



# Variant FCC RF Test Report

APPLICANT : Motorola Mobility, Inc.  
EQUIPMENT : GSM / GPRS Mobile Phone  
BRAND NAME : MOTOROLA  
MODEL NAME : W409G  
FCC ID : IHDP56LJ5  
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)  
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)  
Tx/Rx FREQUENCY RANGE : GSM850 : 824.2 ~ 848.8 MHz /  
869.2 ~ 893.8 MHz  
GSM1900 : 1850.2 ~ 1909.8 MHz /  
1930.2 ~ 1989.8 MHz  
MAX. ERP/EIRP POWER : GSM850 (GSM) : 0.43 W  
GSM1900 (GSM) : 0.40 W

This is a variant report which is only valid together with the original test report. The product was received on May 03, 2011 and completely tested on May 13, 2011. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai / Manager



**SPORTON INTERNATIONAL INC.**

No. 52, Hwa Ya 1<sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION                                                                                                                                                                                                                                                                                    | ISSUED DATE   |
|------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| FG150324   | Rev. 01 | This is a variant report for changing HW Version and SW Version. All the test cases were performed in original report which can be referred to CCS report number T101008002-RP1 as appendix B. Based on original report, only the worst cases of ERP/EIRP and radiated emission were verified. | Jun. 17, 2011 |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |
|            |         |                                                                                                                                                                                                                                                                                                |               |

## SUMMARY OF TEST RESULT

| Report Section | FCC Rule                            | IC Rule                            | Description                          | Limit                                  | Result | Remark                                  |
|----------------|-------------------------------------|------------------------------------|--------------------------------------|----------------------------------------|--------|-----------------------------------------|
| 3.1            | §22.913(a)(2)                       | RSS-132(4.4)<br>SRSP-503(5.1.3)    | Effective Radiated Power             | < 7 Watts                              | PASS   | -                                       |
| 3.1            | §24.232(c)                          | RSS-133 (6.4)<br>SRSP-510(5.1.2)   | Equivalent Isotropic Radiated Power  | < 2 Watts                              | PASS   | -                                       |
| 3.2            | §2.1053<br>§22.917(a)<br>§24.238(a) | RSS-132 (4.5.1)<br>RSS-133 (6.5.1) | Field Strength of Spurious Radiation | $< 43 + 10 \log_{10}(P[\text{Watts}])$ | PASS   | Under limit<br>14.97 dB at<br>11280 MHz |

# 1 General Description

## 1.1 Applicant

Motorola Mobility, Inc.

8F, No. 9, Songgao Rd., Taipei 110, Taiwan, R.O.C.

## 1.2 Manufacturer

Arima Communications Corp

6F., No. 866, Zhongjhen Rd., Zhonghe Dist., New Taipei City 23586, Taiwan

## 1.3 Feature of Equipment Under Test

| Product Feature & Specification |                                                                         |
|---------------------------------|-------------------------------------------------------------------------|
| Equipment                       | GSM / GPRS Mobile Phone                                                 |
| Brand Name                      | MOTOROLA                                                                |
| Model Name                      | W409G                                                                   |
| FCC ID                          | IHDP56LJ5                                                               |
| Tx Frequency                    | GSM850 : 824 MHz ~ 849 MHz<br>GSM1900 : 1850 MHz ~ 1910 MHz             |
| Rx Frequency                    | GSM850 : 869 MHz ~ 894 MHz<br>GSM1900 : 1930 MHz ~ 1990 MHz             |
| Maximum ERP/EIRP                | GSM850 (GSM) : 0.43 W (26.31 dBm)<br>GSM1900 (GSM) : 0.40 W (26.04 dBm) |
| Antenna Type                    | Fixed Internal Antenna                                                  |
| HW Version                      | P1                                                                      |
| SW Version                      | FINCH_G_01_38.00RP                                                      |
| Type of Modulation              | GMSK                                                                    |
| EUT Stage                       | Production Unit                                                         |

### Remark:

1. For other wireless features of this EUT, the test report will be issued separately.
2. This test report recorded only product characteristics and test results of PCS Licensed Transmitter Held to Ear (PCE).
3. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Testing Site

|                           |                                                                                                                                                                 |                                |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <b>Test Site</b>          | SPORTON INTERNATIONAL INC.                                                                                                                                      |                                |
| <b>Test Site Location</b> | No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park,<br>Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |                                |
| <b>Test Site No.</b>      | <b>Sporton Site No.</b>                                                                                                                                         | <b>FCC/IC Registration No.</b> |
|                           | 03CH07-HY                                                                                                                                                       | 722060/4086B-1                 |

## 1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC 47 CFR Part 2, 22(H), 24(E)
- ♦ ANSI / TIA / EIA-603-C-2004
- ♦ IC RSS-132 Issue 2
- ♦ IC RSS-133 Issue 5

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC), recorded in a separate test report.

## 1.6 Ancillary Equipment List

| Item | Equipment        | Trade Name | Model No. | FCC ID | Data Cable | Power Cord        |
|------|------------------|------------|-----------|--------|------------|-------------------|
| 1.   | System Simulator | R&S        | CMU200    | N/A    | N/A        | Unshielded, 1.8 m |

## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

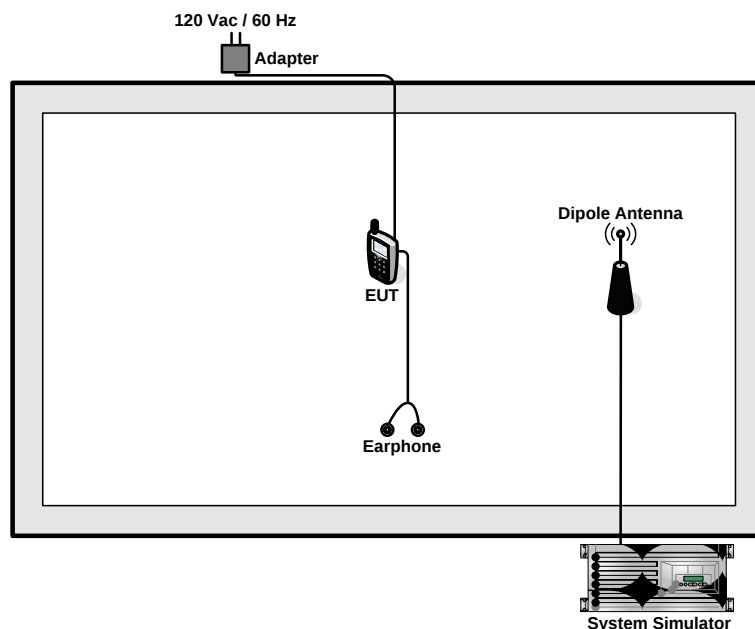
Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850.
2. 30 MHz to 19000 MHz for GSM1900.

| Test Modes |              |
|------------|--------------|
| Band       | Radiated TCs |
| GSM 850    | ■ GSM Link   |
| GSM 1900   | ■ GSM Link   |

**Note:** Because there are individual antennas for each WWAN, WLAN, and Bluetooth, the co-location test modes are not required.

### 2.2 Connection Diagram of Test System



### 3 Test Result

#### 3.1 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

##### 3.1.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 7 Watts and the EIRP of mobile transmitters are limited to 2 Watts.

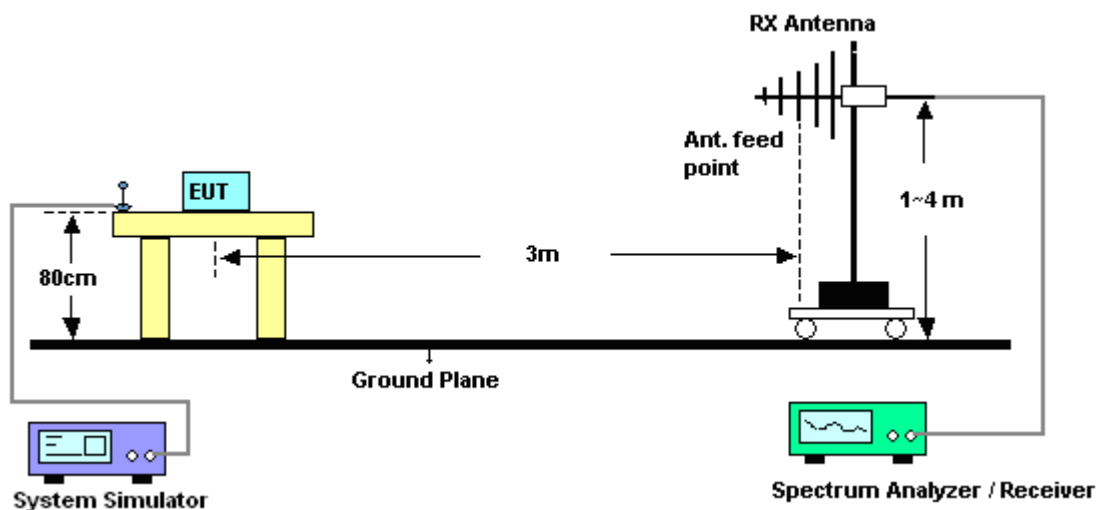
##### 3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

##### 3.1.3 Test Procedures

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz,VBW= 3MHz, and peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor,  $EIRP = LVL + \text{Correction factor}$  and  $ERP = EIRP - 2.15$ .

### 3.1.4 Test Setup



### 3.1.5 Test Result of ERP

| GSM850 (GSM) Radiated Power ERP |              |                           |              |            |
|---------------------------------|--------------|---------------------------|--------------|------------|
| Horizontal Polarization         |              |                           |              |            |
| Frequency<br>(MHz)              | LVL<br>(dBm) | Correction Factor<br>(dB) | ERP<br>(dBm) | ERP<br>(W) |
| 824.2                           | -2.72        | 30.89                     | 26.02        | 0.40       |
| 836.4                           | -2.97        | 31.13                     | 26.01        | 0.40       |
| 848.8                           | -3.16        | 31.62                     | 26.31        | 0.43       |
| Vertical Polarization           |              |                           |              |            |
| Frequency<br>(MHz)              | LVL<br>(dBm) | Correction Factor<br>(dB) | ERP<br>(dBm) | ERP<br>(W) |
| 824.2                           | -14.83       | 35.93                     | 18.95        | 0.08       |
| 836.4                           | -13.97       | 34.95                     | 18.83        | 0.08       |
| 848.8                           | -13.84       | 34.71                     | 18.72        | 0.07       |

\* ERP = LVL (dBm) + Correction Factor (dB) – 2.15

### 3.1.6 Test Result of EIRP

| GSM1900 (GSM) Radiated Power EIRP |              |                           |               |             |
|-----------------------------------|--------------|---------------------------|---------------|-------------|
| Horizontal Polarization           |              |                           |               |             |
| Frequency<br>(MHz)                | LVL<br>(dBm) | Correction Factor<br>(dB) | EIRP<br>(dBm) | EIRP<br>(W) |
| 1850.2                            | -15.20       | 41.24                     | 26.04         | 0.40        |
| 1880.0                            | -15.50       | 41.46                     | 25.96         | 0.39        |
| 1909.8                            | -15.38       | 41.21                     | 25.83         | 0.38        |
| Vertical Polarization             |              |                           |               |             |
| Frequency<br>(MHz)                | LVL<br>(dBm) | Correction Factor<br>(dB) | EIRP<br>(dBm) | EIRP<br>(W) |
| 1850.2                            | -24.98       | 43.52                     | 18.54         | 0.07        |
| 1880.0                            | -24.90       | 43.10                     | 18.20         | 0.07        |
| 1909.8                            | -24.42       | 42.73                     | 18.31         | 0.07        |

\* EIRP = LVL (dBm) + Correction Factor (dB)

**Note:** These new values are very different from the original values caused housing and touch lens had been changed.

## 3.2 Field Strength of Spurious Radiation Measurement

### 3.2.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

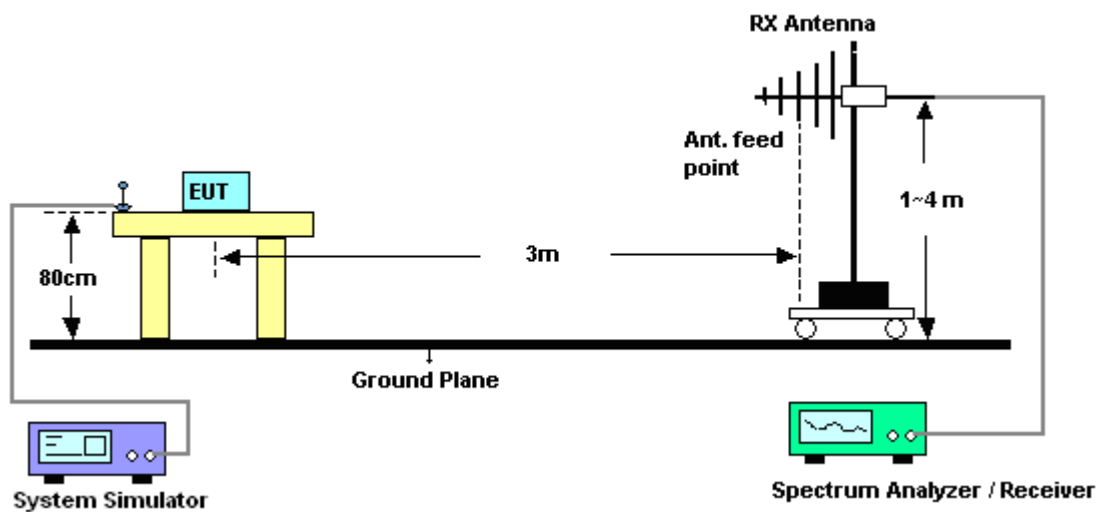
### 3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

### 3.2.3 Test Procedures

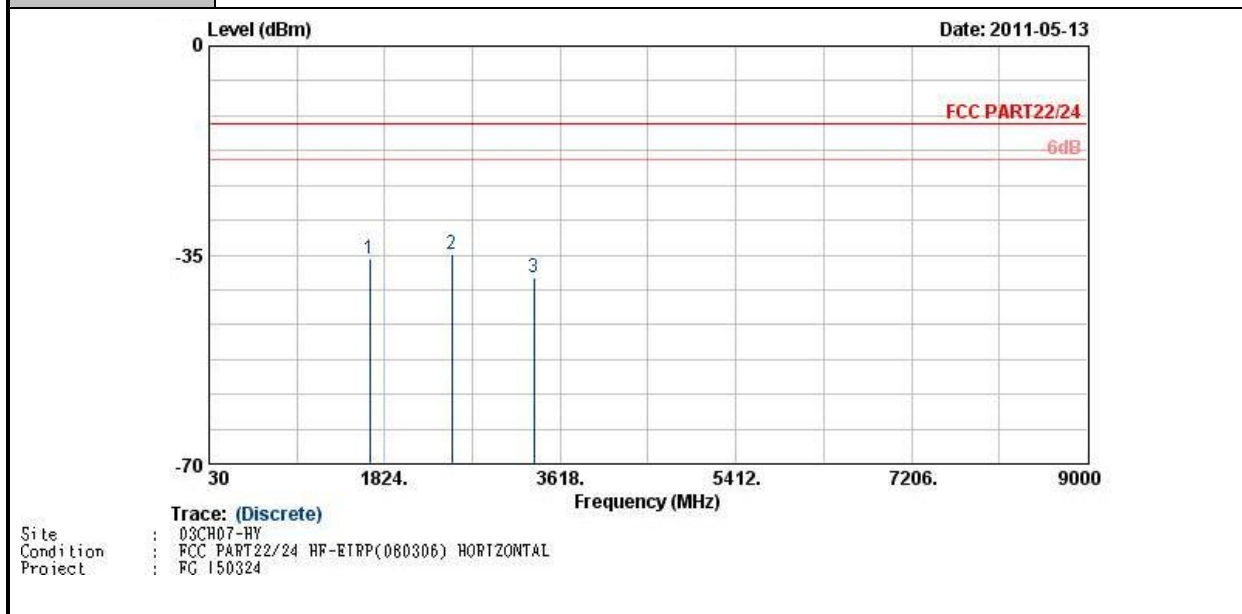
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10.  $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11.  $ERP \text{ (dBm)} = EIRP - 2.15$

### 3.2.4 Test Setup



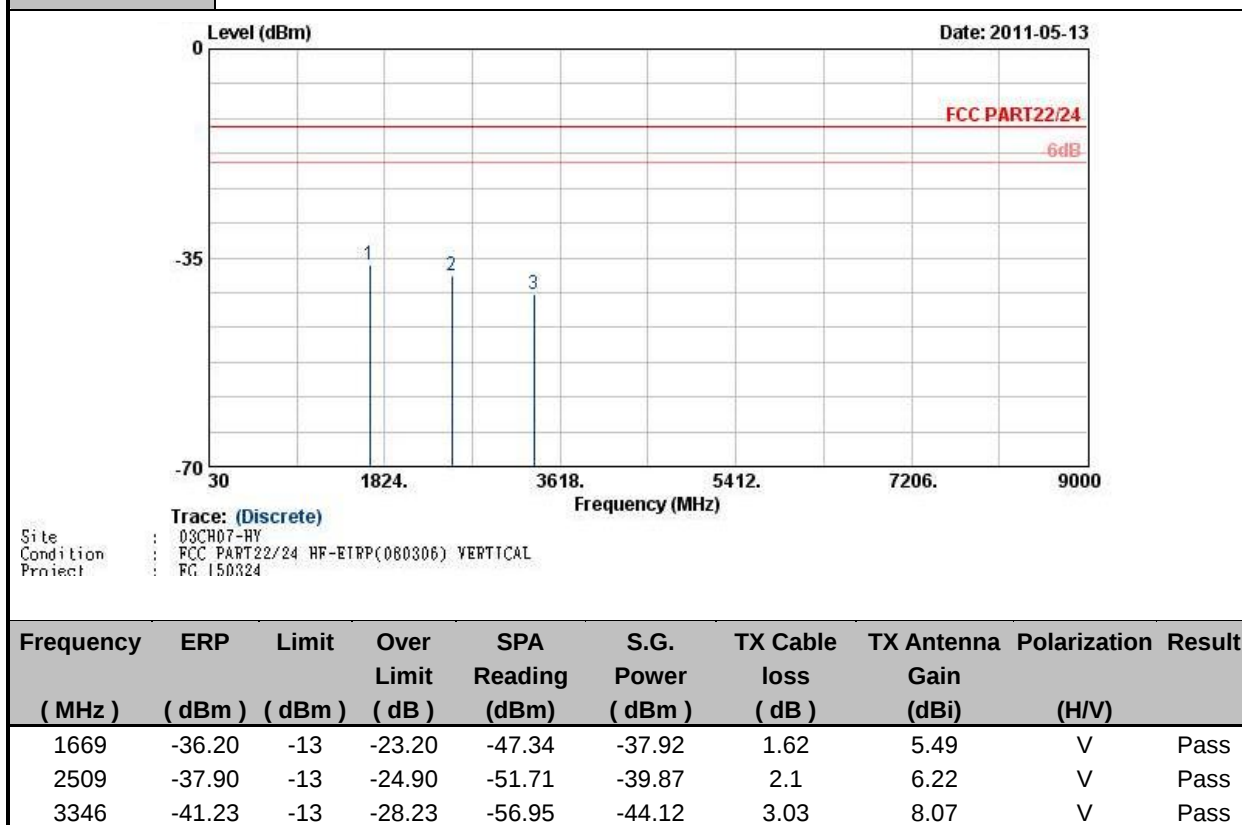
**3.2.5 Test Result of Field Strength of Spurious Radiated**

|                        |                                                                                  |                            |            |
|------------------------|----------------------------------------------------------------------------------|----------------------------|------------|
| <b>Band :</b>          | GSM850                                                                           | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Mode :</b>     | GSM Link                                                                         | <b>Relative Humidity :</b> | 50~51%     |
| <b>Test Engineer :</b> | Ivan Chiang                                                                      | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. |                            |            |

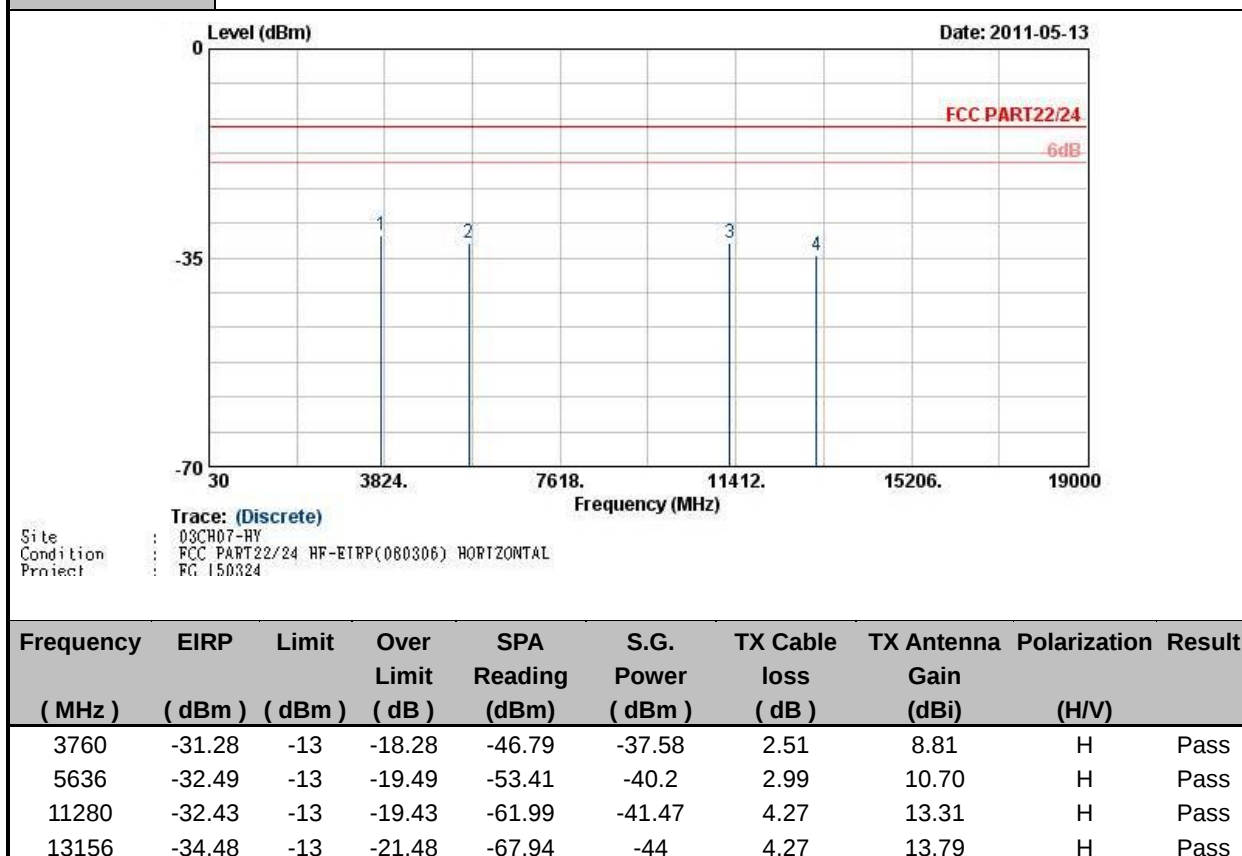


| Frequency<br>( MHz ) | ERP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | SPA<br>Reading<br>(dBm) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) | Result |
|----------------------|----------------|------------------|-------------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|--------|
| 1669                 | -35.61         | -13              | -22.61                  | -44.55                  | -37.33                   | 1.62                       | 5.49                        | H                     | Pass   |
| 2509                 | -34.81         | -13              | -21.81                  | -48.24                  | -36.78                   | 2.1                        | 6.22                        | H                     | Pass   |
| 3346                 | -38.82         | -13              | -25.82                  | -52.98                  | -41.71                   | 3.03                       | 8.07                        | H                     | Pass   |

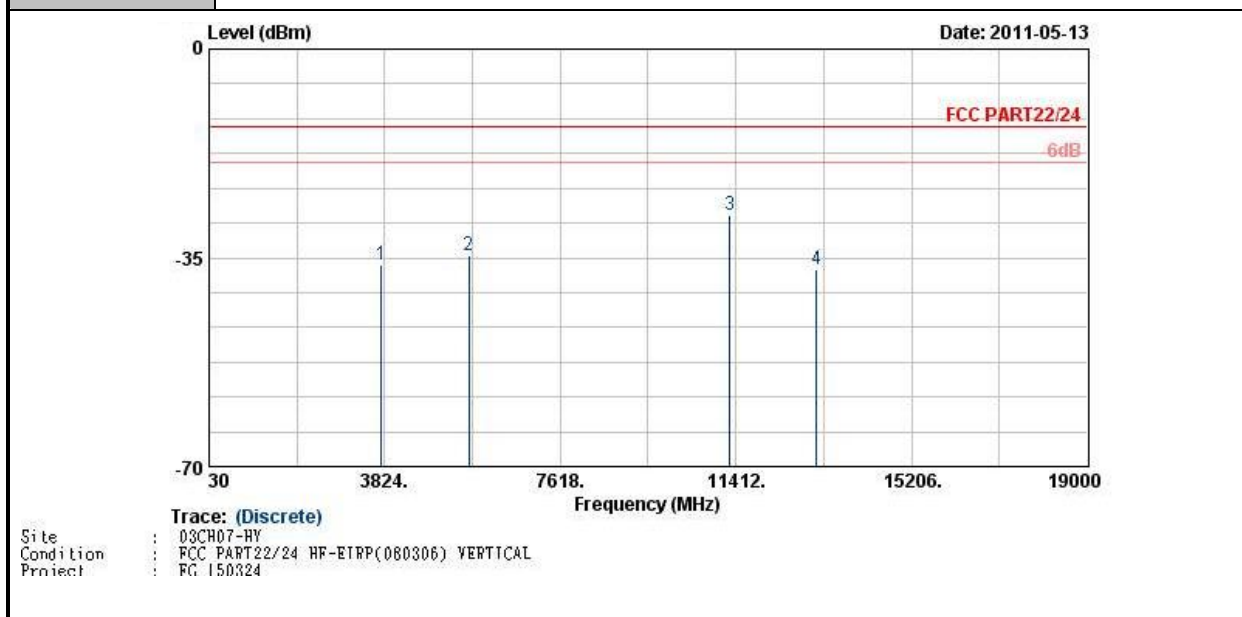
|                        |                                                                                  |                            |          |
|------------------------|----------------------------------------------------------------------------------|----------------------------|----------|
| <b>Band :</b>          | GSM850                                                                           | <b>Temperature :</b>       | 23~24°C  |
| <b>Test Mode :</b>     | GSM Link                                                                         | <b>Relative Humidity :</b> | 50~51%   |
| <b>Test Engineer :</b> | Ivan Chiang                                                                      | <b>Polarization :</b>      | Vertical |
| <b>Remark :</b>        | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. |                            |          |



|                        |                                                                                  |                            |            |
|------------------------|----------------------------------------------------------------------------------|----------------------------|------------|
| <b>Band :</b>          | GSM1900                                                                          | <b>Temperature :</b>       | 23~24°C    |
| <b>Test Mode :</b>     | GSM Link                                                                         | <b>Relative Humidity :</b> | 50~51%     |
| <b>Test Engineer :</b> | Ivan Chiang                                                                      | <b>Polarization :</b>      | Horizontal |
| <b>Remark :</b>        | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. |                            |            |



|                 |                                                                                  |                     |          |
|-----------------|----------------------------------------------------------------------------------|---------------------|----------|
| Band :          | GSM1900                                                                          | Temperature :       | 23~24°C  |
| Test Mode :     | GSM Link                                                                         | Relative Humidity : | 50~51%   |
| Test Engineer : | Ivan Chiang                                                                      | Polarization :      | Vertical |
| Remark :        | Spurious emissions within 30-1000MHz were found more than 20dB below limit line. |                     |          |



| Frequency<br>( MHz ) | EIRP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | SPA<br>Reading<br>( dBm ) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>( dBi ) | Polarization<br>( H/V ) | Result |
|----------------------|-----------------|------------------|-------------------------|---------------------------|--------------------------|----------------------------|-------------------------------|-------------------------|--------|
| 3760                 | -36.14          | -13              | -23.14                  | -52.48                    | -42.44                   | 2.51                       | 8.81                          | V                       | Pass   |
| 5636                 | -34.49          | -13              | -21.49                  | -55.11                    | -42.2                    | 2.99                       | 10.70                         | V                       | Pass   |
| 11280                | -27.97          | -13              | -14.97                  | -56.85                    | -37.01                   | 4.27                       | 13.31                         | V                       | Pass   |
| 13156                | -36.97          | -13              | -23.97                  | -68.5                     | -46.49                   | 4.27                       | 13.79                         | V                       | Pass   |

## 4 List of Measuring Equipment

| Instrument                | Manufacturer | Model No. | Serial No.      | Characteristics          | Calibration Date | Due Date      | Remark                |
|---------------------------|--------------|-----------|-----------------|--------------------------|------------------|---------------|-----------------------|
| Bilog Antenna             | SCHAFFNER    | CBL6111C  | 2726            | 30MHz ~ 1GHz             | Oct. 31, 2010    | Oct. 30, 2011 | Radiation (03CH07-HY) |
| Spectrum Analyzer         | R&S          | FSP       | 101067          | 9KHz ~ 30GHz             | Dec. 03, 2010    | Dec. 02, 2011 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO         | 3117      | 00075962        | 1GHz ~ 18GHz             | Aug. 19, 2010    | Aug. 18, 2011 | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna      | SCHWARZBECK  | BBHA 9170 | BBHA917025<br>1 | 15GHz- 40GHz             | Oct. 18, 2010    | Oct. 17, 2011 | Radiation (03CH07-HY) |
| Pre Amplifier             | Agilent      | 8449B     | 3008A02362      | 1GHz~ 26.5GHz            | Dec. 06, 2010    | Dec. 05, 2011 | Radiation (03CH07-HY) |
| Pre Amplifier             | COM-POWER    | PA-103A   | 161241          | 10-1000MHz.32dB.<br>GAIN | Mar. 29, 2011    | Mar. 28, 2012 | Radiation (03CH07-HY) |
| Loop Antenna              | R&S          | HFH2-Z2   | 860004/001      | 9 kHz~30 MHz             | Jul. 29, 2010    | Jul. 28, 2011 | Radiation (03CH07-HY) |
| System Simulator          | R&S          | CMU200    | 117591          | N/A                      | Oct. 18, 2010    | Oct. 17, 2011 | Radiation (03CH07-HY) |

## 5 Uncertainty of Evaluation

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

| Contribution                                                                             | Uncertainty of $X_i$ |                          | $u(X_i)$ |
|------------------------------------------------------------------------------------------|----------------------|--------------------------|----------|
|                                                                                          | dB                   | Probability Distribution |          |
| Receiver Reading                                                                         | 0.41                 | Normal (k=2)             | 0.21     |
| Antenna Factor Calibration                                                               | 0.83                 | Normal (k=2)             | 0.42     |
| Cable Loss Calibration                                                                   | 0.25                 | Normal (k=2)             | 0.13     |
| Pre-Amplifier Gain Calibration                                                           | 0.27                 | Normal (k=2)             | 0.14     |
| RCV/SPA Specification                                                                    | 2.50                 | Rectangular              | 0.72     |
| Antenna Factor Interpolation for Frequency                                               | 1.00                 | Rectangular              | 0.29     |
| Site Imperfection                                                                        | 1.43                 | Rectangular              | 0.83     |
| Mismatch                                                                                 | +0.39 / -0.41        | U-Shape                  | 0.28     |
| <b>Combined Standard Uncertainty <math>U_c(y)</math></b>                                 | <b>1.27</b>          |                          |          |
| <b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b> | <b>2.54</b>          |                          |          |

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

| Contribution                                                                                                                  | Uncertainty of $X_i$ |                          | $u(X_i)$ | $C_i$ | $C_i * u(X_i)$ |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|----------|-------|----------------|
|                                                                                                                               | dB                   | Probability Distribution |          |       |                |
| Receiver Reading                                                                                                              | $\pm 0.10$           | Normal (k=2)             | 0.10     | 1     | 0.10           |
| Antenna Factor Calibration                                                                                                    | $\pm 1.70$           | Normal (k=2)             | 0.85     | 1     | 0.85           |
| Cable Loss Calibration                                                                                                        | $\pm 0.50$           | Normal (k=2)             | 0.25     | 1     | 0.25           |
| Receiver Correction                                                                                                           | $\pm 2.00$           | Rectangular              | 1.15     | 1     | 1.15           |
| Antenna Factor Directional                                                                                                    | $\pm 1.50$           | Rectangular              | 0.87     | 1     | 0.87           |
| Site Imperfection                                                                                                             | $\pm 2.80$           | Triangular               | 1.14     | 1     | 1.14           |
| Mismatch<br>Receiver VSWR $\Gamma_1 = 0.197$<br>Antenna VSWR $\Gamma_2 = 0.194$<br>Uncertainty = $20\log(1-\Gamma_1\Gamma_2)$ | +0.34 / -0.35        | U-Shape                  | 0.244    | 1     | 0.244          |
| <b>Combined Standard Uncertainty <math>U_c(y)</math></b>                                                                      | <b>2.36</b>          |                          |          |       |                |
| <b>Measuring Uncertainty for a Level of Confidence of 95% (<math>U = 2U_c(y)</math>)</b>                                      | <b>4.72</b>          |                          |          |       |                |



## **Appendix A. Product Equality Declaration**



Arima Communications Corp.  
6F., No.866, Jhongjheng Rd.,  
Jhonghe Dist., New Taipei  
City 23586, Taiwan  
<http://www.arimacomm.com.tw>

Date: 2011/05/23

### GSM/GPRS Mobile phone

#### Subject: Declaration of Hardware Version Change

(Declaration of equality of a product variant with a previously assessed original product. To be signed in the name of the company that is responsible for the product variant.)

**We, Arima Communications Corp, declare on our sole responsibility that the product (variant)**

*GSM/GPRS Mobile phone, model W409G HW Version: P1*

*(Marketing band: Motorola)*

*GSM/GPRS Mobile phone, model W409G HW Version: P1*

*(Marketing band: Motorola)*

**is in all relevant parts identical to the product**

*GSM/GPRS Mobile Phone, model W418G, Version: PCR*

*(Marketing band: Motorola)*

*GSM/GPRS Mobile phone, model W418G, Version: PCR*

*(Marketing band: Motorola)*

The differences between HW versions W418G & W409G are.

**-Change Housing**

**-Change keypad**

**-Change Lens**

**-Change Flash memory size up to 256Mb**

Signature

Michael Lu/ Manager (Date: May 23, 2011)

Company: Arima Communications Corp.

Address: 6F., No.866, Jhongjheng Rd., Jhonghe Dist., New Taipei City 23586, Taiwan

Tel.: +886-2-8227-7755 ; Fax: +886-2-8227-5533



**Arima Communications Corp.**

6F., No.866, Jhongjheng Rd.,  
Jhonghe Dist., New Taipei  
City 23586, Taiwan

<http://www.arimacomm.com.tw>

-----  
Date: 2011/05/23

GSM/GPRS Mobile phone

-----  
**Subject: Declaration of Software Version Change**

-----  
(Declaration of equality of a product variant with a previously assessed original product. To be signed in the name of the company that is responsible for the product variant.)

**We, Arima Communications Corp, declare on our sole responsibility that the product .**

**Variant PRODUCT INFORMATION**

Request #: 26184

Model #: W409G

HW Version: P1

SW Version: FINCH\_G\_01\_38.00RP

SVN: 21

**PARENT PRODUCT INFORMATION**

Parent Request #:24503

Parent Model #: WX345, W418G

Parent HW Version: PCR

Parent SW Version: FINCH\_G\_01.32.00R

Parent SVN: 11

Parent Date Certified: 12/15/2010

**Description of Change**

SW upgrades for customer requirement.

Signature

Michael Lu/ Manager (Date: May 23, 2011)

Company: Arima Communications Corp.

Address: 6F., No.866, Jhongjheng Rd., Jhonghe Dist., New Taipei City 23586, Taiwan

Tel.: +886-2-8227-7755 ; Fax: +886-2-8227-5533



## Software Version Change Note

Software change history is list below,

| SW Version        | svn | Date       | Description                                                                                                                                                                               |
|-------------------|-----|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FINCH_G_01.32.00R |     | 2010/11/30 | modify ATT SVN to 11                                                                                                                                                                      |
| FINCH_G_01.32.00R | 11  | 2010/12/1  |                                                                                                                                                                                           |
|                   |     | 2010/12/2  | [Aircom 5680] [ATT 129938] GSM-BTR-1-1766 - WAP Browser: non-trusted cert message when launching "GeoTrust Global CA with Equifax SCA cross root and GeoTrust SSL CA intermediate (SHA1)" |
|                   |     | 2010/12/2  | [Aircom 5678] [ATT 129936] GSM-BTR-1-1111 - Miscellaneous Features: TU does not permit enabling bluetooth radio independent from other raidios                                            |
|                   |     | 2010/12/2  | [Aircom 5677] [ATT 129940] GSM-BTR-1-1766 - WAP Browser: non-trusted cert message when launching "GlobalSign" SSL links                                                                   |
| FINCH_G_01.33.00R |     | 2011/2/10  | Video playback causes audio to stop after 7 seconds                                                                                                                                       |
| FINCH_G_01.34.00R |     | 2011/1/23  | 33 out of 20k units occur high standby current drain.                                                                                                                                     |
| FINCH_G_01.35.00R | 17  | 2011/3/28  | Default video capture resolution:<br>Set this to medium instead of high so it can store longer videos (CC does not ship with memory cards)                                                |
|                   |     |            | Add MMAA patch from MTK to support MMAA feature(security requirement2.5.5)                                                                                                                |
|                   |     |            | Porting the patch for security band removal to meet security requirement2.6.9                                                                                                             |
|                   |     |            | Fix the cross flashing issue reported by Moto security team.                                                                                                                              |
|                   |     |            | Merge bootloader patch from MTK as MTK suggestion.                                                                                                                                        |
|                   |     |            | Add patch for removing K3 code from source code to meet Moto security requirement.                                                                                                        |
|                   |     |            | Display the volume icon on sub-lcd when pressing side-key at clamshell close state.                                                                                                       |
|                   |     |            | Modify develop key from ALLMOTOPROJECTTESTKEY to MOTDEVARIMA000002 to meet Moto security requirement.                                                                                     |
|                   |     | 2011/4/1   | Implement OTP(one time program) function for spanion memory to meet Moto security requirement.                                                                                            |
|                   |     |            | Modify SMS max value from 100 to 500                                                                                                                                                      |
|                   |     |            | Porting official MTK spanion memory driver patch                                                                                                                                          |

**Arima Communications Corp.**

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City 23586, Taiwan

<http://www.arimacomm.com.tw>

|                    |    |           |                                                                                                                                                                                  |
|--------------------|----|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |    |           | Change production model string from "MODEL:8202" to "MODEL:8226"                                                                                                                 |
|                    |    |           | Increase user memory from 3MB to 13.5MB                                                                                                                                          |
|                    |    |           | Update SVN number to 17.                                                                                                                                                         |
|                    |    |           | Set corresponding acoustic parameter by different model ID                                                                                                                       |
| FINCH_G_01_35.01RP | 21 | 2011/4/6  | Add compile switch for building TMOBILE version in building file.                                                                                                                |
|                    |    |           | Modify SVN number to 21.                                                                                                                                                         |
|                    |    |           | Modify bps setting to improve video performance                                                                                                                                  |
| FINCH_G_01_36.00RP | 21 | 2011/4/8  | change the bps for low and normal quality to improve video performance                                                                                                           |
|                    |    |           | Porting security tool and AT command function patch to reset retry count and timeout value to meet Moto security requirement.                                                    |
|                    |    |           | Separate USB download key and PPE key to meet security requirement.                                                                                                              |
| FINCH_G_01_37.00RP | 21 | 2011/4/13 | Store PPE K3 key in protected nvram to meet Moto security requirement.                                                                                                           |
|                    |    |           | Enable the voice mail menu item for Non-TF versions to fix DOT-5008.                                                                                                             |
|                    |    |           | Limit the video recording time when recording video to phone memory.                                                                                                             |
|                    |    |           | Remove prompt for storage type change when first power on and after factory reset to fix FLO-634.                                                                                |
| FINCH_G_01_38.00RP | 21 | 2011/4/19 | Fix a bug found in the security test for "security requirement v2.2 -- item 2.4.2.1", the device will check the unlock code every time the device powers up for TracFone custom. |

Signature

Xiang Zhu / SW PM (Date: May 23, 2011)

Company: Arima Communications Corp.

Address: 6F., No.866, Jhongheng Rd., Jhonghe Dist., New Taipei City 23586, Taiwan

Tel.: +886-2-8227-7755 ; Fax: +886-2-8227-5533



## **Appendix B. Original Report**

Please refer to CCS report number T101008002-RP1 as below.



**FCC 47 CFR PART 22 SUBPART H AND PART 24 SUBPART E  
(Class II Permissive Change)**

**TEST REPORT**

**For**

**Mobile Phone**

**Model: W418G, WX345**

**Trade Name: MOTOROLA**

*Issued to*

**Motorola Inc.  
600 N. U.S. Highway 45 Libertyville,  
Illinois United states 60048-5343**

*Issued by*



**Compliance Certification Services Inc.  
No. 11, Wu-Gong 6<sup>th</sup> Rd., Wugu Industrial Park,  
Taipei Hsien 248, Taiwan (R.O.C.)  
<http://www.ccsrf.com>  
[service@ccsrf.com](mailto:service@ccsrf.com)**



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## 1. TEST RESULT CERTIFICATION

**Applicant:** Motorola Inc.  
600 N. U.S. Highway 45 Libertyville,  
Illinois United states 60048-5343

**Equipment Under Test:** Mobile Phone

**Trade Name:** MOTOROLA

**Model Number:** W418G, WX345

**Date of Test:** October 15 ~ 19, 2010

| APPLICABLE STANDARDS                                  |                         |
|-------------------------------------------------------|-------------------------|
| STANDARD                                              | TEST RESULT             |
| FCC 47 CFR Part 22 Subpart H And<br>Part 24 Subpart E | No non-compliance noted |

### We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. 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 FCC PART 22 Subpart H and PART 24 Subpart E.

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

Approved by:

Rex Lai  
Section Manager  
Compliance Certification Services Inc.

Reviewed by:

Gina Lo  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

|                                                  |                                                                                                                                                                                                                                                                                |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product</b>                                   | Mobile Phone                                                                                                                                                                                                                                                                   |
| <b>Trade Name</b>                                | MOTOROLA                                                                                                                                                                                                                                                                       |
| <b>Model Number</b>                              | W418G, WX345                                                                                                                                                                                                                                                                   |
| <b>Model Discrepancy</b>                         | All the specification and layout are identical except they come with different model numbers for marketing purposes.                                                                                                                                                           |
| <b>EUT Power Rating</b>                          | <ol style="list-style-type: none"><li>1. Powered by Power Adapter<br/>MOTOROLA / DCH3-050US-0303<br/>I/P: 100-240V, 50-60Hz, 0.2A<br/>O/P: 5.0V, 550mA</li><li>2. Powered from host device via USB cable</li><li>3. Battery<br/>Model: BQ50<br/>Rating: 3.4V, 910mAh</li></ol> |
| <b>Frequency Range</b>                           | GSM / GPRS: 850: 824.2 ~ 848.8 MHz<br>GSM / GPRS: 1900: 1850.2 ~ 1909.8 MHz                                                                                                                                                                                                    |
| <b>Transmit Power<br/>(ERP &amp; EIRP Power)</b> | GSM 850: 31.00dBm<br>GSM 1900: 31.14dBm<br>GPRS 850: 30.26 dBm<br>GPRS 1900: 31.22 dBm                                                                                                                                                                                         |
| <b>Modulation Technique</b>                      | GSM: GMSK<br>GPRS: GMSK                                                                                                                                                                                                                                                        |
| <b>Type of Emission</b>                          | GSM 850 MHz: 251KGXW---<br>GSM 1900 MHz: 251KGXW---<br>GPRS 850 MHz: 248KGXW---<br>GPRS 1900 MHz: 248KGXW---                                                                                                                                                                   |
| <b>Antenna Gain</b>                              | GSM / GPRS 850 MHz: -4.5 dBi<br>GSM / GPRS 1900 MHz: -4.1 dBi                                                                                                                                                                                                                  |
| <b>Antenna Type</b>                              | Embedded inverted-F antenna                                                                                                                                                                                                                                                    |
| <b>Class II Permissive Change</b>                | Due to we change the GSM antenna (Antenna Type: Inverted-F antenna, Manufacturer: Arima Communications Corp., antenna gain: GSM 850 -4.5 dBi ; GSM 1900 -4.1 dBi, we re-evaluate the RF measurement and submit for a class II permissive change review.                        |

**Remark:** This submittal(s) (test report) is intended for FCC ID: IHDP56LJ5 filing to comply with Part 22 and Part 24 of the FCC 47 CFR Rules.



### **3. TEST METHODOLOGY**

Both conducted and radiated testing were performed according to the procedures document on chapter 13 of ANSI C63.4: 2003, TIA/EIA-603-C: 2004 and FCC CFR 47, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

#### **3.1 EUT CONFIGURATION**

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

#### **3.2 EUT EXERCISE**

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

### **3.3 GENERAL TEST PROCEDURES**

#### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-peak and average detector modes.

#### **Radiated Emissions**

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable 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 maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2003.



### **3.4 DESCRIPTION OF TEST MODES**

The EUT (model: W418G) had been tested under operating condition.

EUT staying in continuous transmitting mode was programmed.

GSM / GPRS 850:

Channel Low (CH128), Channel Mid (CH190) and Channel High (CH251) were chosen for full testing.

GSM / GPRS 1900:

Channel Low (CH512), Channel Mid (CH661) and Channel High (CH810) were chosen for full testing.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz only.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.



## 4 INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

**Remark:** Each piece of equipment is scheduled for calibration once a year and Loop Antenna is scheduled for calibration once three years.

| 3M Semi Anechoic Chamber |                    |                          |               |                 |
|--------------------------|--------------------|--------------------------|---------------|-----------------|
| Name of Equipment        | Manufacturer       | Model                    | Serial Number | Calibration Due |
| Spectrum Analyzer        | Agilent            | E4446A                   | US42510252    | 10/26/2010      |
| EMI Test Receiver        | R&S                | ESCI                     | 100064        | 02/04/2011      |
| Pre-Amplifier            | Mini-Circuits      | ZFL-1000LN               | SF350700823   | 01/13/2011      |
| Pre-Amplifier            | MITEQ              | AFS44-00102650-42-10P-44 | 1415367       | 11/20/2010      |
| Bilog Antenna            | Sunol Sciences     | JB3                      | A030105       | 09/10/2011      |
| Horn Antenna             | EMCO               | 3117                     | 00055165      | 12/07/2010      |
| Loop Antenna             | EMCO               | 6502                     | 8905/2356     | 06/10/2013      |
| Turn Table               | CCS                | CC-T-1F                  | N/A           | N.C.R           |
| Antenna Tower            | CCS                | CC-A-1F                  | N/A           | N.C.R           |
| Controller               | CCS                | CC-C-1F                  | N/A           | N.C.R           |
| Site NSA                 | CCS                | N/A                      | N/A           | 12/31/2010      |
| Test S/W                 | EZ-EMC (CCS-3A1RE) |                          |               |                 |



#### 4.3 MEASUREMENT UNCERTAINTY

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| 3M Semi Anechoic Chamber / 30M~200M   | +/-3.9944   |
| 3M Semi Anechoic Chamber / 200M~1000M | +/-3.9285   |
| 3M Semi Anechoic Chamber / 1G~8G      | +/-2.4734   |
| 3M Semi Anechoic Chamber / 8G~18G     | +/-2.4878   |
| 3M Semi Anechoic Chamber / 18G~26G    | +/-2.6215   |
| 3M Semi Anechoic Chamber / 26G~40G    | +/-2.8603   |

**Remark:** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .



## **5 FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

☐ No. 199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No. No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

### **5.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

**5.3 TABLE OF ACCREDITATIONS AND LISTINGS**

| Country | Agency          | Scope of Accreditation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Logo                                                                                                              |
|---------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| USA     | FCC             | 3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <br>FCC MRA: TW1039            |
| Taiwan  | TAF             | LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310<br>IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17<br>FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959<br>FCC Method -47 CFR Part 15 Subpart B<br>IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11 | <br>Testing Laboratory<br>1309 |
| Canada  | Industry Canada | 3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <br>IC 2324G-1<br>IC 2324G-2   |

\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



## 6 SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

| No. | Device Type                                         | Brand | Model  | Series No. | FCC ID | Data Cable | Power Cord       |
|-----|-----------------------------------------------------|-------|--------|------------|--------|------------|------------------|
| 1.  | Universal Radio<br>Communication Tester<br>(Remote) | R&S   | CMU200 | N/A        | 101245 | N/A        | Unshielded, 1.8m |

**Remark:**

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*



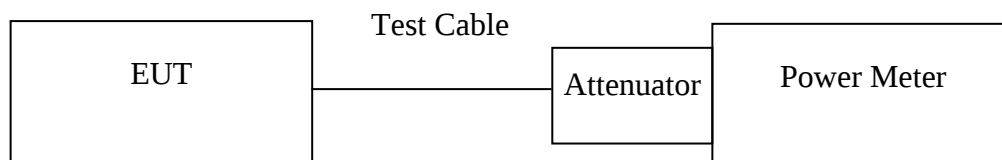
## 7 FCC PART 22 & 24 REQUIREMENTS

### 7.1 PEAK POWER

#### LIMIT

According to FCC §2.1046.

#### Test Configuration



*Remark: Measurement setup for testing on Antenna connector*

#### TEST 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.

#### TEST RESULTS

*No non-compliance noted.*

**Test Data**

| Test Mode           | CH  | Frequency (MHz) | Peak Power (dBm) | Output Power W |
|---------------------|-----|-----------------|------------------|----------------|
| GSM 850 (Class 10)  | 128 | 824.20          | 32.40            | 1.7378         |
|                     | 190 | 836.40          | 32.80            | 1.9055         |
|                     | 251 | 848.80          | 33.00            | 1.9953         |
| GPRS 850 (Class 10) | 128 | 824.20          | 31.80            | 1.5136         |
|                     | 190 | 836.40          | 32.00            | 1.5849         |
|                     | 251 | 848.80          | 32.30            | 1.6982         |

| Test Mode            | CH  | Frequency (MHz) | Peak Power (dBm) | Output Power W |
|----------------------|-----|-----------------|------------------|----------------|
| GSM 1900 (Class 10)  | 512 | 1850.20         | 29.30            | 0.8511         |
|                      | 661 | 1880.00         | 29.90            | 0.9772         |
|                      | 810 | 1909.80         | 30.00            | 1.0000         |
| GPRS 1900 (Class 10) | 512 | 1850.20         | 27.80            | 0.6026         |
|                      | 661 | 1880.00         | 28.30            | 0.6761         |
|                      | 810 | 1909.80         | 28.50            | 0.7079         |

**Remark:** The value of factor includes both the loss of cable and external attenuator

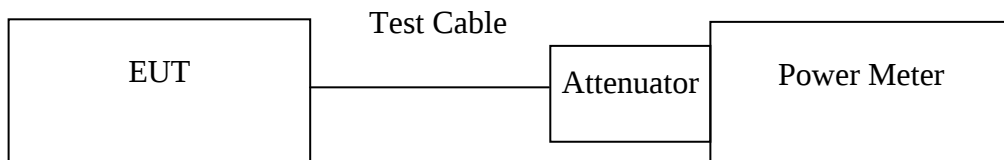


## 7.2 AVERAGE POWER

### LIMIT

For reporting purposes only.

### Test Configuration



*Remark: Measurement setup for testing on Antenna connector*

### TEST 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.

### TEST RESULTS

*No non-compliance noted.*



## **TEST RESULTS**

*No non-compliance noted.*

### **Test Data**

| Test Mode           | CH  | Frequency (MHz) | AVG Power (dBm) | Output Power W |
|---------------------|-----|-----------------|-----------------|----------------|
| GSM 850 (Class 10)  | 128 | 824.20          | 32.30           | 1.6982         |
|                     | 190 | 836.40          | 32.61           | 1.8239         |
|                     | 251 | 848.80          | 32.86           | 1.9320         |
| GPRS 850 (Class 10) | 128 | 824.20          | 31.50           | 1.4125         |
|                     | 190 | 836.40          | 31.82           | 1.5205         |
|                     | 251 | 848.80          | 32.10           | 1.6218         |

| Test Mode            | CH  | Frequency (MHz) | AVG Power (dBm) | Output Power W |
|----------------------|-----|-----------------|-----------------|----------------|
| GSM 1900 (Class 10)  | 512 | 1850.20         | 29.20           | 0.8318         |
|                      | 661 | 1880.00         | 29.80           | 0.9550         |
|                      | 810 | 1909.80         | 29.63           | 0.9183         |
| GPRS 1900 (Class 10) | 512 | 1850.20         | 27.60           | 0.5754         |
|                      | 661 | 1880.00         | 28.10           | 0.6457         |
|                      | 810 | 1909.80         | 28.40           | 0.6918         |

**Remark:** The value of factor includes both the loss of cable and external attenuator



## 7.3 ERP & EIRP MEASUREMENT

### LIMIT

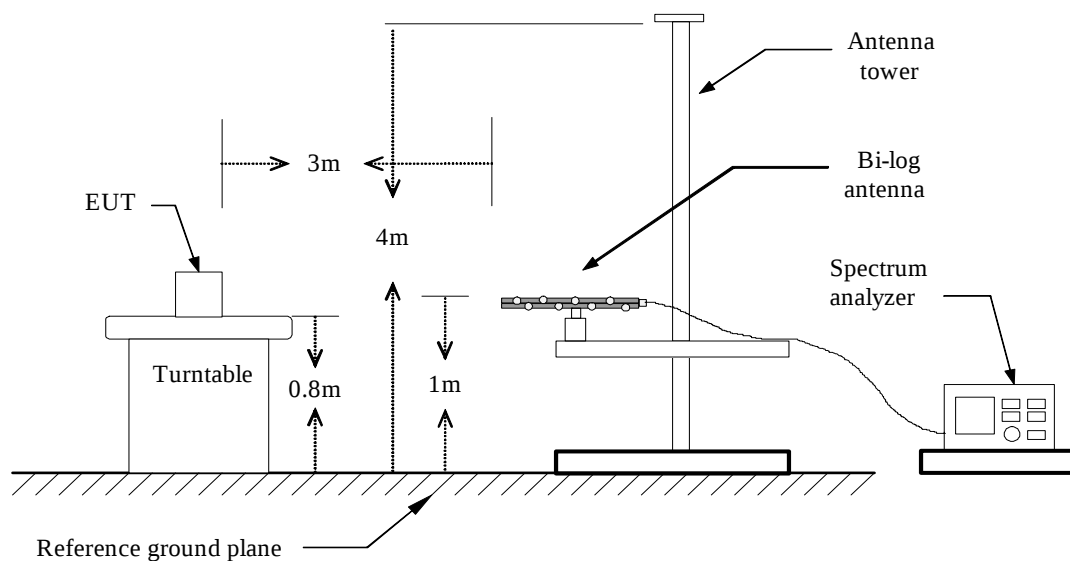
According to FCC §2.1046

FCC 22.913(b): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

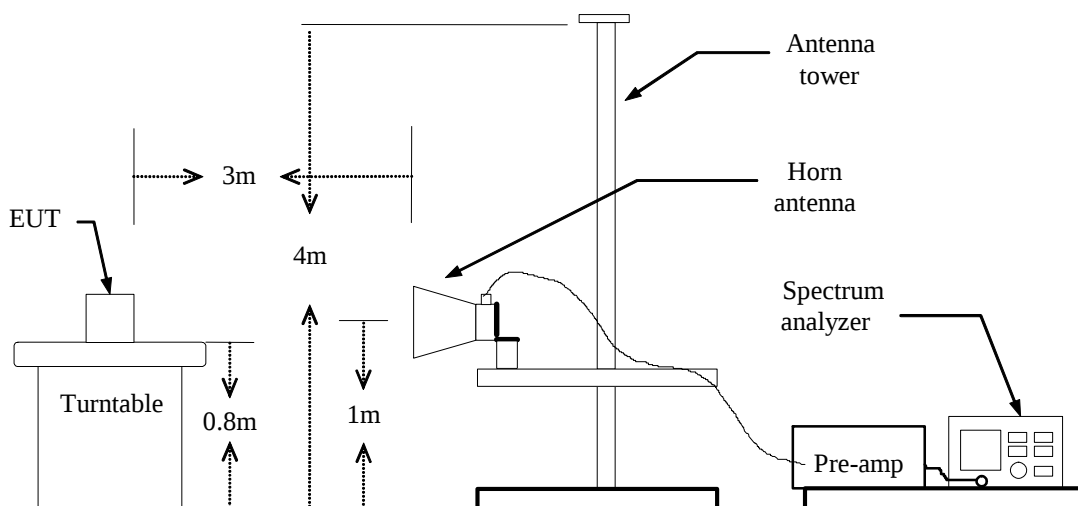
FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

### TEST CONFIGURATION

#### Below 1 GHz

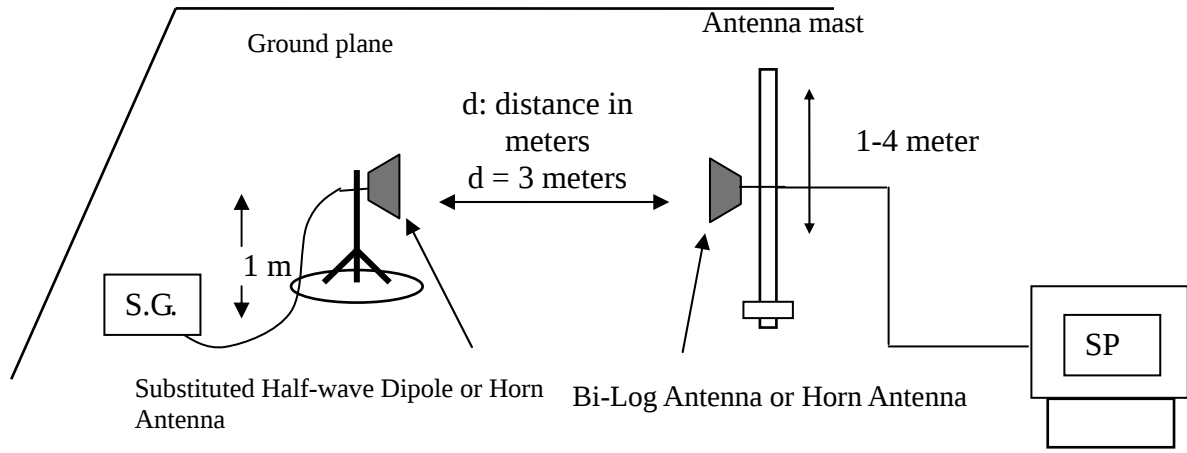


#### Above 1 GHz





## For Substituted Method Test Set-UP



## TEST PROCEDURE

The EUT was placed on an 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 of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

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

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

**TEST RESULTS***No non-compliance noted.***GSM 850 Test Data**

| EUT Pol. | Channel | Frequency (MHz) | Antenna Pol. | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|----------|---------|-----------------|--------------|---------------------|------------------------|----------------------|-------------|-------------|
| X        | 128     | 824.30          | V            | -20.05              | 34.62                  | 14.56                | 38.45       | -23.89      |
|          |         | 824.30          | H            | -4.26               | 34.65                  | 30.38                | 38.45       | -8.07       |
|          | 190     | 836.66          | V            | -19.49              | 34.53                  | 15.04                | 38.45       | -23.41      |
|          |         | 836.66          | H            | -3.63               | 34.63                  | <b>*31.00</b>        | 38.45       | -7.45       |
|          | 251     | 848.84          | V            | -19.87              | 34.64                  | 14.77                | 38.45       | -23.68      |
|          |         | 848.84          | H            | -4.05               | 34.75                  | 30.70                | 38.45       | -7.75       |
| Y        | 128     | 824.18          | V            | -14.47              | 34.62                  | 20.15                | 38.45       | -18.30      |
|          |         | 824.30          | H            | -4.77               | 34.65                  | 29.88                | 38.45       | -8.57       |
|          | 190     | 836.66          | V            | -14.54              | 34.53                  | 19.99                | 38.45       | -18.51      |
|          |         | 836.78          | H            | -5.94               | 34.63                  | 28.69                | 38.45       | -9.76       |
|          | 251     | 848.84          | V            | -18.30              | 34.63                  | 16.33                | 38.45       | -22.17      |
|          |         | 848.84          | H            | -5.60               | 34.75                  | 29.15                | 38.45       | -9.30       |
| Z        | 128     | 824.48          | V            | -6.16               | 34.62                  | 28.48                | 38.45       | -9.99       |
|          |         | 824.06          | H            | -20.77              | 34.65                  | 13.87                | 38.45       | -24.58      |
|          | 190     | 836.66          | V            | -6.43               | 34.53                  | 28.10                | 38.45       | -10.35      |
|          |         | 836.66          | H            | -20.89              | 34.63                  | 13.74                | 38.45       | -24.71      |
|          | 251     | 848.78          | V            | -6.51               | 34.64                  | 28.13                | 38.45       | -10.32      |
|          |         | 848.78          | H            | -21.14              | 34.75                  | 13.61                | 38.45       | -24.84      |

**GPRS 850 Test Data (Class 10)**

| EUT Pol. | Channel | Frequency (MHz) | Antenna Pol. | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|----------|---------|-----------------|--------------|---------------------|------------------------|----------------------|-------------|-------------|
| X        | 128     | 824.30          | V            | -17.09              | 34.62                  | 17.53                | 38.45       | -20.92      |
|          |         | 824.30          | H            | -5.35               | 34.65                  | 29.30                | 38.45       | -9.15       |
|          | 190     | 836.66          | V            | -15.48              | 34.53                  | 19.04                | 38.45       | -19.41      |
|          |         | 836.66          | H            | -4.37               | 34.63                  | <b>*30.26</b>        | 38.45       | -8.19       |
|          | 251     | 848.84          | V            | -16.77              | 34.64                  | 17.87                | 38.45       | -20.58      |
|          |         | 848.84          | H            | -5.10               | 34.75                  | 29.65                | 38.45       | -8.80       |
| Y        | 128     | 824.18          | V            | -13.73              | 34.62                  | 20.89                | 38.45       | -17.56      |
|          |         | 824.30          | H            | -5.07               | 34.65                  | 29.58                | 38.45       | -8.87       |
|          | 190     | 836.66          | V            | -14.11              | 34.53                  | 20.42                | 38.45       | -18.03      |
|          |         | 836.78          | H            | -4.06               | 34.63                  | 28.57                | 38.45       | -9.88       |
|          | 251     | 848.84          | V            | -14.31              | 34.64                  | 20.33                | 38.45       | -18.12      |
|          |         | 848.84          | H            | -5.72               | 34.75                  | 29.03                | 38.45       | -9.42       |
| Z        | 128     | 824.48          | V            | -7.24               | 34.62                  | 27.37                | 38.45       | -11.08      |
|          |         | 824.06          | H            | -18.82              | 34.65                  | 15.82                | 38.45       | -22.68      |
|          | 190     | 836.66          | V            | -6.61               | 34.53                  | 27.92                | 38.45       | -10.53      |
|          |         | 836.66          | H            | -20.58              | 34.63                  | 14.05                | 38.45       | -24.45      |
|          | 251     | 848.78          | V            | -7.18               | 34.64                  | 27.46                | 38.45       | -10.99      |
|          |         | 848.78          | H            | -20.20              | 34.75                  | 14.55                | 38.45       | -23.90      |

**GSM 1900 Test Data**

| EUT Pol. | Channel | Frequency (MHz) | Antenna Pol. | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|----------|---------|-----------------|--------------|---------------------|------------------------|----------------------|-------------|-------------|
| X        | 512     | 1850.10         | V            | -20.27              | 41.17                  | 20.90                | 33.00       | -12.10      |
|          |         | 1850.20         | H            | -10.53              | 40.79                  | 30.26                | 33.00       | -2.74       |
|          | 661     | 1880.00         | V            | -21.52              | 41.23                  | 19.71                | 33.00       | -13.29      |
|          |         | 1879.80         | H            | -11.69              | 41.14                  | 29.45                | 33.00       | -3.55       |
|          | 810     | 1909.70         | V            | -21.88              | 41.30                  | 19.42                | 33.00       | -13.58      |
|          |         | 1909.90         | H            | -10.24              | 41.38                  | <b>*31.14</b>        | 33.00       | -1.86       |
| Y        | 512     | 1850.10         | V            | -11.83              | 41.17                  | 29.34                | 33.00       | -3.66       |
|          |         | 1850.00         | H            | -15.08              | 40.79                  | 25.71                | 33.00       | -7.29       |
|          | 661     | 1880.00         | V            | -11.91              | 41.23                  | 29.31                | 33.00       | -3.69       |
|          |         | 1879.80         | H            | -16.06              | 41.14                  | 25.08                | 33.00       | -7.92       |
|          | 810     | 1909.90         | V            | -12.48              | 41.30                  | 28.82                | 33.00       | -4.18       |
|          |         | 1909.90         | H            | -15.81              | 41.38                  | 25.56                | 33.00       | -7.44       |
| Z        | 512     | 1850.10         | V            | -13.07              | 41.17                  | 28.10                | 33.00       | -4.90       |
|          |         | 1850.10         | H            | -16.84              | 40.79                  | 23.95                | 33.00       | -9.05       |
|          | 661     | 1880.00         | V            | -12.37              | 41.23                  | 28.86                | 33.00       | -4.14       |
|          |         | 1880.00         | H            | -16.95              | 41.14                  | 24.19                | 33.00       | -8.81       |
|          | 810     | 1909.70         | V            | -12.86              | 41.30                  | 28.44                | 33.00       | -4.56       |
|          |         | 1909.70         | H            | -15.75              | 41.38                  | 25.63                | 33.00       | -7.37       |

**GPRS 1900 Test Data (Class 10)**

| EUT Pol. | Channel | Frequency (MHz) | Antenna Pol. | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|----------|---------|-----------------|--------------|---------------------|------------------------|----------------------|-------------|-------------|
| X        | 512     | 1850.10         | V            | -17.36              | 41.17                  | 23.81                | 33.00       | -919        |
|          |         | 1850.20         | H            | -9.57               | 40.79                  | <b>*31.22</b>        | 33.00       | -1.78       |
|          | 661     | 1880.00         | V            | -17.84              | 41.23                  | 23.39                | 33.00       | -9.61       |
|          |         | 1879.80         | H            | -11.03              | 41.14                  | 30.11                | 33.00       | -2.89       |
|          | 810     | 1909.70         | V            | -17.99              | 41.30                  | 23.31                | 33.00       | -9.69       |
|          |         | 1909.90         | H            | -12.10              | 41.38                  | 30.28                | 33.00       | -2.72       |
| Y        | 512     | 1850.10         | V            | -11.90              | 41.17                  | 29.27                | 33.00       | -3.73       |
|          |         | 1850.00         | H            | -16.67              | 40.79                  | 24.12                | 33.00       | -8.88       |
|          | 661     | 1880.00         | V            | -12.01              | 41.23                  | 29.22                | 33.00       | -3.78       |
|          |         | 1879.80         | H            | -16.59              | 41.14                  | 24.55                | 33.00       | -8.45       |
|          | 810     | 1909.90         | V            | -12.03              | 41.30                  | 29.27                | 33.00       | -3.73       |
|          |         | 1909.90         | H            | -17.52              | 41.38                  | 23.86                | 33.00       | -9.14       |
| Z        | 512     | 1850.10         | V            | -13.40              | 41.17                  | 27.77                | 33.00       | -5.23       |
|          |         | 1850.10         | H            | -16.94              | 40.79                  | 23.85                | 33.00       | -9.15       |
|          | 661     | 1880.00         | V            | -12.70              | 41.23                  | 28.53                | 33.00       | -4.47       |
|          |         | 1880.00         | H            | -17.91              | 41.14                  | 23.23                | 33.00       | -9.77       |
|          | 810     | 1909.70         | V            | -12.26              | 41.30                  | 29.04                | 33.00       | -3.96       |
|          |         | 1909.70         | H            | -16.80              | 41.38                  | 24.57                | 33.00       | -8.43       |



## 7.4 OUT OF BAND EMISSION AT ANTENNA TERMINALS

### LIMIT

According to FCC §2.1051, FCC §22.917, FCC §24.238(a).

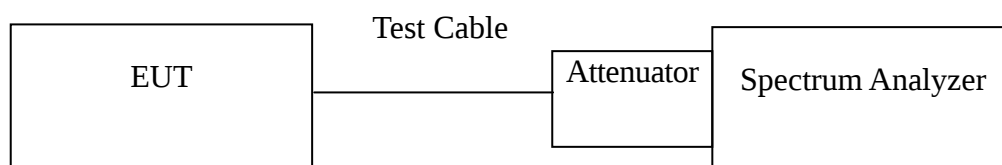
**Out of Band Emissions:** The mean power of emission must be attenuated below the mean power of the non-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at least  $43 + 10 \log P$  dB.

**Mobile Emissions in Base Frequency Range:** The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not exceed -80 dBm at the transmit antenna connector.

**Band Edge Requirements:** In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the Out of band Emission

### Test Configuration

Out of band emission at antenna terminals:



### TEST 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 (824 MHz and 849 MHz /1850MHz and 1910MHz): 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.

### TEST RESULTS

*No non-compliance noted.*

**Test Data**

| Mode                   | CH  | Location   | Description                                 |
|------------------------|-----|------------|---------------------------------------------|
| GSM 850                | 128 | Figure 7-1 | Conducted spurious emissions, 30MHz - 20GHz |
|                        | 190 | Figure 7-2 | Conducted spurious emissions, 30MHz - 20GHz |
|                        | 251 | Figure 7-3 | Conducted spurious emissions, 30MHz - 20GHz |
| GPRS 850<br>(Class 10) | 128 | Figure 8-1 | Conducted spurious emissions, 30MHz - 20GHz |
|                        | 190 | Figure 8-2 | Conducted spurious emissions, 30MHz - 20GHz |
|                        | 251 | Figure 8-3 | Conducted spurious emissions, 30MHz - 20GHz |

| Mode                    | CH  | Location    | Description                                 |
|-------------------------|-----|-------------|---------------------------------------------|
| GSM 1900                | 512 | Figure 9-1  | Conducted spurious emissions, 30MHz - 20GHz |
|                         | 661 | Figure 9-2  | Conducted spurious emissions, 30MHz - 20GHz |
|                         | 810 | Figure 9-3  | Conducted spurious emissions, 30MHz - 20GHz |
| GPRS 1900<br>(Class 10) | 512 | Figure 10-1 | Conducted spurious emissions, 30MHz - 20GHz |
|                         | 661 | Figure 10-2 | Conducted spurious emissions, 30MHz - 20GHz |
|                         | 810 | Figure 10-3 | Conducted spurious emissions, 30MHz - 20GHz |

| Mode                   | CH  | Location    | Description         |
|------------------------|-----|-------------|---------------------|
| GSM 850                | 128 | Figure 11-1 | Band Edge emissions |
|                        | 251 | Figure 11-2 | Band Edge emissions |
| GPRS 850<br>(Class 10) | 128 | Figure 12-1 | Band Edge emissions |
|                        | 251 | Figure 12-2 | Band Edge emissions |

| Mode                    | CH  | Location    | Description         |
|-------------------------|-----|-------------|---------------------|
| GSM 1900                | 512 | Figure 13-1 | Band Edge emissions |
|                         | 810 | Figure 13-2 | Band Edge emissions |
| GPRS 1900<br>(Class 10) | 512 | Figure 14-1 | Band Edge emissions |
|                         | 810 | Figure 14-2 | Band Edge emissions |



## Test Plot

### GSM 850

Figure 7-1: Out of Band emission at antenna terminals – GSM CH Low

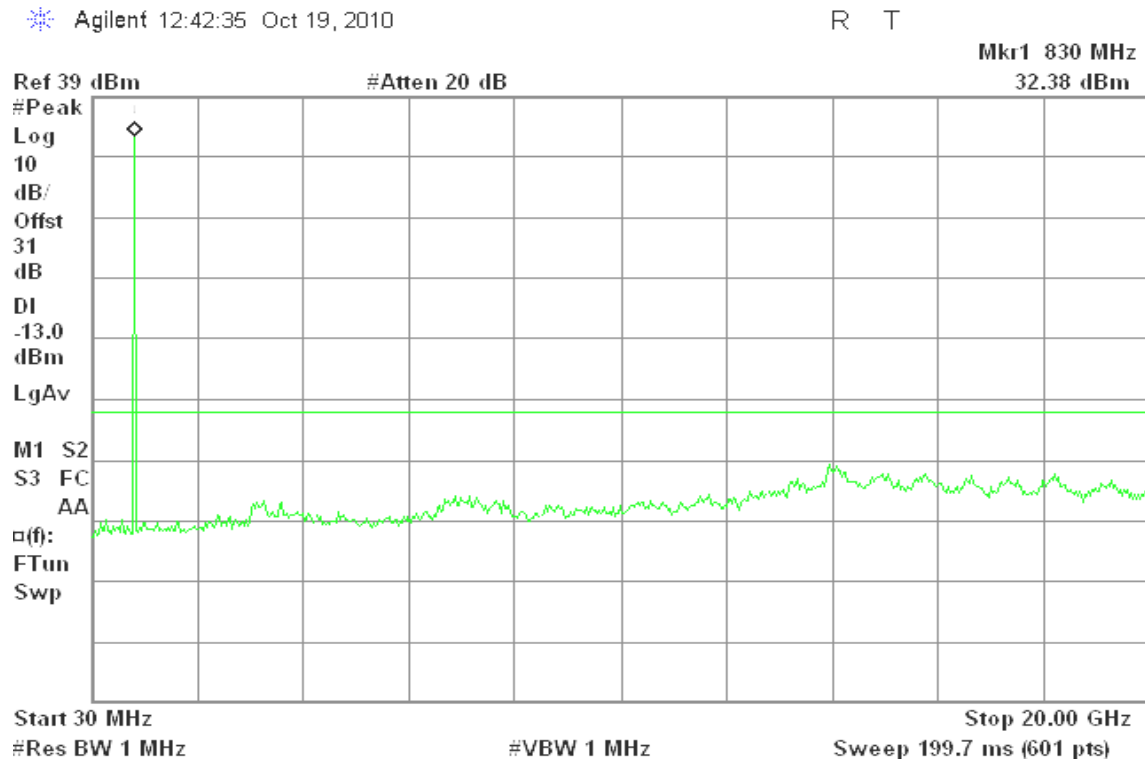


Figure 7-2: Out of Band emission at antenna terminals – GSM CH Mid

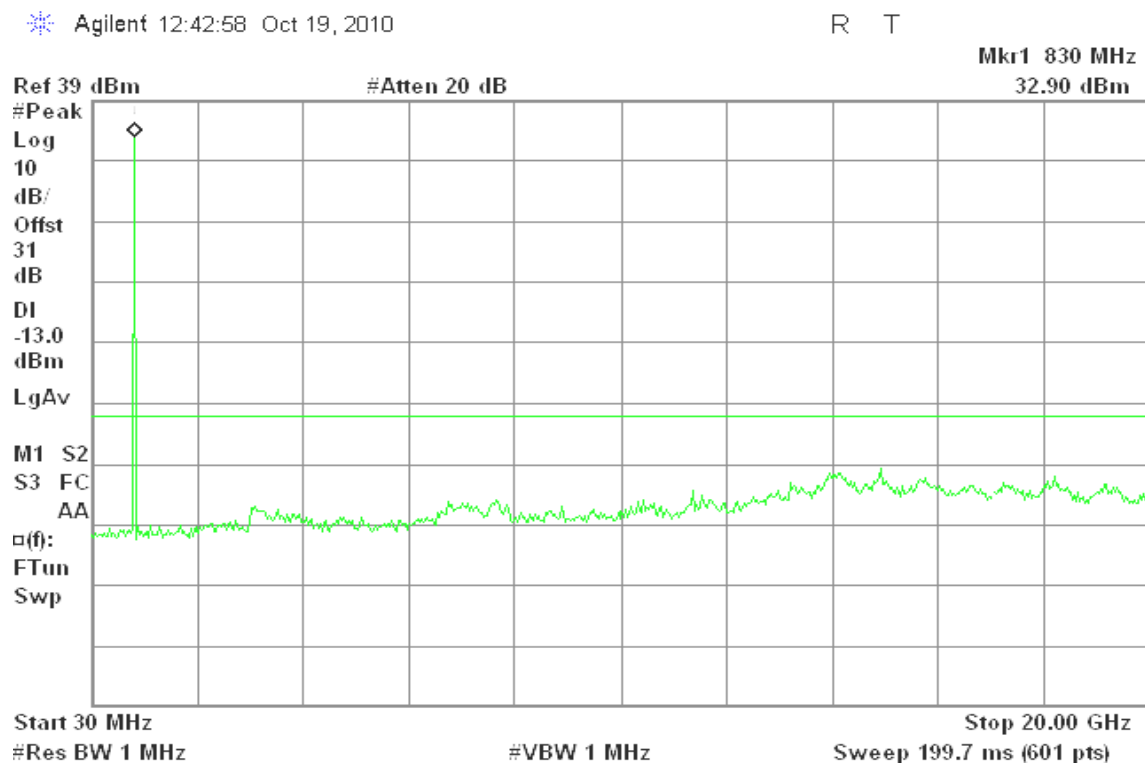
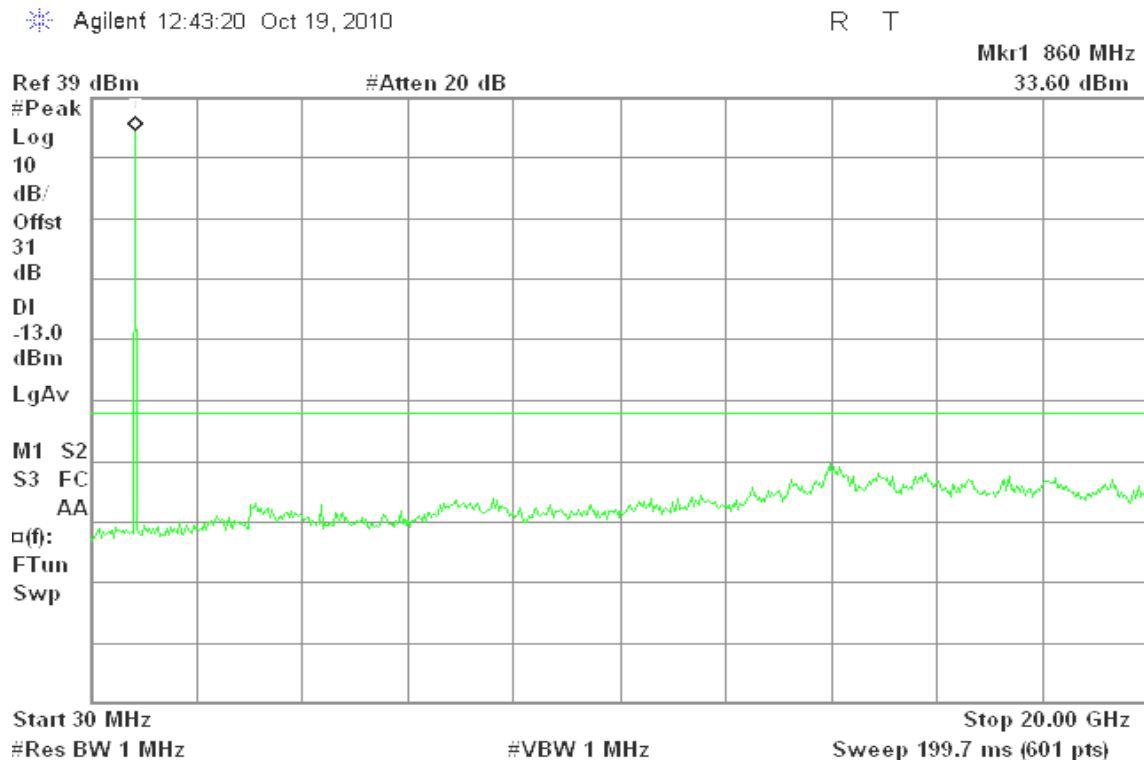




Figure 7-3: Out of Band emission at antenna terminals – GSM CH High



## GPRS 850

Figure 8-1: Out of Band emission at antenna terminals – GPRS CH Low

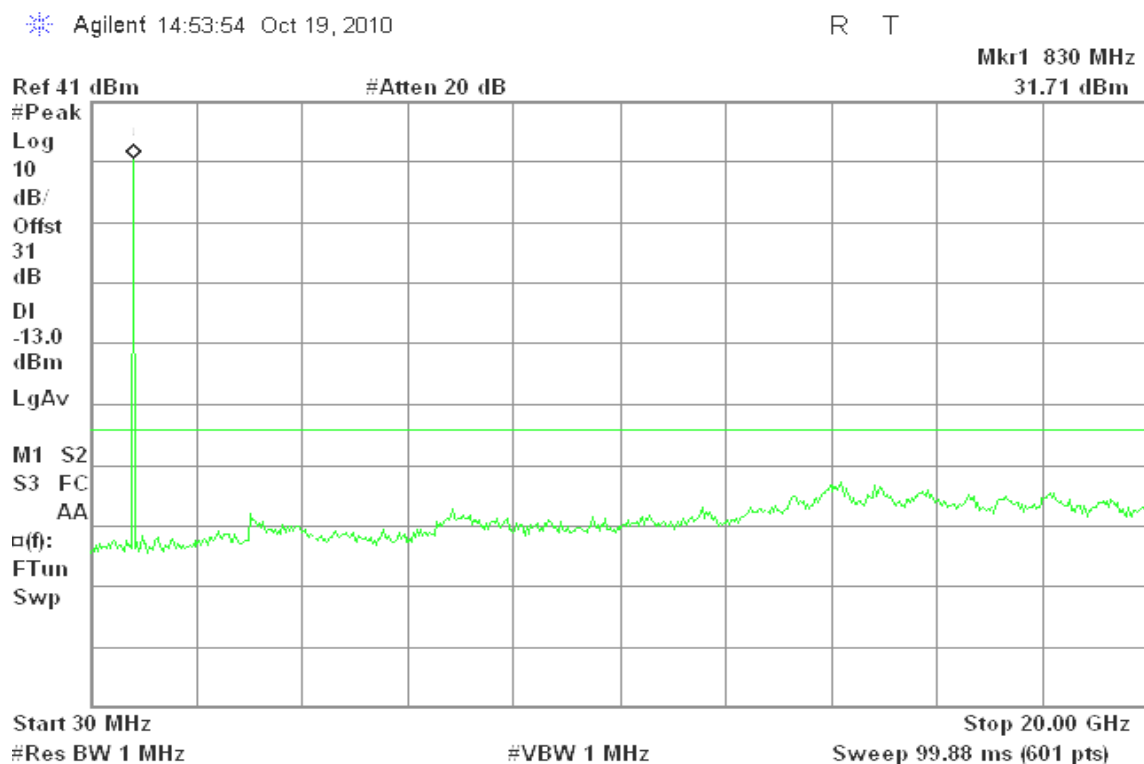




Figure 8-2: Out of Band emission at antenna terminals –GPRS CH Mid

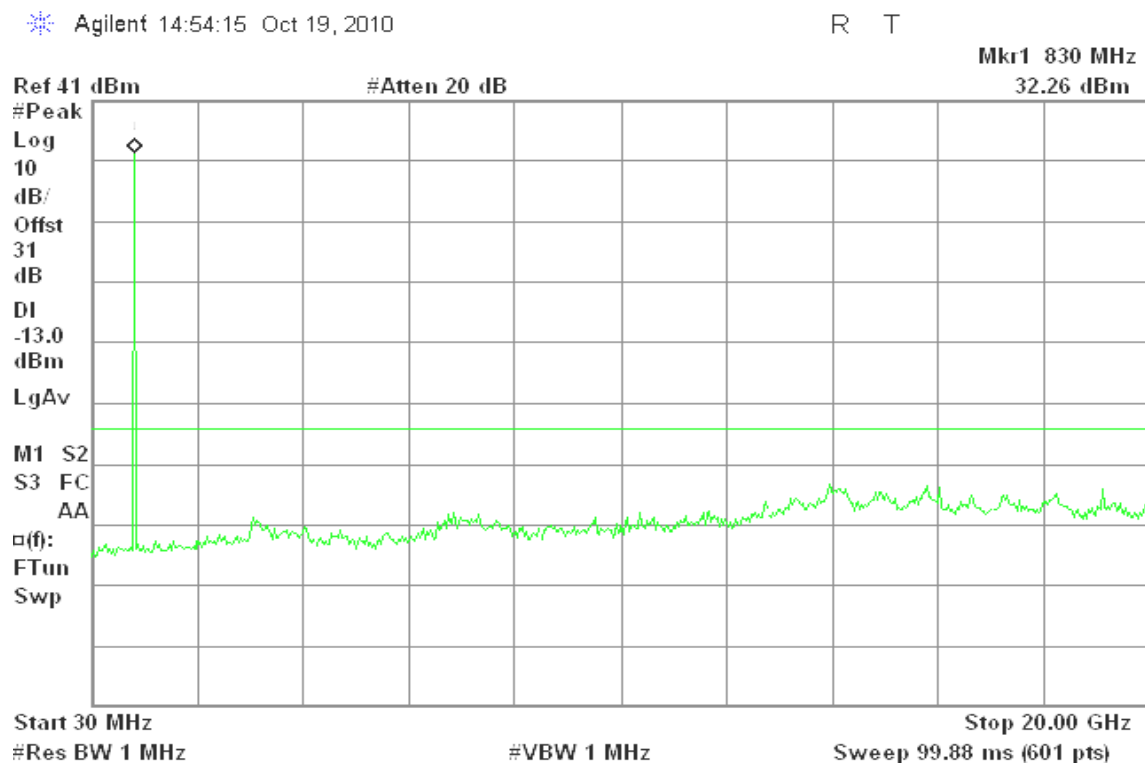
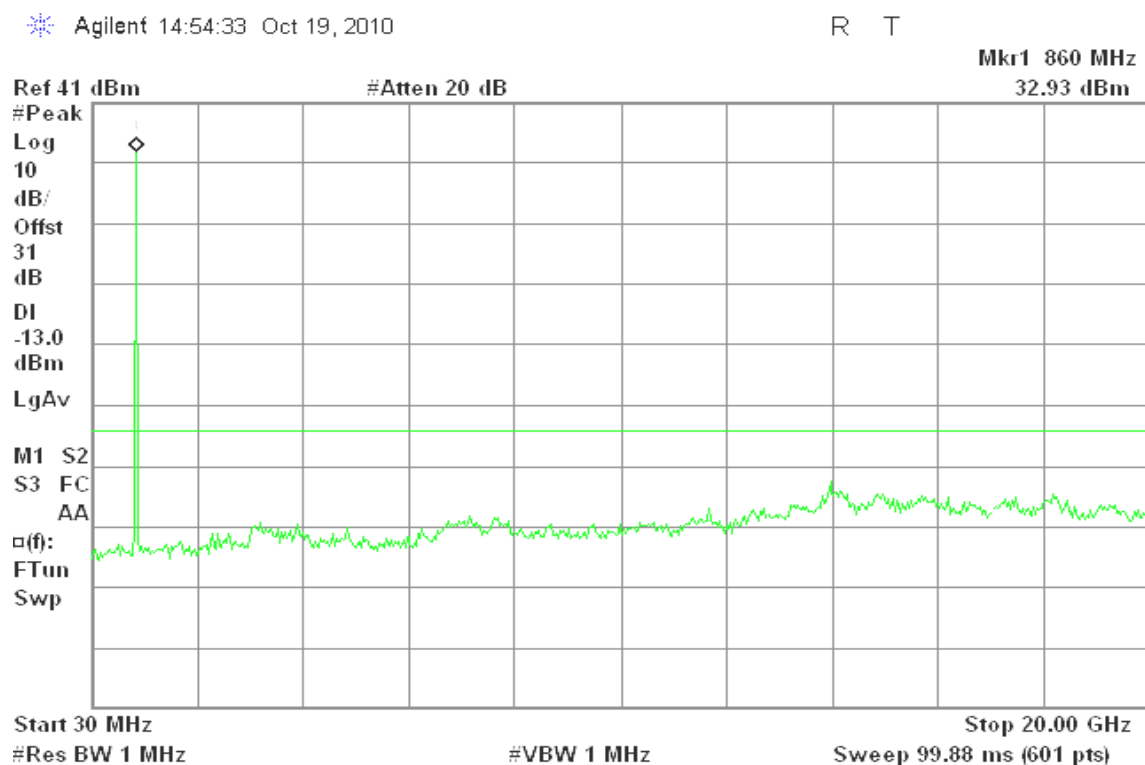


Figure 8-3: Out of Band emission at antenna terminals –GPRS CH High





## GSM 1900

Figure 9-1: Out of Band emission at antenna terminals – GSM CH Low

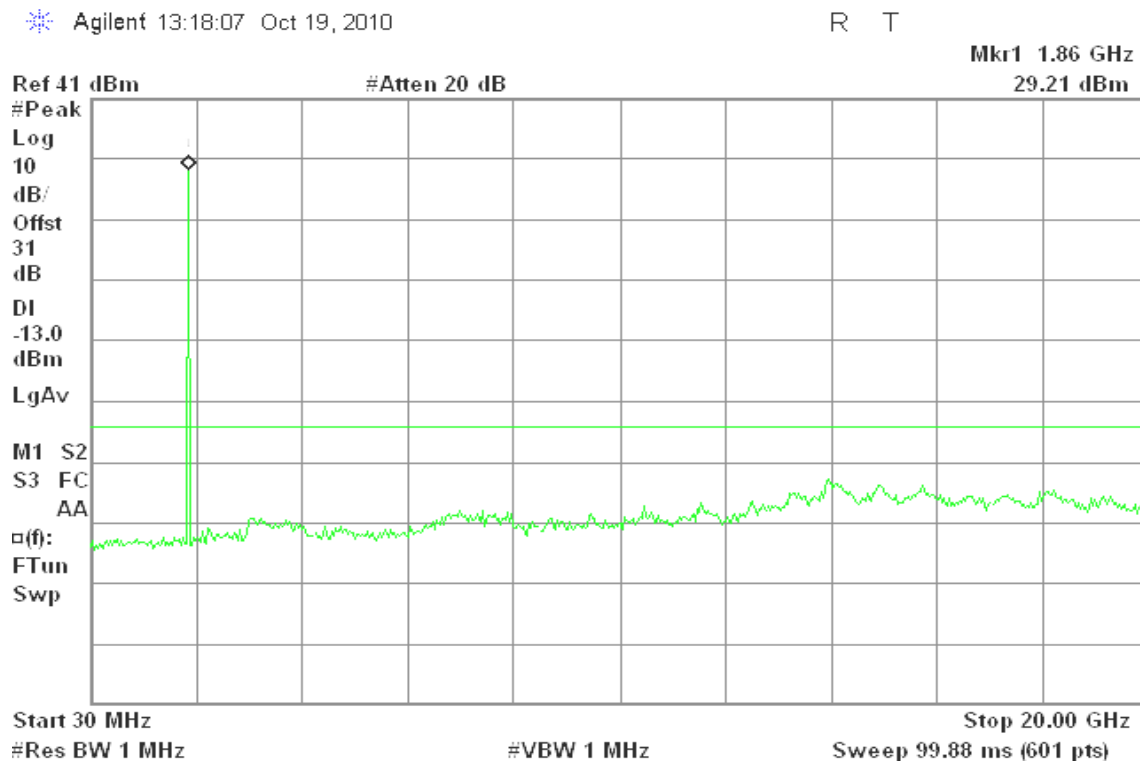


Figure 9-2: Out of Band emission at antenna terminals – GSM CH Mid

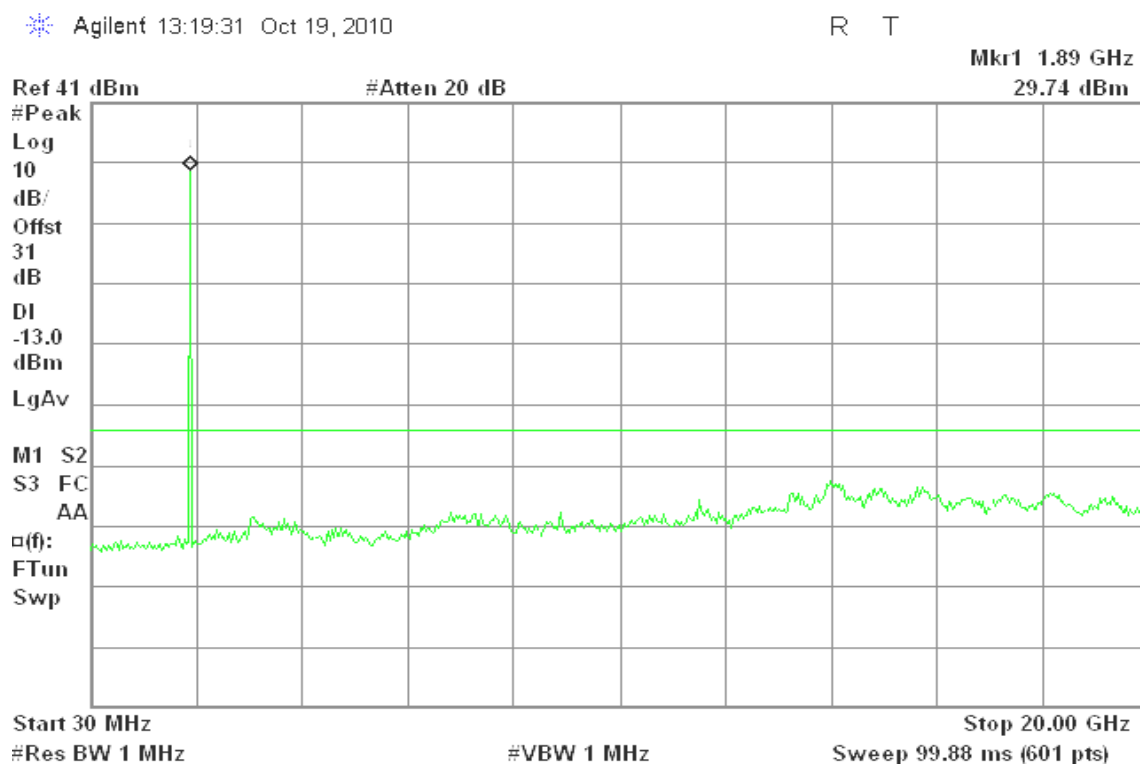
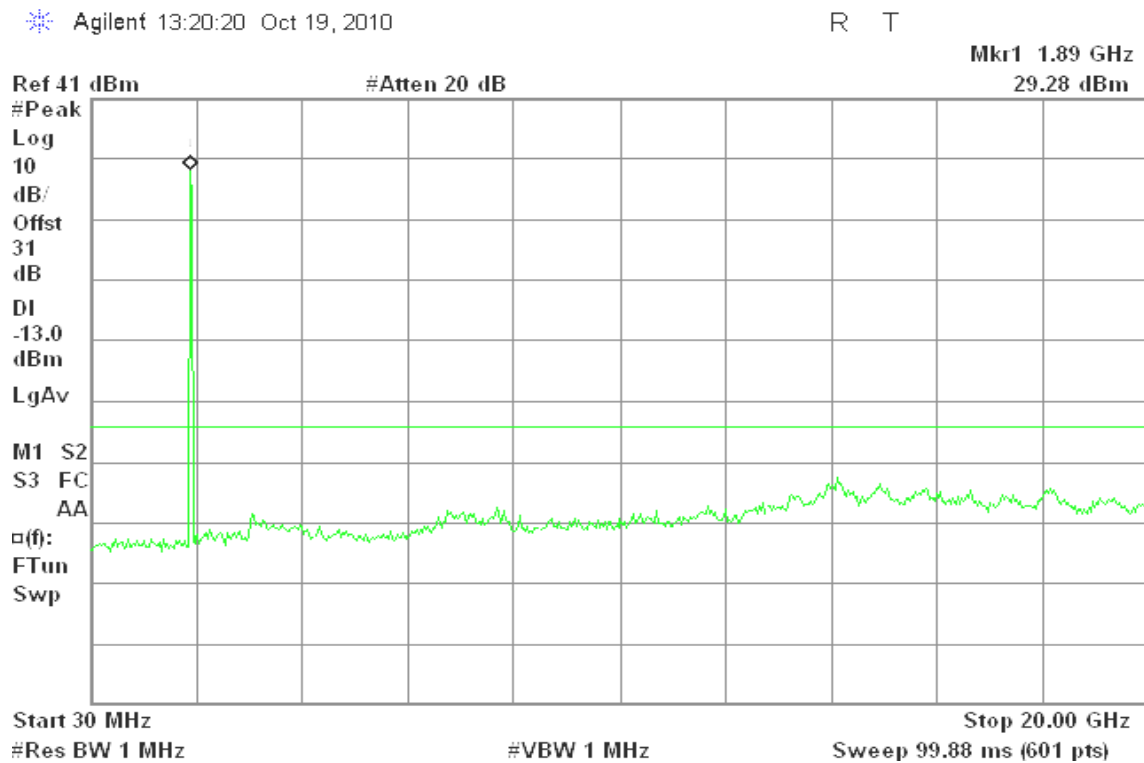




Figure 9-3: Out of Band emission at antenna terminals – GSM CH High



## GPRS 1900

Figure 10-1: Out of Band emission at antenna terminals – GPRS CH Low

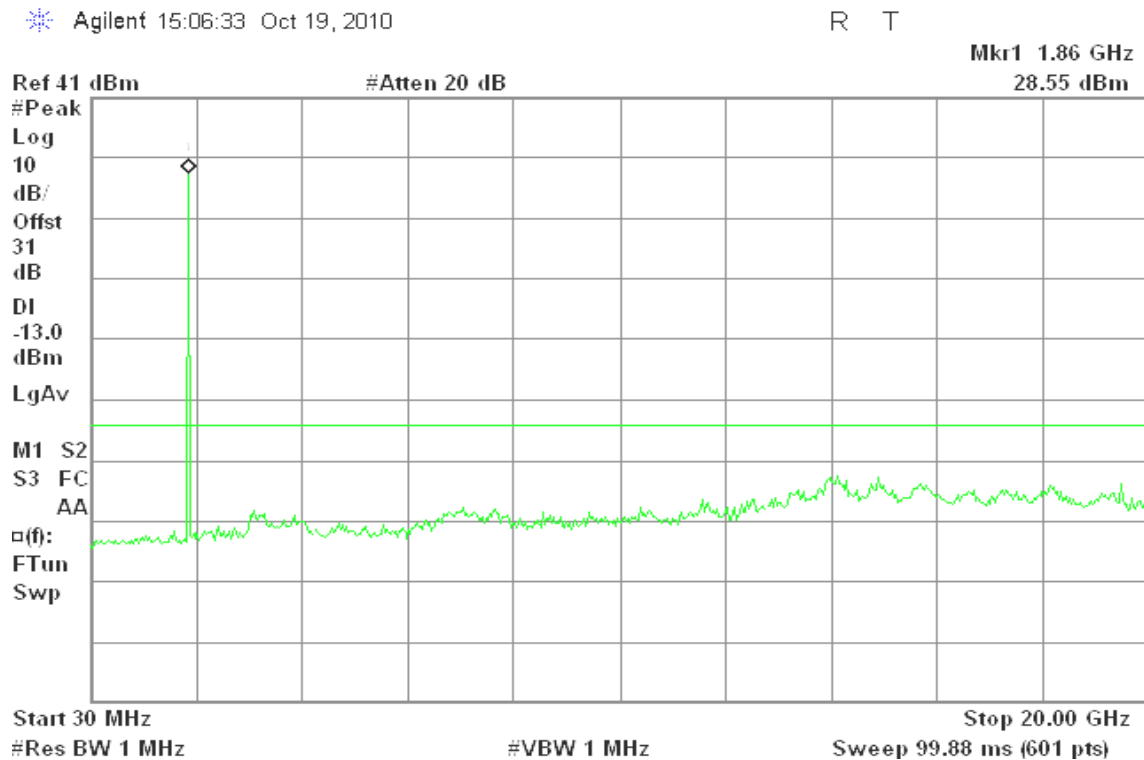




Figure 10-2: Out of Band emission at antenna terminals – GPRS CH Mid

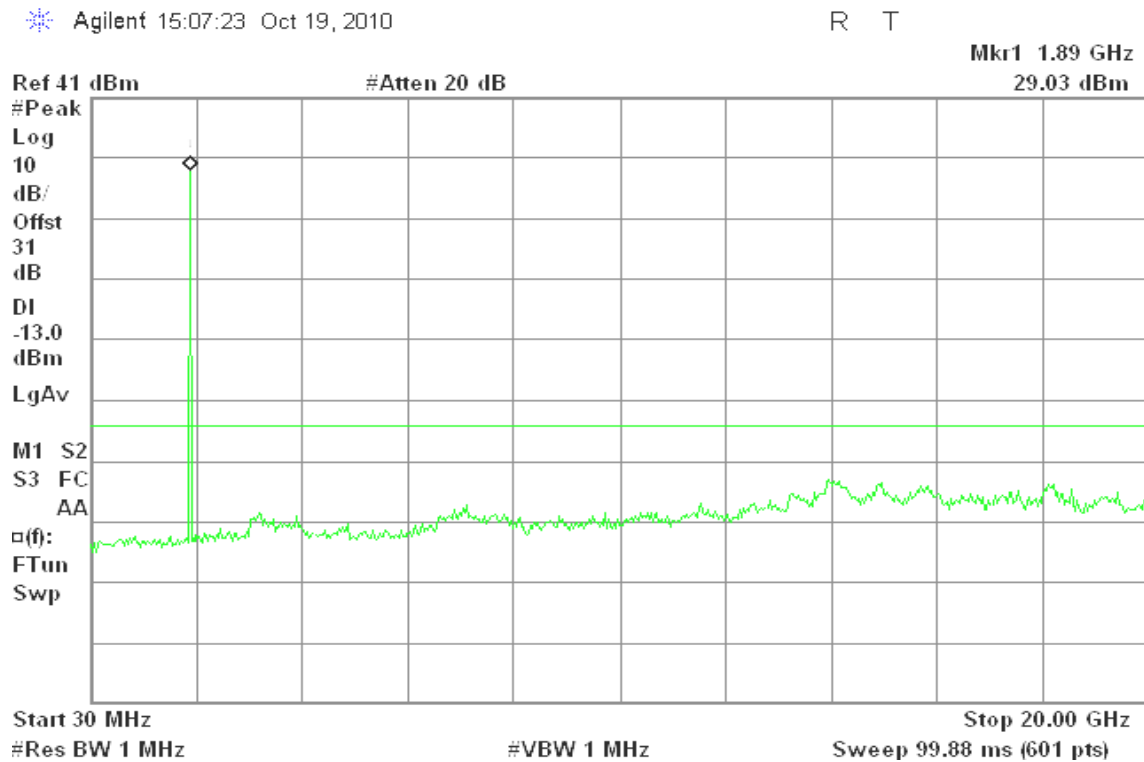
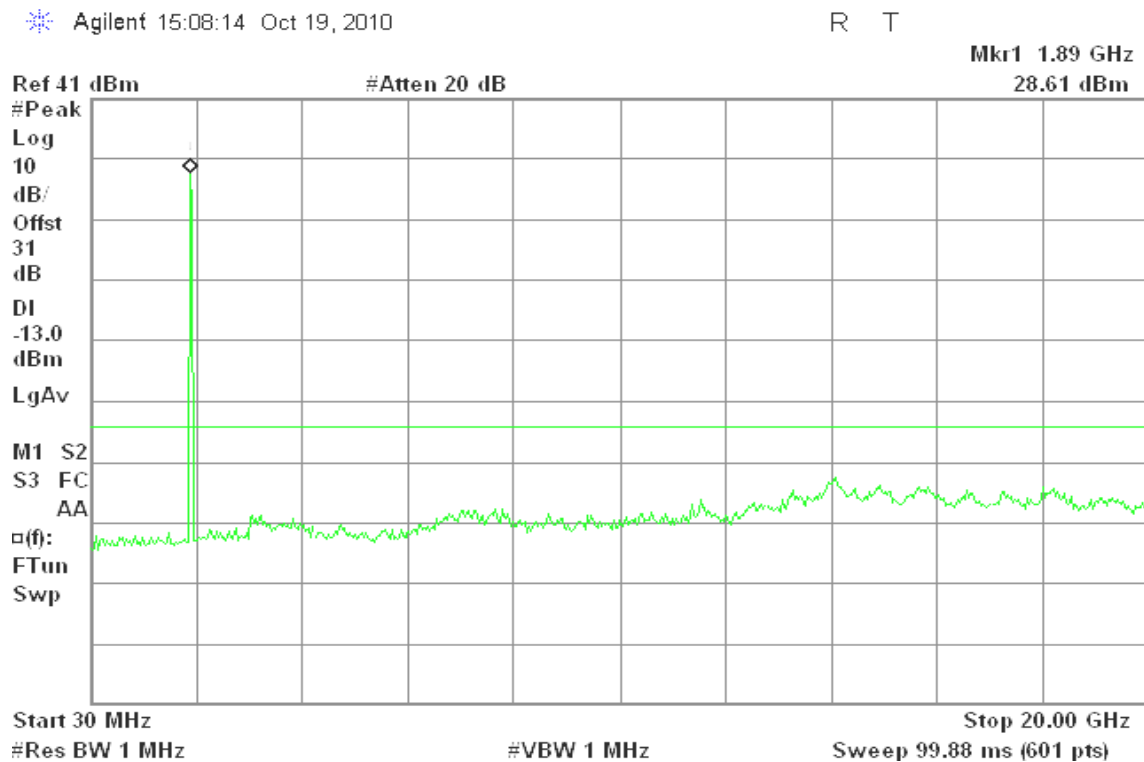


Figure 10-3: Out of Band emission at antenna terminals –GPRS CH High





## GSM 850

Figure 11-1: Band Edge emissions – GSM CH Low

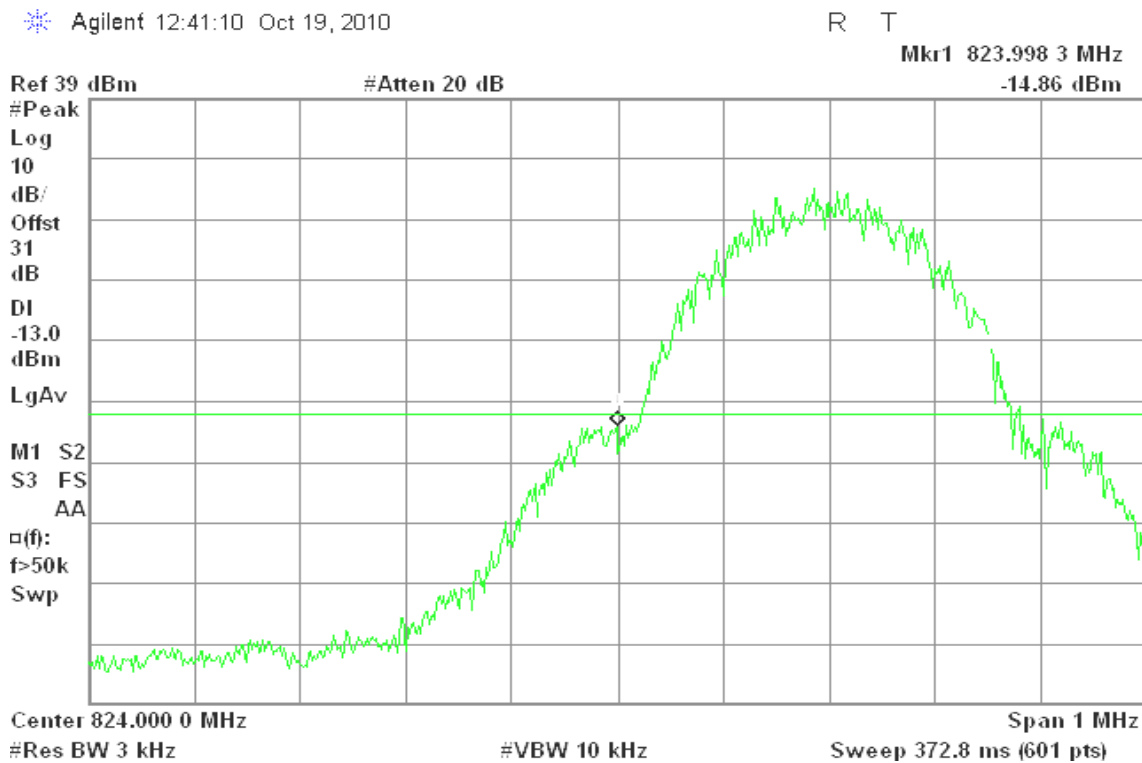
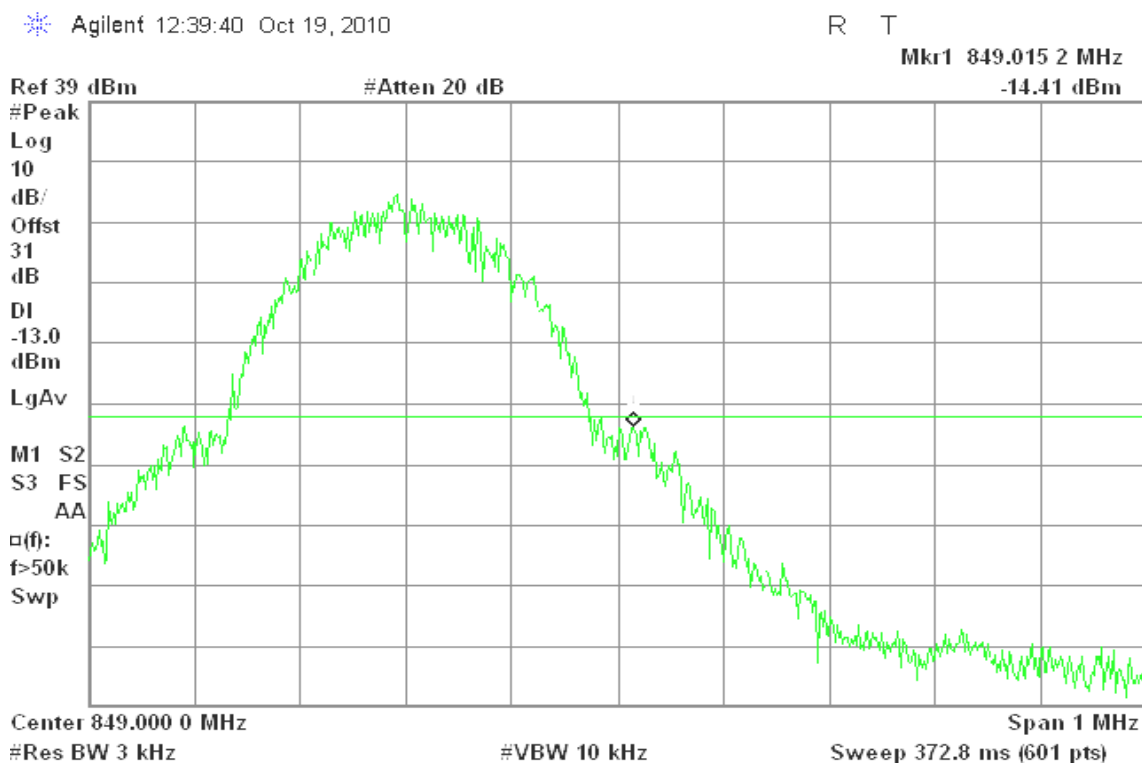


Figure 11-2: Band Edge emissions – GSM CH High





## GPRS 850

Figure 12-1: Band Edge emissions – GPRS CH Low

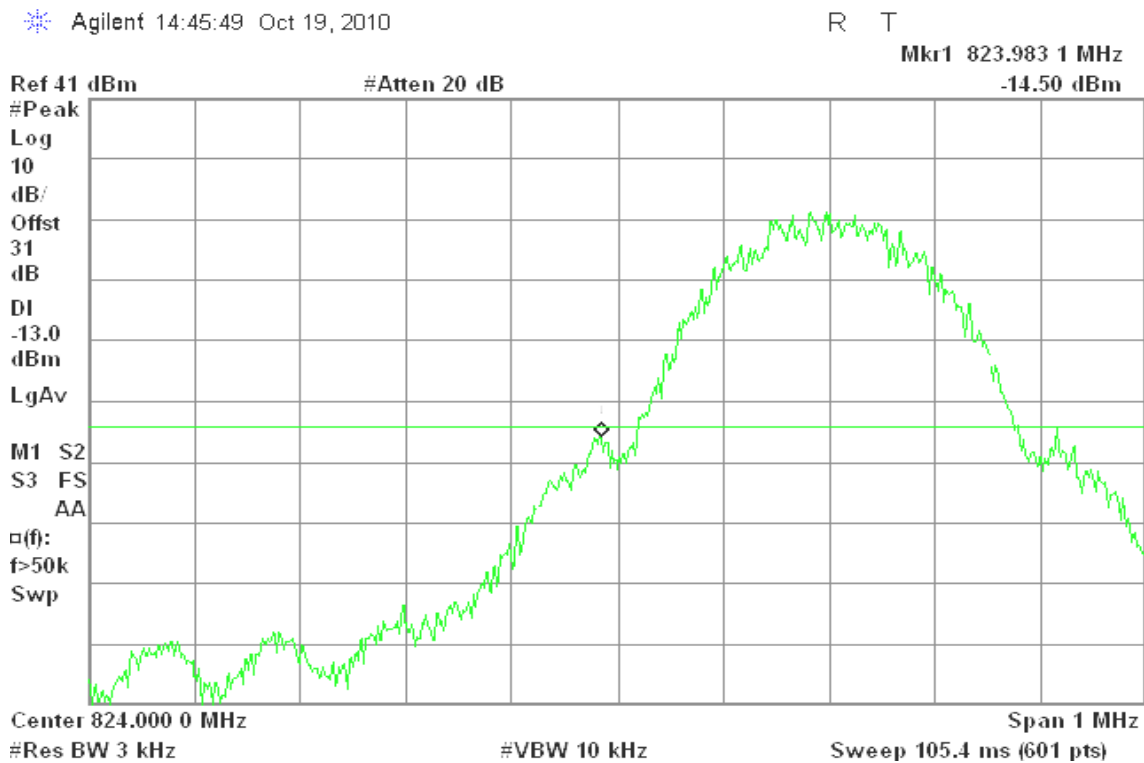
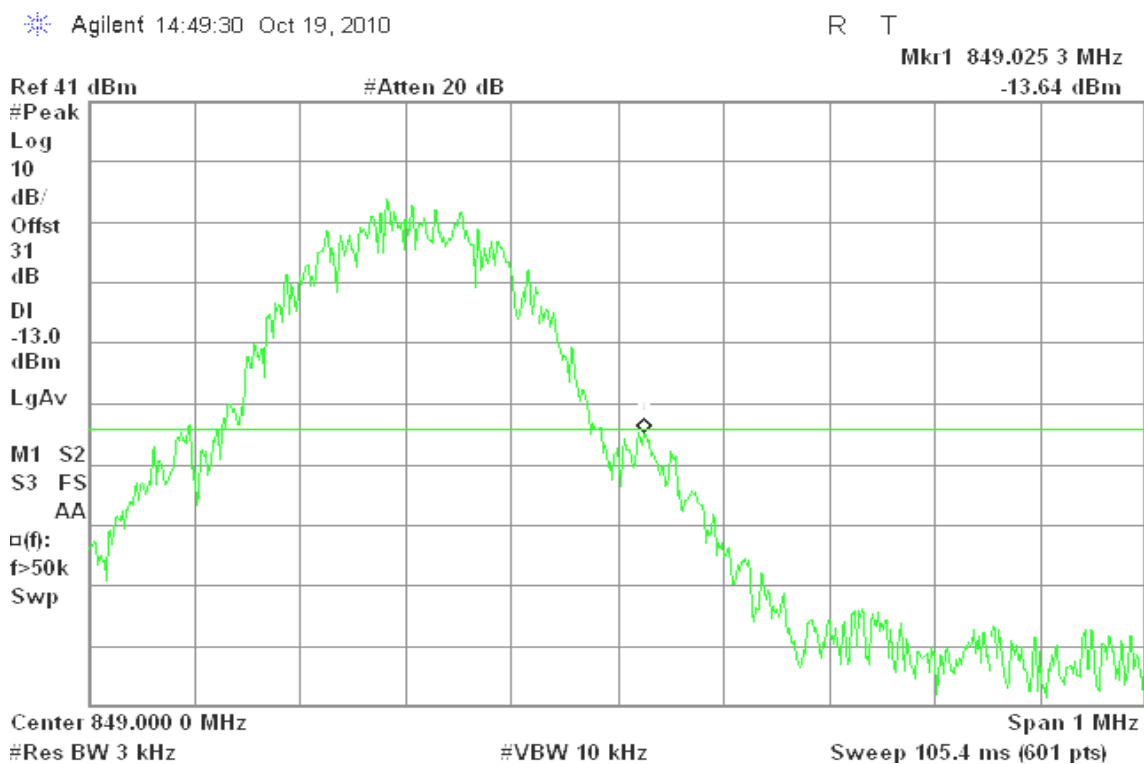


Figure 12-2: Band Edge emissions –GPRS CH High





## GSM 1900

Figure 13-1: Band Edge emissions – GSM CH Low

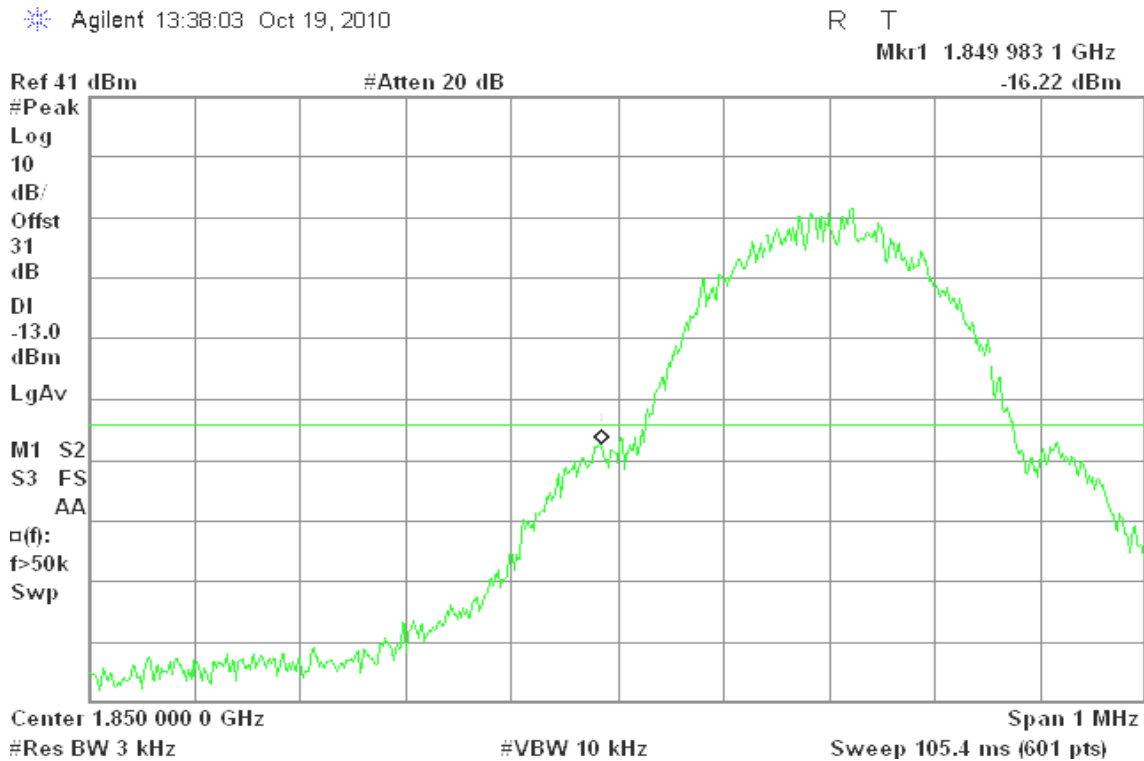
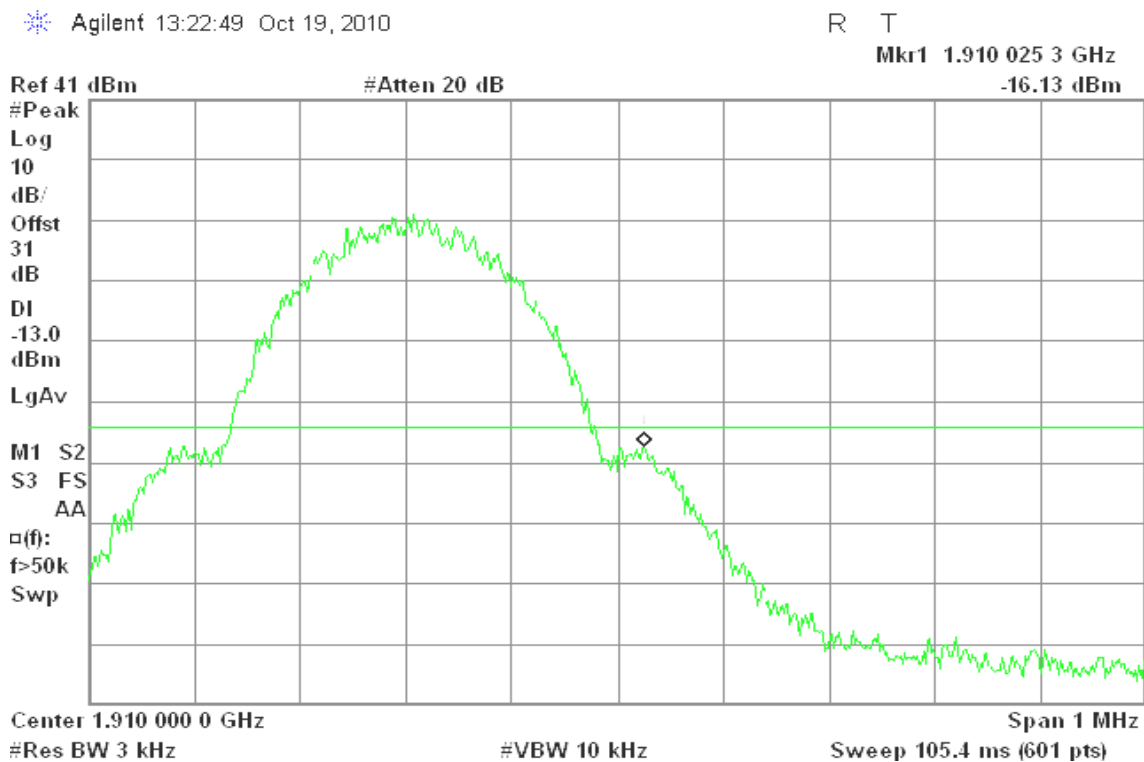


Figure 13-2: Band Edge emissions – GSM CH High





## GPRS 1900

Figure 14-1: Band Edge emissions – GPRS CH Low

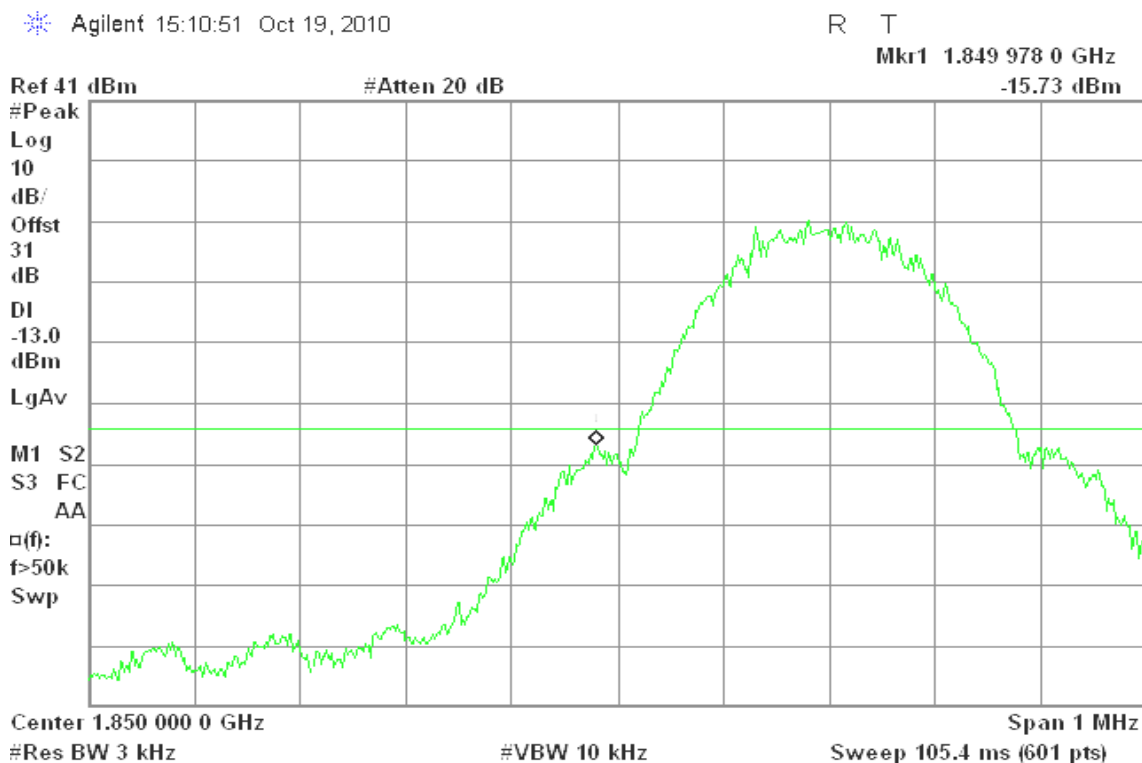
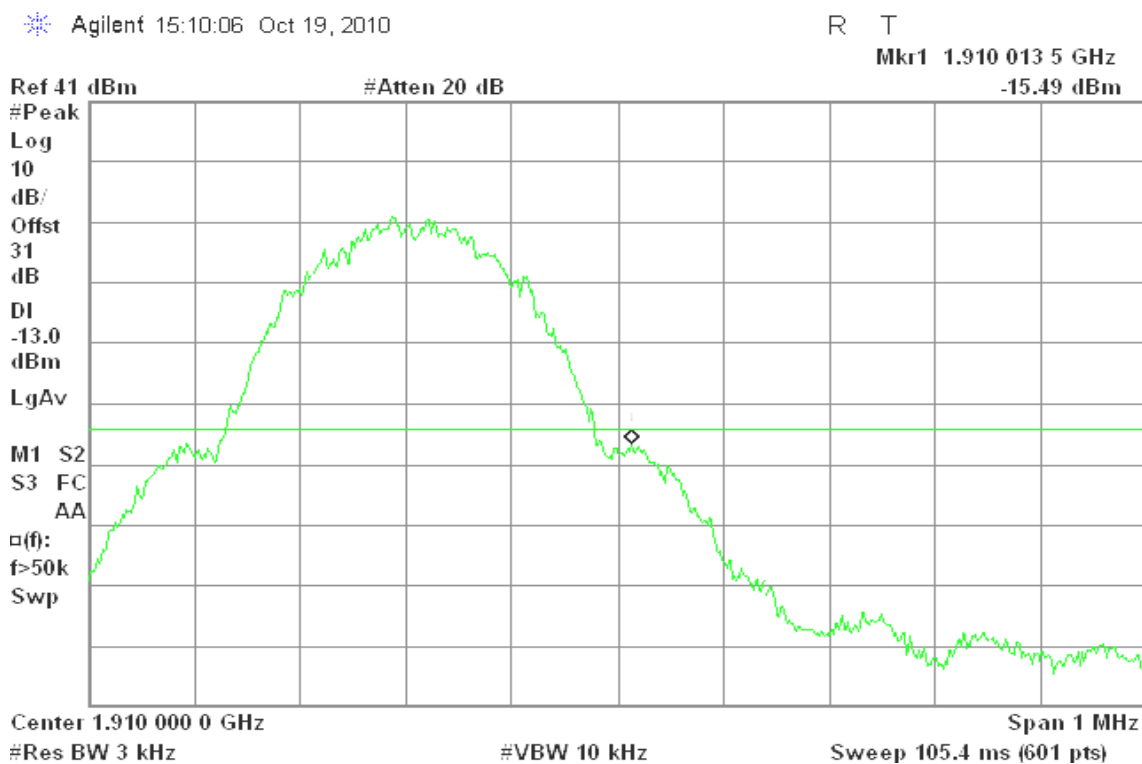


Figure 14-2: Band Edge emissions – GPRS CH High





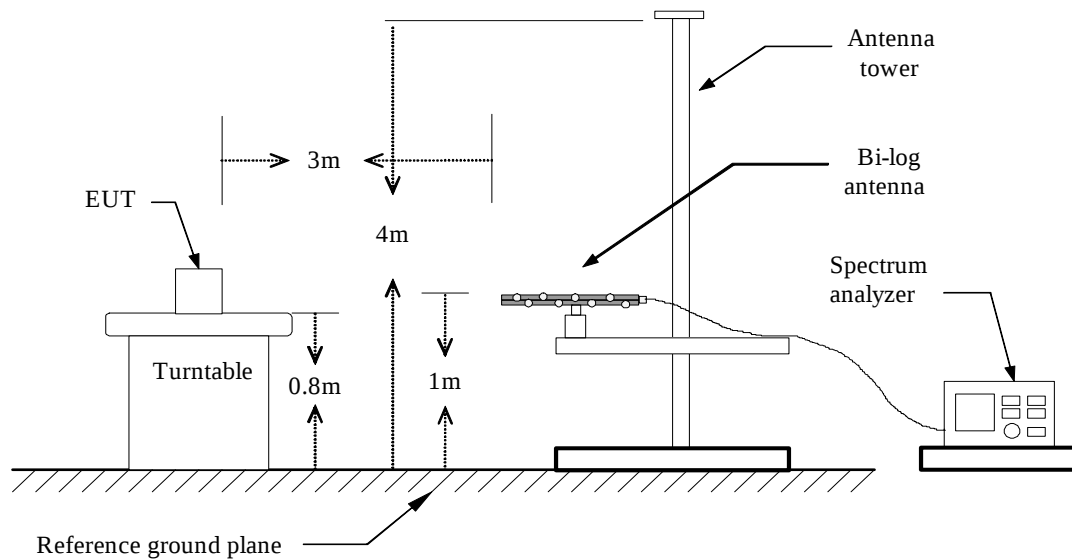
## 7.5 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

### LIMIT

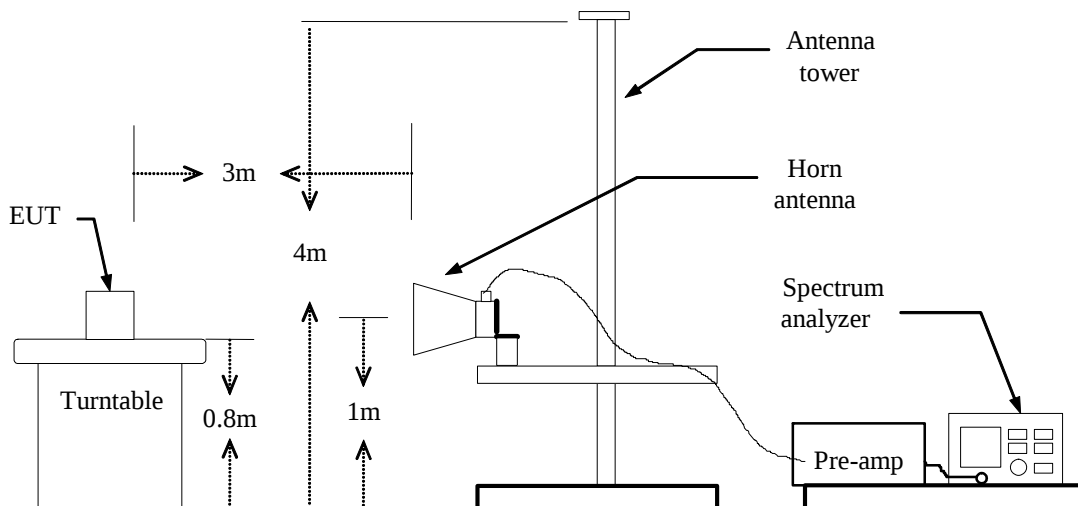
According to FCC §2.1053

### Test Configuration

#### Below 1 GHz

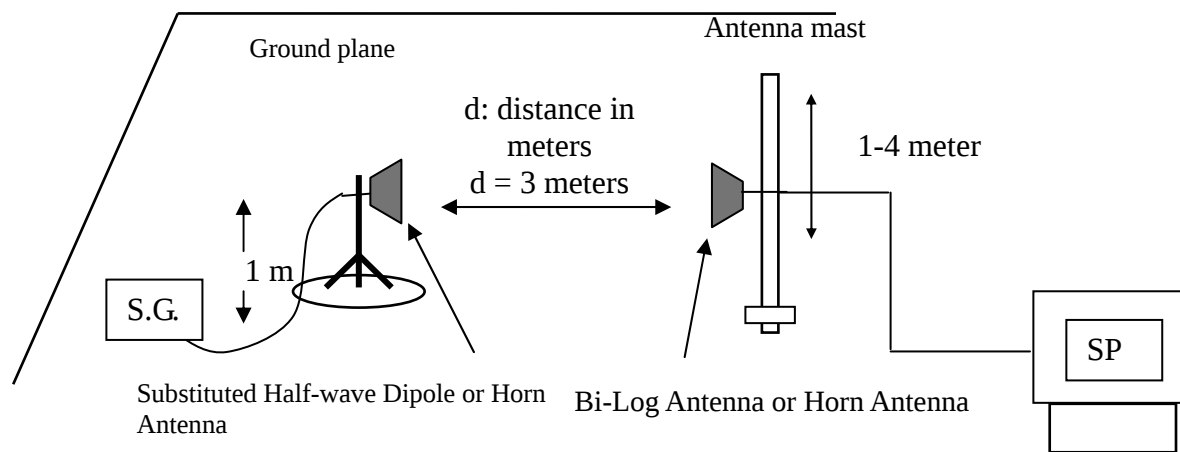


#### Above 1 GHz





## Substituted Method Test Set-up



## TEST 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.

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

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

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

## TEST RESULTS

*Refer to the attached tabular data sheets.*

**Radiated Spurious Emission Measurement Result / Below 1GHz****Operation Mode:** GSM 850 / TX / CH 128**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 40.67           | V                          | -60.55        | -12.66                 | -73.20               | -13.00      | -60.20      |
| 70.74           | V                          | -64.74        | -15.92                 | -80.66               | -13.00      | -67.66      |
| 144.46          | V                          | -66.32        | -13.30                 | -79.62               | -13.00      | -66.62      |
| 240.49          | V                          | -67.58        | -14.30                 | -81.88               | -13.00      | -68.88      |
| 278.32          | V                          | -67.48        | -12.25                 | -79.73               | -13.00      | -66.73      |
| 560.59          | V                          | -68.52        | -7.94                  | -76.46               | -13.00      | -63.46      |
| 44.55           | H                          | -62.58        | -11.72                 | -74.30               | -13.00      | -61.30      |
| 123.12          | H                          | -67.09        | -14.04                 | -81.13               | -13.00      | -68.13      |
| 183.26          | H                          | -60.06        | -14.29                 | -74.35               | -13.00      | -61.35      |
| 326.82          | H                          | -66.26        | -14.08                 | -80.34               | -13.00      | -67.34      |
| 419.94          | H                          | -66.80        | -10.54                 | -77.34               | -13.00      | -64.34      |
| 452.92          | H                          | -66.54        | -9.87                  | -76.41               | -13.00      | -63.41      |

**Remark:**

1. The emission behaviour belongs to narrowband spurious emission.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 850 / TX / CH 190**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 41.64           | V                          | -60.92        | -12.72                 | -73.64               | -13.00      | -60.64      |
| 128.94          | V                          | -65.62        | -12.83                 | -78.45               | -13.00      | -65.45      |
| 211.39          | V                          | -59.37        | -16.46                 | -75.84               | -13.00      | -62.84      |
| 239.52          | V                          | -63.71        | -14.31                 | -78.02               | -13.00      | -65.02      |
| 293.84          | V                          | -61.46        | -12.67                 | -74.13               | -13.00      | -61.13      |
| 326.82          | V                          | -63.72        | -13.60                 | -77.32               | -13.00      | -64.32      |
| 42.61           | H                          | -63.51        | -11.70                 | -75.21               | -13.00      | -62.21      |
| 126.03          | H                          | -65.79        | -14.06                 | -79.85               | -13.00      | -66.85      |
| 147.37          | H                          | -65.44        | -14.08                 | -79.52               | -13.00      | -66.52      |
| 390.84          | H                          | -66.44        | -11.86                 | -78.31               | -13.00      | -65.31      |
| 452.92          | H                          | -66.19        | -9.87                  | -76.05               | -13.00      | -63.05      |
| 690.57          | H                          | -67.67        | -6.55                  | -74.23               | -13.00      | -61.23      |

**Remark:**

1. The emission behaviour belongs to narrowband spurious emission.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 850 / TX / CH 251**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 40.67           | V                          | -61.98        | -12.66                 | -74.64               | -13.00      | -61.64      |
| 136.70          | V                          | -65.56        | -13.23                 | -78.79               | -13.00      | -65.79      |
| 151.25          | V                          | -66.05        | -13.22                 | -79.27               | -13.00      | -66.27      |
| 264.74          | V                          | -63.20        | -13.65                 | -76.84               | -13.00      | -63.84      |
| 326.82          | V                          | -65.92        | -13.60                 | -79.52               | -13.00      | -66.52      |
| 575.14          | V                          | -67.80        | -7.95                  | -75.75               | -13.00      | -62.75      |
| 43.58           | H                          | -63.54        | -11.71                 | -75.25               | -13.00      | -62.25      |
| 199.75          | H                          | -67.77        | -13.37                 | -81.14               | -13.00      | -68.14      |
| 230.79          | H                          | -66.67        | -14.44                 | -81.11               | -13.00      | -68.11      |
| 287.05          | H                          | -67.12        | -13.11                 | -80.23               | -13.00      | -67.23      |
| 326.82          | H                          | -66.39        | -14.08                 | -80.47               | -13.00      | -67.47      |
| 452.92          | H                          | -66.26        | -9.87                  | -76.12               | -13.00      | -63.12      |

**Remark:**

1. The emission behaviour belongs to narrowband spurious emission.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 850 / TX / CH 128**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 41.64           | V                          | -62.95        | -12.72                 | -75.67               | -13.00      | -62.67      |
| 67.83           | V                          | -64.18        | -15.72                 | -79.90               | -13.00      | -66.90      |
| 125.06          | V                          | -66.57        | -13.23                 | -79.79               | -13.00      | -66.79      |
| 239.52          | V                          | -68.01        | -14.31                 | -82.32               | -13.00      | -69.32      |
| 289.96          | V                          | -68.14        | -12.07                 | -80.21               | -13.00      | -67.21      |
| 326.82          | V                          | -66.72        | -13.60                 | -80.32               | -13.00      | -67.32      |
| 41.64           | H                          | -62.79        | -11.68                 | -74.47               | -13.00      | -61.47      |
| 171.62          | H                          | -67.24        | -13.82                 | -81.06               | -13.00      | -68.06      |
| 293.84          | H                          | -67.29        | -13.56                 | -80.85               | -13.00      | -67.85      |
| 452.92          | H                          | -66.04        | -9.87                  | -75.91               | -13.00      | -62.91      |
| 482.02          | H                          | -65.13        | -8.94                  | -74.07               | -13.00      | -61.07      |
| 552.83          | H                          | -65.63        | -7.97                  | -73.60               | -13.00      | -60.60      |

**Remark:**

1. The emission behaviour belongs to narrowband spurious emission.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 850 / TX / CH 190**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 40.67           | V                          | -62.65        | -12.66                 | -75.30               | -13.00      | -62.30      |
| 69.77           | V                          | -65.52        | -15.63                 | -81.15               | -13.00      | -68.15      |
| 126.03          | V                          | -66.89        | -13.13                 | -80.02               | -13.00      | -67.02      |
| 149.31          | V                          | -66.68        | -13.10                 | -79.78               | -13.00      | -66.78      |
| 233.70          | V                          | -65.25        | -14.68                 | -79.93               | -13.00      | -66.93      |
| 286.08          | V                          | -67.49        | -12.09                 | -79.58               | -13.00      | -66.58      |
| 42.61           | H                          | -63.81        | -11.70                 | -75.51               | -13.00      | -62.51      |
| 128.94          | H                          | -66.80        | -14.08                 | -80.88               | -13.00      | -67.88      |
| 240.49          | H                          | -68.06        | -13.67                 | -81.73               | -13.00      | -68.73      |
| 275.41          | H                          | -67.97        | -13.42                 | -81.39               | -13.00      | -68.39      |
| 343.31          | H                          | -66.68        | -13.68                 | -80.36               | -13.00      | -67.36      |
| 452.92          | H                          | -66.02        | -9.87                  | -75.88               | -13.00      | -62.88      |

**Remark:**

1. The emission behaviour belongs to narrowband spurious emission.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 850 / TX / CH 251**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 42.61           | V                          | -63.49        | -12.79                 | -76.28               | -13.00      | -63.28      |
| 69.77           | V                          | -65.42        | -15.63                 | -81.05               | -13.00      | -68.05      |
| 136.70          | V                          | -66.84        | -13.23                 | -80.07               | -13.00      | -67.07      |
| 203.63          | V                          | -65.97        | -15.03                 | -80.99               | -13.00      | -67.99      |
| 275.41          | V                          | -66.64        | -12.45                 | -79.09               | -13.00      | -66.09      |
| 631.40          | V                          | -68.62        | -6.75                  | -75.38               | -13.00      | -62.38      |
| 41.64           | H                          | -63.40        | -11.68                 | -75.08               | -13.00      | -62.08      |
| 124.09          | H                          | -66.62        | -14.05                 | -80.67               | -13.00      | -67.67      |
| 136.70          | H                          | -65.97        | -14.51                 | -80.48               | -13.00      | -67.48      |
| 380.17          | H                          | -66.08        | -12.04                 | -78.12               | -13.00      | -65.12      |
| 452.92          | H                          | -66.31        | -9.87                  | -76.17               | -13.00      | -63.17      |
| 635.28          | H                          | -68.65        | -6.68                  | -75.33               | -13.00      | -62.33      |

**Remark:**

1. The emission behaviour belongs to narrowband spurious emission.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 1900 / TX / CH 512**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 38.73           | V                          | -61.40        | -13.32                 | -74.72               | -13.00      | -61.72      |
| 68.80           | V                          | -64.42        | -15.67                 | -80.09               | -13.00      | -67.09      |
| 127.00          | V                          | -66.68        | -13.03                 | -79.71               | -13.00      | -66.71      |
| 276.38          | V                          | -67.60        | -12.38                 | -79.98               | -13.00      | -66.98      |
| 326.82          | V                          | -64.84        | -13.60                 | -78.44               | -13.00      | -65.44      |
| 631.40          | V                          | -68.28        | -6.75                  | -75.03               | -13.00      | -62.03      |
| 43.58           | H                          | -63.76        | -11.71                 | -75.47               | -13.00      | -62.47      |
| 128.94          | H                          | -66.68        | -14.08                 | -80.77               | -13.00      | -67.77      |
| 202.66          | H                          | -66.69        | -13.84                 | -80.53               | -13.00      | -67.53      |
| 280.26          | H                          | -67.40        | -13.07                 | -80.47               | -13.00      | -67.47      |
| 378.23          | H                          | -66.96        | -12.13                 | -79.09               | -13.00      | -66.09      |
| 452.92          | H                          | -65.52        | -9.87                  | -75.39               | -13.00      | -62.39      |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 1900 / TX / CH 661**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 30.00           | V                          | -57.32        | -18.30                 | -75.62               | -13.00      | -62.62      |
| 39.70           | V                          | -61.20        | -12.78                 | -73.97               | -13.00      | -60.97      |
| 66.86           | V                          | -64.47        | -15.76                 | -80.24               | -13.00      | -67.24      |
| 125.06          | V                          | -66.56        | -13.23                 | -79.79               | -13.00      | -66.79      |
| 285.11          | V                          | -67.92        | -12.10                 | -80.01               | -13.00      | -67.01      |
| 326.82          | V                          | -65.30        | -13.60                 | -78.90               | -13.00      | -65.90      |
| 981.57          | V                          | -68.26        | -2.86                  | -71.12               | -13.00      | -58.12      |
| 43.58           | H                          | -64.10        | -11.71                 | -75.81               | -13.00      | -62.81      |
| 90.14           | H                          | -61.04        | -21.16                 | -82.21               | -13.00      | -69.21      |
| 200.72          | H                          | -67.74        | -13.48                 | -81.23               | -13.00      | -68.23      |
| 277.35          | H                          | -66.28        | -13.27                 | -79.56               | -13.00      | -66.56      |
| 379.20          | H                          | -66.92        | -12.08                 | -79.00               | -13.00      | -66.00      |
| 452.92          | H                          | -65.61        | -9.87                  | -75.48               | -13.00      | -62.48      |

**Remark:**

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**Operation Mode:** GSM 1900 / TX / CH 810**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 40.67           | V                          | -62.24        | -12.66                 | -74.90               | -13.00      | -61.90      |
| 66.86           | V                          | -64.53        | -15.76                 | -80.29               | -13.00      | -67.29      |
| 136.70          | V                          | -65.77        | -13.23                 | -79.00               | -13.00      | -66.00      |
| 200.72          | V                          | -66.72        | -14.35                 | -81.07               | -13.00      | -68.07      |
| 288.02          | V                          | -65.85        | -12.08                 | -77.93               | -13.00      | -64.93      |
| 352.04          | V                          | -66.45        | -13.25                 | -79.70               | -13.00      | -66.70      |
| 41.64           | H                          | -62.49        | -11.68                 | -74.17               | -13.00      | -61.17      |
| 136.70          | H                          | -65.13        | -14.51                 | -79.63               | -13.00      | -66.63      |
| 170.65          | H                          | -65.58        | -13.76                 | -79.35               | -13.00      | -66.35      |
| 277.35          | H                          | -66.44        | -13.27                 | -79.72               | -13.00      | -66.72      |
| 377.26          | H                          | -66.49        | -12.18                 | -78.67               | -13.00      | -65.67      |
| 452.92          | H                          | -64.72        | -9.87                  | -74.58               | -13.00      | -61.58      |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 1900 / TX / CH 512**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 41.64           | V                          | -61.74        | -12.72                 | -74.47               | -13.00      | -61.47      |
| 126.03          | V                          | -66.42        | -13.13                 | -79.55               | -13.00      | -66.55      |
| 200.72          | V                          | -66.87        | -14.35                 | -81.22               | -13.00      | -68.22      |
| 288.02          | V                          | -67.51        | -12.08                 | -79.59               | -13.00      | -66.59      |
| 326.82          | V                          | -66.29        | -13.60                 | -79.89               | -13.00      | -66.89      |
| 807.94          | V                          | -68.66        | -4.94                  | -73.61               | -13.00      | -60.61      |
| 42.61           | H                          | -63.33        | -11.70                 | -75.03               | -13.00      | -62.03      |
| 136.70          | H                          | -64.78        | -14.51                 | -79.28               | -13.00      | -66.28      |
| 198.78          | H                          | -67.72        | -13.47                 | -81.19               | -13.00      | -68.19      |
| 286.08          | H                          | -67.75        | -13.10                 | -80.85               | -13.00      | -67.85      |
| 452.92          | H                          | -66.20        | -9.87                  | -76.07               | -13.00      | -63.07      |
| 633.34          | H                          | -68.55        | -6.70                  | -75.25               | -13.00      | -62.25      |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 1900 / TX / CH 661**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 43.58           | V                          | -62.74        | -12.85                 | -75.59               | -13.00      | -62.59      |
| 67.83           | V                          | -65.12        | -15.72                 | -80.83               | -13.00      | -67.83      |
| 132.82          | V                          | -63.66        | -12.93                 | -76.59               | -13.00      | -63.59      |
| 278.32          | V                          | -68.60        | -12.25                 | -80.85               | -13.00      | -67.85      |
| 326.82          | V                          | -65.49        | -13.60                 | -79.09               | -13.00      | -66.09      |
| 828.31          | V                          | -68.69        | -4.70                  | -73.40               | -13.00      | -60.40      |
| 43.58           | H                          | -63.29        | -11.71                 | -75.00               | -13.00      | -62.00      |
| 127.00          | H                          | -66.32        | -14.07                 | -80.39               | -13.00      | -67.39      |
| 239.52          | H                          | -67.90        | -13.66                 | -81.56               | -13.00      | -68.56      |
| 326.82          | H                          | -66.61        | -14.08                 | -80.69               | -13.00      | -67.69      |
| 452.92          | H                          | -66.38        | -9.87                  | -76.24               | -13.00      | -63.24      |
| 734.22          | H                          | -68.59        | -5.87                  | -74.46               | -13.00      | -61.46      |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 1900 / TX / CH 810**Test Date:** October 15, 2010**Temperature:** 23°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization (V/H) | Reading (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------------|---------------|------------------------|----------------------|-------------|-------------|
| 41.64           | V                          | -62.29        | -12.72                 | -75.01               | -13.00      | -62.01      |
| 66.86           | V                          | -65.35        | -15.76                 | -81.11               | -13.00      | -68.11      |
| 148.34          | V                          | -66.04        | -13.14                 | -79.18               | -13.00      | -66.18      |
| 231.76          | V                          | -67.43        | -14.80                 | -82.23               | -13.00      | -69.23      |
| 288.02          | V                          | -67.83        | -12.08                 | -79.91               | -13.00      | -66.91      |
| 327.79          | V                          | -66.89        | -13.60                 | -80.49               | -13.00      | -67.49      |
| 44.55           | H                          | -64.08        | -11.72                 | -75.80               | -13.00      | -62.80      |
| 125.06          | H                          | -66.52        | -14.06                 | -80.57               | -13.00      | -67.57      |
| 185.20          | H                          | -64.78        | -14.30                 | -79.08               | -13.00      | -66.08      |
| 272.50          | H                          | -61.96        | -13.65                 | -75.61               | -13.00      | -62.61      |
| 368.53          | H                          | -66.37        | -12.63                 | -79.00               | -13.00      | -66.00      |
| 452.92          | H                          | -65.10        | -9.87                  | -74.96               | -13.00      | -61.96      |

**Remark:**

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*

**Above 1GHz****Operation Mode:** GSM 850 / TX / CH 128**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 1651.00         | V                    | -53.98              | 1.61                   | -52.37               | -13.00      | -39.37      |
| 2470.00         | V                    | -58.89              | 4.41                   | -54.49               | -13.00      | -41.49      |
| 3296.00         | V                    | -55.66              | 8.35                   | -47.32               | -13.00      | -34.32      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 1651.00         | H                    | -52.12              | 1.42                   | -50.70               | -13.00      | -37.70      |
| 1924.00         | H                    | -51.65              | 1.22                   | -50.44               | -13.00      | -37.44      |
| 2470.00         | H                    | -52.45              | 4.43                   | -48.02               | -13.00      | -35.02      |
| 3296.00         | H                    | -58.22              | 8.22                   | -49.99               | -13.00      | -36.99      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 850 / TX / CH 190**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 1672.00         | V                    | -55.61              | 1.63                   | -53.98               | -13.00      | -40.98      |
| 1924.00         | V                    | -54.91              | 1.78                   | -53.13               | -13.00      | -40.13      |
| 2512.00         | V                    | -58.14              | 4.62                   | -53.53               | -13.00      | -40.53      |
| 3345.00         | V                    | -56.67              | 8.64                   | -48.03               | -13.00      | -35.03      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 1700.00         | H                    | -44.95              | 1.38                   | -43.56               | -13.00      | -30.56      |
| 2428.00         | H                    | -52.70              | 4.14                   | -48.56               | -13.00      | -35.56      |
| 2547.00         | H                    | -55.00              | 4.82                   | -50.18               | -13.00      | -37.18      |
| 3394.00         | H                    | -52.23              | 8.76                   | -43.46               | -13.00      | -30.46      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 850 / TX / CH 251**Test Date:** October 15, 2010**Temperature:** 25C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 1700.00         | V                    | -55.17              | 1.64                   | -53.53               | -13.00      | -40.53      |
| 1924.00         | V                    | -53.92              | 1.78                   | -52.13               | -13.00      | -39.13      |
| 2547.00         | V                    | -58.81              | 4.76                   | -54.05               | -13.00      | -41.05      |
| 3394.00         | V                    | -59.02              | 8.93                   | -50.08               | -13.00      | -37.08      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 1700.00         | H                    | -50.26              | 1.38                   | -48.88               | -13.00      | -35.88      |
| 1924.00         | H                    | -54.51              | 1.22                   | -53.29               | -13.00      | -40.29      |
| 2428.00         | H                    | -58.27              | 4.14                   | -54.14               | -13.00      | -41.14      |
| 2547.00         | H                    | -54.21              | 4.82                   | -49.38               | -13.00      | -36.38      |
| 3394.00         | H                    | -57.24              | 8.76                   | -48.48               | -13.00      | -35.48      |
| N/A             |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 850 / TX / CH 128**Test Date:** October 15, 2010**Temperature:** 25C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 3296.00         | V                    | -57.55              | 8.35                   | -49.21               | -13.00      | -36.21      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 1651.00         | H                    | -46.80              | 1.42                   | -45.38               | -13.00      | -32.38      |
| 2470.00         | H                    | -53.72              | 4.43                   | -49.29               | -13.00      | -36.29      |
| 3296.00         | H                    | -49.98              | 8.22                   | -41.76               | -13.00      | -28.76      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 850 / TX / CH 190**Test Date:** October 15, 2010**Temperature:** 25C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 1672.00         | V                    | -55.46              | 1.63                   | -53.84               | -13.00      | -40.84      |
| 2239.00         | V                    | -60.17              | 3.14                   | -57.03               | -13.00      | -44.03      |
| 2512.00         | V                    | -59.16              | 4.62                   | -54.54               | -13.00      | -41.54      |
| 3345.00         | V                    | -59.23              | 8.64                   | -50.59               | -13.00      | -37.59      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 1672.00         | H                    | -45.46              | 1.40                   | -44.06               | -13.00      | -31.06      |
| 2512.00         | H                    | -56.51              | 4.69                   | -51.83               | -13.00      | -38.83      |
| 3345.00         | H                    | -51.70              | 8.49                   | -43.20               | -13.00      | -30.20      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 850 / TX / CH 251**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 1700.00         | V                    | -55.95              | 1.64                   | -54.30               | -13.00      | -41.30      |
| 2547.00         | V                    | -59.44              | 4.76                   | -54.68               | -13.00      | -41.68      |
| 3394.00         | V                    | -59.09              | 8.93                   | -50.16               | -13.00      | -37.16      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 1700.00         | H                    | -46.45              | 1.38                   | -45.07               | -13.00      | -32.07      |
| 2547.00         | H                    | -54.55              | 4.82                   | -49.73               | -13.00      | -36.73      |
| 3394.00         | H                    | -53.54              | 8.76                   | -44.78               | -13.00      | -31.78      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 1900 / TX / CH 512**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 3702.00         | V                    | -56.19              | 9.11                   | -47.09               | -13.00      | -34.09      |
| 5550.00         | V                    | -55.48              | 10.32                  | -45.15               | -13.00      | -32.15      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 3702.00         | H                    | -50.12              | 8.89                   | -41.23               | -13.00      | -28.23      |
| 5550.00         | H                    | -55.48              | 10.12                  | -45.35               | -13.00      | -32.35      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 1900 / TX / CH 661**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 3758.00         | V                    | -57.26              | 8.98                   | -48.28               | -13.00      | -35.28      |
| 5641.00         | V                    | -55.55              | 10.40                  | -45.14               | -13.00      | -32.14      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 3758.00         | H                    | -49.38              | 8.76                   | -40.62               | -13.00      | -27.62      |
| 5641.00         | H                    | -54.24              | 10.23                  | -44.02               | -13.00      | -31.02      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GSM 1900 / TX / CH 810**Test Date:** October 15, 2010**Temperature:** 25C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 3821.00         | V                    | -57.37              | 8.83                   | -48.53               | -13.00      | -35.53      |
| 5732.00         | V                    | -56.26              | 10.48                  | -45.78               | -13.00      | -32.78      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 3821.00         | H                    | -51.65              | 8.62                   | -43.03               | -13.00      | -30.03      |
| 5732.00         | H                    | -57.58              | 10.33                  | -47.25               | -13.00      | -34.25      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 1900 / TX / CH 512**Test Date:** October 15, 2010**Temperature:** 25C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 3702.00         | V                    | -56.02              | 9.11                   | -46.91               | -13.00      | -33.91      |
| 5550.00         | V                    | -58.62              | 10.32                  | -48.29               | -13.00      | -35.29      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 3702.00         | H                    | -50.92              | 8.89                   | -42.03               | -13.00      | -29.03      |
| 5550.00         | H                    | -54.98              | 10.12                  | -44.85               | -13.00      | -31.85      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 1900 / TX / CH 661**Test Date:** October 15, 2010**Temperature:** 25C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 3758.00         | V                    | -57.31              | 8.98                   | -48.33               | -13.00      | -35.33      |
| 5641.00         | V                    | -57.35              | 10.40                  | -46.94               | -13.00      | -33.94      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 3758.00         | H                    | -50.24              | 8.76                   | -41.48               | -13.00      | -28.48      |
| 5641.00         | H                    | -58.27              | 10.23                  | -48.05               | -13.00      | -35.05      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Operation Mode:** GPRS 1900 / TX / CH 810**Test Date:** October 15, 2010**Temperature:** 25°C**Tested by:** David Lee**Humidity:** 45 % RH**Polarity:** Ver. / Hor.

| Frequency (MHz) | Antenna Polarization | Reading level (dBm) | Correction Factor (dB) | Emission level (dBm) | Limit (dBm) | Margin (dB) |
|-----------------|----------------------|---------------------|------------------------|----------------------|-------------|-------------|
| 3821.00         | V                    | -56.87              | 8.83                   | -48.04               | -13.00      | -35.04      |
| 5732.00         | V                    | -56.31              | 10.48                  | -45.82               | -13.00      | -32.82      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
| 3821.00         | H                    | -51.27              | 8.62                   | -42.66               | -13.00      | -29.66      |
| 5732.00         | H                    | -58.84              | 10.33                  | -48.51               | -13.00      | -35.51      |
| N/A             |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |
|                 |                      |                     |                        |                      |             |             |

**Remark:**

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.



# **APPENDIX 1**

## **PHOTOGRAPHS OF TEST SETUP**

### **RADIATED EMISSION SET UP PHOTOS**

