Lab Code: 200167-0

# FCC PART 22H

# MEASUREMENT AND TEST REPORT

For

## Boston Amplifier, Inc

2110 Artesia Blvd Suite B-202
Redondo Beach, CA, 90278, USA

**FCC: T5C-819603BDA**
**Model:BDA-819-603**

| **Report Type:** | **Product Type:** |
|---|---|
| Original Report | Bi-Directional Amplifier |

| | |
|---|---|
| **Test Engineer:** | Victor Zhang |
| **Report Number:** | R0807162-22 |
| **Report Date:** | 2008-09-11 |
| **Reviewed By:** | Boni Baniqued<br>Sr. RF Engineer |
| **Prepared By:**<br>**(84)** | Bay Area Compliance Laboratories Corp.<br>1274 Anvilwood Ave<br>Sunnyvale, CA 94089, USA<br>Tel: (408) 732-9162<br>Fax: (408) 732 9164 |

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# DOCUMENT REVISION HISTORY

| Revision Number | Report Number | Description of Revision | Date of Revision |
|---|---|---|---|
| 0 | R0807162-22 | Original Report | 2008-09-11 |

# 1 GENERAL INFORMATION

## 1.1 Product Description for Equipment under Test (EUT)

The *Boston Amplifier, Inc.,* product, BDA-819-603 *FCC ID: T5C-819603-BDA* or the "EUT" as referred to in this report, is a Bi-Directional amplifier that employs GSM, AMPS, TDMA and Code Division Multiple Access (CDMA) modulation to transmit at cellular service (800 MHz).

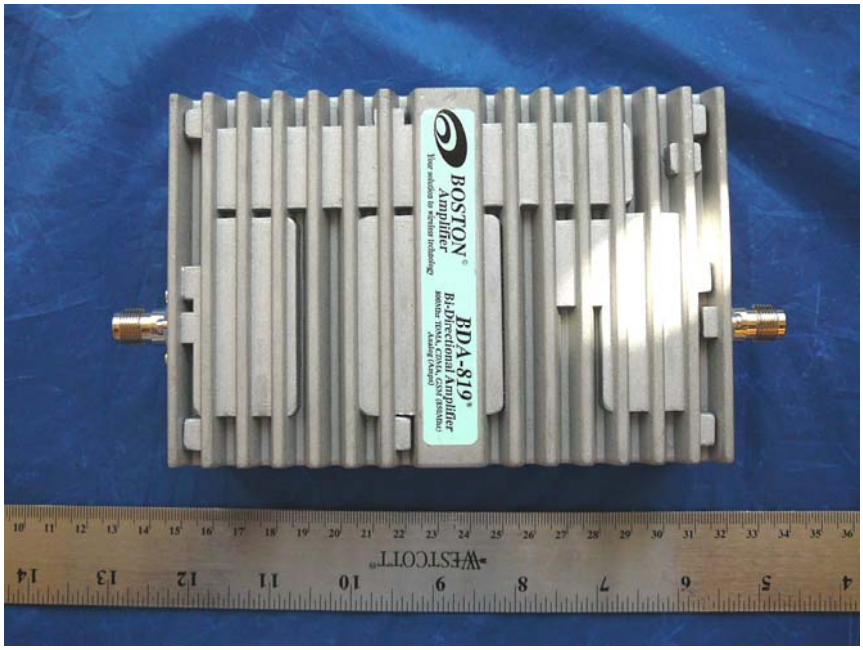
*Note: Out of the series of products, model BDA-819-603, BDA-819-603A and BDA-819-603B, Boston Amplifier, Inc. has chosen BDA-819-603 to test. All models are electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics, which was explained in the attached Declaration Letter.

## 1.2 Mechanical Description

The EUT Approximate measurement is: 174mm (L) x 103 mm (W) x 47 mm (H). It is of metallic construction.

** The test data gathered are from typical production sample, serial number: 72087, provided by the manufacturer.*

## 1.3 EUT Photo




*Please see additional photos in Exhibit C*

## 1.4 Objective

This type approval report is prepared on behalf of Boston Amplifier, Inc. in accordance with Part 2, Subpart J, Part 22 Subpart H, of the Federal Communication Commissions rules.

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

## 1.5 Related Submittal(s)/Grant(s)

No Related Submittals

## 1.6 Test Methodology

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

Part 22 Subpart H - Public Mobile Services

Applicable Standards: TIA EIA 98-C, TIA/EIA603-C, ANSI C63.4-2003.

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

## 1.7 Measurement Uncertainty

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

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

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

## 1.8 Test Facility

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

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

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

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

# 2 SYSTEM TEST CONFIGURATION

## 2.1 Justification

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

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

## 2.2 EUT Exercise Software

NA, signal was sent through EUT using a signal generator, device was set to normal operating mode.

## 2.3 Equipment Modifications

No modifications were made to the EUT.

## 2.4 Power Supply and Line Filters

| Manufacturer | Description | Model | Serial Number |
|---|---|---|---|
| BOSTON Amplifier | AC/DC Switch Adapter | BDA-13 | 3037251 |

## 2.5 Local Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number |
|---|---|---|---|
| Midwest Microwave | 10dB attenuator pad | ATT-0263-10-000-02 | N/A |

## 2.6 Interface Ports and Cabling

| Cable Description | Length (m) | From | To |
|---|---|---|---|
| RF cable | 0.2 | Signal Generator | Input/ EUT |
| RF cable | 0.2 | Output/ EUT | Spectrum analyzer |

# 3 SUMMARY OF TEST RESULTS

| FCC Rules | Description of Tests | Results |
|---|---|---|
| § 2.1046,<br>§ 22.913 (a) | RF Output Power | Compliant |
| § 2.1047 | Modulation Characteristics | N/A |
| § 2.1049,<br>§ 22.917 | Occupied Bandwidth / Out of Band Emissions | Compliant |
| § 2.1053,<br>§ 22.917 | Spurious Radiated Emissions | Compliant |
| § 2.1051,<br>§ 22.917 | Spurious Emissions at Antenna Terminals | Compliant |
| § 22.917 | Band Edge | Compliant |
| § 2.1055 | Frequency Stability | N/A |
| §2.1091 | RF Exposure | Compliant |

# 4 §2.1046, §22.913(a) – RF OUTPUT POWER

## 4.1 Applicable Standard

According to §22.913 (a), the maximum effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts.

## 4.2 Test Procedure

*Conducted:*

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

## 4.3 Environmental Conditions

| | |
|---|---|
| **Temperature:** | 23 °C |
| **Relative Humidity:** | 45 % |
| **ATM Pressure:** | 101.1kPa |

** The testing was performed by Victor Zhang on 2008-08-04.*

## 4.4 Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date |
|---|---|---|---|---|
| Agilent | Spectrum Analyzer | E4440A | MY44303352 | 2008-04-28 |
| Agilent | Signal Generator | 83650B | 3614A00276 | 2008-05-28 |
| R & S | Signal Generator | SMIQ03 | 849192/0085 | 2007-12-03 |

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

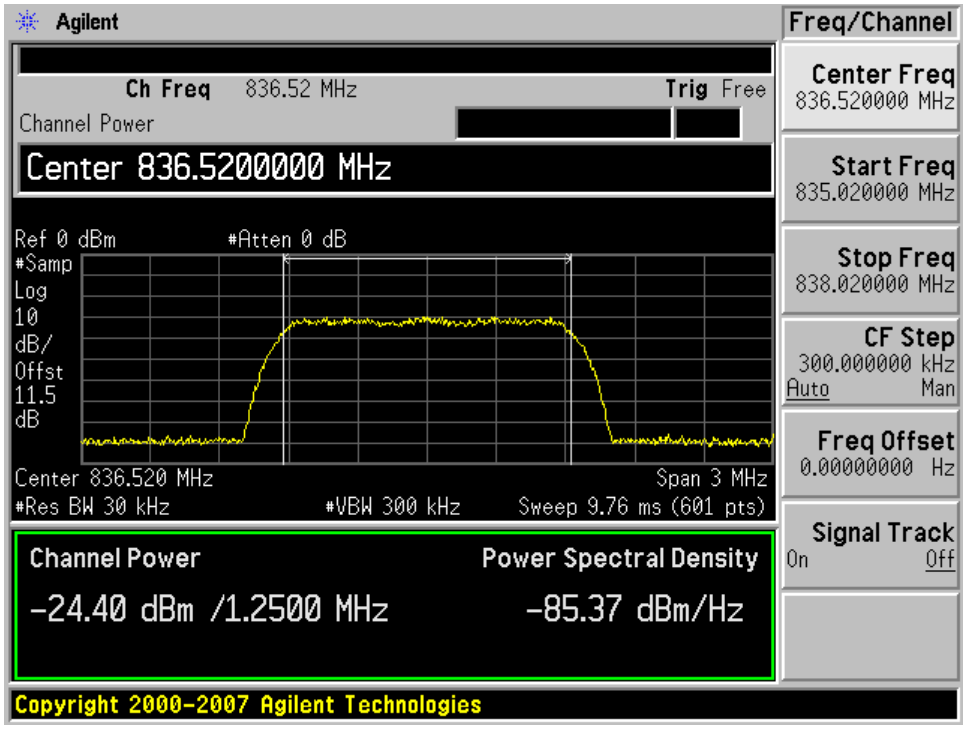
## 4.5 Summary of Test Results

| MODE | | Channel | Frequency (MHz) | Output Power (dBm) | Output Power (W) | ERP Limit (W) |
|---|---|---|---|---|---|---|
| CDMA | Uplink | Middle | 836.52 | 20.91 | 0.123 | 500 |
| | Downlink | Middle | 881.52 | 5.80 | 0.004 | 500 |
| GSM | Uplink | Middle | 836.60 | 21.73 | 0.149 | 500 |
| | Downlink | Middle | 881.60 | 8.35 | 0.007 | 500 |
| TDMA | Uplink | Middle | 836.50 | 23.27 | 0.212 | 500 |
| | Downlink | Middle | 881.50 | 7.69 | 0.006 | 500 |
| AMPS | Uplink | Middle | 836.52 | 23.22 | 0.210 | 500 |
| | Downlink | Middle | 881.52 | 8.30 | 0.007 | 500 |

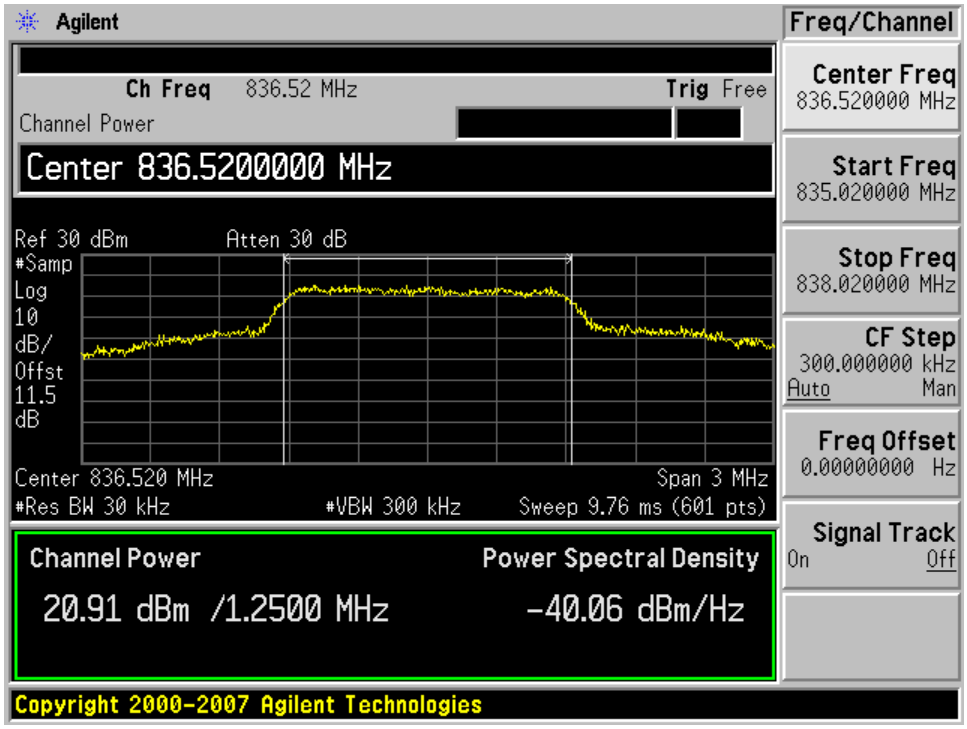
## 4.6 Test data

### CDMA Uplink

**Input**

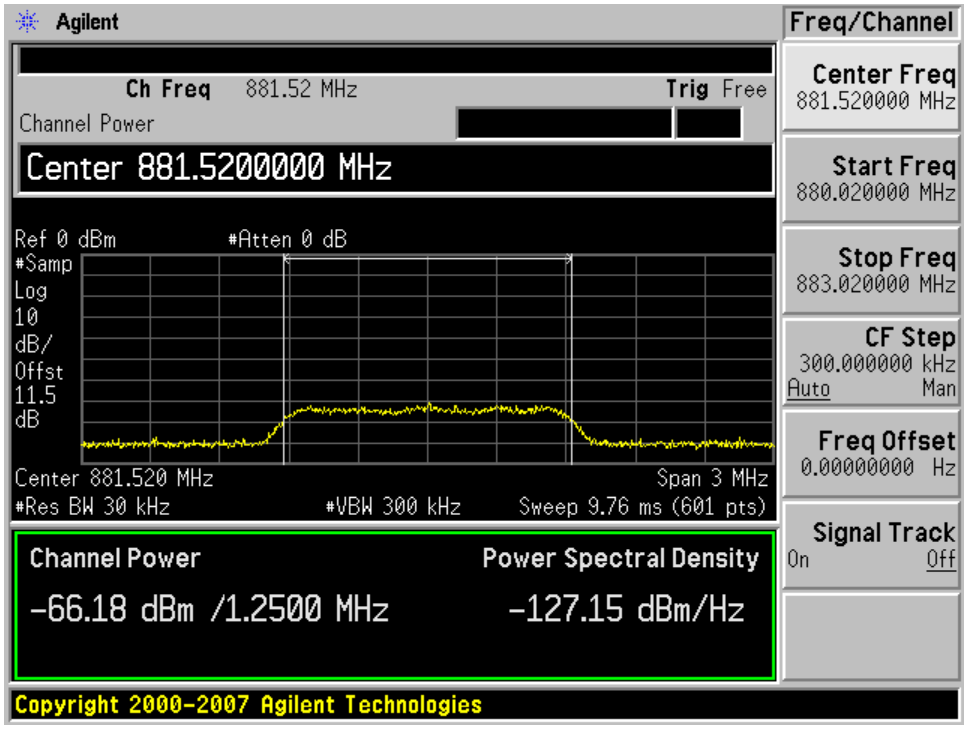



**Output**

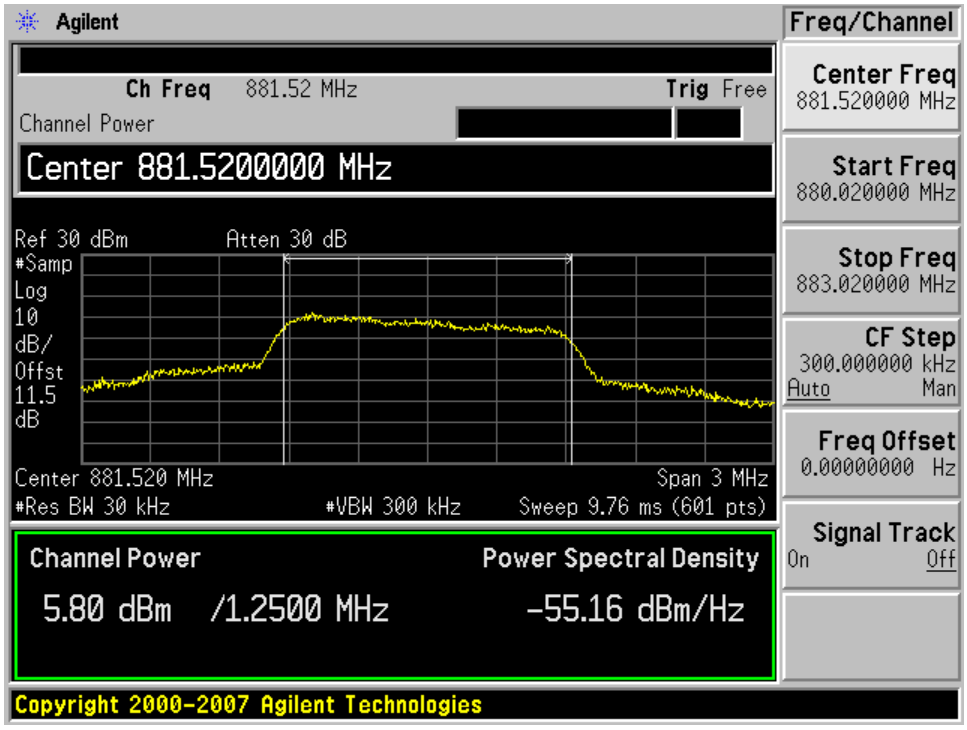


**CDMA Downlink**

**Input**

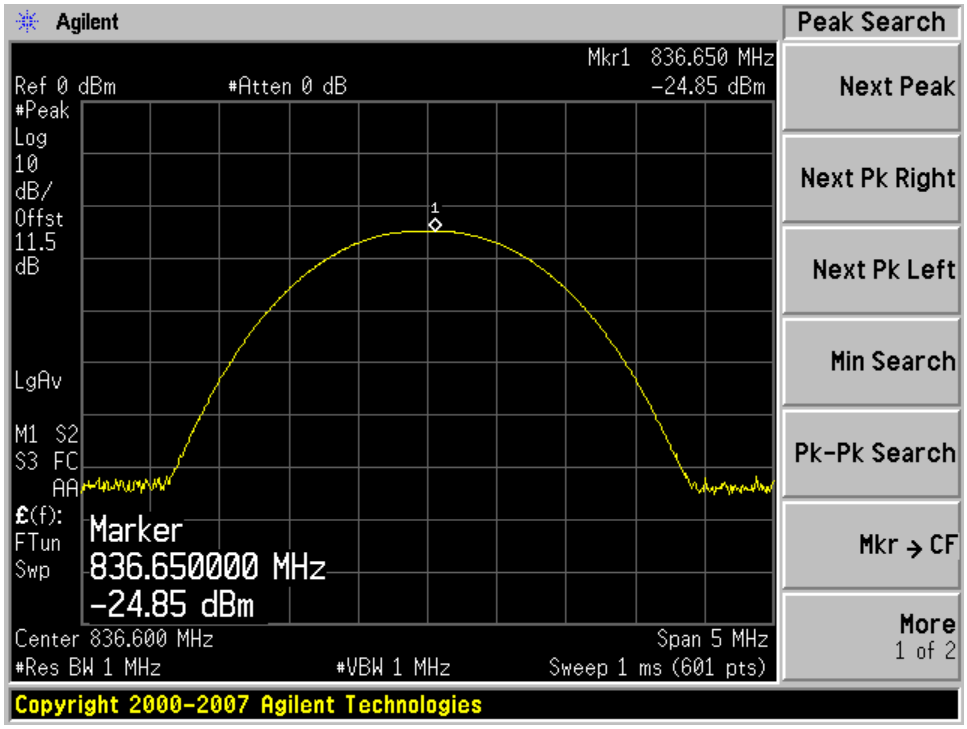



**Output**

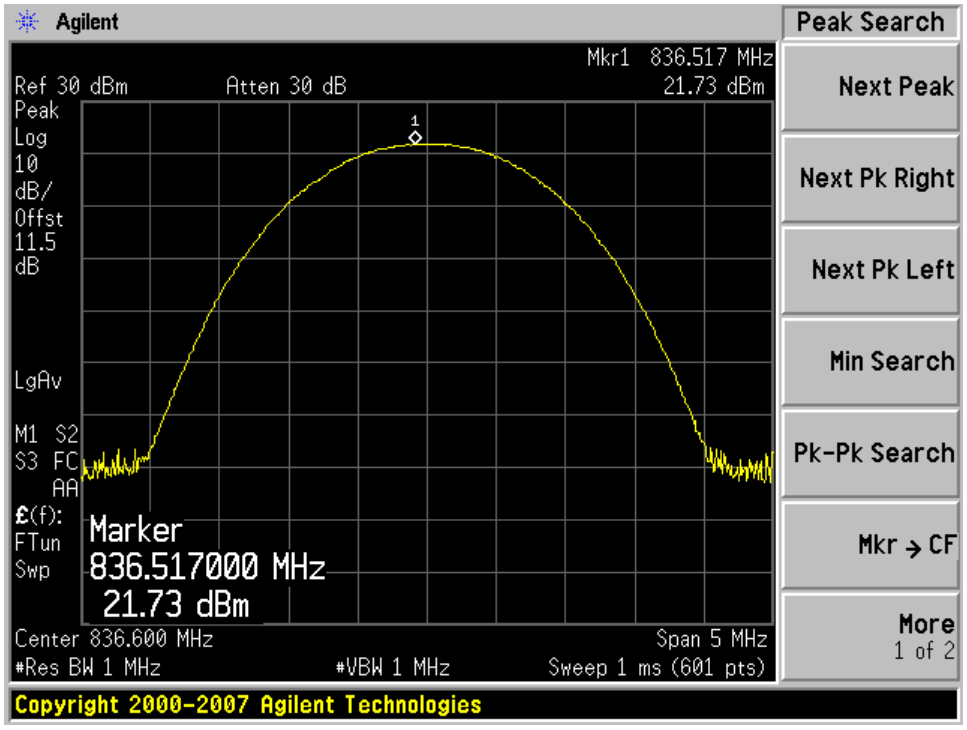


**GSM Uplink**

**Input**

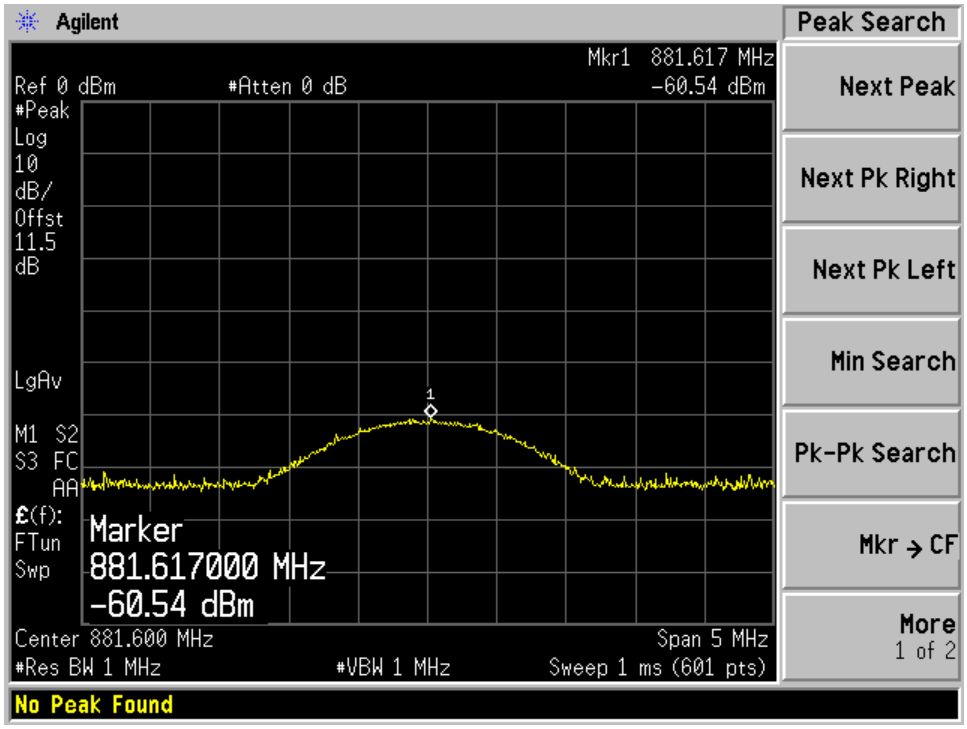



**Output**

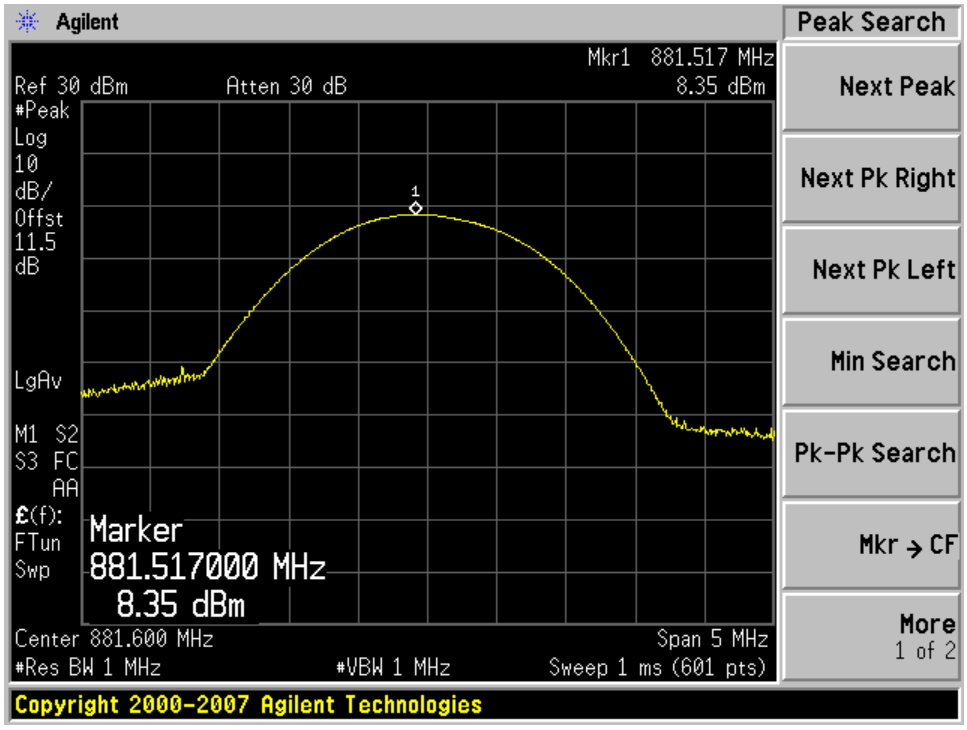


**GSM Downlink**

**Input**

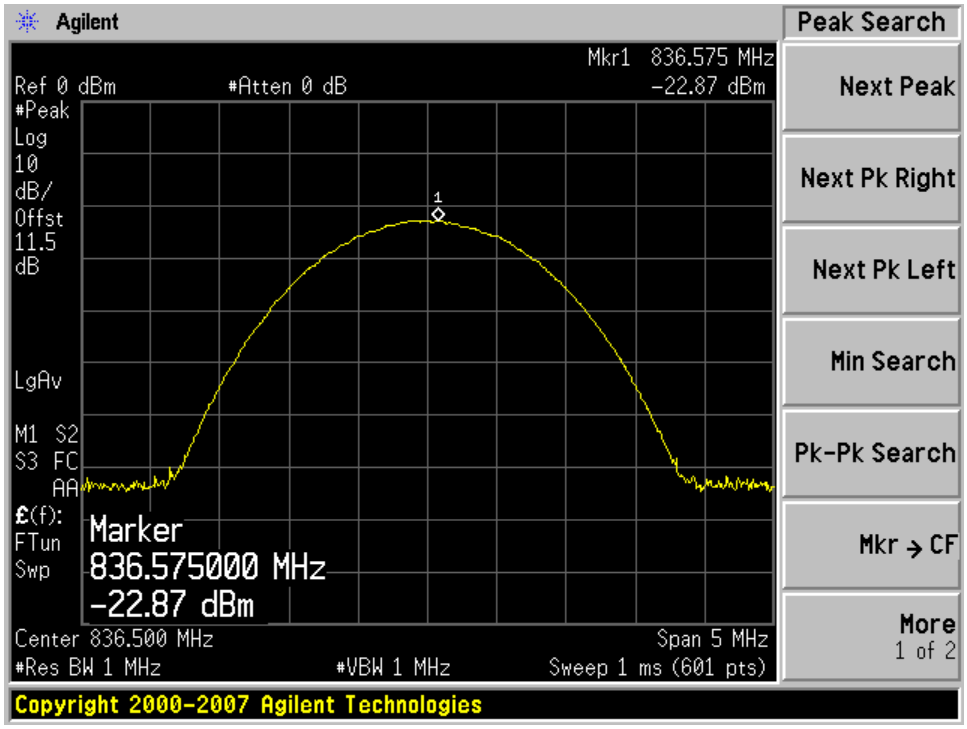



**Output**

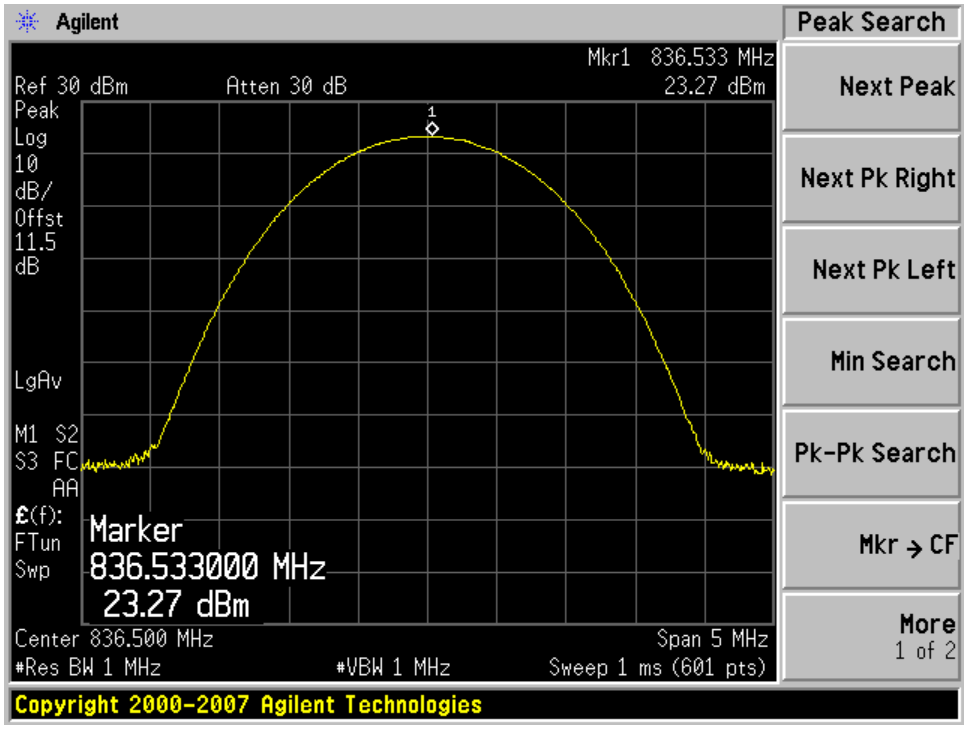


**TDMA Uplink**

**Input**

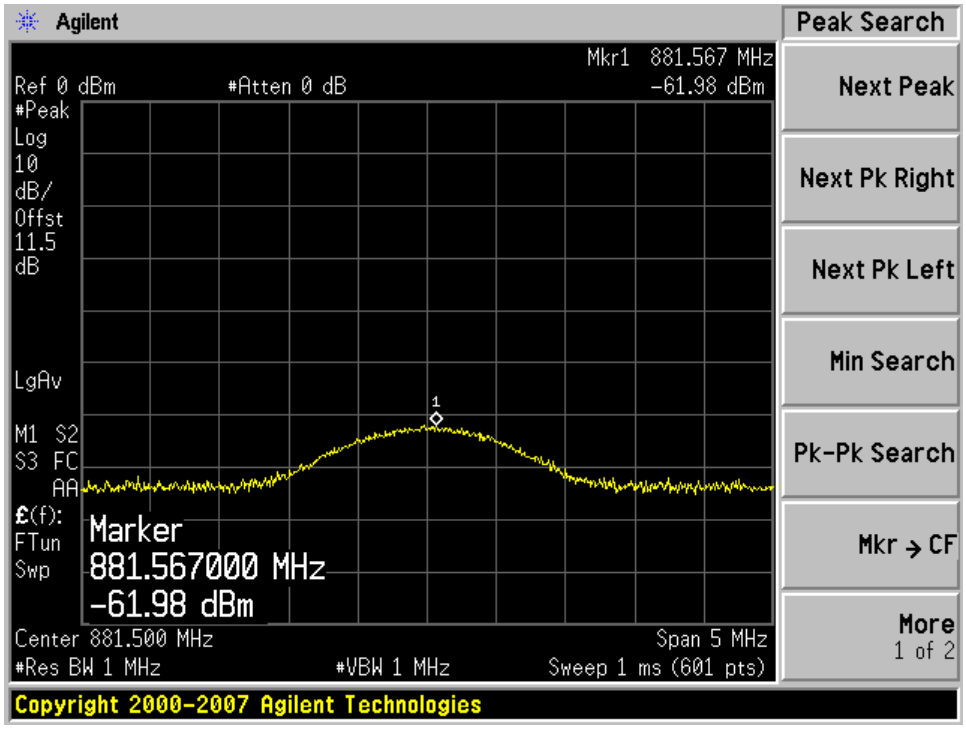



**Output**

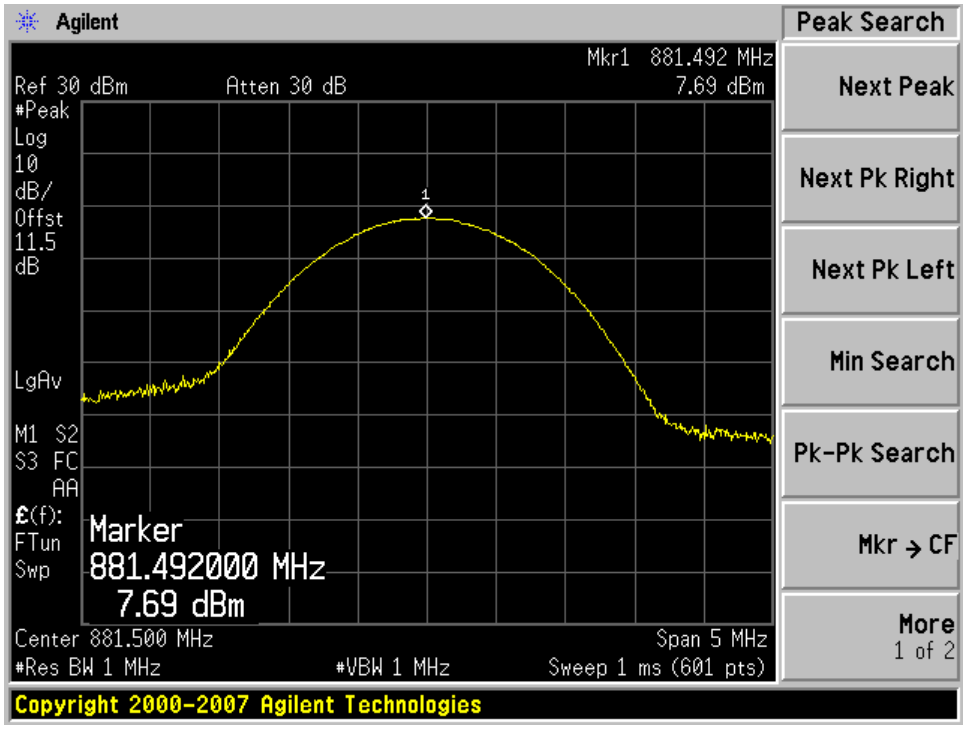


**TDMA Downlink**

**Input**

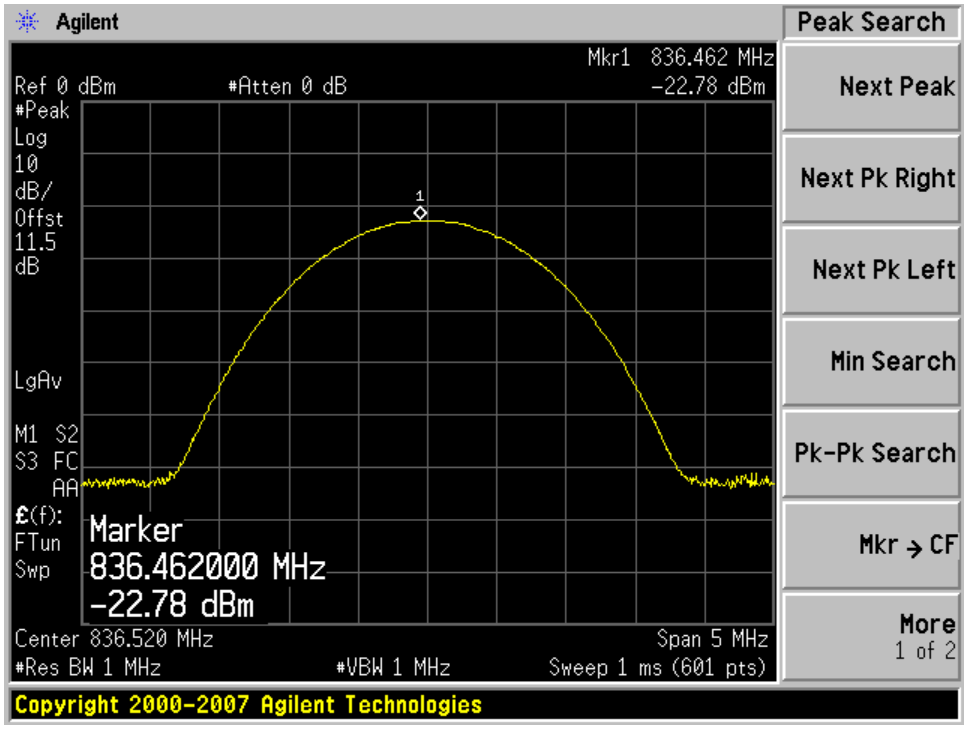



**Output**

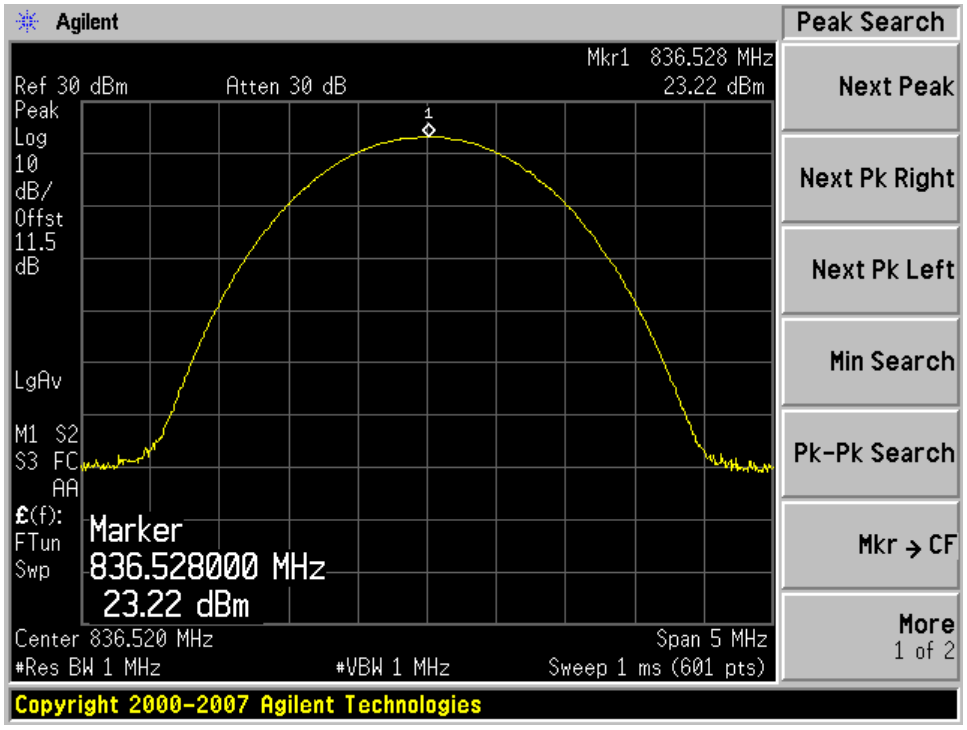


**AMPS Uplink**

**Input**

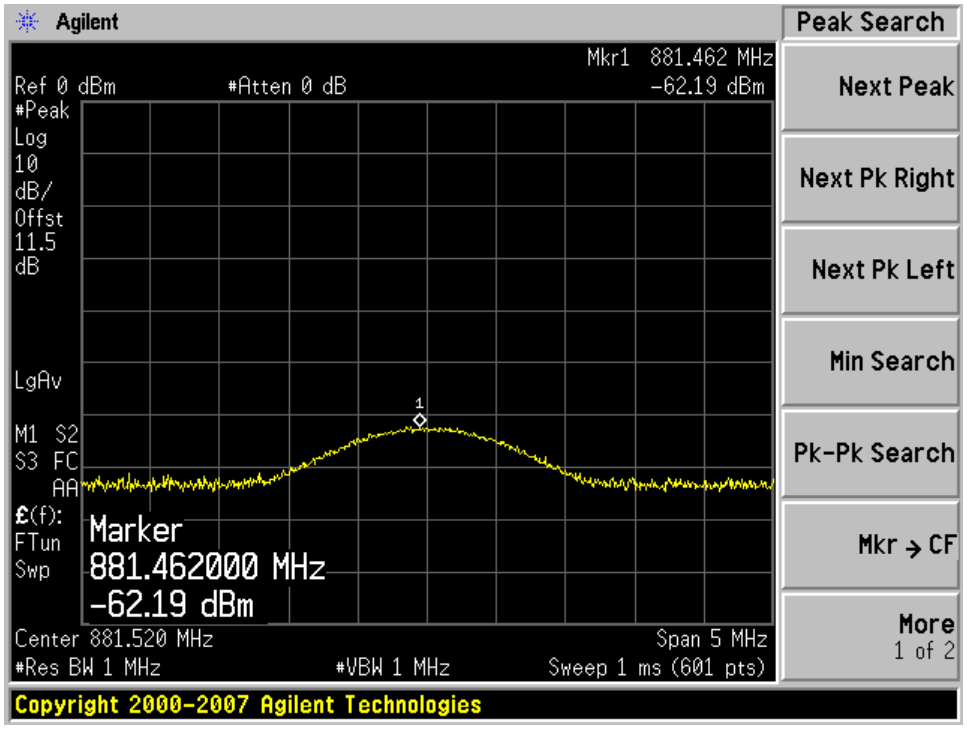



**Output**

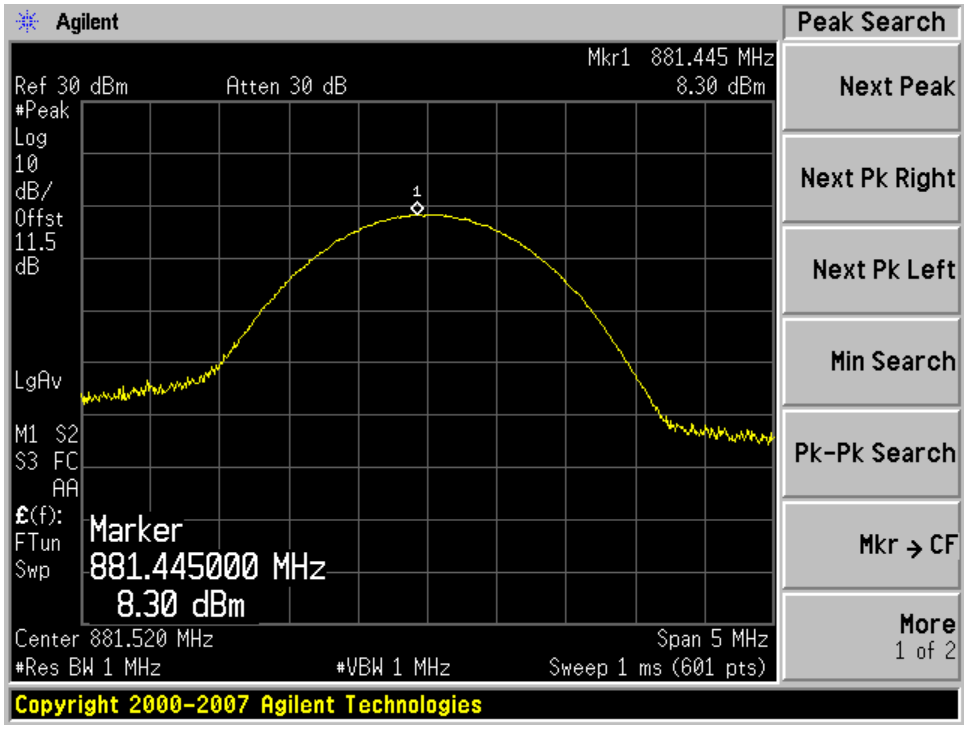


**AMPS Downlink**

**Input**




**Output**



# 5 §2.1047 - MODULATION CHARACTERISTIC

## 5.1 Applicable Standard

According to FCC § 2.1047(d) and part 22H, there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

## 5.2 Test Result

N/A

# 6 §2.1049, §22.917 - OCCUPIED BANDWIDTH

## 6.1 Applicable Standard

Requirements: CFR 47, Section 2.1049 and Section 22.917.

## 6.2 Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 30 kHz (Cellular/PCS) and the 26 dB & 99% bandwidth was recorded.

## 6.3 Environmental Conditions

| | |
|---|---|
| **Temperature:** | 23 °C |
| **Relative Humidity:** | 45 % |
| **ATM Pressure:** | 101.1kPa |

** The testing was performed by Victor Zhang on 2008-08-04.*

## 6.4 Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date |
|---|---|---|---|---|
| Agilent | Spectrum Analyzer | E4440A | MY44303352 | 2008-04-28 |
| Agilent | Signal Generator | 83650B | 3614A00276 | 2008-05-28 |
| R & S | Signal Generator | SMIQ03 | 849192/0085 | 2007-12-03 |

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

## 6.5 Summary of Test Results

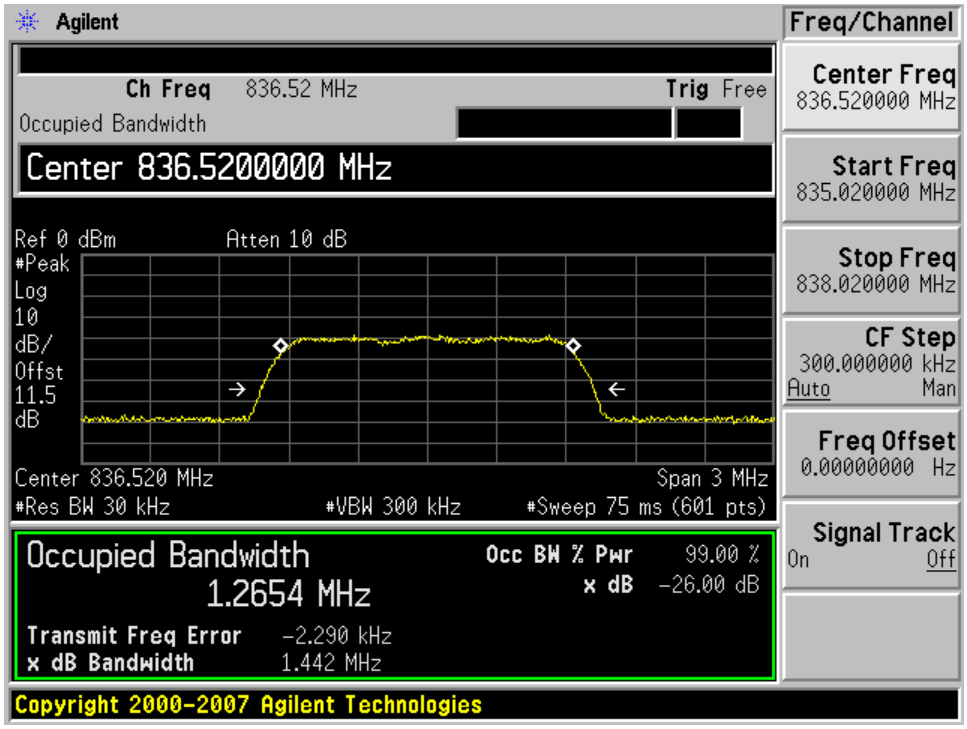
| Mode | | Channel | Frequency (MHz) | Emission Bandwidth (kHz) |
|---|---|---|---|---|
| CDMA | Uplink | Middle | 836.52 | 1276.8 |
| | Downlink | Middle | 881.52 | 1267.1 |
| GSM | Uplink | Middle | 836.60 | 245.8924 |
| | Downlink | Middle | 881.60 | 244.8766 |
| TDMA | Uplink | Middle | 836.50 | 30.0033 |
| | Downlink | Middle | 881.50 | 29.3645 |
| AMPS | Uplink | Middle | 836.52 | 29.9503 |
| | Downlink | Middle | 881.52 | 29.5461 |

## 6.6 Test Data

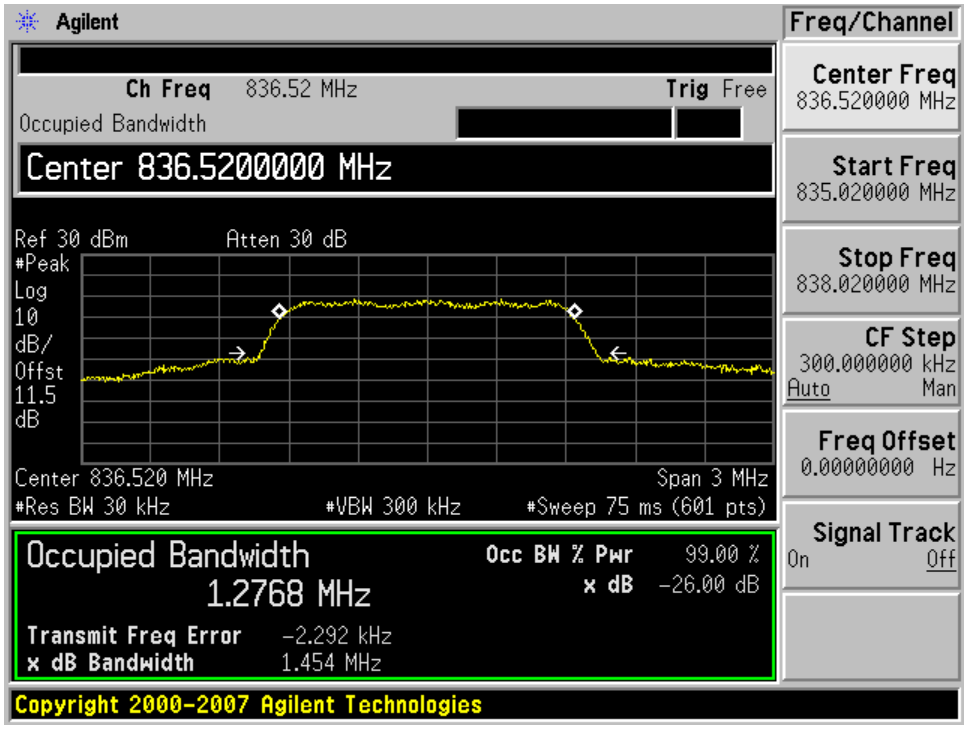
Please refer to the following plots.

**CDMA Uplink**

**Input**

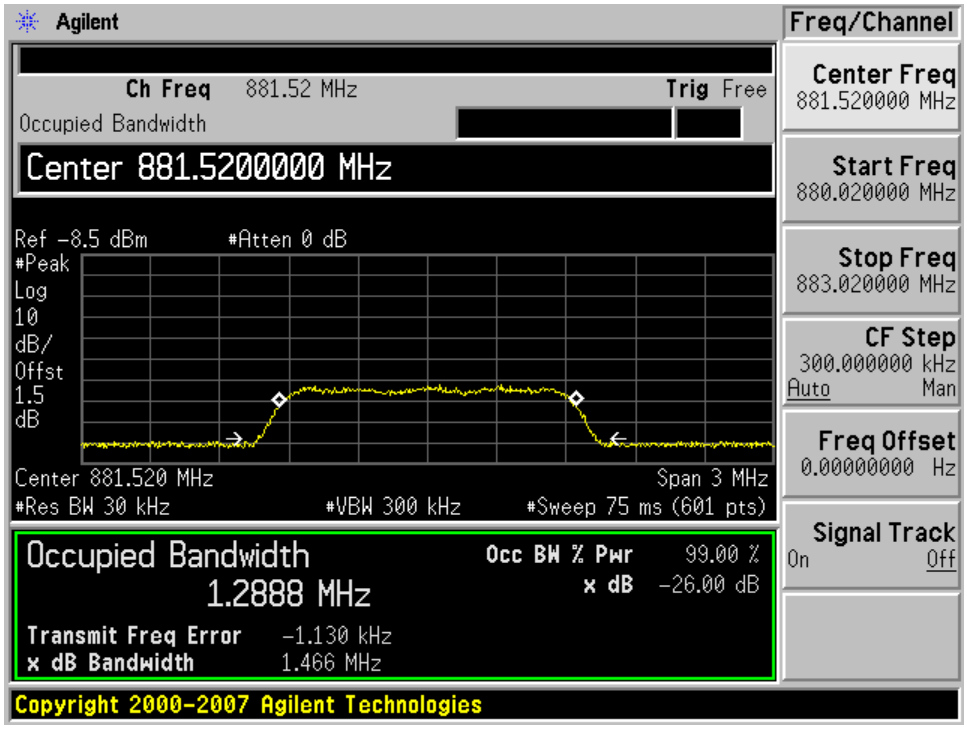



**Output**

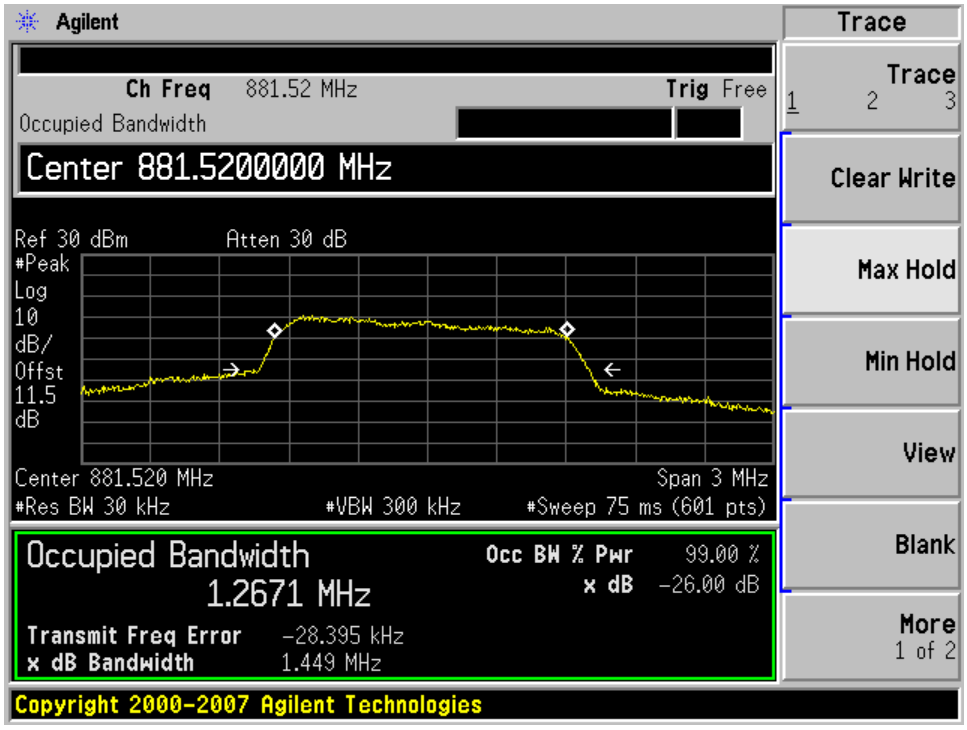


**CDMA Downlink**

**Input**

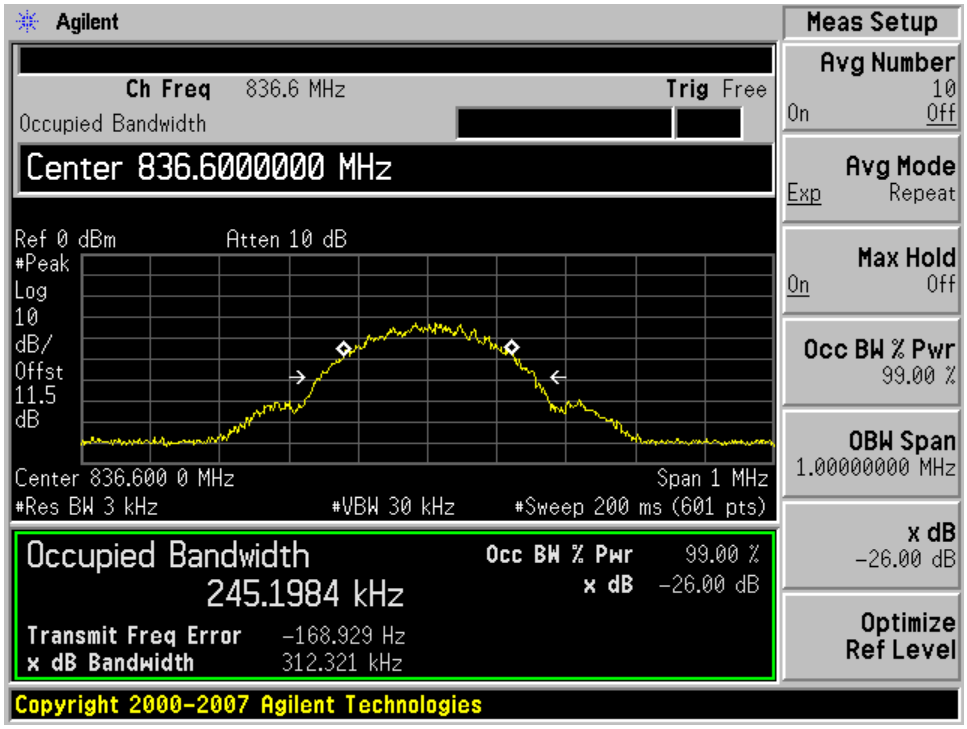



**Output**

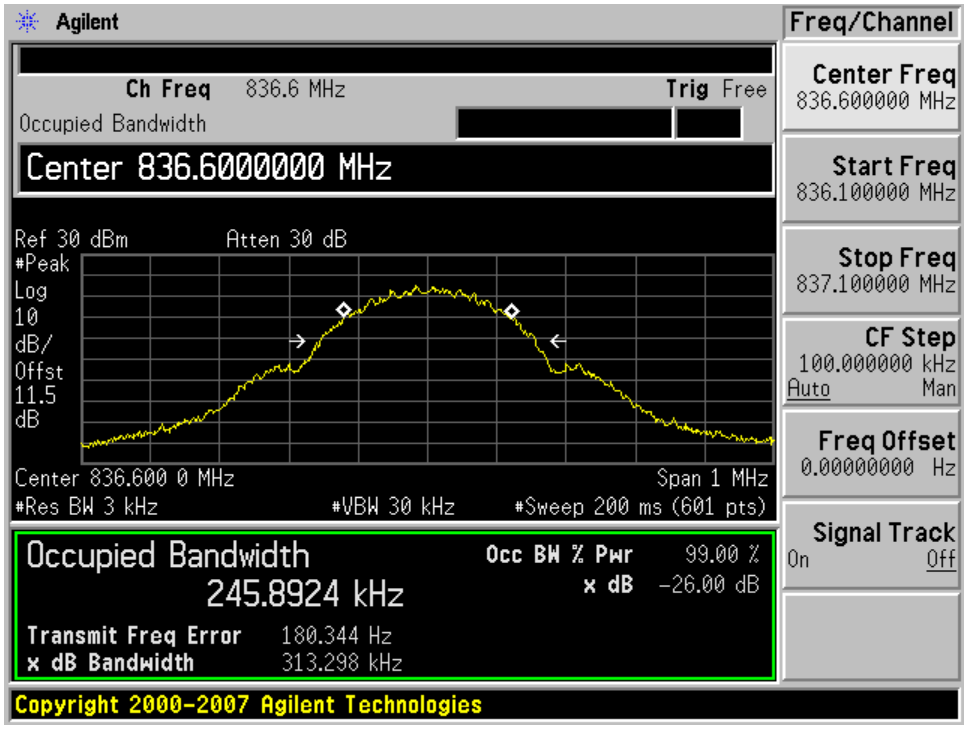


**GSM Uplink**

**Input**

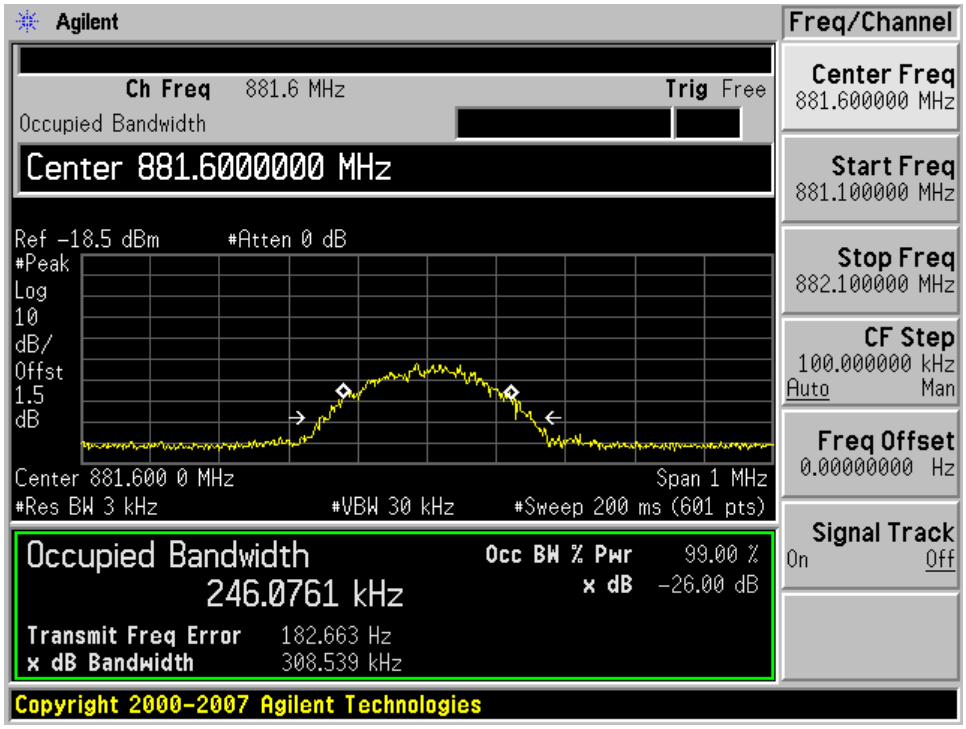



**Output**

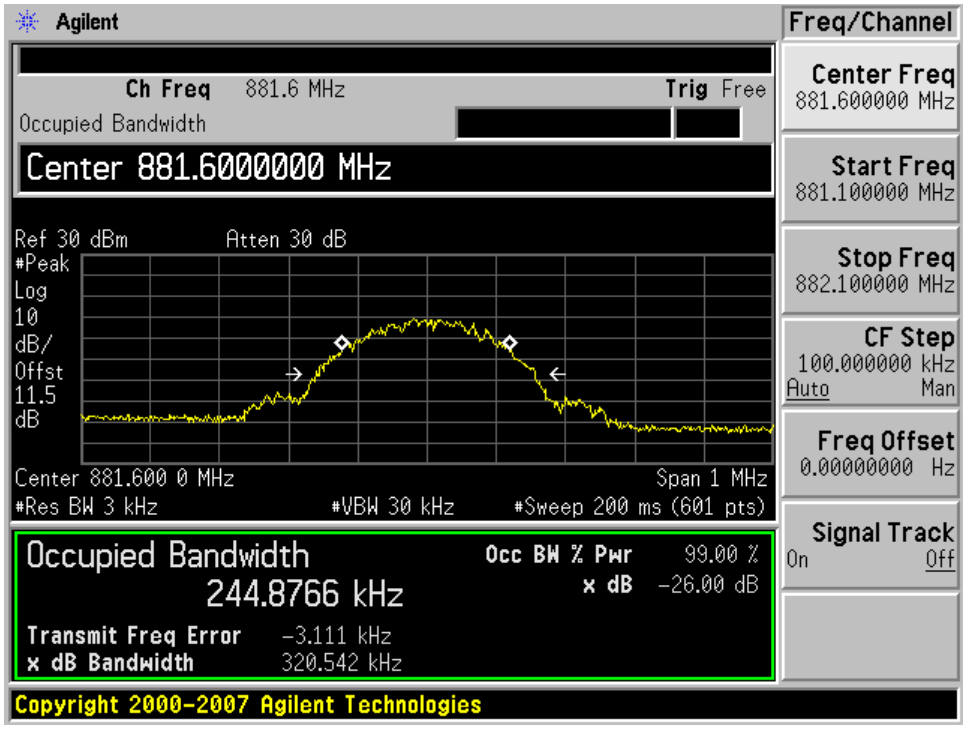


**GSM Downlink**

**Input**

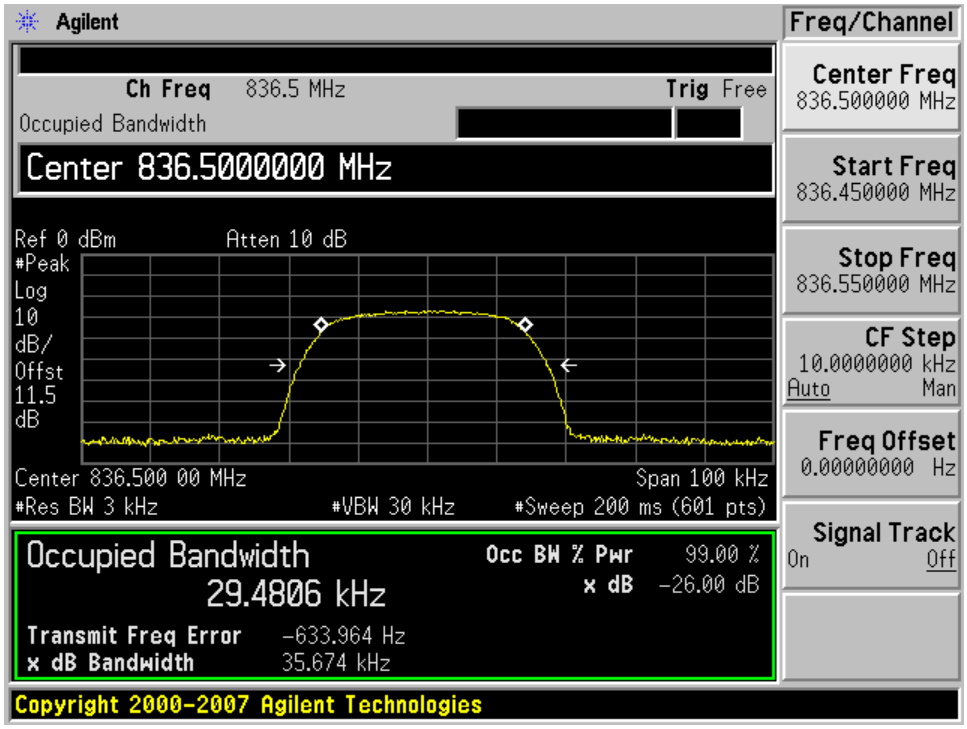



**Output**

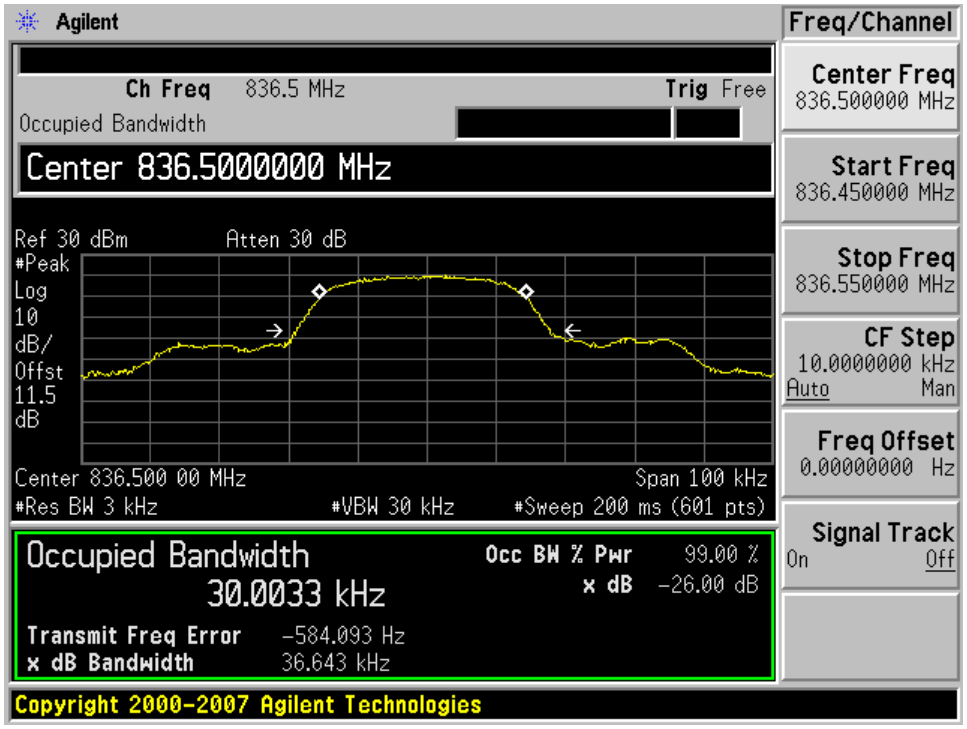


**TDMA Uplink**

**Input**

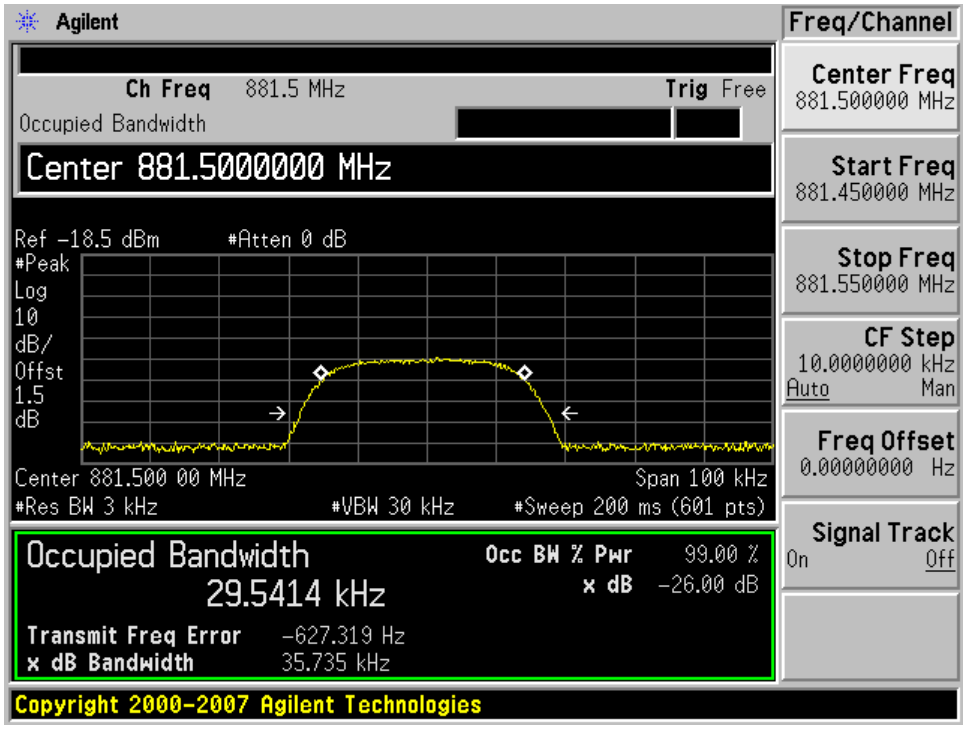



**Output**

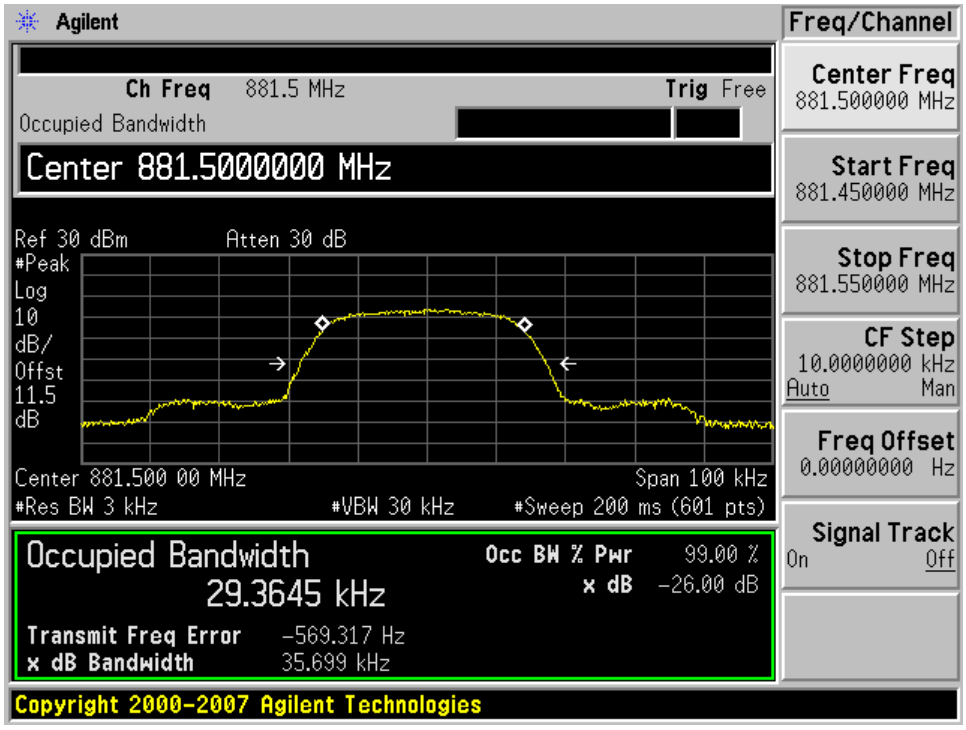


**TDMA Downlink**

**Input**

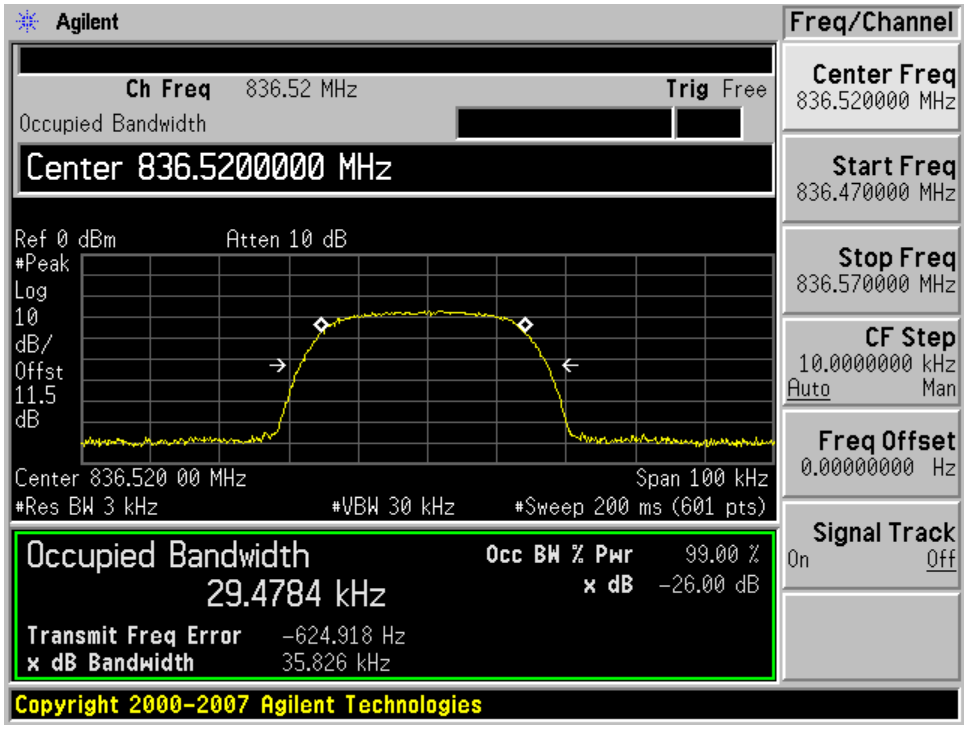



**Output**

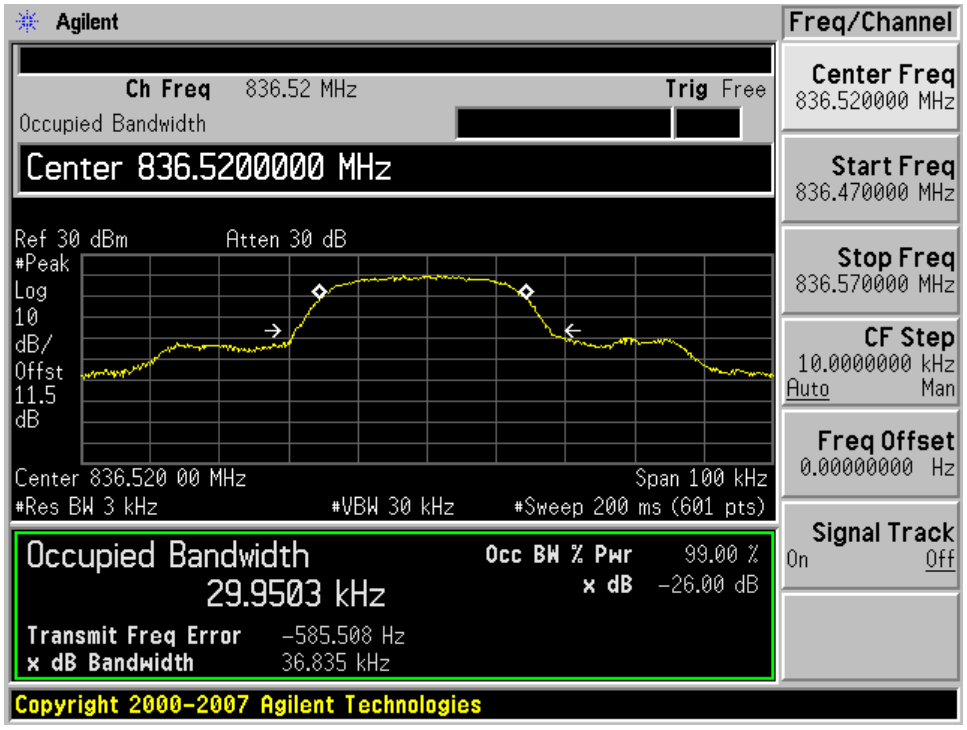


**AMPS Uplink**

**Input**

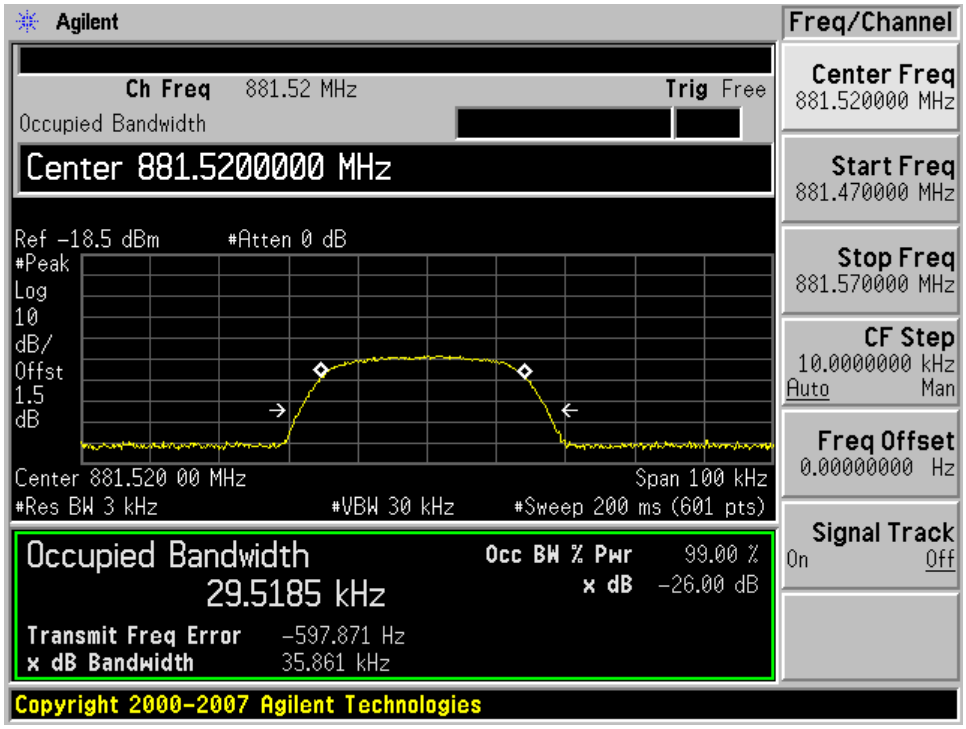



**Output**

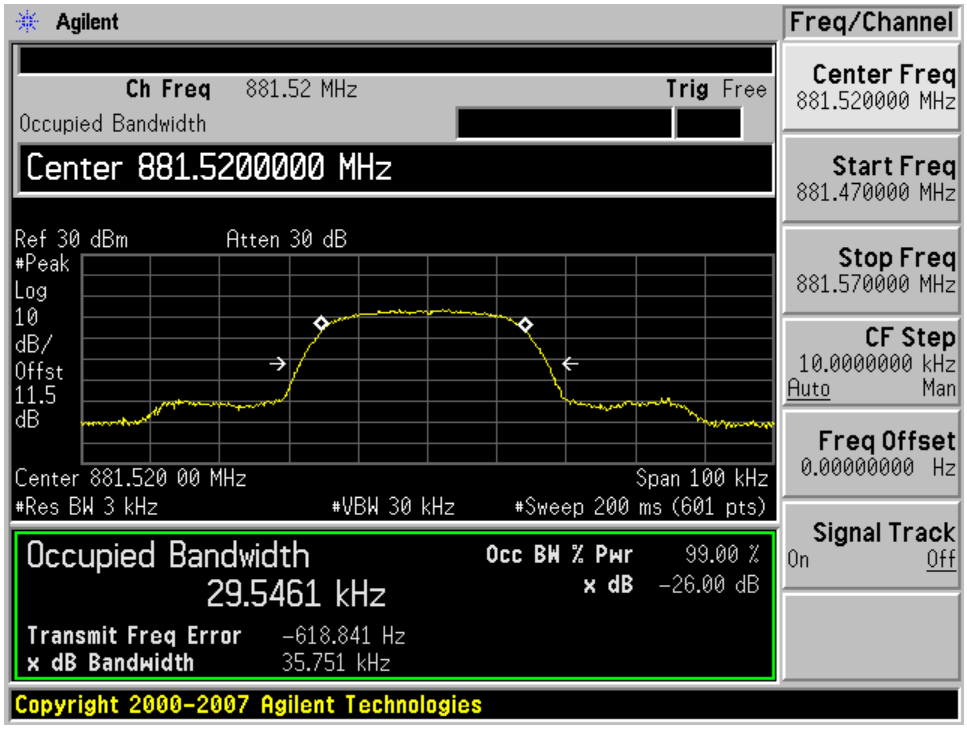


**AMPS Downlink**

**Input**




**Output**



# 7 §2.1053, §22.917 - SPURIOUS RADIATED EMISSIONS

## 7.1 Applicable Standard

Requirements: CFR 47, § 2.1053, § 22.917.

## 7.2 Test Procedure

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

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

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

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

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

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

## 7.3 Environmental Conditions

| | |
|---|---|
| **Temperature:** | 22 °C |
| **Relative Humidity:** | 47 % |
| **ATM Pressure:** | 101.1kPa |

** The testing was performed by Victor Zhang on 2008-08-08*

## 7.4 Test Equipment List and Details

| Manufacturers | Descriptions | Models | Serial Numbers | Calibration Dates |
|---|---|---|---|---|
| Mini-Circuits | Pre amplifier | ZKL-2 | 7786100643 | 2008-01-02 |
| HP | Pre amplifier | 8449B | 3147A00400 | 2007-11-02 |
| Sunol Science Corp | Combination Antenna | JB1 Antenna | A103105-3 | 2008-03-25 |
| A. H. Systems | Antenna, Horn, DRG | SAS-200/571 | 261 | 2008-07-01 |
| Agilent | Spectrum Analyzer | E4440A | MY44303352 | 2008-04-28 |
| A.R.A. | Antenna, Horn | DRG-118/A | 1132 | 2006-08-17 ( 2 yrs Cycle) |
| Agilent | Signal Generator | 83650B | 3614A00276 | 2008-05-28 |
| R & S | Signal Generator | SMIQ03 | 849192/0085 | 2007-12-03 |

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

## 7.5 Summary of Test Results

The worst case reading as follows:

**CDMA**

| Mode: Downlink | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Input Frequency** |
| -27.22 | 2644.56 | Vertical | 881.52 MHz |

| Mode: Uplink | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Input Frequency** |
| -0.78 | 1673.04 | Vertical | 836.52MHz |

**GSM**

| Mode: Downlink | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Input Frequency** |
| -32.52 | 2644.8 | Vertical | 881.6 MHz |

| Mode: Uplink | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Input Frequency** |
| -13.98 | 1673.2 | Vertical | 836.6 MHz |

**TDMA**

| Mode: Downlink | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Input Frequency** |
| -30.12 | 2644.5 | Vertical | 881.5 MHz |

| Mode: Uplink | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Input Frequency** |
| -11.98 | 1673 | Vertical | 836.5 MHz |

**AMPS**

| Mode: Downlink | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Input Frequency** |
| -25.72 | 2644.56 | Vertical | 881.52 MHz |

| Mode: Uplink | | | |
|---|---|---|---|
| **Margin (dB)** | **Frequency (MHz)** | **Polarization (Horizontal/Vertical)** | **Input Frequency** |
| -11.68 | 1673.04 | Vertical | 836.52 MHz |

## 7.6 Test Data

### CDMA

Downlink (Input frequency = 881.52MHz)

| Indicated | | Azimuth (degree) | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV) | | Height (m) | Polarity (H/V) | Frequency (MHz) | Level (dBm) | Antenna Gain Correction (dB) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 2644.56 | 49.73 | 219 | 1.05 | V | 2644.56 | -48.10 | 9.0 | 1.12 | -40.22 | -13 | -27.22 |
| 2644.56 | 44.75 | 225 | 1.12 | H | 2644.56 | -54.00 | 9.0 | 1.12 | -46.12 | -13 | -33.12 |
| 1763.04 | 45.47 | 218 | 1.00 | V | 1763.04 | -55.70 | 8.2 | 0.88 | -48.38 | -13 | -35.38 |
| 1763.04 | 43.22 | 229 | 1.00 | H | 1763.04 | -57.40 | 8.2 | 0.88 | -50.08 | -13 | -37.08 |

Uplink (Input frequency = 836.52 MHz)

| Indicated | | Azimuth (degree) | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV) | | Height (m) | Polarity (H/V) | Frequency (MHz) | Level (dBm) | Antenna Gain Correction (dB) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 1673.04 | 77.21 | 21 | 1.10 | V | 1673.04 | -21.10 | 8.2 | 0.88 | -13.78 | -13 | -0.78 |
| 1673.04 | 69.34 | 29 | 1.24 | H | 1673.04 | -31.30 | 8.2 | 0.88 | -23.98 | -13 | -10.98 |
| 2509.56 | 62.44 | 125 | 1.12 | V | 2509.56 | -36.60 | 9.0 | 1.12 | -28.72 | -13 | -15.72 |
| 2509.56 | 56.87 | 213 | 1.00 | H | 2509.56 | -44.20 | 9.0 | 1.12 | -36.32 | -13 | -23.32 |

**GSM**

Downlink (Input frequency = 881.6MHz)

| Indicated | | Azimuth (degree) | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV) | | Height (m) | Polarity (H/V) | Frequency (MHz) | Level (dBm) | Antenna Gain Correction (dB) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 2644.8 | 47.00 | 330 | 1.22 | V | 2644.8 | -53.40 | 9.0 | 1.12 | -45.52 | -13 | -32.52 |
| 2644.8 | 42.25 | 219 | 1.35 | H | 2644.8 | -58.80 | 9.0 | 1.12 | -50.92 | -13 | -37.92 |
| 1763.2 | 40.39 | 215 | 1.00 | H | 1763.2 | -62.00 | 8.2 | 0.88 | -54.68 | -13 | -41.68 |
| 1763.2 | 41.61 | 219 | 1.47 | V | 1763.2 | -63.00 | 8.2 | 0.88 | -55.68 | -13 | -42.68 |

Uplink (Input frequency = 836.6 MHz)

| Indicated | | Azimuth (degree) | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV) | | Height (m) | Polarity (H/V) | Frequency (MHz) | Level (dBm) | Antenna Gain Correction (dB) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 1673.2 | 64.09 | 22 | 1.00 | V | 1673.2 | -34.30 | 8.2 | 0.88 | -26.98 | -13 | -13.98 |
| 1673.2 | 57.33 | 29 | 1.21 | H | 1673.2 | -43.40 | 8.2 | 0.88 | -36.08 | -13 | -23.08 |
| 2509.8 | 42.35 | 194 | 1.10 | V | 2509.8 | -56.70 | 9.0 | 1.12 | -48.82 | -13 | -35.82 |
| 2509.8 | 40.94 | 182 | 1.00 | H | 2509.8 | -60.10 | 9.0 | 1.12 | -52.22 | -13 | -39.22 |

**TDMA**

Downlink (Input frequency = 881.5MHz)

| Indicated | | Azimuth (degree) | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV) | | Height (m) | Polarity (H/V) | Frequency (MHz) | Level (dBm) | Antenna Gain Correction (dB) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 2644.5 | 49.42 | 330 | 2.02 | V | 2644.5 | -51.00 | 9.0 | 1.12 | -43.12 | -13 | -30.12 |
| 2644.5 | 45.26 | 213 | 1.48 | H | 2644.5 | -55.80 | 9.0 | 1.12 | -47.92 | -13 | -34.92 |
| 1763 | 41.07 | 205 | 1.04 | H | 1763 | -61.40 | 8.2 | 0.88 | -54.08 | -13 | -41.08 |
| 1763 | 41.88 | 220 | 1.00 | V | 1763 | -62.80 | 8.2 | 0.88 | -55.48 | -13 | -42.48 |

**Uplink**

Input frequency = 836.5 MHz

| Indicated | | Azimuth (degree) | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV) | | Height (m) | Polarity (H/V) | Frequency (MHz) | Level (dBm) | Antenna Gain Correction (dB) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 1673 | 67.05 | 22 | 1.05 | V | 1673 | -32.30 | 8.2 | 0.88 | -24.98 | -13 | -11.98 |
| 1673 | 59.33 | 29 | 1.26 | H | 1673 | -41.30 | 8.2 | 0.88 | -33.98 | -13 | -20.98 |
| 2509.5 | 43.43 | 195 | 1.00 | V | 2509.5 | -55.60 | 9.0 | 1.12 | -47.72 | -13 | -34.72 |
| 2509.5 | 40.30 | 200 | 1.00 | H | 2509.5 | -60.80 | 9.0 | 1.12 | -52.92 | -13 | -39.92 |

**AMPS**

Downlink (Input frequency = 881.52MHz)

| Indicated | | Azimuth (degree) | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV) | | Height (m) | Polarity (H/V) | Frequency (MHz) | Level (dBm) | Antenna Gain Correction (dB) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 2644.56 | 51.02 | 330 | 1.09 | V | 2644.56 | -46.60 | 9.0 | 1.12 | -38.72 | -13 | -25.72 |
| 2644.56 | 45.42 | 221 | 1.10 | H | 2644.56 | -53.30 | 9.0 | 1.12 | -45.42 | -13 | -32.42 |
| 1763.04 | 41.55 | 215 | 1.00 | V | 1763.04 | -59.70 | 8.2 | 0.88 | -52.38 | -13 | -39.38 |
| 1763.04 | 40.82 | 221 | 1.05 | H | 1763.04 | -59.80 | 8.2 | 0.88 | -52.48 | -13 | -39.48 |

Uplink (Input frequency = 836.52 MHz)

| Indicated | | Azimuth (degree) | Test Antenna | | Substituted | | | | | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Amplitude (dBuV) | | Height (m) | Polarity (H/V) | Frequency (MHz) | Level (dBm) | Antenna Gain Correction (dB) | Cable Loss (dB) | Absolute Level (dBm) | | |
| 1673.04 | 66.34 | 27 | 1.00 | V | 1673.04 | -32.00 | 8.2 | 0.88 | -24.68 | -13 | -11.68 |
| 1673.04 | 59.65 | 29 | 1.04 | H | 1673.04 | -41.00 | 8.2 | 0.88 | -33.68 | -13 | -20.68 |
| 2509.56 | 43.37 | 199 | 1.11 | V | 2509.56 | -55.70 | 9.0 | 1.12 | -47.82 | -13 | -34.82 |
| 2509.56 | 40.56 | 201 | 1.00 | H | 2509.56 | -60.50 | 9.0 | 1.12 | -52.62 | -13 | -39.62 |

# 8 §2.1051, §22.917 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

## 8.1 Applicable Standard

Requirements: CFR 47, § 2.1051. § 22.917.

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

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

## 8.2 Test Procedure

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

## 8.3 Environmental Conditions

| | |
|---|---|
| **Temperature:** | 22 °C |
| **Relative Humidity:** | 46 % |
| **ATM Pressure:** | 101.1kPa |

** The testing was performed by Victor Zhang on 2008-08-05.*

## 8.4 Test Equipment List and Details

| Manufacturer | Description | Model | Serial Number | Calibration Date |
|---|---|---|---|---|
| Agilent | Spectrum Analyzer | E4446A | US44300386 | 2008-04-28 |
| Agilent | Signal Generator | 83650B | 3614A00276 | 2008-05-28 |
| R & S | Signal Generator | SMIQ03 | 849192/0085 | 2007-12-03 |

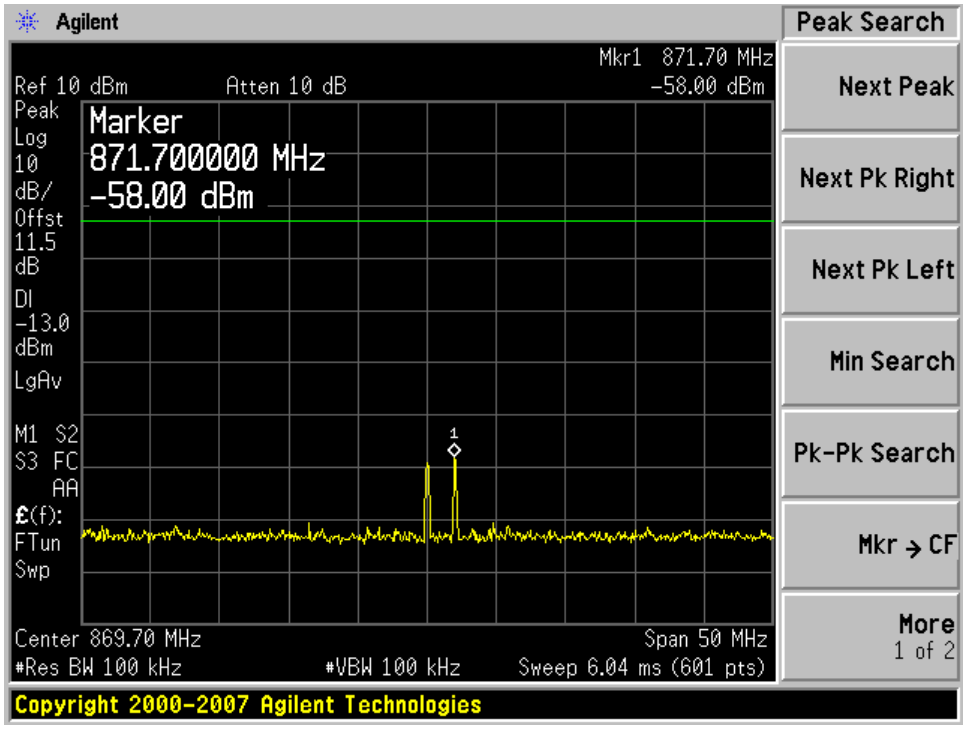
*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

## 8.5 Test Results

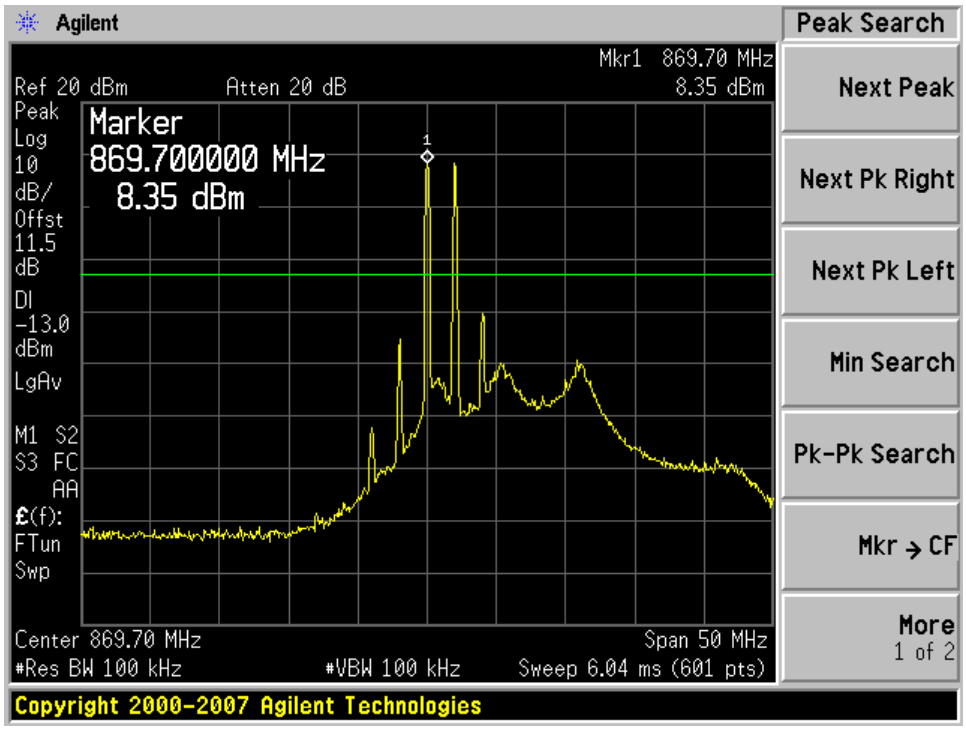
Please refer to the hereinafter plots.

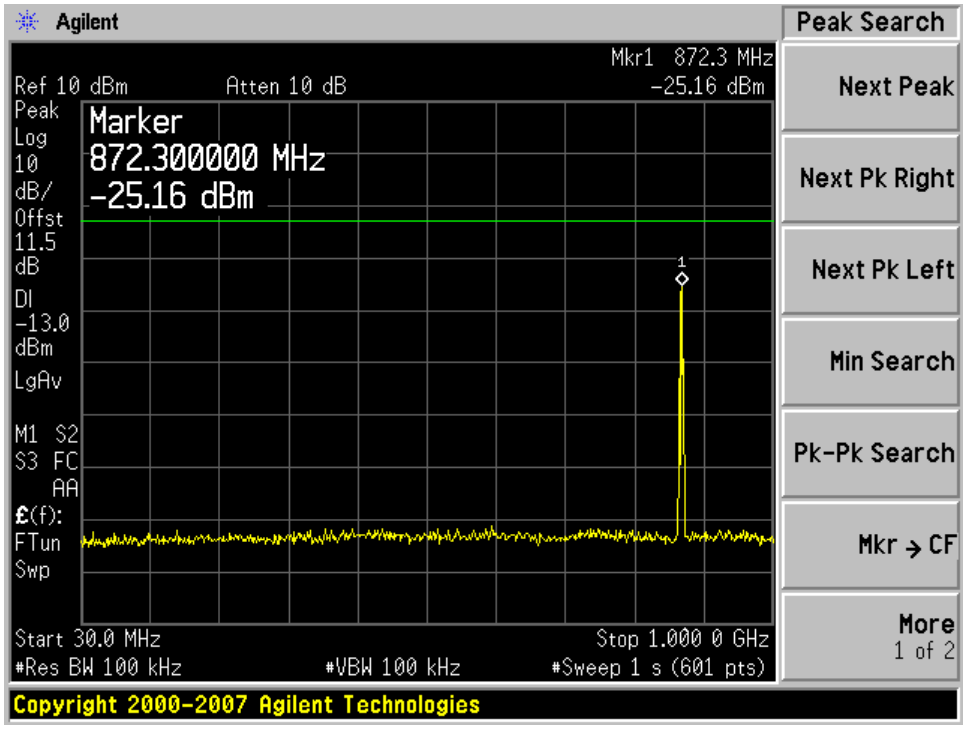
**CDMA Downlink: Low Channel**

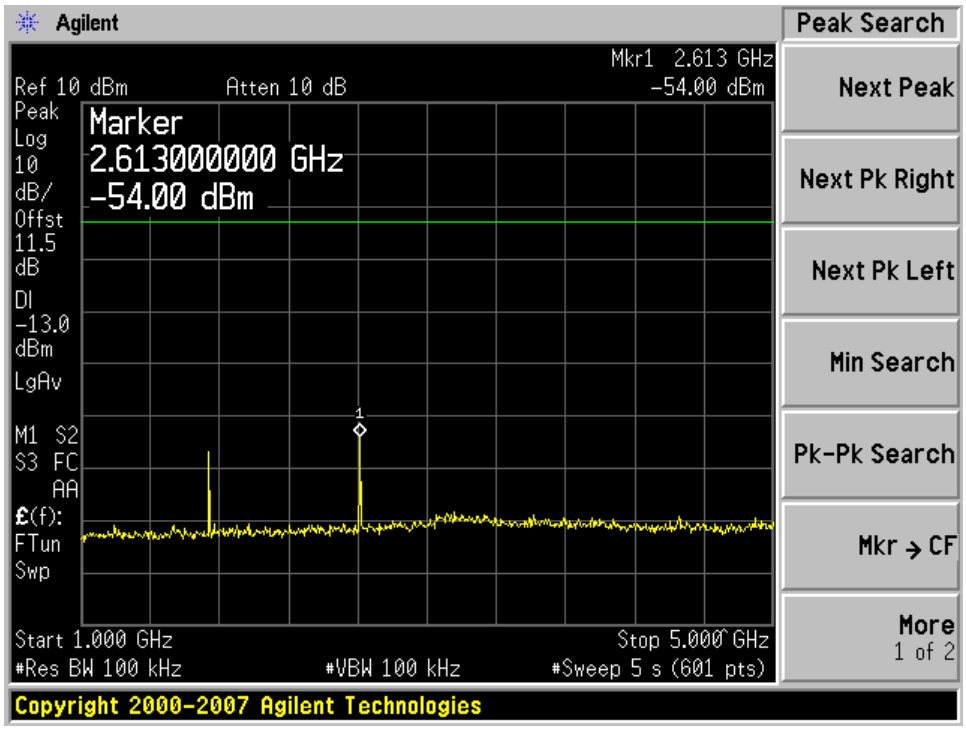
**Input**

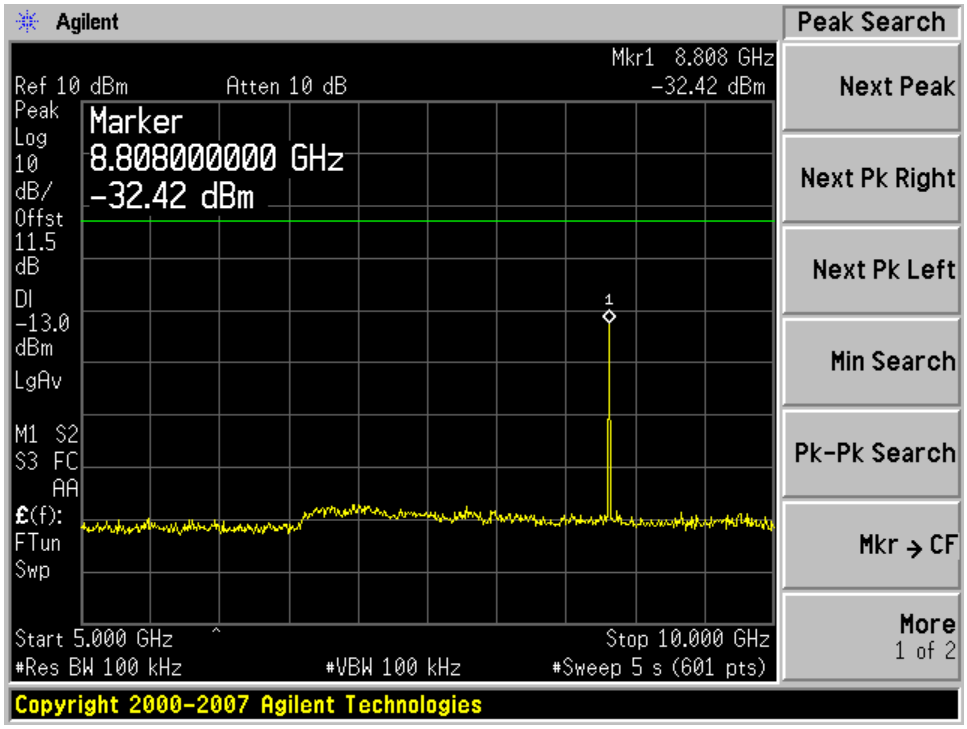



**Output**



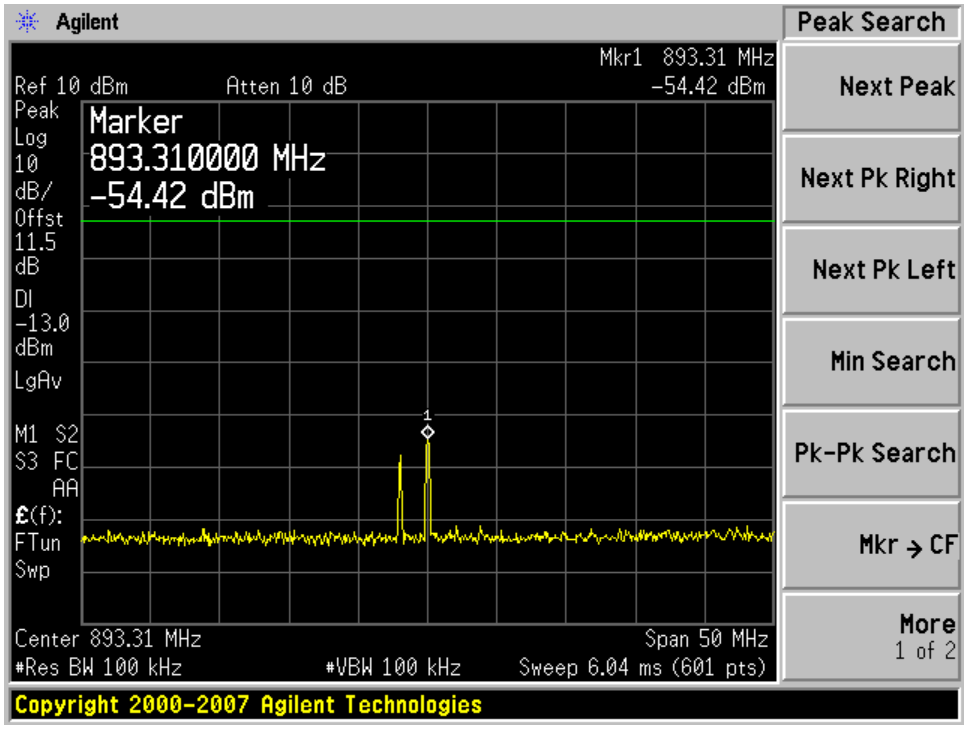

Agilent
Peak Search
Mkr1 872.3 MHz
Ref 10 dBm
Atten 10 dB
-25.16 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
872.300000 MHz
-25.16 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 2.613 GHz
Ref 10 dBm
Atten 10 dB
-54.00 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
2.613000000 GHz
-54.00 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

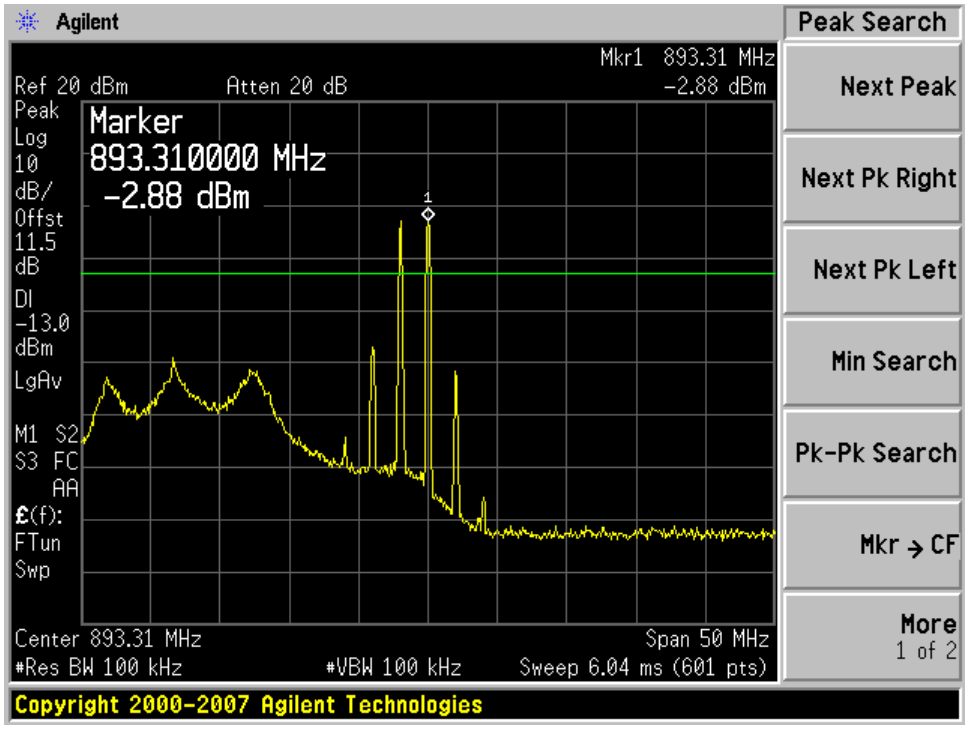


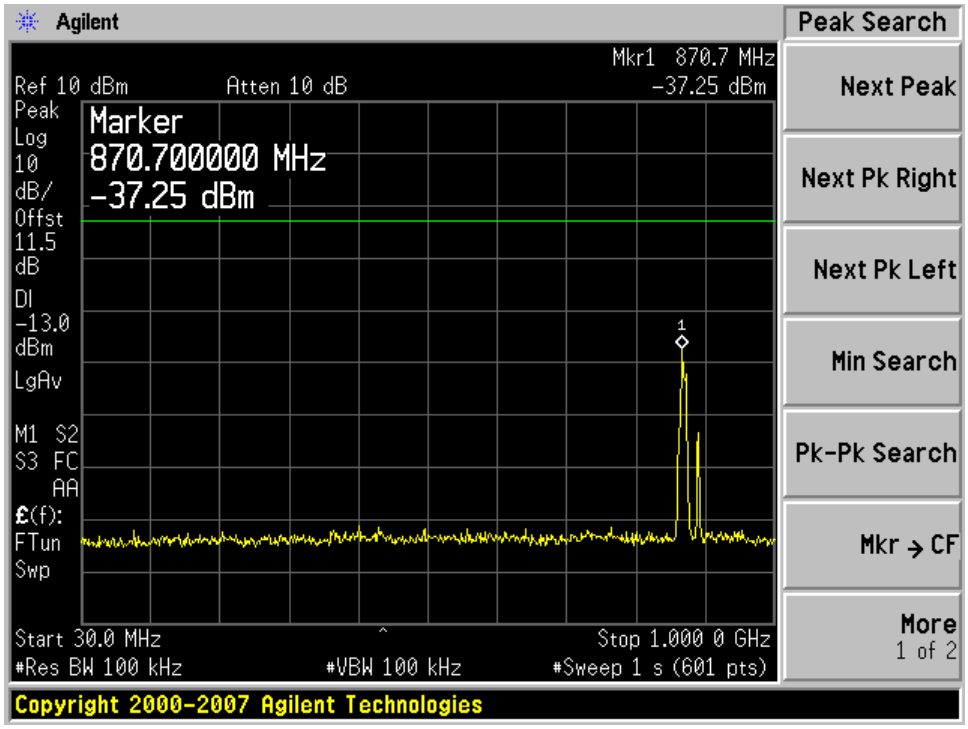

**CDMA Downlink: High Channel**

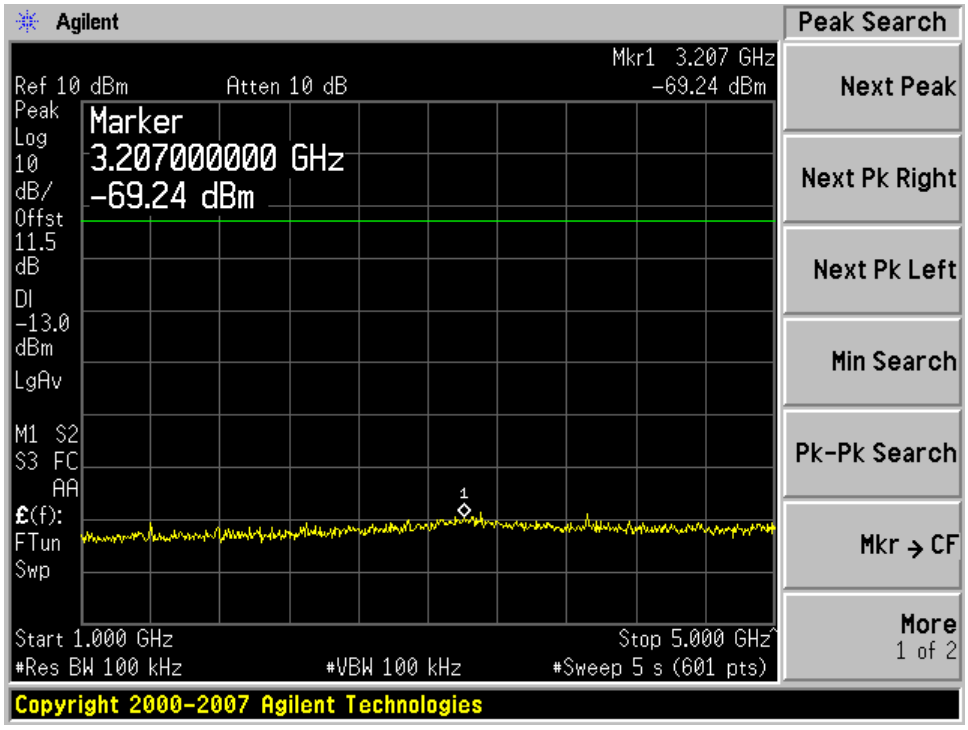
**Input**

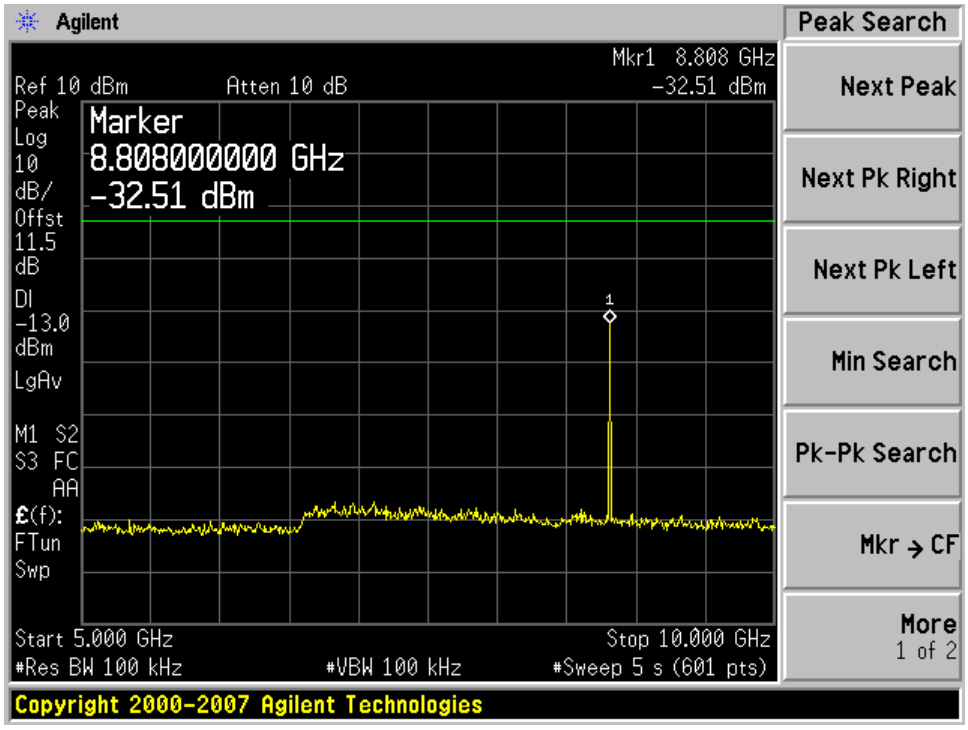


**Output**


Agilent
Peak Search
Mkr1 893.31 MHz
Ref 20 dBm
Atten 20 dB
-2.88 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Marker
893.310000 MHz
-2.88 dBm
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 893.31 MHz
Span 50 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 6.04 ms (601 pts)
Copyright 2000-2007 Agilent Technologies

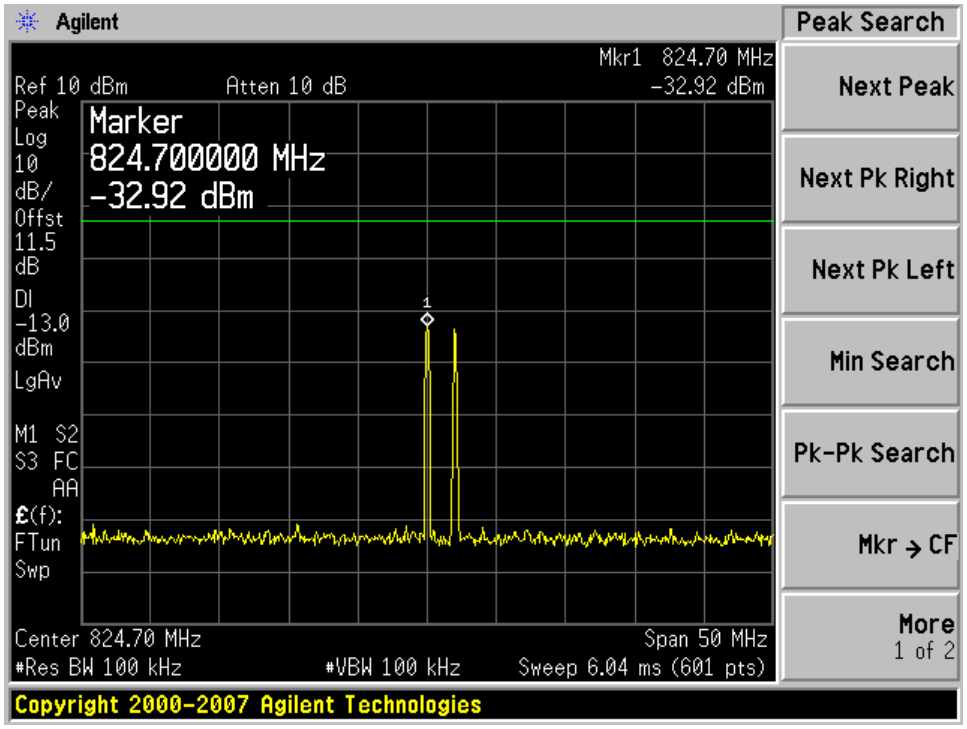

Agilent
Peak Search
Mkr1 870.7 MHz
Ref 10 dBm
Atten 10 dB
-37.25 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Marker
870.700000 MHz
-37.25 dBm
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 3.207 GHz
Ref 10 dBm
Atten 10 dB
-69.24 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
3.207000000 GHz
-69.24 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

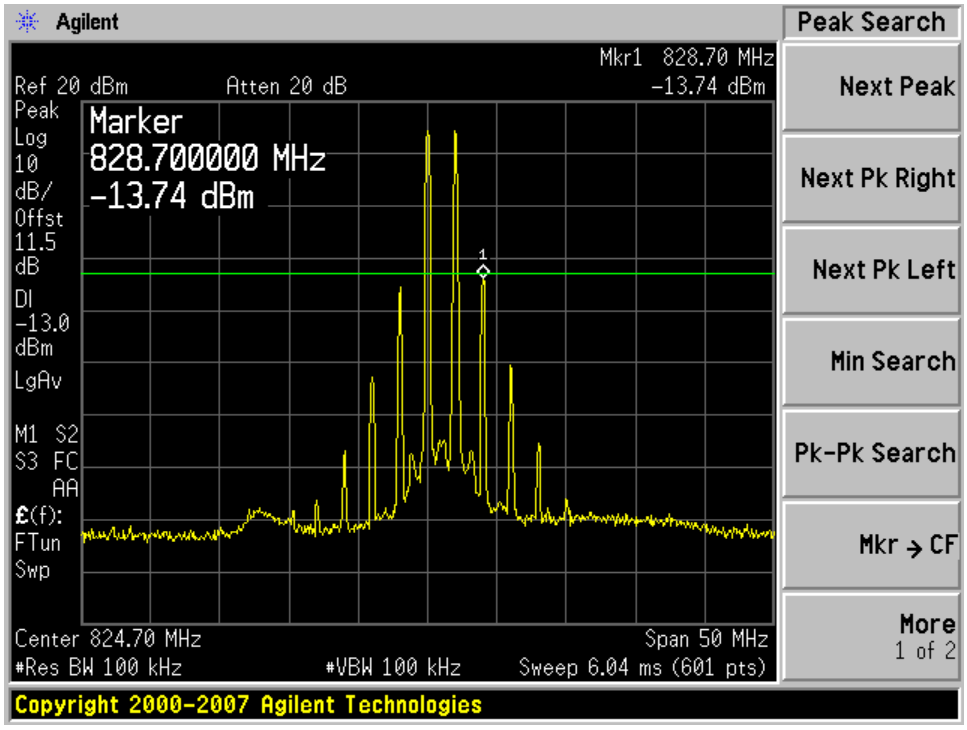

Agilent
Peak Search
Mkr1 8.808 GHz
Ref 10 dBm
Atten 10 dB
-32.51 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
8.808000000 GHz
-32.51 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

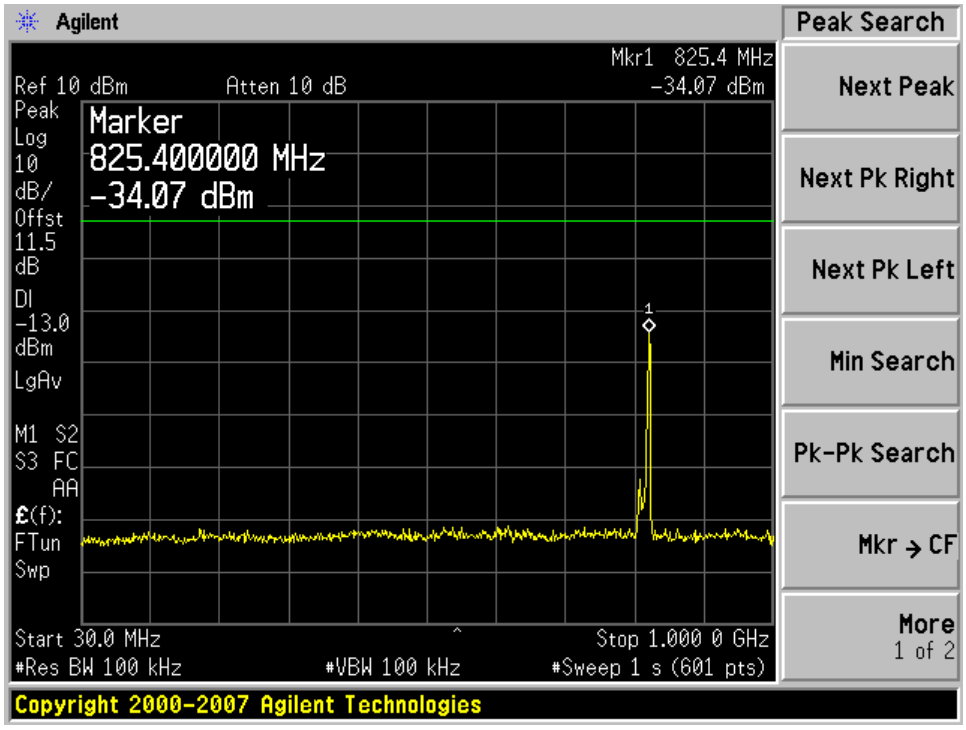
**CDMA Uplink: Low Channel**

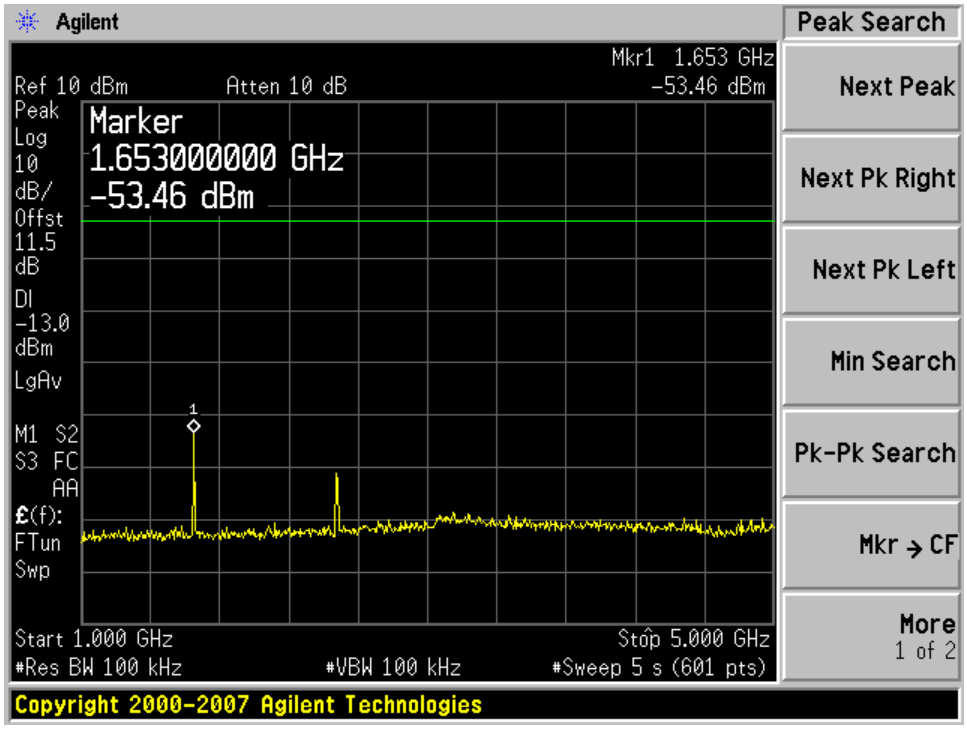
**Input**

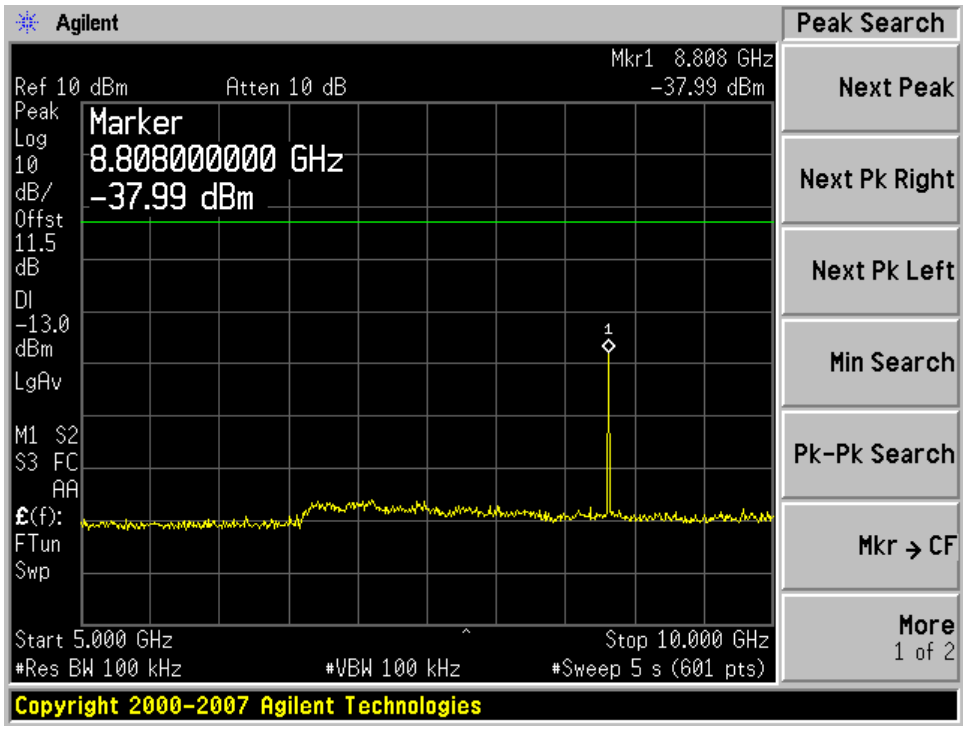



**Output**



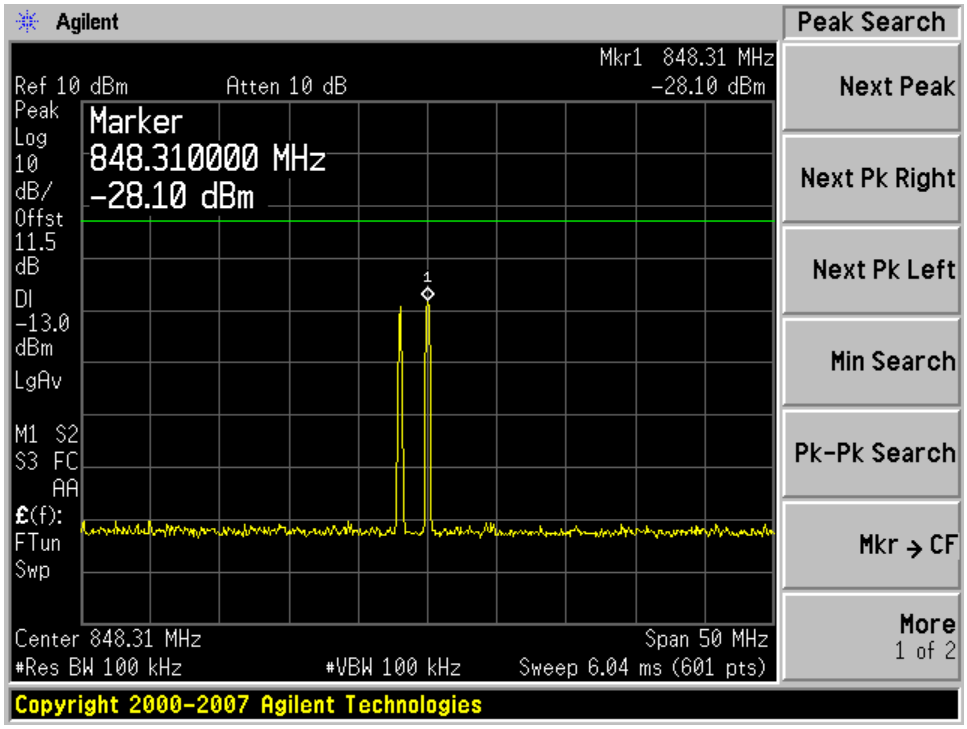

Agilent
Peak Search
Mkr1 825.4 MHz
Ref 10 dBm
Atten 10 dB
-34.07 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Marker
825.400000 MHz
-34.07 dBm
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.653 GHz
Ref 10 dBm
Atten 10 dB
-53.46 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Marker
1.653000000 GHz
-53.46 dBm
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

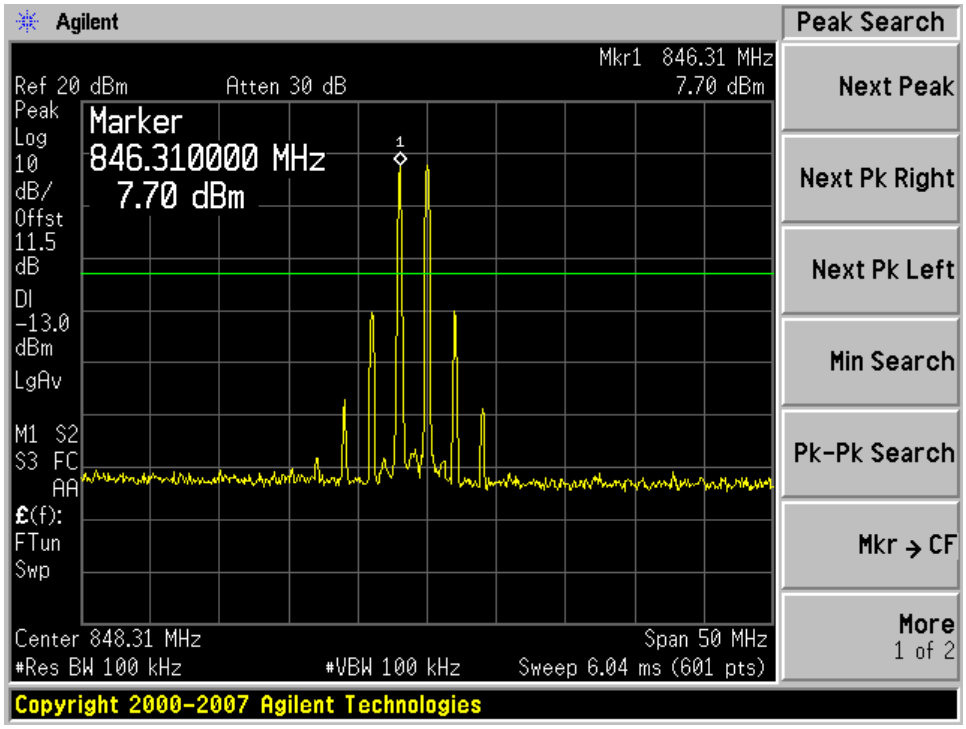


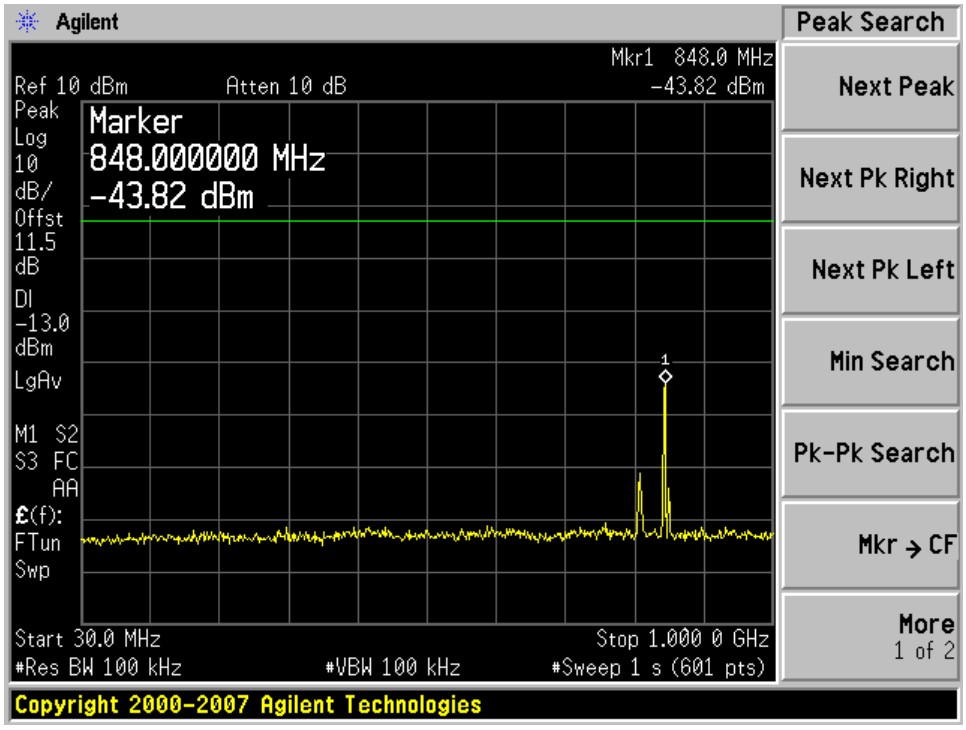

**CDMA Uplink: High Channel**

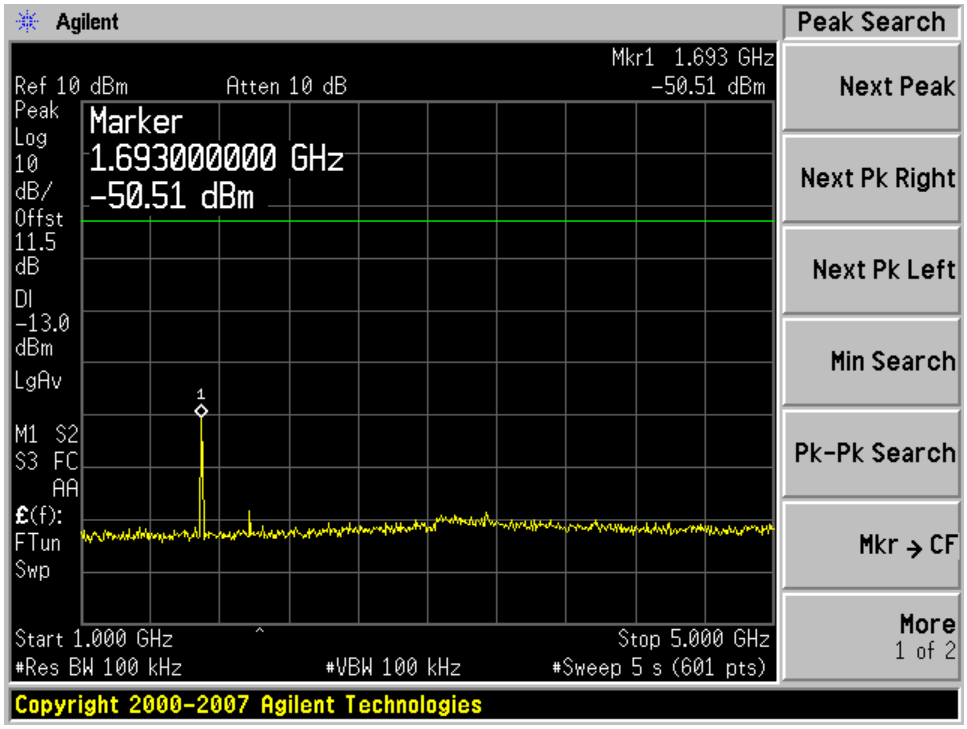
**Input**

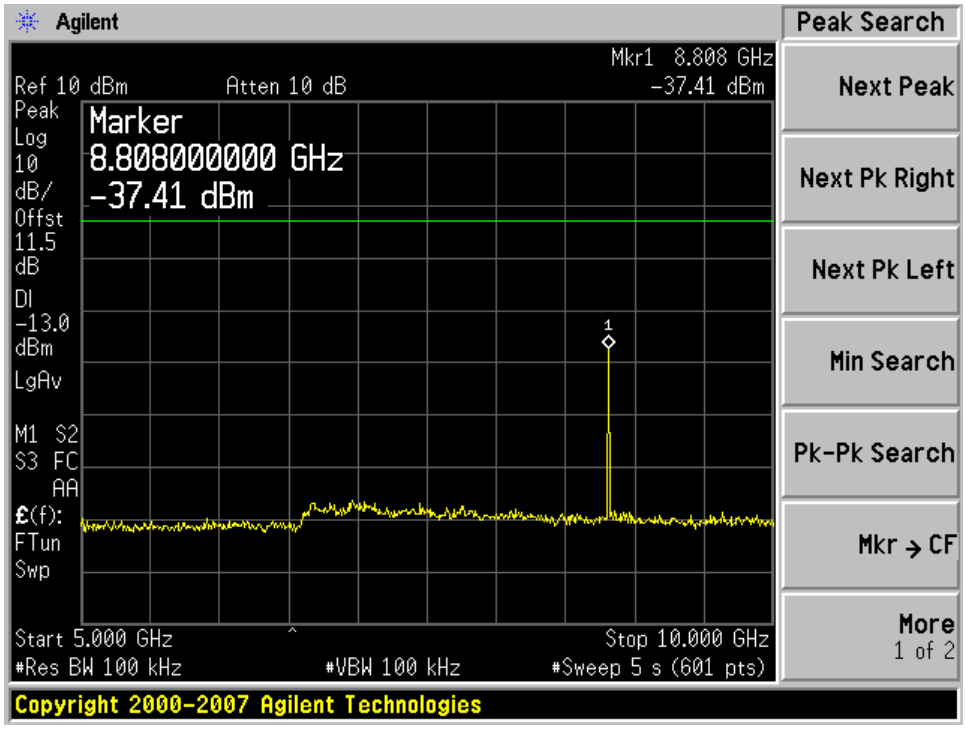


**Output**


Agilent
Peak Search
Mkr1 846.31 MHz
Ref 20 dBm
Atten 30 dB
7.70 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
846.310000 MHz
7.70 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 848.31 MHz
Span 50 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 6.04 ms (601 pts)
Copyright 2000-2007 Agilent Technologies

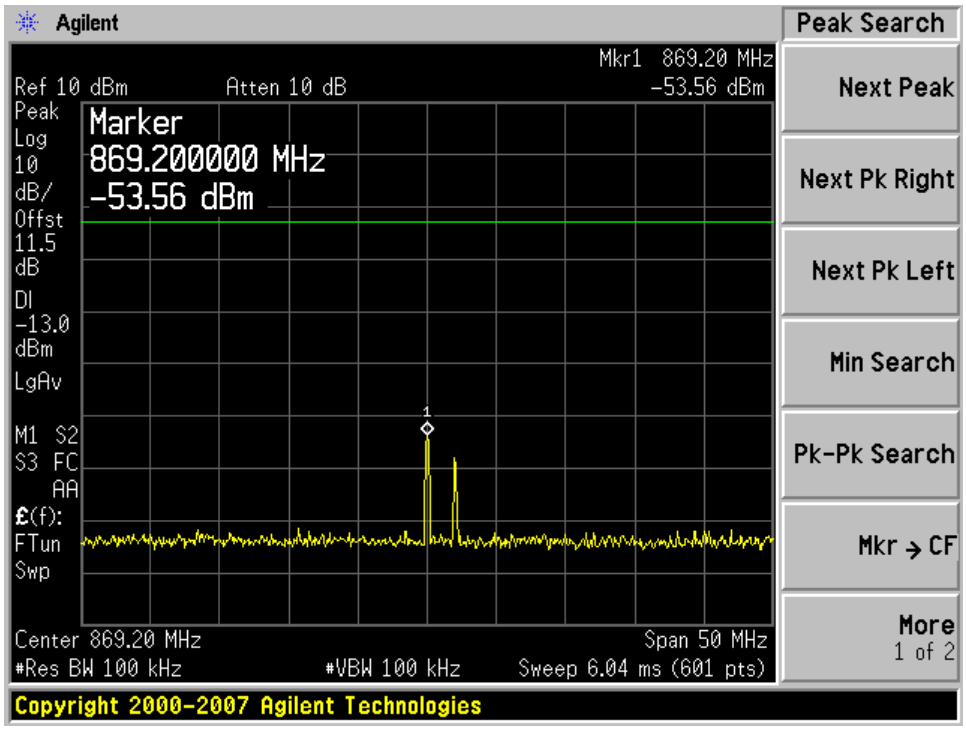

Agilent
Peak Search
Mkr1 848.0 MHz
Ref 10 dBm
Atten 10 dB
-43.82 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
848.000000 MHz
-43.82 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.693 GHz
Ref 10 dBm
Atten 10 dB
-50.51 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
1.693000000 GHz
-50.51 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

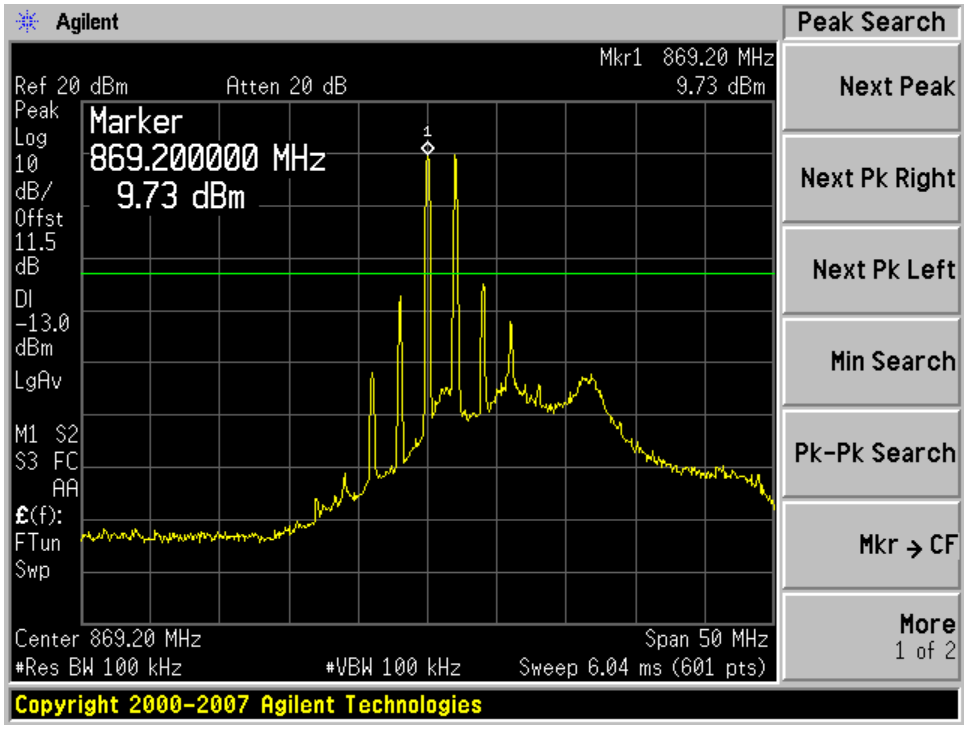

Agilent
Peak Search
Mkr1 8.808 GHz
Ref 10 dBm
Atten 10 dB
-37.41 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
8.808000000 GHz
-37.41 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

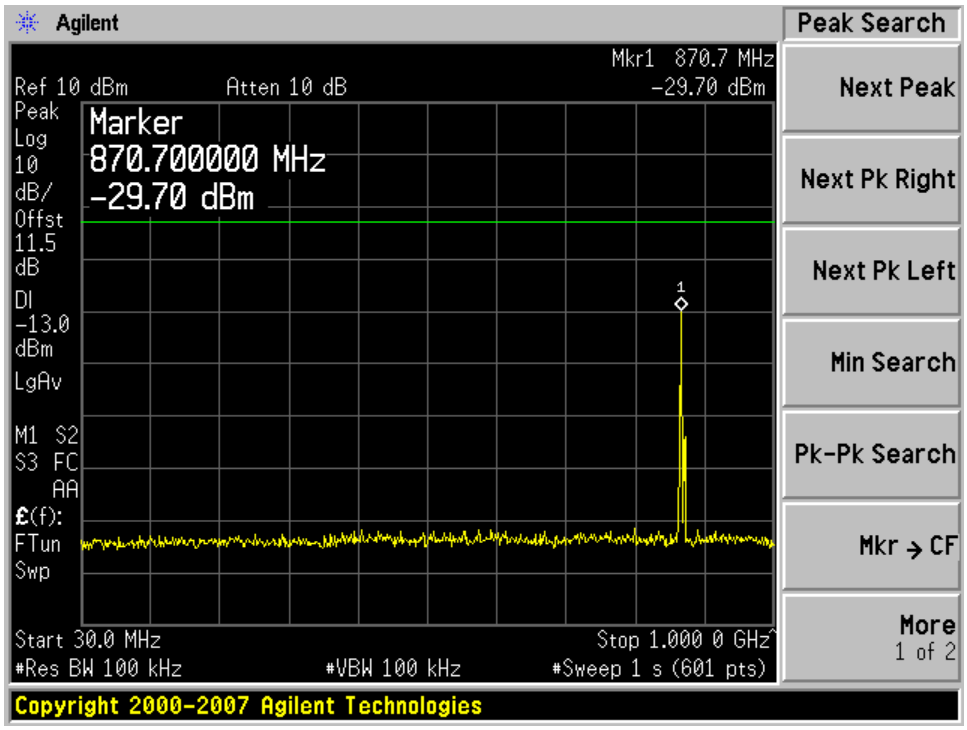
**GSM Downlink: Low Channel**

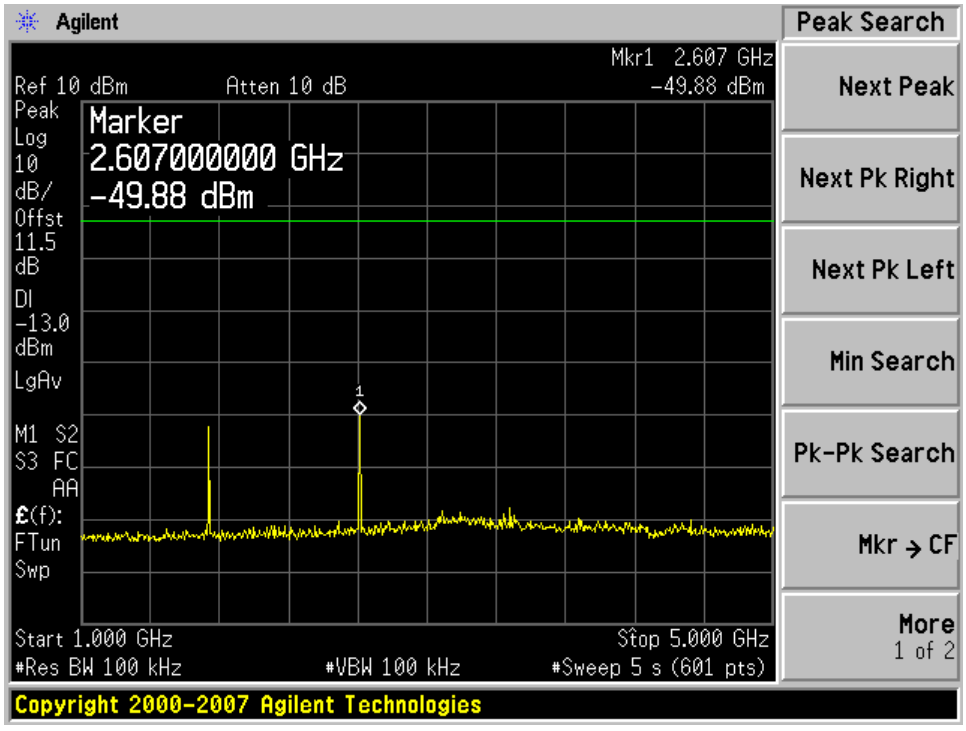
**Input**

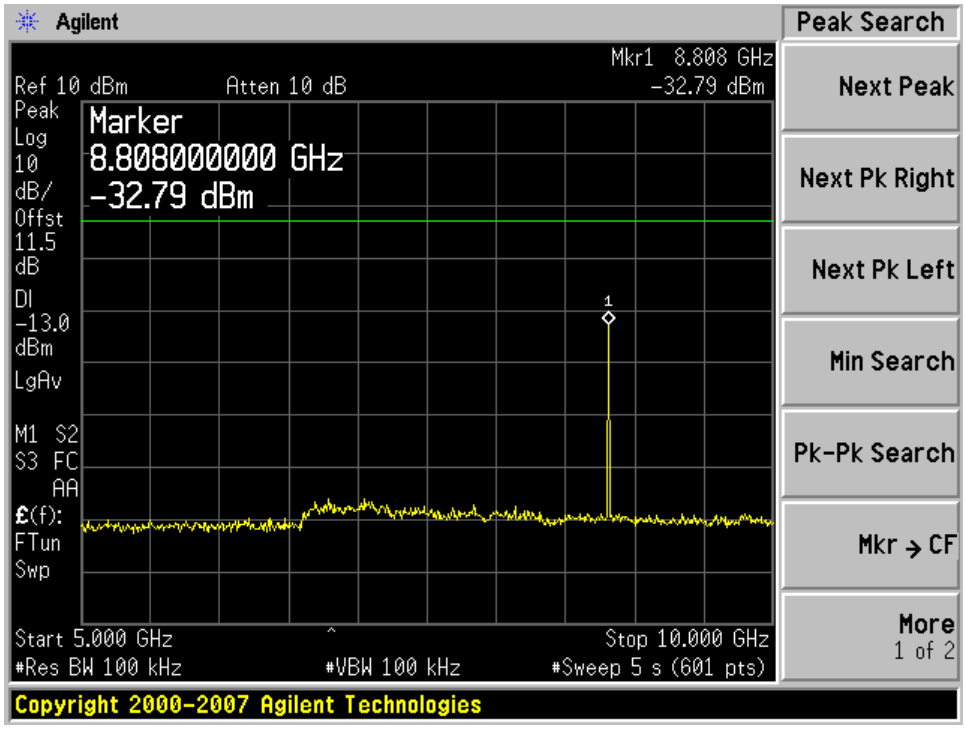



**Output**



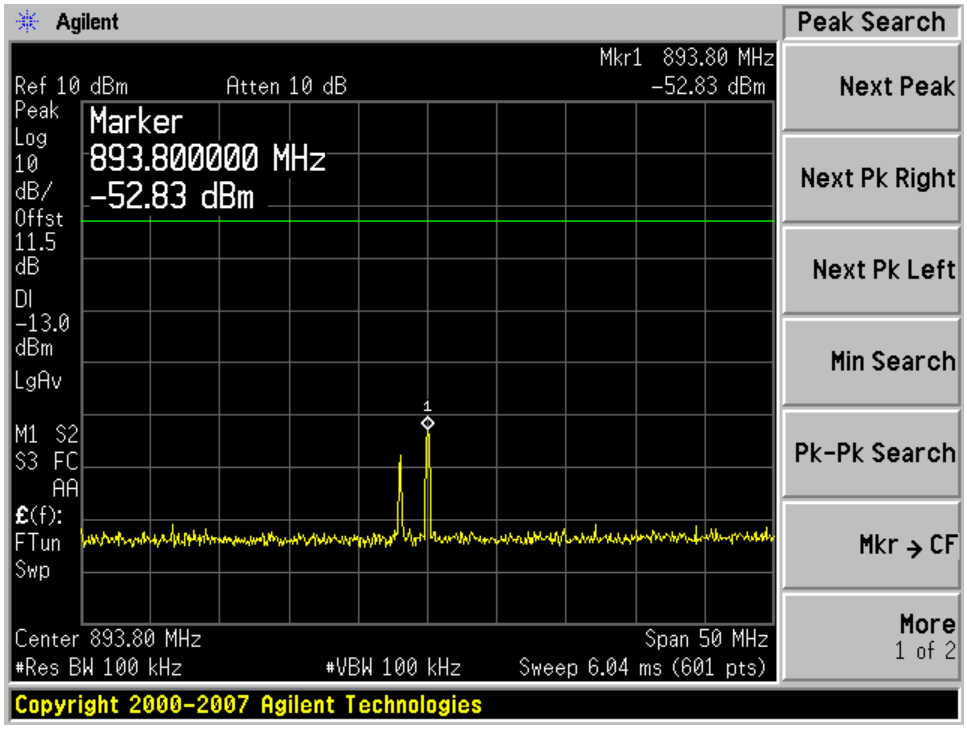

Agilent
Peak Search
Mkr1 870.7 MHz
Ref 10 dBm
Atten 10 dB
-29.70 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
870.700000 MHz
-29.70 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 2.607 GHz
Ref 10 dBm
Atten 10 dB
-49.88 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
2.607000000 GHz
-49.88 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

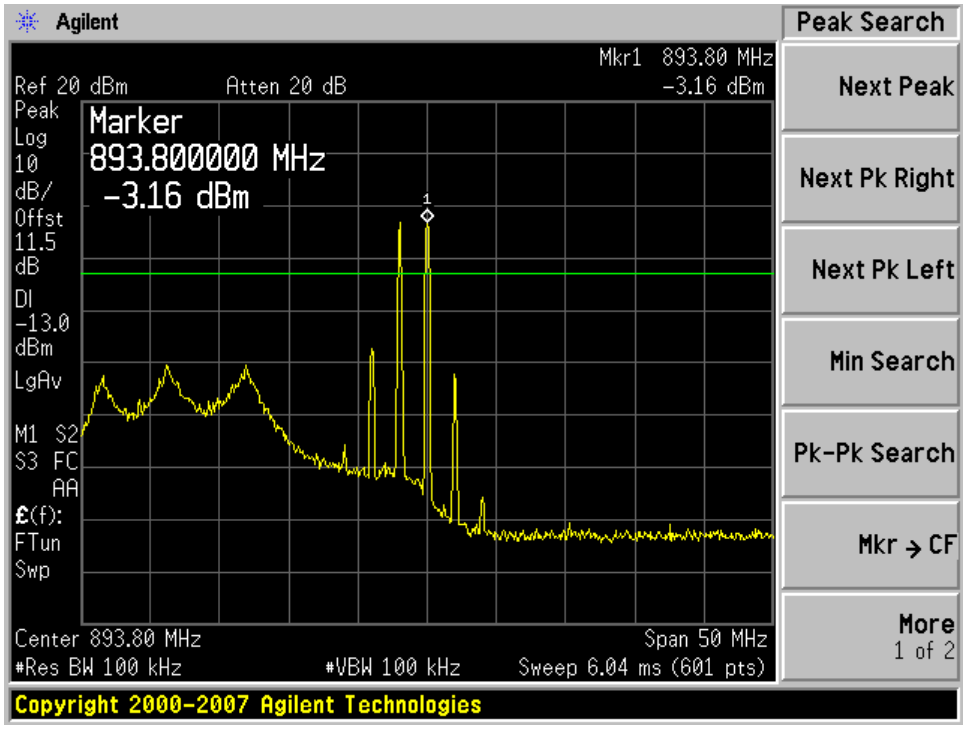


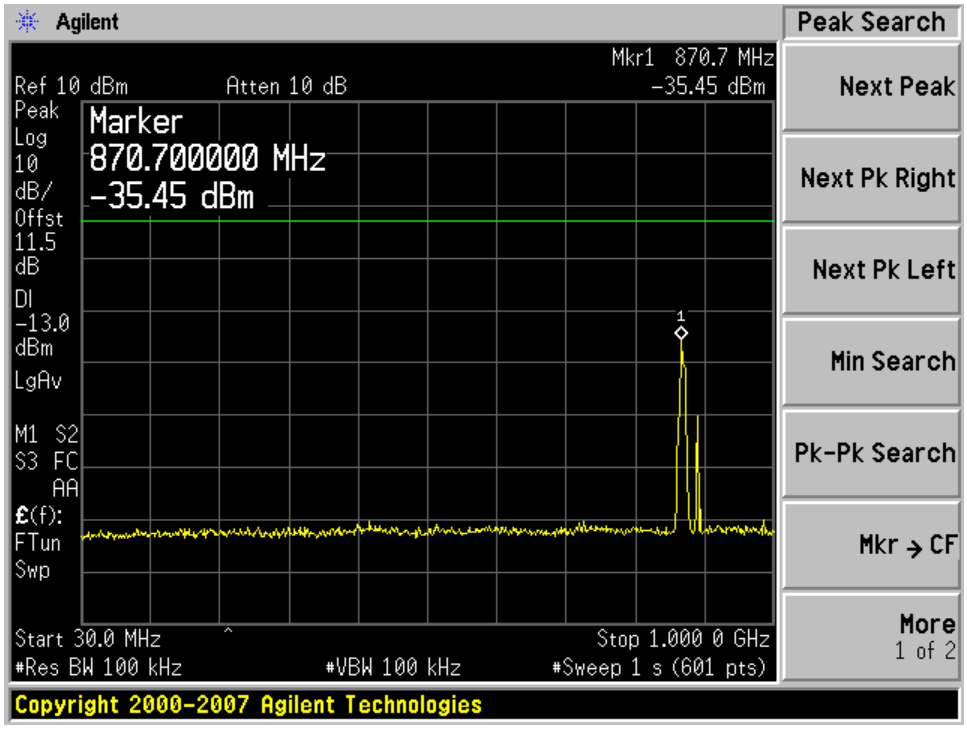

**GSM Downlink: High Channel**

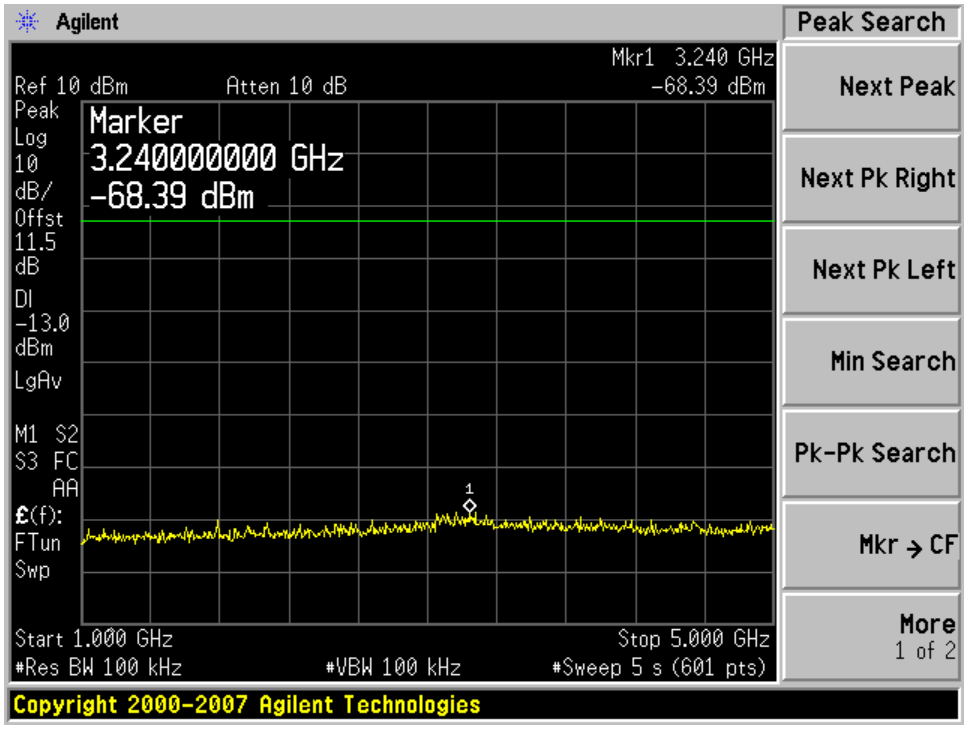
**Input**

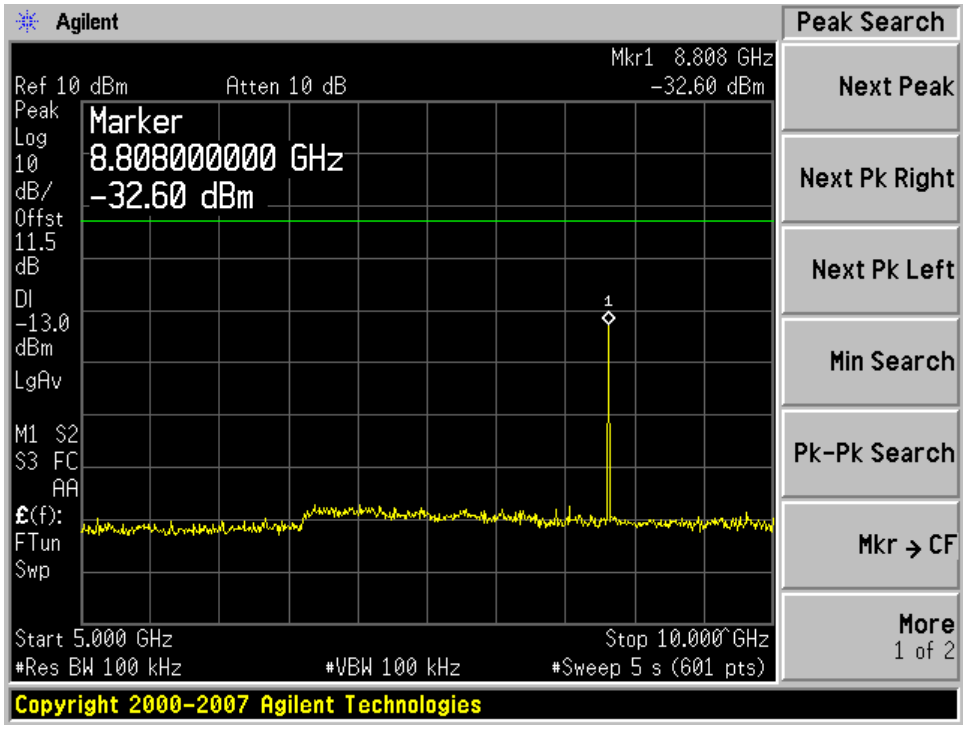


**Output**


Agilent
Peak Search
Mkr1 893.80 MHz
Ref 20 dBm
Atten 20 dB
-3.16 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
893.800000 MHz
-3.16 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 893.80 MHz
Span 50 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 6.04 ms (601 pts)
Copyright 2000-2007 Agilent Technologies

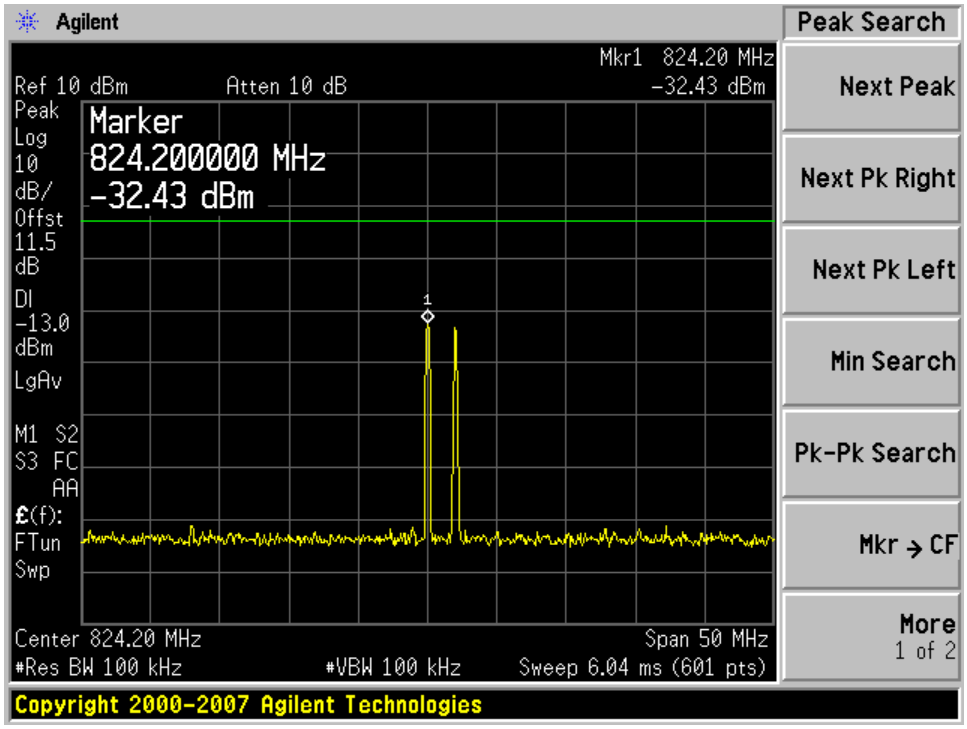

Agilent
Peak Search
Mkr1 870.7 MHz
Ref 10 dBm
Atten 10 dB
-35.45 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
870.700000 MHz
-35.45 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 3.240 GHz
Ref 10 dBm
Atten 10 dB
-68.39 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
3.240000000 GHz
-68.39 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

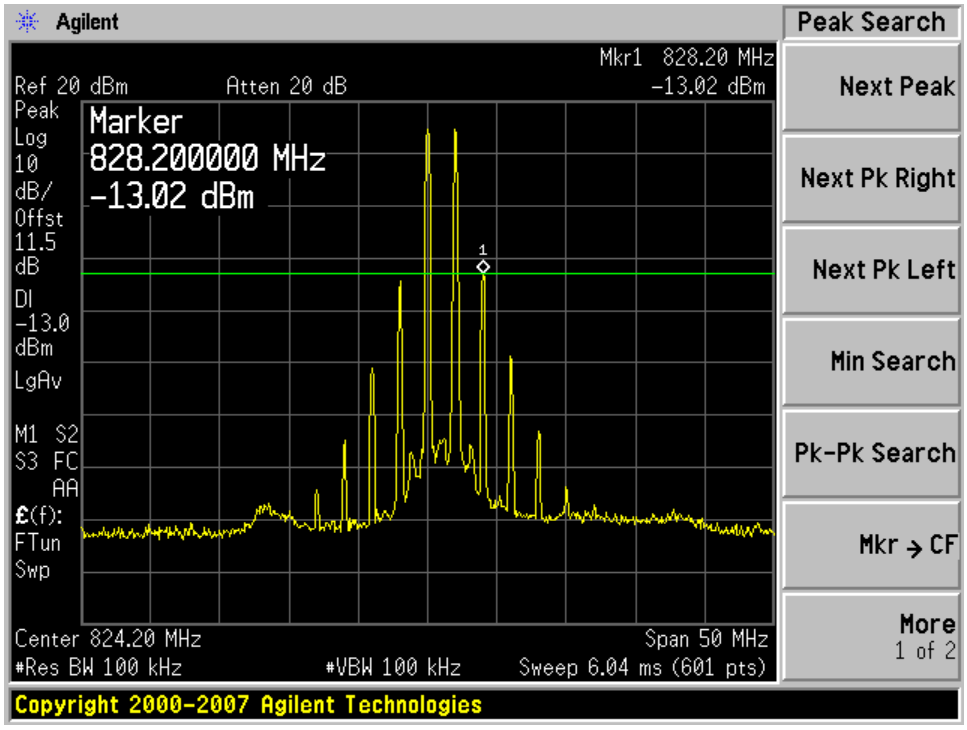

Agilent
Peak Search
Mkr1 8.808 GHz
Ref 10 dBm
Atten 10 dB
-32.60 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
8.808000000 GHz
-32.60 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

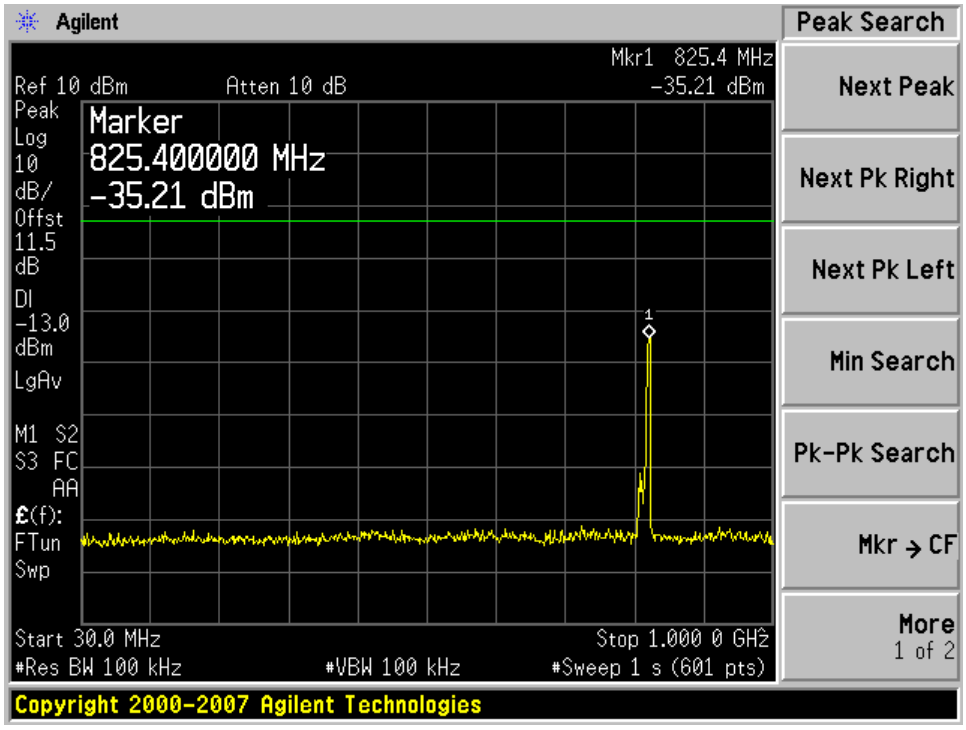
**GSM Uplink: Low Channel**

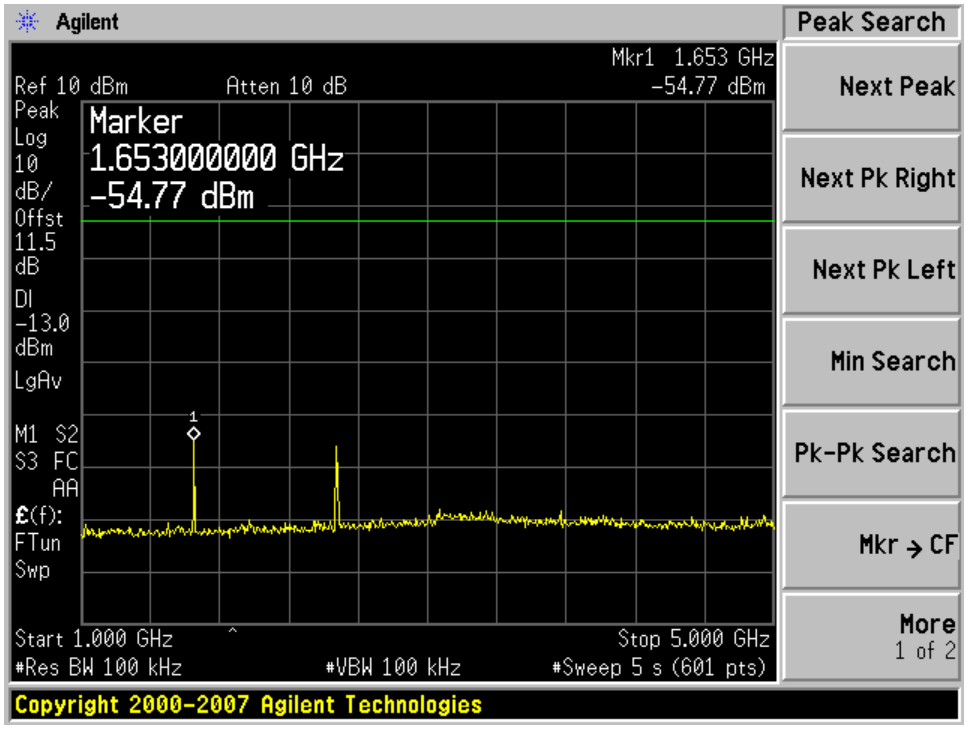
**Input**

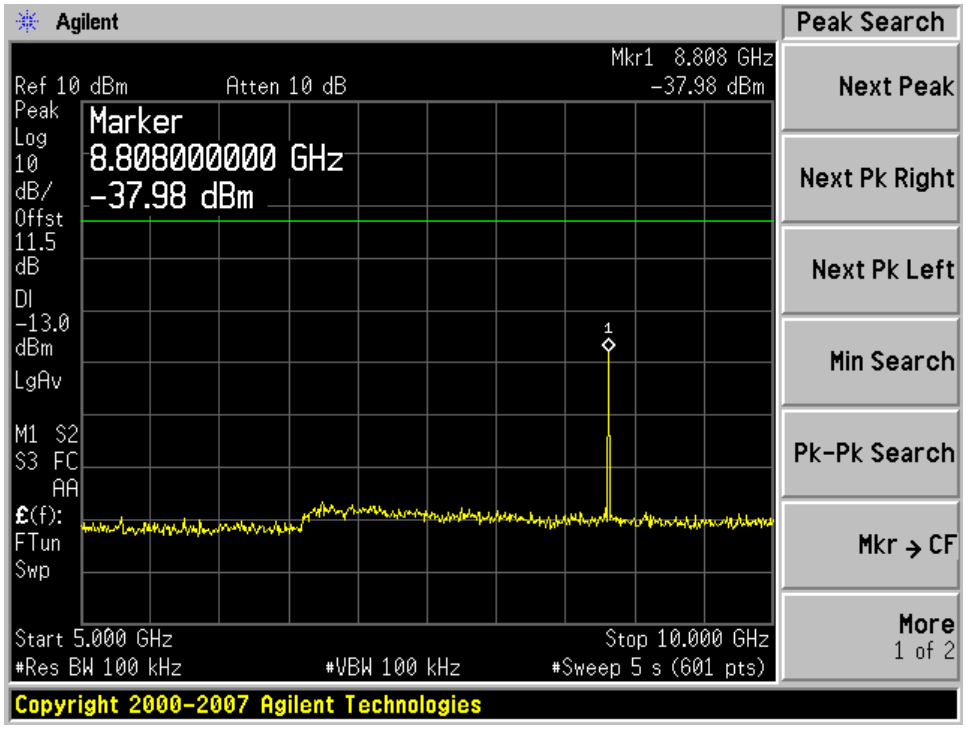



**Output**



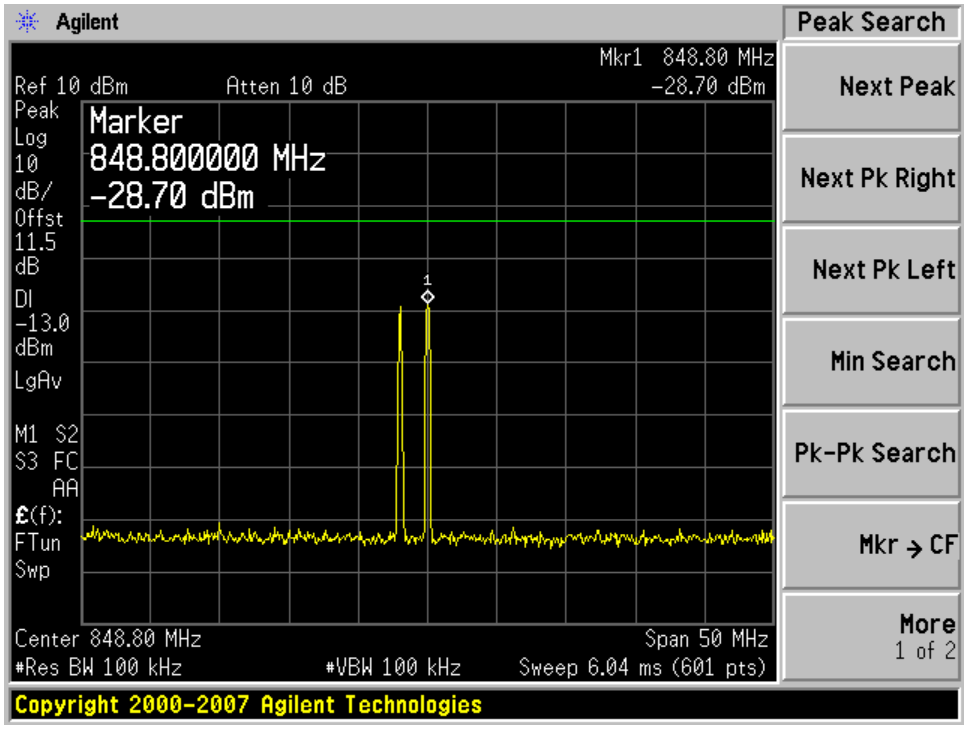

Agilent
Peak Search
Mkr1 825.4 MHz
Ref 10 dBm
Atten 10 dB
-35.21 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
825.400000 MHz
-35.21 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.653 GHz
Ref 10 dBm
Atten 10 dB
-54.77 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
1.653000000 GHz
-54.77 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

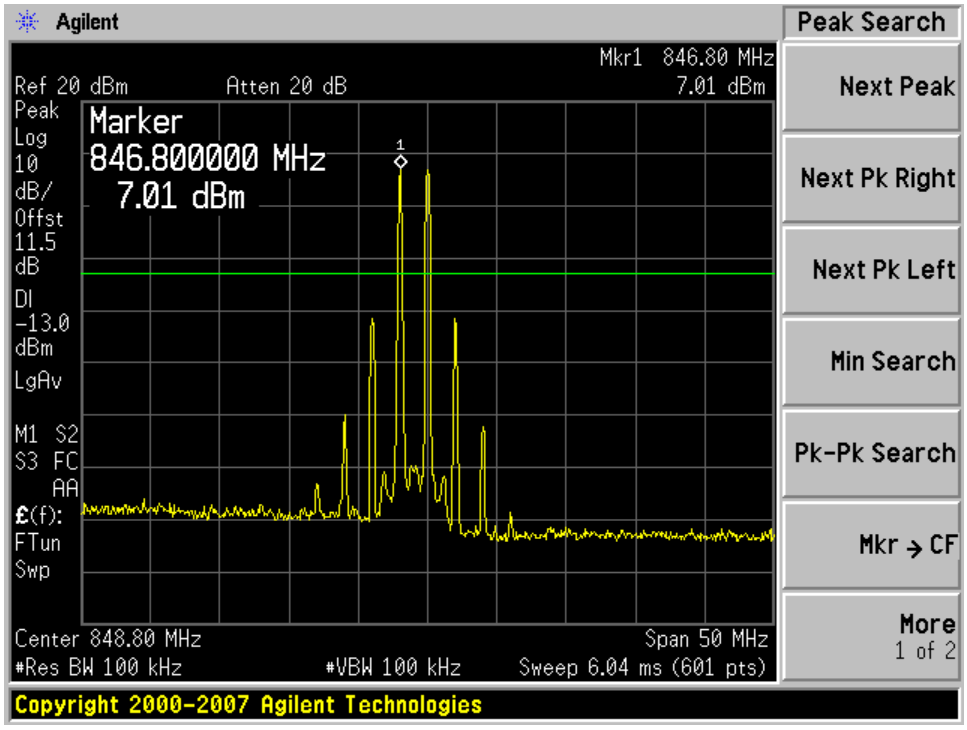


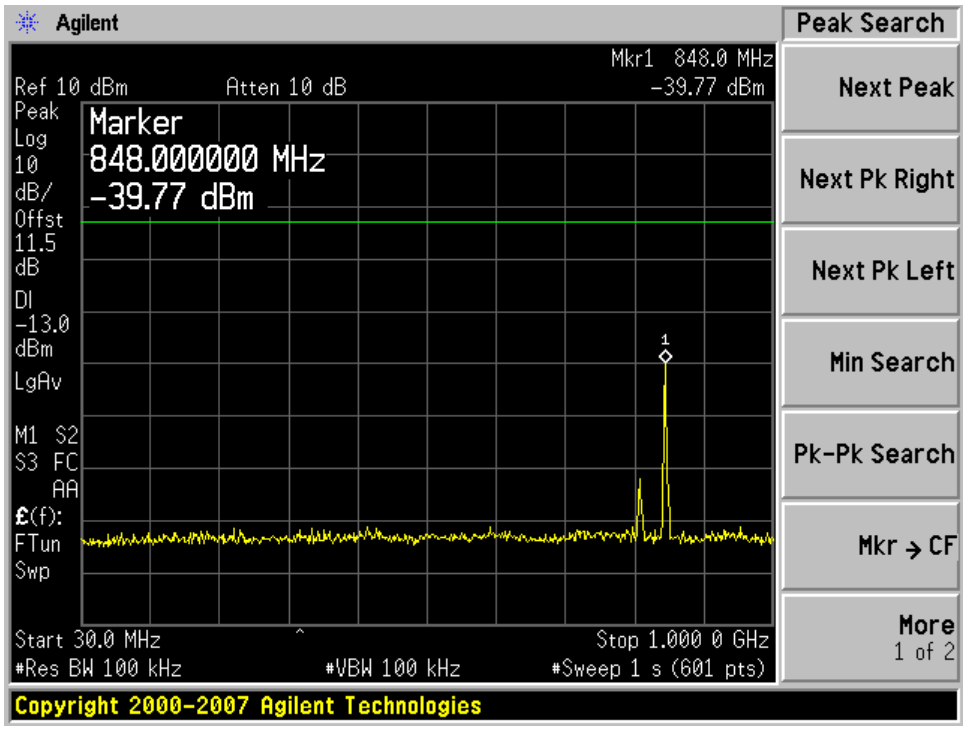

**GSM Uplink: High Channel**

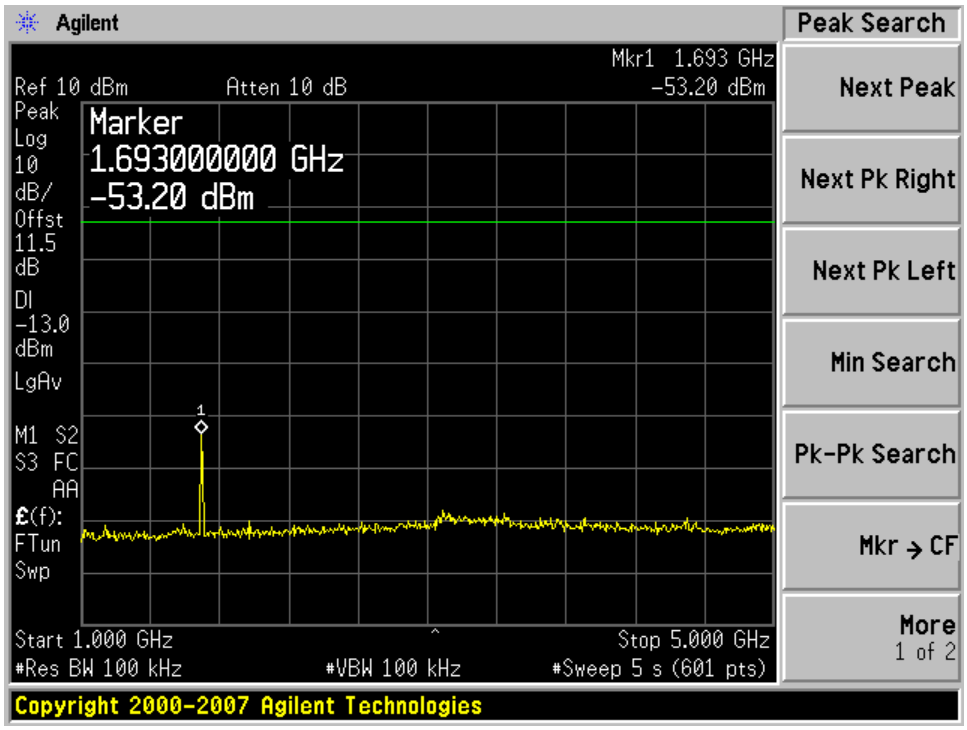
**Input**

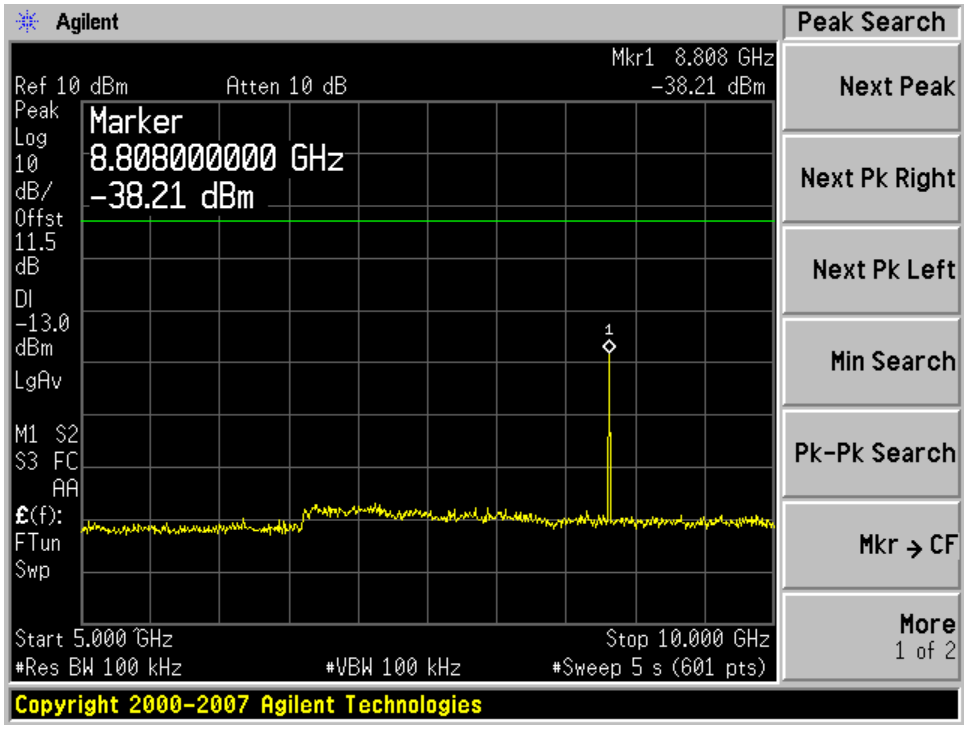


**Output**


Agilent
Peak Search
Mkr1 846.80 MHz
Ref 20 dBm
Atten 20 dB
7.01 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
846.800000 MHz
7.01 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 848.80 MHz
Span 50 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 6.04 ms (601 pts)
Copyright 2000-2007 Agilent Technologies

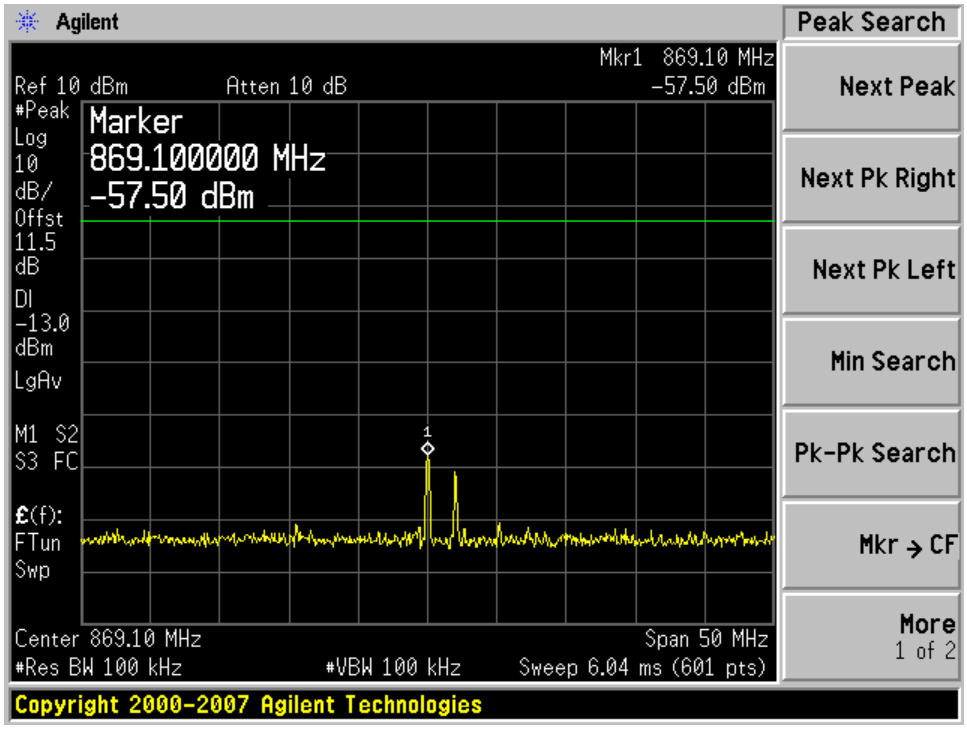

Agilent
Peak Search
Mkr1 848.0 MHz
Ref 10 dBm
Atten 10 dB
-39.77 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
848.000000 MHz
-39.77 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.693 GHz
Ref 10 dBm
Atten 10 dB
-53.20 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
1.693000000 GHz
-53.20 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

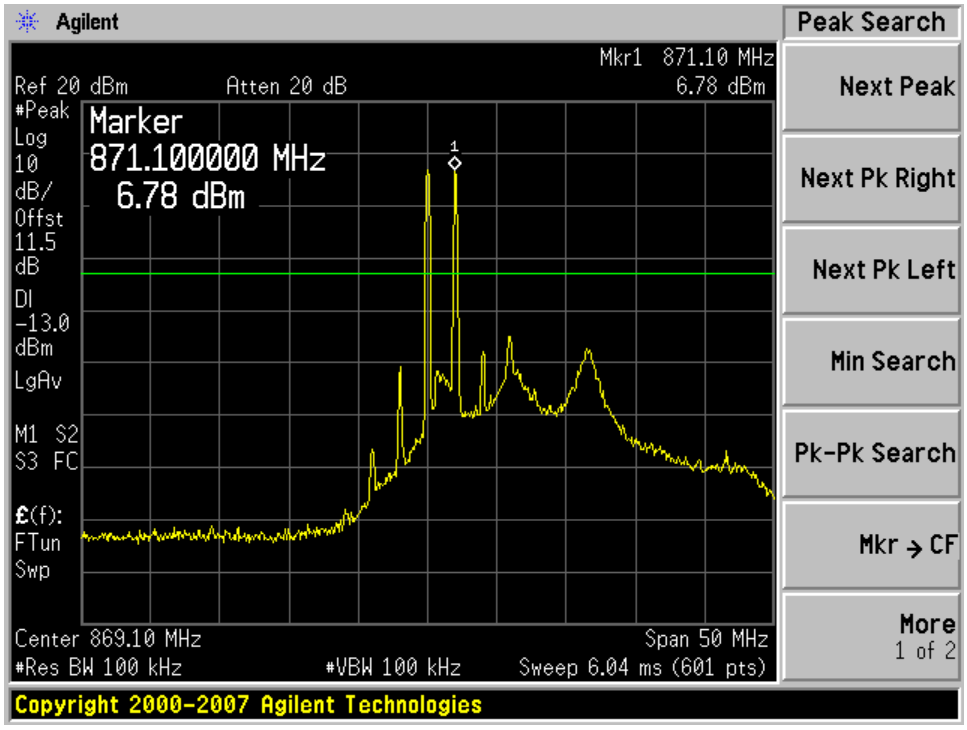

Agilent
Peak Search
Mkr1 8.808 GHz
Ref 10 dBm
Atten 10 dB
-38.21 dBm
Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
Swp
Marker
8.808000000 GHz
-38.21 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

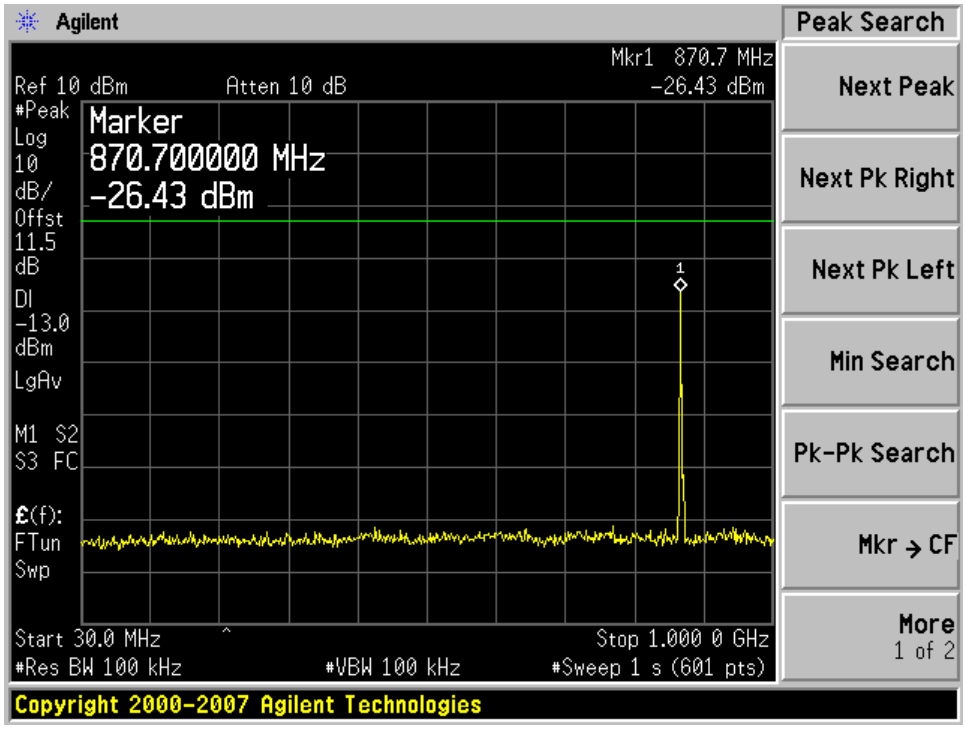
**TDMA Downlink: Low Channel**

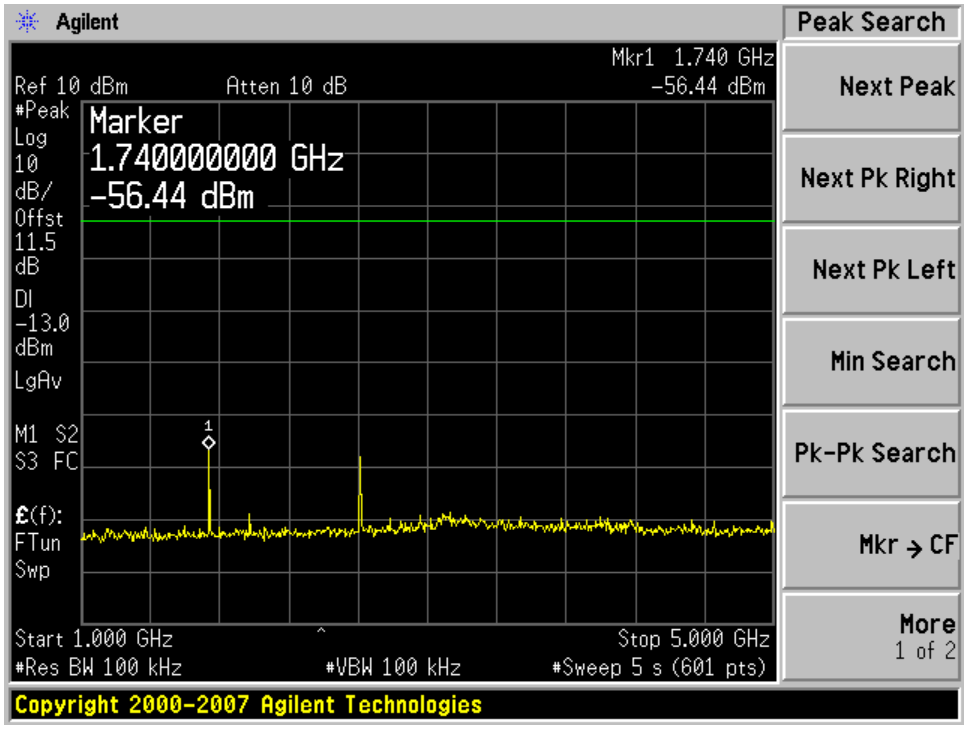
**Input**

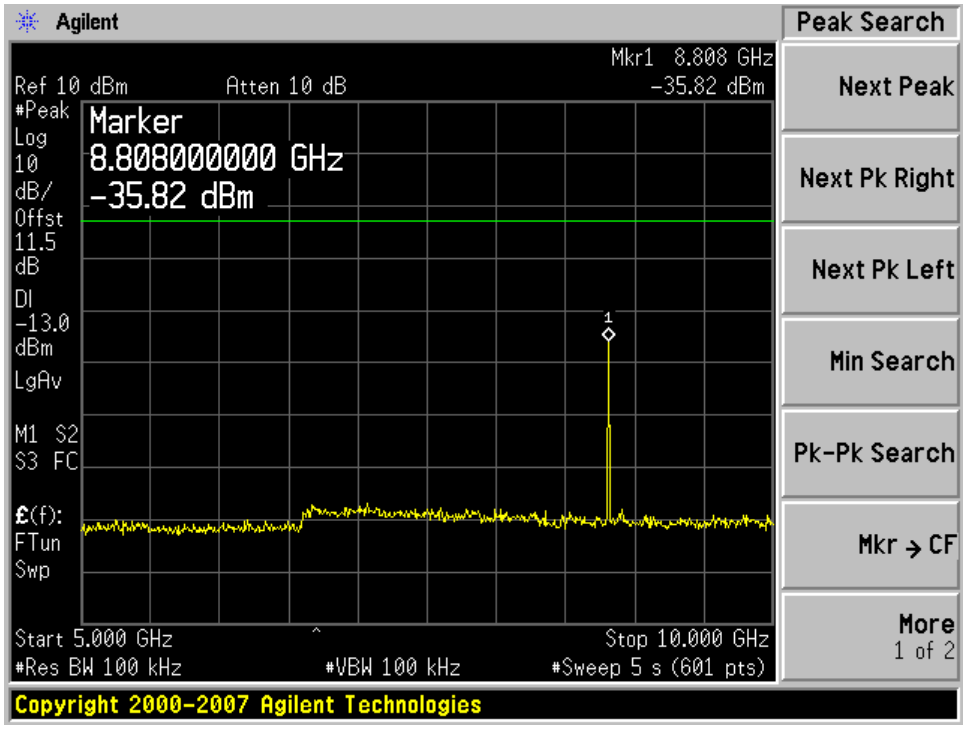



**Output**



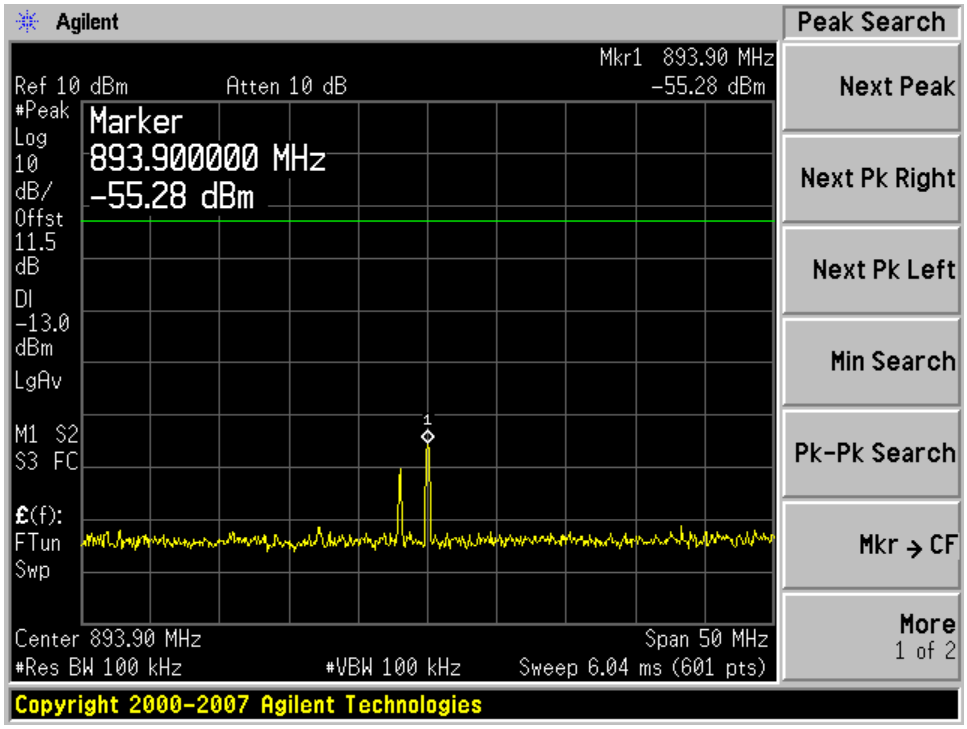

Agilent
Peak Search
Mkr1 870.7 MHz
Ref 10 dBm
Atten 10 dB
-26.43 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
870.700000 MHz
-26.43 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 1.000 0 GHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.740 GHz
Ref 10 dBm
Atten 10 dB
-56.44 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
1.740000000 GHz
-56.44 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

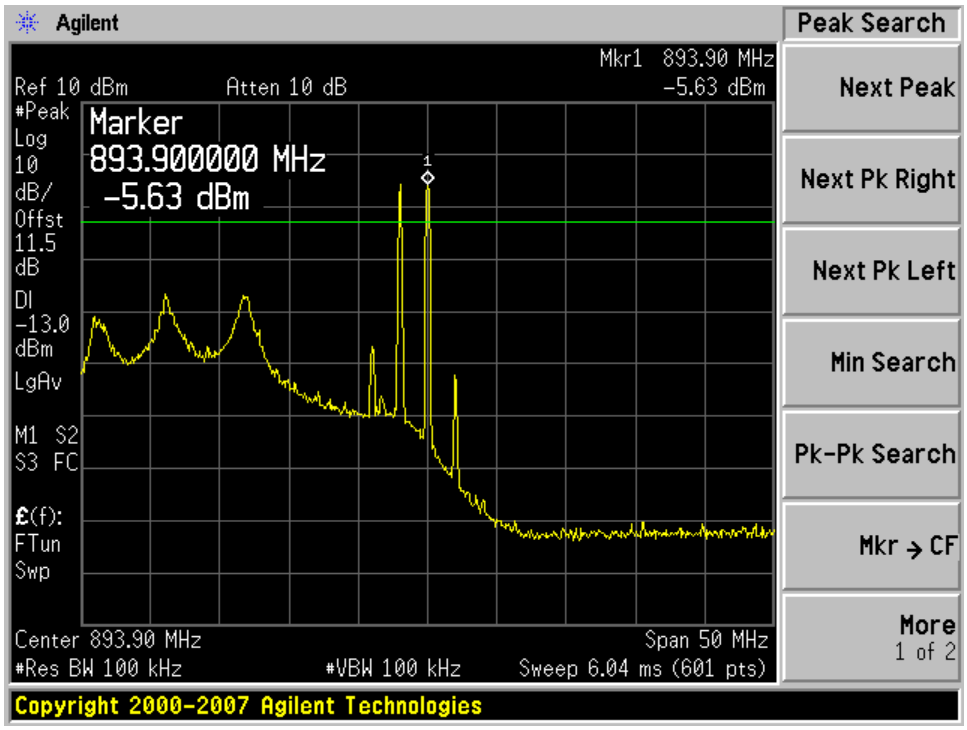


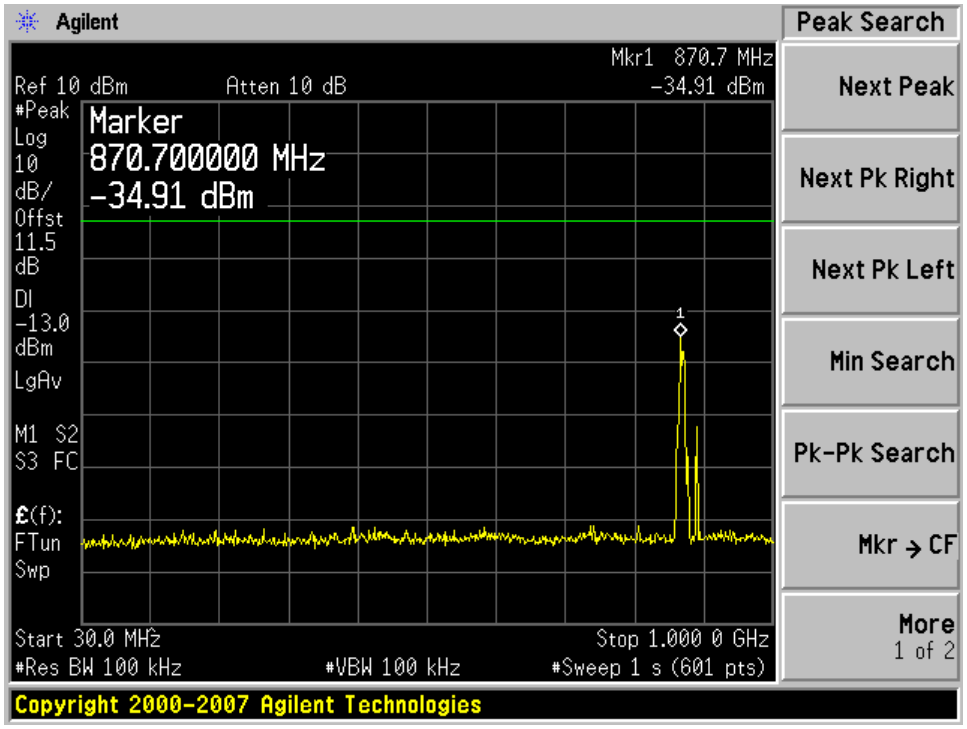

**TDMA Downlink: High Channel**

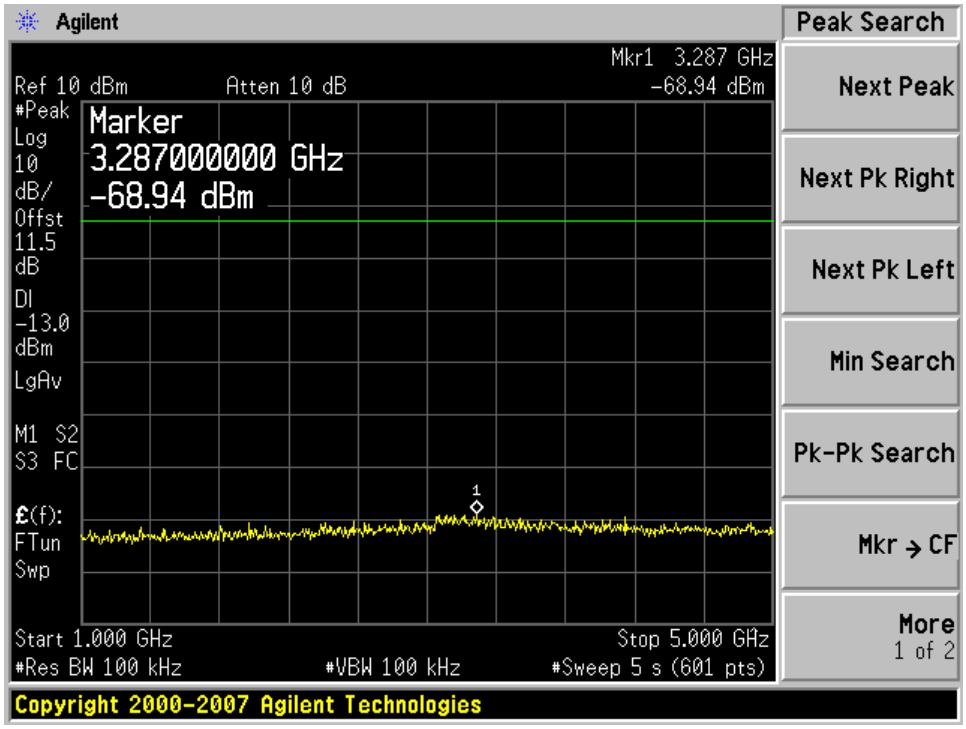
**Input**

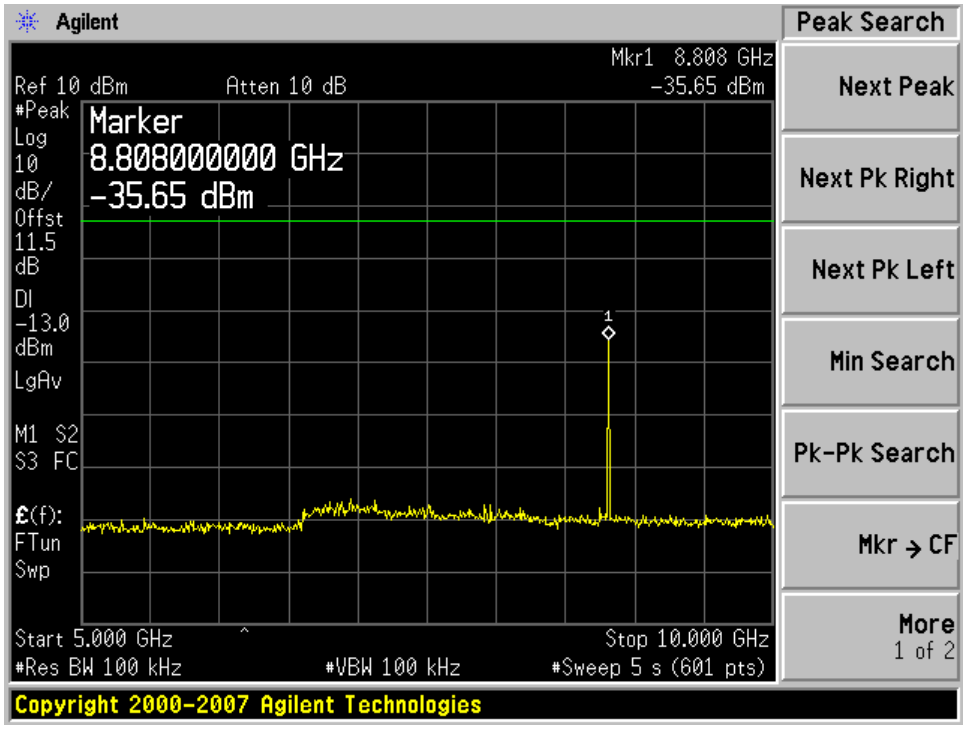


**Output**


Agilent
Peak Search
Mkr1 893.90 MHz
Ref 10 dBm
Atten 10 dB
-5.63 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
893.900000 MHz
-5.63 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 893.90 MHz
Span 50 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 6.04 ms (601 pts)
Copyright 2000-2007 Agilent Technologies

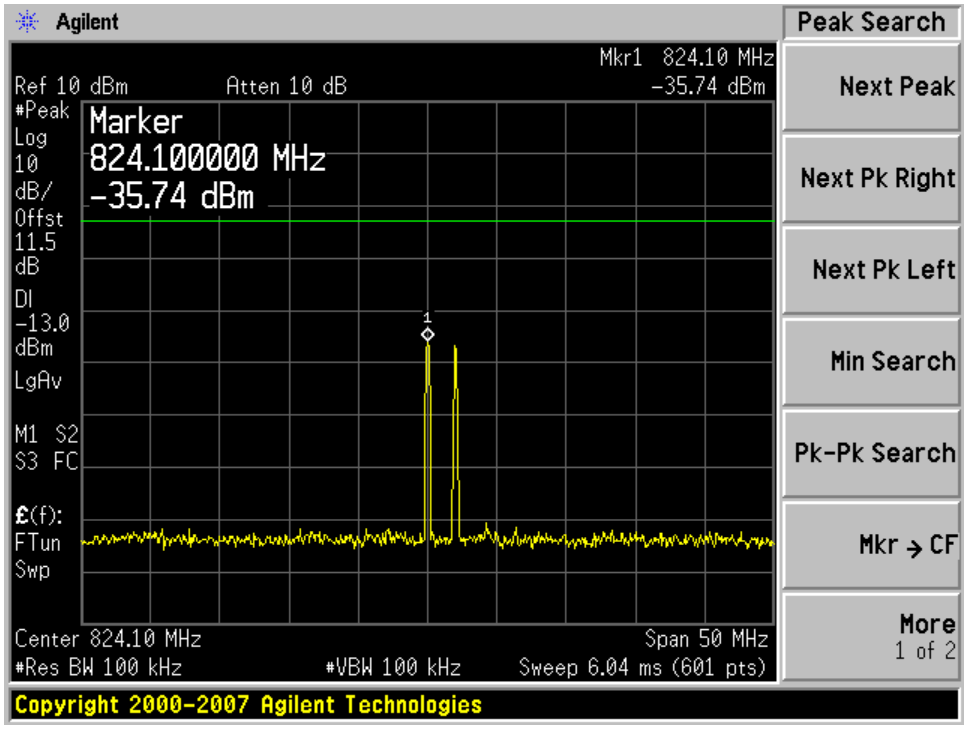

Agilent
Peak Search
Mkr1 870.7 MHz
Ref 10 dBm
Atten 10 dB
-34.91 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
870.700000 MHz
-34.91 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 3.287 GHz
Ref 10 dBm
Atten 10 dB
-68.94 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
3.287000000 GHz
-68.94 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

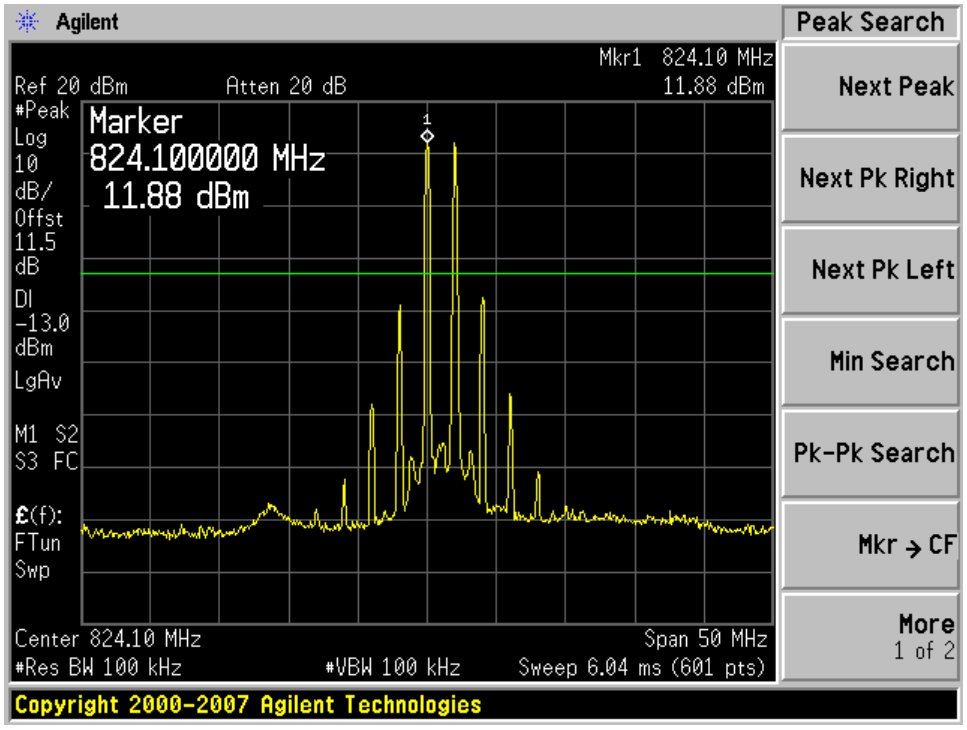

Agilent
Peak Search
Mkr1 8.808 GHz
Ref 10 dBm
Atten 10 dB
-35.65 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
8.808000000 GHz
-35.65 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

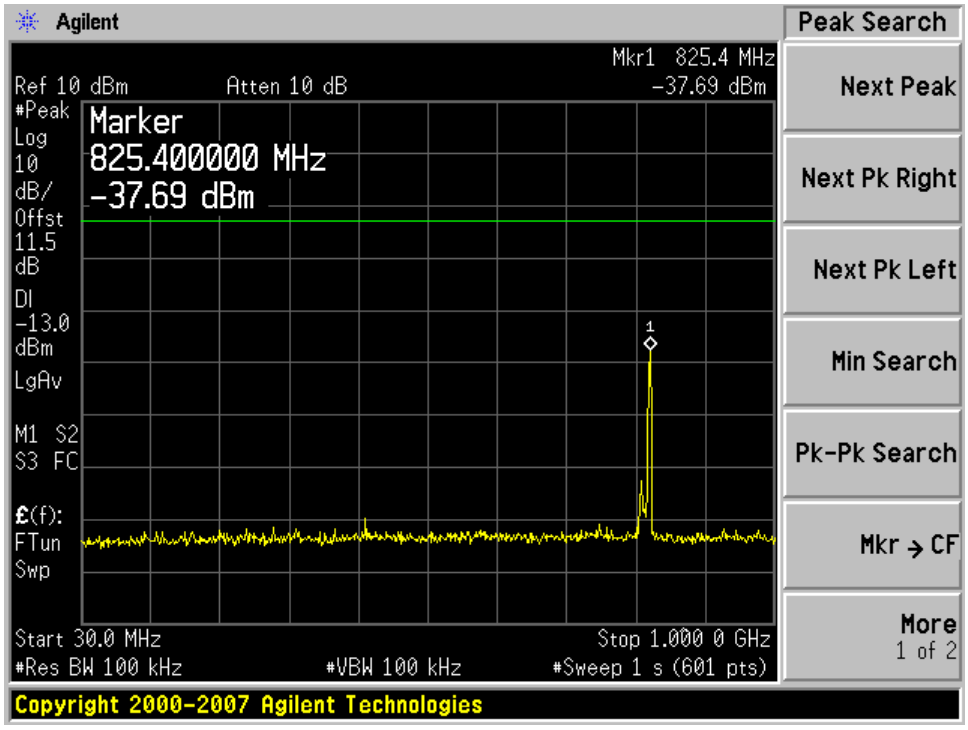
**TDMA Uplink: Low Channel**

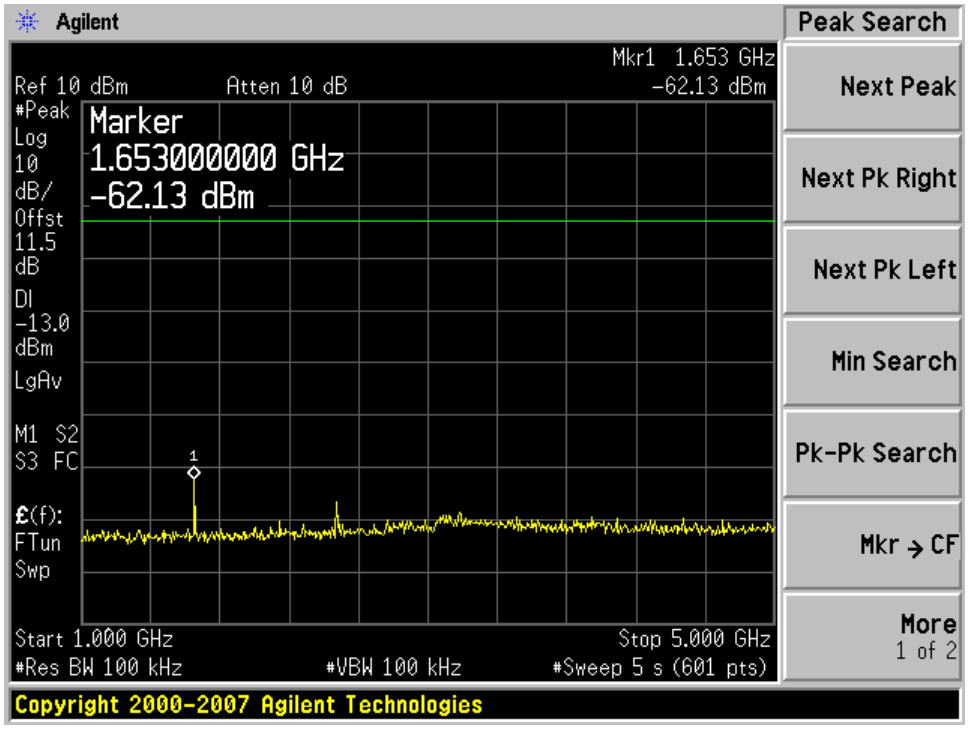
**Input**

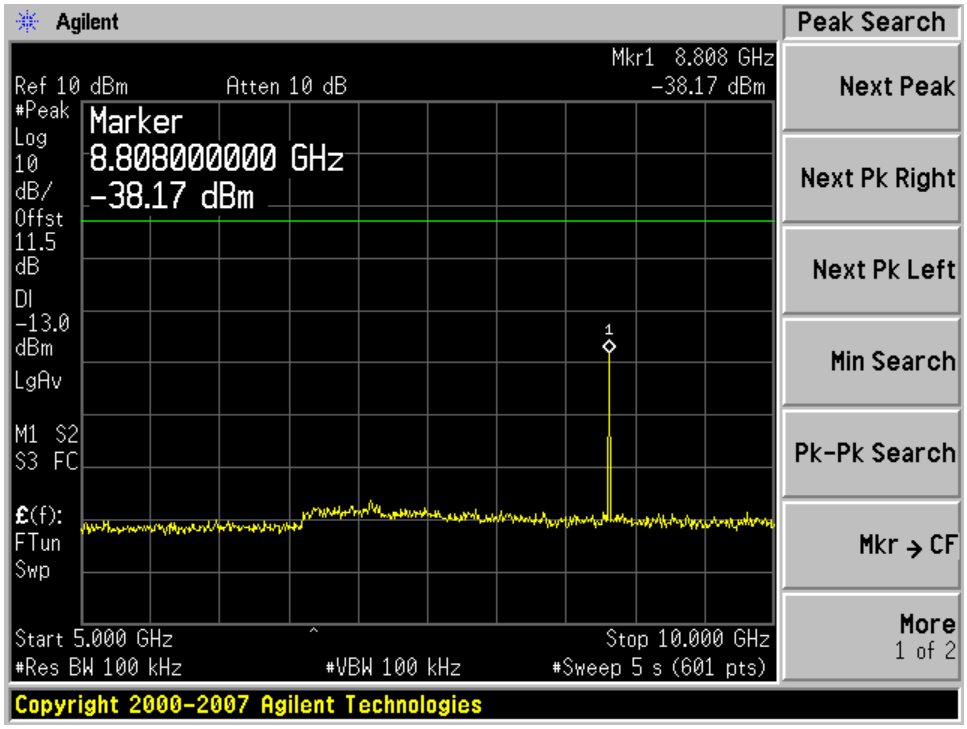



**Output**



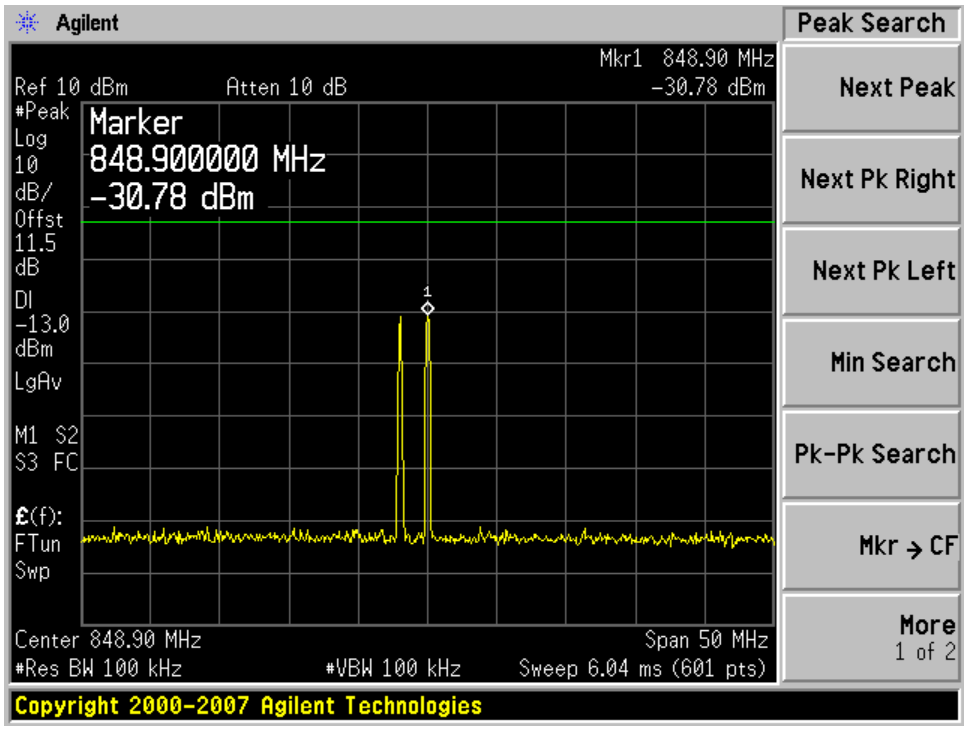

Agilent
Peak Search
Mkr1 825.4 MHz
Ref 10 dBm
Atten 10 dB
-37.69 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
825.400000 MHz
-37.69 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 1.000 0 GHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.653 GHz
Ref 10 dBm
Atten 10 dB
-62.13 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
1.653000000 GHz
-62.13 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

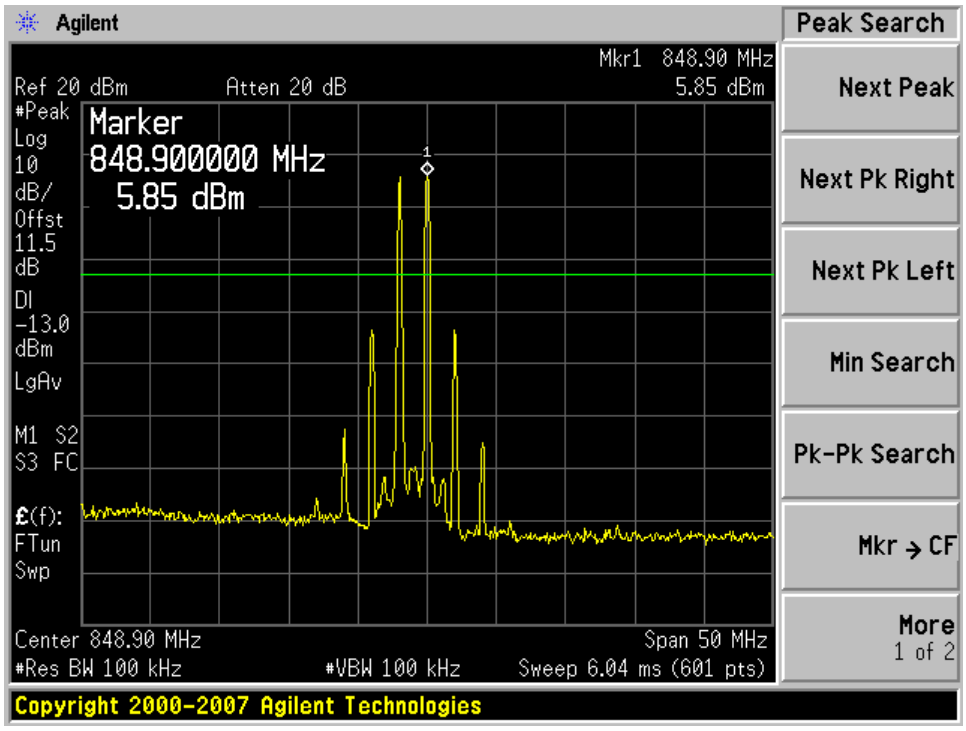


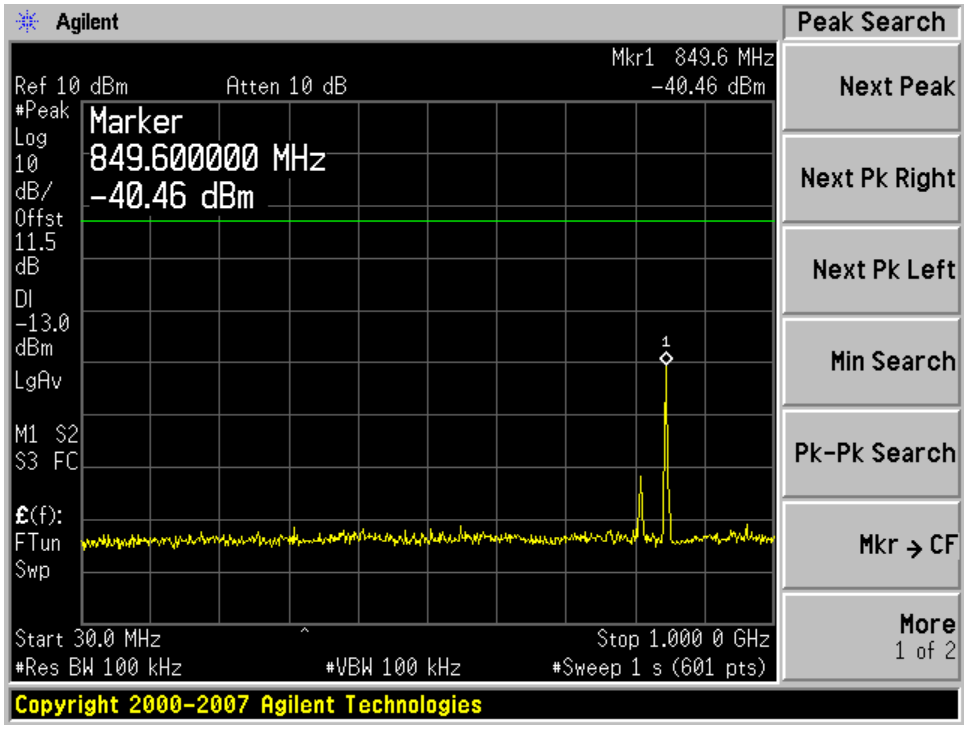

**TDMA Uplink: High Channel**

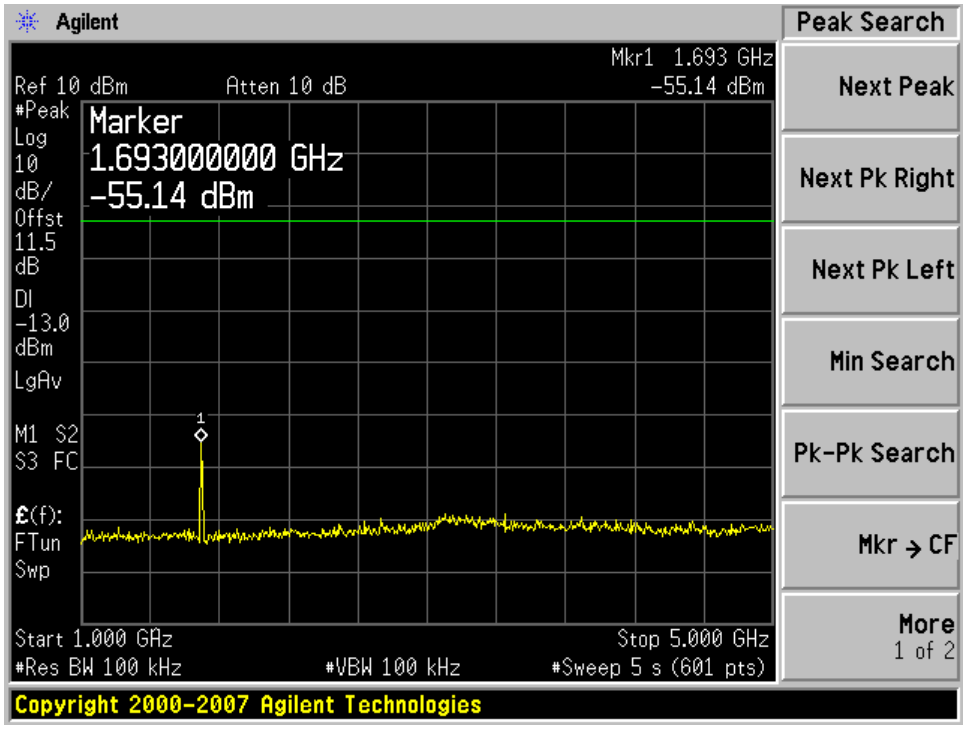
**Input**

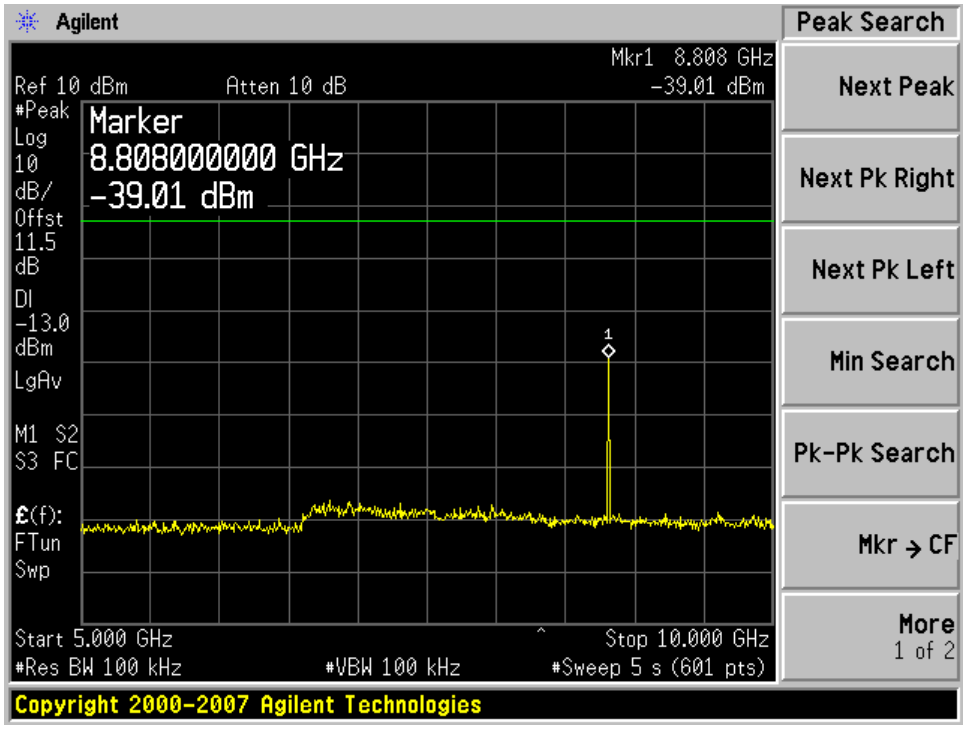


**Output**


Agilent
Peak Search
Mkr1 848.90 MHz
Ref 20 dBm
Atten 20 dB
5.85 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
848.900000 MHz
5.85 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 848.90 MHz
Span 50 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 6.04 ms (601 pts)
Copyright 2000-2007 Agilent Technologies

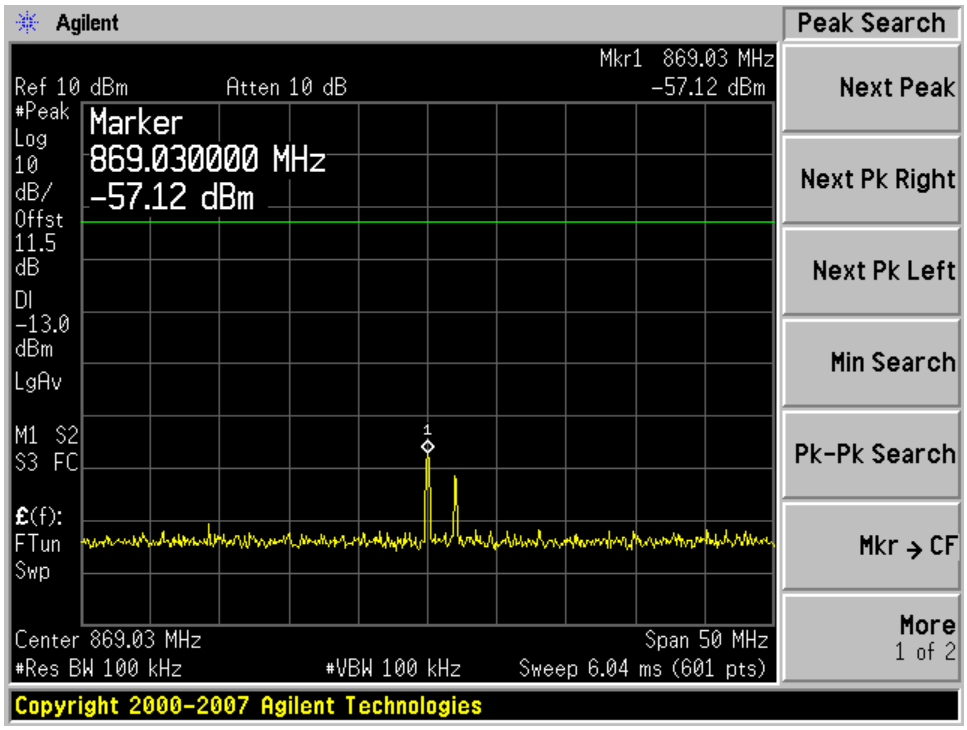

Agilent
Peak Search
Mkr1 849.6 MHz
Ref 10 dBm
Atten 10 dB
-40.46 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
849.600000 MHz
-40.46 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.693 GHz
Ref 10 dBm
Atten 10 dB
-55.14 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
1.693000000 GHz
-55.14 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

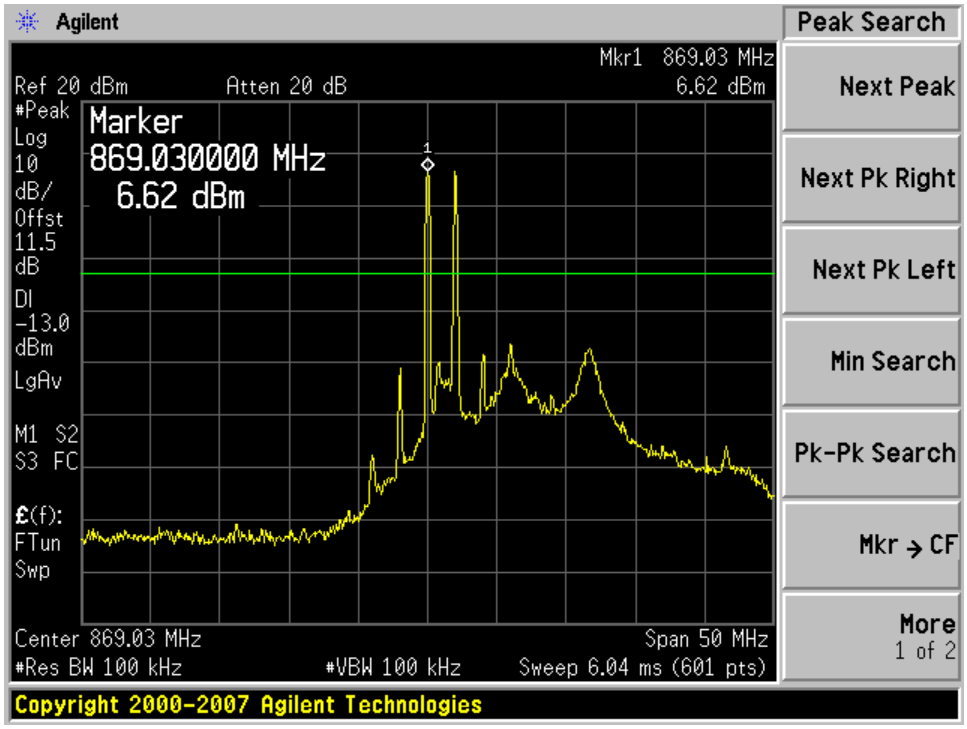

Agilent
Peak Search
Mkr1 8.808 GHz
Ref 10 dBm
Atten 10 dB
-39.01 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
8.808000000 GHz
-39.01 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

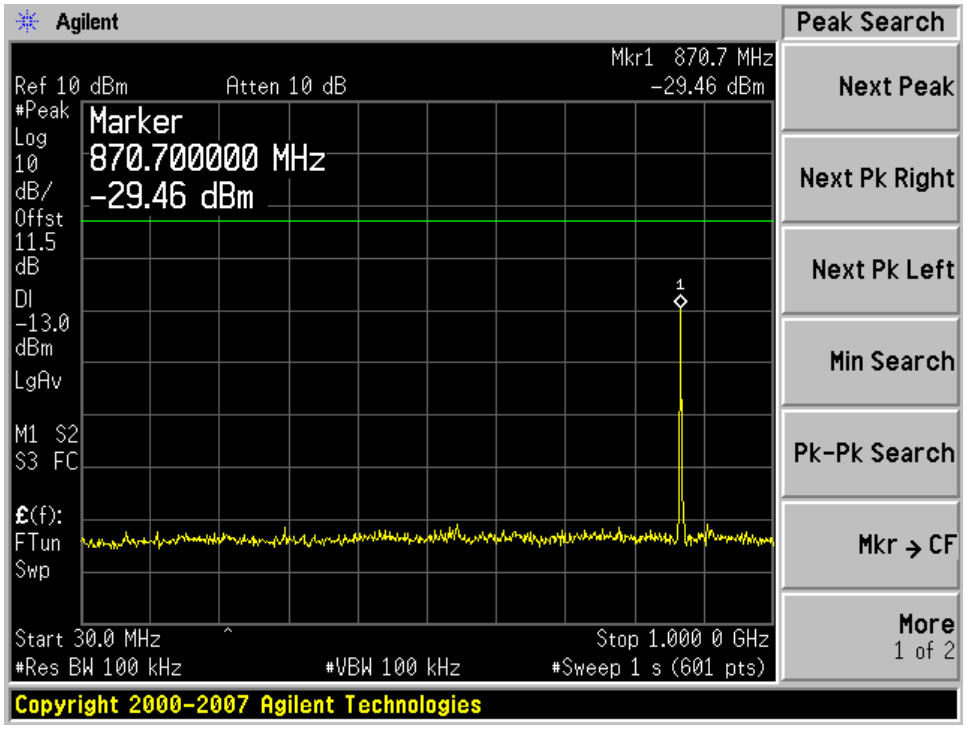
**AMPS Downlink: Low Channel**

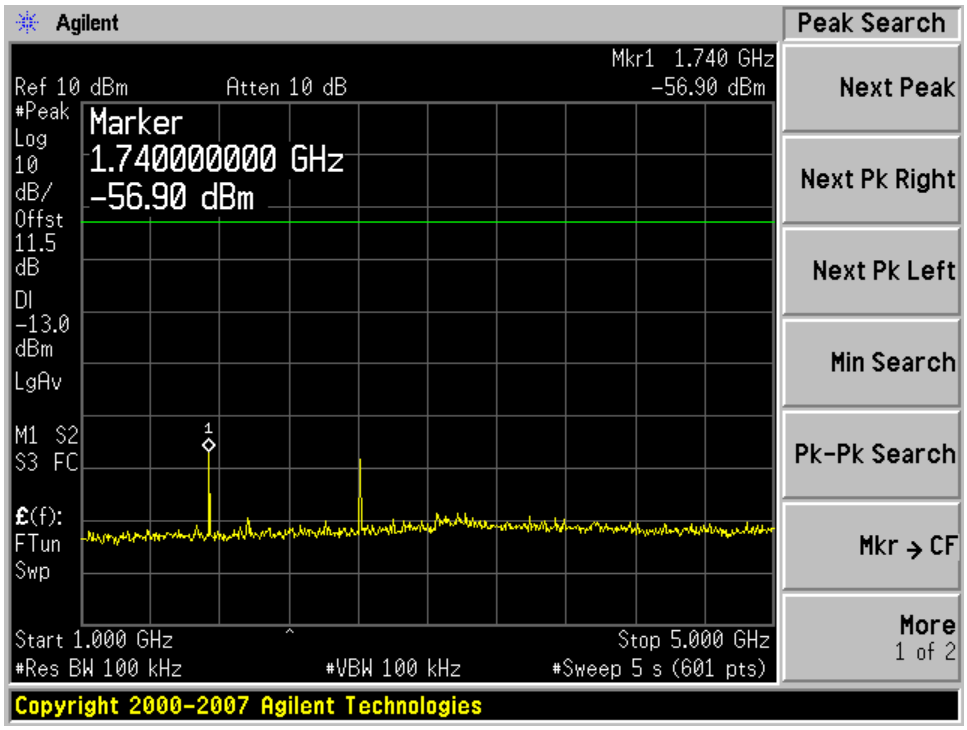
**Input**

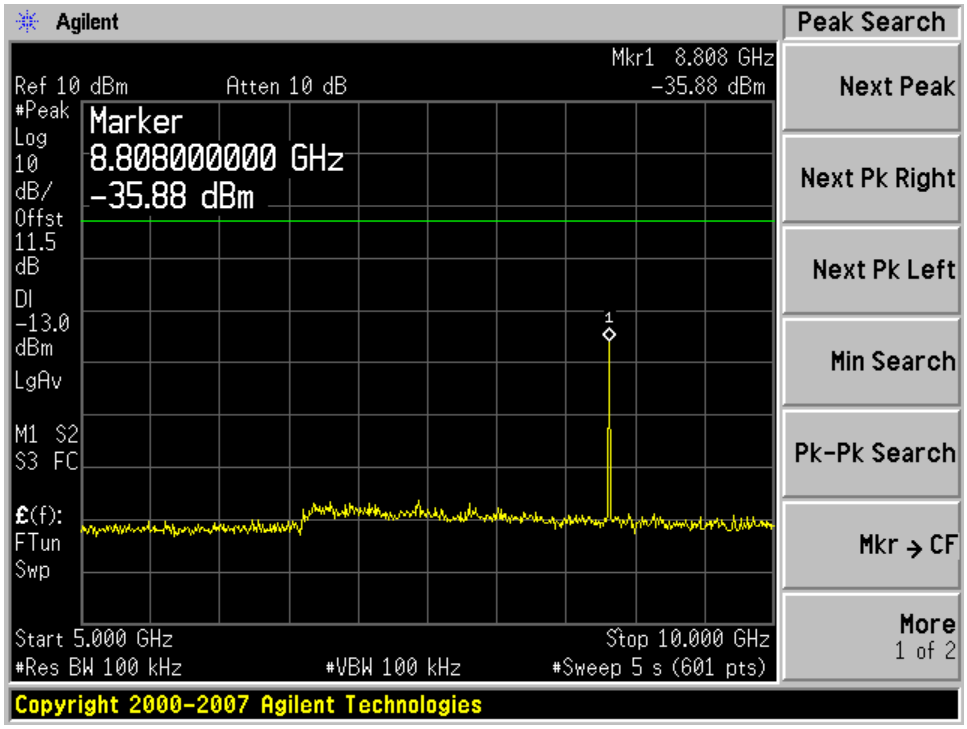



**Output**



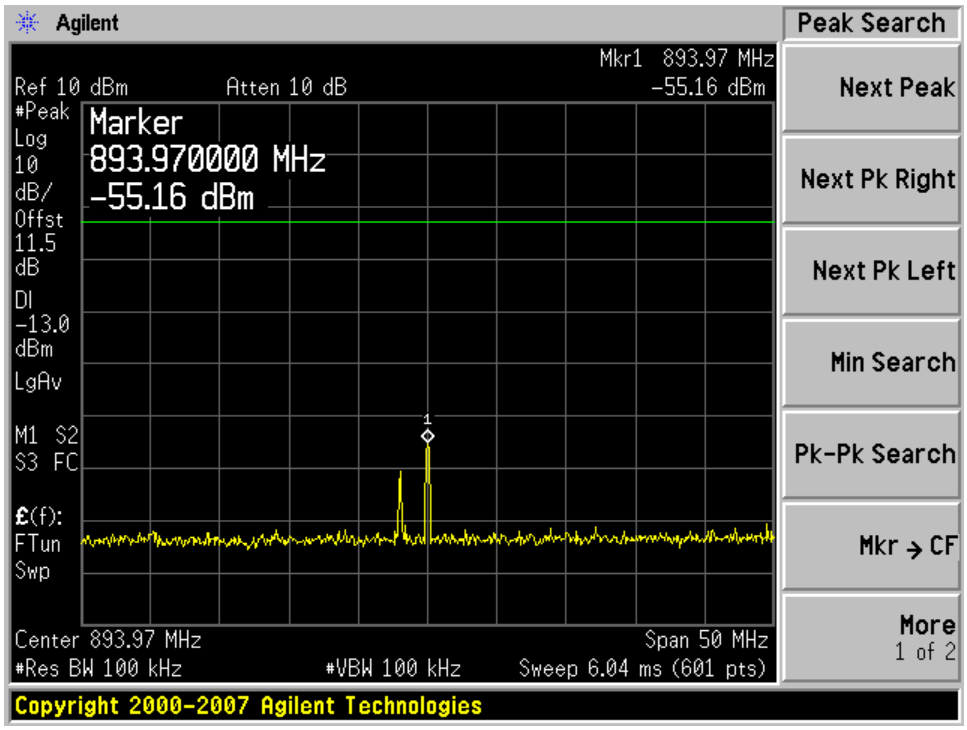

Agilent
Peak Search
Mkr1 870.7 MHz
Ref 10 dBm
Atten 10 dB
-29.46 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
870.700000 MHz
-29.46 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 1.000 0 GHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.740 GHz
Ref 10 dBm
Atten 10 dB
-56.90 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
1.740000000 GHz
-56.90 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

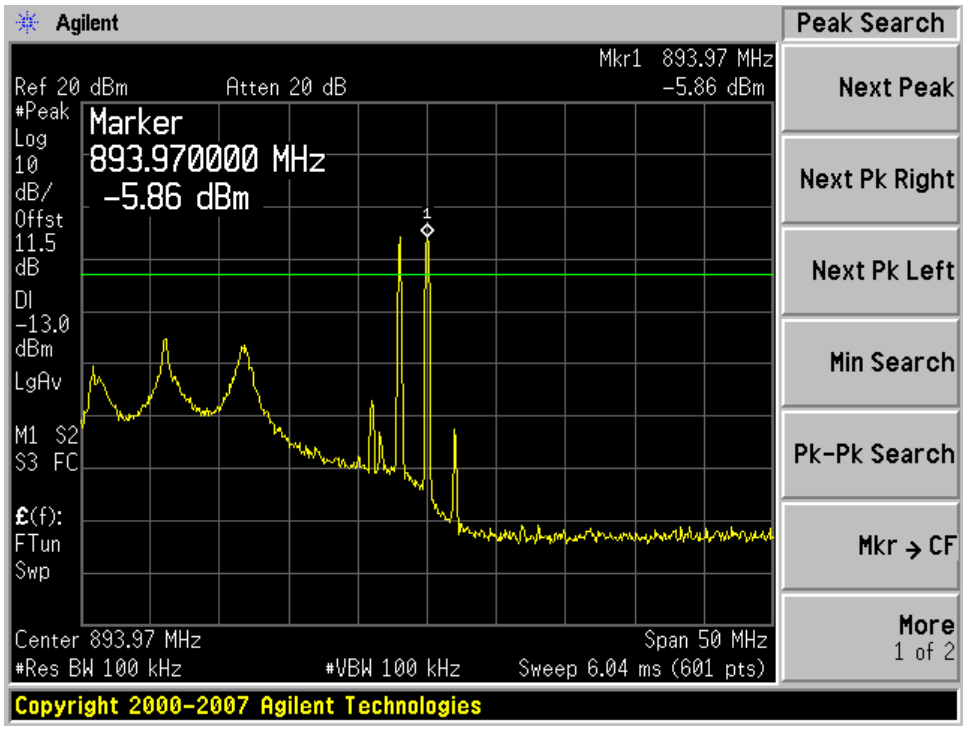


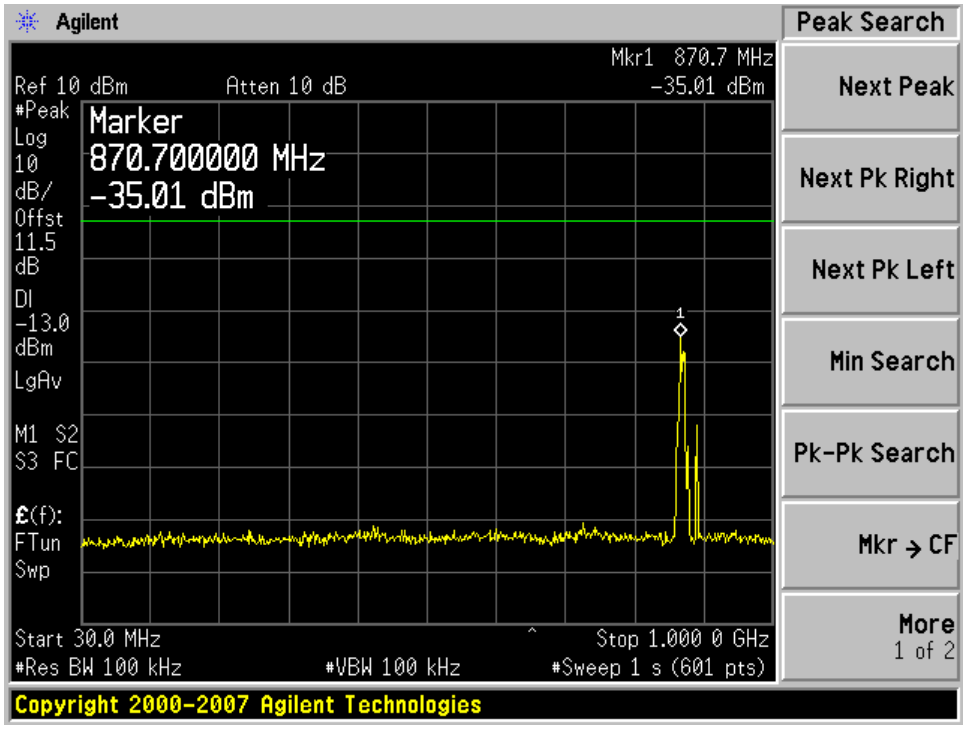

**AMPS Downlink: High Channel**

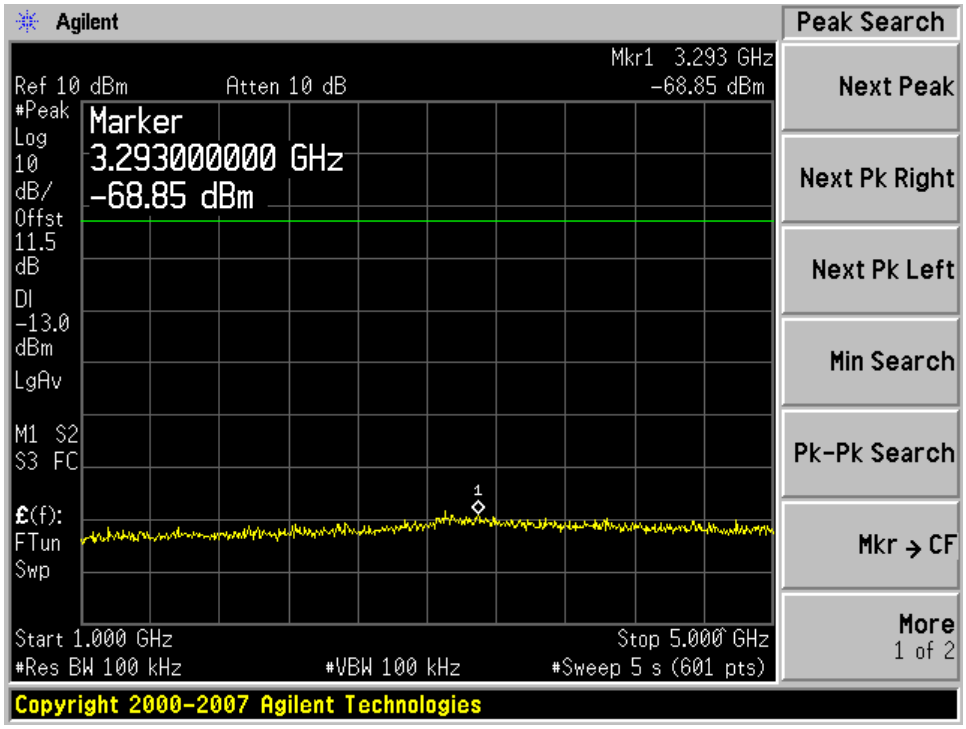
**Input**

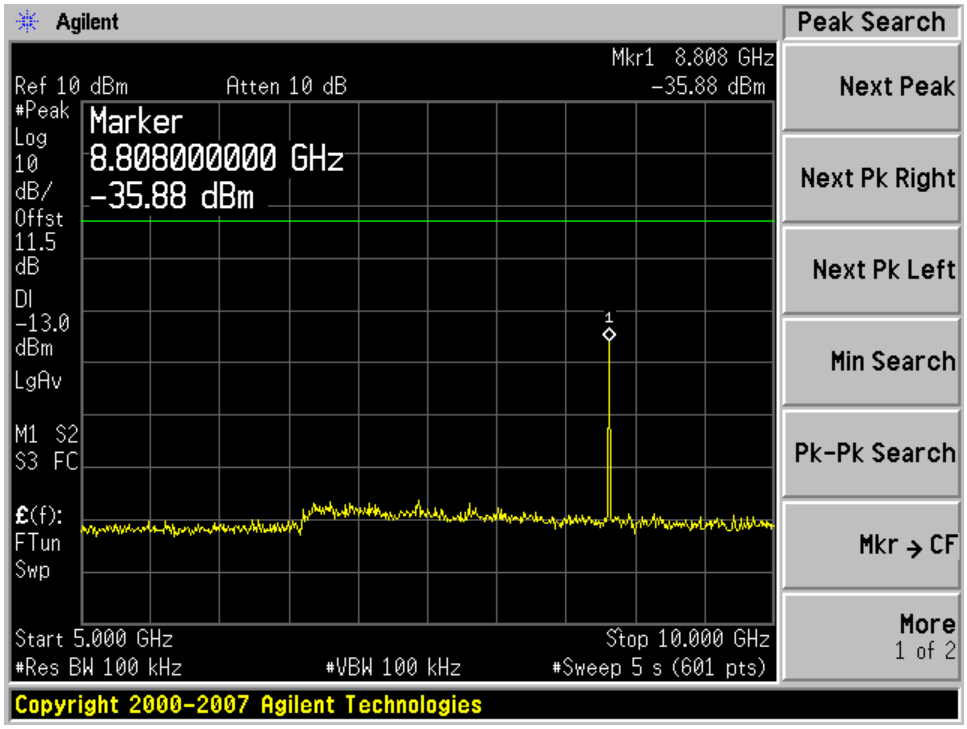


**Output**


Agilent
Peak Search
Mkr1 893.97 MHz
Ref 20 dBm
Atten 20 dB
-5.86 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Marker
893.970000 MHz
-5.86 dBm
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 893.97 MHz
Span 50 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 6.04 ms (601 pts)
Copyright 2000-2007 Agilent Technologies

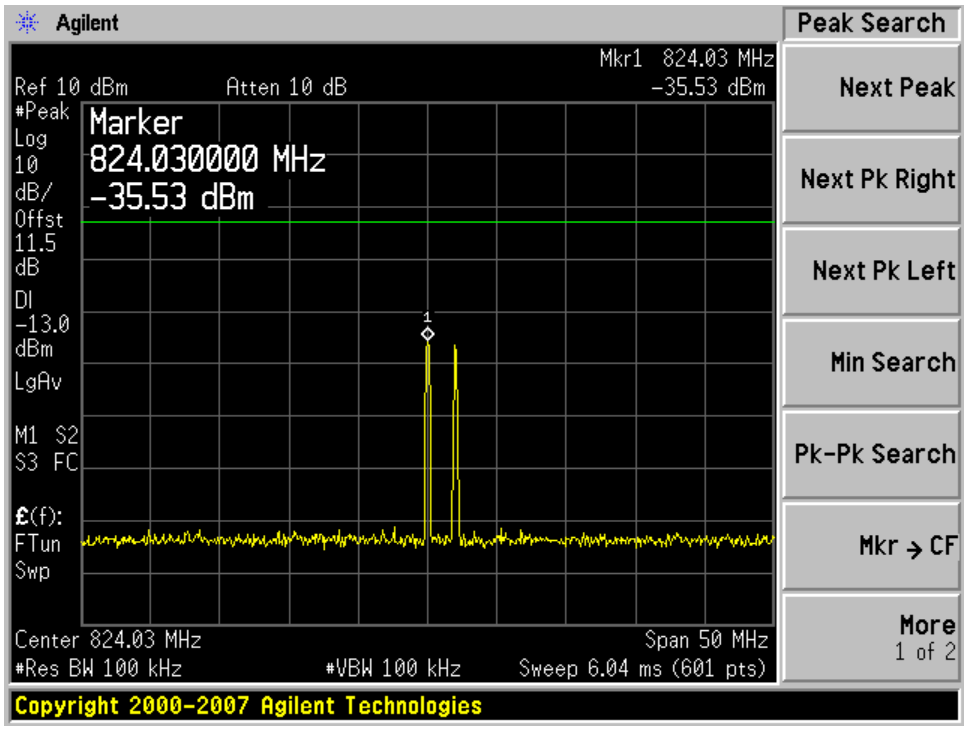

Agilent
Peak Search
Mkr1 870.7 MHz
Ref 10 dBm
Atten 10 dB
-35.01 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Marker
870.700000 MHz
-35.01 dBm
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 3.293 GHz
Ref 10 dBm
Atten 10 dB
-68.85 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
3.293000000 GHz
-68.85 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 5.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

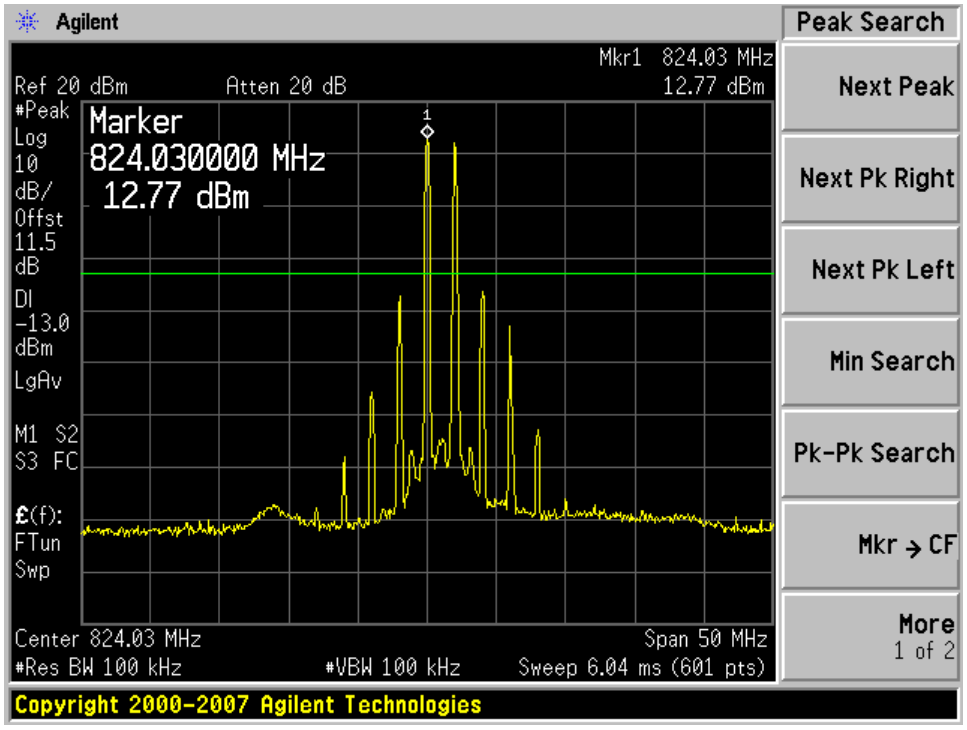

Agilent
Peak Search
Mkr1 8.808 GHz
Ref 10 dBm
Atten 10 dB
-35.88 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
8.808000000 GHz
-35.88 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
Stop 10.000 GHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

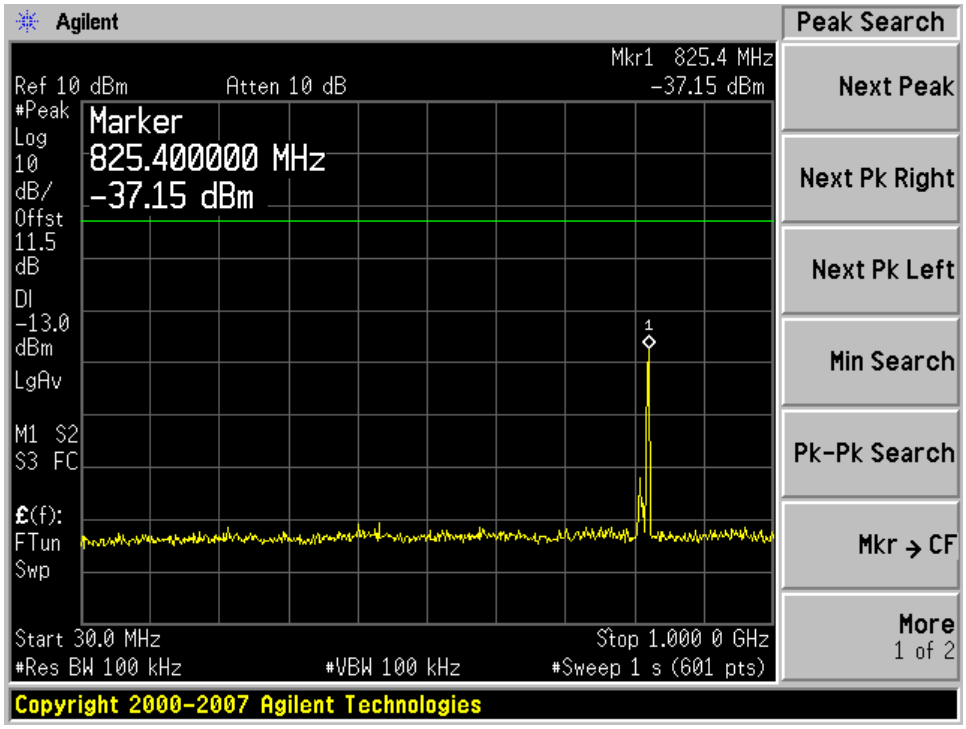
**AMPS Uplink: Low Channel**

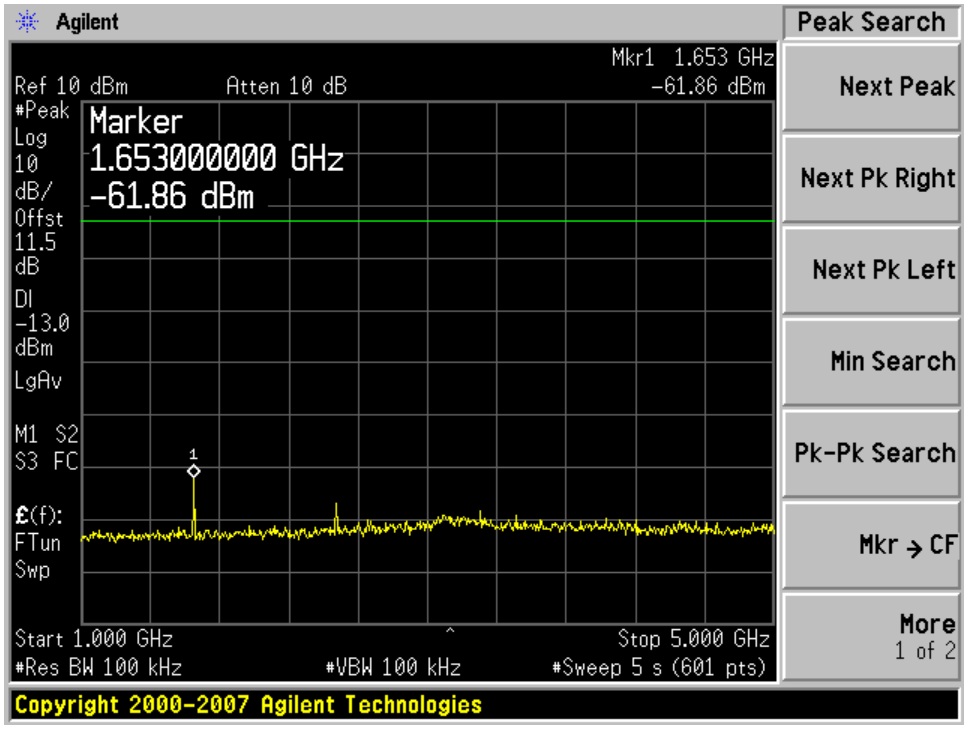
**Input**

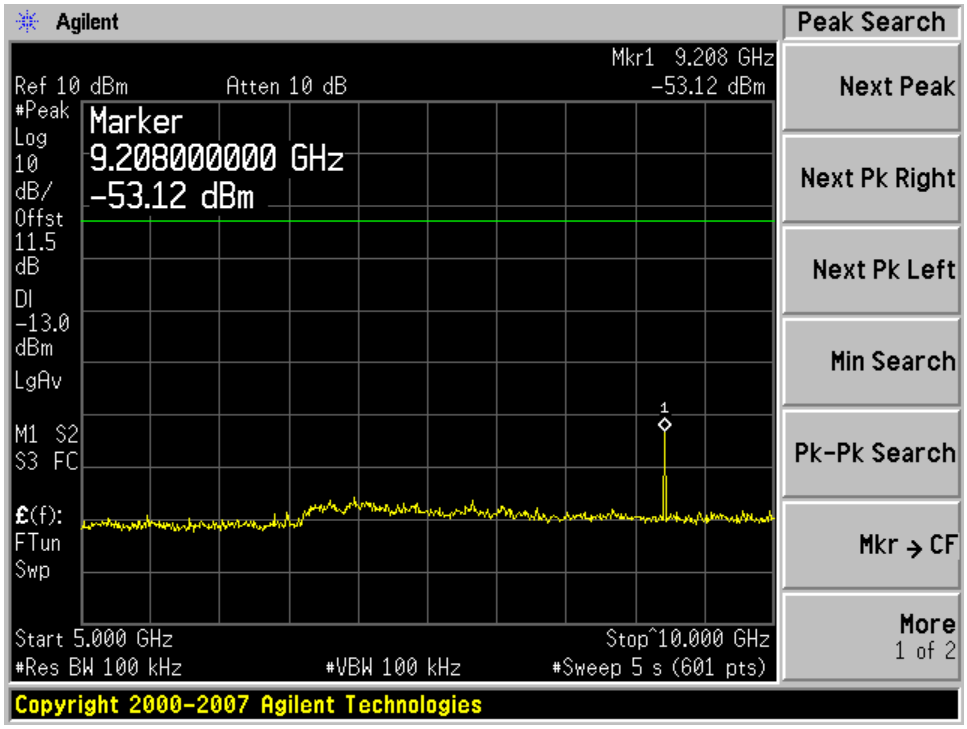



**Output**



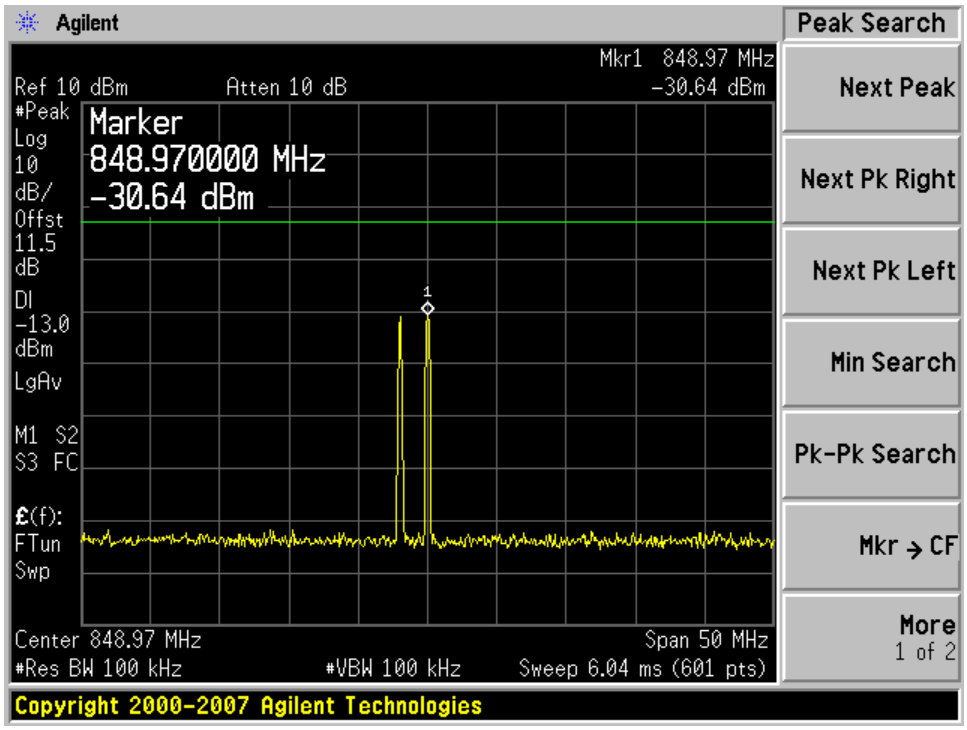

Agilent
Peak Search
Mkr1 825.4 MHz
Ref 10 dBm
Atten 10 dB
-37.15 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
825.400000 MHz
-37.15 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.653 GHz
Ref 10 dBm
Atten 10 dB
-61.86 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
1.653000000 GHz
-61.86 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

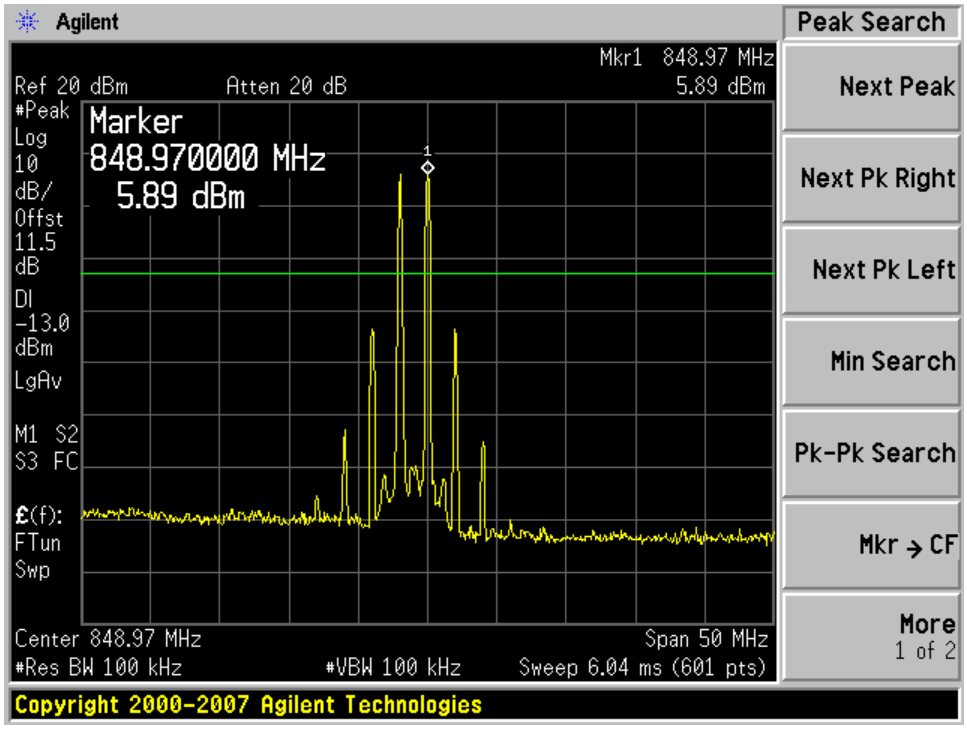


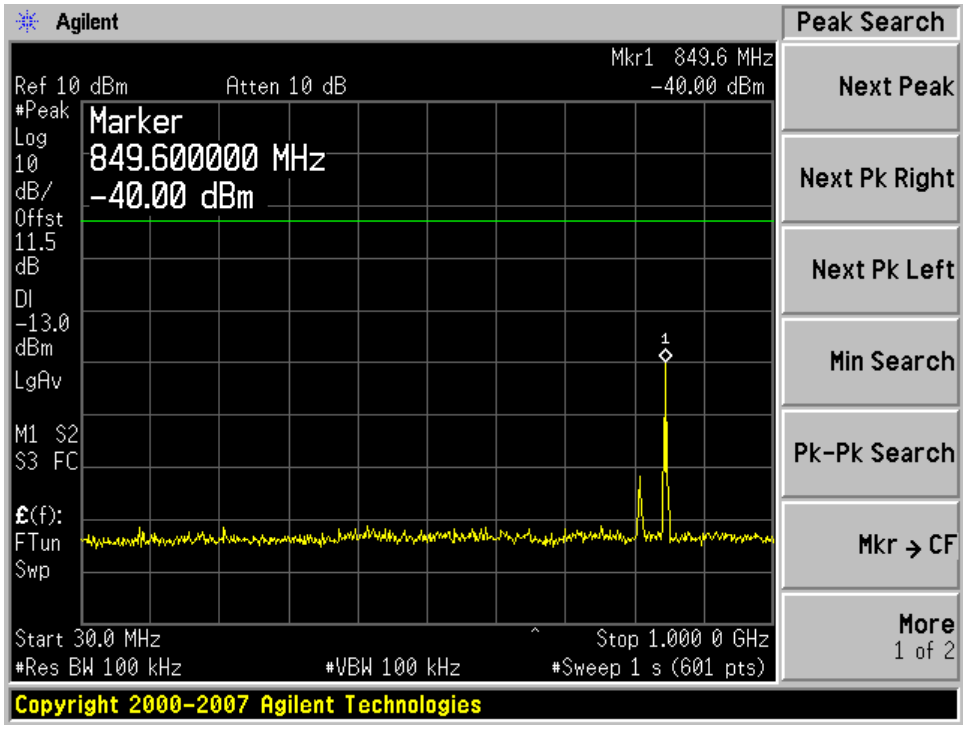

**AMPS Uplink: High Channel**

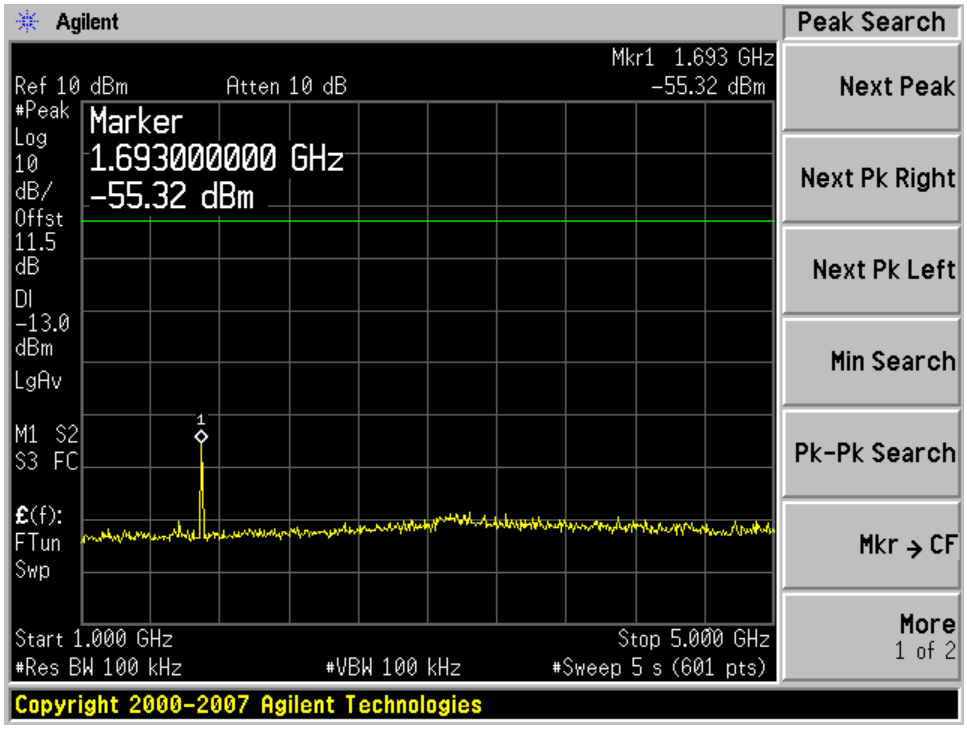
**Input**

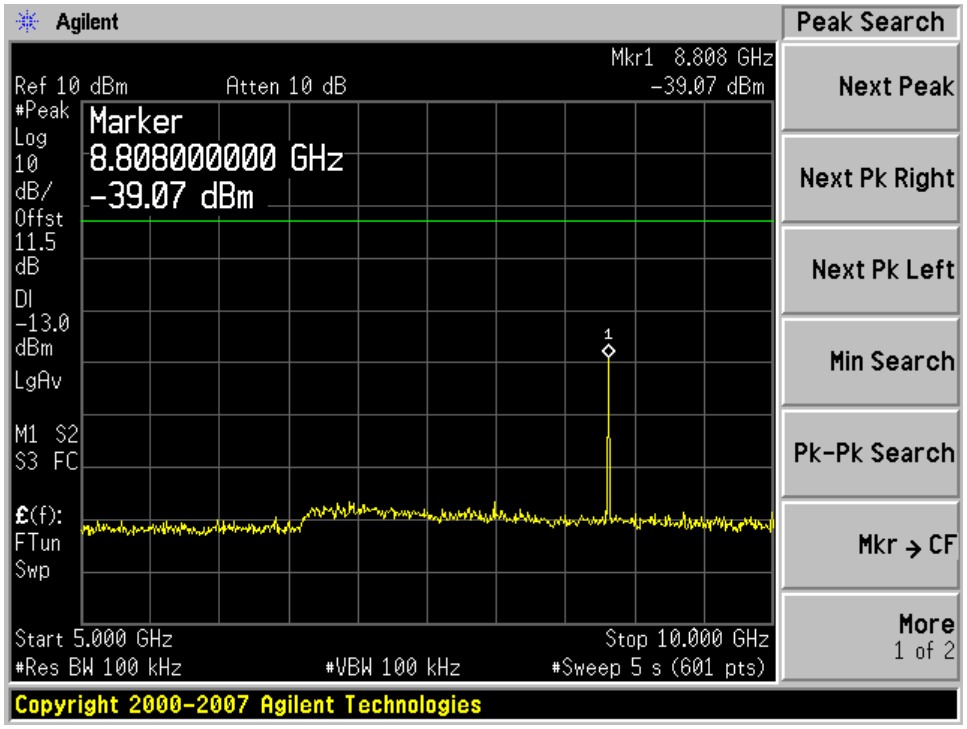


**Output**


Agilent
Peak Search
Mkr1 848.97 MHz
Ref 20 dBm
Atten 20 dB
5.89 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
848.970000 MHz
5.89 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 848.97 MHz
Span 50 MHz
#Res BW 100 kHz
#VBW 100 kHz
Sweep 6.04 ms (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 849.6 MHz
Ref 10 dBm
Atten 10 dB
-40.00 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
849.600000 MHz
-40.00 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 30.0 MHz
Stop 1.000 0 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 1 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 1.693 GHz
Ref 10 dBm
Atten 10 dB
-55.32 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
1.693000000 GHz
-55.32 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies


Agilent
Peak Search
Mkr1 8.808 GHz
Ref 10 dBm
Atten 10 dB
-39.07 dBm
#Peak
Log
10
dB/
Offst
11.5
dB
Dl
-13.0
dBm
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Marker
8.808000000 GHz
-39.07 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Start 5.000 GHz
Stop 10.000 GHz
#Res BW 100 kHz
#VBW 100 kHz
#Sweep 5 s (601 pts)
Copyright 2000-2007 Agilent Technologies

# 9 §22.917 – BAND EDGE

## 9.1 Applicable Standard

According to § 22.917, the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

## 9.2 Test Procedure

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

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

## 9.3 Environmental Conditions

| | |
|---|---|
| **Temperature:** | 21 °C |
| **Relative Humidity:** | 47 % |
| **ATM Pressure:** | 101.2kPa |

** The testing was performed by Victor Zhang on 2008-08-08.*

## 9.4 Test Equipment List and Details

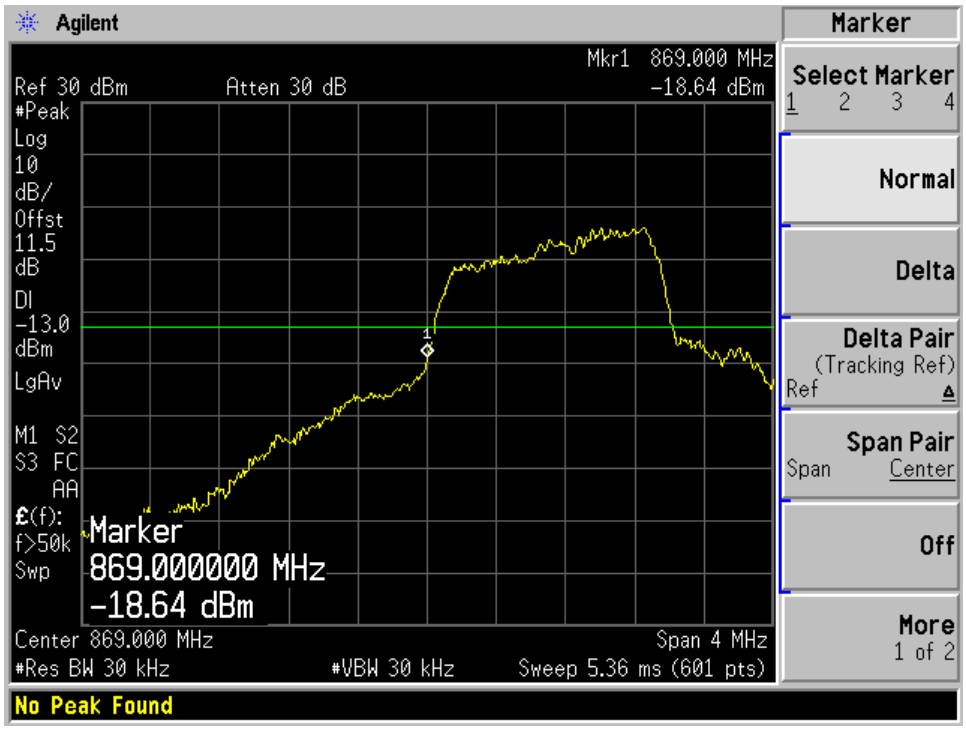
| Manufacturer | Description | Model | Serial Number | Calibration Date |
|---|---|---|---|---|
| Agilent | Spectrum Analyzer | E4440A | MY44303352 | 2008-04-28 |
| Agilent | Signal Generator | 83650B | 3614A00276 | 2008-05-28 |
| R & S | Signal Generator | SMIQ03 | 849192/0085 | 2007-12-03 |

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

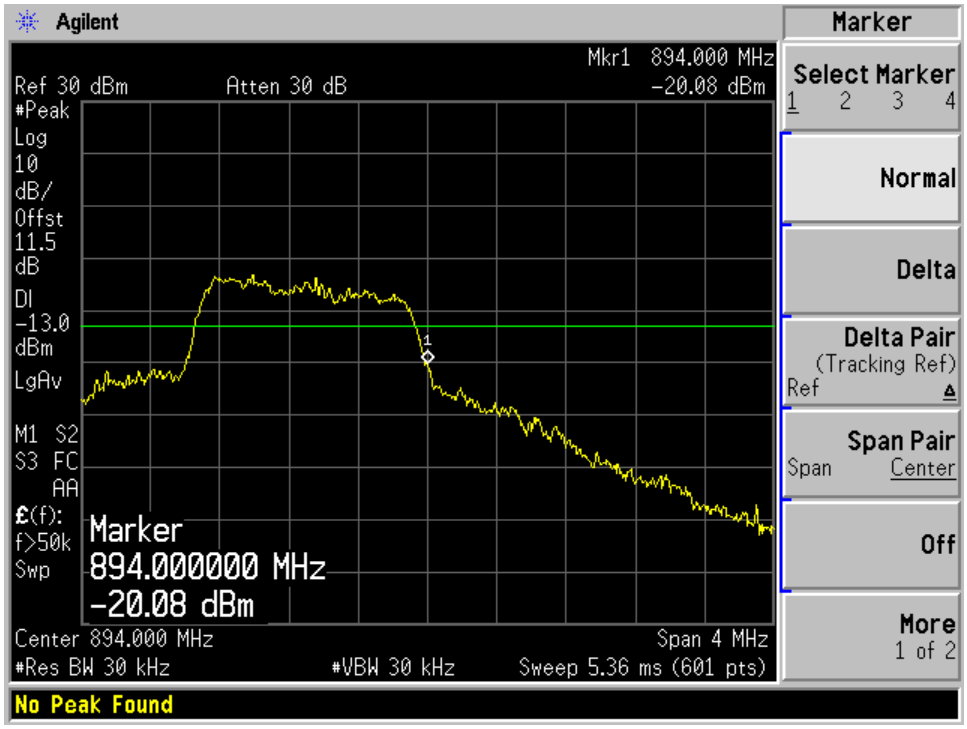
## 9.5 Test Results

Please refer to the following plots.

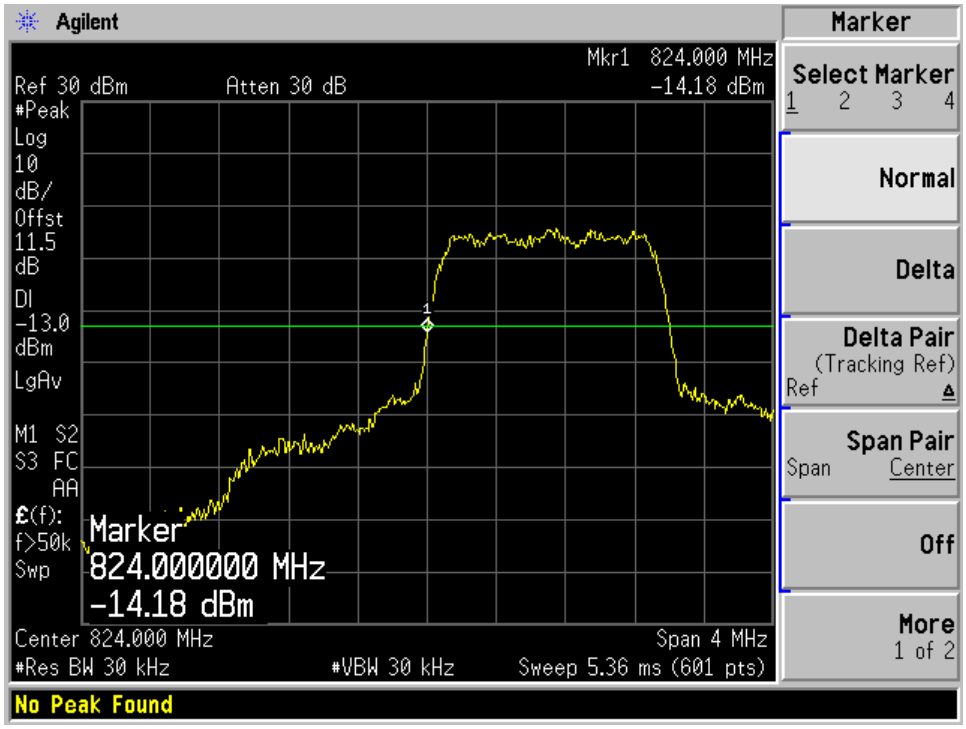
**CDMA Downlink: Lowest Channel**



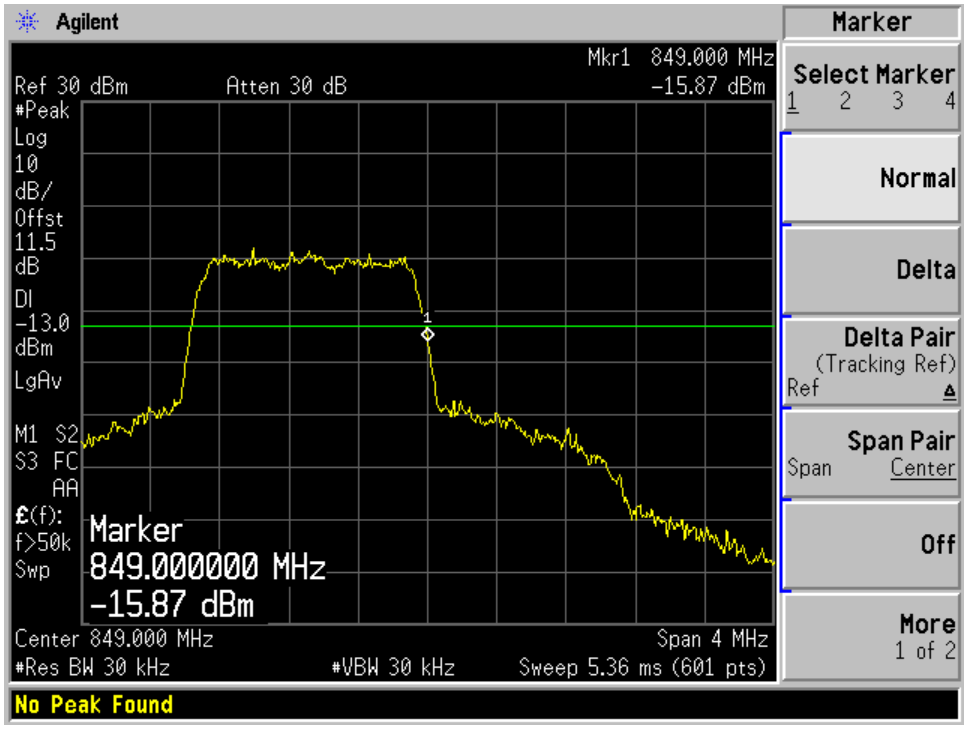

**CDMA Downlink: Highest Channel**



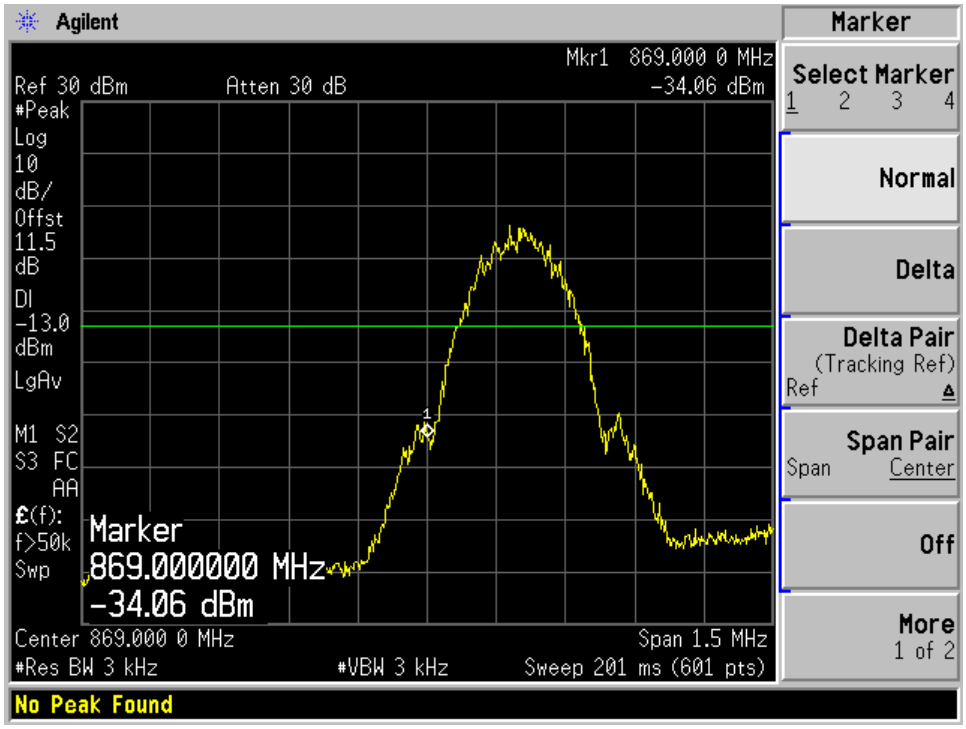
**CDMA Uplink: Lowest Channel**



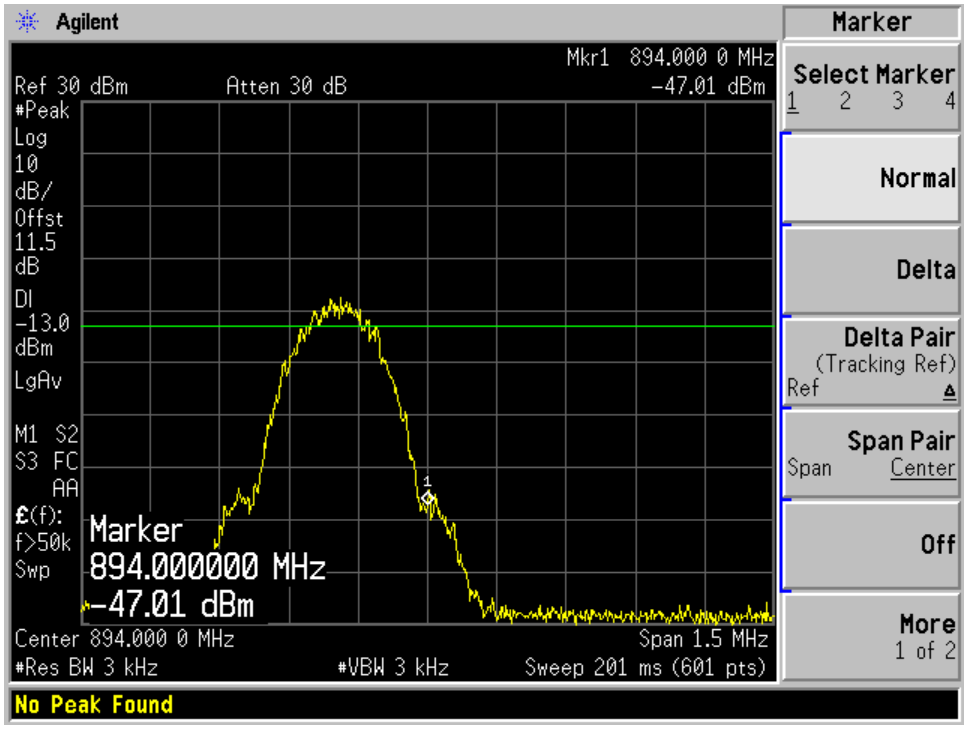

**CDMA Uplink: Highest Channel**



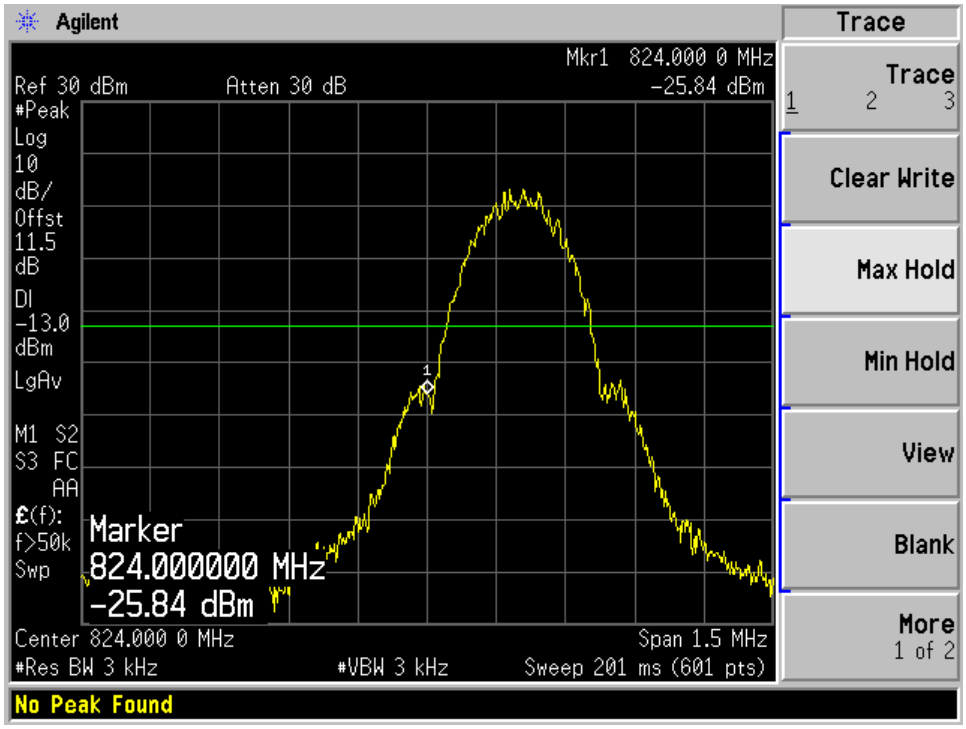
**GSM Downlink: Lowest Channel**



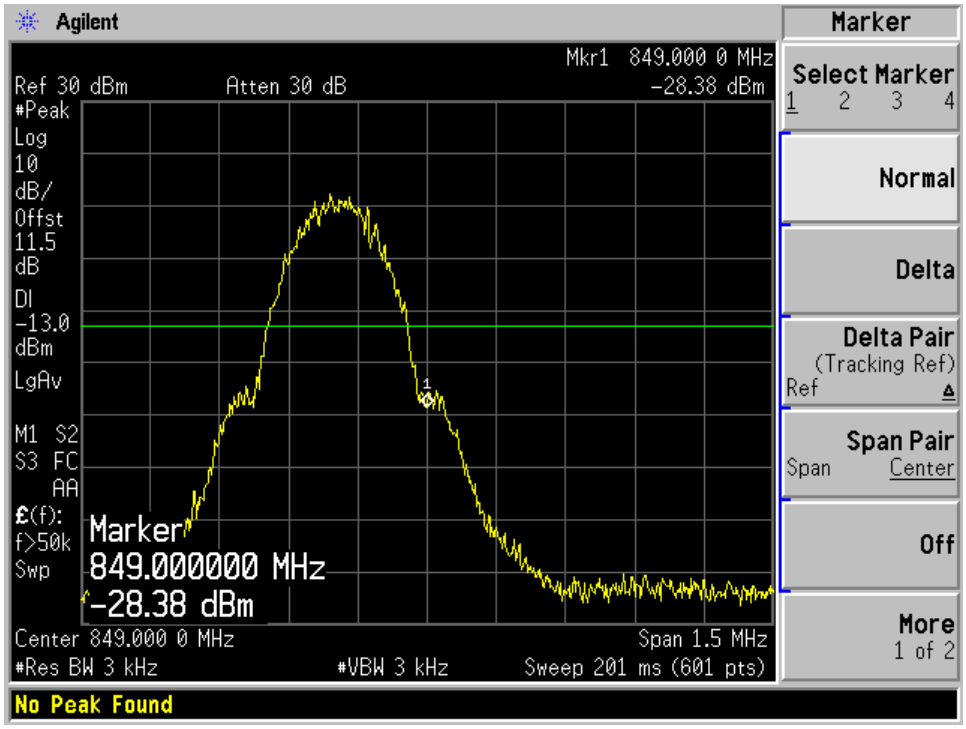

**GSM Downlink: Highest Channel**



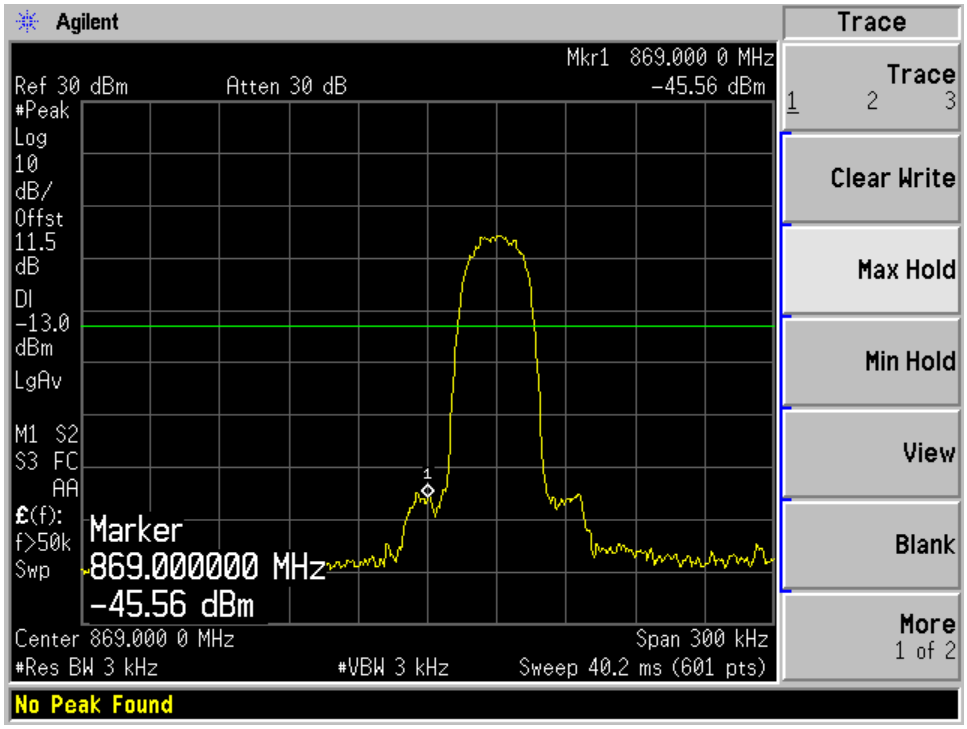
**GSM Uplink: Lowest Channel**



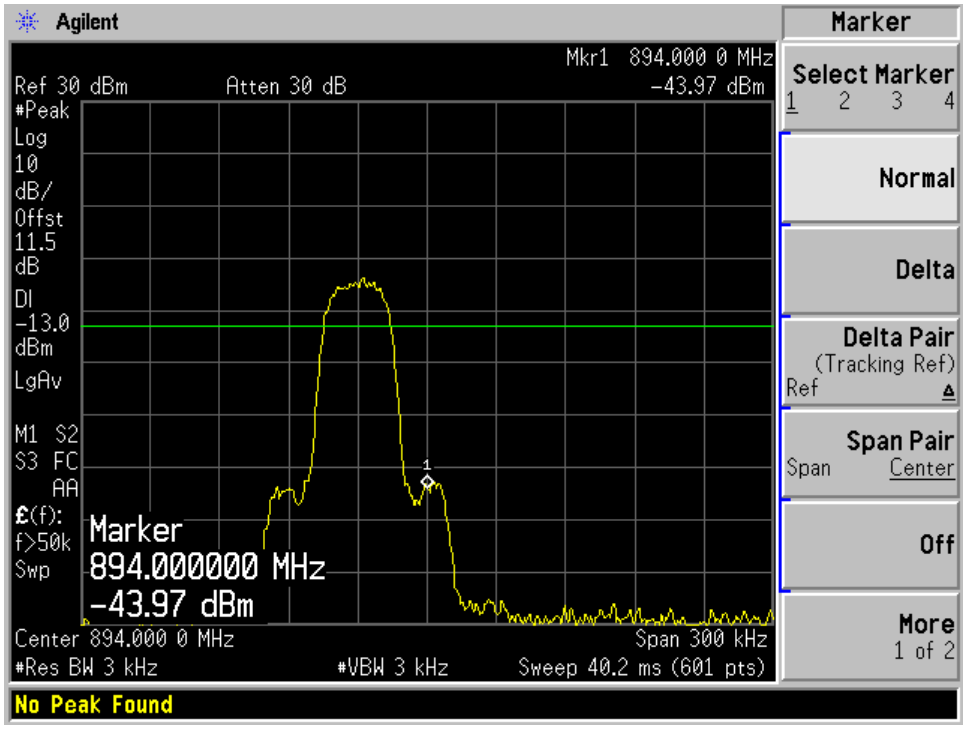

**GSM Uplink: Highest Channel**



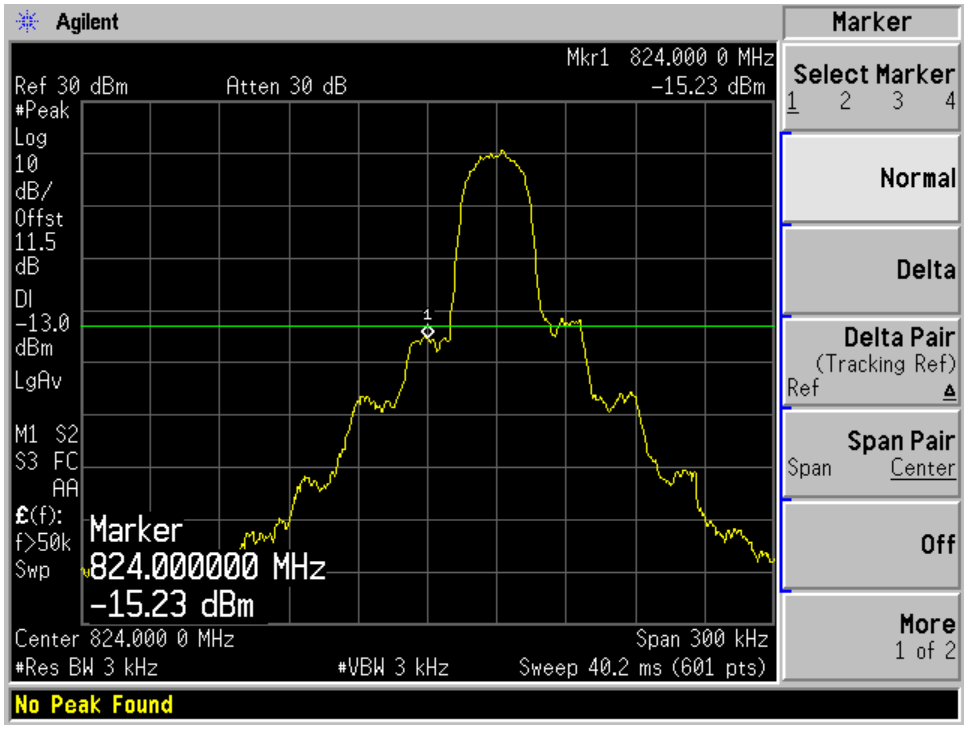
**TDMA Downlink: Lowest Channel**



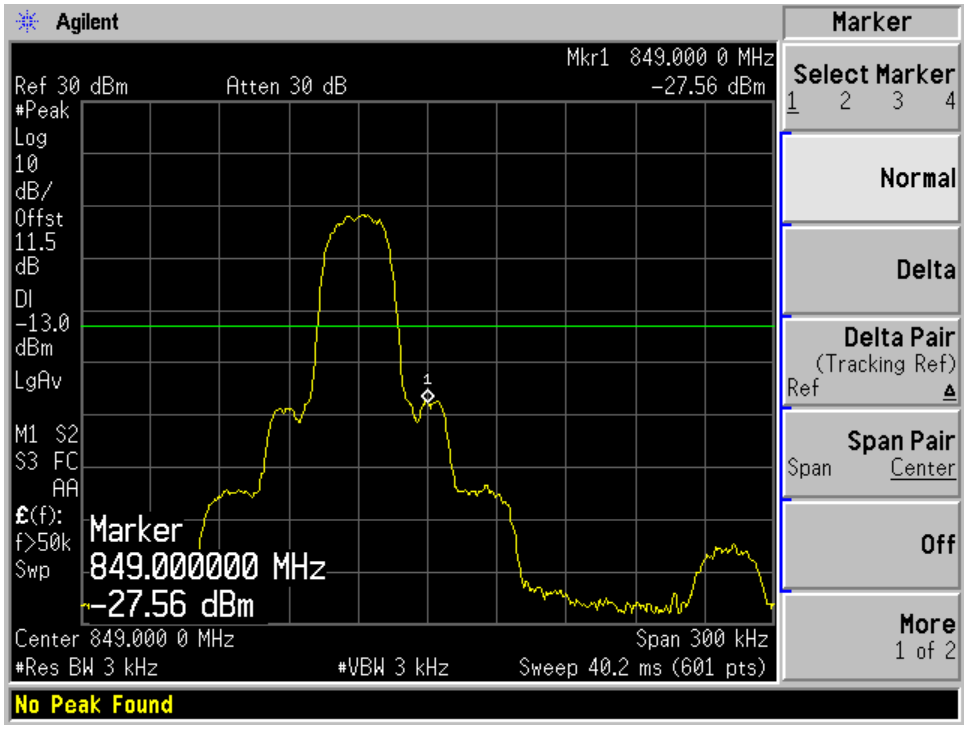

**TDMA Downlink: Highest Channel**



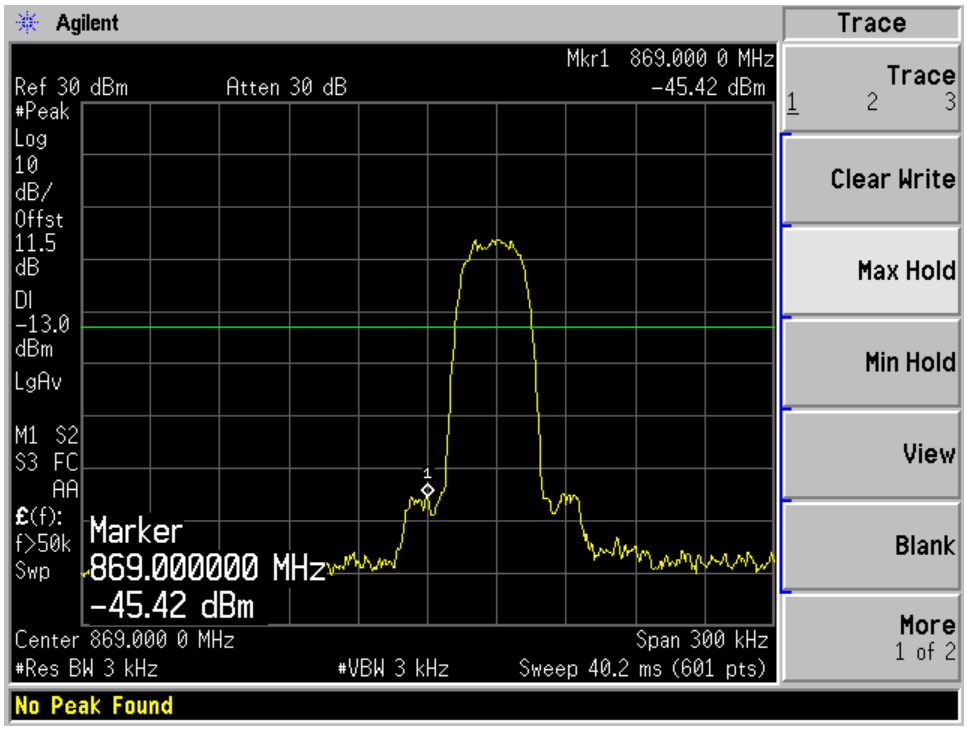
**TDMA Uplink: Lowest Channel**



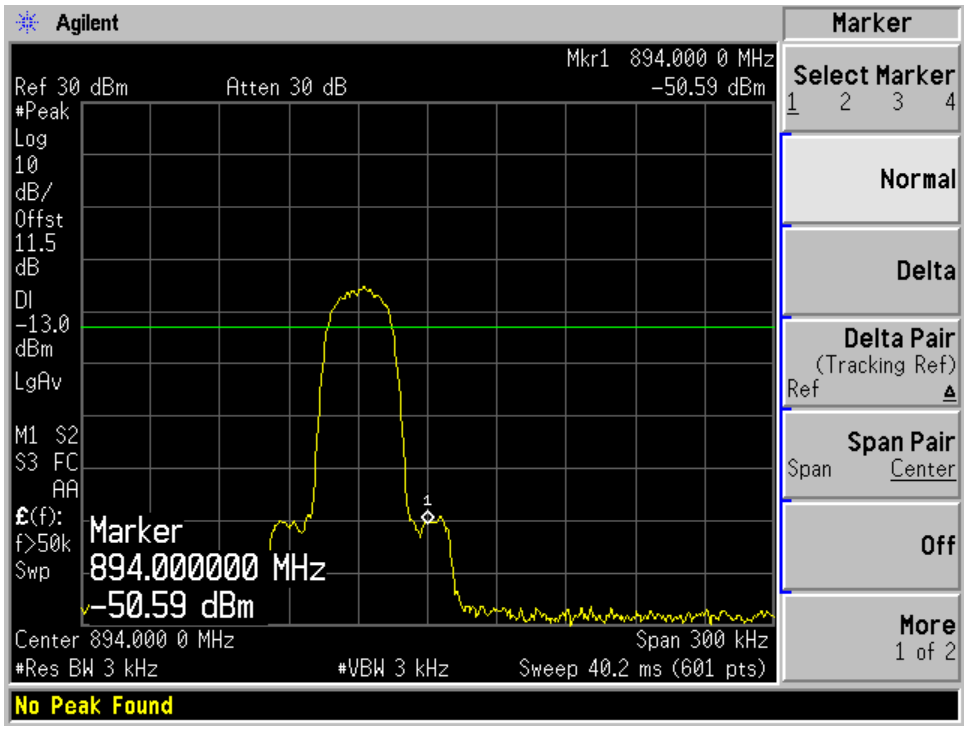

**TDMA Uplink: Highest Channel**



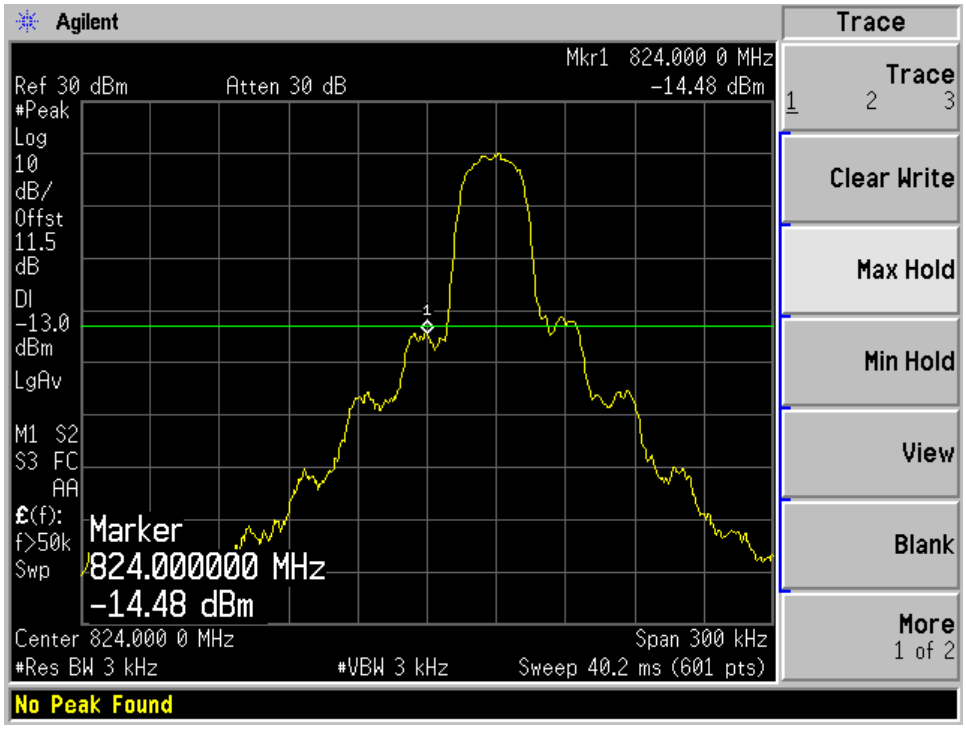
**AMPS Downlink: Lowest Channel**



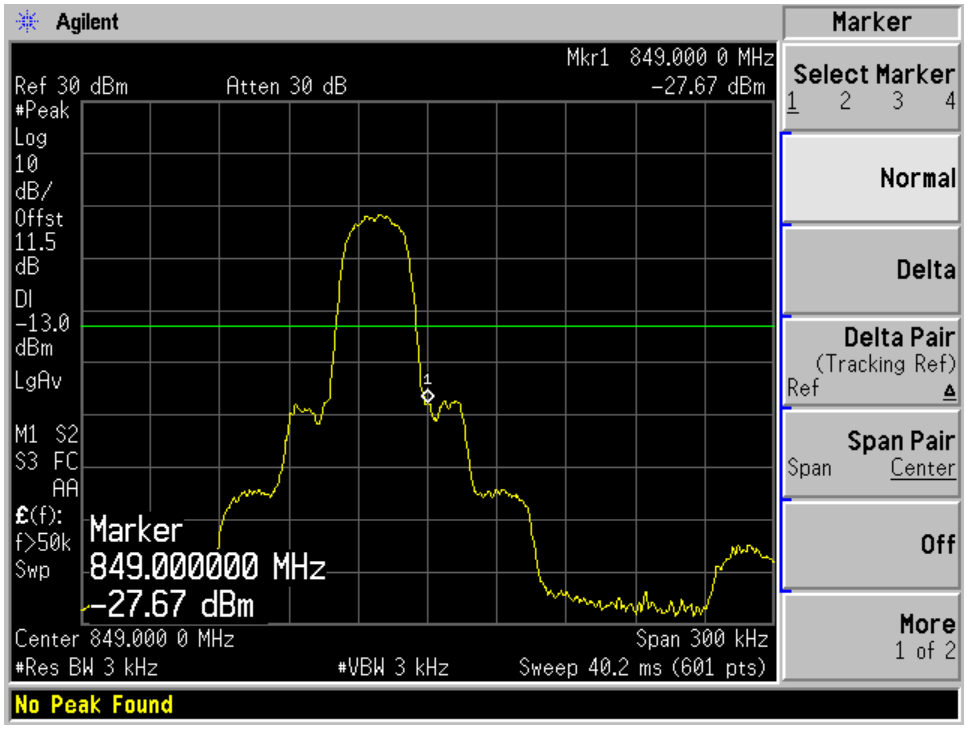

**AMPS Downlink: Highest Channel**



**AMPS Uplink: Lowest Channel**




**AMPS Uplink: Highest Channel**



# 10 §2.1055 – Frequency Stability

This EUT is an amplifier, not a transmitter. There is no oscillator circuit in the EUT, therefore there is no frequency stability measurement required.

## 10.1 Test Result

N/A