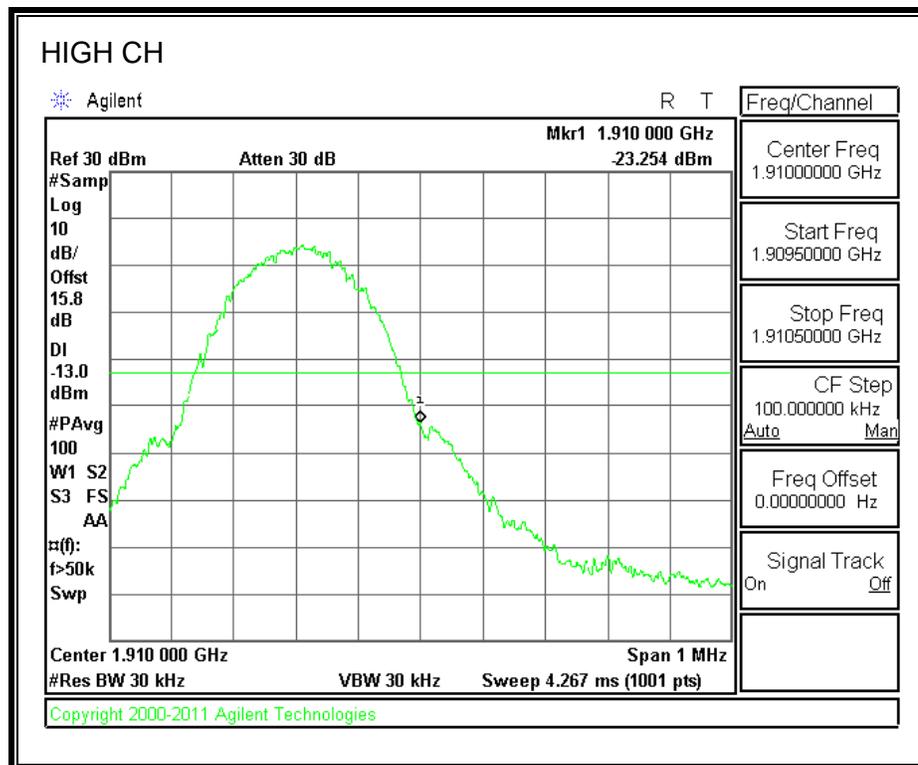
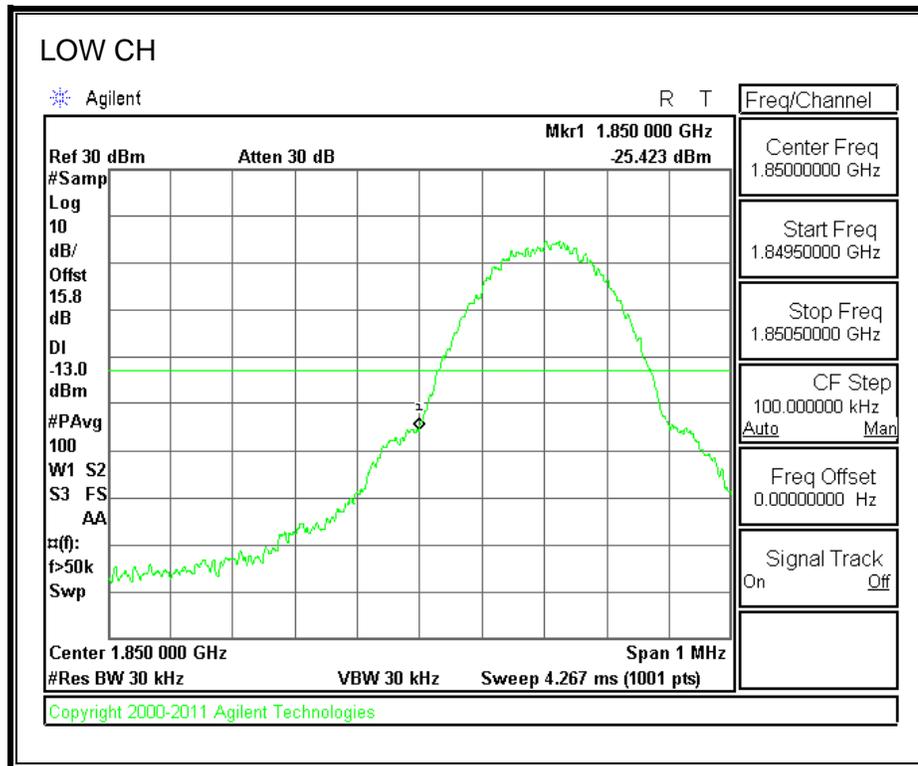
**GPRS1900 BAND**



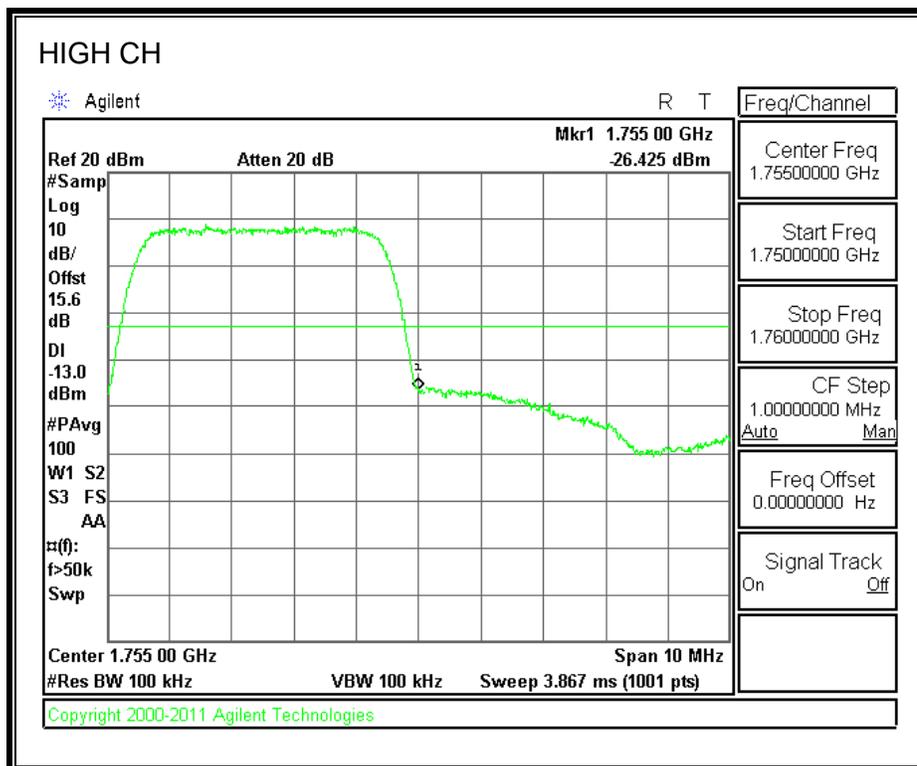
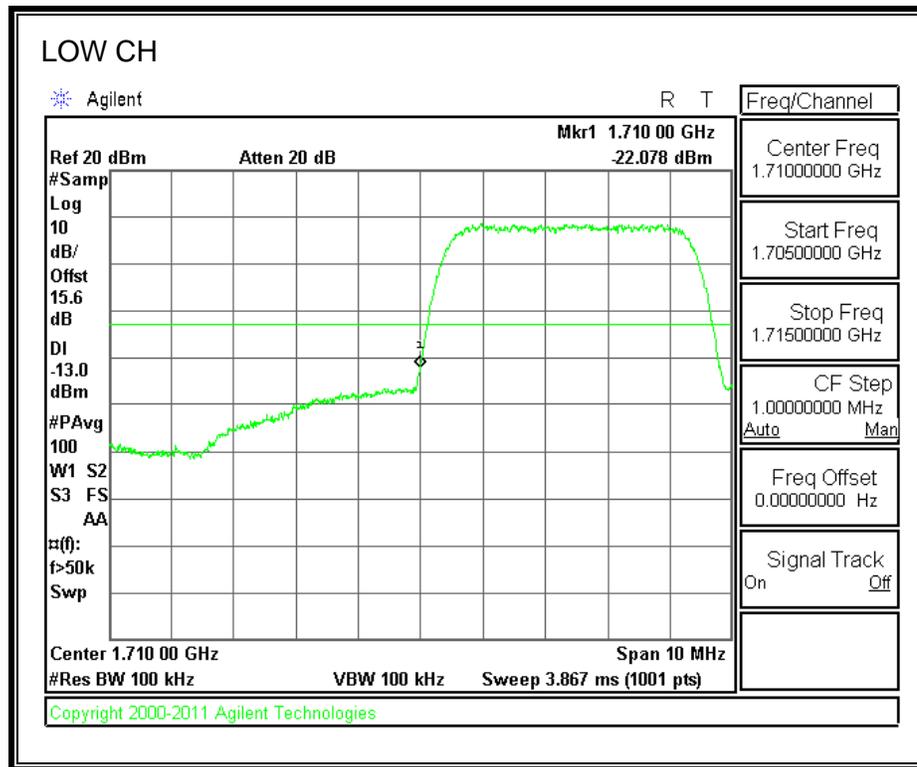
**EGPRS850 BAND**



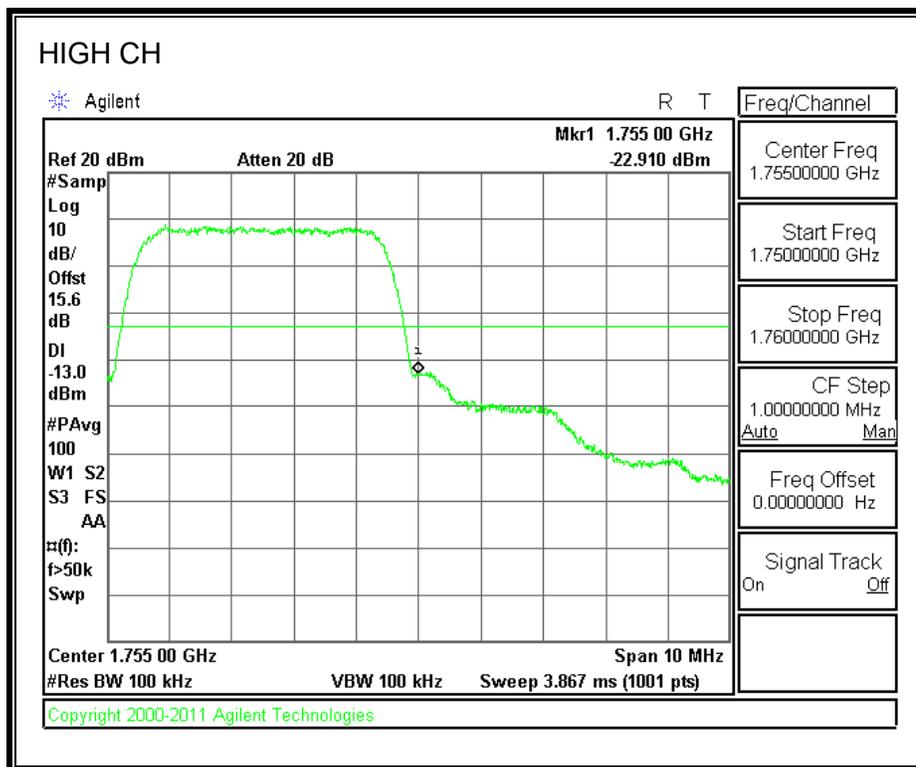
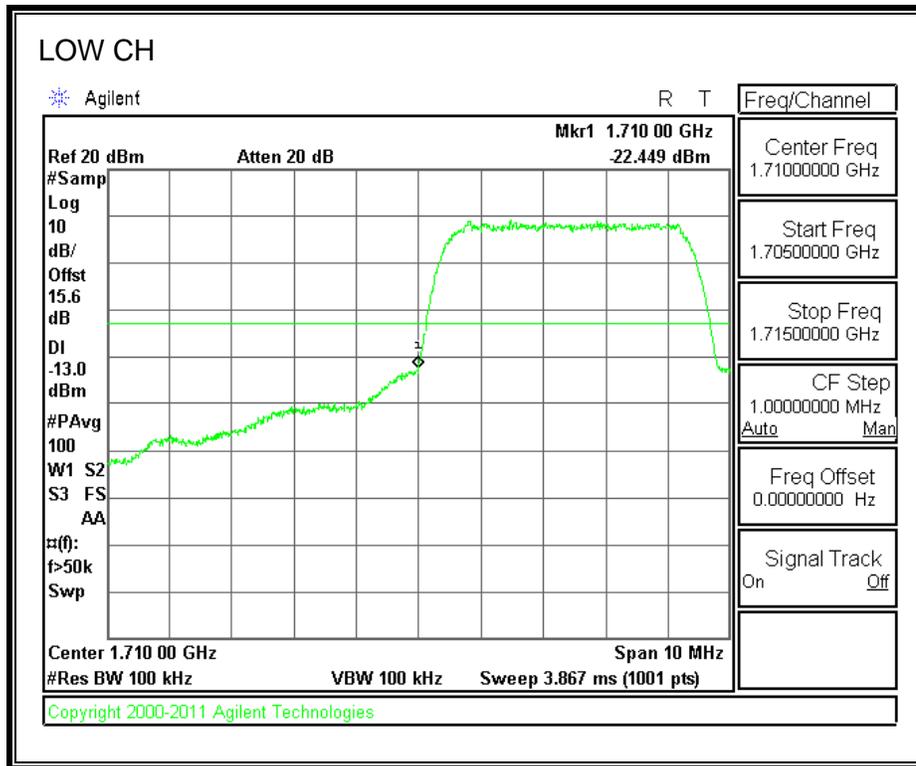
**EGPRS1900 BAND**



**WCDMA REL 99 AWS BAND**



**HSUPA Rel 5 AWS BAND**



### **8.1.3. OUT OF BAND EMISSIONS**

#### **RULE PART(S)**

FCC: §2.1051, §22.901, §22.917, §24.238 and §27.53

#### **LIMITS**

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

#### **TEST PROCEDURE**

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

For each out of band emissions measurement:

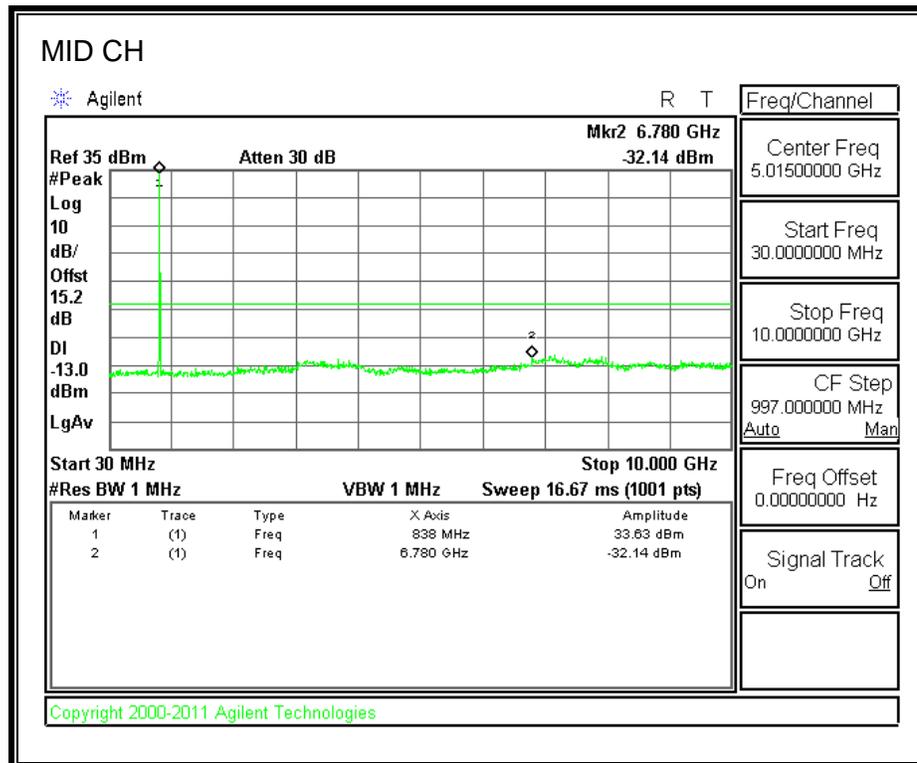
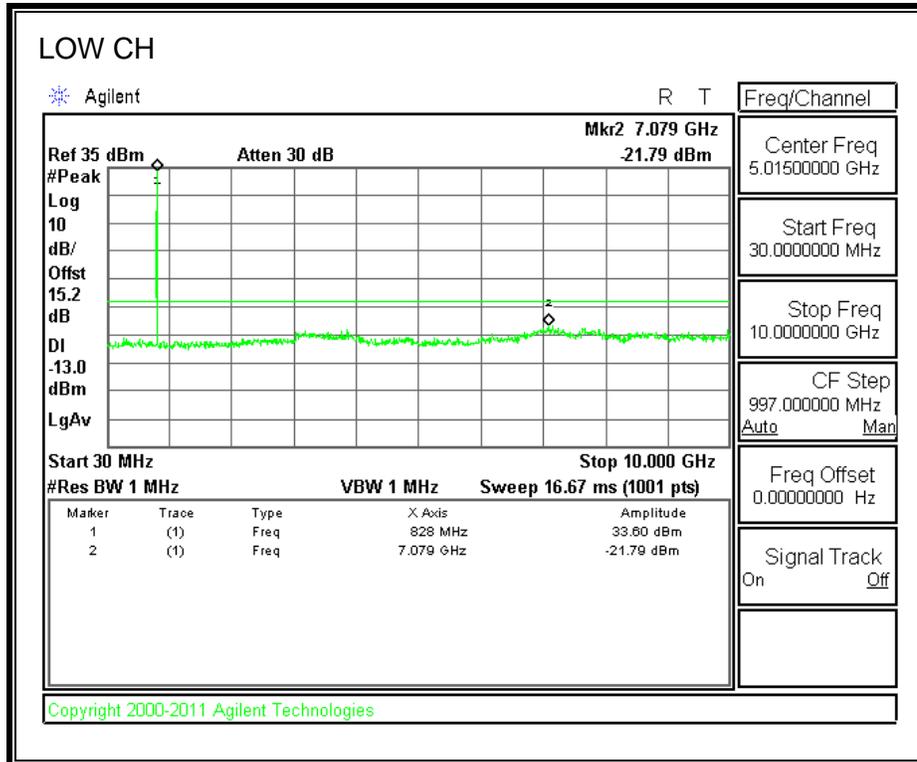
- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

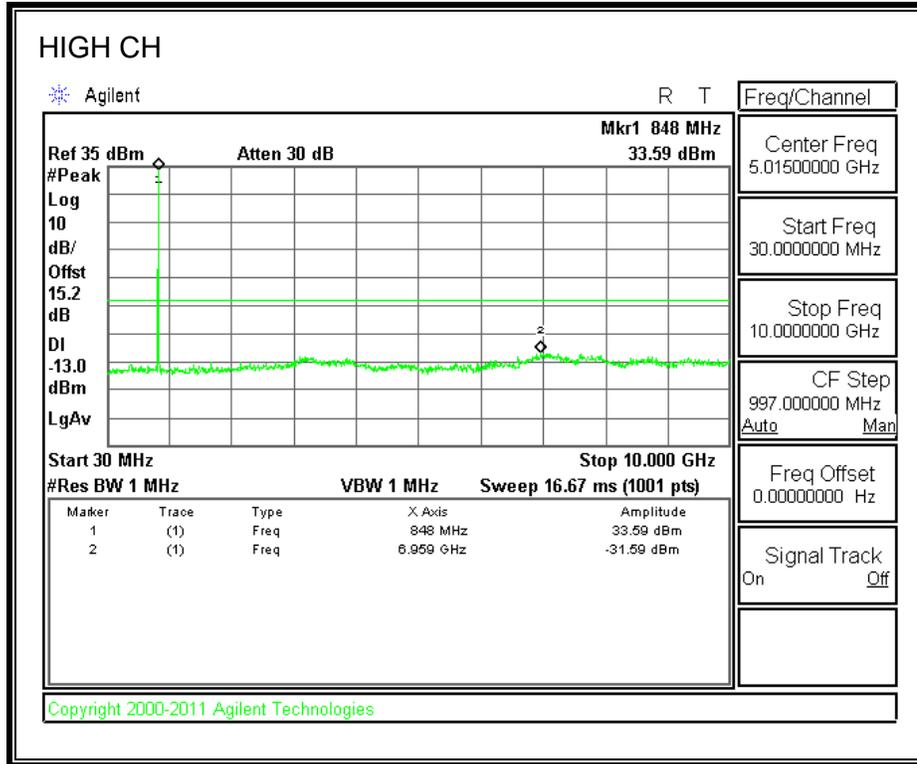
#### **MODES TESTED**

- GPRS
- EGPRS
- WCDMA REL 99
- HSUPA REL 6

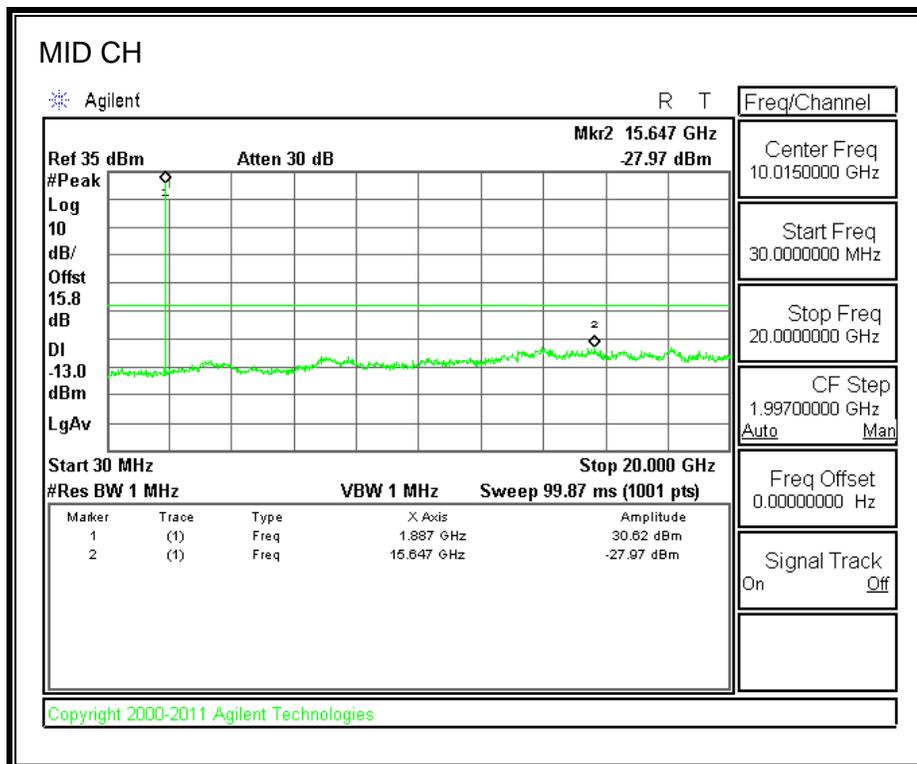
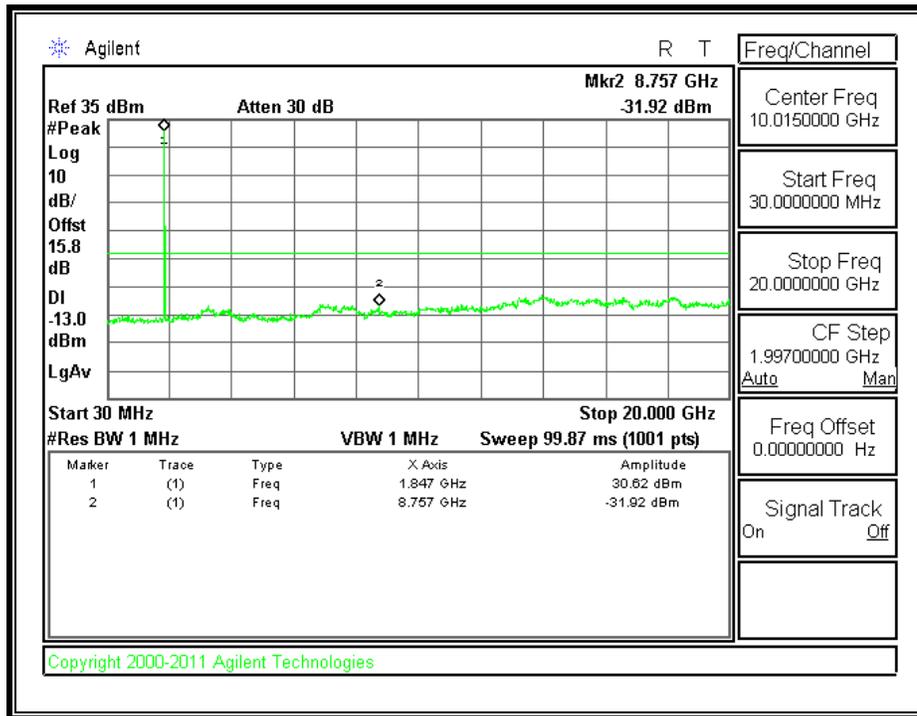
#### **RESULTS**

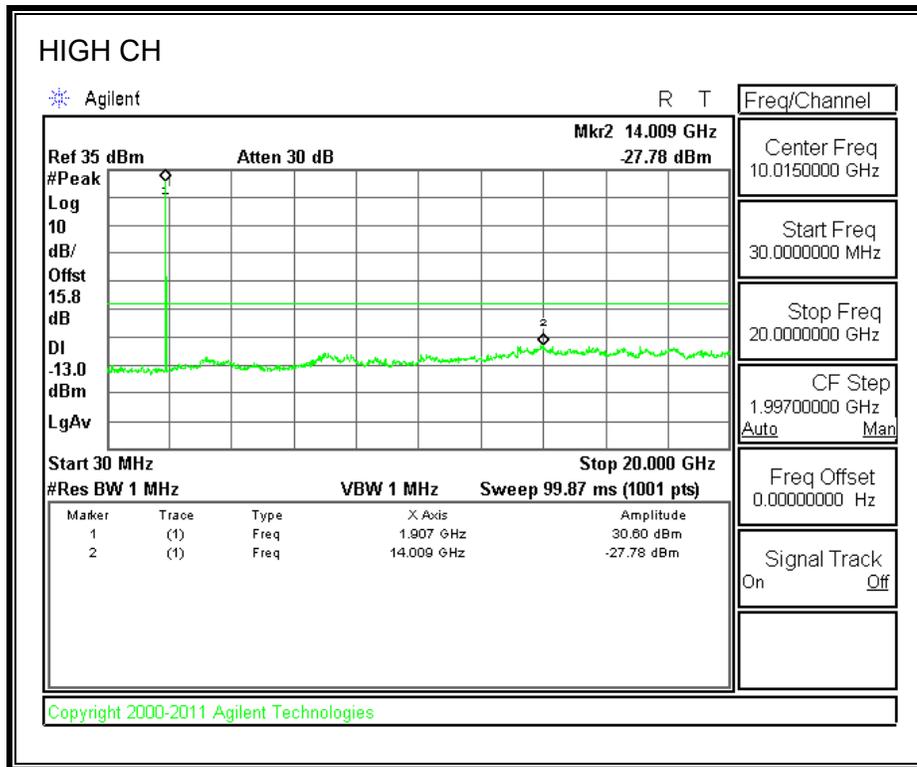
**GPRS850 BAND**



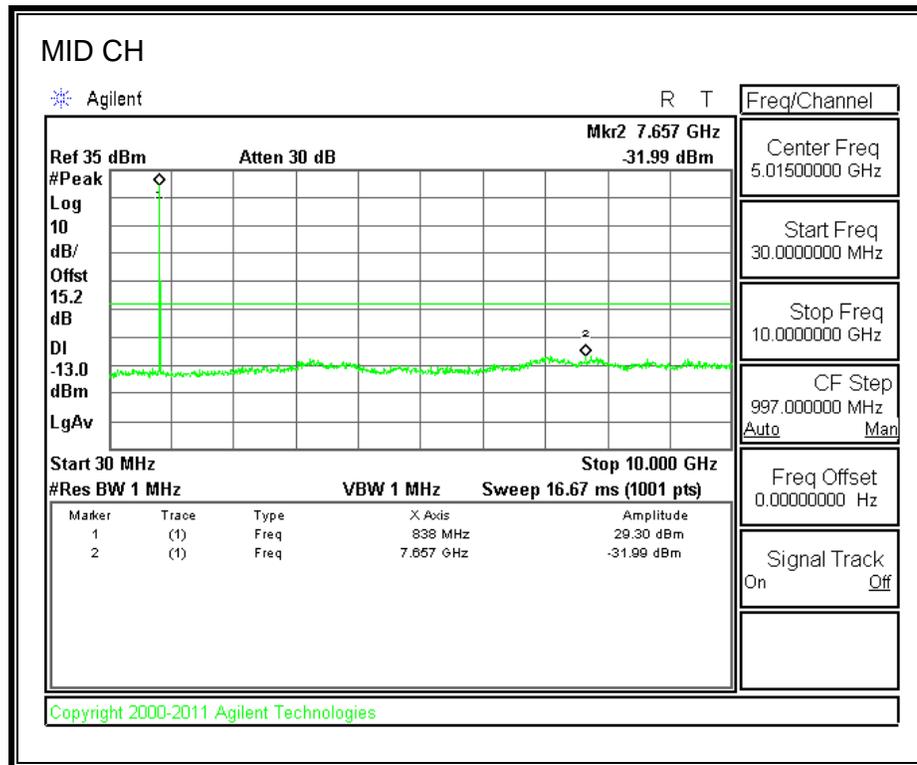
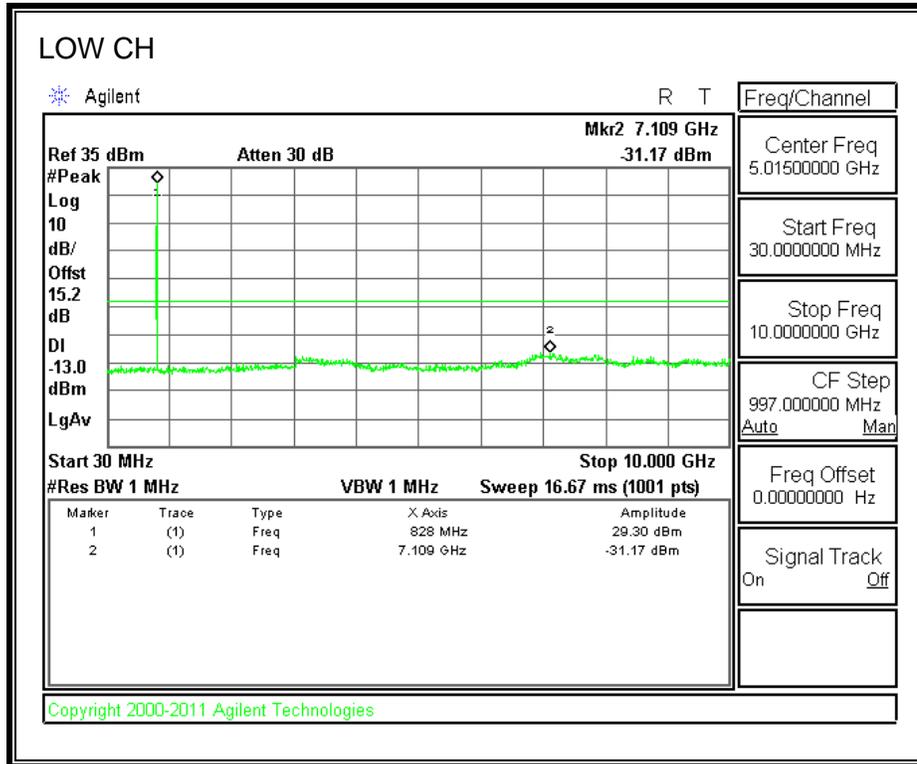


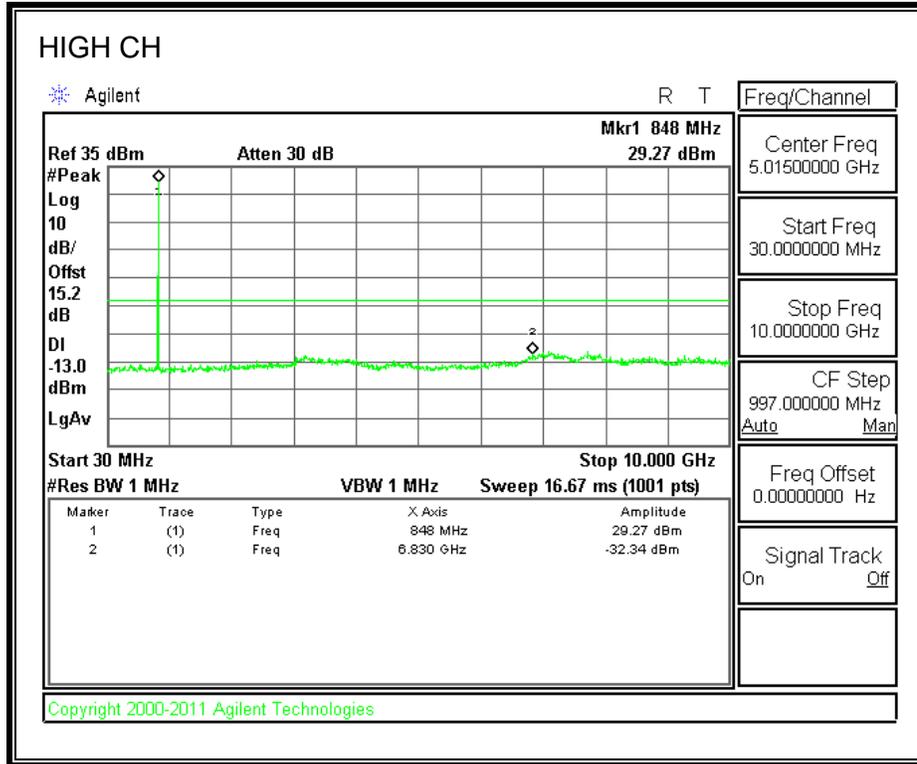
**GPRS1900 BAND**



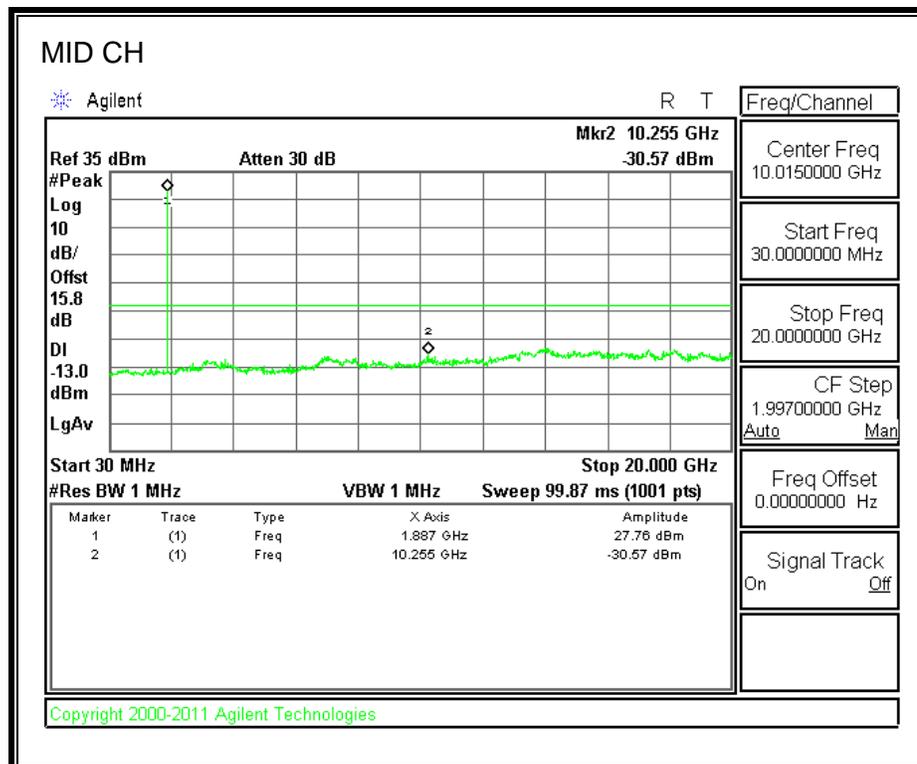
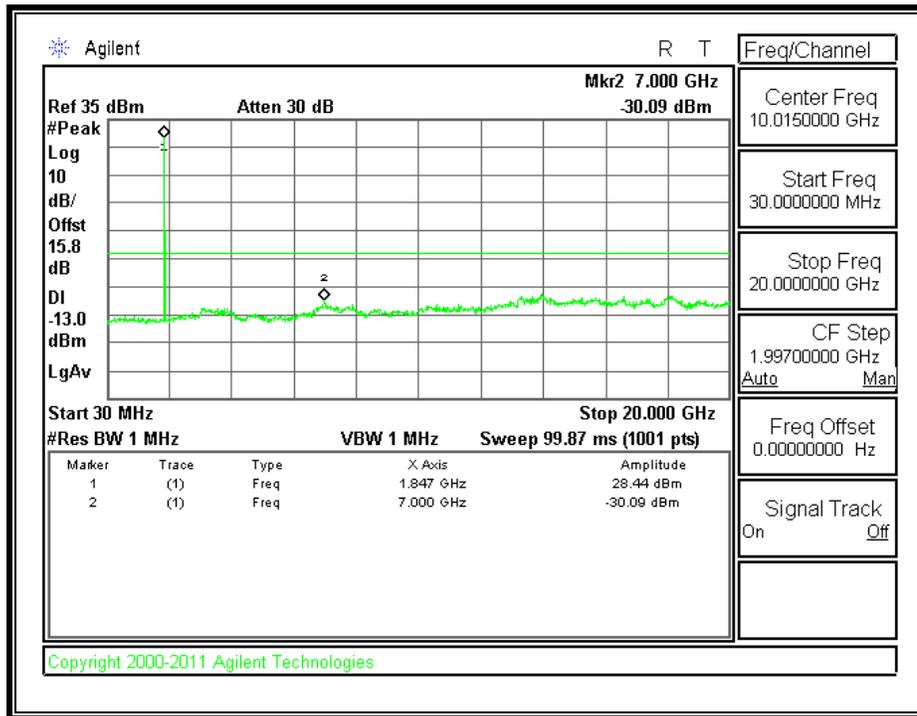


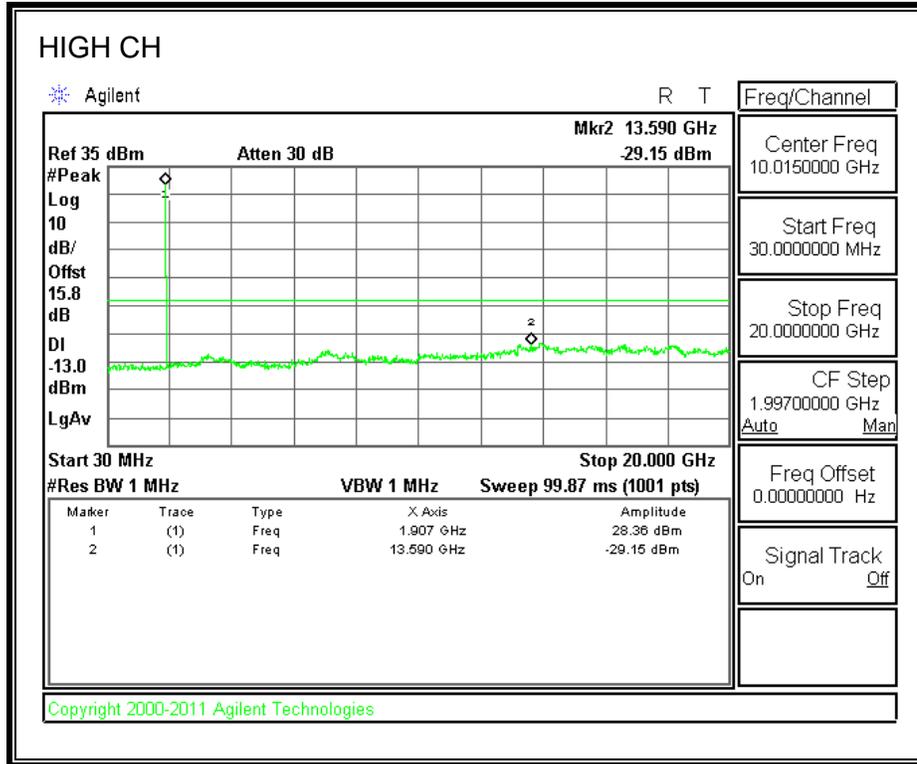
**EGPRS850 BAND**



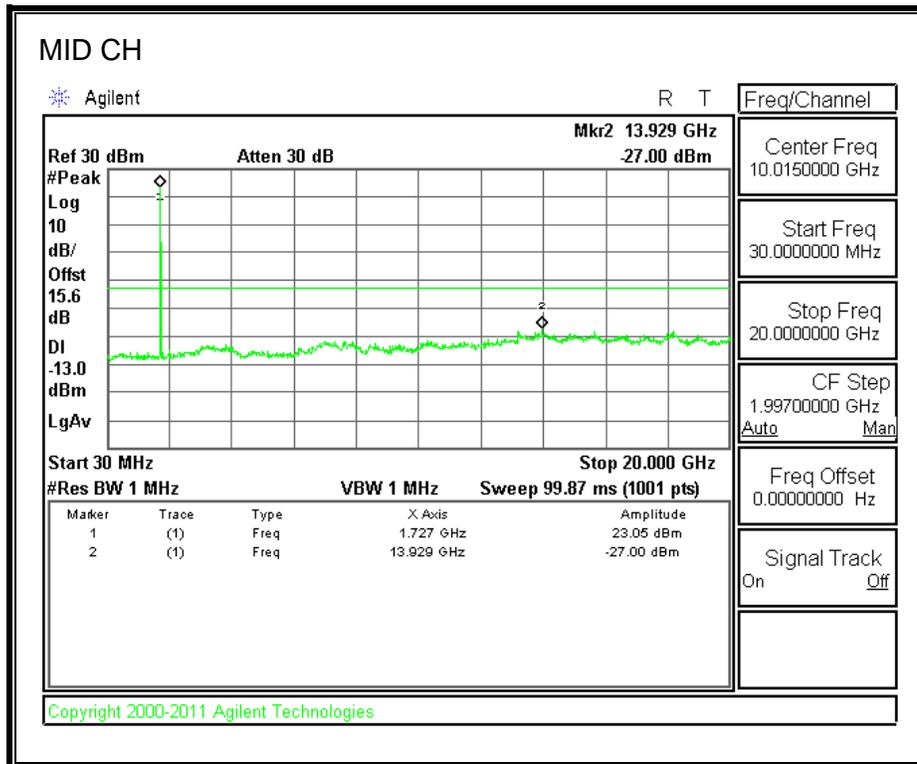
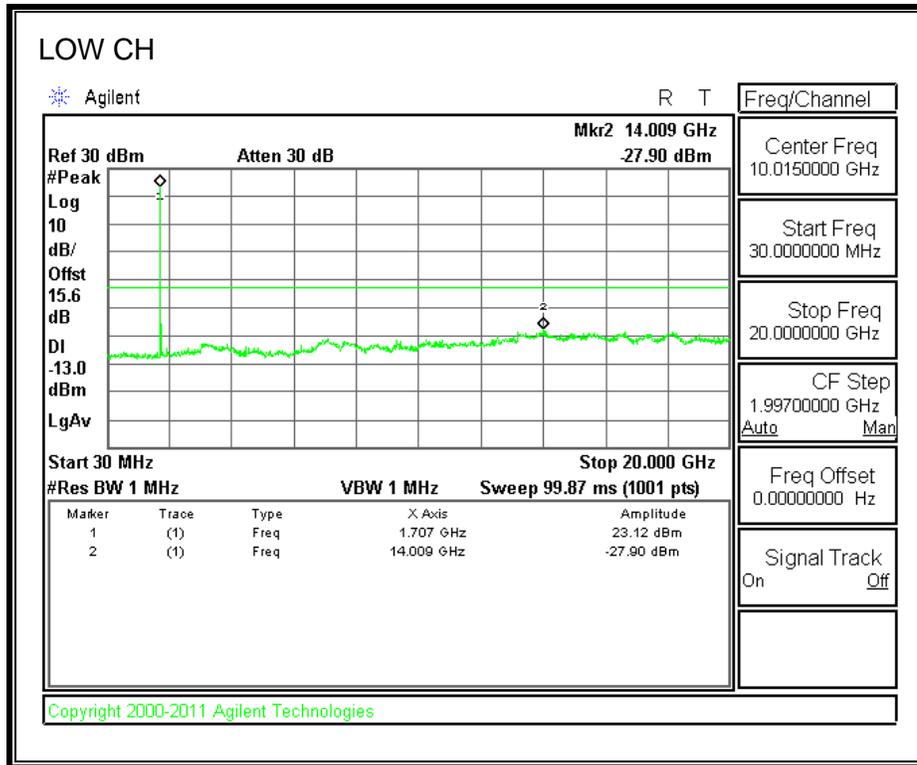


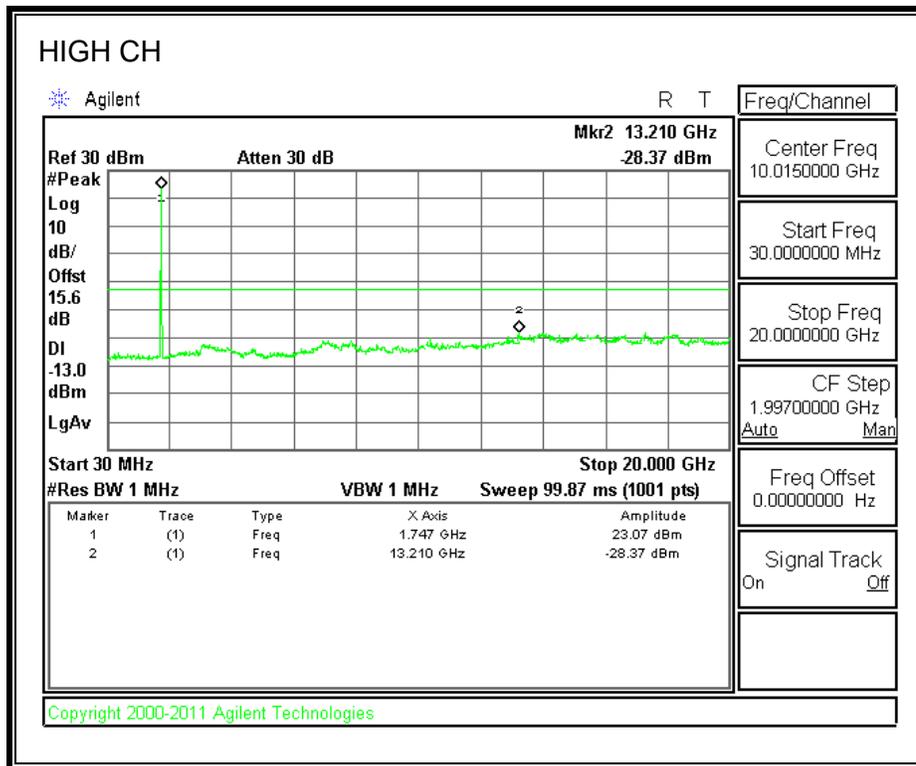
**EGPRS1900 BAND**



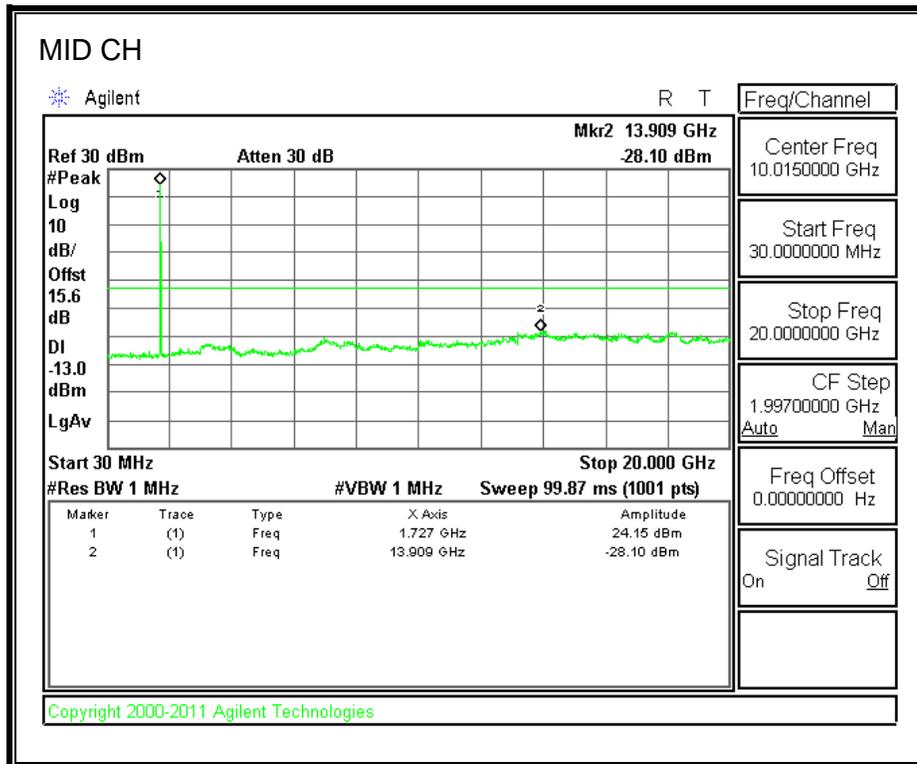
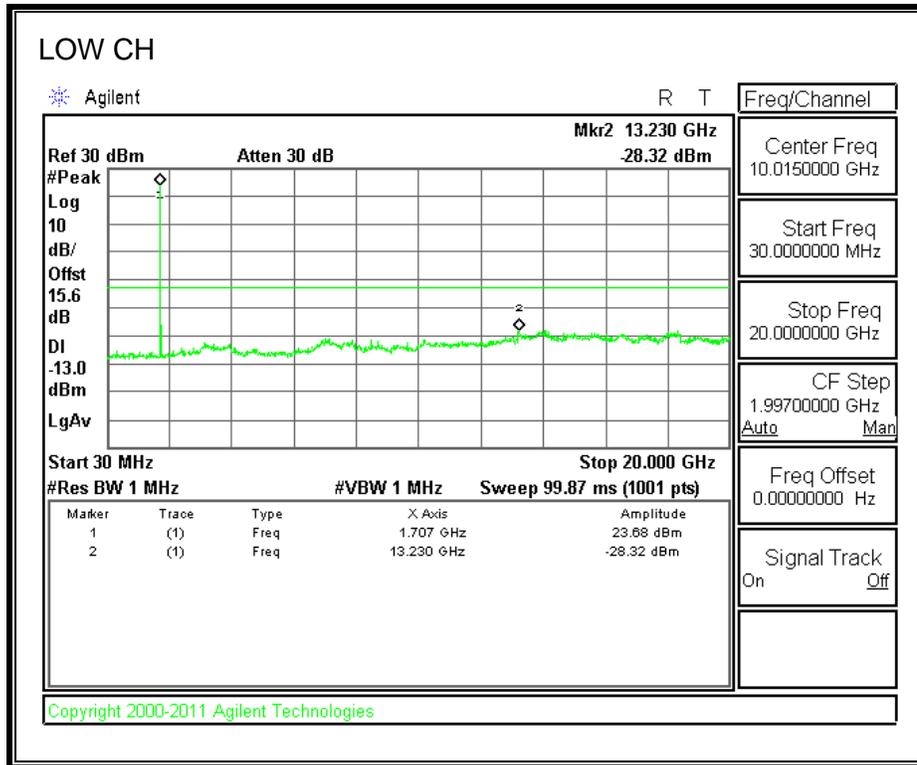


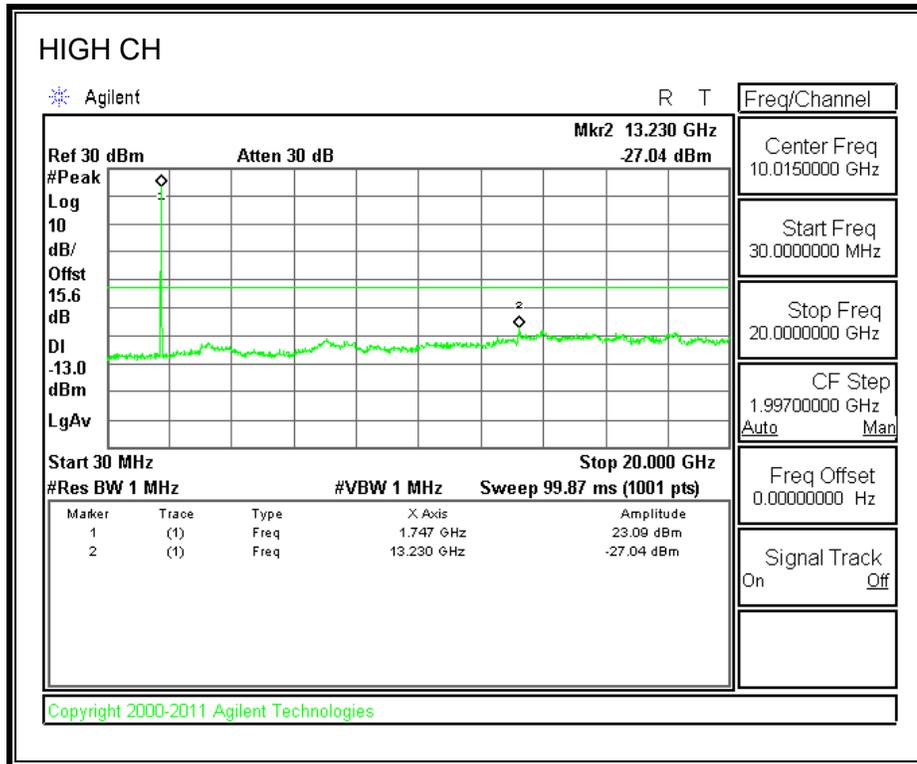
**WCDMA REL 99 AWS Band**





**HSUPA REL 5, AWS Band**





### **8.1.4. FREQUENCY STABILITY**

#### **RULE PART(S)**

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

#### **LIMITS**

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

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

§27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

#### **TEST PROCEDURE**

##### **Frequency Stability vs Temperature:**

The EUT is placed inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50°C is reached. Reference power supply voltage for these tests is 3.7Vdc.

##### **Frequency Stability vs Voltage:**

The peak frequency error is recorded (worst-case). The test voltage ranges from 3.40 to 4.26 VDC.

#### **MODES TESTED**

- GPRS
- EGPRS
- WCDMA, Rel 99
- HSUPA REL 6

#### **RESULTS**

See the following pages.

**CELL, GPRS MODULATION – MID CHANNEL**

Reference Frequency: Cellular Mid Channel 836.600012MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	836.599986	0.031	2.5
3.70	40	836.599991	0.025	2.5
3.70	30	836.599997	0.018	2.5
<b>3.70</b>	<b>20</b>	<b>836.600012</b>	<b>0</b>	<b>2.5</b>
3.70	10	836.599990	0.026	2.5
3.70	0	836.599987	0.030	2.5
3.70	-10	836.599987	0.030	2.5
3.70	-20	836.599985	0.032	2.5
3.70	-30	836.599984	0.033	2.5
Reference Frequency: Cellular Mid Channel 836.600012MHz @ 20°C				
Limit: to stay +/- 2.5 ppm = 2091.500 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.70</b>	<b>20</b>	<b>836.600012</b>	<b>0</b>	<b>2.5</b>
3.15	20	836.600011	0.001	2.5
4.26	20	836.600013	-0.001	2.5

**PCS, GPRS MODULATION – MID CHANNEL**

Reference Frequency: PCS Mid Channel 1879.999993MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4700.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1880.000002	-0.005	2.5
3.70	40	1880.000000	-0.004	2.5
3.70	30	1879.999998	-0.003	2.5
<b>3.70</b>	<b>20</b>	<b>1879.999993</b>	<b>0</b>	<b>2.5</b>
3.70	10	1880.000006	-0.007	2.5
3.70	0	1880.000009	-0.009	2.5
3.70	-10	1880.000008	-0.008	2.5
3.70	-20	1880.000007	-0.007	2.5
3.70	-30	1880.000007	-0.007	2.5

Reference Frequency: PCS Mid Channel 1879.999993MHz @ 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)
<b>3.70</b>	<b>20</b>	<b>1879.999993</b>	<b>0</b>	<b>2.5</b>
3.15	20	1880.000009	-0.009	2.5
4.26	20	1880.000009	-0.009	2.5

**AWS WCDMA – MID CHANNEL**

Reference Frequency: PCS Mid Channel 1732.399994MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4331.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	1732.399995	-0.001	2.5
3.70	40	1732.399995	-0.001	2.5
3.70	30	1732.399994	0.000	2.5
<b>3.70</b>	<b>20</b>	<b>1732.399994</b>	<b>0</b>	<b>2.5</b>
3.70	10	1732.399994	0.000	2.5
3.70	0	1732.399993	0.001	2.5
3.70	-10	1732.399994	0.000	2.5
3.70	-20	1732.399995	-0.001	2.5
3.70	-30	1732.399995	-0.001	2.5

Reference Frequency: PCS Mid Channel 1732.399994MHz @ 20°C				
Limit: within the authorized block or +/- 2.5 ppm = 4331.000 Hz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
<b>3.70</b>	<b>20</b>	<b>1732.399994</b>	<b>0</b>	<b>2.5</b>
3.15	20	1732.399994	0.000	2.5
4.26	20	1732.399997	-0.002	2.5

## **8.2. RADIATED TEST RESULTS**

### **8.2.1. RADIATED POWER (ERP & EIRP)**

#### **RULE PART(S)**

FCC: §2.1046, §22.913, §24.232, §27.50

#### **LIMITS**

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

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

27.50 (d) (2) - Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band are limited to a peak EIRP of 1 watt.

#### **TEST PROCEDURE**

ANSI / TIA / EIA 603 Clause 2.2.17

The ERP/EIRP power was measured with the spectrum analyzer which attached with receiver antenna via calibrated cable. The measurements have been taken at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW  $\geq$  RBW  $\geq$  26dB BW, typically 3MHz for GSM and 5MHz for WCDMA modes respectively.
- Set a marker to point the corresponding peak value.

#### **MODES TESTED**

- GPRS
- EGPRS
- WCDMA REL. 99
- HSUPA REL 6

#### **RESULTS**

**CELLULAR BAND (ERP)**

Mode	Channel	f (MHz)	ERP	
			dBm	mW
GPRS	128	824.20	30.68	1169.50
	192	836.60	<b>30.73</b>	1183.04
	251	848.80	30.36	1086.43
EGPRS	128	824.20	26.09	406.44
	192	836.60	<b>26.21</b>	417.83
	251	848.80	26.15	412.10

**PCS BAND (EIRP)**

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
GPRS	512	1850.20	31.80	1513.56
	661	1880.00	32.05	1603.25
	810	1909.80	<b>32.88</b>	1940.89
EGPRS	512	1850.20	30.25	1059.25
	661	1880.00	29.89	974.99
	810	1909.80	<b>31.23</b>	1327.39

**AWS BAND (EIRP)**

Mode	Channel	f (MHz)	EIRP	
			dBm	mW
UMTS,REL 99	1537	1712.40	26.52	448.75
	1637	1732.40	26.98	498.88
	2087	1752.40	<b>27.96</b>	625.17
HSUPA, Rel 6	1537	1712.40	26.26	422.67
	1637	1732.40	28.55	716.14
	2087	1752.40	<b>29.58</b>	907.82

**ERP GPRS850 BAND**

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
<b>Company:</b>	LG ELECTRONICS							
<b>Project #:</b>	12U14550							
<b>Date:</b>	08/08/12							
<b>Test Engineer:</b>	MENGISTU MEKURIA							
<b>Configuration:</b>	EUT ALONE							
<b>Mode:</b>	TX, 850 MHz BAND, WCDMA MODE							
<b>Test Equipment:</b>								
Receiving: Sunoi T130, 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
<b>Low Ch</b>								
824.20	24.47	V	0.5	0.0	23.97	38.5	-14.5	
824.20	31.18	H	0.5	0.0	30.68	38.5	-7.8	
<b>Mid Ch</b>								
836.60	23.16	V	0.5	0.0	22.66	38.5	-15.8	
836.60	31.23	H	0.5	0.0	30.73	38.5	-7.7	
<b>High Ch</b>								
848.80	24.79	V	0.5	0.0	24.29	38.5	-14.2	
848.80	30.86	H	0.5	0.0	30.36	38.5	-8.1	
Rev. 3.17.11								

**ERP EGPRS850 BAND**

High Frequency Substitution Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG ELECTRONICS						
<b>Project #:</b>		12U14550						
<b>Date:</b>		08/08/12						
<b>Test Engineer:</b>		MENGISTU MEKURIA						
<b>Configuration:</b>		EUT ALONE						
<b>Mode:</b>		TX, 850 MHz BAND, EGPRS MODE						
<b>Test Equipment:</b>								
Receiving: Sunol T130, 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
<b>Low Ch</b>								
824.20	19.71	V	0.5	0.0	19.21	38.5	-19.2	
824.20	26.59	H	0.5	0.0	26.09	38.5	-12.4	
<b>Mid Ch</b>								
836.60	18.93	V	0.5	0.0	18.43	38.5	-20.0	
836.60	26.71	H	0.5	0.0	26.21	38.5	-12.2	
<b>High Ch</b>								
848.80	20.91	V	0.5	0.0	20.41	38.5	-18.0	
848.80	26.65	H	0.5	0.0	26.15	38.5	-12.3	
Rev. 3.17.11								

**EIRP GPRS1900 BAND**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG ELECTRONICS						
<b>Project #:</b>		12U14550						
<b>Date:</b>		08/08/12						
<b>Test Engineer:</b>		MENGISTU MEKURIA						
<b>Configuration:</b>		EUT ALONE						
<b>Mode:</b>		TX, 1900 MHz BAND, GPRS MODE						
<b>Test Equipment:</b>								
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	17.4	V	0.85	8.62	25.15	33.0	-7.9	
1.850	24.2	H	0.85	8.47	31.81	33.0	-1.2	
1.880	15.3	V	0.85	8.46	22.89	33.0	-10.1	
1.880	24.5	H	0.85	8.36	32.05	33.0	-1.0	
1.910	16.4	V	0.85	8.30	23.81	33.0	-9.2	
1.910	25.5	H	0.85	8.25	32.88	33.0	-0.1	
Rev. 3.17.11								

**EIRP EGPRS1900 BAND**

<b>High Frequency Fundamental Measurement Compliance Certification Services Chamber B</b>								
<b>Company:</b>		LG ELECTRONICS						
<b>Project #:</b>		12U14550						
<b>Date:</b>		08/08/12						
<b>Test Engineer:</b>		MENGISTU MEKURIA						
<b>Configuration:</b>		EUT ALONE						
<b>Mode:</b>		TX, 1900 MHz BAND, EGPRS MODE						
<b>Test Equipment:</b>								
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	14.0	V	0.85	8.62	21.75	33.0	-11.3	
1.850	22.6	H	0.85	8.47	30.25	33.0	-2.8	
1.880	12.9	V	0.85	8.46	20.46	33.0	-12.5	
1.880	22.4	H	0.85	8.36	29.89	33.0	-3.1	
1.910	14.5	V	0.85	8.30	21.94	33.0	-11.1	
1.910	23.8	H	0.85	8.25	31.23	33.0	-1.8	
Rev. 3.17.11								

**EIRP WCDMA REL 99, 1700MHz BAND**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG ELECTRONICS						
<b>Project #:</b>		12U14550						
<b>Date:</b>		08/07/12						
<b>Test Engineer:</b>		MENGISTU MEKURIA						
<b>Configuration:</b>		EUT WITH CHARGER						
<b>Mode:</b>		TX, 1700 MHz BAND, WCDMA MODE						
<b>Test Equipment:</b>								
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
1.712	11.3	V	0.85	8.62	19.11	30.0	-10.9	
1.712	18.9	H	0.85	8.47	26.52	30.0	-3.5	
1.732	11.4	V	0.85	8.46	19.02	30.0	-11.0	
1.732	19.5	H	0.85	8.36	26.98	30.0	-3.0	
1.753	12.4	V	0.85	8.30	19.89	30.0	-10.1	
1.753	20.6	H	0.85	8.25	27.96	30.0	-2.0	
Rev. 3.17.11								

**EIRP HSUPA REL 5, 1700MHz BAND**

High Frequency Fundamental Measurement Compliance Certification Services Chamber B								
<b>Company:</b>		LG ELECTRONICS						
<b>Project #:</b>		12U14550						
<b>Date:</b>		08/07/12						
<b>Test Engineer:</b>		MENGISTU MEKURIA						
<b>Configuration:</b>		EUT WITH CHARGER						
<b>Mode:</b>		TX, 1700 MHz BAND, HSUPA MODE						
<b>Test Equipment:</b>								
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
1.712	13.8	V	0.85	8.62	21.54	30.0	-8.5	
1.712	18.6	H	0.85	8.47	26.26	30.0	-3.7	
1.732	13.2	V	0.85	8.46	20.84	30.0	-9.2	
1.732	21.0	H	0.85	8.36	28.55	30.0	-1.5	
1.753	14.3	V	0.85	8.30	21.78	30.0	-8.2	
1.753	22.2	H	0.85	8.25	29.58	30.0	-0.4	
Rev. 3.17.11								

## **8.2.2. 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
- EGPRS
- WCDMA REL. 99
- HSUPA REL 6

### **RESULTS**

**ERP GPRS850 BAND**

Compliance Certification Services									
Above 1GHz High Frequency Substitution Measurement									
Company:		LG ELECTRONICS							
Project #:		12U14550							
Date:		80/09/2012							
Test Engineer:		MENGISTU MEKURIA							
Configuration:		EUT with AC Adapter and Earphone							
Mode:		TX, 850MHz BAND GSM 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)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (824.2MHz)</b>									
1.648	3.2	V	3.0	35.5	1.0	-31.3	-13.0	-18.3	
2.473	0.5	V	3.0	35.4	1.0	-33.9	-13.0	-20.9	
3.297	-18.5	V	3.0	35.5	1.0	-53.0	-13.0	-40.0	
4.121	-15.6	V	3.0	35.2	1.0	-49.9	-13.0	-36.9	
4.945	-13.8	V	3.0	35.3	1.0	-48.1	-13.0	-35.1	
5.769	-18.3	V	3.0	35.5	1.0	-52.8	-13.0	-39.8	
6.594	-12.9	V	3.0	35.6	1.0	-47.5	-13.0	-34.5	
7.418	-8.1	V	3.0	35.7	1.0	-42.8	-13.0	-29.8	
8.242	-9.0	V	3.0	35.6	1.0	-43.6	-13.0	-30.6	
9.066	-15.8	V	3.0	35.6	1.0	-50.4	-13.0	-37.4	
9.890	-5.8	V	3.0	35.5	1.0	-40.3	-13.0	-27.3	
1.648	-2.4	H	3.0	35.5	1.0	-36.9	-13.0	-23.9	
2.473	6.8	H	3.0	35.4	1.0	-27.7	-13.0	-14.7	
3.297	-18.4	H	3.0	35.5	1.0	-53.0	-13.0	-40.0	
4.121	-12.9	H	3.0	35.2	1.0	-47.2	-13.0	-34.2	
4.945	-6.9	H	3.0	35.3	1.0	-41.2	-13.0	-28.2	
5.769	-17.9	H	3.0	35.5	1.0	-52.3	-13.0	-39.3	
6.594	-11.8	H	3.0	35.6	1.0	-46.4	-13.0	-33.4	
7.418	-11.2	H	3.0	35.7	1.0	-45.9	-13.0	-32.9	
8.242	-14.3	H	3.0	35.6	1.0	-49.0	-13.0	-36.0	
9.066	-14.2	H	3.0	35.6	1.0	-48.8	-13.0	-35.8	
9.890	-3.5	H	3.0	35.5	1.0	-38.0	-13.0	-25.0	
<b>Mid Ch, (836.6MHz)</b>									
1.673	4.1	V	3.0	35.5	1.0	-30.5	-13.0	-17.5	
2.510	1.0	V	3.0	35.4	1.0	-33.5	-13.0	-20.5	
3.346	-17.0	V	3.0	35.5	1.0	-51.5	-13.0	-38.5	
4.183	-11.7	V	3.0	35.2	1.0	-45.9	-13.0	-32.9	
5.020	-8.2	V	3.0	35.3	1.0	-42.5	-13.0	-29.5	
5.856	-12.6	V	3.0	35.5	1.0	-47.1	-13.0	-34.1	
6.693	-6.9	V	3.0	35.7	1.0	-41.6	-13.0	-28.6	
7.529	-4.4	V	3.0	35.7	1.0	-39.1	-13.0	-26.1	
8.366	-4.8	V	3.0	35.6	1.0	-39.5	-13.0	-26.5	
9.203	-15.8	V	3.0	35.6	1.0	-50.4	-13.0	-37.4	
10.039	-2.2	V	3.0	35.5	1.0	-36.7	-13.0	-23.7	
1.673	-0.4	H	3.0	35.5	1.0	-34.9	-13.0	-21.9	
2.510	-8.4	H	3.0	35.4	1.0	-42.8	-13.0	-29.8	
3.346	-14.0	H	3.0	35.5	1.0	-48.5	-13.0	-35.5	
4.183	-8.2	H	3.0	35.2	1.0	-42.5	-13.0	-29.5	
5.020	-2.7	H	3.0	35.3	1.0	-37.0	-13.0	-24.0	
5.856	-9.6	H	3.0	35.5	1.0	-44.1	-13.0	-31.1	
6.693	0.3	H	3.0	35.7	1.0	-34.3	-13.0	-21.3	
7.529	-8.9	H	3.0	35.7	1.0	-43.6	-13.0	-30.6	
8.366	-1.2	H	3.0	35.6	1.0	-35.9	-13.0	-22.9	
9.203	-14.0	H	3.0	35.6	1.0	-48.6	-13.0	-35.6	
10.039	1.4	H	3.0	35.5	1.0	-33.1	-13.0	-20.1	
<b>High Ch, (848.8MHz)</b>									
1.698	3.1	V	3.0	35.5	1.0	-31.4	-13.0	-18.4	
2.546	4.7	V	3.0	35.4	1.0	-29.7	-13.0	-16.7	
3.395	-15.9	V	3.0	35.5	1.0	-50.4	-13.0	-37.4	
4.244	-11.5	V	3.0	35.2	1.0	-45.8	-13.0	-32.8	
5.093	-2.6	V	3.0	35.3	1.0	-36.9	-13.0	-23.9	
5.942	-3.8	V	3.0	35.5	1.0	-38.3	-13.0	-25.3	
6.790	-0.9	V	3.0	35.7	1.0	-35.5	-13.0	-22.5	
7.639	-0.2	V	3.0	35.7	1.0	-34.9	-13.0	-21.9	
8.488	-2.6	V	3.0	35.6	1.0	-37.2	-13.0	-24.2	
9.337	-10.5	V	3.0	35.6	1.0	-45.1	-13.0	-32.1	
10.186	-1.3	V	3.0	35.4	1.0	-35.7	-13.0	-22.7	
1.698	0.4	H	3.0	35.5	1.0	-34.1	-13.0	-21.1	
2.546	-5.3	H	3.0	35.4	1.0	-39.7	-13.0	-26.7	
3.395	-13.5	H	3.0	35.5	1.0	-48.0	-13.0	-35.0	
4.244	-5.0	H	3.0	35.2	1.0	-39.2	-13.0	-26.2	
5.093	1.3	H	3.0	35.3	1.0	-33.0	-13.0	-20.0	
5.942	-0.1	H	3.0	35.5	1.0	-34.6	-13.0	-21.6	
6.790	1.6	H	3.0	35.7	1.0	-33.1	-13.0	-20.1	
7.639	-3.2	H	3.0	35.7	1.0	-37.8	-13.0	-24.8	
8.488	-3.9	H	3.0	35.6	1.0	-38.6	-13.0	-25.6	
9.337	-8.7	H	3.0	35.6	1.0	-43.2	-13.0	-30.2	
10.186	4.3	H	3.0	35.4	1.0	-30.1	-13.0	-17.1	

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

**ERP EGPRS850 BAND**

Compliance Certification Services									
Above 1GHz High Frequency Substitution Measurement									
Company:		LG ELECTRONICS							
Project #:		12U14550							
Date:		80/09/2012							
Test Engineer:		MENGISTU MEKURIA							
Configuration:		EUT with AC Adapter and Earphone							
Mode:		TX, 850MHz BAND EGPRS MODE							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 8449B		Filter 1		Part 22			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (824.2MHz)</b>									
1.648	-7.4	V	3.0	38.2	1.0	-44.5	-13.0	-31.5	
2.473	1.4	V	3.0	37.5	1.0	-35.1	-13.0	-22.1	
3.297	-18.2	V	3.0	37.1	1.0	-54.3	-13.0	-41.3	
4.121	-11.3	V	3.0	36.5	1.0	-46.9	-13.0	-33.9	
4.945	-13.8	V	3.0	36.3	1.0	-49.1	-13.0	-36.1	
5.769	-16.7	V	3.0	36.3	1.0	-52.1	-13.0	-39.1	
6.594	-14.5	V	3.0	36.4	1.0	-49.9	-13.0	-36.9	
7.418	-11.2	V	3.0	36.6	1.0	-46.7	-13.0	-33.7	
8.242	-9.1	V	3.0	36.8	1.0	-44.9	-13.0	-31.9	
9.066	-10.6	V	3.0	37.0	1.0	-46.5	-13.0	-33.5	
9.890	-14.3	V	3.0	37.2	1.0	-50.5	-13.0	-37.5	
1.648	-0.5	H	3.0	38.2	1.0	-37.7	-13.0	-24.7	
2.473	-4.1	H	3.0	37.5	1.0	-40.5	-13.0	-27.5	
3.297	-18.9	H	3.0	37.1	1.0	-55.0	-13.0	-42.0	
4.121	-14.1	H	3.0	36.5	1.0	-49.7	-13.0	-36.7	
4.945	-10.0	H	3.0	36.3	1.0	-45.3	-13.0	-32.3	
5.769	-14.5	H	3.0	36.3	1.0	-49.8	-13.0	-36.8	
6.594	-13.2	H	3.0	36.4	1.0	-48.6	-13.0	-35.6	
7.418	-15.8	H	3.0	36.6	1.0	-51.4	-13.0	-38.4	
8.242	-12.1	H	3.0	36.8	1.0	-47.8	-13.0	-34.8	
9.066	-13.5	H	3.0	37.0	1.0	-49.4	-13.0	-36.4	
9.890	-12.4	H	3.0	37.2	1.0	-48.5	-13.0	-35.5	
<b>Mid Ch, (836.6MHz)</b>									
1.673	-8.8	V	3.0	38.1	1.0	-45.9	-13.0	-32.9	
2.510	-12.3	V	3.0	37.5	1.0	-48.8	-13.0	-35.8	
3.346	-19.5	V	3.0	37.1	1.0	-55.6	-13.0	-42.6	
4.183	-19.7	V	3.0	36.5	1.0	-55.3	-13.0	-42.3	
5.020	-19.7	V	3.0	36.3	1.0	-55.0	-13.0	-42.0	
5.856	-17.5	V	3.0	36.3	1.0	-52.9	-13.0	-39.9	
6.693	-15.9	V	3.0	36.4	1.0	-51.3	-13.0	-38.3	
7.529	-16.7	V	3.0	36.6	1.0	-52.3	-13.0	-39.3	
8.366	-13.7	V	3.0	36.8	1.0	-49.5	-13.0	-36.5	
9.203	-15.3	V	3.0	37.0	1.0	-51.3	-13.0	-38.3	
10.039	-14.5	V	3.0	37.2	1.0	-50.7	-13.0	-37.7	
1.673	-10.8	H	3.0	38.1	1.0	-47.9	-13.0	-34.9	
2.510	-20.8	H	3.0	37.5	1.0	-57.3	-13.0	-44.3	
3.346	-20.3	H	3.0	37.1	1.0	-56.4	-13.0	-43.4	
4.183	-19.8	H	3.0	36.5	1.0	-55.4	-13.0	-42.4	
5.020	-20.2	H	3.0	36.3	1.0	-55.5	-13.0	-42.5	
5.856	-14.0	H	3.0	36.3	1.0	-49.4	-13.0	-36.4	
6.693	-9.1	H	3.0	36.4	1.0	-44.6	-13.0	-31.6	
7.529	-11.5	H	3.0	36.6	1.0	-47.1	-13.0	-34.1	
8.366	-11.2	H	3.0	36.8	1.0	-47.0	-13.0	-34.0	
9.203	-13.9	H	3.0	37.0	1.0	-49.9	-13.0	-36.9	
10.039	-8.5	H	3.0	37.2	1.0	-44.7	-13.0	-31.7	
<b>High Ch, (848.8MHz)</b>									
1.698	-12.1	V	3.0	38.1	1.0	-49.2	-13.0	-36.2	
2.546	-11.6	V	3.0	37.5	1.0	-48.1	-13.0	-35.1	
3.395	-20.2	V	3.0	37.1	1.0	-56.2	-13.0	-43.2	
4.244	-20.4	V	3.0	36.5	1.0	-55.9	-13.0	-42.9	
5.093	-20.7	V	3.0	36.3	1.0	-56.0	-13.0	-43.0	
5.942	-17.6	V	3.0	36.3	1.0	-53.0	-13.0	-40.0	
6.790	-15.7	V	3.0	36.5	1.0	-51.2	-13.0	-38.2	
7.639	-15.4	V	3.0	36.6	1.0	-51.1	-13.0	-38.1	
8.488	-15.2	V	3.0	36.8	1.0	-51.1	-13.0	-38.1	
9.337	-15.3	V	3.0	37.0	1.0	-51.3	-13.0	-38.3	
10.186	-7.8	V	3.0	37.1	1.0	-43.9	-13.0	-30.9	
1.698	-11.0	H	3.0	38.1	1.0	-48.1	-13.0	-35.1	
2.546	-16.4	H	3.0	37.5	1.0	-52.8	-13.0	-39.8	
3.395	-19.6	H	3.0	37.1	1.0	-55.6	-13.0	-42.6	
4.244	-14.6	H	3.0	36.5	1.0	-50.1	-13.0	-37.1	
5.093	-19.9	H	3.0	36.3	1.0	-55.2	-13.0	-42.2	
5.942	-14.9	H	3.0	36.3	1.0	-50.3	-13.0	-37.3	
6.790	-8.9	H	3.0	36.5	1.0	-44.4	-13.0	-31.4	
7.639	-13.9	H	3.0	36.6	1.0	-49.5	-13.0	-36.5	
8.488	-14.5	H	3.0	36.8	1.0	-50.3	-13.0	-37.3	
9.337	-13.8	H	3.0	37.0	1.0	-49.8	-13.0	-36.8	
10.186	-6.8	H	3.0	37.1	1.0	-42.9	-13.0	-29.9	

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

**EIRP GPRS1900 BAND**

Compliance Certification Services Above 1GHz High Frequency Substitution Measurement									
Company:		LG ELECTRONICS							
Project #:		12U14550							
Date:		80/09/2012							
Test Engineer:		MENGISTU MEKURIA							
Configuration:		EUT with AC Adapter and Earphone							
Mode:		TX, 1900MHz BAND GPRS MODE							
Chamber		Pre-amplifier		Filter		Limit			
5m Chamber A		T144 8449B		Filter 1		Part 24			
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1850.2MHz)</b>									
3.700	-7.4	V	3.0	36.8	1.0	-43.2	-13.0	-30.2	
5.551	2.5	V	3.0	36.3	1.0	-32.7	-13.0	-19.7	
7.401	-10.7	V	3.0	36.6	1.0	-46.3	-13.0	-33.3	
9.251	-4.2	V	3.0	37.0	1.0	-40.2	-13.0	-27.2	
11.101	-7.0	V	3.0	36.9	1.0	-42.9	-13.0	-29.9	
3.700	-4.6	H	3.0	36.8	1.0	-40.4	-13.0	-27.4	
5.551	-1.3	H	3.0	36.3	1.0	-36.6	-13.0	-23.6	
7.401	-13.7	H	3.0	36.6	1.0	-49.3	-13.0	-36.3	
9.251	-10.2	H	3.0	37.0	1.0	-46.2	-13.0	-33.2	
11.101	-13.0	H	3.0	36.9	1.0	-48.9	-13.0	-35.9	
<b>Mid Ch, (1880.0MHz)</b>									
3.760	-5.0	V	3.0	36.8	1.0	-40.8	-13.0	-27.8	
5.640	1.8	V	3.0	36.3	1.0	-33.5	-13.0	-20.5	
7.520	-5.5	V	3.0	36.6	1.0	-41.2	-13.0	-28.2	
9.400	-13.6	V	3.0	37.0	1.0	-49.7	-13.0	-36.7	
11.280	-11.0	V	3.0	36.8	1.0	-46.8	-13.0	-33.8	
3.760	-7.3	H	3.0	36.8	1.0	-43.1	-13.0	-30.1	
5.640	-4.9	H	3.0	36.3	1.0	-40.2	-13.0	-27.2	
7.520	-11.3	H	3.0	36.6	1.0	-46.9	-13.0	-33.9	
9.400	-13.7	H	3.0	37.0	1.0	-49.8	-13.0	-36.8	
11.280	-13.1	H	3.0	36.8	1.0	-48.9	-13.0	-35.9	
<b>High Ch, (1909.8MHz)</b>									
3.820	-5.2	V	3.0	36.7	1.0	-40.9	-13.0	-27.9	
5.729	-0.8	V	3.0	36.3	1.0	-36.1	-13.0	-23.1	
7.639	-4.0	V	3.0	36.6	1.0	-39.6	-13.0	-26.6	
9.549	-13.8	V	3.0	37.1	1.0	-49.9	-13.0	-36.9	
11.459	-10.3	V	3.0	36.8	1.0	-46.1	-13.0	-33.1	
3.820	-9.3	H	3.0	36.7	1.0	-45.0	-13.0	-32.0	
5.729	-8.4	H	3.0	36.3	1.0	-43.7	-13.0	-30.7	
7.639	-8.7	H	3.0	36.6	1.0	-44.4	-13.0	-31.4	
9.549	-12.4	H	3.0	37.1	1.0	-48.5	-13.0	-35.5	
11.459	-12.9	H	3.0	36.8	1.0	-48.7	-13.0	-35.7	
		H					-13.0		

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

**EIRPEGPRS1900 BAND**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

Company: LG ELECTRONICS  
 Project #: 12U14550  
 Date: 80/09/2012  
 Test Engineer: MENGISTU MEKURIA  
 Configuration: EUT with AC Adapter and Earphone  
 Mode: TX, 1900MHz BAND EGPRS MODE

Chamber

5m Chamber A

Pre-amplifier

T144 8449B

Filter

Filter 1

Limit

Part 24

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1850.2MHz)</b>									
3.700	-15.7	V	3.0	36.8	1.0	-51.5	-13.0	-38.5	
5.551	-13.1	V	3.0	36.3	1.0	-48.4	-13.0	-35.4	
7.401	-15.2	V	3.0	36.6	1.0	-50.8	-13.0	-37.8	
3.700	-13.7	H	3.0	36.8	1.0	-49.6	-13.0	-36.6	
5.551	-15.4	H	3.0	36.3	1.0	-50.7	-13.0	-37.7	
7.401	-15.2	H	3.0	36.6	1.0	-50.8	-13.0	-37.8	
<b>Mid Ch, (1880.0MHz)</b>									
3.760	-9.4	V	3.0	36.8	1.0	-45.2	-13.0	-32.2	
5.640	-11.0	V	3.0	36.3	1.0	-46.3	-13.0	-33.3	
7.520	-15.6	V	3.0	36.6	1.0	-51.2	-13.0	-38.2	
3.760	-13.2	H	3.0	36.8	1.0	-49.0	-13.0	-36.0	
5.640	-17.4	H	3.0	36.3	1.0	-52.7	-13.0	-39.7	
7.520	-13.9	H	3.0	36.6	1.0	-49.5	-13.0	-36.5	
<b>High Ch, (1909.8MHz)</b>									
3.820	-10.9	V	3.0	36.7	1.0	-46.6	-13.0	-33.6	
5.729	-15.0	V	3.0	36.3	1.0	-50.3	-13.0	-37.3	
7.639	-14.4	V	3.0	36.6	1.0	-50.1	-13.0	-37.1	
3.820	-14.8	H	3.0	36.7	1.0	-50.6	-13.0	-37.6	
5.729	-17.1	H	3.0	36.3	1.0	-52.4	-13.0	-39.4	
7.639	-14.3	H	3.0	36.6	1.0	-49.9	-13.0	-36.9	
		H							

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

**EIRP WCDMA REL 99, AWS BAND**

**Compliance Certification Services**  
**Above 1GHz High Frequency Substitution Measurement**

**Company:** LG ELECTRONICS  
**Project #:** 12U14550  
**Date:** 80/09/2012  
**Test Engineer:** MENGISTU MEKURIA  
**Configuration:** EUT with AC Adapter and Earphone  
**Mode:** TX, 1700MHz BAND WCDMA MODE

Chamber

Pre-amplifier

Filter

Limit

5m Chamber A

T144 8449B

Filter 1

Part 27

f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch. (1712.4MHz)</b>									
3.425	-8.1	V	3.0	37.0	1.0	-44.1	-13.0	-31.1	
5.137	1.9	V	3.0	36.3	1.0	-33.4	-13.0	-20.4	
6.850	-11.4	V	3.0	36.5	1.0	-46.9	-13.0	-33.9	
8.562	5.1	V	3.0	36.8	1.0	-40.9	-13.0	-27.9	
10.274	-7.8	V	3.0	37.1	1.0	-43.9	-13.0	-30.9	
3.425	-5.4	H	3.0	37.0	1.0	-41.4	-13.0	-28.4	
5.137	-2.1	H	3.0	36.3	1.0	-37.4	-13.0	-24.4	
6.850	-14.5	H	3.0	36.5	1.0	-49.9	-13.0	-36.9	
8.562	-11.0	H	3.0	36.8	1.0	-46.9	-13.0	-33.9	
10.274	-12.7	H	3.0	37.1	1.0	-48.9	-13.0	-35.9	
<b>Mid Ch. (1732.4MHz)</b>									
3.465	-5.7	V	3.0	37.0	1.0	-41.7	-13.0	-28.7	
5.197	1.2	V	3.0	36.2	1.0	-34.1	-13.0	-21.1	
6.930	-6.3	V	3.0	36.5	1.0	-41.8	-13.0	-28.8	
8.662	-14.6	V	3.0	36.9	1.0	-50.5	-13.0	-37.5	
10.394	-10.8	V	3.0	37.1	1.0	-46.9	-13.0	-33.9	
3.465	-8.1	H	3.0	37.0	1.0	-44.1	-13.0	-31.1	
5.197	-5.7	H	3.0	36.2	1.0	-40.9	-13.0	-27.9	
6.930	-12.1	H	3.0	36.5	1.0	-47.6	-13.0	-34.6	
8.662	-14.7	H	3.0	36.9	1.0	-50.6	-13.0	-37.6	
10.394	-12.8	H	3.0	37.1	1.0	-48.9	-13.0	-35.9	
<b>High Ch. (1752.5MHz)</b>									
3.505	-5.9	V	3.0	37.0	1.0	-41.9	-13.0	-28.9	
5.258	-1.4	V	3.0	36.3	1.0	-36.7	-13.0	-23.7	
7.010	-4.8	V	3.0	36.5	1.0	-40.3	-13.0	-27.3	
8.763	-14.9	V	3.0	36.9	1.0	-50.8	-13.0	-37.8	
10.515	-11.3	V	3.0	37.1	1.0	-47.3	-13.0	-34.3	
3.505	-10.1	H	3.0	37.0	1.0	-46.1	-13.0	-33.1	
5.258	-9.2	H	3.0	36.3	1.0	-44.4	-13.0	-31.4	
7.010	-9.5	H	3.0	36.5	1.0	-45.0	-13.0	-32.0	
8.763	-13.4	H	3.0	36.9	1.0	-49.3	-13.0	-36.3	
10.515	-12.6	H	3.0	37.1	1.0	-48.6	-13.0	-35.6	

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

**EIRP HSUPA REL 5, AWS BAND**

Compliance Certification Services									
Above 1GHz High Frequency Substitution Measurement									
<b>Company:</b>		LG ELECTRONICS							
<b>Project #:</b>		12U14550							
<b>Date:</b>		08/09/12							
<b>Test Engineer:</b>		MENGISTU MEKURIA							
<b>Configuration:</b>		EUT with AC Adapter and Earphone							
<b>Mode:</b>		TX, 1700MHz BAND HSUPA MODE							
<b>Chamber</b>		<b>Pre-amplifier</b>			<b>Filter</b>		<b>Limit</b>		
5m Chamber A		T144 8449B			Filter 1		Part 27		
f GHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
<b>Low Ch, (1712.4MHz)</b>									
3.425	-7.1	V	3.0	37.0	1.0	-43.1	-13.0	-30.1	
5.137	-17.2	V	3.0	36.3	1.0	-52.5	-13.0	-39.5	
6.850	-15.7	V	3.0	36.5	1.0	-51.2	-13.0	-38.2	
3.425	-10.3	H	3.0	37.0	1.0	-46.3	-13.0	-33.3	
5.137	-19.2	H	3.0	36.3	1.0	-54.5	-13.0	-41.5	
6.850	-14.0	H	3.0	36.5	1.0	-49.5	-13.0	-36.5	
<b>Mid Ch, (1732.4MHz)</b>									
3.465	-12.2	V	3.0	37.0	1.0	-48.2	-13.0	-35.2	
5.197	-11.6	V	3.0	36.2	1.0	-46.8	-13.0	-33.8	
6.930	-15.9	V	3.0	36.5	1.0	-51.4	-13.0	-38.4	
3.465	-14.1	H	3.0	37.0	1.0	-50.1	-13.0	-37.1	
5.197	-15.6	H	3.0	36.2	1.0	-50.9	-13.0	-37.9	
6.930	-15.6	H	3.0	36.5	1.0	-51.1	-13.0	-38.1	
<b>High Ch, (1752.5MHz)</b>									
3.505	-13.2	V	3.0	37.0	1.0	-49.1	-13.0	-36.1	
5.258	-16.5	V	3.0	36.3	1.0	-51.7	-13.0	-38.7	
7.010	-16.7	V	3.0	36.5	1.0	-52.2	-13.0	-39.2	
3.505	-13.6	H	3.0	37.0	1.0	-49.6	-13.0	-36.6	
5.258	-17.6	H	3.0	36.3	1.0	-52.9	-13.0	-39.9	
7.010	-14.4	H	3.0	36.5	1.0	-49.8	-13.0	-36.8	
Rev. 03.03.09									
Note: No other emissions were detected above the system noise floor.									