Lab Code: 200167-0

FCC PART 24E

TEST AND MEASUREMENT REPORT

For

Shanghai Simcom Limited

Building A, SIM Technology Building, No.633 Jinzhong Road,

Changning District, Shanghai, P.R. of China

FCC ID: VO4SP01POTTER

Report Type:	**Product Type:**
Original Report	GSM /GPRS Digital Mobile Phone

Test Engineer:	Jack Liu
Report Number:	R0811248-24
Report Date:	2008-12-08
Reviewed By:	Boni Baniqued Sr. RF Engineer
Prepared By: **(84)**	Bay Area Compliance Laboratories Corp. 1274 Anvilwood Ave. Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732 9164

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1 GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

This test and measurement report has been compiled on behalf of *Shanghai Simcom Limited* and their product model: *SH6010C, FCC ID: VO4SP01POTTER* which is a GSM/GPRS/EDGE Digital Mobile Phone with Bluetooth.

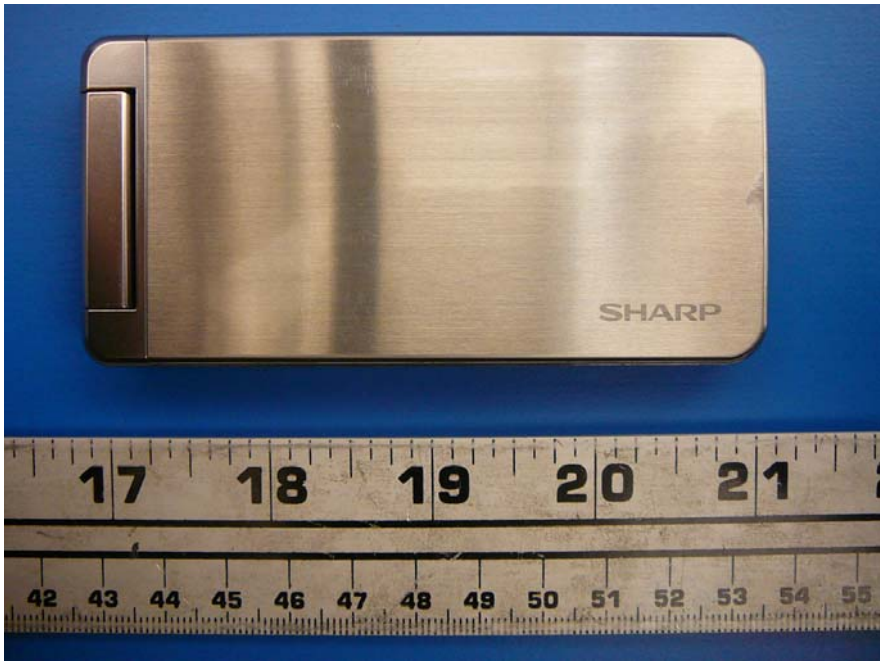
Frequency Band: GSM900: 880-915 MHz (Tx); 925-960 MHZ (Rx)
DCS1800: 1710-1785 MHz (Tx); 1805-1880 MHz (Rx)
PCS1900: 1850-1910 MHz (Tx); 1930-1990 MHz (Rx)
Bluetooth: 2402-2480 MHz (Tx/Rx)

1.2 Mechanical Description

The *Shanghai Simcom Limited* product model: *SH6010C*, FCC ID: *VO4SP01POTTER* or the "EUT" as referred to in this report is a mobile phone. The EUT measures approximately 102mm (L) x 48mm (W) x 13 mm (H), and weighs approximately 97 g with battery.

** The test data gathered are from typical production sample, serial number: 004001/11/175002/8 Sample ID: 72211 provided by the BACL.*

1.3 EUT Photo



Additional Photos in Exhibit C

1.4 Objective

This type approval report is prepared on behalf of *Shanghai Simcom Limited* in accordance with Part 2, Subpart J and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for RF output power, modulation characteristic, occupied bandwidth, spurious emissions at antenna terminal, field strength of spurious radiation, frequency stability, band edge, and conducted and radiated margin.

This measurement and test report only pertains to the PCS1900 portion of the EUT; for measurement and test results to the Bluetooth function please see report RSH08120151 issued by BACL Shenzhen branch.

1.5 Related Submittal(s)/Grant(s)

FCC Part15.247 submission with FCC ID: VO4SP01POTTER.

1.6 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 24 Subpart E - PCS

Applicable Standards: TIA/EIA603-C, ANSI C63.4-2003.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.7 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the values ranging from $\pm$2.0 dB for Conducted Emissions tests and $\pm$4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

Detailed instrumentation measurement uncertainties can be found in BACL Corp. report QAP-018.

1.8 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test sites at BACL have been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission, Industry Canada, and Voluntary Control Council for Interference has the reports on file and is listed under FCC registration number: 90464, IC registration number: 3062A, and VCCI Registration Number: C-2463 and R-2698. The test site has been approved by the FCC, IC, and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm

2 SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was configured for testing according to TIA/EIA 603-C.

The final qualification test was performed with the EUT operating at normal mode.

2.2 EUT Exercise Software

N/A

2.3 Special Accessories

N/A

2.4 Equipment Modifications

No modifications were made to the EUT

2.5 Remote Support Equipment

N/A

2.6 Local Support Equipment

Manufacturer	Description	Model	Serial Number
HP	Laptop	T41	99-KHVP2

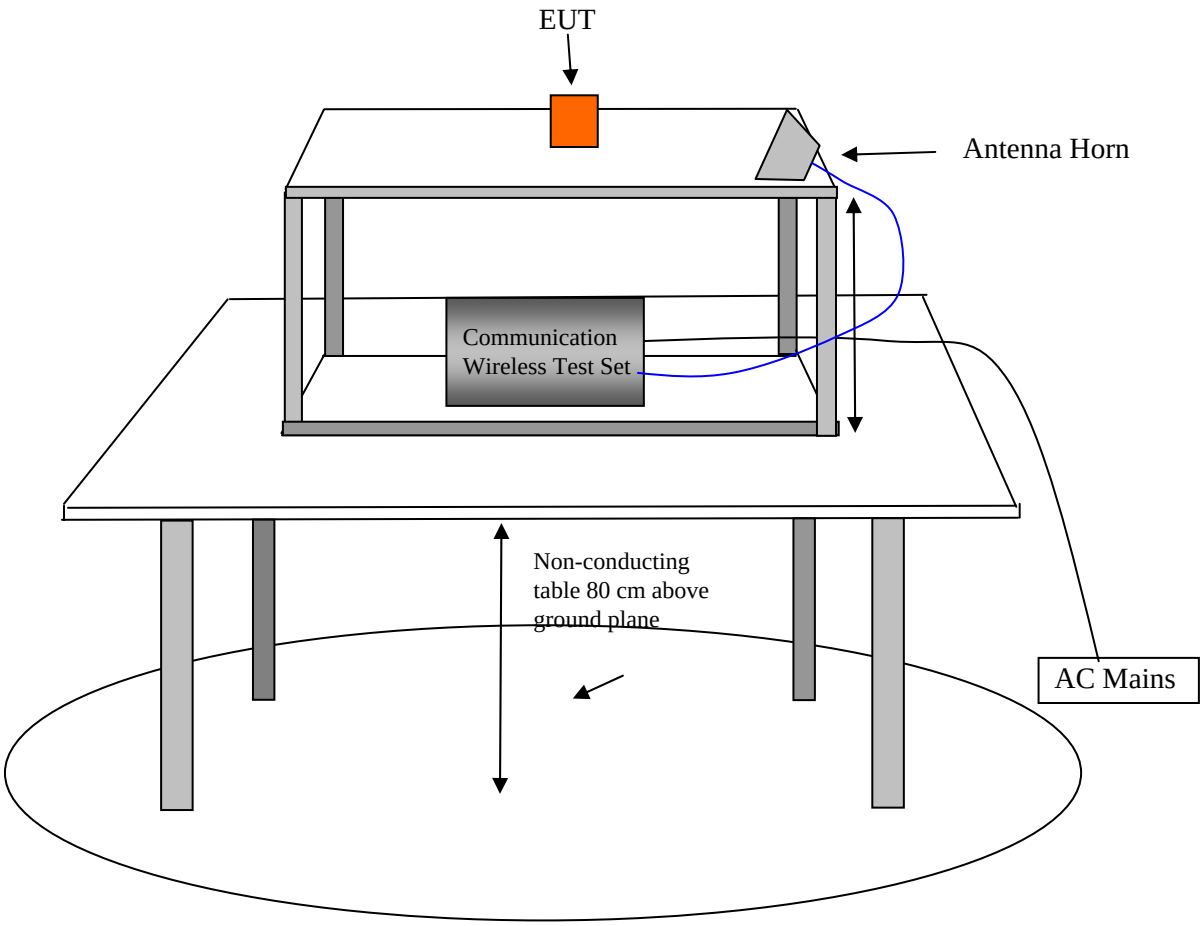
2.7 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
AC/DC Adapter	USB version AC/DC Adapter	P-032B	B2410-0831

2.8 Interface Ports and Cabling

Cable Description	From	To
USB cable	EUT	AC/DC Adapter

2.9 Test setup Block Diagram for radiated emissions tests



3 SUMMARY OF TEST RESULTS

FCC Rules	Description of Tests	Results
§ 2.1047	Modulation Characteristics	N/A
§ 2.1053 § 24.238 (a)	Field Strength of Spurious Radiation	Compliant
§2.1093	RF Exposure	Compliant Please See SAR report R0811248-SAR
§ 2.1046 § 24.232	RF Output Power	Compliant
§ 2.1049 § 24.238	Out of Band Emissions, Occupied Bandwidth	Compliant
§ 2.1051, § 24.238 (a)	Spurious Emissions at Antenna Terminals	Compliant
§ 2.1055 (a) § 2.1055 (d) § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§24.238	Band Edge	Compliant

4 §2.1047 - MODULATION CHARACTERISTIC

4.1 Applicable Standard

According to FCC § 2.1047(d), Part 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

5 §1.1307(b) (1) & §2.1093 - RF EXPOSURE

5.1 Applicable Standard

§1.1310 and §2.1093 RF exposure limits.

5.2 Test Result

Compliant: The EUT is a hand portable device and thus requires SAR evaluation, please see BACL SAR Report R0811248-SAR for measurement and testing in details.

6 §2.1053 - RADIATED SPURIOUS EMISSIONS

6.1 Applicable Standard

Requirements: CFR 47, § 2.1053, § 24.238.

6.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 log (TX Power in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

6.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer, Communications	E5515C	GB44051221	2007-08-08*
Agilent	Spectrum Analyzer	E4446A	US44300386	2008-05-27
Sunol Sciences	Antenna	JB1	A103105-3	2008-04-01
A.R.A	Horn Antenna	DRG-118/A	1132	2008-08-07
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	261	2008-07-14
HP	Pre-Amplifier	8449B	3008A01978	2008-10-21
HP	Pre-Amplifier	8447D	2944A06639	2007-12-19

*Two year calibration cycle
*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

6.4 Summary of Test Results

Environmental Conditions

Temperature:	20 °C ~ 23 °C
Relative Humidity:	40 % ~ 55 %
ATM Pressure:	101.2kPa ~ 101.5kPa

** Testing performed by Jack Liu on 2008-11-25 to 2008-12-01*

Worst case reading as follows:

Mode: Transmitting		
Margin (dB)	**Frequency (MHz)**	**Antenna Polarization (Horizontal/Vertical)**
-18.67	3760	Vertical

Test Data

Run # 1: 30MHz -20GHz PCS Band GSM Middle Channel (1880 MHz)

Indicated		**Azimuth**	**Test Antenna**		**Substituted**				**Absolute Level**	**Limit**	**Margin**
Frequency (MHz)	**Amplitude (dBuV)**	**(degree)**	**Height (m)**	**Polar (H/V)**	**Frequency (MHz)**	**Level (dBm)**	**Antenna Gain (dBi)**	**Cable Loss (dB)**	**(dBm)**	**(dBm)**	**(dB)**
3760	55.44	58	134	V	3760	-40.47	10.6	1.8	-31.67	-13	-18.67
3760	49.73	334	100	H	3760	-48.25	10.6	1.8	-39.45	-13	-26.45

Run # 2: 30MHz -20GHz PCS Band GPRS Middle Channel (1880 MHz)

Indicated		**Azimuth**	**Test Antenna**		**Substituted**				**Absolute Level**	**Limit**	**Margin**
Frequency (MHz)	**Amplitude (dBuV)**	**(degree)**	**Height (m)**	**Polar (H/V)**	**Frequency (MHz)**	**Level (dBm)**	**Antenna Gain (dBi)**	**Cable Loss (dB)**	**(dBm)**	**(dBm)**	**(dB)**
3760	55.17	58	134	V	3760	-40.74	10.6	1.8	-31.94	-13	-18.94
3760	49.29	334	100	H	3760	-48.69	10.6	1.8	-39.89	-13	-26.89

Run # 3: 30MHz -20GHz PCS Band EGPRS Middle Channel (1880 MHz)

Indicated		**Azimuth**	**Test Antenna**		**Substituted**				**Absolute Level**	**Limit**	**Margin**
Frequency (MHz)	**Amplitude (dBuV)**	**(degree)**	**Height (m)**	**Polar (H/V)**	**Frequency (MHz)**	**Level (dBm)**	**Antenna Gain (dBi)**	**Cable Loss (dB)**	**(dBm)**	**(dBm)**	**(dB)**
3760	49.99	58	134	V	3760	-45.92	10.6	1.8	-37.12	-13	-24.12
3760	46.25	334	100	H	3760	-51.73	10.6	1.8	-42.93	-13	-29.93

7 §2.1046 & §24.232 – RF OUTPUT POWER

7.1 Applicable Standard

According to FCC §2.1046 and §24.232 (a), in no case may the peak output power of a base station transmitter exceed 2 watt.

7.2 Test Procedure

Conducted:

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

Radiated (ERP and EIRP):

TIA-603-C §2.2.17

7.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer, Communications	E5515C	GB44051221	2007-08-08*
Agilent	Spectrum Analyzer	E4446A	US44300386	2008-05-27
Sunol Sciences	Antenna	JB1	A103105-3	2008-04-01
A.R.A	Horn Antenna	DRG-118/A	1132	2008-08-07
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	261	2008-07-14
HP	Pre-Amplifier	8449B	3008A01978	2008-10-21
HP	Pre-Amplifier	8447D	2944A06639	2007-12-19

*Two year calibration cycle
*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

7.4 Summary of Test Results

Environmental Conditions

Temperature:	20 °C ~ 23 °C
Relative Humidity:	40 % ~ 55 %
ATM Pressure:	101.2kPa ~ 101.5kPa

** Testing performed by Jack Liu on 2008-11-25 to 2008-12-01*

Conducted Power

PCS Band Part 24E (GSM):

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (dBm)
Low	1850.2	29.38	866.9	33
Middle	1880.0	29.24	839.5	33
High	1909.8	29.70	933.3	33

PCS Band Part 24E (GPRS):

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (dBm)
Low	1850.2	29.41	873.0	33
Middle	1880.0	29.26	843.3	33
High	1909.8	29.71	935.4	33

PCS Band Part 24E (EGPRS):

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (dBm)
Low	1850.2	26.16	413.0	33
Middle	1880.0	25.98	396.2	33
High	1909.8	26.43	439.5	33

Radiated Power (EIRP)

PCS Band Part 24E (GSM):

Indicated		Azimuth	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Amplitude (dBuV)	(degree)	Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Antenna Gain Correction	Cable Loss (dB)			
1850.2	89.00	330	190	V	1850.2	16.80	9.5	1.09	25.21	33	-7.79
1850.2	93.39	54	125	H	1850.2	21.60	9.5	1.09	30.01	33	-2.99
1880.0	88.79	330	190	V	1880.0	17.49	9.0	1.14	25.35	33	-7.65
1880.0	93.00	54	125	H	1880.0	22.04	9.0	1.14	29.90	33	-3.10
1909.8	88.58	330	190	V	1909.8	17.31	9.0	1.14	25.17	33	-7.83
1909.8	92.96	54	125	H	1909.8	22.30	9.0	1.14	30.16	33	-2.84

PCS Band Part 24E (GPRS):

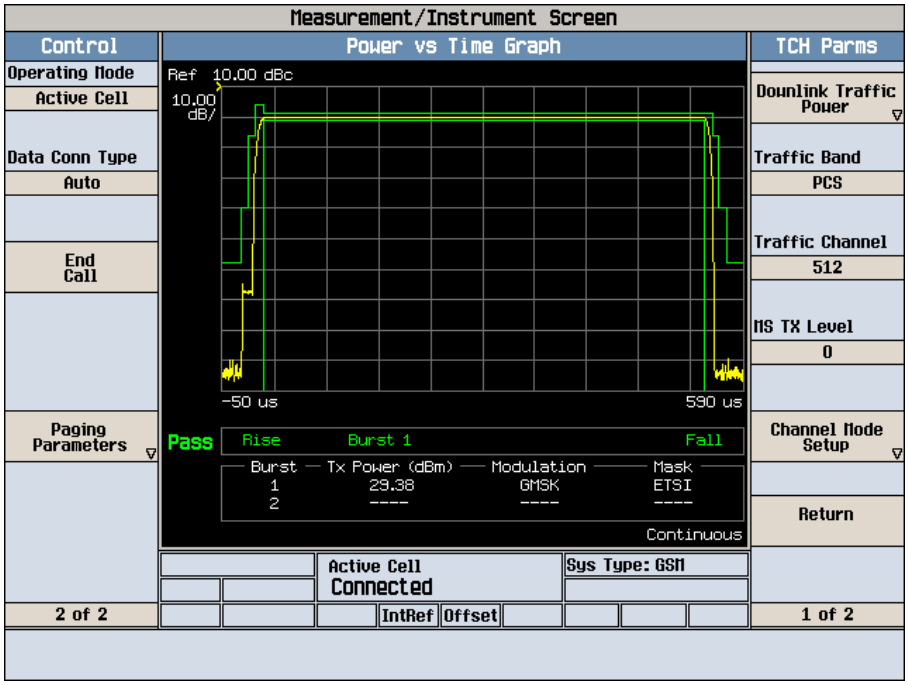
Indicated		Azimuth	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Amplitude (dBuV)	(degree)	Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss (dB)			
1850.2	89.77	330	190	V	1850.2	17.57	9.5	1.09	25.98	33	-7.02
1850.2	94.17	54	127	H	1850.2	22.38	9.5	1.09	30.79	33	-2.21
1880.0	88.56	330	190	V	1880.0	17.26	9.0	1.14	25.12	33	-7.88
1880.0	93.10	54	125	H	1880.0	22.14	9.0	1.14	30.00	33	-3.00
1909.8	87.68	330	190	V	1909.8	16.41	9.0	1.14	24.27	33	-8.73
1909.8	92.98	54	125	H	1909.8	22.32	9.0	1.14	30.18	33	-2.82

PCS Band Part 24E (EGPRS):

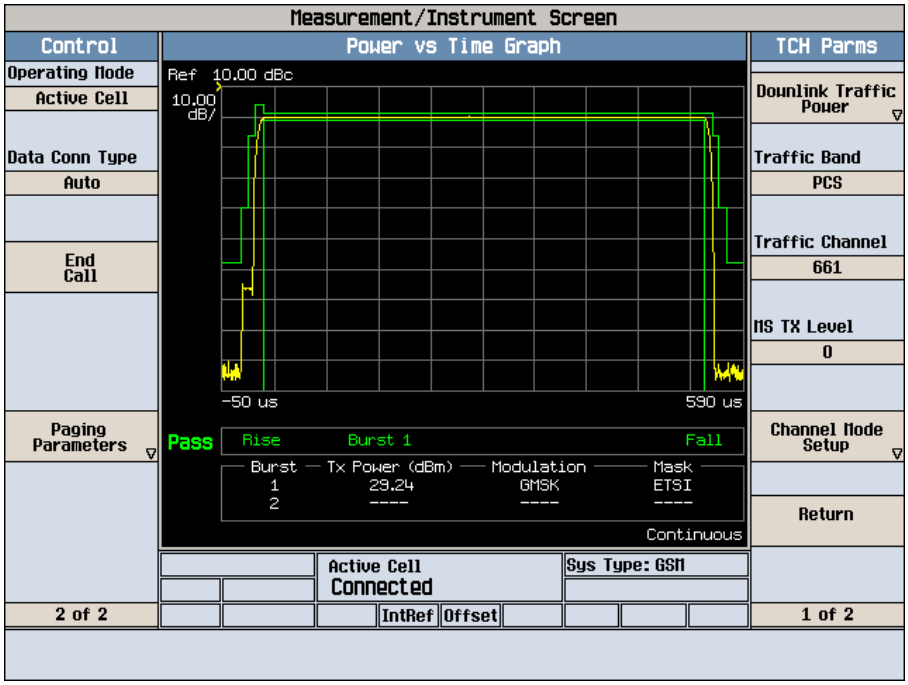
Indicated		Azimuth	Test Antenna		Substituted				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Amplitude (dBuV)	(degree)	Height (m)	Polar (H/V)	Frequency (MHz)	Level (dBm)	Antenna Gain Correction (dBi)	Cable Loss (dB)			
1850.2	86.23	330	190	V	1850.2	14.03	9.5	1.09	22.44	33	-10.56
1850.2	90.65	54	127	H	1850.2	18.86	9.5	1.09	27.27	33	-5.73
1880.0	85.29	330	190	V	1880.0	13.99	9.0	1.14	21.85	33	-11.15
1880.0	89.58	54	125	H	1880.0	18.62	9.0	1.14	26.48	33	-6.52
1909.8	85.10	330	190	V	1909.8	13.83	9.0	1.14	21.69	33	-11.31
1909.8	89.31	54	125	H	1909.8	18.65	9.0	1.14	26.51	33	-6.49

Plots of Conducted Output Power for Part 24E

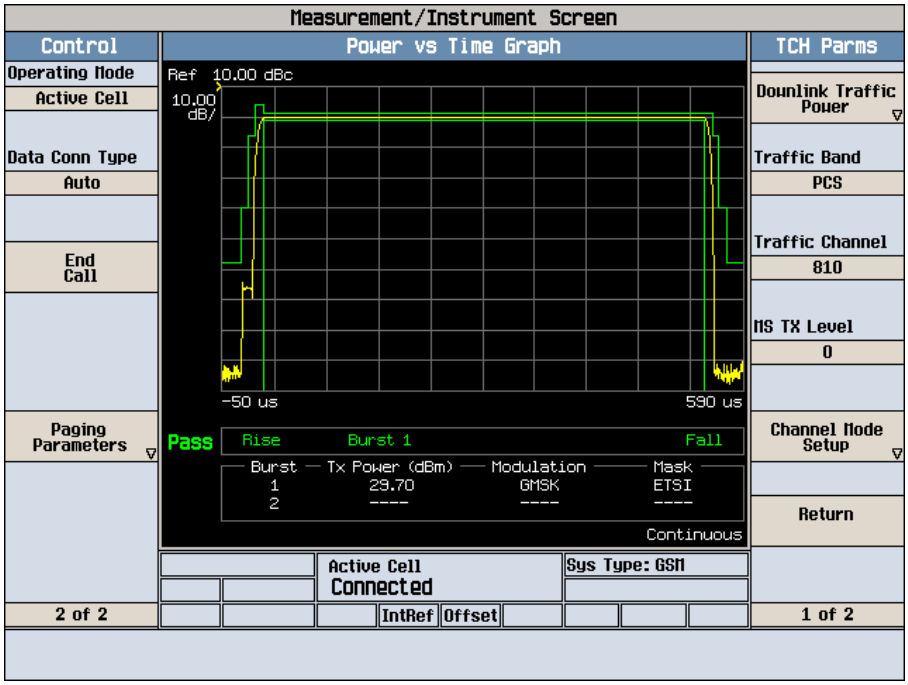
GSM Low Channel



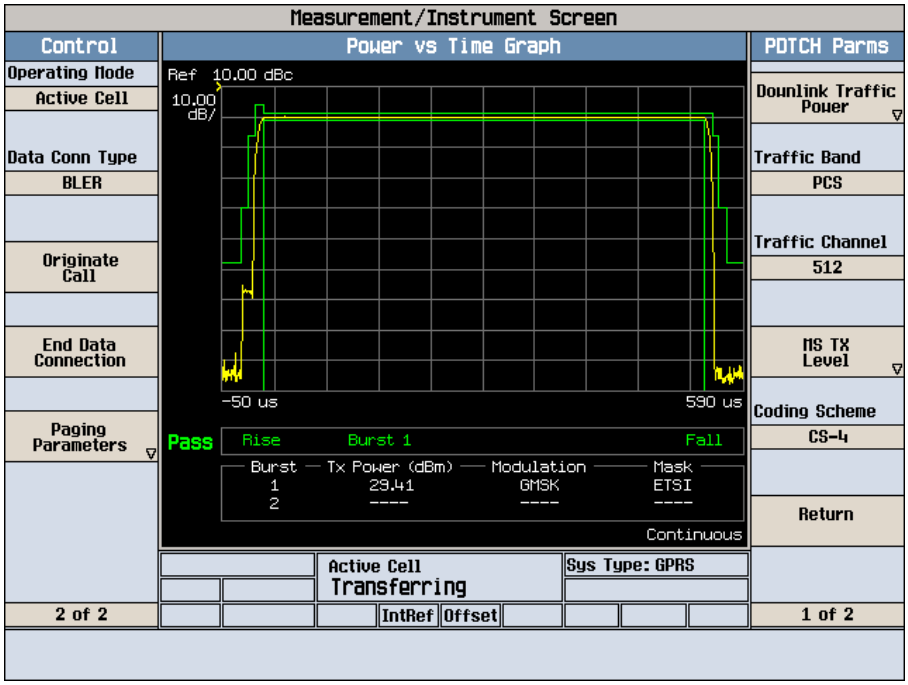
GSM Middle Channel



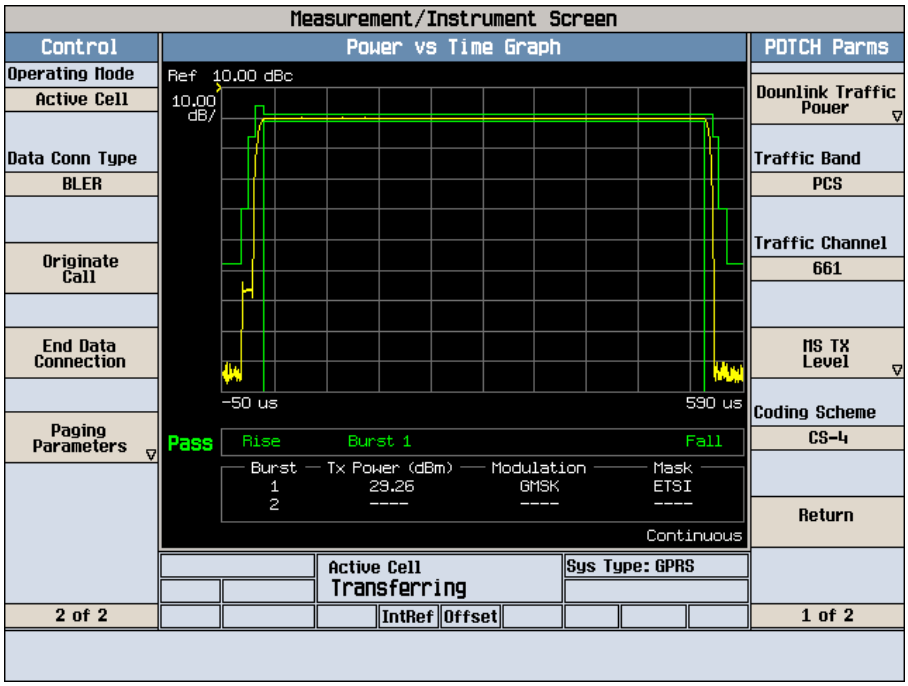
GSM High Channel



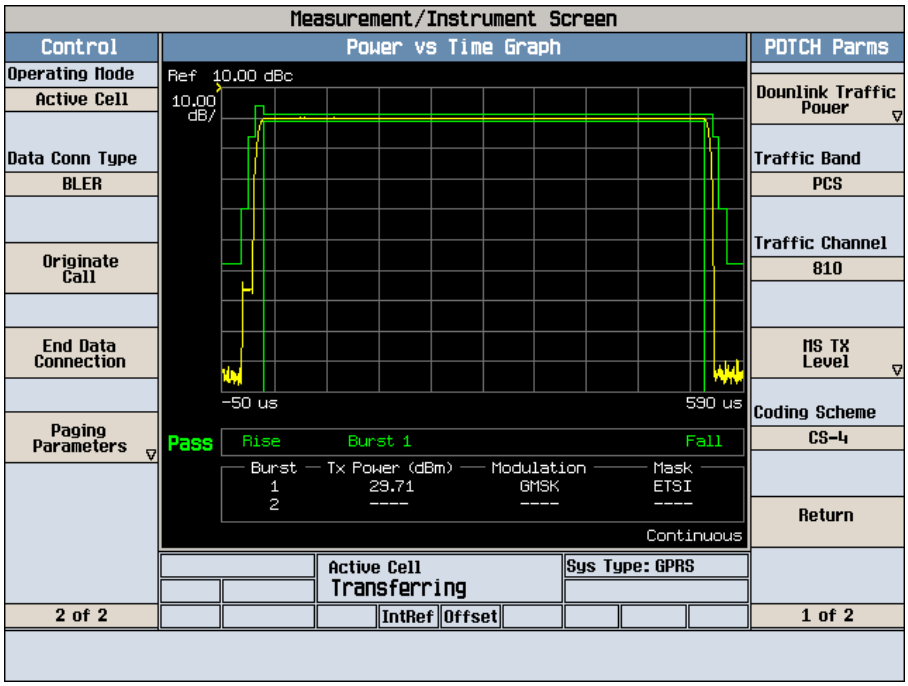
GPRS Low Channel



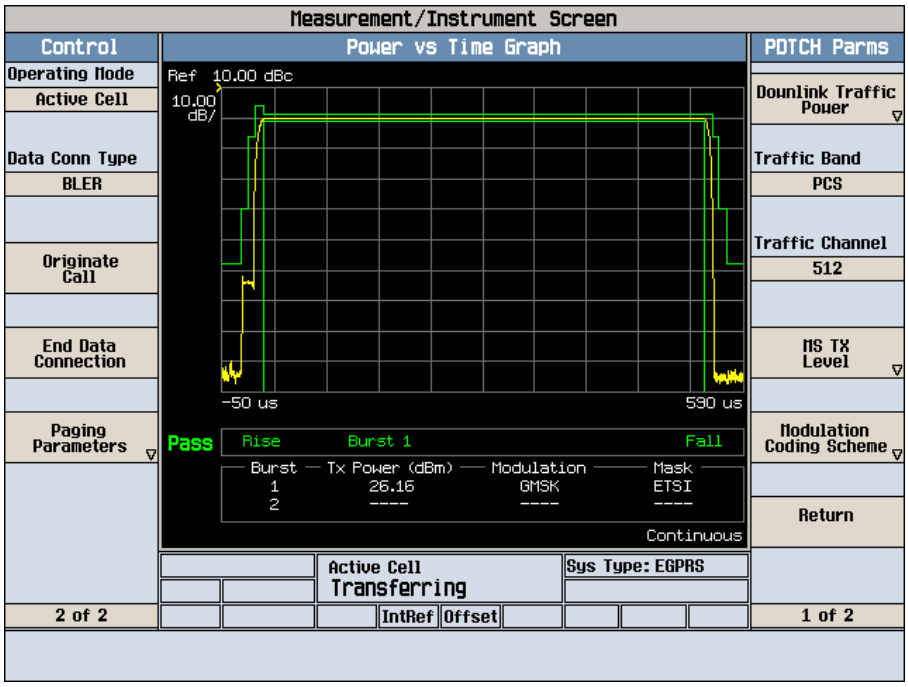
GPRS Middle Channel



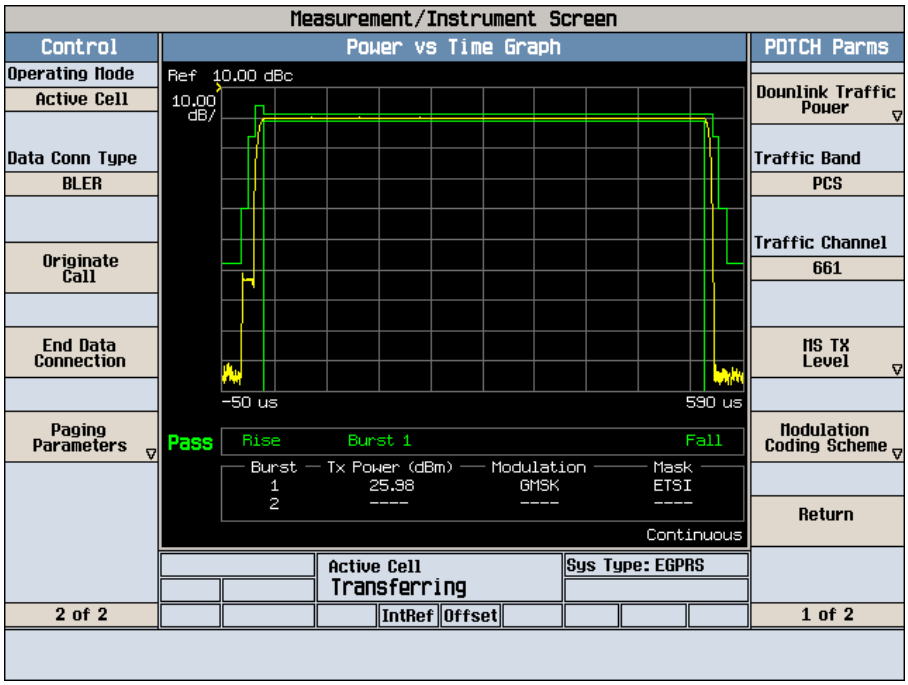
GPRS High Channel



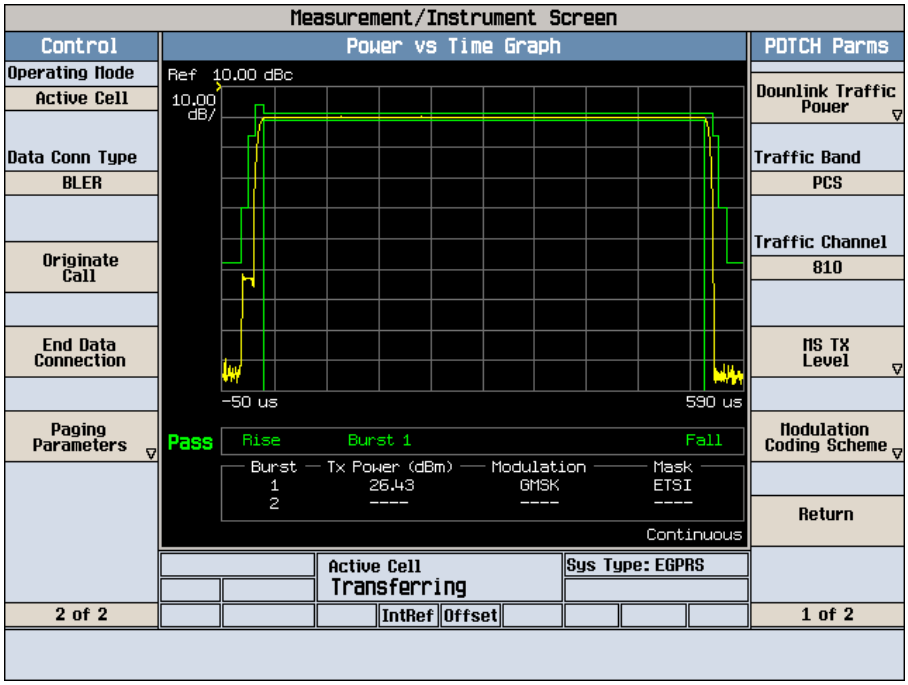
EGPRS Low Channel



EGPRS Middle Channel



EGPRS High Channel



8 §2.1049 & §24.238 - OCCUPIED BANDWIDTH

8.1 Applicable Standard

Requirements: CFR 47, Section 2.1049 and Section 24.238.

8.2 Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 3 kHz (PCS) and the -26 dB bandwidth was recorded.

8.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer, Communications	E5515C	GB44051221	2007-08-08*
Agilent	Spectrum Analyzer	E4446A	US44300386	2008-05-27

*Two year calibration cycle
*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

8.4 Summary of Test Results

Environmental Conditions

Temperature:	20 °C ~ 23 °C
Relative Humidity:	40 % ~ 55 %
ATM Pressure:	101.2kPa ~ 101.5kPa

** Testing performed by Jack Liu on 2008-11-25 to 2008-12-01*

PCS Band Part 24E (GSM):

Channel	Frequency (MHz)	26 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	1850.2	311.308	245.2872
Middle	1880.0	307.586	246.8910
High	1909.8	309.497	245.2761

PCS Band Part 24E (GPRS):

Channel	Frequency (MHz)	26 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	1850.2	311.637	241.5374
Middle	1880.0	312.043	240.9227
High	1909.8	309.766	240.4415

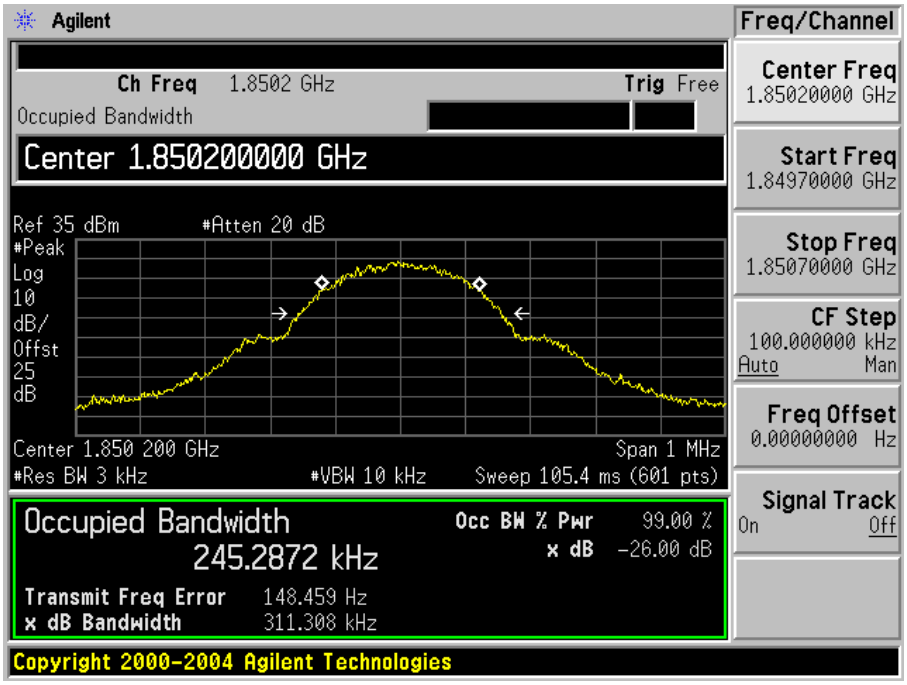
PCS Band Part 24E (EGPRS):

Channel	Frequency (MHz)	26 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	1850.2	310.266	239.9923
Middle	1880.0	310.222	240.1147
High	1909.8	311.306	241.7448

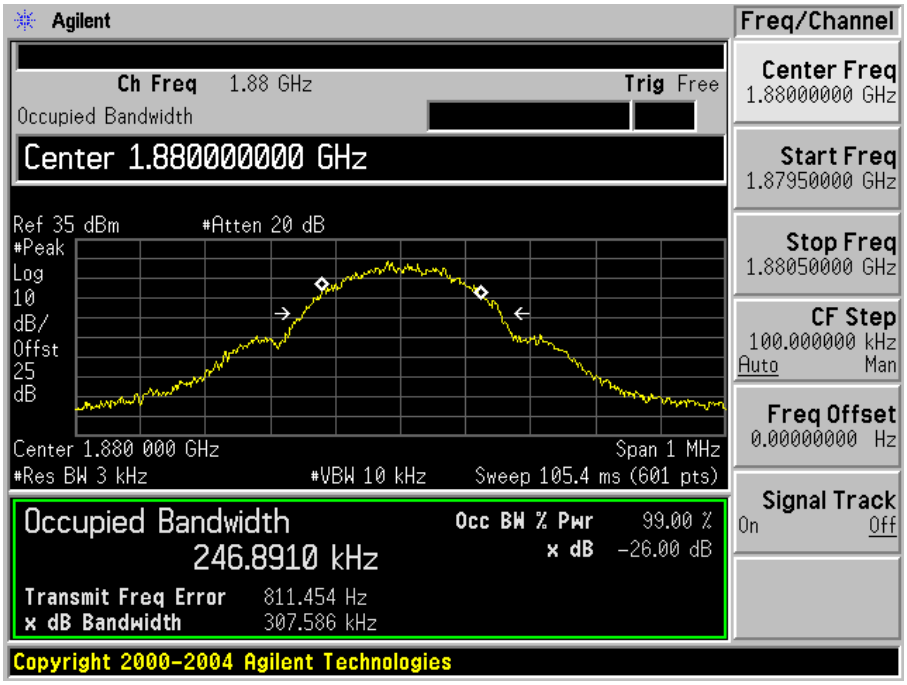
8.5 Test Data & Plots

Please refer to the following plots.

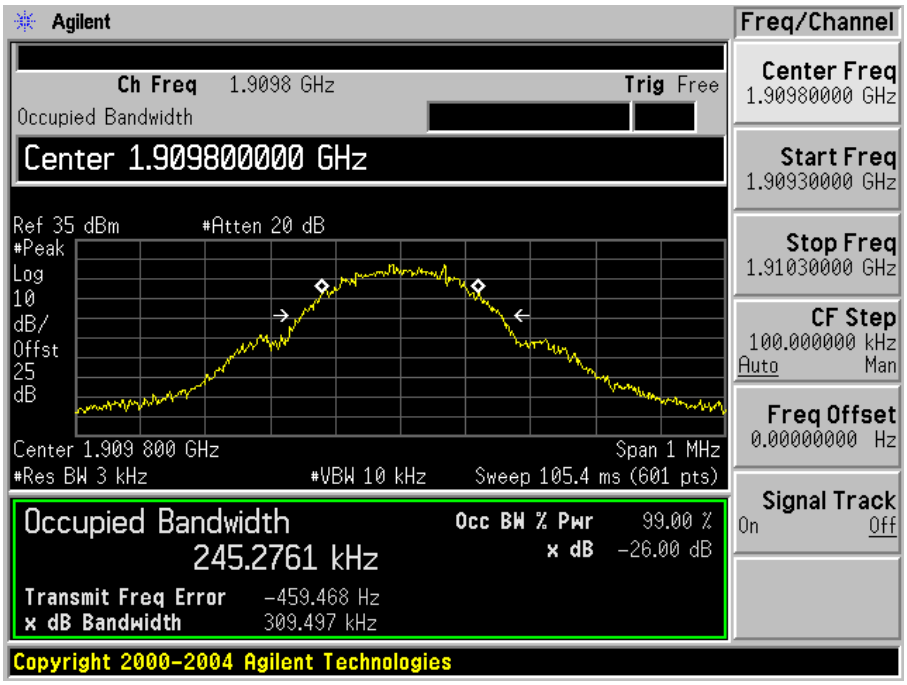
GSM Low Channel



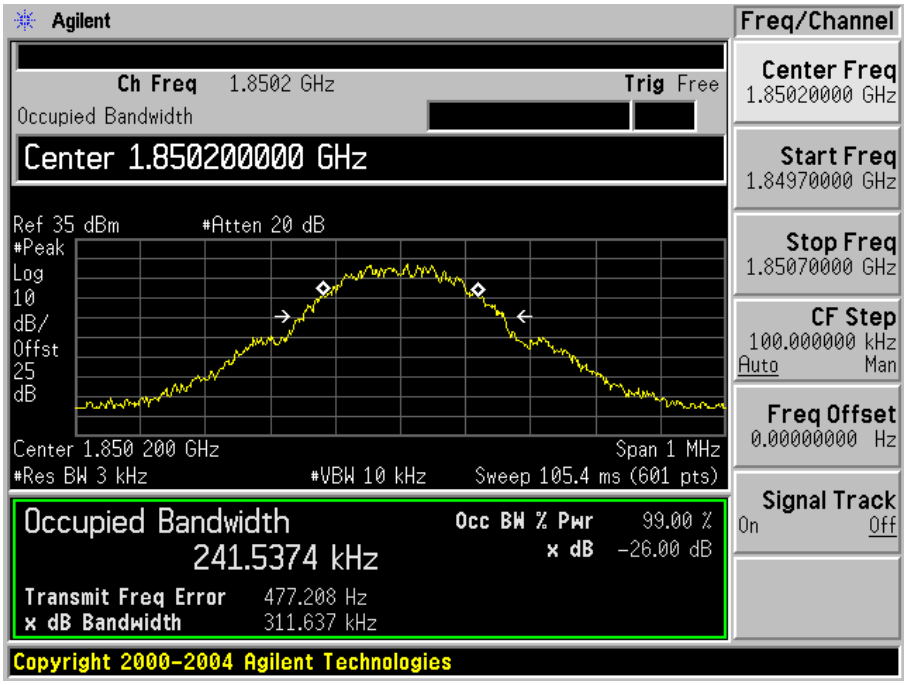
GSM Middle Channel



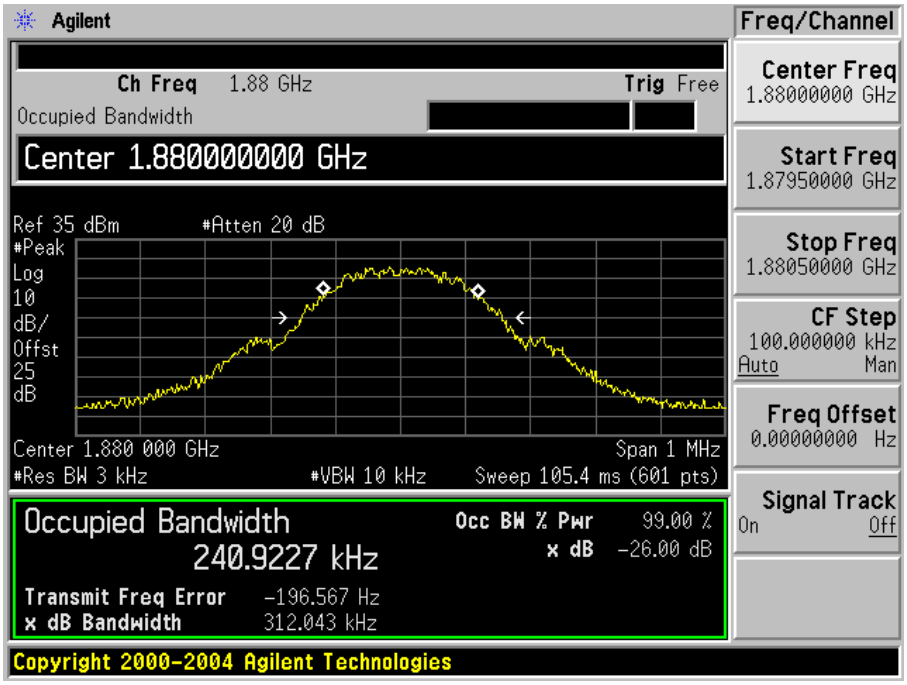
GSM High Channel



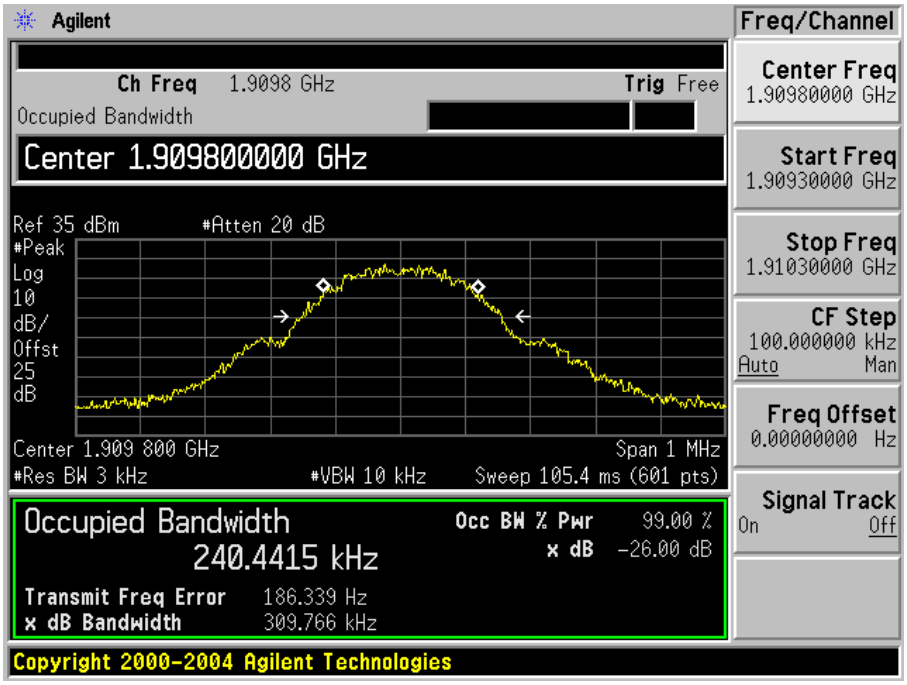
GPRS Low Channel



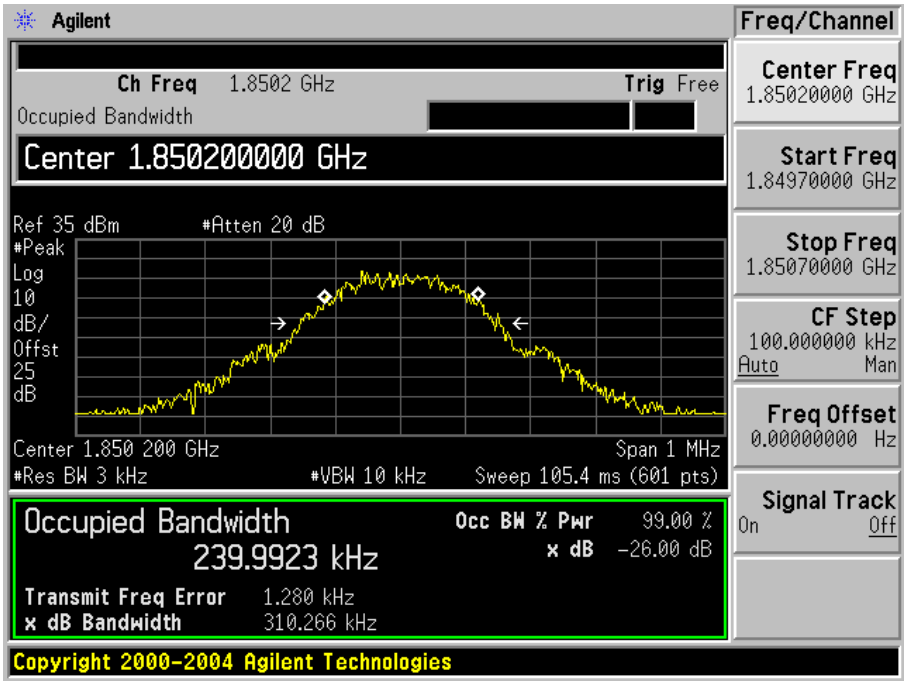
GPRS Middle Channel



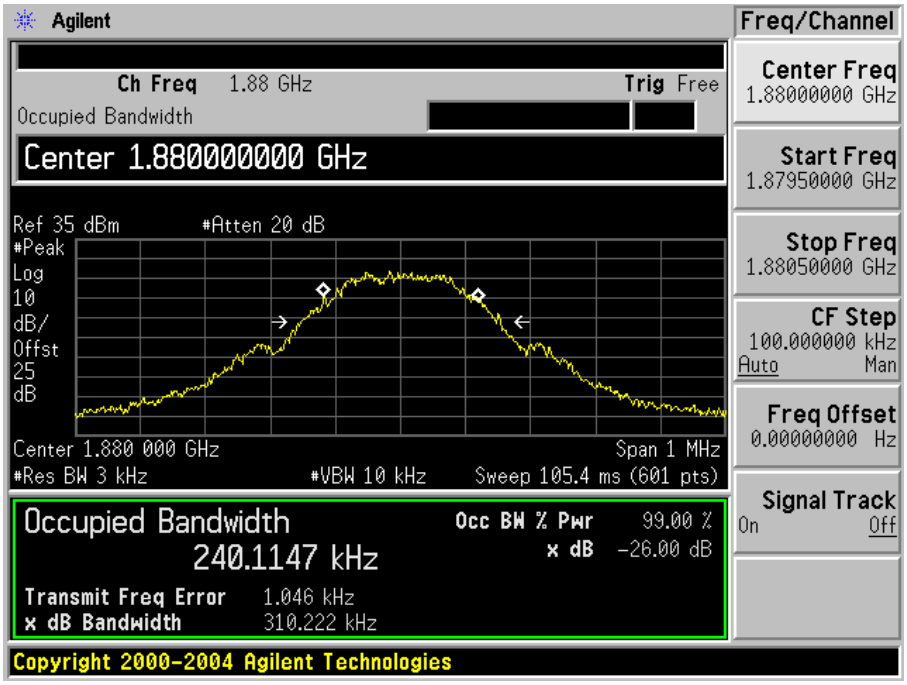
GPRS High Channel



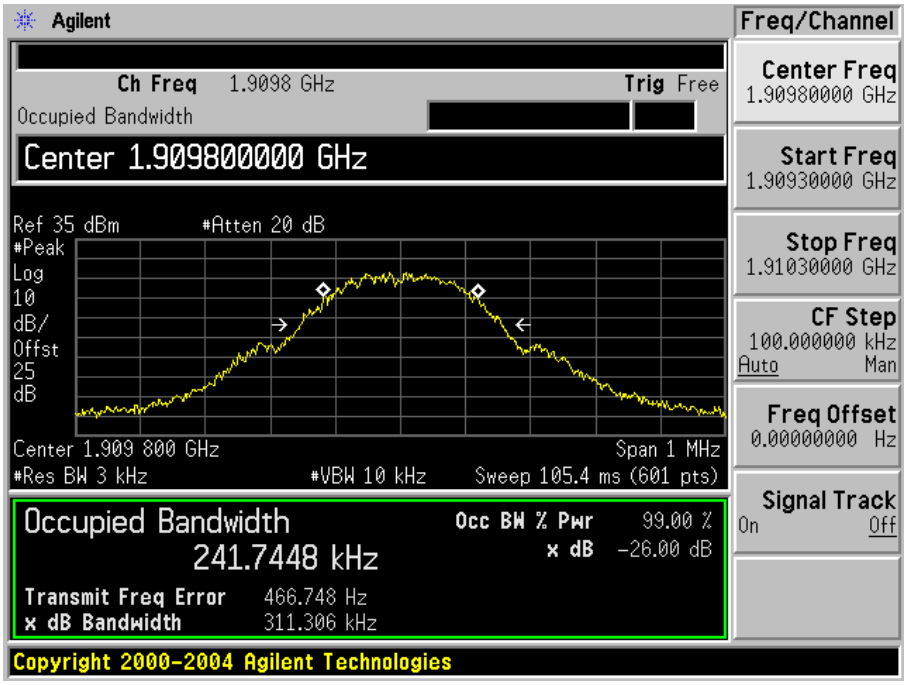
EGPRS Low Channel



EGPRS Middle Channel



EGPRS High Channel



9 §2.1051 & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

9.1 Applicable Standard

Requirements: CFR 47, § 2.1051. & §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

9.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10^{th} harmonic.

9.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Due Date
Agilent	Analyzer, Communications	E5515C	GB44051221	2007-08-08*
Agilent	Spectrum Analyzer	E4440A	US45303156	2008-05-27

*Two year calibration cycle
*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

9.4 Test Results

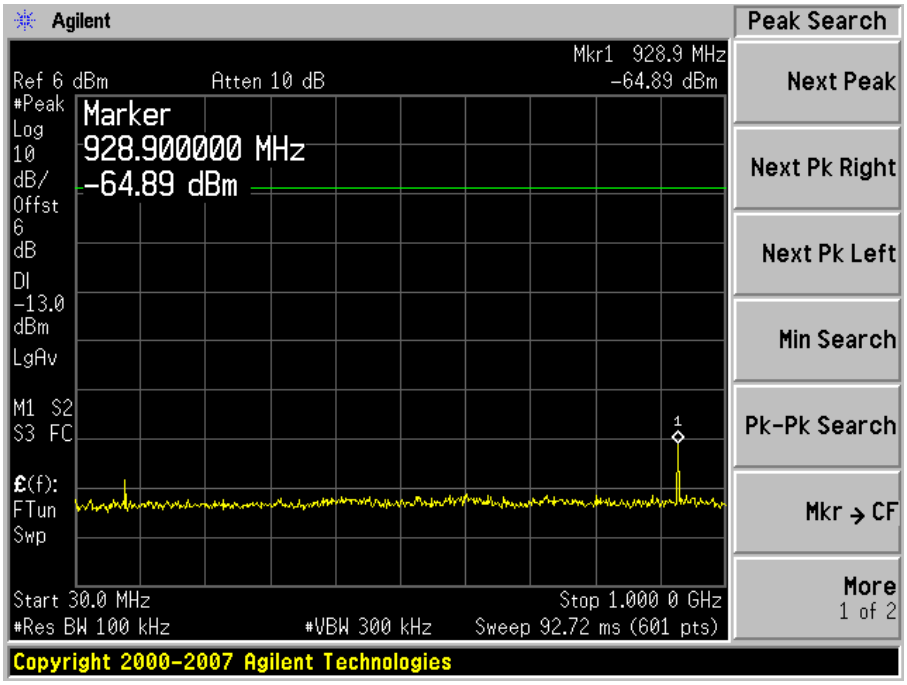
Environmental Conditions

Temperature:	20 °C ~ 23 °C
Relative Humidity:	40 % ~ 55 %
ATM Pressure:	101.2kPa ~ 101.5kPa

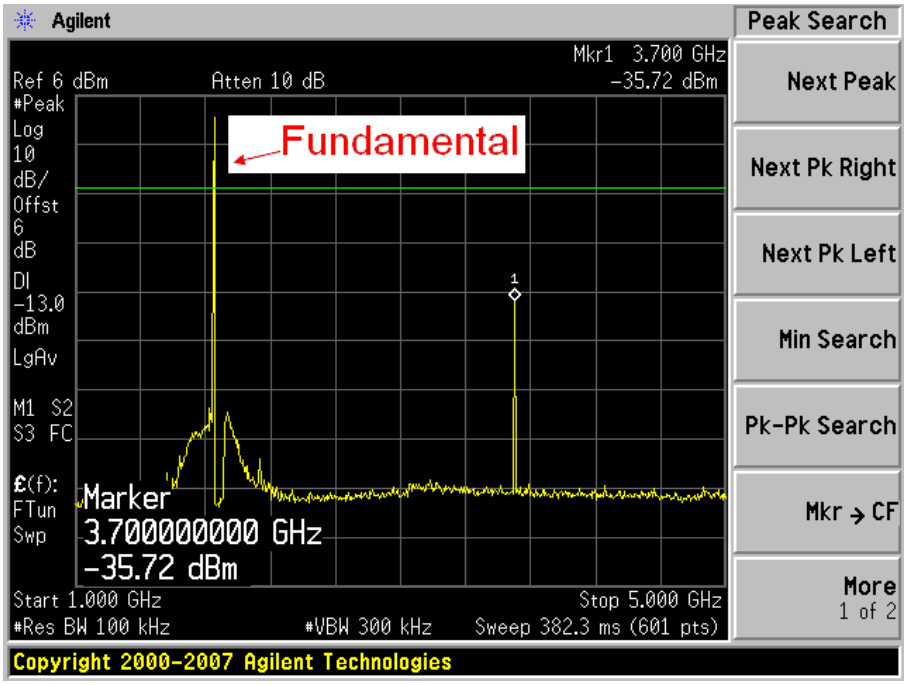
** Testing performed by Jack Liu on 2008-11-25 to 2008-12-01*

Please refer to the plots featured hereinafter

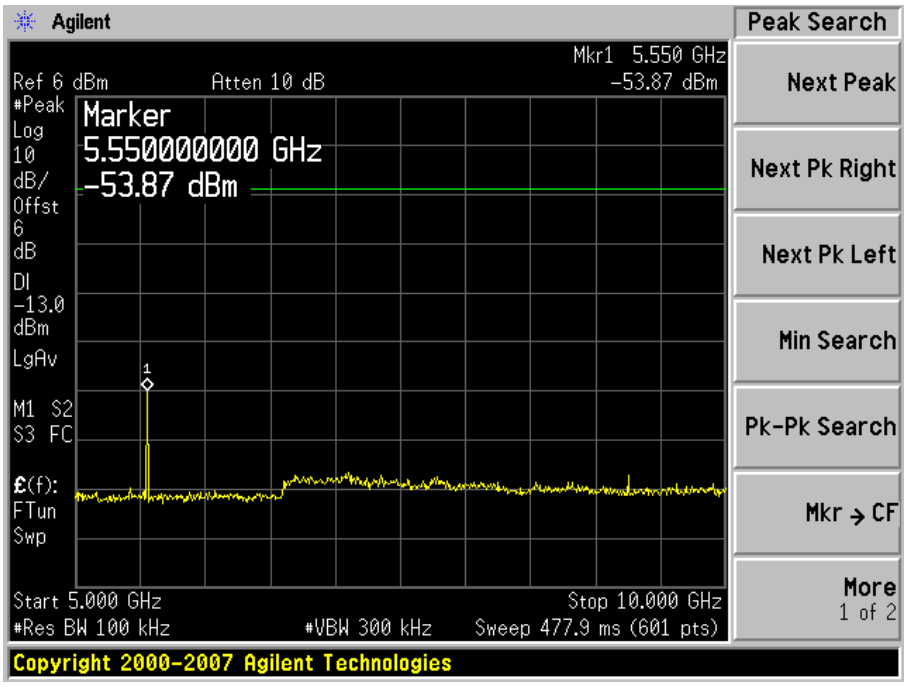
GSM Low Channel (f = 1850.2 MHz)



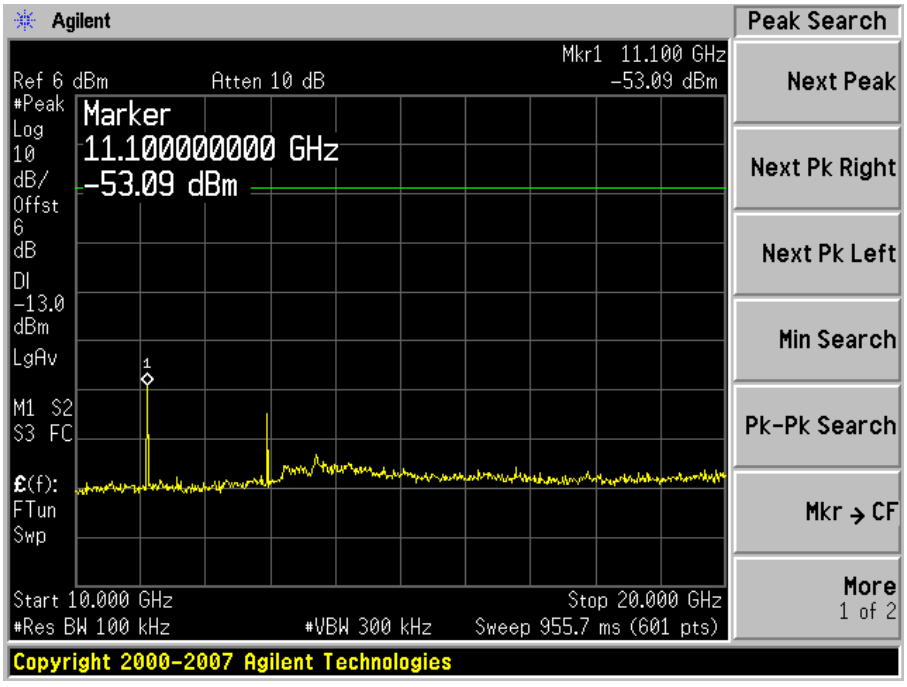
Plot 1a: 30MHz – 1GHz



Plot 2a: 1GHz – 5GHz

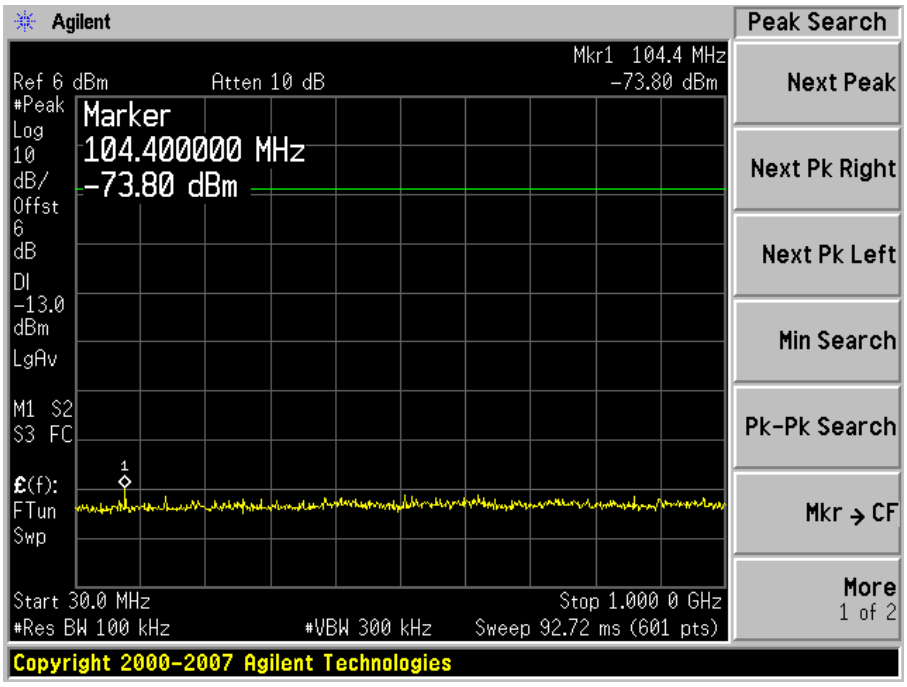


Plot 3a: 5GHz – 10GHz

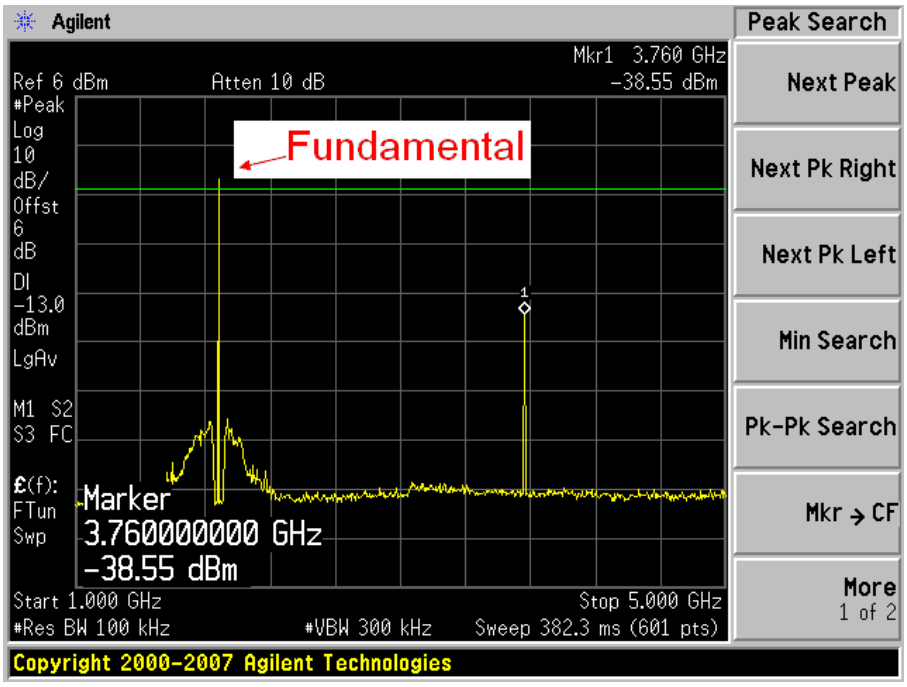


Plot 4a: 10GHz – 20GHz

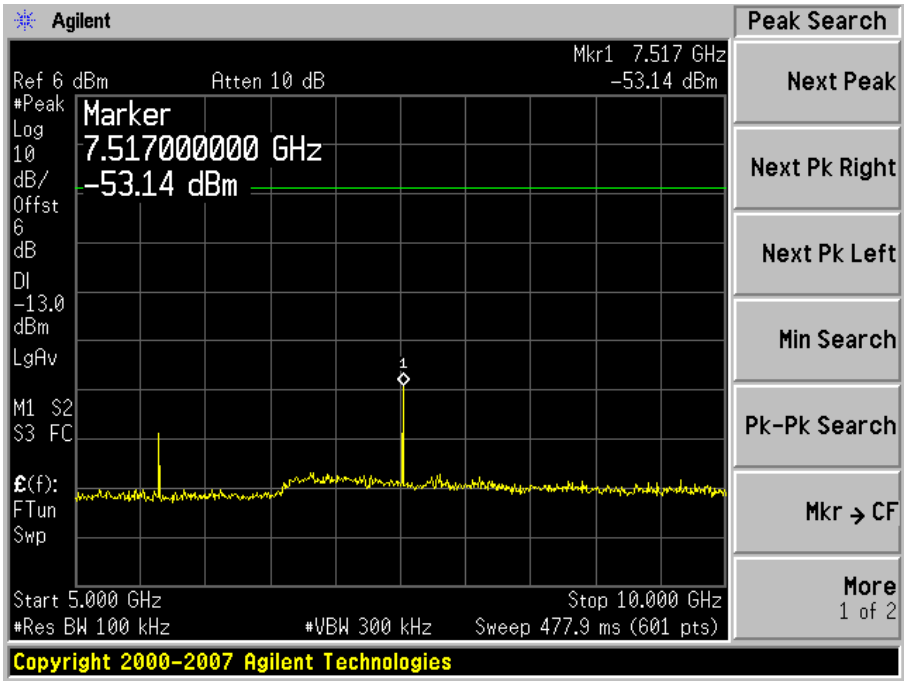
GSM Middle Channel (f = 1880 MHz)



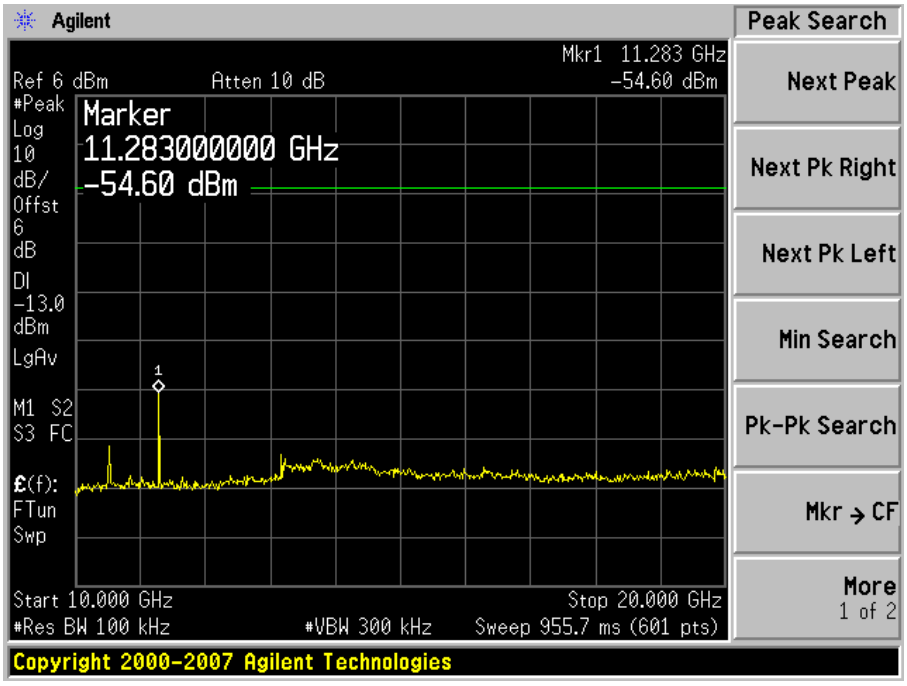
Plot 1b: 30MHz – 1GHz



Plot 2b: 1GHz – 5GHz

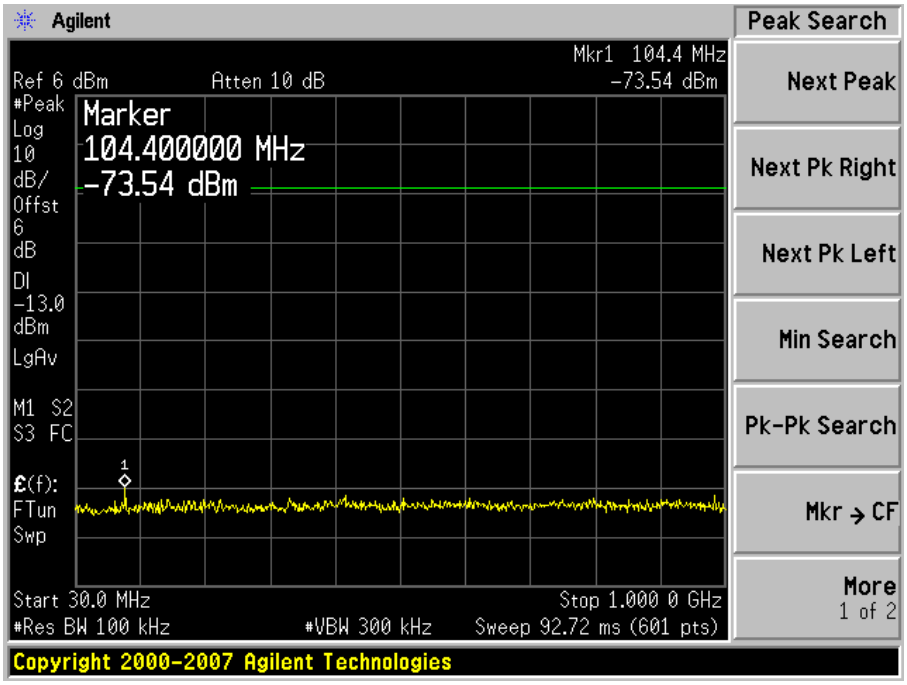


Plot 3b: 5GHz – 10GHz

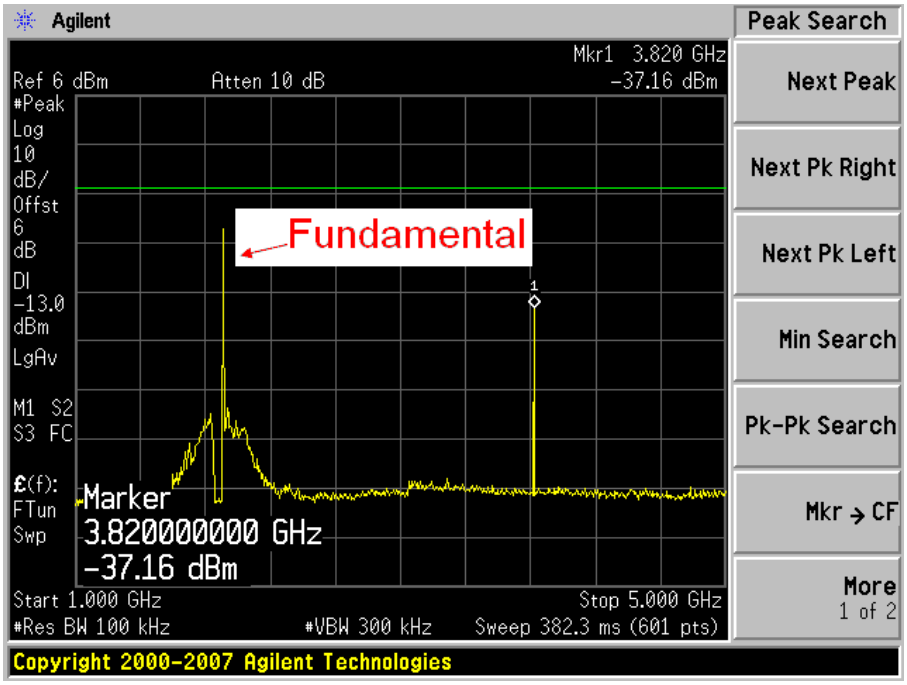


Plot 4b: 10GHz – 20GHz

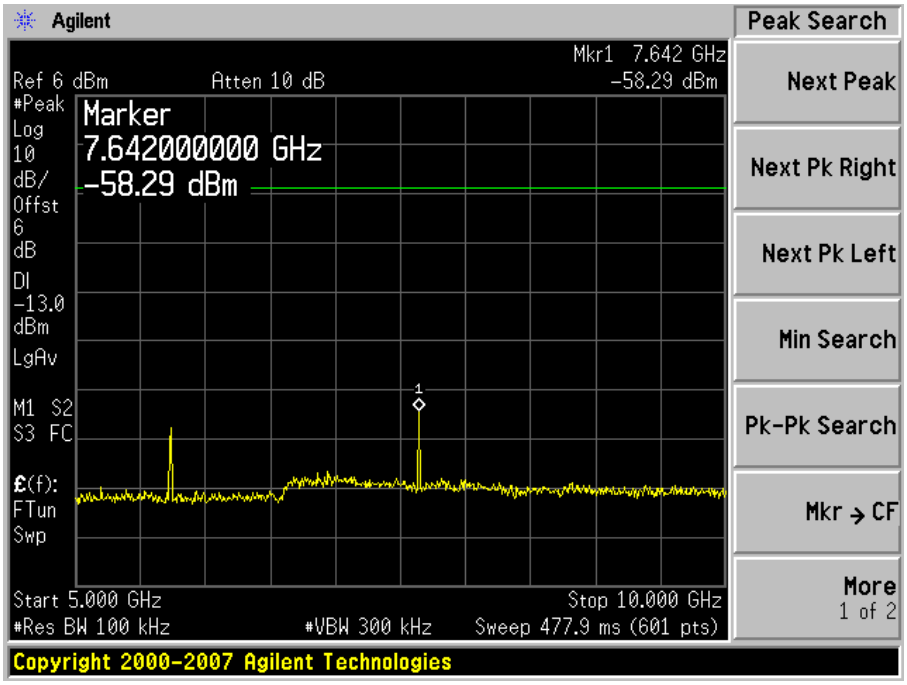
GSM High Channel (f = 1909.8 MHz)



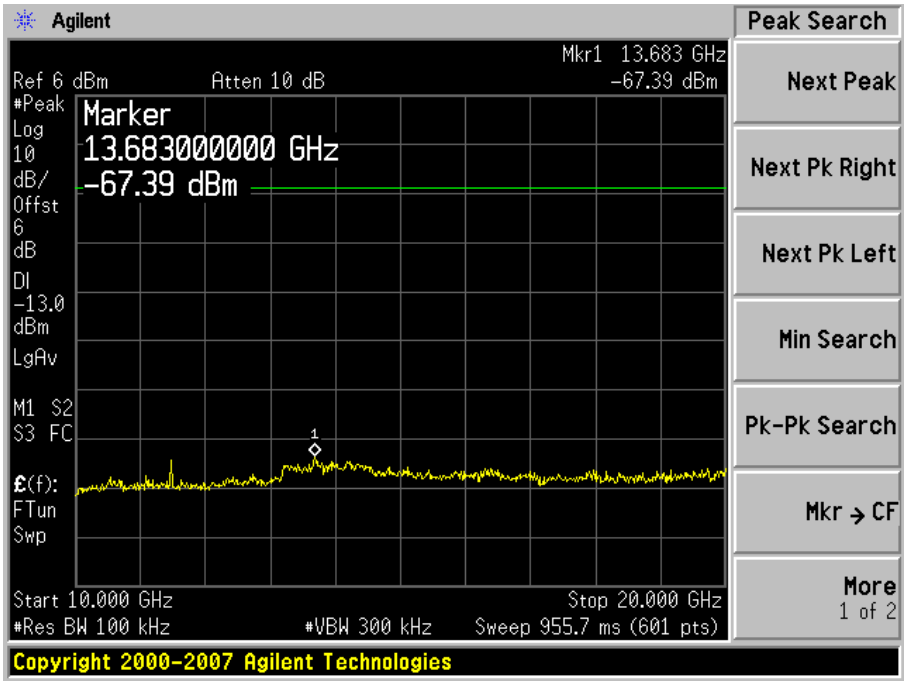
Plot 1c: 30MHz – 1GHz



Plot 2c: 1GHz – 5GHz

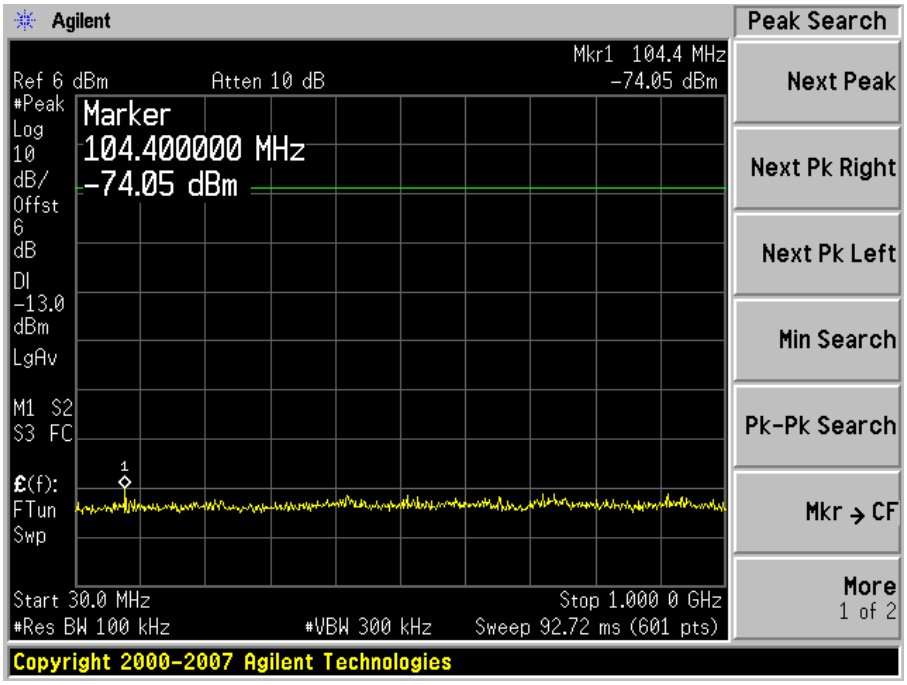


Plot 3c: 5GHz – 10GHz

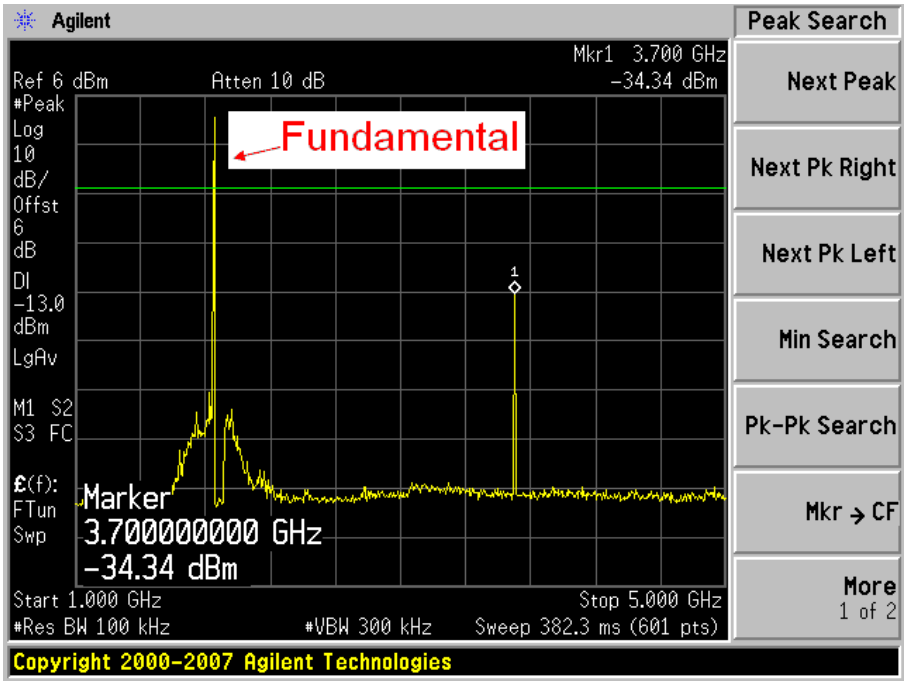


Plot 4c: 10GHz – 20GHz

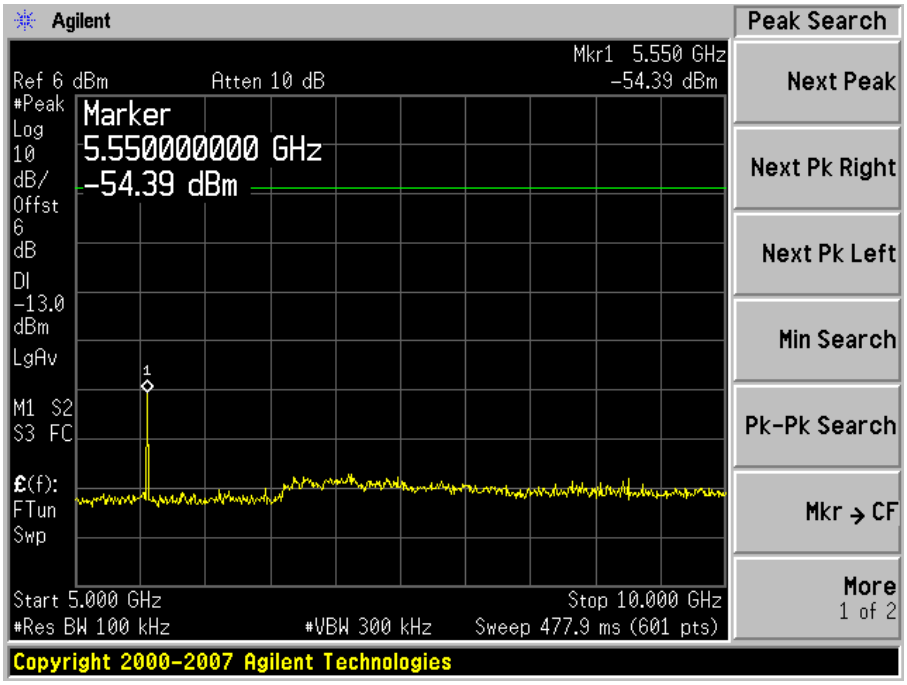
GPRS Low Channel (f = 1850.2 MHz)



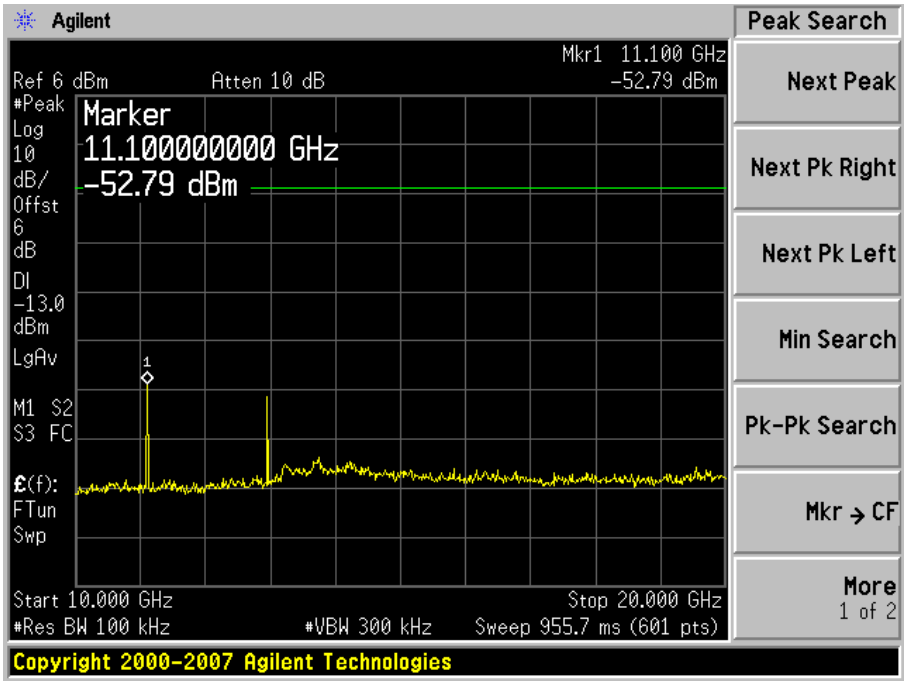
Plot 1d: 30MHz – 1GHz



Plot 2d: 1GHz – 5GHz

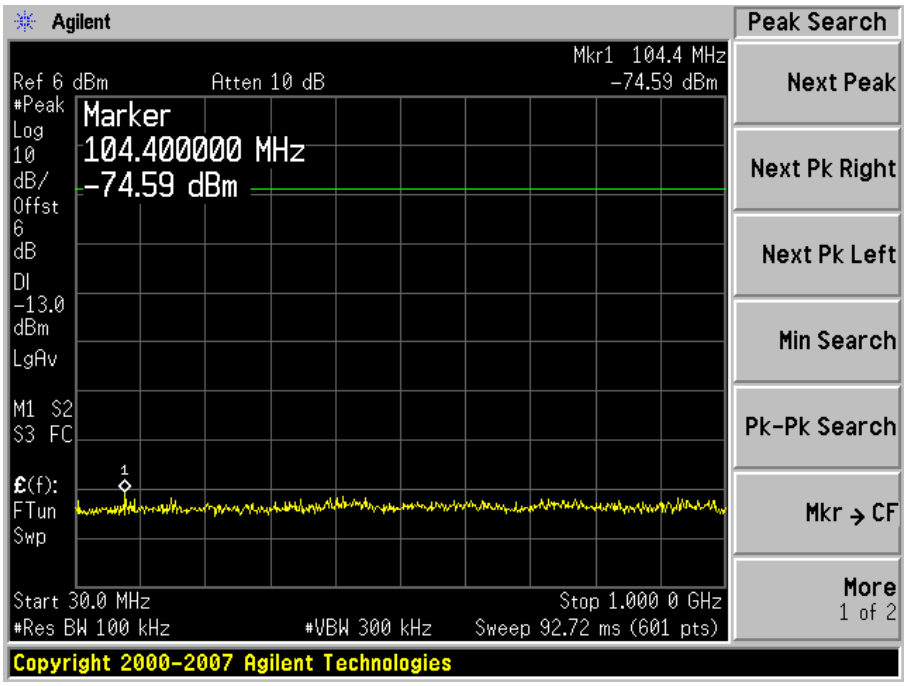


Plot 3d: 5GHz – 10GHz

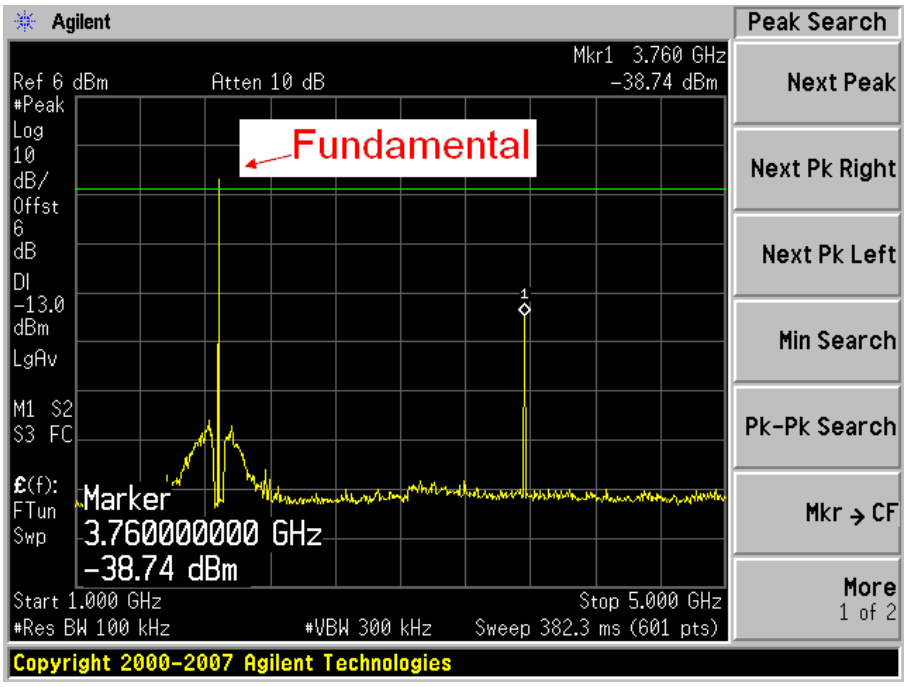


Plot 4d: 10GHz – 20GHz

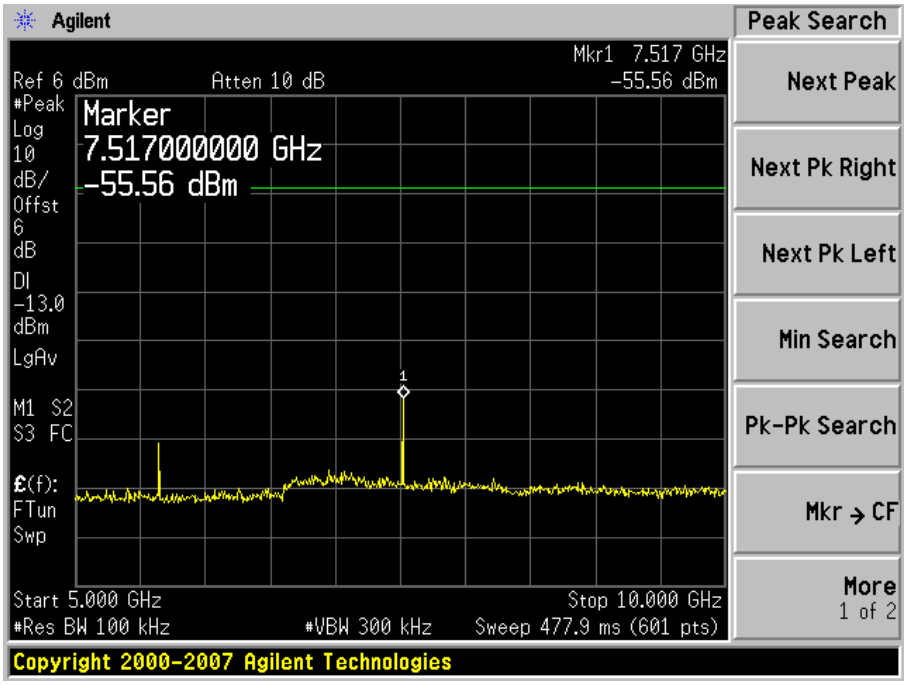
GPRS Middle Channel (f = 1880 MHz)



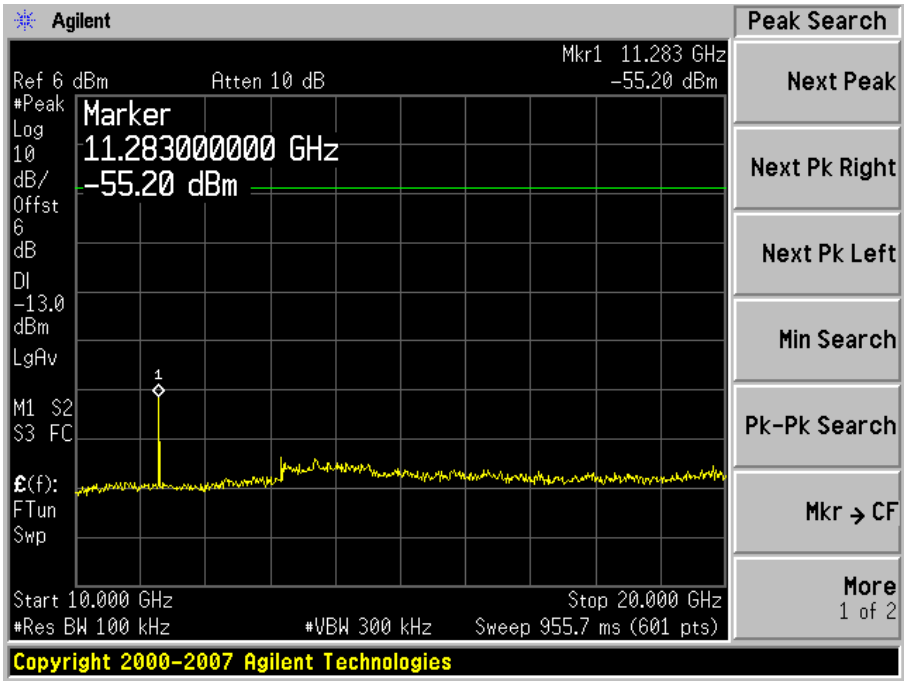
Plot 1e: 30MHz – 1GHz



Plot 2e: 1GHz – 5GHz

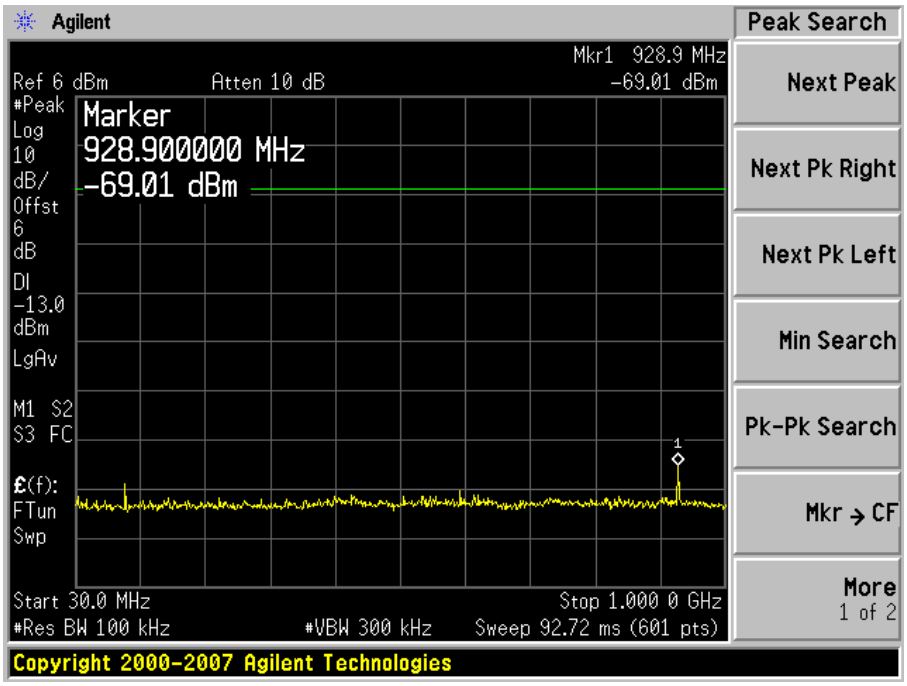


Plot 3e: 5GHz – 10GHz

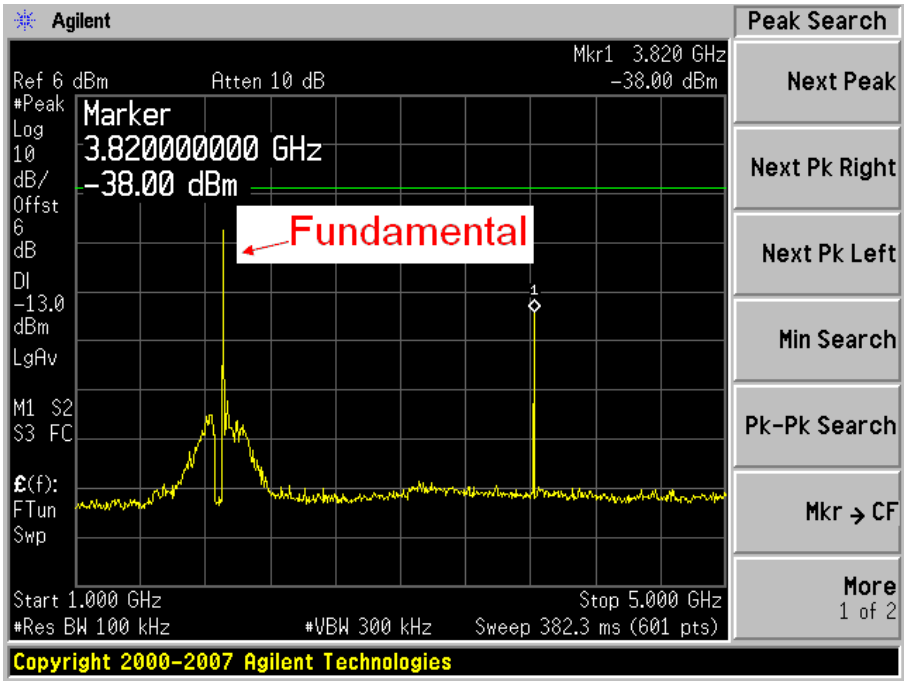


Plot 4e: 10GHz – 20GHz

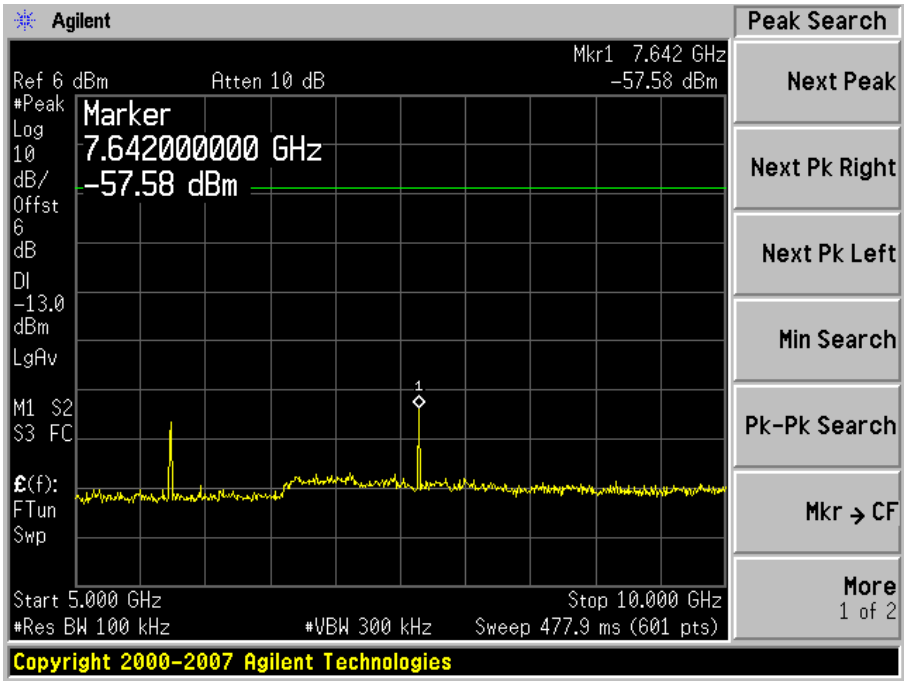
GPRS High Channel (f = 1909.8 MHz)



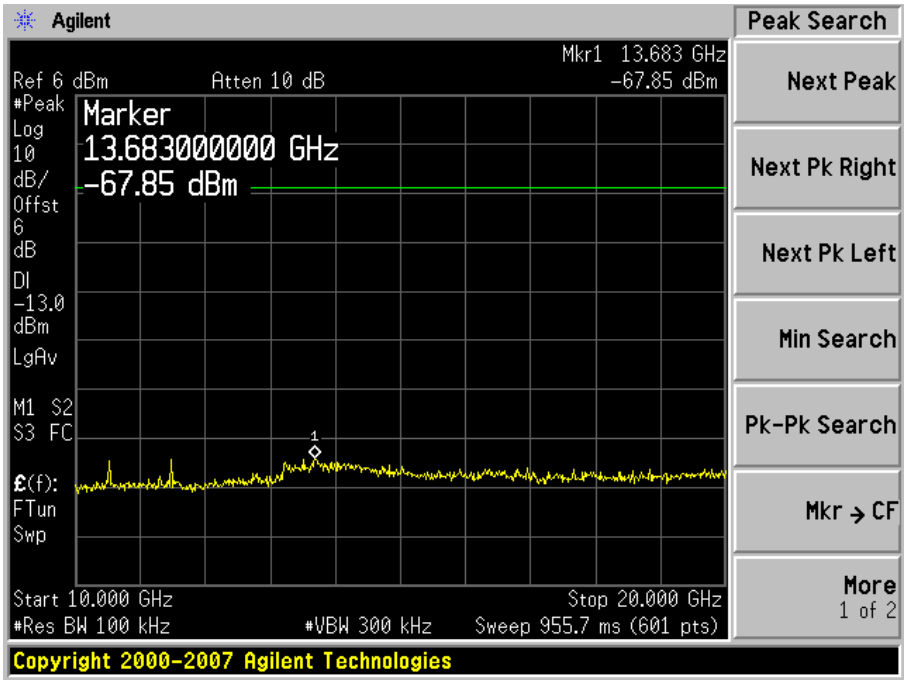
Plot 1f: 30MHz – 1GHz



Plot 2f: 1GHz – 5GHz

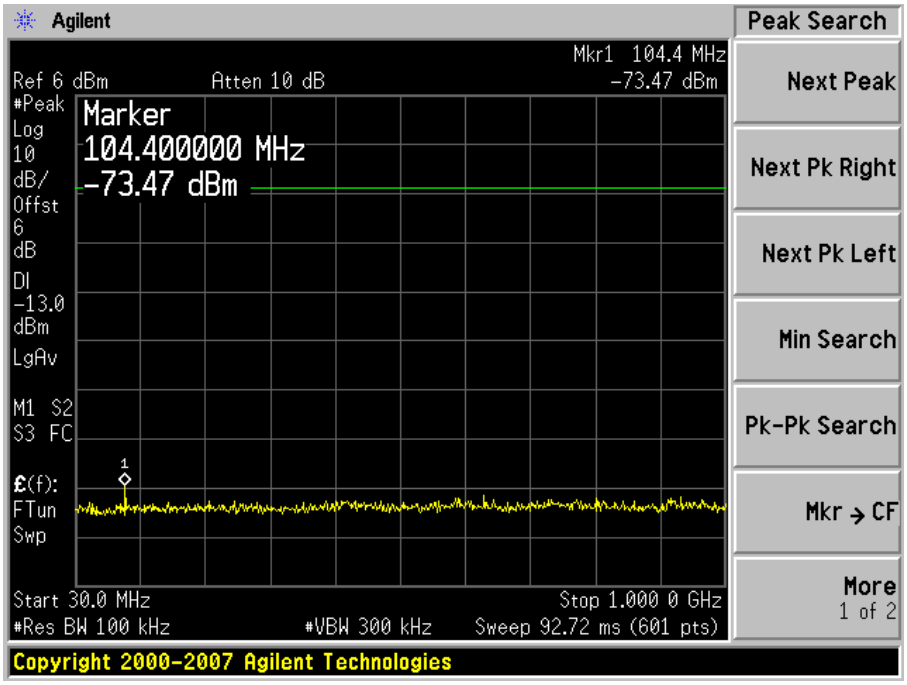


Plot 3f: 5GHz – 10GHz

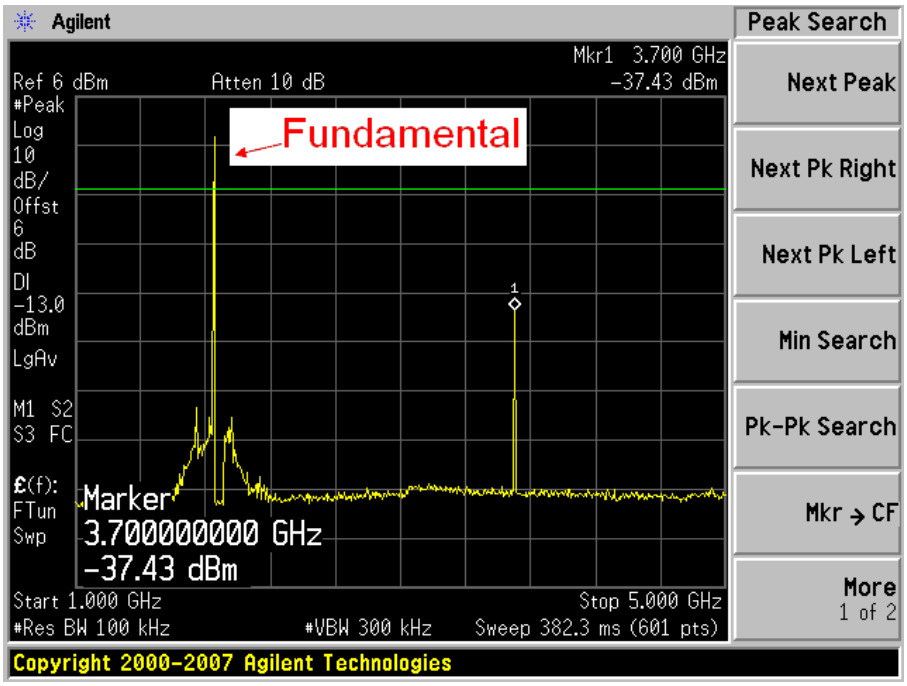


Plot 4f: 10GHz – 20GHz

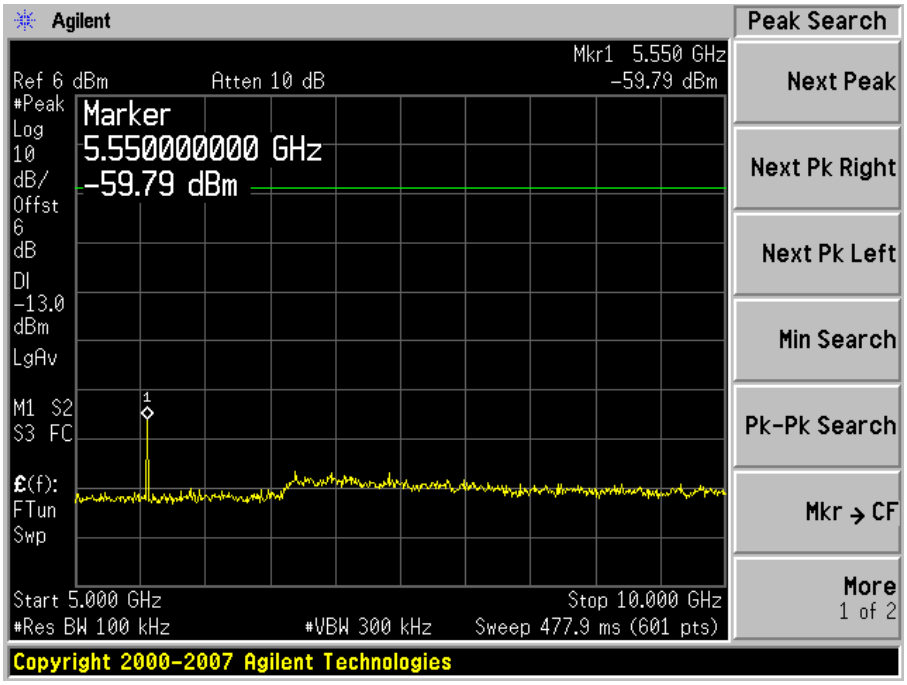
EGPRS Low Channel (f = 1850.2 MHz)



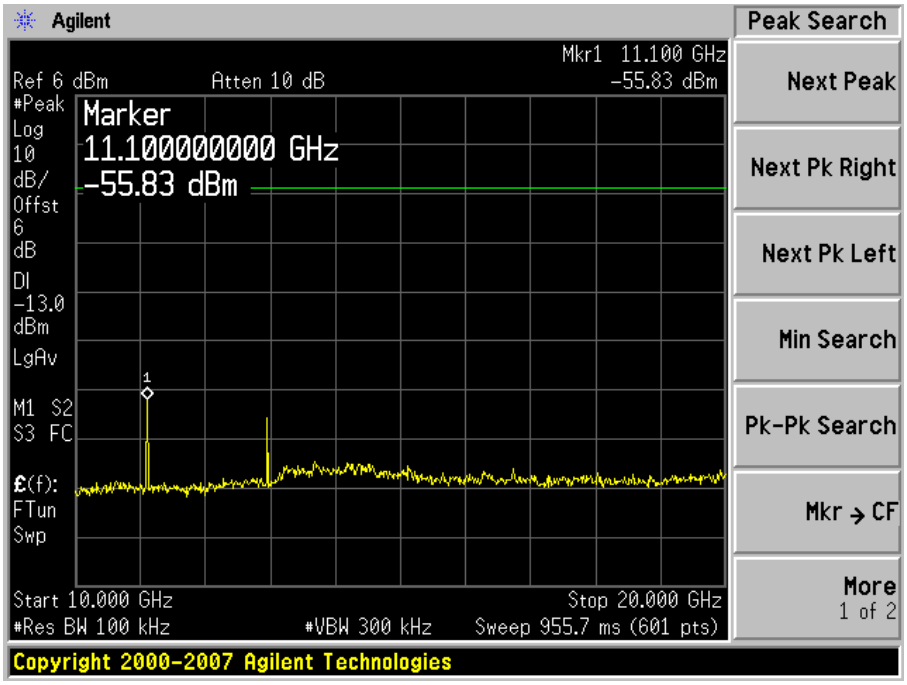
Plot 1g: 30MHz – 1GHz



Plot 2g: 1GHz – 5GHz

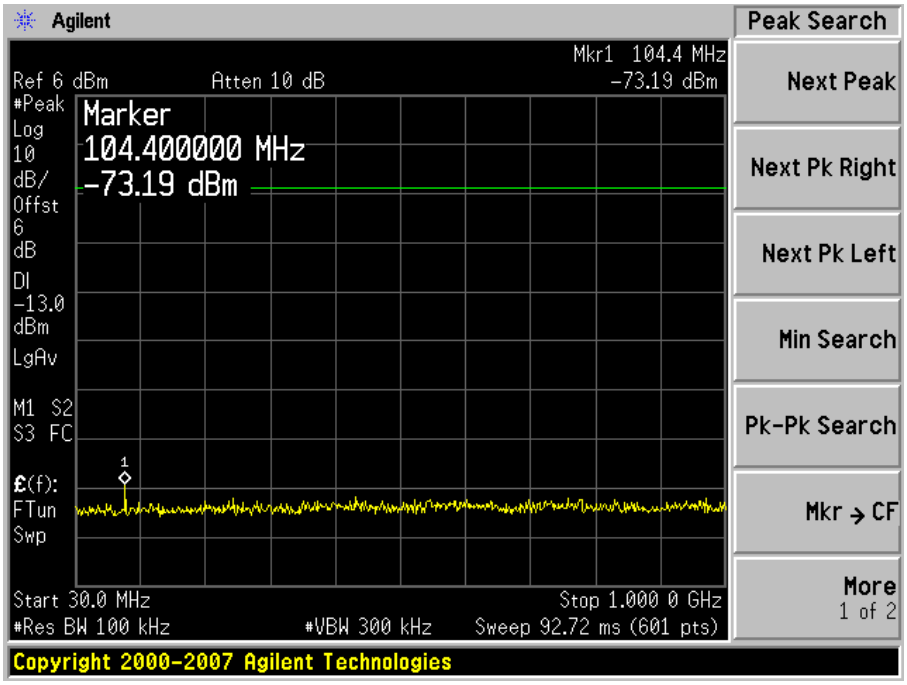


Plot 3g: 5GHz – 10GHz

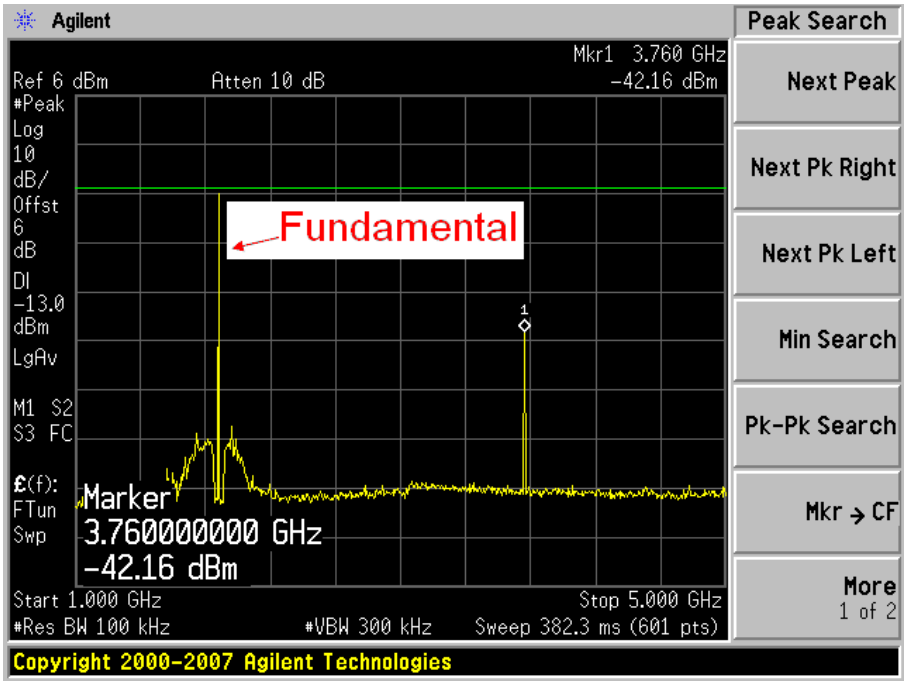


Plot 4g: 10GHz – 20GHz

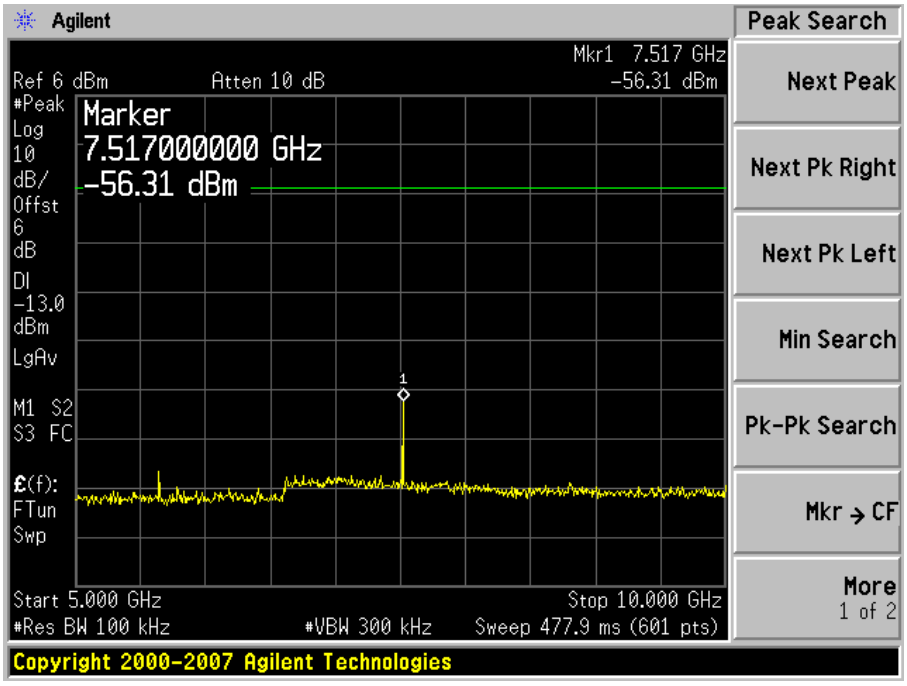
EGPRS Middle Channel (f = 1880 MHz)



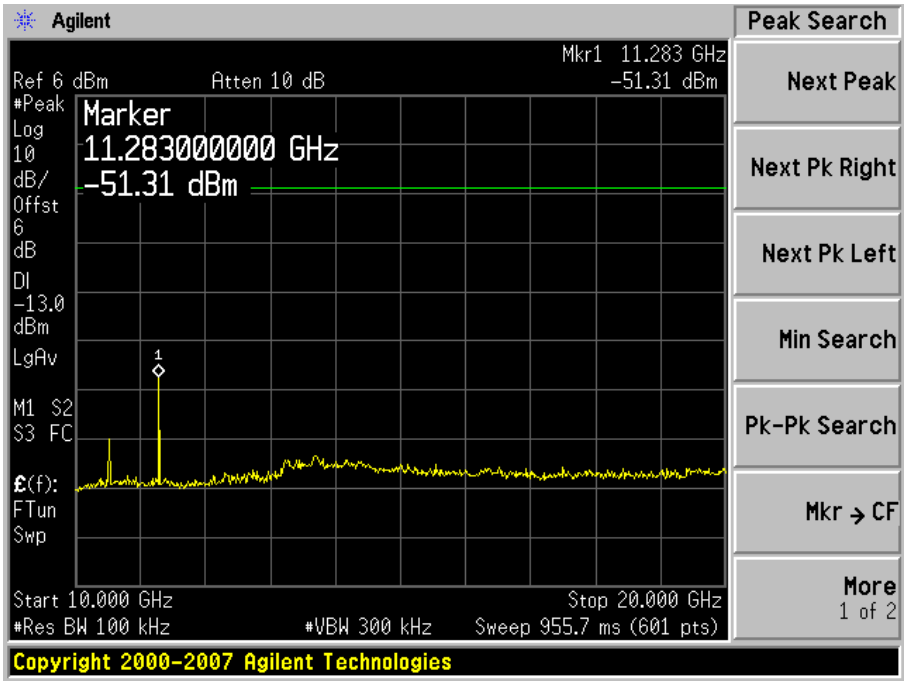
Plot 1h: 30MHz – 1GHz



Plot 2h: 1GHz – 5GHz

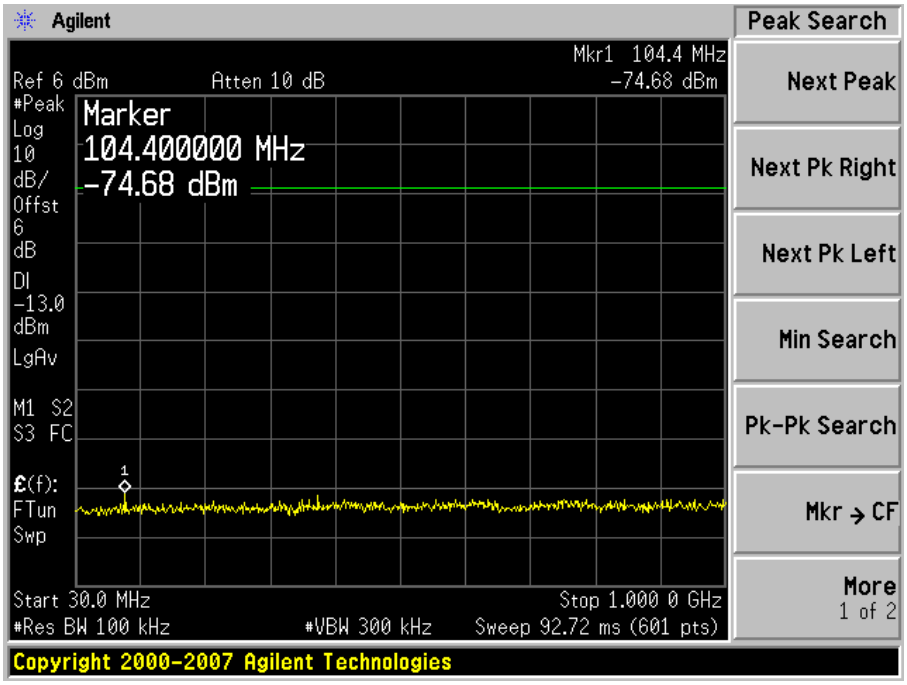


Plot 3h: 5GHz – 10GHz

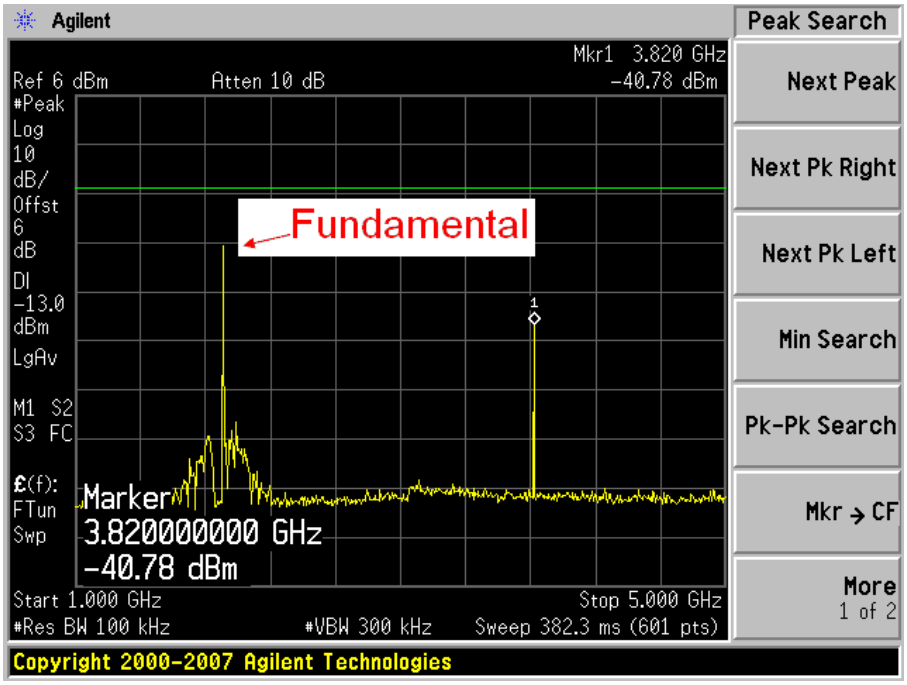


Plot 4h: 10GHz – 20GHz

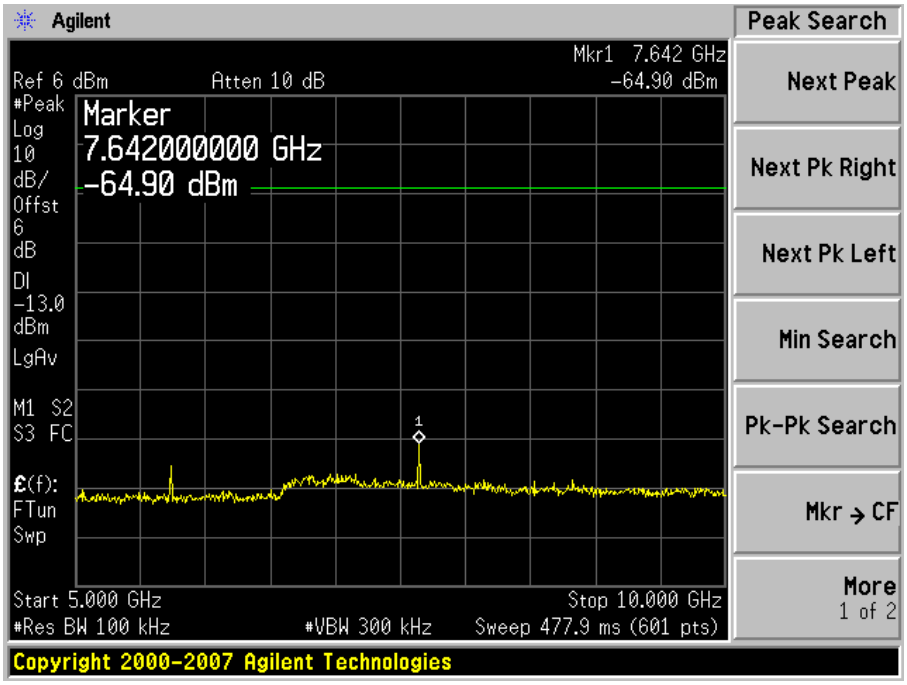
EGPRS High Channel (f = 1909.8 MHz)



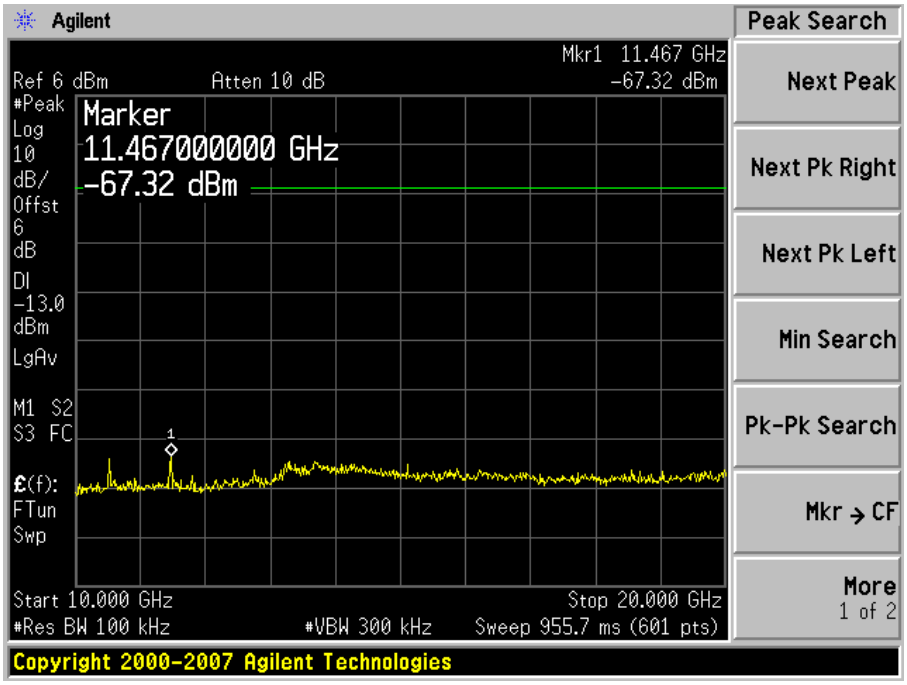
Plot 1i: 30MHz – 1GHz



Plot 2i: 1GHz – 5GHz



Plot 3i: 5GHz – 10GHz



Plot 4i: 10GHz – 20GHz

10 §2.1055 (a), §2.1055 (d), & §24.235 - FREQUENCY STABILITY

10.1 Applicable Standard

Requirements: FCC § 2.1055 (a), § 2.1055 (d) & following:

According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

10.2 Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

10.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
ESPEC	Temp/ Humidity chamber	ESL-4CA	018010	2008-01-02
Agilent	Analyzer, Communications	E5515C	GB44051221	2007-08-08*
Agilent	Spectrum Analyzer	E4440A	MY44303352	2009-04-28

*Two year calibration cycle.
*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

10.4 Test Results

Environmental Conditions

Temperature:	20 °C ~ 23 °C
Relative Humidity:	40 % ~ 55 %
ATM Pressure:	101.2kPa ~ 101.5kPa

** Testing performed by Jack Liu on 2008-11-25 to 2008-12-01*

PCS Band Part 24E (GSM):

Frequency Stability versus Temperature

Reference Frequency: 1880.0 MHz				
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed		
		Measured Frequency (Hz)	Frequency Error (Hz)	Error (ppm)
50	3.7	1899999963.18	-36.82	-0.0195851
40	3.7	1899999963.56	-36.44	-0.019383
30	3.7	1899999967.50	-32.5	-0.0172872
20	3.7	1899999969.81	-30.19	-0.0160585
10	3.7	1899999968.49	-31.51	-0.0167606
0	3.7	1899999977.57	-22.43	-0.0119309
-10	3.7	1900000028.14	28.14	0.01496809
-20	3.7	1900000029.11	29.11	0.01548404
-30	3.7	1900000022.29	22.29	0.01185638

Frequency Stability versus Voltage

Reference Frequency: 1880.0 MHz				
Environment Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (Hz)	Frequency Error (Hz)	Error (ppm)
20	4.2	1900000022.32	22.32	0.011872340
20	3.4	1900000021.68	21.68	0.011531915

PCS Band Part 24E (GPRS):

Frequency Stability versus Temperature

Reference Frequency: 1880.0 MHz				
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed		
		Measured Frequency (Hz)	Frequency Error (Hz)	Error (ppm)
50	3.7	1900000038.22	38.22	0.020329787
40	3.7	1900000036.20	36.20	0.019255319
30	3.7	1900000035.98	35.98	0.019138298
20	3.7	1900000025.57	25.57	0.013601064
10	3.7	1900000022.54	22.54	0.011989362
0	3.7	1899999977.27	-22.73	-0.012090426
-10	3.7	1900000023.16	23.16	0.012319149
-20	3.7	1900000022.37	22.37	0.011898936
-30	3.7	1899999973.95	-26.05	-0.013856383

Frequency Stability versus Voltage

Reference Frequency: 1880.0 MHz				
Environment Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (Hz)	Frequency Error (Hz)	Error (ppm)
20	4.2	1900000020.46	20.46	0.010882979
20	3.4	1900000023.59	23.59	0.012547872

PCS Band Part 24E (EGPRS):

Frequency Stability versus Temperature

Reference Frequency: 1880.0 MHz				
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed		
		Measured Frequency (Hz)	Frequency Error (Hz)	Error (ppm)
50	3.7	1900000039.54	39.54	0.021031915
40	3.7	1900000036.30	36.30	0.019308511
30	3.7	1900000035.69	35.69	0.018984043
20	3.7	1900000035.87	35.87	0.019079787
10	3.7	1900000030.32	30.32	0.01612766
0	3.7	1900000028.88	28.88	0.015361702
-10	3.7	1900000030.44	30.44	0.016191489
-20	3.7	1899999967.34	-32.66	-0.01737234
-30	3.7	1899999975.59	-24.41	-0.012984043

Frequency Stability versus Voltage

Reference Frequency: 1880.0 MHz				
Environment Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (Hz)	Frequency Error (Hz)	Error (ppm)
20	4.2	1900000024.63	24.63	0.013101064
20	3.4	1900000031.23	31.23	0.016611702

11 §24.238 – BAND EDGE

11.1 Applicable Standard

According to §24.238, the power of any emissions 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.

11.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 10 kHz.

11.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date
Agilent	Analyzer, Communications	E5515C	GB44051221	2007-08-08*
Agilent	Spectrum Analyzer	E4446A	US44300386	2008-05-27

*Two year calibration cycle.
*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

11.4 Test Results

Environmental Conditions

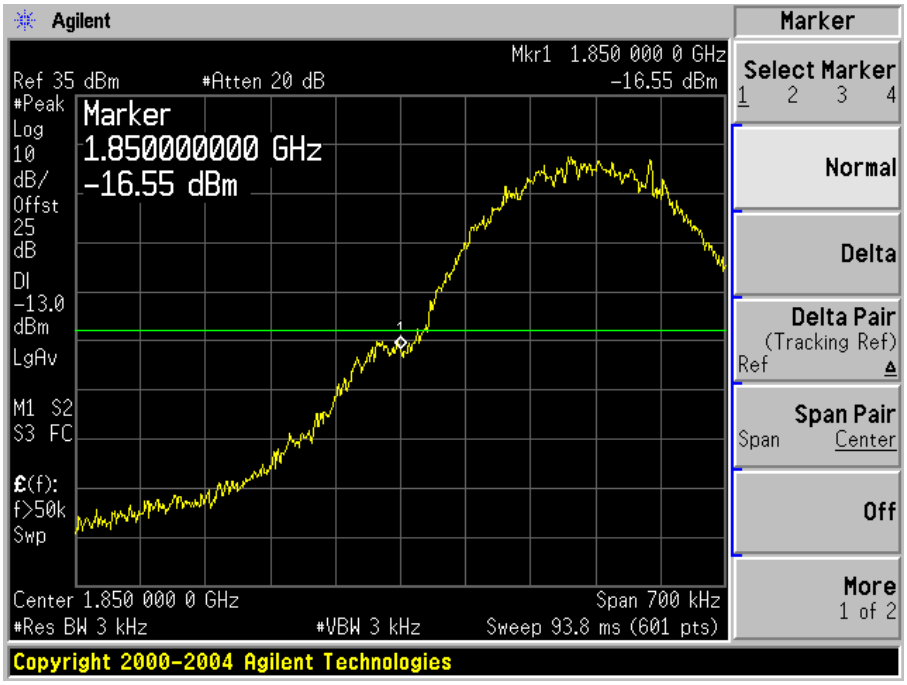
Temperature:	20 °C ~ 23 °C
Relative Humidity:	40 % ~ 55 %
ATM Pressure:	101.2kPa ~ 101.5kPa

** Testing performed by Jack Liu on 2008-11-25 to 2008-12-01*

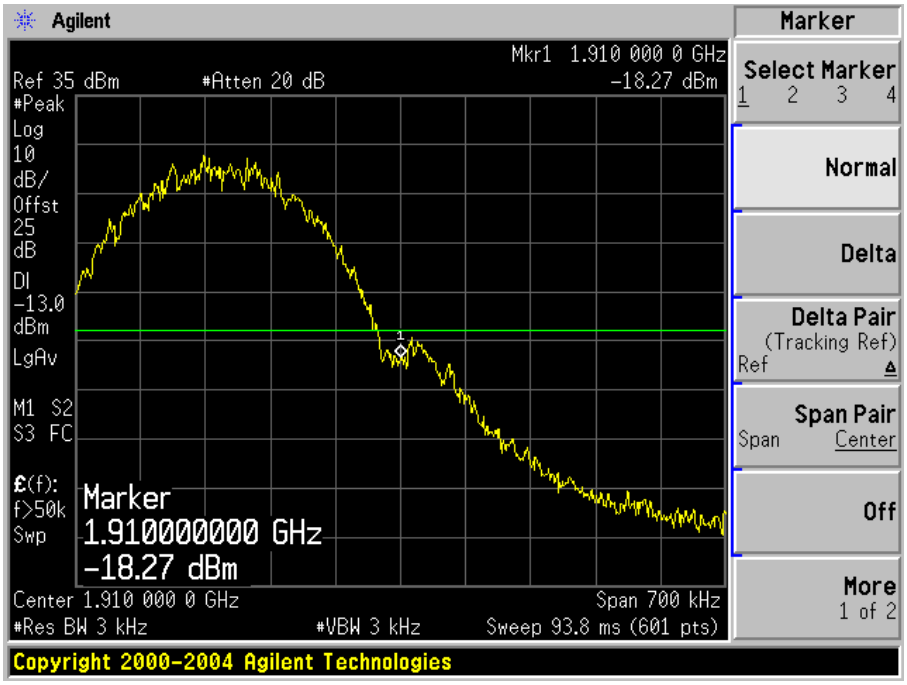
Please refer to the following plots.

Plots of Band Edge for Part 24E (GSM)

Lowest Channel

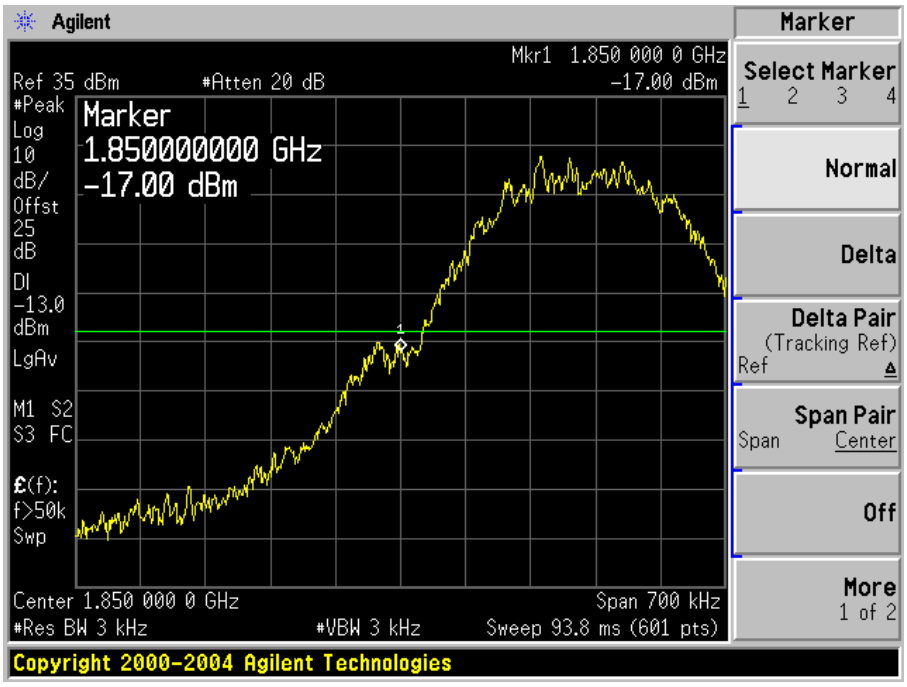


Highest Channel

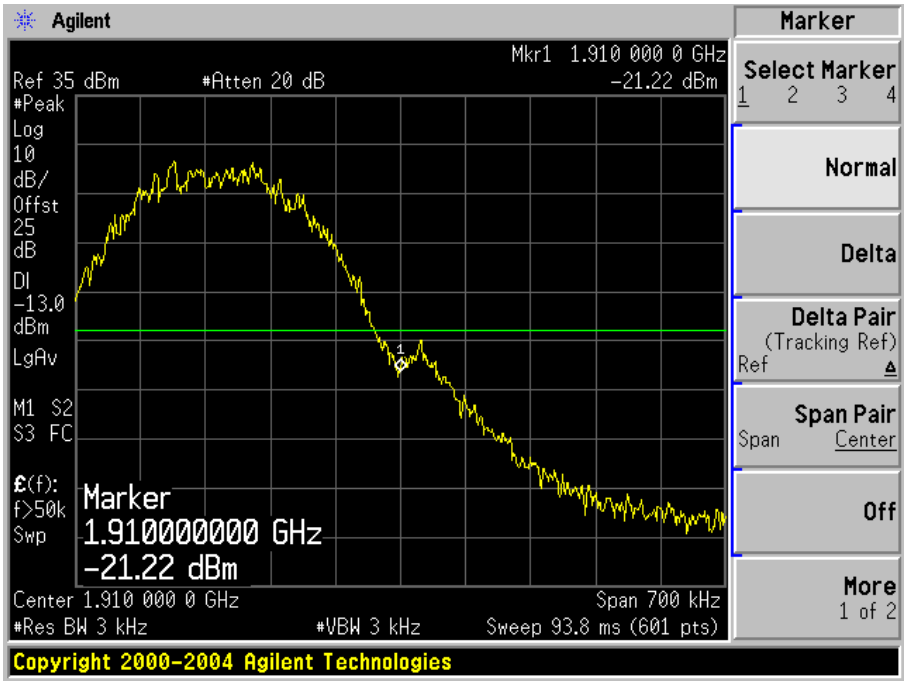


Plots of Band Edge for Part 24E (GPRS)

Lowest Channel

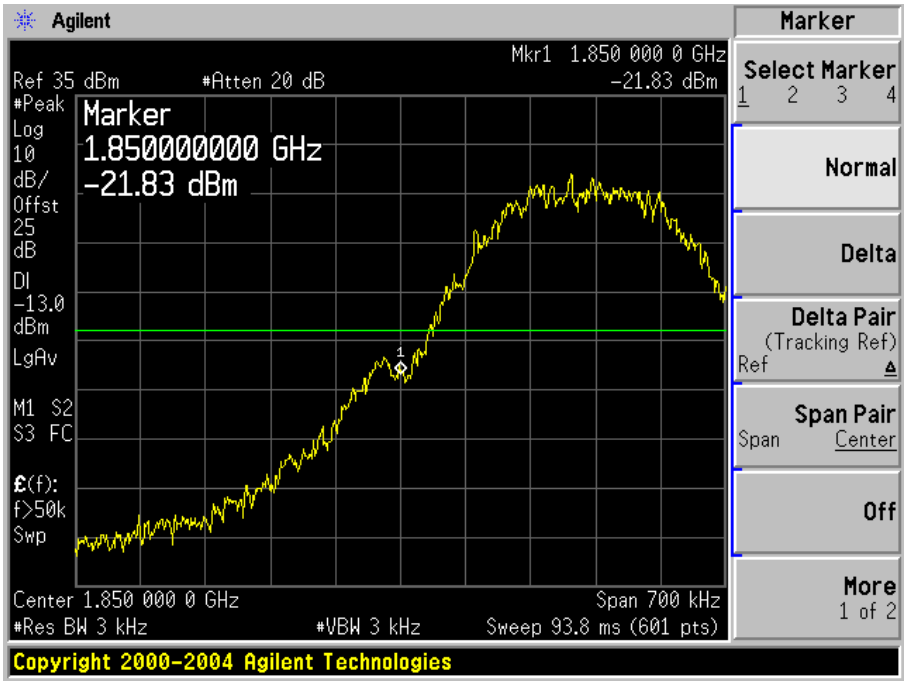


Highest Channel



Plots of Band Edge for Part 24E (EGPRS)

Lowest Channel



Highest Channel