

# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E

OF

**Product Name:** GSM 850/1900 Terminal Device  
**Brand Name:** Foxlink  
**Model Name:** QM03YB3  
**Model Difference:** N/A  
**FCC ID:** QVZ-QM03YB3  
**Report No.:** EH/2010/90002  
**Issue Date:** Sep. 23, 2010  
**FCC Rule Part:** 2, 22H, 24E  
**Prepared for:** CHENG UEI PRECISION INDUSTRY CO., LTD  
  
**Prepared by:** SGS Taiwan Ltd.  
Electronics & Communication Laboratory  
No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.



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## VERIFICATION OF COMPLIANCE

**Applicant:** CHENG UEI PRECISION INDUSTRY CO., LTD  
No.49,Sec.4,jhongyang Rd., Tucheng City,taipei County 23675,Taiwan

**Product Name:** GSM 850/1900 Terminal Device

**FCC ID:** QVZ-QM03YB3

**Brand Name:** Foxlink

**Model No.:** QM03YB3

**Model Difference:** N/A

**File Number:** EH/2010/90002

**Date of test:** Sep. 06, 2010~ Sep, 21, 2010

**Date of EUT Received:** Sep. 06, 2010

### We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule PART 22 subpart H, PART 24 subpart E.

The test results of this report relate only to the tested sample identified in this report.

Test By:



Date:

Sep. 23, 2010

*Bondi Liu / Engineer*

Prepared By:

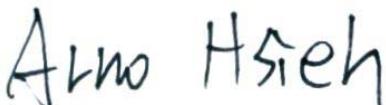


Date:

Sep. 23, 2010

*Gigi Yeh / Clerk*

Approved By:



Date:

Sep. 23, 2010

*Arno Hsieh / Asst. Supervisor*

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## Version

| Version No. | Date          | Description                  |
|-------------|---------------|------------------------------|
| 00          | Sep. 23, 2010 | Initial creation of document |
|             |               |                              |

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## Table of Contents

|  |           |
|--|-----------|
| <b>1 GENERAL INFORMATION .....</b>                       | <b>6</b>  |
| 1.1 Related Submittal(s) / Grant (s) .....               | 8         |
| 1.2 Test Methodology .....                               | 8         |
| 1.3 Test Facility.....                                   | 8         |
| 1.4 Special Accessories.....                             | 8         |
| 1.5 Equipment Modifications.....                         | 8         |
| <b>2 SYSTEM TEST CONFIGURATION.....</b>                  | <b>9</b>  |
| 2.1. EUT Configuration .....                             | 9         |
| 2.2. EUT Exercise .....                                  | 9         |
| 2.3. Test Procedure.....                                 | 9         |
| 2.4. Measurement Equipment Used:.....                    | 10        |
| 2.5. Configuration of Tested System.....                 | 12        |
| <b>3 SUMMARY OF TEST RESULTS .....</b>                   | <b>13</b> |
| <b>4 DESCRIPTION OF TEST MODES .....</b>                 | <b>14</b> |
| <b>5 RF POWER OUTPUT MEASUREMENT .....</b>               | <b>15</b> |
| 5.1 Standard Applicable .....                            | 15        |
| 5.2 Test Set-up: .....                                   | 15        |
| 5.3 Measurement Procedure.....                           | 15        |
| 5.4 Measurement Equipment Used: .....                    | 15        |
| 5.5 Measurement Result: .....                            | 16        |
| <b>6 ERP, EIRP MEASUREMENT .....</b>                     | <b>18</b> |
| 6.1 Standard Applicable .....                            | 18        |
| 6.2 Test SET-UP (Block Diagram of Configuration).....    | 18        |
| 6.3 Measurement Procedure.....                           | 20        |
| 6.4 Measurement Equipment Used: .....                    | 20        |
| 6.5 Measurement Result.....                              | 21        |
| <b>7 99% OCCUPIED BANDWIDTH MEASUREMENT.....</b>         | <b>23</b> |
| 7.1 Standard Applicable .....                            | 23        |
| 7.2 Test Set-up: .....                                   | 23        |
| 7.3 Measurement Procedure.....                           | 23        |
| 7.4 Measurement Equipment Used: .....                    | 23        |
| 7.5 Measurement Result: .....                            | 24        |
| <b>8 OUT OF BAND EMISSION AT ANTENNA TERMINALS .....</b> | <b>28</b> |
| 8.1 Standard Applicable .....                            | 28        |
| 8.2 Test SET-UP .....                                    | 28        |

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|           |   |           |
|-----------|---|-----------|
| 8.3       | Measurement Procedure.....                                    | 28        |
| 8.4       | Measurement Equipment Used: .....                             | 28        |
| 8.5       | Measurement Result.....                                       | 29        |
| <b>9</b>  | <b>FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT .....</b> | <b>37</b> |
| 9.1       | Standard Applicable .....                                     | 37        |
| 9.2       | EUT Setup (Block Diagram of Configuration).....               | 37        |
| 9.3       | Measurement Procedure.....                                    | 39        |
| 9.4       | Measurement Equipment Used: .....                             | 39        |
| 9.5       | Measurement Result.....                                       | 39        |
| <b>10</b> | <b>FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT .....</b> | <b>52</b> |
| 10.1      | Standard Applicable .....                                     | 52        |
| 10.2      | Test Set-up: .....  | 52        |
| 10.3      | Measurement Procedure.....                                    | 52        |
| 10.4      | Measurement Equipment Used: .....                             | 52        |
| 10.5      | Measurement Result : (GSM mode worst case).....               | 53        |
| <b>11</b> | <b>FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT .....</b>     | <b>54</b> |
| 11.1      | Standard Applicable .....                                     | 54        |
| 11.2      | Test Set-up: .....  | 54        |
| 11.3      | Measurement Procedure.....                                    | 54        |
| 11.4      | Measurement Equipment Used: .....                             | 54        |
| 11.5      | Measurement Result : (GSM mode worst case).....               | 55        |

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## 1 GENERAL INFORMATION

### General:

|                    |  |
|--------------------|--|
| Product Name:      | GSM 850/1900 Terminal Device             |
| Brand Name:        | Foxlink                                  |
| Model Name:        | QM03YB3                                  |
| Model difference:  | N/A                                      |
| Simple Hands-Free: | Model No.: MY-109#BM13, Supplier: Meeyon |
| LCM:               | Model No.: TM020GDZ32, Supplier: TIANMA  |

### GSM:

|   |  |  |        |
|---|--|--|--------|
| Cellular Phone Standards Frequency Range: | GSM / GPRS 850, Class 12                         | 824.2 MHz – 848.8 MHz  | 33 dBm |
|   | GSM / GPRS 1900, Class 12                        | 1850.2MHz – 1909.8MHz  | 30 dBm |
| IMEI                                      | 012512009999970                                  |  |        |
| Hardware Version                          | QM03S1-0B  |  |        |
| Software Version                          | QM03YB3.YB3.00.M01.01.01                         |  |        |
| Power Supply                              | 3.7Vdc Li-Ion battery or 5Vdc from AC/DC adapter |  |        |
|   | Battery:   | Model: BL-91, Supplier: B&K  |        |
|   | Adapter :  | 1. Model No.: IT-UL-D, Supplier: Power Solutions<br>2. Model: SPSH035429 DSC-3PFB-05 FUS<br>050070,Supplier: DVE |        |

### Bluetooth:

|                      |   |
|----------------------|---|
| Frequency Range:     | 2402 – 2480MHz                            |
| Bluetooth Version:   | V2.1 + EDR (GFSK + $\pi/4$ DQPSK + 8DPSK) |
| Channel number:      | 79 channels                               |
| Transmit Power:      | 6.91 dBm (Peak)                           |
| Modulation type:     | Frequency Hopping Spread Spectrum         |
| Antenna Designation: | Print Antenna / antenna gain: -2.17dBi    |

The EUT is compliance with Bluetooth 2.1 with EDR

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| Test mode | DC voltage (V) | DC current (mA) |
|-----------|----------------|-----------------|
| GSM 850   | 3.7Vdc         | 350             |
| DCS 1900  | 3.7Vdc         | 280             |

The product sold in U.S use the GSM 850: 824.2~848.8MHz and GSM1900: 1850.2~1909.8MHz.

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

This submittal(s) (test report) is intended for **FCC ID: QVZ-QM03YB3** filing to comply with Section Part 22 subpart H, Part 24 subpart E.

### 1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603C and FCC 47 CFR 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

### 1.3 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-4

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 & 10 meters) and FCC Registration Number: 94644.

### 1.4 Special Accessories

Not available for this EUT intended for grant.

### 1.5 Equipment Modifications

Not available for this EUT intended for grant.

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## 2 SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

### 2.3. Test Procedure

#### 2.3.1 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

#### 2.3.2 Radiated Emissions (ERP/EIRP):

According to measurement procured TIA/EIA 603C and TIA/EIA IS-98 for Mobile stations. The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements.

A standard antenna was used to replace the EUT and connect to the SG. Adjust the SG output level to reach the max emission level which were measured above.

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## 2.4. Measurement Equipment Used:

| Conducted Emission Test Site |               |                  |               |            |            |
|------------------------------|---------------|------------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR           | MODEL NUMBER     | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Spectrum Analyzer            | Agilent       | E4446A           | MY43360126    | 04/19/2010 | 04/18/2012 |
| Spectrum Analyzer            | Agilent       | E4440A           | US41160416    | 01/23/2010 | 01/22/2012 |
| Radio Communication Analyzer | R&S           | CMU200           | 102189        | 05/13/2010 | 05/13/2012 |
| 800 – 1000MHz Filter         | Micro-Tronics | BRM13462         | 001           | 01/04/2009 | 01/03/2011 |
| 1800 – 2000MHz Filter        | Micro-Tronics | BRM13463         | 001           | 01/04/2009 | 01/03/2011 |
| Temperature Chamber          | TERCHY        | MHG-120LF        | 911009        | 04/14/2010 | 04/13/2012 |
| Temperature Chamber          | GIANT FORCE   | GTH-150-40-CP-AR | MAA0512-018   | 02/05/2010 | 02/04/2012 |
| DC Block                     | Agilent       | BLK-18           | 155452        | 07/05/2010 | 07/04/2011 |
| Attenuator                   | Mini-Circuit  | BW-S20W5         | N/A           | 07/05/2010 | 07/04/2011 |
| Attenuator                   | Mini-Circuit  | BW-S10W5         | N/A           | 07/05/2010 | 07/04/2011 |
| Attenuator                   | Mini-Circuit  | BW-S6W5          | N/A           | 07/05/2010 | 07/04/2011 |
| Splitter                     | Agilent       | 11636B           | N/A           | 07/05/2010 | 07/04/2011 |
| DC Power Supply              | HP            | 6038A            | 2929A-07548   | 06/27/2009 | 06/26/2011 |
| DC Power Supply              | Topward       | 3303D            | 981327        | 10/26/2008 | 10/25/2010 |

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## ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber

| EQUIPMENT TYPE               | MFR          | MODEL NUMBER        | SERIAL NUMBER | LAST CAL   | CAL DUE.   |
|------------------------------|--------------|---------------------|---------------|------------|------------|
| Spectrum Analyzer            | R&S          | FSP 40              | 100034        | 02/12/2010 | 02/11/2011 |
| Bilog Antenna                | SCHWAZBECK   | VULB9160            | 9160-3136     | 11/19/2009 | 11/18/2010 |
| Dipole Antenna               | SCHWAZBECK   | VHAP                | 908/909       | 07/10/2010 | 07/09/2012 |
| Dipole Antenna               | SCHWAZBECK   | UHAP                | 891/892       | 07/10/2010 | 07/09/2012 |
| Hor.n antenna                | SCHWAZBECK   | BBHA 9120D          | 309           | 05/09/2010 | 05/10/2012 |
| Horn antenna                 | SCHWAZBECK   | BBHA 9120D          | 9120D-673     | 05/09/2010 | 05/08/2012 |
| Signal Generator             | R&S          | SMR40               | 100210        | 01/22/2010 | 01/21/2012 |
| Signal Generator             | Agilent      | E4438C              | MY45093613    | 05/22/2010 | 05/21/2011 |
| Pre-Amplifier                | Agilent      | 8447D               | 1937A02834    | 11/28/2009 | 11/27/2010 |
| Pre-Amplifier                | Agilent      | 8449B               | 3008A01973    | 01/04/2010 | 01/03/2011 |
| Attenuator                   | Mini-Circuit | BW-S20W5            | 001           | 07/05/2010 | 07/04/2011 |
| Attenuator                   | Mini-Circuit | BW-S10W5            | 001           | 07/05/2010 | 07/04/2011 |
| Attenuator                   | Mini-Circuit | BW-S6W5             | 001           | 07/05/2010 | 07/04/2011 |
| Radio Communication Analyzer | R&S          | CMU200              | 102189        | 05/13/2010 | 05/13/2012 |
| Turn Table                   | HD           | DT420               | N/A           | N.C.R      | N.C.R      |
| Antenna Tower                | HD           | MA240-N             | 240/657       | N.C.R      | N.C.R      |
| Controller                   | HD           | HD100               | N/A           | N.C.R      | N.C.R      |
| Low Loss Cable               | HUBER+SUHNER | SUCOFLEX 104PEA-10M | 10m           | 01/04/2010 | 01/03/2011 |
| Low Loss Cable               | HUBER+SUHNER | SUCOFLEX 104PEA-3M  | 3m            | 01/04/2010 | 01/03/2011 |
| 3m Site                      | SGS          | 966 chamber         | N/A           | 11/08/2009 | 11/07/2010 |

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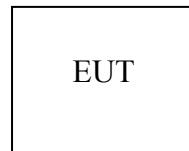
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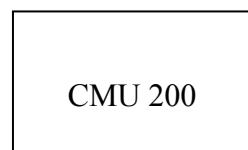
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## 2.5. Configuration of Tested System

**Fig. 2-1 Configuration of Tested System (Fixed Channel)**



**Fig. 2-2 Configuration of Tested System (Remote Side)**



**Table 2-1 Equipment Used in Tested System**

| Item | Equipment                    | Mfr/Brand | Model/Type No. | FCC ID | Series No. |
|------|------------------------------|-----------|----------------|--------|------------|
| 1.   | Radio Communication Analyzer | R&S       | CMU200         | N/A    | 102189     |

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### 3 SUMMARY OF TEST RESULTS

| FCC Rules                                 | Description Of Test                        | Result    |
|---|--|-----------|
| §2.1046(a)<br>§22.913(a)(2)<br>§24.232(c) | RF Conducted Power Output                  | Compliant |
| §2.1046(a)<br>§22.913(a)(2)<br>§24.232(c) | ERP/EIRP measurement                       | Compliant |
| §2.1049(h)                                | 99% Occupied Bandwidth                     | Compliant |
| §2.1051<br>§22.917(a)<br>§24.238(a)       | Out of Band Emissions at Antenna Terminals | Compliant |
| §2.1053<br>§22.917(a)<br>§24.238(a)       | Field Strength of Spurious Radiation (TX)  | Compliant |
| §2.1055(a)(1)<br>§22.355<br>§24.235       | Frequency Stability vs. Temperature        | Compliant |
| §2.1055(d)(2)<br>§22.355<br>§24.235-      | Frequency Stability vs. Voltage            | Compliant |

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## 4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (E1 mode) and lie down position (E1, E2 mode) for GSM/GPRS with power adaptors. The worst-case of H position for GSM 850 band, E2 position for GSM 1900 were reported.

All tests were carried out for worst adapter model name: IT-UL-D

Max ERP/EIRP measurement result:

|               | dBm   | dB   | W     |
|---------------|-------|------|-------|
| GSM 850 Band  | 30.97 | ERP  | 1.250 |
| GSM 1900 Band | 26.05 | EIRP | 0.403 |
|               |       |      |       |
|               |       |      |       |

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## 5 RF POWER OUTPUT MEASUREMENT

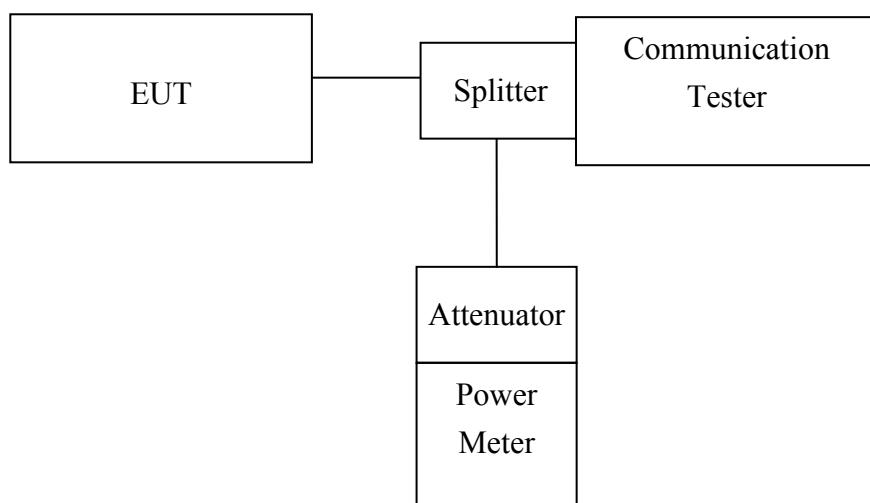
### 5.1 Standard Applicable

According to FCC §2.1046.

FCC 22.913(a) Mobile station are limited to 7W.

FCC 24.232(c) Peak Power Measurement.

### 5.2 Test Set-up:



*Note: Measurement setup for testing on Antenna connector*

### 5.3 Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading.

### 5.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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## 5.5 Measurement Result:

### 5.5.1 RF Conducted Output Power

#### 5.5.1.1.: GSM (GMSK)

##### Result:

| EUT Mode | Frequency (MHz) | CH  | Peak Power (dBm) | Avg. Power (dBm) |
|----------|-----------------|-----|------------------|------------------|
| GSM 850  | 824.2           | 128 | 32.70            | 32.50            |
|          | 836.6           | 190 | 32.60            | 32.50            |
|          | 848.8           | 251 | 32.80            | 32.60            |

| EUT Mode | Frequency (MHz) | CH  | Peak Power (dBm) | Avg. Power (dBm) |
|----------|-----------------|-----|------------------|------------------|
| GSM 1900 | 1850.2          | 512 | 29.40            | 29.30            |
|          | 1880.0          | 661 | 29.40            | 29.20            |
|          | 1909.8          | 810 | 29.30            | 29.20            |

| EUT Mode            | Frequency (MHz) | CH  | Peak Power (1DN 1UP) (dBm) | Avg. Power (1DN 1UP) (dBm) | Peak Power (1DN 2UP) (dBm) | Avg. Power (1DN 2UP) (dBm) | Peak Power (1DN 3UP) (dBm) | Avg. Power (1DN 3UP) (dBm) | Peak Power (1DN 4UP) (dBm) | Avg. Power (1DN 4UP) (dBm) |
|---------------------|-----------------|-----|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| GPRS 850 (Class 12) | 824.2           | 128 | 32.70                      | 32.50                      | 31.70                      | 31.60                      | 30.10                      | 30.00                      | 29.30                      | 29.10                      |
|                     | 836.6           | 190 | 32.60                      | 32.50                      | 31.70                      | 31.60                      | 30.10                      | 29.90                      | 29.30                      | 29.10                      |
|                     | 848.8           | 251 | 32.80                      | 32.60                      | 31.90                      | 31.80                      | 30.20                      | 30.10                      | 29.40                      | 29.30                      |

| EUT Mode             | Frequency (MHz) | CH  | Peak Power (1DN 1UP) (dBm) | Avg. Power (1DN 1UP) (dBm) | Peak Power (1DN 2UP) (dBm) | Avg. Power (1DN 2UP) (dBm) | Peak Power (1DN 3UP) (dBm) | Avg. Power (1DN 3UP) (dBm) | Peak Power (1DN 4UP) (dBm) | Avg. Power (1DN 4UP) (dBm) |
|----------------------|-----------------|-----|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| GPRS 1900 (Class 12) | 1850.2          | 512 | 29.50                      | 29.30                      | 28.60                      | 28.40                      | 27.00                      | 26.80                      | 26.00                      | 25.90                      |
|                      | 1880.0          | 661 | 29.40                      | 29.30                      | 28.50                      | 28.40                      | 26.90                      | 26.70                      | 26.00                      | 25.90                      |
|                      | 1909.8          | 810 | 29.40                      | 29.20                      | 28.50                      | 28.30                      | 26.80                      | 26.70                      | 26.00                      | 25.80                      |

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**Maximum Power Reduction: PCS1900 band**

| PCL                | 0    | 1    | 2   | 3    | 4    | 5    | 6    | 7    | 8    |
|--------------------|------|------|-----|------|------|------|------|------|------|
| Output power (dBm) | 29.4 | 27.7 | 26  | 24.1 | 22.1 | 20.1 | 18.2 | 16.2 | 14.2 |
| PCL                | 9    | 10   | 11  | 12   | 13   | 14   | 15   | 16   | 17   |
| Output power (dBm) | 12.3 | 10.3 | 8.6 | 6.5  | 4.7  | 2.7  | 0.7  |      |      |

Note: The EUT output power was controlled by simulator. Set Communication Tester CMU200 PCL as above, and get the mobile phone output power reading.

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## 6 ERP, EIRP MEASUREMENT

### 6.1 Standard Applicable

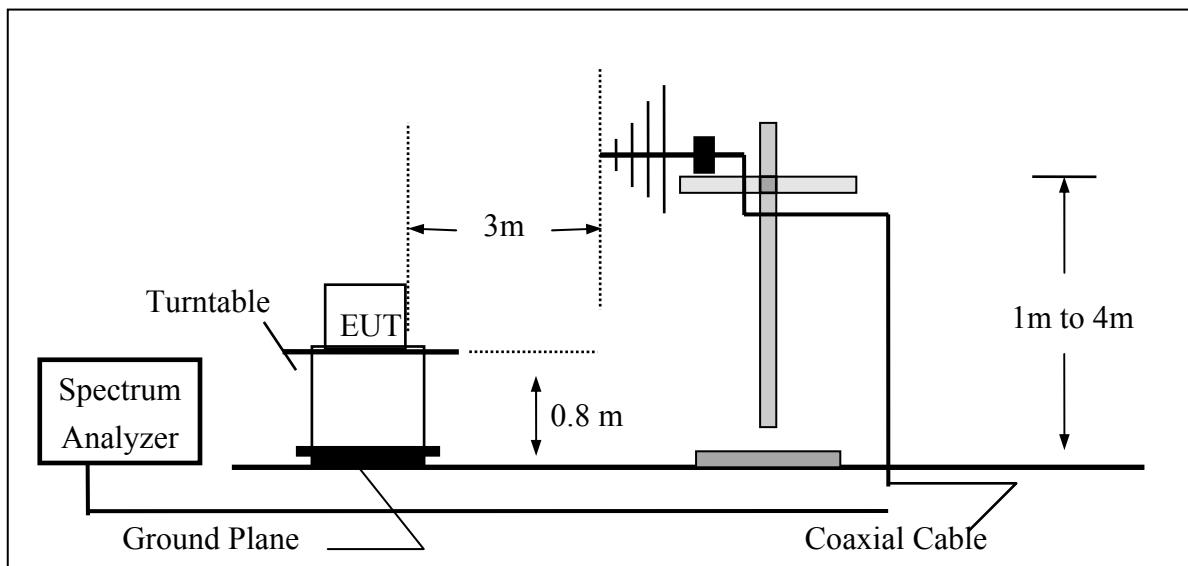
According to FCC §2.1046

FCC 22.913(a) Mobile station are limited to 7W ERP.

FCC 24.232(c) Mobile station are limited to 2W EIRP.

### 6.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz

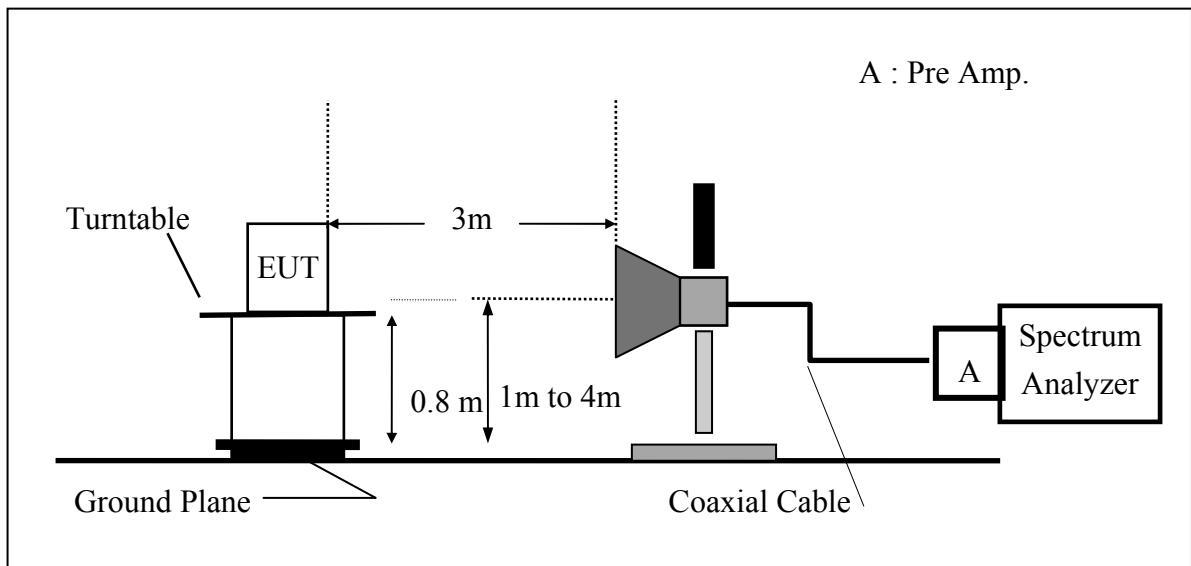


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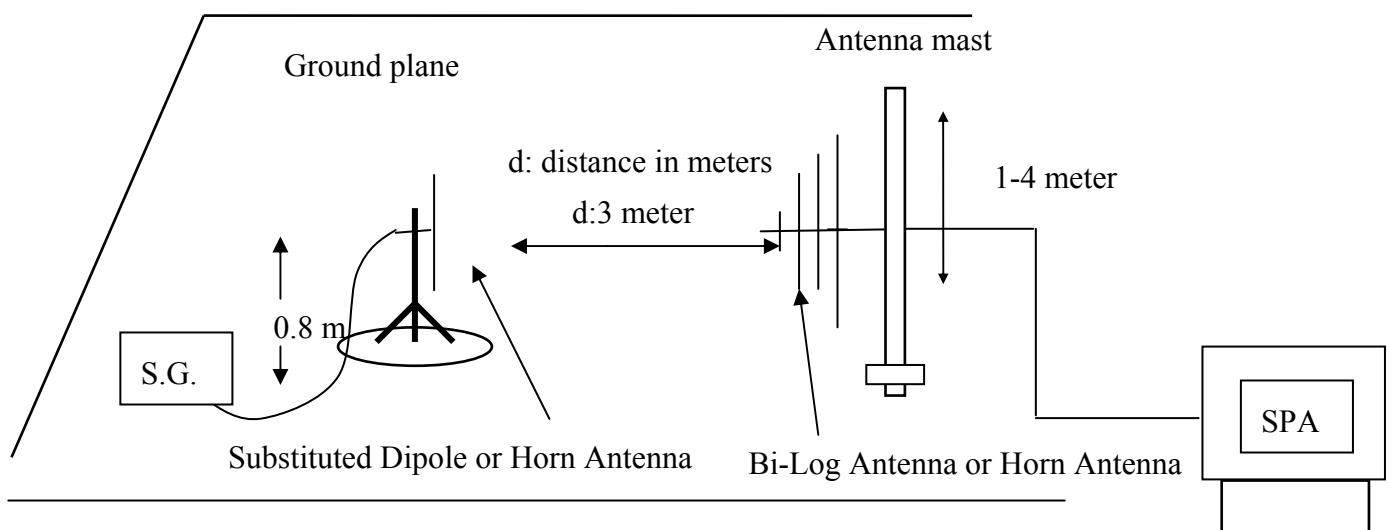
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## (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



## (C) Substituted Method Test Set-UP



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### 6.3 Measurement Procedure

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824 –850 MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1710-1755MHz and 1850 –1910MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

### 6.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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## 6.5 Measurement Result

| EUT Mode | Frequency (MHz) | CH  | EUT Pol. | Antenna Pol. | SPA Reading (dBuV) | S.G. Output (dBm) | Antenna Gain (dBi) | Cable Loss (dB) | ERP (dBm)    | Limit (dBm) |
|----------|-----------------|-----|----------|--------------|--------------------|-------------------|--------------------|-----------------|--------------|-------------|
| GSM 850  | 824.20          | 128 | H        | V            | 127.94             | 41.55             | -7.87              | 3.62            | 30.05        | 38.45       |
|          |                 |     |          | H            | 126.57             | 40.30             | -7.87              | 3.62            | 28.80        | 38.45       |
|          |                 |     | E1       | V            | 126.26             | 39.87             | -7.87              | 3.62            | 28.37        | 38.45       |
|          |                 |     |          | H            | 128.61             | 42.34             | -7.87              | 3.62            | 30.84        | 38.45       |
|          |                 |     | E2       | V            | 126.77             | 40.38             | -7.87              | 3.62            | 28.88        | 38.45       |
|          |                 |     |          | H            | 128.74             | 42.47             | -7.87              | 3.62            | <b>30.97</b> | 38.45       |
|          | 836.60          | 190 | H        | V            | 127.99             | 41.74             | -7.88              | 3.65            | 30.21        | 38.45       |
|          |                 |     |          | H            | 126.74             | 40.51             | -7.88              | 3.65            | 28.98        | 38.45       |
|          |                 |     | E1       | V            | 125.59             | 39.34             | -7.88              | 3.65            | 27.81        | 38.45       |
|          |                 |     |          | H            | 128.55             | 42.32             | -7.88              | 3.65            | 30.79        | 38.45       |
|          |                 |     | E2       | V            | 126.46             | 40.21             | -7.88              | 3.65            | 28.68        | 38.45       |
|          |                 |     |          | H            | 128.62             | 42.39             | -7.88              | 3.65            | 30.86        | 38.45       |
|          | 848.80          | 251 | H        | V            | 128.13             | 42.01             | -7.88              | 3.68            | 30.45        | 38.45       |
|          |                 |     |          | H            | 126.71             | 40.52             | -7.88              | 3.68            | 28.96        | 38.45       |
|          |                 |     | E1       | V            | 124.67             | 38.55             | -7.88              | 3.68            | 26.99        | 38.45       |
|          |                 |     |          | H            | 128.54             | 42.35             | -7.88              | 3.68            | 30.79        | 38.45       |
|          |                 |     | E2       | V            | 125.82             | 39.70             | -7.88              | 3.68            | 28.14        | 38.45       |
|          |                 |     |          | H            | 128.53             | 42.34             | -7.88              | 3.68            | 30.78        | 38.45       |

### Remark :

(1) The RBW,VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz,

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| <b>EUT Mode</b>  | <b>Frequency (MHz)</b> | <b>CH</b> | <b>EUT Pol.</b> | <b>Antenna Pol.</b> | <b>SPA Reading (dBuV)</b> | <b>S.G. Output (dBm)</b> | <b>Antenna Gain (dBi)</b> | <b>Cable Loss (dB)</b> | <b>EIRP (dBm)</b> | <b>Limit (dBm)</b> |
|--|------------------------|-----------|-----------------|---------------------|---------------------------|--------------------------|---------------------------|------------------------|-------------------|--------------------|
| PCS 1900   | 1850.20                | 512       | H               | V                   | 125.02                    | 20.63                    | 9.90                      | 5.56                   | 24.97             | 33.00              |
|  |                        |           |                 | H                   | 124.33                    | 20.15                    | 9.90                      | 5.56                   | 24.49             | 33.00              |
|  |                        |           | E1              | V                   | 124.98                    | 20.59                    | 9.90                      | 5.56                   | 24.93             | 33.00              |
|  |                        |           |                 | H                   | 125.20                    | 21.02                    | 9.90                      | 5.56                   | 25.36             | 33.00              |
|  |                        |           | E2              | V                   | 124.91                    | 20.52                    | 9.90                      | 5.56                   | 24.86             | 33.00              |
|  |                        |           |                 | H                   | 125.93                    | 21.75                    | 9.90                      | 5.84                   | 25.81             | 33.00              |
|  | 1880.00                | 661       | H               | V                   | 124.52                    | 20.16                    | 9.99                      | 5.61                   | 24.54             | 33.00              |
|  |                        |           |                 | H                   | 124.17                    | 20.03                    | 9.99                      | 5.61                   | 24.40             | 33.00              |
|  |                        |           | E1              | V                   | 124.91                    | 20.55                    | 9.99                      | 5.61                   | 24.93             | 33.00              |
|  |                        |           |                 | H                   | 125.48                    | 21.34                    | 9.99                      | 5.61                   | 25.71             | 33.00              |
|  |                        |           | E2              | V                   | 124.82                    | 20.46                    | 9.99                      | 5.61                   | 24.84             | 33.00              |
|  |                        |           |                 | H                   | 125.82                    | 21.68                    | 9.99                      | 5.61                   | <b>26.05</b>      | 33.00              |
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|  |                        |           |                 | H                   | 123.51                    | 19.40                    | 10.08                     | 5.66                   | 23.82             | 33.00              |
|  |                        |           | E1              | V                   | 124.35                    | 20.02                    | 10.08                     | 5.66                   | 24.44             | 33.00              |
|  |                        |           |                 | H                   | 125.30                    | 21.19                    | 10.08                     | 5.66                   | 25.61             | 33.00              |
|  |                        |           | E2              | V                   | 124.34                    | 20.01                    | 10.08                     | 5.66                   | 24.43             | 33.00              |
|  |                        |           |                 | H                   | 124.81                    | 20.70                    | 10.08                     | 5.66                   | 25.12             | 33.00              |

**Remark :**

(1) The RBW,VBW of SPA for frequency

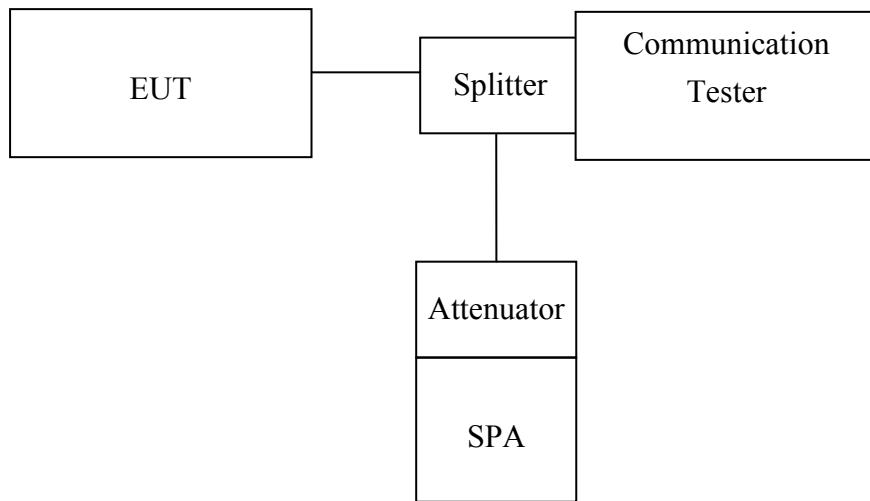
RBW=300 KHz, VBW=1MHz,

## 7 99% OCCUPIED BANDWIDTH MEASUREMENT

### 7.1 Standard Applicable

According to FCC§2.1049(h).

### 7.2 Test Set-up:



*Note: Measurement setup for testing on Antenna connector*

### 7.3 Measurement Procedure

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10/30KHz) was set to about 1% of emission BW, VBW= 3 times RBW(30/100KHz), -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

### 7.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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## 7.5 Measurement Result:

| EUT Mode | Frequency (MHz) | CH  | 99% Bandwidth (MHz) |
|----------|-----------------|-----|---------------------|
| GSM 850  | 824.20          | 128 | 0.2474              |
|          | 836.60          | 190 | 0.2474              |
|          | 848.80          | 251 | 0.2478              |

| EUT Mode | Frequency (MHz) | CH  | 99% Bandwidth (MHz) |
|----------|-----------------|-----|---------------------|
| PCS 1900 | 1850.20         | 512 | 0.2463              |
|          | 1880.00         | 661 | 0.2466              |
|          | 1909.80         | 810 | 0.2468              |

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Figure 7-1: GSM Channel Low

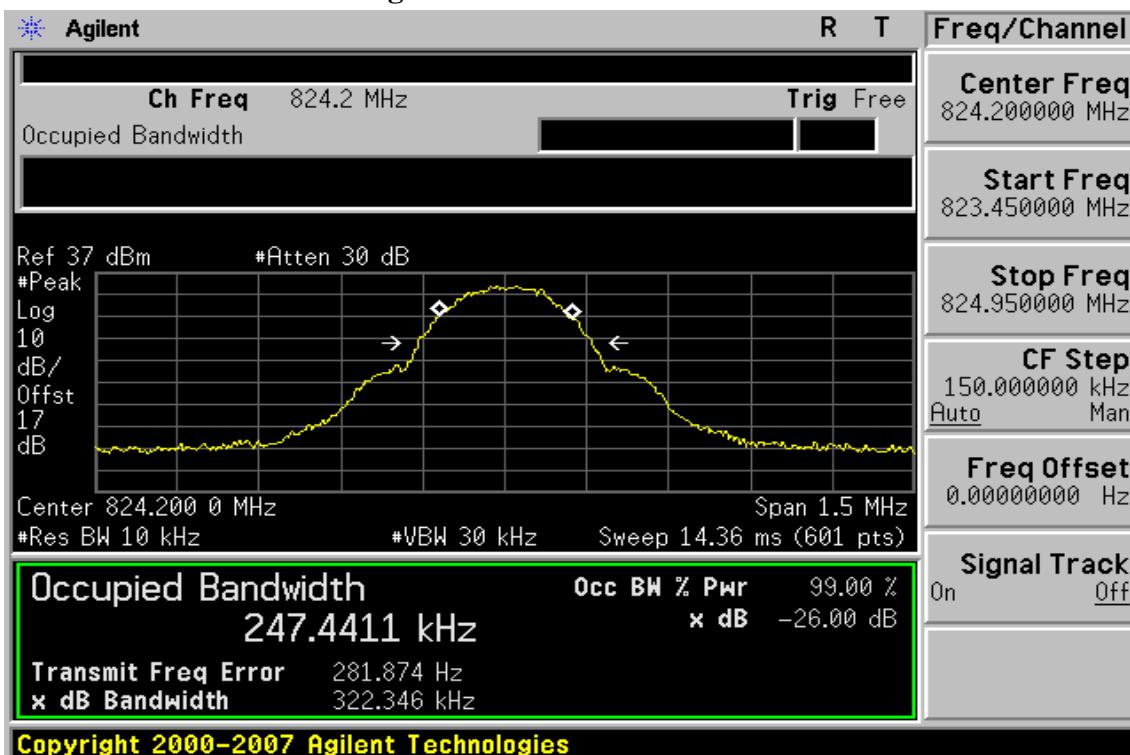
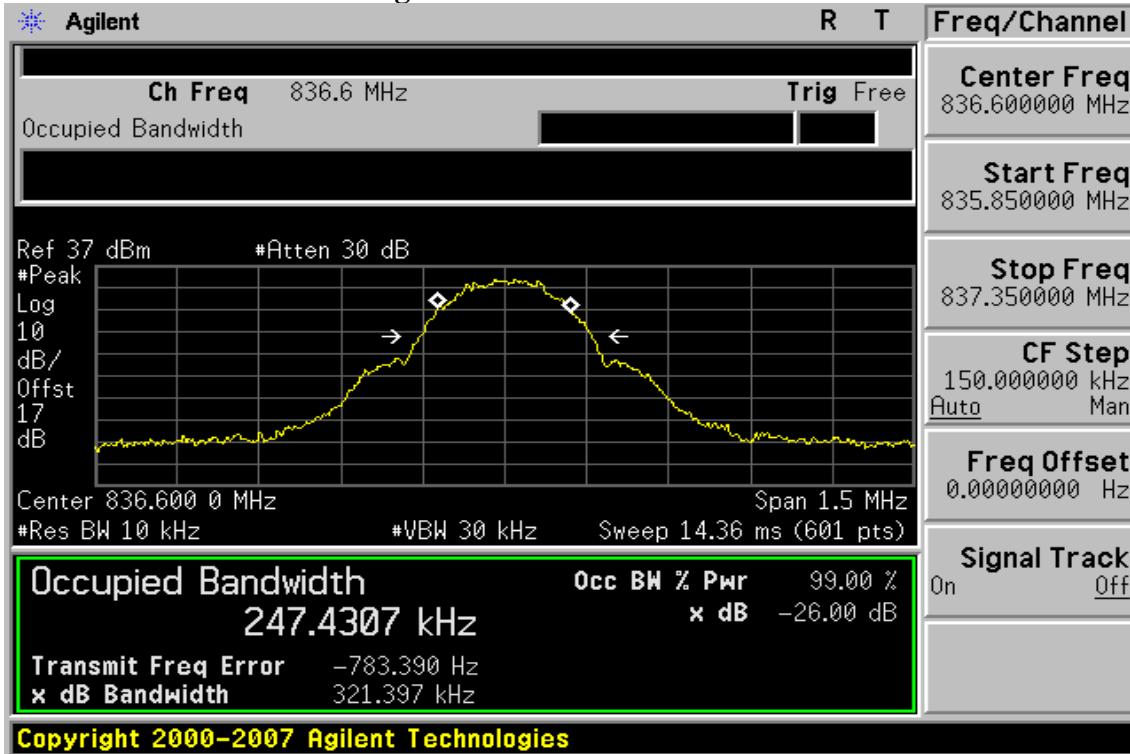


Figure 7-2 GSM Channel Mid



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Figure 7-3: GSM Channel High

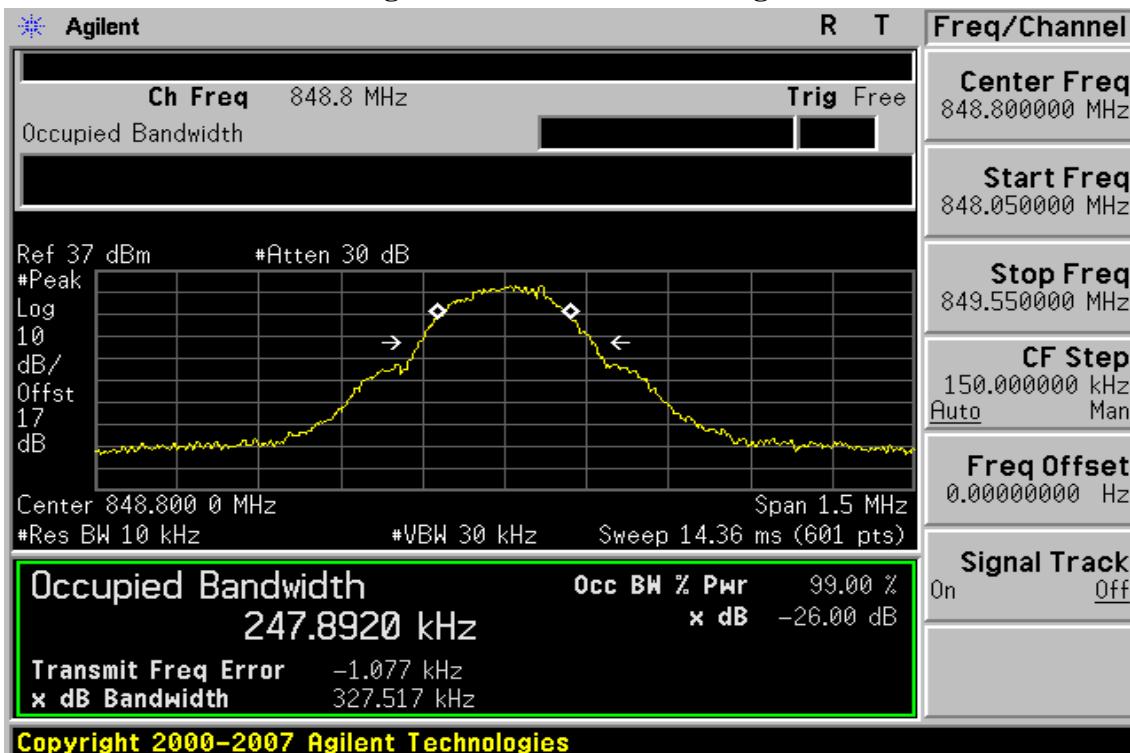
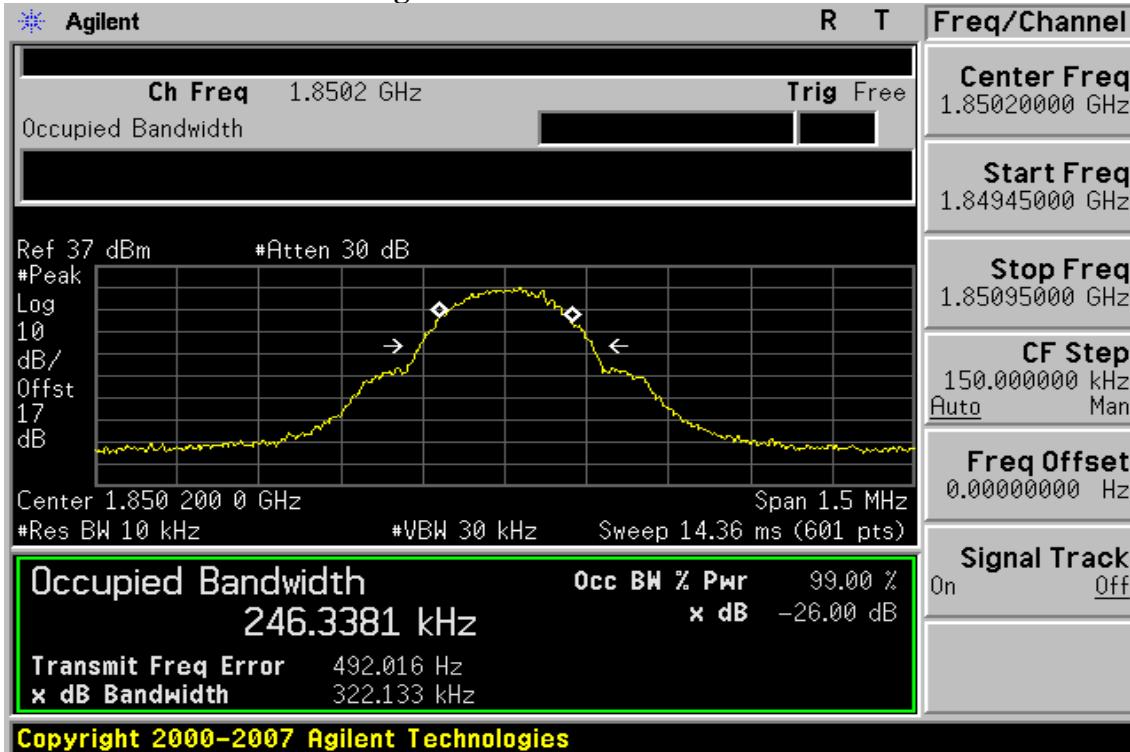


Figure 7-4: PCS Channel Low



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Figure 7-5 PCS Channel Mid

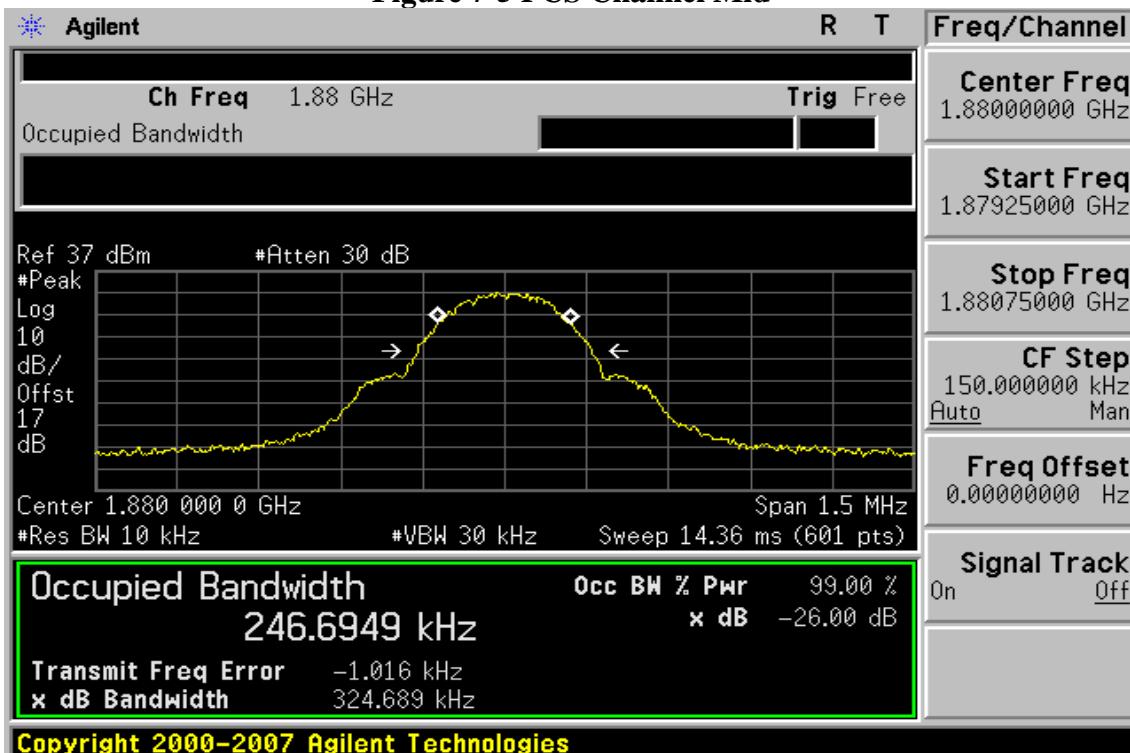
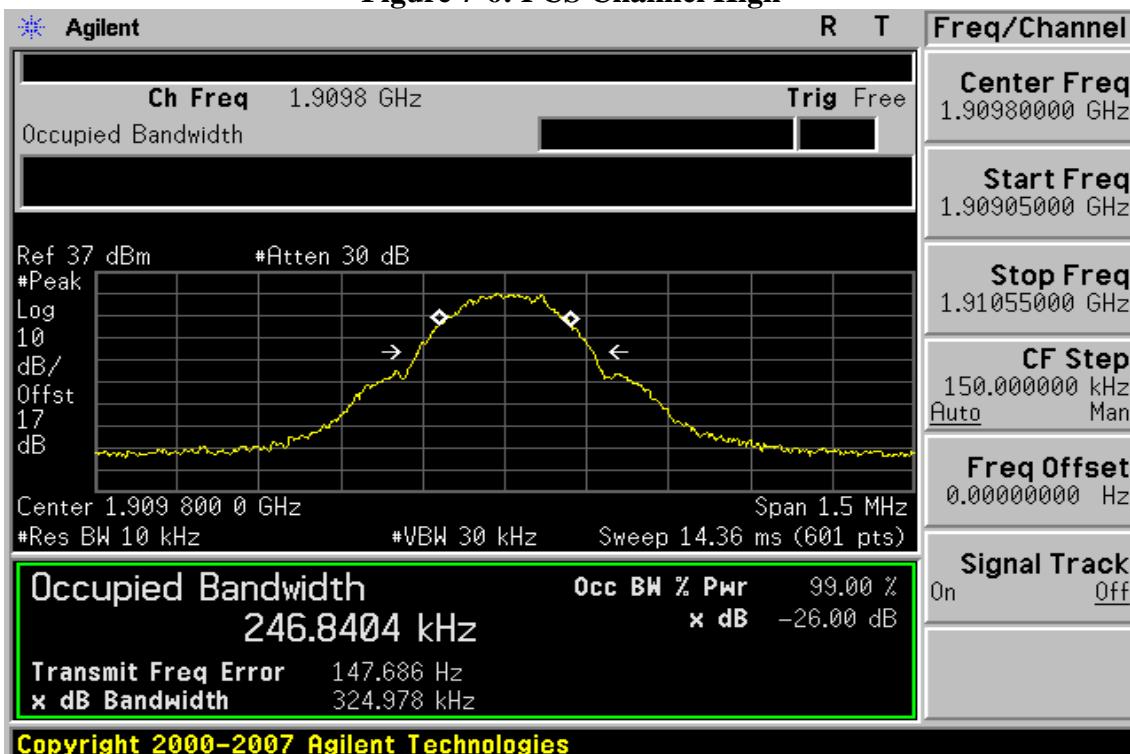


Figure 7-6: PCS Channel High



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## 8 OUT OF BAND EMISSION AT ANTENNA TERMINALS

### 8.1 Standard Applicable

According to FCC §2.1051.

FCC §22.917(a), §24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

### 8.2 Test SET-UP

Refer to section 7.2 in this report

### 8.3 Measurement Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm

Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

### 8.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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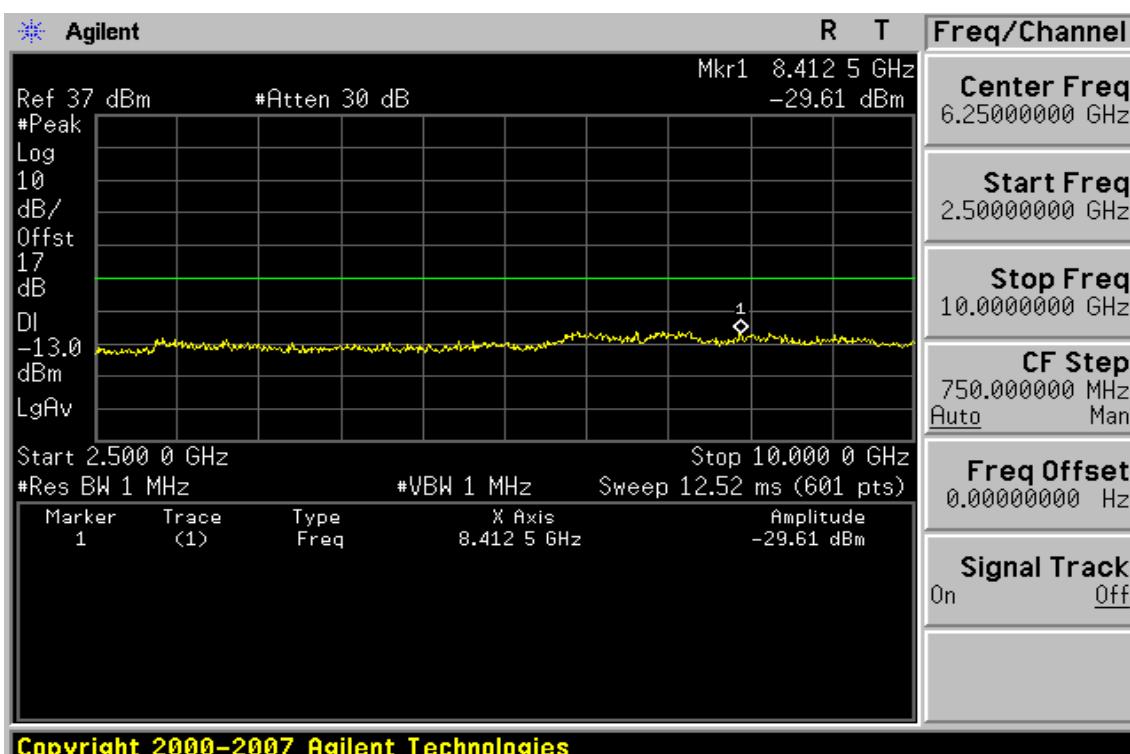
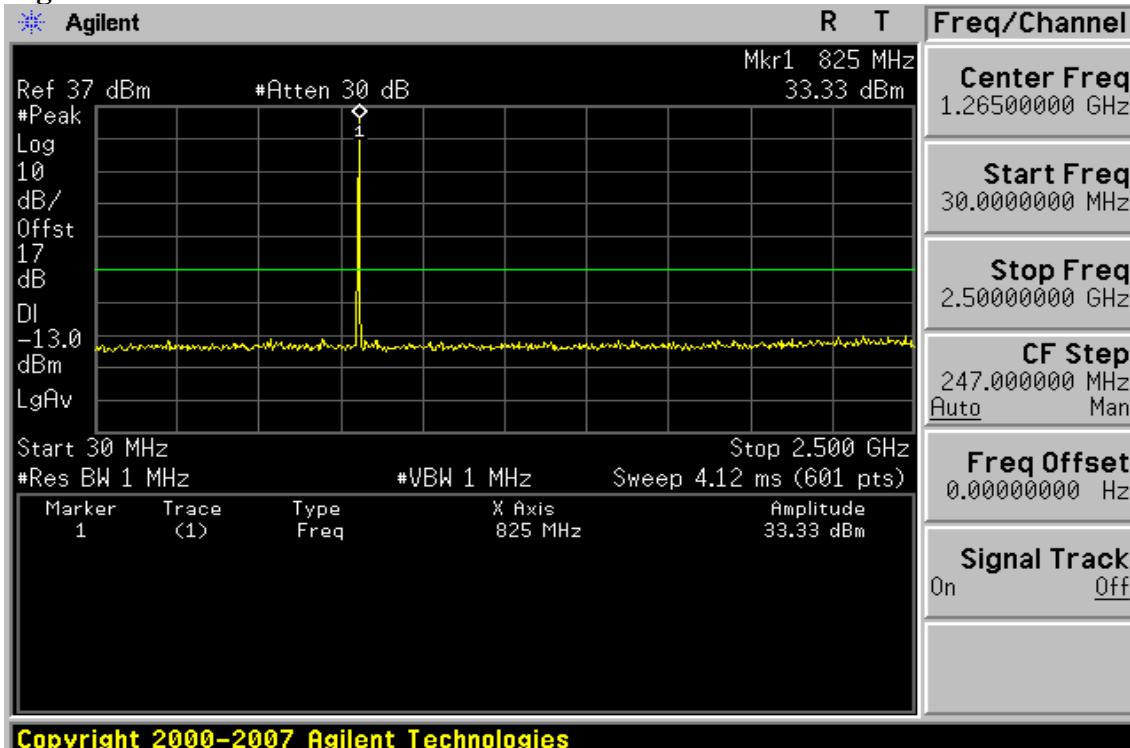
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## 8.5 Measurement Result

Figure 8-1: Out of Band emission at antenna terminals—GSM 850 Channel Lowest



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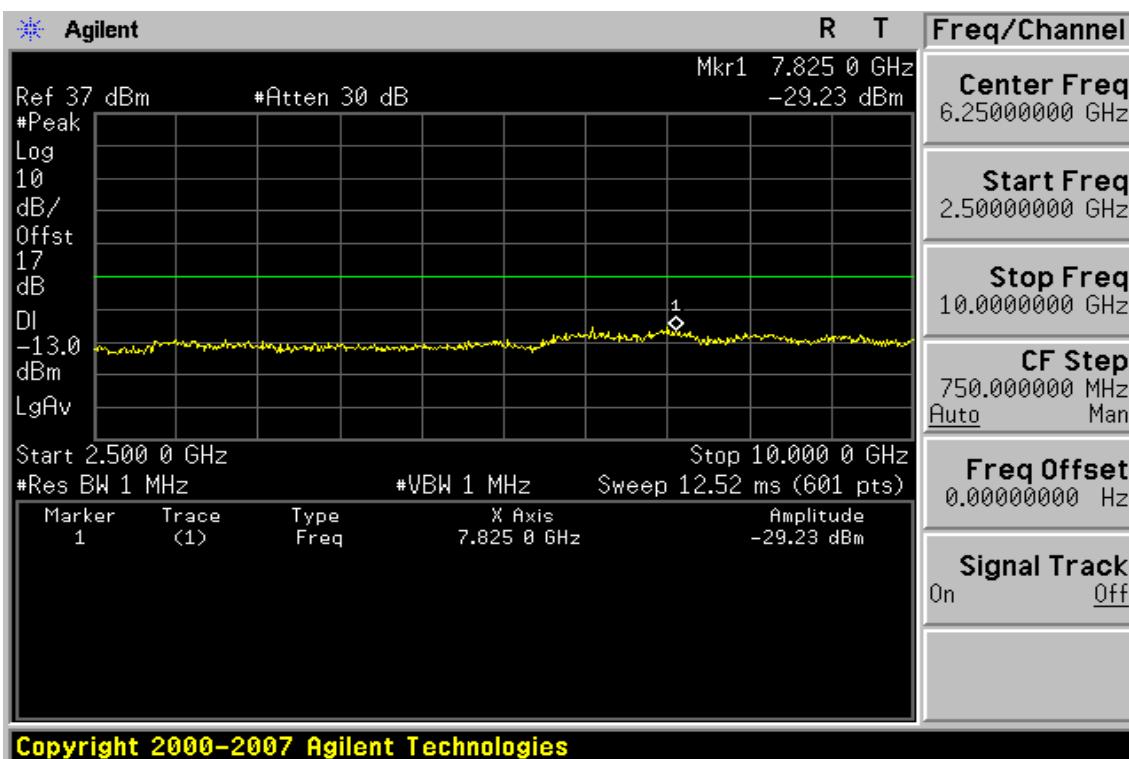
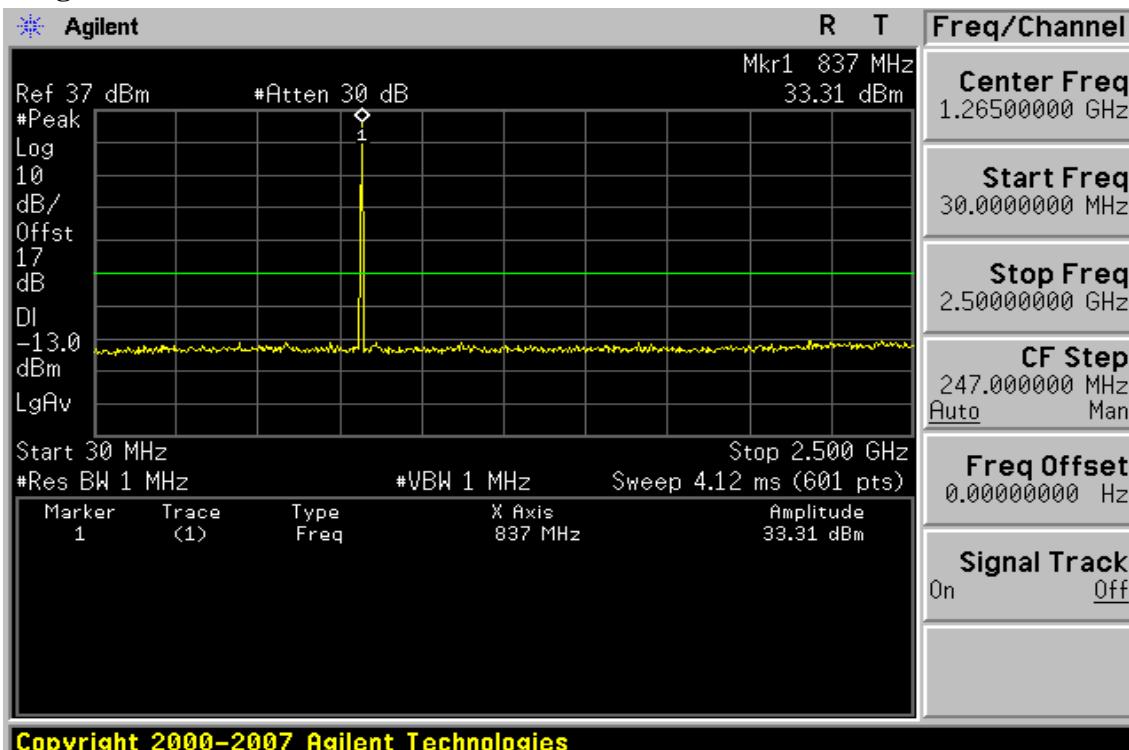
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**Figure 8-2: Out of Band emission at antenna terminals –GSM 850 Channel Mid**


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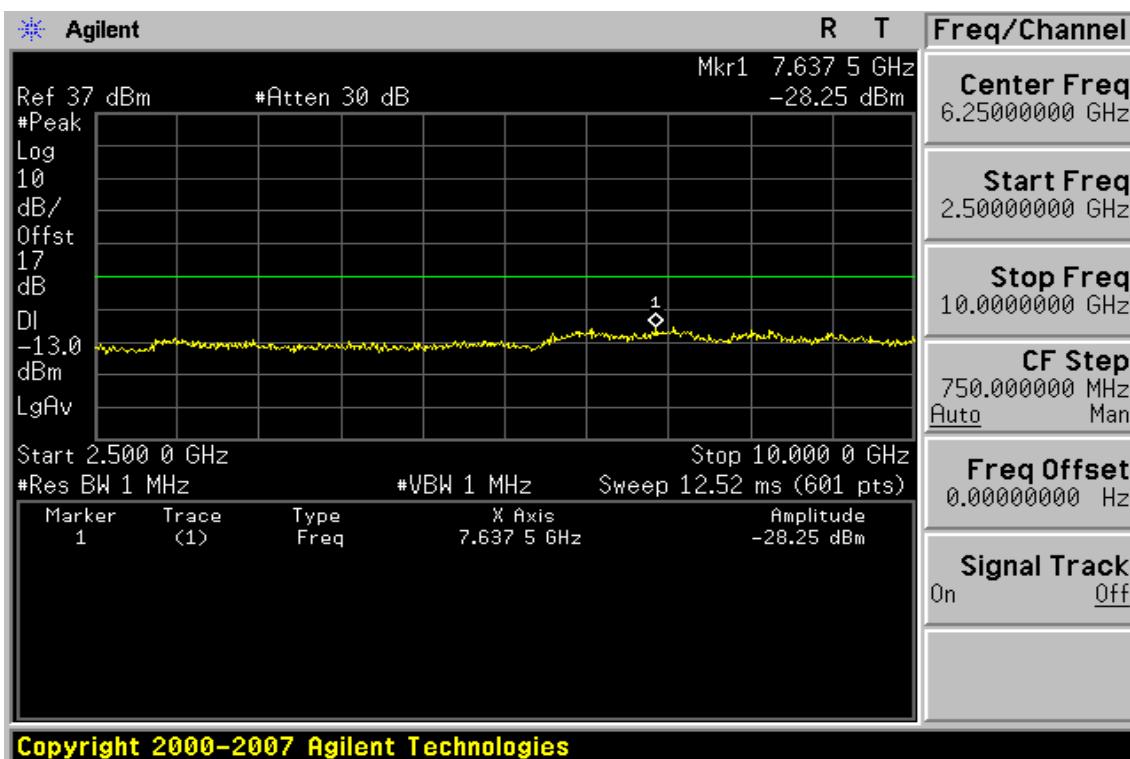
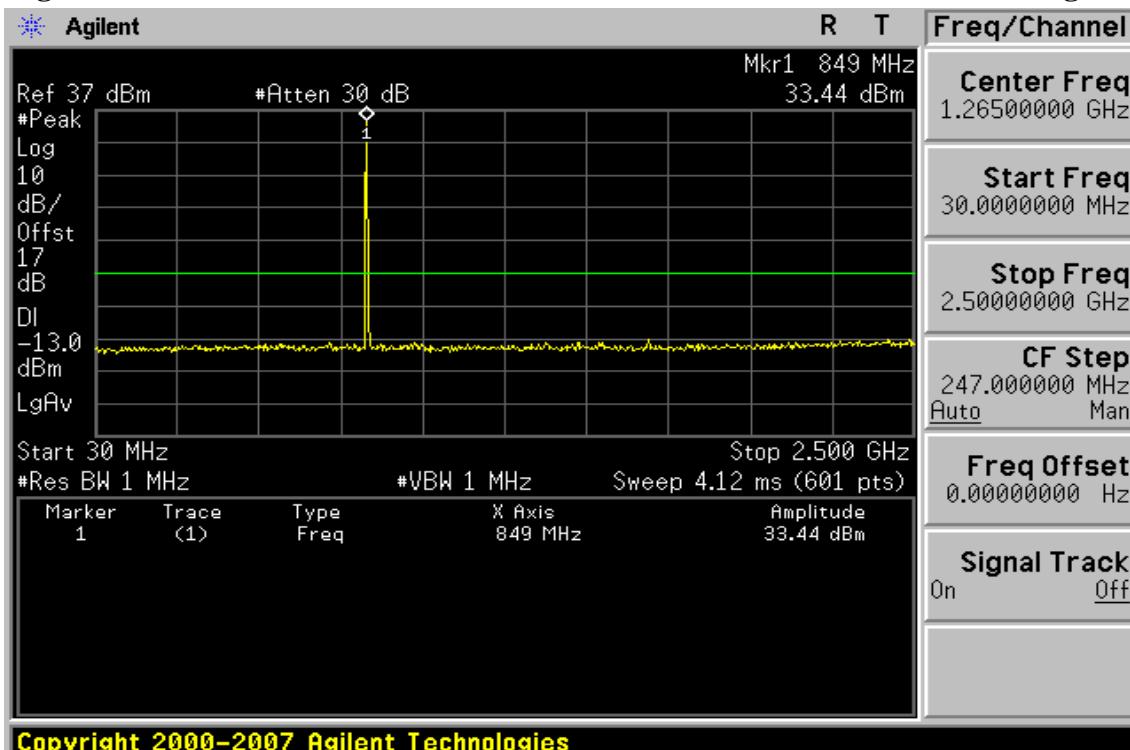
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Figure 8-3: Out of Band emission at antenna terminals—GSM 850 Channel Highest



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Figure 8-4: Band edge emission at antenna terminals – GSM 850 Channel Lowest

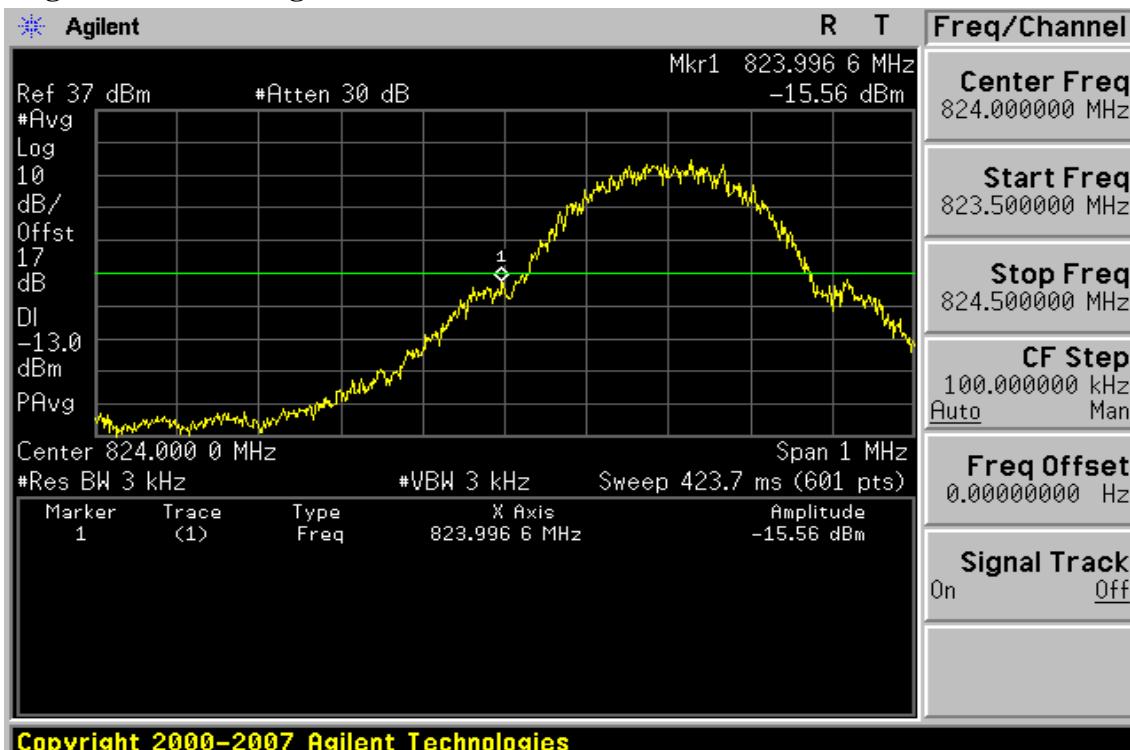
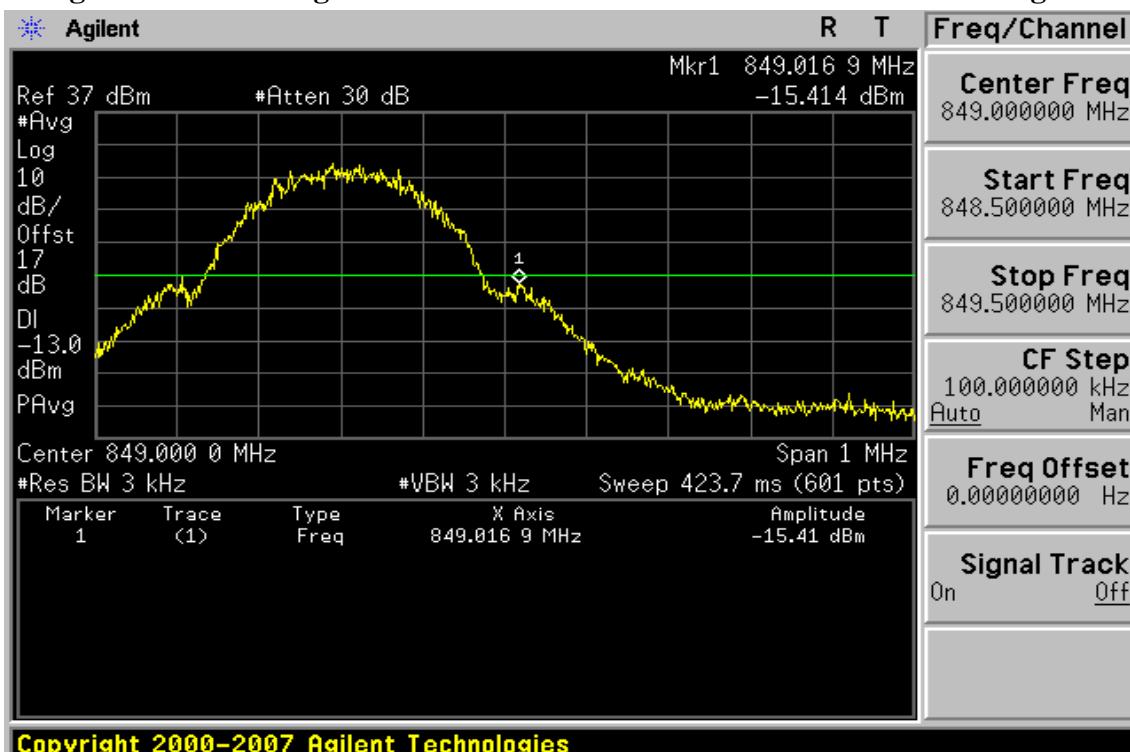


Figure 8-5: Band edge emission at antenna terminals – GSM Channel Highest



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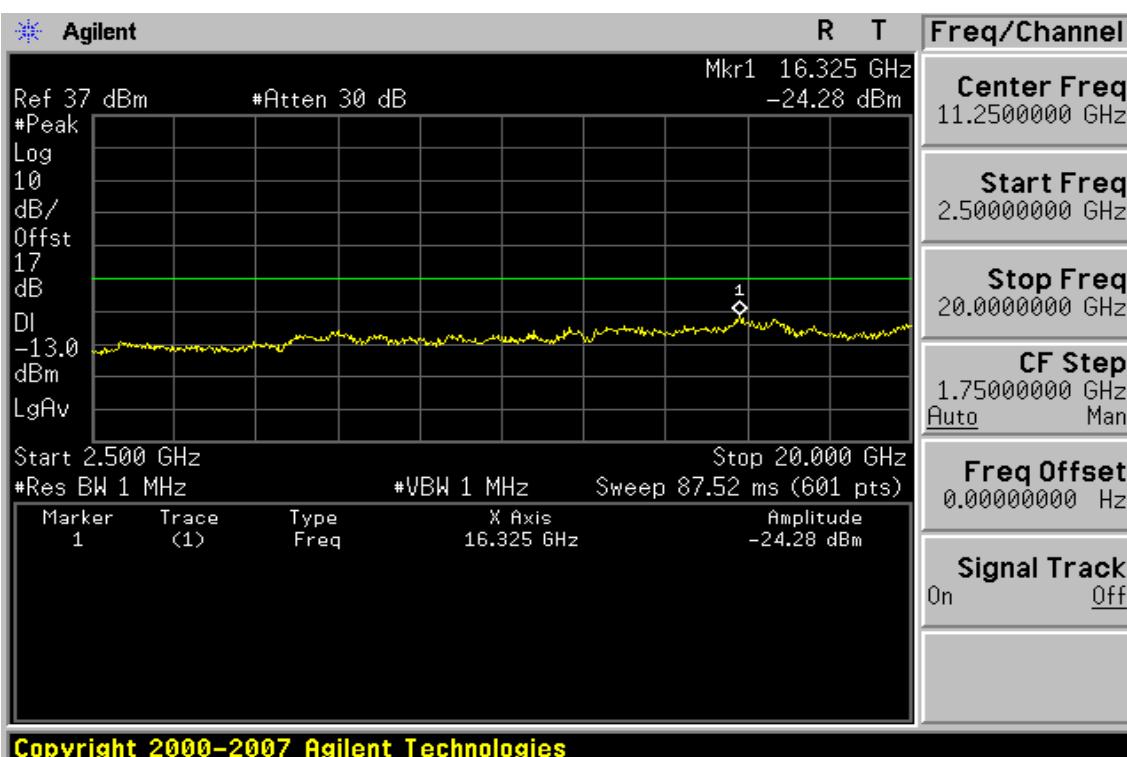
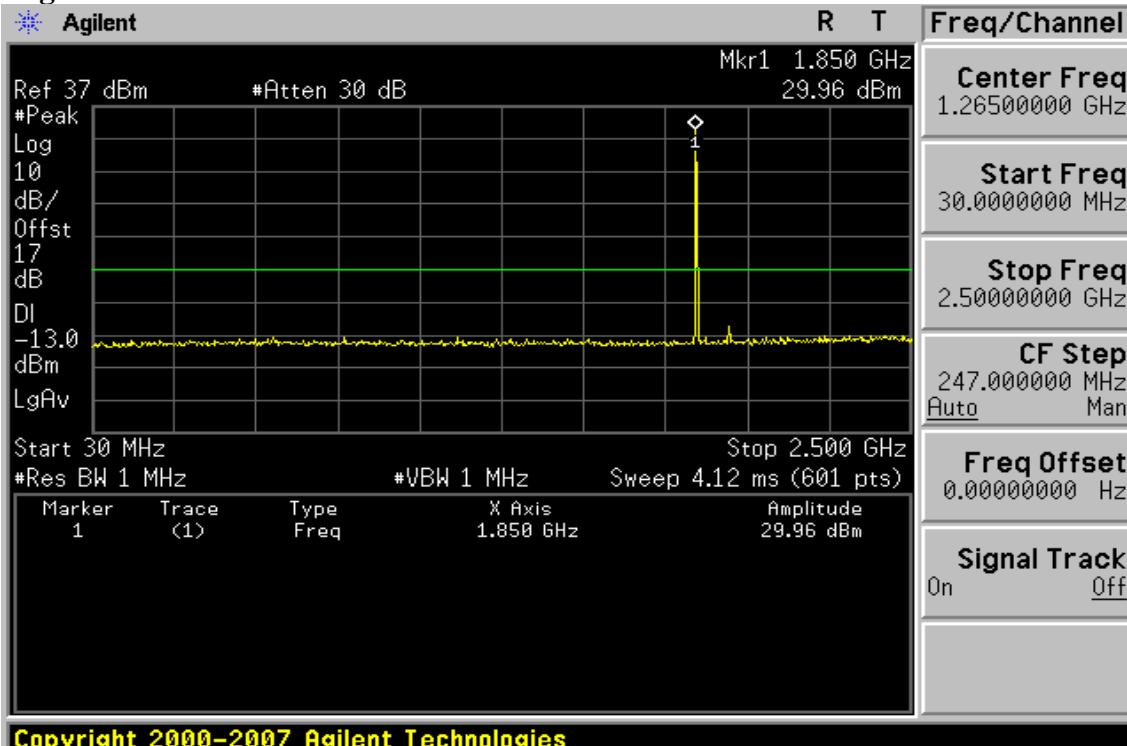
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Figure 8-8: Out of Band emission at antenna terminals—PCS 1900 Channel Lowest



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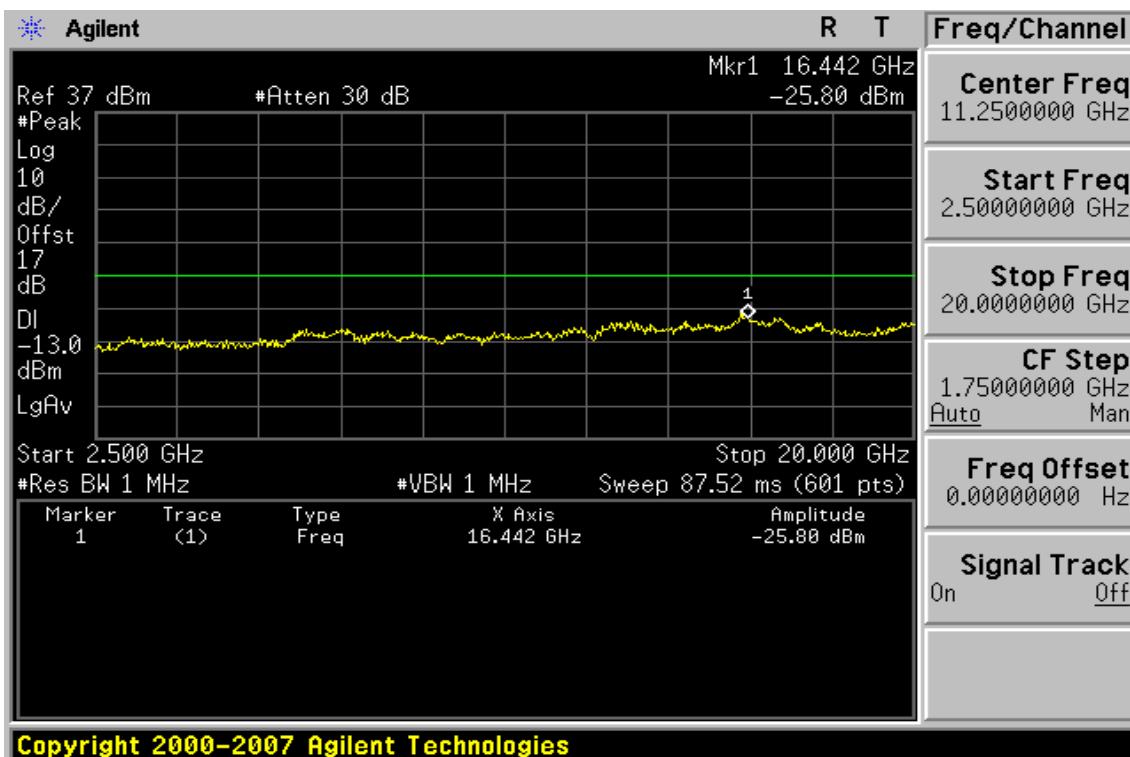
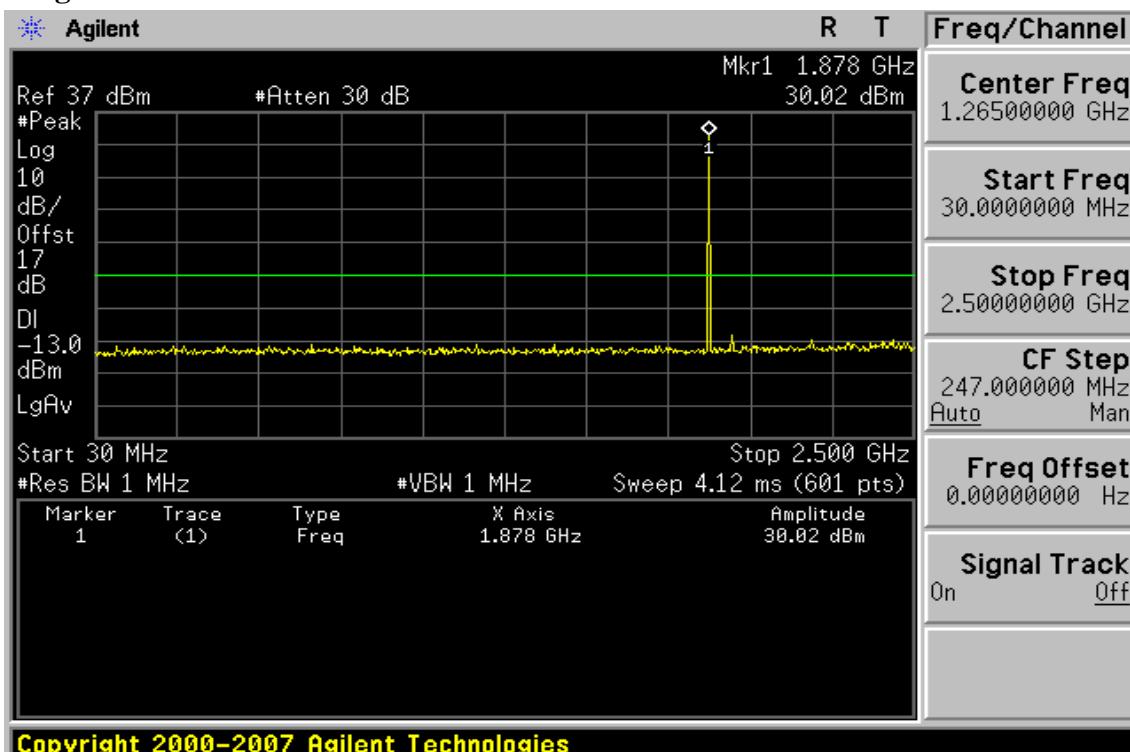
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Figure 8-9: Out of Band emission at antenna terminals –PCS 1900 Channel Mid



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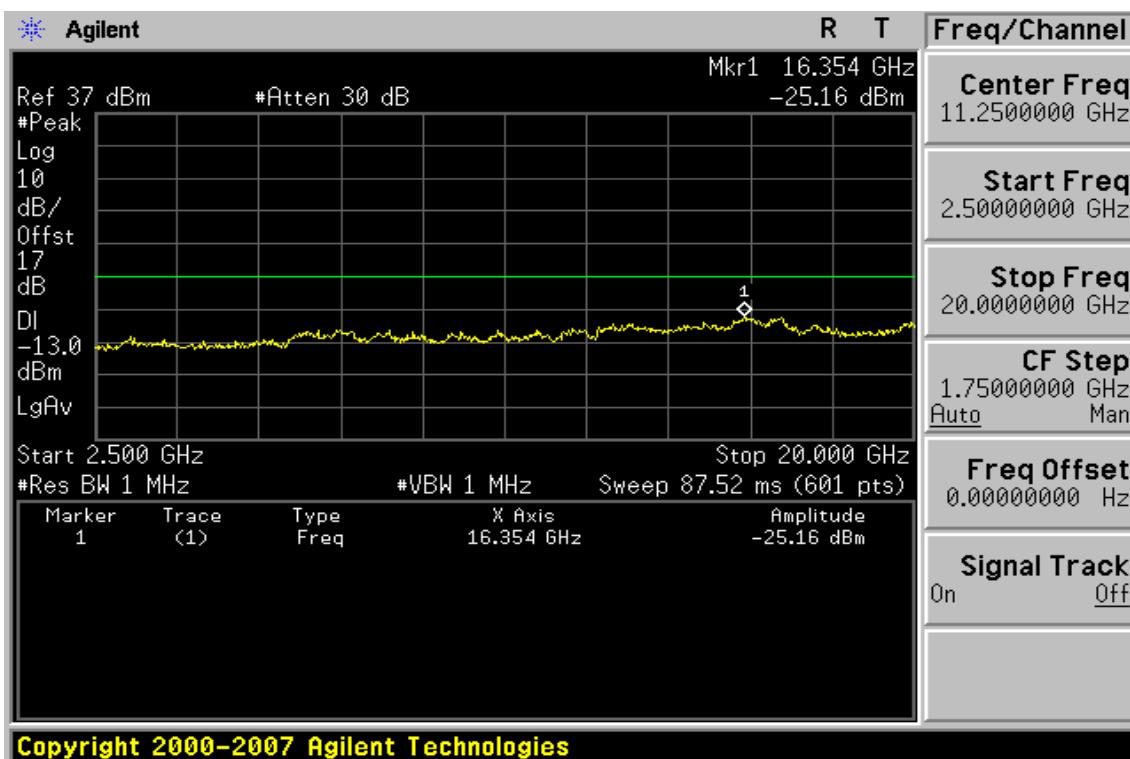
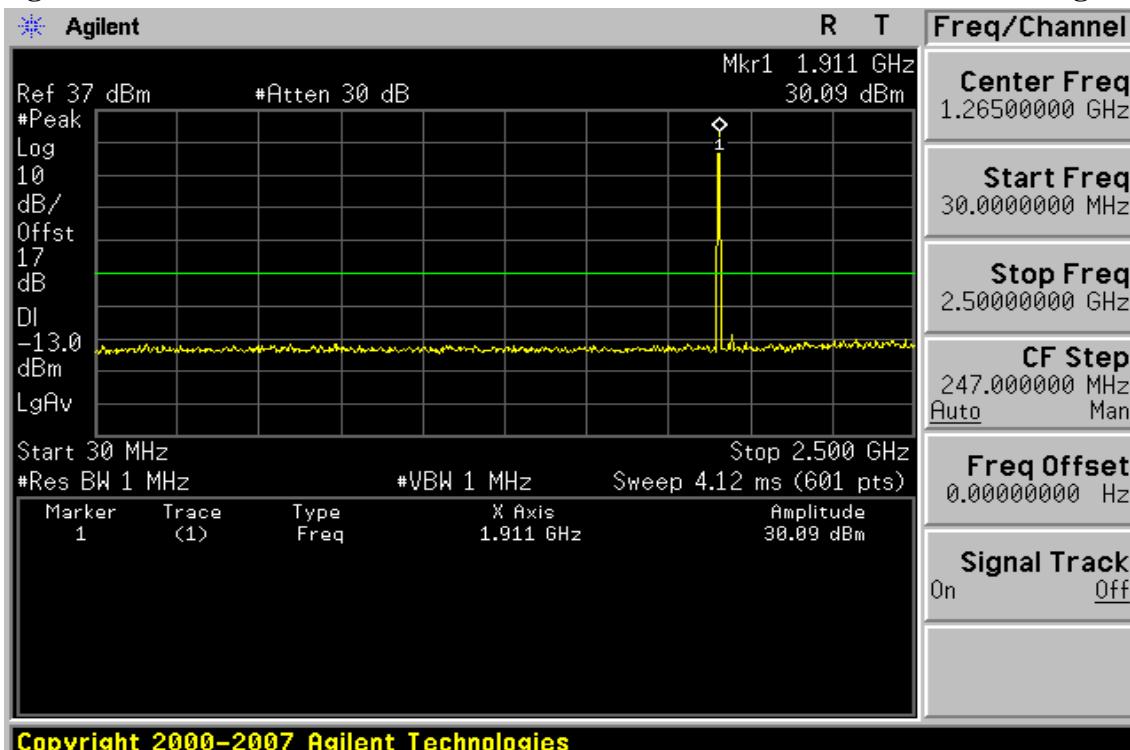
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Figure 8-10: Out of Band emission at antenna terminals—PCS 1900 Channel Highest



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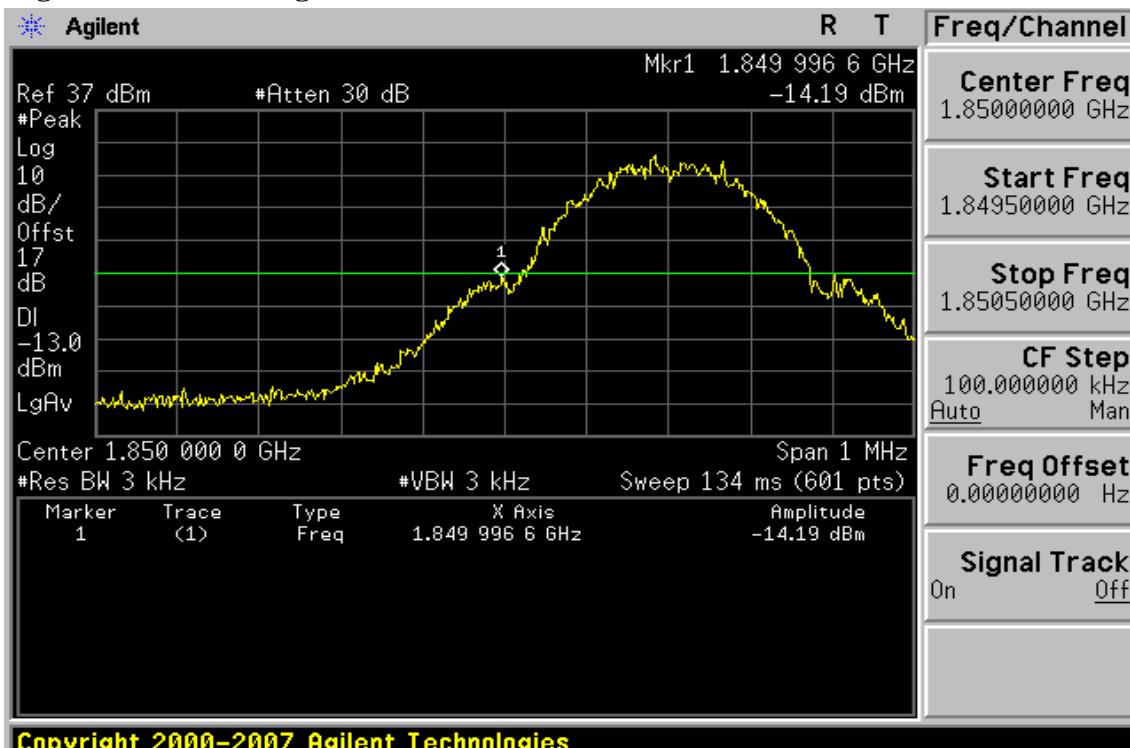
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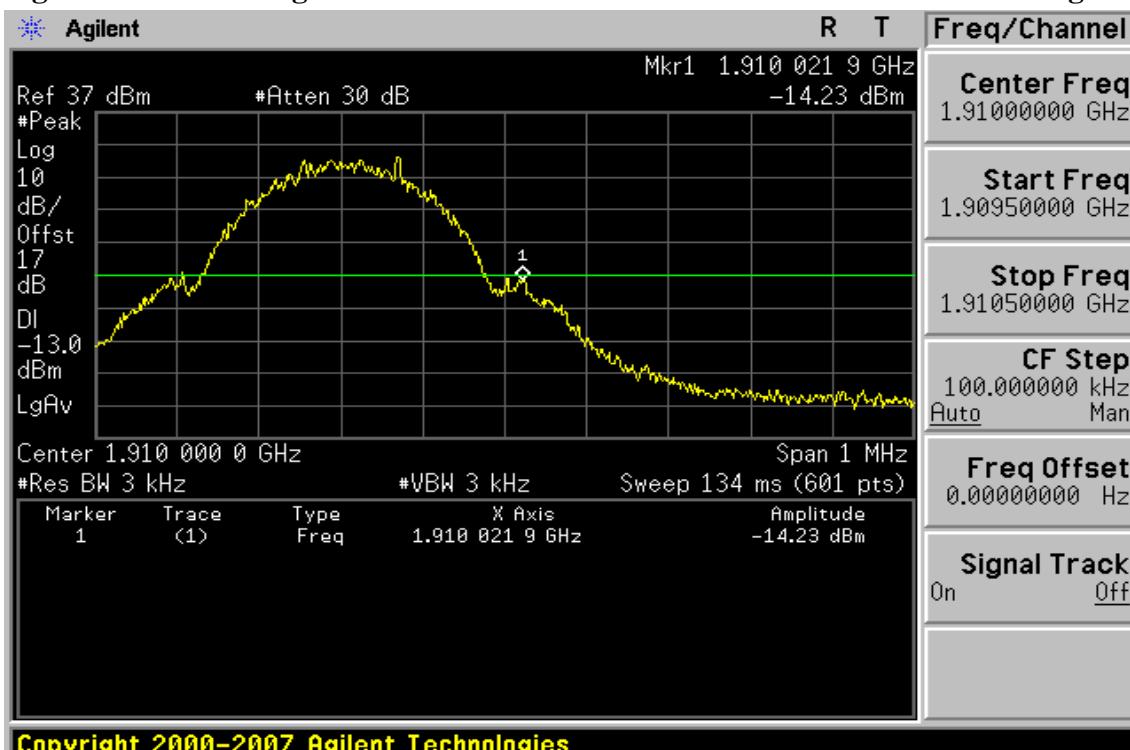
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**Figure 8-11: Band edge emission at antenna terminals – PCS 1900 Channel Lowest**



**Figure 8-12: Band edge emission at antenna terminals – PCS 1900 Channel Highest**



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## 9 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

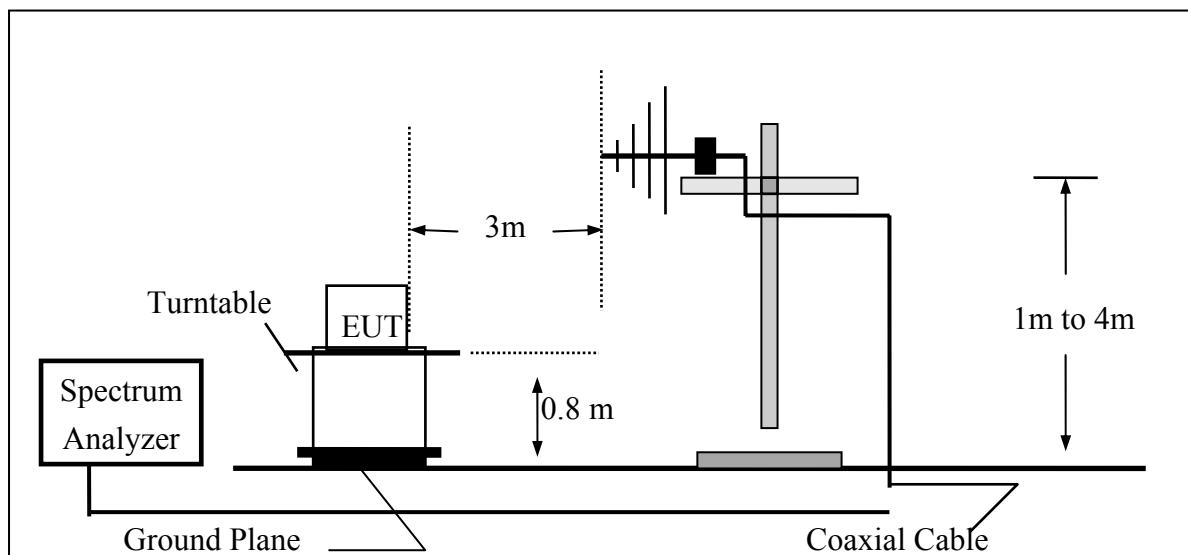
### 9.1 Standard Applicable

According to FCC §2.1053,

FCC §22.917(a),§24.238(a) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

### 9.2 EUT Setup (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz

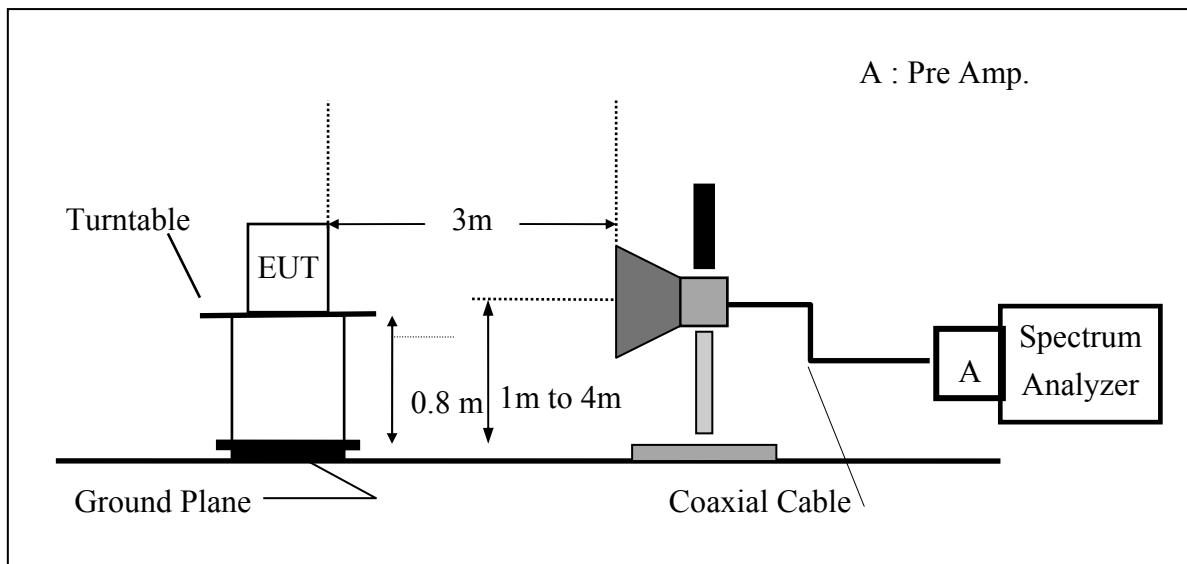


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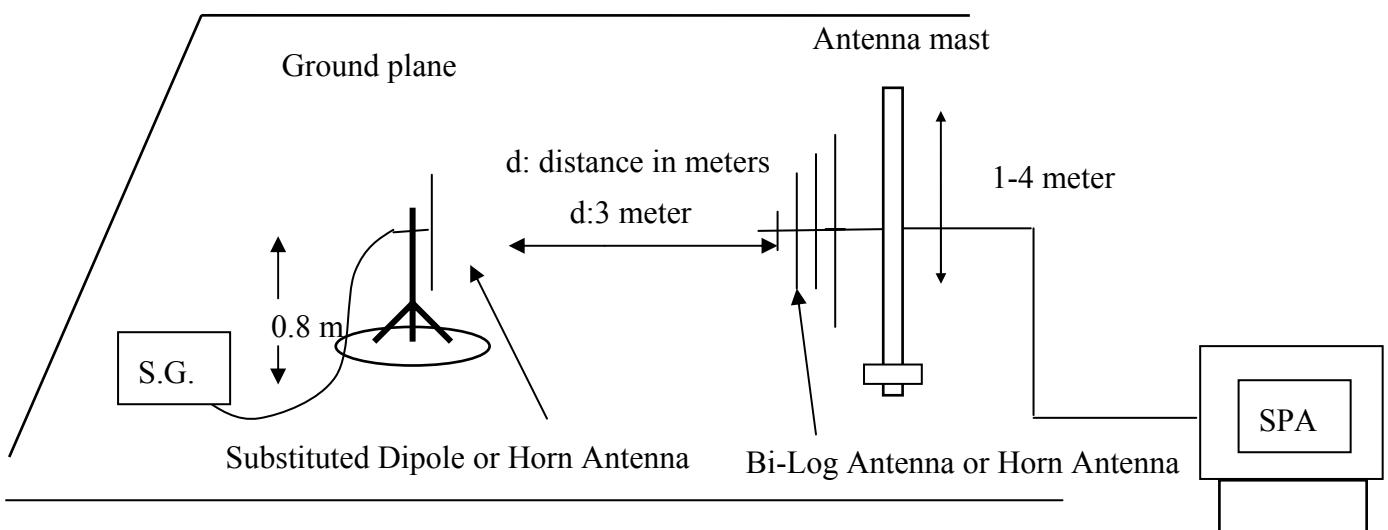
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## (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



## (C) Substituted Method Test Set-UP



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### 9.3 Measurement Procedure

The EUT was placed on a non-conductive, The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission were identified, the power of the emission was determined using the substitution method.

ERP in frequency band 824 –850 MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850.2 –1909.8MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss (dB)}$$

### 9.4 Measurement Equipment Used:

Refer to section 2.4 in this report

### 9.5 Measurement Result

Refer to attach tabular data sheets.

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**Radiated Spurious Emission Measurement Result: GSM 850 Mode**

Operation Mode : TX CH Low Mode Test Date: Sep. 17, 2010  
Fundamental Frequency : 824.20 MHz Test By: Bondi  
Temperature : 25°C Pol: Ver  
Humidity : 65%

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Out-put (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|-------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 99.84       | 35.12               | V            | -66.82            | -7.76                 | 1.36            | -75.94         | -13.00      | -62.94            |
| 185.20      | 34.31               | V            | -66.14            | -7.83                 | 1.67            | -75.64         | -13.00      | -62.64            |
| 222.06      | 36.09               | V            | -64.86            | -7.86                 | 1.83            | -74.55         | -13.00      | -61.55            |
| 456.80      | 32.25               | V            | -61.71            | -7.70                 | 2.68            | -72.09         | -13.00      | -59.09            |
| 824.00      | 81.16               | V            | -5.23             | -7.87                 | 3.62            | -16.73         | -13.00      | -3.73             |
| 1648.40     | 51.80               | V            | -52.78            | 9.29                  | 5.23            | -48.72         | -13.00      | -35.72            |
| 2472.60     | 50.46               | V            | -50.55            | 10.08                 | 6.53            | -47.00         | -13.00      | -34.00            |
| 3296.80     | 41.93               | V            | -56.94            | 12.17                 | 7.71            | -52.49         | -13.00      | -39.49            |
| 4121.00     | 44.50               | V            | -51.62            | 12.61                 | 8.86            | -47.87         | -13.00      | -34.87            |
| 4945.20     | 37.23               | V            | -55.24            | 12.65                 | 9.74            | -52.33         | -13.00      | -39.33            |
| 5769.40     | 35.81               | V            | -54.39            | 13.55                 | 10.54           | -51.37         | -13.00      | -38.37            |
| 6593.60     | ---                 | V            |                   | 12.05                 | 11.30           |                | -13.00      |                   |
| 7417.80     | 37.27               | V            | -43.88            | 11.49                 | 12.10           | -44.48         | -13.00      | -31.48            |
| 8242.00     | ---                 | V            |                   | 11.48                 | 12.71           |                | -13.00      |                   |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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**Radiated Spurious Emission Measurement Result: GSM 850 Mode**

Operation Mode : TX CH Low Mode Test Date: Sep. 17, 2010  
Fundamental Frequency : 824.20 MHz Test By: Bondi  
Temperature : 25°C Pol: Hor  
Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 160.95         | 31.35                     | H               | -67.27                   | -7.81                       | 1.62                  | -76.69                | -13.00         | -63.69                  |
| 379.20         | 32.76                     | H               | -63.99                   | -7.65                       | 2.45                  | -74.09                | -13.00         | -61.09                  |
| 648.86         | 33.04                     | H               | -56.70                   | -7.81                       | 3.16                  | -67.67                | -13.00         | -54.67                  |
| 824.00         | 83.72                     | H               | -2.55                    | -7.87                       | 3.62                  | -14.05                | -13.00         | -1.05                   |
| 1648.40        | 62.41                     | H               | -41.99                   | 9.29                        | 5.23                  | -37.93                | -13.00         | -24.93                  |
| 2472.60        | 50.13                     | H               | -50.78                   | 10.08                       | 6.53                  | -47.23                | -13.00         | -34.23                  |
| 3296.80        | 44.78                     | H               | -54.32                   | 12.17                       | 7.71                  | -49.86                | -13.00         | -36.86                  |
| 4121.00        | 39.19                     | H               | -57.06                   | 12.61                       | 8.86                  | -53.31                | -13.00         | -40.31                  |
| 4945.20        | 32.88                     | H               | -59.76                   | 12.65                       | 9.74                  | -56.84                | -13.00         | -43.84                  |
| 5769.40        | ---                       | H               |                          | 13.55                       | 10.54                 |                       | -13.00         |                         |
| 6593.60        | ---                       | H               |                          | 12.05                       | 11.30                 |                       | -13.00         |                         |
| 7417.80        | ---                       | H               |                          | 11.49                       | 12.10                 |                       | -13.00         |                         |
| 8242.00        | ---                       | H               |                          | 11.48                       | 12.71                 |                       | -13.00         |                         |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB    |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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**Radiated Spurious Emission Measurement Result: GSM 850 Mode**

Operation Mode : TX CH Mid Mode      Test Date: Sep. 17, 2010  
Fundamental Frequency : 836.60 MHz      Test By: Bondi  
Temperature : 25°C      Pol: Ver  
Humidity : 65%

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Out-put (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|-------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 99.84       | 37.98               | V            | -63.96            | -7.76                 | 1.36            | -73.08         | -13.00      | -60.08            |
| 146.40      | 32.63               | V            | -64.99            | -7.80                 | 1.57            | -74.36         | -13.00      | -61.36            |
| 451.95      | 32.67               | V            | -61.27            | -7.70                 | 2.67            | -71.63         | -13.00      | -58.63            |
| 726.46      | 32.86               | V            | -55.35            | -7.87                 | 3.39            | -66.60         | -13.00      | -53.60            |
| 1673.20     | 63.02               | V            | -41.54            | 9.36                  | 5.27            | -37.44         | -13.00      | -24.44            |
| 2509.80     | 46.39               | V            | -54.39            | 10.09                 | 6.58            | -50.89         | -13.00      | -37.89            |
| 3346.40     | 39.52               | V            | -59.34            | 12.28                 | 7.79            | -54.86         | -13.00      | -41.86            |
| 4183.00     | 37.51               | V            | -58.38            | 12.62                 | 8.93            | -54.69         | -13.00      | -41.69            |
| 5019.60     | 31.38               | V            | -60.77            | 12.67                 | 9.81            | -57.91         | -13.00      | -44.91            |
| 5856.20     | ---                 | V            |                   | 13.68                 | 10.62           |                | -13.00      |                   |
| 6692.80     | ---                 | V            |                   | 11.95                 | 11.39           |                | -13.00      |                   |
| 7529.40     | ---                 | V            |                   | 11.45                 | 12.20           |                | -13.00      |                   |
| 8366.00     | ---                 | V            |                   | 11.59                 | 12.81           |                | -13.00      |                   |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belongs to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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**Radiated Spurious Emission Measurement Result: GSM 850 Mode**

Operation Mode : TX CH Mid Mode      Test Date: Sep. 17, 2010  
Fundamental Frequency : 836.60 MHz      Test By: Bondi  
Temperature : 25°C      Pol: Hor  
Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 165.80         | 32.48                     | H               | -66.52                   | -7.81                       | 1.63                  | -75.96                | -13.00         | -62.96                  |
| 432.55         | 32.86                     | H               | -61.92                   | -7.69                       | 2.61                  | -72.21                | -13.00         | -59.21                  |
| 710.94         | 33.42                     | H               | -56.26                   | -7.86                       | 3.33                  | -67.45                | -13.00         | -54.45                  |
| 1673.20        | 63.02                     | H               | -41.36                   | 9.36                        | 5.27                  | -37.26                | -13.00         | -24.26                  |
| 2509.80        | 46.39                     | H               | -54.31                   | 10.09                       | 6.58                  | -50.81                | -13.00         | -37.81                  |
| 3346.40        | 39.52                     | H               | -59.54                   | 12.28                       | 7.79                  | -55.06                | -13.00         | -42.06                  |
| 4183.00        | 37.51                     | H               | -58.52                   | 12.62                       | 8.93                  | -54.83                | -13.00         | -41.83                  |
| 5019.60        | 31.38                     | H               | -60.94                   | 12.67                       | 9.81                  | -58.07                | -13.00         | -45.07                  |
| 5856.20        | ---                       | H               |                          | 13.68                       | 10.62                 |                       | -13.00         |                         |
| 6692.80        | ---                       | H               |                          | 11.95                       | 11.39                 |                       | -13.00         |                         |
| 7529.40        | ---                       | H               |                          | 11.45                       | 12.20                 |                       | -13.00         |                         |
| 8366.00        | ---                       | H               |                          | 11.59                       | 12.81                 |                       | -13.00         |                         |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB    |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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**Radiated Spurious Emission Measurement Result: GSM 850 Mode**

Operation Mode : TX CH High Mode Test Date: Sep. 17, 2010  
Fundamental Frequency : 848.80 MHz Test By: Bondi  
Temperature : 25°C Pol: Ver  
Humidity : 65%

| Freq. (MHz) | SPA. Reading (dBuV) | Ant.Pol. H/V | S.G Out-put (dBm) | Antenna Gain (dB/dBi) | Cable Loss (dB) | ERP/EIRP (dBm) | Limit (dBm) | Safe Margin (dBm) |
|-------------|---------------------|--------------|-------------------|-----------------------|-----------------|----------------|-------------|-------------------|
| 61.04       | 35.01               | V            | -76.34            | -0.52                 | 1.08            | -77.95         | -13.00      | -64.95            |
| 99.84       | 36.60               | V            | -65.34            | -7.76                 | 1.36            | -74.46         | -13.00      | -61.46            |
| 156.10      | 31.86               | V            | -65.98            | -7.80                 | 1.60            | -75.39         | -13.00      | -62.39            |
| 604.24      | 33.35               | V            | -56.16            | -7.79                 | 3.04            | -67.00         | -13.00      | -54.00            |
| 850.00      | 78.82               | V            | -7.29             | -7.88                 | 3.68            | -18.85         | -13.00      | -5.85             |
| 1697.60     | 48.99               | V            | -55.55            | 9.44                  | 5.31            | -51.42         | -13.00      | -38.42            |
| 2546.40     | 50.52               | V            | -50.12            | 10.20                 | 6.63            | -46.56         | -13.00      | -33.56            |
| 3395.20     | 41.53               | V            | -57.32            | 12.38                 | 7.87            | -52.81         | -13.00      | -39.81            |
| 4244.00     | 46.77               | V            | -48.89            | 12.63                 | 9.00            | -45.26         | -13.00      | -32.26            |
| 5092.80     | 37.34               | V            | -54.64            | 12.74                 | 9.88            | -51.77         | -13.00      | -38.77            |
| 5941.60     | 34.39               | V            | -55.30            | 13.81                 | 10.70           | -52.19         | -13.00      | -39.19            |
| 6790.40     | 32.09               | V            | -52.44            | 11.86                 | 11.48           | -52.07         | -13.00      | -39.07            |
| 7639.20     | ---                 | V            |                   | 11.40                 | 12.27           |                | -13.00      |                   |
| 8488.00     | ---                 | V            |                   | 11.70                 | 12.91           |                | -13.00      |                   |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain (dB/dBi)} - Cable \text{ loss (dB)}$

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**Radiated Spurious Emission Measurement Result: GSM 850 Mode**

Operation Mode : TX CH High Mode Test Date: Sep. 17, 2010  
Fundamental Frequency : 848.80 MHz Test By: Bondi  
Temperature : 25°C Pol: Hor  
Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 156.10         | 31.17                     | H               | -67.07                   | -7.80                       | 1.60                  | -76.48                | -13.00         | -63.48                  |
| 621.70         | 32.89                     | H               | -57.38                   | -7.80                       | 3.09                  | -68.27                | -13.00         | -55.27                  |
| 850.00         | 81.48                     | H               | -4.71                    | -7.88                       | 3.68                  | -16.27                | -13.00         | -3.27                   |
| 1697.60        | 63.57                     | H               | -40.78                   | 9.44                        | 5.31                  | -36.65                | -13.00         | -23.65                  |
| 2546.40        | 44.96                     | H               | -55.64                   | 10.20                       | 6.63                  | -52.08                | -13.00         | -39.08                  |
| 3395.20        | 41.36                     | H               | -57.67                   | 12.38                       | 7.87                  | -53.15                | -13.00         | -40.15                  |
| 4244.00        | 40.99                     | H               | -54.82                   | 12.63                       | 9.00                  | -51.20                | -13.00         | -38.20                  |
| 5092.80        | 34.06                     | H               | -58.09                   | 12.74                       | 9.88                  | -55.23                | -13.00         | -42.23                  |
| 5941.60        | ---                       | H               |                          | 13.81                       | 10.70                 |                       | -13.00         |                         |
| 6790.40        | ---                       | H               |                          | 11.86                       | 11.48                 |                       | -13.00         |                         |
| 7639.20        | ---                       | H               |                          | 11.40                       | 12.27                 |                       | -13.00         |                         |
| 8488.00        | ---                       | H               |                          | 11.70                       | 12.91                 |                       | -13.00         |                         |

|                         |                         |
|-------------------------|-------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB   |
|                         | 80MHz - 1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB    |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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**Radiated Spurious Emission Measurement Result: PCS 1900 Mode**

Operation Mode : TX CH Low Mode Test Date: Sep. 17, 2010  
Fundamental Frequency : 1850.20MHz Test By: Bondi  
Temperature : 25°C Pol: Ver  
Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 99.84          | 37.81                     | V               | -64.13                   | -7.76                       | 1.36                  | -73.25                | -13.00         | -60.25                  |
| 144.46         | 32.63                     | V               | -65.17                   | -7.80                       | 1.56                  | -74.53                | -13.00         | -61.53                  |
| 381.14         | 32.90                     | V               | -63.40                   | -7.65                       | 2.45                  | -73.51                | -13.00         | -60.51                  |
| 629.46         | 33.45                     | V               | -55.74                   | -7.80                       | 3.11                  | -66.65                | -13.00         | -53.65                  |
| 752.65         | 32.51                     | V               | -54.58                   | -7.87                       | 3.48                  | -65.92                | -13.00         | -52.92                  |
| 1850.00        | 78.60                     | V               | -25.79                   | 9.90                        | 5.56                  | -21.45                | -13.00         | -8.45                   |
| 3700.40        | 50.49                     | V               | -47.44                   | 12.61                       | 8.31                  | -43.14                | -13.00         | -30.14                  |
| 5550.60        | 45.38                     | V               | -45.46                   | 13.23                       | 10.33                 | -42.56                | -13.00         | -29.56                  |
| 7400.80        | 41.99                     | V               | -39.25                   | 11.50                       | 12.08                 | -39.83                | -13.00         | -26.83                  |
| 9251.00        | ---                       | V               |                          | 11.92                       | 13.50                 |                       | -13.00         |                         |
| 11101.20       | ---                       | V               |                          | 11.66                       | 15.11                 |                       | -13.00         |                         |
| 12951.40       | ---                       | V               |                          | 13.63                       | 16.60                 |                       | -13.00         |                         |
| 14801.60       | ---                       | V               |                          | 12.76                       | 17.95                 |                       | -13.00         |                         |
| 16651.80       | ---                       | V               |                          | 15.92                       | 19.14                 |                       | -13.00         |                         |
| 18502.00       | ---                       | V               |                          | 18.75                       | 10.40                 |                       | -13.00         |                         |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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**Radiated Spurious Emission Measurement Result: PCS 1900 Mode**

Operation Mode : TX CH Low Mode Test Date: Sep. 17, 2010  
Fundamental Frequency : 1850.20MHz Test By: Bondi  
Temperature : 25°C Pol: Hor  
Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 41.64          | 31.35                     | H               | -72.16                   | -2.31                       | 0.93                  | -75.40                | -13.00         | -62.40                  |
| 165.80         | 32.39                     | H               | -66.61                   | -7.81                       | 1.63                  | -76.05                | -13.00         | -63.05                  |
| 451.95         | 32.18                     | H               | -61.69                   | -7.70                       | 2.67                  | -72.06                | -13.00         | -59.06                  |
| 752.65         | 33.23                     | H               | -63.19                   | -7.87                       | 3.48                  | -74.53                | -13.00         | -61.53                  |
| 1850.00        | 79.74                     | H               | -24.44                   | 9.90                        | 5.56                  | -20.10                | -13.00         | -7.10                   |
| 3700.40        | 41.64                     | H               | -56.40                   | 12.61                       | 8.31                  | -52.10                | -13.00         | -39.10                  |
| 5550.60        | 34.86                     | H               | -56.19                   | 13.23                       | 10.33                 | -53.29                | -13.00         | -40.29                  |
| 7400.80        | ---                       | H               |                          | 11.50                       | 12.08                 |                       | -13.00         |                         |
| 9251.00        | ---                       | H               |                          | 11.92                       | 13.50                 |                       | -13.00         |                         |
| 11101.20       | ---                       | H               |                          | 11.66                       | 15.11                 |                       | -13.00         |                         |
| 12951.40       | ---                       | H               |                          | 13.63                       | 16.60                 |                       | -13.00         |                         |
| 14801.60       | ---                       | H               |                          | 12.76                       | 17.95                 |                       | -13.00         |                         |
| 16651.80       | ---                       | H               |                          | 15.92                       | 19.14                 |                       | -13.00         |                         |
| 18502.00       | ---                       | H               |                          | 18.75                       | 10.40                 |                       | -13.00         |                         |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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**Radiated Spurious Emission Measurement Result: PCS 1900 Mode**

Operation Mode : TX CH Mid Mode

Test Date: Sep. 17, 2010

Fundamental Frequency : 1880MHz

Test By: Bondi

Temperature : 25°C

Pol: Ver

Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 99.84          | 38.68                     | V               | -63.26                   | -7.76                       | 1.36                  | -72.38                | -13.00         | -59.38                  |
| 151.25         | 31.89                     | V               | -65.51                   | -7.80                       | 1.59                  | -74.91                | -13.00         | -61.91                  |
| 400.54         | 32.81                     | V               | -62.67                   | -7.66                       | 2.51                  | -72.85                | -13.00         | -59.85                  |
| 626.55         | 33.59                     | V               | -55.63                   | -7.80                       | 3.10                  | -66.53                | -13.00         | -53.53                  |
| 854.50         | 32.92                     | V               | -53.07                   | -7.89                       | 3.69                  | -64.64                | -13.00         | -51.64                  |
| 3760.00        | 51.81                     | V               | -45.85                   | 12.60                       | 8.39                  | -41.63                | -13.00         | -28.63                  |
| 5640.00        | 42.06                     | V               | -48.52                   | 13.36                       | 10.41                 | -45.57                | -13.00         | -32.57                  |
| 7520.00        | ---                       | V               |                          | 11.45                       | 12.19                 |                       | -13.00         |                         |
| 9400.00        | ---                       | V               |                          | 11.93                       | 13.61                 |                       | -13.00         |                         |
| 11280.00       | ---                       | V               |                          | 11.92                       | 15.27                 |                       | -13.00         |                         |
| 13160.00       | ---                       | V               |                          | 13.33                       | 16.71                 |                       | -13.00         |                         |
| 15040.00       | ---                       | V               |                          | 13.76                       | 18.15                 |                       | -13.00         |                         |
| 16920.00       | ---                       | V               |                          | 15.27                       | 19.32                 |                       | -13.00         |                         |
| 18800.00       | ---                       | V               |                          | 18.68                       | 16.58                 |                       | -13.00         |                         |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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**Radiated Spurious Emission Measurement Result: PCS 1900 Mode**

Operation Mode : TX CH Mid Mode

Test Date: Sep. 17, 2010

Fundamental Frequency : 1880MHz

Test By: Bondi

Temperature : 25°C

Pol: Hor

Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 158.04         | 34.47                     | H               | -63.92                   | -7.81                       | 1.61                  | -73.34                | -13.00         | -60.34                  |
| 319.06         | 32.52                     | H               | -64.96                   | -7.81                       | 2.24                  | -75.02                | -13.00         | -62.02                  |
| 425.76         | 32.58                     | H               | -62.54                   | -7.68                       | 2.59                  | -72.81                | -13.00         | -59.81                  |
| 604.24         | 32.87                     | H               | -57.75                   | -7.79                       | 3.04                  | -68.58                | -13.00         | -55.58                  |
| 745.86         | 33.29                     | H               | -62.92                   | -7.87                       | 3.46                  | -74.24                | -13.00         | -61.24                  |
| 3760.00        | 43.14                     | H               | -54.63                   | 12.60                       | 8.39                  | -50.42                | -13.00         | -37.42                  |
| 5640.00        | 33.27                     | H               | -57.48                   | 13.36                       | 10.41                 | -54.53                | -13.00         | -41.53                  |
| 7520.00        | ---                       | H               |                          | 11.45                       | 12.19                 |                       | -13.00         |                         |
| 9400.00        | ---                       | H               |                          | 11.93                       | 13.61                 |                       | -13.00         |                         |
| 11280.00       | ---                       | H               |                          | 11.92                       | 15.27                 |                       | -13.00         |                         |
| 13160.00       | ---                       | H               |                          | 13.33                       | 16.71                 |                       | -13.00         |                         |
| 15040.00       | ---                       | H               |                          | 13.76                       | 18.15                 |                       | -13.00         |                         |
| 16920.00       | ---                       | H               |                          | 15.27                       | 19.32                 |                       | -13.00         |                         |
| 18800.00       | ---                       | H               |                          | 18.68                       | 16.58                 |                       | -13.00         |                         |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG\ Setting(dBm) + Antenna\ Gain\ (dB/dBi) - Cable\ loss\ (dB)$

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**Radiated Spurious Emission Measurement Result: PCS 1900 Mode**

Operation Mode : TX CH High Mode Test Date: Sep. 17, 2010  
Fundamental Frequency : 1909.8 MHz Test By: Bondi  
Temperature : 25°C Pol: Ver  
Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 99.84          | 38.03                     | V               | -63.91                   | -7.76                       | 1.36                  | -73.03                | -13.00         | -60.03                  |
| 151.25         | 31.66                     | V               | -65.74                   | -7.80                       | 1.59                  | -75.14                | -13.00         | -62.14                  |
| 340.40         | 32.66                     | V               | -65.09                   | -7.69                       | 2.32                  | -75.11                | -13.00         | -62.11                  |
| 613.94         | 32.78                     | V               | -56.61                   | -7.80                       | 3.07                  | -67.47                | -13.00         | -54.47                  |
| 856.44         | 32.83                     | V               | -53.10                   | -7.89                       | 3.69                  | -64.69                | -13.00         | -51.69                  |
| 1910.00        | 78.19                     | V               | -26.14                   | 10.08                       | 5.66                  | -21.72                | -13.00         | -8.72                   |
| 3819.60        | 47.48                     | V               | -49.91                   | 12.60                       | 8.47                  | -45.78                | -13.00         | -32.78                  |
| 5729.40        | 38.64                     | V               | -51.68                   | 13.49                       | 10.50                 | -48.68                | -13.00         | -35.68                  |
| 7639.20        | ---                       | V               |                          | 11.40                       | 12.27                 |                       | -13.00         |                         |
| 9549.00        | ---                       | V               |                          | 11.95                       | 13.74                 |                       | -13.00         |                         |
| 11458.80       | ---                       | V               |                          | 12.17                       | 15.43                 |                       | -13.00         |                         |
| 13368.60       | ---                       | V               |                          | 12.97                       | 16.82                 |                       | -13.00         |                         |
| 15278.40       | ---                       | V               |                          | 15.00                       | 18.29                 |                       | -13.00         |                         |
| 17188.20       | ---                       | V               |                          | 14.47                       | 19.52                 |                       | -13.00         |                         |
| 19098.00       | ---                       | V               |                          | 18.66                       | 20.78                 |                       | -13.00         |                         |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)$

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**Radiated Spurious Emission Measurement Result: PCS 1900 Mode**

Operation Mode : TX CH High Mode Test Date: Sep. 17, 2010  
Fundamental Frequency : 1909.8 MHz Test By: Bondi  
Temperature : 25°C Pol: Hor  
Humidity : 65%

| Freq.<br>(MHz) | SPA.<br>Reading<br>(dBuV) | Ant.Pol.<br>H/V | S.G Out-<br>put<br>(dBm) | Antenna<br>Gain<br>(dB/dBi) | Cable<br>Loss<br>(dB) | ERP/<br>EIRP<br>(dBm) | Limit<br>(dBm) | Safe<br>Margin<br>(dBm) |
|----------------|---------------------------|-----------------|--------------------------|-----------------------------|-----------------------|-----------------------|----------------|-------------------------|
| 167.74         | 33.56                     | H               | -65.59                   | -7.81                       | 1.63                  | -75.03                | -13.00         | -62.03                  |
| 321.00         | 31.98                     | H               | -65.49                   | -7.80                       | 2.25                  | -75.54                | -13.00         | -62.54                  |
| 381.14         | 33.32                     | H               | -63.40                   | -7.65                       | 2.45                  | -73.51                | -13.00         | -60.51                  |
| 645.95         | 32.90                     | H               | -56.90                   | -7.81                       | 3.15                  | -67.86                | -13.00         | -54.86                  |
| 862.26         | 32.80                     | H               | -53.06                   | -7.90                       | 3.71                  | -64.67                | -13.00         | -51.67                  |
| 1910.00        | 77.20                     | H               | -26.91                   | 10.08                       | 5.66                  | -22.49                | -13.00         | -9.49                   |
| 3819.60        | 37.39                     | H               | -60.12                   | 12.60                       | 8.47                  | -55.98                | -13.00         | -42.98                  |
| 5729.40        | 31.12                     | H               | -59.33                   | 13.49                       | 10.50                 | -56.34                | -13.00         | -43.34                  |
| 7639.20        | ---                       | H               |                          | 11.40                       | 12.27                 |                       | -13.00         |                         |
| 9549.00        | ---                       | H               |                          | 11.95                       | 13.74                 |                       | -13.00         |                         |
| 11458.80       | ---                       | H               |                          | 12.17                       | 15.43                 |                       | -13.00         |                         |
| 13368.60       | ---                       | H               |                          | 12.97                       | 16.82                 |                       | -13.00         |                         |
| 15278.40       | ---                       | H               |                          | 15.00                       | 18.29                 |                       | -13.00         |                         |
| 17188.20       | ---                       | H               |                          | 14.47                       | 19.52                 |                       | -13.00         |                         |
| 19098.00       | ---                       | H               |                          | 18.66                       | 20.78                 |                       | -13.00         |                         |

|                         |                        |
|-------------------------|------------------------|
| Measurement uncertainty | 30MHz - 80MHz: 5.04dB  |
|                         | 80MHz -1000MHz: 3.76dB |
|                         | 1GHz - 13GHz: 4.45dB   |

**Remark:**

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4  $ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)$

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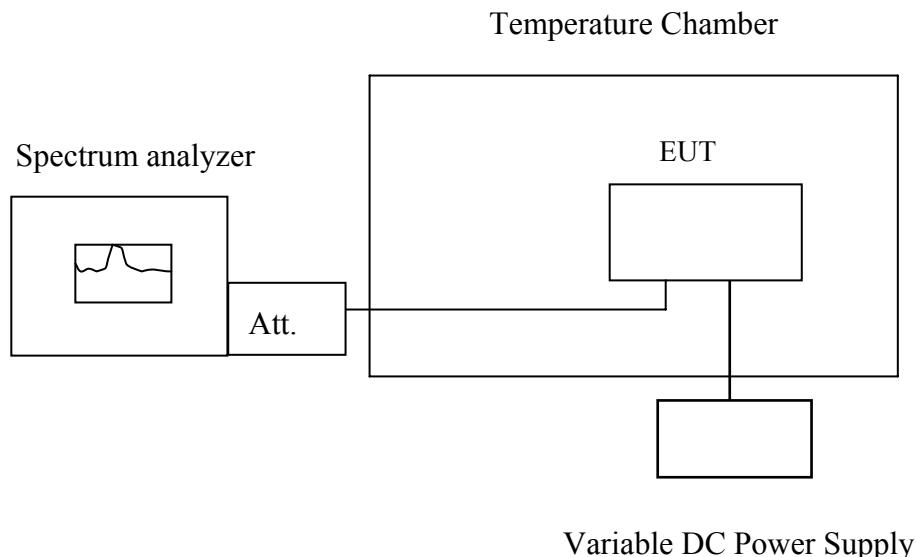
## 10 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

### 10.1 Standard Applicable

According to FCC §2.1055(a)(1)

Frequency Tolerance: +/- 2.5 ppm

### 10.2 Test Set-up:



**Note :** Measurement setup for testing on Antenna connector

### 10.3 Measurement Procedure

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

### 10.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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## 10.5 Measurement Result :

| Reference Frequency: GSM Mid Channel 836.6 MHz |                  |            |            |            |
|--|------------------|------------|------------|------------|
| Limit: +/- 2.5 ppm = 2091 Hz                   |                  |            |            |            |
| Power Supply                                   | Environment      | Frequency  | Delta (Hz) | Limit (Hz) |
| Vdc  | Temperature (°C) | (MHz)      |            |            |
| 3.7  | -30              | 836.599986 | 7.00       | 2091       |
| 3.7  | -20              | 836.599991 | 2.00       | 2091       |
| 3.7  | -10              | 836.599988 | 5.00       | 2091       |
| 3.7  | 0                | 836.599985 | 8.00       | 2091       |
| 3.7  | 10               | 836.59998  | 13.00      | 2091       |
| 3.7  | 20               | 836.599993 | 0.00       | 2091       |
| 3.7  | 30               | 836.599987 | 6.00       | 2091       |
| 3.7  | 40               | 836.599983 | 10.00      | 2091       |
| 3.7  | 50               | 836.599981 | 12.00      | 2091       |

| Reference Frequency: PCS Mid Channel 1880 MHz |                  |             |            |            |
|---|------------------|-------------|------------|------------|
| Limit: +/- 2.5 ppm = 4700 Hz                  |                  |             |            |            |
| Power Supply                                  | Environment      | Frequency   | Delta (Hz) | Limit (Hz) |
| Vdc   | Temperature (°C) | (MHz)       |            |            |
| 3.7   | -30              | 1879.999980 | -3.00      | 4700       |
| 3.7   | -20              | 1879.999983 | -6.00      | 4700       |
| 3.7   | -10              | 1879.999985 | -8.00      | 4700       |
| 3.7   | 0                | 1879.999982 | -5.00      | 4700       |
| 3.7   | 10               | 1879.999980 | -3.00      | 4700       |
| 3.7   | 20               | 1879.999977 | 0.00       | 4700       |
| 3.7   | 30               | 1879.999983 | -6.00      | 4700       |
| 3.7   | 40               | 1879.999981 | -4.00      | 4700       |
| 3.7   | 50               | 1879.999969 | 8.00       | 4700       |

**Note: The battery is rated 3.7V dc.**

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## 11 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

### 11.1 Standard Applicable

According to FCC §2.1055(d)(2)

Frequency Tolerance: +/- 2.5 ppm

### 11.2 Test Set-up:

Refer to section 10.2 in this report

### 11.3 Measurement Procedure

Set chamber temperature to 25°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

### 11.4 Measurement Equipment Used:

Refer to section 2.4 in this report

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### 11.5 Measurement Result :

| Reference Frequency: GSM Mid Channel 836.6 MHz |                  |            |            |            |
|--|------------------|------------|------------|------------|
| Limit: +/- 2.5 ppm = 2091 Hz                   |                  |            |            |            |
| Power Supply                                   | Environment      | Frequency  | Delta (Hz) | Limit (Hz) |
| Vdc  | Temperature (°C) | (MHz)      |            |            |
| 4.20   | 25.00            | 836.599997 | 0.00       | 2091.00    |
| 3.70   | 25.00            | 836.599992 | 5.00       | 2091.00    |
| 3.40   | 25.00            | 836.599994 | 3.00       | 2091.00    |
| 3.2<br>(End Point)                             | 25.00            | 836.599997 | 0.00       | 2091.00    |

| Reference Frequency: PCS Mid Channel 1880 MHz |                  |             |            |            |
|---|------------------|-------------|------------|------------|
| Limit: +/- 2.5 ppm = 4700 Hz                  |                  |             |            |            |
| Power Supply                                  | Environment      | Frequency   | Delta (Hz) | Limit (Hz) |
| Vdc   | Temperature (°C) | (MHz)       |            |            |
| 4.2   | 25               | 1879.999971 | 0.00       | 4700       |
| 3.7   | 25               | 1879.999976 | -5.00      | 4700       |
| 3.4   | 25               | 1879.999990 | -19.00     | 4700       |
| 3.2<br>(Endpoint)                             | 25               | 1879.999985 | -14.00     | 4700       |

**Note: The battery is rated 3.7V dc.**

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