



SAMSUNG ELECTRONICS Co., Ltd.,  
Regulatory Compliance Group  
IT R&D Center  
416 Maetan3-Dong,  
Yeongtong-gu, Suwon city,  
Gyeonggi-Do, Korea 442-742

## FCC CFR47 PART 22 & 24 SUBPART CERTIFICATION REPORT

**Model Tested:** SPH-A420  
**FCC ID (Requested):** A3LSPHA420  
**Report No:** FC-155-R1  
**Job No:** FC-155  
**Date issued:** December 26, 2005

- Abstract -

All measurement reported herein accordance with FCC Rules, 47CFR  
Part2, Part22, Part24.

**Prepared By**

**Date** 2005.12.26

WT JANG – Test Engineer

**Checked By**

**Date** 2005.12.27

SH PARK – Senior Manager

**Authorized By**

**Date** 2005.12.27

JK CHOI – General Manager

# TABLE OF CONTENT

|                                                                  |             |
|------------------------------------------------------------------|-------------|
| <b>MEASUREMENT REPORT</b>                                        | <b>Page</b> |
| <b>1. FCC Certification Information</b>                          | <b>3</b>    |
| 1.1 §2.1033 General Information                                  | 3           |
| <b>2. INTRODUCTION</b>                                           | <b>4</b>    |
| 2.1 General                                                      | 4           |
| <b>3. MEASURING INSTRUMENT CALIBRATION</b>                       | <b>5</b>    |
| <b>4. TEST EQUIPMENT LIST</b>                                    | <b>6</b>    |
| <b>5. DESCRIPTION OF TESTS</b>                                   | <b>7</b>    |
| 5.1 Effective Radiated Power/Equivalent Isotropic Radiated Power | 7           |
| 5.2 Radiated Spurious & Harmonic Emission                        | 8           |
| 5.3 Occupied Bandwidth                                           | 10          |
| 5.4 Spurious and Harmonic Emissions at Antenna Terminal          | 10          |
| 5.4.1 Occupied Bandwidth Emission Limits                         | 10          |
| 5.4.2 Conducted Spurious Emission                                | 11          |
| 5.5 Frequency Stability / Temperature Variation                  | 12          |
| <b>6. TEST DATA</b>                                              | <b>13</b>   |
| 6.1 Effective Radiated Power(E.R.P.)                             | 13          |
| 6.2 Equivalent Isotropic Radiated Power(E.I.R.P.)                | 14          |
| 6.3 Cellular CDMA Radiated Spurious & Harmonic Measurement       | 15          |
| 6.4 PCS CDMA Radiated Spurious & Harmonic Measurement            | 16          |
| 6.5 CDMA Radiated Spurious & Harmonic Conversion Table           | 17          |
| 6.6 PCS Radiated Spurious & Harmonic Conversion Table            | 18          |
| 6.7 Frequency Stability                                          | 19          |
| 6.7.1 CDMA Frequency Stability Table                             | 19          |
| 6.7.2 PCS Frequency Stability Table                              | 20          |
| 6.7.3 CDMA Frequency Stability Graph                             | 21          |
| 6.7.4 PCS Frequency Stability Graph                              | 23          |
| <b>7.SAMPLE CALCULATION</b>                                      | <b>25</b>   |
| 7.1 <u>Emission Designator</u>                                   |             |
| <b>8. CONCLUSION</b>                                             | <b>26</b>   |
| <b>9. TEST PLOTS</b>                                             | <b>27</b>   |



# MEASUREMENT REPORT

## 1. FCC Certification Information

The following information is in accordance with FCC Rules, 47CFR Part2, Subpart J, Sections 2.1033 – 2.1055.

### 1.1 §2.1033 General Information

- Applicant Name: SAMSUNG ELECTRONICS CO., LTD.
- Address: 416 Maetan3-Dong, Yeongtong-gu, Suwon City  
Gyeonggi-Do, Korea 442-742
- Attention: SungJoo KIM, Engineering Manager (QA Lab)
- FCC ID: A3LSPHA420
- Quantity: Quantity production is planned
- Emission Designators: 40K0F8W, 40K0F1D (AMPS), 1M25F9W
- Tx Freq. Range: 824.04-848.97MHz (AMPS)  
824.70-848.31MHz (CDMA)  
1851.25-1908.75MHz (PCS CDMA)
- Rx Freq. Range: 869.04-893.97 MHz (AMPS)  
869.70-893.31 MHz (CDMA)  
1931.25-1988.75 MHz (PCS CDMA)
- Max. Power Rating: 0.146 W ERP AMPS( 21.63 dBm)  
0.116 W ERP CDMA( 20.65 dBm)  
0.272 W EIRP PCS CDMA ( 24.35 dBm)
- FCC Classification(s): Licensed Portable Tx Held to Ear (PCE)
- Equipment (EUT) Type: Tri-Mode Dual-Band Analog/PCS Phone(AMPS/CDMA)
- Modulation(s): AMPS/CDMA
- Frequency Tolerance:  $\pm 0.00025\%$  (2.5ppm)
- FCC Rule Part(s): §24(E), §22(H), §2.
- Dates of Test: December 22-23, 2005
- Place of Test: SAMSUNG Lab,
- Test Report S/N: FC-155-R1

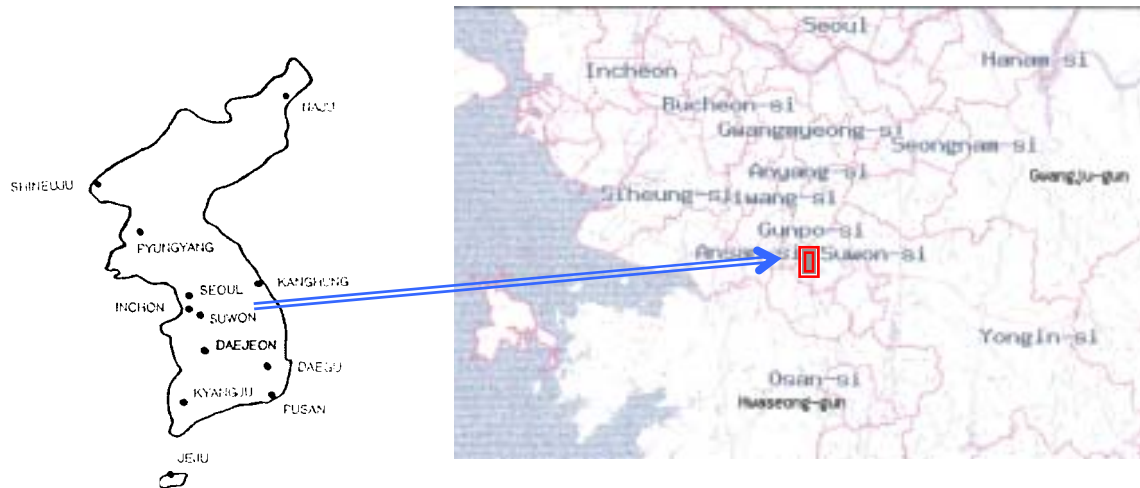
## 2. INTRODUCTION

### 2.1 General

These measurement test were conducted at **SAMSUNG ELECTRONICS CO., LTD(SUWON)**.

The site address is 416 Maetan3-Dong, Yeongtong-gu, Suwon City, Gyeonggi-Do, Korea 442-742

The site have 1 Fully-anechoic chamber and measurement facility.

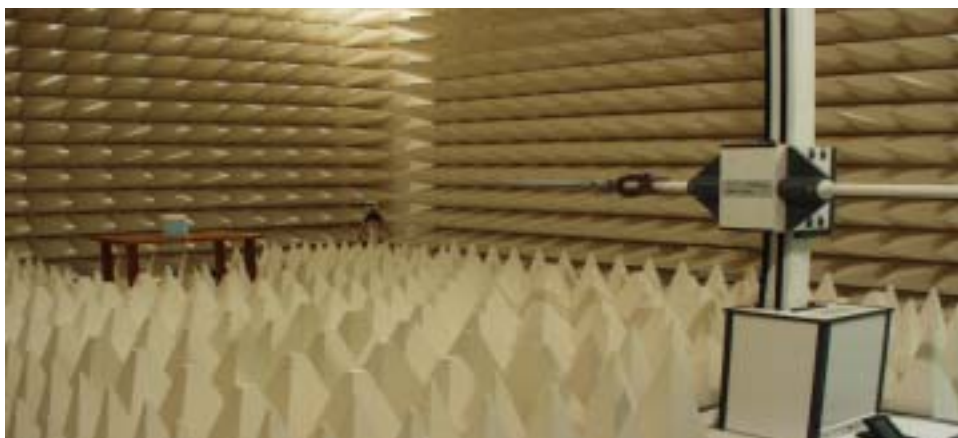


**Figure1. Map of the Suwon City area.**

### Measurement Procedure

The radiated and spurious measurements were made Fully-anechoic chamber at a 3-meter test range (see Figure2). The equipment under testing was placed on a wooden turntable 3-meters from the receive antenna. The receive antenna height and turntable rotations were adjusted for the highest reading on the receive spectrum analyzer. The substitution antenna will replace the EUT antenna it the same position and in vertical polarization. The frequency of the signal generator shall be set to the frequencies that were measured on the EUT. The test antenna shall be raised and lowered, if necessary, to ensure that the maximum signal is still being received. The signal generator, output level, shall be adjusted until an equal or a known related level to what was measured from the EUT is obtained in the spectrum analyzer. This level was recorded.

For readings above 1 GHz, 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.



**Figure2. Photograph of 3m Fully-Anechoic Chamber**

### **3. 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.

- End of page -

#### 4. TEST EQUIPMENT LIST

| Name of Equipment               | Model               | Serial No. | Due Date     |
|---------------------------------|---------------------|------------|--------------|
| Spectrum Analyzer               | ESI26               | 836119/010 | 2006-09-26   |
|                                 | E4440A(3Hz~26.5GHz) | MY41000236 | 2006-10-13   |
|                                 | E4440A(3Hz~26.5GHz) | MY41000233 | 2006-10-20   |
| Signal Generator                | SMIQ03B             | 83824/021  | 2005-12-27   |
|                                 | SMR20               | 835197/030 | 2006-01-18   |
| Power Meter                     | E4419B              | GB41293846 | 2006-09-07   |
| Power Sensor                    | 8481B               | 3318A10325 | 2006-09-08   |
|                                 | 8485A               | 3318A19924 | 2006-09-08   |
| Pre-Amplifier                   | 8449B               | 3008A00691 | 2006-01-11   |
| Communication test set          | 8960                | GB42230535 | 2006-10-20   |
|                                 | 8960                | GB42360886 | 2006-10-17   |
| Antenna Master                  | MA0001              | ANT0967    | Not Required |
| Controller                      | HD100               | 100/756    | Not Required |
| Environmental Chamber           | SH-241              | 92000548   | 2006-11-22   |
|                                 | SH-241              | 92000549   | 2006-11-22   |
| Horn Antenna                    | HF906               | 360306/011 | 2006-03-17   |
|                                 | HF906               | 100134     | 2006-04-25   |
| Dipole Antenna                  | 3121C-DB4           | 9007-588   | 2006-06-04   |
|                                 | 3121C-DB4           | 9007-587   | 2006-12-02   |
| Receive Antenna                 | HL040               | 353255/019 | 2006-08-24   |
|                                 | HL040               | 353255/020 | 2006-06-21   |
| Divider                         | 11636B              | 51941      | Not Required |
|                                 | 11636B              | 51942      | Not Required |
|                                 | 11636B              | 51946      | Not Required |
| High Pass Filter                | WHK1.0/15G-10SS     | 1          | Not Required |
|                                 | WHK1.0/15G-10SS     | 1          | Not Required |
|                                 | WHK/3.5/18G-10SS    | 3          | Not Required |
|                                 | WHK/3.5/18G-10SS    | 4          | Not Required |
| Shielded Fully Anechoic Chamber | RF0002              | ANT0001    | Not Required |

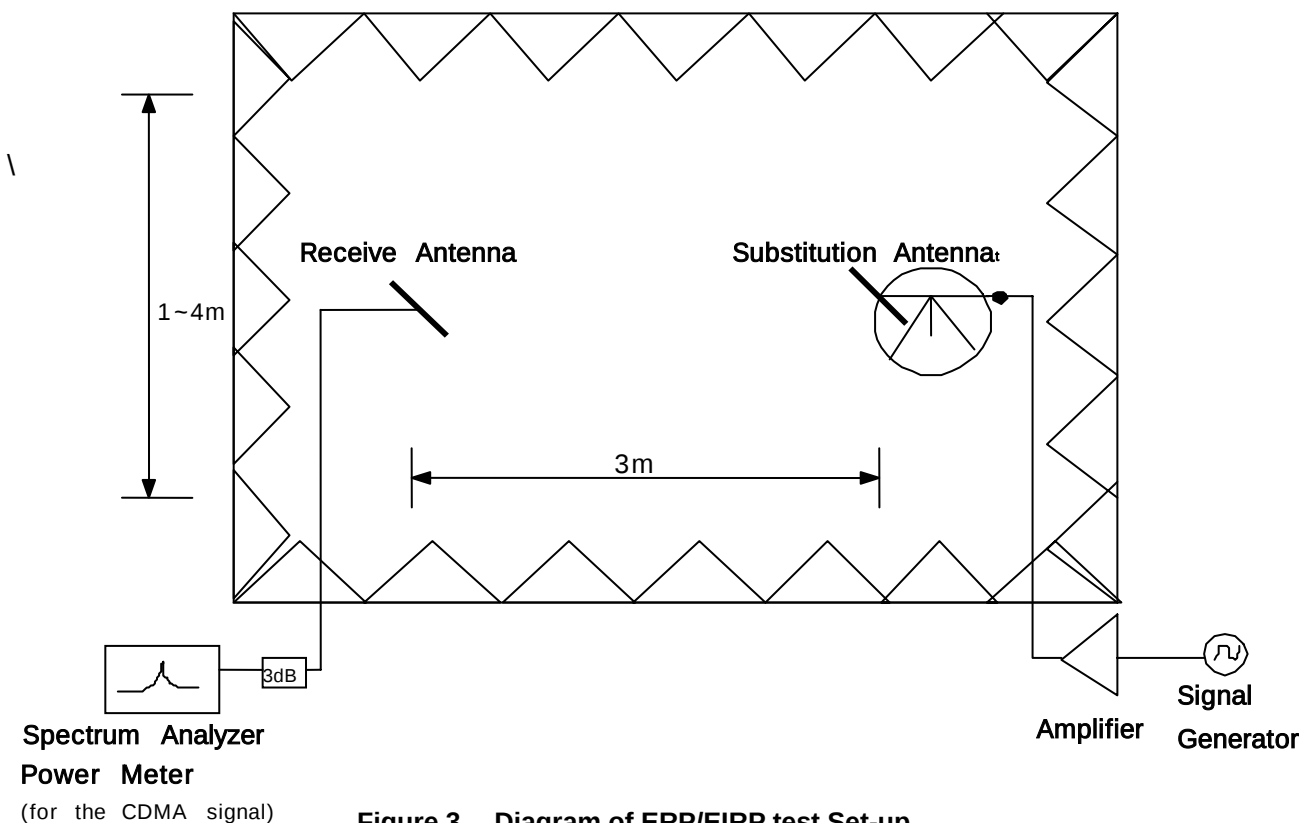
## 5. DESCRIPTION OF TESTS



### 5.1 Effective Radiated Power / Equivalent Isotropic Radiated Power

#### Test Set-up for the ERP/EIRP TEST

Effective Radiated Power Output and Equivalent Isotropic Radiated Power output Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001:

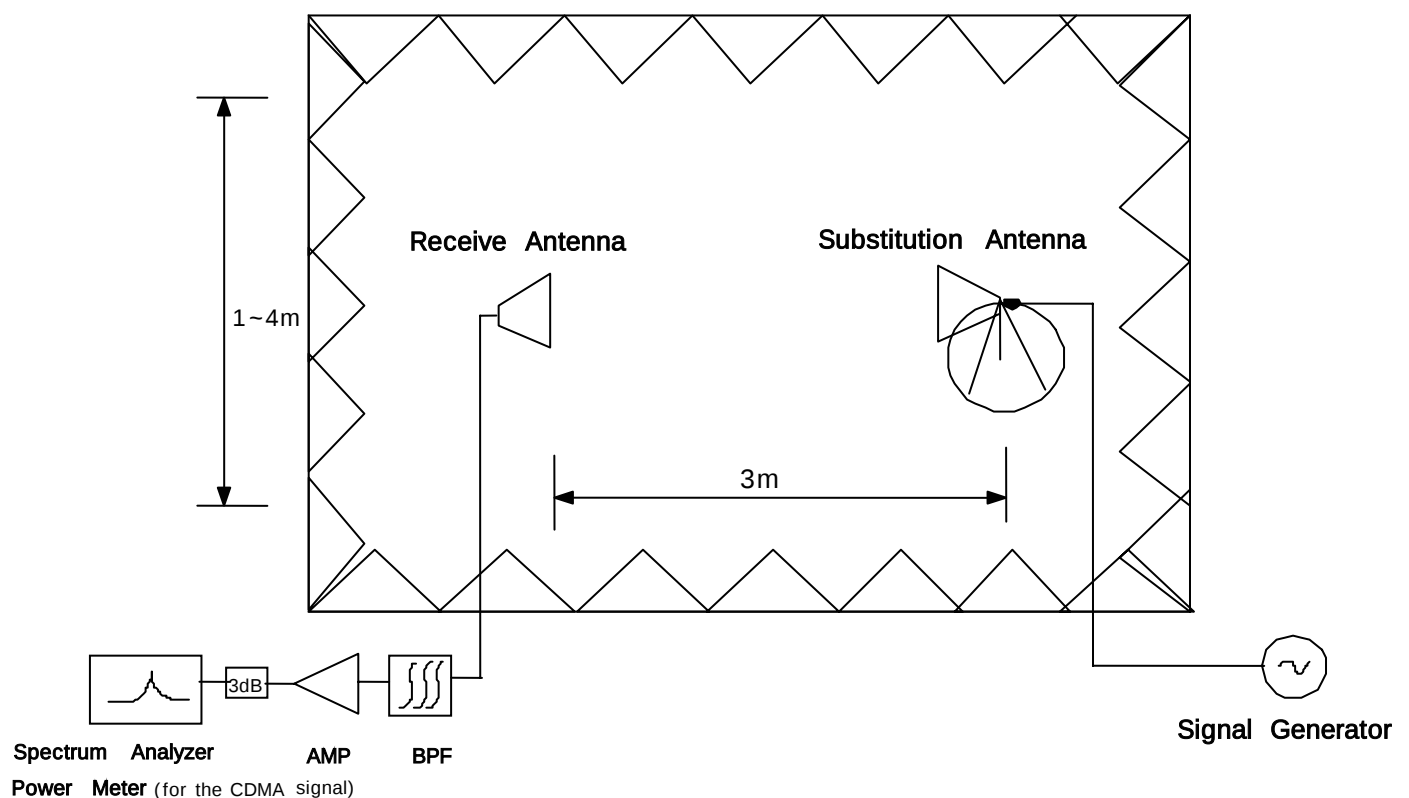


The EUT was placed on a Non-conducted turntable 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For CDMA & PCS signals, an average detector is used, with RBW=VBW=3MHz, SPAN=10MHz. A half-wave dipole 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 dipole is measured. The ERP is recorded.

## 5.2 Radiated Spurious & Harmonic Emission

### Test Set-up for the Radiated Emission TEST

Radiated Spurious Emission Measurements by Substitution Method according to ANSI/TIA/EIA-603-A-2001, Aug. 15, 2001



**Figure 4. Diagram of Radiated Spurious & Harmonic test Set-up**

The EUT was placed on a Non-conducted turntable 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. The Spectrum was investigated from 30MHz to the 10<sup>th</sup> Harmonic of the fundamental. A peak detector is used, with RBW=VBW=1MHz. The value that we could measure was only reported. 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. This spurious level is recorded. For readings above 1GHz, the above procedure is repeated using horn antennas and the difference between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

### **SAMPLE CALCULATION**

#### **Example: Channel 600 PCS Mode 2<sup>nd</sup> Harmonic(3760MHz)**

The receive analyzer reading at 3meters with the EUT on the turntable was  $-81.0\text{dBm}$ . The gain of the substituted antenna is  $8.1\text{dBi}$ . The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of  $-81.0\text{dBm}$  of the receive analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is  $2.0\text{dB}$  at 3760MHz. So  $6.1\text{dB}$  is added to the signal generator reading of  $-30.9\text{dBm}$  yielding  $-24.8\text{dBm}$ . The fundamental EIRP was  $25.5\text{dBm}$  so this harmonic was  $25.5\text{dBm} - (-24.8) = 50.3\text{dBc}$ .

- End of page -

### **5.3 Occupied Bandwidth**

#### **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 26dB below the transmitter power.

Plots of the EUT's occupied bandwidth are shown herein.

### **5.4 Spurious and Harmonic Emissions at Antenna Terminal**

#### **5.4.1 Occupied Bandwidth Emission Limits**

- (a) On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB.
- (b) Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.
- (c) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.
- (d) The measurement of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

- End of page -

| BLOCK | Freq. Range (MHz)<br>Transmitter (Tx) | Freq. Range (MHz)<br>Receiver (Rx) |
|-------|---------------------------------------|------------------------------------|
| A     | 1850 – 1865                           | 1930 – 1945                        |
| B     | 1870 – 1885                           | 1950 – 1965                        |
| C     | 1895 – 1910                           | 1975 – 1990                        |
| D     | 1865 – 1870                           | 1945 – 1950                        |
| E     | 1885 – 1890                           | 1965 – 1970                        |
| F     | 1890 – 1895                           | 1970 – 1975                        |

**Table 1. Broadband PCS Service Frequency Blocks**

| BLOCK      | Freq. Range (MHz)<br>Transmitter (Tx) | Freq. Range (MHz)<br>Receiver (Rx) |
|------------|---------------------------------------|------------------------------------|
| A* Low + A | 824 – 835                             | 869 – 880                          |
| B          | 835 – 845                             | 880 – 890                          |
| A* High    | 845 – 846.5                           | 890 – 891.5                        |
| B*         | 846.5 – 849                           | 891.5 – 894                        |

**Table 2. Cellular Service Frequency Blocks**

### 5.4.2 Conducted Spurious Emission

#### **Minimum standard:**

On any frequency outside a license frequency block, the power of any emission shall be attenuated below the transmitter power(P) by at least  $43+10\log(P)$  dB. Limit equivalent to  $-13$  dBm, calculation shown below.

$$43 + 10\log(0.116 \text{ W}) = 33.65 \text{ dB}$$

$$20.65 \text{ dBm} - 33.65 \text{ dB} = -13 \text{ dBm}$$

#### **Test Procedure:**

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 1MHz bands immediately outside and adjacent to the edge of the frequency block. The measurements are repeated for the EUT's highest channel. For the Out-of-Band measurements a 1MHz RBW was used to scan from 10MHz to 10GHz. (PCS Mode : 10MHz to 20GHz). 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.

Plots are shown herein.

## 5.5 Frequency Stability / Temperature Variation

The frequency stability of the transmitter is measured by:

- a.) Temperature: The temperature is carried from -30°C to +60°C using an environmental chamber.
- b.) Primary Supply Voltage: The primary supply voltage is varied from 85% 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  $\pm 0.00025$  ( $\pm 2.5$ ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter and the individual oscillators is measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
3. After the overnight "soak" at -30°C (Usually 14~16 hours), 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 and the individual oscillators is made within a three minute interval after applying to the transmitter.
4. Frequency measurements are made at 10°C interval up to room temperature. At least a period of one and one half-hour is provided to allow stabilization of the equipment at each temperature level.
5. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
6. Frequency measurements are at 10 intervals starting at -30°C up to +60°C allowing at least two hours at each temperature for stabilization. In all measurements the frequency is measured within three minutes after re-applying power to the transmitter.
7. The artificial load is mounted external to the temperature chamber.

NOTE : The EUT is tested down to the battery endpoint.

- End of page -

## 6. TEST DATA

### 6.1 Effective Radiated Power(E.R.P.)

Supply Voltage : 3.7VDC

Modulation : CDMA

#### ■ Reference level

| Frequency (MHz) | Output (dBm) | Polarization | P/M (dBm) | Ant gain (dBd) | Ref level (dBm) |
|-----------------|--------------|--------------|-----------|----------------|-----------------|
| 824.70          | 22.00        | H            | -16.46    | 0.00           | -16.46          |
|                 |              | V            | -16.42    | 0.00           | -16.42          |
| 836.52          | 22.00        | H            | -16.46    | 0.00           | -16.46          |
|                 |              | V            | -16.42    | 0.00           | -16.42          |
| 848.31          | 22.00        | H            | -16.46    | 0.00           | -16.46          |
|                 |              | V            | -16.42    | 0.00           | -16.42          |

#### ■ Result

| Frequency (MHz) | From EUT Tested level (dBm) | Polarization (H/V) | Azimuth (angle) | ERP (dBm) | ERP (W) | Battery  |
|-----------------|-----------------------------|--------------------|-----------------|-----------|---------|----------|
| 824.70          | -18.87                      | H1                 | 176             | 19.59     | 0.091   | Standard |
| 836.52          | -18.55                      | H2                 | 176             | 19.91     | 0.098   | Standard |
| 848.31          | -17.81                      | H2                 | 173             | 20.65     | 0.116   | Standard |

NOTE : Standard batteries are the only battery options for this phone

Radiated measurements at 3 meters by Substitution Method



## 6.2 Equivalent Isotropic Radiated Power(E.I.R.P.)

Supply Voltage : 3.7VDC

Modulation : PCS

### ■ Reference level

| Frequency (MHz) | Output (dBm) | Polarization | P/M (dBm) | Ant gain (dBi) | Ref level (dBm) |
|-----------------|--------------|--------------|-----------|----------------|-----------------|
| 1851.25         | 24.00        | H            | -17.06    | 8.42           | -25.48          |
|                 |              | V            | -17.38    | 8.42           | -25.80          |
| 1880.00         | 24.00        | H            | -17.29    | 8.25           | -25.54          |
|                 |              | V            | -17.27    | 8.25           | -25.52          |
| 1908.75         | 24.50        | H            | -16.65    | 8.40           | -25.05          |
|                 |              | V            | -16.62    | 8.40           | -25.02          |

### ■ Result

| Frequency (MHz) | From EUT Tested level (dBm) | Polarization (H/V) | Azimuth (angle) | EIRP (dBm) | EIRP (W) | Battery  |
|-----------------|-----------------------------|--------------------|-----------------|------------|----------|----------|
| 1851.25         | -26.28                      | H2                 | 111             | 23.20      | 0.209    | Standard |
| 1880.00         | -25.86                      | H2                 | 18              | 23.68      | 0.233    | Standard |
| 1908.75         | -25.20                      | H2                 | 18              | 24.35      | 0.272    | Standard |

NOTE : Standard batteries are the only battery options for this phone

**Radiated measurements at 3 meters by Substitution Method**

## 6.3 Cellular CDMA Radiated Spurious & Harmonic measurement

### Field Strength of SPURIOUS Radiation

Operating Frequency : 824.70 MHz(Low), 836.52MHz(Middle), 848.31MHz(High)

Measured Output Power : 20.65 dBm = 0.116 W

Modulation Signal : CDMA

$$\text{Limit : } 43 + 10\log_{10}(P) = 33.65 \text{ dBc}$$

#### ■ Result

| Channel | Harmonic | Frequency (MHz) | From EUT Tested level (dBm) | POL (H/V) | Result (dBc) |
|---------|----------|-----------------|-----------------------------|-----------|--------------|
| 1013    | 2        | 1649.40         | -51.84                      | H1        | 60.35        |
|         | 3        | 2474.10         | -58.96                      | H1        | 62.76        |
|         | 4        | 3298.80         | -63.74                      | H1        | 64.48        |
|         | 5        | 4123.50         | -67.21                      | H1        | 63.65        |
|         | 6        | 4948.20         | -                           | -         | -            |
|         | 7        | 5772.90         | -                           | -         | -            |
| 384     | 2        | 1673.04         | -50.73                      | H2        | 59.15        |
|         | 3        | 2509.56         | -59.35                      | H1        | 62.61        |
|         | 4        | 3346.08         | -64.45                      | H1        | 65.21        |
|         | 5        | 4182.68         | -68.05                      | H1        | 63.70        |
|         | 6        | 5019.12         | -                           | -         | -            |
|         | 7        | 5855.64         | -                           | -         | -            |
| 777     | 2        | 1696.62         | -51.49                      | H2        | 58.06        |
|         | 3        | 2544.93         | -45.76                      | H1        | 48.65        |
|         | 4        | 3393.24         | -66.14                      | V         | 65.54        |
|         | 5        | 4241.55         | -68.35                      | V         | 64.55        |
|         | 6        | 5089.86         | -                           | -         | -            |
|         | 7        | 5938.17         | -                           | -         | -            |

### Radiated Spurious Emission measurements at 3 meters by Substitution Method

## 6.4 PCS CDMA Radiated Spurious & Harmonic measurement

### Field Strength of SPURIOUS Radiation

Operating Frequency : 1851.25 MHz(Low), 1880.00 MHz(Middle), 1908.75MHz(High)

Measured Output Power : 24.35 dBm = 0.272 W

Modulation Signal : PCS

**Limit :  $43 + 10\log_{10}(P) = 37.35$  dBc**

#### ■ Result

| Channel | Harmonic | Frequency (MHz) | From EUT Tested level (dBm) | POL (H/V) | Result (dBc) |
|---------|----------|-----------------|-----------------------------|-----------|--------------|
| 25      | 2        | 3702.50         | -45.94                      | H2        | 43.82        |
|         | 3        | 5553.75         | -49.05                      | H2        | 42.53        |
|         | 4        | 7405.55         | -65.67                      | H2        | 54.77        |
|         | 5        | 9256.25         | -67.98                      | H1        | 53.88        |
|         | 6        | 11107.50        | -                           | -         | -            |
|         | 7        | 12958.75        | -                           | -         | -            |
| 600     | 2        | 3760.00         | -45.85                      | V         | 43.29        |
|         | 3        | 5640.00         | -52.99                      | V         | 46.52        |
|         | 4        | 7520.00         | -69.15                      | H2        | 58.71        |
|         | 5        | 9400.00         | -68.86                      | V         | 55.35        |
|         | 6        | 11280.00        | -                           | -         | -            |
|         | 7        | 13160.00        | -                           | -         | -            |
| 1175    | 2        | 3817.50         | -43.31                      | V         | 39.81        |
|         | 3        | 5726.25         | -56.49                      | V         | 49.59        |
|         | 4        | 7635.00         | -68.74                      | H2        | 58.00        |
|         | 5        | 9543.75         | -                           | -         | -            |
|         | 6        | 11452.50        | -                           | -         | -            |
|         | 7        | 13361.25        | -                           | -         | -            |

### Radiated Spurious Emission measurements at 3 meters by Substitution Method

## 6.5 CDMA Radiated Spurious & Harmonic Conversion Table

Date : 2005 . 12. 22~12.23

Test Engineer : WT JANG

Tx Cable loss  
 Tx Horn Ant Gain  
 Rx Cable loss + HPF Insertion loss + Attenuator  
 Pre-Amp gain  
 Air loss  
 Tested Level from EUT  
 = + + -  
 = ERP +2.14 -

| CH   | Har | Frequency (MHz) | Tx CL (dB) | Horn Gain (dB) | Tx Level @ (S/G 0dBm) | Tested Level EUT : H (dBm) | Tested Level EUT : V (dBm) | Amplitude of Emission EUT : H (dBm) | Amplitude of Emission EUT : V (dBm) | Result EUT : H (dBc) | Result EUT : V (dBc) |
|------|-----|-----------------|------------|----------------|-----------------------|----------------------------|----------------------------|-------------------------------------|-------------------------------------|----------------------|----------------------|
| 1013 | 2   | 1649.40         | 7.07       | 8.03           | 0.96                  | -51.84                     | -55.79                     | -37.56                              | -41.60                              | 60.35                | 64.39                |
|      | 3   | 2474.10         | 9.20       | 9.55           | 0.35                  | -58.96                     | -63.23                     | -39.97                              | -43.77                              | 62.76                | 66.56                |
|      | 4   | 3298.80         | 11.23      | 9.64           | -1.59                 | -63.74                     | -66.52                     | -41.89                              | -43.19                              | 64.68                | 65.98                |
|      | 5   | 4123.50         | 13.26      | 10.67          | -2.59                 | -67.21                     | -68.47                     | -40.86                              | -42.17                              | 63.65                | 64.96                |
|      | 6   | 4948.20         | 14.66      | 11.05          | -3.61                 | -                          | -                          | -                                   | -                                   | -                    | -                    |
|      | 7   | 5772.90         | 15.95      | 11.23          | -4.72                 | -                          | -                          | -                                   | -                                   | -                    | -                    |
| 384  | 2   | 1673.04         | 7.22       | 8.03           | 0.81                  | -50.73                     | -56.77                     | -36.36                              | -42.04                              | 59.15                | 64.83                |
|      | 3   | 2509.56         | 9.45       | 9.55           | 0.10                  | -59.35                     | -63.89                     | -39.82                              | -43.60                              | 62.61                | 66.39                |
|      | 4   | 3346.08         | 11.19      | 9.64           | -1.55                 | -64.45                     | -66.74                     | -42.42                              | -43.03                              | 65.21                | 65.82                |
|      | 5   | 4182.68         | 13.56      | 10.67          | -2.89                 | -68.05                     | -68.73                     | -40.91                              | -41.84                              | 63.70                | 64.63                |
|      | 6   | 5019.12         | 14.87      | 11.05          | -3.82                 | -                          | -                          | -                                   | -                                   | -                    | -                    |
|      | 7   | 5855.64         | 16.31      | 11.23          | -5.08                 | -                          | -                          | -                                   | -                                   | -                    | -                    |
| 777  | 2   | 1696.62         | 7.27       | 8.03           | 0.76                  | -51.49                     | -55.35                     | -35.27                              | -39.24                              | 58.06                | 62.03                |
|      | 3   | 2544.93         | 9.61       | 9.55           | -0.06                 | -45.76                     | -62.88                     | -25.86                              | -42.38                              | 48.65                | 65.17                |
|      | 4   | 3393.24         | 11.31      | 9.64           | -1.67                 | -66.58                     | -66.14                     | -44.54                              | -42.75                              | 67.33                | 65.54                |
|      | 5   | 4241.55         | 14.23      | 10.67          | -3.56                 | -68.52                     | -68.35                     | -42.63                              | -41.76                              | 65.42                | 64.55                |
|      | 6   | 5089.86         | 15.09      | 11.05          | -4.04                 | -                          | -                          | -                                   | -                                   | -                    | -                    |
|      | 7   | 5938.17         | 17.05      | 11.23          | -5.82                 | -                          | -                          | -                                   | -                                   | -                    | -                    |

## 6.6 PCS Radiated Spurious & Harmonic Conversion Table

Date : 2005 . 12. 22~12.23

Test Engineer : WT JANG

Tx Cable loss  
Tx Horn Ant Gain  
Rx Cable loss + HPF Insertion loss + Attenuator  
Pre-Amp gain  
Air loss  
Tested Level from EUT  
= + + -  
= EIRP -

| CH   | Har | Frequency (MHz) | Tx CL (dB) | Horn Gain (dB) | Tx Level @ (S/G 10dBm) | Tested Level EUT : H (dBm) | Tested Level EUT : V (dBm) | Amplitude of Emission EUT : H (dBm) | Amplitude of Emission EUT : V (dBm) | Result EUT : H (dBc) | Result EUT : V (dBc) |
|------|-----|-----------------|------------|----------------|------------------------|----------------------------|----------------------------|-------------------------------------|-------------------------------------|----------------------|----------------------|
| 25   | 2   | 3702.50         | 11.95      | 9.73           | 7.78                   | -45.94                     | -49.94                     | -19.47                              | -22.68                              | 43.82                | 47.03                |
|      | 3   | 5553.75         | 15.96      | 11.15          | 5.19                   | -49.05                     | -53.52                     | -18.18                              | -22.51                              | 42.53                | 46.86                |
|      | 4   | 7405.00         | 19.61      | 11.44          | 1.83                   | -65.67                     | -68.02                     | -30.42                              | -34.46                              | 54.77                | 58.81                |
|      | 5   | 9256.25         | 23.09      | 12.17          | -0.92                  | -67.98                     | -69.36                     | -29.53                              | -31.10                              | 53.88                | 55.45                |
|      | 6   | 11107.50        | 26.95      | 13.66          | -3.29                  | -                          | -                          | -                                   | -                                   | -                    | -                    |
|      | 7   | 12958.75        | 32.64      | 13.27          | -9.37                  | -                          | -                          | -                                   | -                                   | -                    | -                    |
| 600  | 2   | 3760.00         | 11.99      | 9.73           | 7.74                   | -46.42                     | -45.85                     | -21.13                              | -18.94                              | 45.48                | 43.29                |
|      | 3   | 5640.00         | 15.83      | 11.15          | 5.32                   | -54.92                     | -52.99                     | -24.57                              | -22.17                              | 48.92                | 46.52                |
|      | 4   | 7520.00         | 19.83      | 11.44          | 1.61                   | -69.15                     | -69.61                     | -34.36                              | -35.81                              | 58.71                | 60.16                |
|      | 5   | 9400.00         | 23.45      | 12.17          | -1.28                  | -69.83                     | -68.86                     | -32.13                              | -31.00                              | 56.48                | 55.35                |
|      | 6   | 11280.00        | 27.31      | 13.66          | -3.65                  | -                          | -                          | -                                   | -                                   | -                    | -                    |
|      | 7   | 13160.00        | 33.13      | 13.27          | -9.86                  | -                          | -                          | -                                   | -                                   | -                    | -                    |
| 1175 | 2   | 3817.50         | 12.36      | 9.73           | 7.37                   | -41.98                     | -43.31                     | -15.87                              | -15.46                              | 40.22                | 39.81                |
|      | 3   | 5726.25         | 15.99      | 11.15          | 5.16                   | -56.86                     | -56.49                     | -26.02                              | -25.24                              | 50.37                | 49.59                |
|      | 4   | 7635.00         | 20.10      | 11.44          | 1.34                   | -68.74                     | -69.71                     | -33.65                              | -35.34                              | 58.00                | 59.69                |
|      | 5   | 9543.75         | 23.59      | 12.17          | -1.42                  | -                          | -                          | -                                   | -                                   | -                    | -                    |
|      | 6   | 11452.50        | 27.37      | 13.66          | -3.71                  | -                          | -                          | -                                   | -                                   | -                    | -                    |
|      | 7   | 13361.25        | 33.63      | 13.27          | -10.36                 | -                          | -                          | -                                   | -                                   | -                    | -                    |

## 6.7 Frequency Stability

### 6.7.1 CDMA Frequency Stability Table

Operating Frequency : 836,520,000 Hz

Channel : 384

Reference Voltage : 3.7VDC

**Deviation Limit :  $\pm 0.00025$  % or 2.5ppm**

| Voltage (%)   | Power (VDC) | Temp. (°C) | Frequency Error (Hz) | Frequency (Hz) | Deviation (%) | ppm    |
|---------------|-------------|------------|----------------------|----------------|---------------|--------|
| 100%          | 3.70        | +20(Ref)   | 12.94                | 836,520,013    | 0.000002      | 0.015  |
| 100%          |             | -30        | -41.29               | 836,519,959    | -0.000005     | -0.049 |
| 100%          |             | -20        | 36.24                | 836,520,036    | 0.000004      | 0.043  |
| 100%          |             | -10        | 21.19                | 836,520,021    | 0.000003      | 0.025  |
| 100%          |             | 0          | -11.27               | 836,519,989    | -0.000001     | -0.013 |
| 100%          |             | +10        | 16.64                | 836,520,017    | 0.000002      | 0.020  |
| 100%          |             | +20        | 12.94                | 836,520,013    | 0.000002      | 0.015  |
| 100%          |             | +30        | 21.64                | 836,520,022    | 0.000003      | 0.026  |
| 100%          |             | +40        | 35.12                | 836,520,035    | 0.000004      | 0.042  |
| 100%          |             | +50        | -17.71               | 836,519,982    | -0.000002     | -0.021 |
| 100%          |             | +60        | -19.24               | 836,519,981    | -0.000002     | -0.023 |
| 85%           | 3.21        | +20        | -41.11               | 836,519,959    | -0.000005     | -0.049 |
| 115%          | 4.26        | +20        | 21.24                | 836,520,021    | 0.000003      | 0.025  |
| Batt.Endpoint | 3.21        | +20        | -41.11               | 835,889,959    | -0.000005     | -0.049 |

**Note : The temperature is varied from -30 °C to +60 °C using an environmental chamber.**

**The EUT is tested down to the battery end point**



## 6.7.2 PCS Frequency Stability Table

Operating Frequency : 1,880,000,000 Hz

Channel : 600

Reference Voltage : 3.7VDC

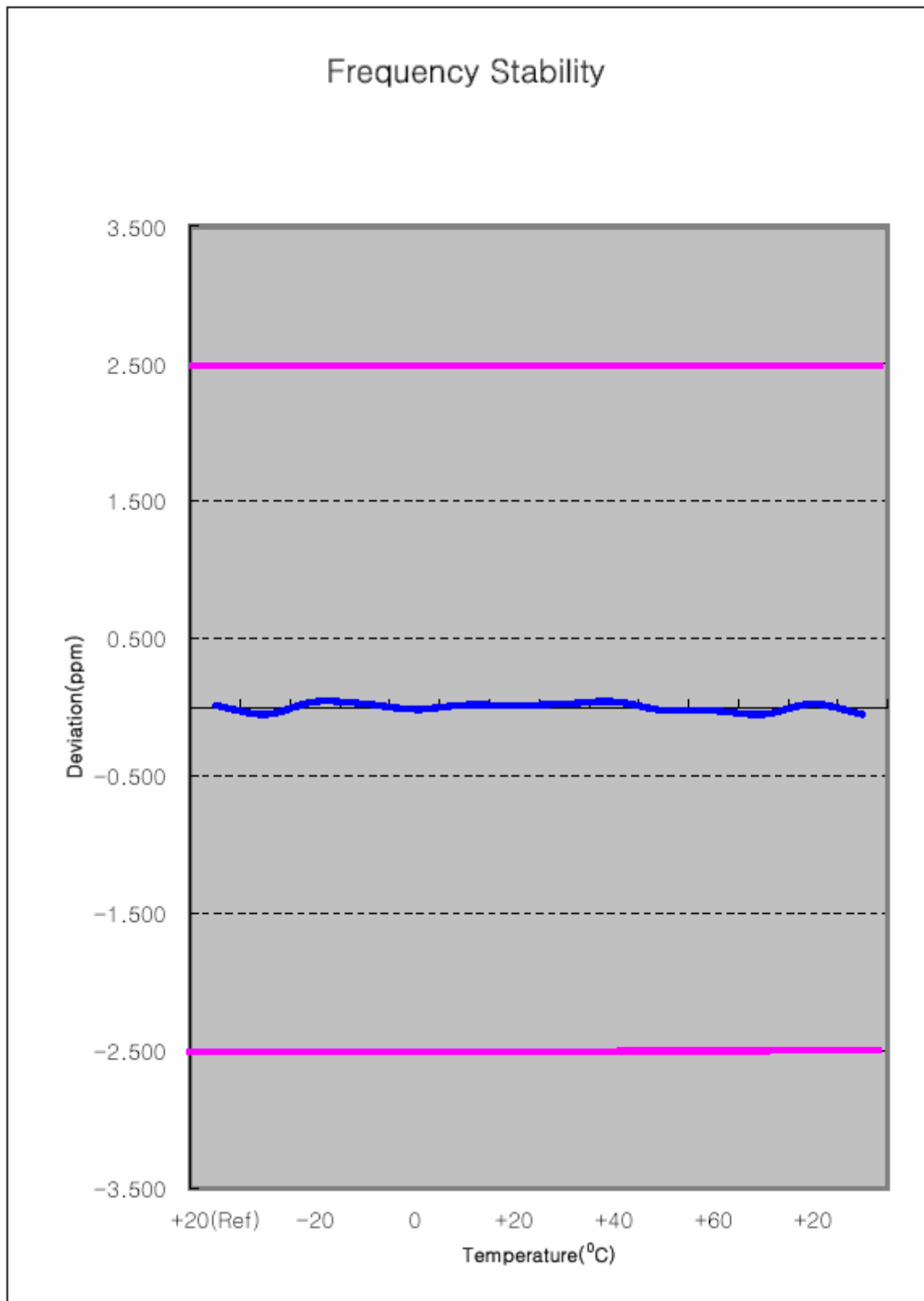
**Deviation Limit :  $\pm 0.00025$  % or 2.5ppm**

| Voltage (%)   | Power (VDC) | Temp. (°C) | Frequency Error (Hz) | Frequency (Hz) | Deviation (%) | ppm    |
|---------------|-------------|------------|----------------------|----------------|---------------|--------|
| 100%          | 3.70        | +20(Ref)   | 15.19                | 1,880,000,015  | 0.000001      | 0.008  |
| 100%          |             | -30        | -16.21               | 1,879,999,984  | -0.000001     | -0.009 |
| 100%          |             | -20        | 19.81                | 1,880,000,020  | 0.000001      | 0.011  |
| 100%          |             | -10        | 26.27                | 1,880,000,026  | 0.000001      | 0.014  |
| 100%          |             | 0          | -21.11               | 1,879,999,979  | -0.000001     | -0.011 |
| 100%          |             | +10        | 25.13                | 1,880,000,025  | 0.000001      | 0.013  |
| 100%          |             | +20        | 15.19                | 1,880,000,015  | 0.000001      | 0.008  |
| 100%          |             | +30        | -18.13               | 1,879,999,982  | -0.000001     | -0.010 |
| 100%          |             | +40        | -17.76               | 1,879,999,982  | -0.000001     | -0.009 |
| 100%          |             | +50        | -16.21               | 1,879,999,984  | -0.000001     | -0.009 |
| 100%          |             | +60        | 31.24                | 1,880,000,031  | 0.000002      | 0.017  |
| 85%           | 3.21        | +20        | -31.11               | 1,879,999,969  | -0.000002     | -0.017 |
| 115%          | 4.26        | +20        | 26.29                | 1,880,000,026  | 0.000001      | 0.014  |
| Batt.Endpoint | 3.21        | +20        | -31.11               | 1,879,999,969  | -0.000002     | -0.017 |

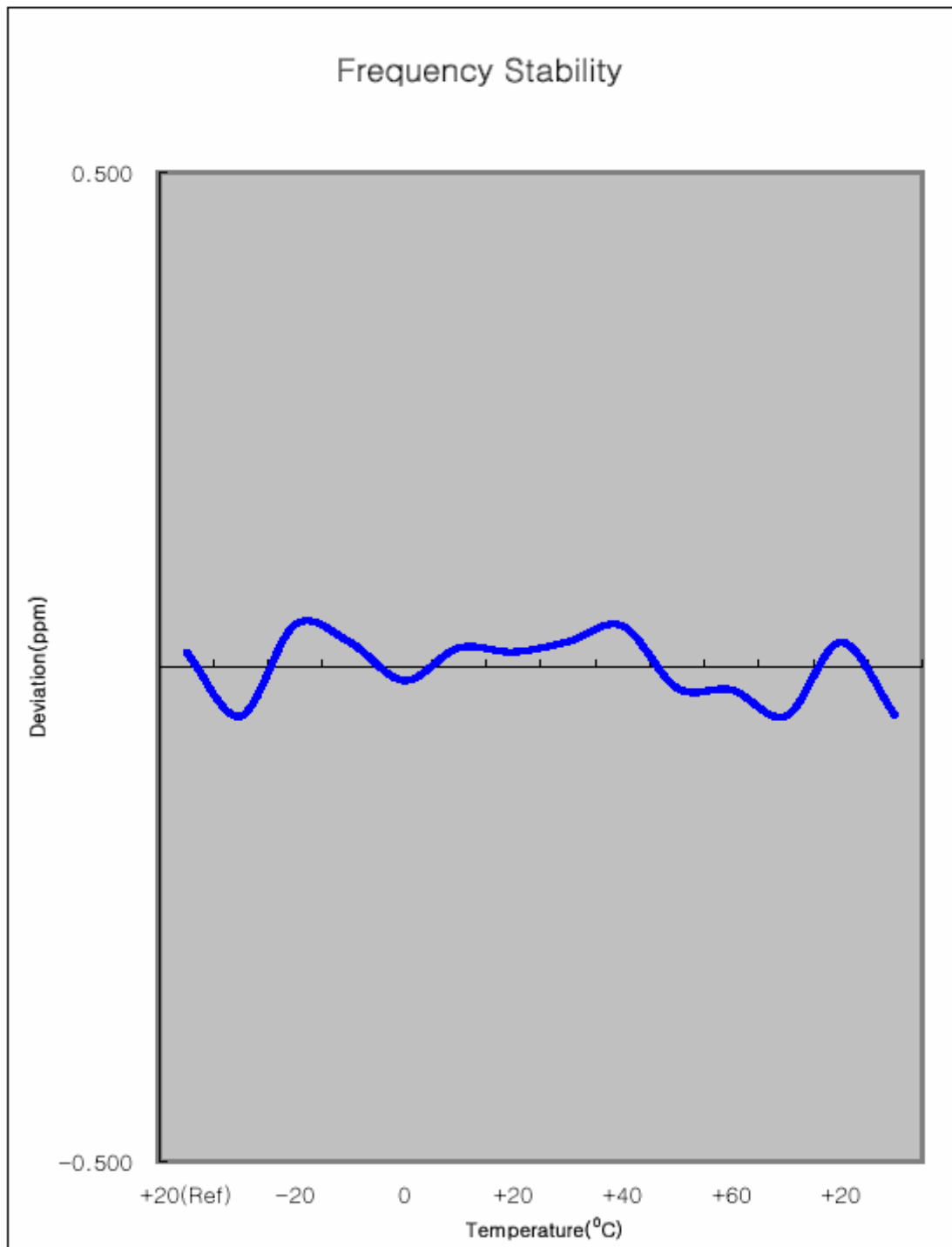
**Note : The temperature is varied from -30 °C to +60 °C using an environmental chamber.**

**The EUT is tested down to the battery end point**

### 6.7.3 CDMA Frequency Stability Graph

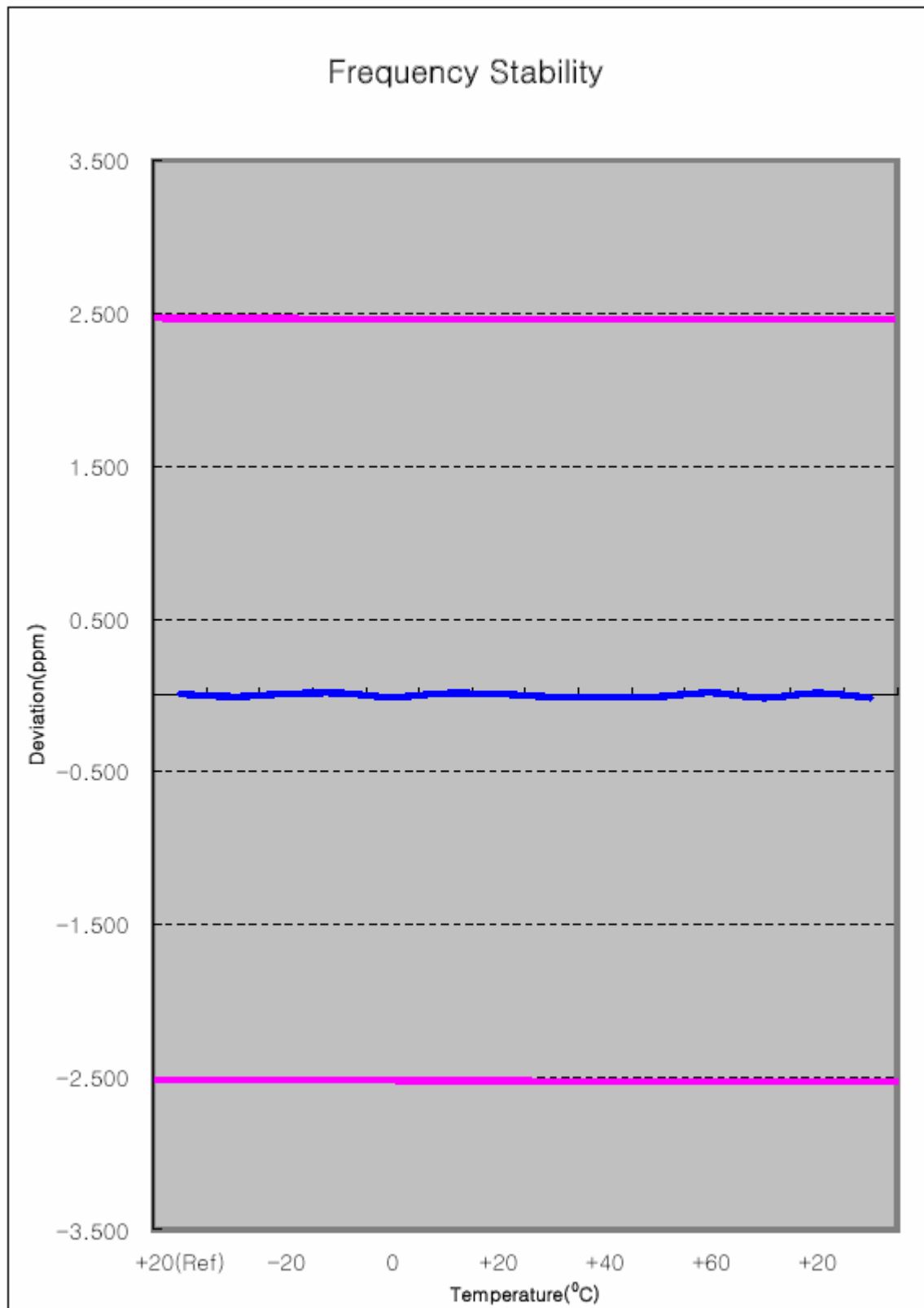


Zoom In



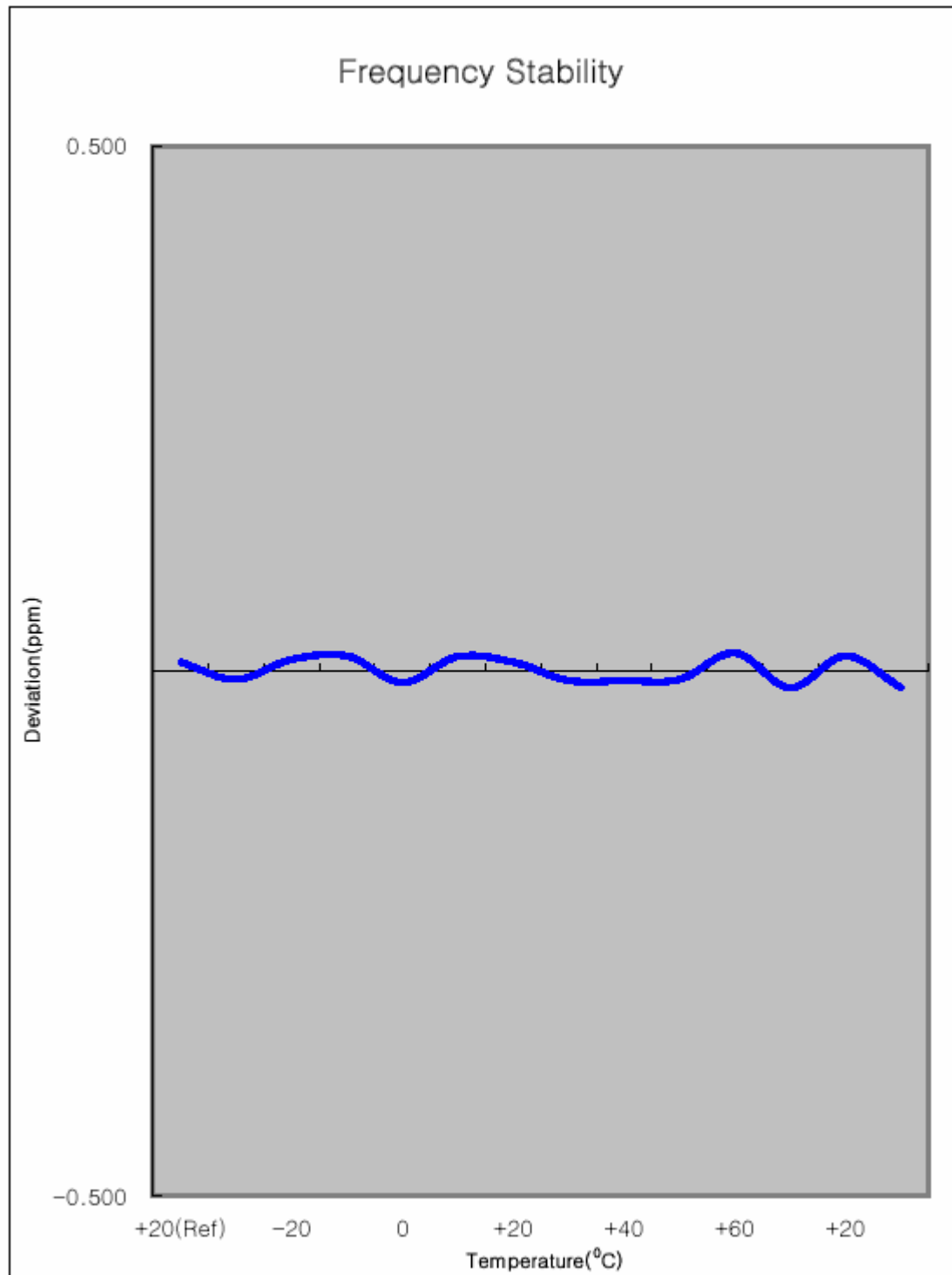
- End of page -

#### 6.7.4 PCS Frequency Stability Graph



- End of page -

Zoom In



- End of page -

## 7. SAMPLE CALCULATION

### 7.1 Emission Designator

Emission Designator = 1M25F9W

Calculation : 2M + 2DK

CDMA BW = 1.25MHz

F = Frequency Modulation

9 = Composite Digital Info

W = Combination(Audio/Data)

(Measured at the 99.75% power bandwidth)

- End of page -



## **8. CONCLUSION**

The data collected shows that the SAMSUNG Tri-Mode Dual-Band Analog/PCS Phone (AMPS/CDMA).

FCC ID : A3LSPHA420 complies with all the requirements of Parts 2,22,24 of the FCC Rules.

- End of page -

## 9. TEST PLOTS

- End of page -

Agilent

L

Freq/Channel

Ch Freq 824.7 MHz

Trig Free

Channel Power

Center Freq  
824.700000 MHzStart Freq  
823.200000 MHzStop Freq  
826.200000 MHzCF Step  
300.000000 kHz  
Auto ManFreq Offset  
0.00000000 HzSignal Track  
On Off

FCC ID:A3LSPHA420 Power Out Ch.1013

Ref 25 dBm

Atten 40 dB

#Avg

Log

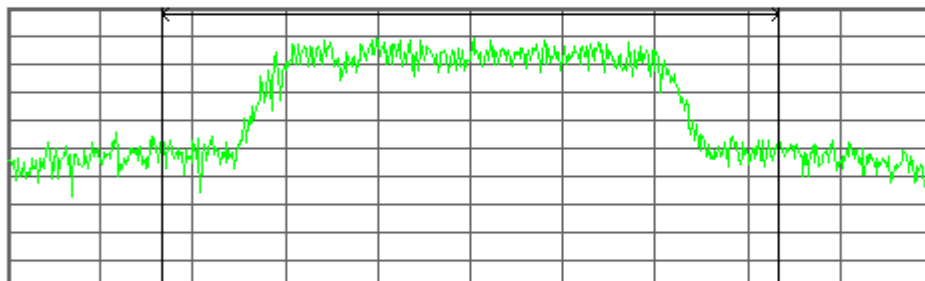
10

dB/

Offst

1.31

dB



Center 824.700 MHz

Span 3 MHz

#Res BW 30 kHz

VBW 300 kHz

#Sweep 20 ms (601 pts)

Channel Power

Power Spectral Density

24.96 dBm /2.0000 MHz

-38.05 dBm/Hz

Copyright 2000-2004 Agilent Technologies

Agilent

L

Freq/Channel

Ch Freq 836.52 MHz

Trig Free

Channel Power

Center Freq  
836.520000 MHzStart Freq  
835.020000 MHzStop Freq  
838.020000 MHzCF Step  
300.000000 kHz  
Auto ManFreq Offset  
0.00000000 HzSignal Track  
On Off

FCC ID:A3LSPHA420 Power Out Ch.0384

Ref 25 dBm

Atten 40 dB

#Avg

Log

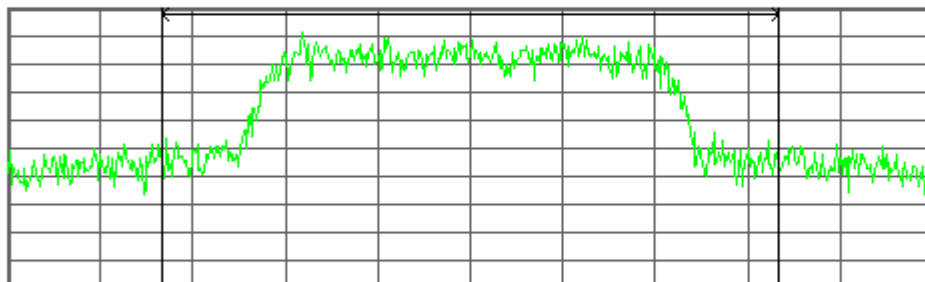
10

dB/

Offst

1.31

dB



Center 836.520 MHz

Span 3 MHz

#Res BW 30 kHz

#VBW 300 kHz

#Sweep 20 ms (601 pts)

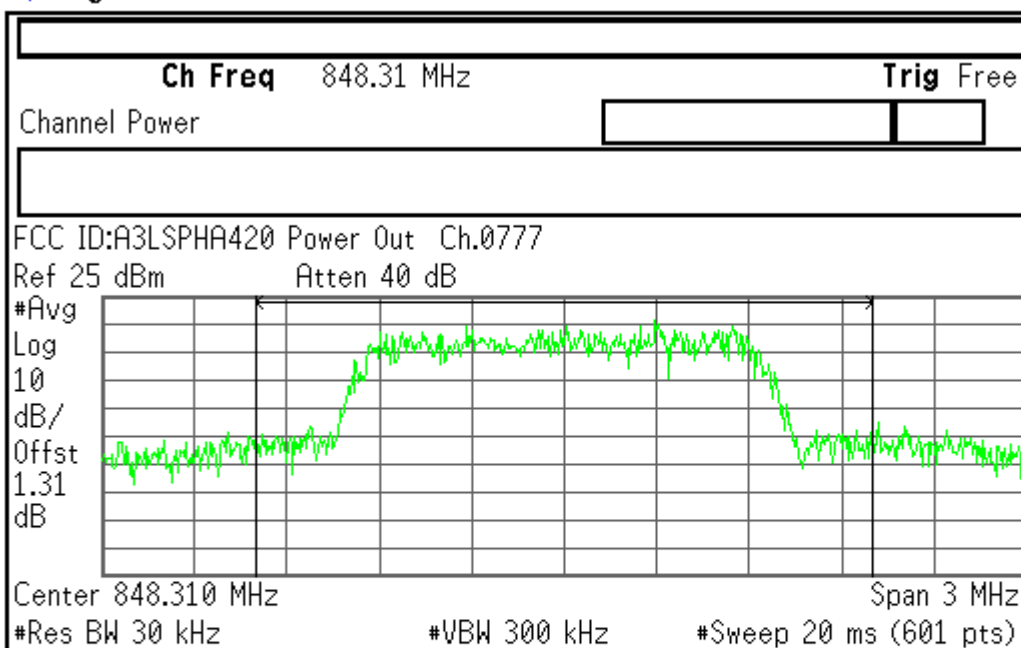
Channel Power

Power Spectral Density

24.92 dBm /2.0000 MHz

-38.09 dBm/Hz

Copyright 2000-2004 Agilent Technologies



**Channel Power**

25.00 dBm /2.0000 MHz

**Power Spectral Density**

-38.01 dBm/Hz

**Freq/Channel**

**Center Freq**  
848.310000 MHz

**Start Freq**  
846.810000 MHz

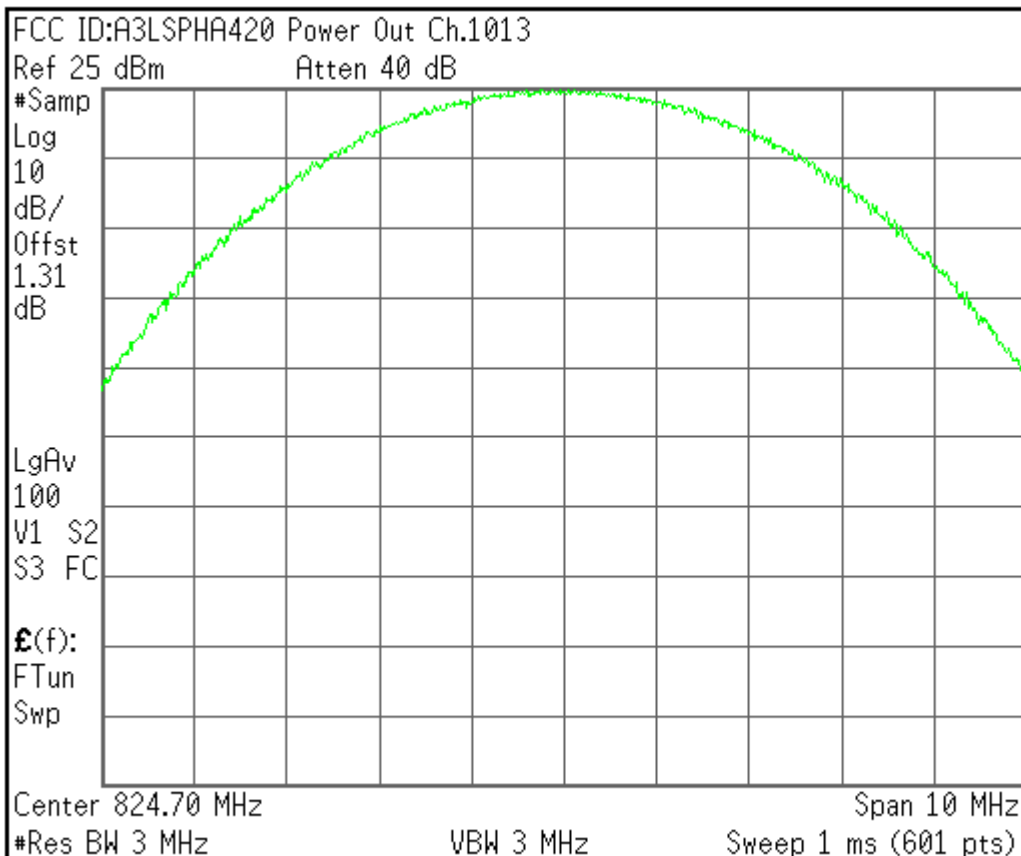
**Stop Freq**  
849.810000 MHz

**CF Step**  
300.000000 kHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

Copyright 2000-2004 Agilent Technologies



**Freq/Channel**

**Center Freq**  
824.700000 MHz

**Start Freq**  
819.700000 MHz

**Stop Freq**  
829.700000 MHz

**CF Step**  
1.00000000 MHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

Copyright 2000-2004 Agilent Technologies

FCC ID:A3LSPHA420 Powr Out Ch.0384

Ref 25 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

1.31

dB

LgAv

100

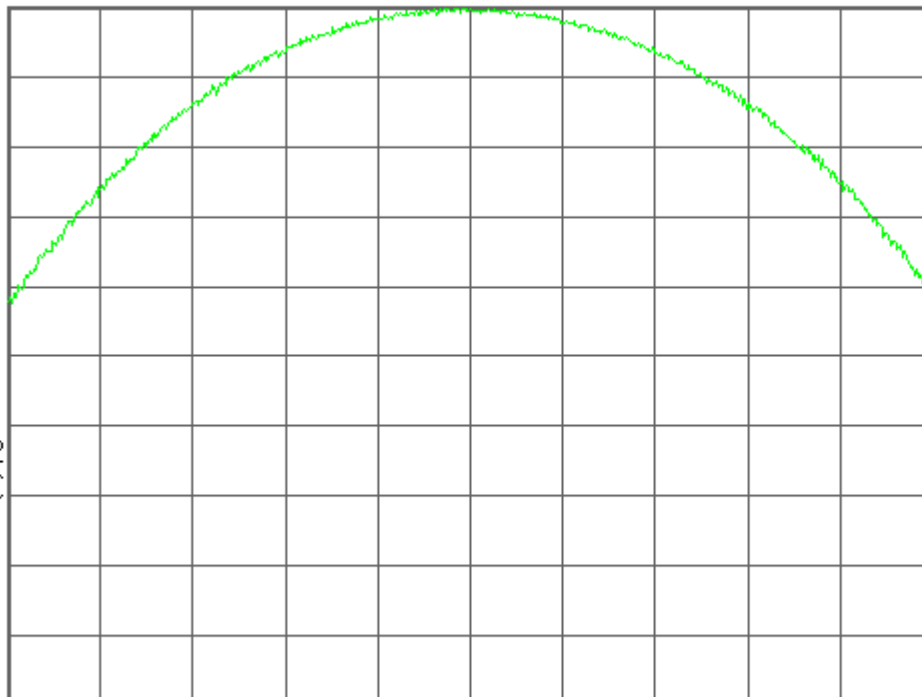
V1 S2

S3 FC

$\mathcal{E}(f)$ :

FTun

Swp



Center 836.52 MHz

Span 10 MHz

#Res BW 3 MHz

VBW 3 MHz

Sweep 1 ms (601 pts)

Center Freq

836.520000 MHz

Start Freq

831.520000 MHz

Stop Freq

841.520000 MHz

CF Step

1.00000000 MHz

Auto

Man

Freq Offset

0.00000000 Hz

Signal Track

On

Off

Copyright 2000-2004 Agilent Technologies

FCC ID:A3LSPHA420 Power Out Ch.0777

Ref 25 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

1.31

dB

LgAv

100

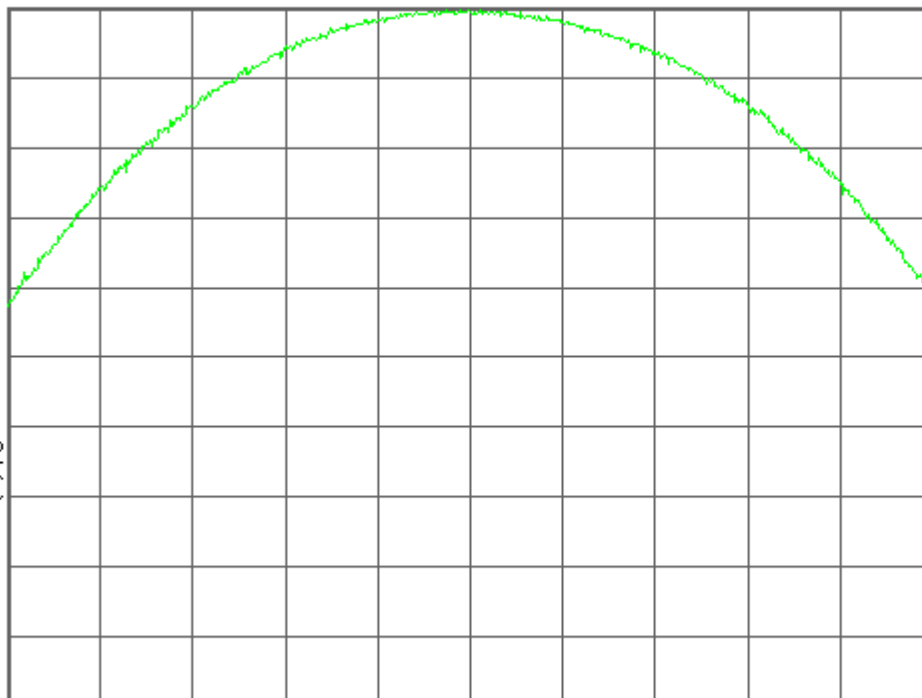
V1 S2

S3 FC

$\mathcal{E}(f)$ :

FTun

Swp



Center 848.31 MHz

Span 10 MHz

#Res BW 3 MHz

VBW 3 MHz

Sweep 1 ms (601 pts)

Center Freq

848.310000 MHz

Start Freq

843.310000 MHz

Stop Freq

853.310000 MHz

CF Step

1.00000000 MHz

Auto

Man

Freq Offset

0.00000000 Hz

Signal Track

On

Off

Copyright 2000-2004 Agilent Technologies

**Ch Freq** 824.7 MHz **Trig** Free

Occupied Bandwidth

**Center Freq**  
824.700000 MHz

**Start Freq**  
823.200000 MHz

**Stop Freq**  
826.200000 MHz

**CF Step**  
300.000000 kHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

FCC ID:A3LSPHA420 0BW Ch.1013

Ref 25 dBm Atten 40 dB

#Samp

Log

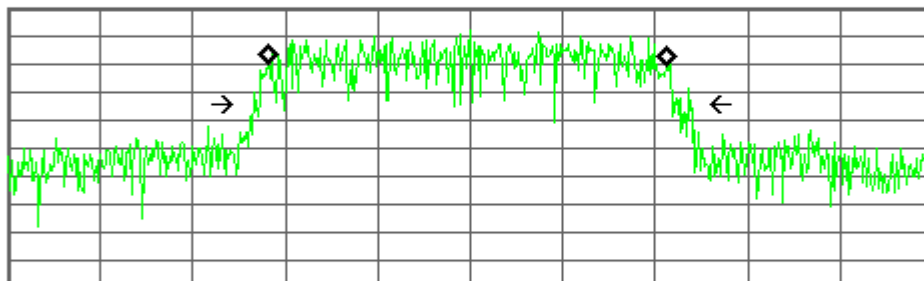
10

dB/

Offst

1.31

dB



Center 824.700 MHz

Span 3 MHz

#Res BW 30 kHz

#VBW 300 kHz

#Sweep 20 ms (601 pts)

**Occupied Bandwidth**

1.2892 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -9.410 kHz

**x dB Bandwidth** 1.420 MHz\*

Copyright 2000-2004 Agilent Technologies

**Ch Freq** 836.52 MHz **Trig** Free

Occupied Bandwidth

**Center Freq**  
836.520000 MHz

**Start Freq**  
835.020000 MHz

**Stop Freq**  
838.020000 MHz

**CF Step**  
300.000000 kHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

FCC ID:A3LSPHA420 0BW Ch.0384

Ref 25 dBm Atten 40 dB

#Samp

Log

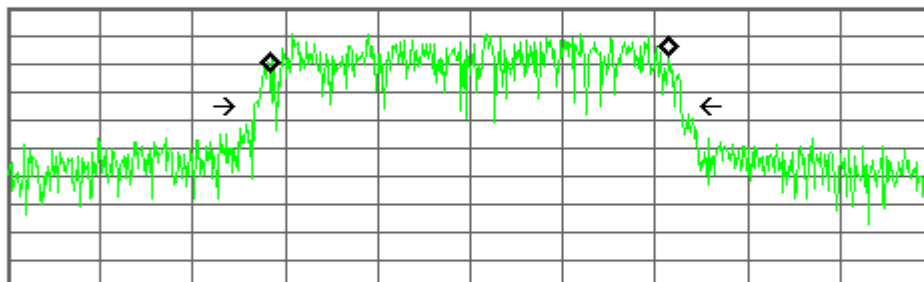
10

dB/

Offst

1.31

dB



Center 836.520 MHz

Span 3 MHz

#Res BW 30 kHz

#VBW 300 kHz

#Sweep 20 ms (601 pts)

**Occupied Bandwidth**

1.2968 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -4.074 kHz

**x dB Bandwidth** 1.386 MHz\*

Copyright 2000-2004 Agilent Technologies

Ch Freq 848.31 MHz Trig Free  
Occupied Bandwidth

Center Freq  
848.310000 MHz

Start Freq  
846.810000 MHz

Stop Freq  
849.810000 MHz

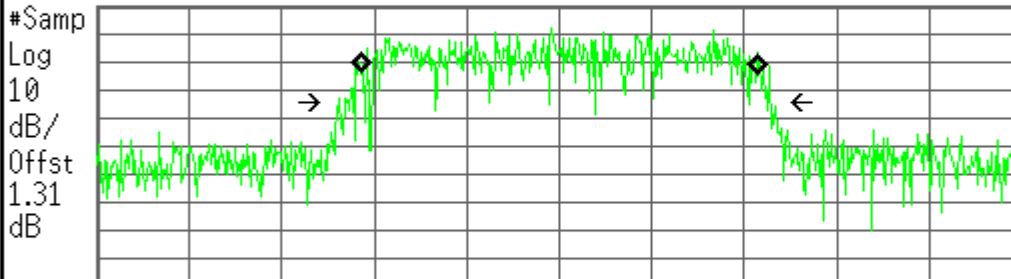
CF Step  
300.000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

Signal Track  
On Off

FCC ID:A3LSPHA420 0BW Ch.0777

Ref 25 dBm Atten 40 dB



Center 848.310 MHz Span 3 MHz  
#Res BW 30 kHz #VBW 300 kHz #Sweep 20 ms (601 pts)

Occupied Bandwidth 1.2895 MHz  
Occ BW % Pwr 99.00 %  
x dB -26.00 dB  
Transmit Freq Error -10.819 Hz  
x dB Bandwidth 1.407 MHz\*

Copyright 2000-2004 Agilent Technologies

FCC ID:A3LSPHA420 Rx Spurious Emission Mkr1 885.12 MHz  
Ref -50 dBm #Atten 0 dB -83.53 dBm

Center Freq  
881.500000 MHz

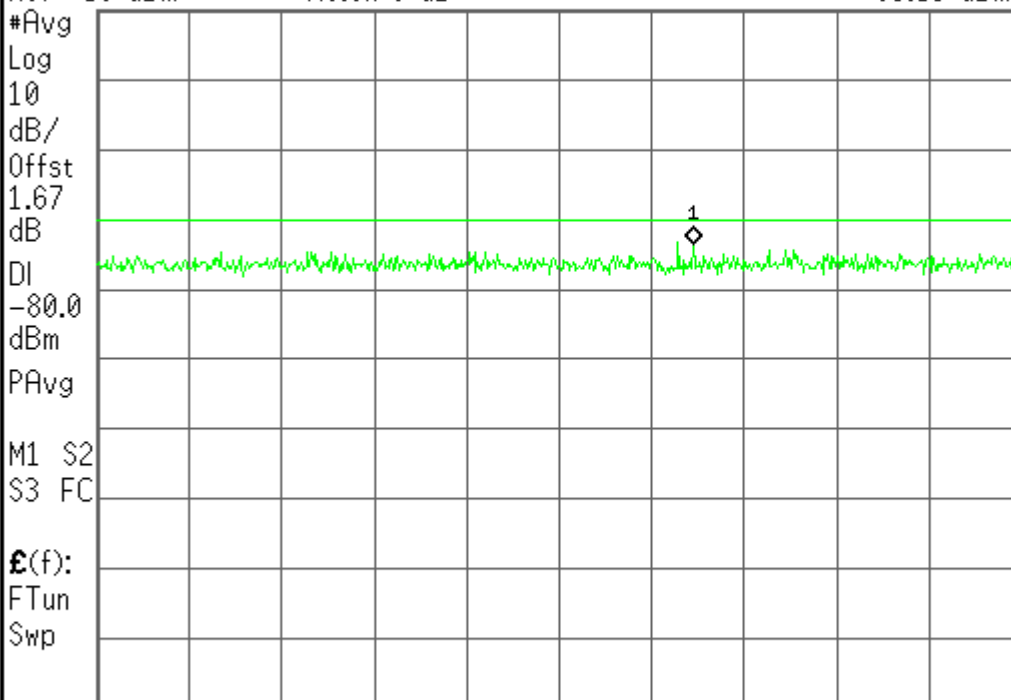
Start Freq  
869.000000 MHz

Stop Freq  
894.000000 MHz

CF Step  
2.50000000 MHz  
Auto Man

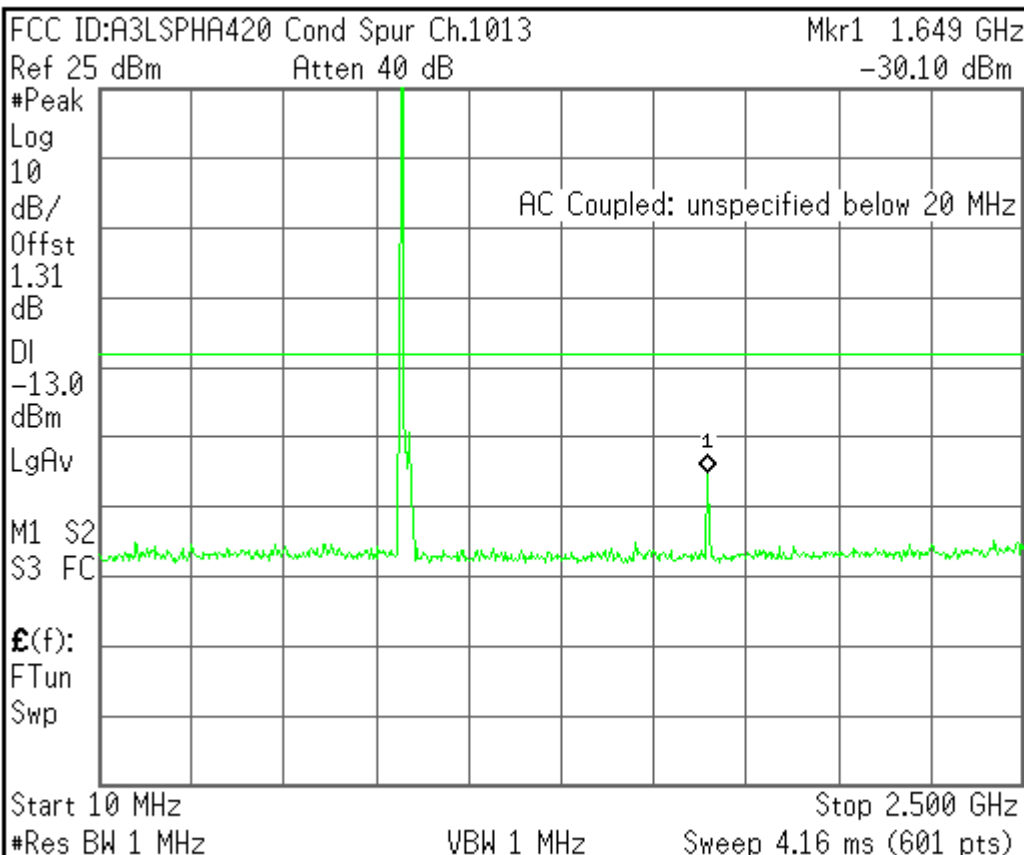
Freq Offset  
0.00000000 Hz

Signal Track  
On Off



Start 869.00 MHz Stop 894.00 MHz  
#Res BW 1 MHz #VBW 1 MHz Sweep 1 ms (601 pts)

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.25500000 GHz

Start Freq  
 10.0000000 MHz

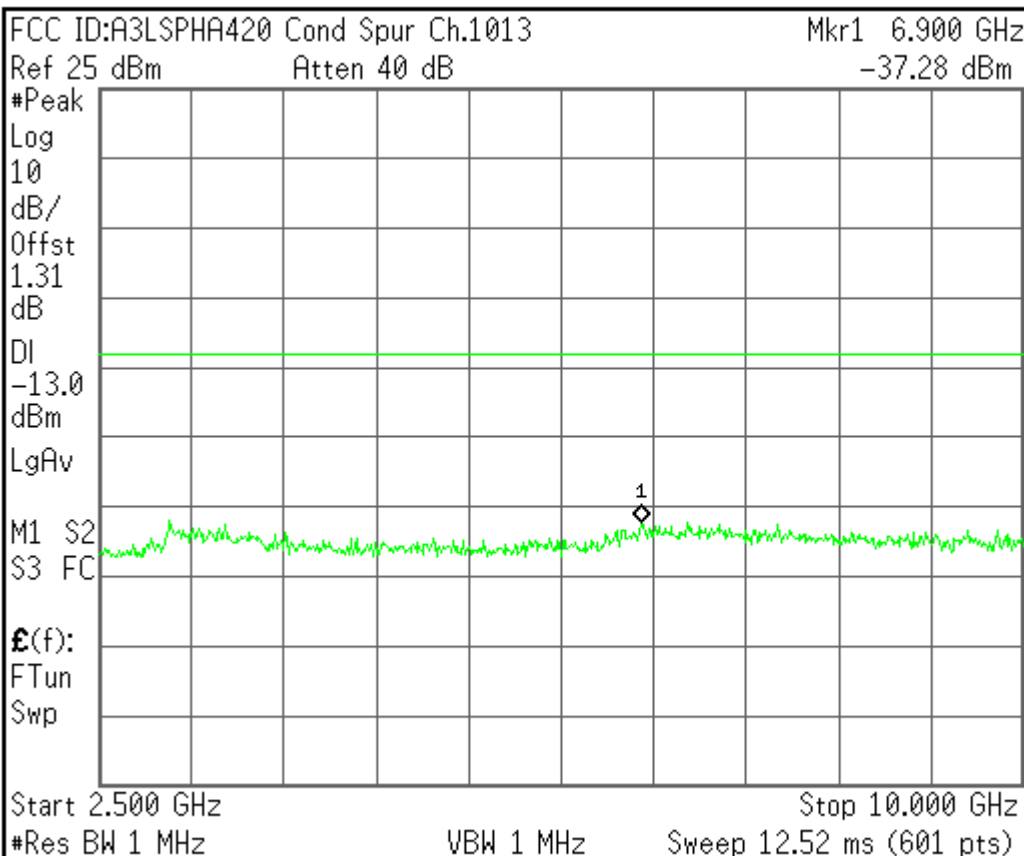
Stop Freq  
 2.50000000 GHz

CF Step  
 249.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 6.25000000 GHz

Start Freq  
 2.50000000 GHz

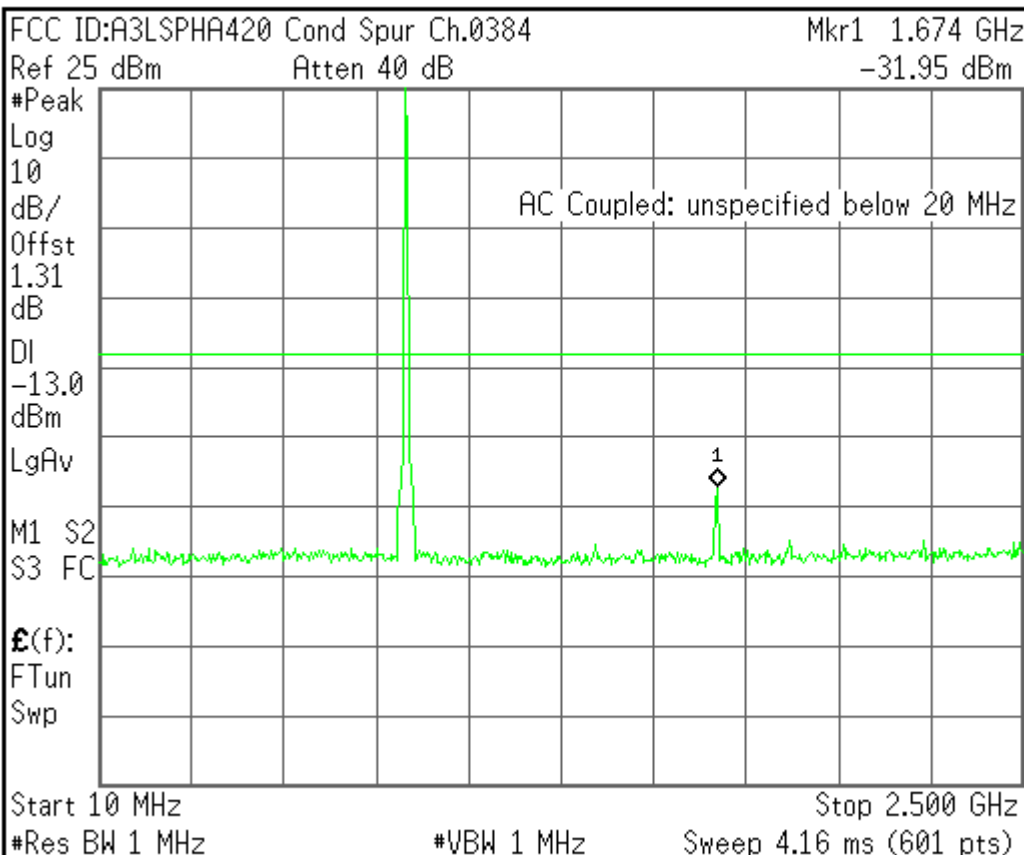
Stop Freq  
 10.0000000 GHz

CF Step  
 750.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.25500000 GHz

Start Freq  
 10.0000000 MHz

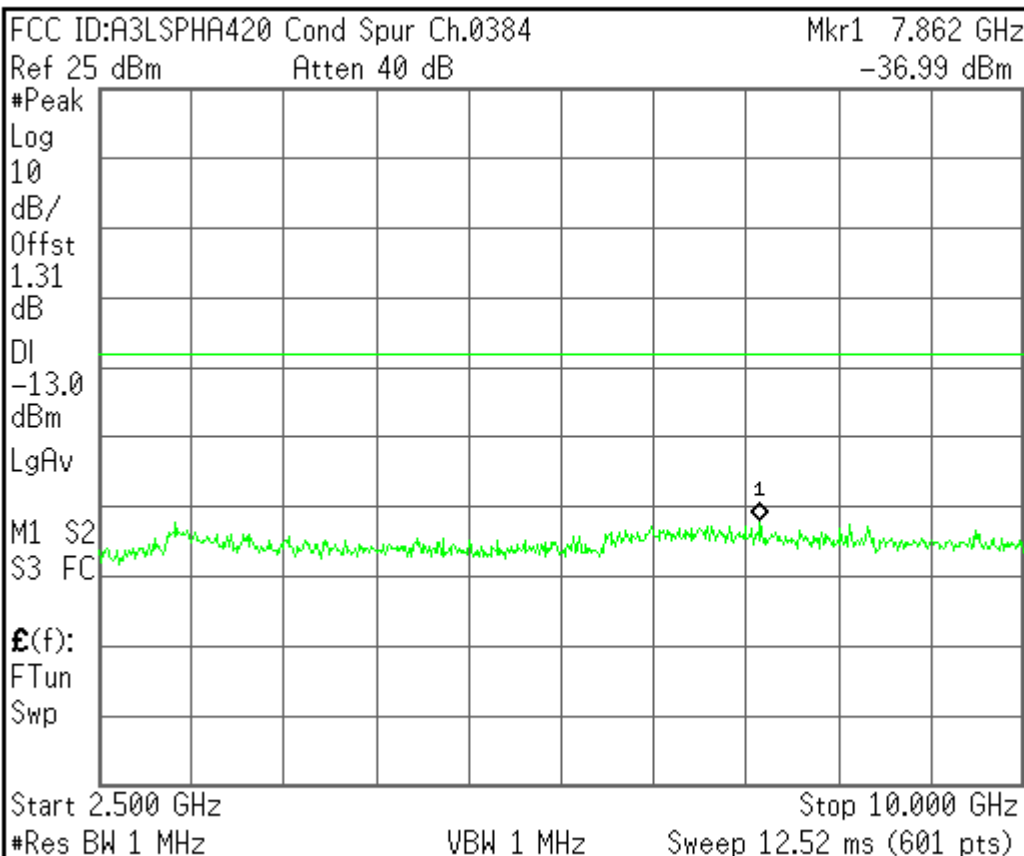
Stop Freq  
 2.50000000 GHz

CF Step  
 249.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 6.25000000 GHz

Start Freq  
 2.50000000 GHz

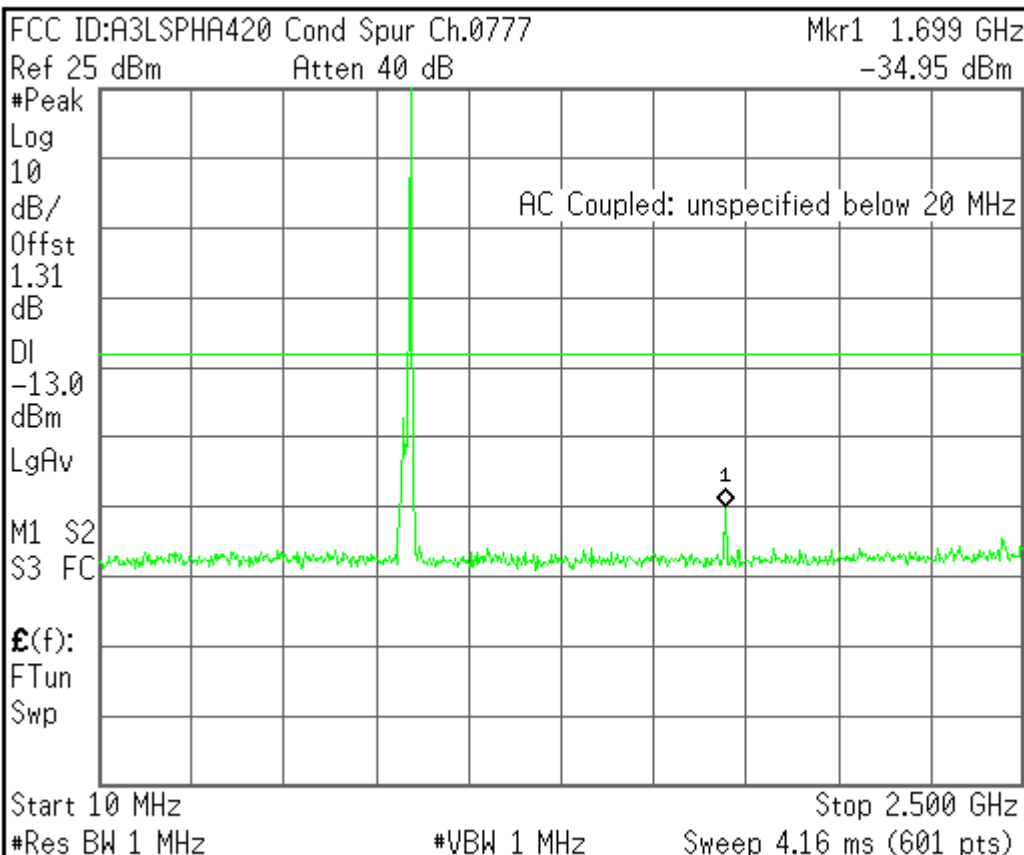
Stop Freq  
 10.0000000 GHz

CF Step  
 750.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.25500000 GHz

Start Freq  
 10.0000000 MHz

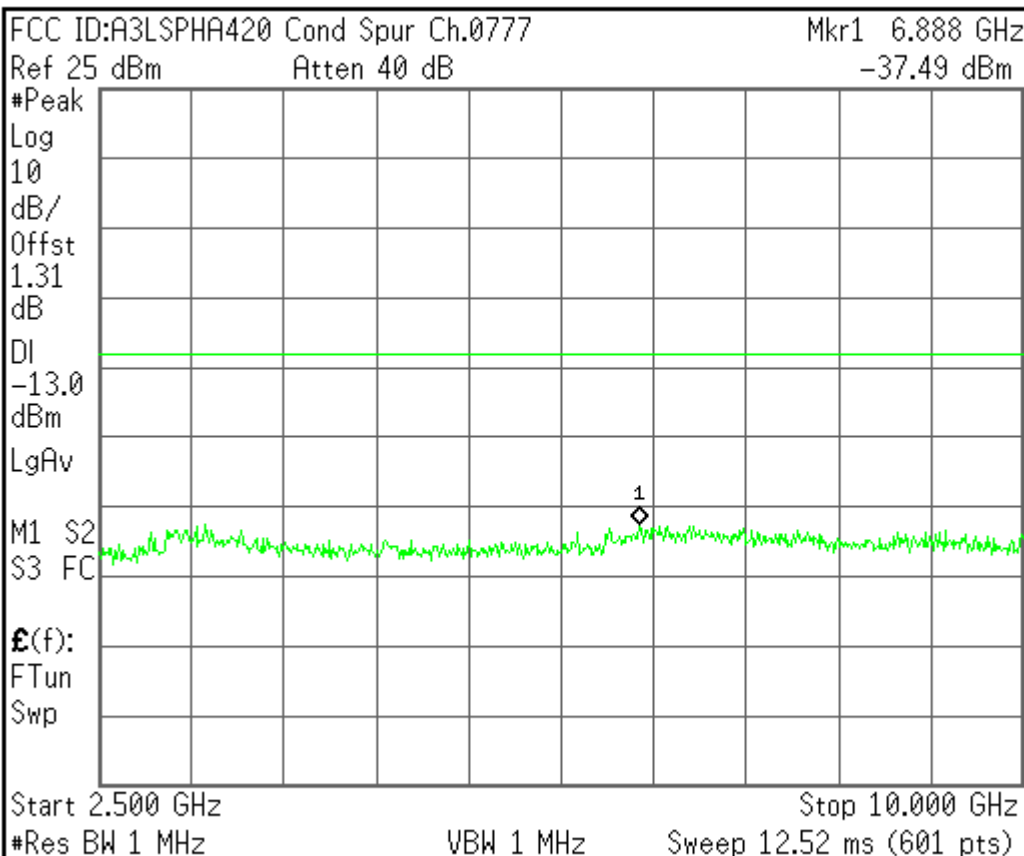
Stop Freq  
 2.50000000 GHz

CF Step  
 249.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 6.25000000 GHz

Start Freq  
 2.50000000 GHz

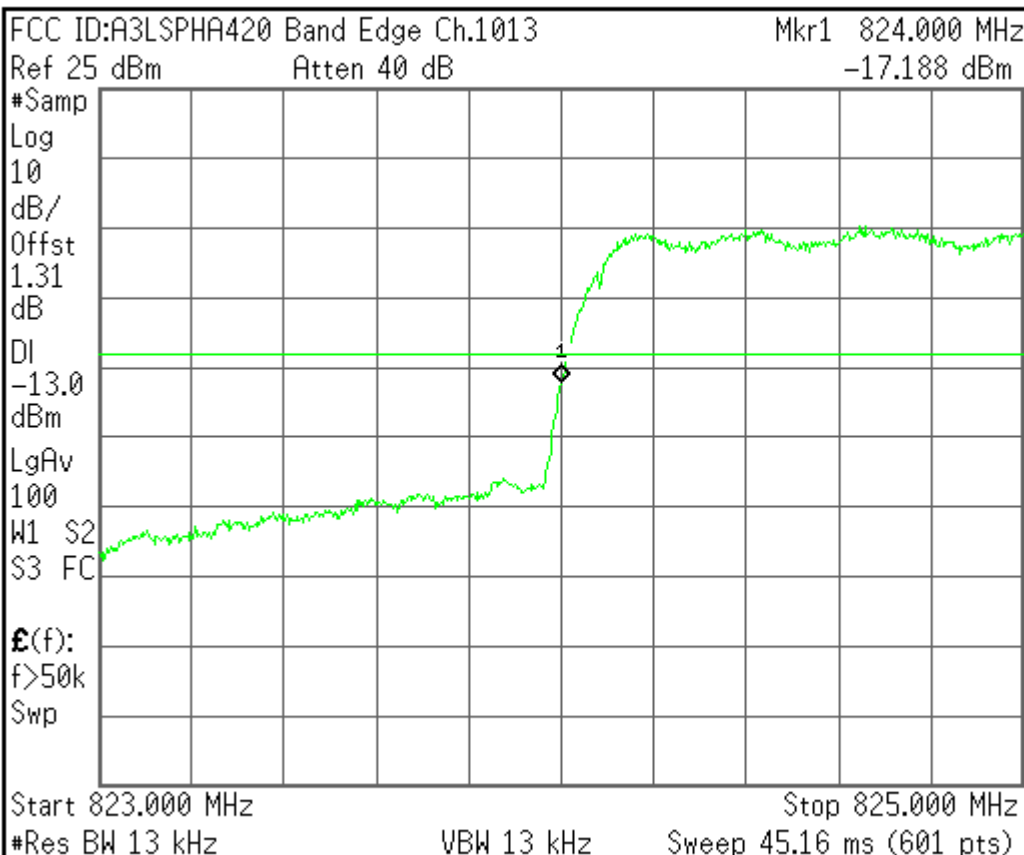
Stop Freq  
 10.0000000 GHz

CF Step  
 750.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 824.000000 MHz

Start Freq  
 823.000000 MHz

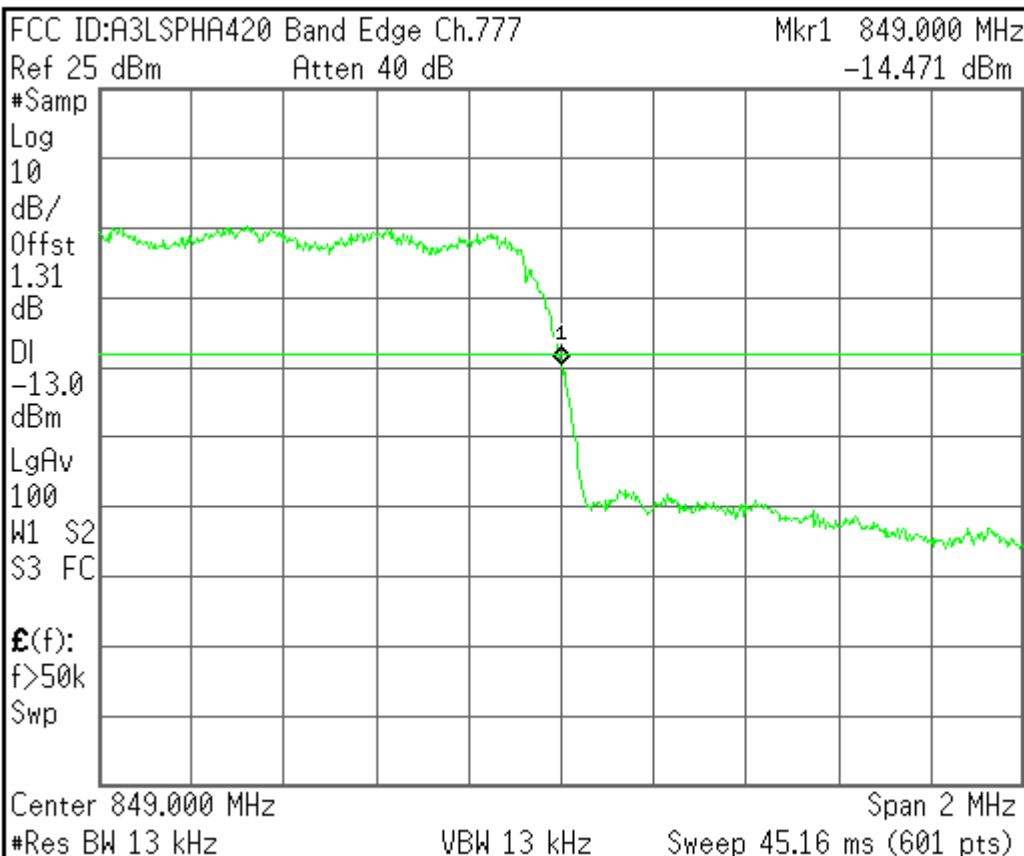
Stop Freq  
 825.000000 MHz

CF Step  
 200.000000 kHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 849.000000 MHz

Start Freq  
 848.000000 MHz

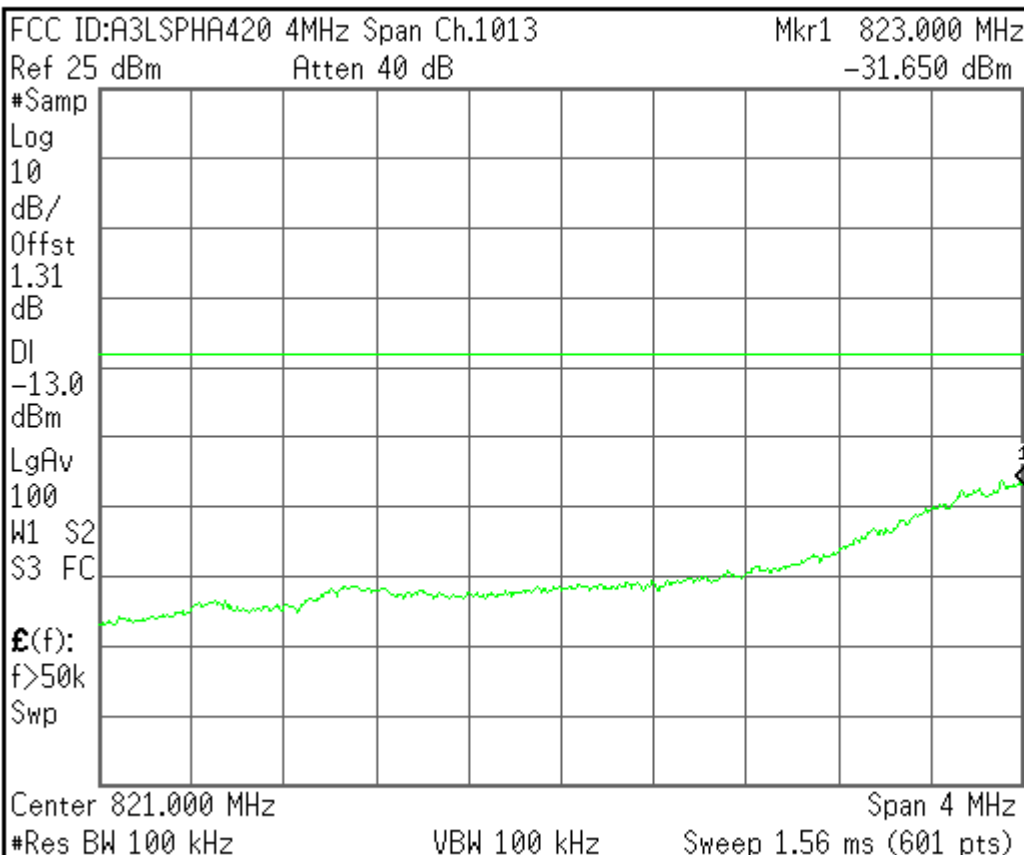
Stop Freq  
 850.000000 MHz

CF Step  
 200.000000 kHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
821.000000 MHz

Start Freq  
819.000000 MHz

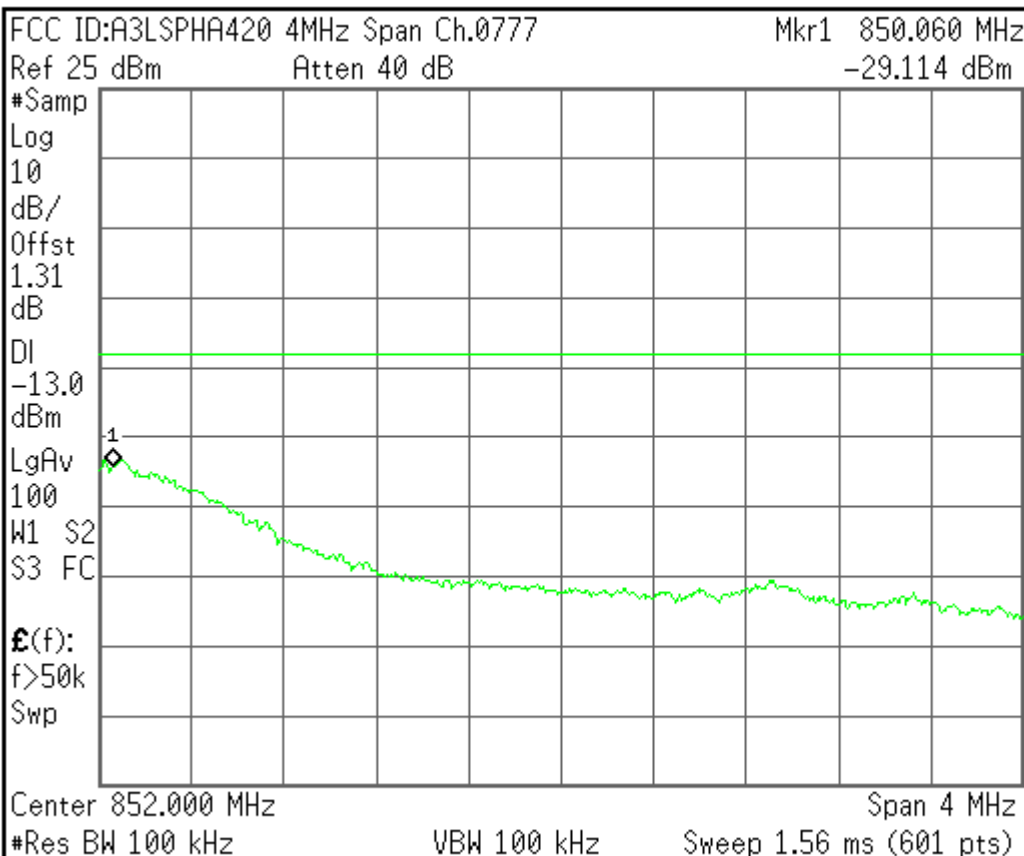
Stop Freq  
823.000000 MHz

CF Step  
400.000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

Signal Track  
On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
852.000000 MHz

Start Freq  
850.000000 MHz

Stop Freq  
854.000000 MHz

CF Step  
400.000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

Signal Track  
On Off

Copyright 2000-2004 Agilent Technologies

Agilent

L

Freq/Channel

Ch Freq 1.85125 GHz

Trig Free

Channel Power

Center Freq  
1.85125000 GHzStart Freq  
1.84975000 GHzStop Freq  
1.85275000 GHzCF Step  
300.000000 kHz  
Auto ManFreq Offset  
0.00000000 HzSignal Track  
On Off

FCC ID:A3LSPHA420 Power Out Ch.0025

Ref 25 dBm

Atten 40 dB

#Avg

Log

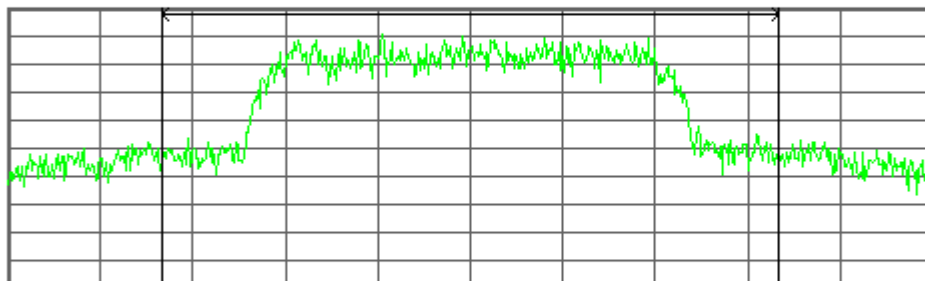
10

dB/

Offst

2.11

dB



Center 1.851 250 GHz

Span 3 MHz

#Res BW 30 kHz

#VBW 300 kHz

#Sweep 20 ms (601 pts)

Channel Power

Power Spectral Density

24.97 dBm /2.0000 MHz

-38.04 dBm/Hz

Copyright 2000-2004 Agilent Technologies

Agilent

L

Freq/Channel

Ch Freq 1.88 GHz

Trig Free

Channel Power

Center Freq  
1.88000000 GHzStart Freq  
1.87850000 GHzStop Freq  
1.88150000 GHzCF Step  
300.000000 kHz  
Auto ManFreq Offset  
0.00000000 HzSignal Track  
On Off

FCC ID:A3LSPHA420 Power Out Ch.0600

Ref 25 dBm

Atten 40 dB

#Avg

Log

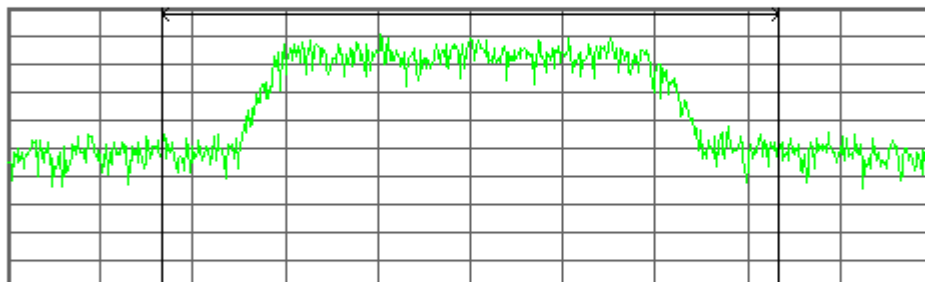
10

dB/

Offst

2.11

dB



Center 1.880 000 GHz

Span 3 MHz

#Res BW 30 kHz

#VBW 300 kHz

#Sweep 20 ms (601 pts)

Channel Power

Power Spectral Density

25.00 dBm /2.0000 MHz

-38.01 dBm/Hz

Copyright 2000-2004 Agilent Technologies

|                            |  |                  |
|----------------------------|--|------------------|
| <b>Ch Freq</b> 1.90875 GHz |  | <b>Trig</b> Free |
| Channel Power              |  |                  |

**Center Freq**  
1.90875000 GHz

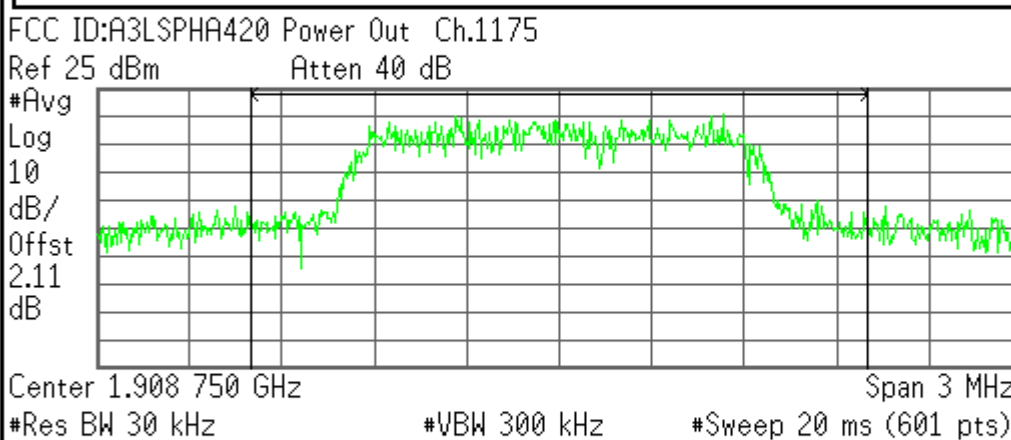
**Start Freq**  
1.90725000 GHz

**Stop Freq**  
1.91025000 GHz

**CF Step**  
300.000000 kHz  
Auto Man

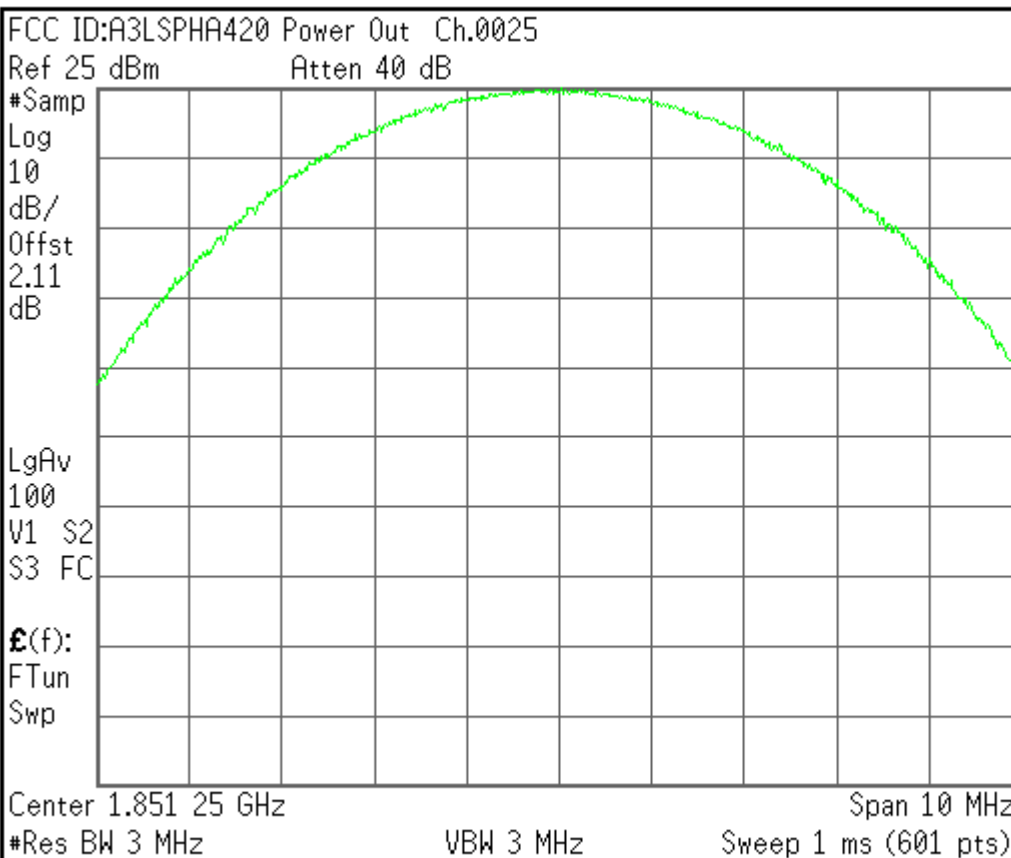
**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off



|                       |                               |
|-----------------------|-------------------------------|
| <b>Channel Power</b>  | <b>Power Spectral Density</b> |
| 24.98 dBm /2.0000 MHz | -38.03 dBm/Hz                 |

Copyright 2000-2004 Agilent Technologies



**Center Freq**  
1.85125000 GHz

**Start Freq**  
1.84625000 GHz

**Stop Freq**  
1.85625000 GHz

**CF Step**  
1.00000000 MHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

Copyright 2000-2004 Agilent Technologies

FCC ID:A3LSPHA420 Power Out Ch.0600

Ref 25 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

2.11

dB

LgAv

100

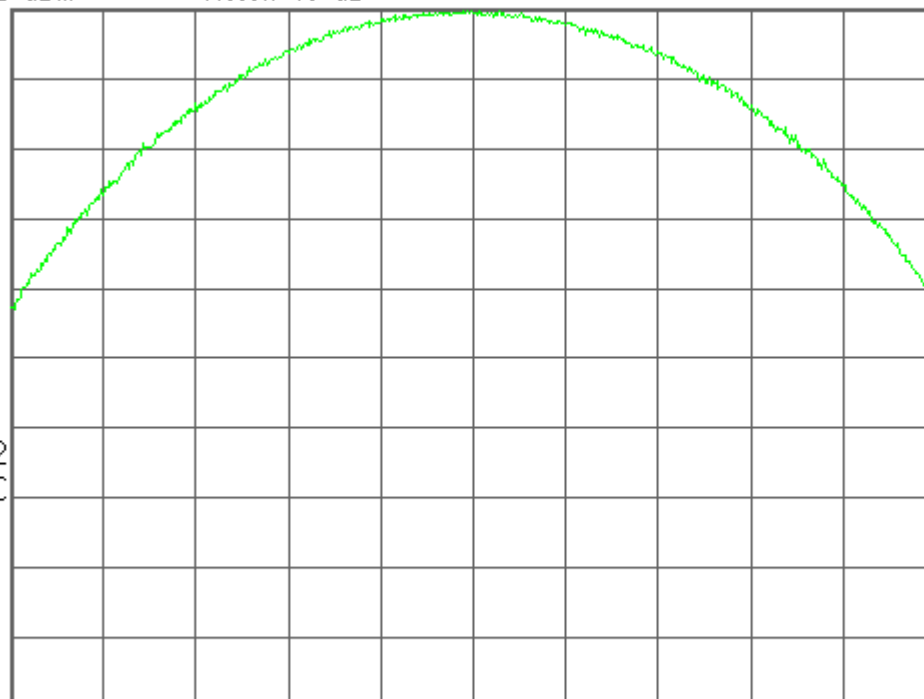
V1 S2

S3 FC

$\mathcal{E}(f)$ :

FTun

Swp



Center 1.880 00 GHz

Span 10 MHz

#Res BW 3 MHz

#VBW 3 MHz

Sweep 1 ms (601 pts)

Center Freq

1.88000000 GHz

Start Freq

1.87500000 GHz

Stop Freq

1.88500000 GHz

CF Step

1.00000000 MHz

Auto

Man

Freq Offset

0.00000000 Hz

Signal Track

On

Off

Copyright 2000-2004 Agilent Technologies

FCC ID:A3LSPHA420 Power Out Ch.1175

Ref 25 dBm

Atten 40 dB

#Samp

Log

10

dB/

Offst

2.11

dB

LgAv

100

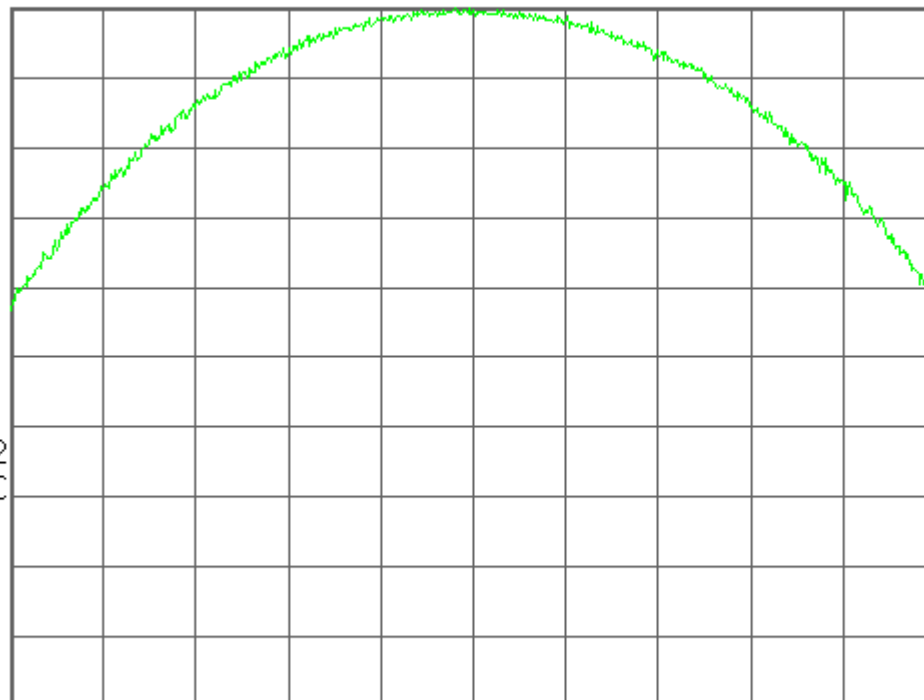
V1 S2

S3 FC

$\mathcal{E}(f)$ :

FTun

Swp



Center 1.908 75 GHz

Span 10 MHz

#Res BW 3 MHz

VBW 3 MHz

Sweep 1 ms (601 pts)

Center Freq

1.90875000 GHz

Start Freq

1.90375000 GHz

Stop Freq

1.91375000 GHz

CF Step

1.00000000 MHz

Auto

Man

Freq Offset

0.00000000 Hz

Signal Track

On

Off

Copyright 2000-2004 Agilent Technologies

**Ch Freq** 1.85125 GHz **Trig** Free  
 Occupied Bandwidth

**Center Freq**  
 1.85125000 GHz

**Start Freq**  
 1.84975000 GHz

**Stop Freq**  
 1.85275000 GHz

**CF Step**  
 300.000000 kHz  
 Auto Man

**Freq Offset**  
 0.00000000 Hz

**Signal Track**  
 On Off

FCC ID:A3LSPHA420 0BW Ch.0025

Ref 25 dBm Atten 40 dB

#Samp

Log

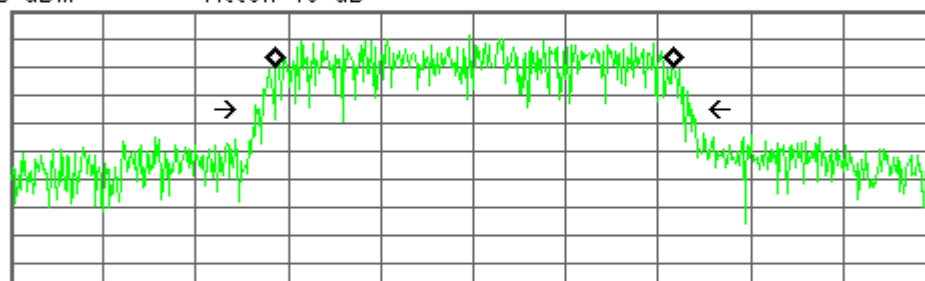
10

dB/

Offst

2.11

dB



Center 1.851 250 GHz

Span 3 MHz

#Res BW 30 kHz

#VBW 300 kHz

#Sweep 20 ms (601 pts)

**Occupied Bandwidth**

**1.2878 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 4.258 kHz

**x dB Bandwidth** 1.405 MHz\*

Copyright 2000-2004 Agilent Technologies

**Ch Freq** 1.88 GHz **Trig** Free  
 Occupied Bandwidth

**Center Freq**  
 1.88000000 GHz

**Start Freq**  
 1.87850000 GHz

**Stop Freq**  
 1.88150000 GHz

**CF Step**  
 300.000000 kHz  
 Auto Man

**Freq Offset**  
 0.00000000 Hz

**Signal Track**  
 On Off

FCC ID:A3LSPHA420 0BW Ch.0600

Ref 25 dBm Atten 40 dB

#Samp

Log

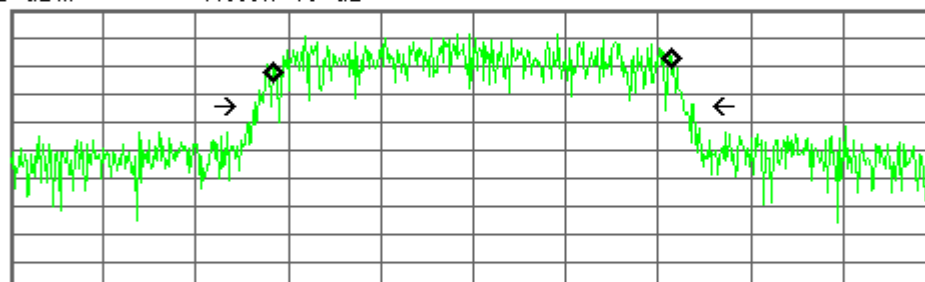
10

dB/

Offst

2.11

dB



Center 1.880 000 GHz

Span 3 MHz

#Res BW 30 kHz

#VBW 300 kHz

#Sweep 20 ms (601 pts)

**Occupied Bandwidth**

**1.2957 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -4.524 kHz

**x dB Bandwidth** 1.422 MHz\*

Copyright 2000-2004 Agilent Technologies

**Ch Freq** 1.90875 GHz **Trig** Free  
Occupied Bandwidth

**Center Freq**  
1.90875000 GHz

**Start Freq**  
1.90725000 GHz

**Stop Freq**  
1.91025000 GHz

**CF Step**  
300.000000 kHz  
Auto Man

**Freq Offset**  
0.00000000 Hz

**Signal Track**  
On Off

FCC ID:A3LSPHA420 0BW Ch.1175

Ref 25 dBm Atten 40 dB

#Samp

Log

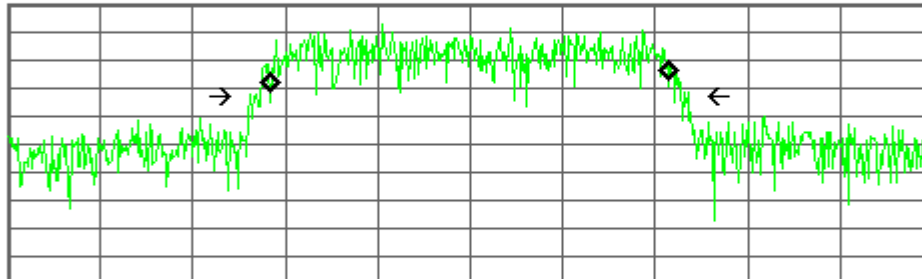
10

dB/

Offst

2.11

dB



Center 1.908 750 GHz

Span 3 MHz

#Res BW 30 kHz

#VBW 300 kHz

#Sweep 20 ms (601 pts)

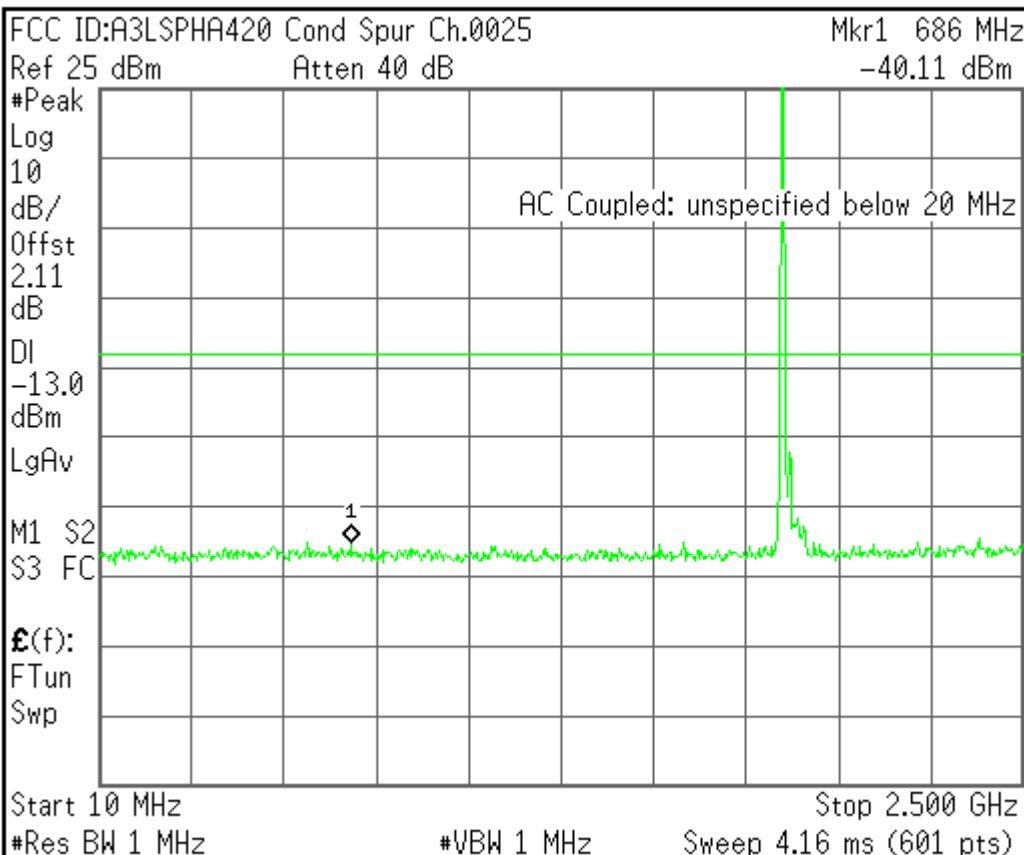
**Occupied Bandwidth**

**1.2981 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -2.384 kHz

**x dB Bandwidth** 1.423 MHz\*



Freq/Channel

Center Freq  
 1.25500000 GHz

Start Freq  
 10.0000000 MHz

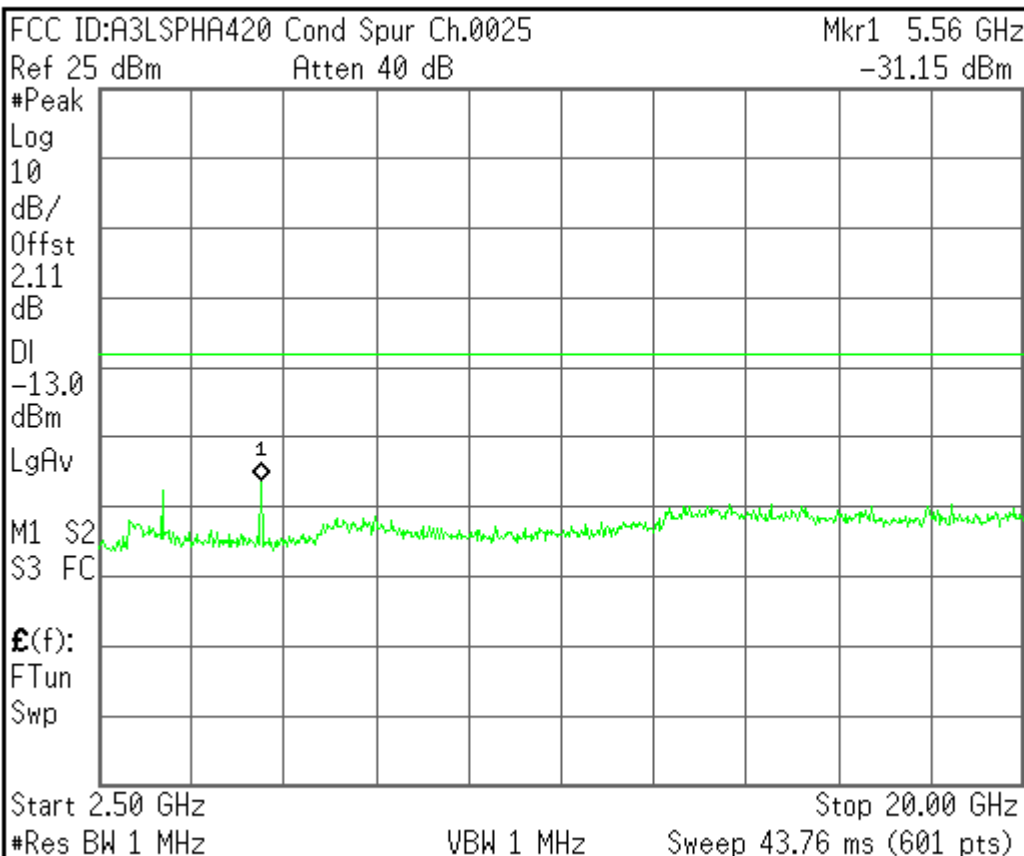
Stop Freq  
 2.50000000 GHz

CF Step  
 249.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 11.2500000 GHz

Start Freq  
 2.50000000 GHz

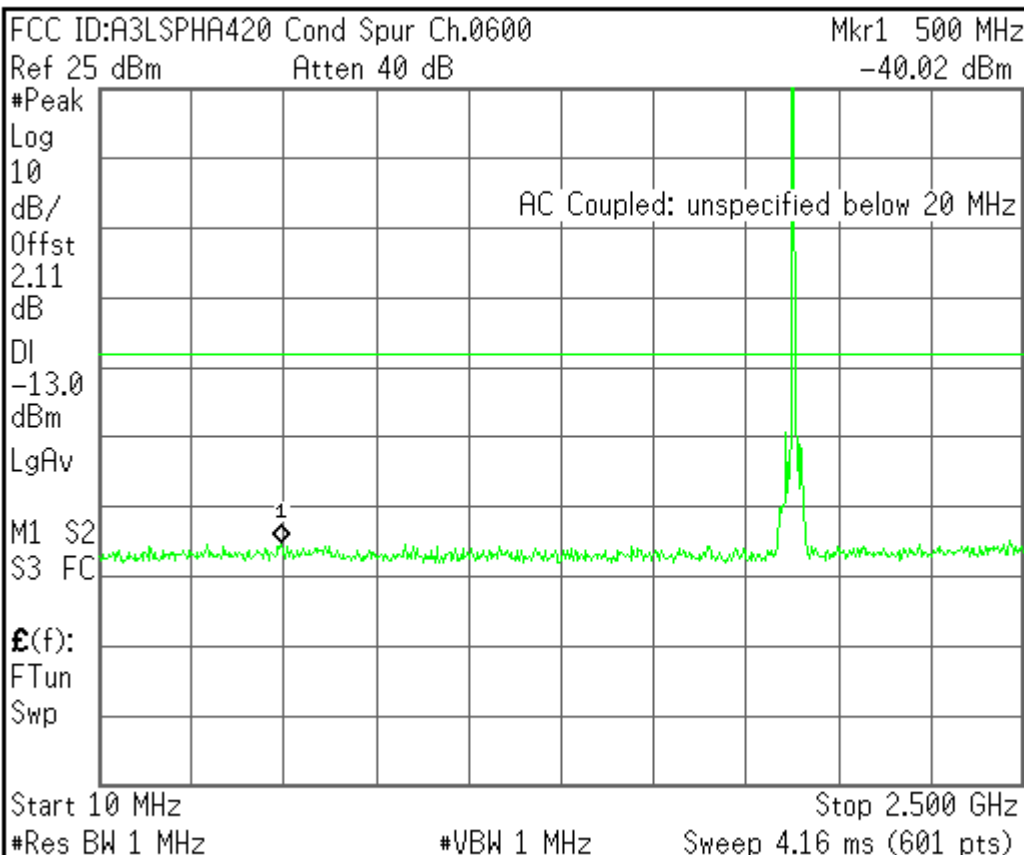
Stop Freq  
 20.0000000 GHz

CF Step  
 1.75000000 GHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.25500000 GHz

Start Freq  
 10.0000000 MHz

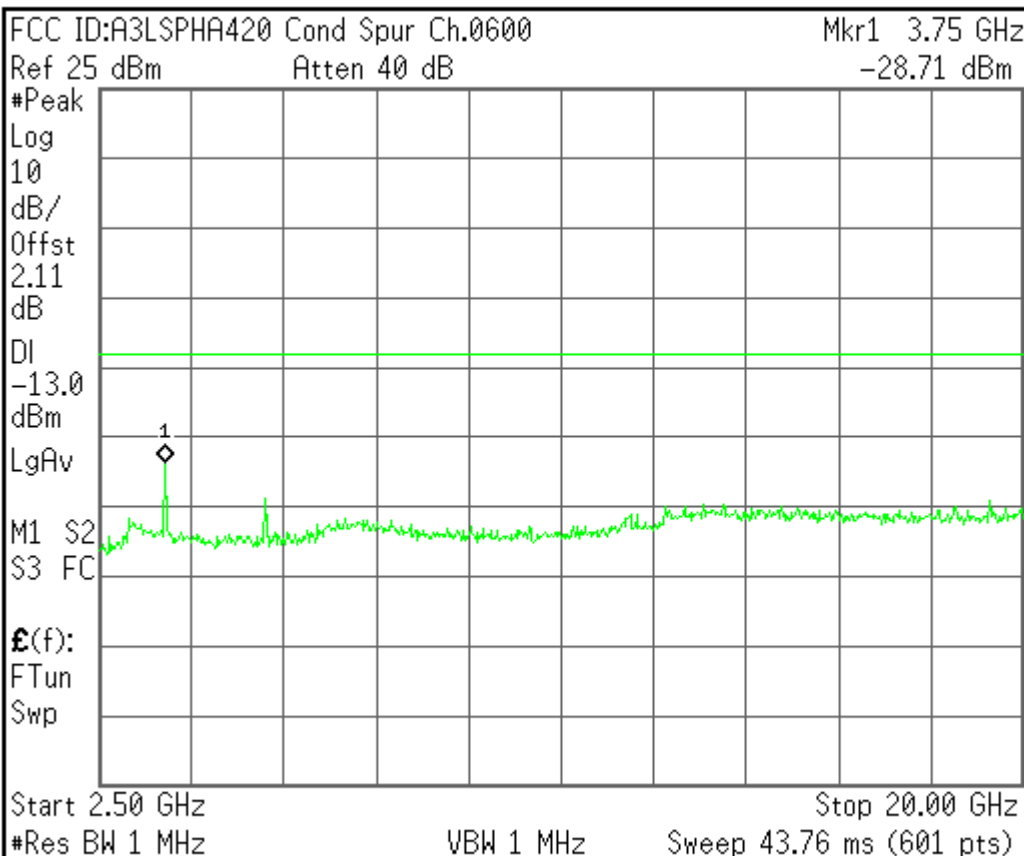
Stop Freq  
 2.50000000 GHz

CF Step  
 249.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 11.2500000 GHz

Start Freq  
 2.50000000 GHz

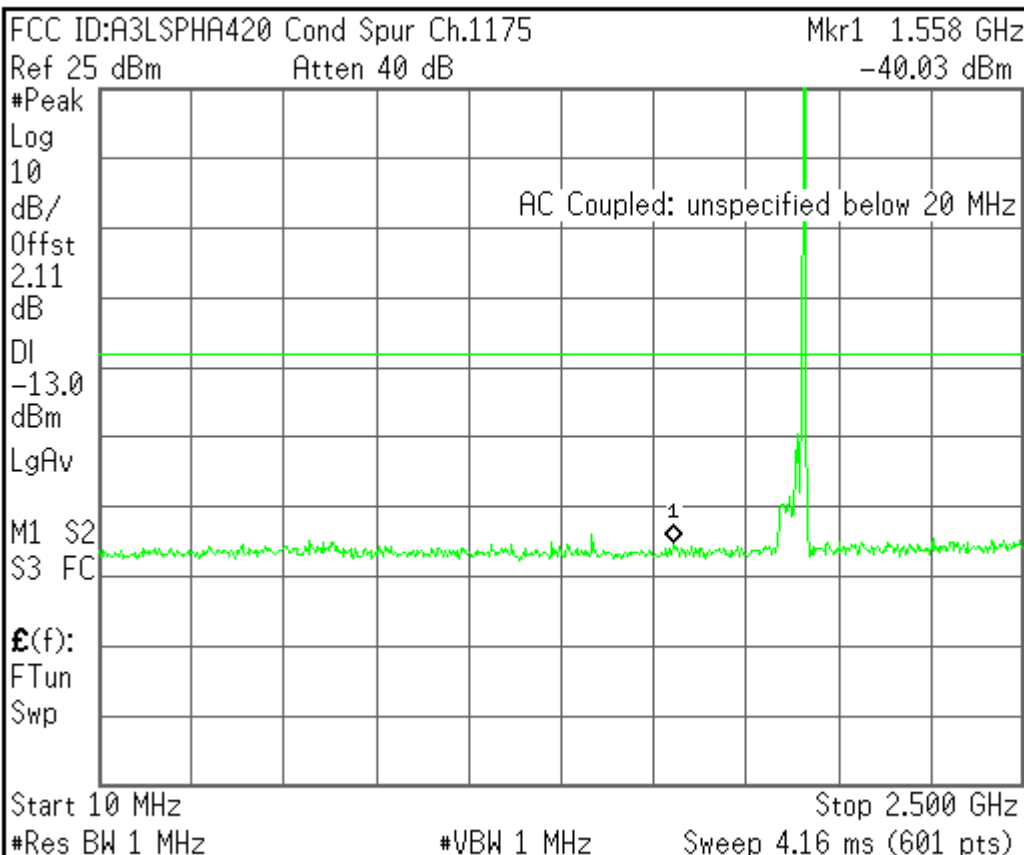
Stop Freq  
 20.0000000 GHz

CF Step  
 1.75000000 GHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.25500000 GHz

Start Freq  
 10.0000000 MHz

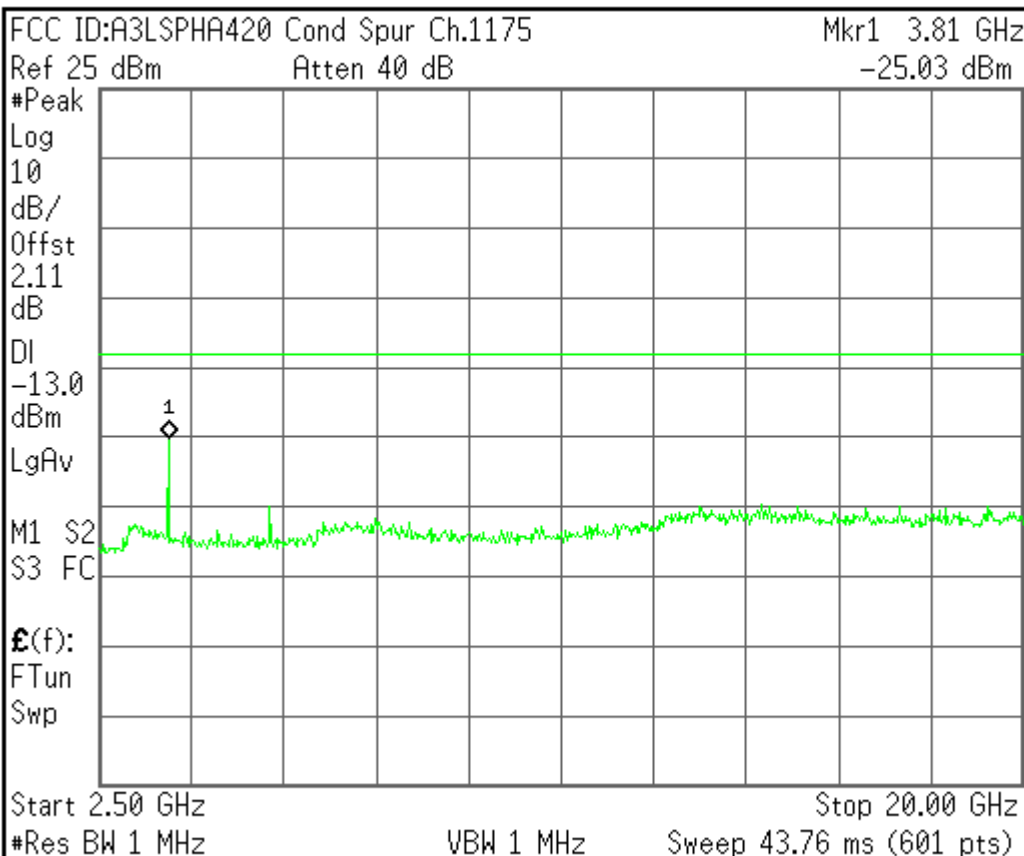
Stop Freq  
 2.50000000 GHz

CF Step  
 249.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 11.2500000 GHz

Start Freq  
 2.50000000 GHz

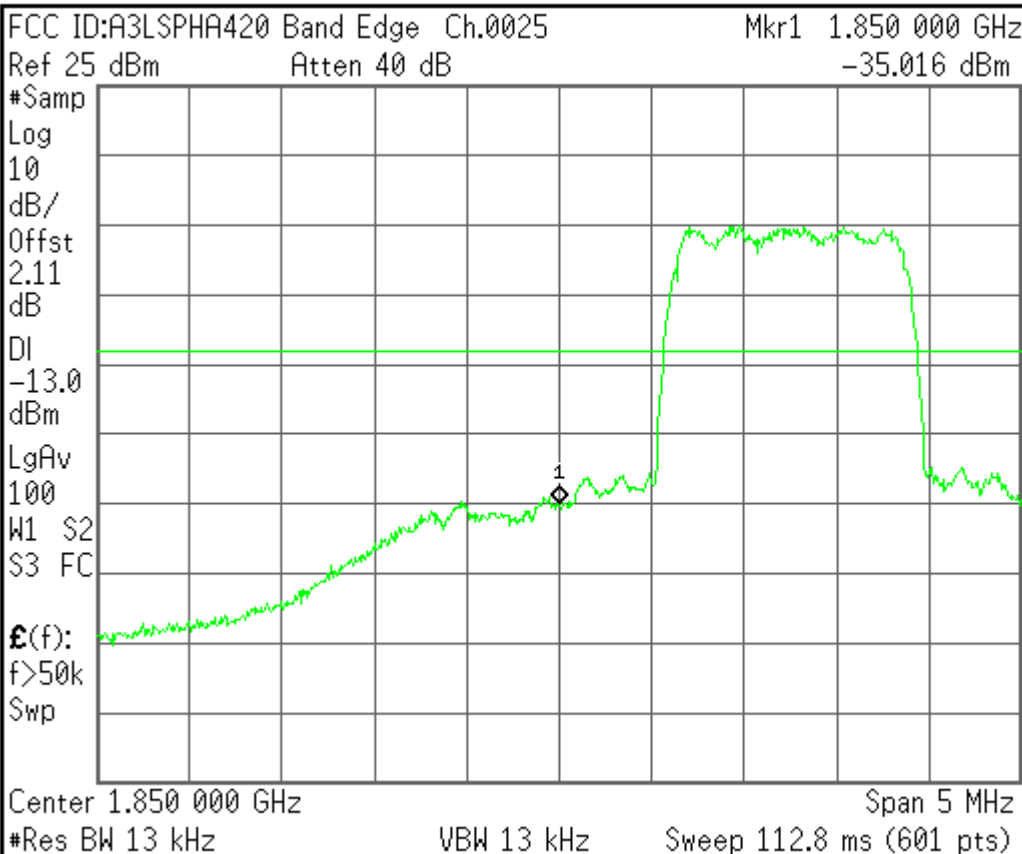
Stop Freq  
 20.0000000 GHz

CF Step  
 1.75000000 GHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.85000000 GHz

Start Freq  
 1.84750000 GHz

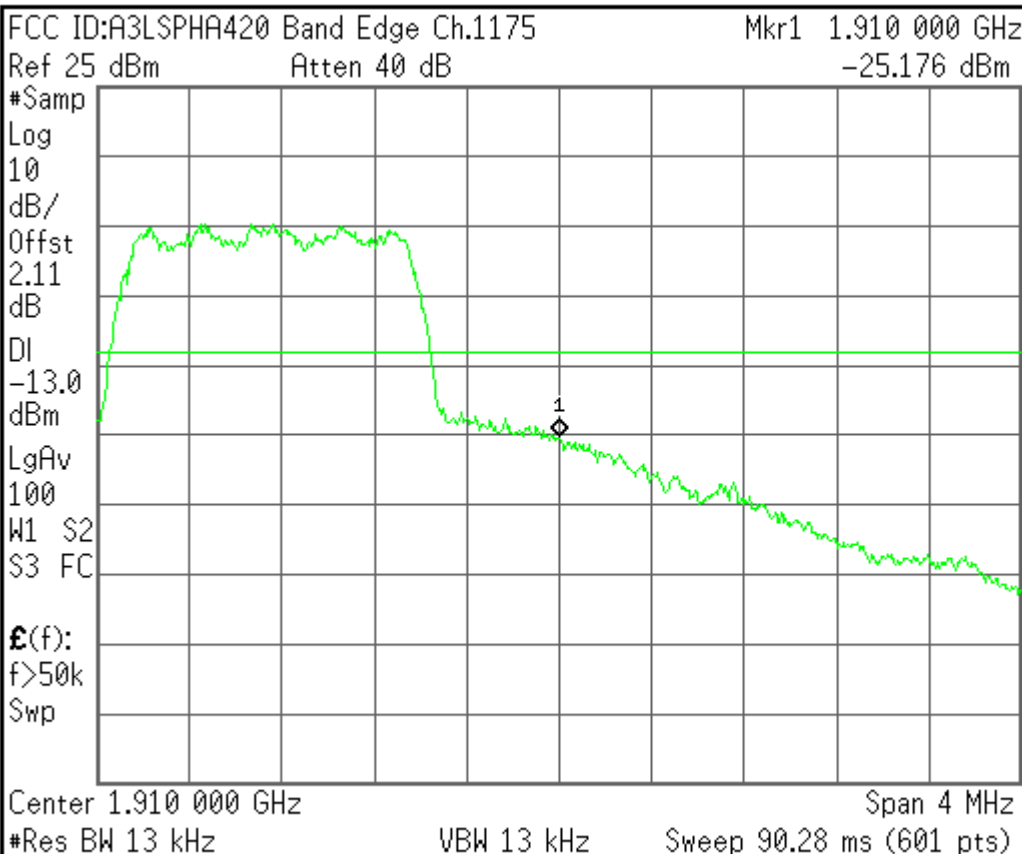
Stop Freq  
 1.85250000 GHz

CF Step  
 500.000000 kHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.91000000 GHz

Start Freq  
 1.90800000 GHz

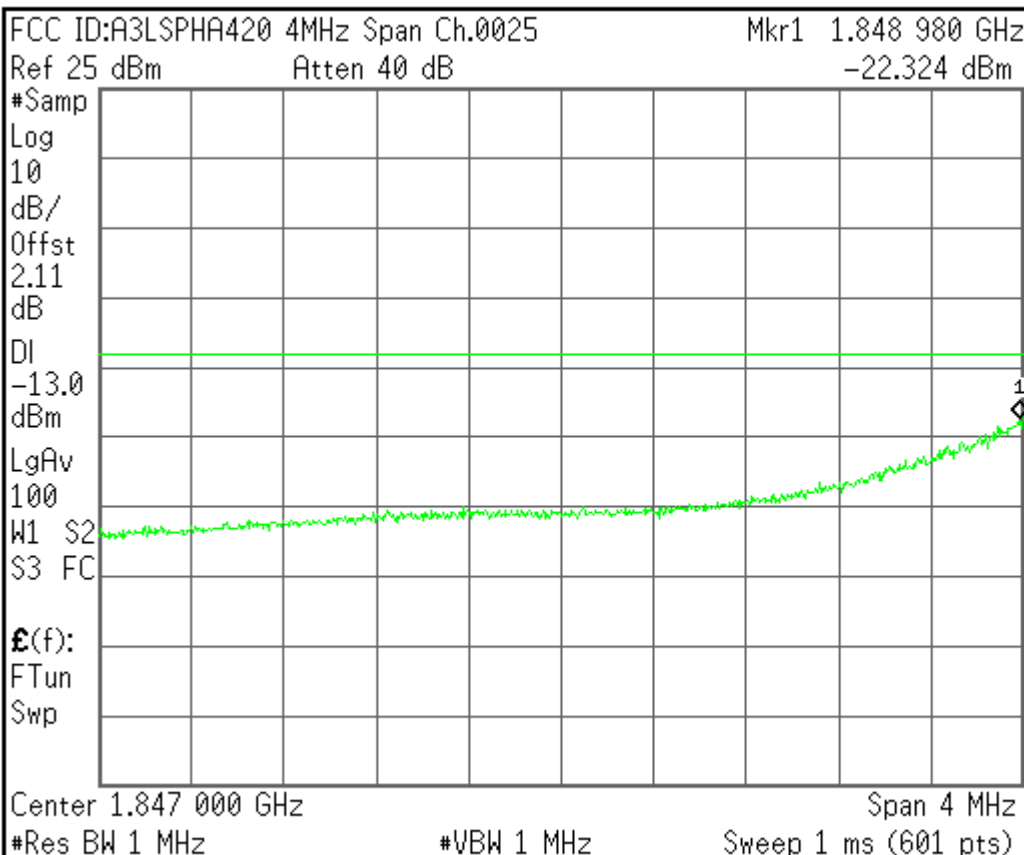
Stop Freq  
 1.91200000 GHz

CF Step  
 400.000000 kHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.84700000 GHz

Start Freq  
 1.84500000 GHz

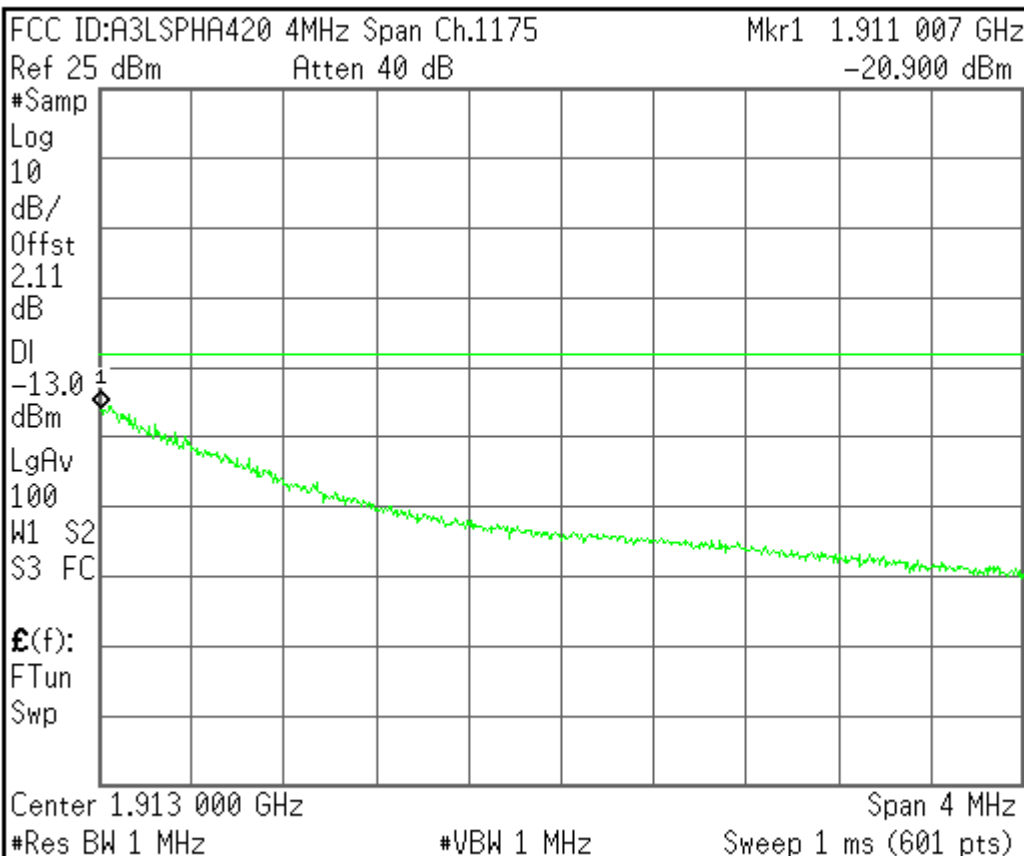
Stop Freq  
 1.84900000 GHz

CF Step  
 400.000000 kHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies



Freq/Channel

Center Freq  
 1.91300000 GHz

Start Freq  
 1.91100000 GHz

Stop Freq  
 1.91500000 GHz

CF Step  
 400.000000 kHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

Copyright 2000-2004 Agilent Technologies