

TEST REPORT

of

FCC Part 22, 24, 15 Subpart B, RSS-132 Issue 2, RSS-133 Issue 4, RSS-Gen Issue 2
FCC ID/IC Certification: BEJ9QK-LGX11/2703H-LGX11

Equipment Under Test : Notebook PC
Model Name : LGX11
Serial No. : 20090114_LJD1
Applicant : LG Electronics Inc.
Manufacturer : LG Electronics Inc.
Date of Test(s) : 2009-02-10 ~ 2009-02-20
Date of Issue : 2009-02-23

In the configuration tested, the EUT complied with the standards specified above.

Tested By:



Date

2009-02-23

Feel Jeong

Approved By



Date

2009-02-23

Denny Ham

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

INDEX

TABLE OF CONTENTS

Page

1. General Information -----	3
2. RF radiated output power & spurious radiated emission -----	6
3. Field Strength of Radiated Emissions-----	13
4. Conducted Output Power -----	16
5. Occupied Bandwidth 26 dB -----	20
6. Spurious Emissions At Antenna Terminal-----	44
7. Band Edge -----	55
8. Frequency Stability -----	66
9. Receiver AC Power Line Conducted Emission-----	70

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

1. General information

1.1. Testing laboratory

SGS Testing Korea Co., Ltd.

Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040

www.electrolab.kr.sgs.com

Telephone : +82 +31 428 5700

FAX : +82 +31 427 2371

1.2. Details of applicant

Applicant : LG Electronics Inc.

Address : 19-1, Chenongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, Korea

Contact Person : Jong-dae Lee

Phone No. : +82 +31 610 5338

Fax No. : +82 +31 610 5355

1.3. Description of EUT

Kind of Product	Notebook PC
Model Name	LGX11
Serial Number	20090114_LJD1
Power Supply	AC 110 V(Battery : DC 11.1 V)
Frequency Range	GSM : 824.2 MHz ~ 848.8 MHz and 1850.2 MHz ~ 1909.8 MHz
	WCDMA : 826.4 MHz ~ 846.6 MHz and 1852.4 MHz ~ 1907.6 MHz
	2412 MHz ~ 2462 MHz (11b/g)
	2402 MHz ~ 2480 MHz (Bluetooth)
Modulation Technique	GSM/WCDMA : GMSK, 8DPSK, QPSK
	11b : DSSS (CCK, BPSK, QPSK), 11g : OFDM (BPSK, QPSK, 16QAM, 64QAM)
	Bluetooth : GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels	GSM 850(125), GSM 1900(300), WCDMA 850(103), WCDMA 1900 (103)
	11b(11), 11g(11), Bluetooth(79)
Operating Conditions	10°C ~ 35°C

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

1.4. Test equipment list

Equipment	Manufacturer	Model	Cal Due.
Signal Generator	Agilent	E4438C	May 09, 2009
Spectrum Analyzer	Agilent	E4440A	May 09, 2009
CMU200	R&S	109495	Oct. 02, 2009
Directional Coupler	Narda	4226-20	Jan. 06, 2010
High Pass Filter	Wainwright Instrument GmbH	WHK3.0/18G-11SS	Dec. 01, 2009
Band Reject Filter	Wainwright	WRCG824/849-814/85960/10SS	May 09, 2009
AC Power Supply	Daekwang	Slidaks	Oct. 01, 2009
Two-Line V-Network	Rohde & Schwarz	ENV216	Jan. 01, 2010
Preamplifier	H.P	8447F	Jul. 03, 2009
Preamplifier	R&S	SCU_F0118_G35_AFS42_SCC(F)	Aug. 25, 2009
Test Receiver	Rohde & Schwarz	ESVS10	Jul. 21, 2009
Test Receiver	Rohde & Schwarz	ESHS10	Jun. 21, 2009
Ultra-Broadband Antenna	Rohde & Schwarz	HL562	Oct. 02, 2009
Horn Antenna	Electro-Metrics	HF906	Nov. 13, 2009
Horn Antenna	R&S	HF 906	Nov. 13, 2009
Dipole Antenna	VHAP/UHAP	975/958	Jan. 18, 2010
Communication Antenna	AR	AT 4002	N.C.R.
Anechoic Chamber	SY Corporation	L x W x H (6.5 m x 3.5 m x 3.5 m)	N.C.R.
Anechoic Chamber	SY Corporation	L x W x H (9.6 m x 6.4 m x 6.6 m)	Jan. 31, 2010

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

1.5. Summary of test results

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22, 24,15 Subpart B, RSS-132 Issue 2, RSS-133 Issue 5, RSS-Gen Issue 2			
Section in FCC part	Section in RSS-132 RSS-133 RSS-Gen	Test Item	Result
§15.109(a)	RSS-Gen 6	Receiver Radiated Spurious Emission	Complied
§2.1046 §22.913(a) §24.232(b)	RSS-132 RSS-133	RF Radiated Output Power	Complied
§22.917(e) §24.238(a)	RSS-132 RSS-133	Spurious Radiated Emission	Complied
§2.1046(a)	RSS-132 RSS-133	Conducted Output Power	Complied
§2.1049(h) (i)	RSS-132 RSS-133	Occupied Bandwidth	Complied
§2.1051 §22.917(e) §24.238(a)	RSS-132 RSS-133	Spurious Emission at Antenna Terminal	Complied
§2.1055 §22.355 §24.235	RSS-132 RSS-133	Frequency Stability	Complied
§22.917(e) §24.238(a)	RSS-132 RSS-133	Band Edge	Complied
§15.107	RSS-Gen 7.2.2	Receiver AC power line conducted emission	Complied

1.6. Test report revision

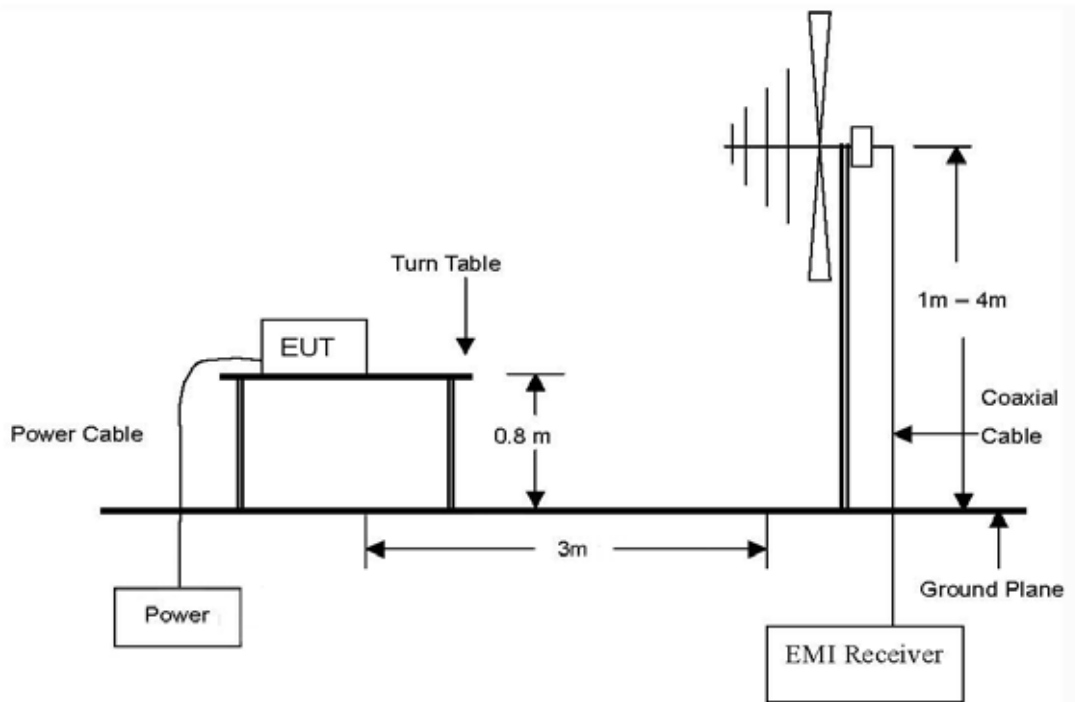
Revision	Report number	Description
0	F690501/RF-RTL002917	Initial

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

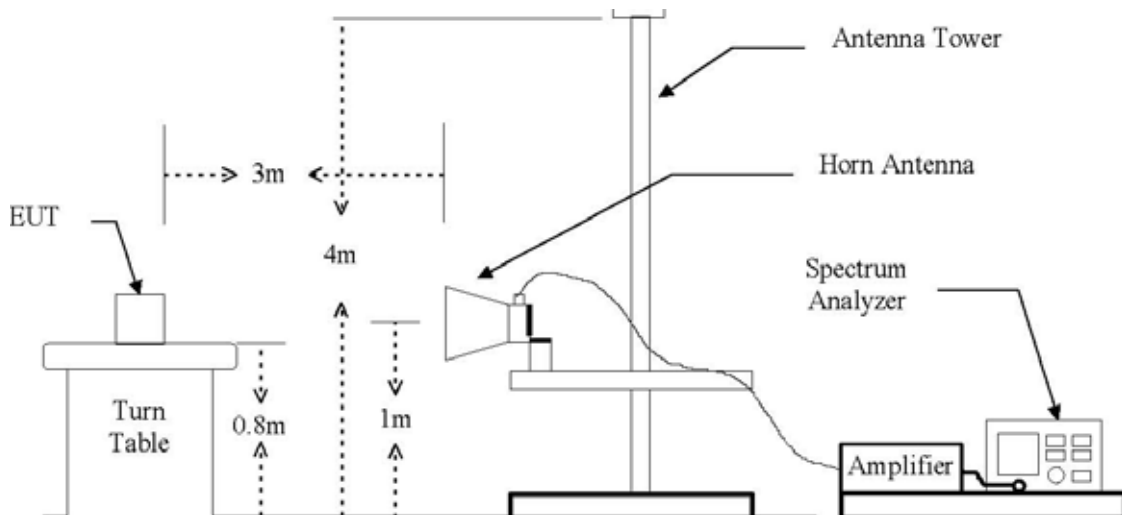
2. RF radiated output power & spurious radiated emission

2.1. Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz Emissions.

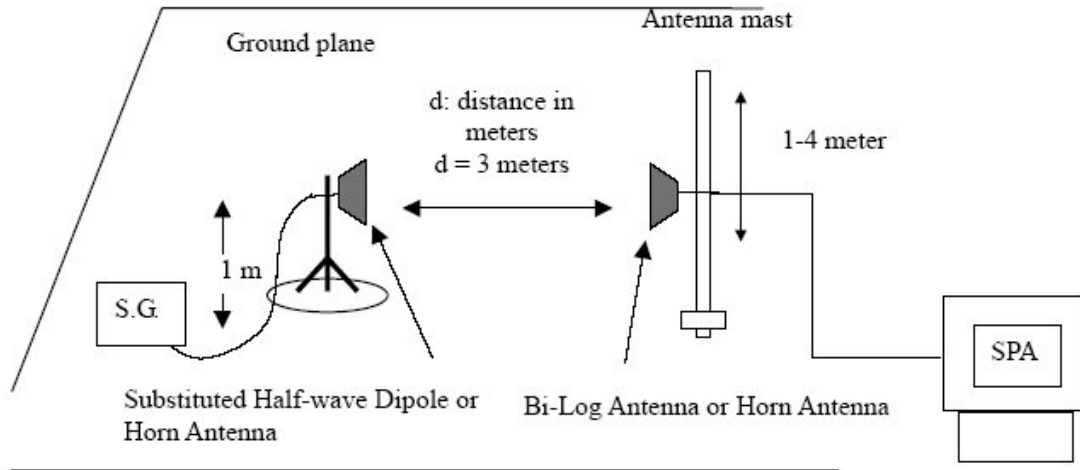


The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to 18 GHz Emissions.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

The diagram below shows the test setup for substituted method



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

2.2. Limit

FCC §22.913(a), the ERP of mobile transmitters must not exceed 7 watts. FCC §24.232(b) 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.

2.3. Test procedure : Based on ANSI/TIA 603C: 2004

1. On a test site, the EUT shall be placed at 80cm height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. During the measurement of the EUT, the resolution bandwidth was to 1 MHz and the average bandwidth was set to 1 MHz.
5. The transmitter shall be switched on, the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
7. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. The EUT was replaced by half-wave dipole (824~849 MHz) or horn antenna (1850 ~1910 MHz) connected to a signal generator.
11. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
13. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
14. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

2.4. Test result for RF output power

Ambient temperature : 21 °C
Relative humidity : 43 % R.H.

Test mode: GSM 850 (GSM)

Frequency (MHz)	Ant. Pol. (H/V)	Cable loss (dB)	S.G level + Amp. (dBm)	Ant. gain (dBd)	E.R.P.	
					(dBm)	(mW)
824.2	H	0.62	38.99	-10.44	27.93	620.87
824.2	V	0.62	36.30	-10.44	25.24	334.20
836.4	H	0.64	38.05	-10.45	26.96	496.59
836.4	V	0.64	37.80	-10.45	26.71	468.81
848.8	H	0.56	37.38	-10.53	26.29	425.60
848.8	V	0.56	38.77	-10.53	27.68	586.14

Test mode: GSM1900 (GSM)

Frequency (MHz)	Ant. Pol. (H/V)	Cable loss (dB)	S.G level + Amp. (dBm)	Ant. gain (dBi)	E.I.R.P.	
					(dBm)	(mW)
1850.2	H	0.99	17.95	8.79	25.75	375.84
1850.2	V	0.99	20.24	8.79	28.04	636.80
1880.0	H	0.97	16.25	8.90	24.18	261.82
1880.0	V	0.97	19.70	8.90	27.63	579.43
1909.8	H	1.14	17.18	9.00	25.04	319.15
1909.8	V	1.14	18.21	9.00	26.07	404.58

Test mode: UMTS 850(HSUPA)

Frequency (MHz)	Ant. Pol. (H/V)	Cable loss (dB)	S.G level + Amp. (dBm)	Ant. gain (dBd)	E.R.P.	
					(dBm)	(mW)
826.4	H	0.62	30.67	-10.44	19.61	91.41
826.4	V	0.62	29.02	-10.44	17.96	62.52
836.0	H	0.64	29.71	-10.45	18.62	72.78
836.0	V	0.64	29.08	-10.45	17.99	62.95
846.6	H	0.56	31.02	-10.53	19.93	98.40
846.6	V	0.56	30.76	-10.53	19.67	92.68

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Test mode: UMTS 1900(HSUPA)

Frequency (MHz)	Ant. Pol. (H/V)	Cable loss (dB)	S.G level + Amp. (dBm)	Ant. gain (dBi)	E.I.R.P.	
					(dBm)	(mW)
1852.4	H	0.99	12.77	8.79	20.57	114.02
1852.4	V	0.99	15.40	8.79	23.20	208.93
1880.0	H	0.97	12.25	8.90	20.18	104.23
1880.0	V	0.97	15.68	8.90	23.61	229.61
1907.6	H	1.14	13.76	9.00	21.62	145.21
1907.6	V	1.14	15.17	9.00	23.03	200.91

Remark:

$E.R.P. \ \& \ E.I.R.P = Cable \ loss(dB) + [S.G \ level + Amp.](dBm) + Ant. \ gain \ (dBd/dBi)$

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

2.5. Test result for spurious radiated emission

Ambient temperature : 21 °C
Relative humidity : 43 % R.H.

Test mode: GSM 850 (GSM)

Frequency (MHz)	Ant. Pol. (H/V)	Cable loss (dB)	S.G level (dBm)	Ant. gain (dBd)	E.R.P (dBm)	Limit (dBm)	Margin (dB)
Low Channel(824.2 MHz)							
1648.4	H	1.03	-60.38	5.93	-55.48	-13.00	42.48
1648.4	V	1.03	-61.01	5.93	-56.11	-13.00	43.11
Middle Channel(836.4 MHz)							
1672.8	H	0.98	-59.75	5.95	-54.78	-13.00	41.78
1672.8	V	0.98	-59.99	5.95	-55.02	-13.00	42.02
High Channel(848.8 MHz)							
1697.6	H	0.91	-58.81	6.10	-53.62	-13.00	40.62
1697.6	V	0.91	-58.47	6.10	-53.28	-13.00	40.28

Test mode: GSM1900 (GSM)

Frequency (MHz)	Ant. Pol. (H/V)	Cable loss (dB)	S.G level (dBm)	Ant. gain (dBi)	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
Low Channel(1850.2 MHz)							
3700.4	H	2.37	-52.94	11.20	-44.11	-13.00	31.11
3700.4	V	2.37	-51.14	11.20	-42.31	-13.00	29.31
Middle Channel(1880.0 MHz)							
3760.0	H	2.33	-53.01	11.25	-44.09	-13.00	31.09
3760.0	V	2.33	-51.42	11.25	-42.50	-13.00	29.50
High Channel(1909.8 MHz)							
3819.6	H	2.36	-52.40	11.31	-43.45	-13.00	30.45
3819.6	V	2.36	-51.14	11.31	-42.19	-13.00	29.19

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Test mode: UMTS 850(HSUPA)

Frequency (MHz)	Ant. Pol. (H/V)	Cable loss (dB)	S.G level (dBm)	Ant. gain (dBd)	E.R.P (dBm)	Limit (dBm)	Margin (dB)
Low Channel(826.4 MHz)							
1652.8	H	1.03	-62.59	5.93	-57.69	-13.00	44.69
1652.8	V	1.03	-62.97	5.93	-58.07	-13.00	45.07
Middle Channel(836.0 MHz)							
1672.0	H	0.98	-61.39	5.95	-56.42	-13.00	43.42
1672.0	V	0.98	-62.75	5.95	-57.78	-13.00	44.78
High Channel(846.6 MHz)							
1693.2	H	0.91	-60.52	6.10	-55.33	-13.00	42.33
1693.2	V	0.91	-61.03	6.10	-55.84	-13.00	42.84

Test mode: UMTS 1900(HSUPA)

Frequency (MHz)	Ant. Pol. (H/V)	Cable loss (dB)	S.G level (dBm)	Ant. gain (dBi)	E.I.R.P (dBm)	Limit (dBm)	Margin (dB)
Low Channel(1852.4 MHz)							
3704.8	H	2.37	-48.97	11.20	-40.14	-13.00	27.14
3704.8	V	2.37	-51.41	11.20	-42.58	-13.00	29.58
Middle Channel(1880.0 MHz)							
3760.0	H	2.33	-48.68	11.25	-39.76	-13.00	26.76
3760.0	V	2.33	-51.17	11.25	-42.25	-13.00	29.25
High Channel(1907.6 MHz)							
3815.2	H	2.36	-48.24	11.31	-39.29	-13.00	26.29
3815.2	V	2.36	-50.80	11.31	-41.85	-13.00	28.85

Remark:

1. E.R.P. & E.I.R.P = Cable loss(dB) + [S.G level + Amp.](dBm) + Ant. gain (dBd/dBi)
2. No more harmonic above 3rd harmonic for all channel.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

3. Field Strength of Radiated Emissions

3.1. Limit

According to §15.109(a), Except for Class A digital devices, the field strength of radiated emission from unintentional radiator at a distance of 3 m shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30 - 88	3	40.0	100
88 – 216	3	43.5	150
216 – 960	3	46.0	200
Above 960	3	54.0	500

3.2. Test Procedure

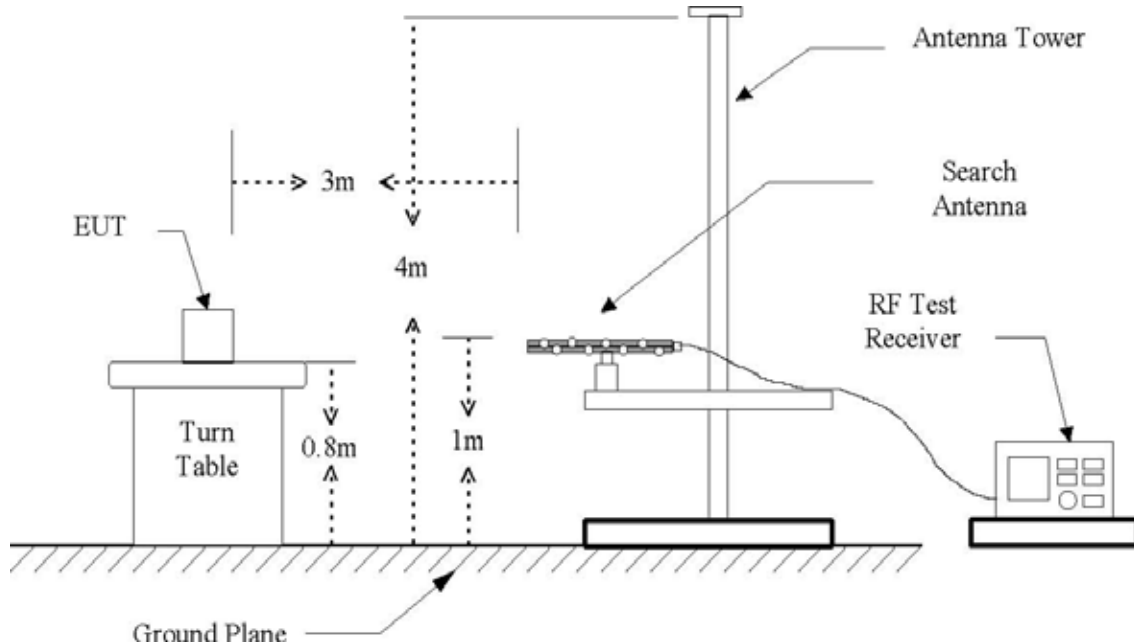
1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 meter away from the interference-receiving antenna.
3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE :

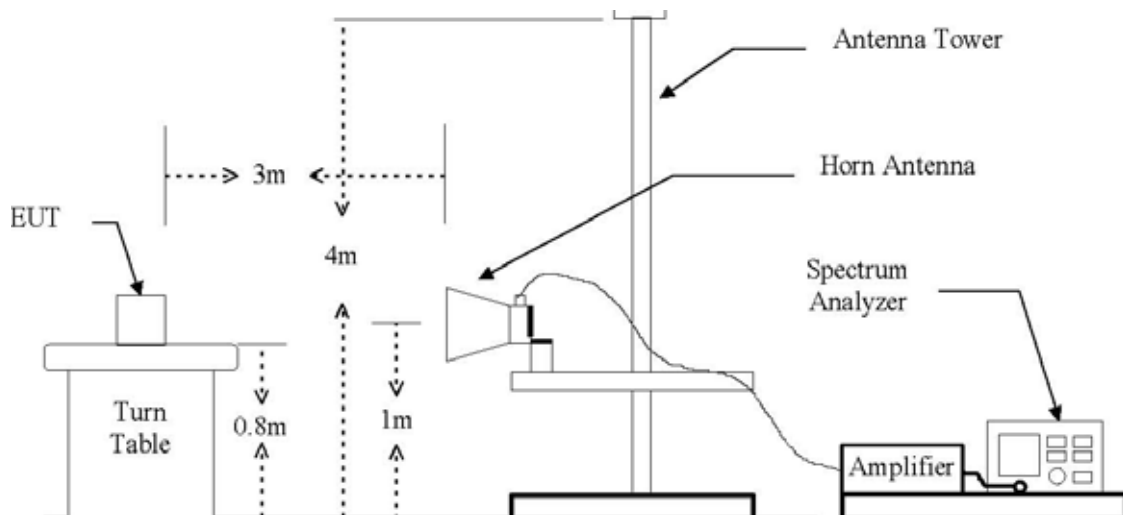
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz for Peak detection and frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1 GHz.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 40 GHz Emissions.



Frequencies measured below 1 GHz configuration



Frequencies measured above 1 GHz configuration

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

3.3. Test Result (Worst case configuration_GSM 1900_ GMSK mode)

Ambient temperature : 21 °C
Relative humidity : 43 % R.H.

The frequency spectrum from 30 MHz to 1000 MHz was investigated. All emissions are not reported much lower than the prescribed limits. All reading values are peak values.

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (MHz)	Reading (dBuV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)
243.40	25.20	Peak	H	9.25	1.75	36.2	46.0	9.8
318.58	17.05	Peak	H	11.44	2.01	30.5	46.0	15.5
337.98	16.39	Peak	H	12.02	2.09	30.5	46.0	15.5
345.25	16.84	Peak	H	12.24	2.12	31.2	46.0	14.9
374.35	15.62	Peak	H	12.84	2.24	30.7	46.0	15.3
Above 380	Not detected							

▣ Remark:

1. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
2. All spurious emission at channels are almost the same below 1 GHz, so that the channel was chosen at representative in final test.
3. $Actual = Reading + AF + CL$

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

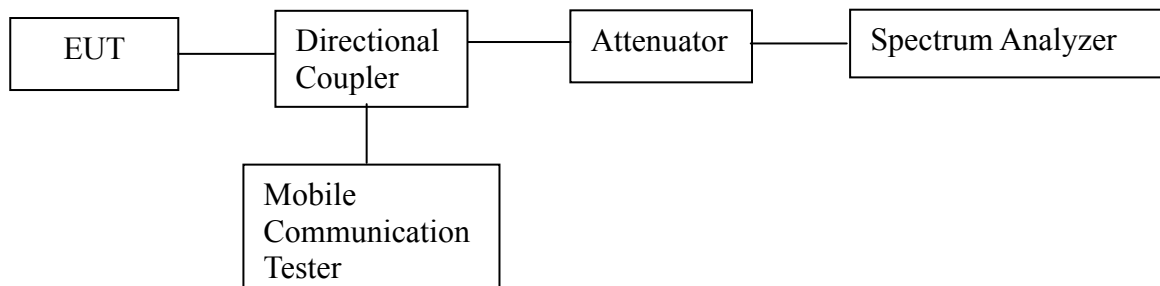
4. Conducted Output Power

4.1. Limit

Requirements: CFR 47, Section §2.1046

4.2. Test Procedure

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The mobile was set up for the max. output power with pseudo random data modulation.
3. The power was measured with Spectrum Analyzer (peak and average)



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

4.3. Test Result

Ambient temperature : 21 °C
Relative humidity : 43 % R.H.

Band	Mode	Frequency (MHz)	Peak output power (dBm)	Average output power (dBm)
GSM 850	GMSK	824.2	32.90	32.80
		836.4	32.80	32.60
		848.8	32.80	32.60
GSM 850	8PSK	824.2	32.90	27.90
		836.4	30.80	27.60
		848.8	30.90	27.60
GSM 1900	GMSK	1850.2	29.30	29.20
		1880.0	29.80	29.70
		1909.8	29.20	29.10
GSM 1900	8PSK	1850.2	27.60	26.30
		1880.0	27.80	26.80
		1909.8	27.60	26.10

GSM (850 / 1900)

We found out the test mode with the highest power level after we analyze all the data rates. So we chose GSM/GMSK (worst case) as a representative.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Band	Mode	Frequency (MHz)	Peak output power (dBm)	Average output power (dBm)
WCDMA V	RMC	826.4	25.95	23.09
		836.0	26.45	23.61
		846.6	26.06	23.39
WCDMA V (HSDPA)	Sub-test 1	826.4	26.02	23.28
		836.0	26.20	23.60
		846.6	25.87	23.17
	Sub-test 2	826.4	26.06	22.56
		836.0	26.48	22.83
		846.6	26.20	22.65
	Sub-test 3	826.4	26.38	22.57
		836.0	26.63	22.87
		846.6	26.24	22.53
	Sub-test 4	826.4	26.21	22.66
		836.0	26.48	22.87
		846.6	25.98	22.57
WCDMA V (HSUPA)	Sub-test 1	826.4	26.66	22.99
		836.0	27.12	23.16
		846.6	26.65	23.07
	Sub-test 2	826.4	26.23	21.42
		836.0	26.77	21.85
		846.6	26.91	21.22
	Sub-test 3	826.4	26.03	21.84
		836.0	25.89	21.82
		846.6	26.93	21.65
	Sub-test 4	826.4	26.17	21.87
		836.0	26.48	21.74
		846.6	26.15	21.77
	Sub-test 5	826.4	26.38	22.83
		836.0	26.37	22.93
		846.6	26.00	22.71

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Band	Mode	Frequency (MHz)	Peak output power (dBm)	Average output power (dBm)
WCDMA II	RMC	1852.4	25.71	22.95
		1880.0	25.51	22.35
		1907.6	25.18	22.59
WCDMA II (HSDPA)	Sub-test 1	1852.4	26.04	23.03
		1880.0	25.93	22.83
		1907.6	25.55	23.12
	Sub-test 2	1852.4	26.07	22.72
		1880.0	25.91	22.53
		1907.6	26.28	22.87
	Sub-test 3	1852.4	26.48	22.43
		1880.0	26.06	22.31
		1907.6	25.98	22.38
	Sub-test 4	1852.4	26.65	22.51
		1880.0	26.43	22.46
		1907.6	26.19	22.50
WCDMA II (HSUPA)	Sub-test 1	1852.4	27.16	22.74
		1880.0	27.05	22.67
		1907.6	26.65	22.75
	Sub-test 2	1852.4	26.48	22.05
		1880.0	26.61	22.09
		1907.6	26.31	21.87
	Sub-test 3	1852.4	26.43	21.89
		1880.0	26.51	22.09
		1907.6	26.14	22.17
	Sub-test 4	1852.4	26.34	22.35
		1880.0	26.49	22.39
		1907.6	26.42	22.29
	Sub-test 5	1852.4	26.68	22.63
		1880.0	26.33	22.34
		1907.6	26.09	22.71

WCDMA (850 / 1900)

We found out the test mode with the highest power level after we analyze all the data rates. So we chose HSUPA (worst case) as a representative.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

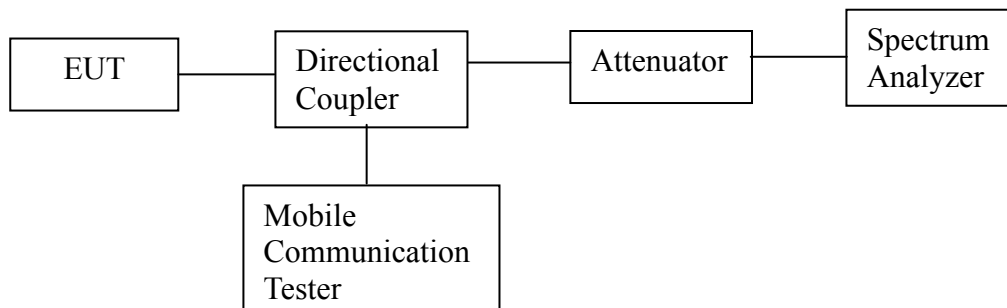
5. Occupied Bandwidth 26 dB

5.1. Limit

Requirements: CFR 47, Section §2.1049.

5.2. Test Procedure

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The resolution bandwidth of the spectrum analyzer was set.
Occupied Bandwidth 26dB was tested under



5.3 Test Results

Ambient temperature : 22 °C
Relative humidity : 45 % R.H.

GSM 850

Normal mode

Frequency	99% Occupied Bandwidth(kHz)	-26 dB Bandwidth(kHz)
824.7 MHz(128)	245	295
836.6 MHz(189)	245	299
848.8 MHz(251)	241	299

EDGE mode

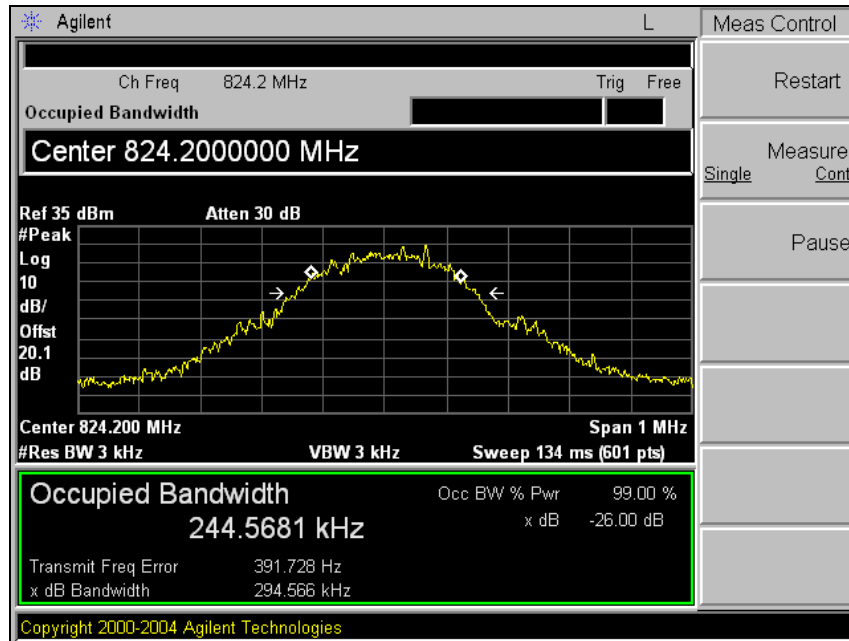
Frequency(MHz)	99% Occupied Bandwidth(kHz)	-26 dB Bandwidth(kHz)
824.7 MHz(128)	245	306
836.6 MHz(189)	246	311
848.8 MHz(251)	244	311

Please refer to the following plots.

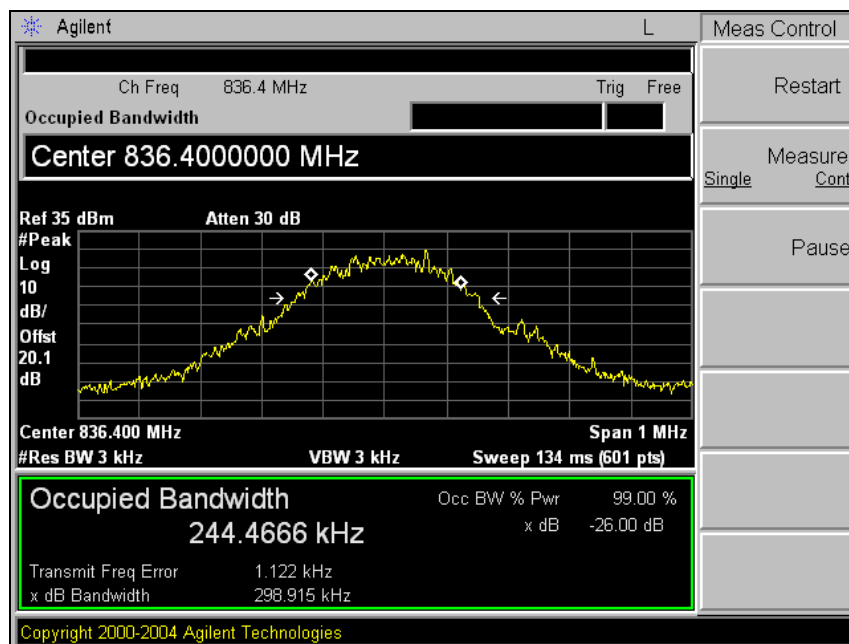
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Normal mode

Low Channel

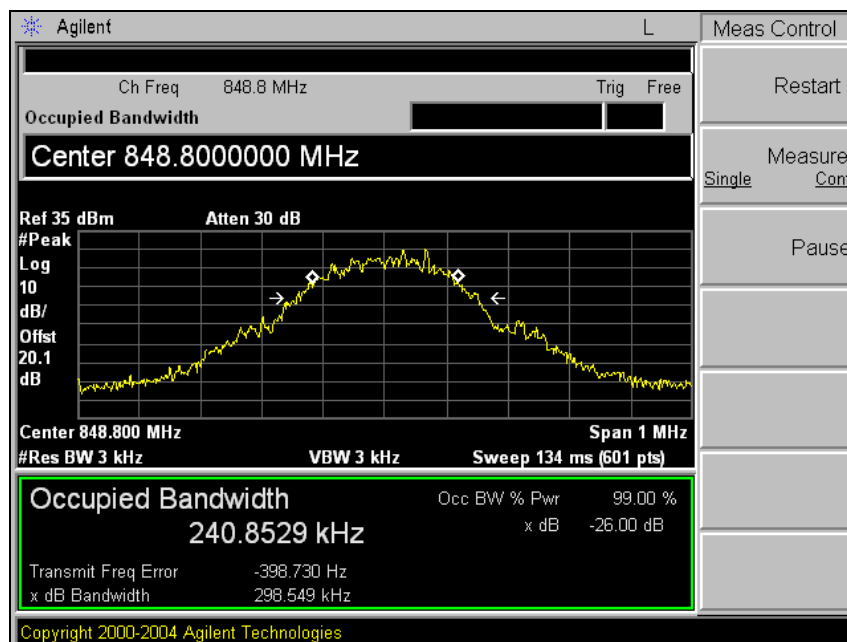


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

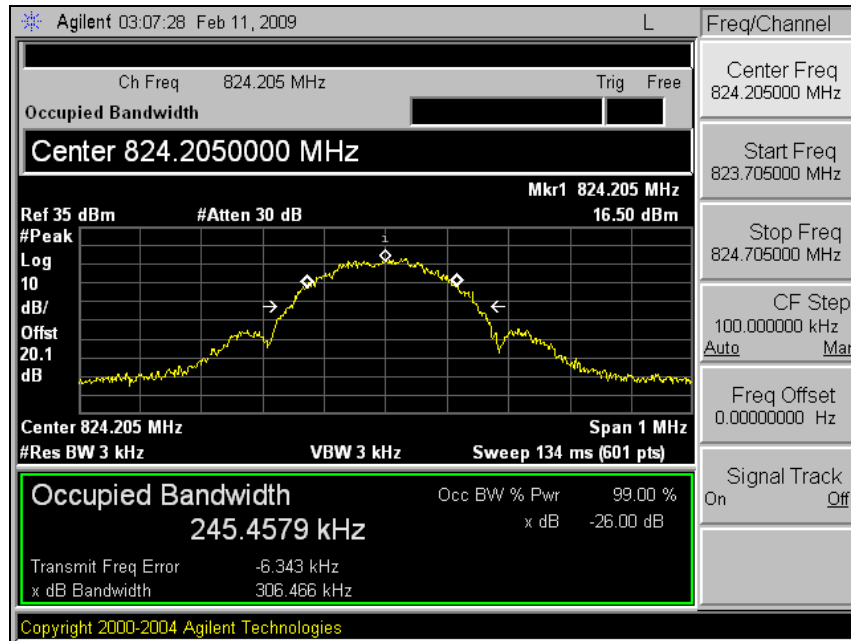
High Channel



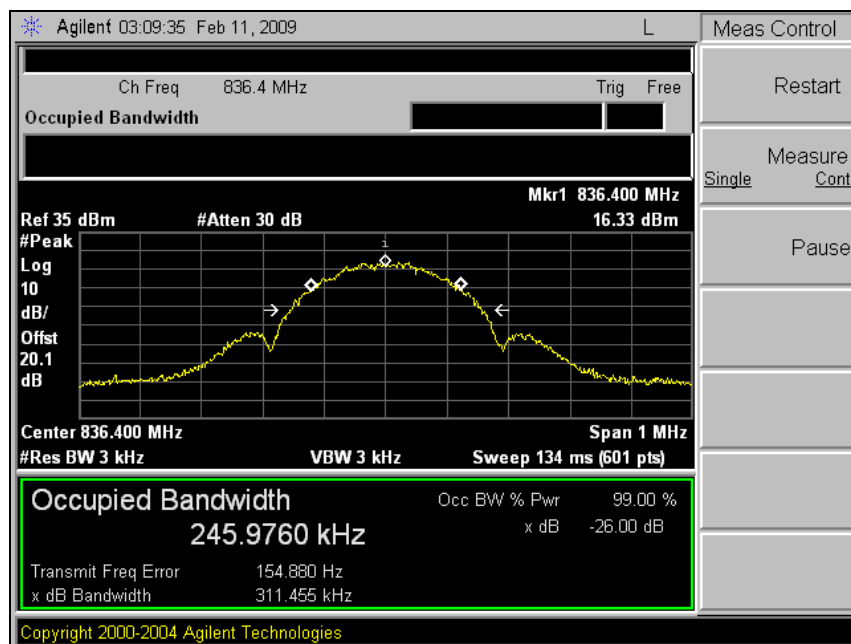
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

EDGE mode

Low Channel

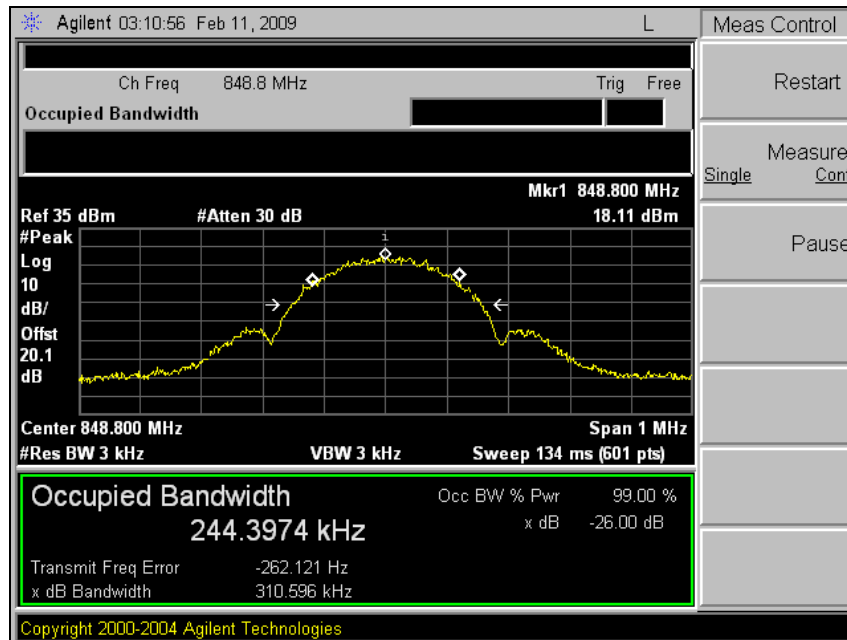


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

GSM 1900

Normal mode

Frequency	99% Occupied Bandwidth(kHz)	-26 dB Bandwidth(kHz)
1850.2 MHz(512)	242	301
1880.0 MHz(661)	241	301
1909.2 MHz(810)	241	300

EDGE mode

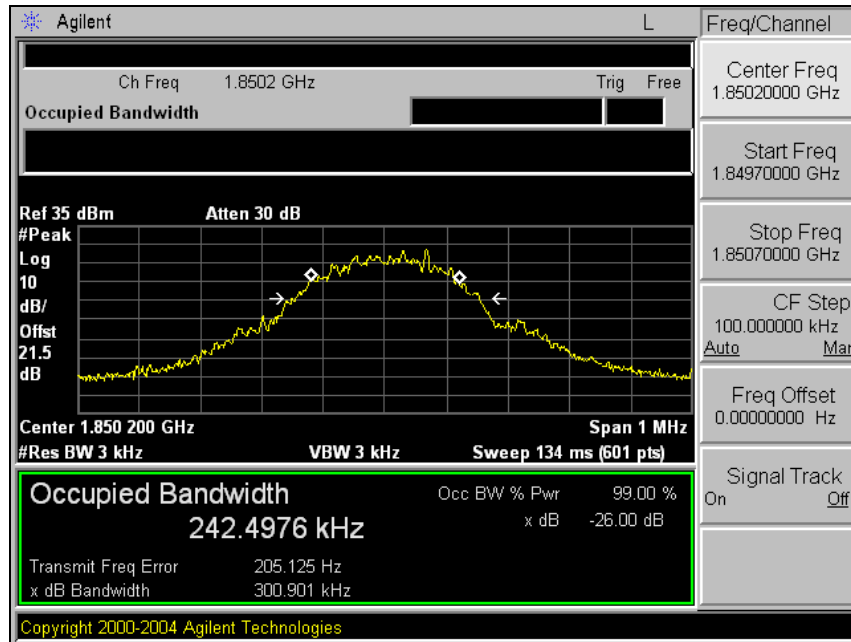
Frequency(MHz)	99% Occupied Bandwidth(kHz)	-26 dB Bandwidth(kHz)
1850.2 MHz(512)	242	317
1880.0 MHz(661)	241	308
1909.2 MHz(810)	240	309

Please refer to the following plots.

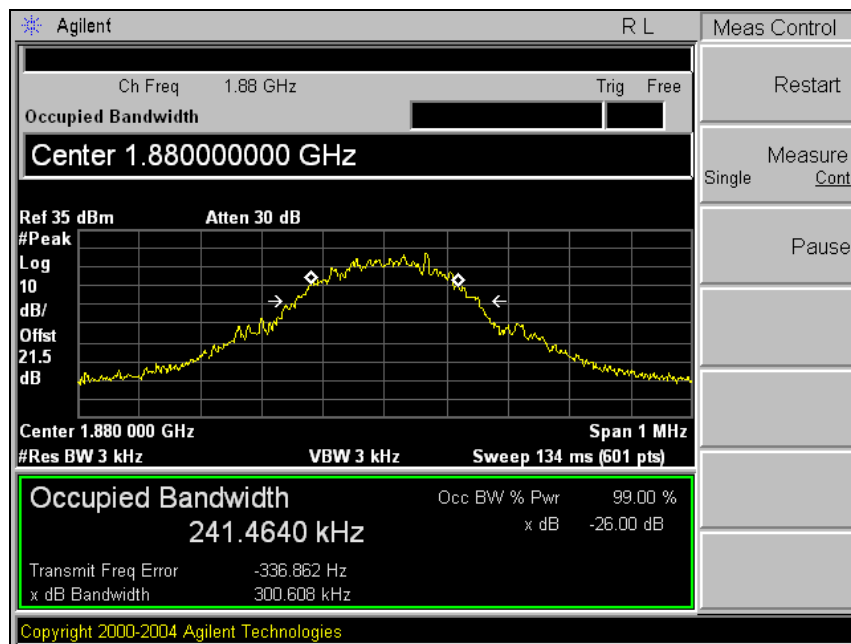
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Normal mode

Low Channel

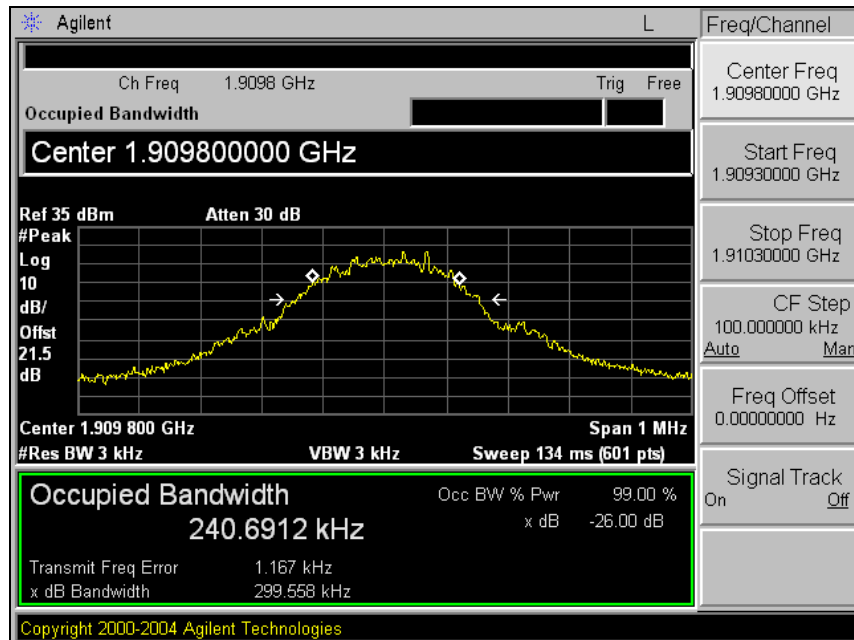


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

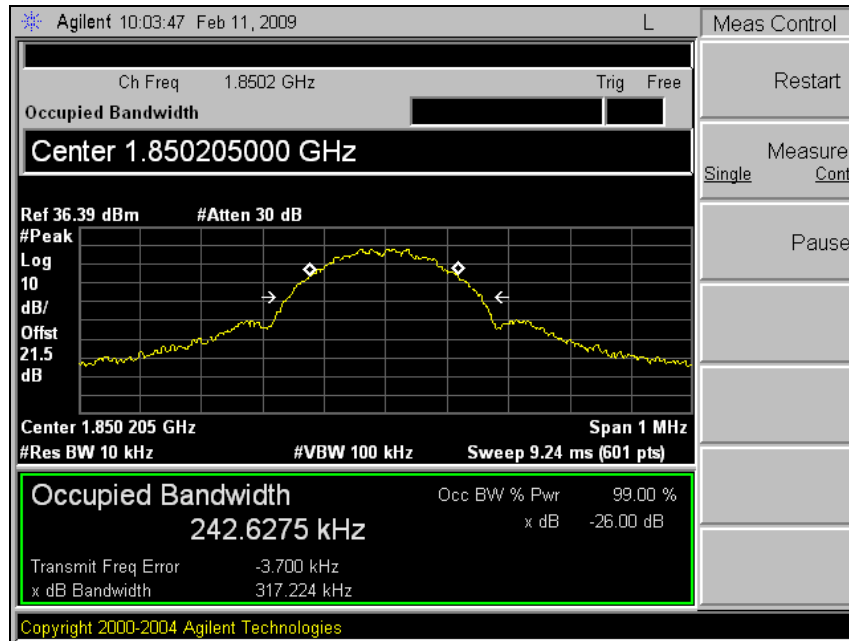
High Channel



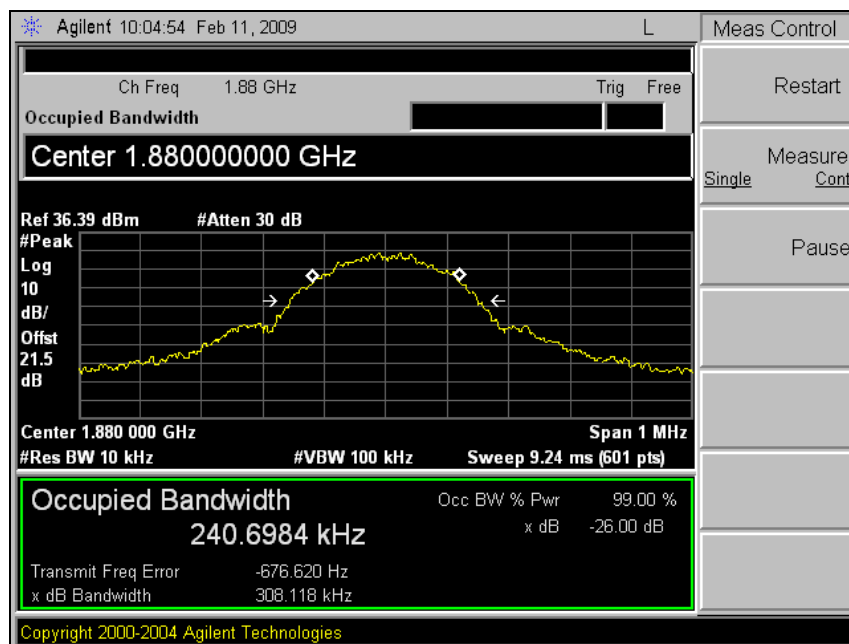
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

EDGE mode

Low Channel

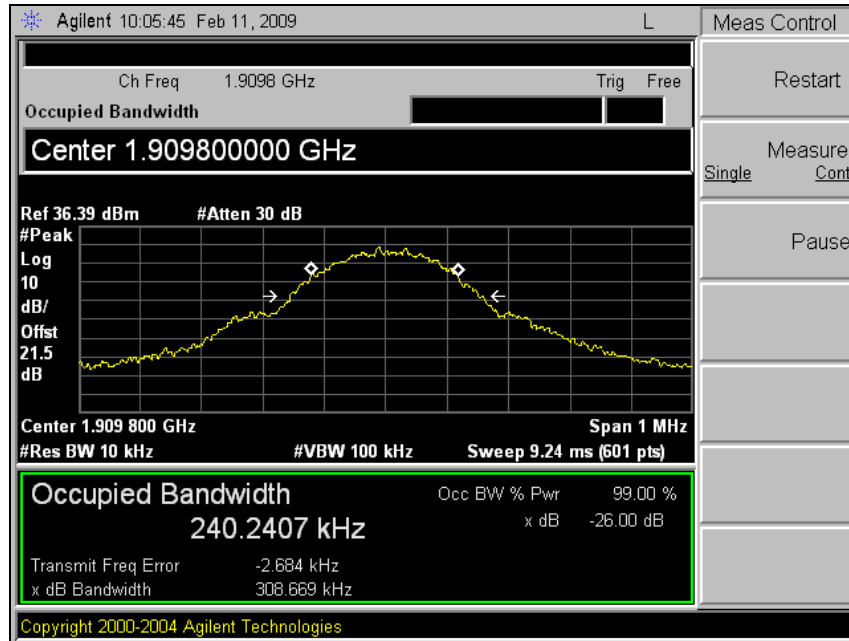


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

UMTS 850

Normal mode

Frequency	99% Occupied Bandwidth(MHz)	-26 dB Bandwidth(MHz)
826.4 MHz(4132)	4.199	4.868
836.0 MHz(4180)	4.183	4.842
846.6 MHz(4233)	4.199	4.894

HSDPA mode

Frequency(MHz)	99% Occupied Bandwidth(MHz)	-26 dB Bandwidth(MHz)
826.4 MHz(4132)	4.198	4.856
836.0 MHz(4180)	4.192	4.863
846.6 MHz(4233)	4.174	4.891

HSUPA mode

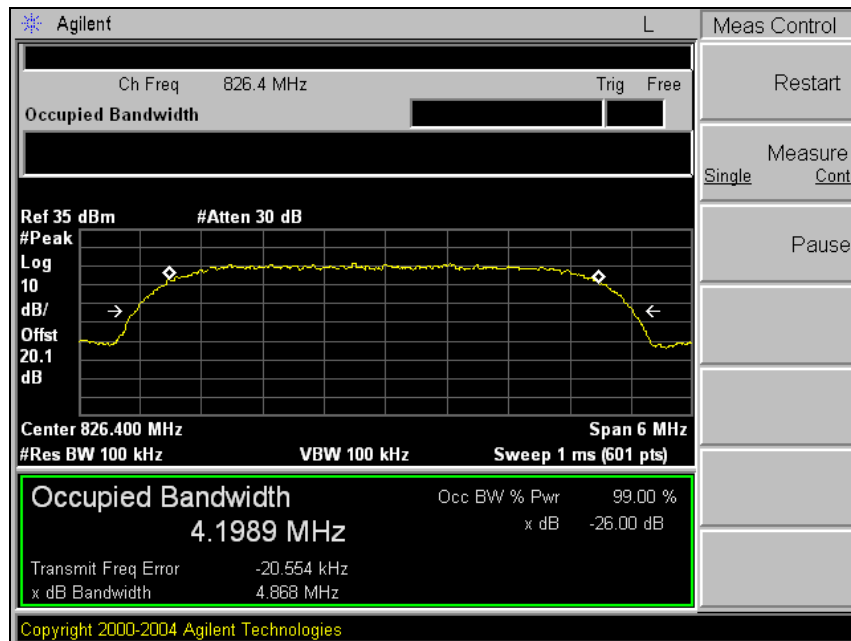
Frequency(MHz)	99% Occupied Bandwidth(MHz)	-26 dB Bandwidth(MHz)
826.4 MHz(4132)	4.188	4.855
836.0 MHz(4180)	4.203	4.863
846.6 MHz(4233)	4.189	4.877

Please refer to the following plots.

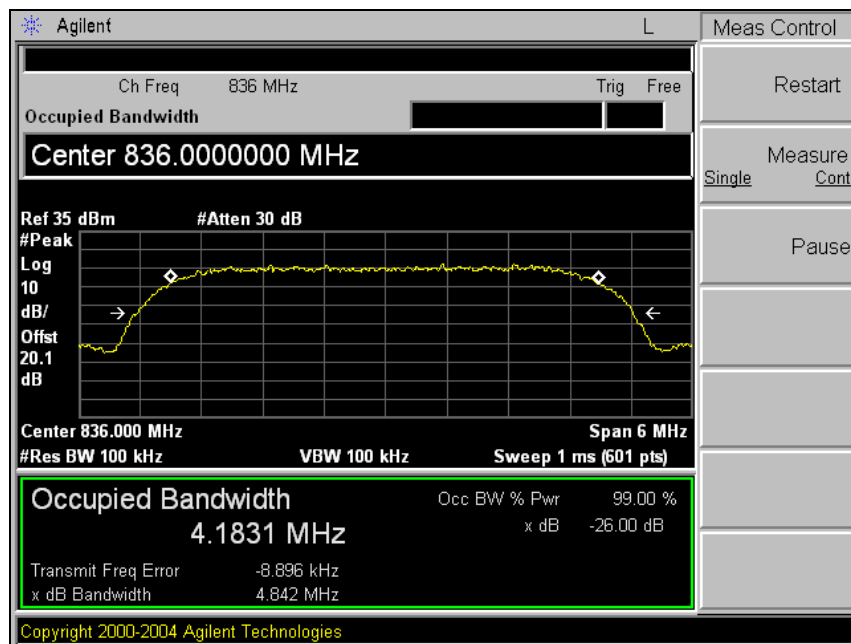
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Normal mode

Low Channel

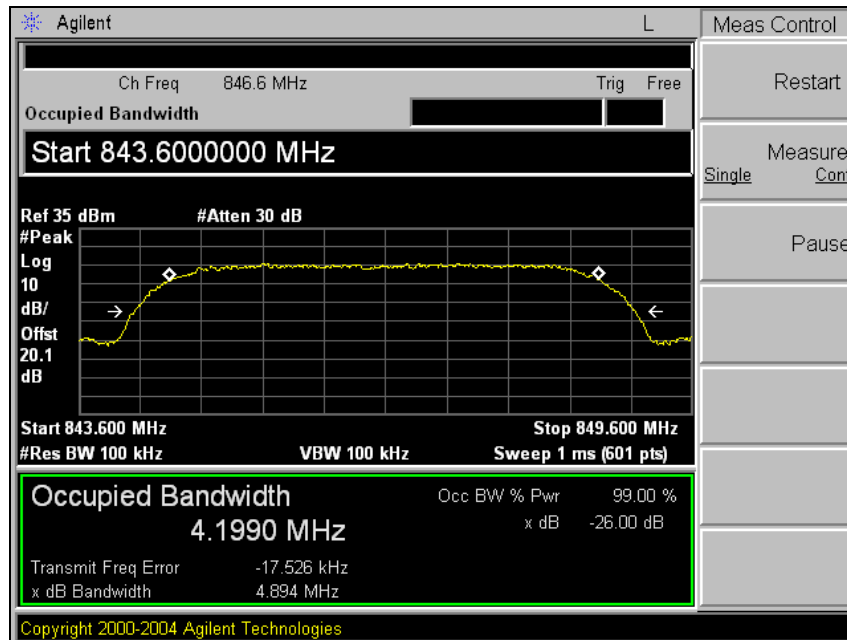


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

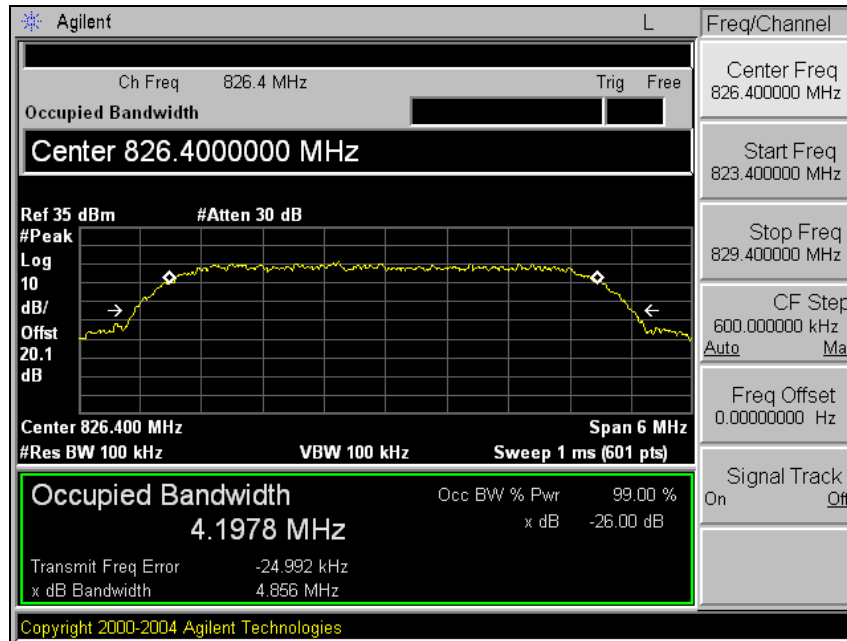
High Channel



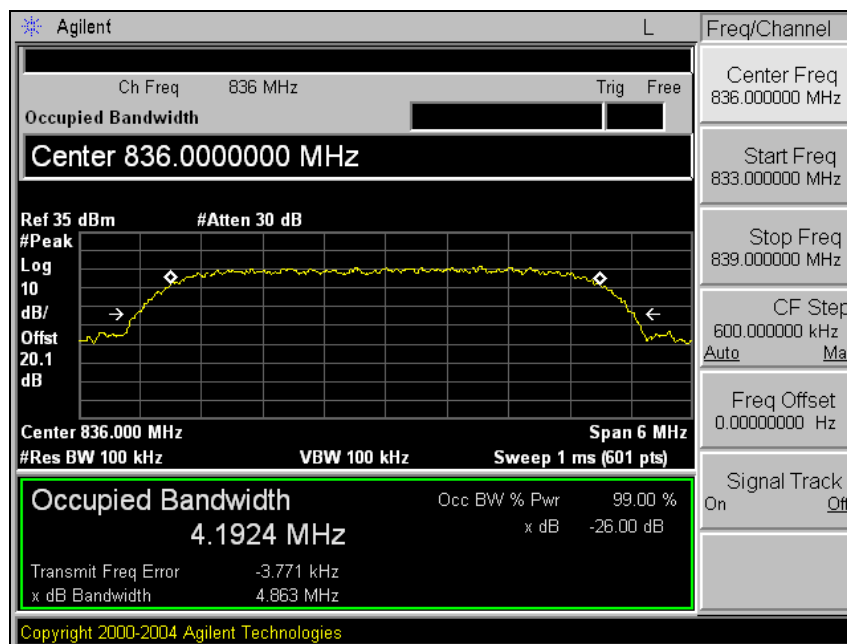
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

HSDPA mode

Low Channel

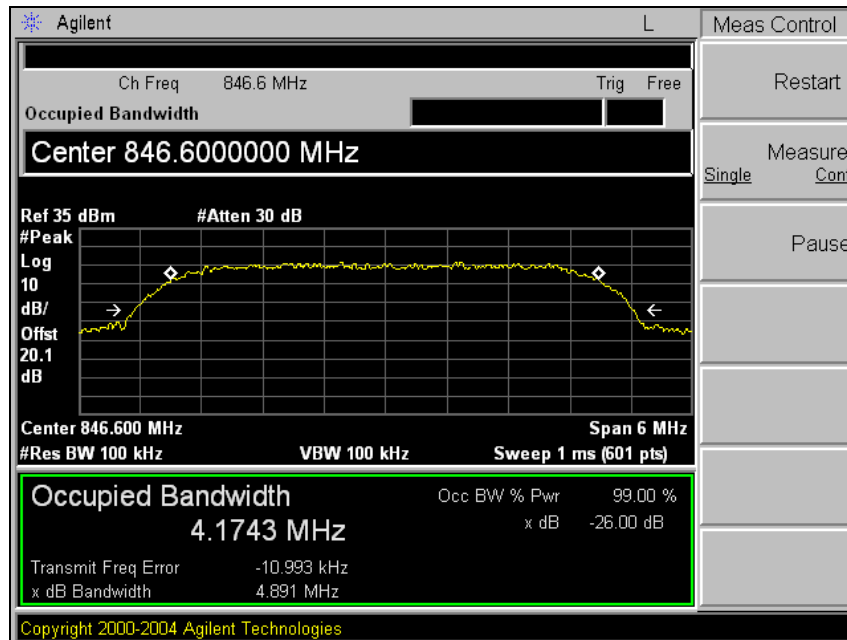


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

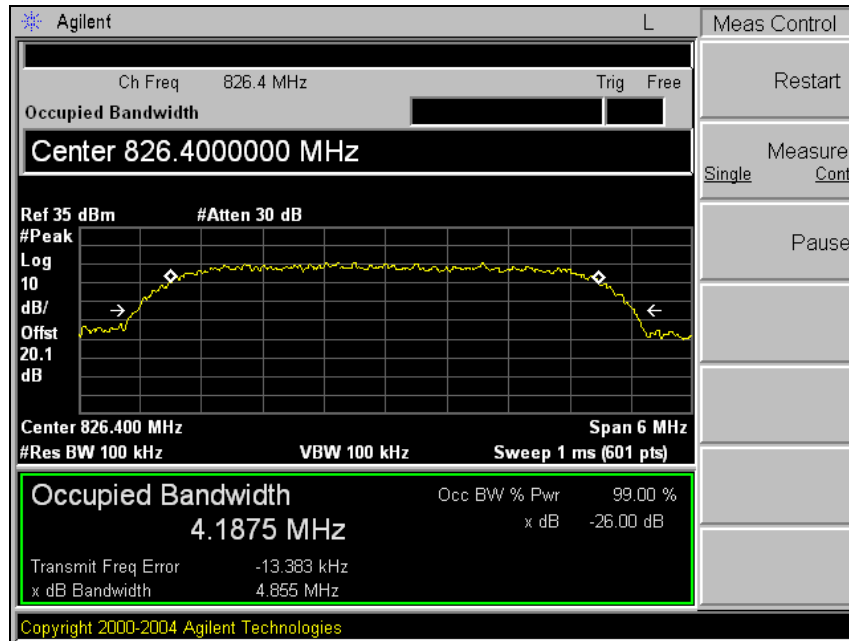
High Channel



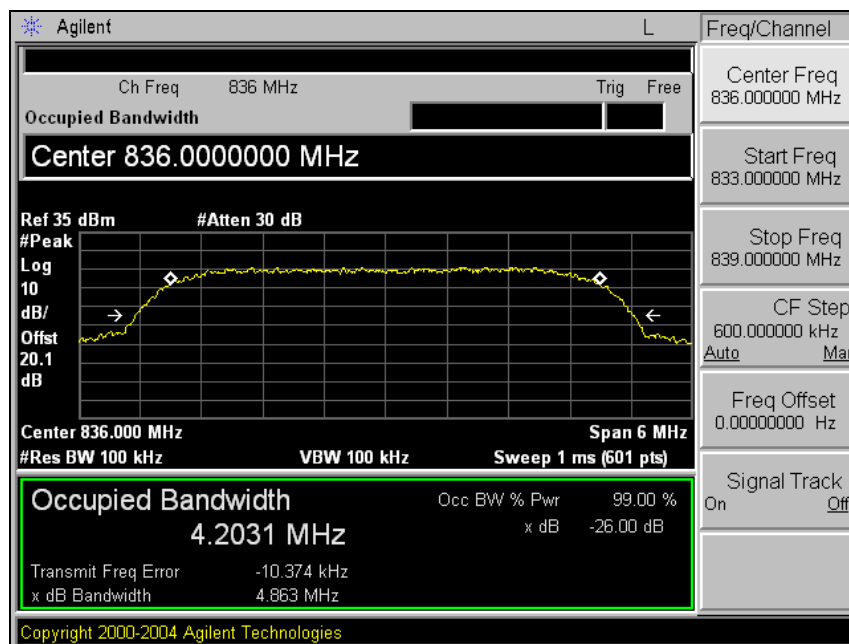
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

HSUPA mode

Low Channel

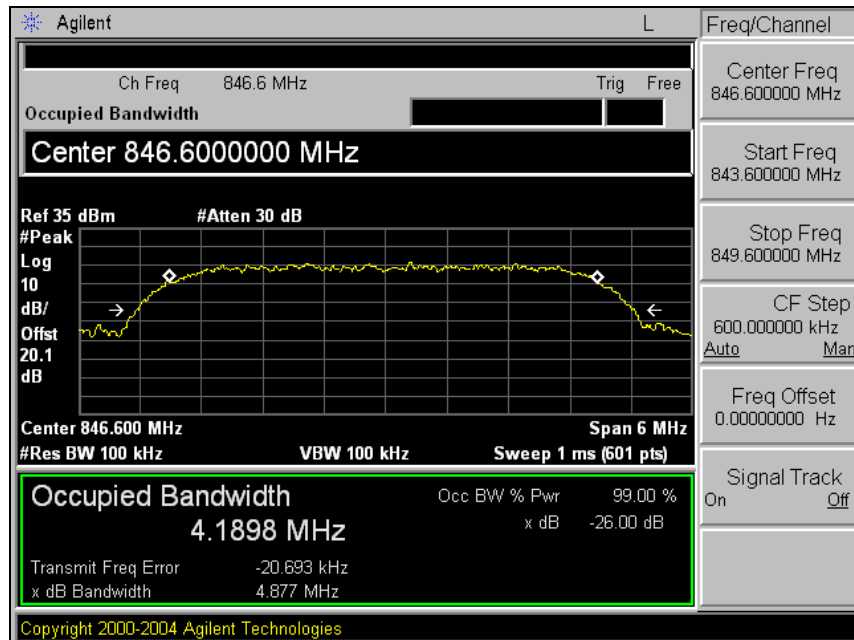


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

UMTS 1900

Normal mode

Frequency	99% Occupied Bandwidth(MHz)	-26 dB Bandwidth(MHz)
1852.4MHz(9262)	4.180	4.831
1880.0 MHz(9400)	4.182	4.872
1907.6MHz(9538)	4.191	4.855

HSDPA mode

Frequency(MHz)	99% Occupied Bandwidth(MHz)	-26 dB Bandwidth(MHz)
1852.4MHz(9262)	4.202	4.853
1880.0 MHz(9400)	4.200	4.871
1907.6MHz(9538)	4.205	4.851

HSUPA mode

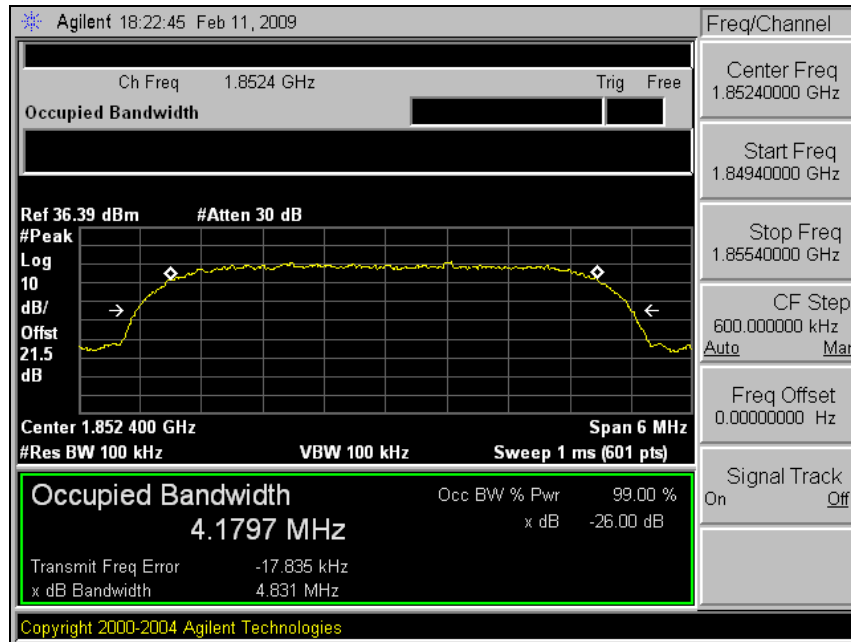
Frequency(MHz)	99% Occupied Bandwidth(MHz)	-26 dB Bandwidth(MHz)
1852.4MHz(9262)	4.196	4.864
1880.0 MHz(9400)	4.188	4.846
1907.6MHz(9538)	4.198	4.817

Please refer to the following plots.

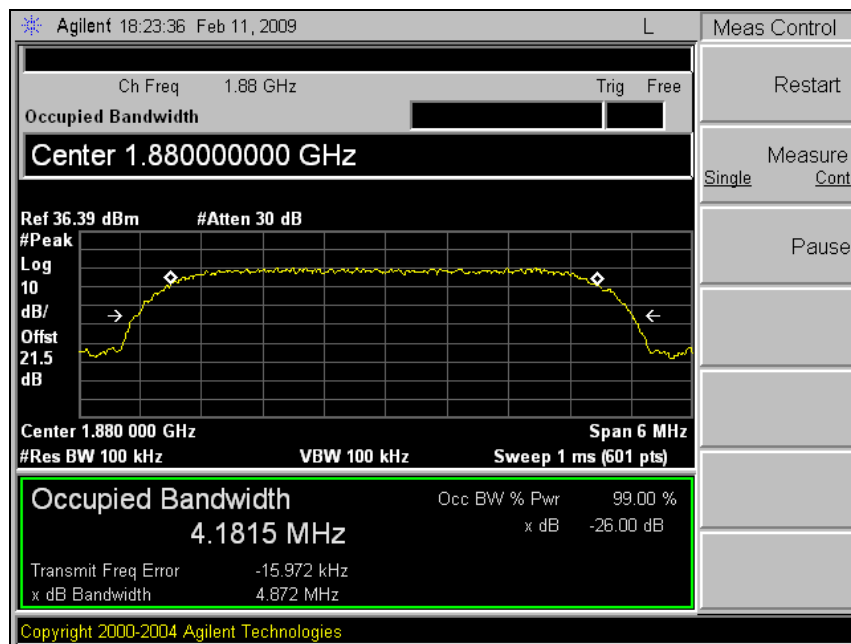
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Normal mode

Low Channel

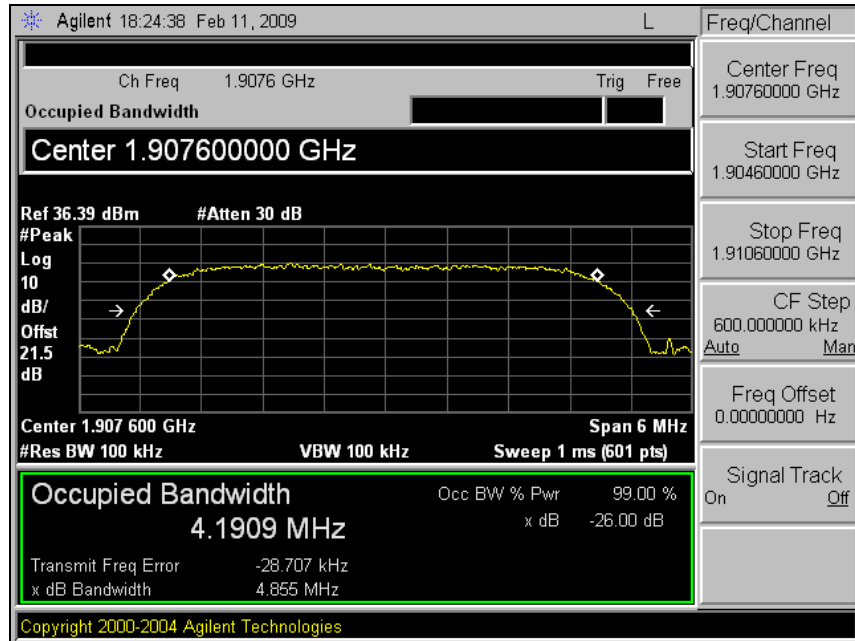


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

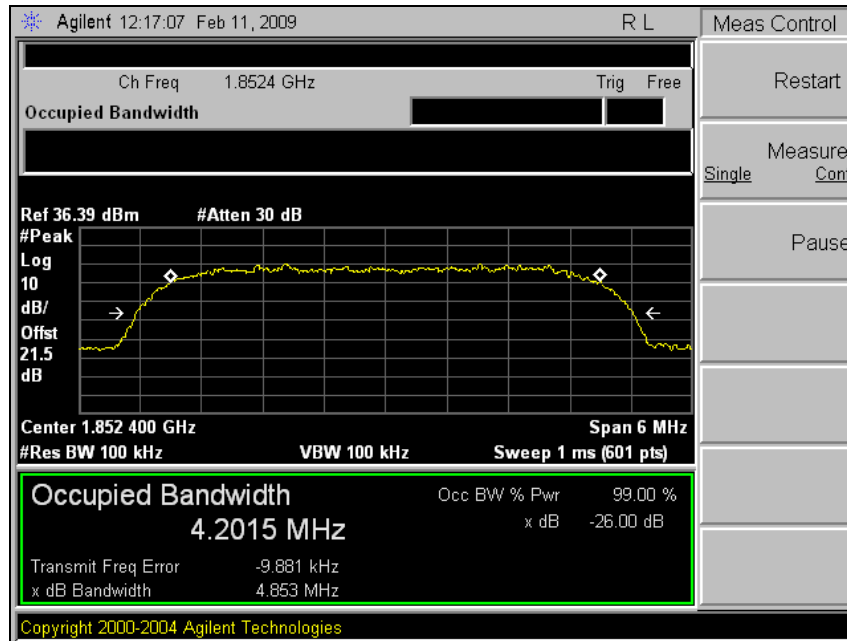
High Channel



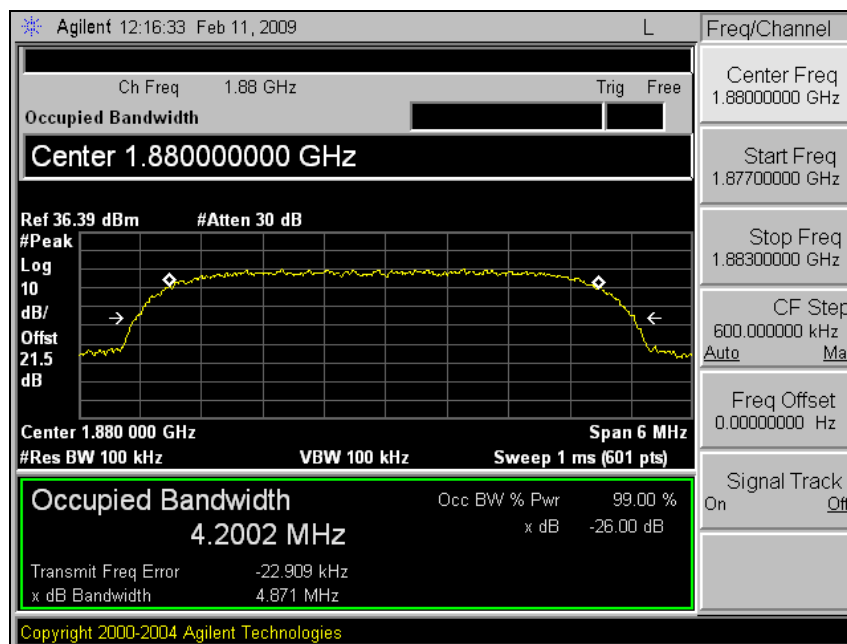
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

HSDPA mode

Low Channel

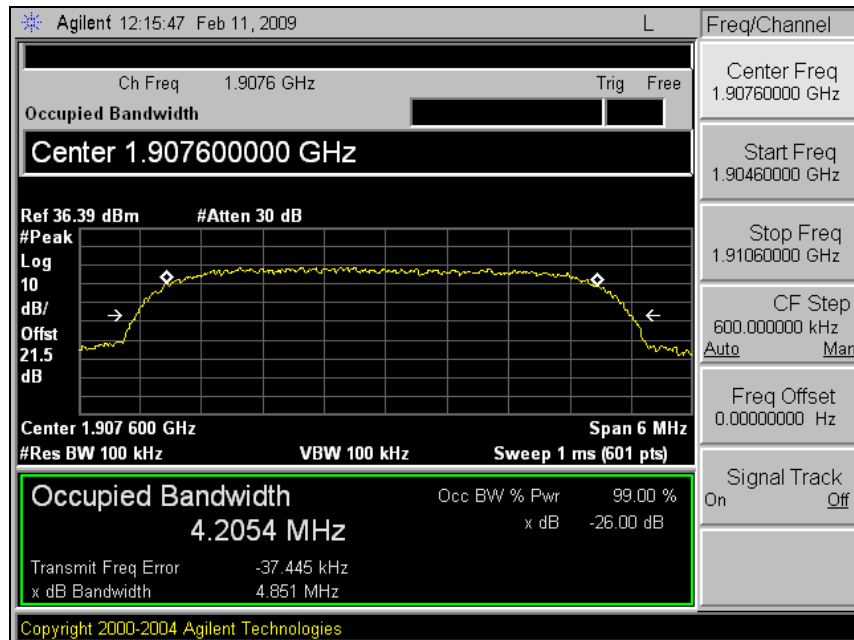


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

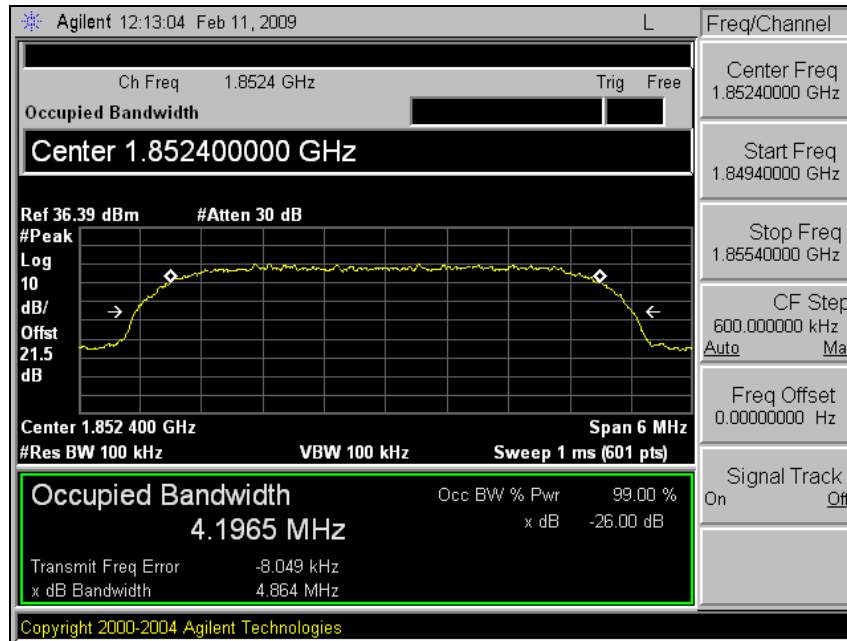
High Channel



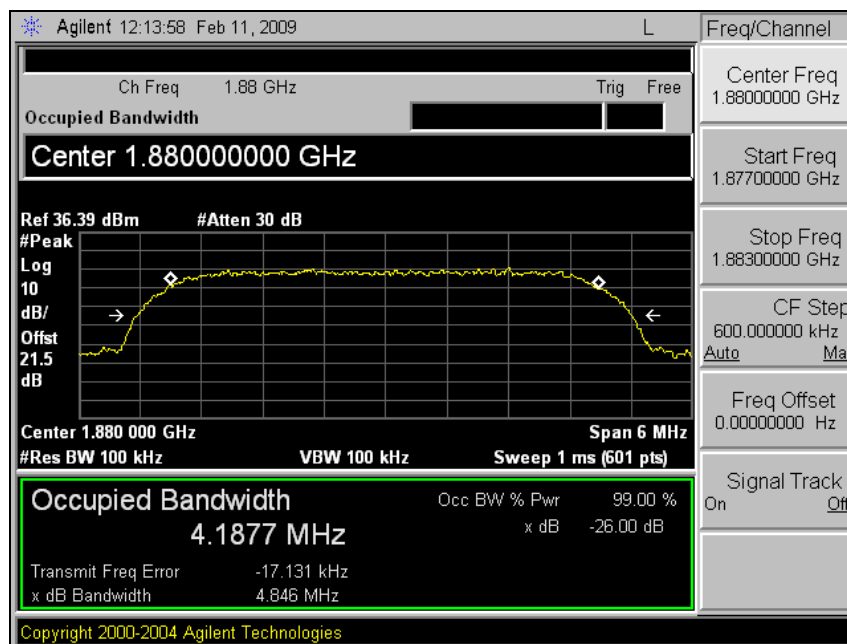
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

HSUPA mode

Low Channel

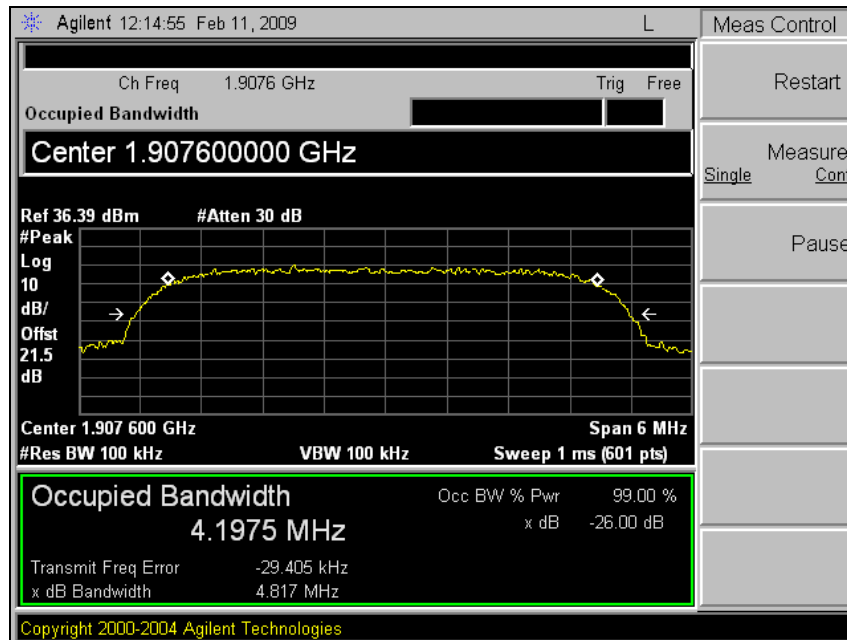


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

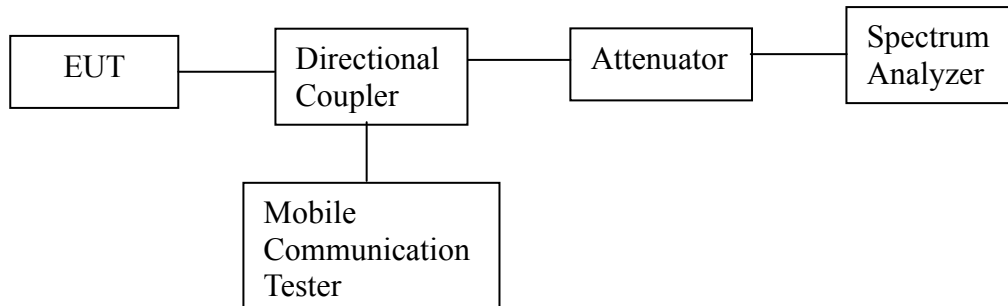
6. Spurious Emissions at Antenna Terminal

6.1. Limit

§ 22.917(e) and §24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency must be attenuated below the transmitting (P) by a factor of at least $43+10\log(P)$ dB.

6.2. Test Procedure

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1 MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.
3. Spurious Emission was tested under RC5/SO55



6.3. Test Results

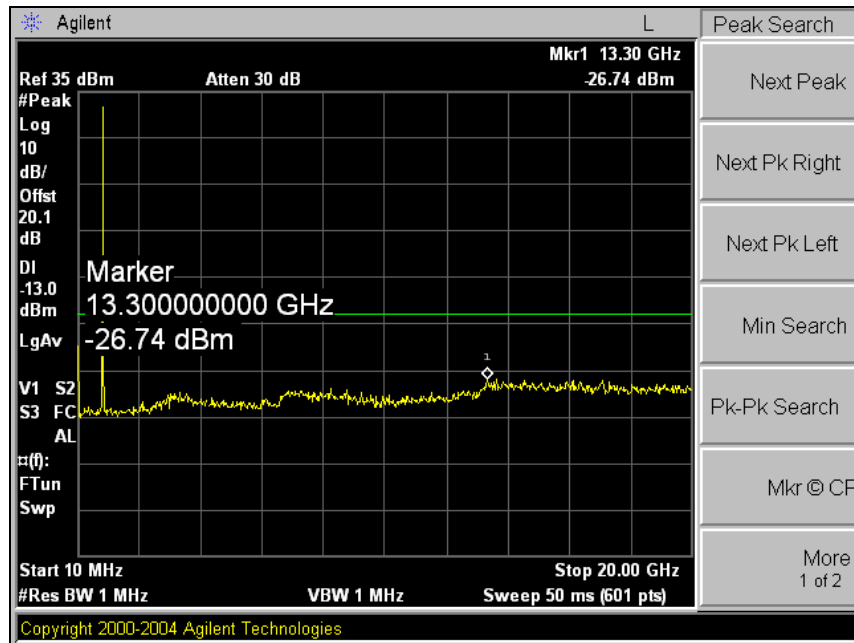
Ambient temperature : 22 °C
Relative humidity : 45 % R.H.

Please refer to the following plots.

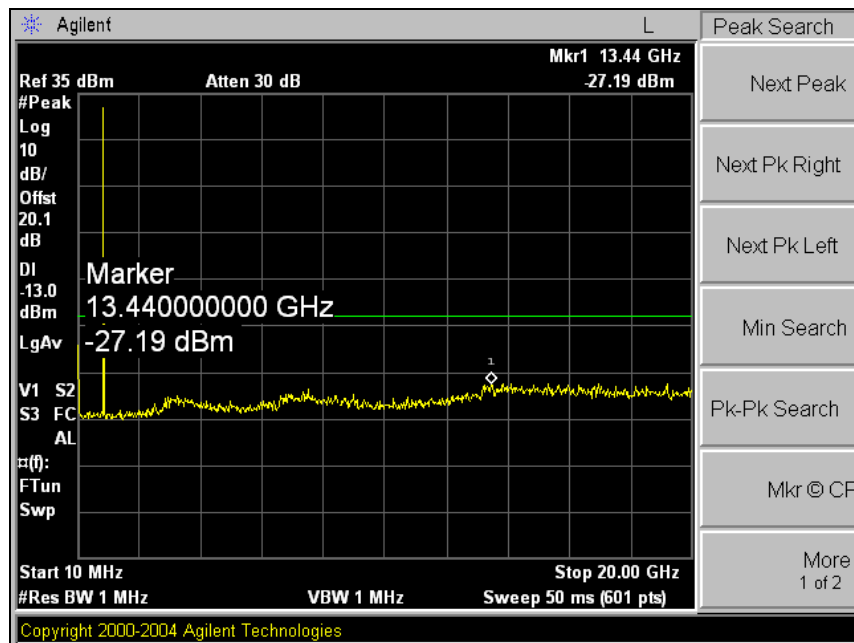
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

GSM 850

Low Channel

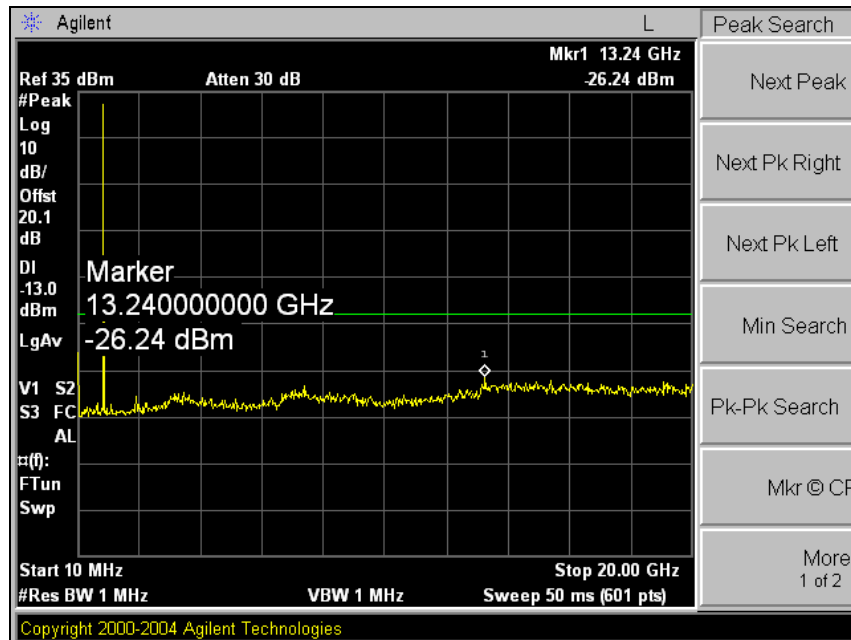


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

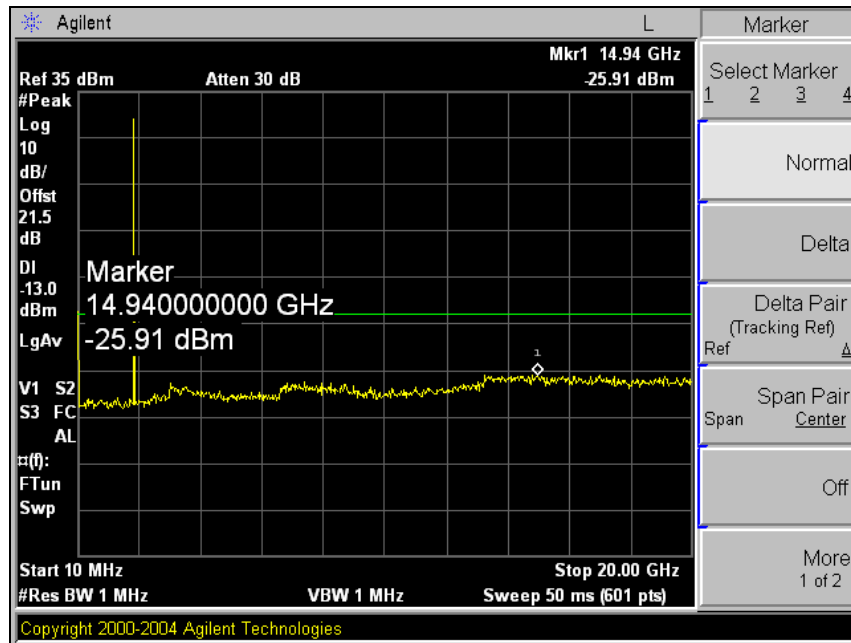
High Channel



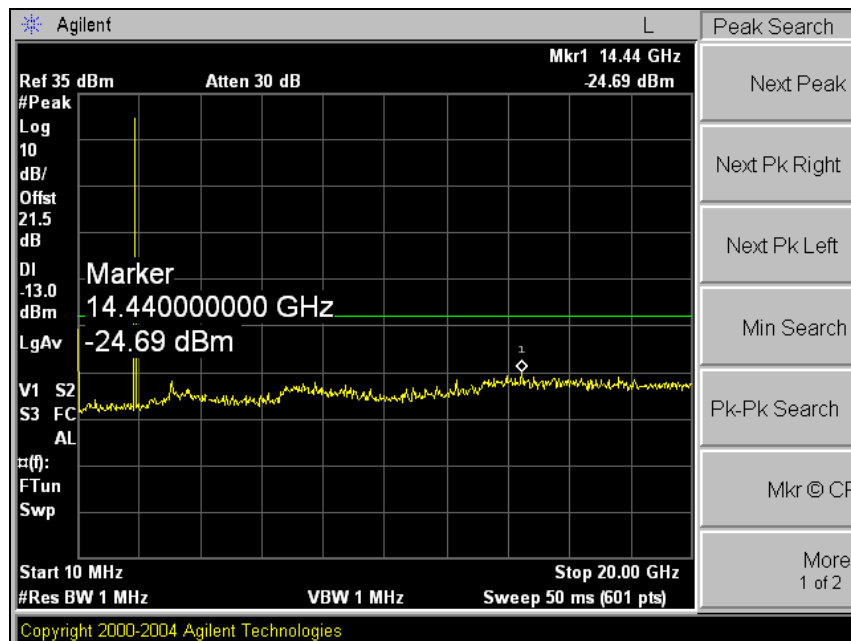
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

GSM 1900

Low Channel

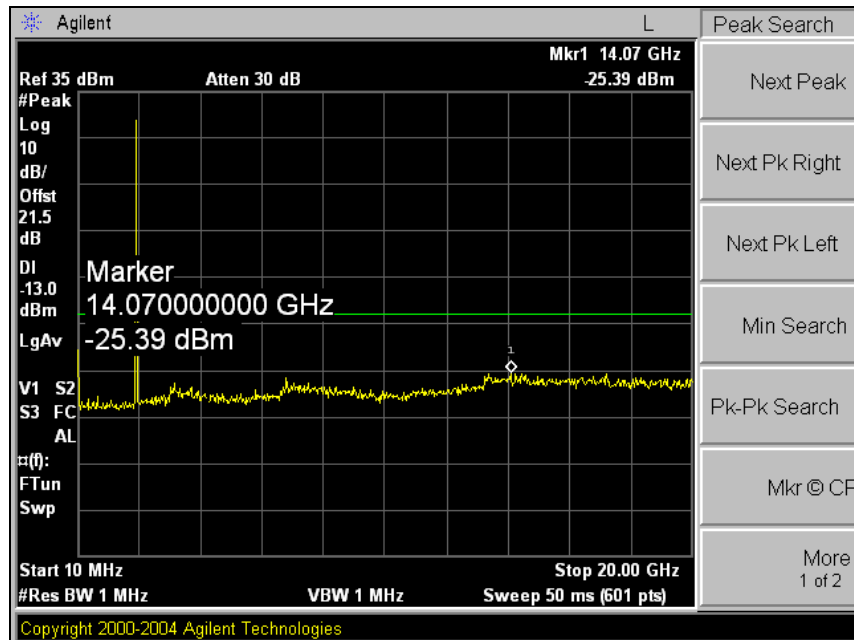


Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

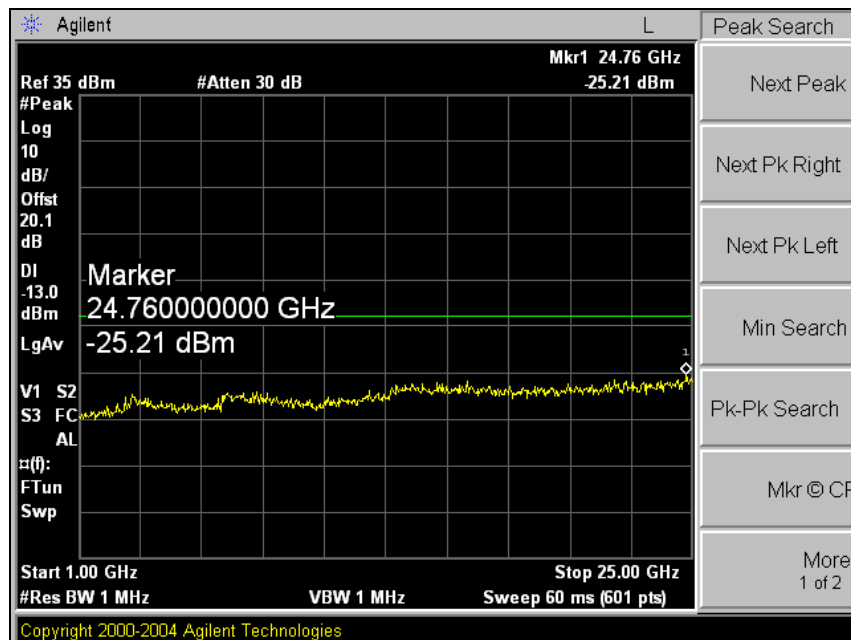
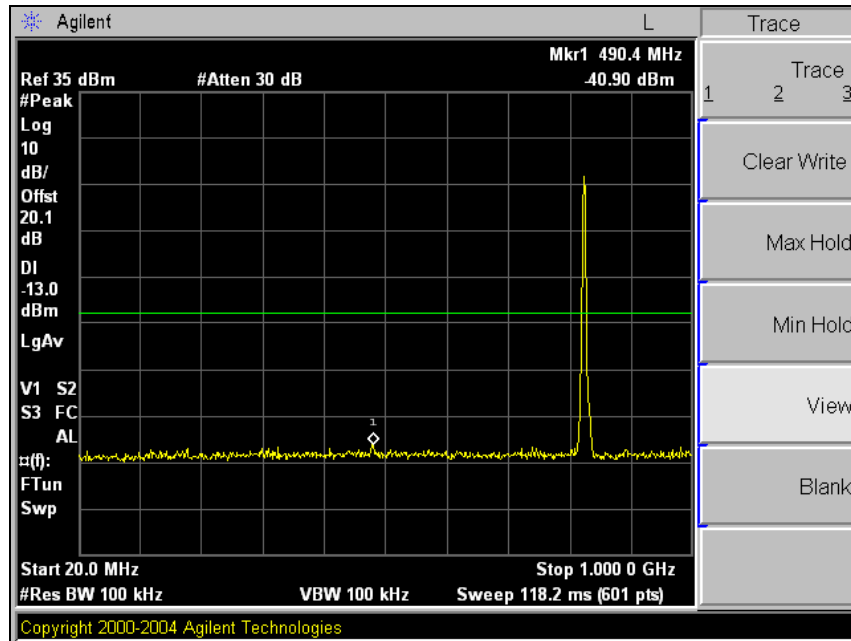
High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

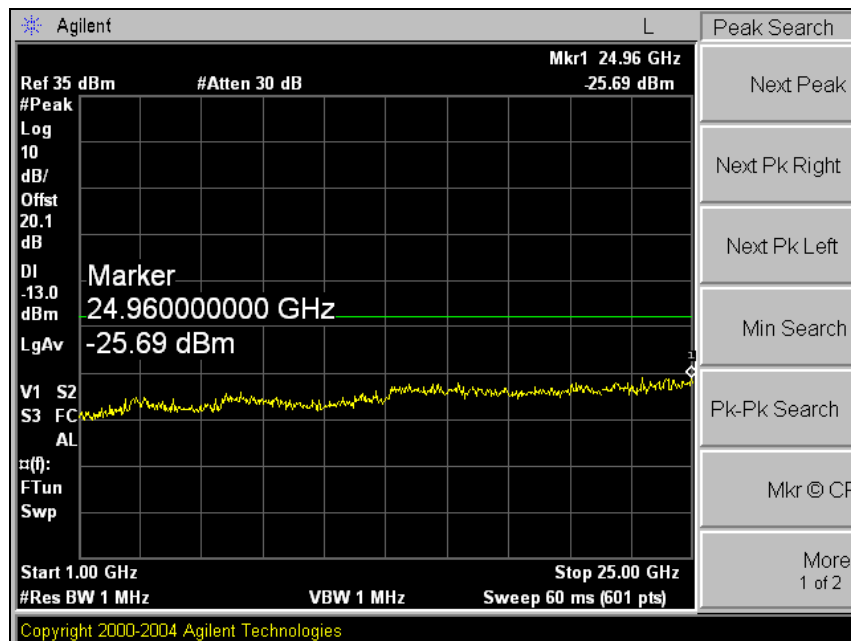
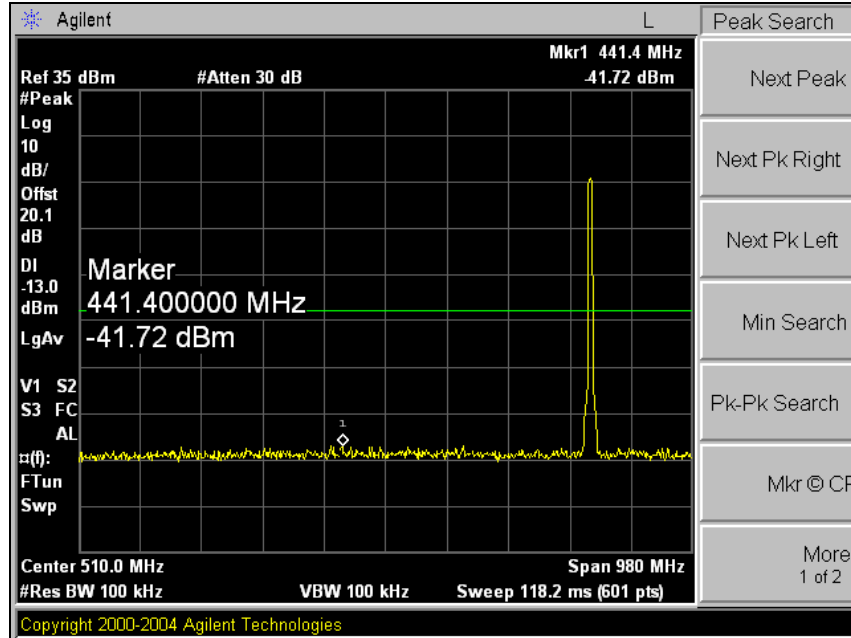
UMTS 850

Low Channel



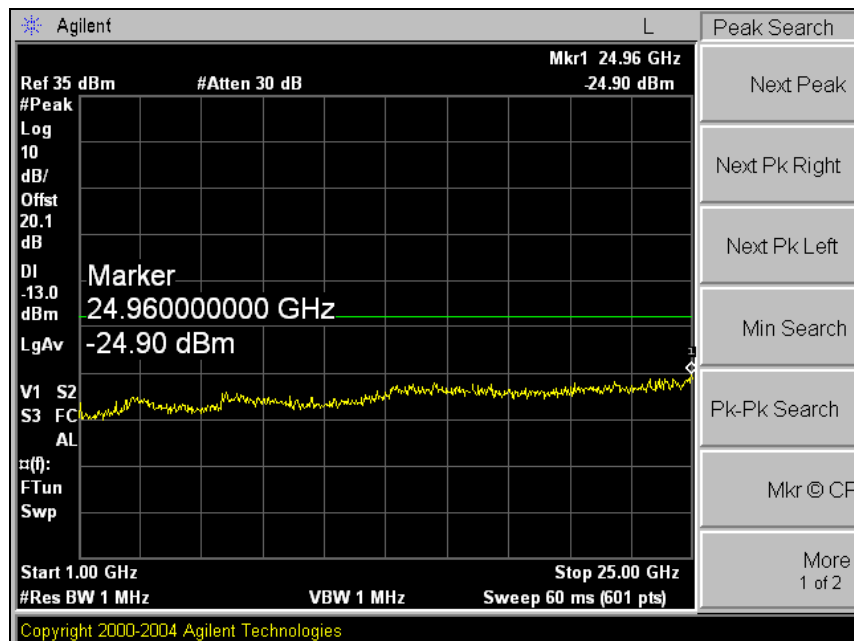
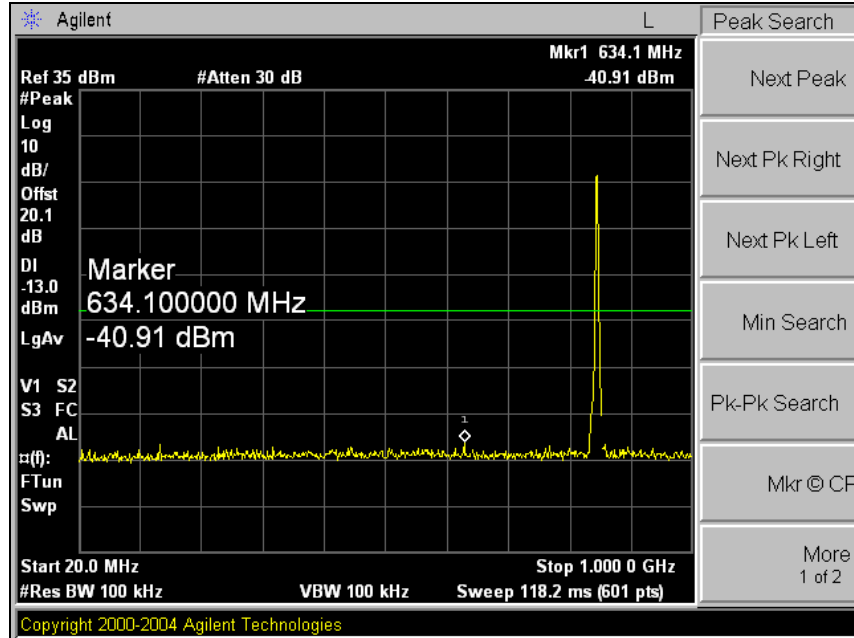
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Middle Channel



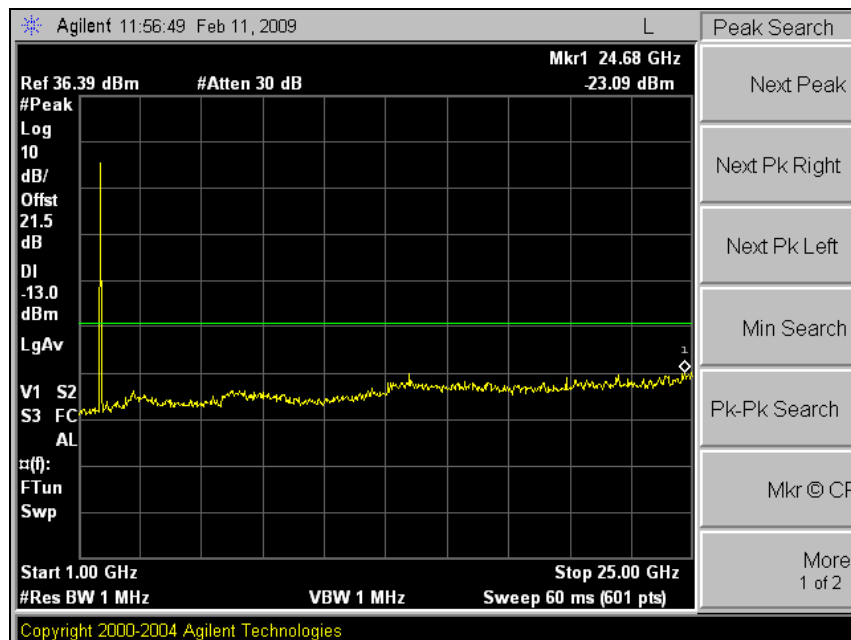
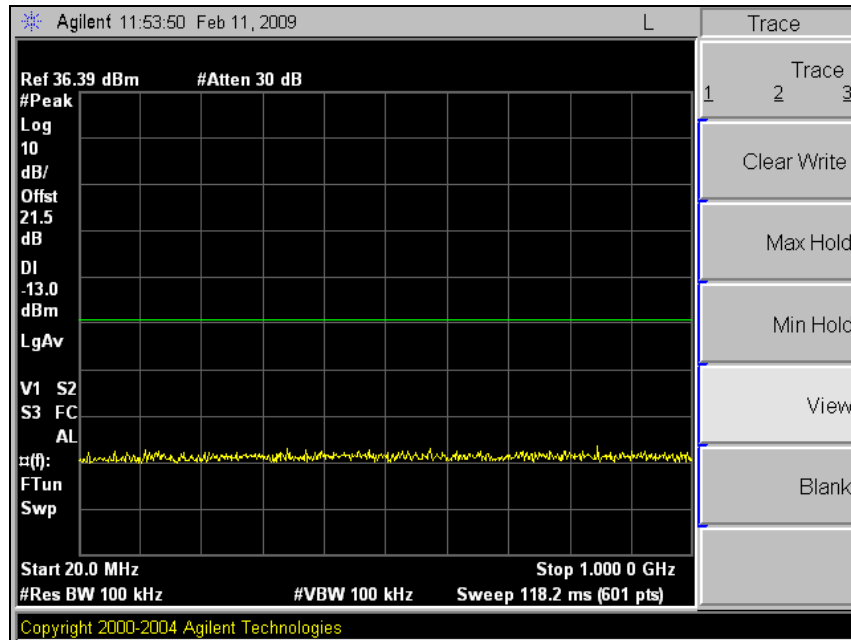
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



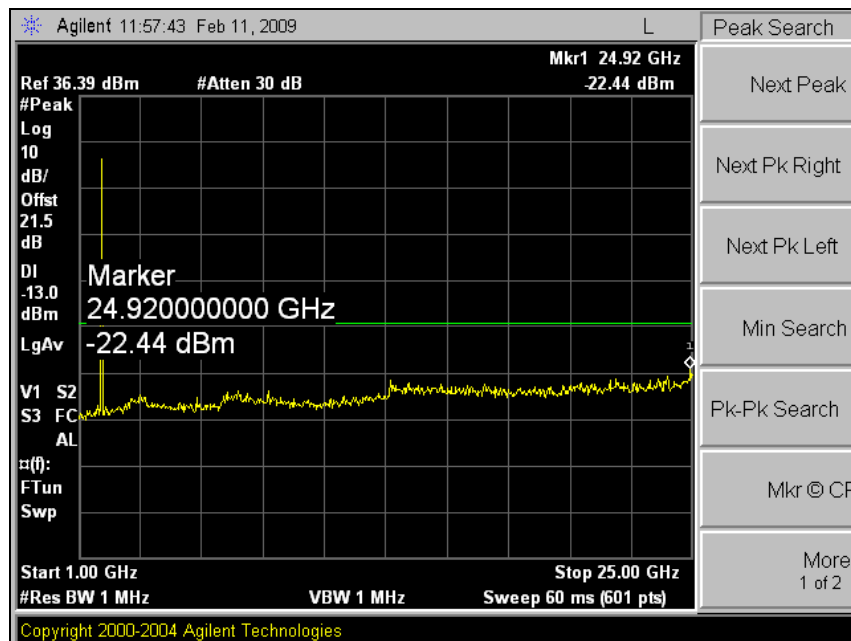
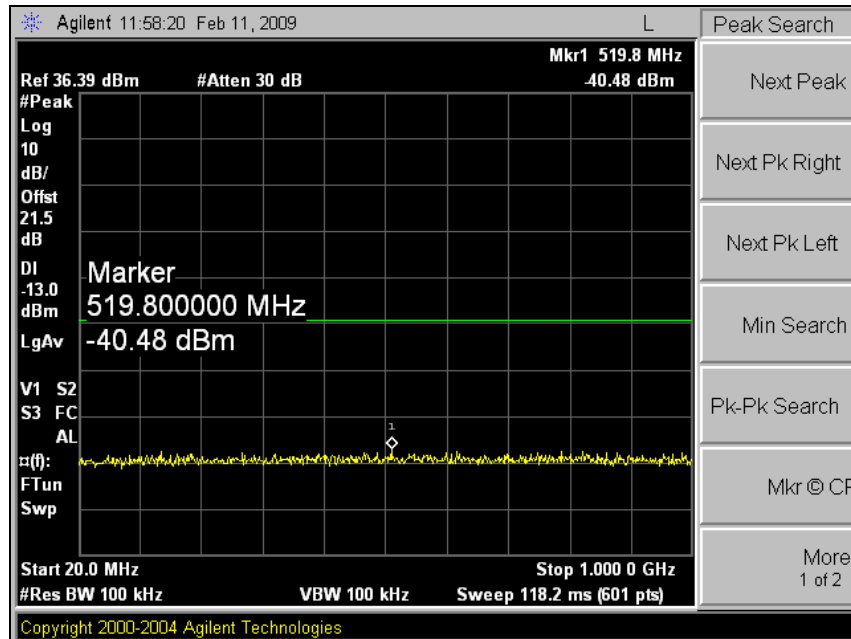
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

UMTS 1900 Low Channel



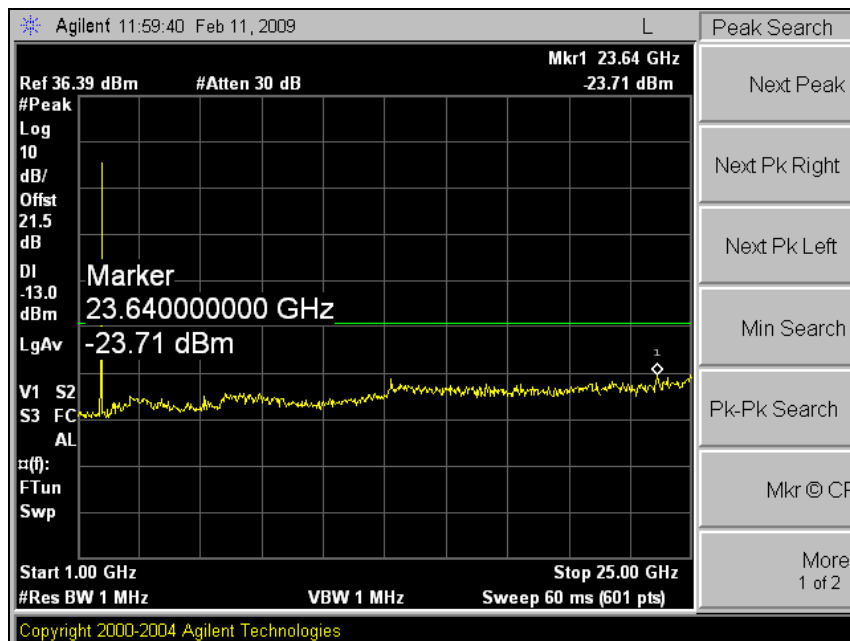
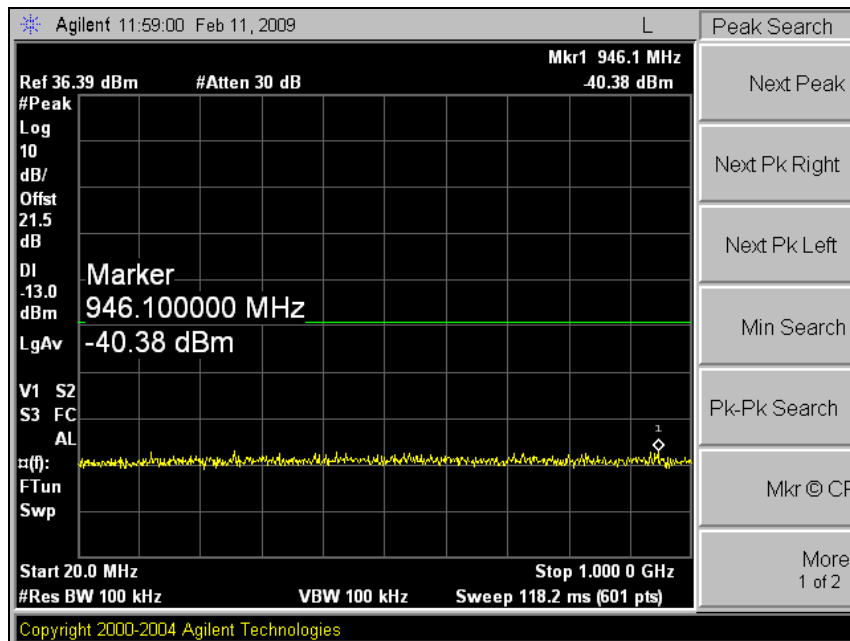
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Middle Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

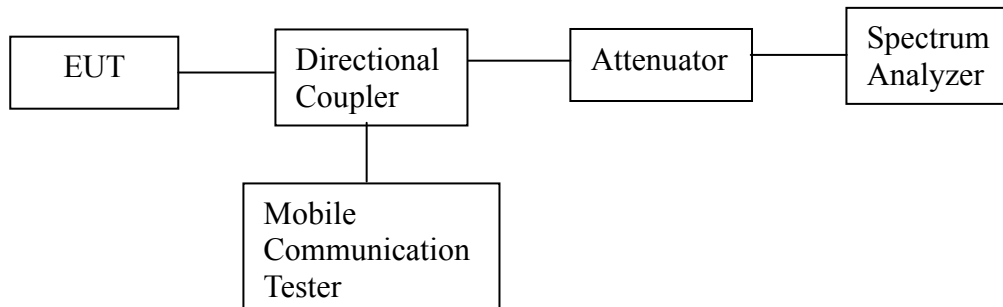
7. Band Edge

7.1. Limit

§ 22.917(e) and §24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency must be attenuated below the transmitting (P) by a factor of at least $43+10\log(P)$ dB.

7.2. Test Procedure

1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The center of the spectrum analyzer was set to block edge frequency.



7.3. Test Results

Ambient temperature : 22 °C
Relative humidity : 45 % R.H.

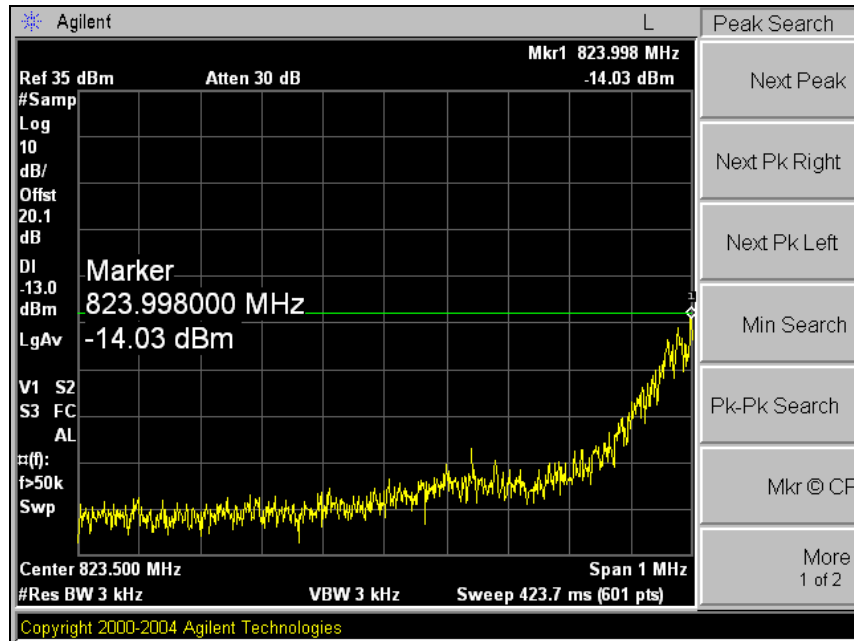
Please refer to the following plots.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

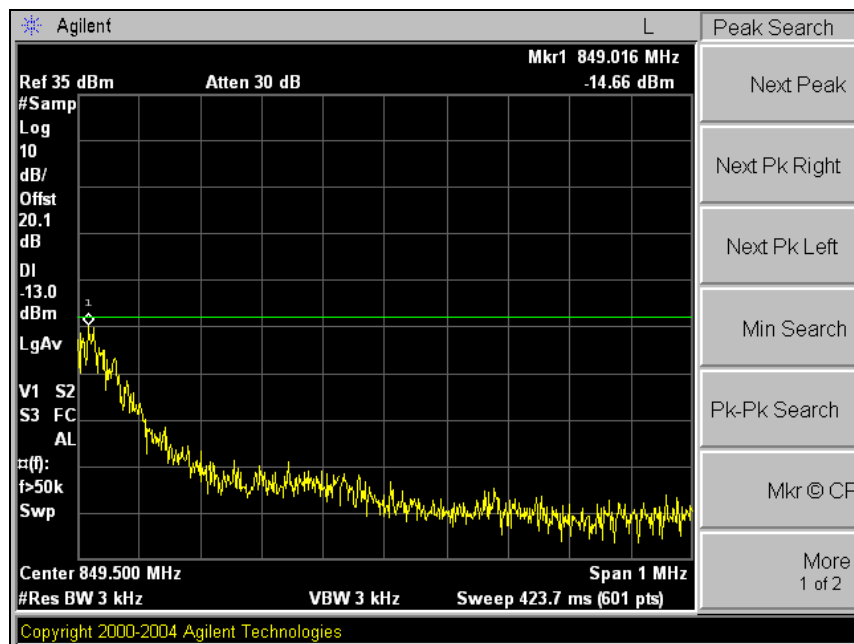
GSM 850

Normal mode

Low Channel



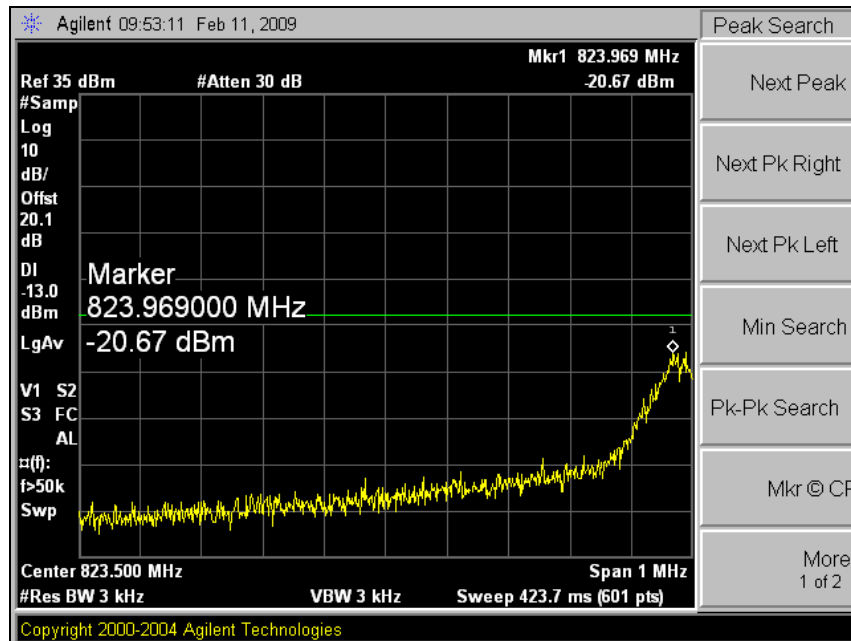
High Channel



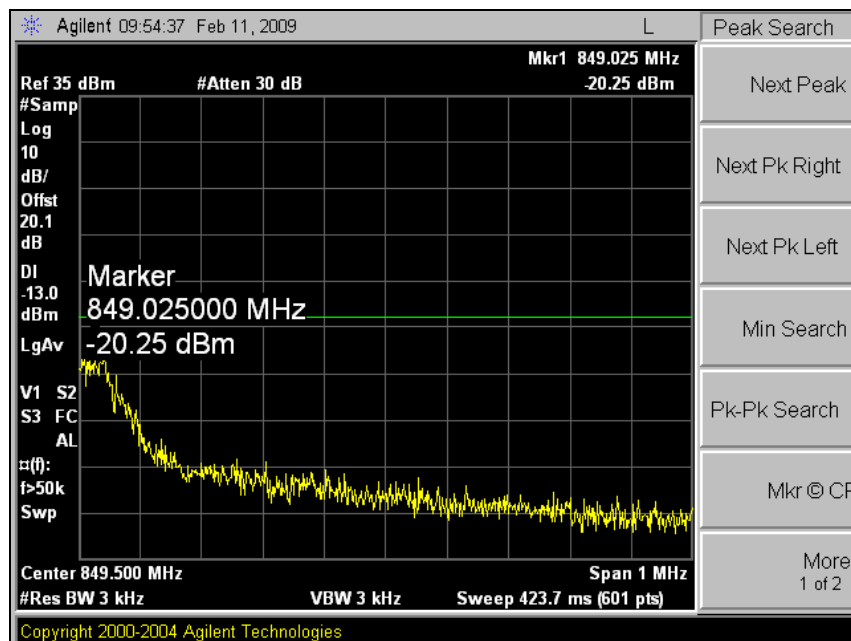
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

EDGE mode

Low Channel



High Channel

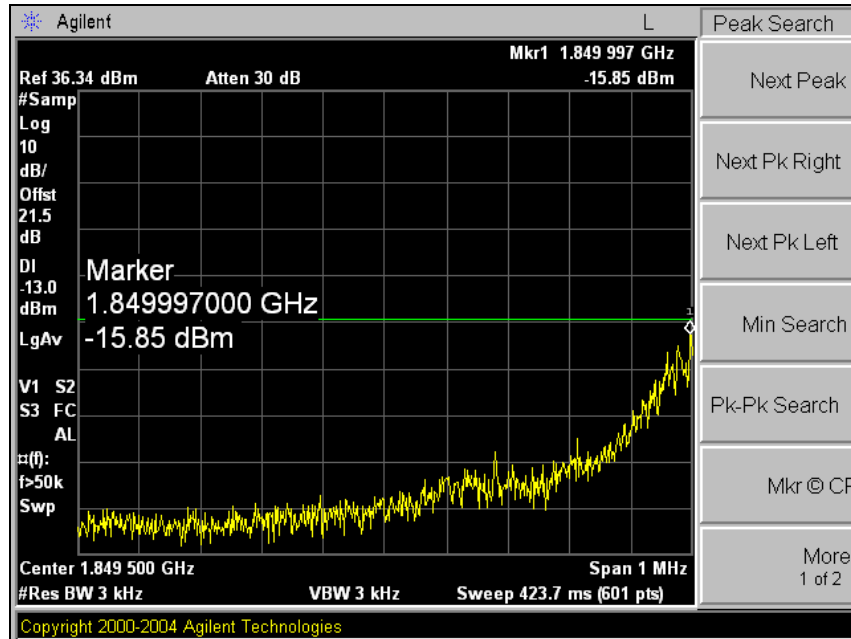


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

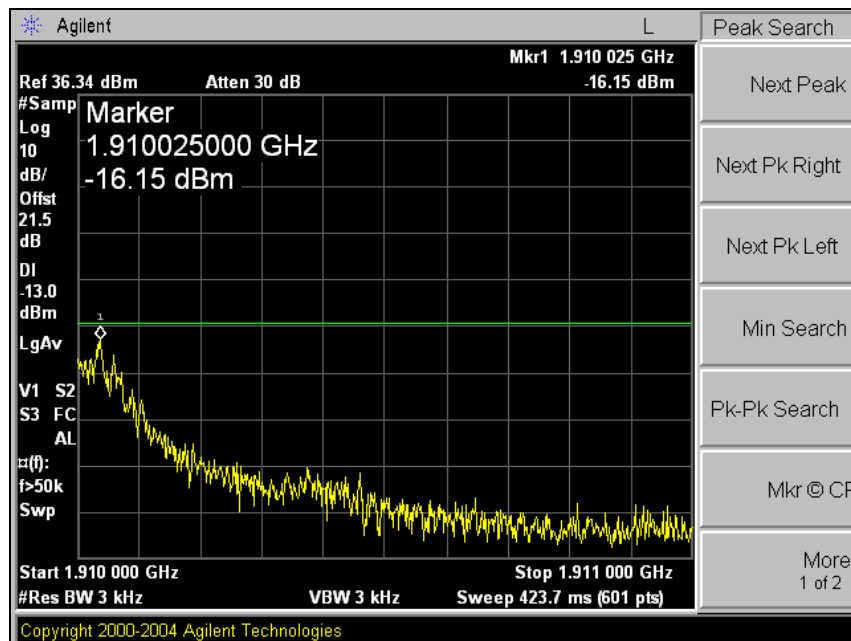
GSM 1900

Normal mode

Low Channel



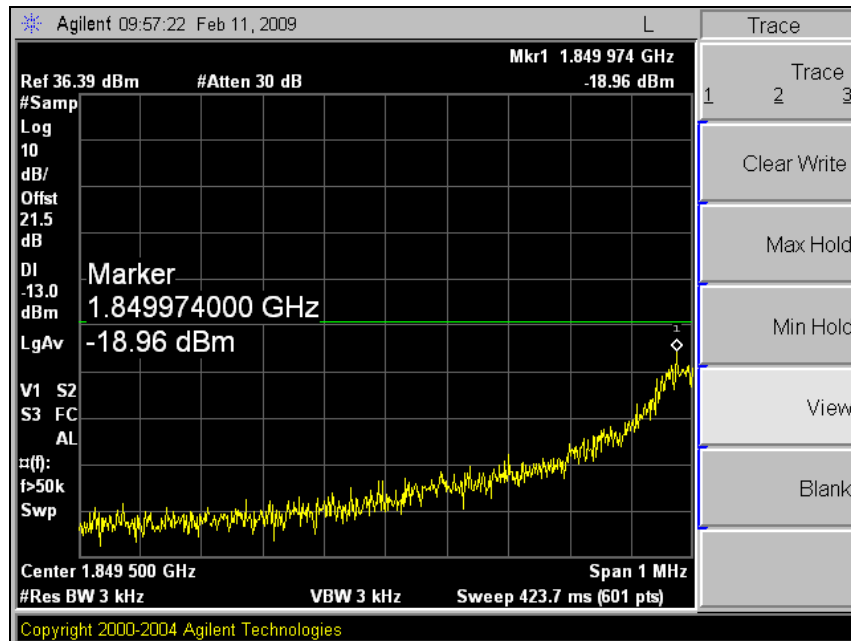
High Channel



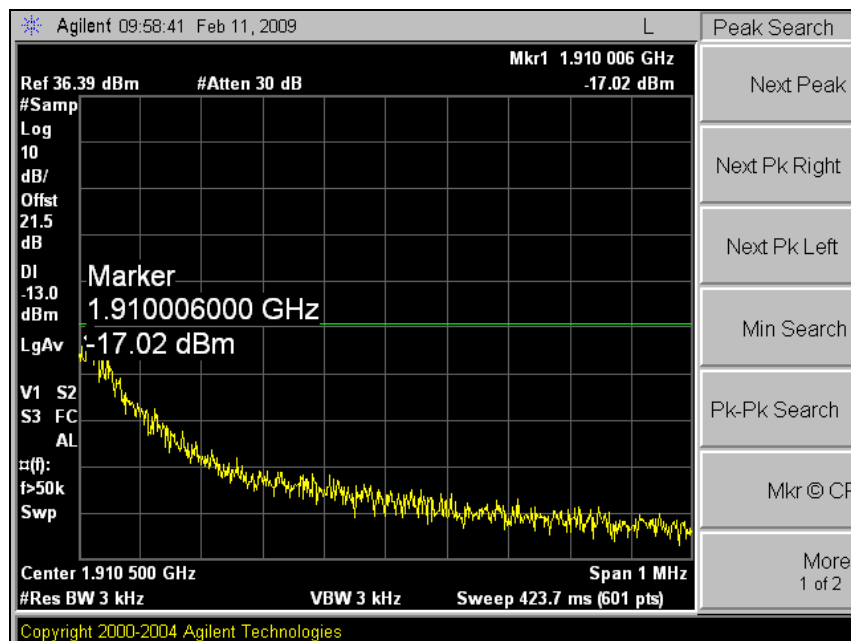
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

EDGE mode

Low Channel



High Channel

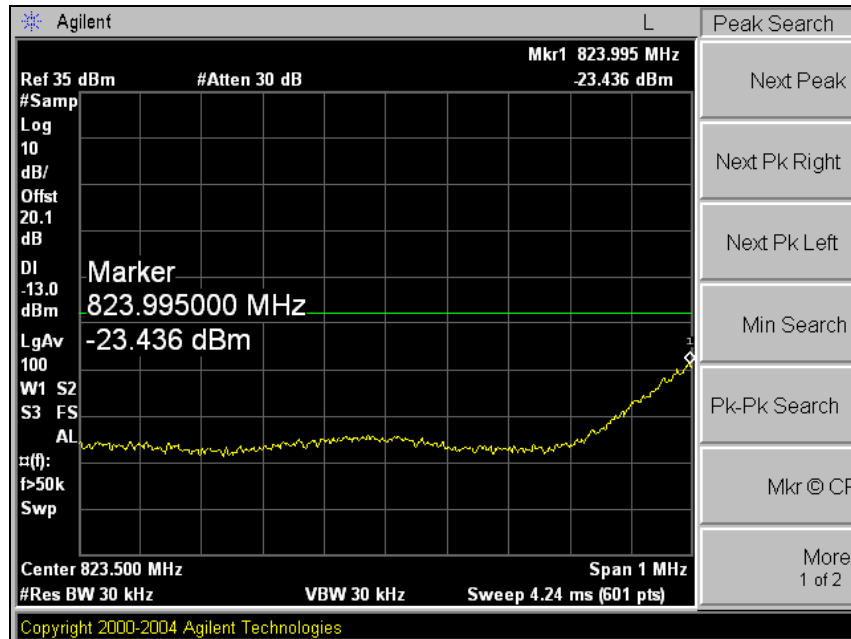


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

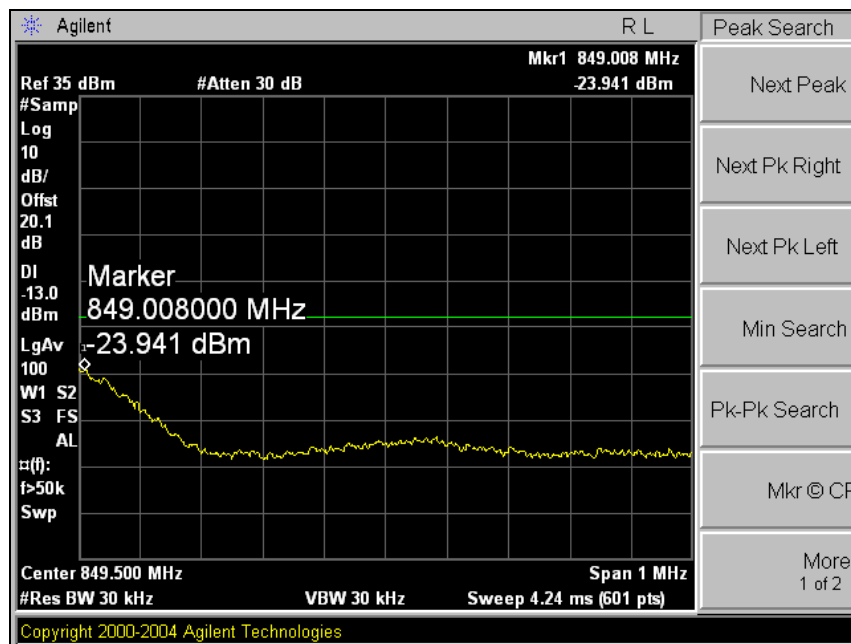
UMTS 850

Normal mode

Low Channel



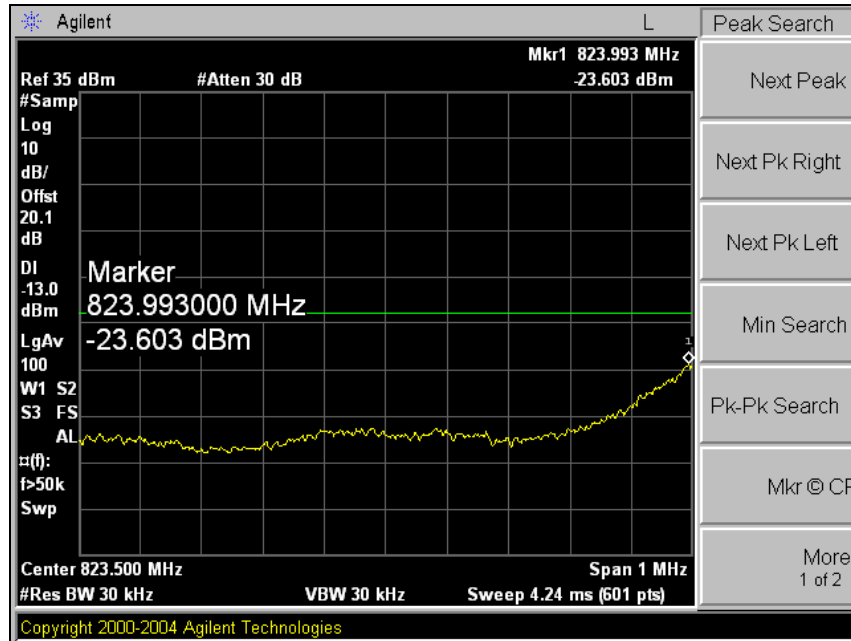
High Channel



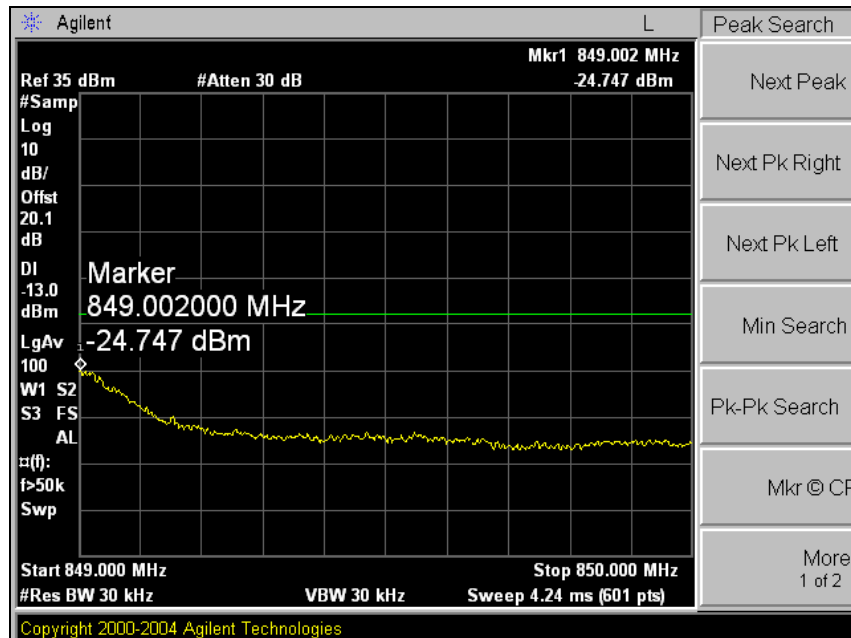
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

HSDPA mode

Low Channel



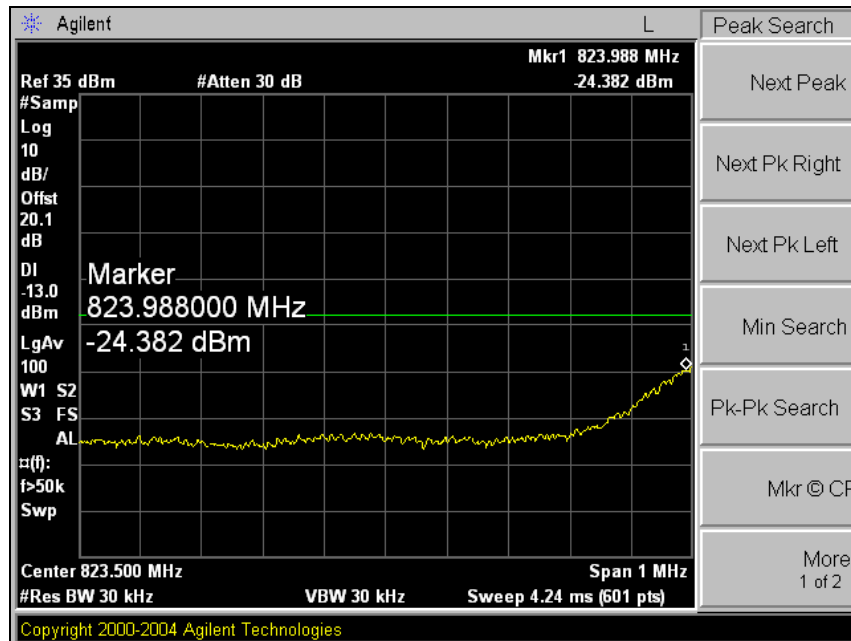
High Channel



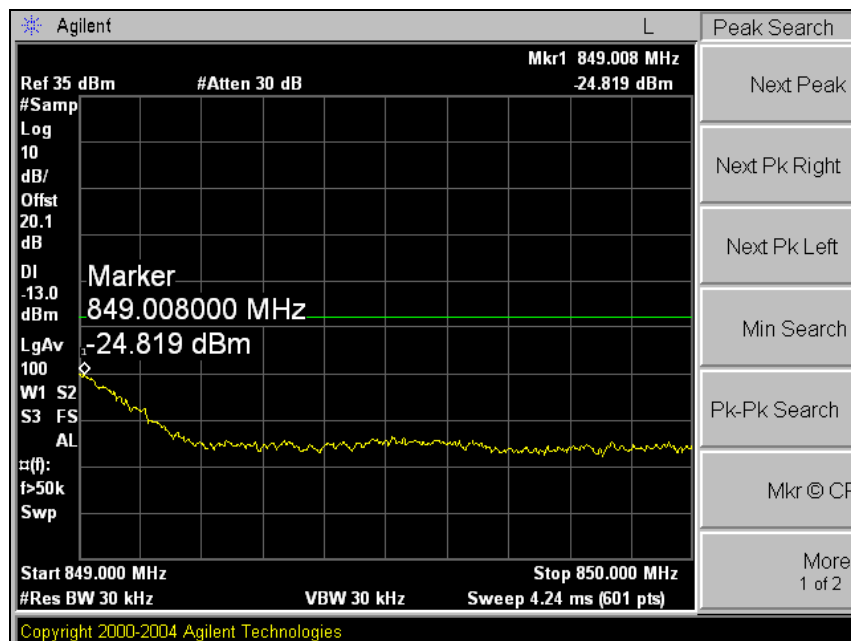
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

HSUPA mode

Low Channel



High Channel

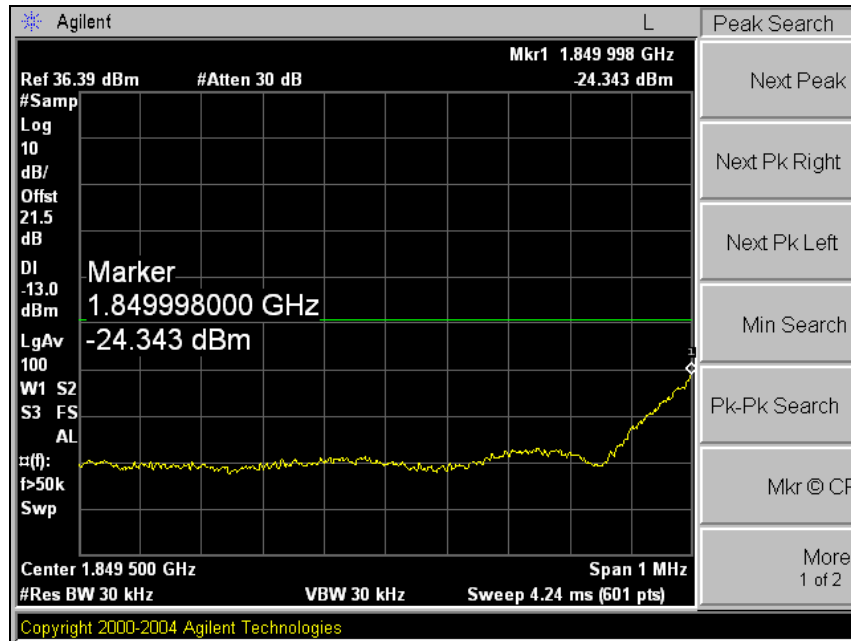


The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

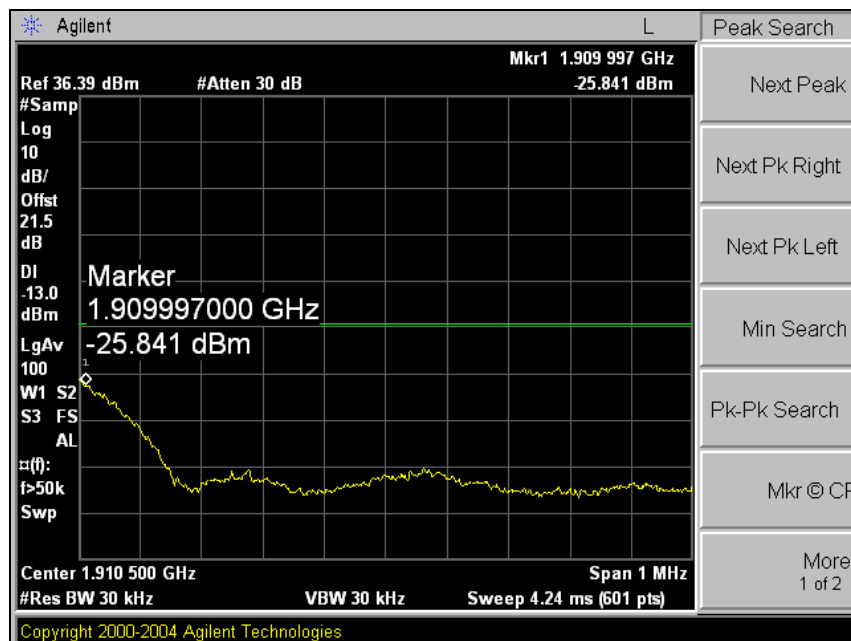
UMTS 1900

Normal mode

Low Channel



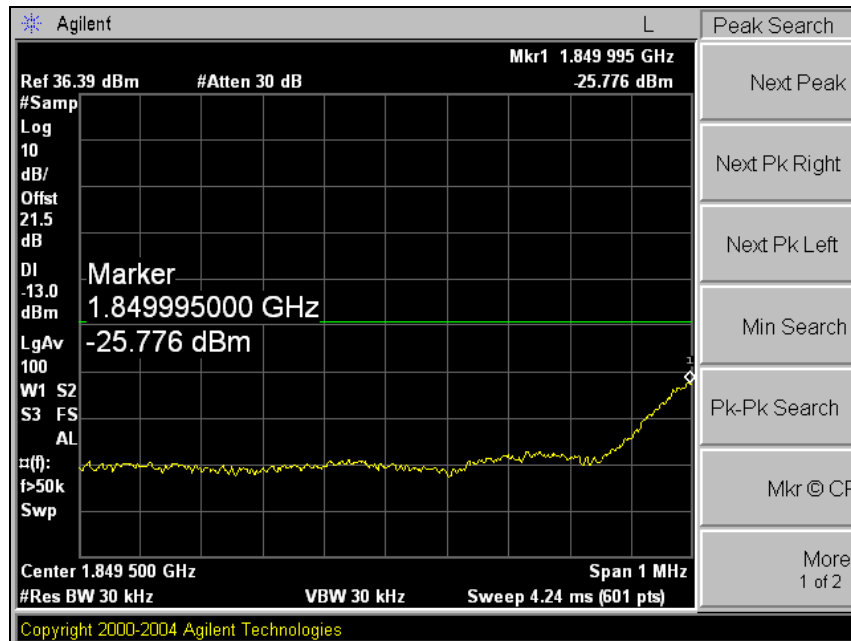
High Channel



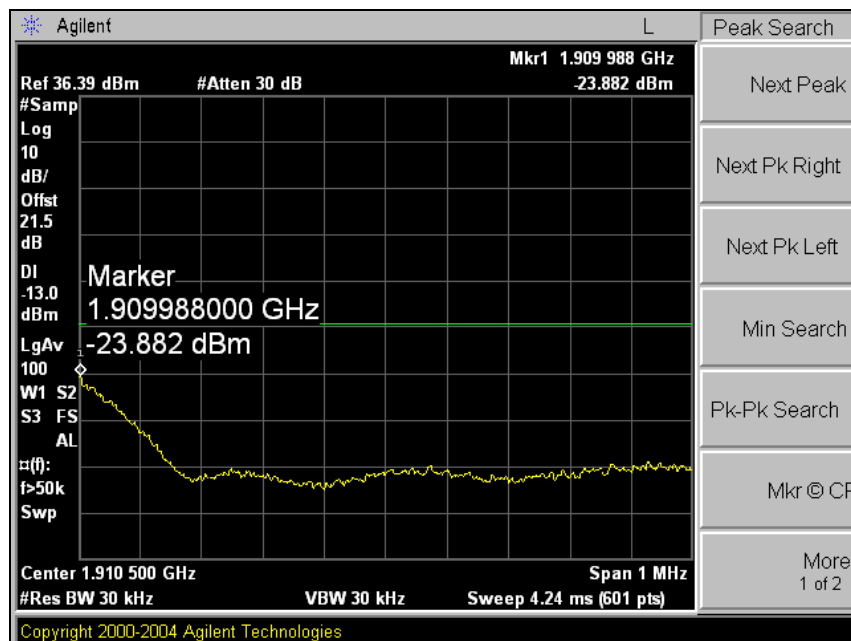
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

HSDPA mode

Low Channel



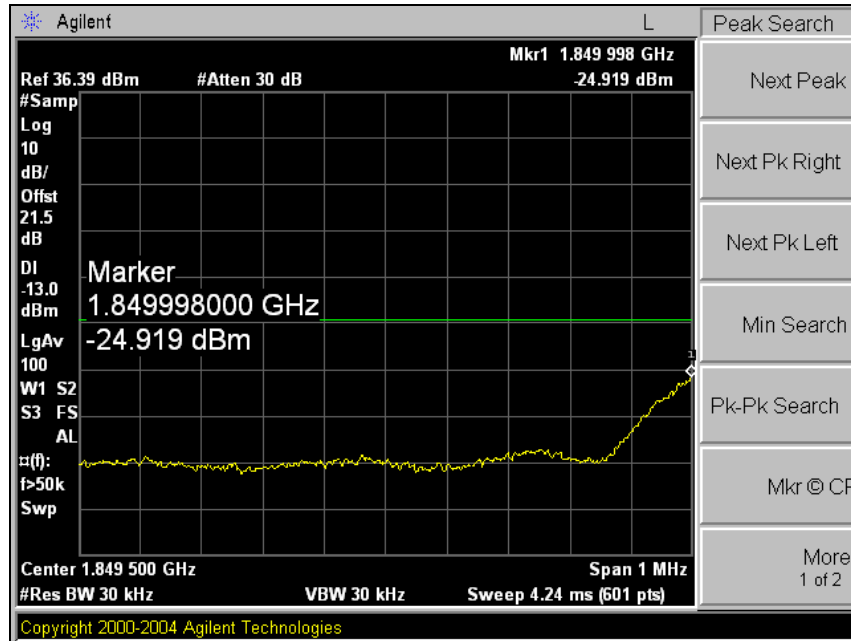
High Channel



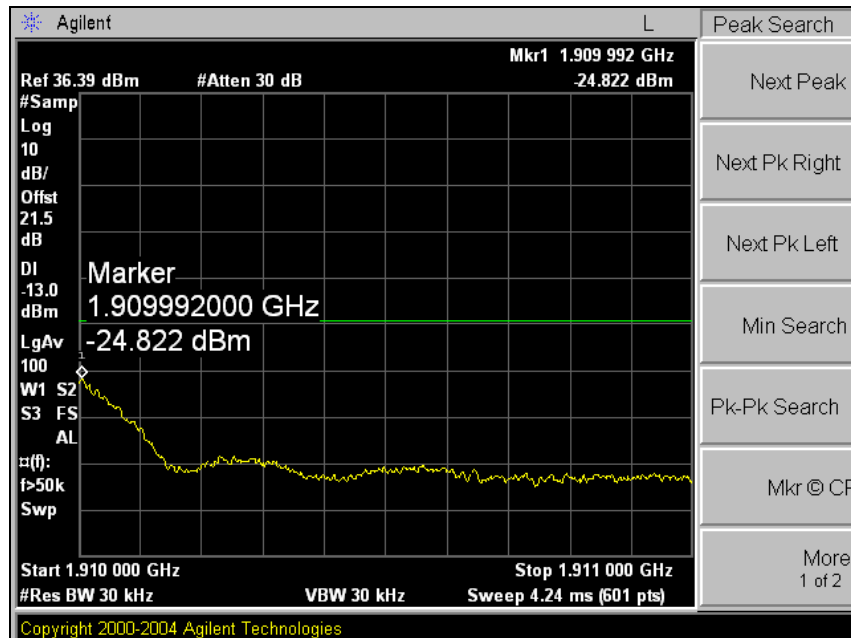
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

HSUPA mode

Low Channel



High Channel



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

8. Frequency Stability

8.1. Limit

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

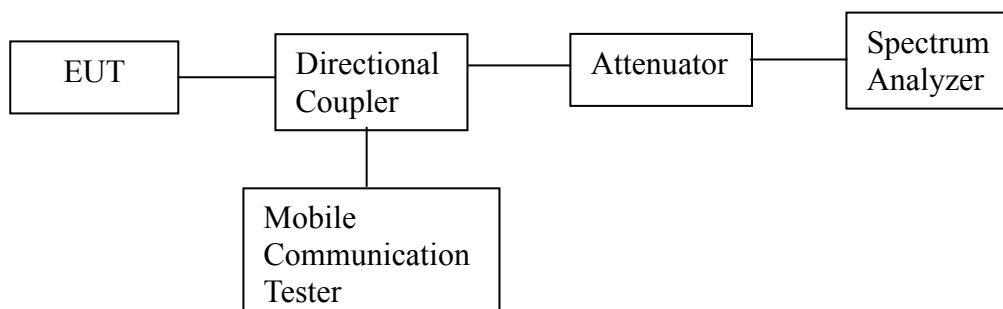
According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.

For Mobile devices operating in the 824 to 849 MHz band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

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

8.2. Test Procedure

1. Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed-through attenuators.
2. The EUT was placed inside the temperature chamber.
3. After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.
4. Frequency Stability vs. Voltage: An external variable AC 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.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

8.3. Test Results

Ambient temperature : 21 °C
Relative humidity : 45 % R.H.

Frequency Stability versus Temperature

GSM 850

Reference Frequency: 836.4 MHz, Limit: 2.5 ppm			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
21(Ref.)	110	-45	-0.054
35	110	-45	-0.054
30	110	-38	-0.045
20	110	-40	-0.048
10	110	-51	-0.061

GSM 1900

Reference Frequency: 1880.0 MHz, Limit: 2.5 ppm			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
21(Ref.)	110	-98	-0.052
35	110	-110	-0.059
30	110	-98	-0.052
20	110	-90	-0.048
10	110	-87	-0.046

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

UMTS 850

Reference Frequency: 836.0 MHz, Limit: 2.5 ppm			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
21(Ref.)	110	-35	-0.042
35	110	-50	-0.060
30	110	-47	-0.056
20	110	-38	-0.045
10	110	-41	-0.049

UMTS 1900

Reference Frequency: 1880.0 MHz, Limit: 2.5 ppm			
Environment Temperature (°C)	Power Supplied (Vac)	Frequency Measure with Time Elapse	
		Frequency Error (Hz)	ppm
21(Ref.)	110	-30	-0.016
35	110	-40	-0.021
30	110	-44	-0.023
20	110	-48	-0.026
10	110	-41	-0.022

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Frequency Stability versus AC power Supply

GSM 850

Reference Frequency: 836.4 MHz, Limit: 2.5 ppm			
Power Supplied (Vac)	Environment Temperature (°C)	Frequency Error (Hz)	ppm
83.5	21	-41	-0.049
126.5	21	-45	-0.054

GSM 1900

Reference Frequency: 1880.0 MHz, Limit: 2.5 ppm			
Power Supplied (Vac)	Environment Temperature (°C)	Frequency Error (Hz)	ppm
83.5	21	-100	-0.053
126.5	21	-104	-0.055

UMTS 850

Reference Frequency: 836.0 MHz, Limit: 2.5 ppm			
Power Supplied (Vac)	Environment Temperature (°C)	Frequency Error (Hz)	ppm
83.5	21	-34	-0.041
126.5	21	-38	-0.045

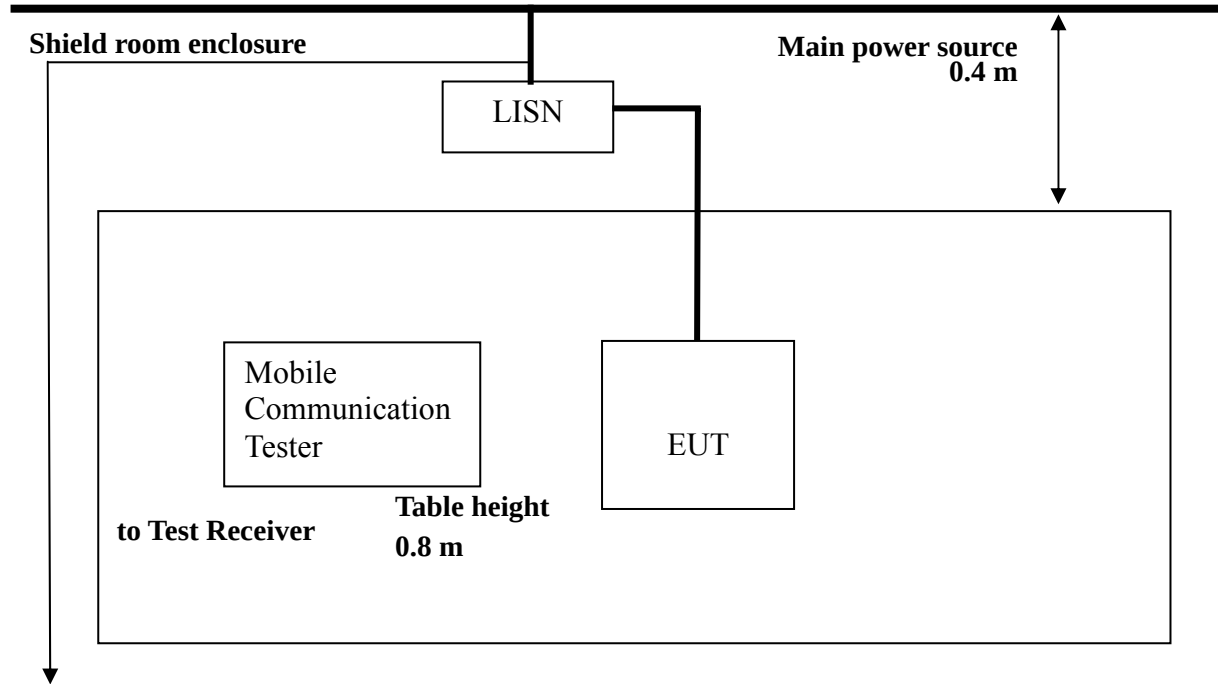
UMTS 1900

Reference Frequency: 1880.0 MHz, Limit: 2.5 ppm			
Power Supplied (Vac)	Environment Temperature (°C)	Frequency Error (Hz)	ppm
83.5	21	-38	-0.020
126.5	21	-41	-0.022

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

9. Receiver AC power line conducted emission

9.1. Test Setup



9.2. Limit

According to §15.107(a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency of Emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15 – 0.50	66-56*	56-46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

□ Decreases with the logarithm of the frequency.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

9.3. Test Procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The test procedure is performed in a 6.5 m × 3.6 m × 3.6 m (L×W×H) shielded room. The EUT along with its peripherals were placed on a 1.0 m(W)× 1.5 m(L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

9.4. Test Results (Worst case configuration_GSM 850 mode)

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Ambient temperature : 22 °C
Relative humidity : 45 % R.H.

Frequency range : 0.15 MHz – 30 MHz
Measured Bandwidth : 9 kHz

Freq. (MHz)	Level (dBuV)		Line	Limit (dBuV)		Margin (dB)	
	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.20	44.00	35.80	H	63.61	53.61	19.61	17.81
0.27	37.40	32.20	H	61.12	51.12	23.72	18.92
0.54	37.80	31.00	H	56.00	46.00	18.20	15.00
1.01	33.60	32.10	H	56.00	46.00	22.40	13.90
4.86	33.60	26.50	H	56.00	46.00	22.40	19.50
15.90	36.60	29.30	H	60.00	50.00	23.40	20.70
0.20	43.20	36.50	N	63.61	53.61	20.41	17.11
0.27	36.50	33.60	N	61.12	51.12	24.62	17.52
0.54	37.80	32.80	N	56.00	46.00	18.20	13.20
1.01	34.50	34.10	N	56.00	46.00	21.50	11.90
4.86	34.20	26.30	N	56.00	46.00	21.80	19.70
15.90	36.50	31.20	N	60.00	50.00	23.50	18.80

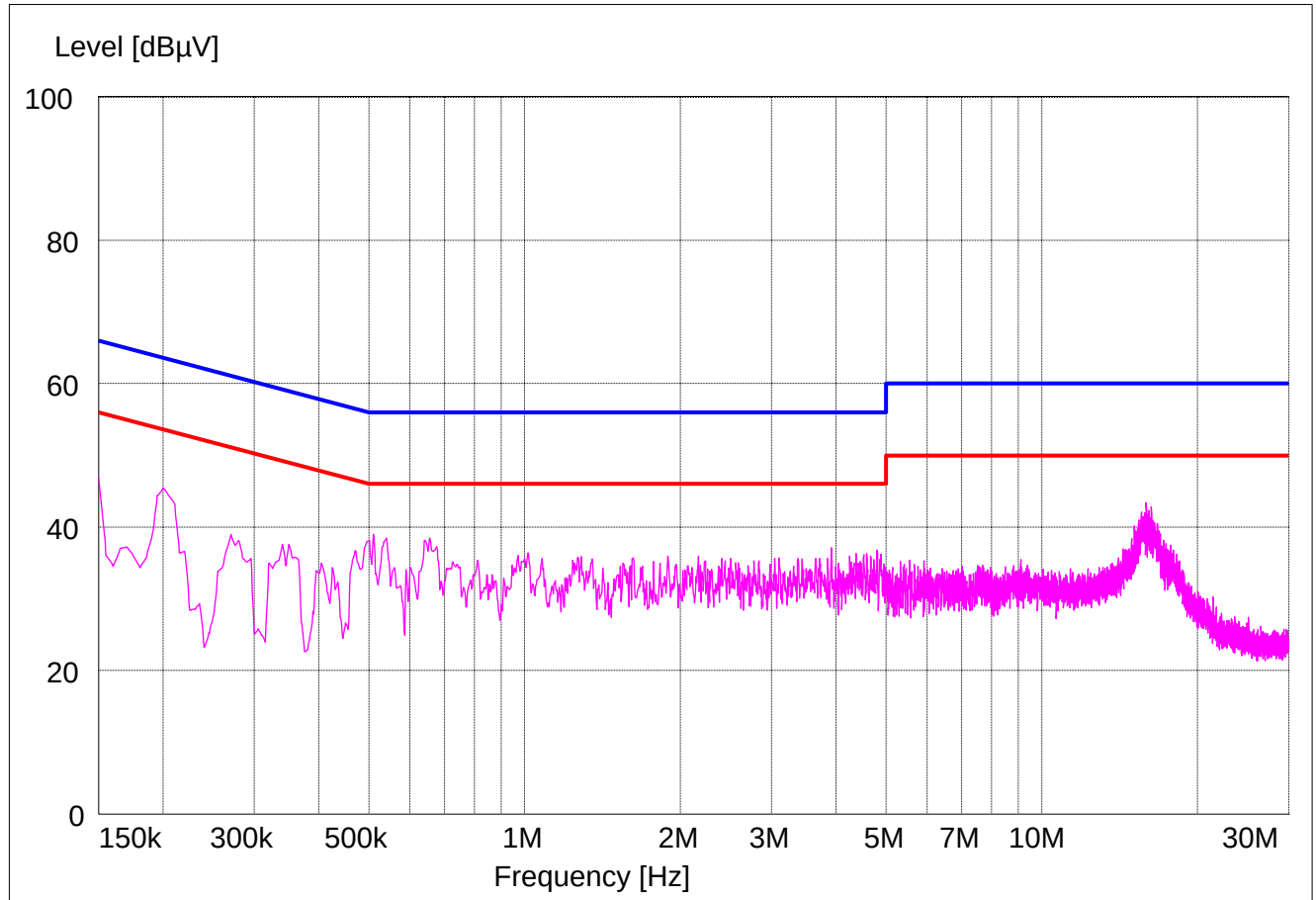
□ Note

Line (H) : Hot
Line (N) : Neutral

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

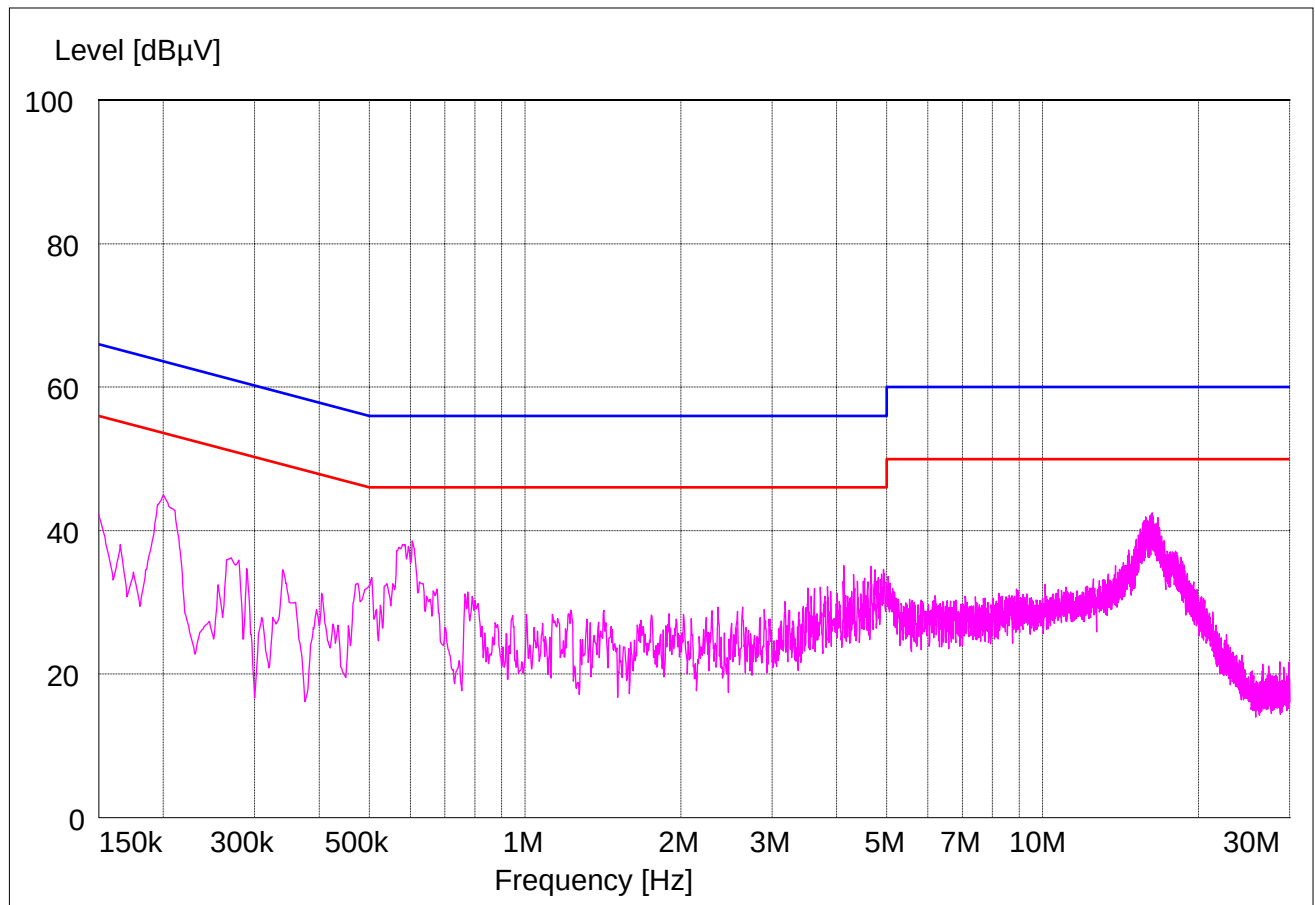
Plot of conducted power line

Test mode : (Hot)



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Test mode : (Neutral)



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.