Testing Laboratory
1190

# FCC TEST REPORT

**for**

## 47 CFR Part 22H, 24E

| | | |
|---|---|---|
| **Equipment** | : | **PDA Phone** |
| **Trade Name** | : | **Opticon** |
| **Model No.** | : | **H-19A, H-19B** |
| **FCC ID** | : | **UFOBC0164AAA390** |
| **Tx Frequency Range** | : | **GSM850 : 824.2~848.8 MHz**<br>**PCS1900 : 1850.2~1909.8 MHz** |
| **Max. ERP/EIRP Power** | : | **GSM850(GSM) : 0.83W**<br>**GSM850(EDGE) : 0.12W**<br>**PCS1900(GSM) : 1.31W**<br>**PCS1900(EDGE) : 0.29W** |
| **Emission Designator** | : | **GSM : 300KGXW**<br>**EDGE : 300KG7W** |
| **Applicant** | : | **OPTOELECTRONICS CO., LTD.**<br>12-17, Tsukagoshi 4-chome, Warabi-shi, Saitama, 335-0002, Japan |

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- The data shown in this test report were carried out on Jul. 15, 2007 at **Sporton International Inc. LAB.**
- Report No.: FG762206-A, Report Version: Rev. 01.

Jones Tsai
Manager

***SPORTON International Inc.***
6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

# Table of Contents

# History of this test report

Report Issue Date: Jul. 23, 2007

| Report No. | Description |
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# 1. General Information

## 1.1. Applicant

**OPTOELECTRONICS CO., LTD.**
12-17, Tsukagoshi 4-chome, Warabi-shi, Saitama, 335-0002, Japan

## 1.2 Manufacturer

**OPTOELECTRONICS CO., LTD.**
12-17, Tsukagoshi 4-chome, Warabi-shi, Saitama, 335-0002, Japan

## 1.3 Basic Description of Equipment under Test

| | | |
|---|---|---|
| **Equipment** | | PDA Phone |
| **Trade Name** | | Opticon |
| **Model Name** | | H-19A, H-19B |
| **AC Adapter 1** | **Brand Name** | PI Electronics |
| | **Model Name** | AD7112B 03LF |
| | **Power Rating** | I/P:100-240Vac, 50-60Hz, 0.25A; O/P: 5Vdc, 1A |
| | **AC Power Cord Type** | 1.6 meter shielded cable with ferrite core |
| **AC Adapter 2** | **Brand Name** | HP |
| | **Model Name** | HSTNN-P05A |
| | **Power Rating** | I/P:100-240Vac, 50-60Hz, 0.6A; O/P: 5Vdc, 3.6A |
| | **AC Power Cord Type** | 1.6 meter shielded cable without ferrite core |
| **Battery** | **Brand Name** | Opticon |
| | **Model Name** | H-19 |
| | **Rating** | 4.2Vdc, 1440mA |
| | **Type** | Li-ion |
| **Earphone** | **Brand Name** | TECHWIN Communication Co. Ltd |
| | **Model Name** | EE-624A-8EN |
| | **Signal line Type** | 1.2 meter non-shielded cable without ferrite core |
| **USB Cable for Phone** | **Brand Name** | WIESON |
| | **Model Name** | 160035 |
| | **Signal line Type** | 0.9 meter shielded cable without ferrite core |
| **USB Cable for Cradle** | **Brand Name** | WIESON |
| | **Model Name** | 160035 |
| | **Signal line Type** | 1 meter shielded cable without ferrite core |
| **Cradle** | **Brand Name** | Opticon |
| | **Model Name** | CRD-19 |
| **Scanner 1** | **Brand Name** | OPTOELECTRONICS |
| | **Model Name** | MDL-2000 |
| **Scanner 2** | **Brand Name** | OPTOELECTRONICS |
| | **Model Name** | MDI-1000 |

Remark : Scanner 1 was used for H-19A, and scanner 2 was used for H-19B.

## 1.4 Feature of Equipment under Test

| | |
|---|---|
| **DUT Type :** | PDA Phone |
| **Trade Name :** | Opticon |
| **Model Name :** | H-19A, H-19B |
| **FCC ID :** | UFOBC0164AAA390 |
| **Tx Frequency :** | GSM850 : 824 ~ 849 MHz<br>PCS1900 : 1850 ~1910 MHz<br>WLAN / Bluetooth : 2400 ~ 2483.5 MHz |
| **Rx Frequency :** | GSM850 : 869 ~ 894 MHz<br>PCS1900 : 1930 ~ 1990 MHz<br>WLAN / Bluetooth : 2400 ~ 2483.5 MHz |
| **Maximum Output Power to Antenna :** | **Phone with Scanner 1**<br>GSM850 : 32.23 dBm (GSM) ; 24.21 dBm (EDGE)<br>PCS1900 : 29.26 dBm (GSM) ; 22.84 dBm (EDGE)<br>**Phone with Scanner 2**<br>GSM850 : 32.61 dBm (GSM) ; 24.16 dBm (EDGE)<br>PCS1900 : 29.29 dBm (GSM) ; 22.91 dBm (EDGE) |
| **Maximum ERP/EIRP :** | **Phone with Scanner 1**<br>GSM850(GSM) : 0.31 W ( 24.86 dBm)<br>GSM850(EDGE) : 0.07 W ( 18.22 dBm)<br>PCS1900(GSM) : 0.51 W ( 27.08 dBm)<br>PCS1900(EDGE) : 0.10 W ( 19.84 dBm)<br>**Phone with Scanner 2**<br>GSM850(GSM) : 0.83 W ( 29.18 dBm)<br>GSM850(EDGE) : 0.12 W ( 20.78 dBm)<br>PCS1900(GSM) : 1.31 W ( 31.18 dBm)<br>PCS1900(EDGE) : 0.29 W ( 24.67 dBm) |
| **Antenna Type :** | GSM : PIFA Antenna<br>Bluetooth : Chip Antenna<br>WLAN : PIFA Antenna |
| **Type of Antenna Connector** | N/A |
| **Power Rating (DC/AC ,Voltage ) :** | DC 3.7V |
| **Digital Modulation Emission :** | GSM : GMSK<br>EDGE : 8PSK |
| **Type of Emission :** | GSM : 300KGXW<br>EDGE : 300KG7W |

## 1.5 Report Date

EUT Received : Jun. 22, 2007

Report Date : Jul. 23, 2007

# 2 Test Configuration of Equipment under Test

## 2.1 Test Manner

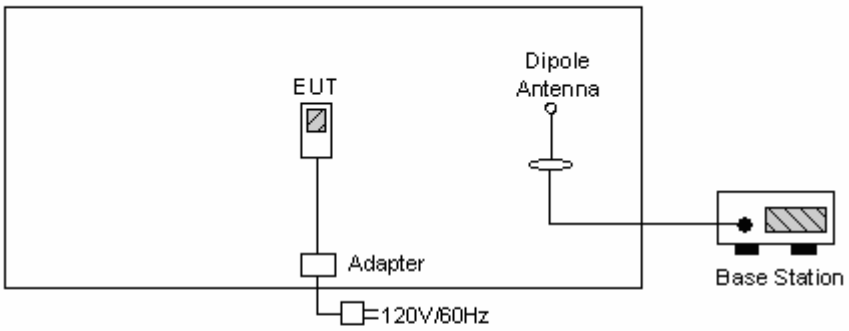
a. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.
b. During all testings, EUT is in link mode with base station emulator at maximum power level.
c. Frequency range investigated: radiated emission 30 MHz to 9000 MHz for GSM850; 30MHz to 19000 MHz for PCS1900.
d. Test modes were performed with scanner 2.

## 2.2 Test Mode

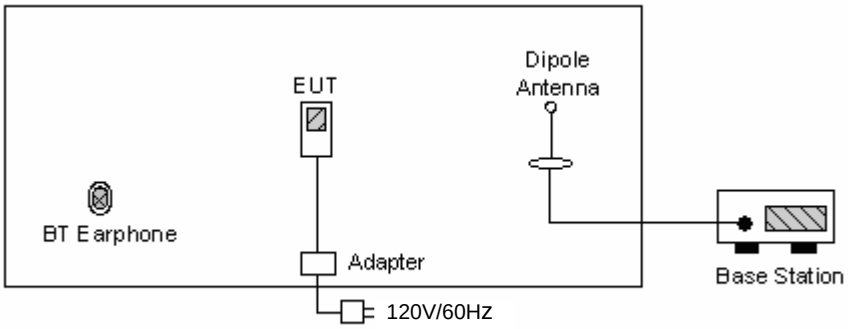
| Application | GSM850 | PCS1900 |
|---|---|---|
| Radiated Emission | ☒ Mode 1: GSM Link<br>☒ Mode 2: EDGE Link<br>☒ Mode 5: GSM Link + BT Link | ☒ Mode 3: GSM Link<br>☒ Mode 4: EDGE Link |
| Conducted Measurement | ☒ Mode 1: GSM Link<br>☒ Mode 2: EDGE Link | ☒ Mode 3: GSM Link<br>☒ Mode 4: EDGE Link |

## 2.3 Connection Diagram of Test System

<GSM Link mode>



<GSM and Bluetooth Link Mode>




## 2.4 Ancillary Equipment List

| Item | Equipment | Trade Name | Model No. | FCC ID | Serial No. |
|---|---|---|---|---|---|
| 1. | Base Station | R&S | CMU200 | N/A | 106656 |
| 2. | Bluetooth Earphone | Engotech | ET-BH111 | PQY471087 | N/A |

# 3. General Information of Test Site

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,
Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
TEL : 886-3-327-3456
FAX : 886-3-318-0055
Test Site No : 03CH06-HY

The chamber meets the characteristics of ANSI C63.4-2003. This site is on file with the FCC.

## 3.1 Test Voltage

AC 120V / 60Hz

## 3.2 Test Compliance

47 CFR Part 22H, 24E, Part 2

## 3.3 Frequency Range

a. Radiation: from 30MHz to 9000MHz for GSM850
b. Radiation: from 30 MHz to 19000 MHz for PCS1900

## 3.4 Test Distance

The test distance of radiated emission from antenna to EUT is 3 m.

# 4. Test Data and Test Result

## 4.1 List of Measurements and Examinations

| FCC Rule | DESCRIPTION OF TEST | Result | Section |
|---|---|---|---|
| §2.1046 | RF Output Power | Passed | 4.2 |
| § 22.913<br>§24.232 | ERP / EIRP | Passed | 4.3 |
| §2.1049,<br>§ 22.917,<br>§ 24.238(b) | Occupied Bandwidth & Band Edge Measurement | Passed | 4.4 |
| §2.1051 | Conducted Emission | Passed | 4.5 |
| §2.1053 | Field Strength of Spurious Radiation | Passed | 4.6 |
| §2.1055,<br>§ 22.355,<br>§24.235 | Frequency Stability vs. Temperature | Passed | 4.7 |
| §2.1055,<br>§22.355,<br>§24.235 | Frequency Stability vs. Voltage | Passed | 4.8 |

## 4.2 RF Output Power

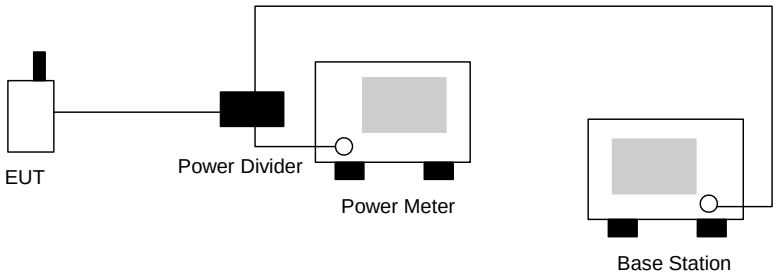
4.2.1 Measurement Instruments：

As described in chapter 5 of this test report.

4.2.2 Test Procedure：

1. The transmitter output was connected to power meter and base station through power divider.
2. Set EUT at PCL=5 for GSM850 and/or PCL=0 for PCS1900 maximum power through base station.
3. Select lowest, middle, and highest channels for each band.

4.2.3 Test Setup Layout：



4.2.4 Test Result :

**<Phone with Scanner 1>**

| Bands | Channel | Frequency (MHz) | Conducted Power (dBm) | Conducted Power (Watts) |
|---|---|---|---|---|
| GSM850 (GSM) | 128 | 824.2 (Low) | 32.12 | 1.629 |
| | 189 | 836.4 (Mid) | 32.19 | 1.656 |
| | 251 | 848.8 (High) | 32.23 | 1.671 |
| GSM850 (EDGE) | 128 | 824.2 (Low) | 24.21 | 0.264 |
| | 189 | 836.4 (Mid) | 24.14 | 0.259 |
| | 251 | 848.8 (High) | 24.12 | 0.258 |
| PCS1900 (GSM) | 512 | 1850.2 (Low) | 28.75 | 0.750 |
| | 661 | 1880.0 (Mid) | 29.11 | 0.815 |
| | 810 | 1909.8 (High) | 29.26 | 0.843 |
| PCS1900 (EDGE) | 512 | 1850.2 (Low) | 22.84 | 0.192 |
| | 661 | 1880.0 (Mid) | 22.76 | 0.189 |
| | 810 | 1909.8 (High) | 22.68 | 0.185 |

**<Phone with Scanner 2>**

| Bands | Channel | Frequency (MHz) | Conducted Power (dBm) | Conducted Power (Watts) |
|---|---|---|---|---|
| GSM850 (GSM) | 128 | 824.2 (Low) | 32.23 | 1.671 |
| | 189 | 836.4 (Mid) | 32.44 | 1.754 |
| | 251 | 848.8 (High) | 32.61 | 1.824 |
| GSM850 (EDGE) | 128 | 824.2 (Low) | 24.16 | 0.261 |
| | 189 | 836.4 (Mid) | 24.11 | 0.258 |
| | 251 | 848.8 (High) | 24.04 | 0.254 |
| PCS1900 (GSM) | 512 | 1850.2 (Low) | 28.89 | 0.774 |
| | 661 | 1880.0 (Mid) | 29.28 | 0.847 |
| | 810 | 1909.8 (High) | 29.29 | 0.849 |
| PCS1900 (EDGE) | 512 | 1850.2 (Low) | 22.91 | 0.195 |
| | 661 | 1880.0 (Mid) | 22.83 | 0.192 |
| | 810 | 1909.8 (High) | 22.71 | 0.187 |

## 4.3 ERP / EIRP Measurement

Equivalent isotropic radiated power measurements by substitution method according to ANSI/TIA/EIA-603-C.

4.3.1 Measurement Instruments

As described in chapter 5 of this test report.

4.3.2 Test Procedure

1. The EUT was placed on a rotatable table with 1.0 meter height in an fully anechoic chamber.
2. The EUT was set 1.2 meters from the receiving antenna which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiated power.
4. The height of the receiving antenna is also kept at 1.0M height.
5. Taking the record of maximum ERP/EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
9. ERP/EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

   Ps (dBm)：Input power to substitution antenna.

   Gs (dBi or dBd)：Substitution antenna Gain.

   Et = Rt + AF

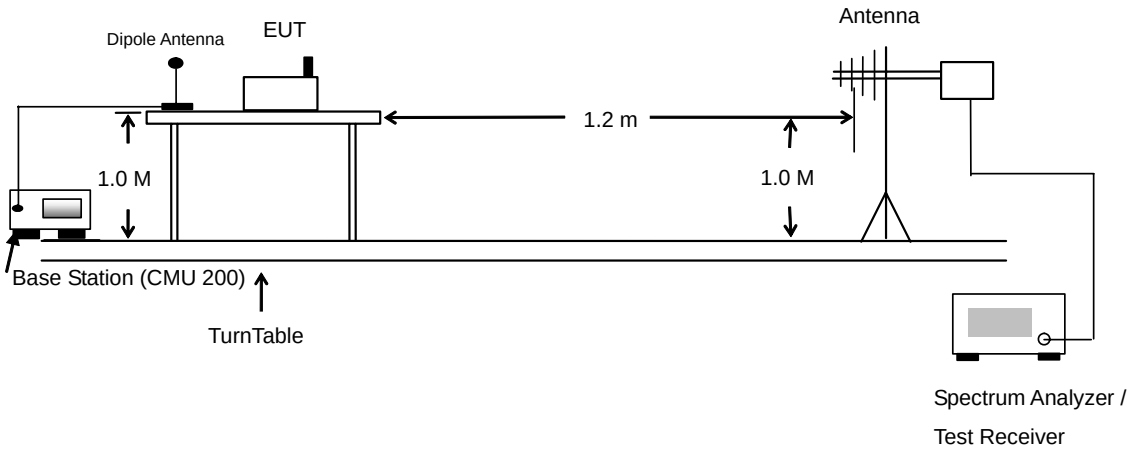
   Es = Rs + AF

   AF (dB/m)：Receive antenna factor

   Rt：The highest received signal in Spectrum Analyzer for EUT.

   Rs：The highest received signal in spectrum analyzer for substitution antenna.

4.3.3 Test Setup Layout of ERP/EIRP



4.3.4 Test Result :

**<Phone with Scanner 1>**

| GSM850 (GSM) Radiated Power ERP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -34.98 | -48.12 | 0.00 | -1.08 | 12.06 | 0.02 |
| 836.40 | -34.56 | -48.28 | 0.00 | -0.93 | 12.79 | 0.02 |
| 848.80 | -34.90 | -48.35 | 0.00 | -0.76 | 12.69 | 0.02 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -22.29 | -47.97 | 0.00 | -1.08 | 24.60 | 0.29 |
| 836.40 | -22.34 | -48.01 | 0.00 | -0.93 | 24.74 | 0.30 |
| 848.80 | -22.43 | -48.05 | 0.00 | -0.76 | 24.86 | 0.31 |

| GSM850 (EDGE) Radiated Power ERP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -40.89 | -48.12 | 0.00 | -1.08 | 6.15 | 0.00 |
| 836.40 | -41.96 | -48.28 | 0.00 | -0.93 | 5.39 | 0.00 |
| 848.80 | -42.88 | -48.35 | 0.00 | -0.76 | 4.71 | 0.00 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -28.67 | -47.97 | 0.00 | -1.08 | 18.22 | 0.07 |
| 836.40 | -29.46 | -48.01 | 0.00 | -0.93 | 17.62 | 0.06 |
| 848.80 | -30.26 | -48.05 | 0.00 | -0.76 | 17.03 | 0.05 |

| PCS1900 (GSM) Radiated Power EIRP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -27.05 | -51.88 | 0.00 | 1.96 | 26.79 | 0.48 |
| 1880.00 | -28.70 | -52.99 | 0.00 | 2.00 | 26.29 | 0.43 |
| 1909.80 | -32.70 | -54.28 | 0.00 | 1.98 | 23.56 | 0.23 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -27.01 | -52.13 | 0.00 | 1.96 | 27.08 | 0.51 |
| 1880.00 | -28.69 | -53.17 | 0.00 | 2.00 | 26.48 | 0.44 |
| 1909.80 | -33.38 | -54.13 | 0.00 | 1.98 | 22.73 | 0.19 |

| PCS1900 (EDGE) Radiated Power EIRP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -34.65 | -51.88 | 0.00 | 1.96 | 19.19 | 0.08 |
| 1880.00 | -37.38 | -52.99 | 0.00 | 2.00 | 17.61 | 0.06 |
| 1909.80 | -39.72 | -54.28 | 0.00 | 1.98 | 16.54 | 0.05 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -34.25 | -52.13 | 0.00 | 1.96 | 19.84 | 0.10 |
| 1880.00 | -37.51 | -53.17 | 0.00 | 2.00 | 17.66 | 0.06 |
| 1909.80 | -39.57 | -54.13 | 0.00 | 1.98 | 16.54 | 0.05 |

**<Phone with Scanner 2>**

| GSM850 (GSM) Radiated Power ERP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -34.07 | -48.12 | 0.00 | -1.08 | 12.97 | 0.02 |
| 836.40 | -33.19 | -48.28 | 0.00 | -0.93 | 14.16 | 0.03 |
| 848.80 | -31.80 | -48.35 | 0.00 | -0.76 | 15.79 | 0.04 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -20.99 | -47.97 | 0.00 | -1.08 | 25.90 | 0.39 |
| 836.40 | -19.43 | -48.01 | 0.00 | -0.93 | 27.65 | 0.58 |
| 848.80 | -18.11 | -48.05 | 0.00 | -0.76 | 29.18 | 0.83 |

| GSM850 (EDGE) Radiated Power ERP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -40.39 | -48.12 | 0.00 | -1.08 | 6.65 | 0.00 |
| 836.40 | -40.66 | -48.28 | 0.00 | -0.93 | 6.69 | 0.00 |
| 848.80 | -40.26 | -48.35 | 0.00 | -0.76 | 7.33 | 0.01 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBd) | ERP (dBm) | ERP (W) |
| 824.20 | -27.39 | -47.97 | 0.00 | -1.08 | 19.50 | 0.09 |
| 836.40 | -26.62 | -48.01 | 0.00 | -0.93 | 20.46 | 0.11 |
| 848.80 | -26.51 | -48.05 | 0.00 | -0.76 | 20.78 | 0.12 |

| PCS1900 (GSM) Radiated Power EIRP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -24.20 | -51.88 | 0.00 | 1.96 | 29.64 | 0.92 |
| 1880.00 | -24.73 | -52.99 | 0.00 | 2.00 | 30.26 | 1.06 |
| 1909.80 | -27.69 | -54.28 | 0.00 | 1.98 | 28.57 | 0.72 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -23.49 | -52.13 | 0.00 | 1.96 | 30.60 | 1.15 |
| 1880.00 | -23.99 | -53.17 | 0.00 | 2.00 | 31.18 | 1.31 |
| 1909.80 | -26.63 | -54.13 | 0.00 | 1.98 | 29.48 | 0.89 |

| PCS1900 (EDGE) Radiated Power EIRP | | | | | | |
|---|---|---|---|---|---|---|
| Horizontal Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -32.25 | -51.88 | 0.00 | 1.96 | 21.59 | 0.14 |
| 1880.00 | -31.25 | -52.99 | 0.00 | 2.00 | 23.74 | 0.24 |
| 1909.80 | -32.93 | -54.28 | 0.00 | 1.98 | 23.33 | 0.22 |
| Vertical Polarization | | | | | | |
| Frequency (MHz) | Rt (dBm) | Rs (dBm) | Ps (dBm) | Gs (dBi) | EIRP (dBm) | EIRP (W) |
| 1850.20 | -31.10 | -52.13 | 0.00 | 1.96 | 22.99 | 0.20 |
| 1880.00 | -30.50 | -53.17 | 0.00 | 2.00 | 24.67 | 0.29 |
| 1909.80 | -32.40 | -54.13 | 0.00 | 1.98 | 23.71 | 0.23 |

## 4.4 Occupied Bandwidth and Band Edge Measurement

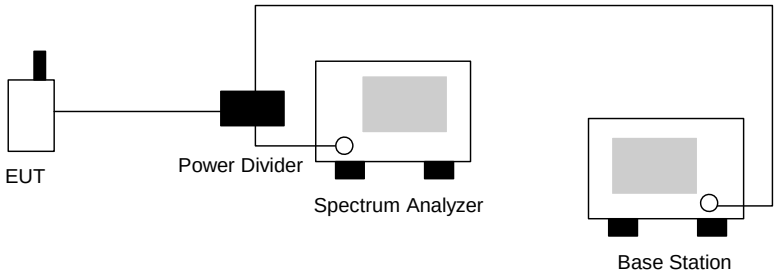
4.4.1 Measurement Instruments

As described in chapter 5 of this test report.

4.4.2 Test Procedure

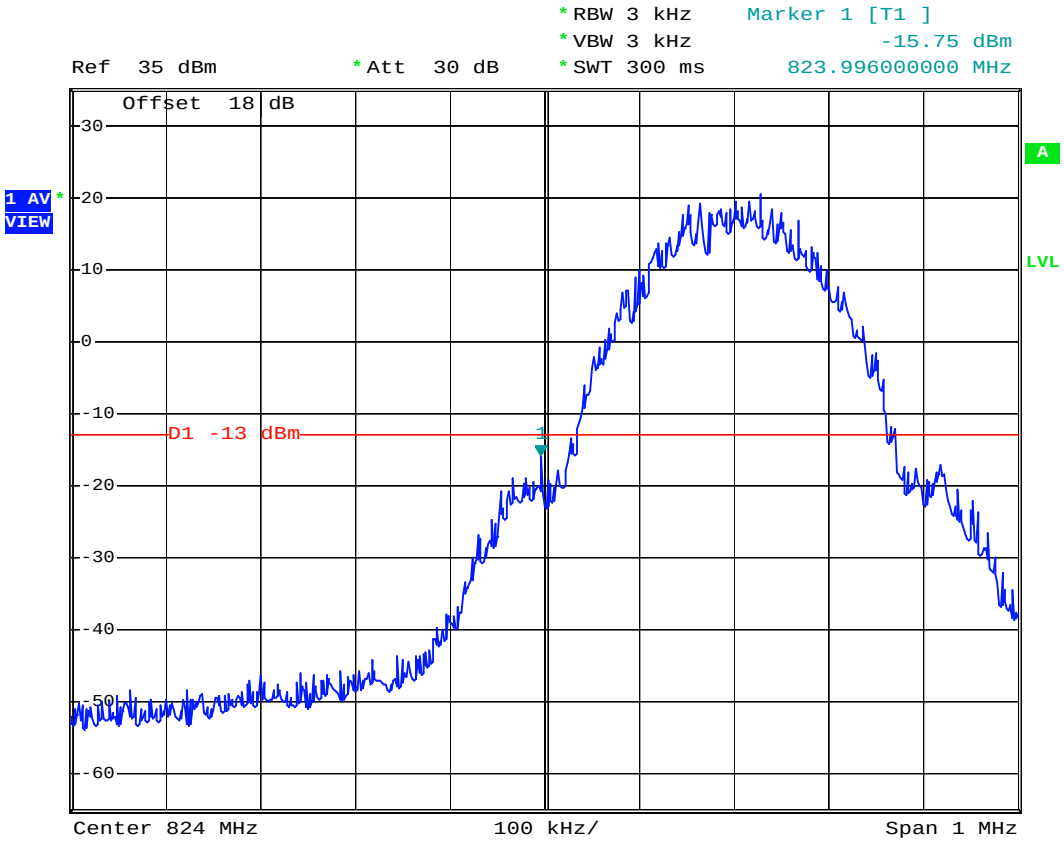
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% occupied bandwidth of middle channel for the highest and lowest RF powers were measured.
3. The bandedge of low and high channels for the highest RF powers within the transmitting frequency band were measured. Setting RBW as roughly BW/100.

4.4.3 Test Setup Layout



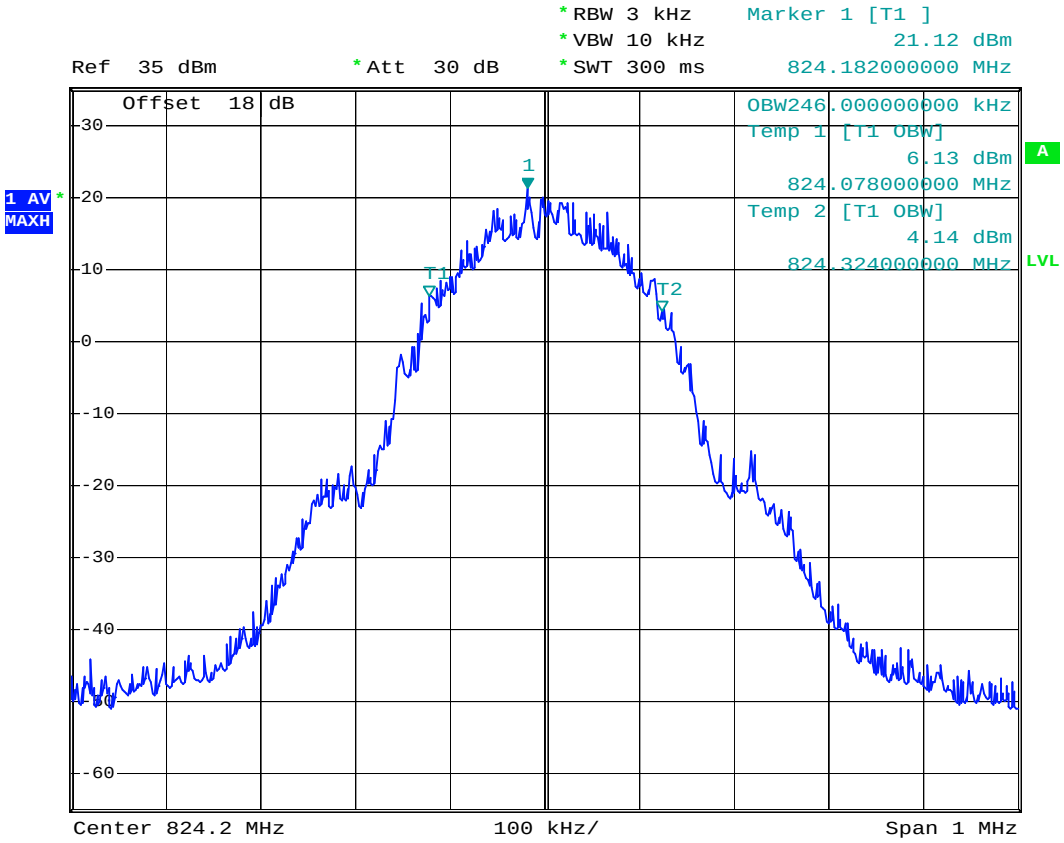
4.4.4 Test Result

- Mode 1
- Test Mode : GSM850 (GSM) CH128 Lower Band Edge
- Power State : High



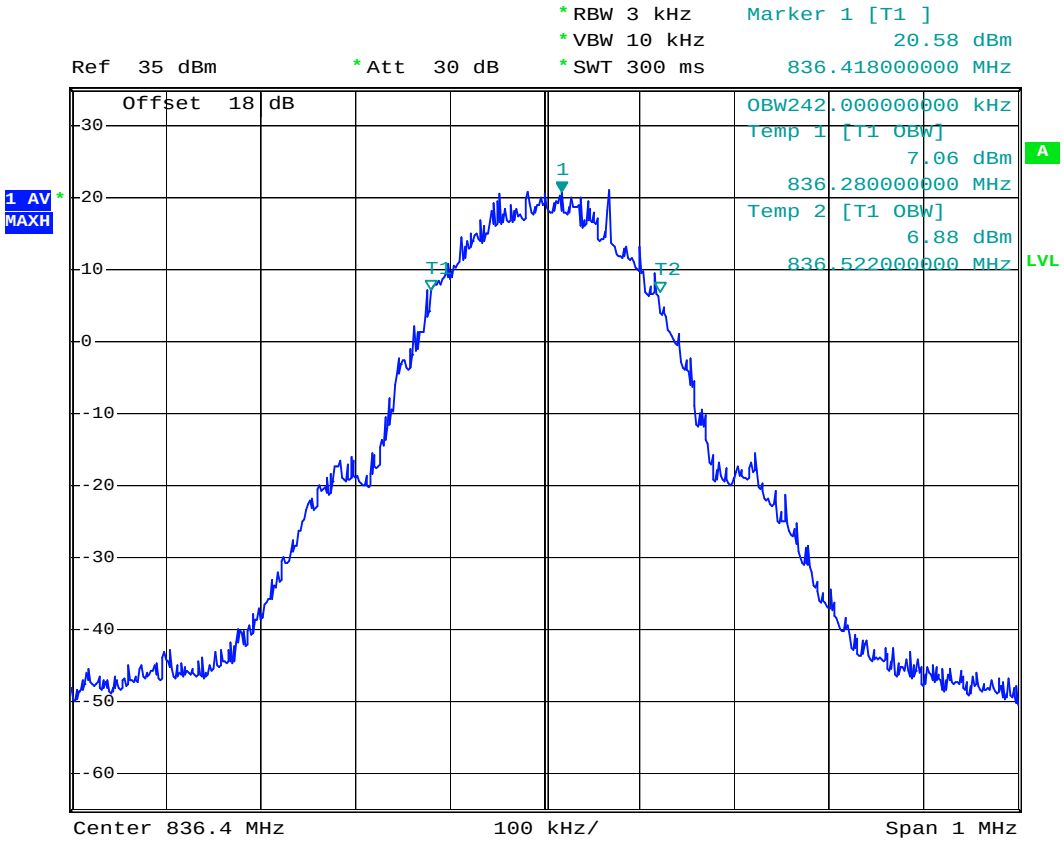

Date: 15.JUL.2007 14:26:23

- Test Mode : GSM850 (GSM) CH128 99% Occupid Bandwidth
- Power State : High



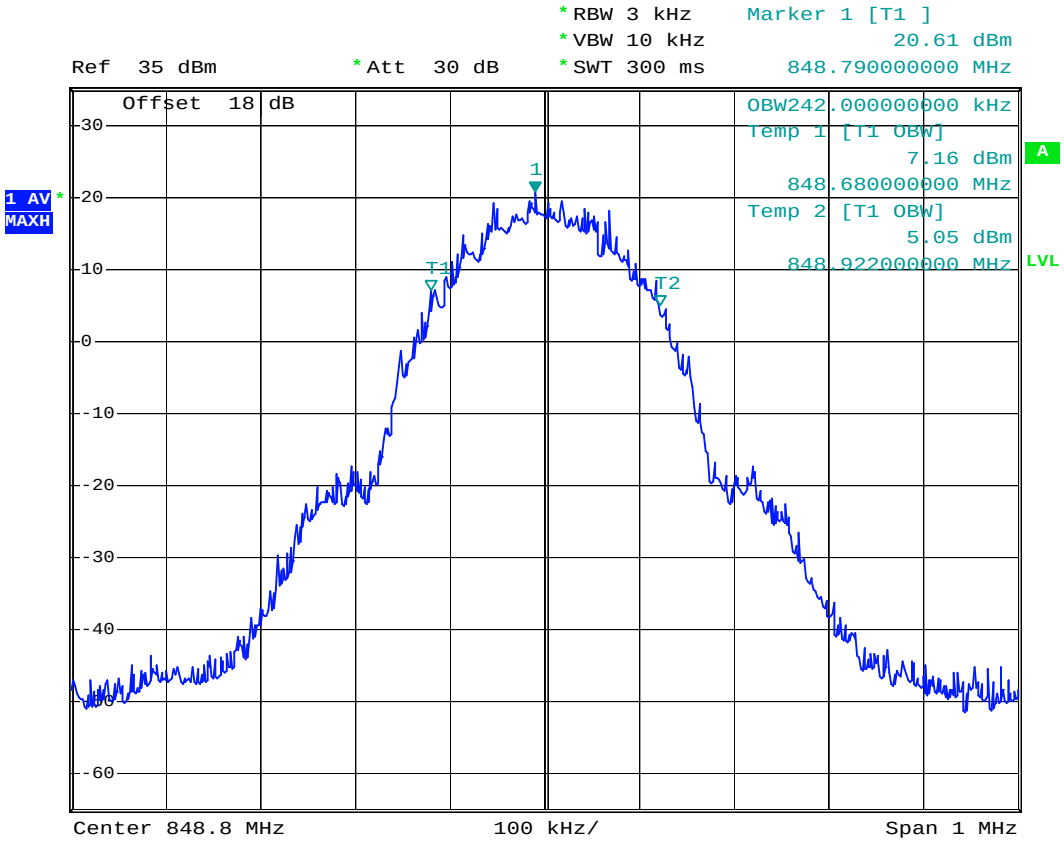

Date: 15.JUL.2007 18:10:48

- Test Mode : GSM850 (GSM) CH189 99% Occupid Bandwidth
- Power State : High



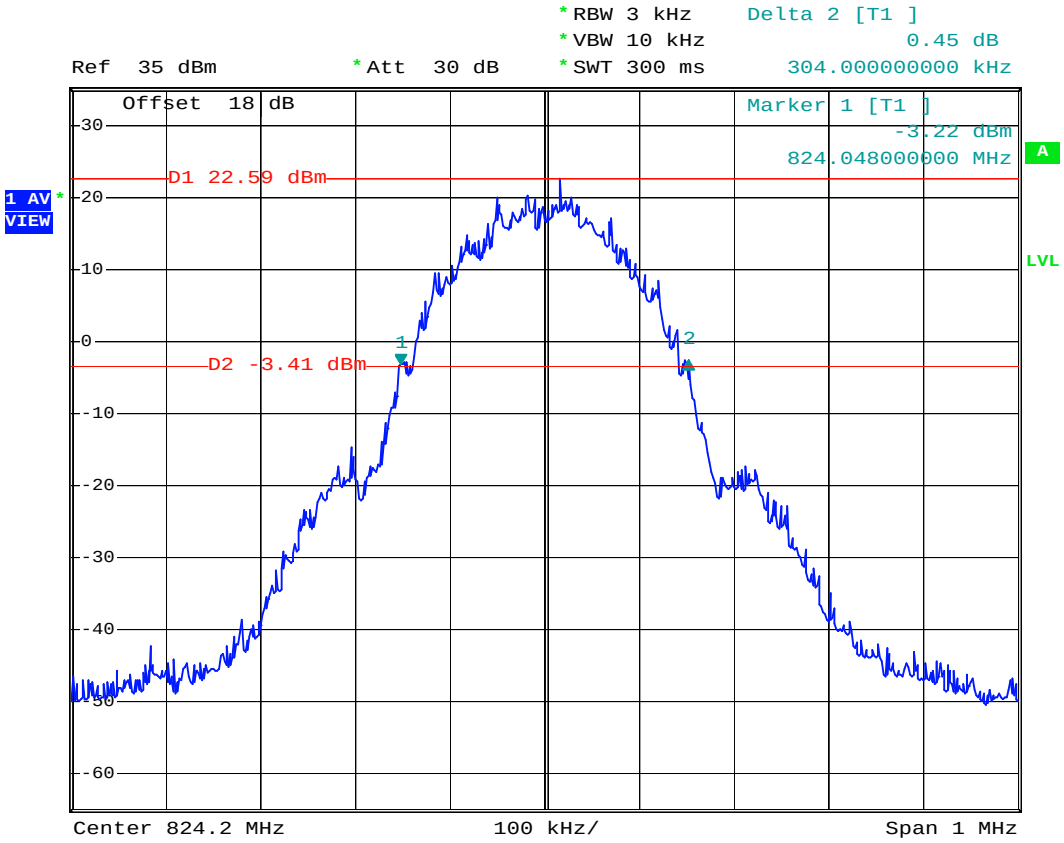

Date: 15.JUL.2007 18:10:03

- Test Mode : GSM850 (GSM) CH 251 99% Occupid Bandwidth
- Power State : High



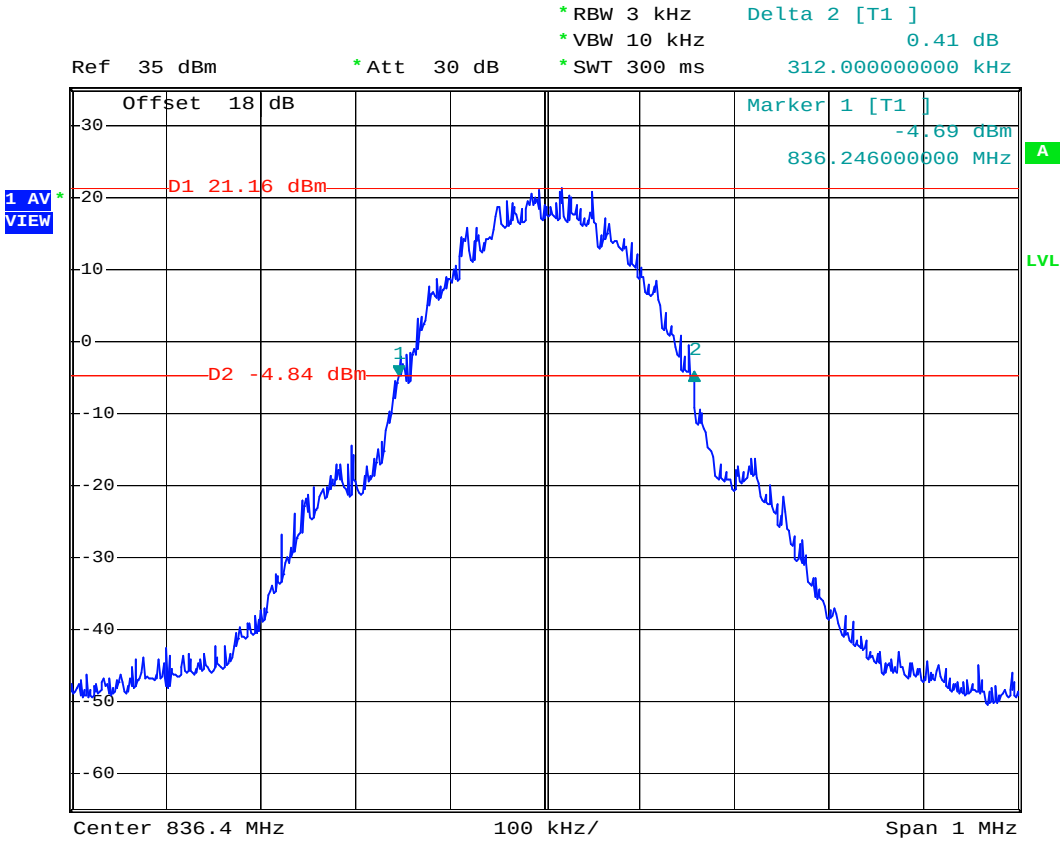

Date: 15.JUL.2007 18:11:48

- Test Mode : GSM850 (GSM) CH128 26dB Bandwidth
- Power State : High



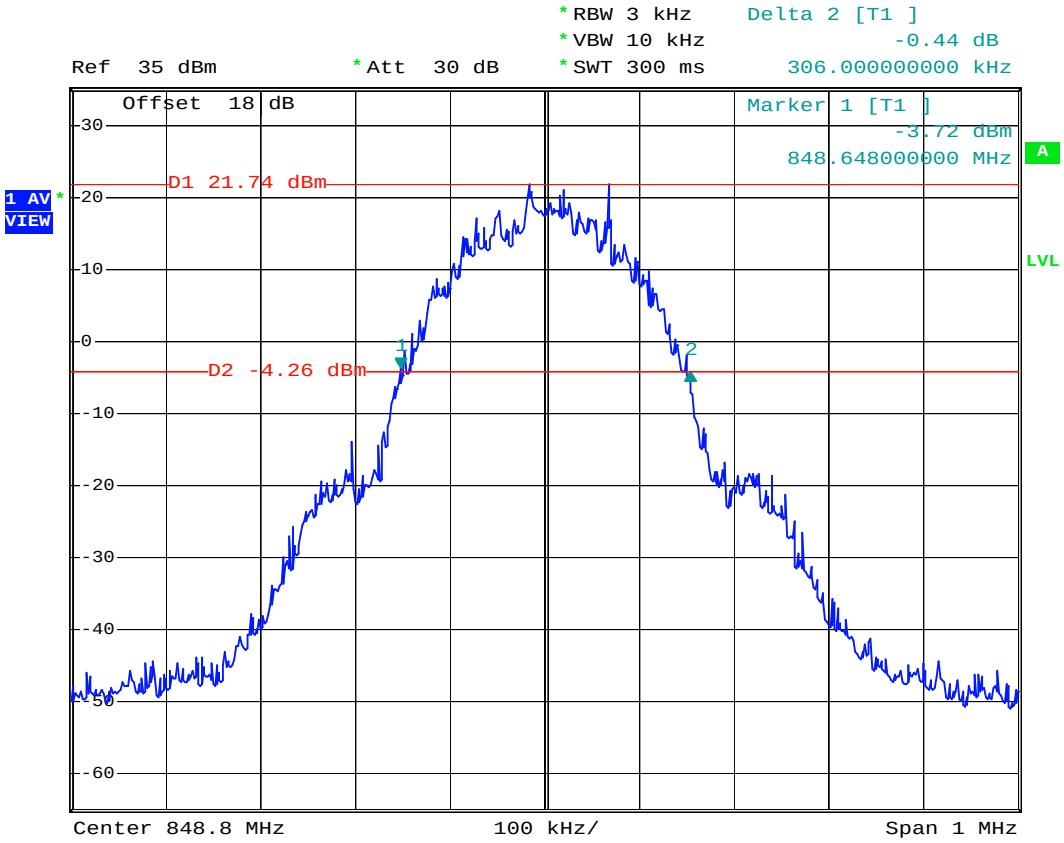

Date: 15.JUL.2007 14:18:55

- Test Mode : GSM850 (GSM) CH189 26dB Bandwidth
- Power State : High



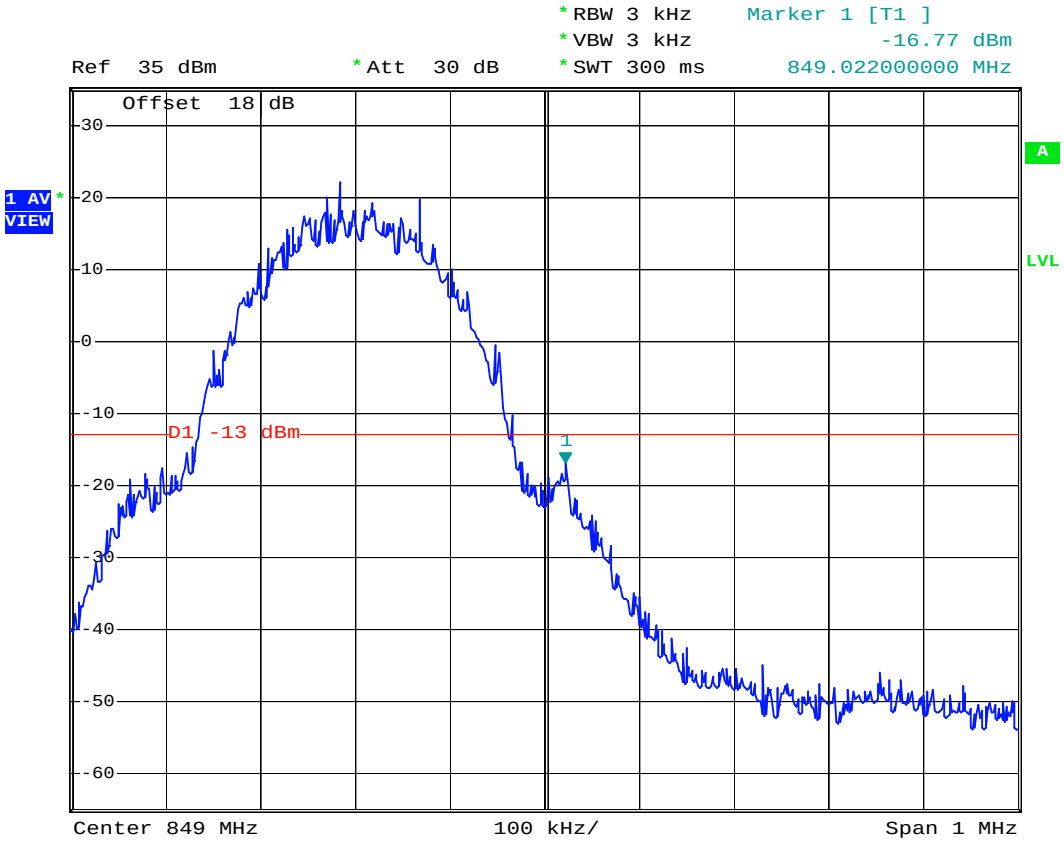

Date: 15.JUL.2007 14:21:00

- Test Mode : GSM850 (GSM) CH 251 26dB Bandwidth
- Power State : High



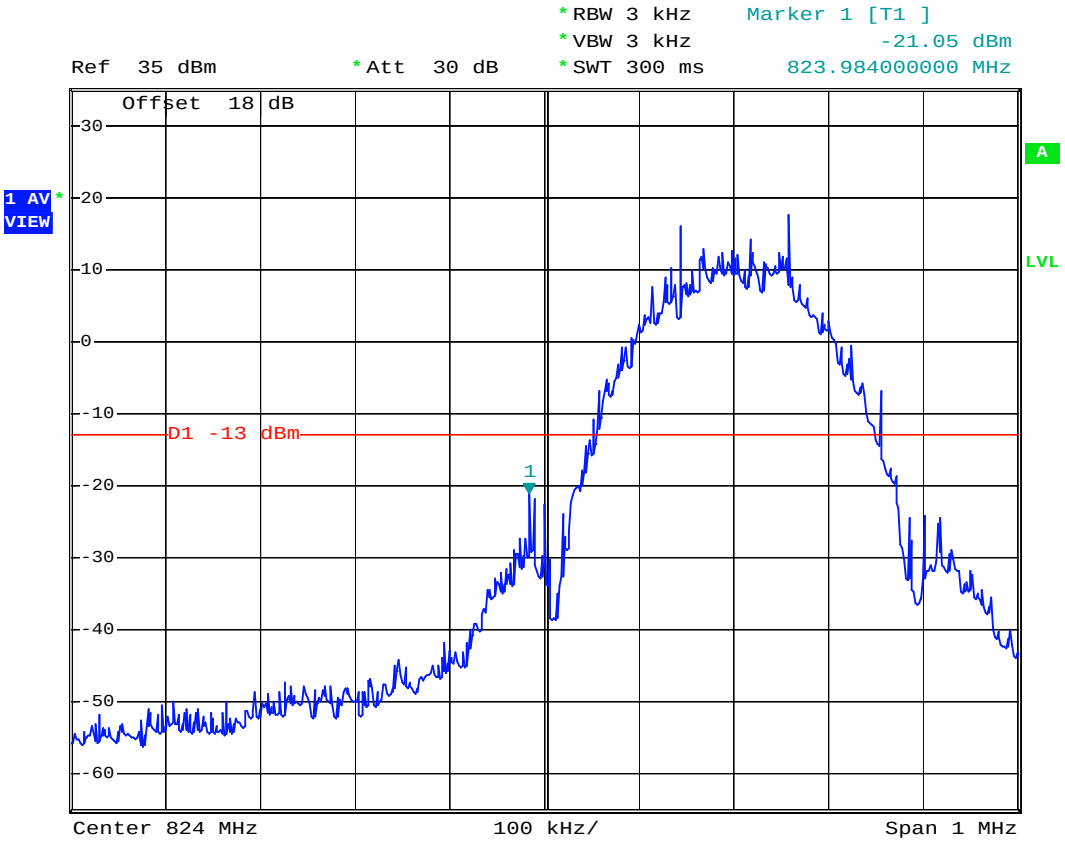

Date: 15.JUL.2007 14:23:11

- Test Mode : GSM850 (GSM) CH251 Higher Band Edge
- Power State : High




Date: 15.JUL.2007 14:27:22

- Mode 2
- Test Mode : GSM850 (EDGE) CH128 Lower Band Edge
- Power State : High

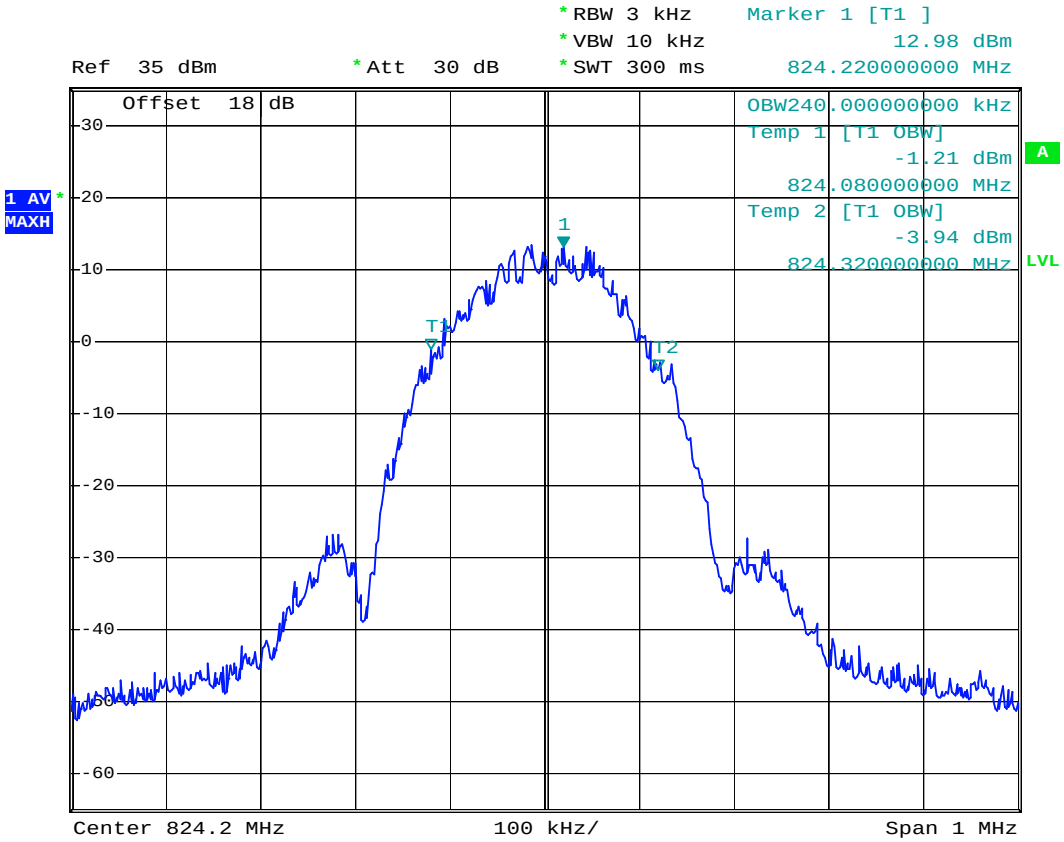



Date: 15.JUL.2007 14:45:42

-

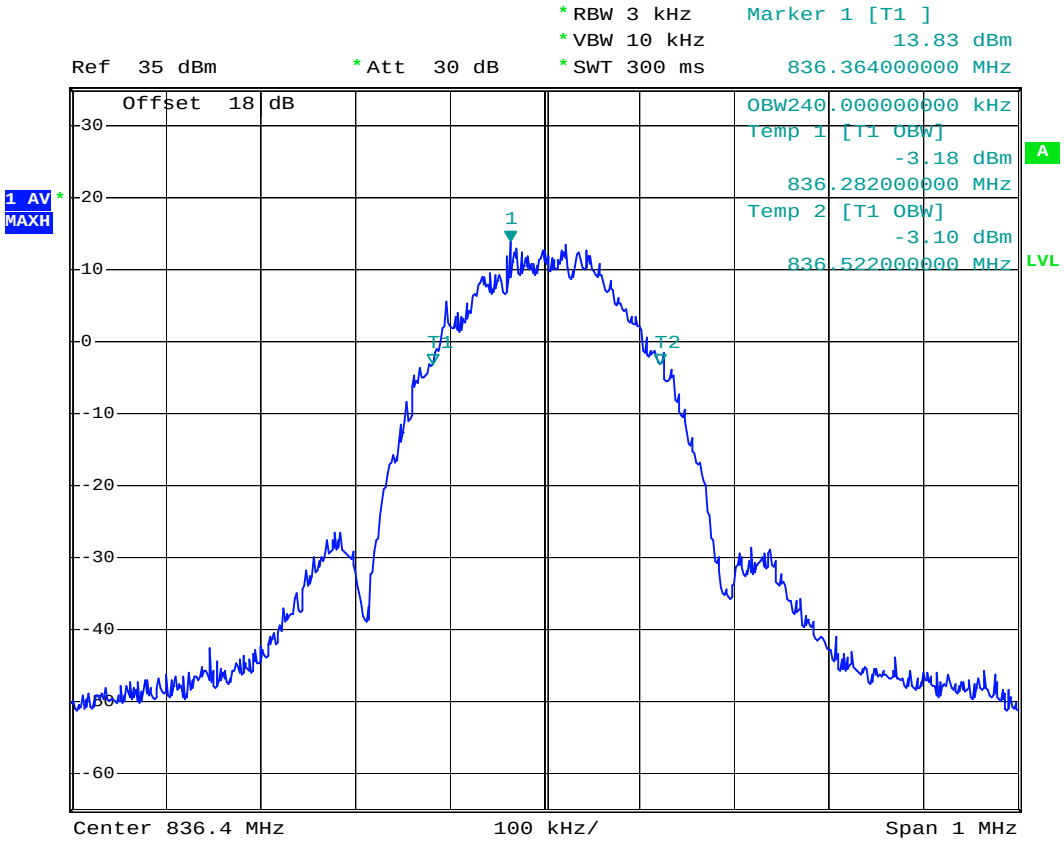
Test Mode : GSM850 (EDGE) CH128 99% Occupid Bandwidth

- Power State : High



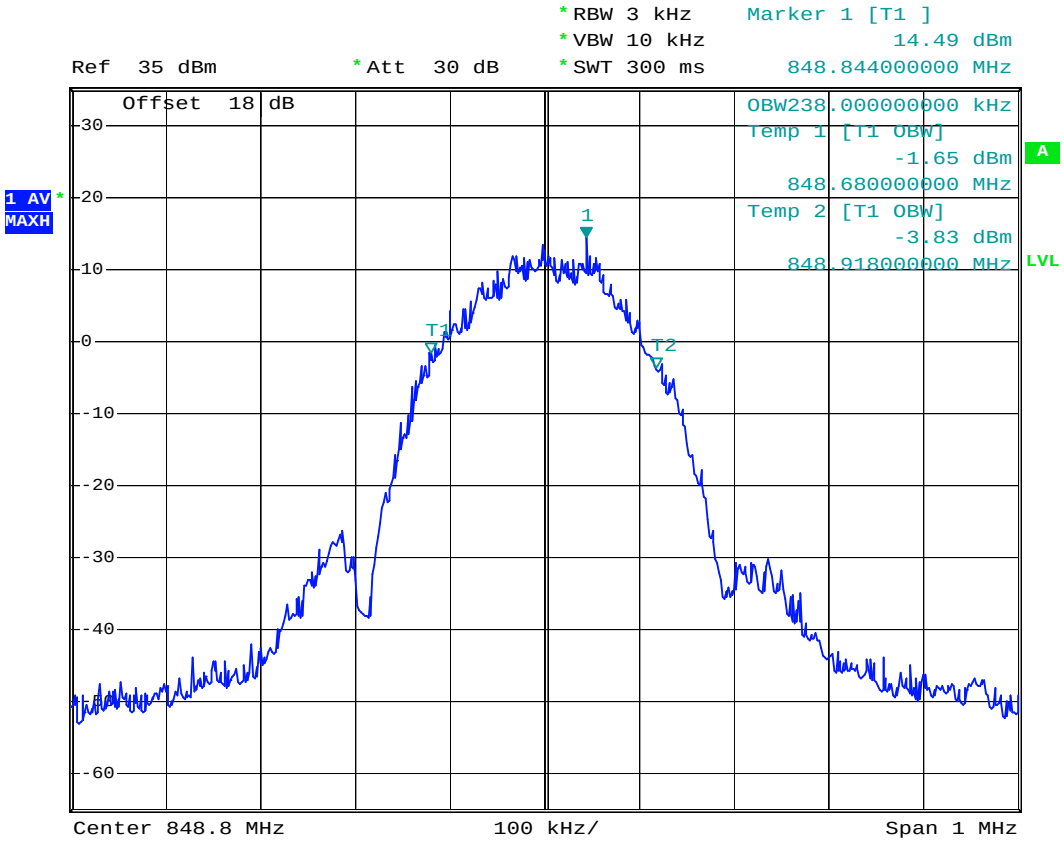

Date: 15.JUL.2007 18:14:54

- Test Mode : GSM850 (EDGE) CH189 99% Occupid Bandwidth
- Power State : High



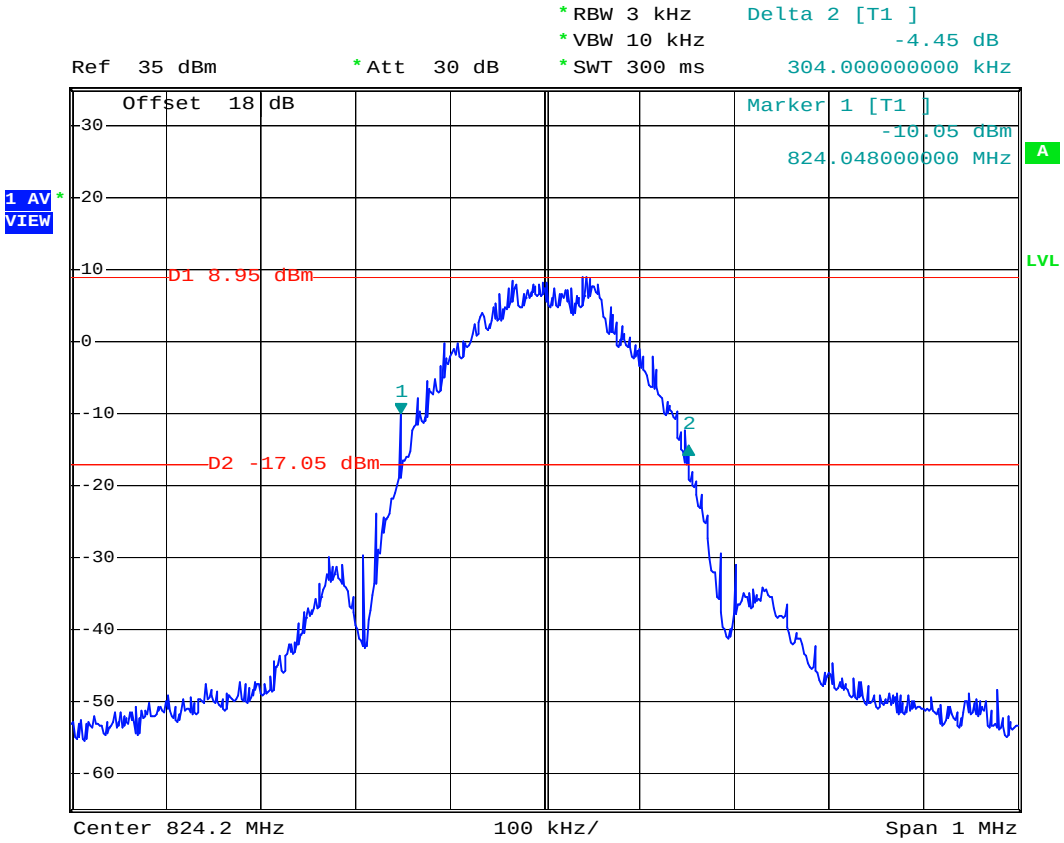

Date: 15.JUL.2007 18:14:14

- Test Mode : GSM850 (EDGE) CH 251 99% Occupid Bandwidth
- Power State : High



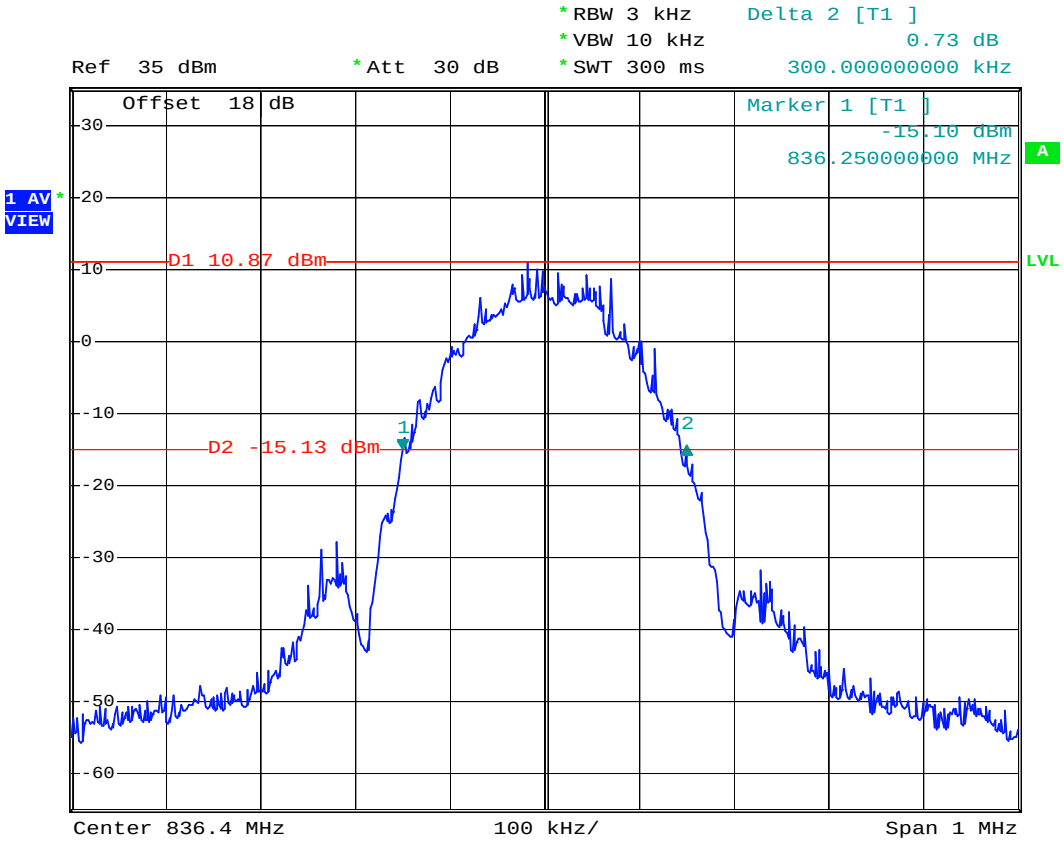

Date: 15.JUL.2007 18:13:10

- Test Mode : GSM850 (EDGE) CH128 26dB Bandwidth
- Power State : High



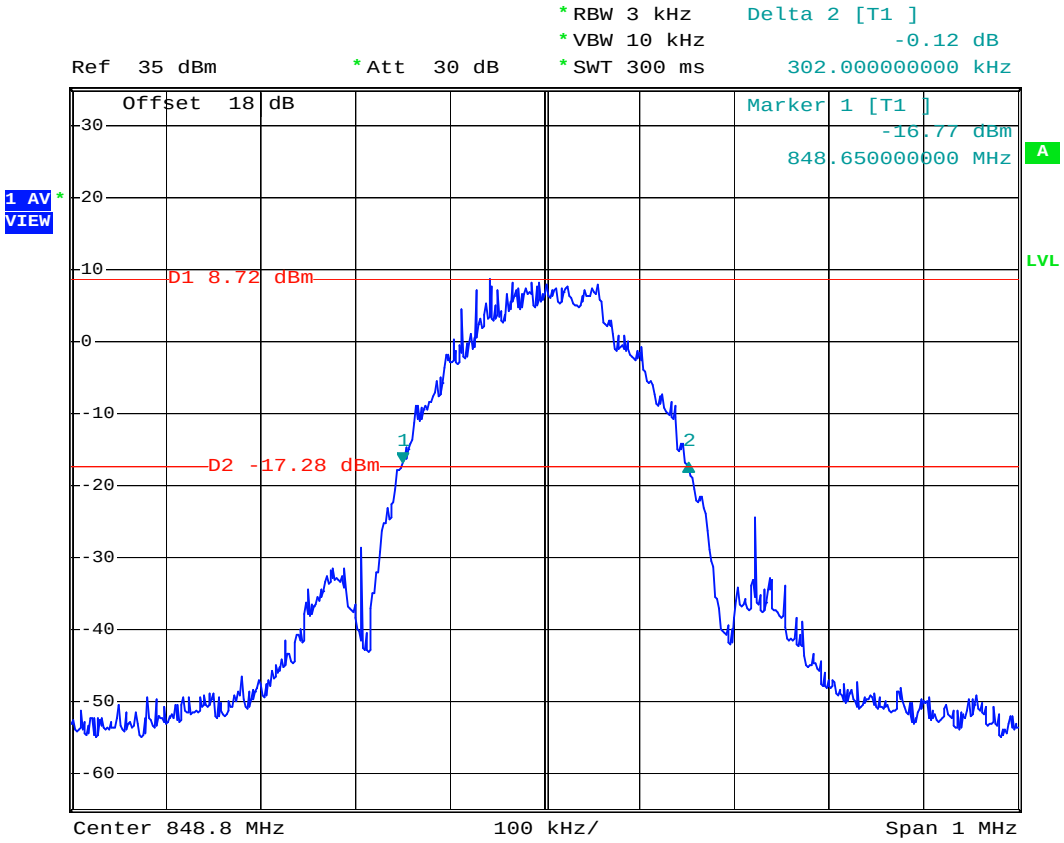

Date: 15.JUL.2007 15:03:36

- Test Mode : GSM850 (EDGE) CH189 26dB Bandwidth
- Power State : High




Date: 15.JUL.2007 15:01:32

- Test Mode : GSM850 (EDGE) CH 251 26dB Bandwidth
- Power State : High

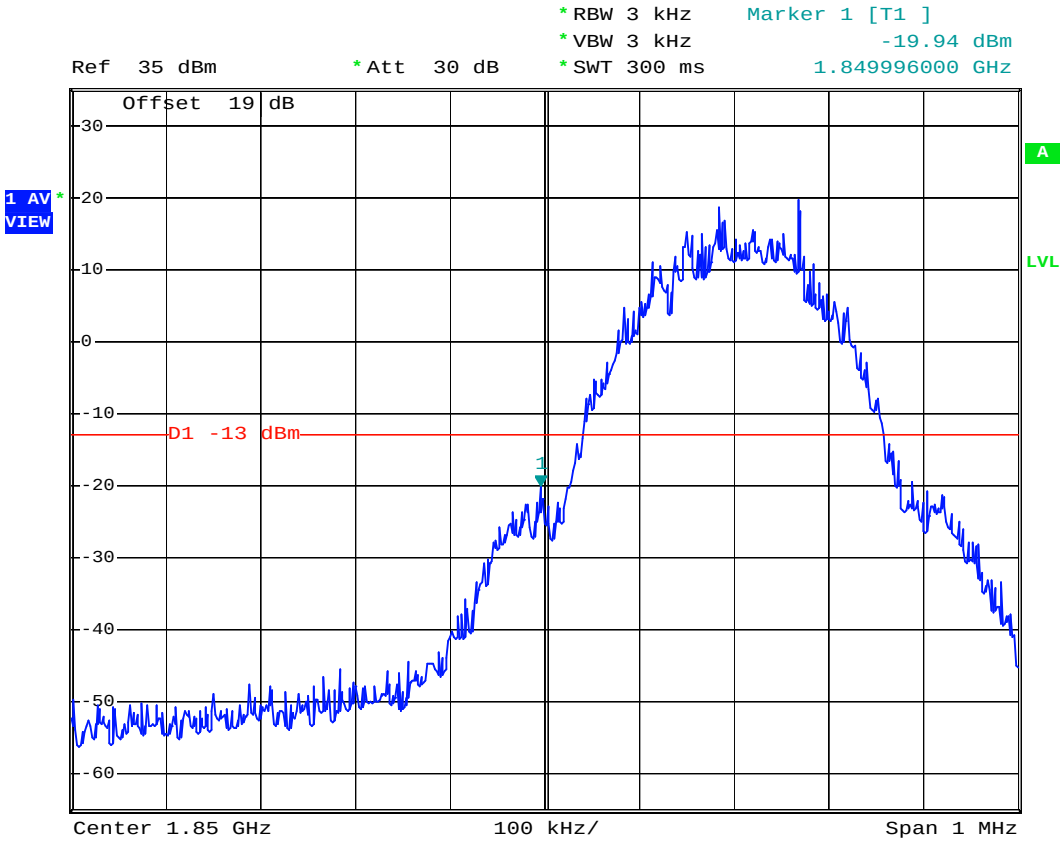



Date: 15.JUL.2007 15:00:10

- Test Mode : GSM850 (EDGE) CH251 Higher Band Edge
- Power State : High

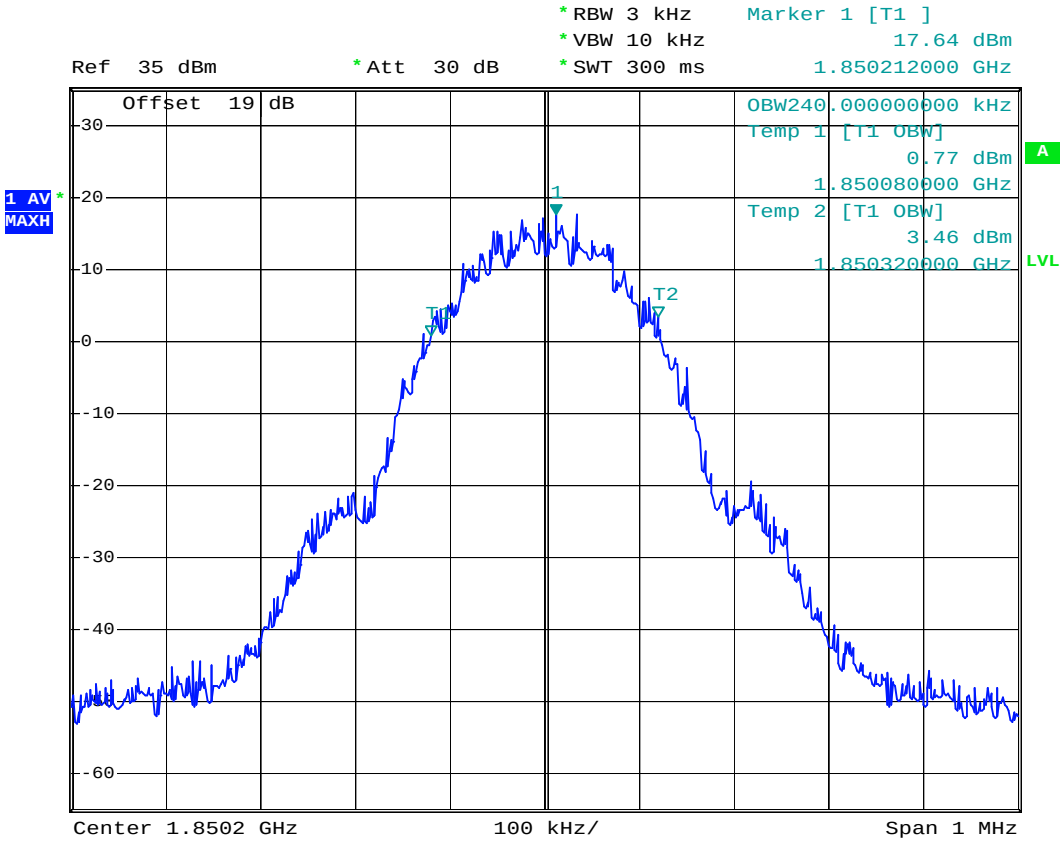

Date: 15.JUL.2007 14:44:57

- Mode 3
- Test Mode : PCS1900 (GSM) CH512 Lower Band Edge
- Power State : High



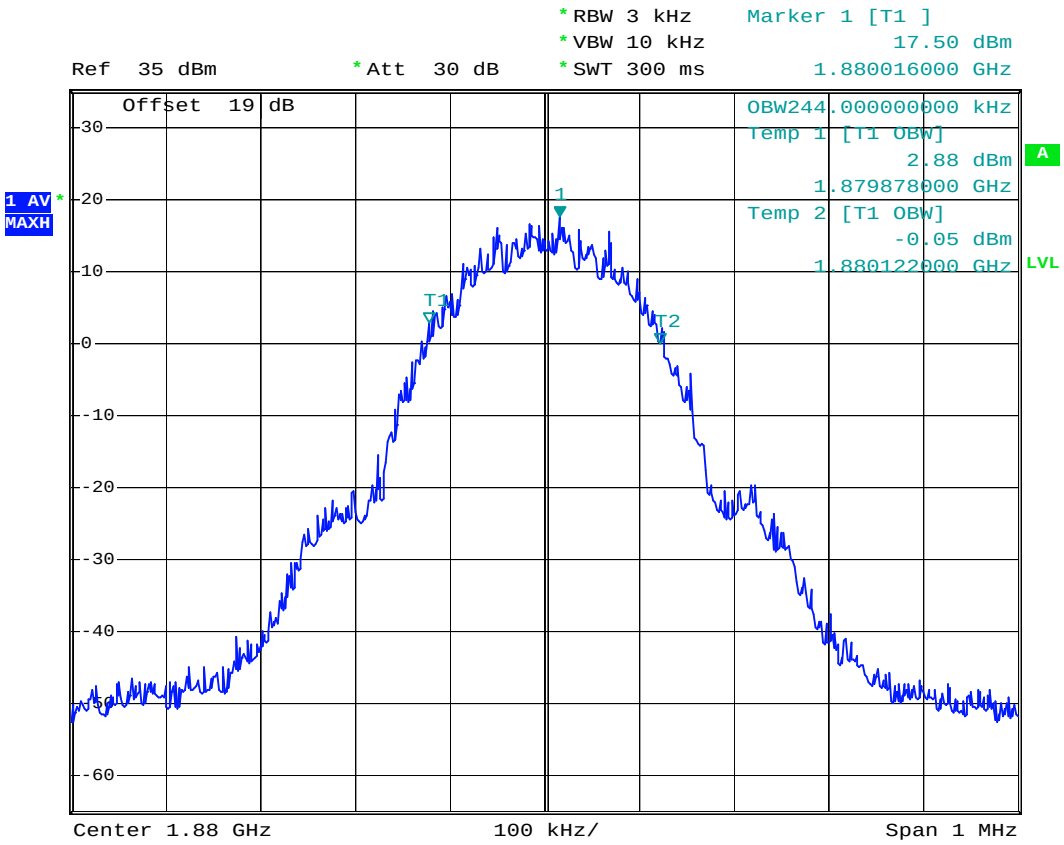

Date: 15.JUL.2007 17:33:14

- Test Mode : PCS1900 (GSM) CH512 99% Occupid Bandwidth
- Power State : High



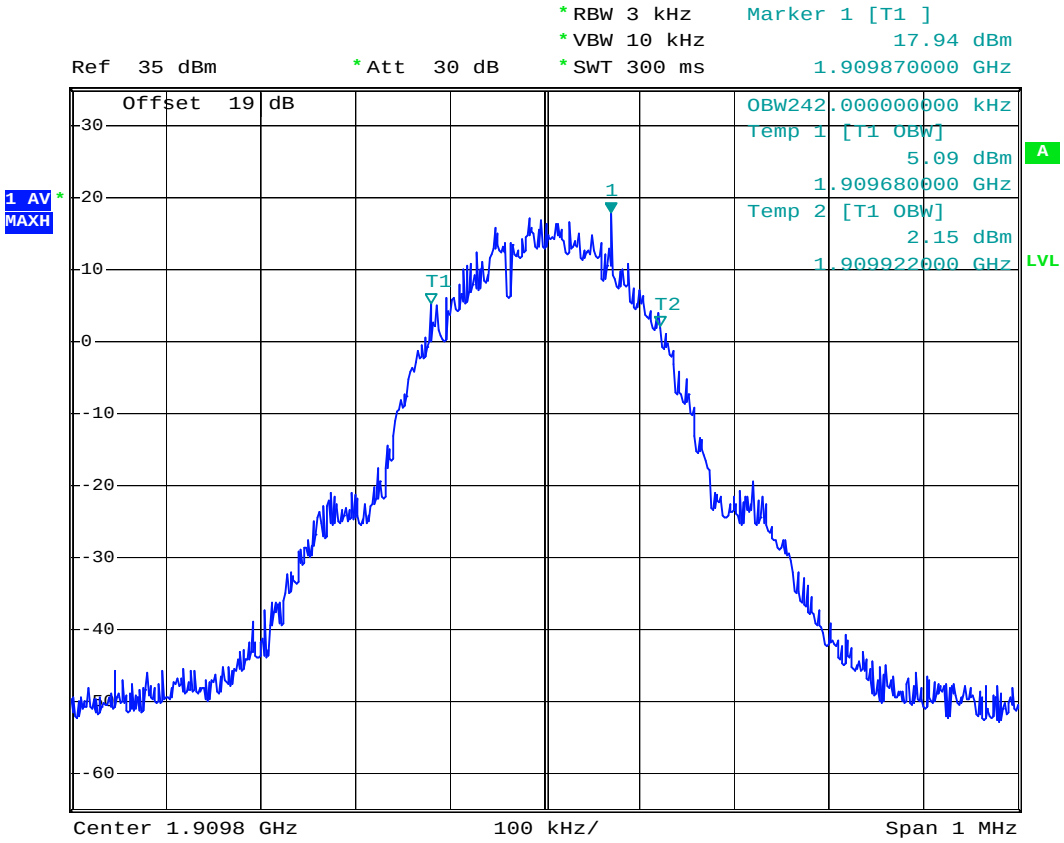

Date: 15.JUL.2007 17:35:34

- Test Mode : PCS1900 (GSM) CH661 99% Occupid Bandwidth
- Power State : High



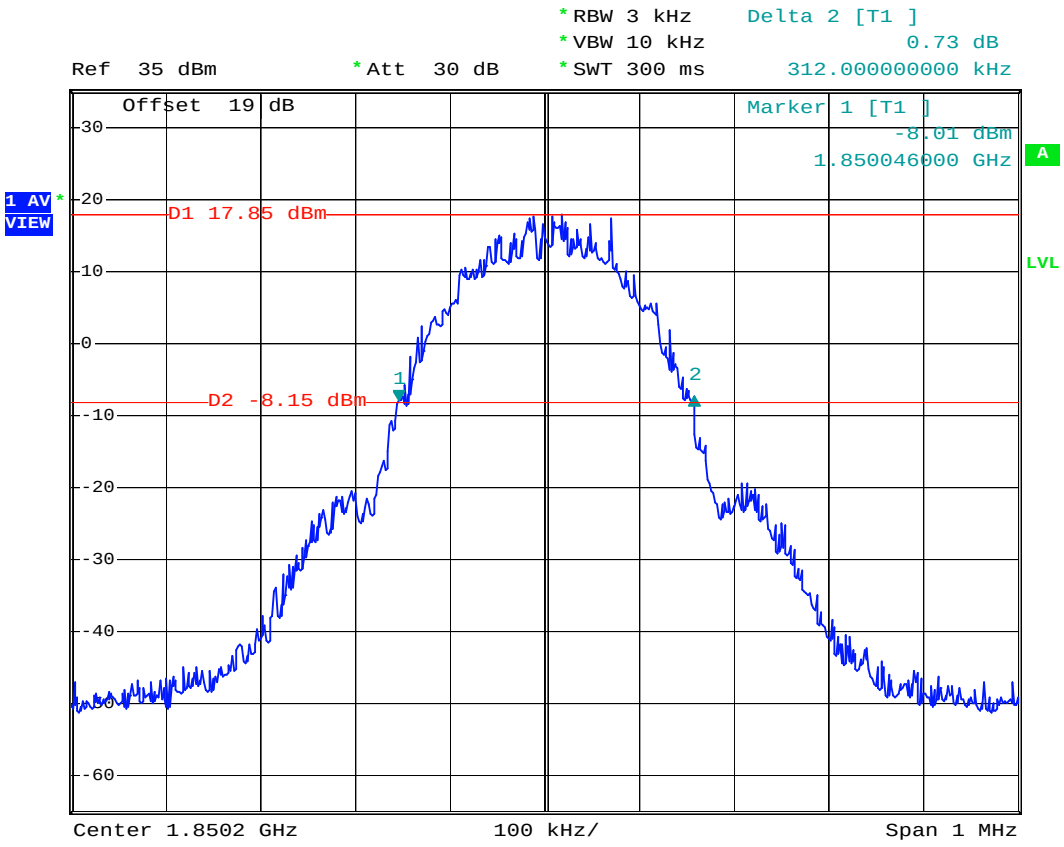

Date: 15.JUL.2007 17:36:40

- Test Mode : PCS1900 (GSM) CH810 99% Occupid Bandwidth
- Power State : High



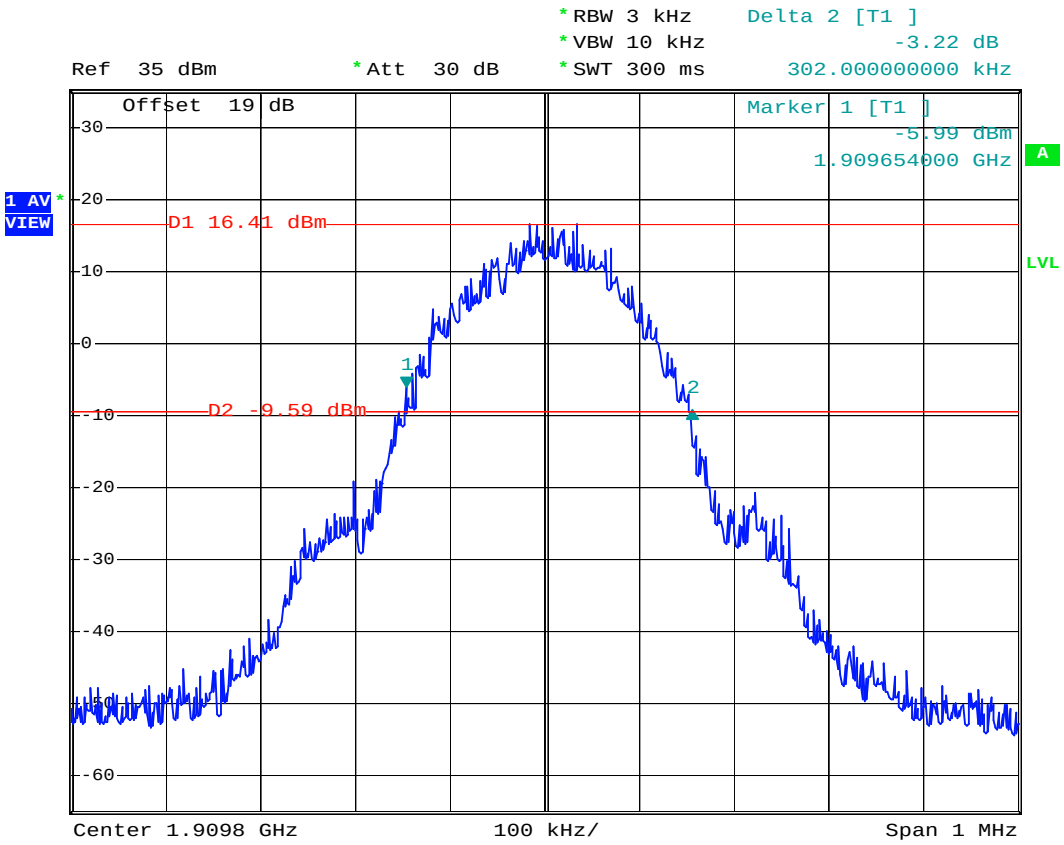

Date: 15.JUL.2007 17:38:24

- Test Mode : PCS1900 (GSM) CH512 26dB Bandwidth
- Power State : High



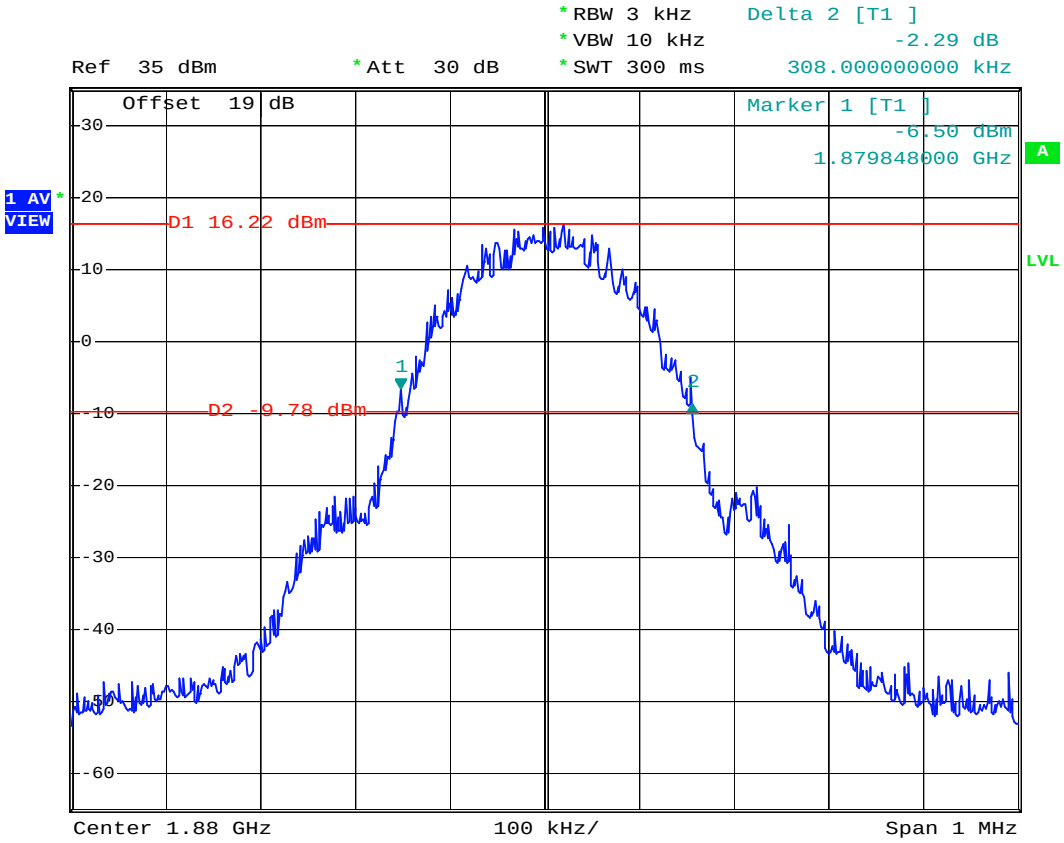

Date: 15.JUL.2007 17:48:00

- Test Mode : PCS1900 (GSM) CH661 26dB Bandwidth
- Power State : High



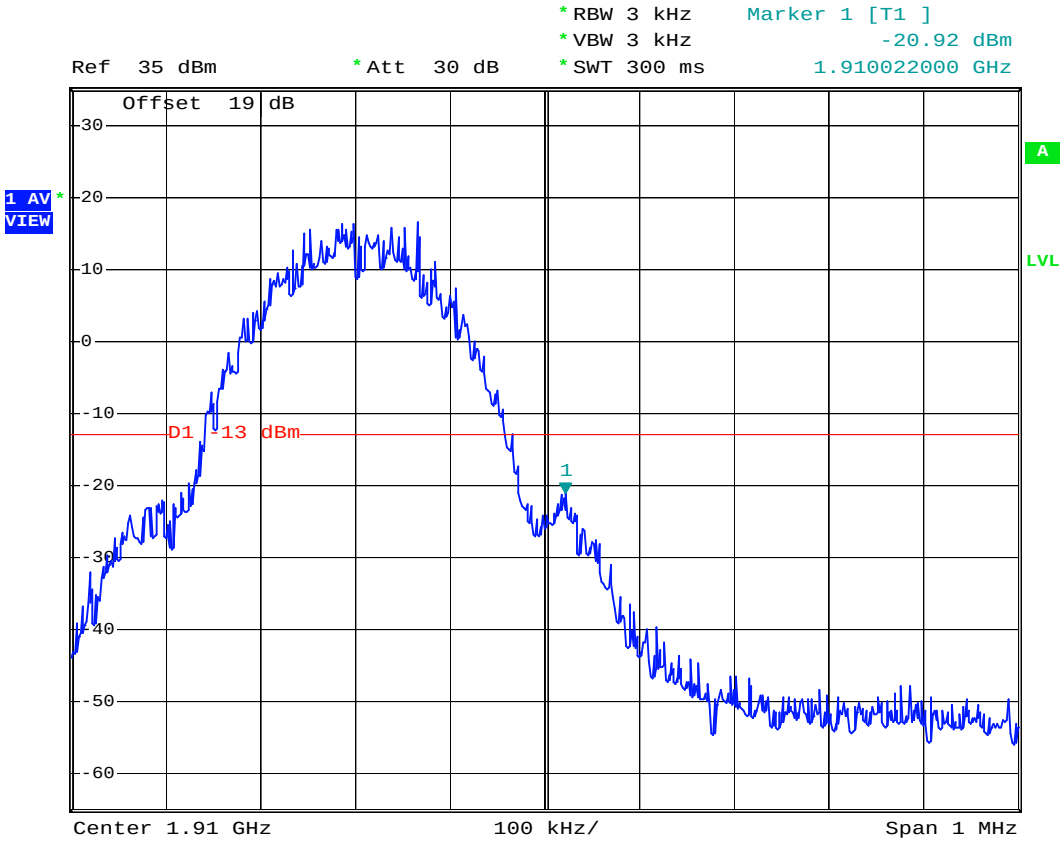

Date: 15.JUL.2007 17:46:25

- Test Mode : PCS1900 (GSM) CH810 26dB Bandwidth
- Power State : High



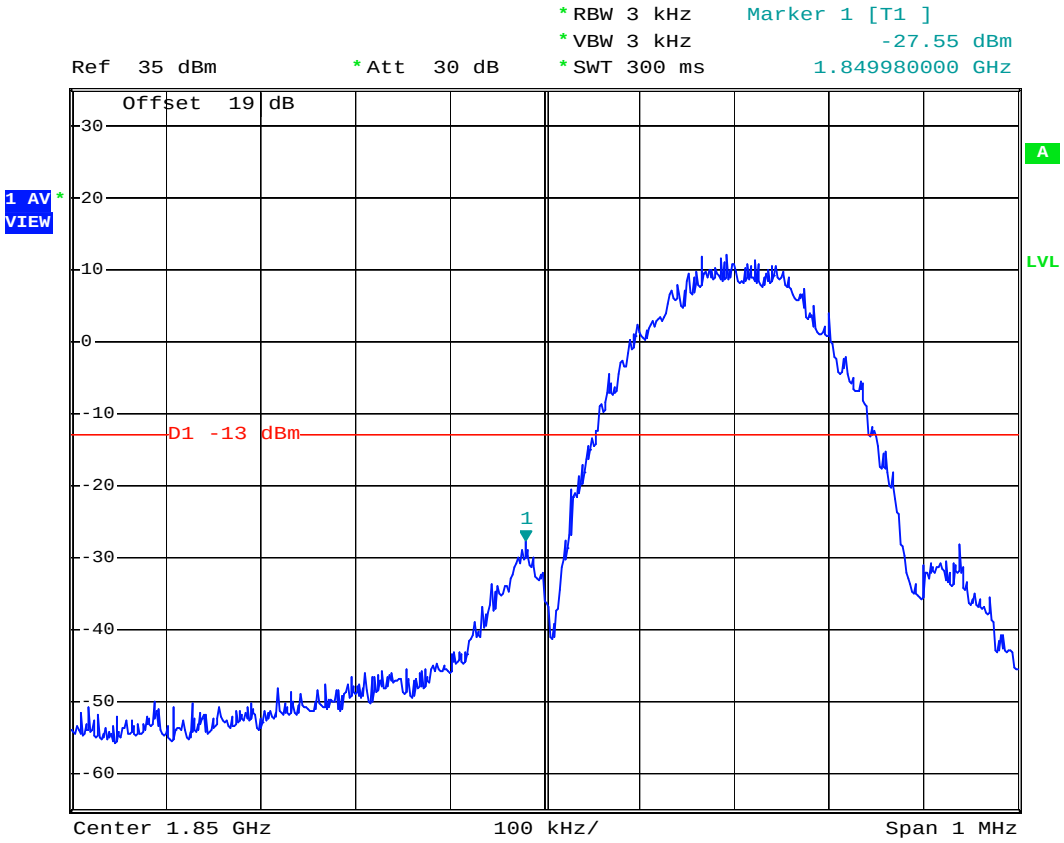

Date: 15.JUL.2007 17:41:30

- Test Mode : PCS1900 (GSM) CH810 Higher Band Edge
- Power State : High



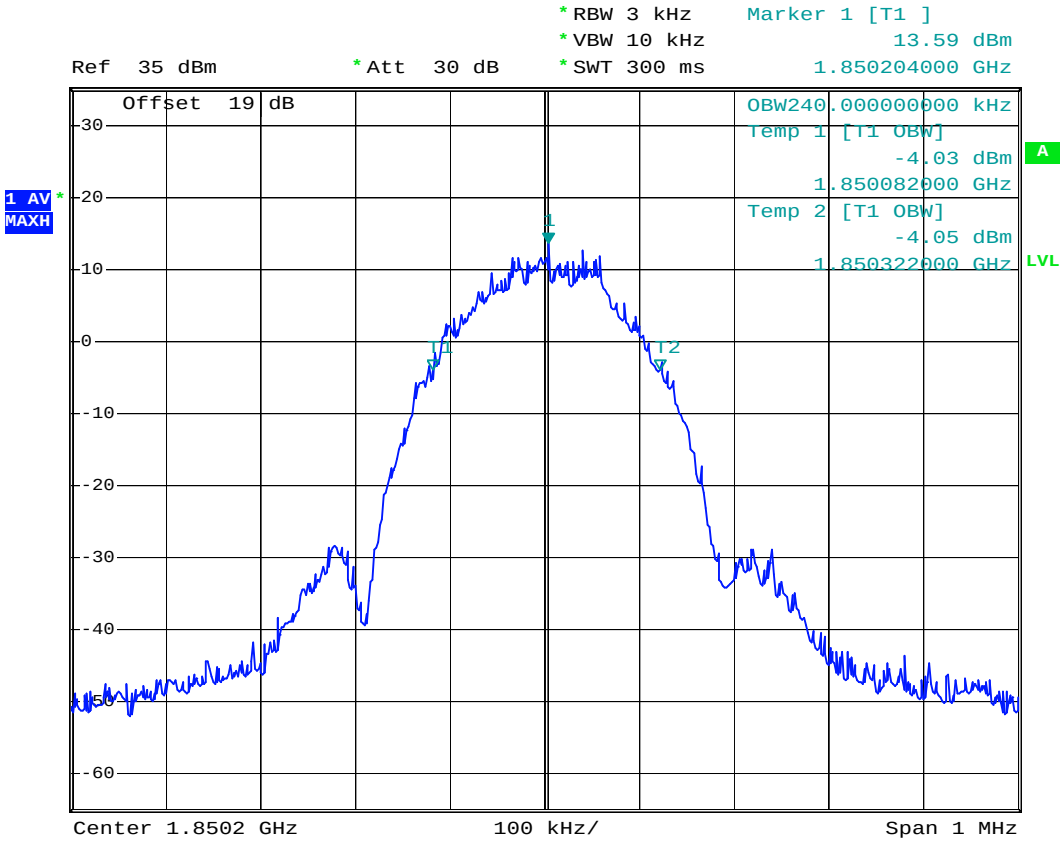

Date: 15.JUL.2007 17:33:46

- Mode 4
- Test Mode : PCS1900 (EDGE) CH512 Lower Band Edge
- Power State : High



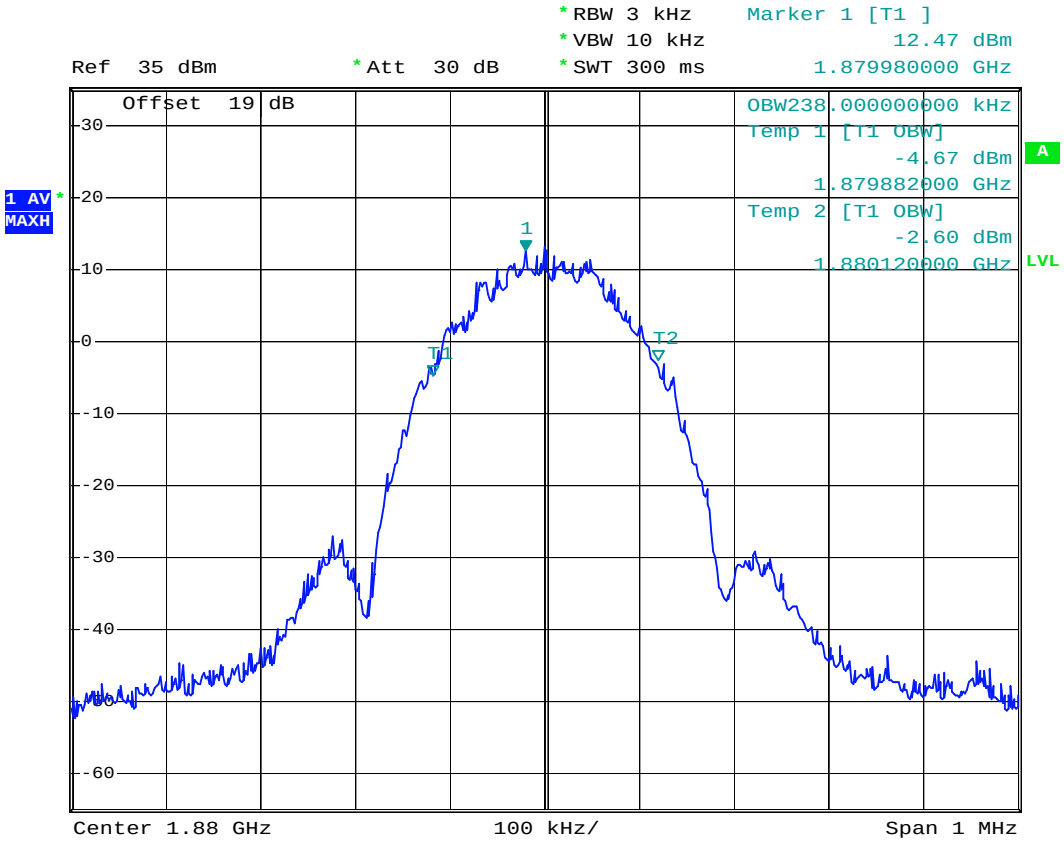

Date: 15.JUL.2007 17:13:57

- Test Mode : PCS1900 (EDGE) CH512 99% Occupid Bandwidth
- Power State : High



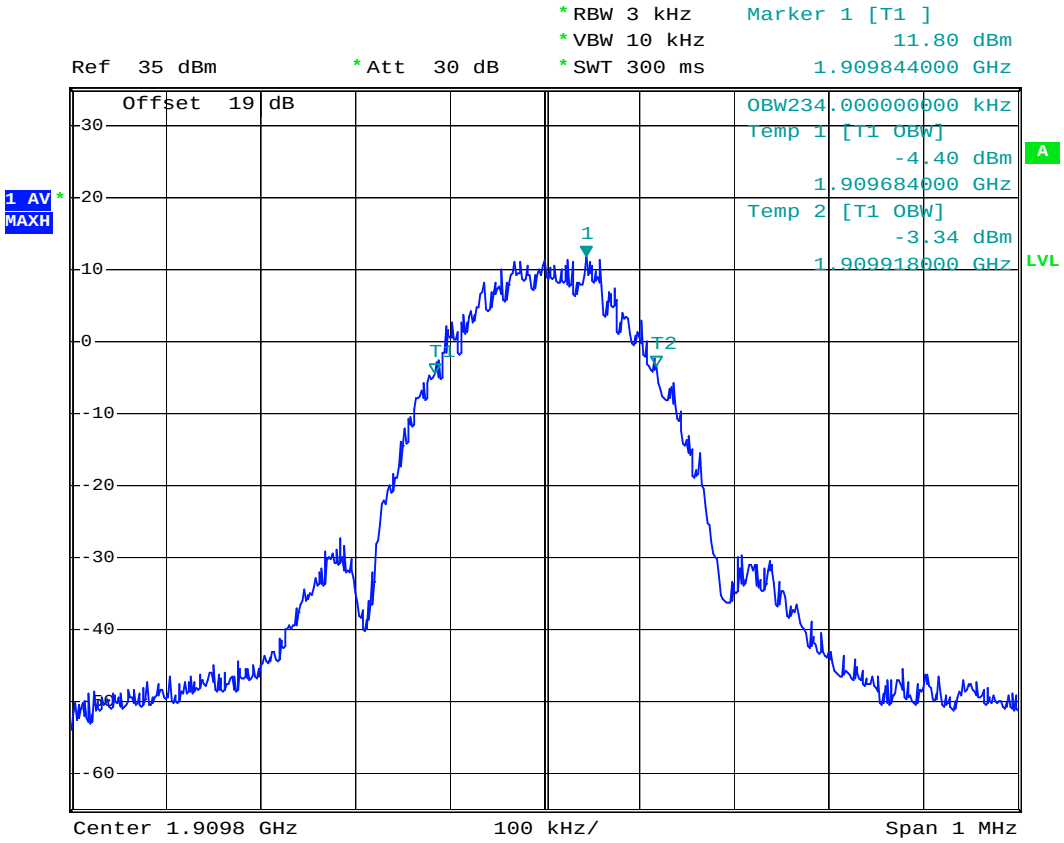

Date: 15.JUL.2007 16:53:50

- Test Mode : PCS1900 (EDGE) CH661 99% Occupid Bandwidth
- Power State : High



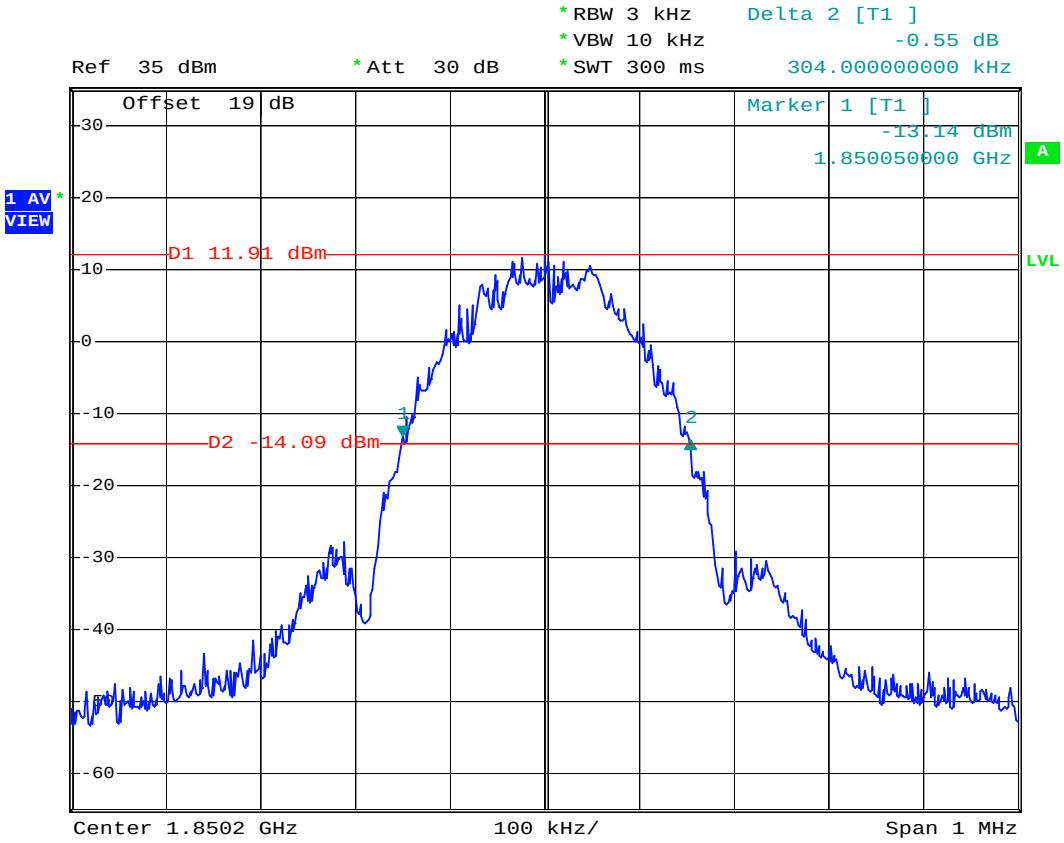

Date: 15.JUL.2007 16:52:44

- Test Mode : PCS1900 (EDGE) CH810 99% Occupid Bandwidth
- Power State : High



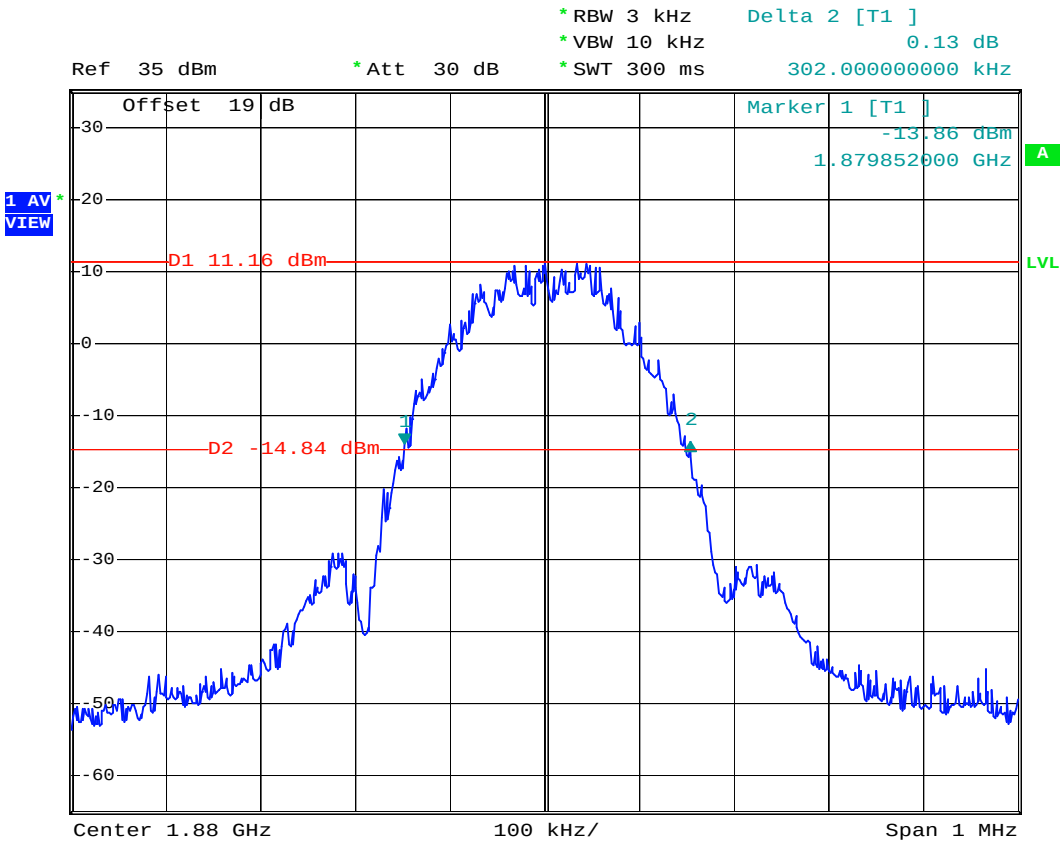

Date: 15.JUL.2007 16:54:45

- Test Mode : PCS1900 (EDGE) CH512 26dB Bandwidth
- Power State : High



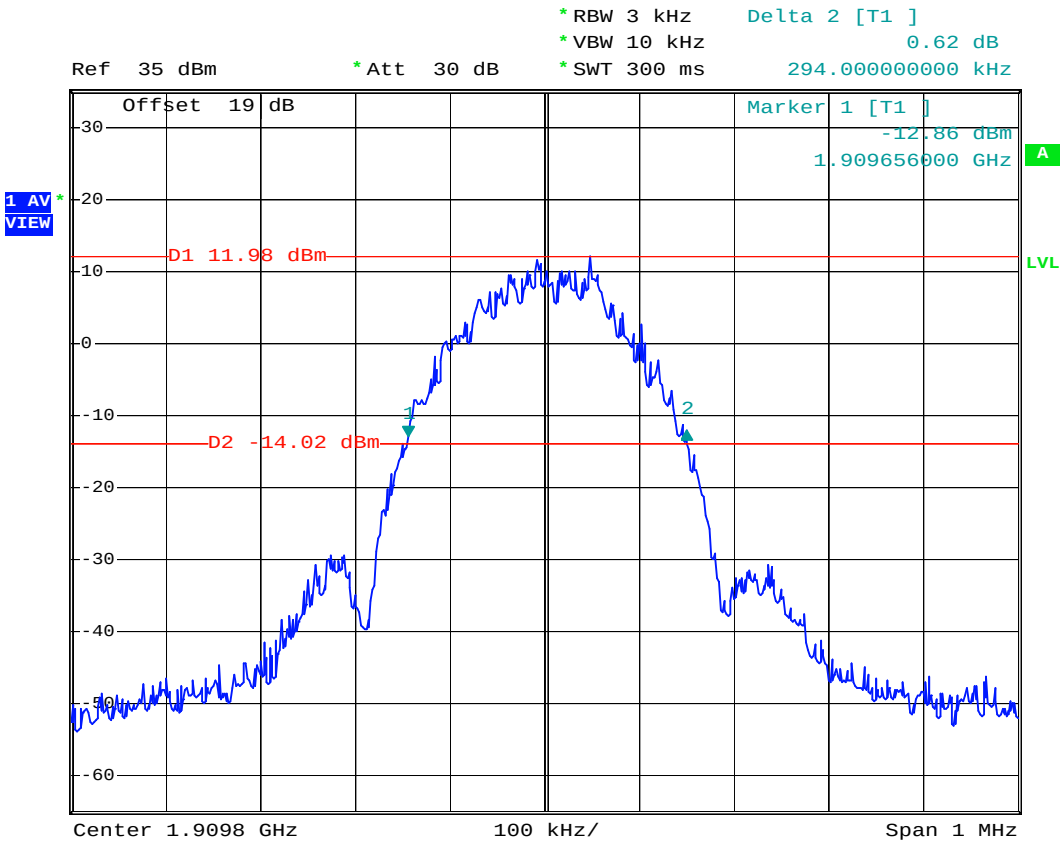

Date: 15.JUL.2007 17:11:17

- Test Mode : PCS1900 (EDGE) CH661 26dB Bandwidth
- Power State : High




Date: 15.JUL.2007 17:12:14

- Test Mode : PCS1900 (EDGE) CH810 26dB Bandwidth
- Power State : High




Date: 15.JUL.2007 17:10:05

- Test Mode : PCS1900(EDGE) CH810 Higher Band Edge
- Power State : High


Date: 15.JUL.2007 17:14:33

## 4.5 Conducted Emission

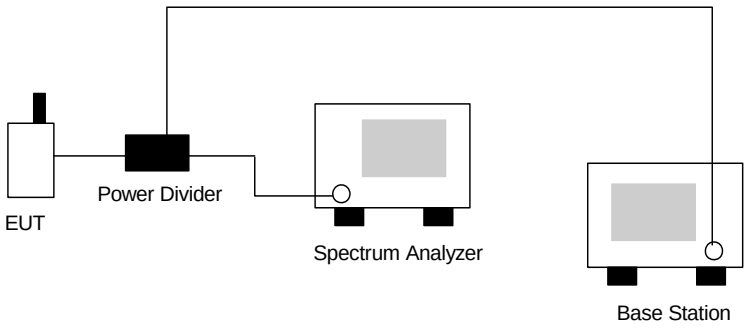
4.5.1 Measurement Instruments

As described in chapter 5 of this test report.

4.5.2 Test Procedure

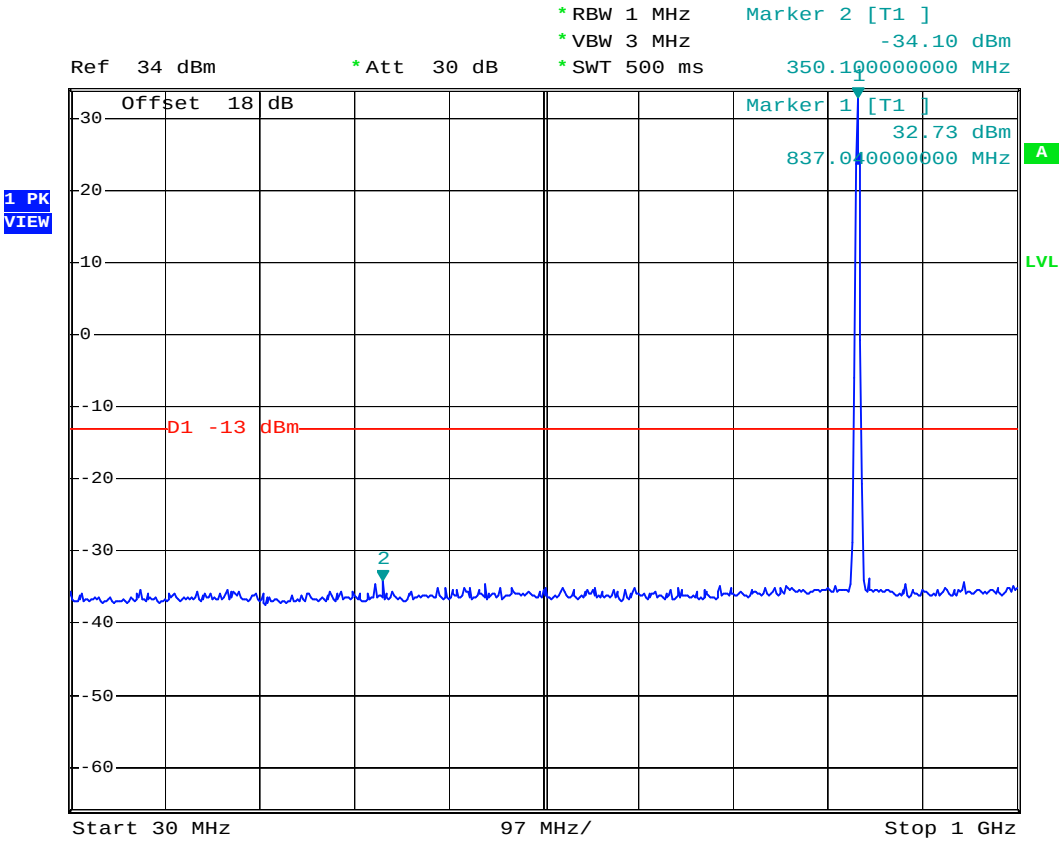
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

4.5.3 Test Setup Layout



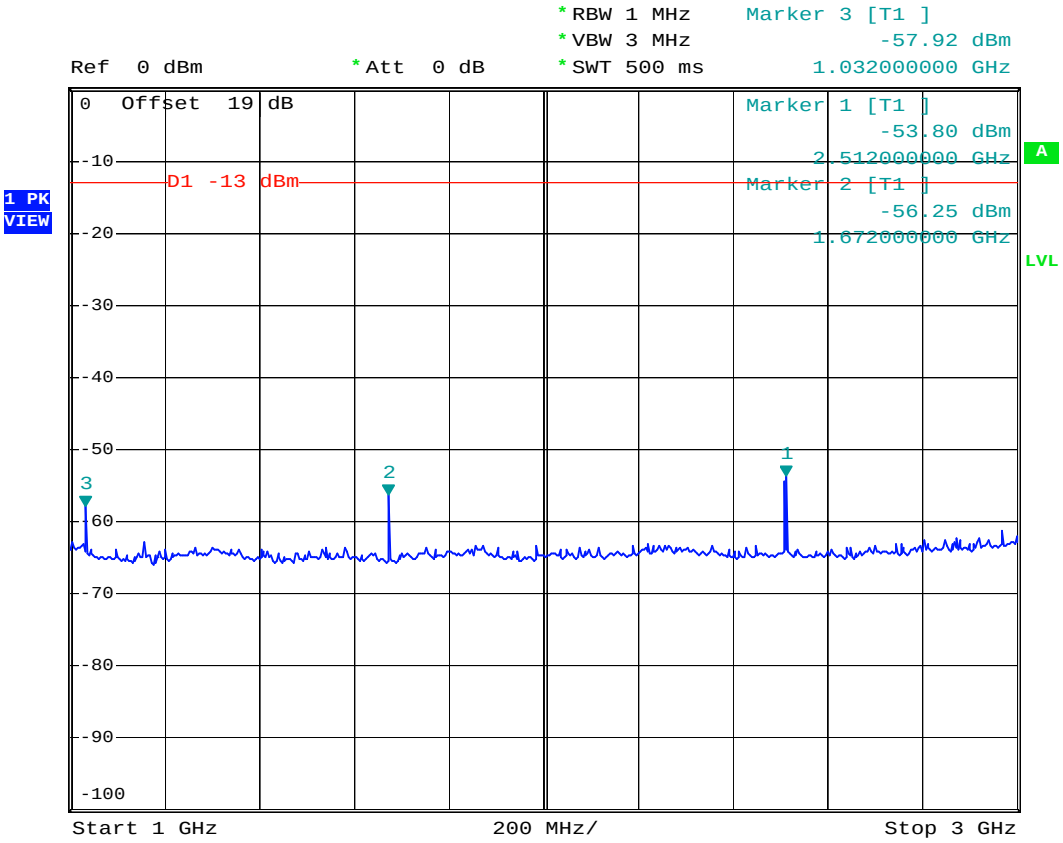
4.5.4 Test Result

- Mode 1
- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 30M-1G



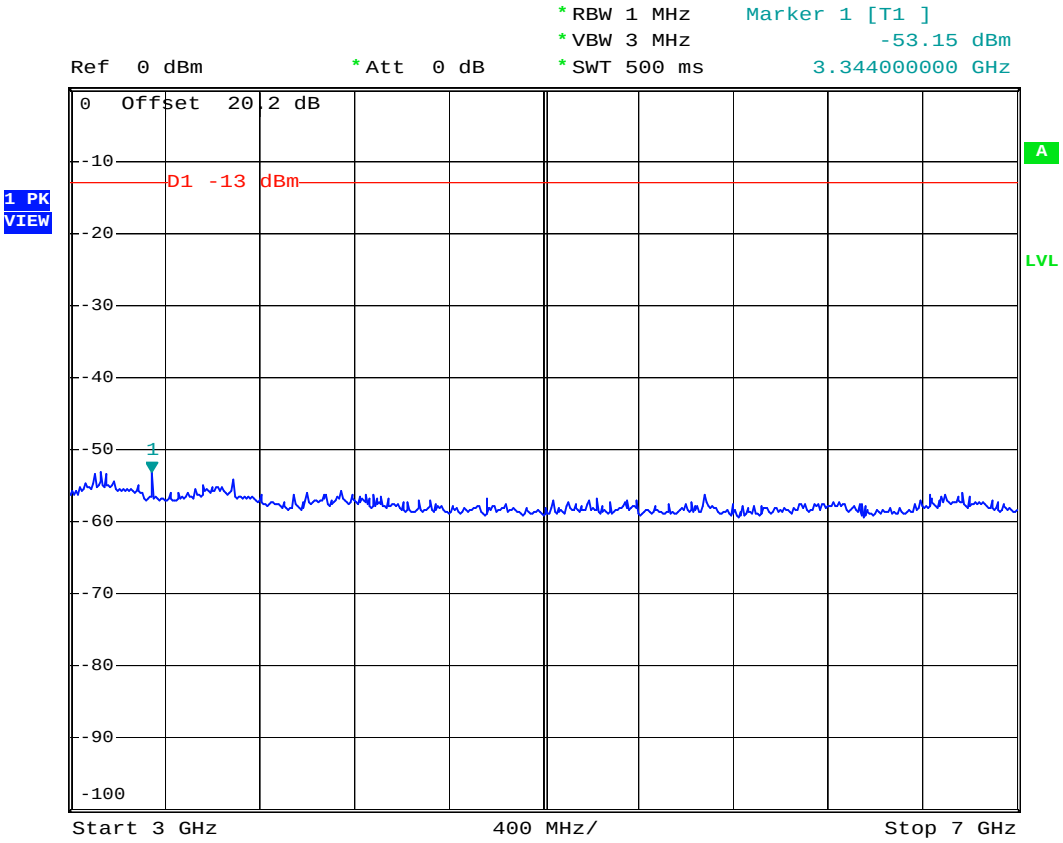

Date: 15.JUL.2007 16:04:45

- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 1G-3G



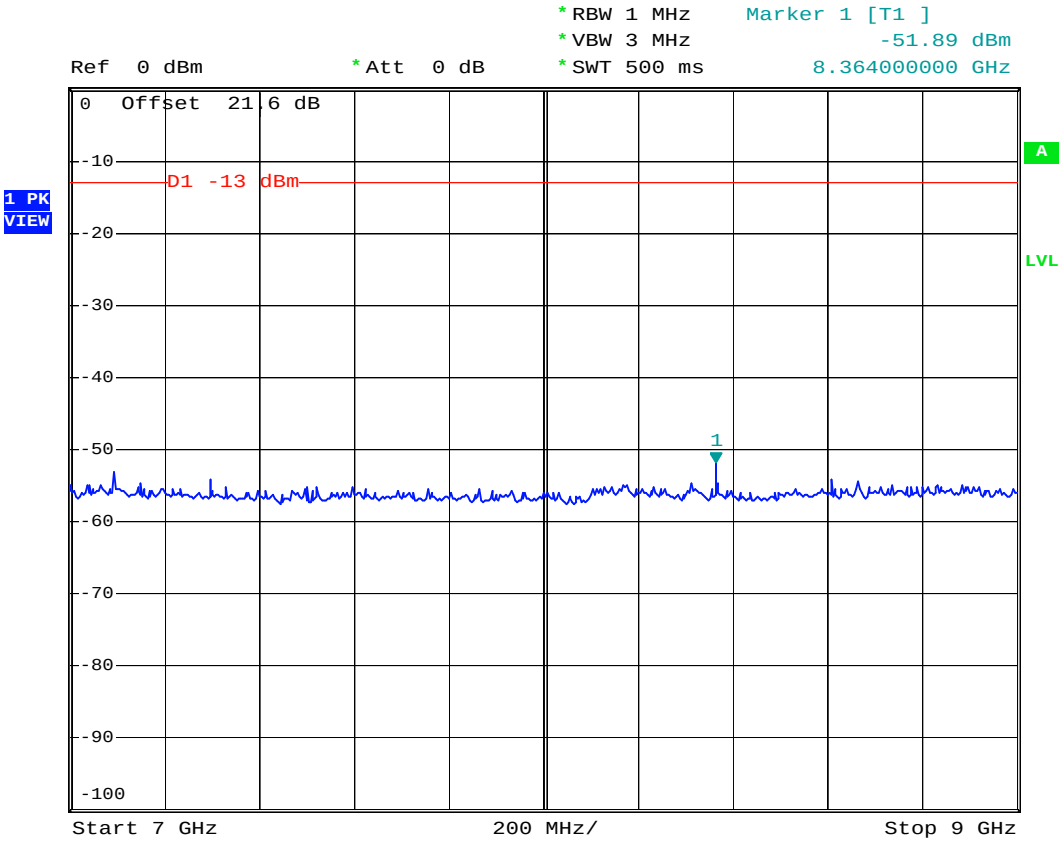

Date: 15.JUL.2007 16:03:26

- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 3G-7G



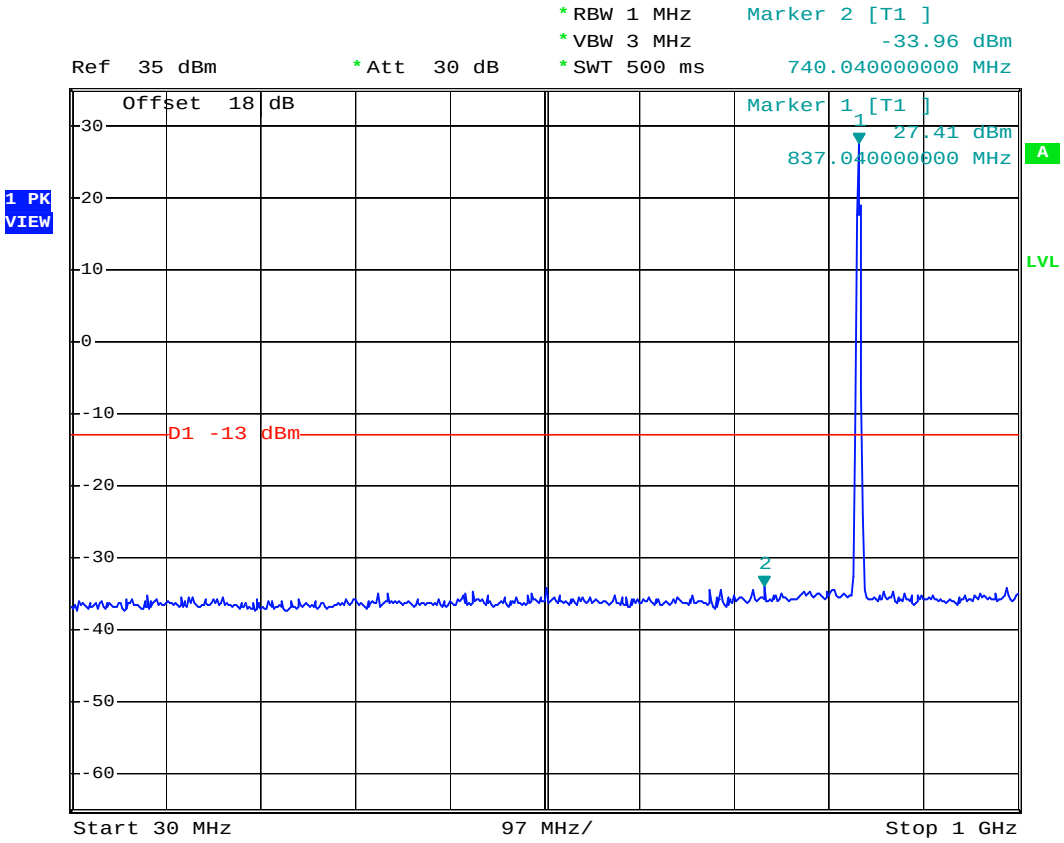

Date: 15.JUL.2007 16:02:46

- Test Mode : GSM850 (GSM) CH189
- Frequency Range : 7G-9G



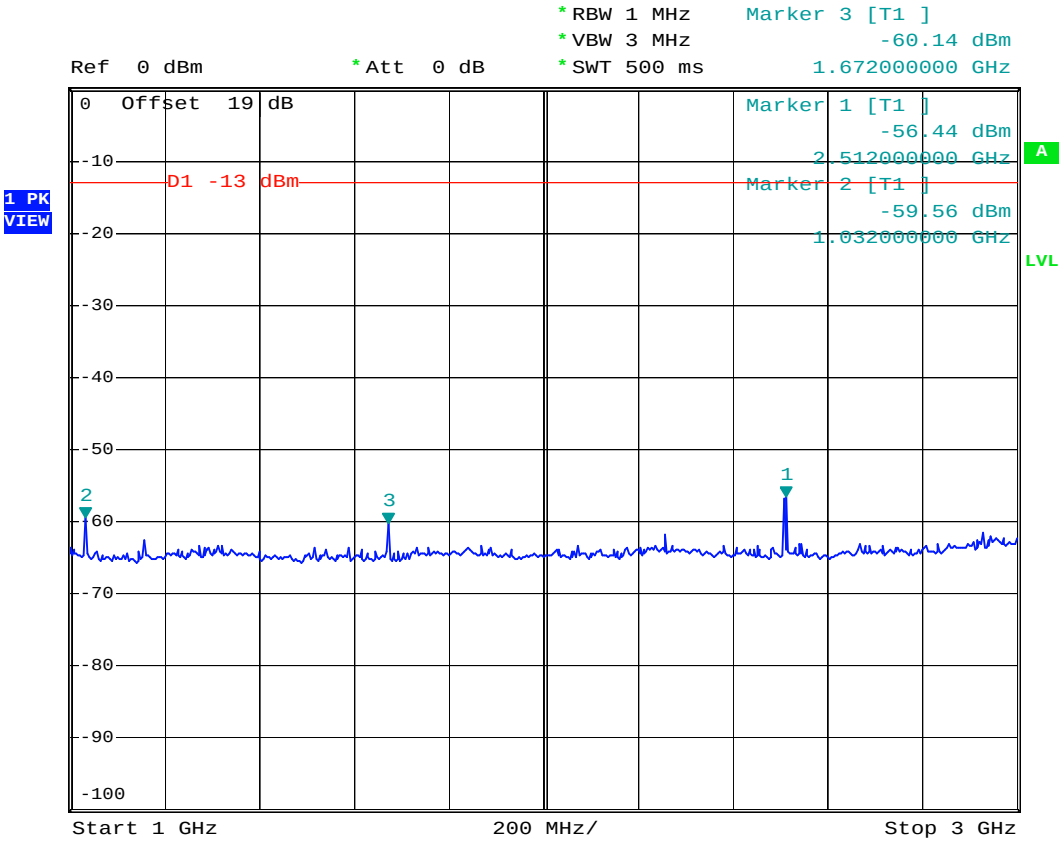

Date: 15.JUL.2007 16:02:18

- Mode 2
- Test Mode : GSM850 (EDGE) CH189
- Frequency Range : 30M-1G



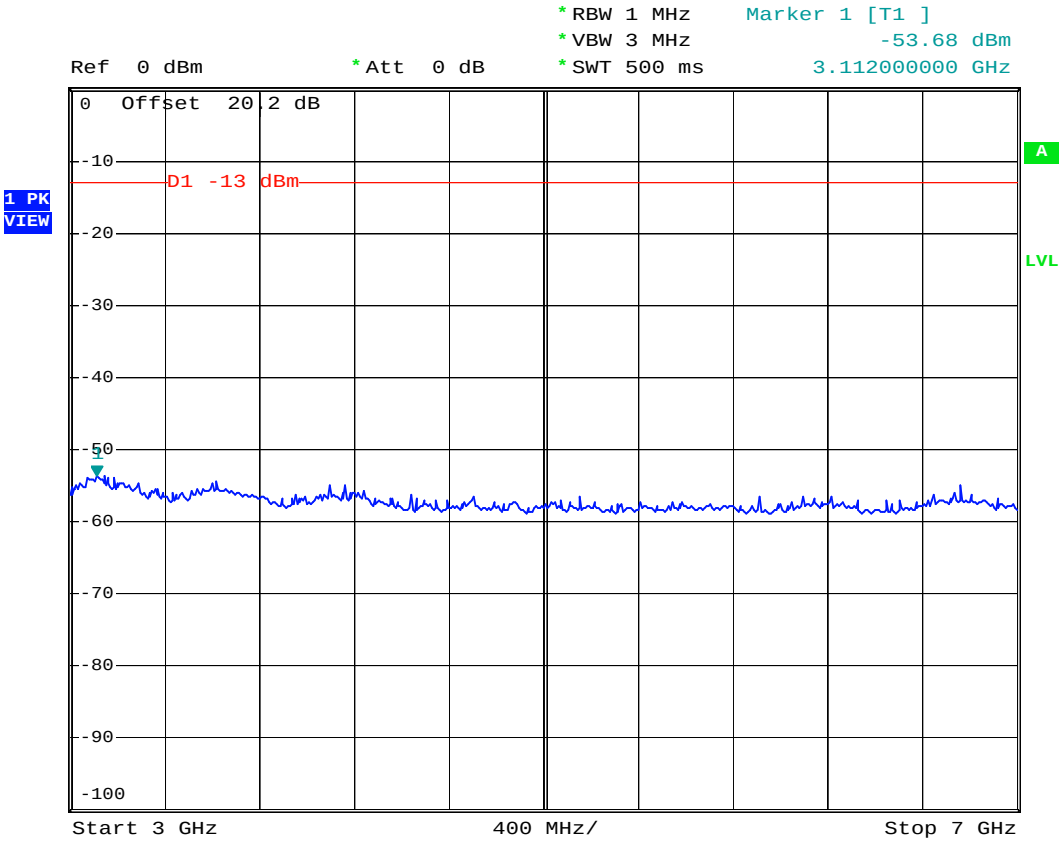

Date: 15.JUL.2007 15:54:17

- Test Mode : GSM850 (EDGE) CH189
- Frequency Range : 1G-3G



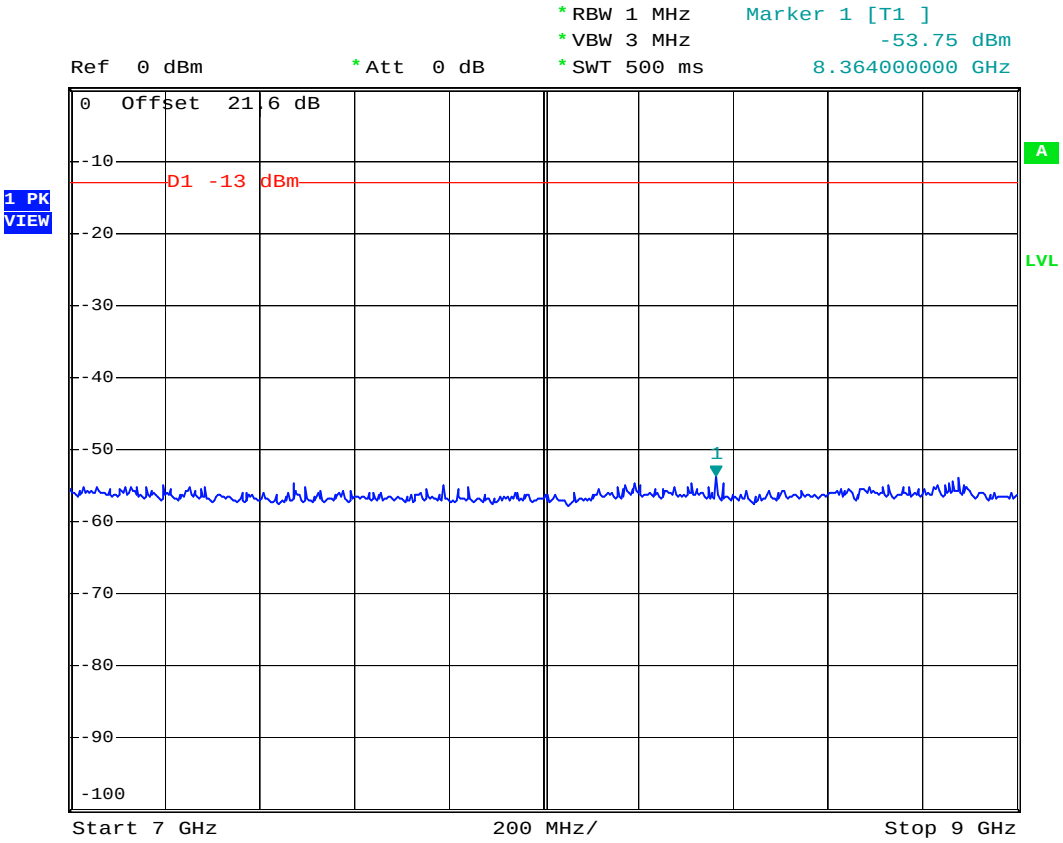

Date: 15.JUL.2007 15:56:51

- Test Mode : GSM850 (EDGE) CH189
- Frequency Range : 3G-7G



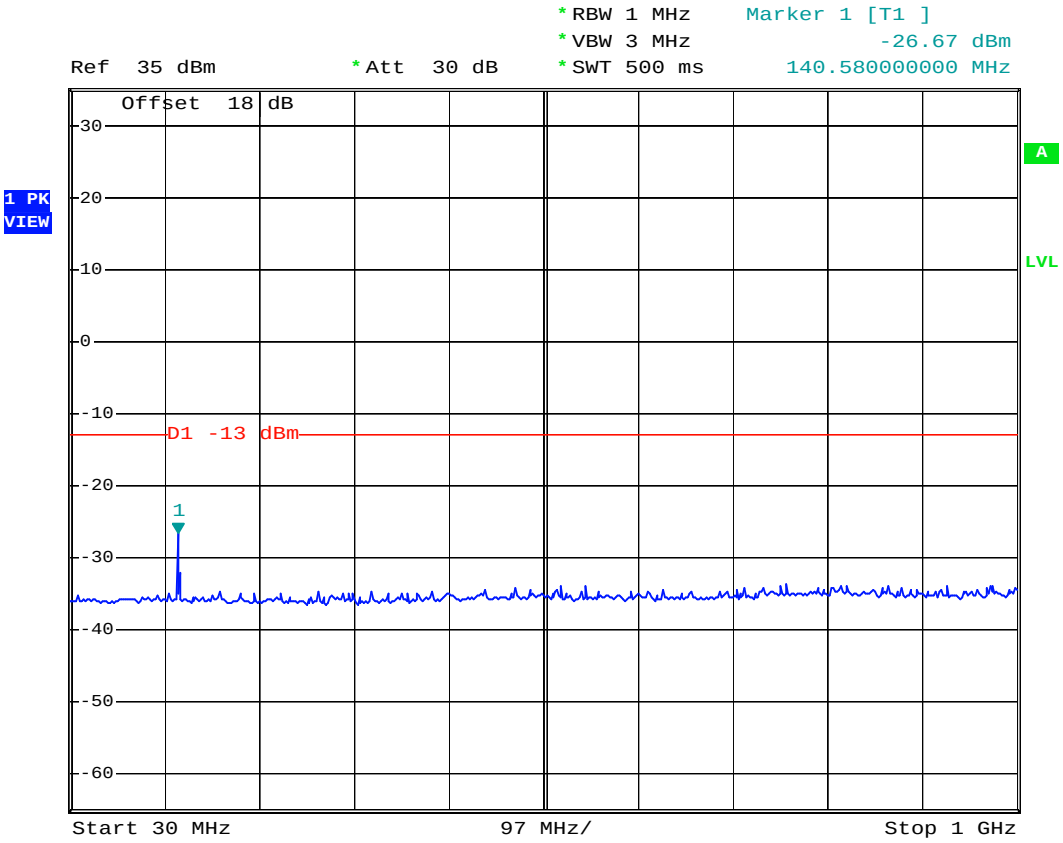

Date: 15.JUL.2007 16:00:06

- Test Mode : GSM850 (EDGE) CH189
- Frequency Range : 7G-9G



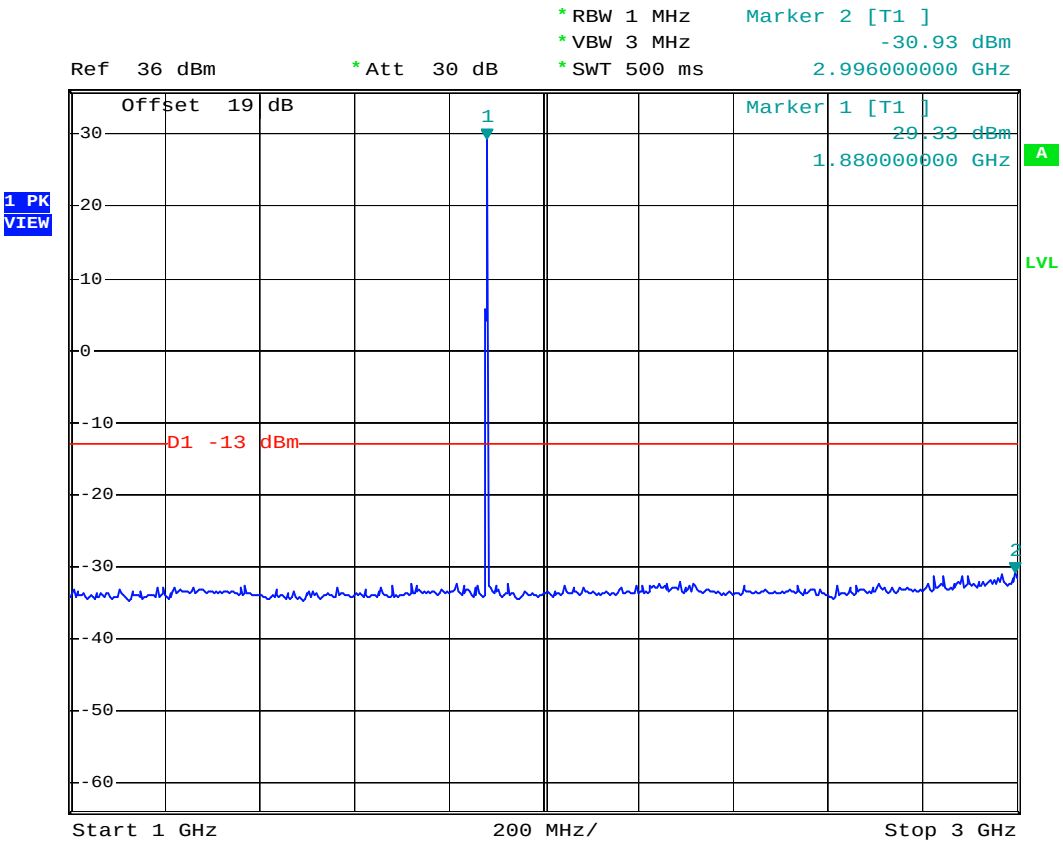

Date: 15.JUL.2007 16:01:29

- Mode 3
- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 30M-1G



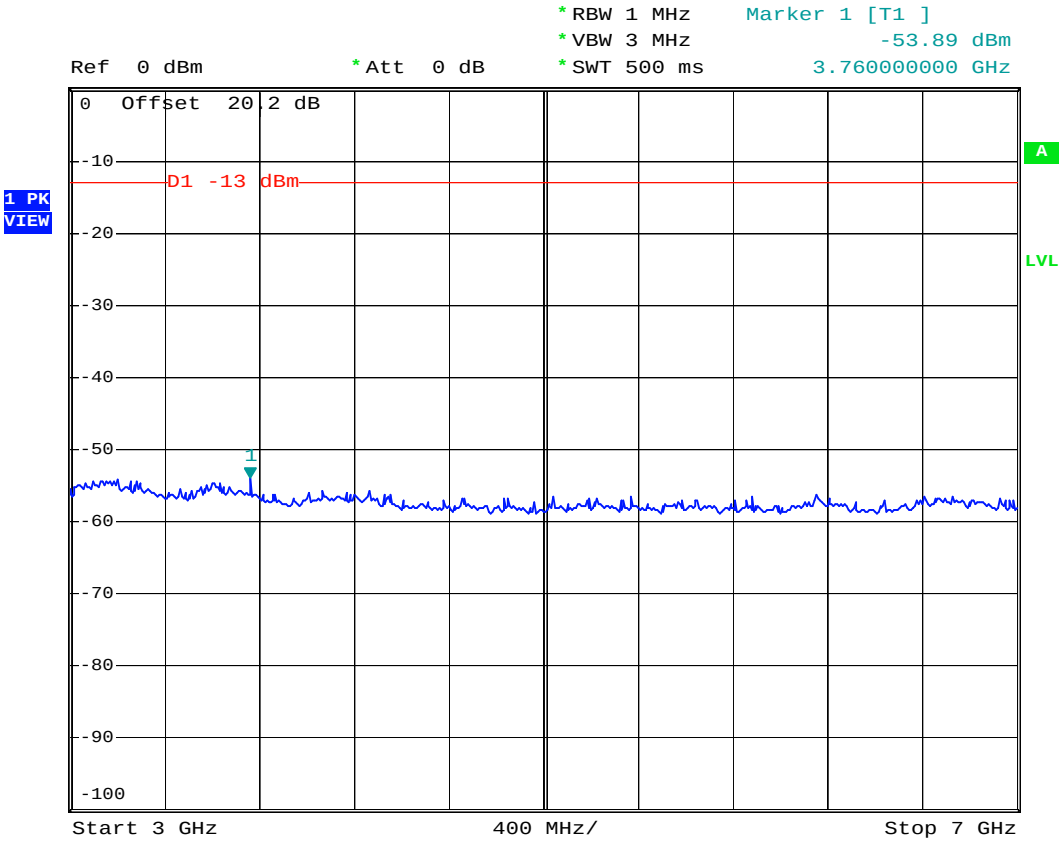

Date: 15.JUL.2007 16:19:14

- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 1G-3G



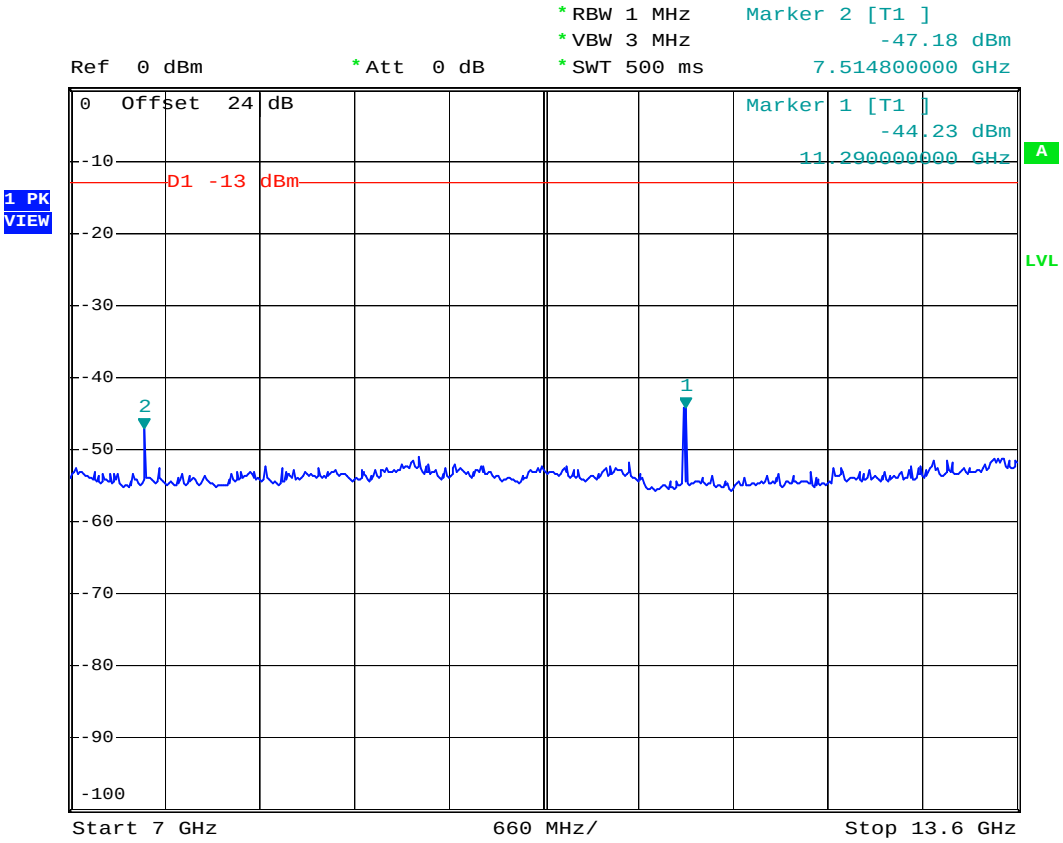

Date: 15.JUL.2007 16:20:53

- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 3G-7G



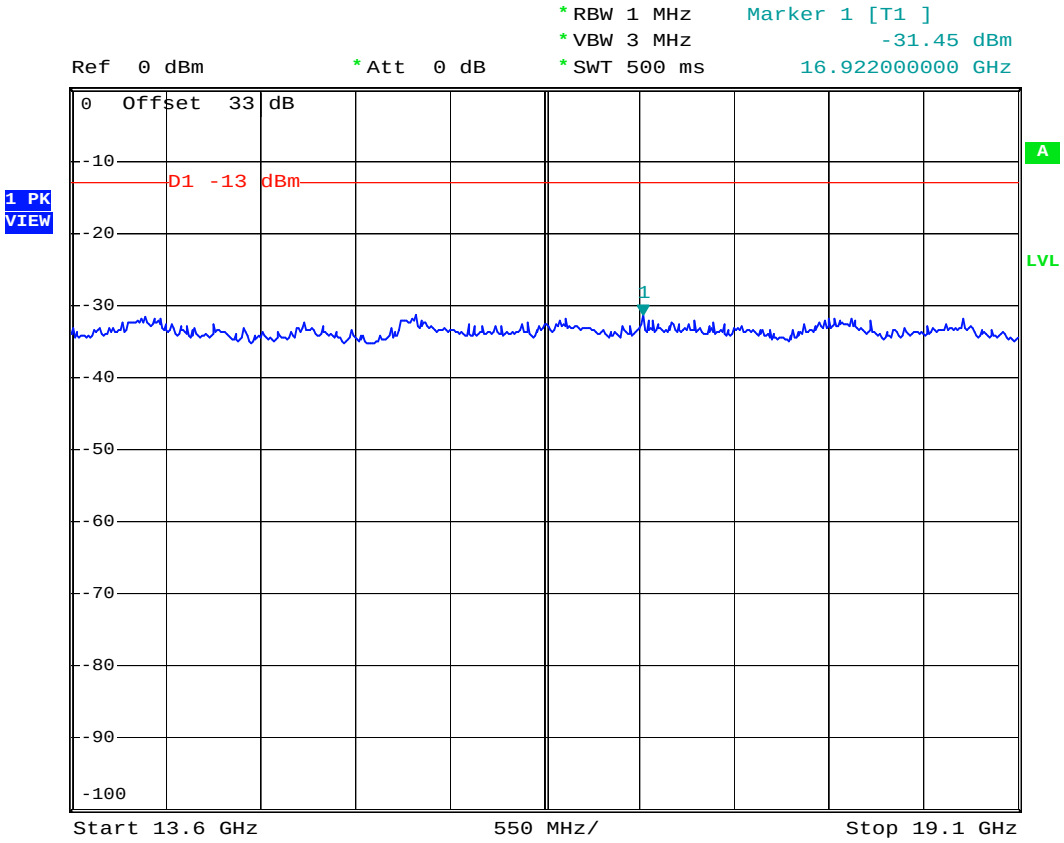

Date: 15.JUL.2007 16:22:00

- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 7G-13.6G



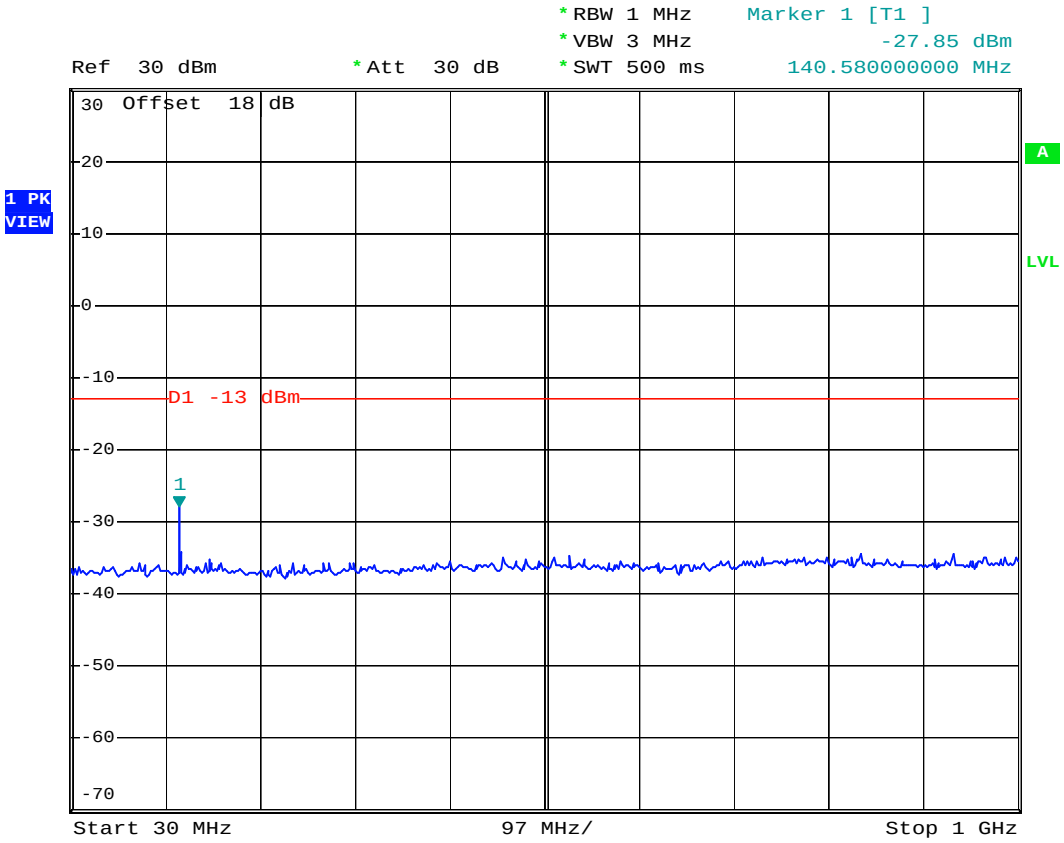

Date: 15.JUL.2007 16:24:20

- Test Mode : PCS1900 (GSM) CH661
- Frequency Range : 13.6G-19.1G



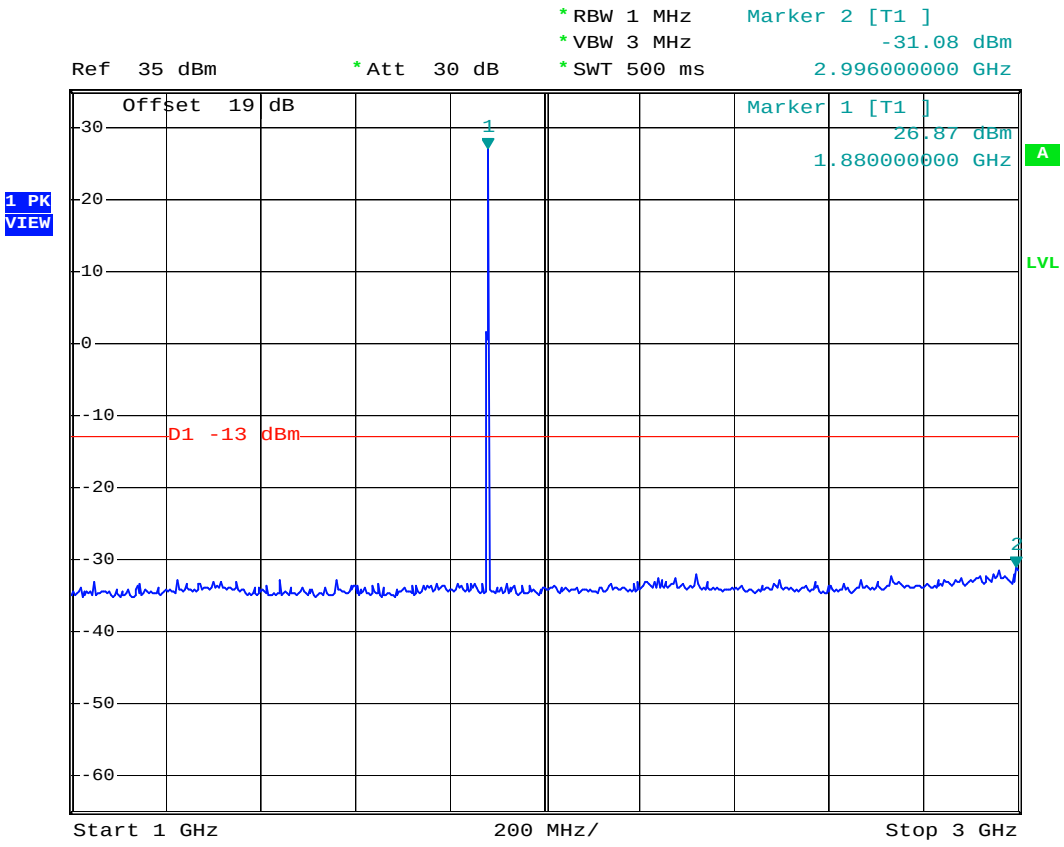

Date: 15.JUL.2007 16:25:10

- Mode 4
- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 30M-1G



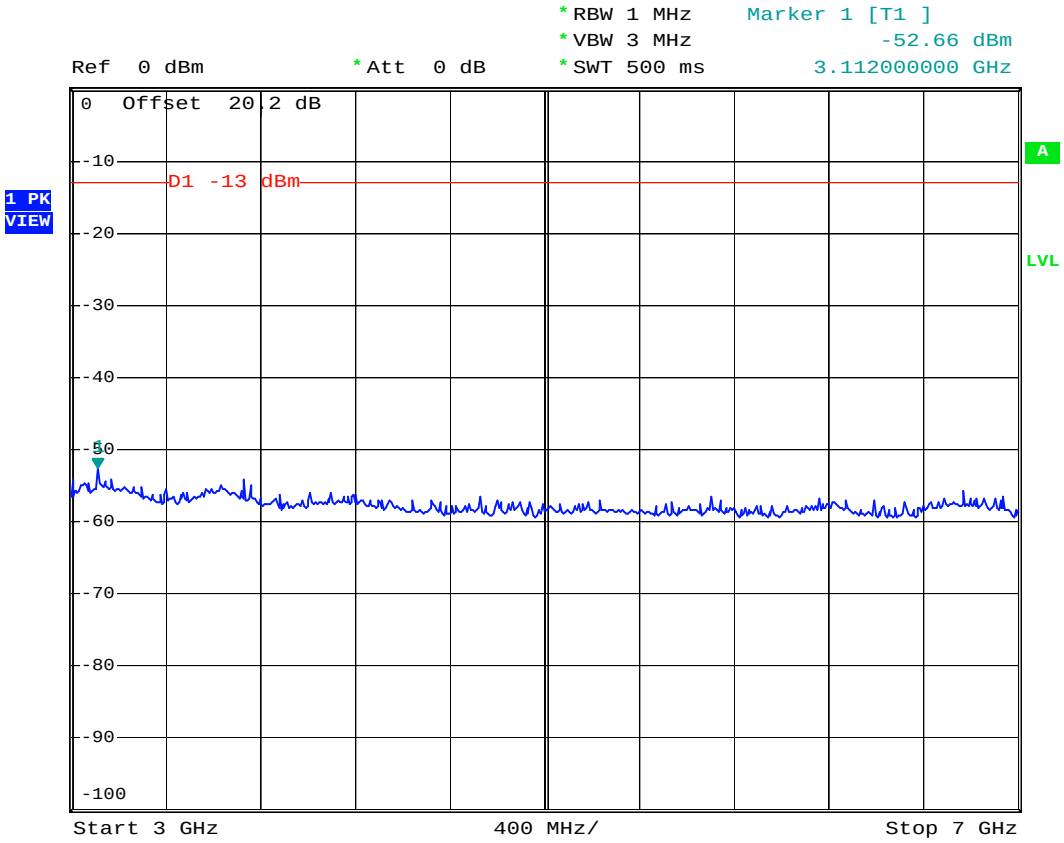

Date: 15.JUL.2007 16:30:30

- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 1G-3G



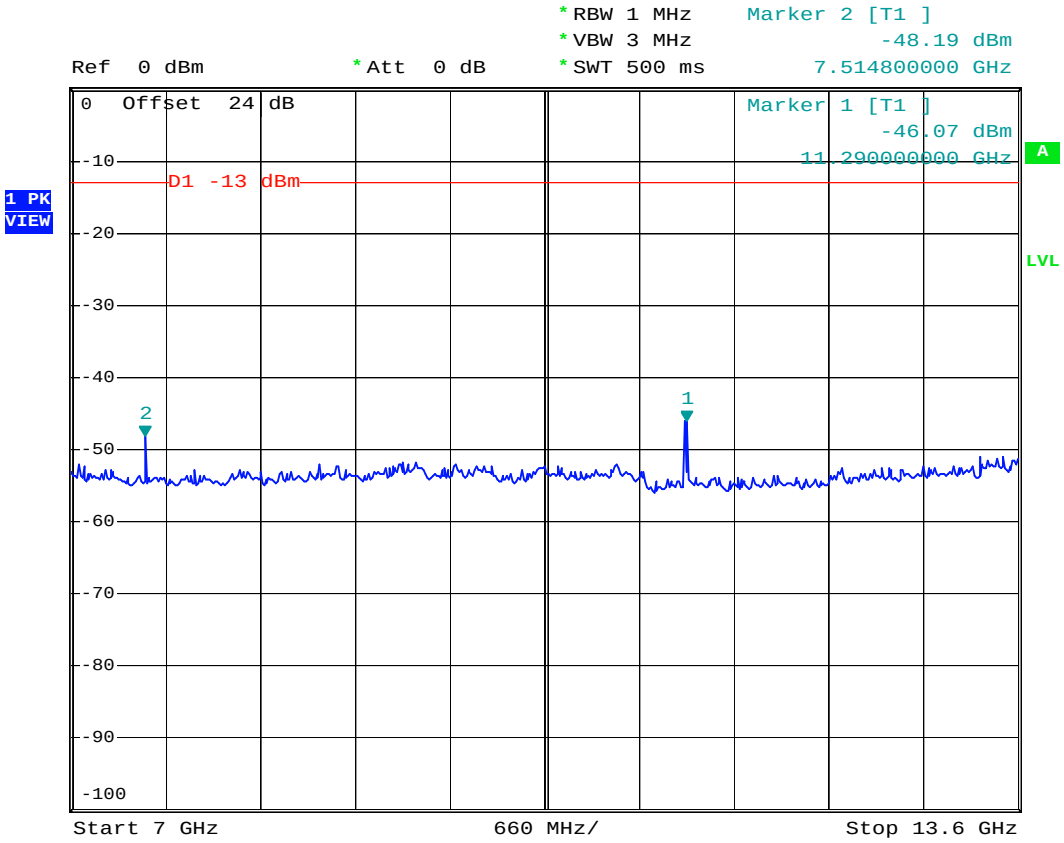

Date: 15.JUL.2007 16:38:58

- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 3G-7G



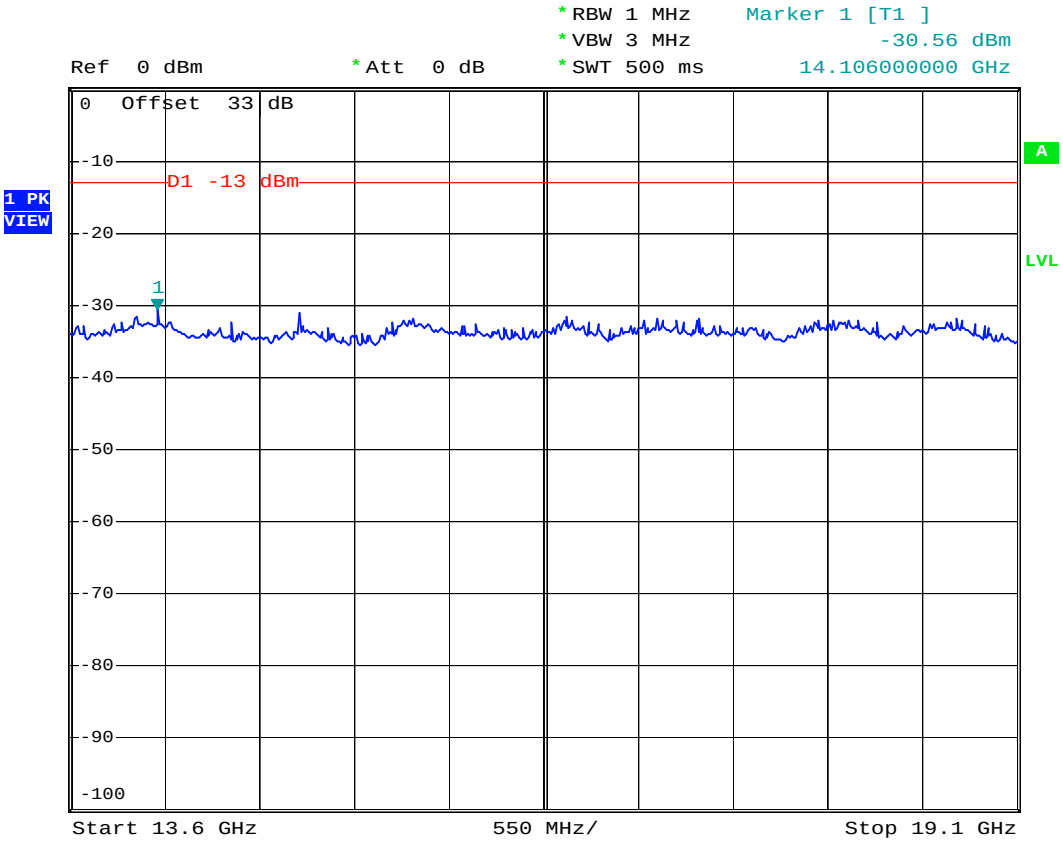

Date: 15.JUL.2007 16:27:45

- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 7G-13.6G




Date: 15.JUL.2007 16:27:01

- Test Mode : PCS1900 (EDGE) CH661
- Frequency Range : 13.6G-19.1G




Date: 15.JUL.2007 16:26:24

## 4.6 Field Strength of Spurious Radiation

Equivalent isotropic radiated Power Measurements by substitution method according to ANSI/TIA/EIA-603-C.

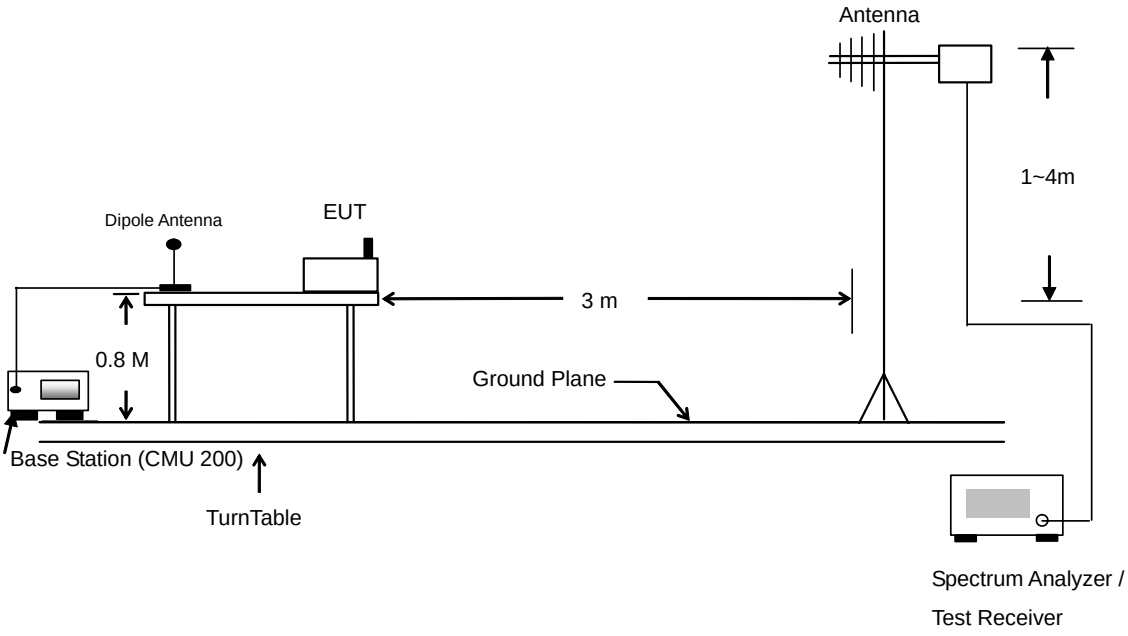
4.6.1 Measurement Instruments

As described in chapter 5 of this test report.

4.6.2 Test Procedure

1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to reach the maximum spurious emission for both horizontal and vertical polarizations.
5. Taking the record of maximum spurious emission.
6. A Horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the recored of output power at antenna port.
9. Repeat step 7 to step 8 for another polariztion.
10. Emission level (dBm) = output power + substitution Gain.

4.6.3 Test Setup Layout



4.6.4 Test Result

- Test Mode : Mode 1

| GSM850 (GSM) Radiated Spurious ERP | | | | | | | |
|---|---|---|---|---|---|---|---|
| H Polarization | | | | V Polarization | | | |
| Frequency (MHz) | ERP (dBm) | Limit (dBm) | Margin (dB) | Frequency (MHz) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| | | | | | | | |
| 36.480 | -60.060 | -13 | -47.06 | 35.940 | -56.890 | -13 | -43.89 |
| 214.680 | -65.190 | -13 | -52.19 | 266.790 | -66.440 | -13 | -53.44 |
| 265.980 | -63.400 | -13 | -50.40 | 675.900 | -60.270 | -13 | -47.27 |
| 995.800 | -56.430 | -13 | -43.43 | 1674.000 | -24.100 | -13 | -11.10 |
| 1674.000 | -21.500 | -13 | -8.50 | 2508.000 | -43.710 | -13 | -30.71 |
| 3344.000 | -55.440 | -13 | -42.44 | 2994.000 | -58.020 | -13 | -45.02 |

- Test Mode : Mode 2

| GSM850 (EDGE) Radiated Spurious ERP | | | | | | | |
|---|---|---|---|---|---|---|---|
| H Polarization | | | | V Polarization | | | |
| Frequency (MHz) | ERP (dBm) | Limit (dBm) | Margin (dB) | Frequency (MHz) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| | | | | | | | |
| 31.080 | -62.160 | -13 | -49.16 | 71.580 | -60.760 | -13 | -47.76 |
| 76.440 | -69.640 | -13 | -56.64 | 101.280 | -62.200 | -13 | -49.20 |
| 265.440 | -64.730 | -13 | -51.73 | 192.540 | -59.580 | -13 | -46.58 |
| 448.400 | -66.120 | -13 | -53.12 | 675.900 | -63.960 | -13 | -50.96 |
| 1464.000 | -55.990 | -13 | -42.99 | 1674.000 | -57.740 | -13 | -44.74 |

- Test Mode : Mode 3

| PCS1900 (GSM) Radiated Spurious EIRP | | | | | | | |
|---|---|---|---|---|---|---|---|
| H Polarization | | | | V Polarization | | | |
| Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| | | | | | | | |
| 31.890 | -60.500 | -13 | -47.50 | 85.890 | -55.570 | -13 | -42.57 |
| 43.230 | -50.990 | -13 | -37.99 | 142.590 | -59.290 | -13 | -46.29 |
| 266.790 | -62.410 | -13 | -49.41 | 266.790 | -62.520 | -13 | -49.52 |
| 666.800 | -63.180 | -13 | -50.18 | 665.400 | -62.700 | -13 | -49.70 |
| 798.400 | -60.200 | -13 | -47.20 | 901.300 | -60.620 | -13 | -47.62 |
| 934.900 | -63.320 | -13 | -50.32 | 932.800 | -59.590 | -13 | -46.59 |
| 5048.000 | -51.350 | -13 | -38.35 | 3758.000 | -49.960 | -13 | -36.96 |
| 7518.000 | -41.960 | -13 | -28.96 | 7518.000 | -44.550 | -13 | -31.55 |

- Test Mode : Mode 4

| PCS1900 (EDGE) Radiated Spurious EIRP | | | | | | | |
|---|---|---|---|---|---|---|---|
| H Polarization | | | | V Polarization | | | |
| Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| | | | | | | | |
| 31.080 | -59.930 | -13 | -46.93 | 58.080 | -51.210 | -13 | -38.21 |
| 180.930 | -59.400 | -13 | -46.40 | 142.590 | -62.730 | -13 | -49.73 |
| 220.890 | -61.060 | -13 | -48.06 | 214.680 | -63.080 | -13 | -50.08 |
| 448.400 | -59.470 | -13 | -46.47 | 409.900 | -45.700 | -13 | -32.70 |
| 637.400 | -48.030 | -13 | -35.03 | 444.900 | -61.290 | -13 | -48.29 |
| 866.300 | -59.740 | -13 | -46.74 | 957.300 | -61.650 | -13 | -48.65 |
| 1598.000 | -53.930 | -13 | -40.93 | 1464.000 | -57.830 | -13 | -44.83 |
| 1718.000 | -49.870 | -13 | -36.87 | 1824.000 | -58.850 | -13 | -45.85 |

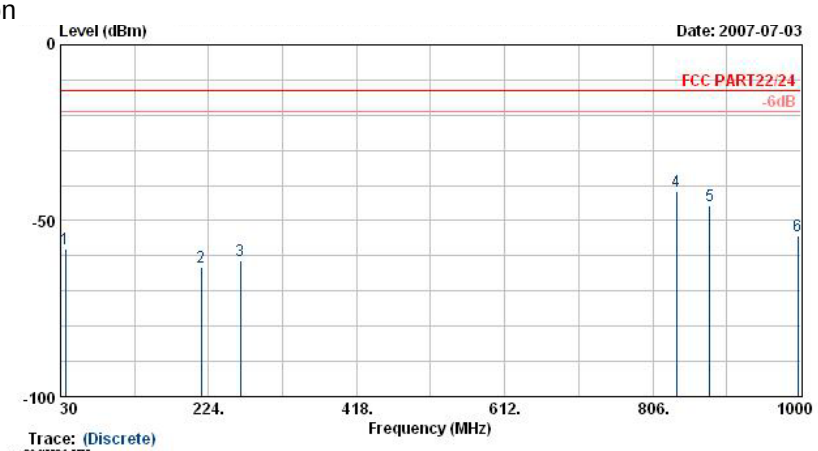
- Test Mode : Mode 5

| GSM850 (GSM) with Bluetooth Co-location Radiated Spurious ERP | | | | | | | |
|---|---|---|---|---|---|---|---|
| H Polarization | | | | V Polarization | | | |
| Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Margin (dB) | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| | | | | | | | |
| 31.620 | -62.630 | -13 | -49.63 | 53.490 | -58.040 | -13 | -45.04 |
| 83.190 | -70.900 | -13 | -57.90 | 82.380 | -54.420 | -13 | -41.42 |
| 265.980 | -64.820 | -13 | -51.82 | 266.790 | -62.130 | -13 | -49.13 |
| 995.800 | -57.100 | -13 | -44.10 | 995.800 | -59.780 | -13 | -46.78 |
| 1218.000 | -51.470 | -13 | -38.47 | 1234.000 | -57.650 | -13 | -44.65 |
| 1674.000 | -32.220 | -13 | -19.22 | 1674.000 | -38.350 | -13 | -25.35 |

4.6.5 Test Data

4.6.5.1 Mode 1

Horizontal Polarization



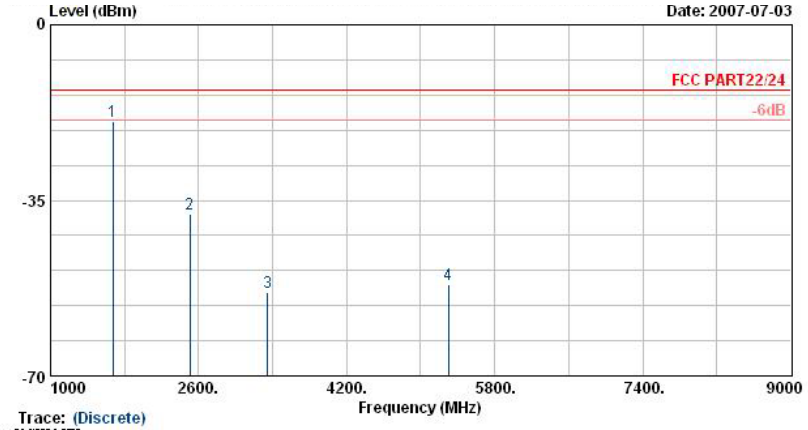

Trace: (Discrete)

Site : 03CH06-HY
Condition : LF-SPURIOUS HORIZONTAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : GSM 850 Link Mode,Ch189+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 36.5 | -57.91 | -44.91 | -13.00 | -54.01 | -3.90 | Peak | HORIZONTAL |
| 2 | 214.7 | -63.04 | -50.04 | -13.00 | -50.15 | -12.89 | Peak | HORIZONTAL |
| 3 | 266.0 | -61.25 | -48.25 | -13.00 | -50.14 | -11.12 | Peak | HORIZONTAL |
| 4 | 836.9 | -41.81 | | | -40.48 | -1.33 | Peak | HORIZONTAL |
| 5 | 881.0 | -45.71 | | | -44.80 | -0.91 | Peak | HORIZONTAL |
| 6 | 995.8 | -54.28 | -41.28 | -13.00 | -54.48 | 0.20 | Peak | HORIZONTAL |

Remark:

1. #4: MS Signal
2. #5: BS Signal

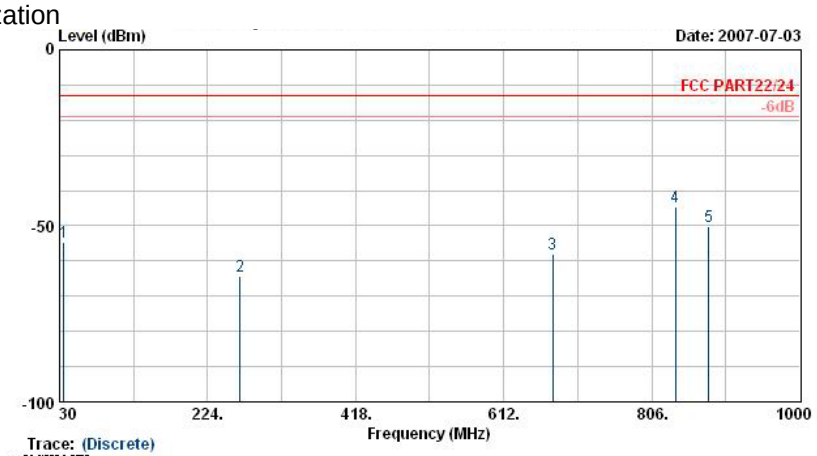



Trace: (Discrete)

Site : 03CH06-HY
Condition : HF-SPURIOUS HORIZONTAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : GSM 850 Link Mode,Ch189+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 @ | 1674.0 | -19.35 | -6.35 | -13.00 | -19.58 | 0.22 | Peak | HORIZONTAL |
| 2 | 2508.0 | -37.63 | -24.63 | -13.00 | -38.83 | 1.20 | Peak | HORIZONTAL |
| 3 | 3344.0 | -53.29 | -40.29 | -13.00 | -58.69 | 5.41 | Peak | HORIZONTAL |
| 4 | 5298.0 | -51.76 | -38.76 | -13.00 | -61.76 | 10.00 | Peak | HORIZONTAL |

Vertical Polarization

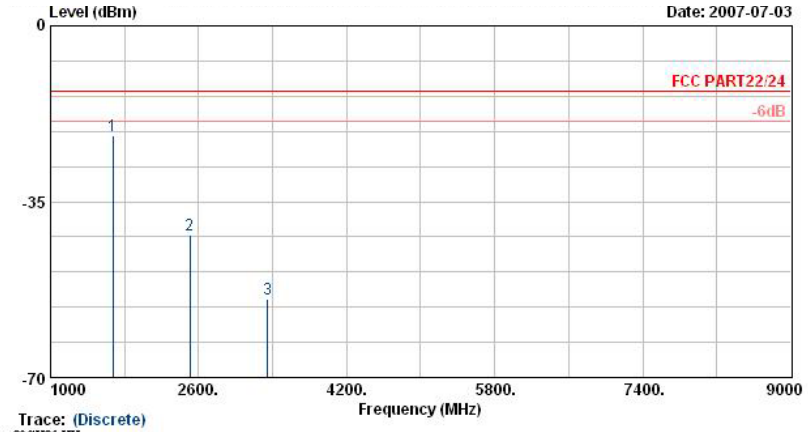



Site : 03CH06-HY
Condition : LF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : GSM 850 Link Mode,Ch189+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 35.9 | -54.74 | -41.74 | -13.00 | -44.02 | -10.71 | Peak | VERTICAL |
| 2 | 266.8 | -64.29 | -51.29 | -13.00 | -57.12 | -7.16 | Peak | VERTICAL |
| 3 | 675.9 | -58.12 | -45.12 | -13.00 | -57.32 | -0.79 | Peak | VERTICAL |
| 4 | 836.9 | -44.53 | | | -45.90 | 1.36 | Peak | VERTICAL |
| 5 | 880.3 | -50.37 | | | -52.08 | 1.71 | Peak | VERTICAL |

Remark:

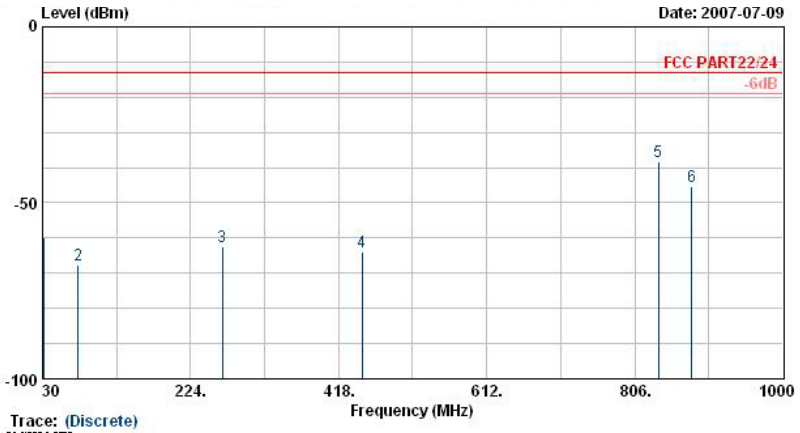
1. #4: MS Signal
2. #5: BS Signal




Site : 03CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : GSM 850 Link Mode,Ch189+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 @ | 1674.0 | -21.95 | -8.95 | -13.00 | -21.47 | -0.48 | Peak | VERTICAL |
| 2 | 2508.0 | -41.56 | -28.56 | -13.00 | -43.83 | 2.27 | Peak | VERTICAL |
| 3 | 3344.0 | -54.33 | -41.33 | -13.00 | -58.80 | 4.47 | Peak | VERTICAL |

4.6.5.2 Mode 2
Horizontal Polarization



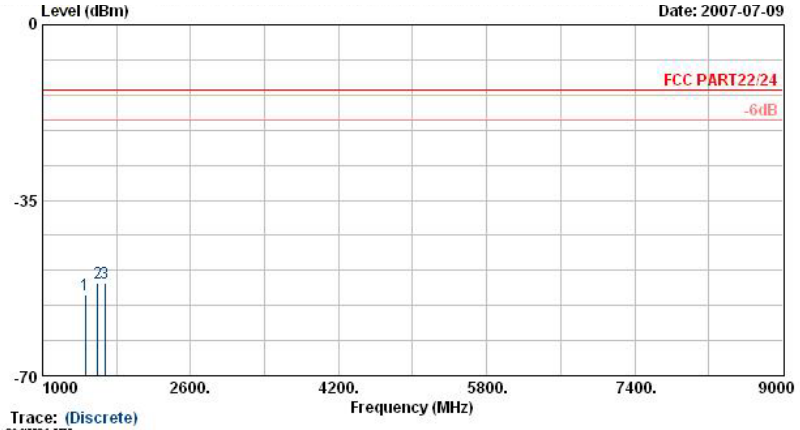

Trace: (Discrete)

| | |
|---|---|
| Site | : 03CH06-HY |
| Condition | : LF-SPURIOUS HORIZONTAL |
| EUT | : Mobile Phone |
| Power | : 120Vac/60Hz |
| Model | : FG 762206 |
| Memo | : EDGE(GSM850) Link Mode,Ch189+Earphone |
| | : +Adaptor |
| Plane | : E2 |

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 31.1 | -60.01 | -47.01 | -13.00 | -59.76 | -0.25 | Peak | HORIZONTAL |
| 2 | 76.4 | -67.49 | -54.49 | -13.00 | -55.16 | -12.33 | Peak | HORIZONTAL |
| 3 | 265.4 | -62.58 | -49.58 | -13.00 | -51.47 | -11.12 | Peak | HORIZONTAL |
| 4 | 448.4 | -63.97 | -50.97 | -13.00 | -58.14 | -5.83 | Peak | HORIZONTAL |
| 5 @ | 836.9 | -38.41 | | | -37.08 | -1.33 | Peak | HORIZONTAL |
| 6 | 880.3 | -45.22 | | | -44.31 | -0.91 | Peak | HORIZONTAL |

Remark:

1. #5: MS Signal
2. #6: BS Signal

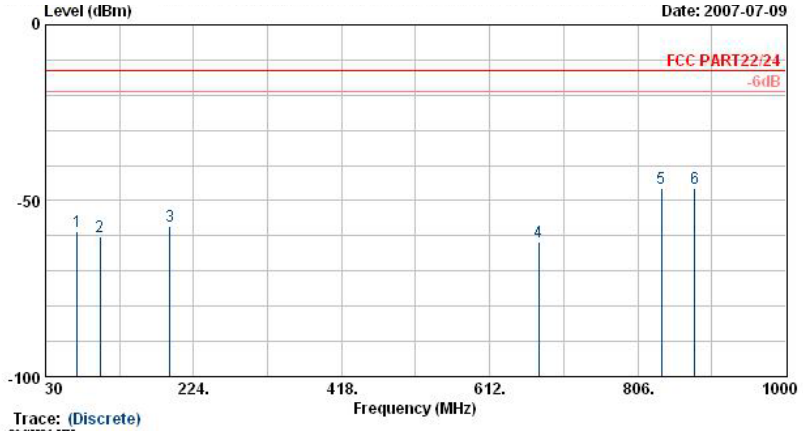



Trace: (Discrete)

| | |
|---|---|
| Site | : 03CH06-HY |
| Condition | : HF-SPURIOUS HORIZONTAL |
| EUT | : Mobile Phone |
| Power | : 120Vac/60Hz |
| Model | : FG 762206 |
| Memo | : EDGE(GSM850) Link Mode,Ch189+Earphone |
| | : +Adaptor |
| Plane | : E2 |

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 1464.0 | -53.84 | -40.84 | -13.00 | -54.37 | 0.53 | Peak | HORIZONTAL |
| 2 | 1598.0 | -51.51 | -38.51 | -13.00 | -51.89 | 0.37 | Peak | HORIZONTAL |
| 3 | 1674.0 | -51.53 | -38.53 | -13.00 | -51.75 | 0.22 | Peak | HORIZONTAL |

Vertical Polarization



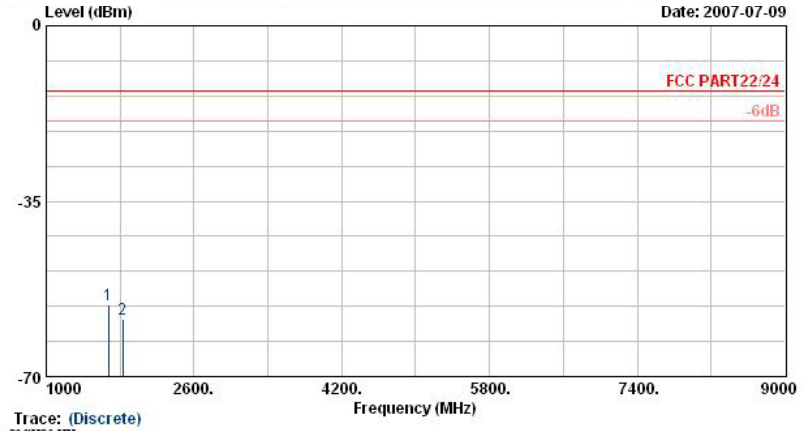

Trace: (Discrete)

Site : 03CH06-HY
Condition : LF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : EDGE(GSM850) Link Mode,Ch189+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 71.6 | -58.61 | -45.61 | -13.00 | -46.86 | -11.74 | Peak | VERTICAL |
| 2 | 101.3 | -60.05 | -47.05 | -13.00 | -52.35 | -7.70 | Peak | VERTICAL |
| 3 | 192.5 | -57.43 | -44.43 | -13.00 | -48.90 | -8.53 | Peak | VERTICAL |
| 4 | 675.9 | -61.81 | -48.81 | -13.00 | -61.02 | -0.79 | Peak | VERTICAL |
| 5 | 836.9 | -46.38 | | | -47.74 | 1.36 | Peak | VERTICAL |
| 6 | 880.3 | -46.48 | | | -48.19 | 1.71 | Peak | VERTICAL |

Remark:

1. #5: MS Signal
2. #6: BS Signal

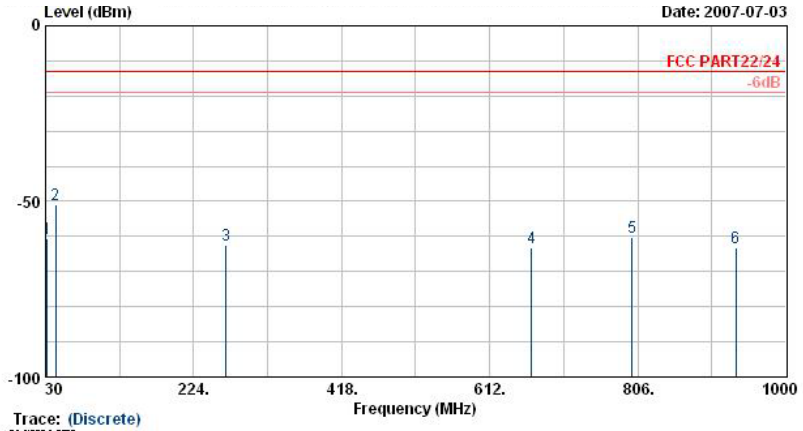



Trace: (Discrete)

Site : 03CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : EDGE(GSM850) Link Mode,Ch189+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 1674.0 | -55.59 | -42.59 | -13.00 | -55.11 | -0.48 | Peak | VERTICAL |
| 2 | 1828.0 | -58.53 | -45.53 | -13.00 | -58.22 | -0.31 | Peak | VERTICAL |

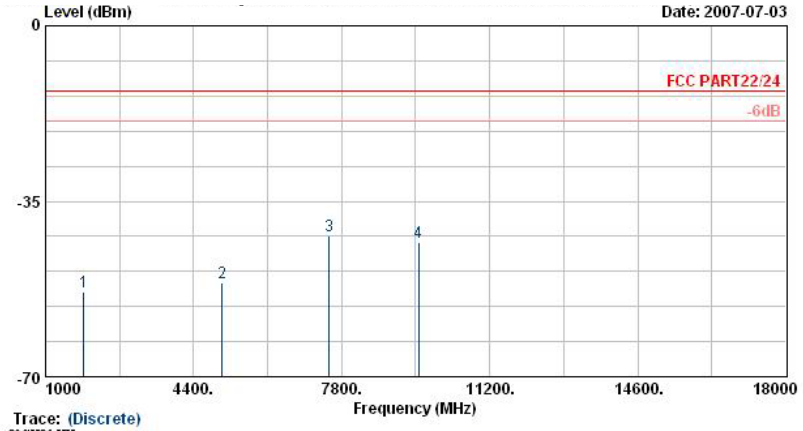
4.6.5.3 Mode 3
Horizontal Polarization




Trace: (Discrete)

Site : 03CH06-HY
Condition : LF-SPURIOUS HORIZONTAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : PCS 1900 Link Mode,Ch661+Earphone
Plane : +Adaptor
: E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 31.9 | -60.50 | -47.50 | -13.00 | -59.65 | -0.86 | Peak | HORIZONTAL |
| 2 | 43.2 | -50.99 | -37.99 | -13.00 | -42.83 | -8.17 | Peak | HORIZONTAL |
| 3 | 266.8 | -62.41 | -49.41 | -13.00 | -51.32 | -11.08 | Peak | HORIZONTAL |
| 4 | 666.8 | -63.18 | -50.18 | -13.00 | -60.12 | -3.06 | Peak | HORIZONTAL |
| 5 | 798.4 | -60.20 | -47.20 | -13.00 | -58.49 | -1.71 | Peak | HORIZONTAL |
| 6 | 934.9 | -63.32 | -50.32 | -13.00 | -62.94 | -0.39 | Peak | HORIZONTAL |




Trace: (Discrete)

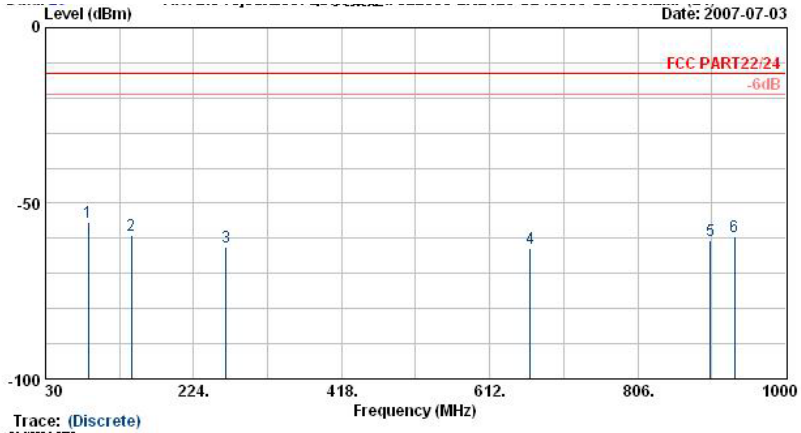
Site : 03CH06-HY
Condition : HF-SPURIOUS HORIZONTAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : PCS 1900 Link Mode,Ch661+Earphone
Plane : +Adaptor
: E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 1878.0 | -53.12 | | | -52.61 | -0.51 | Peak | HORIZONTAL |
| 2 | 5048.0 | -51.35 | -38.35 | -13.00 | -61.53 | 10.18 | Peak | HORIZONTAL |
| 3 | 7518.0 | -41.96 | -28.96 | -13.00 | -57.77 | 15.80 | Peak | HORIZONTAL |
| 4 | 9564.0 | -43.31 | -30.31 | -13.00 | -61.60 | 18.28 | Peak | HORIZONTAL |

Remark:

1. #1: MS Signal

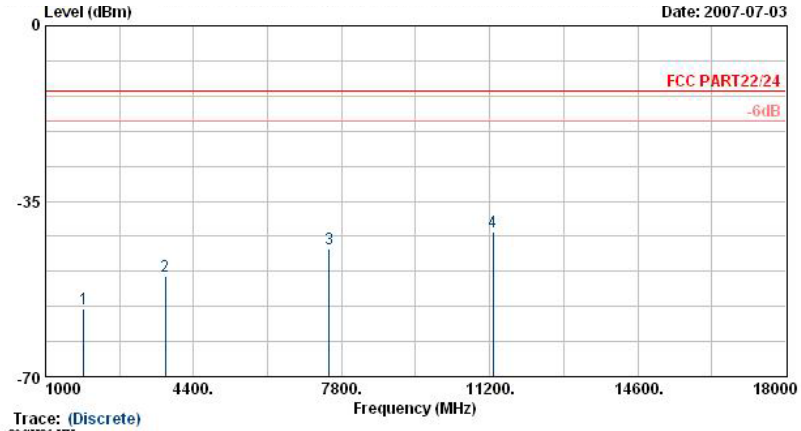
Vertical Polarization




Trace: (Discrete)

Site : 03CH06-HY
Condition : LF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : PCS 1900 Link Mode,Ch661+Earphone
Plane : +Adaptor
: E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 85.9 | -55.57 | -42.57 | -13.00 | -45.93 | -9.65 | Peak | VERTICAL |
| 2 | 142.6 | -59.29 | -46.29 | -13.00 | -51.21 | -8.07 | Peak | VERTICAL |
| 3 | 266.8 | -62.52 | -49.52 | -13.00 | -55.36 | -7.16 | Peak | VERTICAL |
| 4 | 665.4 | -62.70 | -49.70 | -13.00 | -61.75 | -0.95 | Peak | VERTICAL |
| 5 | 901.3 | -60.62 | -47.62 | -13.00 | -62.49 | 1.87 | Peak | VERTICAL |
| 6 | 932.8 | -59.59 | -46.59 | -13.00 | -61.72 | 2.13 | Peak | VERTICAL |




Trace: (Discrete)

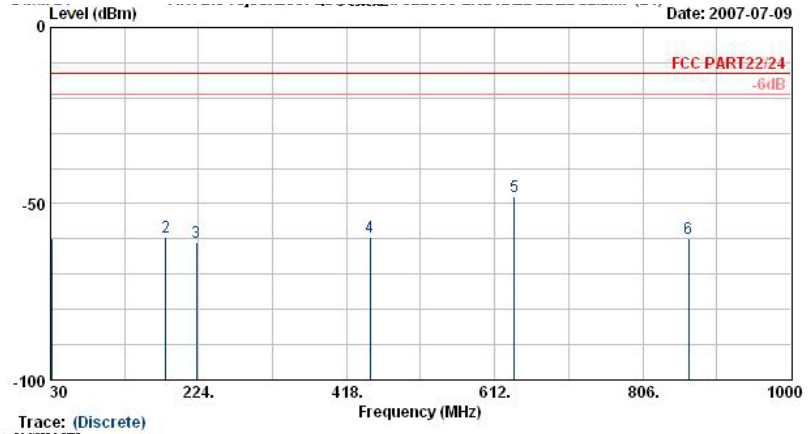
Site : 03CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : PCS 1900 Link Mode,Ch661+Earphone
Plane : +Adaptor
: E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 1878.0 | -56.50 | ----- | ----- | -56.10 | -0.40 | Peak | VERTICAL |
| 2 | 3758.0 | -49.96 | -36.96 | -13.00 | -56.60 | 6.64 | Peak | VERTICAL |
| 3 | 7518.0 | -44.55 | -31.55 | -13.00 | -57.91 | 13.37 | Peak | VERTICAL |
| 4 @ | 11278.0 | -41.22 | -28.22 | -13.00 | -60.10 | 18.87 | Peak | VERTICAL |

Remark:

1. #1: MS Signal

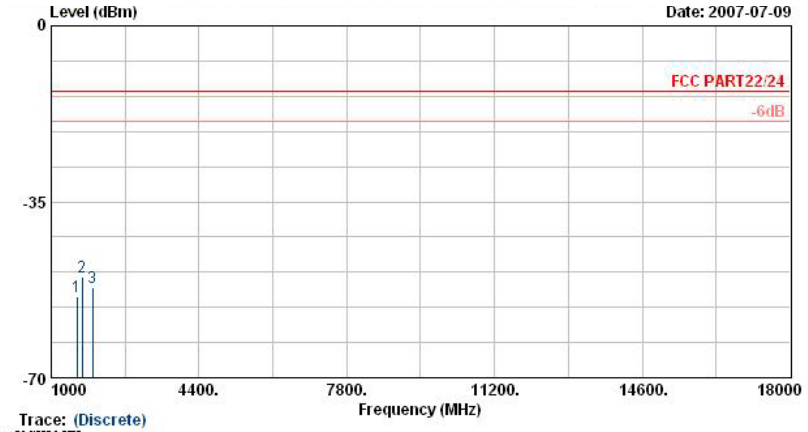
4.6.5.4 Mode 4
Horizontal Polarization




Trace: (Discrete)

Site : 03CH06-HY
Condition : LF-SPURIOUS HORIZONTAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : EDGE(PCS 1900) Link Mode,Ch661+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 31.1 | -59.93 | -46.93 | -13.00 | -59.68 | -0.25 | Peak | HORIZONTAL |
| 2 | 180.9 | -59.40 | -46.40 | -13.00 | -46.22 | -13.18 | Peak | HORIZONTAL |
| 3 | 220.9 | -61.06 | -48.06 | -13.00 | -48.41 | -12.65 | Peak | HORIZONTAL |
| 4 | 448.4 | -59.47 | -46.47 | -13.00 | -53.64 | -5.83 | Peak | HORIZONTAL |
| 5 @ | 637.4 | -48.03 | -35.03 | -13.00 | -44.67 | -3.36 | Peak | HORIZONTAL |
| 6 | 866.3 | -59.74 | -46.74 | -13.00 | -58.69 | -1.05 | Peak | HORIZONTAL |




Trace: (Discrete)

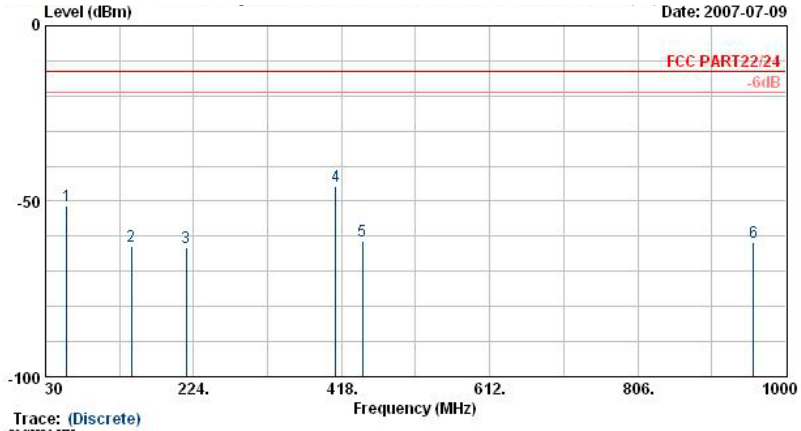
Site : 03CH06-HY
Condition : HF-SPURIOUS HORIZONTAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : EDGE(PCS 1900) Link Mode,Ch661+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 @ | 1598.0 | -53.93 | -40.93 | -13.00 | -54.30 | 0.37 | Peak | HORIZONTAL |
| 2 @ | 1718.0 | -49.87 | -36.87 | -13.00 | -49.94 | 0.08 | Peak | HORIZONTAL |
| 3 @ | 1958.0 | -52.10 | | | -50.99 | -1.11 | Peak | HORIZONTAL |

Remark:

1. #3: BS Signal

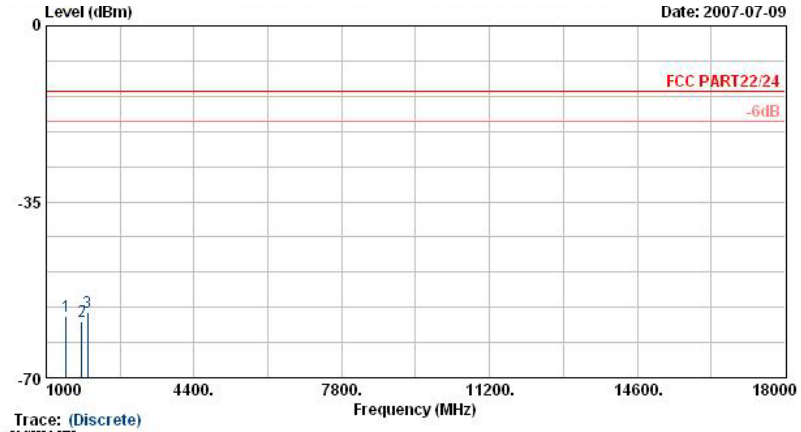
Vertical Polarization




Trace: (Discrete)

Site : 03CH06-HY
Condition : LF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : EDGE(PCS 1900) Link Mode,Ch661+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 @ | 58.1 | -51.21 | -38.21 | -13.00 | -37.51 | -13.70 | Peak | VERTICAL |
| 2 | 142.6 | -62.73 | -49.73 | -13.00 | -54.65 | -8.07 | Peak | VERTICAL |
| 3 | 214.7 | -63.08 | -50.08 | -13.00 | -54.80 | -8.28 | Peak | VERTICAL |
| 4 @ | 409.9 | -45.70 | -32.70 | -13.00 | -41.50 | -4.20 | Peak | VERTICAL |
| 5 | 444.9 | -61.29 | -48.29 | -13.00 | -57.50 | -3.79 | Peak | VERTICAL |
| 6 | 957.3 | -61.65 | -48.65 | -13.00 | -63.97 | 2.32 | Peak | VERTICAL |




Trace: (Discrete)

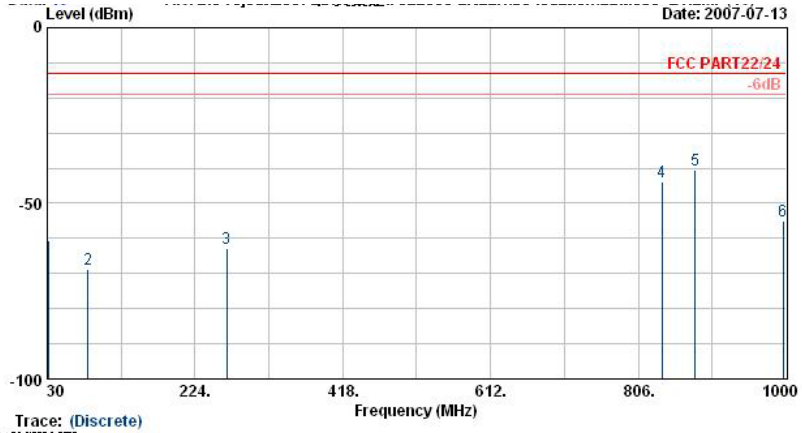
Site : 03CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : EDGE(PCS 1900) Link Mode,Ch661+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 1464.0 | -57.83 | -44.83 | -13.00 | -56.90 | -0.93 | Peak | VERTICAL |
| 2 | 1824.0 | -58.85 | -45.85 | -13.00 | -58.55 | -0.31 | Peak | VERTICAL |
| 3 @ | 1958.0 | -57.10 | | | -56.51 | -0.60 | Peak | VERTICAL |

Remark:

1. #3: BS Signal

4.6.5.5 Mode 5
Horizontal Polarization



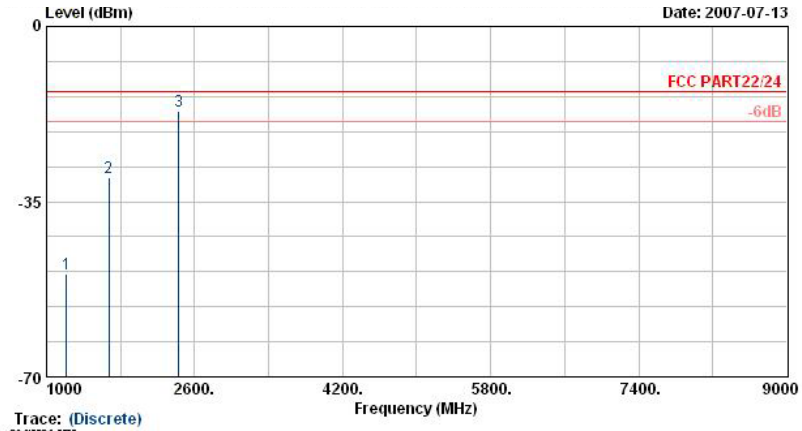

Trace: (Discrete)

Site : 03CH06-HY
Condition : LF-SPURIOUS HORIZONTAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : GSM 850 Link Mode,Ch189+BT Link+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 31.6 | -60.48 | -47.48 | -13.00 | -59.63 | -0.86 | Peak | HORIZONTAL |
| 2 | 83.2 | -68.75 | -55.75 | -13.00 | -56.45 | -12.30 | Peak | HORIZONTAL |
| 3 | 266.0 | -62.67 | -49.67 | -13.00 | -51.55 | -11.12 | Peak | HORIZONTAL |
| 4 | 836.9 | -43.84 | | | -42.51 | -1.33 | Peak | HORIZONTAL |
| 5 | 880.3 | -40.39 | | | -39.48 | -0.91 | Peak | HORIZONTAL |
| 6 | 995.8 | -54.95 | -41.95 | -13.00 | -55.15 | 0.20 | Peak | HORIZONTAL |

Remark:

1. #4: MS Signal
2. #5: BS Signal




Trace: (Discrete)

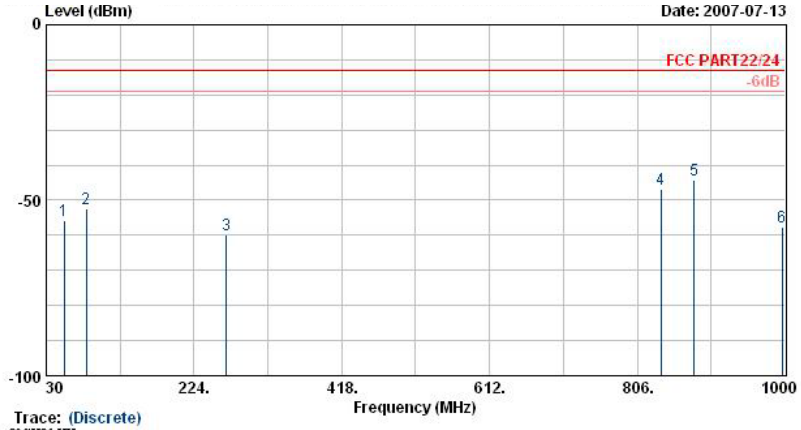
Site : 03CH06-HY
Condition : HF-SPURIOUS HORIZONTAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : GSM 850 Link Mode,Ch189+BT Link+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 1218.0 | -49.32 | -36.32 | -13.00 | -50.62 | 1.30 | Peak | HORIZONTAL |
| 2 | 1674.0 | -30.07 | -17.07 | -13.00 | -30.29 | 0.22 | Peak | HORIZONTAL |
| 3 ! | 2428.0 | -16.80 | | | -17.81 | 1.00 | Peak | HORIZONTAL |

Remark:

1. #3: BT Signal

Vertical Polarization



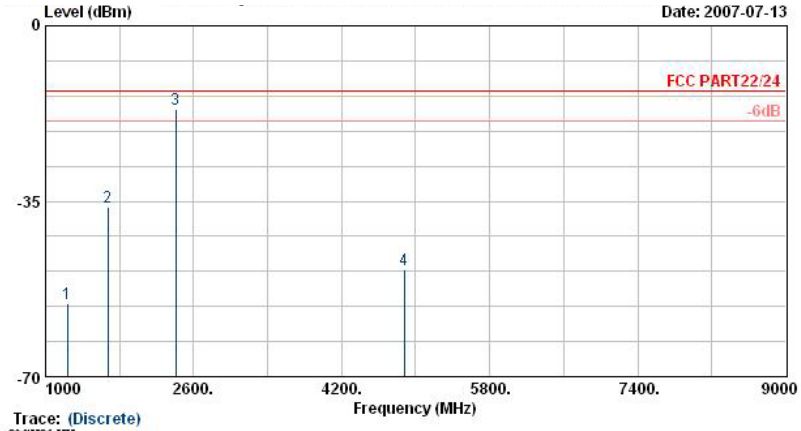

Trace: (Discrete)

Site : 03CH06-HY
Condition : LF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : GSM 850 Link Mode,Ch189+BT Link+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 53.5 | -55.89 | -42.89 | -13.00 | -41.49 | -14.40 | Peak | VERTICAL |
| 2 | 82.4 | -52.27 | -39.27 | -13.00 | -42.06 | -10.21 | Peak | VERTICAL |
| 3 | 266.8 | -59.98 | -46.98 | -13.00 | -52.82 | -7.16 | Peak | VERTICAL |
| 4 | 836.9 | -46.72 | | | -48.09 | 1.36 | Peak | VERTICAL |
| 5 | 880.3 | -44.22 | | | -45.94 | 1.71 | Peak | VERTICAL |
| 6 | 995.8 | -57.63 | -44.63 | -13.00 | -60.26 | 2.63 | Peak | VERTICAL |

Remark:

1. #4: MS Signal
2. #5: BS Signal




Trace: (Discrete)

Site : 03CH06-HY
Condition : HF-SPURIOUS VERTICAL
EUT : Mobile Phone
Power : 120Vac/60Hz
Model : FG 762206
Memo : GSM 850 Link Mode,Ch189+BT Link+Earphone
: +Adaptor
Plane : E2

| | Freq | Level | Over Limit | Limit Line | Read Level | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm | dB | dBm | dBm | dB | | |
| 1 | 1234.0 | -55.50 | -42.50 | -13.00 | -54.80 | -0.70 | Peak | VERTICAL |
| 2 | 1674.0 | -36.20 | -23.20 | -13.00 | -35.72 | -0.48 | Peak | VERTICAL |
| 3 @ | 2408.0 | -16.66 | | | -18.53 | 1.87 | Peak | VERTICAL |
| 4 | 4878.0 | -48.64 | -35.64 | -13.00 | -58.49 | 9.85 | Peak | VERTICAL |

Remark:

1. #3: BT Signal

## 4.7 Frequency Stability (Temperature Variation)

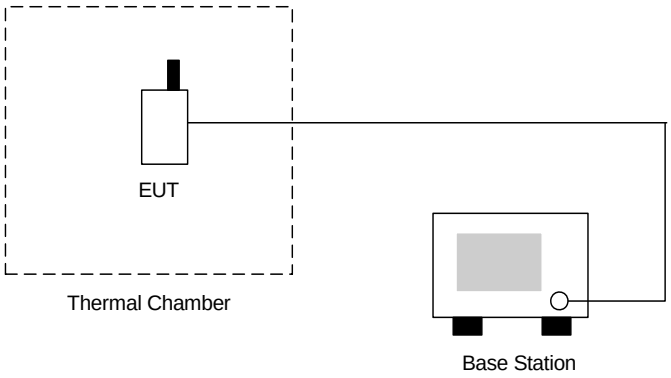
4.7.1 Measurement Instrument

As decribed in chapter 5 of this test report.

4.7.2 Test Procedure

1. The EUT and test equipment were set up as shown on the following section.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was note within one minute.
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change ws noted within one minute.
4. The temperature tests were performed for the worst case.
5. Test data was recorded.

4.7.3 Test Setup Layout



4.7.4 Test Result

- Test Mode : GSM850 (GSM) CH189

| Temperature(°C) | Change (Hz) | Change (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|
| -30 | -55 | -0.03 | 2.5 | Passed |
| -20 | 37 | 0.04 | | |
| -10 | 35 | 0.04 | | |
| 0 | -28 | -0.03 | | |
| 10 | -26 | -0.03 | | |
| 20 | -33 | -0.04 | | |
| 30 | -36 | -0.04 | | |
| 40 | 42 | 0.05 | | |
| 50 | -45 | -0.05 | | |

- Test Mode : GSM850 (EDGE) CH189

| Temperature(°C) | Change (Hz) | Change (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|
| -30 | -66 | -0.03 | 2.5 | Passed |
| -20 | -62 | -0.07 | | |
| -10 | 57 | 0.07 | | |
| 0 | -28 | -0.03 | | |
| 10 | 31 | 0.04 | | |
| 20 | 27 | 0.03 | | |
| 30 | -41 | -0.05 | | |
| 40 | 46 | 0.05 | | |
| 50 | 48 | 0.06 | | |

- Test Mode : PCS1900 (GSM) CH661

| Temperature(°C) | Change (Hz) | Change (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|
| -30 | 38 | 0.02 | 2.5 | Passed |
| -20 | -26 | -0.01 | | |
| -10 | 33 | 0.02 | | |
| 0 | -20 | -0.01 | | |
| 10 | -25 | -0.01 | | |
| 20 | 21 | 0.01 | | |
| 30 | 16 | 0.01 | | |
| 40 | -28 | -0.01 | | |
| 50 | -27 | -0.01 | | |

- Test Mode : PCS1900 (EDGE) CH661

| Temperature(°C) | Change (Hz) | Change (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|
| -30 | -33 | -0.02 | 2.5 | Passed |
| -20 | 28 | 0.01 | | |
| -10 | 24 | 0.01 | | |
| 0 | -22 | -0.01 | | |
| 10 | -25 | -0.01 | | |
| 20 | 31 | 0.02 | | |
| 30 | -33 | -0.02 | | |
| 40 | 35 | 0.02 | | |
| 50 | -42 | -0.02 | | |

## 4.8 Frequency Stability (Voltage Variation)

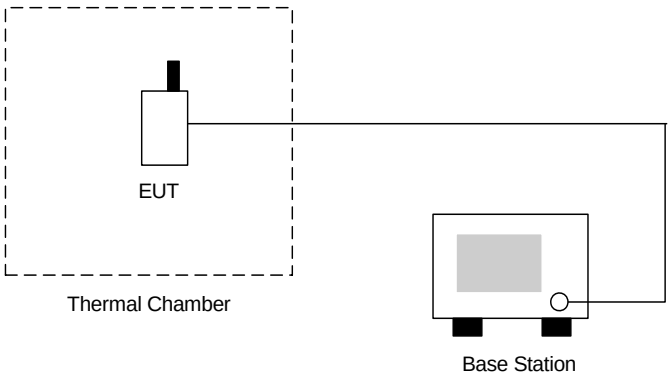
4.8.1 Measurement Instrument

As described in chapter 5 of this test report.

4.8.2 Test Procedure

1. The EUT was placed in a temperature chamber at 25±5 °C and connected as the following section.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

4.8.3 Test Setup Layout




4.8.4 Test Result

- Test Mode : GSM850 (GSM) CH189

| Voltage(Volt) | Change (Hz) | Change (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|
| 3.7 | 22.0 | 0.03 | 2.5 | Passed |
| BEP | 24.0 | 0.03 | | |
| 4.2 | 25.0 | 0.03 | | |

- Test Mode : GSM850 (EDGE) CH189

| Voltage(Volt) | Change (Hz) | Change (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|
| 3.7 | -15.0 | -0.02 | 2.5 | Passed |
| BEP | -18.0 | -0.02 | | |
| 4.2 | -27.0 | -0.03 | | |

- Test Mode : PCS1900 (GSM) CH661

| Voltage(Volt) | Change (Hz) | Change (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|
| 3.7 | 22.0 | 0.01 | 2.5 | Passed |
| BEP | 18.0 | 0.01 | | |
| 4.2 | -20.0 | -0.01 | | |

- Test Mode : PCS1900 (EDGE) CH661

| Voltage(Volt) | Change (Hz) | Change (ppm) | Limit (ppm) | Result |
|---|---|---|---|---|
| 3.7 | 21.0 | 0.01 | 2.5 | Passed |
| BEP | -25.0 | -0.01 | | |
| 4.2 | 16.0 | 0.01 | | |

Remark:

Normal Voltage=3.7V.
Battery End Point (BEP)= 3.4 V.

# 5 List of Measurement Equipments

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|
| Thermal Chamber | Ten Million | TTH-D35P | TBN-930701 | N/A | Jul. 24, 2006 | Jul. 23, 2007 | TH02-HY |
| Spectrum | R&S | FSP40 | 100055 | 9KHz~40GHz | Jun. 25, 2007 | Jun. 24, 2008 | TH02-HY |
| Bluetooth Test | ANRITSU | MT8852A | 6K00003939 | N/A | N/A | N/A | TH02-HY |
| POWER DIVIDER | ARRA | 5200-1 | 3871 | N/A | Oct. 07, 2006 | Oct. 06, 2007 | TH02-HY |
| DC POWER SUPPLY | TOPWARD | 3303D | 740889 | N/A | May 25, 2005 | May 24, 2009 | TH02-HY |
| Power Meter | Agilent | E4416A | GB41292344 | N/A | Feb. 08, 2007 | Feb. 07, 2008 | TH02-HY |
| Spectrum analyzer | Agilent | E4408B | MY44211030 | 9KHz-26.5GHz | Oct. 05, 2006 | Oct. 04, 2007 | Radiation (03CH06-HY) |
| EMI Test Receiver | R&S | ESCS30 | 100356 | 9KHz-2.75GHz | Jul. 13, 2007 | Jul. 12, 2008 | Radiation (03CH06-HY) |
| Bilog Antenna | SCHAFFNER | CBL6112B | 2885 | 30MHz -2GHz | Nov. 20, 2006 | Nov. 19, 2007 | Radiation (03CH06-HY) |
| Double Ridge Horn Antenna | Com-Power | AH118 | 071025 | 1G~18G | Jun. 04, 2007 | Jun. 03, 2008 | Radiation (03CH06-HY) |
| SHF-EHF Horn | SCHWARZBECK | BBHA 9170 | 9170-249 | 14G - 40G | Nov. 20, 2006 | Nov. 19, 2008 | Radiation (03CH06-HY) |
| Pre Amplifier | Agilent | 8449B | 3008A01917 | 1G - 26.5G | Nov. 15, 2006 | Nov. 14, 2007 | Radiation (03CH06-HY) |
| Pre Amplifier | Mini Circuits | ZKL-2 | D092004-1 | 10~2500MHz | Nov. 15, 2006 | Nov. 14, 2007 | Radiation (03CH06-HY) |
| Base Station Simulator | R & S | CMU200 | 106656 | WCDMA | Nov. 20, 2006 | Nov. 19, 2007 | Radiation (03CH06-HY) |

# 6 Uncertainty Evaluation

**Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)**

| Contribution | Uncertainty of $x_i$ | | $u(x_i)$ |
|---|---|---|---|
| | dB | Probability Distribution | |
| Receiver reading | 0.41 | Normal(k=2) | 0.21 |
| Antenna factor calibration | 0.83 | Normal(k=2) | 0.42 |
| Cable loss calibration | 0.25 | Normal(k=2) | 0.13 |
| Pre Amplifier Gain calibration | 0.27 | Normal(k=2) | 0.14 |
| RCV/SPA specification | 2.50 | Rectangular | 0.72 |
| Antenna Factor Interpolation for Frequency | 1.00 | Rectangular | 0.29 |
| Site imperfection | 1.43 | Rectangular | 0.83 |
| Mismatch | +0.39/-0.41 | U-shaped | 0.28 |
| **combined standard uncertainty Uc(y)** | **1.27** | | |
| **Measuring uncertainty for a level of confidence of 95% U=2Uc(y)** | **2.54** | | |

**Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)**

| Contribution | Uncertainty of $x_i$ | | $u(x_i)$ | $Ci$ | $Ci*u(x_i)$ |
|---|---|---|---|---|---|
| | dB | Probability Distribution | | | |
| Receiver reading | ±0.10 | Normal(k=1) | 0.10 | 1 | 0.10 |
| Antenna factor calibration | ±1.70 | Normal(k=2) | 0.85 | 1 | 0.85 |
| Cable loss calibration | ±0.50 | Normal(k=2) | 0.25 | 1 | 0.25 |
| Receiver Correction | ±2.00 | Rectangular | 1.15 | 1 | 1.15 |
| Antenna Factor Directional | ±1.50 | Rectangular | 0.87 | 1 | 0.87 |
| Site imperfection | ±2.80 | Triangular | 1.14 | 1 | 1.14 |
| Mismatch<br>Receiver VSWR Γ1= 0.197<br>Antenna VSWR Γ2= 0.194<br>Uncertainty=20log(1-Γ1*Γ2*Γ3) | +0.34/-0.35 | U-shaped | 0.244 | 1 | 0.244 |
| **Combined standard uncertainty Uc(y)** | **2.36** | | | | |
| **Measuring uncertainty for a level of confidence of 95% U=2Ue(y)** | **4.72** | | | | |

END OF TEST REPORT