HCT.CO., LTD.
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SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
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# CERTIFICATE OF COMPLIANCE

## FCC Part 24 & 22 Certification

**Applicant Name:** Suntech International Ltd.

**Address:**
Room 1021, IT Mirae Tower, 60-21, Gasan-Dong, Geumcheon-Gu, Seoul, Korea (153-801)

**Date of Testing:**
May. 19, 2008

**Test Site/Location:**
HCT.CO., LTD., San 136-1 Ami-ri, Bubal-eup, Icheon-si, Kyungki-do, Korea

**Test Report No.:** HCT-R08-054

**HCT FRN:** 0005866421

**FCC ID : WA2ST-100M**

**APPLICANT : Suntech International Ltd.**

| | |
|---|---|
| **Application Type:** | Certification |
| **FCC Classification:** | PCS Licensed Transmitter worn on body(PCT) |
| **FCC Rule Part(s):** | §22, §24, §2 |
| **EUT Type:** | Quad-band GSM Module |
| **Model(s):** | WA2ST-100M |
| **Tx Frequency:** | 824.20 - 848.80 MHz (GSM850)<br>1 850.20 – 1 909.80 MHz (GSM1900) |
| **Rx Frequency:** | 869.20 - 893.80 MHz (GSM850)<br>1 930.20 – 1 989.80 MHz (GSM1900) |
| **Max. RF Output Power:** | 1.435 W ERP GSM850 (31.57 dBm) / 0.899 W EIRP GSM1900 (29.54 dBm) |
| **Emission Designator(s):** | 253KGXW (GSM850) 250KGXW (GSM1900) |

The measurements shown in this report were made in accordance with the procedures specified in §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

**HCT.CO., LTD.** Certifies that no party to this application has been denied FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Youn Seok Jung

**Report prepared by**
**: Youn Seok Jung**
**Test engineer of RF Part**

Sang Jun Lee

**Approved by**
**: Sang Jun Lee**
**Manager of RF Part**

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# Table of Contents


1. GENERAL INFORMATION ..... 3

2. INTRODUCTION ..... 4

2.1. EUT DESCRIPTION ..... 4

2.2. MEASURING INSTRUMENT CALIBRATION ..... 4

2.3. TEST FACILITY ..... 4

3. DESCRIPTION OF TESTS ..... 5

3.1 Effective Radiated Power/Equivalent Isotropic Radiated Power ..... 5

3.2 Occupied bandwidth. ..... 6

3.3 Spurious and Harmonic Emissions at Antenna Terminal. ..... 6

3.4 Radiated Spurious and Harmonic Emissions ..... 7

3.5 Frequency stability / variation of ambient temperature ..... 8

4. LIST OF TEST EQUIPMENT ..... 9

5. SUMMARY OF TEST RESULTS ..... 10

6. SAMPLE CALCULATION ..... 11

7. TEST DATA ..... 12

7.1 Conducted Output Power ..... 12

7.2 Effective Radiated Power Output(GSM850) ..... 13

7.3 Equivalent Isotropic Radiated Power (E.I.R.P.) (GSM / WCDMA) ..... 14

7.4 Radiated Spurious Emissions(GSM850 Mode) ..... 15

7.5 Radiated Spurious Emissions(GSM1900 Mode) ..... 16

7.6 Frequency stability / variation of ambient temperature ..... 17

7.6.1 FREQUENCY STABILITY (GSM850) ..... 17

7.6.2 FREQUENCY STABILITY (GSM1900) ..... 18

8. TEST PLOTS ..... 19

# MEASUREMENT REPORT

## 1. GENERAL INFORMATION

| | |
|---|---|
| **Applicant Name:** | **Suntech International Ltd.** |
| **Address:** | Room 1021, IT Mirae Tower, 60-21, Gasan-Dong,<br>Geumcheon-Gu, Seoul, Korea (153-801) |
| **Contact:** | Tel: +82-2-2027-5656 Fax: +82-2-2027-5654<br>E-Mail: leekiyeoul@pantech.com |
| **FCC ID:** | WA2ST-100M |
| **Application Type:** | Certification |
| **FCC Classification:** | PCS Licensed Transmitter worn on body(PCT) |
| **FCC Rule Part(s):** | §22, §24, §2 |
| **EUT Type:** | Quad-band GSM Module |
| **Model(s):** | ST-100M |
| **Tx Frequency:** | 824.20 - 848.80 MHz (GSM850)<br>1 850.20 – 1 909.80 MHz (GSM1900) |
| **Rx Frequency:** | 869.20 - 893.80 MHz (GSM850)<br>1 930.20 – 1 989.80 MHz (GSM1900)\ |
| **Max. RF Output Power:** | 1.435 W ERP GSM850 (31.57 dBm) / 0.899 W EIRP GSM1900 (29.54 dBm) |
| **Emission Designator(s):** | 253KGXW (GSM850) 250KGXW (GSM1900) |
| **Antenna Specification** | Manufacturer: EVERCOM COMMUNICATION TECHNOLOGY CO., LTD<br>Antenna type: Patch Antenna<br>Gain: 1 dBi |
| **Date(s) of Tests:** | May. 15, 2008 ~ May. 19, 2008 |
| **Place of Tests:** | HCT.CO., LTD.<br>San 136-1 Ami-ri, Bubal-eup, Icheon-si, |
| **Report Serial No** | HCT-R08-054 |

# 2. INTRODUCTION

## 2.1. EUT DESCRIPTION

The Suntech ST-100M Quad-Band GSM Module consists of GSM850, GSM1900, EGSM, DCS

## 2.2. 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.

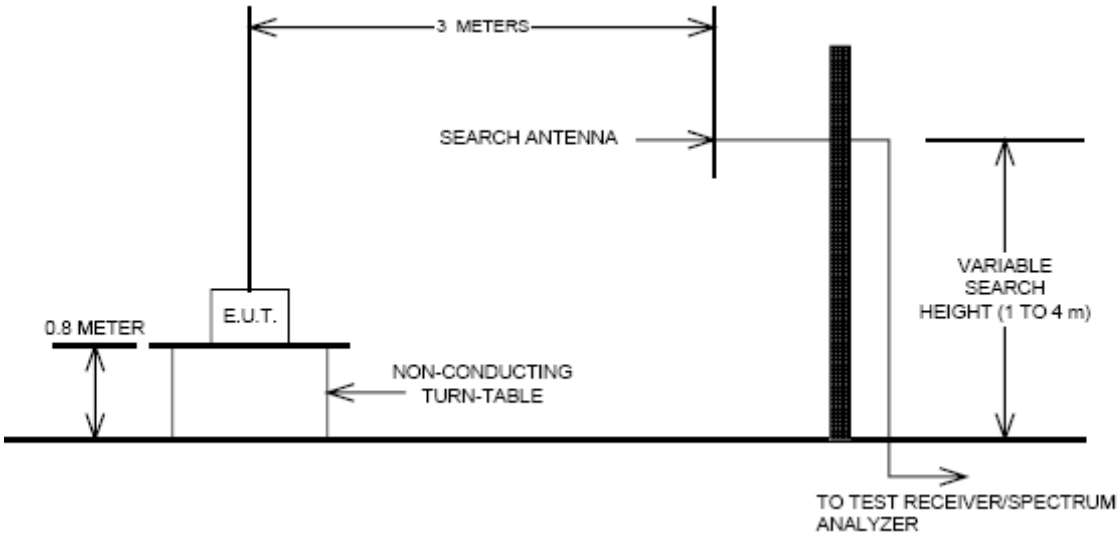
## 2.3. TEST FACILITY

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 6, 2006(Registration Number: 90661)

# 3. DESCRIPTION OF TESTS

## 3.1 Effective Radiated Power/Equivalent Isotropic Radiated Power

Test Set-up




Test Procedure

Radiated emission measurements were performed at an open Site.

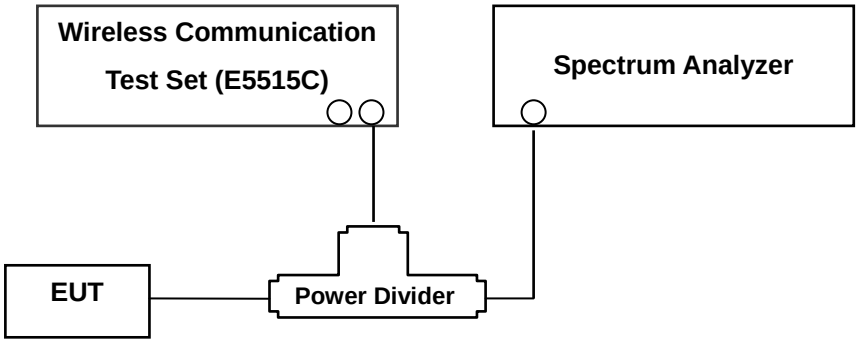
The equipment under test is placed on a wooden turntable 3-meters from the receive antenna.

A wooden turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

## 3.2 Occupied bandwidth.

**Test set-up**




(Configuration of conducted Emission measurement)

Test Procedure

The EUT was setup to maximum output power at its lowest channel. The occupied bandwidth was measured using a spectrum analyzer. The measurements are repeated for the highest and a middle channel. The EUT's occupied bandwidth is measured as the width of the signal between two points, one below the carrier center frequency and one above the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Plots of the EUT's occupied bandwidth are shown herein.

## 3.3 Spurious and Harmonic Emissions at Antenna Terminal.

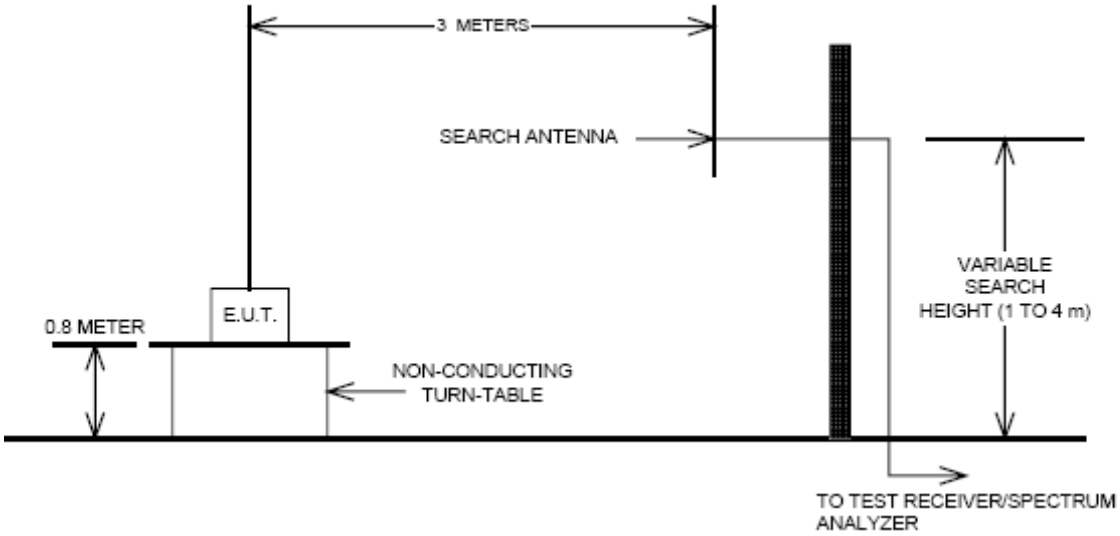
Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer.

The EUT was setup to maximum output power at its lowest channel. The Resolution BW of the analyzer is set to 1 % of the emission bandwidth to show compliance with the – 13 dBm limit, in the 1 MHz bands immediately outside and adjacent to the edge of the frequency block. The 1 MHz RBW was used to scan from 10 MHz to 10 GHz. (GSM1900 Mode: 10 MHz to 20 GHz). A display line was placed at – 13 dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

## 3.4 Radiated Spurious and Harmonic Emissions

### Test Set-up




The measurement facilities used for this test have been documented in previous filings with the commission pursuant to section § 2.948. The open field test site is situated in open field with ground screen whose site attenuation characteristics meet ANSI C63.4 –2003. A mast capable of lifting the receiving antenna from a height of one to four meters is used together with a rotatable wooden platform mounted at three from the antenna mast.

1) The unit mounted on a wooden table 1.5 m × 1.0 m × 0.80 m is 0.8 meter above test site ground level.
2) During the emission test, the turntable is rotated and the EUT is manipulated to find the configuration resulting in maximum emission under normal condition of installation and operation.
3) The antenna height and polarization are also varied from 1 to 4 meters until the maximum signal is found.
4) The spectrum shall be scanned up to the 10$^{th}$ harmonic of the fundamental frequency.

Test Procedure

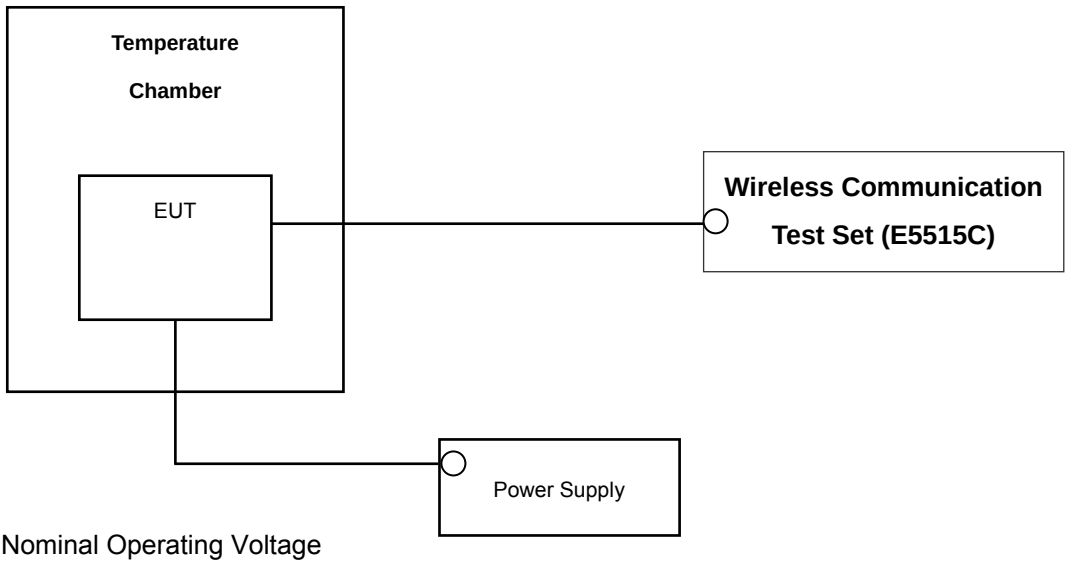
The equipment under test is placed on a wooden turntable 3-meters from the receive antenna.

A wooden turntable was rotated 360° and the receiving antenna scanned from 1-4m in order to capture the maximum emission. A half wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the previously recorded signal was duplicated.

The maximum EIRP was calculated by adding the forward power to the calibrated source plus its appropriate gain value. These steps were carried out with the receiving antenna in both vertical and horizontal polarization. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic antenna are taken into consideration.

## 3.5 Frequency stability / variation of ambient temperature

Test Set-up




* Nominal Operating Voltage

Test Procedure

The frequency stability of the transmitter is measured by:
a.) **Temperature:** The temperature is varied from - 30 °C to + 50 °C using an environmental chamber.

b.) **Primary Supply Voltage:** The primary supply voltage is varied from battery end point to 115 % of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied.

Specification — the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ± 0.000 25 %(± 2.5 ppm) of the center frequency.

**Time Period and Procedure:**

The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
1. The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

2. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.
**NOTE: The EUT is tested down to the battery endpoint.**

# 4. LIST OF TEST EQUIPMENT

| Manufacture | Model/ Equipment | Serial Number | Calibration Interval | Calibration Due |
|---|---|---|---|---|
| R&S | ESI40/ Spectrum Analyzer | 831564/003 | Annual | 11/06/2008 |
| Agilent | E4419B/ Power Meter | MY41291386 | Annual | 11/05/2008 |
| Agilent | 8481A/ Power Sensor | MY41090870 | Annual | 11/05/2008 |
| Agilent | HP8901B/ Modulation Analyzer | 3438A05231 | Annual | 08/04/2008 |
| Agilent | 8903A/ Audio Analyzer | 2433A04322 | Annual | 08/04/2008 |
| R&S | CMU200/ Base Station | 110740 | Annual | 07/26/2008 |
| Agilent | 8960 (E5515C)/ Base Station | GB444400269 | Annual | 02/11/2009 |
| Tescom | TC-3000/ Bluetooth Simulator | 3000A4900112 | Annual | 01/11/2009 |
| MITEQ | AMF-6D-01180-35-20P/ AMP | 990893 | Annual | 01/15/2009 |
| Wainwright | WHK1.2/15G-10EF/H.P.F | 2 | Annual | 06/28/2008 |
| Wainwright | WHK3.3/18G-10EF/H.P.F | 1 | Annual | 06/28/2008 |
| Agilent | 778D/ Dual Directional Coupler | 16072 | Annual | 11/09/2008 |
| Agilent | 1506A/ Power Divider | 99441 | Annual | 11/10/2008 |
| Digital | EP-3010/ Power Supply | 3110117 | Annual | 12/29/2008 |
| Schwarzbeck | UHAP/ Dipole Antenna | 630 | Annual | 11/13/2008 |
| Schwarzbeck | UHAP/ Dipole Antenna | 605 | Annual | 11/13/2008 |
| R&S | HFH2-Z2/ Loop Antenna | 881056/070 | Annual | 12/11/2008 |
| Korea Engineering | KR-1005L / Chamber | KRAB07063-2CH | Annual | 01/05/2009 |
| Schwarzbeck | VULB9160/ TRILOG Antenna | 3150 | Biennial | 04/20/2009 |
| Schwarzbeck | VULB9160/ TRILOG Antenna | 3125 | Biennial | 05/16/2009 |
| Schwarzbeck | BBHA 9120D/ Horn Antenna | 147 | Biennial | 03/26/2010 |
| Schwarzbeck | BBHA 9120D/ Horn Antenna | 1201 | Biennial | 05/02/2009 |
| Agilent | E4440A/Spectrum Analyzer | US45303008 | Annual | 01/08/2009 |

# 5. SUMMARY OF TEST RESULTS

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Test Result |
|---|---|---|---|---|
| 2.1049, 22.917(a), 24.238(a) | Occupied Bandwidth | N/A | CONDUCTED | PASS |
| 2.1051, 22.917(a), 24.238(a) | Band Edge / Spurious and Harmonic Emissions at Antenna Terminal. | < 43 + $\log_{10}$ (P[Watts]) at Band Edge and for all out-of-band emissions | | PASS |
| 2.1046 | Conducted Output Power | N/A | | PASS |
| 2.1055, 22.355, 24.235 | Frequency stability / variation of ambient temperature | < 2.5 ppm | | PASS |
| 22.913(a)(2) 24.232(c) | Effective Radiated Power | < 7 Watts max. ERP | RADIATED | PASS |
| | Equivalent Isotropic Radiated Power | < 2 Watts max. EIRP | | PASS |
| 2.1053, 22.917(a), 24.238(a) | Radiated Spurious and Harmonic Emissions | < 43 + $\log_{10}$ (P[Watts]) for all out-of band emissions | | PASS |

# 6. SAMPLE CALCULATION

## A. ERP Sample Calculation

| Mode | Ch./ Freq. | | Measured Level(dBm) | Substitude LEVEL(dBm) | Ant. Gain | C.L | Pol. | ERP | |
|---|---|---|---|---|---|---|---|---|---|
| | channel | Freq.(MHz) | | | | | | W | dBm |
| GSM850 | 251 | 848.80 | -7.58 | 28.59 | 2.83 | 1.20 | H | 1.05 | 30.22 |

**ERP = SubstitudeLEVEL(dBm) + Ant. Gain – CL(Cable Loss)**

1) The EUT mounted on a wooden tripod is 0.8 meter above test site ground level.
2) During the test , the turn table is rotated and the antenna height is also varied from 1 to 4 meters until the maximum signal is found.
3) Record the field strength meter's level.
4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power (**ERP**).

## B. Emission Designator

### GSM Emission Designator

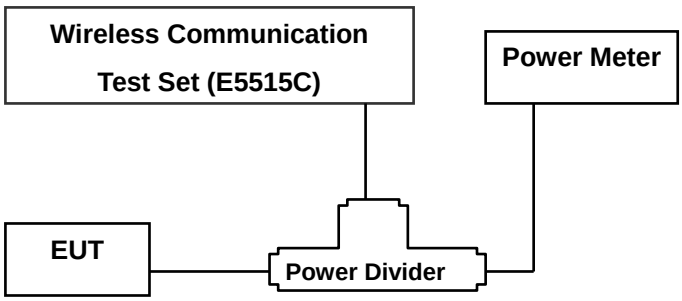
**Emission Designator = 249KGXW**

GSM BW = 249 kHz G = Phase Modulation X = Cases not otherwise covered W = Combination (Audio/Data)

# 7. TEST DATA

## 7.1 Conducted Output Power

A base station simulator was used to establish communication with the Pantech Dual-Band Dual-Mode GSM/WCDMA Phone with Bluetooth. The base station simulator parameters were set to produce the maximum power from the EUT. This device was tested under all configurations and the highest power is reported. Conducted Output Powers of EUT are reported below.




| Band | Channel | Voice |
|---|---|---|
| | | GSM (dBm) |
| GSM 850 | 128 | 31.73 |
| | 190 | 31.70 |
| | 251 | 31.59 |
| GSM 1900 | 512 | 29.44 |
| | 661 | 29.46 |
| | 810 | 28.95 |

(GSM Conducted Output Powers)

## 7.2 Effective Radiated Power Output(GSM850)

**(GSM850 Mode)**

| Mode | Ch./ Freq. | | Measured Level(dBm) | Substitude LEVEL (dBm) | Ant. Gain | C.L | Pol. | ERP | |
|---|---|---|---|---|---|---|---|---|---|
| | channel | Freq.(MHz) | | | | | | W | dBm |
| GSM850 | 128 | 824.20 | -6.22 | 29.11 | 2.19 | 1.17 | V | 1.03 | 30.13 |
| | 190 | 836.60 | -5.51 | 30.26 | 2.50 | 1.19 | V | 1.44 | 31.57 |
| | 251 | 848.80 | -6.52 | 29.65 | 2.83 | 1.20 | V | 1.34 | 31.28 |

Note: Standard batteries are the only options for this phone

**NOTES:**

Effective Radiated Power Output Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A half-wave dipole was substituted in place of the EUT. This dipole antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the dipole is measured. The ERP is recorded.
This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps AMR and TPC bits all set to “1” and in GSM mode and using a Power Control Level of “0” in the PCS Band and “5” in the Cellular Band. This unit was tested with its standard battery.

## 7.3 Equivalent Isotropic Radiated Power (E.I.R.P.) (GSM / WCDMA)

**(GSM1900 Mode)**

| Mode | Ch./ Freq. | | Measured Level(dBm) | Substitude LEVEL (dBm) | Ant. Gain | C.L | Pol. | EIRP | |
|---|---|---|---|---|---|---|---|---|---|
| | channel | Freq.(MHz) | | | | | | W | dBm |
| GSM1900 | 512 | 1,850.2 | -10.24 | 21.37 | 10.05 | 1.91 | V | 0.89 | 29.50 |
| | 661 | 1,880.0 | -10.38 | 21.44 | 10.05 | 1.95 | V | 0.90 | 29.54 |
| | 810 | 1,909.8 | -10.45 | 21.45 | 10.06 | 1.97 | V | 0.90 | 29.54 |

Note: Standard batteries are the only options for this phone

**NOTES:**

Equivalent Isotropic Radiated Power Measurements by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

The EUT was placed on a wooden turn table 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA signals, a peak detector is used, with RBW = VBW = 3 MHz. For WCDMA signals, a peak detector is used, with RBW = VBW = 5MHz. For AMPS, GSM, and NADC TDMA signals, a peak detector is used, with RBW = VBW = 1 MHz. A Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of the Horn antenna is measured. The difference between the gain of the horn and an isotropic antenna is taken into consideration and the EIRP is recorded.

This device was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps AMR and TPC bits all set to “1” and in GSM mode and using a Power Control Level of “0” in the PCS Band and “5” in the Cellular Band. This unit was tested with its standard battery.

## 7.4 Radiated Spurious Emissions(GSM850 Mode)

▣ MEASURED OUTPUT POWER: 31.57 dBm = 1.435 W

▣ MODULATION SIGNAL: GSM850

▣ DISTANCE: 3 meters

▣ LIMIT: - (43 + 10 $lo_{g10}$ (W)) = -44.57 dBc

dBc

| Ch. | Freq.(MHz) | Measured Level [dBm] | Ant. Gain | Substitute Level [dBm] | C.L | Pol. | dBm | dBc |
|---|---|---|---|---|---|---|---|---|
| 128 | 1,648.40 | -48.22 | 9.24 | -60.90 | 1.73 | V | -53.39 | -84.96 |
| | 2,472.60 | -52.66 | 10.27 | -61.92 | 2.28 | V | -53.93 | -85.50 |
| | 3,296.80 | -52.96 | 11.87 | -62.69 | 2.57 | V | -53.39 | -84.96 |
| 190 | 1,673.20 | -44.24 | 9.38 | -57.15 | 1.79 | V | -49.56 | -81.13 |
| | 2,509.80 | -47.46 | 10.29 | -56.74 | 2.33 | V | -48.78 | -80.35 |
| | 3,346.40 | -52.88 | 12.14 | -63.06 | 2.66 | V | -53.58 | -85.15 |
| 251 | 1,699.60 | -49.78 | 9.56 | -62.54 | 1.83 | V | -54.81 | -86.38 |
| | 2,549.40 | -47.48 | 10.36 | -56.91 | 2.34 | V | -48.89 | -80.46 |
| | 3,399.20 | -55.28 | 12.06 | -65.06 | 2.85 | V | -55.85 | -87.42 |

**NOTES:** Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

## 7.5 Radiated Spurious Emissions(GSM1900 Mode)

▣ MEASURED OUTPUT POWER: 29.54 dBm = 0.899 W

▣ MODULATION SIGNAL: GSM1900

▣ DISTANCE: 3 meters

▣ LIMIT: - (43 + 10 $lo_{g10}$ (W)) = -42.54 dBc

| Ch. | Freq.(MHz) | Measured Level [dBm] | Ant. Gain | Substitute Level [dBm] | C.L | Pol. | dBm | dBc |
|---|---|---|---|---|---|---|---|---|
| 512 | 3,700.40 | -61.50 | 12.46 | -69.92 | 2.73 | V | -60.19 | -89.73 |
| | 5,550.60 | -61.73 | 12.70 | -65.46 | 3.60 | V | -56.36 | -85.90 |
| | 7,400.80 | -62.69 | 11.36 | -55.96 | 3.88 | V | -48.48 | -78.02 |
| 661 | 3,760.00 | -61.14 | 12.47 | -69.26 | 2.73 | V | -59.52 | -89.06 |
| | 5,640.00 | -61.59 | 12.75 | -65.39 | 3.60 | V | -56.24 | -85.78 |
| | 7,520.00 | -62.21 | 11.33 | -55.26 | 3.88 | V | -47.81 | -77.35 |
| 810 | 3,819.60 | -61.92 | 12.49 | -69.95 | 2.73 | V | -60.19 | -89.73 |
| | 5,729.40 | -62.03 | 12.80 | -65.49 | 3.60 | V | -56.29 | -85.83 |
| | 7,639.20 | -62.71 | 11.30 | -55.53 | 3.88 | V | -48.11 | -77.65 |

**NOTES:** Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA/EIA-603-C-2004, Aug. 17, 2004:

## 7.6 Frequency stability / variation of ambient temperature

### 7.6.1 FREQUENCY STABILITY (GSM850)

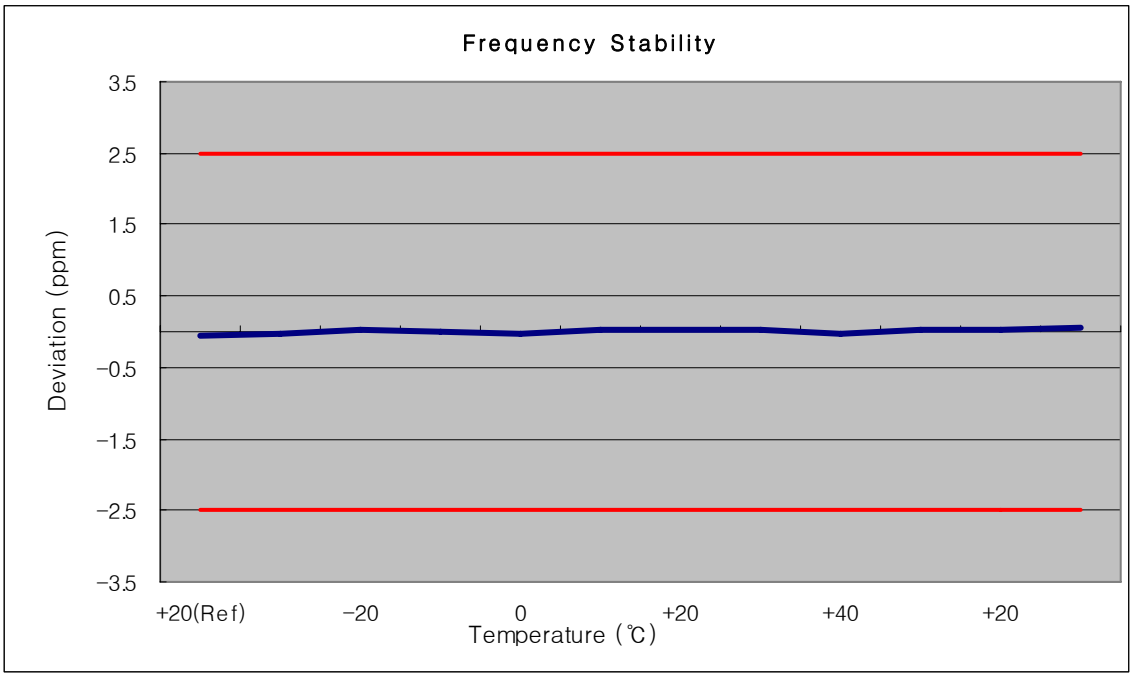
OPERATING FREQUENCY: 836,600,000 Hz

CHANNEL: 190

REFERENCE VOLTAGE: 12.0 VDC

DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 12.0 | +20(Ref) | 836 599 961 | -39 | -0.000 005 | -0.047 |
| 100% | | -30 | 836 519 976 | -24 | -0.000 003 | -0.029 |
| 100% | | -20 | 836 520 021 | 21 | 0.000 003 | 0.025 |
| 100% | | -10 | 836 519 989 | -11 | -0.000 001 | -0.013 |
| 100% | | 0 | 836 519 985 | -15 | -0.000 002 | -0.018 |
| 100% | | +10 | 836 520 012 | 12 | 0.000 001 | 0.014 |
| 100% | | +20 | 836 520 025 | 25 | 0.000 003 | 0.030 |
| 100% | | +30 | 836 520 028 | 28 | 0.000 003 | 0.033 |
| 100% | | +40 | 836 519 983 | -17 | -0.000 002 | -0.020 |
| 100% | | +50 | 836 520 022 | 22 | 0.000 003 | 0.026 |
| 115% | 13.8 | +20 | 836 520 034 | 34 | 0.000 004 | 0.041 |
| 85% | 10.2 | +20 | 836 520 038 | 38 | 0.000 005 | 0.045 |



### 7.6.2 FREQUENCY STABILITY (GSM1900)

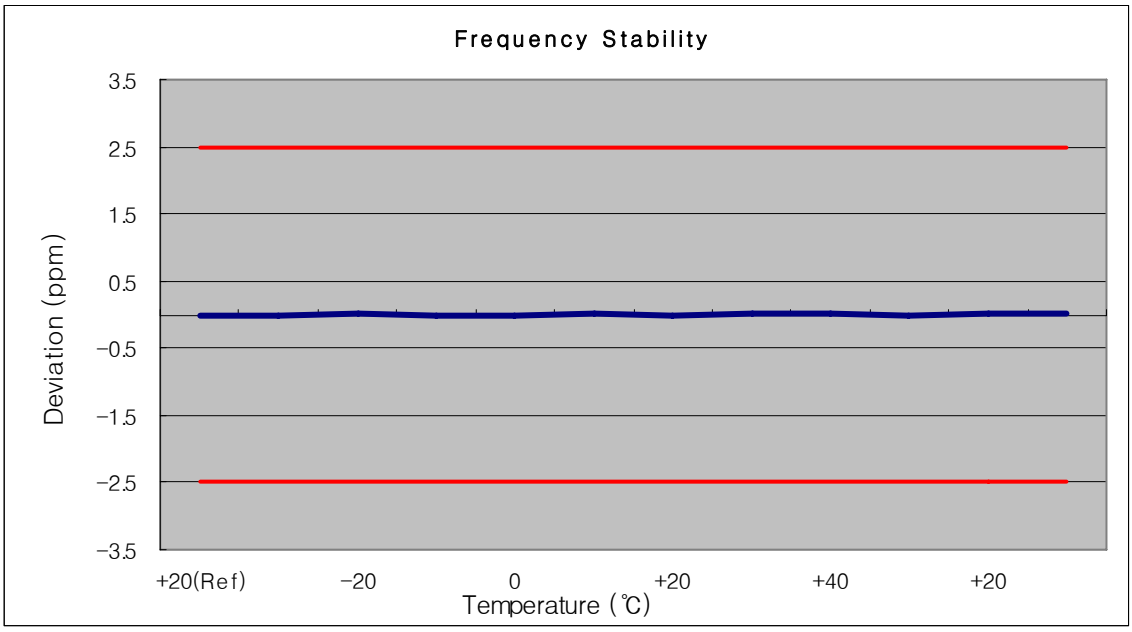
OPERATING FREQUENCY: 1880,000,000 Hz

CHANNEL: 661

REFERENCE VOLTAGE: 12.0 VDC

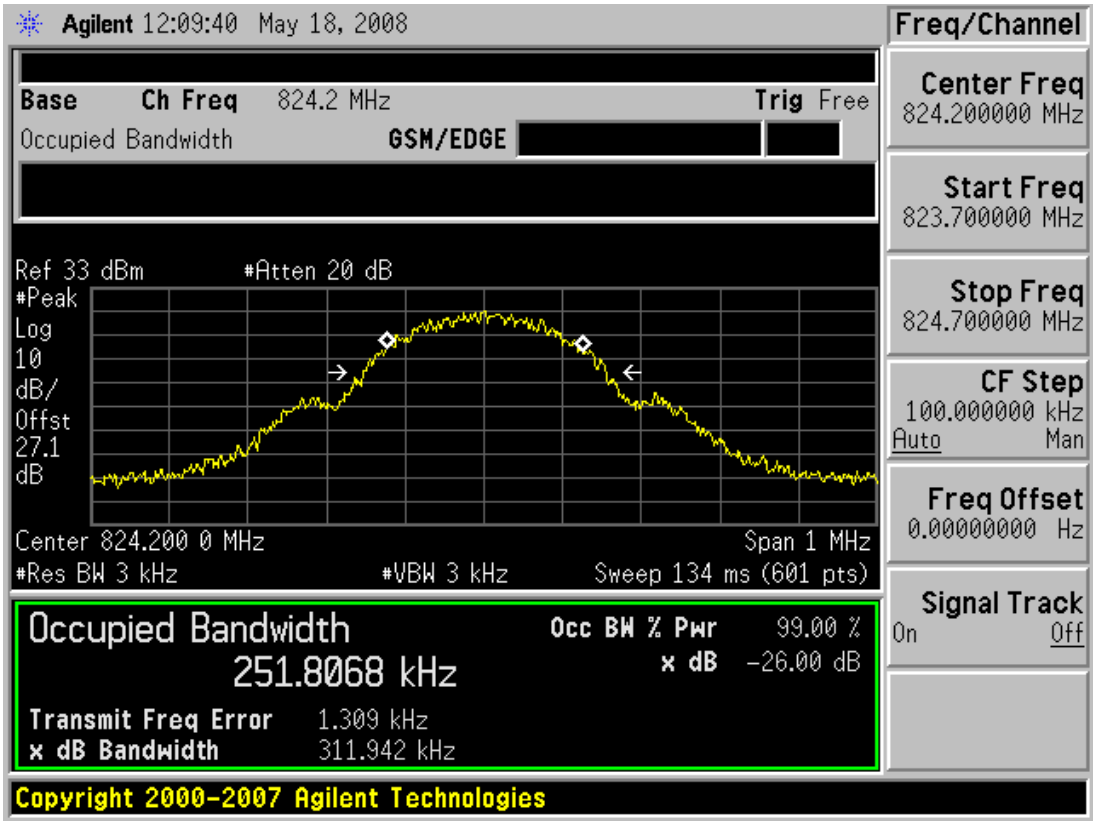
DEVIATION LIM IT: ± 0.000 25 % or 2.5 ppm

| Voltage (%) | Power (VDC) | Temp. (℃) | Frequency (Hz) | Frequency Error (Hz) | Deviation (%) | ppm |
|---|---|---|---|---|---|---|
| 100% | 12.000 | +20(Ref) | 1879 999 988 | -12 | -0.000 001 | -0.006 |
| 100% | | -30 | 1879 999 976 | -24 | -0.000 003 | -0.013 |
| 100% | | -20 | 1880 000 021 | 21 | 0.000 003 | 0.011 |
| 100% | | -10 | 1879 999 967 | -33 | -0.000 004 | -0.018 |
| 100% | | 0 | 1879 999 981 | -19 | -0.000 002 | -0.010 |
| 100% | | +10 | 1880 000 011 | 11 | 0.000 001 | 0.006 |
| 100% | | +20 | 1879 999 978 | -22 | -0.000 003 | -0.012 |
| 100% | | +30 | 1880 000 031 | 31 | 0.000 004 | 0.016 |
| 100% | | +40 | 1880 000 035 | 35 | 0.000 004 | 0.019 |
| 100% | | +50 | 1879 999 976 | -24 | -0.000 003 | -0.013 |
| 115% | 13.800 | +20 | 1880 000 015 | 15 | 0.000 002 | 0.008 |
| 85% | 10.200 | +20 | 1880 000 019 | 19 | 0.000 002 | 0.010 |

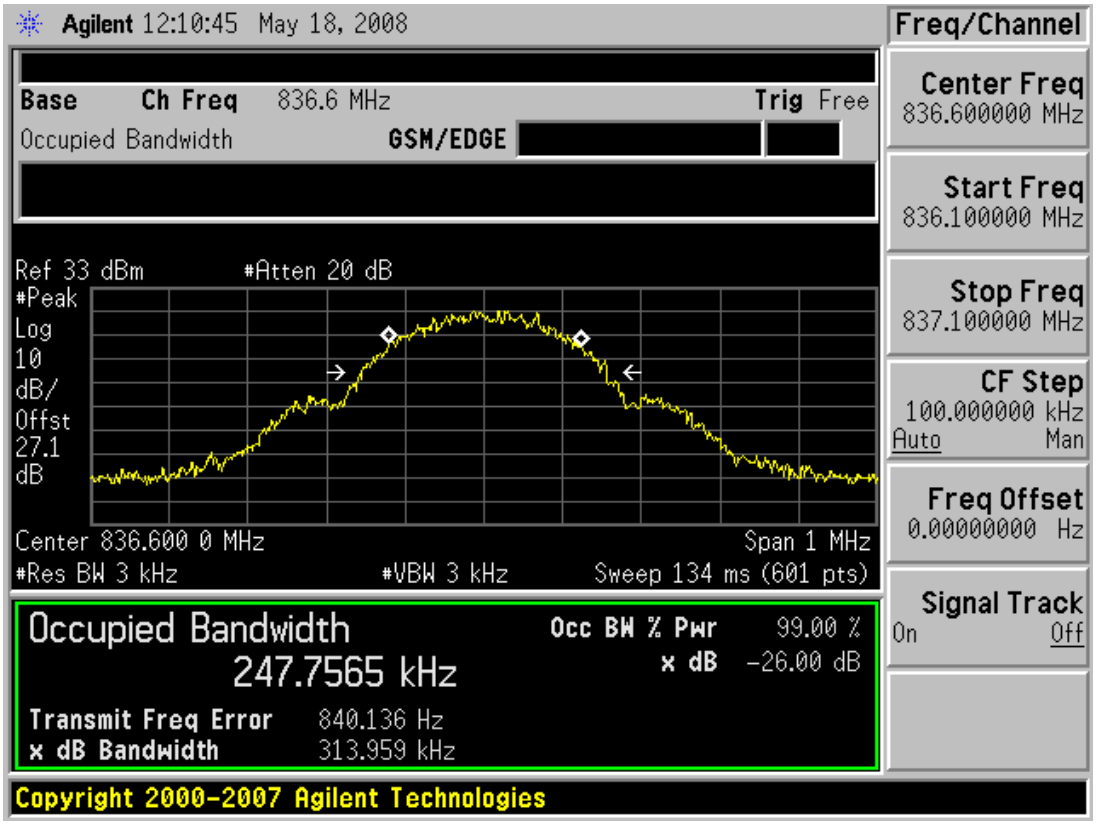


# 8. TEST PLOTS

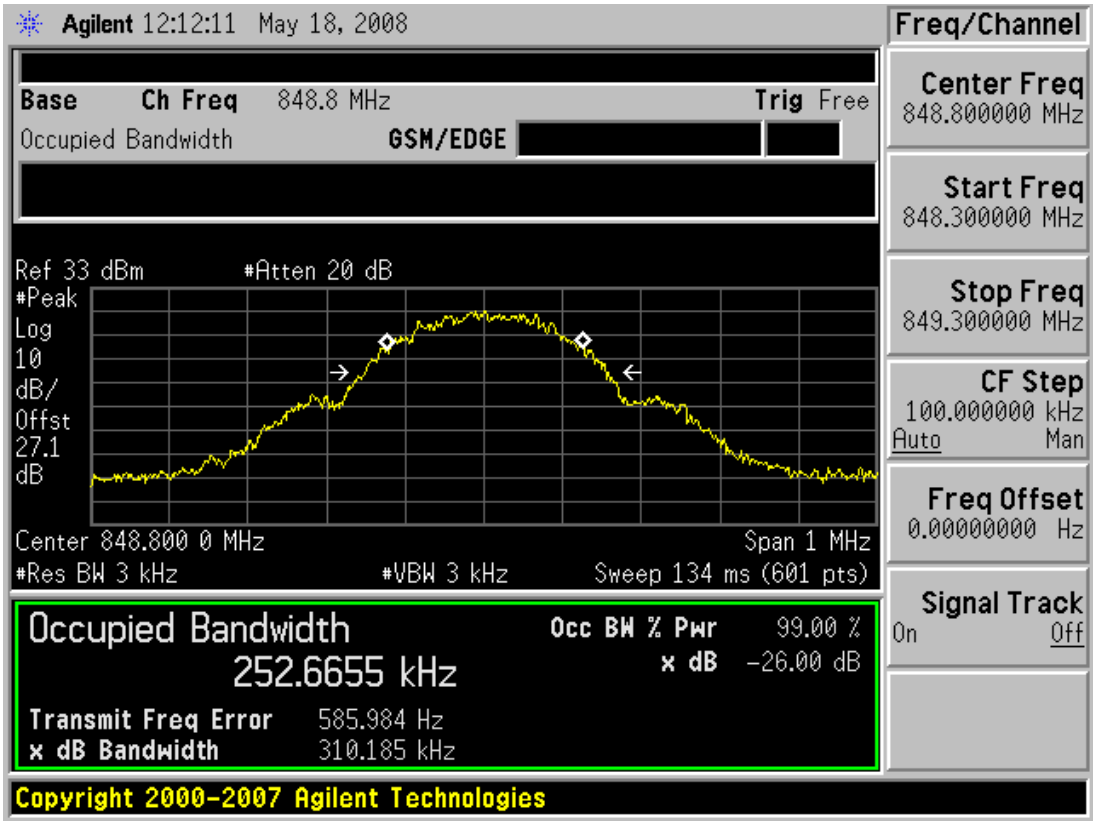
■ GSM850 MODE (128 CH.) Occupied Bandwidth



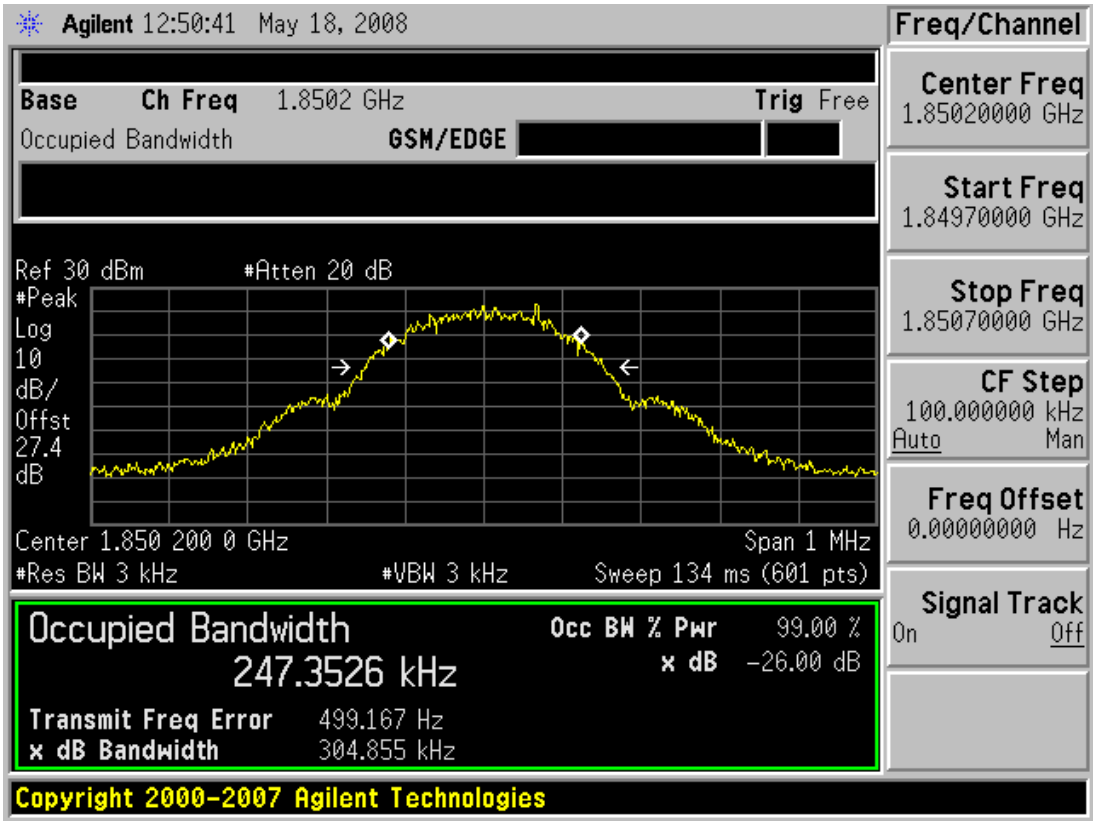

■ GSM850 MODE (190 CH.) Occupied Bandwidth



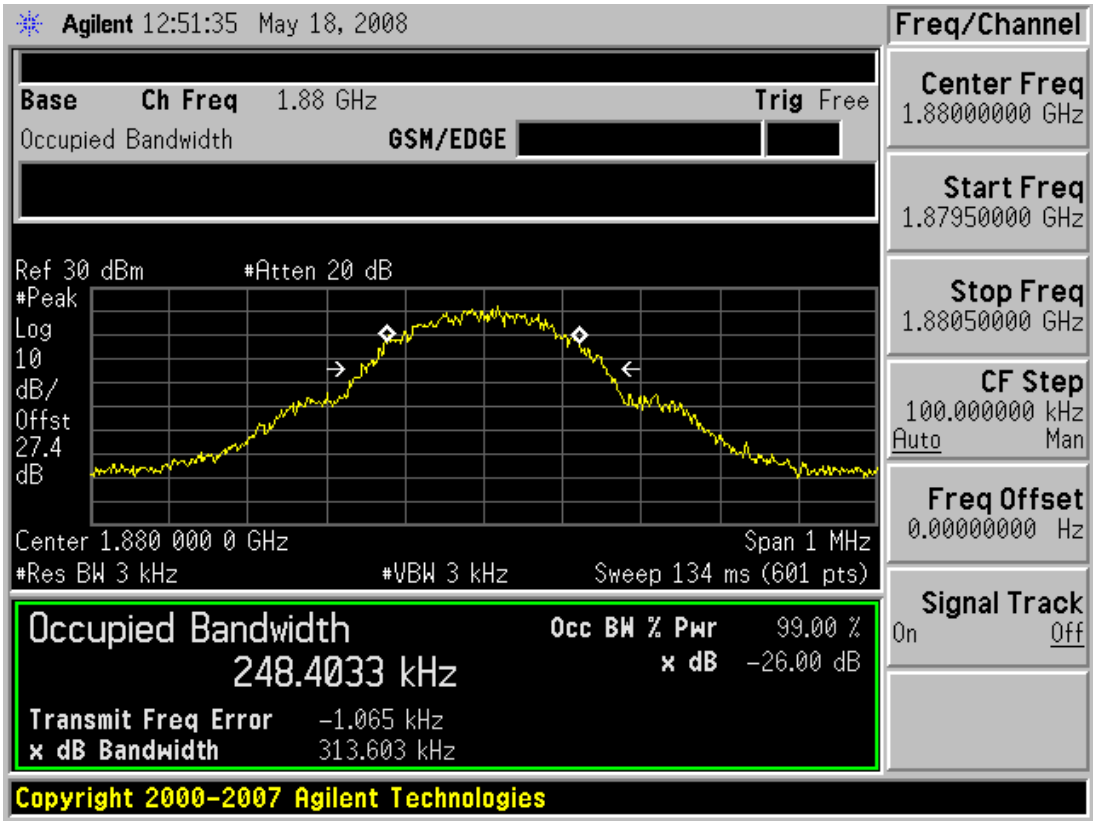
■ GSM850 MODE (251 CH.) Occupied Bandwidth



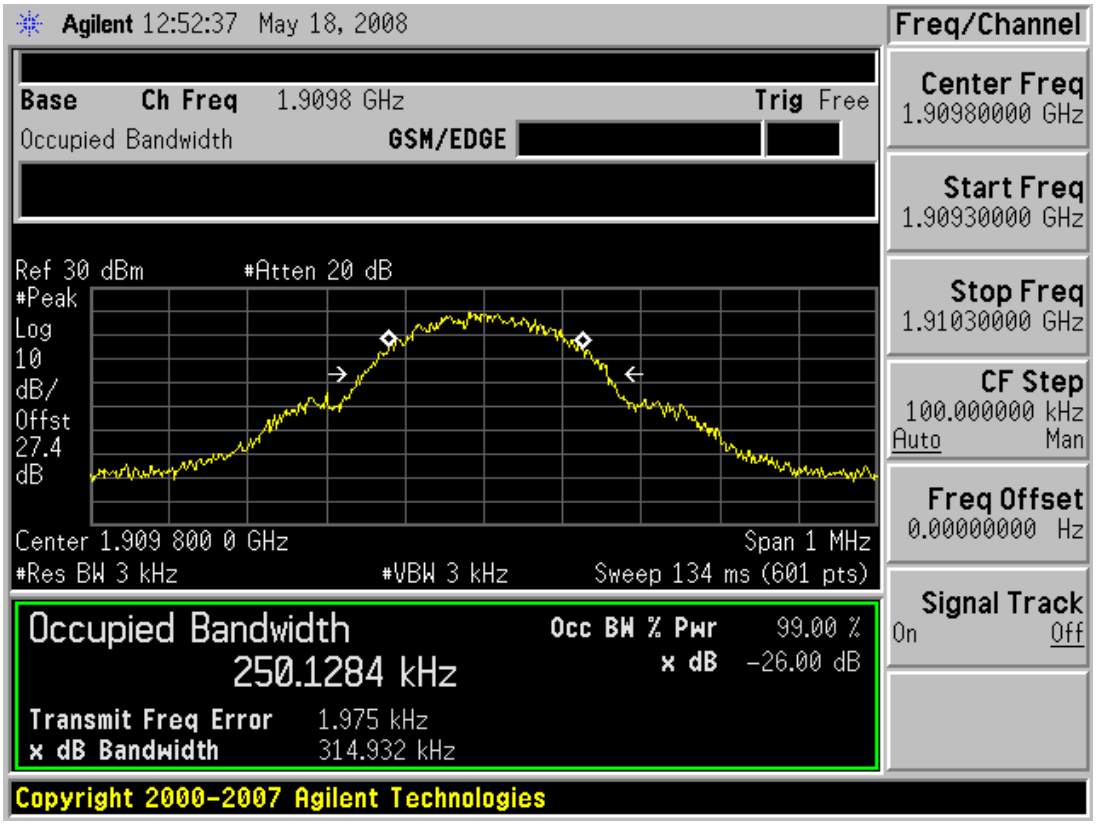

■ GSM1900 MODE (512 CH.) Occupied Bandwidth



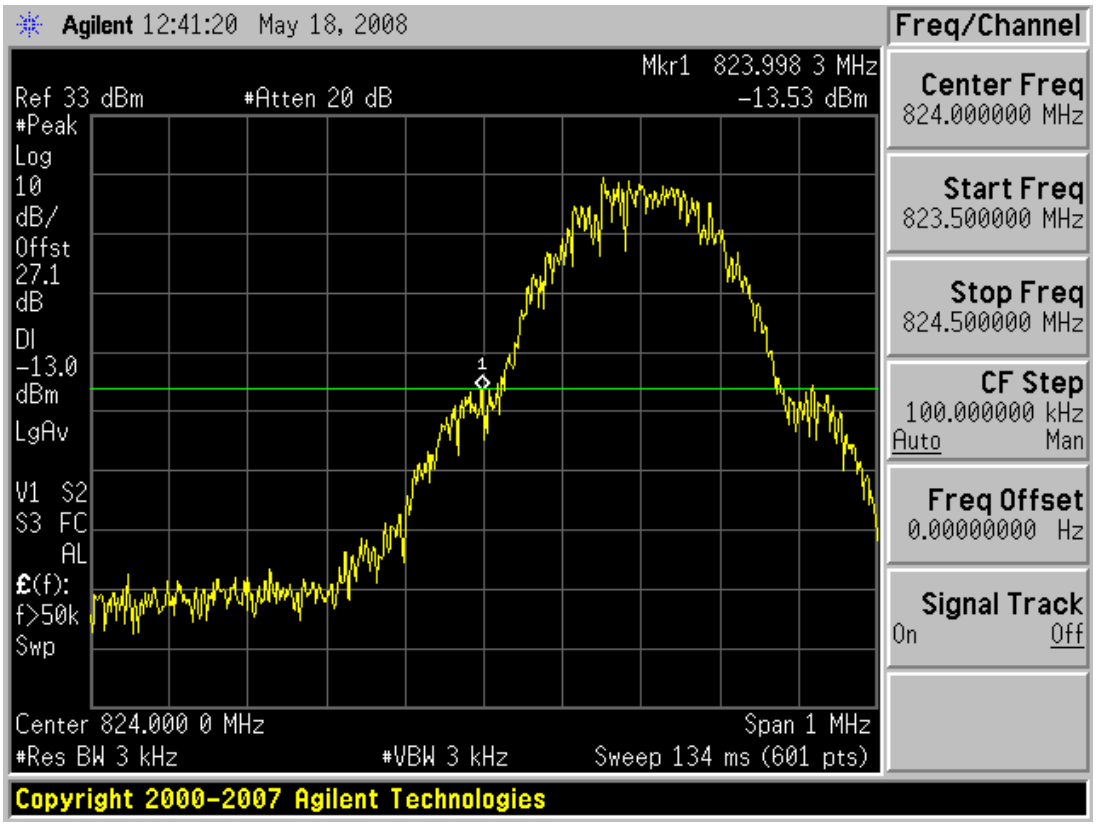
■ GSM1900 MODE (661 CH.) Occupied Bandwidth



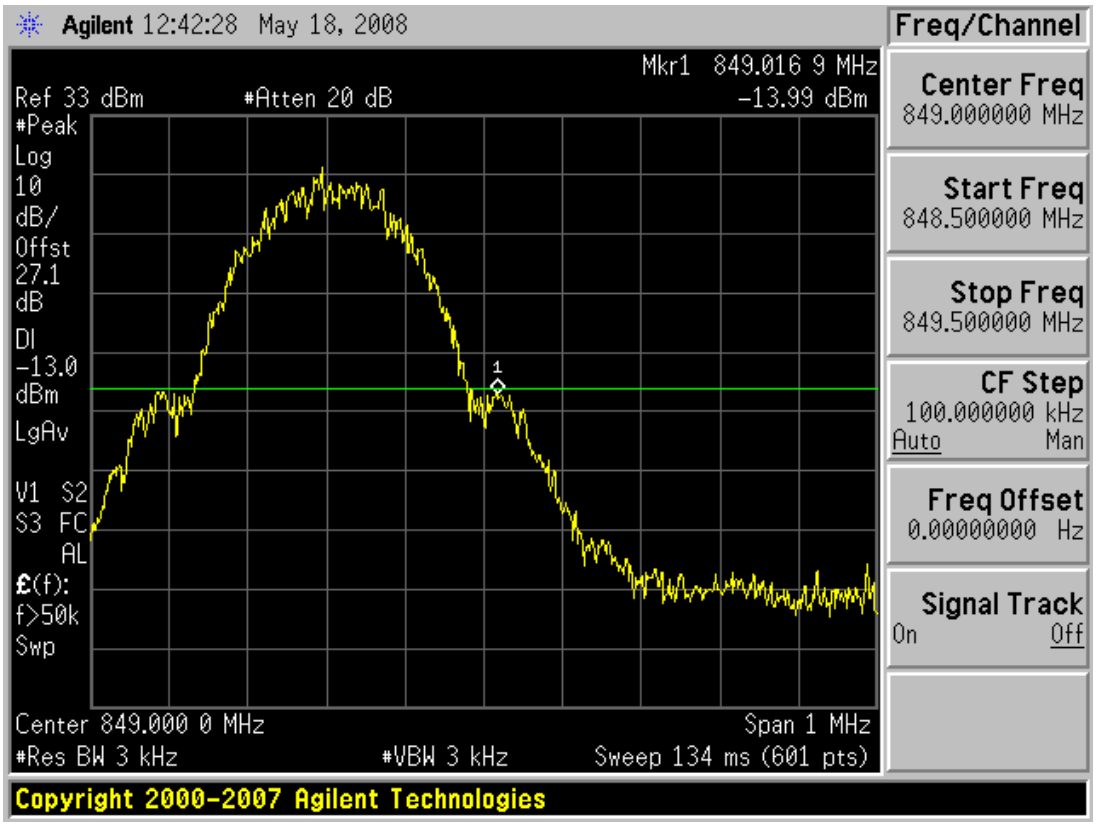

■ GSM1900 MODE (810 CH.) Occupied Bandwidth



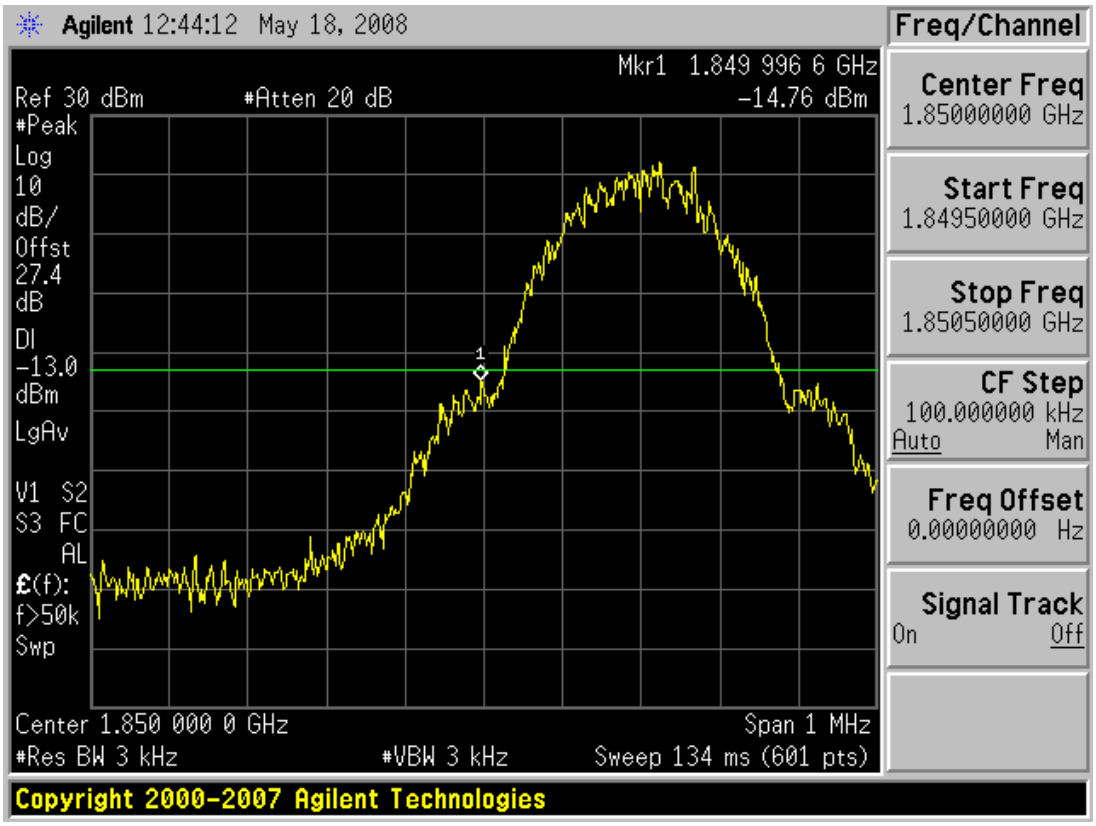
■ GSM850 MODE (128 CH.) Block Edge



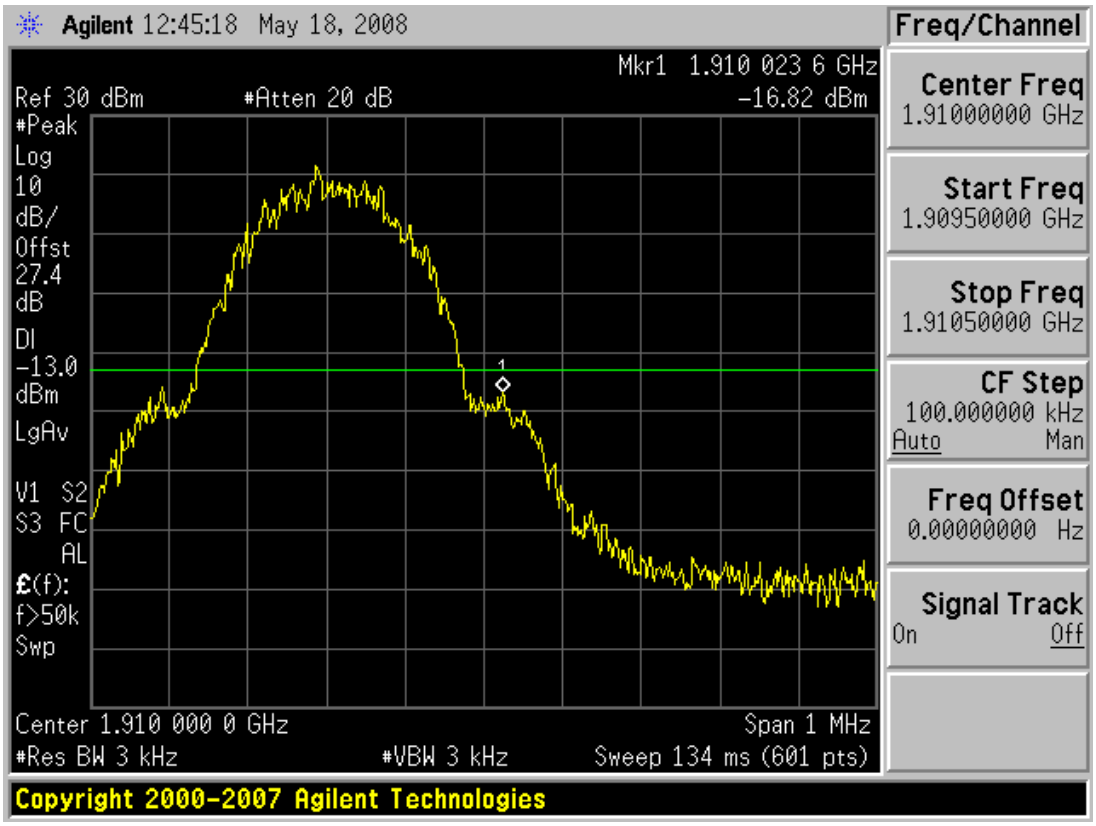

■ GSM850 MODE (251 CH.) Block Edge



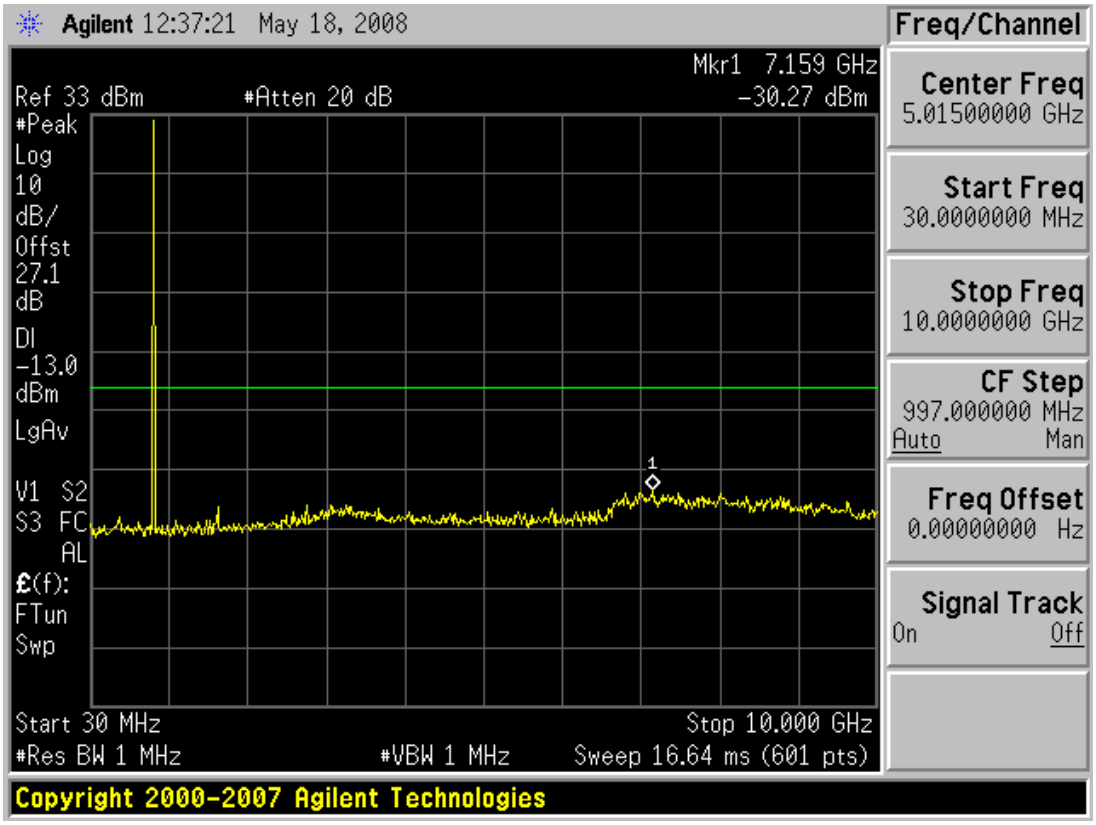
■ GSM1900 MODE (512 CH.) Block Edge



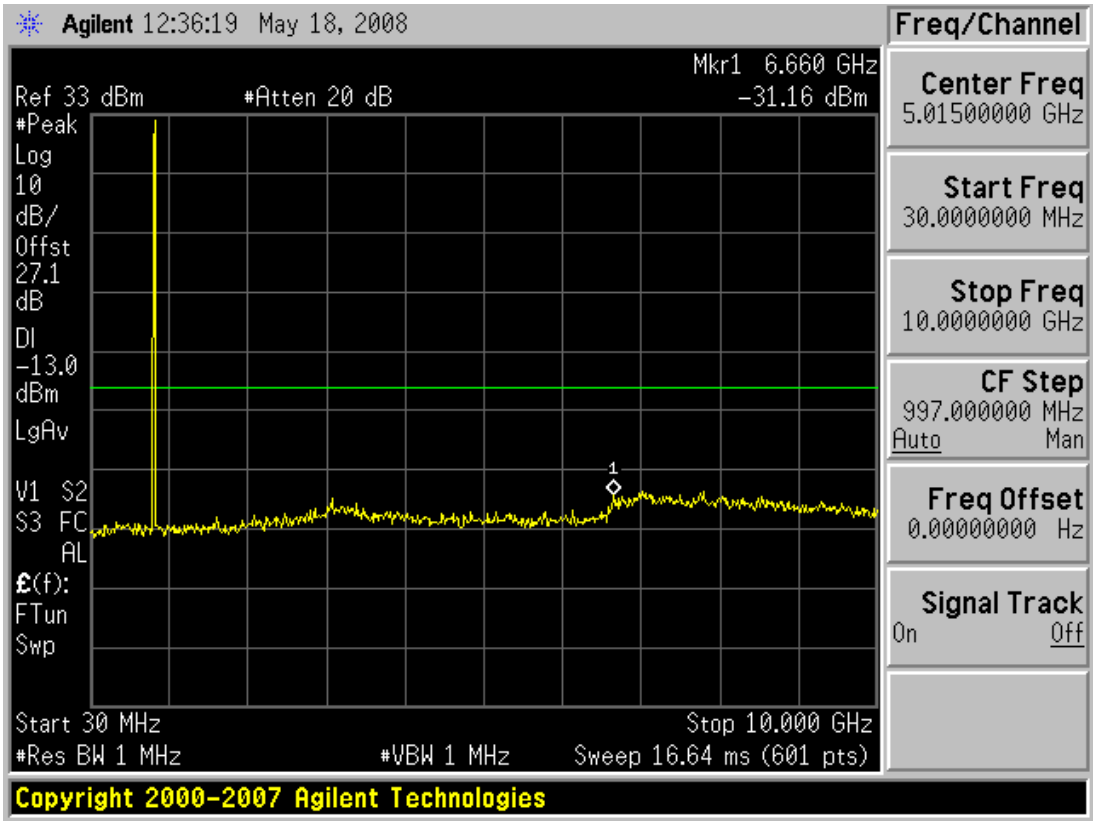

■ GSM1900 MODE (810 CH.) Block Edge



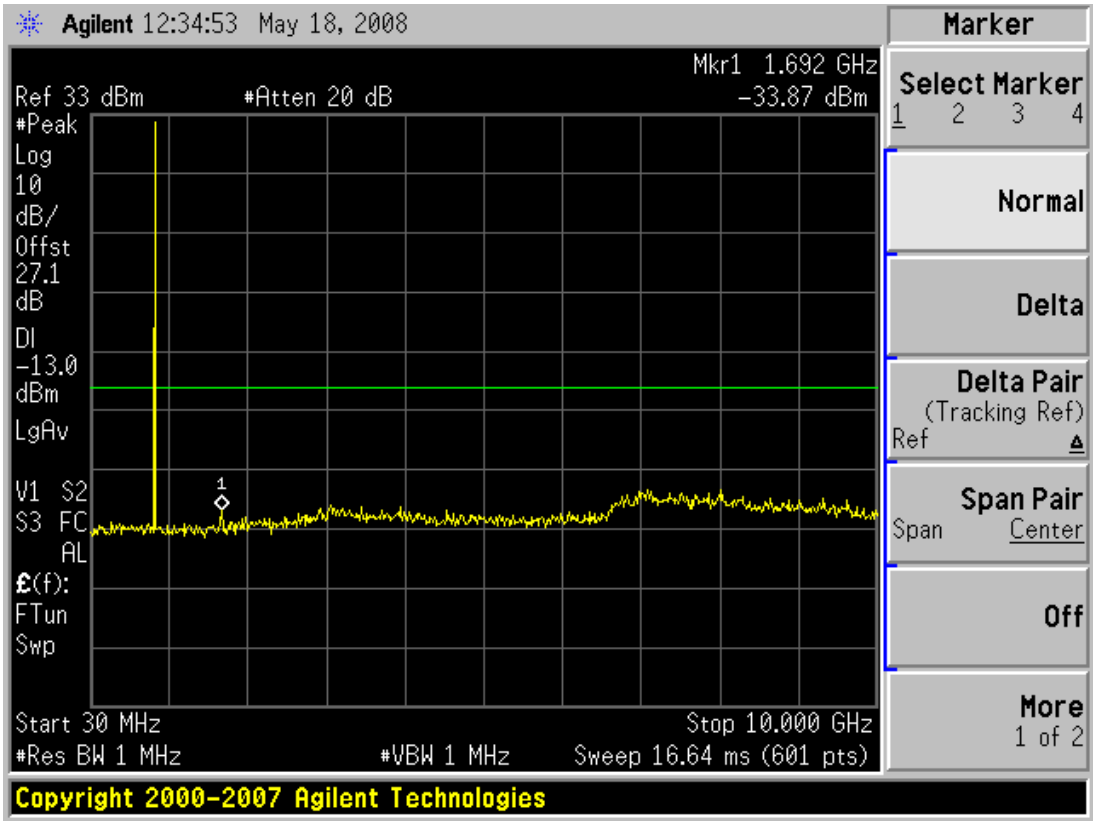
■ GSM850 MODE (128 CH.) Conducted Spurious Emissions



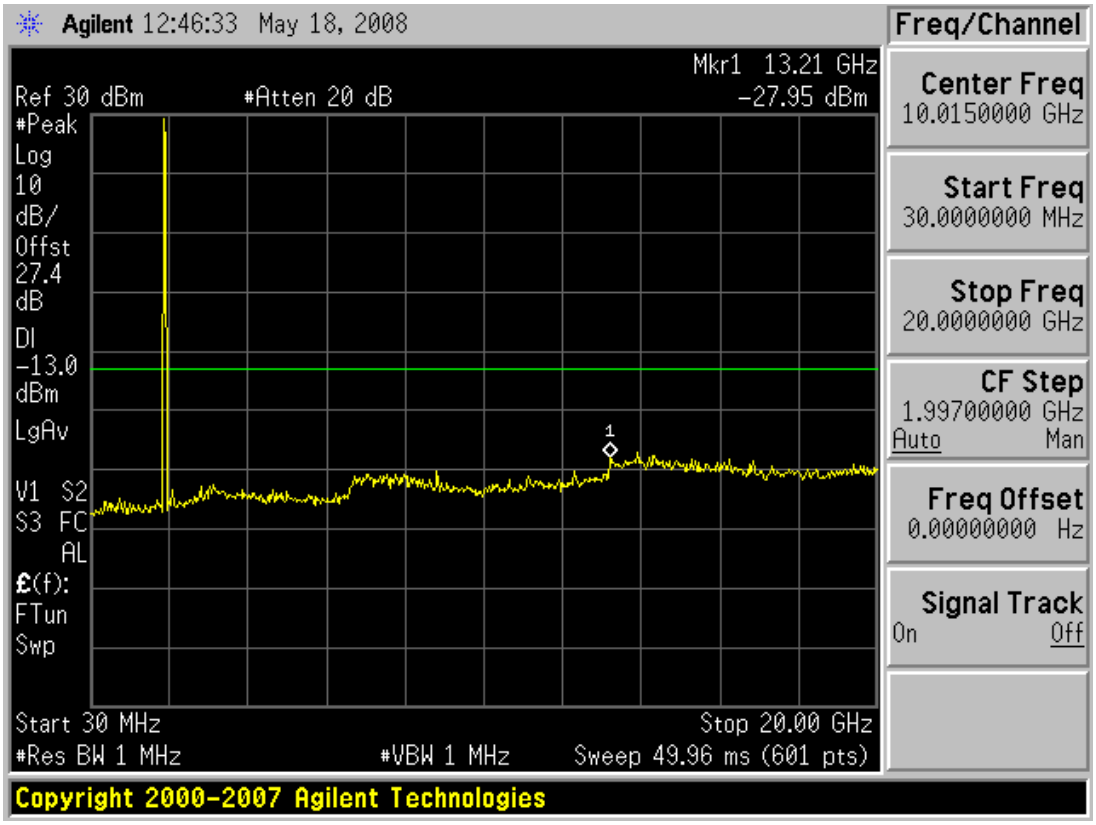

■ GSM850 MODE (190 CH.) Conducted Spurious Emissions



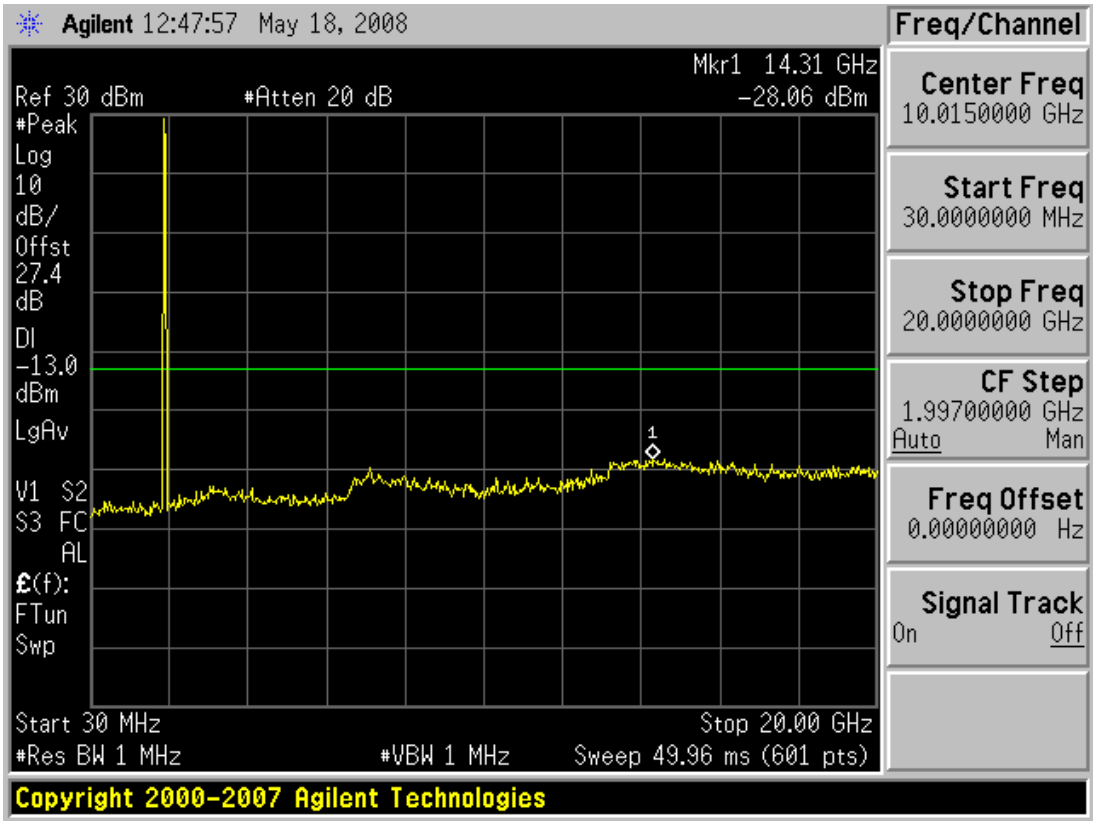
■ GSM850 MODE (251 CH.) Conducted Spurious Emissions




■ GSM1900 MODE (512 CH.) Conducted Spurious Emissions



■ GSM1900 MODE (661 CH.) Conducted Spurious Emissions




■ GSM1900 MODE (810 CH.) Conducted Spurious Emissions