FCC CFR47 CERTIFICATION

PART 24E

TEST REPORT

FOR

CELLULAR PHONE AMPLIFIER

MODEL: CM 1000

FCC ID:RSNCM1000

REPORT NUMBER: 03U2456-1

ISSUE DATE: JANUARY 14, 2004

Prepared for
CELLPHONE-MATE, INC.
36543 SAN PEDRO DRIVE # 277
FREMONT, CA 94536
U.S.A.

Prepared by
COMPLIANCE CERTIFICATION SERVICES
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1. TEST RESULT CERTIFICATION

COMPANY NAME: CELLPHONE-MATE, INC.
36543 SAN PEDRO DRIVE # 277
FREMONT, CA 94536
U.S.A.

EUT DESCRIPTION CELLULAR PHONE AMPLIFIER

MODEL NAME: CM 1000

DATE TESTED: JANUARY 14, 2004

TYPE OF EQUIPMENT	INTENTIONAL RADIATOR, CELL PHONE AMPLIFIER
MEASUREMENT PROCEDURE	ANSI 63.4 / 2001, TIA/EIA 603
PROCEDURE	CERTIFICATION
FCC RULE	CFR 47 PART 24 SUBPART E

Compliance Certification Services, Inc. tested the above equipment for compliance with the requirement set forth in CFR 47, PART 24 subpart E Cellular Radiotelephone Service. The equipment in the configuration described in this report, shows the measured emission levels emanating from the equipment do not exceed the specified limit.

Note : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document.

Tested By:

FRANK IBRAHIM
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Released For CCS By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

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2. EUT DESCRIPTION

1900 MHz CDMA/GSM Cell Phone Amplifier:

- an EIRP of 24.8 dBm for CDMA mode, with 5 dBi gain antenna.
- an EIRP of 29.3 dBm for CDMA mode, with 3 dBi gain antenna.

- an EIRP of 23.7 dBm for GSM mode, with 5 dBi gain antenna.
- an EIRP of 26.3 dBm for GSM mode, with 3 dBi gain antenna.

3. TEST METHODOLOGY

Both conducted and radiated testing were performed according to the procedures documented on chapter 13 of ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

4. TEST FACILITY

The sites and measurement facilities used to collect the radiated data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5. ACCREDITATION AND LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200065-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (reference no: 31040/SIT (1300B3) and 31040/SIT (1300F2))

6. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

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7. INSTRUMENTATION LIST AND EUT SETUP INFORMATION

TEST EQUIPMENT LIST				
Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
Line Filter	Lindgren	LMF-3489	497	CNR
LISN, 10 kHz ~ 30 MHz	Solar	8012-50-R-24-BNC	8379443	10/13/04
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	10/13/04
EMI Test Receiver	R & S	ESHS 20	827129/006	7/17/04
Preamplifier, 1 ~ 26.5 GHz	HP	8449B	3008A00369	4/25/04
Spectrum Nalyzer	HP	8593EM	3710A00205	10/1/04
Signal Generator, 2 ~ 40 GHz	R & S	SMP04	DE 34210	5/25/05
Spectrum Nalyzer	Agilent	E4440A	US41421507	5/8/04
Horn Antenna	ETS.Lindgren	3117	00029310	12/26/04
Horn Antenna	ETS.Lindgren	3117	00029301	12/26/04

TEST PERIPHRALS

TEST PERIPHERALS				
Device Type	Manufacturer	Model Number	Serial Number	FCC ID
Signal Generator	HP	E4432B	US39341935	N/A
Cell Phone	Nokia	6185	253/13967541	GMLNSD-3AX
Cell Phone Charger	Nokia	ACP-7U	H6316	N/A
AC/DC Adapter	HiTRON	HES10-12010-0-1	0115	N/A

TEST I/O CABLES

TEST I / O CABLES								
Cable No	I/O Port	# of I/O Port	Connector Type	Type of Cable	Cable Length	Data Traffic	Bundled	Remark
1	AC/DC	1	US115	Unshielded	1.5 m	No	No	N/A
2	Phone / Sig. Gen.	1	SMA	Shielded	10 cm	Yes	No	N/A
3	Antenna	1	SMA	Shielded	1 m	Yes	No	N/A
4	AC/DC	1	US115	Unshielded	1.5m	No	No	N/A

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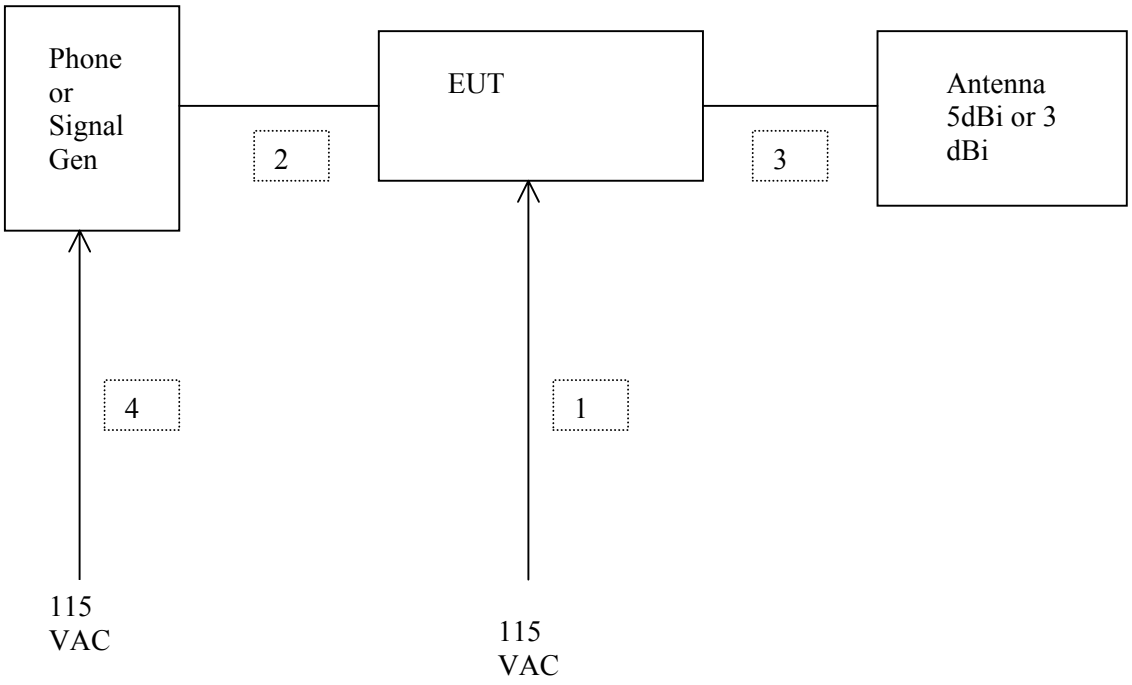
TEST SETUP



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8. MODIFICATIONS LIST

The following modifications were performed for the EUT to pass emissions requirements:

1. Copper tape was placed on the input and output ports of the EUT to close the gap.
2. Copper tape was also connecting the SMA connector to chassis providing a grounding path.

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9. TEST SETUP, PROCEDURE AND RESULT

9.1. SECTION 2.1046: RF POWER OUTPUT (CONDUCTED)

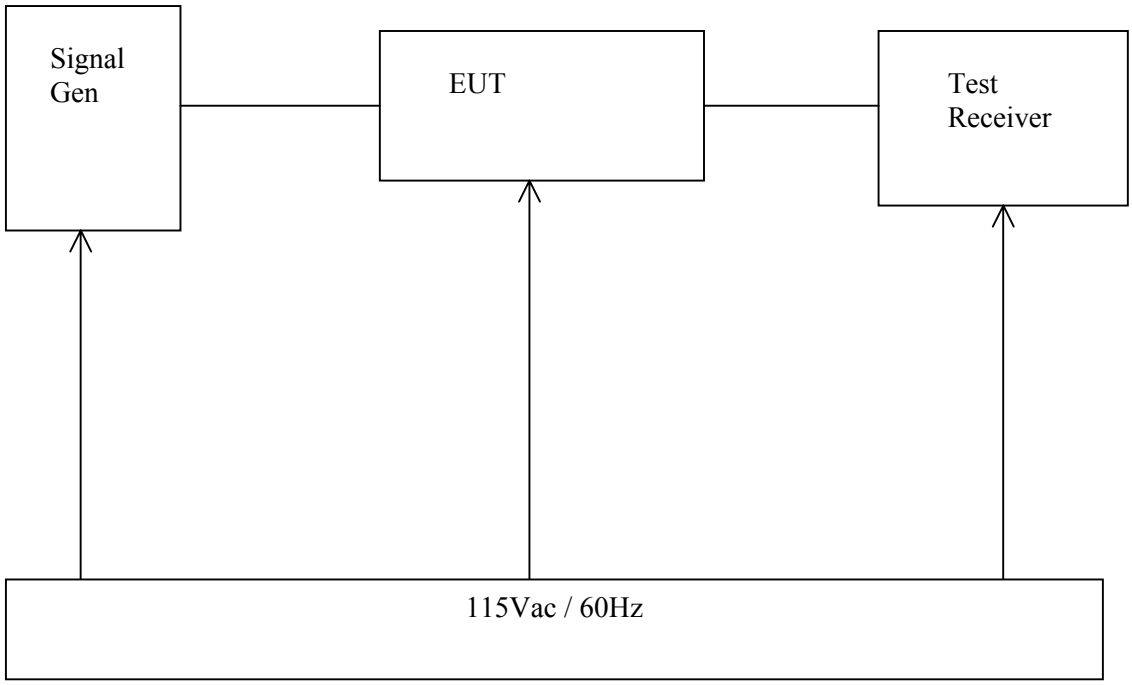
INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
PSA Analyzer	Agilent	E446A	US42070220	1/13/04
10dB Attenuator	Agilent	8493C	59028	N/A
DC Power Supply	Kenwood	PA36-3A	7060074	N/A

TEST PROCEDURE:

The output port of the EUT was connected to a spectrum analyzer, the RBW and VBW were set to 3MHz, the output peak power was recorded, the Input cable going to the EUT was connected to a spectrum analyzer, the output power was measured.

TEST SETUP



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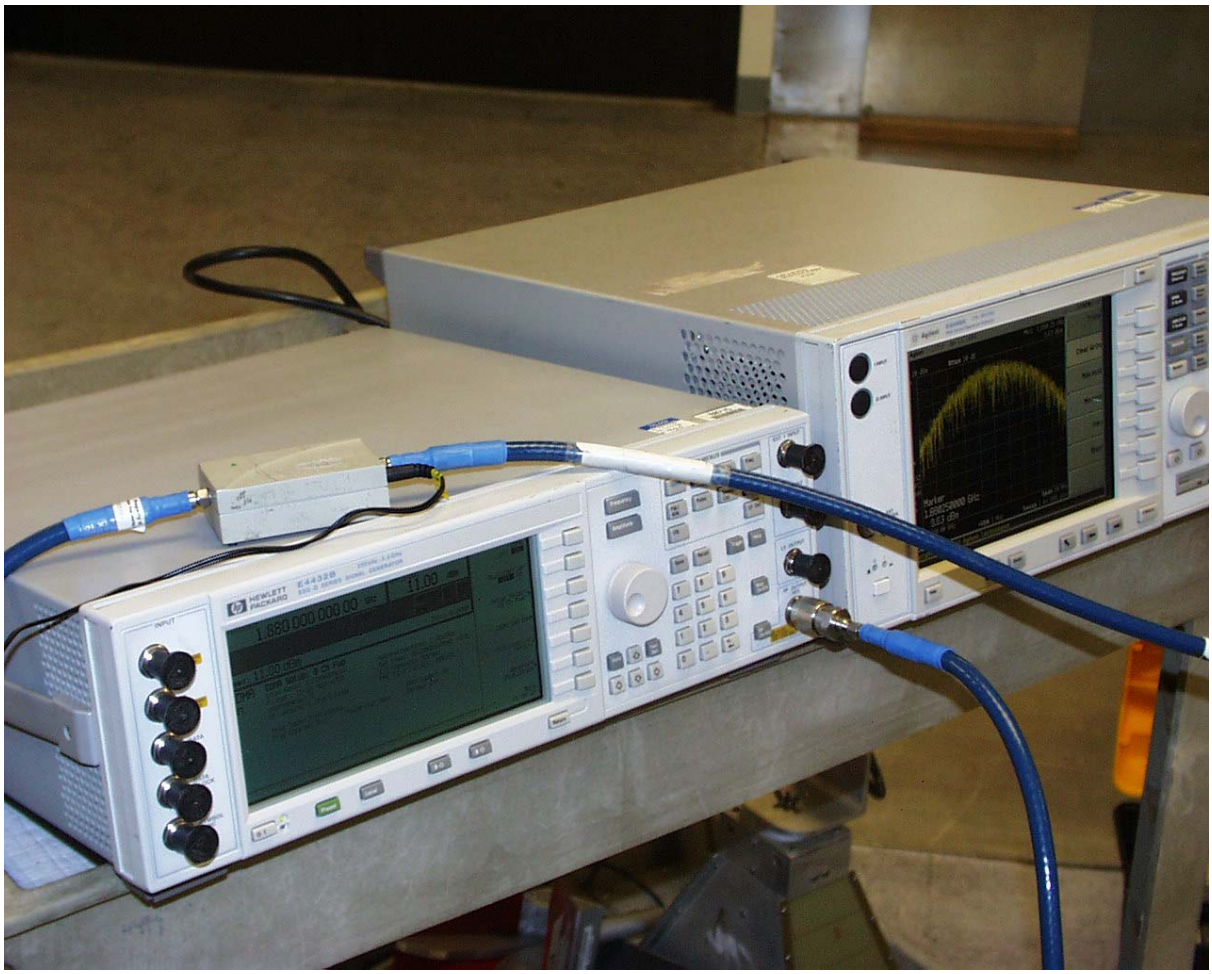

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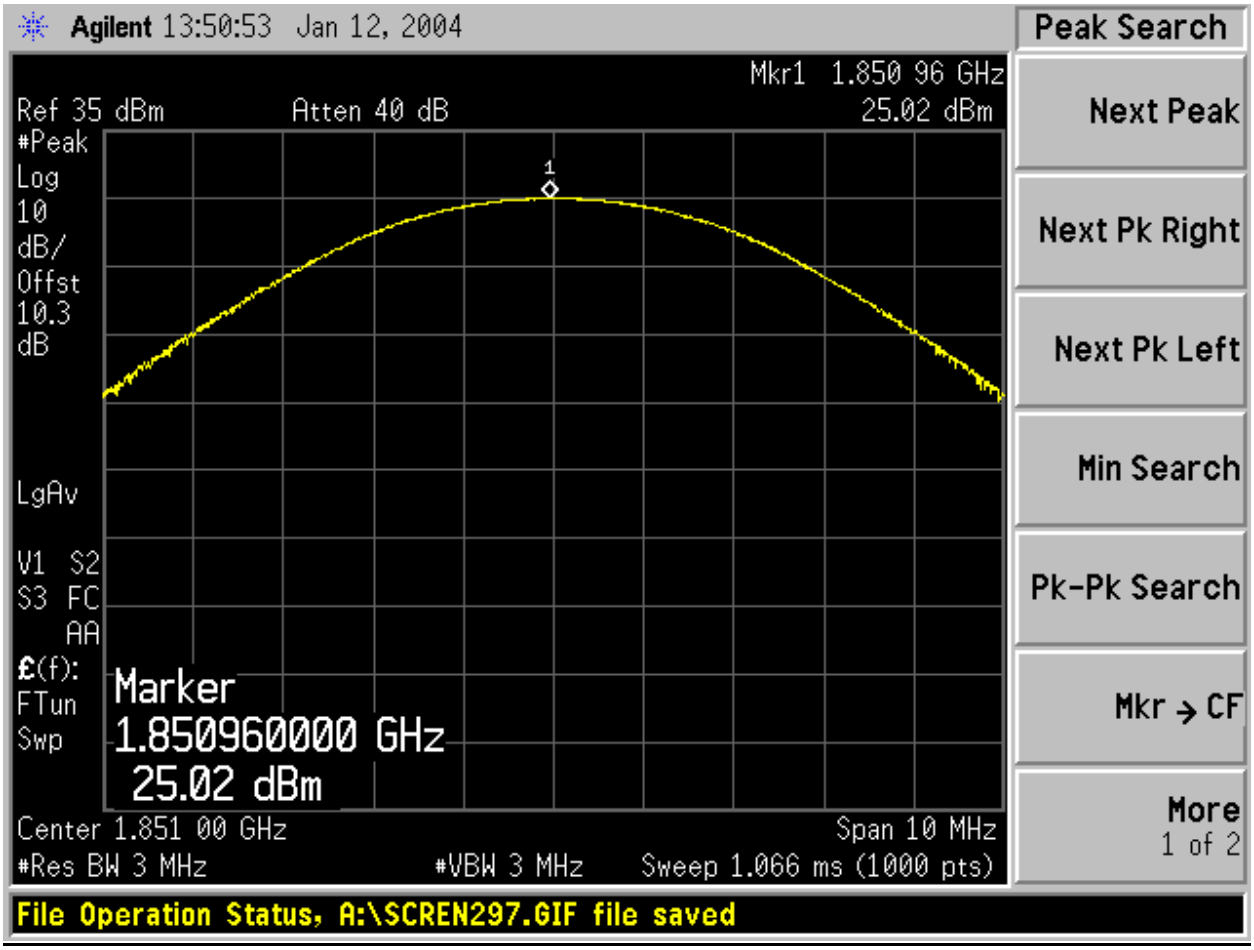
RESULTS:

Output Port, CDMA, Low Channel:



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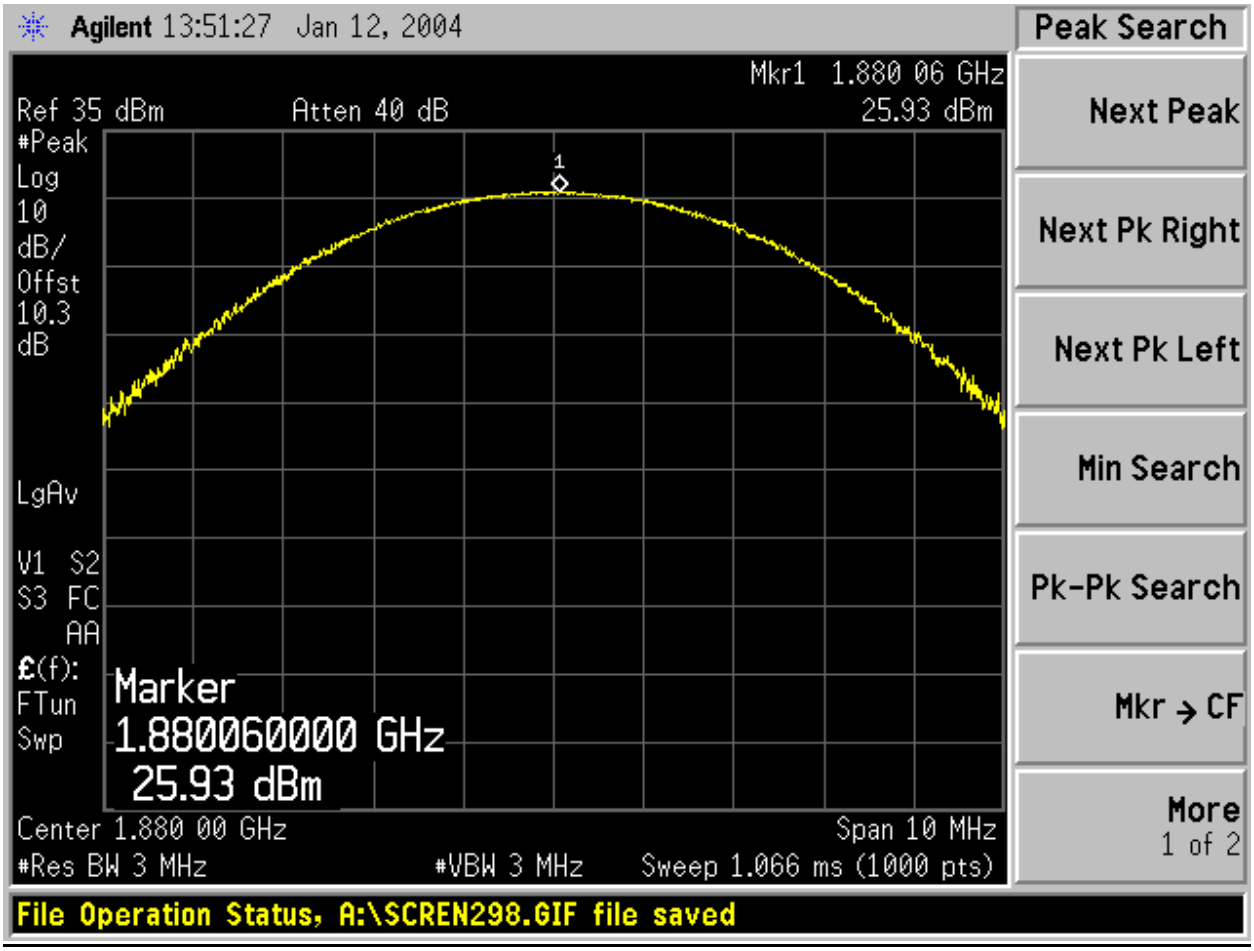
Output Port, CDMA, Mid Channel:



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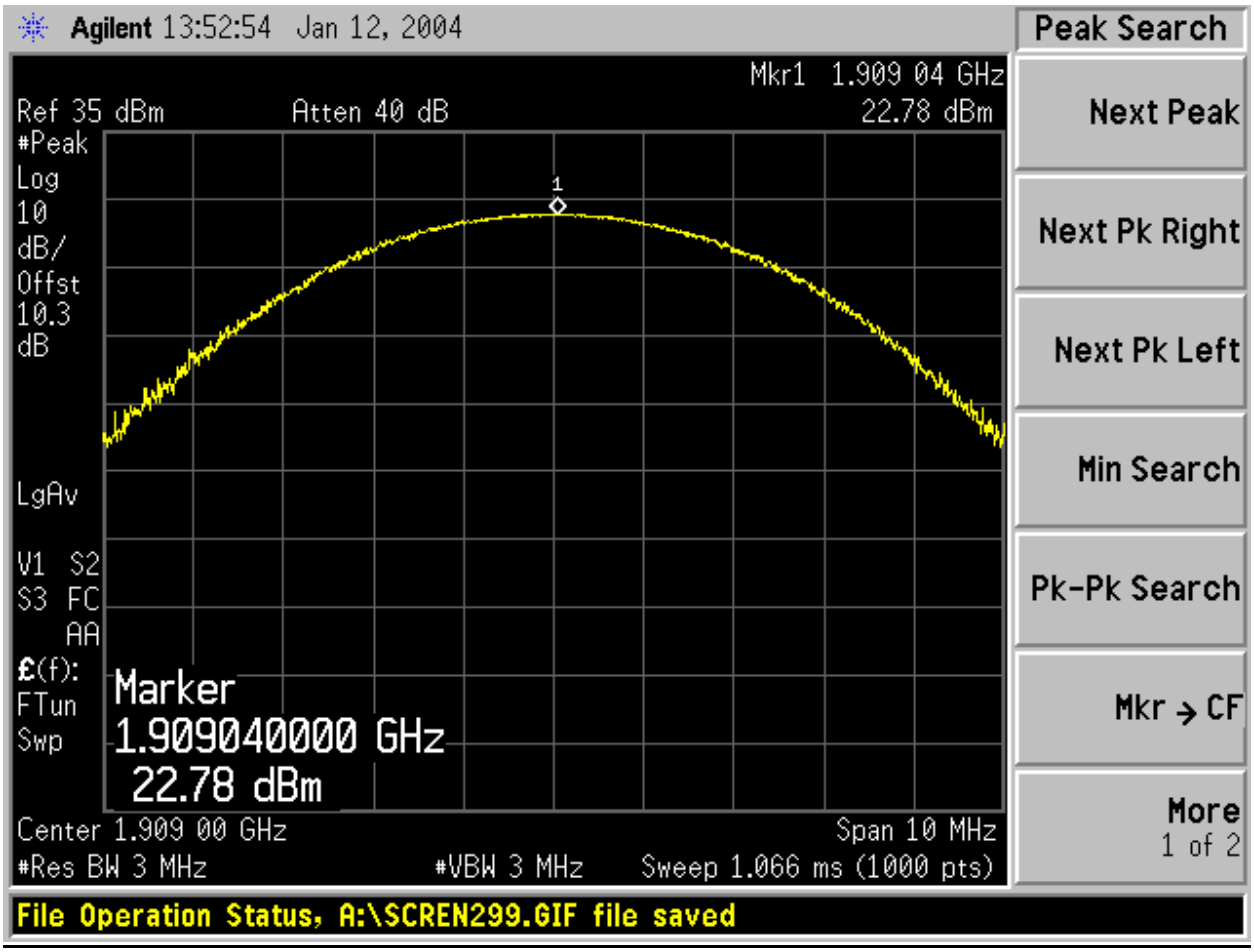
Output Port, CDMA, High Channel:



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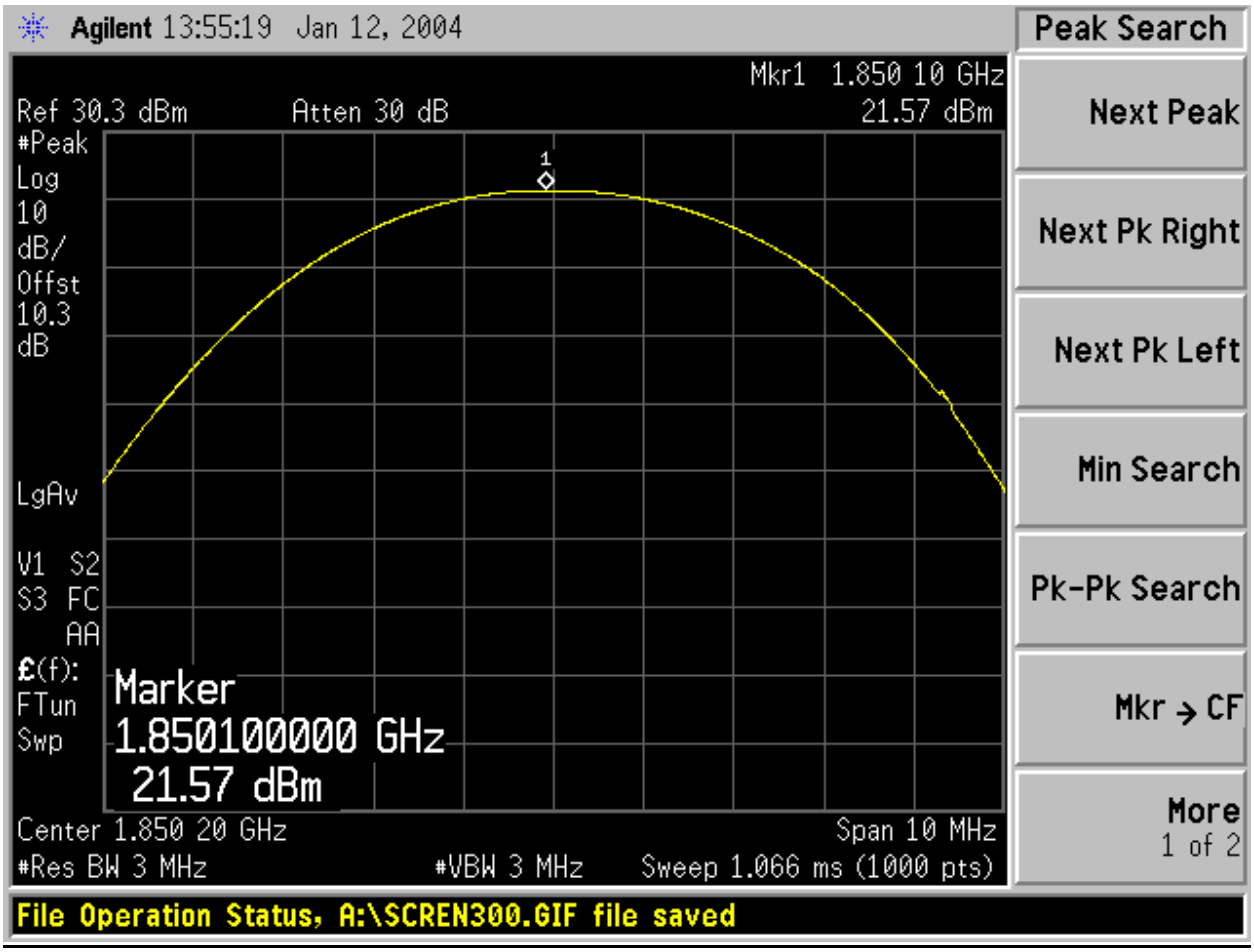
Output Port, GSM, Low Channel:



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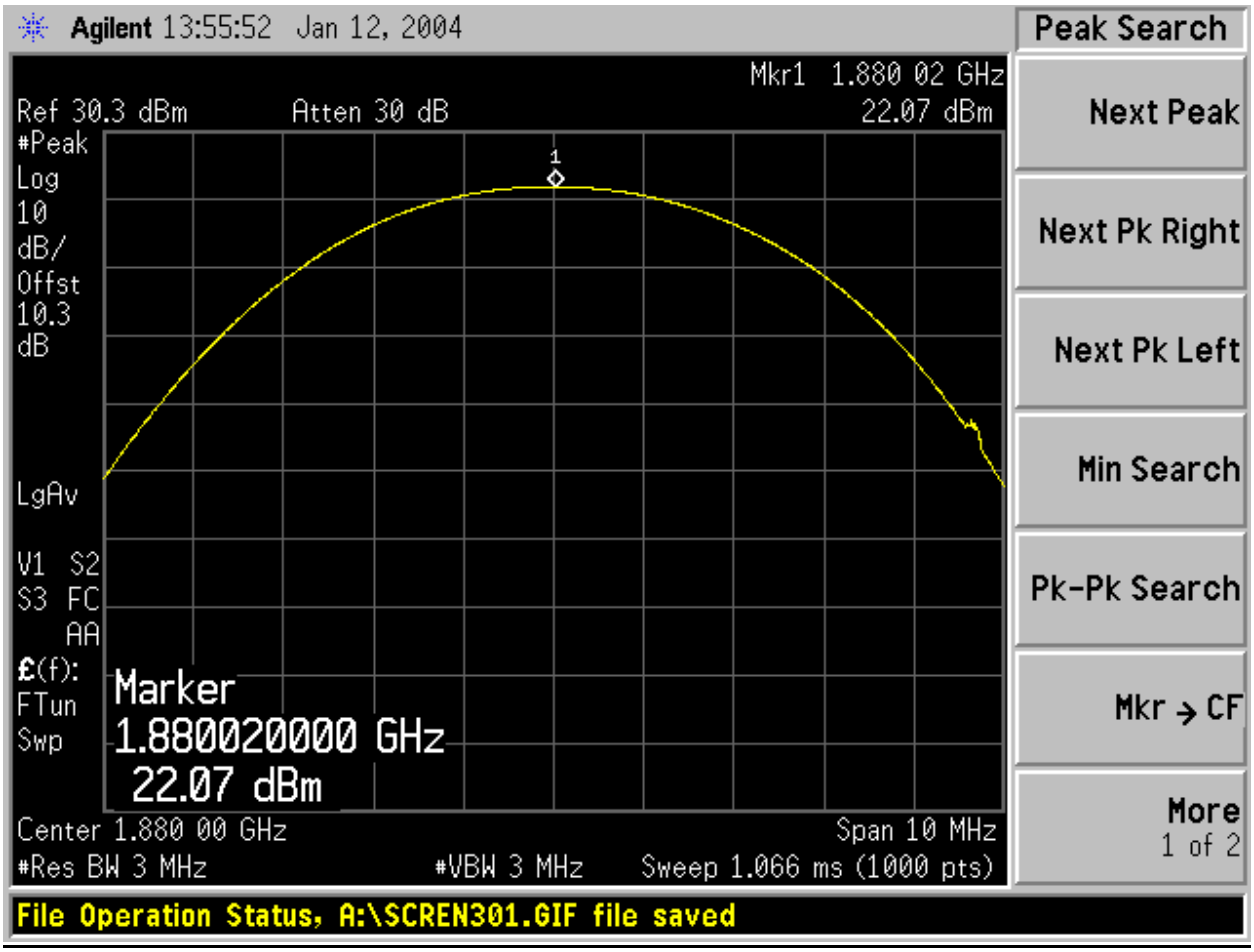
Output Port, GSM, Mid Channel:



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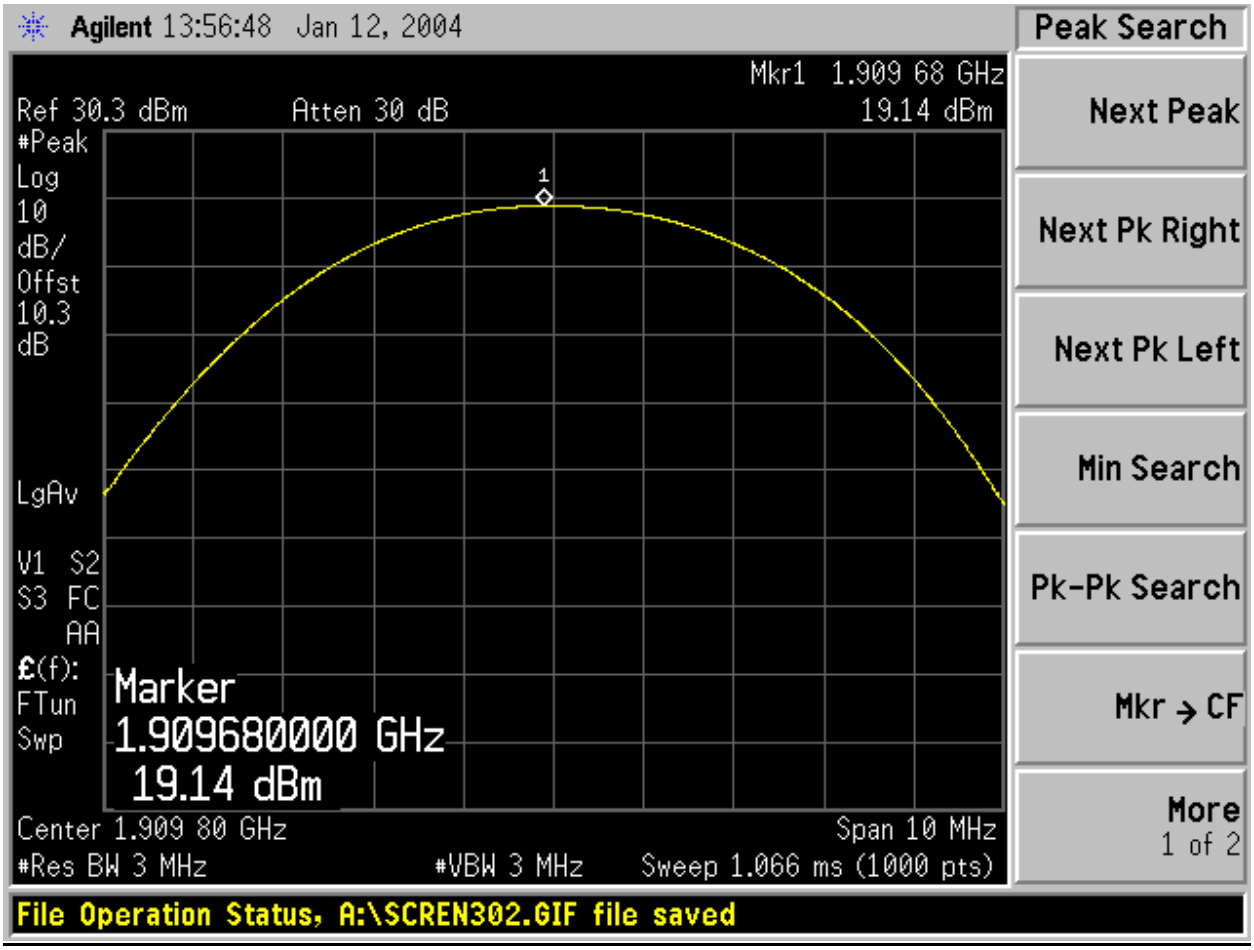
Output Port, GSM, High Channel:



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9.4. SECTION 2.1046: RF POWER OUTPUT (RADIATED)

MEASUREMENT PROCEDURE

1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.

2). The test antenna shall be oriented initially for vertical polarization located 3m from the EUT to correspond to the frequency of the transmitter.

3). The output of the test antenna shall be connected to the measuring receiver and either a peak or quasi-peak detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.

4). The transmitter shall be placed 0.80 meter above the ground plane, the X, Y, and Z positions shall be tested and the worst case reported. The transmitter shall be switched on with typical modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.

5). 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.

6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

7). 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.

8). The maximum signal level detected by the measuring receiver shall be noted.

9). The transmitter shall be replaced by a tuned dipole or horn antenna (substitution antenna).

10). The substitution antenna shall be oriented for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.

11). The substitution antenna shall be connected to a calibrated signal generator.

12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

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13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.

14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.

15). 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.

16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.

17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

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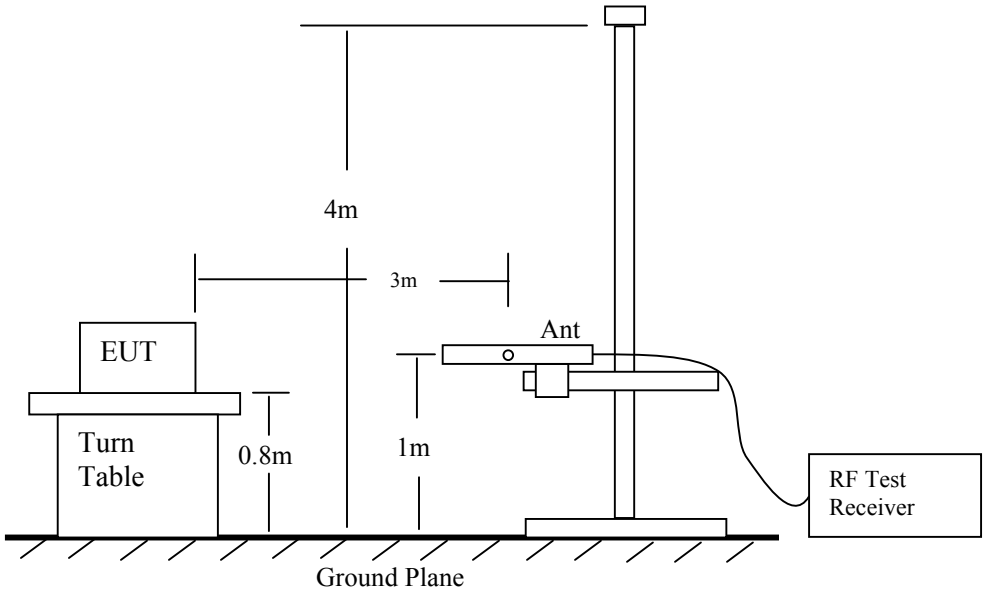
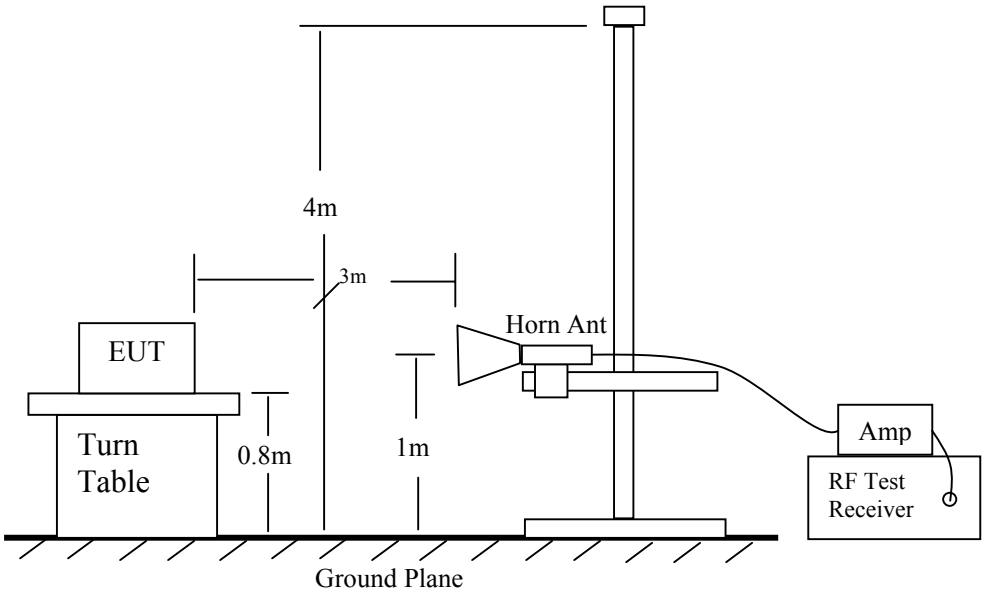


Radiated Emission Measurement 30 MHz to 1000 MHz



Radiated Emission Above 1000 MHz

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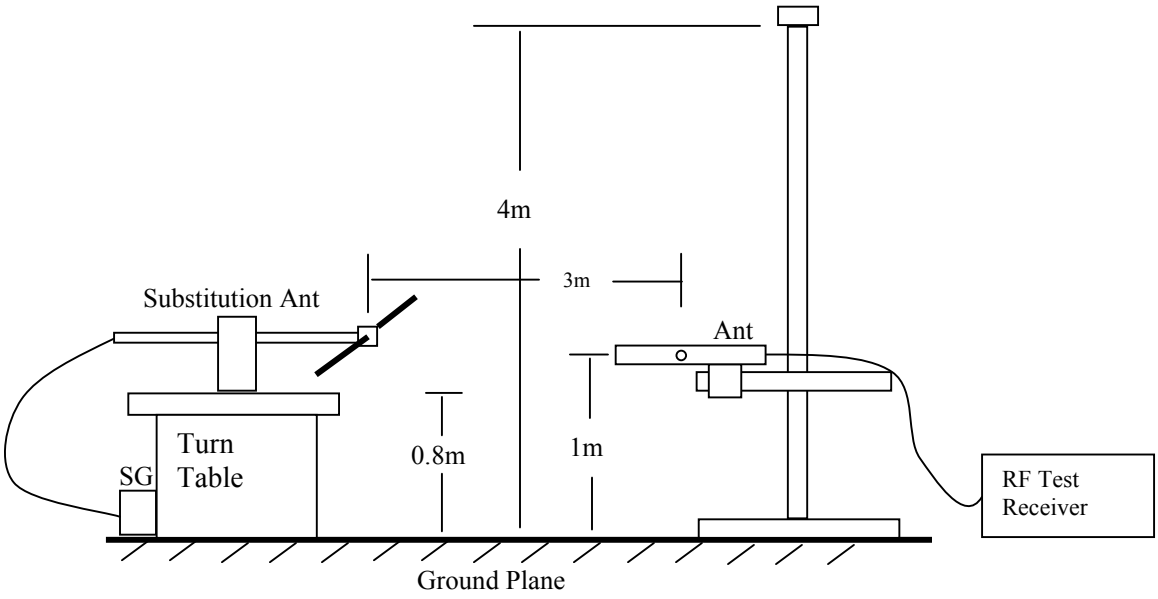
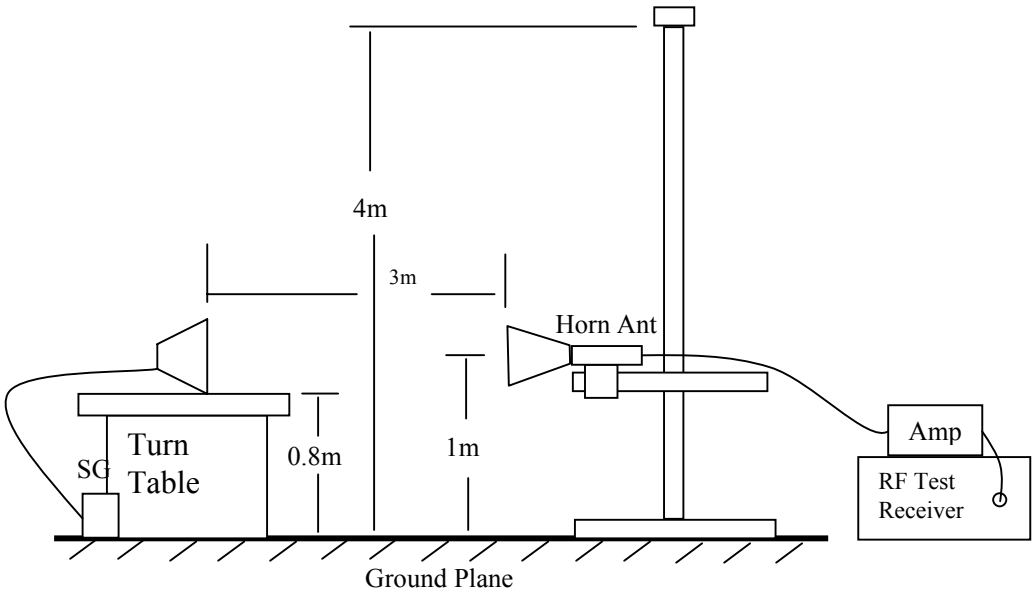


Radiated Emission – Substitution Method Set-up for Freq below 1GHz



Radiated Emission – Substitution Method Set-up for Freq above 1GHz

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MEASUREMENT RESULT:

1900MHz CDMA/GSM Output Power Measurement:

With 5 dBi Gain Antenna:		**EIRP**
	FREQUENCY	**PEAK**
1900 MHz (GSM)	(MHz)	(dBm)
LOW	1850.2	22.0
MID	1880.0	23.7
HI	1909.8	21.5

		EIRP
	FREQUENCY	**PEAK**
1900 MHz (GDMA)	(MHz)	(dBm)
LOW	1851.0	24.0
MID	1880.0	24.8
HI	1909.0	24.1

With 3 dBi Gain Antenna:		**EIRP**
	FREQUENCY	**PEAK**
1900 MHz (GSM)	(MHz)	(dBm)
LOW	1850.2	26.1
MID	1880.0	26.3
HI	1909.8	25.7

		EIRP
	FREQUENCY	**PEAK**
1900 MHz (GDMA)	(MHz)	(dBm)
LOW	1851.0	29.3
MID	1880.0	29.3
HI	1909.0	28.4

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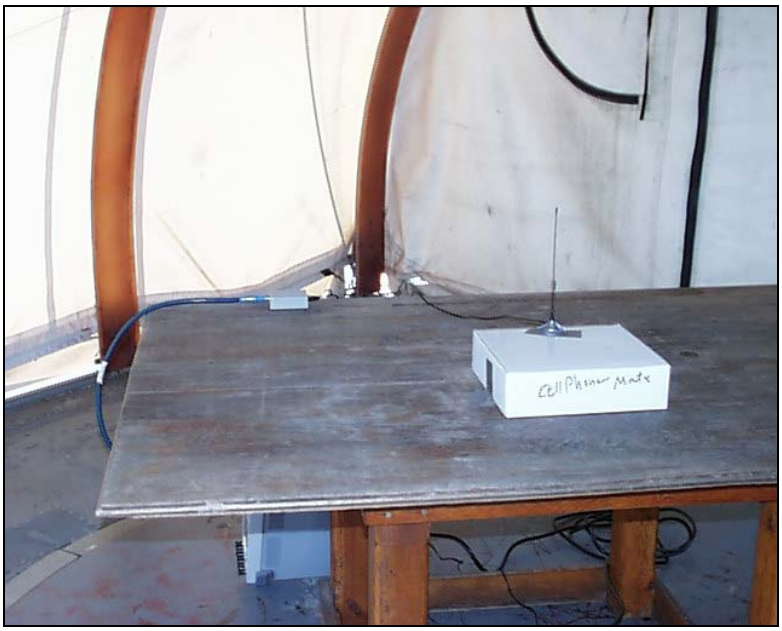
Radiated Emissions

Front, with 5 dBi Gain antenna:



Back, with 5 dBi Gain antenna:

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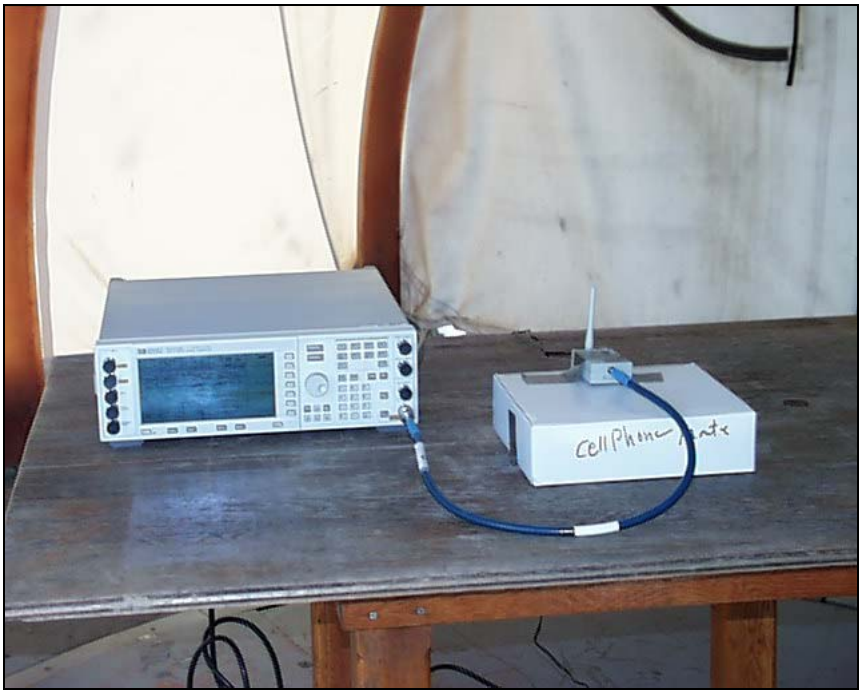
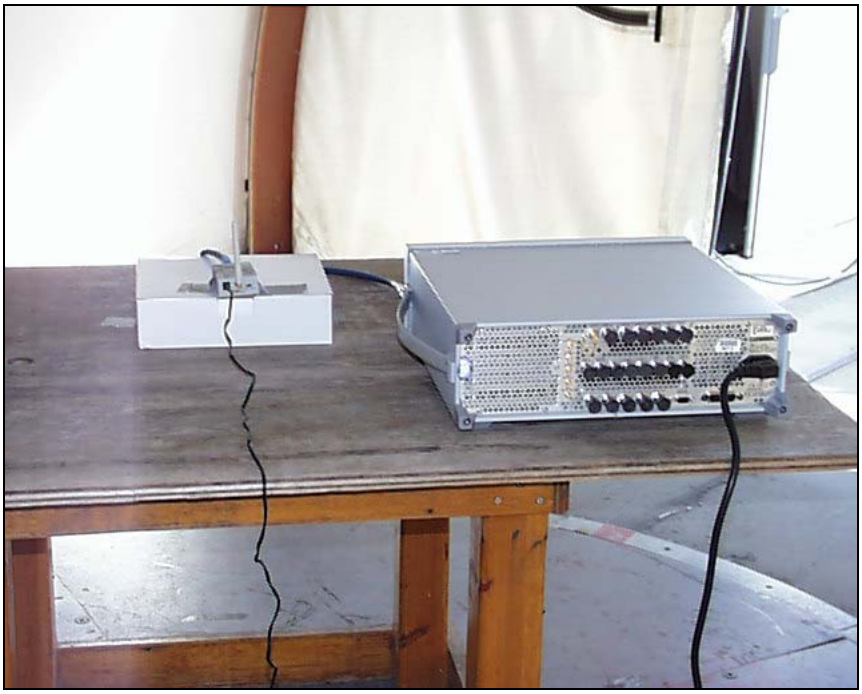
Front, with 3 dBi Gain antenna:



Back, with 3 dBi Gain antenna:



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Output Power (EIRP), 1900 MHz CDMA/GSM – Low / Mid/ High Channel Fundamental

1/8/04 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 03U2456-1
Company: Cellphone Mate
EUT Descrip.: Cellphone Amplifier
EUT M/N: CM 1000
Test Target: FCC PART 24
Mode Oper: TX ON, maximum power

Test Equipment:

EMCO Horn 1-18GHz | Pre-amplifer 1-26GHz | Spectrum Analyzer | Horn > 18GHz | Limit

Hi Frequency Cables
☑ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☐ (12 ft)

Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW, VBW=RBW
Bandedge: RBW=>1% Emissions BW, VBW=> 3*RBW
Spurious: RBW=1MHz, VBW=1MHz

f GHz	SA reading (dBm)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (1851 MHz), CDMA, 5 dBi Antenna									
1.8510	86.5	19.7	0.2	4.4	2.3	23.9	33.0	-9.1	V
1.8510	86.4	19.8	0.2	4.4	2.3	24.0	33.0	-9.0	H
Mid Channel (1880 MHz), CDMA, 5 dBi Antenna									
1.8800	87.5	20.6	0.2	4.4	2.3	24.8	33.0	-8.2	V
1.8800	87.2	19.6	0.2	4.4	2.3	23.8	33.0	-9.2	H
High Channel (1909 MHz), CDMA, 5 dBi Antenna									
1.9090	86.2	19.9	0.2	4.4	2.3	24.1	33.0	-8.9	V
1.9090	83.9	17.2	0.2	4.4	2.3	21.4	33.0	-11.6	H
Low Channel (1851 MHz), CDMA, 3 dBi Antenna									
1.8510	91.3	25.1	0.2	4.4	2.3	29.3	33.0	-3.7	V
1.8510	81.6	14.7	0.2	4.4	2.3	18.9	33.0	-14.1	H
Mid Channel (1880 MHz), CDMA, 3 dBi Antenna									
1.8800	91.8	25.1	0.2	4.4	2.3	29.3	33.0	-3.7	V
1.8800	82.3	16.1	0.2	4.4	2.3	20.3	33.0	-12.7	H
High Channel (1909 MHz), CDMA, 3 dBi Antenna									
1.9090	89.7	24.2	0.2	4.4	2.3	28.4	33.0	-4.6	V
1.9090	81.2	14.8	0.2	4.4	2.3	19.0	33.0	-14.0	H
Low Channel (1850.2 MHz), GSM, 5 dBi Antenna									
1.8502	84.8	17.8	0.2	4.4	2.3	22.0	33.0	-11.0	V
1.8502	83.8	15.9	0.2	4.4	2.3	20.1	33.0	-12.9	H
Mid Channel (1880 MHz), GSM, 5 dBi Antenna									
1.8800	85.5	19.5	0.2	4.4	2.3	23.7	33.0	-9.3	V
1.8800	84.8	18.3	0.2	4.4	2.3	22.5	33.0	-10.5	H
High Channel (1909.8 MHz), GSM, 5 dBi Antenna									
1.9098	84.0	16.9	0.2	4.4	2.3	21.1	33.0	-11.9	V
1.9098	85.0	17.3	0.2	4.4	2.3	21.5	33.0	-11.5	H
Low Channel (1850.2 MHz), GSM, 3 dBi Antenna									
1.8502	89.3	21.9	0.2	4.4	2.3	26.1	33.0	-6.9	V
1.8502	84.5	18.2	0.2	4.4	2.3	22.4	33.0	-10.6	H
Mid Channel (1880 MHz), GSM, 3 dBi Antenna									
1.8800	89.3	22.1	0.2	4.4	2.3	26.3	33.0	-6.7	V
1.8800	85.5	19.0	0.2	4.4	2.3	23.2	33.0	-9.8	H
High Channel (1909.8 MHz), GSM, 3 dBi Antenna									
1.9098	88.9	21.5	0.2	4.4	2.3	25.7	33.0	-7.3	V
1.9098	81.3	14.8	0.2	4.4	2.3	19.0	33.0	-14.0	H

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9.2. SECTION 2.1047: MODULATION CHARACTERISTICS

Not applicable.

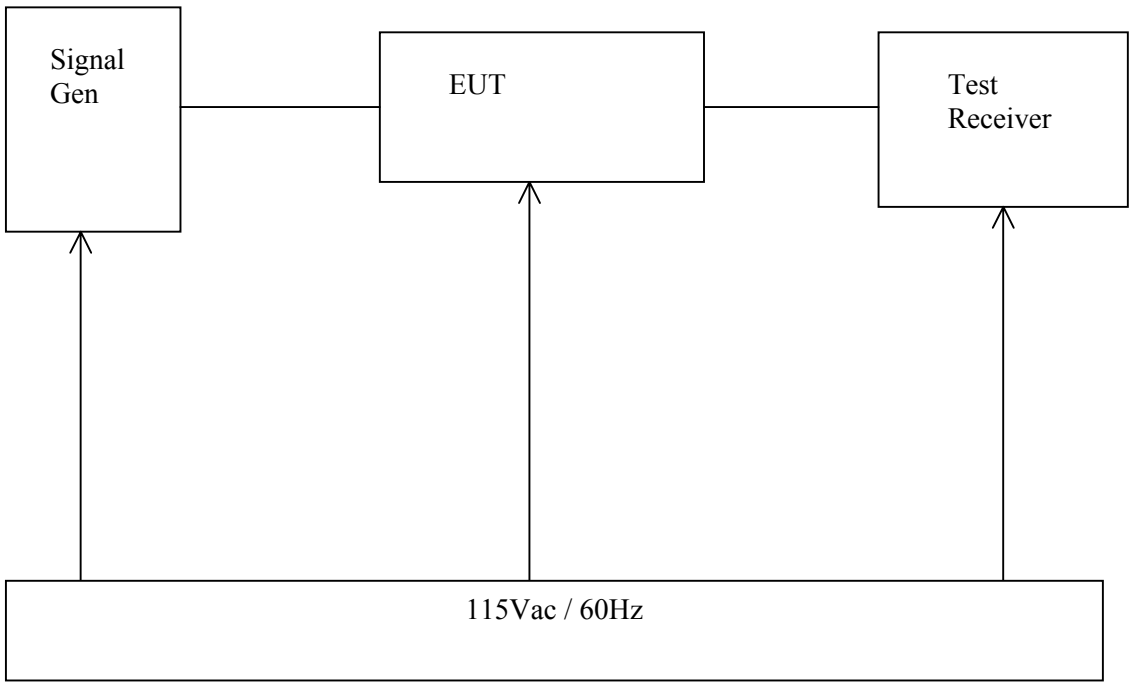
9.3. SECTION 2.1049: OCCUPIED BANDWIDTH

INSTRUMENTS LIST

EQUIPMENT	MANUFACTURE	MODEL NO.	SERIAL NO.	CAL. DUE DATE
PSA Analyzer	Agilent	E446A	US42070220	1/13/04
10dB Attenuator	Agilent	8493C	59028	N/A
DC Power Supply	Kenwood	PA36-3A	7060074	N/A

TEST PROCEDURE:

A comparison of the input- modulated spectrum and the output- modulated spectrum of the EUT was performed. RBW was set to 1 % of EBW, VBW was set to 3 times the RBW, the signal generator with CDMA or GSM modulation was connected to the input port of the EUT, the output port was connected to the spectrum analyzer, the analyzer was tuned to the transmit frequency, 26 dB BW was measured and recorded for Low, Mid and High channels.
TEST SETUP



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RESULTS:

Mode	Channel	26 dB BW (MHz) Output Port	26 dB BW (MHz) Input Port
CDMA	Low	1.376	1.371
CDMA	Mid	1.381	1.383
CDMA	High	1.364	1.374
GSM	Low	0.297912	0.290365
GSM	Mid	0.295447	0.298322
GSM	High	0.296141	0.299641

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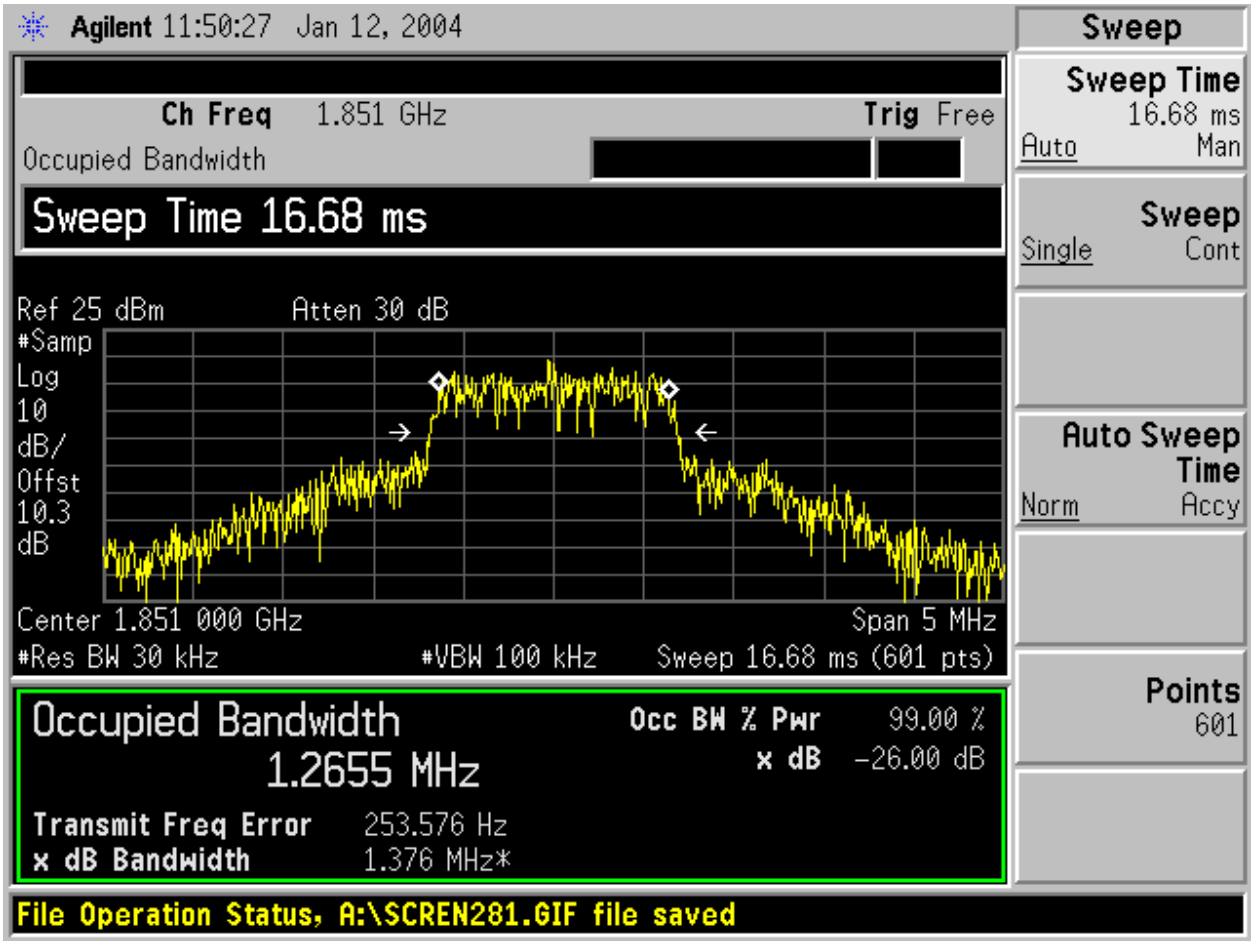
Output Port, CDMA, Low Channel:



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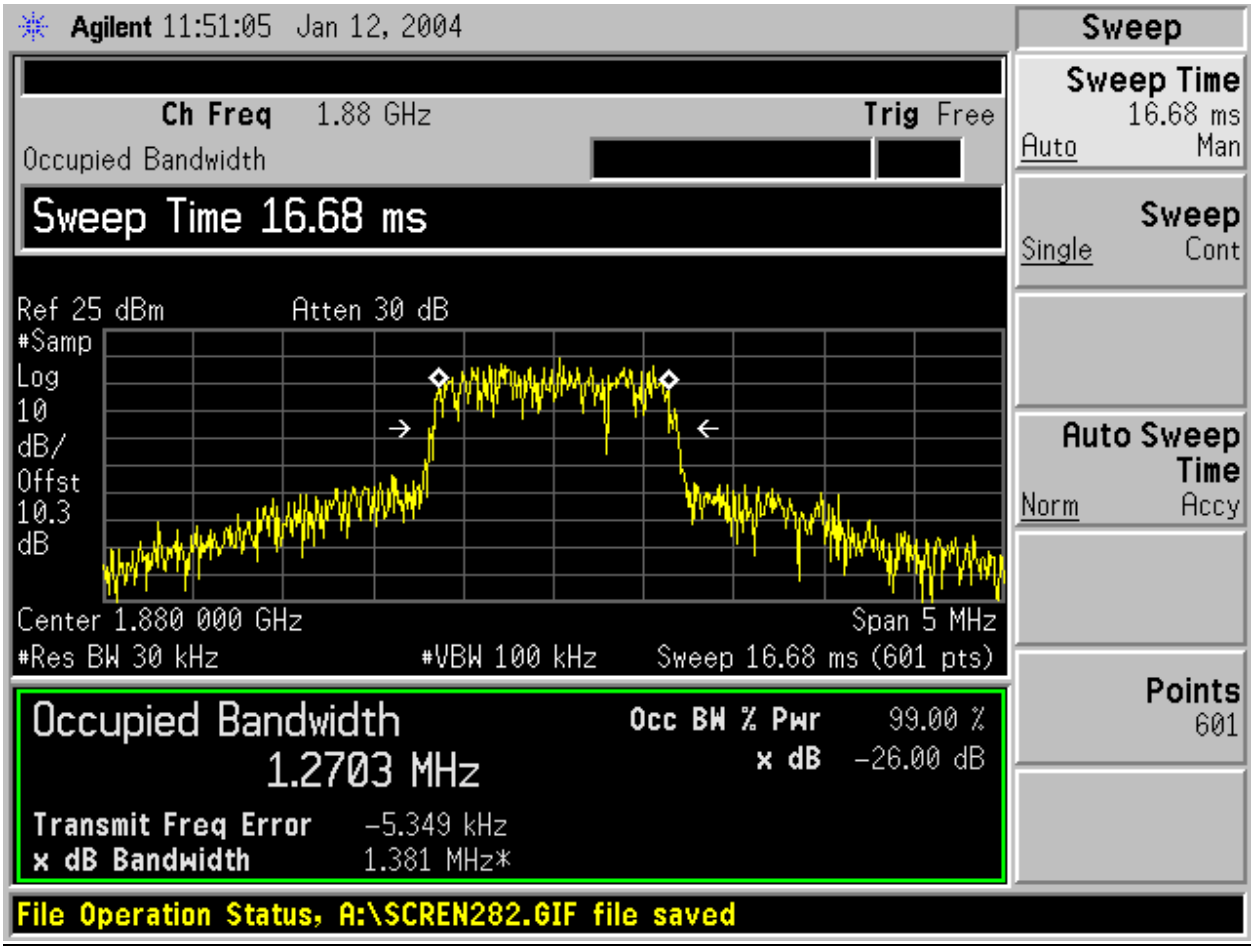
Output Port, CDMA, Mid Channel:



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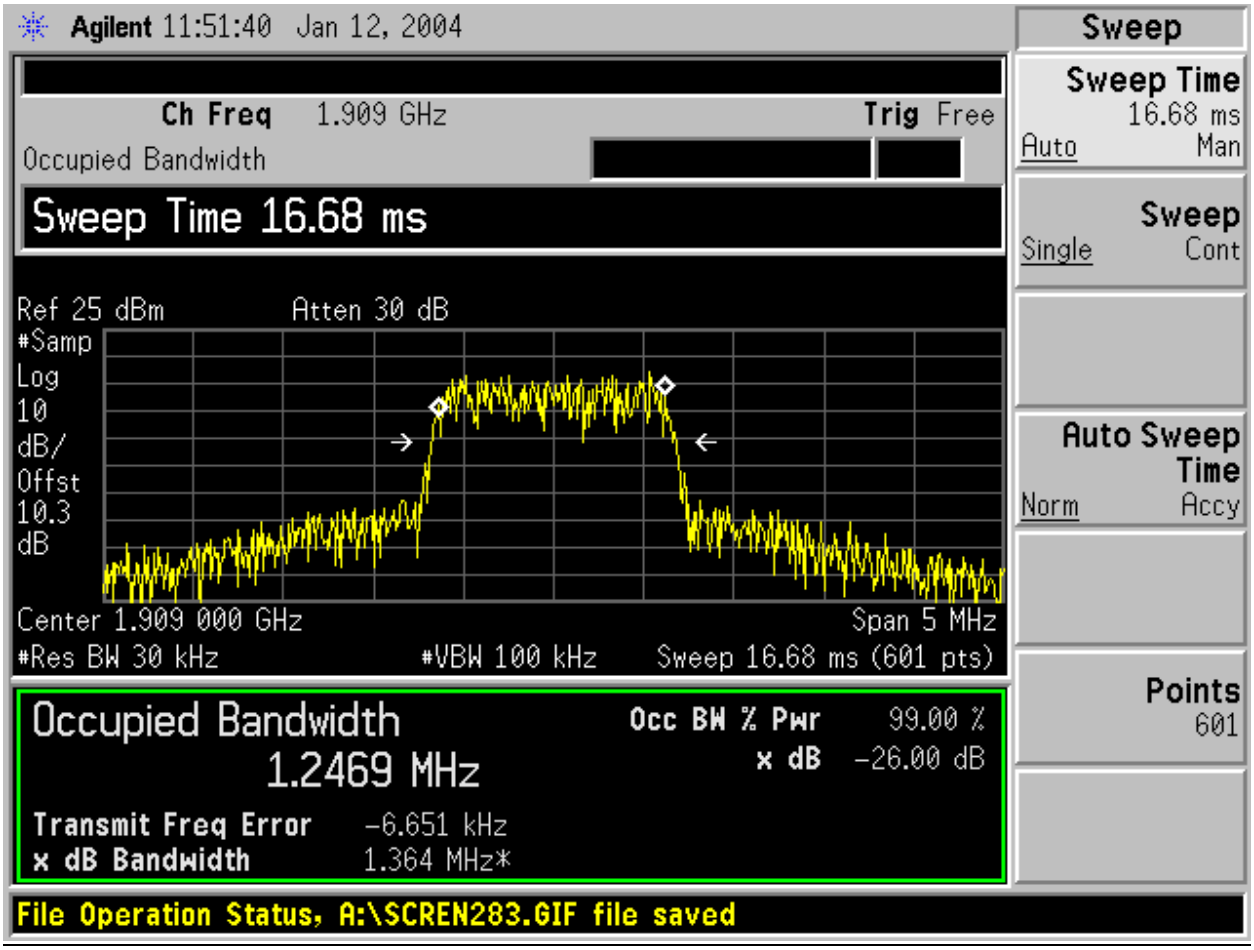
Output Port, CDMA, High Channel:



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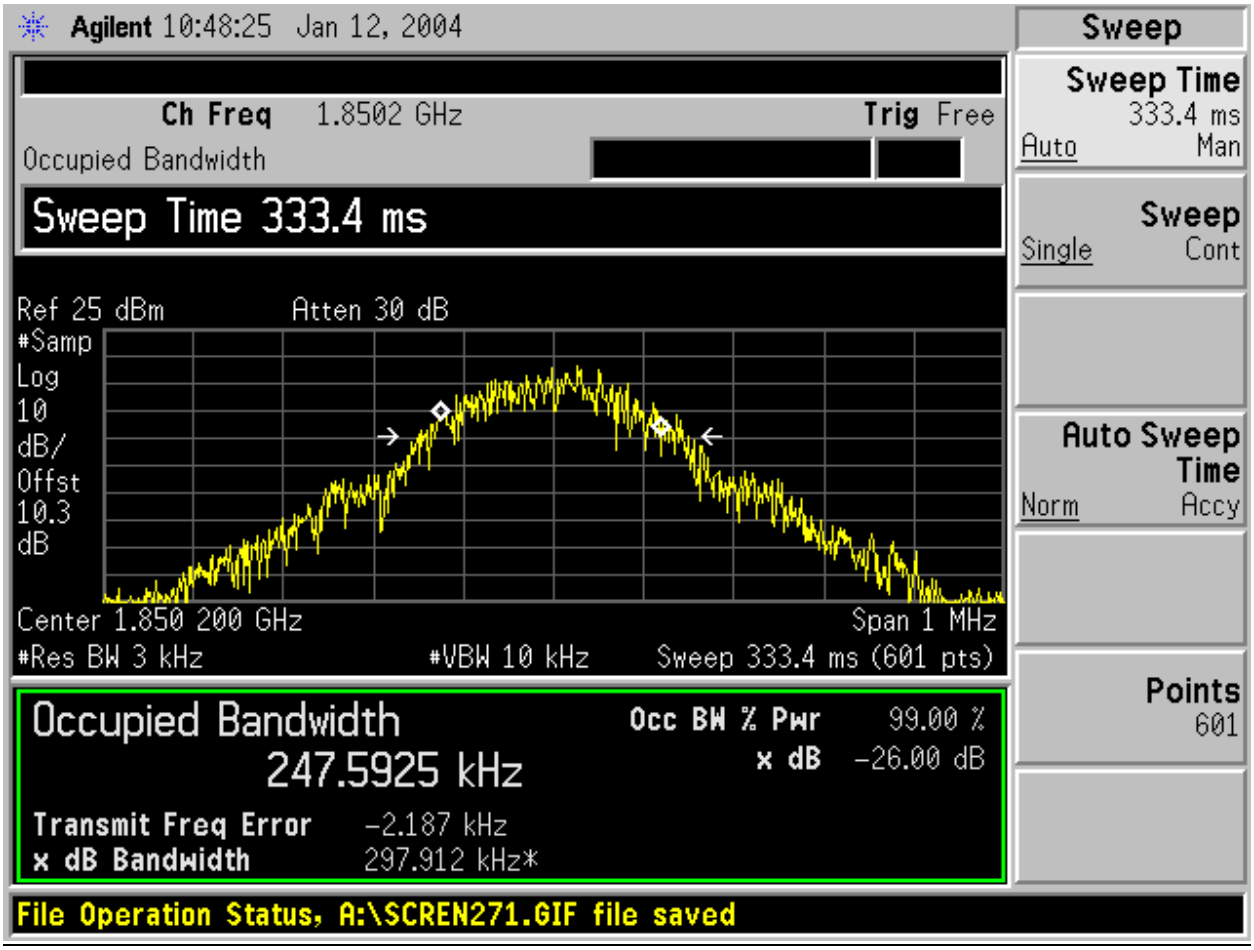
Output Port, GSM, Low Channel:



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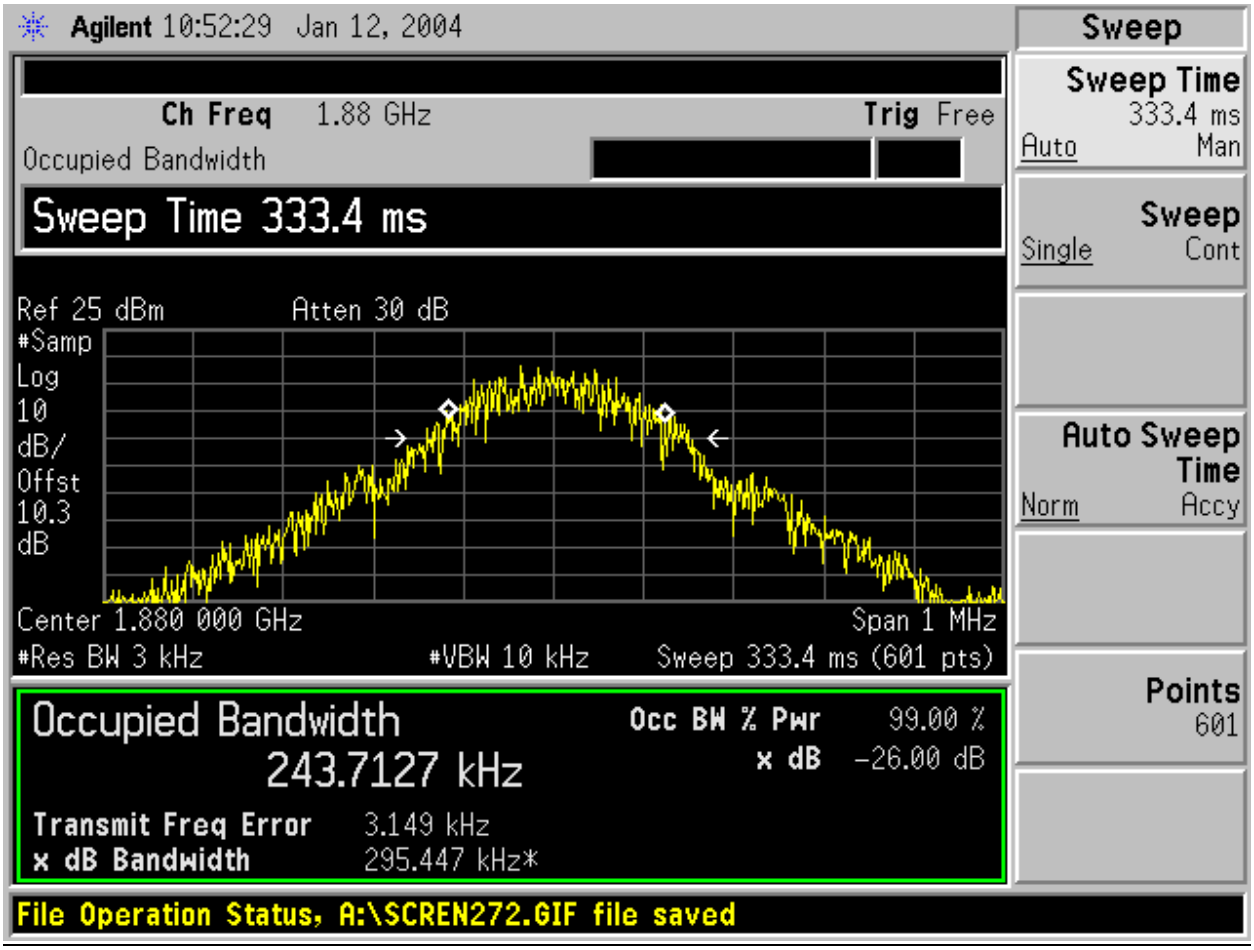
Output Port, GSM, Mid Channel:



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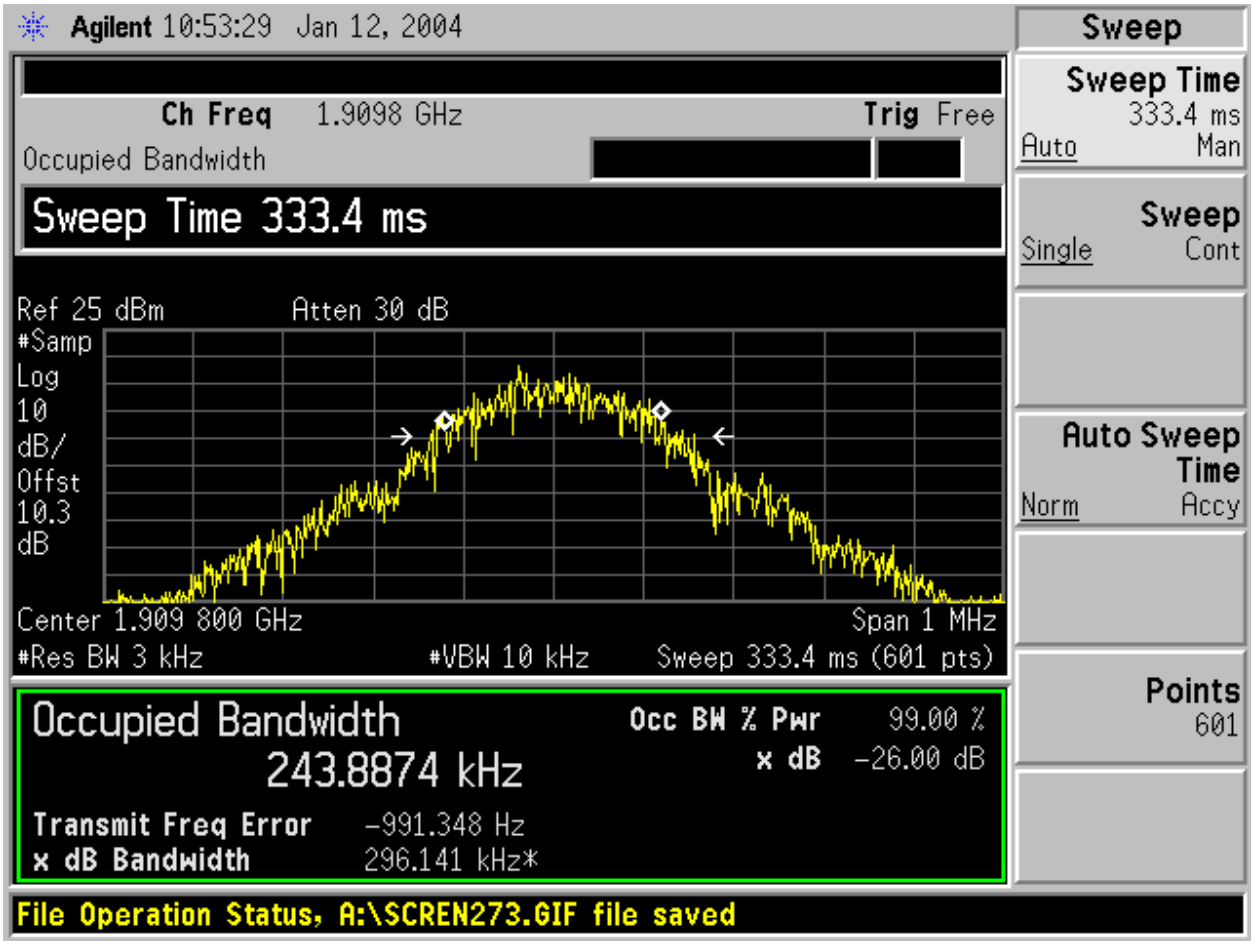
Output Port, GSM, High Channel:



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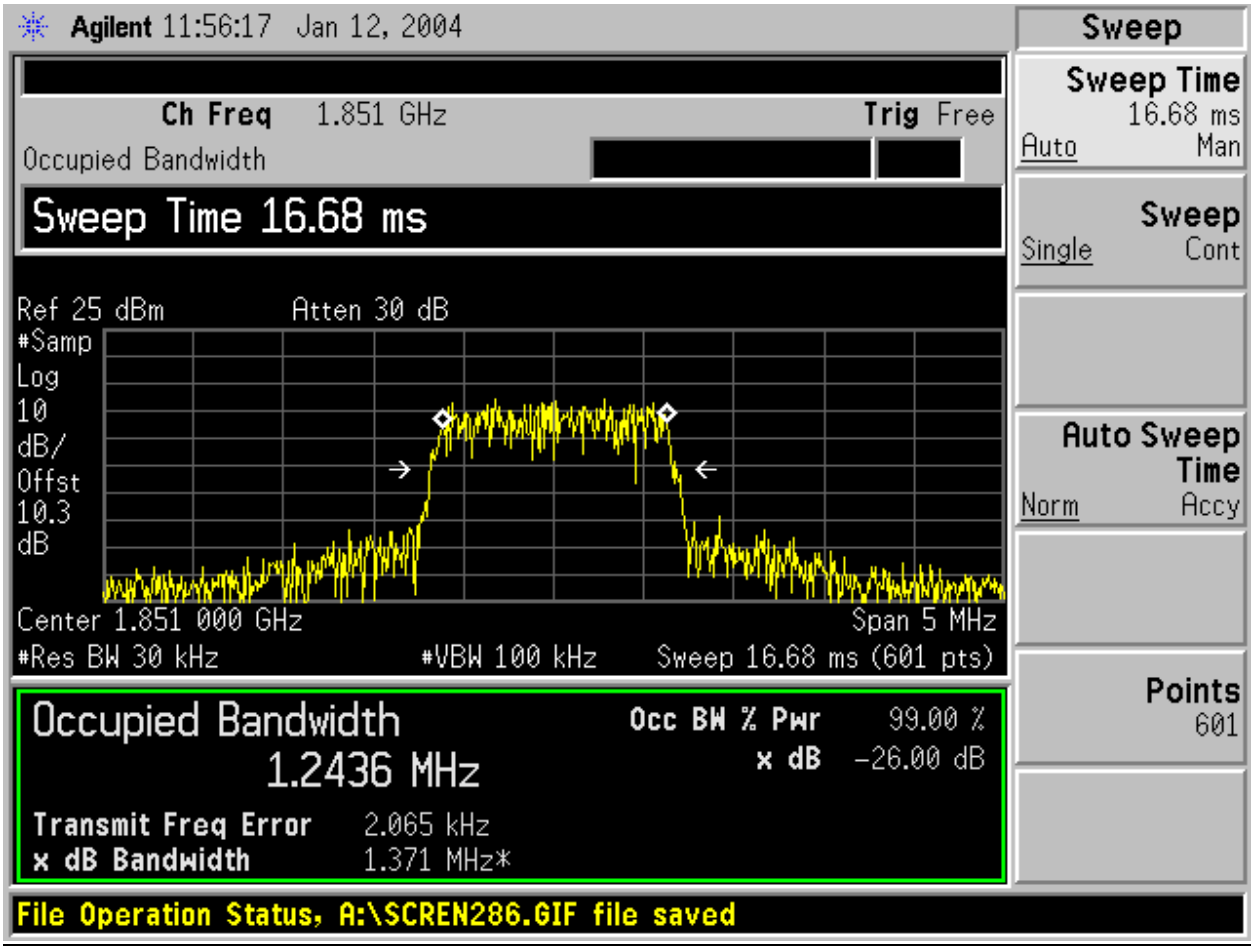
Input Port, CDMA, Low Channel:



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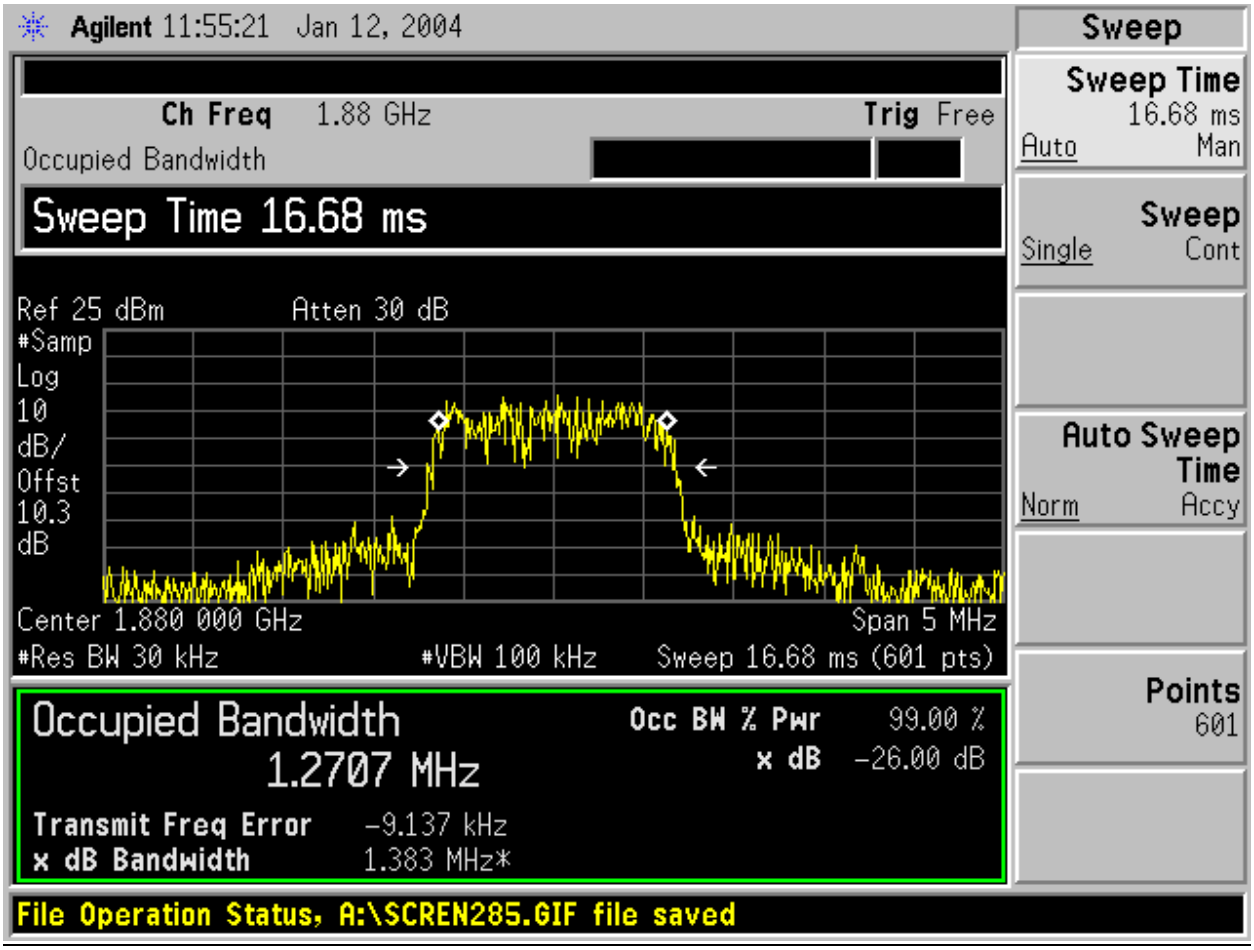
Input Port, CDMA, Mid Channel:



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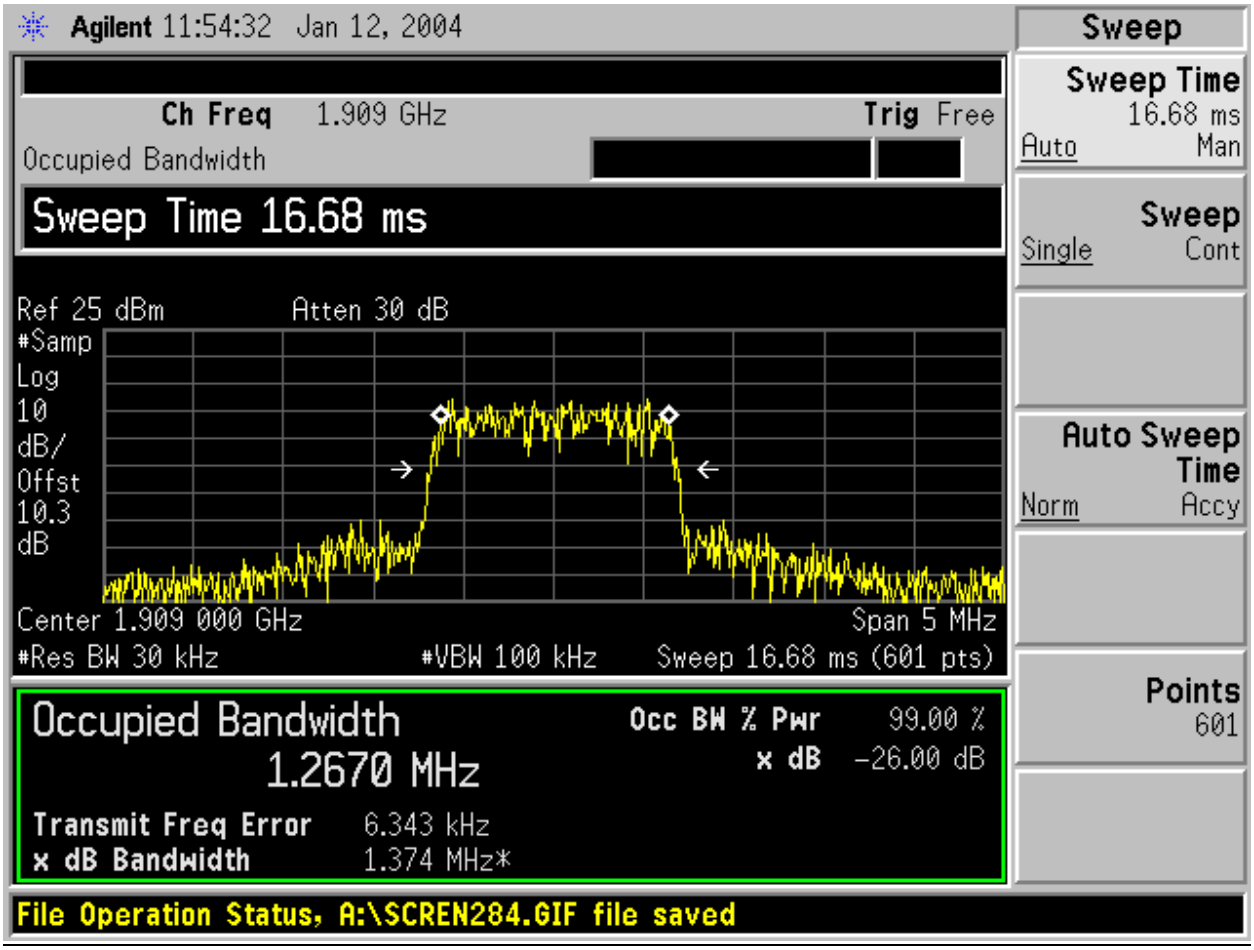
Input Port, CDMA, High Channel:



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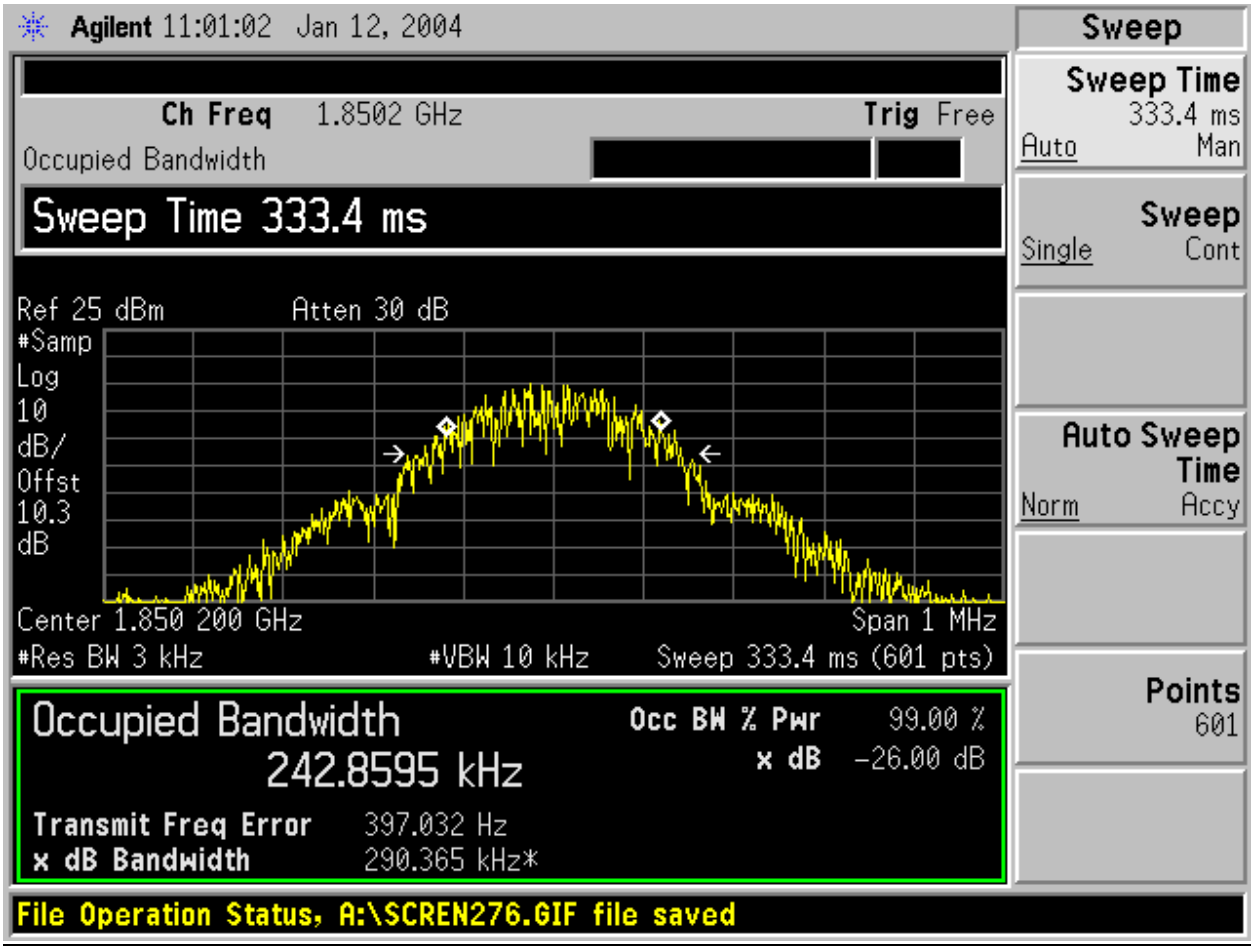
Input Port, GSM, Low Channel:



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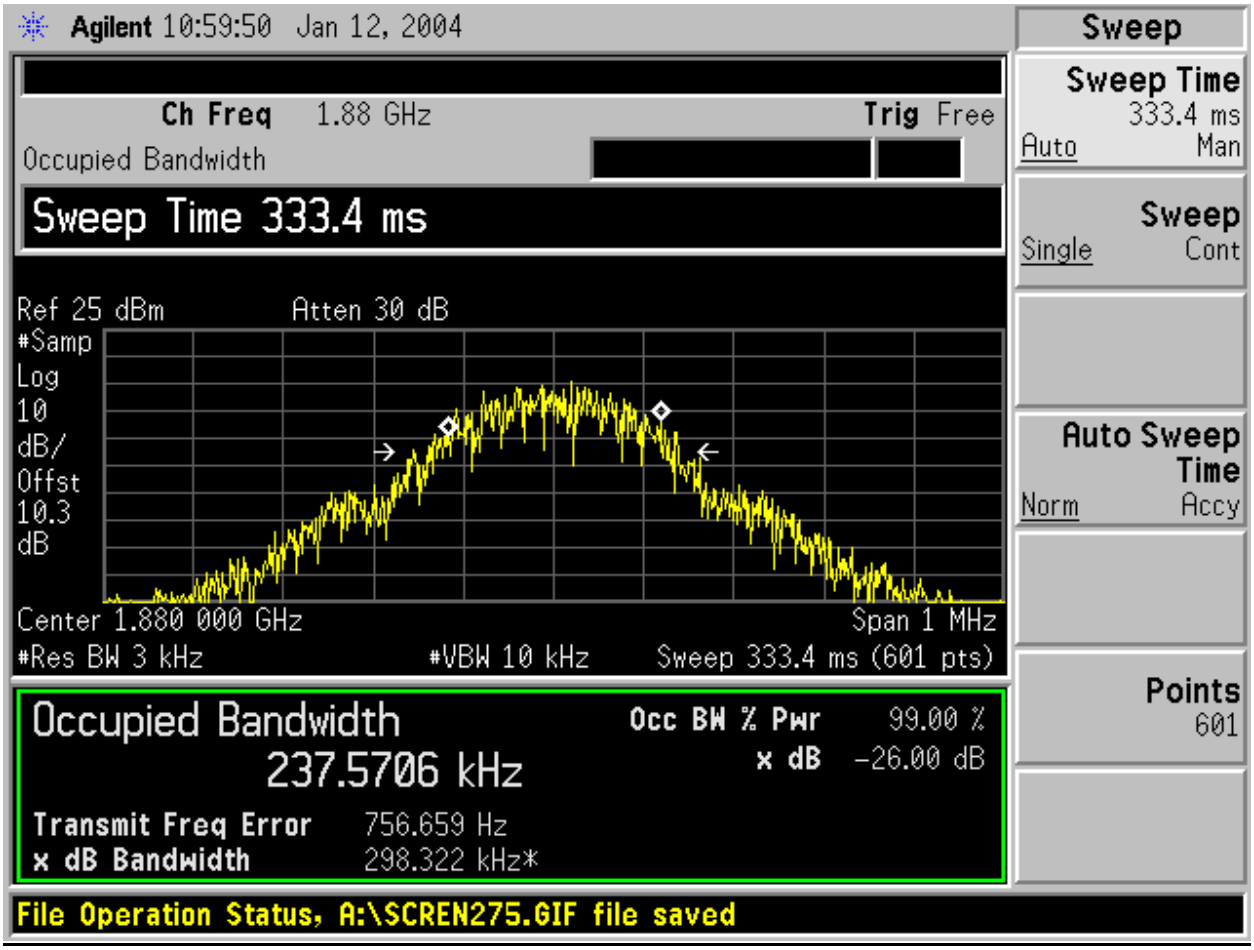
Input Port, GSM, Mid Channel:



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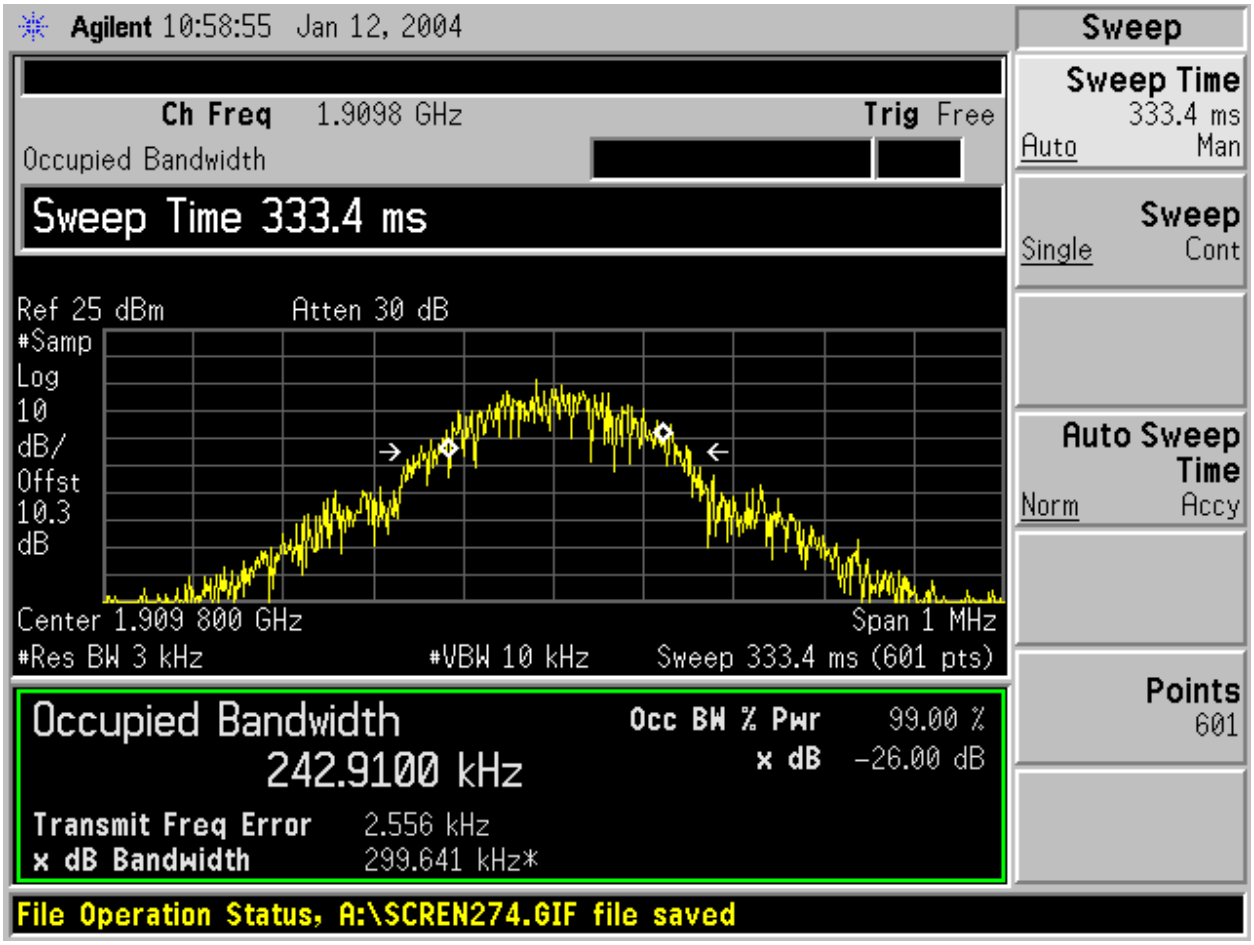
Input Port, GSM, High Channel:



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9.4. SECTION 2.1051: SPURIOUS EMISSIONS AT ANTENNA TERMINAL

TEST PROCEDURE:

The output of the EUT was connected to a spectrum analyzer, RBW & VBW were set to 1 MHz, the spectrum from 30MHz to 10th harmonic of the fundamental was investigated for CDMA/ GSM modes, for Low, Mid and High channels. For the frequency span of 1MHz close to the fundamental frequency the RBW was reduced to 1% of the EBW.

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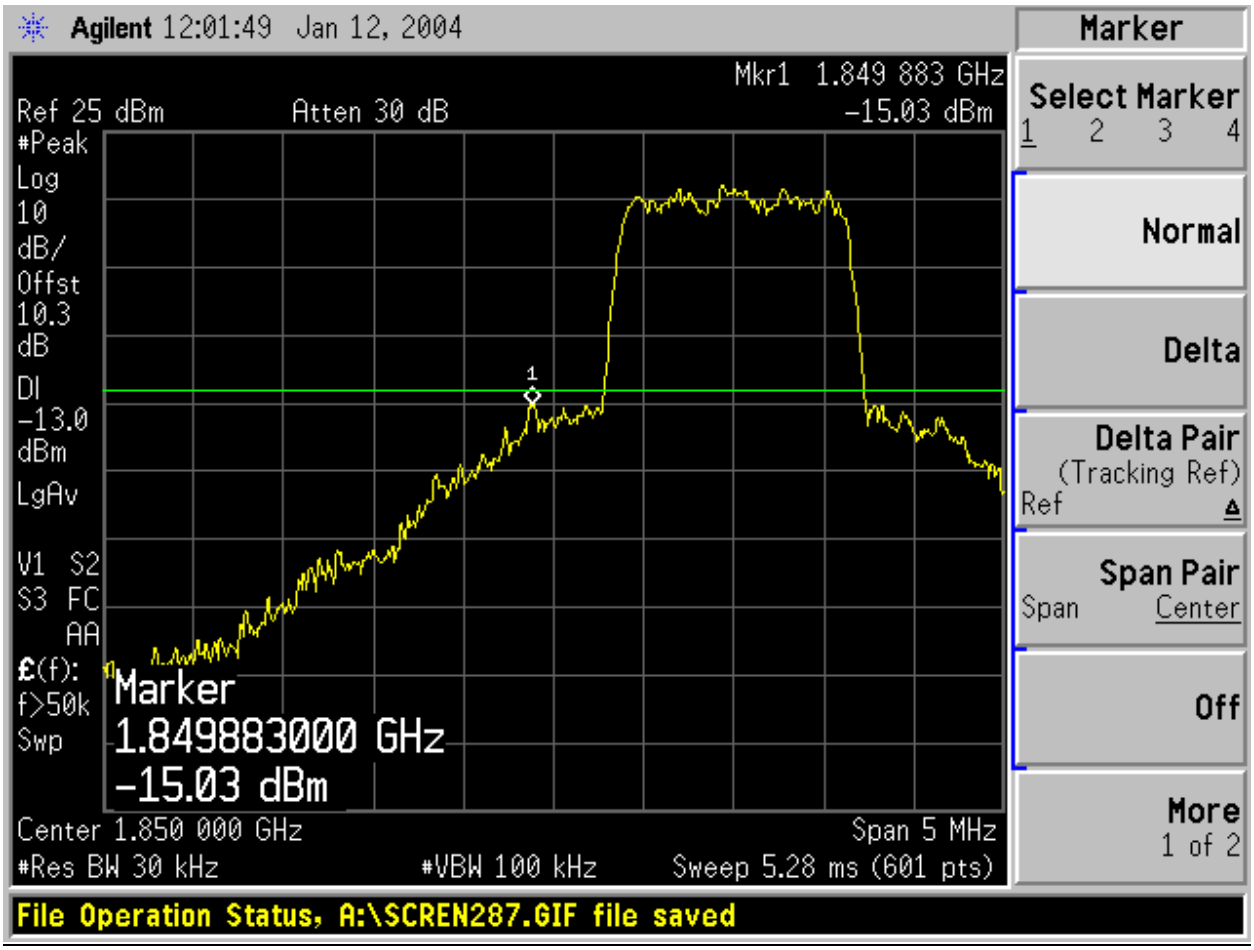
RESULTS:

BAND EDGE , CDMA, Low Channel:



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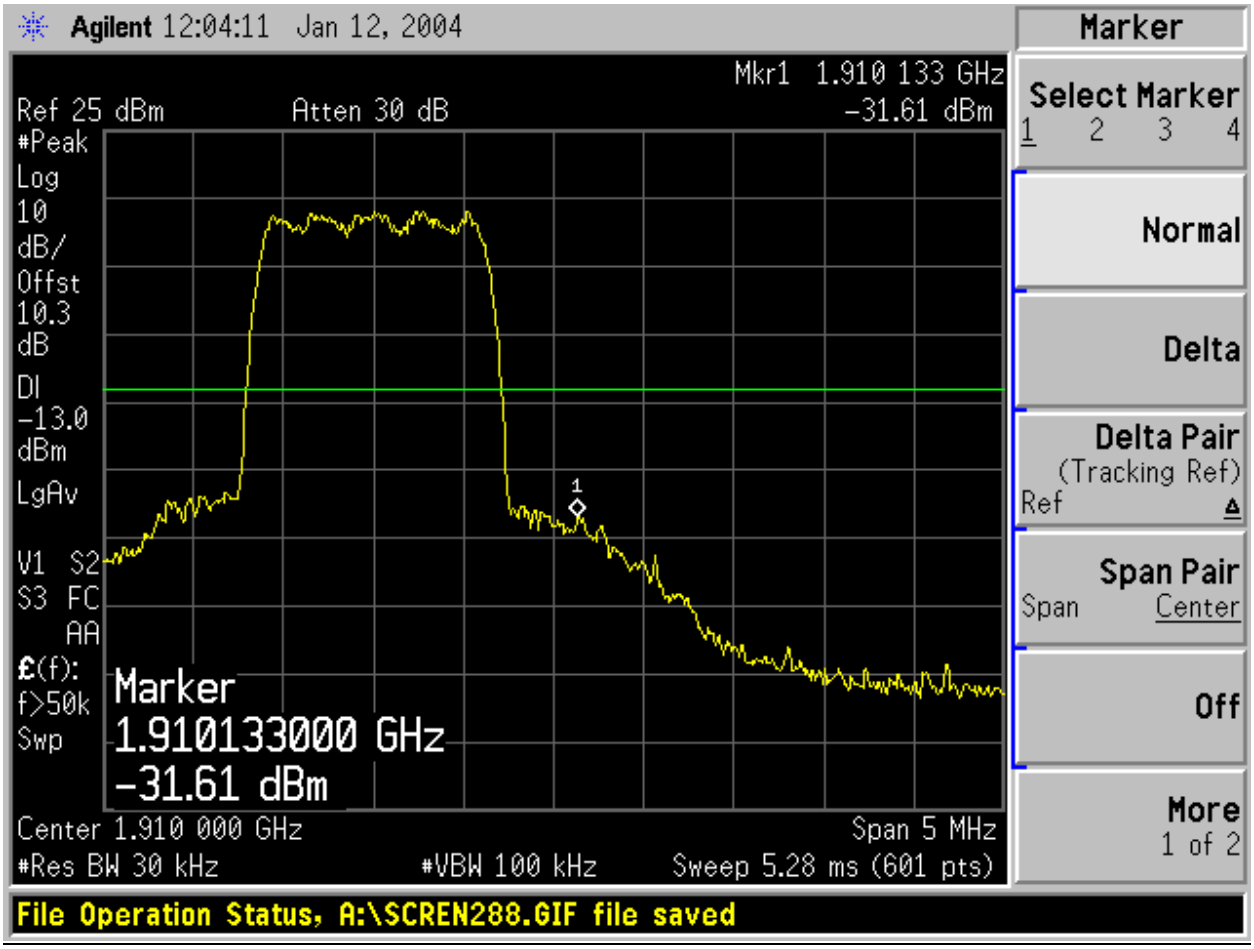
BAND EDGE , CDMA, High Channel:



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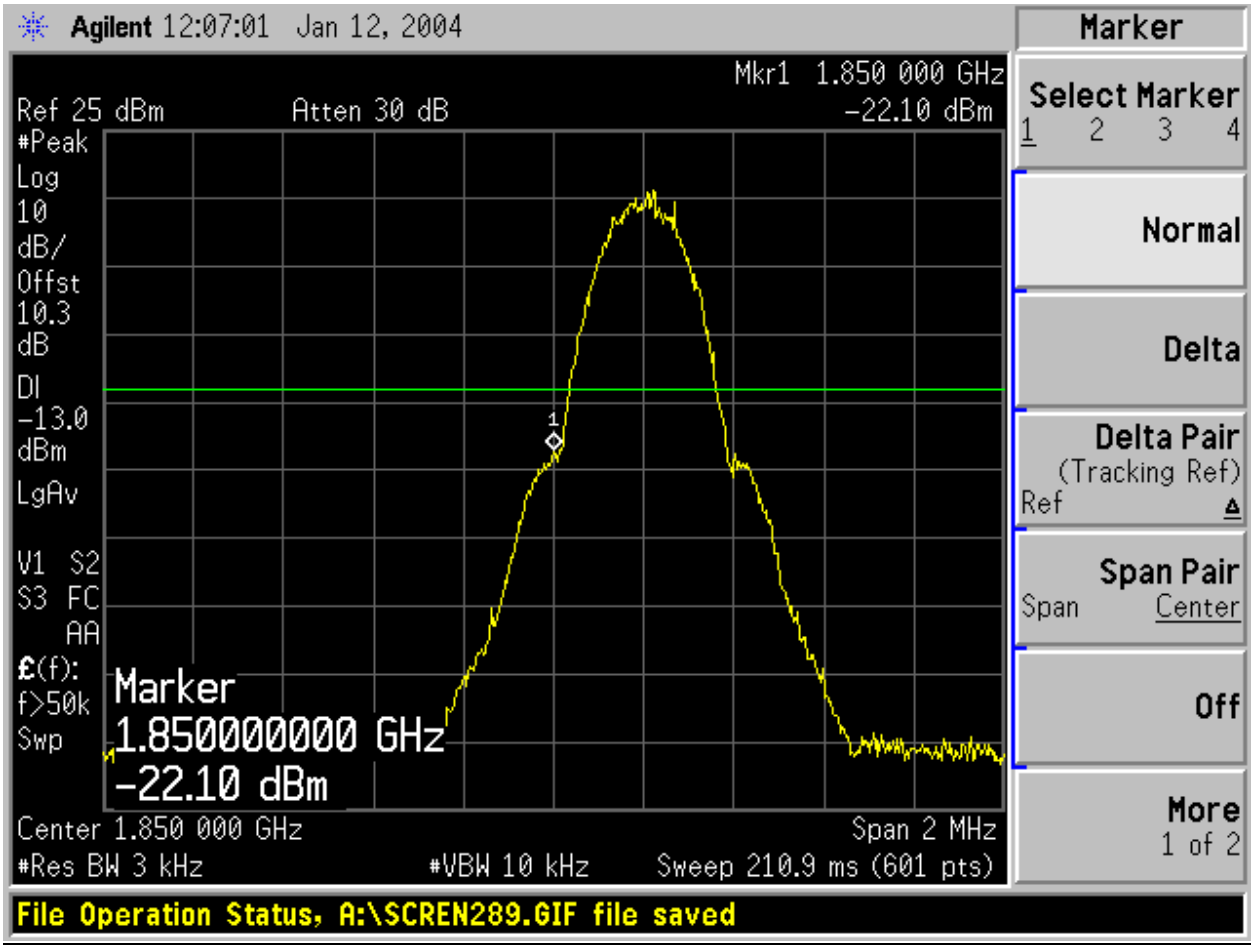
BAND EDGE , GSM, Low Channel:



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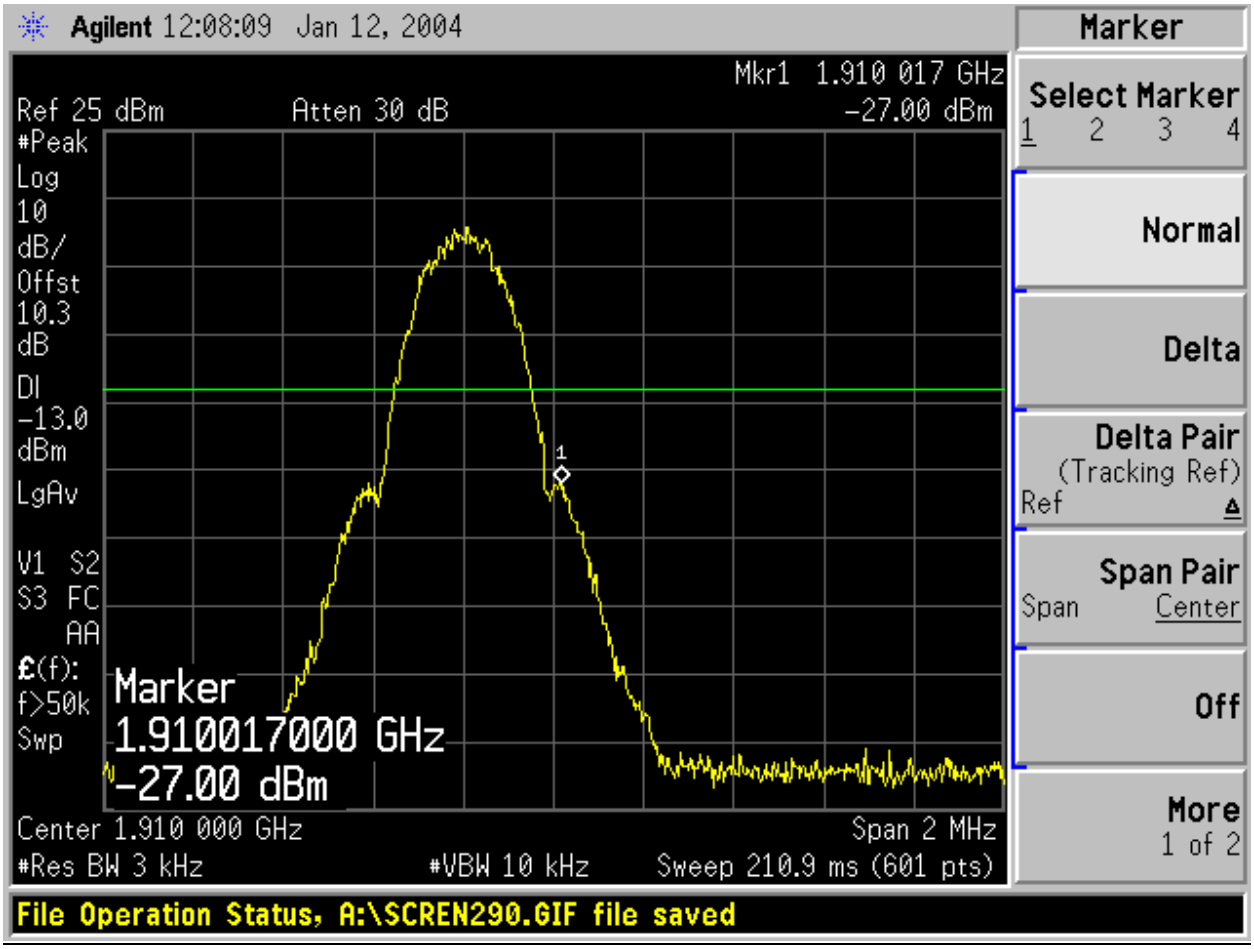
BAND EDGE , GSM, High Channel:



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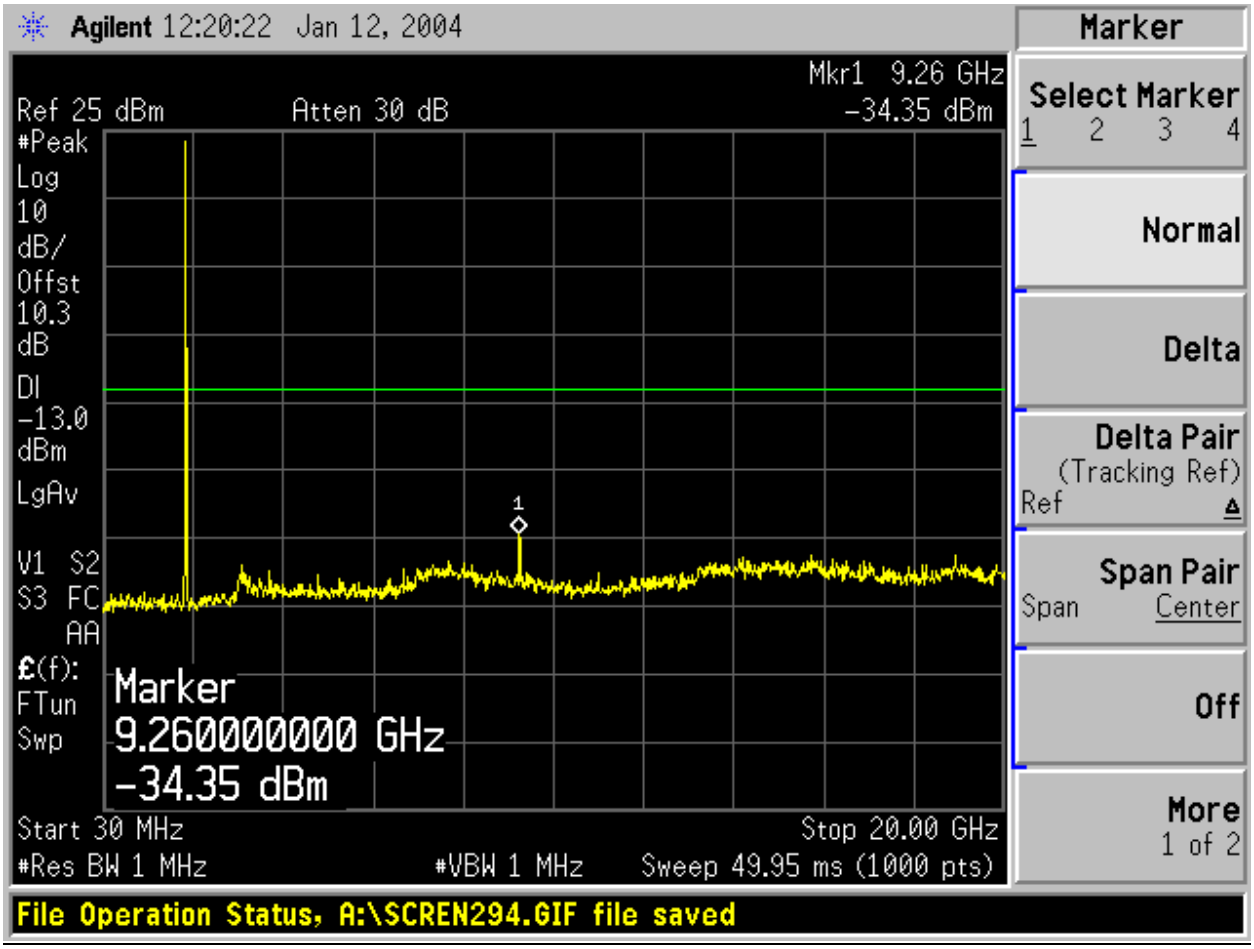
RF Conducted Emissions (30 MHz – 20 GHz), CDMA, Low Channel:



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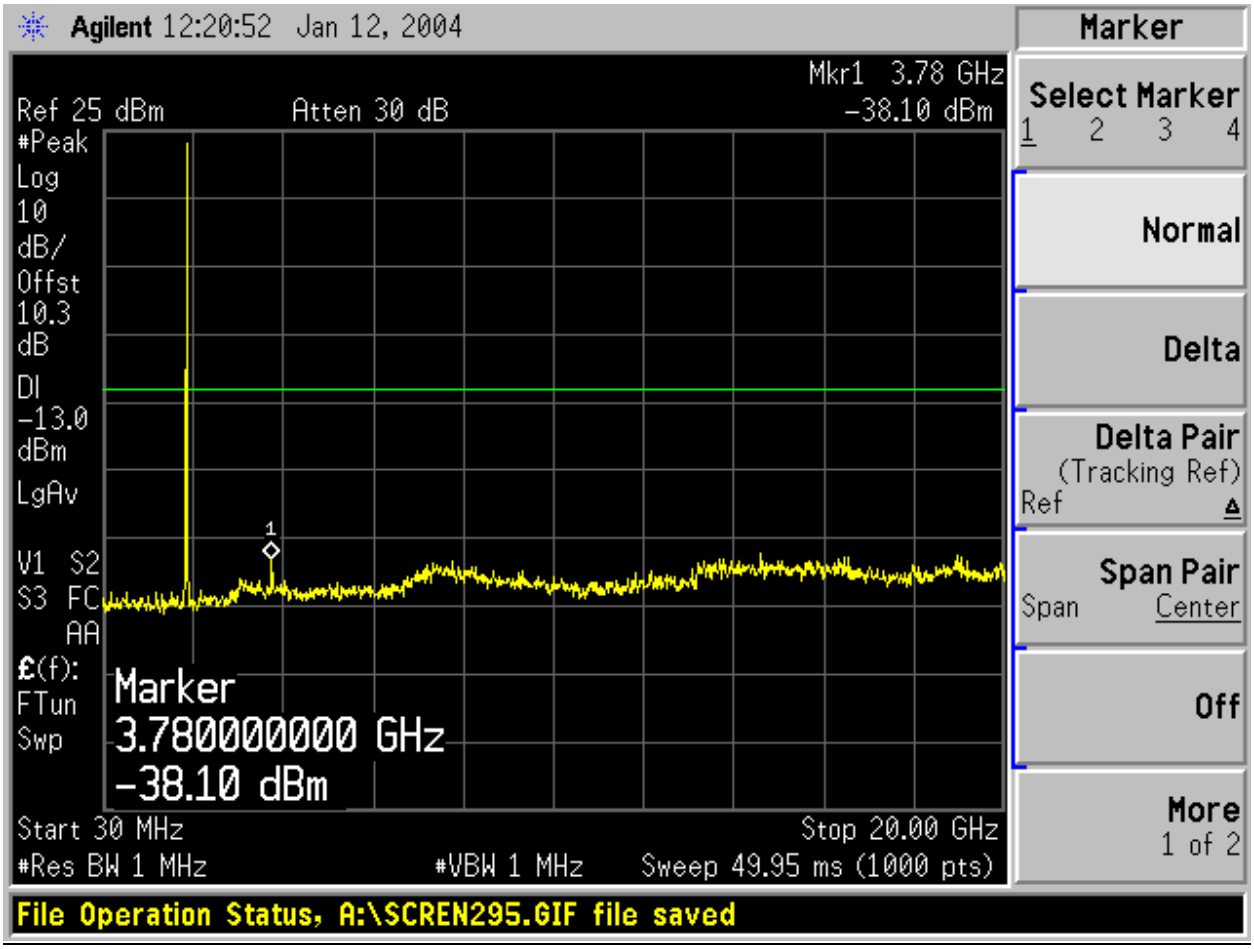
RF Conducted Emissions (30 MHz – 20 GHz), CDMA, Mid Channel:



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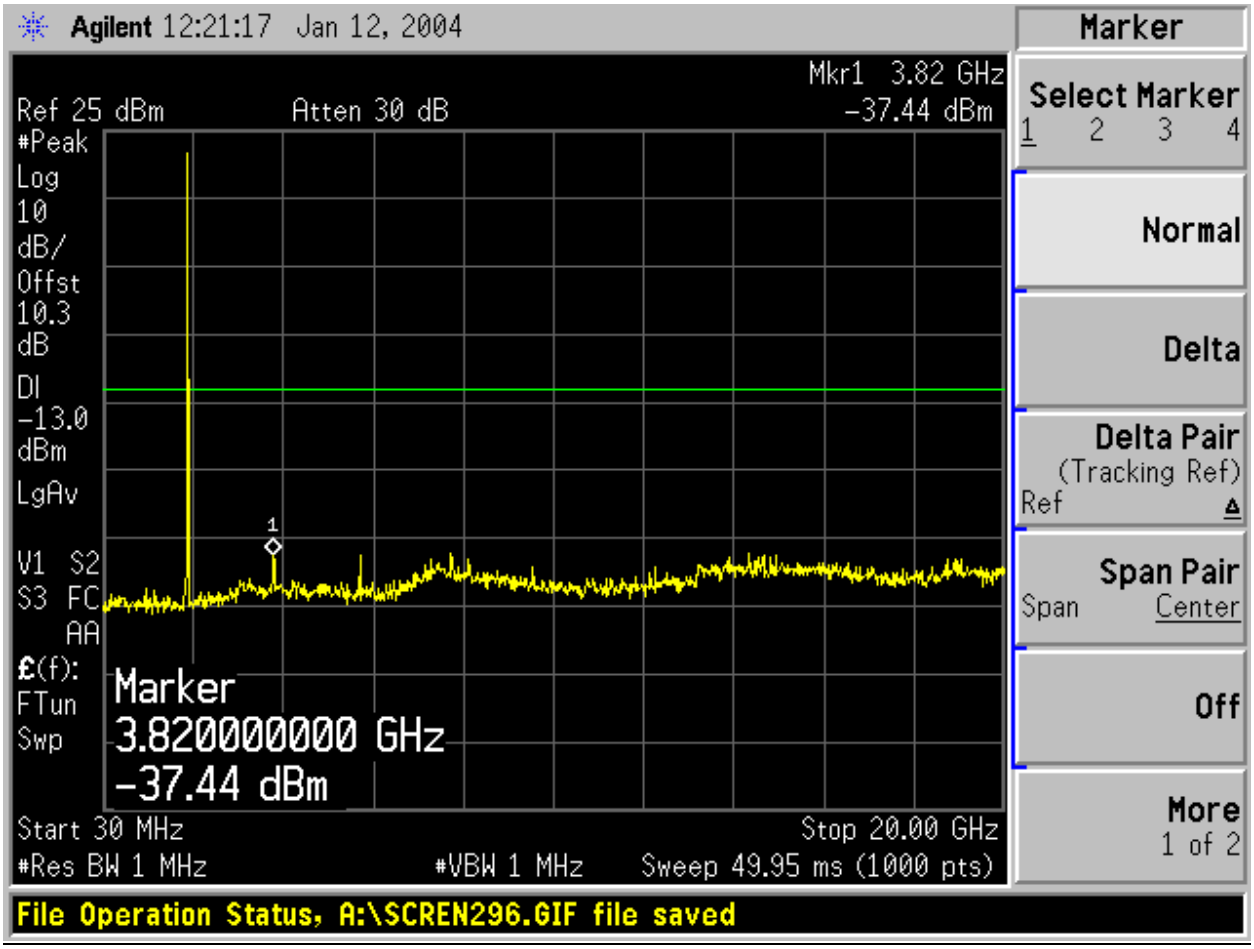
RF Conducted Emissions (30 MHz – 20 GHz), CDMA, High Channel:



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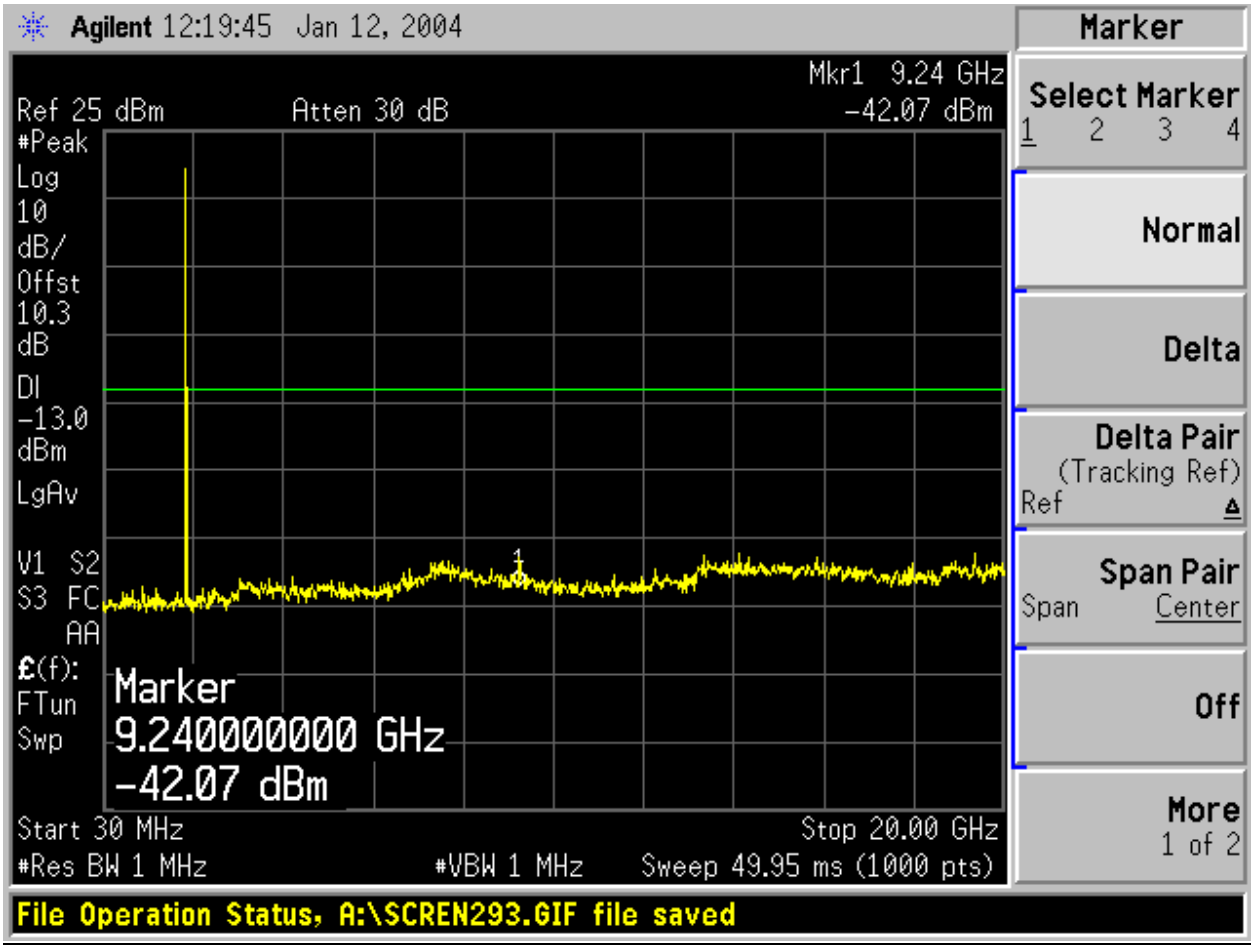
RF Conducted Emissions (30 MHz – 20 GHz), GSM, Low Channel:



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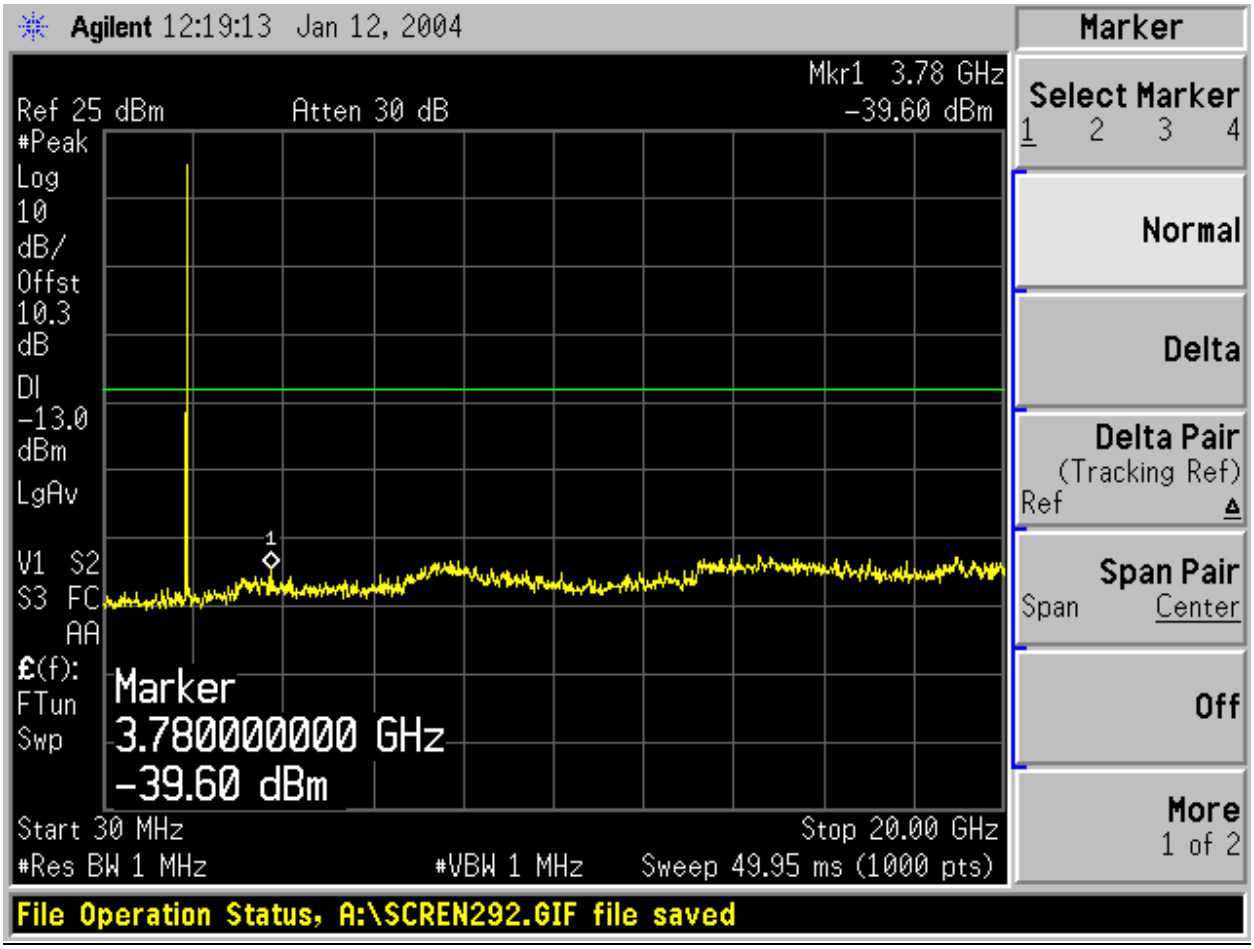
RF Conducted Emissions (30 MHz – 20 GHz), GSM, Mid Channel:



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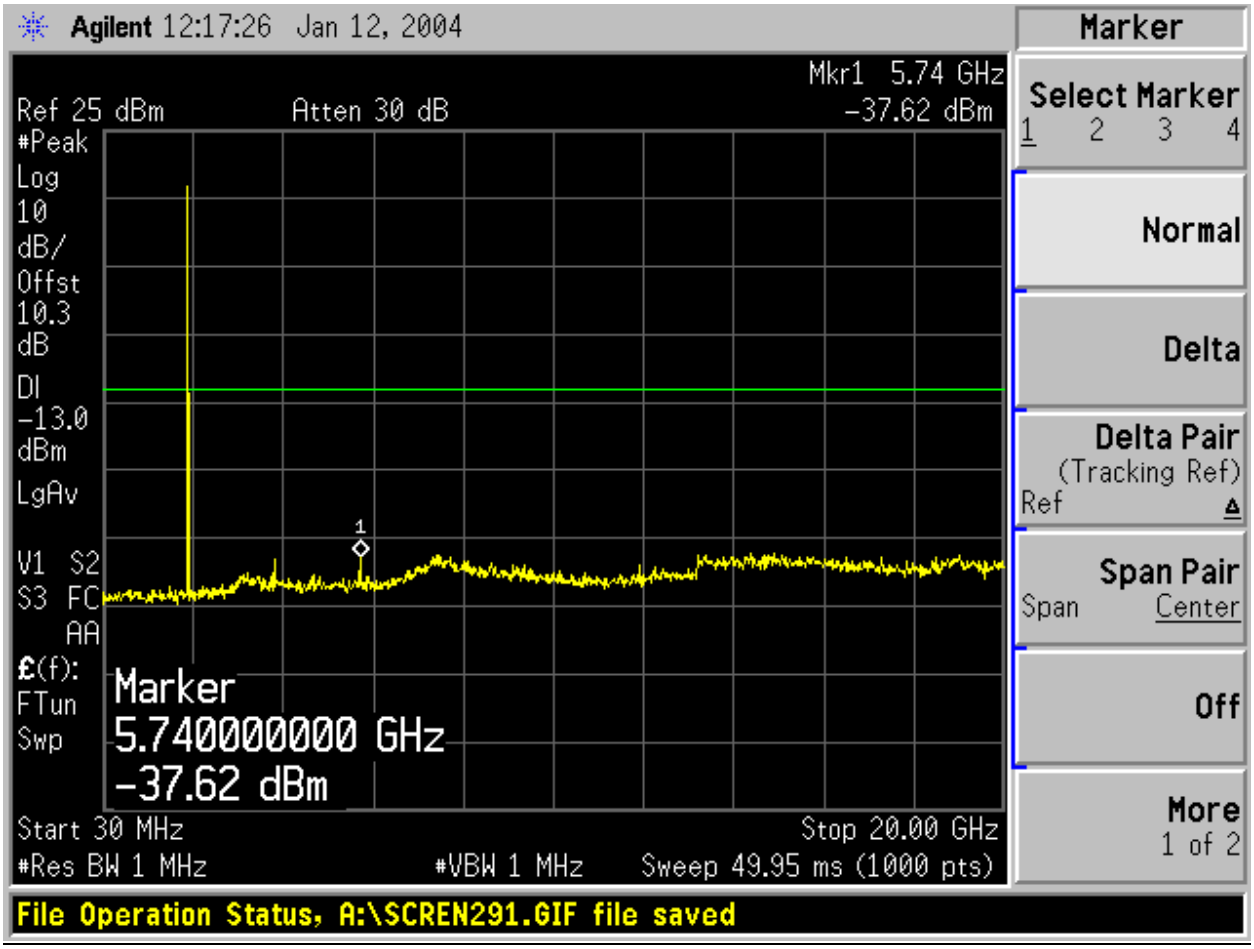
RF Conducted Emissions (30 MHz – 20 GHz), GSM, High Channel:



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9.5. SECTION 2.1053: FIELD STRENGTH OF SPURIOUS RADIATION

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
Above 1000	☒ Peak ☐ Average	☒ 1 MHz ☐ 1 MHz	☒ 1 MHz ☐ 10 Hz

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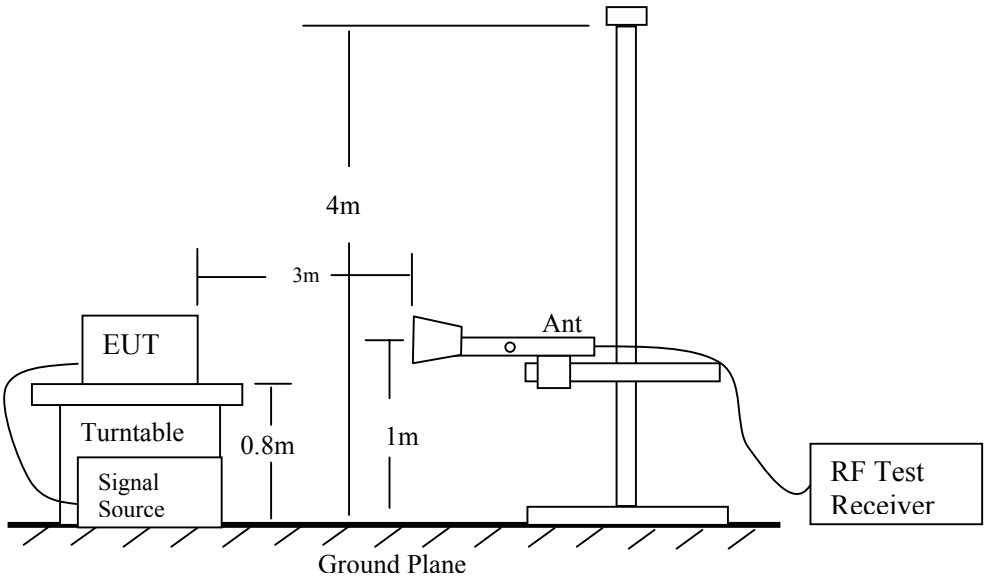
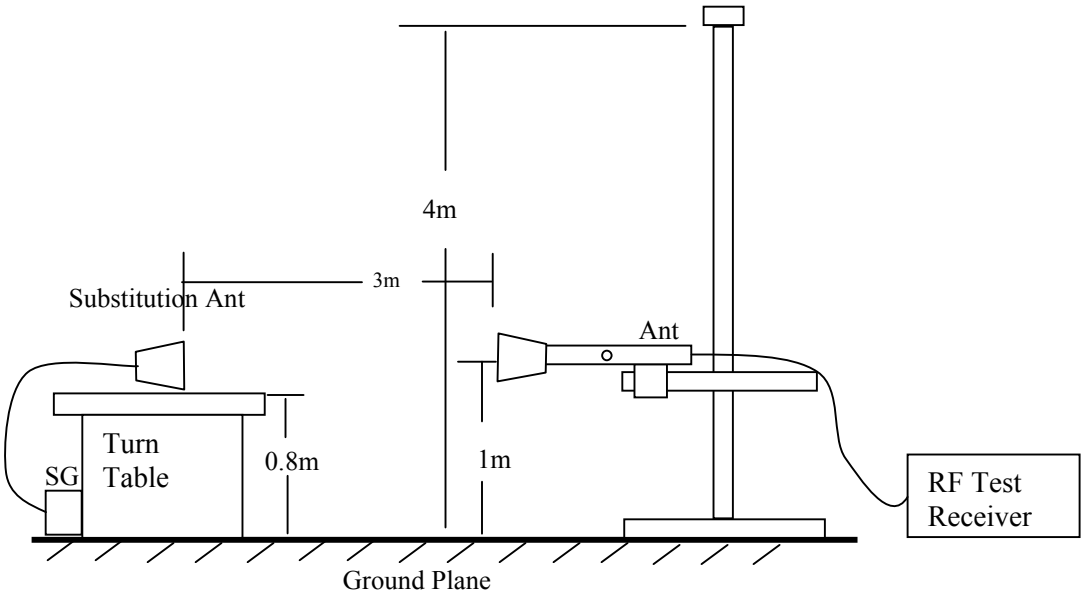


Radiated Emission Measurement



Radiated Emission – Substitution Method set-up

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TEST PROCEDURE

1). On a test site, the EUT shall be placed on a turntable, and in the position closest to the normal use as declared by the user.
2). The test antenna shall be oriented initially for vertical polarization located 1m from the EUT to correspond to the frequency of the transmitter.
3). The output of the test antenna shall be connected to the measuring receiver and either a peak or average detector was used for the measurement as indicated on the report. The detector selection is based on how close the emission level was approaching the limit.
4). The transmitter shall be switched on, if possible, without the modulation and the measurement receiver shall be tuned to the frequency of the transmitter under test.
5). 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.
6). The transmitter shall than be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7). 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.
8). The maximum signal level detected by the measuring receiver shall be noted.
9). The transmitter shall be replaced by a substitution antenna.
10). The substitution antenna shall be oriented for vertical polarization.
11). The substitution antenna shall be connected to a calibrated signal generator.
12). If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13). The test antenna shall be raised and lowered through the specified range of the height to ensure that the maximum signal is received.
14). The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuation setting of the measuring receiver.
15). 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.
16). The measurement shall be repeated with the test antenna and the substitution antenna oriented for horizontal polarization.
17). The measure of the effective radiated power is the larger of the two levels recorded, at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

MEASUREMENT RESULT

No non-compliance noted, as shown below

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1900MHz Band CDMA/GSM - Harmonics / Spurious and Substitution Emissions, Low / Mid / High Channels:

1/8/04 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 03U2456-1
Company: Cellphone Mate
EUT Descrip.: Cellphone Amplifier
EUT M/N: CM 1000
Test Target: FCC PART 24
Mode Oper: TX ON, maximum power

Test Equipment:

EMCO Horn 1-18GHz | Pre-amplifer 1-26GHz | Spectrum Analyzer | Horn > 18GHz | Limit

Hi Frequency Cables: ☑ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☐ (12 ft)

Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW, VBW=RBW
Bandedge: RBW=>1% Emissions BW, VBW=> 3*RBW
Spurious: RBW=1MHz, VBW=1MHz

f GHz	SA reading (dBm)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (1851 MHz), CDMA, 3 dBi Antenna									
3.702	46.1	-23.0	0.4	8.0	5.9	-15.4	-13.0	-2.4	V
5.553	69.6	-32.5	0.5	9.8	7.7	-23.2	-13.0	-10.2	V
7.404	52.3	-48.4	0.7	11.3	9.2	-37.8	-13.0	-24.8	V
9.255	67.4	-33.9	0.8	12.2	10.1	-22.5	-13.0	-9.5	V
11.106	49.5	-50.1	0.9	12.5	10.4	-38.5	-13.0	-25.5	V
3.702	39.8	-29.7	0.4	8.0	5.9	-22.1	-13.0	-9.1	H
5.553	63.7	-37.8	0.5	9.8	7.7	-28.5	-13.0	-15.5	H
7.404	54.2	-46.2	0.7	11.3	9.2	-35.6	-13.0	-22.6	H
9.255	66.2	-33.5	0.8	12.2	10.1	-22.1	-13.0	-9.1	H
11.106	49.5	-48.4	0.9	12.5	10.4	-36.8	-13.0	-23.8	H
Mid Channel (1880 MHz), CDMA, 3 dBi Antenna									
3.760	45.9	-23.2	0.4	8.0	5.9	-15.6	-13.0	-2.6	V
5.640	68.8	-31.8	0.5	9.8	7.7	-22.5	-13.0	-9.5	V
7.520	53.6	-47.1	0.7	11.3	9.2	-36.5	-13.0	-23.5	V
9.400	62.4	-38.2	0.8	12.2	10.1	-26.8	-13.0	-13.8	V
11.280	49.9	-48.0	0.9	12.5	10.4	-36.4	-13.0	-23.4	V
3.760	39.8	-29.4	0.4	8.0	5.9	-21.8	-13.0	-8.8	H
5.640	62.5	-38.9	0.5	9.8	7.7	-29.6	-13.0	-16.6	H
7.520	54.2	-46.0	0.7	11.3	9.2	-35.4	-13.0	-22.4	H
9.400	59.8	-40.1	0.8	12.2	10.1	-28.7	-13.0	-15.7	H
11.280	50.2	-48.0	0.9	12.5	10.4	-36.4	-13.0	-23.4	H
High Channel (1909 MHz), CDMA, 3 dBi Antenna									
3.8180	46.2	-23.5	0.4	8.0	5.9	-15.9	-13.0	-2.9	V
5.7270	68.7	-31.9	0.5	9.8	7.7	-22.6	-13.0	-9.6	V
7.6360	49.6	-49.5	0.7	11.3	9.2	-38.9	-13.0	-25.9	V
9.5450	63.5	-37.0	0.8	12.2	10.1	-25.6	-13.0	-12.6	V
11.4540	48.7	-50.5	0.9	12.5	10.4	-38.9	-13.0	-25.9	V
3.8180	38.9	-31.1	0.4	8.0	5.9	-23.5	-13.0	-10.5	H
5.7270	63.4	-38.0	0.5	9.8	7.7	-28.7	-13.0	-15.7	H
7.6360	48.7	-51.4	0.7	11.3	9.2	-40.8	-13.0	-27.8	H
9.5450	61.2	-39.5	0.8	12.2	10.1	-28.1	-13.0	-15.1	H
11.4540	50.6	-47.0	0.9	12.5	10.4	-35.4	-13.0	-22.4	H

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1/8/04 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
Project #: 03U2456-1
Company: Cellphone Mate
EUT Descrip.: Cellphone Amplifier
EUT M/N: CM 1000
Test Target: FCC PART 24
Mode Oper: TX ON, maximum power

Test Equipment:

EMCO Horn 1-18GHz | Pre-amplifer 1-26GHz | Spectrum Analyzer | Horn > 18GHz | Limit

Hi Frequency Cables
☑ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☐ (12 ft)

Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW, VBW=RBW
Bandedge: RBW=>1% Emissions BW, VBW=> 3*RBW
Spurious: RBW=1MHz, VBW=1MHz

f GHz	SA reading (dBm)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (1851 MHz), CDMA, 5 dBi Antenna									
3.702	45.9	-24.1	0.4	8.0	5.9	-16.5	-13.0	-3.5	V
5.553	70.2	-31.7	0.5	9.8	7.7	-22.4	-13.0	-9.4	V
7.404	53.2	-47.4	0.7	11.3	9.2	-36.8	-13.0	-23.8	V
9.255	68.9	-31.2	0.8	12.2	10.1	-19.8	-13.0	-6.8	V
11.106	50.1	-48.1	0.9	12.5	10.4	-36.5	-13.0	-23.5	V
3.702	38.5	-31.1	0.4	8.0	5.9	-23.5	-13.0	-10.5	H
5.553	65.2	-36.0	0.5	9.8	7.7	-26.7	-13.0	-13.7	H
7.404	55.2	-44.7	0.7	11.3	9.2	-34.1	-13.0	-21.1	H
9.255	65.8	-35.0	0.8	12.2	10.1	-23.6	-13.0	-10.6	H
11.106	50.1	-48.3	0.9	12.5	10.4	-36.7	-13.0	-23.7	H
Mid Channel (1880 MHz), CDMA, 5 dBi Antenna									
3.760	46.2	-23.5	0.4	8.0	5.9	-15.9	-13.0	-2.9	V
5.640	69.4	-31.8	0.5	9.8	7.7	-22.5	-13.0	-9.5	V
7.520	53.8	-47.0	0.7	11.3	9.2	-36.4	-13.0	-23.4	V
9.400	63.2	-37.3	0.8	12.2	10.1	-25.9	-13.0	-12.9	V
11.280	49.5	-48.4	0.9	12.5	10.4	-36.8	-13.0	-23.8	V
3.760	38.5	-31.1	0.4	8.0	5.9	-23.5	-13.0	-10.5	H
5.640	63.4	-37.9	0.5	9.8	7.7	-28.6	-13.0	-15.6	H
7.520	56.8	-44.0	0.7	11.3	9.2	-33.4	-13.0	-20.4	H
9.400	60.4	-39.9	0.8	12.2	10.1	-28.5	-13.0	-15.5	H
11.280	49.8	-38.4	0.9	12.5	10.4	-26.8	-13.0	-13.8	H
High Channel (1909 MHz), CDMA, 5 dBi Antenna									
3.8180	46.4	-24.4	0.4	8.0	5.9	-16.8	-13.0	-3.8	V
5.7270	69.5	-31.7	0.5	9.8	7.7	-22.4	-13.0	-9.4	V
7.6360	48.7	-49.4	0.7	11.3	9.2	-38.8	-13.0	-25.8	V
9.5450	64.3	-36.0	0.8	12.2	10.1	-24.6	-13.0	-11.6	V
11.4540	49.6	-48.1	0.9	12.5	10.4	-36.5	-13.0	-23.5	V
3.8180	38.7	-30.0	0.4	8.0	5.9	-22.4	-13.0	-9.4	H
5.7270	64.3	-36.4	0.5	9.8	7.7	-27.1	-13.0	-14.1	H
7.6360	48.9	-51.8	0.7	11.3	9.2	-41.2	-13.0	-28.2	H
9.5450	62.5	-37.8	0.8	12.2	10.1	-26.4	-13.0	-13.4	H
11.4540	49.6	-48.4	0.9	12.5	10.4	-36.8	-13.0	-23.8	H

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Compliance Certification Services, Morgan Hill Open Field Site

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f GHz	SA reading (dBm)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (1850.2 MHz), GSM, 3 dBi Antenna									
3.700	45.8	-24.4	0.4	8.0	5.9	-16.8	-13.0	-3.8	V
5.551	64.8	-37.1	0.5	9.8	7.7	-27.8	-13.0	-14.8	V
7.401	55.7	-45.2	0.7	11.3	9.2	-34.6	-13.0	-21.6	V
9.251	66.3	-33.5	0.8	12.2	10.1	-22.1	-13.0	-9.1	V
11.101	50.6	-48.1	0.9	12.5	10.4	-36.5	-13.0	-23.5	V
3.700	45.6	-24.4	0.4	8.0	5.9	-16.8	-13.0	-3.8	H
5.551	60.8	-40.7	0.5	9.8	7.7	-31.4	-13.0	-18.4	H
7.401	57.0	-42.7	0.7	11.3	9.2	-32.1	-13.0	-19.1	H
9.251	64.8	-36.0	0.8	12.2	10.1	-24.6	-13.0	-11.6	H
11.101	50.8	-47.4	0.9	12.5	10.4	-35.8	-13.0	-22.8	H
Mid Channel (1880 MHz), GSM, 3 dBi Antenna									
3.760	46.2	-24.0	0.4	8.0	5.9	-16.4	-13.0	-3.4	V
5.640	62.5	-39.1	0.5	9.8	7.7	-29.8	-13.0	-16.8	V
7.520	54.6	-46.0	0.7	11.3	9.2	-35.4	-13.0	-22.4	V
9.400	64.2	-36.0	0.8	12.2	10.1	-24.6	-13.0	-11.6	V
11.280	52.8	-45.0	0.9	12.5	10.4	-33.4	-13.0	-20.4	V
3.760	46.1	-24.1	0.4	8.0	5.9	-16.5	-13.0	-3.5	H
5.640	58.0	-42.7	0.5	9.8	7.7	-33.4	-13.0	-20.4	H
7.520	56.5	-44.2	0.7	11.3	9.2	-33.6	-13.0	-20.6	H
9.400	62.3	-37.8	0.8	12.2	10.1	-26.4	-13.0	-13.4	H
11.280	53.0	-45.2	0.9	12.5	10.4	-33.6	-13.0	-20.6	H
High Channel (1909.8 MHz), GSM, 3 dBi Antenna									
3.820	46.3	-24.4	0.4	8.0	5.9	-16.8	-13.0	-3.8	V
5.729	67.1	-33.9	0.5	9.8	7.7	-24.6	-13.0	-11.6	V
7.639	57.0	-42.7	0.7	11.3	9.2	-32.1	-13.0	-19.1	V
9.549	63.5	-36.8	0.8	12.2	10.1	-25.4	-13.0	-12.4	V
11.459	53.0	-45.2	0.9	12.5	10.4	-33.6	-13.0	-20.6	V
3.820	46.2	-24.4	0.4	8.0	5.9	-16.8	-13.0	-3.8	H
5.729	63.7	-36.7	0.5	9.8	7.7	-27.4	-13.0	-14.4	H
7.639	59.0	-40.7	0.7	11.3	9.2	-30.1	-13.0	-17.1	H
9.549	65.6	-35.0	0.8	12.2	10.1	-23.6	-13.0	-10.6	H
11.459	52.9	-45.5	0.9	12.5	10.4	-33.9	-13.0	-20.9	H

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1/8/04 **High Frequency Substitution Measurement**
Compliance Certification Services, Morgan Hill Open Field Site

Test Engr: Frank Ibrahim
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Mode Oper: TX ON, maximum power

Test Equipment:

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Hi Frequency Cables
☑ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☐ (12 ft)

Peak Measurements:
Fundamental: RBW>99% or 26dB Emissions BW, VBW=RBW
Bandedge: RBW=>1% Emissions BW, VBW=> 3*RBW
Spurious: RBW=1MHz, VBW=1MHz

f GHz	SA reading (dBm)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes
Low Channel (1850.2 MHz), GSM, 5 dBi Antenna									
3.700	44.8	-24.5	0.4	8.0	5.9	-16.9	-13.0	-3.9	V
5.551	66.1	-34.7	0.5	9.8	7.7	-25.4	-13.0	-12.4	V
7.401	54.2	-46.2	0.7	11.3	9.2	-35.6	-13.0	-22.6	V
9.251	64.1	-36.3	0.8	12.2	10.1	-24.9	-13.0	-11.9	V
11.101	50.1	-48.0	0.9	12.5	10.4	-36.4	-13.0	-23.4	V
3.700	40.1	-29.1	0.4	8.0	5.9	-21.5	-13.0	-8.5	H
5.551	58.2	-42.7	0.5	9.8	7.7	-33.4	-13.0	-20.4	H
7.401	56.4	-44.3	0.7	11.3	9.2	-33.7	-13.0	-20.7	H
9.251	57.6	-42.8	0.8	12.2	10.1	-31.4	-13.0	-18.4	H
11.101	49.8	-48.3	0.9	12.5	10.4	-36.7	-13.0	-23.7	H
Mid Channel (1880 MHz), GSM, 5 dBi Antenna									
3.760	45.8	-24.4	0.4	8.0	5.9	-16.8	-13.0	-3.8	V
5.640	64.1	-36.7	0.5	9.8	7.7	-27.4	-13.0	-14.4	V
7.520	53.4	-47.0	0.7	11.3	9.2	-36.4	-13.0	-23.4	V
9.400	62.4	-38.2	0.8	12.2	10.1	-26.8	-13.0	-13.8	V
11.280	52.5	-44.7	0.9	12.5	10.4	-33.1	-13.0	-20.1	V
3.760	40.1	-29.0	0.4	8.0	5.9	-21.4	-13.0	-8.4	H
5.640	59.4	-41.9	0.5	9.8	7.7	-32.6	-13.0	-19.6	H
7.520	58.2	-42.5	0.7	11.3	9.2	-31.9	-13.0	-18.9	H
9.400	53.8	-46.1	0.8	12.2	10.1	-34.7	-13.0	-21.7	H
11.280	48.2	-50.5	0.9	12.5	10.4	-38.9	-13.0	-25.9	H
High Channel (1909.8 MHz), GSM, 5 dBi Antenna									
3.820	45.7	-24.3	0.4	8.0	5.9	-16.7	-13.0	-3.7	V
5.729	68.5	-32.4	0.5	9.8	7.7	-23.1	-13.0	-10.1	V
7.639	57.4	-43.0	0.7	11.3	9.2	-32.4	-13.0	-19.4	V
9.549	62.4	-38.3	0.8	12.2	10.1	-26.9	-13.0	-13.9	V
11.459	54.2	-44.0	0.9	12.5	10.4	-32.4	-13.0	-19.4	V
3.820	39.8	-29.0	0.4	8.0	5.9	-21.4	-13.0	-8.4	H
5.729	58.4	-43.1	0.5	9.8	7.7	-33.8	-13.0	-20.8	H
7.639	50.2	-50.3	0.7	11.3	9.2	-39.7	-13.0	-26.7	H
9.549	54.3	-45.5	0.8	12.2	10.1	-34.1	-13.0	-21.1	H
11.459	50.2	-48.1	0.9	12.5	10.4	-36.5	-13.0	-23.5	H

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9.6. SECTION 2.1055: FREQUENCY STABILITY

No applicable, EUT is an amplifier.

9.7. POWERLINE CONDUCTED EMISSION

Detector Function Setting of Test Receiver

Frequency Range (MHz)	Detector Function	Resolution Bandwidth	Video Bandwidth
150 KHz to 30 MHz	☒ Peak ☐ CISPR Quasi Peak	☒ 9 KHz	☒ 9 KHz

TEST PROCEDURE

1. The EUT was placed on a wooden table 40 cm from a vertical ground plane and approximately 80 cm above the horizontal ground plane on the floor. The EUT was set to transmit in a continuous mode.

2. Line conducted data was recorded for both NEUTRAL and HOT lines.

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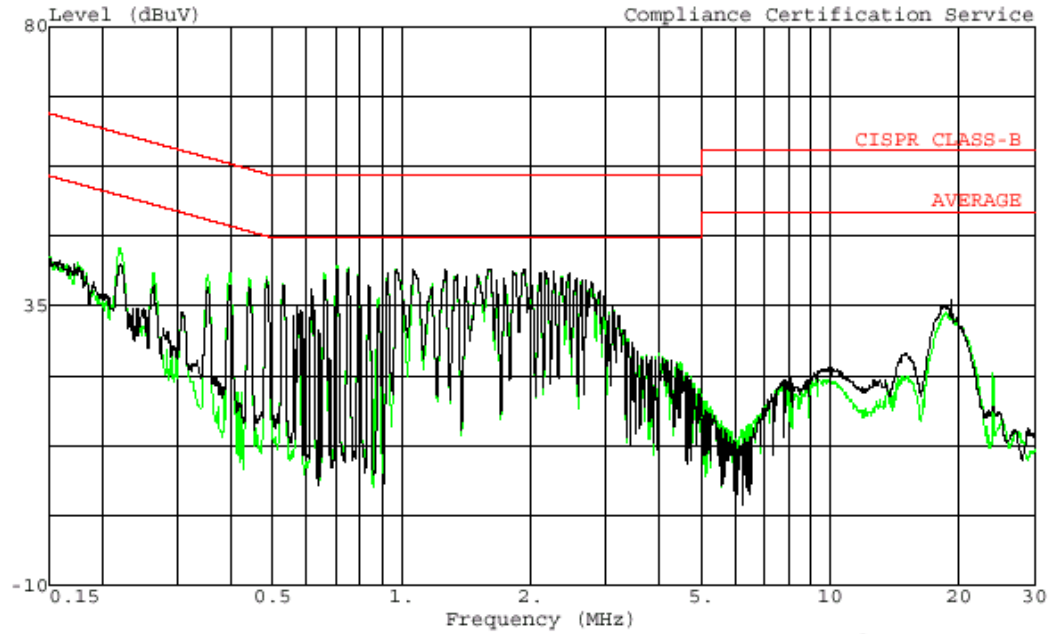
MEASUREMENT RESULT

561F Monterey Road,
San Jose, CA 95037 USA
Tel: (408) 463-0885
Fax: (408) 463-0888

Data#: 10 File#: LC0107.EMI Date: 01-07-2004 Time: 10:54:31



Trace: 6 Ref Trace:
Project # : 03U2456
Test Operator : Frank Ibrahim
Company : Cellphone- Mate
EUT : Cell Phone Amplifier
Model : CM 1000
Configuration : EUT, Cell phone, 5 dBi Antenna
Mode of Operation: Normal Operation
Target of Test : FCC Class B (Using CISPR 22 Limits)
Voltage : 115Vac/60Hz
: PEAK: L1(BLACK), L2(GREEN)

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LINE CONDUCTION DATA

CONDUCTED EMISSIONS DATA (115VAC 60Hz)									
Freq.	**Reading**			**Closs**	**Limit**	**EN_B**	**Margin**		**Remark**
(MHz)	**PK (dBuV)**	**QP (dBuV)**	**AV (dBuV)**	**(dB)**	**QP**	**AV**	**QP (dB)**	**AV (dB)**	**L1 / L2**
0.15	42.94	--	--	0.00	66.00	56.00	-23.06	-13.06	L1
0.22	44.38	--	--	0.00	64.00	54.00	-19.62	-9.62	L1
0.97	40.96	--	--	0.00	56.00	46.00	-15.04	-5.04	L1
0.15	42.70	--	--	0.00	65.94	55.94	-23.24	-13.24	L2
0.22	41.76	--	--	0.00	64.00	54.00	-22.24	-12.24	L2
1.27	41.00	--	--	0.00	56.00	46.00	-15.00	-5.00	L2
6 Worst Data									

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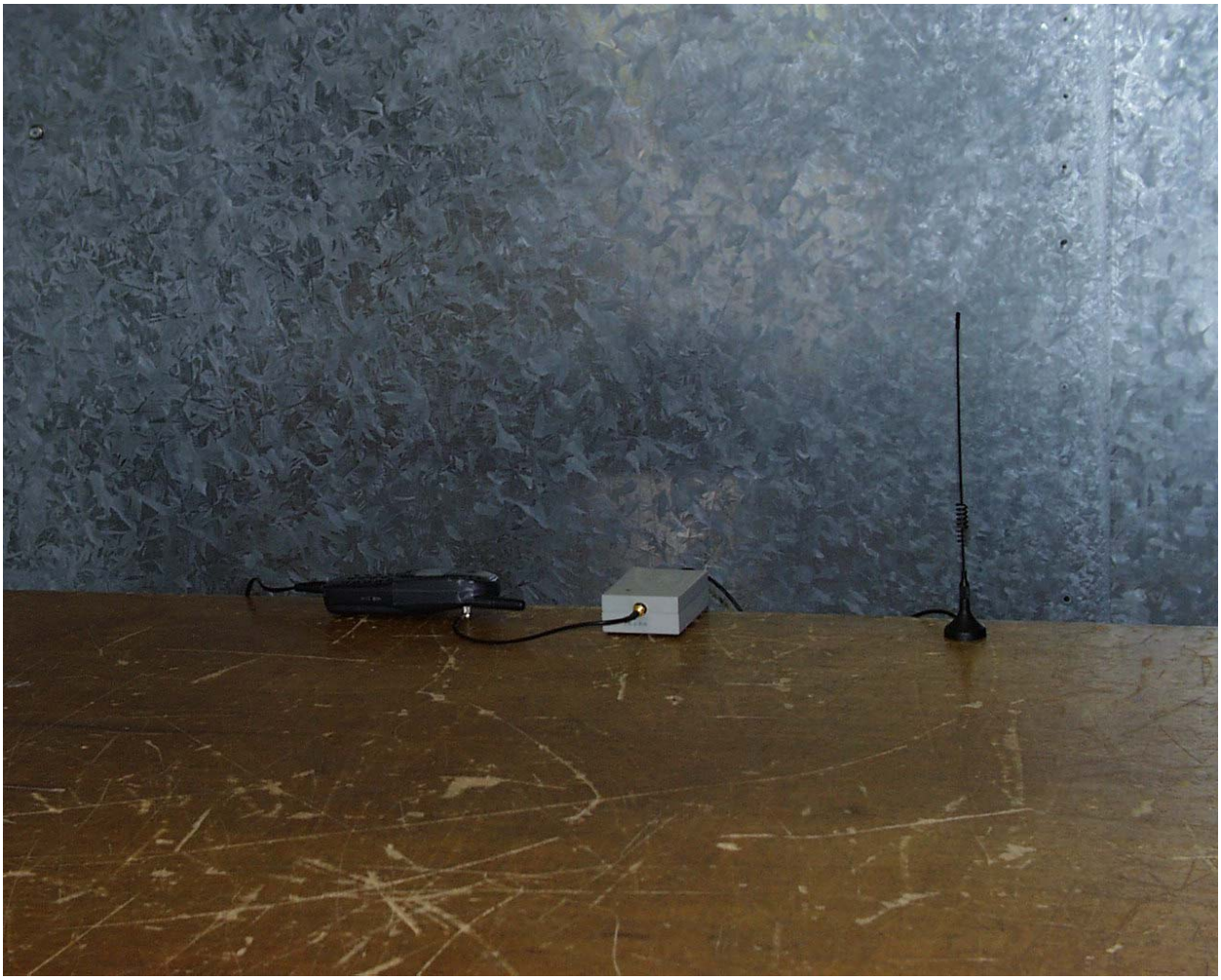
LINE CONDUCTION - FRONT



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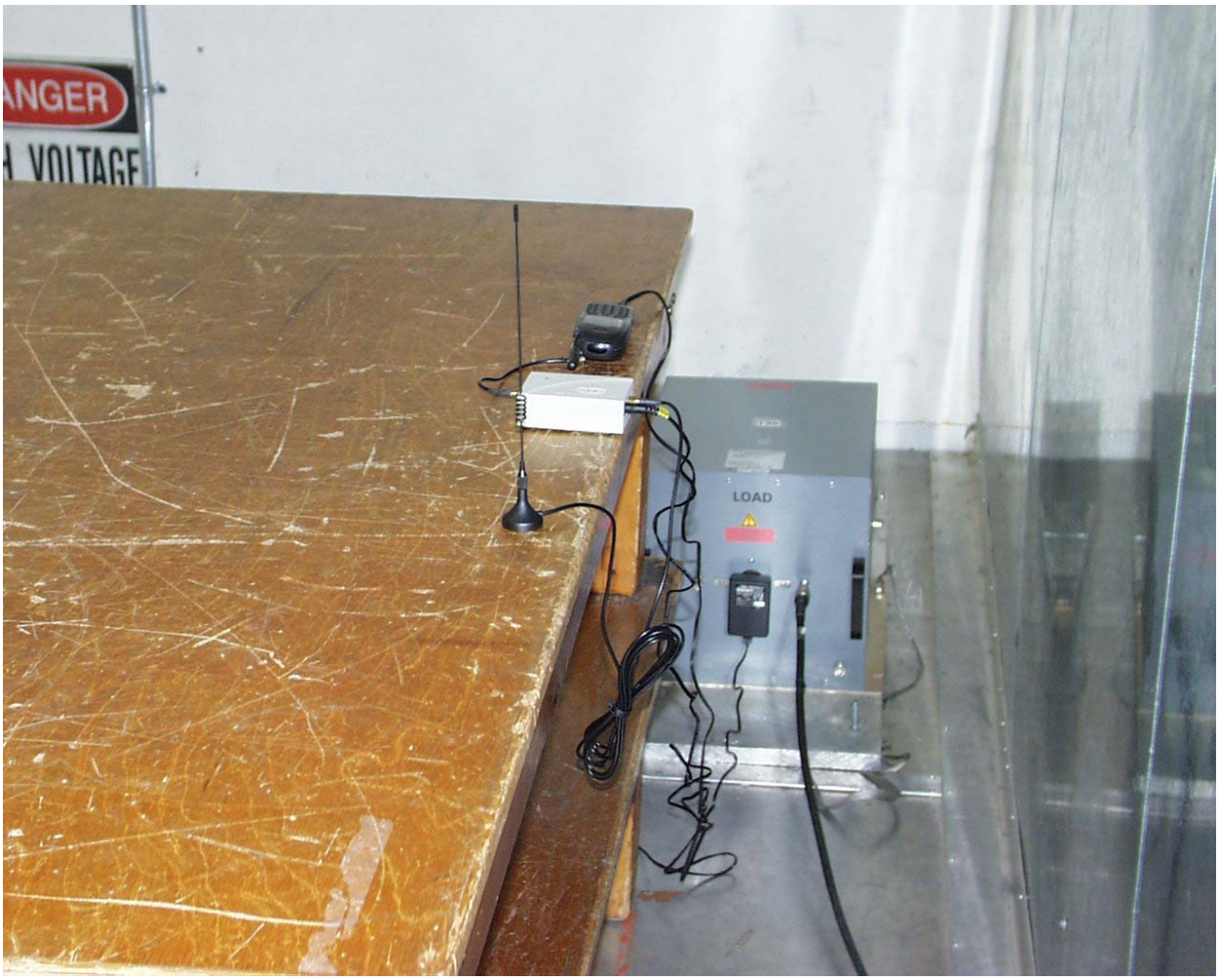
LINE CONDUCTION - BACK



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10. APENDIX

10.1. EXTERNAL & INTERNAL PHOTOS

10.2. SCHEMATICS

10.3. BLOCK DIAGRAM

10.4. USER MANUAL

END OF REPORT

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