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Regulatory Compliance Group  
IT R&D Center  
416 Maetan3-Dong,  
Yeongtong-gu, Suwon city,  
Gyeonggi-Do, Korea 443-742

## FCC CFR47 PART 24 SUBPART CERTIFICATION REPORT

**Model Tested:** **SGH-i300**  
**FCC ID (Requested):** **A3LSGHI300**  
**Report No:** **FC-098-R1**  
**Job No:** **FC-098**  
**Date issued:** **July 18, 2005**

- Abstract -

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

**Prepared By**

WW JANG – Test Engineer

**Date**

2005.07.18

**Checked By**

SH PARK – Senior Manager

**Date**

2005.07.18

**Authorized By**

JK CHOI – General Manager

**Date**

2005.07.18

# 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 Equivalent Isotropic Radiated Power                 | 7           |
| 5.2 Radiated Spurious & Harmonic Emission               | 8           |
| 5.3 Occupied Bandwidth                                  | 9           |
| 5.4 Spurious and Harmonic Emissions at Antenna Terminal | 9           |
| 5.4.1 Occupied Bandwidth Emission Limits                | 9           |
| 5.4.2 Conducted Spurious Emission                       | 11          |
| 5.5 Frequency Stability / Temperature Variation         | 13          |
| <b>6. TEST DATA</b>                                     | <b>14</b>   |
| 6.1 Equivalent Isotropic Radiated Power (E.I.R.P.)      | 14          |
| 6.2 Radiated Spurious & Harmonic Measurement            | 15          |
| 6.3 Radiated Spurious & Harmonic Conversion Table       | 16          |
| 6.4 Frequency Stability                                 | 17          |
| 6.4.1 Frequency Stability Table                         | 17          |
| 6.4.2 Frequency Stability Graph                         | 18          |
| <b>7. CONCLUSION</b>                                    | <b>20</b>   |
| <b>8. TEST PLOTS</b>                                    | <b>21</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 443-742
  
- Attention: SungJoo KIM, Engineering Manager (QA Lab)
  
- FCC ID: A3LSGHI300
  
- Quantity: Quantity production is planned
- Emission Designators: 246KGXW
- Tx Freq. Range: 1850.2MHz -1909.8MHz
- Rx Freq. Range: 1930.2MHz – 1989.8MHz
- Max. Power Rating: 1.807W EIRP GSM1900 (32.57dBm)
- FCC Classification(s): Licensed Portable Tx Held to Ear (PCE)
- Equipment (EUT) Type: Single-Band PCS GSM Phone with Bluetooth
- Frequency Tolerance:  $\pm 0.00025\%$  (2.5ppm)
- FCC Rule Part(s): §24(E), §2.
- Dates of Test: July 8, 11-12 , 2005
- Place of Test: SAMSUNG Lab,
- Test Report S/N: FC-098-R1

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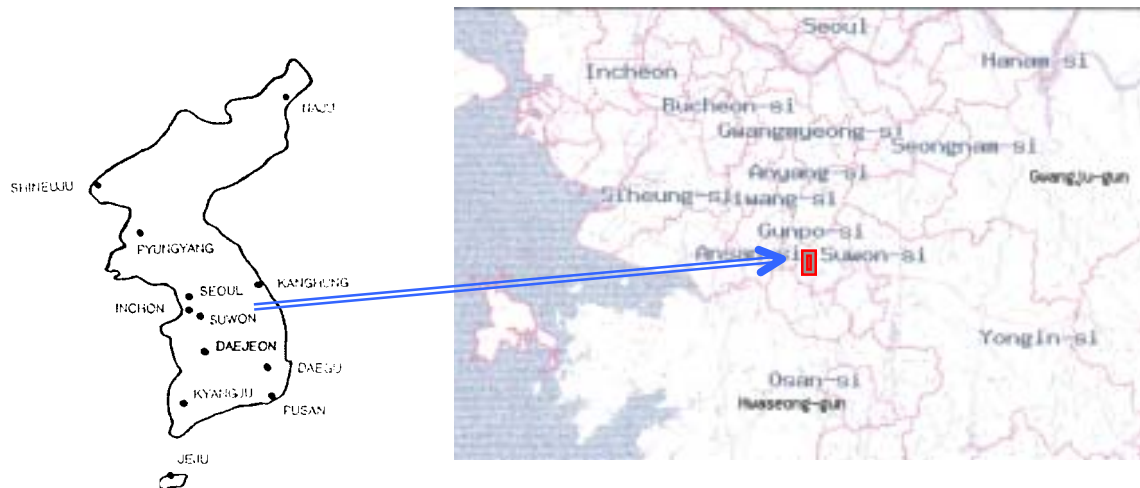
## 2. INTRODUCTION

### 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.

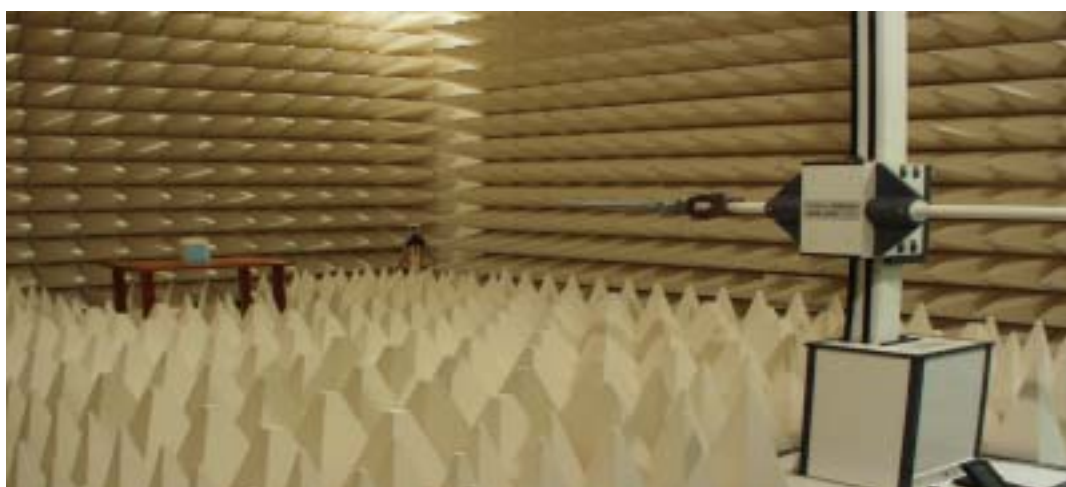


**Figure1. Map of the Suwon City area.**

### 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 Non-conducted 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 | 2005-09-20   |
|                                 | E4440A(3Hz~26.5GHz) | MY41000236 | 2005-10-27   |
|                                 | E4440A(3Hz~26.5GHz) | MY41000233 | 2005-11-04   |
| Signal Generator                | SMIQ03B             | 83824/021  | 2005-12-27   |
|                                 | SMR20               | 835197/030 | 2006-01-18   |
| Power Meter                     | E4419B              | GB41293846 | 2005-09-21   |
| Power Sensor                    | 8481B               | 3318A10325 | 2005-10-06   |
|                                 | 8485A               | 3318A19924 | 2005-09-20   |
| Amplifier                       | 5S1G4               | 304866     | 2005-10-19   |
| Pre-Amplifier                   | 8449B               | 3008A00691 | 2006-01-11   |
| Communication test set          | 8960                | GB42230535 | 2005-11-04   |
|                                 | 8960                | GB42360886 | 2005-10-27   |
| Antenna Master                  | MA0001              | ANT0967    | Not Required |
| Controller                      | HD100               | 100/756    | Not Required |
| Environmental Chamber           | PL-4S               | 13005454   | 2005-07-31   |
|                                 | SH-241              | 92000548   | 2005-11-22   |
|                                 | SH-241              | 92000549   | 2005-11-22   |
| Horn Antenna                    | HF906               | 360306/011 | 2006-03-17   |
|                                 | HF906               | 100134     | 2006-04-25   |
| Dipole Antenna                  | 3121C-DB4           | 9007-587   | 2005-12-02   |
| Receive Antenna                 | HL040               | 353255/019 | 2005-08-13   |
| Attenuator                      | 8494A               | 3308A31997 | 2006-01-03   |
|                                 | 8496A               | 3308A14426 | 2006-01-04   |
| 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 Equivalent Isotropic Radiated Power

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

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

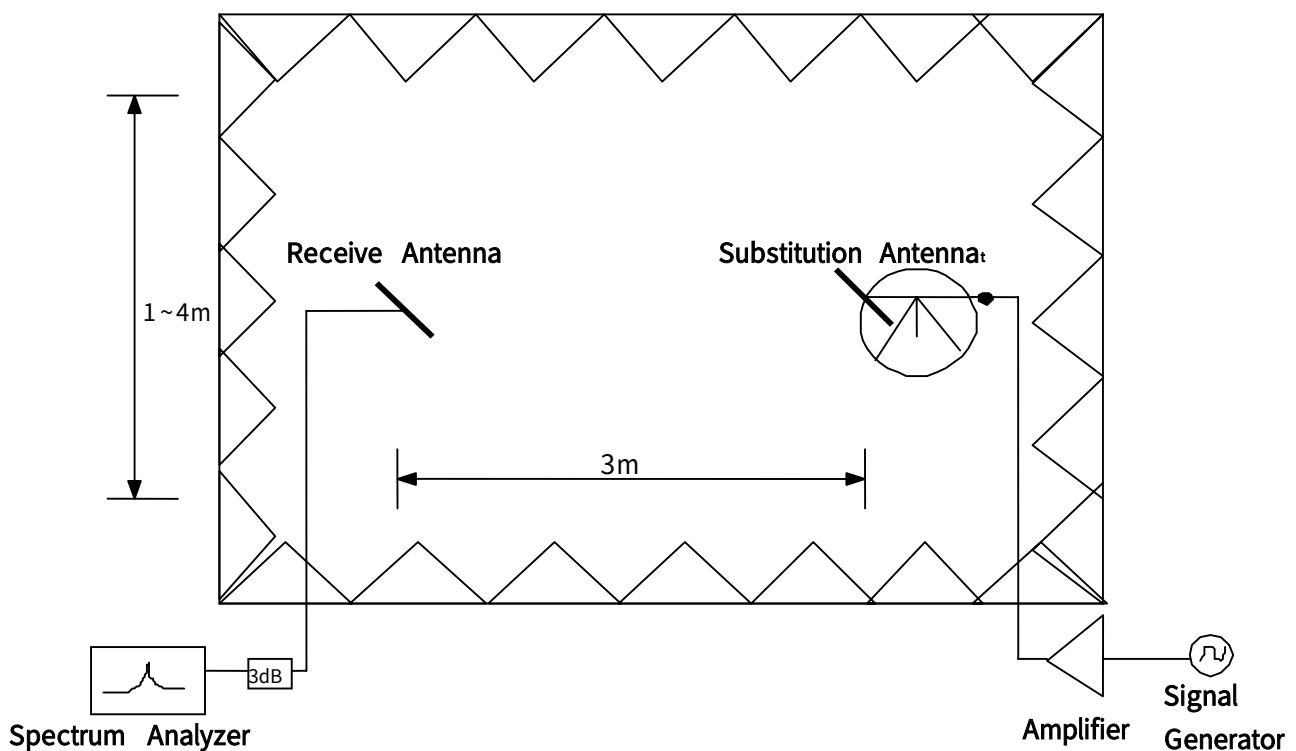


Figure 3. Diagram of ERP/EIRP test Set-up

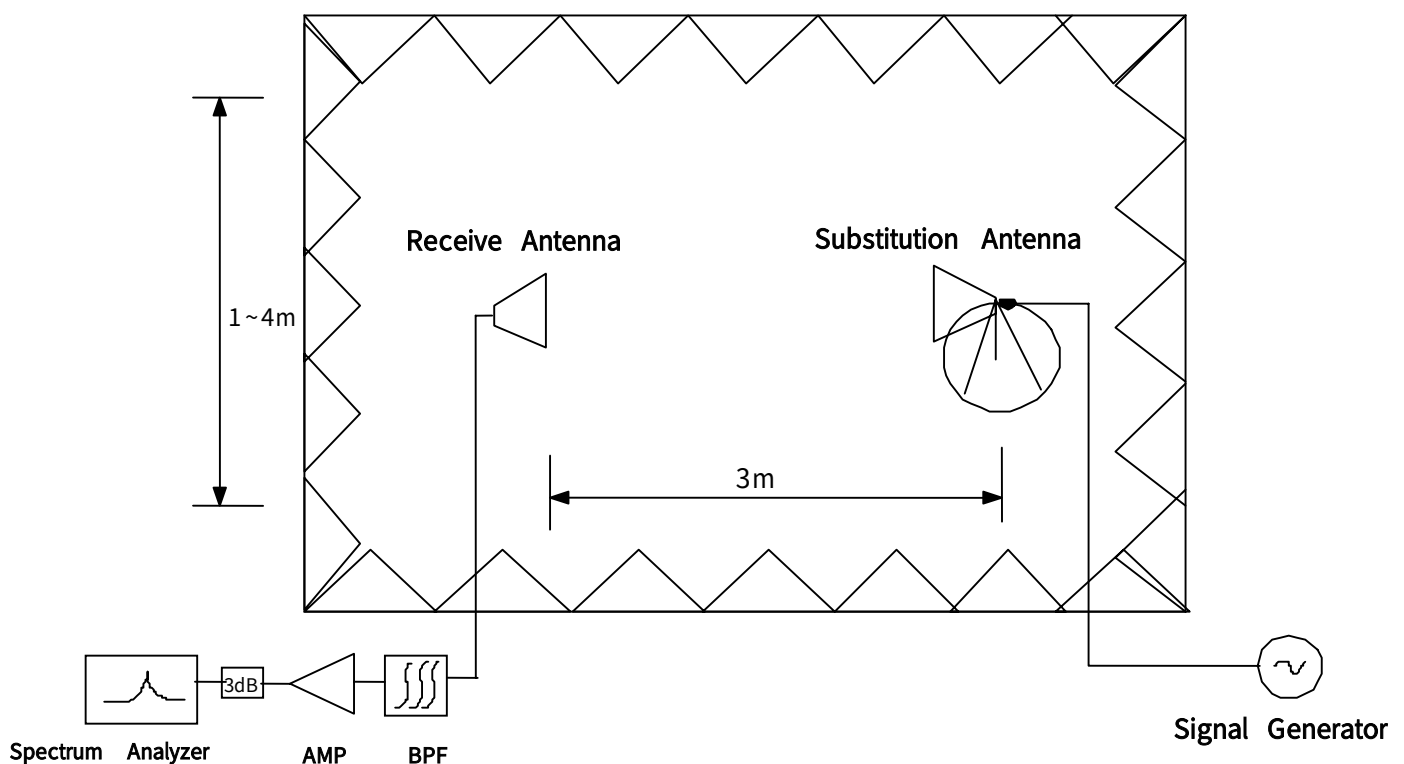
The EUT was placed on a Non-conducted turntable 3-meters from the receive antenna. The receive antenna height and turntable rotation was adjusted for the highest reading on the receive spectrum analyzer. For GSM signals, an average detector is used, with RBW=VBW=3MHz, SPAN=10MHz. A Horn antenna (for readings above 1GHz) was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. The conducted power at the terminals of Horn is measured. The EIRP is recorded. Between the gain of the horn and an isotropic or dipole antenna are taken into consideration.

## 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 Horn antenna was substituted in place of the EUT. This Horn antenna was driven by a signal generator and the level of the signal generator was adjusted to obtain the same receive spectrum analyzer reading. This spurious level is recorded. Between the gain of the horn and an isotropic or dipole antenna are taken into consideration.





### **SAMPLE CALCULATION**

#### **Example: Channel 661 , Second Harmonic(3760.00MHz)**

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 3760.00MHz. 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 -13dBm, calculation shown below.

$$43 + 10\log(1.807 \text{ W}) = 45.57 \text{ dB}$$

$$32.57\text{dBm} - 45.57\text{dB} = -13 \text{ dBm}$$

Compliance with the out-of-band emissions requirement is based on test being performed with an analyzer resolution bandwidth of 1MHz. However in the 1MHz band immediately outside and adjacent to the frequency block a resolution bandwidth of at least 1% of the fundamental emissions bandwidth may be employed.

In case of GSM :  $0.01 * 273\text{KHz} = 2.73\text{KHz}$   
 A Resolution BW of 3KHz was used for measurement at the band edges.

## 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 -13dBm 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 20GHz. A display line was placed at -13dBm to show compliance. The high, lowest and a middle channel were tested for out of band measurements.

Plots are shown herein.

- End of page -

## 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
2. temperature (25°C to 27°C to provide a reference).
3. The equipment is subjected to an overnight "soak" at -30°C without any power applied.
4. 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.
5. 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.
6. Again the transmitter carrier frequency and the individual oscillators is measured at room temperature to begin measurement of the upper temperature levels.
7. 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.
8. 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 Equivalent Isotropic Radiated Power (E.I.R.P.)

Supply Voltage : 3.7VDC

Modulation : PCS 1900

#### ■ Reference level

| Frequency (MHz) | Output (dBm) | Polarization | S/A (dBm) | Ant gain (dBi) | Ref level (dBm) |
|-----------------|--------------|--------------|-----------|----------------|-----------------|
| 1850.20         | 27.00        | H            | -13.63    | 8.42           | -22.05          |
|                 |              | V            | -14.11    | 8.42           | -22.53          |
| 1880.00         | 27.00        | H            | -13.59    | 8.25           | -21.84          |
|                 |              | V            | -13.76    | 8.25           | -22.01          |
| 1909.80         | 27.00        | H            | -13.53    | 8.40           | -21.93          |
|                 |              | V            | -13.81    | 8.40           | -22.21          |

#### ■ Result

| Frequency (MHz) | From EUT Tested level (dBm) | Polarization (H/V) | Azimuth (angle) | EIRP (dBm) | EIRP (W) | Battery  |
|-----------------|-----------------------------|--------------------|-----------------|------------|----------|----------|
| 1850.20         | -16.48                      | H2                 | 143             | 32.57      | 1.807    | Extended |
| 1880.00         | -18.73                      | H2                 | 147             | 30.11      | 1.026    | Extended |
| 1909.80         | -19.64                      | H2                 | 148             | 29.29      | 0.849    | Extended |
| 1850.20         | -16.71                      | H2                 | 144             | 32.34      | 1.714    | Standard |

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

## 6.2 Radiated Spurious & Harmonic measurement

### Field Strength of SPURIOUS Radiation

Operating Frequency : 1850.2 MHz(Low), 1880.00 MHz(Middle), 1909.80 MHz(High)

Measured Output Power : 32.57dBm = 1.807W

Modulation Signal : GSM1900

**Limit :  $43 + 10\log_{10}(P) = 45.57\text{dBc}$**

### ■ Result

| Channel | Harmonic | Frequency (MHz) | From EUT Tested level (dBm) | POL (H/V) | Result (dBc) |
|---------|----------|-----------------|-----------------------------|-----------|--------------|
| 512     | 2        | 3700.40         | -63.31                      | H2        | 70.49        |
|         | 3        | 5550.60         | -65.81                      | H1        | 68.39        |
|         | 4        | 7400.80         | -66.44                      | H1        | 64.73        |
|         | 5        | 9251.00         | -68.67                      | H1        | 61.62        |
|         | 6        | 11101.20        | -                           | -         | -            |
|         | 7        | 12951.40        | -                           | -         | -            |
| 661     | 2        | 3760.00         | -62.85                      | H2        | 70.23        |
|         | 3        | 5640.00         | -63.17                      | H2        | 66.04        |
|         | 4        | 7520.00         | -65.93                      | H2        | 63.52        |
|         | 5        | 9400.00         | -68.24                      | H1        | 62.00        |
|         | 6        | 11280.00        | -                           | -         | -            |
|         | 7        | 13160.00        | -                           | -         | -            |
| 810     | 2        | 3819.60         | -62.63                      | H2        | 70.80        |
|         | 3        | 5729.40         | -63.33                      | V         | 66.19        |
|         | 4        | 7639.20         | -66.12                      | H2        | 63.71        |
|         | 5        | 9549.00         | -68.35                      | H2        | 62.37        |
|         | 6        | 11458.80        | -                           | -         | -            |
|         | 7        | 13368.60        | -                           | -         | -            |

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

### 6.3 Radiated Spurious & Harmonic Conversion Table

Date : 2005 . 07 . 11.

Test Engineer : SS LEES

- ① Tx Cable loss
- ② Tx Horn Ant Gain
- ③ Rx Cable loss + HPF Insertion loss + Attenuator
- ④ Pre-Amp gain
- ⑤ Air loss
- ⑥ Tested Level from EUT
- ⑦ = ⑥ + ⑤ + ③ - ④
- ⑧ = EIRP - ⑦

| CH  | Har | Frequency (MHz) | ① Tx CL (dB) | ② Horn Gain (dB) | Tx Level @ (S/G 10dBm) | ⑥ Tested Level EUT : H (dBm) | ⑥ Tested Level EUT : V (dBm) | ⑦ Amplitude of Emission EUT : H (dBm) | ⑦ Amplitude of Emission EUT : V (dBm) | ⑧ Result EUT : H (dBc) | ⑧ Result EUT : V (dBc) |
|-----|-----|-----------------|--------------|------------------|------------------------|------------------------------|------------------------------|---------------------------------------|---------------------------------------|------------------------|------------------------|
| 512 | 2   | 3700.40         | 12.62        | 9.73             | 7.11                   | -63.31                       | -65.24                       | -37.92                                | -39.43                                | 70.49                  | 72.00                  |
|     | 3   | 5550.60         | 16.79        | 11.55            | 4.76                   | -65.81                       | -66.45                       | -35.82                                | -36.71                                | 68.39                  | 69.28                  |
|     | 4   | 7400.80         | 20.18        | 11.44            | 1.26                   | -66.44                       | -67.35                       | -32.16                                | -34.23                                | 64.73                  | 66.80                  |
|     | 5   | 9251.00         | 23.87        | 12.17            | -1.70                  | -68.67                       | -68.99                       | -29.05                                | -30.47                                | 61.62                  | 63.04                  |
|     | 6   | 11101.20        | 27.05        | 13.66            | -3.39                  | -                            | -                            | -                                     | -                                     | -                      | -                      |
|     | 7   | 12951.40        | 33.04        | 13.27            | -9.77                  | -                            | -                            | -                                     | -                                     | -                      | -                      |
| 661 | 2   | 3760.00         | 12.75        | 9.73             | 6.98                   | -62.85                       | -65.18                       | -37.66                                | -39.65                                | 70.23                  | 72.22                  |
|     | 3   | 5640.00         | 16.66        | 11.55            | 4.89                   | -63.17                       | -67.62                       | -33.47                                | -37.66                                | 66.04                  | 70.23                  |
|     | 4   | 7520.00         | 19.98        | 11.44            | 1.46                   | -65.93                       | -66.15                       | -30.95                                | -32.99                                | 63.52                  | 65.56                  |
|     | 5   | 9400.00         | 23.78        | 12.17            | -1.61                  | -68.24                       | -68.72                       | -29.43                                | -31.27                                | 62.00                  | 63.84                  |
|     | 6   | 11280.00        | 27.20        | 13.66            | -3.54                  | -                            | -                            | -                                     | -                                     | -                      | -                      |
|     | 7   | 13160.00        | 33.30        | 13.27            | -10.03                 | -                            | -                            | -                                     | -                                     | -                      | -                      |
| 810 | 2   | 3819.60         | 13.30        | 9.73             | 6.43                   | -62.63                       | -64.69                       | -38.23                                | -39.06                                | 70.80                  | 71.63                  |
|     | 3   | 5729.40         | 16.85        | 11.55            | 4.70                   | -64.12                       | -63.33                       | -34.52                                | -33.62                                | 67.09                  | 66.19                  |
|     | 4   | 7639.20         | 20.70        | 11.44            | 0.74                   | -66.12                       | -65.96                       | -31.14                                | -32.09                                | 63.71                  | 64.66                  |
|     | 5   | 9549.00         | 24.68        | 12.17            | -2.51                  | -68.35                       | -68.73                       | -29.80                                | -30.71                                | 62.37                  | 63.28                  |
|     | 6   | 11458.80        | 28.00        | 13.66            | -4.34                  | -                            | -                            | -                                     | -                                     | -                      | -                      |
|     | 7   | 13368.60        | 34.17        | 13.27            | -10.90                 | -                            | -                            | -                                     | -                                     | -                      | -                      |



## 6.4 Frequency Stability

### 6.4.1 Frequency Stability Table

Operating Frequency : 1,880,000,000 Hz

Channel : 661

Reference Voltage : 3.7VDC

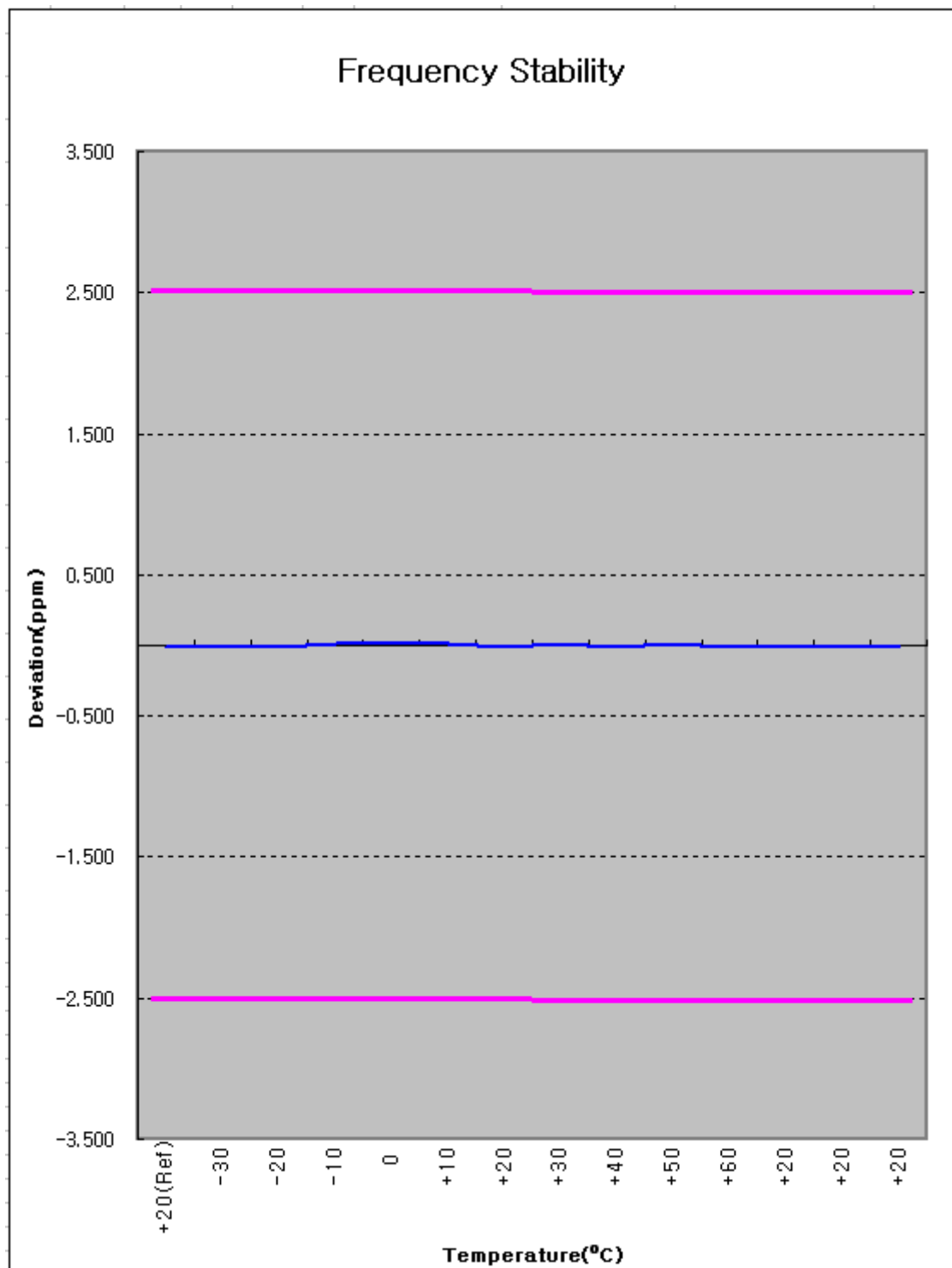
**Deviation Limit :  $\pm 0.00025$  % or 2.5ppm**

| Voltage (%)   | Power (VDC) | Temp. (°C) | Frequency Error (Hz) | Frequency (Hz) | Deviation (%) | ppm    |
|---------------|-------------|------------|----------------------|----------------|---------------|--------|
| 100%          | 3.70        | +20(Ref)   | -22.57               | 1,879,999,977  | -0.000001     | -0.012 |
| 100%          |             | -30        | -14.35               | 1,879,999,986  | -0.000001     | -0.008 |
| 100%          |             | -20        | -19.22               | 1,879,999,981  | -0.000001     | -0.010 |
| 100%          |             | -10        | 23.35                | 1,880,000,023  | 0.000001      | 0.012  |
| 100%          |             | 0          | 18.22                | 1,880,000,018  | 0.000001      | 0.010  |
| 100%          |             | +10        | 21.30                | 1,880,000,021  | 0.000001      | 0.011  |
| 100%          |             | +20        | -22.57               | 1,879,999,977  | -0.000001     | -0.012 |
| 100%          |             | +30        | 19.28                | 1,880,000,019  | 0.000001      | 0.010  |
| 100%          |             | +40        | -21.77               | 1,879,999,978  | -0.000001     | -0.012 |
| 100%          |             | +50        | 20.81                | 1,880,000,021  | 0.000001      | 0.011  |
| 100%          |             | +60        | -22.64               | 1,879,999,977  | -0.000001     | -0.012 |
| 85%           | 3.33        | +20        | -26.85               | 1,879,999,973  | -0.000001     | -0.014 |
| 115%          | 4.26        | +20        | -19.35               | 1,879,999,981  | -0.000001     | -0.010 |
| Batt.Endpoint | 3.33        | +20        | -26.85               | 1,879,999,973  | -0.000001     | -0.014 |

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

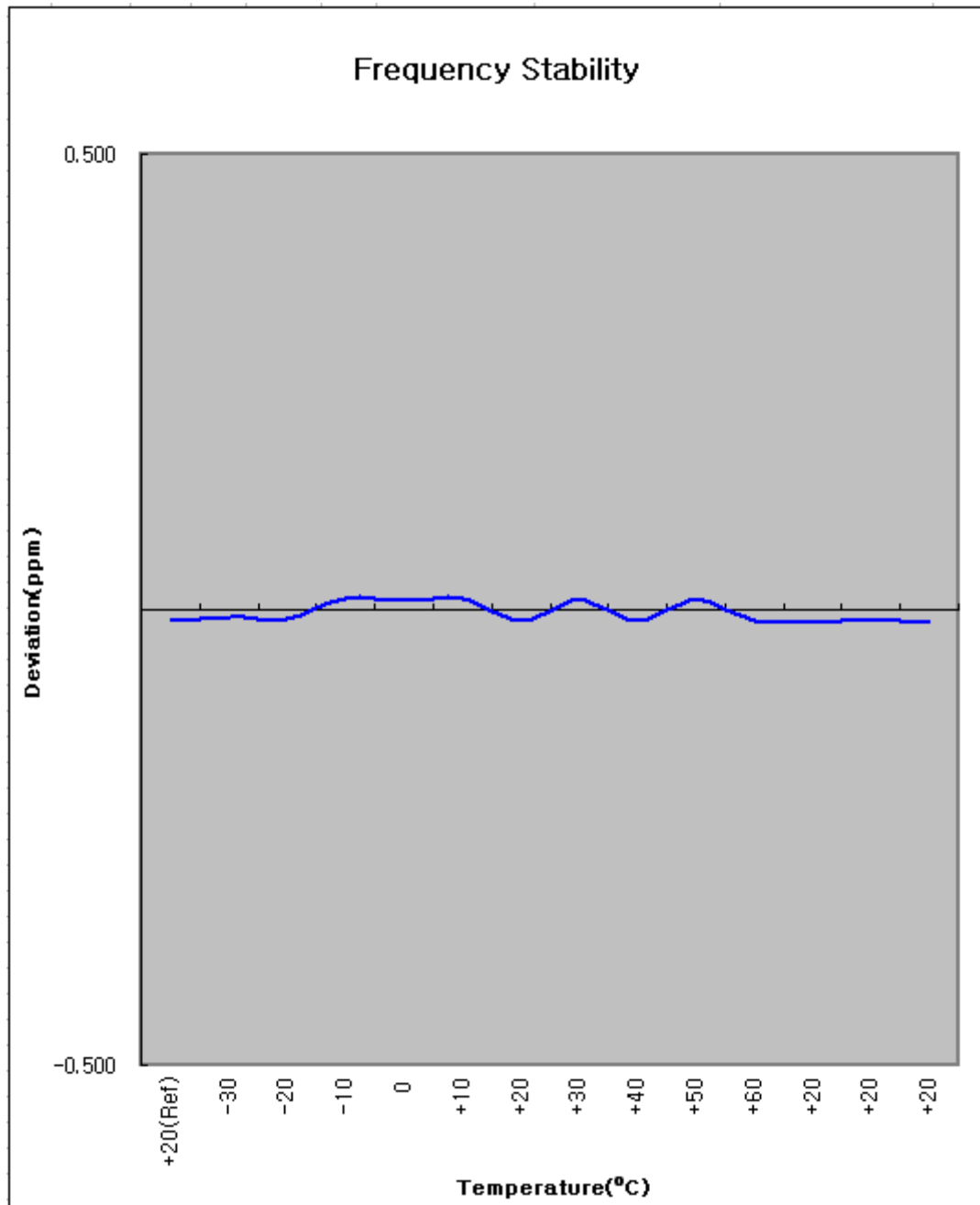
**The EUT is tested down to the battery end point.**

## 6.4.2 Frequency Stability Graph



- End of page -

Zoom In



- End of page -



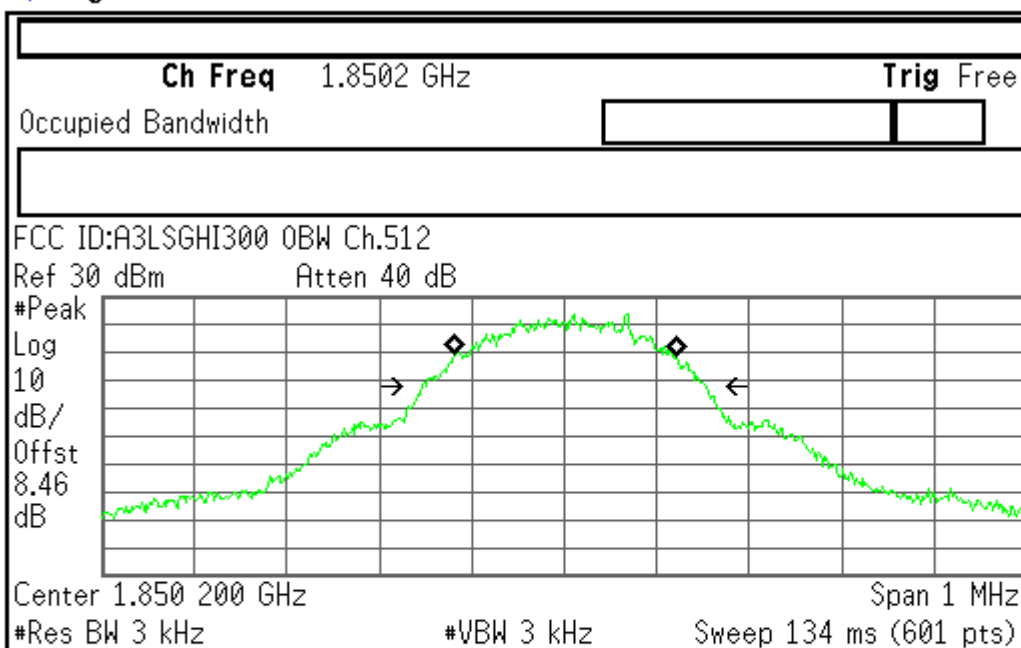
## 7. CONCLUSION

The data collected shows that the SAMSUNG Single-Band PCS GSM Phone with Bluetooth.  
FCC ID : A3LSGHI300 complies with all the requirements of Parts 2,24 of the FCC Rules.

- End of page -

## 8. TEST PLOTS

- End of page -



Freq/Channel

Center Freq  
1.85020000 GHz

Start Freq  
1.84970000 GHz

Stop Freq  
1.85070000 GHz

CF Step  
100.000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

Signal Track  
On Off

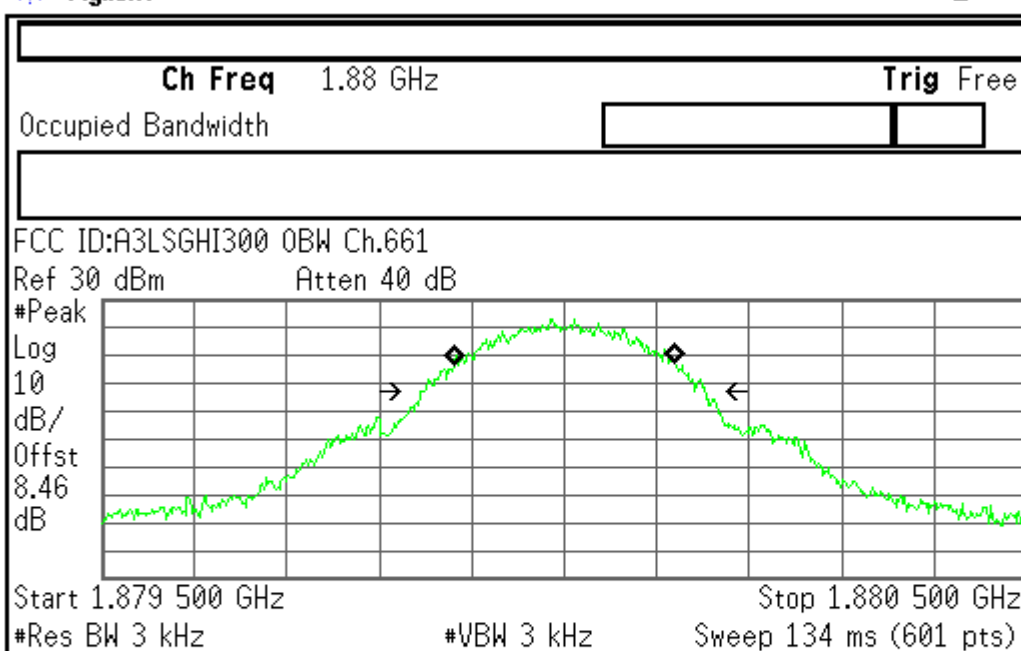
Occupied Bandwidth 243.4733 kHz

Occ BW % Pwr 99.00 %  
x dB -26.00 dB

Transmit Freq Error 1.166 kHz

x dB Bandwidth 311.001 kHz

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Freq/Channel

Center Freq  
1.88000000 GHz

Start Freq  
1.87950000 GHz

Stop Freq  
1.88050000 GHz

CF Step  
100.000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

Signal Track  
On Off

Occupied Bandwidth 243.2837 kHz

Occ BW % Pwr 99.00 %  
x dB -26.00 dB

Transmit Freq Error -87.695 Hz

x dB Bandwidth 311.336 kHz

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Ch Freq 1.9098 GHz Trig Free  
Occupied Bandwidth

Center Freq  
1.90980000 GHz

Start Freq  
1.90930000 GHz

Stop Freq  
1.91030000 GHz

CF Step  
100.000000 kHz  
Auto Man

Freq Offset  
0.00000000 Hz

Signal Track  
On Off

FCC ID:A3LSGHI300 0BW Ch.810

Ref 30 dBm Atten 40 dB

#Peak

Log

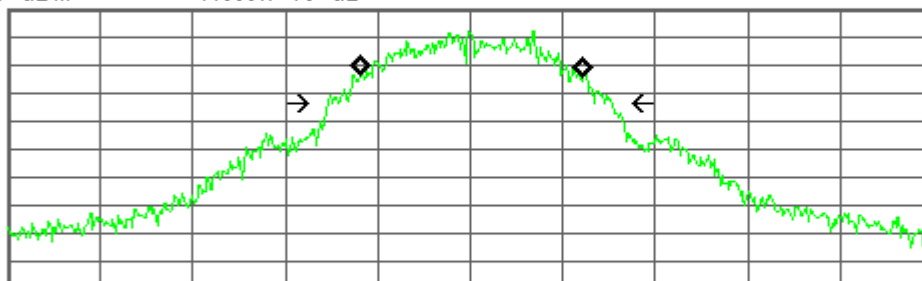
10

dB/

Offst

8.46

dB



Center 1.909 800 GHz

Span 1 MHz

#Res BW 3 kHz

#VBW 3 kHz

Sweep 134 ms (601 pts)

Occupied Bandwidth  
246.0623 kHz

Occ BW % Pwr 99.00 %

x dB -26.00 dB

Transmit Freq Error 1.083 kHz

x dB Bandwidth 310.772 kHz

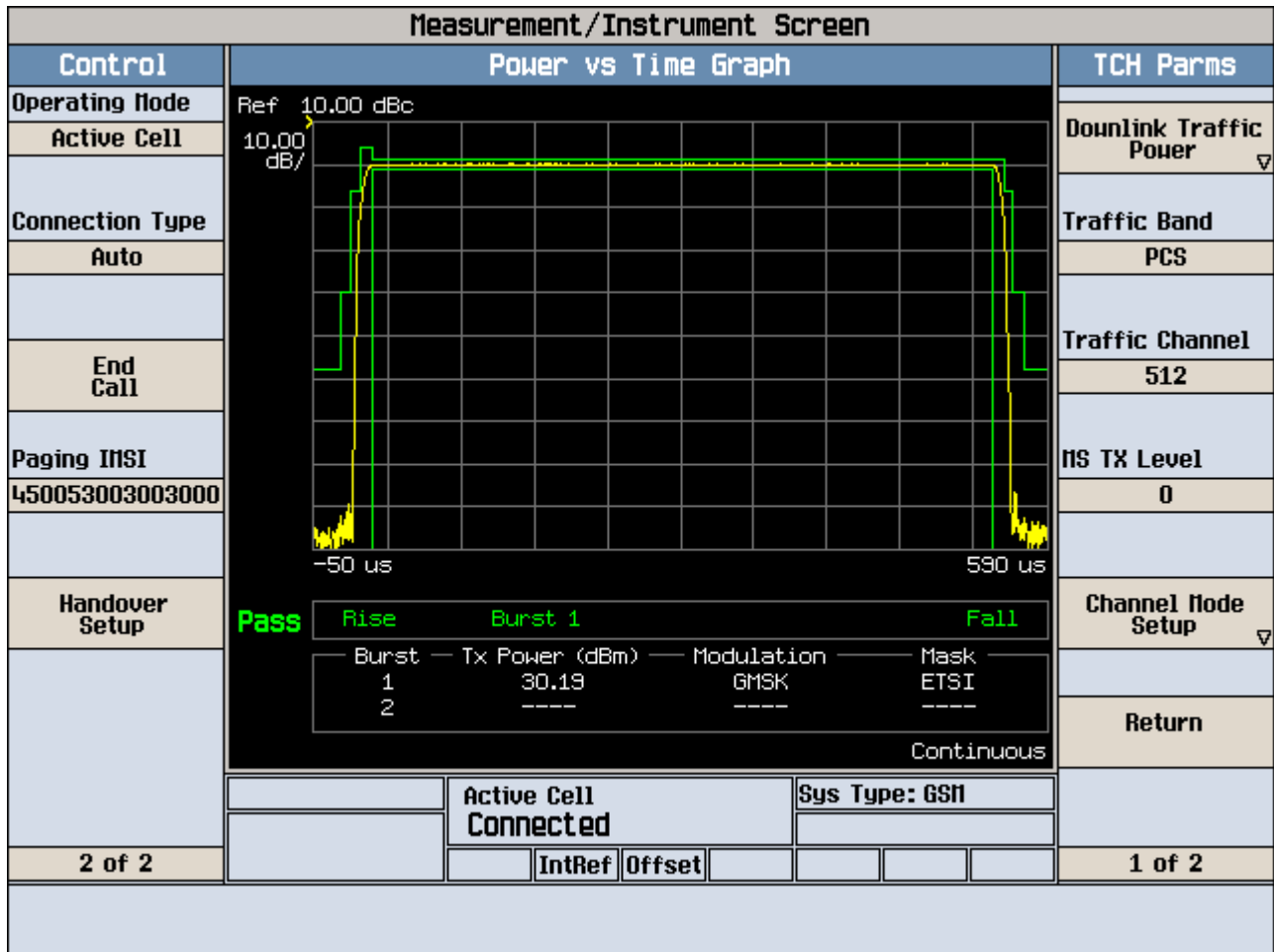
Copyright 2000-2002 Agilent Technologies

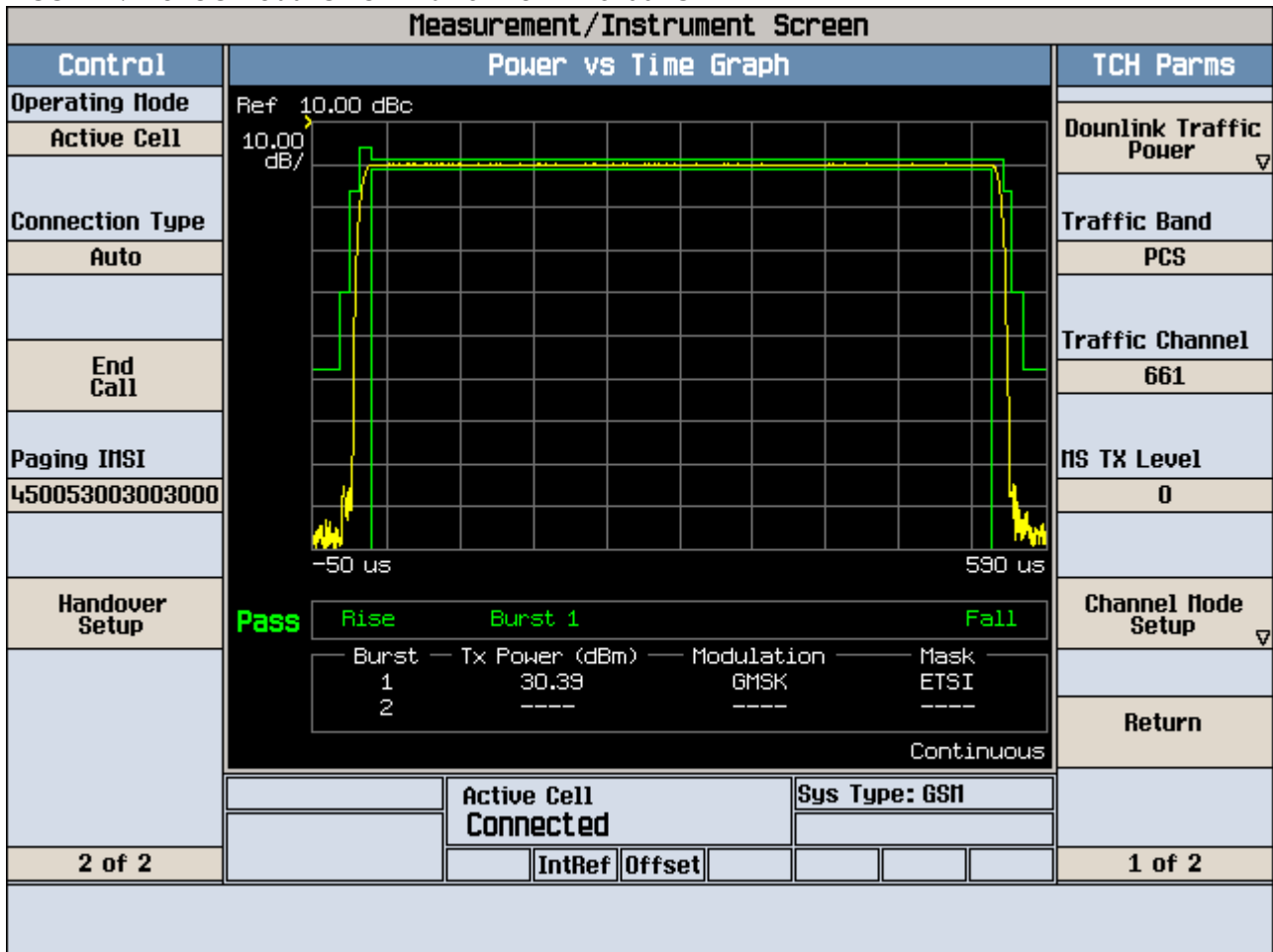
| Measurement/Instrument Screen                          |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
|--------------------------------------------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--|--|--|--|--------------------------|--------------|-------------|--------------|---------|------|------|--------|---------|------|------|------|---------|------|------|-------|-----------|------|------|------|----------------------|--|
| Control                                                |              | GSM/GPRS Transmit Power                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |  |  |  |  | TCH Parms                |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
| GSM/GPRS TX Power Setup ▾                              |              | GSM Transmit Power<br><b>29.97</b> dBm<br>Continuous                                                                                                                                                                                                                                                                                                                                                                                                                |              |  |  |  |  | Downlink Traffic Power ▾ |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
| Swap Window Positions<br><br>1 of 2                    |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |  |  |  |  | Traffic Band             |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
|                                                        |              | PCS                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
|                                                        |              | Traffic Channel                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
|                                                        |              | 512                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
|                                                        |              | RIS TX Level                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
| Phase & Frequency Error                                |              | <table border="1"> <thead> <tr> <th></th> <th>Peak Phase °</th> <th>RMS Phase °</th> <th>Frequency Hz</th> </tr> </thead> <tbody> <tr> <td>Minimum</td> <td>2.56</td> <td>1.01</td> <td>-10.14</td> </tr> <tr> <td>Maximum</td> <td>4.55</td> <td>1.32</td> <td>7.40</td> </tr> <tr> <td>Average</td> <td>3.38</td> <td>1.18</td> <td>-2.25</td> </tr> <tr> <td>Pass/Fail</td> <td>Pass</td> <td>Pass</td> <td>Pass</td> </tr> </tbody> </table> 20 / 50 Continuous |              |  |  |  |  |                          | Peak Phase ° | RMS Phase ° | Frequency Hz | Minimum | 2.56 | 1.01 | -10.14 | Maximum | 4.55 | 1.32 | 7.40 | Average | 3.38 | 1.18 | -2.25 | Pass/Fail | Pass | Pass | Pass | Channel Mode Setup ▾ |  |
|                                                        | Peak Phase ° | RMS Phase °                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Frequency Hz |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
| Minimum                                                | 2.56         | 1.01                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -10.14       |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
| Maximum                                                | 4.55         | 1.32                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 7.40         |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
| Average                                                | 3.38         | 1.18                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -2.25        |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
| Pass/Fail                                              | Pass         | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Pass         |  |  |  |  |                          |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
| <div>Background</div> <div>Active Cell Connected</div> |              | <div>Sys Type: GSM</div> <div></div>                                                                                                                                                                                                                                                                                                                                                                                                                                |              |  |  |  |  | Return                   |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |
|                                                        |              | <div>IntRef</div> <div>Offset</div>                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |  |  |  |  | 1 of 2                   |              |             |              |         |      |      |        |         |      |      |      |         |      |      |       |           |      |      |      |                      |  |

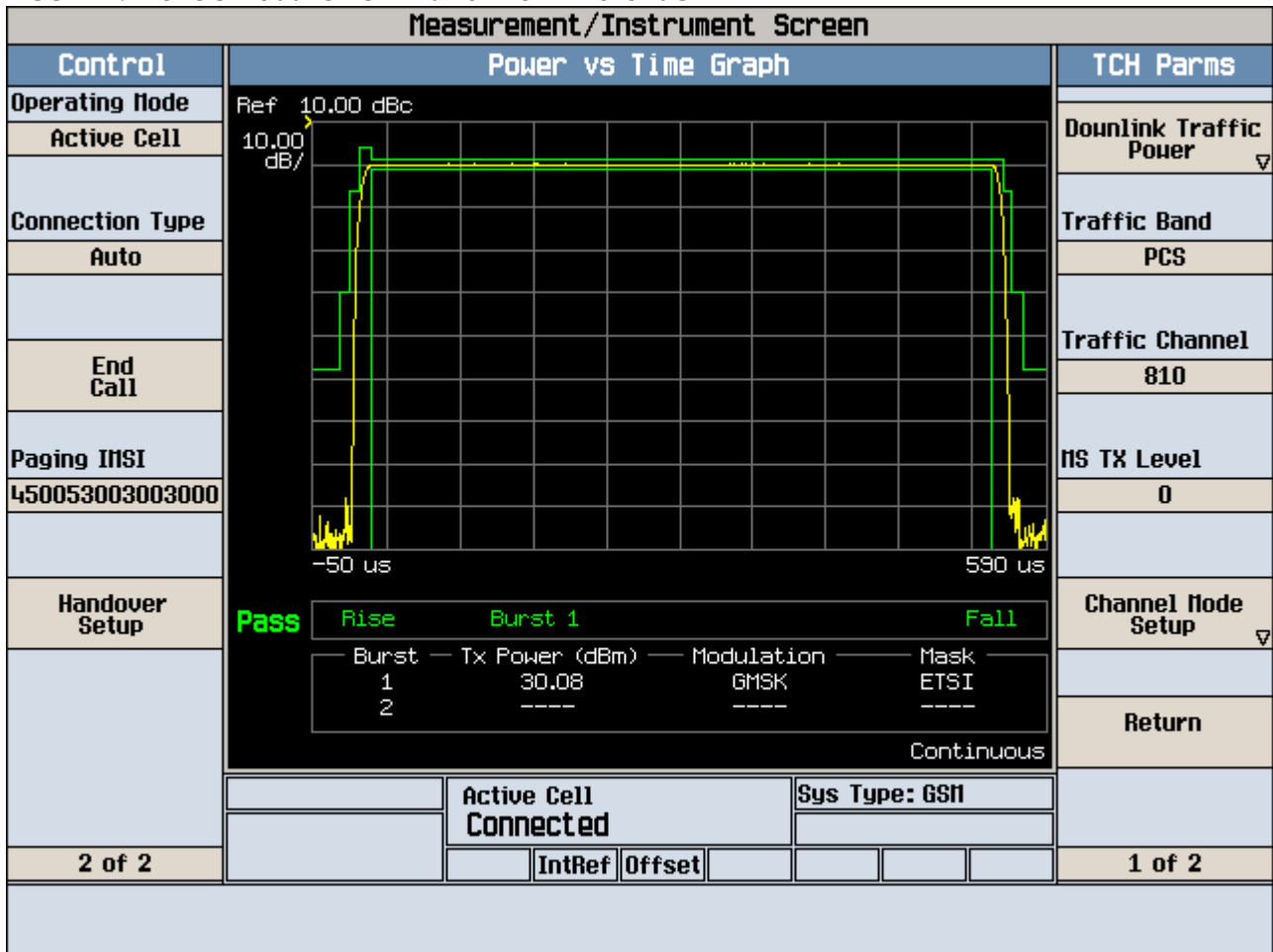


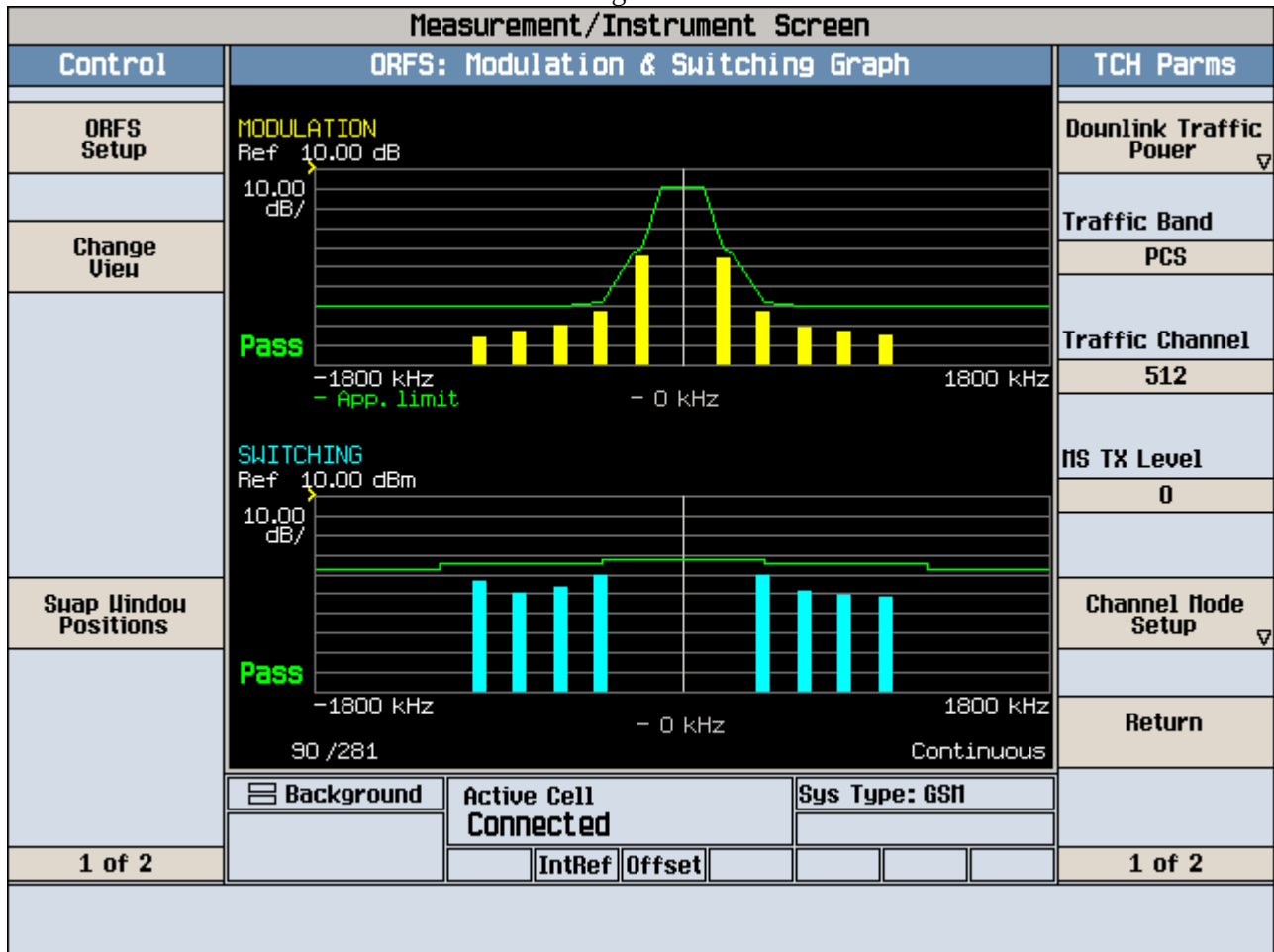
| Measurement/Instrument Screen |  |                                                      |  |                       |  |               |                          |        |  |
|-------------------------------|--|------------------------------------------------------|--|-----------------------|--|---------------|--------------------------|--------|--|
| Control                       |  | GSM/GPRS Transmit Power                              |  |                       |  |               | TCH Parms                |        |  |
| GSM/GPRS TX Power Setup ▾     |  | GSM Transmit Power<br><b>29.97</b> dBm<br>Continuous |  |                       |  |               | Downlink Traffic Power ▾ |        |  |
| Swap Window Positions         |  |                                                      |  |                       |  |               | Traffic Band             |        |  |
|                               |  | PCS                                                  |  |                       |  |               |                          |        |  |
|                               |  | Traffic Channel                                      |  |                       |  |               |                          |        |  |
|                               |  | 661                                                  |  |                       |  |               |                          |        |  |
|                               |  | RIS TX Level                                         |  |                       |  |               |                          |        |  |
|                               |  |                                                      |  |                       |  |               | 0                        |        |  |
|                               |  |                                                      |  |                       |  |               | Channel Mode Setup ▾     |        |  |
|                               |  |                                                      |  |                       |  |               |                          |        |  |
|                               |  |                                                      |  |                       |  |               | Return                   |        |  |
|                               |  |                                                      |  |                       |  |               |                          |        |  |
| 1 of 2                        |  | <input type="checkbox"/> Background                  |  | Active Cell Connected |  | Sys Type: GSM |                          |        |  |
|                               |  |                                                      |  |                       |  |               |                          |        |  |
|                               |  |                                                      |  | IntRef Offset         |  |               |                          |        |  |
|                               |  |                                                      |  |                       |  |               |                          | 1 of 2 |  |

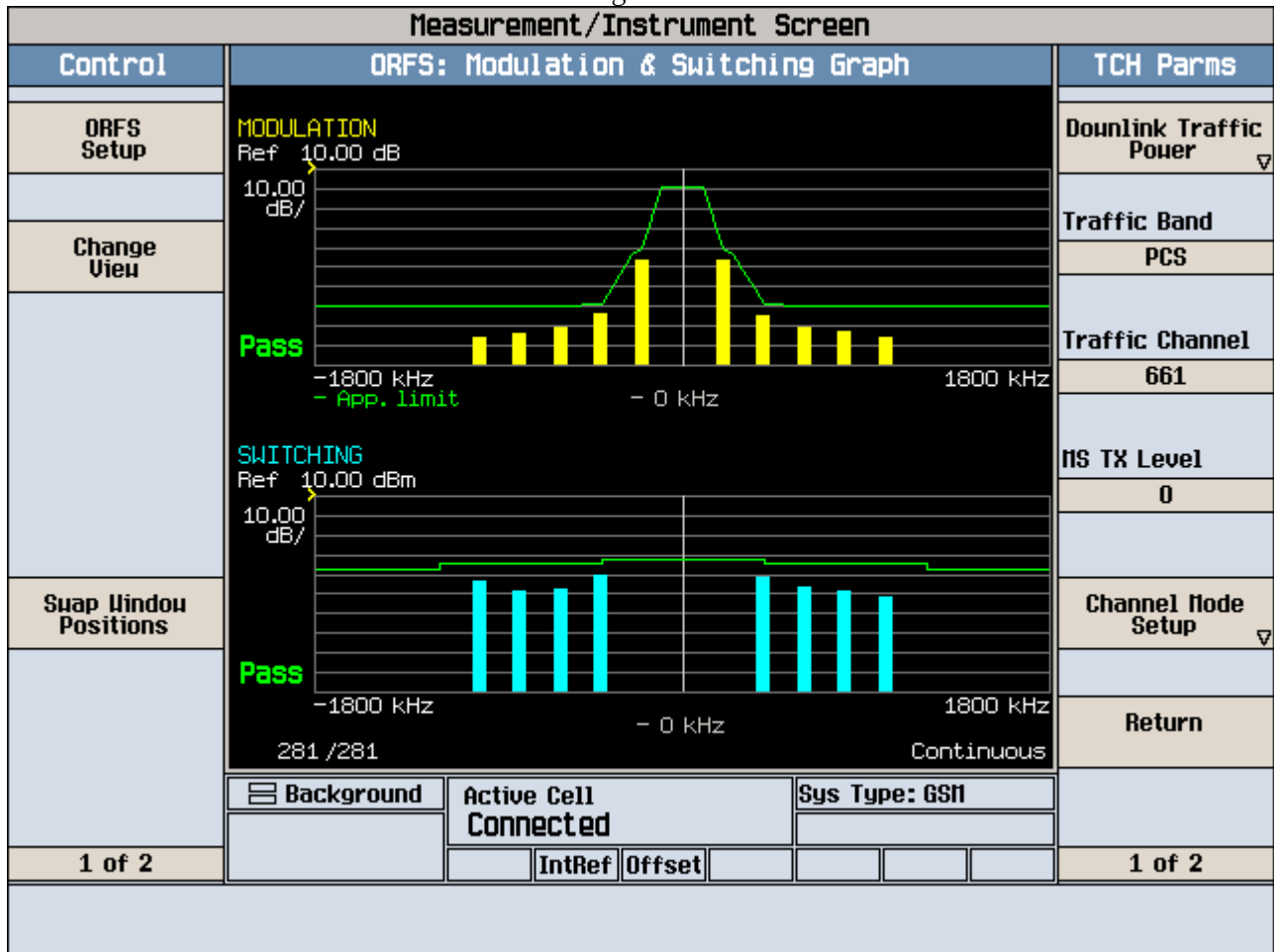
| Measurement/Instrument Screen |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               |                          |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|-------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------|--------|--|---------------|--------------------------|--------------|-------------|--------------|---------|------|------|--------|---------|------|------|--------|---------|------|------|--------|-----------|------|------|------|---|--|
| Control                       |              | GSM/GPRS Transmit Power                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                       |        |  |               | TCH Parms                |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
| GSM/GPRS TX Power Setup ▾     |              | <div>GMSK Transmit Power</div> <div>29.30 dBm</div> <div>Continuous</div>                                                                                                                                                                                                                                                                                                                                                                      |      |                       |        |  |               | Downlink Traffic Power ▾ |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | Traffic Band             |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | PCS                      |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | Traffic Channel          |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | 810                      |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              | Phase & Frequency Error                                                                                                                                                                                                                                                                                                                                                                                                                        |      |                       |        |  |               | MS TX Level              |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              | <table><thead><tr><th></th><th>Peak Phase °</th><th>RMS Phase °</th><th>Frequency Hz</th></tr></thead><tbody><tr><td>Minimum</td><td>3.85</td><td>1.43</td><td>-53.88</td></tr><tr><td>Maximum</td><td>5.99</td><td>1.94</td><td>-40.75</td></tr><tr><td>Average</td><td>4.77</td><td>1.69</td><td>-46.79</td></tr><tr><td>Pass/Fail</td><td>Pass</td><td>Pass</td><td>Pass</td></tr></tbody></table> <div>50 / 50</div> <div>Continuous</div> |      |                       |        |  |               |                          | Peak Phase ° | RMS Phase ° | Frequency Hz | Minimum | 3.85 | 1.43 | -53.88 | Maximum | 5.99 | 1.94 | -40.75 | Average | 4.77 | 1.69 | -46.79 | Pass/Fail | Pass | Pass | Pass | 0 |  |
|                               | Peak Phase ° |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | RMS Phase °              | Frequency Hz |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
| Minimum                       | 3.85         |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | 1.43                     | -53.88       |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
| Maximum                       | 5.99         |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | 1.94                     | -40.75       |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
| Average                       | 4.77         |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | 1.69                     | -46.79       |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
| Pass/Fail                     | Pass         | Pass                                                                                                                                                                                                                                                                                                                                                                                                                                           | Pass |                       |        |  |               |                          |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
| Swap Window Positions         |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | Channel Mode Setup ▾     |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               |                          |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               | Return                   |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              | Background                                                                                                                                                                                                                                                                                                                                                                                                                                     |      | Active Cell Connected |        |  | Sys Type: GSM |                          |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
|                               |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                       |        |  |               |                          |              |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |
| 1 of 2                        |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                |      | IntRef                | Offset |  |               |                          | 1 of 2       |             |              |         |      |      |        |         |      |      |        |         |      |      |        |           |      |      |      |   |  |

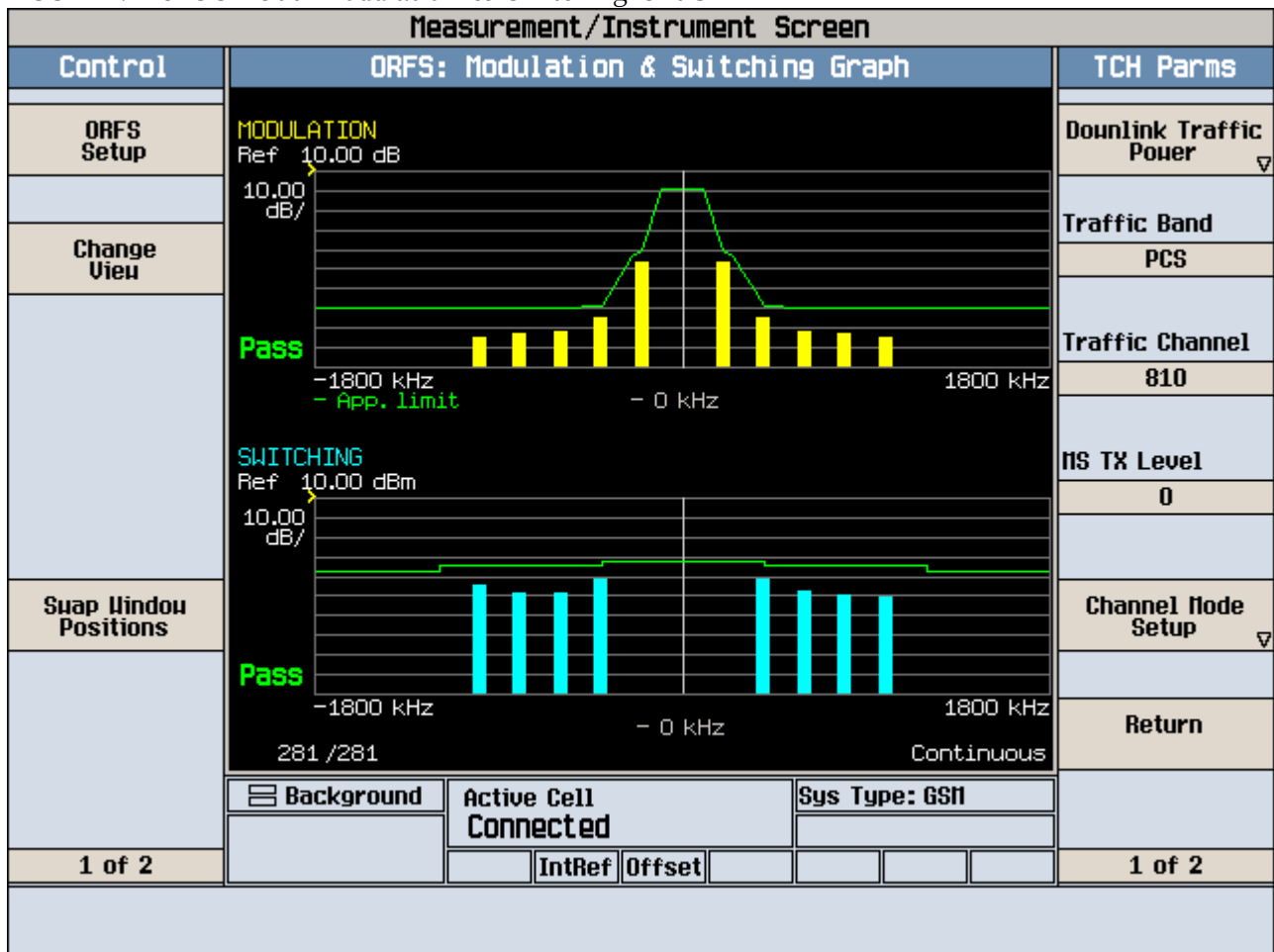




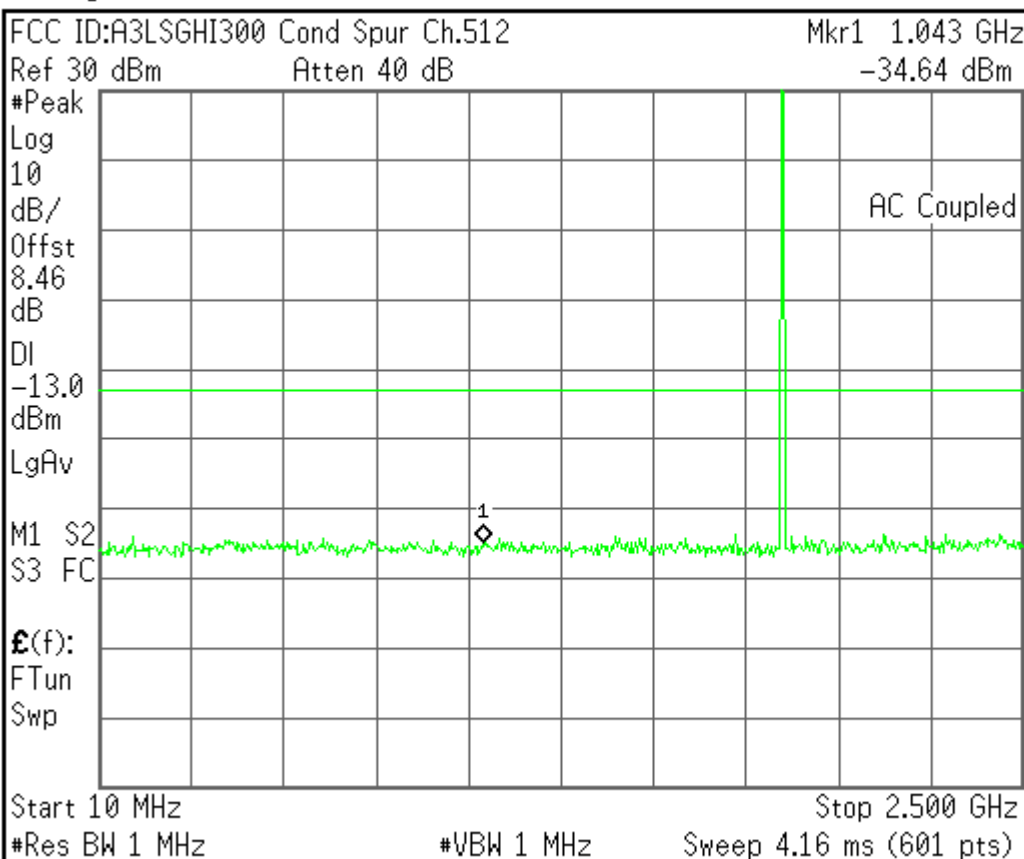












Center Freq  
 1.25500000 GHz

Start Freq  
 10.0000000 MHz

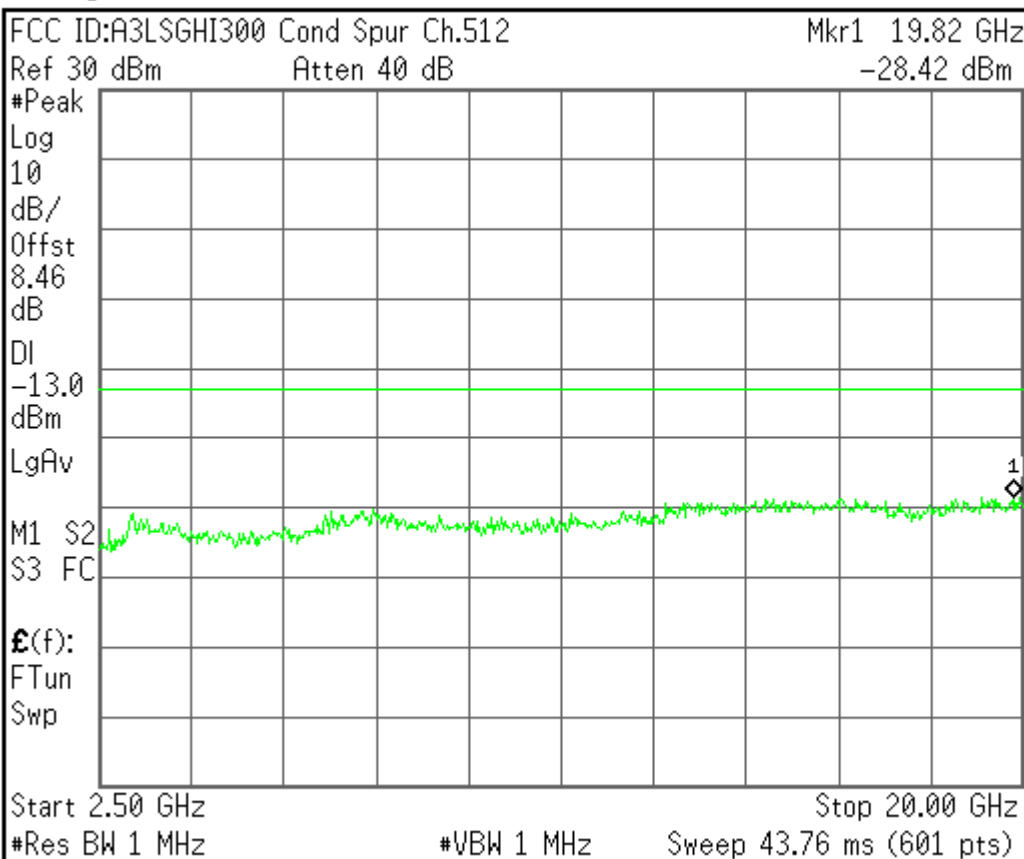
Stop Freq  
 2.50000000 GHz

CF Step  
 249.000000 MHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

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Center Freq  
 11.2500000 GHz

Start Freq  
 2.50000000 GHz

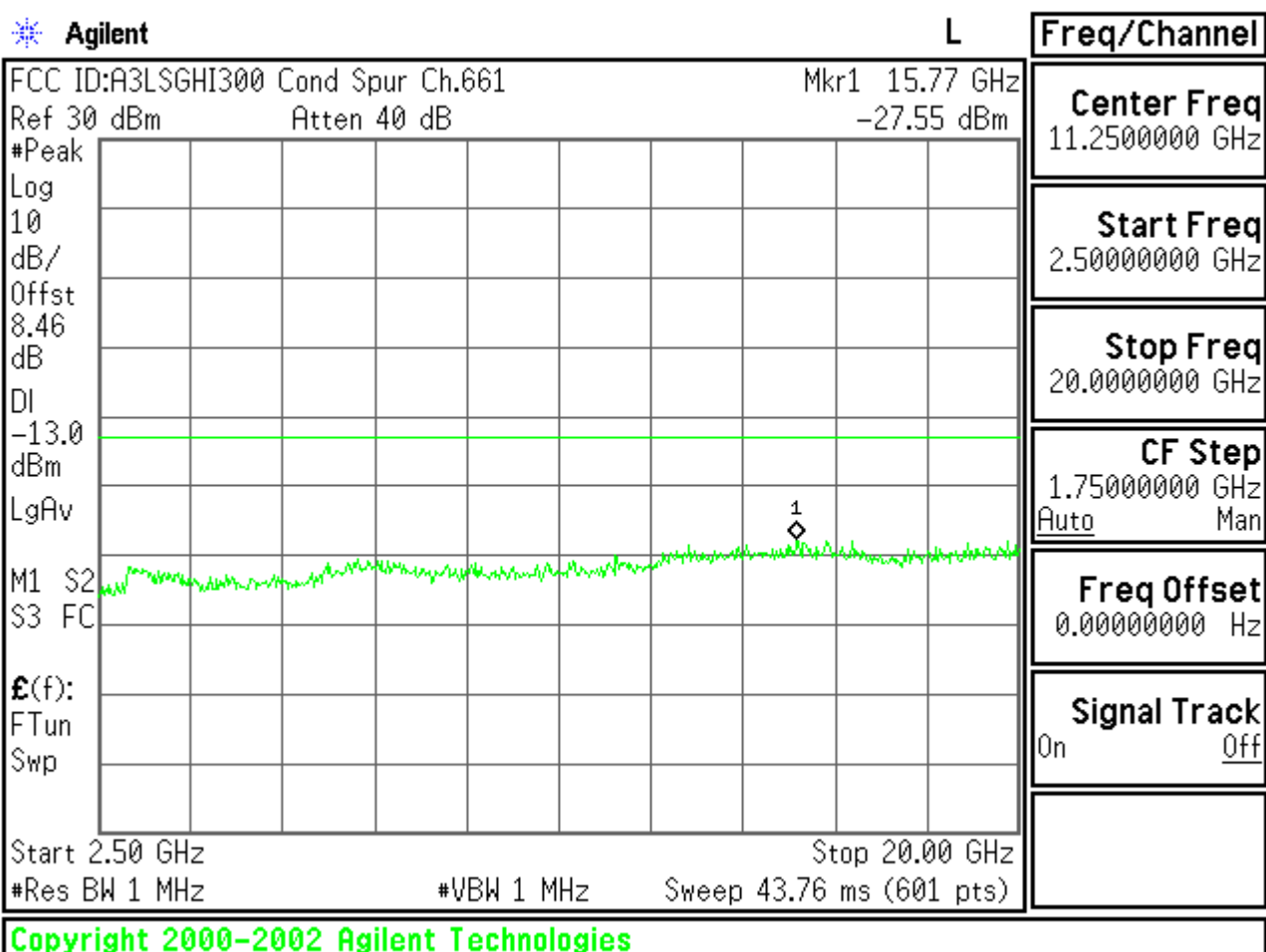
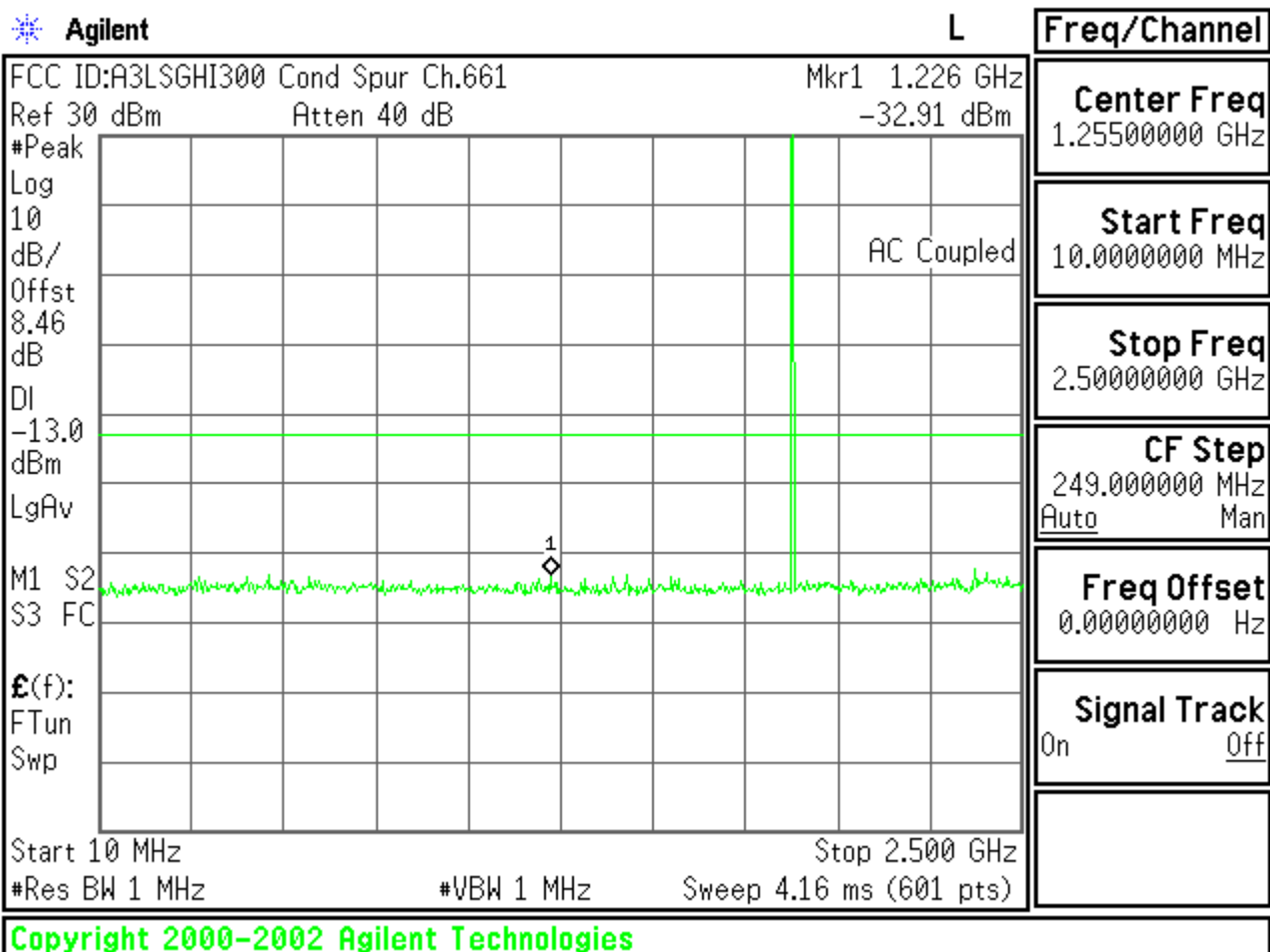
Stop Freq  
 20.0000000 GHz

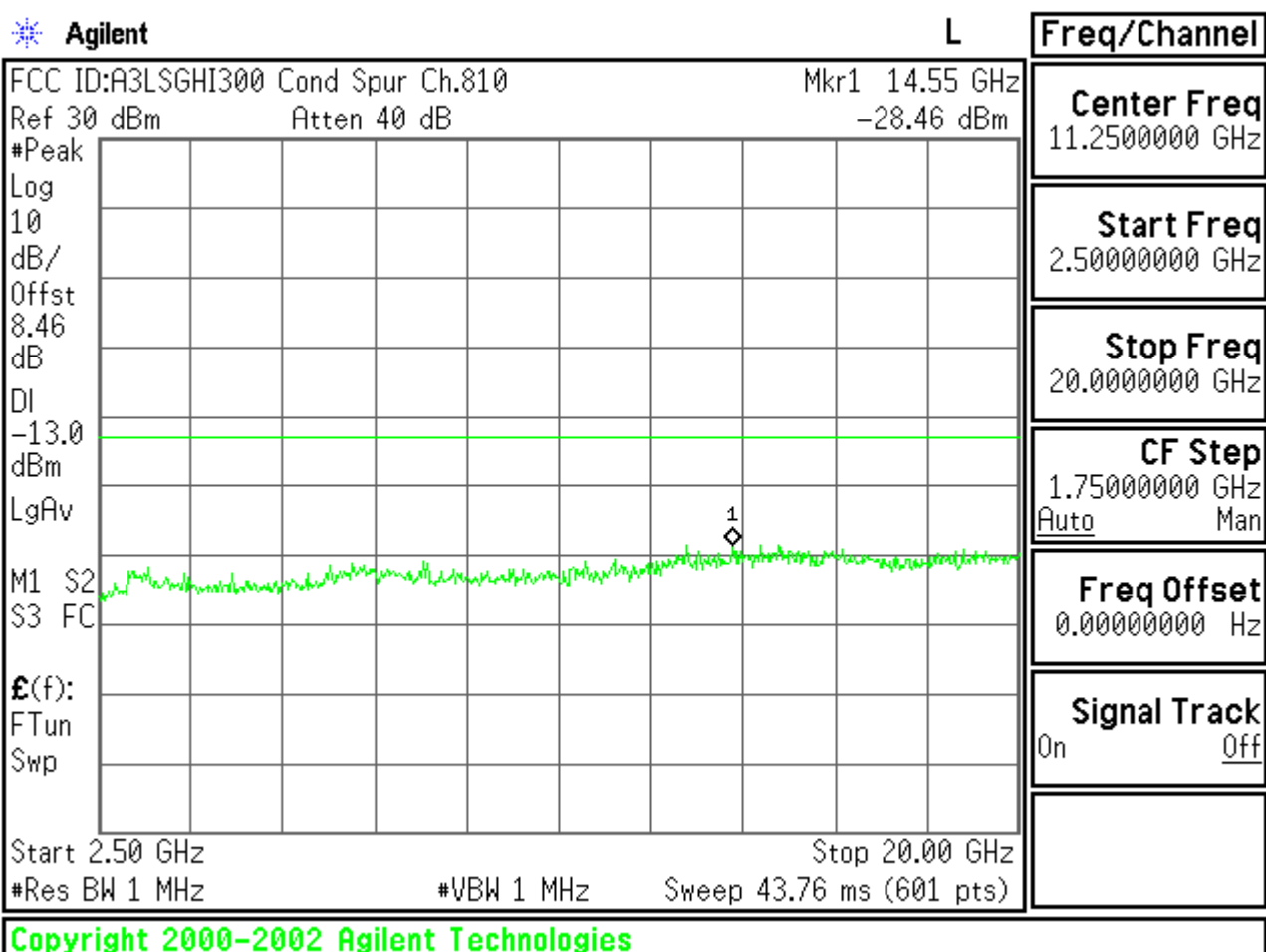
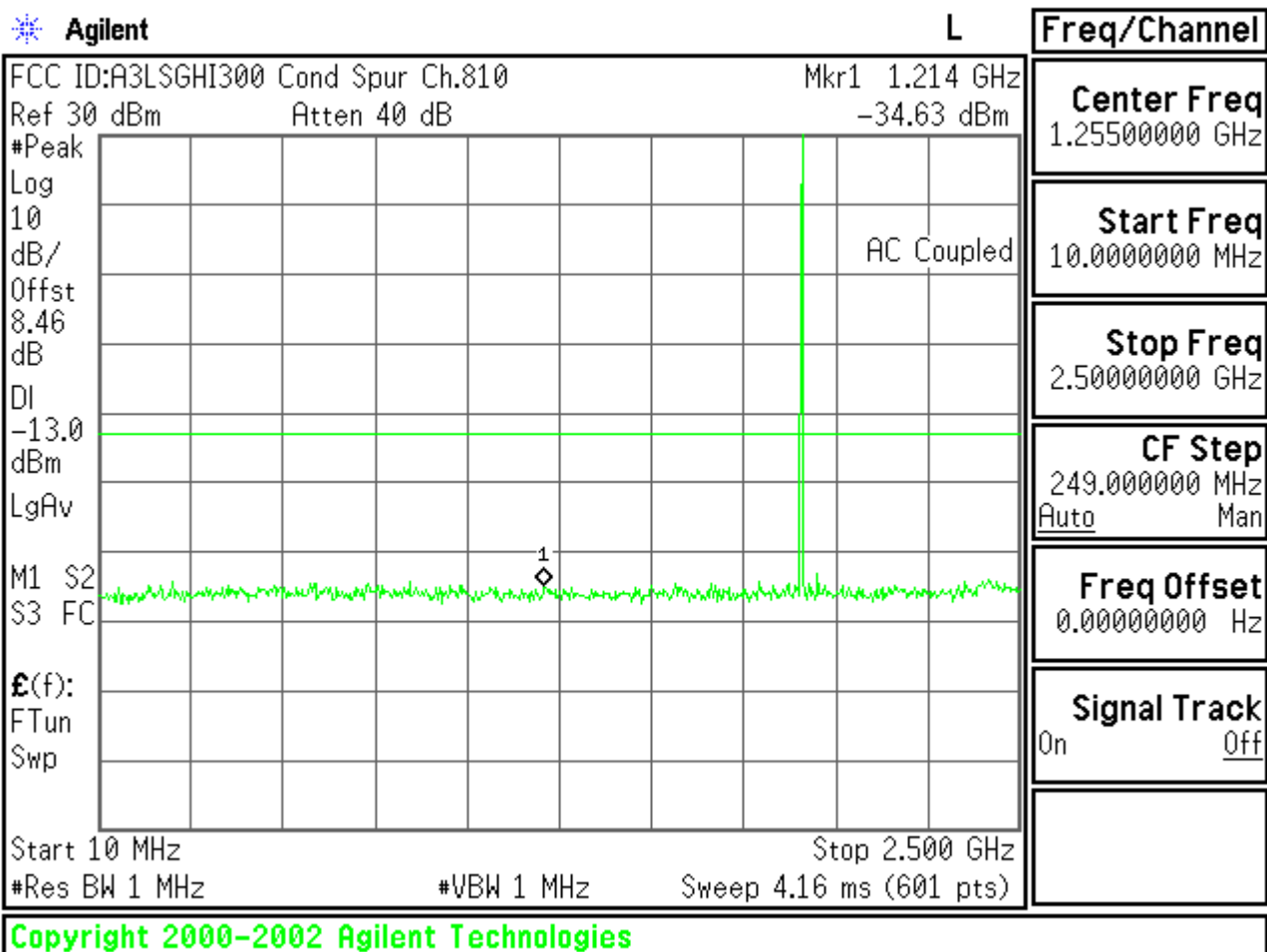
CF Step  
 1.75000000 GHz  
 Auto Man

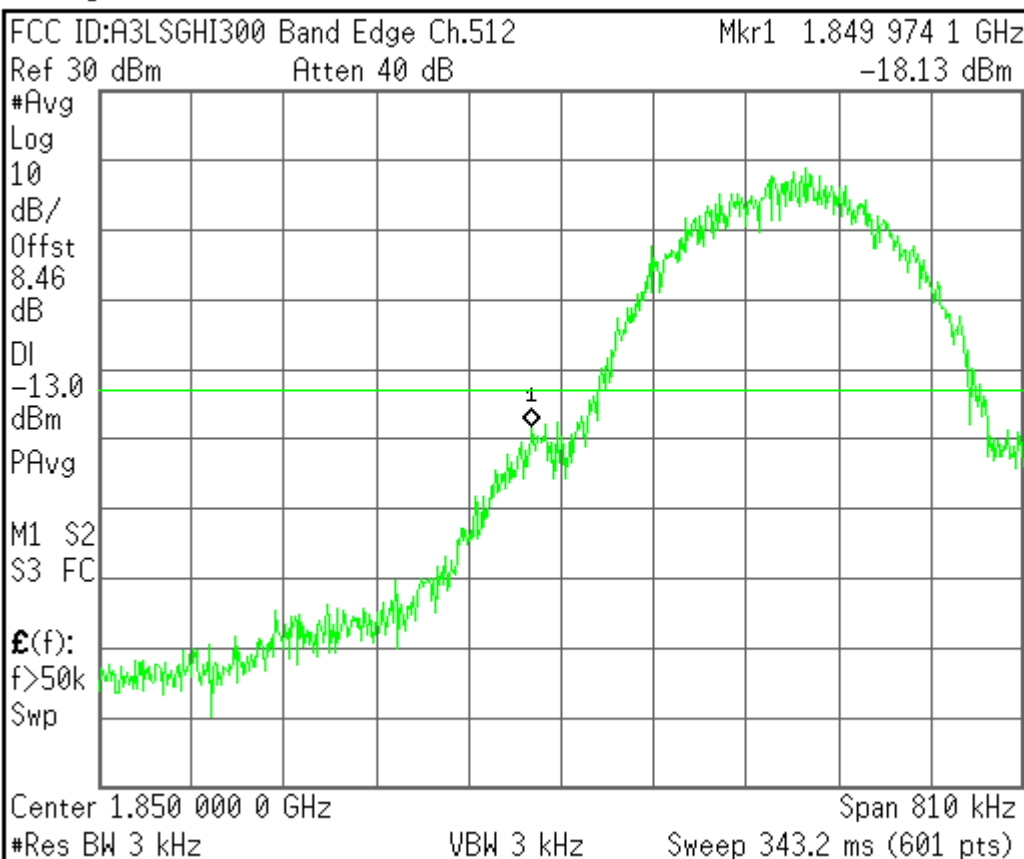
Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

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Freq/Channel

Center Freq  
 1.85000000 GHz

Start Freq  
 1.84959500 GHz

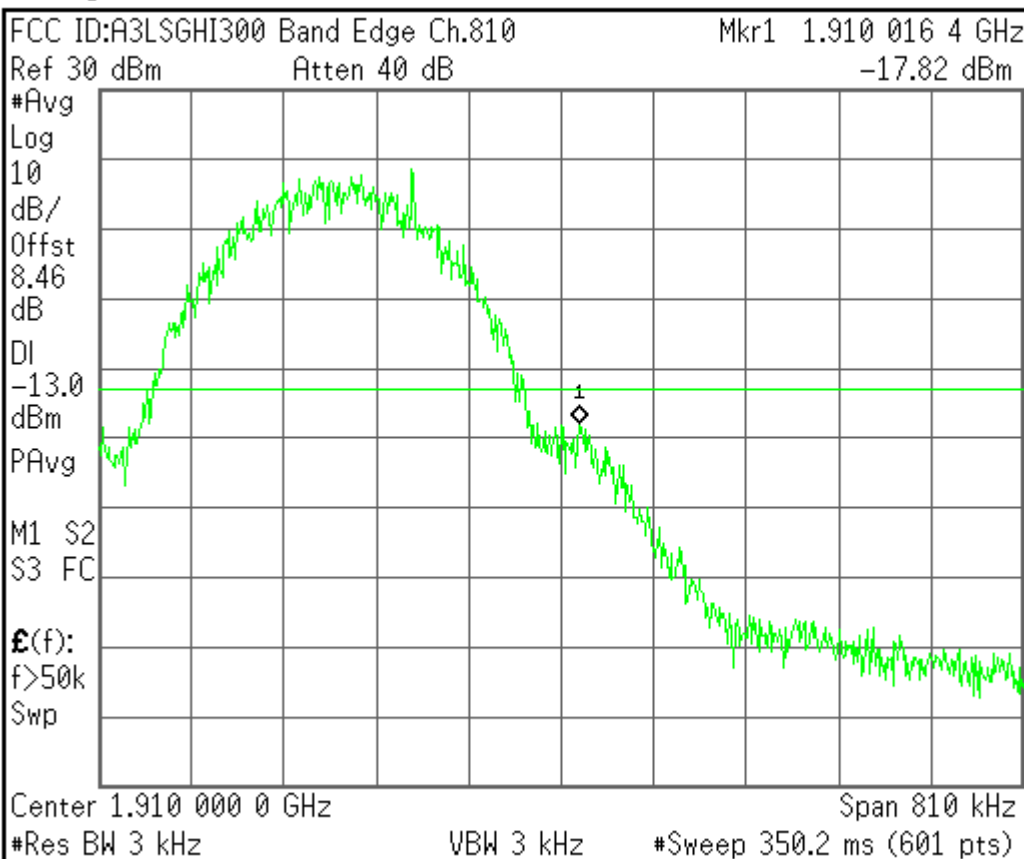
Stop Freq  
 1.85040500 GHz

CF Step  
 81.00000000 kHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

Signal Track  
 On Off

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Freq/Channel

Center Freq  
 1.91000000 GHz

Start Freq  
 1.90959500 GHz

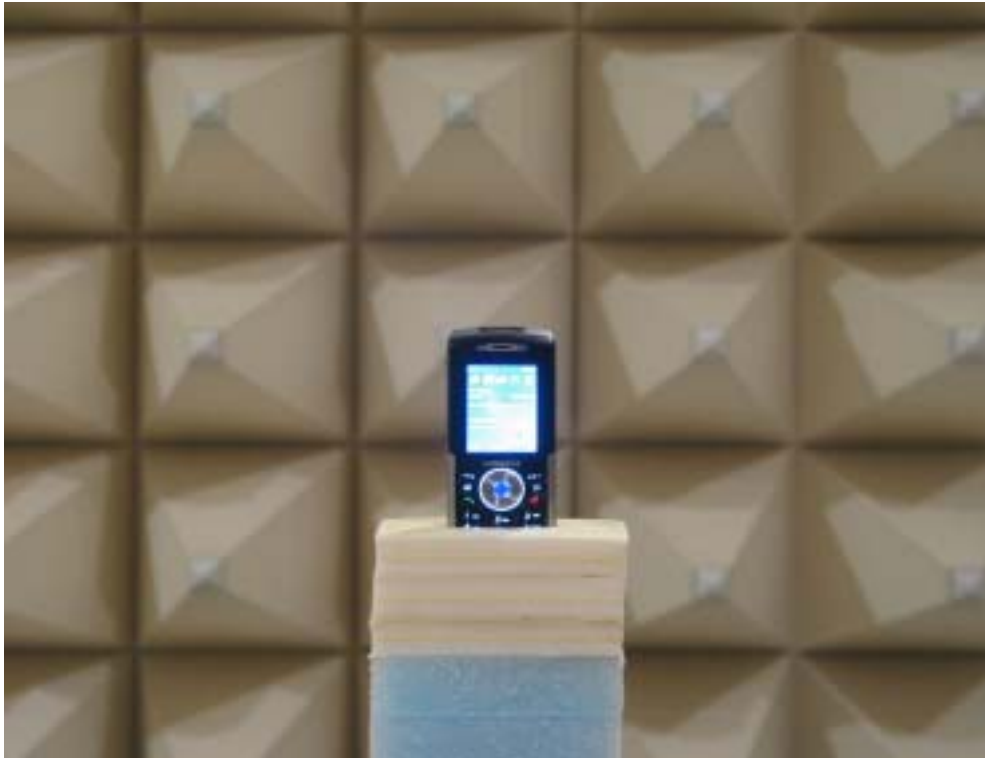
Stop Freq  
 1.91040500 GHz

CF Step  
 81.00000000 kHz  
 Auto Man

Freq Offset  
 0.00000000 Hz

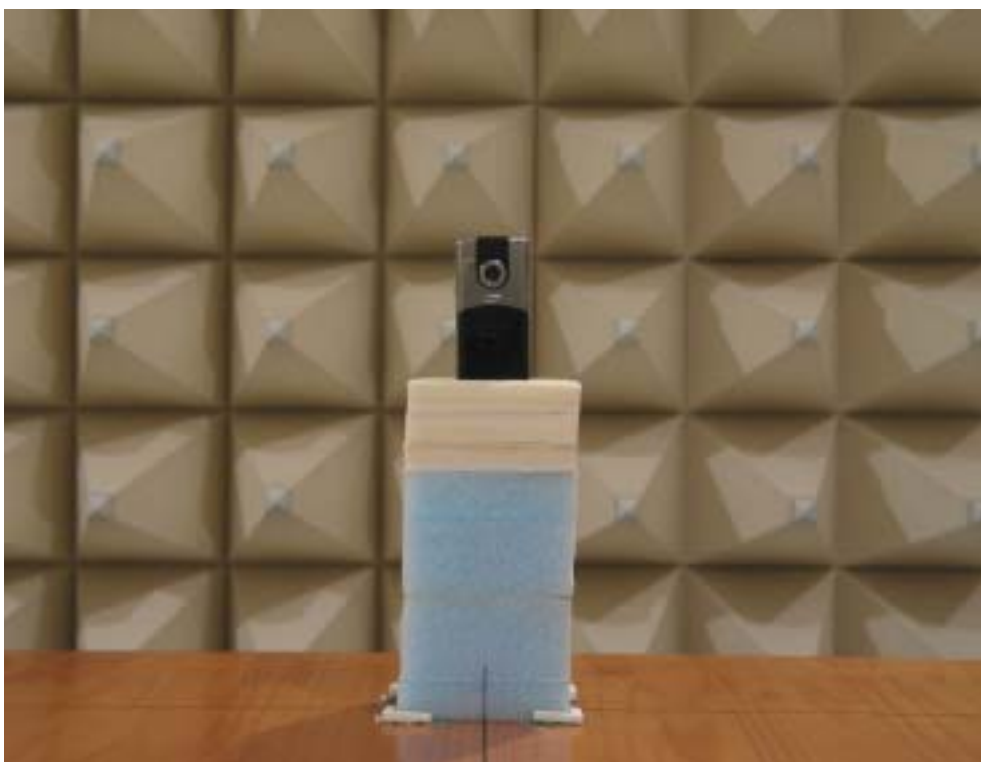
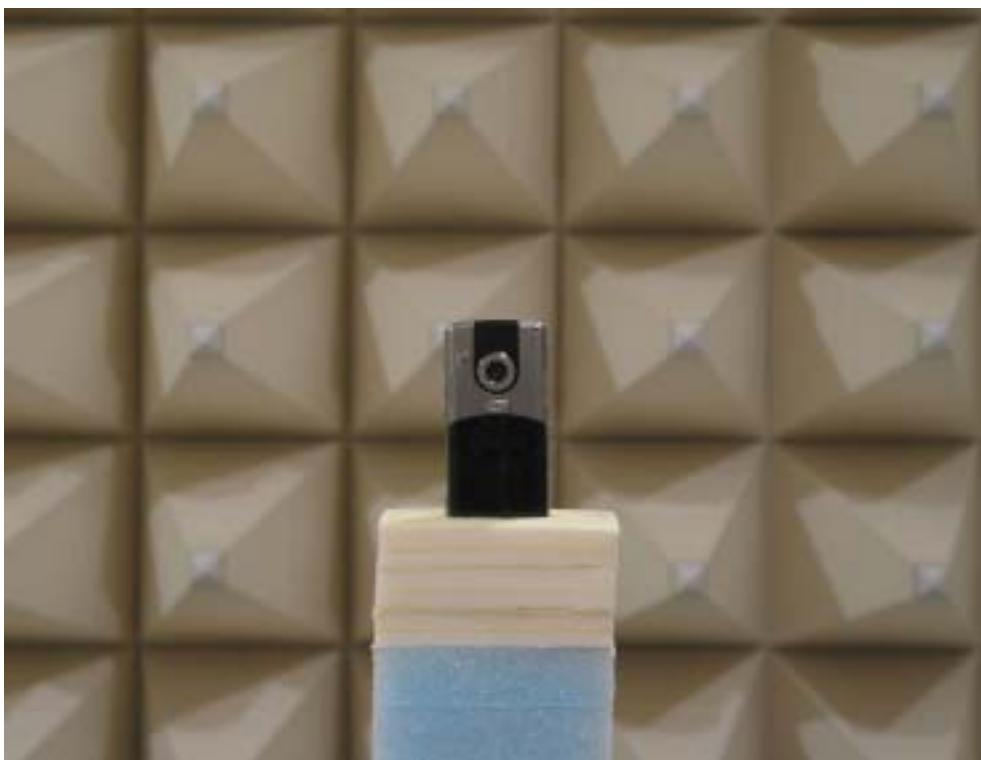
Signal Track  
 On Off

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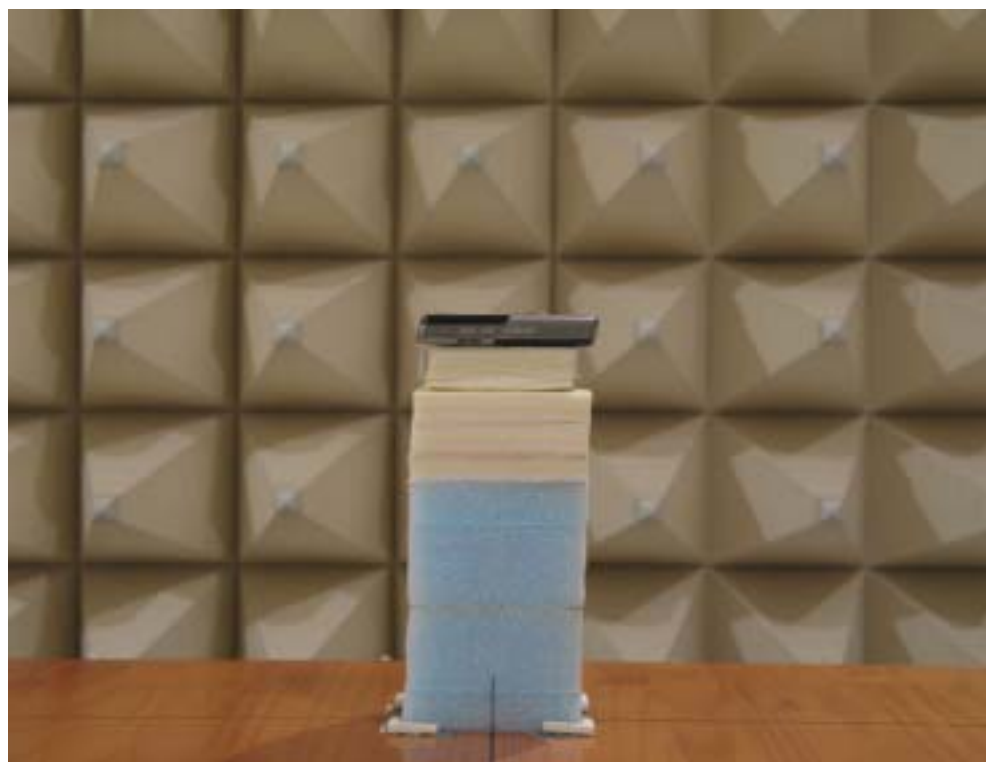
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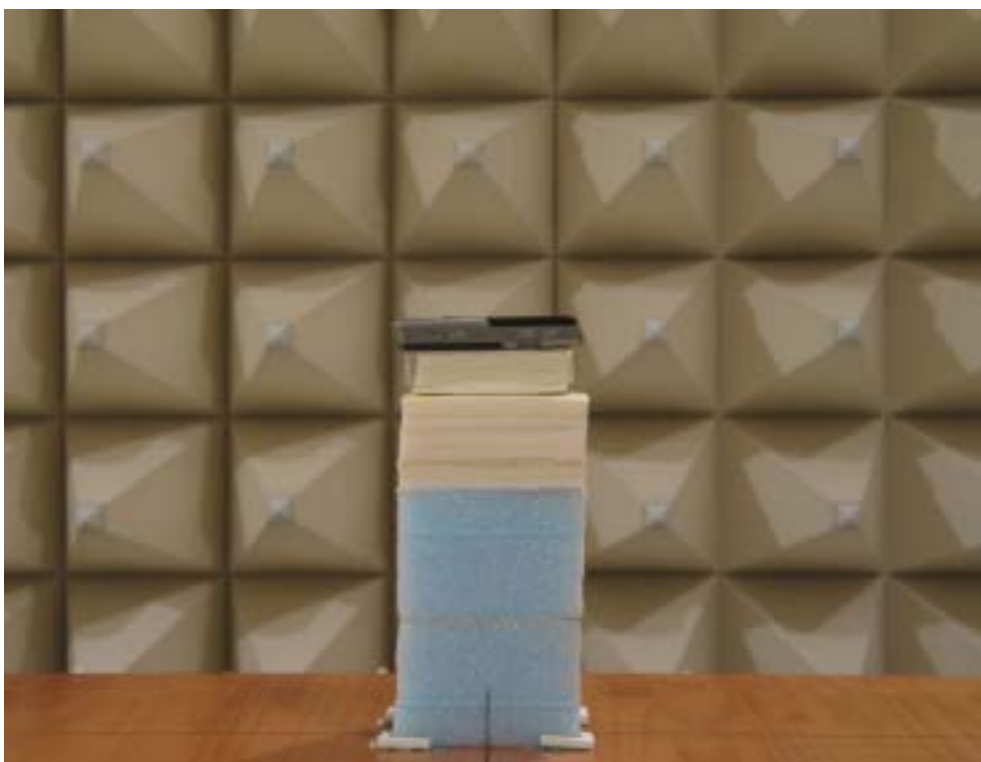
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Single-Band PCS GSM Phone With Bluetooth*



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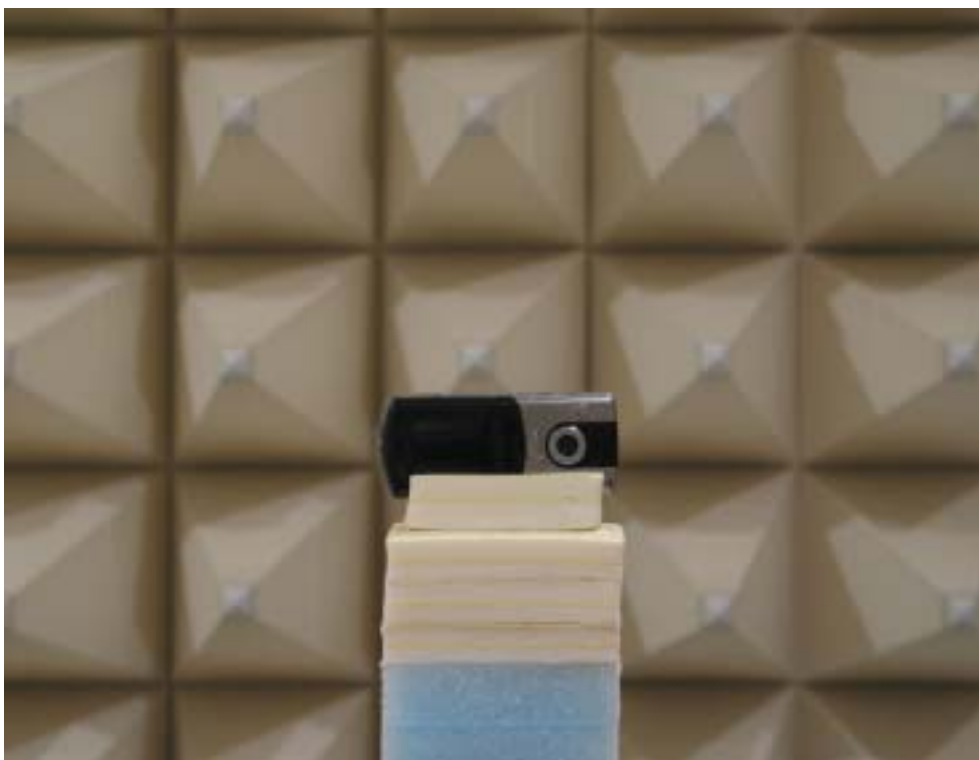
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